START

Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

Volume: 1210 Issues: 1-2

PATENT: 5,745,916 - 5,752,275

Date: MAY 5-12, 1998

UMI Number: 10426.00

Note: REEL NO: 8

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

OL

210

SS

1

MY

5

998

MI

ute to:

U.S.
DEPARTMENT
OF COMMERCE

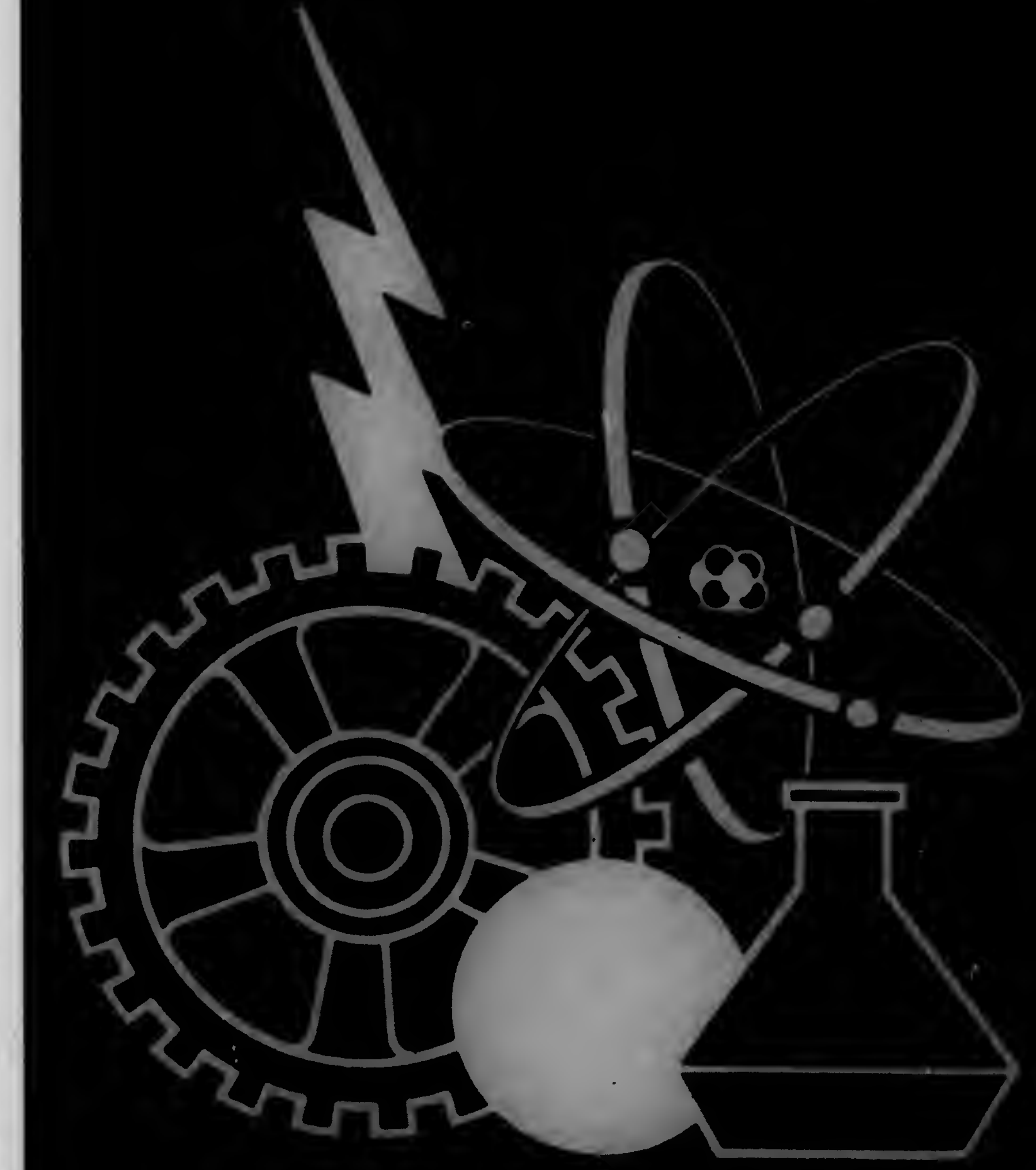
Patent
and
Trademark
Office

Vol. 1210 Number 1

OFFICIAL GAZETTE
of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 5, 1998



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
May 5, 1998 Volume 1210 Number 1

CONTENTS

Page

Patent and Trademark Office Notices

- Patent Cooperation Treaty (PCT) Information .... 1210 OG 3
- Notice of Maintenance Fees Payable .... 1210 OG 3
- Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee .... 1210 OG 4
- Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 02/13/98 .... 1210 OG 11
- Reissue Applications Filed .... 1210 OG 12
- Requests for Reexamination Filed .... 1210 OG 12
- Notice of Expiration of Trademark Registrations Due To Failure to Renew .... 1210 OG 12
- Notice Regarding Technical Center Box Issue Fee Mailings .... 1210 OG 14
- Patent Terms Extended Under 35 U.S.C. § 156 .... 1210 OG 14
- Grant of Certificate of Interim Extension of the term of U.S. Patent No. 4,177,290: PROVIGIL .... 1210 OG 14
- Notice of Petition for Reinstatement .... 1210 OG 15
- Status of Certification Services .... 1210 OG 15
- Service by Publication .... 1210 OG 15
- Certificates of Correction .... 1210 OG 16
- Summary of Final Decisions Issued by the Trademark Trial and Appeal Board .... 1210 OG 17

Special Boxes for Mail .... 1210 OG 20
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries .... 1210 OG 22
Patent Examining Corps .... 1210 OG 24
Condition of Trademark Applications .... 1210 OG 25
Reexaminations 1
Statutory Invention Registrations 5
Reissue Patents Granted (35,780) 7
Plant Patents Granted (10,370) 11
Patents Granted May 5, 1998—Errata 13
Patents Granted
- General and Mechanical (5,745,916) 15
- Chemical (5,746,775) 309
- Electrical (5,747,665) 561

Design Patents Granted (393,935) 1041
Index of Patentees .... PI 1
Indices of Reissue, Reexaminations, Design and Plant Patents .... PI 156
Classification of
- Patents (Including Reissues and Reexaminations) .... PI 165
- Designs and Plants Applications .... PI 171

Statutory Invention Registrations 171
Geographical Index of Residence of Inventors
- Patents (Including Reissues and Reexaminations) .... PI 173
- Designs and Plant Applications .... PI 176

Statutory Invention Registrations 176
Change of Address Form .... PI 177
Subscription Order Form .... PI 179

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202) 512-1800.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP; Washington, DC 20402–9328

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1250.00
International fees	
Basic fee	455.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	105.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	105.00
— Confirmation fee	52.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	49.00	98.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	360.00	720.00
USPTO was ISA but not IPEA	395.00	790.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	535.00	1070.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	465.00	930.00
Other National fees		
— For each independent claim in excess of 3	41.00	82.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	135.00	270.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 10, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 2, 1995 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,410,755 through 5,412,809
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 30, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,010,589 through 5,012,524
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 28, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,660,223 through 4,662,004
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $525.00
By other than a small entity.................................$1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,050.00
By other than a small entity.................................$2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,580.00
By other than a small entity.................................$3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity....................................$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional...$1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED February 25, 1998
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,443	07/157,572	11/20/90
(4,571,865)	(06/537,530)	(02/25/86)
4,571,744	06/603,298	02/25/86
4,571,750	06/581,949	02/25/86
4,571,754	06/477,600	02/25/86
4,571,755	06/571,000	02/25/86
4,571,759	06/547,761	02/25/86
4,571,768	06/640,688	02/25/86
4,571,770	06/658,615	02/25/86
4,571,779	06/491,179	02/25/86
4,571,796	06/674,686	02/25/86
4,571,802	06/605,351	02/25/86
4,571,803	06/620,745	02/25/86
4,571,806	06/624,819	02/25/86
4,571,810	06/574,347	02/25/86
4,571,821	06/526,719	02/25/86
4,571,822	06/557,005	02/25/86
4,571,831	06/636,429	02/25/86
4,571,844	06/502,087	02/25/86
4,571,846	06/689,899	02/25/86
4,571,851	06/634,819	02/25/86
4,571,853	06/616,856	02/25/86
4,571,855	06/553,888	02/25/86
4,571,859	06/689,558	02/25/86
4,571,862	06/654,816	02/25/86
4,571,864	06/668,021	02/25/86
4,571,868	06/643,774	02/25/86
4,571,869	06/589,466	02/25/86
4,571,881	06/520,846	02/25/86
4,571,884	06/568,639	02/25/86
4,571,887	06/593,397	02/25/86
4,571,889	06/573,673	02/25/86
4,571,893	06/593,421	02/25/86
4,571,898	06/447,637	02/25/86
4,571,899	06/489,514	02/25/86
4,571,904	06/539,580	02/25/86
4,571,905	06/600,178	02/25/86
4,571,916	06/558,729	02/25/86
4,571,927	06/572,747	02/25/86
4,571,931	06/673,020	02/25/86
4,571,940	06/693,814	02/25/86
4,571,941	06/333,555	02/25/86
4,571,947	06/611,393	02/25/86
4,571,959	06/741,962	02/25/86
4,571,960	06/431,766	02/25/86
4,571,969	06/532,415	02/25/86
4,571,971	06/638,260	02/25/86
4,571,978	06/579,977	02/25/86
4,571,979	06/687,224	02/25/86
4,571,981	06/590,006	02/25/86
4,571,985	06/552,883	02/25/86
4,571,993	06/583,926	02/25/86
4,571,996	06/639,560	02/25/86
4,572,024	06/637,767	02/25/86
4,572,026	06/529,470	02/25/86
4,572,032	06/747,124	02/25/86
4,572,036	06/718,203	02/25/86
4,572,041	06/732,581	02/25/86
4,572,042	06/624,734	02/25/86
4,572,050	06/553,554	02/25/86
4,572,054	06/583,601	02/25/86

Patent Number	Serial Number	Issue Date
4,572,056	06/669,443	02/25/86
4,572,061	06/559,230	02/25/86
4,572,062	06/689,424	02/25/86
4,572,064	06/613,096	02/25/86
4,572,067	06/676,183	02/25/86
4,572,069	06/707,503	02/25/86
4,572,072	06/447,949	02/25/86
4,572,077	06/670,118	02/25/86
4,572,079	06/643,865	02/25/86
4,572,085	06/698,705	02/25/86
4,572,088	06/708,852	02/25/86
4,572,091	06/553,065	02/25/86
4,572,092	06/534,516	02/25/86
4,572,106	06/677,840	02/25/86
4,572,108	06/619,300	02/25/86
4,572,117	06/712,017	02/25/86
4,572,144	06/593,310	02/25/86
4,572,148	06/629,582	02/25/86
4,572,151	06/635,180	02/25/86
4,572,160	06/686,075	02/25/86
4,572,166	06/494,371	02/25/86
4,572,170	06/617,693	02/25/86
4,572,192	06/534,367	02/25/86
4,572,214	06/328,581	02/25/86
4,572,220	06/509,641	02/25/86
4,572,222	06/407,738	02/25/86
4,572,224	06/664,161	02/25/86
4,572,228	06/685,540	02/25/86
4,572,232	06/636,311	02/25/86
4,572,238	06/573,928	02/25/86
4,572,243	06/511,908	02/25/86
4,572,254	06/588,210	02/25/86
4,572,259	06/609,127	02/25/86
4,572,277	06/705,552	02/25/86
4,572,287	06/604,149	02/25/86
4,572,290	06/577,144	02/25/86
4,572,293	06/646,617	02/25/86
4,572,294	06/610,556	02/25/86
4,572,296	06/653,027	02/25/86
4,572,303	06/512,543	02/25/86
4,572,306	06/679,547	02/25/86
4,572,307	06/591,783	02/25/86
4,572,310	06/635,570	02/25/86
4,572,314	06/602,835	02/25/86
4,572,318	06/618,355	02/25/86
4,572,319	06/657,191	02/25/86
4,572,321	06/357,325	02/25/86
4,572,322	06/506,962	02/25/86
4,572,325	06/546,195	02/25/86
4,572,328	06/711,733	02/25/86
4,572,336	06/505,596	02/25/86
4,572,337	06/597,157	02/25/86
4,572,348	06/551,738	02/25/86
4,572,354	06/606,181	02/25/86
4,572,355	06/657,135	02/25/86
4,572,376	06/615,742	02/25/86
4,572,379	06/624,347	02/25/86
4,572,392	06/736,273	02/25/86
4,572,403	06/575,824	02/25/86
4,572,404	06/578,627	02/25/86
4,572,412	06/638,727	02/25/86
4,572,422	06/655,104	02/25/86
4,572,434	06/559,679	02/25/86
4,572,437	06/484,281	02/25/86
4,572,440	06/274,804	02/25/86
4,572,446	06/592,835	02/25/86
4,572,447	06/648,895	02/25/86
4,572,452	06/674,231	02/25/86
4,572,455	06/626,977	02/25/86
4,572,459	06/585,971	02/25/86
4,572,469	06/710,288	02/25/86
4,572,470	06/305,487	02/25/86
4,572,474	06/585,973	02/25/86
4,572,475	06/691,903	02/25/86
4,572,479	06/622,187	02/25/86
4,572,483	06/616,188	02/25/86
4,572,499	06/615,041	02/25/86
4,572,501	06/510,323	02/25/86
4,572,516	06/743,915	02/25/86
4,572,521	06/643,570	02/25/86
4,572,522	06/730,585	02/25/86
4,572,527	06/599,061	02/25/86
4,572,532	06/633,966	02/25/86
4,572,536	06/498,324	02/25/86
4,572,537	06/652,655	02/25/86
4,572,542	06/453,919	02/25/86
4,572,544	06/605,774	02/25/86
4,572,548	06/539,074	02/25/86
4,572,558	06/584,008	02/25/86
4,572,570	06/620,971	02/25/86
4,572,571	06/619,629	02/25/86
4,572,575	06/423,582	02/25/86
4,572,577	06/639,844	02/25/86
4,572,588	06/583,941	02/25/86
4,572,589	06/717,961	02/25/86
4,572,592	06/628,882	02/25/86
4,572,593	06/619,822	02/25/86
4,572,594	06/578,221	02/25/86
4,572,603	06/625,997	02/25/86
4,572,606	06/674,138	02/25/86
4,572,607	06/604,209	02/25/86
4,572,610	06/612,426	02/25/86
4,572,613	06/616,360	02/25/86
4,572,619	06/574,084	02/25/86
4,572,625	06/606,399	02/25/86
4,572,626	06/558,177	02/25/86
4,572,630	06/585,092	02/25/86
4,572,651	06/378,173	02/25/86
4,572,660	06/586,834	02/25/86
4,572,671	06/514,296	02/25/86
4,572,675	06/622,989	02/25/86
4,572,683	06/565,186	02/25/86
4,572,693	06/679,312	02/25/86
4,572,712	06/627,753	02/25/86
4,572,720	06/528,572	02/25/86
4,572,721	06/618,463	02/25/86
4,572,725	06/675,845	02/25/86
4,572,727	06/599,046	02/25/86
4,572,732	06/634,300	02/25/86
4,572,737	06/624,867	02/25/86
4,572,741	06/565,612	02/25/86
4,572,744	06/422,080	02/25/86
4,572,748	06/722,763	02/25/86
4,572,749	06/587,297	02/25/86
4,572,750	06/624,290	02/25/86
4,572,755	06/427,186	02/25/86
4,572,781	06/584,955	02/25/86
4,572,783	06/695,680	02/25/86
4,572,784	06/659,674	02/25/86
4,572,789	06/592,743	02/25/86
4,572,794	06/453,047	02/25/86
4,572,799	06/723,600	02/25/86
4,572,804	06/682,528	02/25/86
4,572,808	06/629,279	02/25/86
4,572,810	06/651,499	02/25/86
4,572,816	06/564,056	02/25/86
4,572,822	06/587,387	02/25/86
4,572,824	06/667,027	02/25/86
4,572,827	06/594,150	02/25/86
4,572,828	06/701,425	02/25/86
4,572,836	06/675,951	02/25/86
4,572,839	06/726,941	02/25/86
4,572,841	06/687,365	02/25/86
4,572,845	06/620,890	02/25/86
4,572,848	06/635,201	02/25/86
4,572,857	06/698,718	02/25/86
4,572,858	06/674,431	02/25/86
4,572,859	06/722,762	02/25/86
4,572,863	06/759,726	02/25/86
4,572,867	06/545,663	02/25/86
4,572,868	06/600,963	02/25/86
4,572,876	06/718,773	02/25/86
4,572,879	06/482,994	02/25/86
4,572,883	06/619,109	02/25/86
4,572,895	06/690,283	02/25/86
4,572,897	06/539,305	02/25/86

Patent Number	Serial Number	Issue Date
4,572,901	06/507,430	02/25/86
4,572,902	06/698,940	02/25/86
4,572,906	06/656,851	02/25/86
4,572,916	06/553,867	02/25/86
4,572,918	06/766,621	02/25/86
4,572,919	06/702,995	02/25/86
4,572,923	06/547,437	02/25/86
4,572,924	06/495,742	02/25/86
4,572,927	06/473,484	02/25/86
4,572,935	06/702,724	02/25/86
4,572,938	06/571,215	02/25/86
4,572,945	06/675,281	02/25/86
4,572,946	06/609,783	02/25/86
4,572,947	06/615,019	02/25/86
4,572,958	06/646,392	02/25/86
4,572,961	06/601,514	02/25/86
4,572,967	06/415,070	02/25/86
4,572,975	06/595,905	02/25/86
4,572,977	06/560,953	02/25/86
4,572,981	06/640,737	02/25/86
4,572,982	06/557,987	02/25/86
4,572,984	06/600,049	02/25/86
4,572,990	06/554,185	02/25/86
4,572,992	06/616,165	02/25/86
4,572,995	06/638,867	02/25/86
4,573,002	06/637,220	02/25/86
4,573,005	06/573,768	02/25/86
4,573,016	06/576,926	02/25/86
4,573,019	06/588,818	02/25/86
4,573,023	06/638,631	02/25/86
4,573,025	06/595,841	02/25/86
4,573,026	06/584,668	02/25/86
4,573,029	06/598,782	02/25/86
4,573,035	06/634,398	02/25/86
4,573,057	06/708,056	02/25/86
4,573,059	06/706,395	02/25/86
4,573,060	06/537,332	02/25/86
4,573,062	06/708,947	02/25/86
4,573,064	06/317,367	02/25/86
4,573,065	06/448,631	02/25/86
4,573,067	06/587,018	02/25/86
4,573,071	06/497,492	02/25/86
4,573,077	06/647,170	02/25/86
4,573,078	06/718,366	02/25/86
4,573,079	06/461,739	02/25/86
4,573,085	06/489,304	02/25/86
4,573,098	06/545,252	02/25/86
4,573,105	06/466,912	02/25/86
4,573,109	06/661,185	02/25/86
4,573,115	06/546,622	02/25/86
4,573,128	06/480,988	02/25/86
4,573,129	06/645,512	02/25/86
4,573,131	06/528,268	02/25/86
4,573,132	06/488,449	02/25/86
4,573,138	06/440,235	02/25/86
4,573,139	06/415,744	02/25/86
4,573,141	06/599,683	02/25/86
4,573,142	06/403,195	02/25/86
4,573,150	06/633,866	02/25/86
4,573,155	06/561,502	02/25/86
4,573,163	06/417,568	02/25/86
4,573,168	06/646,269	02/25/86
4,573,169	06/560,767	02/25/86
4,573,175	06/531,328	02/25/86
4,573,180	06/644,079	02/25/86
4,573,181	06/455,842	02/25/86
4,573,184	06/655,073	02/25/86
4,573,190	06/448,443	02/25/86
4,573,192	06/570,965	02/25/86
4,573,199	06/608,608	02/25/86
4,573,200	06/453,018	02/25/86
4,573,201	06/556,431	02/25/86
4,573,202	06/572,449	02/25/86
4,573,213	06/507,886	02/25/86
4,573,215	06/582,208	02/25/86
4,901,382	07/221,756	02/20/90
4,901,384	07/284,350	02/20/90
4,901,385	07/364,245	02/20/90
4,901,386	07/305,467	02/20/90
4,901,390	07/248,613	02/20/90
4,901,395	07/316,128	02/20/90
4,901,397	07/318,184	02/20/90
4,901,402	07/321,785	02/20/90
4,901,410	07/018,645	02/20/90
4,901,411	07/232,807	02/20/90
4,901,418	07/278,443	02/20/90
4,901,422	07/165,461	02/20/90
4,901,432	07/316,129	02/20/90
4,901,434	06/878,027	02/20/90
4,901,435	07/274,482	02/20/90
4,901,436	07/184,310	02/20/90
4,901,434	06/878,027	02/20/90
4,901,441	07/158,860	02/20/90
4,901,442	07/238,815	02/20/90
4,901,444	07/181,405	02/20/90
4,901,445	07/339,506	02/20/90
4,901,451	07/179,801	02/20/90
4,901,454	07/243,290	02/20/90
4,901,455	07/184,781	02/20/90
4,901,457	07/107,272	02/20/90
4,901,459	07/125,187	02/20/90
4,901,462	07/098,605	02/20/90
4,901,466	07/189,538	02/20/90
4,901,473	07/109,398	02/20/90
4,901,476	07/229,980	02/20/90
4,901,499	07/336,073	02/20/90
4,901,504	07/180,896	02/20/90
4,901,511	07/257,429	02/20/90
4,901,519	07/380,132	02/20/90
4,901,520	07/231,774	02/20/90
4,901,521	07/316,935	02/20/90
4,901,526	07/300,419	02/20/90
4,901,536	07/277,556	02/20/90
4,901,542	06/673,848	02/20/90
4,901,546	06/862,003	02/20/90
4,901,555	07/245,664	02/20/90
4,901,542	06/673,848	02/20/90
4,901,546	06/862,003	02/20/90
4,901,569	07/241,716	02/20/90
4,901,570	07/304,057	02/20/90
4,901,578	07/196,719	02/20/90
4,901,579	07/269,783	02/20/90
4,901,580	07/251,751	02/20/90
4,901,581	07/302,986	02/20/90
4,901,585	07/277,967	02/20/90
4,901,589	07/251,710	02/20/90
4,901,595	07/086,865	02/20/90
4,901,600	07/262,419	02/20/90
4,901,606	07/208,722	02/20/90
4,901,608	07/315,565	02/20/90
4,901,617	07/328,536	02/20/90
4,901,618	07/286,963	02/20/90
4,901,623	06/667,105	02/20/90
4,901,628	06/785,679	02/20/90
4,901,632	07/126,188	02/20/90
4,901,623	06/667,105	02/20/90
4,901,628	06/785,679	02/20/90
4,901,641	07/278,031	02/20/90
4,901,644	07/332,851	02/20/90
4,901,638	06/866,562	02/20/90
4,901,647	07/177,372	02/20/90
4,901,649	07/278,544	02/20/90
4,901,657	07/220,540	02/20/90
4,901,669	07/047,328	02/20/90
4,901,673	07/320,582	02/20/90
4,901,674	07/217,908	02/20/90
4,901,675	07/331,002	02/20/90
4,901,678	07/267,096	02/20/90
4,901,679	07/323,296	02/20/90
4,901,680	06/649,141	02/20/90
4,901,686	07/354,601	02/20/90
4,901,688	07/313,063	02/20/90
4,901,680	06/649,141	02/20/90
4,901,695	07/260,337	02/20/90
4,901,698	07/304,386	02/20/90
4,901,702	07/300,431	02/20/90

Patent Number	Serial Number	Issue Date
4,901,703	07/195,357	02/20/90
4,901,704	07/191,876	02/20/90
4,901,709	07/214,048	02/20/90
4,901,713	07/202,824	02/20/90
4,901,721	07/227,230	02/20/90
4,901,722	07/349,931	02/20/90
4,901,736	07/202,419	02/20/90
4,901,738	07/285,324	02/20/90
4,901,742	07/187,331	02/20/90
4,901,744	07/231,781	02/20/90
4,901,753	07/378,467	02/20/90
4,901,761	07/254,147	02/20/90
4,901,762	07/251,736	02/20/90
4,901,763	07/283,830	02/20/90
4,901,773	07/260,579	02/20/90
4,901,774	07/345,867	02/20/90
4,901,775	07/303,463	02/20/90
4,901,780	07/225,208	02/20/90
4,901,782	07/351,447	02/20/90
4,901,784	07/330,049	02/20/90
4,901,788	07/190,119	02/20/90
4,901,789	07/170,748	02/20/90
4,901,791	07/223,984	02/20/90
4,901,796	07/286,174	02/20/90
4,901,798	07/226,264	02/20/90
4,901,800	07/216,962	02/20/90
4,901,803	07/211,875	02/20/90
4,901,804	07/232,471	02/20/90
4,901,809	07/325,265	02/20/90
4,901,812	07/272,023	02/20/90
4,901,820	07/250,463	02/20/90
4,901,829	07/169,325	02/20/90
4,901,832	07/224,916	02/20/90
4,901,839	07/316,629	02/20/90
4,901,841	07/037,608	02/20/90
4,901,848	07/269,061	02/20/90
4,901,852	07/341,877	02/20/90
4,901,853	07/358,404	02/20/90
4,901,855	07/278,009	02/20/90
4,901,856	07/121,104	02/20/90
4,901,860	06/632,432	02/20/90
4,901,862	07/241,429	02/20/90
4,901,869	07/236,742	02/20/90
4,901,860	06/632,432	02/20/90
4,901,878	07/239,699	02/20/90
4,901,882	07/314,106	02/20/90
4,901,886	07/193,848	02/20/90
4,901,887	07/229,397	02/20/90
4,901,891	07/038,747	02/20/90
4,901,893	07/229,332	02/20/90
4,901,894	07/222,789	02/20/90
4,901,898	07/244,027	02/20/90
4,901,900	07/182,894	02/20/90
4,901,910	07/329,122	02/20/90
4,901,911	07/240,513	02/20/90
4,901,913	07/378,540	02/20/90
4,901,915	07/235,545	02/20/90
4,901,920	07/309,703	02/20/90
4,901,921	07/314,231	02/20/90
4,901,925	07/057,037	02/20/90
4,901,932	07/240,945	02/20/90
4,901,934	07/182,773	02/20/90
4,901,938	07/274,465	02/20/90
4,901,942	07/095,435	02/20/90
4,901,950	07/242,500	02/20/90
4,901,951	07/215,139	02/20/90
4,901,954	07/230,420	02/20/90
4,901,955	07/311,804	02/20/90
4,901,962	07/284,351	02/20/90
4,901,969	07/241,048	02/20/90
4,901,972	07/321,513	02/20/90
4,901,973	07/359,369	02/20/90
4,901,977	07/360,779	02/20/90
4,901,980	07/044,819	02/20/90
4,901,985	07/269,924	02/20/90
4,901,990	07/054,309	02/20/90
4,901,991	07/141,327	02/20/90
4,901,998	07/327,683	02/20/90
4,901,999	07/269,077	02/20/90
4,902,004	07/250,172	02/20/90
4,902,005	07/279,025	02/20/90
4,902,012	07/142,528	02/20/90
4,902,016	07/229,265	02/20/90
4,902,017	07/377,335	02/20/90
4,902,019	07/285,429	02/20/90
4,902,020	07/227,868	02/20/90
4,902,022	07/291,910	02/20/90
4,902,025	07/268,510	02/20/90
4,902,028	07/245,465	02/20/90
4,902,032	07/290,651	02/20/90
4,902,035	07/289,043	02/20/90
4,902.040	07/100,819	02/20/90
4,902,046	07/073,656	02/20/90
4,902,050	07/232,142	02/20/90
4,902,052	07/225,894	02/20/90
4,902,055	07/303,464	02/20/90
4,902,057	07/380,538	02/20/90
4,902,060	07/309,483	02/20/90
4,902,063	07/272,963	02/20/90
4,902,065	07/313,907	02/20/90
4,902,070	07/244,430	02/20/90
4,902,072	07/323,835	02/20/90
4,902,073	07/263,009	02/20/90
4,902,074	07/302,776	02/20/90
4,902,080	07/295,222	02/20/90
4,902,085	07/201,076	02/20/90
4,902,087	07/245,593	02/20/90
4,902,088	07/170,141	02/20/90
4,902,093	07/223,033	02/20/90
4,902,094	07/233,388	02/20/90
4,902,098	07/263,098	02/20/90
4,902,103	07/230,804	02/20/90
4,902,114	07/226,378	02/20/90
4,902,116	07/199,537	02/20/90
4,902,119	07/239,196	02/20/90
4,902,121	07/253,005	02/20/90
4,902,122	07/213,122	02/20/90
4,902,124	07/242,431	02/20/90
4,902,132	07/205,725	02/20/90
4,902,137	07/152,329	02/20/90
4,902,139	07/180,919	02/20/90
4,902,140	07/334,696	02/20/90
4,902,142	07/190,543	02/20/90
4,902,146	07/223,509	02/20/90
4,902,147	07/140,767	02/20/90
4,902,148	07/227,536	02/20/90
4,902,150	07/338,430	02/20/90
4,902,153	07/102,661	02/20/90
4,902,160	07/309,876	02/20/90
4,902,161	07/214,666	02/20/90
4,902,164	07/212,436	02/20/90
4,902,165	07/157,912	02/20/90
4,902,167	07/318,627	02/20/90
4,902,181	07/308,614	02/20/90
4,902,182	07/254,405	02/20/90
4,902,183	07/346,918	02/20/90
4,902,184	07/214,538	02/20/90
4,902,186	07/282,202	02/20/90
4,902,187	07/237,339	02/20/90
4,902,191	06/806,868	02/20/90
4,902,193	07/230,744	02/20/90
4,902,198	07/238,942	02/20/90
4,902,191	06/806,868	02/20/90
4,902,207	07/289,924	02/20/90
4,902,212	07/279,766	02/20/90
4,902,219	07/160,162	02/20/90
4,902,220	07/219,157	02/20/90
4,902,221	07/048,794	02/20/90
4,902,223	07/209,456	02/20/90
4,902,225	07/249,902	02/20/90
4,902,226	07/188,498	02/20/90
4,902,232	07/246,340	02/20/90
4,902,254	07/248,741	02/20/90
4,902,255	07/305,937	02/20/90
4,902,258	06/792,998	02/20/90
4,902.269	07/155,924	02/20/90

Patent Number	Serial Number	Issue Date
4,902,274	07/255,480	02/20/90
4,902,258	06/792,998	02/20/90
4,902,281	07/232,915	02/20/90
4,902,293	07/337,260	02/20/90
4,902,294	07/124,856	02/20/90
4,902,306	07/230,075	02/20/90
4,902,311	07/256,955	02/20/90
4,902,313	07/334,821	02/20/90
4,902,318	07/201,242	02/20/90
4,902,326	07/266,034	02/20/90
4,902,328	07/268,654	02/20/90
4,902,329	07/223,169	02/20/90
4,902,330	07/228,780	02/20/90
4,902,333	07/114,952	02/20/90
4,902,334	06/666,633	02/20/90
4,902,336	07/245,601	02/20/90
4,902,339	07/238,099	02/20/90
4,902,334	06/666,633	02/20/90
4,902,348	07/256,885	02/20/90
4,902,349	07/100,097	02/20/90
4,902,357	07/188,393	02/20/90
4,902,361	06/827,911	02/20/90
4,902,365	07/128,289	02/20/90
4,902,374	07/188,884	02/20/90
4,902,361	06/827,911	02/20/90
4,902,399	07/337,007	02/20/90
4,902,407	07/204,318	02/20/90
4,902,421	07/201,284	02/20/90
4,902,430	07/303,414	02/20/90
4,902,438	07/190,595	02/20/90
4,902,439	07/181,797	02/20/90
4,902,445	07/185,468	02/20/90
4,902,450	07/250,195	02/20/90
4,902,451	06/668,171	02/20/90
4,902,452	07/078,510	02/20/90
4,902,454	07/219,286	02/20/90
4,902,451	06/668,171	02/20/90
4,902,467	07/238,659	02/20/90
4,902,469	07/217,117	02/20/90
4,902,472	07/208,784	02/20/90
4,902,473	07/122,570	02/20/90
4,902,474	07/293,035	02/20/90
4,902,475	07/102,839	02/20/90
4,902,482	07/078,862	02/20/90
4,902,484	07/150,448	02/20/90
4,902,485	07/275,299	02/20/90
4,902,489	07/273,088	02/20/90
4,902,494	07/357,675	02/20/90
4,902,495	06/888,059	02/20/90
4,902,498	07/200,996	02/20/90
4,902,499	07/031,480	02/20/90
4,902,495	06/888,059	02/20/90
4,902,501	07/061,302	02/20/90
4,902,505	07/185,702	02/20/90
4,902,516	07/178,107	02/20/90
4,902,526	07/211,636	02/20/90
4,902,529	07/275,870	02/20/90
4,902,535	07/139,891	02/20/90
4,902,537	07/232,648	02/20/90
4,902,538	07/221,592	02/20/90
4,902,542	07/077,041	02/20/90
4,902,572	07/183,132	02/20/90
4,902,575	07/288,177	02/20/90
4,902,576	06/919,455	02/20/90
4,902,587	07/295,905	02/20/90
4,902,589	07/204,072	02/20/90
4,902,576	06/919,455	02/20/90
4,902,598	07/214,351	02/20/90
4,902,603	07/104,697	02/20/90
4,902,605	07/077,715	02/20/90
4,902,617	07/055,269	02/20/90
4,902,618	06/840,136	02/20/90
4,902,620	06/726,876	02/20/90
4,902,621	07/093,936	02/20/90
4,902,618	06/840,136	02/20/90
4,902,620	06/726,876	02/20/90
4,902,630	07/219,618	02/20/90
4,902,652	07/216,307	02/20/90
4,902,627	06/698,476	02/20/90
4,902,655	07/121,012	02/20/90
4,902,661	07/294,833	02/20/90
4,902,673	07/270,469	02/20/90
4,902,677	07/159,747	02/20/90
4,902,687	07/328,848	02/20/90
4,902,692	07/169,665	02/20/90
4,902,694	07/231,310	02/20/90
4,902,697	07/089,303	02/20/90
4,902,698	07/178,663	02/20/90
4,902,703	07/141,879	02/20/90
4,902,704	06/936,416	02/20/90
4,902,710	07/284,501	02/20/90
4,902,718	07/179,258	02/20/90
4,902,704	06/936,416	02/20/90
4,902,726	07/192,785	02/20/90
4,902,734	07/082,894	02/20/90
4,902,742	07/243,929	02/20/90
4,902,746	07/283,672	02/20/90
4,902,748	07/166,452	02/20/90
4,902,752	07/104,686	02/20/90
4,902,755	07/253,694	02/20/90
4,902,757	07/253,691	02/20/90
4,902,760	07/262,872	02/20/90
4,902,764	07/157,559	02/20/90
4,902,781	07/273,944	02/20/90
4,902,786	07/196,323	02/20/90
4,902,788	07/250,653	02/20/90
4,902,795	07/272,619	02/20/90
4,902,797	07/135,061	02/20/90
4,902,798	07/126,596	02/20/90
4,902,805	06/820,948	02/20/90
4,902,806	07/261,946	02/20/90
4,902,811	07/208,728	02/20/90
4,902,805	06/820,948	02/20/90
4,902,831	07/118,126	02/20/90
4,902,845	07/274,444	02/20/90
4,902,851	07/234,719	02/20/90
4,902,861	07/326,825	02/20/90
4,902,865	07/273,755	02/20/90
4,902,868	07/129,145	02/20/90
4,902,876	07/253,293	02/20/90
4,902,882	07/099,924	02/20/90
4,902,883	07/149,453	02/20/90
4,902,885	07/286,008	02/20/90
4,902,887	07/359,249	02/20/90
4,902,891	07/202,093	02/20/90
4,902,894	06/912,885	02/20/90
4,902,902	07/049,235	02/20/90
4,902,904	07/279,220	02/20/90
4,902,894	06/912,885	02/20/90
4,902,908	07/146,160	02/20/90
4,902,916	07/270,880	02/20/90
4,902,921	07/195,286	02/20/90
4,902,930	07/261,207	02/20/90
4,902,931	07/168,439	02/20/90
4,902,932	07/317,087	02/20/90
4,902,934	07/192,130	02/20/90
4,902,943	07/357,620	02/20/90
4,902,950	07/247,442	02/20/90
4,902,952	07/355,136	02/20/90
4,902,953	07/234,183	02/20/90
4,902,954	07/196,199	02/20/90
4,902,957	07/344,182	02/20/90
4,902,960	07/310,226	02/20/90
4,902,963	07/295,500	02/20/90
4,902,967	07/353,722	02/20/90
4,902,975	06/641,726	02/20/90
4,902,977	07/295,720	02/20/90
4,902,978	07/295,089	02/20/90
4,902,975	06/641,726	02/20/90
4,902,992	07/182,290	02/20/90
4,902,993	07/290,259	02/20/90
4,902,994	07/242,393	02/20/90
4,902,997	07/357,782	02/20/90
4,902,998	07/274,103	02/20/90
4,903,002	07/173,351	02/20/90
4,903,016	07/215,414	02/20/90

Patent Number	Serial Number	Issue Date
4,903,023	07/174,253	02/20/90
4,903,024	07/111,765	02/20/90
4,903,030	07/075,679	02/20/90
4,903,032	07/215,709	02/20/90
4,903,043	07/124,878	02/20/90
4,903,044	07/312,912	02/20/90
4,903,049	07/398,874	02/20/90
4,903,050	07/375,163	02/20/90
4,903,051	07/222,704	02/20/90
4,903,053	07/296,476	02/20/90
4,903,055	07/303,614	02/20/90
4,903,058	07/363,558	02/20/90
4,903,073	07/346,285	02/20/90
4,903,074	07/336,992	02/20/90
4,903,076	07/357,718	02/20/90
4,903,078	07/178,699	02/20/90
4,903,085	07/177,460	02/20/90
4,903,087	07/286,818	02/20/90
4,903,098	07/273,123	02/20/90
4,903,103	07/263,203	02/20/90
4,903,116	07/384,850	02/20/90
4,903,146	07/281,790	02/20/90
4,903,163	07/349,736	02/20/90
4,903,167	07/208,576	02/20/90
4,903,171	07/364,527	02/20/90
4,903,177	07/343,890	02/20/90
4,903,184	07/203,140	02/20/90
4,903,187	07/339,736	02/20/90
4,903,198	06/430,201	02/20/90
4,903,217	07/013,843	02/20/90
4,903,220	07/148,974	02/20/90
4,903,198	06/430,201	02/20/90
4,903,224	07/168,777	02/20/90
4,903,230	07/214,893	02/20/90
4,903,232	07/066,466	02/20/90
4,903,253	07/306,219	02/20/90
4,903,266	07/187,708	02/20/90
4,903,276	07/187,981	02/20/90
4,903,278	07/265,571	02/20/90
4,903,280	07/240,387	02/20/90
4,903,281	07/225,435	02/20/90
4,903,286	07/125,314	02/20/90
4,903,290	07/222,910	02/20/90
4,903,294	07/301,965	02/20/90
4,903,296	06/930,219	02/20/90
4,903,300	07/342,042	02/20/90
4,903,309	07/198,799	02/20/90
4,903,296	06/930,219	02/20/90
4,903,332	07/163,272	02/20/90
4,903,333	07/274,736	02/20/90
4,903,338	07/368,134	02/20/90
4,903,339	07/209,144	02/20/90
4,903,340	07/172,326	02/20/90
4,903,344	07/215,624	02/20/90
5,287,559	07/900,112	02/22/94
5,287,563	07/884,011	02/22/94
5,287,568	07/986,623	02/22/94
5,287,569	07/973,658	02/22/94
5,287,570	07/841,537	02/22/94
5,287,575	07/973,407	02/22/94
5,287,578	07/984,552	02/22/94
5,287,579	07/953,159	02/22/94
5,287,581	07/970,183	02/22/94
5,287,586	07/865,864	02/22/94
5,287,588	07/836,471	02/22/94
5,287,593	08/022,675	02/22/94
5,287,596	07/824,882	02/22/94
5,287,601	07/921,329	02/22/94
5,287,609	08/074,787	02/22/94
5,287,611	07/977,108	02/22/94
5,287,616	07/950,716	02/22/94
5,287,624	08/000,013	02/22/94
5,287,625	08/027,659	02/22/94
5,287,626	07/976,530	02/22/94
5,287,630	07/753,803	02/22/94
5,287,632	07/557,283	02/22/94
5,287,636	08/008,133	02/22/94
5,287,639	07/989,663	02/22/94
5,287,642	07/881,619	02/22/94
5,287,643	08/010,288	02/22/94
5,287,644	07/959,645	02/22/94
5,287,646	07/992,163	02/22/94
5,287,651	07/648,965	02/22/94
5,287,653	07/917,836	02/22/94
5,287,657	07/887,684	02/22/94
5,287,664	07/967,435	02/22/94
5,287,666	07/703,650	02/22/94
5,287,672	07/686,045	02/22/94
5,287,680	07/926,233	02/22/94
5,287,682	07/944,217	02/22/94
5,287,684	07/960,691	02/22/94
5,287,689	07/926,639	02/22/94
5,287,695	07/979,521	02/22/94
5,287,697	07/816,694	02/22/94
5,287,701	07/984,893	02/22/94
5,287,708	08/013,161	02/22/94
5,287,714	07/805,109	02/22/94
5,287,722	07/800,641	02/22/94
5,287,723	07/881,262	02/22/94
5,287,727	07/901,286	02/22/94
5,287,733	07/765,151	02/22/94
5,287,739	07/937,677	02/22/94
5,287,751	07/969,601	02/22/94
5,287,757	07/846,371	02/22/94
5,287,759	07/909,971	02/22/94
5,287,764	07/910,259	02/22/94
5,287,774	07/875,073	02/22/94
5,287,775	07/947,341	02/22/94
5,287,781	07/727,066	02/22/94
5,287,782	07/947,390	02/22/94
5,287,784	07/893,054	02/22/94
5,287,785	08/012,765	02/22/94
5,287,787	07/925,793	02/22/94
5,287,788	07/828,036	02/22/94
5,287,797	08/012,679	02/22/94
5,287,798	08/052,643	02/22/94
5,287,803	08/031,705	02/22/94
5,287,804	07/709,326	02/22/94
5,287,807	07/946,085	02/22/94
5,287,817	08/017,010	02/22/94
5,287,823	08/017,748	02/22/94
5,287,825	07/993,703	02/22/94
5,287,826	08/064,371	02/22/94
5,287,827	07/761,252	02/22/94
5,287,842	08/005,152	02/22/94
5,287,844	08/018,170	02/22/94
5,287,846	07/958,330	02/22/94
5,287,858	07/949,908	02/22/94
5,287,862	07/764,315	02/22/94
5,287,864	07/956,119	02/22/94
5,287,865	08/044,759	02/22/94
5,287,869	08/103,545	02/22/94
5,287,874	08/036,829	02/22/94
5,287,880	07/824,506	02/22/94
5,287,891	07/850,723	02/22/94
5,287,892	08/034,497	02/22/94
5,287,895	07/871,522	02/22/94
5,287,899	07/939,991	02/22/94
5,287,900	07/978,824	02/22/94
5,287,904	08/058,582	02/22/94
5,287,917	08/017,791	02/22/94
5,287,927	07/974,140	02/22/94
5,287,931	07/910,285	02/22/94
5,287,935	07/987,789	02/22/94
5,287,942	07/979,311	02/22/94
5,287,945	07/986,611	02/22/94
5,287,946	07/906,484	02/22/94
5,287,948	07/793,845	02/22/94
5,287,950	07/859,474	02/22/94
5,287,951	07/938,373	02/22/94
5,287,963	07/747,528	02/22/94
5,287,965	08/077,421	02/22/94
5,287,967	07/970,449	02/22/94
5,287,970	07/867,196	02/22/94
5,287,972	07/817,287	02/22/94
5,287,974	07/945,002	02/22/94

Patent Number	Serial Number	Issue Date
5,287,979	07/720,515	02/22/94
5,287,980	07/899,728	02/22/94
5,287,982	08/063,812	02/22/94
5,287,989	07/954,551	02/22/94
5,287,991	07/930,111	02/22/94
5,287,995	07/865,559	02/22/94
5,288,002	07/664,363	02/22/94
5,288,005	07/941,205	02/22/94
5,288,009	07/980,160	02/22/94
5,288,010	07/730,788	02/22/94
5,288,013	08/000,838	02/22/94
5,288,017	07/985,582	02/22/94
5,288,020	08/038,504	02/22/94
5,288,024	07/791,859	02/22/94
5,288,028	07/942,942	02/22/94
5,288,038	07/954,581	02/22/94
5,288,044	08/093,870	02/22/94
5,288,045	08/097,158	02/22/94
5,288,046	07/774,042	02/22/94
5,288,050	07/802,484	02/22/94
5,288,053	08/068,796	02/22/94
5,288,055	08/034,927	02/22/94
5,288,058	07/993,690	02/22/94
5,288,061	07/843,615	02/22/94
5,288,071	07/985,335	02/22/94
5,288,075	07/823,627	02/22/94
5,288,082	08/044,282	02/22/94
5,288,084	07/983,039	02/22/94
5,288,085	08/041,862	02/22/94
5,288,089	08/043,347	02/22/94
5,288,090	08/018,150	02/22/94
5,288,092	08/030,728	02/22/94
5,288,095	08/013,081	02/22/94
5,288,096	08/059,257	02/22/94
5,288,104	07/973,971	02/22/94
5,288,106	07/780,981	02/22/94
5,288,114	07/864,794	02/22/94
5,288,118	08/020,708	02/22/94
5,288,119	07/964,670	02/22/94
5,288,129	07/871,397	02/22/94
5,288,131	07/670,023	02/22/94
5,288,133	07/953,928	02/22/94
5,288,136	07/837,369	02/22/94
5,288,137	07/872,594	02/22/94
5,288,138	07/954,583	02/22/94
5,288,144	07/811,072	02/22/94
5,288,146	07/769,122	02/22/94
5,288,150	08/002,911	02/22/94
5,288,152	07/980,511	02/22/94
5,288,167	07/968,445	02/22/94
5,288,170	07/947,046	02/22/94
5,288,177	07/964,561	02/22/94
5,288,186	07/948,403	02/22/94
5,288,190	07/914,984	02/22/94
5,288,194	07/943,876	02/22/94
5,288,195	07/854,682	02/22/94
5,288,197	07/831,560	02/22/94
5,288,205	07/589,230	02/22/94
5,288,208	08/069,744	02/22/94
5,288,213	07/978,628	02/22/94
5,288,217	07/820,193	02/22/94
5,288,225	07/991,433	02/22/94
5,288,233	08/046,132	02/22/94
5,288,234	08/015,304	02/22/94
5,288,243	07/818,869	02/22/94
5,288,255	07/966,779	02/22/94
5,288,257	08/014,742	02/22/94
5,288,260	07/945,898	02/22/94
5,288,262	07/806,372	02/22/94
5,288,265	07/982,560	02/22/94
5,288,274	07/910,724	02/22/94
5,288,275	08/017,606	02/22/94
5,288,276	08/029,012	02/22/94
5,288,280	07/934,778	02/22/94
5,288,284	07/989,866	02/22/94
5,288,285	08/018,291	02/22/94
5,288,295	08/015,261	02/22/94
5,288,296	07/456,238	02/22/94
5,288,302	07/895,310	02/22/94
5,288,305	07/884,198	02/22/94
5,288,311	07/950,151	02/22/94
5,288,312	08/023,280	02/22/94
5,288,315	07/808,388	02/22/94
5,288,321	07/916,003	02/22/94
5,288,324	07/992,563	02/22/94
5,288,335	07/901,915	02/22/94
5,288,342	07/816,636	02/22/94
5,288,353	07/822,905	02/22/94
5,288,359	07/927,125	02/22/94
5,288,362	08/005,045	02/22/94
5,288,373	08/075,864	02/22/94
5,288,383	07/491,475	02/22/94
5,288,386	07/913,927	02/22/94
5,288,391	07/787,162	02/22/94
5,288,394	07/907,320	02/22/94
5,288,399	07/936,835	02/22/94
5,288,412	07/818,678	02/22/94
5,288,413	07/887,720	02/22/94
5,288,415	07/826,775	02/22/94
5,288,422	08/031,740	02/22/94
5,288,426	07/601,026	02/22/94
5,288,442	07/900,435	02/22/94
5,288,447	08/020,968	02/22/94
5,288,449	07/904,189	02/22/94
5,288,472	08/014,621	02/22/94
5,288,483	08/020,003	02/22/94
5,288,484	07/884,964	02/22/94
5,288,521	07/840,663	02/22/94
5,288,524	07/847,462	02/22/94
5,288,535	07/982,113	02/22/94
5,288,538	07/992,271	02/22/94
5,288,554	08/028,489	02/22/94
5,288,563	07/835,391	02/22/94
5,288,576	07/980,641	02/22/94
5,288,613	07/802,698	02/22/94
5,288,617	07/767,369	02/22/94
5,288,621	07/629,104	02/22/94
5,288,626	07/539,302	02/22/94
5,288,631	07/822,353	02/22/94
5,288,640	07/716,131	02/22/94
5,288,680	07/888,248	02/22/94
5,288,684	07/673,812	02/22/94
5,288,685	08/035,334	02/22/94
5,288,694	07/979,758	02/22/94
5,288,701	07/723,996	02/22/94
5,288,704	07/830,330	02/22/94
5,288,706	08/019,347	02/22/94
5,288,709	07/743,424	02/22/94
5,288,712	07/957,116	02/22/94
5,288,714	07/954,287	02/22/94
5,288,718	08/080,985	02/22/94
5,288,719	08/006,858	02/22/94
5,288,732	08/040,827	02/22/94
5,288,733	07/979,756	02/22/94
5,288,735	07/899,176	02/22/94
5,288,741	07/922,022	02/22/94
5,288,742	07/853,277	02/22/94
5,288,743	07/979,138	02/22/94
5,288,749	07/811,091	02/22/94
5,288,752	07/980,238	02/22/94
5,288,758	07/918,424	02/22/94
5,288,759	07/936,436	02/22/94
5,288,763	07/995,793	02/22/94
5,288,787	07/714,317	02/22/94
5,288,800	07/996,945	02/22/94
5,288,807	07/724,691	02/22/94
5,288,808	07/979,345	02/22/94
5,288,810	07/999,617	02/22/94
5,288,821	07/907,085	02/22/94
5,288,825	07/968,475	02/22/94
5,288,834	08/036,868	02/22/94
5,288,845	07/879,470	02/22/94
5,288,848	07/978,174	02/22/94
5,288,851	07/925,702	02/22/94
5,288,876	07/916,749	02/22/94
5,288,885	07/971,875	02/22/94

Patent Number	Serial Number	Issue Date
5,288,887	07/978,788	02/22/94
5,288,899	08/085,235	02/22/94
5,288,900	08/030,076	02/22/94
5,288,904	08/056,976	02/22/94
5,288,905	07/761,111	02/22/94
5,288,913	08/100,895	02/22/94
5,288,915	07/992,519	02/22/94
5,288,929	07/834,555	02/22/94
5,288,953	07/875,650	02/22/94
5,288,955	08/097,307	02/22/94
5,288,960	07/863,447	02/22/94
5,288,964	07/986,740	02/22/94
5,288,973	07/990,020	02/22/94
5,288,986	07/946,209	02/22/94
5,288,995	08/011,795	02/22/94
5,289,012	07/877,893	02/22/94
5,289,083	07/715,749	02/22/94
5,289,092	07/740,269	02/22/94
5,289,104	07/979,565	02/22/94
5,289,106	07/655,384	02/22/94
5,289,107	07/968,642	02/22/94
5,289,130	07/923,324	02/22/94
5,289,131	07/943,395	02/22/94
5,289,134	07/866,311	02/22/94
5,289,145	07/934,523	02/22/94
5,289,150	07/752,307	02/22/94
5,289,155	07/855,642	02/22/94
5,289,158	07/858,612	02/22/94
5,289,160	07/769,937	02/22/94
5,289,163	07/945,371	02/22/94
5,289,165	07/858,037	02/22/94
5,289,169	07/648,291	02/22/94
5,289,176	07/853,960	02/22/94
5,289,177	07/582,640	02/22/94
5,289,182	07/818,293	02/22/94
5,289,189	07/889,970	02/22/94
5,289,194	07/904,109	02/22/94
5,289,206	07/773,428	02/22/94
5,289,218	08/005,773	02/22/94
5,289,221	07/984,697	02/22/94
5,289,223	07/775,917	02/22/94
5,289,241	07/822,978	02/22/94
5,289,278	07/838,049	02/22/94
5,289,304	08/046,254	02/22/94
5,289,308	07/988,999	02/22/94
5,289,309	08/006,608	02/22/94
5,289,319	07/960,034	02/22/94
5,289,323	07/834,965	02/22/94
5,289,345	07/545,041	02/22/94
5,289,348	07/979,056	02/22/94
5,289,352	07/834,275	02/22/94
5,289,355	08/002,311	02/22/94
5,289,362	07/452,285	02/22/94
5,289,366	07/856,211	02/22/94
5,289,367	07/651,380	02/22/94
5,289,381	08/017,407	02/22/94
5,289,385	07/710,195	02/22/94
5,289,389	07/817,543	02/22/94
5,289,410	07/905,666	02/22/94
5,289,436	07/965,595	02/22/94
5,289,440	07/952,028	02/22/94
5,289,450	07/922,143	02/22/94
5,289,454	07/810,213	02/22/94
5,289,463	07/888,807	02/22/94
5,289,465	07/927,800	02/22/94
5,289,477	07/711,480	02/22/94
5,289,503	07/757,303	02/22/94
5,289,510	07/965,836	02/22/94
5,289,521	07/848,045	02/22/94
5,289,522	07/977,241	02/22/94
5,289,530	07/732,781	02/22/94
5,289,571	07/649,729	02/22/94
5,289,576	07/849,920	02/22/94
5,289,581	07/947,370	02/22/94

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 02/13/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,362,403	06/289,793	08/03/81	12/07/82	02/18/98
4,508,907	06/431,373	09/30/82	04/02/85	02/13/98
4,523,588	06/372,124	04/27/82	06/18/85	02/17/98
4,535,314	06/563,250	12/19/83	08/13/85	02/13/98
4,687,420	06/877,456	06/23/86	08/18/87	02/17/98
4,708,079	06/647,549	09/05/84	11/24/87	02/18/98
4,761,066	06/819,155	01/14/86	08/02/88	02/13/98
4,787,448	07/086,555	08/18/87	11/29/88	02/18/98
4,801,138	07/127,113	12/01/87	01/31/89	02/19/98
4,801,921	07/088,252	08/24/87	01/31/89	02/18/98
4,846,979	07/084,454	08/12/87	07/11/89	02/18/98
4,847,835	06/820,254	11/05/85	07/11/89	02/18/98
4,866,162	06/914,556	10/02/86	09/12/89	02/13/98
4,866,431	07/158,584	02/22/88	09/12/89	02/17/98
4,873,268	06/917,887	10/14/86	10/10/89	02/18/98
4,874,435	07/138,349	12/28/87	10/17/89	02/13/98
4,879,820	07/227,574	08/03/88	11/14/89	02/13/98
4,943,282	07/311,044	03/13/89	07/24/90	02/18/98
4,964,554	07/397,773	08/23/89	10/23/90	02/19/98
4,977,718	07/352,756	05/16/89	12/18/90	02/18/98
5,070,546	07/537,910	06/12/90	12/10/91	02/13/98
5,075,025	07/362,356	06/06/89	12/24/91	02/18/98
5,077,939	07/618,488	11/27/90	01/07/92	02/13/98
5,112,328	07/563,849	08/07/90	05/12/92	02/17/98
5,127,675	07/524,548	05/17/90	07/07/92	02/18/98
5,129,828	07/685,284	04/15/91	07/14/92	02/17/98
5,132,996	07/554,883	07/20/90	07/21/92	02/13/98
5,153,926	07/446,493	12/05/89	10/06/92	02/18/98
5,180,483	07/766,254	09/27/91	01/19/93	02/18/98
5,183,143	07/708,288	05/31/91	02/02/93	02/18/98
5,198,922	07,670,784	03/19/91	03/30/93	02/18/98
5,220,076	07/890,087	05/29/92	06/15/93	02/13/98

5,221,153	07/743,153	08/12/91	06/22/93	02/18/98
5,237,108	07,890,083	05/29/92	08/17/93	02/13/98
5,244,636	07/645,787	01/25/91	09/14/93	02/17/98
5,244,813	07/870,949	04/20/92	09/14/93	02/13/98
5,245,065	07/971,876	11/05/92	09/14/93	02/13/98
5,250,664	07/778,448	10/16/91	10/05/93	02/18/98
5,252,066	07/936,977	08/28/92	10/12/93	02/13/98
5,253,498	07/933,776	08/24/92	10/19/93	02/18/98
5,254,750	08/042,550	04/05/93	10/19/93	02/18/98
5,257,513	07,912,156	07/10/92	11/02/93	02/18/98
5,260,883	07/816,578	01/03/92	11/09/93	02/17/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,892,753, Re. S.N. 08/752,972, Dec. 2, 1996, Cl. 427/38, PROCESS FOR PECVD OF SILICON OXIDE USING TEOS DECOMPOSITION, David H. Wang, et. al., Owner of Record: *Applied Materials Inc., Santa Clara, Calif.*, Attorney or Agent: Birgit E. Morris, Ex. Gp.: 1762

5,134,481, Re. S.N. 08/932,000, Sept. 17, 1997, Ci. 348/525, METHOD OF AUTOMATICALLY MEASURING THE HORIZONTAL SCAN FREQUENCY OF A COMPOSITE SYNCHRONISM SIGNAL, AND AN ELECTRONIC CIRCUIT OPERATING IN ACCORDANCE WITH THE METHOD, Silvano Gornati, et. al., Owner of Record: *SGS-Thomson Microelectronics, Carrollton, Tex.*, Attorney or Agent: Lisa K. Jorgenson, Ex. Gp.: 2602

5,147,042, Re. S.N. 08/954,404, Oct. 20, 1998, Cl. 206/456, HOLDER FOR MEDICAL SPECIMEN SLIDE, Abner Levy, Owner of Record: *Inventor*, Attorney or Agent: Natan Epstein, Ex. Gp.: 3708

5,556,271, Re. S.N. 09/040,268, Mar. 16, 1998, Cl. 418/201.200, VALVE SYSTEM FOR CAPACITY CONTROL OF A SCREW COMPRESSOR AND METHOD OF MANUFACTURING SUCH VALVES, Jan A. Zuercher, et. al., Owner of Record: *Coltec Industries Inc., New York, N.Y.*, Attorney or Agent: James W. Jakobsen, Ex. Gp.: 3403

5,576,047, Re. S.N. 09/042,826, Mar. 17, 1998, Cl. 426/646, METHOD TO PRODUCE A COOKED, LOW FAT GROUND MEAT PRODUCT, Geoffrey Margolis, Owner of Record: *Inventor*, Attorney or Agent: Richard K. Yoon, Ex. Gp.: 1302

5,610,782, Re. S.N. 09/046,131, Mar. 23, 1998, Cl. 360/99.040, FLOPPY DISK DRIVE DEVICE, Tomoe Aruga, et. al., Owner of Record: *Seiko Epson Corp., Tokyo, Japan*, Attorney or Agent: James A. Oliff, Ex. Gp.: 2511

5,610,782, Re. S.N. 09/046,132, Mar. 23, 1998, Cl. 360/99.040, FLOPPY DISK DRIVE DEVICE, Tomoe Aruga, et. al., Owner of Record: *Seiko Epson Corp., Tokyo, Japan*, Attorney or Agent: James A. Oliff, Ex. Gp.: 2511

5,610,782, Re. S.N. 09/046,133, Mar. 23, 1998, Cl. 360/99.040, FLOPPY DISK DRIVE DEVICE, Tomoe Aruga, et. al., Owner of Record: *Seiko Epson Corp., Tokyo, Japan*, Attorney or Agent: James A. Oliff, Ex. Gp.: 2511

5,664,824, Re. S.N. 09/040,675, Mar. 18, 1998, Cl. 296/100.000, FLEXIBLE TARPAULIN SUPPORT DEVICE, Dan W. Stephens, et. al., Owner of Record: *Inventors*, Attorney or Agent: Mark G. Kachigian, Ex. Gp.: 3102

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,867,938, Reexam. No. 90/004,935, Mar. 5, 1998, Cl. 264/297.2, SEQUENCIAL INJECTION MOLDING PROCESS, Robert D. Schad, et. al., Owner of Record: *Husky Injection Molding Systems Ltd., Bolton, Ontario, Canada*, Attorney or Agent: Bachman and LaPointe, New Haven, Conn., Ex. Gp.: 1732, Requester: Edward W. Callan, San Diego, Calif.

5,239,329, Reexam. No. 90/004,932, Mar. 2, 1998, Cl. 396/655, PHOTOGRAPHIC RETOUCHING IMPLEMENT, Tonya A. Evatt, Owner of Record: *Inventor*, Attorney or Agent: Dennis F. Armijo, Albuquerque, N. Mex., Ex. Gp.: 2101, Requester: Edward R. Weingram, Weingram and Associates, Maywood, N.J.

5,312,633, Reexam. No. 90/004,933, Mar. 2, 1998, Cl. 426/094, METHOD OF MAKING A STUFFED PRETZEL DOUGH PRODUCT AND COMPLETED STUFFED PRETZEL PRODUCT, Janet Schwartz, Owner of Record: *Inventor*, Attorney or Agent: Alan H. Bernstein, Caesar Rivise Bernstein Cohen and Pokotilow, Ltd., Philadelphia, Pa., Ex. Gp.: 1761, Requester: Owner

Schmidt, Minneapolis, Minn., Ex. Gp.: 3403, Requester: Owner

5,359,724, Reexam. No. 90/004,934, Mar. 2, 1998, Cl. 707/205, METHOD AND APPARATUS FOR STORING AND RETRIEVING MULTI-DIMENSIONAL DATA IN COMPUTER MEMORY, Robert J. Earle, Owner of Record: *Arbor Software Corp., Santa Clara, Calif.*, Attorney or Agent: Matthew D. Powers, Weil Gotshal and Manges, Menlo Park, Calif., Ex. Gp.: 2771, Requester: Hugh R. Kress, Arnold White and Durkee, Houston, Tex.

5,376,581, Reexam. No. 90/004,936, Mar. 6, 1998, Cl. 438/039, FABRICATION OF SEMICONDUCTOR LASER ELEMENTS, Kenji Shimoyama, et. al., Owner of Record: *Mitsubishi Chemical Corp., Tokyo, Japan*, Attorney or Agent: William L. Brooks, Armstrong, Westerman, Hattori, McLeland and Naughton, Washington, D.C., Ex. Gp.: 1104, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed,

or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED MARCH 9, 1998 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
116,891	71/100,917	06/05/1917
116,992	71/086,165	06/05/1917
346,494	71/359,823	06/01/1937
346,510	71/376,181	06/01/1937
346,555	71/385,836	06/01/1937
346,558	71/386,081	06/01/1937
346,598	71/387,360	06/01/1937
346,623	71/387,792	06/01/1937
346,635	71/387,918	06/01/1937
346,642	71/387,994	06/01/1937
346,658	71/388,298	06/01/1937
346,660	71/388,463	06/01/1937
613,297	71/677,253	09/27/1955
646,239	71/693,501	06/04/1957
646,256	72/016,826	06/04/1957
646,259	72/017,735	06/04/1957
646,262	71/682,544	06/04/1957
646,263	72/002,106	06/04/1957
646,264	72/002,107	06/04/1957
646,265	72/002,108	06/04/1957
646,269	72/018,116	06/04/1957
646,275	71/696,641	06/04/1957
646,276	71/696,642	06/04/1957
646,277	71/696,643	06/04/1957
646,278	71/697,237	06/04/1957
646,281	72/001,695	06/04/1957
646,291	72/011,272	06/04/1957
646,292	72/011,986	06/04/1957
646,302	72/016,891	06/04/1957
646,304	71/671,774	06/04/1957
646,305	72/017,213	06/04/1957
646,319	72/003,737	06/04/1957
646,329	72/005,519	06/04/1957
646,331	72/011,483	06/04/1957
646,337	72/016,951	06/04/1957
646,348	72/015,312	06/04/1957
646,349	72/015,313	06/04/1957
646,354	72/019,694	06/04/1957
646,363	72/004,183	06/04/1957
646,369	72/000,365	06/04/1957
646,379	72/007,315	06/04/1957
646,386	72/012,482	06/04/1957
646,416	72/013,484	06/04/1957
646,427	71/691,180	06/04/1957
646,428	72/002,835	06/04/1957
646,435	72/005,649	06/04/1957
646,448	72/013,050	06/04/1957
646,454	72/014,754	06/04/1957
646,458	72/016,724	06/04/1957
646,462	72/017,335	06/04/1957
646,466	72/017,745	06/04/1957
646,480	72/014,355	06/04/1957
646,490	71/665,487	06/04/1957
646,494	72/015,917	06/04/1957
646,504	72/015,602	06/04/1957
646,506	71/688,764	06/04/1957
646,513	72/017,045	06/04/1957
646,520	71/667,319	06/04/1957
646,525	72/016,363	06/04/1957
646,526	72/016,431	06/04/1957
646,530	71/657,131	06/04/1957
646,532	71/668,428	06/04/1957
646,535	71/683,948	06/04/1957
646,546	72/016,697	06/04/1957
646,558	71/689,681	06/04/1957
646,559	71/683,837	06/04/1957
646,560	71/695,046	06/04/1957
646,561	71/695,223	06/04/1957
646,566	71/700,287	06/04/1957
646,593	72/014,704	06/04/1957
646,609	71/700,324	06/04/1957
646,611	72/011,343	06/04/1957
646,623	72/015,871	06/04/1957
646,626	71/695,540	06/04/1957
646,635	72/006,271	06/04/1957
646,638	72/009,514	06/04/1957
646,639	72/000,652	06/04/1957
646,658	72/691,972	06/04/1957
646,662	72/018,595	06/04/1957
646,668	72/010,177	06/04/1957
646,672	72/000,962	06/04/1957
1,066,509	73/038,325	05/31/1977
1,066,510	73/054,296	05/31/1977
1,066,516	73/087,944	05/31/1977
1,066,521	73/106,703	05/31/1977
1,066,525	73/071,501	05/31/1977
1,066,530	73/091,544	05/31/1977
1,066,532	73/105,471	05/31/1977
1,066,537	73/076,173	05/31/1977
1,066,539	73/086,368	05/31/1977
1,066,545	73/097,691	05/31/1977
1,066,548	73/098,968	05/31/1977
1,066,549	73/099,031	05/31/1977
1,066,552	73/100,769	05/31/1977
1.066,555	73/105,800	05/31/1977
1,066,556	73/106,110	05/31/1977
1,066,563	73/082,342	05/31/1977
1,066,565	73/086,702	05/31/1977
1,066,569	73/089,691	05/31/1977
1,066,570	73/093,542	05/31/1977
1,066,571	73/093,744	05/31/1977
1,066,575	73/104,403	05/31/1977
1,066,576	73/104,404	05/31/1977
1,066,578	73/104,692	05/31/1977
1,066,583	73/064,823	05/31/1977
1,066,585	73/065,294	05/31/1977
1,066,591	73/078,082	05/31/1977
1,066,596	73/086,314	05/31/1977
1,066,597	73/089,066	05/31/1977
1,066,608	73/105,308	05/31/1977
1,066,610	73/035,474	05/31/1977
1,066,611	73/036,030	05/31/1977
1,066,617	73/080,897	05/31/1977
1,066,618	73/081,680	05/31/1977
1,066,626	73/106,047	05/31/1977
1,066,627	73/062,944	05/31/1977
1,066,636	73/069,934	05/31/1977
1,066,637	73/072,122	05/31/1977
1,066,640	73/075,511	05/31/1977
1,066,642	73/077,909	05/31/1977
1,066,648	73/096,734	05/31/1977
1,066,649	73/103,179	05/31/1977
1,066,650	73/104,179	05/31/1977
1,066,653	73/071,296	05/31/1977
1,066,654	73/098,447	05/31/1977
1,066,656	73/099,619	05/31/1977
1,066,657	73/105,719	05/31/1977
1,066,662	73/059,245	05/31/1977
1,066,663	73/076,581	05/31/1977
1,066,667	73/086,470	05/31/1977
1,066,668	73/087,849	05/31/1977
1,066,669	73/088,420	05/31/1977
1,066,672	73/097,477	05/31/1977
1,066,674	73/063,025	05/31/1977
1,066,677	73/068,833	05/31/1977
1,066,682	73/091,610	05/31/1977
1,066,683	73/092,644	05/31/1977
1,066,687	73/073,363	05/31/1977
1,066,691	73/089,733	05/31/1977
1,066,698	73/041,933	05/31/1977
1,066,700	73/047,953	05/31/1977
1,066,703	73/061,056	05/31/1977
1,066,704	73/068,221	05/31/1977
1,066,707	73/075,613	05/31/1977
1,066,712	73/081,175	05/31/1977
1,066,713	73/082,470	05/31/1977

Reg. Number	Serial Number	Reg. Date
1,066,714	73/083,643	05/31/1977
1,066,716	73/086,828	05/31/1977
1,066,721	73/090,922	05/31/1977
1,066,722	73/091,345	05/31/1977
1,066,727	73/095,421	05/31/1977
1,066,730	73/096,845	05/31/1977
1,066,733	73/098,293	05/31/1977
1,066,736	73/098,529	05/31/1977
1,066,737	73/099,952	05/31/1977
1,066,739	73/055,565	05/31/1977
1,066,740	73/063,469	05/31/1977
1,066,747	73/105,372	05/31/1977
1,066,748	73/105,450	05/31/1977
1,066,750	73/077,835	05/31/1977
1,066,753	73/083,705	05/31/1977
1,066,754	73/043,633	05/31/1977
1,066,756	73/065,273	05/31/1977
1,066,759	73/086,762	05/31/1977
1,066,760	73/090,250	05/31/1977
1,066,766	73/102,465	05/31/1977
1,066,768	73/102,958	05/31/1977
1,066,769	73/060,206	05/31/1977
1,066,771	73/084,276	05/31/1977
1,066,775	73/096,169	05/31/1977
1,066,780	73/080,145	05/31/1977
1,066,783	73/101,363	05/31/1977
1,066,788	73/061,357	05/31/1977
1,066,789	73/061,655	05/31/1977
1,066,792	73/067,631	05/31/1977
1,066,798	73/073,832	05/31/1977
1,066,801	73/080,186	05/31/1977
1,066,803	73/086,273	05/31/1977
1,066,804	73/089,279	05/31/1977
1,066,805	73/089,738	05/31/1977
1,066,809	73/092,125	05/31/1977
1,066,812	73/093,297	05/31/1977
1,066,813	73/093,333	05/31/1977
1,066,814	73/097,110	05/31/1977
1,066,816	73/097,734	05/31/1977
1,066,818	73/090,835	05/31/1977
1,066,820	73/064,704	05/31/1977
1,066,827	73/081,865	05/31/1977
1,066,833	73/095,397	05/31/1977
1,066,834	73/095,640	05/31/1977
1,066,837	73/100,887	05/31/1977
1,066,844	73/103,486	05/31/1977
1,066,846	73/103,534	05/31/1977
1,066,849	73/048,794	05/31/1977
1,066,863	73/077,536	05/31/1977
1,066,865	73/077,833	05/31/1977
1,066,868	73/086,703	05/31/1977
1,066,870	73/094,368	05/31/1977
1,066,871	73/095,936	05/31/1977
1,066,880	73/074,288	05/31/1977
1,066,882	73/089,838	05/31/1977
1,066,889	73/083,949	05/31/1977
1,066,891	73/030,242	05/31/1977
1,066,896	73/096,559	05/31/1977
1,066,897	73/032,416	05/31/1977
1,066,914	73/088,816	05/31/1977
1,066,916	73/103,913	05/31/1977
1,066,917	73/104,093	05/31/1977
1,066,918	73/104,109	05/31/1977
1,066,925	73/075,104	05/31/1977
1,066,928	73/102,708	05/31/1977
1,066,931	73/103,856	05/31/1977
1,066,934	73/074,283	05/31/1977
1,066,937	73/078,130	05/31/1977
1,066,951	73/027,523	05/31/1977
1,066,956	73/064,033	05/31/1977
1,066,960	73/069,688	05/31/1977
1,066,961	73/073,974	05/31/1977
1,066,963	73/080,477	05/31/1977
1,066,964	73/081,135	05/31/1977
1,066,966	73/082,769	05/31/1977
1,066,974	73/095,235	05/31/1977
1,066,977	73/097,382	05/31/1977
1,066,982	73/100,533	05/31/1977
1,066,983	73/101,474	05/31/1977
1,066,991	73/104,020	05/31/1977
1,066,992	73/104,072	05/31/1977
1,066,995	73/105,518	05/31/1977
1,066,996	73/106,166	05/31/1977
1,067,006	72/447,298	05/31/1977
1,067,007	72/447,268	05/31/1977
1,067,008	72/406,204	05/31/1977
1,067,014	73/032,418	05/31/1977
1,067,015	73/032,419	05/31/1977
1,070,359	73/109,764	07/26/1977

Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
Deputy Assistant Commissioner
for Patents (Acting)

Patent Terms Extended Under 35 U.S.C. § 156

A certificate extending the term of the following patent under 35 U.S.C. § 156(d)(1) was issued on October 27, 1997:

U.S. Patent No. 4,935,437; Granted June 19, 1990, to Philip N. Edwards, et al.; Owner of Record: Zeneca Limited; Title: (SUBSTITUTED ARALKYL) HETEROCYCLIC COMPOUNDS; Classification: 514/383; Product Trade Name: ARIMIDEX® (anastrozole); Original Expiration Date: June 10, 2008; Term Extended: 565 days, Extended Expiration Date: December 27, 2009.

In addition, an order granting an interim extension of the term of the following patent under 35 U.S.C. § 156(e)(2) was issued on April 6, 1998:

U.S. Patent No. 4,260,769; Granted April 7, 1981, to Valenino J. Stella et al.; Owner of Record: Merck & Co., Inc.; Title: 5,5-DIPHENYLHYDANTOINS; Classification: 548/112; Product Trade Name: CEREBYX® (fosphenytoin sodium); Original Expiration Date: April 7, 1998; Term Extended: One-Year.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

Grant of Certificate of Interim Extension of the term of U.S. Patent No. 4, 177,290: PROVIGIL

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice of Interim Patent Term Extension

SUMMARY: The Patent and Trademark Office has issued a certificate under 35 U.S.C. 156(d)(5) for a one-year interim extension of the term of U.S. Patent No. 4,177,290.

FOR INFORMATION CONTACT: Karin Tyson by telephone at (703) 305-9285; by mail marked to her attention and addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; by fax marked to her attention at (703) 308-6916, or by e-mail to karin.tyson@uspto.gov.

SUPPLEMENTARY INFORMATION: Section 156 of Title 35, United States Code, generally provides that the term of a patent may be extended for a period of up to 5 years if the patent claims a product, or a method of making or using a product, that has been subject to certain defined regulatory review. Under Section 156(e)(1), a patent is eligible for term extension only if regulatory review of the claimed product was completed before the original patent term expired.

On December 3, 1993, Section 156 was amended by Pub. L. No. 103-179 to provide that if the owner of record of the patent or its agent reasonably expects the applicable regulatory review period to extend beyond the expiration of the patent, the owner or its agent may submit an application to the Commissioner of Patents and Trademarks for an interim extension of the patent term. If the Commissioner determines that, except for permission to market or use the product commercially, the patent would be eligible for a statutory extension of the patent term, the Commissioner shall issue to the applicant a certificate of interim extension for a period of not more that one year. The owner of record of the patent or its agent may apply for subsequent one-year interim extensions.

On February 20, 1998, Cephalon, agent of the patent owner Laboratoire L. Lafon, filed an application under 35 U.S.C. 156(d)(5) for interim extension of the term of U.S. Patent No. 4,177,290. The patent claims the active ingredient modafinil in the human drug product "PROVIGIL." The application indicates that the product is currently undergoing a regulatory review before the Food and Drug Administration for permission to market or use the product commercially.

Review of the application suggests that, except for permission to market or use the product commercially, the subject patent would be eligible for an extension of the patent term under 35 U.S.C. 156. Since it is apparent that the regulatory review period will extend beyond the date of expiration of the patent, an interim extension of the patent term under 35 U.S.C. 156(d)(5) is appropriate. Accordingly, an interim extension under 35 U.S.C. 156(d)(5) of the term of U.S. Patent No. 4,177,290 is granted for a period of one-year from the original expiration date of the patent, March 9, 1998.

April 6, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Petition for Reinstatement

Charles C. Logan, II, of La Mesa, California, whose registration number is 25,256 and who has been suspended pursuant to 36 U.S.C. § 32, has filed a petition for reinstatement. Granting of reinstatement is subject to, *inter alia*, establishing to the satisfaction of the Director of Enrollment and Discipline that granting the petition is not contrary to the public interest, and that the suspended practitioner has complied with the provisions of 37 CFR § 10.158 during his period of suspension. 37 CFR § 10.160. Accordingly, information bearing upon Charles C. Logan, II's good moral character and reputation is material to his eligibility for reinstatement. Any information tending to affect the eligibility of Charles C. Logan, II, on moral, ethical or other grounds should be furnished to the Director in a written communication addressed to the Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231 on or about June 19, 1998.

April 7, 1998

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Status of Certification Services

On November 28, 1995, the Office published an Official Gazette Notice entitled "Temporary Suspension of At Cost Services for Orders for Certified Copies" (1180 OG 121) to advise practitioners and the public of delays in filling orders for certified copies of PTO documents. This is an update of actual days to mail for orders filled during the month of March 1998:

Certified Product	Goal	Actual Calendar Days to Mail
Patent Application-As-Filed, Expedited	7	4
Patent Application-As-Filed, Regular	17	13
Patent Related File Wrapper	25	34*
Patent Copy	10	5
Patent Assignments	10	10
Trademark Application-As-Filed, Expedited	7	6
Trademark Application-As-Filed, Regular	17	12
Trademark Related File Wrapper	25	22
Trademark Assignments	10	10
Trademark Registration, Expedited	5	4
Trademark Registration, Regular	14	8

* Includes turnaround times for files on official search and file reconstruction.

Due to varying availability of media, customers will not be advised when orders are not delivered within the published goal periods. However, customers will be advised if any unexpected delay in their order has been identified. Customers should use the above actual days to mail for each product as a guide as to when they can expect their orders. In determining expected delivery times, the day an order is received in the Office is calculated as "day zero." The next business day is "day one."

Delivery of any specific copy will vary based on the availability of scanned images, microfilm products, and/or file accessibility. On June 10, 1997, the Office published an Official Gazette Notice entitled "Changes in Practice in Supplying Certified Copies and Filing Receipts" (1199 OG 39) which advised customers who placed orders for certified copies of patent applications-as-filed not to request them until the official filing receipt is received; images and related bibliographic data are not available to Certification Division until the filing receipt is generated by the Office of Initial Patent Examination.

Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, DC Metro area), or via E-mail: certdiv@uspto.gov.

April 7, 1998

WESLEY H. GEWEHR
Administrator for Information
Dissemination

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Intra-Dynamics, Inc., San Francisco, Calif., Registration No.

1,091,909 for the mark PUDDLE JUMPER, Canc. No. 27,204.

JEAN BROWN
Technical Program Manager
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Certificates of Correction for May 5, 1998

D. 375,092
D. 386,937
D. 388,735
D. 389,423
D. 389,662
P. 10,112
4,756,812
4,999,376
5,141,879
5,160,101
5,269,946
5,302,670
5,354,779
5,362,482
5,367,385
5,415,835
5,416,211
5,419,900
5,463,092
5,468,745
5,478,143
5,483,846
5,484,956
5,498,549
5,500,433
5,505,008
5,507,079
5,514,688
5,515,189
5,536,016
5,550,160
5,562,928
5,571,814
5,572,088
5,573,782
5,576,175
5,577,179
5,578,036
5,579,095
5,581,102
5,583,171
5,589,633
5,592,418
5,592,929
5,594,598
5,595,474
5,602,130
5,602,545
5,605,732
5,605,994
5,608,219
5,612,201
5,615,232
5,617,804
5,619,871
5,621,983
5,622,939
5,623,387
5,625,667
5,626,409
5,626,719
5,627,250
5,628,822
5,629,112
5,629,715
5,631,365
5,632,632
5,633,598
5,638,384
5,638,418
5,639,442
5,641,222
5,641,284
5,641,476
5,641,556
5,642,860
5,643,286
5,643,710
5,644,558
5,645,247
5,646,085
5,646,646
5,649,579
5,649,729
5,654,164
5,654,404
5,654,701
5,657,305
5,657,529
5,658,703
5,659,343
5,660,808
5,661,054
5,661,127
5,661,881
5,661,971
5,663,794
5,664,529
5,666,428
5,667,887
5,668,229
5,669,637
5,670,315
5,671,074
5,671,108
5,672,622
5,673,084
5,673,119
5,673,525
5,673,565
5,673,611
5,673,860
5,674,332
5,674,349
5,676,070
5,676,812
5,676,828
5,677,153
5,677,725
5,678,672
5,678,985
5,679,194
5,679,641
5,679,950
5,680,153
5,680,541
5,680,648
5,681,276
5,681,530
5,681,643
5,681,865
5,682,128
5,682,568
5,683,201
5,683,452
5,684,028
5,684,154
5,684,185
5,684,369
5,684,768
5,685,275
5,685,493
5,685,677
5,685,732
5,686,069
5,686,258
5,686,766
5,688,160
5,689,247
5,689,916
5,690,209
5,690,330
5,690,869
5,691,228
5,691,456
5,691,565
5,692,304
5,692,576
5,692,992
5,694,068
5,696,712
5,696,765
5,697,421
5,697,763
5,698,208
5,698,300
5,698,378
5,699,045
5,699,046
5,700,137
5,700,180
5,700,547
5,700,727
5,701,460
5,702,094
5,702,441
5,702,821
5,703,238
5,703,653
5,704,363
5,704,472
5,704,658
5,704,704
5,705,016
5,705,151
5,705,224
5,705,495
5,705,873
5,706,190
5,706,251
5,706,755
5,706,982
5,707,061
5,707,626
5,707,675
5,707,962
5,708,065
5,708,319
5,708,539
5,709,687
5,709,701
5,709,807
5,710,259
5,710,293
5,710,369
5,711,198
5,711,381
5,711,536
5,711,641
5,711,931
5,712,268
5,712,669
5,712,722
5,713,098
5,713,746
5,714,011
5,714,073
5,714,109
5,714,695
5,714,903
5,715,048
5,715,536
5,715,647
5,715,845
5,715,883
5,716,092
5,716,549
5,716,820
5,716,951
5,717,014
5,717,061
5,717,067
5,717,350
5,717,833
5,717,912
5,718,156
5,718,652
5,718,672
5,718,711
5,718,842
5,718,845
5,718,867
5,719,345
5,719,496
5,719,784
5,720,175
5,720,401
5,720,457
5,720,638
5,720,694
5,720,879
5,720,889
5,720,950
5,721,322
5,721,348
5,722,280
5,722,344
5,723,020
5,723,109
5,723,928
5,724,136
5,724,201
5,724,272
5,724,395
5,725,450
5,725,951
5,726,603
5,727,100

Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

March 16-20, 1998

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
3-16	EX	74/651,843	Valley Dental, Inc.	whether, as evidenced by the specimens of record, the matter sought to be registered is being used as a service mark for the services recited in the application; whether a more definite recitation of services is required	Refusal Reversed		"CLIFFORD CORNELIUS CANINE" [promoting dental health to children]		No
3-16	EX	75/010,405	Pure Distributors, Inc.	2(e)(1); requirement to specify type of commerce and method of use	Refusal Affirmed (on both grounds)		"NUTRITION FOR THE SKIN" [skin creams, skin lotions, hair shampoo, skin soap, shaving creams, sun tan lotions, and skin moisturizers]		No
3-17	EX	74/645,990	South Central Group Inc.	2(d)	Refusal Reversed		"MAX" [boat anchors]	"MAX" [sailboats]	No

(1)EX5EX PARTE APPEAL; OPP5OPPOSITION; CANC5CANCELLATION; CU5CONCURRENT USE; (SJ)5SUMMARY JUDGMENT;(R)5REQ. FOR RECONSIDERATION; (MD)5MOTION TO DISMISS; (MR)5MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
3-18	EX	74/570,013	Diane Von Furstenberg Studio	2(d)	Refusal Affirmed		"CASUAL CHIC" [handbags, knapsacks, tote bags, belt bags in the nature of waist packs, suitcases and luggage; men's and women's wearing apparel, namely, coats, jackets, vests, shawls, sweaters, hats, tops, shirts, skirts, pants, belts, shoes and boots]	"CHIC" [women's clothing, namely, tops, sweatshirts and jackets]; "CHIC BY H.I.S." (in stylized lettering) [ladies' panties, tops, and coordinated teddys; women's foundation garments, brassieres, girdles, etc.];"CHIC" (in stylized lettering) [ladies' and girls knit hosiery, knit headbands, leg warmers and wristbands, women's foundation garments, brassieres, girdles, etc.]; "CHIC SPORTSWEAR FOR THE NATURAL WOMAN" [women's clothing, namely, jeans, pants, tops, sweaters, activewear, etc.]	No

(1)EX5EX PARTE APPEAL; OPP5OPPOSITION; CANC5CANCELLATION; CU5CONCURRENT USE; (SJ)5SUMMARY JUDGMENT;(R)5REQ. FOR RECONSIDERATION; (MD)5MOTION TO DISMISS; (MR)5MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
3-18	OPP	96,596	Wild Birds Unlimited, Inc. v. Jeanette Davis	2(d)	Opposition Dismissed	bird design [bird feeders and birdhouses; birdfood; retail store services specializing in nature related products]; "WILD BIRDS UNLIMITED" (and a design incorporating birds) [advertisement newsletters with information about feeding and care of birds; retail store services specializing in the feeding and care of birds]	"BIRDWATCHERS' COUNTRY STORE" (and design) [retail store services featuring bird feeding supplies, birdbaths, bird houses, bird watching and bird calling equipment and field guides; books, prerecorded audio and video recordings, greeting cards, note cards, art pieces, gifts, etc. related to birds]		No
3-19	EX	74/497,314	Health Decisions, Inc.	whether the matter asserted for registration is capable of registration on the Supp. Register [genericness]	Refusal Affirmed		"DEMAND ANALYSIS" [investigation of health care utilization]		No
3-19	EX	74/575,074	H. E. Butt Grocery Co.	Sec. 6 disclaimer requirement (of words "OUR OWN ORIGINAL")	Refusal Affirmed		"DR. B—OUR OWN ORIGINAL—H-E-B" (and design) [carbonated non-alcoholic soft drinks]		No

(1)EX5EX PARTE APPEAL; OPP5OPPOSITION; CANC5CANCELLATION; CU5CONCURRENT USE; (SJ)5SUMMARY JUDGMENT;(R)5REQ. FOR RECONSIDERATION; (MD)5MOTION TO DISMISS; (MR)5MOTION TO REOPEN

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box ____________
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box ____________
FEE (or NO FEE)
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box ____________
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) in Sunnyvale, California.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	Not Yet Operational
	New Haven Free Public Library	Not Yet Operational
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(954) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 978-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	Not Yet Operational
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510 Ext. 113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director	308-0661	01/05/96
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	05/28/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	06/03/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	04/28/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	09/28/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	10/19/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	03/01/96
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-3900	03/01/96
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	11/29/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	07/22/96
TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director	305-3900	06/08/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	305-3293	04/05/96
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	11/22/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	10/22/96
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	01/10/96
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	01/16/96
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	11/12/96

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of April 1, 1998

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/03/97	01/29/98
Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/25/97	12/31/97
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/06/97	03/09/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/02/97	01/23/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/22/97	12/28/97
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/25/97	11/05/97
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/04/97	12/19/97
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/16/97	12/23/97
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/01/97	01/26/98
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/19/98	—0—
Renewals (All Classes)	02/19/98	—0—
Section 12(c) Publications (All Classes)	02/02/98	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

MAY 5, 1998

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,601,710 (3503rd)
TROCAR ASSEMBLY

Frederic H. Moll, San Francisco, Calif., assignor to Endotherapeutics Corporation, Norwalk, Conn.

Reexamination Request No. 90/004,129, Feb. 1, 1996.

Reexamination Certificate for Patent 4,601,710, issued Jul. 22, 1986, Ser. No. 638,048, Aug. 6, 1984.

Continuation-in-part of Ser. No. 526,179, Aug. 24, 1983.

Int. Cl.^{6} A61M *5/18*

U.S. Cl. 604—165

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2** and **3** is confirmed.

Claim **1** is cancelled.

Claim **4** is determined to be patentable as amended.

New claims **5**–**28** are added and determined to be patentable.

[1. A trocar assembly comprising:

(a) an elongate trocar obturator having a piercing tip at its front end;

(b) and an elongate trocar tube in which the trocar obturator is housed;

(c) a tubular protective shield mounted concentrically around the trocar obturator and being axially movable relative to the trocar obturator between a normally extended position and a retracted position; and

(d) biasing means acting on the rear end of the protective shield, whereby the shield is forced to said retracted positon to expose the piercing tip when the trocar is being inserted through the wall of a body cavity and is biased by said means to said extended position to shield the piercing tip once the trocar has pierced the wall.**]**

B1 4,982,900 (3504th)
TRIGGER SPRAYER

William S. Blake, 14 Georgetown Ct., Linwood, N.J. 08221

Reexamination Request No. 90/004,730, Aug. 22, 1997.

Reexamination Certificate for Patent 4,982,900, issued Jan. 8, 1991, Ser. No. 453,003, Jan. 24, 1990.

Continuation of Ser. No. 194,296, May 16, 1988, abandoned.

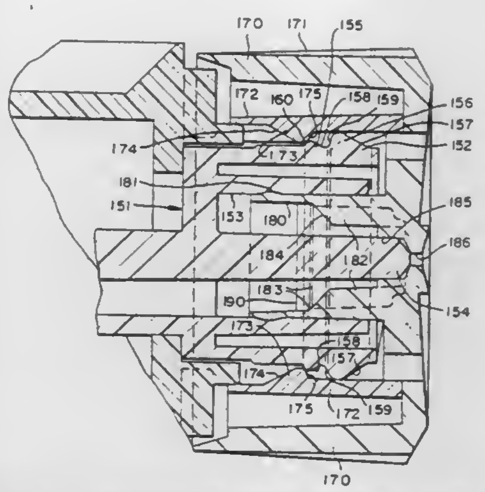
Int. Cl.^{6} B05B *9/043*

U.S. Cl. 239—333

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**–**33** is confirmed.

17. In a dispensing pump including a body with a nose piece having a forward end, a flow passage through the nose piece for product to be dispensed, and an adjustable nozzle carried on the nose piece for controlling flow from the passage and through the nozzle, the improvement comprising:



an elongate, axially projecting valving pin on the forward end of the nose piece;

first and second concentrically spaced cylindrical walls formed on the nose piece and extending forwardly coaxially with the valving pin, one of said walls having nozzle adjustable means thereon and the other of said walls having a smooth sealing surface;

said nozzle having a rearwardly extending cylindrical skirt with nozzle adjustment means thereon for cooperation with the adjustment means on the nose piece to hold the nozzle in different adjusted positions on the nose piece to control flow from the nozzle, said nozzle having a dispensing passage therethrough and said valving pin having an end portion engageable with the nozzle to close the passage in one position of the nozzle on the nose piece, and said nozzle having a rearwardly extending cylindrical wall with a sealing ring slidably engaged with the smooth sealing surface on the nose piece to seal the nozzle with respect to the nose piece; and

a flexible valving member engaged between the valving pin on the nose piece and the cylindrical wall on the nozzle, said valving member being normally closed and being openable by fluid pressure acting thereon to enable flow through the nozzle.

B1 5,018,623 (3505th)
MOLDED PLASTIC OVERWRAP TRAY

John Hrenyo, Washington, N.J., assignor to Tekni-Plex, Inc., Somerville, N.J.

Reexamination Request No. 90/004,559, Feb. 21, 1997.

Reexamination Certificate for Patent 5,018,623, issued May 28, 1991, Ser. No. 492,889, Mar. 12, 1990.

Int. Cl.^{6} B65D *1/34;6/04;71/08*

U.S. Cl. 206—557

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

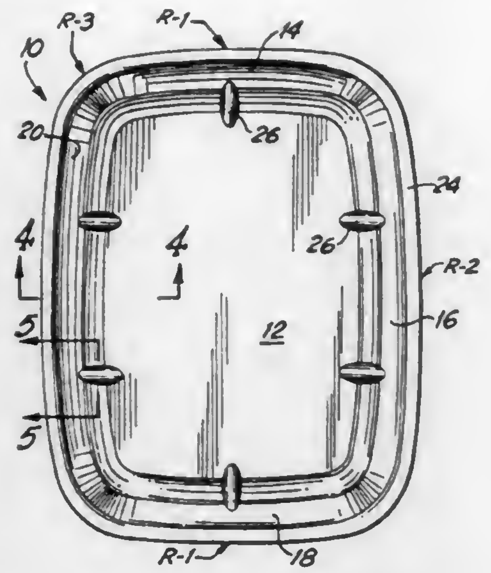
The patentability of claims **2**–**4** and **6**–**11** is confirmed.

Claims **1** and **5** are cancelled.

New claims **12**, **13** and **14** are added and determined to be patentable.

14. A molded plastic tray intended to serve as packaging for a food product, and which tray is then intended to be sealed with an overwrap of tightly stretched transparent film, said tray comprising:

a one piece body of foamed plastic polymer having a base and four sidewalls, said sidewalls defining a generally rectangular



shape with two sidewalls defining longitudinal sides of said tray and two sidewalls defining ends of said tray, the length of said longitudinal sides being greater than the length of said ends;

said sidewalls having an upper edge;

adjacent sidewalls being joined to one another through an integrally formed large radius corner having a radius of curvature from about 1.750 inches to 2.250 inches;

said sidewalls having an integrally formed thick, wide bead located adjacent to the open end of the tray;

a lip extending from and being formed by said bead; and

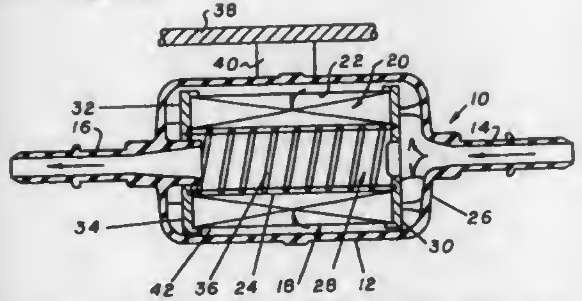
said sidewalls being outwardly bowed by an amount which responds to the compressive forces imposed by the tightly stretched overwrap film to provide the tray with sidewalls having relatively straight or slightly bowed upper edges, wherein the radius of curvature of the bow of said longitudinal sides being greater than the radius of curvature of the bow of said ends.

B2 5,076,920 (3506th)
ELECTROSTATICALLY DISSIPATIVE FUEL FILTER

Daniel R. Danowski, Richmond, R.I.; Sunil K. Kesavan, Troy, Mich.; James W. Martin, and James S. Pereira, both of Rehoboth, Mass., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Reexamination Request No. 90/004,541, Feb. 7, 1997.
Reexamination Certificate for Patent 5,076,920, issued Dec. 31, 1991, Ser. No. 575,260, Aug. 30, 1990.
Reexamination Certificate B1 5,076,920, issued Jun. 25, 1996.
Int. Cl.^{6} **B01D** *27/08;35/02;35/06*

U.S. Cl. 210—243



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–10** are determined to be patentable as amended.

New claims **11–30** are added and determined to be patentable.

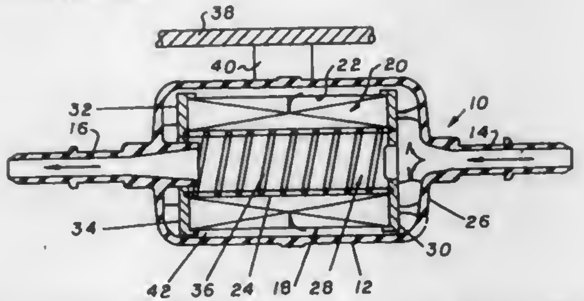
1. [Method] *A method* of preventing material breakdown of a housing of a fuel *injection system fuel* filter for filtering fuel flowing through a fuel line [delivering] *that delivers* fuel to [the] *an* engine of a motor vehicle, said motor vehicle having a common electrical plane maintained at a common electrical potential, *and* said housing defining a chamber therewithin and having an inlet and an outlet connected [in] *with* said fuel line and communicating with said chamber, said housing being primarily composed of an electrically non-conductive material, *and said housing being supported by an electrically conductive bracket, said method* comprising the step of providing an electrically conductive path between the fuel within [the] *said* chamber and said common electrical plane *via said electrically conductive bracket* by providing electrically conductive material in [the] *said* electrically non-conductive material of said housing so that [the] *said* electrically conductive material extends completely through [the] *said* housing such that at least a portion of said electrically conductive path extends through [the] *said* housing to thereby prevent the build-up of electrostatic charge in the fuel and [resulting] *to prevent* arcing [which causes the] *that can cause a* breakdown of [the] *said* housing.

B2 5,164,084 (3507th)
ELECTROSTATICALLY DISSIPATIVE FUEL FILTER

Daniel R. Danowski, Richmond, R.I.; Sunil K. Kesavan, Troy, Mich.; James W. Martin, and James S. Pereira, both of Rehoboth, Mass., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Reexamination Request No. 90/004,542, Feb. 7, 1997.
Reexamination Certificate for Patent 5,164,084, issued Nov. 17, 1992, Ser. No. 724,223, Jul. 1, 1991.
Reexamination Certificate B1 5,164,084, issued Mar. 28, 1995.
Division of Ser. No. 575,260, Aug. 30, 1990, Pat. No. 5,076,920.
Int. Cl.^{6} **B01D** *27/08;35/02;35/06*

U.S. Cl. 210—243



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 9** were previously cancelled.

Claims **1, 3–8, 10–15** are determined to be patentable as amended.

New claims **16–29** are added and determined to be patentable.

1. [Fuel] *A fuel injection system fuel* filter for filtering fuel flowing through a fuel line for delivering fuel to the engine of a motor vehicle, said motor vehicle having a common electrical plane maintained at a common electrical potential, said fuel filter including a housing having an inlet fitting and an outlet fitting connected in said fuel *filter* housing, *and a conductive bracket supporting said housing, with said fuel filter also including* a circumferentially extending array of filtering media within said housing between the inlet fitting and the outlet fitting for filtering the fuel delivered to the engine by the fuel line, said filtering media defining an inner cavity within the filtering media communicated with one of said fittings, said filtering media cooperating with said housing to define an outer cavity communicating with the other fitting, said housing being primarily composed of an electrically non-conductive material[.] and conductive means for providing an electrically conductive path between the fuel within said outer cavity and said common electrical plane *via said conductive bracket*, said conductive means extending completely through the housing, said electrically conductive path being effective to prevent the build-up of electrostatic charge in the fuel flowing through the filter and to thereby prevent arcing which causes breakdown of the electrically non-conductive housing material.

B1 5,350,443 (3508th)
FILTER SHEET MATERIAL FOR PASSENGER CABINS IN MOTOR VEHICLES

Hasso von Blücher, Parkstrasse 10, D-4006 Erkrath, and Ernest de Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, both of Germany

Reexamination Request No. 90/004,605, Apr. 10, 1997.
Reexamination Certificate for Patent 5,350,443, issued Sep. 27, 1994, Ser. No. 47,473, Apr. 19, 1993.
Int. Cl.^{6} **B01D** *53/04;29/01*

U.S. Cl. 96—135

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–24** are cancelled.

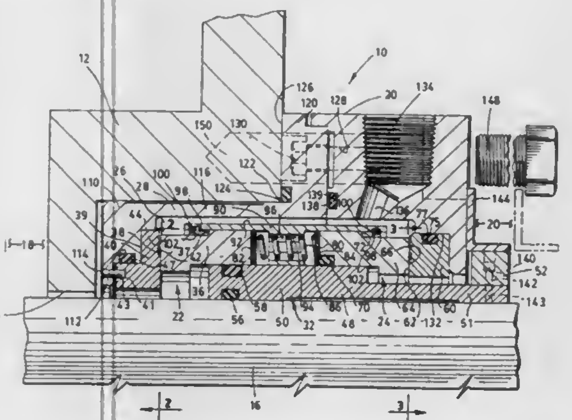
1. A filter sheet material for the removal of unpleasant odours in the passenger cabins of motor vehicles, wherein the improvement resides in that on one and the same air-permeable support material a particle filter-layer as well as an adsorption filter layer containing adsorptive material are fixed.

B1 5,375,853 (3509th)
GAS LUBRICATED BARRIER SEAL

James R. Wasser, Des Plaines; Douglas J. Volden, Park Ridge, and James P. Netzel, Skokie, all of Ill., assignors to John Crane Inc., Morton Grove, Ill.

Reexamination Request No. 90/004,030, Nov. 1, 1995.
Reexamination Certificate for Patent 5,375,853, issued Dec. 27, 1994, Ser. No. 946,914, Sep. 18, 1992.
Int. Cl.^{6} **F16J** *15/16*

U.S. Cl. 277—366



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1-14 13** and **15** was previously disclaimed.
Claim **14** is cancelled.

[**1.** A seal arrangement for sealing against leakage of process fluid under pressure within a housing along a rotatable shaft extending through a wall of the housing, said seal arrangement comprising:

a first rotary mechanical end face seal including a stationary seal ring for sealing connection to the housing and a rotary seal ring for sealing connection to the shaft, each said ring having an annular generally radially extending sealing face in relatively rotating, mating sealing relation with the face of the other of said rings;

a second rotary mechanical end face seal including a stationary seal ring for sealing connection to the housing and a rotary seal ring for sealing connection to the shaft, each said ring having an annular generally radially extending sealing face in relatively rotating, mating sealing relation with the face of the other of said rings;

said first and second rotary mechanical end face seals being axially spaced along the shaft and arranged to define, with said housing, an intermediate chamber therebetween, each said seal including means biasing one of the rings toward the other to maintain said annular sealing faces of each said seal ring in said relatively rotating sealing relation;

the relatively rotatable sealing rings of said first end face seal having one annular circumference of said sealing faces exposed to the process fluid to be seal within the housing, and the other annular circumference of said sealing faces exposed to said intermediate chamber;

the relatively rotatable sealing rings of said second seal having one annular circumference of said sealing faces exposed to said intermediate chamber, and the other annular circumference of said sealing faces exposed to the ambient environment external the said housing;

said intermediate chamber being in communication with the interior of said housing containing process fluid under pressure only across said relatively rotating, mating, sealing faces of said first rotary mechanical end face seal, said intermediate chamber being in communication with the ambient environment external to the housing only across said relatively rotating, mating, sealing faces of said second rotary mechanical end face seal,

said intermediate chamber including means for connection to a source of relatively inert gas at a pressure exceeding the pressure of said process fluid present at said circumference of said annular seal faces of said first rotary mechanical end face seal rings;

the radially extending face of one of said rings of said first rotary mechanical end face seal including a plurality of spiral grooves extending from said circumference exposed to the relatively inert gas in said intermediate chamber partially toward the circumference exposed to said process fluid in the interior of said housing and defining on said face an annular dam adjacent said circumfernce exposed to said process fluid in said housing for pumping the inert gas from said intermediate chamber across the seal faces and toward the process fluid contained in said housing.]

[**14.** A seal arrangement as claimed in claim **1** wherein said first rotary mechanical end face seal further comprises a first sealing O-ring disposed between the stationary seal ring and the housing for providing sealing connection therebetween and a second sealing O-ring disposed between the rotary seal ring and the shaft for providing sealing connection therebetween, said first and second O-rings having substantially similar diameters for providing seal balance of the first rotary mechanical end face seal tending to equalize the fluid pressure forces acting on said first seal.]

B1 5,445,638 (3510th)
BIPOLAR COAGULATION AND CUTTING FORCEPS

Mark A. Rydell, Golden Valley, and Joseph A. O'Brien, Fridley, both of Minn., assignors to Everest Medical Corporation, Minneapolis, Minn.

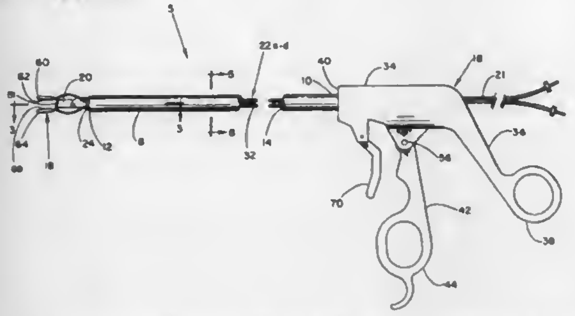
Reexamination Request No. 90/004,184, Mar. 14, 1996.

Reexamination Certificate for Patent 5,445,638, issued Aug. 29, 1995, Ser. No. 92,558, Jul. 16, 1993.

Continuation-in-part of Ser. No. 28,897, Mar. 8, 1993, abandoned.

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—51



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **10** and **22** are cancelled.

Claims **1**, **5–9**, **11–14**, **18**, **20**, **21** and **23** are determined to be patentable as amended.

Claims **2–4**, **15–17** and **19**, dependent on an amended claim, are determined to be patentable.

1. A bipolar electrosurgical device for coagulating and cutting tissue, said device comprising;

(a) an elongated tubular member having a proximal end, a distal end and a luman extending therethrough;

(b) a first moveable forceps jaw and a second moveable forceps jaw extending from said distal end of said tubular member;

(c) a means for opening and closing said first and second moveable forceps jaws relative to one another;

(d) a first electrode on said first moveable forceps jaw and a second electrode on said second moveable forceps jaw;

(e) means for applying a RF voltage across said first and second electrodes for coagulating tissue contained between said first and second moveable forceps jaws;

(f) [a] *an electrically passive, generally planar* cutting [instrument] *blade with a sharpened edge* extending from said distal end of said tubular member; and

(g) a reciprocating means for advancing and retracting *the sharpened edge of* said cutting [instrument] *blade longitudinally* through said tissue when contained between said jaws.

B1 5,455,359 (3511th)
METAL ION BINDING MONOMER AND POLYMER

J. Thomas Ippoliti; Gary A. Mabbott, both of St. Paul, Minn.; Jeremy Hans, Madison, Wis., and Michelle Stohlmeyer, Dubuque, Iowa, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Reexamination Request No. 90/004,390, Sep. 27, 1996.

Reexamination Certificate for Patent 5,455,359, issued Oct. 3, 1995, Ser. No. 130,330, Oct. 1, 1993.

Int. Cl.^{6} C07D *403/06;403/08;403/10;233/54*

U.S. Cl. 548—314.4

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

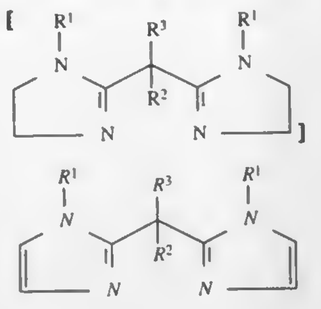
Claim **6** is cancelled.

Claims **1**, **7** and **8** are determined to be patentable as amended.

Claims **2–5** and **9–18**, dependent on an amended claim, are determined to be patentable.

New claims **19–26** are added and determined to be patentable.

1. A bis-imidazolyl compound of the formula



wherein:

R^1 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl or lower alkoxy;

R^2 is lower alkoxy or hydroxy; and

R^3 is a substituted aryl containing 6 to 10 ring carbon atoms wherein the [substituents on the ring carbon atoms are independently hydrogen, lower alkyl,] *aryl is substituted with* lower alkenyl, lower alkynyl, lower alkoxy, [halogen,] sulfate, nitro, lower alkanoyl or formyl; or R^2 and R^3 taken together form —=CR^4R^5— wherein R^4 or R^5 are the same or different and are lower alkyl.

B1 5,520,724 (3512th)
PROCESS FOR THE RECOVERY OF LOW MOLECULAR WEIGHT C_{2+} HYDROCARBONS FROM A CRACKING GAS

Heinz Bauer, Ebenhausen, and Hans Becker, München, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Reexamination Request No. 90/004,512, Jan. 9, 1997.

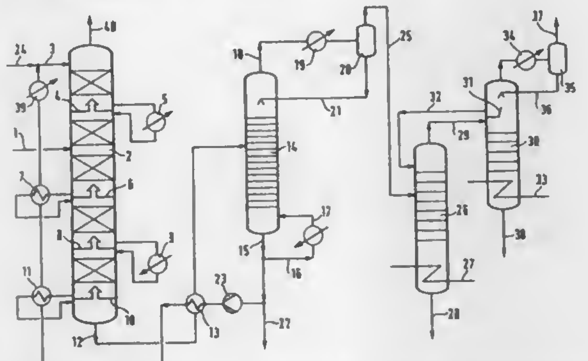
Reexamination Certificate for Patent 5,520,724, issued May 28, 1996, Ser. No. 343,487, Feb. 3, 1995.

PCT No. PCT/EP93/01180, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO93/24428, PCT Pub. Date Dec. 9, 1993

Claims priority, application Germany, May 27, 1992, 42 17 611.5

Int. Cl.^{6} B01D *53/14;19/00*

U.S. Cl. 95—169



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **4–17** and **20–22** are cancelled.

Claims **3** and **18** are determined to be patentable as amended.

Claim **19** dependent on an amended claim, is determined to be patentable.

New claims **23–27** are added and determimed to be patentable.

24. A process according to claim 23 wherein the regenerated scrubbing agent exhibits a higher weight percent of C_3 *hydrocarbons than* C_2 *hydrocarbons.*

STATUTORY INVENTION REGISTRATIONS

PUBLISHED MAY 5, 1998

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration, see 35 U.S.C. 157.

H1725
CLEAR POLYPHENYLENE ETHER/BLOCK COPOLYMER COMPOSITION

Michael John Modic, Houston, Tex.; Ronald Wroczynski, Schenectady, N.Y.; James Scobbo, Slingerlands, N.Y., and Gim Lee, Albany, N.Y., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 23, 1996, Ser. No. 606,181

Int. Cl.^{6} C09K *3/00*

U.S. Cl. 252—1 **15 Claims**

1. A clear composition comprising:

a polyphenylene ether; and

a hydrogenated AB block copolymer having a terminal resinous block derived from styrene or a-methylstyrene and a rubbery block derived from a 4–8 carbon atom conjugated alkadiene, said resinous block having a molecular weight within the range of 23,000–100,000, the total resinous component content of said block copolymer being within the range of 45–58 weight percent;

wherein the total molecular weight of said block copolymer is within the range of 40,000–225,000, said block copolymer being present in an amount within the range of 2–30 weight percent based on the weight of said polyphenylene ether and said block copolymer;

wherein said block copolymer is hydrogenated to the extent that unsaturation is said rubbery block is reduced to less than 10% of the original unsaturation; and

wherein no more than 10% of the original aromatic unsaturation of said resinous block is removed.

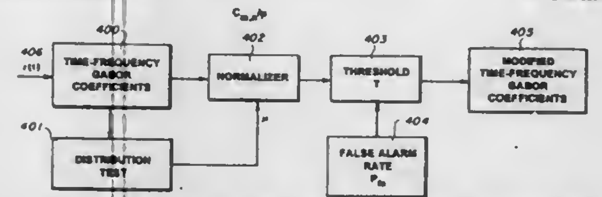
H1726
CFAR TIME-FREQUENCY PROCESSOR FOR SIGNAL DETECTION AND EXTRACTION IN NOISE

Victor C. Chen, 2706 Shawn Leigh Dr., Vienna, Va. 22181

Filed Mar. 31, 1997, Ser. No. 829,262

Int. Cl.^{6} G01S *13/00*

U.S. Cl. 342—93 **9 Claims**


400
402
403
405
406
r(t)
TIME-FREQUENCY GABOR COEFFICIENTS
NORMALIZER
THRESHOLD T
MODIFIED TIME-FREQUENCY GABOR COEFFICIENTS
401
DISTRIBUTION TEST
404
FALSE ALARM RATE P_{fa}

1. In a radar receiver, an improved method for detection and extraction of an unknown information signal and noise comprising:

processing said unknown information signal and said noise received in said receiving step into meaningful information using a series of processing steps comprising:

generating and outputting time-frequency information from said unknown information signal and said noise,

processing said time-frequency information using statistical distribution information of said noise and generating noise filtered information,

receiving said noise filtered information and said time-frequency information and normalizing said noise filtered information and said time frequency information and outputting normalized information,

receiving said normalized information and false alarm rate information and thresholding said normalized information and generating thresholded time-frequency information, and

detecting and extracting a noiseless information signal from said threshold time-frequency information.

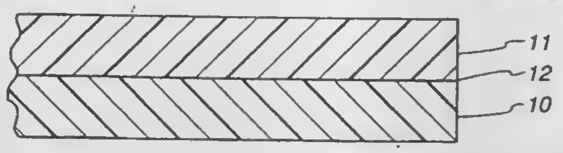
H1727
HEAT SEALABLE PACKAGING MATERIALS HAVING A PEELABLE, EASY-OPENING FEATURE

Gregory K. Jones, 2653 Sunnyview Rd., Appleton, Wis. 54914, and Mary E. Shepard, 1036 Grove St., Oshkosh, Wis. 54901

Filed Jul. 17, 1996, Ser. No. 682,413

Int. Cl.^{6} B29D *23/00*

U.S. Cl. 428—35.7 **6 Claims**



1. A multilayer, heat sealable polymeric film, comprising a first interior layer comprising polypropylene and a polymer selected from the group consisting of an ionomer, an acid copolymer, EVA, LDPE, and LLDPE; a second outer layer comprising polybutylene and a polymer selected from the group consisting of LDPE, LLDPE, EVA, EAA, and an ionomer, said second outer layer being heat sealable; said first interior layer and said second outer layer being disposed in face-to-face contact, wherein said first interior layer and said second outer layer form a delamination type peelable seal.

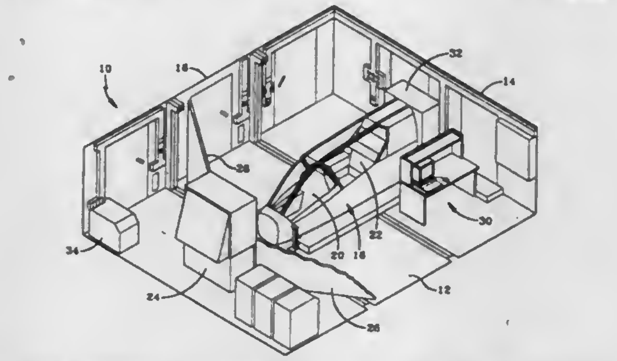
H1728
SIMULATOR

Thomas M. Kelso, Great Mills; David T. Perdue; Gary L. Pratz, both of California; Damon J. Boyle, Leonardtown; Scott R. Davis, Hollywood, and Douglas M. Vojik, California, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1994, Ser. No. 339,991

Int. Cl.^{6} G09B *9/42*

U.S. Cl. 434—43 **11 Claims**



1. In a simulator comprising a crew station comprising a cockpit having seating for at least one crew member, the cockpit having side walls and a window, video display means for displaying images, the images being located outside the crew station but visible therefrom, image generating means for driving said display means to produce scenes simulating mission conditions on said display means, and control means for controlling the operation of said image generating means, the improvement wherein said control means includes:

means for displaying control choices on said video display means at the same location thereon at which at least portions of said mission condition-simulating scenes are displayed; and

a control module located outside the cockpit, adjacent to one of the side walls, and reachable by the crew member through the window while seated in the cockpit, said control module including means by which said crew member can make selections from the displayed choices and thereby affect operation of said image generating means.

H1729

METHOD FOR PREPARING COMPOUNDS EMPLOYING SOLID PHASE SYNTHESIS AND NOVEL LINKER-RESIN

Scott A. Biller, Hopewell, N.J.; R. Michael Lawrence, Yardley, Pa., and Michael A. Poss, Lawrenceville, N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Apr. 21, 1997, Ser. No. 837,560

Int. Cl.^{6} C08K *5/06*

U.S. Cl. 525—54.11 **18 Claims**

1. A dialkoxyaryl aldehyde linker-resin for use in carrying out solid phase syntheses, which aldehyde linker-resin comprises a resin suitable for use as a support for carrying out solid phase syntheses and a dialkoxyaryl aldehyde containing linker attached to the resin.

H1730

FUNCTIONALIZED STAR POLYMERS

Robert Jude Sutherland, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 530,132, May 29, 1990. This application Sep. 8, 1992, Ser. No. 942,019

Int. Cl.^{6} C08F *293/00*

U.S. Cl. 525—299 **20 Claims**

1. A block polymer of the star type having a central core of crosslinked di(alkenyl) aromatic hydrocarbon and a plurality of functionalized branches wherein at least the terminal portion is polymerized alkyl methacrylate polymerized through the ethylenic unsaturation of the methacrylate moiety, the polymer having the formula

$$(A)_t C[(A)_r M]_s$$

wherein C is the core of crosslinked di(alkenyl) aromatic hydrocarbon, A independently is a block of polymerized anionically polymerizable monomer, M is a block of the polymeized alkyl methacrylate, r is 0 or 1, s is an average number from about 3 to about 50, and t is a number up to about 50 which is equal to or greater than s.

REISSUES

MAY 5, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,780

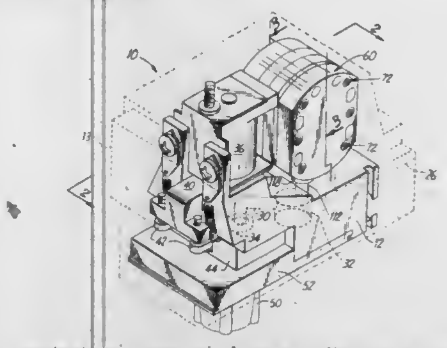
CONSTANT RATIO POST-MIX BEVERAGE DISPENSING VALVE

David A. Hassell, and David C. Anderson, both of Anoka, Minn., assignors to IMI Cornelius Inc., Anoka, Minn.

Original No. 5,156,301, dated Oct. 20, 1992, Ser. No. 628,818, Dec. 17, 1990. Application for reissue Oct. 19, 1994, Ser. No. 326,174

Int. Cl.^{6} B67D *5/56*

U.S. Cl. 222—129.2 **27 Claims**



1. A constant ratio post-mix beverage dispensing valve comprising:

a valve body, the valve body having a carbonated water channel first portion and a syrup channel first portion, both first channel portions extending partially through the valve body from first portion first ends initiating at a valve body connecting end for providing connection to sources of carbonated water and syrup respectively and terminating at first portion second ends, and the valve body having a carbonated water channel second portion and a syrup channel second portion therein, both second channel portions extending partially through the valve body from second portion first ends and terminating at second portion second ends for communicating with valve means, the valve means for regulating flow of carbonated water and syrup from the sources thereof to a dispensing nozzle,

the carbonated water second channel portion having a flow control means therein,

[a plug releasably insertable into the valve body, said plug including sealing means for sealing with the valve body, providing access to the flow control means, and having a top surface forming an interior surface portion of the carbonated water second channel portion.] and

a gear ratioing means, the ratioing means having a housing for retaining a carbonated water gear pair and a syrup gear pair therein, one gear of each gear pair secured to a common drive shaft, and the carbonated water gear pair rotating within a carbonated water cavity and the syrup gear pair rotating within a syrup cavity, and each cavity fluidly separate from the other and having an inlet and an outlet, and the ratioing means sealably securable to the valve body so that both the syrup cavity and the carbonated water cavity inlets are in sealed fluid communication with the carbonated water and syrup channel first portion second ends respectively, and so that the syrup cavity and the carbonated water cavity outlets are in sealed fluid communication with the carbonated water and syrup channel second portion first ends respectively so that the carbonated water and syrup can flow through the ratioing means wherein a desired volume ratio between the carbonated water and syrup is maintained as a function of the relative size of the gear pairs to each other.

Re. 35,781

CODING METHOD OF IMAGE INFORMATION

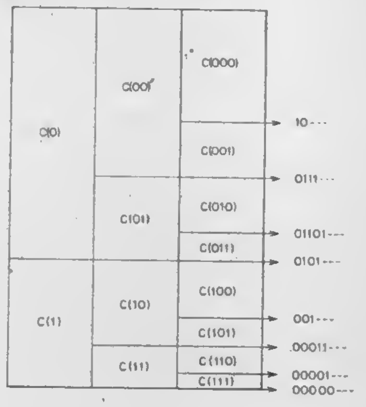
Fumitaka Ono; Shigenori Kino; Masayuki Yoshida, and Tomohiro Kimura, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 5,059,976, dated Oct. 22, 1991, Ser. No. 470,099, Jan. 25, 1990. Continuation of Ser. No. 139,561, Oct. 20, 1993, abandoned. Application for reissue Nov. 7, 1995, Ser. No. 553,235

Claims priority, application Japan, Jan. 31, 1989, 1-21672

Int. Cl.^{6} H03M *7/34*

U.S. Cl. 341—51 **14 Claims**



1. A method for coding information from a binary Markov information source by binary coding an output symbol sequence from said information source comprising less probable symbols (LPS) and more probable symbols (MPS), each having an occurrence probability, on a normalization number line, said method comprising the steps of;

a) storing in a memory storage device a normalization number line having a range from 0 to 1 which corresponds to said output symbol sequence,

b) keeping a desired calculation accuracy by expanding a range of the normalization number line which includes a mapping range by means of a multiple of a power of 2 when the mapping range becomes less than 0.5,

c) allocating a portion of said normalization number line as a predetermined mapping interval for said LPSs, said portion being proportional to the occurrence probability of said LPSs,

d) allocating the remaining portion of said number line as a mapping interval for said MPSs,

e) reassigning half of the LPS mapping interval above 0.5 to said MPS mapping interval when the LPS mapping range exceeds 0.5, and

f) repeating steps b, c, d and e.

Re. 35,782

IN-SITU LANDFILL PYROLYSIS, REMEDIATION AND VITRIFICATION

Louis J. Circeo, Jr., 4245 Navajo Trail, Atlanta, Ga. 30319, and Salvador L. Camacho, 8913 O'Neal Rd., Raleigh, N.C. 27612

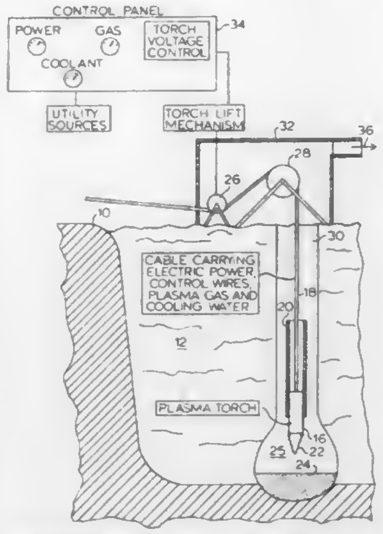
Original No. 5,181,795, dated Jan. 26, 1993, Ser. No. 931,962, Aug. 19, 1992. Application for reissue Dec. 19, 1994, Ser. No. 358,869

Int. Cl.^{6} E02D *3/00;3/11;* **A62D** *3/00*

U.S. Cl. 405—128 **12 Claims**

1. A method for in-situ treatment and remediation of waste materials collected in a landfill by means of a plasma torch having appropriate connected utilities, comprising *the steps of*:

(a) forming a borehole of a size sufficient to accommodate a plasma torch and extending from an upper end to a lower end



at a predetermined depth below the landfill's top surface and passing through waste materials collected in the landfill;

(*b*) *inserting a casing into said formed borehole for preventing sidewall collapse;*

[(b)] (*c*) lowering a plasma torch with connected utilities into said formed borehole and suspending the torch at a location above and proximate said borehole lower end;

[(c)] (*d*) utilizing the connected plasma torch utilities to operate said torch *to convert electrical energy to heat so as* to create a plasma arc flame of sufficient temperature to pyrolize, remediate and vitrify[, substantially in the absence of combustion,] said waste materials located proximate said plasma arc flame, thus forming a molten mass, and permitting any resultant by-product gases to rise in said formed borehole;

[(d)] (*e*) collecting said by-product gases for treatment and recycling;

[(e)] (*f*) deenergizing the torch and stopping production of said plasma arc flame;

[(f)] (*g*) [removing] *raising* the plasma torch with its connected utilities from the borehole; and

[(g)] (*h*) allowing said molten mass to cool and solidify thereby to produce a [column] *mass* of remediated and vitrified waste material [which] *whose* volume is substantially less than the volume of waste material from which the vitrified [column] *material* was produced.

Re. 35,783

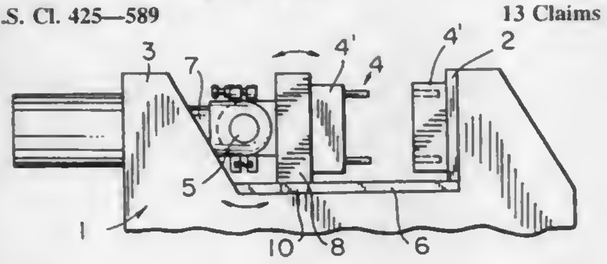
INJECTION MOLDING MACHINE HAVING TILTABLE MOUNTING PLATES

Heinz Leonhartsberger, Schwertberg; Helmut Naderhirn, Perg; Werner Kappelmüller, Schwertberg, and Otto Urbanek, Linz, all of Austria, assignors to Engel Maschinenbau Gesellschaft m.b.H., Schwertberg, Austria

Original No. 5,249,951, dated Oct. 5, 1993, Ser. No. 782,572, Oct. 25, 1991. Continuation of Ser. No. 394,656, Feb. 22, 1995, abandoned. Application for reissue Aug. 30, 1996, Ser. No. 706,446

Int. Cl.^{6} B29C *45/64*

U.S. Cl. 425—589 **13 Claims**



10. An injection molding machine comprising a machine frame, a stationary and a movable mold mounting plate, a closing mechanism for moving the movable mold mounting plate relative to the stationary mold mounting plate, the closing mechanism and the stationary mold mounting plate being connected to each other by the machine frame, means for mounting at least one of said mold mounting plates tiltably about a horizontal axis, and guide means for guiding the movable mold mounting plate during movement of the movable mold mounting plate, said guide means including a guide rigidly mounted to one of said mold mounting plates, the other of said mold mounting plates being slidably engaged with said guide for sliding with respect to said guide during movement of the movable mold mounting plate.

Re. 35,784

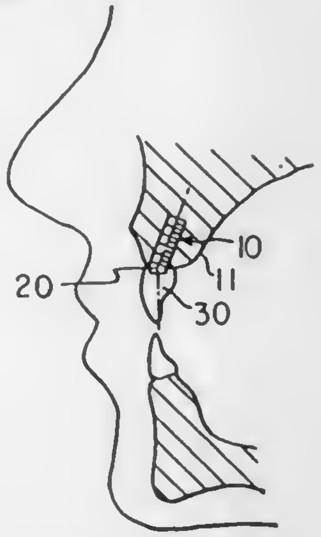
SUBMERGIBLE SCREW-TYPE DENTAL IMPLANT AND METHOD OF UTILIZATION

Leonard I. Linkow, New York, N.Y., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent-Plant Corporation, Philadelphia, Pa.

Original No. 4,932,868, dated Jun. 12, 1990, Ser. No. 319,651, Mar. 6, 1989. Continuation of Ser. No. 771,398, Oct. 2, 1991, abandoned, which is a continuation of Ser. No. 25,942, Mar. 16, 1987, Pat. No. 4,842,518, which is a continuation-in-part of Ser. No. 904,381, Sep. 4, 1986, Pat. No. 4,713,004. Application for reissue Jan. 16, 1996, Ser. No. 587,133

Int. Cl.^{6} A61C *8/00*

U.S. Cl. 433—174 **35 Claims**



1. An implant portion of an implant designed for supporting a prosthetic structure comprising:

an implant body having threads over at least part of its exterior surface and being adapted to be threaded into an opening in a bone of a patient, which bone has been exposed by an incision in the covering tissue; and

at least one channel formed such that it at least extends through threads [on] *of* the body for directing bone chips toward a base portion of the opening in the bone, one edge of the threads at one side of the channel being substantially at a right angle to the circumferential direction of the threads *and shaped to form at least one cutting edge at one of the threads*, said *at least* one *cutting* edge [being adapted] *having a bone tapping and scraping surface so as to come into contact with the bone surrounding the opening upon insertion of the implant body into the opening and while a major portion of the implant body is outside the opening such that threading of the implant body further into the opening causes the bone tapping and scraping surface to engage the surrounding bone and* (i) to [promote self-tapping of] *self-tap* the threads [in] *into* the *surrounding* bone, (ii) to shave off pieces of bone during threading of the implant [portion] *body* into *the opening in* the bone, and (iii) to direct the pieces of bone into the channel such that the channel may direct pieces toward the base portion of the opening.

Re. 35,785

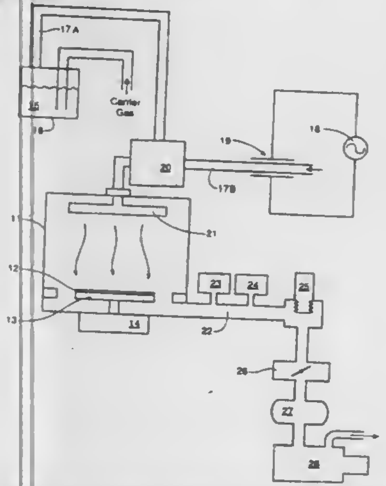
LOW-PRESSURE CHEMICAL VAPOR DEPOSITION PROCESS FOR DEPOSITING HIGH-DENSITY HIGHLY-CONFORMAL, TITANIUM NITRIDE FILMS OF LOW BULK RESISTIVITY

Gurtej S. Sandhu, Boise, Id., and Todd W. Buley, Mesa, Ariz., assignors to Micron Technology, Inc., Boise, Id.

Original No. 5,246,881, dated Sep. 21, 1993, Ser. No. 46,685, Apr. 14, 1993. Application for reissue Sep. 21, 1995, Ser. No. 570,613

Int. Cl.^{6} H01L *21/285*

U.S. Cl. 438—681 **28 Claims**



23. A chemical vapor deposition process for depositing a titanium nitride film on a semiconductor wafer comprising the steps of:

disposing the semiconductor wafer on a heated susceptor plate within a chemical vapor deposition chamber;

admitting into said chamber a metal-organic titanium compound as the primary precursor compound; and

admitting an activated species into said chamber, said activated species having been created in a plasma discharge at a location remote from the chamber, and said primary precursor compound having not been subjected to a plasma discharge.

Re. 35,786

TELEVISION GAME APPARATUS

Makoto Ohara, Botan Koto-ku, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan

Original No. 5,161,803, dated Nov. 10, 1992, Ser. No. 710,520, Jun. 3, 1991. Application for reissue Nov. 9, 1994, Ser. No. 336,829

Claims priority, application Japan, Jun. 14, 1990, 2-155838

Int. Cl.^{6} D63F *5/22*

U.S. Cl. 463—44 **18 Claims**

17. A hand-held video system capable of providing game play and display of television broadcasting signals, comprising:

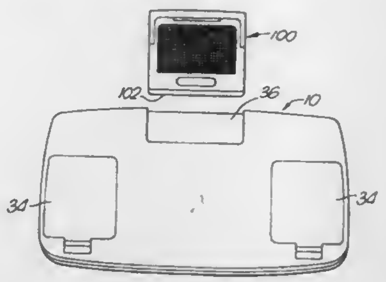
a housing member dimensionally sized to be held in an operator's hands for game play;

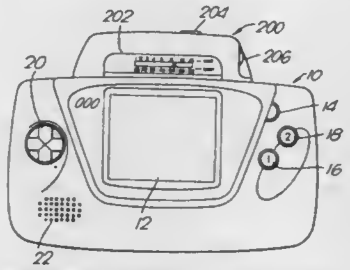
a display screen on said housing member;

a connector port on said housing member for removably making an electrical connection with one of a game cartridge and a television tuner cartridge, said connector port comprising terminals for receiving game programs from the game cartridge and terminals for receiving television display and sound signals from the television tuner cartridge;

game controlling means for controlling the progress of the game when the game cartridge is connected to said connector port;

display controlling means for displaying the progress of the game on said display screen when the game cartridge is connected and for displaying television signals on said display screen when the television tuner cartridge is connected to said connector port;





means for determining whether a game cartridge or a television tuner cartridge is connected to the connector port; and

means for driving the display controlling means in response to the means for determining.

Re. 35,787

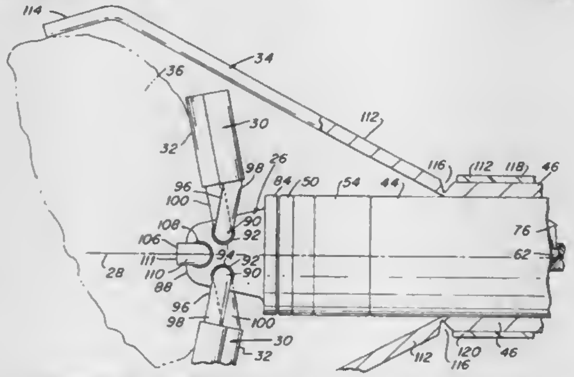
STONE DESTROYING CATHETER AND METHOD OF USE

John Nash, Downingtown, and Mark Michels, Glen Mills, both of Pa., assignors to Kensey Nash Corporation, Exton, Pa.

Original No. 4,811,735, dated Mar. 14, 1989, Ser. No. 79,610, Jul. 30, 1987. Application for reissue Mar. 13, 1991, Ser. No. 668,670

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—128 **61 Claims**



1. Apparatus for disintegrating or otherwise destroying a stone within the body of a living being, said apparatus comprising a small diameter instrument having an elongated portion including a longitudinal axis and comprising a working head, said elongated portion capable of being located at a position within said body wherein said working head is adjacent the stone, said working head being coupled to means for rotating said working head at a high speed about said axis, said working head comprising a first portion, at least one impacting member having an impacting surface thereon *adjacent only one end of said at least one impacting member*, and coupling means movably coupling *only the end of* said impacting member [to said first portion] *opposed to the end to which the impacting surface is adjacent* for enabling said impacting member to move from a retracted position to an extended position, said impacting surface being located a greater radial distance from the longitudinal axis of the elongated portion of the apparatus when in said extended position than when in said retracted position, said impacting surface being arranged when rotating in said extended position to impact said stone to disintegrate or otherwise destroy it.

PLANT PATENTS

GRANTED MAY 5, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,370

AZALEA—'JEAN PANZER'

Fred Panzer, Beaverton, Oreg., assignor to Panzer Nursey, Inc., Beaverton, Oreg.

Filed Jan. 25, 1995, Ser. No. 377,934

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct azalea plant substantially as herein shown and described, characterized particularly by its tea rose-shaped red flowers.

10,371

HYDRANGEA PLANT NAMED 'FRAU NOBUKO'

Hiroshi Ebihara, Ninomiya-machi, Japan, assignor to Miyoshi & Co. Ltd., Tokyo, Japan

Filed Oct. 17, 1996, Ser. No. 731,694

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—67.1 **1 Claim**

1. A new and distinct hybrid plant variety of the Saxifragaceae family substantially as herein shown and described.

10,372

HYDRANGEA PLANT NAMED 'FRAU TAIKO'

Hiroshi Ebihara, Ninomiya-machi, Japan, assignor to Miyoshi & Co. Ltd., Tokyo, Japan

Filed Oct. 16, 1996, Ser. No. 734,366

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—67.1 **1 Claim**

1. A new and distinct hybrid plant variety of the Saxifragaceae family substantially as herein shown and described.

10,373

HIPPEASTRUM (AMARYLLIS) PLANT NAMED 'ROZETTA'

Andre Barnhoorn, Wilgespruit, South Africa, assignor to Hadeco (Pty.) Ltd., Maraisburg, South Africa

Filed Jun. 28, 1996, Ser. No. 671,567

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Hippeastrum (Amaryllis) plant named 'Rozetta', as illustrated and described.

10,374

HIPPEASTRUM (AMARYLLIS) PLANT NAMED 'DOUBLE SIX'

Andre Barnhoorn, Wilgespruit, South Africa, assignor to Hadeco (Pty.) Ltd., Maraisburg, South Africa

Filed Jul. 1, 1996, Ser. No. 672,944

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Hippeastrum (Amaryllis) plant named 'Double Six', as illustrated and described.

10,375

CHRYSANTHEMUM PLANT NAMED 'ARABELLA'

Leon Glicenstein, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 19, 1996, Ser. No. 702,296

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Arabella, as described and illustrated.

10,376

CHRYSANTHEMUM PLANT NAMED 'ORANGE STATE'

Peter S. Hesse, Nipomo, Calif., assignor to Clearwater Nursery, Inc., Nipomo, Calif.

Filed Sep. 12, 1996, Ser. No. 711,856

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—82.3 **1 Claim**

1. A new and distinct chrysanthemum plant named 'Orange State' substantially as herein described and shown characterized by its orange ray floret coloration.

10,377

FUCHSIA PLANT, SANISTANF

Toshi Tanaka, Ashiya; Hidefumi Funakoshi, Takarazuka; Kenkichi Nose, Ashiya, and Ushio Sakazaki, Hikone, all of Japan, assignors to Suntory Limited, Osaka, and Nishinomiya City, Hyogo, both of Japan

Filed Jan. 28, 1997, Ser. No. 788,460

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—84 **1 Claim**

1. A new and distinct variety of fuchsia plant, substantially as herein illustrated and described, characterized particularly as to novelty by (A) being a spreading growth habit plant with strong bushy and thick stem, (B) great profusion blooms, the whole bush remaining in bloom for a considerable period of time, and very long flowering duration, (C) having flowers which are single without variegated pattern on petals which is deep violet to moderate purple color, (D) having vivid red sepals without variegated pattern and vivid red calyx without variegated pattern, and (E) a high resistance to heat, cold, and disease.

10,378

FUCHSIA PLANT, SANIHANF

Toshi Tanaka, Ahiya; Hidefumi Funakoshi, Takarazuka; Kenkichi Nose, Ashiya, and Ushio Sakazaki, Hikone, all of Japan, assignors to Suntory Limited, Osaka, and Nishinomiya City, Hyogo, both of Japan

Filed Jan. 28, 1997, Ser. No. 788,461

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—84 **1 Claim**

1. A new and distinct variety of fuchsia plant, substantially as herein illustrated and described, characterized particularly as to novelty by (A) being a nutant growth habit plant with low plant height and strong bushy, (B) great profusion blooms, the whole bush remaining in bloom for a considerable period of time, and

very long flowering duration, (C) having flowers which are single without variegated pattern on petals which is deep violet to moderate purple color, (D) having vivid red sepals without variegated pattern and vivid red calyx tube without variegated pattern, and (E) a high resistance to heat, cold and disease.

10,379
PHLOX PLANT NAMED 'SHORTWOOD'

Sinclair A. Adam, Jr., 231 S. Bonsall Rd., Coatesville, Pa. 19320
Filed Jan. 13, 1997, Ser. No. 782,616
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.7 **1 Claim**

1. A new and distinct Phlox plant named 'Shortwood', as illustrated and described.

10,380
GERANIUM NAMED 'FREE LIGHT LAU'

Mitchell Eugene Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.
Filed Nov. 13, 1996, Ser. No. 748,267
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant substantially as herein shown and described, named Free Light Lav, that is characterized by: green foliage without zonation, light lavender flower color, and semi-double flowers on large umbels, a vigorous plant that is fast rooting with a semi-compact habit.

10,381
KALANCHOE PLANT NAMED 'SOFIE'

Knud Jepsen, Hinnerup, Denmark, assignor to Knud Jepsen A/S, Hinnerup, Denmark
Filed Jan. 8, 1997, Ser. No. 780,700
Int. Cl.⁶ A01N *5/00*

U.S. Cl. Plt.—87.15 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named 'Sofie' as illustrated and described.

10,382
VRIESIA PLANT NAMED 'PROMINENT'

Henny Bos, Hoefslag 1,, 2641 ZZ Pijnacker, Netherlands
Filed Dec. 16, 1996, Ser. No. 766,340
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Vriesia plant named 'Prominent', as illustrated and described.

10,383
GUZMANIA PLANT NAMED 'SUNSTAR'

Henny Bos, Hoefslag 1, 2641 ZZ Pijnacker, Netherlands
Filed Dec. 16, 1996, Ser. No. 767,212
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Guzmania plant named 'Sunstar', as illustrated and described.

10,384
BA 78-258 KENTUCKY BLUEGRASS

Virgil D. Meier, Marysville, Ohio, and Jay B. Burr, Salem, Oreg., assignors to OMS Investments, Inc., Wilmington, Del.
Filed Dec. 10, 1996, Ser. No. 763,076
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—90.2 **1 Claim**

1. A variety of Kentucky Bluegrass plant, substantially as shown and described, characterized by a medium to high level of resistance to a broad spectrum of serious diseases including leaf spot and melting out, dollar spot, rusts and brown patch; a dark green color throughout the growing season; a medium to high quality turf formation under a wide variety of environmental conditions; a moderately wide blade; a strong root system and a high level of seed yielding capacity.

PATENTS

GRANTED May 5, 1998

ERRATA

For CLASS	See PATENT NO.
101—123	5,746,125
132—232	5,746,226
403—316	5,746,548
548—257	5,746,840
530—402	5,747,293
336—233	5,748,013
349—152	5,748,179
358—296	5,748,307
381—068	5,748,743
382—115	5,748,755
395—306	5,748,806
375—200	5,748,891

PATENTS

GRANTED MAY 5, 1998

GENERAL AND MECHANICAL

5,745,916

PROTECTIVE GLOVE FOR ICE-HOCKEY AND SIMILAR SPORTS

Hans Linner, Sellerberg 7, D-83370 Seeon, Germany

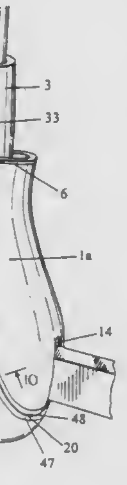
PCT No. PCT/DE95/00204, § 371 Date Oct. 24, 1995, § 102(e) Date Oct. 24, 1995, PCT Pub. No. WO95/22914, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 16, 1995, Ser. No. 545,634

Claims priority, application Germany, Feb. 24, 1994, 44 06 066.1

Int. Cl.^{6} A41D *19/00*

U.S. Cl. 2—16 **20 Claims**



1. A protective hockey glove for a hand, comprising: a first stiff padding member molded for the fingers; a second stiff padding member molded for the thumb of the hand, the padding members being configured in a region of contact between the thumb and index finger so that when the hand is closed to grip a stick edges of the padding members fit together substantially without gaps along a defined line of contact to form an opening for the stick; and outwardly directed hinge means for connecting the first padding member to the second padding member so that the index finger can be moved toward the thumb, the hinge means running transverse to a longitudinal direction of the fingers.

5,745,917

ENERGY EXPENDITURE GARMENT

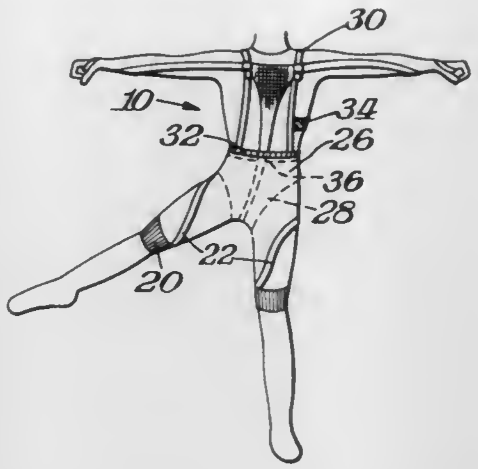
Timothy P. Dicker, 6906 Foothill Blvd., Tujunga, Calif. 91042, and William T. Wilkinson, P. O. Box 73, Salem, N.J. 08079

Filed Dec. 30, 1996, Ser. No. 777,455

Int. Cl.^{6} A41D *13/00*

U.S. Cl. 2—69 **14 Claims**

1. An aerobic resistance garment for indoor use or warm weather use comprising a shorts section, said shorts section having a waist area and a pair of legs with an intermediate body area below said waist area and above said legs, elongated resistance elements in said shorts section, a shoulder anchoring structure mounted to and extending upwardly from said waist area for fitting over the wearer's shoulders, said legs terminating above the calves of the user, said garment including a shirt section with arms and a body portion, said body portion having a navel portion and a torso said elongated resistance elements comprising a T-shaped resistance band which extends across said body portion and said arms of the garment and downwardly on said torso of the garment, and said band tapering to a termination point below said navel portion.



5,745,918

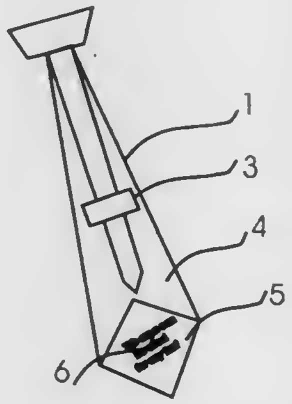
NECKTIE AS AN INFORMATION SOURCE

Mukta M. Shukla, and Ashok K. Shukla, both of 10024 Century Dr., Ellicott City, Md. 21042

Filed May 9, 1997, Ser. No. 853,478

Int. Cl.^{6} A41D *25/00;27/08*

U.S. Cl. 2—144 **4 Claims**



1. A necktie comprising a wide end and a narrow end and a knot portion therein between; said wide end having a front side that will face away from the wearer and said front side having a graphic design said wide end also having; a back side that will face towards the wearer and said back side at its wide lower end having text information permanently placed on said back side wide lower end; and said text information explains said graphic design of said front side.

5,745,919

CUT-RESISTANT PROTECTIVE GLOVE WITH LEATHER SHEATH

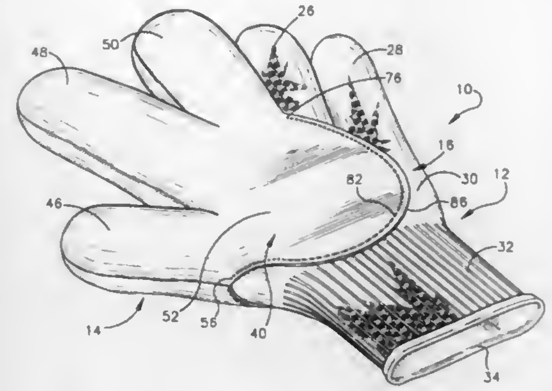
Gerald A. Kraatz, Strongsville, Ohio, assignor to Whizard Protective Wear Corp., Birmingham, Ohio

Filed Oct. 29, 1996, Ser. No. 738,625

Int. Cl.^{6} A41D *19/00*

U.S. Cl. 2—161.6 **18 Claims**

1. A protective glove comprising:



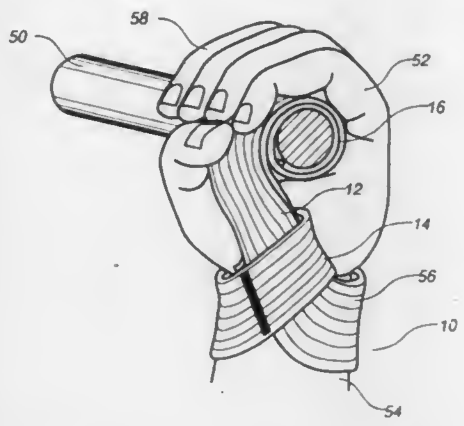
a) a cut-resistant glove comprised of a cut-resistant fabric and having a first side and a second side, the first and second sides being similarly configured such that the glove is suitable to be worn on either of a right hand or left hand of a user; and

b) a grip-enhancing sheath affixed to the cut-resistant glove and having substantially symmetrical portions overlaying the first side and the second side, the symmetrical portions being smaller than the first and second sides.

5,745,920
HAND STRAP FOR USE WITH A WEIGHTLIFTING BAR

W. Christopher Olivier, P.O. Box 56431, Houston, Tex. 77256
Filed Apr. 7, 1997, Ser. No. 831,249
Int. Cl.⁶ A41D *19/00*

U.S. Cl. 2—170 **20 Claims**



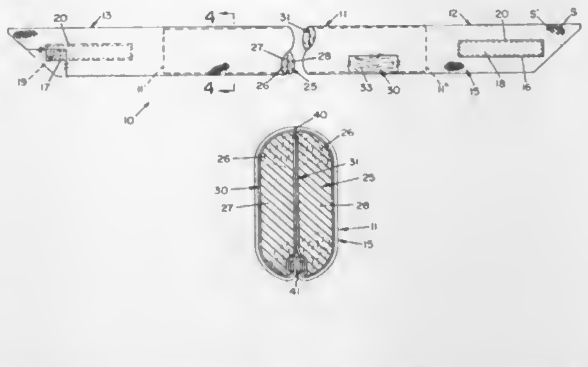
1. A weightlifting hand strap for use with a weightlifting bar comprising:
- a spring strip;
- a strap of fibrous material covering an exterior of said spring strip; and
- a wrist receiving means formed at an end of said strap, said wrist receiving means for extending around a human wrist, said strap extending outwardly from said wrist receiving means.

5,745,921
MOISTURE-TRANSFERRING SWEAT BAND

Albert W. Mitchell, 3244 Cobblestone Dr., Pace, Fla. 32571, and Mark Gifford, 817 Oak Glen Dr., Houston, Tex. 77076
Filed Nov. 4, 1996, Ser. No. 740,847
Int. Cl.⁶ A42C *5/02*

U.S. Cl. 2—181 **18 Claims**

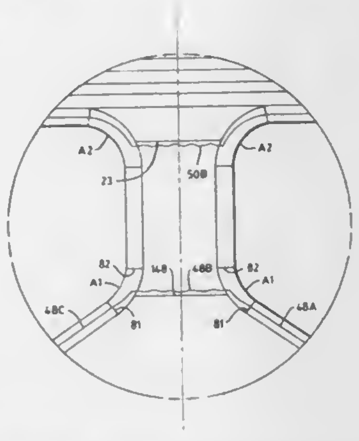
1. A sweat band for absorbing and transferring moisture from the brow of a wearer's head comprising, an elongate body having a generally tubular medial portion for engaging the brow of a wearer's head and extending ends for securing the band about a wearer's head, said medial portion of said elongate body formed of a porous cloth cover on an outer surface thereof, a layer of porous batting material disposed internally of said porous cloth cover in a generally tubular configuration, a surface skin on each side of said layer of porous batting material providing retention of and travel of moisture longitudinally in relation to said layer of porous batting material, and securing elements retaining said layer of porous batting material and said surface skin in a predetermined position relative to said porous cloth cover.



5,745,922
DISPOSABLE GARMENT AND RELATED MANUFACTURING EQUIPMENT AND METHODS

Gregory John Rajala, Neenah; Steven Craig Gehling, Oshkosh, and Paul Daniel Suke, Appleton, all of Wis., assignors to Kimberly Clark Corporation, Neenah, Wis.
Filed Jan. 31, 1995, Ser. No. 382,108
Int. Cl.⁶ A41D *13/04;* **B32B** *31/10;* **A61F** *13/15*

U.S. Cl. 2—243.1 **37 Claims**



1. A garment blank subassembly having a front body portion, a back body portion, and a crotch intermediate of and extending from the front body portion to the back body portion and between a pair of leg openings in a garment to be assembled from the garment blank subassembly, the front body portion having first and second front leg edge portions along the leg openings, a front end opposite the first and second front leg edge portions and first and second front sides, the back body portion having first and second back leg edge portions along the leg openings, a back end opposite the first and second back leg edge portions and first and second back sides, the crotch having first and second crotch edge portions on opposing sides thereof along the leg openings, the garment blank subassembly having a length extending between the front and back ends, width extending between the first and second sides and a longitudinal centerline between the first and second front and back sides, each of the first and second back leg edge portions having an angular portion extending generally along a line forming an acute angle with the longitudinal centerline, the garment blank subassembly, when laid out flat, comprising:

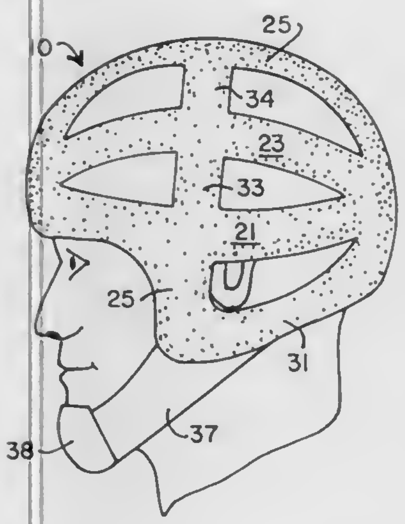
(a) a first layer, extending from the first end through the crotch to the second end;

(b) a first elastic attached to the first layer, and extending from a first locus adjacent the first back side, as a first section of the first elastic, along the width of the garment blank subassembly, toward the front end at an acute angle with the longitudinal centerline and generally following the first back leg edge portion toward the crotch, as a second section of the first elastic across the crotch, and as a third section of the first elastic away from the first end at an acute angle with the longitudinal centerline and generally following the second back leg edge portion, to a second locus adjacent the second back side, wherein the first and third sections of the first elastic are stretched and the second section of the first elastic being substantially relaxed when the garment blank subassembly is laid out flat.

5,745,923
IMPACT ABSORBING PROTECTIVE APPARATUS FOR THE FRONTAL TEMPORAL AND OCCIPITAL BASILAR SKULL

Jeffrey P. Katz, 632 Rainbow Span, Columbia, Md. 21045
Filed Dec. 2, 1996, Ser. No. 759,120
Int. Cl.⁶ A42B *3/04*

U.S. Cl. 2—411 **24 Claims**



1. A helmet for a human head comprising:

(a) a plurality of longitudinal arched segments for encircling the frontal, temporal and occipital basilar skull of a human head, each said arched segment having:
- (i) an outer convex surface and an inner substantially flat longitudinally arched surface,
- (ii) a hollow passage extending longitudinally therein,
- (iii) said arched segments being of cushioning material capable of yielding to absorb impact forces,

(b) a relatively stiff reinforcing element in and substantially filling said passage of each said arched segment, and

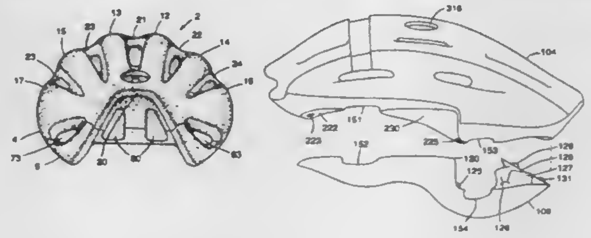
(c) a retaining element extending from a first occipital and temporal area to a second occipital and temporal area, said retaining element when said helmet is on a human head to engage the chin,

whereby to protect a skull in said helmet from impact forces.

5,745,924
BICYCLE HELMET

F. Robert Egger, Watsonville, Calif., assignor to Specialized Bicycle Components, Inc., Morgan Hill, Calif.
Continuation of Ser. No. 526,451, Sep. 11, 1995, Pat. No. 5,651,145, which is a continuation of Ser. No. 123,728, Sep. 17, 1993, Pat. No. 5,450,631. This application Jan. 16, 1997, Ser. No. 784,738
Int. Cl.⁶ A42B *1/06*

U.S. Cl. 2—425 **2 Claims**

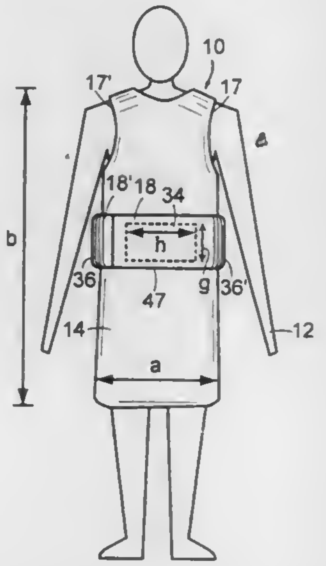


1. A bicycle helmet, comprising: a foam helmet body having a plurality of vents therethrough including at least one rear exit port opening outward onto a surface that is below the most rearward margin of said foam helmet body, a crown member having contacting surfaces around a lower periphery extending across the thickness of the crown member and a skirt member having mating surfaces extending across the thickness of the skirt member mated with the contacting surfaces of the crown member, the skirt member provides an extension downward for protecting along the sides and rear of the user's head; and helmet retention means for securing the helmet to a user's head.

5,745,925
LEAD-CONTAINING GARMENT

Alfred Ghilardi, 34-B Elm St., Pepperell, Mass. 01463, and Sean Paradis, 4 Vale St., Merrimac, Mass. 01860
Filed Sep. 15, 1994, Ser. No. 306,825
Int. Cl.⁶ A41D *13/04;* **G21F** *3/02*

U.S. Cl. 2—457 **20 Claims**



1. An x-ray-attenuating garment comprising a front section containing an x-ray-attenuating material and a surrounding, supporting material, said garment further comprising:
- an adjustable lumbar/abdominal support segment comprising
  - an abdominal panel positioned to extend across the abdomen of a user and vertically to cover a portion of the abdomen between the hips and thorax, and
  - a lumbar panel, connected to either end of said abdominal panel, and positioned to extend across the lumbar region of

a user, said lumbar and abdominal panels being configured together to form a girdle extending entirely around the user's abdomen and lumbar regions, said girdle being circumferentially adjustable to exert substantial circumferential tension and support across the user's abdominal and lumbar regions, thereby providing an adjustable compressive force to support the lumbar/abdominal regions.

5,745,926

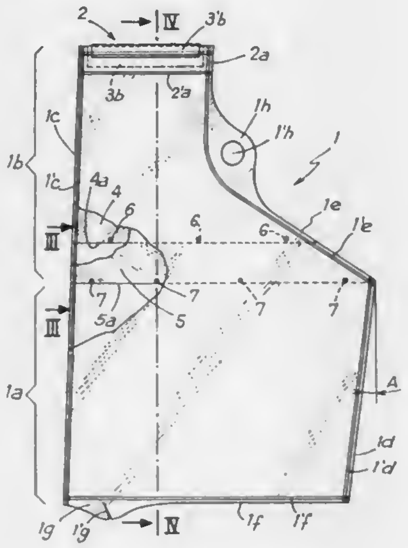
SAFETY BAG, IN PARTICULAR FOR HYGIENIC PURPOSES

Benoit Cailleteau, 97 Avenue du Prado, 13008 Marseille, France

Filed Nov. 12, 1996, Ser. No. 745,817

Int. Cl.^{6} A47K *11/12*

U.S. Cl. 4—144.1 **6 Claims**



1. A safety bag intended for use for hygienic purposes, in particular as a urinal, the bag being comprised of flexible sheet material and having first and second facing walls defining between them an inside of the bag, the bag further having an inlet which has an edge suitable for being bonded to reinforcement means adapted to facilitate the opening of the inlet from a flattened positioned of the bag in which the inlet is closed, the bag also including a first tubular element and at least one second tubular element, each of which comprises sheet material and having a first and a second wall, the first and second walls of said at least one second tubular element being respectively disposed between the first wall of the bag and the first wall of the first tubular element and between the second wall of the bag and the second wall of the first tubular element, said tubular elements being bonded in a leakproof manner to the bag proximate the inlet thereof, said tubular elements extending in a longitudinal direction of the bag from the inlet of the bag into the inside thereof and having respective internal transverse edges opposite the inlet of the bag, a distance between said inlet and the internal transverse edge of the at least one second tubular element being greater than the distance between the inlet and the internal transverse edge of the first tubular element, the internal transverse edges of the tubular elements extending transversely substantially over an entire width of the bag in the flattened position thereof, a first line of discrete, localized bonds along the internal transverse edge of the first tubular element bonding the walls of said first tubular element together and to the walls of the at least one second tubular element, and a second line of discrete, localized bonds along the internal transverse edge of the at least one second tubular element bonding the walls of said at least one second tubular element together.

5,745,927

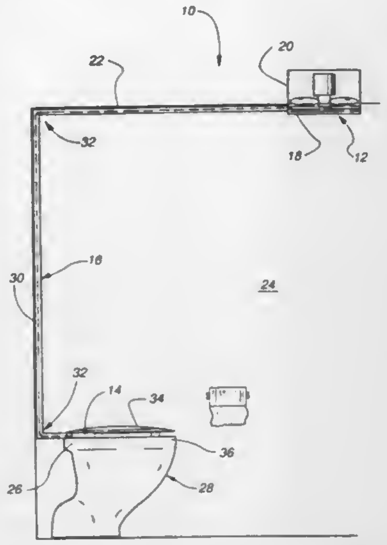
APPARATUS FOR LAVATORY BOWL VENTILATION

Desire Dominique Hoareau, 67 Peel Street, Mandurah, Western Australia, Australia, 6210

Filed Dec. 20, 1996, Ser. No. 770,247

Int. Cl.^{6} E03D *9/052*

U.S. Cl. 4—213 **11 Claims**



1. An apparatus for lavatory bowl ventilation comprising a switching means having a movable portion and adapted to be located on an exhaust fan, a nozzle means adapted to be positioned in or adjacent a bowl of a lavatory pedestal, a conduit and an actuation means, said actuation means being activated upon lifting of a lid of said lavatory pedestal causing switching of said switching means, which causes air and odours to be drawn through said nozzle means and said conduit to said exhaust fan, said actuation means comprising a line adapted to be attached to the lid of the lavatory pedestal and passing through said conduit to said switching means, said line being attached to and able to induce movement in the movable portion of said switching means.

5,745,928

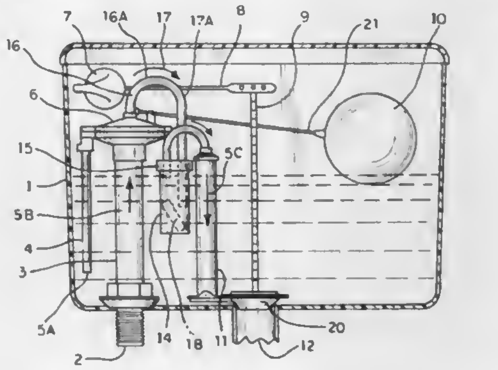
TOILET BOWL DISPENSING SYSTEM

Frank Armanno, Sr., 14399 Picea Ct., Fort Pierce, Fla. 34951

Continuation of Ser. No. 584,239, Jan. 11, 1996, abandoned. This application Apr. 30, 1997, Ser. No. 841,590

Int. Cl.^{6} E03D *9/00*

U.S. Cl. 4—225.1 **3 Claims**



1. A toilet tank in combination with a cleaning/deodorizing agent dispenser, said toilet tank having a bottom and a top and consisting of:

- water inlet means for supplying water to said tank at the bottom,
- a water inlet pipe having a lower end connected to said water inlet means and an upper end,
- a water inlet valve mounted to said upper end of the water inlet pipe,

- a primary water outlet connected to said water inlet valve for discharging water into said tank,
- a secondary water outlet port connected to said water inlet valve,
- a float connected to said water inlet valve by means of a lever to shut off the water inlet valve when water in the tank rises to a predetermined level,
- an exhaust port at the bottom of said tank,
- a flapper valve positioned above said exhaust port for releasing water from the tank into a toilet bowl through said exhaust port when said flapper valve is in an opened position and retaining water in the tank when said flapper valve is in a closed position, and
- a bowl refill tube extending from the bottom of the tank and communicating with said exhaust port;
- said cleaning/deodorizing agent dispenser being disposed intermediate said water inlet pipe and said bowl refill tube and consisting of:
  - a cylindrical container having a closed bottom and an open top,
  - a removable cap for sealingly engaging the open top of said container, said cap having a inlet port and an outlet port,
  - an inlet tube connected at one end to said secondary water outlet port, another end of said inlet tube passing through the inlet port of said cap and terminating proximate said closed bottom of said container,
  - an outlet tube communicating at one end with said bowl refill tube, another end of said outlet tube passing through said outlet port and terminating proximate said cap, and
  - a solid capsule of concentrated cleaning/deodorizing agent disposed at the bottom of said container.

5,745,929

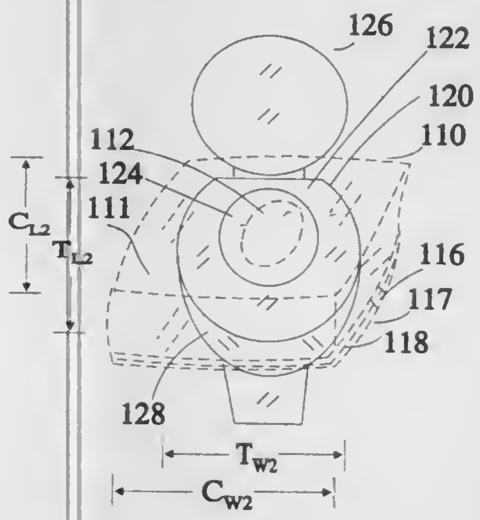
SANITARY COVERING METHOD AND APPARATUS

Linda Paula Sobieralski, 35 Burtis Ave., Yonkers, N.Y. 10701

Division of Ser. No. 531,112, Sep. 20, 1995, abandoned. This application Dec. 10, 1996, Ser. No. 763,165

Int. Cl.^{6} A47K *13/14*

U.S. Cl. 4—245.1 **5 Claims**



1. A method of covering a toilet seat comprising:

- providing a toilet seat cover of a non-porous flexible material having a first opening; wherein the non-porous flexible material is substantially shaped in the form of a bag, having said first opening substantially near the bottom of the bag shape and a second opening substantially near the top of the bag shape;
- wherein the sanitary cover is adapted to be a toilet seat cover and the first opening of the non-porous flexible material is slightly smaller than a toilet seat opening; and
- wherein an attachment device is provided at one or more locations around a peripheral portion of the bag shape at said second opening, and the sanitary cover further comprises a cord which passes through the attachment device;
- inverting said bag shaped cover over a toilet seat such that said first opening will be aligned with said opening in said toilet seat, lifting said toilet seat from contact with a toilet bowl and pulling said cord to tighten said second opening underneath said toilet seat.

5,745,930

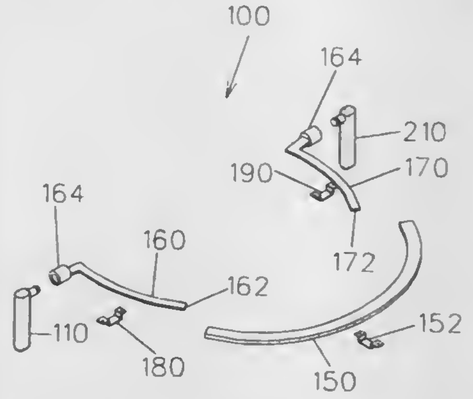
TOILET SEAT LIFTING DEVICE

Christopher L. Fallen, 3021 Monument Ave., Apt. #2, Richmond, Va. 23221

Filed Nov. 4, 1996, Ser. No. 743,170

Int. Cl.^{6} A47K *13/10*

U.S. Cl. 4—246.1 **20 Claims**



14. In a toilet seat swingably mounted to a rim of a toilet bowl between a first horizontal position and a second vertical position relative to the toilet bowl rim, the improvement comprising:

- at least one socket;
- means associated with the toilet seat for positioning said at least one socket on at least one side of the toilet bowl;
- a handle;
- means on said handle and said at least one socket for engaging said handle to said at least one socket at a first position allowing for rotation of said handle relative to said at least one socket and a second position wherein said handle is fixed within said at least one socket, said fixed handle providing for a user transfer of forces on said handle to said at least one socket and associated toilet seat, whereby to move the seat between a horizontal position to a vertical position upon user manipulation of said handle.

5,745,931

METHOD AND MEANS FOR COVERING THE FLANGE OF A WASTE WATER STRAINER

William T. Ball, Leawood, Kans., assignor to WCM Industries, Inc., Colorado Springs, Colo.

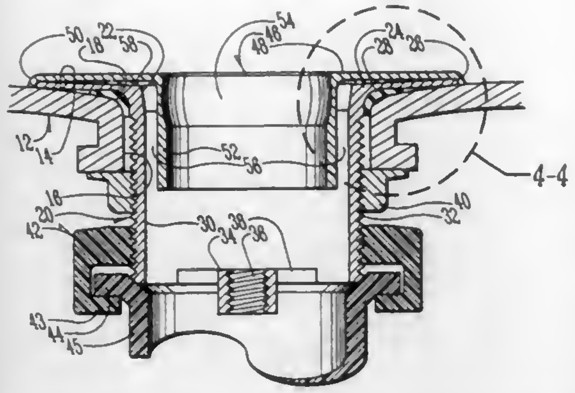
Filed Feb. 9, 1996, Ser. No. 599,291

Int. Cl.^{6} A47K *1/14*

U.S. Cl. 4—286 **8 Claims**

1. In combination with a fluid compartment having a bottom with a waste water strainer mounted in said bottom, said strainer having a cylindrical wall surrounding a vertical cylindrical opening extending through the bottom of said compartment, and a horizontal flange extending outwardly from a level above and adjacent said cylindrical opening and positioned on the bottom of said compartment,

- a waste water insert comprising a cylindrical wall surrounding a vertical cylindrical bore and having an upper end, and a horizontal flange on said upper end extending outwardly from said cylindrical bore,
- the horizontal flange on said insert resting on the horizontal flange of said strainer with a sealant material therebetween.



the horizontal flange on said insert being a flat planar surface uninterrupted by any vertical projections.

the cylindrical wall of said insert being of a smaller diameter than the diameter of the cylindrical wall of said strainer to create a continuous space therebetween, and extends downwardly in spaced relation into the cylindrical opening of said strainer.

the horizontal flange on said strainer having an outer peripheral edge, and a horizontal flange on said insert having an outer peripheral edge with a downwardly extending lip thereon extending over and being in tight engagement with the bottom of said fluid compartment and in engagement with the outer peripheral edge of said horizontal flange of said strainer.

the cylindrical wall of said insert being free from engagement with the cylindrical wall of said strainer.

and the sealant between the horizontal flanges of said strainer and said insert providing the sole means of fixed connection between said strainer and said insert.

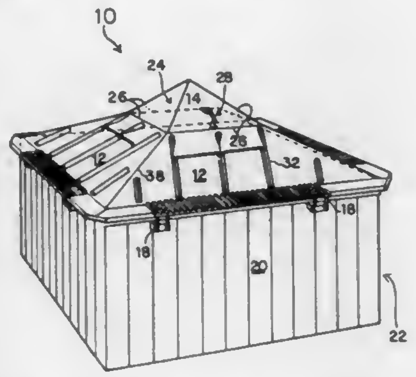
5,745,932
HOT TUB COVER AND ENCLOSURE

David L. Barovetto, P.O. Box 269, Sun Valley, Id. 83353-0269

Filed Nov. 22, 1996, Ser. No. 755,393

Int. Cl.⁶ E04H *4/08*

U.S. Cl. 4—498 **7 Claims**



1. A cover and enclosure for a hot tub which has sides and an interior for holding water, comprising:

a. a plurality of individually self-supporting trapezoidal side walls, each having an exterior surface and being separately movable between an open position adjacent a respective one of the sides of the hot tub and a closed position over the hot tub interior;

b. hinging means for permitting movement of each trapezoidal side wall between the open and closed positions and for detachably connecting each trapezoidal side wall to a respective one of the sides of the hot tub; and

c. gripping means for moving the trapezoidal side walls between the open and closed positions; wherein

in the closed position, the trapezoidal side walls form an upwardly angled enclosure for deflecting rain and snow away from the hot tub interior and, in the open position, the trapezoidal side walls are substantially vertical and provide wind screening and privacy for users in the hot tub interior.

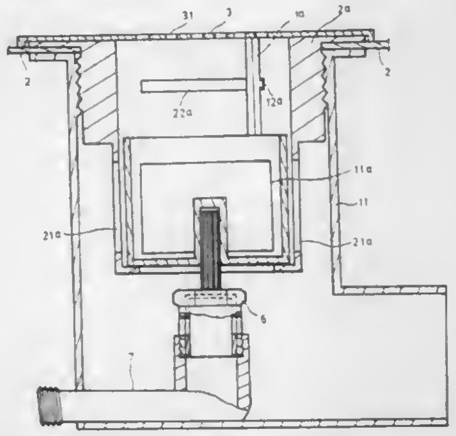
5,745,933
PRE-WASHING DEVICE FOR WATER CIRCULATING TUBE OF MASSAGING BATH TUB

Li-Fu Yu, No. 129-9, Lin-Woei Rd., Lin-Meei Tsuen, Jiau-Shi Shiang, Yi-Lan Hsien, Taiwan

Filed Nov. 12, 1996, Ser. No. 748,167

Int. Cl.⁶ E04H *4/12*

U.S. Cl. 4—541.1 **1 Claim**



1. A pre-washing device for water circulating tubes of a massaging bath tub comprising:

a cap member received in a water circulating tube head,

a rotary adjustment block,

an inner seat,

a valve body and an independent tube disposed in the water circulating tube head;

wherein

said cap member includes a plurality of water vents,

said adjustment block includes two posts projecting upward therefrom, said adjustment block is tubular with at least one opening in a side thereof to allow water to flow therethrough, said posts each include a tenon formed on a side thereof, top ends of said posts are secured to said cap member,

said inner seat is a cylindrical body that receives said adjustment block, said inner seat includes channels to receive said tenons of said posts, said inner seat includes at least one opening in a side thereof to allow water to flow therethrough, said at least one opening in said side opening of said inner seat corresponds with said at least one opening in said adjustment block; such that

when said adjustment block is rotated, said openings in said adjustment block and said side of said inner seat are aligned and offset to open and close to control water flow through said device, a downward extending stem being connected to an underside of said adjustment block, said stem controls opening and closing of said valve body in conjunction with rotation of said cap member such that when said cap member is rotated to align said openings, said valve body is closed, and when said cap member is rotated to offset said openings, said valve body is opened.

5,745,934
SPA APPARATUS WITH HANGING STRUCTURAL LINER

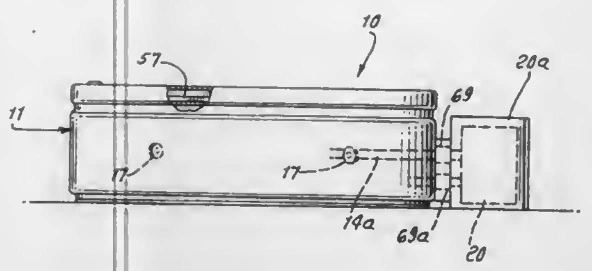
Borg Hansen, Long Beach; Rafael Gonzalez, Palmdale, and Roc V. Fleishman, Venice, all of Calif., assignors to Softub, Inc., Chatsworth, Calif.

Filed Jun. 10, 1996, Ser. No. 661,029

Int. Cl.⁶ A61H *33/00*

U.S. Cl. 4—541.3 **29 Claims**

1. In the method of providing a spa tub including



a) a load-bearing tub side wall having an inner side and an outer side, the tub having an interior to receive liquid,

b) the tub side wall provided to include at least two wall sections, spaced about said interior, said sections assembled end-to-end to form said side wall to extend in a loop,

the steps that include:

c) providing a flexible liner and locating the liner to extend at the inner side of said side wall to contain said liquid,

d) and hanging said flexible liner to extend generally vertically and spaced from the inner side of said side wall to contain liquid filled into the tub interior, whereby sideward pressure exerted by said liquid on the liner is isolated from the tub side wall.

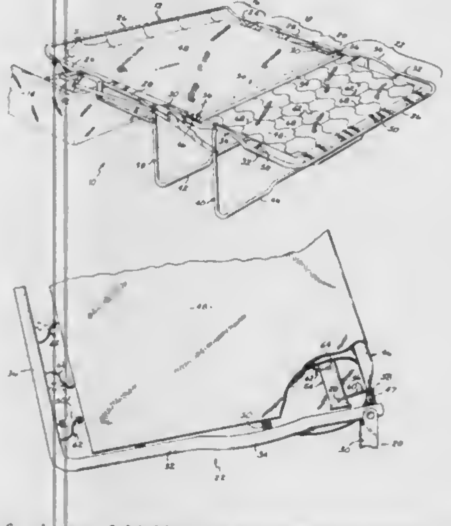
5,745,935
SINUOUS WIRE SEAT SECTION SOFA SLEEPER

Dennis E. Arft, Joplin, Mo., assignor to L&P Property Management Co., South Gate, Calif.

Filed Jul. 14, 1997, Ser. No. 892,327

Int. Cl.⁶ A47C *17/23*

U.S. Cl. 5—13 **13 Claims**



1. A sofa sleeper foldable sofa bed assembly having pivotally interconnected head, body, intermediate and foot frame sections each including a pair of opposed side rails, said foot and head frame sections having end rails connecting said side rails, a cross rail extending between said opposed side rails of said intermediate frame section, said frame sections being extendable to form a bed and foldable to form a sofa seat,

a floating cross tube spaced from and parallel said cross rail, said floating cross tube having two ends, each end being secured to said cross rail,

a plurality of transversely spaced, longitudinally extending sinuous wire springs extending between said floating cross tube and said end rail of said foot frame section.

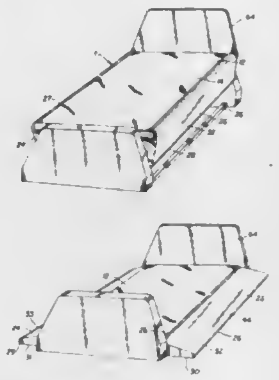
5,745,936
SAFETY BED WITH DUAL PURPOSE SIDE PANELS

James Van McCutchen, Lafayette, and Kurt Lee Shaw, Broomfield, both of Colo., assignors to Windryder Engineering, Inc., Broomfield, Colo.

Filed Jan. 19, 1995, Ser. No. 374,420

Int. Cl.⁶ A47C *21/08*

U.S. Cl. 5—600 **9 Claims**



1. A safety bed, comprising:

a frame having a head end, a foot end, and two sides;

a mattress having a top surface upon which a person using the bed rests;

a mattress support structure supported by said frame and having the mattress mounted thereon;

means for raising and lowering said support structure and mattress between a maximum mattress height and a minimum mattress height, said height being measured from the floor to the top surface of the mattress; and

a pair of side panels mounted to said mattress support structure;

means for moving each of said panels into a substantially horizontal position in which a ramp is formed by said side panels from said top mattress surface to the floor to allow the person to move between the bed and the floor via said ramp when said support structure and mattress are lowered to their minimum height; and

wherein said means for moving said side panels automatically moves said side panels from a substantially downward position into said horizontal position when the bed is lowered to said minimum height.

5,745,937
SUPPORT SURFACES FOR A BED

Matthew W. Weismiller, Batesville; David J. Ulrich, Sunman; Jay T. Butterbrodt, Lawrenceburg; Kenneth L. Kramer, St. Paul; Jason C. Brooke; Eric R. Meyer, both of Greensburg; Gregory W. Branson, Batesville, all of Ind., and James M. C. Thomas, Mt. Pleasant, S.C., assignors to Hill-Rom, Inc., Batesville, Ind.

Division of Ser. No. 511,542, Aug. 4, 1995, Pat. No. 5,630,238. This application May 7, 1997, Ser. No. 852,312

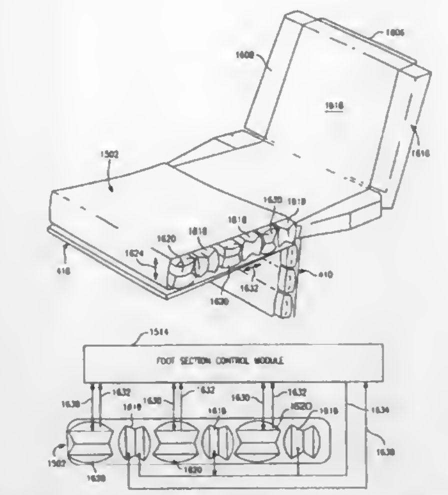
Int. Cl.⁶ A61G *7/057;7/015;* A47C *27/10*

U.S. Cl. 5—624 **12 Claims**

1. A surface foot section for a bed including a base frame, an articulating deck coupled to the base frame, the articulating deck including a generally planar foot deck section, the articulating deck being movable from a bed configuration to a chair configuration, a foot section control module for deflating the surface foot section when the articulating deck is in the chair configuration and for inflating the surface foot section when the articulating deck is in the bed configuration, the surface foot section comprising:

a first air bladder configured to collapse in a first direction generally parallel to the foot deck section when the first air bladder is deflated; and

a second air bladder located adjacent the first air bladder, the second air bladder being configured to collapse in a second direction normal to the foot deck section when the second air bladder is deflated so that the surface foot section has a



substantially reduced thickness and a substantially reduced length when the first and second bladders are deflated.

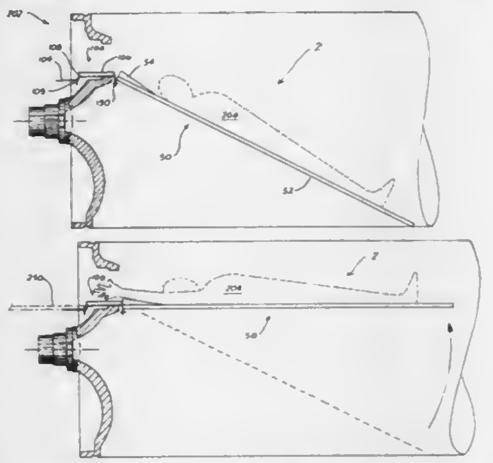
5,745,938
RESCUE BOARD

Charles Allen Bartley, and Robert Burks Scruggs, II, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Aug. 30, 1996, Ser. No. 704,919

Int. Cl.^{6} A61G *1/013*

U.S. Cl. 5—625 **7 Claims**



1. A rescue board for extricating an unconscious or injured patient from a confined space through a small opening, wherein said board is comprised of:
- a rigid lower assembly means for assisting in lifting and retaining said patient, wherein said lower assembly means is further comprised of:
- a first plate having a first and second end and a length;
- a patient support means rigidly attached to said first end of said first plate;
- a first plate support means rigidly attached along said length of said first plate; and
- a first hinge rigidly attached to said first end of said first plate and substantially adjacent to said patient support means; and
- a rigid upper assembly holding means hingedly attached to said lower assembly means and capable of being secured to an area substantially adjacent to said small opening, wherein said upper assembly is further comprised of: a second plate having a first and second end and a length; a third plate rigidly attached to said first end of said second plate wherein said third plate is used to support a conventional backboard; a second plate support means rigidly attached along said length of said second plate; and a second hinge rigidly attached to said second end of said second plate, wherein said second hinge is shaped so as to cooperatively engage with said first hinge and is engaged therewith.

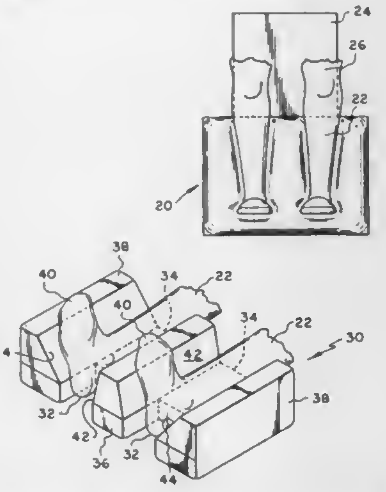
5,745,939
LEG REST

Roland E. Flick, Elma, N.Y., and John K. Whitney, Dorado, Puerto Rico, assignors to Gaymar Industries, Inc., Orchard Park, N.Y.

Filed Nov. 12, 1996, Ser. No. 748,206

Int. Cl.^{6} A61G *7/075;* A47C *20/00*

U.S. Cl. 5—648 **9 Claims**



1. A leg rest for supporting a person's legs while the person is lying on a bed, the leg rest comprising a cushion having a pair of trough portions for receiving a person's legs and further comprising a raised central portion and a pair of raised side portions for restraining sideways leg movement, said central and side portions projecting beyond said trough portions thereby defining means for restraining sideways movement of the person's feet as the person's legs rest on the trough portions with the person's feet projecting beyond the trough portions.

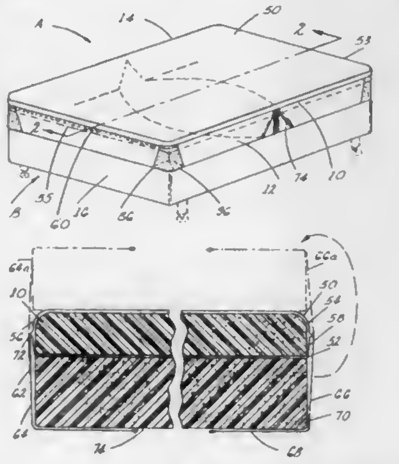
5,745,940
CUSTOMIZED MODULAR MATTRESS AND BEDDING

Derek Roberts, 101 Ridge Rd. #30, Greenville, S.C. 29607, and James B. Orders, III, 109 Holbrook Trail, Greenville, S.C. 29605

Filed Jun. 18, 1996, Ser. No. 666,679

Int. Cl.^{6} A47C *27/22*

U.S. Cl. 5—727 **22 Claims**



1. A mattress assembly system which may be tailored to provide the desired comfort and support characteristics of an individual purchaser comprising:

- a comfort module for directly supporting the individual in a supine position, said comfort module being selected by said individual according to the individual's desired preferences for comfort in firmness and feel;
- a support module for supporting said comfort module, and said support module being selected by said individual according to the individual preferences for the support module's deflection attributes and support;
- said comfort module overlying said support module in a generally co-extending configuration to define a mattress assembly for supporting said individual;
- a module carrier for enclosing said comfort module and said support module providing the individual with a personalized, tailored mattress assembly having the comfort and support characteristics selected by the individual;
- a comfort module chamber included in said module carrier enclosing said comfort module, said comfort module chamber including an opening providing access for insertion and removal of said comfort module in said module carrier;
- a support module chamber included in said module carrier in which said support module is received, and said support module chamber including a carrier bottom panel; and
- a module opening extending generally across a dimension of said carrier bottom panel in which said support module may be easily inserted and removed, and said module opening defining a bottom panel portion on either side of said module opening.

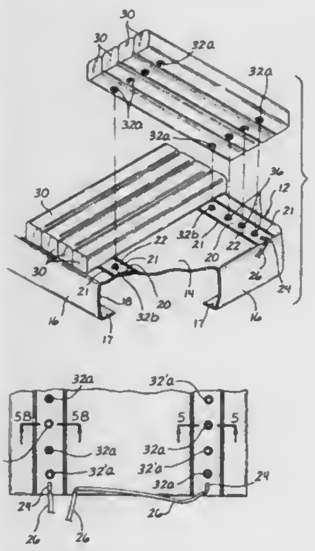
5,745,941
AIR SUPPORT MATTRESS OVERLAY WITH FITTED SHEET MOUNTING

Craig S. Miller, Sr., Yorba Linda, Calif., assignor to Foamex L.P., Linwood, Pa.

Filed Feb. 13, 1997, Ser. No. 799,205

Int. Cl.^{6} A47C *27/10*

U.S. Cl. 5—710 **20 Claims**



1. An inflatable overlay for a bed mattress comprising:
- a base sheet having a top and sides sized for making a retentive fit over a said bed mattress;
- a plurality of inflatable elements secured to said top, said inflatable elements together defining a body supporting surface;
- said base sheet and said inflatable elements being made of pliable sheet material such that the base sheet with said inflatable elements thereon may be folded or rolled to a compact condition off of the said bed mattress for ease of transport and storage; and
- one or more sheet portions of impermeable pliable sheet material bonded to said top for defining with said base sheet one or more air conduits, said inflatable elements being open to said one or more air conduits.

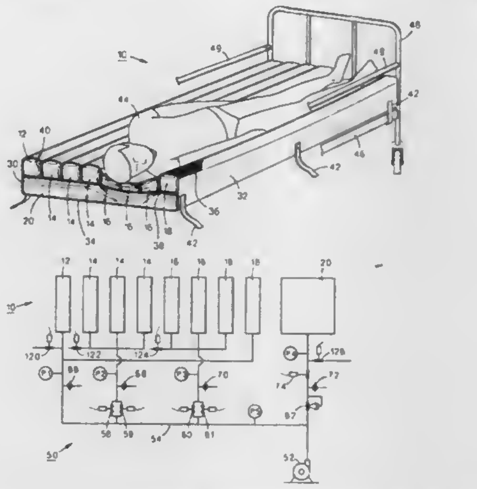
5,745,942
SIMPLIFIED CONTROL FOR LATERAL ROTATION THERAPY MATTRESSES

Jack Wilkerson, Pleasant Valley, N.Y., assignor to Geomarine Systems, Inc., Carmel, N.Y.

Filed Oct. 19, 1995, Ser. No. 545,423

Int. Cl.^{6} A47C *27/10;* A61G *7/057*

U.S. Cl. 5—715 **2 Claims**



1. A lateral rotation therapy mattress system for a patient, comprising:
- (a) a plurality of side-by-side longitudinal air cells, said air cells being divided into first and second side-by-side groups, wherein decreasing the pressure of pressurized air in said second group will cause said patient to rotate in the direction of said second group;
- (b) first and second pairs of solenoid valves connected to provide, respectively, said pressurized air to said first and second groups, wherein opening one of said solenoid valves in a said first and second pairs of solenoid valves will provide a desired low air pressure level and opening both of said solenoid valves in a said first and second pairs of solenoid valves will provide a desired high air pressure level, said low air pressure levels providing partial turn of said patient and said high pressure levels providing full turn of said patient; and
- (c) means to permit air to flow from said first and second groups.

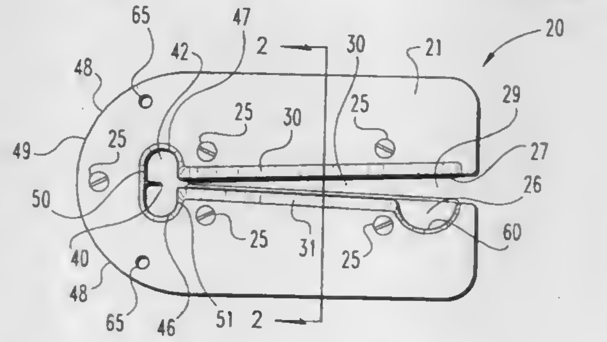
5,745,943
CABLE STRIPPING AND BENDING DEVICE

Wendell W. Bagley, 407 E. Washington, Tipton, Ind. 46072

Filed Nov. 21, 1996, Ser. No. 754,437

Int. Cl.^{6} B25F *1/00*

U.S. Cl. 7—107 **12 Claims**

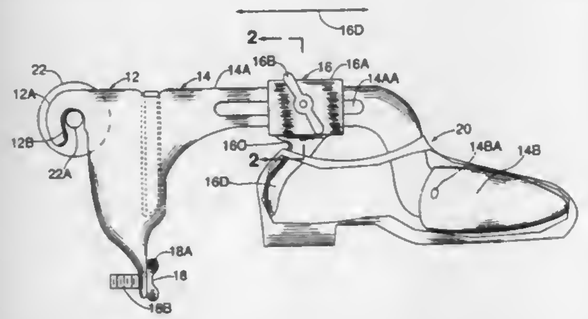


1. A cable stripping and bending device comprising:
- a flat elongated member having a V-shaped recess therein extending longitudinally of the elongated member,
- said flat elongated member having a first rounded recess which opens into the V-shaped recess, a first cutting blade mounted on said flat elongated member and projecting into said rounded recess, and

second and third cutting blades mounted on said flat elongated member so as to project toward one another within said V-shaped recess, each of said cutting blades having a cutting edge with each of said cutting edges facing toward one another and defining a V-shape,

said flat elongated member having a rounded end and a bore extending through the flat elongated member perpendicularly of the flatness of the flat elongated member, said bore being spaced a predetermined distance from the rounded end of said flat elongated member.

5,745,944
DOOR MOUNTED SHOE TREE AND LAST
Milo Hall, 6912 Cumberland Cir., Riverdale, Ga. 30296
Filed Feb. 27, 1997, Ser. No. 807,570
Int. Cl.^{6} A43D *3/14;5/00;* **A47L** *23/18*
U.S. Cl. 12—117.4 **2 Claims**



1. A door mounted shoe tree and last (**10**), functioning to support a standard shoe at an operable position for polishing, the door mounted shoe tree and last (**10**) comprising:

A) a bracket (**12**) which is removably attached to an opening edge of a door, the bracket (**12**) comprises a left side which is securely attached at a front edge to a left edge of a bracket (**12**) front face, a right edge of the bracket (**12**) front face is securely attached to a front edge of a right side of the bracket (**12**), the bracket (**12**) left side and the bracket (**12**) right side are substantially the same, the bracket (**12**) left side and the bracket (**12**) right side and the bracket (**12**) front face form an opening therebetween, a door edge is inserted into the opening therebetween, an upper point of the bracket (**12**) front face comprises a bracket bearing point (**12**D) which functions as a fulcrum, the bracket (**12**) further comprises a bracket track (**12**C) attached to the front face of the bracket (**12**), the bracket (**12**) is removably fastenable to a door knob (**22**) of a door (**24**), the bracket (**12**) comprises a bracket hook (**12**A) formed about a bracket notch (**12**B), the bracket hook (**12**A) is hooked around the door knob (**22**), a proximal edge of a bracket track right wall (**12**CA) is securely attached orthogonal to a right side of the bracket track (**12**C) front face, an opposite edge of the bracket track right wall (**12**CA) is securely attached at right angles to a bracket track right front (**12**CB), the bracket (**12**) is further securely attached along a left edge of the bracket (**12**) front face to a proximal edge of a bracket track left wall (**12**CC), the opposite edge of the bracket track left wall (**12**CC) is securely attached to a proximal edge of a bracket track left front (**12**CD), a bracket track lower stop (**12**CE) is securely attached along a left edge to a lower edge of the bracket track right wall (**12**CA), the bracket track lower stop (**12**CE) is securely attached along a rear edge to a bracket track (**12**C) front face, the bracket track lower stop (**12**CE) is securely attached along a right edge to a lower edge of a bracket track right front (**12**CB), the bracket track right front (**12**CB) and bracket track left front (**12**CD) and bracket track lower stop (**12**CE) and bracket track (**12**C) front face and bracket track left wall (**12**CC) and bracket track right wall (**12**CA) together form a 'T' shaped receptacle opening with a bottom stop positioned at a lower end of the bracket track (**12**C);

B) a shoe tree (**14**) comprises a shoe tree arm (**14**A) having an elongated shoe tree arm slot (**14**AA) therein, an outer end of the shoe tree arm (**14**A) is securely attached to a shoe tree last (**14**B) by a shoe tree last pivot pin (**14**BA), the shoe tree last (**14**B) functions to grip a shoe having a toe portion therein, an inner end of the shoe tree arm (**14**A) is securely attached to a shoe tree arm tee (**14**C), the shoe tree arm tee (**14**C) functions in cooperation with the 'T' shaped receptacle opening in the bracket track (**12**C) when inserted along a shoe tree arm insertion/removal direction (**14**D) to securely and removably attach the shoe tree (**14**) to the bracket (**12**);

C) an adjustable heel snubber (**16**) is adjustably attached to the shoe tree (**14**), the adjustable heel snubber (**16**) comprises an adjustable heel snubber clamp (**16**A) which is slidably attached to the shoe tree arm (**14**A), the adjustable heel snubber clamp (**16**A) comprises an adjustable heel snubber clamp back upper face (**16**AA) having an upper and lower edge, the upper edge of the adjustable heel snubber clamp back upper face (**16**AA) is securely attached to a right edge of adjustable heel snubber clamp top (**16**AB), a left edge of the adjustable heel snubber clamp top (**16**AB) is securely attached to an upper edge of an adjustable heel snubber clamp front (**16**AC), a lower edge of the adjustable heel snubber clamp front (**16**AC) is securely attached to a left edge of an adjustable heel snubber clamp bottom (**16**AD), a right edge of the adjustable heel snubber clamp bottom (**16**AD) is securely attached to a lower edge of an adjustable heel snubber clamp back lower face (**16**AE), the upper edge of the adjustable heel snubber clamp back lower face (**16**AE) and the lower edge of the adjustable heel snubber clamp back upper face (**16**AA) form an opening therebetween, an adjustable heel snubber thumb screw (**16**B) comprises an adjustable heel snubber knob (**16**BA) which is securely attached to an adjustable heel snubber shaft (**16**BB), the adjustable heel snubber shaft (**16**BB) threadably attaches to an adjustable heel snubber square nut (**16**C) which slidably operates within the shoe tree arm slot (**14**AA), when the adjustable heel snubber (**16**) is moved in an adjustable heel snubber adjustment direction (**16**D) functions to grip the inside rear upper of a shoe (**20**) forcing the shoe tree last (**14**B) into the toe of the shoe (**20**) securely fastening the shoe (**20**) to the door mounted shoe tree and last (**10**); and

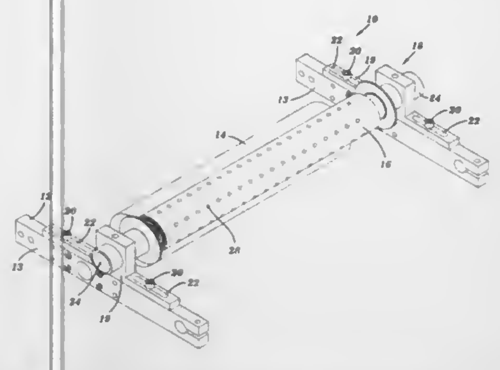
D) a thrust screw (**18**) which comprises a thrust screw handle (**18**A) securely attached to a threaded shaft (**18**B), the threaded shaft (**18**B) is threadably attached to a lower front portion of the bracket (**12**), when the thrust screw (**18**) is operably rotated, causes the bracket (**12**) to rotate about the door knob (**22**) forcing the bracket bearing point (**12**D) against the door (**24**) front edge which rigidly secures the bracket (**12**) to the door (**24**).

5,745,945
BRUSH CONDITIONER FOR A SEMICONDUCTOR CLEANING BRUSH
Paul A. Manfredi, Waterbury, and Raymond G. Morris, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 28, 1996, Ser. No. 674,240
Int. Cl.^{6} B08B *11/00*
U.S. Cl. 15—77 **12 Claims**

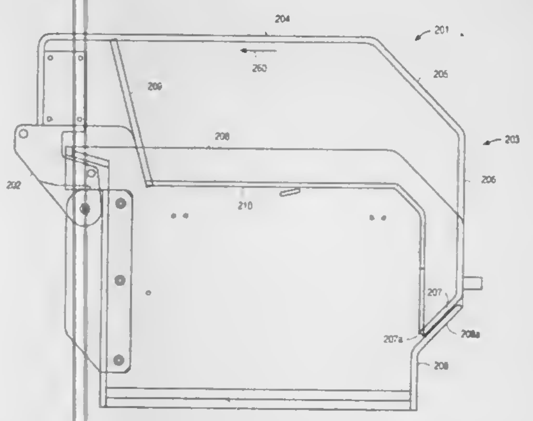
1. A brush conditioning apparatus, said apparatus comprising:

a freely rotatable, cylindrically-shaped brush conditioner having a circumferential surface, said brush conditioner being adjustably mountable onto a wafer cleaning tool; and

a fluid injection system having a first fluid intake port at a first end of said brush conditioner, a second fluid intake port at a second end of said brush conditioner, and at least one fluid dispensing outlet positioned on said circumferential surface of said brush conditioner.



5,745,946
SUBSTRATE PROCESSING SYSTEM
David L. Thrasher, Santa Clara; Lynn S. Ryle, San Jose; Robert M. Ruppell, Cupertino; John S. Hearne, Los Altos; Wilbur C. Krussell, San Jose, and Gary D. Youre, Fremont, all of Calif., assignors to OnTrak Systems, Inc., San Jose, Calif.
Division of Ser. No. 275,804, Jul. 15, 1994, abandoned. This application Jul. 29, 1996, Ser. No. 688,062
Int. Cl.^{6} B08B *11/00;3/02*
U.S. Cl. 15—77 **17 Claims**



1. An assembly for processing a substrate, said assembly comprising:

a wet processing station;

a cover for directing liquid from said wet processing station into an enclosure housing said wet processing station, said cover coupled to said enclosure;

said cover comprising side sections, an angled back section, a top section, and a front section comprising a plurality of angled portions;

said side sections coupled to said angled back section, said top section, and said front section;

said angled back section coupled to said top section;

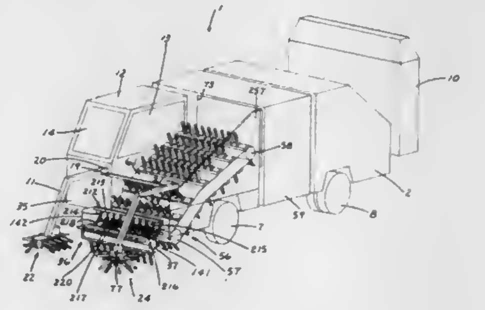
said top section coupled to said front section;

said cover having a closed position, wherein said top section is horizontal and a lower area of each of said side sections, said front section and said back section is contained within a space defined by said enclosure;

said plurality of angled portions of said front section comprising a first angled portion, a second angled portion, and a third angled portion, said first angled portion coupled to said top section, said second angled portion coupled to said first angled portion, said third angled portion coupled to said second angled portion, wherein, when said cover is in said closed position, said first angled portion extends outward and downward from said top section, said second angled portion extends from said first angled portion into said enclosure in at least downward direction, and said third angled portion extends downward and inward from said second angled portion into said enclosure, and further wherein, when said cover is in said closed position, any of said liquid from said wet processing station accumulating on said front section runs down said first angled portion to said second angled portion to said third angled portion and into said enclosure, and any of said liquid accumulating on said angled back section runs down said angled back section and into said enclosure;

said cover having an open position, wherein said third angled portion is disposed above a portion of said enclosure, and further wherein any of said liquid on said third angled portion runs down said third angled portion and into said enclosure, and any of said liquid on said second angled portion runs down said second angled portion to said first angled portion to said top section to said angled back section, and any of said liquid on said first angled portion runs down said first angled portion to said top section to said angled back section, and any of said- liquid on said top section runs down said top section to said angled back section.

5,745,947
AUTOMATIC DEBRIS RETRIEVAL SYSTEM
Kaibai Liu, Eagan; Charles Carl Holley, Bloomington, and Walter John Petersen, Eden Prairie, all of Minn., assignors to The Toro Company, Bloomington, Minn.
Filed Jan. 30, 1996, Ser. No. 593,106
Int. Cl.^{6} E01H *1/04*
U.S. Cl. 15—84 **13 Claims**



1. A debris collection vehicle comprising:
(a) a chassis;
(b) a prime mover mounted on the chassis;
(c) a cab, the cab being mounted on a forward region of the chassis;
(d) a first conveyor, the first conveyor being mounted laterally adjacent to the cab such that a majority of the first conveyor resides in a volume defined by a lateral projection of the cab, the first conveyor comprising:
  (i) a lower support axle;
  (ii) an upper support axle, at least a portion of the upper support axle residing within the volume defined by a lateral projection of the cab;
  (iii) a continuous belt, the belt following a path extending between the lower support axle and the upper support axle;
(e) a second conveyor, the second conveyor having a lower support axle and an upper support axle, the lower support axle residing beneath and behind the upper support axle of the first conveyor; and
(f) a first curb brush, the curb brush being pivotably mounted to the chassis, the curb brush being adapted to direct debris toward the first conveyor, the curb brush further comprising:
  (i) a housing, the housing being formed with an octagonal upper portion and an octagonal lower portion, each octagonal portion being formed of eight wall segments;
  (ii) an hydraulic motor, the hydraulic motor being pivotably affixed to the octagonal upper portion of the housing, the hydraulic motor causing the housing to rotate;

(iii) a single rubber finger extending outwardly from each wall segment, each rubber finger mounted on the octagonal lower portion of the housing being inclined with respect to each rubber finger mounted on the upper octagonal portion of the housing.

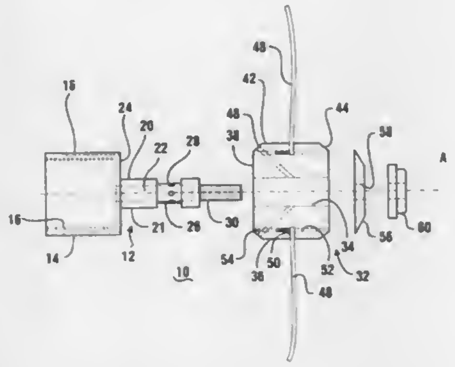
5,745,948
CONDUIT CLEANER

Samuel J. Lloyd, 11461 Glenpark Rd., NE., and Steven R. Martin, 1127 Indian Hill Dr., both of Bolivar, Ohio 44612

Continuation-in-part of Ser. No. 543,237, Oct. 13, 1995, abandoned. This application Aug. 12, 1996, Ser. No. 695,453

Int. Cl.^{6} B08B *9/02*

U.S. Cl. 15—104.12 **14 Claims**



1. A conduit cleaning apparatus comprising:

a generally cylindrical body having a bore, wherein an opening of the bore is adapted for connection with a high pressure fluid source, and wherein said body includes at least one port extending through said body from said bore to an outer surface of said body;

an annular rotor having a central cavity, wherein said annular rotor is rotatably mounted on said body, wherein said annular rotor further includes at least one orifice extending through said annular rotor from said cavity to the exterior of said annular rotor, wherein said at least one orifice is positioned to direct said fluid generally tangential from said rotor, whereby said apparatus is operable to allow fluid to flow from said bore to said port, and then through said at least one orifice, causing the rotation of said annular rotor on said body, wherein the at least one orifice is positioned to direct said fluid behind said apparatus, where the movement of the fluid propels the apparatus in a forward direction, and

at least one wire operatively attached to the annular rotor.

5,745,949
BACK APPLICATOR CONTAINER

Eli S. Pine, 370 River Rd., Nutley, N.J. 07110

Filed Nov. 14, 1995, Ser. No. 557,817

Int. Cl.^{6} A47K *7/03;* **A46B** *5/02;* **B65D** *85/00*

U.S. Cl. 15—244.1 **7 Claims**

1. An apparatus comprised of:

a container comprised of a bottom, sides extending upwardly from the bottom, and a cover;

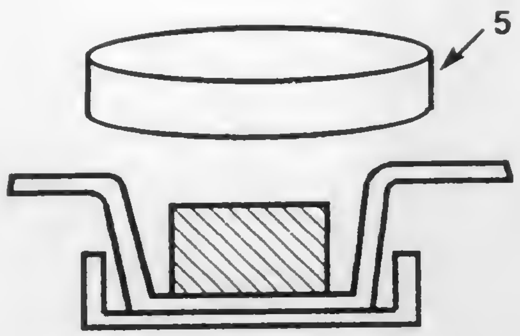
a sponge affixed to the bottom of the container, the sponge extending above the sides of the container;

wherein the bottom and the cover of the container can be combined together to substantially enclose the sponge within the container and further comprised of:

a cloth material of a sufficient length to encompass the back and shoulders of an average person;

the cloth material having a first end, a second end, and a middle;

wherein the bottom of the container is connected to the cloth material at a location near the middle of the cloth material.



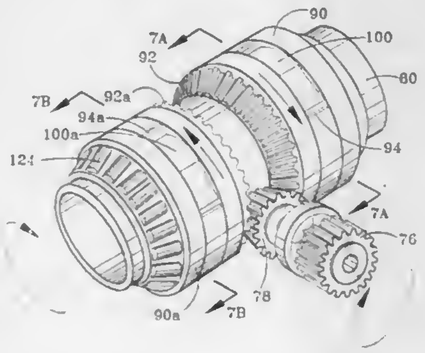
5,745,950
HUB AND DRIVE ASSEMBLY FOR FULL COVERAGE SOOTBLOWER

W. Wayne Holden, and Michael C. Holden, both of Huston, Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 520,369, Aug. 28, 1995, Pat. No. 5,675,863. This application Apr. 14, 1997, Ser. No. 824,705

Int. Cl.^{6} F23J *3/02*

U.S. Cl. 15—316.1 **20 Claims**



1. A hub and drive assembly for imparting rotary movement to a lance in a sootblower powered by a reversible motor alternately rotating in opposite directions, comprising:

a generally cylindrical hub for mounting in a carriage of said soot blower, said hub having a first end configured to receive said lance and a second end configured for fluid communication with a soot blowing medium; and

a drive assembly for imparting rotary movement in a single direction to said hub and lance by converting rotary movement of said reversible motor in either direction to rotary movement in said single direction.

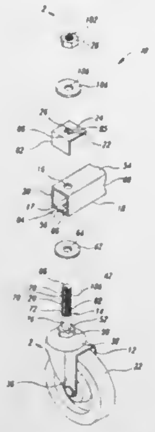
5,745,951
DIRECTIONAL CONTROL CASTER ASSEMBLY

John Waner, Redmond, Wash., assignor to Interstore Transfer Systems, Ltd., Redmond, Wash.

Filed Feb. 23, 1996, Ser. No. 606,420

Int. Cl.^{6} B60B *33/00*

U.S. Cl. 16—31 R **20 Claims**



1. A directional control caster assembly mountable to a mobile frame of the type having a portion with opposing upper and lower sides with a caster shaft aperture therethrough, comprising:

a caster having a caster support, a caster wheel attached to the caster support, and a mounting shaft attached to the caster support and extending away from the caster support and the caster wheel, the mounting shaft being shaped and sized to extend through the aperture in the frame portion when the caster is installed with the caster support being adjacent to the lower side of the frame portion and an intermediate portion of the mounting shaft being adjacent to the upper side of the frame portion, the mounting shaft having a generally flat blocking surface extending along a portion of the shaft such that the blocking surface is adjacent to the upper side of the frame portion when the caster is in the installed position;

a locking washer removably connected to the mounting shaft, the locking washer having a shaft aperture shaped and sized to receive the mounting shaft therein, the locking washer having a generally flat engagement portion defining a portion of the shaft aperture, the engagement portion being immediately adjacent to the blocking surface of the mounting shaft and positioned to engage the blocking surface of the mounting shaft, the locking washer being adapted to prevent the mounting shaft from rotating relative to the frame portion to provide directional stability of the caster wheel relative to the frame during movement of the frame; and

a projection engaging the locking washer and the frame portion to prevent relative movement thereof.

5,745,952
CONSTRAINED HERMAPHRODITIE BALL AND SOCKET HINGE JOINT

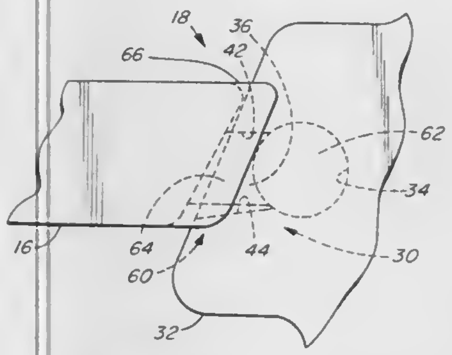
Marc Christopher Baragar, Vancouver, and Michael John Roman, Burnaby, both of Canada, assignors to Xenophon Design Inc., Vancouver, Canada

Filed Jul. 2, 1996, Ser. No. 674,683

Claims priority, application Canada, Jul. 4, 1995, 2153200

Int. Cl.^{6} E05D *7/00;* **G02C** *5/22*

U.S. Cl. 16—228 **24 Claims**



1. A constrained joint comprising:

(a) a ball having at least one axis of rotational symmetry;

(b) a housing having an exterior surface with at least one axis of rotational symmetry, the housing defining:

(i) a socket adapted to receive the ball for rotation there within such that the center of the ball is coincident with the center of the socket, the socket having at least one axis of rotational symmetry and having its centre lying on the exterior surfaces axis of rotational symmetry, and

(ii) a channel connecting the socket to the exterior surface of the housing,

(c) a member extending from the ball and adapted to move within the channel, and

(d) a collar extending from the member and partially enshrouding the ball, the collar defining an interior surface with at least one axis of rotational symmetry that passes through the center of the ball, the interior surface of the collar being adapted to receive the housing for rotation there within such that the axis of rotational symmetry of the exterior surface of the housing is coaxial with the axis of rotational symmetry of the interior surface of the collar.

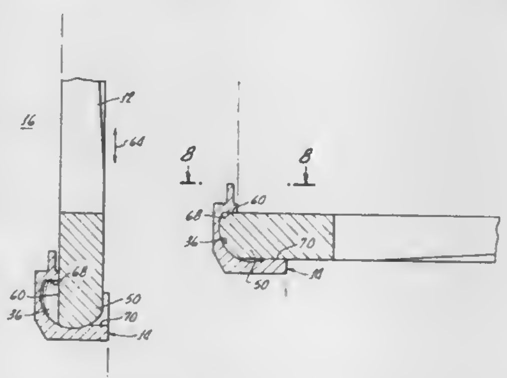
5,745,953
HINGE ASSEMBLY, PLATFORM AND METHOD OF MAKING SAME

Michael D. Golden, Corona del Mar, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed May 24, 1995, Ser. No. 449,220

Int. Cl.^{6} E05D *7/10*

U.S. Cl. 16—260 **7 Claims**



1. A hinged platform assembly comprising:

a platform having an end member with a lobed surface on one side thereof and a relatively flat surface on another side thereof;

socket means for receiving said end member and enabling the end member to turn about an axis within said socket means, said socket means including means, defining an opening in said socket means, for enabling insertion of the end member into said socket means at one angular relationship therebetween, contacting and supporting of the end member and platform at said one angular relationship and preventing separation of said end member and said socket means at all other angular relationship therebetween, said socket means further including means, defining opposing surfaces of said socket means, for cantilevering said platform, by way of said end member, at approximately a 90° angle from said one angular relationship.

5,745,954
PLAYYARD HINGE

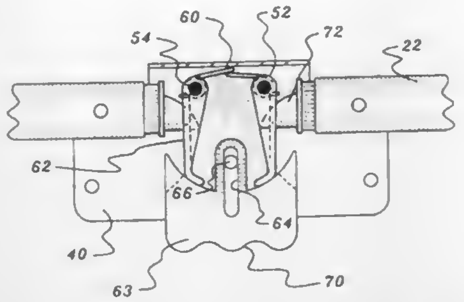
Gregory P. Shogan, Apex, N.C.; David J. Stroud, Dayton, and Mark Dawley, Beavercreek, both of Ohio, assignors to Lisco, Inc., Tampa, Fla.

Filed Oct. 25, 1996, Ser. No. 736,742

Int. Cl.^{6} E05D *11/10*

U.S. Cl. 16—343 **5 Claims**

1. In a playyard of the type having a frame with an upper rail assembly positionable in a horizontal orientation when in a deployed orientation and formed of two side rails and two end rails with each of the rails being formed of two rail components having interior ends and exterior ends, the interior ends being pivotally



coupled with respect to each other for movement between the deployed orientation wherein the rails are horizontally disposed in a common plane and a collapsed orientation wherein the rails are vertically disposed and parallel, the frame also including a lower rail assembly positionable in a horizontal orientation beneath the upper rail assembly when in a deployed orientation, the frame also including four vertically extending corner rails pivotally coupling the upper rail assembly and the lower rail assembly, the playyard also having fabric components above the lower frame assembly and between the corner rails:

- a hinge positioned at the intermediate extents of the end rails and side rails to allow movement of the associated rail components between the horizontal orientation and each hinge including:
- a saddle in a generally inverted U-shaped configuration with a central button aperture, interior plate apertures and exterior end apertures with associated rail pins for pivotally coupling the saddle and the adjacent interior ends of associated rail components;
- a pair of normally vertically-oriented locking plates each with a plate pin coupling the upper end of each plate to a plate aperture of the saddle, each plate having an opening extending therethrough with a lower bearing surface and with springs urging the plates away from each other to a vertical orientation;
- a liftable button with a vertically-oriented elongated slot through a central extent thereof and with an associated button pin for slidably coupling the button to the saddle, the saddle having inclined bearing surfaces on their upper exterior edges; and
- an inwardly facing projection located on the interior end of each rail component, each projection having an upper surface and a lower planar surface with a notch whereby the notches are receivable with the bearing surfaces of the plates when the rail components are in axial alignment to thereby provide a supplemental force to maintain the playyard deployed and wherein upward movement of the button will allow movement of the inclined surfaces against the lower edges of the plates to urge the plates inwardly toward each other and thereby allow separation of the notches from the plates and subsequent movement of the playyard to the collapsed orientation.

5,745,955
FLAT CARD WITH TOOTHED BELT DRIVE AND UPPER GUIDE FOR THE FLATS

Silvano Patelli; Antonio Cossandi, and Giovanni Battista Pasini, all of Palazzolo Sull 'Oglio, Italy, assignors to F.LLi Marzoli & C. S.p.A., Bergamo, Italy

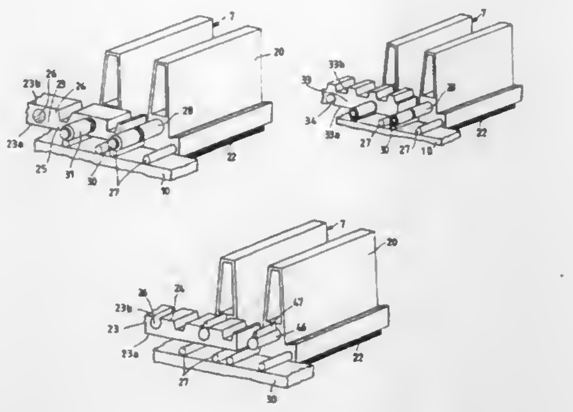
Filed Mar. 3, 1997, Ser. No. 810,367

Claims priority, application Italy, Mar. 4, 1996, MI96A0415

Int. Cl.^{6} D01G *15/08*

U.S. Cl. 19—102 **6 Claims**

1. A sliding flat (**7**) with its body produced from section bars, and a system for guiding and driving it in a card with moving flats driven by toothed drive belts, said flats being provided in their ends with cylindrical pins (**27**) for resting on guides (**10**) and provided on their lower face (**21**) with card clothing (**22**), said flat card being provided with a pair of guides (**40**) for the inoperative upper return path of the flats, characterised in that coupling between the flat (**7**)



and toothed belt (**23**) is achieved by a cylindrical form fit with the toothed belts positioned at its ends, by means of cavities (**26**, **34**) and coupling pins (**28**, **46**) having their axis transverse to the toothed belt, said coupling pins (**28**, **46**) between the belt and flat being made to project from their cavity (**26**, **34**) in the toothed belt (**23**, **33**), such that it is the coupling pins which rest on the return guides (**40**) instead of the projecting teeth (**24**) of the toothed belt.

5,745,956
AUTOMATIC DEVICE FOR REGULATING AND MONITORING THE TENSION OF THE SILVER TRANSFERRED FROM THE DRAFTING UNIT OF A CARD TO THE SILVER COLLECTION UNIT

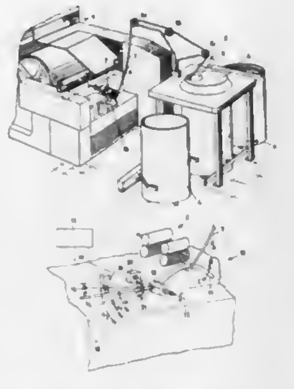
Silvano Patelli; Antonio Cossandi, and Giovanni Battista Pasini, all of Palazzolo Sull'Oglio, Italy, assignors to F.LLI Marzoli & C. S.p.A., Bergamo, Italy

Filed Oct. 16, 1996, Ser. No. 731,619

Claims priority, application Italy, Oct. 16, 1995, MI95A2121

Int. Cl.^{6} D01G *23/06*

U.S. Cl. 19—106 R **7 Claims**



1. A device for monitoring and regulating the tension in the sliver produced by a carding unit and transferred from this along a path (**7**) to a unit for its collection into cans for further processing, comprising a deviator bar (**11**) pivoted on a pivot (**12**) and an oppositely located rod (**14**) provided with means which oppose the rotary movement of the bar (**11**) deriving from the variations in tension of the sliver (**7**) deviated by it, characterised in that the sliver tension is measured by sensors on the basis of the effect induced by the sliver on the bar (**11**), the relative signals being transmitted to the control unit (**17**) which compares the values received with the allowable limiting values.

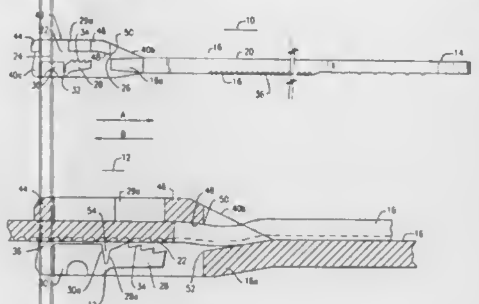
5,745,957
IN-LINE CABLE TIE

Wasim Khokhar, Cordova, Tenn., and Mark A. Bailey, Senatobia, Miss., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Mar. 26, 1997, Ser. No. 824,428

Int. Cl.^{6} B65D *63/00*

U.S. Cl. 24—16 PB **9 Claims**



1. A low profile bundling tie for bundling a number of articles comprising:

- an elongate strap having a locking head at one end and a tail at the other end;
- said elongate strap including two opposing major surfaces, one of said opposing major surfaces having transverse locking notches disposed thereon;
- said head having a passageway therethrough for insertably accommodating said strap;
- said passageway including a strap ingress end and a strap egress end, said strap egress end being located proximal to said elongate strap, said egress end including a transverse surface flaring into said passageway;
- said head further including a flexible locking pawl supported by said head within said passageway, said locking pawl including transverse locking teeth formed to engage the locking notches disposed on said one major surface of said strap; and
- wherein said flaring transverse surface frictionally grips a section of the strap that has been inserted past the locking pawl and thereby minimizes stretching of the strap about the pawl by forces pulling, in an insertion direction, on that portion of the strap exiting said head through said egress end.

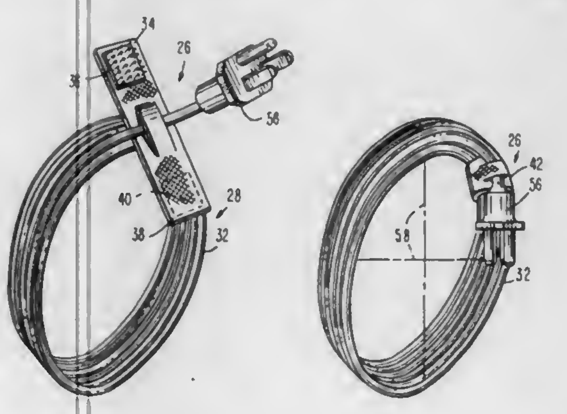
5,745,958
CABLE-BUNDLING BAND

Alan Kaldor, P.O. Box 801, Tesuque, N. Mex. 87574

Filed Apr. 18, 1997, Ser. No. 839,906

Int. Cl.^{6} B65D *63/00;* **H01R** *13/00*

U.S. Cl. 24—16 R **1 Claim**



1. Improvements in a cable-bundling band of a type positioned in encircling relation about a hank of a cable to facilitate the handling thereof when not in use, said embodied improvements of said cable-bundling band comprising a rectangular band having two spaced-apart and adjacently located slits extending longitudinally of said band and each slit having edges bounding an opening oriented lengthwise of said band for receiving therethrough an end of said cable, an end of said cable having an operative position projected through said slit openings for attaching to said end of said cable said band in a transverse relation to said end of said cable, and cooperating patches of VELCRO hook and loop fasteners disposed in opposing directions on opposite ends of said band, said patches being adapted when said cable is coiled in a hank to form said band in a closed loop in encircling relation thereabout, said hank having a diameter in a plane aligning with said end of said cable, whereby both said cable hank and said end of said cable are held by said band in a flat condition when not in use, and when in use said band is maintained on said cable by said operative position thereof projected through said two slit openings.

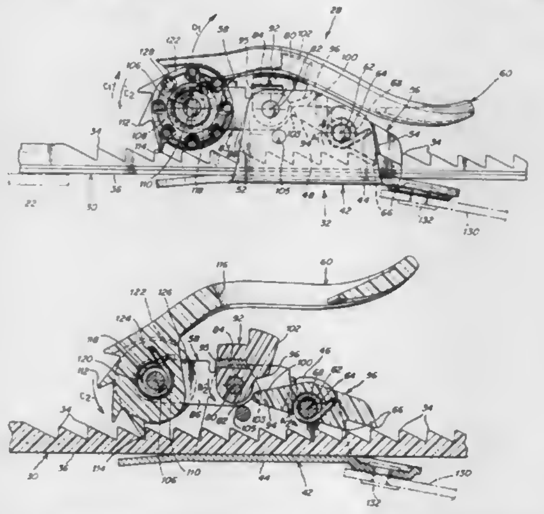
5,745,959
RATCHET-TYPE BUCKLE

David J. Dodge, Williston, Vt., assignor to The Burton Corporation, Burlington, Vt.

Filed Jan. 7, 1997, Ser. No. 779,526

Int. Cl.^{6} A43C *11/00;* **A44B** *21/00*

U.S. Cl. 24—68 SK **28 Claims**



1. A ratchet buckle for adjusting a strap, the ratchet buckle comprising:

- a housing that is adapted to slidably receive the strap, the housing having a front portion and a rear portion;
- a pawl constructed and arranged to engage and prevent movement of the strap in a direction from the rear portion toward and through the front portion of the housing while allowing movement of the strap in a direction from the front portion toward and through the rear portion of the housing;
- a drive actuator constructed and arranged to feed the strap through the housing from the front portion of the housing toward the rear portion of the housing; and
- a release actuator constructed and arranged to be actuated in a first direction to disengage the pawl from the strap, wherein continuously directed movement of the release actuator in the first direction causes withdrawal of the strap from and through the front portion of the housing.

5,745,960
ZIPPER APPARATUS AND METHOD FACILITATING MAINTENANCE AND REPAIR

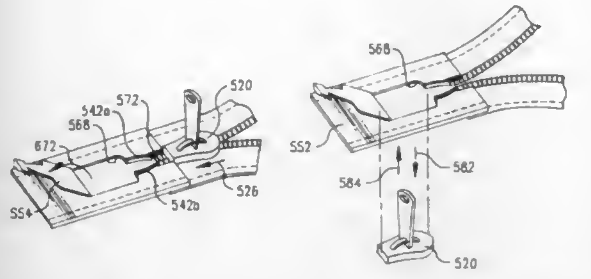
Teddy L. Dishner, and Terry Breaux, both of Rockport, Me., assignors to Walrus, Inc., Seattle, Wash.

Filed Jun. 18, 1996, Ser. No. 665,448

Int. Cl.^{6} A44B *19/36*

U.S. Cl. 24—381 **16 Claims**

1. A zipper apparatus, comprising:



first and second tapes, each bearing a plurality of engagable teeth, said tapes defining a first and a second end;
a slider configured to engage said teeth;
a plate having a first edge adjacent said first end, and interior edges defining a receiving area, communicating with said first edge, sized and shaped to accommodate said slider; and
a door movable from a first position at least partially covering said receiving area, to a second position substantially uncovering said receiving area.

5,745,961

SURFACE FASTENER

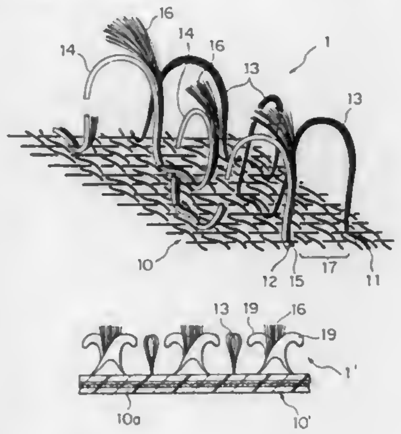
Mitsuhisa Okawa, and Ryuichi Murasaki, both of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Dec. 19, 1996, Ser. No. 769,127

Claims priority, application Japan, Dec. 22, 1995, 7-335272

Int. Cl.⁶ A44B *13/00*

U.S. Cl. 24—446 **11 Claims**



1. A surface fastener comprising:
(a) a substrate;
(b) a multiplicity of male and female engaging elements standing in a mixed order from a front surface of said substrate; and
(c) a multiplicity of cut piles each formed of a multifilament, which is composed of a set of fibers, raised from said front surface of said substrate.

5,745,962

ROLLER CLIP

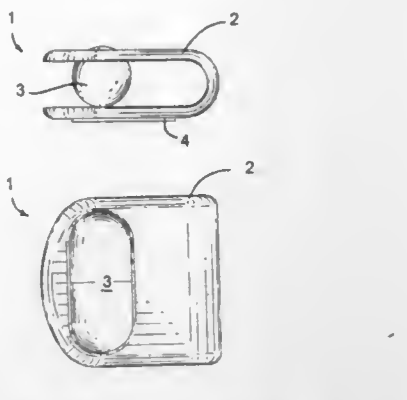
Herbert Richter, Drosselweg 8, 75331 Engelbrand, Germany

Filed Apr. 22, 1997, Ser. No. 844,831

Int. Cl.⁶ A44B *21/00;* **B42F** *1/00*

U.S. Cl. 24—488 **5 Claims**

1. A roller clip comprising a U-shaped body having top and bottom legs such that said top leg is resiliently supported in spaced relationship from said bottom leg, said top leg having at least one opening, at least one rolling means of a size larger than said opening disposed between said legs so as to extend partially through said opening and being captured in said opening, said opening having circumferential wall portions forming a bearing structure for said rolling means to permit rotation of said rolling means when an object is inserted between said bottom leg and said rolling means, and means on said bottom leg for attaching said roller clip to a support structure.



5,745,963

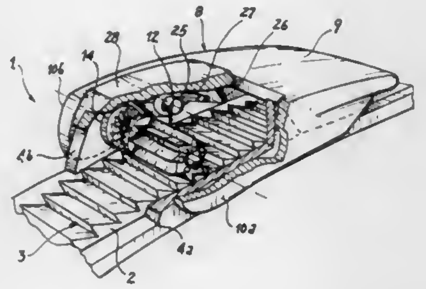
ADJUSTABLE FASTENING DEVICE FOR SPORTS FOOTWEAR

Nicoletti Graziano, Treviso, Italy, assignor to Canstar Italia S.p.A., Montebelluna, Italy

Filed Jul. 11, 1996, Ser. No. 678,179

Int. Cl.⁶ A43C *11/00*

U.S. Cl. 24—685 K **18 Claims**



1. An adjustable fastening device for sports footwear, for closing with respect to one another two footwear portions (A,B) that can be moved relative to one another, comprising:
a ratchet (**3**) that is to be secured to one of the footwear portions,
a base (**4**; **104**) that is to be secured to the other of the footwear portions, the ratchet being slidable in a predetermined direction with respect to the base,
a sprocket wheel (**12**; **112**) supported on the base (**4**; **104**) to be rotatable about an axis that is substantially perpendicular to the sliding direction of the ratchet (**3**), the sprocket wheel being in meshing engagement with the ratchet,
a lever (**8**; **108**) mounted on the base so that it can be swung about the axis of the sprocket wheel,
first unidirectional retaining means between the lever (**8**; **108**) and the sprocket wheel (**12**; **112**) for the rotation of the sprocket wheel and the resultant sliding in one direction of the ratchet (**3**) as a result of the swinging of the lever (**8**; **108**) into an operative position,
second unidirectional retaining means for holding the ratchet (**3**) with respect to the base (**4**; **104**) in the opposite direction to the sliding direction, characterised in that the first unidirectional retaining means comprise a coupling comprising first and second coupling elements coaxial with said sprocket and having axially directed teeth (**13**; **15**; **113**, **115**) which coupling acts between one axial end of the sprocket wheel (**12**; **112**) and the lever (**8**; **108**).

5,745,964

PUSH-BUTTON CLOSURE PART

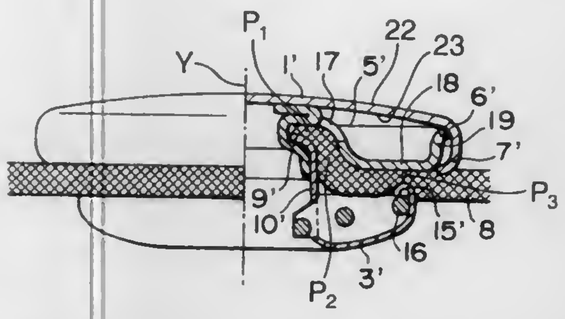
Harald Lüer; Volker Scheffels, and Thomas Pferdehirt, all of Wuppertal, Germany, assignors to YKK Corporation, Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 755,303

Claims priority, application Germany, Nov. 23, 1995, 195 43 728.4

Int. Cl.⁶ A44B *17/00*

U.S. Cl. 24—687 **9 Claims**



1. In a push-button closure part composed of a calotte-shaped metallic button, a metallic rivet part having a rivet shank that projects from the underside of the button and having an approximately radially extending, round rivet flange which under an edge thereof a downwardly and inwardly deformable button edge engages, and which comprises supporting clips formed by punched windows in the region between the edge of the rivet flange and the rivet shank, the clips being bent over onto themselves such that they lie against and support the central region of the calotte-shaped button, and a push-button eyelet having a central opening that is slipped onto the rivet shank, and that, by deforming the rivet shank, the eyelet is fixed with the rivet shank and, thus, the calotte-shaped button while pressing the material between the edge of the central opening of the eyelet and the rivet flange, the improvement comprising:
said rivet part including a window section, having supporting clips cut and bent therefrom, said window section extending approximately parallel to an axis of the rivet shank, leads away from the calotte-shaped button and merges into a supporting section that proceeds transversely relative to the axis and at a distance from the calotte-shaped button; and
a transition section extending approximately parallel to the axis and together with the window section defining the distance of the supporting section from the calotte-shaped button, said transition section adjoins the supporting section, said transition section terminating in an outer edge against the calotte-shaped button, a button edge conducted downward and inward approximately parallel to the axis for fixing the rivet part; and
the position of the edge of the central opening of the eyelet is matched such to the position of an outer flare edge of the eyelet that the flexible material is pressed between the edge of the central opening of the eyelet and the rivet flange and also pressed between the outer flare edge of the eyelet and the supporting section of the rivet flange.

5,745,965

AMPUL AND AN AMPUL-FITTED THEFT-DETERRENT DEVICE

Klas Stoltz, and Bo Gustavsson, both of Huddinge, Sweden, assignors to Färgklämman AB, Huddinge, Sweden

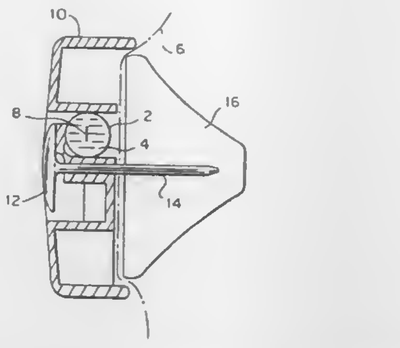
Filed Sep. 26, 1996, Ser. No. 721,017

Claims priority, application Sweden, Jun. 27, 1996, 9602552

Int. Cl.⁶ F16B *21/00;* **E05B** *65/00*

U.S. Cl. 24—704.1 **16 Claims**

1. An ampul which contains a marking substance (4) and which is intended for use in a theft-deterrent device for attachment to theft-attractive goods (6), characterized in that an alarm element (**8**), which can be detected or sensed by a remote electronic alarm system, is enclosed in the ampul (**2**) and is inaccessible unless the ampul (**2**) is broken, crushed or damaged in some other way such as to release the marking substance (**4**).



5,745,966

SINGEING DEVICE

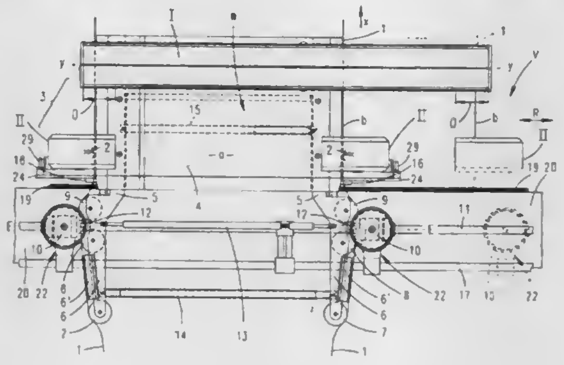
Walter Osthoff, Wuppertal, and Rainer Ebbinghaus, Mönchengladbach, both of Germany, assignors to Osthoff-Senge GmbH & Co. KG, Wuppertal, Germany

Filed Jul. 2, 1996, Ser. No. 675,244

Claims priority, application Germany, Jul. 3, 1995, 195 24 122.3; Mar. 16, 1996, 196 10 394.0

Int. Cl.⁶ D06C *9/00*

U.S. Cl. 26—3 **30 Claims**



1. A singeing device for the gassing of circular goods, including circular knitted textile goods, the device having a singe burner and a cloth guide, wherein the cloth guide comprises:
means for producing flat sides of the circular goods, which flat sides extend substantially parallel to each other;
means for producing rounded transition sides of the goods; and
wherein the singe burner includes means for gassing the circular goods both on the flat sides and on the transition sides.

5,745,967

TURRET HEAD DEVICE FOR MACHINE TOOL

Masakazu Kojima, Shinjuku-ku, Japan, assignor to Dyadic Systems Co., Ltd., Ishikawa-ken, Japan

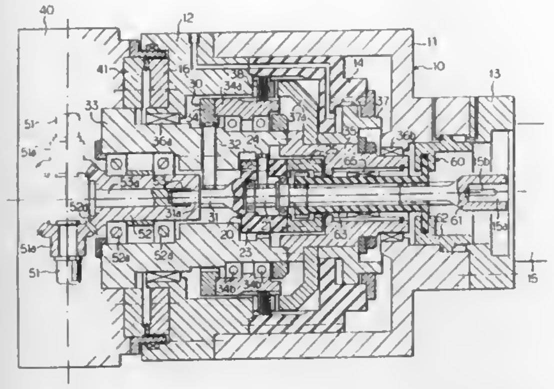
Filed Sep. 25, 1996, Ser. No. 721,764

Claims priority, application Japan, Sep. 25, 1995, 7-246070; Jun. 21, 1996, 8-162034

Int. Cl.⁶ B23B *29/32*

U.S. Cl. 29—40 **13 Claims**

1. A turret head device for machine tool comprising:
a housing;
a motor mounted on a rear surface of said housing;
a first and second planetary gear mechanisms, both integrated into said housing;



a turret for mounting tools, said turret being connected with said motor through said first and second planetary gear mechanisms; and,

a tool driving shaft integrated into said turret and connected with the motor through said first planetary gear mechanism.

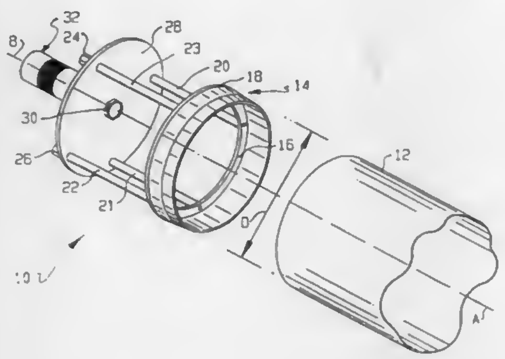
5,745,968
SOUND DAMPENING TOOL FOR CYLINDRICAL PRINTING BLANKETS

John H. Genest, Fort Mill; Andrew J. Gaworowski, Moore, and Herman D. Sheron, Seneca, all of S.C., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Filed Sep. 10, 1996, Ser. No. 711,766

Int. Cl.⁶ B25B *27/00*

U.S. Cl. 29—270 **12 Claims**



1. A tool for applying a cylindrical printing blanket onto a printing press cylinder having a bearing assembly mounted on at least one end thereof, said tool comprising:

- a cylindrical fitting member having a first surface adapted to form a frictional fit with the inner surface of a cylindrical printing blanket sleeve;
- a ring member attached to said cylindrical fitting member at one end thereof, said ring member having front and rear surfaces and an outer diameter which is greater than the outer diameter of said cylindrical fitting member; and
- a manipulation member operatively associated with said ring member for engaging said cylindrical fitting member with said sleeve without interfering with the bearing assembly of the printing press cylinder.

5,745,969
METHOD AND APPARATUS FOR REPAIRING A COKE OVEN

Shigeru Yamada; Hiroyuki Shiraishi; Terutsune Nisbio; Hideaki Morimoto, all of Ehime; Keiji Matsuda, Chiba; Tetsuro Uchida, Chiba; Tamotsu Takahashi, Chiba; Tsutomu Matsuno; Keizi Kamegawa, both of Tokyo; Makoto Numazawa, Osaka; Ryuzo Moritani, Osaka; Hidekuni Ito, Osaka; Toshio Kondo, Wakayama; Hideki Ohhira, and Shunji Horinouchi, both of Hyogo, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo; Kawasaki Steel Corporation, Kobe; NKK Corporation, Tokyo; Sumitomo Metal Industries, Ltd., Osaka, and Kansai Netukagaku Kabushiki Kaisha, Amagasaki, all of Japan

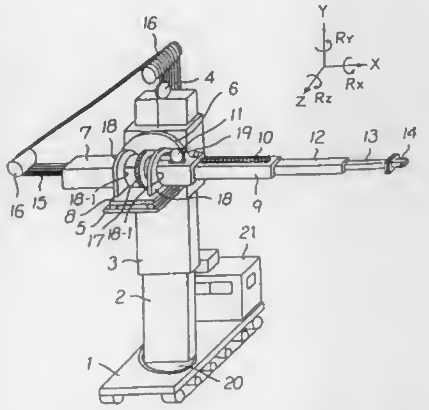
PCT No. PCT/JP94/01821, § 371 Date Aug. 31, 1995, § 102(e) Date Aug. 31, 1995, PCT Pub. No. WO95/11950, PCT Pub. Date May 4, 1995

PCT Filed Oct. 28, 1994, Ser. No. 492,025

Claims priority, application Japan, Oct. 29, 1993, 5-293990; Oct. 29, 1993, 5-293991; Oct. 29, 1993, 5-293992

Int. Cl.⁶ B23P *6/00*

U.S. Cl. 29—402.18 **36 Claims**



1. A coke oven repairing method for repairing an oven wall of a coke oven by the use of a lance, said method comprising the steps of arranging a distance sensor at a top end of said lance, successively measuring a depth of a damaged area in an oven wall surface by successively scanning the oven wall surface by a beam emitted from said distance sensor, determining an amount of a repairing material with reference to a measurement result obtained by said distance sensor, and injecting the amount of the repairing material from a repairing nozzle to said damaged area to thereby repair said damaged area.

5,745,970
DISC DRIVE DEVICE CHUCKING MAGNET MAGNETIZING METHOD AND MAGNETIZING APPARATUS

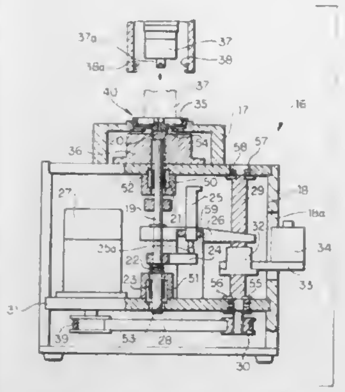
Hiroshi Sakashita, and Masayuki Katagiri, both of Nagano, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano-ken, Japan

Filed Aug. 21, 1995, Ser. No. 517,038

Claims priority, application Japan, Aug. 22, 1994, 6-220935

Int. Cl.⁶ B23Q *17/00*

U.S. Cl. 29—407.05 **7 Claims**



1. A disc drive device chucking magnet magnetizing method comprising the steps of:

- measuring a difference in height between a surface of a hub support on which a disc hub is placed and a surface of a chucking magnet which is mounted on said hub support for magnetically attracting the disc hub; and
- magnetizing the chucking magnet with a magnetizing power from a magnetizing means, where said magnetizing power is varied according to said difference so that attracting forces on said disc hub are substantially uniform.

5,745,971
METHOD OF MANUFACTURING A PULP MOLDING DIE

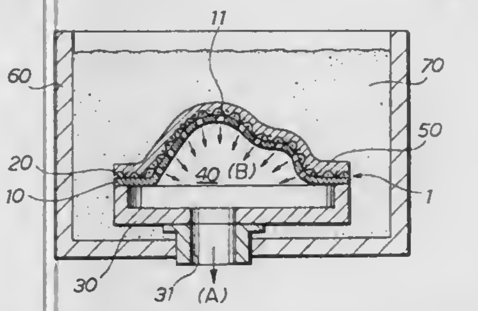
Okimasa Ohsawa, Kashiwa; Kuniaki Osada, Yokohama; Nobuyoshi Okato, and Tatsuo Katagiri, both of Kawasaki, all of Japan, assignors to Nippon Paper Industries Co., Ltd., and Nippon Yakin Kogyo Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 265,826, Jun. 27, 1994, abandoned. This application Apr. 8, 1996, Ser. No. 629,084

Claims priority, application Japan, Jul. 14, 1993, 5-174394

Int. Cl.⁶ B23P *17/04;* **B29C** *49/06;* **B21D** *15/10*

U.S. Cl. 29—421.1 **10 Claims**



1. A method of manufacturing a pulp molding die, comprising:

- providing a superplastic material plate having a plurality of preformed through-holes;
- closing the plurality of preformed through-holes;
- heating the superplastic material plate under a pressurized atmosphere, forming the plate into a desired shape; and
- opening the plurality of preformed through-holes of the plate, thereby forming the pulp molding die.

5,745,972
METHOD OF PRODUCING PARTS/SUBSTRATE ASSEMBLIES

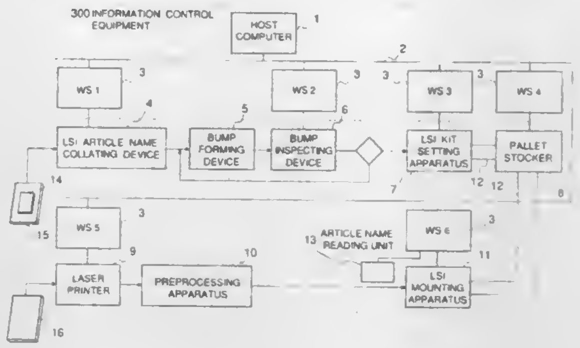
Tetsuhiro Yokayama; Keiji Fujikawa; Yoouichi Fukuoka, all of Hadano; Yooichi Fujiwara, Zama; Junji Narita; Terumi Saitoo, both of Hadano, and Hiroo Inoue, Isehara, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Computer Engineering Co., Ltd., Hadano, both of Japan

Division of Ser. No. 181,142, Jan. 12, 1994, Pat. No. 5,513,427, which is a continuation-in-part of Ser. No. 987,085, Dec. 7, 1992, Pat. No. 5,329,690, which is a continuation of Ser. No. 541,596, Jun. 21, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 484,288

Claims priority, application Japan, Jun. 22, 1989, 1-160291; Jan. 14, 1993, 5-5218

Int. Cl.⁶ B23P *11/00;* **H05K** *3/30*

U.S. Cl. 29—430 **5 Claims**



1. A method of producing a plurality of kinds of parts/substrate assemblies each of said parts/substrate assemblies comprising a predetermined kind and number of parts, and a substrate on which said parts are to be mounted, each of said parts/substrate assemblies being produced by mounting said parts on corresponding substrates, and said parts/substrate assemblies differing in kinds or numbers of parts to be mounted, wherein said plurality of kinds of parts/substrate assemblies are produced in a same production process, where plural kinds of parts are mixed and matched with plural kinds of substrate assemblies, said method comprising the steps of:

- (a) accepting parts necessary for assembling a plurality of kinds of parts/substrate assemblies to be produced;
- (b) providing at least one pallet corresponding to each of said plurality of kinds of parts/substrate assemblies;
- (c) selectively distributing said accepted parts to the pallets thus provided, in accordance with predetermined requirements for each of said parts/substrate assemblies;
- (d) stocking the pallets to which the parts are distributed;
- (e) taking out a respective one of said stocked pallets with its respective parts to be used for assembling a corresponding one of said parts/substrate assemblies and transporting the respective pallet to a place where the respective parts are to be mounted on the corresponding substrate; and
- (f) removing the respective parts from the transported pallet and mounting the respective parts on the corresponding substrate.

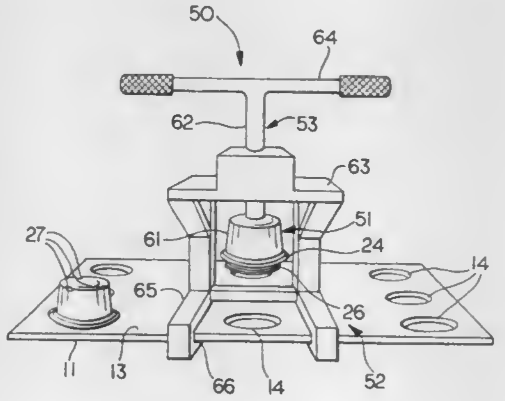
5,745,973
PALLET ASSEMBLY

Frank Anthony Kohlhaas, 130 Lake Julia Dr. North, Ponte Vedra Beach, Fla. 32082

Filed Jan. 9, 1997, Ser. No. 781,130

Int. Cl.⁶ B23P *11/00;* **B65D** *19/16*

U.S. Cl. 29—432 **3 Claims**



1. A method for assembling a pallet assembly comprising a single deck member and multiple leg members attached to and

depending from said deck member, said deck member composed of a generally solid, non-compressible material and having a number of circular apertures, said leg members each comprising a bottom, a side wall connected to said bottom, an annular aperture ring having external threads extending from said side wall, a peripheral flange extending outwardly from said aperture ring and abutting said deck member, where the exterior diameter of said aperture ring corresponds to the interior diameter of said circular aperture whereby said threads bite into said deck member when said aperture ring of said leg member is inserted and rotated within said aperture to securely attach said leg member to said deck member,

the method comprising the steps of providing mechanical insertion means for insertion of the individual leg members into said apertures of said deck member, said mechanical insertion means comprising gripping means to retain a respective said leg member, alignment means to properly align said leg member relative to said aperture, and drive means to rotate said leg member within said aperture to attach said leg member to said deck member, positioning said leg member in said gripping means, aligning said leg member with said aperture, rotating said leg member relative to said aperture to force said threads into said deck member until said peripheral flange abuts said deck member, and releasing said leg member from said gripping means.

fixedly setting each bush of said plurality of bushes in said mold with opposite ends of each bush of said plurality of bushes being positioned so as to prevent movement of said opposite ends of each bush of said plurality of bushes in an axial direction with respect to a longitudinal axis of each bush of said plurality of bushes when said mold is closed;

closing said mold:

injecting said plastic material into said mold cavity, while applying both an injection pressure and a mold closing force to each bush of said plurality of bushes so that said outer circumference of each bush of said plurality of bushes bulges out at said intermediate portion thereof so as to form said barrel-shaped configuration;

opening said mold;

removing each bush of said plurality of bushes from said mold; and

forcibly fitting said opposite ends of each bush of said plurality of bushes which have been removed from said mold, which have elastically recovered so as to return to said original cylindrical shape with said outer circumference thereof being uniformly circular in cross-section, and which are integrally provided with said plastic sleeve formed by molding and elastically deformed so as to be hourglass-shaped, into bush holes formed in chain link plates of said chain link assembly so that each bush of said plurality of bushes is deformed into said barrel-shaped configuration when each bush of said plurality of bushes is deformed within said mold.

5,745,974

METHOD OF FABRICATING A CHAIN LINK ASSEMBLY HAVING BUSHES EACH PROVIDED INTEGRALLY WITH A RESIN SLEEVE ON ITS INNER CIRCUMFERENCE

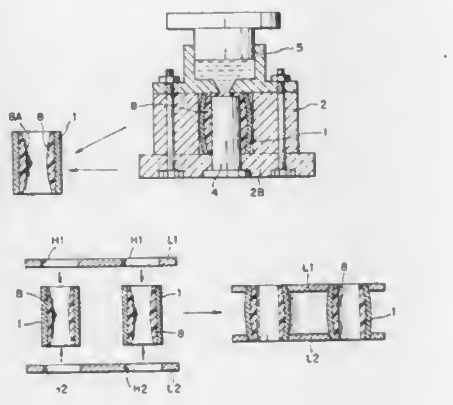
Koji Tanaka, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka-fu, Japan

Filed Mar. 8, 1996, Ser. No. 612,777

Claims priority, application Japan, Mar. 10, 1995, 7-078389; Feb. 26, 1996, 7-038165

Int. Cl.⁶ B23D *11/00*, B21L *9/00*

U.S. Cl. 29—458 **3 Claims**



1. A method of fabricating a chain link assembly having a plurality of bushes which are originally cylindrical in shapes wherein each bush of said plurality of bushes is integrally provided with a plastic sleeve on an inner circumference thereof, said method comprising:

providing a mold having a core of a circular cross-section for forming a mold cavity into which a plastic material is to be injected to form a plastic sleeve on said inner circumference of each bush of said plurality of bushes, said mold having an inner circumference defining a space for allowing a bulging deformation to occur at an intermediate portion of an outer circumference of each bush of said plurality of bushes so that each bush of said plurality of bushes forms a barrel-shaped configuration when assembling said chain link assembly;

5,745,975

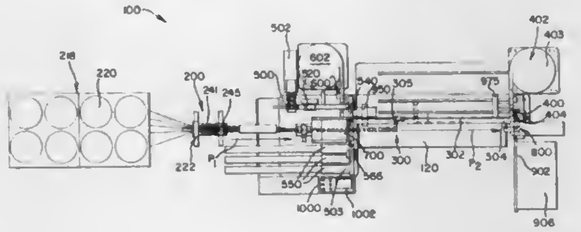
WIRE HARNESS TERMINATION APPARATUS FOR PROGRAMMABLE CONNECTORS

Douglas Lester Heisner, Downers Grove; Peter Ingwersen, Gilberts; Thomas P. Pellegrino, Lise; Eric Stenstrom, Warrenville; Kevin J. Urness, St. Charles, and Steven Wright, Glen Ellyn, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Aug. 21, 1996, Ser. No. 700,895

Int. Cl.⁶ H01R *43/00*

U.S. Cl. 29—564.6 **19 Claims**



1. An apparatus for assembling wire harnesses in which each assembled wire harness has a plurality of elongated wires with first and second connector elements being interconnected to said harness wires at locations spaced apart from each other at predetermined spacings, the second connector elements being of modular construction and having first and second modules which interengage with each other to form a second connector element, said second connector elements further having a plurality of programmable contact terminals, the apparatus comprising:

a supply of harness wires;

means defining a wire feedpath between the wire supply and a first work station;

wire feed means for feeding multiple wires along the wire feedpath from said wire supply to the first work station;

a supply of first connector elements and means for successively advancing individual first connector elements in serial order from said first connector element supply;

carriage means for moving between said first connector element advancement means and said first work station, the carriage means including a connector element nest for receiving a first connector element therein from said first connector element advancement means;

said first work station including a termination assembly aligned with said wire feed means, the termination assembly having first termination means for terminating first ends of said wires fed from said wire supply to a first connector element advanced from said first connector element supply;

respective supplies of the second connector element first and second modules, and means for successively advancing individual second connector element first and second modules from said respective supplies to said first work station;

a second work station interposed between said second connector element first module supply and said first work station, the second work station including programming means for programming said contact terminals of said second connector element first modules;

means for assembling said second connector element first and second modules together at said first work station;

second termination means for terminating said second connector elements to said wires; and

wire cutting means disposed in said first work station for cutting said wires to define a tail end of said wire harness wires.

5,745,976

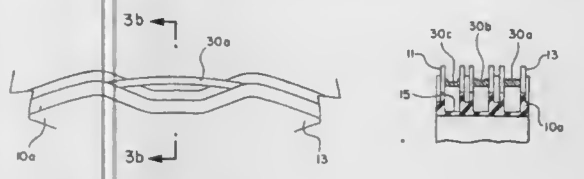
METHOD OF MANUFACTURING AN ELECTRICAL SLIP RING BASE

Russell L. Crockett, Christiansburg; Michael J. Day, Blacksburg; Tyler W. Hamilton, Parrot; Gwendolyn C. Handy, Blacksburg; Glen M. Harris, Christiansburg, and Glenn E. Lawson, Blacksburg, all of Va., assignors to Litton Systems Inc., Woodland Hills, Calif.

Filed May 13, 1996, Ser. No. 645,222

Int. Cl.⁶ H01R *43/10;* B23P *11/02*

U.S. Cl. 29—597 **3 Claims**



1. A method of manufacturing an electrical slip ring base assembly, comprising the steps of:

forming a continuous, undivided conductive strip,

forming a continuous, undivided base member for carrying said conductive strip by one of a molding or an extruding process from a

flexible, electrically non-conductive material,

flexing said base member to allow said conductive strip to be placed there about without the application of additional external force and allowing said base member to return to its original shape so as to be in frictional engagement with said conductive strip.

5,745,977

METHOD OF MANUFACTURING ROTARY ELECTRIC MACHINE

Hideki Ichikawa, Inazawa, and Ryohei Saji, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 29, 1996, Ser. No. 610,065

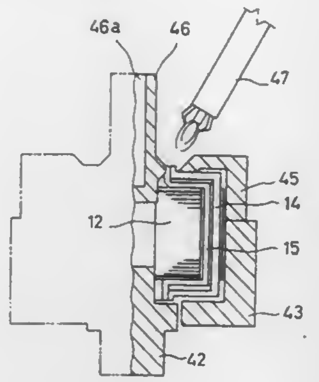
Claims priority, application Japan, Mar. 27, 1995, 7-068234; Dec. 18, 1995, 7-329327

Int. Cl.⁶ H02K *15/04*

U.S. Cl. 29—598 **8 Claims**

1. A method of manufacturing a rotary electric machine comprising the steps of:

providing a cylindrical armature core having a number of slots and a center opening:



providing lower coil bars each of which has an axially straight portion and coil-end portions radially extending from opposite ends of said straight portion;

providing upper coil bars each of which has an axially straight portion and coil-end portions radially extending from opposite ends of said straight portion;

inserting said straight portions of said lower and upper coil bars into respective slots with insulators;

connecting each tip portion of said coil-end portion of said upper coil bar in each slot to each corresponding tip portion of said coil-end portion of said lower coil bars in a corresponding shifted slot to form a one-turn armature coil said connecting step comprises the steps of:

  pressing inside surfaces of said tip portions of said lower coil bars with a cooling member disposed in said center opening;

  placing a welding torch near a pair of said tip portions of said lower and upper coil bars to be connected;

  grounding said coil bars having said tip portions to be connected;

  welding said tip portions to be connected;

  rotating said armature core by a set angle to place another pair of tip portions to be connected near said torch; and

  repeating said steps of grounding, welding and rotating until all said tip portions are connected;

cooling said tip portions with said cooling member concurrently with said welding steps;

removing said cooling member from said center opening; and

press-fitting a shaft into said center opening of said armature core, after said step of cooling and after said step of removing said cooling member, whereby said shaft occupies occupy a space that was occupied by the cooling member.

5,745,978

METHOD OF MAKING MAGNETORESISTIVE SENSOR WITH IMPROVED MICROTRACK PROFILE FOR IMPROVED SERVO-POSITIONING PRECISION

Joseph Adam Aboaf; Edward Virgil Denison, and Vincent Noel Kahwaty, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

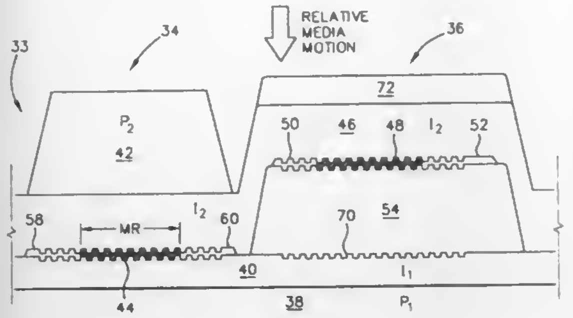
Division of Ser. No. 449,382, May 23, 1995, which is a division of Ser. No. 447,395, May 23, 1995, Pat. No. 5,530,608, which is a continuation of Ser. No. 286,603, Aug. 5, 1994, abandoned, which is a continuation of Ser. No. 999,510, Dec. 30, 1992, abandoned. This application Feb. 12, 1997, Ser. No. 799,716

Int. Cl.⁶ G11B *5/127*

U.S. Cl. 29—603.08 **11 Claims**

1. A method of making a magnetoresistive (MR) magnetic head assembly having a data region and a servo region wherein the regions extend perpendicular to an air bearing surface (ABS) and are spaced laterally along the ABS in a direction perpendicular to a direction of media movement, the method comprising the steps of:

forming a first shield layer in the data and servo regions so that the first shield layer has a data region and a servo region;



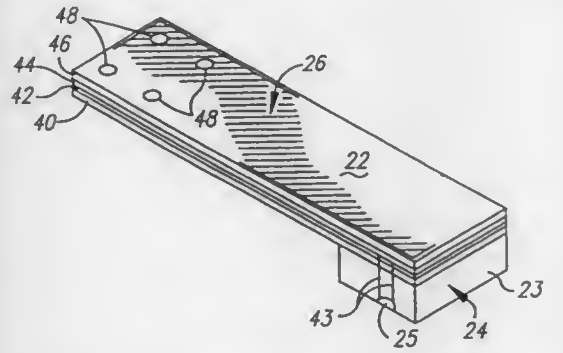
- forming a magnetic insulative first gap layer on the first shield layer in the data and servo regions;
- forming a magnetic insulation spacer layer on the first gap layer only in the servo region;
- forming an MR data sensor on the first gap layer in the data region;
- forming an MR servo sensor on the insulation spacer layer in the servo region so that a spacing between the MR servo sensor and the first shield layer is greater than a spacing between the MR data sensor and the first shield layer;
- forming a magnetic insulative second gap layer on the MR data sensor and on the MR servo sensor; and
- forming a second shield layer on the second gap layer in the data region only.

5,745,979
MAGNETIC HEAD FOR RECORDING WITH ULTRA LOW FORCE

Robert Edward Fontana, Jr., San Jose; Linda Hope Lane, Gilroy; Mason Lamar Williams, III, and Celia Elizabeth Yeack-Scranton, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y. Division of Ser. No. 259,370, Jun. 14, 1994, which is a continuation of Ser. No. 935,000, Aug. 25, 1992, abandoned. This application Oct. 26, 1995, Ser. No. 548,767

Int. Cl.⁶ G11B *5/42*

U.S. Cl. 29—603.12 **51 Claims**



1. A method for processing a combination transducer and suspension assembly comprising the steps of:

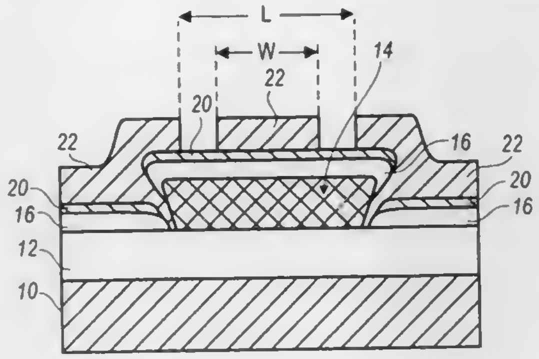
- providing a wafer substrate having a thickness equal to a desired suspension length;
- forming a first release layer on a major surface of said substrate;
- forming a support layer on said first release layer;
- forming a plurality of thin film transducers with transducer conductor leads on said support layer in a row and column pattern;
- separating a row section from said wafer substrate, each row section having a plurality of said formed transducers, one from each said column;
- forming a second release layer on a separated side of said separated row section adjacent said major surface, said second release layer extending from said first release layer to an opposing end of said separated row section;
- forming a suspension section by depositing at least one thin film layer of a resilient material on said second release layer;
- forming electrically conductive members extending from said transducer to said opposing end of said suspension layer;
- dissolving said first and second release layers; and
- separating said row section into individual transducers, each said transducer having an associated portion of said suspension section.

5,745,980
METHOD OF FABRICATING MAGNETIC RECORDING THIN FILM HEAD HAVING PINCHED-GAP

Uri Cohen, 765 San Antonio Rd., #53, Palo Alto, Calif. 94303 Division of Ser. No. 963,783, Oct. 20, 1992. This application Jun. 6, 1995, Ser. No. 477,011

Int. Cl.⁶ G11B *5/42*

U.S. Cl. 29—603.14 **19 Claims**



1. A process of fabricating a pinched-gap TFH device comprising the steps of:

- depositing a bottom magnetic pole comprising a bottom pole-tip, said bottom pole-tip having side-edges;
- depositing a gap layer over said bottom magnetic pole;
- forming over said gap layer a mask having openings in regions near said side-edges of said bottom pole-tip;
- etching gap-vias in said gap layer through the openings in said mask;
- removing said mask; and
- depositing over said gap-layer a top magnetic pole layer, said top magnetic pole layer filling said gap-vias and forming a top magnetic pole comprising a top pole-tip, said top pole-tip being in substantial contact with the bottom pole-tip in locations near said side-edges of the bottom pole-tip.

5,745,981
METHOD FOR MAKING MAGNETIC AND ELECTROMAGNETIC CIRCUIT COMPONENTS HAVING EMBEDDED MAGNETIC MATERIALS IN A HIGH DENSITY INTERCONNECT STRUCTURE

Waseem Ahmed Roshen, Clifton Park; Charles Steven Korman, and Wolfgang Daum, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y. Division of Ser. No. 43,166, Apr. 1, 1993, Pat. No. 5,525,941. This application Jan. 18, 1996, Ser. No. 588,525

Int. Cl.⁶ H01F *4/06*

U.S. Cl. 29—607 **30 Claims**

1. A method for making an HDI circuit component, comprising:

(a) forming a cavity in an HDI dielectric substrate, said cavity having a bottom surface;

(b) machining a magnetic plate to the length and width dimensions of said cavity;

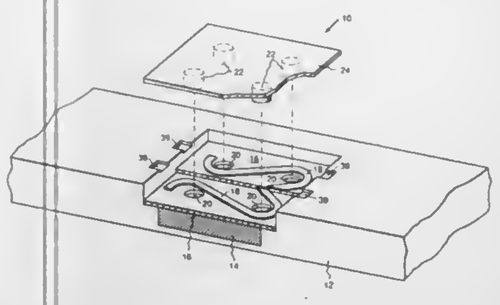
(c) inserting at least one magnetic plate in said cavity,

(d) disposing alternating dielectric and metal layers on said at least one magnetic plate;

(e) electroplating each of said metal layers to a predetermined thickness;

(f) patterning each of said metal layers;

(g) repeating steps (d) through (g) until all metal layers are deposited and patterned within said cavity.



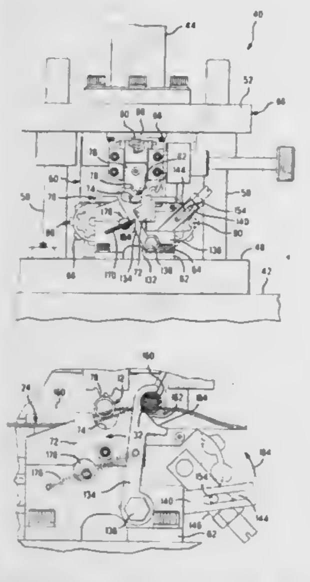
5,745,982
LIFTING DEVICE FOR A CRIMPED WIRE ASSEMBLY

Steven Zane Klinedinst, York, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 22, 1996, Ser. No. 754,709

Int. Cl.⁶ H01R *43/048*

U.S. Cl. 29—753 **10 Claims**



1. In an apparatus for crimping a terminal onto a wire thereby forming a crimped wire assembly wherein said apparatus includes a first tooling unit and a second tooling unit movable toward and matable with said first tooling unit in a work station for effecting said crimping, and a terminal feed unit for feeding a strip of terminals from an upstream side of said work station along a feed path through said work station toward a downstream side thereof, a lifting device for separating said crimped wire assembly from said first tooling unit comprising:

- an arm pivotally attached to said first tooling unit and having a first end arranged so that when said arm is pivoted in a first direction said first end moves from a first position adjacent said work station to a second position on said downstream side of said work station, said first end having a camming surface arranged to engage said crimped wire assembly, said camming surface including a substantially flat angled surface and an abutting surface, wherein during said pivoting of said arm in said first direction, said substantially flat angled surface cams said crimped wire assembly out of said first tooling in a direction substantially perpendicular to said feed path, and then said abutting surface moves said wire assembly along said feed path in a direction toward said downstream side of said work station.

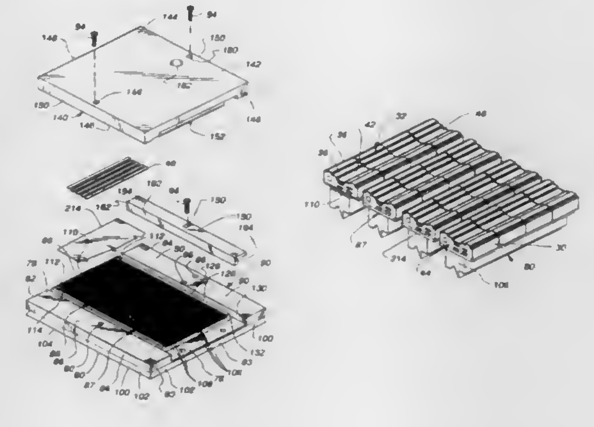
5,745,983
TOOL FOR PROCESSING MAGNETIC READ/WRITE HEADS

Dan W. Quintana, Louisville; Chris Broussalian, Broomfield; John Keil, Jr.; Georgene Nielsen, both of Westminster; Jorg Jemelka, Boulder; Robert Chesnutt, Arvada, and William Trowbridge, Estes Park, all of Colo., assignors to MKE-Quantum Components Colorado LLC, Louisville, Colo.

Filed Oct. 31, 1995, Ser. No. 550,945

Int. Cl.⁶ B23P *19/04;* **G11B** *5/127;* **B25B** *11/00*

U.S. Cl. 29—759 **13 Claims**



1. A tool for use in defining air bearing surfaces on a plurality of rows, each of the rows comprising a plurality of individual sliders, the rows being elongated and defining opposing longitudinal sides, a first end, a second end, a top surface and a bottom surface, one of said rows being an anchor row, the tool comprising:

- a main body member having a length defining a y-axis direction, a width defining an x-axis direction, and a thickness defining a z-axis direction, and a top surface defining a platform and opposing exposed portions spaced apart on the top surface on opposing sides of said platform, the opposing exposed portions forming first and second positioning surfaces;
- the platform having a planar upper surface defining an upwardly facing z-axis base surface, and defining an exposed portion on the planar upper surface forming a y-axis alignment reference surface;
- the second positioning surface defining an x-axis alignment reference surface; and
- the upper surface of the platform engaging the lower surface of the plurality of rows to provide proper z-axis positioning on the tool, the y-axis alignment reference surface engaging one longitudinal side of the anchor row to provide proper y-axis positioning on the tool, and the x-axis alignment reference surface abutting the second end of the plurality of rows to provide proper x-axis positioning on the tool, and wherein the plurality of rows are subsequently positioned adjacent to one another on the upper surface of the platform such that the respective longitudinal sides of each of the adjacent rows are engaged to maintain proper y-axis positioning between the adjacent rows, and the second end abutting the x-axis alignment reference surface to provide proper x-axis positioning between the adjacent rows, so that the plurality of the sliders in each row are positioned in y-axis orientation with the corresponding slider in the adjacent rows, and the top surfaces of the rows lie in a common plane.

5,745,984

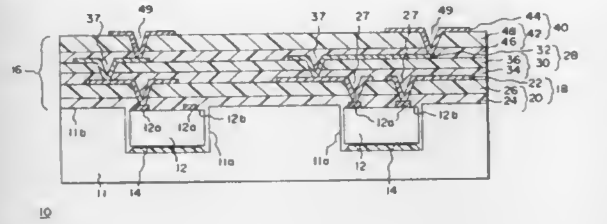
METHOD FOR MAKING AN ELECTRONIC MODULE

Herbert Stanley Cole, [illegible], Burnt Hills, and Theresa Ann Sitnik-Nieters, Clifton Park, both of N.Y., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jul. 10, 1995, Ser. No. 500,671

Int. Cl.^{6} H05K *3/32*

U.S. Cl. 29—834 **8 Claims**



1. A method for making an electronic circuit module, comprising the steps of:

disposing a plurality of electronic chips on a substrate, the chips including contact pads;

adhesively laminating a first thermoset polymer film layer, over the chips and areas of the substrate surface surrounding the chips, with a thermoplastic adhesive;

providing a plurality of via openings over at least some of the contact pads in the first polymer film/adhesive layer;

providing a first pattern of electrical conductors on the first film layer so that conductors extend between the via openings so as to electrically connect selected contact pads;

adhesively laminating at least one additional polymer film over at least a portion of each of the first polymer film layer and the first electrical conductor pattern, with a benzocyclobutene polymer adhesive;

providing a plurality of additional via openings in each additional polymer/benzocyclobutene polymer film, the openings being disposed over at least some of electrical conductors of an associated next lower layer; and

providing an additional pattern of electrical conductors on each of the at least one additional polymer film so that conductors extend into the associated via openings so as to electrically connect with some of the electrical conductors of the associated next lower layer.

5,745,985

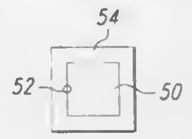
METHOD OF ATTACHING A SEMICONDUCTOR MICROCHIP TO A CIRCUIT BOARD

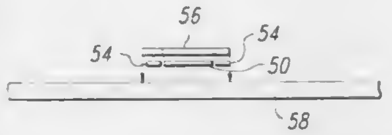
Prosenjit Ghosh, Temple, and Sunil Thomas, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 20, 1995, Ser. No. 546,054

Int. Cl.^{6} H05K *3/32;13/04*

U.S. Cl. 29—834 **12 Claims**





1. A method of attaching a semiconductor microchip to a circuit board, said method comprising:

applying a catalyst on said circuit board;

placing a center core bond portion of thermally conductive and electrically conductive material on said circuit board where the catalyst has been applied thereon;

placing a perimeter bond portion of thermally conductive and electrically nonconductive material around said center core bond portion on said circuit board where the catalyst has been applied thereon;

at least partially curing the circuit board and the center core and perimeter bond portions;

placing said semiconductor microchip on said center core and perimeter bond portions; and

curing the semiconductor microchip, the center core bond portion and the perimeter bond portion.

5,745,986

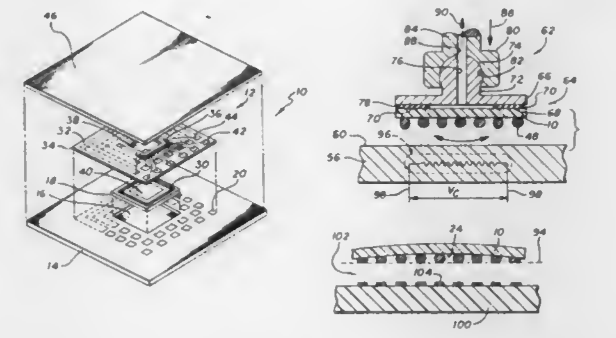
METHOD OF PLANARIZING AN ARRAY OF PLASTICALLY DEFORMABLE CONTACTS ON AN INTEGRATED CIRCUIT PACKAGE TO COMPENSATE FOR SURFACE WARPAGE

Patrick Variot, San Jose; Chok J. Chia, Campbell, and Robert T. Trabucco, Los Altos, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 192,081, Feb. 4, 1994, Pat. No. 5,435,482. This application Jul. 24, 1995, Ser. No. 506,382

Int. Cl.^{6} H05K *3/34;13/04*

U.S. Cl. 29—840 **10 Claims**



1. A method of planarizing an array of plastically-deformable electrical contacts on an integrated circuit package, comprising the steps of:

mounting the package on a positioning device with the array of plastically-deformable electrical contacts substantially parallel to and facing a planar surface of a substrate;

heating the planar surface sufficiently to cause individual ones of the plastically-deformable electrical contacts to locally soften but not to cause said individual ones of the electrical contacts to liquefy throughout their volumes when said electrical contacts engage the heated planar surface and contact said heated planar surface for a residence time period;

moving at least one of the positioning device or the planar surface towards the other so that the plurality of electrical contacts and the planar surface engage and applying a sufficient force to a highest one of the contacts, thereby flattening said highest one of said contacts when it is held in contact with the heated planar surface for the residence time period; and

continuing to move at least one of the device or the planar surface towards the other so that the highest contact is sufficiently flattened to bring the planar surface to a planar level of a highest level of a lowest one of the contacts, thereby selectively distorting said electrical contacts so they cooperatively define a planar array.

5,745,987

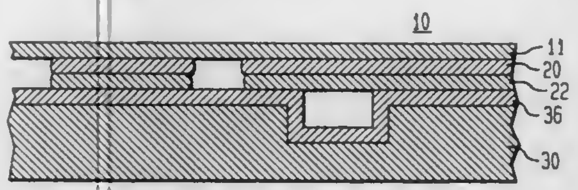
METHOD FOR BONDING CIRCUIT BOARDS TO PALLETS

Paul L. Bartley, West Newbury, Mass., and Deborah A. Fisher, Columbus, Ohio, assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 20, 1995, Ser. No. 546,424

Int. Cl.^{6} H05K *3/34*

U.S. Cl. 29—840 **8 Claims**



1. A method of mounting a circuit board to a pallet, to which one or more electrical components will be connected by melting an alloying metal therebetween, said method to form a circuit board assembly which produces a superior electrical and mechanical connection between the circuit board and the pallet, wherein the circuit board is comprised of an electrically non-conductive substrate and at least one metal circuit path on one face of the substrate, which comprises the steps of:

(a) electroplating the pallet with a bonding metal plating, said bonding metal plating having a higher melting point than the said alloying metal;

(b) positioning the circuit board with the at least one metal circuit path against the pallet; and

(c) pressing the circuit board against the pallet and holding the at least one metal circuit path in contact with the pallet bonding metal plating while heating the pallet until the bonding metal plating melts and alloys with the at least one circuit path and while allowing the circuit board assembly to cool until the bonding metal plating solidifies.

5,745,988

METHOD FOR PRODUCING DATA CARRIERS

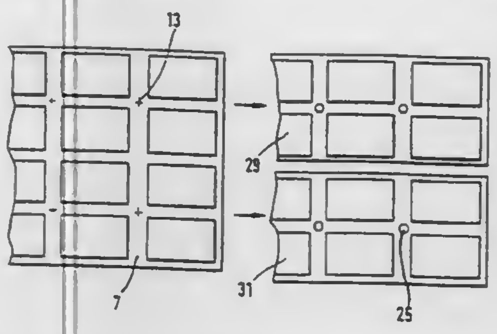
Arno Hohmann; Joachim Hoppe, and Yahya Haghiri-Tebrani, all of München, Germany, assignors to Giesecke & Devrient GmbH, Germany

Filed Jun. 20, 1995, Ser. No. 492,564

Claims priority, application Germany, Jun. 21, 1994, 44 21 607.6

Int. Cl.^{6} A05K *3/30*

U.S. Cl. 29—841 **6 Claims**



1. A method for producing printed data carriers such as identity cards containing at least one element located in a defined position on a surface of each of said data carriers comprising the steps of:

providing a multiple-copy sheet or web at least on one side with several printed patterns of said data carriers located at a grid distance from each other,

subdividing said multiple-copy sheet or web into smaller units each having at least two of said printed patterns of data carriers thereon,

providing position markings on said smaller units,

positioning said smaller units in at least one processing station using said position markings as position reference points in order to accurately provide said data carriers of said smaller units each with at least said one element in a defined position.

5,745,989

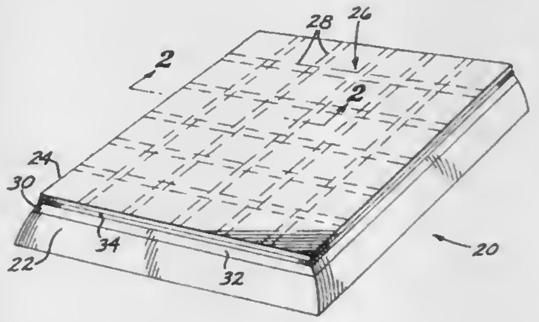
METHOD OF PREPARATION OF AN OPTICALLY TRANSPARENT ARTICLE WITH AN EMBEDDED MESH

Donald Fisher, Valley Center, and Charles Warner, Murrieta, both of Calif., assignors to Exotic Materials, Inc., Murrieta, Calif.

Filed Aug. 4, 1995, Ser. No. 511,392

Int. Cl.^{6} H05K *3/02*

U.S. Cl. 29—846 **16 Claims**



1. A method of fabricating an optically transparent article, comprising the steps of:

providing an optically transparent first piece having a first surface and a first piece lateral periphery;

scribing a channel into the first surface of the first piece, the channel having a channel depth;

depositing a metallic stripe into the channel, the stripe having a metallic stripe thickness less than the channel depth;

providing an optically transparent second piece having a second surface and a second piece lateral periphery; and

placing the optically transparent second piece into contact with the optically transparent first piece with the second surface in contact with the first surface, the second piece not contacting the metallic stripe.

5,745,990

TITANIUM BORIDE AND TITANIUM SILICIDE CONTACT BARRIER FORMATION FOR INTEGRATED CIRCUITS

Chang-Ou Lee; Landon B. Vines, both of San Antonio, Tex.; Felix H. Fujishiro, San Jose, Calif., and Sigmund Koenigseder, San Antonio, Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 6, 1995, Ser. No. 471,253

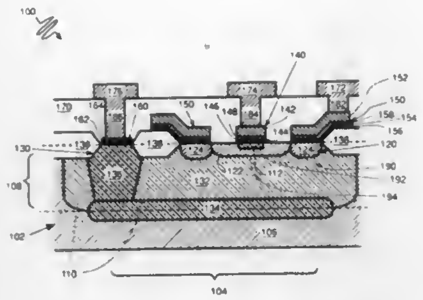
Int. Cl.^{6} H01K *3/10*

U.S. Cl. 29—852 **6 Claims**

1. In the fabrication of an integrated circuit, a method of forming a contact between a relatively highly conductive metal and silicon, said relatively highly conductive metal being more conductive than titanium, said method comprising the steps of:

depositing titanium so as to contact exposed silicon;

rapid thermal annealing in a boron-bearing ambient so as to yield titanium silicide and titanium boride to form a barrier layer; and



depositing said relatively highly conductive metal over said titanium boride.

5,745,991

MACHINE AND METHOD FOR PRODUCING ELECTRICAL HARNESS

Louis Soriano, Aubagne, France, assignor to The Whitaker Corporation, Wilmington, Del.

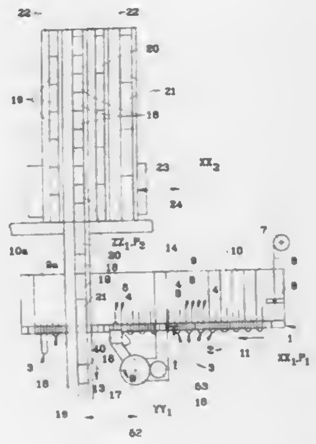
PCT No. PCT/IB95/00479, § 371 Date Nov. 27, 1996, § 102(e) Date Nov. 27, 1996, PCT Pub. No. WO95/34926, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 13, 1995, Ser. No. 750,157

Claims priority, application France, Jun. 15, 1994, 94 07682

Int. Cl.^{6} H01R *43/04*

U.S. Cl. 29—863 **10 Claims**



1. A machine for producing electrical harnesses, the machine comprising: a rectilinear main conveyor suitable for moving transfer clamps for transferring the ends of lengths of wire; a bench; and a loading station for loading and preparing lengths of wire; the loading station being situated on a first side of said main conveyor, and loop-forming portions of said lengths of wire being situated on a second side of said main conveyor, characterized in that the machine includes a fixed rectilinear transverse slideway substantially orthogonal to said main conveyor, which slideway forms a member for supporting components and for guiding them in translation, each of said components being provided with cavities, said machine including a device for moving and positioning said components on said slideway, and said machine including a clamp for grasping and inserting the ends of said lengths of wire into said cavities, the clamp being mounted on a support that is movable in rotation about and translation along an axis orthogonal to said main conveyor and to said slideway, the clamp being situated on said second side of said main conveyor.

5,745,992

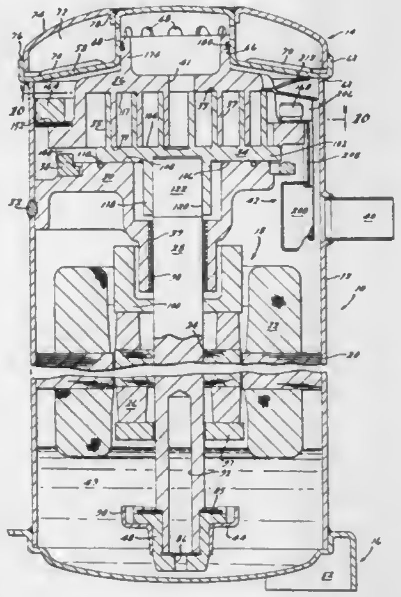
METHOD OF MAKING A SCROLL-TYPE MACHINE

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 194,121, Feb. 9, 1994, Pat. No. 5,427,511, which is a continuation of Ser. No. 998,557, Dec. 30, 1992, abandoned, which is a division of Ser. No. 884,412, May 18, 1992, Pat. No. 5,219,281, which is a division of Ser. No. 649,001, Jan. 31, 1991, Pat. No. 5,114,322, which is a division of Ser. No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Jun. 7, 1995, Ser. No. 486,981

Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—888.022 **14 Claims**



1. A method of fabricating a scroll member for a scroll-type machine wherein the scroll member includes an end plate having a spiral wrap including radially inner and outer flank surfaces generated about an axis perpendicular to said end plate and disposed on one face thereof, said method comprising the following steps:

(a) rough forming a scroll member blank;

(b) finish forming said one face in an area between adjacent turns of said spiral wrap such that said one face in said area is spaced a progressively greater distance from an imaginary flat plane lying parallel to said one face when moving along said area from a radially outer position to a radially inner position; and

(c) finish forming said wrap on said end plate, said wrap being joined to said one face.

5,745,993

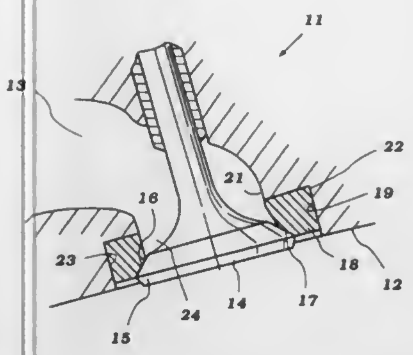
VALVE SEAT

Shuhei Adachi, and Junichi Inami, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 607,823, Feb. 27, 1996. This application Oct. 31, 1996, Ser. No. 742,090

Int. Cl.^{6} B23P *13/00*

U.S. Cl. 29—888.44 **3 Claims**



1. A method for forming a cylinder head for a reciprocating machine, said method comprising the steps of forming a cylinder head from a first material and having a first external surface forming at, in part, a chamber of the reciprocating machine that varies cyclically in volume during the operation of the machine, forming a flow passage extending through said cylinder head from said first external surface to a second internal surface for interchange of fluids with the chamber during the initial forming of said cylinder head, subsequently machining a tapered opening in the end of said flow passage terminating at said first external surface, said machined tapered opening progressively increasing in diameter in the direction of said first external surface and which is adapted to receive an insert ring, rigidly affixing an insert ring into said cylinder head opening, and machining a valve seating surface in said insert ring for forming a final machined tapered opening that forms a continuous, uninterrupted curved passage with the flow passage of the cylinder head and for forming a valve seat for a poppet-type valve.

5,745,994

PROCESS FOR MAKING A COMPOSITE ROTOR WITH METALLIC MATRIX

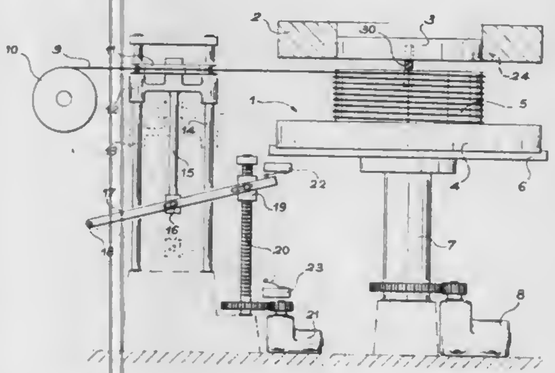
Yves Christian Louis Honnorat, Orsay, France, assignor to Societe Nationale d' Etude et de Construction de Moteurs d'Aviation "Snecma", Paris, France

Filed Nov. 13, 1996, Ser. No. 747,765

Claims priority, application France, Nov. 22, 1995, 95 13832

Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—889.2 **2 Claims**



1. Process for making a composite rotor with metallic matrix composed of a metallic block containing fibers laid out in circles, including the following steps:

making a metal hub composed of a plate and a rod standing upright on the plate,

placing a metal disk on the rod, a metal cap being fixed to the disk and extending around the disk, then:

winding the fibers, the fibers being coated with the matrix material, around the rod and between the disk and the plate,

placing a metal bushing around the plate and fibers, the cap projecting from the bushing and the rod, in an axial direction of the rod,

surrounding the hub, bushing and cap by a sheath fitted with a degassing orifice,

compressing the sheath by a hot isostatic compression process until the cap, being released from the disk, sinks in the axial direction of the rod at a predetermined level into the bushing and the cap, the bushing, the hub, the disk and the fibers coalesce into the metal block,

removing the sheath and if necessary machining the metallic block to a required shape.

5,745,995

ELECTRIC SHAVER WITH SWINGING CUTTER UNIT

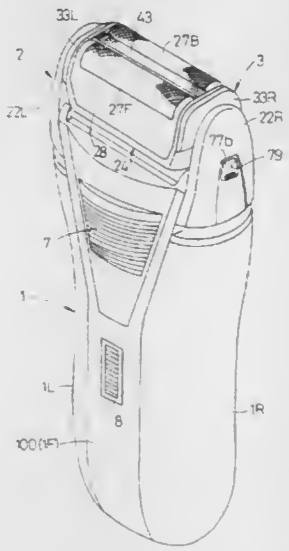
Yasuo Yamashita, and Satoshi Takami, both of Fukuoka, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka-ken, Japan

Filed Jul. 31, 1996, Ser. No. 690,729

Claims priority, application Japan, Jul. 31, 1995, 7-216813

Int. Cl.^{6} B26B *19/16*

U.S. Cl. 30—43.6 **12 Claims**



1. An electric shaver which comprises:

a generally elongated shaver casing having top and bottom ends opposite to each other and also having a compartment defined therein;

a motor casing including a drive motor accommodated therein and having first and second upright walls spaced a distance from each other, said motor casing being accommodated within the compartment with said first and second upright walls protruding upwardly outwardly from the top end of the shaver casing;

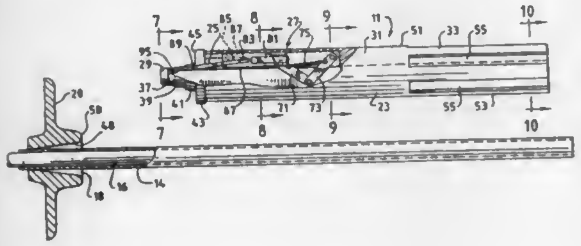
a cutter assembly including a generally U-shaped support structure having first and second arms spaced a distance from each other, said support structure being mounted above the motor casing with said first and second arms pivotally coupled respectively with the first and second upright walls so as to define therebetween a common axis about which the cutter assembly swings relative to the motor casing;

said cutter assembly also including a first cylindrical cutter rotatably mounted on the support structure so as to extend between the first and second arms in parallel relation to the common axis, and a foil-like perforated stationary blade member mounted on the support structure so as to cover the cylindrical cutter in substantially sliding contact therewith, and a drive transmission means disposed within the first arm for transmitting a drive of the drive motor to the cylindrical cutter, said cylindrical cutter having a driven gear mounted fixedly on one end thereof adjacent said first arm in coaxial relation to said cylindrical cutter; and

said drive transmission means including a final transmission gear disposed coaxial with the common axis and means for transmitting the drive of the drive motor to said final transmission gear, said driven gear being constantly meshed with said final transmission gear regardless of the swinging motion of the cutter assembly relative to the motor casing.

5,745,996
SHEATHING CUTTING DEVICE

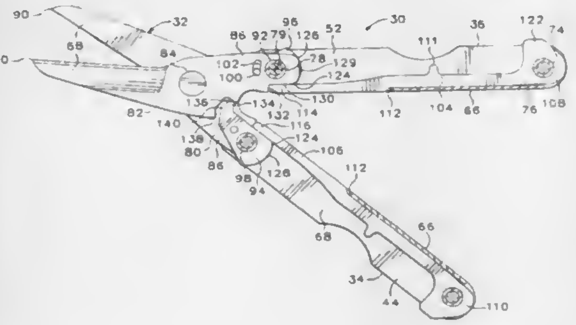
Daniel P. Kenny, Richmond; Donald J. Singer, Langley, and Gerhard G. Kast, Abbotsford, all of Canada, assignors to Dyckerhoff & Widmann AG of Munich, Munich, Germany
Continuation of Ser. No. 349,045, Dec. 2, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 635,037
Int. Cl.⁶ B26B *27/00;* **H02G** *1/12*
U.S. Cl. 30—90.1 **16 Claims**



1. In combination:
(a) an anchor assembly for securing a tendon, the anchor assembly having an inner wall defining a cavity for passage of a sheathed tendon therethrough; and
(b) a device for cutting the sheathing which envelops the tendon comprising:
  (i) a housing mountable on a portion of the sheathed tendon in rotatable fashion;
  (ii) a blade having a cutting edge; and
  (iii) means for securing the blade to the housing, said blade securing means being connected to the housing and fixed to the blade, the blade securing means placing the blade in a position in contact with the anchor assembly inner wall thereby deflecting the cutting edge toward the sheathed tendon into contact with the sheathing when the device is mounted on the sheathed tendon such that the cutting edge cuts the sheathing at a selected location within the cavity as the housing is rotated about the sheathed tendon.

5,745,997
MULTI-PURPOSE TOOL INCLUDING FOLDING SCISSORS

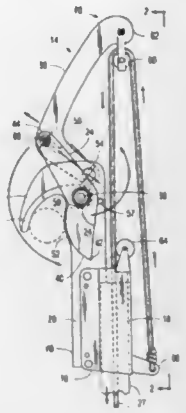
Howard G. Berg, Gresham, and Benjamin C. Rivera, West Linn, both of Oreg., assignors to Leatherman Tool Group, Inc., Portland, Oreg.
Filed Nov. 29, 1995, Ser. No. 563,922
Int. Cl.⁶ B26B *13/00;* **B25B** *7/22*
U.S. Cl. 30—155 **53 Claims**



1. A folding tool including a pair of scissors, comprising:
(a) a handle defining a cavity;
(b) first and second scissors blades interconnected with each other through a scissors pivot joint defining a scissors pivot axis, each of said scissors blades having a respective base portion and a respective cutting portion, said base portion of said first scissors blade being interconnected with said handle and movable with respect to said handle in a first direction about a handle pivot axis, between a stowed position in said cavity and an deployed position, said base portion of said first scissors blade including a stop and said second scissors blade moving about said scissors pivot axis in said first direction with respect to said first scissors blade during a cutting stroke of said scissors;
(c) a rocker pivot located adjacent said base portion of said first scissors blade and a rocker mounted thereon for pivoting movement, about a rocker pivot axis defined by said rocker pivot, with respect to said base portion of said first scissors blade and said handle, said rocker having a first cam portion and an outer end, said outer end extending toward said base portion of said second scissors blade;
(d) spring means disposed in said handle for engaging said first cam portion of said rocker, urging said rocker about said rocker pivot axis toward a first position with respect to said handle, and thereby urging said outer end toward said base end of said second scissors blade, said outer end urging said second scissors blade to pivot about said scissors pivot axis with respect to said first scissors blade, in a blade-opening direction opposite said first direction, toward an open position, and means resting against said stop for preventing said first scissors blade from being moved in said first direction with respect to said first handle beyond said deployed position.

5,745,998
PRUNING IMPLEMENT

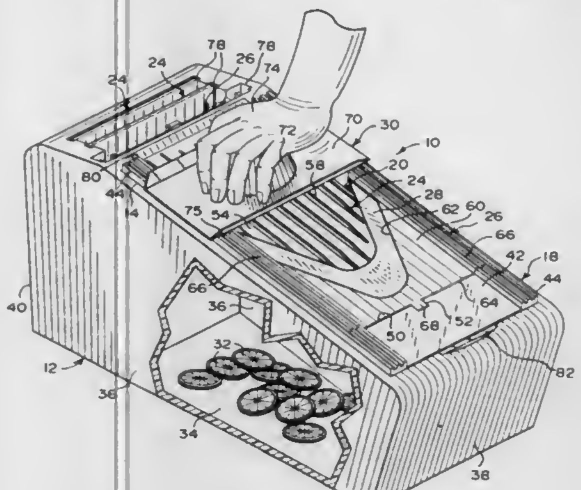
Thong Huu Le, 3749 Stanford Dr., Oceanside, Calif. 92056, and Timothy Van Le, 2038 Cranworth Cir., San Jose, Calif. 95121
Continuation of Ser. No. 585,120, Jan. 11, 1996, abandoned. This application Sep. 27, 1996, Ser. No. 722,792
Int. Cl.⁶ B26B *13/00*
U.S. Cl. 30—249 **22 Claims**



1. A portable pruner for cutting limbs, said pruner comprising:
a hollow shaft having a longitudinal axis, a lower end, an open upper end, and a slidable grip portion, said slidable grip portion being slidable along said longitudinal axis between a first and a second position;
a shearing mechanism attached to said open upper end of said hollow shaft, said shearing mechanism including a body having a hook adapted to receive and hold a limb, a cutting blade pivotally attached to said body and selectively pivotal against said hook to cut said limb;
a leverage arm which is pivotally connected to said body, said cutting blade is connected to a portion of said leverage arm so that pivotal movement of said leverage arm pivotally moves said cutting blade;
a pulley secured to said leverage arm; and
a cable for moving said cutting blade with respect to said hook, having a first end and a second end, the first end connected to said slidable grip portion and the second end connected to said body, the leverage arm attached to said cable between the body and the slidable grip portion by the pulley so that movement of said slidable grip portion between said first and said second positions pivots said leverage arm and said cutting blade with respect to said hook, and wherein, said cutting blade is pivotally attached to said body at a first pivot, said leverage arm is pivotally attached to said body at a second pivot, said first pivot being located nearer to said hook than said second pivot and nearer said cable than said hook, said cutting blade comprising a leverage end portion extending from said first pivot to a location above said hook, said leverage end portion being coupled to said leverage arm, said leverage arm and said leverage end portion comprising a pin and slot assembly for coupling together at the location above said hook, said leverage arm and said leverage end portion, whereby said cutting blade and said leverage end portion are rotated with increasing leverage force as the pin and slot reduce the rotation force radius about said first pivot in response to rotation of said leverage arm about said second pivot.

5,745,999
FOOD SLICER DEVICE

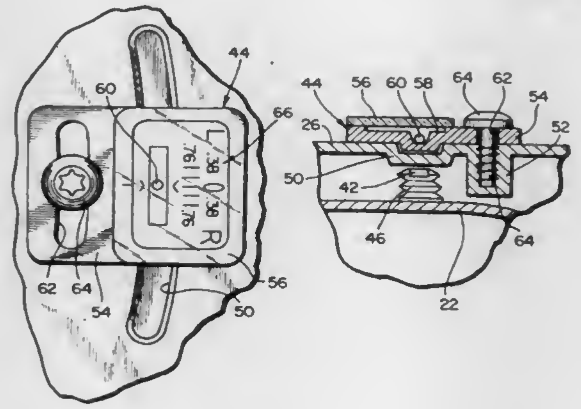
Arkady Zirkiev, 108-24 67th Dr., Forest Hills, N.Y. 11375
Filed Dec. 9, 1996, Ser. No. 761,937
Int. Cl.⁶ B26B *3/00*
U.S. Cl. 30—278 **20 Claims**



1. A food slicer device comprising:
a) a food receiving container having an open top with an inner ledge about said open top, said food receiving container including:
  i) a rectangular horizontal bottom wall;
  ii) a pair of long side walls extending upwardly from said bottom wall;
  iii) a pair of short end walls extending upwardly from said bottom wall, with said front end wall shorter in height than said rear end wall, so that said open top slopes downward at an angle from said rear end wall to said front end wall; and
  iv) a plurality of vertical storage slots between said rear end wall and said open top;
b) a working platform having a pair of low rear insert tracks, a high forward seat and an open area between said high forward seat, whereby said working platform snugly fits into said open top and onto said inner ledge on said food receiving container;
c) a back plate which slides into said low rear insert tracks of said working platform;
d) a front plate having a horizontal cutting blade, wherein said front plate snaps into said high forward seat over said open area in said working platform; and
e) a safety holder which engages with a piece of food and slides the piece of food over said back plate to make contact with said horizontal cutting blade on said front plate to cut the piece of food into slices, so that the food slices will drop through said open area in said working platform and go into said food receiving container.

5,746,000
HEADLAMP ASSEMBLY WITH MAGNETIC INDICATOR FOR HORIZONTAL AND VERTICAL POSITIONING

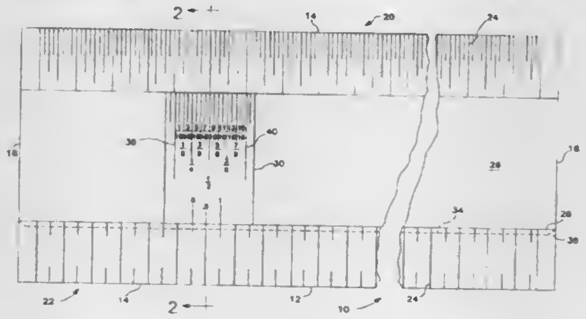
Karl R. Schmitt, Rockford, Ill., assignor to Textron Inc., Providence, R.I.
Filed Aug. 14, 1996, Ser. No. 689,798
Int. Cl.⁶ G01B *5/25*
U.S. Cl. 33—288 **16 Claims**



1. A headlamp position indicator device for use with an adjustable headlamp assembly having a housing, a movable component adjustably retained in said housing, structure for aiming said movable component, said headlamp position indicator device comprising: a magnet operatively associated with said movable component; indicia means in the form of indicia operatively associated with said housing; and position indicating means operatively associated with said housing and moveable relative thereto, said position indicating means being magnetically attracted to said magnet and moveable relative to said housing according to the position of said magnet relative to said housing.

5,746,001
TEACHING RULER

Delores Fisher, 151 East St., South Salem, N.Y. 10590
Filed May 19, 1995, Ser. No. 445,188
Int. Cl.⁶ G01B *3/04*
U.S. Cl. 33—484 **10 Claims**



1. A teaching ruler comprising an elongate rectangular body having a top face and opposite, parallel longitudinal edges, a linear measurement scale along one of the edges, the scale being divided

by gradation marks into a series of repeat basic measurement units and with each unit subdivided by gradation marks into fractions of the basic measurement units, a comparator slide mounted on the top face of the ruler for movement along substantially the full length of the top face, the comparator slide having a parallel edge that is and remains parallel to the measurement scale edge throughout the full range of movement of the slide along the ruler, the parallel edge of the comparator slide having a comparator scale equal in length to a basic measurement unit and having gradation marks subdividing the basic measurement into fractions of predetermined length, the fractional gradation marks of the comparator scale having a fraction inscription indicating the fractional value of the gradation mark in the comparator scale, the comparator scale being slidable into a position on the ruler with the comparator scale gradation marks aligned with the corresponding fractional gradation marks of any one of the series of repeat basic measurement units along the edge of the ruler, the linear measurement scale and the comparator scale each having successively longer gradations to differentiate smaller to larger fractional value gradations, and the gradation marks of the linear measurement scale being fully visible for comparison with the comparator scale gradation marks to enable the user to understand and comprehend the value of the edge scale fractional gradation marks.

5,746,002
MEASURING APPARATUS FOR MEASURING A BEARING HEIGHT OF PLAIN BEARING HALF

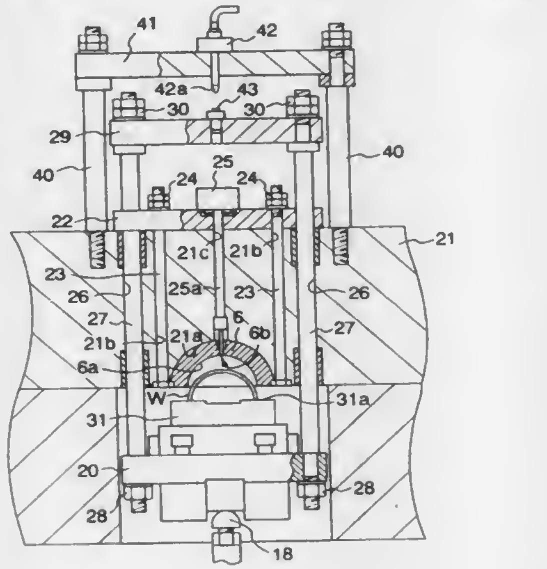
Hiroshi Murakami; Masanori Tsutsui; Katsumi Asai, and Takayoshi Sasaki, all of Nagoya, Japan, assignors to Diado Metal Company Ltd., Nagoya, Japan

Filed Sep. 19, 1996, Ser. No. 710,557

Claims priority, application Japan, Sep. 26, 1995, 7-273598

Int. Cl.^{6} G01B *5/02;5/06;13/02;121/20*

U.S. Cl. 33—517 **4 Claims**



1. A measuring apparatus for measuring a bearing height of a plain bearing half, comprising:

a standard tool having a receiving cavity in which the plain bearing half is fitted in such a manner that opposing ends thereof protrude from the receiving cavity;

pressing means which is opposite to said standard tool and adapted to press the opposing ends of the plain bearing half with a test load; and

measuring means for measuring the bearing height when the opposing ends of the plain bearing half are pressed by said pressing means,

wherein said pressing means comprises:

a movable cylinder;

a driving mechanism for moving the movable cylinder from a receded position to an advanced position at which a test load is exerted to the plain bearing half;

a constant pressure applying mechanism for pressing and holding a plunger of the movable cylinder with the test load; and

a pushing member which is caused by the plunger to push the both opposing ends of the plain bearing half.

5,746,003
GAUGES FOR CHECKING LINEAR DIMENSIONS

Roberto Baruchello, Baricella, Italy, assignor to Marposs Societa Per Azioni, Italy

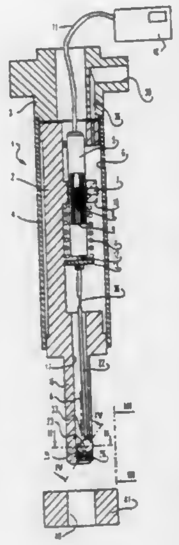
PCT No. PCT/EP94/01995, § 371 Date Dec. 22, 1995, § 102(e) Date Dec. 22, 1995, PCT Pub. No. WO95/01547, PCT Pub. Date Jan. 12, 1995

PCT Filed Jun. 20, 1994, Ser. No. 569,260

Claims priority, application Italy, Jul. 1, 1993, BO93A0311

Int. Cl.^{6} G01B *7/02*

U.S. Cl. 33—542 **16 Claims**



1. Gauge for checking linear dimensions of mechanical parts comprising:

a support casing substantially arranged along a longitudinal direction;

a transducer unit coupled to the support casing and including a movable rod, substantially movable along said longitudinal direction;

a substantially ball-shaped element, movable depending on variations of said linear dimensions along a direction transverse to said longitudinal direction;

an elongate element, substantially arranged along said longitudinal direction, carrying at a first end said ball-shaped element, having a second end coupled to said movable rod by a connection element, said connection element permitting said ball-shaped element to perform displacements with respect to said movable rod, the connection element having a shape symmetrical about a geometrical axis lying substantially along said longitudinal direction, said connection element being configured to permit the ball-shaped element to perform said displacements substantially along all directions perpendicular to said longitudinal direction; and

an abutment member defining a surface portion arranged along a direction inclined with respect to said longitudinal direction and said transverse direction, said ball-shaped element being in contact with said surface portion and movable on it along said inclined direction, said surface portion having a concave cross-section for providing a seat for said ball-shaped element and guiding it along said inclined direction.

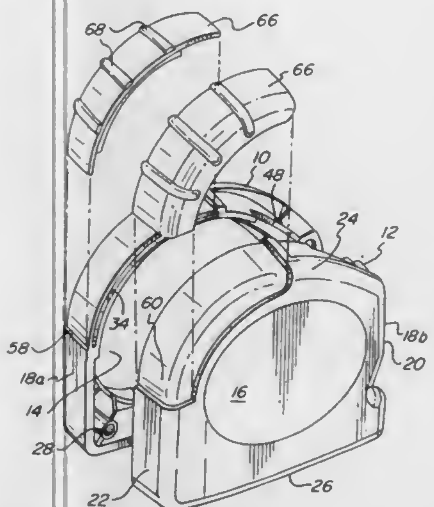
5,746,004
TAPE RULE HOUSING

Gregory D. Wertheim, Coventry, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Aug. 28, 1996, Ser. No. 703,962

Int. Cl.^{6} G01B *3/10*

U.S. Cl. 33—768 **13 Claims**



1. A returnable tape rule housing comprising:

(a) side walls;

(b) a peripheral wall extending therebetween with a bottom portion, upper portion, front end portion, and rear end portion, said walls providing an internal chamber therewithin, said peripheral wall having an aperture therein communicating with said chamber at the juncture between said bottom portion and said front end portion for passage of a tape rule blade therethrough, the juncture between said side walls and said upper portion of said peripheral wall being generally convexly arcuate, said housing walls having recessed portions extending over-the upper section of said rear end portion and the rearward section of said upper portion of said peripheral wall and in the adjacent portions of said sidewalls; and

(c) an elastomeric grip element seated in said recessed portions and extending over the upper section of said rear end portion and the rearward section of said upper portion of said peripheral wall and adjacent said portions of said side wall, said grip element providing a slip-resistant and comfortable gripping surface for the user's palm and thumb.

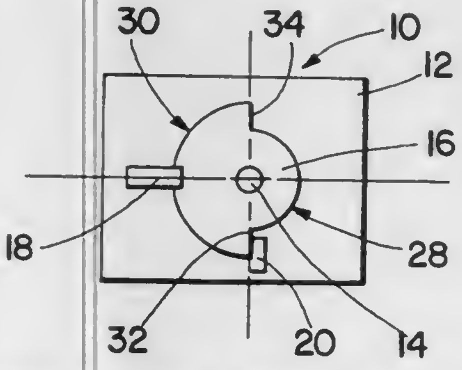
5,746,005
ANGULAR POSITION SENSOR

David E. Steinberg, Cleveland Heights, Ohio, assignor to Powerhorse Corporation, Beachwood, Ohio

Filed Oct. 22, 1996, Ser. No. 734,830

Int. Cl.^{6} B43L *5/00*

U.S. Cl. 33—1 PT **18 Claims**



1. Apparatus for determining the angular position of a member with respect to a reference comprising:

a mounting plate;

a first sensor operatively attached to said mounting plate;

a second sensor operatively attached to said mounting plate and positioned in a spaced-apart relationship with respect to said first sensor;

a disk member positioned adjacent said first and second sensors and being rotatable with respect to said mounting plate and said first and second sensors; and

means for producing a waveform,

rotation of said disk member with respect to said mounting plate causing the actuation of said first and second sensors producing output signals substantially coinciding with a first point and a second point on said waveform.

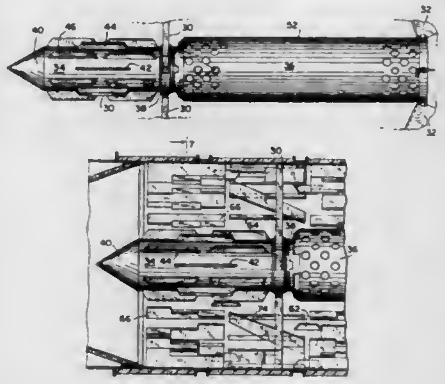
5,746,006
SINGLE PASS ROTARY DRYER

Wilfried P. Duske, Franklin; Robert T. Hogue, Burlington, and Kenneth J. Koeslin, Greenfield, all of Wis., assignors to Duske Engineering Co., Inc., Franklin, Wis.

Filed Oct. 29, 1996, Ser. No. 741,138

Int. Cl.^{6} F26B *11/02*

U.S. Cl. 34—136 **19 Claims**



1. A single pass rotary dryer for drying moist material, the dryer comprising:

(a) a blower in communication with a supply of a gas whereby the blower establishes a moving gas stream;

(b) a heater disposed to heat the gas;

(c) a feeder disposed to discharge the material into the gas stream whereby the gas stream carries the material in the same direction as the gas stream;

(d) a drum rotatable in an operating direction about a longitudinal axis, the drum having an inner wall, an inlet in communication with the stream of gas and material and an outlet for discharging the stream of gas and material; and

(e) a flight which extends inwardly from the wall of the drum and is aligned at an oblique angle with respect to the longitudinal axis.

5,746,007
AGGRESSIVE CONVECTIVE DRYING IN AN AGITATED PAN TYPE DRYER

Len W. Haleen, 1932 Duke St., Edwardsville, Ill. 62025

Division of Ser. No. 443,250, May 17, 1995, Pat. No. 5,544,425. This application May 3, 1996, Ser. No. 643,220

Int. Cl.^{6} F26B *11/00*

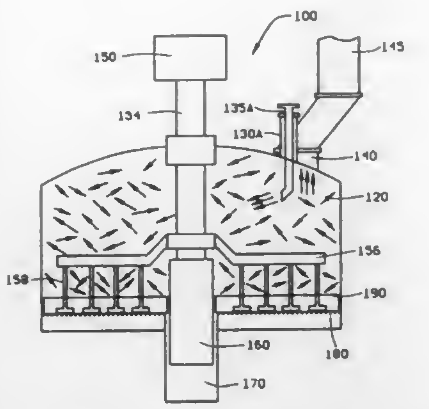
U.S. Cl. 34—187 **1 Claim**

1. In an agitated pan type dryer comprising:

a pan having walls and a bottom;

a cover attached to and covering said pan, said cover including an outlet for the release of vaporized liquids from a product charged to said pan;

an agitator housed within said pan, said agitator including blades for smoothing and plowing product charged to said pan; and



a drive means attached to said agitator and adapted drive said agitator; the improvement comprising:

means to create turbulence within said pan during a drying cycle, said means comprising one high velocity nozzle located away from said outlet.

5,746,008
ELECTRONIC SUBSTRATE PROCESSING SYSTEM USING PORTABLE CLOSED CONTAINERS

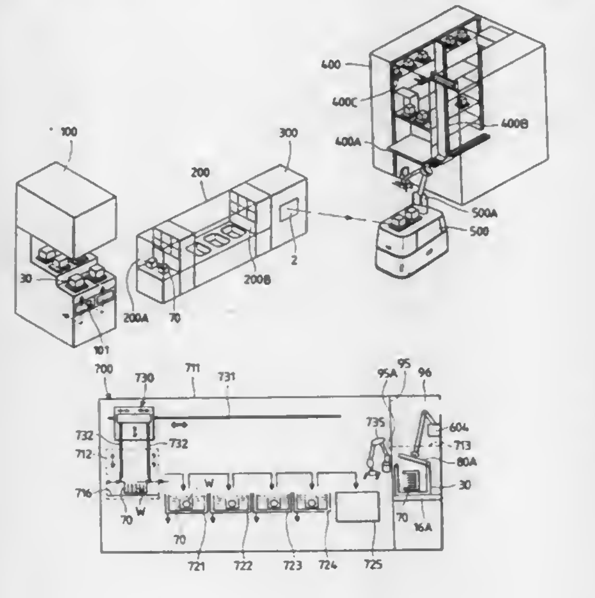
Teppei Yamashita; Masanao Murata; Tsuyoshi Tanaka; Teruya Morita; Hitoshi Kawano; Mitsuhiro Hayashi; Atsushi Okuno, and Akio Nakamura, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 104,472, Jul. 28, 1993, abandoned. This application Feb. 24, 1997, Ser. No. 803,818

Claims priority, application Japan, Jul. 29, 1992, 4-202659; Jul. 29, 1992, 4-202660; Aug. 7, 1992, 4-211546; Aug. 20, 1992, 4-221474; Aug. 20, 1992, 4-221475

Int. Cl.⁶ G26B *19/00*

U.S. Cl. 34—211 **9 Claims**



4. An electronic substrate processing system including a substrate cleaning system, said cleaning system including, in combination:

at least one cassette for holding substrates to be processed;

a housing enclosing the substrate cleaning system, said housing including a cassette carry-in device for receiving said at least one cassette in the housing; and a means for transporting the cassette away from the carry-in device and along the cleaning system;

said cleaning system including cassette liquid cleaning and drying devices;

a gas purging system in the housing, said purging system including a device for receiving a cleaned and dried cassette following a liquid cleaning and drying process carried out by the cleaning system; a closed portable container delivery system; and means for assembling a closed portable container around said at least one cassette so as to enclose the cassette; a gas purging apparatus for purging the interior of the portable container containing the said at least one cassette with an inert gas, and means for closing the portable container with the enclosed at least one cassette in sealed purged condition; said housing including a carry-out opening for enabling removal of the portable container containing the at least one cassette from the housing.

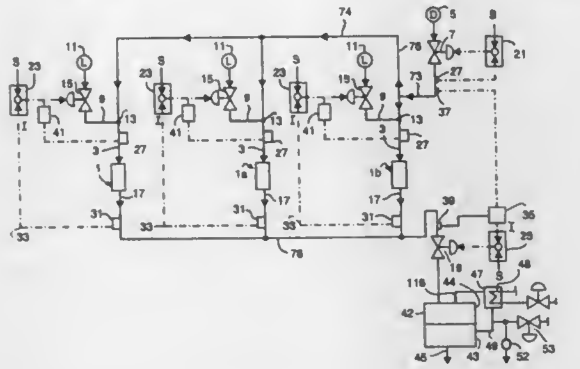
5,746,009
TEMPERATURE CONTROL IN A PAPER MACHINE DRYER

Hubert Brugger, Bergatreute, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany

Continuation-in-part of Ser. No. 635,763, Apr. 22, 1996. This application Dec. 17, 1996, Ser. No. 768,220

Int. Cl.⁶ F26B *3/00*

U.S. Cl. 34—446 **17 Claims**



1. A process for controlling the temperature at the surface of a drying cylinder and thereby its drying rate by controlling the temperature of the mass flux, including steam, air and condensate, exiting the cylinder, wherein the cylinder is hollow and is heated by steam supplied to the hollow of the cylinder, the process comprising:

introducing steam into the hollow inside the cylinder;

selectively mixing air into the steam being introduced into the drying cylinder such that the absolute pressure in the cylinder includes the partial pressures of the steam and the air;

indirectly measuring the condensation temperature in the cylinder by measuring the temperature of the mass flux exiting the cylinder; and

controlling the mixture ratio of air and steam that are introduced into the cylinder by adjusting the amount of air mixed into the steam for controlling the partial pressure of the steam for attaining a desired condensation temperature as a function of the measured temperature of the mass flux exiting the drying cylinder.

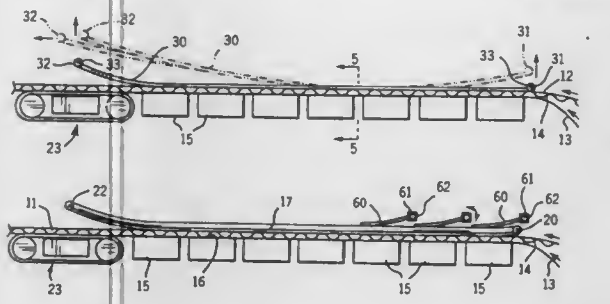
5,746,010
WEB HOLDDOWN AND DRIVE FOR CORRUGATOR DOUBLE BACKER

Carl R. Marschke; Harold D. Welch, and James A. Cummings, all of Phillips, Wis., assignors to Marquip, Inc., Phillips, Wis.

Continuation-in-part of Ser. No. 494,327, Jun. 26, 1995, Pat. No. 5,561,918. This application May 6, 1996, Ser. No. 643,627

Int. Cl.⁶ F26B *9/00*

U.S. Cl. 34—631 **10 Claims**



3. An apparatus for providing a uniformly distributed holddown force on the upper surface of a corrugated paperboard web traveling over a flat heated surface defining a web heating section in a double backer, said apparatus comprising:

a series of laterally spaced flexible parallel strips extending over the web in the direction of web travel between laterally aligned upstream and downstream ends;

means for suspending the strips by their respective upstream ends and downstream ends above the web and respectively upstream and downstream of the heating section to allow portions of the strips intermediate the ends to rest upon the traveling web, said suspending means further positioning the strips to extend at an angle in a horizontal plane with respect to and to depart laterally from the direction of web travel; and,

means for vertically moving one of said upstream and downstream suspending means to adjust the length of said strips resting upon the web.

5,746,011
ORTHOPEDIC INSOLE AND METHOD OF ITS MANUFACTURE

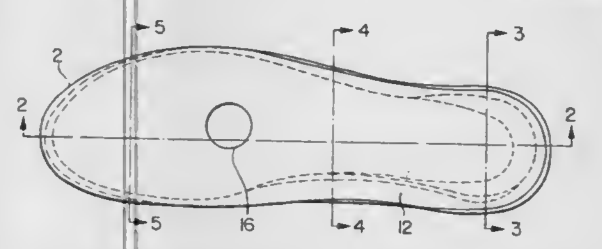
Peter J. Hedström, Umeå, Sweden, assignor to Ortolab AB, Stockholm, Sweden

Continuation of Ser. No. 364,270, Dec. 27, 1994, abandoned. This application Jul. 17, 1997, Ser. No. 895,883

Claims priority, application Sweden, Oct. 24, 1994, 9403647

Int. Cl.⁶ A43B *13/40;* **A61F** *5/14*

U.S. Cl. 36—44 **6 Claims**



1. An orthopedic insole (**2**) having a shape configured to substantially correspond to the shape of a sole of an individual user's foot, said insole including a resilient and yet stiffening lower base part (**4**), and a shock-absorbing upper part (**8**) disposed on top of the base part and extending substantially over the entire surface thereof, wherein an essentially circular recess (**16**) having a diameter of about 1–4 cm is defined in an underside of the base part, approximately midway between opposite sides thereof, at a position lying under a forward arch of the user's foot, said recess enabling a portion of the upper part of the insole overlying the recess and an adjacent portion of the base part overlying the recess, .to resiliently give way when pressure is applied thereto by a forward part of the user's foot.

5,746,012
WATERPROOF SHOE

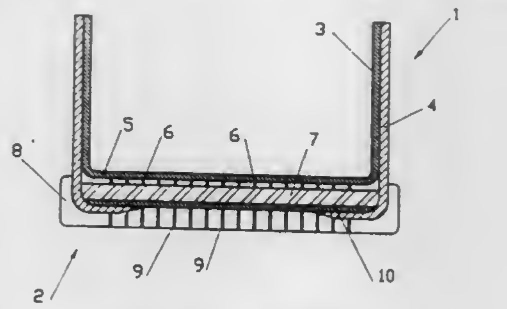
Diego Caletti, Piazza Cordonega 4, Lazise (VR), and Antonio Ferrarese, Via Rimembranza 23, Isola Della Scala (VR), both of Italy

Filed Feb. 6, 1996, Ser. No. 597,268

Claims priority, application Italy, Feb. 21, 1995, VI9500018 U

Int. Cl.⁶ A43B *23/07*

U.S. Cl. 36—3 B **2 Claims**



1. A shoe having an inner sole and an outer sole,

wherein the inner sole has on its upper surface a liquid water impermeable material that permits passage of water vapor;

wherein between said inner sole and outer sole, there is resilient material that has on its side adjacent the outer sole, a liquid water impermeable material permits passage of water vapor;

wherein said inner sole has a plurality of microholes through the inner sole; and yet

wherein said outer sole has a plurality of microholes through the outer sole.

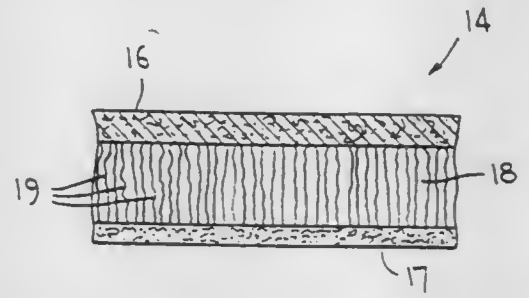
5,746,013
SHOE HAVING AN AIR-COOLED BREATHABLE SHOE LINER

William L. Fay, Sr., Scituate, Mass., assignor to Faytex Corp., Weymouth, Mass.

Continuation of Ser. No. 490,009, Jun. 13, 1995, abandoned. This application Dec. 13, 1996, Ser. No. 766,024

Int. Cl.⁶ A43B *1/10;1/12*

U.S. Cl. 36—3 R **6 Claims**



1. A shoe comprising, an outer sole, a shoe upper of continuous and uninterrupted material attached to said outer sole, and an air-cooled breathable shoe liner for lining at least said shoe upper, the liner comprising an outer knit layer of hydrophilic material in engagement with at least an inner surface of said shoe upper, an inner knit layer of hydrophobic material spaced apart a predetermined distance from said outer layer to define an air chamber therewith, said inner layer being adapted to engage a foot of the wearer, and a plurality of monofilament yarns of hydrophobic material extending between and interknitted with said outer and

inner layers for maintaining the spaced apart distance of the layers defining the air chamber, whereby moisture from the foot of the wearer is transmitted by the hydrophobic material of the inner layer and the monofilament yarns through the air chamber through which air circulates to dry the foot, absorbed by the outer layer of hydrophilic material, and is transmitted into said upper to be dried by the outer air.

5,746,014
SLIPPER

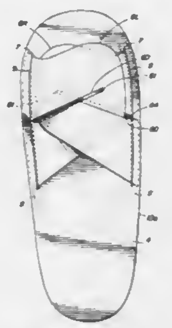
Yoshihisa Tanemoto, 701, Nishijima, Shizouka-shi, Shizuoka-ken, Japan

Filed Jan. 16, 1996, Ser. No. 587,149

Claims priority, application Japan, May 1, 1995, 7-107647; Aug. 9, 1995, 7-203018

Int. Cl.^{6} A43B *3/12;13/28*

U.S. Cl. 36—11.5 **13 Claims**



1. A slipper with a sole and an instep band attached to this sole, said slipper being characterized in that the sole is comprised of an upper sheet and a lower sheet, having outer peripheral parts weld cut to render the sole waterproof attachment slots, into which lateral edges of the instep band are inserted are formed on the upper sheet by weld cutting with a waterproofing part provided at an outer peripheral part of the attachment slots, an auxiliary sheet is provided between the upper sheet and the lower sheet, said auxiliary sheet being in contact with the lower face of the instep band inserted in the attachment slots and the lower face of the upper sheet,

the instep band having a left band member and a right band member pivotally attached at an intermediate attachment position to each other and expanded in an operational mode to receive a user's foot, said attachment position permitting the left band member and the right band member to be folded together to be approximately parallel to an upper surface of the sole in a storage mode;

pivot means for permitting the left band member and the right band member to pivotally rotate about an axis traverse to a longitudinal length of the sole member to permit an adjustment to the size of the user's foot; and

a stitch, for sewing together the auxiliary sheet and the lateral edges of the instep band, is provided along each attachment slot.

5,746,015
COMFORT LINER FOR SKI BOOT

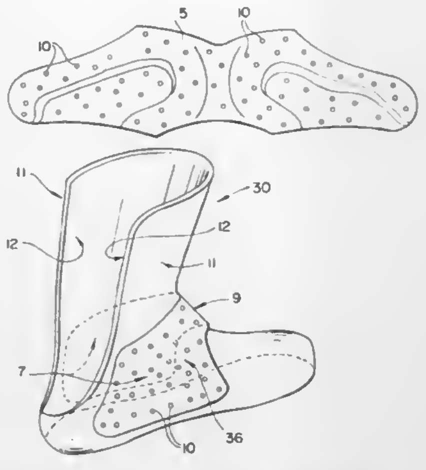
Jean-Pierre Clement, and Olivier Dalvy, both of Annecy-Le-Vieux, France, assignors to Salomon S.A., Metz-Tessy, France

Filed Nov. 8, 1995, Ser. No. 554,240

Claims priority, application France, Nov. 10, 1994, 94 13735

Int. Cl.^{6} A43B *7/14;23/07;19/00*

U.S. Cl. 36—93 **16 Claims**



1. A comfort liner for a ski boot, said comfort liner comprising:

at least one wedging element;

said wedging element consisting of a thermoplastic foam material;

said wedging element having micro-perforations for increasing flexibility and elasticity of said wedging element and for rendering said wedging element permeable; and

said liner having a shape preformed by thermocompression of said wedging element to have an initial standard fitting volume corresponding to a respective boot size.

5,746,016
SKI BOOT HAVING WALKING AND SKIING POSITIONS

Henry Freisinger, and Heinz Wittmann, both of Vienna, Austria, assignors to HTM Sport- und Freizeitgeraete Aktiengesellschaft, Schwechat, Austria

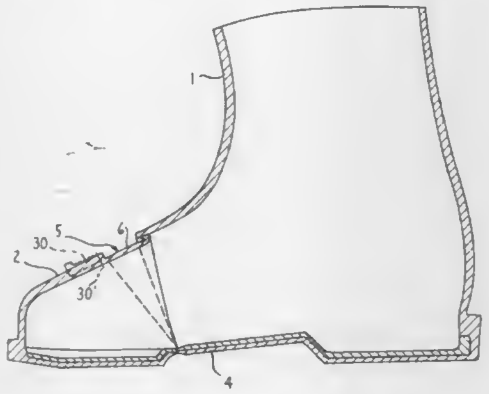
PCT No. PCT/EP95/01027, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO95/26654, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 20, 1995, Ser. No. 564,082

Claims priority, application Austria, Mar. 30, 1994, 677/94; Apr. 20, 1994, 822/94

Int. Cl.^{6} A43B *5/04*

U.S. Cl. 36—117.1 **19 Claims**



1. A ski boots comprising a shell defining two sides and having a sole, a toe cap, and a recess, the shell being adapted to hold at least an instep area of a foot, a shaft surrounding a leg, the shell and toe cap being constructed in one piece of plastic and being pivotally connected with one another by the sole, the recess being provided in the shell following the toe cap and extending through an entire width of the shell, the recess defining a pivoting range of the toe cap, and a cover projecting over the edge of the toe cap, the cover gripping the toe cap adjacent the recess and being movable during pivoting of the toe cap under the instep area of the shell, the cover being spherically curved in a longitudinal cross-section of the ski boot and having a curvature starting from a longitudinal center plane decreasing with an increasing distance toward the two sides in parallel planes, a radius of the curvature corresponding approximately to a distance of the cover from the pivot axis of the sole.

5,746,017
PLOUGHSHARE

Jostein Marvik, Tau, Norway, assignor to Scana Staal AS, Norway

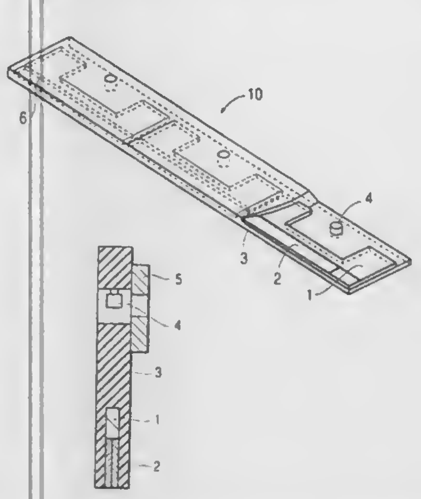
PCT No. PCT/NO95/00061, § 371 Date Oct. 10, 1996, § 102(e) Date Oct. 10, 1996, PCT Pub. No. WO95/28526, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 5, 1995, Ser. No. 727,389

Claims priority, application Norway, Apr. 13, 1994, 941320

Int. Cl.^{6} E01H *5/04*

U.S. Cl. 37—446 **4 Claims**



1. A ploughshare having cutting edges and securing means for attachment to a plough and a plurality of individual metallic shares firmly embedded in an elastomer mass lying between the individual shares and the securing means to enable elastic adjustment of the shares to irregularities in an underlying surface, wherein the individual shares and the elastomer mass project substantially from the securing means, each individual share is substantially vertically and tiltably resilient to be moveable relative to the underlying surface, and each share is substantially U-shaped to define a pair of legs and an upwardly directed opening partially enclosing a part of the securing means, the legs being movably secured by another part of the securing means.

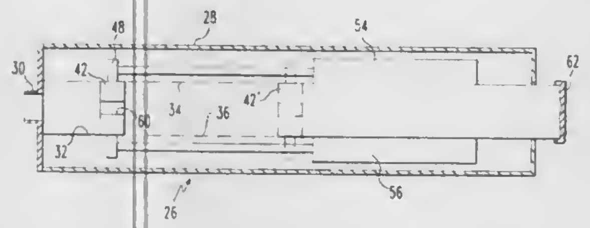
5,746,018
MUZZLE BRAKE FOR AN UNDERWATER GUN

Ivan N. Kirschner, Portsmouth, and Gary R. Berlam, Warwick, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1997, Ser. No. 882,001

Int. Cl.^{6} F41A *21/30*

U.S. Cl. 42—1.14 **13 Claims**



1. A muzzle brake for an underwater gun comprising:

a gas containing projectile conveying structure having opposed first and second ends;

a sealing means positioned at said structure first end for sealing said structure to the barrel of the underwater gun;

a penetrable seal device positioned at said structure second end providing a projectile exit means;

at least one piston positioned inside the projectile conveying structure and capable of axial motion therein between an initial position and a second position and having an axial aperture therethrough, said piston being displaced from said initial position to said second position by gases form said underwater gun; and

means for returning said at least one piston from the second position to the initial position after said piston has been displaced to said second position.

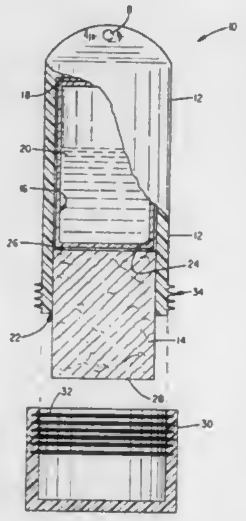
5,746,019
HUNTERS SCENT SYSTEM

Jeffrey J. Fisher, Moose Lake, Minn., assignor to Synergy Technologies, Inc., Moose Lake, Minn.

Filed Jan. 19, 1996, Ser. No. 588,778

Int. Cl.^{6} A01M *31/00*

U.S. Cl. 43—1 **17 Claims**



13. An apparatus for dispensing a scent into the atmosphere, comprising:

a sheath member of moisture impermeable and generally flexible construction having a closed first end, an open second end having a circular aperture formed therein, and an internal cavity formed between said closed first end and said open second end;

a frangible container of moisture impermeable construction disposed within said internal cavity of said sheath member, said frangible container having a first end, a second end, and an internal cavity formed therebetween having a predetermined volume of scented liquid disposed therein;

a wick member having a first end and a second end, said wick member being fixedly attached to said internal cavity of said sheath member proximate said aperture so as to enclose said frangible container within said internal cavity, wherein scent may be dispensed by breaking said frangible container within said internal cavity of said sheath member such that said scented liquid flows from said first end of said wick member toward said second end of said wick member for evaporation into the atmosphere and

attachment means coupled to said sheath member for attaching said sheath member to an object.

5,746,020

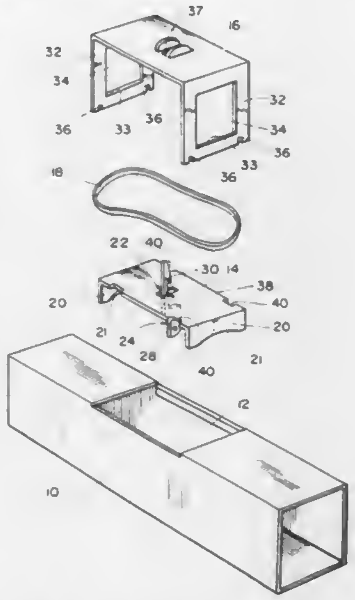
RUBBER BAND AND SPRING POWERED MOUSETRAPS

Joseph F. Fiore, Jr., Lebanon; Michael J. Gehret; Gary Roulston, both of Lititz, all of Pa., and Hesham El-Khateeb, Lawrenceville, N.J., assignors to Woodstream Corporation, Lititz, Pa.

Continuation-in-part of Ser. No. 475,993, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 261,180, Jun. 13, 1994, Pat. No. 5,481,824. This application Jul. 22, 1996, Ser. No. 684,690

Int. Cl.⁶ A01M *23/24*

U.S. Cl. 43—85 **14 Claims**



1. A trapping mechanism for a mousetrap, said mechanism comprising an anchor plate having depending end walls each formed with a lower edge, a striker plate to fit over the anchor plate, the striker plate having depending walls to fit outside the end walls of the anchor plate, the end walls of the striker plate being deeper than the end walls of the anchor plate and each having an aperture therein with a bottom edge spaced below the lower edge of the respective anchor plate end wall to form a trapping aperture therebetween, a spring to be fitted between the plates and provide a force urging the striker plate upwardly with respect to the anchor plate into a sprung position wherein said bottom edges of the striker plate apertures approach the respective lower edges of the anchor plate end walls and wherein the striker plate can be pushed down against said force into a set position wherein said bottom edges are removed from said lower edges, and a trigger assembly carried by the anchor plate for releasably holding the striker plate in the set position wherein the trigger assembly comprises a trigger pivotally mounted in an aperture in the anchor plate, said trigger having a mouse engaging portion extending below the anchor plate between the anchor plate end walls and a catch portion projecting above the anchor plate, the striker plate including an opening to receive the catch portion of the trigger and having one edge to engage and retain the catch portion in the set position of the mechanism.

5,746,021

FIRE ANT BAIT STATION

William Farley Green, Rte. 5, Box 84, Fort Payne, Ala. 35967

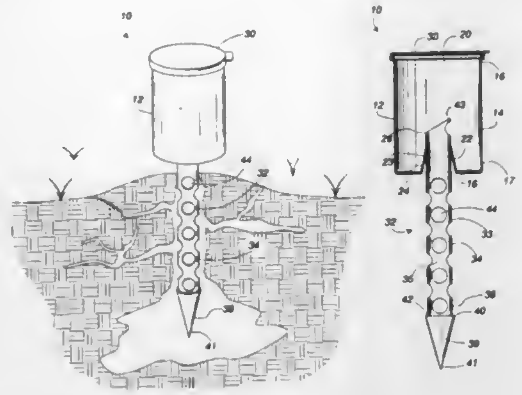
Filed Jun. 25, 1996, Ser. No. 669,981

Int. Cl.⁶ A01M *1/20*

U.S. Cl. 43—131 **14 Claims**

1. A bait station for dispensing a poisonous bait to an ant mound, comprising:

a body portion defining a reservoir sized and shaped to hold the poisonous bait therein and having an open collar extending into said reservoir; and



an elongate probe said probe comprising:

an elongate shaft defined by a side wall;

said side wall having a plurality of perforations defined therein and extending therethrough;

said shaft defining a longitudinally extending internal channel, said shaft having an upper end and a spaced lower end;

wherein the upper end of said shaft is constructed and arranged to be slidably received within said collar said collar being sized and shaped to be biased against said upper end of said shaft to frictionally hold said shaft in position with respect to said body portion at said collar so that said internal channel of said shaft is in communication with said reservoir;

whereby when the lower end of said shaft is inserted into the ant mound, the ants may pass through said perforations and move along said internal channel into said reservoir where the ants will encounter the poisonous bait for carrying the bait back to the ant mound.

5,746,022

COATED SEED HAVING IMPROVED COLORANT

Steven E. Brown, Spartanburg, S.C., and Bruce H. Suddeth, Columbus, N.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 13, 1996, Ser. No. 600,619

Int. Cl.⁶ A01C *1/06;1/00*

U.S. Cl. 47—57.6 **14 Claims**

1. In a seed having a color coating, an improvement comprising a poly(oxyalkylene) substituted organic chromophore incorporated in the coating.

5,746,023

METHOD TO IDENTIFY GENETIC MARKERS THAT ARE LINKED TO AGRONOMICALLY IMPORTANT GENES

Michael K. Hanafey, Wilmington; Scott Anthony Sebastian, Hockessin, both of Del., and Scott Valray Tingey, Elkton, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 97,349, Jul. 23, 1993, Pat. No. 5,437,697, which is a continuation-in-part of Ser. No. 909,833, Jul. 7, 1992, abandoned. This application Jul. 18, 1995, Ser. No. 503,671

Int. Cl.⁶ A01H *1/00;1/02;* **C12N** *15/00*

U.S. Cl. 47—58 **8 Claims**

1. A method for identifying alleles associated with agronomic fitness of crop plants comprising:

a) selecting a sample of current-day elite lines of a given crop to form an elite population;

b) selecting the predominant and earliest known ancestral lines of said elite lines by considering the pedigrees of said elite lines;

c) conducting a genetic marker survey to determine the genotype of said elite lines and said ancestral lines;

d) using the pedigrees of said elite lines and genotypes of said ancestral lines to calculate the probability of each elite line inheriting each allele from said ancestral lines;

e) calculating the expected allele frequency of each allele within said elite population by averaging the probabilities calculated in step d) for each elite line;

f) calculating the observed allele frequency within said elite population;

g) comparing said observed allele frequency with said expected allele frequency for each said allele in said elite population to identify alleles at each locus that have been inherited more frequently than expected; and

h) producing crop plants with superior agronomic fitness;

such that new crop plants with superior agronomic fitness can be efficiently identified with said genetic markers that are diagnostic of said alleles that have been inherited more frequently than expected.

5,746,024

PROCESS FOR PRODUCING LARGE QUANTITIES OF VIABLE TRUE SEED FROM GARLIC

Robert M. Rice; Kevin B. Brink, both of Turlock, and David J. Hansen, Modesto, all of Calif., assignors to Rogers Foods, Inc., Turlock, Calif.

Filed Jul. 3, 1996, Ser. No. 675,604

Int. Cl.⁶ A01B *79/00;* **A01C** *1/00;1/06;21/00;* **A01G** *13/02*

U.S. Cl. 47—58 **6 Claims**

1. A process for obtaining large quantities of viable true seed from garlic comprising the steps of:

A. growing a virus-free garlic parent plant from a virus-free garlic propagule under virus free conditions until flowers develop on the garlic plant, the parent garlic plant having a seed stalk which is attached to the plant bulb;

B. pollinating the flowers of the garlic parent plant;

C. providing sufficient water and nutrients to the garlic parent plant to develop mature, viable true seed;

D. leaving the seed stalk of the garlic parent plant attached to the plant bulb until mature, viable true seed is formed; and

E. harvesting the true seed.

5,746,025

OPERATING DEVICE FOR AN AUTOMOTIVE SLIDE DOOR

Ryoji Shimura, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Feb. 20, 1996, Ser. No. 603,810

Claims priority, application Japan, Feb. 28, 1995, 7-039968; Feb. 28, 1995, 7-039970

Int. Cl.⁶ E05F *11/00*

U.S. Cl. 149—360 **14 Claims**

1. A motor vehicle comprising:

a vehicle body panel having a door opening and a cable passage opening formed therein;

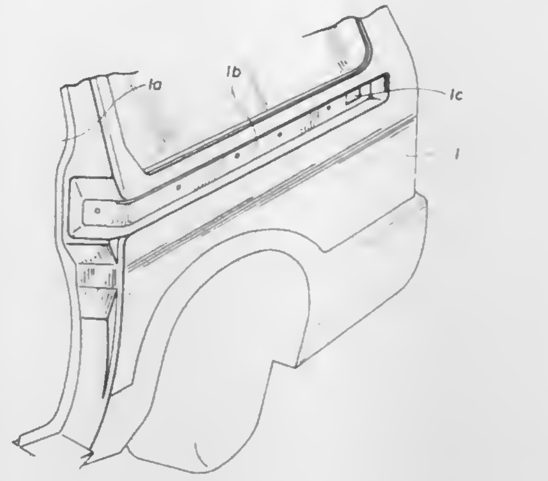
a slide door horizontally movable along said vehicle body panel between a fully closed position, where the slide door occupies said door opening and a fully opened position, where the slide door is located away from said door opening;

a horizontally extending guide track mounted to an outer surface of said vehicle body panel;

a door carrying device movable along said guide track and connected to said slide door;

an electric power device mounted to an inner side of said vehicle body panel;

two cables joined to constitute a loop that extends from said power device, extends out to the outside of the vehicle body panel through said cable passage opening, extends in and around said guide track, which extends outside the vehicle and returns to said power device through the same cable



passage opening, said loop traveling in one direction when said drive pulley is driven in said one direction and traveling in another direction when said drive pulley is driven in said another direction; and

a cable connecting structure provided on said door carrying device, said cable connecting structure having a given part of said loop connected thereto.

5,746,026

METHOD FOR UNLOCKING A WINDOW PANE OF A RAILROAD CAR WITH AN INFLATABLE PRESSURE TUBE

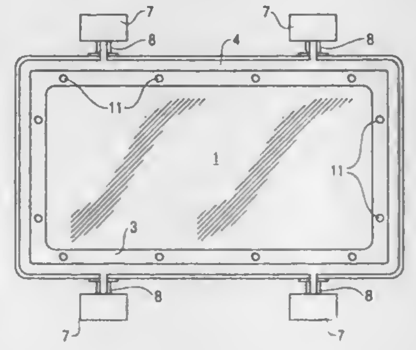
Uwe Brede; Anton Bretfeld; Joachim Fibranz, all of Furth; Gerhard Kordel, Nuremberg; Josef Kraft, Berg; Peter Lehniger, Erlangen, and Jens-Peter Reimer, Herzogenaurach, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jul. 15, 1996, Ser. No. 683,630

Claims priority, application Germany, Jul. 15, 1995, 195 25 833.9; Dec. 1, 1995, 195 44 886.3

Int. Cl.⁶ E06B *3/00*

U.S. Cl. 49—506 **10 Claims**



1. A method for unlocking a window pane, fastening element connects the window pane to a frame element of a window frame, with an inflatable pressure tube being located between the window pane and the frame element, which comprises actuating at least one pyrotechnic gas generator to generate a gas under pressure;

passing the gas under pressure to the inflatable pressure tube; and

inflating the inflatable pressure tube with the gas under pressure which releases the fastening element from the window pane thereby unlocking the window pane from the frame element.

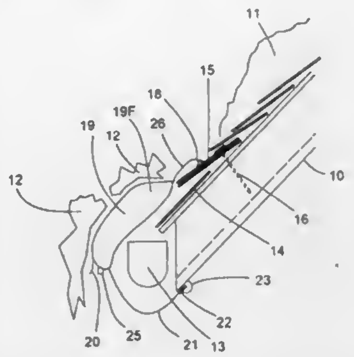
5,746,027
DEVICE AND METHOD FOR REMOVING ICE AND SNOW FROM ROOFS AND OVERHANGS

Timothy C. Bonerb, West Side Rd./39 Attitash Woods, Bartlett, N.H. 03840

Continuation of Ser. No. 703,642, Aug. 27, 1996. This application Dec. 27, 1996, Ser. No. 773,909

Int. Cl.⁶ E04B *1/62*

U.S. Cl. 52—1 **24 Claims**



1. A device for removing ice and snow from a roof comprising a substantially flexible coated fabric protective shield sealingly attached to a roof surface at a first end to prevent moisture from flowing down said roof and under said shield and a second end extending beyond a bottom edge of said roof.

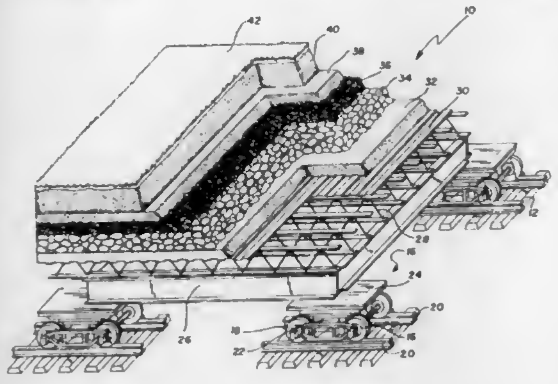
5,746,028
MOVEABLE GRASS FIELD

John DiBenedetto, 11 Horsehill Rd., Brookville, N.Y. 11545

Filed Jun. 26, 1997, Ser. No. 883,564

Int. Cl.⁶ E04B *3/10*

U.S. Cl. 52—6 **5 Claims**



1. A moveable grass field for providing natural turf playfields for enclosed sports stadiums comprising, in combination:

- a pair of elongated tracks positionable on opposing sides of a sports stadium and extending outwardly thereof;
- a plurality of wheel systems (adapted) for rotation coupling with the elongated tracks, the wheel systems each including two pairs of opposing wheels coupling with opposing rails of the tracks, each of the wheel systems including a frame disposed between the wheels and a base member secured to the frame and positioned above the wheels;
- a suprastructure base secured to and spanning the base members of the plurality of wheel systems, the suprastructure base comprising a planar frame of I-beams disposed on the base members of the plurality of wheel systems, internally trussed floor panels disposed above the planar frame, a supplemental base panel disposed above the internally trussed floor panels;
- a layer of cement disposed above the supplemental base panel of the suprastructure base;
- a layer of rocks disposed above the layer of cement;
- a layer of gravel disposed above the layer of rocks;
- a layer of sand disposed above the layer of gravel;
- a layer of soil disposed above the layer of sand; and
- a layer of sod disposed above the layer of soil.

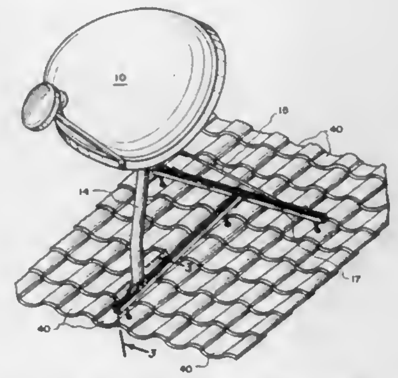
5,746,029
TILE ROOF STRUCTURE FOR SUPPORTING A HEAVY LOAD WITHOUT DAMAGE TO THE TILE

Stanley A. Ullman, 4630 Calle Quetzal, Camarillo, Calif. 93012

Filed Nov. 21, 1996, Ser. No. 752,568

Int. Cl.⁶ E04G *3/08*

U.S. Cl. 52—27 **25 Claims**



4. A tile-covered roof structure for supporting a heavy load without damage to the tile members, comprising:

- a plurality of rafters arranged generally in parallel and inclined at an angle to the horizontal;
- a roof plate supported upon the rafters;
- a tile member having a portion thereof normally elevated above the roof plate;
- a generally Z-shaped metal structure having a lower end that extends downward through the roof plate into one of the rafters,
- the Z-shaped structure having a mid-portion that extends horizontally in a direction perpendicular to the rafters and rests upon the roof plate;
- the Z-shaped structure having an upper end portion that passes vertically upward through an opening in the elevated portion of the tile member; and
- securing means on the upper end portion of the metal structure for securing the heavy load such that the heavy load is supported by the roof plate and the rafter, but not by the tile member;
- the mid-portion of the metal structure having a channel-shaped member, the channel-shaped member having a bottom wall with a hole therethrough, the hole being offset from the longitudinal center of the bottom wall;
- the lower end of the metal structure being comprised of a lag bolt which extends through the hole in the bottom wall of the channel-shaped member;
- a carriage slidably supported upon the channel-shaped member for adjusting the lateral position of the carriage with respect to the rafters; and
- the upper end portion of the metal structure includes a threaded bolt having a lower end for securing the carriage relative to the channel-shaped member.

5,746,030
MULTIPLE LEVEL VAULT ASSEMBLY

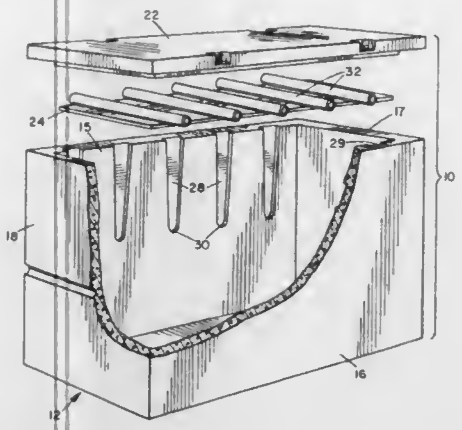
Alfred L. Sannipoli, Sr., 33470 Mirage Mesa Cir., Temecula, Calif. 92592

Filed Dec. 9, 1996, Ser. No. 762,066

Int. Cl.⁶ E04H *13/00*

U.S. Cl. 52—136 **8 Claims**

1. A vault assembly, comprising:



- a vault having a floor, a first pair of opposing spaced side walls and a second pair of opposing spaced end walls forming a burial enclosure having an open upper end;
- an intermediate floor member mounted in the enclosure at a predetermined location between said upper end and floor to divide said enclosure into a lower burial chamber and an upper burial chamber;
- a removable cover closing the open upper end of the vault;
- each wall of at least one of said pairs having at least two spaced guide grooves extending from said open end towards said floor and terminating at said predetermined location intermediate said open end and said floor;
- each guide groove being aligned with a corresponding guide groove in the opposite wall of said pair; and
- the intermediate floor member having a first pair of opposite edges facing respective walls of said one pair of walls, each edge of said first pair having least two spaced projecting pins engaging in said guide grooves as the intermediate floor member is lowered into the vault, each guide groove having a closed end providing a stop engaged by the pin to support the intermediate floor member in the vault.

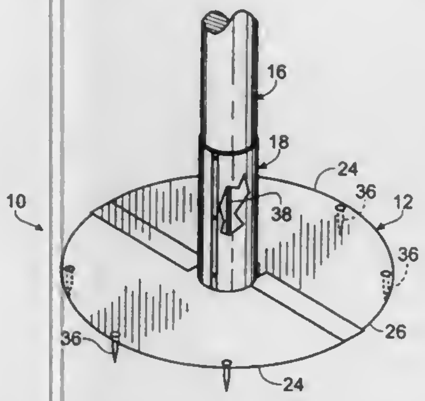
5,746,031
WILD FIRE SUPPRESSOR FOR UTILITY POLES

James M. Burns, P.O. Box 812, Milton-Freewater, Oreg. 97862

Filed Apr. 21, 1997, Ser. No. 837,544

Int. Cl.⁶ A62C *2/00*

U.S. Cl. 52—170 **16 Claims**



1. A wildfire suppressor for use with a utility pole, comprising:

- a base wrap including a fire-resistant, base panel for installation on a ground surface about the base of a utility pole, and base panel anchors for holding said base panel in place on the ground surface; and
- a pole wrap including a fire-resistant, substantially rigid pole panel, and fasteners for fastening said pole panel to the utility pole and a base panel extender for increasing the surface area of said base panel.

5,746,032
STRUCTURE FOR ATTACHING A LOWER TRANSVERSE FRAME MEMBER OF A SASH TO A LOWER EDGE OF A BUILDING OPENING

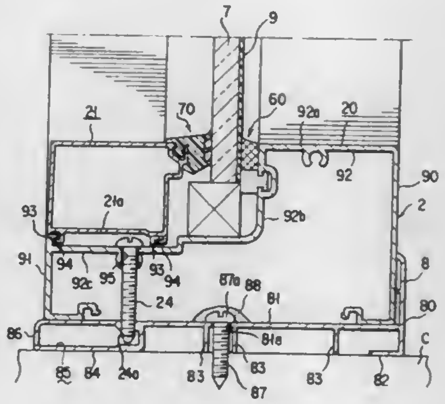
Sou Koike; Masao Hirano, both of Toyama-ken, and Takayuki Okubo, Kagawa-ken, all of Japan, assignors to YKK Architectural Products Inc., Tokyo, Japan

Filed Oct. 30, 1996, Ser. No. 739,600

Claims priority, application Japan, Oct. 31, 1995, 7-283100

Int. Cl.⁶ E06B *1/04*

U.S. Cl. 52—204.1 **5 Claims**



1. A structure for attaching a lower transverse frame member of a sash to a lower edge portion of an opening of a building, the structure comprising:

- an elongated attachment transverse member insertable between the lower transverse frame member and the lower edge portion of the opening, having a base plate defining an indoor side and an outdoor side of said base plate and an enclosed hollow portion formed only on the outdoor side below said base plate, said enclosed hollow portion having a drain port opening to the outdoor side, and a fixing member for fixing the lower transverse frame member to said attachment transverse member, arranged to project through an aperture in the base plate and into said enclosed hollow portion, such that water in the lower transverse frame member flows through the aperture into the enclosed hollow portion and out the drain port;
- said attachment transverse member including an indoor side vertical plate member provided with a support transverse piece integrally formed to said base plate, and said base plate including a plurality of support leg pieces integrally formed to a lower surface thereof to project downward, said hollow enclosed portion being formed by an upwardly opening generally C-shaped piece integrally formed on a lower surface of said base plate at the outdoor side, said attachment transverse member being adapted to be attached to the lower edge portion of said opening of the building by said support transverse piece, said support leg pieces and said upwardly opening generally C-shaped piece;
- said base plate being adapted to be fixed to the lower edge portion of the opening of the said enclosed hollow portion, and a head of said fixing member being covered with building with a fixing member at a position spaced toward the indoor side relative to caulking material.

5,746,033
METHOD FOR CONSTRUCTING ONE-STEP GROUP FIXED WINDOW FRAMES IN A CONCRETE-STRUCTURED BUILDING

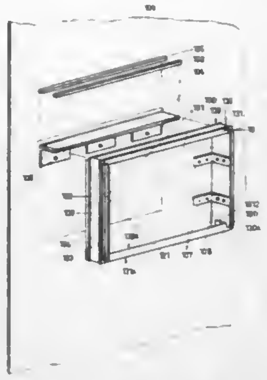
Yung-Chuan Chuang, No. 142, Shin Fuh Road, Feng Shan City, Kaohsung County, Taiwan

Division of Ser. No. 179,702, Jan. 11, 1994, Pat. No. 5,458,828. This application Aug. 15, 1995, Ser. No. 518,396

Int. Cl.⁶ E06B *1/04;* **E04G** *15/00*

U.S. Cl. 52—213 **1 Claim**

1. A combined one-step grout fixed window frame and surrounding building structure, comprising:



- a plurality of vertical lining boards, each of said plurality of vertical lining boards being affixed to an inner side of a respective vertical section of the window frame, each vertical lining board having a width wider than a width of the respective vertical section;
- a plurality of pairs of vertical template sealing strips respectively coupled to said plurality of lining boards, each of said pairs of vertical template sealing strips being attached to a backside of a respective vertical lining board adjacent respective opposing outer edges thereof while abutting respective first and second edges of the vertical sections of the window frame to form a window frame assembly;
- an upper supporting board fixed to a concrete template of an external wall of said building structure;
- said window frame assembly being mounted on said upper supporting board for attaching said window frame assembly to the concrete template;
- a pair of horizontal template sealing strips secured individually to respective first and second edges of an outer side of an upper horizontal section of the window frame;
- a plurality of other corresponding concrete templates secured at predetermined positions to enclose said window frame assembly and form a complete molding cavity for receiving concrete grout therein.

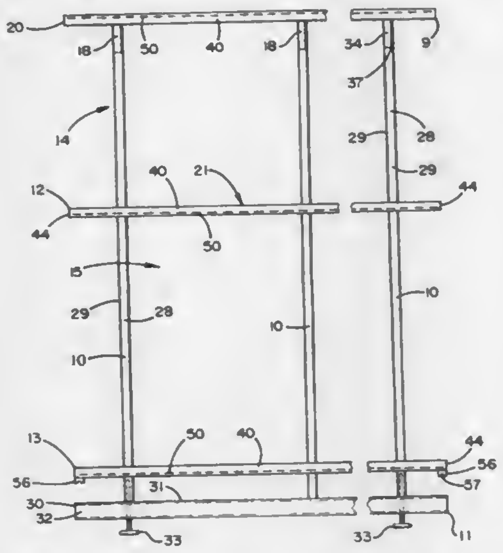
5,746,034
PARTITION SYSTEM

Robert J. Luchetti, Cambridge; Gregg Robert Draudt, Watertown, both of Mass.; James Bender Eldon, III, Barto, and David Dean McClanahan, Harleysville, both of Pa., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Dec. 30, 1994, Ser. No. 367,802

Int. Cl.^{6} E04B *2/76*

U.S. Cl. 52—220.7 **75 Claims**



1. A freestanding portable partition panel for open office spaces and the like, comprising:

- a skeleton-like frame, having:
  - first and second vertical uprights positioned adjacent opposite side edges of said frame with each including outwardly oriented opposite outer faces;
  - a foot extending downwardly from a bottom portion of said frame to abuttingly support said partition panel freestanding on a floor surface;
  - first and second pairs of horizontal stringers attached to the opposite outer faces of said vertical uprights in a vertically spaced apart relationship to rigidly interconnect said vertical uprights and define therebetween first and second horizontal raceway cavities which open to opposite side faces of said frame, and extend continuously between the opposite side edges thereof with open ends, such that when like partition panels are interconnected in a side-by-side relationship, the open ends of adjacent raceway cavities are aligned and communicate, at least said first pair of horizontal stringers each including an apertured planar outer face defining a row of horizontally spaced and aligned slots that in turn define several discrete attachment points along a length of said first stringers for adjustably supporting a furniture component such as an "off-module" partition;
- first and second cover panels shaped to cover at least those portions of the side faces of said frames disposed between said first and second pairs of horizontal stringers and further shaped to permit horizontal access to said slots; and
- fasteners detachably mounting said cover panels on the outer faces of said stringers to provide ready access to the raceway cavities and permit lay-in wiring therealong.

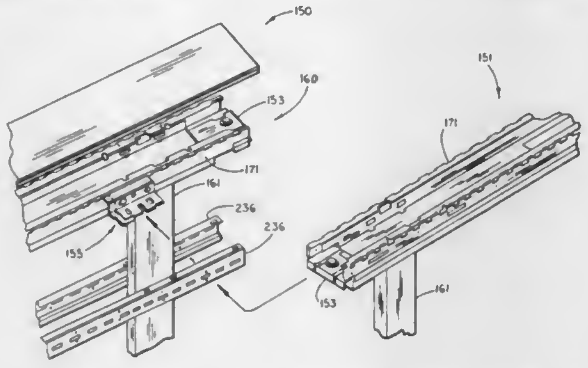
5,746,035
PARTITION SYSTEM

Charles A. Seiber, Palo Alto, Calif.; Benjamin G. Shaw, London, England; Christopher O. Lada, Palo Alto; Phillip M. Hobson, Los Altos, both of Calif.; Robert P. Poppe; David A. Shipman, both of Grand Rapids, Mich.; Robert J. Luchetti, Cambridge; Gregg R. Draudt, Watertown, both of Mass.; James B. Eldon, III, Barto, and David D. McClanahan, Harleysville, both of Pa., assignors to Steelcase Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 367,802, Dec. 30, 1994. This application Dec. 26, 1995, Ser. No. 579,614

Int. Cl.^{6} F04B *2/76*

U.S. Cl. 52—238.1 **41 Claims**



1. A wall construction for subdividing a building work space, comprising:

- a first panel having vertical side edges and further having an internally open frame with a frame member defining a horizontal row of spaced apart first apertures, the first panel including a pair of vertically juxtaposed cover panels attached to the frame so that adjacent edges of the cover panels define a gap therebetween, the row extending substantially across a width of the first panel and the first apertures being accessible from a front of the first panel through the gap;
- an off-module connector including horizontally spaced, oppositely facing hooks configured to securely engage a selected pair of the first apertures at a location spaced from the vertical side edges in an off-module position, the off-module connector further including flanges defining a second aperture which, when the off-module connector is engaged with the selected pair of first apertures, is spaced forwardly from the front of the first panel; and
- a second panel having a marginal edge for positioning adjacent the front of the first panel, the second panel including a panel connector located generally along the marginal edge for securely engaging the second aperture to secure the second panel in a generally perpendicular relationship to the first panel.

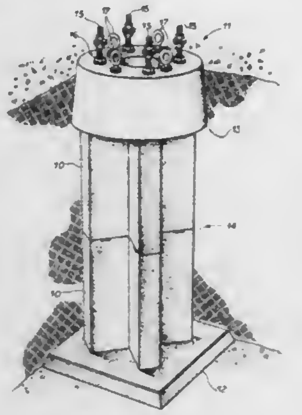
5,746,036
RAILROAD CROSSING SIGNAL FOUNDATION AND SPIDER AND METHOD OF PRODUCING THE SAME

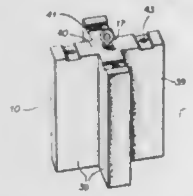
A. M. Angelette, 4160 Ewing Rd., Austell, Ga. 30001

Continuation-in-part of Ser. No. 501,707, Jul. 10, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 783,814

Int. Cl.^{6} E02D *27/42*

U.S. Cl. 52—295 **7 Claims**





1. A spider for a railroad crossing signal foundation comprising a concrete block having a means for removably mounting an eyebolt thereto and a plurality of tubular channels extending in parallel relation through said concrete block with each of said channels including a main cylindrical section and a truncated conical entry section with said entry section having minimum and maximum diameters that straddle the diameter of said cylindrical section, and a plastic liner positioned within each of said channel cylindrical sections having an inside diameter substantially equal to or greater than said channel entry section minimum diameter, whereby the spider can be manipulated and suspended by the removable eyebolt and mounted upon a plurality of upright guide rods during in situ assembly of a foundation such that the guide rods are guided into the main channel section by the channel entry sections without dislodging the channel liners.

5,746,037
CONCRETE BLOCK CONTAINING DISPOSABLE TIRE SECTIONS

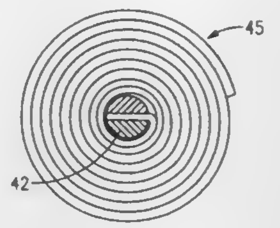
Henry T. Nordberg, Oneida, N.Y., assignor to Tirecore Limited Partnership, Tinton Falls, N.J.

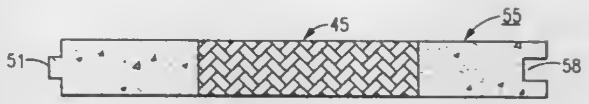
Filed Mar. 13, 1997, Ser. No. 816,696

Int. Cl.^{6} E04C *1/40;* **B29C** *53/56*

U.S. Cl. 52—405.1 **34 Claims**

1. A method of usefully disposing of used automotive tire casing that includes the steps of:





- separating the tread section of a casing circumferentially from the two side wall sections,
- slitting the tread section laterally,
- abutting a plurality of tread sections in an end to end configuration to form an elongated band of tread sections,
- rolling the band of tread sections into a tight spiral bundle whereby the bundle can be incorporated into other structures.

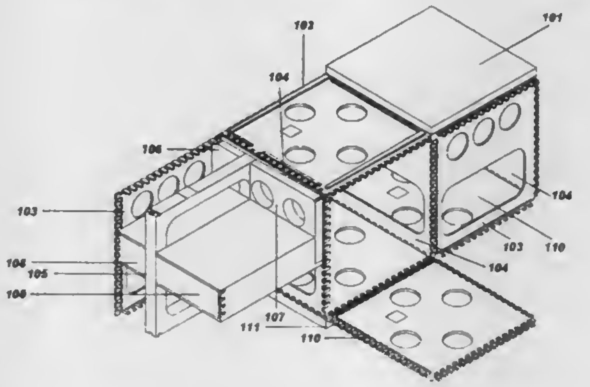
5,746,038
CONSTRUCTION COMPONENTS AND ASSEMBLY SYSTEM

Edward E. Houk, 6106 Townhill, San Antonio, Tex. 78238-5033

Filed Apr. 26, 1995, Ser. No. 430,806

Int. Cl.^{6} F04B *1/38*

U.S. Cl. 52—590.1 **4 Claims**



1. A structure for use in structural, load bearing construction, comprising:

- Interlocking box trusses consisting of core members held by web membranes and pairs of parallel spaced chord membranes, and facing units,
- each of said web membranes and each of chord membranes of said pairs of parallel spaced chord membranes having at least one major axis, upper and lower transverse edge faces, side transverse edge faces, opposing primary faces, and edges,
- each of said web membranes and each of chord membranes of said pairs of parallel spaced chord membranes having a plurality of alternating, tapering, and projecting teeth and transverse strikes on said transverse edge faces and at least one of said primary faces thereof, each said teeth having a shape of a truncated pyramid with a taper on three sides of an inverted trapezoid base and with orthographic projection of a greater side, and having facets joined with at least one primary face at obtuse angles, a distance between said facets at the juncture with said primary face being less than at other respective facets,
  - wherein said web membranes are aligned perpendicular to said parallel spaced chord membranes;
  - each of said chord membranes of said pairs of parallel spaced chord membranes being aligned and interconnected with respective chord membranes of adjacent box trusses,

said web membranes interlocking with pairs of interconnected said parallel spaced chord membranes at said upper and lower transverse edge faces and with pairs of other interconnected web membranes of adjacent aligned box trusses at said side transverse edge faces,

wherein said facing units are deformed by wedges between said facing units and anti-compression rigid frame core members; and

said teeth of web membranes interlocking with teeth of two adjacent aligned chord membranes and interlocking with teeth of two other adjacent aligned web membranes, thereby forming joins of groups of three and forming hollow polyhedron shaped and aligned box trusses.

5,746,039

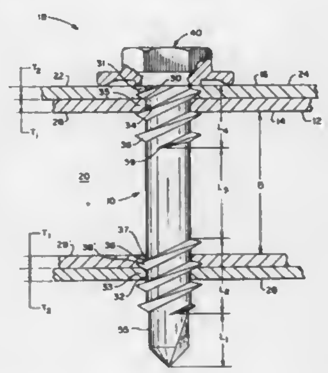
TRUSS FASTENER AND TRUSS ASSEMBLY

Robert G. Nystrom, Glastonbury, Conn., assignor to Metaltite Corporation, West Hartford, Conn.

Filed May 31, 1996, Ser. No. 658,845

Int. Cl.⁶ E04B *1/32*

U.S. Cl. 52—639 16 Claims



1. A truss assembly comprising:

a chord member having opposite first and second walls defining a longitudinally extending channel, said first and second walls having first and second openings, respectively, said second opening being substantially radially opposite said first opening;

a tubular member disposed in said channel, said tubular member defining a longitudinally extending cavity and having third and fourth openings, said third and fourth openings being aligned with said first and second openings, respectively;

fastener means comprising:

head means comprising a top portion and an underside disposed adjacent said chord member; and

shank means integrally extending from said underside through said first and third openings, said cavity, and said fourth and second openings, and terminating at a distal tip, said shank means comprising a proximal portion having a spiral buttress thread, a distal portion having a spiral buttress thread, an unthreaded shaft portion intermediate said proximal and distal portions, and self-drilling means adjacent said distal tip allowing self-drilling into said chord member and said tubular members;

wherein said buttress thread of said proximal portion engages said chord member and said tubular member adjacent said first and third openings, said shaft portion is disposed in said cavity, and said buttress thread of said distal portion engages said chord member and said tubular member adjacent said second and fourth openings.

5,746,040

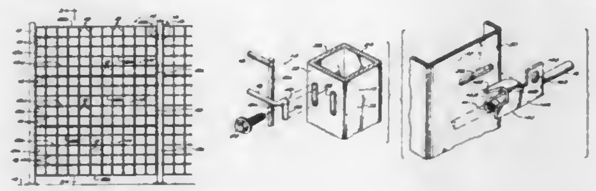
MODULAR WALL CONSTRUCTION

Ronald A. Young, and Gregory C. Young, both of Denver, N.C., assignors to Wireway/Husky Corp., Denver, N.C.

Filed Aug. 20, 1996, Ser. No. 700,033

Int. Cl.⁶ E04B *1/00*

U.S. Cl. 52—775 19 Claims



1. A modular wall construction comprising:

a plurality of laterally spaced support posts having mutually spaced slots in commonly facing walls thereof, each slot being at least partially defined by oppositely disposed first and second edge segments;

at least one panel arranged between said support posts;

connecting elements integrally formed with and extending laterally from said panel to overlie the commonly facing walls of said support posts at said slots, said connecting elements having hook shaped portions received in said slots in engagement with the first edge segments thereof; and

at least one fastener which extends into a selected slot between a corresponding connecting element positioned within said selected slot and a second edge segment associated with said selected slot to coact in engagement with said selected slot and said corresponding connecting element to prevent disengagement of a hook of said corresponding connecting element from a first edge segment associated with said selected slot, wherein

said panel comprises a coplanar array of interconnected rods, and wherein said connecting elements comprise portions of selected rods which are bent out of the plane of said array to define said hook shaped portions.

5,746,041

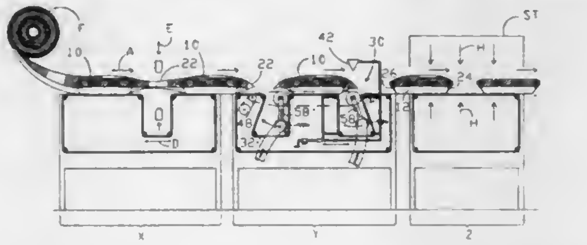
SHRINKING SELECTED PORTIONS OF FILM WRAPPED AROUND A PRODUCT

Sidney S. Tolson, Scotland Neck, N.C., assignor to Ossid Corporation, Rocky Mount, N.C.

Filed Sep. 17, 1996, Ser. No. 718,069

Int. Cl.⁶ B65B *53/02*

U.S. Cl. 53—442 10 Claims



6. A method for shrinking selected first and second bottom portions of a heat shrinkable film wrapped around a package, comprising the steps of:

(a) conveying said package wrapped in said heat shrinkable film in a selected direction at a selected speed on a conveyor with said selected bottom portions oriented substantially transverse to said selected direction;

(b) directing heat from first and second pivotable nozzles each mounted proximately below and extending widthwise of said conveyor so as to emit a flow of heat upwardly toward said package and to cause said flow of heat to track said transversely oriented selected bottom portions of film in coordination with the movement of said package being conveyed on said conveyor in said selected direction at said selected speed while other portions of said film remain unheated;

(c) pivoting each of said first and second nozzles in said selected direction substantially at said selected speed so as to maintain said flow of heat directed at said selected first and second bottom portions of film as said package continues to be conveyed on said conveyor in said selected direction at said selected speed; and

(d) discontinuing said heat as said package continues to be conveyed in said selected direction at said selected speed.

5,746,042

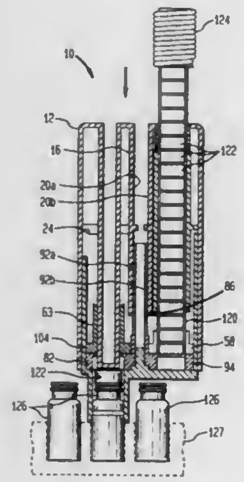
VIAL CAPPING DEVICE

Raymond A. Lombardi, Freehold, N.J., assignor to Scientific Resources, Inc., Eatontown, N.J.

Filed Apr. 2, 1996, Ser. No. 626,562

Int. Cl.⁶ B65B *7/28*

U.S. Cl. 53—305 17 Claims



1. A hand-held device for installing caps on vials, comprising:

a housing of predetermined size which enables said device to be held in a user's hand and be placed over a vial, said housing including; an inner housing portion, an outer housing portion, said outer housing portion being pressable into contact with said vial when said device is operated, and said outer housing portion being moveable with respect to said inner housing portion when said device is operated, a cap storage station for storing a cartridge containing a plurality of caps, and a cap installation station remote from said cap storage station;

shuttle means disposed within said housing for transporting one of said caps from said cap storage station to said cap installation station within said housing when said device is operated; and,

plunger means disposed within said housing for installing a cap transported to said cap installation station onto said vial when said device is operated;

wherein, said device, when operated by moving said outer housing portion with respect to said inner housing portion, affixes a cap upon said vial.

5,746,043

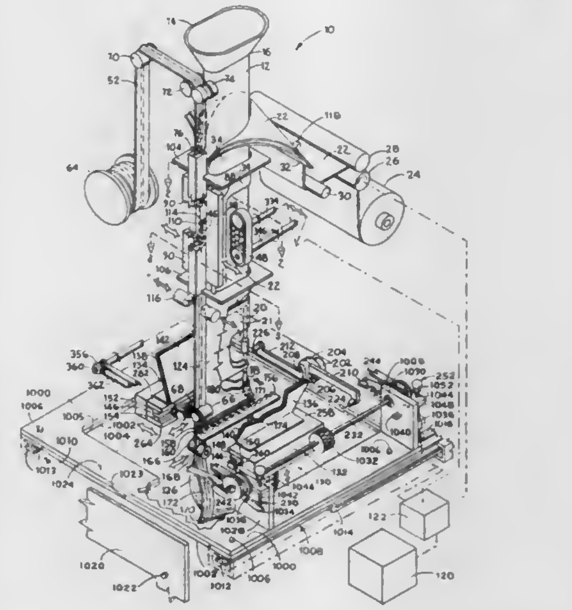
CONVERTIBLE FORM, FILL AND SEAL PACKAGING MACHINE AND METHOD

Emanuele Terminella; Frank Terminella, and Joseph Terminella, all of Fayetteville, Ark., assignors to Pacmac, Inc., Fayetteville, Ark.

Continuation-in-part of Ser. No. 76,018, Jun. 14, 1993, Pat. No. 5,400,565, and a continuation-in-part of Ser. No. 410,673, Mar. 27, 1995, abandoned, which is a continuation-in-part of Ser. No. 355,933, Dec. 14, 1994, Pat. No. 5,505,037, which is a continuation of Ser. No. 905,903, Jun. 29, 1992, abandoned, said Ser. No. 76,018 is a continuation-in-part of Ser. No. 905,903. This application Feb. 21, 1996, Ser. No. 604,255

Int. Cl.⁶ B65B *9/00*

U.S. Cl. 53—451 36 Claims



1. A convertible vertical form, fill and seal apparatus of the type that operates in conjunction with a product supply apparatus providing product in discrete quantities and that forms a continuous, heat sealable plastic film and zipper strip into separate product-filled, reclosable, sealed, pillow style or edge fin seal bags comprising:

a first controlled release festooner arrangement for storing and supplying a continuous plastic film;

a second controlled release festooner arrangement for storing and supplying a continuous, plastic, zippered cap strip;

a generally vertical fill tube assembly including a vertical fill tube downstream of the first and second storing and supplying festooner arrangements for the continuous film and zippered cap strip and around which the continuous film is formed and wrapped;

feeding means for feeding the zippered cap strip and plastic film along the length of the vertical fill tube in bag length increments with edges of the plastic film in overlapping relationship with edges of the zippered cap strip;

vertical sealing means for sealing the edges of the plastic film to the edges of the zippered cap strip to form a length of flexible, plastic tube;

a pinch seal assembly downstream of the vertical fill tube for forming first and second horizontal seals across the flexible, plastic tube and for severing the plastic tube, the first horizontal seal defining a downstream edge of a bag about to be filled with product and the second horizontal seal defining an upstream edge of a bag which has already received product, said pinch seal assembly being mounted on a rectangular base plate having a central opening for passage of said bags therethrough; and

said base plate being attached to a rectangular drawer bottom having a central opening for accommodating passage of said bags therethrough and being supported on respective drawer slides allowing said drawer bottom, base plate and pinch seal assembly to be drawn forwardly out of the apparatus for at least one of servicing, maintenance, and indexing of the pinch seal assembly and base plate through 90°.

5,746,044
PRODUCT WRAPPING METHOD

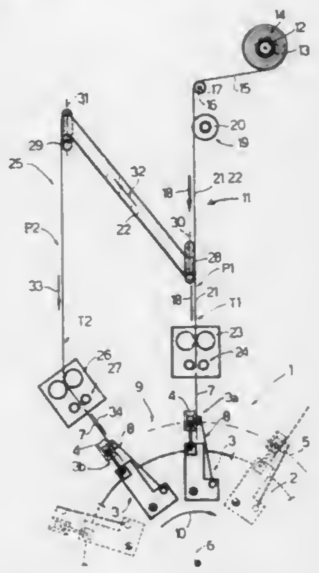
Fiorenzo Draghetti, Medicina, Italy, assignor to G.D Societa Per Azioni, Bologna, Italy

Filed Jan. 30, 1997, Ser. No. 792,583

Claims priority, application Italy, Jan. 31, 1996, BO96A0039

Int. Cl.^{6} B65B *11/30*

U.S. Cl. 53—461 **8 Claims**



1. A method of wrapping products (4), the method comprising the stages of conveying in steps, in a first given direction (10) and along a given path (5), a succession of gripping assemblies (3), each for receiving a respective product (4) and a respective sheet (7) of wrapping material, the path (5) extending through a loading station (9) in which each said assembly (3) receives a respective said sheet (7) of wrapping material; the method being characterized in that, at each step, two assemblies (3), located one behind the other along said path (5), are brought into the loading station (9) and arrested in respective loading positions (3*a*, 3*b*) to simultaneously receive respective said sheets (7); the respective sheets (7) of said two assemblies (3) being fed to the respective loading positions (3*a*, 3*b*) along respective supply paths (P1, P2) located side by side.

5,746,045
LAWN MOWER WITH IMPROVED CLIPPING DISPERSAL

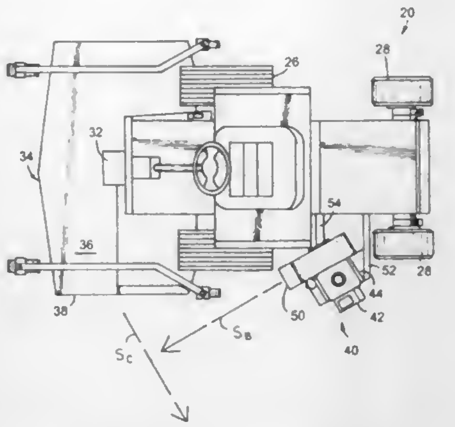
James Haney, 1431 Broadway, NW., Grand Rapids, Mich. 49504

Filed Jun. 11, 1996, Ser. No. 665,023

Int. Cl.^{6} A01D *34/70*

U.S. Cl. 56—13.3 **7 Claims**

1. A lawn mower, comprising:
- a chassis;
- a mower deck assembly dependent from said chassis and having a chute for discharging clippings generally along a first axis; and
- a blower assembly mounted to said chassis on a side coincident with said chute so as to not physically contact the grass clippings discharged from said chute, said blower having an outlet oriented such that a stream of air from said blower is blown onto the ground in an area where said chute would otherwise dispense the discharged grass clippings so as to intersect the clippings discharged along said first axis for dispersing the clippings on the ground along a second axis.



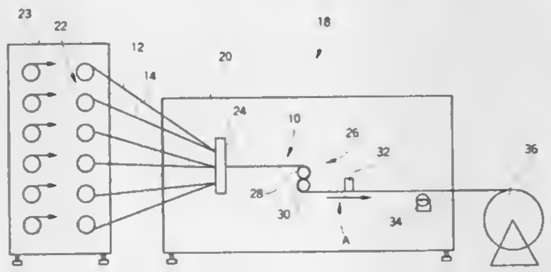
5,746,046
METHOD FOR FORMING COMINGLED COMPOSITE YARN

Phillip D. McCartney, Oak Ridge; McDaniel L. Beard, Burlington, and Elaine V. Inman, Summerfield, all of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Aug. 5, 1996, Ser. No. 693,873

Int. Cl.^{6} D02G *1/20*

U.S. Cl. 57—350 **15 Claims**



1. A method for forming a composite yarn from differential component yarns wherein the resultant yarn exhibits characteristics not apparent from the individual component yarns, said method comprising the steps of:
- providing a textile machine having means for imparting movement to strands for travel through said textile machine for yarn forming operations, means for controlling strand tension and means for entangling two or more strands;
- providing a first creeled component strand for travel through said textile machine;
- providing a second creeled component strand for travel through said textile machine;
- imparting movement to said first and second component strands using said textile machine for propelling said first and second strands therethrough;
- directing said first and second component strands to said entanglement means at a first tension value, said first tension value being imposed on said strands by said means for controlling strand tension;
- entangling said first and second component strands using said entanglement means thereby forming a resultant yarn strand;
- imparting a second tension value to said resultant yarn strand, said second tension value being greater than said first tension value and imparted by said means for controlling strand tension;
- winding said resultant yarn strand on a winder at said second tension value.

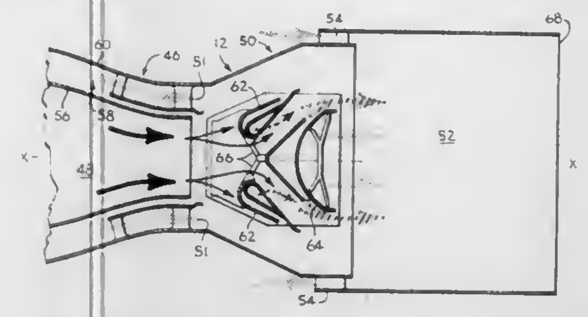
5,746,047
INFRARED SUPPRESSOR

William Steyer, Topsfield, and Timothy Joseph Higgins, Reading, both of Mass., assignors to Gereral Electric Company, Cincinnati, Ohio

Filed Jul. 8, 1982, Ser. No. 396,209

Int. Cl.^{6} F02G *3/00;* **B64D** *33/04;* **B63H** *25/46;* **F02K** *3/04*

U.S. Cl. 60—39.5 **9 Claims**



1. An apparatus for suppressing infrared radiation emitted from hot metal parts at an aft end of a gas turbine engine and from a stream of hot exhaust gases flowing therefrom during operation of the engine, comprising:
- a duct having an exhaust opening at an aft-most end thereof, said duct being effective for receiving the stream of hot exhaust gases from said engine, said duct adapted to generally confine said exhaust gases to flow through said duct;
- a pair of outer baffle assemblies disposed in said duct for dividing said gas stream into a first outer, a second outer, and an inner gas stream flow;
- an inner baffle assembly disposed at least partly between and downstream of said outer baffle assemblies for dividing said inner gas stream flow into upper and lower flowstreams for mixing with said first and second outer gas stream flows, respectively;
- said inner and outer baffle assemblies and said duct cooperating to obstruct the line of sight of said hot metal parts when said engine is viewed from said exhaust opening; and
- said duct having opening means for receiving a cooling gas flow into said duct for mixing with said first and second outer gas stream flows and wherein said baffle assemblies are disposed downstream of said opening means.

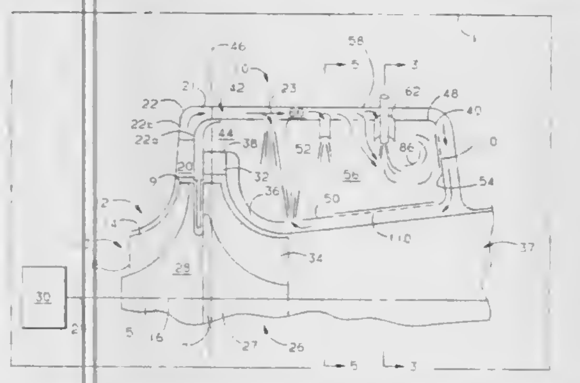
5,746,048
COMBUSTOR FOR A GAS TURBINE ENGINE

Nipulkumar Shah, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 16, 1994, Ser. No. 307,967

Int. Cl.^{6} F02G *3/00*

U.S. Cl. 60—39.06 **57 Claims**



1. A method for combusting fuel in a combustor defining an annular combustion chamber disposed about an axis, with said combustion chamber having a primary combustion zone at an upstream axial end thereof, an outlet at a downstream axial end thereof, and a secondary combustion zone between said primary combustion zone and said outlet, said method comprising the steps of:
- (a) injecting streams of fuel and oxidant into said primary combustion zone;
- (b) mixing said streams to form a combustible mixture of fuel and oxidant;
- (c) combusting said mixture in a manner producing a generally circumferentially spiraling annular flow of said fuel, oxidant, and hot gases of combustion within said primary combustion zone, emanating from a point of injecting said streams of fuel and oxidant into said primary combustion zone and extending generally in a downstream direction toward said outlet, with said spiraling annular flow having components of motion in both a downstream axial and a tangential direction;
- (d) injecting a deflecting stream of oxidant, having at least a component of motion in an upstream direction, into said primary combustion zone and across said circumferentially spiraling flow such that said downstream axial component of motion of said circumferentially spiraling flow is reduced, thereby improving combustion efficiency and reducing emissions of the combustor by increasing dwell time of the fuel, oxidant, and hot gases of combustion within the primary combustion chamber,
- (e) injecting a secondary stream of oxidant into said secondary combustion zone through a plurality of blast tubes extending tangentially into said secondary combustion zone to create a dynamic oxidant baffle to impede the downstream axial component of motion of the circumferentially spiraling flow, to thereby improve combustion efficiency and reduce emissions of the combustor by increasing dwell time of the fuel oxidant, and hot gases of combustion within the secondary combustion zone.

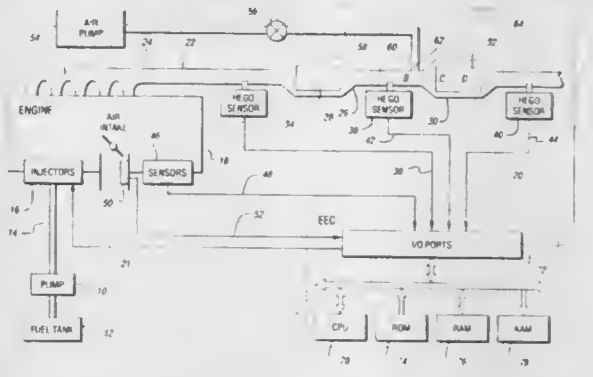
5,746,049
METHOD AND APPARATUS FOR ESTIMATING AND CONTROLLING NO X TRAP TEMPERATURE

Michael John Cullen, Northville, Mich.; Steven Dinsdale, Little Evesden, United Kingdom, and Christopher K. Davey, Novi, Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Dec. 13, 1996, Ser. No. 768,003

Int. Cl.^{6} F01N *3/20*

U.S. Cl. 60—274 **8 Claims**



1. A method of estimating the temperature of a NO_x trap located in an exhaust passage of an engine downstream from a catalytic converter, said exhaust passage including a pierce point located between said converter and said trap permitting controlled amounts of air to be added to the exhaust passage from an air pump prior to entry into said trap, comprising a sequence of the steps of:
- calculating the instantaneous temperature at a first location upstream of said pierce point based on a previous instantaneous temperature value at said first location, an estimated steady-state value, and a predetermined temperature rate of change at said first location as a function of engine air mass flow;

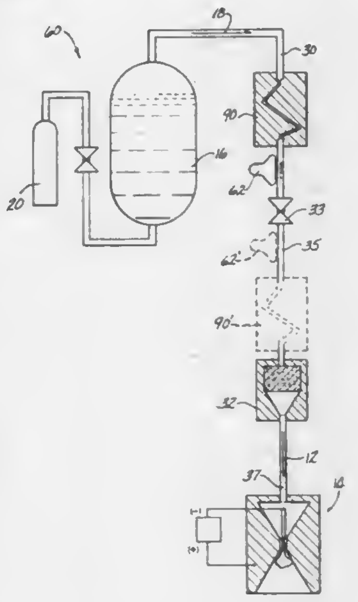
calculating the instantaneous temperature at a second location at the front face of the NO_x trap based on a previous instantaneous temperature value at said second location, an estimated steady-state value at said second location based on the instantaneous temperature at said first location, and a predetermined temperature rate of change at said second location as a function of the sum of engine air mass flow and air pump air mass flow.

5,746,050
GASEOUS PRODUCT DELIVERY SYSTEM
Christopher H. McLean, Seattle; Paul G. Lichon, Bothell; Joseph P. Morris, Bothell, and Philip O. Flugstad, Bothell, all of Wash., assignors to Primex Technologies, Inc., Redmond, Wash.

Filed Jan. 19, 1996, Ser. No. 588,697

Int. Cl.^{6} F02C *3/30;* **F02K** *9/42*

U.S. Cl. 60—200.1 **10 Claims**



1. A system for the delivery of a gaseous product to a reaction chamber, comprising:

- a fuel tank containing a hypergolic liquid;
- a cylinder containing a pressurized gas communicating with said fuel tank through a first conduit;
- a fluid resistor controlling the hypergolic fluid pressure drop of the system disposed between said fuel tank and said reaction chamber in communication with a second conduit;
- a thrust control valve disposed between said fuel tank and said reaction chamber;
- a gas generator receiving said hypergolic liquid from said thrust control valve through a third conduit and delivering a gaseous product to said reaction chamber through a fourth conduit; and
- a bubble disrupter disposed upstream of said gas generator whereby bubbles of said pressurized gas entrained in said hypergolic liquid have a diameter less than the inside diameter of said third conduit.

5,746,051
DEVICE FOR DETOXIFYING EXHAUST FUMES FROM MOBILE EQUIPMENT
Jörg Kieser, Forchheim; Markus Klein, Freiburg; Günter Lins, Erlangen; Robert Seeböck, Bubenreuth, and Michael Römheld, Uttenreuth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

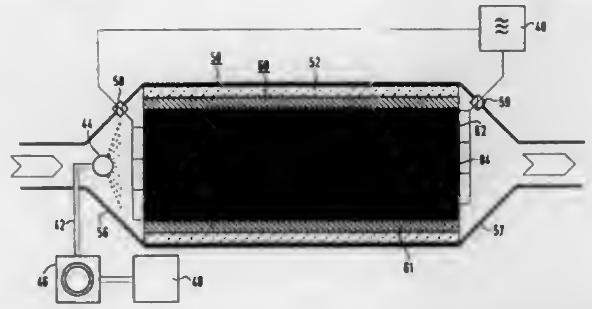
PCT No. PCT/DE95/00619, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO95/31271, PCT Pub. Date Nov. 23, 1995

PCT Filed May 10, 1995, Ser. No. 737,502

Claims priority, application Germany, May 11, 1994, 44 16 676.1

Int. Cl.^{6} B01D *53/32;53/94;* **F01N** *3/02;* **B01J** *19/08*

U.S. Cl. 60—275 **20 Claims**



1. A device for detoxifying exhaust fumes from mobile equipment, wherein the exhaust fumes pass through a plasma reactor operating by the principle of dielectrically inhibited discharge, comprising:

- an arrangement of flat plates with alternating metallic and dielectric layers, whereby a plurality of adjacent discharge paths arranged in parallel in the flow direction are formed, wherein spaces are defined between the plate-shaped electrodes (**72**), the spaces being filled with gas-permeable insulating material (**84**), and wherein successive electrodes (**72**) always have alternating polarities, the electrodes (**72**) being adapted to receive electric power from different sides.

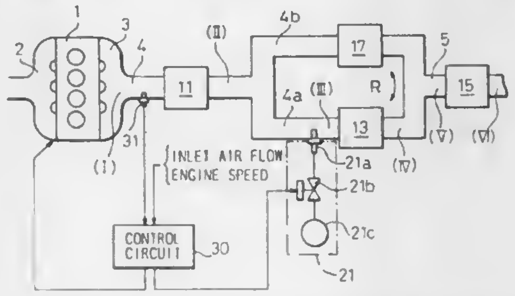
5,746,052
EXHAUST GAS PURIFICATION DEVICE FOR AN ENGINE
Yukio Kinugasa; Kouhei Igarashi, both of Susono; Takaaki Itou; Takehisa Yaegashi, both of Mishima, and Toshifumi Takaoka, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 8, 1995, Ser. No. 525,892

Claims priority, application Japan, Sep. 13, 1994, 6-218800; Aug. 9, 1995, 7-203586

Int. Cl.^{6} F01N *3/20*

U.S. Cl. 60—274 **27 Claims**



1. An exhaust gas purification device for an internal combustion engine comprising:

- a ratio determining means disposed in an exhaust gas passage of an internal combustion engine for converting substantially all of NO_x in the exhaust gas into N_2, NH_3 and NO_x, wherein an amount of NH_3 and an amount of NO_x generated by the conversion are adjusted so that the amount of NH_3 and the amount of NO_x are stoichiometrical, and wherein the NO_x generated by the conversion is essentially NO_2 and a molar ratio of the amount of NO_2 generated to the amount of NH_3 generated is 3:4; and
- purification means disposed in the exhaust gas passage downstream of the ratio determining means for causing the NH_3 generated to react with NO_x generated to produce N_2 and H_2O components.

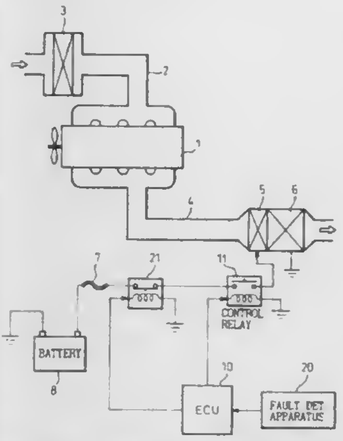
5,746,053
APPARATUS FOR CONTROLLING POWER SUPPLIED TO AN ELECTRICALLY HEATED CATALYST ATTACHED TO AN EXHAUST GAS PASSAGE OF AN INTERNAL COMBUSTION ENGINE
Masahiko Hibino, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 6, 1996, Ser. No. 760,449

Claims priority, application Japan, Dec. 8, 1995, 7-320655

Int. Cl.^{6} F01N *3/20;9/00*

U.S. Cl. 60—277 **17 Claims**



1. An apparatus for controlling power supplied to an electrically heated catalyst attached to an exhaust gas passage of an internal combustion engine from a power source through a power supply circuit which includes a circuit opening/closing means that is opened and closed by a control circuit of the internal combustion engine, comprising:

- a fault detecting means for detecting the occurrence of such a fault that the supply of power to the electrically heated catalyst cannot be interrupted by said circuit opening/closing means;
- a forcible circuit shut-off means provided in the path of the power supply circuit from said power source to said electrically heated catalyst and forcibly shuts off the power supply circuit when it is actuated; and
- a shut-off operation instruction means for causing said forcible circuit shut-off means to effect the shut-off operation when a fault is detected by said fault detecting means.

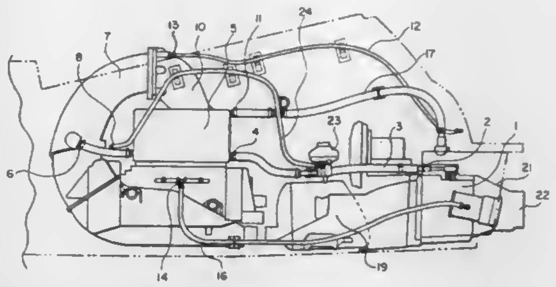
5,746,054
METHOD AND APPARATUS FOR TUNED PIPE WATER INJECTION
Sylvain Matte, St-Denis De Brompton, Canada, assignor to Bombardier, Inc., Montreal, Canada

Filed May 1, 1996, Ser. No. 640,500

Int. Cl.^{6} F01N *3/04;* **F02B** *27/02*

U.S. Cl. 60—310 **5 Claims**

1. An apparatus for improving the efficiency of a two-cycle engine in a jet pump propelled watercraft, said apparatus comprising:



- a source of pressurized water comprising the impeller of a jet pump adapted to propel water in a watercraft;
- a pressurized water conduit;
- a pressurized water regulator;
- a water injector conduit; and
- a water injector;
- said water injector including an orifice adapted, in operation, to inject water into a tuned pipe of an exhaust system of said two-cycle engine;
- said source of pressurized water being in open communication with said pressurized water regulator by means of said pressurized water conduit; and said water injector being in open communication with said pressurized water regulator by means of said water injector conduit, whereby, in operation, the quantity of water injected per minute into said tuned pipe at different revolutions of said two-cycle engine, is proportional to the water pressure in said pressurized water conduit, up to a predetermined speed of said two-cycle engine;
- and thereafter, at greater speeds of said two-cycle engine, said quantity of water injected per minute into said tuned pipe is regulated by said pressurized water regulator such that water pressure in said water injector conduit is less than said water pressure in said pressurized water conduit;
- and said quantity of water injected into said tuned pipe is not proportional to the speed of said two-cycle engine.

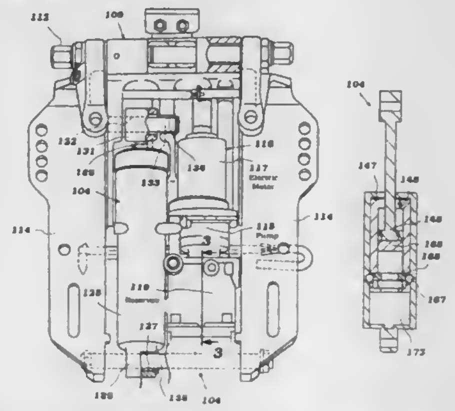
5,746,055
HYDRAULIC TILT AND TRIM CONTROL FOR MARINE PROPULSION
Daisuke Nakamura, and Masahiko Iida, both of Shizuoka-ken, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 13, 1996, Ser. No. 614,542

Claims priority, application Japan, Mar. 13, 1995, 7-079325

Int. Cl.^{6} F16D *31/02*

U.S. Cl. 60—454 **7 Claims**



1. A hydraulic tilt mechanism for a marine outboard drive comprised of a hydraulic motor having a cylinder adapted to be affixed to one member of the outboard drive, said cylinder defining a cylinder bore, a trim cylinder is received and slidably supported within said cylinder bore and defining a second cylinder bore, a piston reciprocating in said second cylinder bore and defining at least one fluid chamber therewith, a piston rod affixed to said piston and extending through one end of said cylinder for connection to another member of the outboard drive for effecting relative movement of the members upon pressurization of said fluid cham-

ber, pressurization of said fluid chamber effecting reciprocal movement of said trim cylinder and said piston for effecting trim adjustment of the outboard drive and for effecting relative movement of said piston to said trim cylinder for effecting tilt up movement of the outboard drive, said cylinder bore being defined by a blind bore extending through said cylinder and closed at one end by an end closure through which said piston rod extends, and means for providing a seal between the end of said trim cylinder disposed adjacent said end closure and said cylinder bore, said piston rod extending through an open end of said trim cylinder, a seal disposed between said open end of said trim cylinder and said piston rod, said cylinder bore of said cylinder being comprised of a first larger diameter portion wherein said means for sealing the one end of said trim cylinder to said bore is positioned, a second smaller diameter portion through which the majority of the length of said tilt cylinder extends, and a third smallest diameter portion adjacent said blind end of said cylinder bore into which said tilt cylinder extends in some positions of said outboard drive, a fluid reservoir disposed at said one side of said cylinder and entirely below a fluid pump for supplying fluid to said fluid pump for said motor operation, and a pick-up tube depending from said fluid pump into said fluid reservoir and terminating above the lower end thereof for permitting contaminants to accumulate at a lower end of the fluid reservoir and not be circulated by the fluid pump.

5,746,056

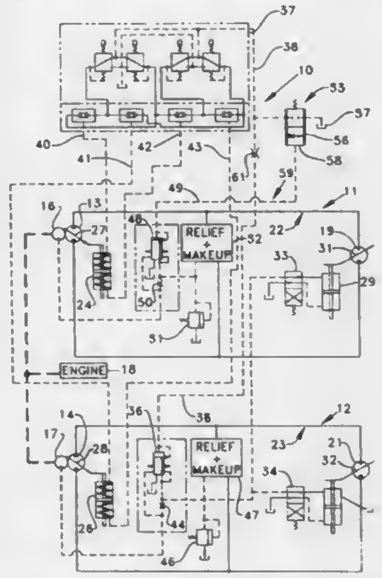
OVERSPEED CONTROL FOR A HYDROSTATIC TRANSMISSION

David P. Smith, Joliet, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 30, 1996, Ser. No. 720,398

Int. Cl.⁶ F16D *31/02*

U.S. Cl. 60—447 **6 Claims**



1. An overspeed control for a hydrostatic transmission which includes a variable displacement hydraulic pump driven by an engine and having a pressure responsive displacement controller for increasing the output displacement of the variable displacement pump in response to an increase in pressure directed thereto and for decreasing the output displacement of the variable displacement pump in response to a decrease in pressure, and a fixed displacement pump driven by the engine, comprising:

a speed control valve arrangement connected to the fixed displacement pump and the displacement controller and having at least one operative position establishing a fluid pressure level in the displacement controller; and

means for reducing the fluid pressure level in the displacement controller when the speed control valve arrangement is in its operative position and the rotational speed of the engine exceeds a predetermined level so that the displacement of the variable displacement pump is reduced to increase the engine retarding torque when the variable displacement pump is acting as a motor, the pressure reducing means includes a supply line connecting the fixed displacement pump with the speed control valve arrangement, an overspeed control valve connected to the supply line and being spring biased to a closed position, and a means for moving the overspeed control valve towards an open position.

5,746,057

ELECTRONIC CONTROL TYPE BRAKE BOOSTER FOR VEHICLE

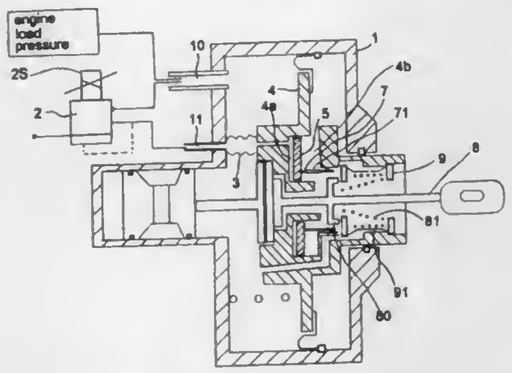
Tae-Young Shim, Seoul, Rep. of Korea, assignor to Mando Machinery Corporation, Kyungki-Do, Rep. of Korea

Filed Nov. 26, 1996, Ser. No. 753,520

Claims priority, application Rep. of Korea, Nov. 28, 1995, 44212

Int. Cl.⁶ F15B *7/00*

U.S. Cl. 60—545 **1 Claim**



1. An electronic control type brake booster for a vehicle comprising:

a brake booster;

an air path separately formed from a path to which an engine vacuum pressure of said brake booster is applied;

a pressure control valve arranged in the air path and driven by a solenoid, said pressure control valve providing a pilot pressure to the air path of said brake booster to control the pressure in the air path to a pressure between atmospheric pressure and the engine vacuum pressure;

a wrinkled bellows tube connected to a predetermined portion of said air path connected to the pressure control valve;

an operational chamber inwardly formed of a movable wall communicated with the bellows tube;

a plunger located at an inside portion of the movable wall and formed with an operational chamber and a further chamber according to an operation of the plunger;

an annular element arranged between the plunger and the movable wall; and

a hole formed at the upper portion of the annular element and communicating with the further chamber.

5,746,058

ADJUSTABLE ACTUATOR FOR A TURBOCHARGER

Mark W. Vertanen, Creston, Iowa, assignor to Gits Manufacturing Company, Creston, Iowa

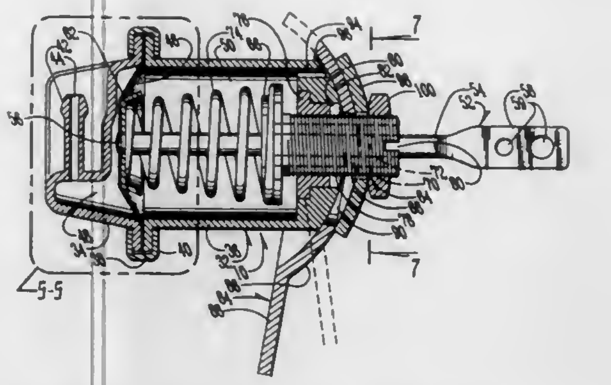
Filed Mar. 11, 1996, Ser. No. 613,496

Int. Cl.⁶ F02B *37/12*

U.S. Cl. 60—602 **11 Claims**

1. An adjustable actuator for a turbocharger having a pressure outlet, an exhaust outlet, and a waste gate exhaust valve fluidly connected with exhaust outlet, comprising:

a housing having a first opening therein for communication with the pressure outlet of the turbocharger, a second opening therein remote from the first opening;



an elongated rod interconnecting the housing and the waste gate exhaust valve through the second opening;

a mounting bracket pivotally connected to the housing adjacent the second opening and having an aperture therein for receiving the rod; and

a fastener for selectively securing the mounting bracket to the housing such that with the fastener loosened the mounting bracket can pivot with respect to the housing and with the fastener tightened the mounting bracket is held in a fixed position with respect to the housing.

5,746,059

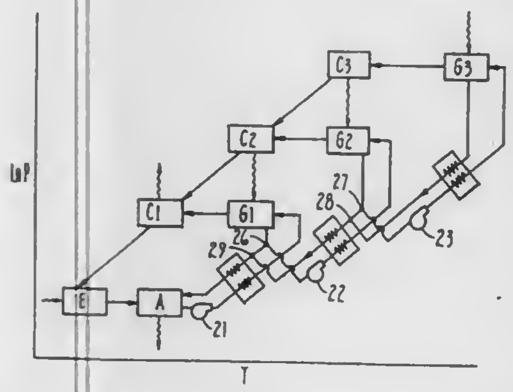
TRIPLE EFFECT ABSORPTION APPARATUS AND METHOD

Paul Sarkisian, and Uwe Rockenfeller, both of Boulder City, Nev., assignors to Rocky Research, Boulder City, Nev.

Filed Apr. 3, 1997, Ser. No. 826,549

Int. Cl.⁶ F25B *15/00*

U.S. Cl. 62—101 **39 Claims**



36. A method of operating a triple effect absorption cycle apparatus having first, second and third stage generators containing an absorption fluid comprising an aqueous solution of a metal salt comprising an alkali, alkaline earth or transition metal halide, or an alkali metal hydroxide and operating at successively higher temperatures, respectively, said method comprising operating the third stage generator at vapor pressure of below 25 psig.

5,746,060

AIR CONDITIONER FOR AUTOMOBILE USE

Hideki Sunaga, and Masatoshi Suto, both of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

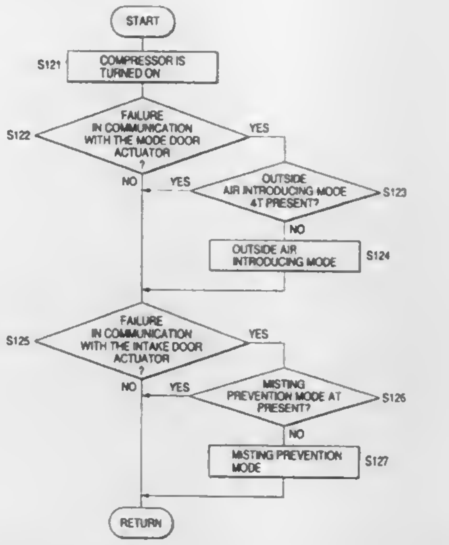
Filed Feb. 13, 1997, Ser. No. 799,929

Claims priority, application Japan, Feb. 15, 1996, 8-028148

Int. Cl.⁶ H01H *85/04*

U.S. Cl. 62—126 **14 Claims**

1. An air conditioner for automobile use comprising:


START
S121
COMPRESSOR IS TURNED ON
S122
FAILURE IN COMMUNICATION WITH THE MODE DOOR ACTUATOR ?
YES
NO
YES
OUTSIDE AIR INTRODUCING MODE AT PRESENT?
S123
NO
OUTSIDE AIR INTRODUCING MODE
S124
S125
FAILURE IN COMMUNICATION WITH THE INTAKE DOOR ACTUATOR ?
YES
NO
YES
MISTING PREVENTION MODE AT PRESENT?
S126
NO
MISTING PREVENTION MODE
S127
RETURN

a detector (**17,19,21**) for detecting environment outside and inside a cabin;

control means (**23**) for controlling a temperature in the cabin in accordance with a detection of the detector (**17,19,21**) to a temperature desired by a passenger;

a compressor (**50**) operating and stopping in accordance with a command given by the control means (**23**);

a plurality of air conditioning executing means (**6,8,10**) for executing air conditioning in the cabin;

communicating means (**40**) for conducting communication between the control means (**23**) and the air conditioning executing means (**6,8,10**);

communication judging means (**23**) for judging whether the communication between the control means (**23**) and the air conditioning executing means (**6,8,10**) is normally conducted or not; and

mist preventing means for realizing an air conditioning state in which a windowpanes are prevented from being misted when it is judged by the communication judging means (**23**) that the communication is not conducted normally.

5,746,061

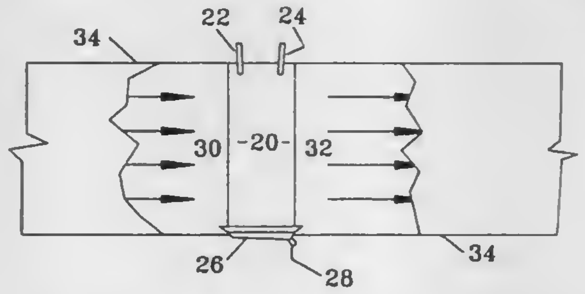
PHYSCHROMETRIC MEASUREMENT OF AIR FLOW THROUGH AIRCONDITIONING EVAPORATOR

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa. 19067

Filed Aug. 19, 1997, Ser. No. 915,336

Int. Cl.⁶ F25B *49/00*

U.S. Cl. 62—127 **7 Claims**



1. An entering airstream having a first set of psychrometric conditions, a first heat content, a first moisture content and an airflow rate, cooled heat transfer means positioned in heat transfer relation to said airstream for receiving said entering airstream, removing a quantity of heat at a rate from the airstream and discharging said airstream, whereby the airstream is cooled and moisture is condensed out of said airstream at a rate, thereby providing a flowrate of condensed moisture and a second set of

psychrometic conditions in said discharge airstream including a second heat content and a second moisture content,

a method for determining the airflow rate of the airstream cooled by the heat transfer element, said method comprising the steps of:

- a. measuring a psychrometric condition of the entering airstream from which the moisture content of the entering airstream is determinable,
- b. measuring a psychrometric condition of the discharge airstream from which the moisture content of the discharge airstream is determinable,
- c. measuring the condensate flow rate
- d. determining the moisture content of the entering airstream, determining the moisture content of the discharge airstream and calculating the airflow rate from the condensate flow rate and the moisture contents of the entering and discharge airstreams.

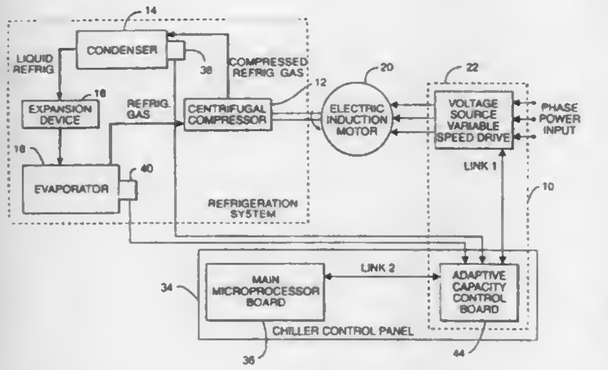
5,746,062
METHODS AND APPARATUSES FOR DETECTING SURGE IN CENTRIFUGAL COMPRESSORS

Gregory K. Beaverson; Harold R. Schnetzka, both of York, and Timothy M. Frank, Wellsville, all of Pa., assignors to York International Corporation, York, Pa.

Filed Apr. 11, 1996, Ser. No. 630,842

Int. Cl.⁶ F25B *1/00*

U.S. Cl. 62—228.3 **18 Claims**



1. A surge detection system for use in fluid system having a load driven by a centrifugal compressor, the compressor being driven by an electric motor, the system comprising:

means for sensing a differential pressure developed across the compressor;

means for sensing a current representing an input power to the motor;

first computing means responsive to the magnitude of said differential pressure developed across the compressor for indicating when a valid surge is occurring in the compressor; and

second computing means responsive to the magnitude of said sensed current for indicating when a valid surge is occurring in the compressor.

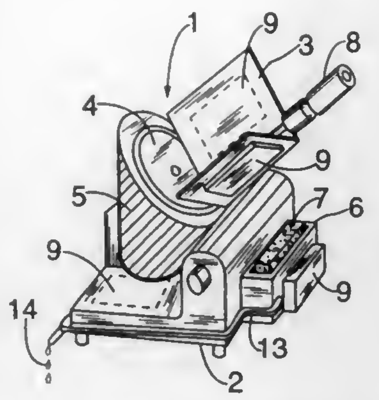
5,746,063
METHOD AND APPARATUS TO COOL FOOD CONTACT MACHINES AND SURFACE

Renee M. Hall, and Donald M. Hall, both of 63 N. Country Rd., Mt. Sinai, N.Y. 11766

Filed Jan. 6, 1997, Ser. No. 778,958

Int. Cl.⁶ F25B *21/02;* **F25D** *23/12*

U.S. Cl. 62—331 **13 Claims**



1. A cooler apparatus to inhibit bacterial and microbial growth on a food contact surface of a portable food handling device, such as a slicing machine having a rotatable food cutting blade, said rotatable food cutting blade being rotatable in ambient air, said rotatable food cutting blade contacting and cutting food being cut in ambient air, said cooler apparatus comprising a cooler impinging upon at least one conductive surface of the portable food handling device, said cooler reducing the temperature of the food contacting surface of the portable food handling device to a predetermined temperature for inhibiting the bacterial and microbial growth thereon;

said portable food handling device having a base, a slicing frame mounted with said base, said slicing frame including a motor rotating said rotatable food cutting blade; said portable food handling device further including an open food accommodating carriage spaced apart from said rotatable food cutting blade;

wherein said cooler comprises at least one thermoelectric module attached by a cold plate therein to at least one conductive surface of said portable food handling device;

said thermoelectric module being located in proximity to said rotatable food cutting blade, but said thermoelectric module being located spaced apart from said rotatable food cutting blade.

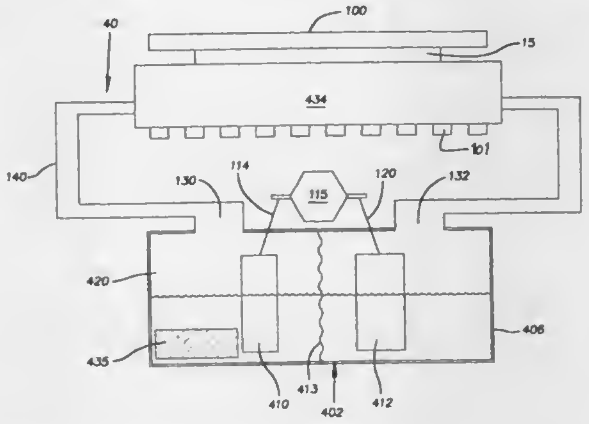
5,746,064
ELECTROCHEMICAL HEAT EXCHANGER

Boris Tsenter, Norcross, Ga., assignor to Borst, Inc., Norcross, Ga.

Division of Ser. No. 586,369, Jan. 16, 1996. This application Jul. 15, 1997, Ser. No. 892,693

Int. Cl.⁶ F25B *17/08;* **F28D** *15/00*

U.S. Cl. 62—480 **6 Claims**



1. An electrochemical heat exchanger comprising:

a housing;

a first hydrogen electrode contained in said housing and having a first gas space;

a second hydrogen electrode contained in said housing having a second gas space, said second hydrogen being separated from said first hydrogen electrode by a solid electrolyte, said electrolyte electrically connecting said first and second hydrogen electrodes;

at least one compensating metal hydride plate having a common gas space with said first hydrogen electrode; and

a heat exchanger chamber disposed between said first and second hydrogen electrodes, said first and second gas space being in communication through said heat exchange chamber.

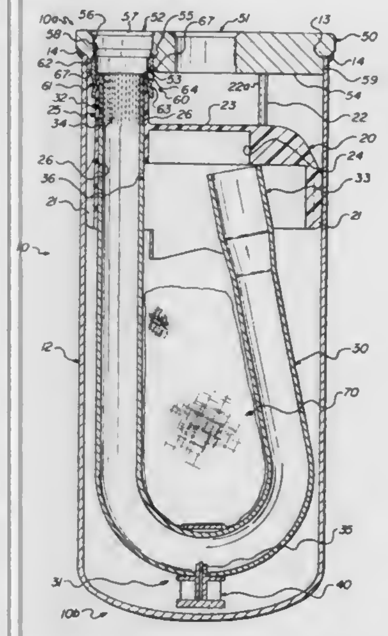
5,746,065
ACCUMULATOR DEFLECTOR CONNECTION AND METHOD

Chhotu Patel, Farmington Hills; Larry M. Lafer, Plymouth, and Steven M. Tossey, Waterford, all of Mich., assignors to Automotive Fluid Systems, Inc., Troy, Mich.

Filed Aug. 21, 1996, Ser. No. 701,174

Int. Cl.⁶ F25B *43/00*

U.S. Cl. 62—503 **9 Claims**



1. An accumulator deflector connection for an accumulator of an air-conditioning system said accumulator having a housing and a desiccant material said accumulator deflector connection comprising:

an outlet passage located in said accumulator;

a bushing having a passage and a first end, said first end of said bushing located in said outlet passage of said accumulator;

an outlet tube having an outlet end, said outlet end of said outlet tube has knurling located thereon and said bushing has a crimped, reduced diameter portion located adjacent said knurling; and

a thermoplastic deflector having a cylindrical extension having a passage and a locating extension member extending in a predefined direction and spaced from said cylindrical extension, said cylindrical extension inserted in said bushing, said passage of said cylindrical extension communicating with said passage of said bushing and said outlet passage.

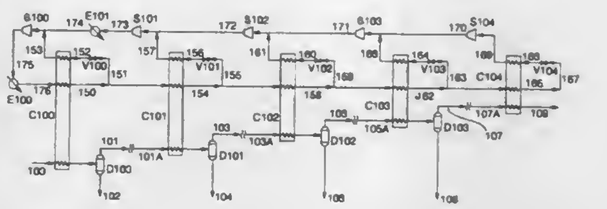
5,746,066
PRE-FRACTIONATION OF CRACKED GAS OR OLEFINS FRACTIONATION BY ONE OR TWO MIXED REFRIGERANT LOOPS AND COOLING WATER

David B. Manley, Rolla, Mo.

Filed Sep. 17, 1996, Ser. No. 714,807

Int. Cl.⁶ F25J *1/00*

U.S. Cl. 62—612 **24 Claims**



1. A process for partial condensation of a process gas which initially comprises significant amounts of methane and ethylene comprising:

(a) a plurality of sequential. condensation and separation stages comprising, at each condensation and separation stage, condensation of at least part of the process gas and separation of the resulting condensate and remaining process gas; and

(b) supplying refrigeration for condensation at each condensation and separation stage by a first mixed refrigerant refrigeration loop, wherein a first mixed refrigerant used therein is comprised substantially of ethylene, ethane, and propylene and the relative proportions of those components remain constant through the first mixed refrigerant refrigeration loop.

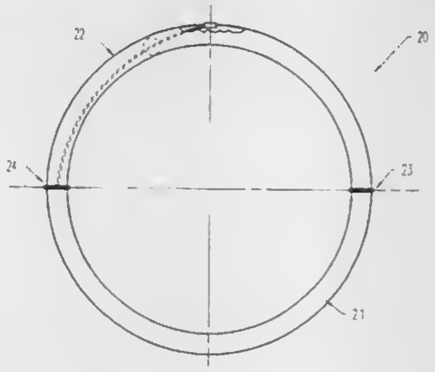
5,746,067
ROUND BANGLE

Edwin F. Leach, II; Marinko Markic, both of Attleboro, Mass., and Ronald E. Precourt, Jr., Woonsocket, R.I., assignors to Leach & Garner Company, North Attleboro, Mass.

Filed Apr. 2, 1997, Ser. No. 831,904

Int. Cl.⁶ A44C *5/18*

U.S. Cl. 63—7 **11 Claims**



1. In a bangle having arcuately-elongated series-connected relatively-movable first and second tubular bangle members, the improvement which comprises:

a clevis-like hinge assembly operatively connecting said bangle members and allowing relative movement therebetween, said hinge assembly having

a first portion mounted on said first bangle member, said first portion having two transversely-spaced knuckles provided with transversely-aligned holes,

a second portion mounted on said second bangle member, said second portion having a tongue arranged between said first portion knuckles, said tongue having a transverse through-hole aligned with said knuckle holes, and

a pin arranged in said tongue and knuckle holes,

whereby said bangle members may be moved relative to one another about the axis of said pin.

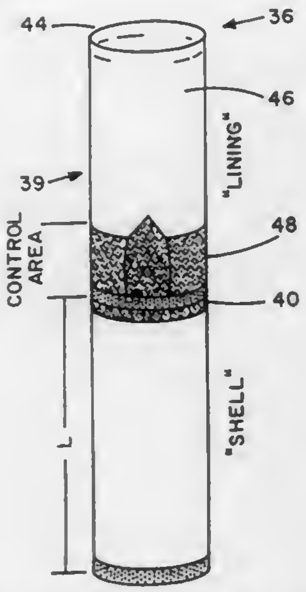
5,746,068
TWO LAYER INTEGRALLY KNIT LOWER BODY GARMENT

Catrinel I. Popa, New York, N.Y.; George A. Browder, Jr., Winston-Salem, and Archie Dale Segraves, Clemmons, both of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Division of Ser. No. 565,413, Nov. 30, 1995, Pat. No. 5,613,378. This application Jan. 24, 1997, Ser. No. 789,189

Int. Cl.^{6} A41B *9/06;* **A41D** *1/14;* **D04B** *1/24*

U.S. Cl. 66—176 **8 Claims**



1. A lower body garment for covering the legs, hips, waist and midriff of a wearer and formed from a tubular sleeve continuously knit of successive courses of yarn comprising: an integrally knit finished waistband or welt for maintaining the garment in position on the wearer; a midriff encircling portion integrally knit with the waistband; first and second leg portions integrally knit with the midriff encircling portion; and first and second cuff portions integrally knit with the first and second leg portions, the cuff and leg portions having a continuous slit forming slit edges, the edges seamed to provide a continuous leg enclosing seam extending from the first cuff portion along the first leg portion, adjacent a midriff encircling portion, along a second leg portion and back to the second cuff portion, the waistband further comprising a garment lining integrally knit thereto, the lining including a midriff encircling portion integrally knit with the waistband and leg enveloping portions integrally knit with the lining and a midriff encircling portion.

5,746,069
CLOTHES WASHING MACHINE HAVING UPPER AND LOWER DYNAMIC BALANCERS

Do Weon Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

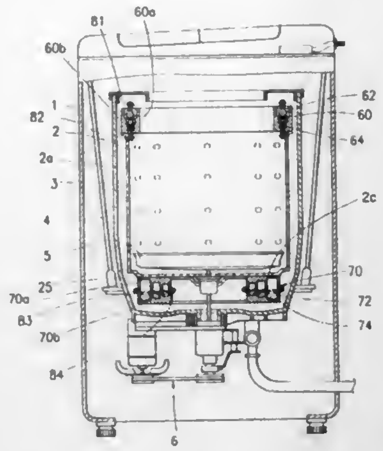
Filed Aug. 28, 1996, Ser. No. 697,567

Claims priority, application Rep. of Korea, Aug. 28, 1995, 95-26953

Int. Cl.^{6} D06F *37/24*

U.S. Cl. 68—23.2 **1 Claim**

1. In a clothes washing machine including a spin basket mounted in a main body and balancing means for keeping the dynamic balance of the spin basket, the spin basket including an upstanding side wall and a bottom wall, the improvement wherein the balancing means includes an upper balancer mounted at the top of the spin basket and a lower balancer mounted at the bottom of the spin basket, the upper balancer having a plurality of separate ring-shaped chambers which are annular and coaxial, each chamber containing balancing liquid and a number of balls, the lower balancer having a plurality of separate ring-shaped chambers which are annular and coaxial, each chamber containing liquid, the lower balancer having its chambers arranged horizontally next to one another, and the upper balancer having its chambers arranged one above the other; the cross sections of the chambers of the upper balancer becoming larger in the upward direction, and the diameters of the balls disposed in those chambers becoming larger in the upward direction; the cross sections of the chambers of the lower balancer becoming larger in a radially outer direction, and the diameters of the balls disposed in those chambers becoming larger in the radially outer direction; each of the upper and lower balancers comprising first and second members adjoining one another along a cylindrical interface which bisects all of the chambers of the balancer, the interface formed by mutually abutting first and second surfaces of the first and second members, respectively, each of the first and second members including first and second flanges projecting outwardly away from the chambers, the first and second flanges of the first member opposing the first and second flanges, respectively, of the second member along the interface to form upper and lower pairs of flanges, the lower pair of flanges of the upper balancer extending into the spin basket and being mounted to the upstanding side wall thereof by fasteners passing through both the upstanding wall and the lower pair of flanges.



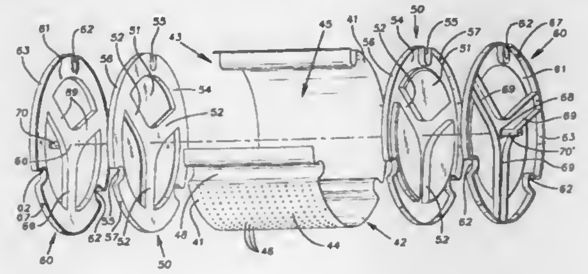
5,746,070
PLASTIC AND STAINLESS STEEL HORIZONTAL AXIS SPIN TUB

Jack W. Bailey, West Fargo, N. Dak., and Joseph E. Howard, Webster City, Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 7, 1996, Ser. No. 649,570

Int. Cl.^{6} D06F *37/06;37/22*

U.S. Cl. 68—24 **21 Claims**



1. A spin drum for use in a washing machine, said spin drum comprising:

- a generally semi-cylindrical side wall having first and second ends and a plurality of vanes extending between the first and second ends, said first and second ends each having a periphery defined in part by the vanes;
- a first end cap secured to the first end of the side wall, said first end cap having a flange contoured to fit the first end of the side wall; and
- a first trunnion disposed over the first end cap, said first trunnion having a flange that brackets the first end of the side wall and the flange on the first end cap.

5,746,071
WASHING MACHINE HAVING A WASHING LIQUID PUMPING APPARATUS

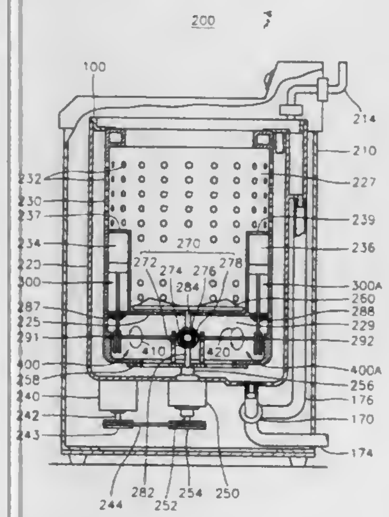
Gab-Jin Youn, Kwangju, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 23, 1996, Ser. No. 774,074

Claims priority, application Rep. of Korea, Dec. 28, 1995, 1995 50766

Int. Cl.^{6} D06F *17/02;17/06*

U.S. Cl. 68—53 **15 Claims**



1. A washing machine comprising:

- a housing;
- an outer tub disposed in the housing so as to receive a washing liquid;
- a spin tub accommodated in the outer tub, the spin tub having a plurality of discharging holes at a side wall thereof, the spin tub being divided into an upper chamber and a lower chamber by a compartment, the spin tub being formed at an inner wall thereof with first and second cylinders which are positioned in opposition to each other;
- a motor for generating a rotational force;
- a pulsator mounted on an upper surface of the compartment;
- a pulsator driving section for driving the pulsator by receiving the rotational force from the motor;
- a first means for pumping the washing liquid towards an upper portion of the spin tub, the first means being disposed within the first cylinder;
- a second means for pumping the washing liquid towards the upper portion of the spin tub, the second means being disposed within the second cylinder;
- a third means for transferring the rotational force of the motor to the first means; and
- a fourth means for transferring the rotational force of the motor to the second means.

5,746,072
SYSTEM FOR CONVEYING AND TREATING AN ENDLESS TEXTILE LOOP

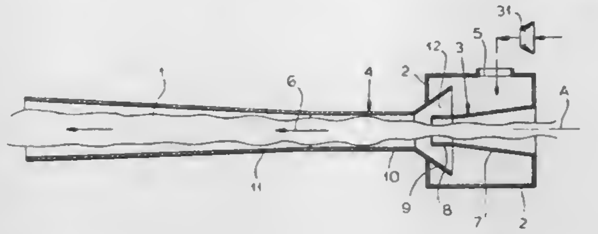
Bernd Böhnke, Eschweiler, Germany, assignor to H.Krantz Textiltechnik GmbH, Wurselen, Germany

Filed Sep. 27, 1996, Ser. No. 724,012

Claims priority, application Germany, Sep. 28, 1995, 195 36 070.2

Int. Cl.^{6} D06B *3/28*

U.S. Cl. 68—178 **9 Claims**



1. In combination with an apparatus for treating an endless textile web by passing it in a direction along an endless path and contacting it with a treatment fluid, a conveying nozzle comprising:

- a housing traversed by the path and having a lateral inlet;
- an upstream tube longitudinally traversed by the path and having
  - an upstream portion of a cross section decreasing in the direction and
  - a downstream portion of substantially constant cross section and having a downstream end;
- a downstream tube longitudinally traversed by the path and having
  - an upstream portion of a cross section decreasing in the direction, the upstream portion having an upstream end in the housing level with or upstream of the downstream end of the upstream tube, spaced laterally outward from the downstream portion of the upstream tube, and forming with the downstream portion of the upstream tube a gap open into the housing, the upstream portion having a downstream end of a cross-sectional size equal to between 1.3 and 3 times a cross-sectional size of the downstream portion of the upstream tube, and
  - a downstream portion of cross section increasing in the direction, the web and path extending through the tubes; and
- blower means connected to the inlet for pressurizing the housing and inducing a gas flow in the direction through the downstream tube to draw the web longitudinally through the tubes along the path.

5,746,073
DYE TUBE SPACER FOR PACKAGE DYEING

Gordon A. Wise, Statesville; Roger N. Saunders, Yadkinville; Matthew M. Thomas, Reidsville; Raymond W. Maynard, Advance, and Ronald W. Mangrum, Greensboro, all of N.C., assignors to Unifi, Inc., Reidsville, N.C.

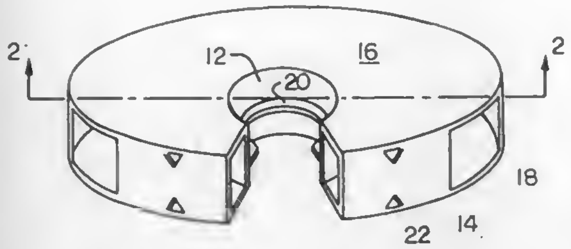
Continuation of Ser. No. 600,032, Feb. 12, 1996, Pat. No. 5,617,748, which is a continuation of Ser. No. 284,305, Aug. 2, 1994, Pat. No. 5,490,401. This application Nov. 8, 1996, Ser. No. 746,300

Int. Cl.^{6} D06B *23/04*

U.S. Cl. 68—198 **8 Claims**

1. A rigid dye tube spacer for separating adjacent ends of a plurality of yarn packages, each having a yarn winding around a tube, said yarn packages placed on a spindle in a package dyeing vessel and compressed prior to dyeing to compensate for variations in package density and to allow more packages to be loaded in said package dyeing vessel, said spacer comprising:

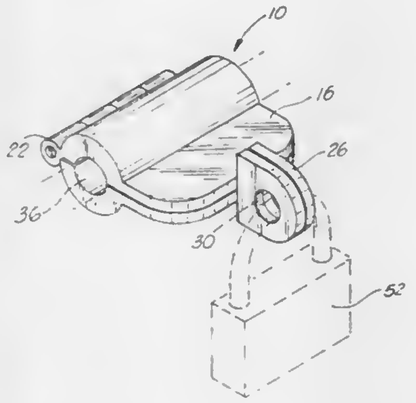
- (a) a cylindrical inner wall having an upper edge and a lower edge;
- (b) a top annular wall inclined upwardly from the upper edge of said inner wall;



(c) a bottom annular wall extending from the lower edge of said inner wall, wherein said top and said bottom annular walls extend substantially the entire width of and conform substantially to the share of the end of said yarn package to prevent undesirable distortion of the yarn package during the compression operation; and

(d) an open support structure spaced from said inner wall and hating an upper end attached to said top annular wall and a lower end attached to said bottom annular wall to maintain the position of said top annular wall and said bottom annular wall during compression.

5,746,074
LOCKING MECHANISM FOR LAWN MOWERS
William V. F. Collins, 406 Sena Dr., Metairie, La. 70005
Filed Sep. 3, 1996, Ser. No. 707,129
Int. Cl.⁶ E05B *73/00*
U.S. Cl. 70—18 **12 Claims**



1. A locking apparatus in combination with a push lawn mower of the type comprising:

a) a primary handle;

b) a secondary handle starting handle which is movable to a position adjacent the primary handle, so that the lawn mower may be started and operated;

c) the locking apparatus comprising:

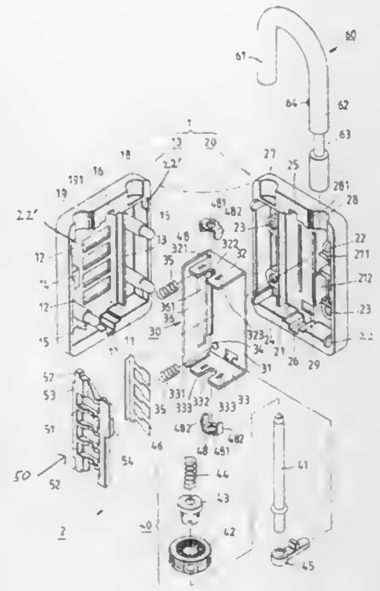
  i) a first body member, having a semi-circular portion, defining a semi-circular channel therethrough;

  ii) a second body member, having a semi-circular portion, and also defining a semi-circular channel therethrough;

  iii) a connection portion along a centerline of the first and second body portions for allowing the body portions to move from an open position, to a close position, so that while in the closed position the channels align and together define a circular bore through the closed body portions;

  iv) bores in each ends of the body member for securing a lock through the bores, when the apparatus is positioned around the primary handle of the lawn mower, so that the starting handle makes contact with the locking apparatus and cannot be moved adjacent the primary handle in order to prevent starting of the lawn mower.

5,746,075
COMBINATION PADLOCK
Yaw-Kuen Yang, No. 190-30, Chang Shoei Rd., Chang Hua, Taiwan
Filed Oct. 4, 1996, Ser. No. 725,906
Int. Cl.⁶ E05B *37/06*
U.S. Cl. 70—25 **2 Claims**



1. A combination padlock comprising:

a housing composed of a front housing and a rear housing, said front housing and said rear housing engaged to each other and provided respectively and correspondingly with a receiving cell, a recess, a pivoting hole penetrating into said receiving cell, said receiving cell having in a bottom thereof a predetermined number of through holes;

a shackle having a body portion engageable with said pivoting holes of said housing, and a hook portion engageable with said recesses of said housing; and

a numbered wheel set disposed in said receiving cells of said front housing and said rear housing, said numbered wheel set provided with a seat for mounting thereon a locking mechanism, said locking mechanism comprising a rotary shaft and a plurality of numbered wheels mounted on said rotary shaft such that each of said numbered wheels is capable of actuating a movable grid plate located thereunder for regulating an axial movement of said shackle along said pivoting holes of said housing;

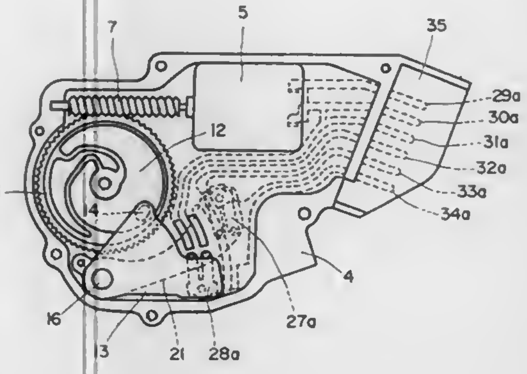
wherein said body portion of said shackle has a retaining portion engageable with a retaining means of said movable grid plate;

wherein said receiving cell of said front housing is provided in a bottom thereof with a position restricting block opposite in location to said body portion of said shackle for confining the movement of said shackle;

wherein said receiving cell of said rear housing is provided in a bottom thereof with a position restricting block and a retaining block, said position restricting block corresponding in location to said body portion of said shackle for confining said shackle, said retaining block being engageable with said retaining portion of said body portion of said shackle at such time when said shackle is pulled upwards;

wherein said seat of said numbered wheel set is provided respectively in two side walls thereof with a shaft slot for receiving said rotary shaft of said locking mechanism, said shaft slots are provided respectively at two sides thereof with a connection slot; wherein two fastening pieces are provided respectively with two connection ribs and are fastened respectively with both ends of said rotary shaft such that said connection ribs of said two fastening pieces are engaged with said connection slots of said shaft slots of said numbered wheel set.

5,746,076
DOOR LOCK ACTUATOR UNIT
Jiro Inoue, Yamanashi-ken, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 17, 1995, Ser. No. 559,943
Claims priority, application Japan, Nov. 21, 1994, 6-311116
Int. Cl.⁶ E05B *47/00*
U.S. Cl. 70—277 **9 Claims**



1. An actuator unit for shifting a lock lever of a vehicle door lock device between a locked position and an unlocked position, comprising:

a housing containing a reversible motor;

an inside lever disposed inside the housing and being shiftable by the reversible motor, said inside lever having a first shaft whose outer end extends through the housing and is connected to the lock lever substantially without any lost motion permitting a movement of the inside lever to be transmitted to the lock lever by way of the first shaft and vice versa;

first detecting means provided inside the housing for detecting a position of the inside lever cooperatively connected to the lock lever;

a key lever disposed inside the housing, said key lever having a second shaft whose outer end extends through the housing and is connected to a door key cylinder permitting a movement of the door key cylinder to be transmitted to the key lever by way of the second shaft;

second detecting means provided inside the housing for detecting a position of the key lever cooperatively connected to the door key cylinder and for outputting a signal to operate the reversible motor in one of the operating directions;

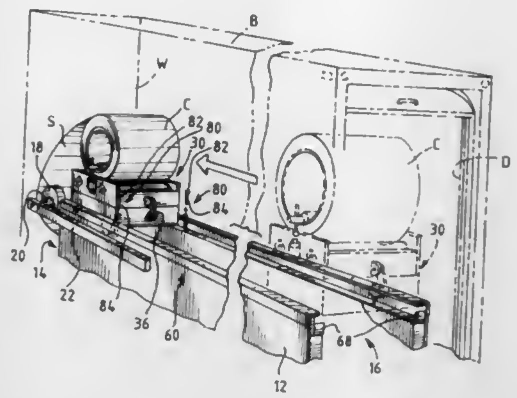
a plurality of conductive pieces each having a first end connected to at least one of the reversible motor, the first detecting means and the second detecting means; and

a connector to which a second end of each of the conductive pieces is attached;

wherein the first shaft and the second shaft are coaxial and separably rotatable relative to each other.

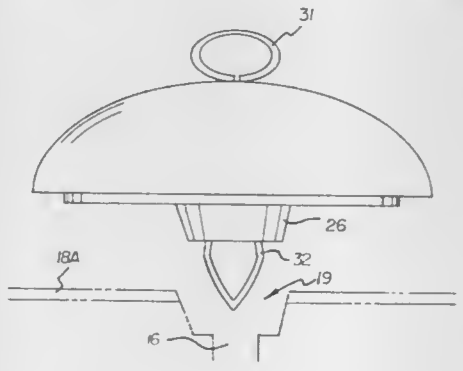
5,746,077
ARTICLE-ROLLING MACHINE HAVING SELECTIVELY POSITIONABLE DISPENSER FOR SHEET METAL COIL
Gregory R. Zaccagni, Aurora, and Joseph A. Kiely, Downers Grove, both of Ill., assignors to ZMC, Inc., Addison, Ill.
Filed Apr. 19, 1996, Ser. No. 636,734
Int. Cl.⁶ B21D *43/20*
U.S. Cl. 72—183 **8 Claims**

1. For a machine for rolling an article from a strip of sheet metal dispensed from a coil, in a truck body having a front wall and a back door, dispensing apparatus comprising an elongate base having an input end, which is toward the front wall of the truck body and at which a strip of sheet metal dispensed from a coil is inputted into the machine, and an output end, which is toward the back door of the truck body and at which an article rolled by the machine is outputted from the machine, means including a dispenser for



supporting a coil of sheet metal and for dispensing a strip of sheet metal from the supported coil, an elongate track mounted on the machine and extending between the input and output ends of the elongate base, and means for mounting the dispenser on the elongate track so that the dispenser can be selectively positioned on the elongate track in a loading position, near the output end of the elongate base and toward the back door of the truck body, or in a dispensing position, near the input end of the elongate base and toward the front wall of the truck body.

5,746,078
PROTECTION DEVICE FOR KEY LOCK OPENINGS
Mark Kiernan, 19 Anne C.T., Bramalea, Ontario, Canada, L6T 1K2
Filed Dec. 9, 1996, Ser. No. 762,276
Int. Cl.⁶ E05B *13/02;17/14*
U.S. Cl. 70—424 **10 Claims**



1. A protection device for a key lock opening proximate to an exterior surface, comprising:

a dome-shaped cap having an exterior convex surface, an interior concave surface, and a bottom surface adapted for engagement with the exterior surface;

a handle extending from the convex surface;

a magnetized clip extending from the concave surface and adapted to be disposed inside of the key lock opening; and

a plug extending from the concave surface and surrounding a portion of the clip, said plug adapted to fit within a recess in the exterior surface;

wherein the plug has a frusto-conical shape.

5,746,079
METHOD FOR THE PRODUCTION OF A VALVE HOUSING

Gerhard Hettinger, Ingelfingen, and Walter Rutsch, Niedernhall, both of Germany, assignors to Burkert Werke GmbH & Co., Ingelfingen, Germany

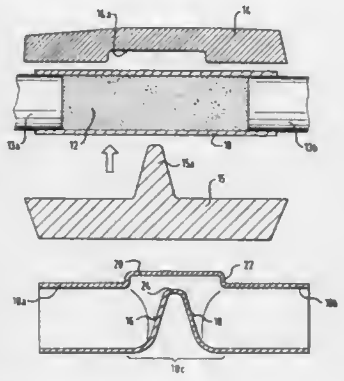
PCT No. PCT/EP96/00503, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO96/24448, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 7, 1996, Ser. No. 722,031

Claims priority, application Germany, Feb. 8, 1995, 195 04 120.8

Int. Cl.⁶ B21D *9/15*

U.S. Cl. 72—57 **19 Claims**



1. A method for the production of a valve housing comprising a metallic valve member by shaping of a cylindrical tube section comprising the following steps:

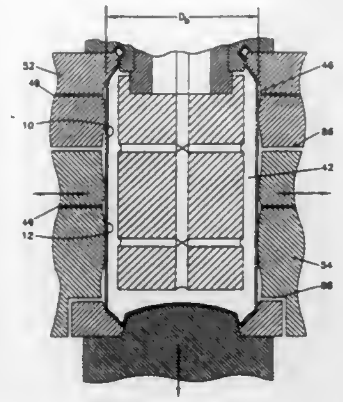
A) charging a cylindrical tube section with a filling material and closing opposite ends of the cylindrical tube section with obturating stamps;

B) placing the cylindrical tube section in a pressing mold after said charging and closing thereof;

C) shaping the cylindrical tube section within the mold in a single step while the cylindrical tube section is cold, said shaping being performed with a pressing stamp acting on the outside of the tube section perpendicularly to a longitudinal axis thereof and thrusting a tube wall of the tube section inward against the filling material and the filling material transmitting shaping pressure to an internal wall surface of the tube section, resulting in ends of the tube section being as tubular port sections by said obturating stamps and a center section between said ends being thrust inward forming a rib-shaped concave surface corresponding to a bottom of the valve member and an opposite side of the tube section being shaped by said mold into a flat, the concave surface forming two guide surfaces which converge inwardly toward said flat in a direction from said ends of the tube section;

D) removing the filling material from the shaped tube section;

E) forming at least one passage opening in said flat into which a flow path along said guides surfaces is directed and a connection surface surrounding the at least one opening.



5,746,080
SYSTEMS AND METHODS FOR MAKING DECORATIVE SHAPED METAL CANS

Mark W. Hartman, Lambertville, N.J.; Zeev W. Shore, Hazel Crest, Ill.; James J. Tang, Palatine, Ill.; Anton A. Aschberger, Downers Grove, Ill.; Michael R. Gogola, Oak Forest, Ill.; William O. Irvine, Chicago, Ill.; Ralph J. Trnka, Tinley Park, Ill.; Richard O. Wahler, Palatine, Ill., and Robert A. Winkless, Oak Lawn, Ill., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 542,422, Nov. 16, 1995, abandoned. This application Dec. 12, 1995, Ser. No. 551,073

Int. Cl.⁶ B21D *26/02*

U.S. Cl. 72—61 **19 Claims**

1. A method of manufacturing a metallic can body that is shaped distinctively in order to enhance its visual presentation to consumers, comprising steps of:

(a) making a can body blank;

(b) partially annealing at least a portion of the can body blank at temperature that is within the range of about 450 degrees Fahrenheit (232° C.) to about 500 degrees Fahrenheit (260° C.), thereby giving the annealed portion of the body blank increased ductility;

(c) providing a mold unit that has at least one mold wall that defines a mold cavity conforming to a desired final shape of the can body;

(d) positioning said can body blank within said mold cavity; and

(e) supplying a pressurized fluid into said mold cavity so that said can body blank is forced by pressure against said mold wall, causing said can body blank to assume the desired final shape of the can body.

5,746,081
REVERSING COMPACT INSTALLATION FOR COLD ROLLING STRIP-SHAPED ROLLING MATERIAL

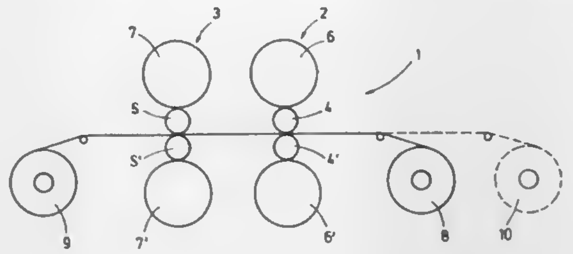
Klaus Klamma, and Wilfried Bald, both of Hilchenbach, Germany, assignors to SMS Schloemann-Siegmag Aktiengesellschaft, Dusseldorf, Germany

Continuation-in-part of Ser. No. 217,579, Mar. 25, 1994, abandoned. This application Dec. 10, 1996, Ser. No. 762,904

Claims priority, application Germany, Mar. 27, 1993, 43 10 063.5

Int. Cl.⁶ B21B *41/02*

U.S. Cl. 72—229 **8 Claims**



1. An installation for cold rolling strip-shaped rolling material, comprising:

two reversing reels;

a first reversing stand disposed between the two reversing reels;

a reel from which the strip to be used can be taken off; and

a second reversing stand provided in the rolling line of the first reversing stand,

wherein both first and second reversing stands can be adjusted corresponding to consecutive passes for performing the rolling process, wherein both first and second stands are simultaneously operated, wherein the reversing stands are four-high stands and comprise:

driven backup rolls, and work rolls displaceable in a horizontal direction from a vertical plane formed by one set of work rolls or backup rolls for horizontal stabilization.

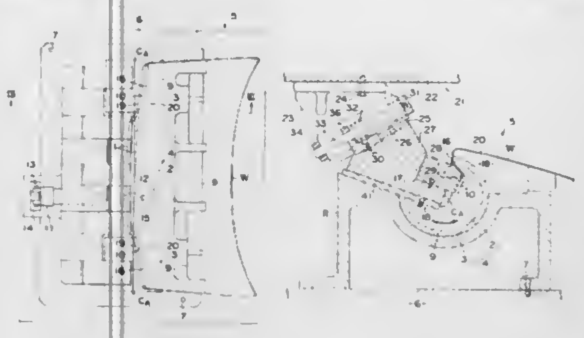
5,746,082
THIN SHEET FORMING DIE ASSEMBLY INCLUDING LOWER DIE CYLINDRICAL MEMBER HAVING VARIED DIAMETERS

Mitsuo Matsuoka, Hirakata, Japan, assignor to Umix Co., Ltd., Osaka, Japan

Filed Feb. 5, 1997, Ser. No. 795,779

Int. Cl.⁶ B21D *5/04*

U.S. Cl. 72—313 **10 Claims**



1. A pressing apparatus comprising a lower die having a supporting portion for supporting a metal sheet material to be worked and an upper die movable in a path downwardly and linearly with respect to said lower die to abut on the material to be worked, so as to shape the material to be worked, said pressing apparatus further comprising:

at least one cylindrical member having an outer surface being rotatably disposed in said lower die adjacent said supporting portion, said cylindrical member having a groove opening to said outer surface and extending along its axial extent and a recess forming portion formed at an edge portion of said groove near to said supporting portion and stepped inside from said path of said upper die;

a slide cam having a recess forming portion and slidably arranged on said upper die for confronting said cylindrical member; and

an automatic return element, provided in said lower die, for rotationally returning said cylindrical member to a starting position at which said material after being shaped can be taken out from said lower die,

wherein said material to be worked is placed on said supporting portion of said lower die and is shaped by said recess forming portion of said cylindrical member by sliding movement of said recess forming portion of said slide cam, and thereafter said cylindrical member is rotationally returned to said starting position by said automatic return element so that the worked material can be taken out from said lower die,

and wherein said at least one cylindrical member comprises a plurality of cylindrical members in varying diameters.

5,746,083
HEMMING MACHINE

Josef Kovarovic, Leicestershire, United Kingdom, and John Ralph Kowalewsky, West Midlands, Great Britain, assignors to Western Atlas U.K. Limited, Buckinghamshire, United Kingdom

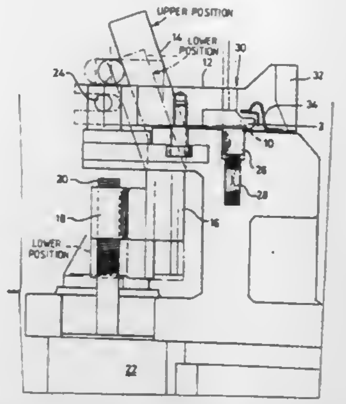
PCT No. PCT/GB95/00288, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO95/21710, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 13, 1995, Ser. No. 693,320

Claims priority, application United Kingdom, Feb. 14, 1994, 9402760

Int. Cl.⁶ B21D *39/02*

U.S. Cl. 72—315 **15 Claims**



1. A hemming machine adapted to externally hem a sheet metal fabrication around an external peripheral edge thereof, comprising a first anvil on which the fabrication rests and having an opening so as to register at least with an aperture in the metal fabrication which is also to be internally hemmed; an external hemming tool moveable downwards against the first anvil; an internal hemming tool mounted at an upper end of drive means located below and protruding up through the opening in the first anvil so as to protrude through the aperture in the fabrication; the internal tool being displaceable upwardly and downwardly as well as horizontally, and including a chamfered lower leading edge; a block carrying the internal tool at one end and horizontally movable in a slide, the block being adapted to transmit a force to the internal tool to force the tool in a downward direction against the internal hem of the fabrication; cam means engageable by the drive means for positioning the internal tool horizontally; and a movable second anvil resiliently displaceable and engageable with the underside of the internal tool to raise the latter relative to its lowermost position to enable the internal tool to move horizontally and effect a preliminary internal hemming.

5,746,084
DRAWING MECHANISM FOR A PRESS

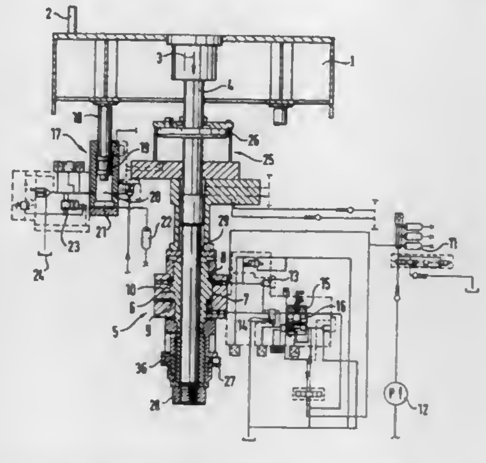
Siegfried Baur, Göppingen; Heinz Horn, Oberbausen, and Hartmut Dexling, Göppingen, all of Germany, assignors to Schuler Pressen GmbH & Co., Germany

Filed Oct. 11, 1996, Ser. No. 729,158

Claims priority, application Germany, Oct. 14, 1995, 195 38 316.8

Int. Cl.⁶ B21D *24/14*

U.S. Cl. 72—351 **20 Claims**



1. Drawing mechanism for a press, comprising

a drawing slide;

a plate holder with a plate held therein, with a holding force being applied to the plate by a piston rod displacable in parallel to a drawing direction, which holding force acts against the drawing direction; and

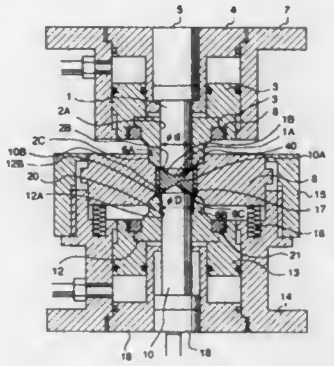
a control arrangement operatively associated with the plate holder such that, before the drawing slide is placed on the plate holder, the plate holder being accelerated in the drawing direction, the control arrangement comprises a pre-acceleration cylinder fixed to the press and having a pre-acceleration piston operatively connected with the piston rod, the pre-acceleration piston having first and second effective surfaces of different sizes acting in opposite directions, the pre-acceleration cylinder further having a first and a second pressure chamber, and the first effective surface of the pre-acceleration piston acts against the drawing direction and is larger than the second effective surface;

wherein the first and the second pressure chambers are connectable with a pressure reservoir, and the first pressure chamber is connectable with a metering cylinder having a displaceably guided metering piston for movement alone an axis parallel to an axis of movement of the piston rod, and a lead cylinder is fixed to the press and has a lead piston rod having an axis of movement spaced from the axis of movement of the piston rod and a lead piston separate from the lead piston rod, with a first pressure medium volume being arranged between the lead piston rod and the lead piston which is controllably dischargeable from the lead cylinder, and a second pressure medium volume being displaceable by the lead piston from the lead cylinder.

5,746,085

GEAR FORMING METHOD

Koji Harada, and Hisanobu Kanamaru, both of Hitachinaka, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 24, 1996, Ser. No. 668,780
Claims priority, application Japan, Jun. 30, 1995, 7-165133
Int. Cl.⁶ B21D *22/00*
U.S. Cl. 72—355.6 **9 Claims**



1. A method of forming a gear through cold plastic working, comprising the steps of:

disposing a disc-like blank in a gear die having a gear-shaped inner periphery so that an outer side periphery of the blank is surrounded by the gear-shaped inner periphery of the gear die;

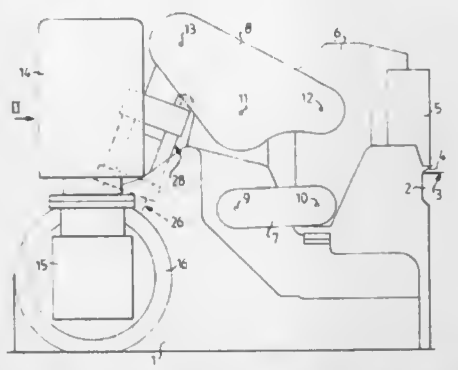
holding peripheral portions of both upper and lower end faces of a blank using a pair of constraint members to constrain axial plastic flow of the material of the blank in the peripheral portions of the upper and lower end faces of the blank; and

pressing concentrically on the upper and lower end faces of the blank with a pair of punches arranged and moved in opposite relation while restraining axial plastic flow in the peripheral portion of the blank and allowing radial plastic flow of the material into the gear die, thereby to form a gear, each of the punches having a diameter equal to or less than a small diameter of the gear die and having a tapered portion at a tip thereof.

5,746,086

DRIVING DEVICE WITH FORCE-LIMITING ELEMENT FOR A BENDING UNIT

Peter Palmqvist, Olofström, Sweden, assignor to AB Volvo, Goteborg, Sweden
PCT No. PCT/SG94/01246, § 371 Date Jul. 18, 1996, § 102(e) Date Jul. 18, 1996, PCT Pub. No. WO95/19856, PCT Pub. Date Jul. 27, 1985
PCT Filed Dec. 22, 1994, Ser. No. 676,280
Claims priority, application Sweden, Jan. 25, 1994, 9400219
Int. Cl.⁶ B21J *9/18;* **B21D** *5/00*
U.S. Cl. 72—450 **8 Claims**

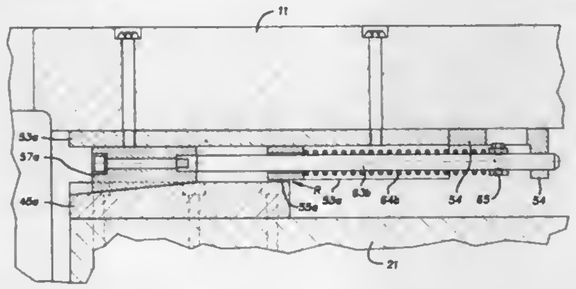


1. In a driving device for a bending unit for bending-in a projecting edge flange against a surface of a workpiece, the bending unit comprising a stand, which carries both the driving device and a supporting surface for the workpiece, and a linkage system which supports a bending tool in such a manner that the tool is movable relative to the workpiece placed on the supporting surface along a predetermined path of movement, the improvement wherein a motor is mounted on the stand and is coupled to a crankshaft mounted in the stand, said crankshaft carrying on a crank pin one end of a connecting rod, the other end of said connecting rod being articulated to a link in the linkage system, said connecting rod being movable by rotation of the crankshaft between a rest position, in which the connecting rod keeps the linkage system and the tool in a deactivated position, and a work position, in which the connecting rod keeps the linkage system and the tool in an end position, where bending-in of the edge flange is completed, and a force-limiting means operatively arranged in said driving device the mounting of the crankshaft in the stand and said linkage system, said force-limiting means being flexible after a predetermined load has been exceeded.

5,746,087

HEADING SLIDE GUIDING SYSTEM

Martin J. Wurm, Willard, and Stanley J. Wasserman, Fremont, both of Ohio, assignors to The National Machinery Company, Tiffin, Ohio
Continuation of Ser. No. 504,350, Jul. 19, 1995. This application Jun. 12, 1997, Ser. No. 873,328
Int. Cl.⁶ B21J *13/04*
U.S. Cl. 72—456 **12 Claims**

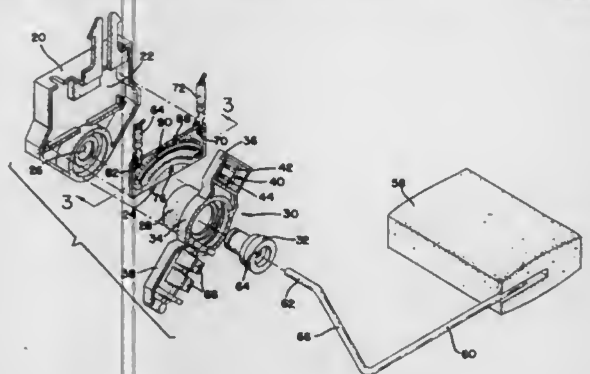


1. A progressive former comprising a machine bed frame, a die breast on said frame, a powered slide reciprocable on said frame to advance toward and retract away from said die breast, tooling mounted on said slide and die breast cooperating to define a plurality of work stations for progressively forming work pieces, said tooling on said slide being advanced into and maintained in working relationship with said tooling on said die breast as said slide completes its motion toward said die breast on each advance stroke, guide means including guide elements associated respectively with said frame and said slide for guiding said slide by constraining it against lateral motion at least during its advance toward said die breast, guide elements associated with said frame and guide elements associated with said slide having their guide faces laterally spaced to provide a running clearance between said frame and slide during the majority of each said advance stroke of said slide, and clearance take-up means for substantially eliminating said clearance toward the end of said advance stroke but before said tooling on said slide advances into working relationship with said tooling on said die breast, said clearance take-up means including a pair of complimentary wedging surfaces mutually engageable through movement of the slide to take-up clearance and thereafter remain substantially motionless with respect to one another during the tool working part of the advance stroke of the slide.

5,746,088

FUEL SYSTEM LOW CURRENT RHEOSTAT

Ulf Sawert, Grand Blanc; Hugh Wesley Ireland, Swartz Creek, and Timothy Francis Coha, Burton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 9, 1996, Ser. No. 594,889
Int. Cl.⁶ G01F *23/36;* **H01C** *10/08*
U.S. Cl. 73—317 **7 Claims**



3. A fuel lever indicator system comprising:

a resistor card having an arc-shaped resistive path comprising a first set of spaced apart conductor lines and an arc-shaped resistive ink material overlying said first set of conductor lines, and said conductor lines being formed at an angle with respect to a radial line drawn from the center of the resistive path arc; and an arc-shaped conductive path comprising an arc-shaped continuously solid conductor base and a second set of spaced apart conductor lines extending from said base at an angle with respect to a radial line drawn from the center of the arc-shaped conductor base, and

a wiper assembly having a pair of spaced apart arms, each arm having a plurality of parallel fingers extending from one end and constructed and arranged so that one of said fingers on a first arm engages a conductor line on the resistive path and a second finger on said first arm engages an adjacent conductor line along said resistive path; and a first finger on said second arm engages a conductive line on said conductive path, and

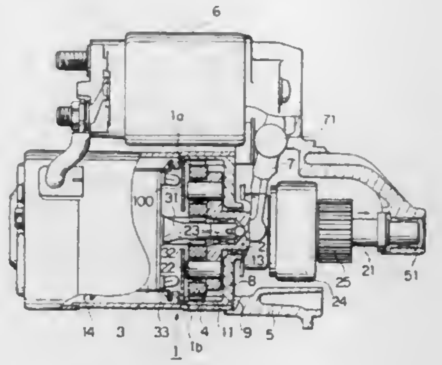
a second finger on said second arm engage an adjacent conductor line on said conductive path, said wiper assembly being constructed and arranged to provide rotational movement along the arc-shaped conductive path and arc-shaped resistive path;

a float having a lever extending therefrom and connected to said wiper assembly to produce rotational movement of the wiper assembly associated with movement of the float.

5,746,089

PLANETARY GEAR-TYPE STARTER

Yoshihiro Morimoto, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 4, 1997, Ser. No. 795,307
Claims priority, application Japan, Jul. 8, 1996, 8-177818
Int. Cl.⁶ H02K *7/00;* **F02N** *11/00*
U.S. Cl. 74—7 E **4 Claims**



1. A planetary gear-type starter comprising:

a motor having a cylindrical yoke, an output shaft and an armature fixedly mounted on said output shaft for integral rotation therewith and disposed in said cylindrical yoke; and

a planetary gear reducer for reducing a rotational output of said motor and transmitting the reduced rotational output to a starting object;

said planetary gear reducer comprising:

a ring gear having an inner peripheral gear portion formed at an inner periphery thereof and being engaged at its outer periphery with said cylindrical yoke;

a sun gear formed on the outer periphery of said motor output shaft;

a plurality of planetary gears disposed between said inner peripheral gear portion of said ring gear and said sun gear so as to be in meshing engagement with said inner peripheral gear portion and said sun gear; and

a starter output shaft connected at its one end with said planetary gears for relative rotation with respect thereto as well as revolution about said sun gear together with said planetary gears, said starter output shaft being rotatably supported by said ring gear and adapted to be engageable at its other end with the starting object;

wherein said ring gear is normally fixed to said cylindrical yoke against rotation relative thereto but permitted to rotate relative thereto in a circumferential direction of said yoke only when a rotational torque applied to said ring gear exceeds a predetermined value

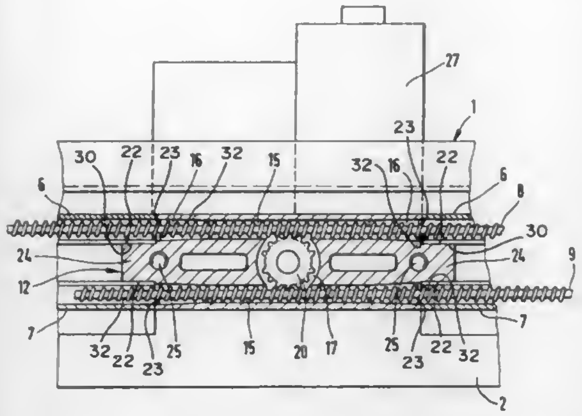
wherein said cylindrical yoke comprises a cylindrical portion having a diametrically enlarged offset portion with an annular shoulder formed at one end thereof, said ring gear being fitted in and engaged with said offset portion, and wherein a plate is disposed and fixedly held between said shoulder and an end surface of said ring gear in such a manner that said plate is disposed between an end of said armature and an adjacent end of each of said planetary gears.

5,746,090

DRIVE APPARATUS FOR SLIDING ROOFS FOR AUTOMOBILES

Christoph Boss, Frankfurt, and Hubert Bachmann, Dannstadt, both of Germany, assignors to Meritor Automotive GmbH, Germany
Filed Aug. 20, 1996, Ser. No. 704,403
Claims priority, application Germany, Aug. 26, 1995, 195 31 514.6
Int. Cl.⁶ F16H *19/04;* **B60J** *7/043;7/057*
U.S. Cl. 74—89.17 **5 Claims**

1. A drive apparatus for driving a pair of flexible drive cables of an automobile sliding roof, comprising:



- a drive casing, said casing including a pair of mutually parallel spaced-apart channels having a determined spacing width between them, said channels adapted to receive said cables slidingly therein, each said channel having a central hollow portion dimensioned to closely surround said cables, each said channel further having first and second flared ends at which are provided cable guides aligned axially with said channels, wherein said cables are enclosed within said channels and wherein each of said cables have exposed portions emerging from said cable guides; and
- a drive pinion rotatably mounted to said casing between said channels, said drive pinion connected to said cables for slidingly driving said cables within said channels.

5,746,091

DEVICE FOR ELIMINATING PLAY IN GEAR WHEELS

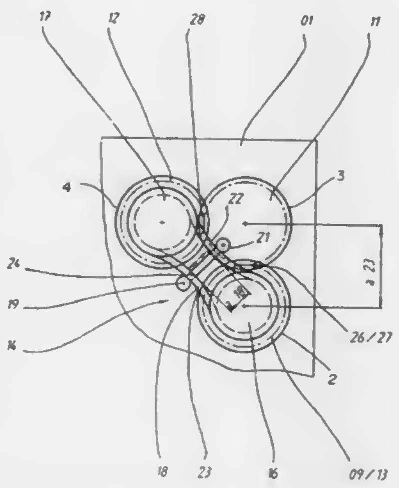
Johannes Georg Schaede, Würzburg, Germany, assignor to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Filed Oct. 18, 1995, Ser. No. 544,580

Claims priority, application Germany, Oct. 18, 1994, 44 37 145.4

Int. Cl.⁶ F16H *55/18;* **B41F** *13/012*

U.S. Cl. 74—409 **5 Claims**



1. A device for the elimination of play between first and second directly cooperating gear wheels supported on first and second journals of first and second cylinders of a rotary printing press and in which said first and second cylinders are disposed at an axial spacing distance from each other and in which said axial spacing distance is changeable during operation of said rotary printing press, said device comprising:

- a toothed segment rotatable supported on said first journal coaxial with said first gear wheel and in engagement with said second gear wheel, said toothed segment being shiftable on said first journal in a circumferential direction with respect to said first gear wheel; and
- a phase adjusting gear assembly for effecting said circumferential shifting of said toothed segment with respect to said first gear wheel during operation of said rotary printing press.

5,746,092

VISCOUS COUPLING GEAR DEVICE

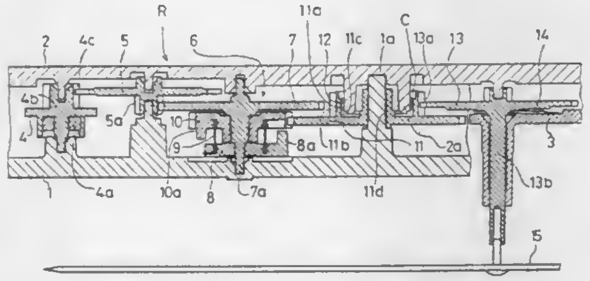
Koji Baba, Tokyo, Japan, assignor to Seiko Clock Inc., Japan

Filed Sep. 28, 1995, Ser. No. 535,520

Claims priority, application Japan, Sep. 28, 1994, 6-233278

Int. Cl.⁶ G04C *3/14*

U.S. Cl. 74—421 R **19 Claims**



12. In a gear device having a first gears, means for intermittently rotating the first gear, at least a second gear, and a housing for supporting the respective gears, the improvement comprising: a viscous coupling for absorbing a velocity variation due to the intermittent rotation of the first gear to thereby transmit a smooth and continuous rotary motion to the second gear, the viscous coupling comprising a pair of upstanding tubular projections extending from a respective one of the gears, the tubular projections being spaced apart to define a gap, a projection extending from the housing into the gap, and a viscous fluid disposed in the gap.

5,746,093

COMPENSATING DEVICE FOR COMPENSATION OF A TORQUE THAT DEPENDS ON THE ANGLE OF ROTATION, AND MEDICAL STAND WITH SUCH A COMPENSATING DEVICE

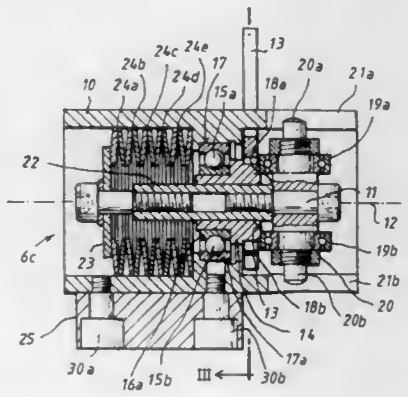
Christof Poglitsch, Aalen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Feb. 22, 1996, Ser. No. 603,969

Claims priority, application Germany, Mar. 11, 1995, 195 08 863.8

Int. Cl.⁶ F16M *11/12;* **G12B** *3/00;* **G05D** *17/02;* **G01L** *3/00*

U.S. Cl. 74—490.05 **5 Claims**



1. A compensating device for compensating a torque that depends on rotation angle and results from rotational motion of a mass around a rotation axis (3*b*, 4*a*, 5) comprising:

- a movably mounted displacement unit (**11**) arranged for linear displacement along a displacement axis, which linear displacement is caused by said rotational motion and depends on said rotation angle,
- at least one elastic compensating element (**24***a*, **24***b*, **24***c*, **24***d*, **24***e*) that is arranged to exert on said displacement unit (**11**) a compensating force in a direction opposite to said linear displacement of said displacement unit (**11**), which compensating force depends on said linear displacement of said displacement unit, wherein said compensating device compensates for torque acting at any given time,
- at least one connecting element (**13**) for connecting said mass to said compensating device, and
- a sleeve (**14**) with at least one cam (**18***a*, **18***b*), mounted rotatably around said displacement axis (**12**) and connected to said connecting element (**13**), wherein said displacement unit (**11**) is arranged to be urged into contact with said at least one cam (**18***a*, **18***b*) of said sleeve (**14**), and said displacement unit (**11**) is provided with at least one ball bearing (**19***a*, **19***b*) that is arranged to roll on said cam (**18***a*, **18***b*) during rotational motion of said mass.

5,746,094

AUTOMATIC LENGTH-CORRECTING DEVICE FOR FLEXIBLE CABLE DRIVES IN PARTICULAR A CABLE-ADJUSTING DEVICE

Thomas Medebach, Wetzlar-Dudenhofen, and Klaus Marscholl, Ehringshausen-Breitenbach, both of Germany, assignors to Kuster & Co., GmbH, Ehringshausen, Germany

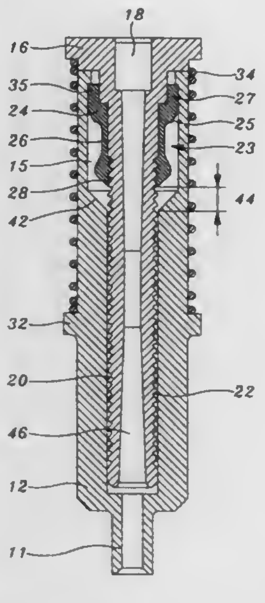
PCT No. PCT/EP96/00596, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996, PCT Pub. No. WO96/25604, PCT Pub. Date Aug. 22, 1996

PCT Filed Feb. 13, 1996, Ser. No. 722,197

Claims priority, application Germany, Feb. 13, 1995, 195 04 497.5

Int. Cl.⁶ F16C *1/22*

U.S. Cl. 74—502.4 **9 Claims**



1. An automatic length-correcting device for a flexible cable drive, said device comprising:

- an essentially bush-like casing (**12**) with a longitudinal borehole (**14**),
- a tube fitting (**16**) having a seat for engaging the bush-like casing and a duct (**46**) in the region of an integral extension (**20**) for receiving a cable of the cable drive, an outside wall of said integral extension being fitted with a radial toothing (**22**), wherein the extension (**20**) is guided in a longitudinally displaceable manner in said longitudinal borehole,
- a compression spring (**34**) being mounted between the casing (**12**) and the tube fitting (**16**) to act on the tube fitting (**16**) to longitudinally displace said tube fitting out of the casing (**12**), and
- a detent means (**23**) cooperating with said radial toothing (**22**),

wherein the casing (**12**) comprises at a rear segment (**13**) a receiving recess (**15**), the detent means (**23**) being entirely disposed within said receiving recess (**15**) and displaceable between two limit positions from a locked position into an unlocked position, said detent means (**23**) cooperating with said radial toothing (**22**) within said receiving recess.

5,746,095

METHOD OF FORMING ROTARY DRILLING TOOLS

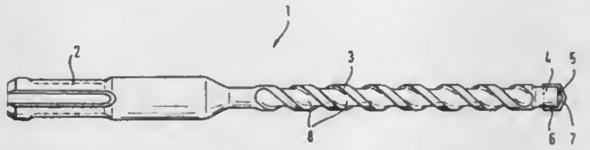
Dieter Söhnlein, Kaufering, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 17, 1996, Ser. No. 664,720

Claims priority, application Germany, Jun. 17, 1995, 195 22 033.1

Int. Cl.⁶ B21K *5/04*

U.S. Cl. 76—108.6 **5 Claims**



1. Method 3, of forming rotary drilling tools (**1**, **100**, **101**) for working on materials subject to brittle failure, such as rock drilling tools for hammer drilling equipment, comprising shaping an axially extending conveying helix (**3**) in an axially extending tool blank (**11**) with the helix being arranged in an axially extending section of the tool blank between an axially extending shank (**2**) and an axially extending cutting head region (**4**), forming the cutting head region (**4**) free of any conveying helix with an axial extent (l) of at least 10% of the maximum diameter (d) of the tool in an axially extending region of the conveying region, forming the cutting head region (**4**) with the diameter (d) of the cutting head region reduced in parts thereof and forming said cutting head region (**4**) with at least two faces (**10**) located opposite one another and extending approximately parallel to one another.

5,746,096

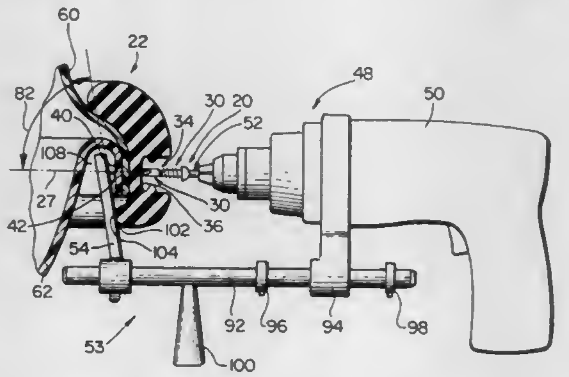
BREAK-OFF DRILLPOINT SCREW

Richard Lukes, Calmar, Iowa, assignor to Textron Inc., Providence, R.I.

Filed Jun. 26, 1995, Ser. No. 494,703

Int. Cl.⁶ B25B *21/00;* **F16B** *25/00;31/00*

U.S. Cl. 81—54 **11 Claims**



1. A method of fastening a fastener to a workpiece, said workpiece having a first side and a second side, said fastener including a shank defining a central axis, a drive head formed on one end of said shank, a drill-point portion located on said shank generally

opposite said head. a threaded portion located on said shank between said head and said drill-point portion and a frangible detachment portion formed an external surface of said shank between said drill-point portion and said threaded portion. said method comprising the steps of:

driving said fastener to drive said drill-point portion into said first side of said workpiece;

driving said fastener into said workpiece with said threaded portion engaging said workpiece until at least a tip of said drill-point portion exits said second side of said workpiece and at least partially extends toward a third surface proximate to said second side;

placing an interference block proximate to said second surface, said interference block providing said third surface along a driving path of said fastener for creating point interference with said tip of said drill-point portion to fracture said detachment portion and facilitate the division of said drill-point portion from said threaded portion; and

continuing to drive said fastener until said tip of said drill-point portion contacts said third surface positioned proximate to said second side causing said drill-point portion to detach from said threaded portion at said frangible detachment portion.

5,746,097

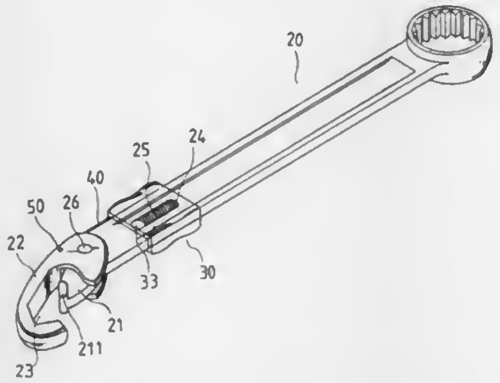
WRENCH HAVING A SPRING BIASED JAW

Frank McCann, 121, Yung Ho Road, Ta Ya Hsiang, Taichung Hsien, Taiwan

Filed Feb. 19, 1997, Ser. No. 802,867

Int. Cl.⁶ B25B *13/28*

U.S. Cl. 81—99 **2 Claims**



1. A wrench for driving a fastener, said wrench comprising:

a handle including a first end having a fixed jaw provided in said first end,

a pivotal jaw pivotally coupled to said first end of said handle at a pivot axle, and

means for rotating said pivotal jaw and for moving said pivotal jaw toward said fixed jaw and for allowing said pivotal jaw and said fixed jaw to solidly engage with the fastener, said rotating means including a knob slidably engaged on said handle, means for coupling said knob to said pivotal jaw, and means for biasing said knob toward said pivotal jaw and for moving said pivotal jaw toward said fixed jaw,

said pivotal jaw including a pin, said knob including a notch, said coupling means including a resilient blade having a first end pivotally coupled to said pivotal jaw at said pin and having a second end secured to said notch of said knob, for allowing said knob to move said pivotal jaw toward said fixed jaw.

5,746,098

ADJUSTABLE SPANNERS

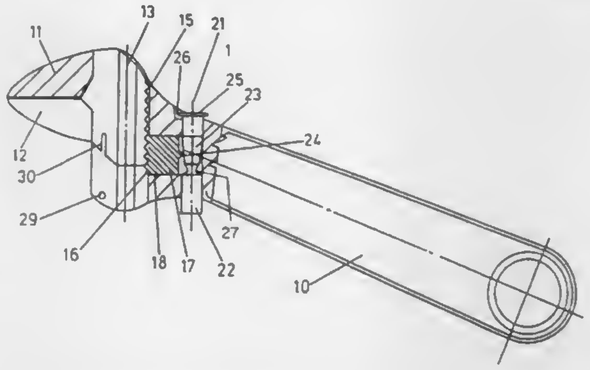
Ian Austin Harrison, 1,2 & 3 Cambridge Rd., Easthourne, East Sussex, BN22 7BP, Great Britain

Continuation of Ser. No. 430,117, Apr. 27, 1995, abandoned, which is a continuation of Ser. No. 137,025, Dec. 7, 1993, abandoned. This application Sep. 11, 1996, Ser. No. 714,032

Claims priority, application United Kingdom, Apr. 15, 1991, 9107930; Jun. 19, 1991, 9113264

Int. Cl.⁶ B25B *13/22*

U.S. Cl. 81—143 **7 Claims**



1. An adjustable spanner, comprising:

a) a body provided with a fixed jaw and a handle, and having a bore extending through said body;

b) a movable jaw mounted in said body for sliding movement relative to said fixed jaw, said movable jaw having a surface provided with a first set of serrations;

c) a locking member having a surface provided with a second set of serrations, and a projection provided on an opposite surface to the serrations with said projection extending transversely into said bore, said locking member being mounted in said body so as to be movable between a locking position in which said second set of serrations engages with said first set of serrations to lock said movable jaw in an operative position and a release position in which said second set of serrations is clear of said first set of serrations to allow adjusting movement of said movable jaw, said locking member comprising a spring and being resiliently biased away from said movable jaw by the spring;

d) a locking pin being mounted in the bore of said body for sliding axial movement between a release position and a locking position, said pin extending through said bore so as to project form both ends of said bore to be accessible to a user on both sides of said body, said pin having a recessed portion in its surface facing said projection, said recessed portion consisting of an inclined surface and, at the end of said inclined surface furthest spaced from said projection, a recess shaped to receive said projection, whereby axial movement of said locking pin by user pressure from one side of said body brings said inclined surface into engagement with said projection and further movement of said pin in the same direction causes said inclined surface to urge said locking member towards said movable jaw and bring said first and second sets of serrations into mutual engagement and then to wedge said locking member into its locking position, and axial movement of said locking pin the opposite direction by user pressure from the other side of said body releases the wedging action and further movement in said opposite direction changes the point of contact between said projection and said inclined surface so that said projection reaches said recess and moves into said recess under influence of said spring so as to bring said first and second sets of serrations out of engagement and allow free movement of said movable jaw.

5,746,099

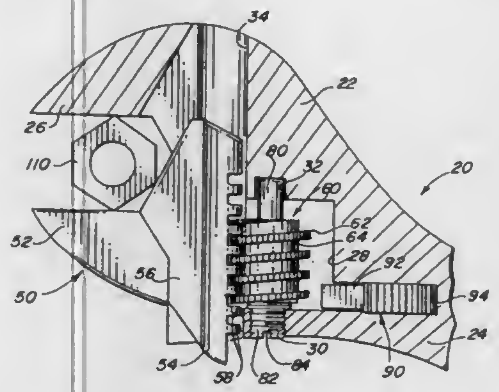
ADJUSTABLE OPEN-WRENCH WITH A SLIDING SIDE JAW HAVING A RELEASABLE ADJUSTMENT MECHANISM TO ALLOW RATCHETING OPERATION

Paul Janson, 19151 Tulsa St., Northridge, Calif. 91326

Filed Oct. 4, 1996, Ser. No. 725,777

Int. Cl.⁶ B25B *13/16*

U.S. Cl. 81—165 **2 Claims**



1. An adjustable sliding jaw wrench comprising:

a) a wrench head having a receiving aperture extending in a lateral direction within said wrench head, said wrench head having a fixed jaw mounted at a first end thereof and a handle extending from a second end thereof which is opposite said first end thereof, said wrench head also having a large opening defined therein, a portion of said receiving aperture being in communication with said large opening in said wrench head;

b) a rack member slideably mounted in said receiving aperture, said rack member supporting a moveable jaw therefrom which moveable jaw faces said fixed jaw and moves respectively toward and away from said fixed jaw as said rack member slides within said receiving aperture in said wrench head;

c) a worm gear rotatably supported on a spindle within said large opening in said wrench head, said worm gear engaging said rack member such that either rotation or lateral movement of said worm gear drives said rack member to slide in said receiving opening in said wrench head, said worm gear being laterally slideable on said spindle between first and second lateral positions;

d) a worm gear biasing spring for laterally biasing said worm gear on said spindle in a direction from said second lateral position toward said first lateral position;

e) a locking member mounted on said wrench head for selective movement between locked and unlocked positions, said said locking member retaining said worm gear in said first lateral position when said locking member is in said locked position, said locking member allowing said worm gear to slide from said first lateral position to said second lateral position when said locking member is in said unlocked position;

f) wherein said locking member is mounted on said wrench head such that when said locking member is in said locked position, said locking member extends between a first end of said worm gear and a side of said large opening in said wrench head to positively prevent said worm gear from sliding from said first lateral position toward said second lateral position;

g) a smaller opening located in said wrench head adjacent to and in communication with said large opening in said wrench head, said smaller opening in said wrench head extending from said large opening in said wrench head in a direction orthogonal to said lateral direction, said smaller opening in said wrench head being located adjacent the side of said large opening in said wrench head toward which said worm gear moves when it moves from said first lateral position to said second lateral position; wherein said locking member is H-shaped, with the bottom portions of the legs of the H being configured to fit over the portion of said wrench head adjacent the side of said smaller opening in said wrench head which is located furthest from said large opening in said wrench head, and the top portions of the legs of the H being configured to fit over said spindle and said spring.

5,746,100

METHOD OF PERFORATING FILM

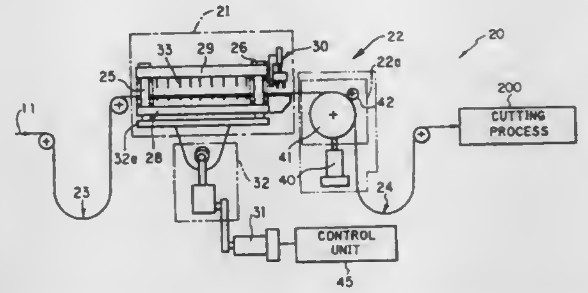
Hiroshi Tsuzaki; Takeshi Kanaoka, and Junichi Tsuchiya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 162,299, Dec. 7, 1993, abandoned. This application Aug. 28, 1996, Ser. No. 704,977

Claims priority, application Japan, Dec. 7, 1992, 4-326981; Dec. 9, 1992, 4-329506

Int. Cl.⁶ B26D *5/20*

U.S. Cl. 83—13 **3 Claims**



1. A method for forming perforations at regular intervals in first sections of a variable length in a continuous photographic film, said first sections alternating with second sections of a constant length along said continuous photographic film, said second sections having no perforations formed therein, said length of said first sections corresponding to a particular film type of a plurality of predetermined film types, said method comprising the steps of:

(a) disposing a die set having a plural number M of punches and dies arranged in a feeding direction of said continuous photographic film, to form said plural number M of said perforations at once for each die-punching through a length of A in said continuous photographic film, M being an integer greater than one;

(b) selecting said film type from among said predetermined film types, said length of said first sections, corresponding to said film type, being N×A, N being an integer, and said constant length of said second sections being B−A, wherein B and A are constants;

(c) feeding said continuous photographic film intermittently (N−1) times by the length A and, thereafter, once by a length of B; and

(d) actuating said die set to perform a die-punching after each of said film feedings, so as to form N×M perforations in said first sections by N feedings and die-punchings.

5,746,101

METHOD FOR CUTTING A CORD REINFORCED ELASTOMERIC LAMINATE

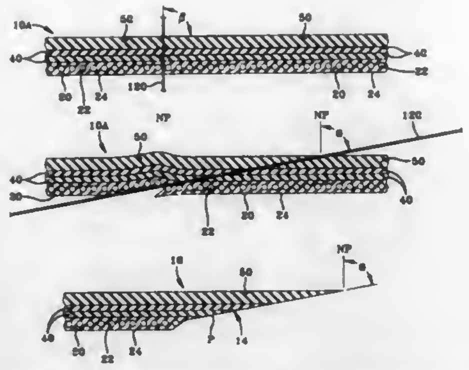
James Alfred Benzing, II, Stow; William James Head, Ravenna; Daniel Ray Downing, Uniontown; Larry James Gehrett, Atwater, and Harold Aloysius Wolbert, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 369,211, Jan. 5, 1995, abandoned. This application Nov. 29, 1996, Ser. No. 758,401

Int. Cl.⁶ B26D *1/547*

U.S. Cl. 83—34 **10 Claims**

1. A method of cutting a cord reinforced elastomeric laminate, the laminate having a length, a width and a thickness, and including at least one cord reinforced elastomeric radial ply, the ply having parallel cords oriented at an angle about 90° relative to the



length of the laminate, and a plurality of elastomeric components laminated to the ply, the method of cutting the laminate comprising the steps of:

- cutting the laminate across a majority of the width and thickness of the laminate at an angle θ greater than 60° relative to a plane (NP), the plane (NP) being perpendicular to the ply and parallel to the cords in the ply, the cutting being accomplished by passing a cutting element through the ply and laminated components to be cut, the cutting element being passed between two adjacent parallel cords of the ply;
- changing the angle θ prior to cutting the ply by changing relative position of the cutting element and the ply to an angle β, β being measured relative to the plane, the plane perpendicular to the ply and parallel to the cords, β being less than θ;
- cutting into the ply a short distance sufficient to position the cutting element between the two parallel cords; and
- reorienting the cutting element relative to the ply to the angle θ and continuing to cut the laminate across said width.

5,746,102

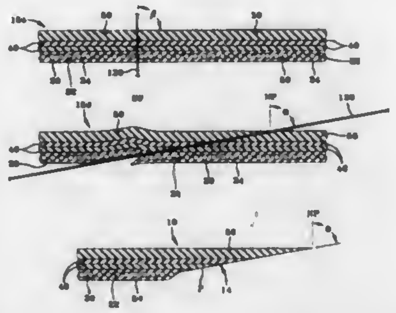
METHOD FOR CUTTING A CORD REINFORCED ELASTOMERIC LAMINATE

James Alfred Benzing, III, Stow; William James Head, Ravenna; Daniel Ray Downing, Uniontown; Larry James Gehrett, Atwater, and Harold Aloysius Wolbert, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 369,211, Jan. 5, 1995, abandoned. This application Dec. 19, 1996, Ser. No. 770,634

Int. Cl.^{6} B26D *1/547*

U.S. Cl. 83—34 **9 Claims**



1. A method of cutting a cord reinforced elastomeric laminate, the laminate having a length, a width and a thickness and including at least one cord reinforced elastomeric radial ply, the radial ply having parallel cords oriented at an angle from 65° to 90° relative to the length of the laminate, and a plurality of elastomeric components laminated to the ply, the method of cutting the laminate comprising the steps of:

- cutting the laminate across a majority of the width and thickness of the laminate at an angle θ greater than 60° relative to a plane (NP), the plane (NP) being perpendicular to the ply and parallel to the cords in the ply, the cutting being accomplished by passing a cutting element through the ply and laminated components from one side of the laminate to the other side until the ply and other laminated components are cut, the cutting element being passed between two adjacent parallel cords of the ply in a region of the ply;
- changing the angle θ prior to cutting the ply by changing relative position of the cutting element and the ply to an angle β, β being measured relative to the plane (NP), the plane (NP) being perpendicular to the ply and parallel to the cords, β being less than θ;
- cutting into the ply a short distance sufficient to position the cutting element between the two parallel cords; and
- reorienting the cutting element relative to the ply to the angle θ and continuing to cut the laminate across said width.

5,746,103

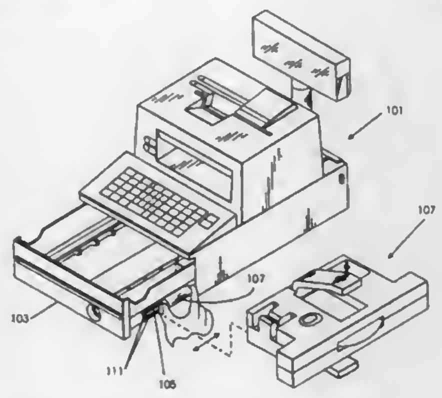
COIN ROLL OPENING DEVICE

Danny Hugh Addison, Durham; George Hufford, III, Clayton; Charles Martin McCray, Raleigh; Kevin L. Schultz, Raleigh, and Craig Walton Turner, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 415,954, Apr. 3, 1995, Pat. No. 5,609,086. This application Aug. 1, 1996, Ser. No. 709,560

Int. Cl.^{6} B26D *1/02*

U.S. Cl. 83—440 **11 Claims**



1. A coin roll opening device comprising:

- a cash drawer having two guides located on a first side of said cash drawer, said guides adapted for receiving a coin roll, said cash drawer having a blade assembly receptacle located between said guides, said blade assembly receptacle having two slots;
- a blade assembly having a blade, a blade holder, and two flexible arms disposed on the blade holder, the blade having a scoring edge, said blade holder for securing said blade in the blade assembly such that the scoring edge of the blade is exposed, the flexible arms cooperating with the slots of the blade assembly receptacle to secure said blade assembly within the blade assembly receptacle.

5,746,104

TWO-PIECE HOLE PUNCH

Howard L. Russell, and William N. Morris, Jr., both of Wilmington, N.C., assignors to Wilmington Rubber & Gasket Co., Inc., Wilmington, N.C.

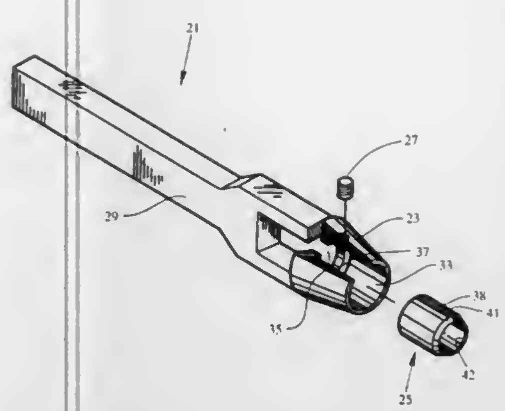
Filed Aug. 23, 1996, Ser. No. 702,067

Int. Cl.^{6} B26D *7/26*

U.S. Cl. 83—698.71 **7 Claims**

7. A punch for use in a punch press to perforate a workpiece, comprising:

- a shank portion for retaining engagement in said punch press;
- a two-piece cutter element including a socket member attached to said shank portion, said socket member having a socket bore with an open end, and a substantially cylindrical annular cutter insert dimensioned to be received in said bore and for seated disposition in said bore;



- said bore including a shank end comprising an annular mounting surface having an opening of reduced diameter relative to said bore, said mounting surface abutting said cutter insert when said cutter insert is in its seated disposition;
- said cutter insert having a cutting end projecting outwardly from said socket member when said cutter insert is in its seated disposition, a cutting edge formed on said cutting end, and an inwardly extending annular shoulder at said cutting end to form a reinforced throat for said cutting edge;
- said cutting edge including an outer bevel formed on the outer annular circumference of said cutter insert at said cutting end, and an inner cleaving edge formed on the inner annular circumference of said cutter element at said cutting end; and
- a set screw threadedly mounted in said socket member to extend into selectively releasable locking engagement with said cutter insert.

5,746,105

BREAD SLICER

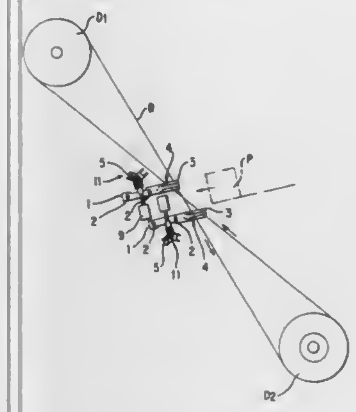
Tomosaburo Suzuki, Kanagawa-ken, and Sanji Kawakami, Kodaira, both of Japan, assignors to Daisey Kikai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 215,570, Mar. 22, 1994, abandoned. This application Oct. 21, 1996, Ser. No. 734,130

Claims priority, application Japan, Mar. 23, 1993, 5-103434; Aug. 23, 1993, 5-241925

Int. Cl.^{6} B23D *53/00*

U.S. Cl. 83—804 **5 Claims**



1. A bread slicer which comprises:

- a plurality of endless blades mounted on the bread slicer and stretched over two spaced drums.
- a plurality of fingers respectively attached to a plurality of finger holders:
- a plurality of guide bars positioned on the bread slicer parallel to said drums, said guide bars movably supporting and guiding each of said finger holders so as to position the blades,
- a plurality of springs respectively positioned on at least one of the guide bars and located between the finger holders, each of said strings biasing adjacent finger holders so as to space the adjacent finger holders from each other;
- a finder interval holding member mounted on the bread slicer and including a rotatable spacer shaft and rows of spacers positioned on the shaft which differ in width from one another wherein the rotatable spacer shaft is positioned parallel to said guide bars and said spacers are positionable between adjacent finger holders so as to space apart the finger holders so as to have equal intervals therebetween; and
- a finger holder fixing device mounted on the bread slicer and clamping the finger holders from opposite sides of the finger holders wherein an air cylinder is mounted on the bread slicer, said air cylinder moving said spacer shaft towards and away from the finger holders.

5,746,106

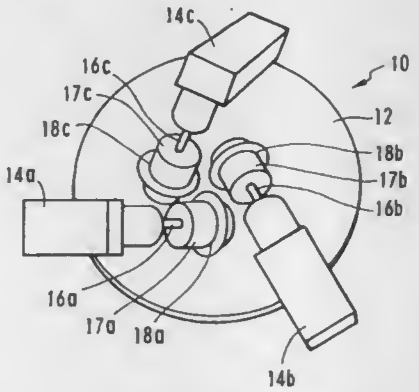
HIGH VOLUME MEAT PRODUCT INCISOR

Ralph S. Hodges, 2907 Shelter Island Dr., No. 105-205, San Diego, Calif. 92106

Filed Jan. 15, 1997, Ser. No. 784,155

Int. Cl.^{6} A23L *1/00;* **A47J** *37/00;* **B26B** *29/00;* **B26D** *3/08*

U.S. Cl. 83—884 **21 Claims**



1. A device for superficially incising a sausage-like meat product which comprises:

- a base;
- a plurality of cutting elements each said cutting element including a cylinder and having a circular blade with a cutting edge extending radially therefrom, said blade defining a blade center and, said cutting edge being distanced from said center by a radius, said plurality of cutting elements being positioned to establish a chute therebetween for concertedly incising the meat product with respective said cutting edges as the meat product passes through said chute, said chute defining a chute axis; and
- a drive means mounted on said base and attached to said respective cutting elements for rotating said cutting elements about a blade axis, said plurality of blade centers being located in a base plane with said base plane being substantially perpendicular to said chute axis and each said blade axis being inclined relative to said base plane with one said radius substantially perpendicular to said chute axis.

5,746,107
PNEUMATIC BOOSTER WITH REDUCED LOAD AND REDUCED HYSTERESIS

Jean Pierre Gautier, and Ulysse Verbo, both of Aulnay-sous-Bois, France, assignors to Bosch Systems De Freinage, Drancy, France

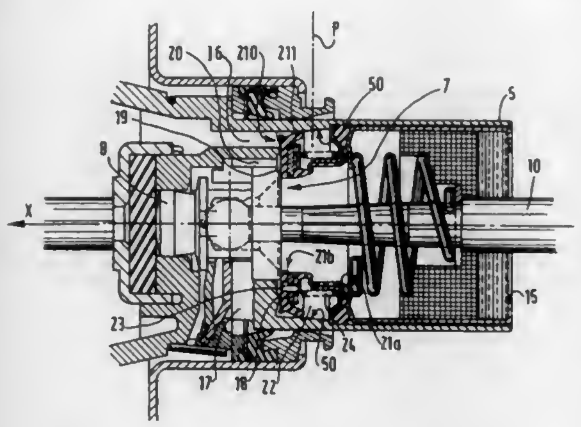
PCT No. PCT/FR95/01089, § 371 Date Sep. 19, 1995, § 102(e) Date Sep. 19, 1995, PCT Pub. No. WO96/07573, PCT Pub. Date Mar. 14, 1996

PCT Filed Aug. 17, 1995, Ser. No. 525,573

Claims priority, application France, Sep. 8, 1994, 94 10727

Int. Cl.^{6} F15B *9/10*

U.S. Cl. 91—376 R **4 Claims**



1. A pneumatic brake booster comprising: a rigid casing having a movable partition which delimits a front chamber from a rear chamber, a hollow piston connected to said movable wall and having a first inlet connected to a first source of pressure with a relatively high pressure, a second inlet connected to said front chamber and a second source of pressure having a relatively low pressure and an outlet connected to said rear chamber wherein the pressure in said rear chamber is to be controlled, and a valve located in said hollow piston for selectively communicating between one of said first and second inlets and said outlet, said valve having a first annular seat formed by an internal crown within said hollow piston adjacent said second inlet, a second annular seat concentric to said first annular seat with a clearance to define a passage connected to said outlet, said second annular seat axially sliding with respect to said first seat from a position of rest wherein said second annular seat is further from said front chamber than said first annular seat to an actuating position wherein said second annular seat is at least as close to said front chamber as said first annular seat, and a shut-off member having a tubular shape with a posterior part mounted in a seal relationship within said hollow piston at a distance away from said first annular seat and the inside of said tubular shape being connected to said first source of pressure, said tubular shape having an annular active face which moves along an axis of said hollow piston by an elastic force in a first axial direction toward said front chamber to interact with said second annular seat and connect said outlet to said second source of pressure through said passage, said annular active face interacting with said first seat in a position of actuation of said second seat to connect said outlet with said first source of pressure while preventing communication between the first and second inlets, said annular active face being coupled to said posterior part by an internal diameter having at least one orifice communicating with said passage formed between said first and second annular seats, said hollow piston having an internal perimeter with a shape adapted to engage an edge of said annular active face to guarantee that a leaktight seal develops in at least one position of said second annular seat, characterized in that said internal perimeter of said hollow piston and said edge of said annular active face are shaped to engage each other with a first contact pressure when said second annular face is some distance for an actuation position, and with a second contact pressure when said second annular seat is in said actuation position, said first contact pressure being less that said second contact pressure.

5,746,108
HYDRAULIC CONTROL SYSTEM OF TRANSFER SYSTEM FOR MACHINE TOOLS

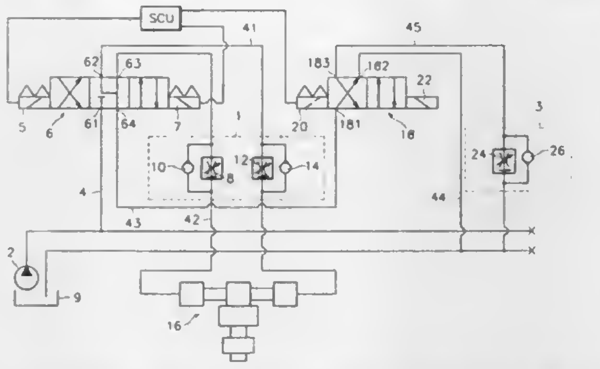
Do Chul Kim, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Jun. 21, 1996, Scr. No. 667,729

Claims priority, application Rep. of Korea, Jun. 23, 1995, 95-17137

Int. Cl.^{6} F15B *11/044*

U.S. Cl. 91—444 **7 Claims**



1. A hydraulic control system of a transfer system for a machine tool, comprising:

a hydraulic pump for generating hydraulic pressure;

a first directional control valve for controlling the flow direction of fluid from the hydraulic pump;

a first flow speed control part, which is located between the first direction control valve and a transfer mechanism, for controlling the flow speed of fluid flowing therebetween;

a second direction control valve controlling a flow direction of fluid fed from the first directional control valve and returned to a fluid tank wherein the second directional control valve varies its ports according to an ON/OFF operation of a primary solenoid, which is controlled by a solenoid control unit, and a secondary solenoid which is manually controlled; and

a second flow speed control part for controlling flow speed of the returning fluid in accordance with a port variation of the second directional control valve.

5,746,109
HYDRAULIC SYSTEM FOR CONTROLLING A MOWER UNIT THROUGH A RAISING AND LOWERING MECHANISM

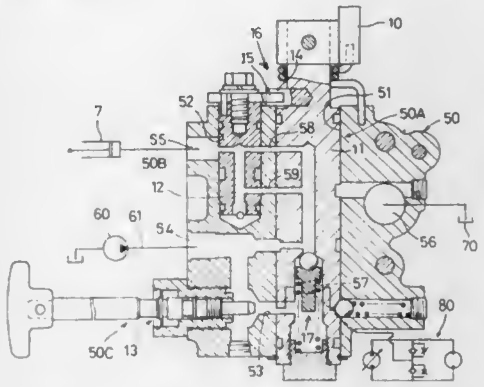
Kenji Matsuda, Sakai, Japan, assignor to Kubota Corporation, Osaka, Japan

Filed Apr. 9, 1996, Ser. No. 637,197

Claims priority, application Japan, Apr. 27, 1995, 7-103602

Int. Cl.^{6} F15B *11/08;* **F16D** *39/00*

U.S. Cl. 91—448 **5 Claims**



1. A hydraulic system for controlling a mower unit through a raising and lowering mechanism, comprising:

a hydraulic cylinder connected to said raising and lowering mechanism;

control means for controlling said mower unit, said control means having a raising position for raising said mower unit, a lowering position for lowering said mower unit, and a neutral position for maintaining said mower unit still;

hydraulic control valve means including a main control valve, an auxiliary control valve and a throttle valve connected in series between a hydraulic pressure source and said hydraulic cylinder, for selectively producing, in response to operation of said control means, a raising state for supplying pressure oil to said hydraulic cylinder to raise said mower unit, a lowering state for draining pressure oil from said hydraulic cylinder to lower said mower unit by gravity, a neutral state for stopping supply and drainage of pressure oil to/from said hydraulic cylinder to maintain mower unit still, and a half floating state for supplying pressure oil to said hydraulic cylinder and draining pressure oil from said hydraulic cylinder through said throttle valve to apply to said mower unit a raising force less than a gravitational lowering force; and

interlock means for controlling said auxiliary control valve in response to movement of said main control valve, such that said hydraulic control valve means produces said half floating state when said control means moves from said lowering position to said neutral position.

5,746,110
DRIVE CYLINDER

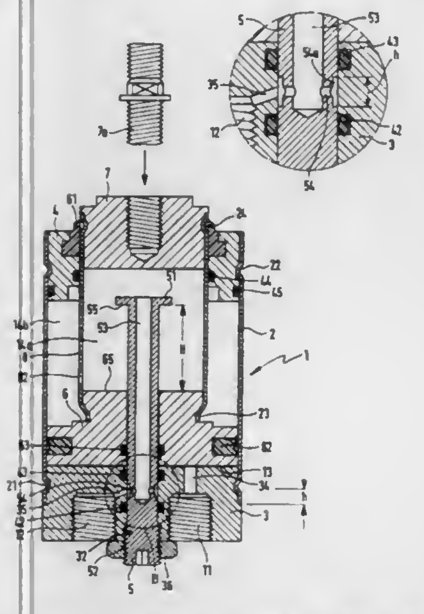
Kurt Stoll, Esslingen, Germany, assignor to Festo KG, Esslinger, Germany

Filed Feb. 19, 1997, Ser. No. 802,067

Claims priority, application Germany, Feb. 20, 1996, 196 06 220.9

Int. Cl.^{6} F01B *31/14*

U.S. Cl. 92—13.6 **12 Claims**



1. A drive cylinder comprising a cylinder barrel, an end cap attached to a first end region of the cylinder barrel, a guide cap attached to a second end region of the cylinder barrel, a piston adapted to slide in the cylinder barrel axially and a piston rod connected with the piston and extending through the guide cap and guided thereby, the axially sliding piston dividing off a thrust chamber and a return chamber in a fluid tight manner from one another, the thrust chamber being connected with a thrust chamber port and the return chamber being connected with a return chamber port in a fluid conducting manner, characterized in that both the thrust chamber port and also the return chamber port are arranged in the end cap; in that an axially extending abutment rod having an abutment, the abutment rod extending through the end cap with which it is connected in an axially fixed fashion and the abutment rod being axially adjustable along an axial distance h, the abutment rod has its inner end extending through the piston into the return chamber so that the abutment is located in the return chamber, the piston being able to be axially slid in relation to the abutment rod along a stroke while being sealed; and in that the abutment rod possesses a cavity, via which the return chamber is connected with the return chamber port for flow of fluid there between.

11. A drive cylinder comprising:

a cylinder barrel having a first and second end;

an end cap attached to a first end of the cylinder barrel;

a guide cap attached to a second end of the cylinder barrel;

a piston adapted to axially slide within the cylinder barrel, the piston dividing off a thrust chamber and a return chamber from one another, the thrust chamber being connected with a thrust chamber port and the return chamber being connected with a return chamber port in a fluid conducting manner, the thrust chamber port and the return chamber port being arranged in the end cap;

a piston rod connected to the piston and extending through the guide cap,

an axially extending abutment rod having an abutment formed on an inner end thereof, the inner end extending through the piston into the return chamber, the abutment rod extending through the end cap and being connected thereto in an axially fixed fashion, the abutment rod being adjustable along an axial extent for adjusting the axial movement of the piston, the abutment rod further including a passage providing a fluid connection between the return chamber port and the return chamber.

5,746,111
PISTON PUMP IN A BRAKE SYSTEM

Erwin Mueller, Renningen; Norbert Alaze, Markgroningen; Gerhard Wetzel, Korntal-Munchingen; Klaus Schmidt, Moglingen, and Harald Ott, Ditzingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

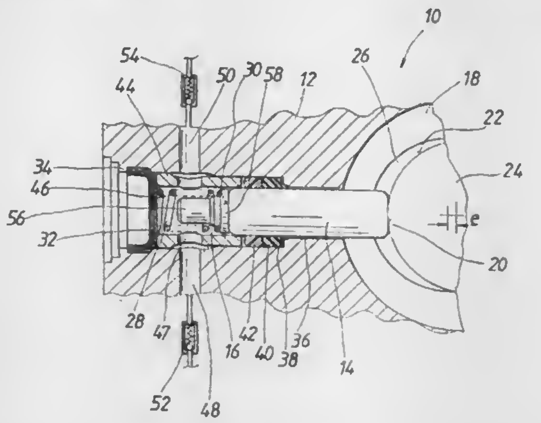
PCT No. PCT/DE96/00466, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997. PCT Pub. No. WO96/38669, PCT Pub. Date Dec. 5, 1996

PCT Filed Mar. 15, 1996, Ser. No. 765,363

Claims priority, application Germany, May 31, 1995, 195 19 833.6

Int. Cl.^{6} F16J *15/18*

U.S. Cl. 92—168 **16 Claims**



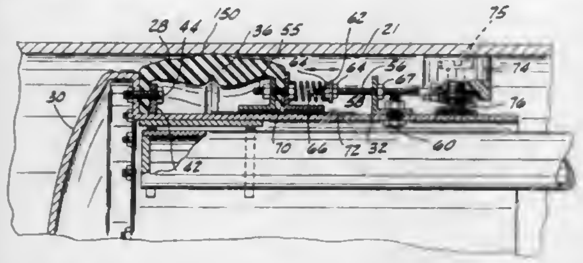
1. A piston pump comprising a piston (**14**), said piston (**14**) having a constant diameter over its length and being reciprocatable in a cylinder (**16**), an excentric tang (**24**) that rotates in an eccentric tang chamber (**18**) for driving said piston (**14**), said cylinder (**16**) includes a first narrow region which adjoins said eccentric tang chamber (**18**) which guides said piston (**14**), said cylinder (**16**) includes a second wider region and an annular shoulder (**38**) between said first narrow region and said second wider region of said cylinder (**16**), and a ring seal (**42**) placed inside said second

wider region of said cylinder having a sealing contact with said piston (**14**), wherein said ring seal (**42**) is spaced apart from said annular shoulder (**38**) by at least a length of a piston stroke.

5,746,112

PISTON FOR TANK

M. Burnell Watson, P.O. Box 34, Dorsey, Ill. 62021
Filed Nov. 20, 1996, Ser. No. 752,835
Int. Cl.⁶ B01D *47/00;* **B65D** *53/00*
U.S. Cl. 92—205 **12 Claims**



1. In an elongate tank for transport or for storage in bulk of semisolid and fluid material, said tank having an outlet at one end thereof for discharging material contained therein, said tank having a generally cylindric interior surface, a generally cylindric piston sized to slide in the tank and adapted to be moved in a direction toward said outlet thereby to force the material in the tank through the outlet, said piston comprising:

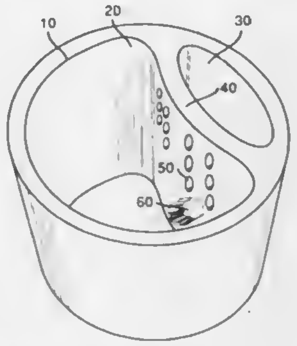
a piston member;

an annular elastic seal carried by said piston member, said seal having an annular crown projecting radially outwardly from the piston member and engageable with the interior surface of the tank, said seal having a pair of spaced apart legs supporting said crown, and means for squeezing the legs together to move the crown outwardly and cause it to be pressed against the interior surface of the tank with a pressure such that when the piston member slides in the tank a portion of the crown is maintained in sliding engagement with the interior surface thereby to wipe the material therefrom and to seal the piston member relative to the tank; and at least one anti-canting member extending radially outwardly beyond the periphery of the piston member and spaced axially from the seal for engagement with the interior surface of the tank for holding the piston member against canting in the tank while permitting said piston member to slide freely in said tank.

5,746,113

INFUSION VESSEL

Lily Ko, 5438 Don Mateo Ct., San Jose, Calif. 95123
Continuation-in-part of Ser. No. 489,055, Jun. 9, 1995, abandoned. This application Dec. 18, 1995, Ser. No. 572,884
Int. Cl.⁶ A47G *19/14;* **A47S** *31/00*
U.S. Cl. 99—323 **2 Claims**



1. An infusion vessel comprising:

a) a beverage containing chamber;

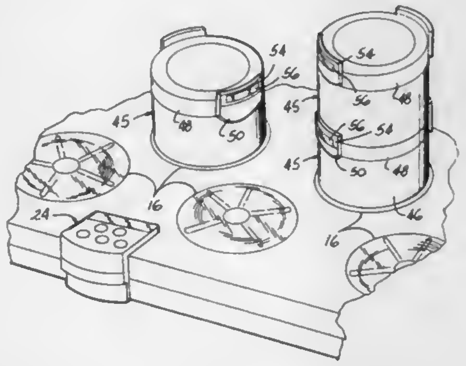
b) an infusion chamber integrally formed along side of said beverage chamber, said infusion chamber consisting of a perforated wall which extends a distance within said beverage chamber and a closed bottom wall, said perforated wall being in fluid contact with an interior of said beverage chamber;

c) wherein fluid within the beverage chamber contacts an infusion product within the infusion chamber to produce a beverage.

5,746,114

INTELLIGENT COOKING SYSTEM WITH WIRELESS CONTROL

David P. Harris, 1028 Walsh, SE., Grand Rapids, Mich. 49507
Filed Aug. 15, 1996, Ser. No. 698,550
Int. Cl.⁶ A47J *27/62;* **F24C** *7/08;* **H05B** *1/02*
U.S. Cl. 99—331 **18 Claims**



1. An intelligent food cooking system comprising:

at least one cooking implement having a temperature sensor;

a plurality of heating surfaces for supporting and transferring heat to the cooking implement;

a proximity sensor associated with each heating surface;

a device for setting a desired cooking temperature; and

controller means operably connected to the temperature sensor, each temperature setting device, each proximity sensor, and each heating surface for controlling the temperature of each heating surface based on temperature signals received from the sensor and the desired cooking temperature and on the presence or absence of the at least one cooking implement on one or more of the heating surfaces as sensed by the proximity sensors.

5,746,115

ELECTRIC TOASTER—BUNWARMER

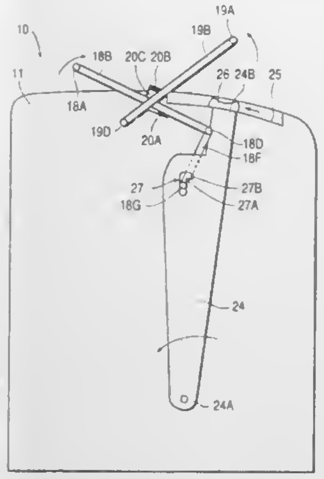
Kit Chuen Yip, Kwun Tong, Hong Kong, assignor to G.E.W. Corporation Limited, Kowloon, Hong Kong
Filed Aug. 18, 1995, Ser. No. 516,648
Claims priority, application United Kingdom, Aug. 27, 1994, 9419567
Int. Cl.⁶ A47J *37/08*
U.S. Cl. 99—339 **20 Claims**

1. An electric toaster comprising:

a body having at least one compartment for accommodating a slice of bread,

an electrical heating element mounted on opposite sides of the at least one compartment for heating the at least one compartment,

a hinged support provided on the body and above the at least one compartment for supporting a piece of food for warming by the heating element, said support being movable between an extended condition for operation and a collapsed condition for storage and being formed by two inverted broad generally U-shaped elongate support members, each of said support members having a central limb for supporting a piece of food and a pair of oppositely disposed first and second side limbs, said support members being arranged to have said first side limbs extending from one end of the central limbs adjacent to each other, said pair of first side limbs being defined as a primary first side limb and a secondary side limb, each of said pair of first side limbs having a portion which is substantially co-planar with the central limb extended therefrom, and said second side limbs extending from another end of the central limbs adjacent to each other, and



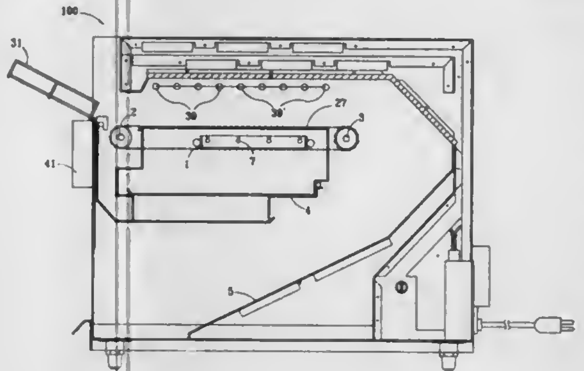
a manual operating member for moving the support between the extended and collapsed conditions, wherein

one of said primary and secondary first side limbs is in engagement with the operating member for movement thereby, and the portion of one of said primary and secondary first side limbs has, at a position above the body, at least one lateral part in engagement with the portion of the other of said primary and secondary first side limbs such that the two support members are simultaneously movable by the operating member.

5,746,116

RAPID TOASTING APPARATUS

Mark J. Smith, Ovilla, Tex., assignor to APW/Wyott Foodservice Equipment Company, Dallas, Tex.
Filed Apr. 28, 1997, Ser. No. 847,676
Int. Cl.⁶ A47J *37/00;37/08*
U.S. Cl. 99—386 **18 Claims**



1. An improved toasting apparatus including:

a conveyor belt for conveying products through the toaster;

a bottom heating element positioned below the conveyor belt, said bottom heating element including a controller for controlling the amount of heat provided by the bottom heating element;

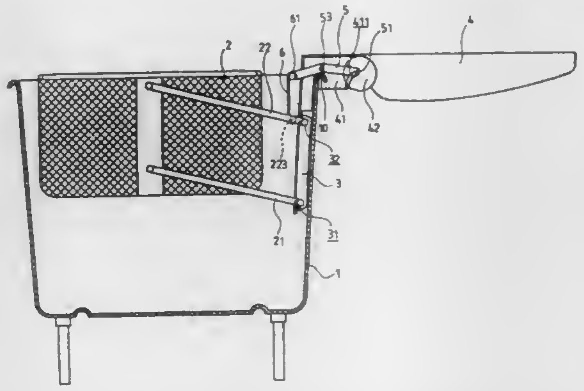
a drying zone for drying products conveyed through the toaster, the drying zone including a first plurality of upper heating elements positioned above the conveyor, the first plurality of upper heating elements including a controller for controlling the first plurality of upper heating elements independent of the bottom heating element; and

a toasting zone for toasting products conveyed through the toaster, the toasting zone including a second plurality of upper heating elements positioned above the conveyor, the second plurality of upper heating elements including a controller for controlling the amount of heat provided by the second plurality of upper heating elements, the second plurality of upper heating elements being controlled independently of the bottom heating element and the first plurality of upper heating elements.

5,746,117

DEEP FRYER

Li-Chen Chang, Taoyuan, Taiwan, assignor to Lyu Jan Co., Ltd., Taiwan
Filed Apr. 21, 1997, Ser. No. 839,920
Int. Cl.⁶ A47J *37/00;37/10;37/12*
U.S. Cl. 99—407 **6 Claims**



1. A deep fryer structure comprising a container-like body for containing frying oil, having a top opening defined by a top rim, and a basket movably received within the body through the top opening thereof, basket control means being provided to move the basket relative to the body between a lifted position and a lowered position, the basket control means comprising an L-shaped base member having a vertical section received into the body and a horizontal section received within a recess formed on the top rim of the body and extending outward therefrom, the horizontal section of the base member defining an interior channel into which an end of a handle is received and pivoted thereto to allow the handle to be rotatable with respect to the base member between a vertical position where the handle is substantially normal to the horizontal section of the base member and a horizontal position where the handle is substantially in alignment with the horizontal section of the base member, a U-shaped bar having a central section rotatably supported on the vertical section of the base member with two leg sections extending therefrom and spaced from each other to accommodate the basket therebetween in a relatively rotatably manner, the U-shaped bar further comprising an arm extending from the central section thereof and configured to allow the U-shaped bar to be rotated by rotating the arm relative to the central section, the arm being mechanically coupled to the handle so that by forcing the handle from the vertical position to the horizontal position, the arm is moved in a first direction to rotate the U-shaped bar in a lifting direction to have the leg sections thereof to move the basket from the lowered position to the lifted position and by forcing the handle from the horizontal position to the vertical position, the arm is moved in a second opposite direction to rotate the U-shaped bar in a lowering direction to have the leg sections thereof to move the basket from the lifted position to the lowered position.

5,746,118

HOLDING DEVICE FOR A COOKING PRODUCT CARRIER

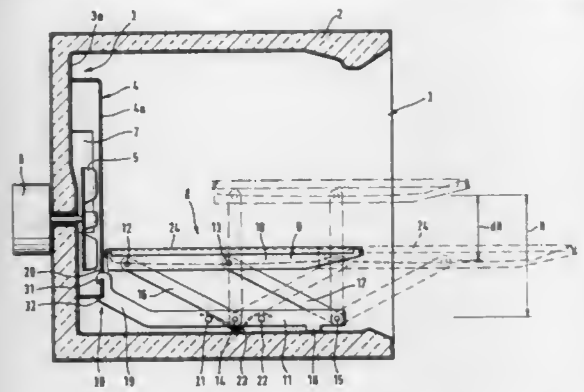
Dieter Brunner; Joachim Damrath, both of Gaggenau, and Martin Kornberger, Baden-Baden, all of Germany, assignors to Gaggenau Hausgerate GmbH, Gaggenau, Germany

Filed May 27, 1997, Ser. No. 863,758

Claims priority, application Germany, Jun. 5, 1996, 196 22 608.2

Int. Cl.^{6} A47J *37/00;37/06;* **F24C** *15/16*

U.S. Cl. 99—427 **12 Claims**



1. Holding device for a cooking product carrier in a baking oven by means of which a cooking product carrier can be drawn out of a baking oven muffle and pushed back into it, comprising a parallelogram linkage with a base arm, which is adapted to be fixed in a fixed position in the baking oven muffle and is connected by a hinged arrangement by means of pivot arms of identical length and articulated at articulation points with a mounting arm of a holding element for the cooking product carrier, the mounting arm being movable in parallel with the fixed-position base arm,

wherein

the spacing of the articulation points on the fixed-position arm and the spacing of the articulation points on the movable mounting arm are the same,

the articulation point of the rear pivot arm is arranged at approximately the middle one-third of the longitudinal dimension of the base arm such that the holding device has a defined end position both in the withdrawn position and in the inserted position, and such that the cooking product carrier in its withdrawn position will protrude from the baking oven muffle and

the fixed-position base arm has a rearward mounting end adapted for removably mounting the fixed-position base arm at the rearward baking oven wall by form-locking engagement.

5,746,119

METHOD AND UTENSIL FOR COOKING FOOD WITH HEAT

Kesafumi Matsumoto, Atsugi, Japan, assignor to Kouken Company, Limited, Kanagawa-ken, Japan

Continuation of Ser. No. 580,699, Dec. 29, 1995, abandoned, which is a division of Ser. No. 498,962, Jul. 6, 1995, Pat. No. 5,580,594. This application Sep. 9, 1997, Ser. No. 926,674

Claims priority, application Japan, Oct. 25, 1994, 6-260046

Int. Cl.^{6} H05B *6/12*

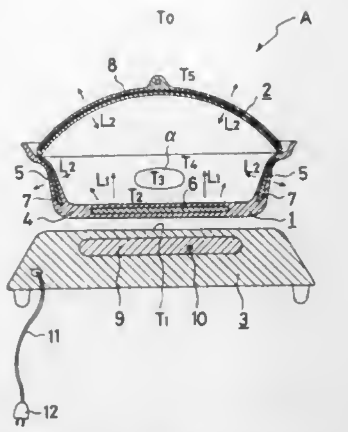
U.S. Cl. 99—451 **5 Claims**

1. A cooking utensil for cooking food using eddy current generated heat in conjunction with an eddy current induction unit, comprising:

a lid formed of a metallic magnetic material capable of carrying a magnetic field and eddy currents;

a body having a bottom and sidewalls defining a cavity for accepting said food;

said body being formed of a metallic magnetic material capable of carrying a magnetic field and eddy currents;



said bottom forming a first magnetic path having a first reluctance for generating eddy currents to heat said bottom to a first temperature for cooking said food;

said sidewalls forming a second magnetic path having a second reluctance for generating eddy currents to heat said side walls to a second temperature, less than said first temperature, for limiting heat transfer from said food; and

said lid forming a third magnetic path having a third reluctance for generating eddy currents to heat said lid to a third temperature, less than said second temperature and greater than an ambient temperature, for limiting heat transfer from said food.

5,746,120

TYING DEVICE IN WHICH THE DRIVE MEANS ARE ELECTRIC SERVOMOTORS

Age Jonsson, Sundsvall, Sweden, assignor to Sunds Defibrator Industries AB, Sweden

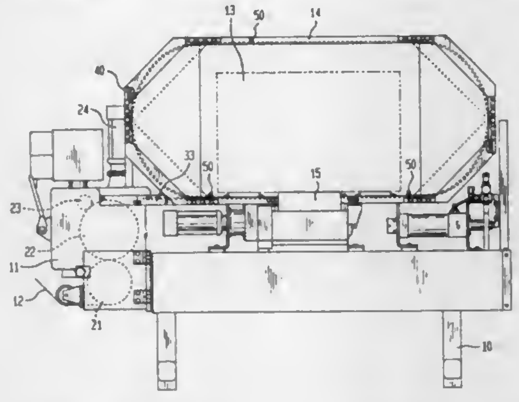
PCT No. PCT/SE94/00929, § 371 Date Mar. 11, 1996, § 102(e) Date Mar. 11, 1996, PCT Pub. No. WO95/10452, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 6, 1994, Ser. No. 615,262

Claims priority, application Sweden, Oct. 14, 1993, 9303380

Int. Cl.^{6} B65B *13/28;13/06*

U.S. Cl. 100—4 **17 Claims**



1. Apparatus for tying objects with wire having an end comprising feed means for feeding and tightening said wire around said object, feed drive means for driving said feed means, said feed drive means comprising a first electric servomotor whereby said first electric servomotor can be rotated through a predetermined number of revolutions for feeding said wire around said object and can be counter-rotated through a predetermined number of revolutions for tightening said wire around said object, a guide rail adjustable between opened and closed conditions for guiding said wire around said object whereby said guide rail can guide said wire around said object when in said closed condition and said wire can be tightened around said object when said guide rail is in said opened condition, locking means for locking said wire around said object after said end of said wire has been fed entirely around said object, wire twisting means for twisting said end of said wire into a knot, wire twisting drive means for driving said wire twisting means, said wire twisting drive means comprising a second electric servomotor whereby said second electric servomotor can be rotated through a predetermined number of revolutions for twisting said end of said wire into said knot, and wire cutting means for cutting said wire after said knot has been formed.

5,746,121

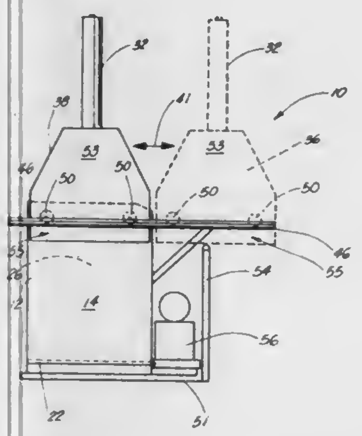
METHOD OF COMPACTING TRASH ON A PLATFORM

John Zimmer, 4308 W. Admiral Doyle Dr., New Iberia, La. 70506

Continuation of Ser. No. 388,627, Feb. 14, 1995, abandoned. This application Jul. 22, 1996, Ser. No. 681,317

Int. Cl.^{6} B30B *1/32*

U.S. Cl. 100—35 **3 Claims**



1. A method of compacting trash upon the edge of a platform having a periphery having a guard rail situated about said periphery, said guard rail having a height, comprising the steps of:

(a) providing a container for receiving said trash to be compacted, said container having an open top and opposing walls;

(b) providing a compaction member moveable in a vertical position, releasably engaging said compaction member to said container, configuring said compaction member so that it may migrate downward into said container so as to compact said trash in a down position, and return to an up position out of said container;

(c) providing power means for urging said compaction member through said up and down positions;

(d) providing a support frame for supporting said compaction member;

(e) engaging a pair of track members along said opposing walls of said container, said track members movably engaging said support frame via a plurality of rollers in such a manner as to support said compaction member movably engaged upon said pair of track members;

(f) providing a shield member secured about said support frame, said shield member configured to envelope said compaction member and said open top of said container when said compaction member is in said compacting position;

(g) urging said compaction member, while in said up position, along with said support frame, to move along said track members laterally away from said container, placing said container in a loading position, and said compaction member is supported above said guard rail and beyond the periphery of said platform such that said open top of said container is exposed for receiving trash;

(h) placing an amount of trash into said open top of said container;

(i) returning said compaction member and said frame to a compacting position, allowing said frame and power means to straddle said open top of said container;

(j) allowing said shield member to envelope said compaction member and said open top of said container; and

(k) actuating said power means for urging said compacting member into said container, so as to compact said trash in said container.

5,746,122

EMBOSSING MACHINE

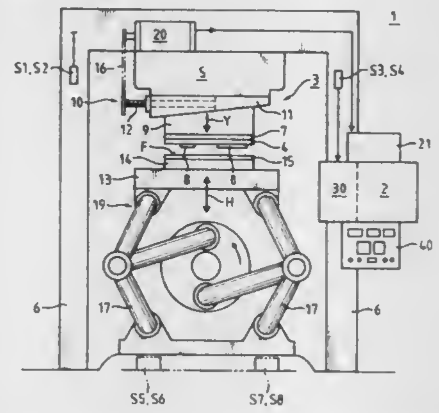
Hanspeter Gietz, Gossau; Manfred Rösli, Herisau, and Heinz Bänziger, Gossau, all of Switzerland, assignors to Maschinenfabrik Gietz AG, Gossau, Switzerland

Filed May 3, 1996, Ser. No. 642,438

Claims priority, application Switzerland, May 4, 1995, 01279/95

Int. Cl.^{6} B30B *15/14*

U.S. Cl. 100—43 **11 Claims**



1. An embossing and printing machine for embossing sheets comprising the combination of

a press top (**3**) having a die block (**9**), a block plate (**4**), means for heating said block plate (**4**) and said block plate having a blocking surface (F) supporting blocks (**8**);

a mechanical positioning device (**10**) comprising a displacement drive for adjusting vertical positioning of said die block;

a press bottom (**19**) comprising a mechanical toggle press (**17**) carrying a make-ready plate and a make-ready (**15**) for supporting sheets during embossing, said toggle press being operative to lift said press bottom a predetermined distance to said press top;

a plurality of pressure sensors mounted around a center (Z) of said blocking surface (F) for sensing compressive forces (X) acting on said blocking surface and for producing outputs representative of said forces; and

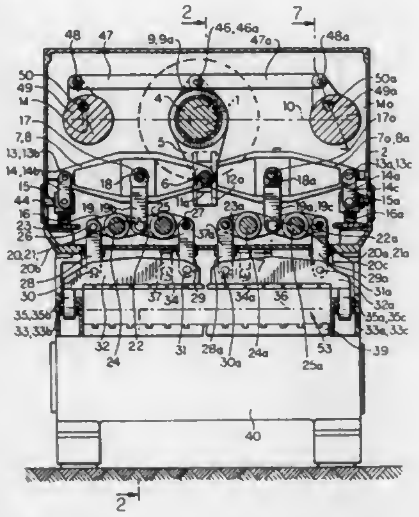
a machine control (**2**) including

  a motor control (**21**) for controlling operation of said positioning device,

  a pressure control (**30**) connected to receive outputs from said plurality of sensors for adjusting operating pressure to a predetermined optimum operating value (XA) by adjusting said positioning device to compensate for variations in displacement values (YO) due to compression of said make-ready (**15**) and heating during an embossing process, thereby precisely controlling pressure applied during embossing, and

  a display and control unit (**40**) for displaying operation of said machine control and for permitting manual operation thereof.

5,746,123
PUNCH PRESS HAVING AN ELONGATE SPACE FOR MOUNTING ITS TOOLS
Oskar Eigenmann, Arbon, Switzerland, assignor to Bruderer AG, Frasnacht, Switzerland
Filed Jan. 16, 1996, Ser. No. 587,035
Claims priority, application European Pat. Off., Jan. 21, 1995, 95100804
Int. Cl.⁶ B30B *1/06*
U.S. Cl. 100—208 **14 Claims**



1. In a punch press having a frame, pressing columns and a punching space for advance in a direction of a web in a plane through the punching space in order to have work performed thereon through a first stroke movement of the pressing columns, the improvement of a structure for producing the first stroke movement, comprising:

at least two first pivots spaced from each other in the direction of the advance of a web through the punching space for performing a second stroke movement; and

first and other link members arranged in groups, at least two first link members each having a first and a second, opposite end, the first ends being respectively pivotally mounted to the at least two first pivots, the other link members being arranged as pairs of double levers each having a first and second end, the first ends of each of the pairs of the double levers being pivotally mounted respectively to the second ends of the first link members in such an arrangement that the other link members of each of the pairs of the double levers project in opposite directions from each other and are supported at rocking support pivots on the frame located symmetrically relative to the second ends of the first link members, the second ends of the double levers being pivotally mounted to respective pressing columns.

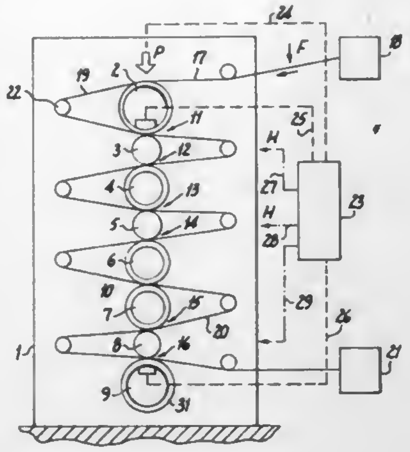
5,746,124
CALENDER FOR TREATING A WEB OF PAPER
Franz Kayser, Geldern, Germany, assignor to Voith Sulzer Finishing GmbH, Krefeld, Germany
Filed Dec. 16, 1996, Ser. No. 767,347
Claims priority, application Germany, Dec. 16, 1995, 195 47 164.4
Int. Cl.⁶ D21G *1/02*
U.S. Cl. 100—331 **23 Claims**

1. A calender for treating a web of paper comprising:

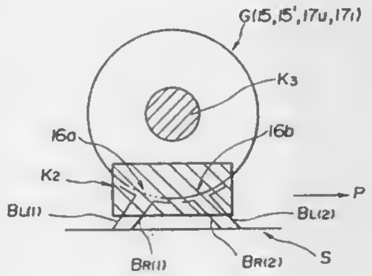
a stack of hard rollers and soft rollers;

a first set of processing nips and a second set of processing nips, each processing nip being formed by a juncture of one of said hard rollers and one of said soft rollers;

whereby one side of said web of paper contacts against said hard rollers in said first set of processing nips and contacts against said soft rollers in said second set of processing nips, at least a last soft roller in said stack, which delimits a last processing nip that said web of paper passes through in said calender, has a lower surface roughness R_a than a surface roughness R_a of at least a first soft roller in said stack, where said first soft roller delimits a first processing nip that said web of paper passes through in said calender, and said surface roughness R_a of said last soft roller is less than 0.35 μm.



5,746,125
ENCLOSED MULTI-BLADE SQUEEGEE STRUCTURE FOR SCREEN PRINTING
Okie Tani, Tokyo, Japan, assignor to Tani Electronics Industry Co., Ltd., Tokyo, Japan
Filed Mar. 6, 1996, Ser. No. 611,812
Claims priority, application Japan, Aug. 31, 1995, 7-259183
Int. Cl.⁶ B41L *13/18*
U.S. Cl. 101—123 **7 Claims**



1. A paired-blade squeegee arrangement for an enclosed squeegee type screen printing device for printed circuits, comprising:

a housing having an outlet means from which printing material may be disposed outside of said housing;

a printing material supplying chamber disposed within said housing;

a replaceable paired-blade squeegee arrangement having a predetermined width and being disposed within said housing and communicated with said outlet means of said housing;

squeegee control means for movably controlling said replaceable paired-blade squeegee arrangement; and

retaining means for detachably mounting and retaining said replaceable paired-blade squeegee arrangement to said outlet means of said housing,

wherein said retaining means has an adjustable width for accommodating said replaceable paired-blade squeegee arrangement having said predetermined width, wherein printing material is provided to the outside of said housing through said replaceable paired-blade squeegee arrangement, and wherein said paired-blade squeegee arrangement comprises;

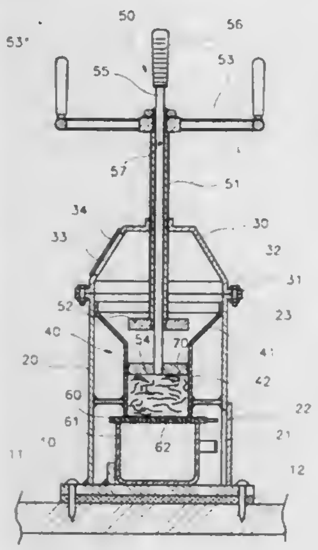
a first set of front and rear blades disposed foremost in a predetermined printing direction;

a second set of front and rear blades disposed behind said first set of front and rear blades relative to said predetermined printing direction and aligned substantially in parallel therewith;

moving means for moving said first and second sets of front blades and rear blades;

wherein said first and second sets of front and rear blades are independently vertically movable by said moving means for adjusting a printing pressure and wherein said first set of front and rear blades is angled toward a printing direction in a forward position relative to the printing direction, and said second set of front and rear blades is angled away from said printing direction in a rearward position relative to the printing direction, and wherein said outlet means comprises first and second slit portions each communicated respectively with said first and second set of front and rear blades.

5,746,126
RUBBISH COMPRESSING APPARATUS
Chai-Yee Huang, No. 47-1 Fanpolin Road, Shipan Chuen, San-Chi Shiang, Taipei Hsien, Taiwan
Filed Mar. 5, 1996, Ser. No. 611,261
Int. Cl.⁶ B30B *9/06*
U.S. Cl. 100—125 **6 Claims**



1. A rubbish compressing apparatus, comprising:

a base plate;

a main body, mounted on said base plate and roughly having the shape of a cylinder, its top end having an opening for throwing in rubbish, its lower part being provided with an opening for removing rubbish;

a compress funnel, mounted fast inside said main body, taking in rubbish which has been thrown into said main body, the upper section of said compress funnel being a cone turned upside-down, the lower section being a cylinder, the lower section having an opening:

a compressing device, further comprising:

a threaded shaft, passing through the top end of said main body into said main body's inside;

a first pressing plate, mounted on the lower end of said threaded shaft;

a horizontal wheel, mounted on the top end of said threaded shaft to drive the rotation of said shaft;

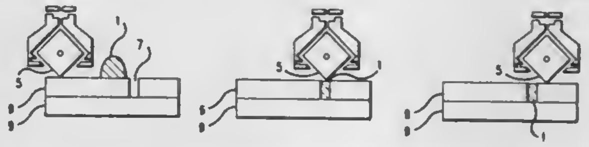
a shaft, glidingly passing through said threaded shaft and said pressing plate along their rotational axis; and

a second pressing plate, mounted in a position below said first pressing plate on the lower end of said shaft; and

an anvil plate, which is mounted below the opening of the lower section of said compress funnel and which can be pulled out through the opening in the lower part of said main body;

whereat said second pressing plate can be taken by said shaft to enter said compress funnel to perform rubbish compression in its first stage and, after that, said threaded shaft drives down said first pressing plate, pushing said second pressing plate from above, thus performing further compression of said rubbish.

5,746,127
ELECTROFORMED SQUEEGEE BLADE FOR SURFACE MOUNT SCREEN PRINTING
Karl W. Fischbeck, Endicott, and Gary T. Marks, Phelps, both of N.Y., assignors to AMTX, Inc., Canandaigua, N.Y.
Filed May 3, 1996, Ser. No. 646,380
Int. Cl.⁶ B05C *17/04*
U.S. Cl. 101—123 **13 Claims**



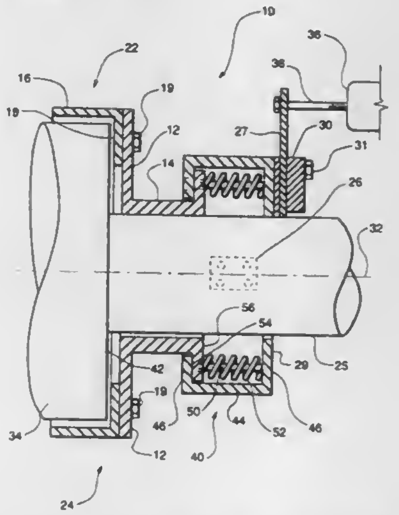
1. An apparatus for depositing a printing material on a substrate, said apparatus comprising:

a stencil having a plurality of apertures therethrough, wherein said stencil is capable of being placed in contact with said substrate;

a depositing member for depositing said printing material onto said stencil; and

an electroformed squeegee blade for spreading said printing material across said stencil, wherein said electroformed squeegee blade is capable of depositing said printing material on said substrate and said electroformed squeegee blade consists of electroformed material.

5,746,128
PRINTING CYLINDER SPRAY SHIELD
David P. Reichwein, Elizabethtown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Jun. 2, 1997, Ser. No. 867,032
Int. Cl.⁶ B41F *35/00*
U.S. Cl. 101—416.1 **8 Claims**



1. A spray shield for a printing cylinder comprising:

a hub located in a plane transverse to an axle of a printing cylinder and divided into at least two separate interconnected sections;

a collar attached to at least one section of the hub and supporting the hub in a location adjacent to an end of the printing cylinder, with the collar able to fit upon the axle of the printing cylinder;

a shield cylinder divided into at least two sections and attached to the sections of the hub, with the shield cylinder extending from the hub so that it is located around an end portion of the printing cylinder cylindrical surface; and

disconnecting means interconnecting the separate sections of the hub and the shield cylinder, with the disconnecting means also permitting the hub sections and the shield cylinder sections to be separated sufficiently to remove the hub and shield cylinder from around the printing cylinder and its axle.

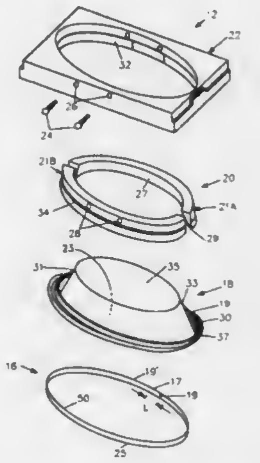
5,746,129
COMPLIANT DOCTORING CUP

Michael P. Murray, Keene, N.H., assignor to Markem Corporation, Keene, N.H.

Filed Sep. 27, 1996, Ser. No. 721,679

Int. Cl.^{6} B41M *1/10*

U.S. Cl. 101—483 **13 Claims**



1. A method of inking a printing plate, comprising
providing a compliant doctoring cup comprising
  a body defining a cavity, said cavity containing ink, and
  a curved blade having a doctoring edge and two free ends coupled to said body along a periphery of said cavity,
positioning the printing plate below said cavity with the doctoring edge of said blade in contact with the printing plate to cover the printing plate with said ink, and
removing some of said ink from the printing plate with said blade.

5,746,130
DEVICE FOR WASHING THE OUTER CYLINDRICAL SURFACE OF A CYLINDER OF A ROTARY PRINTING PRESS

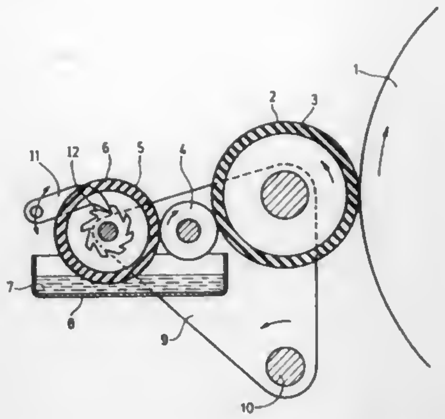
Günter Andl, Sandhausen, and Rolf Kernbach, Neidenstein, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Aug. 16, 1995, Ser. No. 515,793

Claims priority, application Germany, Aug. 16, 1994, 44 29 047.0

Int. Cl.^{6} B41F *35/00*

U.S. Cl. 101—424 **20 Claims**



1. A washing apparatus for washing a cylinder or a roller in a printing press, said washing apparatus comprising:
a reservoir for containing washing fluid;
an absorptive roller, said absorptive roller having an outer region and an absorptive medium disposed at said outer region, said absorptive medium being configured for absorbing and retaining washing fluid from said reservoir;
a metering roller for being engaged with said absorptive roller and for receiving washing fluid from said absorptive roller;
a washing roller for receiving washing fluid from said metering roller and applying the same to a cylinder or a roller, to wash a cylinder or a roller;
a first drive to move said absorptive roller so as to selectively provide fresh washing fluid to said metering roller and said washing roller;
a device to selectively engage and disengage said washing apparatus with respect to a cylinder or a roller in a printing press;
a second drive, independent of said first drive, to drive said washing roller and said metering roller with respect to one another, so as to be simultaneously driven by a cylinder or a roller in a printing press upon said washing apparatus being engaged with a cylinder or a roller in a printing press;
a structure to rotatably support each of said absorptive roller, said metering roller and said washing roller; and
said support structure being configured to dispose said absorptive roller at least partly in said reservoir upon said washing apparatus being engaged with a cylinder or a roller in a printing press.

5,746,131
POWDER SPRAYER

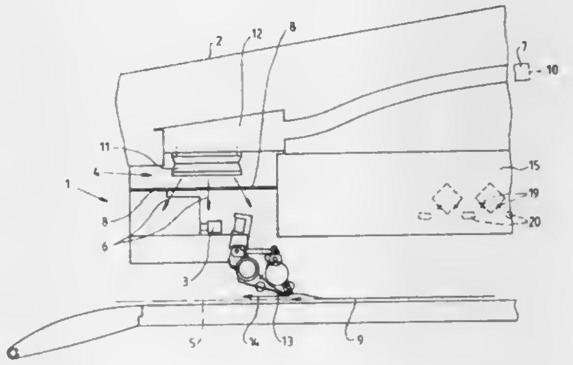
Manfred Henn, Heidelberg, and Maritta Vettermann, Mauer, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Nov. 4, 1996, Ser. No. 743,539

Claims priority, application Germany, Nov. 2, 1995, 295 17 283.5; Jul. 8, 1996, 196 27 460.5

Int. Cl.^{6} B41L *23/22*

U.S. Cl. 101—424.2 **8 Claims**



1. Powder sprayer in a delivery system of a printing press, the powder sprayer comprising:
a row of powder nozzles extending over a sheet width;
a blower associated with said powder nozzles and aimed at a travel path of the sheet, said blower being actuatable for generating an air stream, said powder nozzles being disposed in said air stream; and
an air guide element located between said blower and said powder nozzles for forming said air stream into a laminar air stream.

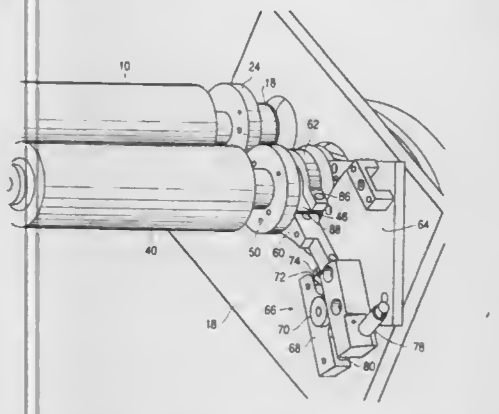
5,746,132
VARIABLE REPEAT PLATE AND BLANKET CYLINDER MECHANISM

Thomas Dewayne Parks, Tacoma; Michael Rolland Turner, Renton, both of Wash.; Dale Leon Bunnell, Chesterfield, and Gary Wilson Teeter, St. Louis, both of Mo., assignors to Mark Andy, Inc., Saint Louis, Mo.

Filed Sep. 24, 1996, Ser. No. 710,138

Int. Cl.^{6} B41F *13/24*

U.S. Cl. 101—483 **36 Claims**



1. A printing machine designed to accommodate different repeat lengths for a first cylinder and a second cylinder therein, comprising:
a front and rear frames;
a first cylinder cartridge, including a first cylinder with a centerline;
a first assembly attached to said front and rear frames for holding said first cylinder cartridge;
a changeable second cylinder cartridge separate from said first cylinder cartridge, said second cylinder cartridge including a second cylinder with a centerline;
a first and second cradles for holding the ends of said second cylinder cartridge, each of said cradles including a cradle arm with a arcuate surface therein; and
a second assembly for each of said cradles for moving its respective cradle toward or away from said first cylinder to allow the substitution of different diameter second cylinders as said second cylinder, to be aligned in parallel adjacency with said first cylinder, said second assembly operable to change the inclination of its respective cradle arm for each different diameter second cylinder, to facilitate lift-off.

5,746,133
POSTAGE METER WITH ROTOR MOVEMENT AND DIE COVER SENSOR

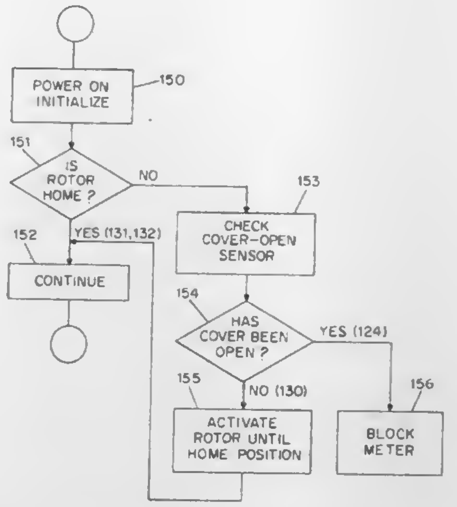
Benedikt Widmer, Bern; Martin Müller, Langenthal; Daniel Flückiger, Zäziwil; Christian Moy, Grossaffoltern, and Philippe Chollet, Corcelles, all of Switzerland, assignors to Ascom Hasler Mailing Systems AG, Switzerland

Filed May 22, 1995, Ser. No. 446,218

Int. Cl.^{6} B41F *1/66*

U.S. Cl. 101—484 **4 Claims**

1. A method of operation of a postage meter upon application of power, said postage meter comprising a rotor for printing postage value, said rotor defining a home position and having a first sensor indicative thereof, said meter further comprising a secure housing, said rotor contained within said secure housing, said meter further comprising a cover movable between an open position and a closed position, said open position offering access to said rotor, said meter further comprising a second sensor, said second sensor operatively coupled with said cover, said method comprising the steps of:
  determining via said first sensor if said rotor is away from said home position;
  in the event said rotor is away from said home position,
  determining via said second sensor if said cover has been opened whilst said rotor has been away from said home position; and
  in the event said cover has been opened whilst said rotor has been away from said home position, annunciating said condition.



5,746,134
RAILWAY VEHICLE SUSPENSIONS

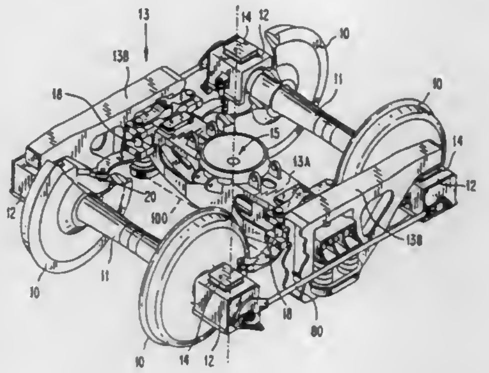
Herbert Scheffel, 83A Van Wouw Street, Groenkloof, Pretoria, Transvaal, South Africa

Continuation-in-part of Ser. No. 207,730, Mar. 9, 1994, Pat. No. 5,588,367. This application Aug. 28, 1996, Ser. No. 703,967

Claims priority, application South Africa, Mar. 9, 1993, 93/1668

Int. Cl.^{6} B61D *5/31;5/38*

U.S. Cl. 105—168 **15 Claims**



1. A railway vehicle which includes a frame suspended on at least two wheelsets coupled to one another and spaced from one another along a longitudinal axis of said frame, each of said coupled wheelsets having a live axle which has ends mounted in respective axleboxes, and couplings which are attached to the frame and which couple the axleboxes of one of the coupled wheelsets to the axleboxes of the other of the coupled wheelsets in such a manner as to constrain relative lateral movements between the coupled wheelsets in a lateral plane, wherein each coupling includes a linkage comprising interconnected crank levers which operate to uncouple lateral movements of the frame from the

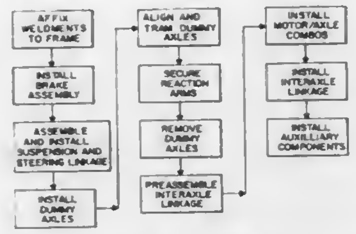
movements of the coupled wheelsets and links which are pivoted to the crank levers at first upright axes and to the axleboxes at second upright axes, the first and second upright axes lying on link axes which are inclined to the said longitudinal axis and the arrangement of the links being such that each link axis intersects another link axis substantially on the said longitudinal axis.

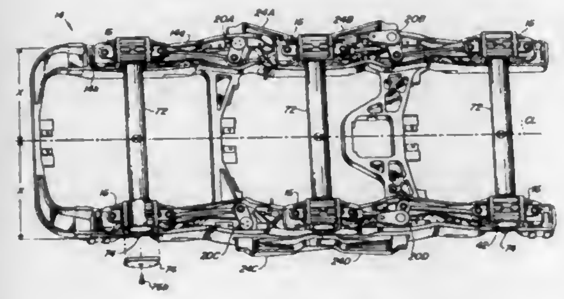
5,746,135
SELF-STEERING RAILWAY TRUCK

Mehdi Ahmadian, Blacksburg, Va.; Laurence William Gray, Kingston, Canada; Dean Zeal McGrew; William Anthony Kurtzhals, both of Erie, Pa.; James Harry Whitehill, Wattsburg, Pa., and Jennifer Lynn Jaramillo, Fuquay-Variena, N.C., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 555,569, Nov. 8, 1995, Pat. No. 5,613,444.
This application Nov. 4, 1996, Ser. No. 743,060
Int. Cl.⁶ B23Q *3/00*

U.S. Cl. 105—196 **9 Claims**


AFFIX WELDMENTS TO FRAME
INSTALL BRAKE ASSEMBLY
ASSEMBLE AND INSTALL SUSPENSION AND STEERING LINKAGE
INSTALL DUMMY AXLES
ALIGN AND TRAM DUMMY AXLES
SECURE REACTION ARMS
REMOVE DUMMY AXLES
PREASSEMBLE INTERAXLE LINKAGE
INSTALL MOTOR/AXLE COMBOS
INSTALL INTERAXLE LINKAGE
INSTALL AUXILIARY COMPONENTS



1. A method of assembling a railway truck comprising a frame including a pair of laterally spaced apart side frames and a plurality of longitudinally spaced apart transoms extending laterally between and integrally joined to said side frames: a plurality of journal boxes resiliently suspended from said side frames; a pair of first and second longitudinally spaced apart end axles extending laterally between said side frames and having opposite ends rotatably mounted in respective ones of said journal boxes; a pair of longitudinally spaced apart bellcranks rotatably joined to each of said side frames between said end axles, each of said bellcranks having a vertically extending crankshaft and a crank arm extending radially outwardly therefrom; a pair of traction links extending longitudinally along each of said side frames, with each of said traction links being pivotally joined between respective ones of said journal boxes and said crank arms for carrying tension and compression traction loads therebetween: a pair of adjoining reaction arms extending longitudinally along each of said side frames, with each of said reaction arms having longitudinally opposite proximal and distal ends, and each of said proximal ends being fixedly joined to a respective one of said crankshafts, and said distal ends adjoining each other; means for operatively joining together said adjoining reaction arm distal ends for carving lateral reaction loads between each of said reaction arm pairs upon rotation of said crankshafts while permitting differential longitudinal and pivotal movement between said adjoining distal ends; and wherein traction loads are carried in turn through said end axles, journal boxes, traction links, and bellcranks to said side frames, with said end axles being self-steering in a yaw direction so that yaw of said first end axle corotates together corresponding ones of said bellcranks on opposite sides of said frame which in turn corotate together said reaction arms joined thereto which cantilever to counterrotate together said adjoining reaction arms to counterrotate together said bellcranks joined thereto to counter-yaw said second end axle; the method comprising the steps of:

installing said journal boxes, bellcranks, traction links, and reaction arms into said truck frame;

installing dummy axles into said journal boxes, with said dummy axles being lighter in weight than said end axles;

aligning and tramming said dummy axles by rotating said reaction arms to adjust said journal boxes and in turn said dummy axles;

installing said reaction arm joining means to join together said adjoining reaction arms and maintain said alignment and tram;

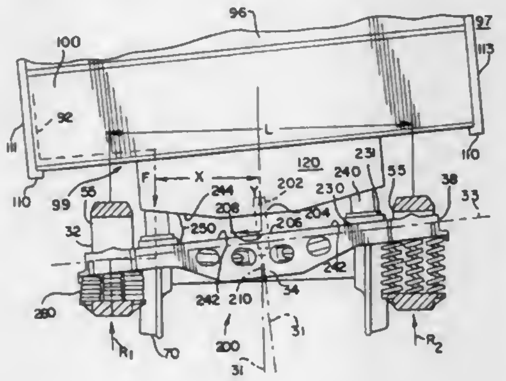
removing said dummy axles from said journal boxes; and installing said end axles into said journal boxes.

5,746,136
DYNAMICALLY STABLE, LIGHTWEIGHT RAILCAR SUPPORT SYSTEM

Vaughn Terrey Hawthorne, Lisle; Charles P. Spencer, Staunton, both of Ill., and Terry L. Pitchford, St. Louis, Mo., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Sep. 13, 1996, Ser. No. 713,987
Int. Cl.⁶ B61F *5/00*

U.S. Cl. 105—199.3 **21 Claims**



1. In a freight railcar having a railcar body with a railcar longitudinal axis and at least one railcar truck assembly, a center-plate-free body bolster and a center-plate-free truck bolster,

said railcar body having said railcar body-bolster free of a center plate, a first end wall and a second end wall, a railcar length extending between said first and second end walls, a railcar longitudinal axis a bottom with a perimeter, a plurality of vertical side walls upwardly extending from said bottom, a railcar width extending between said vertical side walls, a side sill at said perimeter of each said vertical side wall, said bottom, said end walls and said vertical side walls cooperating to define a lading volume,

lading in said volume and said railcar body providing a static vertical load to said railcar, said vertical load from said lading and railcar body of the freight railcar borne by said vertical side walls and said end walls,

said railcar truck assembly having said truck bolster free of a center plate, a second longitudinal axis generally parallel to said railcar axis, a first sideframe and a second sideframe,

said first sideframe having a first midpoint and a first upper surface, said first sideframe defining a first window at about said first midpoint,

said second sideframe having a second midpoint and a second upper surface, said second sideframe defining a second window at about said second midpoint,

said first sideframe generally parallel to said second sideframe, said railcar axis and said second longitudinal axis,

a plurality of bearing pads,

said railcar body bolster having a third longitudinal axis, a top side and a bottom side, a body-bolster midpoint, and a pin-receiving port at about said body-bolster midpoint, a first bearing pad mounted on said bottom side between said port and one of said first and second sideframes, and a second bearing pad mounted on said bolster bottom side between said port and the other of said first and second sideframes, said first and second bearing pads cooperating to form a first pair of bearing pads,

said truck bolster free of a center plate having a fourth longitudinal axis, an upper side, a first truck-bolster end, a second truck-bolster end, a truck-bolster midpoint about centered between said first and second truck-bolster ends, and an aperture at about said truck-bolster midpoint,

a third bearing pad mounted on said truck-bolster upper side between said truck-bolster midpoint and one of said first and second truck-bolster ends, said third bearing pad generally aligned with one of said first and second bearing pads, and a fourth bearing pad mounted on said truck-bolster upper side between said truck-bolster midpoint and the other of said first and second truck-bolster ends, said fourth bearing pad generally aligned with the other of said first and second bearing pads, said third and fourth bearing pads cooperating to form a second pair of bearing pads

a pin positioned in one of said body-bolster port and said truck-bolster aperture, said pin vertically extending to mate with the other of said port and aperture, said third longitudinal axis approximately parallel to said fourth longitudinal axis, said third and fourth parallel axes generally transverse to said railcar axis and said second longitudinal axis,

one of said first and second truck-bolster ends extending through said window in one of said first and second sideframes at said sideframe midpoint, and the other of said first and second truck-bolster ends extending through said window in the other of said first and second sideframes at said sideframe midpoint,

said railcar body-bolster generally extending between said vertical sidewalls, which body-bolster receives said vertical load for communication to said truck-bolster and said first and second sideframes,

each pair of said aligned truck bolster bearing pad and body-bolster sidebearing pad cooperating to define a constant-contact sidebearing assembly to bear and transfer said railcar vertical load,

each said constant-contact sidebearing assembly positioned at a location on said truck-bolster upper side less than thirty-three inches from said truck-bolster midpoint along said fourth longitudinal axis to enable provision of a center-plate-free truck bolster and body bolster with both a reduction in the relative weight of the railcar body and truck bolster, and a shorter, less redundant load path between said railcar body and said sideframes while enhancing dynamic railcar stability.

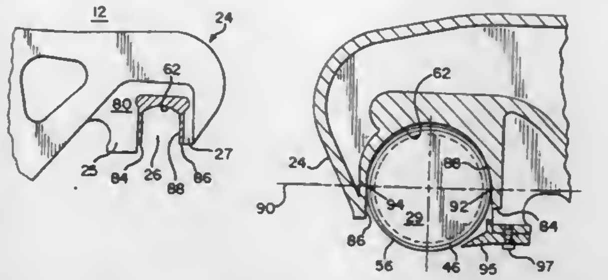
5,746,137
RAILCAR TRUCK BEARING ADAPTER CONSTRUCTION

Vaughn Terrey Hawthorne, Lisle; Charles P. Spencer, Staunton, both of Ill., and Terry L. Pitchford, St. Louis, Mo., assignors to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 351,775, Dec. 8, 1994, Pat. No. 5,572,931. This application Aug. 20, 1996, Ser. No. 700,301
Int. Cl.⁶ B61F *5/00*

U.S. Cl. 105—219 **5 Claims**

1. In a side frame of a railcar truck, said side frame having a first end, a second end, an inboard surface, an outboard surface, a first longitudinal axis, a first pedestal with an integrally cast bearing adapter at said first end, and a second pedestal with an integrally cast bearing adapter at said second end, a plurality of generally cylindrical axles, each said axle having an outer wall, a second longitudinal axis, a first axle end, a second axle end and a generally circular cross-section,



a plurality of journal bearing assemblies having an outer surface, one of said bearing assemblies mounted on each said first and second axle ends.

each said axle cross-section having a generally horizontal diameter extending through said second longitudinal axis, said diameter extending to intersect said journal bearing outer surface at a first contact point and a second contact point.

each said side-frame pedestal first and second end having a first and generally vertical depending leg, a second and generally vertical depending leg and a jaw roof connecting said first and second legs,

each said jaw roof, first depending leg and second depending leg at each said first and second pedestal cooperating to define a pedestal jaw and an opening generally opposite said roof,

each said jaw roof, said first depending leg and said second depending leg having an inner wall,

said jaw roof, said first depending leg and said second depending leg at each side frame first and second pedestal cooperating to accommodate a cast-in-place bearing adapter to receive and secure said bearing assembly and axle end in said opening,

each said bearing adapter having an adapter roof and extending side arms directly engaging a journal bearing assembly on an axle end,

said first longitudinal axis and said second longitudinal axis at each said bearing adapter generally perpendicular at an as-assembled, reference position,

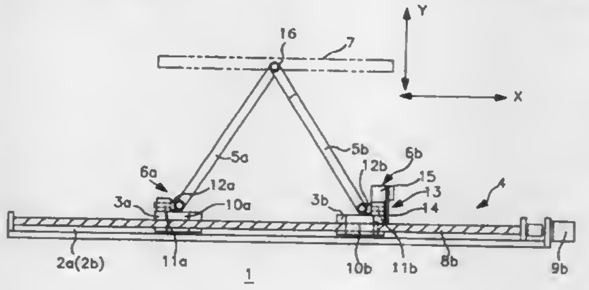
said extending side arms downwardly extending from said adapter roof at least to contact said journal bearing outer surface at said first and second contact points at angular displacement of said axle end in said bearing adapter to maintain said axle end and journal bearing in an approximately fixed relationship with a bearing assembly on said second end of said axle, which second axle end is positioned in a bearing adapter of a second side frame opposite and generally parallel to said first side frame.

5,746,138
MULTI-DEGREE-OF-FREEDOM POSITIONING MECHANISM

Kazuya Hirose, Tokyo, Japan, assignor to Hihaisuto Seiko Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1996, Ser. No. 681,994
Claims priority, application Japan, Jul. 31, 1995, 7-195266
Int. Cl.⁶ A47B *9/00*

U.S. Cl. 108—145 **7 Claims**



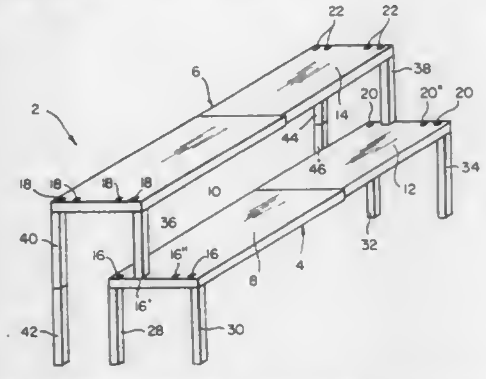
1. A multi-degree-of-freedom positioning mechanism, comprising first and second guide shafts and first and second moving

members movably mounted on each of the first and second guide shafts; one each drive, being connected with the respective first and second moving members, to allow said respective first and second moving members to travel on said first and second guide shafts individually; two pairs of foldably joined equally long links having mating links and two ends, said ends being pivotally rotatable engaged with the respective first and second moving members through respective first and second couplings; two joints, each of said joints connected to a pair of mating links of said foldably joined equally long links; and two opposite edges of a table, being pivotally rotatable engaged with the two joints between the mating links of respective pairs of joints to displaceably support the table,

each of the second couplings being provided with a rotation arrester in which an arbor having two ends is rotatably mounted in a bracket provided on the second moving member, with both ends of the arbor protruding from the bracket, and said arbor having one end rotatably engaged with one end of the link, to prevent the rotation of the arbor around itself.

5,746,139
ADJUSTABLE STORAGE RACK
Robert Villanueva, 4711 Cumberland Cir., El Paso, Tex. 79903-1923

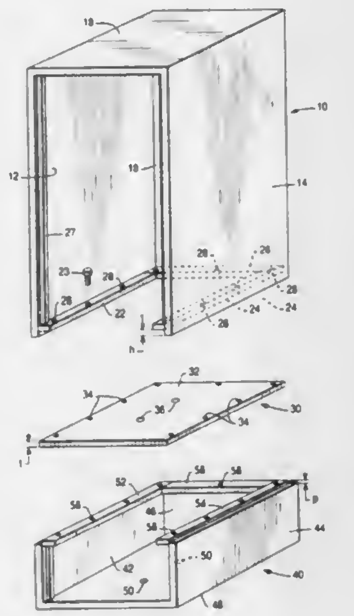
Filed Nov. 19, 1996, Ser. No. 746,997
Int. Cl.^{6} A47B *57/30*
U.S. Cl. 108—92 **7 Claims**



1. An adjustable storage rack, comprising
- (a) a lower shelf assembly, said lower shelf assembly including
  - (1) a first shelf member; and
  - (2) a second shelf member slidably connected with said first shelf member, thereby allowing said lower shelf assembly width to be varied;
  - each said shelf member further including a remote end portion having top and bottom surfaces containing a plurality of cavities;
- (b) elongated support members arranged beneath said lower shelf assembly, each said support member having an end containing a cavity and an end having a projection adapted for mating engagement with one of said lower shelf assembly bottom surface cavities;
- (c) an upper shelf assembly arranged in spaced overlapping relation above and generally parallel to said lower shelf assembly, said upper shelf assembly including
  - (1) a first shelf member; and
  - (2) a second shelf member slidably connected with said first shelf member, thereby allowing said upper shelf assembly width to be varied;
  - each said shelf member further including a remote end portion having top and bottom surfaces containing a plurality of cavities;
- (d) a plurality of elongated connector members arranged between said lower and said upper shelf assemblies, each said connector member having a pair of end projections adapted for mating engagement with a lower shelf assembly top surface cavity and an aligned upper shelf assembly bottom surface cavity, wherein one of said lower shelf assembly top surface or said upper shelf assembly bottom surface contains a number of cavities which exceeds the number of connector members; and
- (e) stacked supports arranged below said upper shelf assembly, each said stacked support including at least two support members.

5,746,140
SECURITY CONTAINER
Dennis Flood, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 2, 1997, Ser. No. 778,343
Claims priority, application United Kingdom, Aug. 29, 1996, 9618068
Int. Cl.^{6} E05G *1/04*
U.S. Cl. 109—50 **6 Claims**



1. An apparatus comprising:

a first steel body of open-floor construction and including a number of wall portions having a number of lower edges and a number of inside wall surfaces which defines at least in part an inside space;

mounting bars disposed on the inside wall surfaces of the wall portions of the first steel body;

a second steel body of open-top construction and including a number of wall portions having a number of upper edges which defines at least in part an inside space;

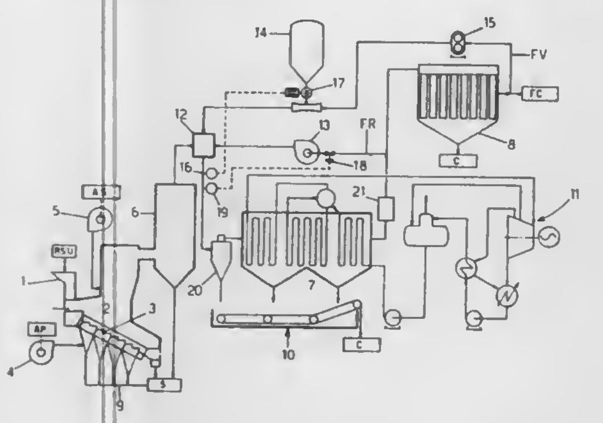
fixing bars disposed on the upper edges of the wall portions of the second steel body and connectable to the mounting bars such that the first and second steel bodies form a security container when the fixing bars and the mounting bars are connected;

a detachable floor interchangeable with the second steel body and connectable to the mounting bars such that the detachable floor and the first steel body form a security container when the detachable floor and the mounting bars are connected; and

securing means for securing either the detachable floor or the fixing bars of the second steel body to the mounting bars of the first steel body to form a security container, the securing means being accessible only from either the inside space of the first steel body or the inside space of the second steel body.

5,746,141
HIGH TEMPERATURE ACID GASES AND PARTICULATE REMOVAL IN WASTE INCINERATION PROCESS
Luigi Lacquaniti; Giuseppe Liuzzo; Marcello Palitto, and Nicola Verdone, all of Rome, Italy, assignors to Consorzio Obbligatorio Nazionale Per Il Riciclaggio Dei Contenitori in Plastica Per Liquidi, Rome, Italy

PCT No. PCT/IT95/00163, § 371 Date Jan. 30, 1997, § 102(e) Date Jan. 30, 1997, PCT Pub. No. WO96/29540, PCT Pub. Date Sep. 26, 1996
PCT Filed Oct. 6, 1995, Ser. No. 776,199
Int. Cl.^{6} F23J *15/00*
U.S. Cl. 110—203 **18 Claims**



1. A process of waste incineration, comprising:

incinerating waste, including combustion and afterburning of said waste, in an incinerator;

removing acid gases and particulate upstream of a heat recovery section;

cooling flue gases; and

reducing particulate concentration in said gases: removing said particulate and subsequently recovering heat therefrom for the production of electric or mechanical energy

wherein said cooling of the flue gases and said reducing of particulate concentration is obtained by recirculating and mixing low temperature flue gases flowing out of a heat recovery section with high temperature flue gases from said flue gas exit of the incinerator: and

wherein said acid gases and particulate are removed at a temperature lower than the temperature prevailing in a flue gas exit of the incinerator.

5,746,142
HORIZONTALLY PIVOTED SYSTEM GRATE FOR A FURNACE
Markus Jennebach, Dachau, Germany, and Joao Augusto Birkhan, Viamao-RS, Brazil, assignors to Leslie Technologies, Inc., Tallahassee, Fla., and Gruntec LTDA, Brazil

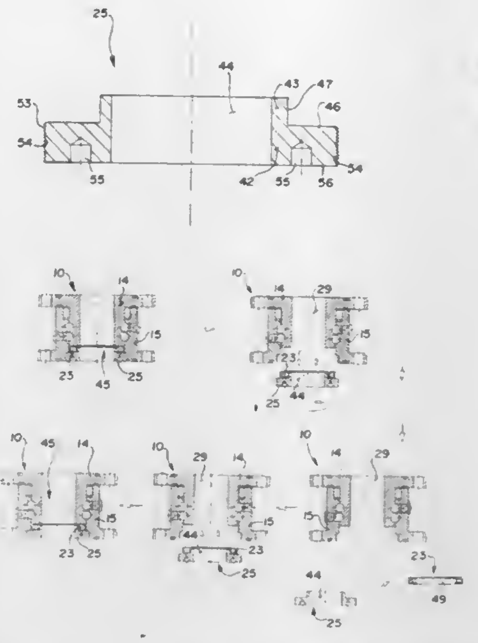
Division of Ser. No. 399,847, Mar. 7, 1995, Pat. No. 5,588,381. This application Nov. 13, 1996, Ser. No. 746,641
Int. Cl.^{6} F23G *5/00;5/24*
U.S. Cl. 110—248 **1 Claim**

1. A vertical furnace receiving waste materials for treatment comprising a system grate for collecting and conveying therethrough solid and gaseous products for treatment, said system grate being situated over a coke bed, having an angled flat roof, and also being pivoted for tilting to and fro on an axle within the vertical furnace,

said roof having slots;

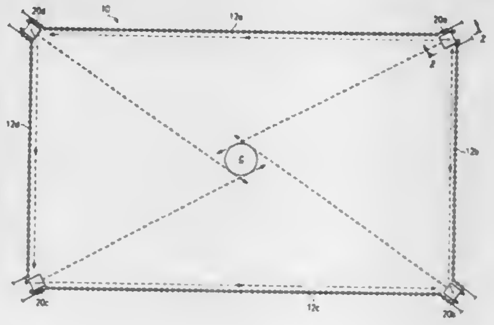
respective spaces being provided around the system grate between the system grate and the walls of the vertical furnace;

a plurality of paddles being mounted on said roof to provide homogenization and mixing of the solid products, to thereby convey said gaseous products and any solid products collected on said roof through said slots and said spaces around the system grate.



5,746,143
COMBUSTION SYSTEM FOR A COAL-FIRED FURNACE HAVING AN AIR NOZZLE FOR DISCHARGING AIR ALONG THE INNER SURFACE OF A FURNACE WALL
Joel Vatsky, 66 Lessing Rd., West Orange, N.J. 07052-2606

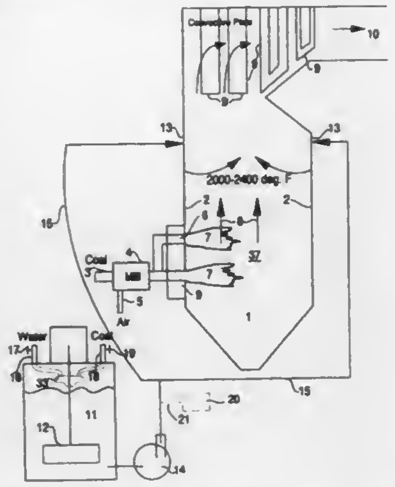
Filed Feb. 6, 1996, Ser. No. 595,900
Int. Cl.^{6} F23L *1/00;9/00;13/00*
U.S. Cl. 110—297 **7 Claims**



1. A combustion system for a fuel-fired furnace having four walls, the system comprising at least one air nozzle comprising a housing for receiving air and discharging air into the interior of the furnace, means for mounting the housing to at least one furnace wall for pivotal movement about a horizontal axis to vary its air discharge pattern along the height of the furnace, a damper blade mounted in the housing about a vertical axis for splitting the air into two streams and directing one stream along the inner surface of a furnace wall and the other stream towards the center of the furnace; and a burner mounted to the at least one furnace wall in a vertically spaced relation to the air nozzle for discharging fuel into the furnace, the damper blade directing the other stream into a combustion-supporting relation with the fuel.

5,746,144
METHOD AND APPARATUS FOR NOX REDUCTION BY UPPER FURNACE INJECTION OF COAL WATER SLURRY

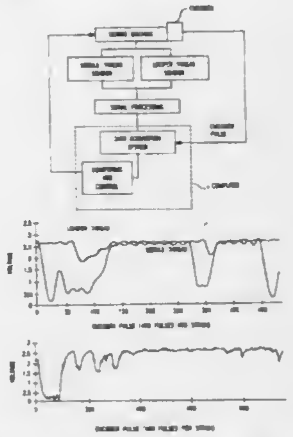
Bernard P. Breen, Pittsburgh, Pa.; James E. Gabrielson, Hanover, Minn., and Joseph Cavello, New Kensington, Pa., assignors to Duquesne Light Company, Pittsburgh, Pa.
Filed Jun. 3, 1996, Ser. No. 657,322
Int. Cl.⁶ F23J *11/00*
U.S. Cl. 110—345 **30 Claims**



1. An apparatus for reducing nitrogen oxide emissions from a furnace wherein a fuel is burned in a primary combustion zone and produces a flue gas containing nitrogen oxide which comprises at least one injector attached to the furnace above the primary combustion zone and a source of a coal water slurry connected to the injector.

5,746,145
STITCH QUALITY MONITORING SYSTEM FOR SEWING MACHINES

Robert N. Cox, Raleigh; Timothy G. Clapp, New Hill, and Kimberly J. Titus, Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.
Filed May 17, 1996, Ser. No. 649,526
Int. Cl.⁶ D05B *69/36*
U.S. Cl. 112—278 **26 Claims**



1. In combination, a sewing machine having one or more stitch threads and a stitch quality monitoring system, said stitch quality monitoring system comprising:

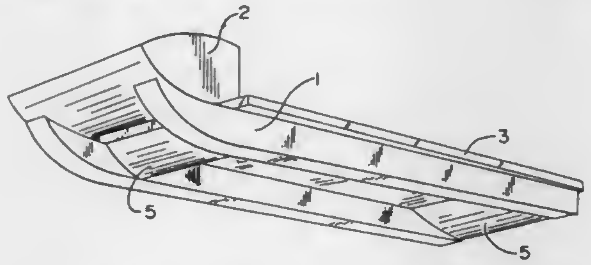
(a) sensor means in at least substantially continuous contact with at least one of said one or more stitch threads for detecting certain thread motion characteristics by detecting vibration resulting from motion of said one or more stitch threads during each stitch cycle and creating corresponding signals;

(b) encoder means operatively connected to said sewing machine for generating a predetermined constant number of sensor means sampling signals for each stitch cycle of said sewing machine; and

(c) circuit means electrically connected to said sensor means and said encoder means for detecting stitch defects during the formation of potentially defective stitches including defects from fluctuations in tension of said one or more stitch threads.

5,746,146
SURFACE EFFECT PLANING PONTOON SEAPLANE (SEPPS)

Charles Gilbert Bixel, Jr., 395 Gardner Dr., Fort Walton Beach, Fla. 32548
Filed Oct. 18, 1996, Ser. No. 732,714
Int. Cl.⁶ B63B *1/34*
U.S. Cl. 114—67 A **4 Claims**



1. A high speed water craft for transporting large cargo loads upon the surface of bodies of water, said craft comprising: a catamaran design having a pair of flat bottomed narrow pontoons in connection with a sealed rectangular floatation cargo deck so as to form an air containment area between said pontoons, each of said pontoons having a bottom surface, said air containment area having a front containment door and having a rear containment door so as to define a front containment area near said front door and a rear containment area near said rear door, a means for generating an air cushion in connection with said air containment area; said means for generating an air cushion sufficient to raise said bottom surfaces of said pontoons to the surface of said body of water, said craft comprising straight line hull sections for modular assembly, said craft having an aerodynamically shaped bow section comprising a bridge, crew and passenger quarters and having a stern section and having at least two streamlined wave piercing pontoon bow sections, said containment doors of rectangular shape and hinged at the top and slanted aft in order to allow said craft to plane upon the water's surface, said craft having bow and stern inflatable skirts laterally mounted between said pontoons and having fuel and liquid storage tanks mounted inside said flat bottom pontoons, said craft having a drive system for propelling said craft through the water.

5,746,147
TRIM DEVICE FOR A BOAT RUDDER

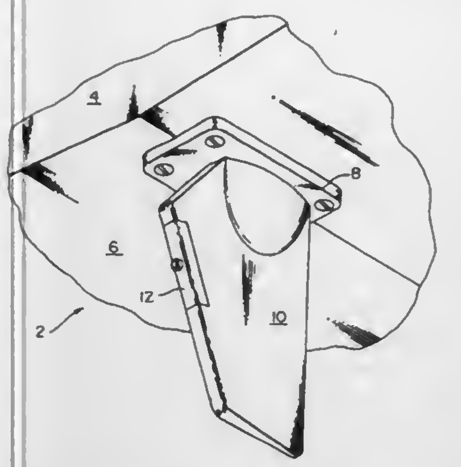
Jeffrey D. Carnevali, 3262 36th Ave. SW, Seattle, Wash. 98126
Filed Mar. 25, 1996, Ser. No. 624,688
Int. Cl.⁶ B63H *25/06*
U.S. Cl. 114—162 **2 Claims**

1. A rudder, including means to compensate for the torque generated by a single screw, comprising:

a main body member having a leading edge and a following edge, said main body member mounted for rotation about a line adjacent and substantially parallel to the leading edge, said following edge including a relieved portion extending along a small portion of its length;

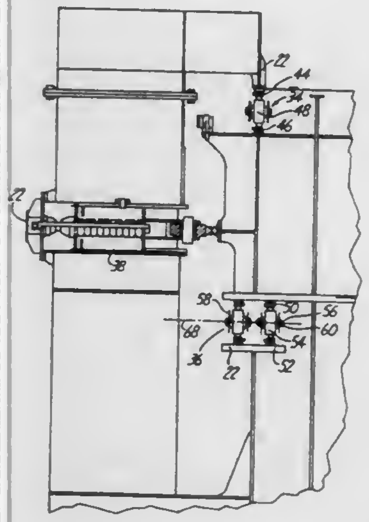
fastening means forming a part of the rudder within the relived portion; and

a trim element mating with the relieved portion, adapted to be placed at a predetermined angle to the side surface of the rudder to compensate for the torque generated by the propeller and then secured in place.



5,746,148
RADIAL SUPPORT ASSEMBLY FOR AN APPARATUS FOR POSITIONING A VESSEL

Pierre C. Delago, 15049 S. Afton Hills Dr., Afton, Minn. 55001
Continuation-in-part of Ser. No. 339,832, Nov. 14, 1994. This application May 10, 1996, Ser. No. 644,712
Int. Cl.⁶ B63B *21/50*
U.S. Cl. 114—230 **16 Claims**



1. A radial roller assembly for passively providing radial support to a cylindrical turret, which is moored to the sea bottom for rotation of a vessel around the turret, where the vessel includes a circumturret structure passing through the vessel and surrounding the turret and the radial roller assembly is adapted to be mounted to the circumturret structure, the radial roller assembly comprising:

(a) an outer housing attached to the circumturret structure;

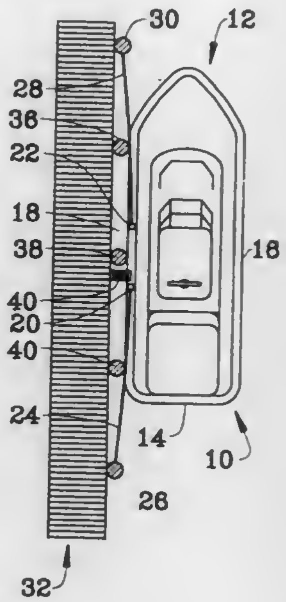
(b) an inner support carriage located within the outer housing, the inner support carriage comprises a first plate, a second plate, and a wheel support assembly, with each of the first and second plates having a bore;

(c) a guide shaft attached to the outer housing and slidably connected to the first and second plates; and

(d) a plurality of springs slidably connected to the guide shaft, the springs located between the first and second plates.

5,746,149
DOCKING APPARATUS

Herbert F. Molz, 1000 N. U.S. Highway 1, Unit 761, Jupiter, Fla. 33477
Filed Apr. 1, 1997, Ser. No. 831,728
Int. Cl.⁶ B63B *21/00*
U.S. Cl. 114—230 **17 Claims**



1. A docking apparatus for temporarily securing a vessel to a pier or pile, said docking apparatus comprising:

at least two housings secured to said vessel, each said housing having an elongated aperture for placement of a docking line therethrough;

a spool rotatable secured inside each said structure;

a docking line having a proximal end coupled to said spool and a distal end available for coupling to said pier or pile, said docking line stored in said housing by rotation of said spool causing said line to wrap around said spool;

a weighted end cover means secured to said distal end of said docking line, said end cover sized to seal said elongated aperture when said docking line is placed around said spool;

means for directional alignment of said docking line to said spool;

a hydraulic means fluidly coupled to said rotatable spool;

remote means for controlling the amount of fluid directed to said rotatable hydraulic spool allowing an operator of said vessel to control the rotational speed thereof;

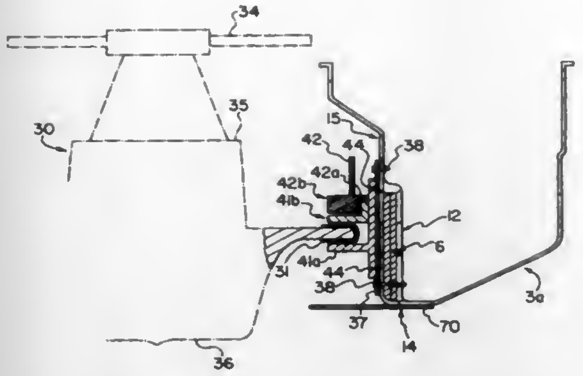
wherein said distal end of said docking line is free wheeled from said spool for coupling to said pier or pile whereby said docking line is retracted into said retrieval structure at a speed dependant upon the amount of fluid flow to said spool allowing vessel movement to the pier at a rate controllable by the operator of said vessel.

5,746,150
BOAT FOR USE WITH A PERSONAL WATERCRAFT

Daniel E. Beaulac, RR5, S.22, B26, Prince Albert, Saskatchewan, Canada, S6V 5R3; Trevor S. Hewison, 2980B - 5th Ave East, Prince Albert, Saskatchewan, Canada, and Wayne Washington, 1213 River St. E., Prince Albert, Saskatchewan, Canada, S6V 0B7
Filed Feb. 17, 1995, Ser. No. 389,882
Int. Cl.⁶ B63B *21/54*
U.S. Cl. 114—248 **4 Claims**

1. A boat for use in combination with a personal watercraft having a bumper on each side of the personal watercraft, the boat comprising:

a hull having a bow and a stern;



the stern of the hull being separated into first and second rear hull portions forming a docking bay between them;

the first rear hull portion including a first side facing the docking bay;

the second rear hull portion including a second side facing the docking bay;

a first longitudinal U-shaped bumper receiving channel fastened to the first side for holding the bumper of a personal watercraft; and

a second longitudinal U-shaped bumper receiving channel fastened to the second side for holding the bumper of a personal watercraft,

wherein at least one of the first and second U-shaped bumper receiving channels includes a clamping mechanism.

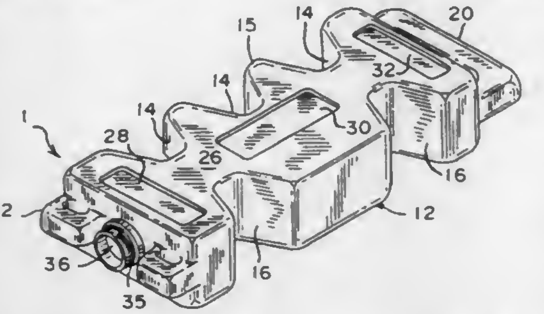
5,746,151
MULTI-FUNCTIONAL CARRIER FOR SAILBOATS

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Feb. 2, 1996, Ser. No. 597,460

Int. Cl.^{6} B63B *8/00*

U.S. Cl. 114—343 **17 Claims**



1. A multi-functional carrier for removably supporting at least one of a boom, mast, and spinnaker pole of a sail boat comprising:

a floatable hollow body having a top wall with at least one receiving means for receiving said at least one of a boom, mast and spinnaker pole, and having side walls with apertured extensions serving as means for securing said hollow body to a sailboat and as a means for holding of the carrier by a user.

5,746,152
TELESCOPING SEAT PEDESTAL

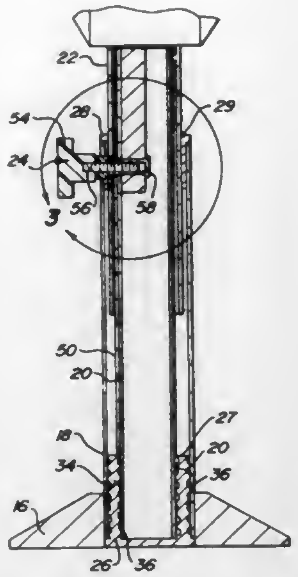
O. C. Huse, Arlington, Tex., assignor to Moeller Marine Products, Goodlettsville, Tenn.

Filed Aug. 28, 1996, Ser. No. 704,372

Int. Cl.^{6} B63B *17/00*

U.S. Cl. 114—363 **19 Claims**

1. A vertically adjustable pedestal for use in mounting a seat for vertical movement with respect to a mounting surface, said pedestal comprising:



mounting means adapted for mounting said pedestal to said mounting surface;

an outer post, said outer post being supported by said mounting means;

a guide post mounted within said outer post, said guide post and said outer post having longitudinal center lines that are generally co-linear;

an adjustable post having first and second ends, said first end having an opening for receipt of said guide post, such that said adjustable post is free to slide with respect to said guide post, said first end also being mounted within said outer post for telescopic movement with respect to said outer post, said second end being adjusted to have a seat mounted thereon;

a locking mechanism for locking said adjustable post at a desired height, said locking mechanism interconnecting said guide post and said adjustable post, said locking mechanism being adapted to draw said guide post and said adjustable post together to restrict movement of said adjustable post with respect to said guide post.

5,746,153
DEVICE FOR EXTRACTING FROM A MILKING FLOW AN ANALYSIS SAMPLE HAVING A PROPORTIONAL AMOUNT

Tilman Hoefelmayr, Niederteufen, Switzerland, assignor to Bio-Melktechnik Hoefelmayer & Co., Niederteufen, Switzerland

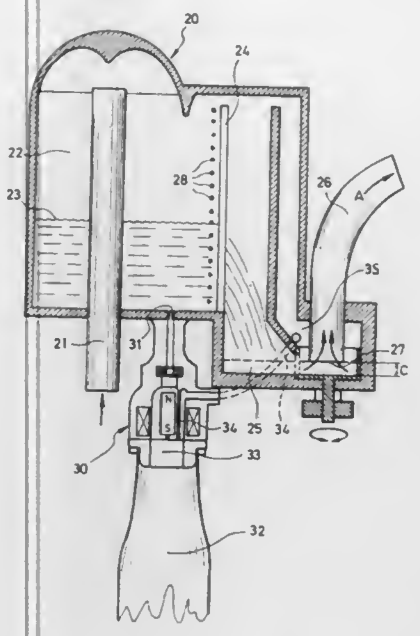
Division of Ser. No. 303,867, Sep. 9, 1994, Pat. No. 5,645,012. This application Dec. 20, 1995, Ser. No. 575,516

Claims priority, application Germany, Sep. 14, 1993, 43 31 203.9

Int. Cl.^{6} A01K *7/00*

U.S. Cl. 119—14.01 **21 Claims**

1. A device for extracting an analysis sample amount of milk from the milk flow milked from a cow, the analysis sample amount being proportional to the amount of milk which has been milked from the cow, whereby sample partial amounts are extracted from the milk flow dependent on the milk flow, comprising a fluid duct for transporting milk, a valve within said fluid duct, and a means for controlling said valve in cycles, each cycle including a valve opening time and a valve closing time, said valve opening time extracting said partial analysis sample amount, said controlling means having a means for storing a predetermined maximum of said analysis sample, a means for determining an expected total amount of milk to be milked from the particular cow based upon prior total amounts milked from the particular cow, and means for determining said valve opening time, said valve closing time, and a cycle time defined by said valve opening time and valve closing time, said cycle time and said valve opening time being determined to lie within a specified range of values, said controlling means determining one of said valve opening time and said cycle time dependent on the milk flow within said milk duct, and said determining means changing said valve opening time and cycle time in a ratio equal to values lying within said specified range.



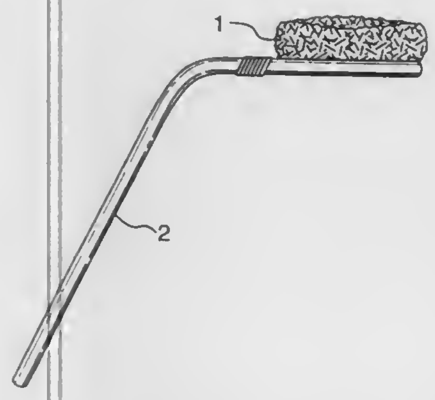
5,746,154
HAND-HELD BIRD FEEDER

Cedar Millet, and Gary Dickson, both of East River Rd., Star Rte., Huntington, Mass. 01050

Filed Aug. 12, 1996, Ser. No. 695,652

Int. Cl.^{6} A01K *39/01*

U.S. Cl. 119—57.8 **2 Claims**



1. A hand-held bird feeder, comprising:

a cane having two ends, one end of which forms a handle, the other end of which is forked to form two branches;

a perch;

a means of affixing said perch to said cane, proximate to the end of each branch of the fork of said cane; and

a receptacle for holding feed affixed to said cane proximate to said perch.

5,746,155
WATER TREATMENT WITH LARGE NUMBERS OF NON-PATHOGENIC BACTERIA TO IMPROVE YIELD OF AQUATIC ANIMALS

Walter T. Logan, Postal Rte. 1, Box. 160, Buena Vista, Va. 24416, and Stephen L. Bartlett, 5310 Cendronella Rd., Chapel Hill, N.C. 27514

Filed Jun. 17, 1997, Ser. No. 877,753

Int. Cl.^{6} A01K *61/02*

U.S. Cl. 119—230 **14 Claims**

1. A method for improving the yield of aquatic non air breathing animals grown in an enclosed body of water comprising,

a) adding sufficient numbers of non pathogenic bacteria to the body of water to increase the weight gain of aquatic animals grown in the body of water more than 10% compared to the weight gain of aquatic animals grown in a body of water to which non pathogenic bacteria were not added,

b) stocking the body of water with a species of non air breathing aquatic animals and allowing the species to grow to harvesting size,

c) harvesting the grown non air breathing aquatic species,

d) repeating the steps a), b), and c).

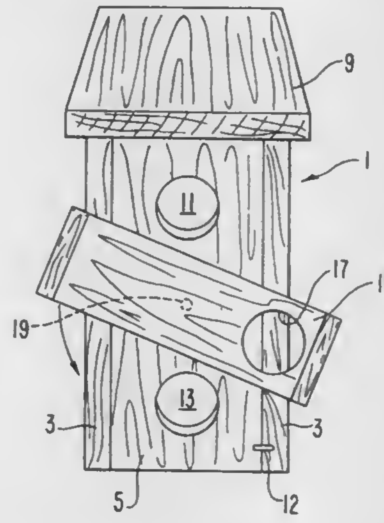
5,746,156
CONVERTIBLE BIRD BOX

George H. Petrides, Bethesda, Md., and Katherene J. Kirchner, McLean, Va., assignors to Wild Bird Centers of America, Inc., Glen Echo, Md.

Filed Feb. 14, 1996, Ser. No. 601,439

Int. Cl.^{6} A01K *31/00*

U.S. Cl. 119—428 **17 Claims**



1. A convertible bird box, comprising:

a) a housing having a floor, walls and a roof,

b) a pair of entrance openings in a wall of the housing, and

c) a closure selectively opening one entrance opening and simultaneously closing the other entrance opening.

5,746,157
VEHICLE-MOUNTED ANIMAL RESTRAINT APPARATUS

Robin Warwaruk, Box 1224, Unity, Saskatchewan, Canada, S0K 4L0

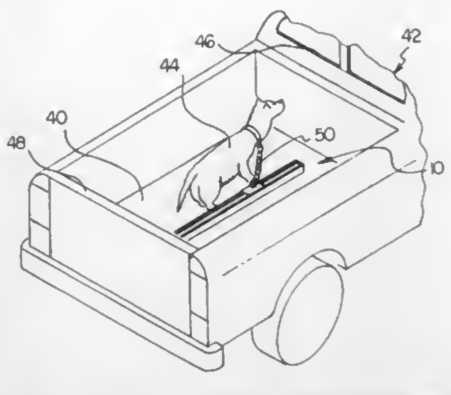
Filed Sep. 9, 1996, Ser. No. 711,105

Int. Cl.^{6} A01K *3/00*

U.S. Cl. 119—785 **1 Claim**

1. An animal restraint apparatus for attachment to a horizontal surface comprising:

a carriage-retention channel including a base portion, a pair of spaced side walls projecting upward from the base portion,



and a pair of ridges projecting toward each other from top portions of the side walls, the ridges each being semi-cylindrical in cross section and including a semi-cylindrical side wall having a convex outer surface, the convex outer surfaces of the ridges facing inwardly toward each other;

a carriage unit received by the carriage-retention channel, wherein the carriage unit includes a main body portion, a wheel assembly connected to a portion of the main body portion encompassed by the carriage-retention channel, and an animal connector connected to the main body portion;

wherein the wheel assembly includes a pair of axles received by the main body portion of the carriage unit, and two pairs of wheels connected to ends of the pair of axles, the wheels being positioned for engagement against the convex outer surfaces of the semi-cylindrical side walls such that an upward movement of a first side of the carriage unit within the carriage-retention channel will cause a first pair of the wheels on the first side of the carriage unit to engage the convex outer surface of the semi-cylindrical side wall of one of the ridges and cause the carriage unit to move towards an opposed side wall, thereby causing a second pair of the wheels to engage the opposed side wall to retard movement of the carriage unit within the carriage-retention channel;

attachment means for connecting the carriage-retention channel to the horizontal surface.

5,746,158

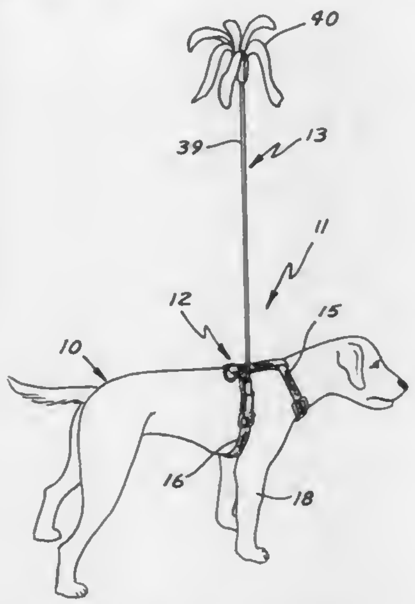
HUNTING DOG SIGNAL DEVICE

Nicholas N. Landherr, 927 East Vine, Owatonna, Minn. 55060

Filed Apr. 7, 1997, Ser. No. 835,317

Int. Cl.^{6} A01K *29/00*

U.S. Cl. 119—858 **14 Claims**



1. A signal device to be worn by a hunting dog, comprising:

a dog harness fitted to a hunting dog;

said harness having a strap section disposed on the side of the dog;

a holster assembly;

means attaching the holster assembly to the harness strap section disposed on the side of the dog;

said holster assembly having an upwardly open pocket;

a generally cylindrical mounting fixture located in the pocket with an upper end and a lower end, and a generally upright axis;

a slot in the mounting fixture extending from the top thereof to an intermediate location toward the bottom of the fixture;

said slot describing a generally zig-zag path on the circumference of the fixture, having a first leg extending from the top of the fixture downwardly at a first angle with respect to the axis of the fixture, and a second leg extending from the lower end of the first leg at an opposite angle relative to the axis of the fixture;

an upwardly extended notch at the bottom of the slot;

a mast assembly including a mast with a proximal end and distal end;

visual signal indicia connected at the distal end of the mast;

a mounting pin at the proximal end of the mast disposed at an angle relative to the mast;

said proximate end of the mast and the pin being of a size to engage the slot with the pin riding in the track of the slot traversing the length of the slot to the notch, and engageable in the notch; and

biasing means to bias the pin in engagement with the notch.

5,746,159

COMBUSTION DEVICE IN TUBE NESTED BOILER AND ITS METHOD OF COMBUSTION

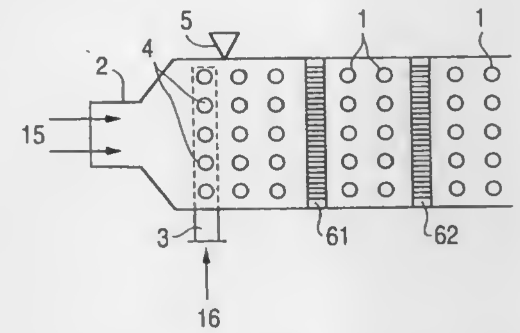
Hiroshi Kobayashi; Yoshiharu Ueda; Masanari Kinoshita; Masamichi Yamamoto, and Atsumi Kaminashi, all of Osaka, Japan, assignors to Hirakawa Guidom Corporation, Osaka, Japan

Division of Ser. No. 201,419, Feb. 24, 1994, Pat. No. 5,482,009. This application Jun. 5, 1995, Ser. No. 465,344

Claims priority, application Japan, Feb. 25, 1993, 5-063522

Int. Cl.^{6} F22B *23/06;37/10*

U.S. Cl. 122—367.1 **6 Claims**



1. A combustion method comprising:

providing in a boiler a plurality of water tubes constituting a water tube nest;

providing a plurality of fuel supply tubes upstream of said water tube nest;

supplying fuel to said fuel supply tubes;

supplying air into the boiler upstream of said water tube nest and independently of the fuel;

providing at least one combustion catalyst layer amongst said water tube nest and across a downstream direction of the boiler;

passing the fuel-air mixture through said at least one combustion catalyst layer;

wherein, in providing said water tubes, said water tubes are arranged in rows spaced apart in the downstream direction; and

wherein, in providing said fuel supply tubes, said fuel supply tubes are arranged in a row spaced upstream of said water tube nest.

5,746,160

HAND-HELD WORKING TOOL WITH COMBUSTION AIR CHANNEL ARRANGED AT BLOWER HOUSING

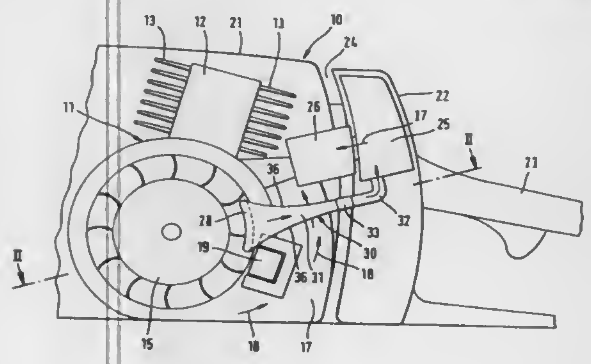
Thomas Stark, Waiblingen; Helmut Zimmermann, Kernen, and Klaus-Martin Uhl, Hohengehren, all of Germany, assignors to Andreas Stihl, Waiblingen, Germany

Continuation of Ser. No. 490,128, Jun. 14, 1995, abandoned. This application Aug. 30, 1996, Ser. No. 706,181

Claims priority, application Germany, Jun. 14, 1994, 44 20 530.9

Int. Cl.^{6} F01P *1/02*

U.S. Cl. 123—41.7 **19 Claims**



1. A hand-held working tool comprising:

a housing;

an air-cooled internal combustion engine positioned in said housing and having cooling ribs;

a sealed carburetor box connected to said internal combustion engine;

a cooling air blowing device with a blower positioned in said housing for supplying cooling air to said internal combustion engine, said blower sucking in cooling air in the axial direction of said blower and conveying a cooling air flow in a flow direction radially relative to said blower and then tangentially in the direction of rotation of said blower to said cooling ribs;

said housing comprising a blower cover;

a combustion air channel connected to said blower cover;

said combustion air channel connected to said carburetor box, wherein said internal combustion engine sucks in the combustion air through said carburetor box;

said combustion air channel having an inlet for branching off a combustion air flow from the cooling air flow, said inlet being in the form of at least one slot within said blower cover;

said inlet positioned adiacent to said blower within a range of the diameter of said blower; and

at least one deflecting element connected to said inlet, said deflecting element having a deflecting front surface for guiding the cooling air flow in said flow direction and a back side, wherein said deflecting element is positioned such that said back side covers said inlet in the flow direction of the cooling air flow and said combustion air flow is reversed relative to said flow direction of the cooling air along said back side into said inlet.

5,746,161

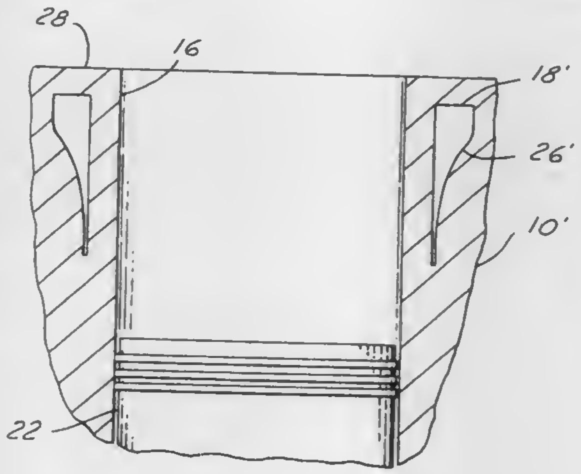
ENGINE CYLINDER BLOCK COOLING PASSAGE

David L. Boggs, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1995, Ser. No. 498,210

Int. Cl.^{6} F02F *1/10*

U.S. Cl. 123—41.72 **15 Claims**



1. An internal combustion engine comprising:

a piston; and

a cylinder block having an upper end and a lower end and including a cylindrical bore in the cylinder block extending from the upper to the lower end forming a piston cylinder for slidably receiving the piston therein, and a coolant jacket encircling the cylinder, adapted for receiving coolant fluid to flow therein in a circumferential flow direction around the piston cylinder, with the coolant jacket tapering non-linearly from top down sufficiently in width such that the velocity of fluid flowing within the coolant jacket will vary in a direction normal to the general direction of fluid flow due to a viscous drag effect acting on fluid over a portion of the length of the cooling jacket, wherein the heat transfer will be reduced with reduced velocity of fluid.

5,746,162

SHEET PROCESSING APPARATUS AND SHEET PROCESSING METHOD

Masatoshi Hosoi; Yoshihide Sugiyama, both of Okazaki; Mitsuru Ichikawa, Nisbio, and Norihisa Masamura, Mizunami, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1996, Ser. No. 719,949

Claims priority, application Japan, Sep. 25, 1995, 7-246301; Aug. 26, 1996, 8-223788

Int. Cl.^{6} B65H *39/10*

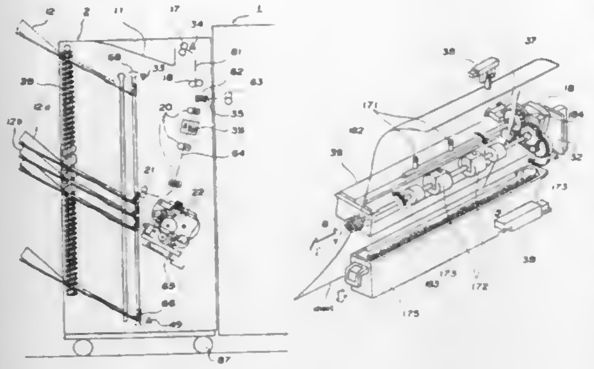
U.S. Cl. 123—58.09 **23 Claims**

1. A sheet processing apparatus for processing a sheet comprising:

a punching unit detachably mounted on said apparatus for punching a sheet which is conveyed thereto;

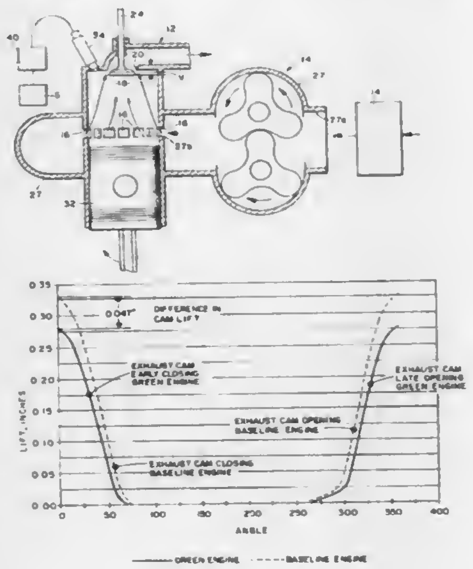
recognition means for recognizing a type of said punching unit mounted on said apparatus; and

control means for controlling a punching operation of said



punching unit in accordance with the type of said punching unit which is recognized by said recognition means.

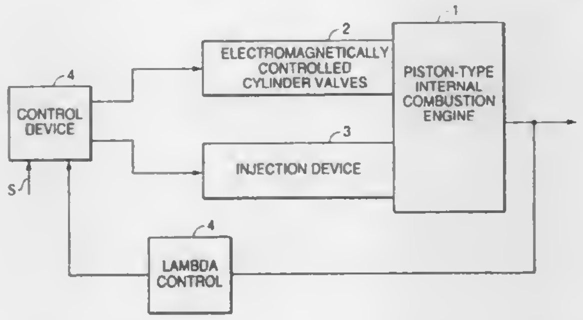
5,746,163
LOW EMISSION POWER PLANT AND METHOD OF MAKING SAME
Edward Green, Bakersfield, Calif., assignor to Clean Cam Technology Systems, Bakersfield, Calif.
Filed Sep. 26, 1996, Ser. No. 721,232
Int. Cl.⁶ F02B *75/02*
U.S. Cl. 123—65 VC **11 Claims**



1. A method of making an improved low emission mechanical power plant by modifying a baseline compression ignited, two-stroke diesel engine component having a combustion cylinder defined by a cylinder sleeve having a plurality of air inlet ports and an exhaust gas outlet port; a valve for opening and closing the exhaust outlet port; injection timing for timing the injection of fuel into the cylinder and a camshaft shaft rotatable through an angle of 360 degrees for lifting the valve relative to the exhaust port a distance of approximately 0.36 inches, said camshaft opening said valve at an angle of rotation of approximately 310 degrees, and closing said valve at an angle of approximately 60 degrees, the method comprising the:

step of modifying the camshaft of the baseline two-stroke diesel engine component to cause the valve to open a distance of approximately 0.28 inches, said camshaft opening said valve at an angle of approximately 330 degrees and closing said valve at an angle of approximately 35 degrees so as to increase the volume of residual gases remaining in the combustion cylinder following the scavenge stroke.

5,746,164
METHOD OF DETERMINING VALVE CONTROL TIMES FOR A MAXIMUM CYLINDER CHARGE FOR A PISTON-TYPE INTERNAL COMBUSTION ENGINE
Ekkehard Schrey, and Guenter Schmitz, both of Aachen, Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Germany
Filed Sep. 5, 1996, Ser. No. 708,709
Claims priority, application Germany, Sep. 20, 1995, 195 34 876.1
Int. Cl.⁶ F02D *41/02*
U.S. Cl. 123—90.11 **1 Claim**


1
2
ELECTROMAGNETICALLY CONTROLLED CYLINDER VALVES
PISTON-TYPE INTERNAL COMBUSTION ENGINE
4
CONTROL DEVICE
3
INJECTION DEVICE
5
4
LAMBDA CONTROL

1. A method for determining valve control times for a maximum charge for cylinders in a piston-type internal combustion engine provided with a fuel injection, a lambda sensor control and electromagnetically operable cylinder valves, and with an engine control which is connected to the lambda sensor control for actuating the fuel injection and for actuating the electromagnetically operable cylinder valves which include gas intake valves, wherein the gas intake valves include an "intake closes" control moment, the method comprising the steps of, in the engine control

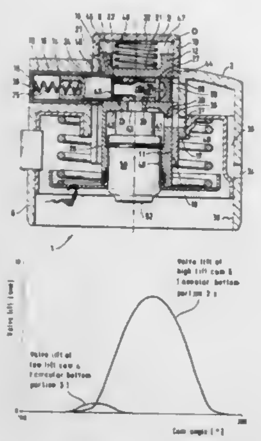
setting the "intake closes" control moment to a preliminary value on all gas intake valves of the engine;

changing continuously the "intake closes" control moment of the gas intake valve of at least one cylinder while maintaining a constant engine rpm until, with the lambda sensor control at μ=1, one of (1) a longest fuel injection duration and (2) a leanest operation at a constant injection duration is determined; and

storing the determined "intake closes" control moments at respective rpm's in a performance characteristic of the engine control for achieving a maximum charge in the cylinders at the respective rpm's.

5,746,165
VALVE DRIVE OF AN INTERNAL COMBUSTION ENGINE
Walter Speil, Ingolstadt, and Gerhard Maas, Herzogenaurach, both of Germany, assignors to Ina Walzlager Schaeffler KG, Germany
PCT No. PCT/EP95/04094, § 371 Date Apr. 29, 1997, § 102(e) Date Apr. 29, 1997, PCT Pub. No. WO96/15360, PCT Pub. Date May 23, 1996
PCT Filed Oct. 18, 1995, Ser. No. 849,007
Claims priority, application Germany, Nov. 10, 1994, 44 40 133.7
Int. Cl.⁶ F01L *1/14;13/00*
U.S. Cl. 123—90.16 **10 Claims**

1. A valve drive of an internal combustion engine comprising cams (4, 5) fixed on a camshaft, which said cams contact at least one cam follower (1), at least one high lift cam (5) and one low lift cam (4) situated next to the high lift cam (5) in an axial direction of the camshaft and being arranged out-of-phase with each other, said cams (4, 5) actuating the cam follower (1) in opening and closing directions of a gas exchange valve (51), the cam follower (1) being comprised of at least a first and a second unit (3, 2) which are displaceable relative to each other, the low lift cam (4) being in contact with the first unit (3) and the high lift cam (5) being in contact with the second unit (2), characterized in that



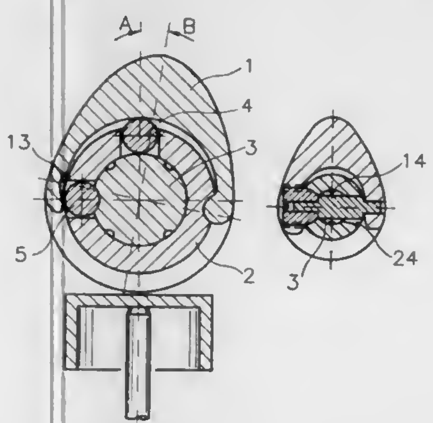
a part of a lift of the low lift cam (4) is in excess of a lift of the high lift cam (5)

an axially displaceable piston (12) is arranged in a bore (11) of the first unit (3), and said piston (12) actuates the gas exchange valve (51) at least indirectly,

for coupling the cam follower (1) to the low lift cam (4), the first unit (3) is coupled to the piston (12) which actuates the gas exchange valve (51), by a coupling means being a further piston (28), while the second unit (2) is uncoupled from the first unit (3) and from the piston (12) which actuates the gas exchange valve (51),

for coupling the cam follower (1) to the high lift cam (5), the first unit (3) is uncoupled from the piston (12) which actuates the gas exchange valve (51) and is axially displaceable relative to the said piston (12) through a distance corresponding at least to an amount by which the lift of the low lift cam (4) exceeds the lift of the high lift cam (5), while the second unit (2) is coupled by a coupling means (24) to the piston (12) which actuates the gas exchange valve (51).

5,746,166
CAM LOBE WITH OFFSET ANGULAR MOVEMENT
Christos Valasopoulos, 22, Koritsas Str., 10447 Athens, Greece
PCT No. PCT/GR94/00023, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO95/16852, PCT Pub. Date Jun. 22, 1995
PCT Filed Nov. 24, 1994, Ser. No. 507,361
Claims priority, application Greece, Dec. 17, 1993, 930100517
Int. Cl.⁶ F01L *13/00;1/08*
U.S. Cl. 123—90.17 **14 Claims**



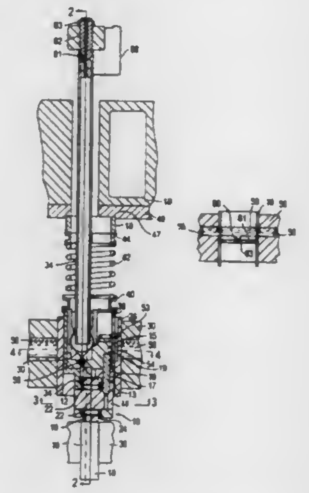
1. A cam lobe angular movement system attached to a rotating shaft, comprising:

a U-shaped cam lobe having a symmetry axis, wherein said U-shaped cam lobe is disposed rotatable around a fixed point located offset relative to the symmetry axis of the U-shaped cam lobe;

a rotating cylindrical shaft supporting the cam lobe;

means for rotating the U-shaped cam lobe around said fixed point located offset relative to the symmetry axis of the U-shaped cam lobe and for causing a defined angular motion of the cam lobe around the fixed point, resulting in a simultaneous gradual change of operational parameters of a valve, namely: i) a phase of operation, ii) a lifting stroke, and iii) an opening— closing duration.

5,746,167
VALVE LIFTER
Daniel H. Jesel, 108 Fitney Ave., Spring Lake, N.J. 07763
Division of Ser. No. 563,099, Nov. 27, 1995, Pat. No. 5,673,661. This application Apr. 11, 1997, Ser. No. 835,968
Int. Cl.⁶ F01L *1/14;* **F01M** *9/10*
U.S. Cl. 123—90.35 **6 Claims**



1. A valve lifter and bushing assembly for installation in an internal combustion engine,

wherein the bushing is constructed and arranged for placement in a valve lifter bushing bore in the engine, the bushing including an oil channel disposed between a first side of the bushing and a second side of the bushing so that when the bushing is installed in the bushing bore, a first side of an oil gallery in the engine flowably communicates with the first side of the bushing oil channel and a second side of the oil gallery flowably communicates with the second side of the bushing oil channel, thereby allowing uninterrupted oil flow from the first side of the oil gallery, through the bushing oil passage to the second side of the oil gallery; and

the valve lifter is constructed and arranged for reciprocating disposition in the valve lifter bushing to mechanically connect between a camshaft and a pushrod installed in the engine, the valve lifter comprising a body, a pushrod seat for engaging the pushrod and an oil flow passage disposed in the body for intermittently flowably communicating between the bushing oil channel and the pushrod seat, wherein during a first portion of a reciprocating cycle of the valve lifter, the valve lifter oil flow passage is open to and flowably communicates with the bushing oil channel, and during a second portion of the reciprocating cycle of the valve lifter, the valve lifter oil flow passage is covered and oil flow is substantially prevented from the bushing oil channel through the valve lifter oil flow passage.

5,746,168

CYLINDER HEAD COVER OF AN INTERNAL COMBUSTION ENGINE

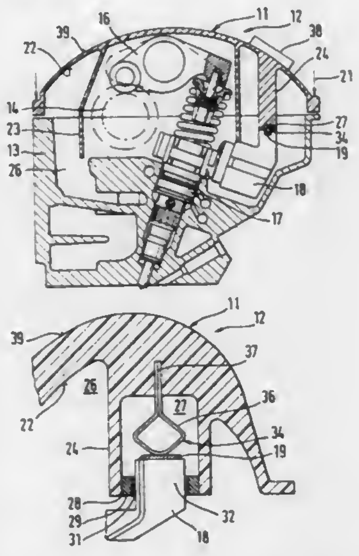
Eduard Lochbrunner, Hemmingen, Germany; Heiko Buss, El Paso, Tex.; Werner Haarer, Illingen; Andreas Oettinger, Bad Urach, both of Germany; Maximilian Kronberger, Steyr, Austria; Régis Blanc, Lyon/Frankreich, France, and Gerhard Weiss, Neuhofen, Austria, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 21, 1997, Ser. No. 803,653

Claims priority, application Germany, Feb. 23, 1996, 296 03 254 U

Int. Cl.⁶ F16J *10/00;* **F02M** *39/00*

U.S. Cl. 123—90.38 **5 Claims**



1. A cylinder head cover of an internal combustion engine with a solenoid-controlled injection device, the cylinder head cover covering drive elements for the injection device connected to a cylinder head, the injection device having a pump-nozzle unit for each cylinder of the internal combustion engine with a corresponding solenoid valve to control fuel delivery to each of the pump-nozzle units, comprising:

first and second contacts connected to each of the solenoid valves, the first contact being electrically coupled to the second contact, to supply power to the solenoid valves, when the cylinder head cover is mounted on the cylinder head.

5,746,169

LIGHT-METAL PISTON FOR HIGHLY STRESSED INTERNAL COMBUSTION ENGINES

Wolfgang Issler, Schwaikheim, and Helmut Kollotzek, Mutlangen, both of Germany, assignors to Mahle GmbH, Stuttgart, Germany

PCT No. PCT/DE95/01064, § 371 Date Jan. 7, 1997, § 102(e) Date Jan. 7, 1997, PCT Pub. No. WO96/07841, PCT Pub. Date Mar. 14, 1996

PCT Filed Aug. 7, 1995, Ser. No. 776,069

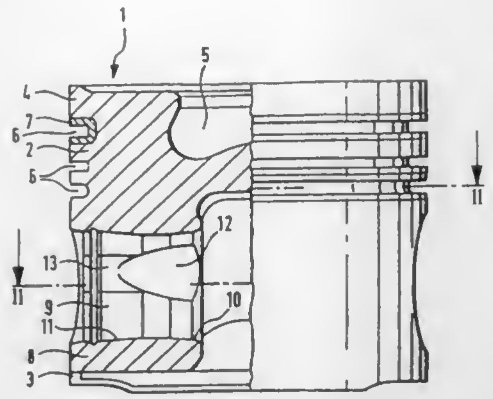
Claims priority, application Germany, Sep. 8, 1994, 44 31 990.8

Int. Cl.⁶ F16J *1/16*

U.S. Cl. 123—193.6 **11 Claims**

1. Light-metal piston for highly stressed internal combustion engines, comprising a piston head having a combustion chamber and an annular groove part, and a piston shaft with integrated gudgeon pin bosses and bores, each bore having an inner end and an outer end, said piston having the following features in combination:

(a) The combustion chamber in the piston head is not reinforced;
(b) The bore of each gudgeon pin boss is widened at and toward its inner end in at least a partial zone x of the total length of the boss bore;



(c) The bore of each gudgeon pin boss substantially conically widens at and toward its outer end in a partial zone z of the total length of the boss bore defining a supporting zone;
(d) The bore of each gudgeon pin boss has two slanted pockets starting from its inner end; and
(e) The ignition pressure occurring during combustion is higher than 120 bar.

5,746,170

ENGINE OIL BLOCK FOR USE IN ROUTING TO AN OIL COOLER

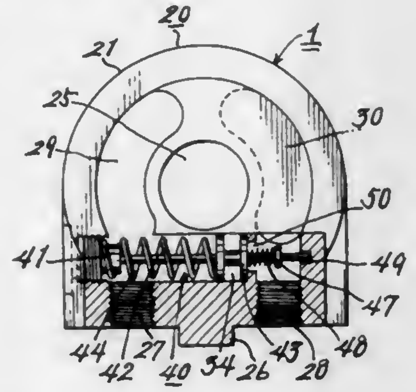
Yukio Moriya, Nerima-ku, Japan, assignor to Ginko Bussan Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1996, Ser. No. 751,422

Claims priority, application Japan, Nov. 16, 1995, 7-322298; Nov. 21, 1995, 7-326549

Int. Cl.⁶ F01M *5/00*

U.S. Cl. 123—196 AB **9 Claims**



1. An engine oil block for use with an engine block having an oil inlet and an oil outlet, an oil cooler having an oil inlet and an oil outlet, and an oil filter having an oil inlet and an oil outlet, and for use in selectively routing engine oil from the engine block to the oil cooler, said engine oil block comprising:

an oil block body having formed therein,
  an oil inlet channel connectable at one side thereof to the oil outlet of the engine block and at another side thereof to the oil inlet of the oil cooler,
  an oil outlet channel connectable at one side thereof to the oil outlet of the oil cooler and at another side thereof to the oil inlet of the oil filter,
  an oil circulation passage connectable at one side thereof to the oil outlet of the oil filter and at another side thereof to the oil inlet of the engine block,
  a communication passage connecting said oil inlet channel to said oil outlet channel and comprising a threaded mounting hole in an end wall thereof and an insert hole in another end wall thereof,
  a passage port located between said oil inlet channel and said communication passage;

a thermostat provided in said communication passage comprising,
  a threaded plug screwed into said threaded mounting hole,
  a shaft secured at one end thereof to the center of said threaded plug and inserted into said insert hole at another end thereof,
  a valve member movable along said shaft for opening and closing said passage port,
  a shape memory alloy member expandable depending on the temperature of the oil, wound spirally along said shaft and arranged between said valve member and said threaded plug for moving said valve member along said shaft,
  a bias spring seat retained on said shaft,
  a bias spring arranged on said shaft between said valve member and said bias spring seat;

wherein said valve member is movable by said shape memory alloy member to,
  open said passage port when the temperature of the oil is high, for returning the engine oil to the engine block without routing it to the oil cooler, and
  close said passage port when the temperature of the oil is low, for routing the engine oil from the engine block to the oil cooler.

5,746,171

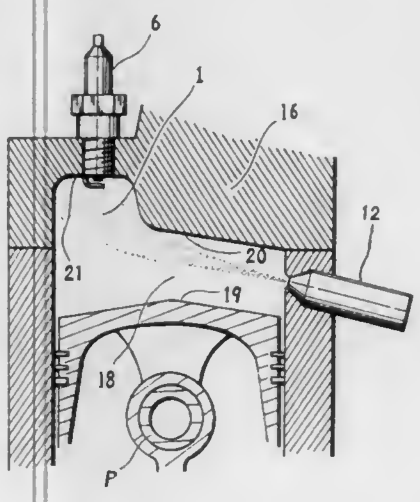
DIRECT FUEL INJECTION STRATIFIED CHARGE ENGINE

Yasuhito Yaoita, Wellstone Terrace 2, 12-32 Nagahama, Kanazawa-ku, Yokohama, 236, Japan

Continuation-in-part of Ser. No. 383,844, Feb. 6, 1995, Pat. No. 5,605,125. This application Oct. 30, 1996, Ser. No. 740,503

Int. Cl.⁶ F02B *3/00*

U.S. Cl. 123—275 **3 Claims**



1. A direct fuel injection stratified charge engine comprising:

a cylinder block defining a cylinder;
a piston located in said cylinder;
a cylinder head on said cylinder block, said cylinder head defining a squish surface facing said piston, and a pocket defining a main combustion chamber on a circumferential wall facing said piston;
a spark plug in said pocket, wherein the greatest spacing between electrodes of the spark plug and any portion of said pocket is less than the radius of said cylinder; and
a fuel injector located on an inner cylinder wall adjacent said squish surface, said fuel injector located diametrically of said pocket and adapted to simultaneously inject fuel and air without impinging on said squish surface to said pocket during the compression stroke.

5,746,172

PROCESS FOR INCREASING THE TORQUE OF AN INTERNAL COMBUSTION ENGINE AND INTERNAL COMBUSTION ENGINE

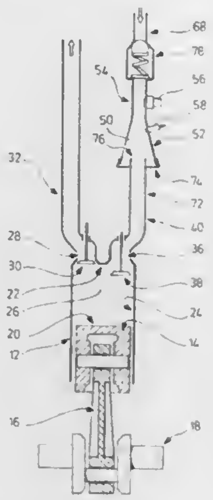
Walter Peschka, Sindelifingen, and Gottfried Schneider, Stuttgart, both of Germany, assignors to Deutsche Forschungsanstalt Fuer Luft-und Raumfahrt E.V., Bonn, Germany

Filed Dec. 18, 1995, Ser. No. 589,564

Claims priority, application Germany, Apr. 19, 1994, 44 13 583.1

Int. Cl.⁶ F02B *19/02*

U.S. Cl. 123—292 **44 Claims**



1. Process for increasing the torque of an internal combustion engine burning a fuel by means of a gaseous oxidizing agent and comprising at least one cylinder and an induction system, wherein the mass flow of the gaseous oxidizing agent into the cylinder or cylinders is increased, characterized in that a charging mixture consisting of a charging fuel and the oxidizing agent is made available in the induction system and cyclically ignited in the induction system at such points of time that due to the expansion during the rapid combustion of the charging mixture an increase in pressure occurs at the intake port of at least one cylinder during its intake phase.

5,746,173

DIVIDED COMBUSTION CHAMBER FOR DIESEL ENGINE

Osamu Takii; Shuichi Yamada; Akinori Muraoka; Kiyoshi Hataura; Atsushi Yamaguchi; Hideo Hasegawa; Manabu Miyazaki, and Hideya Miyazaki, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed May 22, 1997, Ser. No. 861,759

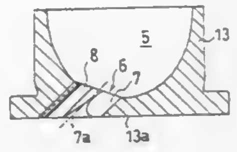
Claims priority, application Japan, Sep. 6, 1996, 8-236052

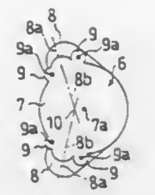
Int. Cl.⁶ F02B *19/18*

U.S. Cl. 123—293 **6 Claims**

1. A divided combustion chamber for diesel engine, comprising a cylinder (**1**) in which a main combustion chamber (**2**) is provided, a sub-chamber (**5**) being provided in a cylinder head (**3**) with a fuel injection nozzle (**4**) facing the sub-chamber (**5**), the main combustion chamber (**2**) being communicated with the sub-chamber (**5**) through a communication hole (**6**), the communication hole (**6**) being composed of a main communication hole (**7**) and sub communication holes (**8**),

when seen in a direction parallel to a center axis (**1***a*) of the cylinder (**1**),
  a pair of sub communication holes (**8**),(**8**) being provided in the shape of grooves in opposite right and left peripheral surface portions of the main communication hole (**7**) with an axis (**7***a*) of the main communication hole (**7**) taken as a center,
  a line (**7***c*) extending from the axis (**7***a*) toward the main combustion chamber (**2**) being adapted to pass through a mid





portion of the main combustion chamber (**2**) and a line (**7***b*) extending from the axis (**7***a*) toward the sub-chamber (**5**) being arranged to pass through a mid portion of the sub-chamber (**5**),

lines (**8***b*),(**8***b*) extending from axes (**8***a*),(**8***a*) of the paired sub communication holes (**8**),(**8**) toward the sub-chamber (**5**) being adapted to gradually approach the extending line (**7***b*) of the axis (**7***a*) of the main communication hole (**7**) and cross each other at a redetermined cross-point (**10**), wherein

provided at boundaries between a peripheral surface of the main communication hole (**7**) and peripheral surfaces of the sub communication holes (**8**),(**8**) are auxiliary communication grooves (**9**),(**9**) smaller than the sub communication holes (**8**),(**8**) in width, and

when seen in the direction parallel to the cylinder center axis (**1***a*),

with the axis (**7***a*) of the main communication hole (**7**) taken as a center, a line (**9***b*) extending toward the sub-chamber (**5**) from an axis (**9***a*) running along a direction in which a left auxiliary communication groove (**9**) is formed is adapted to pass a left side of the cross-point (**10**) and a line (**9***b*) extending toward the sub-chamber (**5**) from an axis (**9***a*) running along a direction in which a right auxiliary communication groove (**9**) is formed is arranged to pass through a right side of the cross-point (**10**).

5,746,174
DIAGNOSTIC SYSTEM FOR PRESSURE SWITCH

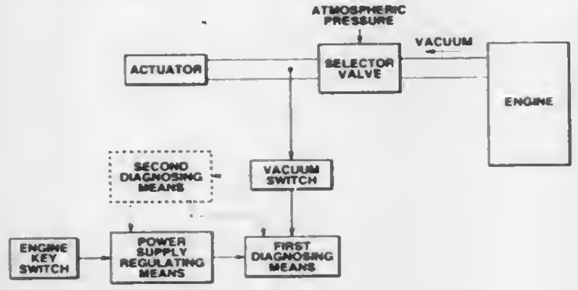
Hiroshi Abe, Yokosuka, and Osamu Matsuno, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 10, 1996, Ser. No. 762,999

Claims priority, application Japan, Dec. 27, 1995, 7-341908

Int. Cl.^{6} F02D *45/00;* **G01M** *9/00*

U.S. Cl. 123—306 **13 Claims**



1. A diagnostic system comprising:

an actuator comprising a vacuum working chamber for receiving an intake vacuum of an engine;

an intake vacuum introducing means for introducing the intake vacuum to said working chamber of said actuator;

a selector valve connected with said working chamber of said actuator by a vacuum control passage, said selector valve comprising a vacuum introducing valve state for introducing the intake vacuum from said intake vacuum introducing means to said working chamber through said control passage, and an atmospheric pressure introducing valve state for introducing an atmospheric pressure to said working chamber through said control passage;

a pressure sensing device for sensing a pressure in said control passage between said selector valve and said working chamber of said actuator, and producing a pressure signal which is in an atmospheric pressure detection signal state when the pressure in said control passage is higher than a predetermined pressure value; and

a controlling means for producing a diagnostic signal which is in a normality judgment state indicating normality of said pressure sensing device when said pressure signal in said atmospheric pressure detection state is produced by said pressure sensing device within a predetermined allowable time from a stop of the engine, and in an abnormality judgment state indicating abnormality of said pressure sensing device when said pressure signal in said atmospheric pressure detection state is not produced by said pressure sensing device within said allowable time, maintaining supply of electric power to said controlling means after a stop of the engine, and shutting off the supply after generation of said diagnostic signal.

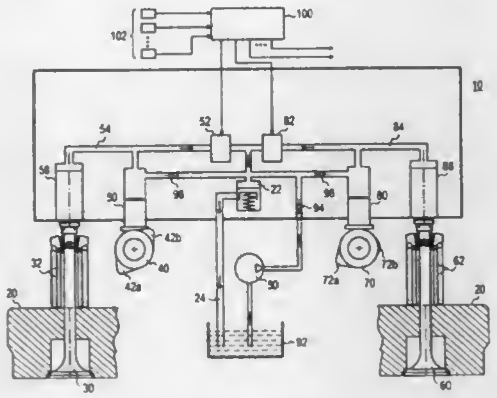
5,746,175
FOUR-CYCLE INTERNAL COMBUSTION ENGINES WITH TWO-CYCLE COMPRESSION RELEASE BRAKING

Haoran Hu, Farmington, Conn., assignor to Diesel Engine Retarders, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 512,540, Aug. 8, 1995, Pat. No. 5,537,976. This application Jul. 22, 1996, Ser. No. 683,981

Int. Cl.^{6} F01L *13/06*

U.S. Cl. 123—322 **20 Claims**



1. An internal combustion engine comprising;

an intake valve associated with a cylinder of said engine;

an exhaust valve associated with said cylinder;

an intake cam having at least one lobe synchronized with possible openings of said intake valve;

an exhaust cam having at least one lobe synchronized with possible openings of said exhaust valve;

a first hydraulic linkage containing hydraulic fluid operatively coupled between said intake cam and said intake valve for selectively responding to said at least one lobe of said intake cam by causing said intake valve to open;

a second hydraulic linkage containing hydraulic fluid operatively coupled between said exhaust cam and said exhaust valve for selectively responding to said at least one lobe of said exhaust cam by causing said exhaust valve to open;

a first hydraulic fluid control for selectively controlling hydraulic fluid pressure in said first hydraulic linkage to selectively modify the openings of said intake valve in response to said at least one lobe of said intake cam, wherein said first hydraulic fluid control is selectively operable to allow said intake valve to open in a first engine operating condition and remain closed during a possible opening in a second engine operating condition in response to said at least one lobe of said intake cam; and

a second hydraulic fluid control for selectively controlling hydraulic fluid pressure in said second hydraulic linkage to selectively modify the openings of said exhaust valve in response to said at least one lobe of said exhaust cam.

5,746,176
METHOD AND ARRANGEMENT FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Eckart Damson, Gerlingen; Martin Klenk, Backnang, and Stefan Miller, Waiblingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

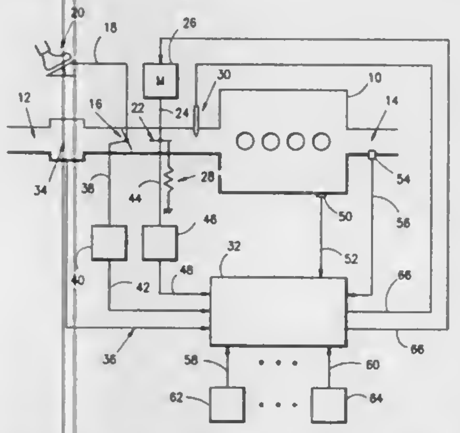
PCT No. PCT/DE95/00505, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31636, PCT Pub. Date Nov. 23, 1995

PCT Filed Apr. 12, 1995, Ser. No. 737,549

Claims priority, application Germany, May 11, 1994, 44 16 611.7

Int. Cl.^{6} F02D *41/00;33/00*

U.S. Cl. 123—336 **11 Claims**



1. A method for controlling an internal combustion engine having at least one electrically actuable adjusting element for controlling the air supply to the engine, the method comprising the steps of:

controlling the metering of fuel to the engine in accordance with operating state present so that at least in a first operating range an adjustment is made to provide a lean air/fuel ratio and in at least a second operating range an adjustment is made to provide a stoichiometric ratio;

switching between said operating ranges pursuant to at least one of the following:

(a) in dependence upon the time-dependent derivative of the accelerator pedal position;

(b) in dependence upon the accelerator pedal position; and,

(c) because of increased torque requirement determined in dependence upon at least one of the following:

(i) accelerator pedal position;

(ii) engine rpm;

(iii) engine load; and,

(iv) transmission ratio;

and effecting said switching at least by acting upon said adjusting element for controlling the air supply to said engine;

setting said adjusting element in accordance with an input value derived in dependence upon a driver command and by taking into account a pregiven air/fuel ratio;

forming said input value in dependence upon said accelerator pedal position and said engine rpm;

changing said dependence when there is a change of the pregiven air/fuel ratio so that the torque outputted by said engine before and after the switchover between said operating regions is essentially the same; and,

shifting said adjusting element in a jump-like manner.

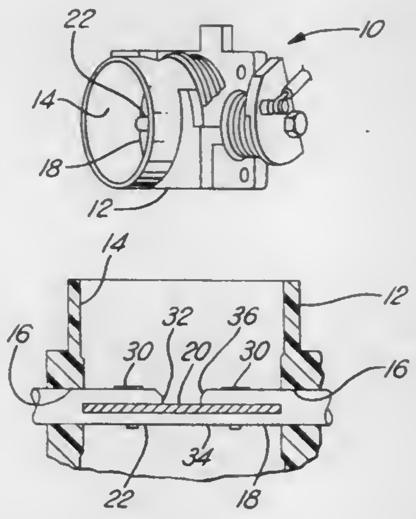
5,746,177
T-SLOT THROTTLE BODY SHAFT

James L. Criss, Cement City, and Linda J. Fry, South Lyon, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 8, 1996, Ser. No. 676,847

Int. Cl.^{6} F02D *9/10*

U.S. Cl. 123—337 **5 Claims**



1. A throttle valve for use with a throttle body of an internal combustion engine comprising:

a disk shaped throttle plate;

a throttle shaft, being generally cylindrical with a longitudinal axis and including a slot through the shaft, generally normal to the longitudinal axis and extending longitudinally a portion of its length, with the shaft also including a notched portion forming an opening from the slot to the outer surface of the shaft on one side; and

means for securing the throttle plate to the throttle shaft within the slot.

5,746,178
THROTTLE VALVE CONTROL SYSTEM OBTAINING CONTINUOUS SENSOR OUTPUT AND THROTTLE VALVE CONTROL METHOD THEREOF

Akira Susaki, Higashimurayama; Tsugio Tomita, Hitachi; Syuuichi Nakano, Hitachinaka, and Koichi Ono, Nakamachi, all of Japan, assignors to Hitachi Ltd., and Hitachi Car Engineering Co., Ltd., both of Japan

Filed Nov. 8, 1996, Ser. No. 746,380

Claims priority, application Japan, Nov. 9, 1995, 7-291101

Int. Cl.^{6} F02D *41/20*

U.S. Cl. 123—399 **12 Claims**

1. A throttle valve control system, comprising:

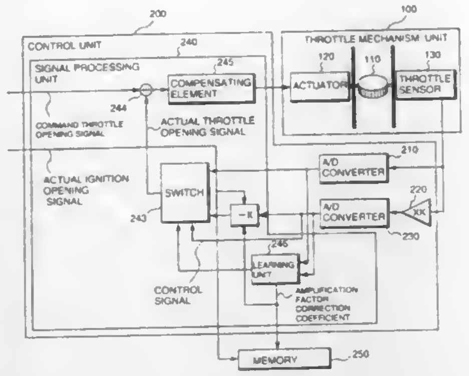
a throttle valve for controlling an intake air flow rate supplied to an engine and a drive actuator for driving the throttle valve;

a throttle sensor for detecting an opening degree of said throttle valve rotated by said drive actuator;

a first A/D converter for converting an output signal of said throttle sensor into a digital signal;

an amplifier for amplifying the output signal of said throttle sensor;

a second A/D converter for converting the signal amplified by said amplifier into a digital signal;



amplification factor adjusting means for receiving any one of outputs from said first A/D converter and said second A/D converter and for converting said one of the outputs of said two A/D converters so that said converted one of the outputs and the other of said outputs are of the same scale; wherein said drive actuator being controlled based on the output of said amplification factor adjusting means and the output of said A/D converter not through said amplification factor adjusting means; which further comprises:

correcting means for outputting a coefficient for correcting an amplification factor of any one of said amplification factor adjusting means and said amplifier based on the outputs of said first A/D converter and said second A/D converter to adjust the amplification factor.

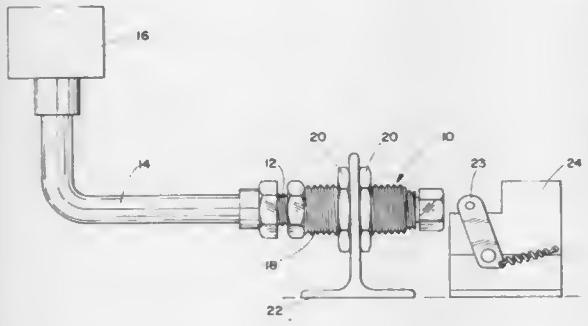
5,746,179
THROTTLE CONTROL DEVICE

Arthur J. Little, Seneca, S.C., assignor to The Nason Company, West Union, S.C.

Filed Sep. 27, 1996, Ser. No. 720,086

Int. Cl.⁶ F02D *11/00;* F15B *7/00*

U.S. Cl. 123—401 **12 Claims**



1. An apparatus to automatically control a throttle of an engine which provides power to a hydraulic or pneumatic system, the apparatus comprised of a housing defining a chamber, said chamber having a first opening comprised of a channel having a diameter narrower than said chamber adapted to receive a fluid containing conduit in communication with said system, a piston slidably mounted in said chamber and having a main body portion within said chamber and a first end with a narrower diameter than said main body positioned within said channel which is acted on by a fluid in said conduit, a spring surrounding a portion of said piston within said chamber and biasing said piston towards said first opening, said piston including a second end extending through a second opening in said chamber which controls said throttle, said second opening including an adjustable stop which limits travel of said piston and an adjustable member which controls the compression of said spring.

5,746,180
FUEL SUPPLY APPARATUS

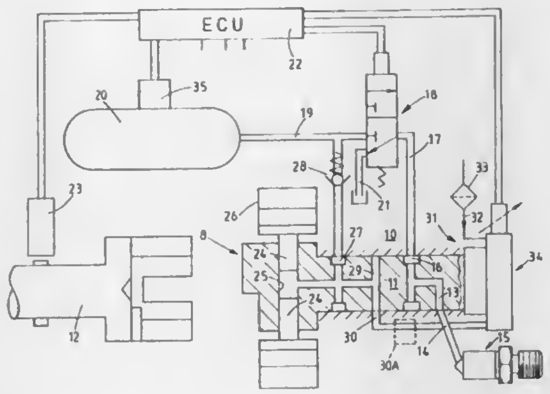
John Roderick Jefferson, Rainham; Peter Alban George Collingborn; Michael Peter Cooke, both of Gillingham, and Paul Buckley, Rainham, all of United Kingdom, assignors to Lucas Industries Public Limited Company, Solihull, England

Filed Sep. 9, 1994, Ser. No. 303,695

Claims priority, application United Kingdom, Sep. 14, 1993, 9318963; Sep. 14, 1993, 9318969

Int. Cl.⁶ F02M *7/00*

U.S. Cl. 123—447 **11 Claims**



1. A fuel supply system for supplying fuel to the injection nozzles of a multi-cylinder internal combustion engine comprising a cam actuated high pressure pump, an accumulator space which is charged with fuel by the high pressure pump, a rotary distributor member including a delivery passage which is arranged to register in turn with a plurality of outlet ports, the outlet ports being formed in a housing which supports the distributor member and being connected in use, to the injection nozzles respectively, valve means operable to connect said delivery passage to the accumulator space to supply fuel to the engine and to connect said delivery passage to a drain, passage means through which fuel can flow to the high pressure pump, a low pressure fuel supply pump which supplies fuel to the high pressure pump through said passage means, a pressure sensor for providing a signal representative of the pressure in the accumulator space, an electrically controlled pressure control valve operable to control the output pressure of the low pressure pump and an electronic control system responsive to the signal provided by said sensor for controlling the operation of said control valve whereby the output pressure of the low pressure pump can be varied to control the amount of fuel delivered by the high pressure pump to the accumulator space.

5,746,181
FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

Friedrich Boecking, Stuttgart, and Stefan Haug, Leinfelden-Echterdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE96/00203, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO96/28656, PCT Pub. Date Sep. 19, 1996

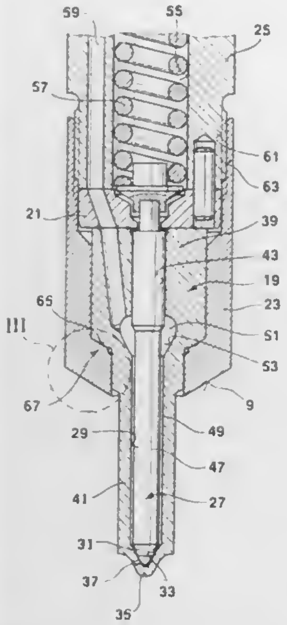
PCT Filed Feb. 9, 1996, Ser. No. 737,327

Claims priority, application Germany, Mar. 10, 1995, 195 08 636.8

Int. Cl.⁶ F02M *55/02*

U.S. Cl. 123—470 **8 Claims**

1. A fuel injection valve for internal combustion engines, having a valve body (**19**) firmly fastened to a valve retaining body (**25**), a valve member (**27**) is guided axially displaceably in a guide bore (**29**) of said valve body, said guide bore (**29**, **43**) is adjoined by a radially widened pressure chamber (**51**), at least one fuel inlet conduit (**59**), extending next to the guide bore (**29**, **43**) in the valve body (**19**) discharges into said pressure chamber (**51**), an adjusting nut (**23**), said adjusting nut rests with an inner, conically embodied annular shoulder (**65**) on a conical annular step (**67**), disposed at a level of the pressure chamber (**51**) of the valve body (**19**), said adjusting nut presses the valve body against the valve retaining body (**25**), a fastening device (**11**) acts axially on the valve retaining body (**25**) and braces the fuel injection valve by means of contact of a contact face (**9**), formed on an end face of the adjusting nut (**23**) remote from the valve retaining body (**25**), against a counterpart stop (**7**) formed in the housing (**5**) of the engine, the contact face (**9**) of the adjusting nut (**23**) and the counterpart stop (**7**) in the engine housing (**5**) are embodied conically in such a way that in addition to the axial bracing, a radial strain component is transmitted to the valve body (**19**) at the level of the pressure chamber (**51**).



5,746,182
METHOD OF CONTROLLING FUEL INJECTION IN ENGINES

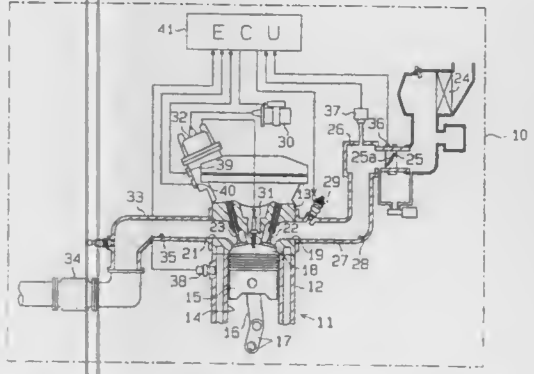
Mitsuhiro Nada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japao

Filed Mar. 13, 1997, Ser. No. 816,331

Claims priority, application Japan, Mar. 19, 1996, 8-062899

Int. Cl.⁶ F02M *51/00*

U.S. Cl. 123—492 **12 Claims**



1. A method for controlling fuel injection in an engine having a plurality of cylinders respectively accommodating a piston that reciprocates in accordance with rotation of a crankshaft, wherein each piston performs a suction stroke in accordance with the position of the crankshaft, an intake passage for drawing air into the cylinders, a throttle valve for adjusting a passage area of the intake passage, a fuel injection valve provided in association with each of the cylinders to inject fuel for the associated cylinder, said method comprising steps of:

- determining necessity of non-sequential injection for the engine;
- selecting the cylinder that needs to perform the non-sequential injection; and
- actuating the selected cylinder to perform the non-sequential injection.

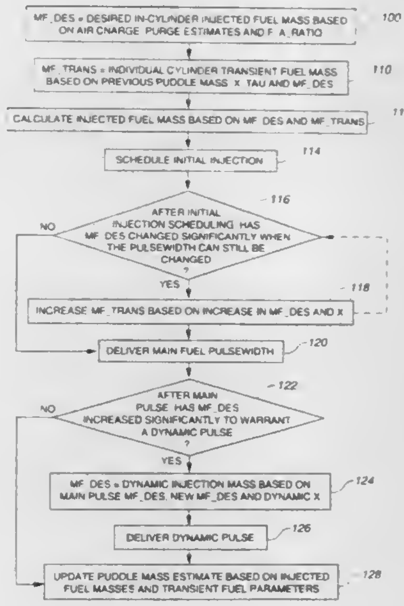
5,746,183
METHOD AND SYSTEM FOR CONTROLLING FUEL DELIVERY DURING TRANSIENT ENGINE CONDITIONS

Alastair William Parke, Ann Arbor; Jeffrey Allen Doering, Canton; Paul Charles Mingo, Farmington Hills; Xiaoying Zhang, Dearborn Heights, and Robert Matthew Marzonie, Northville, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 2, 1997, Ser. No. 887,286

Int. Cl.⁶ F02M *51/00*

U.S. Cl. 123—492 **18 Claims**

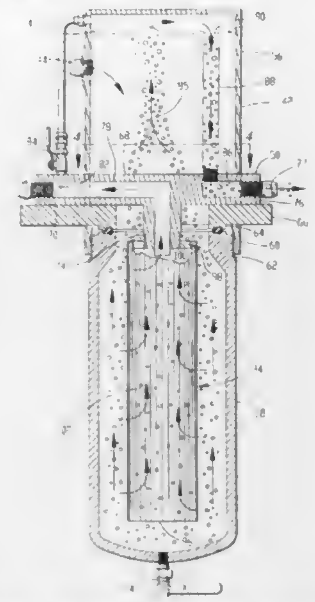

MF_DES = DESIRED IN-CYLINDER INJECTED FUEL MASS BASED ON AIR CNARGE PURGE ESTIMATES AND F_A_RATIO
100
MF_TRANS = INDIVIDUAL CYLINDER TRANSIENT FUEL MASS BASED ON PREVIOUS PUDDLE MASS X TAU AND MF_DES
110
CALCULATE INJECTED FUEL MASS BASED ON MF_DES AND MF_TRANS
112
SCHEDULE INITIAL INJECTION
114
AFTER INITIAL INJECTION SCHEDULING HAS MF_DES CHANGED SIGNIFICANTLY WHEN THE PULSEWIDTH CAN STILL BE CHANGED ?
116
NO
YES
INCREASE MF_TRANS BASED ON INCREASE IN MF_DES AND X
118
DELIVER MAIN FUEL PULSEWIDTH
120
AFTER MAIN PULSE HAS MF_DES INCREASED SIGNIFICANTLY TO WARRANT A DYNAMIC PULSE ?
122
NO
YES
MF_DES = DYNAMIC INJECTION MASS BASED ON MAIN PULSE MF_DES, NEW MF_DES AND DYNAMIC X
124
DELIVER DYNAMIC PULSE
126
UPDATE PUDDLE MASS ESTIMATE BASED ON INJECTED FUEL MASSES AND TRANSIENT FUEL PARAMETERS
128

1. A method for determining fuel mass to be delivered to an individual cylinder of an internal combustion engine during transient engine conditions, the individual cylinder having an intake port for regulating entry of the fuel into the cylinder and having a prior injection history indicating a mass of fuel previously delivered to the individual cylinder, the method comprising:

- sensing a plurality of engine parameters;
- determining an initial base desired fuel mass based on the plurality of engine parameters;
- determining an initial transient fuel mass based on the prior injection history;
- determining a desired injected fuel mass to be delivered to the individual cylinder based on the initial base desired fuel mass and the initial transient fuel mass; and
- sensing delivery of the desired injected fuel mass to the individual cylinder and determining an updated prior injection history based on the desired injected fuel mass and the prior injection history.

5,746,184
FUEL DELIVERY SYSTEM FOR DIESEL ENGINES

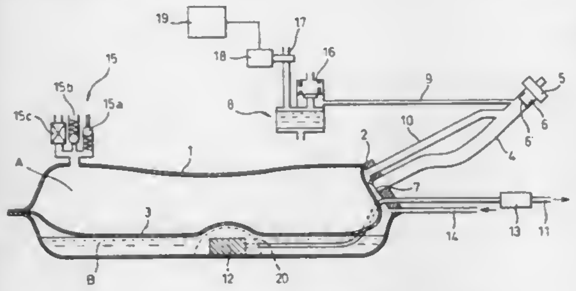
Charles L. Ekstam, Champaign, Ill., assignor to Ekstam Patent, L.L.C., Jefferson City, Mo.
Continuation-in-part of Ser. No. 919,119, Nov. 13, 1992. This application Jun. 17, 1994, Ser. No. 261,469
Int. Cl.^{6} F02M *37/04*
U.S. Cl. 123—510 **20 Claims**



1. A filtration assembly for separating entrained air from a flowing fluid that contains a liquid having an entrained gas portion, comprising:
- a filtration unit including a container having marginal wall structure defining an interior chamber, and a filtration element dividing said chamber into an inlet side and an outlet side; and
- a mounting body having an inlet in fluidic communication with said inlet side and an outlet in fluidic communication with said outlet side, and means for coupling said inlet and said outlet with said filtration unit to cause portions of said fluid to pass between said inlet and said outlet across said filtration element,
- said body having a first gas exit port in fluidic communication with said inlet side and a second gas exit port in fluidic communication with said outlet side.

5,746,185
FUEL STORING DEVICE FOR AN AUTOMOBILE

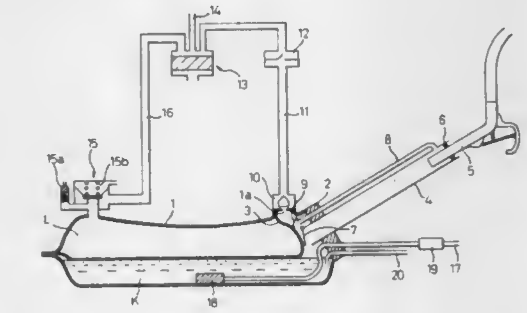
Toru Kidokoro, Hadano; Takaaki Ito, Mishima, and Yoshihiko Hyodo, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Nov. 19, 1996, Ser. No. 751,801
Claims priority, application Japan, Nov. 20, 1995, 7-301534
Int. Cl.^{6} F02M *37/04;25/08*
U.S. Cl. 123—516 **7 Claims**



1. A fuel storing device for an automobile comprising:
- a fuel storage container;
- a flexible separator means disposed in the fuel storage container for separating the inside of the fuel storage container into a fuel storage portion and a space portion, the flexible separator means being moveable up and down in accordance with the movement of a surface of liquid fuel in the fuel storage portion;
- a refuel pipe connected to the fuel storage portion;
- a fuel suction pipe having an inlet opening into the fuel storage portion for withdrawing fuel in the fuel storage portion; and
- a fuel imbibing member made of porous material for maintaining a separation between the flexible separator means and the inlet when the flexible separator comes close to the bottom of fuel storage container in accordance with a decrease in a level of fuel in the fuel storage portion.

5,746,186
FUEL STORING DEVICE FOR AN AUTOMOBILE

Toru Kidokoro, Hadano, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Feb. 27, 1997, Ser. No. 807,169
Claims priority, application Japan, Feb. 29, 1996, 8-043323
Int. Cl.^{6} F02M *37/04*
U.S. Cl. 123—516 **9 Claims**

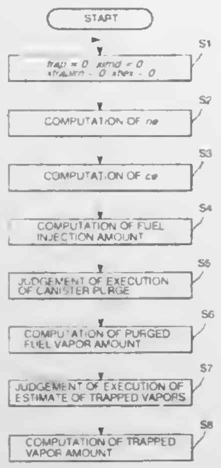


1. A fuel storing device for an automobile, comprising:
- a fuel storage container;
- a flexible separator film arranged in said fuel storage container, to separate the inside of said fuel storage container into a fuel storage part and a space, said separator film being movable with the surface of liquid fuel in said fuel storage container;
- a filler pipe connected to said fuel storage part;
- a nozzle seal arranged in said filler pipe, for sealing a gap with respect to a refueling nozzle inserted into said filler pipe;
- a conduit for communicating a part of said filler pipe adjacent to the nozzle seal with an upper part of said fuel storage part; and
- closure preventive means for preventing said separator film from closing an opening of said conduit toward said fuel storage part.

5,746,187
AUTOMOTIVE ENGINE CONTROL SYSTEM

Hiroshi Ninomiya, and Tetsushi Hosokai, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Aug. 12, 1996, Ser. No. 695,600
Claims priority, application Japan, Aug. 11, 1995, 7-205578
Int. Cl.^{6} F02M *41/00;33/02*
U.S. Cl. 123—520 **10 Claims**

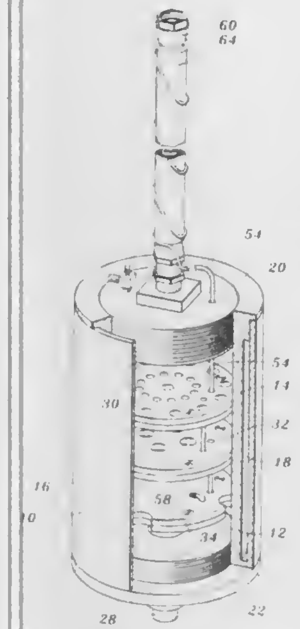
1. A control system for an engine equipped with an intake system and a canister purge system which forces purged gas containing fuel vapors from a canister to enter into the intake system in a specific range of engine operating conditions, said control system comprises:
- an air-to-fuel ratio detection sensor for detecting an air-to-fuel ratio of an air-fuel mixture;


START
S1
trap = 0 sumd = 0
straum = 0 stex = 0
S2
COMPUTATION OF ne
S3
COMPUTATION OF ce
S4
COMPUTATION OF FUEL INJECTION AMOUNT
S5
JUDGEMENT OF EXECUTION OF CANISTER PURGE
S6
COMPUTATION OF PURGED FUEL VAPOR AMOUNT
S7
JUDGEMENT OF EXECUTION OF ESTIMATE OF TRAPPED VAPORS
S8
COMPUTATION OF TRAPPED VAPOR AMOUNT

- fuel injection control means for feedback controlling an amount of fuel injection to bring said air-to-fuel ratio to a target ratio in said specified range of engine operating conditions; and
- purge control means for gradually varying a purged gas flow rate, at which a canister purge is performed, at a changing rate so as to attain a target purged gas flow rate determined according to engine operating conditions after commencement of a canister purge, said changing rate being smaller in an engine operating range of small amounts of intake air than in an engine operating range of large amounts of intake air.

5,746,188
APPARATUS FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE

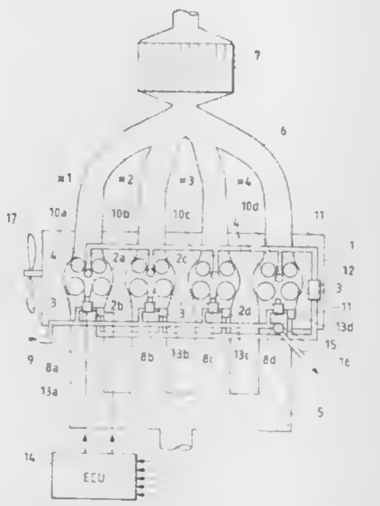
Syd L. Cooke, 1451 Rocky Ridge Dr., #2215, Roseville, Calif. 95661
Filed Jun. 13, 1996, Ser. No. 662,605
Int. Cl.^{6} F02M *31/00*
U.S. Cl. 123—549 **14 Claims**



1. Apparatus for use with an internal combustion engine for supplying fuel to said internal combustion engine, said apparatus comprising, in combination:
- housing means defining a housing interior, said housing means defining an inlet and an outlet, said inlet and said outlet being spaced from one another and communicating with said housing interior, said inlet for receiving liquid hydrocarbon fuel and introducing said liquid hydrocarbon fuel into said housing interior;
- a plurality of spaced baffle members located within said housing interior, said baffle members dividing said housing interior into housing interior segments and each of said baffle members defining at least one opening allowing passage of said liquid hydrocarbon fuel between adjacent housing interior segments as said liquid hydrocarbon fuel passes through said housing interior from said inlet to said outlet;
- heating means for heating said baffle members, said baffle members heated by said heating means heating and promoting the vaporization of said liquid hydrocarbon fuel as said liquid hydrocarbon fuel passes through said housing interior from said inlet to said outlet; and
- a conduit leading from said housing means outlet and defining a conduit interior communicating with said housing interior, said heating means including an elongated electrical resistance element operatively associated with said conduit and extending along said conduit to heat said conduit and further heat the liquid hydrocarbon fuel after the liquid hydrocarbon fuel has exited said housing interior from said outlet.

5,746,189
EGR GAS ASSIST INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihumi Kuzuya; Kimitaka Saito, both of Nagoya, and Hitoshi Shibata, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Oct. 3, 1996, Ser. No. 725,549
Claims priority, application Japan, Oct. 3, 1995, 7-256390
Int. Cl.^{6} F02M *25/07*
U.S. Cl. 123—568 **20 Claims**



1. An EGR gas assist injection system for an internal combustion engine comprising:
- a fuel injector for spraying fuel from an injection nozzle to supply fuel to engine cylinders of the engine, said fuel injector having an EGR gas nozzle; and
- EGR means for recirculating a part of exhaust gasses discharged from a port formed in a cylinder head of one of the engine cylinders which is in an exhaust process to the EGR gas nozzle to mix the part of exhaust gasses with the fuel sprayed from the injection nozzle of said fuel injector into another of the engine cylinders which is in an intake process.

5,746,190
EGR SYSTEM USING PERPENDICULARLY ARRANGED CONTROL VALVE

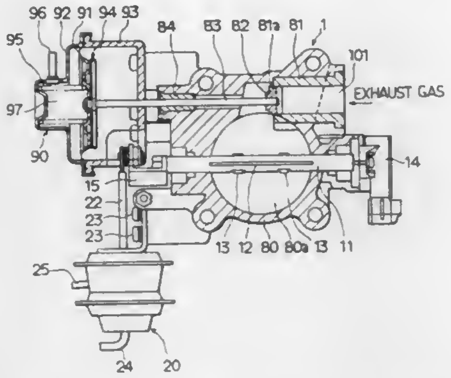
Akihiro Honda, Kariya, Japan, assignor to Denso Corporation, Kariya, Japan

Filed Dec. 11, 1996, Ser. No. 764,651

Claims priority, application Japan, Dec. 21, 1995, 7-333658; Aug. 26, 1996, 8-223922

Int. Cl.⁶ F02M *25/07*

U.S. Cl. 123—568 **26 Claims**



17. An exhaust gas recirculation system for an internal combustion engine, comprising:

a throttle body forming an intake passage leading to said engine;

an exhaust gas passage having an inlet for introducing exhaust gas into said air intake passage;

an EGR control valve axially aligned with said inlet for opening and closing said exhaust gas passage;

an axis of said air intake passage and axes of said EGR control valve and said inlet being disposed perpendicularly to each other; and

said EGR control valve and said inlet being disposed at a location deviating from a diameter of said air intake passage and in contact therewith for being cooled by the flow of intake air flowing through said intake passage.

5,746,191
EVAPORATIVE FUEL-PROCESSING SYSTEM FOR INTERNAL COMBUSTION ENGINES

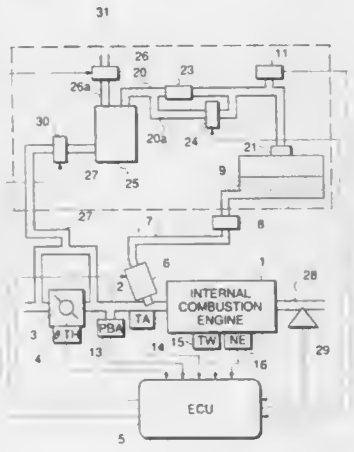
Takashi Isobe, and Takushi Toda, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1997, Ser. No. 842,428

Claims priority, application Japan, Apr. 26, 1996, 8-131410

Int. Cl.⁶ F02M *25/08;* **F02D** *41/14*

U.S. Cl. 123—686 **5 Claims**



1. An evaporative fuel-processing system for an internal combustion engine having an intake system, and a fuel tank, comprising:

an evaporative emission control system including a canister having an adsorbent accommodated therein, for adsorbing evaporative fuel generated in said fuel tank, and an air inlet port communicating with atmosphere, a charging passage extending between said canister and said fuel tank, a purging passage extending between said canister and said intake system, a purge control valve arranged across said purging passage, and a vent shut valve disposed to open and close said air inlet port of said canister;

abnormality-determining means for determining an abnormality in said evaporative emission control system, said abnormality-determining means including pressure-detecting means for detecting pressure within said evaporative emission control system, negatively pressurizing means for negatively pressurizing an interior of said evaporative emission control system into a predetermined negatively pressurized state, by opening said purge control valve and closing said vent shut valve, and leakage-checking means for closing said purge control valve, and for determining whether said evaporative emission control system has leakage, based on a rate of decrease in negative pressure within said evaporative emission control system over a first predetermined time period;

evaporative fuel amount-detecting means for detecting an amount of evaporative fuel supplied from said canister to said engine;

terminating means for terminating operation of said abnormality-determining means when said amount of evaporative fuel detected by said evaporative fuel amount-detecting means exceeds a predetermined amount; and

changing means for changing said predetermined amount in a direction of mitigating operation of said terminating means over a second predetermined time period after starting of said engine in a cold state.

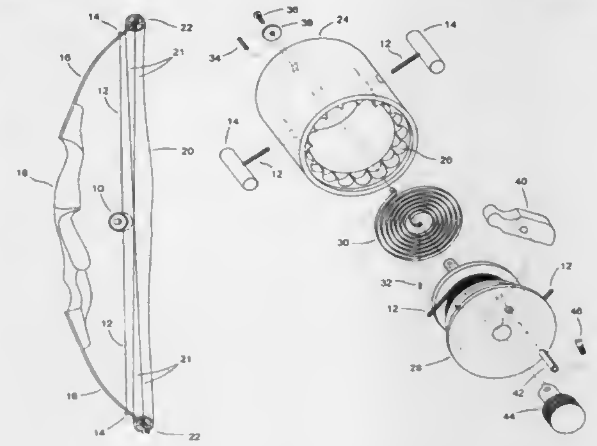
5,746,192
AUTOMATIC BOW RETENTION DEVICE

Edward B. Gissel, 4243 Midway Ave., Grants Pass, Oreg. 97527

Filed Dec. 23, 1996, Ser. No. 771,525

Int. Cl.⁶ F41B *5/14*

U.S. Cl. 124—1 **7 Claims**



1. For use with an archery bow including first and second flexible limbs with respective first and second limb tips, a bowstring extending between the limb tips such that as the bowstring is drawn the limbs will flex under tension, drawing the limb tips closer to each other, a bow retention device for maintaining the bow limbs in the drawn and tensioned condition even after the bowstring is relaxed, said device comprising:

a housing;

a spool rotatable within the housing;

first and second cord segments received and windable onto said spool, said first cord segment passing through said housing and including means to attach said first cord segment to said first bow limb tip; said second cord segment passing through said housing and including means to attach said second cord segment to said second limb tip;

a spring means attached between said housing and said spool for rotatably biasing the spool in a first direction to wind said cord segments onto said spool;

a ratchet means attached between said housing and said spool, said ratchet means movable between: (1) a first position in which said ratchet means permits rotation of said spool in said first direction but prevents rotation of said spool in a second direction in which said cord segments are unwound from said spool, and (2) a second position in which rotation of said spool in said first and said second directions is permitted;

whereby, when said device is installed on a bow with said first cord segment attached to said first limb tip, and said second cord segment attached to said second limb tip, and said ratchet is in said first position, as the bowstring is drawn and the limb tips move closer to each other, the cord segments will be wound onto the spool and when the bowstring is released, the cord segments will be prevented from unwinding from the spool, thus maintaining bow tension, and whereby bow tension may be again relaxed by moving the ratchet to said second position and drawing the bow slightly to release said ratchet means, thus allowing the cord segments to unwind from the spool as the bowstring is relaxed.

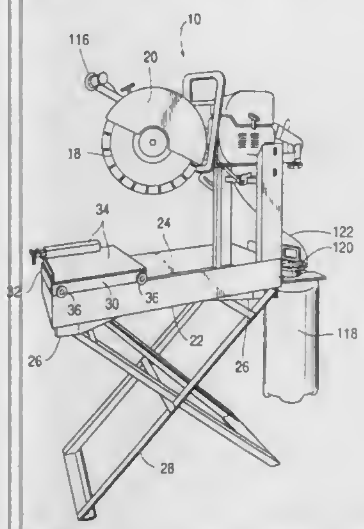
5,746,193
PRESS ASSEMBLY FOR A PORTABLE MASONRY CUT-OFF SAW

Leo Swan, Jefferson, Md., assignor to Equipment Development Company, Inc., Frederick, Md.

Filed Apr. 2, 1997, Ser. No. 832,558

Int. Cl.⁶ B28D *1/04*

U.S. Cl. 125—13.03 **25 Claims**



1. A press assembly for a portable masonry cut-off saw, comprising:

a base including a frame having a pair of mutually parallel upright leg members;

a pivot shaft mounted between the upright leg members;

a cut-off saw support assembly for supporting a hand-held portable masonry cut-off saw including an internal combustion engine, an engine driven rotary saw blade, and front and rear carrying handles;

said saw support assembly further including a mounting plate, first means located at one end of said mounting plate for engaging and securing said front carrying handle of the cut-off saw and second means located at the other end of said mounting plate for engaging and securing said rear carrying handle of the cut-off saw;

a lever arm for pivotally lowering and raising a cut-off saw mounted on said support assembly to and from a workpiece; and

engine throttle control means for controlling rotary operation of the saw blade, said throttle control means including a hand actuable controller located on the lever arm and an actuator assembly attached to said rear carrying handle, said actuator assembly being coupled to said hand actuable controller for actuating a throttle member of the saw in response to operation of said controller.

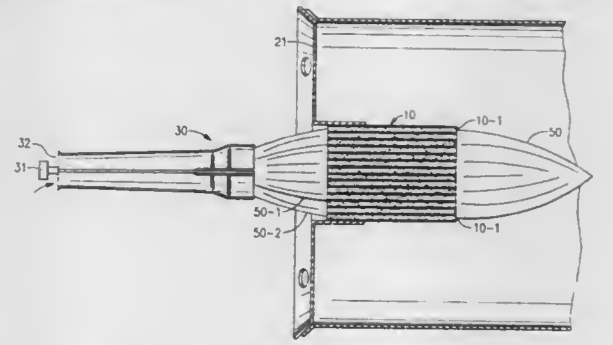
5,746,194
CATALYTIC INSERT FOR NO_X REDUCTION

Thomas J. Legutko, Canastota, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 1, 1995, Ser. No. 566,215

Int. Cl.⁶ F23D *14/12*

U.S. Cl. 126—91 A **10 Claims**



1. Combustion means for a gas fired furnace comprising:

a burner adapted to burn gaseous fuel and to produce a flame having a fuel rich inner cone and an outer cone;

a matrix located with respect to said burner so as to be located at least partially in said inner cone and defining a plurality of flow paths for said flame;

a partial oxidation catalyst lining said flow paths whereby said catalyst causes catalysis of said fuel in said fuel rich inner cone to produce hydrogen and carbon monoxide and thereby reduces the peak flame temperature.

5,746,195
FLOW TURBULENCE CREATING ARRANGEMENT OF A GAS-FIRED DEEP FAT FRYER

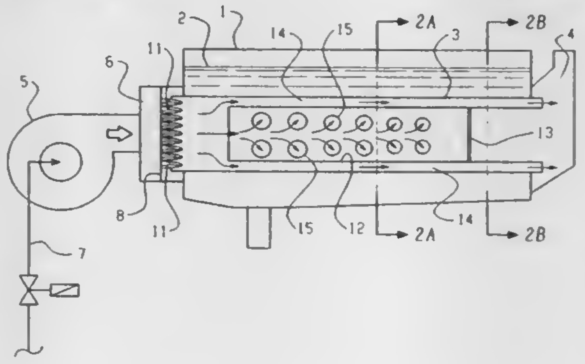
Luca Codazzi, Mestre, and Mauro Moro, Pordenone, both of Italy, assignors to Electrolux Zanussi Grandi Impianti S.P.A., Pordenone, Italy

Filed Jun. 5, 1997, Ser. No. 870,347

Claims priority, application Italy, Jun. 20, 1996, PN96U0026

Int. Cl.⁶ A47J *27/00;37/00;37/12;* **F22C** *11/04*

U.S. Cl. 126—391 **6 Claims**



1. A deep fat fryer with submerged-pipe heating comprising a frying vat (**1**) for containing a bath of oil or fat frying medium: a plurality of heating pipes (**3**) in the vat and submerged in the frying

medium in a heat-exchange relationship with said frying medium; a gas burner arranged at one end of said pipes for creating flue gases moving through the pipes and heating the pipes; a flue riser or exhaust system (**4**) provided on another end of said pipes for exhausting said flue gases into the atmosphere, characterized in that said burner is a powered, at least partially pre-mixed burner comprising:

blowing means (**5**) that take in ambient air;

a sealed container (**6**) defined on a side of the blowing means facing said frying vat and receiving the ambient air delivered by the blowing means; and

a perforated baffle (**8**) disposed between the container and the pipes, wherein perforations (**10**) are concentrated in a plurality of pre-defined zones (**9**), said pre-defined zones being substantially concentrated in front of the inlet openings of said pipes.

5,746,196

Patent Not Issued For This Number

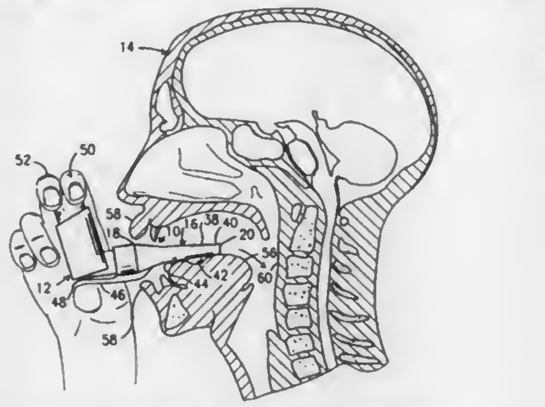
5,746,197
EXTENSION FOR METERED DOSE INHALER

Jeffery W. Williams, 7512 Mahaffey Dr., New Port Richey, Fla. 34653

Filed Aug. 18, 1995, Ser. No. 517,109

Int. Cl.⁶ A61M *11/00;15/08;16/00;* **A62B** *9/06*

U.S. Cl. 128—200.23 **7 Claims**



1. An extension for metered dose inhalers comprising:

a member having a first end and a second end and a bore therethrough having a first end and a second end, said first end of said member being sized and configured for attachment to an inhaler so that said bore is in fluid flow communication with the inhaler, said bore tapering to a cross-sectional area no greater than 0.12 square inches and extending with a cross-section of no more than 0.12 inches for at least one inch, a portion of said member, including said second end thereof, defining a mouthpiece at least one and one half inches long, said mouthpiece receivable within the mouth of a user and not extending into the throat of the user.

5,746,198
VALVE FOR A FIRST STAGE REGULATOR HAVING AN ENCAPSULATED HEAD

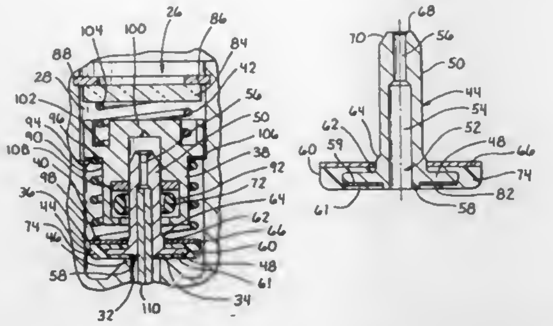
Serge Taba, Mission Viejo, and Michael V. Morgan, Laguna Beach, both of Calif., assignors to U.S. Divers Co., Inc., Santa Ana, Calif.

Filed Mar. 13, 1997, Ser. No. 816,086

Int. Cl.⁶ A62B *9/02;18/02;* **F16L** *7/00;* **F16K** *31/12*

U.S. Cl. 128—204.26 **16 Claims**

12. A movable valve member for a high pressure breathing gas regulator comprising:



a metal member formed with an enlarged head and a stem and having an axial bore extending through said enlarged head and stem;

said enlarged head sized to overlie an orifice;

a plastic material enclosing and adhered to said enlarged head to form a seating surface for an orifice; and,

said stem and said axial bore being free of plastic.

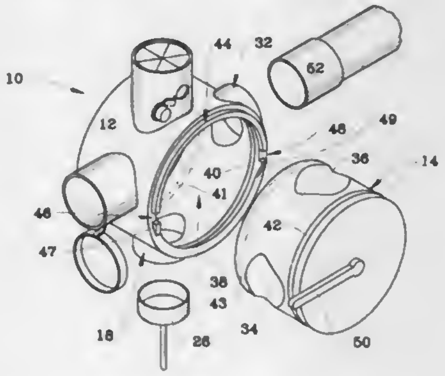
5,746,199
RESPIRATORY VALVE

Harry Bayron, 7439 Pioneer Rd., West Palm Beach, Fla. 33413, and Neil Winthrop, 12A Amherst Ct., Royal Palm Beach, Fla. 33411

Filed Aug. 21, 1996, Ser. No. 701,085

Int. Cl.⁶ A62B *9/02*

U.S. Cl. 128—205.24 **19 Claims**



1. A respiratory valve apparatus comprising:

a housing having an inner chamber, an upper access port and an opposite endotracheal tube connection port, a respirator connection port and an opposite resuscitation bag connection port, and first and second indexing slots defining first and second switching positions;

a rotational valve assembly which rotatably fits inside said housing chamber, said assembly having an inner channel and an outwardly facing handle which locks into said indexing slots, said channel being aligned with said entry, endotracheal, and respirator ports in said first switching position, and said channel being aligned with said entry, endotracheal, and resuscitation ports in said second switching position;

wherein a suction catheter can be inserted through said apparatus in either of said switching positions.

5,746,200
TRABECULA NASAL FILTER HAVING BOTH MACROPORES AND MICROPORES

Klaus Draenert, Gabriel-Max-Str. 3, D-8000 Munich, Germany

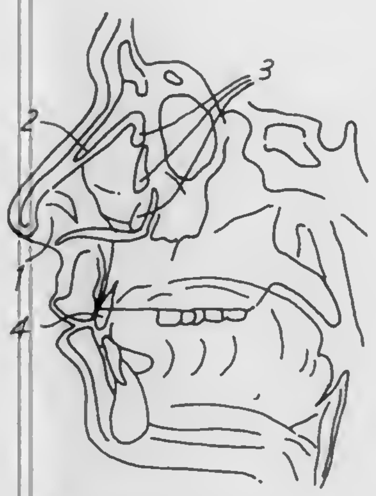
Continuation of Ser. No. 862,741, Jun. 19, 1992, abandoned.

This application Mar. 17, 1995, Ser. No. 407,395

Claims priority, application Germany, Oct. 19, 1990, 40 33 344.2

Int. Cl.⁶ A61G *10/00;* **A61M** *16/00;* **A62B** *7/10;23/02*

U.S. Cl. 128—206.11 **32 Claims**



1. A filter with high porosity for temporary insertion via the vestibule of the nose into the external respiratory tracts, said filter being biological inert and not harmful to the mucous membrane, said filter comprising:

a three-dimensional framework of trabecula structures which surround predetermined cavities, said cavities forming macropores having a size of between 0.2 mm and several mm and being connected to one another to form an interconnected cavity system, the three-dimensional framework of trabecula structures having an external shape adapted to fit the vestibule of the nose;

said trabecula structures being formed of a base material selected from the group consisting of: cast materials and injected materials;

said trabecula structures comprising a microporous filter system created by a highly absorbent filler material within or coating the base material.

5,746,201
CPAP NOSE MASK

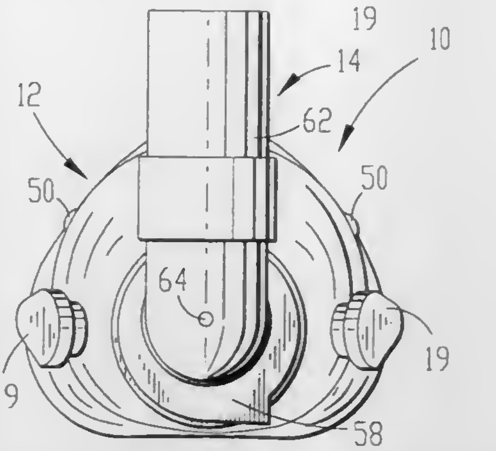
Lisa A. Kidd, Leawood, Kans., assignor to Nellcor Puritan-Bennett, Pleasanton, Calif.

Filed Jan. 23, 1997, Ser. No. 786,886

Int. Cl.⁶ A62B *7/00*

U.S. Cl. 128—206.24 **6 Claims**

1. A nose mask for receiving a patient's nose and engaging the patient's nose and face, said mask comprising a hollow body including wall structure defining an internal nose-receiving cavity, a nose entrance opening and a spaced inhale/exhale opening, said openings in communication with said cavity, said entrance opening-defining structure having a peripheral flange for directly engaging the top of a patient's nose, the sides of the patient's nose and the cheek regions adjacent the nose, and the patient's upper lip area beneath the nose, and a thin, pliable lip inboard of said flange and extending into said nose entrance opening, said lip being configured for facilitating a seal between said mask body and the patient's nose and face to minimize leakage of positive pressure gas from the nose mask, said flange and lip, at the areas thereof engaging the top of the patient's nose and the sides of the patient's nose and the cheek regions adjacent the nose and diverging from each other, said nose entrance opening being generally tria-ngular in configuration, said range and lip each having a pair of oblique, downwardly extending sidewall portions said lip sidewall portions being thinner and more pliable than said flange sidewall portions.



5,746,202
INTRODUCER FOR ORAL TUBES

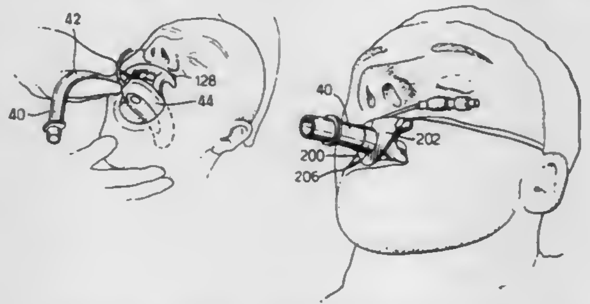
Eric Pagan, Folkestone, England, assignor to Smiths Industries PLC, London, England

Filed Jun. 26, 1996, Ser. No. 672,070

Claims priority, application United Kingdom, Jul. 7, 1995, 9513860

Int. Cl.⁶ A61M *16/00;* **A62B** *9/02;9/06*

U.S. Cl. 128—207.14 **16 Claims**



1. A securing device in combination with an introducer of the kind adapted for introducing an oral tube into a patient, wherein the securing device comprises: engagement members shaped to engage said introducer; an opening in said securing device having a shape adapted to receive an oral tube in a close fit; and a region of variable width in said securing device between said opening and an edge of said securing device such that when said engagement member is engaged with said introducer said region of variable width is compressed and the securing device will be clamped about said oral tube.

5,746,203
FAILSAFE SUPERVISOR SYSTEM FOR A PATIENT MONITOR

Rush W. Hood, Jr., Tampa, Fla., assignor to Johnson & Johnson Medical, Inc., New Brunswick, N.J.

Filed Sep. 26, 1996, Ser. No. 721,140

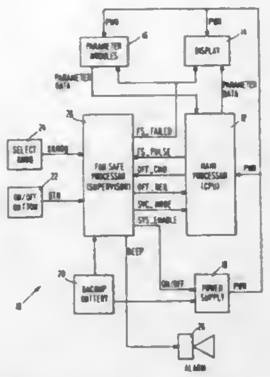
Int. Cl.⁶ A61B *5/00*

U.S. Cl. 128—630 **7 Claims**

1. A patient monitor which collects parameter data related to physiological parameters of a patient and displays said parameter data, said monitor comprising:

means for collecting said parameter data;

a display processing means for processing said parameter data and displaying the processed parameter data on said display and for providing watchdog pulses indicating at least whether



said collecting means and said parameter processing means are operating properly;

a power supply for selectively providing power to said display, said collecting means, and said parameter processing means upon receipt of a power up or power down signal;

an alarm which sounds upon receipt of an error signal;

an on/off button for selectively turning on/off said patient monitor; and

a failsafe supervisor processing means responsive to said on/off button for selectively providing said power up or said power down signals to said power supply and responsive to said watchdog pulses for generating said error signal to sound said alarm when a watchdog pulse is not received by said failsafe supervisor processing means in a predetermined period of time.

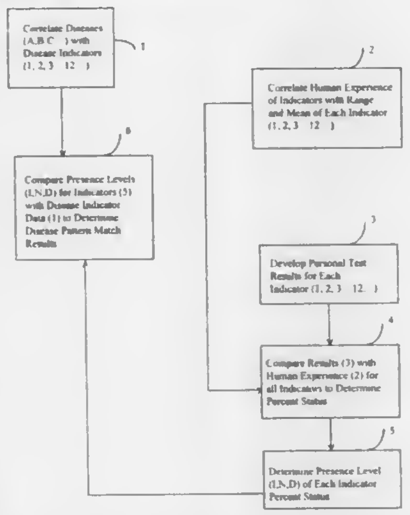
5,746,204
DISEASE INDICATOR ANALYSIS SYSTEM

Mark A. Schauss, Incline Village, Nev., assignor to Carbon Based Corporation, Incline Village, Nev.

Filed Dec. 7, 1995, Ser. No. 568,752

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—630 **10 Claims**


Correlate Diseases (A,B,C ...) with Disease Indicators (1, 2, 3 ... 12 ...)
1
Correlate Human Experience of Indicators with Range and Mean of Each Indicator (1, 2, 3 ... 12 ...)
2
Compare Presence Levels (L,N,D) for Indicators (5) with Disease Indicator Data (1) to Determine Disease Pattern Match Results
6
Develop Personal Test Results for Each Indicator (1, 2, 3 ... 12 ...)
3
Compare Results (3) with Human Experience (2) for all Indicators to Determine Percent Status
4
Determine Presence Level (L,N,D) of Each Indicator Percent Status
5

1. A medical diagnostic method utilizing a computerized system having a means for data storage and a means for data processing comprising:

storing a first database in said means for data storage, said first database having indicator data including a plurality of diseases and a plurality of indicators that are associated with each said disease;

storing a second database in said means for data storage; said second database having indicator data including human experience test result levels associated with each said indicator;

inputting test results for an individual into said means for data processing, said test results including specific indicator levels associated with said individual;

determining an indicator presence level for said indicators by comparing said specific indicator levels with said indicator data of said second database utilizing said means for data processing;

comparing said indicator presence levels with said indicator data of said first database utilizing said means for data processing to provide a determination related to the presence of particular ones of said diseases in said individual.

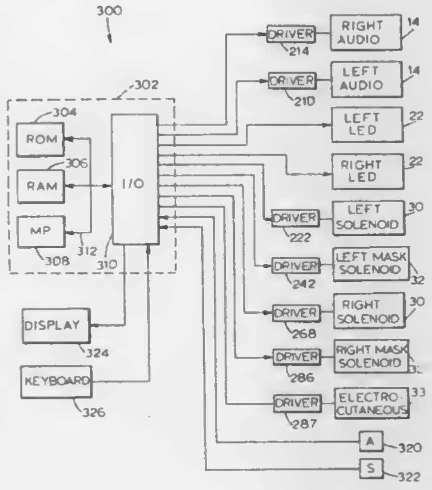
5,746,205
METHOD AND APPARATUS FOR MEASURING THE WORKING CONDITION OF THE BRAIN WITH PERIODIC STIMULI

Veijo Virsu, Espoo, and Seppo Salminen, Helsinki, both of Finland, assignors to Helsinki University Licensing, Ltd., Helsinki, Finland

Filed Mar. 1, 1996, Ser. No. 609,682

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—630 **28 Claims**



1. A method of exposing a subject to periodic stimuli in order to assess the working quality of the brain of the subject, said method comprising the steps of:

(a) exposing the subject to a first periodic stimulus having a substantially constant frequency during a first period of time;

(b) exposing the subject to a second periodic stimulus having a substantially constant frequency during said first period of time while the subject is being exposed to said first periodic stimulus, said frequency of said second periodic stimulus being substantially the same as said frequency of said first periodic stimulus;

(c) receiving form the subject an indication whether said first and second periodic stimuli are synchronous or asynchronous;

(d) depending on the accuracy of said indication given by the subject, selecting a new substantially constant frequency, said new frequency being different than said frequency of said first and second periodic stimuli;

(e) exposing the subject to a third periodic stimulus having said new frequency during a second period of time; and

(f) exposing the subject to a fourth periodic stimulus having said new frequency during said second period of time while the subject is being exposed to said third periodic stimulus.

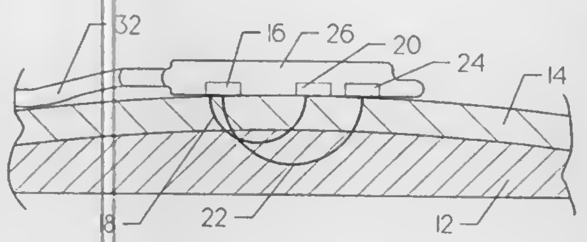
5,746,206
ISOLATED LAYER PULSE OXIMETRY

Paul D. Mannheimer, Belmont, Calif., assignor to Nellcor Incorporated, Pleasanton, Calif.

Continuation of Ser. No. 403,642, Mar. 14, 1995, Pat. No. 5,524,617. This application Jun. 10, 1996, Ser. No. 662,439

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 125—633 **6 Claims**



1. An apparatus comprising:

a. a patient interface adapted to be coupled to a patient;

b. an emitter of electromagnetic radiation coupled to said patient interface;

c. a first detector coupled to said patient interface at a first distance from said emitter;

d. a second detector coupled to said patient interface at a second distance from said emitter;

e. means for synchronizing an oxygen saturation measurement to a predetermined portion of a cardiac cycle of said patient; and

f. means coupled to said first and said second detectors and said synchronizer for computing an oxygen saturation level of arterial blood of said patient, at a predetermined tissue level of interest, with an algorithm that filters out pulsatile signal contributions from a second predetermined tissue level.

5,746,207
PROFILED BIOSIGNAL ELECTRODE DEVICE

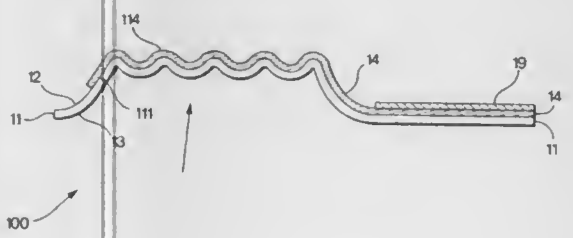
James Andrew McLaughlin, 9 Hampton Court Village, Belfast BT7 3DF; John McCune Anderson, 16 Torgrange, Holywood, County Down, BT18 0NG, and Eric Thomas McAdams, Ormsdale, 52 Cable Road, Whitehead, County Antrim, BT38 9PZ, all of Northern Ireland

Filed Mar. 22, 1994, Ser. No. 210,757

Claims priority, application Ireland, Mar. 23, 1993, 930230

Int. Cl.^{6} A61B *5/04*

U.S. Cl. 128—639 **9 Claims**



1. A biosignal electrode device, comprising:

a) a flexible, electrically insulating substrate, and

b) an electrically conductive layer deposited on a surface of said substrate, and forming thereon an electrode sensor for contacting a patient's skin, and a lead for the sensor,

c) wherein a portion of the substrate bearing the sensor is formed in relief such that said substrate portion and attendantly the sensor are upstanding from surrounding substrate.

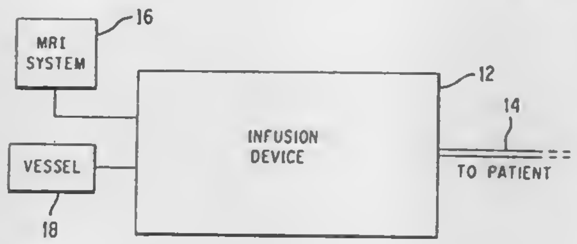
5,746,208
METHOD OF MAGNETIC RESONANCE ARTERIOGRAPHY USING CONTRAST AGENTS

Martin R. Prince, 2022 Delafield St., Ann Arbor, Mich. 48105

Continuation of Ser. No. 378,384, Jan. 25, 1995, Pat. No. 5,553,619, which is a continuation-in-part of Ser. No. 71,970, Jun. 7, 1993, Pat. No. 5,417,213. This application Aug. 6, 1996, Ser. No. 689,270

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 128—653.4 **39 Claims**



1. A method of imaging an artery in a patient using magnetic resonance imaging, comprising,

administering a magnetic resonance contrast agent to the patient; and

collecting image data which is representative of a substantial portion of a center of k-space while the patient suspends respiration and a concentration of the contrast agent in the artery is substantially higher than the concentration of contrast agent in adjacent veins and background tissue.

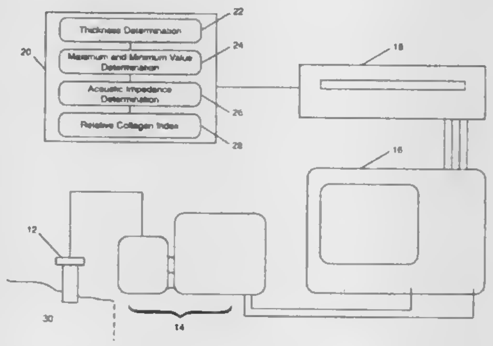
5,746,209
METHOD OF AND APPARATUS FOR HISTOLOGICAL HUMAN TISSUE CHARACTERIZATIONUSING ULTRASOUND

William T. Yost, Newport News; John H. Cantrell, Yorktown, both of Va., and George A. Taler, Baltimore, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 26, 1996, Ser. No. 592,833

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—661.03 **4 Claims**


Thickness Determination
22
Maximum and Minimum Value Determination
24
Acoustic Impedance Determination
26
Relative Collagen Index
28
20
18
16
12
30
14

1. A method for detecting histological properties of human tissue, composed of an iterated stacking sequence of cellular material and collagen containing structural components, using data obtained from ultrasonic ray inputs, comprising the steps of:

emitting a high-frequency ultrasonic pulse into human tissue;

collecting a subsequent sequence of reflected echoes from said tissue;

converting said echoes into a sequence of electrical pulses;

amplifying said sequence of electrical pulses;

performing a Fourier transform upon a time record of said sequence of electrical pulses;

selecting any part of said transform;

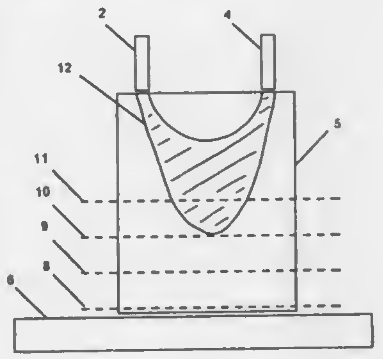
plotting a display of said transform in terms of said part;

evaluating said display to quantitatively determine an index of relative collagen content in said collagen containing structural component, wherein said evaluating is comprised of:
calculating an average thickness of said cellular material and collagen containing components;
determining a ratio for a series of maximum and minimum values that comprise said display and;
calculating an acoustic impedance value for said collagen containing structural component.

5,746,210
DEVICE AND METHOD FOR DETECTION, LOCALIZATION, AND CHARACTERIZATION OF INHOMOGENEITIES IN TURBID MEDIA

David A. Benaron, 454 Birch St., Redwood City, Calif. 94062-1031, and Boris Rubinsky, Albany, Calif., assignors to David A. Benaron, Portola Valley, Calif.

Filed Feb. 26, 1993, Ser. No. 24,278
Int. Cl.⁶ A61B *6/00*
U.S. Cl. 128—665 15 Claims

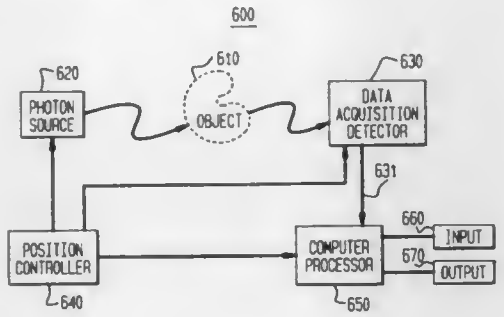


1. An improved spectrophotometer for detecting at least one region of inhomogeneity in a turbid medium, comprising:
(a) means for illumination of said medium with temporally varying electromagnetic radiation, said means for illumination of said medium including a plurality of optical source elements positioned within said medium at a plurality of distances from a surface of said medium;
(b) time-gated detector means for detecting, at a plurality of detection times relative to said illumination of said medium, portions of scattered illuminating radiation having propagated through said medium, and providing output signals, said time-gated detector means including a plurality of detector elements positioned within said medium at a corresponding plurality of depths below said surface of said medium;
(c) intensity measuring means for measuring an intensity of said signals corresponding to the detected portions of said scattered illuminating radiation, and for providing a measured time-intensity relationship signal;
(d) means for comparing said measured time-intensity relationship signal to a reference time-intensity relationship signal corresponding to propagation of electromagnetic energy through said turbid medium in the absence of said region of inhomogeneity therein; and
(e) means for identifying said at least one region of inhomogeneity in accordance with results of said comparison.

5,746,211
ABSORPTION IMAGING SYSTEM AND METHOD USING DIRECT RECONSTRUCTION OF SCATTERED RADIATION

John Scott Leigh, Philadelphia, and John Carl Schotland, Wynnewood, both of Pa., assignors to Bell Communications Research, Inc., Morristown, N.J.

Continuation of Ser. No. 160,108, Nov. 30, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,514
Int. Cl.⁶ A61B *6/00*
U.S. Cl. 128—665 4 Claims

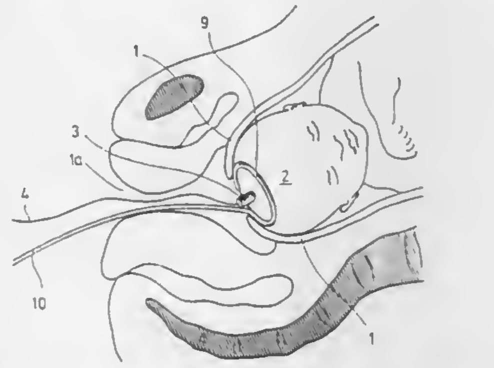


1. A method for generating an absorption image of an object comprising the steps of
irradiating the object with a time-domain source of radiation,
measuring a transmitted intensity due predominantly to diffusively scattered radiation wherein said transmitted intensity is related to an absorption function by an integral operator, and
directly reconstructing the image by executing a prescribed mathematical algorithm, determined with reference to said integral operator, on said transmitted intensity, said step of directly reconstructing including the step of computing a hitting density.

5,746,212
PROCESS AND DEVICE FOR MEASURING VITAL FETAL PARAMETERS DURING LABOR AND DELIVERY

Gerhard Rall, Bozzaristr. 39f., D-8000 Munchen 90, and Reinhold Knitza, Bergstr. 3, D-8015 Gauting, both of Germany

PCT No. PCT/EP93/00664, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO93/18705, PCT Pub. Date Sep. 30, 1993
PCT Filed Mar. 19, 1993, Ser. No. 307,647
Claims priority, application Germany, Mar. 20, 1992, 42 09 147.0
Int. Cl.⁶ A61B *5/04*
U.S. Cl. 128—672 27 Claims



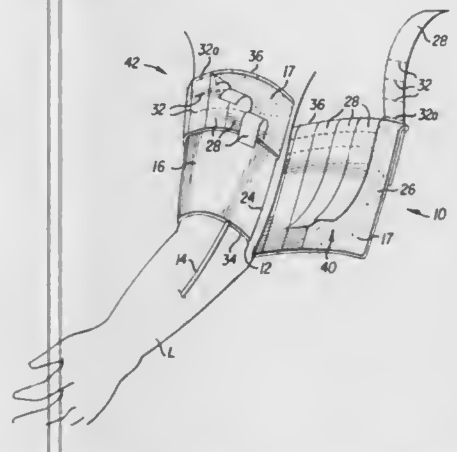
1. A process for measuring the vital parameters of a fetus inside the uterus of a mother during labor and delivery, said process comprising:
forming an occlusion cuff about the presenting part of the fetus;
disposing a blood flow sensor on the presenting part of the fetus;

measuring the blood flow in the presenting part of the fetus through said blood flow sensor;
disposing a pressure sensor between the annular uterine tissue and the presenting part of the fetus;
discontinuously measuring the occlusion pressure between the annular uterine tissue and the presenting part of the fetus through said pressure sensor; and
determining the systolic and diastolic arterial blood pressure of the fetus.

5,746,213
ADJUSTABLE BLOOD PRESSURE CUFF AND METHOD OF USING SAME

Lloyd A. Marks, 727 Great Springs Rd., Bryn Mawr, Pa. 19010

Filed Feb. 24, 1995, Ser. No. 394,304
Int. Cl.⁶ A61B *5/02*
U.S. Cl. 128—686 29 Claims



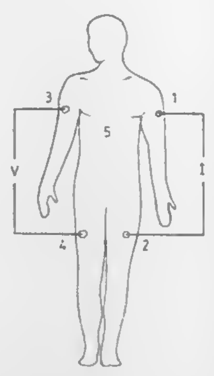
1. A blood pressure cuff having a length and a width and a longitudinal axis along the length thereof comprising an inflatable bladder having first and second sides, said first and second sides each having an adhesive layer extending over a portion thereof, first and second peelable sheets overlying a respective adhesive layer on each side of said bladder, selected portions of each peelable sheet being adapted to be removed from each adhesive layer to expose portions thereof, said cuff being foldable along an axis substantially parallel to said longitudinal axis for adjusting said width and adhesively secured in a folded condition by the adhesive layer on said first side and wrapped about a limb of a patient and adhesively secured in an annular configuration by the adhesive layer on the second side.

5,746,214
INVESTIGATION OF A BODY

Brian Hilton Brown, and David Charles Barber, both of Sheffield, England, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB93/02223, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/09699, PCT Pub. Date May 11, 1994
PCT Filed Oct. 28, 1993, Ser. No. 416,717
Claims priority, application United Kingdom, Oct. 30, 1992, 9222888
Int. Cl.⁶ A61B *5/02*
U.S. Cl. 128—693 15 Claims

1. A method of electrical impedance investigation of a body exhibiting a change in internal state, said method comprising:
applying to the body interrogatory electrical signals at different frequencies;
obtaining first signals representing first electrical impedance measurements at the different frequencies before said change in the internal state of the body;

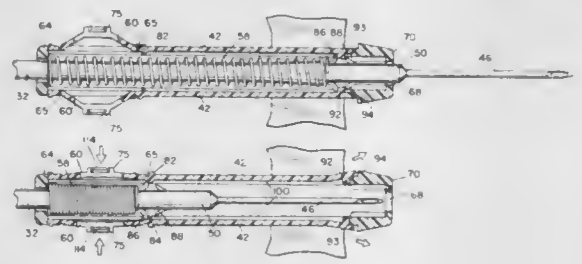


obtaining second signals representing second electrical impedance measurements at the different frequencies after said change in the internal state of the body, wherein the first and second obtained signals are associated with a variation in two variables, said variables being (i) frequency and (ii) internal state of the body;
determining a change in said impedance measurements over a variation of one of said two variables;
determining a normalized change measurement from said change in said impedance measurements, said change in said impedance measurements being normalized with respect to a chosen reference impedance measurement;
determining a response, over a variation of said other of said variables, to said normalized change measurement; and
selectively determining characteristics of a part of said body from said response.

5,746,215
IV INFUSION OR COLLECTION DEVICE WITH EXTENDABLE AND RETRACTABLE NEEDLE

Carlos H. Manjarrez, San Diego, Calif., assignor to U.S. Medical Instruments, Inc., San Diego, Calif.

Filed Nov. 1, 1996, Ser. No. 742,040
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 128—763 20 Claims



1. An IV or blood collection device comprising:
a housing having a proximal end and a distal end with a movable needle carrier operatively positioned for movement in said housing from a retracted position at said proximal end of said housing to an extended position at said distal end of said housing, and then to a shielded, said retracted position;
a stretchable resilient member connected between said needle carrier and said housing;
an actuating member that moves said needle carrier from said retracted position to said extended position while stretching said resilient member;
a releasable locking device that locks said needle in said extended position;
a lock-releasing device that releases said releasable locking device, whereby said resilient member retracts said needle carrier to said retracted position within said housing; and
a lock device that locks said needle carrier in said retracted position within said housing.

5,746,216

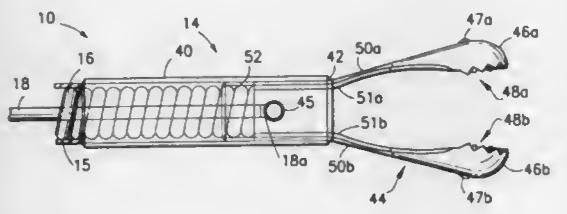
ENDOSCOPIC MULTIPLE SAMPLE BIOPTOME WITH ENHANCED BITING ACTION

Vincent Turturro, Miramar; Matthew A. Palmer, Miami; Charles R. Slater, Fort Lauderdale, and Saul Gottlieb, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Division of Ser. No. 412,058, Mar. 28, 1995, Pat. No. 5,636,639, which is a continuation-in-part of Ser. No. 189,937, Feb. 1, 1994, Pat. No. 5,542,432. This application Dec. 20, 1996, Ser. No. 771,576

Int. Cl.⁶ A61B *10/00*

U.S. Cl. 128—751 **9 Claims**



1. An endoscopic bioptome, comprising:

a) a hollow outer member having a proximal and a distal end;

b) an inner control member having a proximal and a distal end and extending through said hollow outer member;

c) a cylinder having a longitudinal axis, said cylinder being coupled to said distal end of one of said hollow outer member and said inner control member;

d) a jaw assembly including a base member and a pair of resilient arms extending distally from said base member, each of said resilient arms terminating in a jaw cup having a cutting edge, each of said resilient arms having a portion bent away from said longitudinal axis of said cylinder, said base member being coupled to said distal end of the other of said hollow outer member and said inner control member; and

e) actuation means coupled to said proximal end of said hollow outer member and to said proximal end of said inner control member for axially displacing one of said hollow outer member and said inner control member relative to the other of said hollow outer member and said inner control member, whereby said cylinder extends around said pair of resilient arms and closes said jaw cups, wherein,

at least one of said jaw cups has an outer surface which includes a ramp which is engaged by said cylinder when said jaw cups are closed.

5,746,217

INTERSTITIAL FLUID COLLECTION AND CONSTITUENT MEASUREMENT

Brian J. Erickson, Woodbury; Michael E. Hilgers, Roseville; Tracy A. Hendrickson, Minnetonka; J. Edward Shapland, Shoreview; Frank A. Solomon, Plymouth, and Mark B. Knudson, Shoreview, all of Minn., assignors to Integ Incorporated, Roseville, Minn.

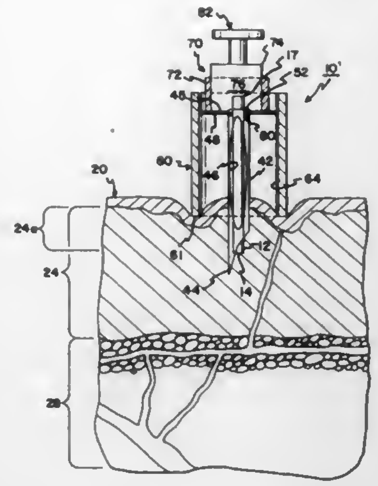
Division of Ser. No. 321,305, Oct. 11, 1994, Pat. No. 5,582,184, which is a continuation-in-part of Ser. No. 136,304, Oct. 13, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,314

Int. Cl.⁶ A61B *5/00*

U.S. Cl. 128—760 **11 Claims**

1. A method for testing a sample of body fluid, said method comprising:

urging a sampler against a patient's skin, said sampler including a penetration member sized to penetrate the patient's skin into but not substantially through a dermal layer upon placement of said sampler against said skin;



drawing a sample of said fluid along said penetration member and out of said skin;

testing said sample for desired constituents.

5,746,218

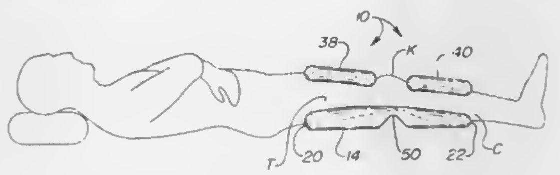
THERAPEUTIC PILLOW

David A. Edge, 5447 Rowe Trail, Pace, Fla. 32571

Filed Aug. 2, 1996, Ser. No. 691,344

Int. Cl.⁶ A61G *15/00*

U.S. Cl. 128—845 **11 Claims**



1. A therapeutic pillow for receiving a user's thighs and calves and holding the user's legs together during sleep comprising:

a base, having a top portion, a medial portion, a bottom portion, a top surface, a bottom surface, a front, a rear, a left side, and a right side;

a first generally concave thigh receiving region, having a first opening facing outwardly, extending upwardly from the top surface and extending from the top portion to the medial portion, for receiving a user's right thigh;

a second generally concave thigh receiving region, having a second opening facing outwardly, extending upwardly from the top surface and extending from the top portion to the medial portion in mirror-image symmetrical fashion to the first thigh receiving region, for receiving a user's left thigh;

a first generally concave calf receiving region, having a third opening facing outwardly, extending upwardly from the top surface and extending from the medial portion to the bottom portion, for receiving a user's right calf;

a second generally concave calf receiving region, having a fourth opening facing outwardly, extending upwardly from the top surface and extending from the medial portion to the bottom portion in mirror-image symmetrical fashion to the first calf receiving region, for receiving a user's left calf: and

such that an open region exists between the first thigh receiving region and the first calf receiving region as well as between the second thigh receiving region and the second calf receiving region.

5,746,219

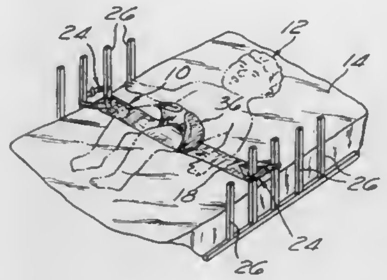
INFANT SLEEP POSITIONING DEVICE

Thomas E. McConnell, 1568 Calzada Ave., Santa Ynez, Calif. 93460

Filed Oct. 18, 1996, Ser. No. 732,134

Int. Cl.⁶ A61G *15/00*

U.S. Cl. 128—845 **6 Claims**



1. An infant sleep positioning device for retrofit attachment to a support structure having opposed sides and an underlying support surface extending between the opposed sides, said positioning device being adapted to maintain an infant in a back sleeping position upon the underlying support surface and comprising:

an elongate belt member defining opposed ends, said belt member being sized to be extensible along the support surface between the opposed sides of the support structure;

a pair of fastener straps attached to the belt member adjacent respective ones of the opposed ends thereof for attaching the belt member to respective ones of the opposed sides of the support structure;

a first attachment member disposed on said belt member substantially intermediate the opposed ends thereof; and

a diaper member sized and configured to be wrapped about the pelvic region of the infant and including a second attachment member disposed thereon which is positioned over the buttocks of the infant when the diaper member is wrapped about the pelvic region;

said second attachment member being releasably engageable to the first attachment member for purposes of maintaining the back of the infant upon the support surface.

5,746,220

Patent Not Issued For This Number

5,746,221

COLD FORMABLE MOUTHGUARDS

Carl H. Jones, Katy, Tex.; John M. Blaha, Chesapeak City, Md., and Gail J. Townsend, Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 18, 1996, Ser. No. 746,801

Int. Cl.⁶ A61C *5/14*

U.S. Cl. 128—859 **19 Claims**

1. A mouthguard comprising a U-shaped structure with inner and outer walls comprising an expanded PTFE material, said mouthguard adapted to extend at least partially over the dental arch.

5,746,222

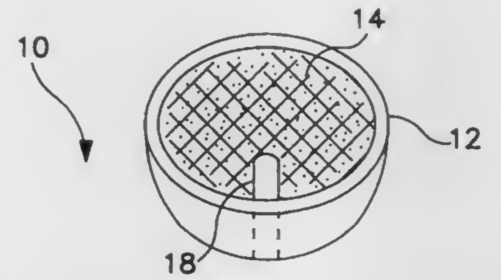
URINARY CONTINENCE DEVICE FOR MEN AND METHOD OF CONTROLLING URINARY INCONTINENCE BY USING SAME

John G. Simoo, Boston; Carl J. Wisnosky, Spencer; Jeffrey C. Cerier, Franklin; Christopher C. Coulter, Newton Upper Falls, and David E. Coats, Newton, all of Mass., assignors to UroMed Corporation, Needham, Mass.

Filed Dec. 14, 1995, Ser. No. 572,332

Int. Cl.⁶ A61F *5/48*

U.S. Cl. 128—885 **13 Claims**



1. A urinary continence device for men comprising:

a body configured to cover the meatus urinarius, said body capable of providing a conformable fit with the penis and of sealing the urethra; and

a locating member protruding inwardly from the internal surface of the body toward the penis in the region of the body that will cover the meatus urinarius when the device is in use.

5,746,223

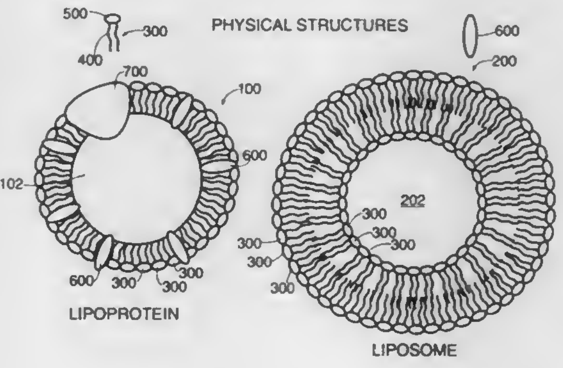
METHOD OF FORCING THE REVERSE TRANSPORT OF CHOLESTEROL FROM A BODY PART TO THE LIVER WHILE AVOIDING HARMFUL DISRUPTIONS OF HEPATIC CHOLESTEROL HOMEOSTASIS

Kevin Jon Williams, 425 Wister Rd., Wynnewood, Pa. 19096

Filed Oct. 11, 1996, Ser. No. 728,766

Int. Cl.⁶ A61B *19/00*

U.S. Cl. 128—898 **20 Claims**

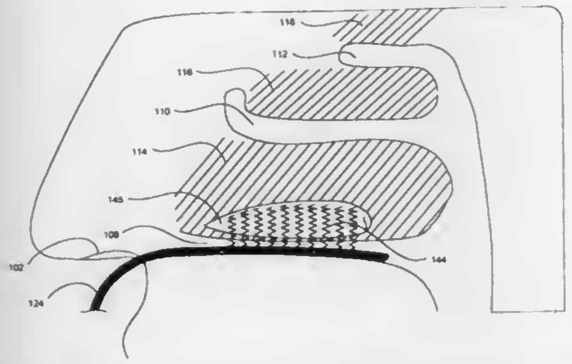


1. A method of forcing the reverse transport of cholesterol from peripheral tissues to the liver in vivo while controlling plasma LDL concentrations comprising the step of:

administering a therapeutically effective amount of a multiplicity of large liposomes comprised of phospholipids substantially free of sterol for a treatment period

whereby said liposomes pick-up said cholesterol during said treatment period.

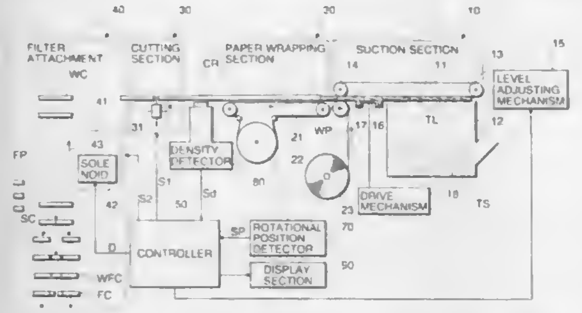
5,746,224
METHOD FOR ABLATING TURBINATES
Stuart D. Edwards, Portola Valley, Calif., assignor to Somnus Medical Technologies, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 752,076, Nov. 19, 1996, and Ser. No. 753,063, Nov. 19, 1996, each which is a continuation-in-part of Ser. No. 651,796, May 22, 1996, and Ser. No. 651,798, May 22, 1996, abandoned, each which is a continuation-in-part of Ser. No. 265,459, Jun. 24, 1994, Pat. No. 5,505,730. This application Nov. 19, 1996, Ser. No. 754,588
Int. Cl.⁶ A61B *17/36*
U.S. Cl. 128—898 35 Claims



1. A method for reducing the size of a nasal concha comprising delivering ablative energy through a surface of the nasal concha into an interior of the nasal concha without introducing an element into the interior of the nasal concha to ablate a portion of the interior of the nasal concha; and

removing the ablated interior portion of the nasal concha by natural absorption of ablated tissue by the patient's body.

5,746,225
METHOD AND APPARATUS FOR DETERMINING THE TOBACCO SHRED FILLING QUALITY OF CIGARETTE RODS
Yutaka Okumoto, and Shigemitsu Inomata, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan
Filed Mar. 14, 1997, Ser. No. 816,367
Claims priority, application Japan, Mar. 14, 1996, 8-057283
Int. Cl.⁶ A24C *5/14*
U.S. Cl. 131—84.1 12 Claims

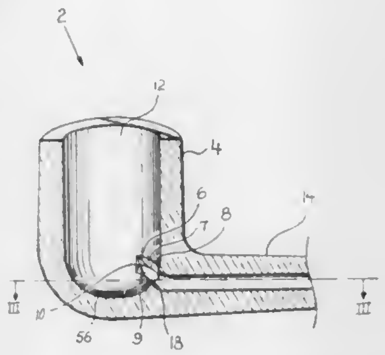


1. A method of determining the tobacco shred filling quality of cigarette rods acquired by cutting a continuous cigarette rod obtained by wrapping tobacco shreds with a cigarette paper, comprising:

a detection step of sequentially detecting tobacco shred filling states in those predetermined portions of the continuous cigarette rod which correspond to at least respective one end portions of individual cigarette rods before cutting the continuous cigarette rod; and

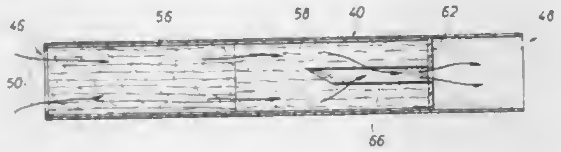
a prediction step of sequentially predicting tobacco shred filling qualities at at least respective one end portions of individual cigarette rods, based on said sequentially detected tobacco shred filling states, before the continuous cigarette rod is cut into the individual cigarette rods.

5,746,226
GROOVED SMOKING PIPES AND METHOD OF FILLING
George M. Beaver, 4190 Ridgewood Ave., Port Orange, Fla. 32127
Filed Oct. 21, 1996, Ser. No. 734,105
Int. Cl.⁶ A24F *5/00*
U.S. Cl. 131—226 9 Claims



1. A grooved pipe comprising a bowl tobacco bore to hold tobacco, in fluid communication with a bowl smoke bore, a V-groove plenum located at an intersection of said bowl tobacco bore and said bowl smoke bore, said V-groove plenum indented within a wall of said bowl tobacco bore at the exit of said bowl tobacco bore and at the entrance of said bowl smoke bore, said V-groove plenum terminating at either extreme in a closed end, said V-groove plenum not communicating directly with the outside of said bowl tobacco bore, whereby an area of tobacco adjacent said bowl smoke bore entrance is increased, thus smoothening pipe draw, avoiding a need to re-light said grooved pipe, and preventing excessive tobacco tamping.

5,746,227
DRY POWDER DELIVERY SYSTEM
Jed E. Rose; Frederique Behm, both of Durham, N.C., and James Turner, Atascosa, Tex., assignors to Advanced Therapeutic Products, Inc., San Antonio, Tex., and Duke University, Durham, N.C.
Continuation of Ser. No. 14,773, Feb. 8, 1993, Pat. No. 5,441,060. This application Jun. 7, 1995, Ser. No. 483,540
Int. Cl.⁶ A61M *15/00*
U.S. Cl. 131—270 13 Claims

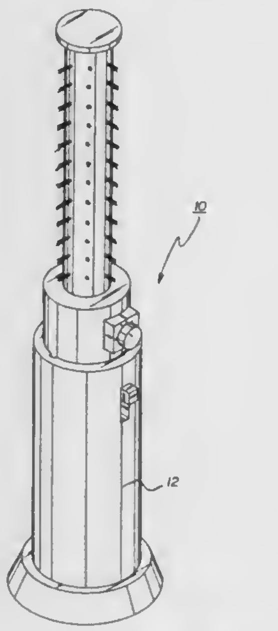


1. A method for delivering dry powder particles through the mouth of a user, comprising the steps of:

(a) creating suction through an opening in a proximal end of an elongated housing for drawing air into a flow path in the housing, from an opening in a distal end of the housing, the distal end including an opening in the housing with a ridge surrounding the housing, and through a resistance member in the housing for introducing a controlled pressure drop in the housing and a resistance to the drawing of air into the mouth of the user;

(b) introducing a measured amount of dry powder particles having a therapeutic capability into the housing so that the particles will travel downstream from the resistance member at a relatively low velocity in a non-agglomerated state, the dry powder particles being sized and coordinated with the controlled pressure drop so that the particles can be drawn into the mouth of the user and inhaled, said resistance being sufficiently great that the particles are drawn into the mouth of the user to simulate the action of puffing on a cigarette so that at least some of the particles are deposited in the oral cavity and upper respiratory tract of the user after being drawn into the mouth.

5,746,228
TRAVELLING HAIR DRYING CURLING AND STYLING APPARATUS
Mary C. Parker, 213 Bradish, Lajunta, Colo. 80150
Filed May 13, 1996, Ser. No. 645,297
Int. Cl.⁶ A45D *1/04*
U.S. Cl. 132—232 1 Claim



1. A travelling hair drying, curling, and styling apparatus for allowing a user to travel with a singular apparatus for styling one's hair comprising, in combination:

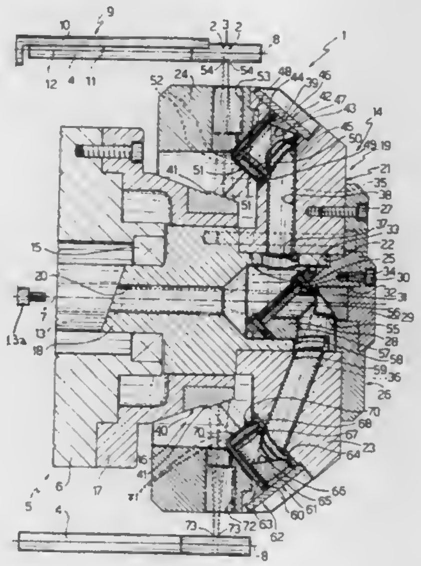
a hollow cylindrical housing having an upper end with an indentation therein and an open lower end, the open lower end having an access panel hingedly secured thereto, the open lower end extending upwardly into a battery chamber within the housing, the battery chamber containing a pair of batteries therein, the housing having an on/off switch secured within an intermediate sidewall thereof, the on/off switch being electrically coupled with the battery chamber, the indentation at the upper end having a pair of electric prongs extending upwardly therethrough, the electric prongs being electrically coupled with the on/off switch, the indentation at the upper end further having a pair of L-shaped recesses formed on opposing sides thereof, the housing further containing a removable stand dimensioned to receive the lower end of the housing therein to support the same in an upright position;

a curling brush iron attachment having temperature control knob thereon, the attachment having a pair of apertures in a lower end thereof for receipt of the pair of electric prongs therein when the lower end of the attachment is coupled with the indented upper end of the housing, the lower end of the attachment having a pair of flanges on opposing sides thereof adapted for coupling with the L-shaped recesses of the housing for securement of the attachment to the housing;

a styling blow dryer attachment having a pair of apertures in a lower end thereof for receipt of the pair of electric prongs therein when the lower end of the dryer attachment is coupled with the indented upper end of the housing, the lower end of the dryer attachment having a pair of flanges on opposing sides thereof adapted for coupling with the L-shaped recesses of the housing for securement of the dryer attachment to the housing; and

a curling iron attachment having a pair of apertures in a lower end thereof for receipt of the pair of electric prongs therein when the lower end of the iron attachment is coupled with the indented upper end of the housing, the lower end of the iron attachment having a pair of flanges on opposing sides thereof adapted for coupling with the L-shaped recesses of the housing for securement of the iron attachment to the housing.

5,746,229
PERFORATING UNIT FOR PRODUCING VENTILATED CIGARETTES
Fiorenzo Draghetti, Medicina, and Roberto Polloni, Modigliana, both of Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy
Filed Aug. 14, 1996, Ser. No. 696,397
Claims priority, application Italy, Aug. 24, 1995, B095A0402
Int. Cl.⁶ A24C *1/38*
U.S. Cl. 131—281 7 Claims



1. A perforating unit (1) for producing ventilated cigarettes (4), the unit comprising cigarette conveying means (5) including a plurality of equally spaced seats (11) for accommodating respective cigarettes (4), said conveying means (5) successively feeding said seats (11) along a path (P) extending about a first axis (7) and crosswise to a second axis (8) of the seats (11); rotation means (9) associated with the conveying means (5) for rotating each seat (11) about the respective second axis (8) as the seat (11) travels along said path (P); a laser source (13*a*) for emitting a laser beam (13) along the first axis (7); a movable reflecting and focusing assembly (14) comprising at least a focusing means (48), (67) for focusing said laser beam (13), reflecting means (34, 31, 46) for directing said laser beam (13) to impinge onto said focusing means (48, 67) and to pass therethrough to become a focused beam (35; 36), and at least one diffracting optical element (49; 68) for dividing said focused beam (35; 36) into a given number of identical further focused beams (52; 71); and a faceted reflecting element (16) having the shape of a truncated regular pyramid disposed coaxially with said first axis and directed toward said reflecting and focusing assembly (14); said reflecting element (16) being mounted for rotation with said seats (11) about the first axis (7) to direct said further focused beams (52, 71) onto given points of the cigarettes (4) carried by said seats (11) to form on each said cigarette (4) a number of rings (2) of ventilation holes (3) equal to said given number.

5,746,230

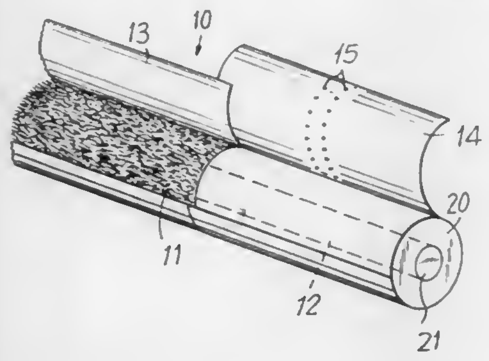
CONCENTRIC SMOKING FILTER DISCRETE TOW AND WEB FILTER MEDIA

Cynthia W. Arterbery, Chesterfield; W. Timothy Callaham, Richmond; Gus D. Keritsis, Richmond, and Morris F. White, Jr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 118,575, Sep. 8, 1993, abandoned, which is a continuation of Ser. No. 796,631, Nov. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 571,878, Aug. 24, 1990, abandoned. This application May 31, 1995, Ser. No. 456,003

Int. Cl.⁶ A24D *3/02;3/06*

U.S. Cl. 131—331 **41 Claims**



1. A smoking filter comprising:
a first filter plug having:
a central core of a first filter material comprising web material, and
a peripheral layer of a second filter material comprising fibrous tow surrounding said central core; wherein:
each of said central core and said peripheral layer has a resistance-to-draw, said central core having a resistance-to-draw of from about 285 mm W.G. to about 500 mm W.G. and said smoking filter having a resistance-to-draw of from about 115 mm W.G. to about 235 mm W.G., said peripheral layer having a lower resistance-to-draw than said central core, to initially direct, when said smoking filter is attached to a smoking article and said smoking article is smoked, a greater fraction of smoke through said peripheral layer than through said central core; said first filter plug further having:
means for admitting ventilation air through said peripheral layer toward said central core, whereby smoke initially directed into said peripheral layer flows back into said central core; whereby:
when said smoking filter is attached to a smoking article and said smoking article is smoked, said filtered smoking article delivers smoke containing a particular level of total particulate matter, and the taste of said smoking article is a taste associated with smoke having a level of total particulate matter higher than said particular level.

5,746,231

TOBACCO SMOKE FILTER FOR REMOVING TOXIC COMPOUNDS

Craig Lesser, 10724 Wilshire Blvd., #810, Los Angeles, Calif. 90024, and Reid W. Von Borstel, Potomac, Md., assignors to Craig Lesser, Middletown, Calif.

Continuation-in-part of Ser. No. 543,050, Oct. 13, 1995, abandoned, and Ser. No. 363,975, Dec. 13, 1994, Pat. No. 5,501,238, each which is a continuation of Ser. No. 2,951, Jan. 11, 1993, abandoned. This application May 15, 1996, Ser. No. 648,314

Int. Cl.⁶ A24D *3/00*

U.S. Cl. 131—334 **36 Claims**

1. A tobacco smoke filter comprising a porous substrate having copper phthalocyanine dispersed therein.

5,746,232

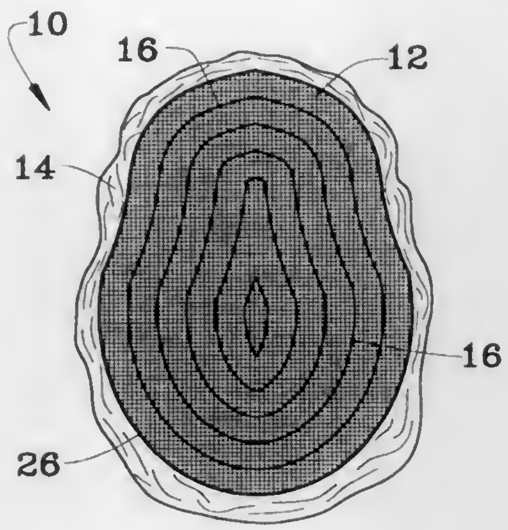
HAIRPIECE WITH REINFORCED MESH BASE

Randy Martin, and Les Martin, both of Palm Beach, Fla., assignors to First Lady Coiffures, Ltd., Canada

Filed Apr. 1, 1997, Ser. No. 831,727

Int. Cl.⁶ A41G *5/00*

U.S. Cl. 132—54 **5 Claims**



1. A hairpiece comprising:
a one-piece mesh substrate sized to fit the head of an individual, said substrate including a first set of fibers and a second set of fibers;
a plurality of selectively-deformable stabilizing rings disposed within said substrate, said stabilizing rings including a third set of substantially-concentric, monofilament fibers sonically welded to said mesh substrate, said set of fibers having a tensile strength which is lower than a tensile strength of said first and second set of fibers; and
a plurality of hairs attached to said substrate,
whereby said stabilizing rings provide structural rigidity to said mesh substrate and maintain said substrate in a preferred orientation through several removals and applications of said hairpiece, thereby increasing the useable life of said hairpiece.

5,746,233

WASHING APPARATUS AND METHOD THEREFOR

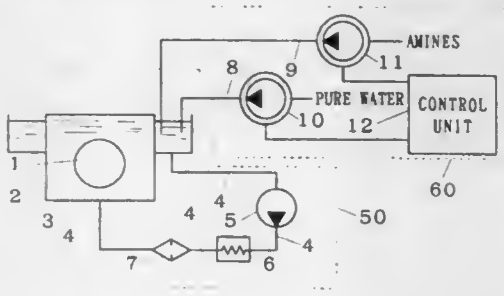
Takeshi Kuroda, Hyogo, and Itaru Kanno, Tokyo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Itami, both of Japan

Filed Jul. 11, 1996, Ser. No. 678,685

Claims priority, application Japan, Jan. 17, 1996, 8-005711

Int. Cl.⁶ B08B *3/04*

U.S. Cl. 134—57 R **5 Claims**



1. A washing apparatus comprising:

a washing part configured to wash a wafer therein with a washing liquid, said washing liquid having a property such that a quantity of said washing liquid is reduced in relation to an amount of operating time that said washing liquid is used and a total amount of said washing liquid contained therein; and
a supply part configured to supply said washing part with an additional amount of said washing liquid so that said quantity of said washing liquid in said washing part is kept within a predetermined range, said supply part comprising,
a controller configured to predict said quantity of said washing liquid as a function of operating time and said total amount of said washing liquid, said controller being configured to control said supply of said additional amount of said washing liquid based the quantity predicted so as to keep said quantity of washing liquid within said predetermined range.

5,746,234

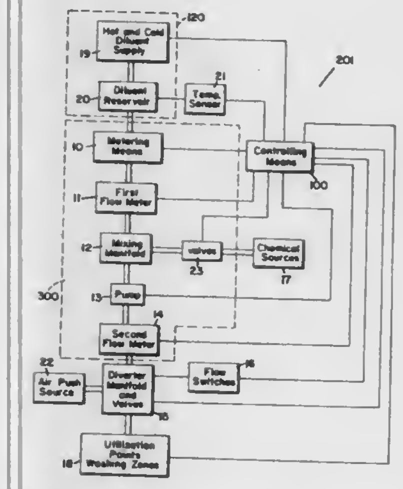
METHOD AND APPARATUS FOR CLEANING THIN SUBSTRATES

Jeffrey D. Jones, Corona, Calif., assignor to Advanced Chemill Systems, Temecula, Calif.

Filed Nov. 18, 1994, Ser. No. 342,132

Int. Cl.⁶ B08B *3/04*

U.S. Cl. 134—64 R **15 Claims**



14. An apparatus useful in the cleaning of a thin substrate having a substrate top side, a substrate bottom side, a substrate central section and substrate edges, the apparatus comprising:
(a) a transporter having one or more edge contactors which move the substrate along a transport path at a uniform transport velocity by non-fluid contact with the substrate bottom side at the edges of the substrate alone;
(b) one or more washing fluid ejectors capable of delivering washing fluid to substrates transported along the transport path;
(c) one or more supporting fluid delivery ejectors, the fluid delivery ejectors being capable of delivering a supporting fluid to a substrate transported along the transport path such that the substrate central section is maintained in a substantially planar configuration by the supporting fluid along the transport path; and
(d) an anti-dragout device disposed along the transport path, the anti-dragout device comprising two pair of opposing anti-dragout ejector manifolds disposed on opposite sides of the washing fluid ejectors, each manifolds comprising a plurality of rotationally driven anti-dragout ejectors disposed at an angle between about 10° and about 80° with respect to the transport path, the anti-dragout ejectors being capable of delivering a fluid stream to the transport path such that liquid flowing past the anti-dragout ejectors is less than about 10 ml per square foot of substrate surface;
wherein, the anti-dragout device comprises a non-flat surface disposed after the washing fluid ejectors and spaced apart from the transport path, the surface having a first section disposed substantially parallel with the transport path, a second section disposed substantially non-parallel with respect to the transport path, and a third section disposed substantially parallel with the transport path, the first section being upstream of the second and third sections, the first section being disposed between about 1.25 and about 15 mm from a substrate being transported along the transport path, and the third section being disposed between about 0.25 and about 6.5 mm from a substrate being transported along the transport path.

5,746,235

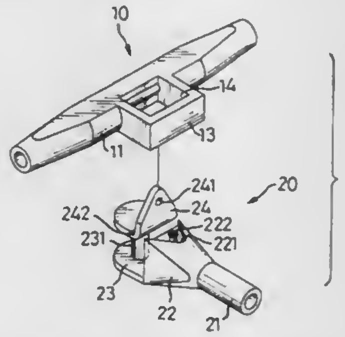
LINKAGE DEVICE FOR AN UMBRELLA

Yao-Chin Lin, Tainan, Taiwan, assignor to Asia Umbrella Industries Co., Ltd., Tainan, Taiwan

Filed Apr. 14, 1997, Ser. No. 838,144

Int. Cl.⁶ A45B *25/00*

U.S. Cl. 135—29 **4 Claims**



1. A linkage member for an umbrella comprising:
a pivot having a tube for receiving a rib of said umbrella therethrough and a frame integrally formed on a periphery of said tube and defining therein an opening;
a joint having a receiving seat for receiving a stretcher of said umbrella therein, a body integrally formed with said receiving seat and defining in a face thereof a recess in which a positioning rod is provided, an extension integrally extending out from a bottom of said body, a pivot rod extending upward from said extension and a deformable leaf securely connected with a distal end of said pivot rod and defining therein a through hole aligned with said positioning rod, and a crease;
said deformable leaf being able to extend through said opening of said frame and having a portion of said frame received within said joint;
said deformable leaf being able to be folded and having said positioning rod extend into said through hole and thus securely maintaining said portion of said frame within said joint.

5,746,236

KNEE CRUTCH

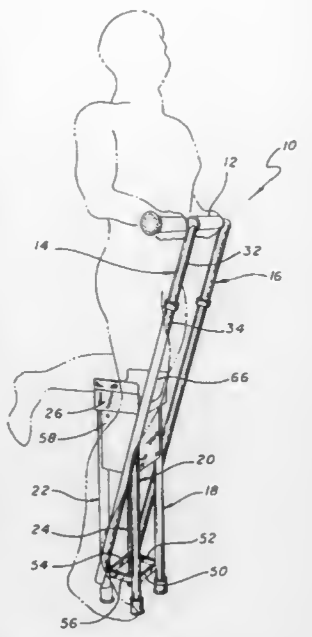
Derek Tilsley, and Ruth Tilsley, both of 905 Berkeley St., Santa Monica, Calif. 90403

Filed Sep. 13, 1996, Ser. No. 713,435

Int. Cl.⁶ A45B *3/00*

U.S. Cl. 135—66 **22 Claims**

1. A knee crutch, for supporting a selected knee of a patient with a lower leg injury or disability on the same side of the patient as the selected knee, comprising:
a knee support for supporting and receiving the selected knee;
at least one base portion having an upper end and a lower end, the base portion connected to the knee support adjacent to the upper end and engaging the floor at the lower end; and



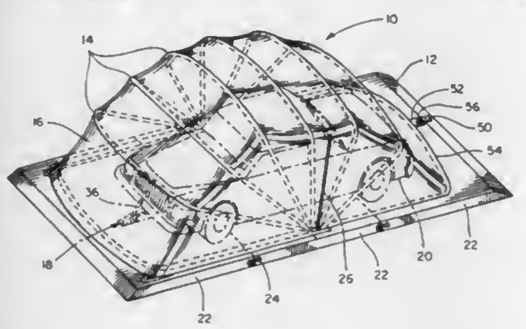
at least one upright portion, each upright portion having a first end and a second end, being connected to the knee support adjacent to the second end and connected to a handle portion at the first end said handle portion extending laterally beyond the knee support towards the other side of the patient;

in which the base portion, the upright portion and the handle portion are sized and oriented so the knee may rest in contact with in the knee support and the handle portion may rest in contact across substantially an entire forward facing portion of the patient's abdomen when the patient is in a standing position,

whereby the knee support and handle may cooperate with the knee and abdomen respectively to thereby support the patient when the patient is standing, and

whereby the handle may be urged forwardly by the patient away from the abdomen to thereby simulate a heel-to-toe motion when the patient is walking with the knee supported by the knee support.

5,746,237
PORTABLE GARAGE
Garlon A. Arnic, 500 Ford La., Bartlett, Ill. 60103
Filed Sep. 13, 1996, Ser. No. 713,745
Int. Cl.^{6} E04H *15/00*
U.S. Cl. 135—88.06 **19 Claims**

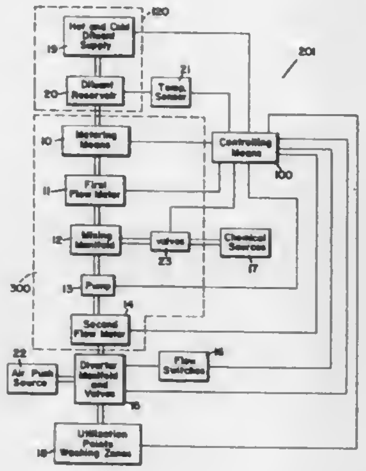


12. In combination with a vehicle,

a portable, expandable protective vehicle cover comprising:

a base, said base being sized to support a vehicle thereon and having a substantially flat upper surface; a canopy, said canopy being supported by a telescoping frame, said telescoping frame comprising a plurality of U-shaped ribs extending along outer edges of said base; and a drive means, said drive means being positioned along a horizontal central axis parallel to the flat upper surface within said base, a rotating rod operatively connected to said drive means, said drive means comprising: a vehicle engaging arm, said vehicle engaging arm extending upwardly beyond said flat upper surface at a height sufficient to engage a bumper of a vehicle, said vehicle engaging arm being movable laterally across a vertical central axis parallel to the flat upper surface said vehicle engaging arm being spring loaded, a chain drive connected to said vehicle engaging arm, said chain drive being operatively connected with said rotating rod, said vehicle engaging arm being movable backwards when engaged by a moving vehicle causing said chain drive to turn said rotating rod to extend said telescoping frame to a fully extended position, said vehicle when moved away from said vehicle engaging arm causing said telescoping frame to retract due to the spring loaded forces counter rotating the vehicle engaging arm, ends of said telescoping frame being pivotally connected to opposing edges on said rotating rod, said drive means providing power to turn said rotating rod to extend and retract said telescoping frame to open and closed positions thereby opening and closing said canopy and allowing a vehicle positioned on the base to be covered by the canopy.

5,746,238
LIQUID CHEMICAL DILUTION AND DOSING SYSTEM
Daniel F. Brady, Eagan; John E. McCall, Jr., West St. Paul; Paul J. Mattia, Prior Lake; John M. Lavorata, Burnsville; Matthew D. PeKarna, Bloomington; Robert David Stokes, East Bethel, and Clyde Arthur Bailey, Hastings, all of Minn., assignors to Ecolab, Inc., St. Paul, Minn.
Filed Mar. 31, 1995, Ser. No. 414,635
Int. Cl.^{6} G05D *7/06*
U.S. Cl. 137—3 **33 Claims**



1. An apparatus for preparing a chemical composition by diluting a chemical concentrate with a diluent, the apparatus comprising:

(a) metering means for controlling the output of a diluent from a diluent source;

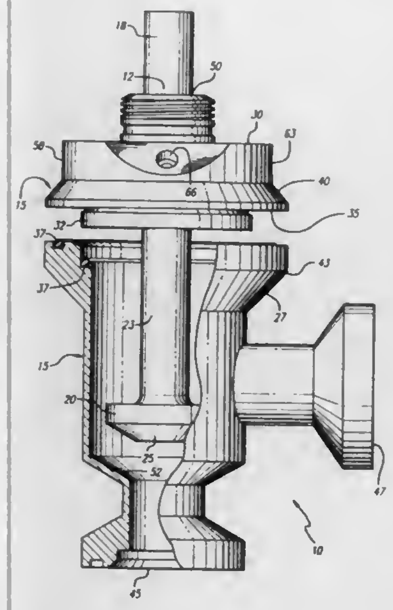
(b) a source of a chemical concentrate;

(c) a mixing manifold, in fluid communication with the metering means and the source of chemical concentrate, for mixing the diluent with the chemical concentrate to form a chemical composition, and wherein the mixing manifold includes an outlet port;

(d) control means for determining a dilution ratio and generating the control signal for the metering means; and

(e) a source of air, operatively connected to the outlet port for pushing the chemical composition to the utilization point, wherein the time required to deliver the chemical composition to the utilization point is reduced.

5,746,239
DUAL TRACE VALVE SYSTEM
Mark Ondrus, Toledo, Ohio, assignor to Hunt-Wesson, Inc., Fullerton, Calif.
Filed Sep. 19, 1995, Ser. No. 531,187
Int. Cl.^{6} B08B *3/04; 9/06;* F16K *51/00*
U.S. Cl. 137—15 **57 Claims**



53. A method for sterilizing a valve system for controlling the flow of a food product through a piping system, wherein the method comprises:

initiating flow of a first sterilizing fluid through a first region inside a valve;

initiating flow of a second sterilizing fluid through a second region inside the valve;

halting flow of the second sterilizing fluid through the second region inside the valve;

initiating flow of a cooling fluid through the second region inside the valve;

operating the valve to control the flow of the food product through the piping system while continuing the flow of the first sterilizing fluid through the first region inside the valve and the flow of the cooling fluid through the second region inside the valve.

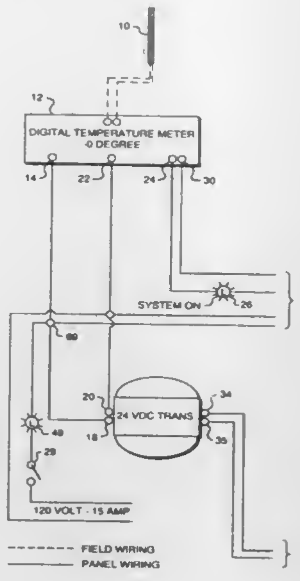
5,746,240
FREEZE PROTECTION SYSTEM FOR CAR WASHER UNITS
Leo Ayotte, 26 Orestis Way, Lewiston, Me. 04240, and Paul Obie, Bailey Hill Rd., Poland, Me. 04273
Filed Oct. 17, 1996, Ser. No. 733,270
Int. Cl.^{6} E03B *7/12;* F16K *37/00;* E03C *1/02*
U.S. Cl. 137—59 **18 Claims**

1. A system for preventing the freezing of liquids in a conduit comprising:

a temperature sensor for sensing the ambient temperature in the vicinity of the conduit;

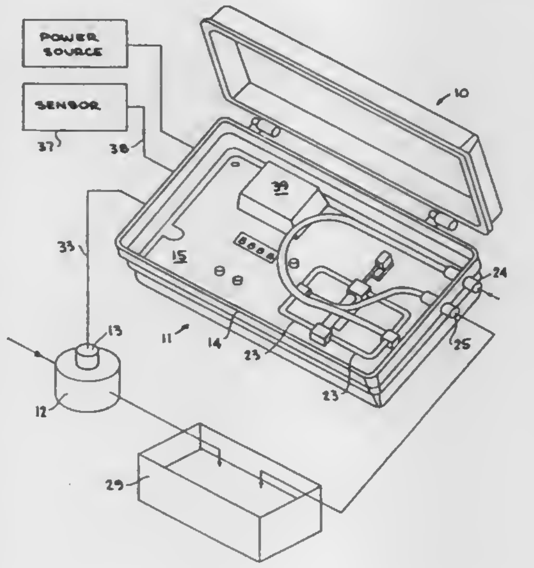
digital temperature means, connected to said temperature sensor, for providing a temperature signal that corresponds to the ambient temperature;

a microprocessor, connected to said digital temperature means, for comparing said signal to a predetermined low temperature and a predetermined high temperature such that when said signal indicates that the ambient temperature is less than said predetermined low temperature, said system is activated to deliver a predetermined volume of antifreeze mist under pressure to said conduit to provide a purged condition, wherein said conduit is protected from freezing; and,



wherein said microprocessor further comprises reuse control means for determining when said conduit has been refilled with a freezable liquid, so that said system can be reactivated to deliver another of said predetermined volume of antifreeze mist under pressure to said conduit to again reinstate said purged condition.

5,746,241
PRECISION DISPENSING SYSTEM
David Stedman, Kirkland, Wash., assignor to AgriBioTech, Inc., Las Vegas, Nev.
Filed Sep. 19, 1995, Ser. No. 531,210
Int. Cl.^{6} G05D *11/13*
U.S. Cl. 137—101.21 **18 Claims**



1. A precision dispensing system (PDS) for accurately and controllably introducing an additive into a flowing liquid, comprising:

a flow meter through which the liquid is flowed and which measures the volumetric flow rate of the liquid therethrough and produces signals related thereto;

a microprocessor controlled dispensing device actuated by signals from the flow meter for introducing a selectable fixed amount of additive per unit volume of the liquid;

wherein the dispensing device comprises:

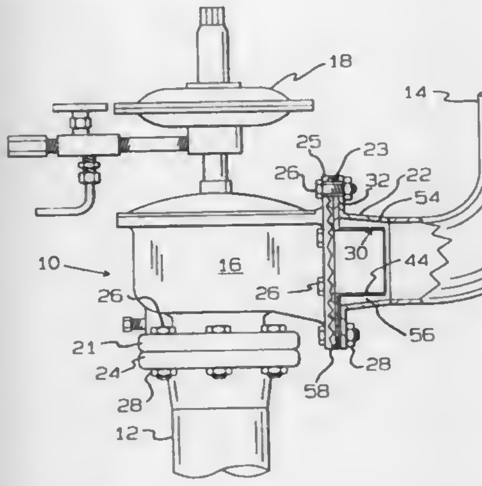
a microprocessor;

a stepper motor controlled by the microprocessor;

a reciprocating pump driven by the stepper motor and having an inlet connected to an additive supply.

5,746,242
GAS RELIEF VALVE PROTECTOR

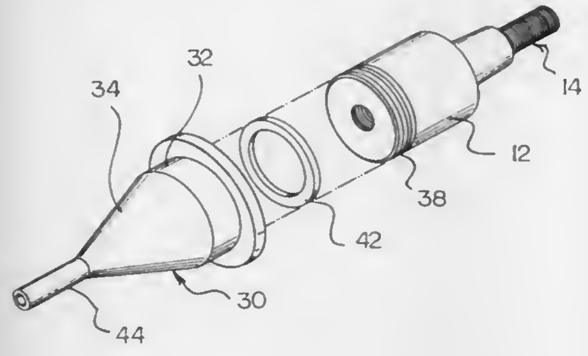
Michael J. Frederick, 3120 Fawn La., Jackson, Mich. 49201
Filed May 27, 1997, Ser. No. 863,285
Int. Cl.⁶ F16T *1/45*
U.S. Cl. 137—177 17 Claims



10. A gas pressure relief valve corrosion protector comprising, in combination, an annular spacer having a circumference, an axis and parallel flat sides transversely disposed to said axis, axial extending bolt receiving openings circumferentially spaced about said spacer intersecting said sides, a tubular neck extending from one of said spacer sides having a longitudinal axis substantially parallel to said spacer axis, said neck and said spacer being interconnected in a liquid-tight manner, and bleed means defined on said one spacer side intersecting said spacer circumference.

5,746,243
VALVED INFLATION ADAPTER

Robert E. Franke, #6 St. Pius, Florissant, Mo. 63033
Filed Mar. 4, 1996, Ser. No. 607,993
Int. Cl.⁶ F16K *15/20*
U.S. Cl. 137—231 1 Claim



1. A valved inflation adapter comprising:

an inflation needle having a threaded neck;

an adapter body, the inflation needle being coupled to the adapter body, the adapter body being shaped so as to define a threaded bore directed thereinto, the threaded bore receiving and threadably engaging the threaded neck of the inflation needle, the adapter body being further shaped so as to define exterior threads extending circumferentially thereabout;

a one-way valve assembly extending into the adapter body for coupling with an air chuck connected to a pressurized air source, the valve assembly being positioned in pneumatic communication with the inflation needle, the valve assembly comprising a hollow threaded conduit threadably directed into the adapter body and into pneumatic communication with the threaded bore thereof; and a valve mechanism threadably secured within the hollow threaded conduit for permitting a one-way injection of air through the hollow threaded conduit and into the adapter body;

an internal annular seal positioned within the threaded bore and against an internal ridge within the adapter body to preclude leakage of pressurized air past a juncture of the inflation needle and the adapter body;

an inflation cone secured to the adapter body, the inflation cone including a cylindrical side wall engaged with the adapter body so as to couple the inflation cone thereto; and a conical side wall extending from the cylindrical side wall and tapering to a diameter smaller than a diameter of the cylindrical side wall to terminate in an inflation aperture permitting a direction of air therethrough, the cylindrical side wall being shaped so as to define interior threads formed along an interior surface thereof, with the exterior threads of the adapter body being engaged with the interior threads of the cylindrical side wall;

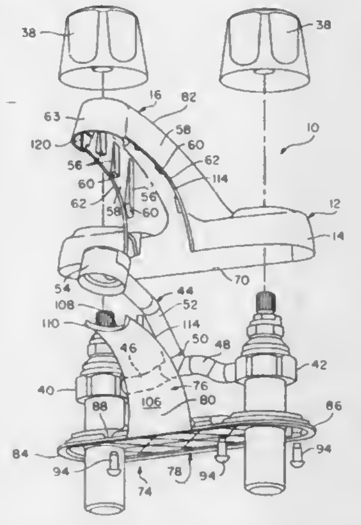
an external annular seal interposed between the adapter body and an internal ridge formed within the cylindrical side wall to preclude leakage of pressurized air past a juncture of the inflation cone and the adapter body;

and,

a valve-operating extension conduit projecting from the conical side wall for entering an inflation conduit of a pneumatic object and engaging an inflation valve therewithin to maintain the inflation valve of the pneumatic object in an open position with the inflation needle therein.

5,746,244
UNITARY THROAT PLATE/PUTTY PLATE FOR A FAUCET

Curtis Scott Woolley, Sr., and Arthur Corpuz Incelda, both of Los Angeles, Calif., assignors to Emhart Inc., Newark, Del.
Filed Feb. 6, 1997, Ser. No. 798,040
Int. Cl.⁶ F16L *5/00*
U.S. Cl. 137—359 4 Claims



3. A housing assembly for a faucet with a "T" copper tube waterway assembly operated responsive hot and cold water valves to discharge water from the waterway comprising:

a. a hollow housing forming a "U" shaped upper body with a spout,

b. a unitary lower body defining a throat plate and a putty plate,

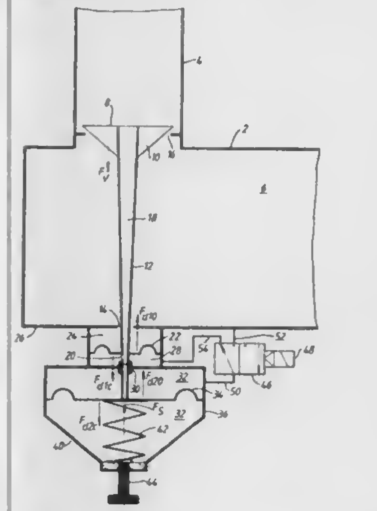
c. bosses formed on the inside of side walls of spout adjacent the terminal end thereof,

d. the throat plate having a flat outerside and upwardly extending spaced ribs formed a short distance from its outer end,

e. fastening members to connect the upper body and the lower body together at the putty plate of the lower body and the ribs of the throat plate to wedgingly engage the bosses of the housing spout to lock the throat plate to the upper body.

5,746,245
METERS

Stephen Leslie Foster, Mellor, England, assignor to Siemens Measurements Limited, Oldham, United Kingdom
Filed Jan. 2, 1997, Ser. No. 778,193
Claims priority, application United Kingdom, Jan. 4, 1996, 9600111
Int. Cl.⁶ F16K *31/12*
U.S. Cl. 137—505.35 9 Claims



1. A meter comprising:

inlet means for providing an unregulated supply of gas,

a first chamber within said meter connected to said inlet means for receiving the gas,

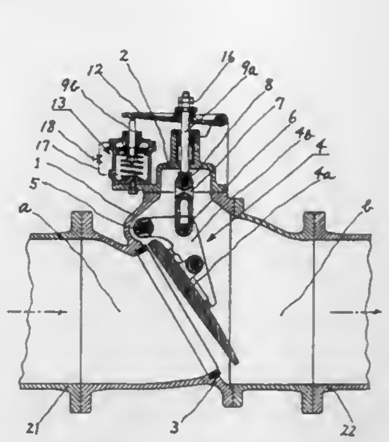
a governor for regulating a flow of gas received by the first chamber, and

valve means for controlling the flow of gas into said first chamber, the valve means forming part of said governor which is formed integrally with said gas meter,

said valve means including means for communicating said unregulated gas supply through said valve means and to said governor.

5,746,246
WATER HAMMER PREVENTING CHECK VALVE

Hiroshi Yokota, 11-11-302, Midori 1-Chome, Minami-Ku, and Shingo Yokota, 17-27, Midori 3-Chome, Minami-Ku, both of Hiroshima-Shi, Hiroshima-Ken, Japan, assignors to Kabushiki Kaisha Yokota Seisakusho; Hiroshi Yokota, and Shingo Yokota, all of Hiroshima-Ken, Japan
PCT No. PCT/JP95/02463, § 371 Date May 16, 1997, § 102(e) Date May 16, 1997, PCT Pub. No. WO96/18054, PCT Pub. Date Jun. 13, 1996
PCT Filed Dec. 1, 1995, Ser. No. 836,795
Claims priority, application Japan, Dec. 5, 1994, 6-300495; Jan. 18, 1995, 7-005398
Int. Cl.⁶ F16K *21/10*
U.S. Cl. 137—514 4 Claims

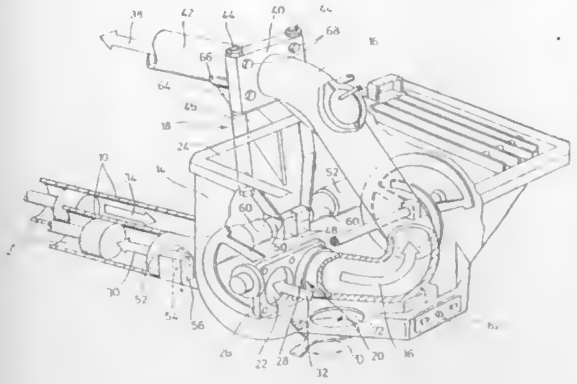


1. A water hammer preventing check valve comprising: a valve casing (1); a valve seat (3) disposed within the casing (1) at an inclination to streamlines of a fluid flowing through a passage in the casing (1); and a monoplane valve element (4) supported for swing motion within the valve casing (1) so as to be open to discharge the fluid while a pump is in operation and to be closed to check the reverse flow of the fluid on the discharge side when the pump stops; wherein the valve element (4) is always urged to swing in a valve closing direction, is formed in a shape which exerts a low form drag and a low inertial resistance, and is constructed so as to be substantially seated on the valve seat (3) at a moment when the inertial flow of the fluid in a discharge direction stops; a braking device (13) is attached to an upper portion of the valve casing (1); the valve element (4) is connected at a position on its back surface on the discharge side to a linear motion transmitting mechanism through a linking mechanism which does not transmit any motion while the valve element (4) is in a moving range other than a limited moving range between a position where the valve element (4) is almost seated on the valve seat (3) and a position where the valve element (4) is seated on the valve seat (3); the linear motion transmitting mechanism is connected to the braking device (13) so that the braking device (13) does not decelerate the valve closing motion until the valve element (4) in the valve closing motion reaches the position where the valve element (4) is almost seated on the valve seat (3), and the braking device (13) exerts a pulling force on the valve element (4) only while the valve element (4) moves in the limited moving range between the position where the valve element (4) is almost seated on the valve seat (3) and the position where the valve element (4) is seated on the valve seat (3).

5,746,247
SLIDE VALVE FOR A TWIN-CYLINDER PUMP FOR VISCOUS FLUIDS

Karl Schlecht, Filderstadt, and Hellmut Hurr, Reutlingen, both of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Germany
PCT No. PCT/EP94/03250, § 371 Date May 16, 1996, § 102(e) Date May 16, 1996, PCT Pub. No. WO95/18304, PCT Pub. Date Jul. 6, 1995
PCT Filed Sep. 29, 1994, Ser. No. 648,106
Claims priority, application Germany, Dec. 24, 1993, 43 44 632.9
Int. Cl.⁶ F04B *7/02*
U.S. Cl. 137—625.45 10 Claims

1. A slide valve device for a viscous fluid pump comprising a material feed container, a pump having two oppositely working conveying cylinders for a conveyance of viscous fluid supplied to the pump from the material feed container, the conveying cylinders having orifices communicating through a wall of the material feed container into an interior of the material feed container, an essentially C-shaped pivoting pipe positioned in the material feed containers, a conveying conduit for transporting the viscous fluid to a desired location, a rotary pipe connection adapted to rotatably fluidly connect an upper end of the pivoting pipe to the conveying conduit, a changeover means for rotating the rotary pipe connection about an axis that extends essentially parallel to axes of the conveying cylinders, a lower end of the pivoting pipe having a

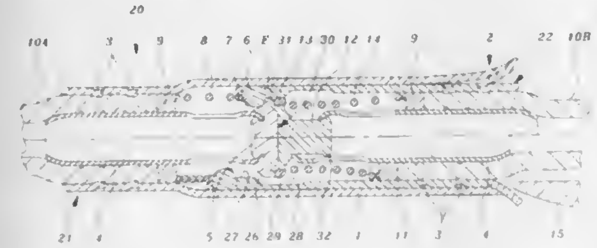


wear ring fixed thereon alternately connectable to one of the orifices of the conveying cylinders in response to an operation of the changeover means, a wear plate positioned on a wall of the material feed container surrounding the orifices, a tensioning means for pressing the wear ring against the wear plate, the changeover means having a changeover lever arranged on an outside of the wall of the material feed container above the conveying cylinders, a first end of the changeover lever being rigidly connectable to the upper end of the pivoting pipe, two oppositely actuatable drive cylinders oriented generally transversely to the conveying cylinders and to the conveying conduit, the conveying cylinders having a support means for supporting the drive cylinders on opposite sides, a second end of the changeover lever being supported on the drive cylinders, the drive cylinders having pistons with mutually confronting articulated ends, the drive cylinders having supporting points connected to the support means of the conveying cylinders and located on the articulated ends, the supporting means and the second end of the changeover lever having ball sockets and the articulated ends of the drive cylinders and an end of the drive cylinders distal the articulated ends having ball heads received in the ball sockets, the drive cylinders forming with one another along the longitudinal direction thereof an obtuse angle open to the wall of the material feed container, the changeover lever having a supporting arm extending outside the material feed container, and the conveying conduit having an extension pipe connected to the upper end of the pivoting pipe, the supporting arm supporting the extension pipe.

5,746,248
SEALED HYDRAULIC COUPLING

André Tobiasz, Epinay sur Seine, France, assignor to Valeo, Paris, Cedex, France

Filed Apr. 29, 1996, Ser. No. 638,790
Claims priority, application France, Apr. 28, 1995, 95 05319
Int. Cl.^{6} F16L *37/28*
U.S. Cl. 137—614.03 **19 Claims**

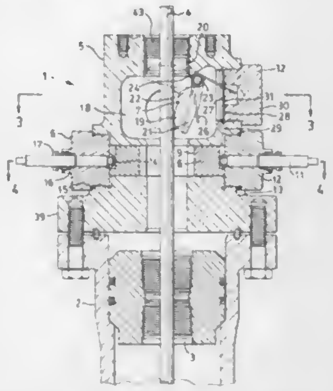


1. A duct for conveying a fluid, comprising two duct parts of deformable material each having a free end portion, and a hydraulic coupling sealingly interconnecting the two said duct portions, said coupling comprising two coupling elements, each said coupling element comprising: a hollow cylindrical outer body for receiving the free end portion of a respective one of the said duct parts; a sleeve, for passage of fluid through it, the sleeve being mounted coaxially within the said outer body and having a free end portion; an end closure member closing the free end portion of the sleeve; and an obturator within the outer body of the coupling member, interposed between the said body and the end closure member so as to render the coupling element fluid-tight when the two coupling elements are disconnected from each other, the coupling further including releasable locking means carried by the said coupling elements for retaining the coupling elements together, said end closure members being carried and retained by the respective associated sleeves and being adapted to make frontal mutual contact when the two coupling elements are fitted together, wherein one said outer body is a male part and the other said outer body is a female part, said male and female parts being adapted to make intimate contact with each other, each said sleeve being rigid and defining fluid flow port means in the vicinity of its said free end, said free end of each said duct part being gripped between the said outer body and sleeve of the associated said coupling element and lying behind the said fluid flow port means of the said sleeve, one said end closure member being a movable end closure member mounted for axial movement with respect to the free end portion of its associated sleeve so as to be guided by the latter, the other end closure member being a fixed end closure member fixed to the free end of its associated said sleeve, the fixed end closure member defining an external seating, one of the said obturators comprising an axially movable first sealing ring adapted to cooperate with the said seating, the coupling element having the movable end closure member defining on its outer body an internal local guide and sealing surface, the other one of the said obturators comprising a second sealing ring carried on the outside of the movable closure member for cooperation with said guide and sealing surface.

5,746,249
OIL WELL BLOW-OUT PREVENTER AND SEALING DEVICE

Andrew Wright, Sherwood Park, and Curtis Phillip Ring, Okotoks, both of Canada, assignors to 569,396 Alberta, Ltd., Leduc, Canada

Filed Nov. 12, 1996, Ser. No. 748,031
Int. Cl.^{6} E21B *33/06*
U.S. Cl. 137—614.19 **20 Claims**



1. An oil well blow-out preventer and sealing device for use on an oil well having a well casing, a wellhead, a production tubing string, and a pump rod receivable within the production tubing string, the device comprising:

(i) a central housing member for mounting on the wellhead, said central housing member including a flow passageway and a pump rod passageway, said flow passageway being in communication with the production tubing string and providing a means for fluid to be removed from the well, said pump rod passageway providing a means for entry of the pump rod into the well;

(ii) blow-out prevention means contained within said central housing member, said blow-out prevention means including a pair of rams that are adjustable to seal around the pump rod to prevent the accidental loss or spillage of oil or fluid from the oil well; and,

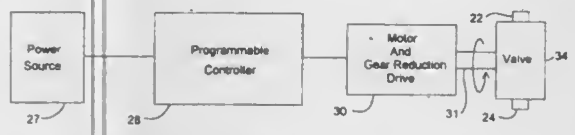
(iii) pump rod passageway sealing means contained within said central housing member, said pump rod passageway sealing means preventing the spillage of fluids from the oil well upon the breakage or removal of the pump rod from said pump rod passageway,

said pump rod passageway sealing means including a valve member that automatically seals said pump rod passageway, upon the breakage or removal of the pump rod from the well, through the engagement of said valve member with a seating member positioned in said central housing member circumferentially about said pump rod passageway.

5,746,250
PORTABLE AUTOMATIC SPRINKLING SYSTEM

John Leslie Wick, 1661 Highway 31 South, Franklin, Ind. 46131

Filed Mar. 8, 1996, Ser. No. 612,547
Int. Cl.^{6} A01G *27/00*
U.S. Cl. 137—624.11 **18 Claims**



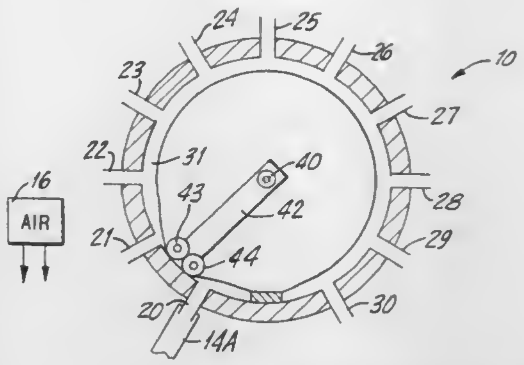
1. A portable automatic sprinkling system comprising:
a housing including a plurality of lateral surfaces that define an upper opening in said housing, said lateral surfaces further defining a lower opening in said housing;
a cover, adapted to mate with and be disposed within said upper opening of said housing;
a fluid manifold mounted within said housing and having a fluid inlet fitting and a plurality of fluid outlet fittings;
a power source mounted within said housing that produces a DC power signal; and
a plurality of programmable valve controllers mounted within said housing, said programmable valve controllers including a power connection connected to said DC power signal, a programmable timer that produces a valve activation signal, a motor responsive to said valve activation signal, a valve having an inlet fitting, an outlet fitting and a fluid conduit fluidly connecting said inlet fitting and said outlet fitting, a flow control mechanism disposed within said fluid conduit and coupled to said motor, said motor positioning said flow control mechanism in response to said valve activation signal to enable and disable fluid flow from said inlet fitting to said outlet fitting, and wherein the inlet fitting of each valve is fluidly coupled to one of said plurality of fluid outlet fittings of said manifold.

5,746,251
MULTI-PORT FLUID VALVE

Horace Bullard, 3333 Henry Hudson Pkwy., Riverdale, N.Y. 10463

Filed May 23, 1996, Ser. No. 652,375
Int. Cl.^{6} F16K *5/04*
U.S. Cl. 137—625.12 **16 Claims**

1. A multi-port fluid valve mechanism comprising:
(a) a housing having an exterior and a cylindrical inner face;
(b) a rotatable shaft centered in the housing and rotatably supported therein;
(c) an arm having an inner end connected to the shaft and having an outer end;
(d) a pinch valve means carried by the arm proximate the arm's outer end to pinch close an elongated flexible and resilient hollow tube having an axis, the tube being positioned along the housing's inner face, the tube having a plurality of orifices spaced-apart and parallel to the axis; and

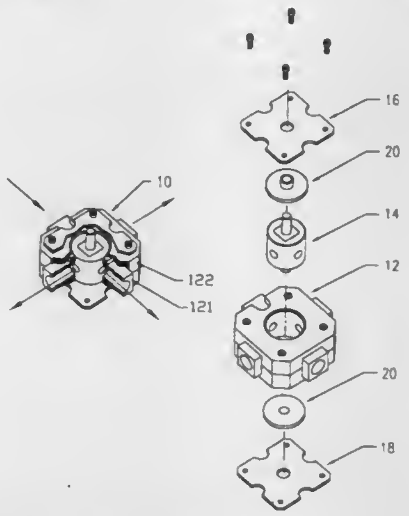


(e) a series of ports each of which leads from the exterior of the housing to an orifice of the tube.

5,746,252
THREE-WAY HOT AIR DIVERT VALVE

Dale Henson, 3350 Scott Blvd., Suite 3801, Santa Clara, Calif. 95054

Filed Feb. 14, 1997, Ser. No. 799,965
Int. Cl.^{6} F16K *11/085*
U.S. Cl. 137—625.47 **6 Claims**



1. A hot air divert valve comprising:
an inlet to receive a hot air supply line,
at least a first and a second outlet,
a housing assembly, said housing assembly comprises a valve core housing, a refractory housing jacket, and a plurality of core spacers, and
a valve core assembly comprising a refractory valve core, a rotation shaft, and a pivot shaft, said valve core assembly further includes a three-pronged airway therein, said airway includes a first branch and a second branch; wherein
said valve core assembly is rotatably secured in said housing assembly, at least one bushing is installed on at least one shaft of said valve core assembly to facilitate rotation of said valve core assembly within said housing assembly, said bushing being formed from a refractory material so as to insulate said valve core assembly from external surfaces of said valve,
said housing jacket surrounds and insulates said valve core housing, isolating a valve core actuator from said hot air supply and reducing ambient cooling of air in said hot air supply line; such that
when said divert valve is in a process mode, a first end of said first branch of said airway is aligned with said inlet so that said hot air supply flows through said first branch and out of said first outlet to a subject workpiece, a second end of said first branch of said airway being aligned with said first outlet, and

when said divert valve is in a pause mode, said second branch of said airway is aligned with said inlet so that said hot air supply flows through said second branch and out of said second outlet to a waste air area, away from said subject workpiece, said first end of said first branch being aligned with said second outlet.

5,746,253

CRUSHABLE CORE AND COVER ASSEMBLY HAVING AN EXPANDED TUBING AND A CRUSHABLE CORE

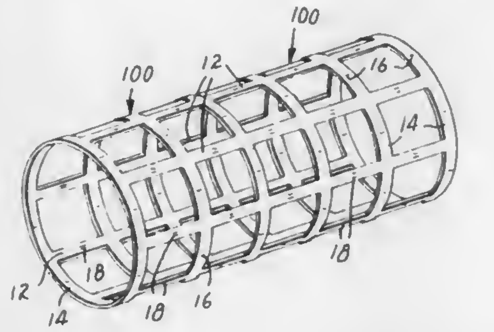
Herbert Dust, Buchholz; Gerhard Lohmeier, Hamburg, and Manfred G. Viebranz, Appel, all of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 23, 1996, Ser. No. 652,876

Claims priority, application European Pat. Off., Jun. 21, 1995, 95201679

Int. Cl.⁶ F16L *7/00*

U.S. Cl. 138—178 14 Claims



1. A hollow crushable support for supporting an elastomeric tube, the elastomeric tube being recoverable to at least a part of its original size and shape after collapse of said support, comprising:

- a plurality of substantially longitudinally extending portions being formed of a first material;
- a plurality of neighboring substantially longitudinally extending frangible zones, each said longitudinally extending portion being connected to each neighboring longitudinally extending portion by one of said longitudinally extending frangible zones to form a rigid structure; and

said longitudinally extending frangible zones being formed from a second material having an elongation at break value substantially lower than first material said longitudinally extending portions.

2. A hollow crushable support for supporting an elastomeric tube, the elastomeric tube being recoverable to at least a part of its original size and shape after collapse of said support, comprising:

- a plurality of substantially longitudinally extending portions formed from a first material;
- a plurality of neighboring connection portions, each longitudinally extending portion being connected to, and spaced apart from neighboring longitudinally extending portions by at least one of said connection portions to form a rigid structure; and
- said at least one of said connection portions including at least one frangible zone,

wherein said frangible zone is formed a second material having a substantially lower elongation at break than elongation at break than said first material.

5,746,254

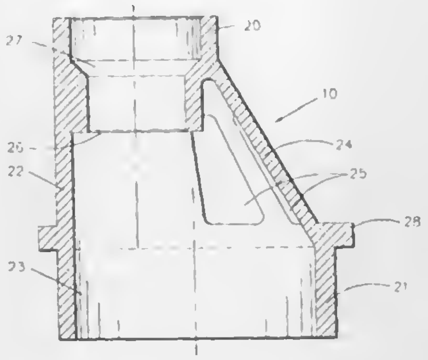
WATER-ESCAPE DEVICE FOR FREEZE-PRONE WATER CONDUIT

Lawrence Janesky, 11 Fawn Meadow La., Huntington, Conn. 06484

Filed Jun. 4, 1996, Ser. No. 658,119

Int. Cl.⁶ E03B *7/10*

U.S. Cl. 138—32 2 Claims



1. A water-escape conduit connector which permits the direct flow of water from an upstream conduit through an inlet neck of said connector, vertically through said connector, and through an outlet neck of said connector having a diameter which is substantially larger than the diameter of said inlet neck, and through an open downstream conduit substantially without any leakage of water from said connector during normal operation, but which permits the free escape of water from said conduit connector radially-outwardly therefrom, at least in a predetermined direction, whenever the water is prevented from flowing freely through said downstream conduit, said conduit connector comprising a tubular element having said inlet neck adapted to be connected to the downstream end of an upstream water conduit, said tubular element having a tubular wall having a rear wall portion which extends vertically between said inlet and outlet necks, and an oblique front wall portion which tapers downwardly and outwardly from the inlet neck to the outlet neck of the connector, at least one escape opening being present as a vertically elongate opening in said oblique front wall portion, which permits the free escape of water from said connector only when water is prevented from flowing through the outlet neck and downstream conduit, the said inlet neck of said connector comprising an interior tubular projection which extends into the tubular element and is substantially smaller in diameter than the outlet neck of the connector to divert the water flow adjacent and parallel to said vertical rear wall portion of the connector, and through the outlet neck of the connector during normal operation when the water is free to flow directly vertically through the downstream conduit.

5,746,255

COMPOUND HOSE SYSTEM

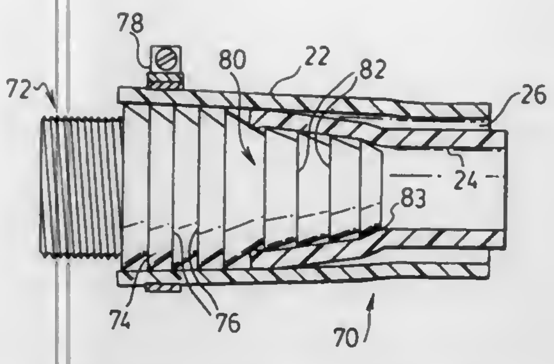
Roger C. Walsh, RR# 4 Colborne, Ont., Canada, K0K 1S0, and Douglas W. Eggins, 17 Robert Street, Thornton, Ont., Canada, L0L 2N0

Continuation-in-part of Ser. No. 209,981, Mar. 11, 1994, Pat. No. 5,445,356. This application Dec. 29, 1994, Ser. No. 365,734

Int. Cl.⁶ F16L *9/18;55/04*

U.S. Cl. 138—115 19 Claims

1. An elongated, substantially flexible pipeline for use in transferring a liquid, said pipeline comprising an outer hose having an imperforate wall connecting an inlet end and an outlet end of the outer hose; an elastic wall within the hose providing an enclosed air space extending substantially the full length of the pipeline; two end fittings receiving said elastic wall and said outer wall in secured sealing relation, each end fitting having an inner end portion of reduced outer diameter, to receive said elastic wall in secured sealing relation therewith, and an adjoining end portion of said end fitting of larger outer diameter, to receive said outer hose in secured sealing relation therewith; two removable clamps; a first said removable clamp sealingly securing said outer wall to said fitting adjoining end portion, and a second said removable clamp compressing said outer wall wall to said fitting inner end portion in mutually securing, hermetic sealing relation; whereby, in use, upon admission of liquid under pressure through a said end fitting, said elastic wall is displaced transversely within said outer hose, to provide a substantially unimpeded flow path for said liquid to the other said end fitting; and upon termination of said admission under pressure, said air space expands to compress said flow path and to discharge said liquid from said pipeline.



5,746,256

METHOD AND APPARATUS FOR A CONTROLLED PNEUMATIC REMOVAL OF A FAULTY WEFT THREAD IN AN AIR JET LOOM

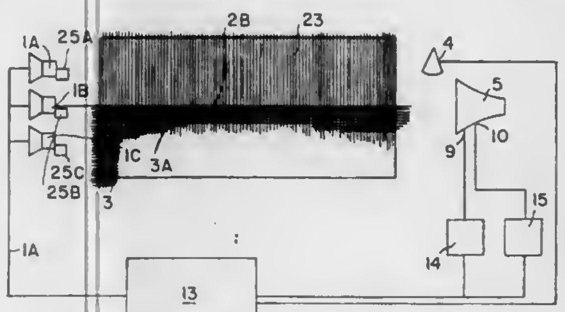
Adnan Wahhoud, Lindau-Boldolz, Germany, and Josef Hehle, Heorbranz, Austria, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Germany

Filed Jun. 10, 1996, Ser. No. 664,307

Claims priority, application Germany, Jun. 9, 1995, 195 21 100.6

Int. Cl.⁶ D03D *51/34*

U.S. Cl. 139—116.2 19 Claims



1. A method for pneumatically removing a faulty twisted weft thread from a cloth fell of a cloth being woven on an air jet loom including a thread removal device arranged at an exit side of a loom shed of said loom, comprising the following steps:

- a) stopping a weaving operation of said loom;
- b) opening said loom shed of said loom;
- c) generating a simultaneously sucking and rotating gas flow in said thread removal device; and
- d) controlling said generating of said gas flow dependent upon at least one thread specific parameter of said weft thread comprising a direction of twist of said weft thread.

5,746,257

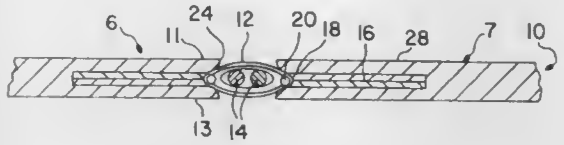
CORRUGATOR BELT SEAM

Ted J. Fry, Summerville, S.C., assignor to Asten, Inc., Charleston, S.C.

Filed Jun. 21, 1996, Ser. No. 668,247

Int. Cl.⁶ D03D *13/00;15/00*

U.S. Cl. 139—383 AA 11 Claims



1. A woven corrugator belt having a seam for joining opposing ends of the corrugator belt comprising:

- a multi-layer system of cross machine direction (CMD) yarns including upper CMD yarns, lower CMD yarns and intermediate CMD yarns disposed between said upper and lower CMD yarns;
- said CMD yarns interwoven with a system of machine direction (MD) yarns including:
  - an upper subsystem of MD yarns which do not weave with said lower CMD yarns,
  - a lower subsystem of MD yarns which do not weave with said upper CMD yarns, and
  - an intermediate subsystem of MD yarns which weave exclusively with said intermediate CMD yarns such that removal of said CMD yarns permits a separation of the woven belt into upper and lower fabric portions;
- each end of said corrugator belt having said intermediate CMD yarns removed for a selected distance from the respective end and having said intermediate MD yarns trimmed back a selected distance from each end to thereby define a void between upper and lower end portions of the belt;
- a seam tape inserted in said void at each end of said belt, said seam tape having a series of seaming loops having a caliper greater than the caliper of said seam tape extending outwardly of a free edge thereof;
- means securing said seam tape within said void at each end of said fabric; and
- said upper and lower end portions on at least one end of said fabric having a beveled edge lying substantially flush with said seaming loops providing minimum interruption in the surface of the joint between said opposing ends of said fabric.

5,746,258

APPARATUS FOR FILLING A CONTAINER WITH FREE-FLOWING BULK MATERIAL

Hans J. Huck, Houston, Tex., assignor to Waeschle Inc., Bloomingdale, Ill.

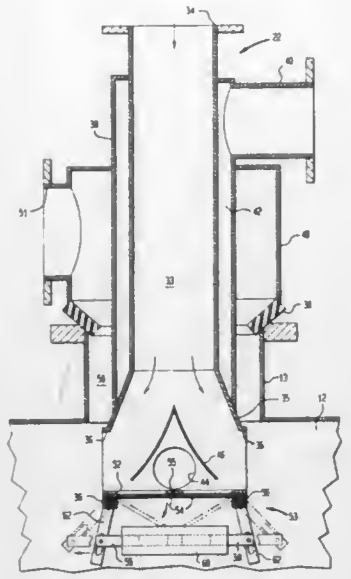
Filed Apr. 3, 1996, Ser. No. 627,054

Int. Cl.⁶ B65B *1/08;1/16;3/08;* B67C *3/02*

U.S. Cl. 141—67 9 Claims

1. Apparatus for discharging bulk material from a silo into a container, comprising:

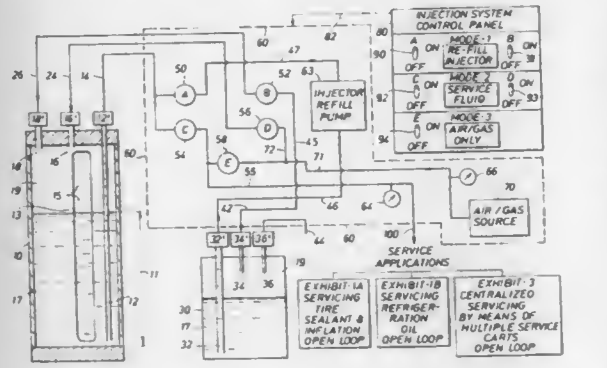
- a tube having an inlet means for receiving bulk material from a silo and a bottom portion formed with lateral outlet means and a central bottom zone for directing bulk material into a container adapted to hold said bulk material;
- a gate mechanism secured to the bottom portion of the tube and movable between a first position in which the bulk material is prevented from being discharged through the central bottom zone and a second position in which the bulk material is allowed to discharge through the central bottom zone into a central area of the container, thereby effectively loading the container with bulk material and effectively emptying the tube; and



control means operatively connected to the gate mechanism for moving the gate mechanism between the first and second positions.

5,746,259
INJECTION SYSTEM FOR SERVICING FLUIDS INTO OR THROUGH AN ENCLOSED REGION

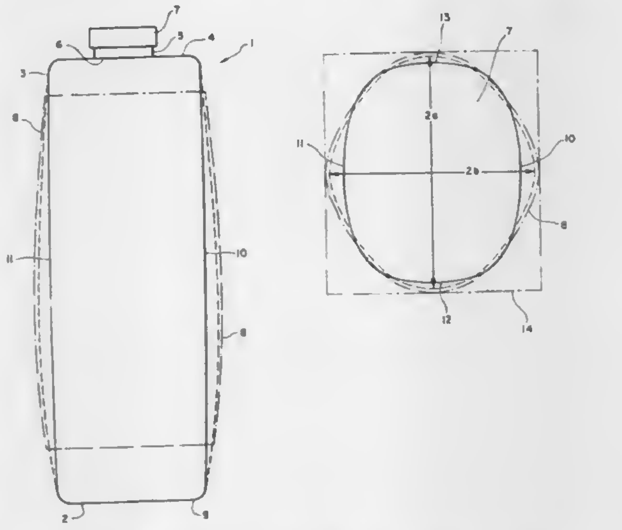
John O. Noble, III, 4803 Ramus, Houston, Tex. 77092
Filed Nov. 27, 1996, Ser. No. 758,236
Int. Cl.⁶ B65B *3/04*
U.S. Cl. 141—92 **47 Claims**


INJECTION SYSTEM CONTROL PANEL
MODE·1 RE-FILL INJECTOR
MODE 2 SERVICE FLUID
MODE·3 AIR/GAS ONLY
ON
OFF
INJECTOR REFILL PUMP
AIR/GAS SOURCE
SERVICE APPLICATIONS
EXHIBIT·1A SERVICING TIRE SEALANT & INFLATION OPEN LOOP
EXHIBIT·1B SERVICING REFRIGERATION OIL OPEN LOOP
EXHIBIT·3 CENTRALIZED SERVICING BY MEANS OF MULTIPLE SERVICE CARTS OPEN LOOP

1. A service apparatus for delivering a measured quantity of fluid, comprising:
- (a) a reservoir component for fluid to be delivered;
- (b) an injector component for temporarily holding a quantity of said fluid for later transfer; and
- (c) an interaction component cooperatively connected with said reservoir component and said injector component, wherein said interaction component comprises:
  - (i) a pump for drawing said fluid from said reservoir component;
  - (ii) means for transferring said drawn fluid to said injector component,
  - (iii) a source of compressed gas for delivering said measured quantity of fluid from said injector component to an apparatus being serviced, and
  - (iv) a control panel having controls on said control panel to control the flow, sequence and timing of drawing fluid, transferring fluid, and delivery of fluid to said apparatus being serviced, wherein
- (d) said service apparatus cooperates with said apparatus being serviced to connect thereto in a closed loop system and an open loop system and said controls are set to define a desired loop connection thereto.

5,746,260
CONTAINER SET COMPRISING AT LEAST TWO CONTAINERS

Steen Vesborg, Gentofte, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.
Continuation-in-part of Ser. No. 186,722, Jan. 26, 1994, Pat. No. 5,533,553. This application Jan. 19, 1995, Ser. No. 376,948
Claims priority, application Denmark, Jan. 27, 1994, 0115/94
Int. Cl.⁶ B65B *1/04*
U.S. Cl. 141—319 **15 Claims**



1. A container adapted to refill another container comprising a container filled with a flowable product, said container comprising a bottom wall with a support engaging face and a circumferential side wall extending upwards from said bottom wall and continuing at its upper end into an upper wall wherein the side wall of the container comprises two pairs of opposing side wall portions which unfilled is of a first non-super elliptic shape and filled in any sectional view parallel to the support engaging face of the container is of a substantially superelliptic shape expressed by the formula

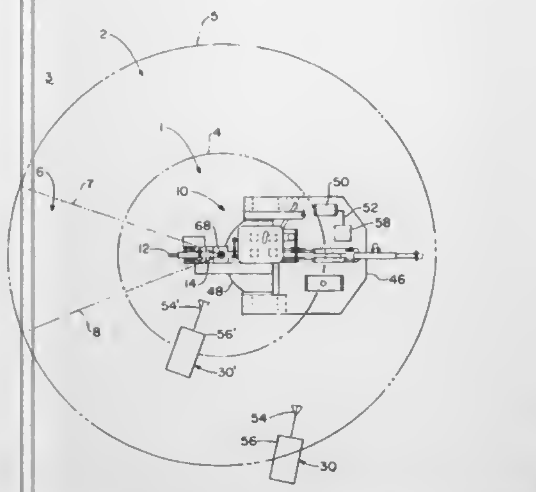
$$\left(\frac{x}{a}\right)^{p} + \left(\frac{y}{b}\right)^{p} = 1$$

where $2a$ equals the length of the major axis, $2b$ equals the length of the minor axis and p is greater than 2 when said container is filled with the product.

5,746,261
REMOTELY CONTROLLED STUMP CUTTER OR SIMILAR APPARATUS

John M. Bowling, 9376 Lincoln Way East, Orrville, Ohio 44667
Continuation-in-part of Ser. No. 367,782, Dec. 29, 1994, Pat. No. 5,638,619. This application Dec. 18, 1996, Ser. No. 768,510
Int. Cl.⁶ A01G *23/06*
U.S. Cl. 144—24.12 **23 Claims**

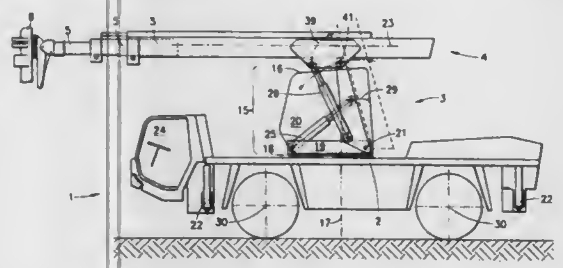
1. A wireless remote control system for a stump cutter comprising:
- an operator's station having a first wireless communications link;
- a control system interface coupled to said stump cutter;
- a second wireless communications link coupled to said control system interface; and



- at least one electro-mechanical transducer coupled to both said stump cutter and said control system interface;
- wherein said second wireless communications link receives commands from said operator's station via said first wireless communications link, said control system interface interprets said received commands and communicates with said at least one electro-mechanical transducer, wherein said at least one electro-mechanical transducer controls said stump cutter accordingly; and
- wherein said stump cutter may only be controlled by said operator's station when said operator's station is within a predefined zone of operation.

5,746,262
BRANCH REMOVER

Hans Baumgartner, Nürensdorf, Switzerland, assignor to Doll Fahrzeugbau GmbH, Oppenau, Germany
PCT No. PCT/EP92/02162, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO94/06275, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 18, 1992, Ser. No. 232,260
Int. Cl.⁶ B27L *1/00*
U.S. Cl. 144—24.13 **23 Claims**



1. A branch remover comprising:
- (a) an undercarriage having a chassis and a driver's cab positioned at a front end of said undercarriage;
- (b) a crane pillar having a lower part and an upper part, wherein a base end of said crane pillar lower part is rotatably coupled to said undercarriage chassis;
- (c) a jib comprising a jointless telescopic arm having a plurality of segments slidably coupled one inside another and capable of transmitting a torque of at least one meter-ton (mt) from a jib free end to a jib base end, wherein said jib is pivotally coupled to said crane pillar upper part;
- (d) a working unit having a holding edge, a claw gripper, and a capping device, wherein said capping device is pivotally movable parallel to said claw gripper and said working unit is pivotally and rotatably coupled to said jib free end;
- (e) coupling means between said working unit and said jib free end capable of transmitting a torque of at least one meter-ton (mt) from said working unit to said jib free end;
- (f) coupling means between said jib and said pillar upper part capable of transmitting a torque of at least one meter-ton (mt) from said jib to said crane pillar upper part;
- (g) coupling means between said pillar upper part and said pillar lower part capable of transmitting a torque of at least one meter-ton (mt) from said crane pillar upper part to said crane pillar lower part; and
- (h) coupling means between said crane pillar lower part to said undercarriage chassis capable of transmitting a torque of at least one meter-ton (mt) from said crane pillar lower part to said undercarriage chassis.

5,746,263
METHOD OF PRODUCING A WOODEN PACKAGE OR CONTAINER AND A WOODEN PACKAGE OR CONTAINER

Matti Koverola, Ristiina, Finland, assignor to Suomen Yrittäjäin Tuki R.Y., Ristiina, Finland
Filed Sep. 23, 1996, Ser. No. 717,910
Claims priority, application Finland, Sep. 21, 1995, 954478
Int. Cl.⁶ B27F *1/00;* **B65D** *88/00*
U.S. Cl. 144—355 **13 Claims**

1. A method of producing a wooden package or container from an elongated block of wood, comprising:
- providing an elongated block of wood;
- axially boring said block of wood to produce at least one essentially cylindrical, hollow blank therefrom;
- drying said at least one blank;
- working the outer and inner surfaces of said at least one blank to provide mutually concentric cylindrical surfaces of desired diameters;
- finishing said mutually concentric, cylindrical surfaces to a desired smoothness to obtain a cylindrical envelope piece; and
- attaching a bottom piece to said cylindrical envelope piece.

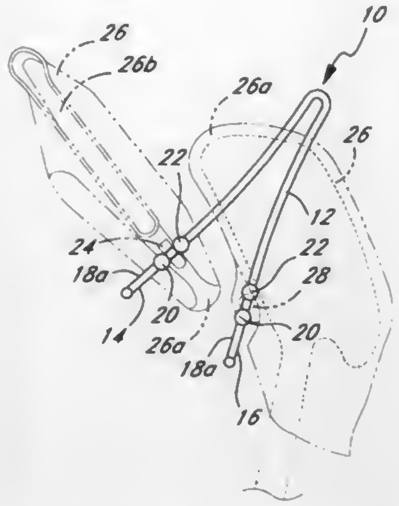
5,746,264

Patent Not Issued For This Number

5,746,265
LANYARD FOR GOLF CLUB HEAD COVERS

David Hoyt, and Gary T. Aldcroft, both of Los Angeles, Calif., assignors to Principle Plastics, Inc., Gardena, Calif.
Filed Sep. 18, 1995, Ser. No. 529,364
Int. Cl.⁶ B65D *65/22*
U.S. Cl. 150—160 **10 Claims**

1. The combination, including
- a pair of head covers for golf clubs, each cover having a connector section with a hole therein for receiving a lanyard which ties the pair of covers together, and
- said lanyard having opposed ends with a pair of protruding members near each of said opposed ends,
- one end of the lanyard being pulled through the hole in one of said covers and the other end of said lanyard being pulled through the hole in the other of said covers,



each pair of protruding members being spaced apart a short distance, with the protruding members at one end of the lanyard straddling the hole in the connector section of one of the covers and the protruding members at the other end of the lanyard straddling the hole in the connector section of the other cover, each pair of protruding members being larger than the hole they straddle,

said connector section and the protruding members being made of an elastic material, so that deformation of the protruding members and stretching of the connector section occurs as a protruding member is pulled through a hole.

5,746,266

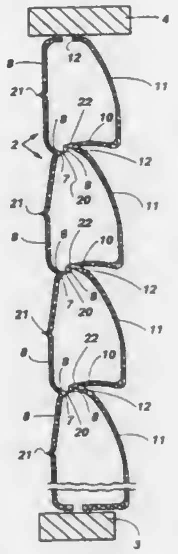
ROLL UP ROMAN SHADE

Wendell B. Colson, Boulder, and Raymond N. Auger, Aspen, both of Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Continuation of Ser. No. 475,593, Jun. 7, 1995, Pat. No. 5,603,368, which is a continuation of Ser. No. 320,116, Oct. 7, 1994, Pat. No. 5,425,408, which is a continuation of Ser. No. 85,677, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 825,591, Jan. 24, 1992, abandoned, which is a division of Ser. No. 520,932, May 9, 1990, Pat. No. 5,104,469. This application Feb. 13, 1997, Ser. No. 799,451

Int. Cl.^{6} E06B *9/06*

U.S. Cl. 160—84.05 **1 Claim**



1. An expandable and contractable roman shade having an expanded state for covering a window and a contracted state in which the window is at least partly uncovered, said shade comprising a first sheet of flexible material having a width and a length, said first sheet of material defining a set of joint lines extending across the width thereof and spaced apart along the length thereof, a second sheet of flexible material having a width and a length, the width of said second sheet material being substantially equal to the width of said first sheet material, and the length of said second sheet material being longer than said first sheet material, said second sheet material having a set of creases extending across the width thereof and spaced apart along the length thereof, the spacing between said creases on said second sheet material being substantially greater than the spacing between said joint lines on said first sheet material, means fixedly joining said first sheet material at said joint lines thereon to said second sheet material at corresponding juxtaposed creases thereon to form a plurality of parallel cells extending across the width of said sheet materials, said first sheet material defining the rear wall portion of each of said cells, said rear wall portion being substantially straight when said shade is in an expanded state along the length of said first sheet material, the height of said rear wall portion of each said cell determining the extent of possible cell expansion, said second sheet material defining a front wall portion of each said cell, which said front wall portion forms a curved, drooping surface projecting outwardly and away from the back face of each cell, said curved, drooping surface of each said cell defining a loop extending in front of a portion of the front wall portion of a directly adjacent lower cell when said shade is in an expanded state, and said second sheet material defining a plurality of overlapping and drooping pleats when said shade is in a contracted state.

5,746,267

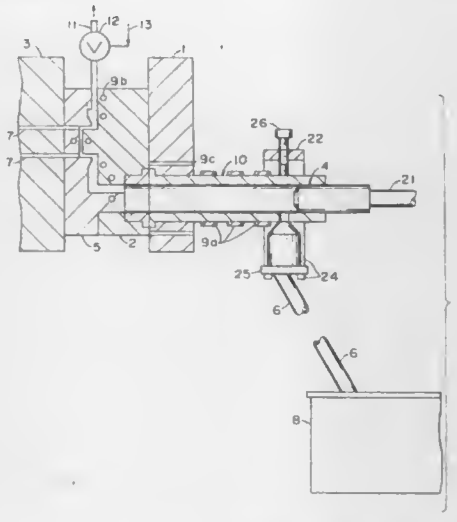
MONOLITHIC METAL MATRIX COMPOSITE

David I. Yun, Murrysville; Ralph R. Sawtell, Monroeville; Warren H. Hunt, Export; H. Robert Baumgartner, Monroeville; Eric T. Streicher, New Kensington, and Michael F. Ehman, Franklin Park, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 603,020, Feb. 16, 1996, abandoned, which is a continuation of Ser. No. 439,647, May 15, 1995, abandoned, which is a continuation of Ser. No. 111,993, Aug. 25, 1993, abandoned, which is a division of Ser. No. 682,513, Apr. 8, 1991, Pat. No. 5,259,436. This application Sep. 9, 1996, Ser. No. 706,763

Int. Cl.^{6} B33D *27/15*

U.S. Cl. 164—65 **17 Claims**



1. A metal matrix composite manufacturing method comprising the steps of:

providing a die cavity;

providing a partially sintered preform containing at least 65 volume % aggregate in particulate form;

providing a charge of molten metal;

applying vacuum to said aggregate to assure complete infiltration of the aggregate;

moving the molten metal by a piston to infiltrate the aggregate in the die cavity, with piston speed being at a level for avoiding damage to the preform; and

solidifying the molten metal which has infiltrated the aggregate.

5,746,268

CONTINUOUS CASTING METHOD AND APPARATUS

Keisuke Fujisaki; Kiyoshi Wajima; Kenji Umetsu; Kenzo Sawada; Takatsugu Ueyama; Takehiko Toh; Kensuke Okazawa, and Yasushi Okumura, all of Futtsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

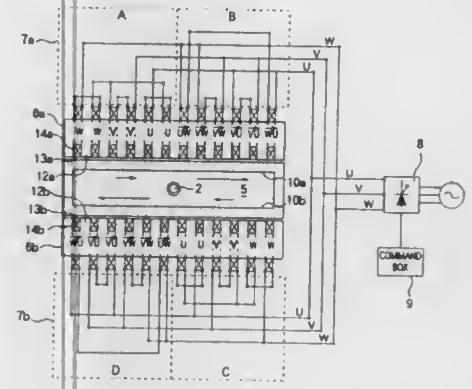
PCT No. PCT/JP95/00027, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/24285, PCT Pub. Date Sep. 14, 1995

PCT Filed Jan. 12, 1995, Ser. No. 646,230

Claims priority, application Japan, Mar. 7, 1994, 6-035541; Mar. 7, 1994, 6-035704; Mar. 11, 1994, 6-041575; Mar. 18, 1994, 6-049257

Int. Cl.^{6} B22D *27/02*

U.S. Cl. 164—468 **37 Claims**



1. A continuous casting method for casting a metal slab, comprising the steps of:

pouring molten metal into a mold from a dipping nozzle provided in a center of a horizontal plane of said mold;

generating electromagnetic force along two long sides of said mold by using at least two electromagnetic stirring coil parts provided along said two long mold sides, said electromagnetic force being directed opposite to each other between said two long sides, and a component of said electromagnetic force directed from said dipping nozzle to a short side of said mold being different from a component of said electromagnetic force directed from said short mold side to said dipping nozzle so as to keep substantially uniform surface flow of said molten metal in said mold; and

pulling out coagulated metal while cooling down a part of said mold.

26. A continuous casting apparatus for continuously casting a metal slab by cooling down a part of a mold and pulling out coagulated metal while pouring molten metal to said mold from a dipping nozzle provided in a center of a horizontal plane of said mold, said apparatus comprising:

two electromagnetic stirring coil parts, provided along two long mold sides respectively, for controlling flow of said molten metal in said mold through effect of electromagnetic force, said two electromagnetic stirring coil parts having plural magnetic cores ranged along said two long mold sides and plural coils wound around at least a part of said magnetic cores; and

conducting means for feeding electricity to said two electromagnetic stirring coil parts;

wherein a space inside and outside of said mold is virtually divided into first, second, third and fourth spaces by a plane passing through a center of said dipping nozzle and in parallel to said two long mold sides and a plane passing through the center of said dipping nozzle and perpendicular to said two long mold sides, said third space being symmetric to said first space with respect to the center of said dipping nozzle and said fourth space being symmetric to said second space with respect to the center of said dipping nozzle, said magnetic cores staying in said first and third spaces are longer than those staying in said second and fourth spaces.

30. A continuous casting apparatus for continuously casting a metal slab by cooling down a part of a mold and pulling out coagulated metal while pouring molten metal to said mold from a dipping nozzle provided in a center of a horizontal plane of said mold, said apparatus comprising:

two electromagnetic stirring coil parts, provided along two long mold sides respectively, for controlling flow of said molten metal in said mold through effect of electromagnetic force, said two electromagnetic stirring coil parts having plural magnetic cores ranged along said two mold sides and plural coils wound therearound;

conducting means for feeding electricity to said two electromagnetic stirring coil parts;

flow speed sensing means for sensing surface flow speed of said molten metal at plural locations of a surface of said molten metal in said mold;

flow speed converting means for converting said sensed flow speed into flow speed components in each of predetermined surface flow speed distribution modes;

compensation calculating means for comparing said converted flow speed components with target values in each of surface flow speed distribution modes to calculate flow speed component deviations;

reverse converting means for reversely converting said flow speed component deviations into flow speed deviations of the surface of said molten metal at said plural locations; and

control means for controlling said conducting means to reduce these flow speed deviations.

5,746,269

REGENERATIVE HEAT EXCHANGER

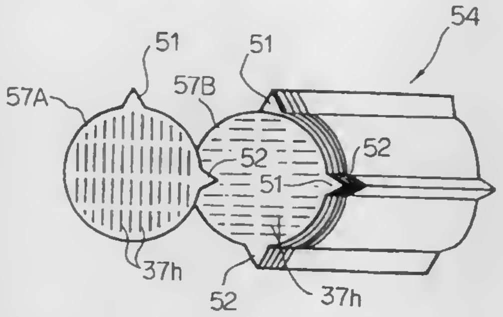
Akito Torii, and Kimio Kohara, both of Nisshin, Japan, assignors to Advanced Mobile Telecommunication Technology Inc., Nisshin, Japan

Filed Jul. 17, 1996, Ser. No. 682,077

Claims priority, application Japan, Feb. 8, 1996, 8-022209

Int. Cl.^{6} F28D *17/00*

U.S. Cl. 165—10 **7 Claims**



1. A regenerative heat exchanger comprising:

a cylindrical core casing having first and second openings; and

a stack body core formed by a plurality of circular mesh plates each having a plurality of fluid passage holes and stacked on one another to form a plurality of fluid passageways each comprising said plurality of fluid passage holes, said stack body core being housed in said core casing to have said fluid passageways held in fluid communication with said first and second openings, said fluid passageways allowing a fluid cooling medium to be introduced thereinto to carry out heat exchange between said stack body core and said fluid cooling medium.

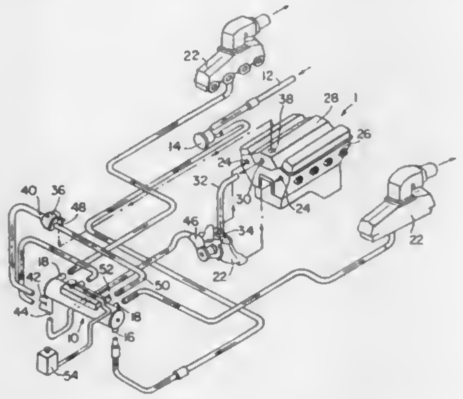
wherein each of said mesh plates has obverse and reverse surfaces and a peripheral surface and is formed with a protrusion extending from said peripheral surface in parallel relationship to said obverse and reverse surfaces, the protrusion of each mesh plate being positioned with respect to said fluid passage holes around the center axis of said stack body core, said mesh plates being stacked so as to form at least a row of the protrusions, the arrangement of the row of the protrusions being changeable and indicating the cross-sectional areas and the lengths of said fluid passageways.

5,746,270
HEAT EXCHANGER FOR MARINE ENGINE COOLING SYSTEM
Bruce A. Schroeder, and James Michael Horak, both of Stillwater, Okla., assignors to Brunswick Corporation, Lake Forest, Ill.

Filed Jan. 30, 1996, Ser. No. 591,963

Int. Cl.^{6} B63H *21/10;21/38;* **F28F** *9/06;21/06*

U.S. Cl. 165—41 **11 Claims**



1. A heat exchanger in a closed loop cooling system for an internal combustion engine in a marine propulsion system, comprising:

a heat exchanger body having a coolant flow path and a sea water flow path;

a heat exchanger sea water supply inlet (**16**) that connects the sea water flow path in the heat exchanger body to a supply of raw sea water;

a heat exchanger coolant inlet (**82**) connects the coolant flow path in the heat exchanger body to a closed loop of engine coolant;

a top tank integrally mounted to an exterior of the heat exchanger body, the top tank having a top tank coolant outlet (**84**),

a top tank venting orifice in the heat exchanger body that allows air and coolant to flow from the coolant flow path in the heat exchanger body into the top tank;

a heat exchanger sea water outlet that allows sea water to exit from the sea water flow path in the heat exchanger body;

a heat exchanger coolant outlet that allows coolant to exit the coolant flow path in the heat exchanger body;

a bypass inlet connected to the heat exchanger coolant outlet, the bypass inlet allowing coolant to selectively bypass the heat exchanger body; and

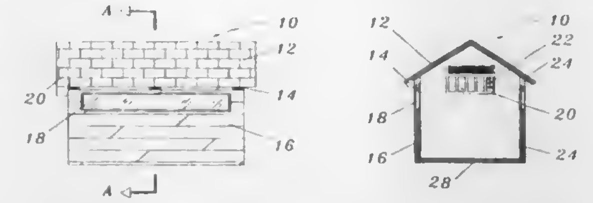
an auxiliary inlet connected to the heat exchanger coolant outlet, the auxiliary inlet being in fluid communication with the top tank coolant outlet.

5,746,271
CLIMATE CONTROLLED DOGHOUSE
Daniel J. DeCosta, 443 W. Church Ave., Longwood, Fla. 32750

Filed Dec. 9, 1996, Ser. No. 762,191

Int. Cl.^{6} F25D *23/00*

U.S. Cl. 165—53 **7 Claims**



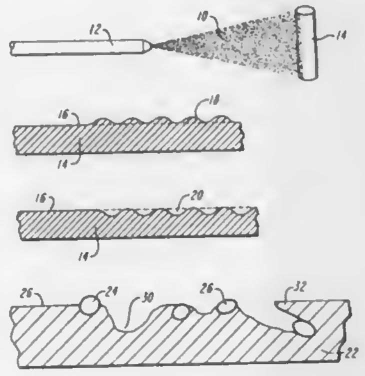
1. A pet shelter which has an interior that is climate controlled for the comfort of pets therein during times of outdoor temperatures extremes, said pet shelter comprising a floor; a plurality of walls each having an upper portion, one of said walls having a door opening therethrough; a roof having opposite sides; said walls upwardly depending from said floor; said roof supported by said walls; said floor, said roof, and said walls being made from insulated materials that are easily washable, said materials also being resistant to solar radiation and exposure to temperature extremes; a plurality of hinges, each of said hinges being connected between one of said opposite sides of said roof and one of said walls so that the other of said opposite sides of said roof is movable between a closed position and opened positions; an air conditioning and heating unit positioned through said upper portion of one of said walls so as to minimize contact between a pet placed within said pet shelter and said air conditioning and heating unit; said pet shelter also comprising a connection means for connecting said air conditioning and heating unit to a remote power source; and a door covering made from a plurality of strips of material having opposed ends, one of said opposed ends being hung from the one of said walls having said door opening and hung in positions to laterally overlap one another so that said strips completely cover the width of said door opening, the other end of each of said strips hanging downwardly so as to completely cover the length of said door opening, said strips each having sufficient weight so as not to become tangled as a result of movement therethrough of pets and not to be frequently disturbed by winds for a maximum retention within said pet shelter of air that has been moderated in temperature by said air conditioning and heating unit.

5,746,272
INVESTMENT CASTING
Brooke W. Mastrorio, Lakeville, and Douglas A. Fifolt, South Easton, both of Mass., assignors to Johnson & Johnson Professional, Inc., Raynham, Mass.

Filed Sep. 30, 1996, Ser. No. 724,732

Int. Cl.^{6} B22C *9/04*

U.S. Cl. 164—516 **16 Claims**



1. A method of making a textured metal casting comprising the steps of:

providing a heat destructible pattern having a substantially smooth surface region that is free of open pores;

providing a heat destructible texturing material;

creating a spray with the texturing material;

directing the spray of the texturing material toward the substantially smooth surface region that is free of open pores to cause the texturing material to create a surface region that is no longer substantially smooth, thereby providing a textured pattern;

creating a shell around the textured pattern;

removing the textured pattern from the shell;

introducing molten metal into the shell;

allowing the molten metal to harden; and

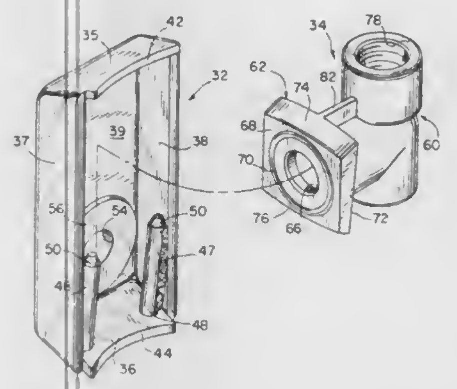
removing the shell from the hardened metal.

5,746,273
PITLESS WELL ADAPTER
John J. Surinak, 2 Earling Ct., Oconomowoc, Wis. 53066

Filed May 9, 1996, Ser. No. 647,224

Int. Cl.^{6} E21B *33/00*

U.S. Cl. 166—85.2 **7 Claims**



6. A pitless well adapter used in a well casing having an underground section formed with an opening in its wall and equipped with a pump, said well adapter comprising:

an adapter housing secured to said underground section in registration with said opening, said adapter housing including a top wall, a bottom wall, a pair of side walls, an outer wall having an inner face in communication with a supply pipe, and a wedge rib formed on each of said side walls;

an adapter insert slidably and removably mounted in said adapter housing in communication with said supply pipe, said adapter insert including a wedge block having a top surface, a bottom surface, an inner surface, and an outer surface, said wedge block being wedgingly inserted between said wedge ribs and said inner face of said adapter housing, said adapter insert further including a coupling member joined to said wedge block for receiving a flow pipe connected to a pump and for receiving a drop pipe to permit installation and removal of said adapter insert, said flow pipe and said pump,

wherein said top wall of said adapter housing and said top surface of said wedge block are formed with matching slopes such that the sliding of said wedge block out of said wedge ribs will enable said adapter insert to deflect away from said adapter housing into said well casing,

wherein said bottom wall of said adapter housing and said bottom surface of said wedge block are formed with matching slopes such that the sliding of said wedge block into said wedge ribs will terminate as said bottom wall is engaged by said bottom surface, and

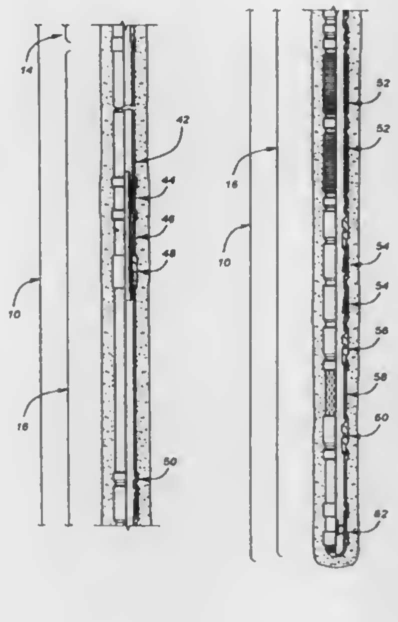
wherein an uppermost portion of said wedge ribs are chamfered to form a guide surface engageable with said inner surface of said wedge block as said adapter insert is slidable into position in said adapter housing.

5,746,274
ONE TRIP CEMENT AND GRAVEL PACK SYSTEM
Benn Arild Voll, Houston, Tex.; Matthew S. Kebodeaux, Abita Spring, La.; Steve Stringfellow, Spring, and Christian F. Bayne, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 388,371, Feb. 14, 1995, Pat. No. 5,595,246. This application Nov. 19, 1996, Ser. No. 753,053

Int. Cl.^{6} E21B *33/13;43/04*

U.S. Cl. 166—278 **18 Claims**



1. A method of well completion from the surface, comprising:

drilling a wellbore;

running into the wellbore in one trip an assembly comprising a liner, equipment for cementing said liner, and equipment for treating, conditioning, or gravel-packing the portion of the formation adjacent the lower end of said assembly;

isolating a zone outside said assembly into an upper and a lower region;

cementing at least a part of said upper region;

manipulating from the surface said equipment for cementing said liner;

providing fluid communication from said cemented liner to said lower region in said single trip via said equipment for treating, conditioning, or gravel-packing the formation as a result of said manipulating;

treating, conditioning, or gravel-packing the lower region of the formation.

5,746,275
THREE-POINT HITCH FOR AN ALL TERRAIN VEHICLE
Gary Cross, Estherville, and Ken Sloan, Milford, both of Iowa, assignors to Cycle Country Accessories Corp., Milford, Iowa

Filed Jun. 12, 1996, Ser. No. 662,046

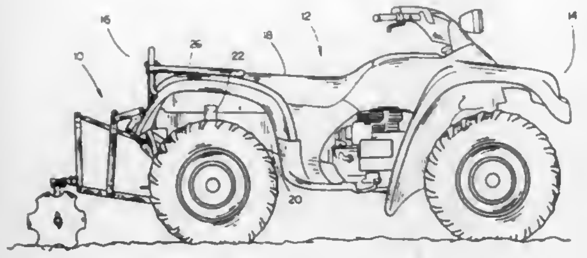
Int. Cl.^{6} A01B *59/043*

U.S. Cl. 172—440 **11 Claims**

1. In combination:

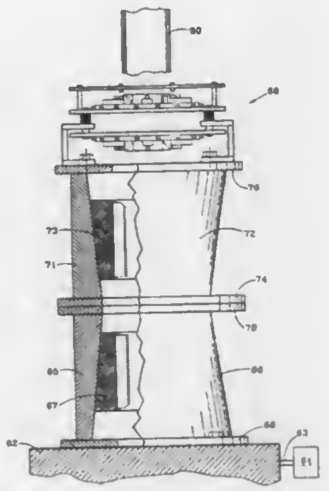
an all terrain vehicle having rearward and forward ends and including a wheeled frame, a body mounted on said wheeled frame, and a suspension system mounting said body on said wheeled frame;

a three-point hitch mounted on the rearward end of said vehicle including mounting means for mounting said hitch on said vehicle and selectively vertically movable attachment points extending rearwardly from said mounting means;



said mounting means including means for locking out said suspension system to prevent relative movement between the rearward ends of said wheeled frame and said body.

5,746,276
METHOD OF ROTATING A TUBULAR MEMBER
Randolph L. Stuart, Odessa, Tex., assignor to Eckel Manufacturing Company, Inc., Odessa, Tex.
Division of Ser. No. 332,117, Oct. 31, 1994, Pat. No. 5,566,769. This application Jul. 18, 1996, Ser. No. 683,252
Int. Cl.^{6} E21B *19/16*
U.S. Cl. 173—1 17 Claims



1. A method of rotating a tubular member while passing through a slip assembly and a powered rotary table of a drilling rig, the slip assembly including an outer body fixed with respect to the rotary table and a plurality of slips for gripping engagement with the tubular member to prevent substantial inadvertent axial movement of the tubular member with respect to the rotary table, the method comprising:

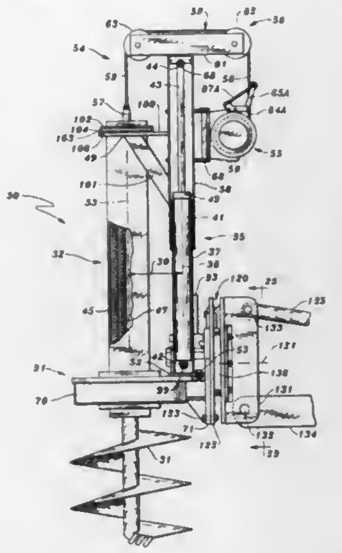
supporting a cam ring on the slip assembly, the cam ring having one or more interior camming surfaces thereon;

rotating a cage plate assembly with respect to the cam ring to move one or more gripping heads radially into gripping engagement with the tubular member;

positioning an axial adjustment member for allowing limited axial movement of the cage plate assembly with respect to the slip assembly body, such that the one or more gripping heads retain gripping engagement with the tubular member while moving axially with respect to the slip assembly body in response to limited axial movement of the plurality of slips with respect to the slip assembly body; and

rotating the rotary table and the cam ring interconnected therewith to rotate the tubular member.

5,746,277
DRILLING APPARATUS
Richard L. Howell, Jr., 6711 Park Ave., Garden Grove, Calif. 92645
Filed Nov. 6, 1995, Ser. No. 554,301
Int. Cl.^{6} F21C *5/12*
U.S. Cl. 173—184 29 Claims



1. Augering means comprising:

extendable mast means having a first mast member and a second mast member, the first mast member having an axis;

downcrowding means for extending the second mast member away from the first mast member and for pulling the second mast member towards the first mast member;

kelly assembly means having a plurality of telescoping kelly sections which include at least an outer kelly section and an inner kelly section, the outer kelly section having an axis parallel to and spaced apart from the axis of the first mast member;

kelly bearing means for rotatably supporting the outer kelly section and for preventing axial displacement of the outer kelly section relative to the kelly bearing means;

first support means for supporting the kelly bearing means, and for causing displacement of the outer kelly section along the axis thereof in response to displacement of the second mast member along the axis of, and relative to, the first mast member;

kelly rotating means for slidably rotating the outer kelly section about the axis thereof; and

second support means for supporting the first mast member and for supporting the kelly rotating means.

5,746,278
APPARATUS AND METHOD FOR CONTROLLING AN UNDERGROUND BORING MACHINE
Brian John Bischel, Pella, and James Richard Rankin, Montezuma, both of Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa
Filed Mar. 13, 1996, Ser. No. 614,532
Int. Cl.^{6} E21B *44/00*
U.S. Cl. 175—24 23 Claims

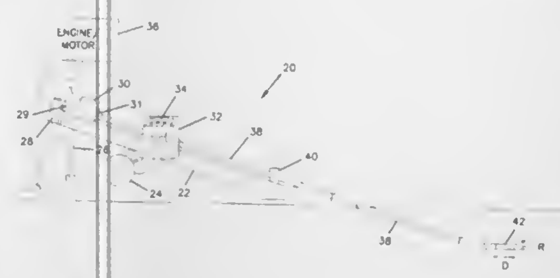
1. A method for controlling an underground boring tool, comprising:

displacing the boring tool along an underground path;

rotating the boring tool at a selected rate while displacing the boring tool;

flowing a liquid from a liquid dispensing pump to the boring tool;

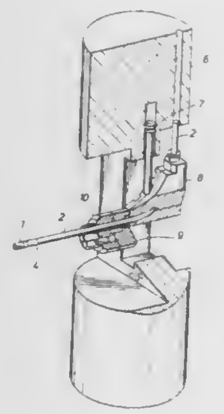
producing a liquid dispensing pump limit signal in response to the liquid dispensing pump pressure rising above a pressure limit;



concurrently modifying the rate of boring tool displacement along the underground path and rotating the boring tool at the selected rotation rate in response to variations in underground conditions impacting boring tool progress along the underground path; and

reducing the rate of boring tool displacement along the underground path in response to the liquid dispensing pump limit signal until the liquid dispensing pressure is reduced to a pressure below the liquid dispensing pump pressure limit.

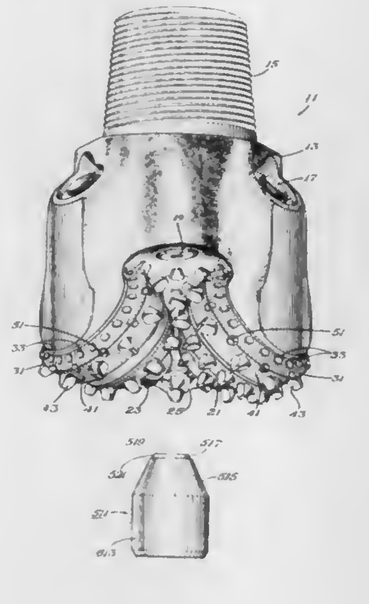
5,746,279
METHOD AND APPARATUS FOR CHANGING BITS WHILE DRILLING WITH A FLEXIBLE SHAFT
Kenneth Havlinek, Missouri City; Thomas D. MacDougall, Sugar Land; Alan Sallwasser, Houston; Miles Jaroska, Richmond; Duane LaDue, Sugar Land; Wayne A. Tyler, Pearland; Mario Flores, Houston; Mark L. Hinton, Sugar Land; Thomas D. Svoboda, Pasadena, and Michele Tesciuba, Houston, all of Tex., assignors to Gas Research Institute, Chicago, Ill.
Filed Feb. 20, 1996, Ser. No. 602,485
Int. Cl.^{6} E21B *29/06;43/112*
U.S. Cl. 175—52 21 Claims



11. A method for drilling through a material using a drilling system that includes a plurality of drill bits, a flexible drilling shaft, and a cartridge to hold said plurality of drill bits, comprising the step of:

a) bringing a drill bit connected to said drilling shaft in contact with said material to be drilled;
b) drilling through said material;
c) retracting said drilled material;
d) indexing said cartridge to replace said drill bit with a new bit, said indexing step comprising:
  i) moving the cartridge in a direction such that the outer surface of said cartridge engages a stationary device causing said cartridge to rotate a predetermined distance; and
  ii) returning said cartridge to a position of said cartridge during the drilling procedure;
e) replacing said drill bit with said new bit from said cartridge; and.
f) repeating steps (a) through (e).

5,746,280
EARTH-BORING BIT HAVING SHEAR-CUTTING INNER ROW ELEMENTS
Danny E. Scott, Montgomery; Rudolf Carl Otto Pessier, and Turlach Paul Boylan, both of Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation-in-part of Ser. No. 468,692, Jun. 6, 1996, Pat. No. 5,592,995. This application Aug. 12, 1996, Ser. No. 695,509
Int. Cl.^{6} E21B *10/16;10/52*
U.S. Cl. 175—374 22 Claims



1. An earth-boring bit comprising:

a bit body:

at least one cantilevered bearing shaft depending inwardly and downwardly from the bit body:

a cutter mounted for rotation on the bearing shaft, the cutter including a plurality of cutting elements arranged in generally circumferential rows on the cutter, the generally circumferential rows including at least one inner row of cutting elements;

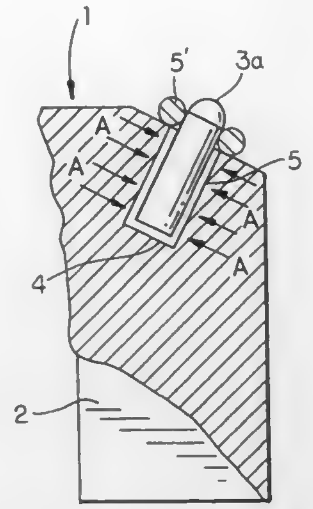
at least one of the cutting elements in an inner row having a cutting end with a crest at least partially formed of super-hard material and defining a cutting edge for shearing engagement with the bottom of the borehole during drilling operation.

5,746,281
METHOD FOR MOUNTING HARD METAL BUTTONS IN A DRILL BIT
Teijo Hulkkonen, Kulju, Finland, assignor to Oy Robit Rocktools Ltd., Saaksjarvi, Finland
PCT No. PCT/FI94/00253, § 371 Date Dec. 13, 1995, § 102(e) Date Dec. 13, 1995, PCT Pub. No. WO94/29564, PCT Pub. Date Dec. 22, 1994
PCT Filed Jun. 13, 1994, Ser. No. 557,181
Claims priority, application Finland, Jun. 14, 1993, 932727; Dec. 10, 1993, 935559
Int. Cl.^{6} E21B *10/54*
U.S. Cl. 175—420.1 9 Claims

1. A method for mounting a substantially cylindrical hard metal button in a drill bit by a compression fit, comprising the steps of:

positioning said substantially cylindrical hard metal button in a hole in a body portion of the drill bit, said hole having a substantially round cross-section and said body the drill bit having a thermal expansion coefficient greater than that of said substantially cylindrical hard metal button;

placing a brazing material adjacent said substantially cylindrical hard metal button;



heating said body portion, substantially cylindrical hard metal button, and said brazing material so that the space between the walls of the hole and the substantially cylindrical hard metal button increases due to the difference in coefficients of thermal expansion of the body portion and the substantially cylindrical hard metal button, respectively, said substantially cylindrical hard metal button moves freely about in said hole and said brazing material melts and flows into and fills said space; and

cooling said body portion, substantially cylindrical hard metal button, and the molten brazing material so that during initial cooling said brazing material solidifies and forms a shell between said substantially cylindrical hard metal button and the wall of said hole and during further cooling said hole in said body portion shrinks more than said substantially cylindrical hard metal button so that said body portion compresses said substantially cylindrical hard metal button through the solidified brazing material, the resulting compressive fit of the substantially cylindrical hard metal button in the hole in the body portion resulting essentially only from the above cooling of said substantially cylindrical hard metal button, brazing material, and body portion.

5,746,282
POWER-ASSISTED CART

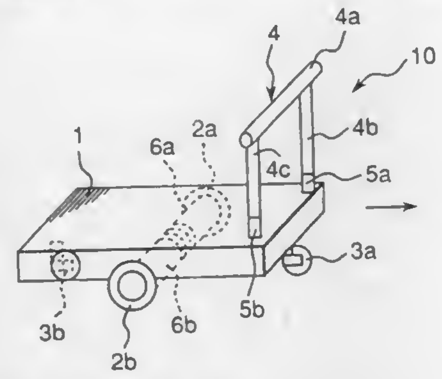
Shigeki Fujiwara; Hideki Yamashita, both of Osaka, and Hiroshi Maeda, Daito, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 12, 1996, Ser. No. 629,945

Claims priority, application Japan, Apr. 14, 1995, 7-089847

Int. Cl.⁶ B62D *6/00*

U.S. Cl. 180—6.2 **22 Claims**



1. A power-assisted cart comprising:

a wheeled platform for supporting a load thereon;

a first driving wheel mounted on the wheeled platform for, when driven, moving the wheeled platform;

a drive means for driving the first driving wheel;

an operating member mounted on the wheeled platform for receiving an external force applied thereto when the cart is desired to be moved;

a force detector for detecting a magnitude and direction of the external force applied to the operating member to thereby detect thrust and yawing forces applied to the power-assisted cart; and

a control means for controlling the drive means to apply a torque to the first driving wheel substantially proportional to the external force detected by the force detector so that the external force, when added to a force resulting from the torque applied to the first driving wheel results in a desired total force being applied to the cart.

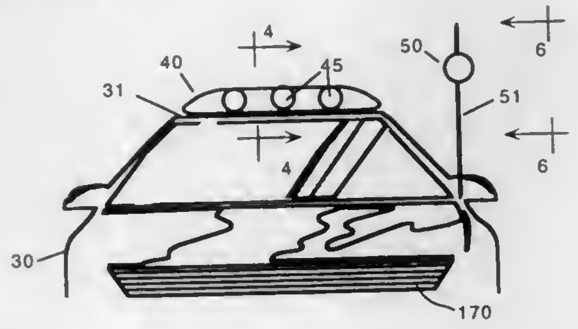
5,746,283
ELECTRIC PROPULSION SYSTEM FOR A VEHICLE

Everett W. Brighton, P.O. Box 2412, Palmer, Ak. 99645

Filed Apr. 24, 1996, Ser. No. 637,047

Int. Cl.⁶ B60K *1/00*

U.S. Cl. 180—65.3 **18 Claims**



1. An electric propulsion system for a vehicle comprising:

a) a stored power unit, providing a voltage output;

b) a means for controlling a flow of electricity from said stored power unit to a plurality of components of said electric propulsion system;

c) a means for directing any available surplus electrical energy from said electric propulsion system back to said stored power unit, said means for directing any available surplus electrical energy being operably connected to said means for controlling the flow of electricity, and further such that said means for controlling the flow of electricity also control said means for directing any available surplus electrical energy;

d) an electric drive motor, controlled by said means for controlling the flow of electricity and being operably connected to said stored power unit;

e) an electric generator, rotatably attached to said electric drive motor and being electrically connected to said means for directing any available surplus electrical energy;

f) at least one propulsion motor, electrically connected to said electric generator;

g) a means for propelling said vehicle, operably connected to said propulsion motor;

h) a power reserve module, integrally installed within said stored power unit, said power reserve module being in operable communication with said means for controlling the flow of electricity from said stored power unit, said power reserve module also being in direct electrical communication with said propulsion motor such that when said means for controlling the flow of electricity from said stored power unit senses a loss of power from said electric generator due to increased loading, said power reserve module provides additional energy directly to said propulsion motor;

i) a bypass circuit, electrically connected between said stored power unit and said propulsion motor; and

j) switch means operably connected to said bypass circuit, whereby said switch means is open during normal operation, and can be closed when said means for controlling the flow of electricity becomes disabled, whereby said bypass circuit can then be used to operate the vehicle in an emergency.

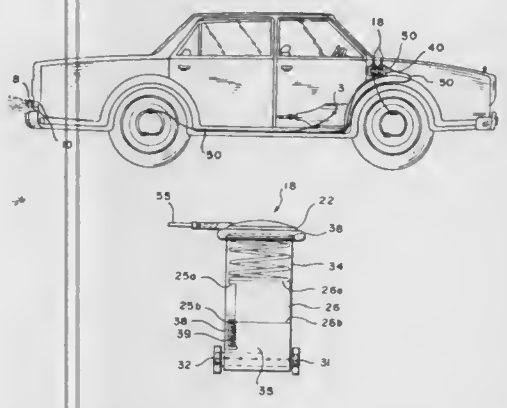
5,746,284
VEHICLE BACK-UP SAFETY DEVICE

David Johnson, Rte. 1, Box 788-B, Hortense, Ga. 31543

Filed Apr. 10, 1996, Ser. No. 632,358

Int. Cl.⁶ B60T *7/16*

U.S. Cl. 180—167 **19 Claims**



1. A vehicle back-up safety device connected to an electrical power source for automatically activating the hydraulic brakes of a vehicle upon detection of an obstruction within a prescribed area behind the vehicle, the vehicle having a brake master cylinder containing a braking fluid and being in fluid communication with the vehicle's brake lines, comprising:

(1) a sensing system for sensing the presence of said obstruction, said sensing system being electrically connected to said electrical power source and comprising a transmitter for generating and transmitting an object detection signal and a receiver for receiving a reflection of said object detection signal and for generating and transmitting an activating signal;

(2) two electrically-motivated plunger assemblies in fluid communication with said brake master cylinder and said brake lines, each of said plunger assemblies comprising:

(a) a plunger having an upper end attached to an extensible plunger spring and a lower end;

(b) a plunger solenoid electrically connectable to said power source;

(c) a hollow solenoid housing having a fluid inlet at its lower end for providing fluid communication with the brake master cylinder and having a fluid outlet at its upper end for providing fluid communication with said brake lines;

(d) a solenoid plunger cap; and

(e) a slide gate shutoff configured to engage the lower end of said plunger;

(3) a control means connected to said electrical power source and responsive to said activating signal from said receiver, said control means being configured for switching an electronic gate in response to said activating signal to provide electrical power to and to activate said plunger assembly.

5,746,285
RACK SUPPORTING DEVICE

Masami Yonezawa, Ito-gun, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Sep. 19, 1996, Ser. No. 715,700

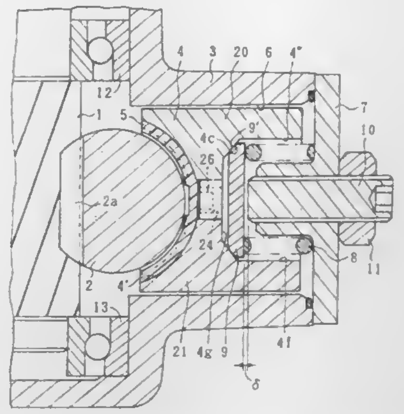
Claims priority, application Japan, Sep. 19, 1995, 7-266516

Int. Cl.⁶ B62D *3/12*

U.S. Cl. 180—428 **4 Claims**

1. A supporting device for a rack engaged with a pinion, comprising:

a housing having a guide hole;



a supporting element inserted into the guide hole so as to be guided in a back and forth direction by an inner circumferential face of the guide hole;

the supporting element being made up of a pair of half pieces, front ends of which support a back face of the rack;

means for exerting an elastic force to press both half pieces to a back face of the rack and to the inner circumferential face of the guide hole;

the inner circumferential face of the guide hole being arranged on a first fictitious cylindrical face having a diameter and an axis along the back and forth direction;

the outer circumferential face of each of the half pieces having a small diameter portion and a great diameter portion;

the small diameter portion being arranged on a second fictitious cylindrical face, which has an axis along the back and forth direction and a diameter of which is smaller than that of the first fictitious cylindrical face;

the great diameter portion being arranged on a third fictitious cylindrical face, which has an axis along the back and forth direction and a diameter of which is greater than that of the first fictitious cylindrical face; and

the outer circumferential face of each of the half pieces being in contact with the inner circumferential face of the guide hole at circumferential ends of the great diameter portion.

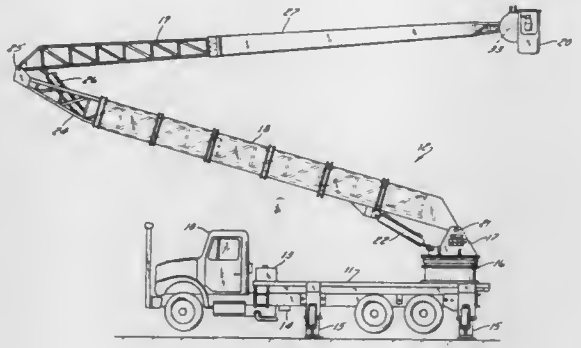
5,746,286
HYDRAULIC BOOM PLATFORM LEVELING SYSTEM

John J. Mlaker, West Allis, Wis., assignor to Mat-3, Inc., Waukesha, Wis.

Filed Sep. 5, 1996, Ser. No. 708,718

Int. Cl.⁶ B66F *11/04*

U.S. Cl. 182—2.9 **27 Claims**



1. A platform leveling system for an aerial lift, said aerial lift comprising a base, a lower boom pivotally connected to the base, an upper boom pivotally connected to the lower boom, a platform pivotally connected to the upper boom, a first hydraulic boom cylinder assembly for raising and lowering the lower boom relative to the base, and a second hydraulic boom cylinder assembly for

raising and lowering the upper boom relative to the lower boom, said platform leveling system comprising:

a first helical hydraulic rotary actuator connected to the base and lower boom, with said first hydraulic boom cylinder assembly exerting a significant mechanical advantage over said first helical hydraulic rotary actuator so that rotational movement of the lower boom relative to the base causes a displacement of hydraulic fluid in said first helical hydraulic rotary actuator;

a second helical hydraulic rotary actuator connected to the lower boom and upper boom, with said second hydraulic boom cylinder assembly exerting a significant mechanical advantage over said second helical hydraulic rotary actuator so that rotational movement of the upper boom relative to the lower boom causes a displacement of hydraulic fluid in said second helical hydraulic rotary actuator;

a third helical hydraulic rotary actuator connected to the upper boom and platform, with hydraulic fluid in said third helical hydraulic rotary actuator becoming displaced in response to a displacement of fluid in the first helical hydraulic rotary actuator and in response to a displacement of fluid in the second helical hydraulic rotary actuator so as to cause rotational movement of the platform relative to the upper boom;

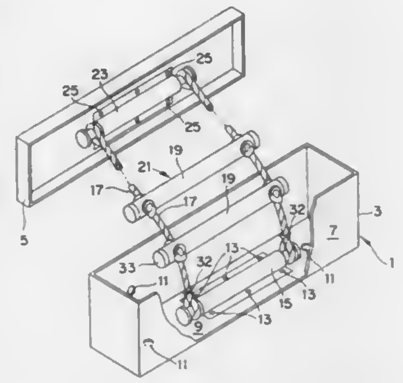
said first, second and third helical hydraulic rotary actuators being hydraulically interconnected such that:

rotational movement of the lower boom relative to the base causes a substantially equal amount of rotational movement of the platform relative to the upper boom; and

rotational movement of the upper boom relative to the lower boom causes a substantially equal amount of rotational movement of the platform relative to the upper boom.

5,746,287
HAM LADDER

Stevenson Durham, Jr., 5619 S. Wolcott, Chicago, Ill. 60636
Filed Aug. 29, 1996, Ser. No. 705,294
Int. Cl.^{6} A62B *1/06*
U.S. Cl. 182—70 **5 Claims**



1. An escape ladder and storage container apparatus comprising:

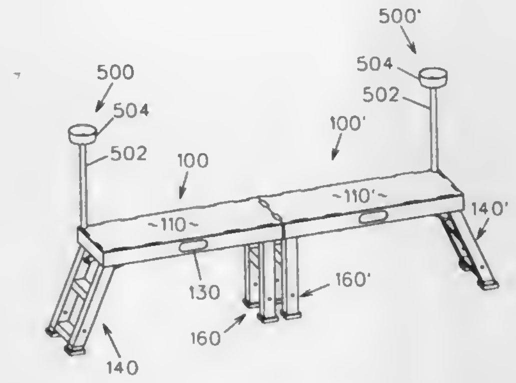
a portable storage container having an openable upper lid and a lower section fastened to a structural component of a dwelling component on an interior of a dwelling;

a collapsible rope ladder having a series of separate rungs including intermediate, top, and bottom rungs, all of said rungs being completely stored within the confines of said portable container;

top and bottom rung retaining members completely stored within said container and fixed to said container's lower section and upper lid, respectively, said top and bottom rung retaining members also being mounted to the ladder's top and bottom rungs, respectively to retain the top rung to the container's lower section and the bottom rung to the lid; whereby said container's lid is opened and separated from the lower section fixed to a structural component on an interior of a dwelling by throwing the lid out of a window to provide a ladder escape route.

5,746,288
WALK BOARD

Diana O'Neal, and Donald P. O'Neal, both of 2144 N. Hyder Mountain Rd., Cookeville, Tenn. 38506
Filed Aug. 29, 1996, Ser. No. 705,053
Int. Cl.^{6} E04G *1/00*
U.S. Cl. 182—118 **9 Claims**



1. A portable platform system comprising:

at least first and second platform assemblies with each assembly comprising:

a platform comprising a generally rectangular surface, said surface presenting first and second opposed end walls and first and second opposed sidewalls extending between said end walls;

support means connected to said platform for elevating said platform above an underlying surface;

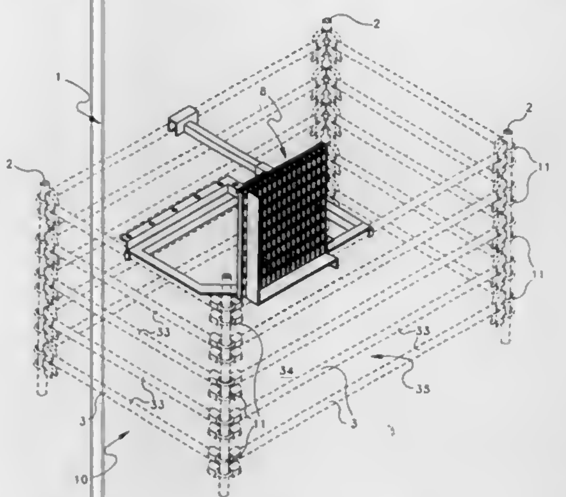
first and second pairs of spaced-apart sidewall apertures in said surface and adjacent each sidewall, said sidewall apertures adjacent said first sidewall aligned with said sidewall apertures adjacent said second sidewall;

a pair of spaced-apart end wall apertures in said surface and adjacent each end wall, said end wall apertures adjacent said first end wall aligned with said end wall apertures adjacent said second end wall, said spaced-apart relationship between said end wall apertures generally equal to said spaced-apart relationship between said apertures of said pairs of said sidewall apertures, whereupon in a first mode a pair of said end wall apertures of said first platform assembly are adapted to be aligned either with a pair of said end wall apertures of said second platform assembly or adapted to be aligned in a second mode with one of said pairs of said sidewall apertures of said second platform assembly;

fastener means comprising a web with a pair of depending legs, one of said legs adapted for user selectable insertion within an aperture of one of said end wall apertures of said first platform assembly with the other said leg adapted for user selectable insertion within one of said apertures of either said aligned end wall apertures in said first mode or said aligned sidewall apertures in said second mode of said adjacent second platform assembly, whereupon said web in said first mode spans adjacent end walls of adjacent first and second platform assemblies to connect said platforms in a longitudinally adjacent relationship or in a second mode spans an adjacent end wall and sidewall of adjacent first and second platform assemblies to connect said platform assemblies in a generally normal relationship for maintaining a walkway therebetween, wherein said web of said fastener means is generally coplanar with said surfaces of adjacent platform assemblies.

5,746,289
SCAFFOLD HATCH SYSTEM

Joe W. Williams, Varnado, La., assignor to Excel Modular Scaffold and Leasing Corporation, Carson City, Nev.
Filed May 22, 1995, Ser. No. 447,238
Int. Cl.^{6} E04G *5/00*
U.S. Cl. 182—129 **15 Claims**



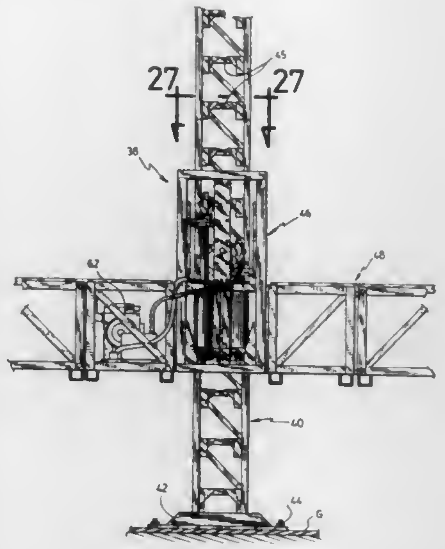
1. A scaffold hatch system comprising a frame member with an opening therethrough, said frame member having a plurality of sides, with a single one of said sides having an expandable section for bridging the width of different width scaffolding systems, said frame member being supportably attachable to a scaffolding system, said scaffolding system including a plurality of horizontal support members, a plurality of vertical support members and a floor having a walking surface with a passageway therethrough, said opening of said frame being alignable with said passageway and;

a hatch sized to partially cover said opening, said hatch being attached to said frame member and said hatch, when closed, being capable of supporting the weight of a person.

5,746,290
SELF ERECTING SCAFFOLDING

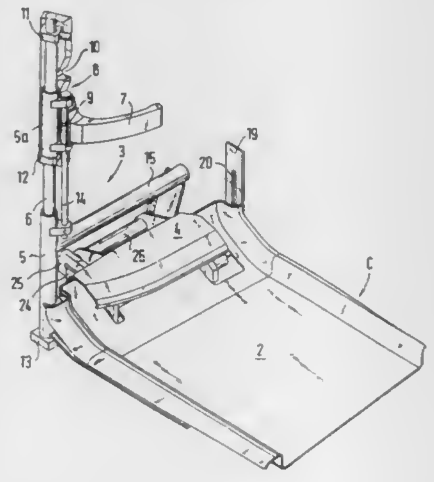
André St-Germain, St-Bonaventure, and Luc Tessier, Drummondville, both of Canada, assignors to Gestion De Brevets Fraco LTÉE, Québec, Canada
Filed Jul. 27, 1995, Ser. No. 507,885
Int. Cl.^{6} E04G *1/20*
U.S. Cl. 182—146 **15 Claims**

1. A platform raising system in a scaffolding for raising a work platform along a tower, said platform being sustained by a sleeve member positioned around said tower, almost encircling it completely, said sleeve member being movable along said tower, said tower having a plurality of approximately parallel and equally spaced rungs, said raising system being installed on said sleeve member, said raising system comprising two rams pivotably attached to said sleeve member and having piston rods movable from a retracted position to an extracted position and at the end of which are pivotably installed corresponding hook members, said rams being connected to power means and control means that simultaneously activate each ram in up and down movement but in alternate directions, first pivoting means for pivoting said hook members from a hooking position to an unhooking position under the action of said rams, said raising system further comprising synchronizing means for synchronizing the relative movement of said rams, at least one of said hook members abutting against one of said rungs in said hooking position at any given time to sustain said sleeve member, said raising system further comprising second pivoting means for pivoting said hook members from said hooking position to said unhooking position, said second pivoting means comprising a latch lever member pivotable between a latched position and an unlatched position, said second pivoting means being gradually activated during the extension stroke of said rams from an inactive position when said piston rods are in said retracted position, said second pivoting means pivoting one of said hook members only if: a) said hook member is not bearing on any one of said rungs in a hooking engagement; and b) said latch lever member is in said unlatched position.



5,746,291
FLOOR CONVEYOR VEHICLE

Hans-Peter Knauss, Leonberg; Hartmut Mayer, Ditzingen, and Bernhard Goetz, Aschaffenbnrg, all of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany
Filed Jul. 1, 1996, Ser. No. 673,086
Claims priority, application Germany, Jul. 1, 1995, 195 24 075.8
Int. Cl.^{6} B66F *9/20*
U.S. Cl. 187—223 **12 Claims**



1. A floor conveyor vehicle, such as a stacker, comprising a braking device and an adjustable floor panel guidable in a vertical direction and holdable in multiple working positions by a locking device, wherein a lifting frame is operatively associated with the floor panel via a column arranged on one side of the vehicle to provide the vertical guidability, and the floor panel is configured as an operating plate for a parking brake and has a pedal plate for a service brake, and shafts swivellably connect the floor panel and the pedal plate on the lifting frame.

5,746,292
DISK BRAKE DEVICE FOR REDUCING BRAKE NOISE

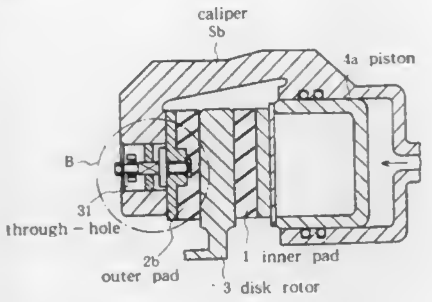
Shinichi Tanaka, Hino, and Shigeru Tanaka, Tsuki-gun, both of Japan, assignors to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1996, Ser. No. 670,710

Claims priority, application Japan, Oct. 28, 1994, 6-265712; Nov. 2, 1994, 6-269880

Int. Cl.^{6} F16D *65/02*

U.S. Cl. 188—73.37 **6 Claims**



1. Disk brake device comprising:

a piston which presses against a disk rotor by way of an inner pad in response to hydraulic pressure applied by a cylinder;

a caliper formed integrally with this cylinder; and

an outer pad which is supported by this caliper and which presses against the disk rotor in opposition to the piston;

said disk brake device being characterized in that a weight fitted to the backplate of the outer pad by way of an elastic body;

wherein a rod is fixed upright on the backplate, and the weight is fitted to the rod by way of the elastic body; and

wherein a hole is provided in the caliper, and the rod passes through said hole.

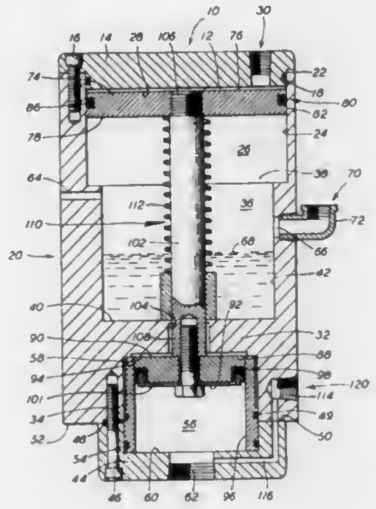
5,746,293
PNEUMATIC PRESSURE TO HYDRAULIC PRESSURE INTENSIFIER MECHANISM

Thomas H. Engle, Clayton, N.Y., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 2, 1996, Ser. No. 691,526

Int. Cl.^{6} B60T *11/10;* **F15B** *21/04*

U.S. Cl. 188—151 R **20 Claims**



1. A pneumatic pressure to hydraulic pressure intensifier mechanism, said intensifier mechanism comprising:

(a) a housing member open adjacent at least a first end thereof, said housing member including:

(i) a first end cap member secured to said at least open first end of said housing member in a substantially fluid tight manner,

(ii) a first chamber, having a first predetermined volume, disposed in said housing member adjacent said at least open first end for receiving pneumatic pressure therein, said first chamber being defined by an inner surface of said first end cap member and an inner surface of said housing member,

(iii) a first fluid connection and communication means formed through said first end cap member for connecting a source of pneumatic pressure to said first end cap member and for communicating such pneumatic pressure to said first chamber,

(iv) a wall-like member disposed in said housing member at one of a position located adjacent a radially opposed open second end of said housing member and a position located intermediate said at least open first end and said radially opposed open second end of said housing member,

(v) a second chamber, having a second predetermined volume, disposed in said housing member in fluid communication with said first chamber adjacent one end thereof for containing each of a predetermined volume of hydraulic fluid and a predetermined volume of unpressurized air therein, said second chamber being defined by a first surface of said wall-like member and an inner surface of said housing member,

(vi) a second end cap member secured to said second end of said housing member in a substantially fluid tight manner,

(vii) a third chamber, having a third predetermined volume, disposed in at least one of said open second end of said housing member, said second end cap member and a first portion of said third chamber in said open second end of said housing member and a second portion of said third chamber in said second end cap member, said third chamber containing a predetermined volume of hydraulic fluid therein, said third chamber being defined at least by a radially opposed second surface of said wall-like member and an inner surface of said second end cap member,

(viii) a second fluid connection and communication means formed through said second end cap means for connecting said third chamber to a fluid communication line and enabling communication of such hydraulic fluid to such fluid communication line,

(ix) a first aperture formed through a wall portion of said second chamber closely adjacent said first chamber to enable evacuation of unpressurized air from a first portion of said first chamber and a first portion of said second chamber during communication of such pneumatic pressure to a second portion of said first chamber and to enable communication of unpressurized air into said first portion of said first chamber and said first portion of said second chamber upon evacuation of such pneumatic pressure from said second portion of said first chamber, and

(x) a second aperture formed through another wall portion of said housing member in a position below said first aperture and closely adjacent an upper surface of such predetermined volume of such hydraulic fluid contained in said second chamber to enable communication of such predetermined volume of such hydraulic fluid to such second chamber as necessary;

(b) a first disc-like piston member disposed for reciprocal movement within said first chamber, an upper surface of said first disc-like piston member facing said inner surface of said first end cap member and a radially opposed bottom surface of said first disc-like piston member facing said first surface of said wall member;

(c) a first sealing means disposed around a peripheral portion of said first disc-like piston member for sealing said peripheral portion of said first disc-like piston member against an inner wall surface of said first chamber to retain such pneumatic pressure, during communication thereof to such first chamber, within said first chamber and thereby cause said first disc-like piston member to move in a downward direction;

(d) a second disc-like piston member disposed for reciprocal movement within said third chamber, an upper surface of said second disc-like piston member facing said radially opposed second surface of said wall-like member and a radially opposed second surface of said second disc-like piston member facing said inner surface of said second end cap member;

(e) a second sealing means disposed around a peripheral portion of said second disc-like piston member for sealing said peripheral portion of said second disc-like piston member against an inner wall surface of said third chamber to thereby enable communication of such hydraulic fluid to such fluid communication line during a downward movement of said second disc-like piston member;

(f) an elongated rod-like means extending through a centrally disposed aperture formed through said wall-like member and connected at a first end thereof to said first disc-like piston member and at an axially opposed second end thereof to said second disc-like piston member for causing said downward movement of said second disc-like piston member during such communication of such pneumatic pressure to said first chamber; and

(g) an urging means disposed around said elongated rod-like means and caged between said radially opposed bottom surface of said first disc-like piston member and said first surface of said wall-like member for moving said first disc-like piston member toward said inner surface of said first end cap member when such pneumatic pressure communicated to said first chamber in said housing member is evacuated therefrom.

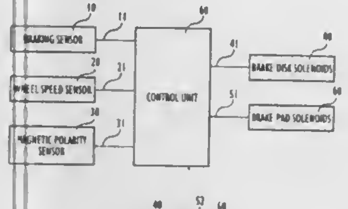
5,746,294
MAGNETIC BRAKE SYSTEM FOR A VEHICLE

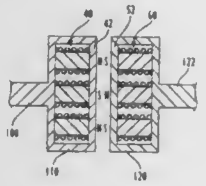
Jae-Woong Lee, Seoul, Rep. of Korea, assignor to Kia Motors Corporation, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 696,429, Aug. 14, 1996, abandoned. This application May 15, 1997, Ser. No. 856,685

Int. Cl.^{6} B60L *7/00*

U.S. Cl. 188—163 **3 Claims**





1. A magnetic brake system for a vehicle, comprising:

a plurality of brake disk solenoids for generating a magnetic force;

a plurality of brake pad solenoids for generating a magnetic force;

a braking sensor for detecting whether a brake pedal is applied;

a wheel speed sensor for detecting wheel speed;

a magnetic polarity sensor for detecting magnetic polarity of said brake disk solenoids; and

a control unit for controlling said brake pad solenoids using signals from said braking sensor, said wheel speed sensor and said magnetic polarity sensor.

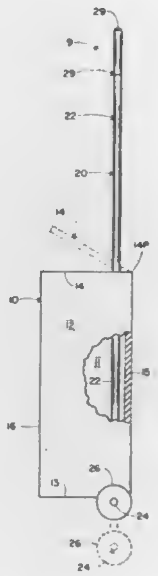
5,746,295
FLOOR-ROLLABLE LUGGAGE

Frederick G. Schweser, Jr., 330 E. Douglas (#209), Elkhorn, Nebr. 68022

Filed Jun. 5, 1995, Ser. No. 461,532

Int. Cl.^{6} A45C *5/14;13/26*

U.S. Cl. 190—18 A **2 Claims**



1. Floor-rollable luggages comprising:

(A) an upright hollow container extending uprightly along and substantially centrally intersected by a vertical central-plane, and with reference to said central-plane comprising six interconnected portions including: a pair of upright and substantially parallel sidewalls transversely flanking said central-plane including a first-sidewall and a second-sidewall; a generally horizontal base-panel portion intersecting said central-plane; a generally horizontal upper portion spaced apart and overlying said base-panel portion and intersecting said central-plane; and a transversely intersecting front-wall; and said hollow container being provided with cargo-receiving means; and

(B) an upwardly slidably movable underlying rolling means for said upright hollow container and comprising:

(Bi) a pair of upright and transversely separated parallel vertical-bars respectively slidably surrounded by said base-panel and upper portions and including a first-bar located between said central-plane and said first-sidewall and a second-bar located between said central-plane and said second-sidewall;

(Bii) extending transversely from said first-bar to said second-bar intersecting said central-plane and loftily overlying said container upper portion, a vertical-bars' connective pull-handle;

(Biii) extending transversely from said first-bar below the container base-panel portion and outwardly beyond said container first-sidewall, a substantially horizontal first-axle outwardly provided with first-wheel means; and

(Biv) extending transversely from said second-bar below the container base-panel portion and outwardly beyond said container second-sidewall, a substantially horizontal second-axle outwardly provided with second-wheel means, and

whereby as said underlying rolling means at the said pull-handle is upwardly moved and said first-bar and second-bar slide upwardly, said first-axle and second-axle will substantially simultaneously move upwardly and abut the base-panel lowermost portion of said container at the said base-panel thereof.

5,746,296
TORQUE CONVERTER HAVING LOCK-UP CLUTCH

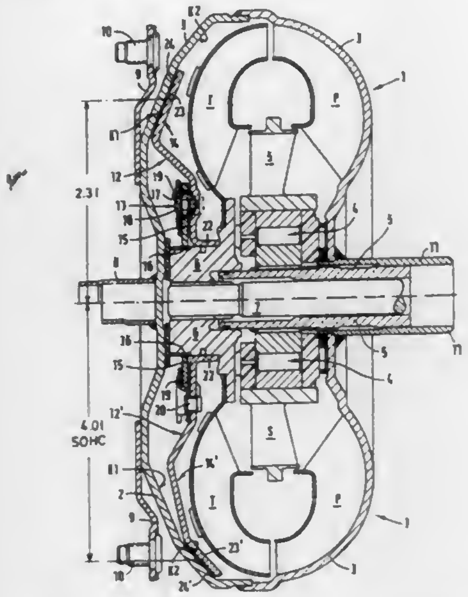
Hans-Peter Wirtz, Cologne, Germany, assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Sep. 17, 1996, Ser. No. 710,442

Claims priority, application Germany, Feb. 17, 1996, 196 05 921.6

Int. Cl.^{6} F16H *45/02;* **F16D** *13/66*

U.S. Cl. 192—3.29 **3 Claims**



1. A torque converter having an impeller and turbine arranged in mutual hydrokinetic fluid flow relation about a common axis, comprising:

a housing having at least two conical areas disposed radially about the axis, and located on an inner wall of the housing, a first radially inner conical area having a relatively small angle with respect to a radial axis, a second radially outer conical area having a relatively larger angle with respect to a radial axis; and

a lockup clutch including a conical clutch disc having a friction disc area, adapted to alternately driveably engage and release one of the group consisting of the first and second conical areas, said first and second conical areas extending from the axis mutually different radial distances.

5,746,297
DEVICE FOR PREVENTING REVERSE ROTATION OF ROTOR IN SPINNING REELS

Bo Kug Park, Pusan, Rep. of Korea, assignor to Silver Star Co. Ltd.

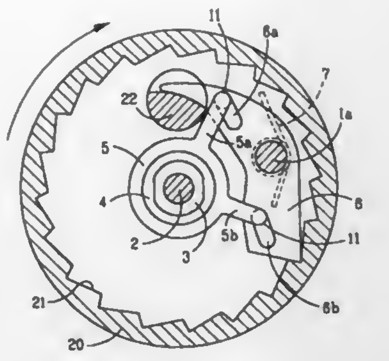
Filed Jun. 27, 1996, Ser. No. 672,170

Claims priority, application Rep. of Korea, Jul. 9, 1995, 1995-24405

Int. Cl.^{6} A01K *89/02*

U.S. Cl. 192—7 **4 Claims**

1. An improved device for preventing reverse rotation of a rotor in spinning reels of the type including a pinion shaft fitted over a spool shaft which extends from a reel body, a connection shaft fitted over said pinion shaft, an operational control shaft fitted over said connection shaft and a reverse rotation prevention claw coupled to said operational control shaft, wherein the improvement comprises:



a pair of connecting arms extending from said operational control shaft in different directions, said arms having pins movably received in said reverse rotation prevention claw having longitudinal holes therein, for coupling said operational control shaft to said reverse rotation prevention claw at two coupling points; and

a plate spring generating an elastic force fitted over said connection shaft between a spring seat and said operational control shaft, said control shaft movably coupled to said claw, for supporting said connection shaft and said operational control shaft, said spring seat being fitted over said pinion shaft and held by a pinion shaft bearing for biasing said control shaft.

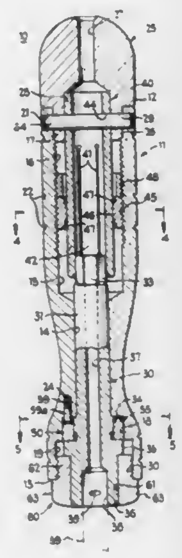
5,746,298
ADJUSTABLE TORQUE-LIMITING MINI SCREWDRIVER

Bert Krivec, Brookfield, Wis.; Thomas B. Petruzzi, Rockaway, and John A. Braun, Kenilworth, both of N.J., assignors to Snap-on Technologies, Inc., Lincolnshire, Ill.

Filed Jul. 19, 1996, Ser. No. 684,242

Int. Cl.^{6} F16D *47/02;7/02;* **B25B** *23/142;23/157*

U.S. Cl. 192—48.3 **20 Claims**



1. A dual-mode torquing apparatus operable in a torque-limiting mode in a first direction and a non-torque-limiting mode in a second direction, said apparatus comprising: first and second rotatable structures; a torque-limiting mechanism coupled between said structures and responsive to rotation of said first structure to rotate said second structure at torques below a predetermined torque and accommodating rotation of the first structure relative to the second structure at said predetermined torque and above; and lock mechanism coupled between said structures and accommodating rotation of said first structure relative to said second structure in the first direction and preventing relative rotation of the structures when said first structure is rotated in the second direction, said torque limiting mechanism and said lock mechanism respectively including portions movable respectively in mutually perpendicular directions.

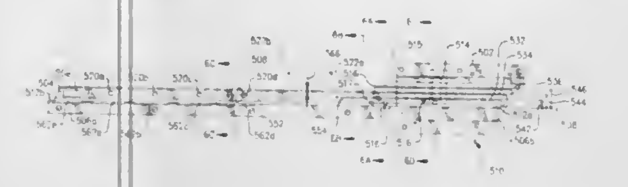
5,746,299
COIN COUNTER DEJAMMING METHOD AND APPARATUS

Jens H. Molbak; Dan Gerrity, both of Bellevue; Scott Scherer, and Aaron R. Finch, both of Seattle, all of Wash., assignors to Coinstar, Inc., Bellevue, Wash.

Filed Apr. 27, 1995, Ser. No. 431,070

Int. Cl.^{6} G07F *9/00*

U.S. Cl. 194—200 **17 Claims**



14. In a coin handling apparatus, a dejamming method comprising:

detecting a jam in said coin handling apparatus; and

automatically initiating a dejamming measure, said dejamming measure including activating a transducer to cause said transducer to vibrate so as to provide mechanical energy to said coin handling apparatus wherein said transducer which is activated to cause said transducer to vibrate is also used for another purpose, wherein said another purpose is a purpose of knocking a coin off said rail.

5,746,300
STORAGE UNIT FOR ELONGATED ELEMENTS PARTICULARLY CIGARETTES

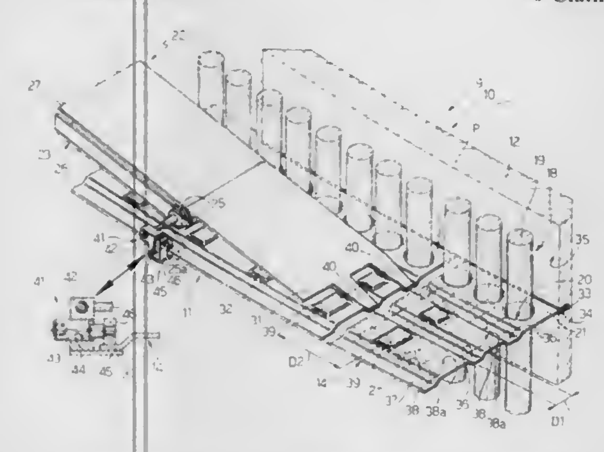
Marco Brizzi, Zola Predosa; Andrea Fantini, Calderara Di Reno, and Antonio Gamberini, Bologna, all of Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy

Filed Jun. 13, 1996, Ser. No. 662,495

Claims priority, application Italy, Jun. 14, 1995, B095A0302

Int. Cl.^{6} B65G *1/00*

U.S. Cl. 198—347.3 **6 Claims**



1. A storage unit (**9**) for elongated elements, particularly cigarettes (**2**), the storage unit (**9**) comprising a first (**14**) and second (**22**) reversible conveyor for said elongated elements (**2**); and a loading-unloading station (**11**) connecting said first and second conveyors (**14**, **22**); the first conveyor (**14**) being defined by a helical conveyor belt (**14**); and said station (**11**) comprising a connecting plate (**32**) presenting an end portion (**31**) connected in axially-sliding, transversely-fixed manner to said conveyor belt (**14**); the storage unit being characterized in that the conveyor belt (**14**) presents at least two longitudinal grooves (**36**) defining, on the conveyor belt (**14**), two longitudinal bands (**38**); the end portion (**31**) of the connecting plate (**32**) being a comb-shaped end portion (**31**) connected to the longitudinal grooves (**36**) of the first conveyor (**14**); and each said band (**38**) presenting a respective succession of projections (**39**).

5,746,301
SORTING CONVEYOR FOR PACKETS

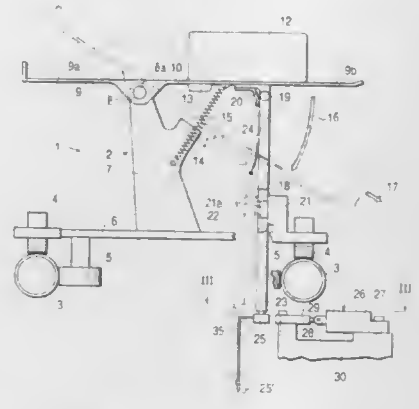
Willi Maier, Kloten, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Nov. 13, 1995, Ser. No. 555,902

Claims priority, application Switzerland, Nov. 16, 1994, 03437/94

Int. Cl.^{6} B65G *47/46*

U.S. Cl. 198—370.04 **8 Claims**



1. A sorting conveyor for packets, comprising:

a plurality of carriages circulating along an endless track;

carrier arrangements for the packets supported by respective ones of the carriages, each carrier arrangement including: a pivotally mounted plate arranged for being tilted in only one direction at predetermined unloading points; a tensioning device for applying a tension force on the plate in the tilt direction; a support arrangement including at least one, swingingly mounted, downwardly extending leg, the leg having a first position for supporting the plate against the tension force, the leg being swingable laterally into a second, detached position in which the leg is freely movable in a downward direction;

a frame; and a support fixed to the frame and against which support the leg is supported in the first position, the leg being slidable off the support in a swinging movement away from the support into the second, detached position so that the plate is not supported against the tension force.

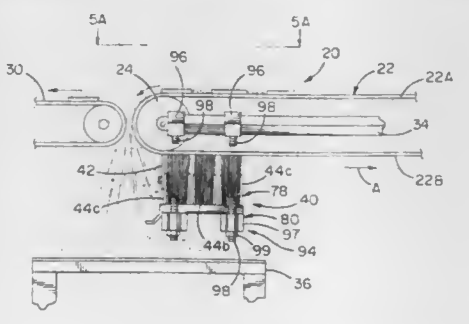
5,746,302
APPARATUS FOR CLEANING CONVEYORS

John H. Bowman, 9740 S. Meade Ave., Oak Lawn, Ill. 60453

Filed Apr. 2, 1996, Ser. No. 627,736

Int. Cl.^{6} B65G *45/00*

U.S. Cl. 198—496 **32 Claims**

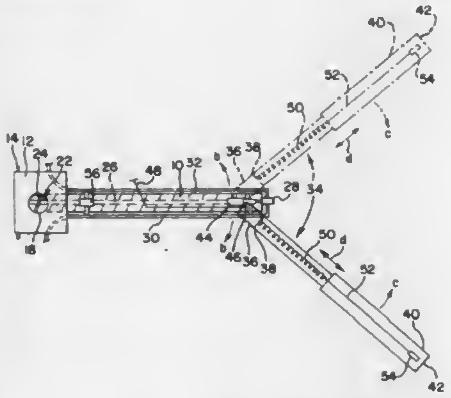


1. A conveyor cleaning assembly for cleaning an endless conveyor as such conveyor moves in a predetermined direction along a portion of its path of movement, said cleaning assembly comprising:

a cleaning head which includes at least one cleaning element for engaging one or more surfaces of said conveyor and removing

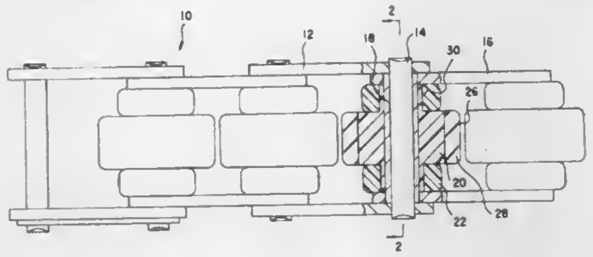
debris therefrom as said conveyor moves along said portion of its path in frictional engagement with said cleaning element, and
a head support for holding said cleaning head in a fixed position adjacent said portion of said path, said head support having an engagement axis disposed generally parallel to said predetermined direction,
means for supporting said head support in a predetermined position and relationship to such a conveyor with said engagement axis generally parallel to said predetermined direction,
said cleaning head and said head support being of complementary configurations for sliding engagement of said cleaning head with said head support upon movement of said cleaning head along said engagement axis generally in said predetermined direction of movement of such conveyor, said head support precluding movement of said cleaning head laterally relative to said engagement axis of said head support when so engaged therewith, and said cleaning head and said head support including abutment portions which limit the sliding engagement movement of said cleaning head onto said head support in said direction of movement of said conveyor, whereby said cleaning head may be so slid onto said head support and into a cleaning position for contact with said conveyor and thereafter will be retained in such cleaning position by friction forces of said conveyor acting on said cleaning head as said conveyor moves in said predetermined direction while in contact with said cleaning head and said cleaning head may be removed by sliding movement thereof opposite to said predetermined direction.

5,746,303
AUGER CONTROL
D. Wayne Niewold, Loda, Ill., assignor to Hydra Fold Auger, Inc., Paxton, Ill.
Filed Feb. 26, 1997, Ser. No. 806,658
Int. Cl.⁶ B65G *33/26*
U.S. Cl. 198—660 **13 Claims**



1. A system for the control of an auger comprising:
an elongate auger tube having an auger mounted for rotation therein:
an inlet to said tube for introducing a particulate material to said tube to be conveyed in said tube by said auger when it rotates;
a discharge from said tube spaced from said inlet, said discharge discharging the material conveyed in said tube from said tube;
an elongate discharge spout which is adjustable in length and which is attached to said tube for receiving and directing the material discharged from said discharge of said tube, said discharge spout being movable relative to said tube and having a discharge opening spaced from and remote to said tube and tube discharge;
a motor on said tube and remote to said discharge opening of said discharge spout to rotate said auger in said tube; and
control means mounted to and selectively operable from a location on said discharge spout adjacent said discharge opening of said discharge spout to start and stop the rotation of said auger, said control means including a control switch mounted to said discharge spout adjacent said discharge opening, and an electrical conductor extending from said switch and over substantially the length of said discharge spout, at least a portion of said electrical conductor also being adjustable in length when the length of said discharge spout is adjusted to accommodate the changes in length of said discharge spout when it is adjusted.

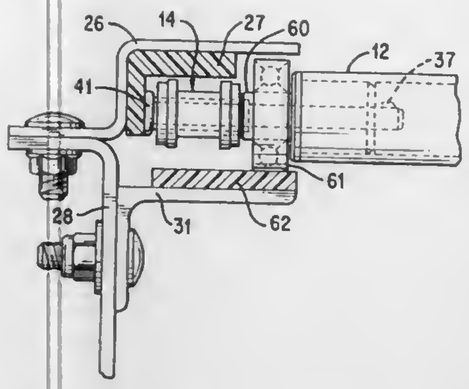
5,746,304
SPEED INCREASING AND ACCUMULATING CONVEYOR CHAIN
Michiya Hashino, Longmeadow; James G. Lamoureux, Springfield, hoth of Mass.; Shinichi Fukushima, Daito, Japan; Katsutoshi Shibayama, Higashiosaka, Japan; Yoshihirn Murakami, Yao, Japan, and Sachio Hayashi, Toyonaka, Japan, assignors to Tsubakimoto Chain Co., Osaka-Fu, Japan
Filed Nov. 20, 1995, Ser. No. 561,177
Int. Cl.⁶ B65G *13/06*
U.S. Cl. 198—781.02 **4 Claims**



1. A speed increasing and accumulating conveyor chain, comprising:
link plates;
a connecting pin extending between and being secured at its opposite ends to said link plates;
a load roller having a large diameter portion and a load surface for supporting a conveyed object formed at an outer peripheral surface of said large diameter portion;
at least one running roller disposed in axially spaced relation with respect to said load roller and having a diameter smaller than that of said large diameter portion of said load roller;
said load roller and said at least one running roller being rotatably and coaxially mounted on said connecting pin in abutting relation with each other at a portion other than said large diameter portion of said load roller to form mutually rotatable abutting surfaces therebetween; and
a frictional material having a coefficient of friction with respect to said conveyed object which is greater than a coefficient of friction between said load roller and said running roller, wherein said frictional material enables the load surface of said load roller to generate a larger frictional force on said conveyed object than said rotatable abutting surface of said load roller generates on the abutting surface of said running roller.

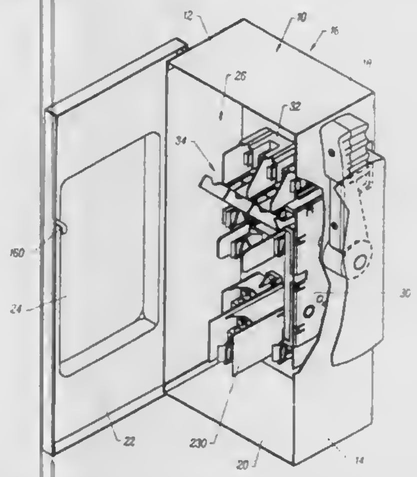
5,746,305
SLAT SORTER
John J. Wilkins, and Walter L. Steffens, both of Cincinnati, Ohio, assignors to HK Systems, Inc., New Berlin, Wis.
Division of Ser. No. 467,844, Jun. 6, 1995, Pat. No. 5,590,758. This application Nov. 22, 1996, Ser. No. 755,385
Int. Cl.⁶ B65G *47/26*
U.S. Cl. 198—890.1 **39 Claims**

1. A slat sorter having a series of platens slidably mounted on an array of slats which are driven by a pair of endless chains, each having an innermost lateral side portion, the sorter comprising:
a frame,



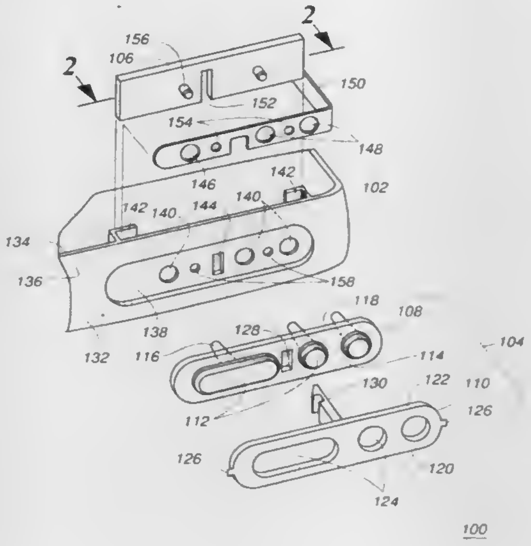
a track mounted on the frame so as to support the slats, and a bearing mounted on the end of a slat, wherein the bearing is positioned between the end of the slat and the innermost lateral side portion of one of the chains, so as to function as a wheel and roll on the track to support the slat.

5,746,306
SWITCH HAVING STACKABLE FUSES
Terry Allen Cassity, Paris; David Emerson Greer, Lexington; Jeffrey James Buchanan, Lexington; Steve Miles Ledbetter, Lexington, and Jonathan Hans Van Camp, Lexington, all of Ky., assignors to Square D Company, Palatine, Ill.
Division of Ser. No. 359,977, Dec. 20, 1994, Pat. No. 5,609,245. This application Jun. 7, 1995, Ser. No. 475,265
Int. Cl.⁶ H01H *1/26*
U.S. Cl. 200—283 **17 Claims**



5. An interior assembly for stacking fuses in an electrical distribution device having a fuse for each phase in a multi-phase circuit, the interior assembly comprising:
a line base module having:
a generally planar line base with upstanding side walls around each phase mounted on the line base and a plurality of line terminals for connecting to the line end of the circuit for each phase, each line terminal being fastened to the line base,
a plurality of switch contacts for opening and closing the circuit for each phase, each switch contact being fastened to the line base, and
a rotor operatively connected to each of the switch contacts, the side walls of the line base having a top edge defining a mounting surface, the rotor being rotatably secured to the mounting surface of the side walls without discrete fasteners;
a load base module having a generally planar load base with upstanding side walls around each phase mounted on the load base and a plurality of load terminals for connecting to the load end of the circuit for each phase, each load terminal being fastened to the load base; and,
a plurality of fuse lug pairs for connecting to the fuse each phase of the circuit, each fuse lug pair having one fuse lug fastened to the line base and the associated fuse lug fastened to the load base, at least one of the fuse lug pairs being fastened to the line and load bases in an elevated plane offset from the other fuse lug pairs.

5,746,307
SWITCH ASSEMBLY FOR A PORTABLE RADIO
Steve M. Joss, Pompano Beach, Fla.; Tyler D. Jensen, San Diego, Calif.; Laurence E. Marvet, Plantation, Fla.; Julio C. Castañeda, Coral Springs, Fla.; David Auld, Lake Park, Fla., and Steven J. Finch, Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 7, 1997, Ser. No. 835,365
Int. Cl.⁶ H01H *9/02*
U.S. Cl. 200—303 **9 Claims**



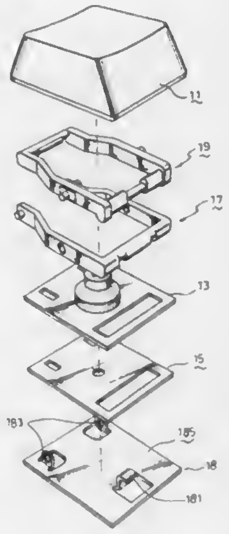
2. A push-to-talk switch assembly for a portable radio, comprising:
a radio housing having inner and outer side walls, the radio housing including:
a recessed area formed within the outer side wall, the recessed area including first and second holes;
a retaining wall coupled to the inner side wall;
a membrane having first and second surfaces, the membrane including:
a key formed on the first surface;
a plunger corresponding to the key formed on the second surface;
an opening formed through the first and second surfaces;
a bezel having first and second sides, the bezel including:
a recessed area formed on the second side for receiving the membrane and forming a bezel keypad assembly;
a through hole formed through the first and second sides for receiving the key of the membrane;
a hook coupled to the second side, the hook protruding through the opening of the membrane when the membrane is seated in the bezel;
first and second tabs coupled to the bezel;
the first and second tabs of the bezel keypad assembly snap fitting into the recessed area of the housing such that the plunger aligns with the first hole of the housing and the hook protrudes through the second hole of the housing; and

- a back support plate slideably inserted between the inner side wall of the radio housing and the retaining wall, the back support plate including:
  - an aperture for slideably engaging the hook of the bezel so as to restrain the back support plate within the retaining wall and the inner side wall of the radio housing;
  - a switch aligning with the plunger when the back support plate is inserted between the inner side wall of the radio housing and the retaining wall.

5,746,308
PUSH BUTTON SWITCH HAVING SCISSORS-TYPE ARM MEMBERS

San-Feng Lin, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Japan

Filed Dec. 2, 1996, Ser. No. 758,686
Int. Cl.⁶ H01H *3/12*
U.S. Cl. 200—344 14 Claims

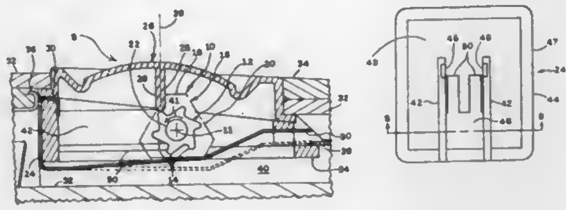


1. A push button switch comprising:
- a key cap having a top and a bottom surface, a first pair of spaced-apart bearing portions and a second pair of spaced-apart bearing portions formed on the bottom surface;
- a baseplate having a pair of receiving slots and a single baseplate bearing portion formed on the baseplate, the single baseplate bearing portion displaced from each receiving slot by substantially the same distance, the baseplate having a main flat surface;
- a switch element which selectively electrically conducts in response to up-and-down motion of the key cap;
- an internal arm element having a closed shape and two ends, the internal arm element having a first shaft provided at the first end thereof, the first shaft being rotatably connected to the first pair of spaced-apart bearing portions and having first and second end portions, the internal arm element further including a second shaft provided at the second end thereof, the second shaft being slidably rotatably received in the single baseplate bearing portion and having first and second end portions, the internal arm element including a first side frame and a second side frame to connect the first shaft and the second shaft at the first and second end portions of the shafts;
- an external arm element having a U-shape, the external arm element having a third shaft provided at an end thereof, the third shaft being rotatably connected to the second pair of spaced-apart bearing portions, the external arm element including a third side frame and a fourth side frame, each having opposed first and second end portions, each connected to the third shaft at its first end portion, and each having, a pin provided at its second end portion, the pin being slidably rotatably received in the pair of receiving slots.

5,746,309
RATCHET CAM ALTERNATE ACTION MECHANISM

James U. Neyer, Middleton, Wis., assignor to Rayovac Corporation, Madison, Wis.

Filed Mar. 19, 1996, Ser. No. 618,528
Int. Cl.⁶ H01H *19/62*
U.S. Cl. 200—528 65 Claims



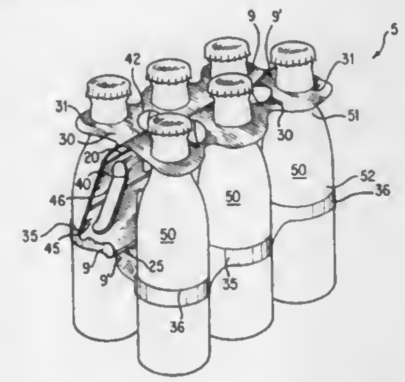
1. An alternate action mechanism, comprising:
- (a) a frame;
- (b) a ratchet cam supported from said frame, said ratchet cam comprising (i) a cam portion, having at least two pairs of alternating high and low cam surfaces, said cam portion being substantially centered in said ratchet cam, and (ii) a ratchet portion secured to and mounted for rotation with said cam portion, said ratchet portion including a number of spaced ratchet teeth facilitating rotating of said ratchet cam about a first axis;
- (c) actuating apparatus rotating said ratchet cam and thereby actuating said alternate action mechanism by pushing against said ratchet teeth to provide a force causing the rotation; and
- (d) a resilient contact sufficiently close to said cam portion of said ratchet cam, that depressing said actuating apparatus rotates said ratchet cam and alternately actuates said resilient contact between first and second positions;

said alternate action mechanism being free from coil springs.

5,746,310
WELDED CONTAINER CARRIER

Edward J. Slomski, Crystal Lake, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 5, 1996, Ser. No. 760,482
Int. Cl.⁶ B65D *71/00*
U.S. Cl. 206—150 12 Claims

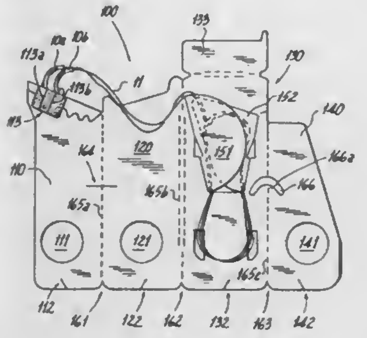


1. A carrier for carrying a plurality of containers in adjacent rows, the carrier comprising:
- two sheets of plastic material, a first line of connection and a second line of connection joining the two sheets together, the first line of connection spaced at a distance from the second line of connection;
- a panel of at least one of the sheets positioned between the first line of connection and the second line of connection so that the carrier when carrying a plurality of containers has the panel positioned between the rows of containers;
- each of the sheets having at least one first receiving opening above the first line of connection and at least one second receiving opening below the second line of connection; and
- at least one of the sheets forming a handle.

5,746,311
SUTURE RETAINER AND METHOD

David L. Brown, Wallingford, Conn.; Andrew P. Stellon, Rivervlae, N.J., and Edward A. Gemma, Jr., Milford, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 370,956, Jan. 10, 1995, Pat. No. 5,566,821. This application Oct. 18, 1996, Ser. No. 733,896
The portion of the term of this patent subsequent to Jan. 10, 2015, has been disclaimed.
Int. Cl.⁶ A61B *17/04*; B65B *11/02*
U.S. Cl. 206—63.3 15 Claims



1. A method for packaging a surgical suture, comprising:
- a) providing a suture retainer having a plurality of foldably connected panels, and an insert member mounted to one of the panels, the insert member having a center portion attached to one of the panels and first and second wings foldably connected to the center portion along respective fold lines, the first and second wings being foldable over the center portion to form a suture retaining pocket;
- b) positioning a coiled suture in the suture retaining pocket;
- c) folding the first wing over the suture;
- d) folding the second wing over the first wing and the suture; and
- e) folding at least one of the panels of the suture retainer to at least partially enclose the suture.

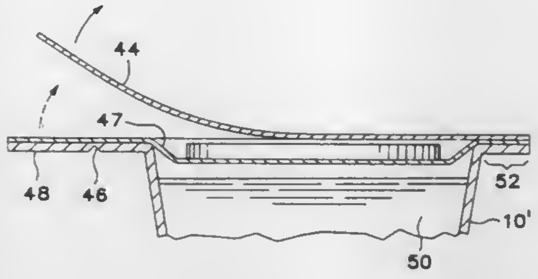
11. A surgical suture retainer comprising:
- a) a suture retaining panel;
- b) a suture coil retained on the suture retaining panel in an epitrochoidal configuration, the suture coil having first and second inwardly curved lateral sides; and
- c) a cover sheet of sealable material attached to the suture retaining panel at weld spots positioned outside the inwardly curved lateral sides for maintaining the suture coil in the epitrochoidal configuration.

5,746,312
METHOD AND APPARATUS FOR SUPPLYING TWO-PART SYSTEMS

Jimmie L. Johnson, 605 W. Madison, No. 4810-3, Chicago, Ill. 60661

Continuation of Ser. No. 477,070, Jun. 7, 1995, Pat. No. 5,584,388, which is a continuation-in-part of Ser. No. 230,847, Apr. 21, 1994, Pat. No. 5,456,351, which is a continuation-in-part of Ser. No. 124,301, Sep. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 864,494, Apr. 7, 1992, Pat. No. 5,246,106. This application Oct. 28, 1996, Ser. No. 738,846
Int. Cl.⁶ A47G *19/22*
U.S. Cl. 206—217 20 Claims

1. A container for supplying at least a first and a second constituent part in a single package while maintaining said at least first and second constituent parts separate, comprising:



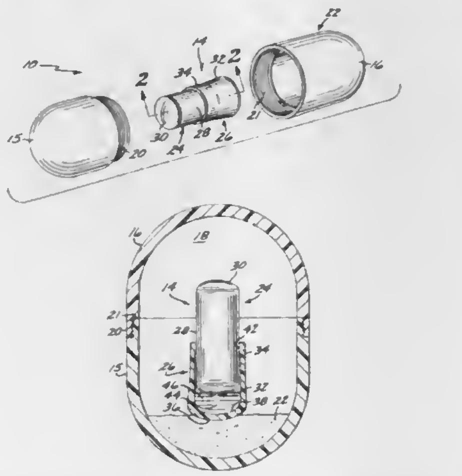
- a first container portion for accommodating said first constituent therewithin and having an opening for receiving and dispensing said first constituent;
- a first sealing member releasably adhered to a portion of said first container portion for sealing said opening to prevent unintended dispensing of said first constituent, wherein said first sealing member has a tab member extending outwardly of said opening of said first container portion; and
- a second sealing member releasably adhered to said first sealing member, said first and second sealing members defining a second container portion therebetween for receiving and containing the second constituent part, wherein said second sealing member has a tab member positioned above the tab member of the first sealing member, and wherein the tab member of the second sealing member extends outwardly of said opening of said first container portion,

whereby a user may access said container for dispensing said second constituent part by removing said second sealing member from said first sealing member by grasping said tab member of said second sealing member and lifting said second sealing member away from said first sealing member, thereby providing access to said second constituent part and whereby the user may access said first constituent part by grasping said tab member of said first sealing member and lifting said first sealing member away from said first container portion.

5,746,313
MIXING CAPSULE AND METHOD OF MANUFACTURING SAME

Michael S. Wilson, Minden, Nev., assignor to Wykle Research, Inc., Carson City, Nev.

Filed Aug. 12, 1996, Ser. No. 695,629
Int. Cl.⁶ B65D *25/08*
U.S. Cl. 206—220 25 Claims



1. A dental amalgam storage capsule device comprising:

an elongated pestle of a predetermined cross-sectional configuration to define an a barrel having an elongated peripheral sealing wall; and

a cap formed with a mercury storage compartment and configured with a peripheral skirt defining an opening receiving said barrel, said skirt terminating in a resilient sealing lip having sufficient resiliency to, upon receipt of mercury in said compartment, normally seal against said sealing wall with sufficient force to normally maintain a tight seal against flow of said mercury and responsive to, upon insertion of said pestle into said compartment to contact said mercury and raise the hydraulic pressure thereof to a predetermined pressure, sealingly disengage said wall for flow of at least a portion of said mercury between said lip and wall.

5,746,314
DISC CASE

Stian V. Knutsen, Veritasv. 2, N-1322 Hövik, Norway, and Jan Fresvig, N-7520, Hegra, Norway

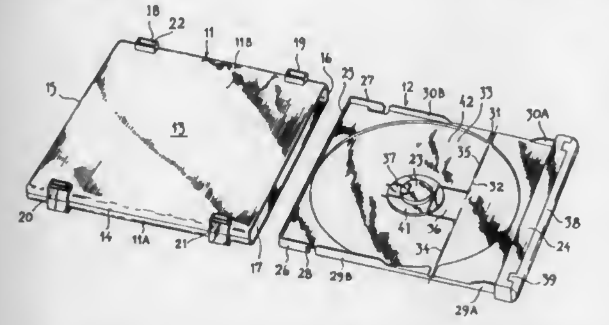
PCT No. PCT/NO94/00205, § 371 Date Dec. 30, 1996, § 102(e) Date Dec. 30, 1996, PCT Pub. No. WO95/17752, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 14, 1994, Ser. No. 700,385

Claims priority, application Norway, Dec. 22, 1993, 934783

Int. Cl.^{6} B65D *85/57*

U.S. Cl. 206—308.1 **4 Claims**



1. A container for compact discs having a pocket shaped disc cover (**11**) and a disc drawer (**12**) for insertion in the cover with a disc having a central opening thereon, said disc drawer being provided with a circular recess (**33**) to receive the disc and a center member (**23**) to maintain the disc in position by engaging the central opening, a front part of the disc drawer (**12**) being provided with a hinge line (**32**) crossing the front portion of the recess (**33**) to expose the adjacent part of the disc characterized by a tongue (**36**) extending from the hinge (**32**) and rigidly connected to the front part of the disc drawer.

5,746,315
HOLDING DEVICE FOR COMPACT DISCS

Hans-Jürgen Luckow, Rhener Kehre 10, D-24558 Henstedt-Rhen, Germany

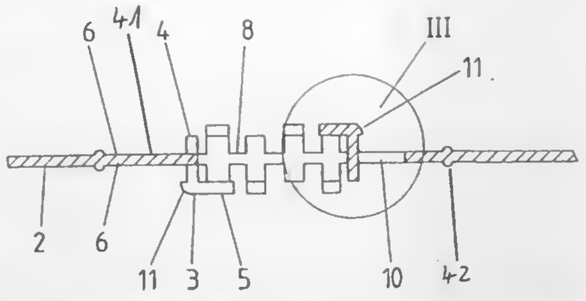
Filed Feb. 1, 1996, Ser. No. 593,152

Claims priority, application Germany, Feb. 2, 1995, 195 03 264.0

Int. Cl.^{6} B65D *85/57*

U.S. Cl. 206—310 **20 Claims**

1. A holding device for compact discs within a receiving container, which contains at least one upper shell and at least one lower shell and which is equipped with clamping elements for retaining the compact discs in the area of a central opening and where the clamping elements with their vertical ridges rise in an essentially perpendicular direction from a support surface of a plate of the holding element for the compact discs and are disposed along the circumference of a central opening of the receiving surface and where, proceeding in a radial direction from a center of the holding device, an opening is disposed behind at least one of the clamping elements, which opening extends in a circumferential direction along at least a part of a rearward boundary of the clamping element, characterized in that the clamping element includes at least one positioning projection (**11**), which forms a collar over the opening (**10**) at least in some regions, that the plate (**13**) of the holding device extends radially inward between adjacent vertical ridges (**4**), and that by the disposition of the plate (**13**) of the holding device between said vertical ridges (**4**) a transition of circumferentially opposite edges of said vertical ridges (**4**) into the plate of the holding device is formed and radial ridges extending radially inwardly into said center opening from the ends of selected ones of said vertical ridges.



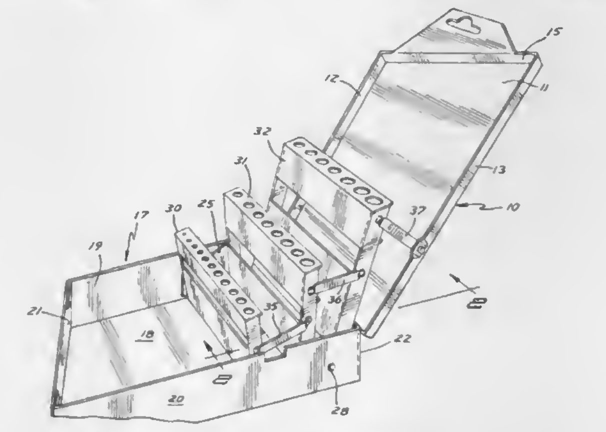
5,746,316
TRAY CONNECTING MEMBERS FOR A DRILL BIT CASE

Charles La Barre, Woodbury, Minn., assignor to Huot Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 496,308, Jun. 29, 1995, abandoned. This application Jan. 24, 1997, Ser. No. 788,192

Int. Cl.^{6} B65D *85/20*

U.S. Cl. 206—379 **3 Claims**



1. A case for containing drill bits comprising
a trapezoidal housing having parallel side walls, a front end and a rear end wall and a cover pivoted to said rear end wall,
a plurality of bit holding trays including a first and a last tray in parallel arrangement with each other and with said cover,
means pivotally securing said trays between said side walls of said housing,
said trays and said cover have side walls,
a first aperture in the side walls of said trays and said cover at one side of said housing,
a second aperture in said side walls of said trays at said one side of said housing except for said first tray,
elongated connecting members connecting each of said trays, and said cover with said rear tray,
said connecting members each having a stepped end portion for initial insertion into said first aperture of each of said side walls of said trays and said cover,
each of said connecting members having at its other end portion a locking substantailly right angled portion having an upwardly angled tip portion for insertion into said second aperture, and

said connecting members being flexed for insertion of their respective end portions into said respective first and second apertures and upon being released said members elongate to extend into locking positions into said respective apertures, and movement of said cover raises and lowers said trays.

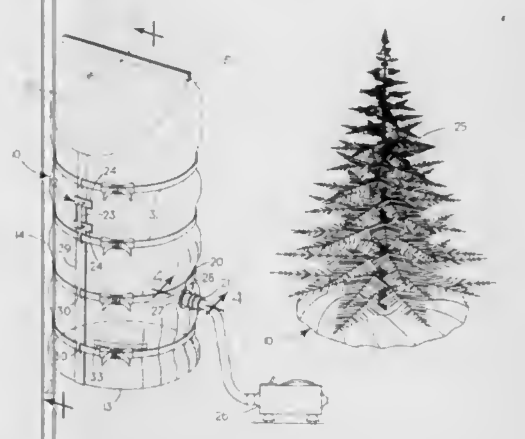
5,746,317
EVACUATIVE CHRISTMAS TREE CONTAINER

Wayne E. Turner, and Peggy B. Turner, both of 3300 Highway 2 West, P.O. Box 8240, Kalispell, Mont. 59904

Filed Jun. 6, 1997, Ser. No. 870,650

Int. Cl.^{6} B65D *85/50*

U.S. Cl. 206—423 **7 Claims**



1. An evacuative Christmas tree container, comprising in combination:
a flexible, gas impervious bag defining a pneumatically sealable internal chamber to contain a Christmas tree and having
a bottom, an elongate body and an upper transition element communicating with
an upper orifice having a plastic zipper openable for access to the internal chamber and closable to form a pneumatically sealed orifice;
handle structure carried by the bag with at least one elongate U-shaped handle interconnected with the outer surface of the bag; and
vacuum structure carried by the bag defining a vacuum orifice in the bag and having
a vacuum channel carried by the bag about the vacuum orifice to extend spacedly distant from the bag to interconnect a vacuum source and
a plastic zipper in the medial portion of the vacuum channel to allow opening and closing of the vacuum channel to provide a pneumatic seal therein.

5,746,318
REUSEABLE FACIAL TISSUE DISPENSING SYSTEM

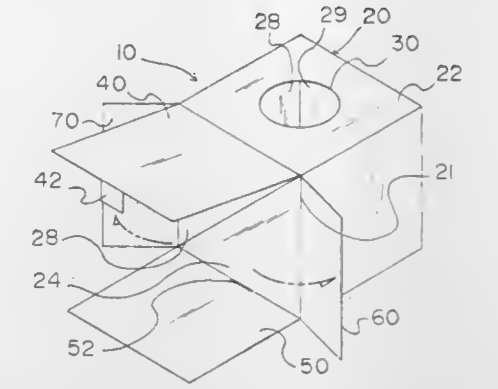
Sally Fiona Batchelor, 39 The Avenue, March, Cambridgeshire, PE5 9PS, United Kingdom

Filed Jan. 16, 1997, Ser. No. 783,355

Int. Cl.^{6} B65D *73/00*

U.S. Cl. 206—494 **6 Claims**

1. A Reusable Facial Tissue Dispensing System comprising:
a tissue dispensing box having a top side, a bottom side, a left side, a right side, a front side and an open rear side forming an interior;
said open rear side having an outer perimeter;
said top side includes an opening concentrically positioned allowing a tissue paper to be dispensed through from within said interior;
a left flap pivotally secured to said outer perimeter adjacent to said left side;



a right flap pivotally secured to said outer perimeter adjacent to said right side, wherein said left flap and said right flap are positioned within said open rear side when said tissue dispensing box is closed thereby substantially closing said open rear side;
a bottom flap pivotally secured to said outer perimeter adjacent to said bottom side forming a pivital intersection, wherein said bottom flap is positioned juxtaposed to said left flap and said right flap when said tissue dispensing box is closed thereby substantially closing said open rear side:
a top flap having a first end and a second end;
said first end pivotally secured to said outer perimeter adjacent to said top side;
said pivotal intersection including a slit concentrically positioned; and
a rectangular tongue flap pivotally secured to said second end of said top flap substantially concentric for matingly coupling with said slit within said pivotal intersection when said tissue dispensing box is closed, said tongue flap having a length parallel said second end of said top flap being not greater than one sixth the length of said second end of said top flap.

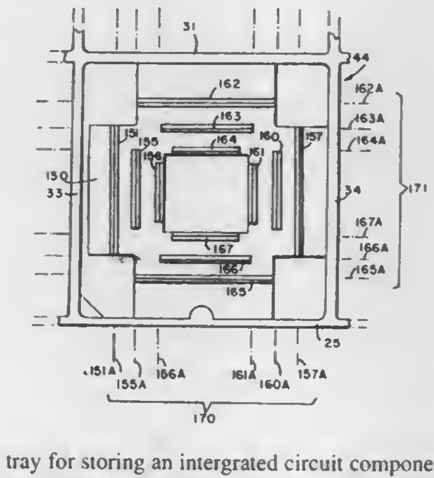
5,746,319
TRAY FOR INTEGRATED CIRCUITS

Robert H. Murphy, Merrimack, N.H., assignor to R.H. Murphy Co., Inc., Amherst, N.H.

Continuation of Ser. No. 165,255, Dec. 10, 1993, abandoned, which is a continuation of Ser. No. 843,622, Feb. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 587,966, Sep. 25, 1990, Pat. No. 5,103,976. This application Oct. 10, 1995, Ser. No. 556,550

Int. Cl.^{6} B65D *73/02*

U.S. Cl. 206—725 **17 Claims**



1. In a tray for storing an intergrated circuit component having a housing lying in a plane with spaced planar surfaces bounded by edges and an array of spaced terminals extending essentially normally to one planar surface of the housing in spaced parallel rows, the improvement comprising:

A. a plurality of upstanding rib means for engaging the housing upon positioning the integrated circuit component in said tray. certain of said upstanding rib means lying on a first set of spaced. parallel rib axes and others of said upstanding rib means lying along a second set of spaced. parallel rib axes. the rib axes in said first set intersecting the rib axes in the second set. each said upstanding rib means having an edge portion that is substantially coplanar with the edge portions of others of said rib means for contacting the one planar surface of the housing intermediate adjacent ones of the spaced terminal rows. said edge portions engaging the one planar surface providing the sole support for the integrated circuit component normal to the planar surface and said upstanding rib means extends between terminal pins adjacent thereto. and

B. dimensionally stable framework means for supporting said upstanding rib means on the axes.

5,746,320

FRICTION ELECTRIFYING-TYPE ELECTROSTATIC SORTING APPARATUS

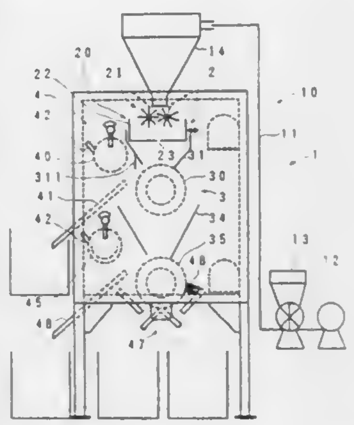
Yoshihisa Fujita, Saitama-ken; Masakatsu Kumagai, and Yoshihisa Aizawa, both of Aichi-ken, all of Japan, assignors to Tooyota Tsusho Corporation, Nagoya; Senko Kogyo Co., Ltd., Tokyo, and Toyota Metal Co., Ltd., Nagoya, all of Japan

Filed Jun. 12, 1995, Ser. No. 489,689

Claims priority, application Japan, Jun. 10, 1994, 6-153008

Int. Cl.^{6} B03C *7/00*

U.S. Cl. 209—127.3 **21 Claims**



1. A friction electrifying-type electrostatic sorting apparatus, comprising:

a preliminary friction electrifying unit for preliminarily electrifying a sorted material by providing a friction

a friction electrifying unit for further electrifying the preliminary friction electrified sorted material. said friction electrifying unit having a chamber with a lining of an electrifying material provided on an inner wall of the chamber and a mechanism for moving the chamber to provide said further electrifying of the preliminary friction electrified sorted material by a corresponding movement of the chamber lining;

a feeding unit for supplying the sorted material having been electrified by said friction electrifying unit: and

an electrostatic sorting unit for electrostatically sorting the electrified sorted material supplied from said feeding unit according to the electrified state of the electrified sorted material by exposing the electrified sorted material to an electrostatic field.

5,746,321

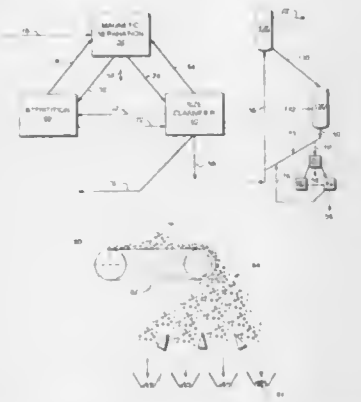
COMBINATION MAGNETIC SEPARATION, CLASSIFICATION AND ATTRITION PROCESS FOR RENEWING AND RECOVERING PARTICULATES

William P. Hettinger, Jr., Deerfield Beach, Fla.; Howard F. Moore, Catlettsburg, Ky.; Terry L. Goolsby, Ashland, Ky., and A. V. Peppard, Catlettsburg, Ky., assignors to Ashland Inc., Ashland, Ky.

Division of Ser. No. 305,525, Sep. 13, 1994, Pat. No. 5,636,747, which is a continuation-in-part of Ser. No. 695,188, May 3, 1991, Pat. No. 5,393,412. This application Jul. 27, 1995, Ser. No. 459,012

Int. Cl.^{6} B07B *1/00;* C10G *11/00*

U.S. Cl. 209—233 **3 Claims**



1. A process for separation of higher metal fractions from lower metal fractions of particulates comprising fluidized catalytic cracking catalyst containing metals from a fluidized catalytic cracking process, comprising classifying classification by elutriation or fluidized centrifugation of said catalyst to split said catalyst into a higher metals-containing fraction and a lower metals-containing fraction and wherein said lower metals-containing fraction is comprised of particulates of larger average diameter than the particulates of the higher metals-containing fraction.

5,746,322

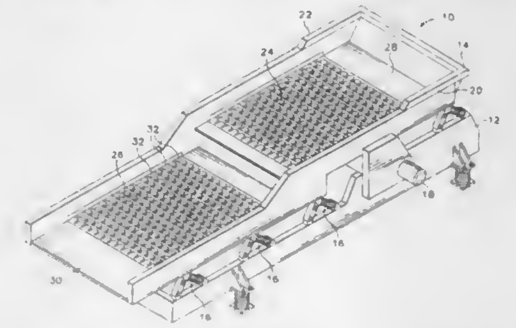
VIBRATORY FINGER SCREEN WITH LATERAL WEDGE MEMBERS

Andrew T. LaVeine, Newberg, and Stanley L. Humiston, Beaverton, both of Oreg., assignors to Action Equipment Co., Inc., Newberg, Oreg.

Filed Jul. 2, 1996, Ser. No. 674,398

Int. Cl.^{6} B07B *1/49*

U.S. Cl. 209—393 **14 Claims**



1. A vibratory screening machine for separating materials according to particle size comprising:

(a) a vibratory frame:

(b) a sizing screen supported by the frame, the sizing screen comprising a plurality of finger plates, each finger plate having a plurality of fingers, the fingers in said plurality comprising a tip portion and a pair of tapered sides, and separated by lateral gaps therebetween, said plurality of fingers having at least one lateral wedge member extending substantially vertically downwardly from said fingers, said at least one lateral wedge member including a pair of lateral wedge surfaces, each one of said lateral wedge surfaces depending from each tapered side of said fingers, respectively.

5,746,323

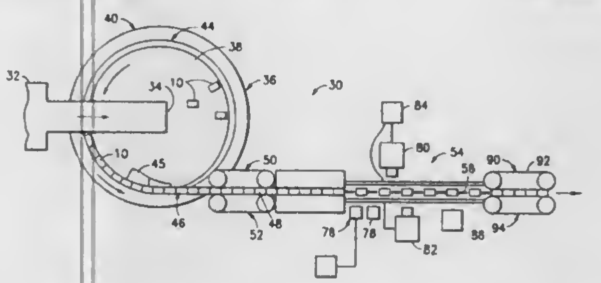
APPARATUS FOR HIGH SPEED INSPECTION OF OBJECTS

Peter J. Dragotta, Wayne, N.J., assignor to M.W. Technologies, Inc., Elmwood Park, N.J.

Filed Dec. 11, 1995, Ser. No. 570,402

Int. Cl.^{6} B07C *5/02*

U.S. Cl. 209—539 **23 Claims**



13. An inspection apparatus for inspecting each of a plurality of objects, said apparatus comprising:

a hopper for storing said plurality of said objects;

a feeder for sequentially feeding objects from said hopper;

a linear conveyor for linearly conveying said objects from said feeder;

a spacing scanner in proximity to said linear conveyor for sensing spacing between adjacent objects on said conveyor;

a blow-off unit downstream from said spacing scanner for removing objects having an elapsed time spacing relative to adjacent objects less than a predetermined minimum elapsed time spacing; and

a pair of oppositely directed cameras disposed respectively on opposite sides of said conveyor for optically inspecting opposed sides of each object being linearly conveyed by said conveyor.

5,746,324

REFUSE SORTING DEVICE FOR REFUSE STORAGE ROOMS

Lars Smedlund, Starrkärr, Sweden, assignor to Smedlund Milsiosystem Ab, Odsmal, Sweden

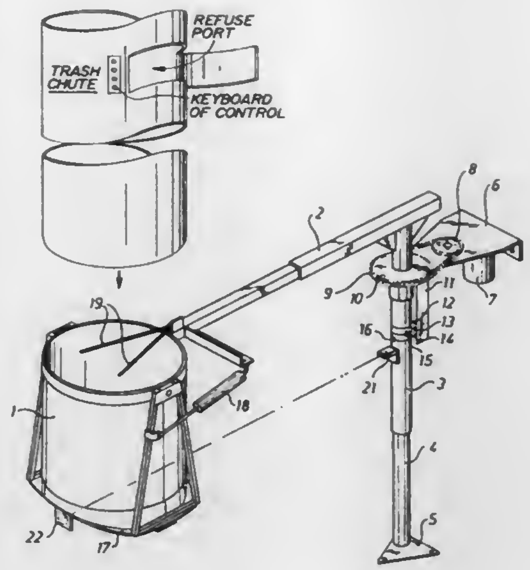
PCT No. PCT/SE94/00259, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO94/21390, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 24, 1994, Ser. No. 525,738

Claims priority, application Sweden, Mar. 24, 1993, 9300968

Int. Cl.^{6} B07C *7/04;* B65D *91/00*

U.S. Cl. 209—705 **7 Claims**



1. A device for sorting refuse discharging from the bottom end of a vertical refuse chute having refuse introducing ports at one of more upper levels, and terminating in a refuse storage room in which a plurality of upwardly opening refuse bins are arranged at respective sites in a horizontally extending array, said device comprising:

an upwardly open container having an openable-closable bottom;

a support supporting said upwardly open container for movement to each of a plurality of positions, in one of which said upwardly open container is positioned to receive a lot of refuse which has been introduced into said refuse chute through one of said refuse ports and is discharging from the bottom end of the refuse chute, and in each of a plurality of which said container is stationed over a respective said site, for facilitating discharging of a lot of refuse disposed in the said container, downwardly into a respective underlying refuse bin;

a first detector associated with said container and arranged to detect the falling of a lot of refuse into said container from said bottom end of the refuse chute;

a motor operatively associated with said support and said container, for moving said container to respective selected ones of said positions;

a second detector operatively associated with said container and arranged to detect that said container has become disposed in a presently selected one of said positions; and

a control operatively associated with said motor and arranged for receiving as import a selection of one of said positions.

5,746,325

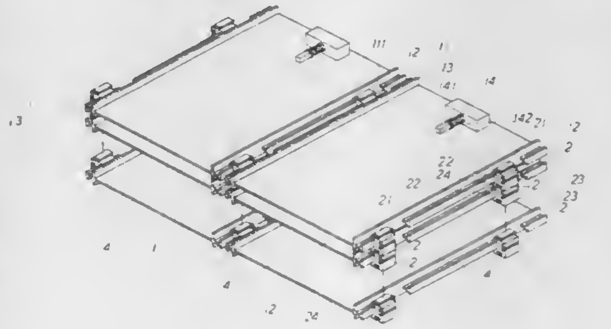
KNOCKDOWN CD/AUDIO TAPE STORAGE RACK

Yu-jong Lee, 10F-3, No. 9, Sec. 2, Roosevelt Rd., Taipei, Taiwan

Filed Feb. 21, 1996, Ser. No. 604,484

Int. Cl.^{6} A47G *29/00*

U.S. Cl. 211—40 **1 Claim**



1. A knockdown CD/audio tape storage rack comprising a plurality of rows and lines of continuous compartments each for storing a CD or an audio tape therein, said compartments each being assembled from two superposed supporting plates and at least six connecting blocks slidably mounted onto two lateral sides of said supporting plates to connect said supporting plates together;

said supporting plates each having two side rails one at each lateral side thereof and a two-step push means connected to a rear end thereof, said side rails each having a front cut and a rear cut for said connecting blocks to be easily mounted onto said side rails, and a stop piece disposed at an inner side adjacent to an edge of said supporting plates of said rail, said two-step push means having a retractable front push rod and a return spring put around said push rod, such that said CD/Audio tape can be positioned in said compartment with a front side thereof flush with a front opening of said compartment by inserting said CD/audio tape into said compartment and pushing said push rod back into said push means, and that said inserted CD/audio tape can be easily removed from said compartment simply by pushing said CD/audio tape once again to touch and release said retracted push rod from said push means under a spring force of said return spring; and

said connecting block each being formed with a top engaging piece, and a left, a right, and a bottom receiving channels, said top engaging piece having an outer configuration the same as an inner profile of said bottom channel such that each said connecting block is allowed to have another connecting block connected to an upper and/or a lower side thereof, and said left and said right receiving channels both having an inner profile the same as an outer configuration of said side rails of said supporting plates, such that each said connecting block is allowed to fitly mount on said side rail and be stably moved along said rail and is allowed to have a second supporting plate connected to one of said left and right side receiving channel thereof; and

thereby unlimited number of said supporting plates can be connected by said connecting blocks to define multiple rows and lines of continuous compartments for accommodating CDs and/or audio tapes, forming said knockdown CD/audio tape storage rack.

5,746,326
SHELF UNIT WITH A SPRING FOR USE IN A RACK FOR STORING A COMMUNICATION SYSTEM

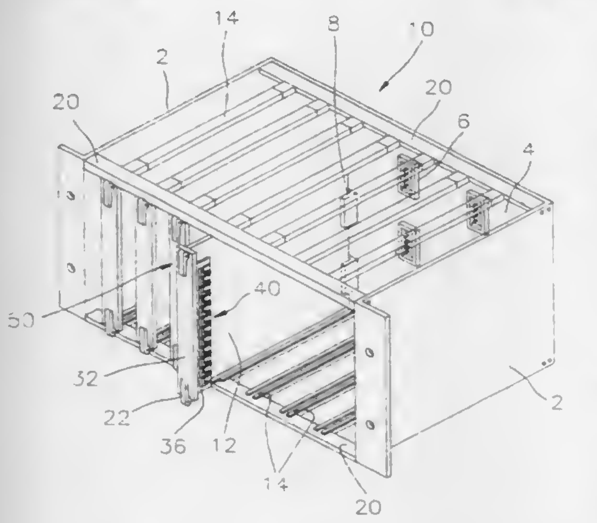
Kee-Chul Hong, Incheon, Rep. of Korea, assignor to Daewoo Telecom Ltd., Rep. of Korea

Filed Dec. 6, 1996, Ser. No. 764,099

Claims priority, application Rep. of Korea, Dec. 8, 1995, 95-47701

Int. Cl.^{6} A47G ***19/08***

U.S. Cl. 211—41.17 **4 Claims**



1. A shelf unit for use in a rack for storing a communication system, the shelf unit comprises:

an elongated front plate having a fixing portion for mounting a printed circuit board and a projecting portion backwardly extended at both lateral edges thereof, respectively, the projecting portion having a recessed portion; and

a spring having a substantially V-shaped configuration, the spring includes one side of said V-shaped configuration defining a body and the opposite side of said V-shaped configuration defining a plurality of spring members connected to and arranged along the body, each of the spring members including an elastic portion having a bending portion inwardly bent at an end thereof toward said body, and a compressing portion provided between the elastic portion and the body and further inwardly bent relative to the elastic portion toward said body, wherein the projecting portion is interposed between the body and the compressing portion of the spring and the elastic portion is adapted to be biased by coming into contact with the fixing portion of an adjacent front plate, to prevent electromagnetic waves from penetrating through a gap between neighboring front plates.

5,746,327
RECEIVING MATERIAL HOLDER

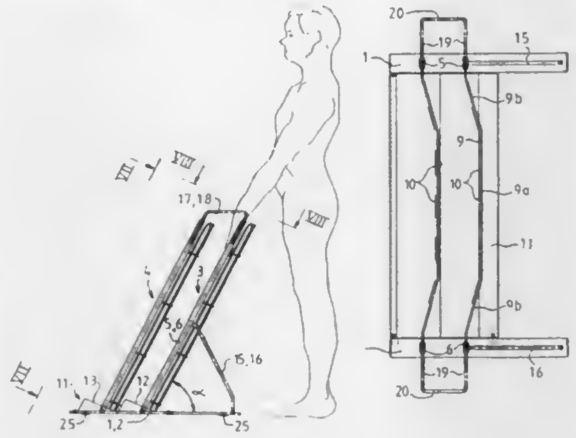
Johannes M.H.P.L. Leermakers, Venlo; Albertus M.B.M. Van Os, Grathem, and Cornelis H.J. Slaats, Neer, all of Netherlands, assignors to OCE-Nederland, B.V., Venlo, Netherlands

Filed Mar. 7, 1996, Ser. No. 614,800

Claims priority, application Netherlands, Mar. 7, 1995, 9500445

Int. Cl.^{6} A47F ***7/00***

U.S. Cl. 211—50 **18 Claims**



1. A holder for sheet material, the holder comprising at least one sloping support for receiving a stack of sheet material, the holder being free-standing and the support sloping at an angle between 60° and 70° relative to horizontal, the at least one sloping support having a horizontally concave shape.

5,746,328
PEGBOARD-MOUNTABLE ADJUSTABLE MERCHANDISING RACK

Mark T. Beeler, and Brian H. Welker, both of Winston-Salem, N.C., assignors to Decision Point Marketing, Inc., Winston-Salem, N.C.

Filed Aug. 23, 1996, Ser. No. 702,260

Int. Cl.^{6} A47F ***7/00***

U.S. Cl. 211—59.3 **12 Claims**

1. An apparatus for displaying products on a pegboard having spaced holes comprising

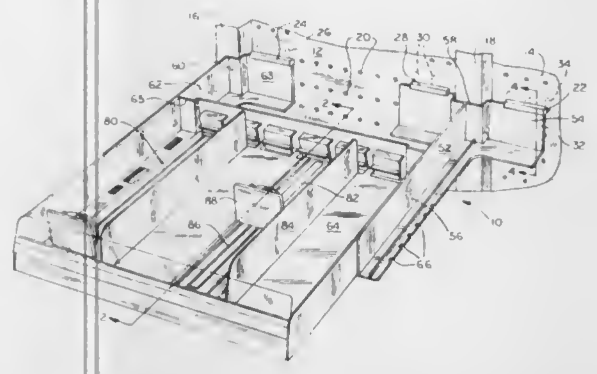
at least two pegboard connection elements each including prongs spaced apart by a distance equal to spacing between holes in the pegboard,

at least two brackets, each engageable with a corresponding pegboard connection element in a laterally adjustable connection, and

a tray supported on said brackets and having product pushers movably mounted therein,

whereby said pegboard connection elements may be mounted on the pegboard by insertion of their respective prongs through holes in the pegboard, said brackets may each be engaged with a corresponding connection element to extend from the pegboard and said tray may be mounted on said brackets,

wherein each pegboard connection element has upper and lower inward-facing grooves spaced apart a first distance, and said brackets have upper and lower outwardly-facing flanges spaced apart slightly less than the first distance to permit lateral insertion of said flanges in said grooves to engage said brackets with said pegboard connection elements.



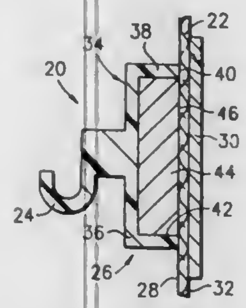
5,746,329
HANGER SYSTEM

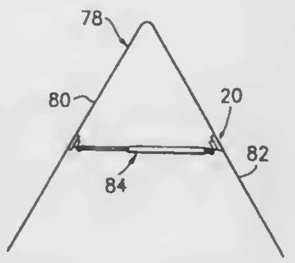
Charles J. Rondeau, Lake Charles, La., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 28, 1995, Ser. No. 520,664

Int. Cl.^{6} A47F ***5/00***

U.S. Cl. 211—123 **8 Claims**





1. A hanger device for harmless removable attachment to flexible sheet material having first and second opposed surfaces comprising:

a hook member for releasably suspending an article;

a magnetic base member integral with said hook member and engageable with the first surface of the flexible sheet material; and

a ferrous backing member engageable with the second surface of the sheet material and generally coextensive with said base member;

whereby said base member and said backing member are drawn together by the magnetic flux and held firmly but removably in engagement with the sheet material in a sandwiched relationship.

5,746,330
TOOL RACK

Geno DiBetta, 4702-8th Ave., Vienna, W. Va. 26105-3104

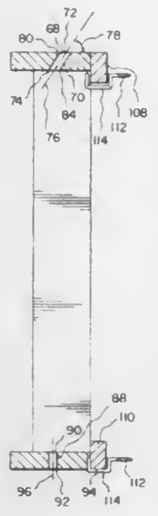
Filed Jan. 22, 1997, Ser. No. 785,402

Int. Cl.^{6} A47F ***7/00***

U.S. Cl. 211—70.6 **9 Claims**

1. A tool rack assembly comprising:

(a) a frame comprising



(i) a top cross piece,

(ii) a bottom cross piece,

(iii) a left side support extending from said top cross piece to said bottom cross piece,

(iv) a right side support extending from said top cross piece to said bottom cross piece, said left sided support being spaced apart from said right side support,

(b) a plurality of panels pivotally and removably attached to said frame, said panels each comprising a top pin unit and a bottom pin, said top pin unit being longer than said bottom pin, said top cross piece having a plurality of top holes each having a downwardly forwardly extending bore, said bottom cross piece having a plurality of holes each having a vertical bore, wherein said top pin unit of each panel has a pin which is positioned within a respective top hole, wherein said bottom pin of each panel is positioned within a respective bottom hole.

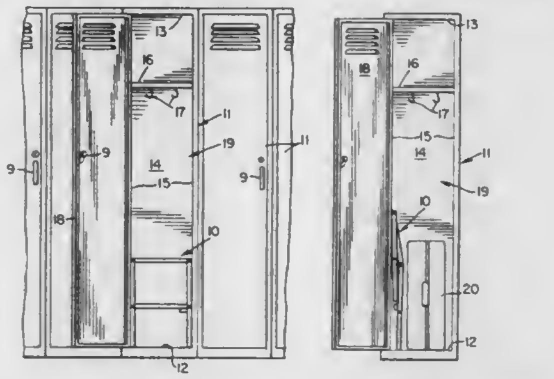
5,746,331
COLLAPSIBLE STAND FOR SCHOOL LOCKER

Rachel M. Kurtis, 6704 Cedar View Ct., Clifton, Va. 20124

Filed Jan. 14, 1997, Ser. No. 783,516

Int. Cl.^{6} A47F ***5/10***

U.S. Cl. 211—149 **4 Claims**



1. In combination with a school locker comprising an upright steel locker having a back wall joined by two side walls, a bottom floor and a top ceiling defining an open interior, a door hinged to one of said side walls for movement to an open position exposing the interior of the locker and to a closed position blocking access to the interior, the improvement comprising a collapsible stand removably inserted in said locker to be stored therein in a collapsed position and supported by said floor and one wall of said locker in an extended position, said stand formed of a pair of vertically spaced back legs, a pair of vertically spaced front legs, a top shelf and a lower shelf, said shelves pivotally connected to said back pair and said front pair of vertical legs for limited motion in

a clockwise and counter clockwise direction, a horizontally displaced stop bar secured to a bottom portion of said lower shelf for limiting rotational movement of said lower shelf by abutting said pair of front vertical legs to maintain said lower shelf in a horizontal substantially extended position whereby, when said stand is placed in said locker against said one wall, it is supported on said floor and prevented from collapsing by said stop bar preventing lower shelf rotational movement in one direction and said one wall preventing rotational movement of said back legs in the same direction.

5,746,332

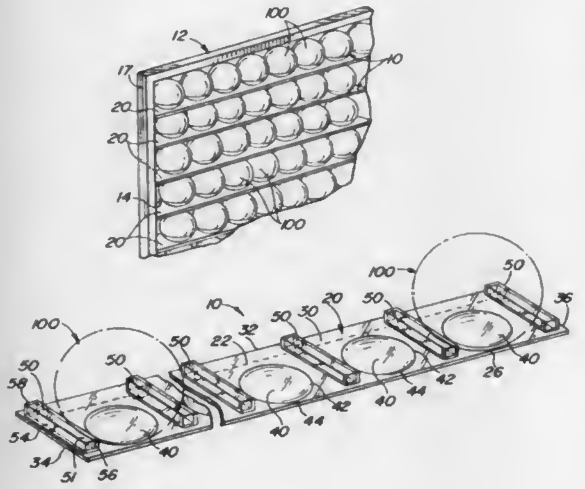
TRANSPARENT SHELF FOR DISPLAY ASSEMBLY

Roger E. Kleinschmidt, 5303 Park Place Cir., Boca Raton, Fla. 33486-1062

Filed Mar. 19, 1997, Ser. No. 820,975

Int. Cl.⁶ A47F *7/00*

U.S. Cl. 211—153 **12 Claims**



1. A shelf for use in a display assembly for displaying one or more objects, the assembly including a panel with an exposed front face and at least one groove therein,

said shelf comprising:

- a base formed of a transparent plastic material and including a top side, a bottom side, a front edge, a rear peripheral edge zone including a rear edge and opposite ends;
- cradle means on said top side for holding at least one of the objects so that the object is visibly disposed thereon;
- installation means on at least a portion of said rear peripheral edge zone of said base for snug fitted receipt within the groove of the panel to releasably hold said base on the panel of the display assembly in perpendicular relation to the front face of the panel to thereby define an installed position; and
- reinforcing means on said base for providing strength and rigidity to said base to discourage bending thereof when fitted to the panel in said installed position.

5,746,333

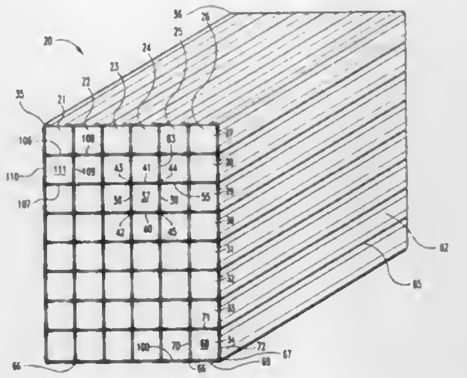
RIGID STORAGE DEVICE WITH VARIABLE SIZED CELLS

Kim Wuertemberger, Richmond, Ind., assignor to Contract Industrial Tooling, Inc., Richmond, Ind.

Filed Mar. 5, 1996, Ser. No. 611,276

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—189 **4 Claims**



1. A storage device having a plurality of parallel extending compartments comprising:

- a plurality of sheet shaped horizontally extending members having first edge portions, said horizontally extending members arranged in vertical rows and horizontal rows;
- a plurality of sheet shaped vertically extending members having second edge portions, said vertically extending members spacing said horizontal rows apart cooperatively with said horizontally extending members defining a plurality of compartments;
- a plurality of cross shaped holders each having a pair of spaced apart first flanges and a pair of spaced apart second flanges with said first flanges opening in an opposite direction than said second flanges receiving adjacent but spaced apart first edge portions of said horizontally extending members arranged in horizontal rows, said holders further having a pair of spaced apart third flanges and a pair of spaced apart fourth flanges with said third flanges opening in an opposite direction than said fourth flanges receiving adjacent but spaced apart second edge portions of said vertically extending members;
- a plurality of T-shaped side holders each having a pair of spaced apart fifth flanges opening inwardly toward said compartments receiving said first edge portions of said horizontally extending members, said T-shaped holders further having a pair of spaced apart sixth flanges and a pair of spaced apart seventh flanges opening in opposite directions and receiving said second edge portions of said vertically extending members;
- a plurality of T-shaped end holders each having a pair of spaced apart eighth flanges opening inwardly toward said compartments receiving said second edge portions of said vertically extending members, said T-shaped end holders further having a pair of spaced apart ninth flanges and a pair of spaced apart tenth flanges opening in opposite directions and receiving said first edge portions of said horizontally extending members; and,
- a plurality of L-shaped holders each having a pair of spaced apart eleventh flanges and a pair of spaced apart twelfth flanges arranged perpendicularly receiving respectively said first edge portions and said second edge portions forming corners of the storage device;
- said horizontally extending members and said vertically extending members are supported along their entire lengths by said cross-shaped holders;
- said horizontal extending members and said vertically extending members each include a pair of sheets separated by corrugated shaped elements.

5,746,334

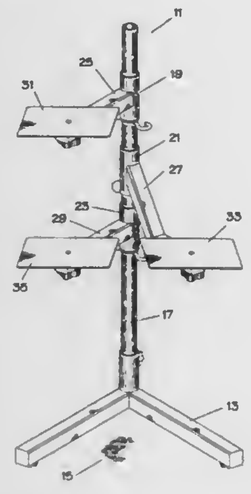
APPARATUS FOR SUPPORTING MODULAR AND COOPERATING COMPONENTS

Carl Brock Brandenberg, FM 3450, Box 188, Cresson, Tex. 76035

Continuation of Ser. No. 157,949, Nov. 24, 1993, abandoned. This application Jan. 23, 1997, Ser. No. 786,325

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—205 **74 Claims**



1. An apparatus for supporting modular and cooperating components having a mass, comprising:

- a base member including a plurality of discrete and orthogonally positioned leg members for engaging a flooring surface;
- a substantially vertical support pole extending upward from said base member and releasably coupled thereto;
- at least one bushing, concentrically engaging said substantially vertical support pole at a particular axial location;
- at least one support arm, extending radially outward from said at least one bushing at a particular orientation; and
- at least one support surface, secured to said at least one support arm, said at least one support surface being positioned substantially orthogonal to said substantially vertical support pole and adapted for receiving and supporting said modular and cooperating components at particular axial and angular positions relative to said base member and said substantially vertical support pole;
- locator means for (a) substantially fixing automatically during assembly through gravity bias said substantially vertical support pole in position relative to said base member in five out of six degrees of freedom, and (b) allowing movement automatically after assembly of said at least one support arm and associated at least one support surface to a predefined range of movement relative to said at least one bushing in order to locate said mass of said modular and cooperating components to a particular range of stable positions defined by said discrete and orthogonally positioned plurality of leg members of said base member.

5,746,335

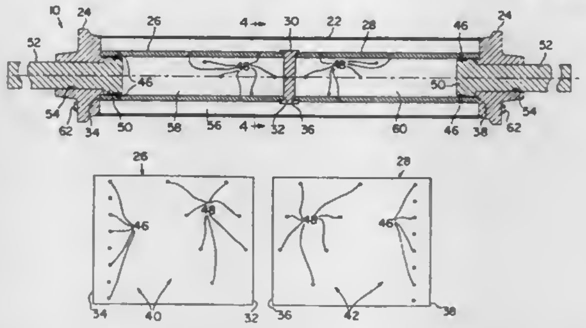
DOUBLE ACTING CENTER-OF-CAR CUSHIONING DEVICE

Steve A. Brough, Gardners, and John F. Deppen, New Cumberland, both of Pa., assignors to Keystone Industries, Inc., Camp Hill, Pa.

Filed May 1, 1996, Ser. No. 637,045

Int. Cl.⁶ B61G *7/00*

U.S. Cl. 213—43 **14 Claims**



12. A double acting center-of-car cushioning device for mounting in a pocket in a sliding sill of a rail car, said device including a generally cylindrical housing having a pair of end heads, a pair of pressure cylinders each connected to one said end head and extending toward the other said cylinder, a center plate joined to the ends of the pressure cylinders away from the end heads, said end heads, the pressure cylinders and the plate defining a pair of spaced pressure chambers, rod bores extending through said end heads and opening into said pressure chambers, and an outer body surrounding the pressure cylinders and the plate and joined to the end heads, said body, said end heads, said pressure cylinders and said plate defining an outer annular chamber, a pair of piston rods, each said piston rod extending through one of said rod bores with an end located in one of said pressure chambers, a piston on the end of each said piston rod and engaging an interior surface of one of said pressure cylinders, and a set of flow orifices formed in each said pressure cylinder, each said set of orifices including damping orifices spaced along one of said pressure cylinders adjacent the plate and at least one return orifice located adjacent one of said end heads.

5,746,336

COUPLER ADAPTOR FOR MODEL RAILROAD ROLLING STOCK

Lawrence D. Edwards, Eagle Point, Oreg., assignor to Kadee Quality Products Co., White City, Oreg.

Filed Jul. 11, 1996, Ser. No. 679,699

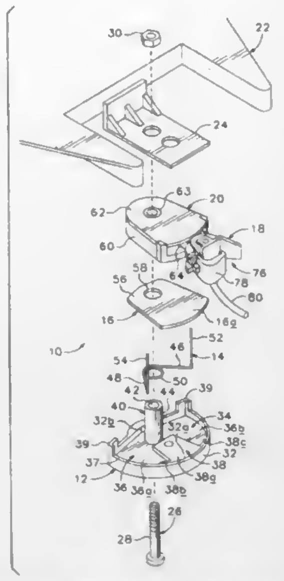
Int. Cl.⁶ B61G *7/00*

U.S. Cl. 213—75 TC **11 Claims**

9. A coupler adaptor for use with a coupler and draft box, for model railroad rolling stock, wherein the rolling stock includes a coupler mount thereon, wherein the coupler includes a coupler head, a knuckle and a shank, wherein the shank has a bore through one end thereof and is received in the draft box, and wherein the draft box also has a bore therethrough and carries a coupler centering spring therein, comprising:

an adaptor plate having:

- a spring receiver, having a wasted area therein, and a raised platform therein, and
- a cylindrical spring post having a cylindrical bore extending axially therethrough, wherein said spring post is sized to receive the draft box bore on the outside thereof and is sized to provide stand-off for adaptor plate from coupler mount with draft box inserted therebetween,
- a spring retainer which is received in said spring receiver and seats on said platform thereby providing a clear region between said adaptor plate and said spring retainer;
- a draft box angular travel limiter for limiting the angular travel of the draft box relative to said adaptor plate; and

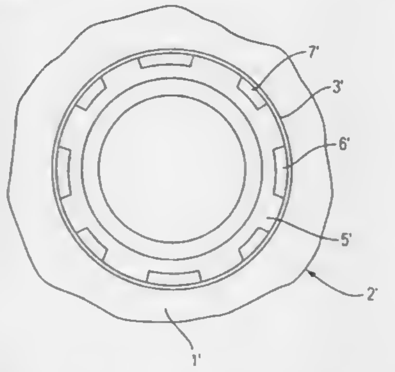


a spring, sized to be received in said clear region between said spring receiver and said spring retainer, having:
- opposed, extensible arms,
- draft-box-capturing fingers located at the ends of said arms, and
- a coil, located intermediate said arms, sized to fit over said spring post;

wherein, with said spring located in said clear region, the bore in the draft box and in the shank are aligned with one another and the draft box and shank are placed over said spring post, with one of said fingers located on either side of the draft box thereby to center the draft box on said adaptor plate.

5,746,337
CONTAINER, IN PARTICULAR A BOTTLE FOR LIQUIDS WHICH MAY BE UNDER PRESSURE

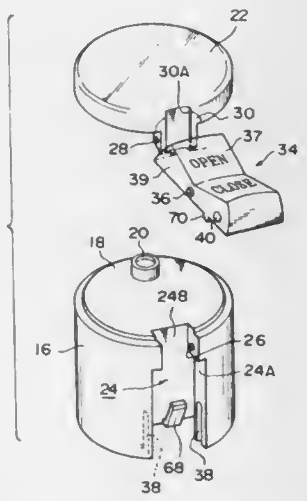
Henri Haist, Neunkirch, Switzerland, assignor to HVB Innova AG, Neunkirch,, Switzerland
Filed Nov. 2, 1995, Ser. No. 556,876
Claims priority, application Germany, Nov. 7, 1994, 44 39 464.0
Int. Cl.⁶ B65D *1/02*
U.S. Cl. 215—44 **6 Claims**



1. A container having an opening with a lip and a cap suited for sealing the opening by means of a sealing mass provided on the cap which can be deformed within limits, said container having an upper lip having at least one depression extending in the direction from the interior of the container to the outside periphery of the lip, said sealing mass having a deformability characteristic such that, upon initial closing of the container, said sealing mass completely fills and seals said depression but once disturbed, no longer fully occupies the depression when the cap position is changed on said lip; a plurality of evenly distributed depressions being provided in the lip of said container, the width of said depressions varying in a way that a depression of relatively small width is followed about the lip with a depresion of larger width in a circumferential direction.

5,746,338
CAP OPENING AND CLOSING MECHANISM

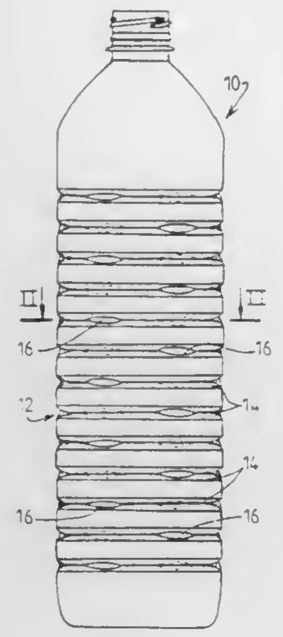
Norio Takahashi, and Yukio Ojima, both of Kanagawa, Japan, assignors to NIFCO Inc., Kanagawa, Japan
Filed Oct. 3, 1995, Ser. No. 538,400
Claims priority, application Japan, Oct. 5, 1994, 6-241560; May 11, 1995, 7-113195
Int. Cl.⁶ B65D *43/16;43/26;51/18*
U.S. Cl. 215—237 **16 Claims**



1. A cap opening and closing mechanism including a cap body attachable to a discharge port portion of a container and having a pouring port through which contents of the container can be discharged, and a lid pivotally supported on a side wall of said cap body and capable of opening and closing said pouring port, said cap opening and closing mechanism comprising:
- a pushing member having an intermediate portion pivotally supported by a pivot on said side wall of said cap body, said pushing member having a first portion and a second portion separated at said pivot and being swingable about said pivot by alternately pushing said first and second portions; and
- connecting means for connecting an end portion of said pushing member and said lid such that alternately pushing said first portion and said second portion of said pushing member opens and closes said lid.

5,746,339
PLASTICS BOTTLE THAT, WHEN EMPTY, IS COLLAPSIBLE BY AXIAL COMPRESSION

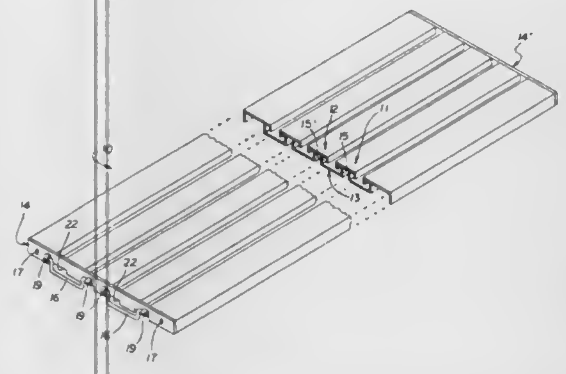
Jean-Marie Petre, Bon-En-Chablais, and Isabelle Fandeux, Evian-Les-Bains, both of France, assignors to Societe Anonyme Des Eaux Minerales D'Evian, Evian-Les-Bains, France
PCT No. PCT/FR96/00097, § 371 Date Sep. 19, 1996, § 102(e) Date Sep. 19, 1996, PCT Pub. No. WO96/22918, PCT Pub. Date Aug. 1, 1996
PCT Filed Jan. 22, 1996, Ser. No. 716,387
Claims priority, application France, Jan. 23, 1995, 95 00711
Int. Cl.⁶ B65D *1/02;1/40;23/00*
U.S. Cl. 215—383 **14 Claims**



1. A plastics material bottle that is collapsible when empty by applying axial compression in a direction defined by a longitudinal axis of the bottle, the bottle comprising a cylindrical body formed with substantially V-section transverse fluting grooves and with outwardly-projecting fold starters formed locally on the bottoms of the fluting grooves, the body having a generally polygonal cross-section normal to the bottle axis, the polygonal cross-section having rounded corners and the fold starters being formed in the immediate vicinity of the rounded corners of the polygonal cross-section of the body.

5,746,340
VENTED LID FOR ELECTRIC ENCLOSURES

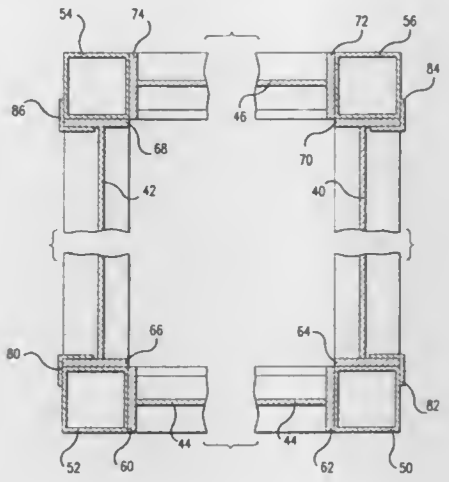
Robert T. Kearfott, Bristol, Va., and Garry F. Raines, Bristol, Tenn., assignors to Line Power Manufacturing Corporation, Bristol, Va.
Filed Feb. 5, 1996, Ser. No. 597,638
Int. Cl.⁶ H02G *3/08*
U.S. Cl. 220—3.8 **27 Claims**



1. A vented lid for covering electrical equipment enclosures, comprising:
- a) a first elongated member having a longitudinal axis and having a lateral portion on each side of said axis extending orthogonally therefrom;
- b) a second elongated member having a longitudinal axis and having a lateral portion on each side of said axis extending orthogonally therefrom;
- c) said first member and said second member nested together in opposing relation so that one lateral portion of said first member is spaced from one lateral portion of said second member to form a tortuous air channel therebetween; and
- d) connecting means for connecting said first member to said second member in spaced relation.

5,746,341
COLLAPSIBLE, STACKABLE, HARD-SIDED CONTAINER

David Alan Olson, 12 Ridge Rd., St. Peter, Minn. 56082
Filed Sep. 16, 1996, Ser. No. 714,580
Int. Cl.⁶ B65D *21/00*
U.S. Cl. 220—6 **4 Claims**

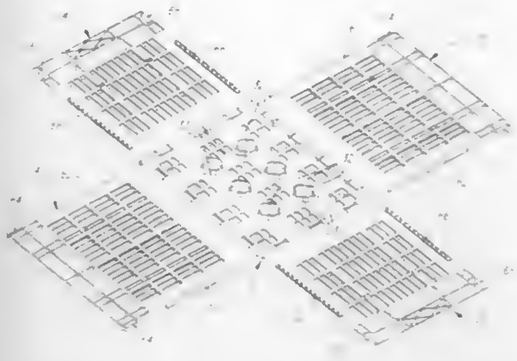


1. A collapsible, stackable container comprising:
- a base portion;
- a plurality of substantially rigid side walls;
- each of said side walls being pivotally connected to said base portion and movable from a horizontal position across the top of said base portion to a vertical position extending upwardly from said base portion and defining a containment cavity between said side walls, two opposite side edges of each of two of said rigid side walls being connected to upper square tube members and each of said upper square tube members being provided along a longitudinal edge thereof with an angle keeper, wherein a gap is provided between said associated upper square tube members and said angle keepers, and two opposite side edges of each of two other side walls of said rigid side walls being connected to flat plates extending substantially perpendicular to said other side walls such that said flat plates are received within said gaps when said rigid side walls are pivoted to a vertical position; and
- a trap door pivotally connected at said base portion and extending across an opening defined in said base portion for emptying contents from said container.

5,746,342
FIVE-PIECE CONTAINER WITH HINGEABLE SIDES

Michel Jacques, St.-Damien-de-Buckland, and Roch Nolet, St-Joseph-de-Beauce, both of Canada, assignors to IPL, Inc., Quebec, Canada
Continuation of Ser. No. 696,241, Aug. 13, 1996, abandoned. This application Aug. 5, 1997, Ser. No. 906,347
Int. Cl.⁶ B65D *21/00*
U.S. Cl. 220—6 **10 Claims**

1. A container comprising:
- a bottom piece formed of plastic, and having a top surface defining a first plane, an opposite bottom surface defining a second plane, a first pair of opposite edges, and a second pair of opposite edges, each of said edges including a plurality of parallel axially spaced apart cylindrical plastic hinge portions, said hinge portions respectively defining hinge axes, the hinge axes of all of said edges lying in a common plane between said first and second planes, each said edge further including a plurality of parallel, spaced apart ledge surfaces extending in a direction perpendicular to an axis defined by the hinge portions of the same edge, said bottom piece including, on said top surface thereof, a series of raised profiles and, on said



bottom surface thereof, a series of recessed areas in vertical complementary alignment with said series of raised profiles;

a pair of plastic side pieces, each side piece having a lower plastic edge including C-shaped extensions closely resiliently receiving the hinge portions of one of the edges of the bottom piece for pivotal movement between an outward foldback position, wherein said side piece is generally coplanar with said bottom piece, and an erected position, said C-shaped extensions impeding movement of the side pieces in a direction radially away from the hinge portions except for removal of said side pieces from said bottom piece, said lower edge of respective side pieces including a series of spaced apart flat faces which are operative to engage at least some of the ledge surfaces of the bottom piece to prevent said side pieces from pivoting inwardly toward the opposite side piece to an inwardly folded position;

a pair of plastic end pieces, each end piece having a lower plastic edge including C-shaped extensions closely resiliently receiving the hinge portions of one of the edges of the bottom piece for pivotal movement between an outward foldback position, wherein said end piece is generally coplanar with said bottom piece, and an erected position, said C-shaped extensions impeding movement of the end pieces in a direction radially away from the hinge portions except for removal of said end pieces from said bottom piece, said lower edge of respective end pieces including a series of spaced apart flat faces which are operative to engage ledge surfaces of the bottom piece to prevent said end pieces from pivoting inwardly toward the opposite side piece to an inwardly folded position; and

resiliently interengaging plastic surfaces on said side pieces and on said end pieces for selectively locking said side pieces to said end pieces to retain said side pieces and end pieces in the erected position wherein, when said side pieces, and end pieces are in the erected position, said side pieces and end pieces have a uniform height greater than the distance between opposite edges of one of the pairs of opposite edges of the bottom piece.

5,746,343

FLEXIBLE BAG FOR LIQUIDS MOUNTED ON A FRAME

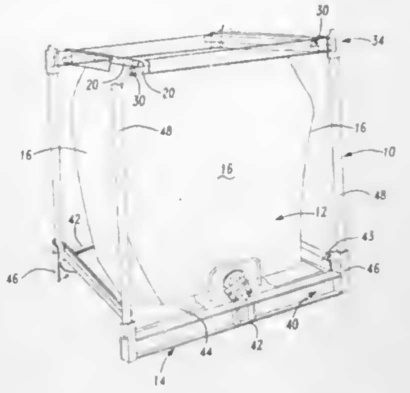
David L. Waltke, and Gary L. Bouc, both of Beatrice, Nebr., assignors to Hoover Group, Inc., Alpharetta, Ga.

Filed Nov. 27, 1996, Ser. No. 757,826

Int. Cl.^{6} B65D *33/02*

U.S. Cl. 220—9.2 **4 Claims**

1. A rigid frame supporting a deformable fabric bag for containing a flowable material to be discharged from an outlet in the lower part of the bag, characterized in that the upper portion of the bag provides a plurality of hollow sleeves, an arrangement of support tubes on said frame arranged to define an inlet for said bag, said sleeves being removably mounted on said support tubes, means forming a discharge opening in a lower part of said bag, said frame being collapsible to enable said bag to collapse, said bag further including a fabric bottom member and said frame further including a support plate on which said bag bottom member is supported,



said plate being elastically deformable in response to up and down movement of said bag during transport, said tubes and said plate thereby cooperating to provide shock absorbing action to cushion said bag during transport.

5,746,344

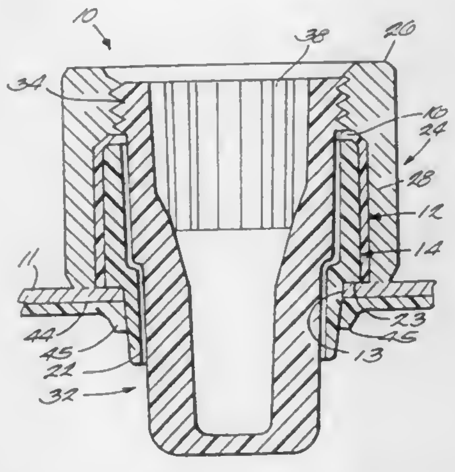
TANK CONNECTOR CONSTRUCTION

Rodney R. Syler, Franklin; Rolf E. Faber, Clarksville, and D. Kent Lindahl, Pleasant View, all of Tenn., assignors to State Industries, Inc., Ashland City, Tenn.

Continuation of Ser. No. 273,579, Jul. 11, 1994, abandoned. This application May 8, 1996, Ser. No. 643,290

Int. Cl.^{6} B65D *25/16*

U.S. Cl. 220—465 **2 Claims**



1. A tank connector assembly comprising:

a metal spud member (**24**) having an upper internally threaded cylindrical portion (**26**) and a lower cylindrical wall portion (**28**) having an internal smooth wall surface portion;

an insert member (**14**) of polymer material having a cylindrical wall portion, said wall portion having an internal and an external face, said insert member mounted inside said cylindrical wall portion of said spud member and spaced therefrom, said insert member (**14**) having an upper cylindrical section (**20**) and a lower cylindrical section (**22**) of a smaller diameter than said upper section to thereby form a shoulder (**21**) between said upper and lower cylindrical sections; and

a bonding member (**12**) of polymer material having a cylindrical wall portion (**18**) having internal and external cylindrical wall surfaces, said cylindrical wall portion of said bonding member positioned in the space between the external surface of said cylindrical wall portion of said insert member and the internal surface of said cylindrical wall portion of said spud member, said internal and external wall surfaces of said cylindrical wall portion of said bonding member bonded to said external wall surface of said insert member and to said internal smooth wall surface of said spud member.

5,746,345

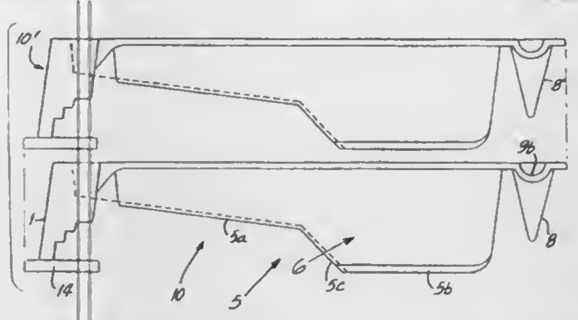
STACKABLE PAINT ROLLER TRAY WITH INTEGRAL PAINT BRUSH STORAGE TROUGH REST

Michael Zurawin, 350 E. 79th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 950,746, Feb. 26, 1996. This application Nov. 26, 1996, Ser. No. 756,545

Int. Cl.^{6} B65D *25/00*

U.S. Cl. 220—735 **6 Claims**



1. A paint roller tray having an interior defined by four walls and a closed bottom, wherein the bottom is downwardly sloped from a front wall nearest a user of the paint roller tray, to a rear wall, distal to the user, with the area of the closed bottom adjacent the distal wall comprising a well for containment of paint, and for insertion and loading of a paint roller with the paint contained therein, wherein the improvement comprises said paint roller tray further comprising at least one closed-bottom trough outside of said walls, with said at least one trough being integrally dependant from the distal wall of the tray, said at least one trough being spaced therefrom and extending parallel thereto, with the at least-one trough being adapted to accommodate a paint brush, as a rest therefor, wherein the at least one trough is tapered to a narrow base to facilitate nesting or stacking of one paint roller tray with a second identical paint roller tray and wherein the at least one trough depends from upper edge of the rear wall, and wherein the at least one trough is narrow and adapted to hold a significant portion of the paint brush in an edgewise insertion therein.

5,746,346

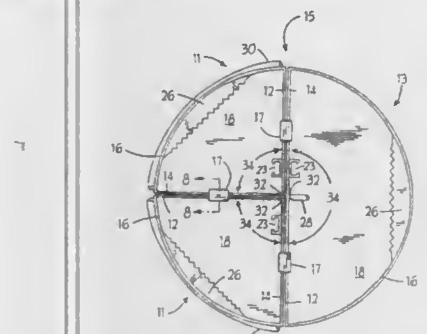
PAINT CARRIER

Thomas G. Crilly, 8 Marian TCE, Slane, Co. Meath, Ireland

Filed Jan. 15, 1997, Ser. No. 783,690

Int. Cl.^{6} B65D *91/00*

U.S. Cl. 220—736 **18 Claims**



1. A paint carrying receptacle for use in combination with at least one other similar receptacle for maintaining a multiplicity of paints separate within a compartmented receptacle arrangement, the receptacle comprised of a generally planar first side wall, a generally planar second side wall, an arcing third side wall, and a bottom wall; wherein the first side wall and the second side wall have lengths which are substantially equal; wherein the first side wall, the second side wall, the third side wall, and the bottom wall are mutually sealingly engaged to create a wedge of a cylinder having a top opening wherein the bottom wall comprises a bottom of the receptacle, wherein the first side wall and the second side wall converge to join at a joint at an angle of 180 degrees or less; and wherein the first side wall and the second side wall have heights that decline downwardly to the arcing third side wall from the joint where the first side wall joins the second side wall for better maintaining the separation of paints when a multiplicity of similar receptacles are juxtaposed to form a generally cylindrical receptacle arrangement whereby a multiplicity of similar receptacles may be juxtaposed to form a generally cylindrical arrangement with each receptacle comprising a compartment, each receptacle being capable of separately retaining a paint, and each receptacle being capable of being selectively removed from the receptacle arrangement.

5,746,347

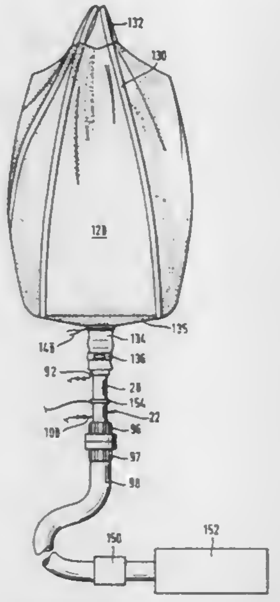
METHOD AND APPARATUS FOR DISPENSING PARTICLES FROM A CONTAINER

Thomas P. Riedemann, Moembris, Germany; Richard F. Cavagnaro, Sparta, N.J.; Klaus W. Rolf, Linsengericht-Geislitz, Germany; Hans-Juergen Strempel, Hainburg, Germany; Guenther Michael, Karlstein, Germany; Gerd T. Brand, Rønneburg, Germany; Andreas Ernst, Maintal, Germany; Roland Schaffer, Linsengericht-Eidengesass, Germany, and Herbert Riemenschneider, Gelnhausen-Meerholz, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed Sep. 3, 1996, Ser. No. 697,857

Int. Cl.^{6} B67B *7/00;* **B65G** *69/06;* **B05D** *7/00*

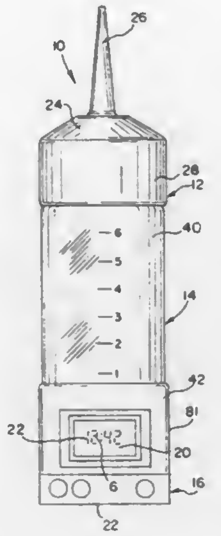
U.S. Cl. 222—1 **42 Claims**



1. A dispensing assembly for dispensing fine particles from a container comprising:

- a dispensing device which includes;
  - at a transport tube having a product inlet opening at a forward region and a product discharge opening at a rearward region;
  - a head piece positioned at the forward region of said transport tube, said head piece including a chamber housing defining a gas receipt chamber, and a plurality of gas outlet ports formed in said chamber housing;
- a gas feed conduit in communication with the gas receipt chamber in said head piece;
- a clamping casing which extends about said tube, and said transport tube being axially adjustable with respect to said clamping casing between a first position and a second position with said first position placing said clamping casing closer to said head piece than said second position, and
- a fixing device which is adapted to fix a portion of the container to said clamping casing while said casing is in or moved between said first position and said second position.

5,746,348
HAIR TREATMENT TIMER RECEPTACLE WITH DETACHABLE TIMER
Robert Bloom, 425 Ascot La., Streamwood, Ill. 60101
Filed Jul. 15, 1996, Ser. No. 679,967
Int. Cl.⁶ B63D *5/32*
U.S. Cl. 222—39 **10 Claims**



1. A hair treatment applicator timer receptacle comprising:

liquid receptacle means for receiving and containing hair treatment liquids therein. said receptacle means having a receptacle base portion;

a housing detachably connected to said receptacle base portion for normally maintaining said receptacle means in a vertical orientation, the connection between said receptacle means and said housing including means for easy detachment of the receptacle means from the housing and easy attachment of the receptacle means to the housing;

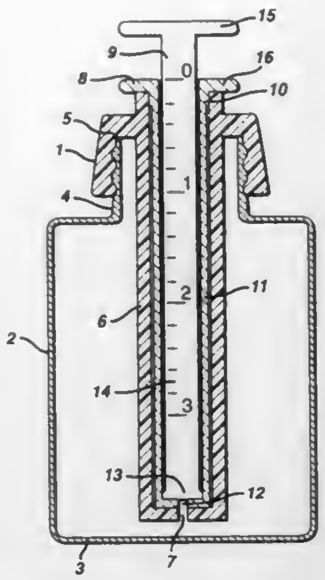
a timer integral to said housing;

said liquid receptacle means includes an applicator spout removably secured to a discharge end of said receptacle means

wherein. said spout includes a spout base portion from which a frusto-conically shaped applicator tip portion axially extends. said applicator tip portion defining an open fluid passage whose size changes along its axial length;

said spout base portion defines a concave recess surrounding a lowermost end of said applicator tip portion said base portion having a web which effectively divides said base into a first chamber and a second chamber. said first chamber being sized and configured to securely accommodate the receptacle.

5,746,349
CHILDPROOF DOSING DEVICE
Peter Putteman, Schellebelle, and Alfons Jeanne Wouters, Beerse, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium
PCT No. PCT/EP94/02149, § 371 Date Dec. 12, 1995, § 102(e) Date Dec. 12, 1995, PCT Pub. No. WO95/01924, PCT Pub. Date Jan. 19, 1995
PCT Filed Jun. 30, 1994, Ser. No. 556,961
Claims priority, application European Pat. Off., Jul. 8, 1993, 93201995
Int. Cl.⁶ B67D *5/22*
U.S. Cl. 222—49 **13 Claims**



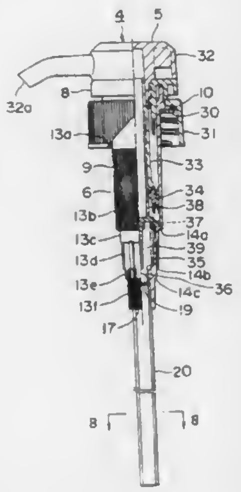
1. A device (**1**) for holding and dispensing liquids that provides precise dosages of the liquid, comprising

a bottle (**2**) for holding the liquid. said bottle extending between a bottle bottom (**3**) and a bottleneck (**4**),

a cap (**5**) which is irremovable from the bottleneck. said cap being associated with a hollow cylinder (**6**) extending axially to near the bottle bottom (**3**) and having a open upper end and a closed lower end with a central opening (**7**),

a reciprocating dispenser fitting within the cylinder (**6**) comprising a barrel (**8**) and a plunger (**9**), wherein the barrel (**8**) includes an upper portion (**10**) having a larger diameter than the lower portion (**11**) for assuring an air- and liquid-tight fit between the upper portion and the interior wall of the cylinder (**6**), and having a closed lower end with a central opening (**12**) that is aligned with the central opening (**7**) in the cylinder (**6**), and wherein the plunger (**9**) includes a piston (**13**) forming an air- and liquid-tight fit with the interior wall of the barrel (**8**), a graduated piston rod (**14**) and a knob (**15**).

5,746,350
PUMP DEVICE FOR A CONTAINER
Akira Nishigami, and Tsugio Arai, both of Ibaraki, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
PCT No. PCT/JP95/00735, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO95/28336, PCT Pub. Date Oct. 26, 1995
PCT Filed Apr. 14, 1995, Ser. No. 564,096
Claims priority, application Japan, Apr. 14, 1994, 6-075755; Jun. 17, 1994, 6-135854; Dec. 9, 1994, 6-306515
Int. Cl.⁶ B65D *77/06;83/00*
U.S. Cl. 222—95 **2 Claims**



1. A pump device for a container, used by attaching said pump device to said container having a contents-filled sealed bag contracting with a negative-pressurization of an interior thereof when taking out contents thereof, said pump device comprising:

an operating portion, an upper edge of which is exposed to an outside of said container;

a suction portion having a flange formed in an upper portion thereof and being fixed to said container with a cap screwed onto a cylindrical mouth of said container from above said flange, a lower end of said suction portion being inserted into said container and sucking the contents from a suction port opened at a lower edge of said suction portion, said suction portion having a plurality of cylindrical portions of decreasing diameter starting below said flange, and a piston movable upward and downward within an upper cylindrical portion with the moving of said operating portion, said piston having a piston packing slideably contacting an internal surface of said upper cylindrical portion;

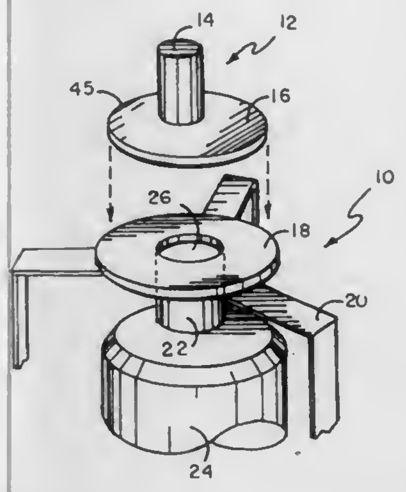
a plurality of first protruded portions and first recessed portions extending along an axial line of said upper cylindrical portion and alternately formed circumferentially on an outer peripheral surface of said upper cylindrical portion;

a plurality of second protruded portions and second recessed portions extending along an axial line of others of said cylindrical portions other than said upper cylindrical portion and alternately formed circumferentially on outer peripheral surfaces of said others of said cylindrical portions;

a gap holding rod having a proximal end internally fitted into said suction port of said suction portion and a distal end extending toward an inner bottom portion of said contents-filled sealed bag; and

third protruded portions and third recessed portions extending from said proximal end of said gap holding rod toward said distal end and being alternately formed on an outer peripheral surface of said gap holding rod.

5,746,351
PALLETTE DISPENSER
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Filed Aug. 29, 1996, Ser. No. 705,542
Int. Cl.⁶ B65D *35/22*
U.S. Cl. 222—106 **11 Claims**

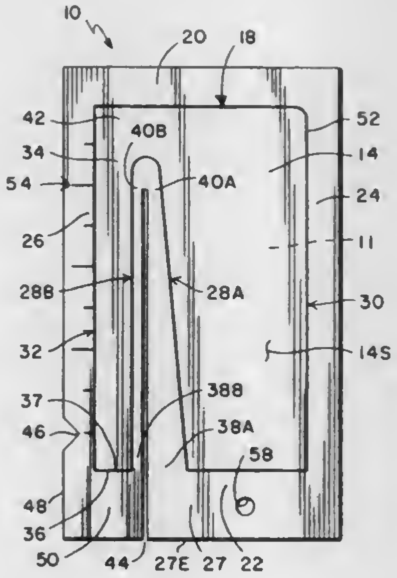


1. In combination, a material contained in a container having a nozzle, a dispenser having a palette base having a surface area with an aperture defined therein to receive said nozzle of said container, said dispenser for dispensing said material through said aperture onto said palette base with a mixing area defined on said palette base for disposing said material;

means for supporting said palette base; and

a cover member having a substantially planar bottom surface and an outer edge, said bottom surface having a surface area. said cover member for positioning over said aperture in said palette base whereby by forcing said cover member onto said palette member above said aperture, some of said material is forced from between said palette member and said cover member to said outer edge of said cover member forming an outer edge of said material which outer edge of material will dry. sealing and protecting the remaining material under said cover member from contact with the air and preventing it from drying out.

5,746,352
METERED FLEXIBLE DISPENSING PACKAGE
Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602
Continuation-in-part of Ser. No. 317,186, Oct. 3, 1994, Pat. No. 5,531,358, which is a continuation-in-part of Ser. No. 14,753, Nov. 1, 1993, Pat. No. Des. 354,221. This application May 21, 1996, Ser. No. 651,110
Int. Cl.⁶ B65D *35/08*
U.S. Cl. 222—107 **14 Claims**



1. A dispensing package comprising:

a sealed enclosure determined by superimposed first and second flexible sides and a peripheral seal circumscribing the sides, the seal comprising a top edge, a bottom edge, and opposed first and second side edges;

means for dividing the sealed enclosure into a storage reservoir and a dispensing channel, the dispensing channel including an open distal end portion in fluid communication with the storage reservoir via a confluence, and an opposed closed proximal end portion contiguous to a section of the bottom edge of the peripheral seal and to a section of the second side edge, said dividing means comprising contiguous first and second depending seals determined by a preformed longitudinal divider defining a slot and extending from the bottom edge of the peripheral seal, each depending seal comprising an upper portion and an opposed lower portion. the upper portions being proximate to the confluence, and the lower portions being contiguous to the bottom edge of the peripheral seal;

tear-open means, responsive to force means, for tearing open said sections of the second side edge and bottom edge and the proximal end portion; and

measuring means for predetermining a quantity of liquid material to be expelled from the dispensing channel.

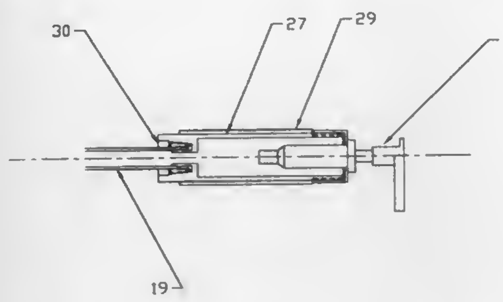
5,746,353
PORTABLE LAUNDRY DETERGENT DISPENSING SYSTEM

Calvin Kok-Hwa Cheok, 3840 Far West Blvd. #321, Austin, Tex. 78731, and Rajesh Jaigopai Saggi, 20 Jaffray Park, Irvington, N.Y. 10533

Filed Jun. 25, 1996, Ser. No. 670,048

Int. Cl.^{6} A47F *3/02*

U.S. Cl. 222—132 **5 Claims**



1. A portable laundry detergent dispensing system comprising:

a light weight case having a bottom, at least one side wall, internal walls, a floor and a removable cover;

a space for storing items provided within said case, said space including a means for holding coins;

a container adapter for liquid detergents supported within said case;

a container adapter for holding liquid fabric softeners supported within said case;

a container adapted for holding powder detergents supported within said case;

a solid dispensing means connected to the case for dispensing precise quantities of powder, said solid dispensing means including a dump cup housing affixed to the case and in supporting contact said container adapted for holding power, and a cylindrical dump cup supported by said dump cup housing;

a pair of pump assembly means connected to one side at least one side wall of said case for dispensing precise quantities of liquid, a one of said pair of pump assembly means connected to said container adapted for holding liquid detergents, and the other of said pair of pump assembly means connected to said container adapter for holding liquid fabric softeners; and

flexible plastic tubing for connection each one of said pair of pump assembly means to each of said containers adapted for holding liquids.

5,746,354
MULTI-COMPARTMENT AEROSOL SPRAY CONTAINER

Gary W. Perkins, 30555 N. Walker Rd., Walker, La. 70785

Filed Oct. 24, 1996, Ser. No. 736,124

Int. Cl.^{6} B67D *5/60*

U.S. Cl. 222—132 **6 Claims**

3. A multi-compartment aerosol spray container comprising:

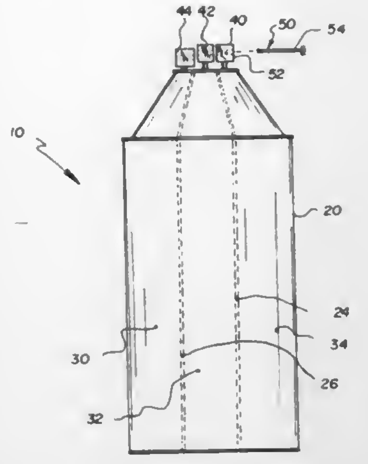
an aerosol can having a first partition and a second partition substantially parallel to said first partition thereby forming a first compartment, a second compartment and a third compartment, where said compartments store under pressure a desired color of paint;

a first spray nozzle coupled to said aerosol can projecting into said first compartment;

a second spray nozzle coupled to said aerosol can projecting into said second compartment;

a third spray nozzle coupled to said aerosol can projecting into said third compartment, where said spray nozzles are aligned to form a vertical plane; and

a horizontal coupling means removably coupled to said spray nozzles to provide activation of all said spray nozzles when a user presses upon a selected spray nozzle, and where a pin may be removed to allow selective painting with a selected color of paint.



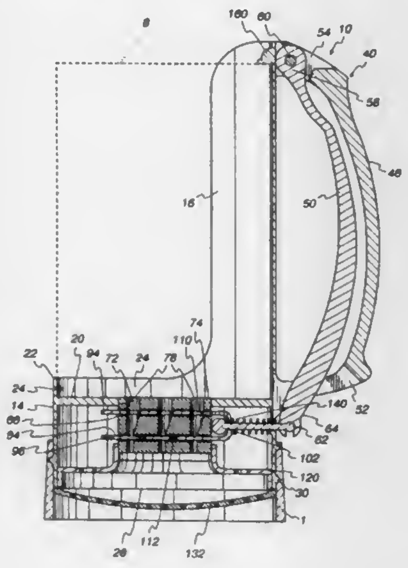
5,746,355
DISPENSER FOR PULVERULENT MATERIAL

Kermit A. Wold, Plymouth, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Filed Mar. 15, 1996, Ser. No. 617,479

Int. Cl.^{6} G01F *11/28*

U.S. Cl. 222—189.02 **13 Claims**



1. A dispenser for pulverulent materials, comprising:

a receptacle for receiving a container holding the material, including a support wall for supporting the container, with the support wall defining an opening;

a valve body mounted in the receptacle adjacent the support wall, the valve body defining metering cavities aligned with the support wall opening to receive material from the container which flows through the support wall opening;

a gate means mounted in the receptacle adjacent the valve body for movement between first and second positions, with the gate means blocking flow out of the valve body in the first position and blocking flow past the support wall opening into the valve body, while opening the valve body to dispense material in the metering cavities in the second position; and

a screen mounted to the receptacle adjacent the support wall, with the valve body between the screen and the support wall.

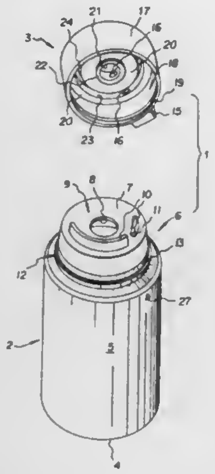
5,746,356
ROTATABLE SPOUT DISPENSING TUBE

Ronald E. Kieras, Woodstock, Ill., assignor to Courtaulds Packaging Inc., Woodstock, Ill.

Filed Dec. 2, 1996, Ser. No. 758,902

Int. Cl.^{6} B65D *35/48*

U.S. Cl. 222—212 **6 Claims**



1. A rotatable spout dispensing tube comprising:

a thermoplastic tubular member having a bottom wall, a side wall, and a neck portion at an opposite end from the bottom wall, a planar wall closing said neck portion having an upper surface with a central discharge aperture therethrough, and an arcuate upwardly extending projection thereon, said projection having a gap therethrough said projection extending only partially concentrically about said central discharge aperture, and said neck portion having a closure cap engagement means;

a thermoplastic closure cap having a circular top wall and a spout extending outwardly adjacent to said top wall with the top wall and said spout having a passageway formed therethrough, a downwardly depending annular skirt about said top wall, said annular skirt having a tubular member engagement means thereon engageable with said closure cap engaging means of said tubular member;

the top wall of said closure cap having a bottom surface, a central bore formed in said bottom surface communicating with the passageway of said top wall and spout, a downwardly depending circular rim about said central bore adapted to fit within the central discharge aperture in the neck portion of said tubular member, and an outer arcuate channel in said bottom surface, said channel extending only partially concentrically about said circular rim, spaced from and concentric with said circular rim;

such that when said closure cap is secured on the neck portion of said tubular member, said circular rim seats in the central discharge aperture and said upwardly extending projection on the neck portion of said tubular member slidably fits within the arcuate channel formed in the bottom surface of the top wall of the closure cap, whereby in one position the passageway of said spout is sealed by said projection and in a rotated position said passageway is aligned with the gap of said projection to provide communication between the central discharge aperture of said tubular member, the bore of said top wall, the gap through said projection, and the passageway of said top wall and spout for dispensing of contents of said tubular member by pressure on the side wall of said tubular member.

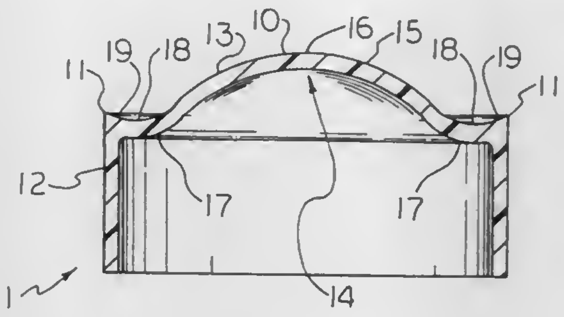
5,746,357
PLUNGER AND APPARATUS USEFUL IN EXTRUDING OR DISPENSING VISCOUS MATERIALS

Keith A. Beveridge, Dayton; Mark A. Bennett, Mason; Kenneth R. Waeber, Loveland, and Clinton A. Haynes, West Chester, all of Ohio, assignors to Essex Specialty Products, Inc., Auburn Hills, Mich.

Filed Apr. 22, 1996, Ser. No. 635,984

Int. Cl.^{6} B67D *5/42*

U.S. Cl. 222—386 **9 Claims**



1. A plunger useful in extruding or dispensing viscous materials which comprises a thin, circular, disc-shaped sheet of a rigid thermoplastic material which is capable of deforming when subjected to back pressure during use, the edge of the disc having a circular shape and a cylindrical lip attached to the edge of the disc and disposed perpendicular to the edge of the disc, wherein the disc comprises:

A) a face and a back surface located on opposite sides of the disc,

B) a symmetrical convex portion which protrudes beyond the plane defined by the edge of the disc in the direction of the face wherein the peak of the convex portion is disposed in the center of the disc, and

C) a symmetrical concave portion which protrudes beyond the plane defined by the edge of the disc in the direction of the back surface,

wherein the concave portion surrounds the convex portion and the convex portion starts at the bottom of the concave portion of the disc, wherein the radius of the convex portion, measured from the peak to the bottom of the concave portion, is sufficient to withstand the back pressure exerted during use without inverting, and the slope of the wall of the concave portion from the edge to the bottom is disposed such that when back pressure is exerted on the plunger, the edge deforms radially outward.

5,746,358
VENTED POURING SPOUT

Donald Crosby, 421 Light Foot Ct., Canton, Ga. 30115

Filed Dec. 20, 1996, Ser. No. 771,582

Int. Cl.^{6} B67D *3/00*

U.S. Cl. 222—479 **7 Claims**

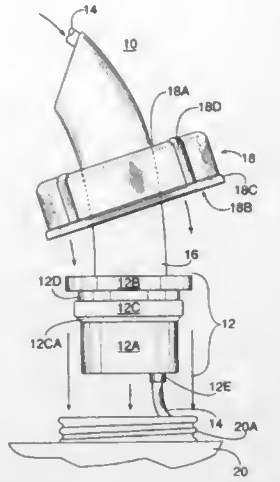
1. An improved spout (**10**) functioning to facilitate pouring of fluid (**22**) from a container (**20**), the improved spout (**10**) comprising:

A) a hollow base (**12**) which comprises a base bottom (**12A**) securely connected to a base stopper (**12B**) positioned at a top distal end, a base ring (**12C**) is securely affixed around the base bottom (**12A**) positioned a predetermined distance from the base stopper (**12B**) forming a base channel (**12D**) therebetween which is slightly larger than a width of a container lip (**20B**);

B) a base ring angle (**12CA**) is positioned along a lower circumference end of the base ring (**12C**);

C) a hollow spout (**16**) is sealably connected at a bottom distal end to the base stopper (**12B**);

an air tube (**14**) is securely and positioned within the base (**12**) extending therethrough, the air tube (**14**) is securely and



positioned within the spout (**16**) extending therethrough terminating at an upper distal end thereof, the air tube (**14**) extends a predetermined distance from the base (**12**), when a user tips the container (**20**), the fluid (**22**) enters the base (**12**) and the spout (**16**) pouring outwardly therefrom, concurrently, air (**24**) enters an air intake (**24**A) positioned at a terminal upper end of the air tube (**14**) transcending therethrough exiting an air egress (**24**B) positioned at a terminal lower end thereof into the container (**20**) replacing the fluid (**22**) with air (**24**) therein at a similar rate as the fluid (**22**) is poured from the container (**20**).

5,746,359

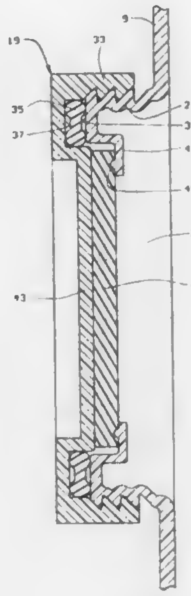
AIR SEAL FOR HUMIDIFIER WATER BOTTLE

Terrence L. Stanek, St. Charles, and Mark J. Tomasiak, O'Fallon, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 6, 1996, Ser. No. 660,093

Int. Cl.⁶ B01F *3/04*

U.S. Cl. 222—542 **23 Claims**



1. A water bottle for use in a humidifier comprising:
- a bottom wall, a top wall and a circumferentially extending side wall connecting the bottom wall and top wall;
- a selective water dispenser for a water dispensing opening formed in one of the walls of the water bottle;
- a water seal for a water filling opening formed in one of the walls of the water bottle, the water seal being formed by the application of pressure to a water sealing member; and
- an air seal for the water filling opening, the air seal being established when water is dispensed through the water dispensing opening of the water bottle such that a negative pressure is established in the water bottle, the strength of the air seal being substantially independent of the pressure applied to the water sealing member.

5,746,360

COAT HANGER BAG

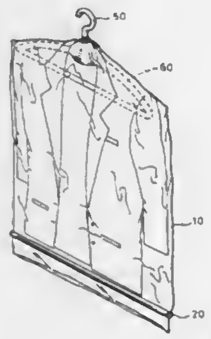
Chin-Lai Chen, 93, Chungliao St., Sanchung, Taipei, Taiwan

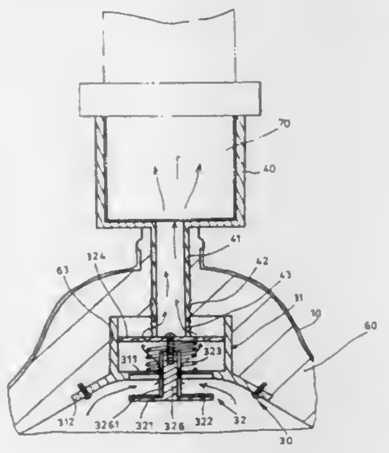
Filed Mar. 26, 1997, Ser. No. 824,196

Claims priority, application Taiwan, Jul. 20, 1996, 85211116

Int. Cl.⁶ A47G *25/54;25/14;* **B65D** *85/18*

U.S. Cl. 223—85 **6 Claims**





1. A coat hanger bag comprising a pressure bag, a press bar to close the hanger body, a hanger member, a puller body, and a coat hanger:
- the coat hanger attached to the pressure bag, the coat hanger having a bore provided on a upper part thereof and a receiving space formed on a lower part thereof, wherein a female screw threaded portion is provided around the lower part of the bore;
- a sucking hole located within the puller body which a sucking tube with a male screw threaded portion formed on a lower part of the outer peripheral surface extending from the bottom of the puller body, and wherein a pair of openings are formed on the bottom of the sucking tube and the length of the sucking tube is longer than the depth of the coat hanger bore;
- the hanger member comprising a body and a moving member, wherein a plate with a central hole is provided on the bottom of the body for defining the axial movement of the moving, member which has an upper plate with a plurality of holes engaged against the bore of the coat hanger, and wherein a peripheral slot is formed on the body of a central rod which formed as a whole with a lower plate of the moving member;
- a hook threaded and secured to the bore of the coat hanger; and
- a spring located within the hanger member wherein body in normal condition the spring is compressed against the upper plate and the lower plate respectively in order to keep the airtightness and in operation, the sucking tube being threaded into the bore of the coat hanger thereby applying a force on the upper plate which presses the spring and thus, the lower plate is moved downwardly away from the plate of the body and thus, the air within the bag is allowed to flow through the slot, a plurality of holes of the upper plate, two openings of the sucking tube, and the sucking hole and then sucked out of the pressure bag.

5,746,361

CARRIER FOR TRANSPORTING ELONGATE RECREATIONAL EQUIPMENT

Randall LeRoy Johnson, 1123 Princeton Ave., Lansing, Mich. 48915

Filed Mar. 1, 1996, Ser. No. 609,861

Int. Cl.⁶ A45F *3/14*

U.S. Cl. 224—258 **27 Claims**

1. An apparatus for carrying an elongate object on a back of a user, which comprises:
- (a) a panel having a top and a bottom and opposed sides with an inner surface and an outer surface spaced therebetween;
- (b) a securing strap having opposed ends and extending from one side of the panel;
- (c) an attachment means provided on the other side of the panel opposite the securing strap for holding the securing strap in position across the inner surface of the panel; and
- (d) a complete carrying strap having a first end and a second end with the first end provided on the panel adjacent the top and one of the sides of the panel with the second end provided on the panel adjacent the bottom and the other side of the panel, wherein the second end of the complete carrying strap provided on the panel such that the complete carrying strap extends upward from the second end of the carrying strap at an angle toward the top of the panel such that an acute angle is formed between the first end and second end of the carrying strap, wherein the carrying strap can be mounted over one shoulder and around a neck of the user such that the complete carrying strap extends diagonally across a torso of the user with the outer surface of the panel adjacent the back of the user and wherein the object can be mounted adjacent the panel and held in a vertical position along the back of the user.

5,746,362

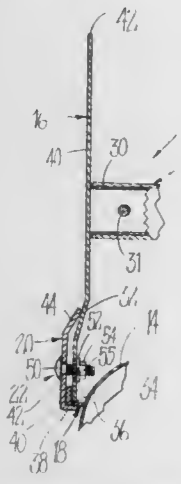
HEAVY DUTY VEHICLE RACK

David R. Hickey, Darien, Ill., assignor to Cross Tread Industries, Inc., Hinsdale, Ill.

Continuation of Ser. No. 309,915, Sep. 21, 1994, abandoned. This application Aug. 2, 1996, Ser. No. 692,040

Int. Cl.⁶ B60R *9/04*

U.S. Cl. 224—331 **20 Claims**



1. A heavy duty vehicle rack for securing heavy items to the drip rails of a van type vehicle, comprising a rectangular cross section tubing cross member adapted to extend horizontally across the full width of a van type vehicle roof generally from one drip rail to the drip rail on the opposite side of the van type vehicle roof, said cross member having opposing ends defining a length therebetween, said length being substantially parallel to a horizontal plane, said cross member tubing made of one of steel and aluminum having a minimum wall thickness of $\frac{3}{16}$ of an inch, a pair of unitary one piece end members, one secured by welding at each end of said cross member, each of said end members being bent from flat material, said unitary one piece end members extending generally downwardly from said cross member towards said drip rails, respectively, each said unitary one piece end member at its lower end being bent and adapted to rest on said van type vehicle drip rail, clamping means for each unitary, one piece end member shorter in height than said unitary, one piece end member, each said clamping means being bent from flat material and having a bent "L" shaped lower end adjacent its associated unitary, one piece end member, said bent "L" shaped lower end and said lower end of said unitary, one piece end member being adapted to sandwich the adjacent van type vehicle drip rail, said unitary, one piece end member having an intermediate bent portion between the location where said unitary, one piece end member is welded to the cross member and the lower end of the unitary, one piece end member, said clamping means having an upper bent end, both said intermediate bent portion of said unitary, one piece end member and said upper bent end of said clamping means being inclined inwardly toward the opposite unitary, one piece end member and upwardly with the inclination of said clamping means from horizontal being less than that of said intermediate bent portion, and fastening means generally extending parallel to said cross member for pulling said clamping means against said unitary, one piece end member to tightly sandwich the drip rail to hold the heavy duty rack to the van type vehicle drip rail and to slide said upper end of said clamping means inwardly and upwardly along said intermediate portion of said unitary, one piece end member, whereby tightening said fastening means pulls said clamping means horizontally tight against said unitary, one piece end member and simultaneously causes said upper bent end, inclined portion of said clamping means to slide up the inclined intermediate bent portion of said unitary, one piece end member to pull said "L" shaped end of the clamping means vertically upwardly to tightly hold the heavy duty rack to the van type vehicle drip rail, whereby heavy loads such as ladders and/or pipes may be carried.

5,746,363

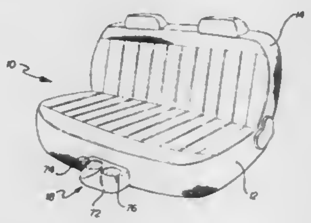
REMOVABLE CONTAINER ASSEMBLY

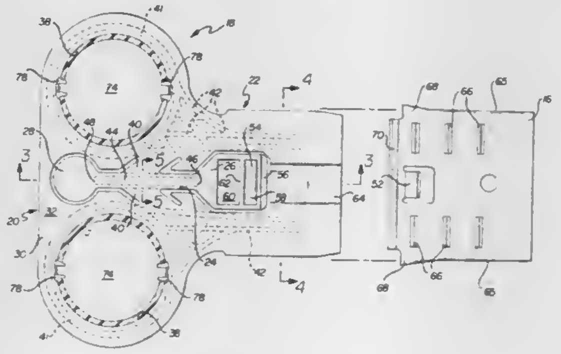
Bill Teller, Farmington; Pete McCulloch, Gross Point Woods; Vaughn J. Drobnich, Rochester, and Jeffrey Lee Goins, Omer, all of Mich., assignors to Lear Corporation, Southfield, Mich.

Filed Jul. 2, 1996, Ser. No. 674,432

Int. Cl.⁶ B60N *3/10*

U.S. Cl. 224—547 **19 Claims**





1. A removable container assembly comprising;
- a container portion;
- a support portion for supporting said container portion from a support structure;

said support portion including a latch portion normally in latched engagement with the support structure for preventing said support portion from being removed from the support structure;

a release portion for manually moving said latch portion from said latched engagement for removal of said assembly from the support structure and

a beam having first and second ends with said latch portion disposed at said first end and said release portion disposed at said second end.

5,746,364

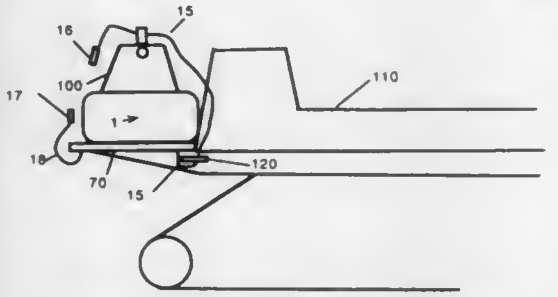
PORTABLE CARRIER FOR OFF-ROAD VEHICLES

Jon D. Stengrim, P.O. Box 1503, Palmer, Ak. 99645

Filed Sep. 11, 1996, Ser. No. 712,084

Int. Cl.^{6} B60R *9/00;9/06*

U.S. Cl. 224—572 **17 Claims**



1. A gas can carrier for an off-road vehicle comprising:

a) a generally rectangular box portion, said generally rectangular box portion having an inner recess formed therein to receive articles, and also having an expandable pocket portion, formed within said inner recess, whereby when a gas can in placed within said inner recess, said expandable pocket portion is collapsed within said inner recess, and when said gas can is not in place, said expandable pocket portion can be expanded as desired, to hold other equipment and supplies;

b) a means for protecting said generally rectangular box portion, said means for protecting said generally rectangular box portion having at least one storage pocket formed therein; and

c) means for retaining said gas can carrier on an off-road vehicle.

5,746,365

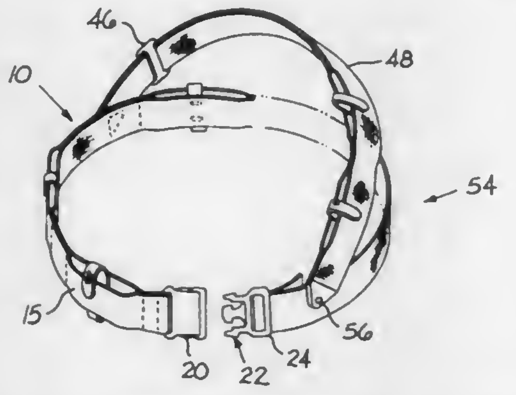
TAPE AND DISC CARRYING DEVICE

Russell Scott, 3482 Uniontown Rd., Uniontwon, Md. 21158

Filed Oct. 2, 1995, Ser. No. 537,356

Int. Cl.^{6} A45F *3/00*

U.S. Cl. 224—676 **3 Claims**



1. A device for storing and transporting articles, comprising:

a two-layer belt having two ends;

means for adjusting the length of said two-layer belt positioned near one of said ends of said belt;

a male end of a quick release buckle attached to one of said ends of said two-layer belt for securing said two-layer belt on a person;

a female end of said quick release buckle attached to other of said ends of said two-layer belt adapted to engage said male end;

a plurality of pockets formed in between said layers of said two-layer belt, each said pocket having a top opening and a bottom opening formed along the length of said belt;

a plurality of retaining straps, the width of each of said straps being less than the length of each of said openings, each of said straps having two ends wherein one of said ends is fixedly attached to an inside face of one of said pockets and loops across said one pocket to lie against the opposite inner face of said one of said pockets to thereby form a bottom thereof, and another of said ends fits across the top of said one pocket; and

a pair of interengaging patches associated with each of said pockets and said straps for closing of each of said pockets wherein one each of said pair of interengaging patches is attached to said another of said ends of said strap and the other of said pair of interengaging patches is attached to an outside of said pocket such that when said interengaging patches are fastened together each of said packets is closed.

5,746,366

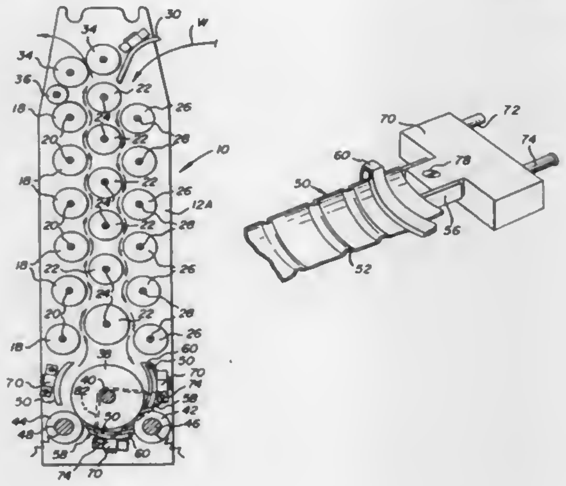
WEAR PLATE POSITIONED GUIDE SHOE

Douglas Oliver Hall, Canandaigua, N.Y. 14424

Filed Feb. 12, 1996, Ser. No. 599,740

Int. Cl.^{6} B65H *20/02;20/24*

U.S. Cl. 226—189 **10 Claims**



1. A web guiding apparatus for use with a flexible web, comprising:

a turnaround roller;

a pinch roller positioned in driving engagement with said turnaround roller and defining a nip therebetween,

a guide means, including a guide shoe, positioned to direct an end of the web into the nip defined by said pinch roller and said turnaround roller; and

a wear plate affixed to said guide shoe and maintained in friction contact with said turnaround roller for controllably maintaining a spacing between said guide shoe and said turnaround roller.

5,746,367

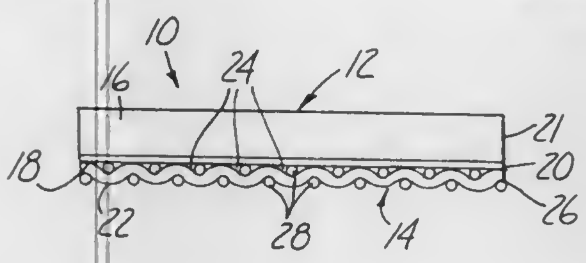
METHOD AND APPARATUS TO WICK SOLDER FROM CONDUCTIVE SURFACES

Deepak Keshav Pai, Burnsville, and Lowell Dennis Lund, Eden Prairie, both of Minn., assignors to Ceridan Corporation, Bloomington, Minn.

Filed Apr. 8, 1996, Ser. No. 629,280

Int. Cl.^{6} B23K *3/00*

U.S. Cl. 228—19 **10 Claims**



1. A wicking system for use in removing solder from an array of conductive surface pads of a microelectronic component, the system comprising:

a carrier made of at least one of a ceramic material and a metal material, the carrier having a rectangular shape with a first surface, a second surface, and four sides, the first surface having a size and shape substantially the same as a size and shape of the array of conductive surface pads of the microelectronic component;

a metal fabric having a first surface, a second surface, and an outer edge, the first surface having a size and shape slightly greater than the size and shape of the first surface of the carrier such that the outer edges of the fabric are capable of being folded to extend upwardly parallel to the sides of the carrier; and

an elongate deformable retainer clip releasably securable about the sides of the carrier and capable of securely holding the outer edges of the fabric against the sides of the carrier.

5,746,368

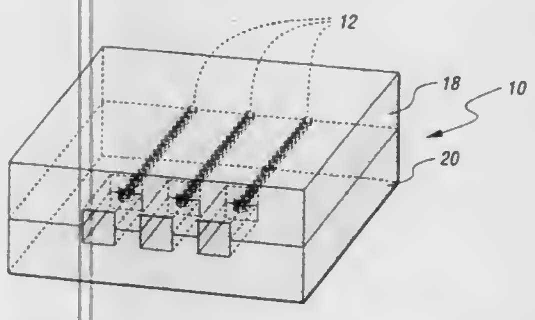
MOLTEN SOLDER DISPENSING SYSTEM

Marc Alan Straub, Dearborn Heights; Frank Burke DiPiazza, Highland; Vivek Amir Jairazbhoy, Farmington Hills; Lakhi Nandial Goenka, Ann Arbor, and Randy Claude Stevenson, Saline, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 15, 1996, Ser. No. 649,750

Int. Cl.^{6} B23K *3/06*

U.S. Cl. 228—33 **6 Claims**



1. An apparatus for dispensing solder, comprising a nozzle body having a plurality of flow channels formed therein, each flow channel having an inlet end and a dispenser end for dispensing solder, said nozzle body forming a nipple surrounding each said dispenser end, and said nozzle body further forming a shielding chamber in communication with each said dispenser end for protecting the respective nipple.

5,746,369

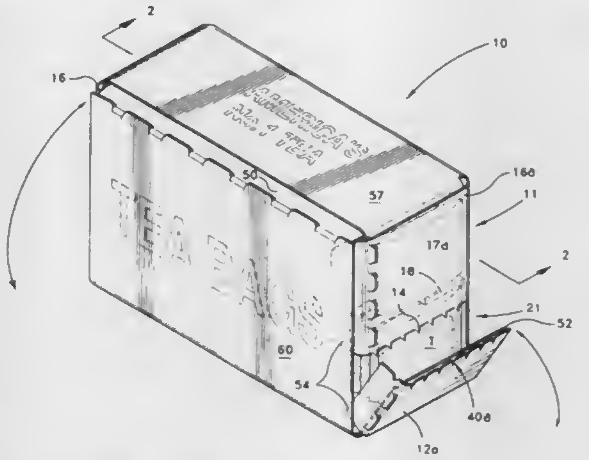
PACKAGING CARTON WITH PERFORATIONS FOR DISPENSING MOUTH

Virginia B. McDermott, 216 Williamsburg Rd., Ardmore, Pa. 19003

Filed Aug. 13, 1996, Ser. No. 696,155

Int. Cl.^{6} B65D *5/10*

U.S. Cl. 229—120.03 **7 Claims**



1. A packaging carton for individually dispensing units comprising:

a parallelepiped carton having a floor, a multiplicity of walls including two end walls, and a cover opposing said floor when closed, said carton defining a cavity containing a plurality of units arranged into a first row and a second row, said first row having a first end unit adjacent one of said end walls and said second row having a second end unit adjacent the other of said end wall, said cavity having a divider between said first row and said second row; and

a series of perforations provided in at least one of said end walls, said perforations defining a panel hinged to said floor, said panel dimensioned to be slightly lesser in dimension than one of said units.

5,746,370

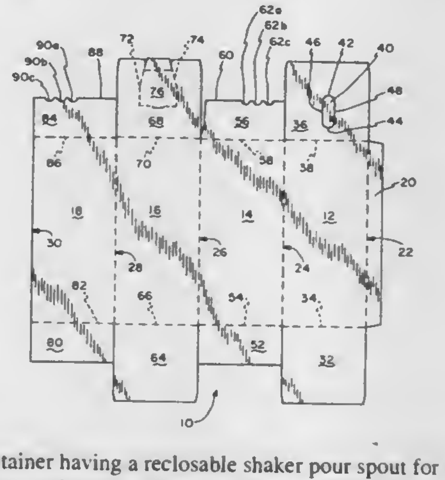
SHAKER POUR SPOUT DISPENSER

James L. Stone, Grand Rapid, Mich., assignor to Tenneco Packaging Inc., Evanston, Ill.

Filed Aug. 7, 1996, Ser. No. 684,977

Int. Cl.^{6} B65P *5/54*

U.S. Cl. 229—217 **14 Claims**



1. A container having a reclosable shaker pour spout for dispensing granular products, said container comprising:

a plurality of side panels hingedly connected along transverse fold lines and folded relative to each other to form a first and second pair of opposing sides of said container;

a plurality of bottom flaps hingedly connected to bottom edges of said side panels and folded inwardly from said opposing sides to form the bottom of said container;

first and second top minor flaps hingedly connected to top edges of one of said first and second pair of opposing sides, said first and second top minor flaps having outer edges defining a plurality of semi-apertures on one of said outer edges and a corresponding plurality of semi-apertures on the other of said outer edges, said semi-apertures being aligned along said first and second top minor flaps, said first and second top minor flaps being folded inwardly toward each other such that said outer edges generally meet to define an interface and said plurality of semi-apertures on each of said outer edges generally meet to define a corresponding plurality of apertures along said interface; and

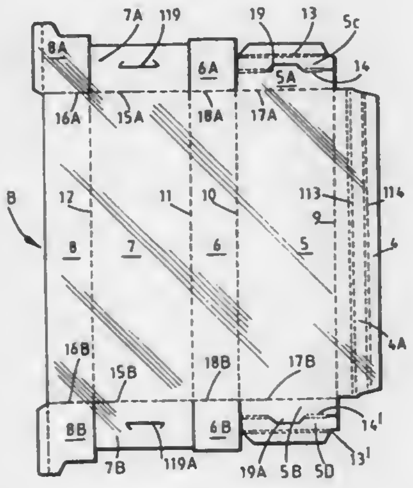
a pair of top major flaps hingedly connected to top edges of the other of said first and second pair of opposing sides and folded inwardly over said top minor flaps, said pair of top major flaps including a first-down top major flap and a second-down top major flap,

said first-down top major flap including a detachable plug, said first-down top major flap overlapping said first and second top minor flaps such that said detachable plug overlays said plurality of apertures,

said second-down top major flap including a tear-away pour spout opening tab, said second-down top major flap folded over said first-down top major flap such that a bottom surface of said opening tab is adhered to said detachable plug, said opening tab being adapted to be torn away from said second-down top major flap, said detachable plug remaining adhered to said bottom surface of said opening tab and becoming detached entirely from said first-down top major flap in response to said opening tab being torn away from said second-down top major flap, said detachable plug thereafter being frictionally engagable within an opening of said first-down top major flap formed by removal of said detachable plug.

5,746,371
CUTTING BRICK FOLDING CARTON AND BLANK

Amit Ben-Haim, 55 Park Lane, Suite 12, London W1Y 3DH, United Kingdom
Filed Dec. 29, 1995, Ser. No. 581,075
Int. Cl.⁶ B65O *5/54*
U.S. Cl. 229—222 **2 Claims**



1. A blank for assembling a cutting brick folding carton which comprises:

(a) cover, top, rear, bottom and front panels hingedly connected in the order named, said panels having bottom and top ends, said cover panel having a first set of perforations defining a first tear-away strip;

(b) first and second front panel end flaps hingedly connected to said bottom and top ends of said front panel;

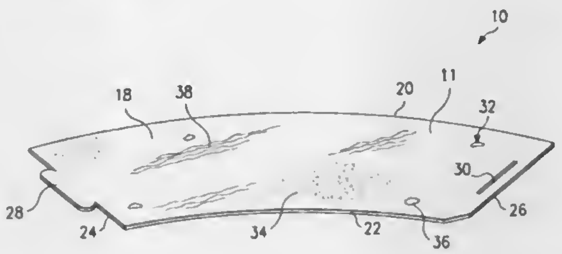
(c) first and second bottom panel end flaps hingedly connected to said bottom and top ends of said bottom panel, said first bottom panel end flap having a first die-cut pocket and said second bottom panel end flap having a second die-cut pocket;

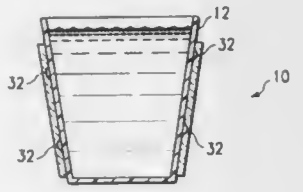
(d) first and second rear panel end flaps hingedly connected to said bottom and top ends of said rear panel; and

(e) first and second top panel end flaps hingedly connected to said bottom and top ends of said top panel, said first top panel end flap having a second set of perforations defining a second tear-away strip and a first lip portion and said second top panel end flap having a third set of perforations defining a third tear-away strip and a second lip portion; wherein the blank is adapted to form an intermediate carton sleeve having top and bottom end openings, said rear panel end flaps are folded first, said front panel end flaps are folded second to overlie a portion of said rear panel end flaps, said bottom panel end flaps are folded third and said top panel end flaps are folded fourth so that said top panel end flaps are operably associated with said bottom panel end flaps and said top and bottom end openings are substantially closed.

5,746,372
BIODEGRADABLE CUP HOLDER

Orville Spence, Arlington, Tex., assignor to American Excelsior Company, Arlington, Tex.
Filed Dec. 12, 1996, Ser. No. 766,161
Int. Cl.⁶ B65D *3/28*
U.S. Cl. 229—403 **15 Claims**

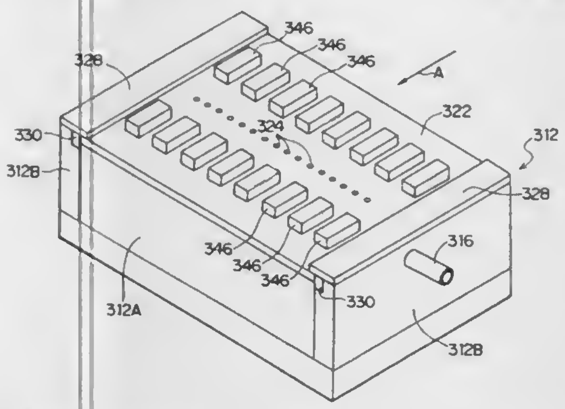




1. An improved beverage container holder of the type adapted for placement around a beverage container and being formed from a band adapted for wrapping around said container and providing insulation from said beverage container, said improvement comprising said band being formed of water soluble, biodegradable material with a plurality of randomly shaped, spaced-apart depressions distributed on portions thereof creating an air gap therein and between said band and said beverage container.

5,746,373
LIQUID INJECTION APPARATUS

Kazuo Sanada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 21, 1996, Ser. No. 604,469
Claims priority, application Japan, Feb. 22, 1996, 7-033552
Int. Cl.⁶ B05B *1/08;* **B41J** *2/045*
U.S. Cl. 239—102.2 **20 Claims**



1. A liquid injection apparatus comprising:

a pressure chamber in which a liquid is filled;

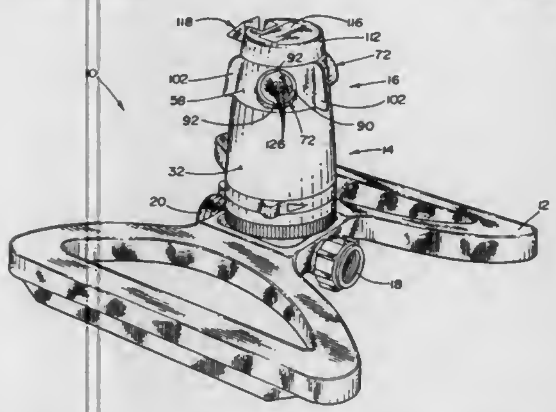
a nozzle plate in which a plurality of nozzle holes for injecting the liquid are arranged;

an actuator which displaces said nozzle plate to pressurize the liquid in said pressure chamber, thereby forcing the liquid in said pressure chamber from said nozzle holes; and

an elastically deformable elastic member connected to an end portion of said nozzle plate in the direction in which said nozzle holes are arranged and to a wall portion of said pressure chamber disposed between the end portion of said nozzle plate and the wall portion of said pressure chamber.

5,746,374
ROTARY SPRINKLER HAVING A TURRET ASSEMBLY

Sergio G. Simonetti, Westport, Conn., and Howard W. Andrews, Winchester, Va., assignors to Melnor Inc., Winchester, Va.
Filed Nov. 30, 1995, Ser. No. 568,312
Int. Cl.⁶ B05B *3/04*
U.S. Cl. 239—240 **50 Claims**



1. A turret assembly for use in a rotary sprinkler having a base and a main housing rotatably mounted on said base, said main housing including a top cover with a radially extending raised portion positioned thereon in diametrically opposed relation with respect to a water outlet defined in said main housing, said turret assembly comprising:

(a) a generally hollow turret housing mounted on said main housing for concomitant rotation therewith during operation of said rotary sprinkler, said turret housing having a top and a side wall with inner and outer surfaces;

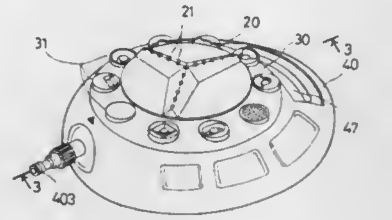
(b) a plurality of circumferentially spaced nozzle interface extensions attached to and extending outwardly of said outer surface of said side wall;

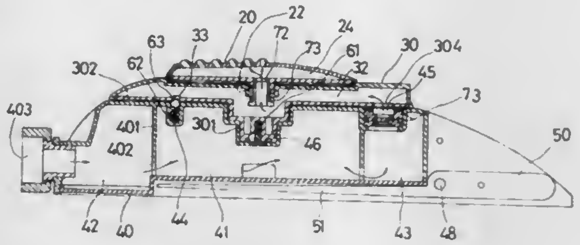
(c) a plurality of circumferentially spaced nozzle ports extending through said side wall; and

(d) means for circumferentially orienting said turret housing relative to said main housing so as to selectively align one of said nozzle ports with said water outlet and to selectively provide fluid communication between said water outlet and one of said nozzle interface extensions during operation of said rotary sprinkler.

5,746,375
SPRAYER DEVICE

Wen-Li Guo, No. 10, Fang Dong Road, Wen Gin Tsuen, Fang Yuan Hsiang, Chang Hua Hsien, Taiwan
Filed May 31, 1996, Ser. No. 655,816
Int. Cl.⁶ B05B *3/00*
U.S. Cl. 239—245 **3 Claims**





1. A sprayer device comprising:

a base including an inner chamber formed therein for receiving water therein, said base including an upper portion having an aperture formed therein,

a rotary member including a tube extended downward and engaged through said aperture and rotatable secured to said base, said tube being arranged to allow the water to flow from said base into said rotary member, said rotary member including at least one row of radially aligned holes formed therein, said holes including a slope for allowing the water to flow out of said rotary member in a slope and for allowing the water to apply a force against said rotary member so as to rotate said rotary member relative to said base, and

a housing including at least one room formed therein, including a water inlet for allowing water to flow into said room, and including an outlet for allowing said water to flow out of said housing, said housing including a center portion having a recess formed therein,

said base including a stud rotatably engaged in said recess of said housing and including a bottom plate for blocking said outlet, said base including a plurality of nozzles for aligning with said outlet so as to receive water from said outlet, said bottom plate including an aperture formed therein for aligning with said outlet and for allowing the water to flow into said inner chamber of said base.

5,746,376

VALVE AND METHOD FOR THE PRODUCTION OF A VALVE

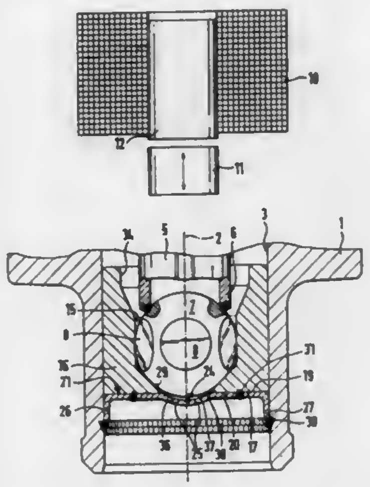
Peter Romann, Stuttgart, Germany, and Siegfried Rohde, Yokohama, Japan, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 20, 1995, Ser. No. 575,380

Claims priority, application Germany, Dec. 20, 1994, 44 45 358.2

Int. Cl.⁶ B05B *1/02*

U.S. Cl. 239—585.4 **2 Claims**



1. A fuel injection valve for a fuel injection system of internal combustion engines, which comprises a valve housing, a valve seat body having a downstream end and is arranged within said housing, a movable valve-closing spherical shaped element which interacts with a valve seat surface formed in said valve seat body, a wall of said valve seat surface extends to said downstream end of the valve seat body, a perforated spray disk which is arranged downstream of the valve seat surface on said downstream end of the valve seat body, said perforated spray disk has a bulge in a central area having a shape of a spherical shell with said bulge in a direction away from the valve seat body into which the valve-closing element projects and in which at least one spray opening is provided, wherein the perforated spray disk (**21**) is rigidly connected to said downstream end (**17**) of the valve seat body (**16**) in an area outside the bulge (**36**), and a wall (**38**) of the bulge (**36**) merges directly into said wall of the valve seat surface (**29**) whereby a small volume collecting space is formed.

5,746,377

APPARATUS FOR COMMINUTING WASTE MATERIALS

Johann Gehrig, Kleinwallstadt, Germany, assignor to Colortronic GmbH, Friedrichsdorf, Germany

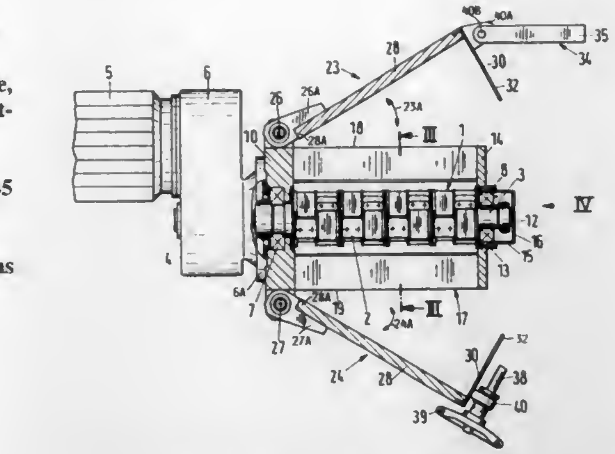
Filed Sep. 19, 1995, Ser. No. 531,167

Claims priority, application Germany, Sep. 20, 1994, 44 33 473.7

Int. Cl.⁶ B02C *18/16*

U.S. Cl. 241—73 **17 Claims**

1. An apparatus for comminuting waste materials, comprising a housing, a rear bearing shield (**10**), a front bearing shield (**14**), a knife rotor (**1**) rotatably mounted in said front and rear bearing shields, at least one rotor knife (**2**) carried by said knife rotor (**1**) for rotation about a rotational rotor axis (**4**), said housing comprising two housing sections (**23**, **24**) matching each other for forming said housing in a closed position of said housing sections (**23**, **24**), each housing section comprising a first hinge (**26**, **27**) hingeably securing the respective housing section to one of said rear and front bearing shields, each first hinge (**26**, **27**) comprising a first hinging axis (**26A**, **27A**) extending crosswise to said rotational rotor axis (**4**) so that said housing sections (**23**, **24**) are tiltable in opposite directions away from each other to open said housing and toward each other to close said housing, said apparatus further comprising a clamping and locking device (**33**) including a clamping frame (**34**) and a locking member (**38**), a second hinge (**40**B) hingeably securing said clamping frame (**34**) to one of said housing sections (**23** or **24**) near one of said front and rear bearing shields (**14**, **10**), said locking member (**38**) being secured to the respective other housing section (**24** or **23**) of said housing sections (**23**, **24**) for cooperation with said clamping frame to lock said housing sections (**23**, **24**) to each other, and at least one stator knife (**20**, **21**) positioned in said housing for cooperating with said rotor knife (**2**).



5,746,378

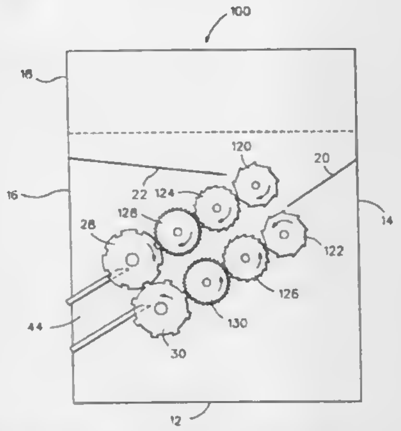
VOLUME REDUCTION MACHINE

Charles Donald Beadle, New Westminster, and Murray Frank Green, North Vancouver, both of Canada, assignors to Marathon Equipment Company, Vernon, Ala.

Filed Jun. 23, 1995, Ser. No. 494,152

Int. Cl.⁶ B02C *19/14*

U.S. Cl. 241—99 **5 Claims**



1. A volume reduction machine, comprising:
- a) a frame having an end, side, and bottom panels;
- b) a first feed plate disposed at one end of said frame adjacent an upper edge thereof and inclined toward the center thereof,
- c) a second feed plate disposed at an opposite end of said frame adjacent an upper edge thereof and inclined toward said first feed plate, said first and second feed plates forming an inlet therebetween;
- d) first and second feed rolls transversely and rotatively mounted above said first feed plate, each feed roll including a plurality of feed disks spaced along the length thereof and said first and second feed rolls being aligned and providing an overlap of respective feed disks;
- e) first and second crusher rolls transversely and rotatively mounted adjacent a transverse lower edge of said first feed plate, each crusher roll including a plurality of crusher plates spaced along the length thereof and said first and second crusher rolls being aligned to provide an offset between respective crusher disks and to provide a predetermined gap between said first and second crusher rolls, said first crusher roll being aligned with said second feed roll to provide an overlap between respective feed disks;

- f) first and second forks transversely disposed within said frame and adjacent said first and second crusher rolls for defining an outlet;
- g) a hopper positioned on said frame and communicating with the inlet; and
- h) a first pair of cap removal rolls including an upper cap removal roll and a lower cap removal roll, said first pair of cap removal rolls rotatably mounted to said frame and said upper cap removal roll adapted to rotate at a rate faster than the rate at which said lower cap removal roll rotates.

5,746,379

METHOD OF PRODUCING CORELESS TOILET PAPER ROLL AND CORELESS TOILET PAPER ROLL PRODUCED THEREBY

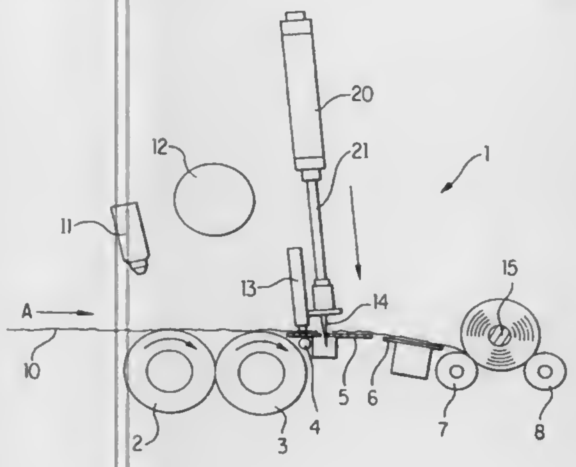
Akira Shimizu, 1600-3 Fujioka, Fuji, Shizuoka, 417, Japan

Filed Dec. 5, 1996, Ser. No. 759,637

Claims priority, application Japan, Nov. 12, 1996, 8-300203

Int. Cl.⁶ B65H *18/20;18/28;19/28*

U.S. Cl. 242—160.1 **5 Claims**



5. A coreless toilet paper roll comprising:
- a paper roll body, in a central portion of which a hole is formed; and
- a roll-like portion provided at an initial end of the paper roll body,
- wherein the roll-like portion is formed like a roll by folding back an initial end portion of paper in such a manner as to be laid over a shaft, around which the paper is wound, and by gluing an initial end part and an inner part, which is located at a distance of about 1 to 4 cm from the initial end part, of the initial end portion of the paper together, with an adhesive, and
- wherein the paper roll body ls formed by winding up a remaining portion of the paper around the shaft, and the hole is formed by detaching the shaft from the paper roll body.

5,746,380

DEVICE FOR PREVENTING WELDING WIRE IN A WELDING WIRE PAIL FROM TANGLING

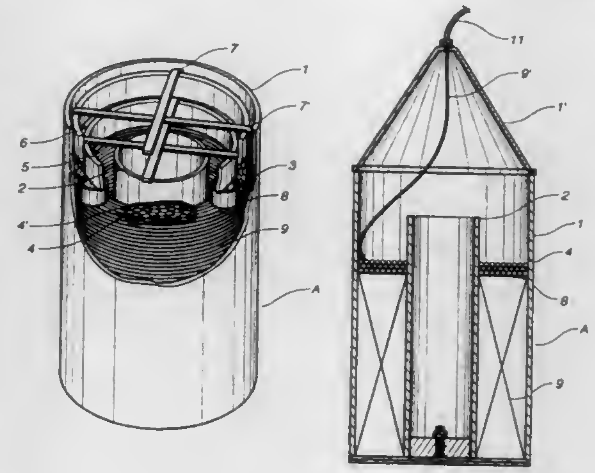
Mong-Suk Chung, Seoul, Rep. of Korea, assignor to Hyundai Welding & Metal Col, Ltd., Seoul, Rep. of Korea

Filed Jul. 29, 1996, Ser. No. 688,112

Claims priority, application Rep. of Korea, Mar. 20, 1996, 5412/96

Int. Cl.⁶ B65H *55/00;49/00;* **C10G** *1/08*

U.S. Cl. 242—171 **3 Claims**



1. A device for preventing a coiled welding wire from getting tangled in a welding wire pail, said coiled welding wire being received in an annular gap formed between inner and outer tubs of said pail, comprising:
- a plurality of tangle preventing bead packages laid on top of said coiled welding wire, each package packaging a plurality of tangle preventing beads;
- a plurality of pressing pipes vertically standing on the top of said coiled welding wire at portions between said packages;
- an internal buffer ring laid on the tops of said pressing pipes;
- an external buffer ring provided with two elastic bands and laid on said internal buffer ring, said bands being diametrically fitted over said external buffer ring to make a right angle with each other and laid on the top edge of said internal buffer ring to lay said external buffer ring on said internal buffer ring; and
- a top lid covering the top of said outer tub.

5,746,381

FISHING REEL WITH CLUTCH MECHANISM UTILIZING AN ENGAGING PROTRUSION AND ENGAGING RECESSES

Takeo Miyazaki, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

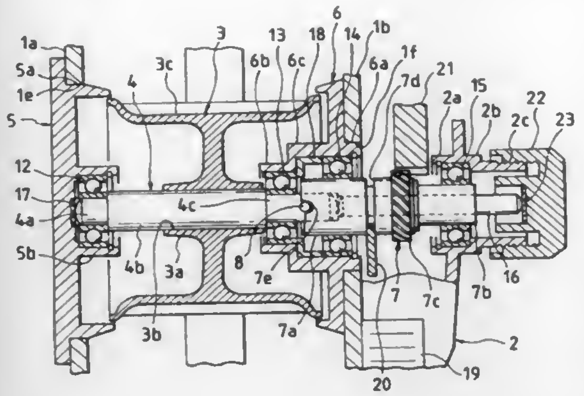
Filed Jun. 5, 1996, Ser. No. 659,239

Claims priority, application Japan, Jun. 7, 1995, 7-200343

Int. Cl.⁶ A01K *89/015*

U.S. Cl. 242—261 **8 Claims**

1. A fishing reel comprising:
- a spool rotatably supported between side plates of a reel body and around which a fishing line is wound, said spool comprising a spool shaft;
- a drive mechanism for driving said spool, said drive mechanism comprising a rotatably mounted pinion; and
- a clutch mechanism for transferring a drive force between said drive mechanism and said spool, wherein said clutch mechanism comprises:
  - an engaging protrusion attached to one of said spool and said spool shaft so as to extend in a direction substantially perpendicular to an axis of rotation of said spool shaft;
  - a pair of engaging recesses provided in peripheral portions of an end face of said pinion, said engaging recesses being



arranged substantially perpendicular to an axis of rotation of said pinion, wherein when said pair of engaging recesses are engaged and disengaged with said engaging protrusion, said clutch mechanism is changed over, respectively, between a winding condition in which the fishing line is taken up on said spool and a free rotating condition in which the fishing line is let out from said spool; and

a first end plane and a first oblique face arranged to extend continuously between said engaging recesses on one side of the end face of said pinion, and a second end plane and a second oblique face arranged to extend continuously between said engaging recesses on a side of the end face of said pinion opposite the one side.

5,746,382
FISHING SPINNING REEL WITH SPOOL HAVING TAPERED PORTION AND GUIDE

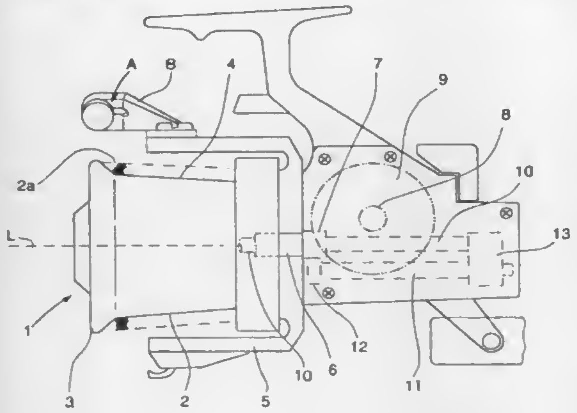
Wataru Tsutsumi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 510,618, Aug. 3, 1995, abandoned. This application Mar. 21, 1997, Ser. No. 821,411

Claims priority, application Japan, Aug. 5, 1994, 6-010736 U

Int. Cl.^{6} A01K *89/01*

U.S. Cl. 242—322 **9 Claims**



1. A fishing spinning reel in which a fishing line is wound on a spool to form a wound fishing line surface, said spool being mounted to said spinning reel at a proximal end of said spool and being moved back and forth in association with the rotation of a handle, wherein said spool comprises:

a guide at a distal end of said spool for restraining the fishing line from touching the wound fishing line surface when the fishing line is let out from said reel; and

a tapered portion having a fishing line winding surface that extends from a proximal end of said guide to the proximal end of said spool, said tapered portion consisting of no more than two sections, each said section having a substantially linear profile, each said section having a constant taper angle, and each said section gradually decreasing in diameter towards the proximal end of said spool.

5,746,383
FILM FORWARDING DEVICE

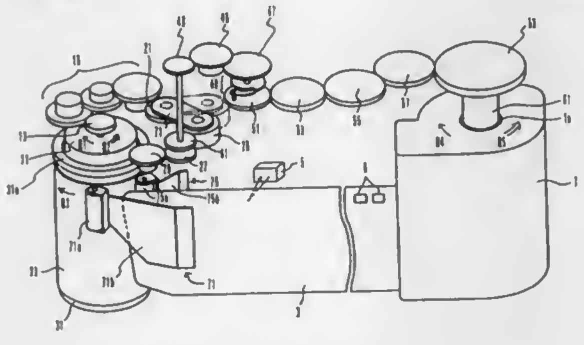
Akira Ezawa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 15, 1996, Ser. No. 632,066

Claims priority, application Japan, Apr. 17, 1995, 7-090657

Int. Cl.^{6} G03B *1/58*

U.S. Cl. 242—332.7 **2 Claims**



1. A film forwarding device, comprising:

a take up spool which takes up a film upon a circumferential outer surface of the take up spool, the film having, upon a leading end of the film, a projecting portion and a sloping portion, connected to the projecting portion, which slopes with respect to a transverse direction perpendicular to a direction of forwarding the film, the projecting portion being a tip of the film positioned on the right-hand side in the direction of forwarding the film;

a pressure member which presses the film against said circumferential outer surface of the take up spool; and

an advancing mechanism which pushes out the film from a film cartridge and advances the film at least until taking up of the film by said take up spool has started, wherein

said pressure member is located so as to initially come into contact with the film at the projecting portion of the leading end of the film, when the taking up of the film by the take up spool starts.

5,746,384
TAPE TENSION CONTROL APPARATUS

Masaki Yoshizawa, Saitama; Takanobu Kohno, Tokyo, and Satoshi Ota, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 583,956, Jan. 11, 1996, abandoned, which is a continuation of Ser. No. 149,088, Nov. 9, 1993, abandoned. This application Aug. 14, 1997, Ser. No. 911,569

Claims priority, application Japan, Nov. 9, 1992, 4-298505; Nov. 9, 1992, 4-298511; Nov. 11, 1992, 4-300875

Int. Cl.^{6} B65H *59/38;* **G11B** *15/46*

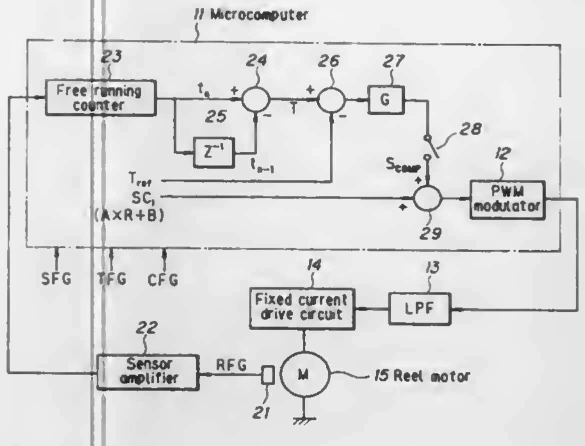
U.S. Cl. 242—334.4 **1 Claim**

1. A tape driving apparatus for driving a tape type recording medium extending between and wound around a pair of tape reels comprising:

a reel motor including an output shaft;

a capstan for stabilizing a transport speed of the tape type recording medium;

diameter calculating means for calculating a diameter of the tape type recording medium wound around one of said pair of tape reels which is engaged with said output shaft of said reel motor from a capstan pulse signal and from a pair of tape reel pulse signals;



control signal generating means for generating a control signal which is a function of the calculated diameter of the tape type recording medium wound around said one tape reel;

rotation speed detecting means for detecting a rotation speed of said reel motor so as to generate a reel motor rotation speed detection signal including:

a shaft rotation sensor;

a free running counter for generating a count value by timing an interval between signals from said shaft rotation sensor;

delay means for delaying a first output from said free running counter; and

first subtracting means for subtracting an output of said delay means corresponding to an immediately previous count value from a next successive output from said counter corresponding to a current count value to produce said reel motor rotation speed detection signal;

reel motor rotation speed reference signal generating means for generating a reel motor rotation speed reference signal indicative of a reference speed which is a function of said diameter of the tape wound around said one tape reel;

second subtracting means for subtracting said reel motor rotation speed reference signal from said reel motor rotation speed detection signal to produce a compensation signal;

adding means for adding said compensation signal to said control signal only when said reel motor rotation speed reference signal is larger than said reel motor rotation speed detection signal to create a compensated control signal; and

reel motor driving means for driving said reel motor with a signal that is a function of said compensated control signal, whereby said rotation speed is made to approach said reference speed and a tension imposed upon the tape type recording medium is controlled.

5,746,385
TAPE LIBRARY CARTRIDGE STORAGE AND CONTROL SYSTEM

Gregory S. Leger; Scott R. Patterson, both of Colorado Springs, and Ryan S. Porter, Monument, all of Colo., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Sep. 16, 1996, Ser. No. 716,685

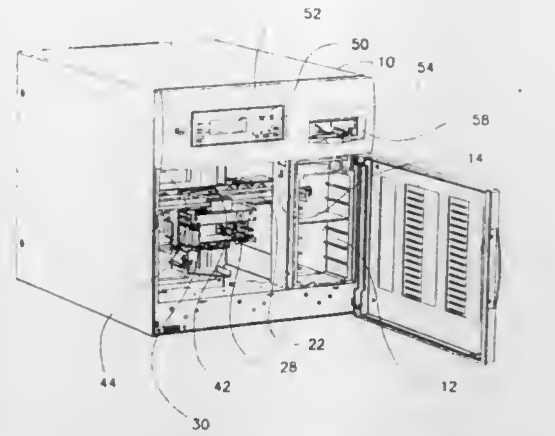
Int. Cl.^{6} G11B *15/68*

U.S. Cl. 242—337 **15 Claims**

1. A mailbox for receiving and disgorging cartridges from a tape library having a cartridge manipulation system with three axis translation capability for cartridge handling, said mailbox comprising:

an aperture in an exposed face of the library;

means for blocking access to an interior bay of the tape library, said blocking means moveable by contact with the cartridge manipulation system for passing cartridges through the mailbox; and



means for ejecting cartridges inserted into the mailbox, said ejecting means operative through engagement with the cartridge manipulation system.

5,746,386
EXPANDING SHAFT

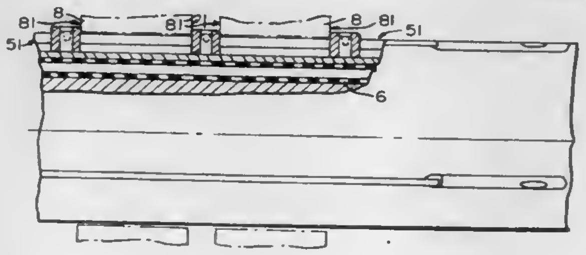
Giancarlo Marin, Montecchio Maggiore, Italy, assignor to Svecom Pe SRL, Montecchio Maggiore, Italy

Continuation of Ser. No. 496,291, Jun. 29, 1995, Pat. No. 5,597,134. This application Jan. 27, 1997, Ser. No. 791,488

Claims priority, application Italy, Mar. 3, 1995, VI95A0034

Int. Cl.^{6} B65H *75/24*

U.S. Cl. 242—571.2 **3 Claims**



1. An expanding shaft comprising, a cylindrical shaft having a longitudinal axis and an outer surface, said shaft having a plurality of radially disposed slots extending longitudinally of said shaft and opening at said outer surface, said shaft being adapted to support one or more tubular supports each of which has side edges and is disposed coaxially around said shaft, a plurality of mobile means each of which is disposed within one of said slots for radial movement with respect to said longitudinal axis, thrusting means for urging each of said mobile means radially outwardly with respect to said longitudinal axis, a plurality of bucking elements supported for longitudinal movement relative to one of said mobile means and being adapted to engage the side edges of one or more tubular supports, and means for locking said bucking elements in position longitudinally of said shaft to thereby lock one or more tubular supports in position longitudinally of said shaft.

5,746,387
HYBRID COMPOSITE EXPANDABLE SHAFT

Alessio G. Pretto, RD2, Box 414 Wilkinson Hollow Rd., Pawling, N.Y. 12564, and John A. Pretto, 100 Union City Rd., Prospect, Conn. 06712

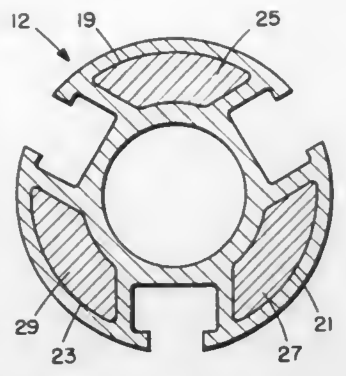
Filed Feb. 20, 1996, Ser. No. 604,152

Int. Cl.^{6} B65H *75/24;75/08*

U.S. Cl. 242—571.2 **7 Claims**

1. An expandable shaft comprising:

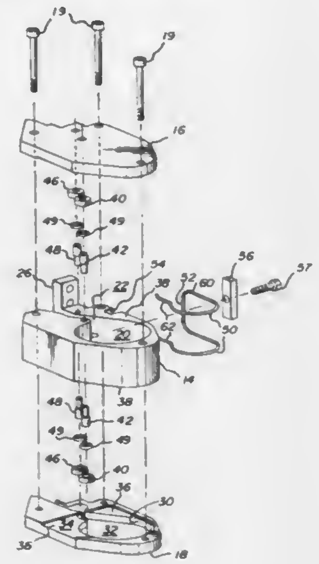
an elongated metallic shell structure having a central axis, a cylindrical metallic core and a plurality of rails positioned



outward from the cylindrical core and extending parallel to the central axis of the shell structure;
said rails being spaced apart to form slots extending parallel with the shell axis;
pressure protrusions located within each slot and adapted to be moved radially outward;
inflatable means located within each slot to selectively move said pressure protrusion means radially outward;
each of said plurality of rails having an elongated opening of accurate cross section therein; and
a composite fibrous stiffener material substantially filling each said opening.

5,746,388
PHOTOGRAPHIC FILM STORAGE RECEPTACLE WITH CONSTRAINED FILM SPOOLING LOOPS

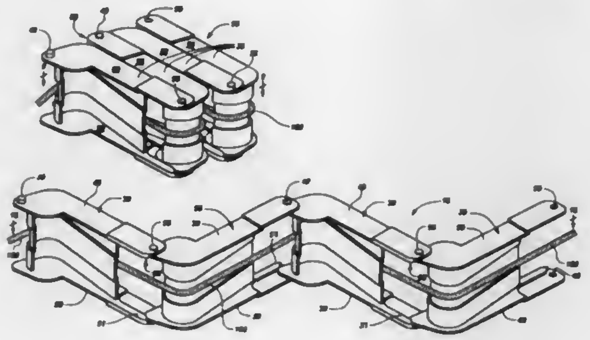
Russell J. Raimondi, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 21, 1996, Ser. No. 668,111
Int. Cl.⁶ B65H *18/04*
U.S. Cl. 242—595 **7 Claims**



1. A photographic film storage receptacle for forming a spool-free coil of film therein comprising:
a housing having a side wall and a pair of end walls, said side wall defining a generally cylindrical inner chamber having an axially extending film entry slot for insertion of a film strip into the chamber, said housing having a circumferential pocket at an end of said cylindrical chamber adjacent said film entry slot; and
a generally circular loop of elastic material having an expandable diameter, said loop having a first end secured to said housing at a side of said film slot opposite to said pocket so as to form said inserted film into a rotating film coil of expanding diameter within the loop and a second end slidably captured within said pocket so as to allow the diameter of said loop to expand in concert with the film coil diameter expansion while holding a defined line of contact between the loop and the outer surface of the rotating film coil.

5,746,389
CABLE RETRACTOR

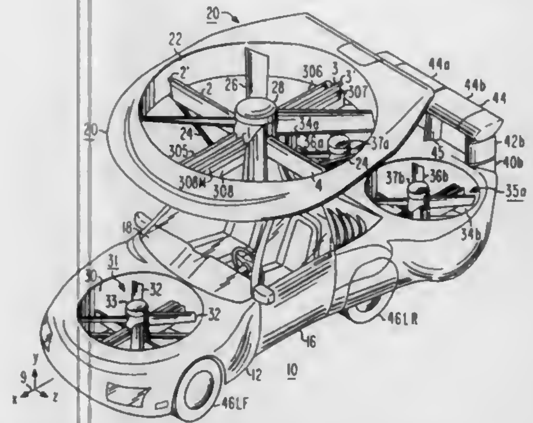
Donald F. Willmann, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.
Filed Dec. 20, 1996, Ser. No. 771,261
Int. Cl.⁶ B65H *57/28;57/04*
U.S. Cl. 242—615.1 **14 Claims**



1. A rolling action, bi-directional foldable cable retractor for supporting a cable above a minimum bend radius as the cable retractor bi-directionally folds and unfolds, said cable retractor comprising:
at least two restrainer segments each having a forward orientation and a back orientation, said restrainer segments interconnected with the forward orientation and backward orientation alternating to enable bi-directional folding of the cable to weave between the interconnected restrainer segments, each restraining segment comprising:
a right end plate having a longitudinal axis and a head end and a tail end, the head end offset from the longitudinal axis;
a complimentary left end plate having a longitudinal axis and a head end and a tail end, the head end offset from the longitudinal axis;
a web having a longitudinal cross section including a substantially linear portion integral with an arcuate portion, the arcuate portion having a radius of curvature equal to or greater than the minimum bend radius of the cable engaging said web, said web attached on one side to the right end plate and on the opposite side to the complimentary left end plate with the arcuate portion at the head end of each end plate;
pivot means at the head end of each end plate, said pivot means displaced from the longitudinal axis of the end plate; and
pivot means in the tail end of each end plate for coupling with the pivot means at the head end of the adjacent restrainer segment, whereby the position in the pivot means in the head end and the pivot means in the tail end enable a rolling bi-directional foldable action between adjacent interconnected restrainer segments.

5,746,390
AIR-LAND VEHICLE WITH DUCTED FAN VANES PROVIDING IMPROVED PERFORMANCE

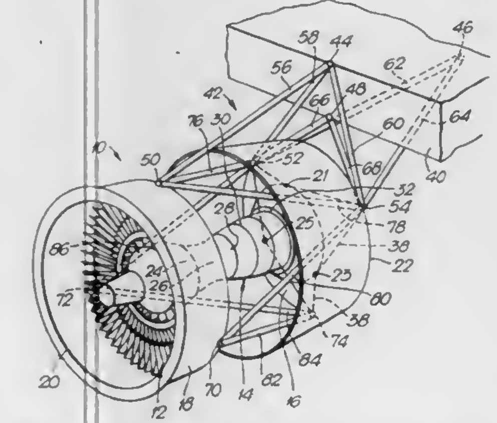
Frank Richard Chiappetta, Berwyn, Pa., assignor to Fran Rich Chi Associates, Inc., Berwyn, Pa.
Filed Mar. 20, 1996, Ser. No. 618,595
Int. Cl.⁶ B64C *27/08;29/02*
U.S. Cl. 244—12.3 **11 Claims**



1. A vehicle adapted for flight, said vehicle comprising:
a body defining a forward/aft axis;
at least one shrouded fan mounted on said body, said shrouded fan including a circular shroud defining a duct, and a fan centered for rotation in said duct, said shrouded fan, when powered, providing lift to said body to aid in flight of said vehicle, said shrouded fan further including direction control vanes for redirecting airflow through said duct in a manner which provides a net thrust in at least one of forward/aft and left/right directions, said shrouded fan further including thrust negation vanes located within said duct, which reduce said lift provided by said shrouded fan, each and every one of said thrust negation vanes associated with said duct being elongated along an axis of elongation, and extending, across at least a portion of said duct, with said axes of elongation of said thrust negation vanes parallel with said forward/aft axis of said body.

5,746,391
MOUNTING FOR COUPLING A TURBOFAN GAS TURBINE ENGINE TO AN AIRCRAFT STRUCTURE

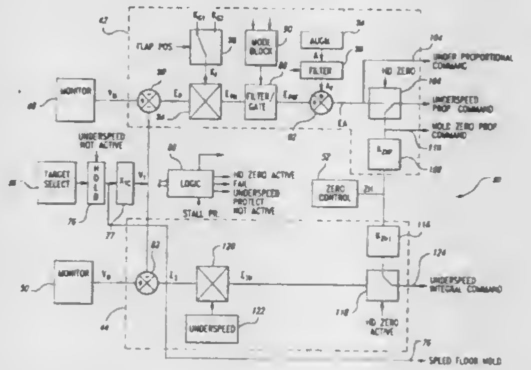
Leonard J. Rodgers; Arnold C. Newton; James P. Berry; Peter G. G. Farrar, all of Derby, and Kenneth F. Udall, Derbyshire, all of England, assignors to Rolls-Royce plc, London, England
Filed Apr. 1, 1996, Ser. No. 625,356
Int. Cl.⁶ F02C *7/20;* **B64D** *27/12*
U.S. Cl. 244—54 **31 Claims**



1. A mounting for coupling a turbofan gas turbine engine to an aircraft structure, the turbofan gas turbine engine having an axis and comprising a core engine and a fan, the core engine having compressor means, combustion means, turbine means and a core casing, the fan operating within a fan duct defined in part by a fan casing, the fan casing extending from a fan duct intake to a fan duct nozzle,
the aircraft structure having three mounting points on the aircraft structure, the three mounting points being arranged at the vertices of a first triangle,
the fan casing having three mounting points arranged at the vertices of a second triangle,
support means connecting the three mounting points on the fan casing with the core casing to support the core engine,
first connecting means connecting a first one of the mounting points on the aircraft structure with the three mounting points on the fan casing,
second connecting means connecting a second one of the mounting points on the aircraft structure with two of the mounting points on the fan casing,
and third connecting means connecting a third one of the mounting points on the aircraft structure with at least one of the mounting points on the fan casing;
said three mounting points on the aircraft structure being arranged in a first plane,
said fan casing having a first mounting point in a second plane, the second plane being arranged perpendicular to the axis of the turbofan gas turbine engine,
said fan casing having a second mounting point and a third mounting point in a third plane, said third plane being arranged perpendicular to the axis of the gas turbine engine, the third plane being spaced axially from the second plane, the second and third mounting points being angularly spaced on the fan casing such that the three mounting points on the fan casing are arranged at the vertices of the second triangle,
the second connecting means connecting a second one of the mounting points on the aircraft structure with the second and third mounting points on the fan casing,
the third connecting means connecting a third one of the mounting points on the aircraft structure with at least one of the second or third connecting points on the fan casing.

5,746,392
AUTOPILOT/FLIGHT DIRECTOR UNDERSPEED PROTECTION SYSTEM

Mark E. Gast, Seabrook, Tex., assignor to The Boeing Company, Seattle, Wash.
Filed May 15, 1995, Ser. No. 441,468
Int. Cl.⁶ B64C *13/08;* **G05D** *1/00;1/08*
U.S. Cl. 244—76 B **17 Claims**



1. A method of limiting underspeed in an aircraft having flaps, comprising the steps of:
selecting a set of flight parameters;
determining a target speed of the aircraft;
determining an actual speed of the aircraft;
comparing the target speed to the actual speed;
producing an electrical first error signal indicative of the difference between the actual speed and the target speed;
monitoring a flap position of the flaps;

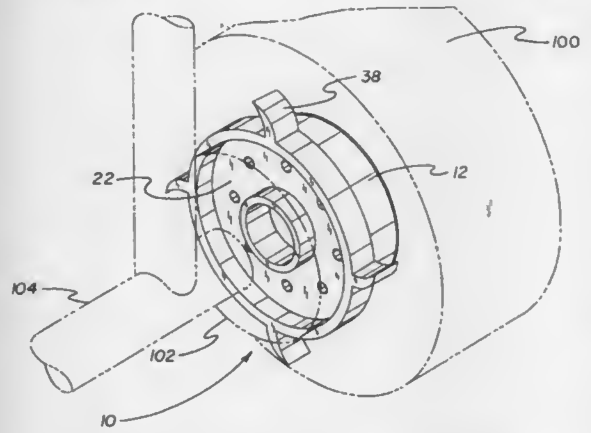
adjusting the first error signal in response to the monitored flap position;
receiving the adjusted first error signal with an electronic controller; and
adjusting the selected set of flight parameters with the electronic controller in response to the adjusted first error signal.

5,746,393

AIRCRAFT WHEEL ROTATING APPARATUS

Rosemarie A. Gennaro, 6545 Southwest 20th Ct., Plantation, Fla. 33317

Filed Jun. 21, 1996, Ser. No. 670,266
Int. Cl.^{6} B64C *25/40*
U.S. Cl. 244—103 S **2 Claims**



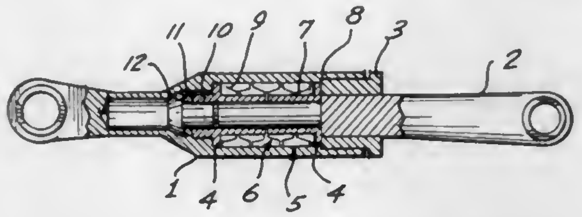
1. An aircraft wheel rotating apparatus for accelerating airplane landing gear during final approach to a runway comprising, in combination:
an inner circular portion having an inner end and an outer end, the inner end being dimensioned for coupling with a wheel of an aircraft, the inner circular portion having a central aperture formed therethrough;
an outer circular portion having an inner end and an outer end, the inner end of the outer circular portion being integral with the outer end of the inner circular portion, the outer circular portion having a plurality of apertures therethrough arranged in a circular configuration, the plurality of apertures forming a periphery equal in dimension to the central aperture of the inner circular portion, the outer circular portion having a central aperture formed therethrough within the periphery of the plurality of apertures, the central aperture at the outer circular portion having a flange thereabound, the outer end of the outer circular portion having an outer flange secured to an outer periphery thereof, the outer end of the outer circular portion being dimensioned to receive a braking system of an aircraft therein, the central aperture of the outer circular portion receiving an axle of the aircraft therethrough to extend through the central aperture of the inner circular portion to couple with the aircraft wheel;
a plurality of crescent shaped turbine blades secured to an outer portion of the outer flange of the outer end of the outer circular portion, each of the blades having a concave outer surface and a convex inner surface, wherein the blades are equally spaced apart along the outer flange.

5,746,394

METHOD AND APPARATUS FOR DAMPING HIGH FREQUENCY VIBRATIONS GENERATED BY LANDING GEAR BRAKE APPLICATIONS

Lowell G. Gunnoe, Carnation, Wash.; Hideo Kawada, Loa Angeles, Calif., and Philip C. Nutting, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 405,050, Mar. 15, 1995, abandoned. This application Mar. 11, 1997, Ser. No. 814,853
Int. Cl.^{6} B64C *25/46*
U.S. Cl. 244—111 **3 Claims**



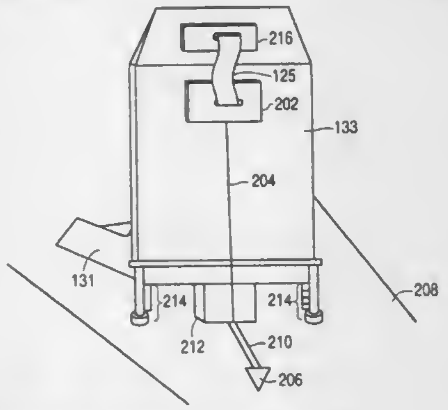
1. In combination in an aircraft multi-wheel landing gear having adjacent wheel brake assemblies:
a brake rod assembly interconnected between said adjacent wheel brake assemblies for providing torque compensation and vibration damping; and
a brake rod assembly comprising a double acting ring spring brake rod assembly, wherein said double acting ring spring brake rod assembly is activated when subjected to either tension or compression loading by brake generated vibrations.

5,746,395

HELICOPTER SEAT SAFETY SYSTEM

Walter Richard Peck, Asheville, and Ronald Wayne Oates, Hendersonville, both of N.C., assignors to LME Inc., Annapolis, Md.

Filed Oct. 20, 1995, Ser. No. 546,073
Int. Cl.^{6} B64D *25/06;25/115*
U.S. Cl. 244—121 **14 Claims**



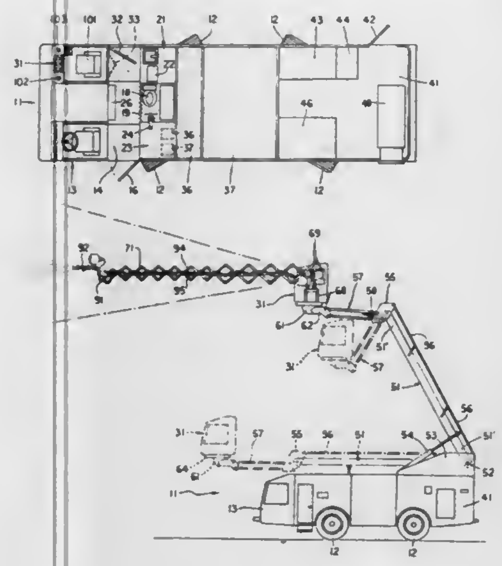
1. A helicopter seat safety system comprising:
a harness, including an inertia reel strap; and
a strap tensioning means engaged with the inertia reel strap, a cockpit floor and a seat frame of the helicopter seat;
wherein the strap tensioning means tensions the inertia reel strap as a result of the occurrence of a specific operational condition, such that an upper body of a seat occupant is pulled toward a back of the helicopter seat;
a seat pan for supporting the buttocks of a seat occupant, and a spinal compression means coupled to the seat pan, wherein the spinal compression means pushes the seat pan in an upward direction relative to the cockpit floor as a result of the occurrence of the specific operational condition; and
the seat frame being coupled to the seat pan and driven by the spinal compression means such that pushing of the seat frame in the upward direction relative to the cockpit floor causes the strap tensioning means to tension the inertia reel strap.

5,746,396

DEICER

Walter E. Thorton-Trump, Providencialles, Turks/Caicos Islands, assignor to Baltab Holdings, Ltd., Turks/Caicos Islands

Filed Oct. 21, 1994, Ser. No. 327,201
Int. Cl.^{6} B64D *15/10*
U.S. Cl. 244—134 R **14 Claims**



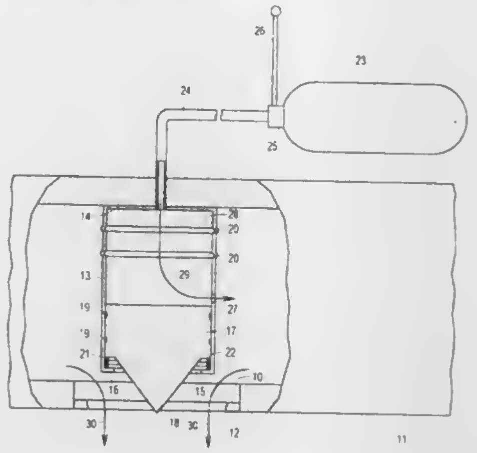
1. Apparatus for deicing aircraft comprising, in combination:
(a) a ground vehicle having means for propulsion over the surface of the ground and a longitudinal axis wherein said vehicle has an enclosed internal crew compartment, a enclosed drivers compartment accessible from said crew compartment, and a closable door between the crew compartment and the exterior of said vehicle, said crew compartment and said drivers compartment being protected from external ambient weather conditions;
(b) a main boom mounted to said ground vehicle and aligned with said longitudinal axis, said main boom being mounted for selective movement about a horizontal pivotal mount at one end thereof atop said vehicle;
(c) a parallelogram boom mounted to said main boom at an end thereof opposite said pivotal mounting, said parallelogram boom being selectively positionable between a vertical position and a position displaced over 90° from the vertical position;
(d) a platform supported on said parallelogram boom distal said main boom such that said platform remains horizontally disposed at all positions of said parallelogram boom;
(e) means for rotating said platform through 360° about a vertical axis;
(f) an enclosed operator's compartment mounted on said platform for an operator to occupy, said compartment having an access opening cooperatively formed to define an entry way providing ingress and egress between the internal crew compartment of said vehicle and said operator's compartment without exposure to ambient weather externally of said vehicle when said operator's compartment is positioned adjacent an entry way opening into said crew compartment and said operator's compartment and means for closing said entry way when said operator's compartment is displaced from said vehicle by said boom;
(g) an extendible boom mounted on said platform and extendible generally horizontally therefrom;
(h) a positionable nozzle mounted on said extendible boom for directing a spray of deicing fluid therefrom under the control of an operator in said operator's compartment; and,
(i) means for providing a supply of deicing fluid from within said vehicle to said nozzle.

5,746,397

AIRCRAFT DEFUELING SYSTEM

Topper DeField, and Brent DeField, both of 4135 Autumn La., Billings, Mont. 59106

Filed Jun. 14, 1996, Ser. No. 664,343
Int. Cl.^{6} B64D *37/12*
U.S. Cl. 244—135 R **19 Claims**



1. A defueling system for jettisoning fuel from a fuel tank, comprising:
a fuel jettison port on said fuel tank for providing an exit for said fuel;
an openable frangible closure sealing said fuel jettison port;
a pressurized gas bottle containing a gas, said gas bottle being connectable to said fuel tank, said gas in said bottle (a) having sufficient pressure to pressurize said fuel tank so as to rapidly jettison said fuel when said gas in said bottle is connected to said fuel tank, and (b) having sufficient volume to fill said fuel tank when said fuel tank is emptied of said fuel, so as to eliminate the possibility of fire and explosion; and
means for opening said closure on said fuel jettison port for jettisoning said fuel and releasing said gas into said fuel tank, said means comprising a valve for controlling flow of said gas from said bottle, a cylinder positioned adjacent said openable closure, said cylinder containing a piston, said cylinder connected to said gas bottle on one side of said piston and containing a vent on another side of said piston, such that when said valve is opened, said gas will force said piston to move within said cylinder and strike, break, and thereby open said removable frangible closure and allow said gas to flow through said vent.

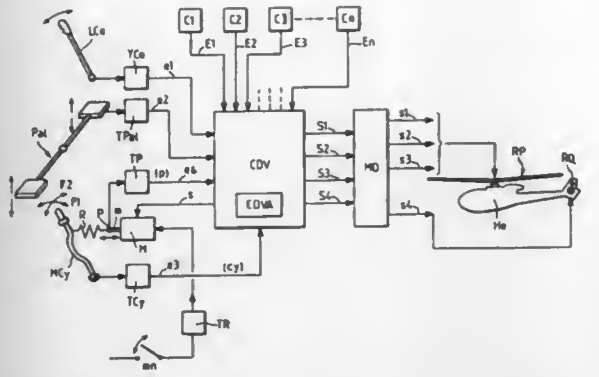
5,746,398

FORCE-GRADIENT CYCLIC STICK SYSTEM FOR A HELICOPTER

Philippe Alain Jean Rollet, Velaux, and Jacques Serge Louis Bellera, Aix-en-Provence, both of France, assignors to Eurocopter France, Marigoane Cedex, France

Filed Dec. 22, 1995, Ser. No. 577,130
Claims priority, application France, Dec. 22, 1994, 94 15466
Int. Cl.^{6} B64C *13/06;13/46*
U.S. Cl. 244—223 **14 Claims**

1. A cyclic stick system for a helicopter, the helicopter including condition sensing means for continuously sensing a current flight status of the helicopter and delivering parameters representative of the current flight status of said helicopter, said cyclic stick system comprising:
a cyclic stick for displacement by a pilot in two different directions corresponding respectively to piloting of the helicopter in pitch and to piloting of the helicopter in roll;
elastic return means for exerting, in at least one of the two different directions, a countering action counter to the displacement by said pilot on said cyclic stick in said at least one of the two different directions;



a movable member to which the elastic return means is attached at an attachment point;

a motor for displacing the movable member to which said elastic return means is attached;

difference delivering means for (i) sensing a position of the cyclic stick in said at least one of the two directions to output a first electrical signal representing the position of the cyclic stick in said at least one of the two directions, (ii) sensing a position of the attachment point to output a second electrical signal representing the position of the attachment point and (iii) delivering a difference between the first electrical signal and the second electrical signal;

link means for addressing said difference to said motor to control said motor to displace the movable member to cancel out the countering action of the elastic return means; and

a first controllable switch, interposed in said link one of said means (Cl to Cn) delivering said parameters representative of the flight status, in such a way that:

- in its closed position, said first switch (11) provides the continuity of said link, when said parameter is below a reference threshold (qo), so that said motor (M) is then supplied with said difference (d) between said first and second electrical signals and so that the displacement of said movable member (m) by said motor (M) tends to cancel out said countering action of said elastic return means (R);
- in its open position, said first switch (11) cuts said link, when said parameter is above said reference threshold, so that then said motor (M) is not supplied and so that the countering action of said elastic return means (R) is exerted totally on said cyclic stick displaced in said direction and receiving at least one of the parameters, for selectively opening and closing in accordance with the at least one of the parameters so as selectively (i) to allow the link means to address the difference to the motor when the first controllable switch is closed or (ii) to prevent the link means from addressing the difference to the motor when the first controllable switch is open.

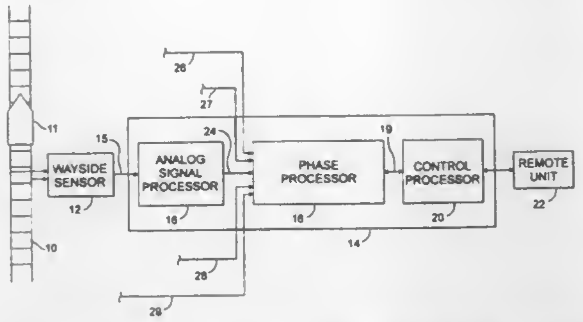
5,746,399
CAR SPACE MEASUREMENT APPARATUS

Kenneth P. Ehrlich, Pittsburgh; David Kutz, Greensburg, and Edmund C. Nowakowski, Pittsburgh, all of Pa., assignors to Union Switch & Signal Inc., Pittsburgh, Pa.
Filed Apr. 16, 1996, Ser. No. 632,941
Int. Cl.^{6} B61L *25/02*
U.S. Cl. 246—122 R **44 Claims**

1. A car space measurement apparatus for tracking a rail vehicle position on a track, comprising:

a. a wayside sensor operably connected to said track for sensing a plurality of track parameters, said parameters being representative of said rail vehicle position; and

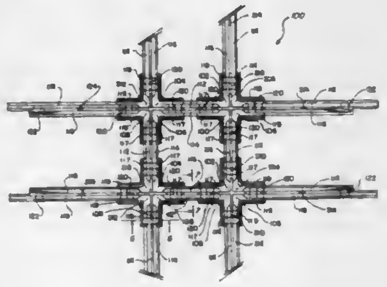
b. a supervisory processor, connected to said wayside sensor, for receiving selected ones of said plurality of track parameters, determining said rail vehicle position therefrom, and asynchronously displaying a track position indication representative of said rail vehicle position;

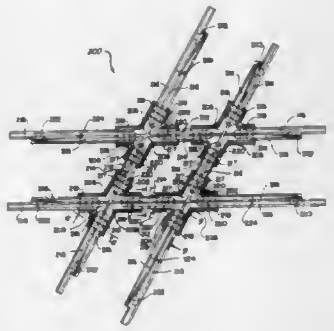


wherein said selected ones are analog signals that are received from the track and are representative of track phase signals, and said supervisory processor further comprises an analog signal processor connected to said wayside sensor for receiving said analog signals.

5,746,400
RAIL CROSSING ASSEMBLY

James A. Remington, St. Joseph, Mo.; Kenneth L. Schultz, Orland Park, Ill., and Russell R. Hein, Collierville, Tenn., assignors to ABC Rail Products Corporation, Chicago, Ill.
Filed Dec. 3, 1996, Ser. No. 759,958
Int. Cl.^{6} E01B *7/00*
U.S. Cl. 246—465 **6 Claims**





1. A railroad trackwork rail crossing having at least one crossing corner, and comprising at each crossing corner;

four spaced-apart corner casting elements each having an angled planform and an upper point surface;

straight intermediate rail elements co-operating with the angled planforms of said corner casting elements;

straight traffic rail elements co-operating with the angled planforms of said corner casting elements;

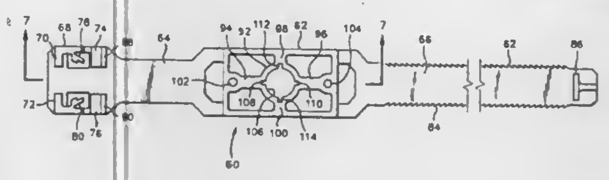
straight guard rail elements co-operating with the angled planforms of said corner casting elements;

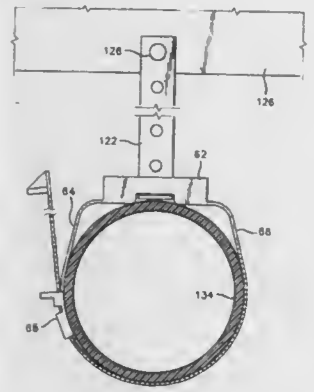
flangeway filler elements co-operating with said straight intermediate rail elements and with said straight traffic and guard rail elements to define railcar wheel flangeway therebetween; and

bolt fasteners joining said corner casting elements, said straight intermediate rail element, said straight traffic rail elements, said straight guard rail elements, and said flangeway filler elements into a unitary rigid structure.

5,746,401
UNIVERSAL PIPE HANGER WITH STRAP TIGHTENED BY BELT BUCKLE RATCHET

Duane R. Condon, 2330 Raymond Ave., Ramona, Calif. 92065
Filed Mar. 15, 1995, Ser. No. 404,344
Int. Cl.^{6} E21F *17/02*
U.S. Cl. 248—62 **4 Claims**





1. A universal pipe hanger for mounting a pipe to a building structure comprising:

an elongated flexible strap for encircling a pipe, said strap having first and second ends and a plurality of ratchet teeth along at least one side edge thereof;

a ratchet buckle on said first end of said strap for receiving said second end of said strap, and having latching pawls for [illegible]y engaging said teeth; and

a universal attachment bracket spaced from said first end, said universal attachment bracket having a generally box-like open frame including a plurality of slots for receiving a hanger bar in multiple orientations, and a bore formed in a hub centrally of said frame by means of a plurality of arms, said bore extending normal to said strap for receiving a hanger rod, a pair of first slots of said plurality of slots being disposed adjacent said bore in opposed relation transverse to said strap for receiving the hanger bar, a pair of second slots of said plurality of slots disposed adjacent said bore in opposed relation longitudinally to said strap for receiving the hanger bar, and a third slot extending parallel to said strap for receiving the hanger bar.

5,746,402
SLIDING POINTING DEVICE TRAY

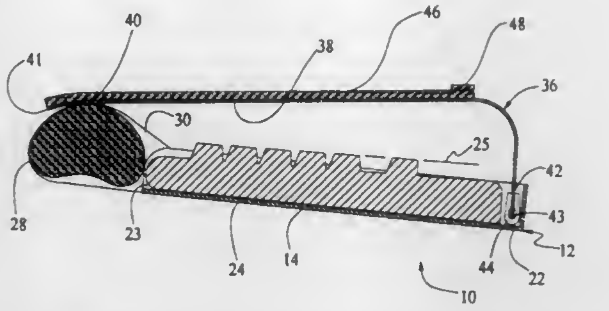
Frederic C. Ambrose, 142 The Channel, Brewster, Mass. 02631, and David Hawley, 108 Chase Hill Rd., Sterling, Mass. 01564
Continuation-In-part of Ser. No. 556,593, Nov. 13, 1995. This application Mar. 11, 1996, Ser. No. 613,857
Int. Cl.^{6} B68G *5/00*
U.S. Cl. 248—118 **2 Claims**

1. A system for positioning a pointing device relative to a computer keyboard having a cable, the system comprising:

(a) a keyboard support tray having a support surface and a rear wall, said support surface having a front portion and a rear portion and being adapted to support the keyboard, said keyboard support tray further comprising a slot disposed in said rear wall;

(b) a palm rest engaged with said front portion of said keyboard support tray; and

(c) a pointing device positioning member adapted to support the pointing device and having a support surface, a first end, and

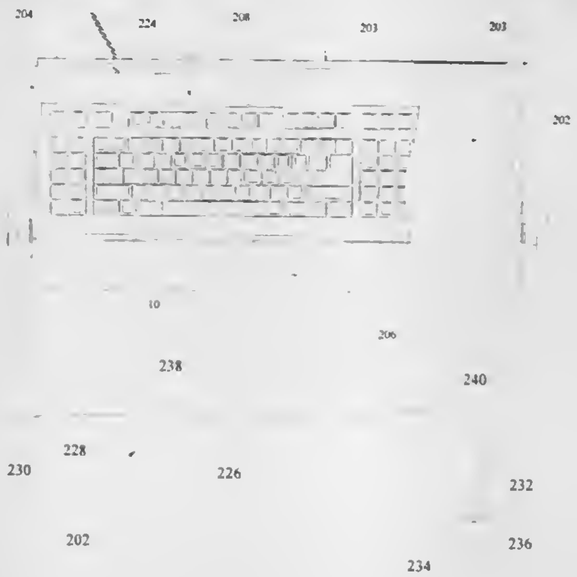


a second end, said first end being slidably disposed upon said palm rest and said second end being slidably engaged with said slot,

whereby said pointing device positioning member may be moved about said palm rest and said slot to thereby position the pointing device to a variety of positions above the keyboard.

5,746,403
SLIDING POINTING DEVICE TRAY

Frederic C. Ambrose, 142 The Channel, Brewster, Mass. 02631, and David Hawley, 108 Chase Hill Rd., Sterling, Mass. 01564
Continuation-in-part of Ser. No. 613,857, Mar. 11, 1996, which is a continuation-in-part of Ser. No. 556,593, Nov. 13, 1995. This application Apr. 29, 1996, Ser. No. 641,007
Int. Cl.^{6} B68G *5/00*
U.S. Cl. 248—118 **4 Claims**



1. A system for positioning a pointing device relative to a computer keyboard having a cable, the system comprising:

(a) a keyboard support tray having a support surface, a front portion, first and second sidewalls, and rear wall portion, said support surface being adapted to support the computer keyboard;

(b) a palm rest disposed substantially adjacent said front portion of said keyboard support tray;

(c) a bracket member having a mounting portion and a channel, said mounting portion adapted to engage with said rear wall portion of said keyboard support tray; and

(d) a pointing device positioning member adapted to support the pointing device and having a support surface, a first end, and a second end, said first end being slidably disposed upon said palm rest and said second end being slidably engaged within said channel of said bracket member, whereby said pointing device positioning member may be moved about said palm rest and said channel to thereby position the pointing device to a variety of positions above the computer keyboard.

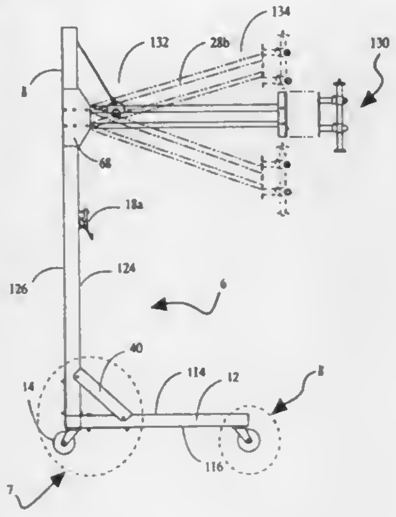
5,746,404
APPARATUS FOR COUNTERBALANCING EQUIPMENT

Andrew V. Merko, 1294 Sunny Oaks Cir., Altadena, Calif. 91001

Filed Feb. 12, 1997, Ser. No. 800,078

Int. Cl.^{6} F16M *13/00*

U.S. Cl. 248—123.11 **7 Claims**



1. An apparatus for counterbalancing equipment comprising:
a. a base having a top and a bottom;
b. a wheel attached to said bottom;
c. a column having an upper and lower end; said column being hollow and attached at said lower end to said top;
d. a parallelogram having an inner end and an outer end; said parallelogram being pivotally attached to said column means at said inner end, adjacent to said upper end;
e. an equipment mounting means for mounting said equipment on said outer end;
f. a slider adjustably attached to said parallelogram;
g. a spring, fasten to and contained within said column;
h. a pulley located within said column at said upper end; said column being adapted for external access to said pulley;
i. a wire connecting said slider to said spring over said pulley;
j. a stop means for preventing and allowing vertical translation of said equipment mounting means; and
k. a safety means for preventing sudden upward motion of said equipment mounting means in case equipment accidentally falls off.

5,746,405
WATER HEATER SEISMIC SUPPORT SYSTEM

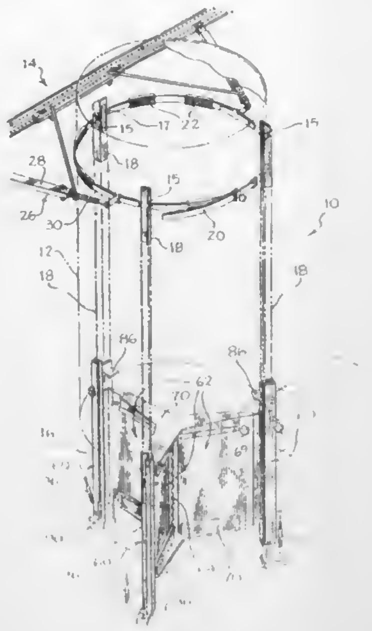
John Thomas Dvorak, 19725-A Redwood Rd., Castro Valley, Calif. 94546, and Joseph J. Erasmy, 150 Keefe Ct., San Bruno, Calif. 94066

Filed Feb. 10, 1995, Ser. No. 386,426

Int. Cl.^{6} A47G *23/02*

U.S. Cl. 248—146 **17 Claims**

17. A stand assembly for supporting a bottom end portion of a water heater and for elevating the water heater bottom end portion and associated flame-ignitable heating elements of the water heater at a specified vertical height distance above floor level, the water heater stand assembly comprising:



a) three vertically oriented leg supports arranged in a tripod configuration about a common vertical center axis, said common vertical center axis being aligned substantially coordinate with a center axis of a water heater, each of said leg supports having an upper end portion and a lower end portion, said upper end portion of each of said leg supports including connection means for receivingly engaging an extension member for connection to a water heater strap assembly;
b) frame means for interconnecting said three leg supports to each other, said frame means is movable between a first, compactly folded stowed position and a second, use position, and wherein said frame means further includes:
  i) three vertically oriented width-adjustable panel assemblies each having a top edge, a bottom edge, a first inner side edge and a second outer side edge;
  ii) a hinge assembly connecting said three panel assemblies to one another along their respective first inner side edges to define a tri-spoke configuration when moved into said second, use position; and
  iii) hub means constructed to engage each of said panel assemblies for locking said panel assemblies into said second, use position;
  c) each of said leg supports including vertical height adjustment means constructed to adapt the stand assembly to uneven floor surfaces while maintaining said water heater in a desired horizontally level support position; and
d) fastener means for fastening the respective lower end portions of each of said leg supports to a floor surface.

5,746,406
TRIPOD STAND

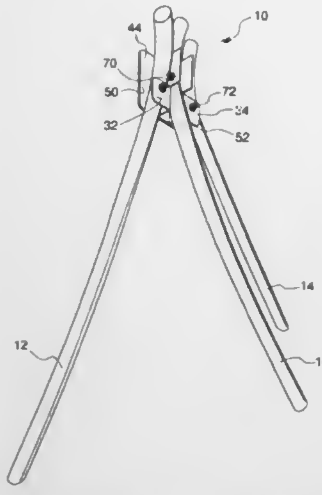
Grant D. Dicke, and Jeffrey A. Williams, both of Downers Grove, Ill., assignors to Dicke Tool Company, Downers Grove, Ill.

Filed Mar. 29, 1996, Ser. No. 626,248

Int. Cl.^{6} F16M *11/38*

U.S. Cl. 248—166 **11 Claims**

8. A sign stand adapted to support a sign panel above the ground, comprising:
a first leg, a second leg and a third leg, each having lower ground-engaging ends and upper ends adapted for coupling together as a tripod device;
a unitary one-piece bracket formed of sheet material defining a pair of spaced-apart, wall portions and a trough member extending from the wall portions and cooperating therewith to form pockets receiving and guiding movement of the first and the second legs, with the trough member receiving the third leg, separating the third leg from the first and the second legs and guiding movement of the third leg;
pin means for providing support for the legs, the pin means pinning the first and the second legs to respective wall portions for rotation with respect to the wall portions between a collapsed position with the upper ends of the legs away from the trough member and an open position with the upper ends of the legs bearing against the trough member and said pin means further pinning the third leg to the bracket; and
the legs formed from tubes having rounded cross sections, with the upper ends of the legs being open and pointing so as to provide socket mounting of warning devices inserted within the upper ends.



5,746,407
TRIPOD

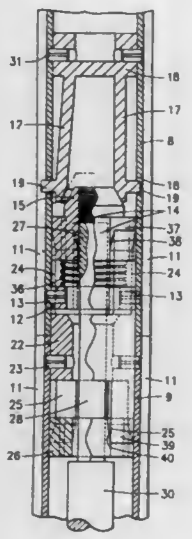
Koichiro Nakatani, Tokyo, Japan, assignor to Nihon Velbon Seiki Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP95/00333, § 371 Date Jul. 26, 1996, § 102(e) Date Jul. 26, 1996, PCT Pub. No. WO96/27100, PCT Pub. Date Sep. 6, 1996

PCT Filed Mar. 2, 1995, Ser. No. 495,668

Int. Cl.^{6} F16M *11/04*

U.S. Cl. 248—178.1 **14 Claims**



1. A tripod, comprising:
a main body;
a center column attached to said main body;
said center column including an upper column member and a lower column member joined at connecting ends thereof;
said lower column member being removable from said upper column member;
a first plurality of rack teeth on an outer surface of said upper column member;
a second plurality of rack teeth on an outer surface of said lower column member;
a gear rotationally attached to said main body;
said gear engaging said first and second pluralities of rack teeth, whereby rotating said gear vertically moves said upper column member and said lower column member;
said first plurality of rack teeth being axially aligned with said second plurality of rack teeth when said lower column member is attached to said upper column member;
a joint attached to one of said connecting end of said upper column member and said connecting end of said lower column member;
said joint having an irregular shape corresponding to an inner surface of the other of said connecting end of said lower column member and said connecting end of said upper column member;
a sliding nut inside said upper column member;
a screw rod extending axially from a lower end of said lower column member;
said screw rod screwing into said sliding nut inside said upper column member, thereby affixing said lower column member to said upper column member;
at least one key way forming a continuous axial groove along an outer surface of said upper column member and an outer surface of said lower column member;
at least one key on said main body which continuously engages said at least one key way; and
means for selectively engaging said at least one key way in said upper column member to prevent said upper column member from slipping off said main body when said lower column member is removed.

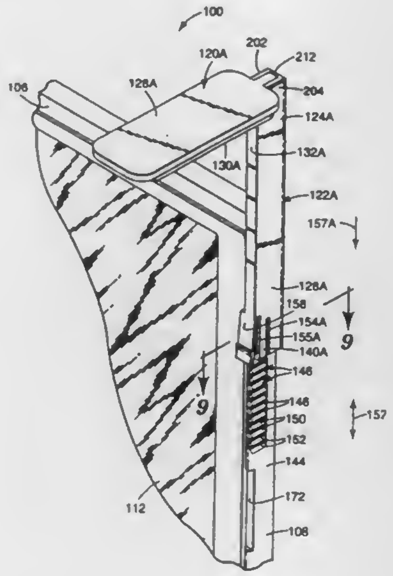
5,746,408
HINGED, ADJUSTABLE MOUNTING MECHANISM FOR AN OPTICAL FILTER SCREEN

Scott G. Theirl, Stillwater, and Gerald E. Drake, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 5, 1996, Ser. No. 596,483

Int. Cl.^{6} A47F *1/10*

U.S. Cl. 248—295.11 **26 Claims**



1. An optical filter screen for a visual display monitor, comprising:
a support frame including first and second side members;
an optical filter supported by the support frame; and

a mounting means for supporting the support frame from a visual display monitor such that the filter is positioned adjacent a display area of the display monitor, the mounting means including:
- sliding engagement means for slidably engaging the first and second side members of the support frame;
- a stem element having a first end and an opposite second end, and

a support element rotatably engaged with the first end of the stem element; said support element having a stop position in which it extends outwardly from the first end of the stem element to engage a top surface of the visual display monitor for supporting the support frame of the filter screen and having a storage position in which it is folded down towards and substantially parallel with said stem element wherein one of the support element and the stem element includes two trunion elements with a support rod fixed therebetween and the other of the stem element and support element includes a nose portion with an opening for sliding receipt of said support rod.

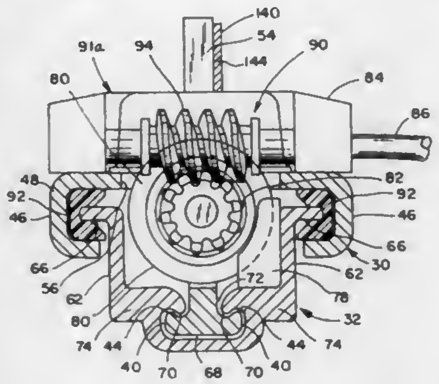
5,746,409
REINFORCED SEAT TRACK

Richard W.A. Rees, Greenville, Mich., assignor to Excellence Manufacturing, Inc., Grand Rapids, Mich.

Filed Jul. 19, 1996, Ser. No. 684,567

Int. Cl.^{6} F16M ***13/00***

U.S. Cl. 248—422 **22 Claims**



1. A track assembly for an automotive vehicle seat comprising:

an upper track having a vertical web with a first longitudinally extended lower flange and a horizontal web defining a pair of opposed inwardly-opening longitudinally extended channels; and

a lower track slidably interfitted with said upper track, said lower track including a pair of opposed outwardly-extending longitudinally extended upper flanges, said upper flanges slidably fitted within said channels of said upper track, said lower track further including a partially closed channel slidably fitted around said lower flange of said upper track.

5,746,410
DOCUMENT HOLDING PANEL WITH A DEPRESSION BAR FOR INCREMENTALLY ADJUSTING AN INDEXING RULER

Teng-Shun Hung, No. 231, Jeu-Ren St., Pai-Ho Town, Tai-Nan Hsien, Taiwan

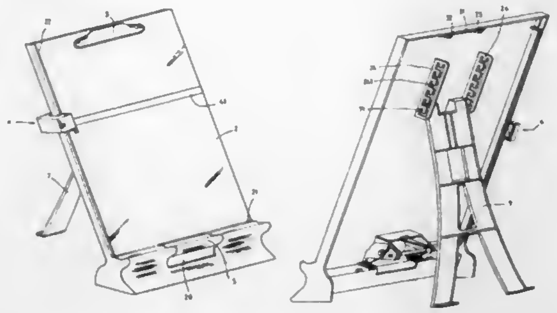
Filed Sep. 5, 1996, Ser. No. 709,333

Int. Cl.^{6} A47B ***63/00;*** **B41J** ***29/15***

U.S. Cl. 248—441.1 **2 Claims**

1. A document holding panel comprising:

a) a panel body, a securing clip, a ruler locating device, a depression bar, a rack, a leg support, and a restriction button; wherein



b) the panel body is rectangular, having an arch rest board at a lower end of the panel body, a projecting plate being disposed at an upper end of the panel body and a slot being disposed at the lower end of the panel body, a lateral side of the panel body being formed with a channel, a leg support seat being secured to an upper side of the back face of the panel body, a lower end of the back face being disposed with a stopper strip and a plurality of retaining boards, each retaining board formed with a pivot hole;

c) the securing clip is pivotally connected with the projecting plate via a circular rod to provide a clipping force by means of a spring;

d) the ruler locating device is composed of a scale ruler and a locating device, the locating device being disposed with at least one projecting block slidably fitted into the channel to linearly reciprocate therein, a locating board being pivotally connected to an outer side of the locating device to achieve a locating effect via a spring and a rack;

e) the depression bar is located in the slot and serves to control the ruler locating device to move downward via the rack, a pivot board being fixed at each end of the depression bar, the pivot board being formed with a pivot hole pivotally connecting with the pivot holes of the retaining boards via a shaft rod, a lateral side of the pivot board being disposed with a stopper block and a projecting boss, a spring fitted on the projecting boss with two ends secured to the stopper block and the stopper strip, whereby the spring on the projection boss provides the depression bar with a resilient restoring force, the pivot board having another pivot hole, a connecting rod pivotally connected with another pivot hole on one end of the connecting rod, the other end of the connecting rod being pivotally connected with a lower end of the rack;

f) the rack has multiple downward inclined teeth and a plane face section on the lower end of the rack; and

g) the restriction button is slidably connected on a protective cover, by means of sliding the restriction button, a flange on the lower side of the restriction button abuts against a slope face of the pivot board so as to restrict the restoring position of the pivot board and restrict the travel of the depression bar.

5,746,411
SUSPENSION PAD DESIGNED TO BE INTERPOSED BETWEEN TWO STRUCTURAL ELEMENTS, IN PARTICULAR BETWEEN A FRAME AND A CONTAINER TANK

Michel Y. Bruas, Paris, and Henri J. Cainaud, Fontaine les Dijon, both of France, assignors to Michel Bruas, Paris, France

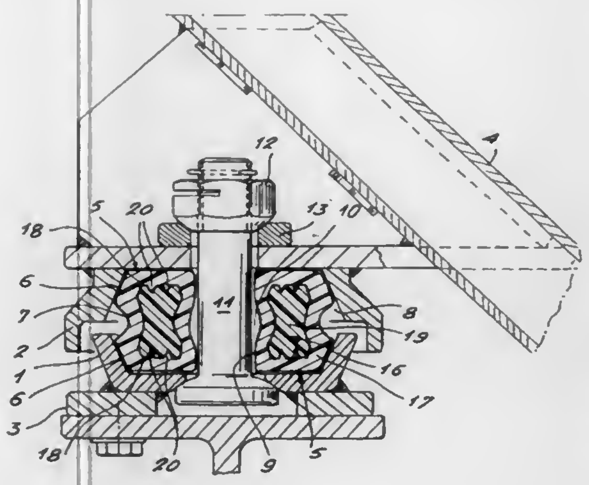
Filed Feb. 9, 1995, Ser. No. 385,960

Claims priority, application France, Feb. 9, 1994, 94 01470

Int. Cl.^{6} F16M ***13/00***

U.S. Cl. 248—635 **15 Claims**

1. A suspension pad designed to be placed in a cavity (8) formed by two structural elements (1, 3; 2, 4), in particular by a frame and a container tank, and to prevent the transmission of vibrations and shocks from one structural element to the other, comprising two parallel supporting surfaces (5), a lateral surface which is provided with an annular groove (7) equidistant from the supporting surfaces and is defined by two coaxial and opposing cone trunks having small bases attached to the supporting surfaces (5) and large bases attached to the sides of the annular groove (7), and a central orifice (9) intended to permit the passage of connecting means (11, 12) designed to connect the structural elements (1, 3; 2, 4) to one another, the central orifice extending perpendicularly to the supporting surfaces (5), characterized in that the suspension pad includes a core (16) formed of a rigid material capable of absorbing low frequency vibrations, and a shell (17) formed of a material capable of absorbing high frequency vibrations, the core being located inside the shell and comprising two end surfaces (18) which are parallel and adjacent to the supporting surfaces (5) and a neck (19) located between the end surfaces.



5,746,412
ELECTROMAGNETIC VALVE DEVICE AND MANUFACTURING METHOD FOR THE SAME

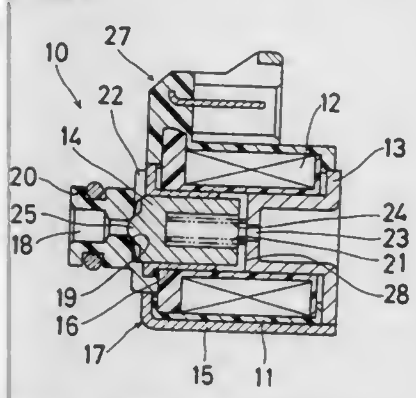
Shigeki Niimi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1995, Ser. No. 535,828

Claims priority, application Japan, Sep. 28, 1994, 6-233868

Int. Cl.^{6} F16K ***31/06***

U.S. Cl. 251—129.15 **4 Claims**



1. An electromagnetic valve device comprising:

a solenoid wound around a hollow bobbin;

a stable core of magnetic material having an end portion disposed at one end of said solenoid and a central portion extending inside said one end of said solenoid;

a one piece casing of magnetic material comprising a cylindrical yoke portion located inside an opposite end of said solenoid, an end portion extending from said yoke portion over an opposite end of said solenoid and a holder portion extending along an outer periphery of the solenoid in contact with said end portion of said stable core;

a movable core of magnetic material slidably disposed inside said yoke portion of said casing;

a base secured to said casing and having a fluid passage therein engageable by said movable core to open and close said passage; and

an elastic member mounted between the stable core and the movable core for biasing the movable core in a direction to close said passage.

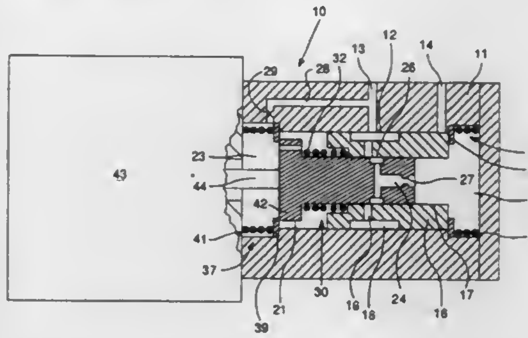
5,746,413
FLUID METERING VALVE

Charles N. Goloff, Secor, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed May 1, 1996, Ser. No. 641,664

Int. Cl.^{6} F16K ***31/06***

U.S. Cl. 251—129.15 **11 Claims**



1. A fluid metering valve for outputting a fixed volume of fluid per valve actuation comprising:

a body having a bore therein and an inlet and an outlet opening into the bore;

a cylindrical sleeve slidably disposed within the bore and having a radial port continuously communicating with the inlet;

a piston valve slidably disposed within the sleeve and cooperating therewith to define a chamber in the body;

first means for resiliently biasing the sleeve to a default position blocking the chamber from the outlet and for biasing the piston to a default position communicating the radial port with the chamber;

second means for resiliently establishing the default position of the sleeve; and

third means for establishing the default position of the piston valve.

5,746,414
FLUID ACCESS AND FLOW CONTROL VALVE

Thomas D. Weldon, Gainsville; Charles E. Larsen, Cumming, and Jonathan J. Rosen, Alparette, all of Ga., assignors to Novoste Corporation, Norcross, Ga.

Division of Ser. No. 154,944, Nov. 19, 1993, Pat. No. 5,529,278. This application Jun. 21, 1996, Ser. No. 668,537

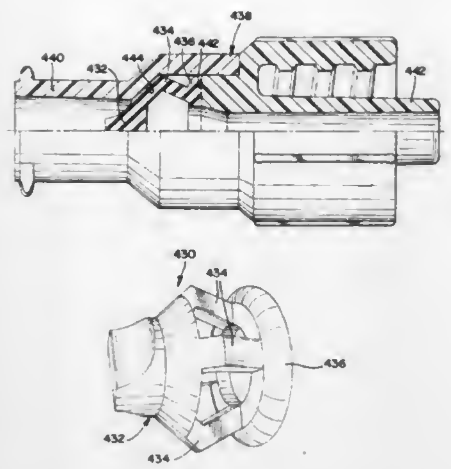
Int. Cl.^{6} F16L ***29/02***

U.S. Cl. 251—149.6 **7 Claims**

1. A flow control valve to be operated by a conduit having a fluid passageway therein, said valve comprising:

a rigid housing including a fluid inlet, a fluid outlet, a flow path through said housing between said inlet and outlet, and a valve seat surface disposed around said flow path in said housing;

a resilient valve element carried by said housing within said flow path, said valve element including a raised engagement surface adapted for contact by the end of the conduit having an area less than the cross-sectional area of the fluid passageway of the conduit and being biased against said valve seat surface by a plurality of spaced-apart resilient legs that extend away from said valve element, at least a portion of said legs engaging said valve seat surface, so as to prevent fluid flow through said flow path.



said engagement surface of said valve element being spaced sufficiently close to the fluid flow inlet so it may be contacted by the conduit when inserted into the inlet to push said valve element away from said seat surface and allow fluid flow through said flow path.

5,746,415

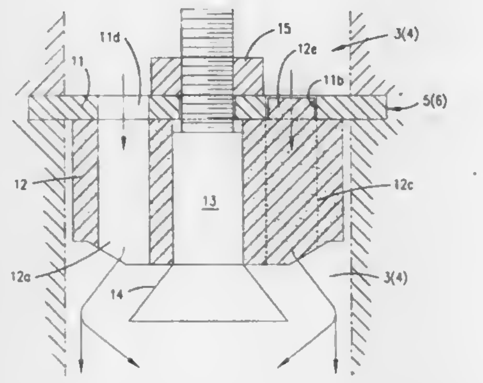
WATER SAVING DEVICE FOR USE IN WATER LINES

Kiyoshi Shimizu, Asahi Bussan Kabushiki Kaisha 226 Shinden-shintamashiro, Hisagoyama-cho, Kuze-gun, Kyoto-fu, Japan

Filed Jul. 3, 1996, Ser. No. 675,565

Int. Cl.^{6} F16K *5/10*

U.S. Cl. 251—208 12 Claims



1. A water saving device for use within a water line, said device comprising:

a plate member sandwiched and maintained within a joint of a water line so as to divide the water line across the line of water flow, said plate member being exchangeable with other plate members of varying diameter so as to fit within varying sizes of water lines; and

a main body block rotatably secured to one side of the plate member and positioned downstream of the plate member within the water line, the plate member and the body block each having a plurality of holes arranged circumferentially so that the number of holes of the body block and plate that are aligned to permit water flow therethrough may be changed by relative rotation of the plate member with the main body block.

5,746,416

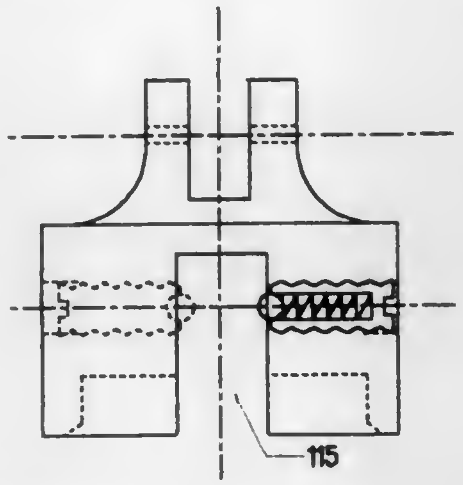
ADAPTOR TOOLS AND METHOD TO EXPOSE VALVE

Christopher John Paylor, 4225 Hickory Drive, Mississauga, Ontario, Canada, L4W 1L3

Continuation-in-part of Ser. No. 78,927, Jun. 21, 1993. This application Dec. 27, 1993, Ser. No. 173,048

Int. Cl.^{6} F16K *31/46;31/60*

U.S. Cl. 251—291 8 Claims



1. An adaptor having one end for activating a service box valve and another end for connection to a rod, said adaptor including:

a socket at said one end to register with said valve for operating said valve;

a slot at said other end for receiving and pivotally connecting said rod; and said socket comprising a gripping means for grasping said valve;

said rod including one flat end with an aperture therein, and said other end of said adaptor includes a hole for alignment with said aperture of said rod when said slot receives said flat end of said rod;

a connecting pin received by said aperture and said hole;

said socket including at least one displaceable engageable member for gripping said valve when said socket is urged against said valve for operating said valve; and for disengagement from said valve by solely pulling said rod.

5,746,417

ADJUSTABLE BALL VALVE

David Lamar Bowers; Robert Joseph Brown, both of Cookeville; Royce Chaffin, Baxter; Donnie Ray Hammock, and Gerald Patrick McDermott, both of Cookeville, all of Tenn., assignors to The Duriron Company, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 391,427, Feb. 16, 1995, abandoned. This application Aug. 14, 1996, Ser. No. 696,389

Int. Cl.^{6} F16K *5/20*

U.S. Cl. 251—315.12 19 Claims

1. An adjustable ball valve assembly comprising:

a valve body having an internal chamber formed therein, said internal chamber having a vertical taper whereby the upper portion of said chamber is wider or greater in circumference than the lower portion of said chamber;

a ball disposed within said chamber;

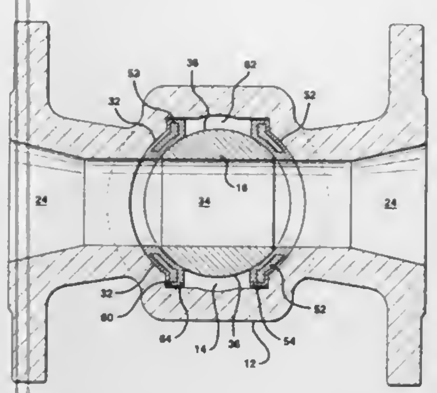
a valve stem connected to said ball and adapted to rotate said ball between open and closed positions;

seat members disposed in said chamber for supporting said ball, each seat member having a sealing surface with the outer surface of said ball and a sealing surface with the inner surface of said chamber, the sealing surface of said seat member in contact with the inner surface of said chamber having a vertical taper corresponding to the vertical taper of

said chamber, and each seat member comprising a rigid, solid support frame completely encapsulated in a polymeric material;

locking members disposed in said chamber for preventing substantial horizontal or rotational movement of said seat members yet allowing for vertical adjustment, said locking members being slots disposed in the sides of said chamber into which portions of said seats extend; and

an adjustment mechanism for adjusting said ball and seat members vertically within said chamber, said adjustment mechanism comprising an adjuster adapted to apply pressure to said seat members, one or more fasteners extending through said adjuster for applying pressure to said adjuster and a collar in contact with said adjuster for transferring pressure to said seat members.



5,746,418

RETARDATION SYSTEM FOR REDUCING THE SPEED OF A MOVING OBJECT

Arie Jansen, Gaardedreef 33, Zoetermeer, Netherlands, 2733 AK

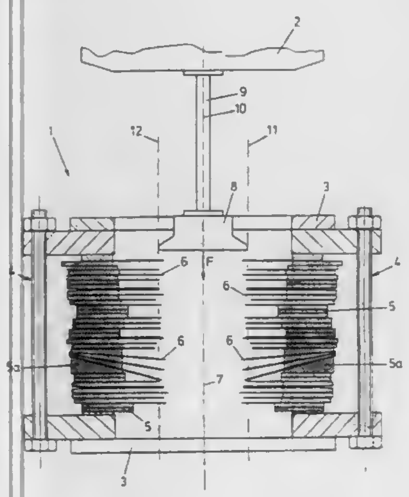
PCT No. PCT/NL95/00029, § 371 Date Sep. 19, 1996, § 102(e) Date Sep. 19, 1996, PCT Pub. No. WO95/20112, PCT Pub. Date Jul. 27, 1995

PCT Filed Jan. 20, 1995, Ser. No. 682,527

Claims priority, application Netherlands, Jan. 21, 1994, 9400105

Int. Cl.^{6} F16M *1/00*

U.S. Cl. 267—136 12 Claims



1. A retardation system for adjustably reducing the speed of an object moving relative to the retardation system, said retardation system comprising a retardation mechanism to which is transferred the kinetic energy of the object when the speed of the object is being reduced by the retardation mechanism said retardation mechanism comprising a frame with a retaining device for removably and slidably receiving in the retaining device a braking body containing one of the ends of a force-absorbing element, the plane of the element being mainly transverse with respect to an axis of the frame, and the force-absorbing element being slidable by its other free end in the plane of the element relative to the axis of the frame against said braking body for frictional contact therewith, in such a manner that the object having a relative direction of motion generally aligned with the axis of the frame through said braking body, while passing the force-absorbing element, is in a predetermined effective frictional contact with the other free end of this force-absorbing element, the amount of the frictional contact between the object and the force-absorbing element being a measure for the magnitude of the kinetic energy to be transferred to the force-absorbing element and said amount of contact in an overlapping radial area of a contact portion of the braking body and the other end of said force-absorbing element is given such that in a first position of movement of the braking body relative to said force-absorbing element no contact therebetween is given, in a second position of said movement contact is given, and in a third position no contact is given, the force-absorbing element being elastically deformed when being in contact with said contact portion of the object.

5,746,419

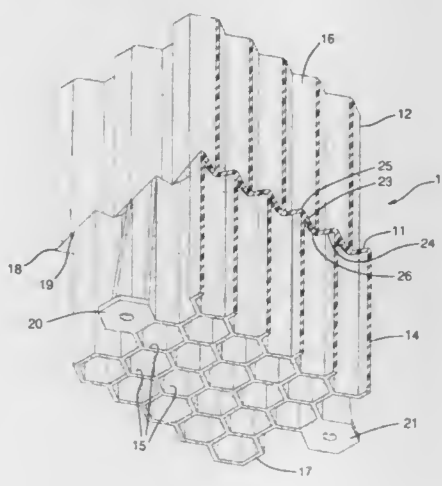
ENERGY ABSORBING DEVICE

James Robert McFadden, Oxford; Joseph Paul Greene, West Bloomfield, and Michael James Bland, Oxford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1996, Ser. No. 732,194

Int. Cl.^{6} B60R *19/02;* F16F *1/36*

U.S. Cl. 267—140 11 Claims



1. An energy absorbing device comprising:

a one-piece energy absorber element having a plurality of elongated straight sided hollow hexagonal cells arranged in a first layer and a second layer, the first and second layers interconnected by an intermediate plate of the one-piece energy absorber element so that the intermediate plate closes adjacent ends of the first and second layers with the cells of the first layer offset relative to the cells of the second layer.

5,746,420
CLAMPING DEVICE FOR SECURING A FIRST COMPONENT, SUCH AS A TOOL, TO A SECOND COMPONENT

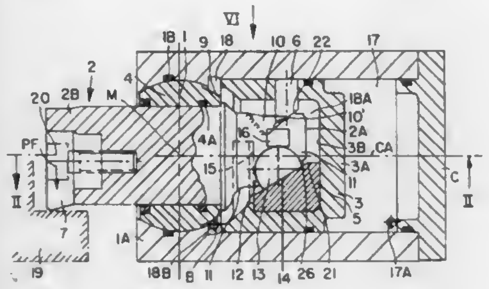
Rudolf Kohlert, Danziger Strasse 3, 63811 Stockstadt, Germany

Filed Aug. 21, 1996, Ser. No. 701,047

Claims priority, application Germany, Aug. 30, 1995, 195 31 889.7

Int. Cl.^{6} B23Q *3/08*

U.S. Cl. 269—32 **15 Claims**



1. A clamping device for securing a first component to a second component, comprising a housing (**1**), an end wall (**1A**) and a cylindrical axial bore in said housing, a clamping piston (**3**) axially movable in said axial bore, said clamping piston comprising an axial dead-end cavity (**18A**) and an end wall (**3A**) dividing said axial bore into a first pressure chamber (**17**) and a second pressure chamber (**18**), said dead-end cavity (**18A**) communicating with said second pressure chamber (**18**), a clamping lever (**2**) having an inner end (**11**) reaching inside said dead-end cavity (**18A**) and an outer end (**2B**) for applying a clamping force (**PF**), a ball-bushing (**4**) pivotally mounted in said end wall (**1A**) of said housing (**1**), said ball-bushing (**4**) having a center (**M**), said clamping lever (**2**) extending in an axially slidable manner through said ball-bushing (**4**) for pivoting about said center (**M**), a first slanted wedge surface (**21**) in a fixed position inside said dead-end cavity (**18A**) of said clamping piston (**3**) so that said first slanted wedge surface (**21**) is movable in unison with said clamping piston (**3**), a second slanted surface (**14**) at said inner end of said clamping lever (**2**) for cooperation with said first slanted surface (**21**) in response to relative axial movement between said clamping lever (**2**) and said clamping piston (**3**) for pivoting said clamping lever (**2**) about said center (**M**) to apply or release a clamping force depending on a pivoting direction, and fluid pressure ports (**17A, 18B**) in said housing for axially moving said clamping piston (**3**) and said first slanted wedge surface (**21**) together in said housing.

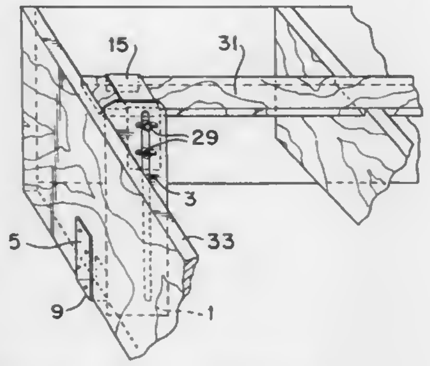
5,746,421
BOARD HOLDING DEVICE

Dean E. Bowerman, 9725 Hawkins Ct., Elk Grove, Calif. 95624

Filed Aug. 29, 1996, Ser. No. 705,290

Int. Cl.^{6} B25B *5/14*

U.S. Cl. 269—41 **4 Claims**



1. An adjustable board holder comprising:

a metal base plate member having an adjustment plate slot and a first board receiving bracket with nail receiving holes;

a metal body plate member having an extending member mounted on said plate, said extending member being adapted to be inserted within said base member adjustment slot, said metal body plate member being pivotally movable with respect to a second board receiving bracket attached to the body member and having nail receiving holes;

locking means for locking said base and body members to each other when said extending member is inserted in said base member's slot such that boards in said first and second brackets are oriented in a desired relationship.

5,746,422
CLAMPING DEVICE

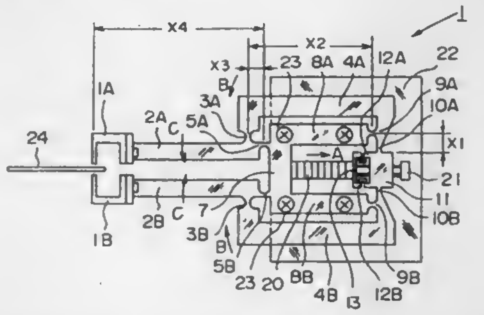
Koichi Harada; Minoru Torihata, and Takayuki Iiyama, all of Musashimurayama, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Sep. 12, 1996, Ser. No. 712,894

Claims priority, application Japan, Sep. 13, 1995, 7-259510

Int. Cl.^{6} B25B *1/06*

U.S. Cl. 269—172 **2 Claims**



1. A clamping device provided with a pair of clamping arms to which clamping claws are respectively attached, a piezo-electric element which opens and closes said clamping claws so as to hold a workpiece, an amplifying means which amplifies expansion and contraction of said piezo-electric element, and a pressure adjustment screw which applies a preparatory pressure to said piezo-electric element via a contact plate, wherein said contact plate is connected, via flexible sections which are capable of expansion and contraction, to a screw mount means with which said pressure adjustment screw is screw-engaged.

5,746,423
PRECISION MACHINE TOOL VISE WITH SELF ADJUSTING CLAMP

Gennady Arov, 8969 N. Iroquois Rd., Bayside, Wis. 53217, assignor to Gennady Arov, Bayside, and James L. Zaske, Greendale, both of Wis.

Filed Jan. 30, 1996, Ser. No. 593,943

Int. Cl.^{6} B25B *1/24;5/16*

U.S. Cl. 269—266 **66 Claims**

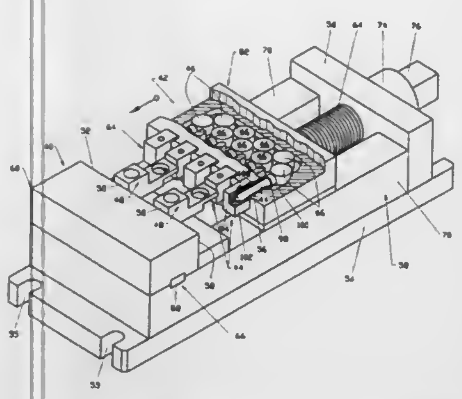
1. A vise for holding one or more workpieces comprising:

(a) a base;

(b) a pair of jaws carried by said base with one of said jaws movable relative to the other of said jaws for holding one or more workpieces between said jaws;

(c) wherein one of said jaws comprises a clamp having a housing, at least two reciprocable clamp fingers extending outwardly from said housing for bearing against a workpiece, a plurality of movable load transfer elements received in said housing with at least some of said load transfer elements arranged in a row of said load transfer elements disposed adjacent to and rearwardly of said clamp fingers; and

(d) wherein said row of load transfer elements has as many load transfer elements as the number of said clamp fingers and each said load transfer element of said row is disposed behind one of said clamp fingers.



5,746,424
DEVICE FOR COLLECTING FOLDED AND UNFOLDED COPY SHEETS

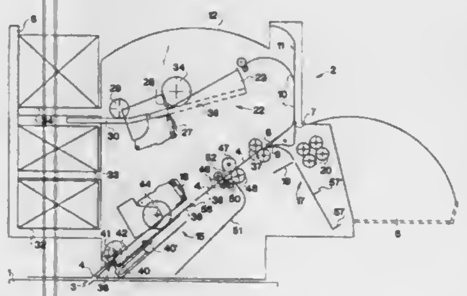
Hendrik Gerard Jozef Rutten, EK Arcen; Jacobus Arnoldus Peter Berkers, NP Koningslust, and Gert Vegter, PT Baarlo, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Jul. 3, 1996, Ser. No. 674,107

Claims priority, application Netherlands, Jul. 20, 1995, 1000855

Int. Cl.^{6} B41L *43/12*

U.S. Cl. 270—37 **22 Claims**



1. A device for collecting copy sheets into a stack, at least one sheet in the stack being foldable with length and width dimensions when folded which are at maximum equal to length and width dimensions of unfolded copy sheets in the stack, the device comprising:

a collecting station for holding the stack of copy sheets;

a first transport path for feeding copy sheets to the collecting station;

at least one pair of first folding rollers forming a first folding nip, the first folding nip being situated in the first transport path;

a first transport nip in the first transport path for transporting a copy sheet to the first folding nip;

a second transport path adjacent a side of one of the first folding rollers, the second transport path facing the first transport nip and extending as far as the first transport path; and

a second transport nip in the second transport path, a direction of transport of the second transport nip being reversible.

15. A method for collecting copy sheets into a stack, at least one sheet in the stack being foldable with length and width dimensions when folded which are at maximum equal to length and width dimensions of unfolded copy sheets in the stack, the method comprising the steps of:

feeding copy sheets through a first transport path in a transport direction;

providing a first folding nip in the first transport path, the first folding nip being formed by at least one pair of first folding rollers;

providing a first transport nip in the first transport path for transporting a copy sheet to the first folding nip;

selectively feeding the copy sheets to a second transport path when the sheets are to be folded, the second transport path being adjacent a side of one of the first folding rollers and facing the first transport nip, the second transport path extending as far as the first transport path;

providing a second transport nip in the second transport path, a direction of transport of the second transport nip being reversible; and

discharging the copy sheets from the first transport to a collecting station for holding the stack of copy sheets.

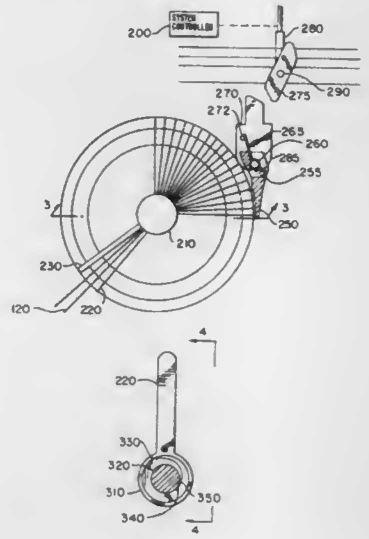
5,746,425
GRIPPER-ACCUMULATOR

James W. Flannery, Jr., Stamford, Conn., assignor to Time Inc., New York, N.Y.

Filed Nov. 1, 1996, Ser. No. 742,772

Int. Cl.^{6} B65H *39/00*

U.S. Cl. 270—52.14 **29 Claims**



1. A gripper-accumulator for releasably gripping and accumulating a plurality of pieces, said gripper-accumulator comprising:

a hub extending substantially along an axis;

a fixed support extending radially outward from said hub;

a plurality of gripper-fingers rotatably affixed to said hub and angularly spaced about said axis, each being movable between a respective releasably secured open position remote from said fixed support and a respective closed position adjacent to said fixed support; and

a plurality of force-applying members, each of said force-applying members biasing a respective one of said gripper-fingers toward said respective closed position; whereby:

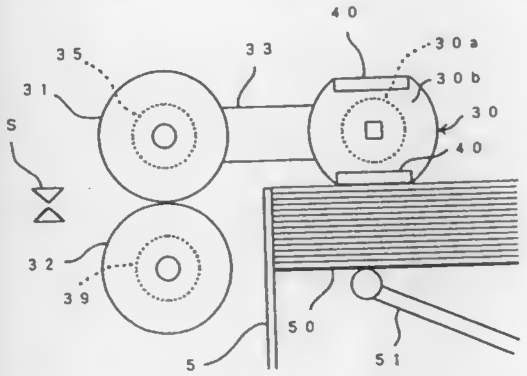
one of said plurality of pieces is held between said fixed support and a first one of said plurality of gripper-fingers, and each additional one of said plurality of pieces is held between two angularly adjacent ones of said gripper-fingers.

5,746,426

FEEDING DEVICE HAVING A FEED ROLLER WITH A LOW COEFFICIENT PORTION

Yoshikazu Nakabayashi; Hiroshi Hadano, both of Toyohashi; Norikazu Okabe, and Hideki Sendou, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Continuation of Ser. No. 359,545, Dec. 20, 1994, abandoned. This application Feb. 27, 1997, Ser. No. 807,198
Claims priority, application Japan, Dec. 22, 1993, 5-324749
Int. Cl.^{6} B65H *3/06*

U.S. Cl. 271—119 **13 Claims**



1. A feeding device which feeds paper sheets in an image forming apparatus, comprising:

a paper supply tray detachable from a body of the image forming apparatus;

a feed roller having an exterior surface, said exterior surface includes at least one flat shaped portion having a friction coefficient lower than a remaining portion of the exterior surface;

a pressure contact mechanism which induces paper sheets stacked in the paper supply tray to make pressure contact with said feed roller; and

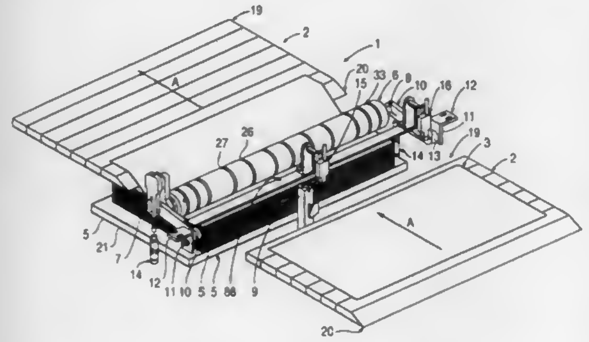
stop means for stopping rotation of said feed roller in a state that said lower friction coefficient flat shaped portion of the exterior surface of said feed roller contacts with an uppermost paper sheet at least whenever said paper tray is being removed from the body of the image forming apparatus.

5,746,427

ROLLER TYPE STACKER AND METHOD FOR STACKING PIECES OF LIMP MATERIAL

Hadi Muzaffar Nayyer Hamid, New Hartford, N.Y., assignor to Jet Sew Technologies, Inc., Bowling Green, Ky.
Filed Sep. 26, 1995, Ser. No. 533,858
Int. Cl.^{6} B65H *43/00*

U.S. Cl. 271—176 **16 Claims**



1. An apparatus for transferring workpieces from a conveyor to stack having at least one flight forwardly traveling in a defined path, said flight being capable of carrying one of said workpieces thereon, the apparatus comprising:

means for stacking a plurality of workpieces in a stack as removed from said conveyor, said stacking means being positioned below the path of said at least one forwardly traveling flight;

means for transferring an individual workpiece from an upper surface of the at least one forwardly traveling flight to said stacking means by engaging an upwardly facing surface of the workpiece to impede the forward motion of the engaged workpiece as the flight continues forward, said transferring means comprising a rotatable engaging means for rotatably engaging an individual workpiece against the upper surface of the at least one forwardly traveling flight at a rotational speed substantially the same as the forward speed of the at least one forwardly moving flight; and

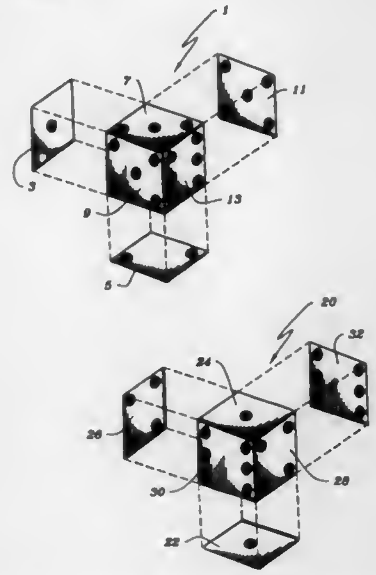
braking means for selectively stopping rotation of said rotatable engaging means to impede the forward movement of the engaged workpiece as the at least one forwardly traveling flight continues forward.

5,746,428

DICE MARKED TO PERMIT FAIR AND MATHEMATICALLY SIMPLE BETTING ODDS IN CRAPS

Edward A. Fredenburg, 2204 Enterprise Dr., Richland, Wash. 99352
Filed Jul. 10, 1997, Ser. No. 889,933
Int. Cl.^{6} A63F *9/04*

U.S. Cl. 273—146 **14 Claims**



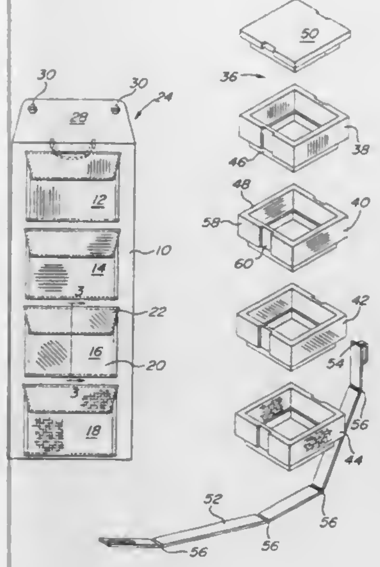
1. A first and second six faced die each having a first, second, third, fourth, fifth and sixth face wherein the six faces of the first die are marked randomly with symbols representing the value of the set of integers 1, 2, 3, 5, 5, and 6, and the six faces of the second die are marked randomly with symbols representing the value of the set of integers 1, 1, 4, 4, 6, and 6.

5,746,429

TOYS AND STORAGE DEVICE

Janet Ruben, 500 Kane Dr., Maple Glen, Pa. 19002
Continuation of Ser. No. 323,823, Oct. 17, 1994, abandoned, which is a continuation of Ser. No. 107,511, Aug. 17, 1993, Pat. No. 5,360,215. This application Apr. 22, 1996, Ser. No. 635,617
The portion of the term of this patent subsequent to Aug. 17, 2013, has been disclaimed.
Int. Cl.^{6} A63F *9/10*

U.S. Cl. 273—157 R **5 Claims**



1. A combination comprising a jigsaw puzzle and a storage device therefor, for use by children, wherein:

the jigsaw puzzle comprises multiple, disengageable pieces, and each piece comprises a top face bearing a part of a puzzle image, and a bottom face bearing sensorially perceptible means for identifying said piece as a part of a particular puzzle;

the storage device comprises a storage compartment, capable of containing all of the pieces of the jigsaw puzzle, and having, on its exterior, sensorially perceptible identifying means matching the identifying means on the bottom faces of the puzzle pieces;

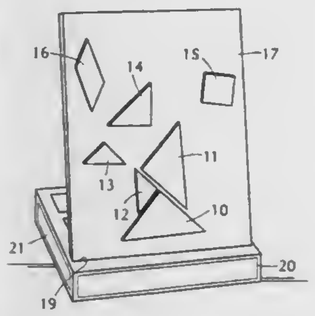
whereby, after use of the puzzle, a child can readily associate the pieces of the puzzles with the storage device.

5,746,430

MAGNETIC TANGRAM PUZZLE GAME ASSEMBLY

Mark S. Chester, P.O. Box 640501, San Francisco, Calif. 94164-0501
Filed Feb. 18, 1997, Ser. No. 801,961
Int. Cl.^{6} A63F *9/10*

U.S. Cl. 273—157 R **7 Claims**



1. A Tangram puzzle game assembly comprising:

A. a Tangram set of magnetized geometric pieces derived from a square;

B. a ferromagnetic playboard on which the pieces are placeable and adhere thereto by magnetic attraction to create a figure by interfitting the pieces of the set; and

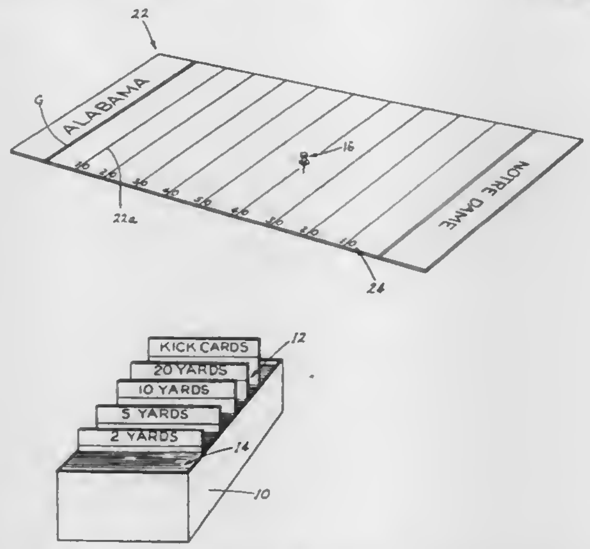
C. a tray having a cavity for storing the set of pieces and a raised side wall provided with an elongated slot adapted to socket a lower end of the playboard to hold the playboard at a tilted, upright position to facilitate the placement of the pieces thereon.

5,746,431

QUESTION AND ANSWER FOOTBALL GAME

Martin D. McIntyre, 13 Yorkshire Dr., Greenville, S.C. 29615, and Jerry L. McLendon, 6437 Shady La., Mobile, Ala. 36695
Filed May 13, 1996, Ser. No. 645,430
Int. Cl.^{6} A63F *7/06*

U.S. Cl. 273—247 **8 Claims**



1. A method of playing an educational, question and answer sports game based on a player's knowledge of factual sports information about a sport or an institution comprising:

providing at least one set of cards including a plurality of playing cards having indicia representing progressive numerical levels of advancement representing yards advanced in regards to reaching an objective of said game wherein each said playing card includes a written question corresponding to said indicia representing the progressive numerical levels of advancement representing yards advanced, and said written question being about factual information pertaining to a particular sports team and a written answer responsive to said written question wherein said written questions have degrees of difficulty corresponding to said progressive numerical levels of advancement;

selecting said playing cards by a respective player in accordance with a level of advancement desired to be achieved by the player;

answering the question by the player;

monitoring an answer by the player and an advancement of said player toward said game objective in response to whether said player's answer to said corresponding questions embodied on said playing cards is correct;

repeatedly selecting said playing cards and adding the numerical levels of advancement for correct answers until the player achieves a first down by advancing at least a total of ten yards in four or less selections of the playing cards or achieves a touchdown;

providing a set of kick cards which include kick instructions; and

drawing one of said kick cards as an option after failing to achieve a total of at least ten yards in three or less selections of the playing cards.

5,746,432

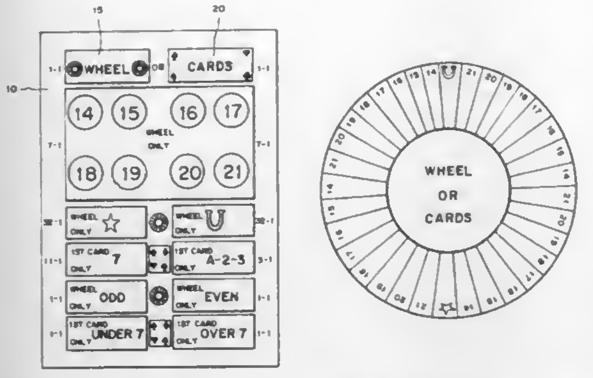
METHOD OF PLAYING A GAME USING PLURALITY OF RANDOM VALUE SELECTORS

John Feola, 42 Irving St., Medford, Mass. 02155
Continuation of Ser. No. 425,424, Apr. 20, 1995, abandoned. This application Oct. 11, 1996, Ser. No. 728,919
Int. Cl.^{6} A63F *1/00*

U.S. Cl. 273—274 **15 Claims**

1. A method of playing a game comprising the steps of:

providing a predetermined maximum value;



providing at least one player with an opportunity to make at least one wager on the occurrence of one or more of a plurality of possible outcomes wherein at least some of said possible outcomes are dependent on values obtained from two distinct, random value selectors;

randomly selecting a first value from a plurality of possible values ranging up to said predetermined maximum value, wherein said first random value is never greater than said predetermined maximum value using a first random value selector;

subsequently obtaining a second value, from a plurality of possible values using a second random value selector which is different in form from said first random value selector, comparing said first random value with said second random value to determine each successful wager, and when said first random value is compared to said second random value, requiring said second random value to be never less than said first random value; and

providing a winning payout to each successful wagerer.

5,746,433

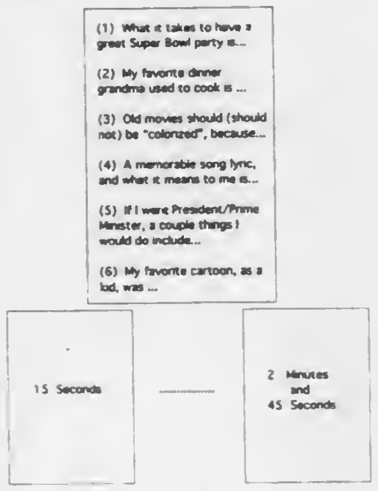
METHOD OF PLAYING A CARDS AND DICE GAME TO DEVELOP PUBLIC SPEAKING ABILITY

Karen Klassen, 405, 720-15 Ave SW., and Dwayne Klassen, 706, 720-15 Ave SW., both of Calgary, Canada, T2R 0R6

Filed Feb. 10, 1997, Ser. No. 798,357

Int. Cl.^{6} A63F *1/00*

U.S. Cl. 273—302 **5 Claims**


(1) What it takes to have a great Super Bowl party is...
(2) My favorite dinner grandma used to cook is ...
(3) Old movies should (should not) be "colonized", because...
(4) A memorable song lyric, and what it means to me is...
(5) If I were President/Prime Minister, a couple things I would do include...
(6) My favorite cartoon, as a kid, was ...
15 Seconds
2 Minutes and 45 Seconds

1. A method of playing a cards and dice game to develop public speaking ability, to be played by a group of people, involving the steps of:

(a) choosing a person to play the role of grammar judge;
(b) choosing a person to play the role of timer judge;
(c) determining an order of play, by which each person within the group of people will take a turn as speaker in a sequential order;
(d) drawing a card from a stack of cards, wherein each card in the stack provides a plurality of speaking topics, each speaking topic associated with a number;
(e) rolling a die as a method for selecting one of the plurality of speaking topics on the card drawn;
(f) speaking on the selected topic for up to, and including, a maximum speech length;
(g) counting periods of silence during the speaker's turn;
(h) counting the number of speech fillers used during the speaker's turn;
(i) scoring the speaker's turn by assigning 1 point for every second that the speaker spoke, up to and including the number of seconds in the maximum speech length, and by deducting 1 point for every period of silence and by deducting 1 point for every speech filler used and by deducting 10 points for straying off the topic;
(j) choosing a new speaker and repeating steps (d) through (i); and
(k) terminating the game when all players have taken a turn as speaker.

5,746,434

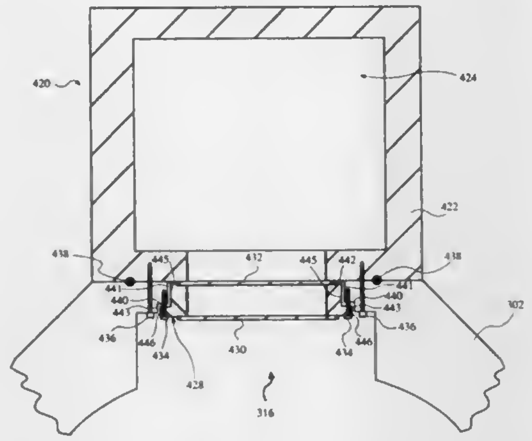
CHAMBER INTERFACING O-RINGS AND METHOD FOR IMPLEMENTING SAME

Trace L. Boyd, San Jose; Richard D. Beer, Sunnyvale; Eric A. Terbeek, Fremont, and Vernon W. H. Wong, Mountain View, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Jul. 9, 1996, Ser. No. 675,994

Int. Cl.^{6} F16J *15/02*

U.S. Cl. 277—1 **25 Claims**



1. A method for implementing a vacuum seal between an interface of a transport chamber interface port of a transport chamber and another chamber, said transport chamber being configured to mate with the another chamber in an adjacent relationship, comprising:

placing an insert plate having a sealing surface containing a first O-ring into the transport chamber interface port such that the first O-ring is sandwiched between the sealing surface and a surface of the another chamber, the insert plate having a stepped lip substantially contained within a stepped groove defined in the transport chamber interface port, and the vacuum seal is achieved between the transport chamber and the another chamber within the transport chamber interface port via the first O-ring.

5,746,435

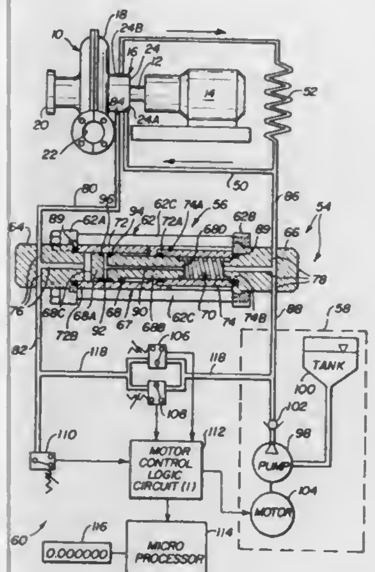
DUAL SEAL BARRIER FLUID LEAKAGE CONTROL METHOD

Donald P. Arbuckle, 4483 S. Vrain, Denver, Colo. 80236

Continuation of Ser. No. 315,821, Sep. 30, 1994, abandoned. This application Dec. 27, 1996, Ser. No. 773,440

Int. Cl.^{6} F16J *9/00*

U.S. Cl. 277—1 **13 Claims**



1. A method for controlling leakage of barrier fluid from a dual seal assembly of fluid handling equipment, the dual seal assembly having a process fluid chamber containing pressurized process fluid, a barrier fluid chamber containing pressurized barrier fluid and being spaced from the process fluid chamber, a primary seal disposed between the process fluid chamber and barrier fluid chamber and a secondary seal disposed between the barrier fluid chamber and external atmosphere, said method comprising the steps of:

(a) maintaining the pressure of the barrier fluid in the barrier fluid chamber at a preset pressure level above the pressure of the process fluid in the process fluid chamber in response to the absence of barrier fluid leakage from the dual seal assembly;
(b) decreasing the pressure of the barrier fluid in the barrier fluid chamber below the preset pressure level in response to the presence of barrier fluid leakage from the dual seal assembly;
(c) measuring the difference between the barrier fluid pressure and the process fluid pressure and producing an output representing the measured difference;
(d) activating supplying of barrier fluid to the barrier fluid chamber in response to the measured difference is less than the preset pressure level and until the measured difference has increased above the preset pressure level; and
(e) calculating a rate of leakage of barrier fluid in response to successive activating of the supplying of barrier fluid.

5,746,436

AIR PRESSURIZED CHUCK

Stephen Kulan, Muskogee, and Kenneth L. Smith, Porum, both of Okla., assignors to Coburn Optical Industries, Inc., Tulsa, Okla.

Filed Jul. 12, 1995, Ser. No. 501,410

Int. Cl.^{6} B23B *31/103;31/30*

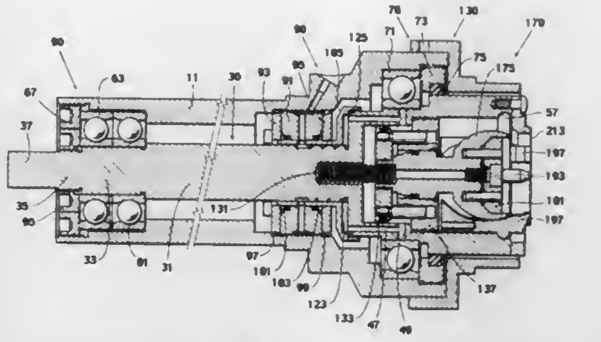
U.S. Cl. 279—4.04 **16 Claims**

1. An air pressurized chuck comprising:

a housing;

a spindle journalled in said housing for rotation about a longitudinal axis; means mounted in a penultimate portion of said spindle and rotatable therewith for longitudinally reciprocating along said axis in one direction in response to the bias of a coil spring of diameter less than a smallest outer diameter of said reciprocating means disposed concentrically about said axis between said spindle and said reciprocating means and in an opposite direction in response to a force of fluid under pressure selectively applied to said reciprocating means in excess of said bias; and

means mounted in an ultimate portion of said spindle and rotatable therewith for concentrically reciprocating gripping portions thereof in relation to said longitudinal axis in an outward direction in response to movement of said longitudinal reciprocating means in said one direction and in an inward direction in response to movement of said longitudinal reciprocating means in said opposite direction.



5,746,437

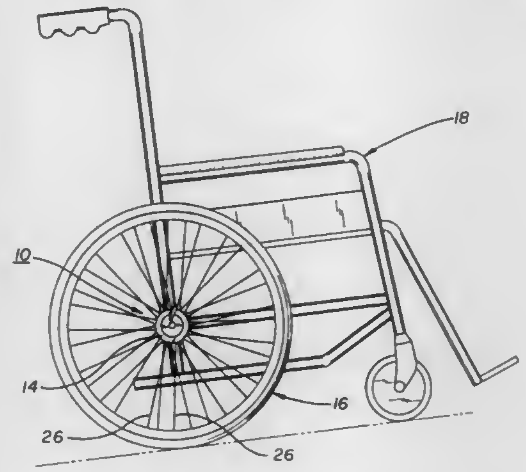
RATCHETING HUB WHEELCHAIR ATTACHMENT

Robin L. Faber, 4201 Columbia Dr., Cheyenne, Wyo. 82009

Filed Jan. 3, 1996, Ser. No. 582,505

Int. Cl.^{6} B62M *1/14*

U.S. Cl. 280—304.1 **10 Claims**



1. A ratcheting hub attachment comprising:

a hub mounting assembly for attaching a hub of a wheel of a conveyance;

a ratchet assembly mounted relative to the hub mounting assembly which can be secured to a wheel axle of the conveyance for permitting rotation of the wheel of the conveyance in a single direction only

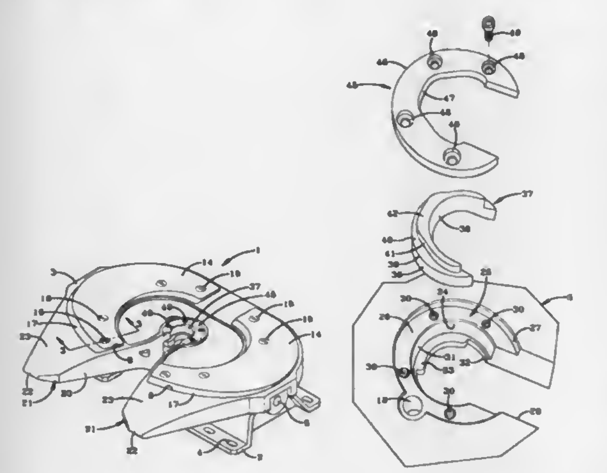
wherein the hub mounting assembly comprises a hub mounting plate which can be abuttingly positioned against an outer surface of the hub of the wheel of the conveyance; and a plurality of spoke engaging members projecting from an interior surface of the hub mounting plate which can be positioned between adjacent spokes of the wheel; and

wherein the ratchet assembly comprises an outer housing which can be secured to the wheel axle of the wheelchair, a ratchet fixedly secured to the hub mounting plate of the hub mounting assembly as to rotate wherewith, the ratchet being positioned within the outer housing; a pawl axle directed through an eccentric portion of the outer housing; and a pawl secured to the pawl axle and biased into engagement with the ratchet.

5,746,438
FIFTH WHEEL

Wolfgang Bergmann, Hosbach; Hans Dreyer, Egelsbach, and Wolfgang Pohl, Dreieich, all of Germany, assignors to Jost—Werke AG, Frankfurt am Main, Germany

Filed Mar. 3, 1995, Ser. No. 398,514
Int. Cl.^{6} G62D *53/08*
U.S. Cl. 280—433 **17 Claims**



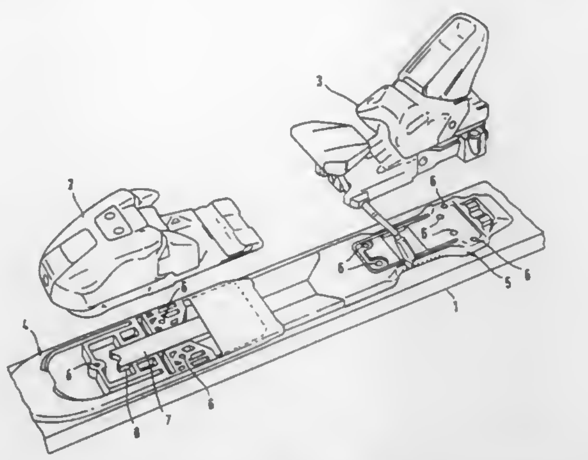
1. A fifth wheel for coupling a tow vehicle to a trailer having a king pin, comprising:
- a saddle;
- a coupling plate formed with a pair of flanges, and an insertion slot extending between said flanges mounted to the saddle;
- an aperture having an inner surface, operatively associated with the insertion slot and adapted to receive a king pin;
- a non-metallic wear ring carried in the aperture and adapted to extend adjacent a trailer king pin and formed with an inner contour wall and an outer contour wall whereby the outer contour wall is complementary related to the inner surface of the aperture with said outer contour wall having a first center of curvature, and the inner contour wall having a second center of curvature offset from the first center of curvature for at least partially preventing the ring from rotating;
- a holding plate attached to the coupling plate and extending at least partially over the wear ring for retaining the wear ring against axial displacement; and
- fastening means for retaining the holding plate to the coupling plate.

5,746,439
SPACER-PLATE ARRANGEMENT FOR SKI BINDINGS

Alfred Boehm, Polling; Edwin Lehner, Farchant, and Werner Messerschmidt, Garmisch-Partenkirchen, all of Germany, assignors to Marker Deutschland GmbH, Germany

Filed Feb. 3, 1995, Ser. No. 383,464
Claims priority, application Germany, Feb. 3, 1994, 44 03 192.0
Int. Cl.^{6} A63C *5/07*
U.S. Cl. 280—602 **14 Claims**

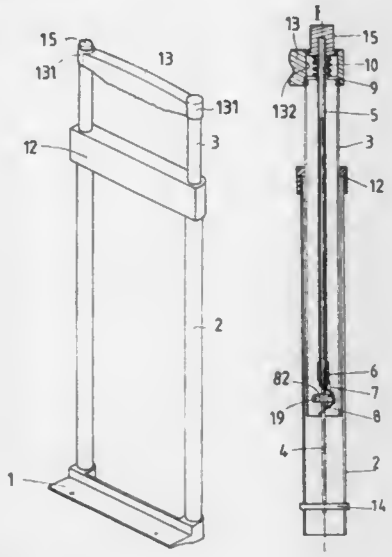
1. A spacer-plate arrangement for a ski binding comprising:
- a rear spacer-plate part mountable between a ski binding heel piece and the upper side of a ski;
- a front spacer-plate part mountable between a ski binding toe piece and the upper side of the ski; and
- a relatively rigid continuation means extending from one of said spacer-plate parts towards the other spacer-plate part, and projecting into a cutout on the other said spacer-plate part, wherein when the ski bends, said continuation means moves in the longitudinal direction of the ski and interacts with said other spacer-plate part, said other spacer-plate part providing a frictional resistance to the longitudinal movement of said continuation means to dampen vibration of the ski.



5,746,440
LUGGAGE CARRIER

Guan-Zhon Chen, No. 13, Lane 430, Section 2, Yuan Lu Road, Yi Min Tsuen, Pu Hsin Hsiang, Chang Hua Hsien, Taiwan

Filed May 6, 1996, Ser. No. 642,951
Int. Cl.^{6} B62B *1/00*
U.S. Cl. 280—652 **4 Claims**

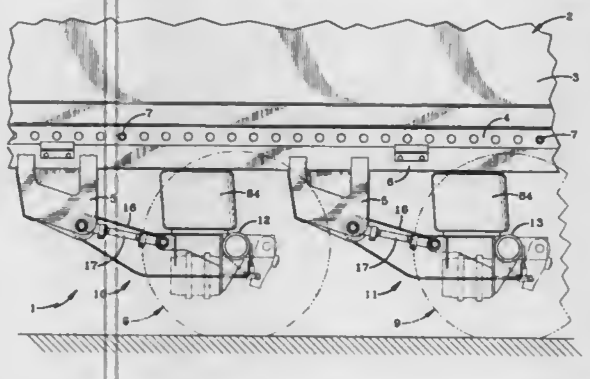


1. A luggage carrier comprising:
- a base including two side portions,
- two outer tubes each including a lower end secured to said side portions of said base and each including an upper portion,
- a bar secured to said upper portions of said outer tubes
- a rod engaged in a first of said outer tubes and including a lower end secured to said lower end of said first outer tube, said first outer tube including a pin secured to said lower end thereof, said lower end of said rod being secured to said pin,
- two inner tubes each including a lower portion slidably engaged in said outer tubes and each including an upper portion, a first of said inner tubes being slidably engaged in said first outer tube and including a lower portion,
- a hand grip secured to said upper portion of said inner tubes,
- a resilient blade secured to said lower portion of said first inner tube and including at least one orifice including an interior wall for engaging with and for securing to said rod, said orifice including a size slightly larger than that of said rod, and
- means for disengaging said interior wall of said orifice from said rod so as to allow said first inner tube to be adjusted relative to said rod and said first outer tube.

5,746,441
CENTER BEAM SUSPENSION SYSTEM

Ervin K. VanDenberg, Massillon, Ohio, assignor to Rockwell Heavy Vehicle Suspension Systems, Inc., Canal Fulton, Ohio

Filed Dec. 2, 1996, Ser. No. 756,947
Int. Cl.^{6} B60G *11/26*
U.S. Cl. 280—713 **27 Claims**



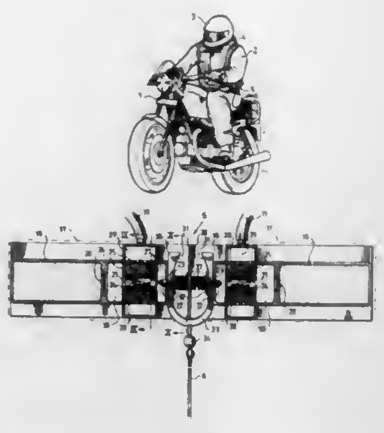
1. A suspension system adapted to be mounted to a vehicle frame comprising:
- an axle;
- a suspension frame;
- a central beam non-rotatably secured to the axle and having a pair of spaced apart sidewalls and one of a top wall and a bottom wall extending between the axle and suspension frame;
- a rigid control arm extending between the central beam and the suspension frame adjacent each side of the central beam;
- at least one air spring adapted to be positioned intermediate the central beam and the vehicle frame; and
- at least one hanger bracket adapted for extending from the vehicle frame and for supporting the suspension system.

5,746,442
SAFETY APPAREL

Peter Hoyaukin, Stagneliusvägen 42 II, S-112 57, Stockholm, Sweden

PCT No. PCT/SE95/00645, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO95/33389, PCT Pub. Date Dec. 14, 1995
PCT Filed Jun. 2, 1995, Ser. No. 750,327
Claims priority, application Sweden, Jun. 6, 1994, 9401944
Int. Cl.^{6} B60R *21/00*
U.S. Cl. 280—730.1 **16 Claims**

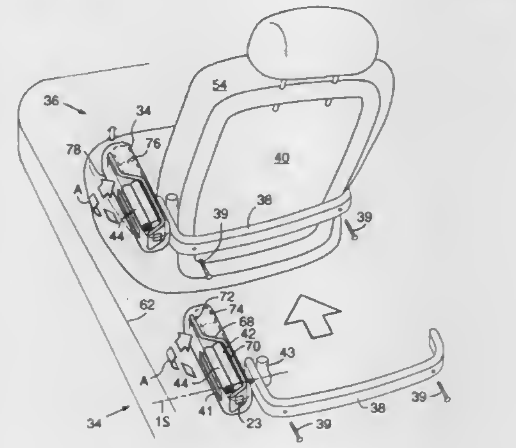
1. Safety apparel, particularly, but not exclusively, for motorcyclists, equestrians and other unprotected persons, comprising gas-inflatable, shock-absorbing pockets or pads (**8**, **9**, **12**), at least one gas-delivering device (**5**) which is connected to said pockets or pads and which includes a container (**19**) sealed by a sealing plate (**20**) and containing compressed or liquified gas, a small explosive charge (**22**), means (**6**, **30**) for initiating detonation of the explosive charge in the event of an accident which causes the wearer (**2**) of the protective apparel (**4**) to be thrown from a motorcycle (**1**), or a horse, and means (**21**) activated by the explosive charge (**22**) to penetrate the sealing plate (**20**), characterized in that the explosive charge (**22**) is intended to be detonated by means of a striking pin (**23**) operated by a spring (**37**), and in that said means (**6**, **30**) are arranged for storing the energy required herefor in the spring as a result of a relative motion between the wearer (**2**) of the protective apparel (**4**) and a motorcycle (**1**), or a horse caused by an accident.



5,746,443
SIDE IMPACT AIR BAG DEPLOYABLE BETWEEN A VEHICLE BODY AND AN OCCUPANT

John A. Townsend, Troy, Mich., assignor to Joalto Design, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 510,514, Aug. 2, 1995, Pat. No. 5,531,470, which is a continuation-in-part of Ser. No. 257,080, Jun. 9, 1994, which is a division of Ser. No. 912,790, Jul. 13, 1992, Pat. No. 5,378,036. This application Jul. 1, 1996, Ser. No. 673,129
Int. Cl.^{6} B60R *21/22*
U.S. Cl. 280—730.2 **15 Claims**



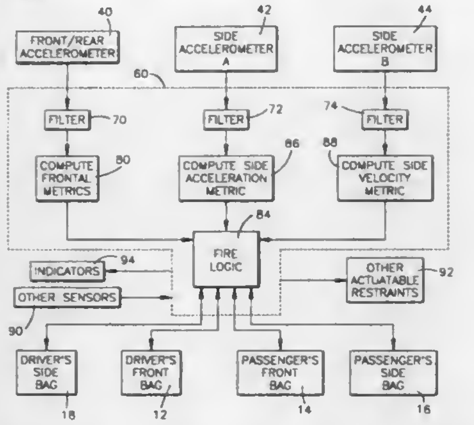
1. An air bag restraint apparatus for use in a vehicle having a body and a seat within the body, said apparatus arranged for protecting a vehicle occupant and comprising:
- an armrest mounted adjacent to an outboard side of the vehicle seat, said armrest having inboard and outboard sides; and
- an air bag stowed within the armrest for deployment through the outboard side thereof into a space between the outboard side of the armrest and the vehicle body, wherein the air bag deploys outward against the vehicle body and expands upward along the body to protect the occupant's torso from side impact.

5,746,444
METHOD AND APPARATUS FOR SINGLE POINT SENSING OF FRONT AND SIDE IMPACT CRASH CONDITIONS

Chek-Peng Foo, Ann Arbor, Mich., and James Edward Bormann, La Porte, Ind., assignors to TRW Inc., Lyndhurst, Ohio

Filed Sep. 27, 1996, Ser. No. 720,353
Int. Cl.^{6} B60R *21/32*

U.S. Cl. 280—735 **12 Claims**



1. An apparatus for controlling first and second actuatable side restraints in a vehicle, comprising:

first acceleration sensing means having an axis of sensitivity and mounted to the vehicle at a location for providing a first crash signal upon the occurrence of a sideways crash acceleration of the vehicle;

second acceleration sensing means having an axis of sensitivity and mounted at said location for providing a second crash signal upon the occurrence of said sideways crash acceleration of the vehicle;

means for determining a sideways crash acceleration value in response to said first crash signal;

means for determining a sideways crash velocity value in response to said second crash signal;

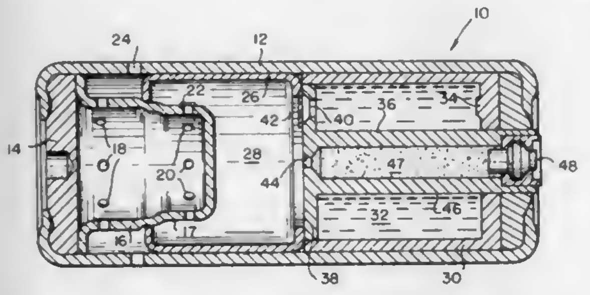
means for actuating one of said first and second actuatable side restraints when (i) said determined crash acceleration value is greater than an acceleration discrimination threshold value and said determined crash velocity value is greater than a velocity safing threshold value or (ii) said determined crash acceleration value is greater than an acceleration safing threshold value and said determined crash velocity value is greater than a velocity discrimination threshold value.

5,746,445
INJECTION TERMINATION FEATURE

Darrin L. Johnson, 16158 E. Glenbrook Blvd., Fountain Hills, Ariz. 85268, and Bradley D. Harris, 761 Southhampton Ct., Farmington, Utah 84025

Filed Dec. 3, 1996, Ser. No. 770,380
Int. Cl.^{6} B60R *21/26*

U.S. Cl. 280—741 **20 Claims**



1. An inflator of a vehicle safety restraint system, comprising:

a housing, the housing including a reservoir of liquid propellant;

a combustion chamber disposed in the housing in communication with the liquid propellant reservoir;

regenerative piston means for separating the liquid propellant reservoir and the combustion chamber, the piston means including a plurality of injection ports for delivering the liquid propellant to the combustion chamber in a controlled manner; and

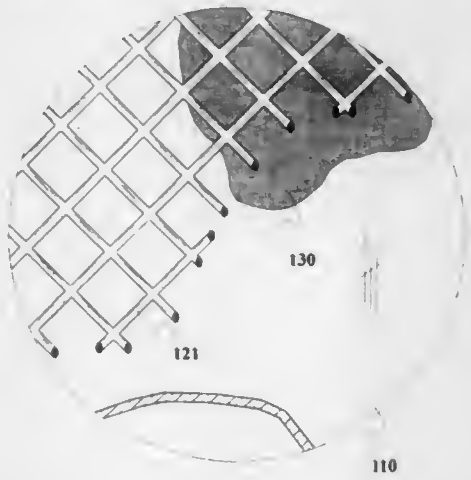
injection termination means disposed in the housing, wherein upon completion of a stroke of the piston means, the injection termination means seals the injection ports of the piston means for preventing combustion and decomposition reactions of any residual liquid propellant from propagating through the piston means.

5,746,446
PLASTIC FILM AIRBAG

David S. Breed, Boonton Township, and William Thomas Sanders, Rockaway Township, both of N.J., assignors to Automotive Technologies International, Inc., Denville, N.J.

Continuation-in-part of Ser. No. 247,763, May 23, 1994, Pat. No. 5,505,485, Ser. No. 539,676, Oct. 5, 1995, Pat. No. 5,653,464, and Ser. No. 571,247, Dec. 12, 1995. This application Apr. 2, 1996, Ser. No. 626,493
Int. Cl.^{6} B60R *21/02*

U.S. Cl. 280—743.1 **20 Claims**



1. In a vehicle having an inflatable occupant protection system, an inflatable occupant restraint module comprising:

a housing mounted in the vehicle and having an interior;

at least one deployable airbag contained within said housing interior prior to deployment, said at least one airbag comprising a respective first non-perforated sheet of film and a member arranged in connection with said first sheet of film for arresting the propagation of a tear in said first sheet of film, said member being selected from the group consisting of (i) a network of multi-directional material strips and (ii) a second non-perforated sheet of film having substantially anisotropic tear properties whereby the direction of least tear resistance of said second sheet of film is different than a direction of least tear resistance of said first sheet of film,

inflation means coupled to said housing for inflating said at least one airbag, said inflation means comprising gas supply means for supplying a gas into an interior of said at least one airbag;

attachment means for attaching said at least one airbag to and in fluid communication with said inflation means; and

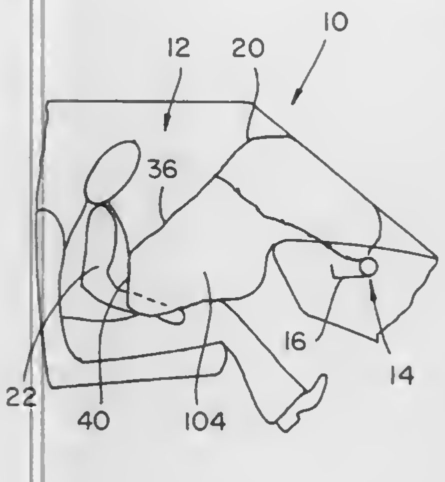
initiation means for initiating said gas supply means to supply the gas into the interior of said at least one airbag in response to a crash of the vehicle.

5,746,447
AIRBAG MODULE

David J. Dyer, Kaysville, Utah; Claus J. Geisler, Markgröningen, and Ulrich Woerner, Weil derStadt, both of Germany, assignors to Morton International, Inc., Chicago, Ill.

Filed Jan. 21, 1997, Ser. No. 784,567
Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—743.2 **16 Claims**



1. An inflatable restraint airbag module for the protection of an occupant of a vehicle, said module comprising:

an inflatable airbag cushion with external and internal surfaces and having an inflation gas inlet opening and a rearwardly facing cushioning surface for engaging the occupant when said airbag cushion is inflated, said airbag cushion including a tether having opposed first and second ends, with the first end of the tether attached to the internal surface of the rearwardly facing cushioning surface and the second end of the tether attached to an airbag cushion tether base, the tether dividing said airbag cushion into an upper portion and a lower portion,

an airbag inflator which emits inflation gas upon actuation,

an open-mouthed reaction canister forming a housing for said airbag cushion and said inflator, and

an inflation gas diffuser including a face member interposed between said inflator and the gas inlet opening of said airbag cushion, the face member including a gas flow through area comprising at least one inflation gas passage aperture for conveying inflation gas from said inflator to said airbag cushion, said diffuser and said reaction canister cooperating to define an inflator storage volume for storage of said inflator and an airbag cushion storage volume for storage of said airbag cushion, the airbag cushion storage volume including an airbag cushion storage compartment offset from gas flow through area of said diffuser and an airbag cushion storage space adjacent the gas flow through area of said diffuser,

wherein:

the lower portion of said airbag cushion is formed in a compact shape and placed within the airbag cushion storage compartment, and

the upper portion of said airbag cushion is formed in a compact shape and placed within the airbag cushion storage space,

wherein, upon inflation of said airbag cushion, inflation of the upper portion of said airbag cushion precedes inflation of the lower portion of said airbag cushion.

5,746,448
SEAT BELT HOLDER

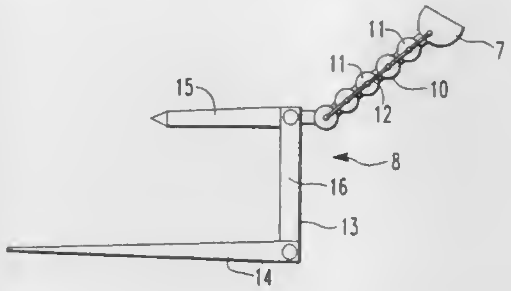
Leonie Apfel, 34 Sandhill Oval, Alwoodley, Leeds LS17, United Kingdom

Filed Aug. 13, 1996, Ser. No. 695,489

Claims priority, application United Kingdom, Aug. 15, 1995, 9516693

Int. Cl.^{6} B60R *22/00;22/48*

U.S. Cl. 280—801.1 **12 Claims**



1. A seat belt holder, for releasably holding a buckle of a seat belt in a position readily accessible for use, comprising a body, attachment means for attaching the body to a car seat, and an elongated member having a first end attached to the holder and a second, free end, for releasably holding the buckle.

5,746,449
SHOCK ABSORBING COVER FOR SEAT BELT ANCHOR

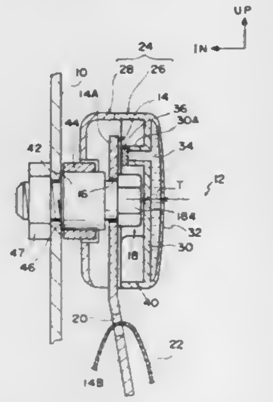
Atsushi Hiroshige, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1996, Ser. No. 724,252

Claims priority, application Japan, Oct. 5, 1995, 7-259060; Jul. 30, 1996, 8-200577

Int. Cl.^{6} B60R *22/18;22/28*

U.S. Cl. 280—808 **17 Claims**



1. A shock absorbing seat belt device for a seat belt anchor mounted to a vehicle by a bolt, comprising:

a cover which covers the bolt and includes a first wall covering a head portion of the bolt, and a second wall disposed adjacent to said first wall such that a predetermined space is defined between said first wall and said second wall; and

a fluid filled in said space between said first wall and said second wall,

wherein said second wall is constructed and arranged to deform along a configuration of an object colliding with said second wall.

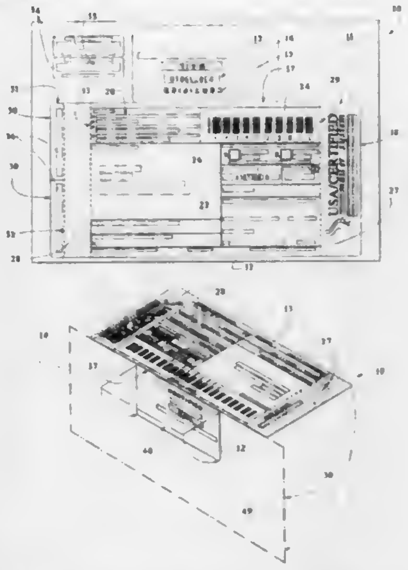
5,746,450
INTEGRAL SPECIAL SERVICE MAILING ASSEMBLY WITH A CUT OUT PORTION AND A METHOD FOR USING SAME

Glenn Petkovsek, 20 Tortoise Park Cove, Little Rock, Ark. 72211-2349

Continuation-in-part of Ser. No. 425,578, Apr. 20, 1995, Pat. No. 5,697,648. This application Jan. 17, 1996, Ser. No. 587,585

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—61 **10 Claims**



1. A special service mailing assembly comprising:
a backing sheet;
a sheet directly attached to the backing sheet having a first section integrally formed with a second section, the first section including a label having an adhesive back side indicative of the special service, and the second section including a form, a first anchor portion having an adhesive back side and a second anchor portion having an adhesive back side wherein the anchor portions are located at opposite ends of the form, the form being independently detachable from the anchor portions and the label and further wherein the sheet is removably attached to the backing sheet by the adhesive back sides of the label, the first anchor portion and the second anchor portion; and
a cut out section in the backing sheet.

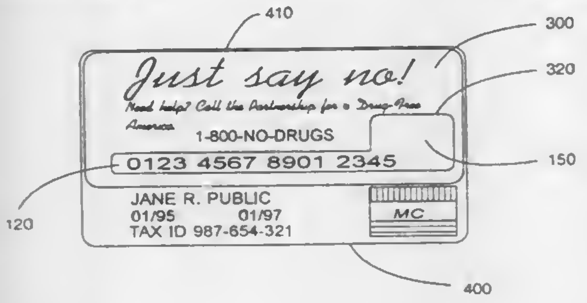
5,746,451
CUSTOMIZABLE CREDIT CARD OVERLAY

Frank M. Weyer, 505 S. Beverly Dr. #1224, Beverly Hills, Calif. 90212

Filed Aug. 28, 1996, Ser. No. 703,991

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—65 **19 Claims**



1. An overlay for affixing to a transaction card, said transaction card having a front surface and a first embossed region, said overlay comprising:
a bottom surface comprising means for adhering to said front surface of said transaction card, said means for adhering to said front surface of said transaction card comprising a contact adhesive;
a top surface comprising a message region;
a first cut-out region corresponding, when said overlay is affixed to said transaction card, to said first embossed region such that said first embossed region remains unobscured by said overlay and an operability of said transaction card is preserved.

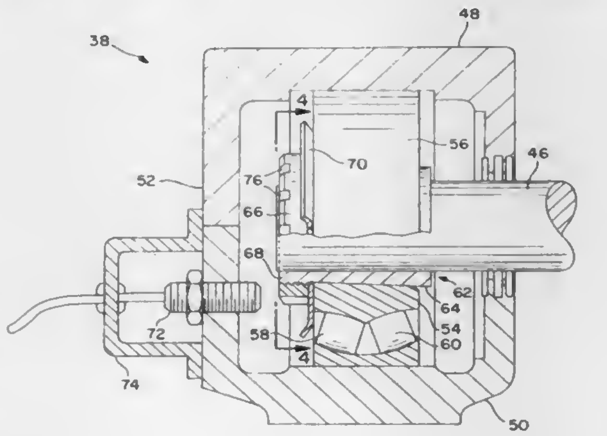
5,746,452
BEARING ASSEMBLY HAVING INTEGRATED SPEED SENSOR

Yehia El-Ibiary, Simpsonville; Donald L. Nisley, Greenville, and Jack D. Stroobandt, Simpsonville, all of S.C., assignors to Reliance Electric Industrial Company, Cleveland, Ohio

Filed Mar. 29, 1995, Ser. No. 412,521

Int. Cl.^{6} F16C *19/00*

U.S. Cl. 384—446 **24 Claims**



1. A bearing apparatus comprising:
a bearing housing;
a bearing assembly contained in said housing and including respective first and second ring members capable of relative rotation; securement means for securing said first ring member to a rotatable shaft during operation such that said first ring member will rotate therewith;
detection means, associated with said securement means, for producing predetermined variations in a predetermined characteristic as said securement means is rotated; and
a sensor device mounted to said housing and operative to detect a rate of rotation of said shaft by detecting said detection means.

5,746,453
HIGH TEMPERATURE INLINE EXPANSION JOINT

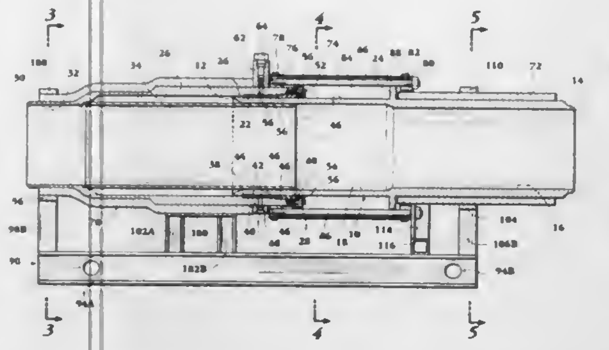
Allen L. Roberts, Shawnee, Okla., assignor to ERC Industries, Inc., Houston, Tex.

Filed Jun. 17, 1996, Ser. No. 664,715

Int. Cl.^{6} F16L *21/02*

U.S. Cl. 285—47 **22 Claims**

1. An inline pipeline expansion joint comprising:
a first sleeve having an inner and an outer end, the outer end adaptable to receive an attachment of a fluid carrying member;
a second sleeve having an inner end and an outer end, the outer end adaptable to receive attachment of a fluid carrying member, an inner end portion of said first sleeve being co-axially and telescopically received within said second sleeve;



seal means interposed between said first sleeve and said second sleeve;
a tubular insulation shield having a first end secured to said second sleeve adjacent said inner end thereof and an outer end, the insulation shield being of internal diameter greater than said first sleeve providing an annular telescopic air space surrounding a portion of said first sleeve; and
an annular scraper affixed to said first sleeve inner end and in sliding engagement with an interior circumferential surface of said second sleeve.

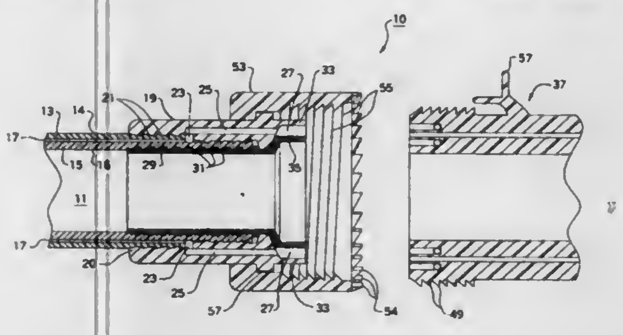
5,746,454
PIPE COUPLING ASSEMBLY

Michael C. Webb, Chester Springs, Pa., assignor to Environ Products, Inc., Exton, Pa.

Continuation of Ser. No. 306,680, Sep. 15, 1994, abandoned. This application Jul. 24, 1996, Ser. No. 685,775

Int. Cl.^{6} F16L *55/00*

U.S. Cl. 285—92 **20 Claims**



1. A pipe coupling assembly, comprising:
a pipe having an inner wall, an outer wall and an interstitial space between said walls, said pipe terminating in a coupling end defining an axial direction;
a ferrule attached to said outer wall at said end, said ferrule having an outer annular ring extending from said coupling end in said direction and further having an interstitial channel aligned with said interstitial space in said pipe for presenting an interstitial chamber at said coupling end;
an insert attached to said inner wall at said end, said insert having an inner annular ring extending from said coupling end in said direction;
an externally threaded transition fitting for attachment to said ferrule, said fitting including an interstitial channel aligned with said interstitial chamber, an outer seal channel for sealing engagement with said outer annular ring, and an inner seal channel for sealing engagement with said inner annular ring; and
coupling means keyed to said ferrule to prevent removal thereof in said direction and including internal threads for engagement with said fitting to provide coupling engagement between said ferrule and insert with said fitting.

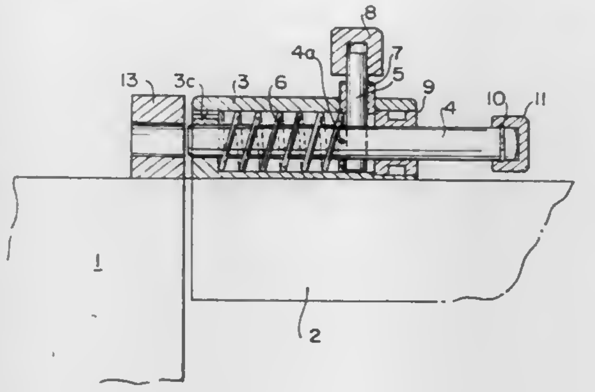
5,746,455
GATE OR DOOR SPRING-BIASED BOLT LATCH

Kazuhide Takimoto, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 639,744, Apr. 29, 1996, abandoned. This application May 15, 1997, Ser. No. 857,123

Int. Cl.^{6} E05C *5/02*

U.S. Cl. 292—62 **5 Claims**



1. A spring-biased bolt latch for fixedly mounting onto a door or gate, the latch comprising
a socket member (**13**) suitable for fixedly mounting on a stationary frame element (**1**);
an elongated latch body (**3**) having a front end portion and a rear end portion, and having dual flange portions (**3***d*) for fixedly mounting on a door or gate (**2**) said latch body being provided with a longitudinal groove (**3***a*) and a circumferential groove (**3***b*) in the latch body outer peripheral portion, said circumferential groove (**3***b*) being perpendicular to said longitudinal groove (**3***a*) and communicating with and extending from a front-end portion of said longitudinal groove (**3***a*);
a bolt (**4**) movably mounted in said elongated latch body (**3**) so as to be axially slidable and rotatable on its axis relative to said latch body (**3**), said bolt (**4**) having a rear-end portion extending from said latch body (**3**) rear end portion and having a front-end portion for engaging with said socket member (**13**) in a locking operation of the bolt latch; said bolt (**4**) having a push button (**11**) rotatably mounted on the rear end portion of the bolt (**4**) by a retaining ring (**10**);
a control pin (**5**) fixedly mounted radially on said bolt (**4**) and received in said longitudinal groove (**3***a*) and said circumferential groove (**3***b*) of said latch body (**3**) so as to be slidable along the length of each said longitudinal groove (**3***a*) and said circumferential groove (**3***b*); said control pin (**5**) having a knob (**8**) fixedly mounted on an outer end portion of the control pin (**5**);
a coil and torsion spring (**6**) which is slidably mounted in said latch body (**3**) front end portion and linearly urges said bolt (**4**) to have its front-end portion received in said latch body (**3**) and rotatably urges said bolt (**4**) to have said control pin (**5**) received in said circumferential groove (**3***b*) of said latch body (**3**);
said spring (**6**) having a front end portion which is engaged with a mounting hole (**3***c*) in said latch body (**3**) front end portion and having base end portion which is engaged with a mounting hole (**4***a*) of said bolt (**4**), so as to serve both as a compression and torsion spring; and
a seat member (**9**) which is mounted in said latch body (**3**) rear-end portion by a set screw (**12**) and butts against said control pin (**5**) in unlocking operation of the bolt latch (**3**) to prevent said bolt (**4**) from further moving towards the rear-end portion in said latch body (**3**).

5,746,456
OVEN DOOR LOCKING DEVICE

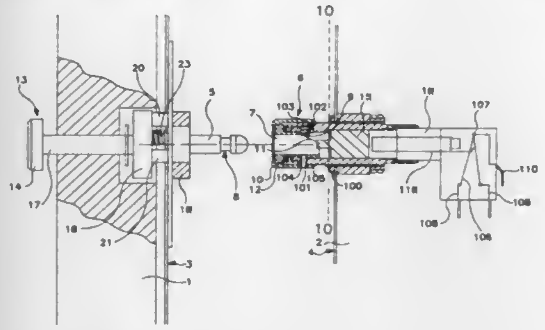
Raymond Violi, Marlens, and Jean-Francois Ferbus, Seythenex, both of France, assignors to Societe Cooperative de Production Bourgeois, Faverges, France

Continuation-in-part of Ser. No. 307,246, Sep. 16, 1994, abandoned. This application Oct. 7, 1996, Ser. No. 726,610

Claims priority, application France, Sep. 17, 1993, 93 11247

Int. Cl.^{6} E05C *1/04*

U.S. Cl. 292—146 **9 Claims**



1. A locking oven comprising:
an oven door having an oven door contact side,
an oven muffle having an oven muffle contact side, and
a locking device for locking the oven door when the oven door contact side is pressed against the oven muffle contact side, wherein:
  - a male rod projects perpendicularly from the respective contact side of one of the group consisting of the oven door and the oven muffle,
  - a female member with an internal bore is fitted to the other of the group consisting of said oven door and said oven muffle, the female member having a base portion,
  - said male rod and said female member are shaped and disposed so that said male rod enters said female member when said oven door is pressed against the opening of said oven muffle to close it,
  - said male rod includes at least one intermediate annular groove,
  - said female member includes a locking member movable radially between a locking position in which said locking member enters said internal bore and into said groove of said male rod to prevent axial sliding of said male rod and an unlocking position in which said locking member is withdrawn from said internal bore and from said groove to allow axial sliding of said male rod,
  - said female member includes a cylindrically shaped unlocking ring sliding axially relative to the base portion and shaped to move said locking member radially between said locking position and said unlocking position when it is moved axially,
  - spring means urge said unlocking ring towards its locking position in which said locking member is in said locking position, and
  - a push-button is provided on the one of the group consisting of the oven door and the oven muffle and is shaped to move said unlocking ring in translation on said female member to bring about unlocking.

5,746,457
LOCKING DEVICE

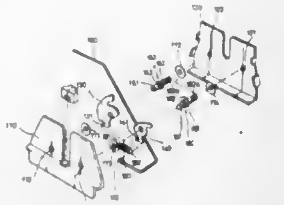
Manyeob Kim, Incheon, Rep. of Korea, assignor to Dongyang Mechatronics Corp., Incheon, Rep. of Korea

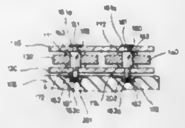
Filed Feb. 28, 1997, Ser. No. 807,436

Claims priority, application Rep. of Korea, Oct. 28, 1996, 1996 48967

Int. Cl.^{6} E05C *3/16;* E05B *9/06*

U.S. Cl. 292—216 **3 Claims**





1. A locking device comprising a pair of shafts, each shaft having a middle part and first and second end parts, said middle part having a first diameter and said first and second end parts, having a second diameter, said second diameter being smaller than said first diameter said second end part having a screw portion;
  - a lower plate having a pair of screw holes for receiving said second end parts of said shafts;
  - an upper plate having a pair of holes for accepting said first end parts of said shafts;
  - a latch and a pawl interlocked to each other, said latch and said pawl being rotatably affixed to said middle part of respective ones of said shaft; and
  - a releasing means for rotating said latch;
  - wherein said second end portion of each of said shafts is screw-jointed to a fixing portion while said first end portion of each of shafts is riveted to said upper plate.

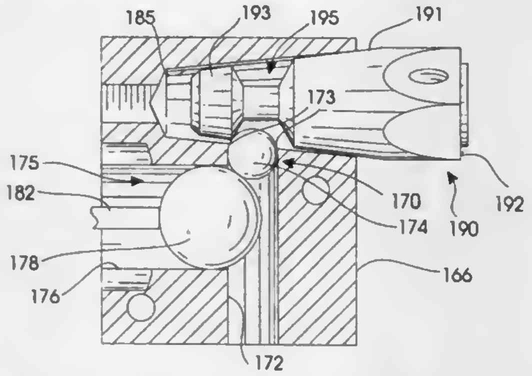
5,746,458
EASILY INSTALLABLE DELAYED EGRESS LOCK SYSTEM

Roy E. Fisher, Dover, Ark., assignor to Ralph's Welding Inc., Russellville, Ark.

Continuation of Ser. No. 645,179, May 13, 1996, abandoned. This application Aug. 11, 1997, Ser. No. 909,035

Int. Cl.^{6} E05C *19/00*

U.S. Cl. 292—252 **5 Claims**



5. A fail safe auxiliary door locking system for use with a primary paddle arm lock to delay door opening, said system comprising:
  - a bolt comprising a body and an annular seat defined in said body;
  - a latching mechanism for receiving said bolt when said door is closed, said mechanism comprising:
    - keeper means for normally captivating said bolt, said keeper means comprising a displaceable keeper disposed within said mechanism for selectively engaging said annular seat, said keeper being spherical and adapted to mate within said seat, and an actuator being spherical for displacing said keeper when selectively activated by plunger means, said spherical actuator comprising a diameter larger than the diameter of said spherical keeper to geometrically increase the force necessary to withdraw said keeper while said keeper is mated in said seat;
  - a port aligned with said bolt for receiving same;
  - a first tubular channel defined in said mechanism intersecting said port for housing said keeper;
  - a second tubular channel defined in said mechanism terminally intersecting said first channel for housing said actuator; and,
  - timer means for temporarily delaying unlocking in response to said primary door latch.

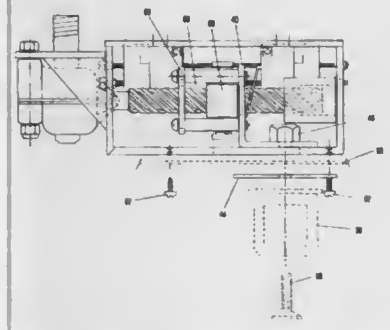
5,746,459
POWER DOOR LATCH METHOD AND APPARATUS

William H. Giroux, Jr., Kirtland, and Charles E. Johnson, Farmington, both of N. Mex., assignors to Independent Mobility Systems, Inc., Farmington, N. Mex.

Filed Jul. 31, 1996, Ser. No. 691,170

Int. Cl.^{6} E05B *15/02*

U.S. Cl. 292—341.16 **12 Claims**



1. A power door closing mechanism for use with an original equipment latch mechanism on motor vehicle doors comprising:
  - a reversible D.C. motor; and
  - a housing adapted to be affixed to the motor vehicle door frame comprising:
    - a drive apparatus powered by said D.C. motor;
    - a rotating structure driven by said drive apparatus;
    - a means for changing rotational movement in said rotating structure into linear movement in a linear structure;
    - a striker affixed to said linear structure; and
    - a mechanical delay means for allowing the striker to remain stationary after rotation of the rotating structure begins so as to allow adequate time for the latch mechanism to fully engage with the striker before linear movement of the striker begins.

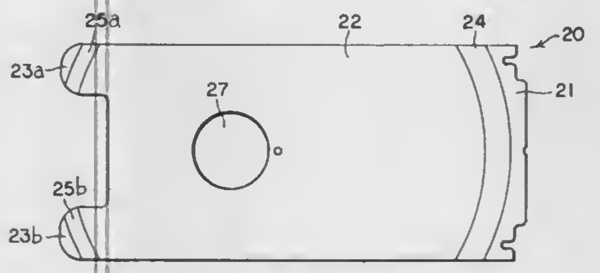
5,746,460
END EFFECTOR FOR SEMICONDUCTOR WAFER TRANSFER DEVICE AND METHOD OF MOVING A WAFER WITH AN END EFFECTOR

Dan A. Marohl, San Jose, and Kenny King-Tai Ngan, Fremont, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 8, 1995, Ser. No. 569,760

Int. Cl.^{6} B65G *65/00*

U.S. Cl. 294—1.1 **9 Claims**



1. An end effector for an article transfer device comprising:
  - a rear support mechanism for attaching the end effector to the article transfer device;
  - a pocket extending forward from a front edge of the rear support mechanism for receiving an article therein;
  - wafer capture shoes projecting forward through a peripheral forward end of the pocket; a lower surface of each of said shoes exhibiting a sloped surface.

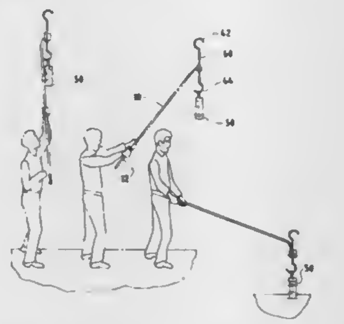
5,746,461
BIRD FEEDER HANGING DEVICE SYSTEM

James Broberg, 2819 Oak Ridge Rd., Crystal Lake, Ill. 60012

Filed Dec. 12, 1996, Ser. No. 766,227

Int. Cl.^{6} B25J *1/04*

U.S. Cl. 294—19.1 **1 Claim**



1. A device for attaching an object to an overhead support comprising:
  - a hanger having opposingly located first and second end portions and a stop located between said first and second end portions of said hanger;
  - said first end portion adapted to releasably engage said support;
  - said second end portion adapted to engage said object;
  - a pole having a handle and an opposingly located rotatable catch having a U-shape and a bottom portion in which said stop rests;
  - said catch adapted to operatively engage said stop; and
  - said object maintained in a vertical position during the attachment of said object to said support by the rotational movement of said catch.

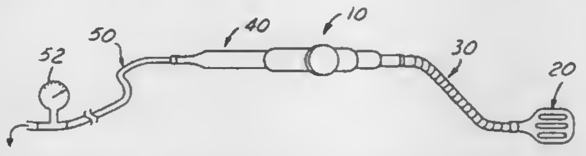
5,746,462
FLEXIBLE VACUUM PICK-UP DEVICE

C. H. Lee, Chang-hua, and Y. H. Chen, Hsin-Chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company,Ltd., Hsin-Chu, Taiwan

Filed Dec. 12, 1996, Ser. No. 764,327

Int. Cl.^{6} B25J *15/06*

U.S. Cl. 294—64.1 **11 Claims**



1. A flexible vacuum pick-up device for use in semiconductor wafer processing comprising:
  - a handle portion adapted for holding by a human hand, said handle portion containing a passage therein for fluid communication,
  - a shapeable flexible conduit for providing a vacuum passage therethrough constructed of a helical metal tape having a first end and a second end, said first end is adapted for connecting to one end of said handle portion and said second end is adapted for connecting to a pick-up, and
  - a pick-up head having a fluid outlet for connecting to said second end of said conduit and a generally laterally extended surface having at least one aperture therein adapted for intimate contact with a substantially flat wafer surface and for fluid communication with the passage in the handle portion such that vacuum may be applied to the wafer surface.

5,746,463

BOX PALLET

Akitoshi Nagata, 19-13, Shibazaki, Koi-cho, Anjo-shi, Aichi-ken, Japan

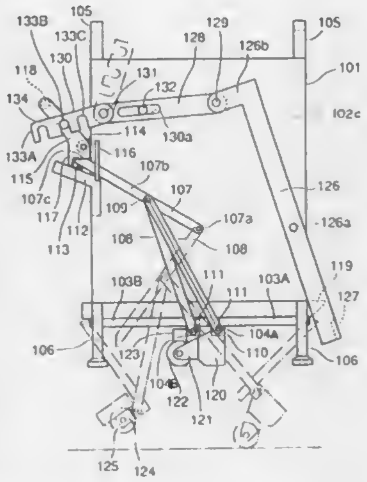
PCT No. PCT/JP95/00037, § 371 Date Sep. 18, 1995, § 102(e) Date Sep. 18, 1995, PCT Pub. No. WO96/00690, PCT Pub. Date Jan. 11, 1996

PCT Filed Jan. 17, 1995, Ser. No. 525,760

Claims priority, application Japan, Jan. 20, 1994, 6-004666; Mar. 23, 1994, 6-052227; Jul. 6, 1994, 6-154914; Jul. 6, 1994, 6-154915

Int. Cl.^{6} B65D *51/00*

U.S. Cl. 294—68.24 **13 Claims**



1. A box pallet having an open top, a plurality of side plates and a bottom plate for surrounding the box pallet on four sides and a bottom, said bottom plate being divided into two bottom plate parts and being assembled to move in a downward direction for opening said bottom, the box pallet comprising an actuation arm vertically pivotal about a pivot axis supported by one of two opposite side plates of said plurality of side plates, an interlocking member provided for interlocking between said actuation arm and said two divided bottom plate parts so as to permit opening and closing movement of each bottom plate part, and an actuation rod horizontally supported such that said actuation rod can change its position in a plane perpendicular to said pivot axis of said actuation arm between a first position within a pivotal range of said actuation arm for engagement with said actuation arm and a second position out of the pivotal range of said actuation arm for disengagement from said actuation arm, and said bottom plate parts being permitted to be opened when said actuation rod is in said second position.

5,746,464

SELF-LOCKING FRICTION BASED ROBOTIC GRIPPER

D. Scott Paul, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 30, 1996, Ser. No. 640,415

Int. Cl.^{6} B25J *15/08*

U.S. Cl. 294—116 **3 Claims**

1. A robotic gripper comprising:

a sleeve;

a thumb adapted to slide in the sleeve;

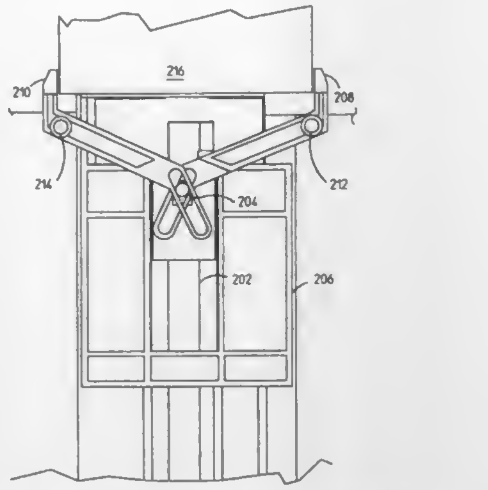
pivot points on the thumb;

a post that is moveable relative to the thumb;

a pair of fingers for gripping an object, the fingers rotating around the pivot points on the thumb, the post extending into slots in the fingers, wherein movement of the post relative to the thumb causes the fingers to rotate:

movement of the post relative to the thumb requiring a first force having a first force magnitude;

movement of the thumb relative to the sleeve requiring a second force having a second force magnitude; and



the second force magnitude being greater than the first force magnitude.

5,746,465

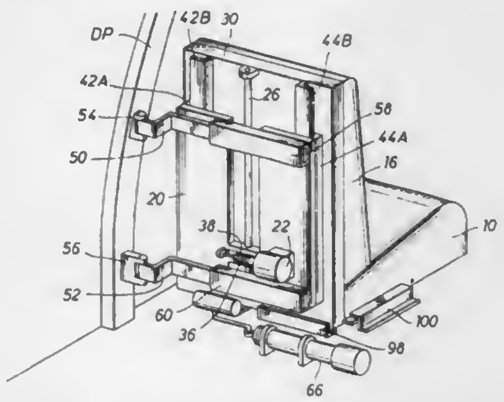
METHOD AND APPARATUS FOR MOVING A PHYSICALLY DISABLED PERSON TO AND FROM A DRIVING POSITION WITHIN A VEHICLE

David L. Jones, Houston, and George L. Drenner, Jr., Sugarland, both of Tex., assignors to Mobility Plus, Inc., Houston, Tex.

Filed Oct. 23, 1995, Ser. No. 551,901

Int. Cl.^{6} B60N *1/10*

U.S. Cl. 296—65.1 **9 Claims**



1. An apparatus for transferring a physically disabled driver through a vehicle's driver side door opening to and from a driving position behind the steering wheel of the vehicle, comprising:

a seat including a back support and a frame for supporting the seat;

a hinge assembly mounted on the driver's side door post of the vehicle for supporting the seat for pivotal movement between a position outside the vehicle facing outwardly from the vehicle and an intermediate position inside the vehicle facing forwardly;

means attached to the seat for allowing lateral movement of the seat relative to the hinge assembly between the intermediate forwardly facing position and a driving position behind the steering wheel;

powered means for applying force transverse the vehicle to move the seat between the outwardly facing position and the driving position; and

lift means carried by the seat frame for lifting the seat to a position to move a disabled driver on the seat into the vehicle and lowering the seat to return the driver to the ground when the seat is in the outwardly facing position.

5,746,466

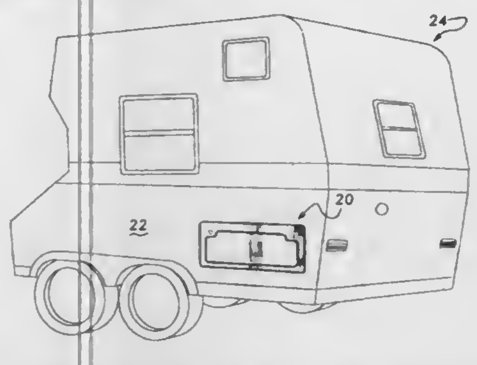
FLUSH SERVICE DOOR FOR RV

John M. Antos, Ann Arbor; John R. Selina; David B. Cameron, both of Brighton; James M. Byrne, Ann Arbor, all of Mich.; Gerard Cornelis Rijn, and Marinus Antonius Ros, both of Etten-Leur, Netherlands, assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Apr. 2, 1996, Ser. No. 626,564

Int. Cl.^{6} B60R *5/00*

U.S. Cl. 296—37.1 **8 Claims**



1. A door assembly for a recreational vehicle having a side wall with a cutout and an internal compartment, for alternatively providing and closing off access to said internal compartment, said door assembly comprising:

a body frame,

a door panel positioned within said body frame, said door panel being movable between an open position and a closed position,

a one piece seal member surrounding said door panel having inner and outer spaced-apart flexible sections so that said inner and outer spaced-apart flexible sections are compressed between said door panel and said body frame when said door panel is placed in said closed position, said inner flexible section being a dog-legged shaped cross section biased away from said internal compartment and said outer flexible section being a dog-legged shaped cross section biased away from said internal compartment connected to a flange section having an open C-shaped cross section facing said body frame, when said door panel is placed in said closed position.

5,746,467

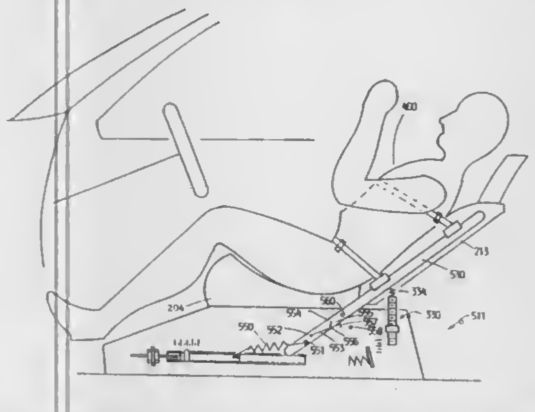
AUTOMATIC SAFETY CAR SEAT USING TENSION SPRINGS

Mongkol Jesadanont, 386/2 Soi Chalermsuk, (Pahonyothin 28), Jatujak, Bangkok 10900 THX

Division of Ser. No. 535,868, Sep. 28, 1995. This application Aug. 16, 1996, Ser. No. 698,669

Int. Cl.^{6} B60N *2/02*

U.S. Cl. 296—68.1 **1 Claim**



1. An automatic safety seat for an occupant in a front compartment of a vehicle whose backrest can recline suddenly backward upon a frontal collision of said vehicle, comprising:

a backrest that can recline backward together with an upper part of -a body of said occupant when a frontal collision occurs at a predetermined relative velocity or higher;

two long rectangular steel bars fixed tightly flanking on each side, one on the left side and one on the right side, to said backrest;

two automatic seat-belt tensioner sets on said steel bar on the left side of said backrest, one at the chest level and the other at the pelvis level of said occupant;

an upper short steel axle and a lower short steel axle on said steel bar on the right side of said backrest, one at the chest level and the other at the pelvis level of said occupant;

a seat cushion placed on and fixed tightly at its left and right edges to the top of two thick steel plates which are mounted perpendicularly and tightly to the floor of said vehicle;

two strap-type seat-belts, each together with a strap-lock to fasten the upper part of an occupant's body to said backrest, where one seat-belt is at chest level of said occupant with one end spooled inside the upper seat-belt tensioner set and the other end mounted tightly to said upper short steel axle on said right rectangular steel bar, while the other seat-belt is at the pelvis level of said occupant with one end spooled inside the lower seat-belt tensioner set and the other end mounted tightly to said lower short steel axle on said right rectangular steel bar;

a circular hole all the way through the thickness of each said rectangular steel bar at a level relatively lower than said seat-belt tensioner set or said steel axle at the pelvis level and three additional short steel axles, an upper short steel axle, a middle short steel axle and a lowest short steel axle, are arranged vertically in a row protruding out on the outer surface of each said rectangular steel bar opposite to said backrest at a level relatively lower than said circular hole:

a cylindrical steel shaft perpendicularly and integrally protruding out laterally on the surface of each said thick steel plate supporting said seat cushion which can pivotally fit into said circular hole of said rectangular steel bar;

rearwardly and lower relative to said cylindrical steel shaft on the surface of each said thick steel plate, there is a steel axle onto which a curving end of a hook is engaged where the lower end of said hook pivotally winds round said middle short steel axle at the lower end of said steel bar flanking said backrest:

a tension spring having its lower end fixed to the middle of said hook with its upper end fixed to said upper short steel axle at the lower end of each said steel bar in such a manner that there is sufficient tension force to lift the hook up when the curving end of said hook is disengaged from said steel axle on said thick steel plate:

rearwardly, at a lower level relative to said steel axle on the surface of said thick steel plate supporting said seat cushion, there is a small steel plate with a compression spring having one end fixed on the lateral surface of said small steel plate facing to the front of said vehicle with its free end pointing towards the posterior of the lowest end of said rectangular steel bar such that said lowest end presses on said compression spring to reduce the impact and limit the angle at which said steel bar moves pivotally forward and around said cylindrical shaft during a frontal collision of said vehicle:

rearwardly next to said compression spring and said small steel plate, there is a force-absorbing spring set each consists of a thick steel block mounted perpendicularly onto the surface of each said thick steel plate having a circular hole with several turns of internal threads to mate with external threads of a vertical thick steel rod with a compression spring fixed on top whose level can be adjusted by turning said thick steel rod up or down to set a predetermined angle at which each of said two steel bars together with said backrest and said fastened occupant may pivotally recline backward to the rearmost as it presses on said compression spring:

at a position relatively anterior and lower than said cylindrical shaft, there is a scale showing the numbers representing the body weights of the occupants on said surface:

at a position relatively lower than said scale, there is a force-adjusting set fixed onto the surface of said steel plate consists of:

a steel rail of C-shaped cross-section of said force adjusting spring set with its back mounted onto each said thick steel plate having a steel bar slidable and horizontally fitted along said rail where at the posterior end of said slidable steel bar there is a circular loop fixed laterally to be engaged to a circular loop at an anterior end of a tension spring whose posterior end winds tightly round the lowest short steel axle at the lower end of said steel bar, and relatively near the anterior end of said slidable steel bar there is a cursor made of steel fixed onto the surface whose arrow head points to the number on said scale indicating body weight of said occupant on said seat, and at the anterior end of said slidable steel bar is a long steel rod extended as a single piece with external threads to mate with internal threads of two hexagonal head nuts flanking a small steel plate with a circular hole in the center through which said long steel rod inserts, mounted perpendicularly to said steel plate supported said seat cushion, where moving of said long steel rod to and fro horizontally is possible by adjusting said two hexagonal head nuts and that said occupant must adjust said two head nuts to pull said arrow head cursor to point at a number on said scale corresponds to his body weight before using said automatic safety seat.

5,746,468

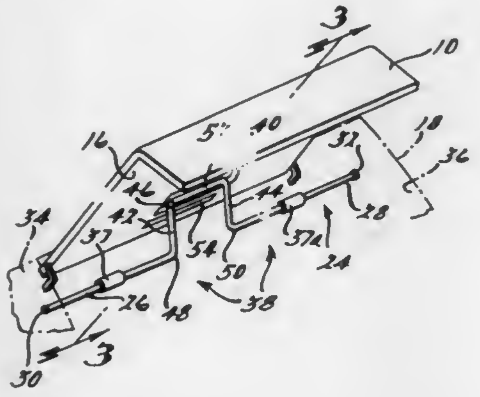
TORSION BAR ASSIST WITH RATCHET HOLD MECHANISM FOR AUTOMOBILE DECK LIDS

Robert M. Schoen, West Bloomfield, and Anthony J. Anderson, Farmington, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Oct. 27, 1995, Ser. No. 549,412

Int. Cl.^{6} B62D *25/10*

U.S. Cl. 296—76 **20 Claims**



1. A mechanism engageable with a deck lid of a vehicle having a body for assisting movement of the deck lid relative to the body, comprising:

- a torsion bar defining first and second opposed ends establishing a line therebetween, at least one end being connected to the body with the torsion bar oriented generally transversely relative to the vehicle, the torsion bar including a bight segment having an offset shaft oriented transversely relative to the vehicle and offset from the line established by the ends of the torsion bar;
- a roller coupled to the offset shaft; and
- a ratchet track positioned on the deck lid in contact with the roller, the ratchet track including a plurality of longitudinally spaced detents, each detent for releasably engaging the roller.

5,746,469

APPARATUS FOR COVERING WINDSHIELD OF VEHICLES

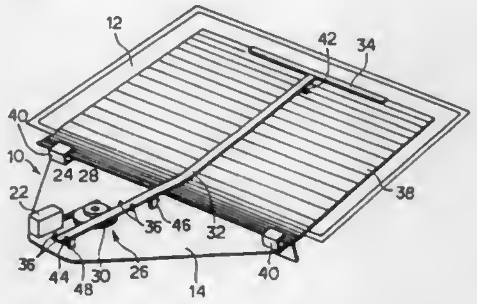
Tokio Nonaka, Kyoto-fu, Japan, assignor to Shigenobu Tuda, Osaka-fu, Japan

Filed Sep. 18, 1996, Ser. No. 710,467

Claims priority, application Japan, Jan. 12, 1996, 8-021964

Int. Cl.^{6} B60J *3/00*

U.S. Cl. 296—97.7 **3 Claims**



1. An apparatus for covering a windshield of a vehicle comprising:

- a mounting plate located on a back side of a bonnet and fixed to the vehicle;
- a cover capable of being unfolded and folded vertically on a windshield of the vehicle, and which is large enough to cover most of the windshield when unfolded;
- an accommodating section attached to a front end of said mounting plate for accommodating said cover when folded;
- a slide arm which is elongated along a vertical direction of the windshield and formed of a flexible material, a front end of the slide arm being fixed to a front end of said cover, the slide arm being supported for performing reciprocating motion freely in a longitudinal direction to move along an external side of the windshield and an upper side of said mounting plate;
- arm drive means fixed to said mounting plate for moving said slide arm linearly in reciprocating motion; and
- a switch for driving said arm drive means from inside of the car.

5,746,470

HARD-TOP VEHICLE

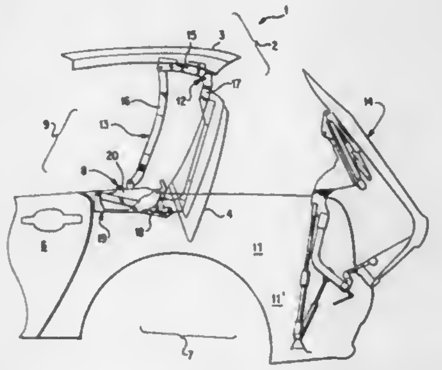
Holger Seel; Kurt Schaible, both of Aidlingen, and Bernhard Schenk, Boeblingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Dec. 20, 1995, Ser. No. 580,020

Claims priority, application Germany, Dec. 20, 1994, 44 45 580.1

Int. Cl.^{6} B60J *7/14*

U.S. Cl. 296—108 **5 Claims**



1. A hard-top vehicle having a roof structure which bears against a front windscreen frame and covers a rear-passenger-compartment region in a closed position and which is pivoted into a folding-top compartment for an open position of the roof structure, comprising:

- a roof part;
- a rear-window part connected pivotably to said roof part about a roof pivot pin to form said roof structure; and
- a linkage control element forming a substantially parallelogram configuration, moving both the roof part and rear-window part and comprising:
- a) a guide part rotationally fixed to the roof part;
- b) a guide rod and a main guide rod both pivotally connected to the guide part;
- c) an intermediate link pivotally connected to both the guide rod and to a tail-end pivot pin;
- d) a pivot link pivotally connected to both the intermediate link and the main guide rod.

5,746,471

CORNER PIECE FOR AN AUTOMOBILE

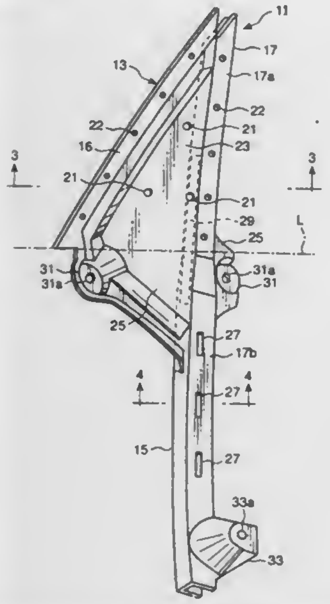
Mitsunobu Teramoto, Nagoya, and Akira Itou, Aichi-ken, both of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan

Filed Jun. 5, 1996, Ser. No. 659,679

Claims priority, application Japan, Jun. 5, 1995, 7-138186; Jun. 5, 1995, 7-138196; Jun. 5, 1995, 7-138206

Int. Cl.^{6} B60J *5/04*

U.S. Cl. 296—146.1 **6 Claims**



1. A corner piece for an automobile, the corner piece comprising:

- a resin insert having a bracket body portion and a glass run portion molded together as a unit, said bracket body portion and said glass run portion each having a rear side and a common channel extending along the respective rear sides thereof, said channel including a glass run member,
- a high molecular elastic material covering at least a part of the resin insert, and
- a reinforcing metal insert embedded in part of said channel between said bracket body portion and said glass run portion.

5,746,472

WIND DEFLECTING COVER FOR A CONVERTIBLE VEHICLE

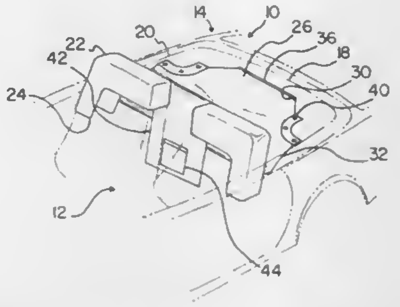
Arthur A. Rogers, 5310 E. Suncrest Rd., Anaheim, Calif. 92807

Filed Oct. 11, 1996, Ser. No. 730,000

Int. Cl.^{6} B62D *35/00*

U.S. Cl. 296—180.1 **1 Claim**

1. A wind deflecting cover comprising, in combination:



- a convertible vehicle with a front seat area and a rear seat area, the front seat area having a pair of seats with a space situated therebetween, a bottom horizontally oriented portion, an intermediate vertically oriented portion, and a head rest situated on a top extent of the intermediate portion, the rear seat area having a rear periphery with a pile faster along the length thereof and a pair of side peripheries each with a pile fastener adhered thereto, wherein the rear and side peripheries of the rear seat area are formed of an exterior of the vehicle, the rear seat area further having a front periphery defined by a rear extent of the seats, the rear seat area having a first predetermined length between the front periphery and the rear periphery;
- a pair of head rest covers each including a closed top face and a periphery integrally formed therewith and depending therefrom thus defining an open bottom for releasably receiving the head rests, the head rest covers each further including a head rest extension portion formed on a side of the head rest cover with a resilient material, each head rest extension portion extending from a top extent of the associated head rest and extending downwardly half the height of the intermediate portion of the associated seat on an outboard side thereof for abutting against a door and a raised window of the vehicle to cause an airtight seal which precludes the window from rattling and preventing a draft from entering the front seat area, the head rest covers each further having a strip of pile fasteners along the periphery thereof covering a rear face of the associated head rest;
- a vinyl canvas with a front edge, a rear edge, and a pair of side edges defining a periphery with a length between the front edge and the rear edge being about twice the first predetermined length, the front edge having a length equal to that of the front periphery of the rear seat area and a pair of pile fasteners for releasably coupling with the pile fasteners of the head rest covers, the rear edge having a length equal to the rear periphery of the rear seat area with a pile fastener formed thereon along the length thereof for releasably coupling with that of the rear periphery of the rear seat portion, the side edges each having a pile fastener for releasably coupling with the pile fastener of the side peripheries and a plurality of button snaps for releasably coupling with button snaps also situated about the side peripheries of the rear seat area, the side edges of the canvas having U-shaped cut outs formed therein for conforming to the side peripheries of the rear seat area of the vehicle, whereby upon the securement of the pile fasteners and button snaps of the canvas, the canvas depends within the rear seat forming a rear extent sloping slightly downward from the rear edge forward, an intermediate extent sloping sharply downward from the rear extent forward, and a front extent sloping sharply upward between the intermediate extent and the head rest covers for directing a draft normally directed to the front seat area instead in a vertical direction where a standard oncoming head wind may direct it rearward away from the front seat area; and
- a front flap situated within the space between the seats of the front seat area for further preventing the draft from entering the front seat area and further providing a pouch for supporting a conventional flashlight.

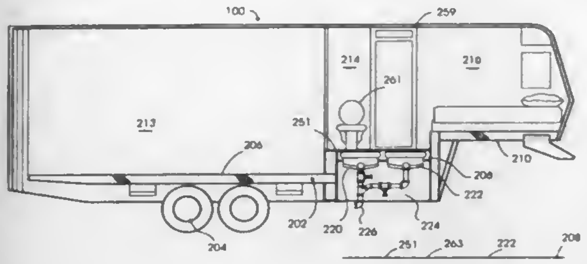
5,746,473
TRAVEL TRAILER CHASSIS

Johnnie Robert Crean, Chino, Calif., assignor to Alfa Leisure, Inc., Chino, Calif.

Filed Jun. 7, 1995, Ser. No. 476,436

Int. Cl.^{6} B60R *11/00*

U.S. Cl. 296—181 **37 Claims**



1. An improved fifth wheel travel trailer having a set of trailer wheels and a chassis overlying said trailer wheels, wherein the chassis has a raised floor and defines a bathroom sitting on said raised floor, whereby at least one plumbing drainage control is located above the bottom of said chassis, and at least one sewage holding tank is located immediately beneath said raised floor, said fifth wheel trailer comprising;

- a main chassis section that is coupled to said wheels to allow for rolling motion of said trailer and so that said main chassis section is positioned at a first height above said ground wherein said main chassis section is configured to support a main section of said trailer;
- a first elevated chassis section beneath said bathroom, said first elevated chassis section having one end coupled to a first end of said main chassis section so that said chassis section is positioned at a second height above said ground;
- one or more of said sewage holding tanks mounted to said first elevated section of said chassis;
- a second elevated chassis section beneath the bedroom of said travel trailer, said second chassis section having an end connected to said first elevated chassis section;
- a fifth wheel hitch attached to the bottom of said second elevated chassis section;
- a storage compartment located below said first elevated section, the bottom of said storage compartment being located approximately in the plane of the bottom of said main chassis section; and
- said plumbing drainage controls connected to said sewage holding tanks so that the user can drain said sewage tanks into an external sewage receptacle, said plumbing drainage controls being located within said storage compartment above the plane of the bottom of said main chassis section.

5,746,474
BODY PANEL REINFORCEMENT

Paul Raymond Bacina, Livonia, and John Jude Fusco, White Lake, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

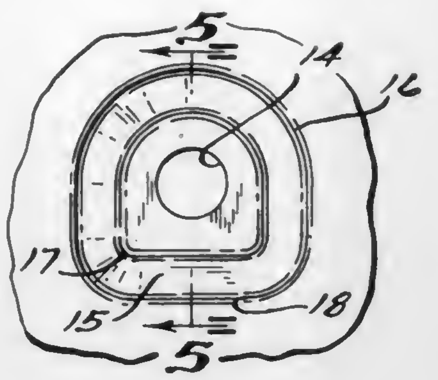
Filed Sep. 17, 1993, Ser. No. 122,970

Int. Cl.^{6} B62D *25/16*

U.S. Cl. 296—191 **13 Claims**

1. A reinforcement for an automotive body panel positioned in vertically extending orientation for receiving a liquid surface coating thereon, the body panel including a generally vertically extending exterior surface, the reinforcement comprising;

- means defining a depression on the surface, said depression having a portion parallel to said body panel and imperforate canted portions extending between said parallel portion and said exterior surface; and
- means defining a nonfunneling surface proximate the lower terminus of said depression for collecting excess liquid surface coating applied to the panel and for preventing the liquid surface coating from running onto surfaces directly beneath said reinforcement.



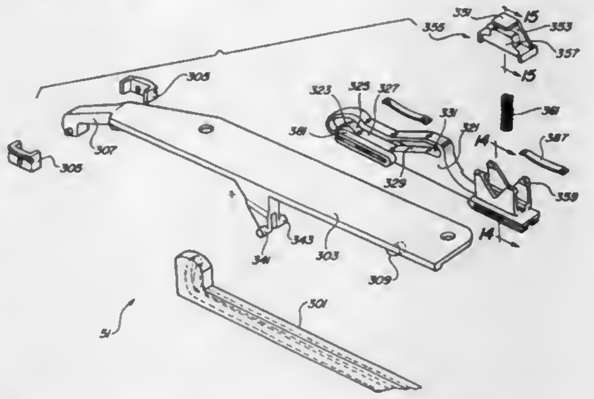
5,746,475
DRIVE MECHANISM FOR AN AUTOMOTIVE VEHICLE SUNROOF ASSEMBLY

Mark A. Caye, Allen Park, and Robert J. Boutin, Madison Heights, both of Mich., assignors to ASC Incorprated, Southgate, Mich.

Filed Jun. 7, 1995, Ser. No. 473,351

Int. Cl.^{6} B60J *7/057;7/19;7/047*

U.S. Cl. 296—223 **15 Claims**



14. A sunroof assembly for use in an automotive vehicle, said sunroof assembly comprising:

- a movable cam having a camming surface;
- a latch being movably coupled to said cam, said latch having an engaging surface; and
- a spring upwardly biasing said latch away from said cam.

5,746,476
LOAD BEARING AUTOMOTIVE BENCH SEAT ASSEMBLY

Miloslav Novak, Glenshaw; Andrew B. Trageser; Isabel M. Summe, both of Pittsburgh, and Susan L. Kane, Apollo, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

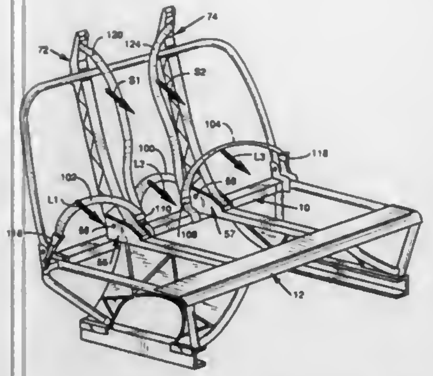
Filed Jun. 2, 1995, Ser. No. 459,928

Int. Cl.^{6} B60N *2/42*

U.S. Cl. 297—216.13 **13 Claims**

1. An automotive bench seat assembly comprising

- a seat portion,
- a seatback adjacent to said seat portion,
- a pair of relatively spaced stanchions having an upper portion secured to said seat portion and an elongated lower floor engaging portion,
- said seat portion having a front rail and rear rail and a pair of side members connecting said front rail and said rear rail,
- said side members having generally downwardly and inwardly projecting portions connected to said stanchions,
- said stanchions having upper portions supportingly secured to said rear rail intermediate the ends thereof and to said front rail intermediate the ends thereof, said stanchions extending downwardly and outwardly to engage a vehicle floor,
- said seatback having a pair of elongated relatively spaced belt supporting towers, and
- said towers each having a lower portion generally in line with and pivotly mounted with respect to said upper portion of one of said stanchions to facilitate transfer of load from said belt supporting towers to said stanchions.



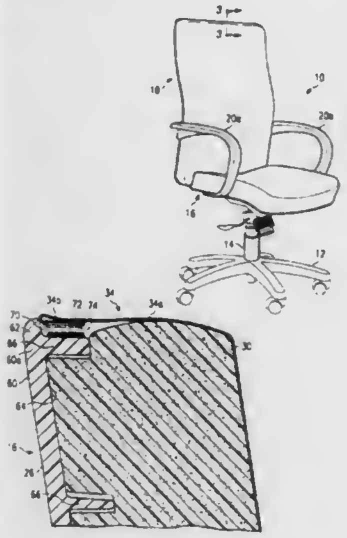
5,746,477
UPHOLSTERY TO FURNITURE FASTENER SYSTEM

Greg Saul, Charlotte, N.C., assignor to O'Sullivan Industries, Inc., Lamar, Mo.

Filed Feb. 3, 1997, Ser. No. 794,315

Int. Cl.^{6} A47C *31/02*

U.S. Cl. 297—218.5 **6 Claims**



1. An article of furniture comprising a shell including:

- a main section having an inner and outer surface;
- a molded lip extending longitudinally from the perimeter of the main section;
- a tongue spaced from the molded lip extends outwardly and laterally from the inner surface of the main section along the perimeter; and
- a first fastener strip attached to the tongue;
- wherein the first fastener strip may selectively engage with a second fastener strip attached to an upholstery to secure the upholstery to the shell, and wherein the molded lip hides the first and second fastener strips when engaged.

5,746,478
RECLINING MECHANISM AND LATCH FOR CHILD SAFETY SEAT

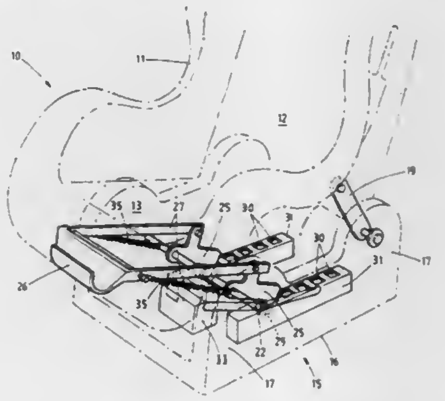
Micheal Andrew Lumley, and Wieslaw Peter Maciejczyk, both of Sunshine, Australia, assignors to Britax Child-Care Products Pty Ltd, Sunshine, Australia

Filed Nov. 7, 1996, Ser. No. 743,976

Claims priority, application Australia, Nov. 10, 1995, PN6495

Int. Cl.^{6} A47C *1/08*

U.S. Cl. 297—256.13 **19 Claims**



1. A reclining mechanism for a child safety seat that enables said safety seat to be used in both a forward and rearward facing position in a motor vehicle, comprising:

- a seat,
- a base member for attachment of said seat thereto,
- connection means between said seat and base member for allowing movement of said seat with respect to said base member, said movement comprising a first range of reclining movement where said seat is able to move between an upright position and a first reclined position, and a second range of reclining movement where said seat further moves between said first reclined position and a second reclined position,
- stop means for preventing said seat moving from said first reclined position to said second range of reclining movement, and said stop means being manually operable to allow release of said seat into said second range of reclining movement,
- a latch to hold said seat in a plurality of positions within at least said first range of reclining movement, and
- a pivot connection between the rear of said seat and said base member that allows longitudinal movement of said seat with respect to said base member as well as rotational movement.

5,746,479
ARMREST ATTACHMENT FOR CHAIR

David A. Bodnar, Jenison, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

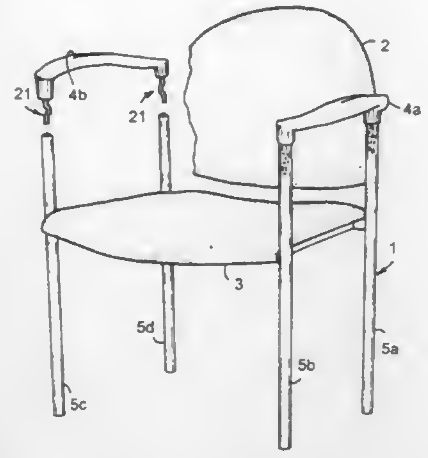
Filed Nov. 27, 1996, Ser. No. 757,839

Int. Cl.^{6} A47C *7/54*

U.S. Cl. 297—411.26 **18 Claims**

1. A chair comprising:

- a frame including a pair of spaced apart tubes having open ends; and
- a pair of armrests, each armrest including a reinforcement rod with an intermediate section and configured end sections extending from said intermediate section, said configured end sections of said reinforcement rods each defining a transversely-oriented U-shaped bend with upper and lower legs and a curved intermediate portion defining a transverse dimension greater than a diameter of said open ends when in a disassembled condition to provide an interference fit such



that insertion of said end sections into said open ends frictionally retains said armrests to said frame.

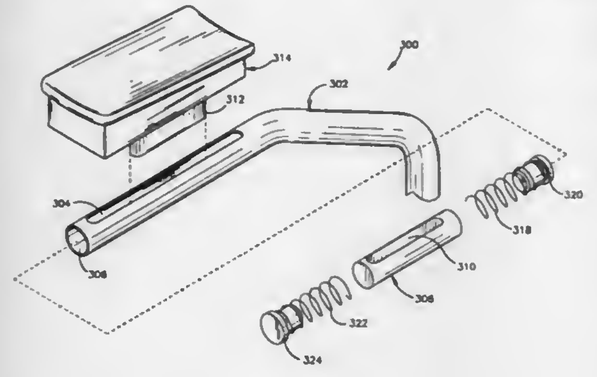
5,746,480
ARMREST ASSEMBLY

Peter M. Bonutti, 1303 W. Evergreen Plaza, Effingham, Ill. 62401

Division of Ser. No. 955,201, Oct. 1, 1992, Pat. No. 5,407,249, which is a continuation-in-part of Ser. No. 597,691, Oct. 15, 1990, Pat. No. 5,215,282. This application Aug. 11, 1994, Ser. No. 289,300

Int. Cl.⁶ A47C *7/54*

U.S. Cl. 297—411.35 **32 Claims**



1. An armrest assembly for use with a chair having a seat which is engaged by a person sitting on the seat, said armrest assembly comprising a tubular support member, said tubular support member including surface means for at least partially defining a slot, an armrest which extends through said slot in said tubular support member and is movable along said slot in said tubular support member under the influence of force transmitted from an arm of a person sitting on the seat of the chair, said tubular support member having a cylindrical inner side surface, and a cylindrical slider disposed within said tubular support member, said cylindrical slider having a cylindrical outer side surface area disposed in engagement with the cylindrical inner side surface of said tubular support member, said armrest including a portion which extends through said slot and is connected with said cylindrical slider.

5,746,481
SITTING DEVICE

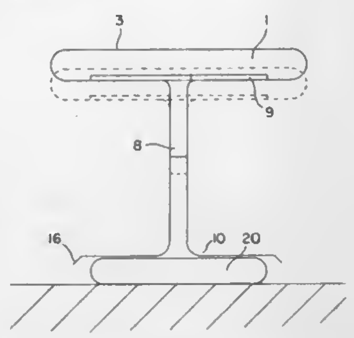
Anton Obermaier, Prien, Germany, assignor to Gebruder Obermaier oHG, Prien-Bachham, Germany

Filed Jan. 21, 1997, Ser. No. 786,433

Claims priority, application Germany, Feb. 2, 1996, 196 03 798.0; Apr. 3, 1996, 296 03 988.8

Int. Cl.⁶ A47C *3/026*

U.S. Cl. 297—452.41 **7 Claims**



1. A sitting device having a first hollow body providing a sitting surface, a second hollow body, and an elongated seat support extending between said first and second hollow bodies, said first and second hollow bodies each respectively fully enclosing a volume of air, said seat support having opposing first and second ends, said first hollow body being mounted to said first end of said seat support such that said seat support supports said first hollow body, said second hollow body being secured to said second end of said seat support, wherein said second hollow body is elastically deformable to allow for tilting of the seat support and the sitting surface relative to the floor.

5,746,482
BRUSH BODY FEEDING DEVICE

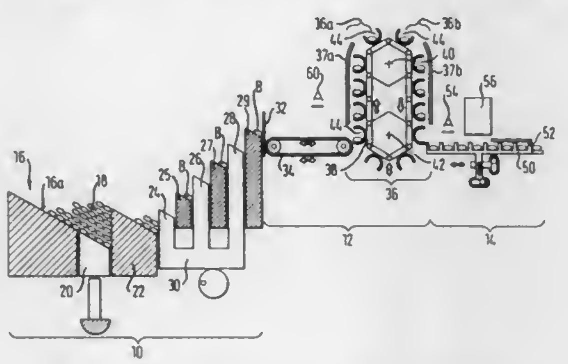
Leonel Polydore Boucherie, Izegem, Belgium, assignor to G.B. Boucherie N.V., Belgium

Filed Oct. 23, 1996, Ser. No. 736,352

Claims priority, application European Pat. Off., Dec. 19, 1995, 95120023

Int. Cl.⁶ A46D *3/00*

U.S. Cl. 300—11 **18 Claims**



1. A brush body feeding device for feeding individualized brush bodies from a collective supply to a tufting station in a brush making machine, comprising a discharging device for successively discharging individual brush bodies from said collective supply, a delivering device for delivering brush bodies to said tufting station, and a storage conveyor arranged between said discharging device and said delivering device and having a plurality of accommodations for a single brush body each, said storage conveyor being controllable to present any of said accommodations to said discharging device for receiving a single brush body therein, and to present any of said accommodations to said delivering device for transferring a single brush body from said accommodation to said delivering device, said delivering device comprising alignment means for aligning individualized brush bodies in a continuous stream of aligned brush bodies.

5,746,483

Patent Not Issued For This Number

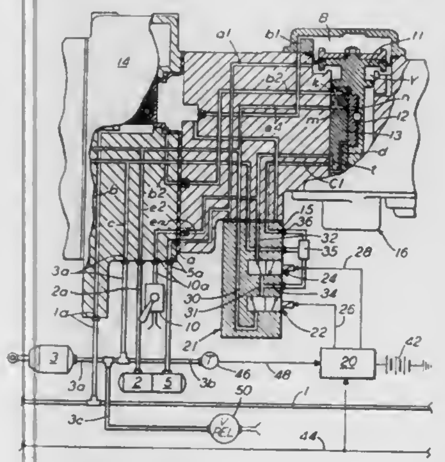
5,746,484
E/P INTERFACE WITH PNEUMATIC CONTROL VALVE FOR BACK-UP BRAKE ARRANGEMENT

Edward W. Gaughan, Irwin, and Vincent F. Troiani, New Florence, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 9, 1996, Ser. No. 693,643

Int. Cl.⁶ B60T *13/74*

U.S. Cl. 303—3 **4 Claims**



1. A combined automatic pneumatic and electro-pneumatic brake control system for a railroad freight car comprising:

a) a brake pipe charged with fluid at a pre-determined train operating pressure;

b) a reservoir charged with fluid under pressure;

c) a brake cylinder device;

d) pneumatic control valve means having a control passage to which said brake pipe is connected, a supply passage to which said reservoir is connected, a brake passage to which said brake cylinder device is connected, an exhaust passage connected to atmosphere, and a first delivery passage, said pneumatic control valve means being operative in response to variation of said brake pipe fluid pressure for controlling fluid pressure communication between said supply passage and said first delivery passage, and between said first delivery passage and said exhaust passage;

e) respective first, second, third, and fourth ports of said supply passage, said brake passage, said exhaust passage and said first delivery passage;

f) means for receiving a brake command signal;

g) electro-pneumatic means operative responsive to said brake command signal for controlling fluid pressure communication between said supply passage and a second delivery passage and between said second delivery passage and said exhaust passage, including:

(i) an application solenoid valve having an inlet and outlet, said inlet being connected to said supply passage at said first port;

(ii) a release solenoid valve having an inlet and an outlet, said outlet being connected to said exhaust passage at said third port;

(iii) said second delivery passage being interconnected between said outlet of said application valve and said inlet of said release valve; and

(iv) a double check valve device having a first inlet connected to said first delivery passage at said fourth port, a second inlet connected to said second delivery passage, and an outlet connected to said brake passage at said second port.

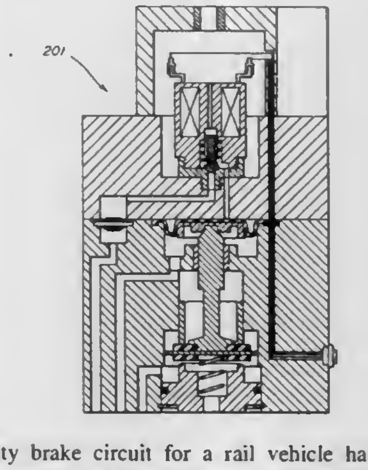
5,746,485
PENALTY BRAKE CIRCUIT FOR STRAIGHT AIR PIPE BRAKE CONTROL EQUIPMENT

Paul E. Jamieson, Greer, S.C., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 24, 1996, Ser. No. 736,265

Int. Cl.⁶ B60T *7/14*

U.S. Cl. 303—19 **10 Claims**



1. A penalty brake circuit for a rail vehicle having a brake control apparatus to apply and release the brakes of said rail vehicle generally according to changes in pressure occurring within a straight air pipe of said rail vehicle, said brake control apparatus including a controlling means for initiating changes of pressure within said straight air pipe, a first means for providing a service brake control pressure in accordance with a command for a service brake application, a second means for providing an emergency brake control pressure in accordance with a command for an emergency brake application, a standard check valve means for conveying the higher of said service and said emergency brake control pressures received from said first means and said second means, and a standard load valve means for effecting operation of said brake control apparatus in response to whichever of said brake control pressures is received from said standard check valve means, said penalty brake circuit comprising:

(a) a third means for providing to said straight air pipe in response to a command for a penalty brake application a penalty brake pressure that is ultimately communicable to said standard load valve means so that said standard load valve means can effect operation of the brakes also in response to said penalty brake control pressure.

5,746,486
BRAKE CONTROL SYSTEM

Ronald Paul, Detroit; Stephen Robert Pastor, Farmington Hills; Michael Douglas Rizzo, White Lake; Duane Edward Bassett, West Bloomfield; Edward John Bedner, Brighton; Douglass L. Carson, Walled Lake; Hsien Heng Chen; Yuen-Kwok Chin, both of Troy; Youssef Ahmed Ghoneim, Macomb Township; Alan James Lee, Farmington Hills; William Chin-Woei Lin, Troy, and Howard Hans Ludwig, Eastpoint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

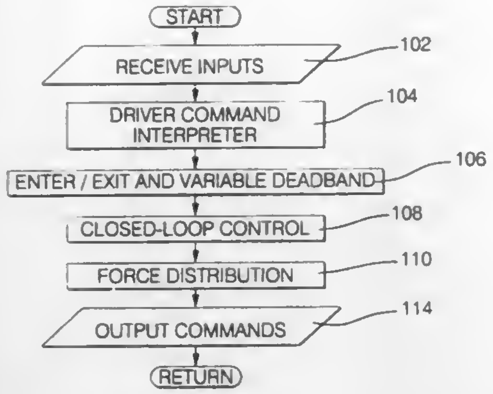
Continuation of Ser. No. 730,386, Oct. 16, 1996, abandoned. This application Aug. 29, 1997, Ser. No. 920,648

Int. Cl.⁶ A60K *28/16;* **B60T** *8/32*

U.S. Cl. 303—146 **7 Claims**

1. A brake control system method according to the steps of:

determining driver commanded yaw rate;



- measuring actual yaw rate;
- determining a yaw rate error;
- determining, in response to vehicle conditions, a yaw rate dead band wherein the yaw rate dead band varies with vehicle conditions;
- comparing the yaw rate error to the dead band; and
- if the yaw rate error exceeds the dead band, controlling the vehicle responsive to the yaw rate error, wherein yaw rate control only occurs when the yaw rate error exceeds the dead band.

5,746,487
ANTI-SKID CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

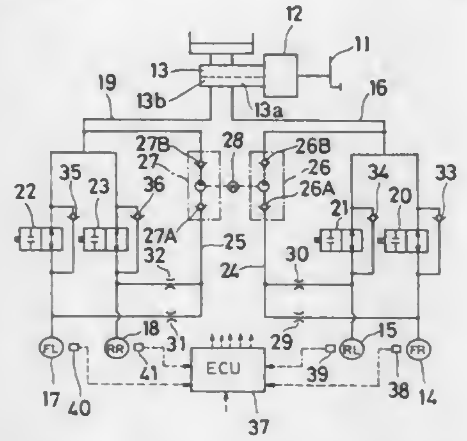
Takeshi Naito, Anjo, and Akitaka Nishio, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 17, 1995, Ser. No. 560,487

Claims priority, application Japan, Nov. 18, 1994, 6-285086

Int. Cl.^{6} G06F *7/70*

U.S. Cl. 303—158 **6 Claims**



1. An anti-skid control system for an automotive vehicle comprising:

- a hydraulic pressure source;
- a wheel brake connected to the hydraulic pressure source for braking a wheel;
- a pressure control valve interposed between the hydraulic pressure source and the wheel brake to regulate hydraulic braking pressure supplied from the hydraulic pressure source to the wheel brake, the pressure control valve being operable under a duty-cycle pressure-increasing mode operation and a pressure-decreasing mode operation for respectively increasing and decreasing the hydraulic braking pressure;
- a speed sensor for detecting a speed of the wheel; and
- an electric control device for controlling the pressure control valve on the basis of signals from the speed sensor to alternatively establish the duty-cycle pressure-increasing mode operation and the pressure-decreasing mode operation, the electric control device controlling the pressure control valve such that when a time duration between the previous and later duty-cycle pressure-increasing mode operations is less than a set value the later duty-cycle pressure-increasing mode operation is treated as a succession of the previous duty-cycle pressure-increasing mode operation.

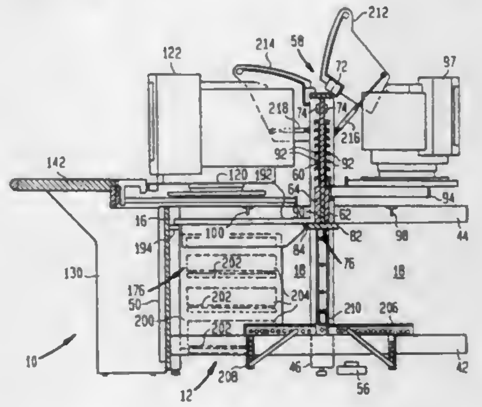
5,746,488
STRESSED MODULAR DESK SYSTEM

Paul M. LaCour, Upper Saddle River, N.J., assignor to LaCour,Inc., Harrington Park, N.J.

Continuation-in-part of Ser. No. 189,459, Feb. 1, 1994, abandoned. This application Oct. 12, 1995, Ser. No. 542,170

Int. Cl.^{6} A47B *27/00*

U.S. Cl. 312—196 **45 Claims**



1. A stressed modular desk system, comprising a core having an interior raceway extending longitudinally from one end of said core to an opposite end of said core and a substantially open top, whereby said raceway is accessible through said open top of said core; mounting means, including a plurality of platforms, for mounting electronic equipment therefrom; supporting means, extending from said one end of said core to said opposite end of said core and spanning said raceway without significantly obstructing said open top of said core, for supporting said platforms such that each of said platforms extends outwardly from said supporting means above said raceway, at least one of said platforms being supported in a cantilevered fashion by said supporting means; a face panel removably attached to one side of said core; and a work top extending outwardly from said one side of said core, said work top being removably attached to said face panel, whereby said work top can be detached from said face panel and removed from said core or said panel can be detached from said core and removed therefrom together with said work top.

5,746,489
DESK FOR COMPUTER SYSTEM

Jae-Nyun Moon, 803 Jiwol-ri, Chowol-myun, Kyungki-do, Rep. of Korea

Filed May 7, 1996, Ser. No. 646,070

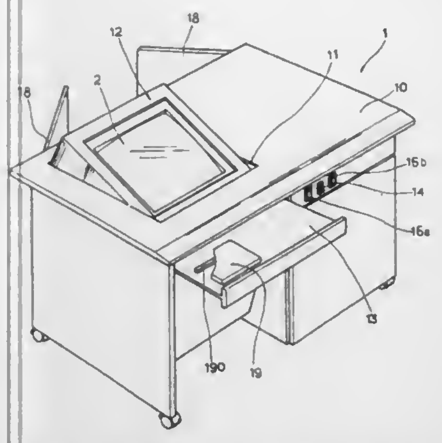
Claims priority, application Rep. of Korea, Feb. 27, 1996, 96-4886

Int. Cl.^{6} A47B *81/00*

U.S. Cl. 312—223.3 **18 Claims**

1. A computer desk which comprises:

- a computer monitor;
- a desk body comprising an upper surface and an interior sized and shaped to receive the computer monitor therein, an opening being formed from the interior through the upper surface;



- support means in the interior of the desk body for movably supporting the computer monitor, the support means being rotatable relative to the desk body for extending and retracting the monitor through the opening, the desk body further comprising a pair of axis holes on opposite sides of the support means, the support means comprising supporting members releasably spring biased into the holes to facilitate rotation of the support means;
- driving means for lifting/lowering the support means for lifting/lowering the monitor through the opening, whereby in an extended position the monitor is extended through the opening, and in a retracted position the monitor is completely retracted within the interior of the desk body with a viewing portion of the monitor facing the opening; and
- a transparent window in the plane of the upper surface of the desk body covering the opening when the monitor is in the retracted position, wherein the monitor is visible through the transparent window with the monitor in the retracted position, the transparent window rotating as the monitor is extended through the opening for enabling visibility of the monitor in the extended position.

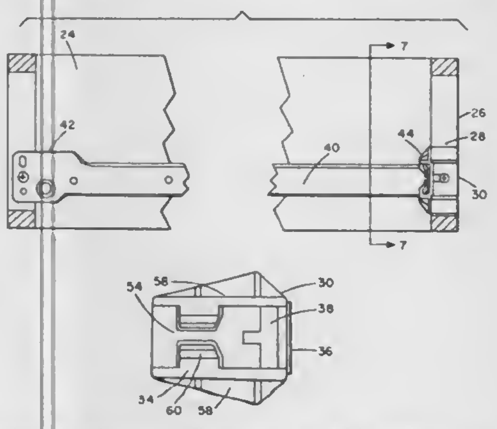
5,746,490
DRAWER GUIDE SUPPORT BRACKET

Georg Domenig, Kernersville, N.C., assignor to Grass America, Inc., Kernersville, N.C.

Filed Oct. 2, 1996, Ser. No. 720,697

Int. Cl.^{6} A47B *88/00*

U.S. Cl. 312—334.5 **18 Claims**



1. A support bracket for supporting a drawer guide on an inside surface of a face frame member of a furniture article, said support bracket comprising:

- a bracket body:
- a drawer guide recieving portion on the bracket body;
- a bracket fastening means extending from the bracket body and adapted to secure the bracket body to the inside surface of the face frame member; said bracket body having a bracket base with a front portion and a rear portion and a cut-away section in the rear portion of the base, wherein the bracket fastening means is adapted to secure the cut-away section of the rear portion of the base against the inside surface of the face frame member;
- said bracket fastening means including a depending ledge extending from the base and adapted for fastening the bracket body to the face frame member; and
- the bracket base having a front wall, a back wall and opposite sides, said front and back walls together defining a predetermined thickness of the base, and said drawer guide receiving portion being positioned on the front portion of the base,
- wherein said cut-away section in the rear portion of the base forms an opening extending through the front and back walls;
- wherein the bracket body is adapted to be secured to the face frame member with the front wall of the bracket base flush with the inside surface of the face frame member, and wherein said cut-awayt section is adapted to eliminate interposing the rear portion of the bracket base between the inside surface of the face frame member and the drawer guide.

5,746,491
HEAD LAMP FOR VEHICLES

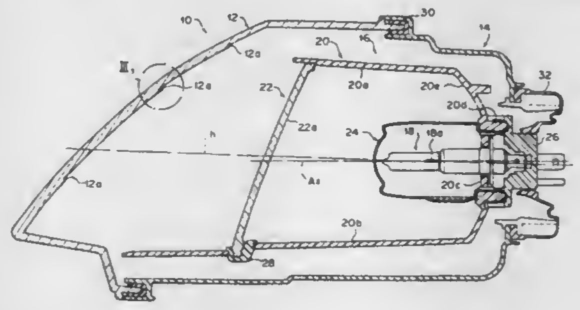
Masashi Tatsukawa, Shimizu, Japan, asslgnor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1996, Ser. No. 758,943

Claims priority, application Japan, Dec. 8, 1995, 7-345535

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 362—61 **10 Claims**



1. A vehicular lamp comprising:

- a light-distribution control unit having an optical axis;
- a transparent cover disposed in front of said light-distribution control unit and inclined with respect to said optical axis and with an outer surface of said transparent cover facing upwardly;
- one or more substantially horizontally extending decorative lines formed on an inner surface of said transparent cover; and
- one or more steps formed on the inner surface of said transparent cover, said decorative line being formed by a step such that said transparent cover immediately below said step is thicker than immediately above said step, said step being of uniform thickness between any steps and of a different thickness on opposite sides of a step.

5,746,492
EMERGENCY LIGHT HAVING SMOKE PROOF MASK

Tzu Hsiung Tai, No. 137, San Hsien St., Taichung, Taiwan

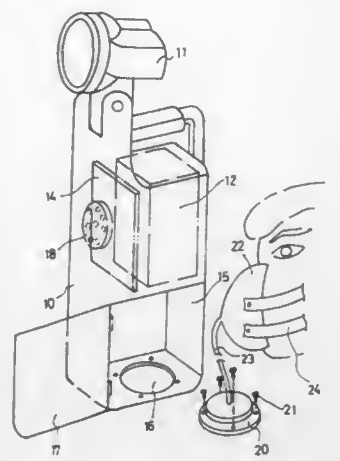
Filed Jan. 17, 1997, Ser. No. 785,010

Int. Cl.^{6} F21V *23/00;33/00;* **F21L** *15/14*

U.S. Cl. 362—20 **4 Claims**

1. A light combination comprising:

- a portable housing including a chamber,
- a lamp pivotally secured to said housing,
- at least one battery secured in said housing and coupled to said lamp for energizing said lamp,



a smoke-proof mask disposed in said chamber of said housing for allowing a user to find the mask easily, said smoke-proof mask including a filter for filtering smoke and including a mask body coupled to said filter, and

means for securing said filter directly to said on an inside surface of said chamber housing.

5,746,493

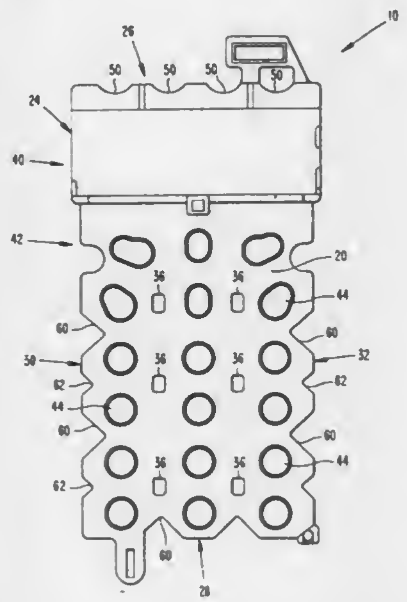
LIGHT GUIDE FOR A DISPLAY OR KEYBOARD

Anders Jönsson, Durham, N.C., and Mats Wictor, Lund, Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Mar. 8, 1996, Ser. No. 610,602

Int. Cl.^{6} F21V *7/04;* **G01D** *11/28;* **H04M** *1/22*

U.S. Cl. 362—31 **17 Claims**



1. A light guide for illuminating a display or keyboard, comprising a substantially translucent element having a substantially rectangular shape with end edges and side edges, and having an upper surface and a lower surface, a first portion of the light guide being a backing screen for a display and a second portion being a keyboard portion having a plurality of keyholes, the light guide having a plurality of light coupling recesses formed on a first end edge adjacent to the first portion, the recesses being arcuately shaped to transmit light substantially uniformly into the light guide.

5,746,494

ILLUMINATING APPARATUS OF ENDOSCOPE

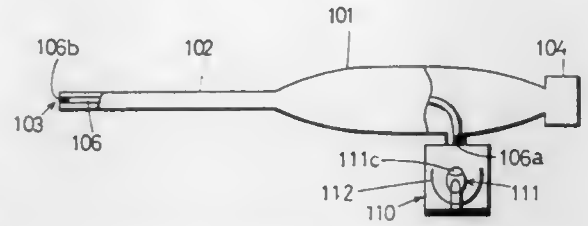
Takashi Koeda; Hiroshi Sano; Hirohisa Ueda; Kunitoshi Ikeda; Kunikiyo Kaneko, and Rensuke Adachi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1995, Ser. No. 557,821

Claims priority, application Japan, Nov. 22, 1994, 6-287002; Jun. 9, 1995, 7-142306

Int. Cl.^{6} F21V *8/00*

U.S. Cl. 362—32 **21 Claims**



1. An illuminating apparatus of an endoscope having a bulb for supplying illuminating light to a light guide for illumination, said bulb being disposed to face an entrance end surface of said light guide, said illuminating apparatus comprising:

a concave mirror for converging light emitted peripherally from said bulb, said concave mirror converging said light in a vicinity of said entrance end surface of said light guide, and said concave mirror surrounding side and rear portions of said bulb; and

a convex lens for allowing light emitted forward and obliquely forward from said bulb to be incident on said entrance end surface of said light guide, said convex lens being formed integrally with said bulb at a distal end of said bulb.

5,746,495

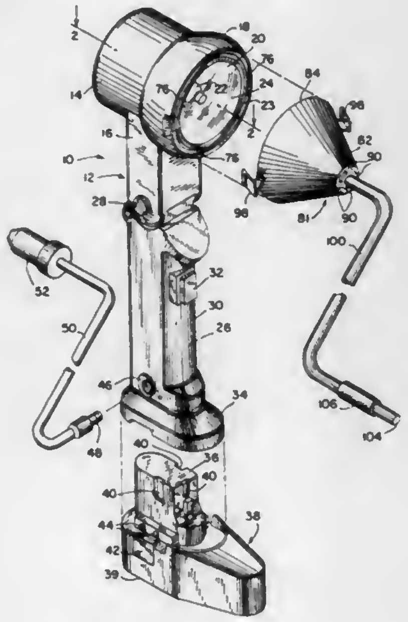
PORTABLE WORK LIGHT WITH OPTICAL FIBER ADAPTER

Thomas L. Klamm, 253 N. Wisconsin St., Racine, Wis. 53402

Filed Feb. 5, 1997, Ser. No. 795,732

Int. Cl.^{6} F21V *8/00;29/00;21/26;* **F21L** *7/00*

U.S. Cl. 362—32 **14 Claims**



1. A portable work light comprising:

a handle having electrical terminals for connection to a battery;

a head pivotally attached to the handle and having a opening, a first air inlet and a first air outlet, said head having a light source with a reflector to direct light from the light source through the opening;

a fan mounted within said head for drawing air through the inlet, forcing the air over a surface of the reflector and through the outlet;

a battery releaseably connected to the handle and engaging the electrical terminals for receiving electricity to power the fan and the light source; and

an optical fiber adapter having a coupling for releaseably attaching to said head over the opening to receive light from the light source, and a fiber optic cable with a first end connected to the coupling for receiving light and a second end from which received light is emitted.

5,746,496

BLINK LAMP

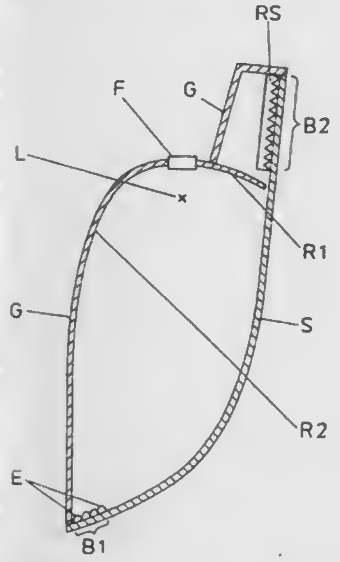
Beate Weigelt; Martin Mügge, and Detlef Decker, all of Lippstadt, Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany

Filed Feb. 3, 1995, Ser. No. 383,369

Claims priority, application Germany, Feb. 25, 1994, 44 06 183.8

Int. Cl.^{6} B60Q *1/02*

U.S. Cl. 362—61 **14 Claims**



1. Blink lamp for a motor vehicle, which is arranged at a corner area of a vehicle, said blink lamp having a reflector with an outer first reflector portion (R1), said outer first reflector portion directed toward a side area of the motor vehicle, and an inner second reflector portion (R2), said inner second reflector portion directed toward a longitudinal center line of the motor vehicle; having a light source (L) whose socket is arranged between the first and second reflector portions (R1, R2); and having a light-transmissive shield (S) covering a facing side of the lamp for extending substantially across a driving direction of the motor vehicle and along the side area of the motor vehicle and a free end of the outer first reflector portion (R1) is bordered by the light-transmissive shield (S), wherein:

the first and second reflector portions (R1, R2) are formed together as one piece and have reflector surfaces which run continuously together;

a projection of the inner second reflector portion (R2) in the driving direction is at least as large as a projection of the outer first reflector portion (R1);

reflector surfaces of both the first and second reflector portions are formed so that light beams, which originated from the light source and are reflected on these reflector surfaces, are reflected in a light reflection direction which continuously changes as a function of changes in geometric positions on the reflector surfaces from which the light beams are reflected, so that as light from the light source strikes the surfaces of the reflector portions at different geometric positions, directions in which they are reflected vary, and both the first and second reflector portions (R1, R2) create substantially a same light distribution, with both of the first and second reflector portions (R1, R2), in both horizontal as well as vertical cross sectional directions, having a light scattering reflective characteristic substantially corresponding to the light distribution.

5,746,497

AUTOMOTIVE SIGNAL LAMPS

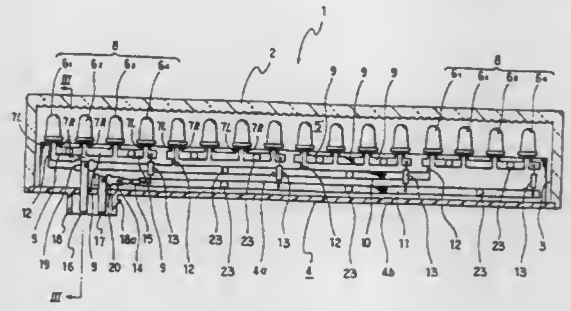
Tsutomu Machida, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed May 31, 1996, Ser. No. 655,832

Claims priority, application Japan, Jun. 9, 1995, 7-167112

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 362—80 **22 Claims**



1. An automotive signal lamp, comprising:

a lamp body having a base plate;

a plurality of light source group arranging in series each consisting of a plurality of light source elements, said light source elements being arranged on a front end part of said base plate of said lamp body along a front edge thereof;

a plus line connector formed of a conductive material, said plus line connector being secured to and arranged in substantially parallel with said base plate of said lamp body;

a minus line connector formed of a conductive material, said minus line connector being secured to said base plate of said lamp body and arranged in substantially parallel with said plus line;

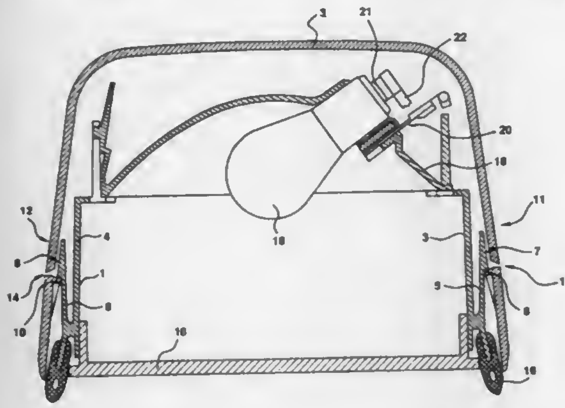
a plurality of a first and second lead connectors projecting from each of said light source elements, said first lead connector of each of said light source elements within each light source group connecting to said second lead connector of the adjacent light source element within the same light source group, said first lead connector of the first end light source element of each of said light source group connecting to said plus line connector, and said second lead connector of the second end light source element of each of said light source group connecting to said minus line connector; and

a lamp connector comprising a plus side power supply terminal electrically engaging with said plus line connector, a minus side power supply terminal electrically engaging with said minus line connector, and an enclosure wall surrounding said plus and minus side power supply terminal.

5,746,498

VEHICLE LAMP MOUNTABLE IN AN INTERIOR OF A VEHICLE, PARTICULARLY A RAISED AUXILIARY BRAKE LAMP

Ingo Rogge, Lippstadt, Germany, assignor to Hella KG Hueck & Co., Lippstadt, Germany
PCT No. PCT/EP95/02933, § 371 Date Apr. 3, 1996, § 102(e) Date Apr. 3, 1996, PCT Pub. No. WO96/04151, PCT Pub. Date Feb. 15, 1996
PCT Filed Jul. 25, 1995, Ser. No. 624,472
Claims priority, application Germany, Aug. 3, 1994, 44 27 434.3
Int. Cl.^{6} B60Q *1/30*
U.S. Cl. 362—80.1 **6 Claims**



1. A vehicle lamp mountable in a cab of a motor vehicle, particularly for use as a raised brake light, including:

a housing (**1**) having a transparent light body (**15**) affixed thereto, said housing and said light body enclosing a light source (**19**), a reflector (**18**) and electrical leads (**20**, **21**, **22**); and

a removable covering cap including an enclosure wall (**2**) placed over the housing (**1**) to thereby substantially hide said housing from view, with an exterior surface of the enclosure wall forming a visible surface, said enclosure wall being formed to fit a mount for the vehicle lamp; wherein:

exterior surfaces of side portions (**3**, **4**) of the housing (**1**) have spring snapping tongues (**5**, **6**) formed thereon with outwardly protruding catch noses (**7**, **8**) thereon for gripping behind snapping engaging elements (**9**, **10**) formed on an interior surface of the enclosure wall of the covering cap (**2**) for holding said covering cap on said housing; and

the enclosure wall of the covering cap (**2**) has flexible detaching lashings (**11**, **12**), which are bendable about defined axes, for engaging the spring snapping tongues (**5**, **6**) and moving the spring snapping tongues so as to release their catch noses from engagement with the snapping engaging elements (**9**, **10**) upon application of an external force to said flexible detaching lashings.

5,746,499

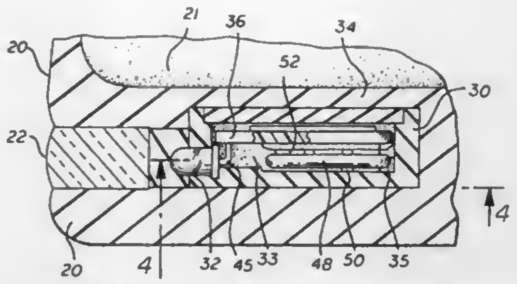
FOOTWEAR WITH PULSED LIGHTS

William R. Ratcliffe, Santa Monica, and Don C. Lawrence, Los Angeles, both of Calif., assignors to L.A. Gear, Inc., Santa Monica, Calif.
Filed Apr. 28, 1995, Ser. No. 235,592
Int. Cl.^{6} A43B *23/00;* **F21L** *15/08*
U.S. Cl. 362—103 **26 Claims**

1. An illuminating apparatus for use in footwear including a sole and a cavity formed in the sole, the illuminating apparatus providing a pulsed light visible exteriorly of the footwear, the apparatus comprising:

a light source mounted in said cavity such that light emitted from said source is visible exteriorly of said footwear;

a power source operative connected with said light source for providing power for energizing said light source;



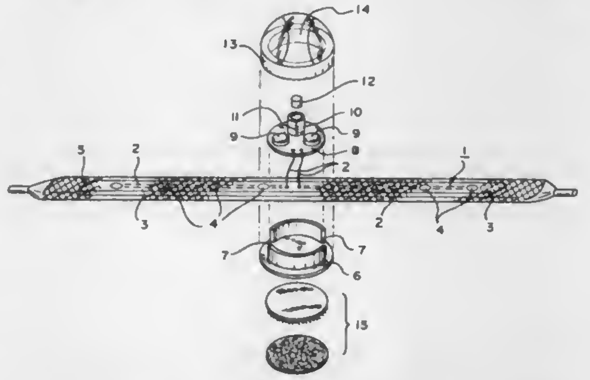
switch means for initiating illumination of said light source, said switch means being operatively connected with said power source and operatively responsive to close when pressure is applied to said switch means and to open when pressure is removed from said switch means, wherein said switch means is a pressure switch; and

timing means, operatively responsive to said switch means, for causing illumination of said light source for a predetermined period of time after pressure is applied to said switch means.

5,746,500

ILLUMINATED LACES FOR FOOTWEAR

Tseng-Lu Chien, 8F, No. 29, Alley 73, Lin-Shen Street, Shi-Chi Town, Taipei, Hseng, Taiwan
Filed Oct. 28, 1996, Ser. No. 738,555
Int. Cl.^{6} F21L *15/08*
U.S. Cl. 362—103 **22 Claims**



1. An illuminated lace arrangement for footwear, comprising:

at least one flexible strip, said strip being at least partially transparent and having affixed thereon a plurality of light emitting diodes visible from two sides of the strip and conductive means for supplying electrical power to the light emitting diodes;

a textile lace material having inserted therein said strip;

a power pack including means for affixing the power pack at a desired location on the footwear;

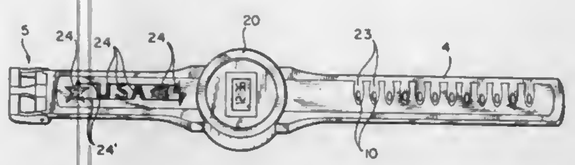
electrical circuit means positioned in said power pack and connected to said conductive means in said strip for causing said LEDs to turn on and off to provide a desired light performance.

5,746,501

PORTABLE OBJECT HAVING A FASTENING BAND ILLUMINATED BY A SUPER THIN LIGHTING ELEMENT

Tseng Lu Chien, 8F, No. 29, Alley 73, Lin-Shen Street, Shi-Chi Town, Taipei, Taiwan
Continuation of Ser. No. 522,940, Sep. 1, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 766,805
Int. Cl.^{6} F21L *15/20*
U.S. Cl. 362—103 **32 Claims**

1. In an arrangement made up of a portable object having a display, said display including means for displaying a variable



message; an adjustable band having two ends and adapted to be worn around a body part of a wearer; means for mounting said object on said band; and means for adjustably fastening the band around the body part of the wearer by fastening the two ends to each other, the improvement comprising:

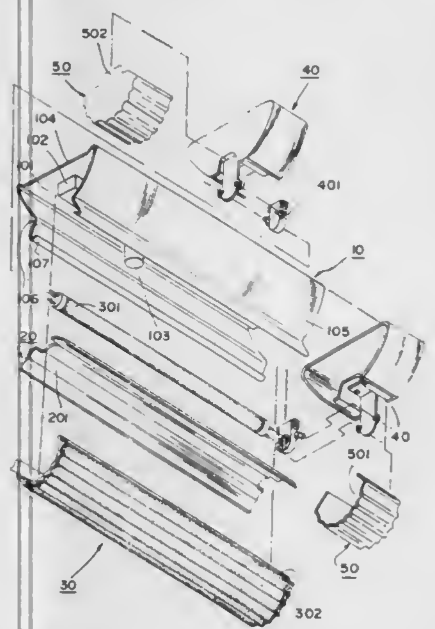
at least one super thin lighting element on said band, said super thin lighting element being in addition to said means for displaying a variable message; and

means for mounting the super thin lighting element on said band.

5,746,502

RECEPTACLE STRUCTURE FOR FLUORESCENT LAMP

Tseng-Tsai Huang, No. 18-1, Tung-Feng Street, Shu-Lin, Taipei, Taiwan
Filed Oct. 2, 1996, Ser. No. 725,091
Int. Cl.^{6} F21S *3/02*
U.S. Cl. 362—223 **4 Claims**



1. A receptacle structure for a fluorescent lamp including:

an elongated base having a top and lateral plates extending downwardly from the top defining a trough shaped receiving space in which a ballast and a starter for said fluorescent lamp can be provided, said elongate base being able to be fixed on a ceiling or a wall through a top plate of said elongated base, the lateral plates on both sides of said elongated base being bevelly extended outwardly to form wing plates;

a light refracting plate provided beneath said trough shaped receiving space and between said two wing plates and being arched upwardly to form an arc shaped end section, a bottom face of said light refracting plate thereof being a light refracting surface and being in an undulated form;

a lamp shade provided beneath said light refracting plate, being arciform just opposite in direction to said arc shape of said light refracting plate, both sides on top of said lamp shade being engaged with bottom ends of said wing plates, said lamp shade thus forming a generally elliptical space with said light refracting plate for receiving a lamp pipe of said fluorescent lamp, material of said lamp shade being transparent acrylic, a bottom surface of said lamp shade being undulated;

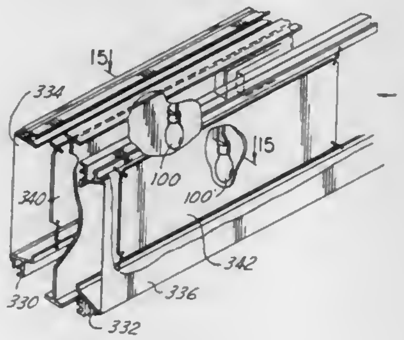
two end fixing-seats being able to be fixed on two opposite ends of said trough shaped receiving space in said elongated base, bottoms of said fixing-seats are provided each with a connector for the lamp pipe and being connected exactly with two ends of said lamp pipe between said light refracting plate and said lamp shade, so that said lamp pipe is able to be illuminated; and

two end fixing-caps being able to be fixed on two opposite ends of said two wing plates, inner bottom surfaces of said fixing-caps being in undulated shape like that of the bottom of said lamp shade, said end fixing-caps being able to be fixedly engaged with two opposite ends of the bottom surface of said lamp shade to fix the lamp shade not to drop.

5,746,503

ILLUMINATED CANOPY SYSTEM

David U. Hillstrom, Novi, and Brian J. Hillstrom, Milford, both of Mich., assignors to Marketing Displays Inc., Farmington Hills, Mich.
Continuation-in-part of Ser. No. 996,103, Dec. 23, 1992, Pat. No. 5,381,324. This application Oct. 5, 1994, Ser. No. 321,045
Int. Cl.^{6} F21V *1/12*
U.S. Cl. 362—248 **55 Claims**



22. An illuminated system comprising:

a housing, said housing having a generally rectangularly shaped box structure with four elongated sides and two shorter ends;

elongated translucent panel member positioned on at least two elongated sides of said housing and attached to said box structure;

at least one point light source in said housing for projecting light;

light dispersion means for distributing light from said point light sources uniformly on said elongated translucent panel member; and

access means on said housing for accessing said point light source from below and outside said housing;

said light dispersion means having a plurality of light passages arranged in a prespecified pattern to allow differing amounts of light to pass through the film at different areas and thereby create a uniform distribution of light on all portions of each of said translucent panel members.

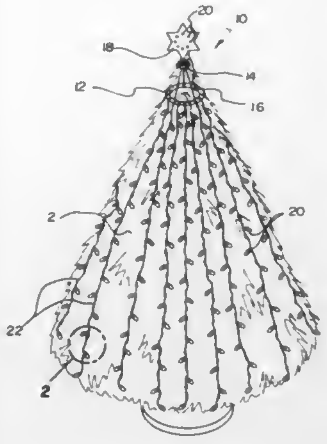
5,746,504

CHRISTMAS TREE LIGHT RING

Esther L. Dodson, 219 N. Howell St., Owosso, Mich. 48867
Filed Jul. 5, 1996, Ser. No. 700,723
Int. Cl.^{6} F21P *1/00;1/02;* **F21V** *21/00*
U.S. Cl. 362—252 **8 Claims**

1. A Christmas tree light ring system for mounting on a tree having a central trunk and radiating branches, said system comprising:

a securing clamp for securing about the central trunk of a tree, said securing clamp having an aperture for snugly receiving and embracing the trunk of a tree;



- a circular power member having a plurality of electrical connector sockets therein and a central opening for receiving a portion of the trunk of a tree upon which said securing clamp is mounted, said central opening being sufficiently large such that said central member is located at a radially spaced relationship to said tree trunk;
- a plurality of light strands, each said light strand having a plurality of lights thereon and an electrical connector plug for connecting to one of said electrical connector socket of said circular power member; and
- a plurality of substantially stiff support posts,
- each said support post being connected at an upper end to said securing clamp and at a lower end to said circular power member, said supports posts extending in an downward and radially outward relationship from said securing clamp to said circular power member to support said circular power member at a position spaced radially outward from the trunk of said tree without requiring support for said circular power member from the branches of said tree;
- wherein the securing clamp comprises a first semicircular clamp half and a second semicircular clamp half and fastener means for removably fastening said first and second clamp halves together.

5,746,505

ELECTRICAL CONDUCTOR FOR AN OPTICAL SYSTEM

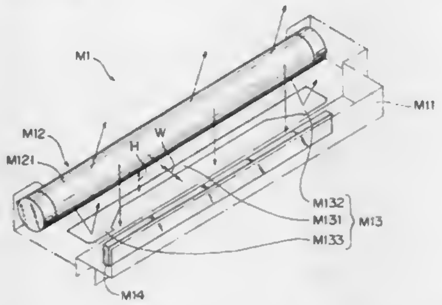
Junichi Hirobe; Yukihiro Aikawa; Ikuo Makie; Tsutomu Sugaya, and Hiroyuki Sadamori, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 305,314, Sep. 15, 1994, abandoned. This application Feb. 16, 1996, Ser. No. 602,689

Claims priority, application Japan, Sep. 21, 1993, 5-234814

Int. Cl.^{6} F21V *7/22*

U.S. Cl. 362—260 **8 Claims**



1. An electrical conductor for use with an optical system including a unit body and a fluorescent lamp supported by the unit body, the lamp having a glass tube and mercury contained therein, said conductor having

- a length that is substantially the same as the length of the optical system lamp, and
- a base portion, with an upper surface and a lower surface, said upper surface including a material for causing the mercury within the fluorescent lamp tube to diffuse when said conductor is disposed in non-contacting opposition to the lamp, said lower surface being adapted for fixation to the unit body to dispose said conductor in said opposition to the lamp,
- wherein a pair of reflection portions are provided at both ends of said base portion for reflecting light coming from both end portions of the glass tube to a surface of a document, and
- wherein said base portion and said reflection portions are formed in a unitary structure and are made of a tape member of luster aluminum.

5,746,506

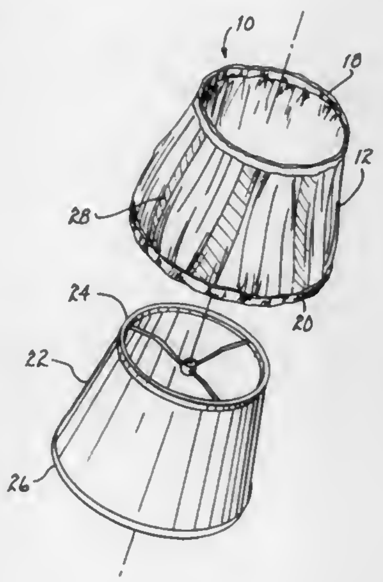
REMOVABLE LAMPSHADE COVER AND METHOD THEREFOR

Belinda W. Dunbar, 52 W. Lynwood St., Phoenix, Ariz. 85003

Filed Oct. 30, 1995, Ser. No. 550,341

Int. Cl.^{6} F21V *1/06*

U.S. Cl. 362—351 **10 Claims**



1. A removable lampshade cover comprising, in combination:

- shading means for covering an existing lampshade of a variety of shapes;
- said shading means comprising a tubular band of material and having a top opening and a bottom opening;
- elastic clasping means substantially circumscribing said top opening of said shading means for releasably attaching said shading means substantially to the top portion of an existing lampshade; and
- elastic clasping means substantially circumscribing said bottom opening of said tubular band of material for releasably attaching said shading means substantially to the bottom portion of an existing lampshade, said elastic clamping means substantially circumscribing said top opening and said bottom opening of said tubular band of material comprising a u-shaped elastic member located around and connected to a top edge portion and a bottom edge portion of said tubular band of material.

5,746,507

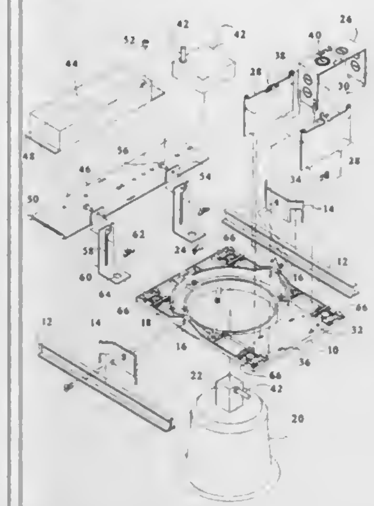
RECESSED LIGHTING FIXTURE FOR TWO LIGHT SIZES

Kiem T. Lee, Whittier, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.

Filed Jan. 6, 1997, Ser. No. 779,328

Int. Cl.^{6} F21S *1/06*

U.S. Cl. 362—365 **7 Claims**



1. A recessed light frame for mounting a light and reflector at an opening in a ceiling above a plane of the ceiling, comprising:

- a generally planar member defining an opening of a first size for the light and reflector;
- reflector mounting means adjacent the opening in said generally planar member on which is mountable;
- struts extending inwardly of the opening, said struts being selectively removable;
- means on said struts defining an opening of a second size, wherein said second size is smaller than said first size and said opening of said second size is within said opening of said first size, said opening of said second size being selectively removable from within said opening of said first size by removal of said struts.

5,746,508

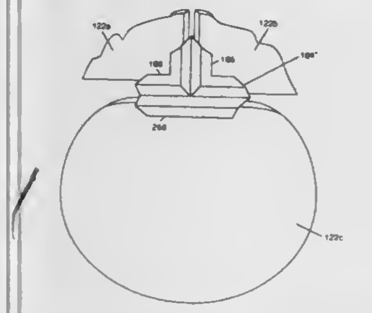
CORNER STRUCTURE FOR SECURING LIGHTING FIXTURE PANELS

Paul W. Chin, Jr., Saratoga, Calif., assignor to Lite Corporation, Saratoga, Calif.

Continuation of Ser. No. 316,126, Sep. 30, 1994, Pat. No. 5,613,770, which is a continuation-in-part of Ser. No. 243,232, May 16, 1994, Pat. No. 5,605,396. This application Sep. 27, 1996, Ser. No. 721,194

Int. Cl.^{6} F21V *17/00*

U.S. Cl. 362—367 **14 Claims**



14. A corner structure for coupling first and second panels in a lighting structure at predetermined angles to each other, the corner structure comprising:

- first and second sockets, the first socket having a substantially L-shaped cross section, the second socket having a substantially L-shaped cross section, the first and second sockets being coupled to each other for coupling the first and second panels at selected angular orientations; and
- an adhesive, connected to the first and second sockets, for attaching the first and second sockets to the first and second panels.

5,746,509

HYDROSTATIC-MECHANICAL GEAR FOR DRIVING A MIXING DRUM

Wolfgang Gebhard, and Egon Mann, both of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

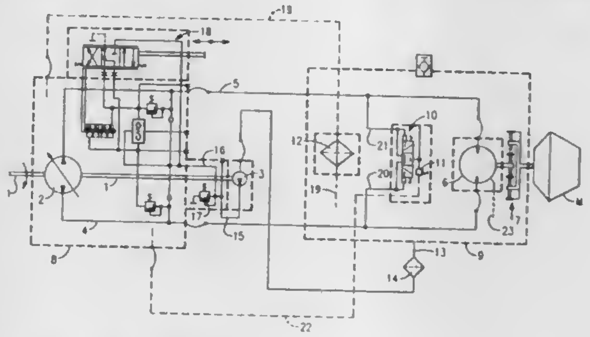
PCT No. PCT/EP94/01203, § 371 Date Oct. 18, 1995, § 102(e) Date Oct. 18, 1995, PCT Pub. No. WO94/23918, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 19, 1994, Ser. No. 537,805

Claims priority, application Germany, Apr. 21, 1993, 43 13 025.9

Int. Cl.^{6} F16D *31/02;* **B28C** *5/42*

U.S. Cl. 366—61 **14 Claims**



1. A hydrostatic-mechanical gear, for driving a mixing drum of a concrete mixer vehicle, comprising:

- a hydraulic pump (**2**) being connected via supply and return pipes (**4**, **5**) with a hydraulic motor (**6**) and forming therewith a high pressure circuit, and said hydraulic motor (**6**) driving said mixing drum via a planetary gear set (**7**);
- a pump housing (**8**) accommodating said hydraulic pump (**2**);
- a gear housing (**9**), having an interior, accommodating both said hydraulic motor (**6**) and said planetary gear set (**7**);
- a flushing slide valve (**10**) being attached to said supply and return pipes (**4**, **5**) by connecting pipes (**20**, **21**) so that, during operation of said hydrostatic-mechanical gear, heated oil is constantly removed from said high pressure circuit, via a flushing valve (**11**) and is replaced with cooled oil, and said flushing valve (**11**) being operatively connected with said flushing slide valve (**10**);
- wherein said heated oil passes through an oil cooler (**12**) and is continuously deposited, during operation of said hydrostatic-mechanical gear, within the interior of said gear housing (**9**) via a deposit pipe (**19**).

5,746,510

MIXING DEVICE INCLUDING COUNTERWEIGHT

Fritz Mark, Maeder, Austria, and Martin Noser, Vaduz, Liechtenstein, assignors to Friedhelm Schneider, Reichshof-Hahn, Germany

PCT No. PCT/EP95/04747, § 371 Date Apr. 2, 1997, § 102(e) Date Apr. 2, 1997, PCT Pub. No. WO96/17677, PCT Pub. Date Jun. 13, 1996

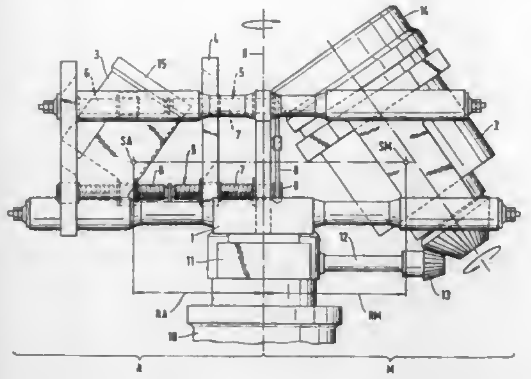
PCT Filed Dec. 1, 1995, Ser. No. 809,858

Claims priority, application Germany, Dec. 3, 1994, 44 43 140.6

Int. Cl.^{6} B01F *9/02*

U.S. Cl. 366—217 **4 Claims**

1. A mixing device for mixing free flowing masses in a container, the mixing device having a rotational axis and comprising:



a rotating carrier defining a mixing side, a balancing side disposed opposite the mixing side, and a direction of rotation about the rotational axis of the mixing device;

a container carrier for carrying the container, the container carrier being disposed on the mixing side of the rotating carrier and further being adapted to rotate counter to the direction of rotation of the rotating carrier;

a housing defining a housing center of gravity and being effective as an active balancing weight for the container carrier for balancing moments on the mixing side and on the balancing side;

a counterweight defining a counterweight center of gravity and disposed on the rotating carrier, the counterweight further having a weight matching a tare weight of the housing;

wherein:

the housing and the counterweight are displaceable radially with respect to the rotational axis of the mixing device on the balancing side of the rotating carrier;

the housing center of gravity and the counterweight center of gravity are located on a common line extending perpendicularly with respect to the rotational axis of the rotating carrier; and

the counterweight and the housing are displaceable counter to one another by an equal distance.

5,746,511

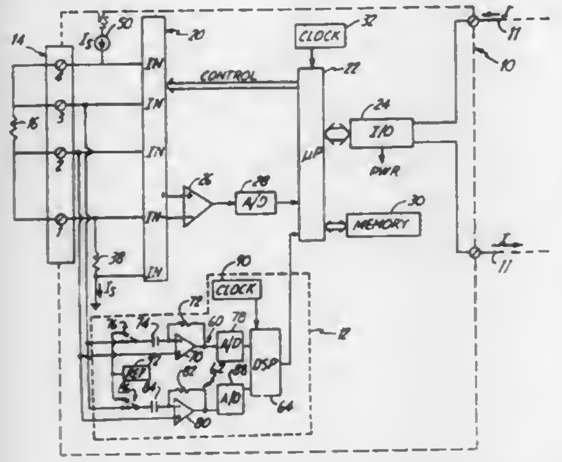
TEMPERATURE TRANSMITTER WITH ON-LINE CALIBRATION USING JOHNSON NOISE

Evren Eryurek, and Gary Lenz, both of Eden Prairie, Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Jan. 3, 1996, Ser. No. 582,514

Int. Cl.^{6} G01K *15/00*

U.S. Cl. 374—2 **17 Claims**



1. A transmitter in a process control system, comprising:

a sensor input for coupling to a temperature sensor having a temperature dependant resistance;

resistance measuring circuitry coupled to the sensor input having resistance output related to resistance of the temperature dependent resistance;

an amplifier coupled to the sensor input providing an amplified output having an AC noise component and a Johnson noise component;

analog to digital conversion circuitry coupled to the amplified output providing a digital output;

digital signal processing circuitry coupled to the digital output for isolating the Johnson noise component and providing a digitized Johnson noise output;

temperature measurement circuitry coupled to the resistance measurement circuitry and the digital signal processing circuitry providing a calibrated temperature output based upon the resistance output and the digitized Johnson noise output; and

output circuitry for coupling to a process control loop and transmitting the calibrated temperature output over the loop.

5,746,512

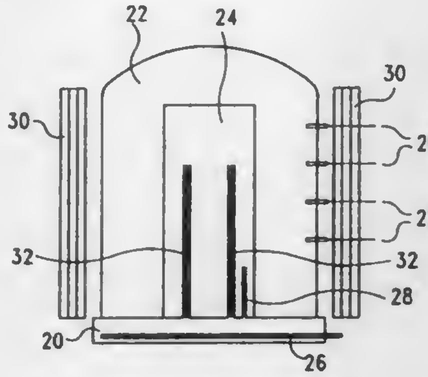
METHOD FOR REDUCING CRACK OF POLYSILICON IN A QUARTZ TUBE AND BOAT

Liang-Gi Yao, Taipei, and Kuo-Shu Tseng, Hsinchu, both of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Sep. 10, 1996, Ser. No. 711,650

Int. Cl.^{6} G01N *25/00*

U.S. Cl. 374—45 **13 Claims**



1. A method of reducing crack of polysilicon in a quartz tube and a boat, herein said method comprising the steps of:

determining a temperature of polymorphic transformation of said quartz tube and boat; and

reducing the temperature gradient during heating and cooling of said quartz tube and boat during said temperature of polymorphic transformation.

5,746,513

TEMPERATURE CALIBRATION SUBSTRATE

Wayne Renken, San Jose, Calif., assignor to SensArray Corporation, Santa Clara, Calif.

Continuation of Ser. No. 299,863, Sep. 1, 1994, abandoned. This application Jun. 18, 1997, Ser. No. 877,978

Int. Cl.^{6} G01K *7/06;1/14;1/16*

U.S. Cl. 374—179 **32 Claims**

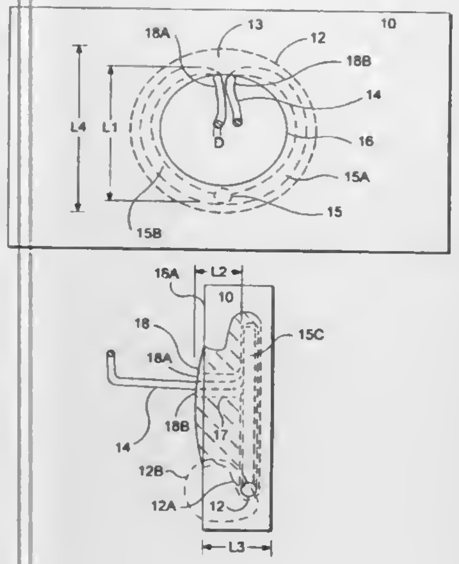
1. A temperature sensor instrumented substrate for producing increased temperature measurement accuracy, comprising:

a substrate;

a cavity in said substrate, said cavity having a cavity opening at a surface of said substrate and an inner wall defining an inside shape of said cavity;

a thermocouple comprising first and second lead wires and a thermocouple junction disposed in said cavity so that the first and second lead wires enter the cavity opening at respective first and second locations and the thermocouple junction is positioned at a third location in said cavity, the third location being a first particular distance from said first location and being a second particular distance from said second location, and so that the first and second lead wires extend along respective paths shaped to have lengths within said cavity the length of the respective path of the first lead wire being greater than the first particular distance; and

heat conductive material in said cavity for transferring heat from said substrate to said thermocouple.



5,746,514

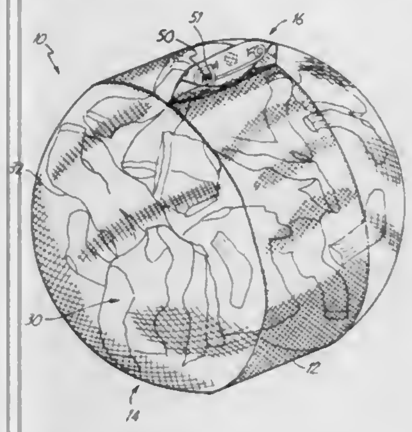
LAUNDRY BAG AND METHOD OF USING SAME

Henry E. Orensten, Wayzata, Minn., assignor to O & P Company, Inc., Wayzata, Minn.

Filed May 3, 1996, Ser. No. 643,002

Int. Cl.^{6} B65D *30/06*

U.S. Cl. 383—66 **9 Claims**



1. A laundry bag, comprising:

a body of openwork material defining a substantially spherical interior volume in at least one state, the body of openwork material having an opening to the interior volume; and

a closure positioned at the opening to close the opening while maintaining the substantially spherical interior volume when the laundry bag is in a closed state, the closure includes an additional body of openwork material extending from the opening and having an open end for inserting objects into the interior volume, and in a closed state the openwork material is substantially continuous about the interior volume when the opening is closed by the closure additional body of openwork material being flattened and folded upon itself.

5,746,515

DYNAMIC-PRESSURE GAS BEARING

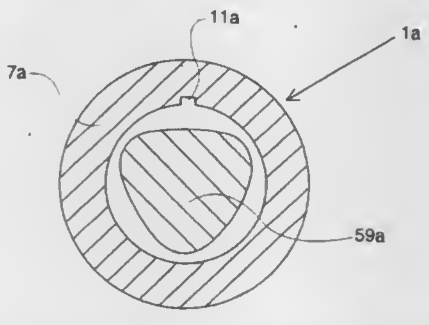
Akiyoshi Takahashi; Nakazo Ariyama; Isao Ohkawa; Hiroki Matsushita, and Kachu Ishizuka, all of Iruma, Japan, assignors to Copal Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1997, Ser. No. 791,945

Claims priority, application Japan, Feb. 2, 1996, 8-052203

Int. Cl.^{6} F16C *32/06*

U.S. Cl. 384—115 **18 Claims**



1. A dynamic-pressure gas bearing including a rotational shaft disposed to surround an outer circumference of a stationary shaft or to be surrounded by an inner circumference of a stationary shaft, to thereby generate a dynamic pressure between the stationary shaft and the rotational shaft through rotation of the rotational shaft, wherein a water relief portion is provided on the rotational shaft or the stationary shaft, which is disposed to surround the outer circumference of the stationary shaft or the rotational shaft, in a region where the surface of the stationary shaft and the surface of the rotational shaft are close to each other.

5,746,516

POROUS BEARING SYSTEM HAVING INTERNAL GROOVES AND ELECTRIC MOTOR PROVIDED WITH THE SAME

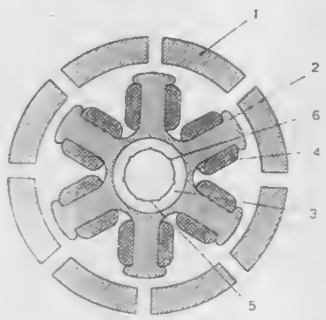
Motohiro Miyasaka; Makoto Kondo, both of Matsudo, and Shigeru Otsuka, Kadoma, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Chiba, and Matsushita Electric Industrial Co., Ltd., Osaka, both of Japan

Filed Aug. 8, 1996, Ser. No. 694,322

Claims priority, application Japan, Aug. 11, 1995, 7-227404

Int. Cl.^{6} F16C *33/04*

U.S. Cl. 384—291 **5 Claims**



1. An internally grooved porous bearing system which is characterized in that said porous bearing is provided with a plurality of grooves in its bearing surface and that the number (C) of said grooves meets at least one of the following equations:

$$nA+mB-C\neq0,\ nA-C\neq0 \text{ and } mB-C\neq0$$

wherein A is the number of magnetic poles of a motor magnet. B is the number of the slots of an armature, and n and m are integers, respectively.

5,746,517

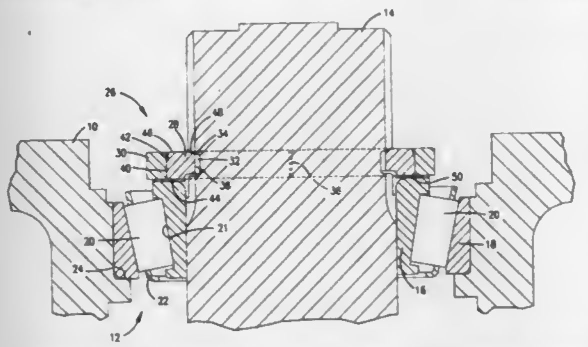
RETAINING ASSEMBLY FOR ROLLER BEARINGS

Darrell Lee Durham, Lee's Summit, Mo.; Mark Anthony Johnson, and David Wayne O'Reilly, both of Olathe, Kans., assignors to Eskridge, Inc., Olathe, Kans.

Filed Dec. 30, 1996, Ser. No. 777,109

Int. Cl.^{6} F16C *43/00*

U.S. Cl. 384—538 **8 Claims**



1. Apparatus for retaining a roller bearing on a shaft having a circumferential groove, comprising:

a split ring having an inside diameter to fit around the shaft and at least one split for accommodating reduction of said inside diameter to permit the split ring to enter the groove and retain the bearing;

a lock ring having a size to fit around said split ring to hold the split ring in the groove, one of said lock ring and split ring having a beveled surface thereon acting to force the split ring into the groove when said lock ring is applied onto said split ring;

an inclined ramp surface bounding said groove and being inclined relative to a radius of the shaft; and

an inclined surface on said split ring engaging said ramp surface to move the split ring in a direction axially on the shaft toward the bearing as the split ring moves into the groove, thereby preloading the bearing.

5,746,518

BRAILLE PRINTING APPARATUS

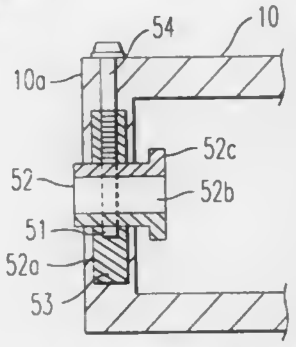
Takashi Ogawa, Kanagawa-ken, and Toshiya Tsukasa, Hadano, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1996, Ser. No. 607,455

Claims priority, application Japan, Mar. 30, 1995, 7-073261; Aug. 29, 1995, 7-220686

Int. Cl.^{6} B41J *3/32;2/255*

U.S. Cl. 400—109.1 **2 Claims**



1. A braille writing apparatus for writing braille on a recording medium placed against an underlay comprising:

at least one projection for pressing into the recording medium against the underlay to make an embossing on the recording medium; and

means, formed on the at least one projection, for limiting a depth of the at least one projection into the recording medium;

wherein the means for limiting a depth of the at least one projection comprises a step formed on the at least one projection having a greater outer diameter than the at least one projection, and wherein the at least one projection is formed in a projection holder having a front wall and a hole formed in the front through which the projection projects, the diameter of the hole being less than the outer diameter of the step so that the step abuts against the front wall to limit a depth of the projection into the recording medium; and

wherein the hole of the front wall contains a movable screw element which moves to change a depth of the projection into the recording medium.

5,746,519

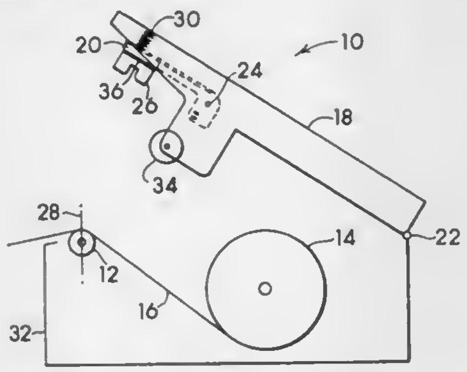
BI-DIRECTIONAL THERMAL PRINT HEAD ALIGNMENT APPARATUS AND METHOD

Kenneth W. Ricketts, Houston, Tex., assignor to Oyo Instruments, Inc., Houston, Tex.

Filed May 6, 1996, Ser. No. 643,666

Int. Cl.^{6} B41J *2/375*

U.S. Cl. 400—120.01 **13 Claims**



1. A print head alignment system, comprising:

(a) a frame;

(b) a cylindrical rotatable platen having its ends mounted to said frame, said platen having an alignment groove formed thereon at a location adjacent so said frame,

(c) a floating-print head, said floating-print head being moveable between a raised position and a lowered position; and

(d) a first alignment member fixedly attached to said floating-print head, said alignment member being adapted to be received by the alignment groove of said platen, to fix the location of said floating-print head in the direction parallel with the longitudinal axis of said platen when said floating-print head is in the lowered position.

5,746,520

PRINTER WITH PRINTHEAD AND PRESSING BODY IN POINT CONTACT

Hiroyuki Kohira, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

PCT No. PCT/JP95/02277, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO96/14213, PCT Pub. Date May 17, 1996

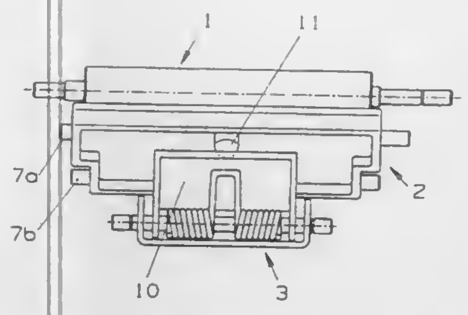
PCT Filed Nov. 8, 1995, Ser. No. 676,134

Claims priority, application Japan, Nov. 8, 1994, 6-273259

Int. Cl.^{6} B41J *2/32*

U.S. Cl. 400—120.01 **29 Claims**

14. A printer comprising: a frame having a pair of side walls spaced apart a given distance according to a given width size of a recording medium; a platen supported between the pair of side walls and having a surface for supporting the recording medium; a printhead supported between the side walls and operable in a printing position thereof to perform a printing operation on the recording medium; the printhead extending substantially from one side wall to the other side wall and support means for supporting the printhead for movement in forward/backward and rightward/leftward directions relative to the frame, following the surface of the platen, when the printhead is in the printing position.



5,746,521

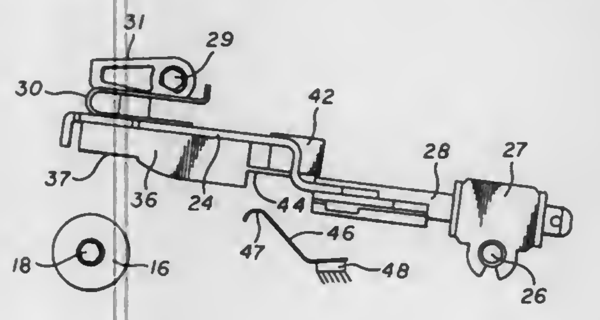
THERMAL PRINTHEAD WITH INTEGRATED PRINTHEAD POSITION SENSOR

Joel A. Schoen, Woodinville, and Jay M. Miazga, Marysville, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Dec. 20, 1996, Ser. No. 771,588

Int. Cl.^{6} B41J *29/38*

U.S. Cl. 400—120.16 **18 Claims**



1. A printing apparatus, comprising:

a platen;

a printhead disposed in relation to said platen to permit selectively pivoting of said printhead between a closed position abutting said platen and an open position substantially separated from said platen, said printhead being operable to print information onto a print media transported between said platen and said printhead when said printhead is pivoted to said closed position, said printhead further having a circuit element coupled thereto that pivots in cooperation with said printhead, said circuit element further having first and second electrical contact points; and

a bridge fixedly disposed relative to said printhead to come into contact with said first and second contact points only when said printhead is pivoted to one of said open and closed positions, said first and second contact points thereby providing a printhead status signal indicating that said printhead is pivoted to said one of said open and closed positions.

5,746,522

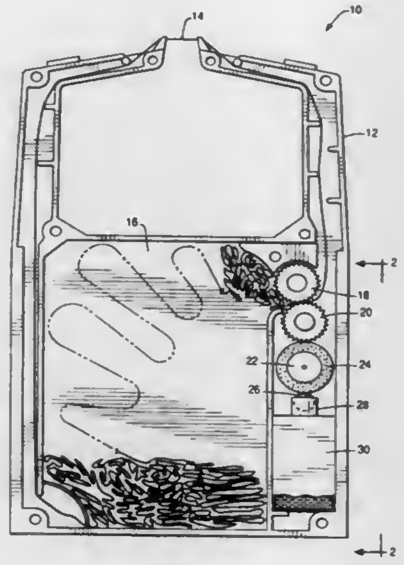
LIQUID TANK RE-INKER USING BALL TRANSFER MECHANISM

Richard B. Moreland, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 11, 1996, Ser. No. 763,911

Int. Cl.^{6} B41J *31/14;32/02*

U.S. Cl. 400—197 **8 Claims**



1. An apparatus for re-inking a printing ribbon, comprising:

a tank having an opening and containing liquid ink;

a ball rotatable positioned in the opening of the tank for receiving liquid ink from the tank, wherein the ball is formed of a porous material;

a wheel rotatable positioned adjacent and in frictional contact with the ball, the wheel for receiving liquid ink from the ball, and

a roller for guiding the printing ribbon and for receiving liquid ink from the wheel and transferring the liquid ink to the printing ribbon.

5,746,523

Patent Not Issued For This Number

5,746,524

PRINTING CONTROL APPARATUS FOR SPACING 1-BYTE AND 2-BYTE CHARACTERS

Hirotaka Koizumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

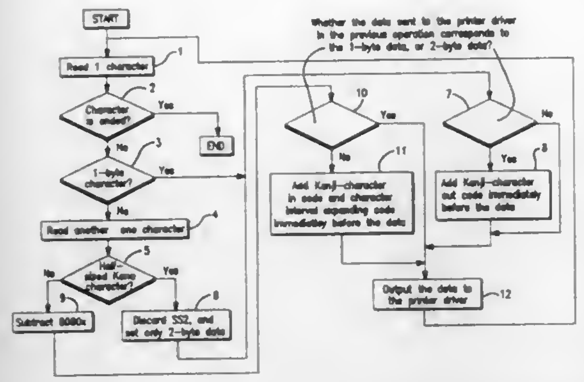
Filed Sep. 12, 1996, Ser. No. 712,885

Claims priority, application Japan, Sep. 13, 1995, 7-235090

Int. Cl.^{6} B41J *19/32*

U.S. Cl. 400—306 **18 Claims**

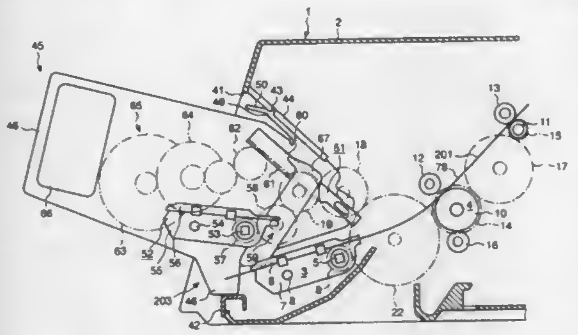
1. A printer printing control apparatus for adjusting a printing interval of a printer that prints 1-byte characters and 2-byte characters with a 1 to n ratio of a printed width of the 1-byte characters to a printed width of the 2-byte characters, $1<n<2$, the apparatus comprising a printer driver for expanding a character interval adjacent each of the 2-byte characters so that a ratio of the printed


START
Read 1 character
1
2
Character is ended?
Yes
END
No
3
1-byte character?
Yes
No
Read another one character
4
5
Half-sized Kana character?
No
Yes
9
Subtract 8080x
8
Discard SS2, and set only 2-byte data
Whether the data sent to the printer driver in the previous operation corresponds to the 1-byte data, or 2-byte data?
10
Yes
No
11
Add Kanji-character in code and character interval expanding code immediately before the data
7
No
Yes
8
Add Kanji-character out code immediately before the data
Output the data to the printer driver
12

width of the 1-byte characters to the printed width of the 2-byte characters plus the interval is 1 to 2.

5,746,525
PRINTER AND TRACTOR DEVICE THEREFOR

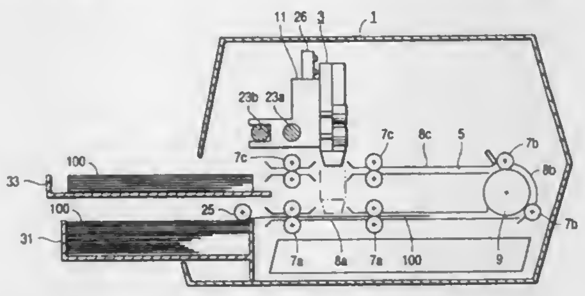
Tsuyoshi Sanda, and Tsutomu Fujiwara, both of Shizuoka, Japan, assignors to Kabushiki Kaisha TEC, Tokyo, Japan
Filed Nov. 8, 1996, Ser. No. 745,609
Claims priority, application Japan, Nov. 10, 1995, 7-292517
Int. Cl.⁶ B41J *11/50*
U.S. Cl. 400—605 **18 Claims**



1. A printer, comprising:
a printing mechanism;
a paper guide path communicating with said printing mechanism;
a driving source having an output shaft generating a feeding force;
a permanent tractor located at a position communicating with said paper guide path for feeding a continuous sheet of paper, said permanent tractor having an input gear connected to the output shaft of said driving source, thereby applying the feeding force to the continuous sheet of paper through said permanent tractor;
an output gear connected to said output shaft of said driving source;
a drive force selecting mechanism for selectively transmitting a drive force from said driving source to one of said input gear of said permanent tractor and said output gear;
a movable operating member for operating said drive force selecting mechanism;
a slider connected to said operating member, said slider being slid by the movement of said operating member;
a cam member provided on said slider so that said cam member independently slides along the surface of said slider in a first state and also integrally slides with said slider in a second state, said cam member operating said drive force selecting mechanism by integrally sliding with said slider when said operating member is moved;
an external device connecting portion selectively allowing attachment and detachment of one of an automatic sheet feeder for successively feeding a plurality of cut sheets of paper and a tractor device for feeding a continuous sheet of paper so that a paper feed mechanism of one of said automatic sheet feeder and said tractor device communicates with said paper guide path and said output gear is connected to an input gear of said paper feed mechanism;
a second drive force selecting mechanism mounted in said tractor device for operating said drive force selecting mechanism by displacing independently said cam member; and
a clutch member connected between the paper feed mechanism of said tractor device and said output gear.

5,746,526
PRINTER APPARATUS FOR PRINTING ON BOTH SURFACES OF PAPER OR THE LIKE

Takashi Hirose, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Sep. 19, 1996, Ser. No. 716,537
Claims priority, application Japan, Sep. 21, 1995, 7-242689
Int. Cl.⁶ B41J *11/26*
U.S. Cl. 400—619 **20 Claims**

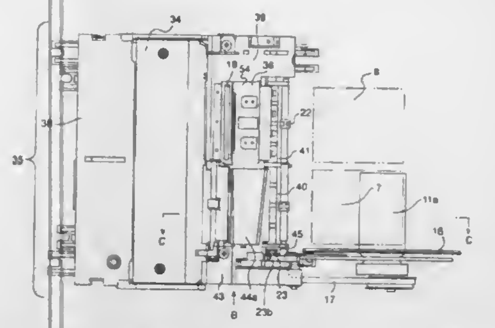


1. A printer apparatus comprising:
a transport section, having a transport path including a first linear path, a second linear path and a curved path, for transporting a printing medium so that the printing medium passes through said first linear path, said curved path and said second linear path, respectively, in this order;
a print head for executing a first printing operation onto the printing medium when the printing medium passes through said first linear path, and a second printing operation onto the printing medium when the printing medium passes through said second linear path; and
a first moving mechanism for moving said print head between the vicinity of said first linear path and the vicinity of said second linear path.

5,746,527
PRINTING APPARATUS PROVIDED WITH AN AUTO CUTTER

Mitsuhiko Nebashi; Keiji Murakoshi; Satoshi Iwaya, and Akihiro Goto, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Sep. 18, 1996, Ser. No. 718,151
Claims priority, application Japan, Sep. 19, 1995, 7-240357
Int. Cl.⁶ B41J *11/70*
U.S. Cl. 400—621 **22 Claims**

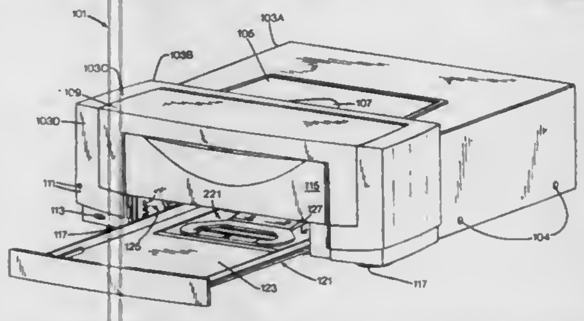
1. A printing apparatus comprising:
a body frame including at least a printing element for printing on a first recording medium, having a first surface and a second surface, and transport path for guiding the first recording medium through said printing element, an auto cutter for cutting the first recording medium printed by said printing element, and a first cover, provided on said body frame, for covering said printing element; wherein, when the recording medium is guided by said transport path adjacent said printing element, the first surface faces said auto cutter and the second surface faces said first cover; and



a second cover, disposed on said body frame opposing said first cover, for mounting said auto cutter, said auto cutter comprising:
a cutter frame for fixing said auto cutter to said second cover;
a cutter blade, movably supported on the cutter frame, for cutting the first recording medium; and
an auto cutter drive source for driving said cutter blade to cut the first recording medium.

5,746,528
HARD COPY APPARATUS WITH A PRINT MEDIA TELESCOPING TRAY SYSTEM

Jeremy Mayer; Juan B. Belon, and A. Terence Kennedy, all of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 26, 1997, Ser. No. 806,589
Int. Cl.⁶ B41J *11/58*
U.S. Cl. 400—625 **20 Claims**

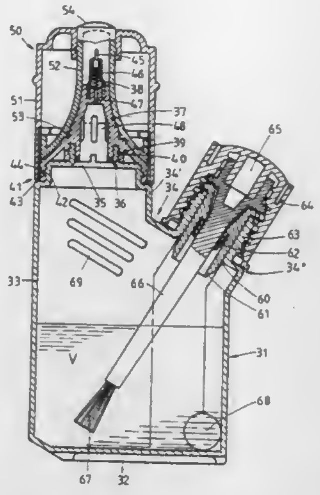


1. A print media tray apparatus for a hard copy apparatus having a media input mechanism, said tray apparatus comprising:
first tray means for receiving print media output by the hard copy apparatus; and
second tray means for holding cut-sheet, input, print media in operative relational position to said media input mechanism, wherein said second tray means is in a nested relationship with said first tray means in a sliding fit such that when nested said first tray means and said second tray means telescope cooperatively into and out of said hard copy apparatus.

5,746,529
CONTAINER FOR A FLUID PRODUCT

Bernd W. Peters, Solingen; Marie-Claude Bossert, Erkrath, both of Germany; Johannes Hubertus Jozef Maria Kelders, Drunen, and Roy Edwln Van Swieten, Heusden, both of Netherlands, assignors to Henkel Kommanditgesellschaft auf Aktien, Germany, and Raycap B.V., Netherlands
PCT No. PCT/EP95/00176, § 371 Date Sep. 5, 1996, § 102(e) Date Sep. 5, 1996, PCT Pub. No. WO95/20496, PCT Pub. Date Aug. 3, 1995
PCT Filed Jan. 18, 1995, Ser. No. 682,650
Claims priority, application Netherlands, Jan. 27, 1994, 9400126; Germany, Jun. 17, 1994, 44 21 286.0
Int. Cl.⁶ B43K *29/00;* **A46B** *11/04*
U.S. Cl. 401—18 **9 Claims**

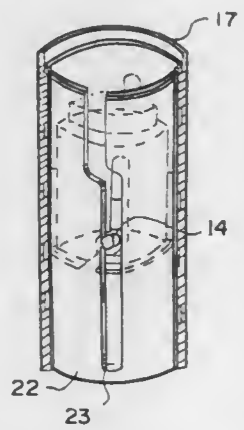
1. A container for a fluid product, comprising:



a first tube-like projection with a discharge opening having a needle-like actuator projecting therefrom for operating an internal valve closure for the controlled, measured application of the fluid product to a substrate;
a second tube-like projection with a second opening provided with a removable closure cap with an integrated brush-like applicator; and
wherein in the standing position of the container, the first and second tube-like projections are arranged in an upper part of the container in such a way that the free end of the first tube-like projection with the discharge opening extends upward, relative to a bottom of said container beyond the closure cap when the second opening is closed.

5,746,530
MEDIUM CONTAINER AND ITS SPARE MEDIUM

Etsuji Oota, Manshon Suzuno 401, 2-10, Honcho 3-chome, Nakano-ku, Tokyo 164, Japan
PCT No. PCT/JP95/00292, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/23747, PCT Pub. Date Sep. 8, 1995
PCT Filed Feb. 27, 1995, Ser. No. 700,413
Claims priority, application Japan, Mar. 1, 1994, 6-054430; Apr. 15, 1994, 6-101492; May 30, 1994, 6-137795; Jun. 13, 1994, 6-153039; Jul. 27, 1994, 6-193860
Int. Cl.⁶ B43K *27/08*
U.S. Cl. 401—88 **15 Claims**



1. A dispensing container for a stick cosmetic comprising:
a cylindrical member having a longitudinally extending slot;
holding means, slidably mounted in said cylindrical member for receiving and holding the stick cosmetic, said holding means comprising:
a first holding member axially movable relative to said cylindrical member between a fully retracted position and a fully extended position;

a second holding member, in the form of a cylinder slidably fitted with said first holding member, for axial movement relative to said first holding member;

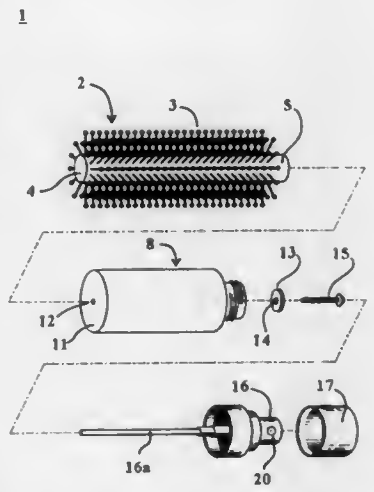
stopper means for holding said first and second holding members together for movement in tandem between the fully retracted position and an intermediate position between the fully retracted position and the fully extended position;

interrupt means for preventing said second holding member from moving beyond said intermediate position toward said fully extended position; and

driving means for moving said first and second holding members, held together by said stopper means, in tandem from the fully retracted position to the intermediate position, responsive to manual application of a first force, and for moving said first holding member beyond said intermediate position, toward said fully extended position, responsive to manual application of a second force greater than said first force and sufficient to release said stopper means.

5,746,531
HAIRBRUSH AND CONTAINER WITH DISPENSER

Allan Izbak, 2 High Point Dr., Poughkeepsie, N.Y. 12603
Filed Nov. 27, 1996, Ser. No. 753,709
Int. Cl.^{6} A46B *11/00;11/02*
U.S. Cl. 401—139 **5 Claims**



1. A hairbrush and container assembly comprising:

a brush comprising an elongated core, a plurality of bristles extending generally outward from the core, the core having a solid end portion, the solid end portion having a proximate surface and having a first hole extending through the proximate surface and into the solid end portion,

a hollow container formed from a flexible plastic material and having a wall for containing a dispensable material, the wall adapted to serve as a handle for the brush and having opposed top and bottom ends, the bottom end of the container having a second hole therein,

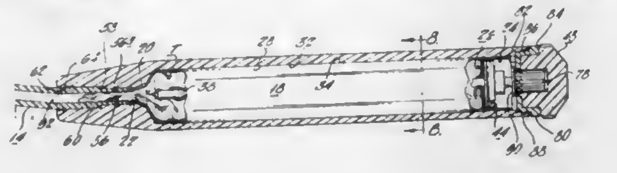
mounting and sealing means comprising a screw extending through the second hole into the first hole for connecting the bottom end of the container to the solid end portion of the core through the proximate surface so that a seal is formed between the bottom end of the container and the solid end portion when the screw is securely fastened,

a washer disposed on the screw for enhancing the seal between the bottom end of the container and the solid end portion when the screw is securely fastened, preventing leakage of the dispensable material from the container through the second hole, and

dispensing means disposed on the top end of the container distal from the core.

5,746,532
TOOTHBRUSH ASSEMBLY

Joseph M. Megill, and John T. Megill, both of 7362 Wissinoming St., Philadelphia, Pa. 19136
Filed Oct. 1, 1996, Ser. No. 724,313
Int. Cl.^{6} A46B *11/02*
U.S. Cl. 401—175 **2 Claims**



1. A toothbrush assembly comprising;

an elongated hollow handle (**12**) defining a chamber (**28**);

a cartridge (**18**) filled with toothpaste mounted in said chamber (**28**);

the cross-section of the cartridge (**18**) and chamber (**20**) being generally circular and having a short, segmental chord defining a longitudinally extending flat (**32**) to prevent relative rotation of the cartridge (**18**) in the chamber (**28**);

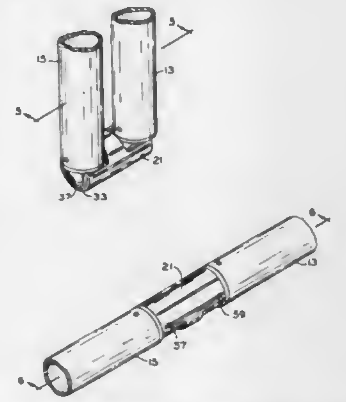
a brush head assembly (**14**) including bristles (**16**) on a support pad detachably mounted at one end of the handle;

a plurality of slit valves (**68**) mounted in openings in said bristle support pad, each valve (**68**) being generally cylindrically shaped having a pair of axially spaced circumferentially extending mounting flanges (**70**) for supporting the valves in place, the upper wall of each valve being slit (**74**) in an predetermined pattern to define a plurality of valve segments (**76**) which are normally in a closed position located adjacent the base of the bristles;

an actuator assembly (**36**) mounted at the opposite open end of the handle including a piston (**44**) actuatable axially in the cartridge to displace toothpaste through a channel (**92**) in the brush head assembly and through said series of valves (**68**) in the brush head, said actuator assembly including a rod (**38**) moveable axially so that having a piercing tip (**40**) aligned with scoring (**26*a***) in the cap seal (**26**) penetrates the scoring when desired.

5,746,533
LOCKABLE HINGE MECHANISM

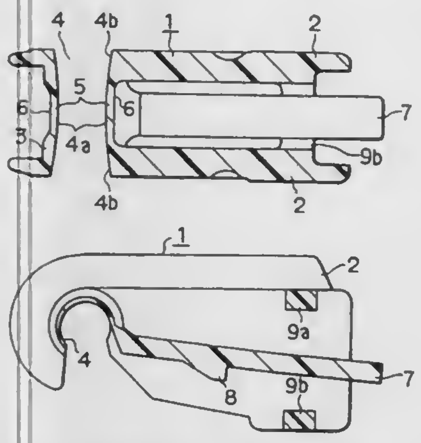
Todd W. Schmidt, 214 E. Collins Rd., Fort Wayne, Ind. 46825
Continuation-in-part of Ser. No. 328,116, Oct. 24, 1994, Pat. No. 5,539,957, and Ser. No. 380,682, Jan. 30, 1995, abandoned. This application Jul. 12, 1996, Ser. No. 679,525
Int. Cl.^{6} F16C *11/10*
U.S. Cl. 403—102 **9 Claims**



1. A lockable hinge mechanism comprising a hinge member and a pair of elongated tubular members having respective ends pivotably joined to the hinge member for movement of the tubular members between generally parallel and collinear relative positions, and selectively operable means comprising a hollow cylindrical cuff at least partially surrounding the hinge member and coaxially rotatable relative to the tubular members through a range of about 180 degrees for precluding relative movement of the tubular members from the collinear position to the parallel position when in one location and allowing relative movement of the tubular members from the collinear position to the parallel position when in another location, said selectively operable means including abutments near said respective ends of the tubular members, said cylindrical cuff having opposed semicylindrical extensions for engaging the abutments and the hinge member having a pair of opposed semicylindrical end portions for engaging the abutments.

5,746,534
CLIP FOR WINDSHIELD WIPER BLADE

Masami Hara, Toyohashi, Japan, assignor to ASMO Co., Ltd., Kosai, Japan
Filed Dec. 4, 1996, Ser. No. 760,310
Claims priority, application Japan, Apr. 5, 1996, 8-083927
Int. Cl.^{6} B60S *1/40*
U.S. Cl. 403—133 **8 Claims**



2. A clip for a windshield wiper blade, comprising:

a pair of side plates made of resin, said side plates each having longitudinally spaced first and second ends;

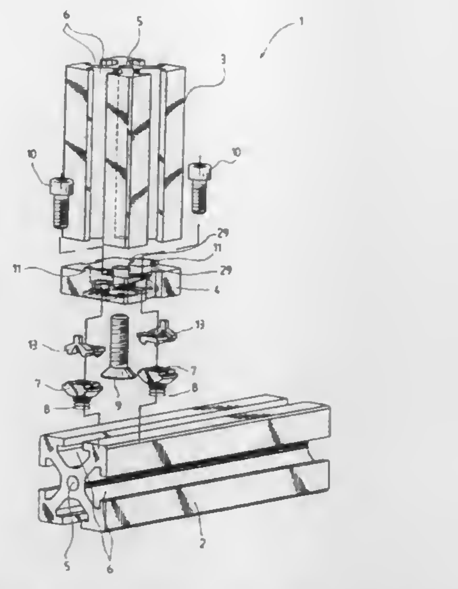
a connecting bar made of resin and connecting said side plates, said connecting bar being positioned adjacent said first ends of said side plates, said connecting bar having a penetration hole penetrating therethrough in a width direction for receiving a rivet therethrough;

a plurality of supporting bars extending in parallel with said connecting bar and connecting said side plates at a position different from said connecting bar, said supporting bars being positioned adjacent said second ends of said side plates, said supporting bars being provided at upper and lower portions of said side plates; and an arm piece fixing portion integrally formed with said connecting bar and extending away from said connecting bar between said side plates and between said supporting bars.

5,746,535
PLATE FASTENER

Dietmar Kohler, Lustenau, Austria, assignor to Heron Sondermaschinen und Steuerungen Ges.m.b.H, Austria
Filed Sep. 27, 1996, Ser. No. 722,656
Int. Cl.^{6} F16B *9/00*
U.S. Cl. 403—258 **13 Claims**

1. A plate fastener assembly comprising: an elongated first section having an end connected to a side of an elongated second section so that the first section extends outwardly from the second section, the side of the second section having a longitudinally-extending slotted groove along the side communicating by sidewalls with a longitudinally-extending channel in the second section;



a fastening plate having a top face with a top centering means for centering the fastening plate with respect to the end of the first section, and having a bottom face with a recess adapted to receive a bottom centering means for centering the fastening plate with respect to the side of the second section; a first means for securing the fastening plate to the end of the first section; a second securing means disposed within the longitudinally-extending channel in the second section and having a notched upper portion sized to fit within the groove of the second section for securing the fastening plate to the side of the second section, the second securing means cooperating with a fastening means for fastening the fastening plate to the side of the second section, the bottom centering means comprising a member sized to fit within the recess in the bottom face of the fastening plate and to engage the side of the second section, the member having expandable side portions sized to fit within the groove, the side portions being expandable in response to a force applied to the member to engage the sidewalls of the groove to center the second section with respect to the fastening plate.

5,746,536
DOUBLE TAPER LOCK SYSTEM FOR A LOCKING A MIXER SHAFT IN A QUILL

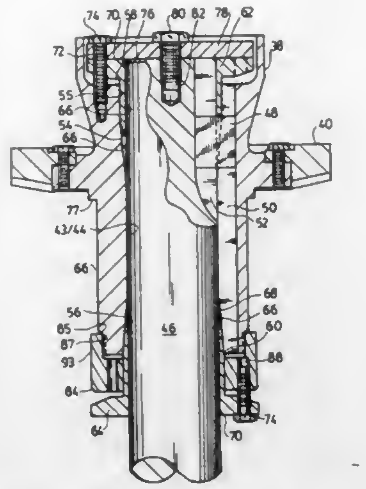
William F. Hutchings, 19 Cannock Dr., Fairport, N.Y. 14450; Marlin D. Schutte, 40 Corwin Rd, Rochester, N.Y. 14610; Stephen L. Markle, 69 South Main St., Holley, N.Y. 14470; Joel S. Berg, 532 Parma Center Rd., Hilton, N.Y. 14468, and David J. Engel, 9687 Purcell Hill Rd, Springwater, N.Y. 14560
Filed Nov. 7, 1996, Ser. No. 739,739
Int. Cl.^{6} F16B *3/06*
U.S. Cl. 403—370 **10 Claims**

1. A double taper lock system for coaxially centering and retaining a mixer shaft disposed in a mixer drive quill, comprising:

a) the quill having an axial bore receivable of the mixer shaft, said bore including a central cylindrical portion having a first diameter and a first portion tapering in increasing diameter from said central portion toward an end of said bore and a second portion tapering in increasing diameter from said central portion toward the opposite end of said bore;

b) a first taper lock having a cylindrical bore receivable of the mixer shaft and an outer surface concentric with said bore and tapered in diameter in an axial direction to define a first tapered surface substantially identical with said first tapered portion in said quill;

c) a second taper lock having a cylindrical bore receivable of the mixer shaft and an outer surface concentric with said bore and tapered in diameter in an axial direction to define a second



tapered surface substantially identical with said second tapered portion in said quill, at least one of said first and second taper locks including a circular flange extending radially over at least a portion of one of said ends of said quill bore, and at least one of said first and second taper locks extending beyond the corresponding end of said quill bore;

d) first means reactive against said quill for urging said first taper lock toward said second taper lock; and

e) second means reactive against said quill for urging said second taper lock toward said first taper lock, at least one of said first and second means for urging including a removable ring attachable to an end of said quill, said ring and said circular flange on said taper lock having a plurality of matching bores for receiving bolts, the ring bores being threaded, the flange and ring being spaced apart, and the tightening of said bolts urging said taper lock through said ring into said quill bore.

5,746,537

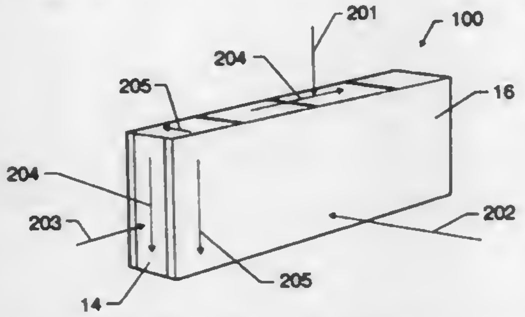
CRASH-ENERGY ABSORBING COMPOSITE STRUCTURE AND METHOD OF FABRICATION

Sotiris Kellas, Yorktown, and Huey D. Carden, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 20, 1996, Ser. No. 624,843

Int. Cl.^{6} E01F ***13/00;15/00***

U.S. Cl. 404—6 **16 Claims**



1. A crash-energy absorbing structure, comprising:

a plurality of adjoining rigid cells, each of said plurality of adjoining rigid cells having a longitudinal axis and including resin-cured fibers wrapped continuously at least one time wholly about a perimeter thereof that surrounds said longitudinal axis, said plurality of adjoining rigid cells arranged in a geometric configuration; and

a fabric of ductile fibers adhered to said geometric configuration of said plurality of adjoining rigid cells for maintaining said plurality of said adjoining rigid cells in said geometric configuration.

5,746,538

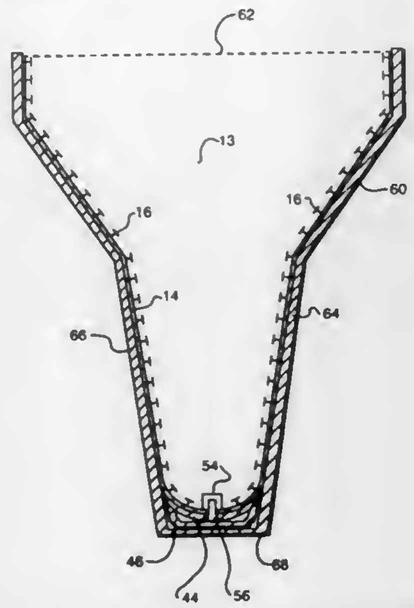
CONCRETE BARRIER HAVING A PLASTIC CLADDING

Clark Robert Gunness, 120 Morse Hill Rd., Newbury, N.H. 03255

Filed Oct. 1, 1996, Ser. No. 724,419

Int. Cl.^{6} E01F ***13/02***

U.S. Cl. 404—6 **15 Claims**



15. A concrete structure which is molded in a reusable form, said structure comprising:

an anchor sheet having a plurality of ribs, with each rib having a cross-sectional profile that will enable said rib to be held firmly within cured concrete, said anchor sheet having a bendable radius;

a radiused member attached to said form, with said radiused member having a radius that corresponds to the bendable radius of said anchor sheet, said anchor sheet being releasably fastened to said form on or adjacent to said radiused member via a plurality of fasteners, such that when said form is filled with wet concrete and allowed to cure to provide said concrete structure, and said concrete structure is removed from the reusable form and said anchor sheet is released, said concrete structure will have at least one surface with a radius that is protected by said anchor sheet engaging said surface without any substantial voids between said anchor sheet and said surface.

5,746,539

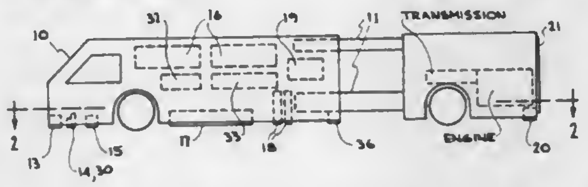
RAPID ROAD REPAIR VEHICLE

Leo M. Mara, Livermore, Calif., assignor to Sandia National Laboratories, Livermore, Calif.

Filed Jun. 28, 1995, Ser. No. 496,274

Int. Cl.^{6} E01C ***19/18;23/07***

U.S. Cl. 404—84.05 **8 Claims**



1. A rapid road repair vehicle, comprising: a vehicle capable of traveling over a surface to be repaired; a first row of scanners attached to said vehicle capable of detecting and measuring at least one surface imperfection in the surface to be repaired; a row of cleaning devices attached to said vehicle to clean the surface imperfection; a second row of scanners attached to said vehicle for remeasuring the cleaned imperfection and for calculating the volume of the surface imperfection; an array of fast acting pneumatic dispensing nozzles attached to said vehicle, said array comprising a plurality of interwoven and independently addressable nozzles to apply an amount of repair material to the surface imperfection to be repaired; a row of surface tampers attached to said vehicle to smooth the surface of the repaired surface imperfection; a row of dispensing nozzles to apply a finish coat/sealer over the repaired surface imperfection; and a third row of scanners attached to said vehicle to catalog the repair work.

5,746,540

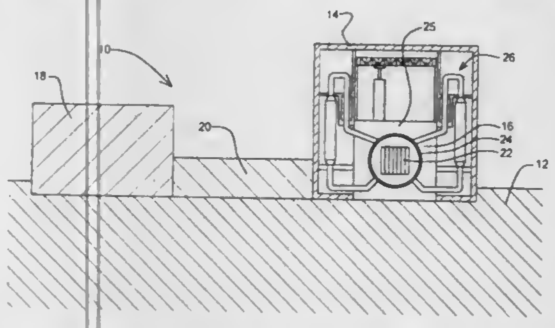
METHOD OF ISOLATING A NUCLEAR REACTOR OR OTHER LARGE STRUCTURES

David J. Hindle, 291 Lammer Court, Hammersmith Road, London W6 7LD UK, United Kingdom; Christopher D. Breeds, 5106 272nd Ave. NE, Redmond, Wash. 98053; Jeremy J. Conway, Well Cottage Burconbe Rd., Chalford Hill Stroud GC6 8BH UK, United Kingdom; Ian W. Morris, 1 Kendal Road, Hove, Sussex BN3 5HZ UK, United Kingdom, and Eric Ledgerwood, 20 Rhandda Grove, London E3 5AP UK, United Kingdom

Continuation-in-part of Ser. No. 241,468, May 12, 1994, abandoned. This application May 6, 1996, Ser. No. 643,771

Int. Cl.^{6} E02D ***19/14***

U.S. Cl. 405—131 **20 Claims**



1. A method of lowering an environmentally critical structures, such as a nuclear reactor unit, or other critical structure, into an ground strata, comprising:

a. excavating a cavern in the ground strata at a location below the critical structure;

b. filling the cavern to a predetermined support level with water;

c. freezing the water to form an ice support;

d. isolating the critical structure and any underlying portion of the ground strata positioned between the critical structure and the cavern; and

e. thawing the ice support to cause the critical structure, along with any of said underlying portion of the ground strata, to descend into the ground strata toward the cavern.

5,746,541

ELECTRONIC DOG FENCE INSTALLER

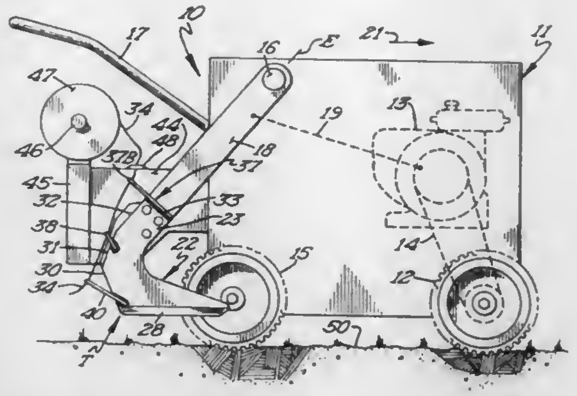
Robert C. Brophy, Raymond; Eldon W. Wooters, Lincoln, and R. Scott Capps, Clatonia, all of Nebr., assignors to Tuefco Manufacturing, Incorporated, Minneapolis, Minn.

Filed May 24, 1996, Ser. No. 652,957

Int. Cl.^{6} E02F ***5/10***

U.S. Cl. 405—174 **20 Claims**

1. Mechanism for cutting a slit trench in the ground and paying out cable when moved in a forward direction in the ground for burying cable and adapted for attachment to a mobile machine, comprising a vertical cutting blade having a front ground slitting edge and an upper shank mounting portion, said shank mounting portion having a rear edge and a upper edge, the blade having a bottom edge portion intersecting the ground slitting edge, with the bottom edge portion in a vertical direction being at a substantially lower elevation than the shank portion, a first cable guide for having the cable movably extended therethrough and moving the cable forwardly therewith, the first guide being mounted to the shank portion to extend rearwardly thereof, and a second cable guide for having the cable extended therethrough, the second cable guide being mounted to the blade vertically downwardly of the first cable guide in substantial vertical spaced relationship to the first cable guide, the second cable guide including elongated legs that are generally horizontally elongated in a direction extending rearwardly of the blade slitting edge and a reversely bent web portion joined to the legs at a substantial distance along the length of the legs from the blade bottom edge for having the cable extend from the first guide, thence between the web portion and the blade and then rearwardly of the web portion to pay out the cable as the trench is being cut.



5,746,542

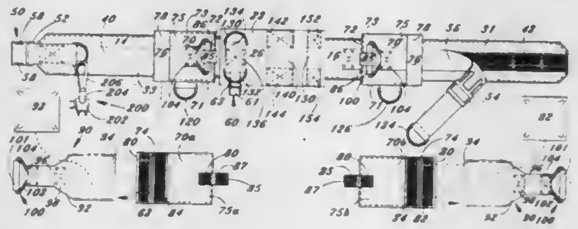
DROP WEIGHT DIVE BELT

Robert M. Carmichael, 2124 NE. 24th St., Wilton Manors, Fla. 33305

Filed Nov. 17, 1995, Ser. No. 560,329

Int. Cl.^{6} B63C ***11/30***

U.S. Cl. 405—186 **22 Claims**



1. A dive belt adapted to be disposed around a waist and adjacent back area of a diver and for use in underwater activities, comprising:

a body member having a first section and a second section, said first section having a first end and a second end, said second section having a first end and a second end, said first end of said first section and said first end of said second section operatively associated with each other, said first section having an exterior section and an interior section, said second section having an exterior section and an interior section;

means for removably attaching said second end of said first section to said second end of said second section;

a first pocket member attached to the exterior section of said first section;

a second pocket member attached to the exterior section of said second section;

a first weight means disposed within said first pocket member;

a second weight means disposed within said second pocket member;

first quick release means for rapidly removing said first weight means from said first pocket member; and

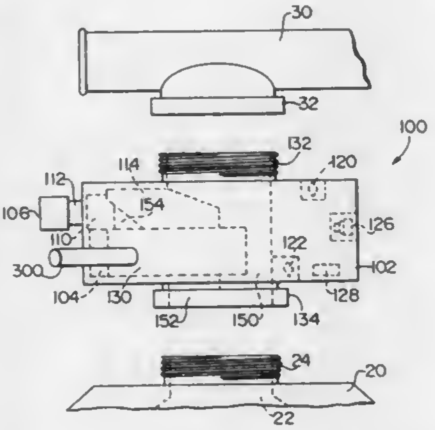
second quick release means for rapidly removing said second weight means from said second pocket member;

wherein said body member adapted to remain attached around the waist and adjacent back area of the diver after said weight means are released;
wherein said first quick release means comprises:
a first flap member attached along its edge to an open end of said first pocket member, said first flap member structurally separate from said first pocket member;
a first pouch member disposed within said first pocket member, said first weight means disposed within said first pouch member;
a first handle member attached to said first pouch member; and
first means for removably attaching a substantial portion of said first flap member to said first pocket member;
wherein said first pouch member having said first weight disposed within is disposed within said first pocket member and said first handle member extends out of said first pocket member and said means and said first flap member is folded over said first handle member and removably attached to said first pocket member by said first means for removably attaching.

5,746,543
VOLUME CONTROL MODULE FOR USE IN DIVING

Kenneth J. Leonard, 13507 Riverton Dr., Midlothian, Va. 23113

Filed Aug. 20, 1996, Ser. No. 699,737
Int. Cl.^{6} B63C *11/02;11/26*
U.S. Cl. 405—186 **44 Claims**

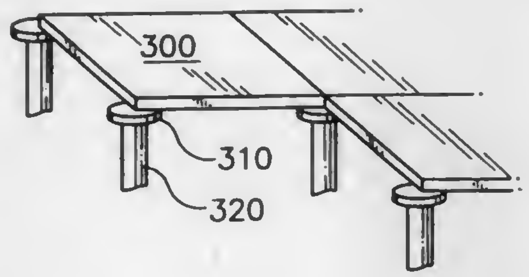


1. A volume control module for controlling the volume of fluid in a buoyancy chamber of a buoyancy compensator device, comprising:
a main unit housing having a first opening connectable to a buoyancy compensator device and a second opening connectable to an inflator hose assembly;
pressure sensing means for measuring ambient pressure externally of said volume control module and generating output signals indicative of the measured ambient pressure;
a microprocessing unit encased in said main unit housing, said microprocessing unit being programmed to carry out a variety of buoyancy-control functions and being responsive to said output signals of said pressure sensing means;
an intake valve in said main unit housing, said intake valve being configured for connection to a source of low pressure fluid and being controlled by said microprocessing unit;
a vent valve in said main unit housing for venting fluid from the buoyancy chamber, said vent valve being controlled by said microprocessing unit;
a first main passage in said main unit housing extending between said first opening connectable to the buoyancy compensator device and said second opening connectable to the inflator hose assembly, said first main passage being unobstructed;
a second main passage in said main unit housing extending between said vent valve and said first opening connectable to the buoyancy compensator device, said second main passage being in fluid communication with said intake valve; and
switch means for selecting one of the functions to be carried out by said microprocessing unit.

5,746,544
PROCESS AND STRUCTURE FOR REDUCING ROADWAY CONSTRUCTION PERIOD

Hovik Baghoomian, Salt Lake City, Utah, assignor to Hovik Baghoomian, and Technology Licensing Co. LLC, Ashland, Ky.

Filed Aug. 24, 1995, Ser. No. 517,876
Int. Cl.^{6} E02D *5/60*
U.S. Cl. 405—229 **16 Claims**



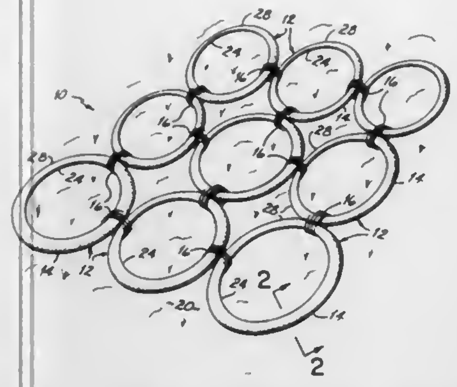
1. A structure for facilitating the widening of existing roadway while reducing: disruption of traffic, required right-of-way, closing of underlying acquifers, and soil compression, comprising in combination:
a. an existing roadway;
b. a layer of subsoil of compressible characteristics, extending substantially along the edge of said existing roadway;
c. three or more piles penetrating said soft subsoil to a depth sufficient to provide sufficient side friction to support a load on said piles, said piles terminating at an upper elevation substantially at the top of said layoff soft subsoil;
d. an individual, substantially rigid, cap surmounting each of said piles so as to expand the upper end of said pile to distribute load down into said pile;
e. at least two isolating slabs each being a substantially rectilinear figure in plan view and each contacting at least one cap so that each of said slabs rests on and is supported by a plurality of said caps, each of said slabs being rigid and resistant to substantial deflection and located substantially at the upper surface of said layer of soft subsoil, said slabs lying in a substantially horizontal plane and being located so that some of said caps each support a plurality of said slabs;
f. a soil burden, roadway or other load resting on said slabs so that said slabs transmit the load onto said piles, whereby said slabs substantially isolate said layer of soft subsoil from said load.

5,746,545
GROUND STABILIZATION STRUCTURE

S. Alex Parker, Jr., Maysville, Ky., assignor to Parco Industries, Maysville, Ky.

Filed Apr. 2, 1996, Ser. No. 626,360
Int. Cl.^{6} E02B *3/12*
U.S. Cl. 405—258 **12 Claims**

1. A ground stabilization structure comprising:
a plurality of rings placed in abutting relation to one another, said rings being formed of continuous circular tire beads cut from the rims of tires;
a plurality of fasteners securing adjacent, abutting rings together, said fasteners formed by helical coils with each coil surrounding abutting ring portions at a junction between two adjacent rings;

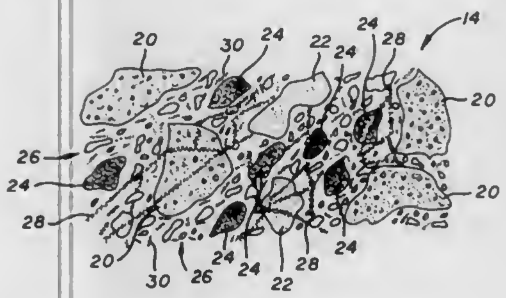


the helical coils being operably configured for securing adjacent abutting rings together when substantially flat on a ground surface and further for providing rotation of a ring onto an adjacent ring for forming a stack of rings.

5,746,546
SOIL STABILIZATION COMPOSITION AND METHOD

Jonathan W. Hubbs, and James J. Hubbs, Jr., both of Phoenix, Ariz., assignors to Stabilizer, Inc., Phoenix, Ariz.

Filed Jan. 24, 1996, Ser. No. 590,774
Int. Cl.^{6} E02D *3/12*
U.S. Cl. 405—263 **85 Claims**



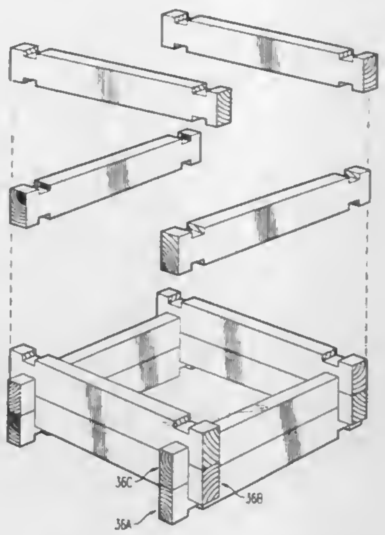
1. A product for forming a stable resilient layer, the product comprising:
a particulate aggregate with particles of a plurality of sizes ranging downward from a selected maximum particle size,
a selected amount of fiber strands having lengths within a selected range, and
a selected amount of water-activated adhesive particles having a swell volume when absorbing water in a range of 25% to 45%.
in relative proportion such that when subjected to sufficient water the water-absorbent particles swell and bind the aggregate and fiber strands, forming a high shear strength flexible resilient layer.

5,746,547
MINE SUPPORT CRIBS

John Joseph Reinmann, Alpharetta, Ga., and Clifford A. McCartney, Eighty-Four, Pa., assignors to Strata Products, Inc., Atlanta, Ga.

Filed Oct. 19, 1995, Ser. No. 545,257
Int. Cl.^{6} E21D *15/48*
U.S. Cl. 405—288 **33 Claims**

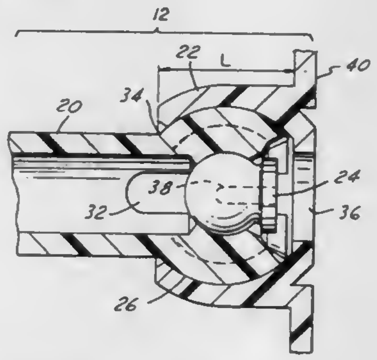
1. A mine support providing support for the roof of a mine working above the floor thereof, the mine support comprising:
a mine support crib which includes a series of superimposed layers of elongate chocks with a plurality of parallel, spaced apart chocks in each layer, each chock in one layer being arranged transversely to each chock in the adjacent layer or layers so that the chocks in a superimposed layer cross the chocks in the layer below at at least two crossing points which are located inwardly of the ends of the chocks, and wherein operative upper and lower surfaces of the chocks in superimposed layers are formed with notches at the crossing points, the notches interlocking with one another to lock the chocks together, and the notches being of such depth that portions of the chocks which are located between and beyond the notches bear on corresponding portions of the chocks in the next layer but one below, and
an inflatable grout bag adapted to be positioned between the top layer of the crib and a mine roof, the grout bag being inflated with grout under pressure, thereby to place the crib under a compressive preload force.



5,746,548
CORE LOCK PIVOT SYSTEM

Robert M. Crandall, Capac, Mich., assignor to Harman Automotive, Inc., Farmington Hills, Mich.

Filed Feb. 19, 1997, Ser. No. 803,159
Int. Cl.^{6} F16C *11/06*
U.S. Cl. 403—316 **13 Claims**



1. A pivot connection system comprising:
an elongated member having a generally ball-shaped end:
a socket sized to receive said ball-shaped end, said socket having a first opening into which said ball-shaped end is inserted and a second opening:
said ball-shaped end having width greater than the width of said first opening, said ball-shaped end having a deformable hollow core: and
a core lock sized to be received within said core through said second opening of said socket to prevent said core from deforming after said ball-shaped end is inserted into said socket, said core lock has a generally spherical shape with a first diameter:

said hollow core having a portion with a second diameter substantially equal to said first diameter,

said ball-shaped end having at least a portion having a generally spherical shape with a third diameter larger than said first diameter.

5,746,549
METAL CUTTING TOOL

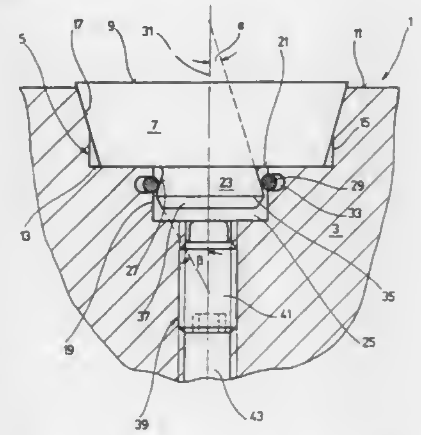
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Germany, assignors to Mapal Fabrik für Präzisionswerkzeuge Dr. Kress KG, Aalen, Germany

Continuation of Ser. No. 263,278, Jun. 21, 1994. This application Aug. 29, 1996, Ser. No. 699,718

Claims priority, application Germany, Jun. 21, 1993, 43 20 409.0

Int. Cl.^{6} B23P *15/28*

U.S. Cl. 407—102 **16 Claims**



1. A metal cutting tool for a chip-type machining process, comprising:
- a tool head;
- a cutting plate; and
- snap-action locking means for securing said cutting plate in said tool head, wherein said snap-action locking means comprises a projection having a locking surface and extending from one of a bottom of a hole, which is formed in said tool head for receiving said cutting plate, and a bottom face of said cutting plate, a hole formed in another one of said bottom and said bottom face for receiving said projection, and an elastic locking element located in said hole for applying a locking force to said locking surface of said projection.

5,746,550
COUPLING REAMING APPARATUS AND METHOD

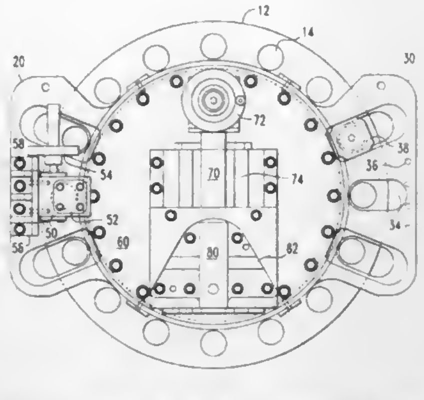
Vincent M. Iacono, Rock Hall, Md.; John R. Kimmich, Collegeville, Pa.; Keith L. Mayhood, Pittsburgh, Pa.; Walter B. Vogel, Brookhaven, Pa., and John J. McGettigan, Middletown Twp., Delaware County, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1995, Ser. No. 549,382

Int. Cl.^{6} B23B *35/00;41/00*

U.S. Cl. 408—1 R **29 Claims**

23. A method of reaming a first plurality of coupling bolt holes on a face of a coupling of rotor of a turbine generator system with a drill, comprising the steps of:
- a) mounting a fixture plate onto the coupling;
- b) axially slidably, rotatably, and radially slidably mounting the drill to the fixture plate;
- c) aligning the drill with a center of a first coupling bolt hole of the first plurality of coupling bolt holes, the drill having a fixed distance from an axis of the rotor after being aligned with the center of the first coupling bolt hole;



- d) after step c), reaming the first coupling bolt hole;
- e) after step d), aligning the drill with a center of a second coupling bolt hole of the first plurality of coupling bolt holes by rotating the drill to the center of the second coupling bolt hole while maintaining the fixed distance of the drill from the axis of the rotor; and
- f) after step e), reaming the second coupling bolt hole.

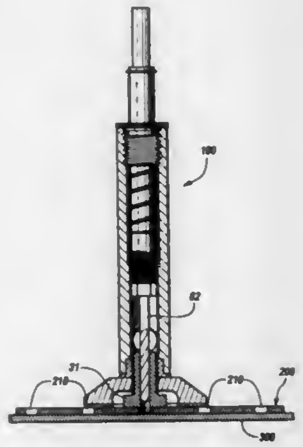
5,746,551
HOLE PREPARATION APPARATUS AND METHOD OF USE

John M. Skaggs, Rockwall, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jul. 1, 1996, Ser. No. 674,142

Int. Cl.^{6} B23B *35/00;49/00*

U.S. Cl. 408—1 R **21 Claims**



7. A method for back drilling, upsizing and reaming a mating hole in adjacent first and second parts of an assembly comprising the steps of:
- positioning a pilot bushing over a preexisting hole in the first part to enable insertion of a pilot of the pilot bushing into the preexisting hole;
- applying rotational and downward forces to a pilot drill to rotate the pilot drill in the pilot bushing and through the preexisting hole in the first part to open an aligned pilot hole in the second part;
- removing the pilot bushing from the first part;
- positioning an opener drill bushing over the preexisting hole in the first part and the aligned pilot hole of the second part;
- inserting a pilot end of an opener drill into the preexisting hole of the first part and the aligned pilot hole of the second part; and
- applying rotational and downward forces to the opener drill to rotate the opener drill for movement through the preexisting hole in the first part and the aligned pilot hole in the second part to open the aligned pilot hole to the desired size.

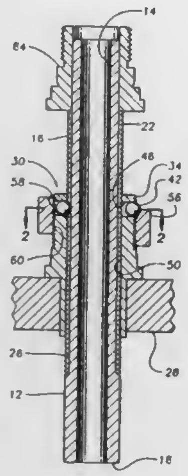
5,746,552
ADJUSTABLE DRILL BUSHING

Gary Tsui, 209 W. Hermosa Dr.,, San Gabriel, Calif. 91775; James B. Tran, 22532 Roscoe Blvd., West Hills, Calif. 91304, and Tony J. Alba, 1236 E. Michelle Ave., West Covina, Calif. 91790

Continuation of Ser. No. 621,504, Mar. 25, 1996, abandoned. This application Jun. 10, 1996, Ser. No. 664,100

Int. Cl.^{6} B23B *45/14*

U.S. Cl. 408—72 B **18 Claims**



1. An adjustable depth drill bushing assembly comprising:
- a drill bushing having a generally cylindrical body, a central tool receiving bore and a generally cylindrical external surface generally concentric with said central tool receiving bore;
- a mounting bushing adapted to being mounted in a fixture and having a generally axial bore, said cylindrical body being axially adjustably receivable in said axial bore;
- a structure formed in said external surface, said external surface including a flat cylindrical surface mating with said generally axial bore; and
- a structure engaging mechanism operatively engaged with said structure and carried by said mounting bushing, said structure engaging mechanism including a releasable locking unit and a positioning element, said positioning element cooperating with said structure to accurately position said cylindrical body axially relative to said mounting bushing, and said releasable locking unit being adapted to releasably lock said mounting bushing rigidly to said cylindrical body.

5,746,553
DUAL PURPOSE LAY-UP TOOL

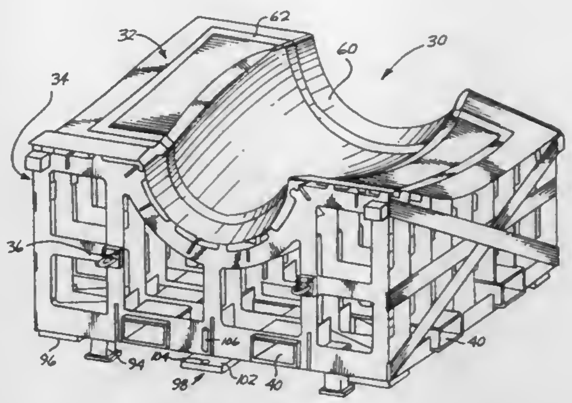
Dwight L. Engwall, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 8, 1996, Ser. No. 629,120

Int. Cl.^{6} B23C *9/00*

U.S. Cl. 409—132 **25 Claims**

1. A dual purpose tool serving both as a form on which constituent materials are applied for bonding or curing on said tool into a part in a desired configuration, and for holding said materials in the originally applied position during subsequent machining of a peripheral edge of said part after said constituent materials have bonded or cured on said tool, comprising:
- a tool body having a facing surface configured to a desired shape of one surface of a part to be made on said tool;
- a supporting structure for supporting said tool body to maintain said facing surface in said desired shape;
- a substantially continuous groove in said tool body opening in said facing surface into which a cutting tool extends while edge trimming said peripheral edge of said part;
- a sacrificial material filling said groove and having a top surface substantially flush with said tool body facing surface for supporting said constituent materials substantially flush with said tool body facing surface during bonding or curing;



whereby said constituent materials for said part are applied on said tool body, bonded or cured, and then edge trimmed thereon with said cutting tool which extends into said groove, cutting into said sacrificial material and engaging the full thickness of said part, all while said materials for said part remain on said tool body in said originally applied position.

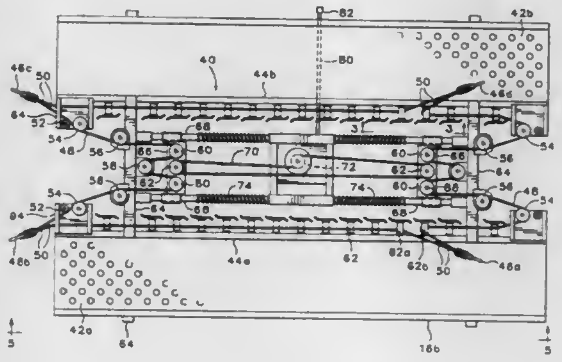
5,746,554
TIE-DOWN METHOD FOR VEHICLE TRANSPORTER

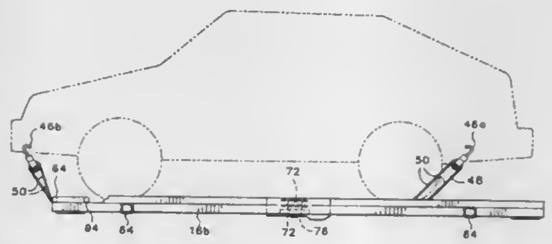
Robert D. Boydstun, IV, Clackamas, and John T. Huey, Milwaukie, both of Oreg., assignors to Boydstun Metal Works Inc., Portland, Oreg.

Filed Jun. 5, 1996, Ser. No. 658,497

Int. Cl.^{6} B60D *7/08*

U.S. Cl. 410—12 **18 Claims**





1. A method for securing a vehicle to a longitudinally-extending elongate vehicle transporter, comprising:
- (a) placing a vehicle on a longitudinally-extending vehicle support assembly having transversely-spaced opposite sides;
- (b) attaching at least a respective pair of longitudinally-spaced securement devices to said vehicle adjacent each of said sides;
- (c) interconnecting a respective flexible tension member portion with each of said securement devices, each said tension member portion capable of exerting a pull-down force on a respective one of said securement devices;
- (d) interconnecting a tension-applying mechanism to each said tension member portion, said tension-applying mechanism capable of automatically simultaneously distributing tension

applied by said tension-applying mechanism among each said tension member portion;

(e) engaging at least one respective said flexible tension member portion with said vehicle support assembly adjacent each of said sides at selected ones of different alternative longitudinally-spaced positions and exerting a resultant pull-down force on each of said securement devices through a respective said flexible tension member portion, including selecting said selected ones of said different alternative longitudinally-spaced positions adjacent said sides so that each resultant pull-down force exerted on a respective one of said pair of longitudinally-spaced securement devices has a longitudinal inclination opposing said resultant pull-down force exerted on another of said pair of longitudinally-spaced securement devices; and

(f) simultaneously adjusting each said respective pull-down force on each of said securement devices to secure said vehicle to said vehicle support assembly.

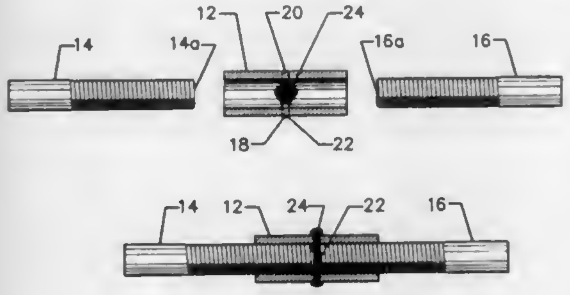
5,746,555
CONNECTOR WITH ENGAGEMENT INDICATOR

William Richard McEvoy, 3705 Kingridge Dr., San Mateo, Calif. 94403

Filed Feb. 6, 1996, Ser. No. 597,219

Int. Cl.⁶ F16B *31/02;* F16D *1/02*

U.S. Cl. 411—14 **5 Claims**



1. A method of coupling two axially aligned structural parts which utilizes a sleeve as a coupling member in a way that permits a visual confirmation that a successful coupling has been made, the method comprising:

- forming the sleeve with two opposed open ends, each open end for receivingly engaging a corresponding inserted end of one of the structural parts, the sleeve having a sidewall portion including at least one substantially medially disposed through-hole;
- placing a displaceable inspection element within said sleeve adjacent said at least one through-hole in said sidewall portion; and
- introducing each of the two structural parts to be coupled a predetermined insertion distance within corresponding opposed open ends of the sleeve and into engagement with one another such that abutting ends of the inserted structural parts contact the inspection element and cause the inspection element to extrude from said at least one through-hole for visual confirmation that a coupling of desired penetration depth of each structural part within the sleeve has been successfully made.

5,746,556
ANCHOR UNIT WITH EXPANSIVE ANCHOR MEMBER EXPANDED BY UTILIZING TURNING FORCE OF BOLT

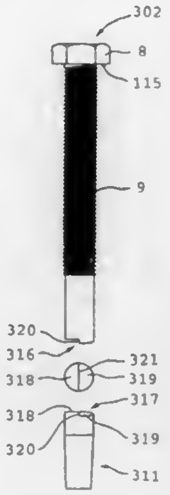
Yoshinori Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Youma Kohboh, Tokyo, Japan

Filed Mar. 6, 1996, Ser. No. 612,984

Claims priority, application Japan, Mar. 13, 1995, 7-052158; Jun. 29, 1995, 7-163229; Aug. 2, 1995, 7-197297; Jan. 19, 1996, 8-006992

Int. Cl.⁶ F16B *13/06*

U.S. Cl. 411—42 **17 Claims**



1. An anchor unit comprising:

- an anchor socket having a threaded hole, an external projection at a peripheral portion around said threaded hole, and a split end portion having a plurality of slits and a tapered hole connected with said threaded hole;
- a bolt having at an end an integral plug portion and a threaded portion engaged with said threaded hole of said anchor socket;
- said plug portion expanding said split end portion when driven into said tapered hole;
- said bolt having an annular groove between said plug portion and said threaded portion, for enabling said plug portion to be twisted off from said remaining portion of said bolt; and
- ratchet means for allowing said plug portion to be bodily movable with said remaining portion of said bolt and driven into said tapered hole when said bolt is rotated in a first direction to be screwed into said anchor socket and for causing said plug portion to be twisted off from said remaining portion of said bolt and left behind within said tapered hole when said bolt is rotated in a second direction opposite to said first direction.

5,746,557
EXPANSION DOWEL

Werner Kaibach, Buchloe, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

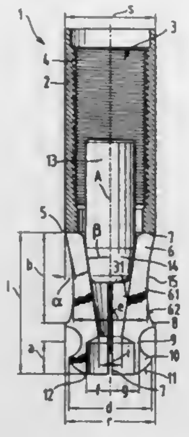
Filed Jan. 30, 1997, Ser. No. 791,125

Claims priority, application Germany, Jan. 30, 1996, 196 03 265.2

Int. Cl.⁶ F16B *13/06*

U.S. Cl. 411—60 **12 Claims**

1. An expansion dowel, comprising an expansion sleeve (**2**) one end portion (**4**) of which functions as a load-receiving means and an opposite portion of which has an expansion region divided into expansion tabs (**6**) by a Plurality of longitudinal slots (**7**) extending toward a leading end of the expansion sleeve (**2**), the expansion tabs (**6**) being connected with the expansion sleeve (**2**) by a first ductile joint (**5**) and having an annular collar (**8**) interrupted by the longitudinal slots (**7**); and an expansion mandrel (**13**) displaceable in an axial through-bore (**3**) of the expansion sleeve (**2**) from an initial position to an end position upon expansion of the expansion region of the expansion sleeve (**2**), the expansion tabs (**6**) protecting beyond the annular collar (**8**) and being integrally connected with a distance segment (**10**) of the expansion sleeve (**2**) by a second ductile joint (**9**), the distance segment (**10**) collapsing radially inward upon an expansion displacement of the expansion tabs (**6**), the through-bore (**3**) tapers from the first ductile joint (**5**) in a direction toward the second ductile joint (**9**) up to a region with a smallest bore diameter (i) which is located in a region of the annular collar (**8**), and wherein a wall (**31**) of the through-bore (**3**) forms with a longitudinal axis (A) of the expansion sleeve (**2**) an angle (α) from about 8° to about 13°, the wall (**31**) widening again from the region with the smallest bore diameter (i).



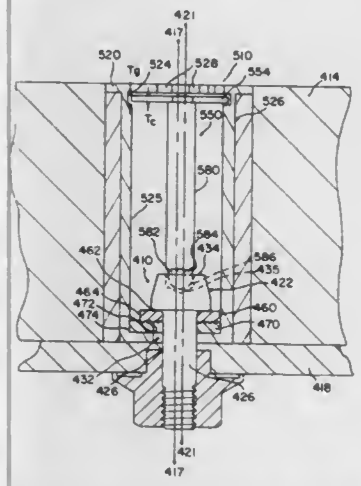
5,746,558
LOCKING APPARATUS FOR FASTENING SYSTEM

William D. Nygren, Jr., Denver, and Arwen G. Isaar, Golden, both of Colo., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Jul. 24, 1996, Ser. No. 687,140

Int. Cl.⁶ F16B *39/28*

U.S. Cl. 411—110 **18 Claims**



1. A fastening system for interconnecting first and second members having first and second bores therethrough, respectively, said fastening system comprising:

- a fastening member having a shank portion capable of being received within the first and second bores of the first and second members;
- a nut means for engaging said shank portion of said fastening member proximate the second member to securably interconnect the first and second members; and
- a locking means, interconnectable with said fastening member and said first member, for inhibiting displacement of said fastening member relative to the first member, said locking means comprising a tubular insert having at least one slot positioned about a perimeter of a bore extending through said tubular insert, said tubular insert being insertable within the first bore of the first member, and a locking member, insertable within said bore of said tubular insert, said locking member having at least one tab extending radially outwardly from an elastically deformable upper portion interconnected with a distally extending leg, said leg being engagable with a proximal portion of said fastening member, wherein said tab is receivable within said slot of said tubular insert.

5,746,559
SELF-LOCKING NUT HAVING DIVIDED AND UNDIVIDED CIRCUMFERENTIAL PORTIONS

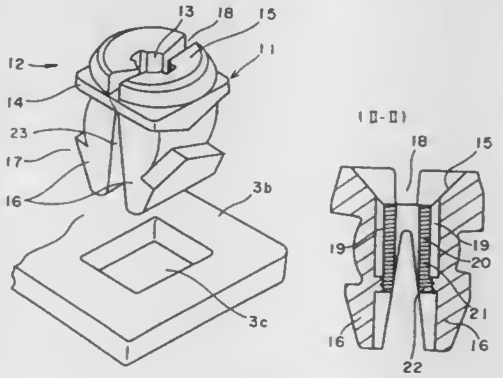
Katutada Shirai, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1996, Ser. No. 665,683

Claims priority, application Japan, Jun. 28, 1995, 7-183246

Int. Cl.⁶ F16B *37/04*

U.S. Cl. 411—182 **13 Claims**



1. A self-locking nut for fitting into a fitting hole of a reflector of a vehicle lamp, and engaging with an aiming screw for adjusting an inclination angle of the reflector, the self-locking nut comprising:

- a body for receiving the aiming screw;
- a fitting portion formed below said body, for fitting into the fitting hole of the reflector, wherein said fitting portion comprises a pair of legs, each of said legs having a wedge shape, and said pair of legs being elastically expandable;
- a shaft hole having an inner surface, said shaft hole passing through said body and said fitting portion in a vertical direction; and
- a threaded portion formed on the inner surface of said shaft hole, for engaging with the aiming screw, said threaded portion comprising:
  - a groove extending along said inner surface of said shaft hole from said fitting portion through said body, a divided circumferential portion divided in a circumferential direction thereof by said groove; and
  - an undivided circumferential portion disposed below said groove, wherein said threaded portion is undivided in the circumferential direction by said groove.

5,746,560
FASTENER HAVING TORQUE-ABSORBING RIBS

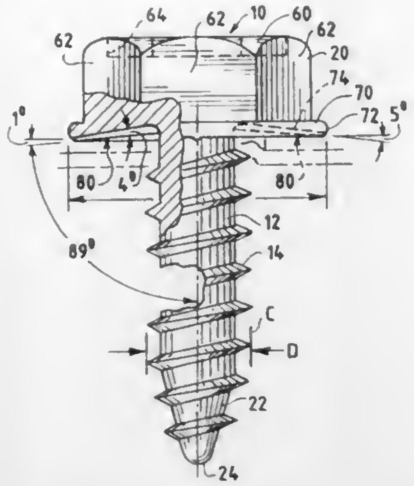
Gerald D. Barth, South Elgin, and Frank W. Bechtel, Hanover Park, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 31, 1997, Ser. No. 829,349

Int. Cl.⁶ F16B *39/00;* A44B *21/00*

U.S. Cl. 411—188 **11 Claims**

1. A fastener for fastening a faying plate to a tapping plate, the fastener being adapted to be rotatably driven,



the fastener having a shank including a tapered tip, the shank defining an axis of the fastener and having a thread extending along and around the shank,

the fastener having a head unitary with the shank, the head having a driving portion and a bearing portion adjoining the shank, the driving portion being adapted to be rotatably driven so as to drive the fastener rotatably about the axis defined by the shank, the bearing portion having a peripheral edge and a clamping surface facing the shank, the peripheral edge being annular, the clamping surface flaring outwardly from the shank, toward the tapered tip, the clamping surface being frusto-conical and defining a conical angle of about 5° relative to a plane perpendicular to the axis defined by the shank,

the head having torque-absorbing ribs projecting from the clamping surface of the bearing portion and spaced at regular intervals about the axis defined by the shank, each rib having a leading flank and a trailing flank with the leading and trailing flanks defining a flank angle of about 90° and with the leading and trailing flanks defining a ridge,

wherein the ridges of the ribs lie on an imaginary, frusto-conical surface flaring outwardly toward the shank at a conical angle of about 1° relative to a plane perpendicular to the axis defined by the shank and at a conical angle of about 4° relative to the clamping surface of the bearing portion, and wherein each rib has a depth not less than about 0.0001 inch when measured from the clamping surface of the bearing portion to the ridge of said rib, in a plane comprising the axis defined by the shank, at the peripheral edge of the bearing portion.

5,746,561
ALIGNMENT TOLERANT FASTENING SYSTEM

William D. Nygren, Jr., Denver, and Arwen G. Isaac, Golden, both of Colo., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Jul. 24, 1996, Ser. No. 687,138

Int. Cl.^{6} F16B *33/00;39/00*

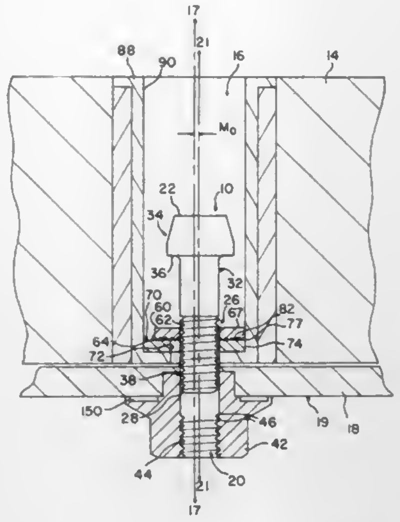
U.S. Cl. 411—368 **53 Claims**

1. An alignment tolerant fastening system for interconnecting first and second members, the first and second members each having a bore therethrough defined by first and second bore walls, respectively, said fastening system comprising: members each having a bore therethrough defined by first and second bore walls, respectively, said fastening system comprising:

a fastening member having a shank portion, wherein said shank portion is capable of being received within the bores of the first and second members;

first and second washers each having inner and outer walls, wherein said inner wall of said first washer is slidably engagable with said shank portion of said fastening member and said outer wall of said second washer is slidably engagable with the first bore wall of the first member, wherein at least a portion of said inner wall of said first washer is concentric with at least a portion of said outer wall of said first washer and at least a portion of said inner wall of said second washer is concentric with at least a portion of said outer wall of said second washer; and

nut means for engaging said shank portion of said fastening member proximate the second member to securably interconnect the first and second members.



5,746,562
PROCESSING SYSTEM AND DEVICE MANUFACTURING METHOD USING THE SAME

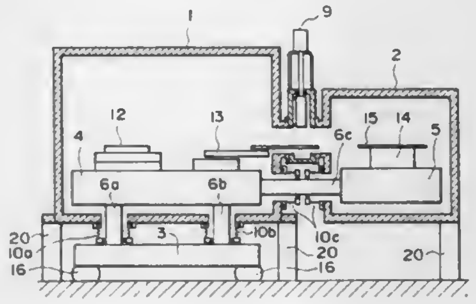
Takayuki Hasegawa; Yutaka Tanaka, both of Yokohama, and Hidehiko Fujioka, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 278,263, Jul. 21, 1994, abandoned. This application Jul. 25, 1997, Ser. No. 898,568

Claims priority, application Japan, Jul. 21, 1993, 5-180353; Jul. 21, 1993, 5-180356; May 16, 1994, 6-101006

Int. Cl.^{6} F16M *1/00*

U.S. Cl. 414—217 **7 Claims**



1. A processing system, comprising:

a chamber containing a processing apparatus said chamber being capable of maintaining a gas-tight seal;

an air mount for supporting said processing apparatus on a floor, said air mount being disposed outside of said chamber; and

a member for supporting said processing apparatus upon said air mount through an opening of said chamber.

5,746,563
CAR AND A DEVICE FOR INSERTING AND TAKING OUT A WHEEL CHAIR FROM A LUGGAGE COMPARTMENT

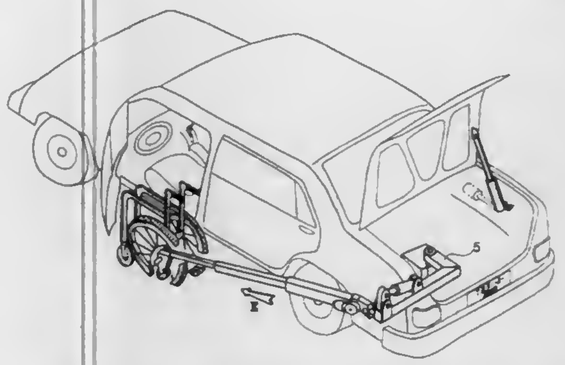
Dov Steckler, 28 Segula Street, Industrial Zone Segula, Petach Tiona, Israel, 49 277

Continuation of Ser. No. 973,148, Nov. 6, 1992, abandoned. This application Jun. 29, 1995, Ser. No. 496,899

Claims priority, application Israel, Apr. 2, 1992, 101460

Int. Cl.^{6} B60P *3/06*

U.S. Cl. 414—462 **4 Claims**



1. In a motor car having a passenger compartment with a front door and a luggage compartment, an apparatus installed in said luggage compartment comprises mechanical and electrical equipment which includes carrier means for holding a wheelchair, said equipment further including a system of telescopic levers, having a pair of hingedly connected levers, for automatically controlling the movement of the wheelchair along a predetermined path, such that the wheelchair is moved by said carrier means from the luggage compartment to a position adjacent the front door of the passenger compartment of the motor car.

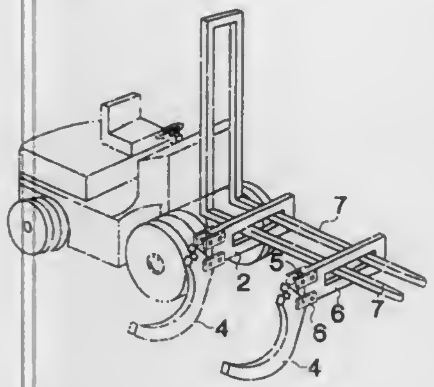
5,746,564
LIFT TRUCK SIDE LOADING ATTACHMENT

Raymond Willard McPherson, 1220 Milwaukee Ave., S. Milwaukee, Wis. 53172

Filed Feb. 10, 1997, Ser. No. 797,849

Int. Cl.^{6} B66F *9/12*

U.S. Cl. 414—607 **6 Claims**



1. An attachment apparatus for a fork lift device, having a pair of forward facing tines, which adapts the tines to carry cylindrical objects, said attachment apparatus comprising:

at least a pair of supports,

each said support having a top, bottom and two sides, thereby forming an enclosure for receiving said tines,

securing means for securing said tines to said at least a pair of supports by extending through the bottom of each said support for contacting the tines in the enclosure,

at least a pair of hinge means attached to at least one of said sides,

at least one holder having a semi-cylindrical portion for holding cylindrical objects,

one of said pair of hinge means being attached at one end adjacent said bottom and at another end to a said at least one holder,

another of said pair of hinge means being attached at one end adjacent said top and detachably secured at another end to said holder.

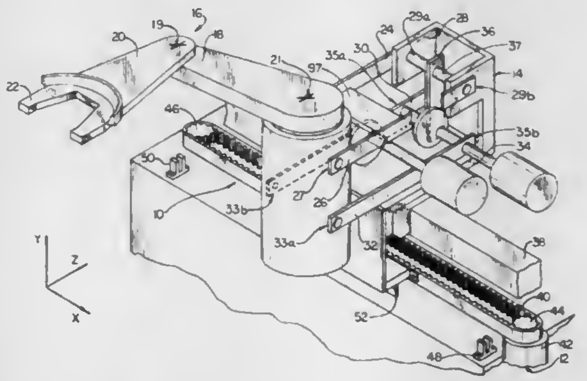
5,746,565
ROBOTIC WAFER HANDLER

Gary B. Tepolt, North Pelham, N.H., assignor to Integrated Solutions, Inc., Tewksbury, Mass.

Filed Jan. 22, 1996, Ser. No. 589,554

Int. Cl.^{6} B25J *9/06*

U.S. Cl. 414—744.5 **20 Claims**



1. A robotic wafer handler comprising:

a first drive mechanism;

a first arm portion coupled to said first drive mechanism, and drivable by said first drive mechanism through 360 degrees of rotation;

a second drive mechanism;

a second arm portion coupled to said second drive mechanism, and pivotally engaged with said first arm portion, said second arm portion drivable by said second drive mechanism through more than 360 degrees of rotation with respect to said first arm portions;

a lift mechanism coupled to said first arm portion, said lift mechanism functioning to vertically lift said first and second arm portions along a vertical axis; and

a tilt mechanism coupled to said first arm portion, said tilt mechanism functioning to tilt said first and second arm portions.

5,746,566
APPARATUS FOR A MOVING WORKPIECE

Craig E. Pfarr, Issaquah, and Norman A. Rudy, Renton, both of Wash., assignors to Design Systems, Inc., Redmond, Wash.

Filed Apr. 26, 1995, Ser. No. 429,055

Int. Cl.^{6} G25J *9/06*

U.S. Cl. 414—751 **14 Claims**

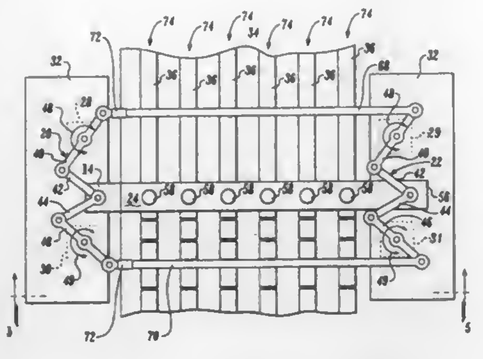
1. An apparatus for doing work to a material moving along a path relative to the apparatus, comprising:

(a) first and second guide arms, each guide arm including a first link, a last link, and at least two intermediate links disposed between the first and last links;

  the first, last, and intermediate links of the first and second guide arms pivotably connected substantially end-to-end to each other to define a multiple bar linkage arrangement;

(b) a tool mount having a first end connected to an intermediate link of the first guide arm, and a second end connected to an intermediate link of the second guide arm;

(c) first and second rotation mechanisms,



the first rotation mechanism in communication with the first guide arm at a location on the first link, the first rotation mechanism for pivoting the first link about an axis of rotation generally parallel to the axes of rotation of the rotatable connections of the first, intermediate, and last links of the first guide arm;

the second rotation mechanism in communication with the first guide arm at a location on the last link, the second rotation mechanism for pivoting the last link about an axis of rotation generally parallel to the axes of rotation of the rotatable connections of the first, intermediate, and last links of the first guide arm;

whereby rotation of the first and last links of the first guide arm causes movement of the intermediate links of the first guide arm, further causing movement of the tool mount in the path of the moving material; and

(d) synchronization means connected between the first and second guide arms;

whereby rotation of the first and second rotation mechanisms at the first guide arm causes synchronous motion of the second guide arm.

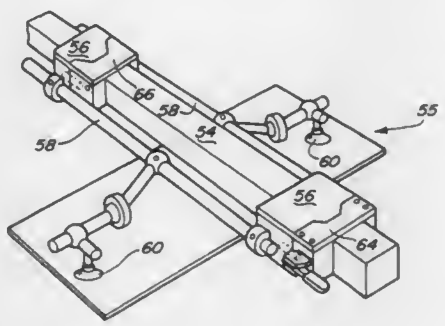
5,746,567
TOOL MOUNT FOR MOVING ELEMENTS

Alfred F. Herbermann, Ann Arbor; Jacob J. Van't Land, Ypsilanti, and Michael A. Filipiak, Ann Arbor, all of Mich., assignors to Syron Engineering & Manufacturing Corporation, Saline, Mich.

Continuation-in-part of Ser. No. 353,920, Dec. 12, 1994. This application Oct. 23, 1995, Ser. No. 546,940

Int. Cl.^{6} B25J *10/06*

U.S. Cl. 414—752 **24 Claims**



1. A tool mounting system comprising:

a generally rigid moving member to manipulate a tool;

at least one tool mounted to said tool mount at any one of an infinite number of positions; and

a pair of elongate tool mounts fixed to said moving member adjacent each axial end of each said tool mount extending parallel to a longitudinal axis of said moving member and connected by saddle bracket members extending laterally across said moving member.

5,746,568
ARTICLE COMBINING DEVICE

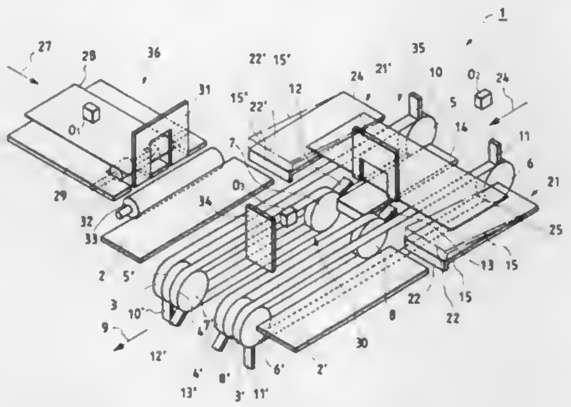
Hiroshi Ogawa; Seiichi Sugita, and Toshio Sato, all of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan

Filed Apr. 5, 1996, Ser. No. 628,312

Claims priority, application Japan, Apr. 7, 1995, 7-082744

Int. Cl.^{6} B65H *29/38*

U.S. Cl. 414—789.6 **4 Claims**



1. An article combining device, comprising:

an article combining portion where articles are placed;

article carrying-in means having a plural number of article carrying-in paths for carrying articles into the article combining portion, the direction of carrying-in articles from the plural number of article carrying-in paths into the article combining portion intersecting at the article combining portion, and said article carrying-in means superposing the plural number of articles received from the article carrying-in paths one upon another in the article combining portion:

article carrying-in control means for adjusting the order of carrying-in articles from the article carrying-in paths into the article combining portion in accordance with information for designating the order of superposing the articles;

blocking means, provided in an exit portion of at least one of the plural number of article carrying-in paths, for blocking the advancement of the article from the exit portion to the article combining portion to thereby stack the plural number of incoming articles in the exit portion;

article sensing means, provided in each of the exit portions, for detecting a kind of the articles, the advancement of which is blocked in the exit portion by the blocking means; and

carrying-in preparation/control means operating such that, in accordance with information for designating a plural number of articles to be carried into the article combining portion from the individual article carrying-in paths having the article sensing means provided therein, the carrying-in preparation/control means judges that the plural number of articles have been stacked in the exit portion, by a signal derived from the article sensing means, and then releases the articles from their state being blocked by the blocking means, to thereby allow the plural number of articles to be carried into the article combining portion.

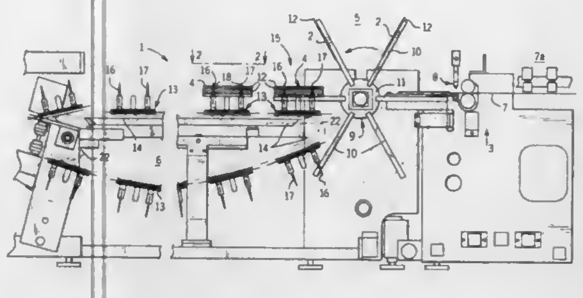
5,746,569
BAG FORMING MACHINE HAVING ADJUSTABLE SUPPORT STRUCTURE FOR PAIRED WORK ELEMENTS

Michael J. Smith, and Giles R. Blaser, both of Green Bay, Wis., assignors to Amplas, Inc., Green Bay, Wis.

Filed Feb. 13, 1996, Ser. No. 600,341

Int. Cl.^{6} B31B *01/94;23/14*

U.S. Cl. 414—790.4 **14 Claims**



1. In a bag forming machine having a web passed through a bag forming line, said line having at least one work station having at least two aligned first and second working members for working of each bag, an adjustable support structure for presetting the spacing between said working members, said adjustable support structure comprising a slide assembly having a common support track member extending longitudinally of the web, said track member having a plurality of spaced locking elements longitudinally spaced along the track member, a first slide member and a second slide member mounted on said track member and each independently movable along the length of the track member for alignment with said spaced locking elements, said first and second slide members adapted to be connected to said first and second working members respectively, each slide member having a single manually operated locking element aligned with said spaced locking elements on said track member, said manually operated locking element being manually operable for selective manual release and engagement with an aligned locking element of said track member for quick and accurate readjusting and placement of the slide members in alignment with a predetermined one of said spaced locking elements for orienting of said working members in a corresponding spacing from each other.

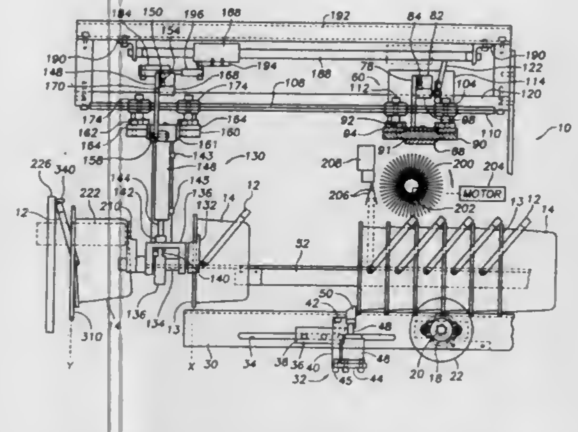
5,746,570
APPARATUS FOR POSITIONING A HANDLE OF A PAIL FOR A PRINTING OPERATION ON THE PAIL

Mieczyslaw Gujda, Elmwood Park; Pieter S. van der Griendt, Far Hills, and James W. Dominico, West Paterson, all of N.J., assignors to Polytype America Corporation, Union City, N.J.

Filed Oct. 15, 1996, Ser. No. 730,350

Int. Cl.^{6} B65G *59/10*

U.S. Cl. 414—795.6 **20 Claims**



1. An apparatus for positioning a handle of a pail for a printing operation on the pail, said apparatus comprising:

a mandrel assembly for rotatably supporting a pail thereon, said mandrel assembly including a backstop;

a retainer band mounted to said backstop; and

a helix member mounted to said backstop at a position different from said retainer band and engaging a handle of the pail during rotation of the pail on the mandrel assembly so as to automatically move said handle to a position within and releasably engaged by said retainer band.

5,746,571
PROCESS FOR THE INITIAL OPERATION OR CHANGEOVER OF A SHEET METAL PROCESSING MACHINE AND A MODULAR MAGAZINE FOR CARRYING OUT THE PROCESS

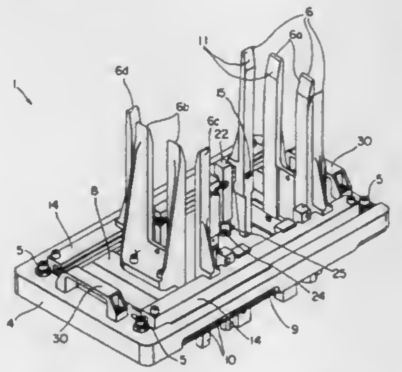
Roland Dietschi, Unterlunkhofen, and Gideon Levy, Orselina, both of Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Filed Nov. 27, 1995, Ser. No. 563,223

Claims priority, application Switzerland, Nov. 28, 1994, 03-575/94; Dec. 22, 1994, 03-881/94

Int. Cl.^{6} B65G *59/06*

U.S. Cl. 414—795.7 **13 Claims**



1. Process for initial operation or changeover of a sheet metal processing machine for sheet metal blanks which are to be processed and have one or more predetermined characteristics, wherein the sheet metal blanks to be processed are individually fed from a magazine having a frame by means of a separating device which transports them to a processing station, comprising the steps of:

presetting one or more operating parameters of at least one auxiliary device of a modular and portable magazine for sheet metal blanks, the at least one auxiliary device being mounted to the frame of the magazine, the magazine having the at least one auxiliary device for the separation of the sheet metal blanks, the one or more operating parameters of the at least one auxiliary device having been preset to an operative condition to suit the characteristics of the sheet metal blanks to be processed; and

installing the modular and portable magazine to the sheet metal processing machine by joining the frame to the sheet metal processing machine.

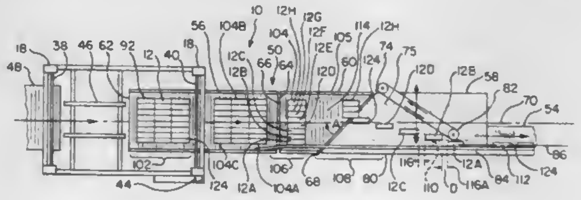
5,746,572
CONVEYING APPARATUS AND METHODS OF USE

Ernest P. Winski, Oshkosh, Wis., assignor to Goldco Industries, Inc., Loveland, Colo.

Continuation-in-part of Ser. No. 672,314, Mar. 20, 1991, Pat. No. 5,299,691, which is a continuation-in-part of Ser. No. 449,235, Dec. 6, 1989, Pat. No. 5,255,028, which is a continuation of Ser. No. 102,386, Sep. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 888,511, Jul. 23, 1986, abandoned. This application Mar. 18, 1994, Ser. No. 214,432

Int. Cl.^{6} B65G *59/02*

U.S. Cl. 414—796.3 **74 Claims**



19. An apparatus, comprising:

(a) an unloading station for removing units of material from a supporting surface; and

(b) a conveyor system, for receiving the units of material removed from the supporting surface, said conveyor system having a length, and a path of travel, and comprising a converting conveyor assembly, for receiving the units, and for converting a group of the units of material into a line advancing single file, said converting conveyor assembly comprising

(i) a removal conveyor, for receiving the units of material from said unloading station, and for driving the units of material in groups, each such group advancing along said converting conveyor assembly in a first drive zone, at a first drive speed, and

(ii) an accelerating conveyor, for accelerating the speed of travel of units of material along the path of travel of said conveyor system, whereby each unit of material is accelerated into sole occupation of a discrete portion of the length of said conveyor system while maintaining its position across the transverse dimension of said conveyor system.

5,746,573

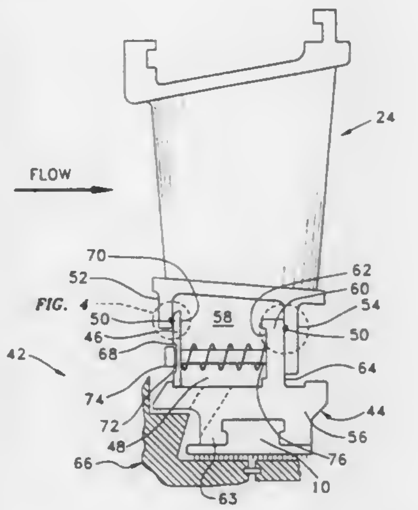
VANE SEGMENT COMPLIANT SEAL ASSEMBLY

John Edward Junkin, Orlando, and George Joseph Robinson, Oviedo, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1996, Ser. No. 775,823

Int. Cl.^{6} F04D *29/38*

U.S. Cl. 415—115 **9 Claims**



1. A vane segment compliant seal assembly, said assembly comprising;

a seal housing adapted to adjustably receive a baffle plate, said housing having an outer wall adapted to be in sealing communication with a vane segment rail and securely mounted within a combustion turbine;

a baffle plate adapted to be in sealing communication with a vane segment rail, said baffle plate adjustably mounted within said housing to move from a first position to a second position relative to a vane rail; and

at least two compliant seals, said compliant seals adapted to be securely mounted between said seal housing outer wall and a vane segment rail, and between said baffle plate and a vane segment rail.

5,746,574

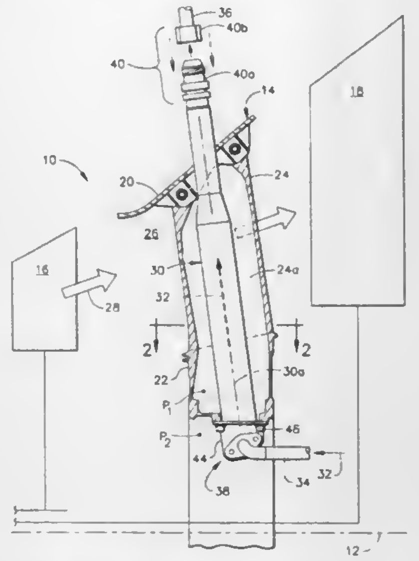
LOW PROFILE FLUID JOINT

Robert P. Czachor, Cincinnati, and Robert E. Jones, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 27, 1997, Ser. No. 863,133

Int. Cl.^{6} F01D *5/14*

U.S. Cl. 415—115 **12 Claims**



1. A gas turbine engine frame comprising:

an outer casing;

a hub disposed coaxially with said casing and spaced radially inwardly therefrom;

a plurality of circumferentially spaced apart, hollow struts extending radially between said casing and hub and defining therebetween a flowpath for channeling engine gases;

an elongate strut tube having a longitudinal axis, and extending radially through a first one of said struts;

said strut tube having a closed distal end, and an annular sideseat spaced radially from said distal end and disposed substantially perpendicularly to said longitudinal axis to define a flow orifice;

a secondary tube having a ballnose at a distal end thereof disposed in abutting contact with said sideseat for channeling fluid therethrough; and

a fastener joining together said strut and secondary tubes in compression between said ballnose and sideseat to maintain sealed contact therebetween and defining a fluid joint for channeling said fluid between said strut and secondary tubes.

5,746,575

BLOOD PUMP AS CENTRIFUGAL PUMP

Dieter Westphal, Woerthsee; Helmut Reul, Dueren, and Guenter Rau, Aachen, all of Germany, assignors to Baxter International, Inc., Deerfield, Ill.

PCT No. PCT/EP94/02049, § 371 Date Dec. 22, 1995, § 102(e) Date Dec. 22, 1995, PCT Pub. No. WO95/00185, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 23, 1994, Ser. No. 569,098

Claims priority, application Germany, Jun. 25, 1993, 43 21 260.3

Int. Cl.^{6} F04D *29/04*

U.S. Cl. 415—206 **12 Claims**

1. A pump comprising a pump housing having

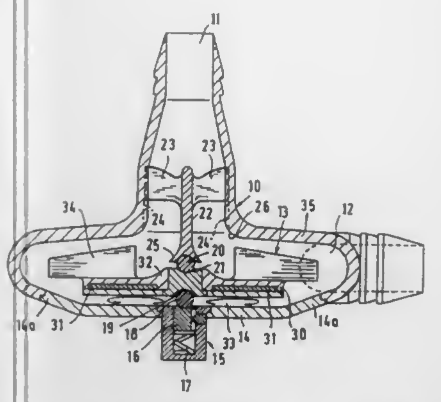
an axial inlet;

a tangential outlet;

a front wall;

a back wall;

an impeller rotatably supported in said pump housing, said impeller comprising



a plate having a back side arranged at a substantially constant distance from the back wall of said pump housing,

blades projecting from the plate and beyond the plate in a radially outward direction, said blades having a height that decreases in the radially outward direction;

wherein the front wall of said pump housing extends substantially parallel to the plate of said impeller and the back wall of said pump housing includes a circumferential sloping portion located beyond the plate and defining a transition to the tangential outlet.

5,746,576

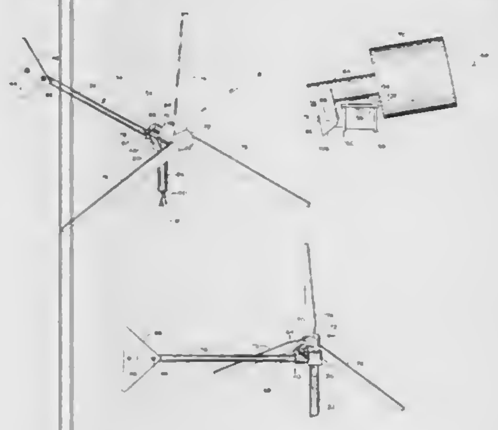
WIND ENERGY CONVERSION DEVICE WITH ANGLED GOVERNING MECHANISM

Elliott Bayly, Duluth, Minn., assignor to World Power Technologies, Inc., Duluth, Minn.

Filed Oct. 15, 1996, Ser. No. 662,995

Int. Cl.^{6} F03B *7/00*

U.S. Cl. 416—16 **25 Claims**



1. A wind energy conversion apparatus including:

(a) a rotor shaft;

(b) a propeller structure mounted to the rotor shaft for transferring a wind-induced torque to the rotor shaft to rotate the rotor shaft about a drive axis and provide a wind-induced thrust acting along the drive axis;

(c) a support assembly for supporting the rotor shaft, comprised of:

i. a support frame mounted to pivot on a substantially vertical yaw axis;

ii. a bushing structure supporting the rotor shaft for rotation on the drive axis;

iii. a speed-governing coupling for mounting the bushing structure to pivot relative to the support frame about a governing axis, in first and second opposite arcuate directions respectively toward and away from a normal operating position in which a vertical plane containing the drive axis is substantially parallel to a wind direction, wherein the governing axis is laterally offset from the drive axis, inclined at least about 20 degrees from the horizontal, and is inclined from the vertical to bias the bushing structure in the first arcuate direction toward the normal operating position due to gravity; and

iv. a first stop means for preventing travel of the bushing structure in the first arcuate direction beyond the normal operating position; and

(d) a tail assembly mounted to the support assembly and extending away from the support assembly along a tail axis, said tail assembly tending to seek a selected angular alignment relative to a direction of the wind, and thereby tending to pivot the support assembly about the yaw axis toward a selected angular alignment relative to said wind direction.

25. A wind energy conversion apparatus, including:

a support frame mounted to pivot on a substantially vertical yaw axis;

a tail assembly mounted to the support frame and extending away from the support frame along a tail axis, for causing the support frame to pivot about the yaw axis toward a selected angular alignment relative to a wind direction, thereby tending to maintain the support frame in the angular alignment;

a rotor shaft, and a bushing structure supporting the drive shaft for rotation about a substantially horizontal drive axis, and a propeller structure mounted to the rotor shaft for transferring a wind-induced torque to the drive shaft to rotate the rotor shaft about the drive axis;

a speed-governing coupling for mounting the bushing structure to pivot relative to the support frame about a governing axis, in first and second opposite arcuate directions respectively toward and away from a normal operating position in which the drive axis is parallel to a vertical plane that contains the tail axis, wherein the governing axis is laterally offset from the drive axis, inclined at least about 20 degrees from the horizontal, and inclined from the vertical to bias the bushing structure in the first arcuate direction toward the normal operating position due to gravity; and

a first stop means integral with the support frame for preventing travel of the bushing structure in the first arcuate direction beyond the normal operating position.

5,746,577

CENTRIFUGAL-TYPE BLOWER

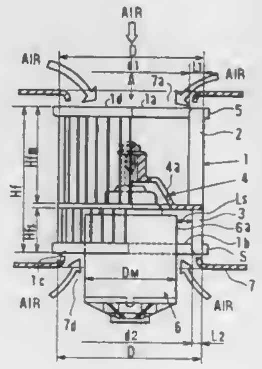
Koji Ito, Nagoya; Teruhiko Kameoka, Okazaki; Kouji Matsunaga, Kariya, and Kazutoshi Kuwayama, Nakashima-gun, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Feb. 11, 1997, Ser. No. 797,728

Claims priority, application Japan, Feb. 14, 1996, 8-027031

Int. Cl.^{6} F04D *29/38*

U.S. Cl. 416—178 **9 Claims**



1. A centrifugal-type blower comprising:

a centrifugal-type multiple-vane fan having a plurality of vanes formed circumferentially for sucking air from first and second open ends in an axial direction thereof and blowing air radially outwardly;

a motor having a motor body portion for driving said fan;

- a boss plate disposed between said first and second ends of said fan for connecting said plurality of vanes and transmitting a driving force generated by said motor to said plurality of vanes; and
- a casing for accommodating said fan, wherein:
- said motor body portion of said motor is inserted into said fan from said first end of said fan, said motor body portion being supported in said first end;
- said fan has a uniform outer diameter (D) throughout an entire length thereof in the axial direction of said fan; and
- an inner diameter (d_2) of said fan between said boss plate and said first end is greater than an inner diameter (d_1) of said fan between said boss plate and said second end.

5,746,578

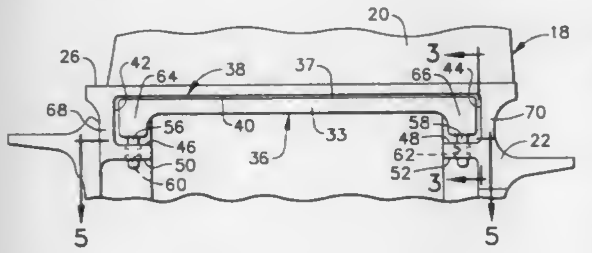
RETENTION SYSTEM FOR BAR-TYPE DAMPER OF ROTOR

Steven R. Brassfield, Cincinnati, and Alan L. Webb, Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 11, 1996, Ser. No. 728,711

Int. Cl.^{6} F01D *5/10*

U.S. Cl. 416—190 **14 Claims**



12. A rotor assembly for a gas turbine engine, comprising:

(a) a rotor disk including means for receiving a root portion of a rotor blade arranged on the outer circumference of said rotor disk;

(b) at let one rotor blade, comprising:

- (1) a root portion received by said receiving means of said rotor disk;
- (2) a platform portion connected to said root portion and having a damper pocket formed therein, said damper pocket having a substantially triangular cross-section and including:
  - (a) a rear surface having an upper portion and a lower portion at an angle to said upper portion;
  - (b) a pair of spaced side surfaces; and
  - (c) a pair of spaced, substantially coplanar lower surfaces extending from said rear surface lower portion, said damper pocket lower surfaces being provided by a first blade tab extending laterally inward from one of said side surfaces and a second blade tab extending laterally inward from the other of said side surfaces;
- (3) an airfoil portion connected to said platform portion;
- (4) a generally bar-shaped damping member loosely arranged in said damper pocket having at least one scrubbing surface, said bar-shaped damping member further comprising first and second legs extending from opposite ends of said bar-shaped damping member through said first and second blade tabs, respectively, so as to retain said bar-shaped damping member within said damper pocket.

5,746,579

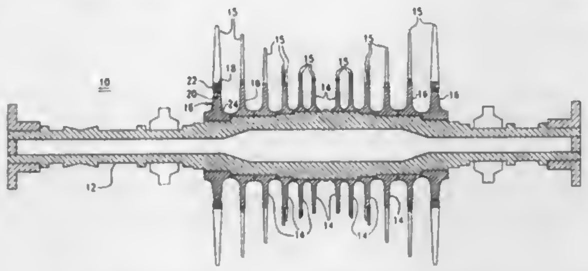
STRESS CORROSION RESISTANT RIMS AND DISCS FOR STEAM TURBINE ROTORS DEVICE AND METHOD

Dennis Ray Amos, Rock Hill, S.C.; Sallie Ann Bachman, Oviedo, and Jianqiang Chen, Winter Springs, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1996, Ser. No. 775,075

Int. Cl.^{6} F04D *29/34*

U.S. Cl. 416—204 A **13 Claims**



1. A rim for a formed disc of a low pressure steam turbine rotor, the rim comprising an alloy having a chromium content between approximately 9% and 17%, the rim being attachable to a perimeter surface of an unformed disc.

5,746,580

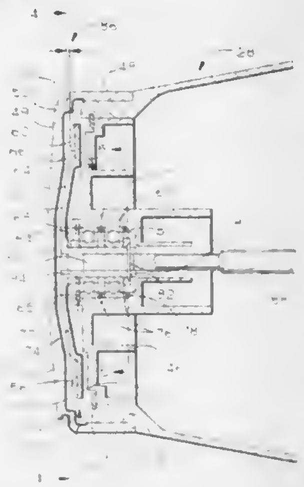
ELECTROMAGNETIC HEATING DEVICES, PARTICULARLY FOR RAM AIR TURBINES

Barry John Parker; Alexander Krinickas; John Douglas Stilwell, all of Rockford, and Neil Leonard Brown, Stillman Valley, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 161,765, Dec. 2, 1993, Pat. No. 5,558,495. This application Jun. 28, 1996, Ser. No. 671,865

Int. Cl.^{6} F04D *29/18*

U.S. Cl. 416—245 R **22 Claims**



1. A rotary device for movement about a longitudinal axis in an air stream, comprising:

- a forward portion having a leading surface for receiving initial impingement of air moving within said air stream, said forward portion including electromagnetic means for inducing a flow of current in said forward portion, said flow of current creating heat adapted to melt ice tending to form on said forward portion due to passage of said forward portion through said air stream,
- a lip extending radially from said leading surface, and
- a recess formed longitudinally downstream from and adjacent to said lip, said recess separating said forward portion from a rearward portion downstream of said forward portion and thereby isolating said heat to said forward portion to more effectively melt said ice,
- said recess being radially inward from said lip.

5,746,581

METHOD AND APPARATUS FOR EVACUATING VACUUM SYSTEM

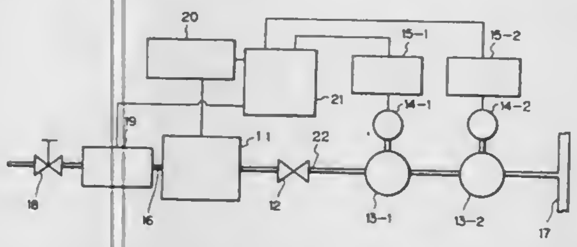
Katsuya Okumura, Pouhkeepsie, N.Y.; Yuuichi Mikata; Manabu Tsujimura, both of Kanagawa-ken, Japan, and Yoshio Ando, Kanagawa-ken, Japan, assignors to Ebara Corporation, Tokyo, and Kabushiki Kaisha Toshiba, Kawasaki-shi, both of Japan

Filed Jun. 6, 1995, Ser. No. 468,325

Claims priority, application Japan, Jun. 28, 1994, 6-170301; May 23, 1995, 7-149503

Int. Cl.^{6} F04B *41/06;49/00*

U.S. Cl. 417—2 **18 Claims**



1. An apparatus for evacuating a vacuum system which includes an evacuating portion, the apparatus comprising first and second vacuum pumps which are connected in series, in that said apparatus including a controller for operating said first vacuum pump in a range from reverse rotation to forward rotation, and for rotating said second vacuum pump unidirectionally.

5,746,582

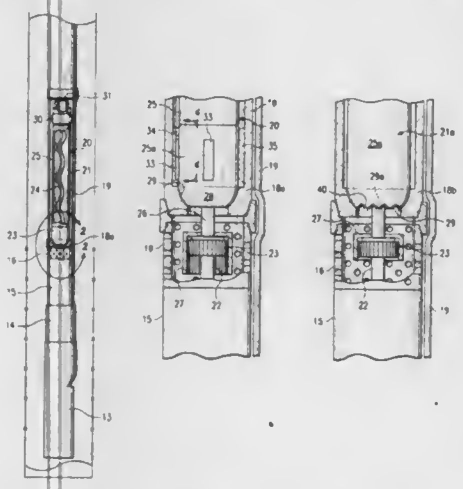
THROUGH-TUBING, RETRIEVABLE DOWNHOLE SUBMERSIBLE ELECTRICAL PUMP AND METHOD OF USING SAME

John C. Patterson, Garland, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 23, 1996, Ser. No. 717,985

Int. Cl.^{6} F04B *17/03*

U.S. Cl. 417—53 **13 Claims**



1. A method for lifting fluids from a subterranean formation to the surface through a wellbore which penetrates said formation, said method comprising:

- lowering a string of tubing down said wellbore to a point substantially adjacent said formation, said tubing having an electrical motor secured to the lower end thereof and a pump unit therein which is releasably connected to said motor; and
- retrieving said pump unit to the surface through said tubing when said pump unit needs servicing or replacing without removing said tubing.

5,746,583

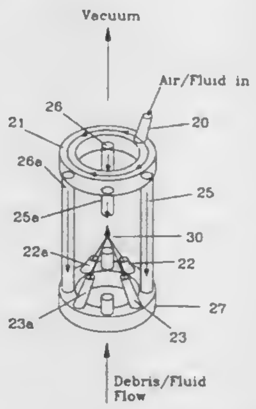
VACUUM BOOST DEVICE

Scott Spear, P.O. Box 295233, Lewisville, Tex. 75029-5233

Continuation of Ser. No. 375,307, Jan. 20, 1995, abandoned. This application Feb. 29, 1996, Ser. No. 610,071

Int. Cl.^{6} F04F *5/16;5/44*

U.S. Cl. 417—197 **6 Claims**



1. A vacuum boost device used in conjunction with a vacuum truck system for moving material a vertical distance, comprising:

- a housing, having first, second, and third housing parts sequentially connected, end to end, to each other, and having an internal channel through the housing through which a vacuum is drawn;
- a first annular channel in said housing formed from a circular cavity in said first part of said housing, and enclosed by an end of said second part;
- a second annular channel formed from a circular cavity in an end of said second cylindrical part and enclosed by an end of said third cylindrical part;
- an inlet in said third part for injecting a fluid into said second annular channel;
- a first plurality of linear channels connecting said first and second annular channels through the length of said second housing part; and
- a plurality of jet-outlets connected to said first annular channel directing the fluid introduced into said inlet into said internal channel.

5,746,584

INNER CAM TYPE FUEL INJECTION PUMP HAVING MODIFIED PLUNGERS

Hisashi Nakamura; Kenichi Kubo; Jun Matsubara; Kazuaki Narikiyo; Hajime Machida; Noriyuki Abe; Tsunayoshi Motoyoshi, and Atsushi Ueda, all of Higashimatsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Mar. 6, 1996, Ser. No. 611,670

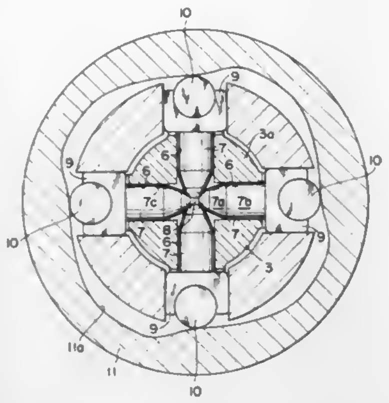
Claims priority, application Japan, Mar. 13, 1995, 7-080716

Int. Cl.^{6} F04B *19/00*

U.S. Cl. 417—273 **14 Claims**

1. An inner cam type injection pump comprising:

- a pump housing;
- a rotor rotatably supported in said pump housing, said rotor defining an interior compression space, a fluid passage communicating with said compression space to allow fluid to flow in and out of said compression space, and a plurality of plunger cylinders extending radially from said compression space and lying in a common radial plane, said plunger



cylinders being uniformly spaced about a central axis of said rotor and each of said plunger cylinders has a first end remote from said compression space and a second end opening into said compression space;

a plurality of plungers slidably disposed in said plunger cylinders, respectively, each of said plungers comprising a base portion disposed in sliding contact with an inner surface of said respective plunger cylinder, and a protruding portion extending inwardly from said base portion,

wherein a shoulder portion is formed on each of said plungers by a transition from said base portion to said protruding portion, each of said protruding portions has a cross section which becomes smaller toward a front end thereof so as to prevent collisions between shoulder portions of said plungers, and said plungers which are oppositely disposed have the same shape;

and an inner cam concentrically disposed about said rotor, said inner cam having a cam surface formed on an inner side thereof for engaging said plungers to, upon rotation of said rotor, simultaneously move said plungers toward said compression space to an innermost position, wherein each of said shoulder portions of said plungers is located within said respective cylinder and is spaced from said second end of said respective cylinder at said innermost position, and said plungers are shaped to contact only at said front ends having said smaller cross section when at said innermost position.

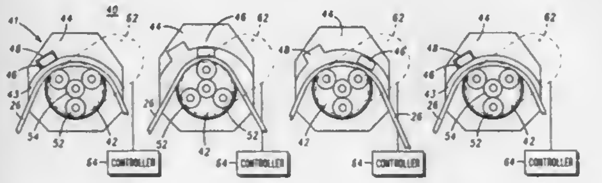
5,746,585
PERISTALTIC PUMP AND METHOD IN A PERISTALTIC PUMP FOR ADVANCING A TUBE FROM A FIRST POSITION TO A SECOND POSITION

Kevin J. McDunn, Lake in the Hills; Linda Limper-Brenner, Glenview, and Minoo D. Press, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1996, Ser. No. 775,325

Int. Cl.⁶ F04B *43/08*

U.S. Cl. 417—477.11 **16 Claims**



1. A peristaltic pump comprising:

a motor; and

an assembly driven by the motor, the assembly comprising:

a rotating member;

a retaining member having a slot; and

a tubing advance pad sized to be substantially disposed in the slot,

wherein in a first time interval the tubing advance pad is substantially disposed in the slot and the rotating member is configured to compress a tube along a path defined by the retaining member and at least a portion of the tubing advance pad, and in a second time interval the retaining member is configured to release the tubing advance pad from the slot, the tubing advance pad is coupled to the rotating member and the tube is prepared to advance from a first position to a second position.

5,746,586
SCROLL COMPRESSOR HAVING POSITIONING MEANS FOR AXIALLY MOVABLE NON-ORBITING SCROLL

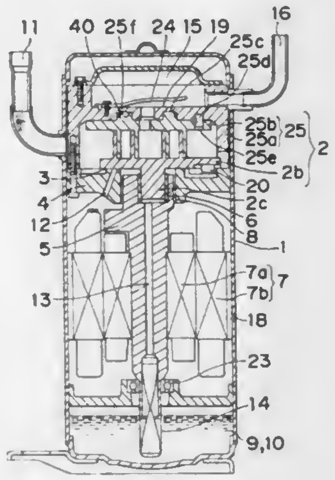
Hiroyuki Fukuhara; Sadayuki Yamada, both of Otsu, and Shigeru Muramatsu, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 17, 1996, Ser. No. 682,263

Claims priority, application Japan, Jul. 18, 1995, 7-181295

Int. Cl.⁶ F04C *18/04*

U.S. Cl. 418—55.2 **28 Claims**



1. A scroll compressor having a closed vessel, a compression mechanism accommodated in the closed vessel and including a non-orbiting scroll and an orbiting scroll in engagement with each other, and a drive mechanism for driving the compression mechanism, wherein:

said non-orbiting scroll comprises a frame portion and a non-orbiting end plate axially movable relative to said frame portion;

said frame portion has a first recess defined therein and a pin secured thereto;

said non-orbiting end plate has a cylindrical wall integrally formed therewith and loosely received in said first recess, thereby radially positioning said non-orbiting end plate relative to said frame portion;

said non-orbiting end plate has a second recess defined therein in which said pin is loosely received, thereby circumferentially positioning said non-orbiting end plate relative to said frame portion; and

said pin is itself hardened so as to have a Rockwell hardness of more than 35 on a scale C, and has a chemical compound layer deposited thereon.

5,746,587
LIGHTER ATTACHABLE TO A CIGARETTE PACKET

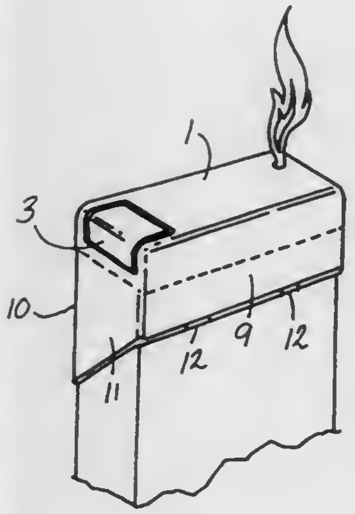
Roland Racine, deceased, late of Avully; by Francine Racine, legal representative, 40 rue de Geneve, 1225 Chene-Bourg, Geneva, and Gian Lanoir, 40 route de Chene, CH-1225 Chene-Bourg, all of Switzerland

PCT No. PCT/EP91/02463, § 371 Date Apr. 26, 1995, § 102(e) Date Apr. 26, 1995, PCT Pub. No. WO92/10950, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 17, 1991, Ser. No. 104,145

Int. Cl.⁶ A24F *15/18*

U.S. Cl. 431—253 **6 Claims**



1. A lighter adapted to receive and retain in a detachable manner a cigarette packet having an upper flap, the lighter comprising a lighter body forming a parallelepiped comprising an upper surface and a pair of long sides formed integral with the upper surface and extending parallel to a longitudinal axis of the upper surface and a pair of relatively shorter sides formed integral with the upper surface and extending parallel to a transverse axis of the upper surface, at least two parallel sides of the lighter body being extended to receive the cigarette packet, one of the at least two extended sides being extended by a predefined distance and another of the at least two extended sides being extended by a distance greater than the predefined distance to receive the cigarette packet, the at least two extended sides having a predetermined elasticity and provided with grips for holding the cigarette packet, whereby the lighter can be fitted onto an upper flap of the cigarette packet and retained on the cigarette packet.

5,746,588
DUAL INLET GAS BURNER

Dan Binzer, 13120 76th Avenue, Surrey, British Coumbia, Canada, V3W 2V6

Filed Mar. 1, 1996, Ser. No. 609,355

Int. Cl.⁶ F23D *14/10*

U.S. Cl. 431—354 **6 Claims**

1. A substantially elongated gas fireplace burner, said burner comprising a substantially hollow enclosure comprising:

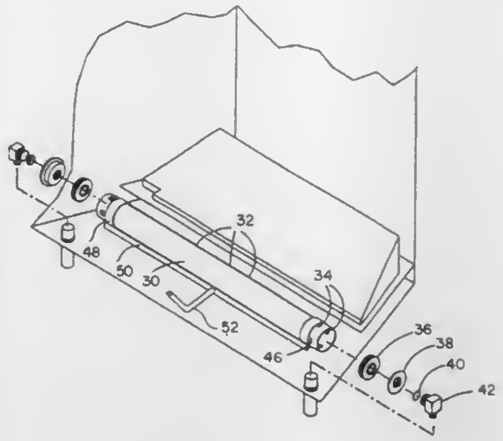
at least one gas inlet;

at least one air inlet;

at least two apertures which vent a gas and air mixture from a first position and a second position, respectively, on the burner;

means for selectively moving a maximum flame emanating from the burner enclosure between said first position and said second position; and

at least two venturis disposed between said air inlet and said two apertures which vent a gas and air mixture, and



wherein said moving means is adapted to restrict the flow of air through the air inlet to a varying degree according to the position of the moving means.

5,746,589
PHOSPHOR HEAT-TRANSFER METHOD AND APPARATUS THEREFOR

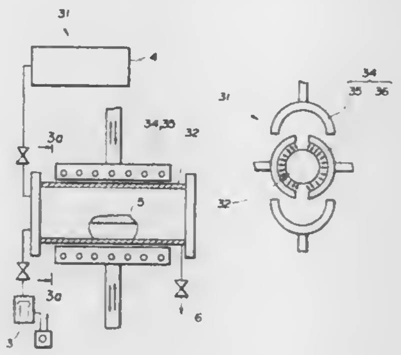
Shigeo Itoh; Yoshihisa Yonezawa; Hitoshi Toki, and Yoshitaka Satoh, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Chiba-ken, Japan

Filed May 11, 1995, Ser. No. 439,272

Claims priority, application Japan, May 11, 1994, 6-097585

Int. Cl.⁶ F27D *15/02*

U.S. Cl. 432—77 **10 Claims**



1. A phosphor heat-treating apparatus, comprising:

a closed vessel constructed so as to hold atmosphere gas at a pressure of 5×10^6 to 1×10^9 Pa therein, said closed vessel having a heat-treating zone for heat-treating a phosphor received in said vessel, a cooling zone for cooling said phosphor, and means for introducing said atmosphere gas into said closed vessel and maintaining said atmosphere gas at said pressure;

a heating means for heating said phosphor received in said vessel in said heat-treating zone, said heating means being operatively positioned with said heat treating zone;

a processing means for rapidly cooling the heated phosphor in said cooling zone at a cooling speed of 100° C./sec or more, said processing means being operatively positioned with said cooling zone; and

means for transferring said heated phosphor from said heating zone to said cooling zone for rapid cooling, said transferring means including a tray on which said phosphor is carried and a conveying device on which said tray is mounted, said conveying device being formed to alternatingly move said tray between one of said heat treating zone and said cooling zone.

5,746,590
HEATING CHAMBER WITH INNER HEATING TUBES AND METHOD OF REPLACING THE HEATING TUBES

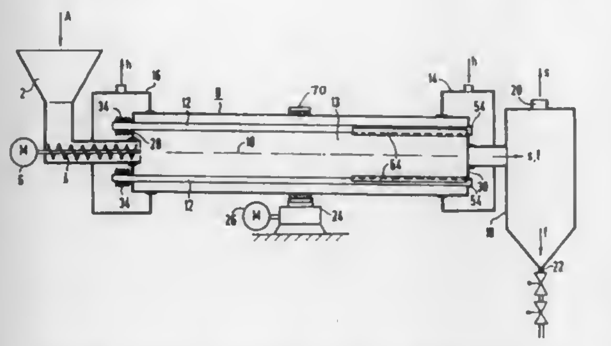
Karl May, Bad Vilbel; Hartmut Herm, Dreieich, and Karlheinz Unverzagt, Seligenstadt, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 9, 1996, Ser. No. 599,384

Claims priority, application Germany, Aug. 9, 1993, 43 26 678.9

Int. Cl.^{6} F27B *7/10*

U.S. Cl. 432—114 **12 Claims**



1. Heating chamber rotatable about a longitudinal axis thereof and having a plurality of heating tubes located in the interior thereof for heating the interior of said heating chamber, a first end plate to which each of the heating tubes is secured by an end thereof, a second end plate to which each of the heating tubes is secured by the other end thereof, at least one of the ends of each of the heating tubes protruding through a respective opening formed in at least one of the end plates, and a respective collar outside the heating chamber for connecting the at least one end of the respective heating tubes to the outer surface of at least one end plate, comprising a respective reduced diameter portion formed in each of the heating tubes, the heating tubes being spaced from one another a greater distance at the at least one end plate than in the interior of the heating chamber.

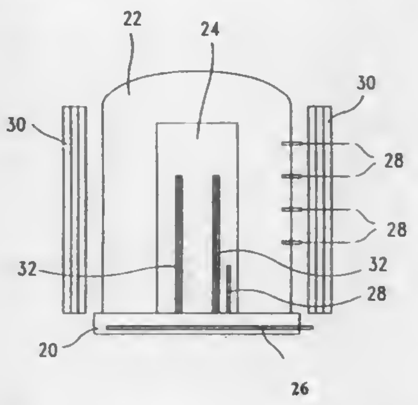
5,746,591
SEMICONDUCTOR FURNACE FOR REDUCING PARTICULATES IN A QUARTZ TUBE AND BOAT

Liang-Gi Yao, Taipei, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Aug. 15, 1996, Ser. No. 700,739

Int. Cl.^{6} F27D *3/12*

U.S. Cl. 432—241 **16 Claims**



1. An improved semiconductor furnace system that reduces particles in a quartz tube and wafer boat, said system comprising:

a bottom plate;

a quartz furnace tube set on said bottom plate;

a wafer boat set on said bottom plate and inside said furnace tube for holding said semiconductor wafers;

first heating means set outside of said furnace tube for providing heat to said furnace tube;

cooling water means set in said bottom plate for cooling down the temperature of said system;

first temperature detecting means responsive to the temperature inside of said wafer boat;

second temperature detecting means responsive to the temperature inside of said furnace tube and outside of said wafer boat; and

second heating means set inside of said wafer boat for providing heat to lower the temperature gradient between said first temperature detecting means and said second temperature detecting means during a heating or a cooling cycle during a phase transformation point of said quartz tube.

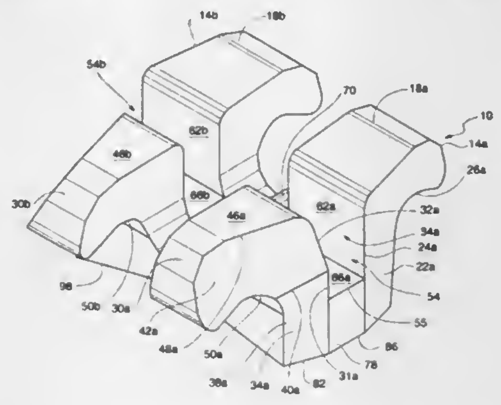
5,746,592
EDGEWISE ORTHODONTIC BRACKET WITH TIE WING RELIEF FOR ENHANCING LIGATURE REMOVAL

Hiroshi Nezu, Kawasaki, and Kenji Nagata, Kyoto, both of Japan, assignors to RMO, Inc., Denver, Colo.

Filed Sep. 5, 1996, Ser. No. 708,769

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—8 **36 Claims**



1. An edgewise orthodontic bracket having mesial and distal ends, comprising:

(a) a first pair of tie wings comprising a first tie wing tip and a second tie wing tip;

(b) a generally mesio-distally extending archwire slot for receiving an archwire disposed between said first tie wing tip and said second tie wing tip of said first pair of tie wings, said archwire slot comprising a bottom wall and first and second spaced sidewalls extending labially away from said bottom wall, said archwire slot further comprising a first end which is disposed on one of said mesial end and said distal end of said bracket, said first sidewall of said archwire slot extending labially from said bottom wall a first distance at said first end and said second sidewall extending labially from said bottom wall a second distance at said first end, said first and second distances being different; and

(c) a ligature which is designed to contact said first pair of tie wings in order to hold said archwire in said archwire slot;

wherein said first tie wing tip includes relief disposed below said archwire for enhancing ligature removal by providing a space between said bracket and said ligature to allow a ligature cutter to effectively engage said ligature.

5,746,593
ORTHODONTIC DEVICE MADE OF METAL

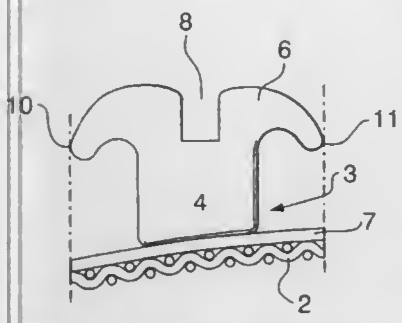
Rolf Forster, Pforzheim, Germany, assignor to Bernhard Forster GmbH, Pforzheim, Germany

Filed Sep. 23, 1996, Ser. No. 725,227

Claims priority, application Germany, Sep. 21, 1995, 195 35 095.2

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—8 **16 Claims**



1. An orthodontic attachment or bracket made of metal and consisting of a foot section which is made of titanium or of a corrosion-resistant alloy consisting substantially of titanium, for bonding to a tooth; and a functional section made of stainless steel which is mounted on said foot section.

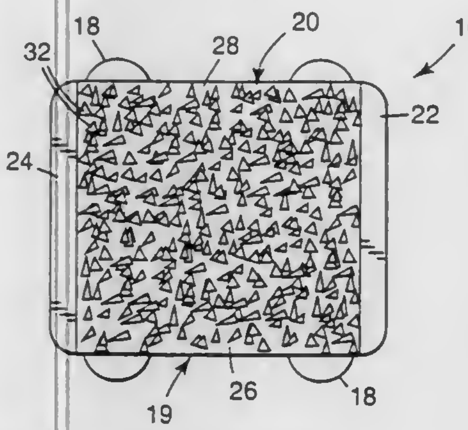
5,746,594
ORTHODONTIC APPLIANCE WITH ASYMMETRIC BONDING STRUCTURE

Russell A. Jordan, Rancho Cucamonga, and James D. Hansen, Duarte, both of Calif., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Mar. 5, 1996, Ser. No. 611,120

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—9 **27 Claims**



1. An orthodontic appliance comprising:

a non-plastic body having wall sections defining a slot for receiving an archwire; and

bonding structure connected to said body for bonding said body to a tooth, said bonding structure including an imperforate base extending in a reference plane that matches the contour of the tooth and having a mesial edge, a distal edge, a gingival edge and an occlusal edge, said base also having a mesial edge portion, a distal edge portion, a gingival edge portion and an occlusal edge portion, said mesial edge portion, said distal edge portion, said gingival edge portion and said occlusal edge portion extending along the entire extent of said mesial edge, said distal edge, said gingival edge and said occlusal edge respectively, each of said mesial edge portion, said distal edge portion, said gingival edge portion and said occlusal edge portion having equal areas extending along said reference plane and being devoid of grooves extending inwardly from said reference plane toward said body, wherein said bonding structure includes first means for bonding said mesial edge portion to the tooth with a first bond strength value, second means for bonding said distal edge portion to the tooth with a second bond strength value, third means for bonding said gingival edge portion to the tooth with a third bond strength value and fourth means for bonding said occlusal edge portion to the tooth with a fourth bond strength value, and wherein at least one of said first bond strength value, said second bond strength value and said third bond strength value is less than said fourth bond strength value.

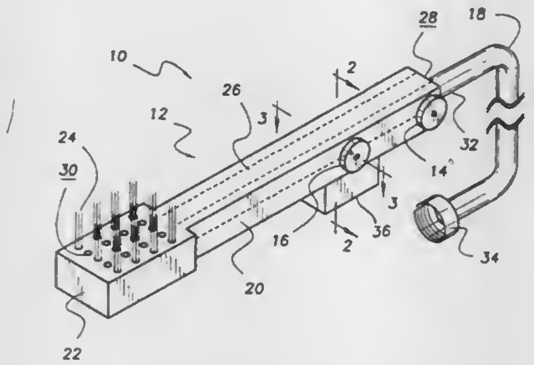
5,746,595
TOOTHBRUSH

Frank E. Ford, 4416 Willow Bend Dr., Arlington, Tex. 76017

Filed Feb. 6, 1996, Ser. No. 597,610

Int. Cl.^{6} A61G *17/02*

U.S. Cl. 433—80 **10 Claims**



1. A toothbrush comprising:

a body having a handle and a brush head, said body forming a conduit therein in fluid connection between a water inlet formed by said handle and a plurality of holes formed by said brush head;

a flexible hose having a first end connected to said water inlet and a second connector end connectable to a source of pressurized water; and

a pulsatile mechanism in operational connection with said conduit for transforming the flow of water through said conduit into a pulsating stream of water;

said pulsatile mechanism including:

a paisley shaped water wheel having a rounded section and a concave section, said paisley shaped water wheel being rotatably mounted within said handle with a portion of said paisley shaped water wheel extending into said conduit;

a shaft extending from said paisley shaped water wheel, said shaft having a shoe end; and

a braking mechanism having a circular pad end and a control end connected by a threaded rod member, said rod member being threadedly disposed through said handle with said control end located exterior of said handle and said circular pad end being concentrically aligned with said shoe end of said paisley shaped water wheel in a manner such that said braking mechanism is functionally connected to said paisley shaped water wheel.

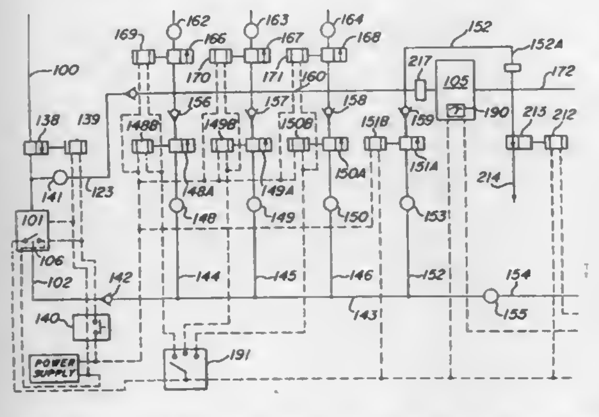
5,746,596
DENTAL TREATMENT METHOD

Ben J. Gallant, Portland, Tex.; Alan N. Gleeman, Mountain View, Calif., and William S. Parker, Ann Arbor, Mich., assignors to American Dental Technologies, Inc., Southfield, Mich.

Division of Ser. No. 276,964, Jul. 19, 1994, Pat. No. 5,525,058, which is a continuation-in-part of Ser. No. 859,158, Mar. 27, 1992, Pat. No. 5,330,354, and Ser. No. 29,732, Mar. 25, 1993, Pat. No. 5,350,299. This application Jun. 10, 1996, Ser. No. 662,435

Int. Cl.⁶ A61C *3/02*

U.S. Cl. 433—88 **12 Claims**



1. A method of treating teeth or associated tooth structure by means of abrasive particles carried by a fluid stream comprising:
- providing a stream of fluid under pressure;
- providing a source of abrasive particles;
- mixing said abrasive particles and said stream of fluid under pressure to produce an abrasive-laden fluid stream;
- delivering said abrasive-laden stream to the teeth or tooth structure undergoing said dental procedure;
- regulating the pressure of said stream of fluid prior to mixing of said abrasive particles with said stream by providing an electrically controllable multi-pressure level valve having a fluid inlet and a fluid outlet interconnected in said stream; and
- providing command signals to said valve, said command signals each corresponding to one of a plurality of selected conditions and being operable to select a corresponding one of said plurality of pressure levels.

5,746,597
INSTRUMENT FOR BORING DENTAL RADICULAR CANALS

Pierre-Luc Maillefer, Ballaigues, and François Aeby, Montagny-Pres-Yverdon, both of Switzerland, assignors to Maillefer Instruments S.A., Switzerland

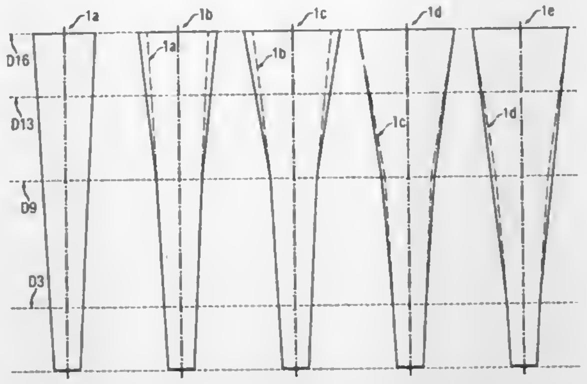
Filed Apr. 8, 1996, Ser. No. 629,317

Claims priority, application Switzerland, Dec. 20, 1995, 3604/95

Int. Cl.⁶ A61C *5/02*

U.S. Cl. 433—102 **1 Claim**

1. Instrument for boring dental radicular canals comprising, a tapered stem, said stem including at least one helicoidal cutting edge on at least part of its length which forms the active portion of the stem, the stem having a conicity the angle of opening of which is greater at its rear end then the angle at its front end, said active portion including at least two portions of different conicity, said last named two portions being formed of two cones each of which has the same conicity along its length, the angle of opening of said last named two portions being smaller at the front end of said active portion and greater at the rear end thereof.



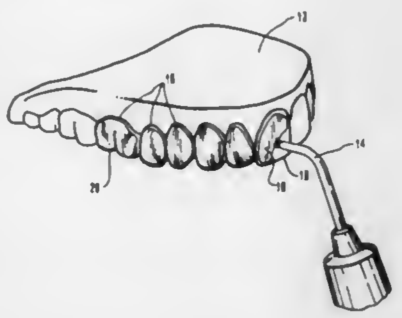
5,746,598
DENTAL BLEACHING COMPOSITIONS INCLUDING A STICKY MATRIX MATERIAL

Dan E. Fischer, Sandy, Utah, assignor to Ultradent Products, Inc., South Jordan, Utah

Continuation of Ser. No. 378,315, Jan. 25, 1995, which is a continuation of Ser. No. 99,247, Jul. 28, 1993, abandoned, which is a continuation of Ser. No. 985,700, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 718,210, Jun. 20, 1991, abandoned, which is a division of Ser. No. 497,934, Mar. 22, 1990, abandoned. This application Sep. 27, 1996, Ser. No. 722,553

Int. Cl.⁶ A61C *15/00*

U.S. Cl. 433—216 **23 Claims**



1. A dental bleaching composition comprising:
- a dental bleaching agent capable of bleaching tooth surfaces in contact with the dental bleaching agent; and
- a matrix material into which the dental bleaching agent is dispersed, wherein the matrix material comprises carboxypolymethylene, which includes any reaction products of carboxypolymethylene, wherein the matrix material has a stickiness and resistance to dilution by saliva such that when the dental composition is placed within a dental tray and the dental tray is positioned over the teeth the dental composition will retain the dental tray in position over the teeth for at least about 2 hours without significant pressure exerted by the dental tray, thereby allowing the bleaching agent to contact the tooth surfaces while the dental tray is held in place by the dental composition.

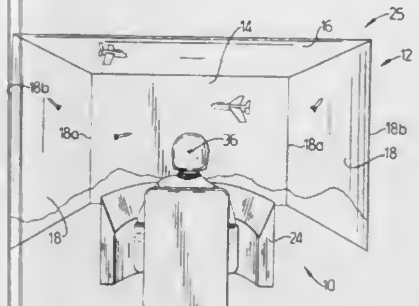
5,746,599
MODULAR VIDEO DISPLAY SYSTEM

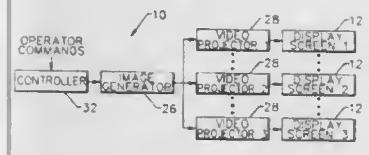
Robert J. Lechner, St. Charles County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 331,418, Oct. 31, 1994, Pat. No. 5,487,665. This application Mar. 20, 1995, Ser. No. 407,138

Int. Cl.⁶ G09B *9/08;19/16*

U.S. Cl. 434—44 **6 Claims**





1. A flight simulation system comprising:
- video projection means for projecting a predetermined video image;
- a plurality of display screens, responsive to said video projection means, for displaying the predetermined video image projected by said video projection means, said plurality of display screens comprising a front screen, first and second opposed side screens and an upper screen, wherein each of said first and second opposed side screens has a trapezoidal shape such that each side screen has a first edge adjacent said front screen and a second edge, opposite the first edge, and wherein the height of each side screen increases in an outward direction from the front screen such that the second edge of each side screen is longer than the first edge;
- a control station for providing control signals in response to actuation by an operator of the flight simulation system based upon the predetermined video image displayed on said plurality of display screens, wherein the operator is positioned in a predetermined viewing position; and
- a flight simulation controller for controlling the video image projected by said video projection means in response to the control signals provided by the operator,

wherein each of said plurality of display screens is circumscribed by an imaginary sphere having a predetermined radius and centered about a design eye of the flight simulation system, and wherein the design eye is positioned in a predetermined fixed relation to the viewing position of the operator such that distortion of the displayed video image is thereby reduced.

5. A flight simulation system comprising:
- video projection means for projecting a predetermined video image;
- a plurality of display screens, responsive to said video projection means, for displaying the predetermined video image projected by said video projection means, said plurality of display screens comprising a front screen, first and second opposed side screens and an upper screen, wherein said front screen has a first predetermined aspect ratio of greater than one such that the width of the video image displayed on said front screen is greater than the height of the video image displayed on the front screen, and wherein each side screen has a second predetermined aspect ratio of less than one such that the width of the video image displayed on the respective side screen is less than the height of the video image displayed on the respective side screen;
- a control station for providing control signals in response to actuation by an operator of the flight simulation system based upon the predetermined video image displayed on said plurality of display screens, wherein the operator is positioned in a predetermined viewing position; and
- a flight simulation controller for controlling the video image projected by said video projection means in response to the control signals provided by the operator,

wherein each of said plurality of display screens is circumscribed by an imaginary sphere having a predetermined radius and centered about a design eye of the flight simulation system, and wherein the design eye is positioned in a predetermined fixed relation to the viewing position of the operator such that distortion of the displayed video image is thereby reduced.

5,746,600
COLOR REFERENCE CHIPS SYSTEM FOR PLASTICS

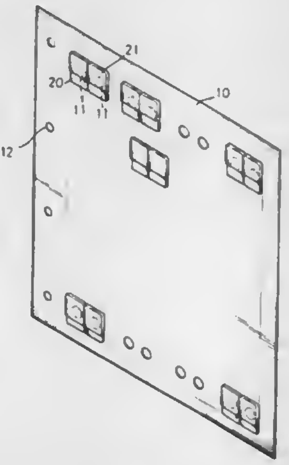
Chin-lu Chang, No.17, Chung Liao, Chung Liao Tsun, Lu Tsao Hsiang, Chiayi Hsien, Taiwan

Filed Feb. 25, 1997, Ser. No. 805,469

Claims priority, application Taiwan, Sep. 20, 1996, 85214554

Int. Cl.⁶ G09B *19/00*

U.S. Cl. 434—98 **5 Claims**



1. A color reference chips system for plastics comprising a sheet having a plurality of sets of holes, each set being provided with two holes, a first side of each hole receiving a color chip made of dyed plastic whereby shade difference between said color chips is perceptible when light is shone from a second side of said hole.

5,746,601
AUDIO SYSTEM WITH LANGUAGE EXERCISE FUNCTION

Man Hee Yoon, Nakwon Apt. 1406-Ho, 284-6 Nakwon-dong, Jongro-ku, Seoul 110-320, Rep. of Korea

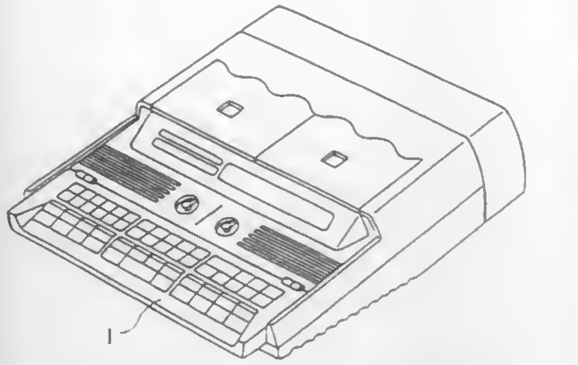
PCT No. PCT/KR93/00042, § 371 Date Nov. 15, 1995, § 102(e) Date Nov. 15, 1995, PCT Pub. No. WO94/27266, PCT Pub. Date Nov. 24, 1994

PCT Filed May 18, 1993, Ser. No. 553,470

Int. Cl.⁶ G09B *19/00*

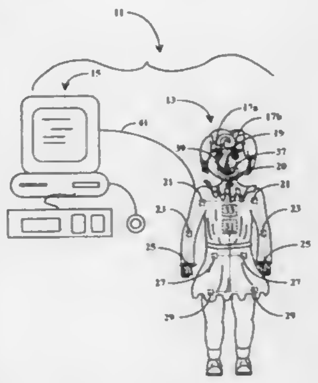
U.S. Cl. 434—156 **4 Claims**

1. An audio system with a language exercise function, to which a video system is connectable, said system including a cassette tape deck, comprising:
- a keyboard for generating a plurality of function key inputs for performing a double deck function, a simultaneous recording function, a sentence memory function, a repeat memory function, and an automatic playback repetition function for at least two repetitions selectively activatable through the keyboard; and



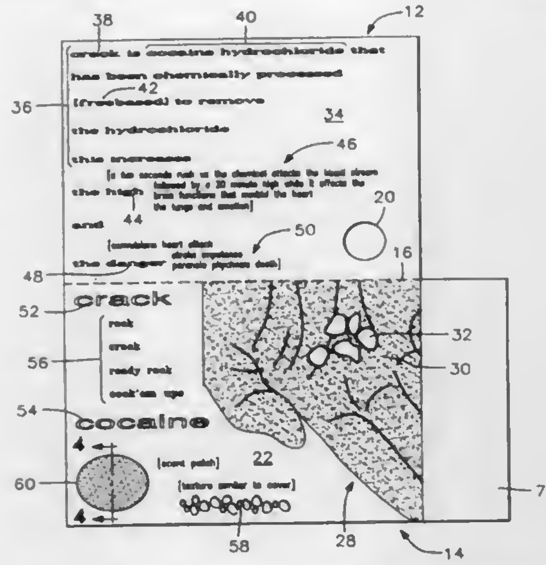
voice synthesizer memory means for enabling automatic repeated playback and pronunciation functions of the cassette tape deck and the video system through said selective keyboard activation.

5,746,602
PC PERIPHERAL INTERACTIVE DOLL
Dan Kikinis, 20264 Ljepava Dr., Saratoga, Calif. 95070
Filed Feb. 27, 1996, Ser. No. 606,757
Int. Cl.⁶ G09B *5/00;3/00;* A63H *3/28;* G11B *17/22*
U.S. Cl. 434—169 **21 Claims**



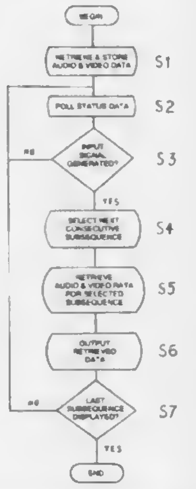
1. An interactive system comprising:
- a personal computer (PC) having a CPU, a memory, a first communication port adapted for peripheral communication coupled to the CPU, and control routines executable by the CPU;
- a personalized entity separate from the PC, having therein control circuitry coupled to a microphone, to a speaker and to a second communication port adapted for peripheral communication; and
- a communication link coupling the first and the second communication ports;
- wherein, through execution of the control routines by the CPU, communication is executed between the PC and the personalized entity as a peripheral device, wherein stored audio data is retrieved by the CPU, passed to the personalized entity via the communication link converted to analog audio at the speaker in the personalized entity, and wherein voice input via the microphone in the personalized entity is converted to audio data by the control circuitry, transferred to the computer via the communication link, and is utilized at the computer in conjunction with the control routines to guide selection of stored audio data to be retrieved and sent to the personalized entity.

5,746,603
NARCOTICS FLASH CARDS
Kenneth C. Foster, 10130 Avella La., Richmond, Va. 23236, and Darlene S. Duncan, 2037 Woodland Rd., Petersburg, Va. 23805
Filed Nov. 6, 1996, Ser. No. 744,585
Int. Cl.⁶ G09B *19/00*
U.S. Cl. 434—219 **20 Claims**



1. An educational device for training an individual to recognize a particular illegal narcotic or legal substance used illegally, said device comprising:
- a card,
- a textured area of said card simulative of the feel of a particular drug,
- a scent patch on said card containing a simulated smell of the particular drug, and
- indicia on said card describing the particular drug.

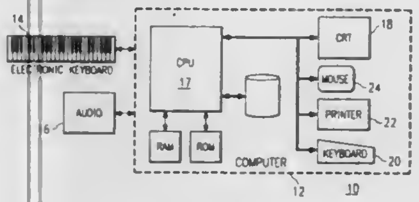
5,746,604
METHOD OF SIMULATING ACTIVITIES FOR INFANTS AND VERY YOUNG CHILDREN
Justin R. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Division of Ser. No. 495,311, Jun. 27, 1995, Pat. No. 5,603,658. This application Jun. 6, 1996, Ser. No. 659,438
Int. Cl.⁶ G09B *5/00*
U.S. Cl. 434—307 R **7 Claims**

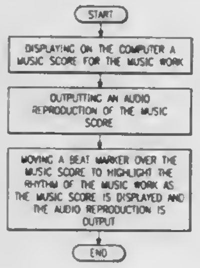

BEGIN
RETRIEVE & STORE AUDIO & VIDEO DATA
S1
POLL STATUS DATA
S2
INPUT SIGNAL GENERATED?
NO
S3
YES
SELECT NEXT CONSECUTIVE SUBSEQUENCE
S4
RETRIEVE AUDIO & VIDEO DATA FOR SELECTED SUBSEQUENCE
S5
OUTPUT RETRIEVED DATA
S6
LAST SUBSEQUENCE DISPLAYED?
NO
S7
YES
END

1. A method of electronically simulating a predetermined activity, utilizing a computer, a display screen, and an input device, the progression of the simulation being controlled by activating the input device, the method comprising:

(a) digitally storing audio and video data associated with a group of consecutively arranged audiovisual subsequences, said subsequences comprising sequential portions of an audiovisual simulation of a predetermined activity;
(b) detecting an input signal which is generated and sent to the computer by the input device when the input device is activated whereby the pace of said simulation may be controlled;
(c) selecting from the group of consecutively arranged audiovisual subsequences the subsequence which consecutively follows the last selected subsequence;
(d) retrieving the audio data associated with the selected audiovisual subsequence and sending said audio data to the computer audio output whereby sound is generated;
(e) retrieving the video data associated with the selected audiovisual subsequence and sending said video data to the display screen whereby video is generated; and
(f) repeating steps (b), (c), (d), and (e), whereby an audiovisual simulation of said predetermined activity automatically progresses.

5,746,605
METHOD AND SYSTEM FOR MUSIC TRAINING
Stephen E. Kennedy, Dallas, Tex., assignor to Red Ant, Inc., Tex.
Continuation of Ser. No. 254,403, Jun. 6, 1994, Pat. No. 5,533,903. This application Jul. 8, 1996, Ser. No. 677,639
Int. Cl.⁶ G09B *5/00*
U.S. Cl. 434—307 R **6 Claims**

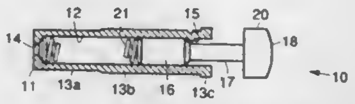


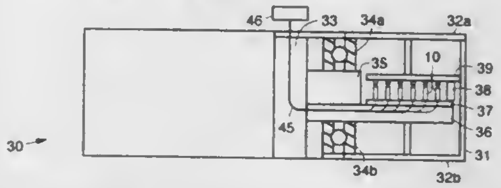

START
DISPLAYING ON THE COMPUTER A MUSIC SCORE FOR THE MUSIC WORK
OUTPUTTING AN AUDIO REPRODUCTION OF THE MUSIC SCORE
MOVING A BEAT MARKER OVER THE MUSIC SCORE TO HIGHLIGHT THE RHYTHM OF THE MUSIC WORK AS THE MUSIC SCORE IS DISPLAYED AND THE AUDIO REPRODUCTION IS OUTPUT
END

1. A method, using a computer, for training a student to play a music work on a music instrument, the music work having an identifiable rhythm determined by a number of beats and a time value assigned to each musical note in a measure, comprising the steps of:
- displaying on the computer a music score for the music work;
- outputting an audio reproduction of the music score; and
- moving a beat marker over the music score to highlight the rhythm of the music work as the music score is displayed and the audio reproduction is output.

6. A method of training a student to play a music work, comprising the steps of:
- creating a plurality of notational variations of the music work, each of the notational variations being progressively more complex than a prior notational variation and wherein all of the notational variations retain some predefined structure of the music work;
- arranging the notational variations in some predefined order of difficulty; and
- teaching the student to play the music work by presenting to the student the notational variations in some predetermined order such that the student may master the notational variations in a progressive manner as the student's performance skill increases.

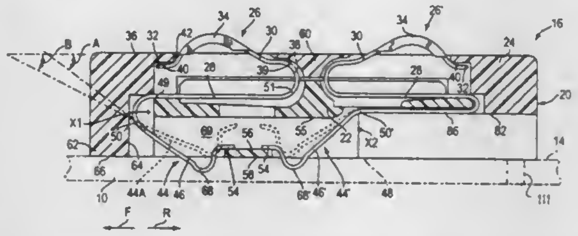
5,746,606
SPRING LOADED CONTACT DEVICE AND ROTARY CONNECTOR
Mohi Sobhani, Encino, Calif., assignor to Hughes Electronics, Los Angeles, Calif.
Filed Sep. 30, 1996, Ser. No. 724,591
Int. Cl.⁶ H01R *39/00*
U.S. Cl. 439—21 **4 Claims**





1. A spring loaded contact device for use in a spring-loaded rotary connector between a fixed component and a rotating component, said spring loaded contact device comprising:
- a housing having a first end, a second end, and an internal bore wherein the housing has a first diameter adjacent to the first end thereof for a portion of the length of the housing and a slightly larger diameter for substantially the remainder of the housing and a lip formed at the second end of the housing
- a spring disposed in the bore wherein the spring has a first end directly contacting the first end of the housing and a second end;
- a pin having a first portion disposed in the bore that contacts the second end of the spring, a center portion that is smaller than the first portion and that protrudes from the bore wherein the pin is tapered between the first portion and the center portion, and a head disposed external to the bore that has a rounded cylindrical end;
- a dimple formed in the housing that secures the first portion of the pin in the bore.

5,746,607
SMART CARD ELECTRICAL CONNECTOR
Herve Guy Bricaud, Dole, and Fabrice Valcher, Damparis, both of France, assignors to ITT Composants et Instruments, France
Filed Jul. 26, 1996, Ser. No. 688,180
Claims priority, application France, Jul. 28, 1995, 95 09205
Int. Cl.⁶ H01R *9/09*
U.S. Cl. 439—66 **4 Claims**



1. A combination of a smart card that has contact pads, and a read/write device that includes a circuit board with an upper face and conductive traces thereon and that also includes a connector for connecting said card contact pads to said traces, wherein:

said connector includes an insulative body having upper and lower faces and upper and lower contact-engaging stops (**40, 58**) lying adjacent to said faces, said connector also includes a first set of contacts mounted on said body, with each of said contacts having a card-engaging portion with a card-engaging part that projects above said body upper face, with each contact having a tail with a trace-engaging part that lies at said lower face and engages one of said traces, and with each contact having a fixing portion that lies between said card engaging portion and said tail and that is substantially fixed to said body;

each of said contacts being formed of a strip of sheet metal which has a length in a predetermined longitudinal horizontal direction that is a plurality of times its length in a perpendicular lateral horizontal direction as seen in a plan view;

the card engaging portion of each contact has a free forward end (**32**) biased up against said upper stop and has a rear end that forms an upper elbow (**38**) comprising a largely 180° upper loop that merges with said fixing portion (**28**), with said fixing portion extending primarily forwardly from said upper elbow along most of the longitudinal length of said contact, with said tail having a forward-upper end forming a lower elbow (**50**) comprising a lower loop of more than 90° and with said tail having a tail limb (**46**) extending at a downward incline from said lower elbow to said trace-engaging part, and with said tail having a free rear end (**54**) biased down against said lower stop;

said upper elbow (**38**), the opposite sides of said upper loop are free to deflect closer together by bending along the largely 180° of said upper loop;

at said lower elbow (**50**) the opposite sides of said lower loop are free to deflect closer together by bending along said more than 90° of said lower loop, to raise said tail limb (**48**).

5,746,608

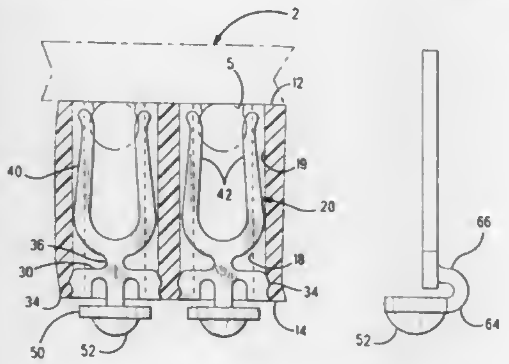
SURFACE MOUNT SOCKET FOR AN ELECTRONIC PACKAGE, AND CONTACT FOR USE THEREWITH

Attalee S. Taylor, R.D. #1 Box 429G, Palmyra, Pa. 17078

Filed Nov. 30, 1995, Ser. No. 565,539

Int. Cl.^{6} H01R ***9/09***

U.S. Cl. 439—70 **16 Claims**



1. A socket for interconnecting an electronic package to a circuit board, comprising:

a dielectric housing having a top surface for receiving the electronic package thereon, a bottom surface, and a plurality of cavities extending between the top and bottom surfaces;

contacts disposed in respective ones of the cavities, each of the contacts comprising body electrically conductive body which is stamped and formed from a material strip, the body having a retention section securable in its said cavity, a lead-receiving section extending upwardly and engageable with a respective lead of the electronic package, and a surface mount section extending below the bottom surface and engageable with a respective circuit trace on the circuit board, the surface mount section having a convex bottom surface which is formed by stamping a portion of the material strip into a shape which mimics at least a lower surface portion of a sphere.

5,746,609

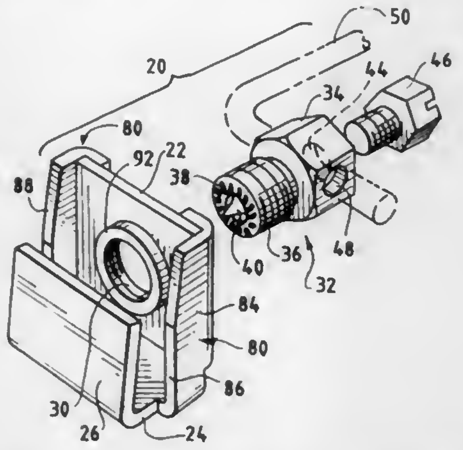
CLAMPING BRACKET FOR A GROUNDING SYSTEM

George J. Franks, Jr., 664 Thompson Clr., Inverness, Ill. 60067

Filed Dec. 26, 1996, Ser. No. 777,839

Int. Cl.^{6} H01R ***4/66***

U.S. Cl. 439—92 **17 Claims**



1. A clamping bracket for mechanical and electrical connection to a metal plate, comprising:

a front planar member having a threaded bore extending axially therethrough,

a base member extending rearwardly from the front planar member,

a brace planar member extending upwardly from the base member to create therebetween a generally U-shaped space for containing the metal plate, the planar members being slanted towards each other so that the axial distance between the front planar member and the brace planar member is closer at a top opening and wider at a bottom adjacent the base member,

at least certain ones of the members being resiliently movable to increase the axial distance of the top opening,

a threaded stud which engages the threaded bore and is rotatable to axially advance an abrading end surface of the stud into engagement with the metal plate and cause resilient movement of the certain ones of the members to thereby increase the axial distance at the top opening as the threaded stud is advanced to clamp the bracket to the metal plate, the abrading end surface of the threaded stud penetrating the outer surface of the metal plate to thereby electrically connect the metal plate to the bracket.

5,746,610

GROUND CONTACT FOR A SPLICE ENCLOSURE

Leung Man Shiu, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Division of Ser. No. 506,679, Jul. 25, 1995, Pat. No. 5,606,150. This application Nov. 26, 1996, Ser. No. 756,862

Int. Cl.^{6} H01R ***4/66***

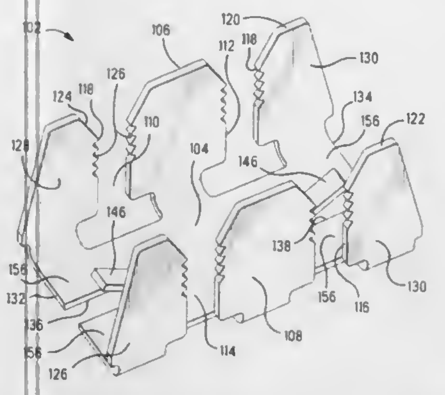
U.S. Cl. 439—98 **3 Claims**

1. A ground contact for commoning electrical engagement of shields of at least a pair of shielded cables, comprising:

a unitary metal member having a body section and opposed first and second plate sections extending orthogonally from side edges of said body section to free edges,

at least two cable-receiving slots extending from said free edges of each of said first and second plate sections to said body section, the cable-receiving slots of said first plate section being substantially aligned with the cable-receiving slots of said second plate section defining aligned pairs associated with a common said cable, and each said aligned pair being associated with an adjacent end edge of said body section, and

said body section including relief slots extending inwardly from respective said end edges thereof at least to centerlines of said associated pair of cable-receiving slots,



whereby the portions of said first and second plate sections adjacent associated said end edges of said body section and adjacent portions of said body section generally form cantilever beams having deflectability during insertion into said cable-receiving slots of said cables.

5,746,611

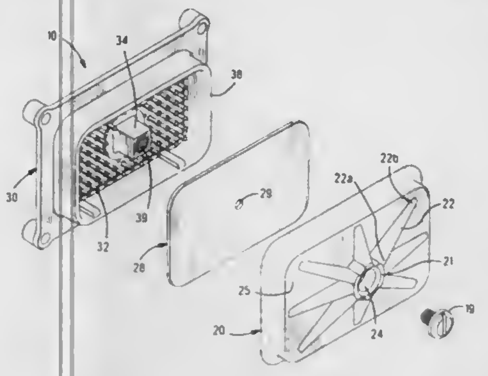
ELECTRICAL CONNECTOR SEAL CAP ASSEMBLY

Michael Dale Brown, Greensboro; Frank Louis Duncan, Madison, and Ralph Talmadge Bentley, II, Belews, all of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 15, 1996, Ser. No. 683,602

Int. Cl.^{6} H01R ***13/44***

U.S. Cl. 439—135 **20 Claims**



1. An electrical connector with a cover, the electrical connector and the cover comprise an assembly, the assembly comprising:

the cover is fixable to the electrical connector by a fastener, the fastener pressing on the cover so that the fastener is operable to apply forces to the cover for holding the cover to the electrical connector;

the cover comprises a sealing member for hermetically sealing the electrical connector; and

the electrical connector comprises a sealing interface section for sealing contact with the sealing member.

5,746,612

ADAPTER JUNCTION BOX

Wang Chien-Yuan, No. 1, Lane 199, Sec. 1, Min-Chuan Rd., Tainan, Taiwan

Filed Nov. 13, 1996, Ser. No. 748,539

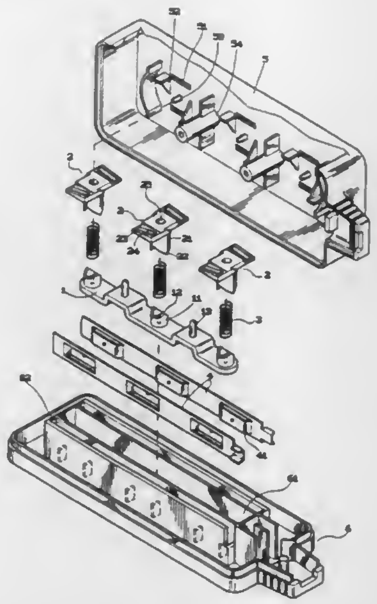
Int. Cl.^{6} H01R ***13/44***

U.S. Cl. 439—139 **1 Claim**

1. An adapter junction box, comprising:

a lower shell having a pair of spaced locating slots formed therein and a base strip holder formed therebetween;

a pair of conducting strips respectively retained in said pair of locating slots;



a base strip disposed in said base strip holder and having a plurality of hollow bushings extending from an upper surface of said base strip, each of said plurality of hollow bushings having a V-shaped slot formed in an upper end thereof to define a pair of beveled guide heads;

a plurality of springs, each of said plurality of springs having a first end coupled to a respective one of said plurality of hollow bushings;

a plurality of guard plates, each of said plurality of guard plates having opposing upper and lower surfaces, each of said plurality of guard plates having a hollow sleeve extending from a central portion of said lower of said guard plate, each said hollow sleeve being coupled to a second end of a respective one of said plurality of springs and having a V-shaped slot formed in a distal end thereof to define a pair of V-shaped heads, each of said plurality of guard plates having a pair of slopes formed on said upper surface of said guard plate and a pair of sloping ledges respectively formed on said pair of slopes; and,

an upper shell overlaying said lower shell and secured thereto, said upper shell having a plurality of pairs of openings for receiving prongs of an electrical plug therein, each of said pair of openings being located in aligned relationship with said pair of sloping ledges of a respective one of said plurality of guard plates for initiating a rotative displacement of said guard plate as the prongs of the electrical plug are inserted into said respective pair of openings for angling said V-shaped heads relative to said beveled guide heads, wherein subsequent contact between said V-shaped heads and said beveled guide heads rotates said respective guide plate to provide a path for the prongs of the electrical plug contact said pair of conducting strips.

5,746,613

CARD EDGE CONNECTOR WITH EJECTOR

Lee-Ming Cheng, Cupertino, and Edmond Choy, Union City, both of Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan

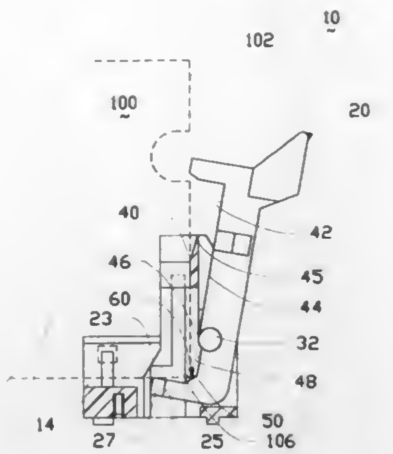
Continuation-in-part of Ser. No. 420,478, Apr. 12, 1995, Pat. No. 5,634,803, and a continuation-in-part of Ser. No. 673,070, Jul. 1, 1996, Pat. No. 5,672,069. This application Mar. 4, 1997, Ser. No. 811,506

Int. Cl.^{6} H01R ***13/62***

U.S. Cl. 439—157 **12 Claims**

1. A card edge connector comprising:

an elongated insulative housing defining two lengthwise ends and a central slot between the two ends for receiving a card therein;



a plurality of contacts positioned at two sides of the slot;
a cavity section positioned at one of the two lengthwise ends of the housing;
a card alignment wall formed between the cavity section and the central slot; and
an ejector received within said cavity section and movable between a card locked and card ejected position, said ejector including a main body comprising a spindle pivotably connected to the housing, a first side near the card alignment wall, a second side opposite the first side, a card locking peg projecting from an upper portion of the main body toward the card alignment wall and a card ejecting kicker projecting from a lower portion of the main body toward the card alignment wall, said first side comprising a first section located between the locking peg and the spindle, said first section abutting the card alignment wall when the ejector is at the locked position, a second section continuing from the first section and sharing a same surface with a portion of a periphery of the spindle extending toward the second side of the main body and a third section continuing from the second section and extending toward the card ejecting kicker, said third section being offset from the first section a distance in a direction toward the second side of the main body.

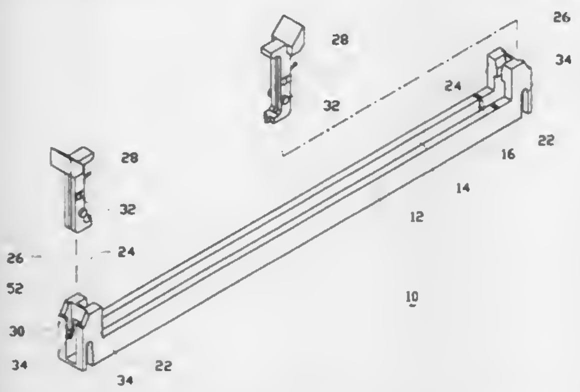
5,746,614
CARD EDGE CONNECTOR WITH EJECTOR

Lee-Ming Cheng, Cupertino; Edmond Choy, Union City, both of Calif., and Gwou-Jong Tseng, Taipei Hsien, Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan

Continuation of Ser. No. 420,478, Apr. 12, 1995, Pat. No. 5,634,803. This application Mar. 21, 1997, Ser. No. 823,657

Int. Cl.⁶ H01R *13/62*

U.S. Cl. 439—157 **14 Claims**



1. A card edge connector comprising:
an elongated insulative housing defining a central channel for receiving a card therein;
a plurality of passageways disposed by at least one side of the channel for receiving a corresponding number of contacts therein;
at least one tower formed at one end of the housing;
an ejector adapted to be received within said tower;
said ejector including a main body with a kicker at a bottom portion and a locker/handle at a top portion; wherein
a slot extends along almost a full lengthwise dimension of and through, in a lateral direction, the main body, and at least a retention protrusion is disposed about a mid-point of the slot.

5,746,615
LIGHTING DEVICE

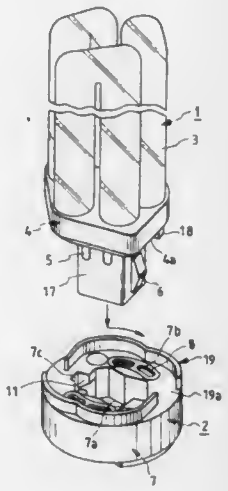
Masaaki Ichikawa; Tomoyuki Ono; Nobumichi Nishihama, and Masaaki Isoda, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 26, 1996, Ser. No. 672,025

Claims priority, application Japan, Jul. 17, 1995, 7-180047; Dec. 28, 1995, 7-341978

Int. Cl.⁶ H01R *33/02*

U.S. Cl. 439—227 **11 Claims**



1. A single end lamp and a single end lamp socket assembly comprising:
- a single end lamp including:
  - a base;
  - a bulb projected from a first surface of said base;
  - a lamp pin projected from a second face of said base in a direction opposite to said bulb;
  - a projection projected from said second face of said base at substantially a center portion of said base; and
  - a lock engaging portion laterally projected from a side face of said projection;
- a single end lamp socket including:
  - a socket body having a recess portion shaped to receive said projection of said single end lamp so that said projection is rotatable by a predetermined rotation angle, said recess portion opening to a lamp attaching face of said socket body;
  - an arcuate lamp pin insertion hole formed in a circumferential region of said lamp attaching face outside said recess portion and concentric with said recess portion, said arcuate lamp pin insertion hole being shaped to receive said lamp pin;
  - a conductor plate disposed in said lamp pin insertion hole for elastically contacting said lamp pin; and
  - an engaging portion disposed on a side wall of said recess portion, said engaging portion being disposed to abut against said lock engaging portion to retain said single end lamp in said single end lamp socket when said single end lamp is rotated by said predetermined rotation angle.

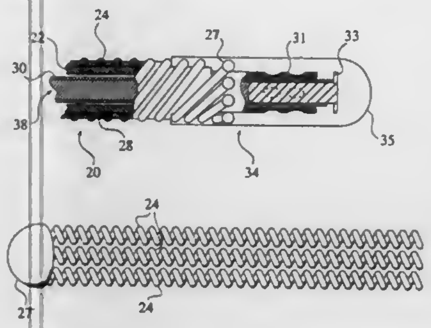
5,746,616
DEFIBRILLATION ELECTRODE CONNECTION

Craig E. Mar, Fremont, Calif., assignor to Pacesetter, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 126,291, Sep. 24, 1993, Pat. No. 5,488,768. This application Nov. 7, 1995, Ser. No. 553,114

Int. Cl.⁶ H01R *4/02;4/18;4/56;* **A61N** *1/05*

U.S. Cl. 439—245 **4 Claims**



1. An electrical connection comprising:
one end of each of a plurality of coiled platinum iridium wires melted to form a ball of metal such that each of said coiled platinum iridium wires is attached to said ball, said ball crimped within or welded to a metal sleeve, and said sleeve electrically attached to a conductor.

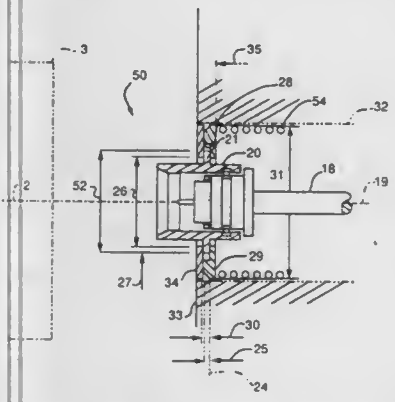
5,746,617
SELF ALIGNING COAXIAL CONNECTOR ASSEMBLY

Frank Kendall Porter, Jr., Billerica, and James J. Kerrigan, Andover, both of Mass., assignors to Quality Microwave Interconnects, Inc., Wilmington, Mass.

Filed Jul. 3, 1996, Ser. No. 674,882

Int. Cl.⁶ H01R *13/64*

U.S. Cl. 439—248 **24 Claims**



1. A connector for coaxially coupling a cable to a complementary connector assembly, said connector comprising:
a) a coupling member adapted to receive the cable and to selectively matingly engage the complementary connector assembly to electrically couple the cable in coaxial alignment with the complementary connector assembly, said coupling member including a planar centering washer and a flange means, said flange means extending outwardly about a periphery of said coupling member in a substantially orthogonal direction, said flange received in said centering washer and constrained for sliding movement in a substantially orthogonal direction therein;
b) a housing adapted to movably support said coupling member wherein said coupling member is adapted for substantially unrestricted movement within a predetermined range of movement in a substantially orthogonal direction into coaxial alignment with the complementary connector assembly during initial contact of said connector and the complementary connector assembly as said connector and the complementary connector assembly are moved towards one another to facilitate the mating engagement of said connector and the complementary connector assembly; and
c) an urging member adapted to resiliently urge said coaxially aligned coupling member towards said mating engagement for biased engagement of said connector and the complementary connector assembly.

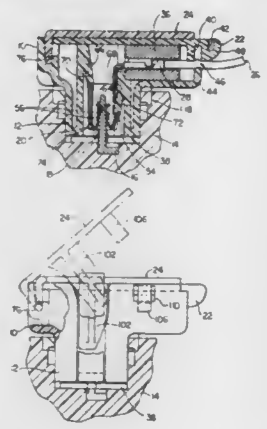
5,746,618
SQUIB CONNECTOR FOR AUTOMOTIVE AIR BAG ASSEMBLY

Bradford K. Gauker, Clinton Township, Mich., assignor to Augat Inc., Mansfield, Mass.

Division of Ser. No. 502,523, Jul. 14, 1995, Pat. No. 5,616,045. This application Aug. 29, 1996, Ser. No. 705,427

Int. Cl.⁶ H01R *13/627*

U.S. Cl. 439—352 **6 Claims**



1. A squib connector for an automotive air bag assembly having a squib, the squib having a pair of terminal pins anchored thereto and extending upwardly in a squib connector receiving receptacle, said squib connector comprising:
- a connector housing having a portion adapted to mate with the receiving receptacle of the squib, said connector housing having a wire entrance, said connector housing further having an internal floor and a terminal latching assembly; and
- a terminal assembly disposed within said connector housing for electrical communication with the terminal pins of the squib and a pair of electrical wires entering said connector housing through said wire entrance, said terminal assembly comprising a pair of box elements and a pair of opposed contact beams integrally formed with each box element and disposed to extend within each box element from a base region of each box element in a direction away from the floor of the connector housing to contact the terminal pins of the squib, said terminal assembly retained within said connector housing between and in contact with generally opposed faces of said internal floor at said base region and said terminal latching assembly at an upper region spaced from said base region.

5,746,619
COAXIAL PLUG-AND-SOCKET CONNECTOR

Dietmar Harting, Espelkamp; Dirk Oberhokamp, Herford; Ralf Bokamper, Lubbecke; Horst Blomenkamp, Hullhorst, and Stephan Schreier, Espelkamp, all of Germany, assignors to Harting KGAA, Espelkamp, Germany

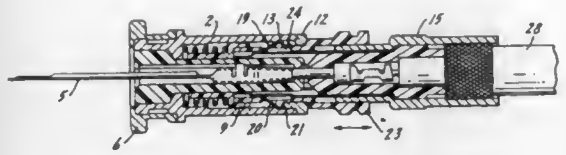
Filed Oct. 8, 1996, Ser. No. 727,246

Claims priority, application Germany, Nov. 2, 1995, 295 17 358.0

Int. Cl.⁶ H01R *13/627*

U.S. Cl. 439—352 **4 Claims**

1. Coaxial plug-and-socket connection comprising a socket part and a pin part with releasable interlocking using spring or spring-



mounted detent elements on the one connection part and complementary arresting means on the other connection part, wherein the detent elements are releasable out of or from the arresting means by a force directed preferably orthogonally relative to the axis of the plug-and-socket connection and incapable of being generated by pulling on the cables of socket part and pin part and wherein during the insertion process a spring element on one of the two connection parts, which is independent of said detent elements, exerts an axial resistance and repels the other connection part so long as the interlocking is not effectively latched, characterized in

that the outer sleeve (**15**) of the pin part (**14**) comprises a front, thin-walled sleeve (**18**) which is insertable into the socket part (**1**),

that an interlock deactivating sleeve (**23**) is provided which is longitudinally displaceable on the sleeves (**15**, **18**),

that spring detent hooks (**19**) bent out from the thin-walled sleeve (**18**) are directed out through openings (**24**) of the interlock deactivating sleeve (**23**), the detent hooks having a front slope (**20**) and a rear interlock deactivating end (**21**) and the interlocking sleeve being pressed forward by the slope,

that the socket part (**1**) comprises an outer sleeve (**2**), into which a helical pressure spring (**7**) is inserted,

that there is inserted into the outer sleeve (**2**) a thrust sleeve (**9**) provided with shoulders, the front end (**10**) of which engages into the pressure spring and the rear end of which is held slidably in the outer sleeve (**2**), and

that a terminating sleeve (**12**) is inserted into the outer sleeve (**2**), the inner edge (**13**) of the terminating sleeve forming on the one hand a stop for the thrust sleeve (**9**) and on the other hand a detent shoulder for the detent hooks (**19**).

5,746,620

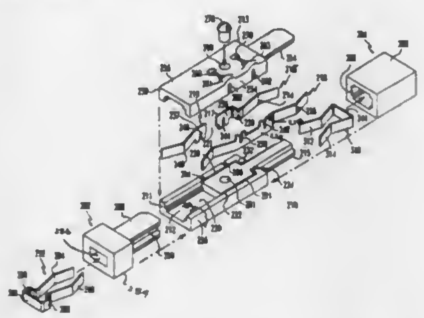
ELECTRICAL CONNECTOR INCLUDING MEANS FOR TERMINATING WIRES

Stephen L. Clark, Dillsburg, Pa., assignor to Berg Technology, Inc., Reno, Nev.

Division of Ser. No. 441,586, May 15, 1995, Pat. No. 5,639,258. This application Mar. 4, 1997, Ser. No. 810,051

Int. Cl.⁶ H01R *4/24*

U.S. Cl. 439—404 **9 Claims**



1. An electrical connector interposed between a socket and a plug comprising:

a socket engagement means, a plug engagement means, opposed lateral walls, first and second opposed ends, an exterior and interior surfaces, and a medial electrical conductive means;

the socket engagement means being at the first end and the plug engagement means being at the second end, the socket engagement means having a receiving recess for receiving said socket;

the medial electrical conductive means connects the socket engagement means and the plug engagement means and comprising two metallic contacts contained at least partially within said insulative housing, one of said metallic contacts connecting the socket engagement means to the plug engagement means and the other of said metallic contacts being segmented into at least two axially spaced segments and each of said contacts having a wire terminal means comprising at least one transverse slot;

wire access means comprising at least a pair of apertures in the insulative housing each of which is aligned with one of said transverse slots, for allowing entry of wires into said insulative housing for engagement with said wire terminal means;

said socket having a projection portion including opposed lateral walls, the projection portion being inserted in the socket receiving recess, the socket further comprising socket metallic contact means, the socket metallic contact means having two legs and a base side interposed therebetween, and positioned such that each of the legs abuts one of said opposed lateral walls and one of the medial metallic contact means.

5,746,621

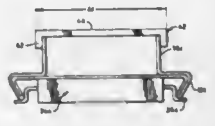
ELECTROSTATIC DISCHARGE PROTECTION DEVICE

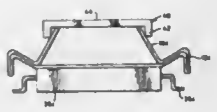
David V. Cronin, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 278,063, Jul. 20, 1994, Pat. No. 5,599,205. This application Jun. 14, 1996, Ser. No. 664,147

Int. Cl.⁶ H01R *13/703*

U.S. Cl. 439—507 **8 Claims**





1. An electrostatic discharge protection device for use with a semiconductor chip package of a type having an upper surface with depending lateral sides and a plurality of connector leads extending from the lateral sides, said electrostatic discharge protection device comprising:

a base section suitable for attachment to the package upper surface;

grounding means extending from said base section, said grounding means having an operative position in which said grounding means are placed into electrical contact with the connector leads so as to provide a shunt across the leads, and an inoperative position in which said shunt is removed from the connector leads; and

constriction means emplaced against said grounding means such that a rise in temperature will cause a decrease in size of said constriction means and act to move said grounding means from said operative position to said inoperative position.

5,746,622

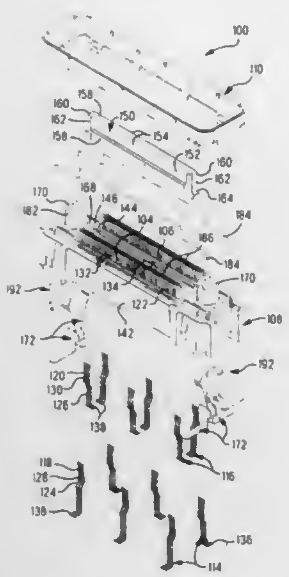
BOARD-MOUNTABLE ELECTRICAL CONNECTOR

John Joseph Consoli, Harrisburg, and Lynn Robert Sipe, Lewistown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 31, 1996, Ser. No. 690,085

Int. Cl.⁶ H01R *13/52*

U.S. Cl. 439—521 **5 Claims**



1. An electrical connector of the type having an insulative housing defining a mating face and an opposed board-mounting face and at least a pair of elongate plug portions extending forwardly at the mating face along side surfaces of each of which are positioned contact sections of contacts where the contacts include solder tails for surface mounting to circuit pads of a circuit board, the connector comprising:

the insulative housing including an elongate aperture extending from the mating face to the board-mounting face between adjacent ones of the plug portions and exposing solder tails of rows of the contacts arrayed in the interior of the housing for visual inspection thereof; and

an insert member securable within said elongate aperture following mounting of the connector to a circuit board, coextending alongside said plug portions forwardly at said mating face,

whereby upon assembly of said insert in said elongate aperture, said connector is free of susceptibility of debris entering the elongate aperture.

5,746,623

AXIALLY ADJUSTABLE COAXIAL ELECTRICAL CONNECTING LINE WITH CONSTANT IMPEDANCE

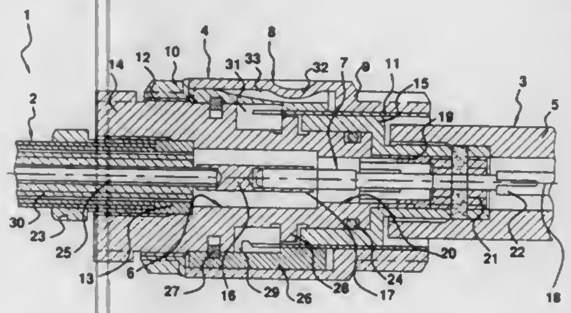
Josef Fuchs, Appenzell, and Mario Schneider, Oberriet, both of Switzerland, assignors to Huber & Suhner AG, Herisau, Switzerland

Filed May 31, 1996, Ser. No. 656,047

Claims priority, application Switzerland, Jun. 1, 1995, 1613-95

Int. Cl.⁶ H01R *9/05*

U.S. Cl. 439—578 **7 Claims**



1. Coaxial electrical connecting line (**1**) with an integrated trimmer (**4**) for the mechanical fine adjustment of the electrical length of the connecting line, said trimmer having an outside conductor (**6**) and an inside conductor (**7**), said outside conductor having two housing parts (**14**, **15**) which can be moved phaselessly toward and away from each other between two terminal positions by means of a surrounding clamping device (**8**), said inside conductor having two connecting parts (**16**, **18**) that can be moved toward and away from each other, each of said connecting parts being connected to an associated housing part, the inside diameters (D) of the two housing parts and the outside diameters (d) of the two connecting parts (**16**, **18**) being so dimensioned that the trimmer will have a constant impedance over its entire length, said impedance not substantially changing during an adjustment of the electrical length of the connecting line between the two terminal positions, and further comprising means (**10**) for fixing an adjusted length of the line in any relative position of said two housing parts.

5,746,624

CONNECTOR ALLOWING PLAY

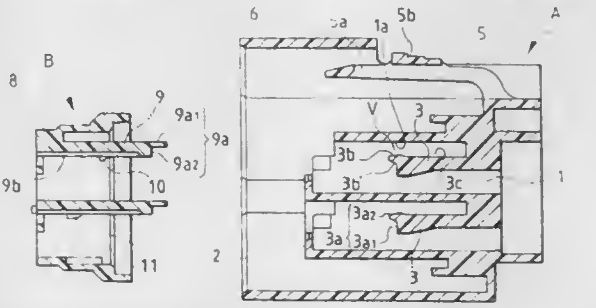
Hideki Ohsumi, and Yoshinori Tomita, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 30, 1996, Ser. No. 640,106

Claims priority, application Japan, May 2, 1995, 7-108407

Int. Cl.⁶ H01R *13/422*

U.S. Cl. 439—595 **10 Claims**



1. A connector comprising:

a connector housing including a terminal accommodating chamber configured to receive a terminal fitting and a cantilevered flexible retaining arm extending from an inner wall surface of the terminal accommodating chamber, the flexible retaining arm having a first recessed surface; and

a terminal retainer including an insertion portion configured to receive a mating terminal for the terminal fitting and a spacer, the spacer having a second recessed surface,

wherein, when the terminal retainer is connected to the connector housing and the terminal fitting is completely inserted into the terminal accommodating chamber, the first and second recessed surfaces are in a confronting relationship to allow for play of the terminal fitting.

5,746,625

DEVICE TO JOIN UP CABLE SHEATHINGS

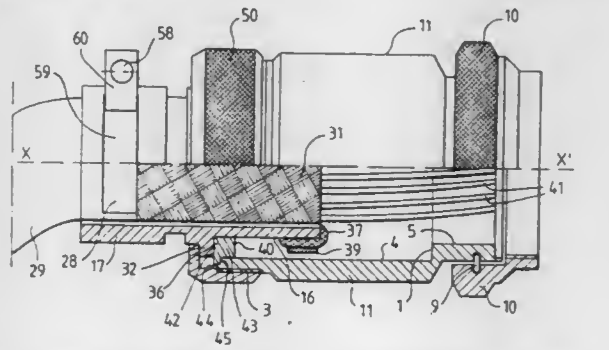
Jean-Pierre Aparicio, Velizy, and Christian Douchin, Montrouge, both of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 17, 1996, Ser. No. 633,357

Claims priority, application France, Apr. 21, 1995, 95 04819

Int. Cl.⁶ H01R *9/03*

U.S. Cl. 439—610 **12 Claims**



1. A device for sheathing ends of a strand of sheathed cables, where said ends are inserted into a sheathing casing, the device comprising:

a chamber having an axis and two ends along the axis including a front end close to the ends of the cables and a rear end at a distance from the ends of the cables, the chamber having an internal surface which demarcates an internal volume of the chamber;

a single shaft having the same axis as said chamber and two ends along said axis including a front end close to the ends of the cables and a rear end at a distance from the ends of the cables, said shaft having an internal surface and an external surface, with the internal surface of the shaft demarcating a volume for housing part of the strand;

a means of contact between the shaft and the chamber for ensuring electromagnetic imperviousness at the rear end of the chamber, said means of contact being in continuous electrical contact throughout a periphery of the shaft and also in continuous electrical contact throughout a periphery of the chamber, the external perimeter of said means of contact being greater than an internal perimeter of the chamber in a plane perpendicular to said axis.

5,746,626

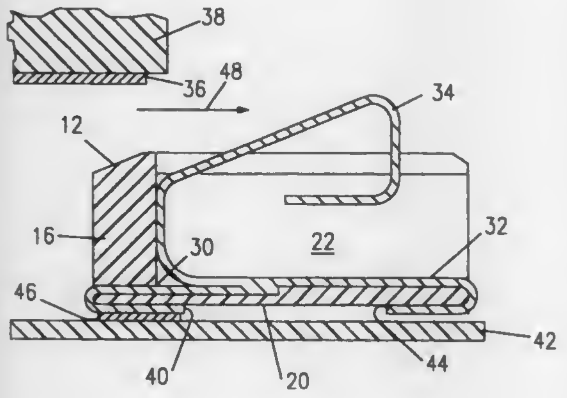
ELECTRICAL CONNECTOR ASSEMBLY

Karol Kwiat, Thousand Oaks, Calif.; John Sheehan, Bollintemple, Ireland; Ricky Brown, Pomona, Calif., and Pat Doyle, Togher, Ireland, assignors to Bourns, Inc., Riverside, Calif.

Filed Oct. 11, 1996, Ser. No. 728,709

Int. Cl.^{6} H01R *23/70*

U.S. Cl. 439—630 **20 Claims**



1. An electrical connector assembly, comprising:

an insulative housing having a top surface, a bottom surface, a front side, and a rear side;

a compartment in the housing defined by a longitudinal opening in the top surface and an opening in the rear side;

an aperture in the housing communicating between the front side and the compartment; and

a spring contact element disposed in the compartment and comprising a cantilevered portion defined between a front leg and a rear leg;

wherein the cantilevered portion extends through the longitudinal opening, the front leg extends through the aperture to form a front terminal lead, and the rear leg extends through the opening in the rear side to form a rear terminal lead.

5,746,627

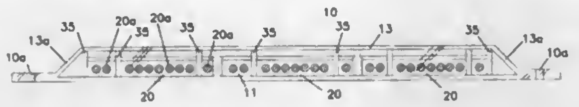
ELECTRICAL CONNECTION BAR ASSEMBLY AND HOUSING

Scott J. Bratten, 14560 - 40th Pl. North, Plymouth, Minn. 55446-7312

Continuation of Ser. No. 790,520, Jan. 29, 1997, abandoned, which is a continuation of Ser. No. 311,682, Sep. 23, 1994, abandoned. This application Jul. 15, 1997, Ser. No. 893,941

Int. Cl.^{6} H01R *9/24;11/09*

U.S. Cl. 439—721 **8 Claims**



1. An electrical connector arrangement comprising:

(a) an elongated, unitary, one-piece housing having: a first end, a second end, a length between the first and second ends, a front wall, a back wall, a top wall, and a bottom wall;

(i) said housing front wall, back wall, top wall, and bottom wall being constructed from a transparent material and being adapted for mounting on a surface along the housing length;

(ii) said housing front wall including a first plurality of openings constructed and arranged to permit access to an interior of the housing from the front wall of said housing; all of said first plurality of openings positioned an equal distance from said top wall of said housing; said first plurality of openings adapted to accommodate a plurality of electrical wires;

(iii) said housing top wall including a second plurality of openings constructed and arranged to permit access to the housing interior from the top wall of the housing;

(iv) said first end including a first beveled portion extending from the top wall and to the bottom wall, and said second end including a second beveled portion;

(b) a plurality of elongated terminal bars including at least a first elongated terminal bar; said first terminal bar being:

(i) positioned within said housing and mounted on said bottom wall and against said back wall;

(ii) spaced a first distance from said front wall and said first plurality of openings; and

(iii) spaced a second distance from said top wall and said second plurality of openings; and

(c) a plurality of set-screws engaging said first terminal bar and constructed and arranged to electrically connect said plurality of electrical wires to said terminal bar; each of said set screws being positioned coaxially with one of each of said second plurality of openings; each of said set screws having a first length;

(i) said first length being greater than said second distance; and

(ii) said first distance being sufficient to permit insulated portions of said plurality of electrical wires to penetrate into the housing interior prior to uninsulated portions contacting said first terminal bar.

5,746,628

ENGAGING STRUCTURE OF A TERMINAL AND A CONNECTOR HOUSING

Masaya Yamamoto, Shizuoka-ken, Japan, assignor to Yasaki Corporation, Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 553,765

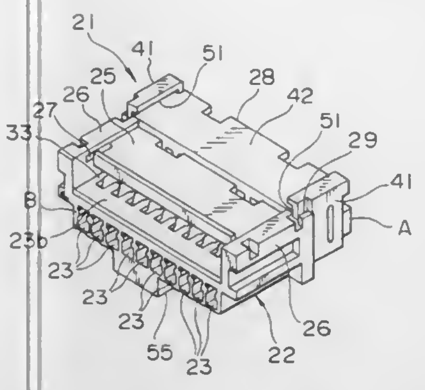
Claims priority, application Japan, Oct. 28, 1994, 6-265193

Int. Cl.^{6} H01R *13/447*

U.S. Cl. 439—752 **3 Claims**

1. An engaging structure of a terminal and a connector housing comprising:

a housing including a terminal receiving cavity;



the terminal including a base plate, a contact piece formed at a front end portion of the base plate, and an electric wire connecting portion formed at a rear end portion of the base plate, the terminal being inserted into the terminal receiving cavity from the front end of the base plate; and

a retainer being movable along a direction intersecting a direction of inserting the terminal into the terminal receiving cavity between a provisional locking position and a primary locking position and being allowed to be locked at these positions, the retainer having a detecting protrusion protruded into the terminal receiving cavity;

the terminal being provided with a projecting portion for moving the retainer to the primary locking position by slipping off from a moving path of the detecting protrusion toward the front side of a terminal insertion direction when the retainer is at the provisional locking position and the terminal is completely inserted at a normal position, and said projecting portion prevents the retainer from moving to the primary locking position by abutting against the detecting protrusion when the terminal is incompletely inserted just before the normal position,

wherein said projecting portion is provided with a detection hole which is formed between said contact piece and an end edge of said projecting portion and which is engageable with the detecting protrusion as the terminal moves toward said normal position when the terminal is inserted into the housing where the retainer is located at the primary locking position, and

wherein a protecting portion for protecting the contact piece is arranged between the detection hole and the contact piece.

5,746,629

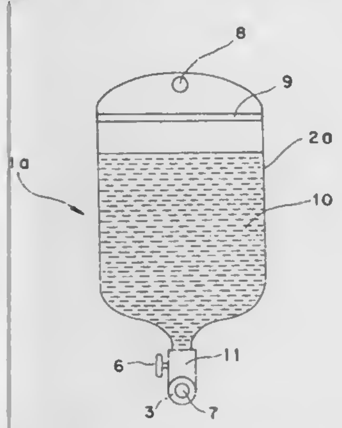
OUTBOARD MOTOR FLUSHING SYSTEM

Stanley K. Smith, 7780 Hayne Blvd., New Orleans, La. 70126

Filed Sep. 30, 1996, Ser. No. 722,963

Int. Cl.^{6} B63H *21/10*

U.S. Cl. 440—88 **1 Claim**



1. A system for flushing an outboard motor, said system comprising:

container means for holding a outboard motor flushing compound,

said container means comprising a top, a bottom and at least two sides,

means for securing said container means to a support,

aperture means for allowing said outboard motor flushing compound to exit from said container means,

T-shaped means having one arm connected to said aperture means, a second arm of said T-shaped means having female threads for connecting to a hose, and

a third arm of said T-shaped means having female threads for connected to a second hose,

valve means connected between said aperture means and said T-shaped means for controlling the flow of said outboard motor flushing compound, and

wherein said container means is made from a flexible material, and

wherein said container means has a resealable closure means, at an end opposite said T-shaped means, for allowing said container means to be filled with an outboard motor flushing compound,

said releasable closure means comprising an opening extending between said at least two sides,

one of said sides having a channel extending approximately across all of said one of said sides, and

another of said sides having a tongue extending approximately across all of said another of said sides,

said tongue being sealing engaged within said channel in order to close said opening, and

said tongue being removed from said channel in order to open said opening.

5,746,630

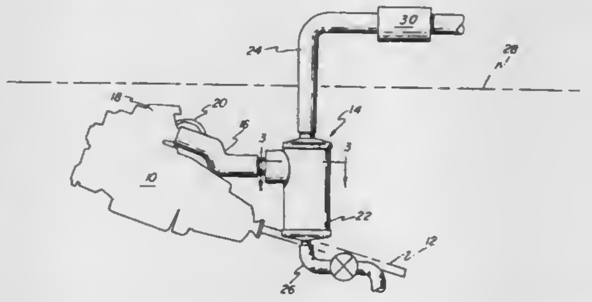
COMBINATION WET MARINE EXHAUST MUFFLER AND WATER SEPARATOR

John R. Ford, Xenia, Ohio, and Sam V. Shelton, Atlanta, Ga., assignors to Centek Industries, Inc., Thomasville, Ga.

Filed Aug. 26, 1996, Ser. No. 703,346

Int. Cl.^{6} B63H *21/32*

U.S. Cl. 440—89 **2 Claims**



1. Apparatus for muffling noise in and separating a marine exhaust fluid flow comprising exhaust gas and cooling liquid, said apparatus comprising a housing having a longitudinally extending axis, an inlet means communicating with said housing for providing ingress of said fluid flow, said inlet means including a port member and an inlet baffle proximate said port member, said inlet means further including first and second wall members disposed in spaced relationship and defining a channel therebetween, said inlet baffle being contiguous to said second wall and extending toward said first wall at said port member, said inlet baffle and said first wall, at said port member, defining a restricted opening having a smaller area than said channel, said inlet baffle further including a trailing edge portion adjacent said port member and having a concave shape, said inlet means inducing said fluid flow to swirl about said axis to impart centrifugal force thereon, a first outlet means communicating with said housing for providing egress of said exhaust gas and a second outlet means communicating with said housing for providing egress of said cooling liquid.

5,746,631

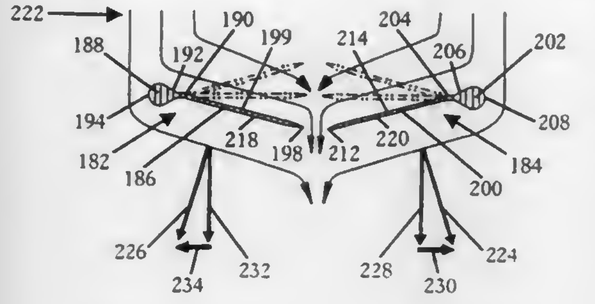
HIGH EFFICIENCY HYDROFOIL AND SWIM FIN DESIGNS

Peter T. McCarthy, 1628 W. Ocean Front Apt. #2, Newport Beach, Calif. 92663

Filed Jan. 11, 1996, Ser. No. 583,973

Int. Cl.^{6} A63B *31/08*

U.S. Cl. 441—64 **75 Claims**



1. A method for improving the performance of a swim fin, comprising:

(a) providing a shoe member,

(b) providing a blade member forming a substantially forward extension of said show member, said blade member having a root portion disposed near said shoe member, and a fore edge spaced from said shoe member and said root portion, wherein said shoe member is molded to said blade member proximate to said root portion to secure said blade member to said shoe member,

(c) orienting the spanwise alignment of at least a forward portion of said blade member near said fore edge at an angle to the transverse alignment of said shoe member in an amount effective to cause said spanwise alignment of said forward portion to be at a sufficiently reduced angle of attack to create a significant reduction in flow separation within the water flowing around the lee surface of said forward portion as said swim fin is kicked through said water during a swimming stroke,

(d) providing said forward portion with a leading side edge and a trailing side edge relative to said reduced angle of attack,

(e) providing said forward portion having said reduced angle of attack with a sufficiently large enough region of the surface area of said blade member for said reduction in said flow separation to occur in an amount effective to significantly reduce drag on said blade member during said swimming stroke,

(f) providing a substantially unobstructed flow path around said lee surface of said forward portion for permitting said water to flow around said lee surface from said leading side edge to said trailing side edge with sufficiently attached flow conditions to significantly increase the formation of a lifting force on said blade member,

(g) configuring said lee surface of said forward portion so as to encourage said attached flow conditions to occur along said lee surface in an amount effective to significantly increase said lifting force on said forward portion, and

(h) providing said blade member with sufficient rigidity to permit said blade member to substantially maintain orientations effective in generating said lifting force as said lifting force is transferred from said forward portion to said shoe member during said swimming stroke.

5,746,632

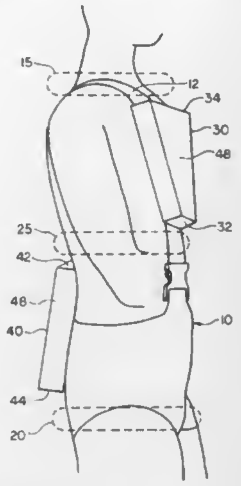
FLOATATION AID

Dawn L. Theberge, 32 Walker St., Lowell, Mass. 01854

Continuation-in-part of Ser. No. 651,466, May 23, 1996, abandoned. This application Apr. 7, 1997, Ser. No. 838,444

Int. Cl.^{6} B03C *9/08*

U.S. Cl. 441—115 **16 Claims**



1. A floatation aid for horizontal support of a person in a body of water, said floatation aid comprising:

a harness having a first end, a second end, and a central region, said central region proximate a person's lower ribs;

a first floatation device having a first end proximate said central region of said harness, and having a second end extending from said central region of said harness toward said first end of said harness, said first floatation device located only over the frontside of a torso of a person;

a second floatation device having a first end proximate said central region of said harness, and having a second end extending from said central region of said harness toward said second end of said harness, said second floatation device located only over the backside of a torso of a person;

one of said first and second floatation devices positioned only below said central region proximate the person's lower ribs and extending downward towards the person's hipbone, the other of said first and second floatation devices positioned only above said central region and extending upwards towards the person's neck, said first and second floatation devices positioned to floatationally support a person generally in a horizontal position.

5,746,633

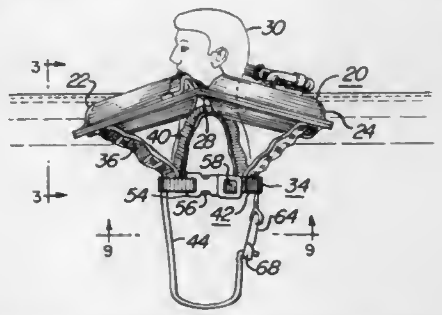
PERSONAL FLOTATION DEVICE

Lawrence W. Jeffrey, 842 E. Alosta, Sp. #18, Glendora, Calif. 91740

Continuation-in-part of Ser. No. 589,811, Jan. 22, 1996, abandoned. This application Nov. 6, 1996, Ser. No. 744,622

Int. Cl.^{6} B63C *9/15*

U.S. Cl. 441—123 **25 Claims**



1. An inflatable personal flotation device comprising:

a float for positioning at the shoulders of a user and having front and rear portions,

means for inflating the float upon being disposed in water,

harness means connected with the float and comprising a belt to be disposed about the user, at least one shoulder strap extending between the belt and the float, and elastic strap means between the harness and said float, and

said elastic strap means comprising a plurality of elastic straps connected with the front and rear float portions to pull downwardly thereon when the float is inflated in response to the weight of the user urging downwardly the central portion of the float to urge the front and rear float portions upwardly.

5,746,634

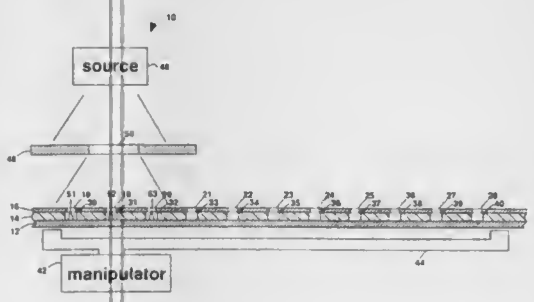
PROCESS SYSTEM AND METHOD FOR FABRICATING SUBMICRON FIELD EMISSION CATHODES

Alan F. Jankowski, Livermore, and Jeffrey P. Hayes, Ripon, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Apr. 3, 1996, Ser. No. 627,152

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—14 **4 Claims**



1. A method for fabricating field emission devices, the method comprising the steps of:

attaching to a manipulator a substrate that has an insulative layer sandwiched between a top and a bottom conductive layer, wherein said top conductive layer has an array of submicron holes beneath which are cavities in said insulative layer that extend down to the bottom conductive layer;

positioning a metal deposition source near said substrate on the side of said top conductive layer with said array of holes;

inserting between said substrate and said metal deposition source a shield with an aperture through which a spray of metal from said metal deposition source is allowed to pass to the substrate to form a first set of field emission cathodes in the form of metal cones on said bottom conductive layer in a first group of said cavities;

moving said substrate with said manipulator such that said spray of metal from said metal deposition source through said aperture is allowed to pass to the substrate to form a second set of field emission cathodes, apart from said first set, in the form of metal cones on said bottom conductive layer in a second group of said cavities;

moving said substrate with said manipulator such that said spray of metal from said metal deposition source through said aperture is allowed to pass to the substrate to form a subsequent set of field emission cathodes, apart from any previous sets, in the form of metal cones on said bottom conductive layer in subsequent groups of said cavities until all such cavities have formed in them a field emission cathode.

5,746,635

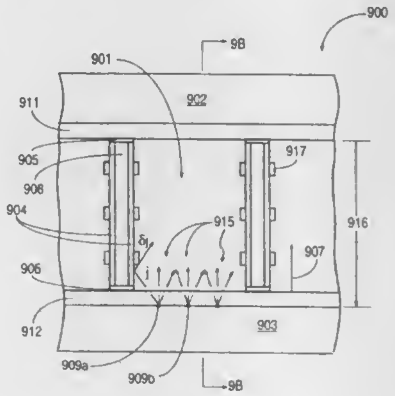
METHODS FOR FABRICATING A FLAT PANEL DISPLAY HAVING HIGH VOLTAGE SUPPORTS

Christopher J. Spindt, Menlo Park; David L. Morris; Theodore S. Fahlen, both of San Jose; Anthony P. Schmid, Solana Beach, and Paul A. Lovoi, Saratoga, all of Calif., assignors to Candescent Technologies Corporation, San Jose, Calif.

Continuation of Ser. No. 450,327, May 25, 1995, abandoned, which is a division of Ser. No. 188,857, Jan. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 12,542, Feb. 1, 1993, Pat. No. 5,589,731, which is a continuation-in-part of Ser. No. 867,044, Apr. 10, 1992, Pat. No. 5,424,605. This application Dec. 12, 1995, Ser. No. 572,348

Int. Cl.^{6} H01J *9/20*

U.S. Cl. 445—24 **40 Claims**



1. A method for fabricating a flat panel device, comprising the steps of:

providing a faceplate structure comprising a faceplate and a light emitting structure;

providing a backplate structure comprising a backplate and an electron emitting structure;

mounting a spacer between the backplate and faceplate structures;

treating surfaces of the spacer to inihibit charge buildup on the spacer surfaces;

coating an edge surface of the spacer with edge metallization such that the edge metallization forms an electrical connection between the spacer and the electron emitting structure of the backplate structure; and

sealing the backplate and faceplate structures together to encase the spacer in an enclosure.

5,746,636

BUBBLE AND SOUND GENERATING TOY

Joseph Cernansky, Lomita; George T. Foster, Signal Hill, and Elliot Rudell, Rancho Palos Verdes, all of Calif., assignors to Elliot A. Rudell, Torrance, Calif.

Continuation of Ser. No. 328,471, Oct. 25, 1994. This application Mar. 11, 1997, Ser. No. 814,350

Int. Cl.^{6} A63H *33/28*

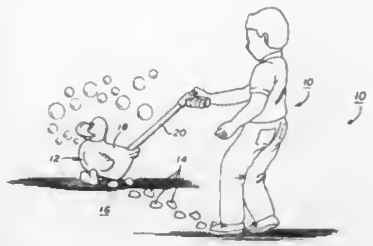
U.S. Cl. 446—16 **3 Claims**

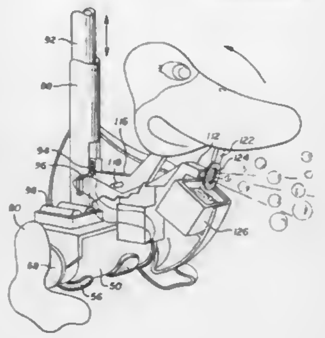
1. A toy device that can be moved along a surface, comprising:

a housing that is shaped as a toy duck and adapted to be moved along the surface said housing having a head that can move between a first position and a second position; and,

bubble producing means for generating a bubble when said housing head is in the second position;

a button that is depressed to move said head housing to the second position; and,





sound producing means that is coupled to said housing for generating an audible sound.

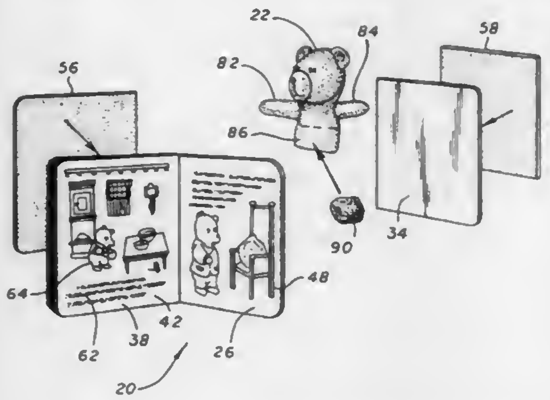
5,746,637
CHILDREN'S BOOK CONSTRUCTION

Waldo Henley Hunt, Encino, Calif., assignor to The Hunt Group, Santa Monica, Calif.

Continuation of Ser. No. 570,781, Dec. 12, 1995, abandoned. This application Sep. 11, 1996, Ser. No. 712,159

Int. Cl.^{6} A63H *3/00;33/38;3/02*

U.S. Cl. 446—72 **36 Claims**



1. A children's educational book and toy assembly, comprising:

a children's book in general rectangular configuration and having a front, back, upper and lower ends, and a predetermined thickness, and width;

said book including pictures of at least one specific figure such as an animal or a person;

a three-dimensional plush toy figure generally corresponding to said specific figure secured to a back of said book, said three-dimensional plush toy figure extending above a top of said book, and having a thickness substantially equal to the thickness of said book, and a lateral extent approximately equal to the width of said book; and

said back of said book bearing an image corresponding to an extension of said specific figure, so that, when viewed from a rear, the image and said three-dimensional plush toy figure form a continuous representation of said specific figure;

wherein the dimensions of said assembly are such that said assembly has a width and thickness substantially equal to the width and thickness of said book, and a length equal to the length of said book plus an outward extent of said specific three-dimensional plush toy figure, for ease in packaging of said assembly; and

wherein said plush toy figure is constructed and attached to said book so as to be rigid enough to be upright self-standing relative to said book.

5,746,638
MAGNETIC TOY BLOCKS

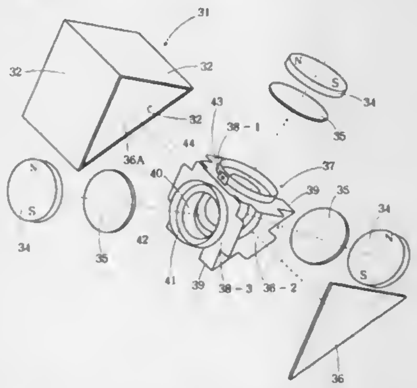
Masami Shiraishi, Tiba, Japan, assignor to Stuff Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 523,491, Sep. 1, 1995, abandoned. This application Aug. 29, 1996, Ser. No. 705,687

Claims priority, application Japan, Jan. 25, 1995, 7-043362

Int. Cl.^{6} A63H *33/04*

U.S. Cl. 446—92 **13 Claims**



1. A block toy composed of a plurality of blocks magnetically connectable to each other, wherein at least one of said blocks comprises a hollow block main body having plural flat surface portions, a plural number of magnet holders, corresponding to said plural flat surface portions, arranged on inner sides of said respective flat surface portions and having magnet holding portions extending in parallel with said corresponding flat surface portions, and permanent magnets accommodated within said magnet holding portions of said magnet holders for rotation about imaginary axes extending at right angles relative to said flat surface portions corresponding to said magnet holding portions;

wherein said plural magnet holders are connected together to form a connected magnet holder; said connected magnet holder having a cross-sectional shape substantially similar to a corresponding cross-sectional shape of the hollow block main body formed by said corresponding plural flat surface portions, said connected magnet holder with said permanent magnets accommodated within said magnet holding portions being positioned within an opening defined on said hollow block main body such that said connected magnet holder is immovably maintained in contact with inner walls of said hollow block main body.

5,746,639
FLAT STUFFED DOLL AND CLOTHING COMBINATION

Stuart J. Bloom, Concord, and Lorna Nichols, Stowe, both of Mass., assignors to Pockets of Learning, Ltd., Sudbury, Mass.

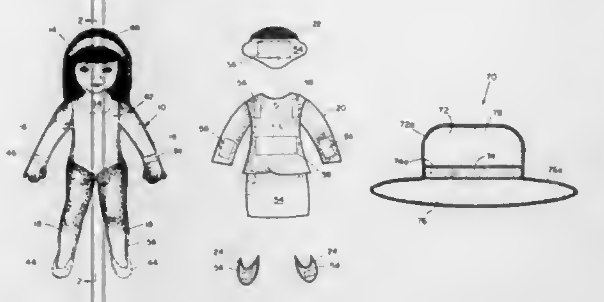
Continuation-in-part of Ser. No. 169,166, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 993,306, Dec. 18, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,286

Int. Cl.^{6} A63H *3/08;3/02*

U.S. Cl. 446—98 **9 Claims**

1. A stuffed doll and clothing combination comprising:

a 3-dimensional doll body having a front and rear surface made from a soft material enclosed by a fabric cover;



attachment means of a first component of hook and loop fastener material located on the front surface of said doll body representing articles of clothing including underwear and wristbands;

flat clothes adapted to attach to the front surface of said doll body, the clothes having fastening means of a second component of hook and loop fastener material for joining the clothes to at least a portion of the attachment means.

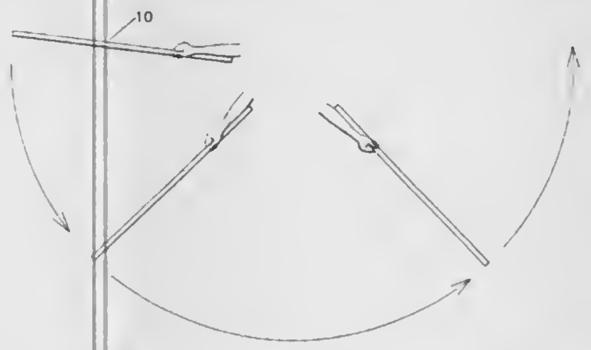
5,746,640
MOTION-ACTIVATED MUSICAL DEVICE

Michael R. Meadows, 2226 W. Barker, West Peoria, Ill. 61604

Continuation-in-part of Ser. No. 349,681, Dec. 5, 1994, abandoned. This application May 3, 1996, Ser. No. 642,589

Int. Cl.^{6} A63H *5/00*

U.S. Cl. 446—213 **3 Claims**



1. A hand-held musical device for producing several discrete musical tones in response to minimal motion comprising: a wand having first and second ends wherein the wand includes

(a) a longitudinal resonator comprising an elongated cavity having a solid inner wall for receiving and transmitting airflow therethrough, said wand being open at said first end, said cavity possessing a predetermined length and diameter capable of supporting longitudinal sound waves associated with harmonics of said longitudinal resonator, said length being at least twenty times said diameter, and

(b) a hole tone resonator disposed substantially at said second end of said wand, said hole tone resonator comprising a chamber enclosed by a chamber wall and two restrictive circular apertures, said chamber possessing a predetermined diameter substantially equal to diameter of said longitudinal resonator, both said apertures capable of transmitting airflow therethrough, said apertures being of substantially equal diameters and being coaxial with said chamber, each said aperture diameter being no more than fifty percent of said chamber diameter, and

c) a tone hole disposed in said inner wall intermediate and between said first and second ends, said tone hole being more proximate to said first end, and being distinct and separate from said first end, whereby a performer may quickly effect complete opening and closure of said tone hole with a thumb or finger while simultaneously grasping and swinging said wand, thereby creating melodic phrases from two distinct sets of harmonic overtones.

5,746,641
TOY

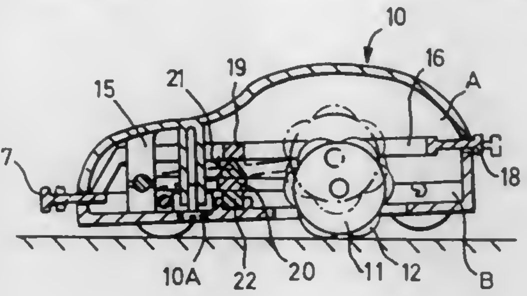
Tak-Ko Wong, Hong Kong, Hong Kong, assignor to T.K. Wong & Associates Ltd., Chaiwan, Hong Kong

Filed Jul. 7, 1997, Ser. No. 888,861

Claims priority, application United Kingdom, Aug. 5, 1996, 9616403

Int. Cl.^{6} A63H *17/00*

U.S. Cl. 446—431 **5 Claims**



1. A wall walker toy having a sticky surfaced wheel mounted inside a body of the toy in a first position with its surface partially exposed outside the body, in which the wheel is movable to a second position where the wheel is positioned wholly within the body, and an externally accessible operating mechanism arranged on physical impact to cause the wheel to move from its first position to its second position.

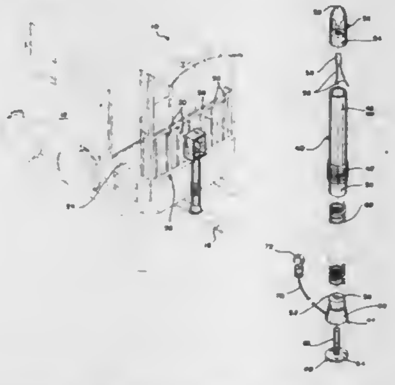
5,746,642
REAR TELEMETRY LIGHT FOR MODEL TRAINS

Raymond Grapp, 401 Montgomery Ave., Rockledge, Pa. 19046

Filed Dec. 20, 1996, Ser. No. 769,755

Int. Cl.^{6} A63H *17/28;* **H01R** *33/22*

U.S. Cl. 446—438 **2 Claims**



1. A rear telemetry light for use in association with a model train kit including a track and a caboose with a rear axle, the apparatus comprising in combination:

a light housing having a top and a bottom including an aperture extending therethrough, the light housing being coupled to a caboose;

a light assembly comprising a bulb, a bulb cover, a rigid tube and a base including a contact, the rigid tube having an upper end, a lower end and a hollow interior, the rigid tube includes a flexible section positioned adjacent to its lower end, the flexible section being fabricated of plastic and allowing movement of the upper end of the tube, the bulb cover having an enclosed top and an open bottom, the bulb cover being positioned upon the upper end of the tube through the aperture in the light housing, a bulb support being positioned within the open bottom of the bulb cover, the bulb including a plurality of power wires electrically coupled thereto, the bulb being positioned within the bulb support, the base including an aperture extending therethrough, the base being positioned within the lower end of the tube, the contact being positioned within the base, the contact being in electrical communication with the power wires, an inner spring being positioned within the hollow interior of the rigid tube, a ground wire being coupled to the base and around an axle of the caboose;

the contact is fabricated of metal and formed as a planar generally circular shaped plate with a cylindrical rod projecting upwardly from the plate, the rod being positioned through the aperture in the upper and lower sections, and the inner spring in an operative orientation urging the contact into communication with the railroad track thereby energizing the bulb; and

the bulb cover includes a decorative cap fabricated of brass and formed in a generally semi-spherical configuration with two downwardly extending projection members, the decorative cap being positioned upon the enclosed top of the bulb cover.

5,746,643

METHOD OF GRINDING AND MACHINING NON-CIRCULAR WORKPIECE AND APPARATUS FOR THE SAME

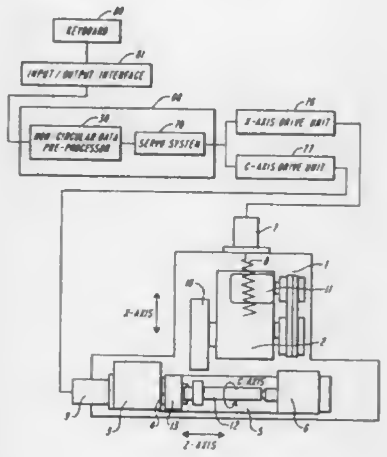
Fumitoshi Terasaki, Kani; Kenji Yoshimura, and Tatsuhiro Yoshimura, both of Komaki, all of Japan, assignors to Okuma Corporation, Aichi-ken, Japan

Filed Mar. 25, 1996, Ser. No. 621,474

Claims priority, application Japan, Mar. 23, 1996, 7-064380

Int. Cl.^{6} B24B *49/04*

U.S. Cl. 451—5 **2 Claims**



1. A method of grinding a non-circular workpiece comprising generating X/C axis data representative of work spindle rotating angle and wheel spindle head position from profile data representative of non-circular configuration of the workpiece, grinding wheel diameter and time required by the workpiece to make one revolution, and control of the work spindle rotation and reciprocal movement of the wheel spindle head, reading the X/C axis data while skipping a specified number of data points from which said X/C axis data is computed in order to compute speeds, accelerations and changes in acceleration of the work spindle and the wheel spindle head and the contact arc between the workpiece and the grinding wheel during grinding operation, thereby controlling rotation of the work spindle and reciprocal movement of the wheel spindle head by using modified X/C axis data generated by comparing the computed values with limit values of the speed, acceleration, change in acceleration and the length of contact arc which have been stored in advance and, when any of the computed values exceeds the limit values, reducing said specified number of data points from which said axis data is computed so that the value falls within the limit values.

5,746,644

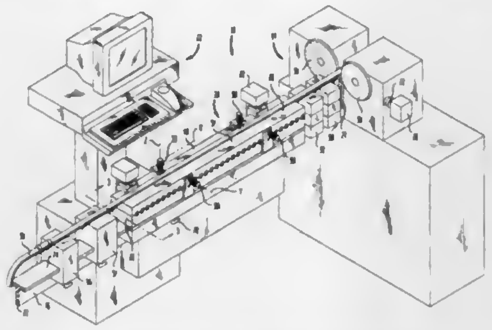
CENTERLESS GRINDER ASSEMBLY AND METHOD OF OPERATING THE SAME

Charles J. Cheetham, Wayne, N.J., assignor to Royal Master Grinders, Inc., Oakland, N.J.

Division of Ser. No. 635,328, Apr. 19, 1996, Pat. No. 5,674,106, which is a continuation-in-part of Ser. No. 598,549, Feb. 8, 1996, abandoned. This application Feb. 12, 1997, Ser. No. 799,399

Int. Cl.^{6} B24B *49/00*

U.S. Cl. 451—6 **10 Claims**



1. A method of operating a centerless grinder assembly comprising: determining the ideal profile dimensions of an elongate workpiece to be machined, said ideal profile having a non-uniform diameter along the length of said workpiece; inputting data representative of the ideal profile dimensions into a computer readable memory of the centerless grinder assembly; placing an elongate workpiece at a desired location on said centerless grinding assembly to be fed past a work wheel during machining operations; feeding said elongate workpiece past said work wheel of said centerless grinder assembly to obtain an actual machined workpiece profile, said actual machined workpiece profile having a non-uniform diameter along the length of said workpiece; continuously measuring the dimensions along the profile of the actual machined workpiece by feeding said machined workpiece through a gauging device; converting said measured workpiece profile dimensions into digital signals; transmitting said digital signals representative of said measured workpiece profile dimensions into a computer system of the centerless grinder assembly; calculating deviations between the ideal inputted workpiece dimensions and the measured workpiece dimensions; transmitting signals representative of the calculated deviations to means for modifying the profile of the next workpiece to be machined so that the profile dimensions of the next machined workpiece will be at least as close to said inputted ideal workpiece dimensions as the profile dimensions of the previously machined workpiece.

5,746,645

WORKING A NATURAL OR SYNTHETIC HARD STONE SUCH AS A GEMSTONE

David William Beal, Wooburn Green; Peter Armstrong Aked, Reading; David Antony Homer, Maidenhead; Timothy James Osgood, Basingstoke, all of United Kingdom; Eric Jozef Gentil Blondeel, Bruges, Belgium, and Ewan Howden Croucher, Whitburn, United Kingdom, assignors to Gersan Establishment, Liechtenstein, Liechtenstein

Continuation of Ser. No. 352,885, Dec. 9, 1994, abandoned. This application May 5, 1997, Ser. No. 851,118

Claims priority, application United Kingdom, Dec. 13, 1993, 9325443

Int. Cl.^{6} B24B *49/00*

U.S. Cl. 451—11 **21 Claims**

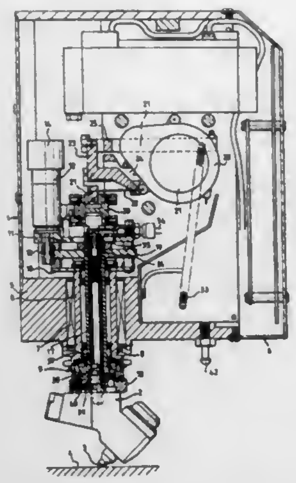
1. Apparatus for working a natural or synthetic stone having a Mohs hardness greater than about 5, using a tool, comprising:

a support member;

a mounting member for mounting a stone holder or a tool holder, the mounting member being movable relative to the support member to provide feed and apply a working force between the stone and the tool, and the mounting member being rotatable relative to the support member about an axis of relative rotation which intersects the tool;

a spring for applying to the mounting member an alterable biasing force which can at will be either in a direction for decreasing said working force or in a direction for increasing said working force, the spring having a portion acting on the mounting member, said spring portion being intersected by said axis; and

an actuating member for actuating said spring, whereby said biasing force can be altered and whereby said biasing force can be directed by said activating member to be in a direction for decreasing said working force or in a direction for increasing said working force.



5,746,646

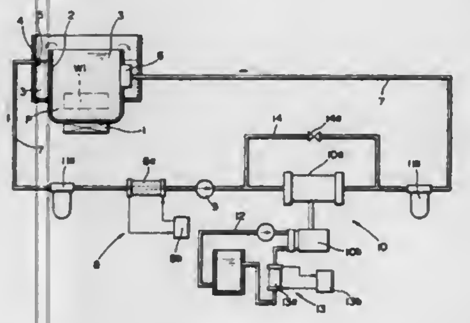
METHOD OF ULTRASONICALLY GRINDING WORKPIECE

Yoshihide Shibano, 1629-1-12, Oyama-cho, Machida, Tokyo, Japan

Division of Ser. No. 44,609, Apr. 12, 1993, Pat. No. 5,384,989. This application Nov. 9, 1994, Ser. No. 338,200

Int. Cl.^{6} B24B *31/06*

U.S. Cl. 451—36 **13 Claims**



1. A method of ultrasonically grinding a workpiece, comprising the steps of:

immersing a workpiece in a processing solution with abrasive grains suspended therein, the processing solution being contained in an ultrasonic processing tank equipped with an ultrasonic vibrator;

radiating ultrasonic energy from said ultrasonic vibrator into said processing solution to grind surfaces of the workpiece;

cooling said processing solution to a temperature lower than a boiling point thereof; and

deaerating said processing solution to reduce a net amount of dissolved oxygen contained in said processing solution, wherein said processing solution is deaerated to a dissolved oxygen content ranging from 0.5 to 3 ppm.

5,746,647

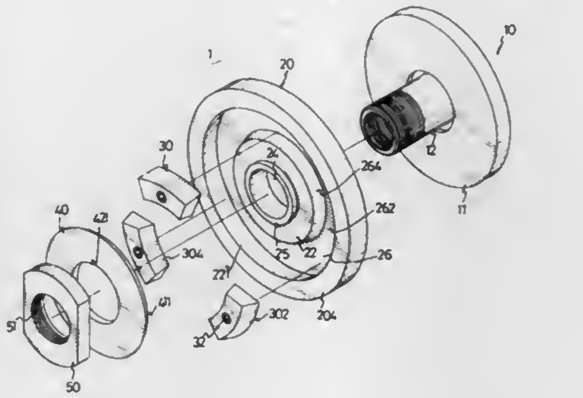
SLEEVE FLANGE TYPE MOUNTING DEVICE FOR MOUNTING A GRINDING WHEEL ON A SPINDLE OF A GRINDING MACHINE

Shih-chung Huang, Panchiao, Taiwan, assignor to China Grinding Wheel Corporation, Taiwan

Filed Nov. 12, 1996, Ser. No. 745,514

Int. Cl.^{6} B24D *5/16*; B24B *45/00*

U.S. Cl. 451—343 **4 Claims**



1. A sleeve flange type mounting device for mounting a grinding wheel on a spindle of a grinding machine, comprising:

a sleeve flange defining a flange portion and a sleeve portion projecting from the flange portion and defining an extremity having an outer thread formed thereon, said sleeve flange further defining a means for attaching the sleeve flange to the spindle;

a circular pressing plate for clamping the grinding wheel on the flange portion, comprising:

a first side for engaging with the grinding wheel;,

a second side opposite to the first side and defining a circular recess therefrom toward the first side;

a base wall located between the first side and second side;

a far wall located near a circumferential periphery of the pressing plate and inclined outwardly toward the first side of the pressing plate and terminating at a first end of the base wall;

a central stepped portion protruding from the base wall and located about a center of the pressing plate and defining a middle wall, said middle wall substantially parallel to the far wall and terminating at a second end of the base wall; and

a first central hole axially extending through the pressing plate, said sleeve portion being extended through the first central hole, wherein said far wall, base wall, middle wall and central stepped portion cooperatively form a recess from the second side of the pressing plate toward the first side thereof;

a plurality of arc-shaped balance weights received in the recess, each balance weight defining a first arc-shaped side abutting against the far wall, a front face located near the second side of the pressing plate, a rear face located near the base wall and a second arc-shaped side opposing the first arc-shaped side and inclined from the front face of the balance weight toward the rear face thereof in a manner that the distance between the first arc-shaped side and second arc-shaped side is gradually increased from the front face of the balance weight to the rear face thereof;

a plurality of screws respectively extending through the balance weights from the front face to the rear face thereof and exerting a pushing force on the base wall;

a circular cover attached to the pressing plate and having a circumferential periphery abutting against the second arc-shaped side of each of the balance weights; and

a nut threadedly engaging with the extremity of the sleeve portion and exerting a compressive force on the cover.

5,746,648

APPARATUS AND METHOD FOR MAKING A CUT IN AND PARTICULARLY REMOVING THE SPINE FROM A HALF

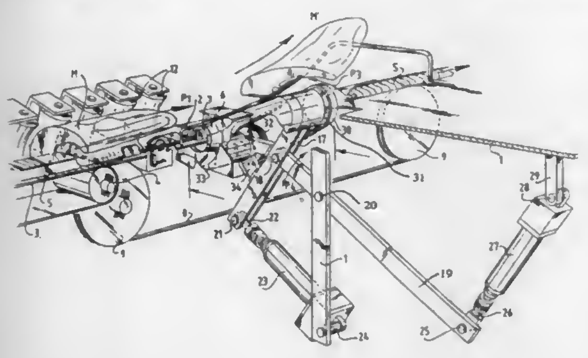
Johannes Wilhelmus Boeyen, Oss, and Jan Johannes Meerdink, Ravenstein, both of Netherlands, assignors to Stork Protecon-Langen B.V., Oss, Netherlands

Filed Dec. 1, 1995, Ser. No. 566,309

Claims priority, application Netherlands, Dec. 2, 1994, 9402036

Int. Cl.^{6} A22C *17/00*

U.S. Cl. 452—156 **20 Claims**



1. An apparatus for removing a spine from a part of a slaughtered animal, said apparatus comprising: a frame with a receiving member supported thereby; a separating member arranged close to the receiving member for applying an incision along the spine; transporting means for effecting a relative movement between the part of the slaughtered animal and the separating member; and a sensor member carried on the frame for determining a depth of a spinal marrow channel of the spine.

5,746,649

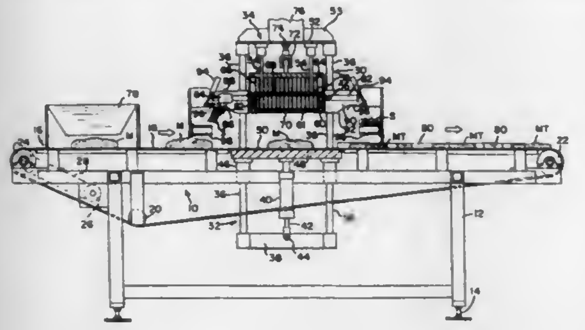
DESINEWING OF BONELESS TRIM

Gary R. Skaar, Marshall; Terry L. Holmes, DeForest; Donald E. Lucke, Madison; Gerald R. Popenhagen, Middleton; Jay I. Gust, Poynette; William N. G. Barron, III, Waunakee, and Dean F. Schwarz, Lodi, all of Wis., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 675,175, Jul. 3, 1996. This application Oct. 22, 1996, Ser. No. 740,135

Int. Cl.^{6} A22C *18/00*

U.S. Cl. 452—172 **40 Claims**



1. A method of separating muscle tissue of meat from the sinew comprising:

restraining the sinew against movement relative to a surface; and imparting a compressive force to the muscle tissue in a direction toward said surface while restraining the sinew, said force being sufficient to separate the muscle tissue from the sinew and cause the muscle tissue to move away from the restrained sinew in a direction at a substantial angle to the direction in which said compressive force is imparted to the muscle tissue.

5,746,650

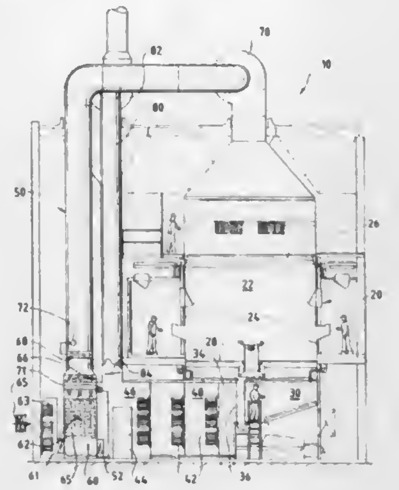
INTEGRATED PAINT SPRAY BOOTH AND AIR CONDITIONING SYSTEM AND PROCESS

Jeffrey Johnson, Beverly Hills, and Daniel M. St. Louis, MaComb, both of Mich., assignors to Haden, Inc., Auburn Hills, Mich.

Filed Jul. 27, 1995, Ser. No. 507,930

Int. Cl.^{6} B05B *15/12*

U.S. Cl. 454—52 **6 Claims**



1. An integrated paint spray booth and air conditioning system comprising:

(a) a longitudinally extending spray booth housing with opposed side walls, a top and a bottom defining a paint application zone, said top and bottom having passages to accommodate an air flow passing downward through said paint application zone;

(b) a scrubber chamber extending longitudinally below said paint application zone and having an inlet for receipt of paint laden air discharged from the housing and an outlet for the air leaving the scrubber chamber;

(c) a filtering chamber communicating with the outlet of the scrubber chamber and extending longitudinally and substantially coextensive with said scrubber chamber at least partially below said paint application zone, said filtering chamber including a plurality of air filters arranged longitudinally therein and an outlet located opposite to the scrubber chamber for the discharge of filtered air;

(d) a duct extending from said filtering chamber outlet to an air circulation system having an output communicating with the top of said spray booth housing;

(e) means in fluid communication with said duct to condition the air to a predetermined temperature and humidity prior to introduction into the housing, wherein said air conditioning means comprises an adiabatic saturator, a demister and a reheater, wherein said adiabatic saturator is at least in part a vertically standing packed tower arranged for a downward flow of water and a flow of air therethrough;

(f) whereby air is circulated from said housing and through the scrubber chamber, filter chamber and duct and returned to said housing in a path that is substantially transverse to the length of said spray booth housing.

5,746,651

EYEBALL OUTLET ASSEMBLY

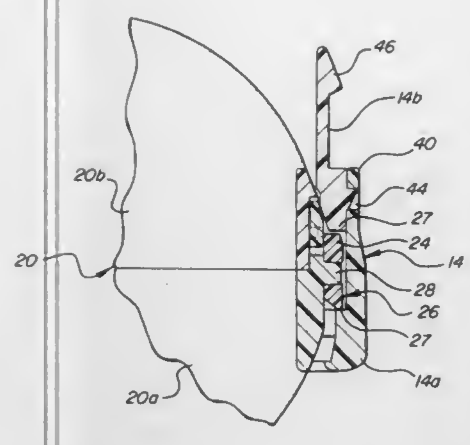
Guntis Arajs, Scarborough, and Dennis Patel, Markham, both of Canada, assignors to Collins & Aikman Plastics, Inc., Troy, Mich.

Filed Jan. 26, 1996, Ser. No. 592,065

Int. Cl.^{6} B60H *1/34*

U.S. Cl. 454—154 **17 Claims**

1. An air outlet assembly for directing air in a plurality of directions, said assembly comprising:



a housing having an air inlet and an air outlet and a circular interior housing surface;

a barrel rotatable within said housing and including directional vanes connected across said barrel for directing air in a plurality of directions;

a retainer ring of circular shape having a circumferential wall with at least one aperture formed in said wall, and rotatably interconnecting said housing and said barrel, and defining a first axis extending along a diameter of said retainer ring and a second axis extending longitudinally through said retainer ring transverse to said first axis, one of said barrel or said housing connected to said retainer to be relatively rotatable solely about said first axis and the other of said housing or said barrel connect to said retainer ring to be relatively rotatable solely about said second axis;

a guide operatively connected to one of said housing or said barrel to slidably engage said retainer ring with the one of said housing or said barrel to allow sliding rotation about said second axis:

one of said housing and said barrel including pivot pin extending therefrom for engagement with said aperture of said retainer ring for pivoting with respect thereto;

said retainer ring being made of flexible material to allow flexing during assembly of said retainer ring against said pivot pin and continued retention of said circular shape thereafter.

5,746,652

ACTIVATED AIR SHOWERING SYSTEM FOR CLEAN ROOM AND METHOD FOR CONTROLLING THE SAME

Joung-Sun Lee, Suwon; Dae-Yul Kim; Yo-Han An, both of Seoul, and Jae-Kang Jun, Anyang, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 771,775

Claims priority, application Rep. of Korea, Dec. 29, 1995, 95-65738

Int. Cl.^{6} B01L *1/04*

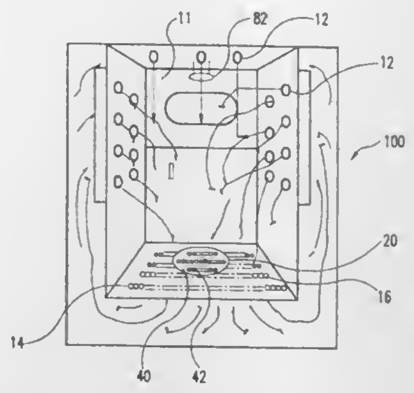
U.S. Cl. 454—187 **14 Claims**

1. An activated air showering system for a clean room comprising:

a plurality of shower disks provided on a floor of said clean room, each of said shower disks being formed with a plurality of exhaust holes for exhausting particles released from a worker;

sensing means for sensing the presence of the worker on said shower disk;

driving means for driving said shower disk in response to a signal from said sensing means; and



air spraying means for spraying air when said shower disk is driven by said driving means.

5,746,653

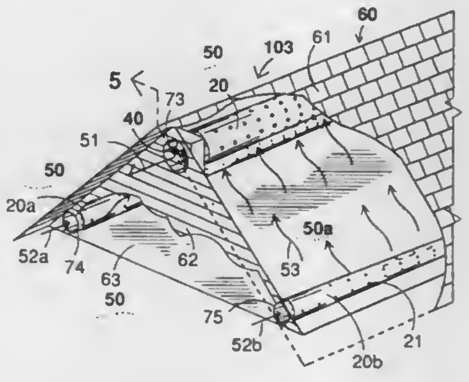
AIR DISTRIBUTOR OR COLLECTOR

Edward G. Palmer, Elk River, and Ephraim M. Sparrow, St. Paul, both of Minn., assignors to Solar Attic, Inc., Elk River, Minn.

Continuation-in-part of Ser. No. 528,720, Sep. 15, 1995, abandoned. This application Sep. 20, 1996, Ser. No. 717,148

Int. Cl.^{6} F24F *7/02*

U.S. Cl. 454—186 **9 Claims**



1. An airflow apparatus comprising:

a) an elongated tube having an axis, an axial length, a proximal end, a distal end, and a peripheral permeable wall around said axis, said wall having a surface area;

b) said tube disposed in an air environment;

c) said wall having a plurality of openings distributed along said axial length to allow said air to pass through said wall, said openings being arranged in size and quantity along said axial length to provide a progressively increasing wall air flow-through area per unit surface area of said wall along said axial length;

d) said wall air flow-through area per unit surface area of said wall being at a minimum value proximate said proximal end and at a maximum value proximate said distal end;

e) a fan connected to said tube by means of a duct, forcing said air to flow through said tube, said air flowing through said proximal end of said tube and at least a first portion of said air flowing through said wall of said tube;

f) means for terminating said tube at said distal end, said terminating means defining a second portion of said air which flows through said distal end, said second portion of said air having a minimum magnitude of zero;

g) said terminating means, said openings and said fan cooperating to define an airflow-rate through any portion of said wall along said axial length of said tube.

5,746,654
VENTILATOR

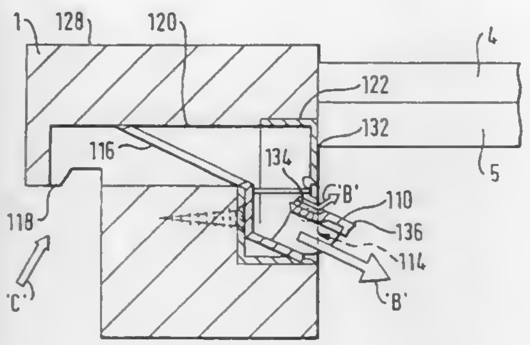
Richard Allan Peak, Colchester, United Kingdom, assignor to Titon Hardware Limited, United Kingdom

Filed Jun. 3, 1996, Ser. No. 655,694

Claims priority, application United Kingdom, Jun. 2, 1995, 9511202

Int. Cl.^{6} F24F *13/18*

U.S. Cl. 454—211 **16 Claims**



1. A vented window or door frame including an air passage extending from exterior side to an interior side of the frame, and an elongate ventilator positioned at the interior side of the frame and extending along the frame and communicating with the air passage, the ventilator comprising a main body having separable first and second parts, a first ventilation opening being provided in the first part at an end of the ventilator remote from the periphery of the frame, the frame being located with the second part of the ventilator adjacent a layer of interior building finish on the interior side of the frame, the first part of the ventilator being on the interior side of the frame and spaced from the layer of interior building finish such that the first part can be removed without disruption to the interior finish.

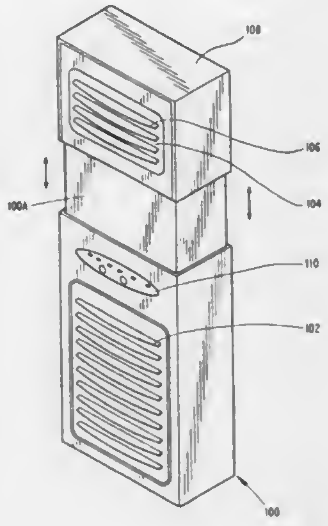
5,746,655
METHOD AND APPARATUS FOR OPENING AND CLOSING AN AIR OUTLET OF AN AIR CONDITIONER

Gab-Youl Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 10, 1996, Ser. No. 763,142

Int. Cl.^{6} F24B *13/20*

U.S. Cl. 454—233 **16 Claims**



1. An air conditioner comprising:
- a housing having an air inlet adjacent a lower portion thereof for admitting air into the housing to be heat exchanged therein;
- an air discharge member mounted at an upper end of the housing and including an outlet opening for discharging the heat-exchanged air; the discharge member being movable up and down relative to the housing; the outlet opening being closed by a portion of the housing when the discharge member is in a lowermost position, and being progressively opened in response to being raised;
- a drive mechanism for raising and lowering the discharge member;
- a detecting mechanism for detecting when the discharge member is in lowermost and uppermost positions, and
- a controller connected to the drive and detecting mechanisms for controlling the drive mechanism in accordance with signals received from the detecting mechanism.

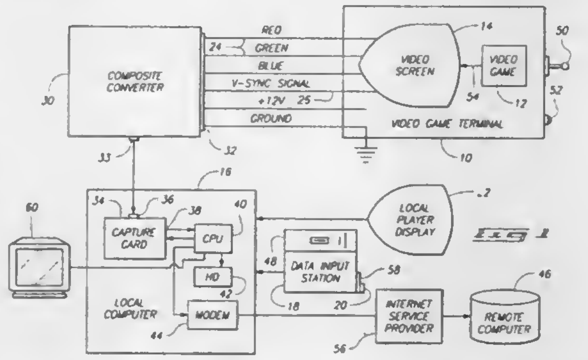
5,746,656
VIDEO GAME COMPETITION METHOD AND APPARATUS

William Bezick, 4138 S. Cook, Spokane, Wash. 99223; Allen E. Fiedler, P.O. Box 12660, Oldtown, Id. 83822; Jody Kerlee, 20017 Williams Lake Rd., Cheney, Wash. 99004, and Shan Hemphill, E. 17505 Cataldo, Greenacres, Wash. 99016

Filed Apr. 23, 1996, Ser. No. 636,249

Int. Cl.^{6} A63F *9/22*

U.S. Cl. 463—42 **27 Claims**



19. Method of conducting video game tournament competition comprising:
- receiving player information associated with each player of a video game in a video game tournament at a data entry station associated with a video game terminal at which said video game is played, wherein each said video game results in a final score which is associated with said player of said video game and said final score is displayed on a video screen associated with said video game terminal, said final score being displayed as a result of a video game screen output signal, wherein said video game screen output signal is communicated to said video screen by said video game terminal;
- intercepting said video game screen output signal and communicating said intercepted video game screen out put signal to a video capture circuit;
- digitizing said video game screen output signal containing said final score with said video capture circuit;
- saving each said digitized video game screen output signal into a computer memory;
- processing each said digitized video game screen output signal using character recognition software to extract said final score from said digitized video game screen output signal;
- saving each said extracted final score to said computer memory;
- comparing all said extracted final scores to determine a winning extracted final score; and
- determining a winner of said video game tournament by identifying said player information associated with said winning extracted final score and identifying said player associated with said player information, wherein said identified associated player is said winner.

5,746,657
OFF-TRACK BETTING SYSTEMS

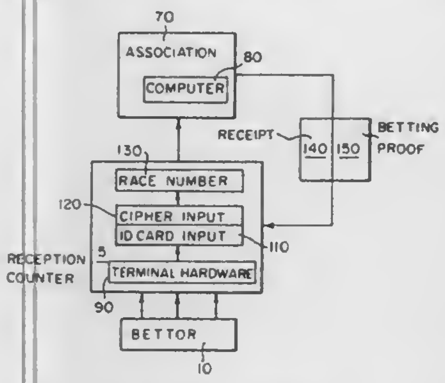
Teruo Ueno, c/o Royal Housing, Inc., 9-11, Sougawa 3-chome, Toyama-shi, Toyama-ken, Japan, assignor to Teruo Ueno, and Royal Housing, Inc., both of Toyama-ken, Japan

Filed Feb. 16, 1996, Ser. No. 602,452

Claims priority, application Japan, Feb. 16, 1995, 7-053355; Feb. 22, 1995, 7-059852

Int. Cl.^{6} G06G *7/48*

U.S. Cl. 463—41 **4 Claims**



1. An off-track betting system comprising:
- receiving means for receiving live racing from a race track,
- display means for displaying the received live racing so that unspecified bettors can watch the race,
- betting means for enabling the bettors to enter bets on the outcome of the race displayed on said display means through a TV telephone or facsimile, and
- banking means for enabling a race organization to receive bets placed by the bettors and to transfer any winnings to or deduct any money lost from the bettors' accounts.

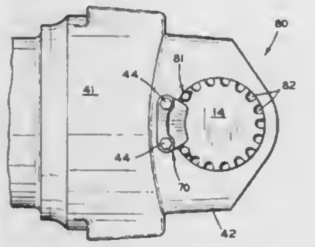
5,746,658
ANTI-ROTATION RETAINER FOR UNIVERSAL JOINT

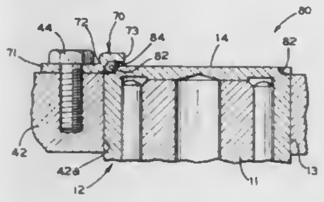
James A. Duggan, Temperance, Mich., and Ray A. Gall, Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 459,939, Jun. 5, 1995, Pat. No. 5,620,374, which is a division of Ser. No. 364,176, Dec. 27, 1994, which is a continuation-in-part of Ser. No. 696,229, May 6, 1991, Pat. No. 5,376,051. This application Apr. 1, 1996, Ser. No. 626,729

Int. Cl.^{6} F61D *3/26*

U.S. Cl. 464—130 **10 Claims**





1. A universal joint assembly comprising:
- a yoke including an arm having an opening formed therethrough;
- a cross including an outwardly extending trunnions;
- a bearing cup rotatably mounted on said trunnions and disposed within said yoke arm opening;
- a retainer clip including a base portion secured to said yoke arm and an end portion extending over a portion of said bearing cup to retain it within said yoke arm opening;
- a retainer wire disposed between said retainer clip and said bearing cup; and
- at least one element secured to said retainer wire and engaging a portion of said bearing cup to prevent said bearing cup from rotating relative to said yoke arm.

5,746,659
FLANGE DRIVER FOR A CARDAN SHAFT

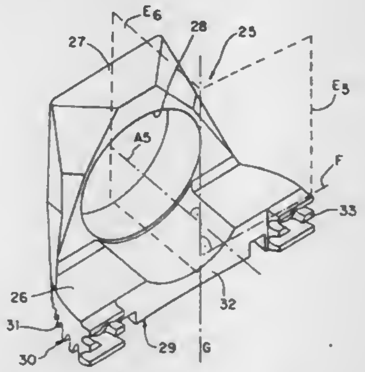
Hans Lindenthal, Heidenheim, Germany, assignor to J. M. Voith GmbH, Germany

Continuation of Ser. No. 231,336, Apr. 22, 1994, abandoned. This application Jul. 3, 1996, Ser. No. 674,978

Claims priority, application Germany, Apr. 22, 1983, 43 13 141.7

Int. Cl.^{6} F16D *3/38*

U.S. Cl. 464—135 **9 Claims**



1. A flange driver for a cardan joint, the cardan joint having a spider including two pins disposed offset by 90° relative to each other, said flange driver adapted to engage a shaft, the shaft defining a yoke axis, said flange driver comprising:
- two mutually complementary yoke halves positively connected together, each said yoke half having a base and a bearing part, each said bearing part having a bore therein, said bores defining a pin axis, said pin axis and said yoke axis defining a plane;
- each said yoke half base having an end face including a plurality of spurs for engagement with the shaft, said plurality of spurs extending radially from said yoke axis;
- each said yoke half having an interface surface disposed substantially perpendicular to the pin axis, said interface surface having teeth disposed thereon extending toward the interface surface of the other yoke half and mating therewith, said teeth having engageable tooth flanks that engage adjacent respective tooth flanks on the other yoke half, said engageable tooth flanks defining at least one tangent line that is non-parallel to said plate, whereby relative movement of said yoke halves along the direction of the yoke axis is prevented.

5,746,660
GAME TABLE TILT AND ROLL SUPPORT

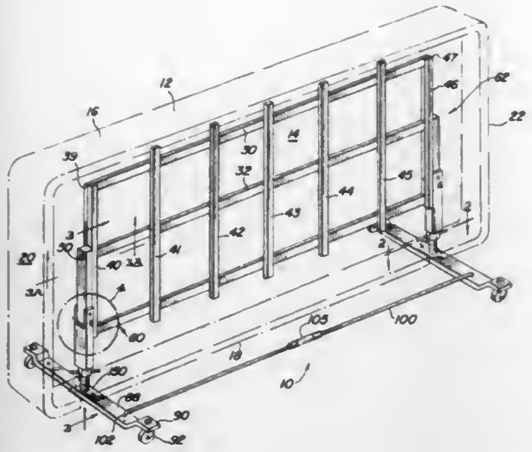
Douglas B. Grover, Phoenix, Ariz., assignor to T & R Assembly, Inc., Alma, Mich.

Filed Nov. 29, 1995, Ser. No. 564,469

Int. Cl.^{6} A63B *71/00*

U.S. Cl. 473—15 **8 Claims**

1. A table having a generally planar playing surface and a bottom surface and having a longitudinal and a transverse dimension, said table comprising:



- (a) a plurality of main legs secured to the bottom of said table and moveable between an extended position supporting said table and a retracted position and which normally support the table in a use position in said extended position;
- (b) adjustment means associated with said main legs for selectively increasing or decreasing the length thereof;
- (c) a frame secured to said table bottom; and
- (d) a pair of tilt and roll support members disposed at opposite longitudinal locations, each of said tilt and roll members comprising:
  - (i) an upper leg member pivotally secured to said frame about a longitudinal axis;
  - (ii) a lower leg member pivotally secured to said upper leg member about a generally transverse axis, said lower leg member being pivotal between an extended and a stored position in which the lower leg is disposed below the table bottom; and
  - (iii) base means having rollers associated therewith, said base means connected to said lower leg member by adjustment means to selectively adjust the position of said base means with respect to said lower leg member wherein said lower leg member and said base means may be pivoted from a stored position to a generally vertical position to transfer the weight of the table to said tilt and roll support members and whereby said tilt and roll support members may be moved to said stored position and said playing surface pivoted to a generally vertical position for mobility and storage.

5,746,661

GOLF PUTTER WITH OFFSET GRIP SHAFT

James Murphy, P.O. Box 412, Accord, Mass. 02018

Filed May 3, 1996, Ser. No. 642,508

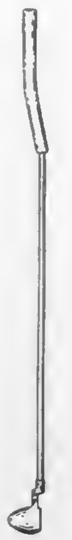
Int. Cl.^{6} A63B *53/14*

U.S. Cl. 473—204 **6 Claims**

1. A golf club having a shaft with a grip portion at one end and a putter head at an opposite end;

wherein the grip portion has an offset bend therein, wherein an upper side of the offset bend accommodates one hand of a user while a lower side of the offset bend accommodates the other hand of a user,

said lower side of said offset bend being positioned behind a plane containing said striking face of said head, and said upper side of said offset being substantially parallel to the plane of the striking face of said head.



5,746,662

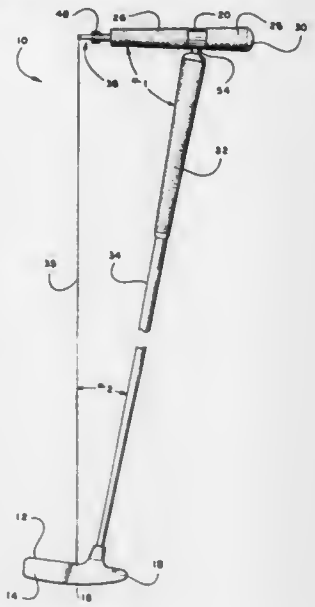
CONTROLLED PENDULUM GOLF PUTTER

Herbert D. Squire, 67 River Isles, Bradenton, Fla. 34208

Filed May 6, 1997, Ser. No. 851,676

Int. Cl.^{6} A63B *69/36*

U.S. Cl. 473—206 **18 Claims**



1. A golf putter comprising:

a club head;

an elongate shaft having an upper end and a lower end, the lower end of said shaft affixed to and extending upwardly from said club head at a predetermined angle;

a first forward handle rotatably affixed to the upper end of said first shaft at a second predetermined angle and extending away from a user for gripping by the user;

a second handle rotatably affixed to the upper end of said first shaft and extending toward the user; and

a third handle affixed to said shaft opposite the club head,

whereby a user grips the first handle in order to support the putter, rests the second handle against the body, and employs the third handle to rotate the shaft relative to the axis of the first handle so as to swing the club head in a pendulum motion.

8. A golf putter comprising:

a club head having a striking face between a heel portion and a toe portion;

an elongate first shaft extending upwardly from said club head;

a bearing head affixed on an end of said first shaft opposite said club head and having a bore with an axis extending substantially parallel to a plane containing the striking face of said club head;

an elongate substantially horizontal second shaft rotatably mounted in and extending through the bore of said bearing head;

a first forward handle affixed to one end of said second shaft and extending away from the heel portion of said club head and from a user for gripping by the user;

a second handle affixed to the other end of said second shaft and extending rearwardly toward the user; and

a third handle affixed to said first shaft opposite said club head;

whereby a user grips the first handle in order to support the putter, rests the second handle against the body, and employs the third handle to rotate the first shaft relative to the axis of the bearing head so as to swing the club head in a pendulum motion.

5,746,663

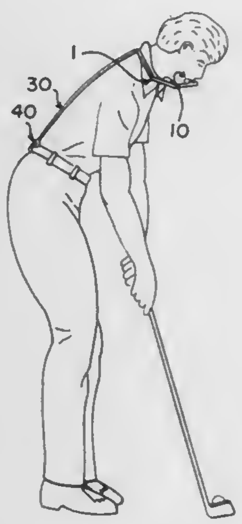
GOLFING AND BATTING AID

Michael A. Calace, 3054 Olive View Rd., Alpine, Calif. 91901

Filed Jun. 27, 1997, Ser. No. 884,135

Int. Cl.^{6} A63B *69/36*

U.S. Cl. 473—211 **16 Claims**



1. A golfing and batting aid for enabling a user to maintain proper head position while executing the swinging of a golf club or baseball bat comprising:

a mouthpiece;

a rigid support bar having a proximal end connected to said mouthpiece by fastening means, and a distal end;

an inflexible connecting member having a first end and a second end, said first end having securing means for attachment to said distal end of said rigid support bar and said second end having attachment means for engaging a user's belt or waistband;

wherein said rigid support bar is configured in such a manner that it extends away from said mouth piece and towards the rear of said user's head.

5,746,664

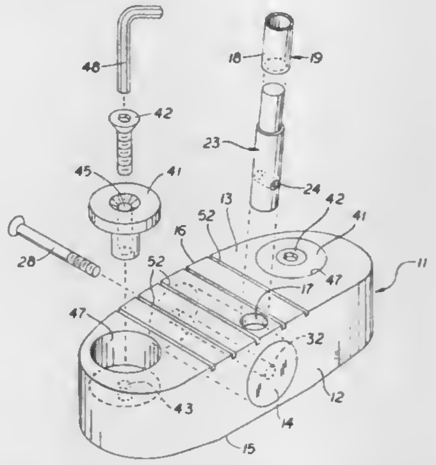
GOLF PUTTER

Walker Reynolds, Jr., 14 Rendalia Rd., Anniston, Ala. 36201

Continuation-in-part of Ser. No. 387,175, Feb. 13, 1995, Pat. No. 5,533,725, which is a continuation-in-part of Ser. No. 241,278, May 11, 1994, Pat. No. 5,388,827. This application Jan. 16, 1996, Ser. No. 585,938

Int. Cl.^{6} A63B *53/02;53/04*

U.S. Cl. 473—252 **21 Claims**



12. A golf putter comprising a combination

- a) a shaft having a grip end and a distal end, said grip end including at least one removable weight selected form a group of cooperatively formed weights which can be selectively exchanged to adjust the overall weight of said grip end;
- b) an adapter, selected form a group of cooperatively formed adapters, rigidly attached to said distal end and extending longitudinally therefrom, and wherein said adapter is weighted such that said adapter can be selectively exchanged with any of said group of cooperatively formed adapters to adjust the overall weight of said distal end;
- c) a head having a striking face and an upper surface perpendicular to said striking face, said upper surface having a bore formed therein, oblique to the surface thereof and parallel to said striking face, of a dimension adapted to fixedly receive said adapter, and wherein said striking face includes an insert for adjusting the percussion response of said striking face; and,
- d) means for engaging said adapter within said bore for releasably securing the same to said head;

5,746,665

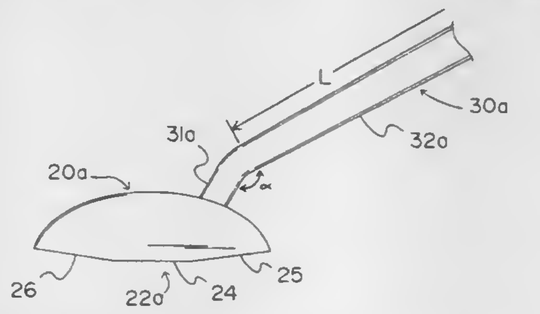
GOLF PUTTER

Jack A. Wenker, 1727 Huntley Rd., Goshen, Ohio 45122

Filed Dec. 26, 1996, Ser. No. 772,580

Int. Cl.^{6} A63B *53/00;69/36*

U.S. Cl. 473—313 **12 Claims**



1. A golf putter comprising:

a putter head having a planar, vertically extending ball striking surface, a top surface, and a bottom surface; and an elongated shaft attached to the top surface, said shaft comprising a continuous piece bent into two portions, including a first portion extending from the top surface at a first angle less than 90 degrees relative to the bottom surface formed between the first portion and the top surface, and a second portion extending from the first portion at a second angle, said second angle being measured interiorly between the second portion and the first portion and being greater than the first angle;

wherein the second angle is fixed at approximately 166 degrees.

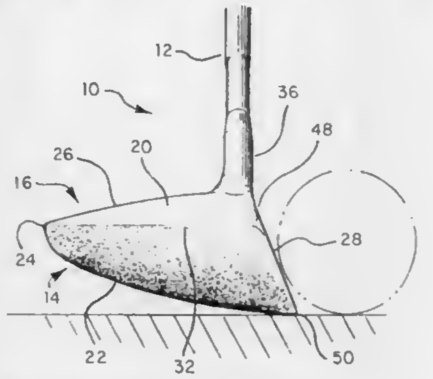
5,746,666
GOLF CLUB AND CLUB HEAD

William E. Lovett, Naples, Fla., assignor to Love It Golf Company, Naples, Fla.

Filed Nov. 6, 1996, Ser. No. 744,786

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—328 **15 Claims**



1. A metal wood type golf club comprising:

a substantially hollow metallic body defining a toe portion, a heel portion, said heel portion having a hosel formed therein and adapted to receive an end of a golf club shaft, a front ball striking surface having a perimeter which includes upper and lower edges, a top wall surface extending rearwardly from said upper edge of said striking surface, and

a bottom wall surface extending from said lower edge of said front ball striking surface rearwardly to meet said top wall surface; said bottom wall surface being substantially rounded in the heel to toe direction so as to define a generally blunt apex at the lower edge of said ball striking surface;

said bottom wall surface also being inclined in a rearward direction from a center point on said lower edge of said ball striking surface and said front ball striking surface inclined to define a predetermined loft angle with respect to the ground when the longitudinal axis of said hosel is in a vertical plane parallel to the longitudinal axis of said front ball striking surface.

5,746,667
SUSPENSION TYPE GOLF TEE

Paul M. Fraser, 3155 Robenson Street, Regina, Saskatchewan, Canada, S4S 1V6, and Stanley Dwayne Proctor, 488 S. Cedar St., Allegan, Mich. 49010

Filed Mar. 24, 1997, Ser. No. 823,088

Int. Cl.^{6} A63B *69/36*

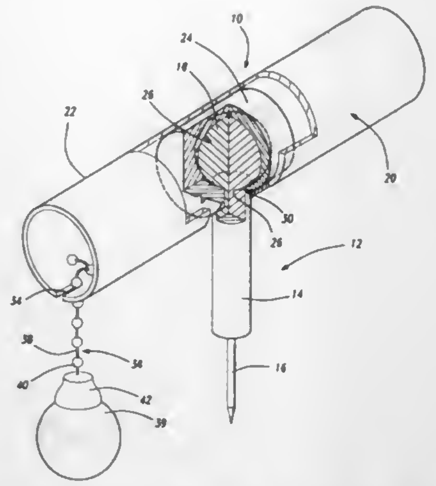
U.S. Cl. 473—393 **13 Claims**

1. A suspension type golf tee comprising:

a vertical member having a pointed lower end,

a transverse member,

a pivotal joint comprising a ball at one end of said vertical member and a spherical socket provided in said transverse member, said pivotal joint connecting the upper end of said vertical member to said transverse member, permitting angular movement between said transverse member and said vertical member,



a stringer connected at one end to one end of said transverse member, and having a golf ball retaining means connected to the other end of said stringer,

whereby the pointed end of said vertical member may be struck into the ground, a golf ball engaged by said golf ball retaining means, and said transverse member may be pivoted angularly with respect to said vertical member, until said golf ball is suspended at the desired height above ground for hitting the ball with a golf club.

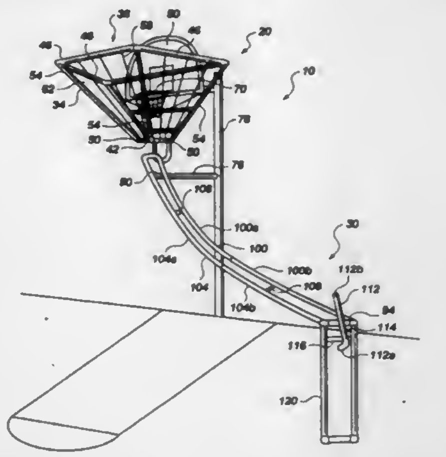
5,746,668
BASKETBALL RETRIEVAL APPARATUS AND SHOOTING SYSTEM

Peter Ochs, 7623 Champions Ct., Wichita, Kans. 67226

Filed Feb. 9, 1996, Ser. No. 599,086

Int. Cl.^{6} A64B *69/00*

U.S. Cl. 473—433 **25 Claims**



1. A basketball retrieval apparatus for attachment to a basketball backboard/basket supported by a mast, the basketball retrieval apparatus comprising:

collection means disposed about the basket, the collection means having an upper opening and a lower opening;

a basketball return ramp having a first end and a second end, the first end being disposed adjacent the collection means and below the lower opening, the basketball return ramp being pivotable adjacent the first end such that movement of the second end causes the first end to pivot with respect to the collection means; and

support means for holding the collection means adjacent the backboard/basket for supporting the first end in a pivotable attachment adjacent the collection means the support means comprising a support arm configured at one end for attachment to the mast and at an opposing end for attachment to the basketball return ramp for attaching the collection means and the first end of the basketball return means to the mast of the basketball standard adjacent the backboard.

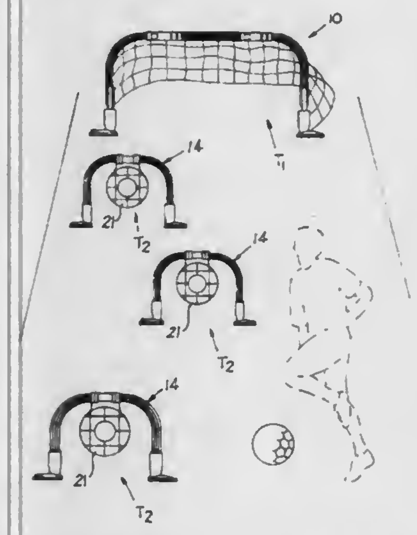
5,746,669
GAME AND TRAINING DEVICE FOR TEACHING SOCCER SKILLS

Michael N. Sinsheimer, 1723 Beverly Dr., Charlotte, N.C. 28207; Richard W. Turner, Charlotte, N.C., and Holger Schleife, Berlin, Germany, assignors to Michael N. Sinsheimer, Charlotte, N.C.

Filed Oct. 31, 1996, Ser. No. 751,298

Int. Cl.^{6} A63B *69/00*

U.S. Cl. 473—446 **20 Claims**



1. A game and training device for use on a playing field for teaching skills to a player, comprising

a primary goal on the playing field forming a target opening in a generally vertical plane through which a ball may be kicked by the player; and

a plurality of intermediate goals arranged on the playing field in spaced relation to one another and in spaced relation to said primary goal,

each said intermediate goal defining a respective target opening through which the ball is to be passed as the player advances the ball to said primary goal, and

each said intermediate goal comprising a pair of base members positioned in laterally spaced apart relation to one another, and a hoop member supported by said pair of base members, said hoop member including upright portions extending respectively from said base members and a medial portion extending laterally between and interconnecting said upright portions, and said hoop member comprising two substantially identically shaped pieces releasably fitted together to form said pair of upright portions and said medial portion, said upright portions and said medial portion defining said target opening.

5,746,670
BATTING SWING TRAINING DEVICE

Steven Garvin Brady, 4511 McDonald Dr. N., Stillwater, Minn. 55082

Filed Oct. 23, 1996, Ser. No. 735,686

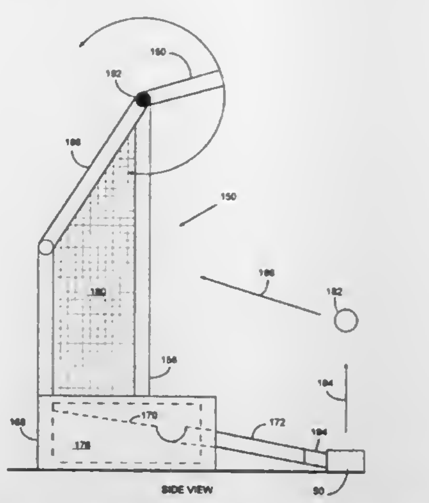
Int. Cl.^{6} A63B *69/40*

U.S. Cl. 473—451 **1 Claim**

1. An automated batting swing training apparatus, comprising:

a ball projecting unit to propel balls in a substantially upward direction for a batter to hit, the ball projecting unit comprising:

a drive motor to drive a wheel drive pinion;



a cam member rotatably engaging the wheel drive pinion and axially moving a ball propelling platform in response thereto, the cam member having a recurring rod release mechanism;

a ball guide conduit encompassing the ball propelling platform, wherein the ball propelling platform moves longitudinally within a guide cylinder; and

an axial compression spring having a first end coupled to the guide cylinder, and a second end positioned against the ball propelling platform, wherein the ball propelling platform is propelled axially outward from the direction of the compression of the axial compression spring, and in the longitudinal direction of the guide cylinder, upon activation of the recurring rod release mechanism;

a ball stopping device, having a substantially non-resilient portion positioned to absorb a force of the balls resulting from being hit by a batter;

a containing unit located at a base of the ball stopping device and positioned to collect the balls; and

a guide channel, demountably connected to the containing unit and the ball projecting unit at opposite ends, wherein the guide channel is sloped downward from the containing unit to the ball projecting unit to return the balls to the ball projecting unit by way of gravity.

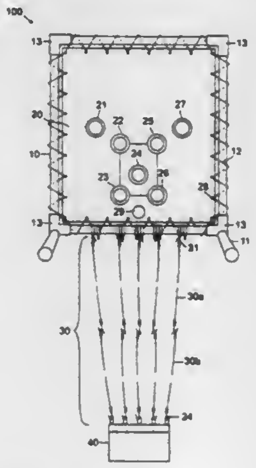
5,746,671
PITCHER'S TRAINING DEVICE AND METHOD OF TRAINING

Gregory Ritchie, Rte. 1, Box 933, Mineral, Va. 23117

Filed Dec. 29, 1995, Ser. No. 581,160

Int. Cl.^{6} A63B *69/00*

U.S. Cl. 473—454 **62 Claims**



1. A sports training device comprising:

a frame having vertical supports;

- a tarpaulin secured to the frame;
- one or more targets arranged on the tarpaulin;
- one or more fasteners secured in a predetermined spacial relationship with a selected target; and
- a lead line having a first end adapted to be engaged with a selected fastener, the lead line extending from the selected fastener below the selected target toward a player-in-training and being adapted to provide a visible guide line from a point near the player to a point below the selected target for alignment with the selected target.

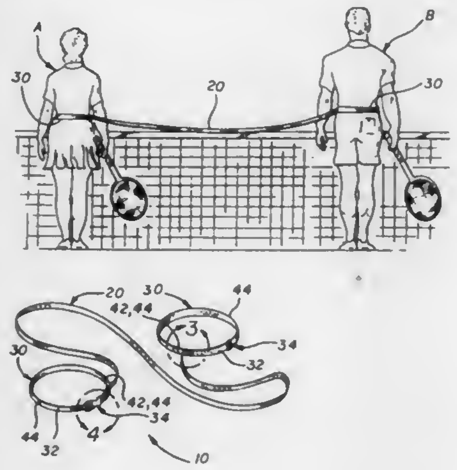
5,746,672
TENNIS DOUBLES TRAINING APPARATUS AND METHOD

Gwenevere Jane Smith, 852 A Third St., Encinitas, Calif. 92024

Filed Sep. 13, 1996, Ser. No. 713,439

Int. Cl.^{6} A63B ***69/00***

U.S. Cl. 473—464 **9 Claims**



1. Tennis training apparatus for aiding in maintaining the desired spacing between players on a doubles team, comprising:
- an elongated, flexible tether;
- connecting means for attaching said tether at spaced apart locations to the players to connect them to one another via said tether; and
- disconnect means including at least one Velcro™ fastener associated with said tether and responsive to a force on said tether in excess of a predetermined level to break the tether connection.

5,746,673
FASTENING EYE FOR A TENSIONER

Rudolf Polster, Baiersdorf, and Werner Schmidt, Herzogenaurach, both of Germany, assignors to Ina Waelzlager Schaeffler OHG, Herzogenaurach, Germany

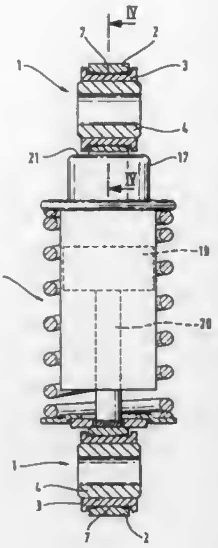
Filed Sep. 3, 1996, Ser. No. 706,450

Claims priority, application Germany, Sep. 9, 1995, 195 33 457.4

Int. Cl.^{6} F16H ***7/08;*** **F16C** ***27/06***

U.S. Cl. 474—101 **22 Claims**

1. A tensioning device for a traction drive in an internal combustion engine, comprising a tensioner of a type having a cylindrical housing; a piston means received in the housing for reciprocating in a longitudinal direction; a compression spring extending between the housing and the piston for exerting a linear force on the traction drive; and two tensioning eyes with one tensioning eye secured to one end of the housing, and the other tensioning eye secured to one end of the piston means, each of the tensioning eyes comprising:
- a fastening sleeve for attachment to the tensioner,



- a bushing, and
- an elastic ring securing the bushing in a bore of the sleeve and defining an outer surface area, said bore of the sleeve and said outer surface area of the elastic ring being so configured as to form a central, circumferential contact zone from which a gap expands continuously in radial direction toward each end face of the sleeve,
- said elastic ring having opposite ends formed with radially outwardly directed flanges which define an outer diameter and are spaced from the end faces of the sleeve by an axial distance, said bore of the sleeve being defined by an inside diameter, wherein the outer diameter of the flanges is greater than the inside diameter of the bore so as to form a radial overlap.

5,746,674
POWER TRANSMISSION BELT AND METHOD OF PRODUCING THE SAME

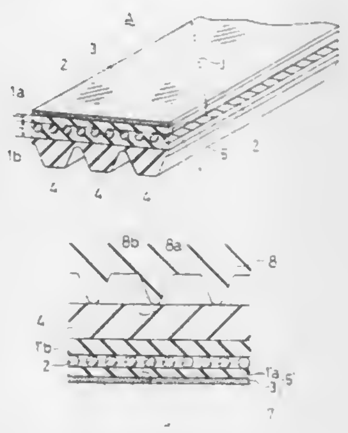
Yoshitaka Tajima, and Takamitsu Akashi, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed May 2, 1996, Ser. No. 642,242

Claims priority, application Japan, May 11, 1995, 7-112906

Int. Cl.^{6} F16G ***3/10;1/10***

U.S. Cl. 474—253 **4 Claims**



1. A power transmission belt comprising:
- an adhesion rubber layer in which a cord is arranged at specific intervals in a belt width direction and is embedded along the length of the belt; and
- a top fabric adhered on the top surface of the adhesion rubber layer so as to be integral with the adhesion rubber layer,

- wherein the top fabric is laminated with an adhesion rubber sheet made of an unvulcanized rubber sheet to form a band-shaped laminate integral with the adhesion rubber sheet, said adhesion rubber sheet being located on the upper side from the cord of the adhesion rubber layer and forming an upper rubber portion of the adhesion rubber layer, and
- wherein both the top fabric and the adhesion rubber sheet of the band-shaped laminate are butt-jointed at both ends so as to be prevented from producing a level difference at the top surface of the top fabric and at the bottom surface of the adhesion rubber sheet.

5,746,675
CARRIER CONNECTING STRUCTURE FOR AN AUTOMATIC TRANSMISSION

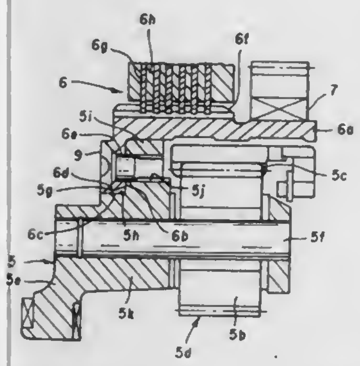
Shinichi Sugiyama, Fuji, Japan, assignor to Jatco Corporation, Japan

Filed Dec. 15, 1995, Ser. No. 573,295

Claims priority, application Japan, Dec. 28, 1994, 6-337553

Int. Cl.^{6} F16H ***3/44***

U.S. Cl. 475—278 **5 Claims**



1. A carrier connecting structure for an automatic transmission comprising:
- a brake that connects and disconnects a rotating member by oil pressure and a planetary gear mechanism comprising a carrier supporting a planetary gear train,
- wherein a fixing section having fixing surface oriented in a perpendicular direction and a circumferential direction relative to a shaft line is provided on the outer circumference of said carrier, a flange having a fixing surface which comes in contact with said fixing surfaces projects from said rotating member, and said fixing section of said carrier and said flange of said rotating member are connected by connecting means, and
- wherein said rotating member and said planetary gear train are located at the same side of said carrier.

5,746,676
FRICTION TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Tatsuo Kawase; Naoshi Hattori; Takashi Nozaki; Tomoaki Makino, and Takahide Saito, all of Iwata, Japan, assignors to NTN Corporation, Osaka, Japan

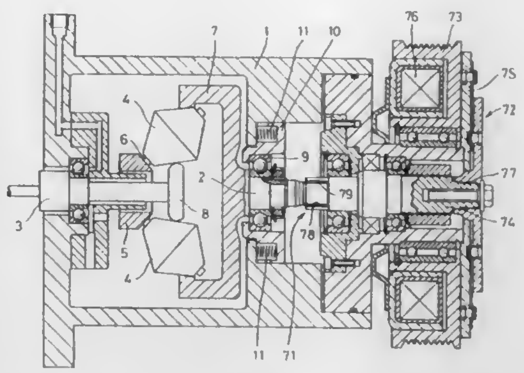
PCT No. PCT/JP95/00840, § 371 Date May 29, 1996, § 102(e) Date May 29, 1996, PCT Pub. No. WO95/33147, PCT Pub. Date Dec. 7, 1995

PCT Filed Apr. 27, 1995, Ser. No. 596,110

Claims priority, application Japan, May 31, 1994, 6-118741; May 31, 1994, 6-118790; Jun. 29, 1994, 6-147763

Int. Cl.^{6} F16H ***15/16;57/04***

U.S. Cl. 476—50 **7 Claims**



1. A friction type continuously variable transmission comprising an input shaft, an output shaft provided coaxially with said input shaft, a plurality of double cones kept in contact with both said input shaft and said output shaft so as to be movable in the axial direction of said input and output shafts, a biasing means biasing said input shaft away from said double cones so that said double cones are pulled by said input shaft and said output shaft in opposite directions, a clutch coupled to said input shaft for, and a rotation preventive means provided between said input shaft and said clutch for preventing the rotation of said input shaft relative to said clutch while allowing axial movement of said input shaft.

5,746,677
VEHICLE TRANSMISSION SYSTEM

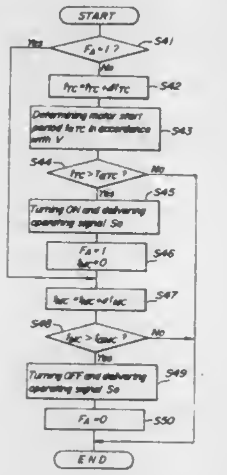
Tatsuo Wakahara, Kawasaki, and Kenichiro Murakami, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1995, Ser. No. 531,740

Claims priority, application Japan, Sep. 21, 1994, 6-226469

Int. Cl.^{6} B60K ***17/348***

U.S. Cl. 477—35 **6 Claims**


START
Yes
F_A=1 ?
S41
No
S42
Determining motor start period in accordance with V
S43
S44
No
Yes
S45
Turning ON and delivering operating signal So
F_A=1
S46
S47
S48
No
Yes
Turning OFF and delivering operating signal So
S49
F_A=0
S50
END

1. A vehicle transmission system comprising:
- an input shaft to which a drive force is transmitted from a rotary drive source;
- output shafts for transmitting the drive force from said input shaft to wheel sides;
- a hydraulic circuit for feeding hydraulic fluid having a predetermined pressure so as to change the drive force transmitted from said input shaft; a main pump driven by the drive force transmitted from said rotary drive source and a subpump driven by a motor;
- fluid pressure supply means for feeding a predetermined pressure based upon a hydraulic fluid pressure given by said main pump and said subpump which suck up hydraulic fluid from a tank, into said hydraulic circuit;
- motor control means for controlling drive of said motor in accordance with a predetermined condition;
- motor control condition detecting means for detecting a condition of the motor controlled by said motor control means; and

motor auxiliary control means for energizing said motor with a preset predetermined timing for a predetermined drive time during a period in which said motor control condition detecting means detects a stopping control condition of said motor, and including vehicle speed detecting means for detecting a vehicle speed,

wherein at least either said predetermined timing with which said motor is started, or said predetermined drive time with which said motor is energized, is set in accordance with a vehicle speed detected by said vehicle speed detecting means.

5,746,678

CONTINUOUSLY VARIABLE TRANSMISSION

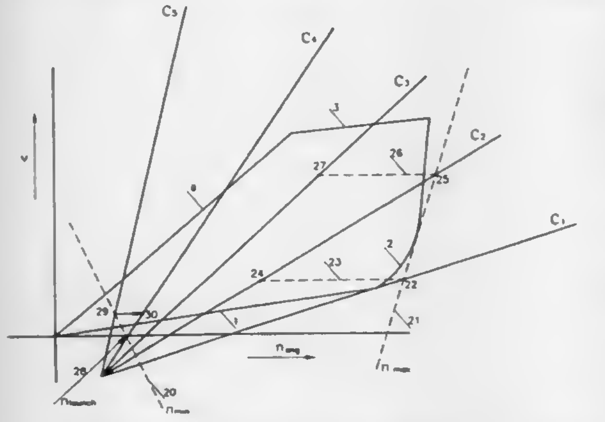
Wilhelmus Cornelus Waltherus Maria Roovers, Prinsenbeek, and Chi Chung Chol, Eindhoven, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Jul. 21, 1995, Ser. No. 505,153

Claims priority, application Netherlands, Aug. 15, 1994, 9401313

Int. Cl.^{6} B60K *41/12*

U.S. Cl. 477—45 **13 Claims**



1. Continuously variable transmission comprising a control for the transmission ratio of the transmission, which control in a first operating mode controls the transmission ratio on the basis of at least one input signal and in a second operating mode controls the transmission ratio along at least one control curve of at least one set of control curves, wherein said control curves relate an input speed of the transmission to an output speed of the transmission such that, in accordance with said functions, the control curves of a set converge in the direction of decreasing input speed and, if extrapolated beyond an operating range of said transmission, intersect one another at an intersection point outside a common zero origin of the input speed and output speed of the transmission.

5,746,679

METHOD AND APPARATUS FOR CONTROLLING DRIVING POWER OF MOTOR VEHICLE

Toshimichi Minowa, Ibaraki-ken, and Yoshishige Ohyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

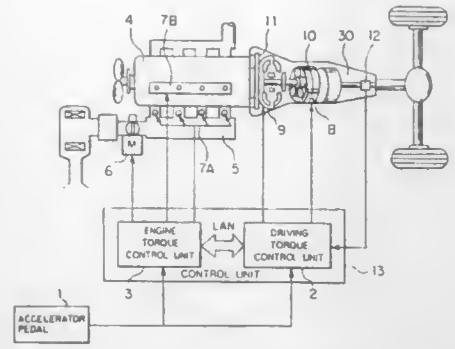
Continuation of Ser. No. 260,362, Aug. 2, 1994, Pat. No. 5,580,330, which is a continuation of Ser. No. 936,005, Aug. 27, 1992, Pat. No. 5,343,781, which is a division of Ser. No. 686,527, Apr. 17, 1991, Pat. No. 5,150,635. This application Dec. 3, 1996, Ser. No. 758,947

Claims priority, application Japan, Apr. 18, 1990, 2-100321

Int. Cl.^{6} B60K *41/04;* F16H *59/18*

U.S. Cl. 477—92 **3 Claims**

1. A method of controlling a driving power of a motor vehicle equipped with at least a throttle valve controller for controlling a throttle valve disposed in an intake passage of an internal combustion engine and a transmission mechanism disposed between said engine and driving wheels of said motor vehicle, wherein upon detection of a state in which said throttle valve is at least approximately fully opened, said transmission mechanism is actuated to change speed of the motor vehicle, said throttle valve being closed to a predetermined degree of opening in synchronism with said speed change or alternatively after or before said speed change.



5,746,680

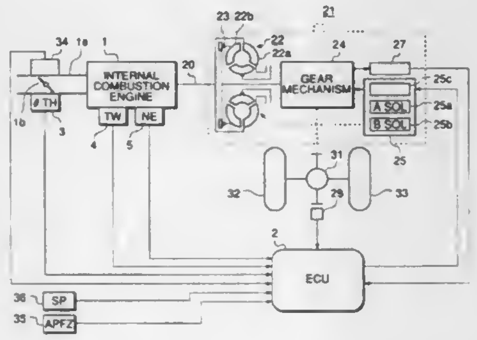
CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Akira Kato; Toru Kitamura; Hisashi Igarashi; Sakae Suzuki; Yasuo Takagi; Toshiaki Hirota, and Jun Takahashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1996, Ser. No. 763,256

Int. Cl.^{6} B60K *41/10*

U.S. Cl. 477—95 **10 Claims**



1. In a control system for an automatic transmission of an internal combustion engine installed on an automotive vehicle, including deceleration-determining means for determining whether said automotive vehicle is in a predetermined decelerating condition, speed position-detecting means for detecting a speed position of said automatic transmission, and downshift control means for effecting a downshift of said speed position of said automatic transmission to a lower speed position when it is determined by said deceleration-determining means that said automotive vehicle is in said predetermined decelerating condition,

the improvement comprising:

measuring means for measuring a duration over which said automatic transmission continues to be in said speed position detected by said speed position-detecting means; and

inhibiting means for inhibiting said downshift control means from effecting said downshift of said speed position to said lower speed position if said duration measured by said measuring means does not exceed a predetermined time period, when it is determined by said deceleration-determining means that said automotive vehicle is in said predetermined decelerating condition.

5,746,681

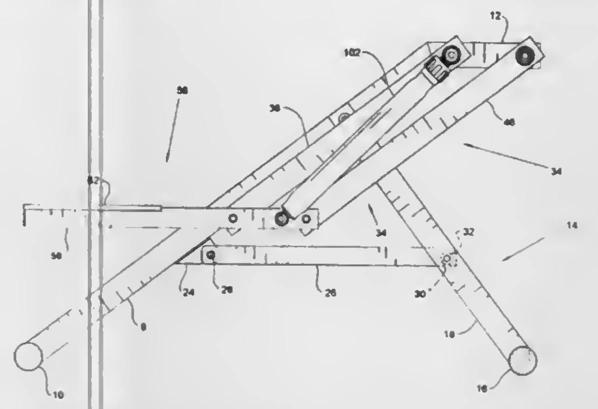
WALKING EXERCISE MACHINE

John W. Bull, 2502 Wedgewood Ct., Olympia, Wash. 98501

Continuation-in-part of Ser. No. 597,608, Feb. 6, 1996, abandoned. This application Feb. 11, 1997, Ser. No. 798,667

Int. Cl.^{6} A63B *22/04*

U.S. Cl. 482—53 **22 Claims**



1. A non-impact exercise machine for simulating walking comprising:

a frame;

right platform manias for supporting user's right foot;

right linkage means having an upper end pivotally connected about non-moving right upper pivot axes to the frame, and a lower end pivotally connected about moving right lower pivot axes to the right platform means, wherein the distances from the right upper pivot axes to the right lower pivot axes are fixed lengths,

the right linkage means for moving the right platform means over a right fixed path below the right upper pivot axes while maintaining the right platform means approximately horizontal,

the right fixed path having a right forwardmost and uppermost terminal position and a right rearmost terminal position;

left platform means for supporting user's left foot; and

left linkage means having an upper end pivotally connected about non moving left upper pivot axes to the frame, and a lower end pivotally connected about moving left lower pivot axes to the left platform means, wherein the distances from the left upper pivot axes to the left lower pivot axes are fixed lengths,

the left linkage means for moving the left platform means over a left fixed path below the left upper pivot axes while maintaining the left platform means approximately horizontal,

the left fixed path having a left forwardmost and uppermost terminal position and a left rearmost terminal position;

bias means for returning the right platform means to the right forwardmost and uppermost terminal position when there is no downward external force on the right platform means and for returning the left platform means to the left forwardmost and uppermost terminal position when there is no downward external force on the left platform means; and

resistance means for resisting rearward movement of the right platform means along the right fixed path and the left platform means along the left fixed path.

5,746,682

FOLDING DEVICE FOR TREADMILL

Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Tao Yuan County, Taiwan

Filed Jul. 24, 1996, Ser. No. 685,563

Int. Cl.^{6} A63B *22/02*

U.S. Cl. 482—54 **1 Claim**

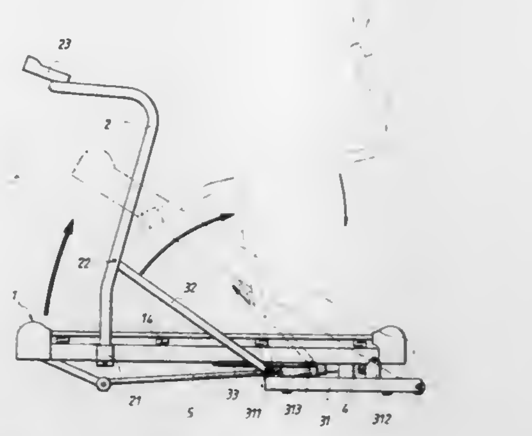
1. A folding device for treadmill comprising mainly:

a treadmill body with two pivot holes located symmetrically beneath two side walls at its the front end, two screw holes arranged symmetrically at appropriate positions on the two side walls at its rear end, and a connection hole between a pivot hole and a screw hole at a position beneath the two side walls;

a handle frame fixed with a pipe socket at each end and locked to a pivot hole formed on the treadmill body with a bolt has a locking hole at an appropriate location on each side pipe; and

a folding device including a U-like base (31) welded with a L-like hinging plate at the front end and a pivoting plate at the rear end of each side, a hinge plate between the L-like hinging plate and the pivoting plate at an appropriate position on one side, in which each of the pivoting plates is movably connected to a screw hole at each side of the treadmill body by means of a screw, while two links are used and having their holes at both ends movably connected to the locking hole and the L-like hinging plate respectively by means of screws, and a pneumatic or hydraulic retractable pressure bar is movably connected to each connection hole and the hinge plate on the U-like base by means of screws;

whereby the treadmill body is at an expanded condition to serve as a treadmill when the handle frame is erected vertically on the front end of the treadmill body by retaining it at the side walls, and the handle frame is folded promptly to the surface of the treadmill body by upward pulling of the handle frame to separate it from the side walls which consequently causes the retractable pressure bar to act and cause the treadmill body to stand vertically and drive the handle frame to fold to the surface of the treadmill body.



5,746,683

FOLDING COLLAPSIBLE STEP EXERCISING MACHINE

Kuo-Lung Lee, No. 61, Mai Jou II Rd.,, Yi Lan City, Taiwan, China

Filed Jul. 16, 1997, Ser. No. 895,299

Int. Cl.^{6} A63B *69/16:27/04*

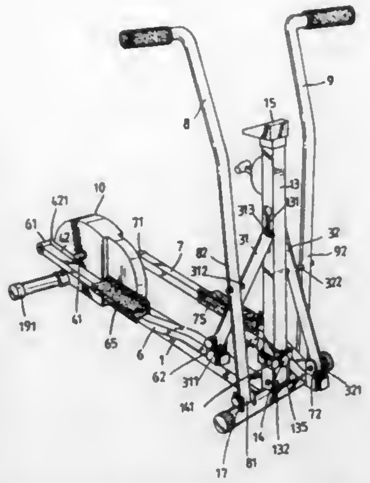
U.S. Cl. 482—57 **2 Claims**

1. A folding collapsible step exercising machine comprising:

a base frame having an upright front mounting frame raised from a front side thereof in the middle, a rear upright support raised from a rear side thereof in the middle, two pairs of upright lugs symmetrically raised from its front side and bilaterally spaced from said upright front mounting frame, two rollers bilaterally mounted on its rear side for supporting on the ground, and a carrying handle at its front side in front of said upright front mounting frame for carrying by hand;

a front upright having a bottom end pivoted to said upright front mounting frame of said base frame, a top end, two longitudinal sliding slots bilaterally disposed near its top end, an instrument case fixedly mounted on its top end, and two longitudinal sliding tracks bilaterally disposed on the inside corresponding to said longitudinal sliding slots;

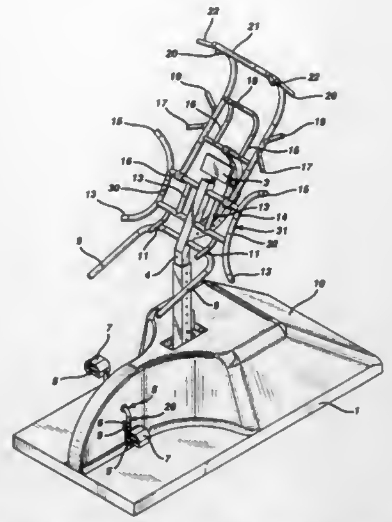
lock means mounted on said upright front mounting frame of said base frame and controlled to lock said front upright in a vertical position;



a U-shaped damping wheel holder frame fixedly mounted on said base frame between said rear upright support and said upright front mounting frame, having a projecting rod;
a damping wheel having a fixed wheel shaft revolvably supported on said U-shaped damping wheel holder frame;
a driving wheel revolvably supported on said rear upright support of said base frame, having a fixed wheel shaft;
two rear pedal links having a respective front end respectively and fixedly connected to two opposite ends of the fixed wheel shaft of said driving wheel and a respective rear end;
a transmission belt coupled between said driving wheel and the fixed wheel shaft of said damping wheel and driven by said driving wheel to turn said damping wheel;
an idle wheel revolvably supported on said projecting rod of said U-shaped damping wheel holder frame and peripherally disposed in contact with said transmission belt;
two pedals having a respective rear end respectively pivoted to the rear ends of said rear pedal links, a respective front end fixedly mounted with a respective U-lug, and a respective middle part fixedly mounted with a respective foot plate;
two front pedal links respectively coupled between said pedals and said front upright, each of said front pedal links having a bottom end pivoted to the U-lug of one pedal, a pivot perpendicularly raised from the periphery at one side in the middle, a top end, a wheel axle perpendicularly raised from the periphery of its top end and inserted into one longitudinal sliding slot of said front upright, and a roller revolvably supported on said wheel axle and moved with the respective front pedal link along one longitudinal sliding track of said front upright;
two handlebars respectively turned about the pivots of said front pedal links, having a respectively bottom end respectively pivoted to upright legs of said base frame; and
a guard shell mounted on said base frame and covered over said driving wheel and said transmission belt and said damping wheel.

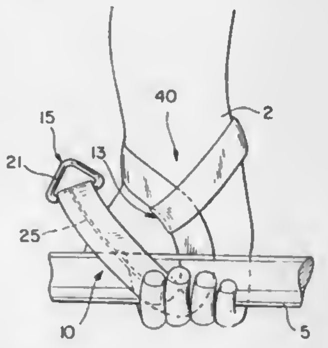
5,746,684
FOUNDATION STAND AND METHOD OF USE
James L. Jordan, Box 40, Brandon, Vt. 05733
Filed Dec. 5, 1996, Ser. No. 759,477
Int. Cl.^{6} A63B ***22/08***
U.S. Cl. 482—62 **7 Claims**

1. An exercise and rehabilitation device comprising:
a frame including a base, an upwardly extending main support and a variable resistance cycle ergometer;
said upwardly extending main support is pivotally attached to said base at a first point and attached via a pitch stabilizer at a second point thereby permitting pitch adjustability of said upwardly extending main support relative to said base;
said upwardly extending main telescopingly receives a handhold assembly, thereby allowing for telescopic adjustment of said handhold assembly;



said handhold assembly comprises a support frame including a semicircular projection and pivot tubes;
said semicircular projection telescopingly receives a semicircular locking arm, wherein said semicircular looking arm is rigidly attached to an upper handhold assembly;
said upper handhold assembly includes pivot arms that are pivotally attached to said handhold assembly support frame via said pivot tubes, thereby permitting pivotal adjustment of said upper handhold assembly relative to said handhold assembly support frame; and
said upper handhold assembly and said handhold assembly support frame each having multiple left handholds and multiple right handholds attached thereto such that said multiple left handholds and said multiple right handholds can be positioned at user defined locations upon adjustment of said upwardly extending main support, said handhold assembly support frame and said upper handhold assembly, thereby permitting the placement of a user's body, while the user is holding said multiple left handholds and said multiple right handholds during simultaneous pedaling of said variable resistance cycle ergometer in a standing position, in differing angulations including full hip flexion to full hip extension, further placing the user's upper and lower body musculature and joints in a range of conditions from full flexion to full extension while the user's arms can be neutrally positioned, internally and externally rotated, abducted, adducted and circumducted isotonically, isometrically, agonistically and antagonistically.

5,746,685
WRIST MEMORY STRAP TO ASSIST POWERLIFTING
Mark Leonard Glaser, 8903 Arley Dr., Springfield, Va. 22153-1504
Filed Apr. 25, 1997, Ser. No. 840,634
Int. Cl.^{6} A63B ***21/00;*** **A41D** ***19/00***
U.S. Cl. 482—93 **12 Claims**

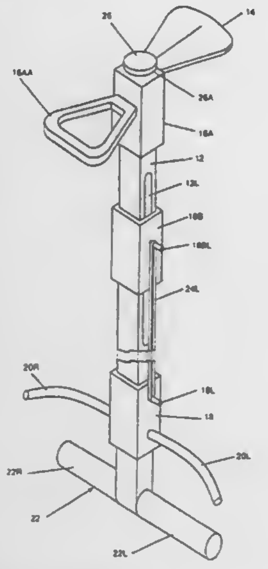


1. A strap for assisting a user in gripping a bar, comprising:

a) an elongated flexible body having a first end and a second end;
b) said first end having a loop;
c) said second end having a ring attached thereto, said loop being large enough to permit said second end including said ring to pulled therethrough; and
d) an elongated thin stiff wire in said elongated body along the length thereof for imparting rigidity to the elongated body.

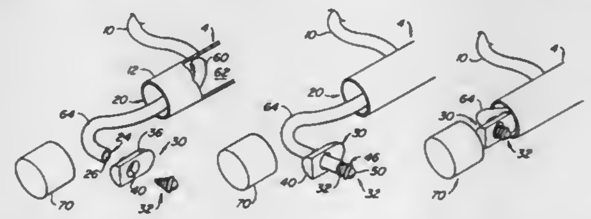
8. A method of enhancing grip of a barbell bar by a user while weightlifting, including the steps of:
a) providing a strap including:
  i) an elongated flexible body having a first end and a second end;
  ii) said first end having a loop;
  iii) said second end having a ring attached thereto, said loop being large enough to permit said second end including said ring to be pulled therethrough; and
  iv) an elongated thin stiff wire in said body along a direction of extension thereof;
b) pulling said second end of said strap through said loop to create a strap portion;
c) encircling a wrist of a user with said strap portion;
d) tightening said strap portion about a wrist;
e) wrapping said body about a bar, said wire causing said second end of said strap to extend upwardly;
f) inserting a finger through said ring; and
g) tightening said strap about said bar.

5,746,686
EXERCISE APPARATUS
Paul Berman, 1650 Tenth St., Santa Monica, Calif. 90404, and Jim Kraushaar, 9 Pemberton Pl., Laguna Niguel, Calif. 92677
Filed Jan. 23, 1997, Ser. No. 787,629
Int. Cl.^{6} A63B ***21/02***
U.S. Cl. 482—125 **14 Claims**



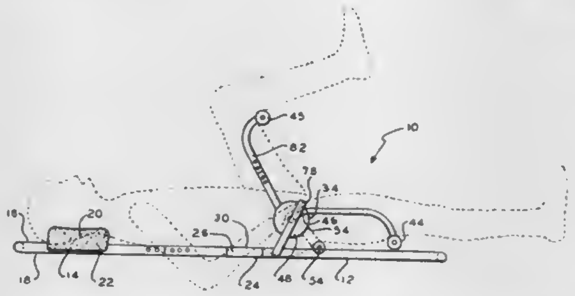
1. An exercise apparatus comprising:
a tubular elongated frame having an upper end and a lower end;
a preload housing securely attached to said upper end of said tubular elongated frame;
a brace securely attached to said preload housing, said brace extending outwardly from said preload housing, said brace comprising a brace horizontal member and a brace angle member, said brace horizontal member securely attached at one end to said preload housing and at the other end to said brace angle member, wherein the brace is adapted to allow securement of the upper end of the exercise apparatus to a seat when a user sits thereon;
a lower slide movable attached to said frame;
a leg brace left member securely attached to the left side of said lower slide, wherein said leg brace left member is adapted to support the user's left foot;
a leg brace right member securely attache d to the right side of said lower slide, wherein said leg brace right member is adapted to support the user's left foot; and
a resistance device securely attached at one end to said preload housing and at the other opposite end to the lower slide.

5,746,687
MULTI-PURPOSE EXERCISE DEVICE
Silvano Vial, and Maria Vial, both of 84 Euclid Ave., Atheron, Calif. 94025
Filed Sep. 27, 1995, Ser. No. 534,423
Int. Cl.^{6} A63B ***21/02***
U.S. Cl. 482—126 **14 Claims**



1. An exercise device comprising:
a rigid tube defining an open end and an inner lumen in communication with the open end, the tube defining a circumferential opening spaced from the open end;
an elastic flexible line having an end portion extending through the circumferential opening into the inner lumen of the tube;
a retainer positioned within the inner lumen for connecting the flexible line to the tube, the retainer defining a hole for receiving the end portion of the flexible line;
a fastener securing the end portion of the flexible line to the retainer; and
wherein the retainer comprises a guide portion shaped for guiding the retainer through the open end of the tube, the guide portion comprising a bull-nosed end portion.

5,746,688
EXERCISE DEVICE
Howard A. Prager, 191 Hamburg Turnpike, Pompton Lakes, N.J. 07442
Filed May 13, 1997, Ser. No. 855,383
Int. Cl.^{6} A63B ***21/04***
U.S. Cl. 482—142 **15 Claims**



1. An exercise device for providing resistance type exercise of all the muscles which make up the buttocks, comprising
a generally horizontal extending base having a length;
a headrest affixed to the base;
a resistance bar for pressing against the thigh of the user;
means pivotally connecting the thigh bar to the base;
biasing means for urging the resistance bar to a vertical position with a force which the user can overcome by moving the

thigh of the user downward the biasing means also exerting a force to resist lateral movement of the resistance bar; and

a support means for supporting the back of the user affixed to the base.

5,746,689

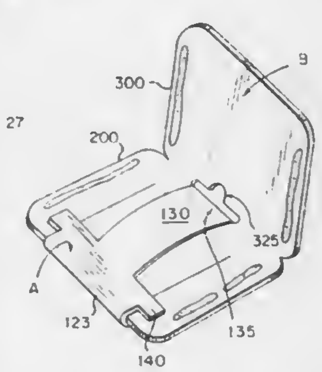
METHOD FOR TRANSVERSE-FOLD POP-UP

Andrew Murphy, Baltimore, Md., assignor to Ottenheimer Publishers, Inc., Baltimore, Md.

Division of Ser. No. 409,184, Mar. 16, 1995, Pat. No. 5,611,161. This application Sep. 9, 1996, Ser. No. 711,253

Int. Cl.⁶ B65H *45/30*

U.S. Cl. 493—397 **13 Claims**



1. A method of making a pop-up, comprising:

providing a blank having a blank length and edges separated by a blank width,

the blank including a tongue at a first end and a pull-slot intermediate the tongue and a second end, the pull-slot having a pull-slot width less least equal tk width and at least equal to a tongue width;

creasing a pop-up portion of the blank intermediate the tongue and the pull-slot;

folding the tongue onto a second section of the blank about a first fold line in a first sense of rotation, the first fold line separating the second section from a first section of the blank, the first fold line being angled to the length such that the tongue aligns with the pull-slot;

folding a third section of the blank onto the second section about a second fold line in a second sense of rotation;

fastening the second section to the third section proximal the edges; and

providing slide means for slidably holding a base end of the tongue, proximal the first fold line, adjacent the third section.

5,746,690

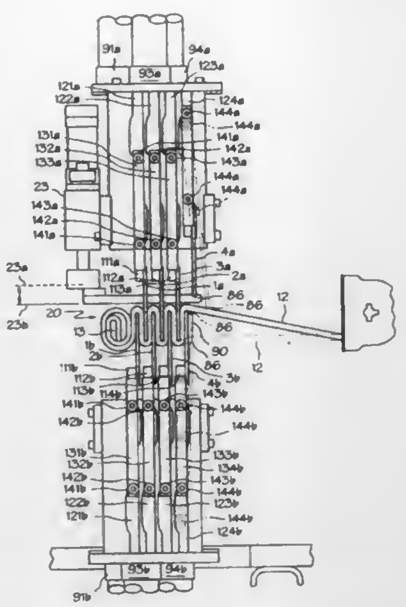
METHOD AND APPARATUS FOR FOLDING AN INFLATABLE CUSHION

Robert Allen Humbarger, Fairborn; Paul V. Camposeo, Huber Heights, and Terry William Hurtig, Dayton, all of Ohio, assignors to Omega Automation, Inc., Dayton, Ohio

Filed Jun. 28, 1996, Ser. No. 671,649

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 493—405 **16 Claims**



1. An inflatable cushion folding device comprising:

a cushion fixture adapted to releasably engage a cushion module of a cushion assembly;

a cushion receiving mechanism spaced from said cushion fixture and adapted to releasably engage an inflatable cushion portion of said cushion assembly such that said inflatable cushion portion is positioned along a cushion path extending between said cushion fixture and said cushion receiving mechanism; and

a fold developer positioned in a folding area located along said cushion path for creating at least one fold in said inflatable cushion portion, said fold developer including at least one folding blade slidably coupled to a blade track wherein said blade track defines a track path designed to permit movement of a distal end of said at least one folding blade along a distal end path including (i) a cushion approaching component of movement and (ii) a gathering component of movement parallel to said cushion path and directed towards said cushion receiving mechanism, and wherein said blade track is designed to permit the orientation of an axis of said at least one folding blade to change from a first position perpendicular to said cushion path to a second position not perpendicular to said cushion path to a third position perpendicular to said cushion path.

4. A method of folding an inflatable cushion portion of a cushion assembly comprising the steps of:

installing said cushion assembly in a cushion fixture and a cushion receiving mechanism such that said inflatable cushion portion of said cushion assembly is positioned along a cushion path extending between said cushion fixture and said cushion receiving mechanism; and

creating at least one fold in said inflatable cushion portion at a fold location along said cushion path by moving a distal end of a folding blade along a distal end path, said distal end path including (i) a cushion approaching component of movements, (ii) a gathering component of movement parallel to said cushion path and directed towards said cushion receiving mechanism, and (iii) a cushion fixture approaching component of movement parallel to said cushion path and directed towards said cushion fixture, wherein said distal end path extends towards said cushion fixture prior to extending towards said cushion receiving mechanism.

5,746,691

METHOD FOR POLISHING SURGICAL STENTS

John J. Frantzen, Copperopolis, Calif., assignor to Global Therapeutics, Inc., Broomfield, Colo.

Filed Jun. 6, 1997, Ser. No. 870,962

Int. Cl.⁶ A61F *2/04*

U.S. Cl. 600—36 **5 Claims**

1. A method for polishing surfaces of a cylindrical radially expandable surgical stent including the steps of:

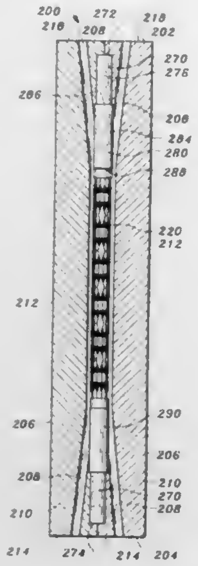
selecting an abrasiveness for particles within a fluid abrasive media;

providing a source of the fluid abrasive media;

orienting the radially expandable surgical stent with a central axis thereof extending in an axial direction;

flowing the abrasive media past the radially expandable surgical stent in an axial direction with the abrasive media coming into physical contact with the surfaces of the radially expandable surgical stent; and

wherein said flowing step includes the further step of limiting the abrasive media to physical contact with inner surfaces and side surfaces of the cylindrical radially expandable surgical stent, such that only the side surfaces and the inner surfaces of the radially expandable surgical stent facing the central axis of the stent are polished by the abrasive media flowing adjacent the stent.



5,746,692

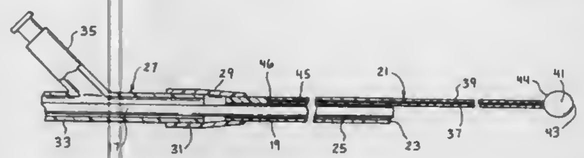
CATHETER AND ENDOSCOPE SYSTEM WITH DISTAL PROTRUDING BALL TIP AND METHOD

Steven R. Bacich, Laguna Niguel; Tuoc Tan Nguyen, Westminster, and John Patrick Greelis, Aliso Viego, all of Calif., assignors to Imagen Medical, Inc., Laguna Niguel, Calif.

Continuation-in-part of Ser. No. 238,314, May 5, 1994, Pat. No. 5,505,686. This application Apr. 8, 1996, Ser. No. 630,122

Int. Cl.⁶ A61B *1/00*

U.S. Cl. 600—104 **42 Claims**



24. An apparatus for viewing an interior passage of a patient comprising:

a catheter including an elongated catheter body adapted to be received in the interior passage and a displacing member, said catheter body having a distal end and a lumen extending to the distal end, said displacing member being carried by the catheter body and extending longitudinally beyond the distal end of the catheter body;

an endoscope positionable within the lumen of the catheter body, said endoscope being movable longitudinally within the lumen relative to the catheter body to a location for viewing a zone of the interior passage when the catheter body is within the interior passage; and

said displacing member being capable of contacting material within or forming the passage and relatively displacing the distal end of the catheter body and such material to facilitate viewing of said zone with the endoscope.

5,746,693

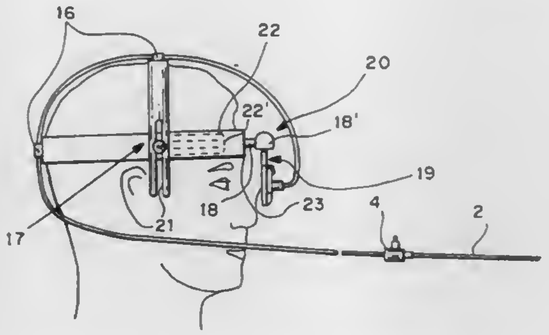
FLEXIBLE ENDOSCOPIC APPARATUS AND METHODS OF USE

Aaron Spitz, 1249 9th St. #6, Santa Monica, Calif. 90401, and Perry Sutaria, 445 E. 68th St. #8E, New York, N.Y. 10021, assignors to Aaron Spitz, Santa Monica, Calif., and Perry Sutaria, New York, N.Y.

Filed May 22, 1995, Ser. No. 446,296

Int. Cl.⁶ A61B *1/04*

U.S. Cl. 600—112 **22 Claims**



1. An attachment which can be coupled to an endoscope having an eyepiece, comprising:

a flexible extension capable of extending an optical output of an endoscope eyepiece to a remote location;

a receiving lens positioned at one end of the flexible extension capable of receiving light output from an endoscope eyepiece;

a coupling device capable of attaching the one end of the flexible extension to an endoscope eyepiece which includes a retainer for securing the receiving lens and the eyepiece together in an optically transmissive relationship wherein the coupling device permits the endoscopic eyepiece to rotate relative to the receiving lens when the attachment is attached to an endoscope eyepiece, and

means for stably positioning a remote end of the flexible extension in front of an eye of a person at the remote location.

5,746,694

ENDOSCOPE BIOPSY CHANNEL LINER AND ASSOCIATED METHOD

Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023, and Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022

Filed May 16, 1996, Ser. No. 648,906

Int. Cl.⁶ A61B *1/04*

U.S. Cl. 600—123 **13 Claims**

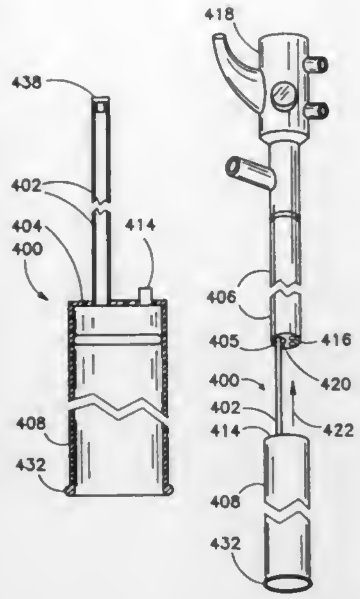
1. A method for preparing an endoscope for an endoscope surgical operation, comprising:

providing an endoscope having an insertion member with a biopsy channel extending between a distal end of said insertion member and a proximal end thereof;

also providing a tubular liner element having a distal end attached to a distal end of a tubular sheath, said sheath being initially in an inside-out configuration so that said liner element projects free of said sheath;

disposing said sheath about said insertion member to enclose at least a distal end portion of said insertion member in a fluid tight seal inside said sheath, the disposing of said sheath about said insertion member including inverting said sheath, said inverting proceeding from the distal end of said insertion member towards the proximal end thereof;

inserting said liner element into said biopsy channel from one end thereof; and



attaching said distal end of said liner element to said insertion member at least at the distal end thereof, said liner element being attached to said insertion member via said sheath.

5,746,695
FRONT END STRUCTURE OF ENDOSCOPE

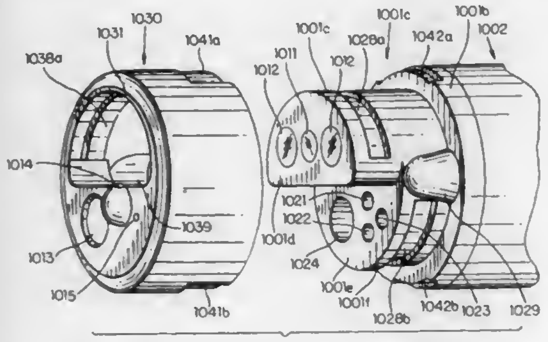
Naoki Yasui; Hiroshi Iwata; Hiroyuki Katsurada; Keiji Ito, and Takayuki Ogino, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 342,250, Nov. 18, 1994, abandoned. This application Sep. 12, 1996, Ser. No. 711,875

Claims priority, application Japan, Nov. 18, 1993, 5-288567; Nov. 26, 1993, 5-296530; Dec. 1, 1993, 5-301426; Jan. 24, 1994, 6-5491; Mar. 15, 1994, 6-42987; Mar. 15, 1994, 6-42988

Int. Cl.^{6} A61B *1/04*

U.S. Cl. 600—127 **3 Claims**



1. An endoscope including a front end body which has a circular cross section and which is provided at a front end of an inserting portion of said endoscope, and a substantially cylindrical end cap of a resilient material, which is detachably attached to said front end body, said endoscope further comprising:

a partial projection which is provided on said front end of said front end body to project forward, at least one peripheral groove provided on an outer peripheral surface of said partial projection and at least one peripheral groove provided on an outer peripheral surface of said front end body;

an insertion hole formed in said end cap so that said projection is fitted in said insertion hole;

a plurality of projections provided on said end cap including a first projection to be fitted in said peripheral groove provided on said front end body and a second projection disposed axially from said first projection to be fitted in said peripheral groove provided in said partial projection;

wherein when said end cap is attached to said front end body from said front end of said latter, said partial projection of said front end body is fitted in said insertion hole of said end cap to determine a relative angular position therebetween in a rotational direction, and thereafter, said projections of said end cap are fitted simultaneously in said groove of said front end body and said groove of said partial projection.

5,746,696
FLEXIBLE SHEATHING TUBE CONSTRUCTION

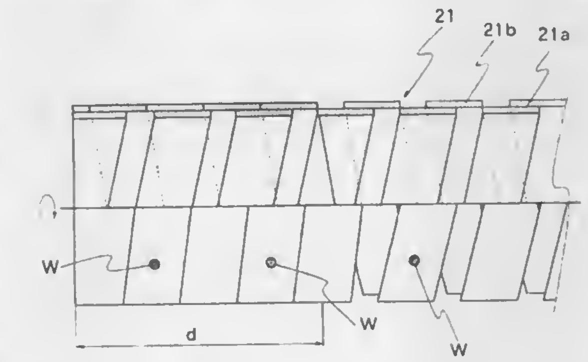
Mituo Kondo, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 24, 1996, Ser. No. 636,265

Claims priority, application Japan, May 16, 1995, 7-140060

Int. Cl.^{6} A61B *1/00*

U.S. Cl. 600—139 **5 Claims**



1. A flexible sheathing tube for use on an endoscope, said sheathing tube having a laminated wall including, from the inner side thereof, a flexible helical coil structure formed by helically winding a metal strip in a predetermined open pitch, a tubular metal wire netting fitted on said helical coil structure, and an outer skin layer laminated on said tubular netting, characterized in that:

said helical coil structure is constituted by at least one helical coil member having a number of helices thereof tightly closed and fixed to each other into the form of a rigid ring at least at one end of said sheathing tube to be trimmed in a subsequent stage, said rigid ring providing a solid backing support uniformly on and around the inner periphery of said tubular metal wire netting in such a way as to permit a cutter blade to trim said sheathing tube to a predetermined length by a straight clear cut through said tubular metal wire netting and helical coil member of said laminated wall.

5,746,697
MEDICAL DIAGNOSTIC APPARATUS WITH SLEEP MODE

David B. Swedlow, Danville; Michael J. Bernstein, San Ramon; Charles E. Porges, Orinda; James E. Luecke, Dublin, and Michael W. Nootbaar, Benicia, all of Calif., assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.

Filed Feb. 9, 1996, Ser. No. 599,255

Int. Cl.^{6} A61B *5/00*

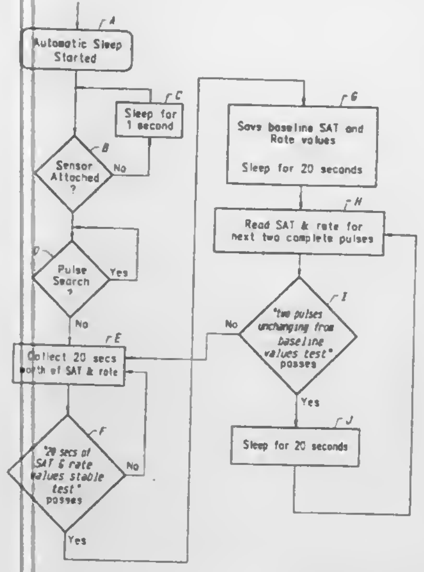
U.S. Cl. 600—323 **29 Claims**

1. A method for conserving power in a pulse oximeter apparatus, said apparatus including electronic circuitry, the method comprising the steps of:

(a) measuring a blood oxygen saturation of a patient using said apparatus;

(b) monitoring said blood oxygen saturation of said patient;

(c) determining when said blood oxygen saturation has been stable for a predetermined stable time period and providing a stability indication signal;


A
Automatic Sleep Started
C
Sleep for 1 second
B
Sensor Attached ?
No
D
Pulse Search ?
Yes
No
E
Collect 20 secs worth of SAT & rate
F
"20 secs of SAT & rate values stable test" passes
No
Yes
G
Save baseline SAT and Rate values
Sleep for 20 seconds
H
Read SAT & rate for next two complete pulses
I
"two pulses unchanging from baseline values test" passes
No
Yes
J
Sleep for 20 seconds

(d) initiating a sleep mode for at least a portion of said electronic circuitry, in response to said stability indication signal, for a first, sleep portion of each of a plurality of sleep mode time periods;

(e) exiting said sleep mode for at least some of said portion of electronic circuitry for a second, awake portion of each of said plurality of sleep mode time periods;

(f) determining whether said blood oxygen saturation remains stable during at least periodic ones of said sleep mode time periods;

(g) repeating steps (a)–(f) if said blood oxygen saturation is determined to not have remained stable during said awake portion; and

(h) repeating steps (c)–(f) if said blood oxygen saturation is determined to have remained stable during said awake portion.

5,746,698
METHOD AND DEVICE FOR DETERMINING BRACHIAL ARTERIAL PRESSURE WAVE ON THE BASIS OF NONIVASIVELY MEASURED FINGER BLOOD PRESSURE WAVE

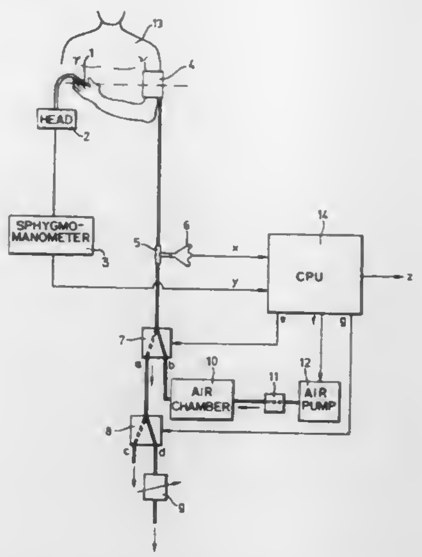
Willem Jan Wubbo Bos, Bilthoven, and Karel Hendrik Wesseling, HT The Hague, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, Delft, Netherlands

Filed Sep. 30, 1996, Ser. No. 723,119

Claims priority, application Netherlands, Sep. 28, 1995, 1001309

Int. Cl.^{6} A61B *5/022*

U.S. Cl. 600—493 **10 Claims**



1. Method for determining a proximal arterial blood pressure waveform in a person, starting from a distally measured arterial pressure waveform, comprising the steps of: applying age-dependent waveform filtering to the distal pressure waveform, in order to obtain the proximal pressure waveform with mutually correct systolic, diastolic and mean pressure levels, and calibrating the filtered pressure waveform to the correct proximal pressure level.

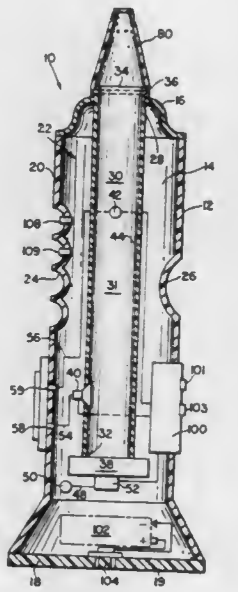
5,746,699
ACOUSTIC IMAGING

Jeffrey Fredberg, Sharon; Gary Glass, Boston; John Lehr, Newton, all of Mass., and Bruno Louis, Puteaux, France, assignors to Hood Laboratories, Pembroke, and Biomechanics, Inc., Boston, both of Mass.

Division of Ser. No. 117,176, Jun. 16, 1993, Pat. No. 5,666,960, which is a continuation-in-part of Ser. No. 808,907, Dec. 17, 1991. This application Dec. 18, 1996, Ser. No. 769,697

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—529 **9 Claims**



1. A coupler for coupling a head assembly of an acoustic imaging device to the orifice leading to the respiratory tract of a mammal for acoustic imaging, which head assembly comprises:

A. a rugged hand-holdable housing having
  1. an elongate body, defined by
    (a) a top end;
    (b) a base end;
    (c) an outer wall extending between the top end and the base end; and
    (d) an internal chamber;

2. an aperture through the housing top end, providing fluid communication between the internal chamber and the outside of the housing; and
3. a shape and configuration of the outer wall facilitating gripping of the housing with a human hand

B. an acoustic pipe for transmitting acoustical energy and receiving the reflected acoustical energy, mounted in the aperture said pipe having a first end within the chamber and an open second end outside of the housing, said second end of the acoustic pipe being adapted for connection of the acoustic pipe to an orifice leading into the respiratory tract;

C. a lauching transducer mounted in the chamber and coupled to the first end of the acoustic tube, for launching acoustical energy into the acoustic pipe, propagating and incident wave out of the open second end;

D. at least one acoustic pressure wave sensing transducer mounted on the acoustic pipe at a location between the first and second ends of the acoustic pipe for sensing reflections of the incident wave, received back in the acoustic tube through the open second end and generating a signal; and

E. means at least partially within the chamber, connected to the acoustic wave sensing transducer, to processor means for processing said echo signals into an acoustic image signal characteristic of the morphology of a site within the mammal's respiratory tract said coupler comprising:
  (a) a tube having a first end adapted by size and configuration to sealingly mate with said orifice;
  (b) a second end adapted by size and configuration to be mounted on the acoustic pipe of the head assembly;
  (c) a tube body extending between the first and second ends of the tube, said body having an internal contour such that impedance matching between the head assembly and the mammal is maintained with maximum acoustic energy transmission; said head assembly comprising an assembly for acoustically imaging portions of the internal morphology of the respiratory tract of a mammal, including a human, which comprises a lightweight, easy to manipulate, hand-held acoustic imaging head which is rugged and entirely hand supportable and operable by an operator, throughout an imaging procedure.

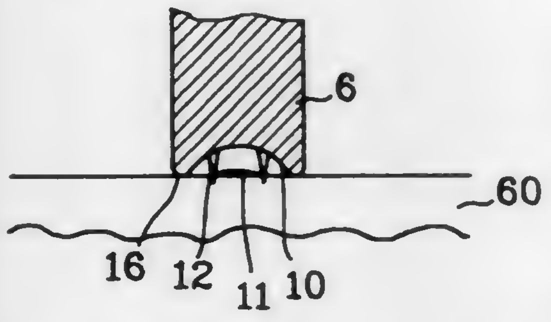
5,746,700
SKIN ALLERGIC TEST ASSEMBLY

Ray-Ling Hsiao, 4F, No. 12,Alley 15,Lane 175,Ho-Ping East Rd., 2nd Sec., Taipei, Taiwan

Filed Feb. 7, 1996, Ser. No. 598,235

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—556 **6 Claims**



1. In a skin puncture test bar comprising a finger grip, an elongated stem extending therefrom, and a plurality of punctures provided at an end of said elongate stem, the improvement of said skin allergic test bar comprising:
  the end of said elongate stem being formed with a concave surface on which said plurality of punctures are provided, said plurality of punctures extending directly from said concave surface substantially parallel to said elongated stem to project out of the outer edge of said concave surface at a predetermined length less than the thickness of the human epidermis layer so that the penetration made by said skin puncture test bar will have a limited penetration depth due to an outer edge of said concave surface which acts as a stop, therefore said punctures will make a limited penetration to avoid the penetration through of the epidermis layer of the skin of a patient and provide an adequate amount of antigen solution to a test site of the patient.

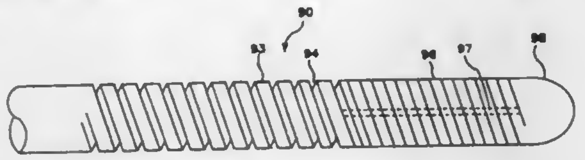
5,746,701
GUIDEWIRE WITH NON-TAPERED TIP

Michael S. Noone, Londonderry, N.H., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 14, 1995, Ser. No. 528,035

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—585 **10 Claims**



1. A guidewire comprising:
an elongated core of a substantially solid cross-section having a proximal end and a distal end portion, the distal end portion having a plurality of notches therein, the notches having a depth of 5–25% of the diameter of the proximal end, the proximal end having a diameter in the range of 0.005–0.040 inches, the notches defining a continuous helix with a constant depth;
a helically wound spring, the spring having a proximal end, a distal end, a plurality of coils, and defining a lumen, at least part of the distal end portion of the elongated core being received within the lumen, the part of the distal end portion of the elongated core being received within the lumen forming with the helically wound spring an intermediate portion, at least a portion of the coils being disposed within the continuous helix of the elongated core, the helically wound spring being sized and positioned on the elongated core such that a smooth continuous outer diameter is attained over the length of the guidewire, and
means for bonding the coils to the distal end portion,
so that the guidewire has a continuous stiffness gradient along the length of the guidewire from a stiffest point at the proximal end to a more flexible portion in the distal end portion proximal to the intermediate portion, to a still more flexible portion in the intermediate portion to a most flexible point at the distal end of the helically wound spring.

5,746,702
METHOD OF AND DEVICE FOR LOCAL SKIN MASSAGING

David Mendeloevich Gelfgat, Dakabrietov; Sergei Yakovlevich Skipidarov, Moldayakaya, both of Russian Federation; Michael Yakhats, Los Angeles, Calif., and Vyacheslav Tikhonovich Kamensky, Sovataki, Russian Federation, assignors to A. Relin, Langhorne, Pa.

PCT No. PCT/RU94/00065, § 371 Date Nov. 24, 1995, § 102(e) Date Nov. 24, 1995, PCT Pub. No. WO94/27532, PCT Pub. Date Dec. 8, 1994

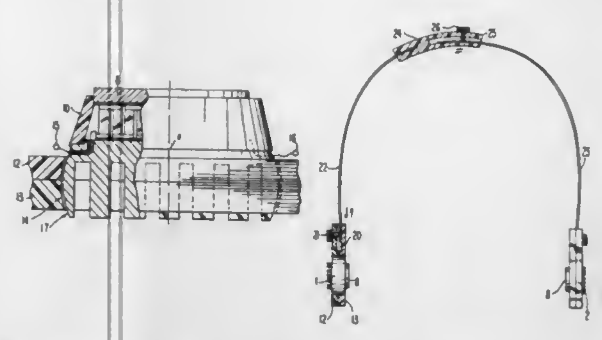
PCT Filed Mar. 31, 1994, Ser. No. 564,138

Claims priority, application Russian Federation, May 27, 1993, 93031379

Int. Cl.^{6} A61H *15/02*

U.S. Cl. 601—15 **13 Claims**

1. A method of local skin massage comprising the steps of selecting a plurality of local skin portions for their subsequent temperature stimulation; placing each of heat contact plates of a plurality of massage thermoelectric blocks of a thermoelectric device above each of the plurality of the selected local skin portions; providing a fixed force of pressing the heat contact plates of the massage thermoelectric blocks against the plurality of the selected local skin portions; automatic performance of a temperature-time cycle including carrying out of sign-alternating processes of change of the electric currents simultaneously flowing through the thermal elements of the massage blocks operating on the base Peltier effect; and automatic uninterrupted successive repetition of the cycle with a predetermined frequency.



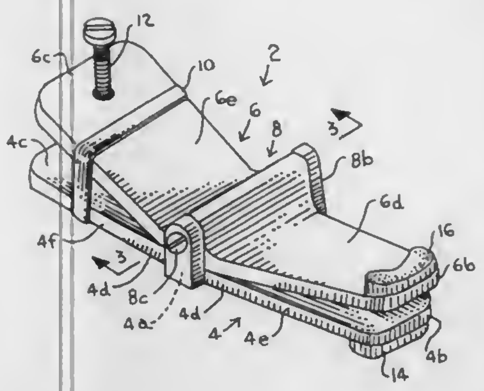
5,746,703
TEMPOROMANDIBULAR REHABILITATOR

Samuel R. Levatino, 3608 Woodland Ridge Blvd., Baton Rouge, La. 70816

Filed Aug. 26, 1996, Ser. No. 701,803

Int. Cl.^{6} A63B *23/03*

U.S. Cl. 601—38 **3 Claims**



1. A temperomandibular rehabilitator, comprising:
(a) a lower planar member having a longitudinal center, first and second ends, and a segment connecting the first and second ends to one another;
(b) an upper angular member having first and second ends, and first and second planar faces defining an obtuse interior angle therebetween, the angular member being pivotally connected at the vertex of the obtuse interior angle to the segment of the planar member which connects the first and second ends thereof to one another, whereby the first planar face of the angular member can be brought into parallel contact with the first end and with a first portion of the segment connecting the first and second ends of the planar member to one another, or the second planar face of the angular member can be brought into parallel contact with the second end and with a second portion of the segment connecting the first and second ends of the planar member to one another;
(c) biasing means for forcing the first planar face of the angular member apart from the first end and first portion of the segment connecting the first and second ends of the planar member to one another; and
(d) means for controlling the extent to which the first planar face of the angular member is forced apart from the first end and first portion of the segment connecting the first and second ends of the planar member to one another, said controlling means being a set screw rotatably and perpendicularly disposed in the second planar face of the angular member.

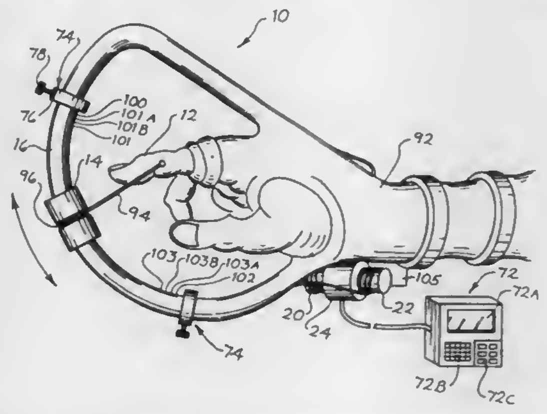
5,746,704
THERAPY APPARATUS HAVING A PASSIVE MOTION DEVICE FOR FLEXING A BODY MEMBER

Robert R. Schenck, 1100 N. Lake Shore Dr., Chicago, Ill. 60611, and Walter Richard Krevald, 696 W. Lincoln La., Des Plaines, Ill. 60018

Filed Aug. 4, 1995, Ser. No. 511,144

Int. Cl.^{6} A61H *1/00*

U.S. Cl. 601—40 **9 Claims**



1. A device for flexing a body member to rehabilitate the same, the device comprising:
  a slide guide having an exterior surface defining a predetermined path including a curved portion positioned relative to the body member;
  a carriage having an interior surface mounted on the slide guide exterior surface for sliding travel about the curved portion when being pulled in a forward direction and being pulled in a reverse direction;
  at least one connector extending from the carriage and connected to the body member to alternately flex the body member;
  a flexible tension member associated with the slide guide and connected to the carriage to exert a forwardly or rearwardly directed pulling force on the carriage to cause it to slide in the forward and reverse directions along the slide guide in the predetermined path having a curved portion for flexing the body member;
  a drive connected to the flexible tension member to exert a pull on the tension member to cause it to travel in either a forward or a reverse direction and to pull the carriage to slide on the slide guide in the same direction as the tension member is pulled and to flex the body member; and
  the slide guide exterior surface and the carriage interior surface being of a low friction material so that with the carriage interior surface engaged on the slide guide exterior surface and the carriage being pulled by the tension member and drive, the carriage interior surface will slide over the slide guide exterior surface with low frictional resistance to sliding of the pulled carriage on the slide guide.

5,746,705
ADJUSTABLE ARM SLING AND METHOD OF SUPPORTING AN INJURED ARM

John H. Sheppard, 2960 Dacusvile Hwy., Easley, S.C. 29640

Filed Nov. 21, 1996, Ser. No. 754,547

Int. Cl.^{6} A61F *5/00;5/01*

U.S. Cl. 602—5 **20 Claims**

11. An adjustable arm sling comprising:
a first elongated cylindrical member and a second elongated cylindrical member;

- a first curved cylindrical member for engaging the neck of a user, said first curved cylindrical member extending from said first elongated cylindrical member; and
- a second curved cylindrical member for supporting an injured arm of the user, said second curved cylindrical member extending from said second elongated cylindrical member;
- said first and second elongated cylindrical members being adjustably connected together,
- wherein said first curved cylindrical member is connected to said first elongated cylindrical member, further comprising a connecting end of said first elongated cylindrical member containing a plurality of holes, said connecting end communicating with a second elongated cylindrical member having an inserting end with one hole in said second elongated cylindrical member, said one hole containing a connector which communicates with one of said plurality of holes in said connecting end of said first elongated cylindrical member.

14. A method of supporting an injured arm of a user comprising the steps of:

- providing a first elongated member and a second elongated member;
- providing a first curved member, said first curved member extending from said first elongated member;
- providing a second curved member, said second curved member extending from said second elongated member;
- connecting said first and second elongated members;
- positioning said first curved member on the neck of said user; and
- supporting said injured arm on said second curved member.

5,746,706

Patent Not Issued For This Number

5,746,707
CARPEL TUNNEL SYNDROME EXTERNAL BRACE

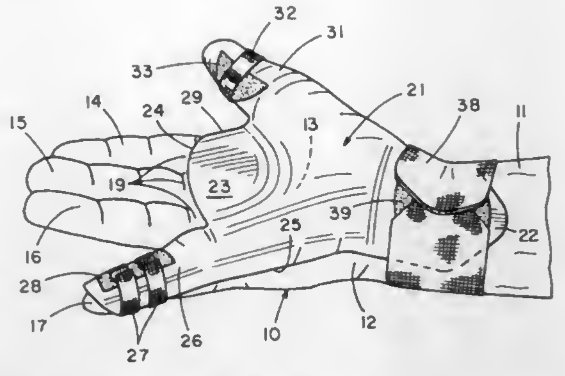
Donald R. Eck, 8965 E. Arthur Rd., Hesperia, Mich. 49421

Filed Sep. 30, 1996, Ser. No. 723,339

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—21 **12 Claims**

1. In combination, a wrist and hand brace for application to the wrist and hand of a patient for the amelioration of the symptoms of carpal tunnel syndrome, the hand being connected to the wrist and including a heel, a palm, and four fingers and a thumb connected to the palm, the brace comprising a rigid base strip of a suitable moldable material having a generally concave shape conformably receiving the wrist of a patient, a forward portion of said strip covering the heel and palm of the hand and terminating adjacent the base of the fingers thereof, an integral thumb support extending at an angle from one side edge of the forward portion, an integral fifth finger support extending at an angle from a side edge of the forward portion opposite to the thumb support, and means joined to said strip and thumb and fifth finger supports for attaching said brace to the wrist, thumb and fifth finger of the patient to provide the thumb and fifth finger in generally fully abducted positions from the hand.



10. A method of alleviating a patient's carpel tunnel symptoms by treatment of a patient with carpal tunnel syndrome, including the steps of conformably receiving the wrist of the patient with a rigid base strip, supporting the heel and palm of the hand with a forward portion of the rigid base strip, supporting the thumb and fifth finger of the hand with a thumb support at a substantially right angle to a fifth finger support, and securing the rigid base to the wrist, the thumb support to the thumb and fifth finger support to the fifth finger of the patient.

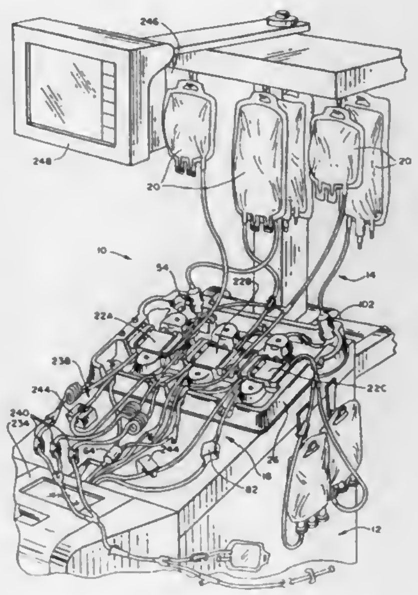
5,746,708
PERISTALTIC PUMP TUBE HOLDER WITH PUMP TUBE SHIELD AND COVER

Richard C. Giesler, Deerfield; Myra P. Miles, Hanover Park, both of Ill.; Susan L. Lovelace, Mountain Home, Ark.; Timothy J. Patno, Mundelein, and Richard L. West, Lake Villa, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 22, 1993, Ser. No. 172,135

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—4 **17 Claims**



1. An organizer tray assembly constructed and arranged for removable mounting on a peristaltic pump rotor assembly, which carries a peristaltic pump rotor, the organizer tray assembly comprising

- a flexible tubing loop, and
- a tray body comprising side panels, which define an open interior area, a region of the tray body including a pump tube support receiving the flexible tubing loop within the open interior area for engagement with the peristaltic pump rotor, the tray body further comprising an interior wall defining a chamber within the open interior area covering the flexible tubing loop to thereby shield the flexible tubing loop within the open interior area, another region of the tray body having an opening underlying the chamber to receive the peristaltic pump rotor into the chamber during removable mounting of the organizer tray assembly on the peristaltic pump rotor assembly, the chamber further serving, during engagement between the flexible tubing loop and the peristaltic pump rotor, as a cover for the peristaltic pump rotor.

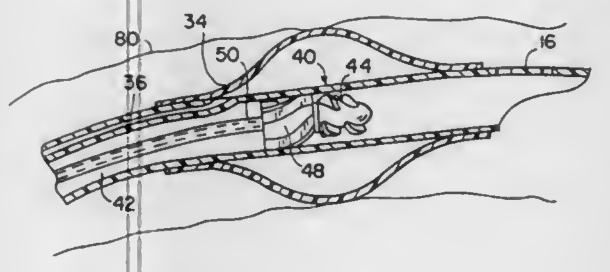
5,746,709
INTRAVASCULAR PUMP AND BYPASS ASSEMBLY AND METHOD FOR USING THE SAME

Paul F. Rom, Kentwood, and Russell A. Corace, Grand Rapids Township, both of Mich., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 25, 1996, Ser. No. 638,020

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—8 **12 Claims**



1. An intravascular catheter assembly comprising:

- a primary catheter comprising:
  - a body with a lumen formed therein;
  - a distal end adapted to be received inside a blood vessel;
  - a proximal end adapted to be positioned outside the blood vessel;
  - a fluid inlet fluidly connected to the lumen;
  - a fluid outlet fluidly connected to the lumen;
  - an inflatable member provided on the exterior surface of the body of the catheter, the member being selectively inflated between a retracted state and an inflated state, wherein the inflatable member in the inflated state creates an occlusion in the blood vessel;
  - an inflation lumen having a distal end fluidly connected to the inflatable member and a proximal end adapted to receive fluid from a suitable source; and
  - an intravascular pump provided in the lumen of the catheter intermediate the fluid inlet and outlet, the pump being adapted to create a positive fluid differential between the fluid outlet and the inlet; and
- a plurality of subcatheters each having a proximal end, a distal end and a lumen formed therein, the subcatheter lumens being fluidly connected to the lumen of the primary catheter and adapted to receive fluid flowing therethrough, each of the subcatheters being adapted to be fluidly connected to one or more blood vessels downstream from the occlusion so that blood flow can continue through the blood vessels, despite the occlusion.

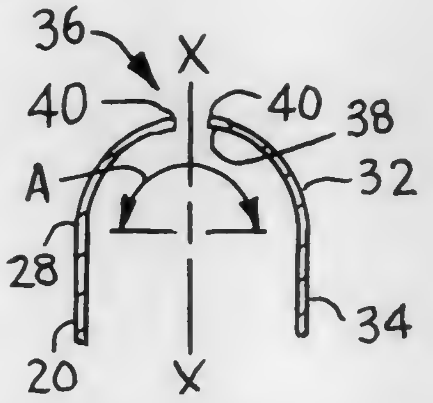
5,746,710
TAMPON APPLICATOR HAVING A SEMI-SPHERICALLY SHAPED PLEATED TIP

Steven James Nielsen, Greenville; Tammy Jo Rentmeester, Appleton; Allan James Krueger, Winneconne, and Jeffrey Michael Weyenberg, Appleton, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 294,230, Aug. 22, 1994, abandoned. This application May 16, 1996, Ser. No. 650,052

Int. Cl.^{6} A61F *13/20*

U.S. Cl. 609—14 **7 Claims**



1. A tampon applicator comprising:

a) a first member capable of housing an absorbent tampon, said first member being a spirally wound, hollow cylindrical tube formed from paper and having a central longitudinal axis, a smooth exterior surface, and first and second ends, said smooth exterior surface being free of any breaks located between said first and second ends;

b) an insertion tip integrally formed on said first end of said first member and extending outwardly therefrom, said insertion tip having an aperture extending therethrough with a side wall which is aligned essentially parallel to said central longitudinal axis, said aperture having a diameter of at least about 1.5 mm and having a radius formed on an exterior surface of said insertion tip, said insertion tip including an even number of pleats arranged to form a semi-spherical configuration, each of said pleats having a first end which coincides with said aperture and a second end which coincides at a location where said insertion tip is integrally joined to said first member, and said pleats capable of expanding outward as said tampon is expelled from said first member; and

c) a second member telescopically mounted in said second end of said first member, said second member adapted to expel an absorbent tampon through said insertion tip as it is pushed into said first member.

5,746,711
PROGRAMMABLE CONTROL AND MOUNTING SYSTEM FOR TRANSDERMAL DRUG APPLICATOR

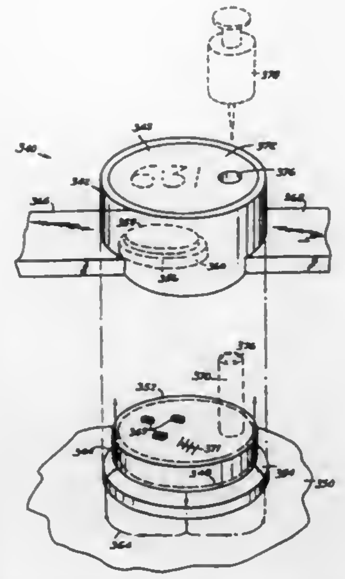
Dan Sibalis, Stony Brook, and Sanford Rosen, New York, both of N.Y., assignors to Drug Delivery Systems, Inc., New York, N.Y.

Division of Ser. No. 381,141, Jan. 30, 1995, Pat. No. 5,591,123, which is a continuation of Ser. No. 858,685, Mar. 27, 1992, abandoned, which is a division of Ser. No. 711,589, Jun. 6, 1991, Pat. No. 5,135,479, which is a continuation of Ser. No. 396,746, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 555, Jan. 5, 1987, abandoned. This application Sep. 23, 1996, Ser. No. 717,642

Int. Cl.^{6} A61N *1/30*

U.S. Cl. 604—20 **23 Claims**

1. An electrically powered transdermal drug applicator that is adapted to be adhered to a mucous membrane of a body for the controlled, automatic delivery of at least one drug through the mucous membrane, comprising



applicator means having a mucous membrane-contacting surface and including at least one drug reservoir containing at least one drug;

power means electrically connected to said at least one drug reservoir at an electrode for delivery of said at least one drug,

circuit means completing an electrical circuit between said at least one drug reservoir and said power source by return through the mucous membrane when said transdermal drug applicator is in use;

programmable computer means for regulating the generation of power so as to provide the controlled, automatic delivery of said at least one drug through said mucous membrane; and

computer activating means connected to said at least one drug reservoir for operating programmed resources within said computer means, said computer activating means comprising cams which activate said programmable computer means.

5,746,712

Patent Not Issued For This Number

5,746,713
PHACOEMULSIFICATION NEEDLE

Larry Hood, 25652 Nottingham Ct., Laguna Hills, Calif. 92653, and Tony V. Lemus, 4915 Coolidge Ave., Culver City, Calif. 90230

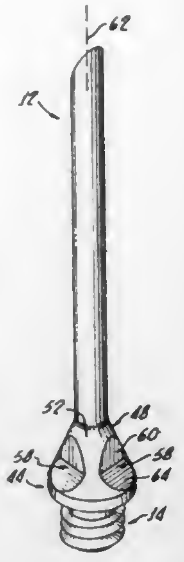
Filed Jun. 6, 1996, Ser. No. 659,630
Int. Cl.⁶ A61B *17/00*

U.S. Cl. 604—22 **13 Claims**

1. A phacoemulsification needle apparatus for ophthalmic surgical procedures, the apparatus comprising:

needle means for cutting and/or fragmenting eye tissue at a surgical site; and

sleeve means, coaxially disposed about the needle means and defining a generally annular chamber between said needle means and sleeve means, for introducing a fluid into the surgical site, said needle means including shoulder means, having a conical surface of revolution and a plurality of recesses formed within the conical surface, for inhibiting bubble and microbubble formation in fluid passing between the shoulder means and the sleeve means.

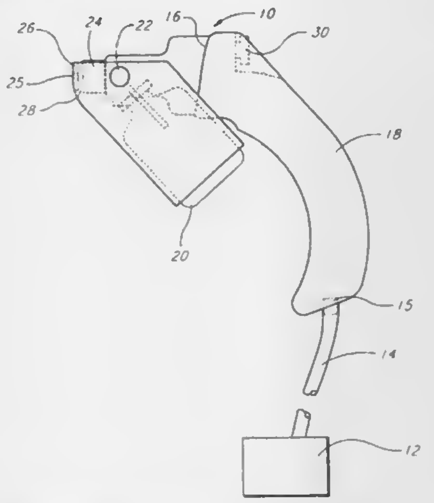


5,746,714
AIR POWERED NEEDLELESS HYPODERMIC INJECTOR

Timothy J. Salo, Seattle, Wash.; Sergio Landau, Laguna Niguel, Calif.; Glenn D. Austin, and T. Patrick Lennon, both of Seattle, Wash., assignors to P.A.T.H., Seattle, Wash., and Vitajet Corporation, Laguna Hills, Calif.

Continuation-in-part of Ser. No. 215,037, Mar. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 43,476, Apr. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,192
Int. Cl.⁶ A61M *5/30*

U.S. Cl. 604—68 **13 Claims**



1. A needleless hypodermic injector comprising:

a main housing containing an air chamber for receiving air at a pressure between about 50 to 250 pounds per square inch gauge, a driving piston slidably mounted in said chamber, injection activating means to admit pressurized air to said chamber to activate the driving piston, and means for connecting said chamber to a source of air at a pressure between about 50 to 250 pounds per square inch gauge; and

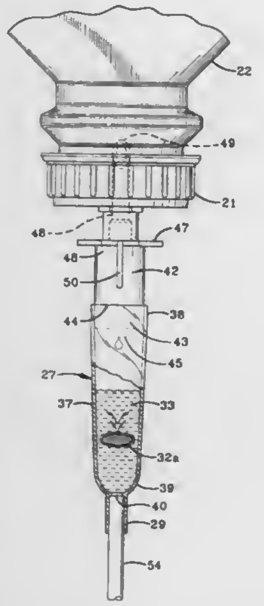
a medicine delivery unit comprising means to detachably mount said delivery unit to said main housing, a medicine chamber with a side wall and a medicine fill port in said side wall of said medicine chamber, said fill port adapted to be connected to a source supplying medicament to said fill port under positive pressure, a discharge nozzle valvelessly connecting one end of said medicine chamber to an ejection orifice with a substantially total absence of dead space between said chamber and said ejection orifice, a discharge piston in said medicine chamber, said discharge piston detachably engaging said driving piston when said delivery unit is mounted in said main housing and is detached from said driving piston when said delivery unit is detached from said main housing, and biasing means urging said discharge piston to an end of said medicine chamber opposite from said discharge nozzle.

5,746,715
METHOD OF ADDING MARKER DYE TO NUTRITIONAL PRODUCT DURING ENTERNAL TUBE FEEDING

Terrence Bruce Mazer, Reynoldsburg; Joseph Edward Walton, Westerville; Ronita Kay Geckle, Columbus; Carl Joseph Piontek, Powell, all of Ohio; Susan Beth Duel, Laurinburg, N.C.; Andre Daab-Krzykowski; Robert Louis Joseph, both of Columbus, Ohio; William Guy Pierson, Canal Winchester, Ohio; Thomas Daniel Loughrin, Columbus, Ohio, and Thomas Walter Osip, Dublin, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 372,613, Jan. 13, 1995, Pat. No. 5,549,550. This application Jun. 28, 1996, Ser. No. 673,446
Int. Cl.⁶ A61M *37/00*

U.S. Cl. 604—83 **7 Claims**



1. A method of dye marking a liquid enteral nutritional product during the flow thereof from a supply container containing such composition to a feeding tube leading into the gastrointestinal tract of a patient, comprising the steps of:

(a) providing an apparatus comprising:

a formulation chamber having an inlet and an outlet and being connectable to a supply container of a liquid enteral nutritional product so as to receive said product therefrom;

the formulation chamber further comprising at least one physiologically acceptable marker dye, the at least one marker dye being contained within at least one sustained release reservoir positioned within the formulation chamber so as to be in physical contact with said liquid enteral nutritional composition in said formulation chamber, the at least one marker dye being soluble in said liquid enteral nutritional product, said at least one sustained release reservoir containing marker dye being a means for providing and dispensing marker dye into said liquid enteral nutritional product having a viscosity of at least about 3 centipoises when the sustained release reservoir is physically contacted thereby during the feeding thereof to a patient over a time period of at least about two hours; and

fluid communication means capable of operatively connecting the outlet of the formulation chamber to a device that feeds the dye-marked liquid enteral nutritional product into the gastrointestinal tract of a patient;

(b) providing said supply container containing said liquid enteral nutritional product having a viscosity of at least about 3 centipoises;

(c) placing the apparatus in communicative series in the fluid flow between the supply container and said device that feeds the liquid enteral nutritional product which is dye-marked, while the device that feeds said liquid enteral nutritional product which is dye-marked is in communication with the gastrointestinal tract of a patient; and

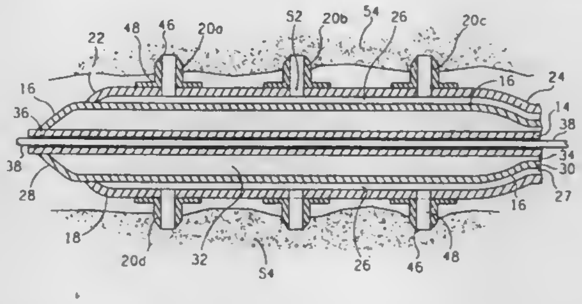
(d) flowing the liquid enteral nutritional product through the apparatus and into the device for feeding over a time period of at least about two hours.

5,746,716
CATHETER FOR INJECTING FLUID MEDICATION INTO AN ARTERIAL WALL

Dennis M. Vigil, San Diego, and Peter Barath, Los Angeles, both of Calif., assignors to InterVentional Technologies Inc., San Diego, Calif.

Filed Jul. 10, 1995, Ser. No. 500,121
Int. Cl.⁶ A61M *29/00*

U.S. Cl. 604—97 **18 Claims**



17. A device for injecting a fluid from a fluid source into a treatment area in a wall of a vessel, the device comprising:

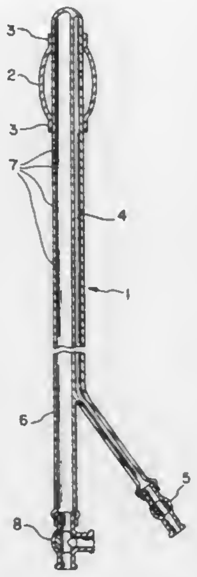
an inflatable balloon that at least can be expanded from a first configuration to a larger, second configuration;

a plurality of injectors, each injector is suitable for penetrating the treatment area and releasing the fluid into the treatment area when the balloon is substantially in the second configuration, each injector comprises a substantially tubular protrusion defining a fluid channel for the fluid, the tubular protrusion having a base and an open, cutting edge which extends away from the balloon for penetrating the treatment area and releasing the fluid into the treatment area;

a tubular sleeve which substantially encircles at least a portion of the inflatable balloon and moves with the inflatable balloon, the tubular sleeve having an external outer surface for securing the base of the injectors to the tubular sleeve; and

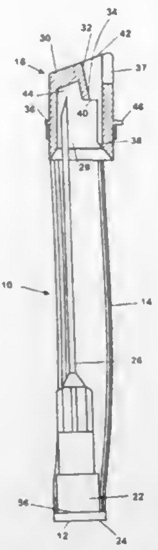
means for establishing fluid communication between the fluid source and at least one injector.

5,746,717
BALLOON CATHETER AND DEVICE FOR PERFUSION WITH THE BALLOON CATHETER
Karl R. Aigner, Biebricher Allee 9, D-65187 Wiesbaden, Germany
PCT No. PCT/EP94/00903, § 371 Date Aug. 8, 1995, § 102(e) Date Aug. 8, 1995, PCT Pub. No. WO94/22519, PCT Pub. Date Oct. 13, 1994
PCT Filed Mar. 23, 1994, Ser. No. 500,997
Claims priority, application Germany, Mar. 30, 1993, 43 10 378.2
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 604—102 **19 Claims**



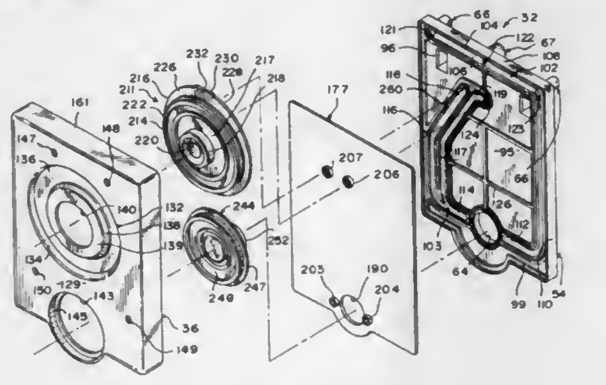
1. Multi-lumen balloon-type blocking catheter having a side wall a proximal end, and a distal end, said catheter comprising: a closed tip at said proximal end, an expandable balloon arranged at a short distance from said proximal end, a contrast marking at one location on the catheter to permit determination of the position of the balloon, at least two lumens extending in the longitudinal direction of the catheter, the first said lumen communicating with the inside of the expandable balloon for filling and expanding said balloon, the second said lumen terminating in said closed tip, said second lumen further having a number of lateral openings in the catheter side wall arranged serially in the longitudinal direction of the catheter, a first said lateral opening spaced a distance of 2 mm to 5 mm from the balloon in the direction toward the distal end of the catheter, the distance between successive adjacent lateral openings progressively increasing in the direction toward the distal end of the catheter.

5,746,718
NEEDLE PROTECTIVE DEVICE
Ricardo Sheath Oxford Steyn, 16 Farrow Rd., Randpark Ridge Extension 13, Randburg, Gauteng, South Africa
Continuation-in-part of Ser. No. 211,365, Jul. 5, 1994, Pat. No. 5,538,508. This application May 17, 1996, Ser. No. 649,533
Claims priority, application South Africa, Jun. 19, 1995, 95/5021
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—192 **37 Claims**



1. A needle protective device for a needle assembly having a needle hub and a needle projecting from the hub, the needle protective device comprising, a tubular member of resilient flexible material which extends about the needle, the tubular member having first and second ends, a first end of the tubular member having a bevel thereon and being mounted skew on and frictionally engaged with the needle hub with the bevel normal to the longitudinal axis of the needle hub, and an end cap mounted on the second end of the tubular member, the end cap having a blocking surface defining a hole through which the end of a needle may pass, the skew mounting biasing the tubular member to a position in which the end of the needle opposes the blocking surface.

5,746,719
FLUID FLOW CONTROL SYSTEM INCORPORATING A DISPOSABLE PUMP CARTRIDGE
Robert Farra, Acton, and Ronald J. Forni, Littleton, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Filed Oct. 25, 1996, Ser. No. 736,879
Int. Cl.⁶ A61M *1/00*
U.S. Cl. 604—151 **46 Claims**



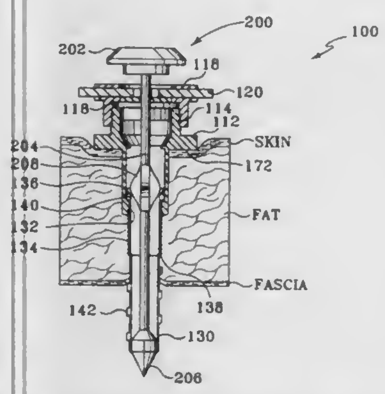
1. A fluid flow control system comprising:
a disposable cartridge including:
- a cartridge housing formed from at least two housing sections which are joined together, said housing sections being provided with at least two fluid connection ports and an opening exposing an interior of said cartridge housing;
- a pump having associated inlet and outlet ports and at least one movable pump element provided with an attachment member adapted to be interconnected with a drive element for operating said pump, said pump being positioned within said cartridge housing with said attachment member being located at said opening; and
- a separating member positioned within said cartridge housing, said separating member defining, at least in part, a plurality of flow passages respectively fluidly interconnected to said at least two fluid connection ports and the inlet and outlet ports of said pump; and

a control module including:
- a control housing having a main body portion and a carrier body portion, said carrier body portion defining a cartridge receiving area that is adapted to receive said disposable cartridge;

- a drive unit including a drive element adapted to be drivingly connected to the attachment member of said pump following insertion of the disposable cartridge in said cartridge receiving area; and

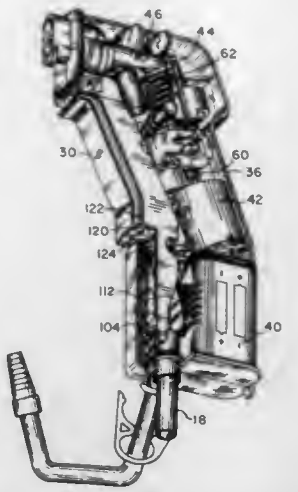
means for controlling the operation of said drive unit in order to regulate an operation of said pump.

5,746,720
METHOD AND APPARATUS FOR INSERTION OF A CANNULA AND TROCAR
Albert E. Stouder, Jr., 318 N. West St., Tipton, Ind. 46072
Continuation-in-part of Ser. No. 544,722, Oct. 18, 1995. This application Dec. 18, 1995, Ser. No. 574,202
Int. Cl.⁶ A61M *5/00;5/178;5/32;29/00*
U.S. Cl. 604—117 **23 Claims**



1. A method for inserting a cannula through a body cavity wall and into a body cavity, comprising the steps of:
(a) providing an insufflation needle;
(b) providing a guiding cannula;
(c) providing a hollow dilator;
(d providing a second cannula;
(e) inserting the insufflation needle through the body cavity wall such that a distal end of the insufflation needle extends into the body cavity;
flowing gas through the insufflation needle and into the body cavity in order to insufflate the body cavity;
(g) inserting the guiding cannula over the insufflation needle and through the body cavity wall such that a distal end of the guiding cannula extends into the body cavity wherein inserting the guiding cannula causes the guiding cannula to block the flow of gas through the insufflation needle; and
(h) inserting the hollow dilator sleeved within the second cannula through the body cavity wall over the guiding cannula, such that a distal end of the dilator and a distal end of the second cannula extend into the body cavity.

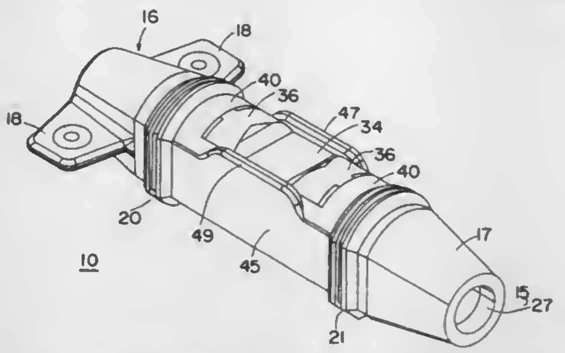
5,746,721
PULSED LAVAGE PUMP WITH INTEGRAL POWER SOURCE AND VARIABLE FLOW CONTROL
Kenneth A. Pasch, Kennebunkport, Me., and Andrew Zeigler, Arlington, Mass., assignors to C.R. Bard, Inc., Murray Hill, N.J.
Filed Feb. 15, 1995, Ser. No. 389,155
Int. Cl.⁶ A61H *9/00*
U.S. Cl. 604—153 **19 Claims**



1. A self-contained disposable pulsatile surgical irrigation device comprising:
- a housing;
- a trigger movably mounted to the housing;
- a motor contained within the housing;
- a battery contained within the housing for energizing the motor, the battery being electrically connectible to the motor by actuation of the trigger;
- an electrical path defined within the housing between the motor and the battery and including an electrical switch within the housing, the switch being operatively associated with the trigger to selectively open or close the switch;
- a linear fluid pump contained within the housing;
- a mechanical drive train coupling the motor and the linear fluid pump, the drive train enabling the stroke of the linear fluid pump to be varied, thereby varying the output flow from the surgical irrigation device;

the trigger being mechanically connected to the drive train to effect said variation in stroke.

5,746,722
SUTURE SLEEVE WITH CIRCUMFERENTIAL LEAD LOCKING DEVICE
Peter J. Pohndorf, Stillwater, and Douglas H. Gubbin, Brooklyn Park, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Feb. 5, 1997, Ser. No. 795,425
Int. Cl.⁶ A61N *1/04;* A61M *25/04*
U.S. Cl. 604—175 **13 Claims**



1. A suture sleeve adapted to secure a flexible, elongated structure having a predetermined outer diameter to a patient's body tissue, comprising:
- a sleeve body having a longitudinal throughbore dimensioned to fit over and receive said outer diameter of said elongated structure allowing relative movement of said sleeve body over said elongated structure, said sleeve body having a transverse channel intersecting said longitudinal throughbore;
- a locking member movable within said transverse channel between an unlocked position and a locked position and having a longitudinal lock member throughbore having a throughbore diameter dimensioned to receive said outer diameter of said elongated structure in said locked and unlocked positions;

said locking member upon being moved by an applied locking force in a locking direction moving from said unlocked position wherein its throughbore diameter exceeds the predetermined outer diameter and allows relative movement of said locking member and said sleeve body over said elongated structure to said locked position wherein said locking member throughbore diameter is reduced substantially evenly about its circumference to less than said predetermined diameter, thereby exerting force relatively evenly around the outer surface of said elongated structure within said locking member throughbore to substantially increase frictional resistance against relative movement of the suture sleeve and the elongated structure; and

first and second collar pieces, each collar piece having a collar piece throughbore dimensioned to receive said elongated structure and affixed to one end of said sleeve body with the collar piece throughbore in substantial coaxial alignment with said sleeve body longitudinal throughbore, each of said collar pieces being made of a resilient material and being of a length dimension sufficient to reduce substantial bending of the elongated structure extending through the sleeve body throughbore.

5,746,723

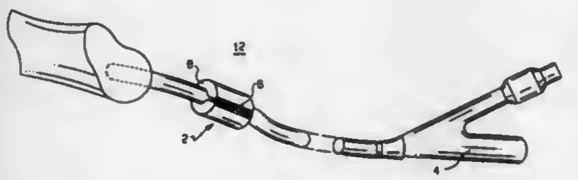
CATHETER FLUID ABSORPTION DEVICE AND METHOD OF USE

Jack B. Freeman, 20 Meadow Rd., Briarcliff, N.Y. 10510, and Edward R. Gomez, 317 W. 95th St. #5E, New York, N.Y. 10025

Filed Feb. 12, 1996, Ser. No. 600,053

Int. Cl.^{6} A61M *25/02*

U.S. Cl. 604—178 **12 Claims**



1. A catheter and an absorbing device removably attached thereto, to minimize excess drainage from the meatus-catheter junction, comprising:

a catheter;

absorbing material at least partially surrounding said catheter, positioned on the catheter at a selected location for avoiding contact between the device and the meatus, and for insuring that a substantial amount of the drainage is absorbed by the absorbing material; and

securing means for removably attaching said absorbing material to the catheter.

5,746,724

ASPIRATION NEEDLE APPARATUS INCORPORATING ITS OWN VACUUM AND METHOD AND ADAPTER FOR USE THEREWITH

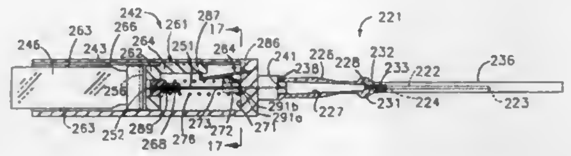
Trevor J. Powles, Surrey, United Kingdom; Mir A. Imran, Los Altos Hills, Calif.; Baber Syed, Palo Alto, Calif., and Deepak R. Gandhi, San Jose, Calif., assignors to Advanced Cytometrix, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 504,928, Jul. 20, 1995, Pat. No. 5,653,694, which is a continuation-in-part of Ser. No. 421,064, Apr. 13, 1995, abandoned. This application Apr. 12, 1996, Ser. No. 631,537

Int. Cl.^{6} A61M *5/00;5/31*

U.S. Cl. 604—240 **10 Claims**

1. An aspiration needle apparatus for collecting cell samples from tissue comprising a vacuum container having an enclosed evacuated space evacuated to a subambient pressure and sealed by a penetrable diaphragm, an adapter having a recess to receive said vacuum container, needle means carried by the adapter and having a distal extremity serving as an aspiration needle to collect the cell sample and having a proximal extremity disposed in said recess and being capable of penetrating the diaphragm of the vacuum container to couple the evacuated space to the flow passage of the needle means to supply a subambient pressure to the distal extremity of the needle means, an on-off mechanism carried by the adapter including a member mounted in the recess for axial movement in the recess and engaged by the vacuum container, yieldable means disposed within the recess and engaging said member and yieldably urging said member and the vacuum container in a direction out of the recess and detent means secured to said member for sequentially retaining said member in a first forwardmost position and a second rearwardmost position whereby in the first forwardmost position the needle means penetrates the diaphragm to supply a subambient pressure to the needle means and in the second rearwardmost position the needle means is free of the diaphragm so that subambient pressure is no longer supplied to the needle means.



5,746,725

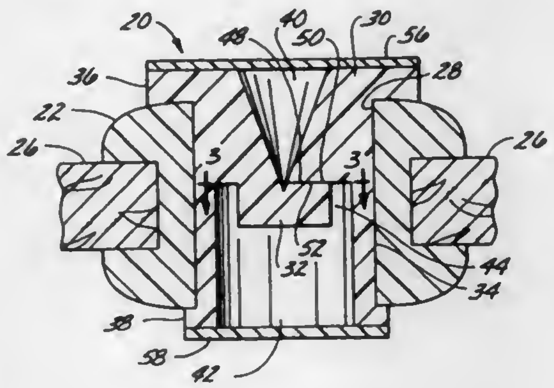
CHECK VALVE AND METHOD FOR FACILITATING PRESSURIZATION OF A PATIENT'S MIDDLE EAR

Tadmor Shalon, Brentwood, Mo., and John J. Shea, Jr., Memphis, Tenn., assignors to Metaphase Technology Access, Ltd., St. Louis, Mo.

Filed Dec. 15, 1995, Ser. No. 573,242

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—246 **12 Claims**



1. A method of pressurizing a middle ear of a patient comprising:

providing a check valve having an intake port, a discharge port, and a fluid passageway extending between the intake and discharge ports, said check valve being configured for permitting fluid flow from the intake port to the discharge port and for preventing fluid flow from the discharge port to the intake port; and

positioning the check valve in the patient so that the discharge port is in fluid communication with said middle ear of the patient.

5,746,726

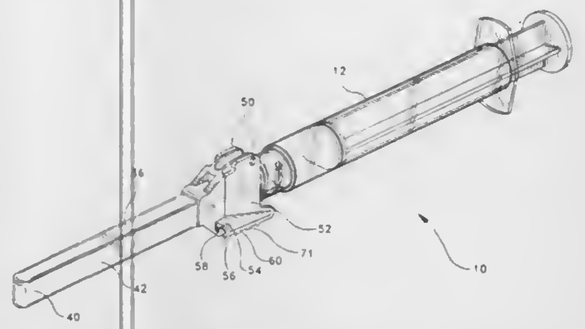
SHIELDED NEEDLE ASSEMBLY

Niall Sweeney; Adriano Morigi, both of Rutherford, and Sandor Gyure, West Orange, all of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 23, 1996, Ser. No. 702,083

Int. Cl.^{6} A61M *5/32*

U.S. Cl. 604—263 **6 Claims**



1. A needle assembly comprising:

an elongate needle having a proximal end, a distal end and a passageway therethrough;

a needle hub having a proximal end, a distal end and an exterior surface, said needle hub having an axial opening therethrough to receive and hold said needle at said distal end of said needle hub with said distal end of said needle projecting distally axially therefrom, said proximal end of said needle hub further including means for releasably mounting said needle hub on a fluid handling device;

an elongate shield having an open proximal end, a distal end and a sidewall having an elongate opening on one side;

hinge means including a mount for retaining said shield onto said needle hub, said mount sized and shaped to receive at least a portion of said needle hub;

said shield being movable about said hinge means by an off-axis pivotal movement between an open position, wherein said distal end of said needle is exposed, and a latched closed position, wherein said shield substantially obstructs access to said needle; and

latch means for releasably latching said shield to said mount including at least one hook on said proximal end of said shield adjacent to said elongate opening and at least one lug on said mount, said hook and said lug being disposed to engage releasably when said shield is moved to said latched position, said lug including a deflectable projection disposed so that when said projection is deflected, said hook and said lug are disengaged and said shield is pivotable about said hinge means to said open position.

5,746,727

SAFETY NEEDLE ASSEMBLY HAVING TELESCOPING SHIELD

Arlinda Graves, Stamford, Conn., and Sandor Szabo, Elmwood Park, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 327,538, Oct. 21, 1994, abandoned. This application Dec. 23, 1996, Ser. No. 772,237

Int. Cl.^{6} A61M *25/00*

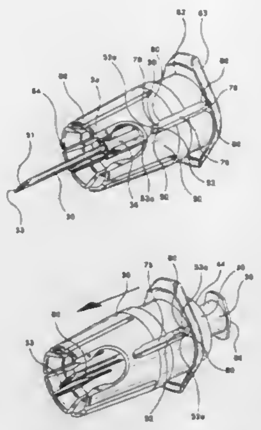
U.S. Cl. 604—283 **20 Claims**

1. A locking safety assembly for an intravenous fitting, comprising:

a piercing element defining a lumen therethrough for fluid communication and having proximal and distal ends;

a carrier member secured with said piercing element, said carrier member having a locking element wherein said locking element is expansible in diameter; and

a protective shield defining an interior dimensioned for accepting said intravenous fitting therewithin said protective shield having a proximal end and an open distal end, said open distal end including a plurity of cantilevered fingers configured to releasably grip a portion of said intravenous fitting introduced into the shield, said protective shield disposed in sliding relationship about said carrier member and slidable between a first position wherein the distal end of said piercing element is exposed and a second position wherein the protective shield is locked to said carrier member and the distal end of said protective shield is extended beyond the distal end of said piercing element so that said a plurity of cantilevered fingers grips said portion of the intravenous fitting, said protective shield having a guide element cooperatively engaged with the expansible diameter of said locking element of said carrier member to guide the shield between its first and second positions.



5,746,728

FLUID PUMP WITHOUT DEAD VOLUME

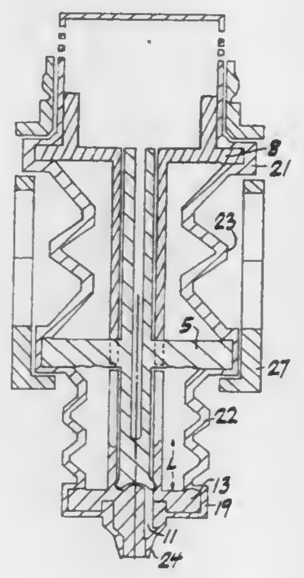
Daniel Py, 40, rue Franklin, 78100 St.Germain En Laye, France

Filed Sep. 27, 1995, Ser. No. 534,609

Claims priority, application France, Oct. 3, 1994, 94 11785

Int. Cl.^{6} A61M *35/00;* **B65B** *37/00*

U.S. Cl. 604—298 **14 Claims**



1. A pump for the delivery of a fluid contained in an elastic phial, comprising:

a pump body having a front end on a fluid outlet side, said front end comprising an outlet orifice (11) normally sealed off by an elastic membrane (24), and continuing backwards through a pump duct (18) with a fluid inlet orifice (15);

a movable piston fitted inside the pump body, the relative displacement of an end (2) of the piston in relation to the pump body between the inlet orifice (15) and a stop (16) position located towards the outlet orifice (11) thus determining the quantity of fluid expelled on displacement, the end (2) of the piston fitting hermetically by slight friction against the pump duct (18), the inlet orifice (15) being of a sufficient size for only the preset quantity of fluid to be trapped in an end of the pump duct (18) for its expulsion through the outlet orifice (11) and a separable seam defined by interface of said outlet orifice (11) and said elastic membrane (24), the pump body and the piston being totally enveloped by the elastic phial, with the exception of the front end of the pump body.

5,746,729
SANITARY NAPKIN

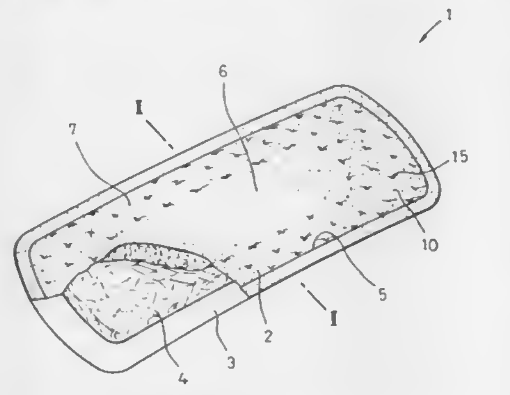
Ichiro Wada; Hideki Kondo, both of Ehime-ken, and Masataka Kinoshita, Kagawa-ken, all of Japan, assignors to Uni-Charm Corporation, Ehime-Ken, Japan

Continuation of Ser. No. 546,256, Oct. 20, 1995, abandoned. This application Dec. 31, 1996, Ser. No. 777,860

Claims priority, application Japan, Oct. 27, 1994, 6-263963

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—378 **7 Claims**



1. A sanitary napkin comprising:
- a liquid permeable top layer;
- a liquid impermeable back layer;
- a liquid absorbent core disposed between said top layer and said back layer;
- said top layer having a central zone and side zones at both sides of said central zone, said top layer including an upper layer of a thermoplastic synthetic resinous material and a lower layer of thermoplastic synthetic fibers which is more hydrophilic than said upper layer but less hydrophilic than said core;
- said upper and lower layers being intermittently bonded together by thermally embossing said side zones; and
- said central zone being thicker and softer than said side zones.

5,746,730
ABSORBENT ARTICLE AND METHOD OF MANUFACTURING ARTICLE

Migaku Suzuki, Kanagawa, and Hiroaki Fukui, Saitama, both of Japan, assignors to Paragon Trade Brands, Inc.

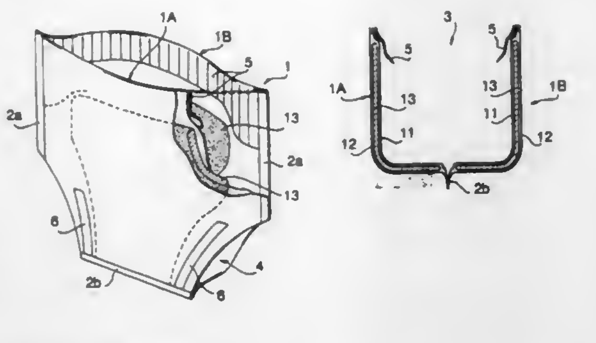
PCT No. PCT/US94/06230, § 371 Date Mar. 5, 1996, § 102(e) Date Mar. 5, 1996, PCT Pub. No. WO94/28845, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 3, 1994, Ser. No. 553,636

Claims priority, application Japan, Jun. 3, 1993, 5-156343

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **12 Claims**



1. An absorbent article comprising:
- a main body having a waist hole and a pair of leg holes,
- a crotch region between the leg holes, opposite side regions,
- an elastic waist portion disposed along said waist hole, and
- a leg gather disposed along each of said leg holes;
- said main body comprising separately produced front and rear sections,
- said front section comprising a first backsheet formed from material supplied from a first backsheet web, a first topsheet formed from material supplied from a first topsheet web, and a first absorbent body interposed between said first topsheet and said first backsheet, and
- said rear section comprising a second backsheet formed from material supplied from a second backsheet web, a second topsheet formed from material supplied from a second topsheet web and a second absorbent body interposed between said second topsheet and said second backsheet,
- said separately produced front and rear sections being joined so that their respective topsheets face each other and are bonded to each other in the crotch region and opposite side regions of the article.

5,746,731
DISPOSABLE UNDERGARMENT

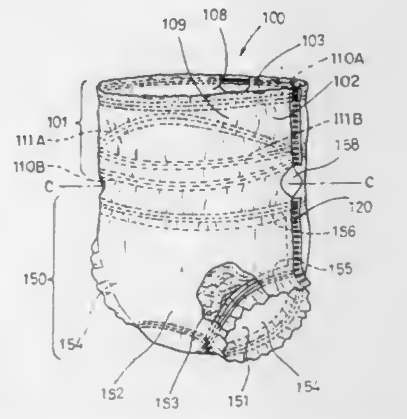
Kenichi Hisada, Ehime-ken, Japan, assignor to Uni-Charm Corporation, Ehime-ken, Japan

Filed Apr. 16, 1996, Ser. No. 632,827

Claims priority, application Japan, Apr. 26, 1995, 7-102279

Int. Cl.^{6} A61F *13/15;* **A41C** *1/00;1/08*

U.S. Cl. 604—385.2 **5 Claims**



1. A disposable undergarment comprising a belly protector, said belly protector comprising:
- a front body and a rear body joined together along transversely opposite side edges thereof so as to form a tubular configuration having upper and lower openings; a pair of first elastic members secured in an elastically contractible condition along said upper and lower openings, respectively; a pair of second elastic members secured in an elastically contractible condition to at least said front body between said pair of first elastic members to extend between the transversely opposite side edges of said front body with a transversely symmetric arrangement and only curved convexly toward said upper and lower openings, respectively; and one of said pair of second elastic members extending in close proximity to said lower opening.

5,746,732
ABSORBENT ARTICLES

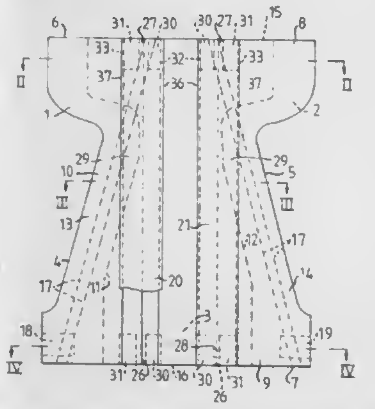
Stefan Olsson, Floda; Urban Widlund, Mölnlycke, and Anders Söderbergh, Partille, all of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Continuation of Ser. No. 256,448, Jul. 13, 1994, abandoned. This application Oct. 29, 1996, Ser. No. 740,393

Claims priority, application Sweden, Jan. 30, 1992, 9200259

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **13 Claims**



1. An absorbent article intended for one-time use only and comprising:
- a liquid-permeable upper casing layer intended to face towards a wearer in use;
- a lower casing layer intended to lie distal from the wearer in use;
- an absorbent pad sandwiched between said liquid-permeable upper casing layer and said lower casing layer;
- said article extending in a longitudinal direction and having one side edge and an opposite second side edge, said article further comprising a central receiving zone extending in said longitudinal direction and having a first edge and an opposite second edge spaced from said one and said second side edges, respectively, said first edge and said opposite second edge extending in said longitudinal direction;
- a first tubular fold arranged between said first edge and said one side edge, and a second tubular fold arranged between said opposite second edge and said opposite second side edge, each tubular fold comprised of a flexible material which extends in the longitudinal direction on a side of the article which is intended to face the wearer in use, so as to form leakage barriers;
- each fold having a first end part, a second end part, an intermediate part, and two first fold lines extending in the longitudinal direction, said first fold lines being close to one another so as to essentially coincide to form a common base line extending in the longitudinal direction;
- each fold extending in a lateral direction away from the base line in opposite directions;
- two elastic elements mounted within each tubular fold in a pre-stretched state and along said fold with one elastic element positioned on each side of the base line;
- said first and second end parts having a maximum extension in said lateral direction and terminating at second fold lines on each side of said base line, said two elastic elements respectively extending along said second fold lines;
- said end parts being joined to the liquid-permeable upper casing layer in a flat state, the folds being sufficiently spaced apart to enable body fluids to collect therebetween;
- said two elastic elements being joined to the fold along said second fold lines only at the first and second end parts of the fold; and
- all portions of the intermediate part of the fold and the two elastic elements extending therethrough being freely movable, whereby in an extended flat state of the article, each tubular fold including the intermediate part is flat, with each of the two elastic elements located on a respective side of the base line, and when in use, the article is forcibly curved to conform to a body of the wearer, and the intermediate part of each fold will lift vertically as a result of the action of the two elastic elements, so as to form said leakage barriers.

8. An absorbent article intended for one-time use only and comprising:
- a liquid-permeable upper casing layer intended to face towards a wearer in use;
- a lower casing layer intended to lie distal from the wearer in use;
- an absorbent pad sandwich between said liquid-permeable upper casing layer and said lower causing layer;
- said article extending in a longitudinal direction and having two side edges, a first end edge and an opposite second end edge, a front part intended to lie forwardly of the wearer in use, a back part intended to lie rearwardly of the wearer in use, and a crotch part located between said front and said back parts said article further comprising a central receiving zone extending in said longitudinal direction and having a first edge and an opposite second edge spaced from said first and said opposite second end edges, respectively, said first edge and said second opposite second edge extending in a direction transverse to said longitudinal direction;
- a first tubular fold arranged between said first edge and said first end edge, and a second tubular fold arranged between said opposite second edge and said opposite second end edge, each tubular fold comprised of a flexible material which extends in the transverse direction on a side of the article which is intended to face the wearer in use, so as to form leakage barriers;
- each fold having a first end part, a second end part, an intermediate part, and two first fold lines extending in the transverse direction, said first fold lines being close to one another so as to essentially coincide to form a common base line extending in the tranverse direction;
- each fold extending in said longitudinal direction away from the base line in opposite directions;
- two elastic elements mounted within each tubular fold in a pre-stretched state and along said fold with one elastic element positioned on each side of the base line;
- said first and second end parts having a maximum extension in the longitudinal direction and terminating at second fold lines on each side of said base line, said two elastic elements, respectively, extending along said second fold lines;
- said end parts being joined to the liquid-permeable upper casing layer in a flat state, the folds being sufficiently spaced apart to enable body fluids to collect therebetween;
- said two elastic elements being joined to the fold along said second fold lines only at the first and second end parts of the fold; and
- all portions of the intermediate part of the fold and the two elastic elements extending therethrough being freely movable, whereby in an extended flat state of the article, each tubular fold including the intermediate part is flat, with each of the two elastic elements located on a respective side of the base line, and when in use, the article is forcibly curved to conform to a body of the wearer, and the intermediate part of each fold will lift vertically as a result of the action of the two elastic elements, so as to form said leakage barriers.

5,746,733
SYRINGE FILLING AND DELIVERY DEVICE

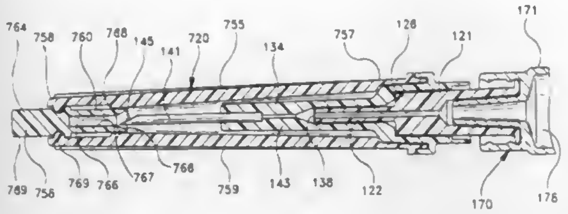
Paul R. Capaccio, Clifton; Gary Cohen, Highland Lakes; Alvin T. Olsen, Caldwell, and Mark C. Yale, Westwood, all of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 681,253, Jul. 22, 1996, which is a continuation-in-part of Ser. No. 245,934, May 19, 1994, abandoned. This application Apr. 22, 1997, Ser. No. 839,224

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—411 **17 Claims**

1. A fluid transfer device for accessing fluid from vials and ampoules comprising:



- a cannula assembly including a cannula having a proximal end, a distal end and a lumen therethrough, and a hub having an open proximal end and a distal end joined to said proximal end of said cannula so that said lumen is in fluid communication with said open proximal end of said hub;
- a filling straw having a proximal end, a distal end and a passageway therethrough, said straw including a housing at said proximal end, a needle portion at said distal end and a shaft portion therebetween, said housing having a cavity in its proximal end in fluid communication with said passageway, a cutting edge at the distal end of said needle portion for piercing a vial stopper, and said cannula assembly and said filling straw being removably engaged so that said open proximal end of said hub is in fluid communication with said passageway of said filling straw;
- a shield having an open proximal end, an open distal end and a side wall therebetween defining a recess in said shield, said shield being removably connected to said filling straw so that said shaft portion and said needle portion are contained substantially within said recess; and
- a seal plug having a proximal end and a distal end, said seal plug having a distal position wherein said seal plug projects distally outwardly from said distal end of said shield for telescoping movement from said distal position to a proximal position, said seal plug including means for sealing said needle portion to prevent unpressurized fluid communication between said passageway and the exterior of said shield when said seal plug is in said proximal position.

5,746,734

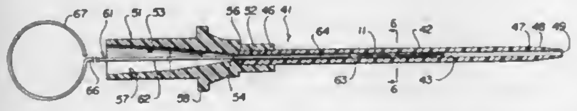
INTRODUCER CARTRIDGE FOR DELIVERING AN EMBOLIZATION DEVICE

Ray H. Dormandy, Jr., San Bruno; Marcelyn A. Berlo, San Francisco, and David J. Paul, Pleasanton, all of Calif., assignors to International Therapeutics Corporation, Fremont, Calif.

Continuation of Ser. No. 243,197, May 16, 1994, Pat. No. 5,476,472, which is a continuation-in-part of Ser. No. 969,008, Oct. 30, 1992, Pat. No. 5,382,260. This application Sep. 12, 1995, Ser. No. 527,186

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 606—1 **4 Claims**



1. In combination, an introducer cartridge and an embolization device for use with a delivery catheter having a proximal end with a hub mounted thereon and having a conical recess therein, said introducer cartridge comprising a flexible elongate tubular member formed of a plastic and having a flow passage extending therethrough and having proximal and distal extremities, said flow passage having a diameter, said distal extremity being tapered and a hub formed of plastic secured to the proximal extremity of the flexible elongate tubular member, said hub of the introducer cartridge having a conical recess free of obstructions therein with a proximal extremity and with a distal extremity, the distal extremity of the conical recess terminating at the proximal extremity of the flexible elongate tubular member and having a diameter which is less than the diameter of the flow passage in the flexible elongate tubular member to aid in preventing the embolization device from hanging up in the introducer cartridge and to prevent damage to the embolization device and, said embolization device comprising an elongate coil having a plurality of turns formed of a metal, said embolization device being situated within said introducer cartridge flow passage.

5,746,735

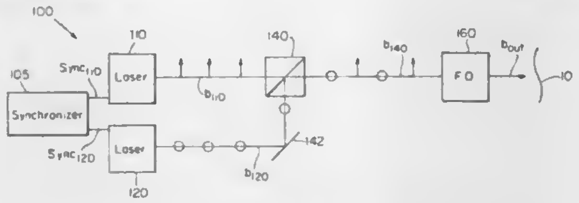
ULTRA LONG PULSED DYE LASER DEVICE FOR TREATMENT OF ECTATIC VESSELS AND METHOD THEREFOR

Horace W. Furumoto, Wellesley, and Harry L. Ceccon, Boston, both of Mass., assignors to Cynosure, Inc., Chelmsford, Mass.

Continuation of Ser. No. 329,195, Oct. 26, 1994, abandoned. This application Aug. 8, 1996, Ser. No. 695,661

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 606—9 **17 Claims**



1. A selective photothermolysis method comprising:

- irradiating a tissue section of a patient with a pulsed laser beam of wavelengths that will be preferentially absorbed by a targeted tissue of a patient; and
- changing color of the pulsed laser beam across a time period of the pulse to maximize absorption in the targeted tissue taking into account heating caused by a preceding portion of the pulse.

5,746,736

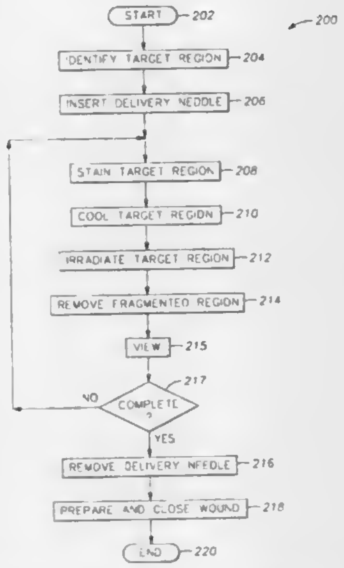
CRYOGENIC LASER LITHOTRIPSY WITH ENHANCED LIGHT ABSORPTION

Nikolai Tankovich, San Diego, Calif., assignor to Lumedics, Ltd., San Diego, Calif.

Filed Aug. 9, 1995, Ser. No. 512,884

Int. Cl.^{6} A61N *5/02*

U.S. Cl. 606—9 **59 Claims**



1. A method for treating tissue of a living body, comprising:

- increasing tendency of a target region of tissue internal to the living being to absorb a selected type of light by staining the target region with a selected color of stain;
- reducing temperature of the target region to a selected temperature no greater than zero degrees Celsius; and
- breaking the target region tissue into multiple pieces by irradiating the target region with the selected type of light.

5,746,737

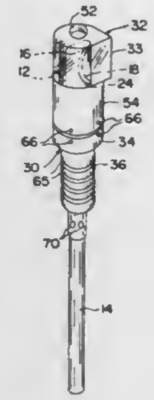
ENCLOSURE FOR A LASING DEVICE

Vahid Saadat, Irvine, Calif., assignor to Trimedyne, Inc., Irvine, Calif.

Filed Jun. 7, 1995, Ser. No. 485,362

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—15 **32 Claims**



31. An attachable enclosure for a lateral lasing device which device includes a fiber optic with a distal end adapted for emitting a laser beam and an exposed lateral reflector for the laser beam opposite the distal end of the fiber optic and connected thereto by an elongated mounting stem, the enclosure comprising:

- an elongated body having a head portion and a tail portion, the elongated body defining a longitudinal flute for receiving the mounting stem within the body;
- means for immobilizing the mounting stem when it is received within the elongated body; and
- a hollow envelope, having a cutting edge, an open end, and a fluid exit port removably mounted to the head portion at its open end, the hollow envelope being dimensioned to surround the lateral reflector and being in fluid flow communication with the longitudinal flute through the open end of the elongated body.

5,746,738

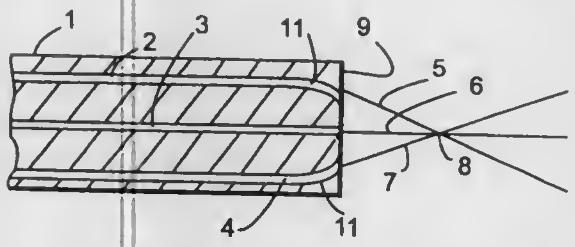
LASER SURGICAL DEVICE

David J. Cleary, Alexandria, Va., and Hyung S. Ryu, Washington, D.C., assignors to Cleary & Oxford Associates, Alexandria, Va.

Filed Nov. 20, 1996, Ser. No. 751,428

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—15 **23 Claims**



1. A laser beam delivery system for removing human or animal tissue from a surgical site by simultaneously irradiating the tissue with a plurality of laser beams that intersect at the surgical site to ablate tissue, said system comprising:

- a conduit having a plurality of optical fibers for transmitting laser beams, wherein the fibers extend through said conduit to a distal end of the conduit place near the surgical site, and
- said laser beams are directed by the distal end of the conduit to the point of intersection at the surgical site, and wherein each of the laser beams individually has insufficient energy level to ablate the tissue, and wherein the laser beams at the point of intersection have a combined energy level sufficient to ablate the tissue at the surgical site,

---

5,746,739

BIPOLAR COAGULATION FORCEPS WITH RINSING TUBE

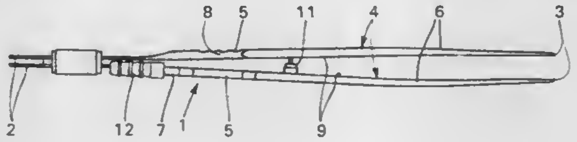
Hermann Sutter, Gundelfingen, Germany, assignor to Select Medizin-Technik Hermann Sutter GmbH, Freiburg, Germany

Filed Nov. 6, 1995, Ser. No. 554,330

Claims priority, application Germany, Nov. 10, 1994, 44 40 158.2; Nov. 10, 1994, 9418006 U

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—51 **12 Claims**



1. A bipolar coagulation forceps (1) comprising two forceps limbs (4) which can be pressed together against spring tension, the forceps limbs being connected together at a first end and having free ends opposite to the first end, a connection (2) for high frequency energy located at the first end, the forceps limbs (4) including grips (5) having parallel narrow sides and facing inner sides, the grips being capable of being pressed together against the spring tension, and working limbs (6) fastened thereupon which include tips (3) located at the free ends of the forceps limbs which form poles for coagulation, at least one of the working limbs (6) having a closed hollow cross section with the tip of the at least one working limb being formed at the free end of the closed hollow cross section, the closed hollow cross section having a connection (7) for one of a rinsing fluid and a suction source, and the working limbs (6) being fastened on the parallel narrow sides (8) of the grips (5).

5,746,740

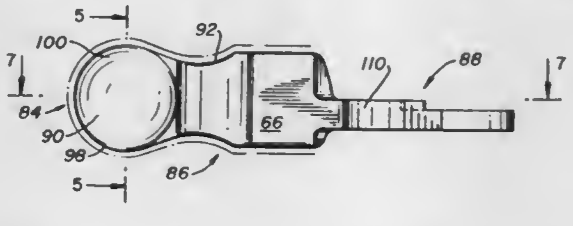
SURGICAL BIOPSY FORCEPS APPARATUS

David A. Nicholas, Trumball, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 950,449, Sep. 23, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 196,822

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—52 **13 Claims**



1. Apparatus for endoscopic or laparoscopic electrosurgery which comprises:

a) a frame;

b) a generally elongated endoscopic portion connected to said frame and extending distally therefrom, said endoscopic portion being electrically conductive said endoscopic portion including:
  i) an inner rod member positioned within said endoscopic portion;
  ii) an outer tubular member secured to said frame and surrounding said inner rod member such that said inner rod member is slidable within said outer tubular member;

whereby said inner rod member is slidable between a first position and a second position;

c) conducting means attachable to said frame and in electrical communication with said endoscopic portion for receiving an electrical current from an electrical source;

d) a pair of jaw members mounted at a distal end of said endoscopic portion, disposed in opposing relation and being relatively pivotable about a common point between at least an open position and a closed position, at least one of said jaw members being electrically conductive and each of said jaw members including:
  i) a distal portion including a first surface adapted for engaging tissue, said first surface having a recessed portion formed therein and a second surface being of smooth continuous construction;
  ii) a proximal portion pivotably attached to said inner rod member such that said jaw members are pivotable between said open and said closed positions;
  iii) an intermediate portion including a first section being recessed relative to said first surface of said distal portion such that said opposing jaw members are contactable with one another along said distal and intermediate portions only at said first surfaces of said respective distal portions for engaging tissue, said intermediate portion of each of said jaw members remaining spaced apart from each other, said intermediate portion further including an arcuate cross sectional dimension along a periphery thereof which is transverse to said first section of said intermediate portion.

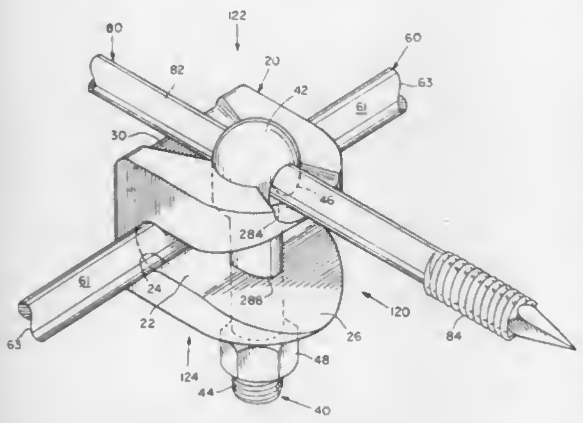
5,746,741
EXTERNAL FIXATOR SYSTEM

Karl H. Kraus, Sutton; George E. Chu, Westford; Brian J. Rollins, Bellingham; Harold M. Wotton, III, Fiskdale; Danielle L. Luongo, Tyngsboro, all of Mass.; Donald M. Kallio, Jr., Barrington, R.I.; Bryan E. Cotton, Watertown, and David P. Brooks, II, Framingham, both of Mass., assignors to Tufts University, Medford, and Worcester Polytechnic Institute, Worcester, both of Mass.

Filed May 6, 1996, Ser. No. 643,512

Int. Cl.^{6} A61B *17/56*

U.S. Cl. 606—54 **39 Claims**



1. An external fixator clamp comprising:

a unitary u-shaped clamp body having a slot dimensioned to transversely receive a connecting rod and a hole extending transversely through the slot; and

a pin connector extending through the clamp body hole and having a hole for receiving a fixator pin to brace the pin against the clamp body.

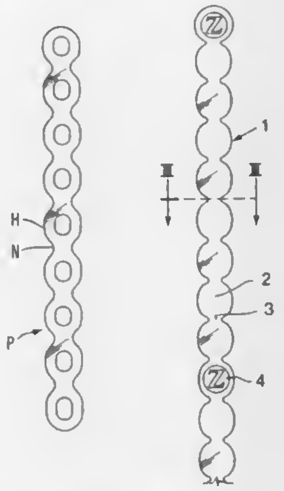
5,746,742
BONE PLATE TEMPLATE

Robert John Runciman, Renfrew, Canada, and Randall N. Allard, Plymouth, Ind., assignors to Bristol-Myers Squibb Company, New York, N.Y., and Terray Corporation, Ontario, Canada

Filed Jun. 25, 1996, Ser. No. 668,299

Int. Cl.^{6} A61B *17/56*

U.S. Cl. 606—69 **18 Claims**



1. In combination, a template and a corresponding bone plate, the template for use in preparing a contouring model for the bone plate to be implanted on a bone, said bone plate comprising an elongated strip having at least two screw holes formed therein, adjacent screw holes being joined together by unapertured regions of said elongated strip; said template having a silhouette substantially resembling a selected said bone plate, with first portions corresponding to the locations of said screw holes being bridged by second portions corresponding to the locations of said unapertured regions of said strip, said template has a thickness T, and said second portions have a minimum width W, the ratio of W:T being from about 1.4:1 to about 1.6:1, whereby said template is deformable in the region of said second portions by manual pressure, said first portions lacking apertures corresponding in size to said screw holes.

5,746,743
SINGLE-HANDED SURGICAL DRILL DEPTH GUIDE WITH MANDIBULAR RETRACTOR

Alex M. Greenberg, New York, N.Y., assignor to Greenberg Surgical Technologies, LLC, New York, N.Y.

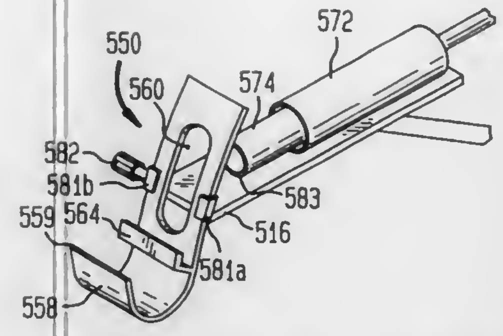
Continuation-in-part of Ser. No. 919,783, Jul. 24, 1992, Pat. No. 5,409,493, which is a continuation-in-part of Ser. No. 719,178, Jun. 21, 1991, Pat. No. 5,133,720, which is a continuation-in-part of Ser. No. 552,703, Jul. 13, 1990, Pat. No. 5,026,376. This application Sep. 2, 1994, Ser. No. 300,707

Int. Cl.^{6} A61F *17/00*

U.S. Cl. 606—96 **16 Claims**

1. A surgical drill guide and retractor for restricting the penetration depth of a distal end of an instrument into a bone, a proximal end of the instrument having a larger girth than said distal end, said drill guide and retractor comprising:

(a) an adjustable length sleeve, including:
  (1) an outer segment having a first lumen;



  (2) an inner segment having a second lumen, said inner segment being retractable disposed within said first lumen so that said first and second lumens are linearly aligned to form a single lumen of said adjustable length sleeve;
  (3) said inner and outer segments being cooperatively connected so that said inner sleeve is displaceable into and out of only a first end of said first lumen and so that a displacement of said inner segment out of and into said first lumen segment changes a longitudinal length of said adjustable length sleeve; and
  (4) said single lumen of said adjustable length sleeve having a diameter dimensioned for slidably receiving an instrument therethrough, until the larger girth proximal end of the instrument abuts a proximal end of said adjustable length sleeve and a distal end of the instrument protrudes from a distal end of said sleeve;

(b) a handle on said adjustable length sleeve, said handle including a trigger connected to the handle in a way to cause said inner segment to retract into said outer segment to shorten said adjustable length sleeve so as to expose a preselected length of the instrument;

wherein said penetration depth of said instrument is restricted to said preselected length; and

(c) a retractor blade extending from a distal end of the adjustable length sleeve, the retractor blade including:
  (1) a curved portion at a proximal end of the adjustable length sleeve;
  (2) an arcuate portion having a tip, the arcuate portion connected to a distal end of the curved portion; and
  (3) an aperture defined in the retractor blade and located proximally from the tip;

wherein the retractor blade is slidably adjustable superiorly and inferiorly with respect to a distal end of the adjustable length sleeve and wherein a pair of clamps are connected to the distal end of the adjustable length sleeve for selectively retaining the retractor blade at a desired position.

5,746,744

Patent Not Issued For This Number

5,746,745
BALLOON CATHETER

John E. Abele, Concord, and Ronald A. Sahatjian, Lexington, both of Mass., assignors to Boston Scientific Corporation, Natick, Mass.

Continuation-in-part of Ser. No. 441,603, May 15, 1995, which is a continuation of Ser. No. 110,655, Aug. 23, 1993, abandoned. This application Mar. 1, 1996, Ser. No. 609,274

Int. Cl.^{6} A61F *11/00*

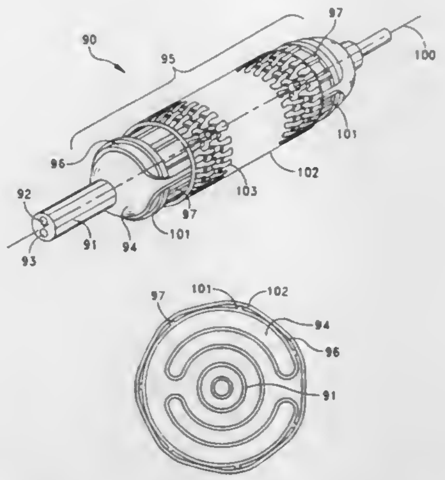
U.S. Cl. 606—108 **12 Claims**

1. A system for the delivery of a medical expansible stent to a patient's vessel for expansion therein, said system comprising:

(A) a catheter having an inflation lumen therein extending from a proximal end to a distal end,

(B) a medical expansible stent, and

(C) a medical balloon for supporting said stent thereon, said balloon being formed of a thin material positioned at the distal end of said catheter in communication with said inflation lumen whereby said balloon is expansible from a compact state to an expanded state in a patient's vessel in response to the injection of an inflation fluid through said inflation lumen, said balloon being formed with a first material portion and in its compact state, essentially exposing the exterior surface of only said first material portion to support said stent, said balloon, in its expanded state, expanding said stent and exposing the exterior surfaces of said first material portion and of the remaining material portion, the exterior surface on said first material portion having an integral surface with a coefficient of friction that is greater than the coefficient of friction of the exterior surface of said remaining material portion of said balloon whereby said balloon in its compact state holds said stent in place thereon and in its expanded state facilitates the removal of said balloon from said stent.



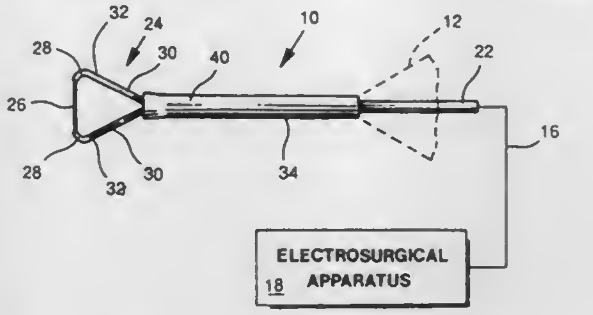
5,746,746
ELECTROSURGICAL ELECTRODE AND METHOD FOR SKIN RESURFACING

Jon C. Garito, and Alan G. Ellman, both of 1135 Railroad Ave., Hewlett, N.Y. 11557

Filed Aug. 30, 1996, Ser. No. 705,600

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—41 **14 Claims**



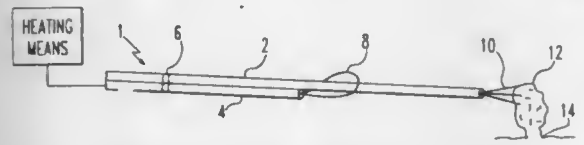
1. An electrosurgical electrode for tissue planing, comprising:

(a) an electrically-conductive shaft member having a longitudinal direction and a first end for mounting to a handpiece and a second end,

(b) said second end comprising an active, electrically-conductive, exposed wire portion having a generally straight shape extending generally transverse to the shaft member and terminated at opposite ends by end segments generally aligned with and lying in the same plane as that of the active wire portion, the end segments terminating said exposed wire portion being provided with a coating of a thickness such that, when the active wire portion is applied to tissue, the coating prevents the exposed active wire portion from digging into, gouging or scarring the tissue.

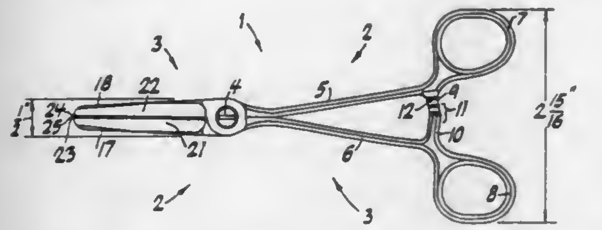
(c) said active wire portion being exposed electrically for applying electrosurgical currents to said tissue when said shaft member is connected to a source of electrosurgical currents,
(d) the coating on the end segments terminating said exposed wire portion being electrically-insulating to prevent contact and passage of electrosurgical currents to areas adjacent to or surrounding the tissue to be treated and controlling the depth of tissue treated.

5,746,747
POLYPECTOMY INSTRUMENT
John A. McKeating, 1074 Osage Dr., Pittsburgh, Pa. 15235
Filed May 13, 1994, Ser. No. 242,178
Int. Cl.^{6} A61B *17/24*
U.S. Cl. 606—114 **6 Claims**



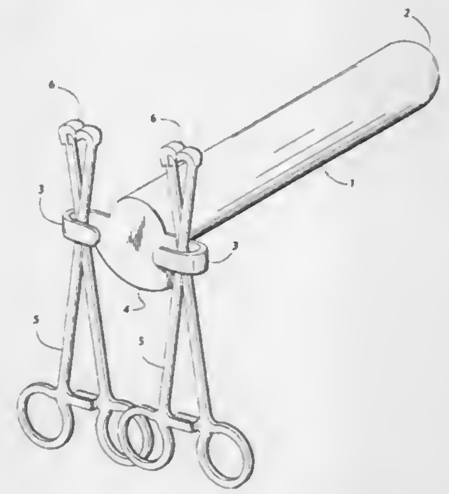
1. A cut and retrieval instrument comprising:
a first portion which is adapted to grasp a polyp, said first portion includes a first sheath member having a grasping forcep slidably disposed within said first sheath member; and
a second portion which is adapted to cut away the polyp, said second portion connected to the first portion, said second portion includes a second sheath member disposed adjacent to the first sheath member having a wire snare with a snare loop slidably disposed within said second sheath member such that the grasping forcep can slide relative to the first sheath member through the snare loop of the wire snare when the snare loop extends from the second sheath member, said loop trained into a bent configuration which upon its advancement out of the second sheath bends towards the forcep so the forcep slides through the loop.

5,746,748
CIRCUMCISION INSTRUMENT
Frederic Steinberg, 40 Cooper Run Dr., Cherry Hill, N.J. 08003; Phyllis Adams, 12 Forestview Ct., Marlton, N.J. 08053, and Frank W. Arnoth, Glen Mills, Pa., assignors to Frederic Steinberg, Cherry Hill, and Phyllis Adams, Marlton, both of N.J.
Filed Dec. 27, 1995, Ser. No. 579,330
Int. Cl.^{6} A61B *17/32*
U.S. Cl. 606—118 **43 Claims**



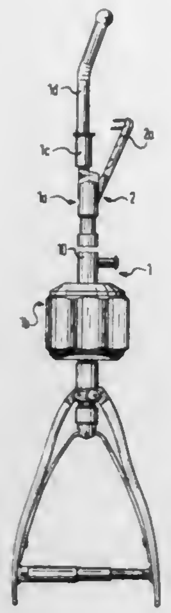
1. A circumcision instrument comprising:
a pair of crossed members having proximal ends and distal ends; and
a pivot pin fixed between the crossed members allowing for movement of the crossed members toward and away from each other;
the crossed members comprising
handles with finger loops at the proximal ends of the crossed members;
clamping tabs extending from the finger loops wherein the clamping tabs will overlap when the handles are closed and wherein angular facets are formed on the clamping tabs such that the clamping tabs will lock together as the angular facets engage; and
jaws on the distal ends of the crossed members having upper surfaces and lower surfaces wherein the upper surfaces of the jaws provide surfaces along which a cutting instrument is moved to sever tissue clamped between the jaws and wherein the lower surfaces of the jaws are partially cut away forming clamping surfaces of reduced area on inner sides of the jaws whereby the clamping surfaces act to crush tissue between the clamping surfaces without severing the tissue when the handles are fully closed.

5,746,749
RECTOVAGINAL SURGICAL REPAIR INSTRUMENT
Cindylee Willard, 615 Justis St., Mountain Home, Ark. 72653
Continuation-in-part of Ser. No. 181,820, Jan. 18, 1994, abandoned. This application Apr. 26, 1995, Ser. No. 625,683
Int. Cl.^{6} A61B *17/42*
U.S. Cl. 606—119 **11 Claims**



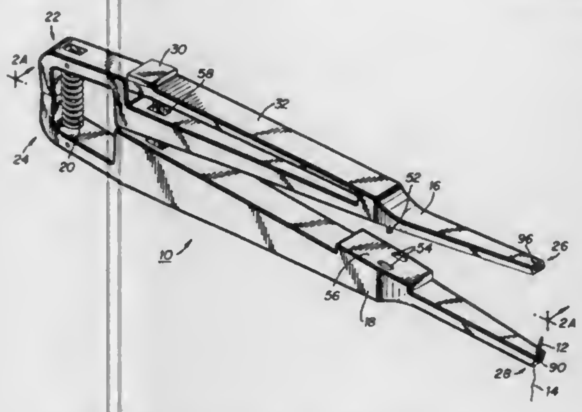
4. A rectovaginal surgical repair instrument comprising:
(a) a smooth, rigid, elongated cylindrical member having a first end and a second end and a longitudinal axis, said elongated cylindrical member having a length in a range of 3 cm to 15 cm and a diameter range at its widest point of 1 cm to 4 cm; and
(b) two generally opposing rigid, wing devices rigidly attached to and extending outwardly from said first end of said elongated cylindrical member and then curving back inwardly to respective points such that the perpendicular distance between each of said points and said longitudinal axis is less than the radius of said cylindrical member.

5,746,750
MEDICAL INSTRUMENT FOR MANIPULATION OF THE UTERUS
Stephan Prestel, Rheinstetten-Mörsch; Manfred Boebel, Ötisheim, both of Germany; Harry Reich, Kingston, Pa., and Hossein Messroghli, Gross -Gerau, Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany
Filed Feb. 5, 1997, Ser. No. 795,031
Claims priority, application Germany, Feb. 5, 1996, 196 03 981.9
Int. Cl.^{6} A61B *17/42*
U.S. Cl. 606—119 **9 Claims**



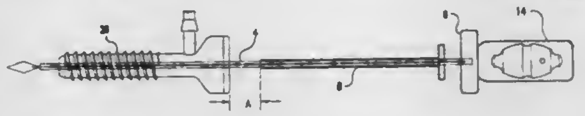
1. A medical instrument for manipulation of the uterus through a vaginal opening of a vagina comprising:
an elongate shank having a proximal end, a distal end and a longitudinal axis;
a manipulator probe, disposed at the distal end, for manipulating the uterus;
a holding means, pivotally connected to the distal end, for fastening the uterus in at least one therapeutic position relative to said manipulator probe;
a handle, disposed at the proximal end, for holding said elongate shank;
a sealing means for receiving said elongate shank and for sealing said elongate shank within the vagina, such that when said sealing means is inserted into the vaginal opening and said elongate shank is inserted therethrough, said elongate shank is sealed within the vagina such that said sealed elongate shank is axially displaceable within said sealing means.

5,746,751
VASCULAR SUTURING APPARATUS
Charles R. Sherts, Southport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Continuation of Ser. No. 319,703, Oct. 7, 1994, Pat. No. 5,571,090. This application Jun. 6, 1995, Ser. No. 470,757
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—139 **21 Claims**



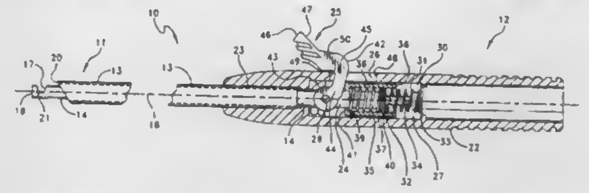
1. A method of suturing a pair of vascular tissue sections comprising:
a) providing a suturing apparatus having first and second needle holding members, the first and second needle holding members being pivotally interconnected in tweezer like fashion;
b) holding a surgical needle having a length of suture affixed thereto within a recess in the first needle holding member by engaging the needle with a first member longitudinally movable with respect to the first needle holding member;
c) aligning edges of first and second tissue sections to bring the edges together in adjacent relationship;
d) positioning the first and second needle holding members adjacent the edges;
e) closing the first and second needle holding members to pierce the edges with the surgical needle and to enable the surgical needle to be passed to the second needle holding member; and
f) opening the first and second needle holding members such that the length of suture material affixed to the surgical needle held in the second needle holding member is drawn through the edges.

5,746,752
DOUBLE-DIAMETER KNOT PUSHER
Stephen S. Burkhart, San Antonio, Tex., assignor to Arthrex, Inc., Naples, Fla.
Filed Nov. 7, 1996, Ser. No. 745,189
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—139 **20 Claims**



1. An apparatus consisting essentially of:
an inner tube having a distal end for pushing and holding suture, a proximal end, a lumen, and an outer surface; and
an outer tube disposed slidably over the inner tube, the outer tube having a distal end for pushing suture, a proximal end, and a lumen receiving the inner tube,
wherein the distal end of the outer tube and the outer surface of the inner tube cooperate to prevent passage of suture between the inner tube and the outer tube when the outer tube is advanced toward the distal end of the inner tube to advance a loop of suture along the outer surface of the inner tube.

5,746,753
NEEDLE GRASPING APPARATUS
Roy H. Sullivan, Uxbridge, and Barry N. Gellman, North Easton, both of Mass., assignors to Boston Scientific Corporation, Natick, Mass.
Filed May 13, 1996, Ser. No. 645,173
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—147 **36 Claims**



1. In apparatus for facilitating endoscopic therapy having first and second axially, relatively displaceable coaxial members having proximal and distal ends and adjacent proximal and distal end portions wherein relative motion of the coaxial members defines first and second limit positions and, in response to interference between said end portions, an intermediate position, a handle means supporting the proximal portions of the first and second coaxial members for producing the motion between the first and second limit positions and to the intermediate position, said handle means comprising:
A. a housing attached to a proximal end portion of the first coaxial member;
B. camming means supported in said housing for movement between first and second positions; and
C. lost motion transfer means mounted coaxially with the coaxial members and concentrically with the coaxial members, abutting said housing, said camming means and the

second coaxial member being responsive to motion of said camming means for producing motion to the first limit position when said camming means is at the first position and, when the camming means is at the second position, notion to one of the second limit position and intermediate depending upon the presence of interference between the distal end portions of said coaxial members.

5,746,754

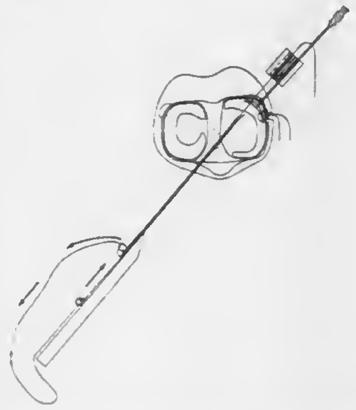
METHOD OF USING A SURGICAL REPAIR KIT

Kwan-Ho Chan, 4702 S. Jackson, Joplin, Mo. 64804

Division of Ser. No. 90,651, Jul. 12, 1993, Pat. No. 5,562,687. This application Oct. 8, 1996, Ser. No. 727,025

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—148 **32 Claims**



1. A method for suturing internal tissue at least partially accessible through a body cavity, said method comprising the steps of:

(A) providing at least one suture having a first limb and a second limb;

(B) providing a suture passer comprising a longitudinally extending hollow cannula having a distal opening, a proximal opening and a central passage slidingly receivable of a surgical suture;

(C) introducing said distal end of said cannula into a body cavity at least partially accessing internal tissue to be sutured;

(D) identifying a first insertion site for passing a first limb of a suture through said internal tissue to be sutured;

(E) inserting a first hollow needle through said first insertion site, said hollow needle extending from outside said body through said first insertion site into said body cavity;

(F) identifying a second insertion site for passing a second limb of said suture through said internal tissue to be sutured;

(G) inserting a second hollow needle through said second insertion site, said hollow needle extending from outside said body through said second insertion site into said body cavity;

(H) passing said second limb of said suture through said first hollow needle into said distal opening of said cannula until it exits said proximal opening of said cannula;

(I) feeding said second limb of said suture back into said cannula through said proximal opening;

(J) passing said second limb of said suture through said hollow cannula into said second hollow needle until it exits said needle external of the body;

(K) drawing said suture through said cannula into said body cavity;

(L) removing said first and second hollow needles by drawing them outwardly of said body cavity;

(M) tying said limbs of said suture; and

(N) repeating steps (D)–(M) until a surgically sufficient number of sutures have been tied.

5,746,755

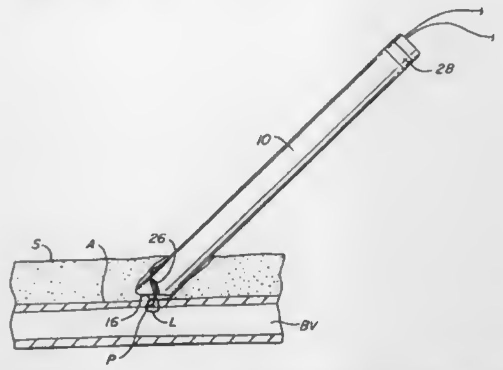
METHOD AND DEVICE FOR PROVIDING HEMOSTASIS AT VASCULAR PENETRATION SITES

Timothy J. Wood, Santa Clara, and Bernard H. Andreas, Fremont, both of Calif., assignors to Perclose, Inc., Menlo Park, Calif.

Continuation of Ser. No. 252,483, Jun. 1, 1994, abandoned. This application Nov. 15, 1995, Ser. No. 559,254

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—148 **32 Claims**



1. A method for occluding a puncture of a blood vessel at the end of a tissue tract, said method comprising:

applying pressure without applying heat directly to an adventitial surface of the blood vessel with a surface which is engaged against the adventitial surface, wherein a force in the range from 5 g to 50 g is applied over an area in the range from about 6 mm^2 to 30 mm^2 for a time in the range from about 10 minutes to 24 hours, the pressure applied at least in part by tensioning a member, the member selected from the group consisting of suture and a guidewire, and anchoring the member to a shaft which extends out the tissue tract from the surface, the force being transferred along the shaft and to the surface from outside the tissue tract; and

removing the shaft with the surface through the tissue tract after applying the pressure.

5,746,756

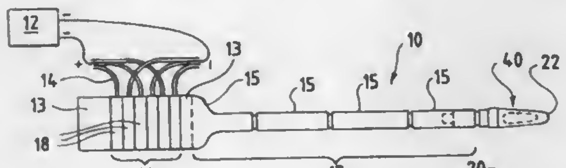
INTERNAL ULTRASONIC TIP AMPLIFIER

George Bromfield, Murray, Utah, and Jeffrey J. Vaitekunas, West Chester, Ohio, assignors to Ethicon Endo-Surgery, Inc.

Filed Jun. 3, 1996, Ser. No. 657,146

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—169 **4 Claims**



1. An ultrasonic energy propagation assembly comprising:

waveguide means for guiding and transmitting ultrasonic energy having velocity;

ultrasonic energy means coupled to the waveguide means for producing ultrasonic energy and propagating said ultrasonic energy along the waveguide means; and

amplification means coupled to the waveguide means for receiving ultrasonic energy from said waveguide means and amplifying the velocity of said ultrasonic energy, said amplification means having a length and including a proximal portion and a hollow distal portion which terminates in an inwardly-tapering distal end, wherein a first cross section of the amplification means taken through the hollow distal portion orthogonal to the length defines a cross-sectional area which is less than a cross-sectional area defined by a second orthogonal cross section taken through the proximal portion of said amplification means, wherein the hollow distal portion defines an enclosure having a distal end, and wherein the amplification means further comprises a distal end wall which defines said distal end of the enclosure and which is substantially uniform in thickness.

5,746,757

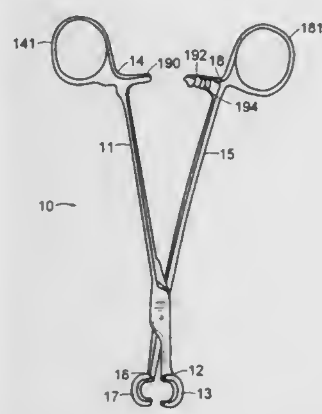
SUTURING JIG AND METHOD FOR USING SAME

David A. McGuire, 3418 Lakeside Dr., Anchorage, Ak. 99515

Filed Jan. 17, 1997, Ser. No. 784,401

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **36 Claims**



2. A surgical jig for use in suturing tissue, the jig comprising:

a pair of opposing clamping members bent toward one another for circumferentially engaging the tissue;

a first arm being attached at its distal end to one clamping member, and a second arm being attached at its distal end to the opposing clamping member, the first and second arms being pivotably connected to one another for variably adjusting a distance between the respective clamping members;

a plurality of openings positioned on each clamping member for guiding a needle and suture thread from one clamping member to the other; and

a plurality of slots, each slot being positioned between adjacent openings for allowing a portion of the suture thread to move between the adjacent openings.

5,746,758

INTRA-ARTERY OBSTRUCTION CLEARING APPARATUS AND METHODS

Gregory N. Nordgren, Wilsonville, and Thomas L. Kelly, West Linn, both of Oreg., assignors to Evi Corporation, Vancouver, Wash.

Continuation of Ser. No. 401,836, Mar. 10, 1995, Pat. No. 5,643,297, which is a division of Ser. No. 973,514, Nov. 9, 1992, abandoned. This application Oct. 21, 1996, Ser. No. 731,805

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—159 **18 Claims**

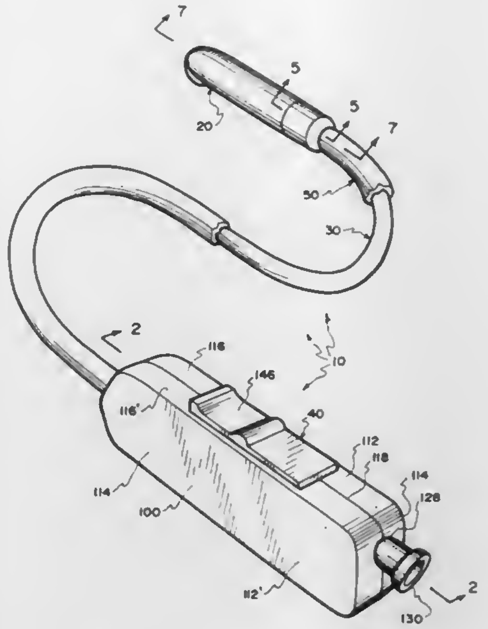
1. A combination for concentric arterial plaque removal comprising:

a hollow catheter tube comprising a distal end and an inside diameter;

a drive cable rotatably passing through the hollow of the catheter tube, the drive cable comprising a distal end;

a rotatable cutting head of fixed dimensions for plaque removal as the head is distally advanced to increase blood flow;

the cutting head comprising a maximum diametral size greater than the inside diameter of the catheter tube a distal portion comprising a rounded leading end.



5,746,759

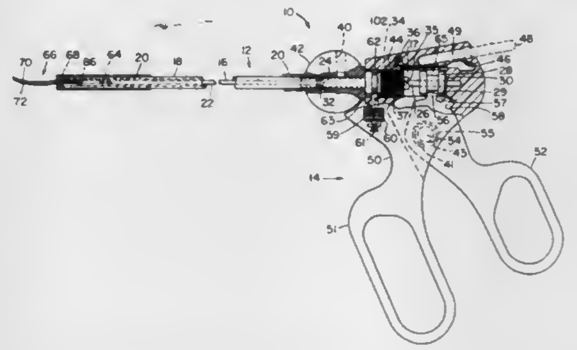
REUSABLE ENDOSCOPIC SURGICAL INSTRUMENT

John C. Meade, Walpole, and John C. Baccus, Wayland, both of Mass., assignors to MicroSurge, Inc., Needham, Mass.

Continuation of Ser. No. 475,674, Jun. 7, 1995, abandoned, which is a division of Ser. No. 396,890, Mar. 1, 1995, Pat. No. 5,499,992, which is a continuation of Ser. No. 4,790, Jan. 14, 1993, abandoned, and Ser. No. 287,069, Aug. 8, 1994, Pat. No. 5,478,351, which is a continuation of Ser. No. 903,162, Jun. 24, 1992, abandoned. This application Sep. 10, 1996, Ser. No. 707,951

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—170 **21 Claims**



1. A surgical instrument comprising:

a tool assembly comprising:

a sleeve;

jaws pivotable relative to each other, each jaw having an open-ended slot open at a proximal end of the jaw, said jaws being pivotably mounted to a distal end of the sleeve;

an extension within the sleeve longitudinally translatable relative to the sleeve in and out of the open-ended slots at the proximal ends of the jaws, said extension being engageable with inner walls of the open-ended slots to drive the jaws toward open and closed positions when said extension is in the open-ended slots; and

a handle assembly for retaining the tool assembly and longitudinally translating the extension relative to the sleeve.

5,746,760

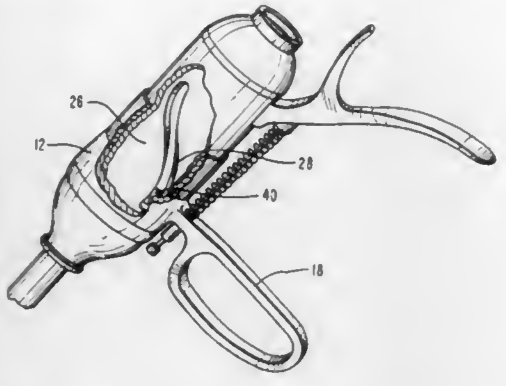
SEMI-AUTOMATIC TISSUE MORCELLATION DEVICE

Louis E. Humphrey, Jr., San Jose, Calif., assignor to Laserscope, San Jose, Calif.

Filed Jan. 17, 1995, Ser. No. 373,566

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—171 15 Claims



1. A bulk tissue removal device comprising:
- a helically-slotted cylindrical element having a hollow core therethough;
- rotation means for rotating said helically-slotted cylindrical element about the cylindrical axis of said helically-slotted cylindrical element in either a clockwise or counterclockwise direction;
- an inner shaft element rotatably positioned within the hollow core of the helically-slotted cylindrical element, said shaft element having a hollow core therethrough;
- an excision sleeve adapted to connect to the inner shaft element, said sleeve having a cutting tip for cutting tissue; and
- unidirectional rotation transfer means for transferring rotation of the helically-slotted cylindrical element to the inner shaft element during rotation of the helically-slotted cylindrical element in one direction and preventing transfer of rotation of the helically-slotted cylindrical element to the inner shaft element during rotation of the helically-slotted cylindrical element in the opposite direction, wherein said unidirectional rotation transfer means facilitates smooth cutting of uniform tissue fragments without recoil of the cutting tip.

5,746,761

DISPOSABLE LANCET FOR FINGER/HEEL STICK

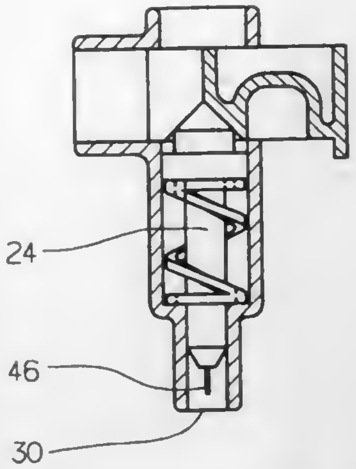
Arkadiy Turchin, 278 Grove St., Apt. 7, Newton, Mass. 02166, assignor to Arkadiy Turchin, Newton, Mass.

Filed Jul. 3, 1997, Ser. No. 887,782

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—181 2 Claims

1. A lancet type device having a distal or patient contacting end and an opposed proximal end comprising:
- an elongated lancet body having a central axis;
- a lancet that is substantially encased in the lancet body, the lancet having a sharp distal tip that extends beyond the distal end of the lancet body;
- an arm that sliding transverse to the axis of lancet body, the arm having opened slot on the front end, a blind conical hole, a blind cylindrical hole and a finger pad;
- a case having a chamber contoured to the shape of the lancet body so that the lancet body is slidably encased in the chamber and moves in the chamber along the central axis of the lancet body, the chamber having an axis;
- a case having a channel guide transversely across to the axis of lancet body, contoured to the shape of the arm so that the arm is slidably encased in the channel guide and moves in the channel guide transversely across to the axis of lancet body;
- a removable cap that encloses the sharp distal tip;



- an actuating mechanism that moves the sharp distal lancet tip linearly out of the case, the actuating mechanism including:
  - a conical top of lancet body
  - the blind conical hole of the arm;
- a retracting and locking mechanism that moves the sharp distal lancet tip linearly into the case and locking the arm, the retracting and locking mechanism including:
  - a cylindrical head of the lancet body
  - a spring, that is molded as part of the lancet body
  - a blind cylindrical hole of the arm;
- whereby, as the arm moves, contact between the blind conical hole of the arm and the conical top of the lancet body moves the lancet body in a linear direction along the axis of the lancet body;
- whereby the lancet tip moves into and out of contact with a patient's skin.

5,746,762

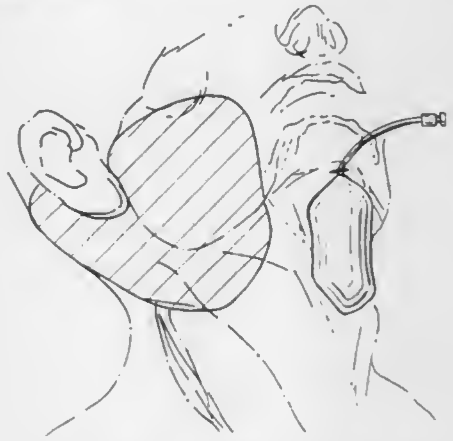
DEVICE AND METHOD FOR SURGICAL FLAP DISSECTION

Lawrence S. Bass, 4 Garden St., Great Neck, N.Y. 11021

Filed Oct. 2, 1996, Ser. No. 720,724

Int. Cl.^{6} A61H *29/00*

U.S. Cl. 606—192 6 Claims



1. A system including an inflatable means for use in cosmetic surgery to expand an initial cavity into a predetermined region of fatty-tissue cleavage extending transverse to the initial cavity to form a final cavity, the system comprising:
- an elongate means having spaced proximal and distal ends and adapted at its proximal end to receive an inflation fluid and having at least one port at a location distal to the proximal end for supplying inflation fluid to the inflatable means;
- the inflatable means comprising two like panels of pliant but essentially non-stretch material conforming generally to a predetermined region within a fatty-tissue cleavage and secured to the elongate means along a longitudinal alignment distal with respect to the proximal end and otherwise peripherally secured to each other, such that the port is in communication with the inflatable means;
- the inflatable means being capable of initially being in an uninflated state wherein the inflatable means is precoiled and operatively connected to the elongate means;
- whereby, upon insertion of the system into the initial cavity, the inflatable means is capable of conforming to an inflated state, wherein in the inflated state, the inflatable means is capable of expanding within a fatty-tissue and throughout an area within a fatty-tissue which is laterally offset with respect to the system such that when the inflatable means is inflated, the inflatable means deploys in a pattern that permits the inflatable means to remain in the initial plane within a fatty-tissue to form a final cavity within a fatty-tissue which conforms substantially to the predetermined region.

5,746,763

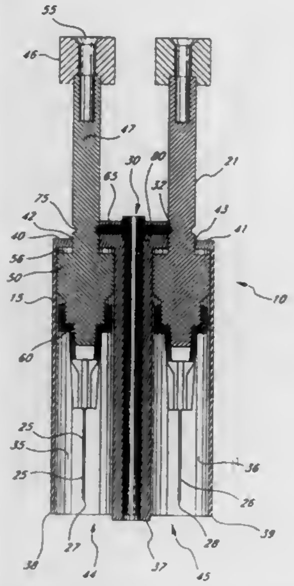
DEVICE FOR SUPPORTING AND POSITIONING MEDICAL EQUIPMENT

Theodore V. Benderev, San Juan Capistrano; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Boston Scientific Technology, Inc., Maple Grove, Minn.

Continuation of Ser. No. 78,403, Jun. 17, 1993, abandoned, which is a division of Ser. No. 862,847, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Feb. 14, 1995, Ser. No. 390,434

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—193 18 Claims



1. A support structure for supporting and positioning medical equipment with respect to a patient, comprising:
- a support plate for positioning external to the patient, the support plate having a weight bearing area for positioning beneath at least a portion of the patient so that the patient's weight rests on the weight bearing area of the support plate to securely hold the support plate in place;
- a mounting bracket secured to the support plate; and
- a speculum removably secured to the mounting bracket, the speculum comprising an elongate plate having a proximal end, a distal end, and a longitudinal axis extending therebetween, said elongate plate beings curved about the longitudinal axis to produce a concave upward configuration, at least the distal end of the elongate plate being in alignment with at least a portion of the support plate along a vertical axis, the distal end of the elongate plate also being angled downwardly in the direction of the support plate, wherein the speculum is adapted for insertion into the patient transvaginally for use in a medical procedure.

5,746,764

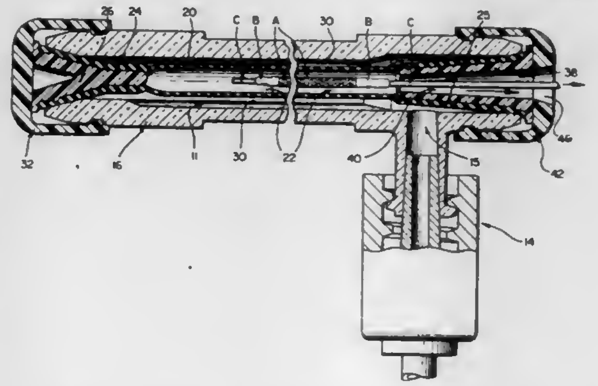
STENT COMPRESSION INSTRUMENT

Nicholas A. Green, Kinnelon, N.J., and Fred E. Williams, Jr., Arab, Ala., assignors to Atrion Medical Products, Inc., Arab, Ala., and Cordis Corporation, Miami, Fla., a part interest

Continuation of Ser. No. 567,136, Dec. 4, 1995, abandoned. This application Nov. 12, 1996, Ser. No. 745,317

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—194 22 Claims



1. A fluid compression instrument for particular use in presurgically conforming and securing a vascular stent upon an angioplasty balloon comprising:
- a) a housing for containing a pressurized medium;
- b) an elastic enclosing diaphragm having an internal cavity and opening therein and arranged to receive a vascular stent and an angioplasty balloon inserted within said internal cavity, said elastic enclosing diaphragm being mounted within said housing; and
- c) pressure chamber structure provided by said housing and arranged as an envelope about said elastic enclosing diaphragm for enabling containment of pressurized forces imposed upon an outer surface of said elastic enclosing diaphragm to be transmitted through said elastic enclosing diaphragm and circumferentially applied against the inserted vascular stent in order uniformly to compress the vascular stent into secured purchase against the angioplasty balloon.

5,746,765

STENT AND METHOD AND APPARATUS FOR FORMING AND DELIVERING THE SAME

Stephen J. Kleshinski, Scituate; Morris A. Simon, Boston, and Dmitry Rabkin, Brookline, all of Mass., assignors to Nitinol Medical Technologies, Inc., Boston, Mass.

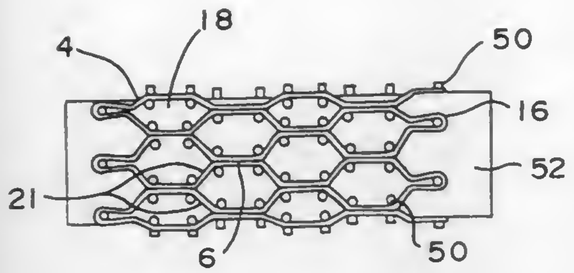
Division of Ser. No. 252,198, Jun. 1, 1994, Pat. No. 5,540,712, which is a continuation-in-part of Ser. No. 167,661, Dec. 16, 1993, Pat. No. 5,395,390, which is a continuation of Ser. No. 878,184, May 1, 1992, Pat. No. 5,354,308. This application May 17, 1996, Ser. No. 649,289

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—198 5 Claims

1. A method for forming a stent from an elongate strand of a metallic thermal shape memory material having a longitudinal axis, said material including martensite variants and/or a metallic grain structure, said method including the steps of:
- magnetically orienting said martensite variants at an angle to the longitudinal axis of said elongate strand;
- forming a plurality of open cells from said elongate strand by placing said elongate strand on a cell forming mandrel to form

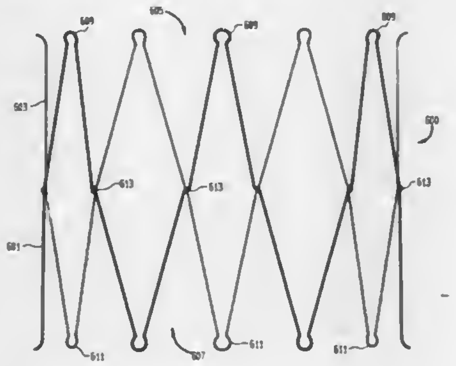
OL
2 10
SS
1
MY
5
998
MI



said open cells and, subsequently joining said open cells by welding on said mandrel.

5,746,766
SURGICAL STENT

John K. Edoga, 10 Franklin Pl., Morristown, N.J. 07960
Continuation of Ser. No. 437,502, May 9, 1995, abandoned. This application Apr. 2, 1997, Ser. No. 831,832
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 606—198 **7 Claims**

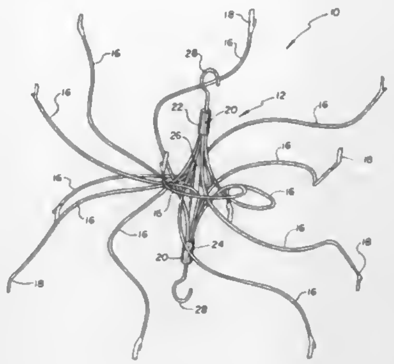


1. A self-actuating stent comprising
- a first and second wire, said first wire zigzagging to define a generally closed cylindrical boundary having first and second open ends, said first wire extending from said first open end to said second end,
- said second wire zigzagging to define same said generally closed cylindrical boundary, said second wire extending from said first open end to said second end,
- said zigzagging first and second wires having apexes, said apexes being located at said first and second open ends,
- said first wire joining said second wire at a plurality of points between said open ends, and
- at said points, said first wire includes a loop for accepting said second wire, said loop being unitary with said first wire.

5,746,767
REMOVABLE THROMBUS FILTER

Scott R. Smith, Chaska, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 328,629, Oct. 25, 1994, Pat. No. 5,601,595. This application Feb. 7, 1997, Ser. No. 797,092
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 606—200 **18 Claims**

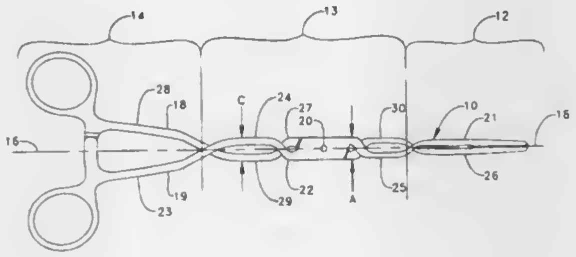
1. A thrombus filter for placement within a blood vessel lumen, having a longitudinal axis, the filter comprising:
- first and second units,
- a first wire having two ends, the first wire extending from said first unit in a first direction to one of the ends,



- a second wire having two ends, the second wire extending from said second unit in a second direction to one of the ends opposite to said first direction; and
- means for detachably coupling said first an second wires.

5,746,768
SCISSOR ACTION LOW PROFILE SURGICAL HAND INSTRUMENT

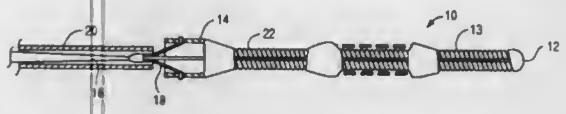
Ralph Lewis, Basking Ridge, N.J., and Troy Hershberger, Warsaw, Ind., assignors to Biomet, Inc., Warsaw, Ind.
Filed Jan. 25, 1996, Ser. No. 591,150
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—205 **14 Claims**



1. A scissor action low profile surgical hand instrument comprising:
- a first member formed from a single piece of a surgical metallic alloy into a first handle portion separated from a first surgical tip portion by a first middle portion;
- a second member formed from a single piece of a surgical metallic alloy into a second handle portion separated from a second surgical tip portion by a second middle portion;
- said first middle portion being pivotably attached to said second middle portion at a pivot point;
- a centerline passing through said pivot point separates said first handle portion from said second handle portion and said first surgical tip portion from said second surgical tip portion;
- said first middle portion including a first switchback segment positioned at least partially on an opposite side of said centerline from one of either said first handle portion or said first surgical tip portion;
- said second middle portion including a second switchback segment positioned at least partially on an opposite side of said centerline from one of either said second handle portion or said second surgical tip portion at a location adjacent said first switchback segment of said first middle portion; and
- whereby said first member is pivotable with respect to said second member from a closed position toward a spread position independently of said first switchback segment and said second switchback segment.

5,746,769
ENDOLUMINAL COIL DELIVERY SYSTEM HAVING A MECHANICAL RELEASE MECHANISM

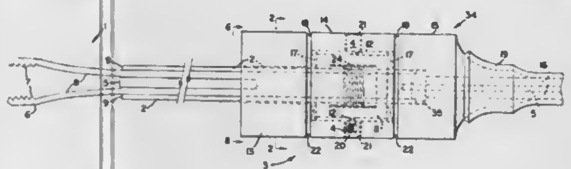
Dai T. Ton, San Jose, and Julian N. Nikolchev, Portola Valley, both of Calif., assignors to Conceptus, Inc., San Carlos, Calif.
Continuation of Ser. No. 525,485, Sep. 8, 1995, Pat. No. 5,601,600. This application Oct. 22, 1996, Ser. No. 735,348
Int. Cl.^{6} A61B *17/28*
U.S. Cl. 606—206 **29 Claims**



1. An endoluminal coil delivery system comprising:
- an endoluminal coil having a proximal end, a distal end, and a lumen extending from the proximal end toward the distal end;
- a first elongate body releasably attached proximal of the coil, wherein rotation of the first elongate body torques the coil;
- a corewire extending distally from the first elongate body, the corewire removably disposed within the lumen of the coil; and
- a second elongate body which articulates relative to the first body to remove the corewire from the lumen of the coil.

5,746,770
ENDOSCOPIC RETRIEVER

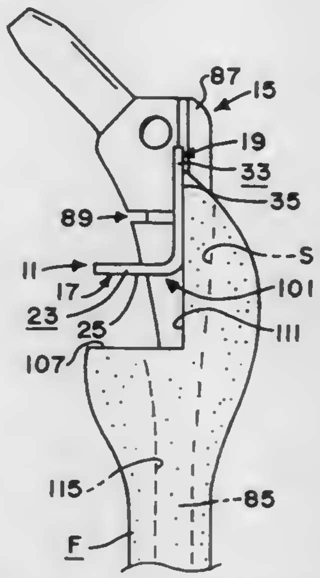
Jerrold Roy Zeitels, 4 Ellsworth Dr., Warren, N.J. 07059, and David Douglas Grewe, 3450 W. 83rd Ave., Westminister, Colo. 80030
Filed Nov. 22, 1995, Ser. No. 535,888
Int. Cl.^{6} A61B *17/28*
U.S. Cl. 606—207 **19 Claims**



1. An endoscopic retriever comprising:
- an endoscope;
- a retriever, said retriever having a pair of opposing grasping arms, said grasping arms comprising a pair of grasping jaws, said grasping arms being positioned around an endoscope;
- at least one illuminating light guide fiber, said at least one light guide fiber travelling at least partly through at least one of said grasping arms, said at least one guide fiber passing perpendicular to a length of at least one of said grasping jaws through at least one of said grasping jaws, terminating in at least one of said grasping jaws at right angles to the plane of one of said grasping jaws;
- a handle, said handle having at least three sections, said three sections being a distal handle section which is integral with said grasping arms, a middle rotatable handle section, and a proximal handle section;
- distal slots positioned in said distal handle section;
- at least two splints, a distal end of said at least two splints surrounding a distal end of said grasping arms, and said at least two splints after passing through said distal slots positioned in said distal handle section having a common threaded circular proximal section, said middle rotatable handle section further comprising means to advance the splints along a length of the grasping arms to reversibly close the grasping jaws as said middle rotatable handle rotates about a longitudinal axis of said at least two splints, said means of said middle rotatable handle section being in communication with said common threaded circular proximal section of said at least two splints to reversibly advance said splints along said length of said graspings arms:
- and wherein said endoscope is positioned between said grasping arms, such that illuminating light passes angularly from a plane of at least one of said grasping jaws.

5,746,771
CALCAR COLLAR INSTRUMENTATION

Lemuel Vance Clement, Jr.; Joseph S. Clift, Jr., both of Memphis, and Rodney L. Houfburg, Cordova, all of Tenn., assignors to Wright Medical Technology, Inc., Arlington, Tenn.
Filed Sep. 30, 1996, Ser. No. 723,992
Int. Cl.^{6} A61F *2/28*
U.S. Cl. 623—16 **9 Claims**

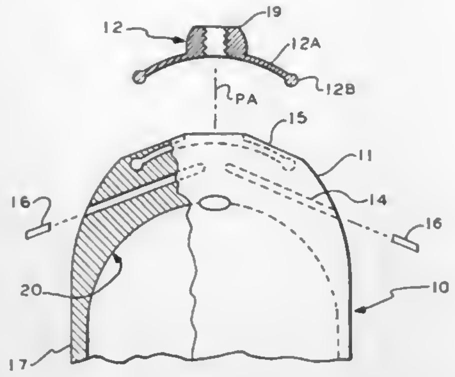


1. A calcar collar for a proximal femoral stem having a first end and a second end; the calcar collar comprising:
- (a) a foot including a foot member having a face surface;
- (b) a back attached to the foot and including a back member having a face surface arranged at an angle to the face surface of the foot member; and
- (c) attachment means for removably and adjustably attaching the foot and the back to the proximal femoral stem and for allowing the level of the face surface of the foot member to be varied between at least a first level located a first distance from the first end of the proximal femoral stem and a second level located a second distance from the first end of the proximal femoral stem.

5,746,772
PROSTHETIC SOCKET

Gilbert R. Jacobs, Landing, N.J., assignor to Ja-Bar Silicone Corp., Andover, N.J., and Ortho Europe Ltd., Oxon, United Kingdom
Filed Jan. 13, 1997, Ser. No. 782,123
Int. Cl.^{6} A61F *2/80*
U.S. Cl. 623—35 **24 Claims**

1. A prosthetic socket adapted to support a prosthesis and adapted to be worn on a stump of a partially amputated limb, comprising:
- a coupler for holding said prosthesis along a prosthetic axis;
- a cup having an inside surface an d an outside surface, said inside surface being adapted to fit on said stump, said coupler being centrally attached to said cup to face outwardly from said outside surface, said cup containing a separated plurality of contractible cavities distributed around said prosthetic axis between said inside surface and said outside surface to pro-



vide cushioning by allowing deflection of said cup into said cavities along said prosthetic axis to contract said cavities.

5,746,773

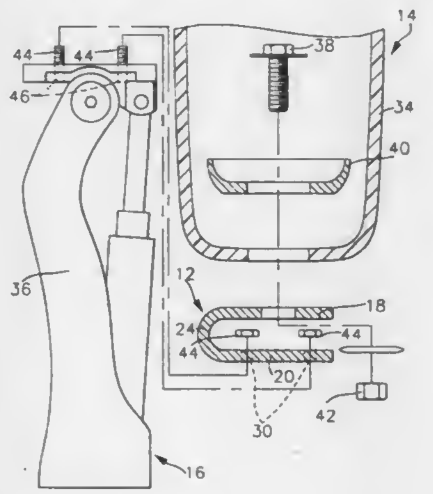
C-SHAPED SPRING MEMBER FOR PROSTHETIC LIMBS

David H. Littig, Ventura, Calif., assignor to United States Manufacturing Company, Pasadena, Calif.

Filed Mar. 13, 1996, Ser. No. 615,026

Int. Cl.^{6} A61F *2/62;2/66*

U.S. Cl. 623—35 **4 Claims**



1. An above-knee prosthesis comprising:
a prosthetic thigh component;
a prosthetic knee component; and
a modular composite generally C-shaped spring member formed from a plurality of synthetic resin-impregnated high strength filament sheets molded together as a one-piece unit, the C-shaped member being normally rigid in a rest position maintaining its C-shaped configuration, the C-shaped member having spaced apart upper and lower legs that elastically flex with energy absorbing compliance under a load tending to move the upper and lower legs together, while the C-shaped member essentially resists elastic flexion in lateral directions, the spring member including means for being rigidly secured between the thigh component and the knee component along a weight-bearing axis of the above knee prosthesis for simulating flexion between the thigh component and the knee component and providing a main weight-bearing compliance for the prosthesis in which the securing means includes a pattern of holes extending through the upper and lower legs of the spring member and releasable fastening means engaged with the pattern of holes for providing alignment movement of the C-shaped member fore and aft of the weight-bearing axis.

5,746,774

KNEE JOINT MECHANISM FOR KNEE DISARTICULATION PROSTHESIS

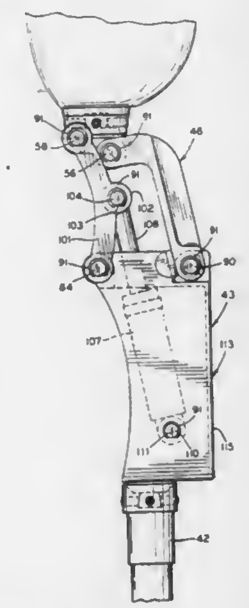
Steven Kramer, Perrysburg; Sujatha Srinivasan, Mount Sterling, and Verner Swanson, Toledo, all of Ohio, assignors to The University of Toledo, Toledo, Ohio

Continuation of Ser. No. 303,502, Sep. 9, 1994, abandoned.

This application Jan. 16, 1996, Ser. No. 587,129

Int. Cl.^{6} A61F *2/64*

U.S. Cl. 623—39 **24 Claims**



1. In a knee joint for knee disarticulation prosthesis rotatable between flexed and extended positions, and comprising a four bar linkage consisting of a thigh link and a shin link pivotally connected to an anterior link and a posterior link to define a four bar linkage, the improvement comprising:
(a) the thigh link forming a negative angle with respect to a horizontal plane when the knee joint is in an extended position;
(b) the shin link being positioned substantially along the horizontal plane when the knee joint is in the extended position,
the length of said shin link and said anterior link and posterior link, as well as the angle which the thigh link forms with respect to the horizontal plane, are selected to maximize a height, Y_{IC}, of an instant center of the knee joint for knee disarticulation prosthesis above the shin link at 90° flexion according to the equation:

$$Y_{IC}=\frac{L_1\tan\theta_2\tan\theta_4}{\tan\theta_4-\tan\theta_2}$$

where L_1 is the length of the shin link, θ_2 is the angle made between the posterior link and the shin link, and θ_4 is the angle made between the anterior link and the shin link.

CHEMICAL

5,746,775

METHOD OF MAKING CALCIFICATION-RESISTANT BIOPROSTHETIC TISSUE

Robert J. Levy, Ann Arbor, Mich., and Danielle Hirsch, Jerusalem, Israel, assignors to The Board of Regent6s of the University of Michigan, Ann Arbor, Mich.

Continuation-In-part of Ser. No. 689,652, Apr. 23, 1991, Pat. No. 5,368,608, which is a continuation-in-part of Ser. No. 515,484, Apr. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 176,789, Apr. 1, 1988, Pat. No. 5,094,661.

This application Oct. 21, 1993, Ser. No. 140,722

Int. Cl.^{6} A61F *2/02;2/24;* **D01C** *3/00*

U.S. Cl. 8—94.11 **32 Claims**

1. A method of treating a biomaterial, the method comprising the steps of:
(1) forming a liquid treatment solution consisting essentially of greater than 50% by volume of a water-soluble C1–C3 aliphatic alcohol in an aqueous buffer of a pH between 6.0 and 8.0;
(2) exposing the biomaterial, wherein the biomaterial is a collagenous material derived from a mammalian species selected from the group consisting of bovine pericardium, porcine aortic heart valves, saphenous bypass grafts, aortic homografts, and dura mater, to the liquid treatment solution for a period of time sufficient to render the biomaterial resistant to calcification; and
(3) rinsing the exposed biomaterial with a rinsing solution.

5,746,776

DRY-CLEANING KIT FOR IN-DRYER USE

James A. Smith, Chatham, Mass., and George W. Kellett, Cranford, N.J., assignors to Creative Products Resource, Inc., North Caldwell, N.J.

Continuation of Ser. No. 463,493, Jun. 5, 1995, abandoned.

This application Aug. 20, 1996, Ser. No. 700,119

Int. Cl.^{6} D06L *1/00;1/02;* **C11D** *17/00*

U.S. Cl. 8—142 **25 Claims**

1. A bag adapted for containment and cleaning of a soiled fabric article, said bag comprising (a) an opening comprising a fastening system so that the bag can enclose in a vapor impermeable manner a soiled fabric article and (b) at least a portion of the interior surface having an effective amount of a dry-cleaning composition releasably absorbed thereto, wherein the dry-cleaning composition consists essentially of about 40–95% water, about 0.25–8% of a gelling agent, about 2–32% of a water miscible organic solven and about 1–10% surfacant, wherein said bag is formed of a flexible non-porous material which is not substantially damaged upon exposure to agitation and to a temperature effective to cause the release of said dry-cleaning composition from said interior surface.

5,746,777

SCATTERABLE CARPET CLEANING FORMULATIONS

Theo Fleckenstein, Hilden; Alexander Ditze, Remscheid, and Thomas Hahn, Hueckelhoven, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/02288, § 371 Date Jan. 28, 1997, § 102(e) Date Jan. 28, 1997, PCT Pub. No. WO95/35358, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 13, 1995, Ser. No. 765,859

Claims priority, application Germany, Jun. 22, 1994, 44 21 784.6

Int. Cl.^{6} C11D *3/00;7/44;3/382;* **D06L** *1/00*

U.S. Cl. 8—142 **18 Claims**

1. A scatterable dry cleaning formulation for textiles comprising:
A) cellulose powder which is substantially free from lignin and other impurities from plant material;
B) colloidal silicon dioxide in the form of a dilute aqueous preparation with a negative particle charge and charge compensation by sodium ions; and
C) water.

5,746,778

WOOD STAIN CONTAINING A STABILIZING AGENT

Axel Jankewitz, Furth, and Gerhard Lugert, Nürnberg, both of Germany, assignors to A.W. Faber-Castell Unternehmensverwaltung GmbH & Co., Germany

Division of Ser. No. 509,300, Jul. 31, 1995, Pat. No. 5,567,206.

This application May 23, 1996, Ser. No. 652,309

Claims priority, application Germany, Aug. 2, 1994, 44 27 299.5

Int. Cl.^{6} D06P *1/06;3/60;1/44*

U.S. Cl. 8—402 **13 Claims**

1. A wood stain which is water-based and which is suitable for staining wood, comprising:
from about 1–20% of at least one dye substance selected from the group consisting of azo, diazo, and triarylmethane dyes and mixtures thereof;
from about 0.01 to about 5% of at least one wetting agent;
from about 0.1% to about 0.5% of at least one preserving agent; and
from about 1 to about 20% of a stabilizing agent which is effective to reduce free iron ion concentration, which comprises one of (a) at least one buffer effective to maintain pH of the wood stain at greater than 7, (b) at least one complexing agent which forms a complex with iron ions, or (c) a mixture of the at least one buffer and the at least one complexing agent; and
remainder water,
wherein the buffer is selected from the group consisting of acetates and carbonates of ammonium, potassium and sodium; ammonium hydrogen phosphate; secondary and tertiary phosphates of potassium and sodium; and ammonium sodium hydrogen phosphate, and
wherein the complexing agent is selected from the group consisting of diacetyldioxime; 1,10- phenanthroline; terpyridine; water-soluble salts of ethylene-diamine-tetraacetic acid; diethylenetriamine pentaacetic acid; 1,2-cyclohexylinedinitrilotetraacetic acid, and mixtures thereof.

5,746,779

QUATERNIZED BLUE ANTHRAQUINONE HAIR DYES IN AN ISATIN/AMINE DYE SYSTEM

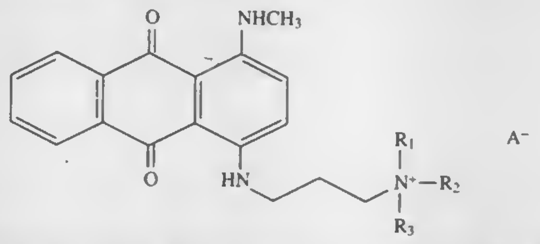
Keith Brown, New Canaan, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jul. 12, 1996, Ser. No. 678,803

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—426 **16 Claims**

5. A composition for dyeing a keratin fiber comprising a tinctorially effective amount of an isatin or isatin derivative/amine reaction product; a tinctorially effective amount of a quaternized blue anthraquinone compound of formula I



I

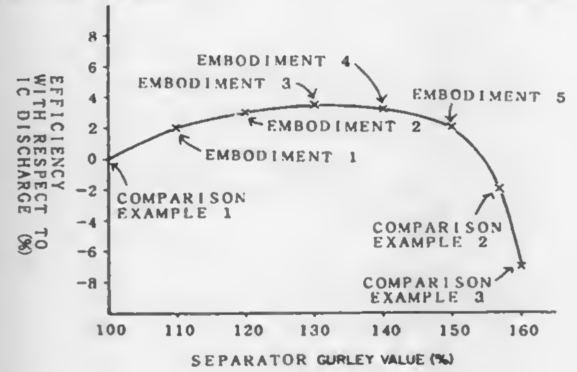
wherein R_1 and R_2 are methyl and R_3 is propyl, or R_1 and R_2 are ethyl and R_3 is methyl, and A^- is a cosmetically acceptable anion; and a cosmetically acceptable vehicle.

5,746,780

METHOD OF MANUFACTURING A BATTERY CONTAINING A NON-CIRCULAR SPIRAL ELECTRODE UNIT

Satoshi Narukawa, Sumoto; Toru Amazutsumi, Tsuna-gun; Hideki Fukuda, and Hiyoshi Tamaki, both of Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 3, 1996, Ser. No. 656,827
Claims priority, application Japan, Jun. 12, 1995, 7-144367
Int. Cl.^{6} H01M *10/04*
U.S. Cl. 29—623.1 **18 Clalms**



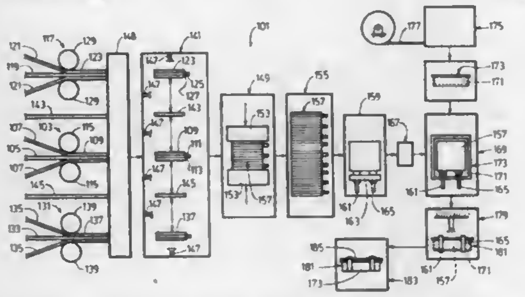
1. A method of manufacturing a battery, the method comprising:
winding a positive electrode plate and a negative electrode plate into a spiral shape to form a cylindrical electrode unit, said positive and negative electrode plates being insulated by a micro-porous polymer film separator disposed between said positive electrode plate and said negative electrode plate;
pressing said cylindrical electrode unit from opposing sides to form a non-circular spiral electrode unit, said cylindrical electrode unit being pressed until a gurley value of said micro-porous polymer film separator becomes 110% to 150% of the gurley value of said micro-porous polymer film separator prior to pressing said cylindrical electrode unit; and
inserting said non-circular spiral electrode unit into an external case to form the battery.

5,746,781

METHOD AND APPARATUS FOR PREPARING ELECTROCHEMICAL CELLS

David A. Velasquez, Fairfield, Calif.; Douglas B. Holmes, Lexington, and E. Lawrence Gogolin, Sudbury, both of Mass., assignors to Valence Technology, Inc., Henderson, Nev.

Continuation-in-part of Ser. No. 603,894, Feb. 22, 1996, Pat. No. 5,670,273. This application Apr. 12, 1996, Ser. No. 630,983
Int. Cl.^{6} B25P *19/00*
U.S. Cl. 29—730 **15 Claims**



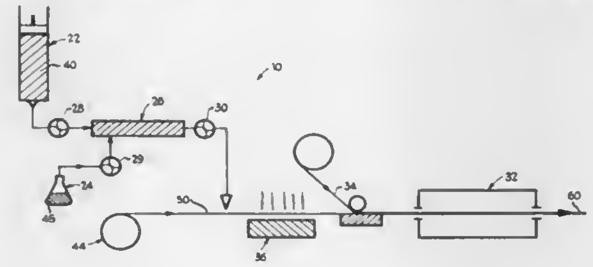
1. An apparatus for preparing an electrochemical cell, comprising:
a first laminating station that includes means for laminating an anode current collector to at least one anode material film on at least one side of the anode current collector to form an anode precursor at the first laminating station, the anode current collector including an extending anode tab extending past an edge of the anode material film, and the anode material film including a first polymer, an intercalation carbon material, and a first plasticizer;
a second laminating station that includes means for laminating a cathode current collector to at least one cathode material film on at least one side of the cathode current collector to form a cathode precursor at the second laminating station, the cathode current collector including an extending cathode tab extending past an edge of the cathode material film, and the cathode material film including a second polymer, a cathode active material, and a second plasticizer;
an assembling station that includes means for interposing a polymeric layer including a third plasticizer between the anode precursor and the cathode precursor at the assembling station such that the polymeric layer prevents direct contact between the anode current collector and the cathode current collector;
a fusion station that includes means for fusing the polymeric layer to the anode precursor and the cathode precursor at the fusion station to form a bicell battery;
a stacking station that includes means for stacking a plurality of bicell batteries on top of one another at the stacking station to form a stack;
a welding station that includes means for welding a plurality of anode tabs of the stack to one another and to a conductive anode lead, and means for welding a plurality of cathode tabs of the stack to one another and to a conductive cathode lead at the welding station;
an extraction station, downstream from the welding station, that includes means for extracting the first, second, and third plasticizers from the stack at the extraction station;
an installation station, downstream from the extraction station, that includes a stack receptacle which defines a recess that accommodates the stack such that at least portions of the anode lead and the cathode lead extend beyond an outer periphery of the stack receptacle;
a filling station that includes a source of an electrolyte solution including an electrolyte solvent and an inorganic salt to be filled into the receptacle and into the anode precursor, the cathode precursor, and the polymeric layer at the filling station; and
a closing station that includes means for sealing the recess in the stack receptacle such that the portions of the anode lead and the cathode lead are disposed outside of an outer periphery of the closed stack receptacle.

5,746,782

ELECTRODE PASTE APPLICATOR APPARATUS

Arthur A. Massucco, Natick; Denis G. Fauteux, Acton, and Martin Van Buren, Chelmsford, all of Mass., assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 451,911, Sep. 26, 1995. This application Jul. 8, 1996, Ser. No. 679,442
Int. Cl.^{6} H01M *10/06*
U.S. Cl. 29—730 **6 Claims**



1. An apparatus for applying an electrode paste on a substrate to be used in an electrolytic cell, the apparatus comprising:
means for releasably supporting an electrode paste;
means for releasably retaining a polymerization initiator;
means for mixing a regulated amount of electrode paste and polymerization initiator, which has been operatively released from the electrode paste supporting means and the polymerization initiator retaining means, respectively, toward eventual release and application onto the substrate;
means, operatively associated with the mixing means, for precluding polymerization of the electrode paste prior to the application of the mixed polymerization initiator and electrode paste onto the substrate;
means for releasably supporting an electrolyte;
means for releasably retaining an electrolyte polymerization initiator;
means for combining an amount of the electrolyte and electrolyte polymerization initiator, which has been operatively released from the electrolyte supporting means and the electrolyte polymerization initiator retaining means, respectively, toward eventual release and application onto the electrode paste which has been applied onto the substrate; and
means, operatively associated with the combining means, for precluding polymerization of the electrolyte prior to the release and application of the combined electrolyte and electrolyte polymerization initiator onto the electrode paste on the substrate.

5,746,783

LOW EMISSIONS DIESEL FUEL

Alicia L. Compere, Knoxville; William L. Griffith, Oak Ridge; George F. Dorsey, Farragut, and Brian H. West, Kingston, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Continuation of Ser. No. 220,144, Mar. 30, 1994, abandoned. This application Nov. 8, 1995, Ser. No. 555,348
Int. Cl.^{6} C01L *1/32*
U.S. Cl. 44—301 **21 Claims**

1. A fuel composition comprising:
a microemulsion containing a middle distillate base constituent and an additive constituent selected from the group consisting of urea, a urea-based compound, and a triazine compound in an amount sufficient to effect a reduction in NO_x emissions from combustion.

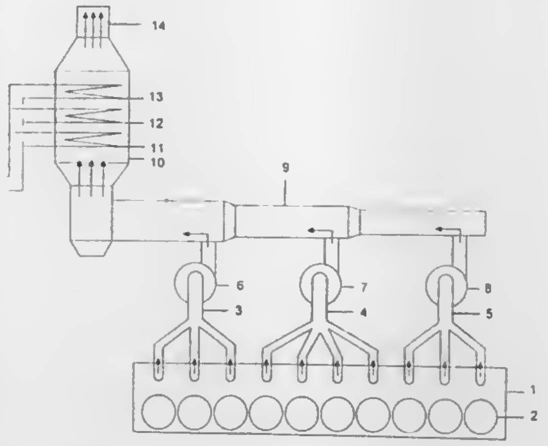
5,746,784

USE OF FERROCENE

Walter Thünker, Bottrop; Gabriele Lohmann, Lünen; Arnim Marschewski, Gelsenkirchen, all of Germany; Tage Nielsen, Espergaerde, and Christian Lützen, Ballerup, both of Denmark, assignors to Chemische Betriebe Pluto GmbH, Herne, Germany; A/S Dampskibsselskabet Svendborg, and Dampskibsselskabet AF 1912 A/S, both of Copenhagen, Denmark

Continuation of Ser. No. 525,551, Sep. 19, 1995, abandoned. This application Apr. 14, 1997, Ser. No. 837,082
Claims priority, application Germany, Mar. 20, 1993, 43 09 066.4
Int. Cl.^{6} C10L *1/23;* **F02B** *75/12*
U.S. Cl. 44—361 **4 Claims**

1. A process for reducing carbonaceous deposits resulting from the combustion of heavy residual fuel oil in a low-speed, high-compression, spontaneous-ignition internal combustion engine having a speed of 900 to 50 revolutions per minute, which comprises adding at least one additive selected from the group consisting of ferrocene, ethyl ferrocene, butyl ferrocene and 2,2-bis-ethyl ferrocenyl propane to a heavy fuel oil having a density of 0.9 to 1.01 kg/dm^3, the heavy fuel oil being a heavy residual fuel oil, in an amount of 1 to 100 ppm prior to combustion of the residual fuel oil and combusting the residual fuel oil containing the at least one additive in the low-speed, high-compression, spontaneous-ignition internal combustion engine having the speed of 900 to 50 revolutions per minute.



5,746,785

DIESEL FUEL HAVING IMPROVED QUALITIES AND METHOD OF FORMING

David S. Moulton, Hondo, and David W. Naegeli, San Antonio, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jul. 7, 1997, Ser. No. 888,991
Int. Cl.^{6} C10L *1/18*
U.S. Cl. 44—443 **9 Claims**

1. A method for forming an improved diesel fuel comprising:
providing a mixture of alkoxy-terminated poly-oxymethylenes having a molecular weight of from about 80 to about 350;
mixing said mixture of alkoxy-terminated poly-oxymethylenes with diesel fuel in a ratio, by volume, of 1 part mixed alkoxy-terminated poly- oxymethylenes with from about 2 to about 5 parts diesel fuel; and
separating said mixed alkoxy-terminated poly-oxymthylenes and diesel fuel into a first phase containing diesel fuel and said mixed alkbxy-terminated poly-oxymethylenes, and a second phase containing insoluble reaction products from the synthesis of said mixed alkoxy-terminated poly-oxymethylenes and gums extracted from said diesel fuel.

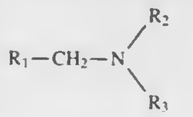
5,746,786

POLY-1-N-ALKENYLAMINES, AND FUEL AND LUBRICANT COMPOSITIONS CONTAINING THEM

Hans-Joachim Mueller, Gruenstadt; Bernd Lothar Marczinke, Speyer; Roger Klimesch, Alsbach-Haehnlein; Michael Roeper, Wachenheim; Lothar Franz, Mutterstadt; Peter Schreyer, Weinheim; Juergen Thomas, Fussgoenheim; Juergen Mohr, Gruenstadt; Knut Oppenlaender, Ludwigshafen, and Wolfgang Guenther, Mettenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/01113, § 371 Date Oct. 23, 1995, § 102(e) Date Oct. 23, 1995, PCT Pub. No. WO94/24231, PCT Pub. Date Oct. 27, 1994
PCT Filed Apr. 11, 1994, Ser. No. 532,810
Claims priority, application Germany, Apr. 22, 1993, 43 13 088.7
Int. Cl.^{6} C10L *1/22*
U.S. Cl. 44—412 **19 Claims**

1. A composition, which comprises a fuel and at least one poly-1-n-alkenylamine of the formula I



$$R_1-CH_2-N\begin{matrix} R_2 \\ R_3 \end{matrix} \qquad \text{I}$$

where R_1 is a poly-1-n-alkene radical derived from one or more 1-n-alkenes of 3–6 carbon atoms and 0–50% by weight of ethene and

R_2 and R_3 may be identical or different and are each hydrogen, hydroxyalkyl, aliphatic or aromatic hydrocarbons, primary or secondary, aromatic or aliphatic aminoalkylene radicals or polyaminoalkylene radicals, polyoxyalkylene radicals, heteroaryl or heterocyclyl radicals, or together with the nitrogen atom to which they are bonded, form a ring in which further hetero atoms may be present, wherein the poly-1-alkenylamine is obtained by a process comprising

a) polymerization of 1 -n-alkene in the presence of a metallocene catalyst of the formula V

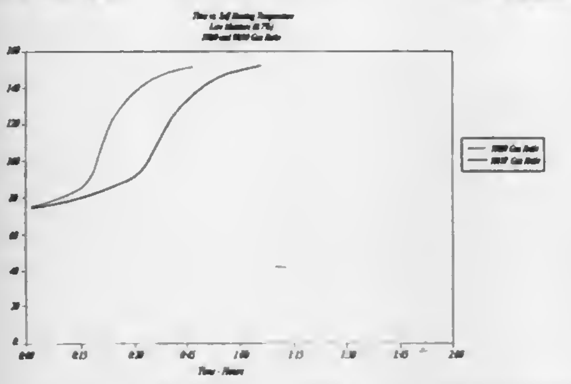
$$Cp_mMX_nY_r \quad V$$

where Cp is an unsubstituted or substituted cyclopentadiene ring, M is a transition metal of group 4 b, X is hydrogen or C_1–C_6-alkyl, Y is halogen, m is 1–3, n is 0–3, r is 0–3 and m+n+r correspond to the valency of M;

b) subsequent hydroformylation of the poly-1-n-alkene; and

c) amination of the reaction product from reaction step b) under hydrogenating conditions.

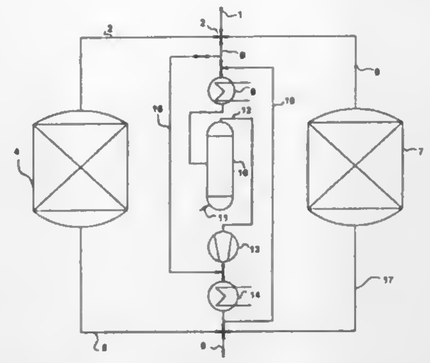
5,746,787
PROCESS FOR TREATING CARBONACEOUS MATERIALS
Edward Koppelman, Encino, Calif., assignor to KFx Inc., Denver, Colo.
Filed Oct. 28, 1996, Ser. No. 738,524
Int. Cl.⁶ C10L *9/00*
U.S. Cl. 44—621 **18 Claims**



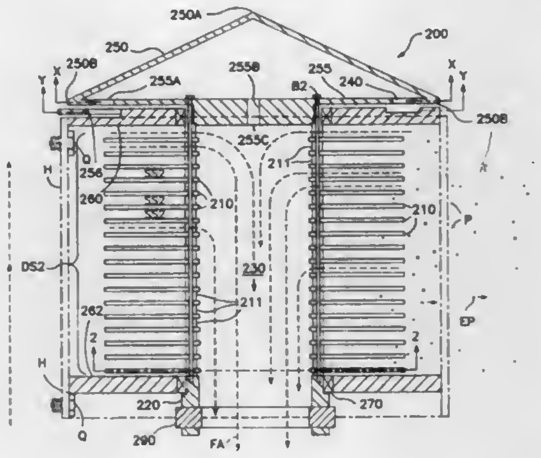
1. A process for treating moist carbonaceous material to render the material resistant to undesired combustion, comprising the steps of: preheating the carbonaceous material to convert the moisture contained therein into superheated steam; and then applying a gaseous mixture to the preheated carbonaceous material for up to about thirty minutes, said gaseous mixture comprising a major amount of inert gas and a minor amount of oxygen.

5,746,788
PROCESS FOR THE SIMULTANEOUS SORPTION OF WATER AND ORGANIC COMPOUNDS
Torsten Schmidt, and Michael Hoffmeister, both of Hanover, Germany, assignors to Engelhard Process Chemicals GmbH, Iselin, N.J.
PCT No. PCT/EP94/03729, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/13857, PCT Pub. Date May 26, 1995
PCT Filed Nov. 11, 1994, Ser. No. 633,752
Claims priority, application Germany, Nov. 19, 1993, 43 39 500.7
Int. Cl.⁶ B01D *53/02*
U.S. Cl. 48—198.2 **16 Claims**

1. A process for the simultaneous sorption of water and organic compounds from process gases of maleic acid anhydride synthesis, terephthalic acid anhydride synthesis or phthalic acid anhydride synthesis, wherein the gas is contacted with a sorbent comprising particulate activated carbon in an oxidic carrier, wherein said carrier has been made from a gel.



5,746,789
APPARATUS FOR SEPARATING PARTICULATES FROM A FLUID STREAM
Steve Robin Wright, Hillsborough, and Harry Steven Crouch, Chapel Hill, both of N.C., assignors to Innovatech, Inc., Durham, N.C.
Filed Nov. 28, 1995, Ser. No. 563,630
Int. Cl.⁶ B01D *45/14*
U.S. Cl. 55—306 **17 Claims**



1. A radial inflow centrifugal filter device for separating particulates from a flow of fluid, comprising:

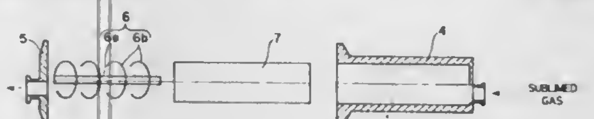
(a) a rotatable plurality of disks having an inlet end and an exit end, and each disk having a hollow center and a perimeter and two sides, the centers defining an interior hollow plenum that is continuous and of uniform diameter, and the disks being mounted to spacers in spaced apart parallel relationship defining spaces between the disks and wherein the hollow plenum communicates with the spaces between the disks;

(b) an end cap attached at the disk inlet end; and

(c) a hollow rotatable tube attached at the exit end and in communication with the hollow plenum of the disks to provide, during operation of said filter device, clean filtered fluid passage via a lower pressure existing in the hollow plenum than in the spaces between the disks due to the communication through the hollow tube to the hollow plenum of the disks such that rotating the hollow tube and the disks while a flow of particulate laden fluid is introduced to the inlet end of the disks from outside the disks produces a sufficient boundary layer of fluid on each of the two sides of each disk wherein the boundary layer of fluid on the side of a disk touches or overlaps with the adjacent boundary layer of fluid on the side of the adjacent disk, and the boundary layers of fluid impart angular momentum to particulates entrapped in the fluid flow,

thereby preventing their entering the spaces between the disks, so that clean filtered fluid passes through the plenum and out the exit end and the particulates are ejected and pass outside the perimeters of the disks.

5,746,790
TRAP FOR COLLECTING SOLID
Yasuhiro Niimura, Ayase; Tetsuma Ikegami, Kawasaki; Naoya Hanafusa, Yokohama, and Masaru Nakaniwa, Ebina, all of Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Aug. 13, 1996, Ser. No. 696,228
Claims priority, application Japan, Aug. 14, 1995, 7-228515
Int. Cl.⁶ B01D *45/16;45/18*
U.S. Cl. 55—317 **7 Claims**



1. A trap for collecting solid separated from a sublimed gas, comprising:

a casing;

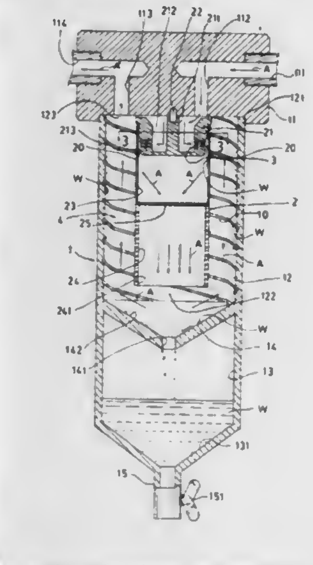
a passage defining member removably disposed in said casing and defining a gas passage in said casing; and

an intermediate member disposed between said casing and said passage defining member, said intermediate member being made of a flat thin sheet which is formed into a tubular member;

wherein said tubular member has a tendency to spread when taken out from said casing,

wherein said passage defining member is removable from the casing together with said tubular member and is subsequently separable therefrom by spreading said tubular member for cleaning each of said passage defining member and said tubular member separately.

5,746,791
MOISTURE AND CONTAMINANT SEPARATOR FOR COMPRESSED AIR
Chun-Wen Wang, P. O. Box 55-846, Taipei, Taiwan
Filed Feb. 3, 1997, Ser. No. 794,640
Int. Cl.⁶ B01D *59/50;51/00*
U.S. Cl. 55—337 **1 Claim**



1. A moisture and contaminant separator for compressed air comprising:

an outer cylinder for directing a compressed air stream into said outer cylinder for removing water and contaminants laden in the compressed air in said outer cylinder and for discharging dry clean compressed air outwardly through said outer cylinder;

an inner cylinder secured within said outer cylinder for passing the compressed air stream therein to impact, mix and coagulate water mists and dirts as laden in the compressed air in said inner cylinder to be water drops or stream to be drained and collected into a bottom of said outer cylinder;

said outer cylinder including: a head portion an upper mist accumulator secured under the head portion, a lower water collector formed on a lower portion of the upper mist accumulator having a bottom cone portion of the collector, a conical baffle formed between the upper mist accumulator and the lower water collector, and a discharge pipe connected to a bottom of the lower water collector having a valve formed in the discharge pipe for discharging water collected in the lower water collector;

said head portion including: an inlet adapter connected to an compressed air source for leading compressed air stream into an inlet port communicated with the inlet adapter and the inner cylinder; an outlet adapter connected with a compressed air pipe for delivering dry clean compressed air outwardly, with an outlet port communicated with the outlet adapter and with the outer cylinder;

said upper mist accumulator including: an upper portion secured with the head portion at least a helical groove helically recessed in an inside wall of the upper mist accumulator from the upper portion to a bottom portion adjacent to the conical baffle for draining water as collected through the helical groove, a conical portion tapered downwardly from the conical baffle and a central hole formed in the central portion of the baffle, said baffle draining the water into the lower water collector having a discharge pipe for discharging water from the collector;

said inner cylinder including: an impinging condenser secured on a top portion of an upper cylinder portion of said inner cylinder and fixed to the head portion of the outer cylinder, a lower cylinder portion formed on a lower portion of the upper cylinder portion having a bottom hole formed in the bottom of the lower cylinder portion to communicate with the upper mist accumulator, a screen formed between the upper cylinder portion and the lower cylinder portion for filtering contaminants laden in a compressed air stream flowing from the upper cylinder portion to the lower cylinder portion and an annular gap defined between a cylindrical wall of the condenser and an inside wall of the upper cylinder portion to allow the compressed air stream flowing through a plurality of air passages formed through the cylindrical wall of the impinging condenser to impact with one another in the annular gap between the condenser and the upper cylinder portion for coagulating the water mists and contaminants downwardly along the inside wall of the upper and lower cylinder portions to be drained downwardly into the lower water collector in the outer cylinder; the improvement which comprises:

said impinging condenser including: a central stem secured to a bottom of the head portion of the outer cylinder, an intermediate chamber concentrically formed in the condenser and confined between the cylindrical wall and the central stem to communicate with the inlet port of the head portion, a plurality of leftward oriented air passages volutely leftwardly formed through the cylindrical wall for radially directing a plurality of compressed air streams leftwardly from the intermediate chamber, and a plurality of rightward oriented air passages volutely rightwardly formed through the cylindrical wall for radially directing a plurality of compressed air streams rightwardly from the intermediate chamber, with the mists and dirts laden in the compressed air streams operatively impacting, mixing, coagulating and condensing with one another in the annular gap between the impinging condenser and the upper cylinder portion of the inner cylinder to be water drops containing dirts to be gravitationally drained into the lower water collector.

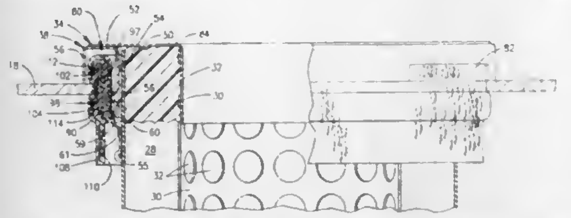
5,746,792
DUST COLLECTOR FILTER ELEMENT AND SUPPORTING STRUCTURE

Jack T. Clements, Lee's Summit, Mo.; Anthony J. Thill, Prairie Village, and Ronald L. Mahoney, Fairway, both of Kans., assignors to BHA Group Holdings, Inc., Kansas City, Mo.

Filed Oct. 25, 1996, Ser. No. 738,098

Int. Cl.^{6} B01D *29/17*

U.S. Cl. 55—341.1 **11 Claims**



1. A filter device, for use in a baghouse particulate collector having a tube sheet with a plurality of apertures therein, said filter device comprising:
a core;
a filter media positioned about said core;
an upper end cap positioned at an upper end of said core and having an annular rim extending over the top of said filter media;
an annular collar having a downwardly depending annular barrel, said barrel having an upper and a lower outwardly protruding rim, said upper end cap being secured to said annular collar;
a flexible, annular snap band assembly biased radially outwardly and having an inner face and outer face, said outer face having upper and lower outwardly protruding portions separated by an annular groove, wherein said annular groove sealingly receives a peripheral edge of one of said tube sheet apertures, and wherein said barrel of said collar is positioned into said annular snap band assembly such that said upper and lower outwardly protruding rims of said barrel engage said inner face of said snap band assembly, said upper outwardly protruding rim engaging said inner face at a location slightly beneath a plane of said tube sheet.

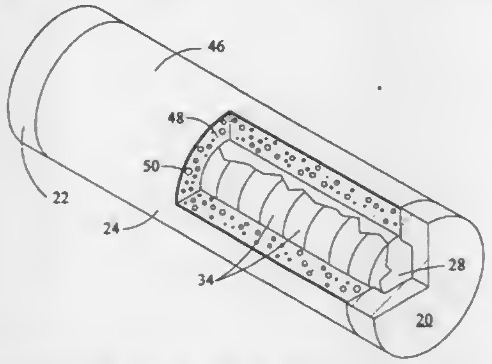
5,746,793
REINFORCED CERAMIC AIR BAG FILTERS

Linda M. Rink, Liberty; Guy R. Letendre, Ogden, both of Utah; Alexander Teverovsky, Concord, Mass., and George C. Marjanski, Riverdale, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jan. 16, 1996, Ser. No. 586,044

Int. Cl.^{6} B01D *39/20*

U.S. Cl. 55—385.3 **19 Claims**



1. A unitary filter for use with an inflator, comprising:
a monolithic, reticulated, porous body constructed and arranged for use as a filter for gasses produced by a pyrotechnic inflator, said body including:
a first layer formed of a porous ceramic, and;
a second layer formed of an agglomeration of metal particles secured to each other and to said first layer, said second layer reinforcing said first layer and providing additional filtration.

5,746,794
FILTER FOR THE AIR IN THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE

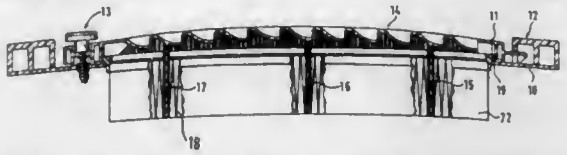
Hans-Peter Hamm, Ludwigsburg, and Klaus Moessinger, Obersulm, both of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Feb. 13, 1996, Ser. No. 600,827

Claims priority, application Germany, Feb. 18, 1995, 195 05 583.7

Int. Cl.^{6} B01D *46/52*

U.S. Cl. 55—385.3 **12 Claims**



1. A filter for filtering the air for a vehicle interior, comprising a filter housing comprising a clean-air-side basic body, a filter insert comprising an accordion-folded filter element, and an unfiltered-air-side cover, said filter insert being arranged between the clean-air-side basic body and the unfiltered-air-side cover, said cover comprising a plurality of holder prongs which engage in respective pockets of the accordion-folded filter element, and wherein said filter element is held by prongs extending from only the unfiltered-air-side of the filter.

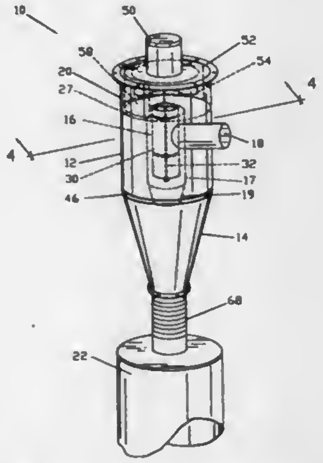
5,746,795
REPLACEABLE, SELF-CLEANING CARTRIDGE FOR A CYCLONIC AIR CLEANING DEVICE

Robert Witter, 150 Robineau Rd., Syracuse, N.Y. 13207

Filed Dec. 18, 1995, Ser. No. 574,305

Int. Cl.^{6} B01D *45/12*

U.S. Cl. 55—472 **25 Claims**



1. A cyclonic air cleaning device comprising:
a) a barrel portion having an inlet and an outlet, a first longitudinal axis extending centrally therethrough, and a top end substantially closed by a flange having a centrally positioned aperture formed therethrough, and an at least partially open bottom end defined by a continuous sidewall having a predetermined peripheral dimension;
b) a blower means;
c) an elongated vortex tube securely attached to and positioned concentrically within said barrel portion, said vortex tube including a first elongated section of a constant, first cross-sectional diameter, and a second portion integrally extending downwardly from said first elongated portion, said second portion tapering from said first cross-sectional diameter to a second cross-sectional diameter smaller than said first cross-sectional diameter;
d) an elongated filter unit substantially concentrically positioned entirely within said first elongated section of said vortex tube, and having a central passage extending longitudinally therethrough, and an open top end and a lower end having a plate positioned in abutting relation thereto, said plate having a centrally positioned aperture extending therethrough;

e) means for holding said filter unit within said barrel, said holding means comprising:
  i) an elongated member having opposite first and second ends and a second longitudinal axis which extends parallel to said first longitudinal axis; and
  ii) means for retaining said elongated member in fixed position with respect to said filter unit.

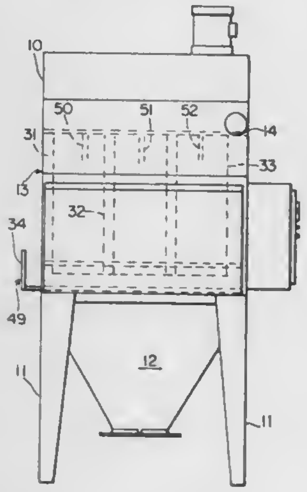
5,746,796
AIR FILTRATION APPARATUS AND FILTER CARTRIDGE RETAINING MEANS THEREFOR

Richard W. Ambs, Williamsport; Mary C. Reiner, Hughesville; Howard E. Stugard, Muncy, and John W. Pfeiffer, Hughesville, all of Pa., assignors to The Young Industries, Inc., Muncy, Pa.

Filed Jan. 22, 1997, Ser. No. 787,585

Int. Cl.^{6} B01D *46/42*

U.S. Cl. 55—493 **30 Claims**



1. A filter apparatus comprising:
a housing defining an air plenum having an inlet and at least one outlet;
a filter member having an outlet, disposable within said air plenum in a preoperative position with said outlet thereof in registry with said housing outlet;
means selectively operable when said filter member is in said preoperative position for displacing said filter member into an operative position with said filter member outlet communicating with said housing outlet and said filter member in sealing engagement with said housing about said housing outlet;
means engageable by said filter member for guiding said filter member when said filter member is displaced from said preoperative position to said operative position; and
means for producing an airflow from said housing inlet and through said filter member and said housing outlet whereby airborne particles entrained in airflow drawn through said housing inlet are caused to be removed by said filter member.

5,746,797
PROCESS FOR PRODUCING A GRADIENT INDEX OPTICAL ELEMENT

Satoshi Noda, Akishima, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

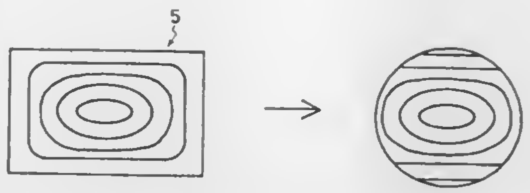
Filed Dec. 29, 1995, Ser. No. 580,884

Claims priority, application Japan, Dec. 29, 1994, 6-340470

Int. Cl.^{6} C03B *8/00;37/016;* **C03C** *15/00;37/018*

U.S. Cl. 65—17.2 **9 Claims**

2. A process for producing a gradient index optical element comprising the step of providing a component capable of creating a refractive index distribution inside a rodlike base material with a concentration distribution inside the rodlike base material, wherein:



said step of providing a component capable of creating a refractive index distribution is effected by subjecting a side of the rodlike base material to a replacement, a leaching or an infiltration of the component to be provided with the concentration distribution,
said step of providing a component being conducted under conditions different from each other between a plurality of zones of a peripheral surface of the rodlike base material.

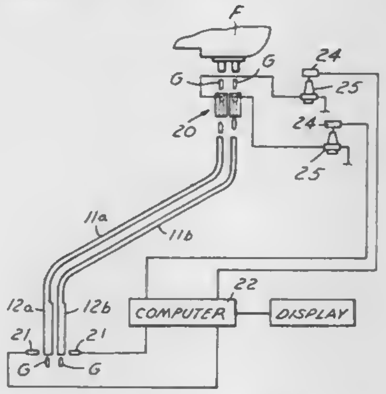
5,746,798
CONTROL OF GLASS GOB DELIVERY FOR SIMULTANEOUS ARRIVAL AT BLANK MOLDS

Andrew B. Menzie, Toledo, Ohio, assignor to Owens-Brockway Glass Container Inc., Toledo, Ohio

Continuation of Ser. No. 331,150, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 92,348, Jul. 16, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 808,272

Int. Cl.^{6} C03B *7/14*

U.S. Cl. 65—29.12 **3 Claims**



1. In manufacture of glass articles wherein a plurality of at least two series of glass gobs are delivered from a corresponding plurality of sources to a corresponding plurality of blank molds in each section of an individual section (IS) glass manufacturing machine by means of a corresponding plurality of predetermined fixed paths to each section of the machine, each of said paths having an upper end at one of said sources and a lower end at one of said blank molds in each machine section, and each of said paths being for delivery of one of said series of glass gobs from its source to one of said blank molds, a method of controlling times of glass gob delivery to the blank molds of each machine section comprising the steps of:
(a) positioning at said upper end of each said path a gob guide having a plurality of angulated jet orifices disposed in a uniformly spaced circumferential array around said path, and coupling each of said gob guides and its array of orifices to an associated variable air supply such that air from each said supply impinges upon and assists force of gravity to accelerate a gob in each said path by an amount that varies with the amount of air delivered from the variable air supply to the gob guide in that path,
(b) positioning a gob sensor at the lower end of each said path to sense time of arrival of a gob to the blank mold at the lower end of each said path,
(c) sensing passage of a gob at said gob sensor at the lower end of one of said paths and determining from such sensed passage a gob arrival time of said one path to the associated blank mold of one machine section, and
(d) automatically and individually adjusting air flow from said variable air supply through said jet orifices at each gob guide in the other of said paths to said one machine section such that

gobs in all of said paths to all of said blank molds in said one machine section, as sensed by associated gob sensors at the lower end of each of said paths, arrive simultaneously at all of said blank molds of said one machine section.

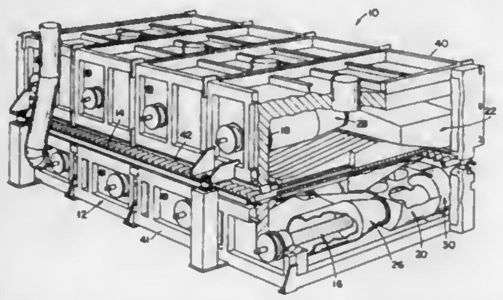
5,746,799
PROCESS FOR HEATING GLASS SHEETS WITHIN A FORCED CONVECTION HEATING APPARATUS BY MIXING AND DISTRIBUTING SPENT WORKING FLUID AND COMBUSTION GASES

Kenneth R. Kormanyos, Sylvania, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 262,310, Jun. 20, 1994, abandoned. This application Dec. 19, 1996, Ser. No. 769,765

Int. Cl.^{6} C03B *25/08*

U.S. Cl. 65—111 **6 Claims**



1. A process for heating a sheet of glass in a forced convection heating apparatus, wherein the apparatus includes a housing having an interior region and the glass sheet has a top and bottom surface, the process comprising the steps of:

inserting a glass sheet into the interior region of the housing;

supporting the glass sheet in a substantially horizontal manner with at least one solid support member;

producing hot combustion gases from at least one gas burner;

distributing the hot combustion gases from the at least one gas burner toward and into operable contact with at least one of the top and bottom surfaces of the glass sheet within the interior region of the housing;

sucking at least a portion of spent hot working fluid which has operably contacted the at least one of the top and bottom surfaces of the glass sheet toward and into a mixing chamber operably associated with a corresponding one of the at least one gas burner;

each of the mixing chambers being operably positioned about at least a portion of the corresponding one of the gas burners;

mixing the spent hot working fluid in the mixing chamber with the hot combustion gases being produced from the corresponding one of the at least one gas burner; and

distributing the mixed spent hot working fluid and the newly produced hot combustion gases toward and into operable contact with the at least one of the top and bottom surfaces of the glass sheet.

5,746,800
GLASS MAKING APPARATUS HAVING AUTOMATIC BLANK-MOLD SOOTING DEVICE

Morettin Ambrogio, Cinto Cao Maggiore, Italy, assignor to Avir Finanziaria S.p.A., Asti, Italy

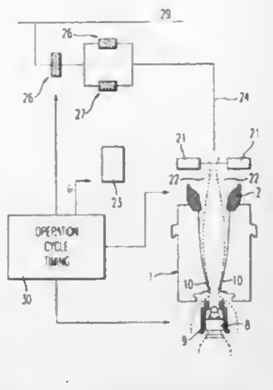
Continuation of Ser. No. 207,704, Mar. 9, 1994, abandoned. This application Jul. 31, 1996, Ser. No. 688,772

Claims priority, application Italy, Oct. 11, 1993, PN93A0065

Int. Cl.^{6} C03B *40/00;9/00*

U.S. Cl. 65—169 **20 Claims**

1. Glass making apparatus adapted to deposit a lubricating/detaching layer of carbon black obtained from acetylene cracking on the internal wall of a blank mold, said glass making apparatus comprising:



(a) a blank mold having an open top and an open bottom;

(b) a collar disposed adjacent to the open bottom of said blank mold during a glass forming process;

(c) a ring disposed in said collar;

(d) a plunger movable between at least first and second positions, wherein in said first position said plunger is positioned and arranged with respect to said collar and said blank mold such that said open bottom of said blank mold is closed by said plunger and said collar, and wherein in said second position of said plunger an interior of said blank mold communicates with an exterior of said blank mold through said open bottom of said blank mold and through a space between said plunger and said open bottom of said blank mold;

(e) a sleeve surrounding said plunger;

(f) means for providing an acetylene flame while said plunger is in said second position such that the acetylene flame enters said top of said blank mold and leaves said blank mold through the open bottom of said blank mold and through said space between the open bottom of said blank mold and said plunger, whereby said means for providing an acetylene flame performs a sooting process to deposit a lubricating/detaching layer of carbon black in a substantially uniform way on all portions of the internal wall of said blank mold, allowing glass gobs to flow freely along the internal wall of said blank mold; and

(g) operation cycle timing means for controlling said means for providing an acetylene flame and for controlling movement of said plunger such that said plunger is in said second position during the sooting process.

5,746,801
PROCESS OF PRODUCING FLUORIDE GLASS

Chie Fukuda; Masashi Onishi, and Hiroo Kanamori, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 262,063, Jun. 17, 1994, abandoned. This application Jan. 15, 1997, Ser. No. 785,835

Claims priority, application Japan, Jun. 18, 1993, 5-147211

Int. Cl.^{6} C03B *37/00;3/02*

U.S. Cl. 65—379 **18 Claims**

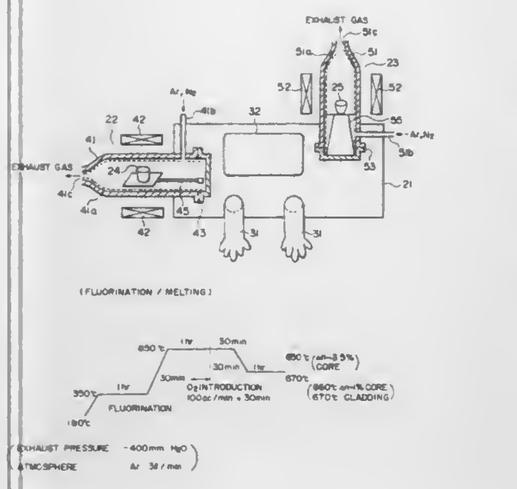
1. A process of producing fluoride glass, comprising:

introducing at least one raw material and at least one fluorinating agent into a heating vessel having an internal metallic surface comprising platinum;

introducing an inert gas into the heating vessel;

providing the heating vessel with a pressure difference of not greater than -50 mmH$_2$O and not less than -1000 mmH$_2$O and heating the at least one raw material in the heating vessel having the pressure difference so as to melt the at least one raw material and to provide a molten mixture, while the heating vessel has the inert gas therein, the molten mixture comprising a combination of the at least one raw material and the at least one fluorinating agent; and

subjecting the molten mixture to casting in an operating vessel which is communicated with the heating vessel and thereby obtaining a fluoride glass,



wherein the pressure difference is equal to an internal pressure in the heating vessel minus the ambient atmospheric pressure.

5,746,802
METHOD AND DEVICE FOR COMPOSTING ORGANIC MATTER

Bertil Hagander, Fotbollsvägen 5, S-615 33 Valdemarsvik, Sweden

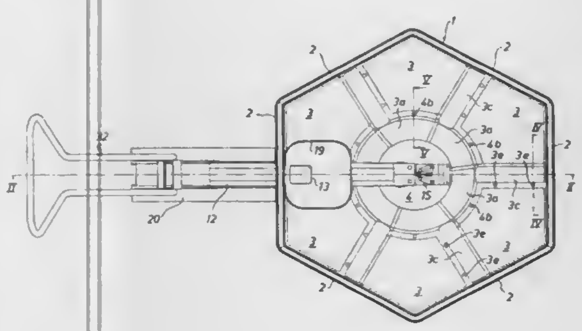
PCT No. PCT/SE95/00066, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/20555, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 26, 1995, Ser. No. 669,421

Claims priority, application Sweden, Jan. 28, 1994, 9400272

Int. Cl.^{6} C05F *11/08*

U.S. Cl. 71—9 **18 Claims**



1. A method of composting organic material, especially domestic waste, in which method the material to be composted is placed in disintegrated form in a container (1) to be biologically degraded under the influence of degradative organisms, said container having an upper zone and a lower zone which is vertically and colinearly positioned below the upper zone, characterised in that the disintegrated material is placed in the container (1) by being introduced into the central region of the lower zone of an accumulation, located in the container, of disintegrated material previously introduced therein, to be degraded in zones which, as disintegrated material is being introduced into the container, are moved upwards and outward from said central region, whereupon finally composted material is withdrawn from the upper zone of the accumulation of material, said inner lower zone of the container being laterally surrounded by the previously introduced accumulation of material.

5,746,803
METALLIC-CARBIDE GROUP VIII METAL POWDER AND PREPARATION METHODS THEREOF

Stephen D. Dunmead, Midland, and Michael J. Romanowski, Clio, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 4, 1996, Ser. No. 657,988

Int. Cl.^{6} C01B *31/34*

U.S. Cl. 75—351 **18 Claims**

1. A method for preparing a transition metal carbide-Group VIII metal powder, the method comprises:

(A) heating an admixture comprising:

a finishing source of carbon,

an oxide powder of a Group VIII metal selected from the group consisting of iron, cobalt, nickel and mixtures thereof and

a particulate precursor comprised of a metal containing tungsten and a precursor carbide comprising a carbide of a transition metal selected from the group consisting of: tungsten; titanium; tantalum; molybdenum; zirconium; hafnium; vanadium; niobium; chromium and mixture thereof,

to a temperature of about 1173 K to about 1773 K under a hydrogen-containing atmosphere for a time sufficient to form the transition metal carbide-Group VIII metal powder wherein at least 25% by weight of the precursor carbide is carburized, the transition metal carbide-Group VIII metal powder contains an amount of Group VIII metal of at least about 0.25% to at most about 50% by weight of the transition metal carbide-Group VIII metal powder and the transition metal carbide-Group VIII metal powder is comprised of particles in which 95% by number of the particles have a size of at most about 0.4 micrometer in diameter.

5,746,804
APPARATUS FOR MELTING FINE PARTICLES CONTAINING CARBON AND METHOD FOR MELTING SUCH FINE PARTICLES USING THE APPARATUS

Sang Hoon Joo; Dong Joon Min, and Myoung Kyun Shin, all of Kyongsangbook-Do, Rep. of Korea, assignors to Pohang Iron & Steel Co., Ltd.; Research Institute of Industrial Science & Technology, both of Kyongsangbook-do,, Rep. of Korea, and Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria

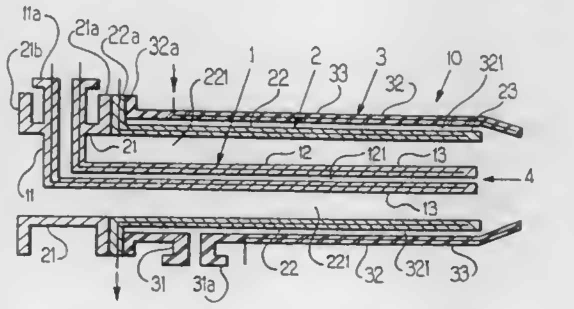
PCT No. PCT/KR95/00173, § 371 Date Aug. 28, 1996, § 102(e) Date Aug. 28, 1996, PCT Pub. No. WO96/21048, PCT Pub. Date Jul. 11, 1996

PCT Filed Dec. 27, 1995, Ser. No. 700,532

Claims priority, application Rep. of Korea, Dec. 29, 1994, 1994-38981

Int. Cl.^{6} C21B *13/14*

U.S. Cl. 75—387 **25 Claims**



1. An apparatus for melting fine particles containing carbon, comprising:

an inner oxygen feeding section including an inner oxygen inlet tube connected at a rear end thereof to an air/oxygen supply source for supplying air and/or oxygen and adapted to receive air and/or oxygen from the air/oxygen supply source, and an inner oxygen feeding tube connected at a rear end thereof to a front end of the inner oxygen inlet tube, the inner oxygen feeding tube having an inner oxygen feeding passage communicating at a rear end thereof with the inner oxygen inlet tube;

a particle feeding section arranged such that it radially surrounds the inner oxygen feeding section, the particle feeding section including a particle inlet tube connected at a rear end thereof to a particle/carrier gas supply source for supplying fine particles and carrier gas and adapted to receive fine particles and carrier gas from the particle/carrier gas supply source, and a particle feeding tube connected at a rear end thereof to a front end of the particle inlet tube, the particle feeding tube having a particle feeding passage communicating at a rear end thereof with the particle inlet tube;

an outer oxygen feeding section arranged such that it radially surrounds the particle feeding section, the outer oxygen feeding section including an outer oxygen inlet tube connected to an oxygen supply source and adapted to receive oxygen from the oxygen supply source, and an outer oxygen feeding tube having an outer oxygen feeding passage communicating with the outer oxygen inlet tube;

the particle inlet tube fixedly mounted on the inner oxygen inlet tube such that the inner oxygen inlet tube extends into the interior of the particle inlet tube; a first flange provided at the front end of the particle inlet tube, a second flange provided at the rear end of the particle feeding tube and a third flange provided at the rear end of the outer oxygen feeding tube, all the flanges being coupled together by coupling means;

each of the inner oxygen feeding passage and particle feeding passages being opened at both ends thereof, and the outer oxygen feeding hole being closed at a rear end thereof by the second flange; and

a nozzle constituted by the front ends of the inner oxygen feeding tube, particle feeding tube and outer oxygen feeding tube, the nozzle serving to inject the fine particles fed through the particle feeding tube together with air and/or oxygen flows respectively fed through the inner and outer oxygen feeding tubes so that the injected fine particles will be burned and melted.

5,746,805

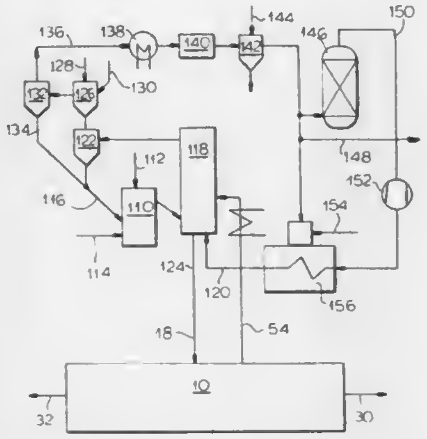
PROCESS FOR THE CONTINUOUS MANUFACTURE OF STEEL

Paul E. Queneau, Cornish, N.H., and Martin Hirsch, Friedrichsdorf, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany, and Paul Queneau, Cornish, N.H.

Filed Jul. 18, 1995, Ser. No. 503,710

Int. Cl.⁶ C22B *5/14;* C21B *13/14*

U.S. Cl. 75—446 **43 Claims**



1. A process for continuous steel making in an elongated approximately horizontal reactor with a carbonaceous material and a flux comprising:

(a) providing an iron-rich feed more than half by weight of which is an iron rich material containing a fine iron ore which has been more than half by weight metallized to elemental iron by pre-reduction;

(b) introducing the iron-rich feed and carbonaceous material into a smelting zone of the elongated approximately horizontal reactor;

(c) continuously forming in the smelting zone a liquid bath of hot metal covered by a layer of slag;

(d) introducing by submerged injection into the bath in the smelting zone a carbonaceous material and a tonnage oxygen gas containing at least 80%, by volume of oxygen;

(e) introducing a gas containing at least 80% by volume of oxygen into the smelting zone atmosphere without penetrating the slag layer;

(f) causing a moderate turbulence in the reactor bath and flowing the iron layer and the slag layer counter currently so that the iron flows from the smelting zone into a refining zone of the reactor and the slag flows from the refining one into the smelting zone;

(g) withdrawing the slag from the smelting zone;

(h) supplying substantially nitrogen-free oxygen gas by injection into the bath in the refining zone whereby steel is formed;

(i) withdrawing the steel from the refining zone; and

(j) removing gaseous products formed in the smelting and refining zones from a slag discharge end of the smelting zone as an exhaust gas.

5,746,806

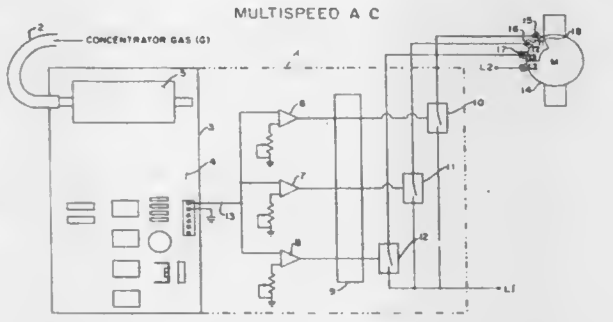
APPARATUS AND METHOD FOR CONTROLLING OUTPUT OF AN OXYGEN CONCENTRATOR

Alonzo C. Aylsworth, St. Louis; Kyle Adriance, St. Charles, and Gregory R. Miller, St. Louis, all of Mo., assignors to Nellcor Puritan Bennett Incorporated, St. Charles, Mo., a part interest

Filed Aug. 15, 1996, Ser. No. 698,062

Int. Cl.⁶ B01D *53/047*

U.S. Cl. 95—8 **36 Claims**



1. A method of controlling the concentration of oxygen from an oxygen concentrator driven by a motor, comprising the steps of:

determining the concentration of oxygen in a sample produced by such oxygen concentrator;

converting said oxygen concentration to a low D.C. voltage which corresponds to said oxygen concentration;

conducting said voltage to a plurality of set-point amplifier;

amplifying said voltage;

conducting said voltage as amplified to a logic block;

analyzing said voltage;

determining a rate of operations per minute for said motor hase voltage;

energizing one of a plurality of switching means based upon said rate of operations per minute of said motor; and

energizing an appropriate control means on the motor through said switching means based upon the rate of operation of said motor per minute.

5,746,807

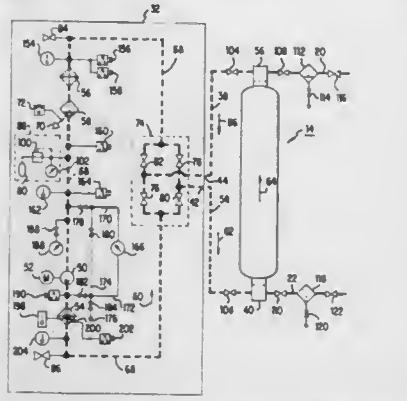
GAS HANDLING SYSTEM AND ADSORBENT DRYER REGENERATION APPARATUS

John E. Thelen, Ocala, and Sundar R. Mylavarapu, Gainesville, both of Fla., assignors to Pneumatic Products Corp., Ocala, Fla.

Continuation of Ser. No. 533,448, Sep. 25, 1995, abandoned, which is a continuation of Ser. No. 304,172, Sep. 12, 1994, abandoned, which is a continuation of Ser. No. 103,002, Aug. 6, 1993, Pat. No. 5,350,442. This application Jun. 19, 1996, Ser. No. 666,052

Int. Cl.⁶ B01D *53/04;53/26*

U.S. Cl. 95—123 **11 Claims**



1. A method of handling gas, said method comprising the steps of:

flowing a first gas through a first adsorbent dryer, using said first dryer to dry said first gas, and subsequently compressing said first gas into a first storage vessel;

flowing a second gas through a second adsorbent dryer, using said second dryer to dry said second gas, and subsequently compressing said second gas into a second storage vessel, said second dryer being remote from said first dryer during said step of using said second dryer to dry said second gas; and

using a regeneration apparatus to regenerate said first dryer, and subsequently using said regeneration apparatus to regenerate said second dryer.

5,746,808

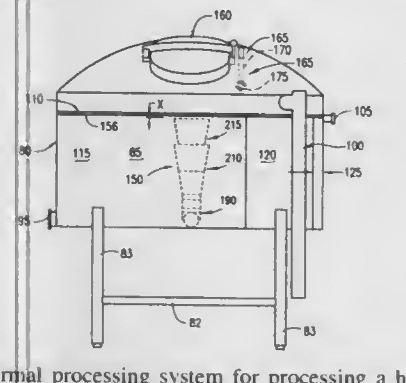
THERMAL PROCESSING AND PACKAGING SYSTEM EMPLOYING AN INTERMEDIATE DEGASSING TANK

Stephen P. Hellenschmidt, Baltimore, Md., assignor to Tetra Laval Holdings & Finance SA, Pully, Switzerland

Filed Apr. 29, 1996, Ser. No. 642,020

Int. Cl.⁶ B01D *19/00*

U.S. Cl. 96—205 **29 Claims**



1. A thermal processing system for processing a hot-fill liquid product and filling containers with the hot-fill liquid product, the thermal processing system comprising:

a thermal processing unit for thermally processing a hot-fill liquid product;

a packaging machine for filling individual containers with the hot-fill liquid product; and

an intermediate degassing tank comprising

a tank body defining an interior chamber for holding the thermally processed hot-fill liquid;

an inlet receiving the thermally processed hot-fill liquid product from the thermal processing unit,

an outlet facilitating fluid communication of the thermally processed hot-fill liquid product from the interior chamber of the degassing tank to the packaging machine,

a vent,

a degasser disposed in the interior chamber of the tank body and receiving the hot-fill liquid product from the inlet, the degasser having an inlet and an outlet and shaped to have a greater flow area at the outlet thereof than at the inlet thereof to thereby facilitate degassing of the hot-fill liquid product, the outlet of the degasser opening to the interior chamber of the tank body, gas removed from the liquid product passing to the vent, the degasser comprising

an elbow section having a first open end connected to receive the hot-fill liquid product from the inlet of the intermediate degassing tank, and a second open end disposed approximately at a right angle with respect to the first open end,

a frustoconical channel section having a first open end connected to the second open end of the elbow section and a second open end that is in fluid communication with the interior chamber of the tank body, the second open end of the frustoconical channel section having a flow cross-section that is larger than the flow cross-section of the first open end of the frustoconical channel section, and

a further frustoconical channel section having a first open end connected to receive the thermally processed hot-fill liquid product from the second open end of the frustoconical channel section and a second open end in fluid communication with the interior chamber of the tank body, the second open end of the further frustoconical channel section having a flow cross-section that is larger than the flow cross-section of the first open end of the further frustoconical channel section, the flow cross-section of the second end of the frustoconical channel section being larger than the flow cross-section of the first open end of the further frustoconical section,

a baffle disposed in the interior chamber to at least partially separate the outlet of the intermediate degassing tank from the inlet of the intermediate degassing tank.

5,746,809

ACTIVATING CATALYTIC SOLUTION FOR ELECTROLESS PLATING

Osamu Kanoh, Ohmihachiman; Yasushi Yoshida, Shiga-ken, and Atsuo Senda, deceased, late of Kyoto-fu, all of Japan, by Eiko Senda, Yoshio Senda, Hiroko Senda, Masako Senda, legal representatives, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 10, 1997, Ser. No. 839,432

Claims priority, application Japan, Apr. 9, 1996, 8-086725

Int. Cl.⁶ C23C *18/28*

U.S. Cl. 106—1.11 **12 Claims**

1. A activating catalytic solution for hydrophilic electroless plating comprising an alkaline solution of zinc salt, copper salt and palladium salt wherein at least one of the zinc and copper salts is oxalate.

5,746,810

AQUEOUS EMULSION OF ALKYLALKOXYSILANE, PROCESS FOR THE PRODUCTION THEREOF, AND USE THEREOF

Takehiro Suzuki, Tokyo, Japan, assignor to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed May 8, 1996, Ser. No. 646,496

Int. Cl.⁶ C09K *3/18;* C09D *5/00;* B01J *13/00*

U.S. Cl. 106—2 **11 Claims**

1. An aqueous alkylalkoxysilane emulsion comprising an alkylalkoxysilane, water and an emulsifier, wherein droplets of the alkylalkoxysilane in the water has a diameter in the range of 2 to 10 μm.

10. An infiltrative water-absorption preventer for a porous inorganic construction material, which comprises the aqueous alkylalkoxysilane emulsion recited in claim 1 as an active ingredient.

5,746,811
DISC REPAIR SYSTEM

Michael J. Smithlin, 11 Stanton Cir., Boxford, Mass. 01921
Continuation-in-part of Ser. No. 603,684, Feb. 20, 1996, abandoned, which is a continuation of Ser. No. 193,944, Feb. 9, 1994, abandoned. This application Sep. 23, 1996, Ser. No. 717,759
Int. Cl.^{6} B24B *1/00*
U.S. Cl. 106—10 **6 Claims**

1. A composition for repairing a defect on the surface of a laser-readable object having a protective plastic surface, by smoothing the edges of the defect and filling the defect with the composition, the composition comprising a substantially water-free mixture of

a wax capable of filling the defect and having a refractive index between about 1.4 and 1.6,
a hydrotreated petroleum distillate,
a dispersant, and
an abrasive material comprising round particles having a particle size of about 2μ or less in diameter.

5,746,812
STABLE AQUEOUS POLYOLEFIN WAX DISPERSIONS

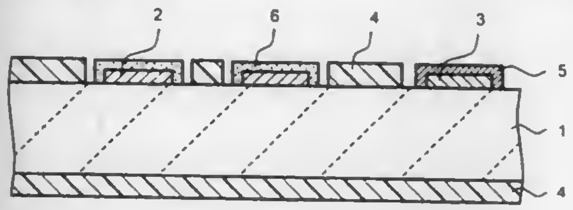
Michael Wolfgang Müller, Biblis; Paul Klingelhöfer, Mannheim, and Stefan Weiss, Neckargemünd, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
PCT No. PCT/EP94/02846, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/07313, PCT Pub. Date Mar. 16, 1995
PCT Filed Aug. 27, 1994, Ser. No. 605,071
Claims priority, application Germany, Sep. 8, 1993, 43 30 342.0
Int. Cl.^{6} C09G *1/08;* **C09F** *1/02;* **C08L** *11/06;* **A61K** *7/16*
U.S. Cl. 106—10 **15 Claims**

1. A stable aqueous polyolefin wax dispersion comprising

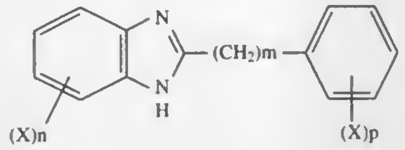
A) from 5 to 65% by weight of polyethylene wax or polypropylene wax having a mean particle size of from 1 to 50 μm and an acid number of less than 5 mg of KOH/g of wax and
B) from 0.5 to 20% by weight of a glyceride of predominantly ethylenically monounsaturated or polyunsaturated C_{16}–C_{22}-monocarboxylic acids or said C_{16}–C_{22}-monocarboxylic acids containing hydroxyl groups, said glyceride having been reacted with 1 to 50 mol of a 1,2-alkylene oxide of 2 to 4 carbon atoms, as a dispersant.

5,746,813
SURFACE PROTECTION MATERIAL FOR PRINTED CIRCUIT BOARD AND PROCESS OF FORMING SURFACE PROTECTION FILMS

Kiminori Ishido, and Masahiro Yamaguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Division of Ser. No. 478,668, Jun. 7, 1995, Pat. No. 5,658,611. This application Feb. 18, 1997, Ser. No. 801,497
Claims priority, application Japan, Jun. 21, 1994, 6-138842
Int. Cl.^{6} C04B *9/02*
U.S. Cl. 106—14.16 **1 Claim**



1. A surface protection material for printed circuit boards, in which a compound having a benzimidazole derivative as an effective component and being represented by a general formula of



(wherein X is a radical, with the number of carbon atoms from 1 to 7, of the group consisting of alkyl group, halogen atoms, amino group, lower dialkylamino group, lower alkoxyl group, cyano group, acetyl group, benzoyl group, carbamoyl group, formyl group, carboxyl group, lower alkoxylcarbonyl group and nitro group, n and p are integers of 0 to 4, and m is an integer of 1 to 10) is adjusted to pH range from 1 to 5 with a salt-forming acid and which is an aqueous solution whose metal content of a heavy metal, from the group consisting of copper, manganese and zinc, is not higher than 50 ppm.

5,746,814
DECURLING COMPOSITIONS

Shadi L. Malhotra, Mississauga, Canada, and Diane M. Foley, Palmyra, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 7, 1997, Ser. No. 851,564
Int. Cl.^{6} C09D *5/00;5/14;* **G03G** *8/00*
U.S. Cl. 106—18 **19 Claims**

1. A composition comprised of a hydrophilic solvent, a polymeric binder, a water soluble/dispersible paper desizing agent, a water soluble/dispersible paper anticurl agent, a defoamer, a biocide, an antistatic agent, a lightfastness promoting agent, and a filler.

5,746,815
STABLE OIL-IN-WATER INK EMULSIONS BASED UPON WATER-REDUCIBLE NIGROSINE DYES FOR INK-JET PRINTERS AND FELT-TIP AND ROLLER-BALL PENS

Peter A. Caputo, South Orange, N.J., assignor to Morton International, Inc., Chicago, Ill.
Filed Jul. 31, 1996, Ser. No. 688,921
Int. Cl.^{6} C09D *11/02*
U.S. Cl. 106—31.25 **18 Claims**

1. A stable aqueous ink emulsion based upon a water-insoluble nigrosine dye, which comprises:

between about 1 and about 30 wt. % based on said emulsion of a water-reducible nigrosine dye-containing solution, said water-reducible nigrosine dye-containing solution comprising:
  between about 20 and about 50 wt. % based on said nigrosine dye-containing solution of at least one water-insoluble nigrosine dye;
  between about 25 and about 50 wt. % based on said nigrosine dye-containing solution of a first solvent including at least one solvent having a flash point of at least about 141° F. (61° C.) and a boiling point of at least about 280° F. (138° C.); and,
  between about 20 and about 40 wt. % based on said nigrosine dye-containing solution of a non-ionic surfactant;
between about 25 and about 90 wt. % based on said emulsion of water;
between about 0 and about 30 wt. % based on said emulsion of at least one second solvent; and,
between about 0.1 and about 45 wt. % based on said emulsion of an emulsion stabilizer comprising at least one water-soluble resin.

5,746,816
LIQUID INK PROCESS AND PRINTING METHOD

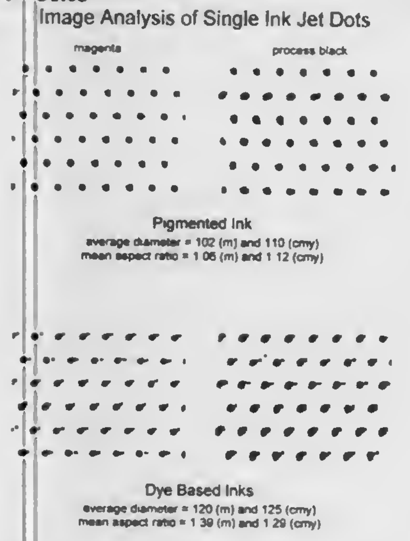
Ming Xu, Mt. Pleasant, S.C., assignor to Sawgrass Systems, Inc., Mt. Pleasant, S.C.
Filed Aug. 1, 1996, Ser. No. 691,699
Int. Cl.^{6} C09D *11/02*
U.S. Cl. 106—31.25 **6 Claims**

1. A method of producing a liquid ink from solid heat activated dye, comprising:

a. combining at least one solid heat activated dye, at least one emulsifying agent, and at least one liquid, to form a mixture;
b. creating a micelle ink by placing said mixture in a vessel, and heating said mixture to transfer heat to said mixture, and creating and maintaining an elevated pressure within said vessel and maintaining an elevated temperature within said vessel until said dye is melted but not activated, and subsequently, rapidly cooling said mixture to form said micelle ink; and
c. combining a liquid with said micelle ink to form a liquid ink.

5,746,817
INK JET INK COMPOSITION

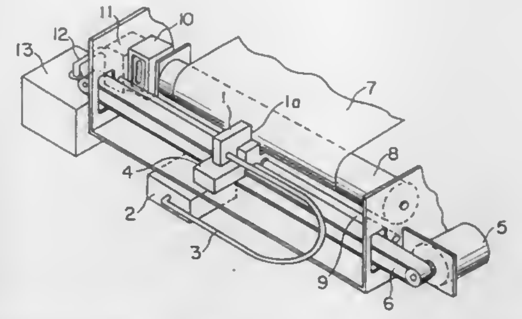
Boris Joseph Katsen, Longmeadow; Richard S. Himmelwright, Wilbraham; Barbara Jones Stewart, Springfield, and Nate R. Schwartz, South Hadley, all of Mass., assignors to Rexam Graphics Inc., South Hadley, Mass.
Filed Aug. 16, 1996, Ser. No. 698,867
Int. Cl.^{6} C09D *11/02*
U.S. Cl. 106—31.65 **32 Claims**



1. An ink jet ink formulation comprised of pigment, water, a water immiscible organic compound exhibiting a high boiling point, and a water miscible compound, with at least a portion of the water immiscible organic compound being absorbed by the pigment.

5,746,818
PIGMENT INK COMPOSITION CAPABLE OF FORMING IMAGE HAVING NO SIGNIFICANT BLEEDING OR FEATHERING

Masahiro Yatake, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo-To, Japan
Filed Aug. 29, 1996, Ser. No. 705,287
Claims priority, application Japan, Aug. 31, 1995, 7-224330; Oct. 6, 1995, 7-260585; Jan. 19, 1996, 8-007216; Apr. 16, 1996, 8-094568; Aug. 1, 1996, 8-204008
Int. Cl.^{6} C09D *11/02*
U.S. Cl. 106—31.86 **30 Claims**



1. A recording method comprising the step of:

depositing a reactant-containing reaction solution and an ink composition onto a recording medium to conduct printing, the ink composition comprising a pigment a glycol ether, and water the pigment being dispersible and/or soluble in water without the aid of any dispersant, the glycol ether being one member or a mixture of two or more members selected from the group consisting of diethylene glycol mono-n-butyl ether, triethylene glycol mono-n-butyl ether, propylene glycol mono-n-butyl ether, and dipropylene glycol mono-n-butyl ether, the reactant being a material which can break a state of dispersion and/or dissolution of the pigment.

5,746,819
HIGH SOLIDS ANATASE TIO_2 SLURRIES

Robert J. Kostelnik, Ellicott City, and Fu-Chu Wen, Severna Park, both of Md., assignors to SCM Chemicals, Inc., Hunt Valley, Md.
Filed Nov. 14, 1995, Ser. No. 557,953
Int. Cl.^{6} C04B *14/30;* **C09C** *1/36*
U.S. Cl. 106—447 **9 Claims**

1. A high solids slurry of anatase TiO_2 pigment which comprises at least 65% by weight of anatase TiO_2 pigment dispersed in water containing a dispersing agent selected from the group consisting of i) acrylic acid homopolymers and ii) copolymers that are predominantly acrylic acid and contain at least one comonomer selected from the group consisting of maleic acid, methacrylic acid, itaconic acid, crotonic acid, fumaric acid, acrylamide, acrylonitrile, ethylene, propylene, styrene and esters of the acids,

wherein the homopolymers or copolymers have been partially or completely neutralized with a neutralizing agent having a monovalent group and at least one neutralizing agent having a polyvalent group.

5,746,820
SURFACE-TREATED QUINACRIDONE AND DIOXAZINE PIGMENTS

Manfred Urban, Wiesbaden, and Dieter Schnaitmann, Eppstein, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed Apr. 22, 1997, Ser. No. 837,720
Claims priority, application Germany, Apr. 24, 1996, 196 16 364.1
Int. Cl.^{6} C09C *1/02;* **C08K** *5/00;5/34;* **C09B** *48/00*
U.S. Cl. 106—471 **19 Claims**

1. A pigment preparation consisting essentially of

a) a pigment from the class of quinacridones or dioxazines,
b) one or more sulfuric monoesters of the formula (II)

$$R^1—CO—NR^2—(CH_2O)_{(n+1)}SO_3^-M^+ \qquad (II)$$

in which

R^1 is a straight-chain or branched alkyl group of 10 to 24 carbon atoms,
R^2 is a hydrogen atom or a C_1–C_6-alkyl group,
M^+ is a hydrogen ion, an alkali metal ion, ½ an alkaline earth metal ion, or an ammonium ion of the formula $N^+R^3R^4R^5R^6$, where the substituents R^3, R^4, R^5 and R^6

independently of one another, are each hydrogen atoms or C_1–C_6-alkyl groups, which alkyl groups optionally are substituted by 1 to 3 hydroxyl groups, and

n is a number from 0 to 4; and

c) optionally a pigment dispersant of the formula (VI)

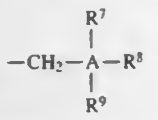
$$P—[X]_m \qquad (VI)$$

in which

P is an m-valent radical of a pigment based on a quinacridone or dioxazine,

m is a number from 1 to 4, and

X is a group of the formula (VII)



$$-CH_2-\overset{\overset{R^7}{|}}{\underset{\underset{R^9}{|}}{A}}-R^8 \qquad (VII)$$

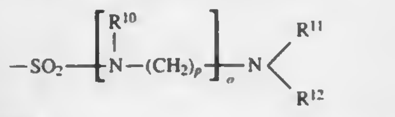
in which

A is a five- or six-membered aromatic heterocycle which is optionally fused on, and which contains 1 to 3 identical or different heteroatoms selected from the group consisting of nitrogen, oxygen, sulfur, and a combination thereof, and the heterocycle is attached to the methylene group via a carbon atom,

R^7 and R^8 independently of one another, are a hydrogen atom a C_1–C_4-alkyl, a C_2–C_4-alkenyl or an aryl group, or R^7 and R^8 together form an aliphatic or aromatic ring, and

R^9 is a hydrogen atom or a C_1–C_4-alkyl, a C_1–C_3-hydroxyalkyl or a C_2–C_4-alkenyl group, or in which

X is a group of the formula (VIII)



$$-SO_2-\left[\overset{\overset{R^{10}}{|}}{N}-(CH_2)_p\right]_o-N\begin{matrix}R^{11}\\ R^{12}\end{matrix} \qquad (VIII)$$

in which

R^{11} and R^{12} independently of one another are each a hydrogen atom, a C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl group or a C_5–C_7-cycloalkyl group, or R^{11} and R^{12}, together with the adjacent nitrogen atom, form an aliphatic or aromatic, five- or six-membered heterocyclic system having in each case from 1 to 3 identical or different heteroatoms which belong to the ring and are selected from the group consisting of nitrogen, oxygen, sulfur and a combination thereof,

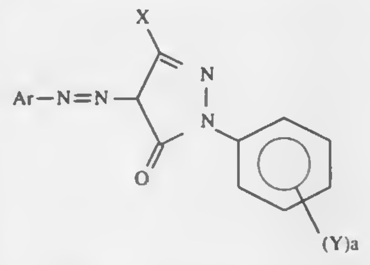
R^{10} is a hydrogen atom or a C_1–C_4-alkyl group,

p is a number from 1 to 6 and

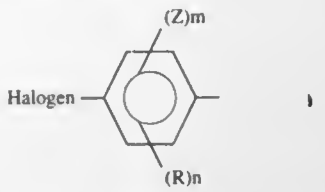
o is 1 or 2.

5,746,821
PIGMENT COMPOSITIONS
Byron G. Hays, Chagrin Falls, Ohio, assignor to Engelhard Corporation, Iselin, N.J.
Filed Feb. 13, 1995, Ser. No. 387,994
Int. Cl.^{6} C09B *63/00;29/36*
U.S. Cl. 106—496 **17 Claims**

1. An azo pigment composition comprising one or more compounds of the formula:



wherein X is a hydrocarbyl, carboxylic acid ester, sulfonic acid ester, carboxylic acid amide or sulfonic acid amide group; each Y is independently a hydrocarbyl, halogen, hydrocarbyloxy, carboxylic acid ester, sulfonic acid ester, carboxylic acid amide, imidazolone, sulfonic acid amide or nitro group; a equals 1, 2 or 3; and Ar is an aromatic moiety having as a substituent a divalent metal salt of a carboxylic acid or sulfonic acid group, provided that when Ar is monocyclic it is of the formula:

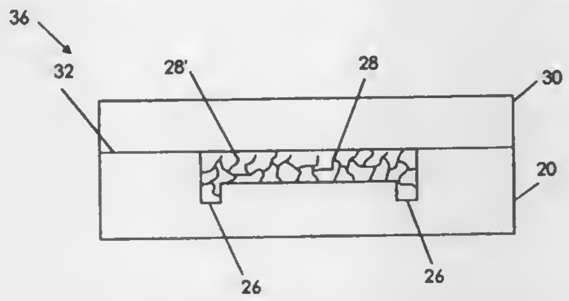


wherein each Z is independently a salt of a —COOH or —SO_3H group; m is 1 or 2; each R is independently a halogen, hydrocarbyl, hydrocarbyloxy, carboxylic acid ester, sulfonic acid ester, carboxylic acid amide, imidazolone, sulfonic acid amide or nitro group; and n is 0, 1 or 2.

5,746,822
READY-MIXED SETTING TYPE JOINT COMPOUND
Therese A. Espinoza, Wood Dale; Charles J. Miller, McHenry, and Richard B. Stevens, Lakewood, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.
Continuation of Ser. No. 242,280, May 12, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 585,548
Int. Cl.^{6} C04B *22/16*
U.S. Cl. 106—785 **18 Claims**

1. A ready-mixed, cementitious composition which forms a setting type joint compound when mixed with an accelerator for the reaction of calcium sulfate hemihydrate with water to form set gypsum, said composition comprising from about 20 to about 99 weight percent (based on total solids used to form the composition) of a calcium sulfate hemihydrate filler, a calcium carbonate filler, from about 1 to about 10 weight percent (based on total solids used to form the composition) of a sepiolite, bentonite, or attapulgus clay, from about 0.1 to about 10 weight percent (based on total solids used to form the composition) of a non-calcium bearing phosphate set retarder which maintains said cementitious composition in an unset state for at least 175 days, a binder, a thickener and water.

5,746,823
ORGANIC CRYSTALLINE FILMS FOR OPTICAL APPLICATIONS AND RELATED METHODS OF FABRICATION
Alexander Leyderman, Mayaguez, Puerto Rico, assignor to University of Puerto Rico, San Juan, Puerto Rico
Filed Sep. 8, 1995, Ser. No. 525,852
Int. Cl.^{6} C30B *29/54*
U.S. Cl. 117—5 **15 Claims**



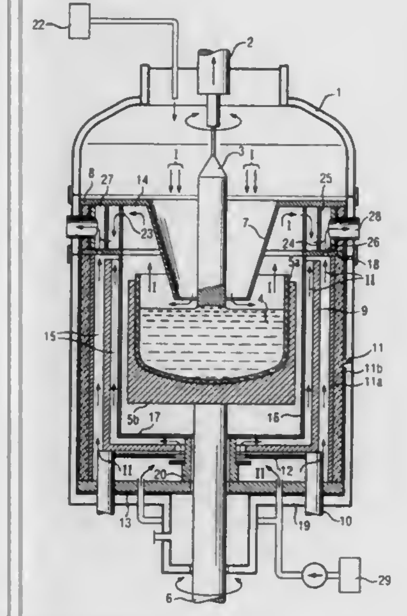
1. A method for forming an optical device, said method comprising the steps of:

providing a first plate having a first face, said first face defining a recess;

filling said recess with a material which can be crystallized; and

covering said first face and said recess with a second plate having a second face, so that said second face is in contact with said first face and said material in said recess is completely enclosed by said first and second plates.

5,746,824
METHOD AND APPARATUS FOR PRODUCING A SINGLE CRYSTAL
Friedrich Nemetz, Mauerkirchen, Austria, assignor to Wacker Siltronic Gesellschaft für Halbeitermaterialien AG, Burghausen, Germany
Filed Jun. 10, 1997, Ser. No. 872,566
Claims priority, application Germany, Jul. 17, 1996, 196 28 851.7
Int. Cl.^{6} C30B *15/20*
U.S. Cl. 117—13 **5 Claims**



1. A method for producing a silicon single crystal in an inert-gas flushed pulling chamber by pulling the single crystal from a melt by the Czochralski method, which comprises the steps of

a) providing in the pulling chamber a first inner chamber and a second inner chamber, said first inner chamber having a side boundary, a top boundary, and a bottom boundary, and said second inner chamber having a side boundary, a top boundary, and a bottom boundary;

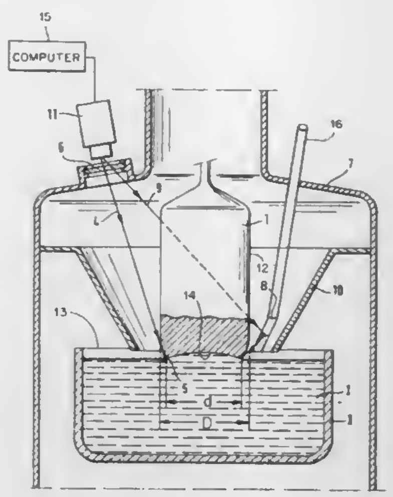
b) passing a first inert gas stream through the top boundary of the first inner chamber into the first inner chamber, which contains a heat shield, which is disposed around the single crystal, and a crucible containing the melt, and

c) passing a second inert gas stream through the bottom boundary of the second inner chamber into the second inner chamber, which contains a heating device for heating the crucible,

with the proviso that the first inert gas stream and the second inert gas stream are only able to mix, at the earliest, after leaving the first inner chamber and the second inner chamber.

5,746,825
METHOD FOR DETERMINING THE DIAMETER OF A GROWING MONOCRYSTAL
Wilfried Von Ammon, Burghausen; Herbert Weidner, Haiming, and Ludwig Thanner, Neuötting, all of Germany, assignors to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG, Burghausen, Germany
Filed Jul. 23, 1996, Ser. No. 686,118
Claims priority, application Germany, Aug. 10, 1995, 195 29 485.8
Int. Cl.^{6} C30B *15/20*
U.S. Cl. 117—14 **5 Claims**

1. A method for determining a diameter of a monocrystal growing at a crystallization boundary during a pulling of the monocrystal from a melt, which method comprises



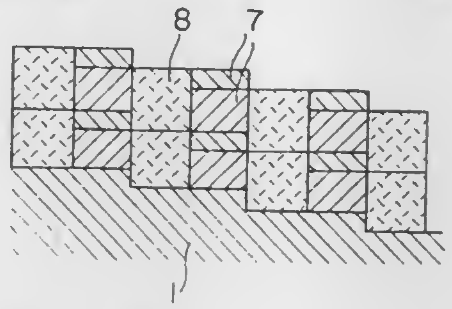
imaging a part of the crystallization boundary on at least one mirror to produce a mirror image;

observing a relative position of the crystallization boundary on the mirror image in a final phase of the pulling of the monocrystal when the diameter of the monocrystal is reduced to form a terminal cone;

determining the diameter of the monocrystal on a basis of an observed relative position of the crystallization boundary on the mirror image; and

using the information contained in the mirror image about the diameter of the monocrystal to change the diameter of the monocrystal if necessary.

5,746,826
METHOD AND APPARATUS FOR FORMING MICROSTRUCTURE BODY
Tsuyoshi Hasegawa; Shigeyuki Hosoki, both of Tokyo; Makiko Kohno, Kawasaki; Masakazu Ichikawa; Hitoshi Nakahara, both of Tokyo, and Toshiyuki Usagawa, Yono, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
PCT No. PCT/JP94/00561, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO94/23445, PCT Pub. Date Oct. 13, 1994
PCT Filed Apr. 5, 1994, Ser. No. 347,416
Claims priority, application Japan, Apr. 7, 1993, 5-080441; Jul. 13, 1993, 5-172857
Int. Cl.^{6} C30B *25/04*
U.S. Cl. 117—90 **40 Claims**



1. A method for making a microstructure body on a substrate which comprises forming a layer of a first element, thinner than one monolayer, by arranging the first element at a rugged position of the substrate, then forming a layer of at least one second element on a part of the substrate on which the layer of the first element is not formed, and not on the layer of the first element, wherein the first element is selected from the group consisting of gold, silver, copper, nickel, palladium, platinum and elements of group IV and the second element is selected from the group consisting of elements of group III, elements of group IV and elements of group V.

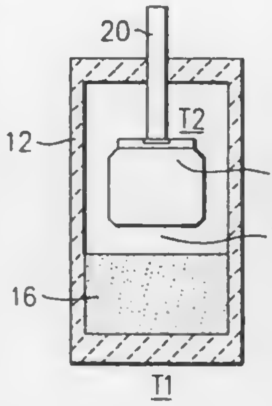
5,746,827
METHOD OF PRODUCING LARGE DIAMETER SILICON CARBIDE CRYSTALS

Donovan L. Barrett, New Smyrna Beach, Fla.; Richard N. Thomas, Murrysville, Pa.; Raymond G. Seidensticker, deceased, late of Forest Hills, Pa., by Joan Seidensticker, heir, and Richard H. Hopkins, Murrysville, Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Dec. 27, 1995, Ser. No. 579,277

Int. Cl.^{6} C30B *23/00*

U.S. Cl. 117—100 **14 Claims**



1. A method for producing crystals of silicon carbide in a furnace, wherein the furnace has a crucible with a cavity therein, means for heating the crucible cavity, and first and second spaced-apart regions of the crucible cavity, the method comprising the steps of:
providing a source material of silicon carbide having a sublimation temperature at the first region of the crucible cavity;
providing a monocrystalline seed at the second region of the crucible cavity;
conducting a first growth stage in which the first region and the second region of the crucible cavity are heated to at least the sublimation temperature of silicon carbide under substantially isothermal conditions; and
conducting a second growth stage in which a temperature gradient is provided between the first and the second region of the crucible cavity, such that the seed in the second crucible region is kept at a temperature lower than a temperature of the first crucible region.

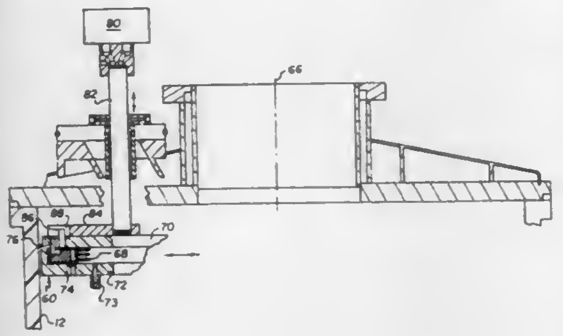
5,746,828
TEMPERATURE CONTROL SYSTEM FOR GROWING HIGH-PURITY MONOCRYSTALS

Anatoli S. Boulaev, Pittsford, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 16, 1996, Ser. No. 587,362

Int. Cl.^{6} C30B *35/00*

U.S. Cl. 117—201 **19 Claims**



1. An apparatus for growing crystals from a melt of crystal-forming material comprising:
a processing chamber;
a crucible mounted in said processing chamber for containing the melt of crystal-forming material and having an open end through which the crystal can be pulled from the melt;
a heater that maintains the crystal-forming material in a melted condition within the crucible;
a temperature monitor that senses a temperature of the melt in the vicinity of a solidification between the crystal and the melt;
a radiation shield that is adjustable for regulating an amount of radiated heat that is returned to the melt; and
a control system that adjusts the radiation shield in response to changes in the sensed temperature of the melt for enhancing dislocation-free growth of the crystal.

5,746,829
IMPURITY CONCENTRATOR AND ANALYZER

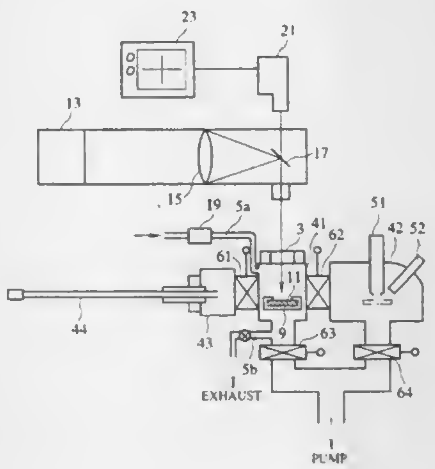
Hideki Matsunaga; Hiroshi Yamaguchi, both of Kanagawa; Mitsuhiro Tomita; Seizou Doi, both of Tokyo; Masahiko Yoshiki, Kanagawa; Shoji Kozuka, Kanagawa, and Masayuki Onuma, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1996, Ser. No. 711,968

Claims priority, application Japan, Sep. 14, 1995, 7-237174; Mar. 14, 1996, 8-057905; Jul. 25, 1996, 8-196654

Int. Cl.^{6} C30B *35/00*

U.S. Cl. 117—203 **10 Claims**



1. An impurity concentrator for concentrating impurity in a single crystal, the concentrator comprising:
(a) a sealed container provided with an intake inlet and an exhaust outlet for a carrier gas;
(b) a window provided at the upper part of said sealed container;
(c) a sample fixing holder for securely fixing a single crystal sample, the sample fixing holder is provided opposite to said window inside said sealed container;
(d) a gas control for controlling a quantity of said carrier gas to be supplied;
(e) an irradiator for irradiating repeatedly a specified position of said sample with a laser beam through said window, the laser beam having an energy intensity which is weaker than the value at which vaporization of said single crystal sample begins, so that said impurity is precipitated in a vicinity of a surface irradiated by the laser beam; and
(f) observing apparatus for observing variation of the surface condition of said sample through said window.

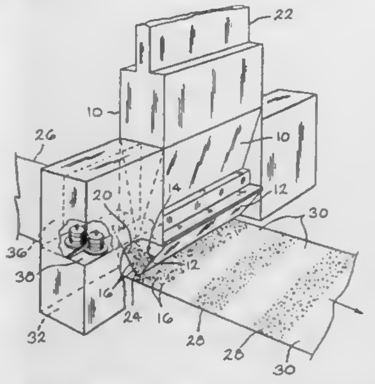
5,746,830
PNEUMATIC GRANULE BLENDER FOR ASPHALT SHINGLES

Charles A. Burton, Columbus; Douglas E. Boyd, Dublin; Thomas D. Haubert, Columbus, and James S. Belt, Utica, all of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation of Ser. No. 144,374, Nov. 2, 1993, abandoned. This application Jul. 17, 1996, Ser. No. 682,417

Int. Cl.^{6} B05C *19/04;19/06*

U.S. Cl. 118—308 **16 Claims**



1. Apparatus for applying granules to a coated asphalt sheet comprising;
a nozzle having an upper region for holding an accumulation of granules having a top surface and an opening at the bottom of the nozzle for discharging the granules onto the coated asphalt sheet, wherein the nozzle is wider at its upper region than at the nozzle opening;
a buffer chamber positioned above the nozzle in communication with the top surface of the accumulation of granules so that a negative pressure in the buffer chamber provides an upwardly oriented drag force on the granules in the accumulation of granules;
a hopper for supplying granules to the nozzle, the hopper having a throat for feeding granules to the accumulation of granules, wherein the hopper extends upwardly away from the buffer chamber and the nozzle, and is adapted to receive granules as a downwardly moving flow and to supply the granules to the accumulation of granules in the nozzle; and
vacuum means connected to the buffer chamber for reducing the pressure in the buffer chamber to stop the flow of granules through the opening, wherein the vacuum means creates an upward flow of air through the granules at the opening, the upward flow of air being sufficient to prevent the granules from flowing down through the nozzle opening by gravity, but insufficient to create fluidization of the granules at the opening.

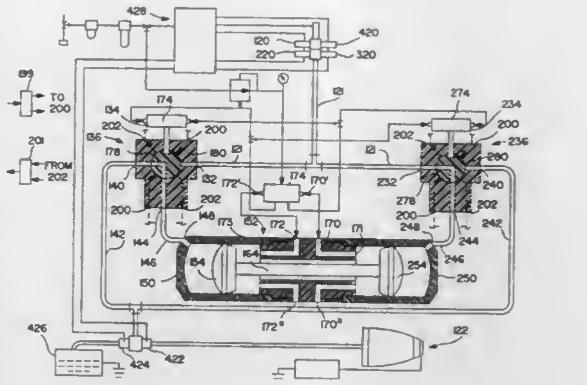
5,746,831
VOLTAGE BLOCK

Harold T. Allen, Indianapolis, Ind.; Edward T. Feldman, Buffalo Grove, Ill.; Varce E. Howe, Zionsville, Ind.; Ghaffar Kazkaz, Mount Prospect, Ill.; Ghazi M. A. Khattab, Wheeling, Ill.; Jerry L. McPherson, Jr., Greenfield, and James A. Scharfenberger, Indianapolis, both of Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 273,653, Jul. 12, 1994, abandoned. This application May 3, 1995, Ser. No. 429,075

Int. Cl.^{6} B05B *5/00*

U.S. Cl. 118—621 **34 Claims**



1. A coating system comprising a source of electrically non-insulative coating material, a dispenser for dispensing the coating material toward an article to be coated thereby, an electrostatic high potential supply device for supplying charge to the coating material, first means for coupling the high potential supply device to the dispenser and to the article, a first reservoir, a first valve having a first housing, the first housing providing first, second and third ports, a first component movable to a first orientation within the first housing, the first component having a first passageway selectively to connect the first port to the second port to permit coating material to flow between the first and second ports, second means for coupling the first port to the coating material source, third means for coupling the second port to the first reservoir, and fourth means for coupling the third port to the dispenser, the first component being movable to a second orientation within the housing selectively to connect the second port to the third port to permit coating material to flow between the first reservoir and the dispenser and prevent coating material from flowing from the coating material source to the first reservoir, the first housing further comprising a fourth port, the first component comprising a second passageway, the apparatus further comprising a second reservoir, and fifth means for coupling the fourth port to the second reservoir, movement of the first component in the first housing to connect the first port to the second port connecting the third port to the fourth port to permit coating material to flow between the second reservoir and the dispenser, and movement of the first component in the first housing to connect the second port to the third port to permit coating material to flow between the first reservoir and the dispenser also connecting the first port to the fourth port to permit coating material to flow between the coating material source and the second reservoir, the first and second reservoirs together comprising a first double-acting fluid piston and cylinder, the piston being reciprocable in the cylinder, the piston providing first and second opposed piston surfaces, the first reservoir being defined between the first piston surface and a first head of the first cylinder, the first cylinder having a second head at an end thereof opposite the first head, the second reservoir being defined between the second piston surface and the second head, the first head provided with a fifth port, the third means comprising the fifth port, the second head provided with a sixth port, the fifth means comprising the sixth port, and further comprising sixth means for moving the first valve alternately to the first orientation and the second orientation.

5,746,832
APPARATUS FOR DEPOSITING PARTICLES ONTO A WAFER

Seung-ki Chae; Byung-seol Ahn; Sang-kyu Hahm, and Jong-soo Kim, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 476,113, Jun. 7, 1995, Pat. No. 5,654,205. This application Oct. 3, 1996, Ser. No. 724,891

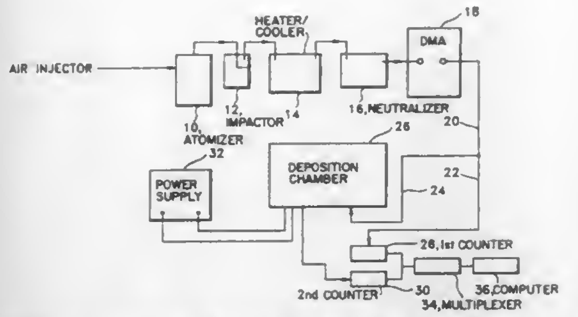
Claims priority, application Rep. of Korea, May 4, 1995, 95-11019

Int. Cl.^{6} G03G *15/10;* G01R *31/26*

U.S. Cl. 118—665 **3 Claims**

1. An apparatus for depositing particles onto a wafer comprising:
means for generating said particles;
means for controlling the size of said particles connected to an output terminal of said particle generating means;
a first transmitting tube connected to an output terminal of said means for controlling the size of said particles;
a second transmitting tube and a third transmitting tube each connected to an output terminal of said first transmitting tube;
first counting means connected to an output terminal of said second transmitting tube;

OL
2 10
SS
1
MY
5
998
MI



means for depositing particles on the wafer being connected to an output terminal of said third transmitting tube;

second counting means connected to said particle depositing means; and

power supplier means connected to said particles depositing means.

5,746,833

APPARATUS FOR CONTINUOUSLY APPLYING A COATING TO A SHEET OF INDETERMINATE LENGTH

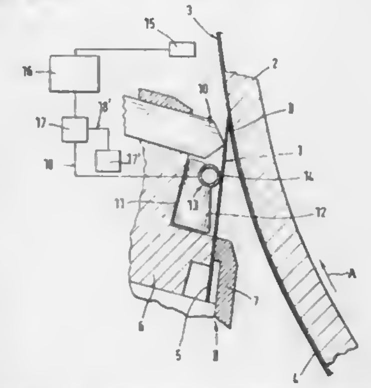
Norbert Gerhardt, Celle, Germany, assignor to TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH, Unterlüss, Germany

Division of Ser. No. 529,543, Sep. 18, 1995, Pat. No. 5,601,868. This application Oct. 3, 1996, Ser. No. 725,546

Claims priority, application Germany, Sep. 16, 1994, 44 33 048.0

Int. Cl.^{6} B05C *1/00*

U.S. Cl. 118—665 **10 Claims**



1. An apparatus for continuously applying a coating to a running web, comprising

(a) an elastic doctor blade having first and second ends, a frontal side and a reverse side opposite said frontal side; during operation said frontal side being oriented towards the web and said reverse side being oriented away from the web;

(b) a clamping device firmly holding said doctor blade by engagement therewith in a zone of said first end; said clamping device positioning said doctor blade for contacting the web at said second end along a scraping line;

(c) an inflatable actuator engaging said reverse side between said clamping device and said first end of said doctor blade; said actuator having a pressurized state in which a surface portion of said actuator is enlarged by an inflating fluid towards said reverse side for pressing said doctor blade against the web; said actuator including

(1) a guide sleeve having opposite first and second ends and an inner chamber;

(2) an elastic hose enclosing said guide sleeve;

(3) first and second clamping rings tightening said hose to said guide sleeve at said first and second ends, respectively;

(4) a nipple extending from said first clamping ring; and

(5) means for maintaining fluid communication between said nipple and said elastic hose;

(d) a fluid pressure source; and

(e) pressure control means for generating in said actuator periodic fluid pressure fluctuations of predetermined frequency and magnitude to impart corresponding oscillations to said doctor blade; said pressure control means being connected to said fluid pressure source and having a pressure line extending to said actuator; said nipple of said actuator being attached to said pressure line.

5,746,834

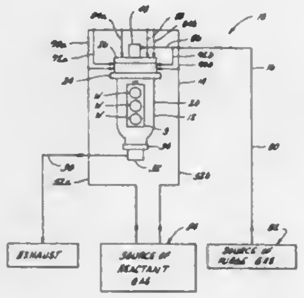
METHOD AND APPARATUS FOR PURGING BARREL REACTORS

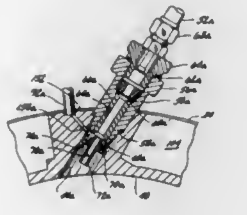
Thomas Martin Hanley, O'Fallon, Mo., assignor to MEMC Electronics Materials, Inc., St. Peters, Mo.

Filed Jan. 4, 1996, Ser. No. 582,650

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—715 **15 Claims**





1. A reactor for depositing a material on a semiconductor wafer by a chemical vapor deposition process using a reactant gas, said reactor comprising:

a shell defining a reaction chamber sized to receive at least one semiconductor wafer, said shell comprising a chamber vessel and a gas ring positioned adjacent the chamber vessel, the gas ring having a jet port cavity opening into said reaction chamber and extending away from the reaction chamber;

a reactant gas delivery system for delivering the reactant gas to the reaction chamber, said reactant gas delivery system comprising:

a) a nozzle positioned within the jet port cavity for directing the reactant gas into the reaction chamber;

b) a reactant gas source for storing the reactant gas prior to directing the reactant gas through the nozzle and into the reaction chamber; and

c) a reactant gas line extending between the reactant gas source and the nozzle for delivering the reactant gas to the nozzle; and

a purge gas delivery system including:

a) a purge gas port opening into said jet port cavity for directing the purge gas into the jet port cavity to purge the reactant gas from said cavity;

b) a purge gas source for storing a purge gas prior to directing the purge gas through the purge gas port and into the jet port cavity; and

c) means for delivering the purge gas from the purge gas source to the purge gas port for purging the jet port cavity.

5,746,835

RETRACTABLE PROBE SYSTEM WITH IN SITU FABRICATION ENVIRONMENT PROCESS PARAMETER SENSING

Terry R. Turner, Austin; James F. Belcher, Plano, and Gary W. Andrews, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

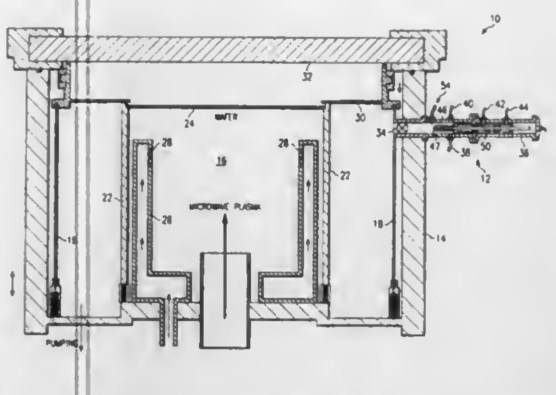
Filed Jun. 2, 1994, Ser. No. 252,817

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—723 MW **10 Claims**

1. A retractable probe for sensing in situ at predetermined process parameters of a semiconductor device fabrication environment, comprising:

a sensor for sensing a predetermined process parameters in situ;



an arm for holding said sensor and having sufficient length to extend said sensor into a predetermined location of the fabrication environment;

a housing for receiving said sensor and said probe arm;

an actuator mechanism for controllably locating said sensor and said probe arm within said fabrication environment and within said housing;

an isolator mechanism for isolating said sensor and said probe arm within said housing and essentially out of gaseous communication with fabrication environment; and

a cleaning mechanism for cleaning said sensor within said housing and permitting said sensor to be immediately thereafter located in the fabrication environment.

5,746,836

METHOD FOR REMOVING A PHOTOSENSITIVE LAYER FROM A PHOTOSENSITIVE DRUM

Hisayo Fukai, Tokyo, Japan, assignor to Oyentos Corporation, Japan

Division of Ser. No. 319,016, Oct. 6, 1994, abandoned. This application Jun. 19, 1996, Ser. No. 665,819

Claims priority, application Japan, Oct. 7, 1993, 5-251724; Sep. 28, 1994, 6-233231

Int. Cl.^{6} G03G *13/28;5/05*

U.S. Cl. 134—1 **16 Claims**

1. A method for separating and removing a photosensitive layer containing a binder resin from a photosensitive drum, comprising:

immersing the photosensitive drum in a remover consisting essentially of water and an dibasic diester capable of dissolving or swelling the binder resin in an oil-in-water dispersion.

5,746,837

PROCESS FOR TREATING AN ALUMINUM CAN USING A MOBILITY ENHANCER

Leslie M. Beck, Concord, and David A. Raney, Brookpark, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 447,891, May 23, 1995, abandoned, which is a division of Ser. No. 212,324, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 18,736, Feb. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 889,172, May 27, 1992, abandoned. This application Jan. 21, 1997, Ser. No. 786,407

Int. Cl.^{6} C23G *1/02*

U.S. Cl. 134—2 **17 Claims**

1. A process for conveying an aluminum can along a conveyor or trackwork comprising:

applying an effective amount of at least one mobility enhancer to the surface of said can to enhance the mobility of said can by decreasing the coefficient of static friction on an outside surface of said can to about 0.9 or less and providing a substantially 100% water-break-free surface, said mobility enhancer comprising water, a surfactant and the product made by the reaction of at least one carboxylic acid or acid-producing compound with ammonia, at least one amine, or at least one alkali or alkaline-earth metal; and

conveying said can along said conveyor or trackwork.

5,746,838

ENZYME COMPOSITIONS AND METHODS FOR CONTACT LENS CLEANING

Stanley W. Huth, Newport Beach, Calif., assignor to Allergan, Waco, Tex.

Division of Ser. No. 673,993, Jul. 1, 1996, Pat. No. 5,630,884, which is a division of Ser. No. 343,284, Nov. 22, 1994, abandoned, which is a continuation of Ser. No. 79,195, Jun. 17, 1993, abandoned. This application Nov. 22, 1996, Ser. No. 755,801

Int. Cl.^{6} B08B *3/08;* **C12S** *9/00*

U.S. Cl. 134—27 **15 Claims**

1. A method for cleaning a contact lens comprising:

contacting a contact lens in a liquid medium containing an acid acting enzyme component in an amount effective to remove debris from a contact lens located in said liquid medium, said liquid medium being weakly buffered at an acidic pH at which said acid acting enzyme component is active;

removing said contact lens from said liquid medium; and

directly placing said contact liens into an eye.

5,746,839

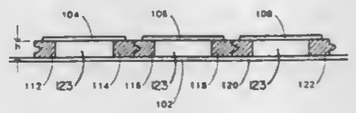
LIGHTWEIGHT, SELF-BALLASTING PHOTOVOLTAIC ROOFING ASSEMBLY

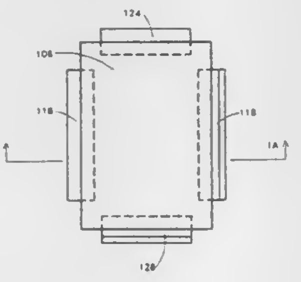
Thomas L. Dinwoodie, Berkeley, Calif., assignor to PowerLight Corporation, Berkeley, Calif.

Filed Apr. 8, 1996, Ser. No. 629,052

Int. Cl.^{6} E04D *13/18*

U.S. Cl. 136—251 **54 Claims**





1. A photovoltaic assembly comprising:

a photovoltaic module having sides and having upper and lower surfaces; and

a spacer secured to the lower surface of the photovoltaic module;

said spacer sized and configured to define:

an open region beneath said lower surface and

including access openings formed therein for fluidly coupling said open region to said upper surface;

said access openings extending along at least two sides of said photovoltaic module;

whereby wind uplift forces are resisted when said photovoltaic assembly is mounted to a support surface.

5,746,840

PROCESS FOR PREPARING ENANTIOMERICALLY PURE 6-(4-CHLOROPHENYL) (1 H-1,2,4-TRIAZOL-1-YL) METHYL)-1-METHYL-1 H-BENZOTRIAZOLE

Albert Louis Anna Willemsens, Beerse; Walter Louis Antoine Verstappen, Kontich; Alex Herman Copmans, Lille; Anna Maria Jozefa Vandenriessche, Oostmalle; Alfons Gaston Maria De Knaep, Turnhout, all of Belgium, and Marc Gaston Venet, Le Mesnil Esnard, France, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

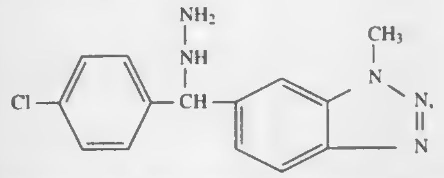
Division of Ser. No. 424,295, Apr. 18, 1995, Pat. No. 5,663,354. This application Mar. 28, 1997, Ser. No. 827,204

Claims priority, application European Pat. Off., Nov. 10, 1992, 92203443

Int. Cl.^{6} C07D *249/18*

U.S. Cl. 548—257 **1 Claim**

1. Intermediate of formula


(VII)

the racemic mixture, the enantiomerically pure forms and the acid addition salt forms thereof.

5,746,841

PROCESS FOR PASSIVATING TREATMENT OF PIPING SYSTEM FOR HIGH-PURITY GAS

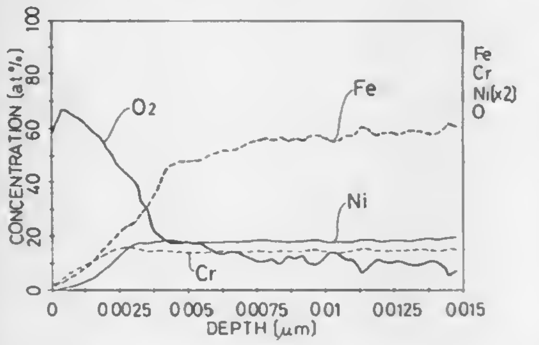
Kunihiko Koike, and Goichi Inoue, both of Moriyama, Japan, assignors to Iwatani Sangyo Kabushiki Kaisha Iwatani International Corporation, Osaka, Japan

Filed Mar. 8, 1996, Ser. No. 612,644

Claims priority, application Japan, Jan. 17, 1996, 8-005327

Int. Cl.^{6} C23C *8/12*

U.S. Cl. 148—280 **4 Claims**



1. A process for passivating a piping system, which process comprises forming an oxide passivation film on a metal surface of the piping system by exposing an electrolytically polished or electrolytically combination-polished metal surface to a gas containing at least 50 VOL % ozone within the temperature range of room temperature to about 60° C.

5,746,842

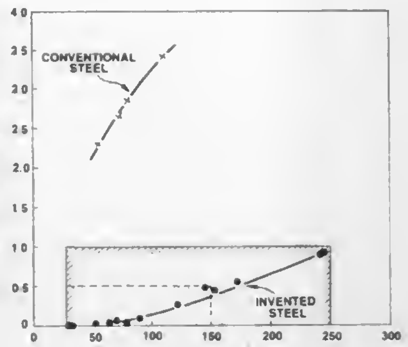
STEEL GEAR

Toyoaki Eguchi, Izumi-ku, and Hiroshi Majima, Aoba-ku, both of Japan, assignors to Toa Steel Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1995, Ser. No. 536,997

Int. Cl.^{6} C22C *38/22;38/44*

U.S. Cl. 148—319 **77 Claims**



1. A steel gear having been carburized on a quenched said steel gear formed from a steel composition consisting essentially of: 0.1 to 0.35 wt. % C, 0.5 to 2.5 wt. % Si, 0.2 to 2.5 wt. % Mn, 0.01 to 2.5 wt. % Cr, 0.01 to 0.7 wt. % Mo, and the balance being Fe and inevitable impurities;

said steel composition having an Ac_3 point parameter (Ac_3) of 850° to 960° C. and an ideal critical diameter (D_I) of 30 to 250 mm, the Ac_3 point parameter (Ac_3) and the ideal critical diameter (D_I) being defined by the following equations;

$$A_3=920-203\sqrt{C}+44.7\times Si+31.5\times Mo-30\times Mn-11\times Cr$$

$$D_I=7.95\sqrt{C}(1+0.70\times Si)\ (1+3.3\times Mn)\ (1+2.16\times Cr)\ (1+3.0\times Mo),$$

said steel gear having a non-carburized internal structure comprising martensite and 10 to 70 area % ferrite in a dual phase; and

said steel gear having a distortion of a Navy C specimen of 1% or less.

5,746,843

LOW MN-LOW CR FERRITIC HEAT RESISTANT STEEL EXCELLENT IN STRENGTH AT ELEVATED TEMPERATURES

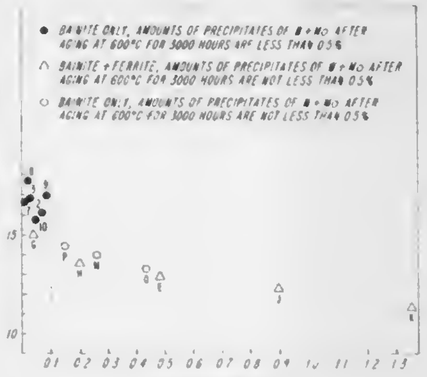
Kaori Miyata; Masaaki Igarashi, both of Osaka; Fujimitsu Masuyama, Nagasaki; Nobuyoshi Komai, Nagasaki, and Tomomitsu Yokoyama, Tokyo, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, and Mitsubishi Jukogyo Kabushiki Kaisha, Tokho, both of Japan

Filed Feb. 10, 1997, Ser. No. 799,041

Claims priority, application Japan, Feb. 10, 1996, 8-048130

Int. Cl.^{6} C22C *38/22;38/44*

U.S. Cl. 148—335 **19 Claims**



1. A low Mn-low Cr ferritic heat resistant steel excellent in high temperature strength consisting essentially of, in weight %:

0.02–0.20% C,	up to 0.7% Si	less than 0.1% Mn,
up to 0.8% Ni,	0.8–3.5% Cr,	0.01–3.0% W,
0.1–0.5% V,	0.01–0.20% Nb,	0.001–0.05% Al,
0.0005–0.05% Mg,	0.0005–0.01% B,	less than 0.05% N,
up to 0.03% P,	up to 0.015% S,	0.001–0.05% Ti,

-continued

and the balance Fe and incidental impurities, wherein the B content is defined so as to satisfy the following formula:

$$\begin{aligned}(14/11)B > N - N(V/51)/\{(C/12)+(N/14)\} -\\ N(Nb/93)/\{(C/12)+(N/14)\} -\\ N(Ti/48)/\{(C/12)+(N/14)\}.\end{aligned}$$

5,746,844

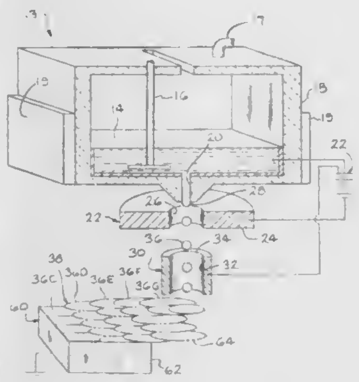
METHOD AND APPARATUS FOR CREATING A FREE-FORM THREE-DIMENSIONAL ARTICLE USING A LAYER-BY-LAYER DEPOSITION OF MOLTEN METAL AND USING A STRESS-REDUCING ANNEALING PROCESS ON THE DEPOSITED METAL

Robert A. Sterett, Jackson, and Atul M. Sudhalkar, Ann Arbor, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Sep. 8, 1995, Ser. No. 525,924

Int. Cl.^{6} B06B *1/20*

U.S. Cl. 148—522 **8 Claims**



1. A method for the accurate formation of a free-form three-dimensional article without the use of a mold of the three-dimensional article, the method comprising:

providing a supply of substantially uniform size droplets of a desired molten or semimolten metal material, each droplet having the same positive or negative charge,

aligning each droplet in the supply of droplets into a substantially single file stream, the droplets being aligned by allowing the droplets to pass through at least one alignment means, the alignment means having the same charge as the droplets wherein the alignment means repels each droplet toward an axis extending through the alignment means,

depositing each of the aligned droplets in a pattern defining a shape of the three-dimensional article onto a target, the droplets being deposited onto the target along the axis extending longitudinally through the alignment means wherein the axis is substantially perpendicular to a top surface of the target, the deposited droplets forming at least one layer of the three-dimensional article, wherein the three-dimensional article comprises a plurality of the layers of the deposited droplets, and

reducing stress in the deposited droplets by annealing the deposited droplets as the deposited droplets form the newly formed layer of the three-dimensional article, by using a source of laser energy to reduce the stress in the deposited droplets.

5,746,845

METHOD FOR MANUFACTURING HIGH-STRENGTH MEMBER OF PRECIPITATION HARDENING MARTENSITIC STAINLESS STEEL

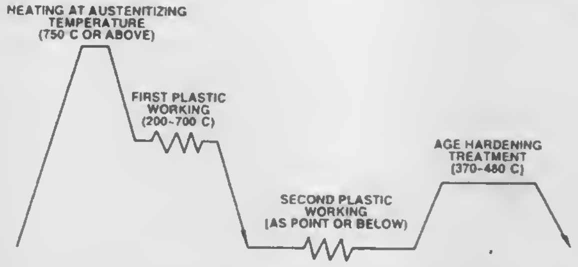
Hiroaki Yoshida, Tokai, and Sachihiro Isogawa, Nagoya, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 27, 1995, Ser. No. 534,308

Claims priority, application Japan, Sep. 30, 1994, 6-261018

Int. Cl.^{6} C21D *8/00*

U.S. Cl. 148—587 **8 Claims**


HEATING AT AUSTENITIZING TEMPERATURE (750 C OR ABOVE)
FIRST PLASTIC WORKING (200-700 C)
SECOND PLASTIC WORKING (AS POINT OR BELOW)
AGE HARDENING TREATMENT (370-480 C)

1. A method for manufacturing a high-strength member which comprises the steps of:

heating precipitation hardening martensitic stainless steel at an austenitizing temperature:

performing first plastic working for said stainless steel at a temperature between 200° C. and 700° C.;

cooling the stainless steel at a temperature not higher than Ms point;

performing second plastic working for the stainless steel at a temperature not higher than As point; and

conducting age hardening treatment for said stainless steel at a temperature between not lower than 370° C. and lower than 480° C.

5,746,846

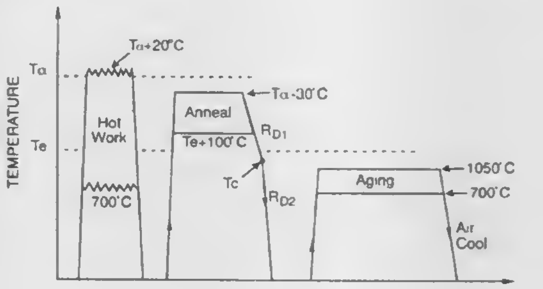
METHOD TO PRODUCE GAMMA TITANIUM ALUMINIDE ARTICLES HAVING IMPROVED PROPERTIES

Young-Won Kim, Dayton, and Dennis M. Dimiduk, Beavercreek, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 379,860, Jan. 27, 1995, Pat. No. 5,558,729. This application May 28, 1996, Ser. No. 652,679

Int. Cl.^{6} C22F *1/18*

U.S. Cl. 148—671 **3 Claims**

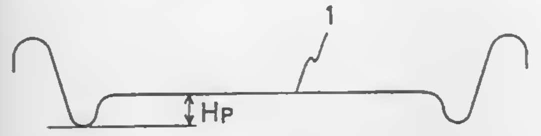


1. A method to produce duplex microstructure in an article of tungsten-containing gamma titanium aluminide alloy, which comprises the steps of: (a) hot working the article, (b) annealing said article at an annealing temperature in the range of T_e+100° C. to T_α−30° C. for about 1 to 15 hours, (c) cooling said article from said annealing temperature to an aging temperature in the range of 700° to 1050° C. at a cooling rate of about 5 to 1000° C./min, and (d) aging said article at said aging temperature for about 2 to 150 hours.

5,746,847
ALUMINUM ALLOY SHEET FOR EASY-OPEN CAN ENDS HAVING EXCELLENT CORROSION RESISTANCE AND AGE SOFTENING RESISTANCE AND ITS PRODUCTION PROCESS

Hiroki Tanaka, Osaka; Hiroyuki Mizutani; Midori Narita, both of Toyoake, and Koichi Takada, Aichi, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,413
Claims priority, application Japan, Jul. 12, 1995, 7-199121
Int. Cl.^{6} C22C *21/00*
U.S. Cl. 148—692 **4 Claims**

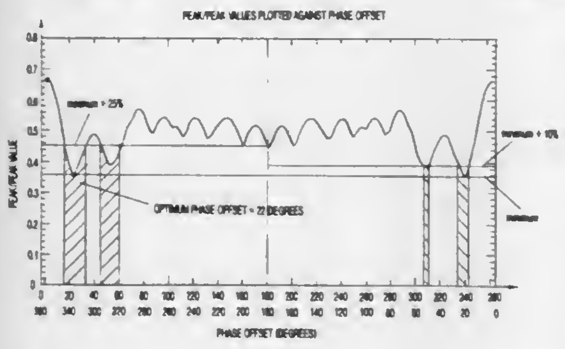


4. A coated aluminum alloy can end having excellent corrosion and age softening resistance, said can end being of size 204 and having a panel height of 2.3 mm, said can end being made from a sheet of an aluminum alloy coated with an organic resin, said aluminum alloy comprising from 3.0–3.6 wt. % Mg, more than 0.5 to not more than 1.0 wt. % Mn, 0.2–0.6 wt. % Cu, 0.05–0.4 wt. % Fe and the balance being aluminum and having an electrical conductivity of 30–32% IACS after heating at 260° C. and a yield strength of at least 320 MPa, the ratio of decrease in buckling strength of the can end being less than 10% after heating for 30 minutes at 120° C. the buckling strength being determined by seaming the can end with a can body, clamping the seamed portion of the can end and applying an internal pressure until the periphery of the can end begins to deform polygonally.

5,746,848
PROFILED VEHICLE TIRE AND METHOD FOR DIMENSIONING THE OPTIMUM PHASE OFFSET BETWEEN ADJACENT TREAD PORTIONS

Thomas Schulze, Hanover; Geert Roik, Cremlingen; Michael Hahn, Hanover, and Klaus Kleinhoff, Rodenberg, all of Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany

Filed Sep. 27, 1994, Ser. No. 313,891
Claims priority, application Germany, Sep. 27, 1993, 43 32 811.3
Int. Cl.^{6} B60C *113/00*
U.S. Cl. 152—209 R **10 Claims**



1. In a vehicle tire having a profiled tread with at least two axially adjacent tread parts, on the periphery of which are arranged pitches of at least two different pitch lengths, with successive pitches in each tread part forming a pitch sequence, wherein said pitch sequences of said at least two tread parts are offset relative to one another by a phase offset beta, the improvement wherein:

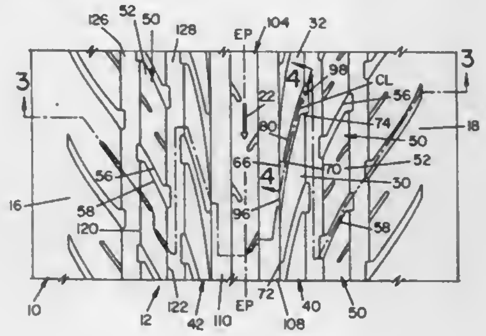
said phase offset beta is defined by:

- a) obtaining for each of said tread parts a mathematical function from said pitch sequence thereof by:
  - 1) taking a random pitch of said pitch sequence as the first pitch, the next following pitch as the second pitch, the next following pitch as the third pitch, and so on for all remaining pitches of said pitch sequence, and
  - 2) plotting a graph of pitch length on the ordinate versus pitch on the abscissa for the entire pitch sequence such that, in the interval between zero and the end of the first pitch, the graph has an ordinate value constantly equal to the length of the first pitch, in the interval between the end of the first pitch and the end of the second pitch, the graph has an ordinate value constantly equal to the length of the second pitch, and so on for all remaining pitches of said pitch sequence, wherein the graph defines the mathematical function;
- b) defining a representation of each of said functions as a synthesis in proper amplitude and phase-relation of a harmonic analysis of said function from a first to an xth harmonic with x being an integer between 8 and 14;
- c) for a given phase offset beta, plotting a graph of a combined representation of said functions and then reading from the ordinate of said graph the distance between absolute extremes of said combined representation, wherein said combined representation equals a summation of the representations with each representation weighted by a weighting factor, with the sum of the weighting factors equaling 1;
- d) repeating step c) at a plurality of phase offset betas and for each of said phase offset betas plotting on a graph the distance between the absolute extremes of the combined representation versus the phase offset beta; and
- e) from the graph of step d), determining a minimum distance between the absolute extremes and reading off a phase offset beta value that corresponds to a distance between absolute extremes which is at most 10% greater than said minimum distance, wherein this read-off value defines said phase offset beta.

5,746,849
TIRE TREAD INCLUDING TIE BAR

David Dean Hutson; Christopher Paul Johenning, both of Akron; John Janis Taube, Tallmadge, and Terry John Waibel, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 11, 1995, Ser. No. 570,305
Int. Cl.^{6} B60C *103/04;115/00*
U.S. Cl. 152—209 R **8 Claims**

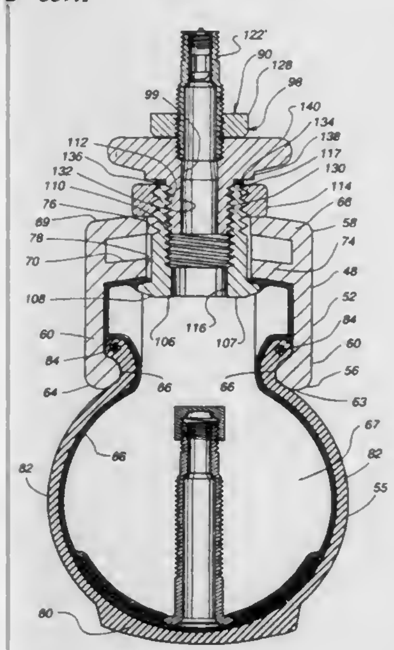


1. A pneumatic tire having an equatorial centerline and a tread, said tread having first and second circumferentially aligned wedge-shaped tread elements positioned between first and second circumferential grooves, each of said tread elements having a ground contacting surface and spaced lateral edges defining a tread element width, a stiffness of each of said tread elements increasing from said lateral edge nearest said equatorial centerline to said other lateral edge, each wedge shaped tread element having a circumferentially extending linear base defining said other lateral edge, a first curved inclined side and a second curved inclined side, said tread further having a tie bar extending between said first and second tread elements, said tie bar being inclined and having a centerline making an angle between 0 degrees and 20 degrees with said equatorial centerline, said tie bar having first and second spaced lateral edges defining a tie bar width, said tie bar width being essentially equal to said tread element width, said tie bar having a radial height decreasing from said first lateral edge to said second lateral edge.

5,746,850
DOUBLE INNER TUBE AND VALVE SYSTEM

Marcus P. Luscher, P.O. Box 1836, Nederland, Colo. 80466, and Stephen F. Ridley, 600 Arapahoe Ave., No. 6, Boulder, Colo. 80302

Filed Apr. 26, 1996, Ser. No. 638,549
Int. Cl.^{6} B60C *5/22;17/01*
U.S. Cl. 152—339.1 **15 Claims**



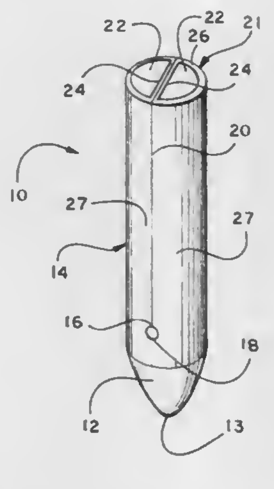
1. An inner tube for use in a wheel assembly, said wheel assembly including a generally circular rim having a pair of spaced flanges forming an outwardly open annular well therearound and an aperture through the rim, a tire mounted on said rim so as to define an annular cavity in conjunction with said rim, said inner tube being positionable in said cavity between said rim and said tire, said inner tube comprising:

- an inflatable portion having an inflatable primary tube positioned radially outward and concentrically surrounding an inflatable secondary tube, said primary and secondary tubes having a common wall; said primary tube positionable adjacent to said tire and said secondary tube positionable within said well between said primary tube and said rim when said inner tube is disposed in said cavity;
- a valve assembly attached to said inflatable portion for insertion through said aperture in said rim when said inner tube is installed in said cavity, said valve assembly comprising:
  - a primary valve connected to said common wall and in fluid communication with said primary tube for inflation of said primary tube;
  - a secondary valve member for insertion through said aperture when said inner tube is installed between said rim and said tire in said cavity, said secondary valve member connected to a wall of said secondary tube and being in fluid communication with said secondary tube wherein said primary valve is slidably receivable in said secondary valve member in order to inflate said primary tube; and
  - a secondary valve removably attachable to said secondary valve member for inflating said secondary tube, said valve assembly being selectively configurable to inflate said primary tube or said secondary tube depending on whether said primary valve is slidably received in and extends outwardly through said secondary valve member or said primary valve is not slidably received and said secondary valve is attached to said secondary valve member.

5,746,851
TIRE REPAIR APPARATUS

James L. Smith, 1435 White City Dr., Canton, Ga. 30114

Filed Mar. 11, 1996, Ser. No. 613,900
Int. Cl.^{6} B29C *73/08;73/06*
U.S. Cl. 152—370 **8 Claims**



1. A tire repair plug for insertion into an injury in a tire and plugging of said injury, comprising:

- a cylindrical stem with a trailing end and a conical head at a leading end;
- a transverse slit in said cylindrical stem, said transverse slit extending through and along the length of said cylindrical stem to a location spaced inwardly from said conical head; and
- a transverse bore through said stem communicating along its length with a bottom edge of said transverse slit.

8. A method for repairing a injury in a tire comprising the steps of:

- preparing said injury by enlarging said injury to a generally circular configuration;
- coating with vulcanizing cement outside walls and inside walls of a cylindrical stem of a tire plug, said tire plug comprising:
  - a cylindrical stem with a leading and a trailing end;
  - a transverse opening in said cylindrical stem;
  - a transverse slit in said cylindrical stem, said transverse slit extending from said transverse opening to said trailing end of said cylindrical stem, said transverse slit bisecting said cylindrical stem such that the cross-section of said bisected portion of the cylindrical stem is two semi-circles and such that said bisected portion of the cylindrical stem has two parallel inner walls, said walls extending from said transverse opening to said trailing end of said cylindrical stem;
  - cushion gum sheet attached to the outside of said cylindrical stem and attached to the inner walls;
  - a conical head attached to said leading end of said cylindrical stem
- placing said tire plug on an insertion tool, said insertion tool comprising a shaft and a transverse bar attached to an extending end of said shaft;
- said bar being adapted to be received within said slit such that when said stem is aligned with said injury, pressure exerted on said bar through said shaft urges said conical head into said injury,
- stretching said tire plug on said insertion tool until a diameter of said tire plug is less than a diameter of said injury;
- pushing said tire plug into said injury with said insertion tool;
- releasing said tire plug from said insertion tool such that said diameter of said tire plug increases to a size larger than said diameter of said injury; and
- removing said insertion tool back through said slit in said tire plug.

5,746,852

MOTORCYCLE RADIAL TIRE WITH RUBBER MEMBER BETWEEN CARCASS PLIES

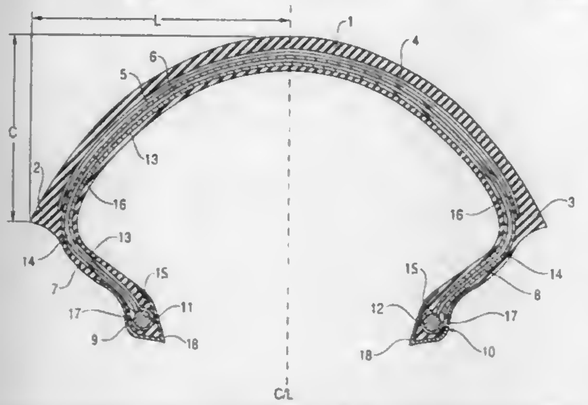
David Robert Watkins; Nigel Gerard Nock, both of Sutton Coldfield, and Michael Jackson, Birmingham, all of England, assignors to Sumitomo Rubber Industries Limited, Hyogo, Japan

Filed Sep. 20, 1995, Ser. No. 530,888

Claims priority, application United Kingdom, Sep. 21, 1994, 9418963

Int. Cl.^{6} B60C *3/04;9/02;9/14;15/00*

U.S. Cl. 152—454 **9 Claims**



1. A motorcycle tire comprising a tread reinforced between its edges by a breaker assembly and having in its normally inflated fitted condition a camber value C/L being a ratio between the radial distance C from the center to the edge of the tread and the axial distance L between the center and the edge of the tread of between 0.5 to 0.7, a reinforcing carcass ply of rubber covered cords radially inside the breaker assembly and extending between two bead regions and wrapped in each bead region around an annular bead core to form carcass ply turn-ups, and tire sidewalls between the tread edges and bead regions, wherein under the tread is disposed radially inward of the breaker assembly and radially outwardly of the carcass ply a secondary carcass ply of rubber covered cords and between the carcass ply and the secondary carcass ply is disposed a rubber member extending from tread edge to tread edge, the rubber member having a substantially constant cross-sectional thickness between 0.4 and 1.6 mm, wherein

- the rubber member continues from the tread edges to the respective bead region,
- the secondary carcass ply extends from the tread to each bead region,
- the rubber member extends from the bead core in each bead region.

5,746,853

RADIAL HEAVY-DUTY TRUCK TIRE WITH CROWN REINFORCEMENT HAVING A MULTIPARTITE PLY

Laurence Burlacot, Riom, France, assignor to Compagnie Générale des Etablissements Michelin - Michelin Cie, Clermont-Ferrand Cedex, France

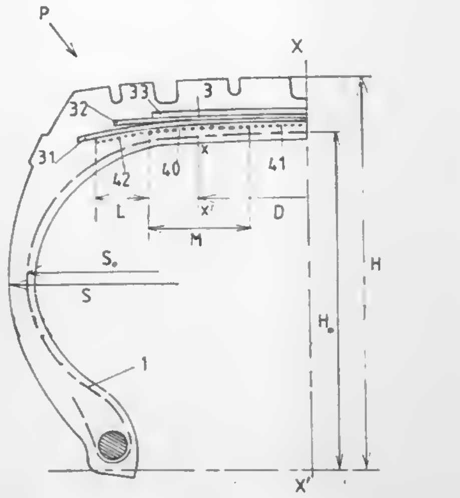
Filed Nov. 4, 1996, Ser. No. 743,559

Claims priority, application France, Nov. 8, 1995, 95 13304

Int. Cl.^{6} B60C *9/18;9/20;9/22;9/28*

U.S. Cl. 152—531 **5 Claims**

1. A tire, having a radial carcass reinforcement surmounted radially by a crown reinforcement comprising at least two work crown plies of inextensible metal cords which are crossed from one ply to the next, making angles of between 10° and 45° with the circumferential direction XX', and two limiting blocks each composed of at least one ply of metal cords oriented with respect to the circumferential direction XX' at an angle of between 0° and 10°, said blocks being arranged in two separate regions on either side of the equatorial plane XX', and radially between the carcass reinforcement and the radially outermost work crown ply, the tire characterized in that the two limiting blocks are axially joined together by a reinforcement which is composed of at least one ply of circumferentially oriented textile or metal cords centered on the equatorial plane XX', the tensile rigidity per unit width of the reinforcement, measured in the direction of the cords, being, in the field of operation of the tire, at most equal to 0.5 times the tensile rigidity, measured under the same conditions, of the most extensible ply of the limiting blocks.



5,746,854

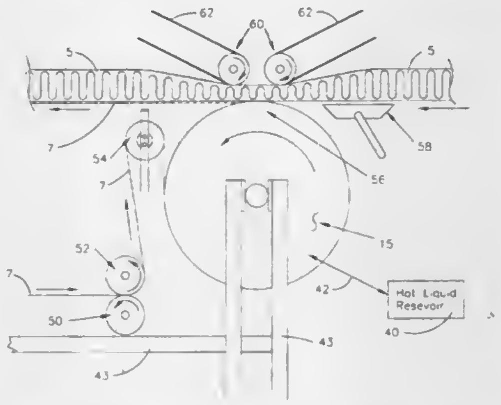
METHOD OF MAKING MINERAL FIBER INSULATION BATT IMPREGNATED WITH COEXTRUDED POLYMER LAYERING SYSTEM

Gary E. Romes, Cincinnati, Ohio; Joseph T. Church, Memphis, Tenn.; Steven Sanford, Albion, Mich., and Robert W. Syme, King City, Canada, assignors to Guardian Fiberglass, Inc., Albion, Mich.

Filed Jul. 22, 1996, Ser. No. 686,049

Int. Cl.^{6} B32B *17/02;31/20*

U.S. Cl. 156—62.2 **7 Claims**



1. A method of impregnating a fiberglass substrate with a polymer based layering system, the method comprising the steps of:

- (i) providing an insulating fiberglass substrate having a density of from about 0.3 to 6.0 lbs. per cubic foot;
- (ii) providing a polymer based layering system having first and second layers, the first layer having a melting point less than the second layer;
- (iii) feeding the polymer based layering system around the periphery of a heated drum or roller with the second layer contacting the periphery of the heated drum or roller so that the first layer is caused to become tacky or melt to some extent due to the heat generated from the heated drum or roller;
- (iv) causing the heated first layer of the polymer based layering system on the heated drum or roller to contact the fiberglass substrate so as to impregnate the fiberglass substrate with the layering system;
- (v) following said step (iv), feeding the fiberglass impregnated with the polymer based layering system away from the heated drum or roller thereby allowing the impregnation to cure;

- (vi) providing a pair of tension control rollers with a nip therebetween through which the layering system is fed prior to reaching the heated drum or roller;
- (vii) driving the heated drum or roller at a first speed; and
- (viii) operating the tension control rollers at a second speed so that the layering system travels faster through the nip between the tension control rollers than it does around the periphery of the heated drum or roller.

5,746,855

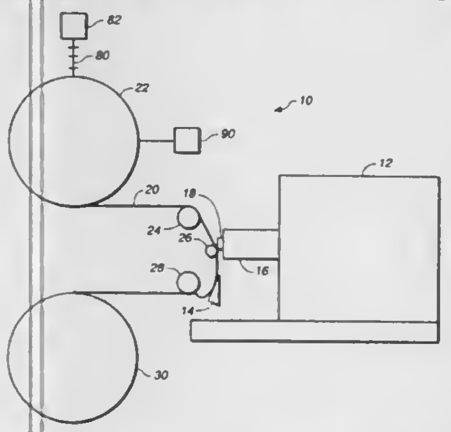
METHOD AND APPARATUS FOR AUTOMATIC ARCHIVAL STORAGE OF TISSUE SAMPLE SECTIONS CUT FROM A SAMPLE BLOCK

Michael Bolles, Sausalito, Calif., assignor to Advanced Pathology Systems, Inc., Mill Valley, Calif.

Filed Oct. 24, 1996, Ser. No. 738,976

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—64 **14 Claims**



11. A method for automatic archival storage of tissue sample sections cut by a microtome blade from a tissue sample block having an exposed surface, said method comprising the steps of:

- providing a length of section-storing tape having a surface bearing serially-spaced adhesive areas separated by non-adhesive areas, said adhesive areas being generally the same size as the tissue sample block exposed surface;
- placing one of said adhesive areas onto the tissue sample block exposed surface;
- cutting a section from the tissue sample block with the microtome blade; and
- lifting said section-storing tape with the section cut from said tissue sample block away from the microtome blade.

5,746,856

METHOD OF ULTRASONICALLY WELDING ARTICLES OF POROUS POLYTETRAFLUOROETHYLENE

William J. Hendershot; Michael L. McDonald, and Vivian J. Timian, all of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

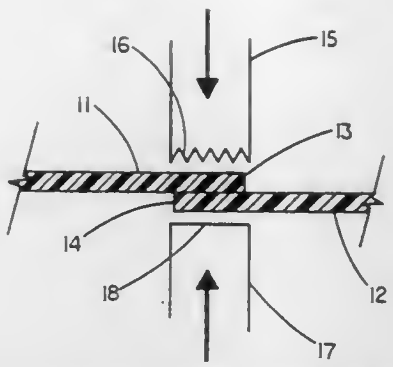
Division of Ser. No. 316,054, Sep. 30, 1994, abandoned, which is a continuation of Ser. No. 116,475, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 866,673, Apr. 10, 1992, abandoned. This application Apr. 24, 1996, Ser. No. 637,313

Int. Cl.^{6} B32B *31/16*

U.S. Cl. 156—73.4 **12 Claims**

1. A method of welding together sheets of porous polytetrafluoroethylene material, comprising:

- a) overlapping adjacent edges of two sheets of porous polytetrafluoroethylene;
- b) placing the overlapped adjacent edges between an ultrasonic welding horn and a metal anvil;
- c) compressing the overlapped adjacent edges between the ultrasonic welding horn and the metal anvil while limiting the distance between the ultrasonic welding horn and the metal anvil in such a way as to retain porosity within the overlapped edges of the two sheets of porous polytetrafluoroethylene; and
- d) applying ultrasonic energy to the ultrasonic horn for a time sufficient to weld together the overlapped adjacent edges such that the polytetrafluoroethylene material of the welded edges is porous having a density less than about 2.0 g/cc after welding.



5,746,857

SEMI-TRANSMISSIVE SEMI-REFLECTIVE FILM LAMINATE AND A METHOD OF PRODUCTION THEREFOR

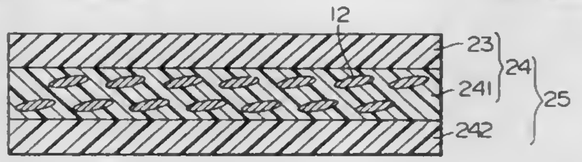
Chikara Murata; Shinichi Takahashi, and Mitsuhiro Yoshida, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Division of Ser. No. 390,318, Feb. 17, 1995, abandoned. This application Sep. 23, 1996, Ser. No. 710,882

Claims priority, application Japan, Feb. 18, 1994, 6-021532; Dec. 26, 1994, 6-323428; Dec. 26, 1994, 6-323429

Int. Cl.^{6} C03C *27/12;* **G02F** *1/1335;* **B32B** *31/12;* **B29C** *41/22*

U.S. Cl. 156—102 **15 Claims**



1. A production method for the preparation of a semi-transmissive semi-reflective film laminate consisting of a polarizing film and a semi-transmissive semi-reflective layer comprising a light transmissive resin and angled pearl pigments, comprising the step of forming a coated layer containing a solution for said semi-transmissive semi-reflective layer, the average of the angle of orientation of the pearl pigments being set to less than 30° by means of providing shearing stress to the coated layer, said angle of orientation being between the longitudinal axis of the pearl pigments and a line parallel to the planar direction of said polarizing film whereby incident light is reflected with regularity in a fixed direction.

5,746,858

METHOD OF AFFIXING TRIM STRIP FOR WINDSHIELD INSTALLATION

Bradley M. Finkbeiner, Ann Arbor, Mich., assignor to James M. Deimen, Pinckney, Mich.

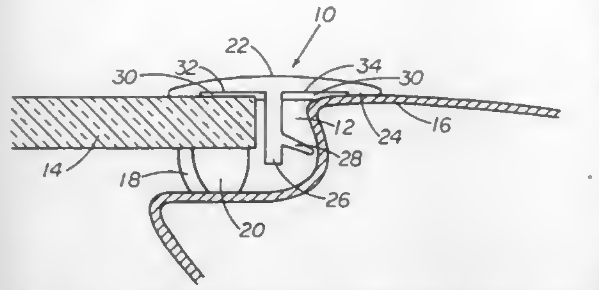
Filed May 24, 1995, Ser. No. 448,804

Int. Cl.^{6} B60J *10/02*

U.S. Cl. 156—108 **1 Claim**

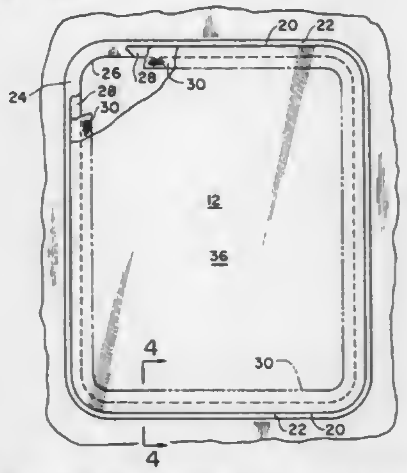
1. A method of installing a windshield comprising the steps of,

- placing a dam on a vehicular body,
- disposing an adhesive bead adjacent the dam leaving a space between the bead and a wall of the vehicular body,
- placing the windshield on the adhesive bead.



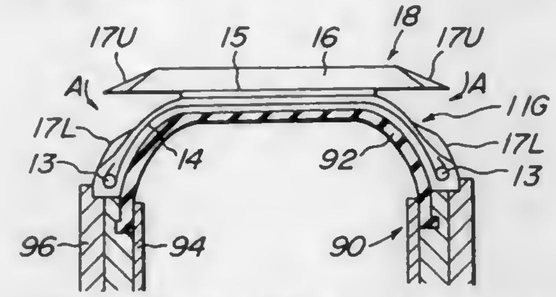
removing cover strips protecting two sided tape on either side of a depending stem on the underside of a trim strip, the depending stem having a downwardly canted appendage,
positioning the trim strip to adhere one of the two sided tapes to the windshield and another of the two sided tapes to the vehicular body whereby the depending stem of the trim strip extends into the space between the bead and the wall of the vehicular body and the downwardly canted appendage on the depending stem clears debris from the space thereby allowing the space to be clear for thermal contraction and expansion.

5,746,859
STATIONARY MOTOR VEHICLE WINDOW
Peter Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570
Filed Dec. 24, 1996, Ser. No. 772,773
Int. Cl.⁶ B60J *1/00;* **E06B** *3/00*
U.S. Cl. 156—108 **2 Claims**



1. A method of installing a stationary window in a motor vehicle in the installation of which a slightly undersized window is bonded in place on a horizontally oriented flange in a slightly oversized window opening bounded by a vertically oriented flange extending outboard of said horizontally oriented flange and using urethane in an interposed position between a peripheral edge of said window and said horizontally oriented flange, said window installing method comprising the steps of providing a barrier in encircling relation about a peripheral edge of said window using a tape of urethane-inert construction material in adhesively attached relation oriented transversely of said window peripheral edge, depositing a first amount of urethane in a viscous condition on an interior surface of said window using said barrier as a guide to position said deposited urethane inboard and in adjacent position to said tape and window interior surface, establishing said tape and adjacent urethane deposit as an edge support for said window by orienting said edge support in depending relation to said window interior surface, supporting said window on said depending edge support upon said horizontally oriented flange within said window opening bounded by said vertically oriented flange, depositing a second amount of urethane upon said first urethane deposit effective to establish surface contact of said deposited urethane with said interior window surface and said horizontally oriented flange, and after curing of said urethane manually removing said tape serving as said barrier using the clearance provided by the oversized and undersized relation of said window opening and window, whereby said stationary window is permanently bonded in place with an enhanced appearance of an unencapsulated peripheral edge.

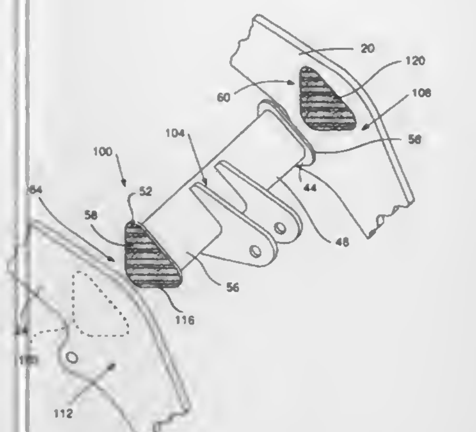
5,746,860
METHOD OF BUILDING GREEN TIRES FOR LOW-SECTION PROFILE PNEUMATIC RADIAL TIRES
Sadao Moriyama, Musashimurayama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Continuation of Ser. No. 420,474, Apr. 12, 1995, abandoned. This application Dec. 17, 1996, Ser. No. 767,856
Claims priority, application Japan, Apr. 12, 1994, 6-073082; Apr. 12, 1994, 6-073083; Mar. 10, 1995, 7-051001
Int. Cl.⁶ B29D *30/30;30/72*
U.S. Cl. 156—111 **4 Claims**



1. A method of building a green tire for a low-section profile pneumatic radial passenger car tire having a radial carcass of at least one rubberized ply toroidally extending between bead cores embedded in a pair of bead portions, a belt superimposed about a crown portion of the carcass, a tread rubber arranged on the belt, a pair of sidewall rubbers each extending from each side end of the tread rubber to an upper position of each of the bead portions and having an aspect ratio of not more than 55%, said sidewall rubber made from a different rubber material than said tread rubber, which method comprises:
separately providing an uncured inner sidewall rubber segment and an uncured outer sidewall rubber segment, which segments correspond respectively to an inner portion and an outer portion of each sidewall rubber of the tire after vulcanization in a radial direction thereof to satisfy a condition where an end of a parting face between said inner and outer segments located on an outer surface of the sidewall rubber is not more than ½ of a section height of the tire;
sticking the uncured inner sidewall rubber segment on a cylindrical green case having already assembled thereon an uncured carcass ply member, a rubber chafer and an uncured bead core member at a first building step;
toroidally expanding and deforming the green case by narrowing a distance between the uncured bead core members; and
sticking an uncured belt member and an uncured tread rubber member on an outer periphery of the toroidally deformed green case at a second building step, in which the uncured outer sidewall rubber segment which is integrally united to each side face of the uncured tread rubber member is then stuck on the uncured inner sidewall rubber segment of the green case to form a unified sidewall rubber member.

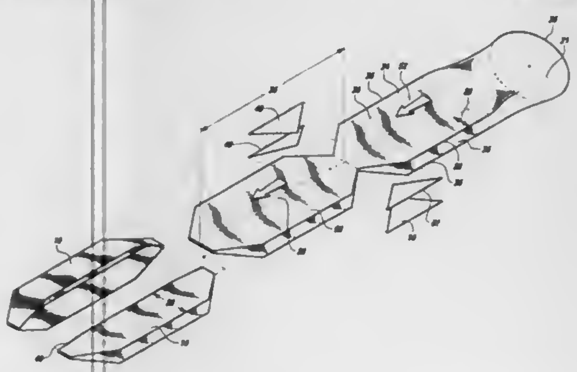
5,746,861
METHOD OF MANUFACTURING A STRUCTURAL PORTION OF A CONSTRUCTION MACHINE
Stephane L. Mandon, LaMurette, France, assignor to Caterpillar Inc., Peoria, Ill.
Filed Sep. 6, 1996, Ser. No. 706,622
Int. Cl.⁶ B32B *15/00;1/00*
U.S. Cl. 156—182 **7 Claims**

1. A method of manufacturing a structural portion of a construction machine, comprising the steps of:



assembling a first structural member to define a first modular component including welding a first plate at a first end of the first structural member;
assembling a second structural member to define a second modular component;
machining the second modular component within a plurality of predetermined dimensional characteristics; and
bonding the first modular component at the first end to the second modular component by applying an adhesive to the first plate to define a joint capable of withstanding a total force greater than 2000000N in shear stress.

5,746,862
METHOD OF MAKING A LINER FOR ROLL-OFF WASTE CONTAINERS
Norwin C. Derby, Dallas, Tex., assignor to Super Sack Mfg. Corp., Dallas, Tex.
Filed Oct. 26, 1995, Ser. No. 548,760
Int. Cl.⁶ B31B *33/60;* **B32B** *31/02*
U.S. Cl. 156—198 **6 Claims**

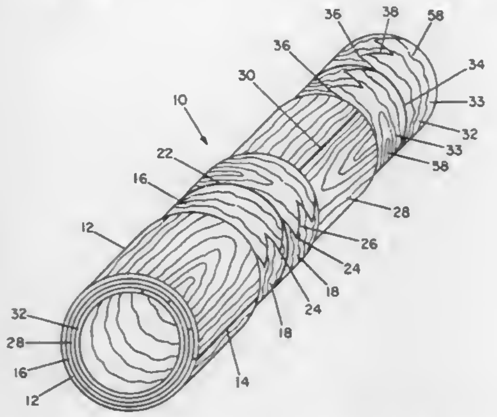


1. A continuous method for manufacture of a series of liners for a roll-off waste container, each of said liners having a first end and a second end, said method comprising the steps of:
- a. extruding a tube of polymeric material having a continuous sidewall, interior and exterior surfaces, and a radius predetermined as a function of height and width dimensions of the roll-off waste container;
- b. forming two parallel horizontal gussets from the sidewall of the tube, one on each side of the extruded tube,
  - said gussets projecting inwardly equidistant from sides of the extruded tube a distance predetermined as a function of the width of the roll-off waste container,
  - said distance of projection of the gussets having a maximum distance such that the two parallel horizontal gussets do not cross a longitudinal centerline of the tube and do not overlap,
  - said gussets having an upper side and a lower side;
- c. flattening the tube and the parallel gussets into a substantially flat workpiece.
  - said workpiece having a longitudinal centerline, a top side and a bottom side, a gusset to the right of the centerline and a gusset to the left of the centerline, a first end and a second end and an interior surface and an exterior surface;
- d. heat sealing a first portion of the top right side of the workpiece to a first portion of the upper side of the right gusset at a 45 degree angle to the centerline of the workpiece, wherein a heat sealing and cutting apparatus starts at the exterior of the workpiece and proceeds inwardly to the centerline of the workpiece forming a first heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- e. heat sealing a second portion of the top right side of the workpiece to a second portion of the upper side of the right gusset, wherein a heat sealing and cutting apparatus starts at the termination point of the first heat seal and proceeds outwardly at a 45 degree course away from the centerline until terminating at the exterior of the workpiece thereby forming a second heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- f. heat sealing a first portion of the bottom right side of the workpiece to a first portion of the lower side of the right gusset at a 45 degree angle to the centerline of the workpiece, wherein a heat sealing and cutting apparatus starts at a point on the exterior of the workpiece directly below the starting point for the first seal and proceeds inwardly to the centerline of the workpiece forming a third heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- g. heat sealing a second portion of the bottom right side of the workpiece to a second portion of the lower side of the right gusset, wherein a heat sealing and cutting apparatus starts at the terminating point of the third heat seal and proceeds outwardly at a 45 degree course away from the centerline until terminating at the exterior of the workpiece thereby forming a fourth heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- h. heat sealing a first portion of the top left side of the workpiece to a first portion of the upper side of the left gusset at a 45 degree angle to the centerline of the workpiece, wherein a heat sealing and cutting apparatus starts at the exterior of the workpiece and proceeds inwardly to the centerline of the workpiece forming a fifth heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- i. heat sealing a second portion of the top left side of the workpiece to a second portion of the upper side of the left gusset, wherein a heat sealing and cutting apparatus starts at the termination point of the fifth heat seal and proceeds outwardly at a 45 degree course away from the centerline until terminating at the exterior of the workpiece thereby forming a sixth heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- j. heat sealing a first portion of the bottom left side of the workpiece to a first portion of the lower side of the left gusset at a 45 degree angle to the centerline of the workpiece, wherein a heat sealing and cutting apparatus starts at a point of the exterior of the workpiece directly below the starting point for the fifth seal and proceeds inwardly to the centerline of the workpiece forming a seventh heat seal, and concurrently therewith cutting waste polymeric material from the workpiece;
- k. heat sealing a second portion of the bottom left side of the workpiece to a second portion of the lower side of the left gusset, wherein a heat sealing and cutting apparatus starts at the termination point of the seventh seal and proceeds outwardly at a 45 degree course away from the centerline until terminating at the exterior of the workpiece thereby forming a eighth heat seal and sealing the first end of the workpiece, and concurrently therewith cutting waste polymeric material from the workpiece;
- l. advancing the workpiece a predetermined distance and repeating steps d through k, thereby completely sealing the second end of the workpiece and sealing a first end of a consecutive liner that is being manufactured according to the same method; and

m. subsequent to steps d through k, splitting the sealed workpiece along the longitudinal centerline into two substantially equal halves such that each half has one complete gusset and thereby forming two liners.

5,746,863
METHOD OF MAKING WOOD TUBING

Mark G. Jarrett, St. Clair Shores, Mich., assignor to Hollowood, Inc., Clinton Township, Mich.
Division of Ser. No. 333,788, Nov. 3, 1994, Pat. No. 5,576,082. This application Aug. 7, 1996, Ser. No. 689,410
Int. Cl.^{6} B32B *31/04;* **F16L** *9/16*
U.S. Cl. 156—218 **16 Claims**



1. The method of making a wood tube comprising the steps of:

forming a first flat single layer of wood veneer having a length equal to the length of the tube to be formed and with the grain extending transversely to said length of said tube, said first flat layer having complementary fingers at opposite edges with said fingers at one edge disposed opposite spaces between adjacent fingers on the opposite edge,

forming a second flat single layer of wood veneer having a length equal to said first flat layer and in which the grain of said veneer extends longitudinally of said tube, said second flat layer having a width substantially equal to the circumference of the tube to be formed,

placing said flat layers in adjacent relation to each other,

bending said first flat layer into a first tubular layer with said fingers in mating relation to each other to form a single layer finger joint and simultaneously bending said second flat layer into a second tubular layer with opposed edges in abutting relation to each other to form a single layer butt joint, and

bonding said first and second tubular layers to each other.

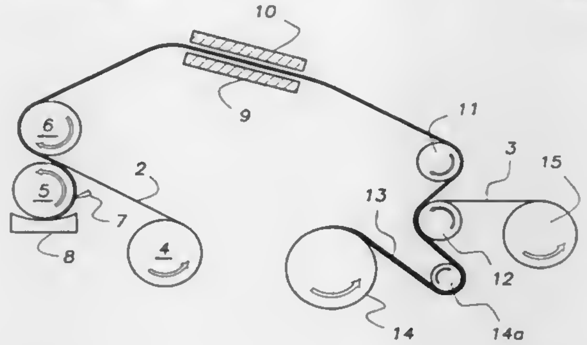
5,746,864
PROCESS FOR APPLYING SMOOTH SURFACE TO IMAGE-RECEIVING LAMINATE FOR ID CARD STOCK

Thomas Carl Reiter, Hilton; Peter P. Soscia, Geneseo, and David P. Brust, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 26, 1996, Ser. No. 721,129
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—220 **4 Claims**

1. A process of providing a smooth surface in an image-receiving laminate in an identification card stock, said image-receiving laminate comprising an oriented polymeric film support having an image-receiving layer located on a first outermost surface thereof, and the second outermost surface of said oriented polymeric film support having a heat- or chemically-activated adhesive thereon, said process comprising laminating said image-receiving laminate adhesive side down to a polymeric core substrate using a textured plate to apply an embossed surface to said image-receiving layer using heat and pressure to provide an identification card stock having a textured surface, and then subjecting said identification card stock having a textured surface to a second laminating process using a smooth plate to apply a smooth surface to said image-receiving layer using heat and pressure, thus providing an identification card stock having a smooth surface.

5,746,865
PROCESS FOR TRANSFERRING HOLOGRAPHIC IMAGES

Stephen B. Stepanek, Amherst, N.H., assignor to Hampshire Holographic Manufacturing Corp., Milford, N.H.
Filed Jul. 9, 1996, Ser. No. 655,000
Int. Cl.^{6} B44C *1/165*
U.S. Cl. 156—233 **8 Claims**



1. A process for transferring a metallized holographic image from a polymeric substrate to a foil substrate comprising the steps of:

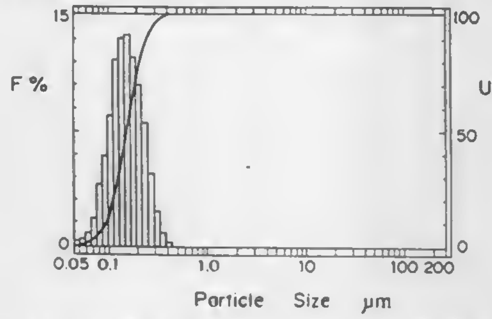
a. contacting said holographic image on said polymeric substrate to an adhesive and drying said adhesive on said holographic image at a temperature not greater than 150° C.;

b. contacting said dried adhesive containing holographic image on said polymeric substrate to said foil substrate at a temperature greater than 35° C. and a pressure greater than 1 pound per square inch; and,

c. delaminating said laminate whereby said holographic image is transferred from said polymeric substrate to said foil substrate.

5,746,866
HEAT SENSITIVE INK SHEET AND IMAGE FORMING METHOD

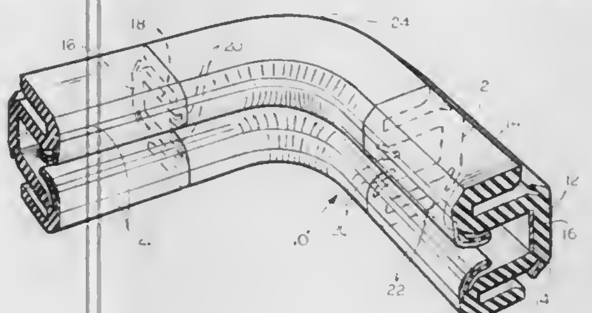
Toshiharu Tanaka, and Mitsuru Yamamoto, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 25, 1996, Ser. No. 637,272
Claims priority, application Japan, Apr. 25, 1995, 7-124453
Int. Cl.^{6} B41M *5/26;5/40*
U.S. Cl. 156—234 **7 Claims**



1. A heat sensitive ink sheet having a support sheet and a heat sensitive ink layer having a thickness of 0.2 to 1.0 μm which is formed of a heat sensitive ink material comprising 30 to 70 weight % of colored pigment, wherein at least 70 weight % of said colored pigment comprises particles having a particle size of 0.1 to 0.1 μm, 25 to 65 weight % of amorphous organic polymer having a softening point of 40° to 150° C., and 0.5 to 25 weight % of colorless fine particles having a mean particle size of 0.01 to 0.7 μm.

5,746,867
PROCESS FOR FILM TRANSFER RUBBER MOLDING OF GLASS RUN CHANNEL COMPOSITES AND THE PRODUCT FORMED THEREBY

Kohji Y. Chihara, Carmel; James A. Roth, Wabash, and Gary A. Krotke, North Manchester, all of Ind., assignors to GenCorp Inc., Fairlawn, Ohio
Division of Ser. No. 263,299, Jun. 21, 1994, Pat. No. 5,635,274. This application Sep. 30, 1996, Ser. No. 724,723
Int. Cl.^{6} E06B *7/23*
U.S. Cl. 156—242 **22 Claims**



1. A process for forming a molded composite glass run channel of an elastomeric rubber substrate having a sealing contact surface of a continuous thin film of ultra high molecular weight polyethylene comprising the steps of:

a) providing at least one metal mold core insert and at least one metal mold core shell, the metal mold core insert and the metal mold core shell capable of being operatively coupled to form a mold having a cavity of a glass run channel shape and having at least one access opening to the cavity and further having at least one aperture:

b) heating at least one metal mold core insert to a temperature greater than 266 degrees fahrenheit:

c) pressing the ultra high molecular weight thin film to a surface of the heated metal mold core insert at a pressure from 1–400 pounds per square inch for more than 2 seconds to adhere the ultra high molecular weight thin film to the insert:

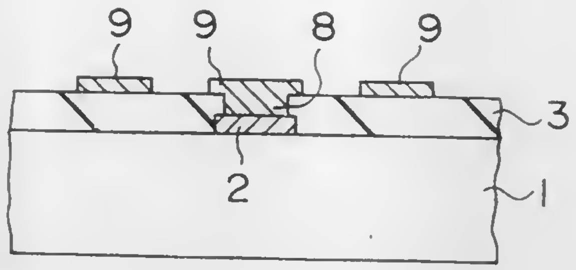
d) coupling the metal mold core insert and the metal mold core shell to form the mold cavity having a temperature greater than 266 degrees fahrenheit:

e) forcing nonpolar elastomeric material into the at least one access opening of the mold cavity; and

f) opening the mold to remove a molded glass run channel of an elastomeric rubber having a sealing contact surface of a continuous thin film of ultra high molecular weight polyethylene from the cavity.

5,746,868
METHOD OF MANUFACTURING MULTILAYER CIRCUIT SUBSTRATE

Tomoyuki Abe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jul. 19, 1995, Ser. No. 503,917
Claims priority, application Japan, Jul. 21, 1994, 6-169827
Int. Cl.^{6} B32B *31/18;31/26;* **H05K** *3/02;* **B05D** *5/12*
U.S. Cl. 156—247 **18 Claims**



1. A method of manufacturing a multilayer circuit substrate, comprising the steps of:

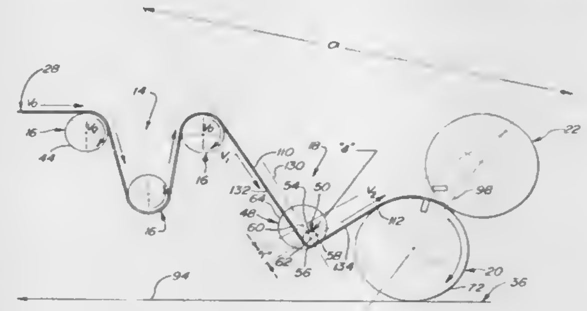
forming via holes in an insulating film on an under layer;

applying an electrically conductive paste obtained by having ultra-fine metal particles dispersed in a solvent onto said insulating film and into said via holes, said ultra-fine metal particles having a grain size of 5 to 50 nm; and

forming vias composed of a sintered product of said ultra-fine metal particles in said via holes by removing said solvent and also sintering said ultra-fine metal particles by heating at a temperature of approximately 300° C.

5,746,869
APPARATUS AND PROCESS FOR CYCLICALLY ACCELERATING AND DECELERATING A STRIP OF MATERIAL

Michael Patrick Hayden, Montgomery, and Karl Heinz Stuermer, New Richmond, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 136,519, Oct. 14, 1993, Pat. No. 5,407,513. This application Apr. 7, 1995, Ser. No. 418,923
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—265 **16 Claims**



8. A method for accelerating and decelerating a leading end segment of a continuous web of material, said method comprising the steps of:

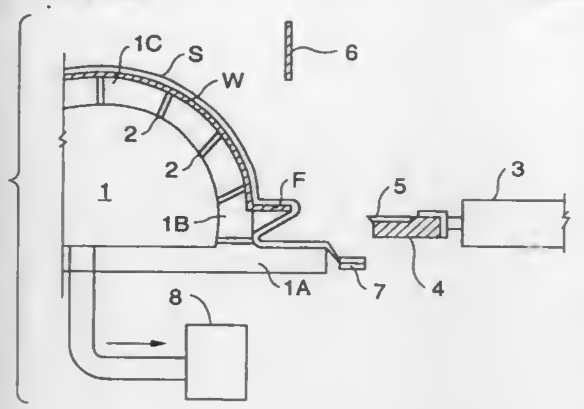
wrapping an intermediate segment of the web material partially around at least one upstream roll, said upstream roll being driven to feed the material in a longitudinally forward direction with a first velocity;

wrapping a leading segment of the material partially around an adjacent first portion of a downstream roll, said downstream roll having an outer circumferential surface which rotates at a substantially faster rotational velocity than does said upstream roll;

variably accelerating and decelerating the leading segment of the material by an acceleration and deceleration mechanism moving in a constant direction until the leading segment of the material has a desired velocity while said upstream and downstream rollers maintain their respective constant rotational velocities and directions wherein said acceleration and deceleration mechanism is operable for cyclically reversing and allowing acceleration of the leading segment relative to said downstream roll for intermittently matching the speed of the leading segment to said rotational velocity of said downstream roll.

5,746,870
DEVICE FOR SIMULTANEOUSLY CARRYING OUT VACUUM FORMING, WRAPPING, AND TRIMMING

Masanori Tomioka, Hoi-gun, and Tetsu Yabuno, Toyokawa, both of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan
Filed May 22, 1996, Ser. No. 651,640
Claims priority, application Japan, May 26, 1995, 7-152172
Int. Cl.^{6} B29C *41/50*
U.S. Cl. 156—267 **2 Claims**



1. A vacuum forming, wrapping and trimming device comprising:

a base material having a horizontally extending attaching edge at the lower peripheral part thereof and having a skin sheet attached thereto;

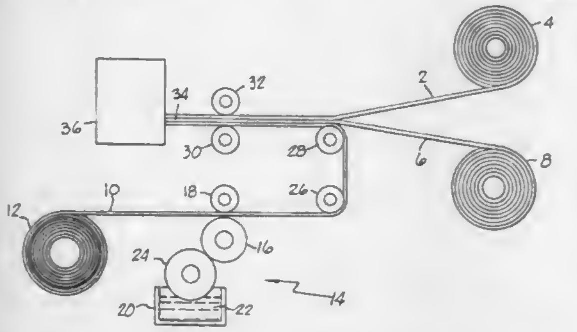
a vacuum-forming mold capable of supporting said base material such that a space exists under said attaching edge of said base material;

holding-down means vertically movable above said attaching edge of said base material so as to hold down a first portion of said skin sheet on said horizontally extending attaching edge of said base material; and

a wrapping head disposed outside the space, said head movable into said space to wrap a second portion of said skin sheet around said horizontally extending edge, said head having a trimming edge to trim a residual portion of said skin sheet, such that when said skin sheet is shaped by vacuum forming, substantially simultaneously said wrapping head moves into said space, such that substantially simultaneously said second portion of said skin sheet is wrapped around said horizontally extending attaching edge and is attached to said attaching edge, and said residual portion of said skin sheet is trimmed.

5,746,871
METHOD FOR FORMING CARTON BLANKS

Joseph Christopher Walsh, Longmont, Colo., assignor to Graphic Packaging Corporation, Paoli, Pa.
Filed Aug. 10, 1995, Ser. No. 513,289
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—268 **20 Claims**



1. A method for forming a carton blank from a continuous laminate comprising at least a layer of a relatively rigid material and a layer of a relatively flexible fluid impervious material adhered to at least portions of said relatively rigid material comprising:

dividing said continuous laminate into individual carton blanks;

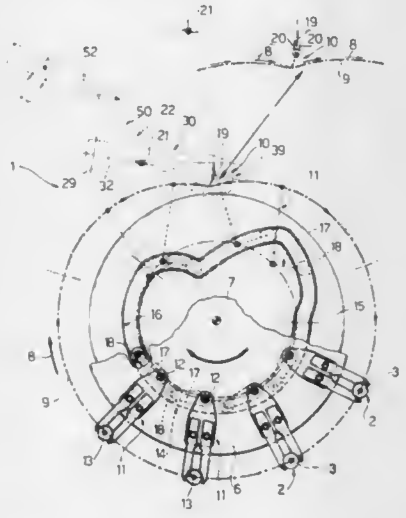
making modified cut lines and fold lines in said individual carton blanks to form in said relatively rigid material top and bottom panel portions, sidewall panel portions, a glue tab panel portion, and removable portions of said relatively rigid material;

extending said modified cut lines through said relatively rigid material but not through said relatively flexible fluid impervious material; and

removing only said removable portions of said relatively rigid material at various locations defined by said modified cut lines so as to leave a desired carton blank.

5,746,872
METHOD AND UNIT FOR END SEALING ELONGATED WRAPPINGS

Mario Spatafora, Bologna, and Andrea Berti, Castel San Pietro Terme, both of Italy, assignors to Azionaria Costruzioni Macchine Automatiche ACMA, SpA, Bologna, Italy
Filed Apr. 12, 1996, Ser. No. 631,250
Claims priority, application Italy, Apr. 13, 1995, B095A0161
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—274.2 **13 Claims**



1. A method of end scaling elongated wrappings made of sheet material comprising a first metal component and a second heat-sealable component; the method comprising:

successively feeding the wrappings, by means of a drum conveyor rotating at a substantially constant speed and presenting oscillating grips, each of which feeds a respective wrapping in a first given direction and along a given path extending through an end sealing station;

varying the traveling speed of the wrappings in relation to the conveyor at the sealing station by oscillating the respective grip of the sealing station so that wrappings at the sealing station travel along a trajectory extending in a third direction substantially perpendicular to the given path and substantially radial in relation to the drum conveyor; and

heating at least one end of the wrapping for a given length of time, to melt said second component at said end and seal the end itself.

7. A unit for end sealing elongated wrappings made of sheet material comprising a first metal component and a second heat-sealable component; the unit comprising:

a drum conveyor rotating at a substantially constant speed and presenting oscillating grips, each of which feeds a respective wrapping in a first given direction and along a given path;

an end sealing station located along said path;

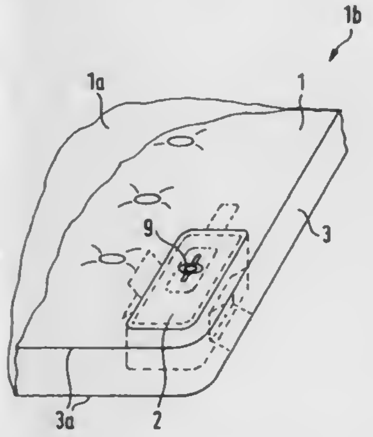
speed varying means connecting each said wrapping to the conveyor, and for varying the traveling speed of the wrappings in relation to the conveyor at the sealing station;

actuating means interposed between the drum conveyor and said grip, and for so oscillating the grip so that a wrapping at the sealing station travels along a trajectory extending in a third direction substantially radial in relation to the drum conveyor; and

heating means located at the sealing station and cooperating with the wrapping to heat said first component at at least one end of the wrapping for a given length of time at the sealing station, and so melt said second component at said end to seal the end itself.

5,746,873
PROCESS FOR PRODUCING AN AIR MATTRESS WITH A PUMP PART AND A PART TO BE INFLATED

Josef Graf, Sagberg 1, 83112 Frasdorf, Germany
PCT No. PCT/EP94/03451, § 371 Date Nov. 27, 1996, § 102(e) Date Nov. 27, 1996, PCT Pub. No. WO95/28112, PCT Pub. Date Oct. 26, 1995
PCT Filed Oct. 20, 1994, Ser. No. 722,016
Claims priority, application Germany, Apr. 18, 1994, 44 13 445.2
Int. Cl.^{6} B32B *31/20;* **F04B** *33/00;45/00*
U.S. Cl. 156—274.4 **17 Claims**



1. A method of producing an air mattress having a pump and an inflatable part, wherein the pump has an inlet opening, which can be closed off, and the pump is connected to the inflatable part by a one-way outlet valve, the pump has a propellant material for biasing the pump into an expanded state and said inflatable part has an outlet opening for deflation, the method comprising the steps of:

forming upper and lower covering skins of the air mattress from thermoplastic material;

forming a pump wall of said pump part from thermoplastic material, the pump wall having opposite sides with web lugs extending from an exterior surface of said pump wall;

disposing said upper and lower covering skins parallel to one another and between an upper and a lower plate of a high frequency welding machine;

providing a metallic sealing die tool having die walls conforming to at least a portion of an outside perimeter of an installed state of said pump wall and extending substantially perpendicularly with respect to said upper and lower covering skins, the sealing die tool being divided into first and second die parts which are connectable together to encircle said pump and having slots for accepting said web lugs, said slots communicating with connectable edges of said first and second die parts;

disposing said pump wall over an inside surface of said die walls with upper and lower edges of said pump wall being folded over upper and lower surfaces of said die walls and inserting said web lugs through said slots in the sealing die tool;

interposing said sealing die tool with said pump wall disposed thereon between the upper covering skin and the lower covering skin;

pressing the upper and lower plates together to clamp said upper and lower edges of said pump wall in contact with said upper and lower covering skins;

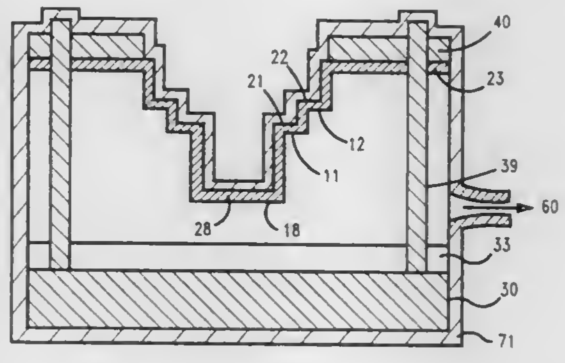
applying a high frequency power source to said upper and lower plates to weld said upper and lower edges of said pump wall to the upper covering skin and the lower covering skin, respectively;

separating said first and second die parts and removing said sealing die tool from between said upper and lower covering skins after the welding process; and

joining said web lugs in diagonal directions to the upper covering skin and to the lower covering skin.

5,746,874
APPARATUS AND METHOD FOR FORMING CAVITY SUBSTRATES USING FLEXIBLE PREFORM INSERT

Govindarajan Natarajan, Pleasant Valley, and Robert William Pasco, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 29, 1995, Ser. No. 537,319
Int. Cl.^{6} B32B *35/00*
U.S. Cl. 156—285 **30 Claims**



1. A method of forming a ceramic substrate having at least one cavity, comprising the steps of:

(a) placing at least one ceramic layer having at least one cavity over a first plate, wherein said cavity forms a female portion in said ceramic layer,

(b) placing at least one flexible preform insert having at least one cavity over said ceramic layer, wherein said cavity in said flexible preform insert forms a male portion and a female portion, such that the male portion of the flexible preform insert mates with the cavity of the ceramic layer and the surface of the male portion of said flexible preform insert follows the contours of at least a portion of said cavity of said ceramic layer,

(c) placing a second plate having at least one opening over at least a portion of said at least one flexible preform insert,

(d) pressurizing at least a portion of said second plate so that said first and second plates come closer and laminating said at least one ceramic layer, and whereas said male portion of said flexible preform insert prevents the collapse of the cavity of said ceramic layer, wherein said first plate, said at least one ceramic layer and said second plate are inside at least one environmental enclosure, and wherein said at least one environmental enclosure collapses and follows the contour of at least a portion of said ceramic substrate, and thereby forms a ceramic substrate having at least one cavity.

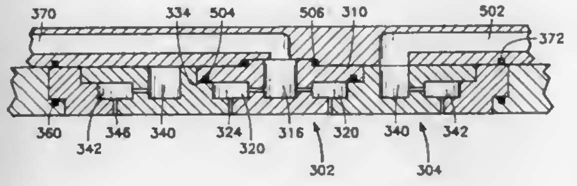
5,746,875
GAS INJECTION SLIT NOZZLE FOR A PLASMA PROCESS REACTOR

Dan Maydan, Los Altos Hills; Steve S. Y. Mak, Pleasanton; Donald Olgado, Mountain View; Gerald Zheyao Yin, Sunnyvale, all of Calif.; Timothy D. Driscoll, Hamilton, Mont.; James S. Papanu, San Rafael, and Avi Tepman, Cupertino, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 307,888, Sep. 16, 1994, Pat. No. 5,643,394. This application Oct. 16, 1995, Ser. No. 551,881

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 156—345 18 Claims



1. A plasma reactor having a vacuum chamber and a gas distribution apparatus, said gas distribution apparatus comprising:
- an elongate thin slotted aperture facing the interior of said chamber;
- a gas manifold that is in correspondence with said slotted aperture;
- a gas inlet cavity;
- at least one connecting hole connecting said gas inlet with said manifold for controlling the flow rate of gas from said slotted aperture into the interior of said chamber; and
- a blocking device capable of at least partially blocking said at least one connecting hole so as to restrict the flow of gas therethrough.

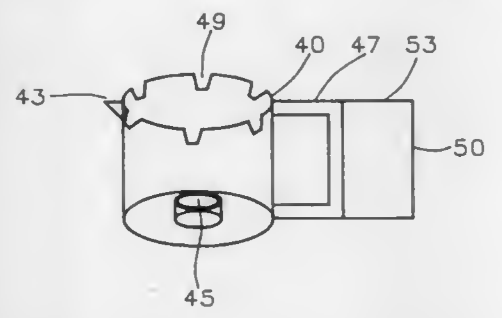
5,746,876
SAFETY SAMPLER FOR HOT ACID IN SEMICONDUCTOR MANUFACTURING FAB

Shun-Long Chen, and Kuo-Yue Hsu, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsinchu, Taiwan

Filed Jun. 3, 1996, Ser. No. 657,232

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 156—345 41 Claims



1. An apparatus for transporting substances to be processed in a manufacturing line comprising:
- a container for storing said substances;
- said container having a handle;
- said container having a shield;
- said container having a plurality of spouts; and
- said container having a recessed bottom.

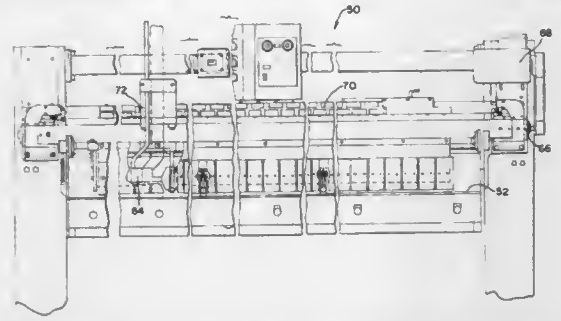
5,746,877
APPARATUS FOR MATTRESS INNERSPRING CONSTRUCTION

Michael S. Notheis, Lilburn, and Bernhard W. Kuchel, Stone Mountain, both of Ga., assignors to Simmons Company, Atlanta, Ga.

Filed Sep. 10, 1996, Ser. No. 711,540

Int. Cl.^{6} B05B *12/00*

U.S. Cl. 156—356 20 Claims



1. Apparatus for assembling innerspring constructions from rows of pocketed coil springs, comprising:
- a generally planar support surface;
- means for retaining rows of pocketed coil springs on said support surface with said coil springs having longitudinal axes all disposed normal to said surface;
- means for applying bonding material to a first row of pocketed coil springs retained by said retaining means; and
- means for pushing a second row of pocketed coil springs into contact with said first row of coil springs such that said bonding material bonds said two rows together;
- said pushing means having a first side with cups defined thereon for receiving pocketed coil springs in which the springs have a first diameter, and having a second side with cups defined thereon for receiving pocketed coil springs in which the springs have a second diameter different from said first diameter.

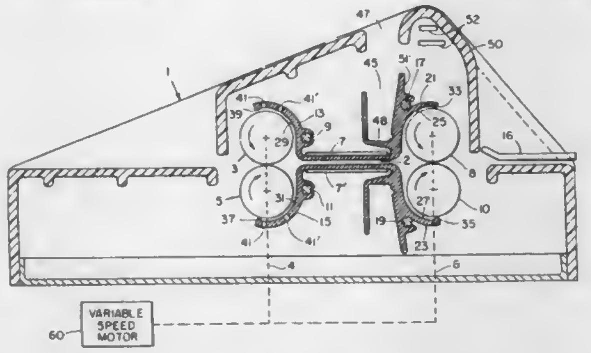
5,746,878
VARIABLE EFFECTIVE TEMPERATURE LAMINATOR THERMALBINDER

Roger J. Kuhns, Lincoln, and Scott Chandler, Acton, both of Mass., assignors to Avant Incorporated, Concord, Mass.

Division of Ser. No. 1,678, Jan. 7, 1993. This application Dec. 18, 1995, Ser. No. 572,894

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—364 21 Claims



1. A variable effective temperature laminator comprising:
- roller means for applying heat and pressure to items to be laminated therebetween;
- a channel for feeding the items to be laminated between the roller means;
- heater means disposed along a length of said channel including a platen terminating in at least one thin arcuate member disposed closely adjacent to and at least partially about said roller means;
- means for driving said rollers at variable speeds for maintaining a constant actual temperature for said heater means while achieving a variable effective temperature for items passing between said roller means; and
- a slot with a terminal portion for receiving perfect binders.

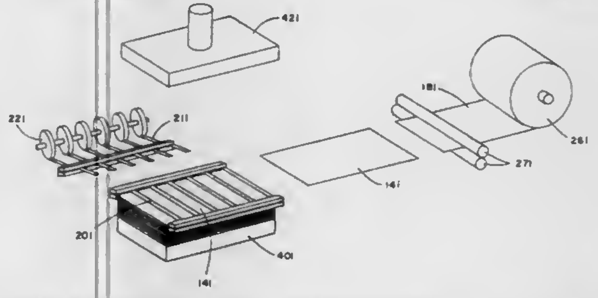
5,746,879
APPARATUS FOR MAKING HONEYCOMB FROM SUBSTRATES AND NODE STRIPS

Fritz Huebner, and Gerard J. Schoeb, both of Holland, Mich., assignors to Plascore, Inc., Zeeland, Mich.

Division of Ser. No. 226,939, Apr. 13, 1994, Pat. No. 5,670,001. This application Sep. 26, 1995, Ser. No. 534,112

Int. Cl.^{6} B32B *31/18;31/20*

U.S. Cl. 156—516 13 Claims



1. An apparatus for forming a precursor block expandable into a honeycomb structure, comprising:
- a substrate feeder for advancing substrate layers;
- node strip feeding means for advancing successive sets of pluralities of polymeric node strips in parallel relationship, at equal spacings, onto said substrate layers, one set for each layer, and for advancing successive sets of spaced, parallel node strips laterally off-set half way relative to the strip spacing of the set therebelow;
- said node strip feeding means comprises spools of solid, continuous thermoplastic node strips; and
- heating means for heating said node strips to a temperature above the softening point of said node strips as said node strips are advanced from said node strip feeding means and prior to said node strips being applied onto said substrate layers.

5,746,880
TAPE CASSETTE AND AUTOMATIC ATTACHING APPARATUS FOR HEAT-FUSIBLE TAPE PIECES

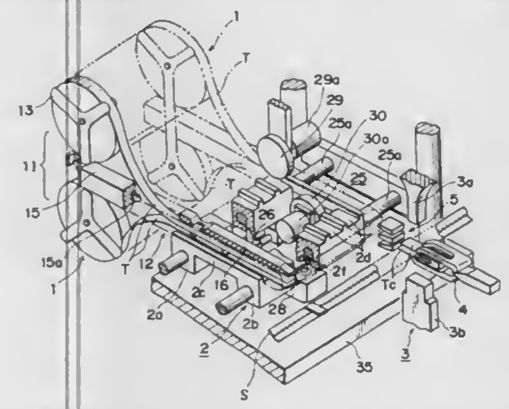
Mitsugu Umino, Toyama-ken, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 145,135, Nov. 3, 1993, abandoned. This application Oct. 26, 1995, Ser. No. 548,780

Claims priority, application Japan, Nov. 6, 1992, 4-297005

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—517 9 Claims



1. An apparatus for automatically attaching heat-fusible tape pieces successively onto a surface of a continuous strip at predetermined distances while the strip is being intermittently conveyed, said apparatus comprising:
- (a) a tape cassette equipped with a reel support part rotatably supporting a tape reel, and a tape guide part defining a tape guide path extending from said reel support part perpendicularly towards said continuous strip, said tape guide part further comprising a front half comprising a substantially enclosed tube through which the tape guide path passes, the tube accommodating a pressure roller sectioning a part of said tape guide path, and a window through which part of said pressure roller is exposed to the outside through said window, there being situated a drive roller movable to come into and out of engagement with the respective exposed surface of said pressure roller;
- (b) a tape cassette support base situated alongside of a traveling path of the strip and able to detachably support a plurality of said tape cassettes spaced apart at predetermined distances along the traveling path, said tape cassette support base being movable along the traveling path for positioning; and
- (c) a tape piece fusing means situated on the traveling path of the strip at a predetermined position within a range of movement of said tape cassette support base.

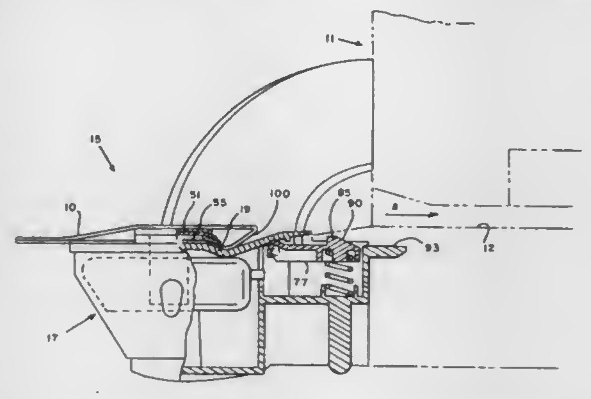
5,746,881
MOISTENER FOR A POSTAGE METER

Ian R. Jenkins, Fairfield; Walter J. Kulpa, Trumbull; Howard M. Stevens, Stratford; Chiping Sye, Stamford, all of Conn., and Christopher V. Hibberd, Essex, England, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 26, 1995, Ser. No. 548,717

Int. Cl.^{6} B43M *5/00*

U.S. Cl. 156—578 5 Claims



1. A moistening system for a postage meter system, wherein said postage meter system includes a horizontally extending deck supported by a meter housing, a portion of said deck defining a printing station, said moistening system comprising:
- a housing defining a first chamber;
- a horizontally extending feed deck detachably mounted to said housing and enclosing said first chamber, said feed deck having an aperture;
- attachment means for detachably mounting said housing and said feed deck to said postage meter such that said feed deck is aligned contiguous to said deck of said postage meter;
- a reservoir container removably mounted within said first chamber of said housing and having an aperture aligned to the aperture formed in said feed deck; and
- a wick assembly having a support brace detachably mounted to said feed deck, a wick and a cap wherein said support brace has a first section extending into said reservoir container and said wick having a first section confined by said first section of said support brace to extend into said reservoir container, said support brace having a second section extending horizontally in spaced apart relation to said feed deck and supporting a second section of said wick such that a portion of said wick extends horizontally beyond said second section of said brace, said cap being detachably mounted to said second section of said brace to securely position said second section of said wick therebetween.

5,746,882

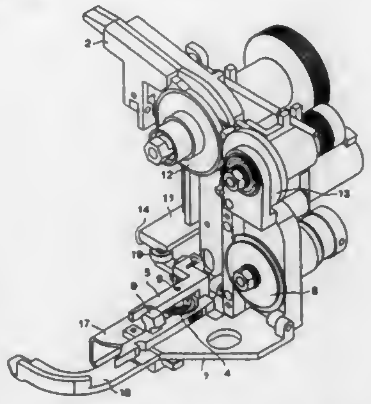
STRAP PATH ACCESS APPARATUS AND METHOD FOR STRAPPING MACHINE

Lem Bell, Zion; Tim Pearson, Antioch, and James Haberstroh, Vernon Hills, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 15, 1995, Ser. No. 573,457

Int. Cl.^{6} B29C *65/06*

U.S. Cl. 156—580 **6 Claims**



1. An apparatus for facilitating access to the path of a strap in a strapping machine having a frame, a feed wheel fixed to the frame, a secondary feed wheel, and a first and second strap tensioning wheel mounted to said frame, said tensioning wheels having respective operating axis disposed parallel to each other such that a strap path is defined between each wheel, said feed wheel located below said second tensioning wheel, comprising:

a main access cover having a lower edge and a terminal edge, said lower edge pivotally mounted to said frame of the strapping machine,

a first strap feeding wheel rotatable attached to the terminal edge of the main access cover and adapted to guide the strap into the machine, said first wheel opposing said secondary feed wheel, and

a first feed wheel lever pivotably attached to said first feed wheel, said lever including a biasing spring attached thereto, said biasing spring adapted to bias said feed wheel lever in a manner which presses a feed strap against said secondary feed wheel,

a spring-loaded latching means,

wherein upon unlatching the latching means, the main access cover is pivotable from a closed operating position to an open access position, wherein said latching means causes simultaneous movement of said biasing spring such that said first feed wheel is moved away from said secondary wheel, allowing access to a strap path without the detachment of an element from the strapping machine.

5,746,883

APPARATUS FOR BONDING SEMICONDUCTOR WAFERS

Gi-ho Cha, Suwon; Chi-jung Kang, Seoul; Byung-hun Lee, Kyungki-do, and Kyung-wook Lee, Seongnam, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 27, 1996, Ser. No. 723,239

Claims priority, application Rep. of Korea, Sep. 29, 1995, 95-32978; Sep. 29, 1995, 95-38997

Int. Cl.^{6} B32B *31/00;* H01L *21/00*

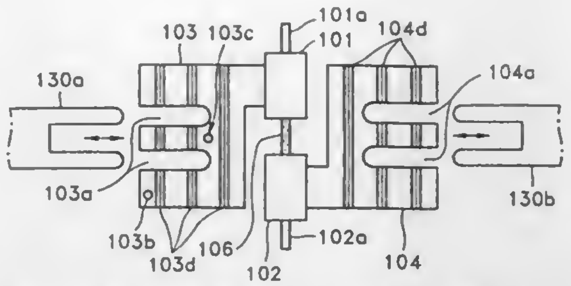
U.S. Cl. 156—580 **24 Claims**

1. An apparatus for bonding semiconductor wafers, comprising:

a stepping motor;

a first roller and a second roller which share a same axis and rotate in opposing directions by said stepping motor; and

a first bonding plate and a second bonding plate attached to and rotating with said first roller and said second roller, respectively, and on which wafers are placed, wherein a plurality of grooves are formed on respective surfaces of said first bonding plate and said second bonding plate on which the wafers are placed.



13. An apparatus for bonding semiconductor wafers, comprising:

a stepping motor;

a first driving shaft and a second driving shaft which are respectively connected to said stepping motor, share a same axis, and rotate in opposing directions;

a first roller and a second roller which are fixed to and rotate with said first driving shaft and said second driving shaft, respectively;

a third driving shaft installed between said first driving shaft and second driving shaft;

a third roller and a fourth roller contacting said third driving shaft and which are installed between said first roller and said second roller, respectively;

a fifth roller having a larger diameter than those of said first, second, third and fourth rollers, which is in contact with said third driving shaft between said third roller and said fourth roller;

a first bonding plate attached to said first roller and said fourth roller and whereon a first wafer is placed;

a second bonding plate attached to said second roller and said third roller and whereon a second wafer is placed; and

a fixing pin for connecting said third roller to said fifth roller, such that said fifth roller rotates with said third roller.

5,746,884

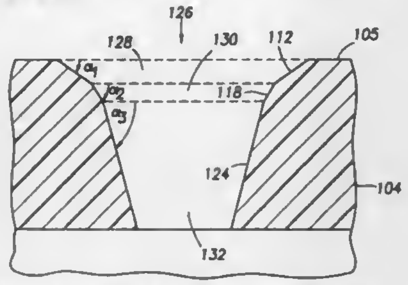
FLUTED VIA FORMATION FOR SUPERIOR METAL STEP COVERAGE

Subhash Gupta; Robert Flores; Michael Ross Stamm; Eric Thomas Sharp, all of Austin; Erich W. E. Denninger, Buda; Pamela G. Dye; Joel Samuel Utz, both of Austin, all of Tex., and James K. Kal, San Francisco, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 13, 1996, Ser. No. 696,774

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 156—643.1 **11 Claims**



1. A method of forming a fluted via, comprising:

providing a semiconductor substrate having a first conductive layer formed thereon;

forming a dielectric layer on said first conductive layer;

depositing a photoresist layer on said dielectric layer;

forming a contact opening in said photoresist layer to expose a contact region of said dielectric layer;

performing a first etch step to remove portions of said dielectric layer proximal to said contact region whereby a first stage of the fluted via is formed, said first stage including a first sidewall stage extending from an upper surface of said dielectric layer at a first angle less than 50°, said first stage of said fluted via extending a first lateral distance and a first vertical distance wherein said first lateral distance is greater than a lateral dimension of said contact opening such that said photoresist layer effectively shadows said first sidewall stage;

performing a second etch step to further remove portions of said dielectric layer whereby a second stage of the fluted via is formed, said second stage of the fluted via including a second sidewall stage extending from said first sidewall stage at a second angle between 40° and 70°; and

performing a third etch step to remove further portions of said dielectric layer whereby a final stage of the fluted via is formed, said fluted via extending from an upper surface of said dielectric layer to an upper surface of said first conductive layer and, wherein said final stage of the fluted via includes a third sidewall stage extending from said second sidewall at an angle between 60° and 80°.

5,746,885

METHOD FOR DEINKING PRINTED PAPER USING AN EMULSION OF CROSSLINKED, INSOLUBLE, IONIZABLE AND SWELLABLE POLYMER PARTICLES

John Oliver Stockwell, Liversedge; Timothy Guy Bingham, Heaton Moor, and Howard Roger Dungworth, Greetland, all of England, assignors to Allied Colloids Limited, West Yorkshire, England

Filed Jul. 22, 1996, Ser. No. 685,921

Claims priority, application United Kingdom, Nov. 21, 1994, 9423454

Int. Cl.^{6} D21C *5/02*

U.S. Cl. 162—5 **14 Claims**

1. A deinking process which comprises forming a pulp of recycled paper, separating a hydrophobic fraction containing ink from the pulp and recovering the deinked pulp, and in which the separation of the hydrophobic fraction is promoted by including in the pulp an emulsion in water of polymer formed of a water insoluble monomer blend comprising

a) at least 20% by weight hydrophobic monomer having a solubility in water of below 5 g/100 cc

b) at least 10% by weight of a hydrophilic ionizable monomer that is more soluble in the monomer blend than in water when the monomer is substantially non-ionized but is more soluble in water than the monomer blend when the monomer is ionized

c) 0 to 50% by weight of a non-ionizable hydrophilic monomer that is more soluble in the monomer blend than in water and which has a solubility in water of above 5 g/100 cc, and

d) 0.05 to 10% cross-linking agent and in which the proportions of a, b, c, and d are such that an aqueous composition, formed by blending 3% (dry weight polymer) of the emulsion in water with acid or alkali to ionize monomer (b) is a fluid composition which contains the polymer in swollen particulate form.

5,746,886

METHOD FOR THE RECOVERY OF ENERGY AND CHEMICALS FROM CELLULOSE SPENT LIQUOR CONTAINING POTASSIUM USING A GASIFIER

Åke Backlund, Karlstad, and Lars Stigsson, Hammarö, both of Sweden, assignors to Kvaerner Pulping AB, Sweden

PCT No. PCT/SE94/00028, § 371 Date Jul. 14, 1995, § 102(e) Date Jul. 14, 1995, PCT Pub. No. WO94/17240, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 18, 1994, Ser. No. 491,893

Claims priority, application Sweden, Jan. 25, 1993, 9300199

Int. Cl.^{6} D21C *11/12*

U.S. Cl. 162—30.1 **13 Claims**

1. A method for producing pulp cooked under alkaline conditions in a digester and recovery of energy and chemicals produced from the spent cooking liquor generated in the digester, the method comprising the steps of:

treating a cellulose-containing material in the digester with an alkaline cooking liquor containing dissolved potassium and sodium compounds under conditions to produce pulp and spent cooking liquor;

separating out said spent cooking liquor from the pulp by withdrawing said spent cooking liquor from the digester, wherein the spent cooking liquor has a molar ratio between potassium and sodium of greater than 0.25 calculated as (moles potassium) divided by (sum of moles of potassium and moles of sodium);

concentrating said withdrawn spent cooking liquor with respect to its content of solid material;

subjecting said concentrated spent cooking liquor to partial oxidation in a gasifying reactor, resulting in the formation of a combustible gas which contains entrained solid and/or liquid alkali metal compounds;

supplying an effective amount of oxygen-containing gas to the reactor to support the partial oxidation;

adjusting an operating temperature in the reactor to between 400° and 900° C., whereby said solid and/or liquid alkali metal compounds have a molar ratio between potassium sulfide and sodium sulfide of greater than 0.4. calculated as (moles of potassium sulfide) divided by (sum moles of potassium sulfide and moles of sodium sulfide);

withdrawing said combustible gas containing said alkali metal compounds from the reactor;

separating said alkali metal compounds from said combustible gas by bringing said combustible gas into direct contact with a cooling liquid, in which cooling liquid the alkali metal compounds are soluble to form a liquid containing said alkali metal compounds;

using said liquid containing alkali metal compounds either wholly or in part for preparing said alkaline cooking liquor; and

using said combustible gas for the production of useful energy.

5,746,887

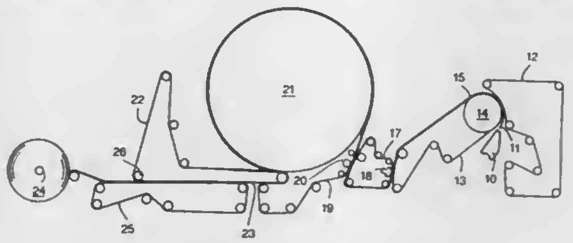
METHOD OF MAKING SOFT TISSUE PRODUCTS

Greg Arthur Wendt, Neenah, Wis.; Kai F. Chiu, Brandon, Miss.; Mark Alan Burazin; Theodore Edwin Farrington, Jr., both of Appleton, Wis., and David Alan Heaton, Woodstock, Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of Ser. No. 384,304, Feb. 6, 1995, Pat. No. 5,672,248, which is a continuation-in-part of Ser. No. 226,630, Apr. 12, 1994, abandoned. This application Apr. 24, 1996, Ser. No. 637,141

Int. Cl.^{6} D21F *11/00*

U.S. Cl. 162—109 **40 Claims**



1. A method of making a tissue sheet comprising:

(a) depositing an aqueous suspension of papermaking fibers having a consistency of about 1 percent or less onto a forming fabric to form a wet web;

(b) dewatering the wet web to a consistency of from about 20 to about 30 percent;

(c) transferring the dewatered web from the forming fabric to a transfer fabric traveling at a speed of from about 10 to about 80 percent slower than the forming fabric

(d) transferring the web to a throughdrying fabric having from about 5 to about 300 elongated machine direction knuckles above the plane formed by the highest points of the cross-machine direction knuckles of the fabric, wherein the web is macroscopically rearranged to conform to the surface of the throughdrying fabric; and

(e) throughdrying the web to produce a throughdried web of substantially uniform density having a Wet Compressed Bulk (WCB) of about 4.5 or greater, an Absorbent Capacity of about 9 grams per gram or greater and a cross-machine direction stretch of about 9 percent or greater.

5,746,888

METHODS FOR INHIBITING ORGANIC CONTAMINANT DEPOSITION IN PULP AND PAPERMAKING SYSTEMS

Duy T. Nguyen, and Tien-Feng Ling, both of Jacksonville, Fla., assignors to BetzDearborn Inc., Trevose, Pa.

Filed Jul. 9, 1996, Ser. No. 677,181

Int. Cl.^{6} D21F *1/32*

U.S. Cl. 162—199 **8 Claims**

1. A method for inhibiting the deposition of organic contaminants from pulp on the surfaces of papermaking machinery and equipment in pulp and papermaking systems comprising spraying onto said surfaces an effective deposition inhibiting amount of a water soluble blood-related protein.

5,746,889

STOCK FEED SYSTEM FOR A MULTI-LAYER HEADBOX AND METHOD IN THE OPERATION OF A MULTI-LAYER HEADBOX

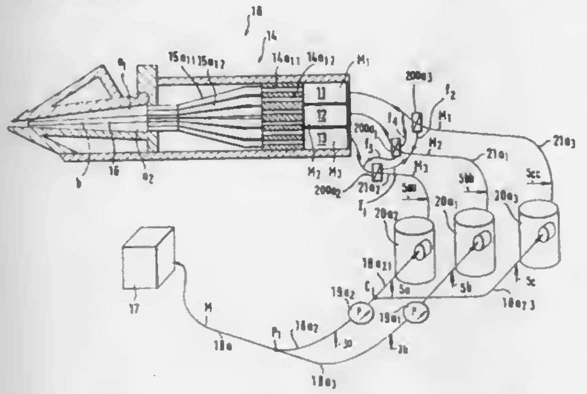
Jyrki Huovila, and Ari Linsuri, both of Muurame, Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Nov. 21, 1996, Ser. No. 754,527

Claims priority, application Finland, Oct. 18, 1996, 964180

Int. Cl.^{6} D21F *9/00;11/04*

U.S. Cl. 162—216 **17 Claims**



1. In a combination of a multi-layer headbox having a plurality of inlet headers and a stock feed system for the multi-layer headbox, the stock feed system comprising at least three stock flows, means for passing each of the stock flows into a respective one of the inlet headers of the multi-layer headbox and means for adding chemicals, additives and/or fillers to each of the stock flows, said at least three stock flows comprising first and second surface stock flows directed into respective ones of the inlet headers to form surface layers of a web produced by the headbox and at least one intermediate stock flow directed into a respective one of the inlet headers to form a respective intermediate layer of the web produced by the headbox between said surface layers of the web, the stock feed system comprising

a single fresh-stock storage container,

means for dividing a single flow of fresh stock from said container into said first and second stock flows and said at least one intermediate stock flow, and

fiber distribution means for transferring fibers between said at least three stock flows before the inlet headers, said fiber distribution means comprising first transfer means for transferring longer fibers, in comparison to an average distribution of fibers in the single flow of fresh stock, from said first and second surface stock flows to said at least one intermediate stock flow whereby shorter fibers, in comparison to the average distribution of fibers in the single flow of fresh stock, in said first and second surface stock flows remain in said first and second surface stock flows to be passed into the respective one of the inlet headers.

5,746,890

DEVICE FOR ADMIXING A PROCESSING AGENT INTO A PULP SUSPENSION

Kjell Forslund, Sundsbruk, Sweden, assignor to Sunds Defibrator Industries AB, Sweden

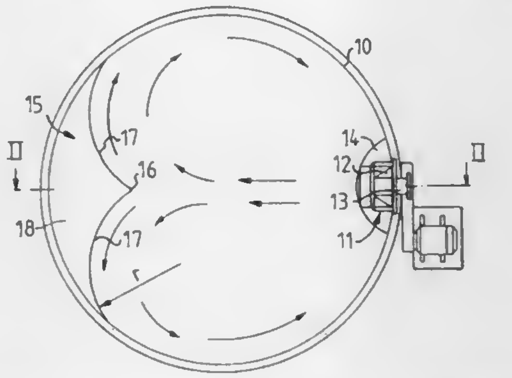
PCT No. PCT/SE94/01009, § 371 Date May 22, 1996, § 102(e) Date May 22, 1996, PCT Pub. No. WO95/17243, PCT Pub. Date Jun. 29, 1995

PCT Filed Oct. 27, 1994, Ser. No. 640,783

Claims priority, application Sweden, Dec. 21, 1993, 9304240

Int. Cl.^{6} B01F *5/00*

U.S. Cl. 162—243 **10 Claims**



1. A mixing device for mixing a processing agent with a suspension comprising a mixing vessel having an inner surface and including a lower cylindrical portion having a diameter, an agitator mounted with respect to said inner surface of said mixing vessel for creating a flow of said suspension across said mixing vessel, processing agent supply means for supplying said processing agent to said flow of said suspension across said mixing vessel, and a flow divider mounted with respect to said inner surface of said mixing vessel at a location substantially opposite to the location of said agitator, said flow divider comprising a substantially vertical front distribution edge spaced from said inner surface of said mixing vessel and a pair of arcuate front surfaces extending from said front distribution edge to said inner surface of said mixing vessel on opposite sides of said front distribution edge, said pair of arcuate front surfaces including an upper surface defining an inclined plane with respect to said inner surface of said mixing vessel.

5,746,891

WEAR INDICATORS FOR SEAL STRIP OF A SUCTION ROLL OF A PAPER MAKING MACHINE

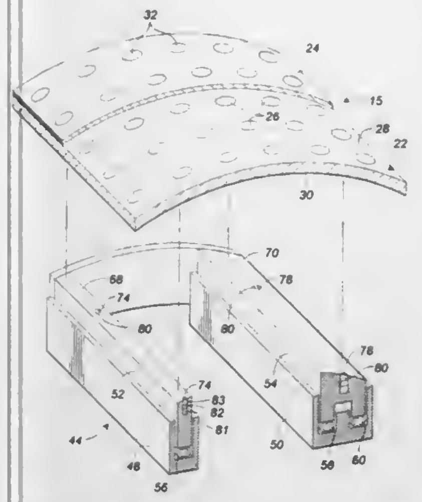
William David Withers, 79 Brighton Rd., Atlanta, Ga. 30309

Filed Jul. 25, 1996, Ser. No. 686,252

Int. Cl.^{6} D21F *3/10*

U.S. Cl. 162—371 **8 Claims**

1. In a suction roll assembly of a paper making machine which includes a cylindrical shell rotatable about its longitudinal axis for receiving a slurry, and a vacuum system for applying a vacuum internally of said cylindrical shell and drawing liquid from the slurry and from the outside to the inside of said cylindrical shell, the improvement therein of:



a suction box juxtaposed the inside surface of said cylindrical shell for applying the vacuum to an arc of said cylindrical shell, said suction box including seal strips having seal surfaces facing the inside surface of said cylindrical shell for engaging said cylindrical shell

biasing means engaging said seal strips for urging the seal surfaces of said seal strips toward engagement with the inside surface of said cylindrical shell a predetermined distance;

wear indicators carried by said seal strips at intervals along the seal strips, said wear indicators comprising a series of holes spaced along said seal strips and formed through the seal surfaces of and into said seal strips, the depth of said holes corresponding to the predetermined distance that said biasing means can urge said seal strip toward the cylindrical surface of said cylindrical shell.

5,746,892

PROCESS FOR PURE GRADE ACRYLIC ACID

William Bauer, Jr., Huntingdon Valley, Pa.; Timothy Allen Hale, Houston, Tex.; Robert Michael Mason, Roslyn, and Rita Karina Upmacis, North Wales, both of Pa., assignors to Rohm and Haas Company, Phila., Pa.

Continuation of Ser. No. 251,762, May 31, 1994, Pat. No. 5,571,386. This application Aug. 5, 1996, Ser. No. 692,160

Int. Cl.^{6} B01D *3/34*

U.S. Cl. 203—38 **5 Claims**

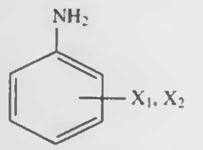
1. A continuous process for producing a pure grade acrylic acid (PGAA) comprising the steps of:

a) feeding to a final distillation column prior to distillation a crude acrylic acid feed stream containing from 400 to 1100 ppm of aldehyde comprising acrolein, benzaldehyde and furfural at a temperature of from 25° to 100° C., the feed stream comprising:

i) a crude acrylic acid, and

ii) a minimum effective level of from 0.1 to 2.0 molar ratio, based on total moles of aldehydes and maleic acid and maleic anhydride in the crude acrylic acid, of at least one of a Group A amine selected from the group consisting of:

i) a primary arylamine of structure (I),

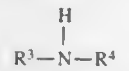


(I)

wherein X_1 and X_2 are selected from the group consisting of H, NR^2, OR, Cl, and R, wherein R is H or C_1–C_6 alkyl and R^2 is selected from H, phenyl, 4-nitrophenyl or 2,4-dinitrophenyl;

ii) a hydrazine, optionally its hydrate, of structure $R^2—NH—NH_2$, wherein R^2 is H, phenyl, 4-nitrophenyl, or 2,4-dinitrophenyl;

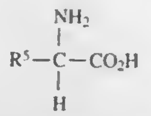
iii) an alkylenepolyamine of structure (II)



$$R^3-\overset{\displaystyle H \atop |}{N}-R^4 \qquad (II)$$

wherein R^3 is selected from H or a C_1–C_6 alkyleneamine, and R^4 is a C_1–C_6 alkyleneamine; and

iv) an α-amino acid selected from the group consisting of structure III



$$R^5-\underset{\displaystyle | \atop H}{\overset{\displaystyle NH_2 \atop |}{C}}-CO_2H \qquad (III)$$

wherein R^5 is selected from H, R, or R^4; arginine, aspartic acid, gutamic acid, histidine, and methionine;

b) during distillation feeding to an upper 30% portion of the final distillation column, above the crude acrylic acid feed stream, an amine feed stream comprising a minimum effective level of from 0.01 to 1.0 molar ratio, based on total moles of aldehydes and maleic acid and maleic anhydride in the crude acrylic acid, of at least one of a Group B amine selected from the group consisting of o-, m-, p-phenylenediamine, 4-nitrophenyl-hydrazine, and 2,4-dinitrophenylhydrazine; and

c) fractionally distilling the crude acrylic acid feed stream through the final distillation column, distilling off PGAA having a residual individual aldehyde content less than 10 ppm.

5,746,893

METHOD OF MANUFACTURING MAGNETIC RECORDING MEDIUM

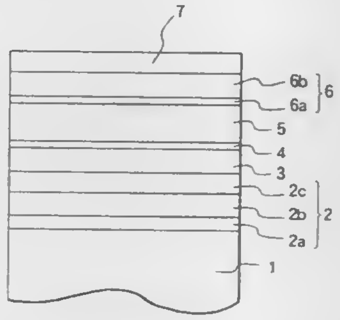
Masato Kobayashi; Osamu Nozawa, both of Tokyo; Hisao Kawai, Yamanashi; Keiji Moroishi, Yamanashi; Takashi Sato, Yamanashi, and Junichi Horikawa, Yamanashi, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,019

Claims priority, application Japan, Dec. 19, 1994, 6-333788; Jun. 28, 1995, 7-161942

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—192.2 **19 Claims**



1. A method of manufacturing a magnetic recording medium by using a sputtering apparatus of an inline type, said magnetic recording medium comprising a substrate, an underlying layer on said substrate, and a magnetic layer which is deposited on said underlying layer and which has a first magnetic film comprising Co and Pt, a nonmagnetic intermediate film including Cr, and a second magnetic film comprising Co and Pt, said underlying layer comprising a surface film in contact with said magnetic layer, said method comprising the step of:

depositing at least one of the surface film and the nonmagnetic film at a sputtering current density between 0.9 and 10 W/cm^2, both inclusive, within said sputtering apparatus of the in-line type.

5,746,894

Patent Not Issued For This Number

5,746,895

COMPOSITE REFRACTORY/CARBON COMPONENTS OF ALUMINIUM PRODUCTION CELLS

Jainagesh A. Sekhar, Cincinnati, Ohio, assignor to Moltech Invent S.A., Luxembourg

PCT No. PCT/US93/10993, § 371 Date Oct. 20, 1995, § 102(e) Date Oct. 20, 1995, PCT Pub. No. WO95/13407, PCT Pub. Date May 18, 1995

PCT Filed Nov. 12, 1993, Ser. No. 535,160

Int. Cl.^{6} C25C *3/08*

U.S. Cl. 204—279 **154 Claims**

1. A part-manufactured component of an aluminium production cell, for the production of aluminium by the electrolysis of alumina in a molten halide electrolyte, which cell component when fully manufactured comprises an aluminium-wettable refractory coating on a heat-stable baked carbon-containing body, said part manufactured cell component being a layered composite of two precursors, comprising:

a precursor layer of the aluminium-wettable refractory coating, said precursor layer containing at least one aluminium-wettable refractory material in particulate form, or a particulate micropyretic reaction mixture which when ignited reacts to form at least one aluminium-wettable refractory material, or a mixture thereof, and non-carbon fillers and binders; on

a non-baked or part-baked precursor of the heat-stable carbon-containing body, comprising particulate carbon compacted with a heat-convertible binder which when subjected to heat treatment binds the particulate carbon into the heat-stable carbon-containing body of the fully-manufactured cell component;

the layered composite being convertible to the fully manufactured cell component by heat treatment to form said aluminium-wettable refractory coating and simultaneously bind and heat-stabilize the carbon-containing body.

5,746,896

METHOD OF PRODUCING GAS DIFFUSION ELECTRODE

Takayuki Shimamune; Yasuo Nakajima, both of Tokyo; Yoshinori Nishiki, and Takahiro Ashida, both of Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Apr. 3, 1996, Ser. No. 626,925

Claims priority, application Japan, Apr. 10, 1995, 7-110160

Int. Cl.^{6} C25B *11/00*

U.S. Cl. 204—284 **3 Claims**

1. A method of producing a gas diffusion electrode, comprising the steps of:

i) forming a thin layer having a surface comprising a carbon powder and a silver powder and having perforations in the thickness direction on the surface of a metal substrate comprising at least one metal selected from the group consisting of silver, copper, nickel, and stainless steel, and

ii) fluorinating at least the surface of the thin layer until the carbon in the thin layer is rendered water repellent.

5,746,897

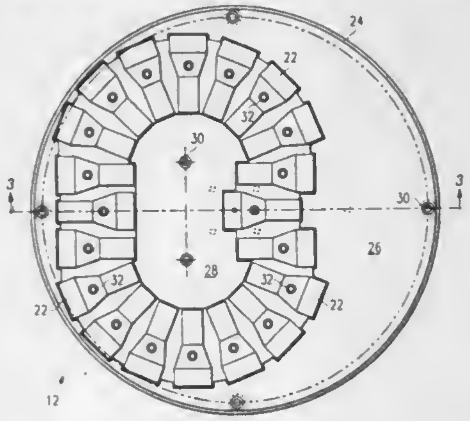
HIGH MAGNETIC FLUX PERMANENT MAGNET ARRAY APPARATUS AND METHOD FOR HIGH PRODUCTIVITY PHYSICAL VAPOR DEPOSITION

Dorian Heimanson, Rochester, N.Y.; Mehrdad M. Moslehi, Los Altos, Calif.; Paul E. Spronz, Rochester, N.Y., and Thomas R. Omstead, Austin, Tex., assignors to CVC Products, Inc., Rochester, N.Y.

Filed Jul. 10, 1996, Ser. No. 677,956

Int. Cl.^{6} C23C *14/35*

U.S. Cl. 204—298.2 **23 Claims**



1. A high magnetic flux rotatable permanent magnet array for use in a magnetron sputtering system to sputter a substance from a target, the magnet array comprising:

a plurality of magnet assemblies, each magnet assembly comprising:

a first magnetized portion having a magnetization substantially perpendicular to the target,

a second magnetized portion having a magnetization substantially perpendicular to the target, the magnetization of the second portion being opposite to the first portion; and

a third magnetized portion located between the first portion and the second portion, the third portion having a magnetization substantially parallel to the target.

5,746,898

ELECTROCHEMICAL-ENZYMATIC SENSOR

Walter Preidel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 742,598, Aug. 8, 1991. This application Nov. 12, 1992, Ser. No. 973,933

Claims priority, application European Pat. Off., Aug. 10, 1990, 90115421

Int. Cl.^{6} G01N *27/327;27/404*

U.S. Cl. 204—403 **15 Claims**

1. An electrochemical-enzymatic sensor for use in determining the concentration of glucose and other substances in body fluids, comprising:

an oxygen sensor comprising a sensor electrode means for determining an oxygen content, the sensor electrode means being of an electrocatalytically inactive carbon selected from the group consisting of vitreous carbon, pyrographite, sputtered carbon, sputtered graphite and amorphous hydrogenated carbon;

a counterelectrode;

a reference electrode;

an enzyme-containing layer disposed before the sensor electrode means; and

a diaphragm of biocompatible, hydrophilic, oxygen-permeable material covering the enzyme layer and retaining the enzyme.

5,746,899

ELECTROCHEMICAL GAS SENSOR

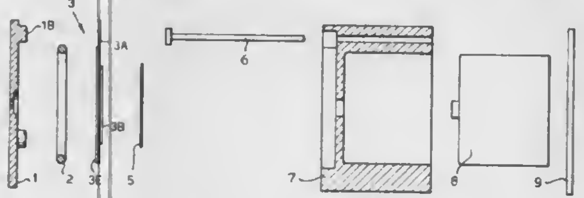
John Robert Finbow, and Malcolm Robert Bulpitt, both of Hampshire, Great Britain, assignors to City Technology Limited, Portsmouth, United Kingdom

Filed Nov. 14, 1996, Ser. No. 749,176

Claims priority, application United Kingdom, Dec. 20, 1995, 9526101

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—415 **14 Claims**



1. An electrochemical gas sensor comprising sensing and counter electrodes mounted on the same side of a planar support; an electrolyte in contact with said sensing and counter electrodes; means for controlling the access of gas to said sensing electrode; and a barrier layer provided on said support on the opposite side to and extending over said sensing and counter electrodes, said barrier layer being positioned relative to said gas access control means and said support being non-electrically conductive and being sufficiently porous such that gas from said gas access control means is guided transversely and laterally through said support first to reach said sensing electrode and then to reach said counter electrode.

5,746,900

NON-AQUEOUS AMPEROMETRIC MULTI-GAS SENSOR

H. V. Venkatasetty, Burnsville, Minn., assignor to H.V. Setty Enterprises, Inc., Burnsville, Minn.

Continuation of Ser. No. 612,319, Mar. 7, 1996, abandoned. This application Sep. 9, 1997, Ser. No. 925,684

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—415 **17 Claims**

$$\text{SAMPLING RATE} = D\frac{A}{d}$$

$$= 0.04\ \frac{\text{cm}^2}{\text{SEC}}\ \frac{5\,\text{cm}^2}{0.5\,\text{cm}}\ \frac{60\ \text{SEC.}}{\text{MIN.}}$$

$$= 25\ \text{cm}^3/\text{MIN.}$$

$$\text{RESPONSE TIME} = \frac{d^2}{D} = 8\ \text{SECONDS}$$

1. A system for sensing gaseous species of interest comprising:

(a) an electrochemical sensor for sensing sampled gaseous species of interest, the sensor comprising:

i. a sensing electrode selected from the group of materials consisting of platinum and gold;

ii. a platinum counter-electrode;

iii. reference electrode consisting of a material selected from silver and platinum; and

iv. a mixed solvent based aprotic non-aqueous electrolyte comprising an aprotic organic solvent mixture containing solvents selected from the group consisting of γ-butyrolactone, ethylene carbonate, propylene carbonate, dimethoxy ethane, dimethyl carbonate, ethyl acetate and diethyl carbonate and an amount of a stable, non-hygroscopic tetraalkylammonium salt in said solvent; and

(b) an air sampling diffusion chamber associated with said electrochemical sensor, said diffusion chamber comprising:

i. a sidewall enclosing a known diffusion area and having a known height, thereby describing a diffusion chamber having two ends;

ii. a sample diffusion membrane selected from the group consisting of gas permeable and micro porous membranes and combinations thereof for contacting the environment closing one of said ends of said diffusion chamber;

iii. wherein a second end of said diffusion chamber is exposed to and closed by said electrochemical cell a selected distance from said diffusion membrane thereby defining a diffusion chamber depth; and

iv. wherein said known diffusion area and chamber depth dimensions of said sampling diffusion chamber and diffusion coefficient of a gas of interest define a set sampling rate for said electrochemical cell with respect to said gas of interest.

5,746,901

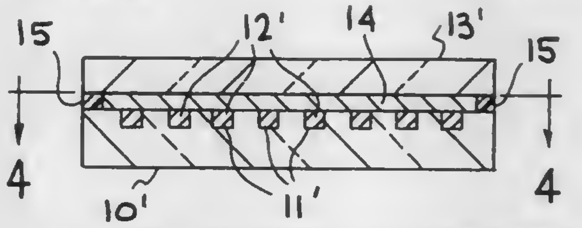
HYBRID SLAB-MICROCHANNEL GEL ELECTROPHORESIS SYSTEM

Joseph W. Balch; Anthony V. Carrano; James C. Davidson, all of Livermore, and Jackson C. Koo, San Ramon, all of Calif., assignors to Regents Of The University Of California, Oakland, Calif.

Filed Apr. 5, 1996, Ser. No. 628,309

Int. Cl.^{6} G01N *27/26;27/447*

U.S. Cl. 204—606 **19 Claims**



1. A microchannel electrophoresis device having means for reducing current leakage between microchannels, comprising:

a bottom plate having parallel longitudinally extending microchannels in one surface thereof;
a first separation medium located in said microchannels;
a slab of separation medium separate from said first separation medium positioned over said microchannels and the first separation medium therein;
a top plate of optical quality material positioned on said slab of separation medium, and
means for retaining the slab of separation medium between said bottom and top plates.

5,746,902

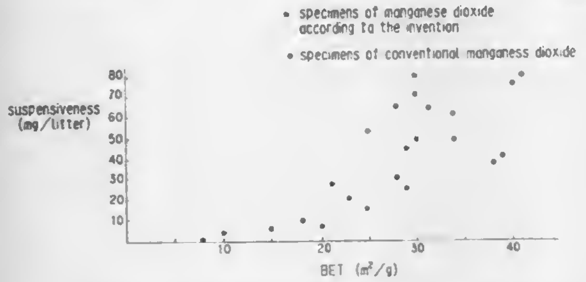
ELECTROLYTIC MANGANESE DIOXIDE AND METHOD OF MANUFACTURING THE SAME

Hisao Takehara; Yoshihiro Nakayama, both of Chuo-ku; Ryoichi Shimizugawa, Takaoka; Tsutomu Kishikawa, Takaoka; Takumi Murai, Takaoka; Fumiya Takahashi, Takaoka, and Koh Takahashi, Tsukuba, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 574,927

Int. Cl.^{6} C25B *1/00*

U.S. Cl. 205—57 **3 Claims**



1. A method of manufacturing electrolytic manganese dioxide using electrolysis in an electrolytic bath, said method comprising:
suspending a manganese oxide having an average particle size of less than 5 μm in an electrolytic bath solution by adding the oxide to the solution at a rate of 0.01 to 0.2 g/liter;
wherein the electrolytic bath solution has a sulfuric acid concentration between 0.40 to 0.55 mol/liter, the anodic current density is between 0.4 and 3.0 A/dm^2, the electrolytic temperature is between 93° and 103° C., and the relationship between the anodic current density and the electrolytic temperature is expressed by the formula $103 \geqq y \geqq 1.67x+92.33$, where x represents the anodic current density and y represents the electrolytic temperature; and
wherein said method further comprises causing the anodic current density to cyclically take two or more values in the range of 0.4 and 3.0 A/dm^2.

5,746,903

WET CHEMICAL PROCESSING TECHNIQUES FOR PLATING HIGH ASPECT RATIO FEATURES

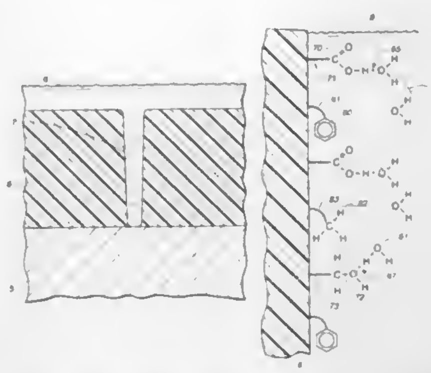
Solomon I. Beilin, San Carlos; William T. Chou, Cupertino; Michael G. Lee, San Jose, and Wen-chou Vincent Wang, Cupertino, all of Calif., assignors to Fujitsu Limited, Japan

Filed Jul. 26, 1996, Ser. No. 687,716

Int. Cl.^{6} C25D *5/02*

U.S. Cl. 205—118 **10 Claims**

1. A method of filling a high aspect-ratio aperture with a plating solution, said aperture being formed within a photosensitive layer, said method comprising the steps of:
(a) pattern exposing a layer of photosensitive material to actinic radiation to define said aperture;
(b) exposing said pattern-exposed photosensitive layer to a developer solution which comprises water to develop said aperture therein, said aperture being surrounded by one or more walls of said pattern-exposed photosensitive layer, each said wall having hydrophilic molecular groups disposed thereon and being coated with at least a film of water from the developer solution, said film of water maintaining said hydrophilic molecular groups on each said aperture wall;
(c) thereafter rinsing said developed photosensitive layer with water without drying said aperture of the film of water from the developer solution of said exposing step, said rinsing step maintaining said film of water and said hydrophilic molecular groups; and
(d) exposing said rinsed photosensitive layer to a plating solution, wherein said aperture is not dried of the film of water between the time it is rinsed in step (c) and the time it is exposed to the plating solution in step (d), said film of water and said hydrophilic groups being maintained between the time said aperture is rinsed in step (c) and the time said aperture is exposed to the plating solution in step (d).



5,746,904

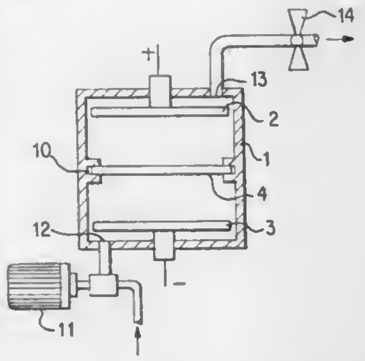
METHOD, APPARATUS AND SYSTEM FOR CONTINUOUSLY TREATING WATER BODY

Ming Shing Lee, 4th Floor, No. 5, Lane 146, Hsin-Sheng South Road, Section 1, Taipei, Taiwan

Filed Mar. 5, 1996, Ser. No. 610,882

Int. Cl.^{6} G02F *1/461*

U.S. Cl. 205—757 **14 Claims**



1. A method for continuously treating a water body, comprising a step of using a substantially sealed processing tank, at a top and a bottom portions of which a water outlet and a water inlet are arranged respectively, and in an interior space of which three or more conductive plates substantially in parallel relation with the tank bottom and substantially in parallel relation with one another for upwardly forming a substantially closed S-shaped one-way flow path in said processing tank, wherein said conductive plates are made of a conductive material having a resistivity ranged from 1.59 μΩcm to 1300 μΩcm and at least two of said conductive plates are respectively electrically connected to a positive and a negative power source to serve as an anode and a cathode, wherein said water to be treated is introduced into said processing tank from said water inlet, flows upwardly through said S-shaped one-way flow path, and then is discharged out of said processing tank from said water outlet, and wherein a voltage is applied to said cathode and said anode to generate an electric field having an intensity ranged from 0.5 mV/cm to 1000 V/cm during the flow of said water body in said flow path, thereby polarizing and coagulating impurities in said water body for removing said coagulating impurities.

5,746,905

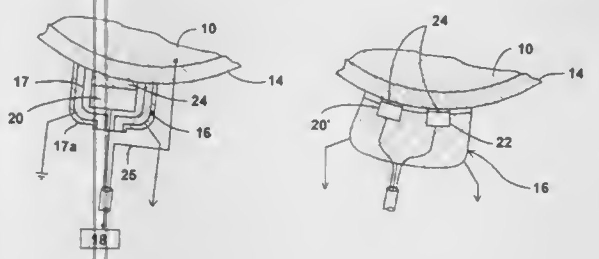
COATING EVALUATION SYSTEM

John N. Murray, Timonium, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1996, Ser. No. 601,272

Int. Cl.^{6} G01N *27/02;27/26*

U.S. Cl. 205—791 **9 Claims**



1. A method for evaluating quality of a coating deposited on a substrate and wetted by seawater during exposure of the substrate thereto, comprising the steps of:
positioning on said substrate an electrochemical cell which comprises a housing, an electrode and a porous medium covering said electrode, said porous medium separating said electrode from the coating;
absorbing and retaining the seawater in said porous medium during said exposure of the substrate thereto;
generating an AC voltage not exceeding 10 mV and applying said AC voltage to said electrode to conduct electrical current at a fixed frequency above 10,000 Hz to the substrate through the coating;
measuring the electrical current and phase shift thereof in response to said conduction through the coating;
calculating a characteristic of the coating from parameters thereof and measurement data obtained from said step of measuring; and
extracting a readout of said characteristic which is representative of the quality of the coating.

5,746,906

COAL TAR PITCH BLEND HAVING LOW POLYCYCLIC AROMATIC HYDROCARBON CONTENT AND METHOD OF MAKING THEREOF

E. Ronald McHenry, Berea, Ohio, and William E. Saver, Natrona Heights, Pa., assignors to Koppers Industries, Inc., Pittsburgh, Pa.

Filed Aug. 10, 1995, Ser. No. 513,329

Int. Cl.^{6} C10C *73/36*

U.S. Cl. 208—22 **71 Claims**

1. A blended binder pitch material, comprising:
a) a coal tar pitch base, said coal tar pitch having a softening point in the range of 130 degrees Celsius to 175 degrees Celsius; and
b) a petroleum pitch component having a softening point in the range of 75 degrees Celsius to 85 degrees Celsius;
whereby,
the resultant blended binder pitch material has a softening point in the range of 107 degrees Celsius to 114 degrees Celsius and further achieves a 40 percent reduction in benzo(a)pyrene equivalents as compared to unadulterated coal tar pitch having a softening point within the range of 107 degrees Celsius to 114 degrees Celsius.

5,746,907

METHOD TO REMOVE METALS FROM RESIDUALS

Antonius Franziskus Heinrich Wielers, Richmond, and Vitold Raimond Kruka, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 245,143, May 16, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 603,491

Int. Cl.^{6} G10G *32/02;45/00*

U.S. Cl. 208—251 H **11 Claims**

1. A method to remove metals from a residual oil containing an initial amount of a selected metal, the method comprising passing the residual oil over a hydrodemetalization catalyst in the presence of hydrogen, the improvement consisting essentially of the steps of:
providing a vessel for exposing the residual oil to a DC electric field having a strength of about one kV/inch or greater and providing a residence time of between about two minutes and about two hours and one or more electrodes, the electrodes having a total surface area of between about 0.01 and about one m^2/(ton/day) based on the total residual oil; and
prior to passing the residual oil over the hydrodemetalization catalyst, passing the residual oil through the vessel wherein residence time of the residual oil in the vessel in minutes times the applied electric field strength in KVolts per inch divided by the viscosity of the residue stream at the temperature of the residue when it is Passed through the vessel in centistokes is between about two and about fifty, whereby at least ten percent by weight of the initial amount of the selected metal is removed by attraction to an electrode.

5,746,908

CRUDE OIL DESALTING PROCESS

Kent E. Mitchell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 12, 1996, Ser. No. 599,913

Int. Cl.^{6} C10G *17/00*

U.S. Cl. 208—251 R **23 Claims**

1. A process comprising: (1) combining steam with a fluid to form a first mixture wherein said fluid comprises a hydrocarbon and a salt; (2) introducing water into said first mixture to form a second mixture; and (3) separating said hydrocarbon in said second mixture from water under a condition effective to reduce the salt content in said fluid and to form a salt-reduced fluid containing said hydrocarbon wherein the weight % of water in said second mixture is in the range of from about 1 to about 25%.

5,746,909

PROCESS FOR EXTRACTING TAR FROM TARSAND

Jeffrey S. Calta, P.O. Box T, Chicora, Pa. 16025

Filed Nov. 6, 1996, Ser. No. 744,764

Int. Cl.^{6} C10G *1/04*

U.S. Cl. 208—390 **15 Claims**

1. A process for the recovery of tar from tarsand, said process comprising the steps of:
(a) forming a slurry, wherein said slurry comprises tarsand, an anionic surfactant, at least one high boiling alkane, said alkane boils within the range of from about 225° F. to about 500° F. at 760 mm Hg, and water;
(b) mixing said slurry under conditions effective to remove tar from said tarsand and to form a mixture of (i) substantially tar-free sand and (ii) an emulsion comprising said tar, said high boiling alkane, said anionic surfactant and said water;
(c) separating said substantially tar-free sand from said emulsion; and

(d) separately treating said emulsion to separate said tar therefrom.

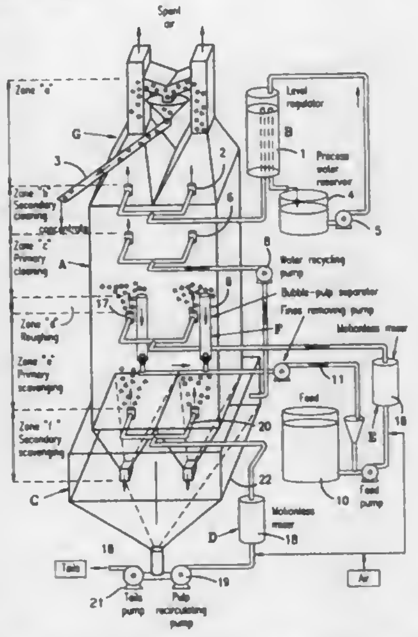
5,746,910
FROTHLESS FLOTATION APPARATUS

Tesfaye Negeri, Ottawa, Canada, assignor to Her Majesty The Queen in right of Canada, as represented by the Minister of Natural Resources, Canada

Filed Mar. 5, 1996, Ser. No. 610,876

Int. Cl.^{6} B03D *1/24*

U.S. Cl. 209—168 **14 Claims**



1. An apparatus for selective concentration by frothless flotation of minerals in an ore from an aqueous pulp containing said ore comprising:

- (a) a flotation column having an upper, a middle and a lower region;
- (b) a cover sealingly engaged to the top edge of the upper region of the column, said cover having a first outlet comprising a first conduit to allow aqueous suspension to exit from the top of the apparatus;
- (c) a second conduit extending between a feeding tank containing said aqueous pulp and a first inlet located in the middle or upper region of the column for introducing said aqueous pulp wherein said second conduit includes a stationary mixer and a means of introducing a gas into said aqueous pulp;
- (d) a third conduit extending from the tails at the bottom of the cell to the top of the lower region or the lower part of the middle region, wherein said third conduit includes a pump, a stationary mixer and a means to introduce a gas into the tails;
- (e) a second outlet at the bottom of the lower region of the column for removing the tails;
- (f) a fourth conduit extending from the upper part of the lower region of the column to the upper region of the column wherein said fourth conduit includes a pump and a photosensor;
- (g) a wash-water chamber in communication with the upper region of the column above said first inlet wherein the water level in said wash-water chamber is maintained at or above the uppermost part of said cover; and
- (h) moans to recycle the pulp comprising walled housings mounted above separate members to provide bubble-pulp separators having upper openings and lower slit openings wherein said separate members are shaped and situated below said housings in such a way that downward flowing aqueous suspension can flow out the lower slit openings but upwardly moving bubbles cannot enter the housings through the lower slit openings.

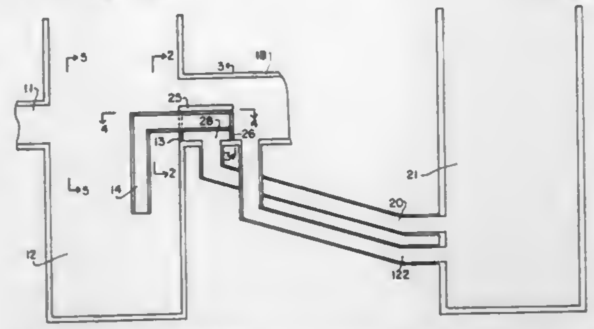
5,746,911
APPARATUS FOR SEPARATING A LIGHT FROM A HEAVY FLUID

Thomas E. Pank, 10546 Harp Rd., Walkersville, Md. 21793

Filed Jan. 13, 1997, Ser. No. 782,373

Int. Cl.^{6} C02F *1/40*

U.S. Cl. 210—170 **17 Claims**



1. Apparatus for separating a relatively light fluid from a relatively heavy fluid in a stream of fluid that may vary in its rate of flow from a very low to a very large rate, comprising:

- an inlet tank for receiving said stream,
- a main separation tank for separating at least some of the relatively light fluid from the relatively heavy fluid by allowing relatively light fluid to float on the relatively heavy fluid,
- outlet means which, when said stream has a relatively very low rate of flow, feeds fluid from the surface of the fluid in said inlet tank to said main separation tank so that any relatively light fluid in said stream may float on the relatively heavy fluid in said main separation tank,
- conduit means, including an outlet conduit having an overflow means in communication with said inlet tank, which when said stream has a relatively very large rate of flow allows fluid of said stream to flow from said inlet tank to said outlet conduit without passing through said main separation tank, and
- means for receiving relatively heavy fluid from below the surface of the fluid in said inlet tank and feeding such relatively heavy fluid to said outlet conduit comprising a conduit having an inlet below the surface of the fluid in said inlet tank and an outlet in said outlet conduit.

5,746,912
MULTICELL SEPARATOR

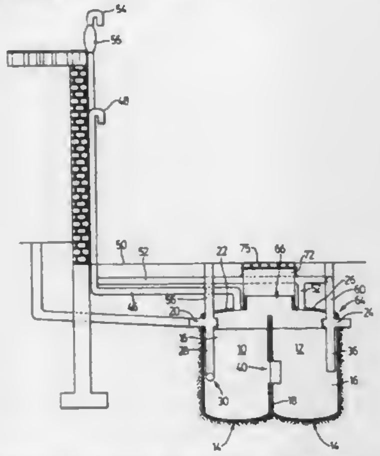
Joseph Gordon Monteith, Etobicoke, Canada, assignor to Stormceptor Canada Inc., Ontario, Canada

Filed Mar. 4, 1997, Ser. No. 811,510

Claims priority, application Canada, Jan. 23, 1997, 2195822

Int. Cl.^{6} B01D *21/02*

U.S. Cl. 210—170 **16 Claims**



1. A wastewater treatment and storage installation comprising:

at least two tank units, each unit including a bottom wall and a side wall, each side wall exhibiting an inner surface which is substantially curvilinear over a substantial portion thereof; the tank units being disposed in serial, side-by-side relation such that each unit has at least one portion that is contiguous with an adjacent unit;

an inlet opening through the side wall of an end one of said tank units, positioned adjacent the top thereof and generally opposite said portion of said end unit;

an outlet opening through the side wall of the opposite end one of said tank units, positioned adjacent the top thereof and generally opposite said portion of said opposite end unit;

an inlet drop pipe connected to the inlet opening and extending downward therefrom inside the first end tank unit to a delivery structure located adjacent the side wall thereof at an intermediate position between the top and bottom of the unit, said delivery structure ensuring that at least some of the liquid entering the first end tank unit from the inlet drop pipe is directed tangentially in opposite directions along the side wall of the first end tank unit;

an outlet riser pipe connected to the outlet opening and extending downward therefrom inside said opposite end unit to an intake opening located generally adjacent the side wall thereof at an intermediate position between the top and bottom of said opposite end unit;

a transfer opening between each adjacent pair of tank units, located at said portions of the tank units and at an intermediate position between the top and bottom of the tank units, the transfer opening communicating the interiors of the two adjacent tank units; and

diversion means operatively associated with each transfer opening and ensuring that at least some of the liquid entering a tank unit through a transfer opening is ejected tangentially in opposite directions along the side wall of the respective tank unit;

thereby reducing the likelihood of the resuspension of settled materials in the tank units, and the scouring and discharge of floating materials captured in the tank units above the general level of the lower ends of the inlet drop pipe and the outlet riser pipe.

5,746,913
CONTINUOUS SAND FILTER

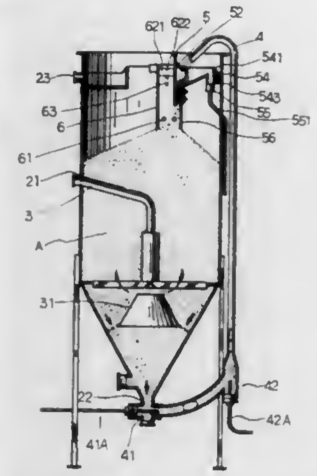
Hsiu-Chuan Chang, 31, Chien-kuo Rd., Chung-shan Lee, Chu-shan Township, NanTou Hsien, and Mao-Sheng Lin, 4, Tai-lin Lane, Tien-tzu Lee, Chu-shan Township, NAn Tou Hsien, both of Taiwan

Filed Feb. 6, 1997, Ser. No. 795,642

Claims priority, application Taiwan, May 23, 1996, 85207694

Int. Cl.^{6} B01D *24/46*

U.S. Cl. 210—189 **1 Claim**



1. A continuous sand filter comprising a tank mounted on a plurality of support rods and provided with an inlet and an outlet, said inlet being provided with a water admitting pipe under which a buffer platform is located, said tank being tapered in shape and connected with a sand pipe connected with air tubes of an air compressor; wherein said tank is provided therein with a first separation container comprising an arresting piece extending from a side wall of said first separation container, said first separation container farther comprising a shallow furrow which is provided in a separation surface of an inner wall thereof with an indentation and is connected with an output tube, said shallow furrow provided integrally with a deep furrow connected with an output tube; and wherein said tank is further provided therein with a second separation container located over filtration sand contained in said tank and provided with two tubular bodies having pores for introducing compressed air into said second separation container from an air pressure tube of said air compressor, said second separation container further provided with a tank body extending from said second separation container such that said tank body is connected with an output tube, and that said tank body has a separation surface provided with an indentation.

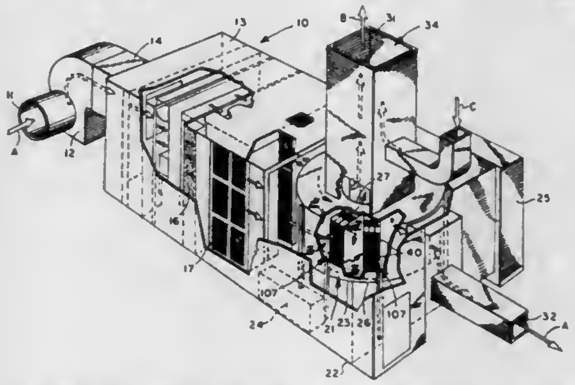
5,746,914
HONEY COMB FILTER ASSEMBLY AND METHOD OF MAKING THE SAME

Scott C. Hanna, Hudson, and Kevin L. Burmeister, Uniontown, both of Ohio, assignors to Graphite Sales, Inc., Chagrin Falls, Ohio

Filed Oct. 28, 1996, Ser. No. 736,713

Int. Cl.^{6} B01D *27/02*

U.S. Cl. 210—266 **32 Claims**



1. A filter assembly comprising: a first filter member having a plurality of openings therethrough to define a plurality of separate flow passages disposed in the direction of airflow, a second filter member having a plurality of openings therethrough to define a plurality of separate flow passages disposed in the direction of air flow, a filter material layer disposed between said first filter member and said second filter member, said first filter member and said second filter member including a plurality of adjacent honeycomb carbon blocks and a frame structure containing said first and said second filter members and said filter material layer to form a self contained filter assembly.

5,746,915
CENTRIFUGE WITH A DRIVE UNIT AND AN ENDLESS DRIVE MEANS

Ralf-Martin Ebeling, Brunswick, Germany, assignor to Braunschweigische Maschinenbauanstalt AG, Brunswick, Germany

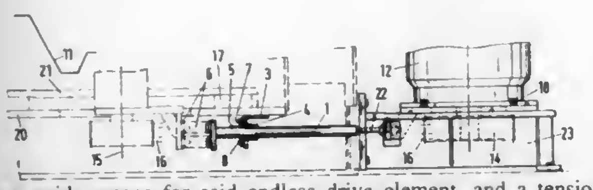
Filed Mar. 22, 1996, Ser. No. 621,814

Claims priority, application European Pat. Off., Mar. 24, 1995, 95104399

Int. Cl.^{6} B04B *1/06;* **F16H** *7/12*

U.S. Cl. 210—363 **23 Claims**

1. A centrifuge comprising a centrifuge basket unit including a centrifuge basket and an elastically supported centrifuge basket support unit, a drive unit, an endless drive arrangement connecting said drive unit to said centrifuge basket unit for drive transmission thereto and including an endless drive element and plural deflec-



tion guide means for said endless drive element, and a tension relieving device for opposing tension forces caused by said endless drive arrangement, wherein said endless drive element extends between said plural deflection guide means along a plane passing through said plural deflection guide means, and wherein said tension relieving device comprises an elastic thrust element and is arranged to extend between said plural deflection guide means and along said plane.

5,746,916

MICROPOROUS MEMBRANE MADE OF NON-CRYSTALLINE POLYMERS AND METHOD OF PRODUCING THE SAME

Jun Kamo; Seiya Koyanagi, and Miho Kawai, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,706

Claims priority, application Japan, Jan. 26, 1994, 6-023430; Feb. 8, 1994, 6-014324

Int. Cl.^{6} B01D *33/21;* **B29C** *65/00*

U.S. Cl. 210—500.23 **13 Claims**

8. A method of producing a microporous hollow fiber membrane comprising the steps of:
   (1) mixing 40 to 95 wt. % of at least one non-crystalline polymer selected from the group consisting of polysulfone. polyimide, polyarylate, polycarbonate, polyphenylene oxide, polystyrene. polymethylmethacrylate, and copolymers thereof and 60 to 5 wt. % of fine particles having an average particle size of from 0.01 to 10 μm to make a mixed composition;
   (2) spinning the mixed composition through a nozzle to make a hollow fiber precursor;
   (3) stretching the hollow fiber precursor at a deformation rate of not less than 200 %/min.

11. A microporous hollow fiber membrane produced by the method of claim 8.

5,746,917

STRONGLY ALKALINE ANION EXCHANGE MEMBRANES AND PROCESS FOR PRODUCING THE SAME

Patrick Altmeier, Donatusstrasse 43, 66822 Lebach, Germany

PCT No. PCT/DE94/00849, § 371 Date Feb. 15, 1996, § 102(e) Date Feb. 15, 1996, PCT Pub. No. WO95/06083, PCT Pub. Date Mar. 2, 1995

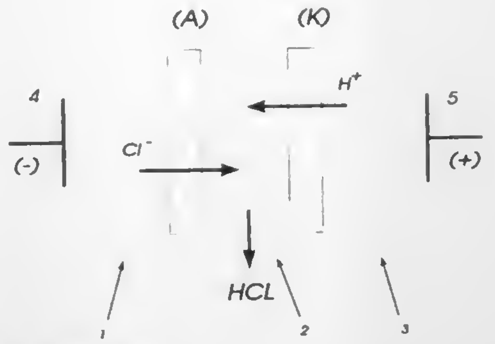
PCT Filed Jul. 22, 1994, Ser. No. 591,628

Claims priority, application Germany, Aug. 23, 1993, 43 28 226.1

Int. Cl.^{6} B01D *39/00*

U.S. Cl. 210—500.37 **11 Claims**

1. Anion exchange membranes produced from a solution of polymers containing reactive halogen-containing functional groups,



tertiary amines, and
inert polymer,

by thermal quaternization of the amine through the reactive halogen-containing polymer at 30° to 200° C. and simultaneous evaporation of the solvent after formation of a film, wherein the polymer which contains reactive halogen-containing functional groups is a halogenated polyether soluble in a solvent and having a polymeric main chain being characterized by ethyleneoxide groups, with a characteristic component having the formula

$$-[CR_1R_2-CR_3R_4-O-]_n-$$

wherein at least one of the residues R_1–R_4 is a CH_2Z group with Z=halogen.

5,746,918

Patent Not Issued For This Number

5,746,919

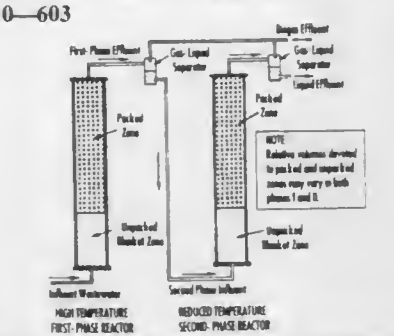
TEMPERATURE-PHASED ANAEROBIC WASTE TREATMENT PROCESS

Richard R. Dague, Ames, Iowa; William L. Harris, Gilbert, Ariz., and Sandra K. Kaiser, Cincinnati, Ohio, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 316,860, Oct. 3, 1994, Pat. No. 5,525,228, which is a continuation of Ser. No. 124,871, Sep. 23, 1993, abandoned. This application May 31, 1996, Ser. No. 656,607

Int. Cl.^{6} C02F *11/04*

U.S. Cl. 210—603 **29 Claims**



1. A method of treating a waste stream, comprising the steps of:

feeding the waste stream into a thermophilic anaerobic reactor;

maintaining thermophilic anaerobic reaction conditions of the waste stream in the thermophilic anaerobic reactor for a predetermined hydraulic retention time to generate a first biogas effluent comprising methane and a first liquid effluent;

feeding the first liquid effluent from the thermophilic anaerobic reactor into a mesophilic anaerobic reactor; and

maintaining mesophilic anaerobic reaction conditions of the waste stream in the mesophilic anaerobic reactor for a predetermined hydraulic retention time to generate a second biogas effluent comprising methane and a second liquid effluent.

5,746,920

PROCESS FOR PURIFYING DAIRY WASTEWATER

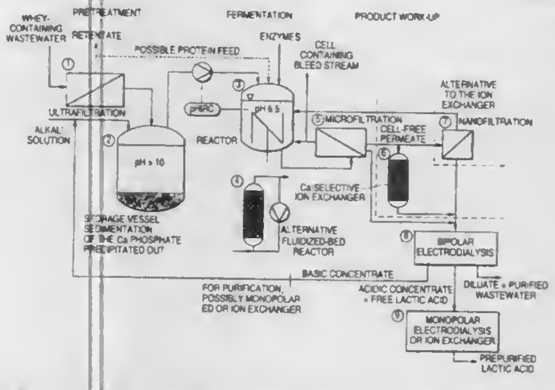
Peter Boergardts, Stuttgart; Wolfgang Krischke, Kirchentellinsfurt, and Walter Troesch, Stuttgart, all of Germany, assignors to Fraunhofer-Gesellschaft zur Foerder der Angewandten Forschung e.V., Munich, Germany

Filed Feb. 8, 1996, Ser. No. 598,324

Claims priority, application Germany, Jun. 8, 1994, 44 20 033.1; WIPO, Jun. 2, 1995, PCT/DE95/00722

Int. Cl.^{6} C02F *3/34;1/46*

U.S. Cl. 210—611 **18 Claims**


PRETREATMENT
FERMENTATION
PRODUCT WORK-UP
WHEY-CONTAINING WASTEWATER
RETENTATE
ENZYMES
POSSIBLE PROTEIN FEED
CELL CONTAINING BLEED STREAM
①
③
pHRC
pH 6.5
ALTERNATIVE TO THE ION EXCHANGER
ULTRAFILTRATION
⑤ MICROFILTRATION
⑦ NANOFILTRATION
ALKALI SOLUTION
②
REACTOR
CELL-FREE PERMEATE
pH > 10
⑥
④
Ca SELECTIVE ION EXCHANGER
STORAGE VESSEL SEDIMENTATION OF THE Ca PHOSPHATE PRECIPITATED OUT
ALTERNATIVE FLUIDIZED-BED REACTOR
⑧
BIPOLAR ELECTRODIALYSIS
BASIC CONCENTRATE
FOR PURIFICATION, POSSIBLY MONOPOLAR ED OR ION EXCHANGER
ACIDIC CONCENTRATE = FREE LACTIC ACID
DILUATE = PURIFIED WASTEWATER
⑨
MONOPOLAR ELECTRODIALYSIS OR ION EXCHANGER
PREPURIFIED LACTIC ACID

1. A process for purifying wastewater containing lactose, comprising the steps of:
   A. treating lactose-containing wastewater with a base;
   B. anaerobically fermenting by use of microorganisms in a fermenter at least a portion of the lactose present in the treated wastewater, thereby forming a fermentation broth comprising lactic acid and base;
   C. removing at least a portion of said fermentation broth from the fermenter;
   D. purifying at least a portion of the fermentation broth removed in Step C to yield a purified broth; and
   E. concentrating at least a portion of the lactic acid and base present in the purified broth by bipolar electrodialysis to yield a lactic acid solution and an alkali solution.

5,746,921

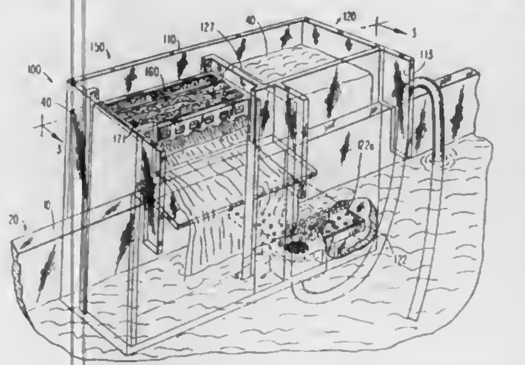
FLUIDIZED BED AQUARIUM FILTRATION METHOD

Joseph E. Gargas, Apollo Beach, Fla., and Robert H. Hyde, Budd Lake, N.J., assignors to The Hartz Mountain Corporation, Secaucus, N.J.

Division of Ser. No. 481,729, Jun. 7, 1995, Pat. No. 5,632,887. This application Feb. 13, 1997, Ser. No. 800,912

Int. Cl.^{6} A01K *63/04;* **C02F** *3/06*

U.S. Cl. 210—617 **20 Claims**



1. A method of treating water in an aquarium, comprising the steps of:

removing water from an aquarium and delivering the water to the bottom of a column both relatively light and relatively heavy particles therein, the column having a tops a bottom, and a support plate positioned across the interior of the column and spaced above the bottom of the column, the plate formed with a plurality of openings arranged in a pattern for permitting substantially uniform flow of water therethrough for fluidizing the bed of particles, each opening defined by a continuous wall extending from a top surface of the plate to a bottom surface of the plate and a bed of particles with bacteria growing thereon over the plate,

flowing water from the aquarium up through the openings in the plate and then up through the bed of particles in the column with a substantially uniform velocity profile, using the flowing water to expand the bed of particles to a volume greater than the bed of particles has at rest and creating a stratification of particles, with the lightest particles at a top portion of the expanded bed, the heaviest particles at a bottom portion of the expanded bed and substantially no mixing of particles from the top of the expanded bed to the bottom of the expanded bed.

5,746,922

PROCESS FOR REMOVING CHROMATE ION FROM A CONCENTRATED SOLUTION OF SODIUM SULFATE

Paul K. Smith, Roscoe, and Eugene P. Bergemann, Hoffman Estates, both of Ill., assignors to NTEC Solutions, Inc., Mt. Prospect, Ill.

Filed Jan. 27, 1997, Ser. No. 789,657

Int. Cl.^{6} B01D *15/00*

U.S. Cl. 210—670 **9 Claims**

1. A process for reducing the concentration of hexavalent chromium ions in an aqueous solution of sodium sulfate comprising the steps of:
   (a) providing a vessel containing a water-insoluble adsorption medium having a plurality of adsorption sites that are pyridyl-containing moieties present as polymerized pyridine or N—C_1–C_4 alkyl pyridinium moieties;
   (b) introducing an influent aqueous solution of about 1.0 molar to saturated sodium sulfate having an initial total hexavalent chromium ion concentration of about 1.0 to about 1000 parts per million to the vessel to contact the insoluble adsorption medium;
   (c) maintaining said solution in contact with said insoluble medium for a time period sufficient for said hexavalent chromium ions in the influent to bind to said adsorption sites to form medium-bound chromate ions and an aqueous composition; and
   (d) discharging the aqueous composition from the vessel as an effluent having a total hexavalent chromium ion concentration whose ratio to the total hexavalent chromium ion concentration of the influent is about zero to about 25.0×10^{-6}.

5,746,923

CONTROL OF IRON DEPOSITION IN BOREHOLE PUMPS

Peter Forward, Berri, Australia, assignor to Minister For Infrastructure, South Australia, Australia

PCT No. PCT/AU94/00580, § 371 Date Mar. 27, 1996, § 102(e) Date Mar. 27, 1996, PCT Pub. No. WO95/09283, PCT Pub. Date Apr. 6, 1995

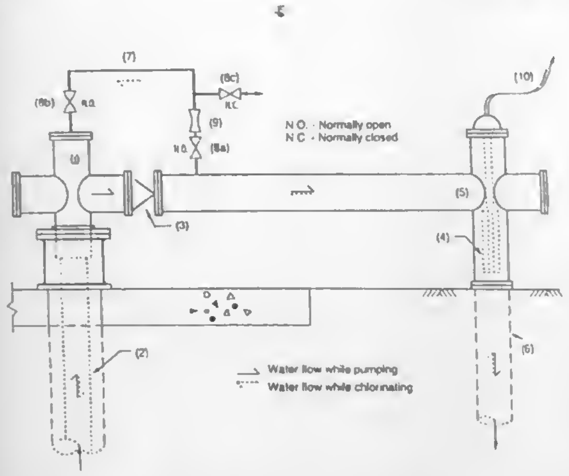
PCT Filed Sep. 28, 1994, Ser. No. 619,562

Claims priority, application Australia, Sep. 28, 1993, PM1473

Int. Cl.^{6} C02F *5/08*

U.S. Cl. 210—696 **10 Claims**

1. A method of controlling deposition of biofouling or abiotic encrustation in a groundwater pumping installation having a submersible pump connected by a riser through a reflux valve to an outlet pipe through which ground water is pumped at a first flow rate, which method comprises the steps of periodically stopping the pump and backfeeding chlorinated water or surfactants or other organic or inorganic acids via a by-pass passage around the reflux



valve and down the riser and through the pump itself at a second flow rate reduced relative to the first flow rate to control the deposition in the pumping installation of materials by bacterial action, or to control biofouling or abiotic encrustation therein.

5,746,924
ANTIFOULANT FOR ACRYLONITRILE PURIFICATION

Fredrick L. Cooper, Houston; Piotr A. Kibala, Fulshear, and Michael C. Weismiller, Sugar Land, all of Tex., assignors to Nalco/Exxon Energy Chemicals, L.P., Sugar Land, Tex.

Filed Apr. 15, 1997, Ser. No. 838,120

Int. Cl.^{6} C02F *5/10*

U.S. Cl. 210—698 **9 Claims**

1. A method of inhibiting the formation of tars, gums, and foulants in acrylonitrile monomer process equipment which comprises adding to the liquid or gaseous phases contained therein an effective antifouling amount of an antifoulant, said antifoulant having the structure:

$$R\text{—}(SO_3)_nM$$

wherein R is a hydrocarbonaceous group having from 1–34 carbon atoms chosen from linear or branched alkyl groups, aromatic, cyclic, alkaryl, aralkyl, or alkenyl groups, alkyl diphenyl ether groups, dialkyl naphthalene groups, or mixtures thereof; M is chosen from the group consisting of H, alkali metals, alkaline earth metals, ammonium cations, alkyl ammonium cations, or mixtures thereof, and n ranges from 1 to about 6.

5,746,925
COMPOSITION FOR COAGULATING OIL

Hal Alper, Brooklyn, N.Y., assignor to Mansfield & Alper, Inc., Gainesville, Ga.

Continuation-in-part of Ser. No. 506,968, Jul. 28, 1995, Pat. No. 5,698,139, which is a division of Ser. No. 74,114, Jun. 8, 1993, Pat. No. 5,437,793. This application Dec. 15, 1995, Ser. No. 572,986

Int. Cl.^{6} B01J *13/00;* **C02F** *1/54;1/56*

U.S. Cl. 210—728 **37 Claims**

1. An oil coagulant, comprising a homogeneous thermal reaction product of a natural glyceride and a methacrylate or acrylate polymer.

22. A process for treating an oil spill, comprising the steps of:

applying a composition that is the homogenous thermal reaction product of a glyceride and a methacrylate polymer to spilled oil, wherein the percentage of said composition to said spilled oil ranges from about 5–15%; and

allowing said composition and spilled oil to mix such that said composition coagulates said spilled oil.

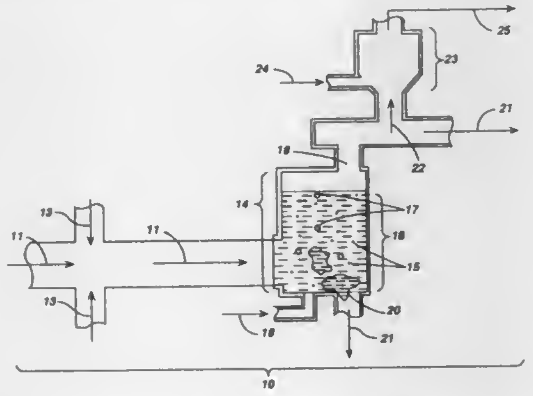
5,746,926
METHOD FOR HYDROTHERMAL OXIDATION OF HALOGENATED ORGANIC COMPOUNDS WITH ADDITION OF SPECIFIC REACTANTS

David S. Ross, Palo Alto; Indira Jayaweera, Fremont, and Roald N. Leif, San Francisco, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 621,746, Mar. 22, 1996. This application Apr. 15, 1996, Ser. No. 632,604

Int. Cl.^{6} C02F *1/72*

U.S. Cl. 210—761 **18 Claims**



1. A process for the decomposition of material selected from halogenated organic compounds, to compounds which are environmentally acceptable, or which are amenable to further degradation by conventional disposal systems to produce environmentally acceptable products, which process comprises:

(a) conveying an aqueous solution or an aqueous slurry of material to be decomposed into a reaction zone capable of withstanding the temperatures and pressures of decomposition of the material; and

(b) contacting the material in the reaction zone in the presence of water with a reactive fluidized bed of a specific reactant present as a solid in an amount effective to decompose the material under hydrothermal water oxidation conditions of between about 300° and 400° C. and a pressure of between about 10 and 400 atmospheres, wherein the specific reactant is at least about 90% insoluble in an aqueous medium at said hot water or supercritical water oxidation conditions, and reacts to neutralize any acid gases produced in the decomposition, and wherein the process occurs in the presence of a gaseous oxidant which is present in an amount of between about 0.1 and 50% by weight of the material to be decomposed;

wherein said reactive fluidized bed is fluidized by said oxidant and said solution or slurry, and wherein said specific reactant is selected from the group consisting of sodium carbonate, calcium oxide, calcium hydroxide, magnesium hydroxide, magnesium oxide, and combinations thereof;

said contacting being carried out for a time sufficient to convert about 99% or greater of the material to compounds which are environmentally acceptable, or to conversion compounds which are amendable to further degradation to environmentally acceptable products.

5,746,927
ELECTRICAL CONNECTING DEVICE AND METHOD FOR MAKING SAME

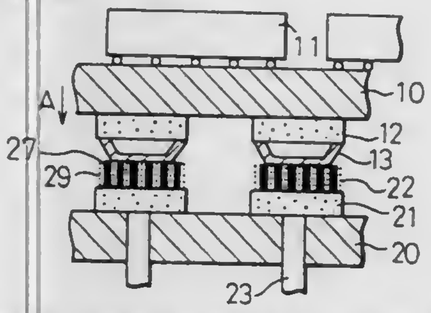
Kaoru Hashimoto; Tatuo Chiyonobu; Kyoichiro Kawano; Koji Watanabe; Masato Wakamura, and Joe Yamaguchi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 403,678, Mar. 14, 1995, Pat. No. 5,610,371, which is a continuation-in-part of Ser. No. 277,992, Jul. 20, 1994, Pat. No. 5,440,454. This application Dec. 12, 1996, Ser. No. 762,882

Claims priority, application Japan, Oct. 14, 1993, 5-257004; Mar. 15, 1994, 6-043445; Sep. 19, 1994, 6-223787; Feb. 27, 1995, 7-38142

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—18 **1 Claim**



1. A method of making an electrical connecting device, said device having a first circuit board provided thereon with input/output terminals, a second circuit board provided with holes at positions corresponding to said input/output terminals of said first circuit board, and conductive material filled in each of said holes, wherein said first and second circuit boards are electrically connected to each other by inserting said input/output terminals of said first circuit board into the respective holes of said second circuit board, said method comprising the steps of:

forming at least portions of said second circuit board, around said holes, with photosensitive polymer; and

etching said second circuit board to form holes thereon, each of said holes having a bottle shape in which a cross-sectional area thereof at an internal side is larger than that at an open-end thereof.

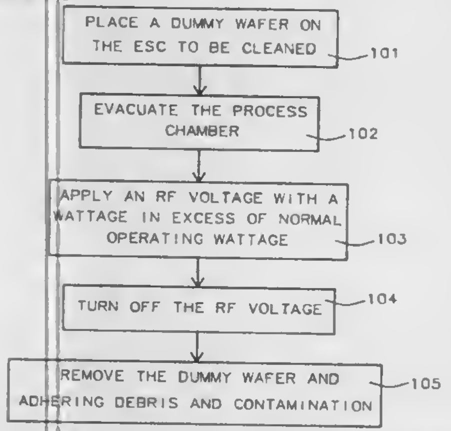
5,746,928
PROCESS FOR CLEANING AN ELECTROSTATIC CHUCK OF A PLASMA ETCHING APPARATUS

Shih Kuel Yen; Po-Tao Chu, and Kuang-Hui Chang, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan

Filed Jun. 3, 1996, Ser. No. 658,522

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 216—37 **7 Claims**


PLACE A DUMMY WAFER ON THE ESC TO BE CLEANED
101
EVACUATE THE PROCESS CHAMBER
102
APPLY AN RF VOLTAGE WITH A WATTAGE IN EXCESS OF NORMAL OPERATING WATTAGE
103
TURN OFF THE RF VOLTAGE
104
REMOVE THE DUMMY WAFER AND ADHERING DEBRIS AND CONTAMINATION
105

1. A process for cleaning debris and contamination from the surface of an electrostatic chuck of a plasma etching apparatus having a process chamber, a source of RF power, an electrostatic wafer chuck within the process chamber, a chuck electrode, and a source of DC power connected to said chuck electrode comprising;

placing a dummy wafer on and in direct contact with the electrostatic wafer chuck,

evacuating the process chamber,

applying an RF voltage with a wattage in excess of the normal wattage applied during normal etching procedure, while refraining to apply the DC power to the chuck electrode,

turning off the RF power,

removing the dummy wafer and the adhering debris and contamination.

5,746,929
PROCESS FOR STRUCTURING POLYMER FILMS

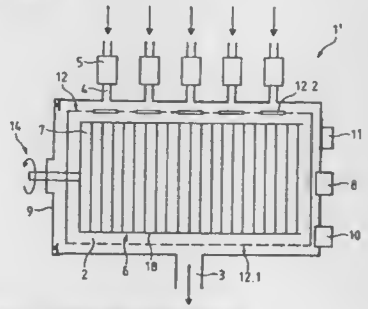
Walter Schmidt, Zürich, and Hermann Schmid, Vaterstetten, both of Switzerland, assignors to Dyconex Patente AG, Zug, Switzerland

Continuation of Ser. No. 344,734, Nov. 23, 1994, abandoned. This application Aug. 18, 1997, Ser. No. 912,537

Claims priority, application Switzerland, Nov. 23, 1993, 486/93

Int. Cl.^{6} C23F *1/00*

U.S. Cl. 216—59 **15 Claims**



12. A process comprising the steps of

providing a container for receiving and holding a polymer film for processing,

flowing an etching gas mixture into the container,

monitoring the surface temperature of the polymer film using a pyrometer and monitoring the pressure of gas in the chamber,

digitizing surface temperature and gas pressure data with a signal integrator and storing the digitized data,

subjecting the gas mixture to microwave energy at a frequency of at least 2.45 GHz and a power density of at least 10 watts per liter of gas to excite the gas mixture into a surface-eroding plasma,

providing a heater in the container around the polymer film, and

while the Polymer film is subjected to surface erosion by the plasma, controlling the power density of the microwave energy, the level of energy provided to the heater and the pressure of gas in the container to maintain the surface of the polymer film at a temperature no treater than 200° C. in accordance with a time pattern algorithm using a computer to thereby erode exposed surface areas of the polymer film in a controlled fashion.

5,746,930
METHOD AND STRUCTURE FOR FORMING AN ARRAY OF THERMAL SENSORS

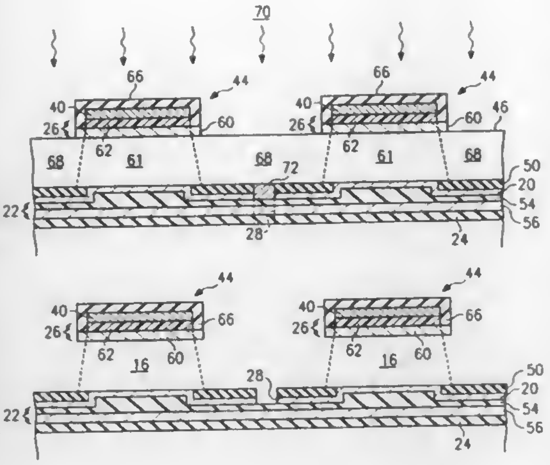
James F. Belcher, Plano; Howard R. Beratan, Richardson, and Scott R. Summerfelt, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1995, Ser. No. 368,068

Int. Cl.^{6} G01J *5/06;* **C23F** *1/00*

U.S. Cl. 216—87 **27 Claims**

1. A method for forming an array of thermal sensitive elements from a substrate of thermal sensitive material having portions of an infrared absorber and common electrode assembly attached thereto, comprising:



forming a first layer of electrically conductive contacts on one side of said substrate to at least partially define masked and unmasked regions thereof;
forming a second layer of electrically conductive contacts on said first layer of contacts;
encapsulating the exposed portions of said second layer of contacts with a mask layer;
exposing said unmasked regions of said substrate to an etchant;
irradiating said unmasked regions with electromagnetic energy to substantially increase the reactivity between said unmasked regions and said etchant; and
wherein during said step of irradiating, said etchant etches said unmasked regions substantially faster than said first layer of contacts and said mask layer.

5,746,931

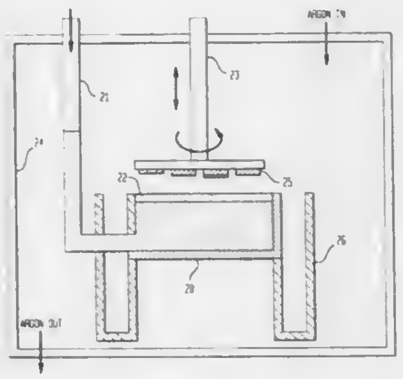
METHOD AND APPARATUS FOR CHEMICAL-MECHANICAL POLISHING OF DIAMOND

John Edwin Graebner, Short Hills; Sungho Jin, Millington, and Wei Zhu, Warren, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 5, 1996, Ser. No. 760,845

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 216—88 **10 Claims**



1. A method for polishing a surface of diamond, nitride or carbide comprising the steps of:
providing in an inert gas, elevated temperature ambient, a porous platen having a planar surface and molten metal in pores adjacent said surface;
pressing said surface to be polished into contact with said platen planar surface; and
moving said surface to be polished in relation to said platen surface to effect polishing.

5,746,932

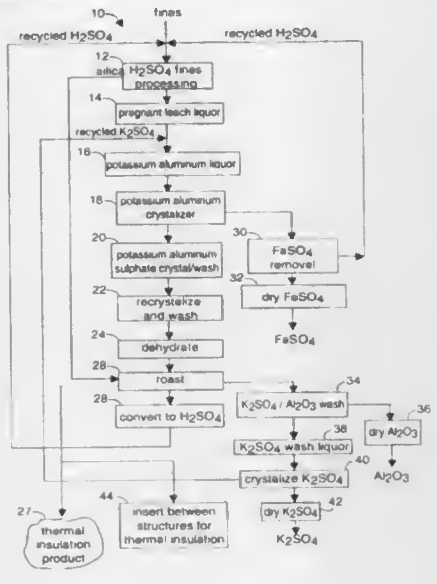
METHOD FOR PRODUCING THERMAL INSULATION FROM DRY-FINE OIL-SANDS TAILINGS

John S. Rendall, and Massoud Ahghar, both of Albuquerque, N. Mex., assignors to Solv-Ex Corporation, Albuquerque, N. Mex.

Filed Nov. 14, 1996, Ser. No. 749,167

Int. Cl.^{6} E04B *1/74*

U.S. Cl. 252—62 **6 Claims**



1. A method for thermally insulating structures from one another, comprising the steps of:
mixing dry oil sands tailings with sulfuric acid:
processing said mixture of oil sands tailings and sulfuric acid to produce a silica-alumina powder; and
placing said silica-alumina powder between structures to be thermally insulated from one another;
wherein the step of processing includes:
adding potassium sulfate to form a potassium aluminum liquor;
crystallizing said potassium aluminum liquor to produce potassium aluminum sulfate crystals;
washing said potassium aluminum sulfate crystals;
recrystallizing said washed potassium aluminum sulfate crystals;
dehydrating said recrystallized potassium aluminum sulfate crystals; and
roasting said dehydrated potassium aluminum sulfate crystals at greater than 850° C. to drive-off sulfur, wherein a synthetic silica-alumina powder having about 80% to 90% silica by weight and 8% to 20% alumina by weight is produced as a result, wherein the synthetic silica processed contains 60% to 70% amorphous silica and remaining crystalline silica.

5,746,933

LUBRICATING OIL AND COMPOSITION FOR REFRIGERATING MACHINE, AND REFRIGERATING MACHINE

Noboru Ishida; Umekichi Sasaki; Katsuya Takigawa, and Satoshi Suda, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

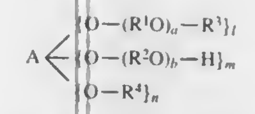
Filed Nov. 3, 1995, Ser. No. 552,540

Claims priority, application Japan, Nov. 7, 1994, 6-296029

Int. Cl.^{6} C09K *5/04;* **C10M** *171/00;107/34*

U.S. Cl. 252—68 **9 Claims**

1. A lubricating oil for a refrigerating machine comprising:
as a main component at least one compound selected from the group consisting of polyoxyalkylene compounds represented by the following general formula (1);



$$A \left\langle \begin{array}{l} \{O-(R^1O)_a-R^3\}_l \\ \{O-(R^2O)_b-H\}_m \\ \{O-R^4\}_n \end{array} \right.$$

wherein A represents a residue obtained by eliminating hydroxyl groups from cyclic glucose; R^1 and R^2 are identical with or different from each other and are each an alkylene group having from 2 to 6 carbon atoms; R^3 is an alkyl group having from 1 to 6 carbon atoms; R^4 is a methyl group; a and b are each a positive integer and l and m are each an integer of 0 or more and n is 1 with the proviso that $a \cdot l + b \cdot m = 2$ to 100 and $l+m+n=5$; further
(a) said main component has a hydroxyl value ranging from 0 mgKOH/g to 30.0 mgKOH/g and
(b) a ratio of butylene groups of all alkylene groups represented by R^1 and R^2 in said general formula (1) to said all alkylene groups satisfies the following formula (1)

$$0.5 \leqq p/(p+q) \leqq 1.0 \quad (1)$$

wherein p is the number of butylene groups, q is the number of alkylene groups having from 2 to 6 carbon atoms excluding the butylene groups.

5,746,934

ELECTRO RHEOLOGICAL FLUID COMPRISING LYOTROPIC LIQUID CRYSTALLINE POLYMER

Makoto Sasaki; Takafumi Ishii, and Katsuhiko Haji, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 396,696, Mar. 1, 1995, Pat. No. 5,536,428. This application Apr. 26, 1996, Ser. No. 638,441

Claims priority, application Japan, Mar. 1, 1994, 6-54423

Int. Cl.^{6} C10M *171/00*

U.S. Cl. 252—77 **8 Claims**

1. An electro rheological fluid consisting essentially of a lyotropic liquid crystalline polyisocyanate polymer dissolved in an electrically insulating solvent therefor in a concentration of from 0.1 to 7 percent by weight of the solvent, said concentration being such that the fluid does not exhibit liquid crystalline properties.

5,746,935

EPOXY RESIN SYSTEM

Larry Steven Corley, Houston; Kalyan Ghosh, Richmond; Joseph Michael Hunter; Derek Scott Kincaid, both of Houston; Leo Meilus, Cypress, and Daniel James Weinmann, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 583,697, Jan. 5, 1996, abandoned, which is a continuation of Ser. No. 290,649, Aug. 15, 1994, abandoned. This application Sep. 23, 1996, Ser. No. 718,614

Int. Cl.^{6} C11D *1/72;* **C07K** *14/00*

U.S. Cl. 252—182.23 **7 Claims**

1. A non-aqueous amine curing agent composition comprising:
(a) one or more polyamine curing agent for epoxy resins having at least 2 nitrogen atoms and at least 2 amine hydrogen atoms, and
(b) from about 1 to about 300 weight percent, based on the polyamine, of a diluent comprising an aliphatic alcohol-alkylene oxide adduct having the formula:

$$R_1-(O-CR_2R_3-CR_4R_5)_n-OH$$

wherein R_1 is a hydrocarbyl group having 7 to 22 carbon atoms, R_{2-5} are independently hydrogen or C_{1-4} alkyl groups and n is a number having an average value of 1 to 5.

5,746,936

HYPOCHLORITE BLEACHING COMPOSITION HAVING ENHANCED FABRIC WHITENING AND/OR SAFETY BENEFITS

Hedeliza Malonzo Mercado, Scarborough, Canada, assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Sep. 13, 1996, Ser. No. 710,217

Int. Cl.^{6} C01B *11/06;* **D06L** *3/06*

U.S. Cl. 252—187.25 **9 Claims**

1. An aqueous liquid bleaching composition having a pH of from 9 to 14, which is particularly suitable as a pre-wash and laundering composition for fabrics, said liquid composition consisting essentially of:
(a) from about 2.0% to about 10%, by weight, of an alkali metal hypochlorite;
(b) a source of alkalinity to provide the desired pH within the aforesaid range of from 9 to 14;
(c) from about 0.2 to about 5%, by weight, of an alkali metal carbonate;
(d) from about 0.2 to about 2.0%, by weight, of an alkali metal salt of phosphate whereby the said phosphate enhances the performance of the said bleaching composition to provide improved whiting and/or fabric safety when bleaching fabrics in comparison to the performance provided by an otherwise identical bleaching composition which is free of said phosphate;
(e) optional periodate ion stabilizer(s) and
(f) the balance being essentially water.

5,746,937

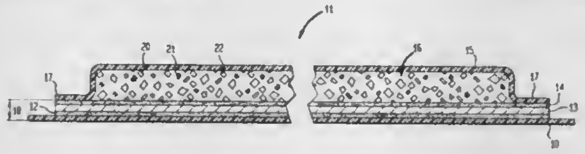
OXYGEN ABSORBING COMPOSITION

George E. McKedy, Williamsville; Ronald C. Idol, Amherst, both of N.Y., and Thomas H. Powers, Rockford, Mich., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Division of Ser. No. 303,171, Sep. 8, 1994, Pat. No. 5,641,425. This application Jun. 14, 1996, Ser. No. 664,160

Int. Cl.^{6} C09K *15/02;15/04;* **B01J** *13/00*

U.S. Cl. 252—188.28 **15 Claims**



1. A method of making an oxygen absorbing product comprising the steps of:
(a) dispersing at least 10.0 weight percent of an oxygen absorbent in an emulsion to form an oxygen absorbing composition, wherein said oxygen absorbent is a mixture of a metal and a salt, and wherein said salt is at a concentration range of between 0.1 to 5.0 weight percent of said metal; and
(b) transferring said oxygen absorbing composition onto a substrate.

5,746,938

ELECTROOPTICAL LIQUID CRYSTAL SYSTEM

David Coates, Merley, Wimborne; Owain Llyr Parri, Poole; Simon Greenfield, Poole; Martin David Tillin, Poole; Mark John Goulding, Poole, and Patrick Nolan, Poole, all of Great Britain, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 81,280, Jun. 25, 1993. This application Jun. 7, 1995, Ser. No. 474,765

Claims priority, application European Pat. Off., Apr. 27, 1992, 92107137

Int. Cl.^{6} C09K *19/52;* **G02F** *1/13*

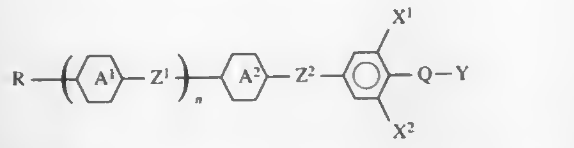
U.S. Cl. 252—299.01 **31 Claims**

1. A precursor of a PDLC film comprising:
A) a photoradically curable precursor of a polymer matrix;

B) a liquid crystalline mixture for forming microdroplets within said matrix, said mixture comprising:

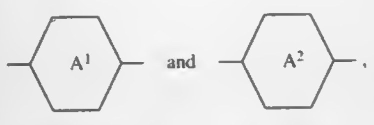
(1) one or more compounds of formula I

I

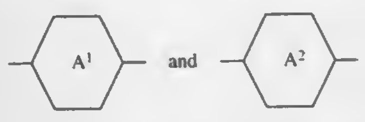


wherein

Z^1 and Z^2, independently of one another, are each a single bond, $—CH_2CH_2—$, —COO—, —OCO— or —C≡C—,



independently of one another, are each trans-1,4-cyclohexylene, 1,4-phenylene,2-fluoro-1,4-phenylene,3-fluoro-1,4-phenylene,2,3-difluoro- 1,4-phenylene or 3,5-difluoro-1,4-phenylene, and one of



can also be pyrimidine-2,5-diyl, pyridine-2,5-diyl or trans-1,3-dioxane-2,5 -diyl,

X^1 and X^2, independently from one another, are each H or F,

Q is $—CF_2—$, $—OCF_2$, $—C_2F_4—$, $—OC_2F_4—$ or a single bond,

Y is —H, —F, —Cl or —CN,

n is 0, 1 or 2 , and

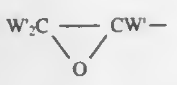
R is alkyl having up to 13 C atoms, in which one or two non-adjacent CH_2 groups can also be replaced by —O—, —CH=CH— or a combination thereof and, in addition,

(2) one or more reactive liquid crystalline compounds of formula II

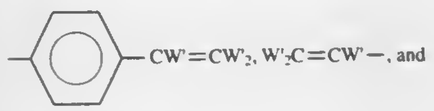
R'-G'-R" II

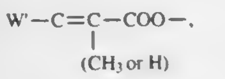
wherein

one of the terminal groups R' and R" is a reactive group exhibiting one reaction site selected from $HOW'_2C—$, $HSW'_2C—$, HW'N—, a carboxyl group,



and O=C—N—, or is a polymerizable reactive group exhibiting two or more reactive sites selected from





$$W'—C{=}\underset{\substack{|\\(CH_3\text{ or }H)}}{C}—COO—,$$

wherein W' is in each case independently, H or an alkyl group with 1–5 C atoms, and

the other of terminal groups R' and R" is, independently from the first terminal group, one of said reactive groups or is an alkyl radical with up to 15 C atoms which is unsubstituted or mono- or polysubstituted by halogen, it being also possible for one or more CH_2 groups in these radicals to be replaced, in each case independently of one another, by —O—, —S—, —CO—, —OCO—, —CO—O— or —O—CO—O— in such a manner that O atoms are not linked directly to one another,

G' is a rod-like diyl group of the formula

$$-S^1-(A^5-Z^3)_m-A^6-S^2-$$

wherein

S^1 and S^2, independently from each other, are alkylene groups with 0–20 C atoms which can be linear or branched, it also being possible for one or more CH_2 groups to be replaced, in each case independently from each other, by —O—, —CO—, —S— or —NW'— with the proviso that O atoms are not linked directly to one another,

A^5 and A^6 are, independently from each other,

- a) a cyclohexylene group, wherein one or two non-adjacent CH_2 groups may be replaced by O or S atoms,
- b) an unsubstituted 1,4-phenylene group wherein one to three CH groups may be replaced by —N— or a 1,4-phenylene group which is mono- or polysubstituted by F, Cl, CH_3 or combinations thereof,
- c) a bicyclo(2,2,2)octylene group, a naphthalene-2,6-diyl group, a decahydronaphthalene-2,6-diyl group or 1,2,3,4-tetrahydronaphthalene group,

Z^3 is, independently from each other, —CO—O—, —O—CO—, $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$, —C≡C— or a single bond, and

m is 1, 2, 3 or 4;

wherein the amount of said reactive liquid crystals is not more than 5 wt. % of the mass of the precursor of the PDLC film.

5,746,939

LIQUID CRYSTAL DEVICE

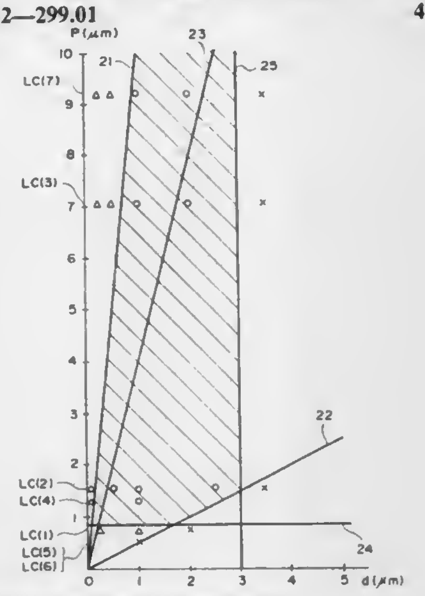
Osamu Taniguchi; Shinjiro Okada, both of Kawasaki; Kazuharu Katagiri, Tama, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 750,238, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 563,856, Aug. 8, 1990, abandoned, which is a continuation of Ser. No. 853,163, Apr. 17, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 478,445

Claims priority, application Japan, Apr. 26, 1985, 60-090122

Int. Cl.⁶ C09K *19/52;19/02*

U.S. Cl. 252—299.01 **43 Claims**



9. A liquid crystal device, comprising:

two cell walls each having an electrode structure, at least one cell wall having been treated for aligning liquid crystal molecules;

a chiral smectic liquid crystal material disposed in a layer thickness between the two cell walls; and

first and second polarizers, wherein said liquid crystal material is characterized by:

- (i) plural switching states and chiral smectic phase at an ordinary device operation temperature, and cholesteric phase at a temperature higher than the operation temperature and an environmental temperature,
- (ii) at least one species of material component showing a levo-rotatory cholesteric spiral,
- (iii) at least one species of material component showing a dextro-rotatory cholesteric spiral,
- (iv) a smectic pitch larger than the layer thickness,
- (v) a cholesteric pitch at least 0.5 times the layer thickness given by mixing the levo-rotatory material component and the dextro-rotatory material component, and
- (vi) a ferroelectricity given by mixing the levo-rotatory material component and the dextro-rotatory material component.

5,746,940

LIQUID CRYSTALLINE MATERIAL COMPRISING TERPENOIDS

David Coates, and Alison Linda May, both of Wimborne, Great Britain, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Jan. 30, 1996, Ser. No. 593,867

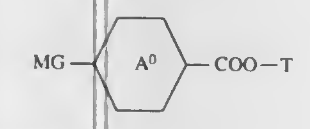
Claims priority, application United Kingdom, Jan. 31, 1995, 9501853

Int. Cl.⁶ C09K *19/52;19/30;19/12;19/20*

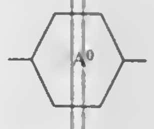
U.S. Cl. 252—299.01 **19 Claims**

1. A liquid crystalline material in the form of an anisotropic gel comprising a polymerized monotropic or enantiotropic liquid crystalline material and a chiral nematic low-molecular weight liquid crystalline material, wherein the polymerized material a) forms a permanently oriented network in the low-molecular weight liquid crystalline material b), and wherein the low-molecular weight liquid crystalline material b) comprises at least one terpenoid compound of formula I

(I)



wherein



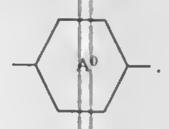
is 1,4-phenvlene optionally substituted by 1 to 4 fluorine atoms or is

1,4-cyclohexylene,

T is a terpenoid radical,

and

MG is a mesogenic group, or forms a mesogenic group with



5,746,941

LIQUID-CRYSTALLINE MEDIUM

Bernhard Rieger, Wacore, Japan; Reinhard Hittich, Modautal; Hans Adolf Kurmeier, Seeheim-Jugenheim, both of Germany; David Coates, Merley, Great Britain, and Herbert Plach, Darmstadt, Germany, assignors to Merck Patent Gesellschaft MIT Beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 721,502, Jul. 5, 1991, abandoned. This application Dec. 27, 1994, Ser. No. 364,033

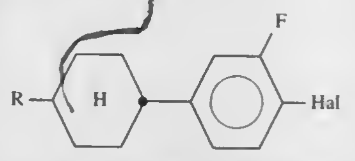
Claims priority, application Germany, Apr. 13, 1990, 40 12 025.2

Int. Cl.⁶ C09K *19/52;19/34;19/30;* **G02F** *1/13*

U.S. Cl. 252—299.63 **12 Claims**

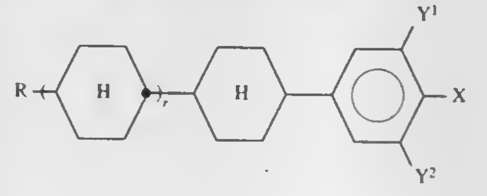
1. Liquid-crystalline medium essentially nitrile-free based on a mixture of polar compounds having positive dielectric anisotropy, characterized in that it contains one or more compounds of the general formula I

I

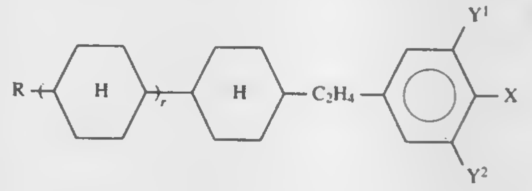


in which Hal is fluorine or chlorine and R is alkyl, oxaalkyl, fluoroalkyl or alkenyl, in each case having up to 7 carbon atoms and additionally contains one or more compounds selected from the group comprising the general formulae II, III and IV:

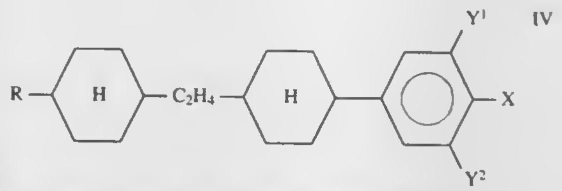
II



III



IV



in which the individual radicals are as defined below:

R is alkyl, oxaalkyl, fluoroalkyl or alkenyl, in each case having up to 7 carbon atoms;

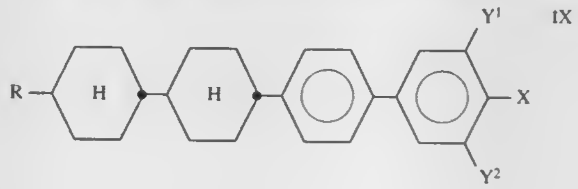
X is F, Cl, CF_3, OCF_3 or $OCHF_2$;

y^1 and y^2 are each F; and

r is 0 or 1;

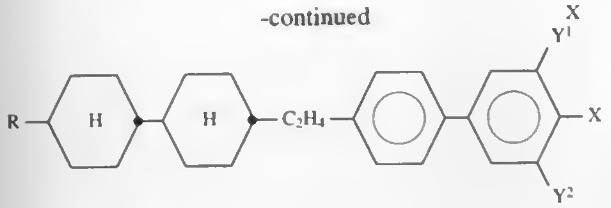
characterized in that it contains one or more compounds selected from the group comprising the general formulae IX to XIV:

IX

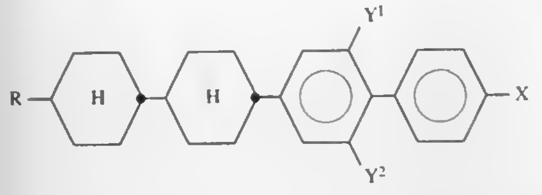


-continued

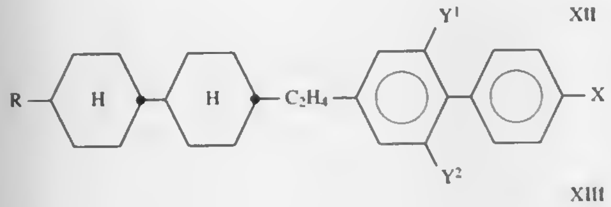
X



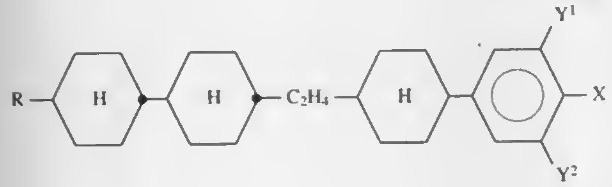
XI



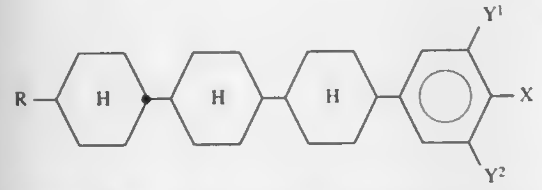
XII



XIII



XIV



in which R and X are each, independently of one another, as defined above and Y^1 and Y^2 are each, independently of one another H or F.

5,746,942

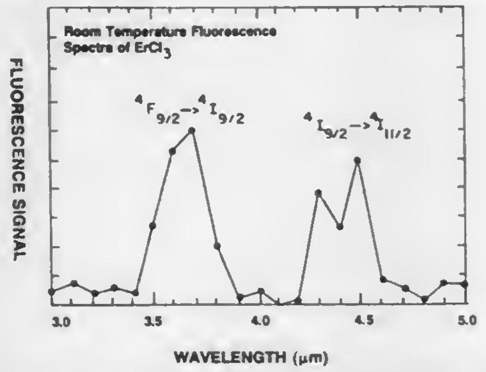
ERBIUM-DOPED LOW PHONON HOSTS AS SOURCES OF FLUORESCENT EMISSION

Steven R. Bowman, Davidsonville, Md.; Barry J. Feldman, Arlington, Va., and Leslie B. Shaw, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1996, Ser. No. 594,559

Int. Cl.^{6} H01S *3/16;3/17;3/094;* **C09K** *11/77*

U.S. Cl. 252—301.4 H **14 Claims**



1. A fluorescent laser comprising a source of excitation light, a lasing medium including a host having a phonon energy of no greater than about 350 cm^{-1} and doped with erbium at a dopant level of about 1% to 100%, and a lasing cavity housing said lasing medium therein, said laser cavity amplifying fluorescent emissions having a wavelength of about 3 μm to about 5 μm from said lasing medium and outputting said amplified emissions.

5,746,943

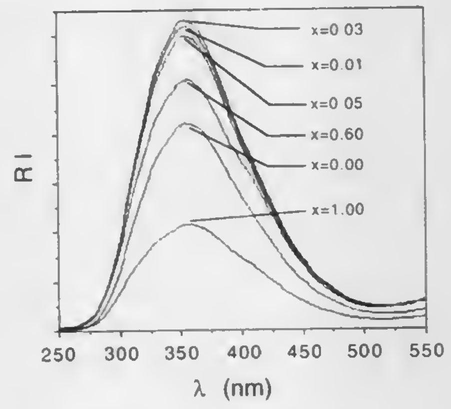
X-RAY INTENSIFYING SCREEN BASED ON BARIUM HAFNIUM ZIRCONIUM PHOSPHATE

Carmine C. Torardi, Wilmington, Del., assignor to Sterling Diagnostic Imaging, Inc., Brevard, N.C.

Filed Feb. 25, 1997, Ser. No. 810,113

Int. Cl.^{6} G01J *1/58;* **C09K** *11/71*

U.S. Cl. 252—301.4 P **11 Claims**



1. An X-ray intensifying screen comprising
a support
at least one active layer coated on said support;
wherein said active layer comprises
a binder; and
a phosphor corresponding to the formula

$BaHf_{1-x}Zr_x(PO_4)_2$

wherein x is 0 to 1.0.

5,746,944

GRANULAR LANTHANUM/CERIUM/TERBIUM/MIXER PHOSHATES HAVING CHARACTERISTIC MORPHOLOGY AND GREEN LUMINOPHORS COMPRISED THEREOF

Jean-Jacques Braconnier, Lagord, France, assignor to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 98,727, Jul. 29, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 810,505

Claims priority, application France, Jul. 29, 1992, 92 09355

Int. Cl.^{6} C09K *11/83*

U.S. Cl. 252—301.4 P **32 Claims**

1. Monodisperse particulates of a lanthanum/cerium/terbium mixed phosphate having the formula

$La_xCe_yTb_{(1-x-y)}PO_4 \cdot zH_2O$

in which x is a number within a range from 0.4 to 0.6, x+y is a number greater than 0.8 and z is a number within a range from 0 to 2, the average particle size of which is within a range from 1 to 15 microns and having a dispersion index of 0.45 or less, wherein said particulates exhibit color coordinates a* and b* ranging from –0.5 to 0.5 after calcination in air at a temperature between 700° and 900° C.

5,746,945

WATER-IN-OIL EMULSIONS CONTAINING INCREASED AMOUNTS OF OIL AND METHODS FOR PREPARING SAME

Irma Ryklin, Buffalo Grove, and Branko Sajic, Lincolnwood, both of Ill., assignors to Stepan Company, Northfield, Ill.

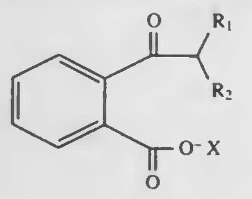
Continuation-in-part of Ser. No. 163,981, Dec. 6, 1993, abandoned. This application Feb. 28, 1996, Ser. No. 608,276

Int. Cl.^{6} B01J *13/00*

U.S. Cl. 252—309 **14 Claims**

1. A water-in-oil emulsion comprising:
(a) water;
(b) from about 10 to 65% by weight of an oil; and
(c) an emulsification system comprising a polysiloxane polyalkyl polyether copolymer and a phthalic anhydride derivative,

the phthalic anhydride derivative having the formula:



where
X is a cation is selected from the group consisting of hydrogen ion, $+NH_2R_3R_4$ where R_3 and R_4 are the same or different and represent hydrogen or straight or branched chain alkyl groups having 8–40 carbon atoms, and
R_1 and R2 are the same or different and represent straight or branched chain alkyl groups having an average of about 8–40 carbon atoms,

the emulsification system substantially permanently maintaining the water and oil as an emulsion, and the emulsification system being substantially free from aluminum and zirconium salts, the emulsion being at a pH of from about 5–10.

5,746,946

IMIDAZOLIDINONE DERIVATIVES AS CORROSION INHIBITORS

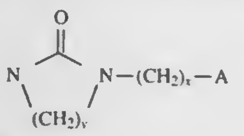
Zhigiang Alex He, Ridgefield, and Werner Joseph Blank, Wilton, both of Conn., assignors to King Idustries, Inc., Norwalk, Conn.

Continuation of Ser. No. 391,973, Feb. 21, 1995, abandoned. This application Dec. 26, 1996, Ser. No. 774,696

Int. Cl.^{6} C23F *11/12;11/14*

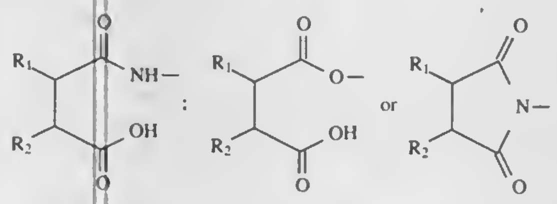
U.S. Cl. 252—392 **26 Claims**

1. An imidazolidinone derivative defined by the formula:



(I)

wherein A is defined as,



and R_1 or R_2 is H, an alkyl-moiety with a C_4 to C_{24} chain length or an alkenyl moiety with a C_4 to C_{24} chain length, or R_1 and R_2 together form tetra or hexahydrobenzene, an alkyl substituted tetra or hexahydrobenzene, or carboxyl substituted benzene; y is from 2 to 3 and x is from 1 to 10; with the proviso that R_1 and R_2 are not both hydrogen.

5,746,947

ALKYLBENZOTRIAZOLE COMPOSITIONS AND THE USE THEREOF AS COPPER AND COPPER ALLOY CORROSION INHIBITORS

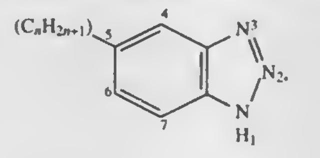
Daniel P. Vanderpool, Coraopolis, and Charles Y. Cha, McMurray, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 20, 1990, Ser. No. 540,977

Int. Cl.^{6} C23F *11/14;11/10*

U.S. Cl. 252—394 **18 Claims**

1. A method for inhibiting corrosion in an aqueous system comprising adding to said system an effective amount of a composition comprising: a) a compound having the following formula:



or a salt thereof
wherein n is greater than or equal to 3 and less than or equal to 12; and b) a compound selected from the group consisting of tolyltriazole, benzotriazole, mercaptobenzothiazole, 1-phenyl-5-mercaptotetrazole, isomers of 1-phenyl-5-mercaptotetrazole, substituted phenyl mercaptotetrazole and salts thereof wherein the weight ratio of a):b) ranges from about 0.01:100 to about 100:1.

5,746,948

WATER-DILUTIVE AND CONDUCTIVE COATING COMPOSITION CAPABLE OF AFFORDING DESIRED COLOR TONE

Yosuke Kondo, Amagasaki, Japan, assignor to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Oct. 11, 1996, Ser. No. 729,533

Claims priority, application Japan, Dec. 7, 1995, 7-345530

Int. Cl.^{6} H01B *1/20*

U.S. Cl. 252—519.33 **1 Claim**

1. A water-dilutive and conductive coating composition which contains 10–50% by weight of water-soluble or water-dispersible synthetic resin as non-volatile content and 5–40% by weight of white electroconductive pigment with regard to non-volatile content of the coating composition and the amount of each of sodium and potassium in the coating composition is not more than 30 ppm.

5,746,949

POLARIZER FILMS COMPRISING AROMATIC LIQUID CRYSTALLINE POLYMERS COMPRISING DICHROIC DYES IN THEIR MAIN CHAINS

Sunny S. Shen, Holmdel, N.J.; David W. Polis, Redondo Beach, Calif.; Hyun N. Yoon, New Providence, and Tze-Pei Tien, Basking Ridge, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 21, 1995, Ser. No. 561,607

Int. Cl.^{6} F21V *9/14;* **C09K** *19/00*

U.S. Cl. 252—585 **26 Claims**

1. A polarizing film having a polarizing efficiency of at least 70% and comprising a film-forming, thermotropic liquid crystal

polymer which comprises a dichroic dye moiety in the repeat unit in the main chain of said polymer.

5,746,950

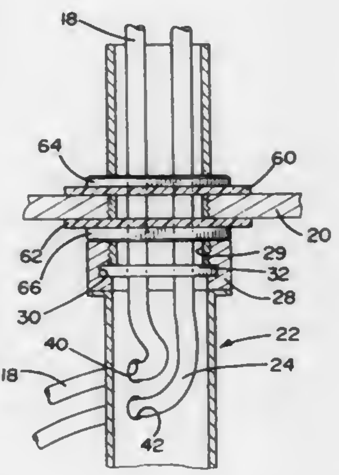
DRAIN HOSE ASSEMBLY

Robert Villanueva, 4711 Cumberland Clr., El Paso, Tex. 79903-1923

Filed Dec. 18, 1996, Ser. No. 768,627

Int. Cl.^{6} B01F *3/04*

U.S. Cl. 261—29 **4 Claims**



1. A roof-supported evaporative cooler having a drain pipe extending through the bottom of a reservoir pan thereof comprising
- a bleeder line and an overflow line leading from said cooler through said drain pipe;
- a relatively flat collector hose having a first end and a second end;
- a collar at one end of said hose that is internally threaded for connection to said drain pipe and has a groove formed therein;
- a grommet received in said groove having a diametric web extending thereacross;
- said web having first and second openings formed therein;
- said collector hose having apertures formed in the side thereof through which said bleeder line and said overflow line can exit; and
- said lines having a length sufficient to reach desired points of disposal.

5,746,951

PROCESS FOR PRODUCTION OF MAGNETIC RECORDING MEDIUM

Kazuo Saito, and Takeshi Ishimatsu, both of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Feb. 13, 1995, Ser. No. 387,558

Claims priority, application Japan, Feb. 28, 1994, 6-054649

Int. Cl.^{6} C01B *31/00*

U.S. Cl. 264—29.1 **2 Claims**

1. A process for producing a substrate for magnetic recording medium, which comprises molding into an appropriate shape a polycarbodiimide resin or a composition mainly comprising a polycarbodiimide resin, thereby producing a shaped material, carbonizing the shaped material at a temperature elevation rate of 2° C./hr or less, and processing the carbonized shaped material into a substrate for magnetic recording medium by simultaneously grinding both sides of said shaped material and by simultaneous polishing of both sides of said shaped material.

5,746,952

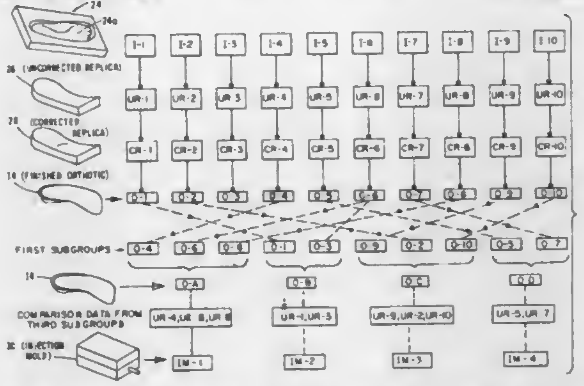
METHOD OF MAKING INJECTION MOLDED ORTHOTICS

Scott Marshall, Ventura, Calif., assignor to Professional Footcare International, Inc., Valencia, Calif.

Filed Aug. 19, 1996, Ser. No. 699,393

Int. Cl.^{6} B29L *31/50;* **G01B** *7/28*

U.S. Cl. 264—40.1 **24 Claims**



1. A method of making injection molds for use in molding orthotics comprising the steps of:

(a) selecting a multiplicity of corrected replicas of the human foot, each having been made from an uncorrected replica of the human foot having an uncorrected contoured lower surface, each said corrected replica exhibiting a corrected contoured lower surface from which an orthotic can be formed by heating and pressing a thermoplastic blank thereagainst;

(b) examining each said corrected replica of said selected multiplicity of corrected replicas to identify those having substantially identical contoured lower surfaces;

(c) identifying a plurality of corrected replica subgroups by grouping said multiplicity of corrected replicas which were examined into subgroups in which said corrected replicas which make up each said subgroup exhibit substantially identical contoured lower surfaces; and

(d) constructing for each of said plurality of subgroups an injection mold having an internal cavity which, when filled with a moldable plastic, will produce a finished orthotic having a contoured upper surface substantially identical to the contoured lower surfaces of said corrected replicas which make up each said subgroup.

5,746,953

CASTING METHOD FOR FORMING A RESIN MOLDING

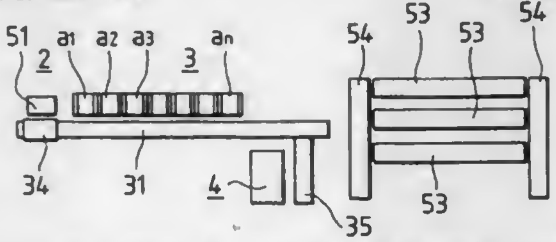
Masashi Sakurai; Masaru Nakanishi; Hiroshi Tamura; Takehiko Kubo; Takeshi Nakamura, and Tatsuya Fujita, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 34,468, Mar. 19, 1993, abandoned. This application Apr. 6, 1995, Ser. No. 418,129

Claims priority, application Japan, Mar. 19, 1992, 4-093811; Nov. 21, 1992, 4-335391; Feb. 26, 1993, 5-063205

Int. Cl.^{6} B29C *35/02;39/06;39/44*

U.S. Cl. 264—40.4 **10 Claims**



1. A casting method, for forming a resin molding in which a plurality of forming metal molds are circulated with a predetermined time lag therebetween, comprising the steps of:
- casting a hardenable resin composition into a preheated forming metal mold to form a casted resin composition;

- heating and hardening the casted resin composition for a predetermined time period to form a hardened product; and
- releasing the hardened product form the metal mold and assembling the metal mold,
- wherein there are provided a plurality of heating devices having heating rates which are varied in accordance with characteristics of the hardenable resin composition, and while one forming mold employed in said hardening step is being heated by one of said heating devices for said predetermined time period the other forming molds employed in said hardening step are sequentially heated for said predetermined time period by the other of said heating devices with said predetermined time lag therebetween.

5,746,954

PROCESSES FOR FORMING THIN, DURABLE COATINGS OF PERFLUOROCARBON IONOMERS ON VARIOUS SUBSTRATE MATERIALS

Robert E. Aikman, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 7, 1995, Ser. No. 525,968

Int. Cl.^{6} B28B *1/26;* **B29C** *71/00*

U.S. Cl. 264—87 **11 Claims**

1. A process for manufacturing a diaphragm for use in a chloralkali diaphragm cell, comprising:
- coating a tetrafluoroethylene-containing particulate or fibrous substrate which is to be incorporated into the diaphragm and with respect to which an improvement in hydrophilicity is desired with a thermoplastic, sulfonyl fluoride precursor of a perfluorosulfonated, salt- or acid-form ionomer via an aqueous, surface active dispersion containing the precursor;
- forming an aqueous draw slurry including the coated substrate;
- drawing a diaphragm from the draw slurry through vacuum deposition on a foraminous diaphragm support;
- drying and then bonding the diaphragm under bonding conditions; and thereafter
- hydrolyzing the sulfonyl fluoride precursor within the bonded diaphragm to its perfluorosulfonate, sodium salt- or acid-form ionomer.

5,746,955

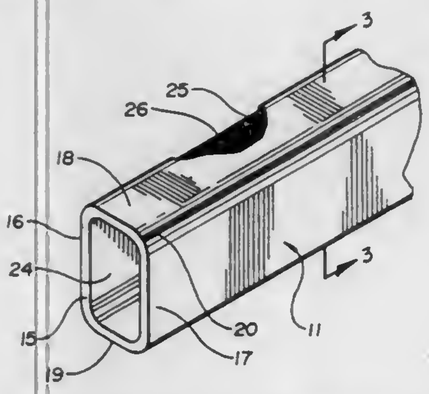
PROCESS FOR MAKING A COMPOSITE HOCKEY STICK SHAFT

David E. Calapp, Redmond, and Michael T. Bennett, Bellingham, both of Wash., assignors to Christian Brothers, Inc., Warroad, Minn.

Division of Ser. No. 976,523, Nov. 16, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,351

Int. Cl.^{6} B29C *45/14;45/63;53/76*

U.S. Cl. 264—103 **29 Claims**



1. A process for making a hockey stick shaft adapted for receiving a replacement blade at one end and having an outer molded surface and an inner molded surface defining a shaft interior, said process comprising:
- providing a rotatable mandrel having first and second ends;
- supporting said mandrel for rotation at its first and second ends in a winding machine;
- providing a filament dispensers
  - preparing a spirally wound mandrel, free of resin material, by spirally winding filaments from said filament dispenser onto said mandrel by rotating said mandrel and moving said dispenser reciprocally back and forth relative to said rotating mandrel between said first and second ends for a plurality of passes so that both clockwise and counterclockwise spiral windings are provided on said mandrel removing said filament wound mandrel from said winding machine;
  - loading said filament wound mandrel into a mold having an inner mold surface with a size and configuration conforming to the desired outer molded surface of said shaft;
  - closing the mold to define a mold cavity between the exterior surface of said mandrel and the inner surface of said mold;
  - injecting a resin material into said mold cavity;
  - allowing said resin material to cure; and
  - removing said shaft from said mold and said mandrel from said shaft.

5,746,956

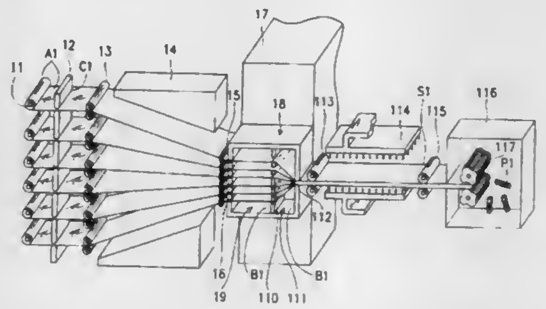
PROCESS AND APPARATUS FOR MANUFACTURING ALUMINUM LAMINALLY FILLED PLASTIC PELLETS FOR SHIELDING ELECTROMAGNETIC INTERFERENCE

Tung-Han Chuang, Taoyuan; Ching-Bin Lin, Taipei; Teng-Chun Tsai, Taipei, and Jiin-Chyuan Chang, Taipei, all of Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Nov. 1, 1996, Ser. No. 743,447

Int. Cl.^{6} B29B *9/04*

U.S. Cl. 264—104 **27 Claims**



1. A process for manufacturing aluminum laminally filled plastic pellets for shielding electromagnetic inteference, comprising the following sequential steps:

(a) lining a plurality of aluminum foil layers such that the aluminum foil layers are substantially parallel to one another, wherein the aluminum foil is made of pure aluminum or is made of aluminum alloy;

(b) coating the upper and lower surfaces of each of the aluminum foil layers with a coupling agent by immersion or spraying;

(c) drying the coupling agent-coated aluminum foil layers;

(d) introducing a molten plastic matrix to the space between each two aluminum foil layers and the outer surfaces of the most outside two aluminum foil layers, such that the upper and lower surfaces of all aluminum foil layers are moisturized and bound by the molten plastic matrix;

(e) reducing the thickness of the moisturized and bound aluminum foil layers to form a continuous laminally filled plastic composite plate; and

(f) cooling and then cutting the aluminum laminally filled plastic composite plate into aluminum laminally filled plastic pellets of a predetermined size.

5,746,957

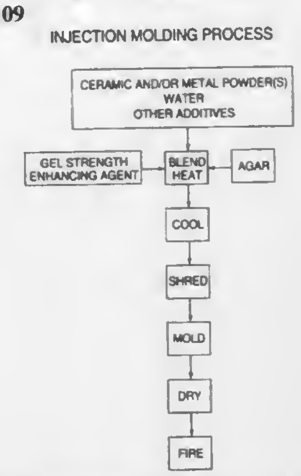
GEL STRENGTH ENHANCING ADDITIVES FOR AGAROID-BASED INJECTION MOLDING COMPOSITIONS

Anthony Fanelli, Rockaway; Mohammad Behi, Lake Hiawatha; Clifford Palmer Ballard, Jr., Lebanon, and Joan V. Burlew, Rockaway, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Feb. 5, 1997, Ser. No. 796,012

Int. Cl.^{6} C04B *35/64*

U.S. Cl. 264—109 **3 Claims**


INJECTION MOLDING PROCESS
CERAMIC AND/OR METAL POWDER(S)
WATER
OTHER ADDITIVES
GEL STRENGTH ENHANCING AGENT
BLEND HEAT
AGAR
COOL
SHRED
MOLD
DRY
FIRE

1. A process for shaping parts from ceramic and metal powders which comprises the steps of:

(a) forming a mixture comprising ceramic and/or metal powder(s), a gel-forming material chosen from the class of polysaccharides known as agaroids, a gel-forming material solvent, and a gel strength enhancing agent having the form of a borate compound selected from the group consisting of calcium borate, magnesium borate, zinc borate, ammonium borate, tetraethylammonium borate, tetramethylammonium borate and boric acid, the mixture being formed in a blender that provides shearing action thereto and the blender being heated to raise the temperature of the mixture to about 70° C. to 100° C.;

(b) supplying the mixture to a mold; and

(c) molding the mixture under conditions of temperature and pressure to produce a self-supporting structure.

5,746,958

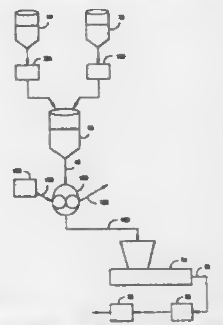
METHOD OF PRODUCING A WOOD-THERMOPLASTIC COMPOSITE MATERIAL

Kjell-Ake Gustafsson, Binghamton, N.Y.; John J. Muller, Winchester, Va., and Roger A. Wittenberg, Newtown, Pa., assignors to Trex Company, L.L.C., Winchester, Va.

Filed Mar. 30, 1995, Ser. No. 413,758

Int. Cl.^{6} B29B *9/12;* **B29C** *47/00*

U.S. Cl. 264—115 **21 Claims**



1. A method for producing a wood/thermoplastic composite material comprising:

(a) providing a wood component;

(b) reducing said wood component to a particle size of less than about 600 microns;

(c) providing a first thermoplastic component;

(d) reducing said first thermoplastic component to a particle size of less than about ¾ inch;

(e) proportioning said wood component and said first thermoplastic component in a weight percent ratio of wood component to thermoplastic component of from about 65/35 to about 40/60 to form a wood-thermoplastic mixture;

(f) pelletizing said wood-thermoplastic mixture into a first stable non-separating high bulk density feedstock, wherein said first feedstock is capable of being readily air transported;

(g) repeating steps (a) through (f) to form a second stable non-separating high bulk density feedstock; wherein said second high bulk density feedstock is comprised of a second thermoplastic component having different physical characteristics from said first thermoplastic component;

(h) mixing said first feedstock and said second feedstock to form a blended high bulk density feedstock.

5,746,959

MANUFACTURE OF ACRYLIC FIBER

Roland Cox, Derby; Jonathan Michael Taylor, Rugby, and Julie Ann Thomson, Coventry, all of United Kingdom, assignors to Courtaulds Fibres (Holdings) Limited, London, United Kingdom

Filed Jan. 21, 1997, Ser. No. 781,357

Claims priority, application United Kingdom, Jan. 23, 1996, 9601292

Int. Cl.^{6} D01F *1/10;6/18*

U.S. Cl. 264—182 **9 Claims**

1. A process for the manufacture of an acrylic fiber, comprising the steps of:

(a) providing a dope which comprises (i) an acrylic polymer in solution in a solvent, and (ii) a fungicidal agent selected from the group consisting of tolnaftate, bifonazole, clotrimazole, miconazole, dichlorophene and hexachlorophene;

(b) extruding said dope through a die into a coagulating bath: and

(c) coagulating said dope in the coagulating bath, thereby forming said acrylic fiber.

5,746,960

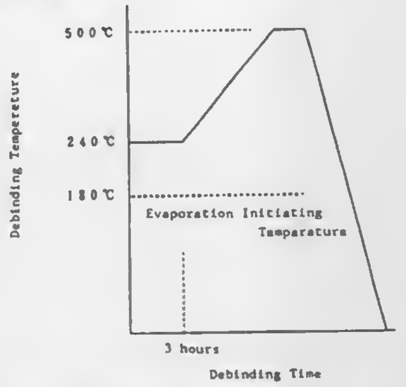
METHOD OF MANUFACTURING POWDER INJECTION MOLDED PART

Takao Kasai, Saitama; Kenichi Yoshikawa, Tokyo; Shigeru Saito, Saitama, and Masami Hoshi, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 325,355, Dec. 19, 1994, abandoned. This application Jul. 22, 1996, Ser. No. 681,315

Int. Cl.^{6} B29C *71/00*

U.S. Cl. 264—234 **5 Claims**



1. A method of manufacturing a powder injection molded part comprising the steps of: forming a molded green body comprising a binder composition containing at least two different thermoplastic binder components, said binder components having an evaporation temperature higher than the temperature at which injection molding is conducted and thermal decomposition evaporation initiation temperatures that are different from each other; heating the green body to a first temperature above the thermal decomposition evaporation initiation temperature of the binder component having the lowest thermal decomposition evaporation initiation temperature at such a rate that the binder component having the lowest thermal decomposition evaporation initiation temperature evaporates from a molten state without downward flow of the molten binder component; removing the binder component having the lowest thermal decomposition evaporation initiation temperature from the molded body by endothermic thermal decomposition in an atmosphere which is inert to all the binder components and their thermal decomposition products by maintaining the molded body at the first temperature; and heating the molded body to a second temperature not lower than the thermal decomposition evaporation initiation temperature of the binder component having the highest thermal decomposition evaporation initiation temperature to remove the remaining binder components from the molded body, wherein the lowest thermal decomposition initiation temperature is in the range of 150° to 280° C., the highest thermal decomposition initiation temperature is in the range of 250° to 400° C. and the second temperature is higher than the first temperature.

5,746,961

METHOD FOR ENHANCEMENT OF THE SURFACES OF MOLDED PLASTIC PRODUCTS

Michael H. Stevenson, Sedona, and Robert A. Reeves, Cottonwood, both of Ariz., assignors to Michael J. Stevenson, Sedona, Ariz.

Filed Dec. 4, 1995, Ser. No. 566,906

Int. Cl.^{6} B29C *45/00*

U.S. Cl. 264—255 **21 Claims**

1. A method for enhancement of a surface of a molded product formed by molding polyethylene in a mold against a heated mold surface with a face having an intaglio pattern of a desired configuration for said molded product which method comprises;

a. coating at least a portion of said mold surface with an enhancement composition having mechanical and chemical properties consisting essentially of:

(1) 50 to 75 weight percent of a non-oleaginous liquid carrier selected from the group consisting of inert organic solvents and water; and

(2) 25 to 50 weight percent of enhancement solids comprising:

i. 5 to 95 weight percent of particles of an enhancement solid selected from the group consisting of: thermoplastic and thermosetting polymer resins; metal flakes; glass beads; carbon; graphite; antistatic agents comprising quaternary ammonium salts and esters of fatty acids; flame retardants comprising aluminum, phosphorous and boron compounds; lubricants comprising hydrocarbon paraffins, metal stearates, fatty acids and fatty acid amides and esters, and aliphatic alcohols and polyols; preservatives comprising copper, tin, antimony, ammonium, arsine, and phthalimide compounds; and polyvinyl chloride heat stabilizers comprising lead, barium, cadmium, zinc, phosphorous, nitrogen, tin and calcium compounds; and

ii. 95 to 5 weight percent of a binder solid selected from the group consisting of: rosins, aromatic and aliphthatic hydrocarbon resins and waxes, and terpene base resins; and

b. forcing polyethylene against said heated mold surface coated with said enhancement composition to mold said polyethylene into said desired product configuration of said molded product while mixing said polyethylene with said enhancement composition; and

c. extracting from said mold, said molded product having an external surface possessing said mechanical and chemical properties of said enhancement solid.

5,746,962

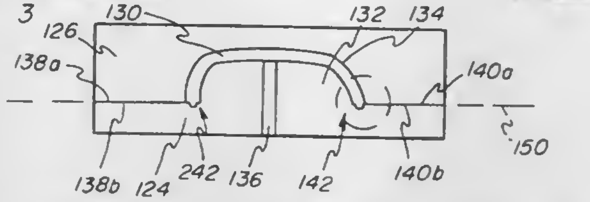
METHOD OF INSERT MOLDING PLASTIC PARTS TO PROVIDE COVERED EDGE SURFACES

Hiroaki Yamamoto, Brookville, Ohio, assignor to Green Tokai Co., Ltd., Brookville, Ohio

Continuation of Ser. No. 372,230, Jan. 13, 1995, abandoned. This application Sep. 3, 1996, Ser. No. 706,976

Int. Cl.^{6} B29C *45/14;45/16*

U.S. Cl. 264—266 **6 Claims**



1. Method of making a plastic part by insert molding of a paint film over a plastic substrate, comprising:

(a) providing a male mold member including a core portion and a female mold member having a surface defining a concavity therein said male mold member and said female mold member mating along planar surfaces and defining together a mold cavity and a plane dividing said mold members into halves on either side of said plane, said mold cavity being defined in one of said halves between said surface in said female mold member and said core portion and being further defined by at least one pocket portion in the other of said halves at an extremity of said mold cavity, said pocket portion being bounded by an inclined surface extending from said female mold member toward said male mold member;

(b) inserting a paint film into said mold cavity and positioning an end of said film into said pocket portion;

(c) injecting molten plastic into said mold cavity and directing said molten plastic along said inclined surface and against said film end positioned in said pocket portion whereby said film is superposed over said molten plastic and substantially covers said molten plastic positioned along said inclined surface, thereby forming said plastic part with an edge portion of said substrate substantially covered by said paint film.

5,746,963

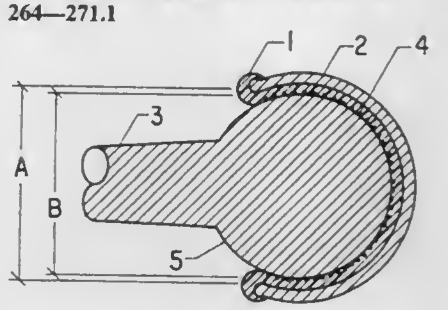
COLD FLOW CONTROL

John Moss Hogg, 122 King William, San Antonio, Tex. 78204

Continuation of Ser. No. 332,366, Oct. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 134,844, Oct. 12, 1993, abandoned. This application Jun. 6, 1996, Ser. No. 699,043

Int. Cl.^{6} B29C *45/57;* **A61F** *2/34*

U.S. Cl. 264—271.1 **2 Claims**



1. A method of controlling the cold flow of artificial cartilage located within a ball and socket joint of a prosthesis comprising the steps of:

providing a solid viscous material;

providing a shell formed of a compatible nonviscous material or a material with a viscosity which is higher than the viscosity of the viscous material;

encapsulating the viscous material between the shell and a web mesh lining, thus restricting expansion, change in shape, cold flow of the viscous material and force required to separate ball from socket, the viscous material forming the artificial cartilage within the socket; and

fitting the ball within the socket so the ball is adjacent to the web mesh to form the ball and socket joint of the prosthesis, wherein the web mesh maintains the shape of and distributes stress to the artificial cartilage during use and further controls cold flow.

5,746,964
LOADING SYSTEM AND METHOD FOR A TIRE VULCANIZING MACHINE

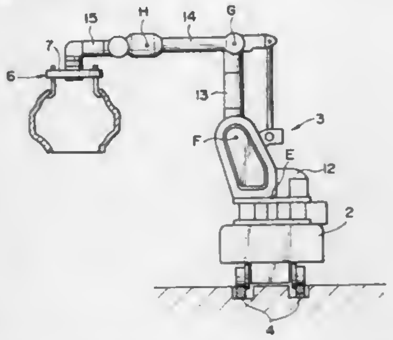
Kashiro Ureshino; Itaru Amano; Masaki Naoi; Kou Takakura, all of Takasago; Takumi Mizokawa, Toyohashi, and Katsumi Ichikawa, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 326,945, Oct. 21, 1994, abandoned. This application Sep. 3, 1996, Ser. No. 711,310

Claims priority, application Japan, Oct. 21, 1993, 5-287661

Int. Cl.^{6} B29C *35/02*

U.S. Cl. 264—315 **15 Claims**



1. A loading system for a vulcanizing press, comprising:

a transport car displaceable to access a plurality of tire vulcanizing presses;

a robot disposed on said transport car, said robot comprising an articulated robot arm assembly movable in three (XYZ) directions, said robot further including a tire chuck disposed on an end of said robot arm assembly; and

a sensor disposed centrally on the end of said robot arm assembly and within said tire chuck, said sensor configured to sense a centering location disposed on the vulcanizing press.

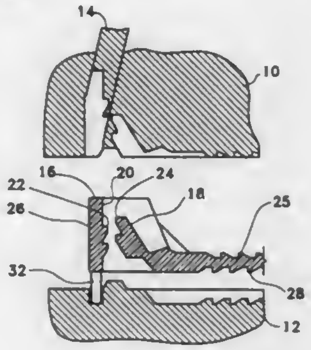
5,746,965
REMOVAL OF INJECTION-MOLDED TIE FROM MOLD BY RETRACTING CORE FROM BETWEEN PAWL AND ABUTMENT SURFACE OF TIE

Soren Christian Sorensen, and Jens Ole Sorensen, both of Cayman Kai, Cayman Islands, assignors to GB Electrical, Inc., Milwaukee, Wis.

Filed Jan. 8, 1996, Ser. No. 584,685

Int. Cl.^{6} B65D *63/00;* **B29C** *45/44*

U.S. Cl. 264—318 **14 Claims**



1. A method of injection molding a tie that includes an elongated tongue with two ends and two broad sides, a locking head at one end of the tongue, a first set of ratchet teeth extending along one broad side of the tongue and a second set of ratchet teeth extending along the other broad side of the tongue, wherein the locking head has sides defining an opening for receiving the tongue, the sides include a movable pawl that is hinged at one side of said opening and an abutment wall that is across the opening from the pawl, and the pawl has at least one pawl tooth disposed for engaging the set of first ratchet teeth when the tongue has been inserted through said opening with the first set of ratchet teeth facing the pawl, wherein the pawl, when the at least one pawl tooth is so engaged, is movable toward an abutment surface of the abutment wall in response to pressure applied to the tongue in a direction opposite to the direction of said insertion in order to force the second set of ratchet teeth against the abutment surface; and wherein the abutment surface includes at least one tooth for locking engagement with the second set of ratchet teeth when the tongue has been inserted through the opening with the second set of ratchet teeth facing the abutment surface and the side of the tongue including the second set of ratchet teeth is forced against the abutment surface by movement of the pawl, the method comprising the steps of

(a) providing a mold that includes first and second mold parts and a core that is retractable within the first mold part for defining a cavity between the mold parts in the general shape of the tie when the core is not retracted;

(b) injecting molten plastic material into the mold cavity;

(c) solidifying the plastic material in the mold cavity to form the tie;

(d) separating the mold parts to enable ejection of the tie from the mold; and

(e) ejecting the tie from the mold;

wherein step (a) comprises providing a said retractable core that defines at least the portion of the abutment surface that includes the at least one abutment surface tooth, wherein the entire core is disposed for unitary retraction in a direction inclined toward the pawl at an acute angle away from the direction of insertion; and

wherein step (d) comprises the step of

(f) retracting the entire core unitarily from said portion of the abutment surface in said inclined direction so that the tie can be ejected from the mold pursuant to step (e) without significantly damaging the at least one abutment surface tooth.

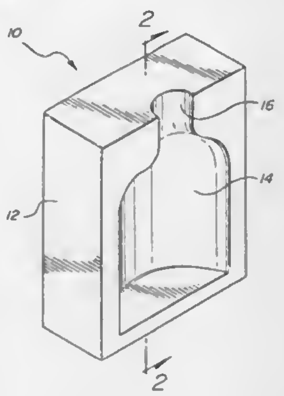
5,746,966
MOLDS, DIES OR FORMING TOOLS HAVING A CAVITY FORMED BY THERMAL SPRAYING AND METHODS OF USE

Robert R. McDonald, Traverse City, Mich., assignor to Metallamics, Inc., Traverse City, Mich.

Division of Ser. No. 349,252, Dec. 5, 1994, Pat. No. 5,609,922. This application Nov. 1, 1996, Ser. No. 740,752

Int. Cl.^{6} B29C *33/56*

U.S. Cl. 264—338 **48 Claims**



1. A mold or die comprising:

a) a porous heat exchanging body support member having a defined porosity for flow of heat transfer fluid; and

b) within the support member a molding cavity portion formed by thermal spraying particles to a desired configuration in the support member.

16. A tool for shaping a material comprising:

a) a porous heat exchanging body support member having a defined porosity for flow of heat transfer fluid; and

b) within the support member a molding surface portion formed by thermal spraying particles to a desired configuration in the support member.

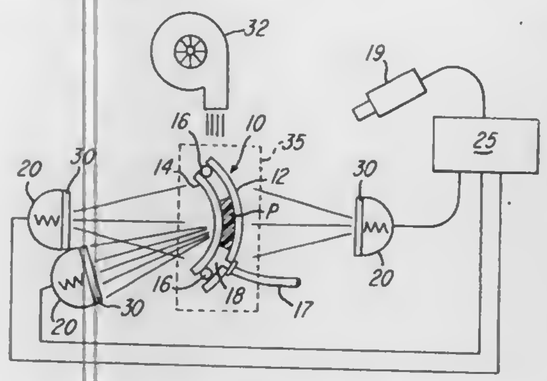
5,746,967
METHOD OF CURING THERMOSET RESIN WITH VISIBLE LIGHT

Walter S. Hoy, and W. Douglas Hoy, both of Huber Heights, Ohio, assignors to Fox Lite, Inc., Fairborn, Ohio

Filed Jun. 26, 1996, Ser. No. 670,642

Int. Cl.^{6} B29C *35/08*

U.S. Cl. 264—406 **14 Claims**



1. A method of molding an opaque article from a non-photosensitive heat-curable thermoset plastics resin having a dark heat-absorbing color, comprising the steps of inserting the resin within a cavity of a mold having a substantially transparent wall portion formed of a material substantially transparent to visible light, closing the mold to confine the non-photosensitive dark color resin within the cavity, heating the resin without substantially heating the transparent mold wall portion by directing visible light energy into the resin through the transparent wall portion for absorption by the dark color resin, and controlling the amount of the visible light energy directed through the transparent wall portion according to the temperature required for heat-curing the non-photosensitive resin.

5,746,968
METHOD FOR MANUFACTURING A HIGH STRENGTH ANGIOPLASTY BALLOON

Herbert R. Radisch, Jr., San Diego, Calif., assignor to Interventional Technologies, Inc., San Diego, Calif.

Continuation of Ser. No. 325,133, Oct. 20, 1994, abandoned. This application Apr. 12, 1996, Ser. No. 631,525

Int. Cl.^{6} B29C *49/18*

U.S. Cl. 264—529 **15 Claims**

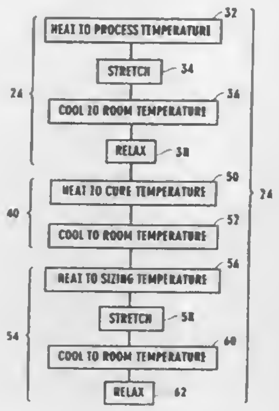
1. A method for producing an oriented polymeric material with reduced pin-hole defects which comprises the following steps in the order named:

heating said material to a process temperature, said process temperature being between a first temperature and a second temperature;

applying a first force to said material to stretch said material into an overstretch configuration while said material is at said process temperature;

cooling said material to room temperature while maintaining said material in said overstretch configuration;

relaxing said force on said material;



heating said material to a cure temperature. said cure temperature being seventy to ninety percent (70%–90%) of said process temperature;

maintaining said material at said cure temperature for a curing period;

cooling said material to room temperature;

heating said material to a sizing temperature;

applying a second force thereto to stretch said material into a desired configuration;

cooling said material to room temperature while maintaining said material in said desired configuration; and

relaxing said second force on said material.

5,746,969
PROCESS FOR THE PRODUCTION OF DENSE SILICON NITRIDE MATERIALS

Lothar Schönfelder, Coburg; Gerhard Leimer, Rödental, and Stefan Roth, Coburg, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Continuation-in-part of Ser. No. 322,589, Oct. 13, 1994, abandoned. This application Oct. 7, 1996, Ser. No. 726,750

Claims priority, application Germany, Oct. 25, 1993, 43 36 311.3

Int. Cl.^{6} C04B *33/32;* **B28B** *1/24;1/26*

U.S. Cl. 264—645 **16 Claims**

1. Process for the production of dense silicon nitride materials having a sintered density greater than 95% of the theoretical density and a room temperature bending strength that exceeds 650 MPa by nitriding of moulded bodies comprising mixtures of 40 to 95 wt % silicon powder, 2 to 60 wt % silicon nitride powder and 0 to 20 wt % sintering additives, said sintering additives being rare earth oxides which can be partially substituted by oxides of aluminum and/or magnesium, under normal atmospheric pressure and sintering of the moulded bodies under nitrogen at normal atmospheric pressure, wherein said nitriding and sintering are performed without the use of a protective bed of powder, and further wherein the average grain size of the silicon and silicon nitride powders is 1 to 20 μm, the iron content of the silicon powder is not more than 0.7 wt % and the silicon nitride powder does not include fibers or whiskers of silicon nitride.

5,746,970
NOZZLE AND METHOD OF BLOWING HOT METAL

Dan Bergman, Luleå, Sweden, and Takeo Inomoto, Chiba, Japan, assignors to Mefos, Stiftelsen För Metallurgisk Forskning, Lulea, Sweden

Filed Jun. 28, 1996, Ser. No. 678,389

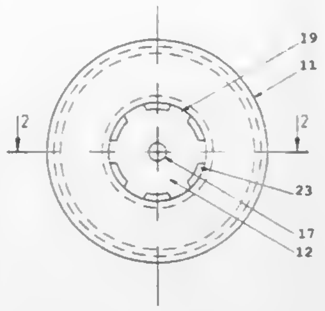
Claims priority, application Sweden, Dec. 30, 1993, 9304369

Int. Cl.^{6} C21C *5/32*

U.S. Cl. 266—225 **5 Claims**

1. A supersonic annular nozzle for an oxygen lance for metallurgical use, said nozzle comprising:

an annular slot;



said annular slot being configured to form an annular jet of gas;

the formed annular jet having an interior portion and an exterior portion;

the exterior portion of the formed annular jet surrounding the interior portion of the formed annular jet;

the formed annular jet being surrounded by an ambient gas;

an arrangement to permit a gas supply to the interior portion of the formed annular jet; and

said arrangement to permit a gas supply being disposed to block at least one part of said slot to permit the ambient gas to flow to the interior portion of the formed annular jet in order to counteract a subpressure in the interior portion of the formed annular jet.

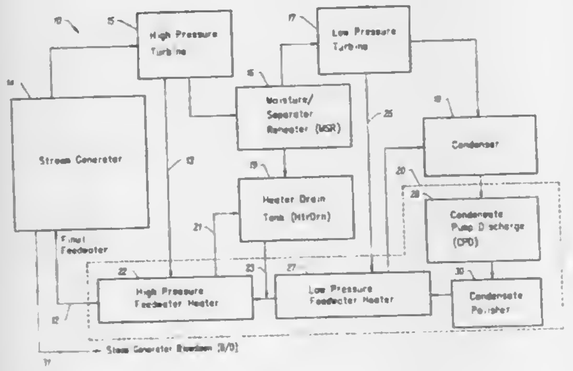
5,746,971
METHOD OF PRODUCING LOW VOLATILITY AMINES FOR POWER PLANT PH CONTROL BY IN SITU HYDROLYTIC DECOMPOSITION OF A MORE VOLATILE AMINE WITH A RING STRUCTURE

Peter J. Millett, Half Moon Bay, and Alan D. Miller, Pacifica, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 24, 1997, Ser. No. 794,200

Int. Cl.^{6} C23F *11/04;* C09K *3/00*

U.S. Cl. 422—16 18 Claims


High Pressure Turbine
Low Pressure Turbine
Moisture/Separator Reheater (MSR)
Condenser
Steam Generator
Heater Drain Tank (HtrDrn)
Condensate Pump Discharge (CPD)
Final Feedwater
High Pressure Feedwater Heater
Low Pressure Feedwater Heater
Condensate Polisher
Steam Generator Blowdown (B/D)

1. A method of controlling pH in a power plant secondary system having a pressurized water reactor, comprising the steps of:

introducing a ring amine having a molecular weight and a first volatility distribution coefficient into said pressurized water reactor; and

producing at least one daughter amine by at least partial in-situ hydrolytic decomposition of said ring amine, wherein said at least one daughter amine has a molecular weight equal to or greater than said ring amine and has a volatility less than said ring amine, and at least one of said daughter and said ring amines acts to control the pH.

5,746,972
COMPOSITIONS AND METHODS FOR DISINFECTING AND CLEANING CONTACT LENSES

John Y. Park, Santa Ana; Larry K. Thomas, Irvine; Lin Peng, Sunnyvale, and Daniel P. Cafaro, Walnut Creek, all of Calif., assignors to Allergan, Waco, Tex.

Filed Nov. 1, 1996, Ser. No. 742,356

Int. Cl.^{6} A61L *2/18;* C12N *9/08*

U.S. Cl. 422—30 17 Claims

13. A method of disinfecting a contact lens comprising:

(1) contacting a contact lens with a liquid medium containing hydrogen peroxide in an amount effective to disinfect said contact lens and a surfactant component in an amount effective to remove deposit material from said contact lens at effective contact lens disinfecting conditions to thereby disinfect said contact lens, said surfactant component being selected from the group consisting of block copolymers of ethylene oxide and propylene oxide which includes at least about 70% by weight of ethylene oxide units and mixtures thereof; and

(2) contacting said liquid medium with a catalase component in an amount effective to cause the destruction of the hydrogen peroxide in said liquid medium, wherein step (2) generates a reduced amount of foam relative to a substantially identical method in which the surfactant component is replaced by a copolymer component selected from the group consisting of block copolymers of ethylene oxide and propylene oxide which include 50% by weight or less of ethylene oxide units and mixtures thereof.

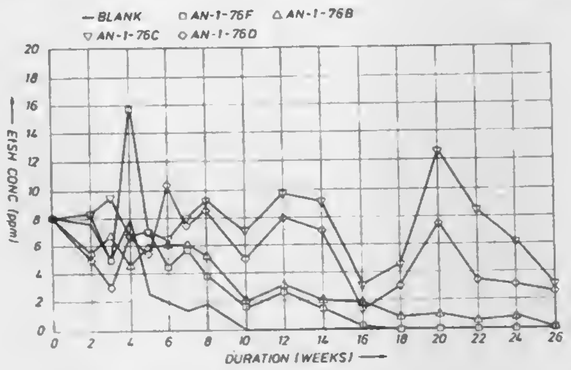
5,746,973
METHOD FOR REDUCING ODORANT DEPLETION

Ali Naraghi, 3614 Oakwick Forest Dr., Missouri City, Tex. 77459

Filed Jul. 10, 1996, Ser. No. 677,891

Int. Cl.^{6} B01J *19/00*

U.S. Cl. 422—41 22 Claims



1. A method for reducing odorant depletion during transfer and storage of liquefied petroleum gas comprising the steps of

(a) completely filling a liquefied petroleum gas transfer or storage vessel with a passivating agent so that all interior surfaces of said vessel come in contact with said passivating agent, said passivating agent comprising one or more phosphate esters, the one or more phosphate esters defined by the equation:

$$[R{-}X{-}[C_mH_{2m}O)_n]_k{-}PO(OH)_{(3-k)}$$

where;

R is an alkyl group containing 4 to 18 carbon atoms or an alkylaryl group comprising an aryl group selected from the group consisting of phenol, diphenol, and mixtures thereof, and an alkyl group containing 4 to 18 carbon atoms;

X is selected from the group consisting of a carboxyl group (—COO—), oxygen (—O—), a secondary amine group (—NH—), sulfur (—S—);

m is an integer having a value from about 2 to about 4;

n is an integer having a value from about 1 to about 20; and

k is an integer having a value from 1 to 2

and one or more additional ingredients selected from the group consisting of fatty amines, poly amides, imidazolines, poly imidazolines, quaternary amines, poly quats, dimmer acids, trimmer acids, polymeric acids, ethoxylated fatty amines, and ethoxylated polyamides, and one or more solvents;

(b) draining said passivating agent from said vessel; and

(c) evacuating said vessel prior to the introduction of said liquefied petroleum gas into said vessel.

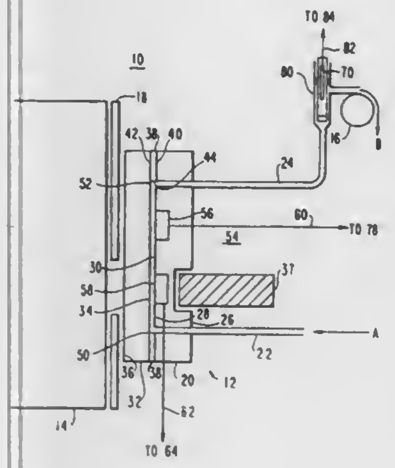
5,746,974
APPARATUS FOR IMPROVED LUMINESCENCE ASSAYS USING PARTICLE CONCENTRATION, ELECTROCHEMICAL GENERATION OF CHEMILUMINESCENCE AND CHEMILUMINESCENCE DETECTION

Richard J. Massey, Rockville; Gary F. Blackburn, Gaithersburg; Elizabeth W. Wilkins, Germantown, and Jonathan K. Leland, Laurel, all of Md., assignors to IGEN International, Inc., Gaithersburg, Md.

Division of Ser. No. 348,749, Dec. 1, 1994, abandoned, which is a continuation of Ser. No. 728,093, Jul. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 652,427, Feb. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,389, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 266,882, Nov. 3, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 467,028

Int. Cl.^{6} G01N *21/66*

U.S. Cl. 422—52 20 Claims



1. An apparatus for performing a chemiluminescent binding assay utilizing a chemiluminescent label to determine whether or in what amount an analyte of interest is present in a sample comprising:

(a) a cell defining a sample volume having a vertically elongated columnar zone and having separate inlet and outlet means, and further including means for generating a magnetic field, and having an electrode positioned below a substantial volume of said cell and said vertically elongated columnar zone for triggering the oxidation or reduction of said chemiluminescent label;

(b) means for impressing a voltage upon said electrode effective to trigger said oxidation or reduction of the chemiluminescent label; and

(c) means for measuring an indication of whether said analyte is present, or the amount of said analyte present, wherein said indication correlates to the amount of chemiluminescence generated at the collection zone.

5,746,975
APPARATUS FOR IMMUNOLOGICAL ANALYSIS

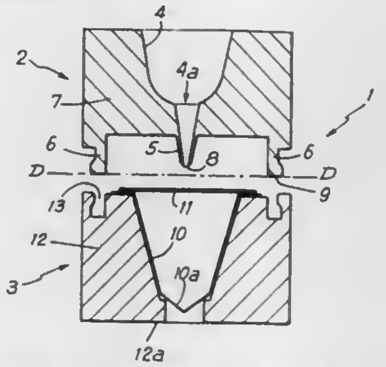
Sophie Chateau, Camon, France, assignor to SCIBIEX (SARL), France

Continuation of Ser. No. 424,701, Apr. 18, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 782,526

Claims priority, application France, Apr. 22, 1994, 94 05123

Int. Cl.^{6} G01N *21/07*

U.S. Cl. 422—61 9 Claims



1. An apparatus for immunological analysis, comprising two independent elements including assembly means to attach the two independent elements in a fluid tight relationship, the first element being an incubation element that includes at least one receptacle having an orifice to accommodate a tapering tube having a tip which is in a fluid relationship with the interior of the receptacle suitable for receiving as its contents a mixture made up of a substance to be analyzed and a test substance, the second element constituting a reaction element including at least one well the upper opening of which is closed by a sealing membrane and which has a bottom and an inside portion on which a reactionally sensitive layer is fixed, wherein the bottom of the receptacle is extended externally by the tapering tube, the inside orifice of which extends from the bottom of the receptacle to the tip of said tube wherein the incubation element being placed over the reaction element, the two elements assembled together in a fluid tight relationship, by the assembly means are positioned relative to each other in such a manner that the tip of the tapering tube of the incubation element perforates the sealing membrane and penetrates into the well of the reaction element wherein the diameter of the inside orifice of the taping tube is such that the mixture contained in the receptacle diffuses from the receptacle of the incubation element into the bottom of the reaction element only under drive from a determined centrifugal force which does not destroy the substance to be analyzed and the test substance.

5,746,976
DETACHABLE GAS ANALYZING APPARATUS

Shinsaku Yamada; Hideki Ohashi, both of Miyanohigashi-machi; Sumio Shimizu, Ohtsu, and Takao Imaki, Miyanohigashi-machi, all of Japan, assignors to Horiba Ltd., Kyoto, Japan

Filed Dec. 15, 1995, Ser. No. 573,004

Claims priority, application Japan, Dec. 17, 1994, 6-333956; Dec. 17, 1994, 6-333958; Dec. 17, 1994, 6-333959; Feb. 21, 1995, 7-058092; Apr. 3, 1995, 7-102971

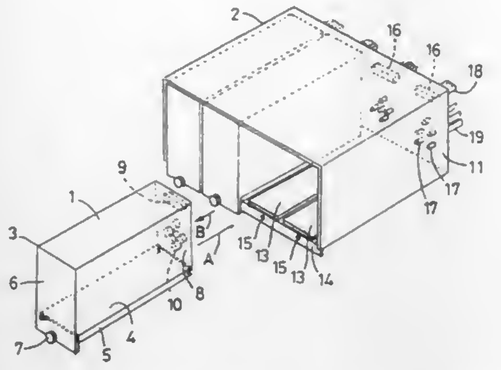
Int. Cl.^{6} G01N *37/00*

U.S. Cl. 422—62 13 Claims

1. A detachable gas analyzing apparatus comprising:

a plurality of gas analyzer units each having a rear plate provided with an electrical connector and at least one gas connector and having an engaging rail; and

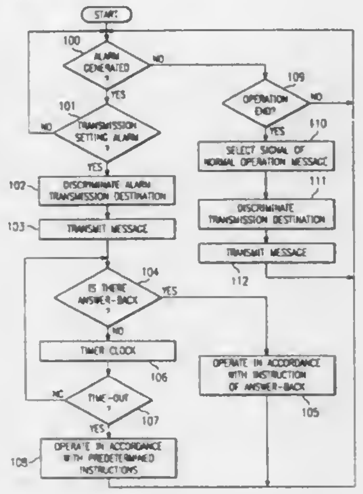
a container case for slidably accommodating the gas analyzer units therein in a substantially mutually parallel arrangement, the container case having a rear side provided with a plurality of electrical connectors correspondingly aligned with and complementary to the electrical connectors of the gas analyzer units, and a plurality of gas connectors correspondingly aligned with and complementary to the gas connectors of the



gas analyzer units, the container case having a plurality of guides disposed in a substantially parallel manner on a bottom thereof for respectively engaging with the engaging rails of the gas analyzer units, each of the gas analyzer units being independently insertable into and removable from the container case.

5,746,977
AUTOMATIC ANALYZER

Kyoko Imai; Kazumichi Imai, both of Hitachinaka, and Yasushi Nomura, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 405,345, Mar. 16, 1995, Pat. No. 5,695,718. This application Sep. 13, 1996, Ser. No. 714,883
Claims priority, application Japan, Mar. 18, 1994, 6-048583
Int. Cl.⁶ G01N *37/00*
U.S. Cl. 422—62 **37 Claims**


START
100
ALARM GENERATED ?
NO
YES
101
TRANSMISSION SETTING ALARM ?
NO
YES
102
DISCRIMINATE ALARM TRANSMISSION DESTINATION
103
TRANSMIT MESSAGE
104
IS THERE ANSWER-BACK ?
YES
NO
TIMER CLOCK
106
TIME-OUT ?
NO
107
YES
108
OPERATE IN ACCORDANCE WITH PREDETERMINED INSTRUCTIONS
109
OPERATION END?
NO
YES
110
SELECT SIGNAL OF NORMAL OPERATION MESSAGE
111
DISCRIMINATE TRANSMISSION DESTINATION
TRANSMIT MESSAGE
112
OPERATE IN ACCORDANCE WITH INSTRUCTION OF ANSWER-BACK
105

1. An in vitro automatic analyzer communication system capable of providing state information and receiving control input for an automatic analyzer, the system comprising:

a means for monitoring the state of a characteristic of the automatic analyzer;

a means for determining when information regarding the state of the characteristic being monitored is required by a recipient monitoring the automatic analyzer;

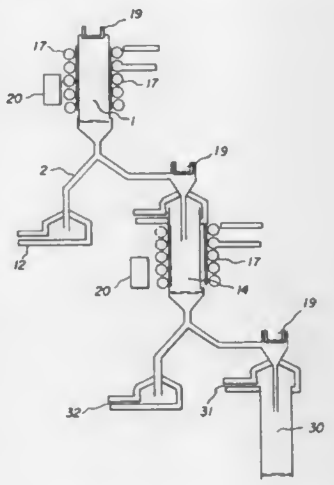
a means for generating a state description signal for describing the state of the characteristic being monitored;

a means for determining an identification code identifying a recipient of the state description signal based upon information regarding the characteristic being monitored; and

a means for transmitting the state description signal along with the identification code to the recipient which compares the identification code to one or more registered identification codes and generates a display if the identification code and at least one of the registered identification codes are coincident.

5,746,978
DEVICE FOR TREATING NUCLEIC ACIDS FROM A SAMPLE

Gerhard Bienhaus, Wielenbach, and Hans Lange, Lampertheim, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany
Continuation of Ser. No. 490,987, Jun. 15, 1995, abandoned. This application Jul. 17, 1997, Ser. No. 895,920
Claims priority, application Germany, Jun. 15, 1994, 44 20 732.8
Int. Cl.⁶ G01N *15/06;* **C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/04*
U.S. Cl. 422—68.1 **42 Claims**



1. A device for treating nucleic acids in a sample solution, said device comprising:

a first reaction chamber for separating nucleic acids from other sample components in the sample solution;

a second reaction chamber for the amplification of purified nucleic acids which have been conveyed to the second reaction chamber by means of a transport path.

a transport path connecting said first reaction chamber to the second reaction chamber;

a controlling means connected to the transport path for controlling liquid flow through the transport path into the second reaction chamber wherein said controlling means allows nucleic acids separated from other sample components in the sample solution to be transported into the second reaction chamber and prevents liquid containing said other sample components from being transported into the second reaction chamber thereby conveying purified nucleic acids to said second reaction chamber.

5,746,979
METHOD FOR RECEIVING AND SEPARATING A FLUID INTO ITS INGREDIENTS

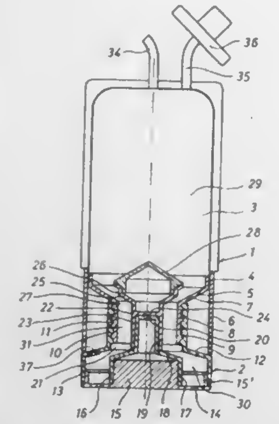
Niels Erik Holm, Birkerød, Denmark, assignor to E. R. Squibb & Sons, Inc., Skillman, N.J.
Division of Ser. No. 240,641, May 2, 1994, Pat. No. 5,462,716. This application Jun. 6, 1995, Ser. No. 472,039
Claims priority, application Denmark, Nov. 11, 1991, 1848/91
Int. Cl.⁶ G01N *9/30;* **B01L** *3/00;* **B01D** *43/00*
U.S. Cl. 422—72 **7 Claims**

1. A method of separating fluid into two or more separable fractions, comprising the steps of:

providing a container having at least a first and a second chamber which are separably joined by cooperating connectors proximate an opening in each of said chambers and in fluid communication when joined;

admitting a fluid into at least one of said first and second chambers;

providing a closure for selectively sealing the opening in at least one of said first and second chambers;



causing said closure to be open to permit fluid communication between said first and second chambers through a channel when said first and second chambers are joined and centrifuged;

centrifuging the container and fluid to cause a first separable fraction to accumulate preferentially in one of said first and second chambers;

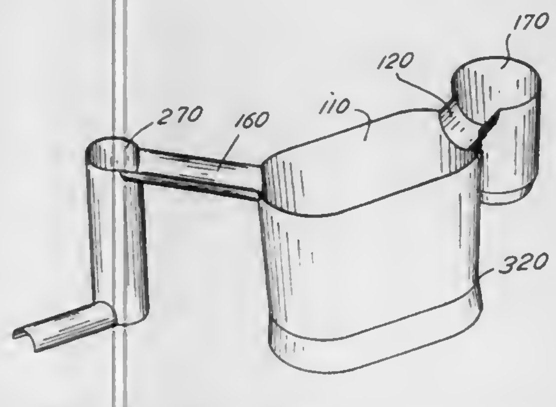
accumulating a substantial portion of the remaining separable fractions in the other of said first and second chambers;

selectively sealing the opening in at least one of said first and second chambers after said centrifugation but before said chambers are separated by causing said closure to seat and close said channel when said cooperating connectors are moved apart; and

thereafter separating said chambers; wherein said step of selectively sealing the opening in at least one of said chambers is accomplished automatically as the chambers are being separated but before the interior of the sealed chamber is exposed to an external environment.

5,746,980
TEST SAMPLE CARD WITH IMPROVED AIR BUBBLE EVACUATION

Raymond E. O'Bear, Granite City, Ill.; Bruno Colin, Marcy l'Etoile, France; G. R. Tegeler, Hazelwood, and John L. Staples, Florissant, both of Mo., assignors to bioMérieux Vitek, Inc., Hazelwood, Mo.
Continuation of Ser. No. 455,534, May 31, 1995, Pat. No. 5,609,828. This application Nov. 5, 1996, Ser. No. 743,843
Int. Cl.⁶ C12M *1/18*
U.S. Cl. 422—102 **4 Claims**



1. A test sample card, comprising:

(a) a card body defining a first surface and a second opposite surface, a fluid intake port and a plurality of sample wells disposed between said first and second opposite surfaces, said first and second opposite surfaces sealed with a sealant tape covering said plurality of sample wells;

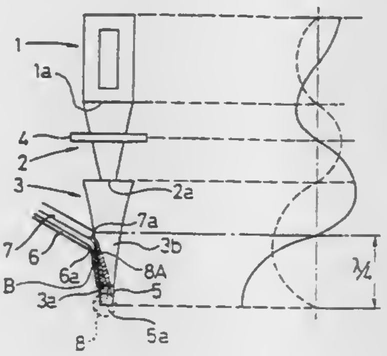
(b) a fluid channel network connecting said fluid intake port to said sample wells;

(c) a bubble trap connected to at least one of said sample wells by a connecting conduit with said connecting conduit formed in said first surface of said card but not in said second surface;

(d) wherein said bubble trap comprises a depression in said first surface of said card extending only part way through said card body and covered by said sealant tape, said bubble trap thereby formed in an elevated position relative to said sample well when said test sample card is held such that said first surface is in a horizontal attitude.

5,746,981
METHOD AND APPARATUS FOR MIXING TWO OR MORE KINDS OF RESIN MATERIAL LIQUIDS

Akio Satoh, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 22, 1996, Ser. No. 636,042
Claims priority, application Japan, Mar. 29, 1996, 8-075541; Mar. 29, 1996, 8-075542
Int. Cl.⁶ B01F *3/10*
U.S. Cl. 422—128 **48 Claims**



1. A method for mixing two or more kinds of resin material liquids, comprising the steps of:

arranging such that resin outlet ports of feed tubes for feeding two or more kinds of resin material liquids which are hardened by reaction face a side skin surface of an ultrasonic wave transmission solid horn;

allowing said resin material liquids to flow down passing along the side skin surface while applying ultrasonic vibrations to said resin material liquids; and

guiding said resin material liquids to a distal end face of said ultrasonic wave transmission solid horn, thereby mixing said resin material liquids in an aerial state;

wherein each of said resin outlet ports is located in an area within a range of a quarter wavelength of acoustic waves propagating through said ultrasonic wave transmission solid horn from the distal end face of said ultrasonic wave transmission solid horn.

8. An apparatus for mixing two or more kinds of resin material liquids, said apparatus comprising a plurality of feed tubes for feeding two or more kinds of resin material liquids which are hardened by reaction, resin outlet ports of said feed tubes being faced onto a side skin surface of an ultrasonic wave transmission solid horn, said resin material liquids being allowed to flow down passing along the side skin surface while applying ultrasonic vibrations to said resin material liquids and be guided to a distal end face of said ultrasonic wave transmission solid horn, thereby said resin material liquids being mixed in an aerial state,

wherein each of said resin outlet ports is located in an area within a range of a quarter wavelength of acoustic waves propagating through said ultrasonic wave transmission solid horn from the distal end face of said ultrasonic wave transmission solid horn.

5,746,982

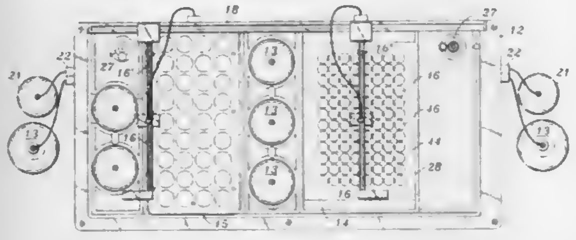
APPARATUS FOR AUTOMATED SYNTHESIS OF CHEMICAL COMPOUNDS

Hossain Saneli; Mohammad R. Boroomand, and Michael R. Ferriell, all of Louisville, Ky., assignors to Advanced ChemTech, Inc., Louisvllle, Ky.

Filed Feb. 29, 1996, Ser. No. 609,968

Int. Cl.^{6} C08F *2/02;* B01J *14/00*

U.S. Cl. 422—134 **27 Claims**



1. Apparatus for the synthesis of chemical compounds comprising a housing having a top, front, side and rear walls surrounding and enclosing a reaction table, track means on said rear wall of said housing, at least one arm extending perpendicularly from said rear wall over said reaction table and being carried by said track means for movement parallel to said rear wall of said housing, at least one container for a system fluid, at least one reciprocally movable probe depending downwardly from said arm and movably mounted thereon for movement along said arm, at least one control syringe, fluid communication lines between said arm and said control syringe and between said probe and said control syringe, means for programming and controlling the probe and control syringe, the invention comprising;

- a. a reaction block comprising a body defining an upper portion and a lower portion and an upper and lower surface, said body having at least one reaction well closed at its lower end and opening to said upper surface,
- b. a flushing conduit located adjacent said well and being in fluid communication therewith;
- c. manifold means in fluid communication with said flushing conduit for leading fluid into and out of said body;
- d. means for closing the opening of said reaction well; and
- e. means for creating a pressure differential between said reaction well and said manifold means;

whereby reagents are introduced into said reaction well by said probe and the contents of said reaction well are flushed therefrom by creation of a pressure differential between said reaction well and said manifold means responsive to commands from the control means.

15. A valveless reaction block for conducting automated chemical synthesis, said reaction block comprising a solid body defining upper and lower portions and upper and lower surfaces, a multiplicity of elongated reaction wells formed in said body, said reaction wells being closed at their bottom and opening at the opposite end to said upper surface of said body for receiving components of said synthesis, a plurality of conduits formed in said lower portion of said reaction block in fluid communication with at least one suitable external container for removal and disposition of fluids from said reaction block, a multiplicity of ducts defining a closed upper end and communicating at the opposite bottom end with one of said conduits being disposed in said reaction block, one of said ducts being located adjacent one of said reaction wells, a flushing conduit extending between each of said reaction wells and said adjacent duct, said flushing conduit defining a bottom end which opens into the closed bottom of said reaction well and an upper end which opens into the closed upper end of said duct, said flushing conduit being disposed at a slight angle with respect to the vertical axis of said reaction well.

5,746,983

APPARATUS AND PROCESS FOR CALCIFICATION

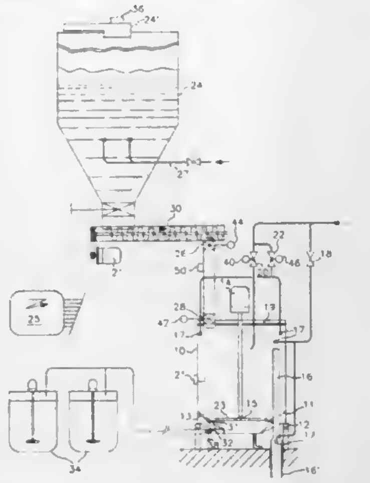
Poju R. Stephansen, P.O. Box 103 - Lilleaker, N-0216 Oslo, Norway

Filed Aug. 31, 1994, Ser. No. 299,060

Claims priority, application Norway, Aug. 31, 1993, 933084

Int. Cl.^{6} C01B *6/04*

U.S. Cl. 422—162 **10 Claims**



1. In an improved automatically driven, cylindrical lime slaking apparatus for interval manufacture of slaked lime comprising a lime silo for storage of dry, unslaked lime, a cylindrical slaker capable of receiving dry lime from said silo and mixing said lime with water in a hydration process, a conveyor mechanism joining the silo and slaker for transfer of dry lime from said silo to said slaker, and a water supply system supplying water to said slaker for the hydration process and for flushing said slaker between intervals of lime slaking, the improvement comprising mounting said slaker on one or more weighing cells and providing an automatic control means whereby the weight of lime and water introduced into said slaker and making up a slaking mixture are measured and provided to said control means to control the operation intervals of said slaker, conveyor mechanism and water supply system.

5,746,984

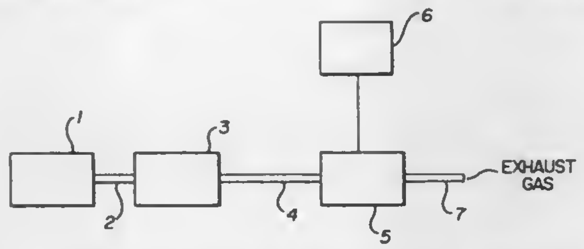
EXHAUST SYSTEM WITH EMISSIONS STORAGE DEVICE AND PLASMA REACTOR

John W. Hoard, Livonia, Mich., assignor to Low Emissions Technologies Research and Development Partnership, Dearborn, Mich.

Filed Jun. 28, 1996, Ser. No. 673,351

Int. Cl.^{6} B01D *50/00;* B01J *19/08*

U.S. Cl. 422—169 **10 Claims**



1. An exhaust system for a combustion process, comprising:

(a) a storage device with means for collecting from an exhaust stream at least one member selected from the group consisting of hydrocarbon, particulate, and NO_x emissions, and mixtures thereof;

(b) a plasma reactor capable of generating a non-thermal plasma; and

(c) means for alternating between collection of the emissions in the storage device and destruction of the collected emissions in the plasma reactor,

wherein, with respect to the direction of flow of the exhaust stream, the storage device is located before the terminus of the plasma reactor.

5,746,985

REFORMING REACTOR

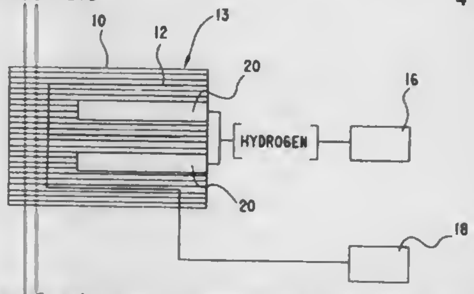
Tomonori Takahashi, Chita, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 439,448, May 11, 1995, abandoned. This application Jun. 17, 1997, Ser. No. 877,513

Claims priority, application Japan, May 23, 1994, 6-108627

Int. Cl.^{6} F01N *3/10*

U.S. Cl. 422—173 **4 Claims**



1. In a reforming reactor comprising a reforming catalyst and wherein a hydrocarbon is mixed with water and oxygen and the mixture heated and contacted with the reforming catalyst to partially oxidize, decompose and reform the hydrocarbon to form hydrogen and carbon dioxide, the improvement comprising a heating resistor embedded in said catalyst and a hydrogen separating film disposed inside said catalyst.

5,746,986

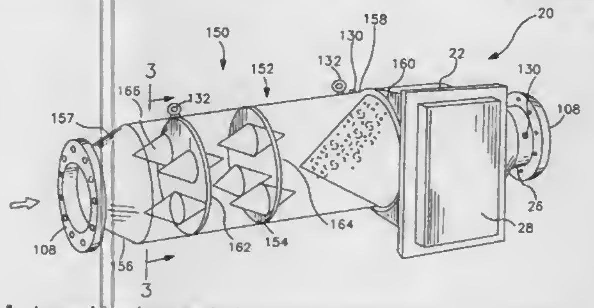
INDUSTRIAL CATALYTIC CONVERTER AND COMBINATION INDUSTRIAL CATALYTIC CONVERTER AND SILENCER

Bobby G. Pollock, Missouri City; Terry A. Segal; John E. Dusek, Jr., both of Houston; Alvin L. Bodin, Missouri City; Cyde D. Maas, Houston; Edward C. Coen, Conroe, and Randall A. Pinter, Seabrook, all of Tex., assignors to Waukesha-Pearce Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 609,669, Mar. 1, 1996, abandoned, which is a continuation-in-part of Ser. No. 395,979, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 366,578, Dec. 30, 1994, abandoned, and a continuation-in-part of Ser. No. 395,979, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 366,578, Dec. 30, 1994. This application Jan. 2, 1997, Ser. No. 778,117

Int. Cl.^{6} B01D *53/34;* F01N *3/10*

U.S. Cl. 422—177 **67 Claims**



1. A combination catalytic converter and silencer, comprising:

a silencer; and

a catalytic converter connected to said silencer, said catalytic converter, comprising:

at least one catalytic converter element;

a central housing having an inlet side and an outlet side and defining an opening therein of a size to allow insertion and removal of said at least one catalytic converter element;

means for selectively sealing said opening; and

means for axially and radially positioning said at least one catalytic converter element in said housing, wherein said positioning means applies a positive force to said at least one catalytic converter element, wherein said means for axially and radially positioning comprises a camshaft assembly disposed within said central housing for applying a positive force to axially position said at least one catalytic converter element.

5,746,987

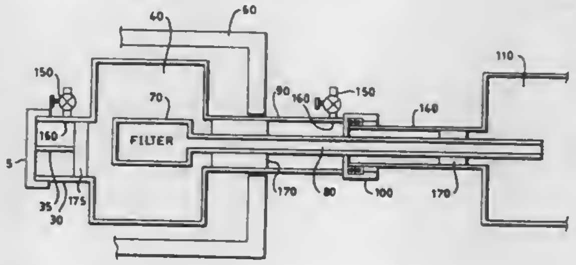
APPARATUS FOR PHYSICAL AMD CHEMICAL SEPARATION AND REACTION

Randy Aulbaugh, Irving, and Gregory G. Hawk, Coppell, both of Tex., assignors to Thermall Corp., Farmers Branch, Tex.

Continuation-in-part of Ser. No. 544,602, Oct. 18, 1995, Pat. No. 5,628,969. This application Jan. 17, 1997, Ser. No. 785,343

Int. Cl.^{6} B01J *8/04;* B01D *11/02*

U.S. Cl. 422—190 **25 Claims**



1. A chemical processing and reaction apparatus for extracting as volatilized gases one or more substances from a material containing the one or more substances, the chemical processing and reaction apparatus comprising:

a retort adapted to rotate about a central axis, the material being disposed within retort;

a sleeve integral with the retort and extending therefrom;

a off-gas tube adapted to receive volatilized gases from the retort

a rotary seal disposed in the sleeve connecting the sleeve to the off-gas tube;

a rotating device in communication with the retort adapted to drive the retort in a rotational motion;

a vacuum device in communication with the retort adapted to generate a vacuum between about 2.25 mmHg and 7.35 mmHg within the retort, thereby lowering a boiling point of the one or more substances and for drawing the volatilized gases into the off-gas; tube and

a heating device in communication with the retort adapted to heat the material in the retort to a temperature sufficient to volatilize the one or more the substances into the volatilized gases.

5,746,988

APPARATUS FOR PROCESSING BIO-HARZARDOUS WASTE

John L. Hall, Tracy, Calif., assignor to Darlene Hall, Edmonds, Wash.; Wilburn E. Hall, Newport, Oreg., and Vern W. Hall, Kodiak, Ak., part interest to each

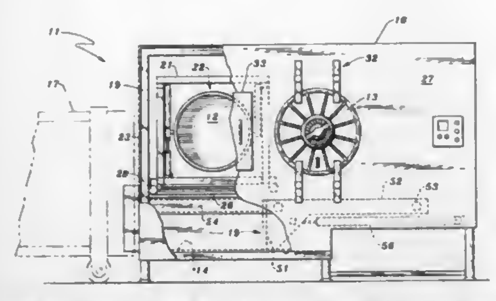
Filed Nov. 24, 1995, Ser. No. 562,508

Int. Cl.^{6} A61L *2/00*

U.S. Cl. 422—292 **20 Claims**

1. A waste sterilizer having a framework and a receptacle supported thereby in which wastes are sterilized which receptacle has an opening for receiving wastes and wherein the receptacle is pivotable between a loading orientation at which wastes are retained in the receptacle and a waste dumping orientation at which wastes are released from the receptacle through the opening, wherein the improvement comprises:

said receptacle being coupled to said framework by at least a first pivot arm and a second pivot arm each of which is

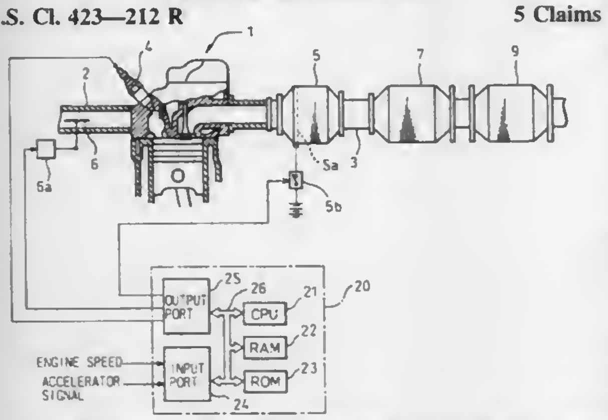


pivotable relative to the framework and pivotable relative to the receptacle, the first pivot arm being coupled to a side of the receptacle by a first pivot coupling having a first horizontally directed pivot axis and the second pivot arm being coupled to the side of the receptacle by a second pivot coupling having a second horizontally directed pivot axis, said second pivot coupling and second horizontally directed pivot axis being closer to said opening than the first pivot coupling and first horizontally directed pivot axis.

5,746,989
METHOD FOR PURIFYING EXHAUST GAS OF A DIESEL ENGINE

Mikio Murachi, Toyota; Seiji Okawara, Susono; Koichi Kojima, Susono, and Takuya Kondo, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1996, Ser. No. 681,957
Claims priority, application Japan, Aug. 14, 1995, 7-207108
Int. Cl.^{6} B01D *53/92;53/94*
U.S. Cl. 423—212 R **5 Claims**



1. A method for purifying the exhaust of a diesel engine, comprising:

catalytically oxidizing nitrogen monoxide, hydrocarbons and carbon monoxide in the exhaust gas from a diesel engine to form an exhaust gas comprising nitrogen dioxide by contacting the exhaust gas with an oxidation catalyst when the air/fuel ratio of the exhaust gas is lean in fuel;

collecting carbon particulates contained in the exhaust gas in a diesel particulate filter;

removing nitrogen oxides out of the exhaust gas by sorbing the nitrogen oxides in an absorbent when the air/fuel ratio of the exhaust gas is lean in fuel;

periodically regenerating the diesel particulate filter by raising the temperature of the exhaust gas by activating an electric heater attached to said oxidation catalyst to a temperature high enough to promote the reaction between nitrogen dioxide and the carbon particulates contained in the diesel particulate filter so as to result in a regenerated diesel particulate filter and an exhaust gas rich in carbon oxides and nitrogen monoxide;

removing nitrogen monoxide from the filter regeneration out of the exhaust gas;

periodically regenerating the absorbent by intentionally shifting the air/fuel ratio of the exhaust gas to a fuel rich air/fuel ratio thereby temporarily terminating the catalytic oxidation of the hydrocarbons and carbon monoxide in the exhaust gas set forth in the first step and passing the resulting hydrocarbon and carbon monoxide rich exhaust gas into the absorbent where a reaction occurs between the hydrocarbons and carbon monoxide and the nitrogen oxides released in the absorbent to convert the nitrogen oxides into nitrogen.

5,746,990
PROCESS FOR THE PREPARATION OF RARE-EARTH SULPHIDES FROM HALIDES

Pierre MaCaudiere, Asnieres/Seine, and Yvette Pescher, Bagneux, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 21, 1996, Ser. No. 620,071
Claims priority, application France, Mar. 22, 1995, 95 03325
Int. Cl.^{6} C01F *17/00*
U.S. Cl. 423—263 **12 Claims**

1. A process for the preparation of a rare-earth sulphide comprising the steps of:

1) providing a mixture of a rare earth halide with either alkali metal halide or aluminum halide within a reactor,
2) heating at a temperature which is sufficient to volatilize the halides,
3) contacting the volatilized mixture with hydrogen sulphide, and
4) separating the obtained rare-earth sulphide from the reaction medium.

5,746,991
COMPOSITION FOR GROWING LASER CRYSTALS

Yoshinori Kubota, Ube, Japan, assignor to Central Glass Company, Limited, Yamaguchi, Japan

Filed Aug. 23, 1996, Ser. No. 704,469
Claims priority, application Japan, Aug. 25, 1995, 7-217000
Int. Cl.^{6} C01G *57/00;* **C30B** *9/00*
U.S. Cl. 423—263 **5 Claims**

1. A composition for growing a laser crystal, said composition being represented by the formula (1),

$$\mathrm{Li}[\mathrm{R}_n\,\alpha_{1\text{-}n}][(\mathrm{Ga}_p\mathrm{In}_q)\,\beta_{1\text{-}p\text{-}q}]\mathrm{F}_{6+n} \qquad (1)$$

where n is within a range from 10^{-5} to 0.1, each of p and q is within a range from 0 to 0.6, a total of p and q is within a range from 0.001 to 0.6, α is at least one member selected from the group consisting of Ca, Sr, Ba and Na, A is at least one member selected from the group consisting of Al, Cr, Ni, Co and Fe, and R is a rare-earth element.

5,746,992
SILICA AEROGEL PRODUCED UNDER SUBCRITICAL CONDITIONS

Bulent E. Yoldas, Pittsburgh, and Michael O. Okoroafor, Export, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 267,687, Jun. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 174,951, Dec. 23, 1993, abandoned. This application Oct. 5, 1995, Ser. No. 539,461
Int. Cl.^{6} C01B *33/158*
U.S. Cl. 423—338 **14 Claims**

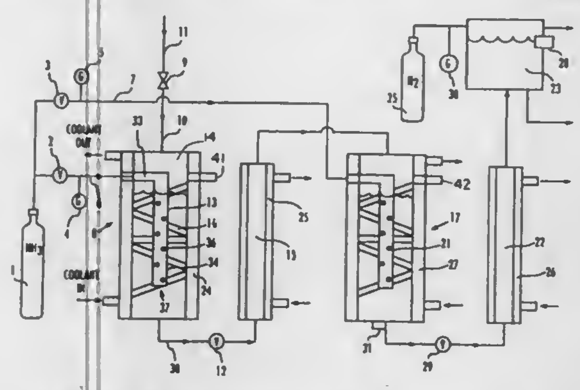
1. Particles of silica aerogel wherein said particles are collectively characterized by:

(a) an internal particle pore diameter at the maximum of the dV/dlog(D) desorption pore volume plot in the range of from 7 to 20 nanometers,
(b) a full width at on e-third maximum of less than 15 nanometers,
(c) an internal porosity of at least 68 percent by volume, and
(d) a bulk porosity of at least 85 percent by volume, and wherein at least 90 percent by weight of said particles have sizes of 25 micrometers or less.

5,746,993
PROCESS FOR MANUFACTURE OF ULTRA-HIGH PURITY AMMONIUM HYDROXIDE

William H. Mullee, Portland, Oreg., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 17, 1996, Ser. No. 733,277
Int. Cl.^{6} C01C *1/00*
U.S. Cl. 423—352 **8 Claims**



1. A process for the production of an ammonium hydroxide solution, comprising the steps of:

(a) injecting gaseous ammonia into a closed first reactor vessel through a sparger tube that releases the ammonia within the first reactor vessel;
(b) adding ultra-pure water to the first reactor vessel so that the ammonia comes in contact with the ultra-pure water and forms the ammonium hydroxide solution;
(c) cooling the first reactor vessel as the ammonium hydroxide solution is formed to maintain a reaction temperature effective to promote the reaction between the ammonia and the ultra-pure water;
(d) maintaining a quantity of the ammonium hydroxide solution in the first reactor vessel;
(e) withdrawing the ammonium hydroxide solution from the first reactor vessel; and
(f) cooling the ammonium hydroxide solution after it is withdrawn from the first reactor vessel;

wherein steps (a) to (f) are conducted substantially concurrently so that the ultra-pure water and the ammonia are added and the ammonium hydroxide solution is withdrawn, without recirculation back to the first reactor vessel, in a manner effective to provide a substantially steady state of reaction within the first reactor vessel;

(g) providing the ammonium hydroxide solution from the closed first reactor vessel into a closed second reactor vessel;
(h) injecting gaseous ammonia into the second reactor vessel through a sparger tube that releases the ammonia within the second reactor vessel so that the ammonia comes in contact with the ammonium hydroxide solution and forms a higher concentration ammonium hydroxide solution;
(i) cooling the second reactor vessel as the higher concentration ammonium hydroxide solution is formed to maintain a reaction temperature effective to promote the reaction between the ammonia and the ammonium hydroxide solution;
(j) maintaining a quantity of the higher concentration ammonium hydroxide solution in the second reactor vessel;
(k) withdrawing the higher concentration ammonium hydroxide solution from the second reactor vessel; and
(l) cooling the higher concentration ammonium hydroxide solution after it is withdrawn from the second reactor vessel;

wherein steps (g) to (l) are conducted substantially concurrently so that the ammonium hydroxide solution is added and the higher concentration ammonium hydroxide solution is withdrawn, without recirculation back to the second reactor vessel, in a manner effective to provide a substantially steady state of reaction within the second reactor vessel.

5,746,994
METHOD FOR SYNTHESIZING FERRATE AND FERRATE PRODUCED THEREBY

Michael D. Johnson, Las Cruces, N. Mex., assignor to New Mexico State University Technology Transfer Corporation, Las Cruces, N. Mex.

Filed Aug. 9, 1996, Ser. No. 694,948
Int. Cl.^{6} C01D *1/02;* **C01G** *49/02*
U.S. Cl. 423—594 **62 Claims**

1. A method of preparing ferrate ($FeO_4{}^{2-}$) comprising the step of oxidizing Fe^{3+} with monoperoxosulfate ($HSO_5{}^-$).

12. A method of preparing ferrate ($FeO_4{}^{2-}$) comprising the steps of:

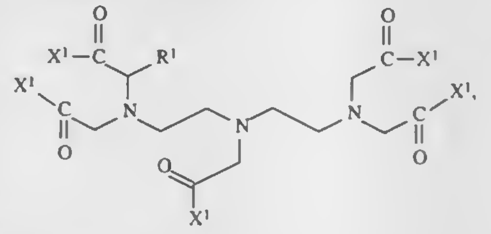
(a) mixing ferric sulfate and a potassium salt;
(b) adding ice and potassium hydroxide.

5,746,995
DTPA DERIVATIVES SUBSTITUTED IN A NOVEL WAY, THEIR METAL COMPLEXES, AND THEIR USE IN DIAGNOSIS AND THERAPY

Franz-Karl Maier; Michael Bauer; Werner Krause; Ulrich Speck; Gabriele Schuhmann-Giampieri, all of Berlin, Germany; Andreas Muhler, Wayne, N.J.; Thomas Balzer, and Wolf-Rudiger Press, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 387,408, Feb. 13, 1995, which is a continuation-in-part of Ser. No. 35,186, Nov. 30, 1994, abandoned. This application Nov. 30, 1995, Ser. No. 565,025
Int. Cl.^{6} A61B *5/055;* **A61K** *49/04*
U.S. Cl. 424—1.65 **29 Claims**

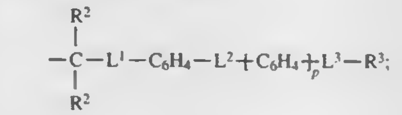
1. A compound of formula I



(I)

wherein

R^1 is a radical of formula Ia



$$-\overset{R^2}{\underset{R^2}{\overset{|}{\underset{|}{C}}}}-L^1-C_6H_4-L^2\!+\!C_6H_4\!+_{\!p}L^3-R^3; \qquad (Ia)$$

is 0 or 1:

R^2 is, in each case independently of one another, H or a branched or unbranched, saturated or unsaturated C_1–C_6 hydrocarbon radical;

R^3 is H, a carboxyl group, or a branched or unbranched, saturated or unsaturated C_1–C_6 hydrocarbon radical;

L^1 is a direct bond or C_1–C_4 alkylene;

L^2 and L^3 are, in each case independently of one another, a direct bond, an oxygen atom, a sulfur atom, C_1–C_{10} alkylene, or C_1–C_{10} alkylene interrupted by one to three oxygen atoms, one to three sulfur atoms or combinations thereof, wherein two or more heteroatoms are not directly connected with one another;

X^1 is, in each case independently of one another, O—X^2 or N(R^4)R^5;

R^4 and R^5 are, in each case independently of one another, H, C_1–C_6 alkyl or a R^1 group, or

R^4 and R^5 together, with inclusion of the common amide nitrogen atom, form a four- to eight-membered ring, optionally containing 1 to 2 oxygen atoms and/or 1 to 2 carbonyl or sulfonyl groups;

X^2 is, in each case independently of one another, H or a metal ion equivalent of an element of atomic numbers 20–32, 39–51 or 57–83; or

a physiologically acceptable salt thereof with inorganic and/or organic cations.

5,746,996

THIOLATION OF PEPTIDES FOR RADIONUCLIDE-BASED RADIODETECTION AND RADIOTHERAPY

Serengulam V. Govindan, Summit; Gary L. Griffiths, Morristown, and Hans L. Hansen, Mystic Island, all of N.J., assignors to Immunomedics, Inc., Morris Plains, N.J.

Continuation-in-part of Ser. No. 253,772, Jun. 3, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 483,095

Int. Cl.^{6} A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **30 Claims**

1. A method of radiolabeling a peptide with a radioisotope of technetium or rhenium, comprising the steps of:

- (a) reacting a peptide that does not contain a free sulfhydryl group, with an acetyl-protected tertiary thiol-containing bifunctional chelating agent containing an amine-reactive functional group, to form a peptide-acetyl-t-thiol-containing conjugate;
- (b) deprotecting the acetyl-t-thiol group to generate a free t-thiol group; and
- (c) admixing the peptide-t-thiol-containing conjugate with a stannous salt for reduction of pertechnetate or perrhenate, the radionuclide to be added in a subsequent step, to form a mixture of reducing agent and peptide-t-thiol-containing conjugate; and
- (d) reacting the mixture of step (c) with pertechnetate or perrhenate, whereby Tc or Re cations bind to the t-thiol group, thereby forming a radiolabeled peptide, or
- (c') adding reduced pertechnetate or perrhenate to said peptide-t-thiol-containing conjugate,

thereby forming a radiolabeled peptide.

5,746,997

RADIOHALOGENATION OF OLIGONUCLEOTIDES VIA TRIALKYLSTANNYLARYL CONJUGATES

Michael W. Reed, Seattle, Wash., assignor to Epoch Pharmaceuticals, Inc., Bothell, Wash.

Filed Oct. 2, 1996, Ser. No. 720,624

Int. Cl.^{6} A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.73 **30 Claims**

1. A process for preparing a halogenated oligonucleotide, having the formula (i) or (ii)

$$[\Psi—\mathrm{ARYL}—Y—Z—Y']_p—\mathrm{ODN} \qquad \text{(i)}$$

$$[\Psi—C(R_2)=C(R_2)—Y—Z—Y']_p—\mathrm{ODN} \qquad \text{(ii)}$$

where ODN represents an oligonucleotide;

Ψ represents a halogen atom;

p is an integer having the value of 1 to 30 with the proviso that the value of p does not exceed the number of nucleotide units in the ODN;

ARYL represents a benzene, naphthalene, pyridine, pyrrol, thiophene, or furan ring which may optionally be substituted with 1, 2, or 3 R_3 groups;

R_2 is H or R_3;

R_3 is alkyl or cycloalkyl of 1 to 5 carbons, or is alkoxy having 1 to 5 carbons, , alkylthio having 1 to 5 carbons or alkylamino having 1 to 5 carbons, or dialkylamino where each alkyl group independently has 1 to 5 carbons;

Y is a linker arm that covalently links the Z moiety to the ARYL or to the $C(R_2)=C(R_2)$ moiety, the length of said Y group not exceeding the length of a normal alkyl chain of 25 carbons;

Y' is a linker arm that covalently links the Z moiety to the ODN, the length of said Y group not exceeding the length of a normal alkyl chain of 25 carbons, and

Z is a moiety formed by the reaction between an electrophilic and a nucleophilic reactive group;

the process comprising the steps of

(1) reacting a trialkylstannyl oligonucleotide of the formula (iii) or (iv)

$$[(R_1)_3\mathrm{Sn}—\mathrm{ARYL}—Y—Z—Y']_p—\mathrm{ODN} \qquad \text{(iii)}$$

$$[(R_1)_3\mathrm{Sn}—C(R_2)=C(R_2)—Y—Z—Y']_p—\mathrm{ODN} \qquad \text{(iv)}$$

where R_1 is an alkyl or cycloalkyl group having 1 to 10 carbons and the remaining symbols are defined as above, with an electrophilic halogen $\Psi+$, and thereafter

(2) separating the halogenated oligonucleotide of formula (i) or (ii) from the trialkylstannyl oligonucleotide of formula (iiii) or (iv).

5,746,998

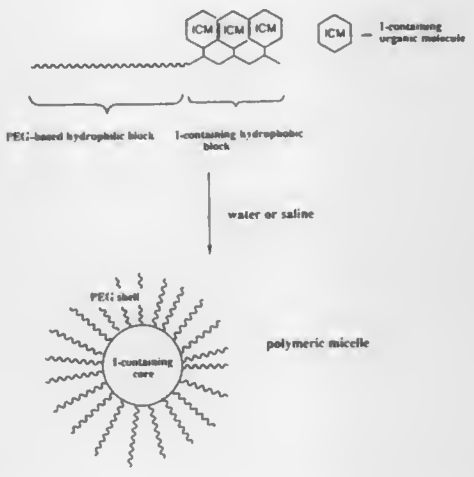
TARGETED CO-POLYMERS FOR RADIOGRAPHIC IMAGING

Vladimir P. Torchilin, Charlestown; Vladimir S. Trubetskoy, Milton; Gerald L. Wolf, Winchester, and G. Scott Gazelle, Hingham, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 265,421, Jun. 24, 1994, Pat. No. 5,567,410. This application Aug. 8, 1996, Ser. No. 695,292

Int. Cl.^{6} A61K *49/04*

U.S. Cl. 424—9.4 **23 Claims**


ICM
ICM
ICM
ICM
I-containing organic molecule
PEG-based hydrophilic block
I-containing hydrophobic block
water or saline
PEG shell
I-containing core
polymeric micelle

1. A targeted compound capable of forming micelles in an aqueous solution, said compound comprising a hydrophilic polymer linked to a hydrophobic polymer, and a targeting ligand linked to one of said hydrophilic polymer or said hydrophobic polymer, wherein said hydrophobic polymer comprises a backbone incorporating radiopaque molecules via covalent bonds.

5,746,999

MAGNETIC PARTICLES FOR DIAGNOSTIC PURPOSES

Heinz Gries; Wolfgang Mützel; Christian Zurth, and Hanns-Joachim Weinmann, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 914,221, Jul. 16, 1992, abandoned, which is a continuation of Ser. No. 693,019, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 404,543, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 363,303, Jun. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 102,754, Sep. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 800,840, Nov. 22, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 484,309

Claims priority, application Germany, Nov. 23, 1984, 34 43 251.5; Nov. 23, 1984, 34 43 252.3; Mar. 4, 1985, 35 08 000.0

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 424—9.322 **13 Claims**

1. A method comprising enhancing contrast of an MR image, by administering an effective amount of physiologically compatible alkali-pretreated polysaccharide-magnetite in particulate form.

5,747,000

USE OF MACROCYCLIC METAL COMPLEXES AS TEMPERATURE SENSORS

Johannes Platzek; Bernd Radüchel; Ulrich Niedballa; Hanns-Joachim Weinmann; Hans Bauer, and Klaus Roth, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP94/01376, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO94/27973, PCT Pub. Date Dec. 8, 1994

PCT Filed Apr. 29, 1994, Ser. No. 549,803

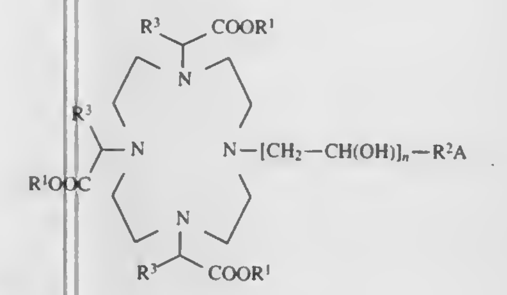
Claims priority, application Germany, May 28, 1993, 43 18 369.7

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 424—9.363 **27 Claims**

1. A method for determining temperature which comprises determining the change in chemical shift of a complex subject to NMR spectroscopy, wherein the complex is a macrocyclic metal complex of at least one metal ion of an element of atomic numbers 21–29, 42, 44 or 57–70 and a complexing agent of formula I

(I)



in which

n means the numbers 0 or 1,

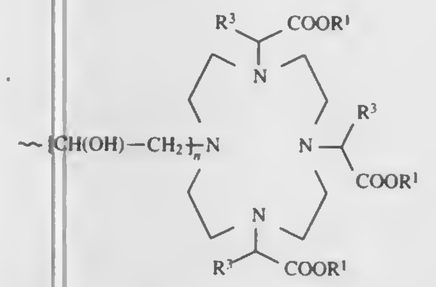
R^1 independently of one another, stand for a hydrogen atom or a metal ion equivalent,

R^3 stands for a hydrogen atom, a straight-chain or branched C_1–C_{10} alkyl group, which is optionally substituted by 1–5 C_1–C_6 alkoxy groups, hydroxy-C_1–C_6 alkyl groups and/or hydroxy groups,

R^2 means a straight-chain or branched C_1–C_{10} alkylene group, which optionally is interrupted by 1 to 5 oxygen atoms and/or carbonyl groups and/or optionally is substituted by 1 to 5 hydroxy groups, C_1–C_6 alkoxy-C_1–C_6 alkyl groups, $—OR^4$, $—CO—NR^5R^6$, $—NR^5R^6$ and/or $—NR^5—CO—R^6$ radicals, in which R^4 stands for a straight-chain or branched C_1–C_4 alkyl radical and R^5, R^6, independently of one another, have the meaning of R^3, and

A stands for a hydrogen atom or a second macrocyclic radical of general formula II,

(II)



in which

n, R^1 and R^3 have the indicated meanings, where free carboxylic acid groups that are not required for complexing a metal ion are present optionally as a salt of an inorganic or organic base or amino acid and/or as an ester or amide and where at least two radicals R^1 stand for a metal ion equivalent.

5,747,001

AEROSOLS CONTAINING BECLOMETHAZONE NANOPARTICLE DISPERSIONS

Timothy S. Wiedmann, Minneapolis, Minn.; Ray W. Wood, Ft. Washington, and Lan DeCastro, West Chester, both of Pa., assignors to NanoSystems, L.L.C., King of Prussia, Pa.

Filed Feb. 24, 1995, Ser. No. 393,973

Int. Cl.^{6} A61K *9/12*

U.S. Cl. 424—45 **10 Claims**

1. An aerosol of an aqueous dispersion of nanoparticles, wherein the nanoparticles comprise 0.1 to 60% (w/w) of insoluble beclomethasone particles having (1) an average particle size of less than about 400 nm, and (2) 0.1 to 90% (w/w) of a surface modifier adsorbed on the surface thereof.

5,747,002

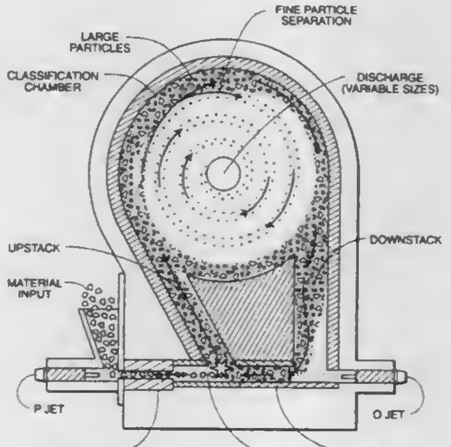
PREPARATION OF SODIUM CHLORIDE AEROSOL FORMULATIONS

Andrew Reginald Clark, Half Moon Bay; Chung C. Hsu, Los Altos, and Andrew J. Walsh, San Francisco, all of Calif., assignors to Genentech, Inc., So. San Francisco, Calif.

Filed Apr. 5, 1995, Ser. No. 416,998

Int. Cl.^{6} A61K *9/12*

U.S. Cl. 424—45 **7 Claims**



1. A method of preparing pharmaceutical preparations of sodium chloride in the form of dispersible particles for aerosol delivery to the lungs comprising the steps of jet milling sodium chloride followed immediately by vacuum drying in an oven to prevent aggregation of the jet milled preparation, wherein said pharmaceutical preparations comprise dispersible particles of sodium chloride of less than about 7 microns in size.

5,747,003

AMORPHOUS PRECIPITATED SILICA ABRASIVE

Shantilal M. Mohnot, Murrysville; Harold E. Swift, Gibsonia; Thomas G. Krivak, Irwin; Robert H. Fear, Pittsburgh; Laura M. Randall, Pittsburgh, and Laurence E. Jones, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 22, 1995, Ser. No. 408,327

Int. Cl.^{6} A61K *7/16;* **B01J** *23/00;* **C01B** *33/12*

U.S. Cl. 424—49 **24 Claims**

1. A statistically large population of particles of amorphous precipitated silica comprising pigmentary phase particles and

glassy phase particles and having a glassy phase fraction in the range of from 0.3 to 30 area percent.

5,747,004
SELF-HEATING DENTIFRICE

Paola Giani, Perchiera Borromeo; Massimo L'Abbate, Polignano a Mare, both of Italy, and Lewis Patrick Cancro, Trumbull, Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jul. 10, 1996, Ser. No. 676,613

Claims priority, application European Pat. Off., Jul. 10, 1995, 95201882

Int. Cl.^{6} A61K *7/16;7/18;7/20*

U.S. Cl. 424—49 **5 Claims**

1. An anhydrous, self-heating dentifrice substantially free from anhydrous synthetic zeolites comprising from 10.5 to 25% by weight of a heat of hydration generating, hydratable inorganic and/or organic salt selected from the group consisting of alkalimetal orthophosphates, alkalimetal pyrophosphates, alkalimetal carbonates, alkalimetal sesquicarbonates, alkalimetal borates, calcium chloride, magnesium chloride, calcium sulphate, alkalimetal acetates, alkalimetal citrates, alkalimetal phosphonates, zinc citrate, zinc sulphate, zinc nitrate and mixtures thereof.

5,747,005
OIL-BASED, ANTI-PLAQUE DENTIFRICE COMPOSITION

Ronald R. Barels, 2856 E. Washington Ave., Escondido, Calif. 92027-1822, and Charles M. Cohler, 18776 Bernardo Trails Dr., San Diego, Calif. 92128

Filed Aug. 2, 1995, Ser. No. 510,420

Int. Cl.^{6} A61K *7/28;33/04;33/30;31/355*

U.S. Cl. 424—50 **14 Claims**

1. An oil-based, anti-plaque composition for use in an oral cavity, consisting essentially of:

at least one enzyme selected from the group consisting of proteases, lipases and saccharinases; and

vitamin E, the vitamin E and the enzyme forming a localizing admixture for an oral substrate contacted therewith, the admixture having the vitamin E and the enzyme in a weight ratio of from about 5:2 to about 13:0.01.

5,747,006
SKIN WHITENER COMPOSITION CONTAINING ACEROLA CHERRY FERMENTATE

Jeffrey M. Dornoff, Grand Rapids; Deborah A. O'Toole, Ionia, both of Mich., and Michael B. Davies, Chattanooga, Tenn., assignors to Amway Corporation, Ada, Mich.

Filed May 14, 1997, Ser. No. 856,433

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 424—62 **9 Claims**

1. A composition for topical use which has a melanin synthesis-inhibiting activity, comprising acerola cherry fermentate and a whitening agent, wherein the acerola cherry fermentate is substantially free of ascorbic acid.

5,747,007
DUSTLESS BABY POWDER

Jin Song, Bedford; John Koch, Dallas, and Marilyn Squier, Garland, all of Tex., assignors to Patty Cake, Inc., Dallas, Tex.

Filed Feb. 13, 1997, Ser. No. 799,891

Int. Cl.^{6} A61K *7/06*

U.S. Cl. 424—69 **26 Claims**

1. A dustless baby powder comprising:

(a) absorbent;

(b) a compression agent; and

(c) a liquid or semi-solid wherein the compression agent diminishes the dispersiveness of the absorbent.

5,747,008
COST EFFECTIVE DENTAL COMPOSITIONS CONTAINING NOVEL SODIUM ALUMINOSILICATES

Satish K. Wason, Bel Air, and James E. Sumpter, Aberdeen, both of Md., assignors to J.M. Huber Corporation, Edison, N.J.

Division of Ser. No. 297,181, Aug. 31, 1994, abandoned. This application Jan. 3, 1997, Ser. No. 778,655

Int. Cl.^{6} A61K *7/16*

U.S. Cl. 424—52 **9 Claims**

1. A dental composition, comprising an abrasive, a humectant material, water and a binder, the abrasive comprising sodium aluminosilicate of the formula $Na_2O \cdot Al_2O_3 \cdot 4XSiO_2 \cdot YH_2O$ wherein X is from about 2 to about 3.4 and Y is from about 2× to 3×, said sodium aluminosilicate having a water demand of greater than 50 g water per 100 g product, said water demand being defined as the weight of water required to saturate 100 g of said sodium aluminosilicate in dry powder form, and said dental composition comprising a water to abrasive weight ratio greater than 1.

5,747,009
DIHYDROXYACETONE-BASED EMULSION AND ITS USE IN COSMETICS

Isabelle Hansenne, Paris, France, assignor to L'Oreal, Paris, France

PCT No. PCT/FR94/00341, § 371 Date Mar. 14, 1996, § 102(e) Date Mar. 14, 1996, PCT Pub. No. WO94/22418, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 28, 1994, Ser. No. 530,168

Claims priority, application France, Mar. 29, 1993, 93/03600

Int. Cl.^{6} A61K *7/42*

U.S. Cl. 424—59 **13 Claims**

1. Stable water-in-oil cosmetic emulsion for coloring the skin, characterized in that it comprises:

A) 50 to 92% by weight, on the basis of the total weight of emulsion, of an aqueous phase comprising 0.5 to 10% by weight of dihydroxyacetone, on the basis of the total weight of the emulsion, and

B) 8 to 50% by weight, on the basis of the total weight of the emulsion, of a fatty phase comprising 5 to 15% by weight of isoparaffin or of poly-α-olefin and 3 to 7% by weight of an emulsifier consisting of a mixture of sorbitol and of glycerol esters of saturated or unsaturated, straight- or branched-chain C_{18} fatty acids, optionally containing a hydroxyl, these esters being oxyethylenated and oxypropylenated, the total number of ethylene oxide and of propylene oxide units being less than or equal to 5, all the percentages being given on the basis of the total weight of the emulsion.

5,747,010
PHOTOPROTECTIVE LIPOPHILIC ANTIOXIDANT COMPOUNDS AND THEIR USE TO PREVENT UVA-MEDIATED LIPID PEROXIDATION

Jeffrey C. Geesin, Doylestown; Curtis A. Cole, Langhorne, and Stephen J. Wisniewski, Doylestown, all of Pa., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Filed Jun. 12, 1996, Ser. No. 664,014

Int. Cl.^{6} A61K *7/42;7/44;7/00*

U.S. Cl. 424—59 **11 Claims**

1. A method of protecting mammalian skin from oxidative effects of ultraviolet A radiation comprising topically applying to the skin an effective amount of a photoprotective composition, said compositive comprising a lipophiiic antioxidant that does not have appreciable absorbance near wavelengths of 320–380 nm.

5,747,011
SUNSCREEN WITH DISAPPEARING COLOR INDICATOR

Jamie S. Ross, South Woodstock, Conn., and Elaine M. Morefield, Eads, Tenn., assignors to Schering-Plough HealthCare Products, Inc., Memphis, Tenn.

Filed Nov. 25, 1996, Ser. No. 756,287

Int. Cl.^{6} A61K *7/42;7/00*

U.S. Cl. 424—59 **26 Claims**

1. A colored, sunscreen emulsion comprising:

(a) about 0.0005 to about 0.5 percent by weight of at least one water-soluble dye that imparts a color other than white to the sunscreen emulsion, such that when the sunscreen emulsion dries after it is spread on skin and/or is rubbed into skin, the color substantially disappears;

(b) at least one sunscreen active ingredient in an amount effective to protect against the actinic radiation of the sun;

(c) at least one emulsifier; and

(d) sufficient water to form the colored emulsion.

5,747,012
COMPOSITIONS CONTAINING SUNSCREENS

Gerd Herbert Dahms, Velbert, Germany, assignor to Tioxide Specialties Limited, London, England

Continuation of Ser. No. 258,286, Jun. 10, 1994, abandoned. This application Oct. 3, 1996, Ser. No. 725,552

Claims priority, application Germany, Jun. 11, 1993, 9312045.9

Int. Cl.^{6} A61K *7/44*

U.S. Cl. 424—60 **28 Claims**

1. A process for the preparation of a composition suitable for topical application to human skin comprising mixing a dispersion in an oil of particles of a metallic oxide having an average primary particle size of less than 0.2 micrometers with one or more emulsifiers and an aqueous phase under conditions in which an emulsion is formed and with a hydrophilic organic sunscreen wherein the composition contains up to 10 percent by weight metallic oxide and up to 7 percent by weight hydrophilic organic sunscreen.

5,747,013
MAKEUP COSMETIC COMPOSITION IN THE FORM OF A MASCARA CONTAINING AT LEAST A WAX AND A PSEUDO-LATEX OF CELLULOSE DERIVATIVES

Nathalie Mougin, Paris; Jean Mondet, Drancy; Bertrand Piot, La Garenne-Colombes; Alex Junino, Livry-Gargan, and Jeanne Patraud, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jan. 17, 1995, Ser. No. 374,480

Claims priority, application France, Jan. 17, 1994, 94 00424

Int. Cl.^{6} A61K *7/06*

U.S. Cl. 424—707 **13 Claims**

1. A mascara composition in the form of an oil-in-water or water-in-oil emulsion or dispersion comprising a mixture of:

(a) a particle suspension of a water-insoluble filmogen polymer in an aqueous phase, said particles having an average diameter ranging from 10 to 300 and said water-insoluble filmogen polymer being selected from the group consisting of ethylcelluloses, cellulose acetates, cellulose propionates, cellulose aceto-butyrates and anionic cellulose esters having carboxylic acid functions, the said carboxylic acid functions being neutralized to a neutralization amount of between 10 and 80 percent by means of a non-volatile basic agent, and

(b) at least one wax having a melting point between 60° C. and 110° C.

7. A mascara composition in the form of an oil-in-water or water-in-oil emulsion or dispersion comprising a mixture of:

(a) a particle suspension of a water-insoluble filmogen polymer in an aqueous phase, said particles having an average diameter ranging from 10 to 300 nm and wherein said filmogen polymer is an anionic cellulose ester having carboxylic acid functions selected from the group consisting of cellulose acetophthalate, cellulose acetate succinate, cellulose propionate succinate, cellulose butyrate succinate, cellulose acetopropionate succinate, cellulose acetobutyrate succinate, cellulose acetate trimellitate, cellulose propionate trimellitate, cellulose butyrate trimellitate, cellulose acetopropionate trimellitate and cellulose acetobutyrate trimellitate, the said carboxylic acid functions being neutralized to a neutralization amount of between 10 and 80 percent by means of a non-volatile basic agent, and

(b) at least one wax having a melting point between 60° C. and 110° C.

5,747,014
COSMETICS COMPOSITIONS CONTAINING AT LEAST ONE ANIONIC SURACANT OF ALKYLGALACTOSIDE URONATE TYPE AND AT LEAST ONE AMPHOTERIC POLYMER

Daniele Cauwet, Paris, and Claude Dublef, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 537,939, Nov. 8, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 912,754

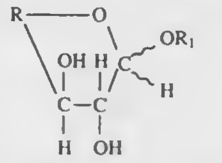
Claims priority, application France, Jun. 1, 1993, 93 06530

Int. Cl.^{6} A61K *7/50*

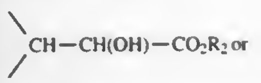
U.S. Cl. 424—70.11 **19 Claims**

1. Hair treating cosmetic composition in the form of a thickened liquid, a gel, an emulsion, and aqueous/alcoholic lotion or a dispersion comprising, in a cosmetically acceptable aqueous medium

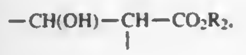
(A) at least one anionic surfactant of alkylgalactoside uronate type of formula


(I)

wherein R_1 denotes a linear or branched alkyl radical containing 8 to 22 carbon atoms, R denotes a group



(i)



$-CH(OH)-CH-CO_2R_2.$

(ii)

in which the carbon carrying the hydroxyl group is connected to the endocyclic oxygen atom; R_2 is a hydrogen atom, an alkali metal, an alkaline-earth metal, a quaternary ammonium group which is unsubstituted or substituted by alkyls or hydroxyalkyls or an amino acid quaternary ammonium group, and

(B) at least one amphoteric polymer containing units A and B distributed statistically in the polymer chain, said at least one amphoteric polymer being selected from a group of polymers consisting of:
  - (i) polymers in which A is a monomer unit containing at least one basic nitrogen atom and B is an acid monomer unit containing one or more carboxyl or sulfonic groups;
  - (ii) polymers in which A and B are carboxy betaine or sulfobetaine zwitterionic monomer units;
  - (iii) polymers in which A and B are cationic polymer chains containing primary, secondary, tertiary or quaternary amine groups, in which chains at least one of the amine groups carries a carboxylic or sulfonic group linked via a hydrocarbon radical; and
  - (iv) polymers in which A and B form part of a chain of a polymer containing an ethylene-α,β-dicarboxylic unit in which one of the carboxyl groups has been reacted with a polyamine containing one or more primary or secondary amine groups.

5,747,015
ACYLATED SILK PROTEINS FOR HAIR CARE
Masato Oshika, and Sachio Naito, both of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Apr. 24, 1996, Ser. No. 636,264
Claims priority, application Japan, May 19, 1995, 7-121182
Int. Cl.^{6} A61K *7/00;7/06*
U.S. Cl. 424—70.14 **2 Claims**

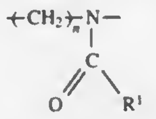
1. A hair care product which comprises a salt of an acylated compound obtained by condensing fatty acids containing at least 40% of branched fatty acids having 22 to 32 carbon atoms with silk protein-derived peptides.

5,747,016
ORGANOPOLYSILOXANES AND A METHOD OF SETTING HAIR USING THE SAME
Koji Yui, Wakayama; Mari Takeshige, Funabashi; Takashi Oda; Akira Yoshimatsu, both of Wakayama; Takashi Itou, Ichikawa; Nakako Sato, Tokyo, and Naohisa Kure, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan
Continuation of Ser. No. 288,394, Aug. 10, 1994, abandoned. This application Dec. 11, 1996, Ser. No. 763,344
Claims priority, application Japan, Aug. 10, 1993, 5-198657; Aug. 11, 1993, 5-199361; Sep. 1, 1993, 5-217722
Int. Cl.^{6} A61K *7/06;7/11*
U.S. Cl. 424—401 **3 Claims**

1. A method of setting hair comprising the steps of:

applying, to hair, a composition containing an organopolysiloxane which is capable of intramolecular or dipole-dipole interaction, hydrogen bonding or ion bonding, and which is not ruptured or plastically deformed at an extension ratio no more than 15% at a temperature of 20° C. under relative humidity of 65%; and removing, any solvent present in the composition,

wherein in said organopolysiloxane at least one silicon atom in a side chain or at a terminal of an organopolysiloxane segment is bonded, through an alkylene group having a hetero atom, to poly(N-acylalkyleneimine) constituted by recurring units in a polymer chain represented by the following formula (1):



wherein R^1 represents hydrogen, C_1–C_{22} alkyl, cycloalkyl, aralkyl or aryl, and n represents a number of 2 or 3, and

wherein the ratio by weight between the organopolysiloxane segment and the poly(N-alkyleneimine) segment is from 98/2 to 40/60, and the weight-average molecular weight of the organopolysiloxane is from 50,000 to 500,000.

5,747,017
LIP COSMETIC
Rosemarie Nichols, Manhattan Beach, and Martin J. Weisman, Canoga Park, both of Calif., assignors to Lip-Ink International, El Segundo, Calif.
Filed May 15, 1995, Ser. No. 440,780
Int. Cl.^{6} A61K *7/04;9/14*
U.S. Cl. 424—61 **7 Claims**

1. A lip cosmetic comprising from about one to about ten parts ethyl cellulose, from about one to about ten parts of a cosmetic pigment, from about 70 to about 95 parts of an organic solvent, from about one to about ten parts of copolymers of N-tert-octylacrylamide, methyl methacrylate, hydroxypropyl methacrylate, acrylic acid and/or t-butyl aminoethyl methacrylate, and castor oil.

5,747,018
NITROCELLULOSE-FREE AQUEOUS NAIL POLISH COMPOSITIONS
Vivian B. Valenty, Tempe, Ariz., assignor to VB Cosmetics Inc., Chandler, Ariz.
Continuation-in-part of Ser. No. 415,143, Mar. 29, 1995, abandoned, which is a continuation of Ser. No. 114,502, Aug. 31, 1993, abandoned. This application Oct. 9, 1996, Ser. No. 728,152
Int. Cl.^{6} A61K *7/043*
U.S. Cl. 424—61 **14 Claims**

1. An aqueous nail polish composition, comprising:

a water dispersion of a sulfonate-containing polymer, copolymer or polymer blend;

a water-soluble polymer or copolymer dissolved in water and mixed with said water dispersion of a sulfonate-containing polymer, copolymer or polymer blend, said water-soluble polymer or copolymer being non-ionic when mixed with said water dispersion of a sulfonate-containing polymer, copolymer or polymer blend; and

a water-insoluble finely-ground powder material suspended in said water dispersion;

said powder material having a particle size not to exceed 50 microns and being present in a concentration between 0.1 and 10.0 percent by weight of total composition; said water-soluble non-ionic polymer or copolymer being present in a concentration between 0.1 and 10.0 percent by weight of total composition; and said sulfonate-containing polymer, copolymer or polymer blend being present in a concentration between 5 and 60 percent by weight of total composition.

5,747,019
NAIL POLISH TOP COAT FREE OF TOLUENE
Martin J. Weisman, Canoga Park, Calif., assignor to Charles S. Martens, Santa Margarita, Calif.
Continuation of Ser. No. 528,677, Sep. 14, 1995, abandoned, which is a continuation-in-part of Ser. No. 347,943, Dec. 1, 1994, abandoned, which is a continuation of Ser. No. 148,891, Nov. 8, 1993, abandoned. This application Apr. 3, 1997, Ser. No. 832,124
Int. Cl.^{6} A61K *7/043*
U.S. Cl. 424—61 **24 Claims**

1. A clear top coat composition for application over a wet nail polish, comprising:

cellulose acetate propionate ester dissolved in a mixture of solvents free of toluene, and

a plasticizer,

said plasticizer being present in an amount to provide a dry non-tacky, non-brittle solid coat and said cellulose acetate propionate ester being present in an amount which is effective to provide quick drying of the composition when applied over a wet nail polish.

11. A quick drying clear top coat composition for application over a nail polish while wet, consisting essentially, in percent by weight, of about:

ethyl acetate 38.0,
N-butyl acetate 39.5,
cellulose acetate propionate ester (general purpose) 18.0,
benzophenone-3 0.1,
dibutyl phthalate 4.0, and
dimethylpolysiloxane 0.4; and
free of toluene.

12. A quick drying clear top coat composition for application over a nail polish while wet, consisting essentially, in percent by weight, of about:

ethyl acetate 30.0,
ethyl alcohol 8.0,
isobutyl acetate 30.0,
methyl ethyl ketone 9.5,
cellulose acetate propionate ester (general purpose) 14.0,
cellulose acetate propionate ester (alcohol soluble) 4.0,
benzotriozole 0.1,
tricresyl phosphate 4.0, and
dimethylpolysiloxane 0.4; and
free of toluene.

13. A quick drying clear top coat composition for application over a wet nail polish, said composition having a solid material comprising about 18% by weight of said composition and a liquid content comprising about 82% by weight of said composition, said composition having a combination of cellulose acetate propionate ester as the solid material, and the plasticizer and solvents as the liquid contents, and free of toluene.

24. A clear top coat composition for application over a wet nail polish, comprising:

cellulose acetate propionate ester dissolved in a mixture of solvents free of toluene, and

a plasticizer,

said plasticizer being present in an amount to provide a dry non-tacky, non-brittle solid coat and said cellulose acetate propionate ester being present in an amount which is effective to provide quick drying of the composition when applied over a wet nail polish,

with said cellulose acetate propionate ester being present in percent by weight of about 18, said solvents being present in percent by weight of about 18.0, and said plasticizer being present in percent by weight of about 4.

5,747,020
BACTERIAL TREATMENT FOR SILAGE
William Michael Rutherford, Des Moines; Mark Alan Hinds, Minburn, and Scott Michael Dennis, Urbandale, all of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa
Filed May 15, 1995, Ser. No. 440,571
Int. Cl.^{6} A01N *63/00;* C12N *1/00;1/20*
U.S. Cl. 424—93.45 **20 Claims**

1. A silage inoculant comprising:
- a) the microorganism *Lactobacillus plantarum* 286 having ATCC Accession No. 53187, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism;
- b) the microorganism *Lactobacillus plantarum* 287 having ATCC Accession No. 55058, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism;
- c) the microorganism *Lactobacillus plantarum* 346 having ATCC Accession No. 55943, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism;
- d) the microorganism *Lactobacillus plantarum* 347 having ATCC Accession No. 55944, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism;
- e) the microorganism *Lactobacillus plantarum* 329 having ATCC Accession No. 55942, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism;
- f) the microorganism *Enterococcus faecium* 346 having ATCC Accession No. 53519, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism; and
- g) the microorganism *Enterococcus faecium* 301 having ATCC Accession No. 55593, or a mutant strain thereof possessing all of the identifying characteristics of the microorganism.

5,747,021
AFTER SHAVE TREATMENT COMPOSITION
Therman McKenzie, 647 Watson Bay, Stone Mountain, Ga. 30087, and James Agard, P.O. Box 2933, Decatur, Ga. 30034
Filed Jan. 10, 1997, Ser. No. 780,955
Int. Cl.^{6} A61K *7/15*
U.S. Cl. 424—73 **8 Claims**

1. A transparent topical agent for treating Pseudofolliculitis Barbae that does not leave a chalky white film upon the skin comprising:
- (a) A mixture of deionized water, glycerin and propylene glycol;
- (b) Homopolymer of acrylic acid crosslinked with an allyl ether of pentaerythritol, and allyl ether of sucrose, or an allyl ether of propylene;
- (c) Isopropyl alcohol;
- (d) Acetylsalicylic acid and ethyl alcohol denatured with t-butyl alcohol and a combination of two or three of the following: brucine (alkaloid), brucine sulfate or quassin; and
- (e) Polymer of ethylene oxide that conforms to the formula: $H(OCH_2CH_2)n\ OH$

wherein n has an average value of 8; said topical agent having a viscocity of between 250 to about 500 cps.

5,747,022
COSMETIC MASK
Craig Steven Slavtcheff, Cheshire, Conn., assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed Jul. 30, 1993, Ser. No. 99,880
Int. Cl.^{6} A61K *7/48*
U.S. Cl. 424—78.03 **5 Claims**

1. A composition for forming a peelable cosmetic mask comprising:

(i) a polyvinyl alcohol polymer having a number average molecular weight ranging from about 5,000 to about 200,000; and

(ii) a hydrophobically-modified acrylate or methacrylate polymer, the polyvinyl alcohol and hydrophobically-modified acrylate or methacrylate polymer being present in a relative weight ratio from about 20:1 to about 1:1, and the polymer being a copolymer formed from a monoolefinically unsaturated carboxylic acid or anhydride monomer of 3 to 6 carbon atoms in an amount from about 50 to 99% by weight and a C_{10}–C_{30} alkyl acrylate ester in an amount from about 1 to about 50% by weight.

5,747,023
CANCER THERAPY USING LYMPHOTOXIN

David V. Goeddel, Hillborough, and Grace H. W. Wong, South San Francisco, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 269,704, Jul. 1, 1994, abandoned. This application Apr. 7, 1995, Ser. No. 418,314

Int. Cl.^{6} A61K *38/19;* **C07H** *15/252;* **C07K** *14/525*

U.S. Cl. 424—85.1 **24 Claims**

1. A method of treating a mammal having cancer, comprising administering to a mammal diagnosed as having cancer chemotherapy and an effective amount of lymphotoxin which sensitizes the mammal's cancerous cells to the chemotherapy and protects the mammal's non-cancerous cells.

5,747,024
VACCINE ADJUVANT COMPRISING INTERLEUKIN-15

Kenneth H. Grabstein, Mercer Island, and Michael B. Widmer, Seattle, both of Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 393,305, Feb. 22, 1995, Pat. No. 5,574,138, which is a continuation-in-part of Ser. No. 233,606, Apr. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 31,399, Mar. 8, 1993, Pat. No. 5,552,303. This application Jul. 19, 1995, Ser. No. 504,042

Int. Cl.^{6} A61K *38/20*

U.S. Cl. 424—85.2 **10 Claims**

1. A method of enhancing a mammal's immune response to a vaccine antigen, comprising the steps of administering to such mammal an immunogenic amount of the vaccine antigen and an immunogenicity-augmenting amount of Interleukin-15 ("IL-15") in concurrent or sequential combination with such vaccine antigen.

5,747,025
BIOLOGICAL CONTROL OF PESTS

Martin Paul Meadows, Brighton; Deborah June Ellis, Bognor Regis, and Paul Jarrett, Littlehampton, all of United Kingdom, assignors to Agricultural Genetics Co., Ltd., Cambridge, England

Division of Ser. No. 365,188, Dec. 28, 1994, Pat. No. 5,501,852, which is a continuation of Ser. No. 883,330, May 14, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 473,907

Claims priority, application United Kingdom, May 14, 1991, 9110391

Int. Cl.^{6} A01N *63/00*

U.S. Cl. 424—93.461 **10 Claims**

1. An entomocidal substance obtained from a culture of the strain *Bacillus thuringiensis* M200, NCIMB 40385, or from the culture of a mutant thereof having all of the identifying characteristics of strain NCIMB 40385, wherein said entomocidal substance is the spore-crystal complex.

5,747,026
ANTIOXIDANTS

James D. Crapo, Durham, N.C., and Bruce A. Freeman, Birmingham, Ala., assignors to University of Alabama at Birmingham Research Foundation, Birmingham, Ala., and Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 136,207, Oct. 15, 1993, abandoned. This application Feb. 2, 1994, Ser. No. 190,504

Int. Cl.^{6} A61K *38/54;9/127*

U.S. Cl. 424—94.3 **16 Claims**

1. A method of reducing the O_2^- concentration of a cell comprising contacting said cell with a liposome having an antioxidant entrapped therewithin under conditions such that said liposome fuses with the membrane of said cell so that said antioxidant enters said cell and reacts with said O_2^- thereby reducing the O_2^- concentration of said cell.

5,747,027
BH55 HYALURONIDASE

Robert Stern; Gregory I. Frost; Jackson Hall; Svetlana Shuster, all of San Francisco; Bent Formby, Santa Barbara, and Gail T. Colbern, Pacifica, all of Calif., assignors to The Regents of the University of California, Oakland; Sansum Medical Research Foundation, Santa Barbara, and California Pacific Medical Center, Research Institute, San Francisco, all of Calif.

Filed Apr. 7, 1995, Ser. No. 419,594

Int. Cl.^{6} C12N *9/26;* **A61K** *38/46;38/00*

U.S. Cl. 424—94.62 **5 Claims**

1. A bovine BH55 hyaluronidase having hyaluronic acid-specific β-1,4-endoglycosidase activity, which hyaluronidase is free from the proteins and naturally occurring organic molecules with which it is naturally associated.

5,747,028
IMMUNIZING COMPOSITIONS COMPRISING *VIBRIO CHOLERAE* EXPRESSING HETEROLOGOUS ANTIGENS

Stephen B. Calderwood, Wellesley; Joan R. Butterton, Newton, and John J. Mekalanos, Cambridge, all of Mass., assignors to The President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 20,501, Feb. 22, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,510

Int. Cl.^{6} C12N *1/21;* **A61K** *39/106*

U.S. Cl. 424—93.2 **33 Claims**

1. A process for inducing in an animal an immune response against a heterologous antigen, the sequence of which does not comprise the sequence of a full length polypeptide expressed by wildtype *V. cholerae*, comprising administering to said animal recombinant *V. cholerae* containing DNA encoding said heterologous antigen, said heterologous antigen being expressed from said DNA in said animal, provided that said heterologous antigen (a) comprises an antigenic part, or all, of a protein that is naturally expressed by an infectious organism other than wildtype *V. cholerae*, and (b) induces an immune response in an animal.

5,747,029
CONTROL OF WEEDS WITH A FUNGAL PATHOGEN DERIVED FROM *M. VERRUCARIA*

Harrell L. Walker, 1171 Highway 3072, Ruston, La. 71270, and Anthony M. Tilley, 2567 Doc Steed Rd., Minden, La. 71055

Filed Aug. 7, 1995, Ser. No. 512,093

Int. Cl.^{6} A01N *63/00*

U.S. Cl. 424—93.5 **11 Claims**

1. A method for the biological control of weeds, comprising the steps of culturing a herbicidal effective amount of conidia of the fungus *Myrothecium verrucaria* (Alb. and Schwein.) Ditmar ex Fr. on a suitable growth medium; harvesting said conidia; and inoculating the weeds with a herbicidal effective amount of said conidia

of the fungus *Myrothecium verrucaria* (Alb. and Schwein.) Ditmar ex Fr., wherein said weeds are inoculated with said conidia by applying said conidia to said weeds in a liquid surfactant.

5,747,030
PHARMACEUTICAL PREPARATION CONTAINING PLASMINOGEN ACTIVATORS

Ulrich Kohnert, Habach; Stephan Fischer, Polling; Hans-Jörg Markl, Ellerstadt, and Heinrich Woog, Laudenbach, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

PCT No. PCT/EP95/00596, § 371 Date Aug. 21, 1996, § 102(e) Date Aug. 21, 1996, PCT Pub. No. WO95/22347, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 18, 1995, Ser. No. 693,226

Claims priority, application Germany, Feb. 21, 1994, 44 05 426.2

Int. Cl.^{6} A61K *38/48;38/54*

U.S. Cl. 424—94.64 **29 Claims**

1. A pharmaceutical composition comprising a protein having plasminogen activator activity, sugar and tranexamic acid, wherein said tranexamic acid is the only aminocarboxylic acid in said composition, and wherein said composition is devoid of citrate.

5,747,031
PROCESS FOR ISOLATING IMMUNOGLOBULINS IN WHEY

Frank E. Ruch, Falmouth, and Elizabeth A. Acker, New Gloucester, both of Me., assignors to ImmuCell Corporation, Portland, Mass.

Filed Oct. 5, 1995, Ser. No. 539,539

Int. Cl.^{6} A61K *39/42;39/40;39/395;* **C07K** *16/00*

U.S. Cl. 424—130.1 **14 Claims**

1. A method of isolating immunoglobulin from whey, concentrated whey or whey fractions derived from a milk-bearing mammal, the method comprising the following steps in order:

a) providing a sample comprising whey, whey concentrate or whey fractions;

b) forming an admixture comprising the sample of step a) and a cationic polymer, the concentration of the cationic polymer in the admixture being appropriate for lipid precipitation;

c) forming a second admixture comprising the admixture of step b) and a fatty acid, the concentration of the fatty acid in the second admixture being appropriate for precipitation of non-immunoglobulin proteins;

d) precipitating lipids and non-immunoglobulin proteins from the second admixture of step c) to form an immunoglobulin-rich supernatant and a lipid and non-immunoglobulin protein precipitate; and

e) isolating the immunoglobulin-rich supernatant from the mixture of step d).

5,747,032
MONOCLONAL ANTIBODY TO HUMAN GRANULOCYTE MACROPHAGE COLONY STIMULATING FACTOR

Donald Metcalf; Nicos Antony Nicola; Andrew Wallace Boyd; Judith Eleanor Layton, and Kaye Wycherley, all of Melbourne, Australia, assignors to Amrad Corporation Limited, Victoria, Australia

Continuation-in-part of Ser. No. 834,534, Aug. 10, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 411,812

Claims priority, application Australia, Oct. 9, 1992, PL-5217

Int. Cl.^{6} A61K *39/395;39/40;39/42;* **C07K** *16/00*

U.S. Cl. 424—133.1 **14 Claims**

1. A monoclonal antibody, or antibody fragment specific for human granulocyte macrophage-colony stimulating factor (hGM-CSF) receptor, said antibody, or antibody fragment having the ability to inhibit the biological activity of hGM-CSF, and to bind both the high and low affinity hGM-CSF receptor.

5,747,033
METHOD OF ENHANCING THE BIOLOGICAL ACTIVITY OF EPH FAMILY LIGANDS

Samuel Davis, New York; Nicholas W. Gale, Dobbs Ferry; Thomas H. Aldrich, Ossining; Peter C. Maisonpierre, Croton, all of N.Y.; Mitchell Goldfarb, River Edge, N.J., and George D. Yancopoulos, Yorktown Heights, N.Y., assignors to Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 229,402, Apr. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 222,075, Apr. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 144,992, Oct. 28, 1993, abandoned. This application Sep. 1, 1994, Ser. No. 299,567

Int. Cl.^{6} A61K *38/16;39/44;* **C07K** *14/705;19/00*

U.S. Cl. 424—134.1 **6 Claims**

1. A method of activating an Elk, Ehk or Eck receptor comprising stimulating said receptor with a composition comprising clustered (soluble Efl)$_n$, wherein the soluble Efl is the extracellular domain of a ligand that binds the Elk, Ehk or Eck receptor and n is 2 or greater, with the exception that the soluble Efl is not the extracellular domain of Elk-L.

4. A purified composition comprising tagged extracellular domain of a ligand that binds to an Elk, Ehk or Eck receptor and an anti-tag antibody.

5,747,034
METHODS AND MATERIALS FOR THE INDUCTION OF T CELL ANERGY

Mark de Boer, Beverwijk, Netherlands, and Leah B. Conroy, Pacifica, Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 15,147, Feb. 9, 1993, which is a continuation-in-part of Ser. No. 910,222, Jul. 9, 1992, Pat. No. 5,397,703. This application Feb. 18, 1994, Ser. No. 200,716

Int. Cl.^{6} A61K *39/395;* **C12N** *5/12;* **C12P** *21/08;* **C07K** *16/18*

U.S. Cl. 424—137.1 **17 Claims**

1. A method for treating transplant rejection in a patient, the method comprising administering to a patient in need of such treatment a therapeutically effective amount of (a) an antibody or an antigen binding fragment thereof that binds to the B7-1 antigen but not to the B7-2 and B7-3 antigens; and (b) an immunosuppressive agent in a pharmaceutically acceptable excipient.

5,747,035
POLYPEPTIDES WITH INCREASED HALF-LIFE FOR USE IN TREATING DISORDERS INVOLVING THE LFA-1 RECEPTOR

Leonard G. Presta, San Francsico, and Bradley R. Snedecor, Portola Valley, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Apr. 14, 1995, Ser. No. 422,091

Int. Cl.^{6} A61K *39/395;38/02;38/17*

U.S. Cl. 424—144.1 **17 Claims**

1. A method for treating disorders caused by cell adherence interactions involving LFA-1 on lymphocytes comprising administering to a mammal in need of such treatment an effective amount of a polypeptide variant of a polypeptide of interest wherein said polypeptide of interest is a LFA-1 antagonist selected from the group of consisting of anti-CD11 antibody, anti-CD18 antibody, anti-CD11/CD18 antibody, anti-ICAM-1 antibody, soluble ICAM-1 and fragments thereof capable of inhibiting the interaction of LFA-1 and ICAM-1, which said polypeptide of interest is cleared from the kidney and does not contain a Fc region of an IgG and wherein said variant of a polypeptide of interest comprises a salvage receptor binding epitope of an Fc region of an IgG, wherein the epitope comprises the sequence: PKNSSMISNTP (SEQ ID NO:3), which said variant has a longer in vivo half-life than the polypeptide of interest.

5,747,036

METHODS AND COMPOSITIONS FOR DETECTING AND TREATING A SUBSET OF HUMAN PATIENTS HAVING AN AUTOIMMUNE DISEASE

Michael Brenner, Brookline, and Harout Der Simonian, Wellesley, both of Mass., assignors to Brigham & Women's Hospital and Dana Farber Cancer Institute, Boston, Mass.

Continuation-in-part of Ser. No. 407,526, Mar. 16, 1995, abandoned, which is a continuation of Ser. No. 936,267, Aug. 26, 1992, Pat. No. 5,445,940, which is a continuation-in-part of Ser. No. 750,986, Aug. 28, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 484,512

Int. Cl.^{6} A61K *39/395*

U.S. Cl. 424—144.1 **7 Claims**

1. A method of treating rheumatoid arthritis in a host showing an elevated level of Vα12.1 on T-cells as compared to a baseline of normal hosts comprising administering a therapeutically effective amount of a Vα12.1 specific antibody to said host.

5,747,037

ANTI-GP39 ANTIBODIES

Randolph J. Noelle, Cornish, N.H.; Teresa M. Foy, Seattle, Wash.; Alejandro Aruffo, Edmonds, Wash., and Jeffrey A. Ledbetter, Seattle, Wash., assignors to Bristol-Myers Squibb Company, New York, N.Y., and Trustees of Dartmouth College, Hanover, N.H.

Continuation-in-part of Ser. No. 232,929, Apr. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 116,255, Sep. 2, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,847

Int. Cl.^{6} A01K *39/395;* **C07K** *16/28;* **C12N** *5/12*

U.S. Cl. 424—154.1 **8 Claims**

1. An anti-human gp39 (CD40L) monoclonal antibody that binds the epitope recognized by a monoclonal antibody selected from the group consisting of 24-31 secreted by hybridoma 24-31 designated by ATCC Accession No. HB1712 and 89-76 secreted by hybridoma 89-76 designated by ATCC Accession No. HB1713.

5,747,038

Patent Not Issued For This Number

5,747,039

RECOMBINANT HERPES SIMPLEX GB-GD VACCINE

Rae Lyn Burke, San Francisco; Carol Pachl, Oakland, and Pablo D. T. Valenzuela, San Francisco, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 990,919, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 416,425, Oct. 2, 1989, Pat. No. 5,171,568, which is a continuation of Ser. No. 79,605, Jul. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,213, Oct. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 597,784, Apr. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 631,669, Jul. 17, 1984, Pat. No. 4,618,578. This application Feb. 8, 1995, Ser. No. 385,731

Int. Cl.^{6} A16K *39/245;45/00;9/127*

U.S. Cl. 424—186.1 **13 Claims**

1. A method for immunizing a human against herpes simplex virus (HSV) infection comprising vaccinating the human with an adjuvant and a vaccine formulation consisting essentially of HSV polypeptides wherein the polypeptides are:

(a) immunogenic;
(b) glycosylated; and
(c) consist of:
    (i) a HSV glycoprotein B polypeptide or a HSV glycoprotein B polypeptide that has a deletion of all or a portion of the transmembrane anchor region; and
    (ii) a HSV glycoprotein D polypeptide or a HSV glycoprotein D polypeptide that has a deletion of all or a portion of the transmembrane anchor region;

and further wherein the immunizing being done is prior to a primary infection with HSV.

5,747,040

ANTI-INFLAMMATORY, TOLEROGENIC AND IMMUNOINHIBITING PROPERTIES OF CARBOHYDRATE BINDING-PEPTIDES

Louis D. Heerze; Glen D. Armstrong, and Richard Smith, all of Edmonton, Canada, assignors to Alberta Research Council, Edmonton, Canada

Continuation of Ser. No. 995,503, Dec. 21, 1992, Pat. No. 5,453,272, which is a continuation-in-part of Ser. No. 956,043, Oct. 2, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,790

Int. Cl.^{6} A61K *39/10;* **C07K** *7/06*

U.S. Cl. 424—190.1 **2 Claims**

1. A peptide which is the amino acid sequence of formula I (SEQ ID NO: 1)

$$SPX_1GX_2C \qquad I$$

where X_1 is selected from the group consisting of amino acids Y, F, W, and H; and

X_2 is selected from the group consisting of amino acids Y, F, R, W, and H with the proviso that when X_1 is Y then X_2 is not R; and

wherein said peptide is capable of binding terminally linked α-sialic acid(2→6)βGal- and/or α-sialic acid(2→3)βGal-groups on structures or molecules comprising such groups; and pharmaceutically acceptable salts thereof.

5,747,041

Patent Not Issued For This Number

5,747,042

METHOD FOR PRODUCING CARBON DIOXIDE, FUNGICIDAL COMPOUNDS AND THERMAL ENERGY

Claude Choquet, 1784 Prieur Street East, Montréal (Québec), Canada, H2C 1M7

Filed Sep. 26, 1996, Ser. No. 721,210

Int. Cl.^{6} A01H *65/00;* **C01B** *31/20*

U.S. Cl. 424—195.1 **10 Claims**

1. An improved method for producing carbon dioxide and fungicidal compounds which comprises in the steps of:

(a) introducing into a forced air combustion chamber a first stream of air and a second stream consisting of a solid organic source selected from the solid organic fuels consisting of agricultural products including corn, shelled corn, crushed corn peat, corn kernels, ears of corns, corn cobs, straw, bagasse, wheat, beet, rye, barley, beans, potatoes, compressed organic material as a by-product of organic transformation industries and of wood transformation industries and mixtures thereof;
(b) causing the combustion of said solid organic source resulting in the production of thermal energy, flue gas and waste ashes, said flue gas transporting said thermal energy and having a content indicative of a carbon dioxide production rate near a stoichiometric combustion equation and containing fungicidal compounds;
(c) maintaining said first stream at a pressure greater than standard atmospheric pressure;
(d) periodically purging said waste ashes from said combustion chamber so as to favor the maintenance of a well-aerated forced air fire;

(e) transporting said flue gas by passage through a conduit at a positive pressure, thereby creating a pressurized stream of exhaust gas rich in carbon dioxide and containing fungicidal compounds;
(f) accumulating said pressurized flue gas.

5,747,043

CUCUMIS MELO PROTEIN EXTRACT WITH ANTIOXIDANT ACTIVITY AND PROCESS FOR PREPARING IT, COSMETIC COMPOSITION OR FOOD COMPOSITION CONTAINING SUCH AN EXTRACT

Jean-Paul Ginoux, Eyragues; Alain Dreyer, Chateauneuf de Gadagne; Philippe Roch, Eyragues; Jean-Claude Baccou, Montpellier, and Dominique Lacan, St Beauzilles de Putois, all of France, assignors to Bio-Obtention SC, Montferrier-Sur-Lez, France

Continuation of Ser. No. 398,940, Mar. 3, 1995, Pat. No. 5,616,323. This application Dec. 31, 1996, Ser. No. 775,802

Claims priority, application France, Mar. 3, 1994, 94 02459

Int. Cl.^{6} A61K *35/74;* **C12N** *5/00*

U.S. Cl. 424—195.1 **12 Claims**

1. Soluble protein extract, obtained from *Cucumis melo* and having a superoxide dismutase enzyme activity greater than 30 U/mg of proteins.

5,747,044

HEPATITIS DELTA DIAGNOSTICS AND VACCINES

Michael Houghton, Danville; Kang-Sheng Wang, Oakland; Qui-Lim Choo, El Cerrito; Amy Joan Weiner, Berkeley, and Lacy Rasco Overby, Alamo, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 262,667, Jun. 20, 1994, abandoned, which is a continuation of Ser. No. 97,519, Jul. 27, 1993, Pat. No. 5,389,528, which is a continuation of Ser. No. 932,920, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 765,917, Sep. 25, 1991, abandoned, which is a division of Ser. No. 53,991, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 875,337, Jun. 17, 1986, abandoned. This application May 24, 1995, Ser. No. 448,835

Int. Cl.^{6} A61K *39/295;39/29;39/12*

U.S. Cl. 424—202.1 **3 Claims**

1. A recombinantly produced immunogenic particle which raises antibodies against HDV antigens, said particle comprising an immunogenic polypeptide encoded within ORF5 of the HDV nucleotide sequence or its complement as represented in FIG. 2, said immunogenic polypeptide selected from the group consisting of $p24^{\delta}$ and $p27^{\delta}$, wherein said immunogenic Polypeptide is linked to the N- or C-terminus of the S protein or the pre-S protein or is inserted within the 55 amino acids of the pre-S region of the hepatitis B surface antigen.

5,747,045

AVIAN POLYOMAVIRUS VACCINE IN PSITTACINE BIRDS

Branson W. Ritchie, Athens; Frank D. Niagro, Loganville, and Kenneth S. Latimer, Athens, all of Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 180,929, Jan. 13, 1994, Pat. No. 5,523,088. This application Jun. 3, 1996, Ser. No. 660,227

Int. Cl.^{6} A61K *39/12;* **C12P** *21/06*

U.S. Cl. 424—204.1 **16 Claims**

1. A vaccine which is protective against avian polyomavirus infection in a bird which is classified as being a member of the Psittaciformes order, comprising an immunogenic amount of a recombinant VP1 capsid protein of an avian polyomavirus and a pharmaceutically acceptable carrier.

5,747,046

VACCINE CONTAINING A PROTEIN COMPLEX FORM *HAEMONCHUS CONTORTUS*

Edward Albert Munn, 72 Station Road, Fulbourn, Cambridge CB1 5ES, England, and Trevor Stanley Smith, 6 The Close, Babraham, Cambridge CB2 4AQ, England

Continuation of Ser. No. 20,526, Feb. 22, 1993, abandoned, which is a division of Ser. No. 761,749, Sep. 17, 1991, abandoned. This application Nov. 21, 1994, Ser. No. 347,198

Claims priority, application United Kingdom, Mar. 17, 1989, 8906156

Int. Cl.^{6} A61K *39/00;* **C07K** *14/00*

U.S. Cl. 424—265.1 **6 Claims**

2. A purified protein complex designated H45 which is derived from the intestinal microvillus plasma membrane of *Haemonchus contortus,* said protein complex comprising first, second and third glycosylated protein components having apparent molecular weights on sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-page) of about 53,000 daltons, about 49,000 daltons and about 45,000 daltons respectively under reducing conditions, and about 53,000 daltons, about 49,000 daltons and about 90,000 daltons respectively under non-reducing conditions, and wherein said protein complex is substantially free of H110D.

5,747,047

PURIFIED MITE ALLERGEN

Satoru Oka; Kazuhisa Ono, both of Hiroshima; Seiko Shigeta, and Takeshi Wada, both of Hiroshima-ken, all of Japan, assignors to Fumakilla Ltd., Tokyo, and Hiroshima University, Hiroshima-Ken, both of Japan

Continuation of Ser. No. 846,935, Mar. 6, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,605

Claims priority, application Japan, Mar. 9, 1991, 3-104950

Int. Cl.^{6} A61K *39/35;39/36;* **C07K** *1/00;16/00*

U.S. Cl. 424—275.1 **11 Claims**

1. A purified and isolated mite allergen, said allergen possessing the following physicochemical and biological properties:

① being isolated and purified from extracts of *Dermatophagoides farinae* mite bodies;
② being a glycoprotein containing about 60% sugar;
③ having a molecular weight of about 94,000 as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis;
④ exhibiting a single precipitation band with rabbit anti-mite serum as immunoassayed by cross immunoelectrophoresis;
⑤ possessing allergen activity; and
⑥ exhibiting mobility on sodium dodecyl sulfate-polyacrylamide gel electrophoresis which is the same under reducing and non-reducing conditions.

5,747,048

MONOCLONAL ANTIBODIES AND VACCINE DEVELOPMENT DIRECTED TO HUMAN CANCER-ASSOCIATED ANTIGENS BY IMMUNIZATION WITH ANIMAL AND HUMAN MUCIN AND WITH SYNTHETIC CARBOHYDRATE-CARRIER CONJUGATES

Thomas J. Kjeldsen; Henrik Clausen; Anil Singhal; Tatsushi Toyokuni; Helio Takahashi, and Sen-itiroh Hakomori, all of Seattle, Wash., assignors to The Biomembrane Institute, Seattle, Wash.

Continuation of Ser. No. 931,339, Aug. 18, 1992, abandoned, which is a division of Ser. No. 807,817, Dec. 16, 1991, Pat. No. 5,229,289, which is a continuation of Ser. No. 317,492, Mar. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 167,786, Mar. 11, 1988, abandoned. This application Dec. 6, 1994, Ser. No. 354,157

Int. Cl.^{6} A61K *38/14;39/00;39/39;* **C07K** *14/82*

U.S. Cl. 424—277.1 **9 Claims**

1. A method of reducing the growth rate of a cancer cell comprising a Tn or sialyl Tn epitope comprising:

(1) immunizing a subject with a composition consisting essentially of:

(a) an effective amount of an isolated agent comprising a Tn or sialyl Tn epitope; and

(b) a pharmaceutically acceptable carrier, diluent or excipient; and

(2) administering an adjuvant to said subject.

5,747,049

COSMETIC COMPOSITION

Naoki Tominaga, Kanagawa, Japan, assignor to Shiseido Company, Ltd., and Sogo Pharmaceutical Co. Ltd., both of Tokyo, Japan

Filed Sep. 18, 1995, Ser. No. 529,601

Claims priority, application Japan, Jul. 7, 1995, 7-195965

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 424—401 **21 Claims**

1. A method of inhibiting cutaneous aging, said method comprising applying an effective amount of an anti-aging composition to skin, the anti-aging composition comprising at least one aminoethyl compound represented by formula (I):

$NH_2CH_2CH_2X$ (I);

and

at least one ultraviolet protective agent,

wherein X represents —SO_2 or —SO_2SH.

2. A method of inhibiting collagen cross-linking, said method comprising applying an effective amount of an anti-aging composition to skin, the anti-aging composition comprising at least one aminoethyl compound represented by formula (I):

$NH_2CH_2CH_2X$ (I);

and

at least one ultraviolet protective agent,

wherein X represents —SO2 or —SO_2SH.

3. A method of protecting skin from harmful effects caused by excessive exposure to ultraviolet light, said method comprising applying an effective amount of an anti-aging composition to skin, the anti-aging composition comprising at least one aminoethyl compound represented by formula (I):

$NH_2CH_2CH_2X$ (I);

and

at least one ultraviolet protective agent,

wherein X represents —SO_2 or —SO_2SH.

5,747,050

PEAT-DERIVED BIOACTIVE PRODUCTS, PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING SAID PRODUCTS AND PROCESSES FOR PRODUCING SAID PRODUCTS AND COMPOSITIONS

Stanislaw Tolpa; Tadeusz Gersz; Stanislawa Ritter; Ryszard Kukla; Malgorzata Skrzyszewska, and Stanislaw Tomkow, all of Wroclaw, Poland, assignors to Torf Establishment, Vaduz, Liechtenstein

Filed Mar. 11, 1992, Ser. No. 849,490

Claims priority, application European Pat. Off., Mar. 16, 1991, 91104098; Poland, May 17, 1991, 290283; Jun. 3, 1991, 290508; Jun. 3, 1991, 290509; Jun. 3, 1991, 290510; Jun. 10, 1991, 290606; Jun. 10, 1991, 290607; Jun. 10, 1991, 290608; Jun. 17, 1991, 290693; Jun. 17, 1991, 290694; Jun. 17, 1991, 290695; Jul. 17, 1991, 291078; European Pat. Off., Oct. 26, 1991, 91118269

Int. Cl.^{6} A61K *9/00*

U.S. Cl. 424—401 **14 Claims**

1. A water soluble peat-derived bioactive product, containing not more than 70% by weight sodium chloride, based on dry mass.

5,747,051

SKIN CARE COMPOSITIONS CONTAINING AN AMIDE OF A HYDROXY FATTY ACID AND A RETINOID

Stewart Paton Granger, Paramus, N.J.; Anthony Vincent Rawlings, Warrington, England, and Ian Richard Scott, Allendale, N.J., assignors to Elizabeth Arden Co., Division of Conopco, Inc., Burlington House, N.Y.

Filed Sep. 27, 1996, Ser. No. 721,874

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 424—401 **2 Claims**

1. A skin conditioning composition comprising

(a) from about 0.001% to about 10% of retinol;

(b) from about 0.0001% to about 50% of an amide of a hydroxy fatty acid selected from the group consisting of lactamide-monoethanolamide, C_{13}-β-hydroxy acid amide, N-hydroxyethyl-2-hydroxy-C_{16} amide, 12-hydroxy-N-(2-hydroxyethyl) octadecanamide, and monoethanolamide of castor oil; and

(c) a cosmetically acceptable vehicle.

5,747,052

AQUEOUS COMPOSITION TO NEUTRALIZE THE IRRITATING EFFECT OF CAPSAICIN ON EYES, SKIN AND MUCOUS MEMBRANES

Andrew N. Mimikos, Grosse Pointe Woods, and Sam Rizzo, East Pointe, both of Mich., assignors to Anthony Rizzo, East Pointe, Mich.

Filed Jun. 9, 1995, Ser. No. 488,901

Int. Cl.^{6} A61K *9/12*

U.S. Cl. 424—402 **12 Claims**

1. A tissue impregnated with an aqueous composition to neutralize the irritating effect of capsaicin on the eyes, skin and mucous membranes, comprised of a neutralizing amount of a $C_xH_{2y}O_y$ carbohydrate, where x and y are numbers and may be the same or different, and a mild, nonirritating detergent comprised of sorbitan PEG 80, cocamidopropyl betaine, sodium tridecth sulfate, sodium laurel amphoacetate, PEG 150 distearate, sodium laureth—13 carboxylate, citric acid, Quaternium 15, tetrasodium EDTA, propylene glycol methylparaben, propylparaben, imidazolididyl, urea and glycerin, said detergent present in an amount of from about 5 to 16 weight percent of the composition, an effective amount of a pH adjuster to keep the pH in the range of from about 6.5 to 8, and the balance water.

5,747,053

ANTIVIRAL FILTER AIR CLEANER IMPREGNATED WITH TEA EXTRACT

Kazuo Nashimoto; Yoshikazu Tashiro; Yoshiomi Kosaka, all of Chigasaki, and Yukihiko Hara, Fujieda, all of Japan, assignors to Matsushita Seiko Co., Ltd., Osaka, and Mitsui Norin Co., Ltd., Tokyo, both of Japan

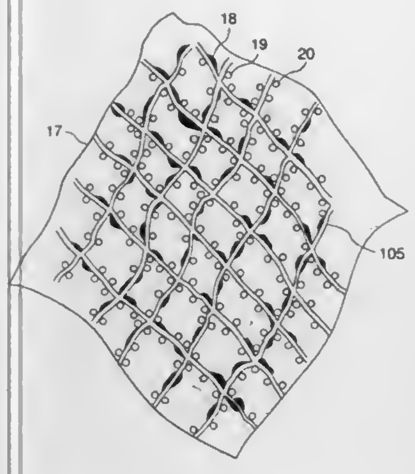
Filed May 9, 1996, Ser. No. 647,012

Claims priority, application Japan, May 11, 1995, 7-112850; Jun. 8, 1995, 7-141513

Int. Cl.^{6} A47J *31/00*

U.S. Cl. 424—405 **25 Claims**

1. An air cleaner comprising a laminate of a dust collecting filter disposed on the upstream side, a tea extract of a polyphenol, and a filter impregnated with said tea extract.



5,747,054

COMPOSITIONS OF GYPSUM PESTICIDE BRIQUETS

Kim W. Yang, 4124 Rainsong Dr., Dallas, Tex. 75287; George J. Junginger, 1609 Homestead St., Flower Mound, Tex. 75028; Raymond G. Mockridge, 4104 Bentley Ct., Grapevine, Tex. 76051, and Robert C. Pearce, III, 3218 Kenilworth Dr., Arlington, Tex. 76017

Filed Mar. 8, 1993, Ser. No. 28,103

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 424—409 **13 Claims**

1. A pesticide formulation comprising a water settable powder mixed with a pesticidally effective amount of at least one active ingredient in a water soluble receptacle.

5,747,055

INSECTICIDAL AND PESTICIDAL COMPLEX, AND METHOD FOR DESTROYING INSECTS AND ECTOPARASITES

Jean-Claude Attali, 5, chemin du Boudard, F-13260 Cassis, and Jean-Claude Vuagnoux, Villa La Martine Plan des Moines, F-13390 Auriol, both of France

PCT No. PCT/FR95/01279, § 371 Date Jun. 10, 1996, § 102(e) Date Jun. 10, 1996, PCT Pub. No. WO96/10909, PCT Pub. Date Apr. 18, 1996

PCT Filed Oct. 3, 1995, Ser. No. 666,546

Claims priority, application France, Oct. 10, 1994, 94/12318

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 424—409 **20 Claims**

1. A pesticidal complex, comprising:

a liquid pesticidal active ingredient including:

a mixture of pesticides including at least one pyrethrinoid; tannin;

a growth hormone analogue comprising at least one member selected from the group consisting of ovoprene and methoprene; and

a carrier comprising pieces of porous or spongy solid matter impregnated with the liquid pesticidal active ingredient, the carrier enabling introduction and diffusion of the liquid pesticidal active ingredient within a permeable dust bag of a vacuum cleaner, the carrier being shaped or sized such that the carrier prevents both the liquid pesticidal active ingredient and the carrier from clogging the permeable dust bag.

5,747,056

PESTICIDE COMPOSITIONS CONTAINING MUSTARD BRAN

John W. Potter, Ridgeville, and Mikio Chiba, St. Catharines, both of Canada, assignors to Her Majesty in right of Canada as represented by the Minister of Agriculture and Agri-Food, Ottawa, Canada

Filed Oct. 18, 1995, Ser. No. 544,614

Int. Cl.^{6} A01N *25/10*

U.S. Cl. 424—410 **10 Claims**

1. A method for controlling plant-parasitic nematodes or fungi in soil, which method comprises applying to the soil a pesticide precursor composition comprising a bran from a mustard of the genus Brassica, wherein the bran is separated from mustard seed, wherein the bran contains sinigrin capable of conversion to allyl isothiocyanate on contact with water in the soil, and further wherein the pesticide precursor composition is applied in an amount sufficient to provide an amount of allyl isothiocyanate pesticidally effective against said plant parasitic nematodes or fungi on contact with water in the soil.

5,747,057

SUSTAINED RELEASE PYRIPROXIFEN COMPOSITIONS FOR PARASITE CONTROL

Thomas A. Miller, Fort Worth, Tex., assignor to Virbac, Inc., Ft. Worth, Tex.

Division of Ser. No. 108,909, Aug. 13, 1993, Pat. No. 5,632,999. This application Apr. 1, 1996, Ser. No. 626,001

Int. Cl.^{6} A01N *25/34;31/44*

U.S. Cl. 424—411 **15 Claims**

1. A composition of matter which, in precentages of the weight of the total composition, comprises:

a. from 10% to 90% matrix;

b. from 5% to 40% plasticizer;

c. from 0.001 to 0.04% pyriproxifen.

5,747,058

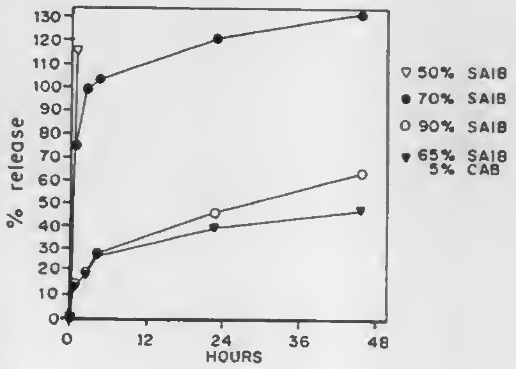
HIGH VISCOSITY LIQUID CONTROLLED DELIVERY SYSTEM

Arthur J. Tipton, and Richard J. Holl, both of Birmingham, Ala., assignors to Southern Biosystems, Inc., Birmingham, Ala.

Filed Jun. 7, 1995, Ser. No. 474,337

Int. Cl.^{6} A61F *2/02;6/06;9/02;* **A61L** *9/04*

U.S. Cl. 424—423 **95 Claims**



1. A liquid composition for the delivery of biologically active substances comprising:

(a) a non-polymeric, non-water soluble high viscosity liquid carrier material having a viscosity of at least 5,000 cP at 37° C. that does not crystallize neat under ambient or physiological conditions; and

(b) a biologically active substance.

5,747,059

ATROPHY OF SKIN/MUCOUS MEMBRANE

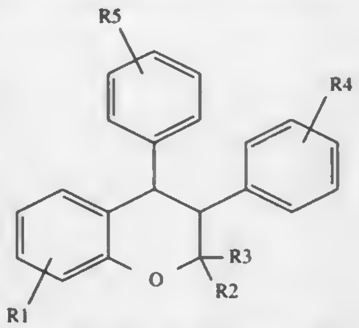
Niels Korsgaard, Værløse, Denmark; James Robertson Piggott, Bothell; Virender Mohan Labroo, Mill Creek, both of Wash., and Steven Bain, Birkerød, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Jul. 11, 1996, Ser. No. 678,260

Int. Cl.^{6} A61K *9/48;9/20;* **A61F** *2/02;9/02*

U.S. Cl. 424—451 **21 Claims**

1. A method for treatment or prophylaxis of atrophy of skin or mucous membranes comprising administering to a patient in need of such treatment or prophylaxis a compound of formula I



(I)

wherein R1, R4, and R5 are individually hydrogen, hydroxy, halogen, trifluoromethyl, lower alkyl, lower alkoxy or (tertiary amino) (lower alkoxy); and R2 and R3 are individually hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof in an amount sufficient to treat or prevent atrophy of skin or mucous membranes.

5,747,060

PROLONGED LOCAL ANESTHESIA WITH COLCHICINE

Richard Sackler, Greenwich; Paul Goldenheim, Wilton, both of Conn., and Mark Chasin, Manalapan, N.J., assignors to Euro-Celtique, S.A., Luxembourg, Luxembourg

Filed Mar. 26, 1996, Ser. No. 622,058

Int. Cl.^{6} A61K *9/14;9/52*

U.S. Cl. 424—426 **33 Claims**

1. A formulation for inducing sustained regional local anesthesia in a patient comprising

a substrate comprising a local anesthetic and an effective amount of a biocompatible, biodegradable controlled release material prolonging the release of said local anesthetic from said substrate to obtain a reversible nerve blockade when implanted or injected in a patient, and

an amount of colchicine effective to prolong the duration of said local anesthesia for a time period longer than that obtainable from the substrate without said colchicine.

5,747,061

SUSPENSION OF LOTEPREDNOL ETABONATE FOR EAR, EYE, OR NOSE TREATMENT

Shimon Amselem, Rehovot, and Doron Friedman, Carmei Yosef, both of Israel, assignors to Pharmos Corporation, Alachua, Fla.

Continuation-in-part of Ser. No. 142,743, Oct. 25, 1993, Pat. No. 5,540,930. This application Jul. 29, 1996, Ser. No. 688,157

Int. Cl.^{6} A61K *9/10;47/32;47/36*

U.S. Cl. 424—427 **30 Claims**

1. A composition for ophthalmic or otolaryngological anti-inflammatory use comprising:

(A) a corticosteroid in an amount of 0.01 to about 2% by weight and having a particle size of about 0.1 to 30 microns in diameter to substantially prevent discomfort upon use of the composition for said ophthalmic or otolaryngological anti-inflammatory treatment;

(B) a nonionic polymer in an aqueous medium;

(C) a nonionic tonicity agent in an amount sufficient to achieve isotonicity; and

(D) a nonionic surface active agent in an amount sufficient to retain the corticosteroid, the nonionic tonicity agent and the nonionic polymer in a suspension.

5,747,062

Patent Not Issued For This Number

5,747,063

THERAPEUTIC ELEMENTS FOR THE ORAL ADMINISTRATION OF MEDICATION TO ANIMALS AND PROCESS FOR MAKING SAME

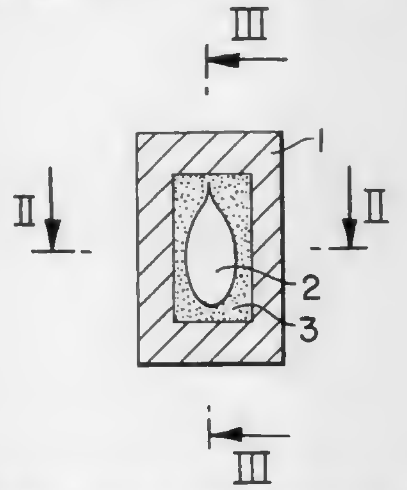
Bernard Languet, Les Cotes D' Arey, and Philippe Desmettre, Ecully, both of France, assignors to Rhone Merieux, Lyon, France

Continuation of Ser. No. 592,018, Oct. 2, 1990, abandoned. This application Jun. 11, 1992, Ser. No. 896,905

Claims priority, application France, Oct. 2, 1989, 89 12831

Int. Cl.^{6} A23K *1/165*

U.S. Cl. 424—442 **14 Claims**



1. A therapeutic element for oral administration of targeted animals comprising

a preformed extruded hollow shaped envelope open at each end, defining an internal volume and of a size consumable by said animals, said hollow shaped envelope being comprised of at least one edible substance attractive to the targeted animals in admixture with at least one material agglomerating said substances; and

an edible binding material attractive to the targeted animals containing an oral medication, said binding material filling said internal volume and closely conforming to the internal shape of hollow-shaped envelope so as to provide a continuity between said envelope and said medication and thus provide a substantially shock-resistant element.

5,747,064

PSORIASIS TREATMENT

Debbie L. Burnett, Basking Ridge; Darius D. Dubash, Pine Brook; Athanasios S. Ladas, Parsippany, and Victor M. Wong, Hackettstown, all of N.J., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 444,180, May 18, 1995, abandoned, which is a division of Ser. No. 98,497, Jul. 28, 1993, abandoned. This application Jul. 17, 1997, Ser. No. 895,719

Int. Cl.^{6} A61L *25/00;15/24;* **A61K** *9/70*

U.S. Cl. 424—443 **1 Claim**

1. A method for the treatment of psoriasis in a human in need of such treatment comprising the application to the psoriatic zone of a composition consisting essentially of:

(a) from about 50 to about 90 weight percent alcohol in an aqueous solution,

(b) from about 0.01 to about 0.5 weight percent alkali,

(c) from about 5to about 25 weight percent vinyl acetate crotonic acid coplymer, and

(d) from about 0.01 to about 0.2 weight percent plasticizer, said composition, when applied to a psoriatic zone of the skin of a human, forming an occlusive area suppressing greater than 70 percent of water transmission from the psoriatic zone.

5,747,065

MONOGLYCERIDE/LACTATE ESTER PERMEATION ENHANCER FOR OXYBUTYNIN

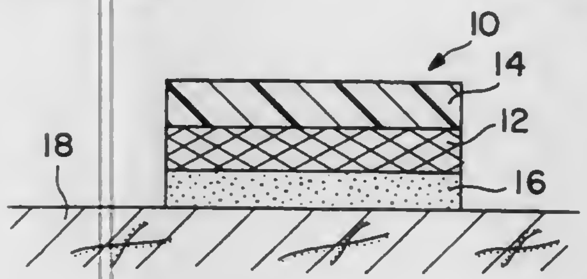
Eun Soo Lee, 108 W. Danbury, Redwood City, Calif. 94061; Tyler Watanabe, 709 Panchita Way; Robert M. Gale, 1276 Russel Ave., both of Los Altos, Calif. 94022, and Terry L. Burkoth, 711 Torreya, Palo Alto, Calif. 94303

PCT No. PCT/US94/11226, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/09007, PCT Pub. Date Apr. 6, 1995

Continuation-in-part of Ser. No. 129,494, Sep. 29, 1993, abandoned. This PCT application Sep. 29, 1994, Ser. No. 617,763

Int. Cl.^{6} A61F *13/02*

U.S. Cl. 424—448 **17 Claims**



1. A composition of matter for application to a body surface or membrane to administer oxybutynin by permeation through the body surface or membrane, the composition comprising, in combination:

(a) oxybutynin to be administered, in a therapeutically effective amount; and

(b) a permeation-enhancing mixture comprising:

(i) 20 wt % of a monoglyceride or a mixture of monoglycerides, and

(ii) 12 wt % of a lactate ester or a mixture of lactate esters.

5,747,066

MIXED MICELLES

Folker Pittrof, Rheinfelden, Germany, and Hans Steffen, Liestal, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 7, 1996, Ser. No. 612,047

Claims priority, application Switzerland, Mar. 7, 1995, 654/95

Int. Cl.^{6} A61K *9/107;9/127*

U.S. Cl. 424—450 **44 Claims**

1. A fluid mixed micelle composition containing micelles dispersed in an aqueous media wherein said micelles comprise:

a) a first compound which is a phosphatide in which two of the hydroxyl groups of the glycerol moiety of said phosphatide are esterified with:

residues formed from saturated fatty acids which independently contain a straight chain of from14 to 20 carbon atoms and one or both of said fatty acids is substituted at one to three carbon atoms with C_{1-5}-alkyl, and

b) a second compound which is a bile acid salt or dihexanoyllecithin;

wherein the concentration of the first compound in said composition is in the range from about 1 mg/ml to about 200 mg/ml and the molar ratio of the first compound to the second compound in said composition is in the range from 0.1:1 to 2:1;

or a lyophilozate of said composition.

5,747,067

CO-PROCESSED PRODUCTS

Michael Auguello, Marlboro, N.J.; Thomas A. Ruszkay, Hockessin, Del., and George E. Reier, Somerset, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 6, 1996, Ser. No. 761,582

Int. Cl.^{6} A61K *9/20;9/26;33/10;9/14*

U.S. Cl. 424—464 **6 Claims**

1. Particulate pharmaceutical tablet excipient compositions comprising co-processed microcrystalline cellulose and particulate USP calcium carbonate, in which the calcium carbonate has an average particle size in the range of 7 to 22 μm and the weight ratio of calcium carbonate to microcrystalline cellulose is in the range of 70:30 to 90:10.

5,747,068

FLOUXETINE PHARMACEUTICAL FORMULATIONS

Flavia Arce Mendizabal, Madrid, Spain, assignor to Lilly S. A., Madrid, Spain

Filed Jul. 18, 1995, Ser. No. 503,570

Claims priority, application Spain, Jul. 20, 1994, 9401593

Int. Cl.^{6} A61K *9/20;9/46;* **C07C** *91/22;93/06*

U.S. Cl. 424—465 **20 Claims**

1. A pharmaceutical formulation suitable for the manufacture of dispersible tablets by direct compression, said tablets dispersible in water at 19°–21° C. in less than three minutes, consisting of fluoxetine or an addition salt thereof, as active ingredient, in a quantity between 4% and 7.5% by weight in relation to the total formulation weight, along with:

a) a disintegrant selected from the group consisting of sodium starch glycollate, polymeric derivatives of acrylic acid, and crospovidone;

b) a diluent selected from the group consisting of microcrystalline cellulose, lactose, hydroxypropyl cellulose (HPC), pregelatinized starch, dry flowing starch, and combinations and mixtures thereof;

c) a lubricant selected from the group consisting of talcum and stearyl sodium fumarate unless the diluent is pregelatinized starch, where the formulation is lubricant free;

d) colloidal silicon dioxide as an anti-adherent;

e) artificial or natural sweeteners selected from the group consisting of sodium saccharin, aspartame, mannitol, sorbitol, and ammonium glyciricinate, or mixtures thereof;

f) a flavoring selected from the group consisting of mint aroma, peppermint aromas, orange flavoring, peach aroma, apricot aroma, raspberry aroma, lemon aroma, coconut aroma, pineapple aroma, strawberry aroma, aniseed, and mixtures thereof; and optionally

g) titanium dioxide as a colorant.

5,747,069

PERCUTANEOUSLY ABSORBABLE PREPARATION

Sotoo Asakura, Kyoto; Sumihisa Kimura, Kawanishi; Kazutake Kado, Toyonaka; Yoshiko Ohishi, Kobe, and Takehisa Hata, Nagaokakyo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/01282, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/04551, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 4, 1994, Ser. No. 592,307

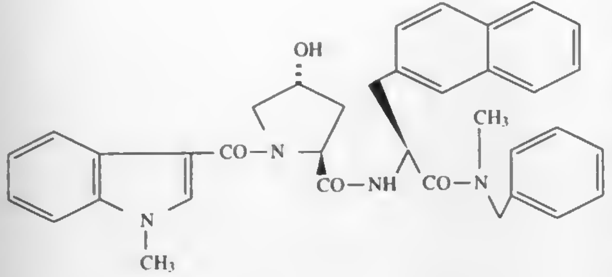
Claims priority, application Japan, Aug. 10, 1993, 5-198014; Dec. 16, 1993, 5-316319

Int. Cl.^{6} A61K *9/06*

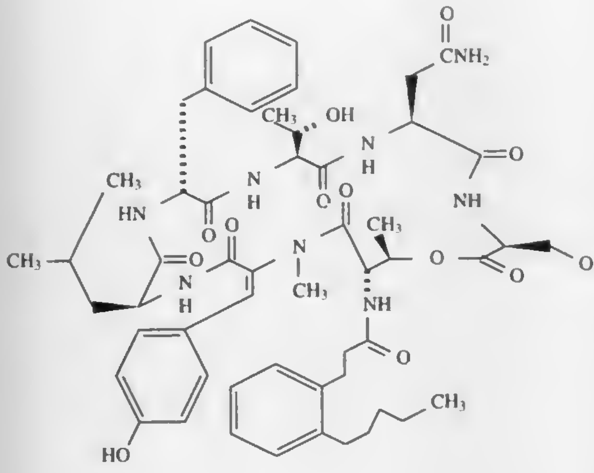
U.S. Cl. 424—484 **10 Claims**

1. A percutaneously absorbable pharmaceutical composition, comprising:

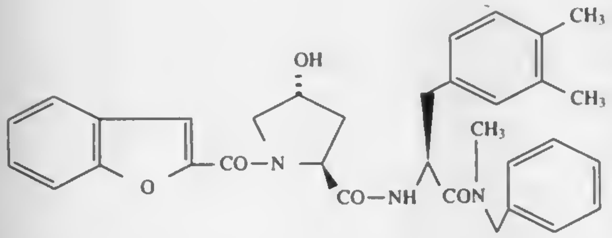
1) a drug selected from the group consisting of those with the formulae:



(A)

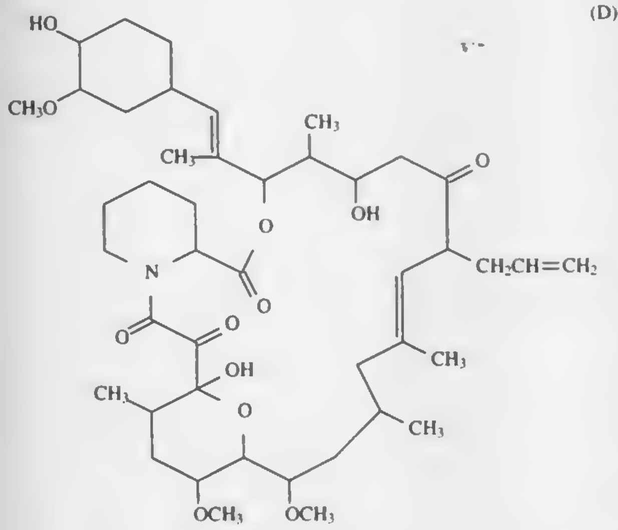


(B)



(C)

and



(D)

2) a percutaneously absorption accelerator, comprising:
  a) a monoglyceride selected from the group consisting of monocaprin, monolaurin, monomyristin, monopalmitin, monostearin and monoolein; and
  b) a fatty acid selected from the group consisting of capric acid, lauric acid, myristic acid, palmitic acid and stearic acid.

5,747,070
METHODS FOR THE TREATMENT OF HERPES VIRUS INFECTIONS

Satyanarayana Majeti, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 654,952, May 29, 1996, Pat. No. 5,658,946. This application Jan. 7, 1997, Ser. No. 779,827

Int. Cl.^{6} A61K *31/32;31/19;33/24*

U.S. Cl. 424—650 **6 Claims**

1. A method for treatment of herpes virus infections in a human or lower animal subject comprising topically administering to the subject:
  a. a safe and effective amount of one or more stannous halides;
  b. a safe and effective amount of one or more stannous carboxylates selected from the group consisting of stannous gluconate, stannous tartrate, stannous malonate, stannous citrate and stannous acetate; and
  c. one or more pharmaceutically acceptable carriers suitable for topical administration.

5,747,071
PLASMA-LIKE SUBSTANCE

Paul E. Segall; Harold D. Waitz; Hal Sternberg, and Judith M. Segall, all of Berkeley, Calif., assignors to BioTime, Inc., Berkeley, Calif.

Division of Ser. No. 133,527, Oct. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 71,533, Jun. 4, 1993, Pat. No. 5,407,428. This application Jun. 5, 1995, Ser. No. 462,650

Int. Cl.^{6} A61K *33/14;31/715;* **A01N** *59/08;1/02*

U.S. Cl. 424—663 **8 Claims**

1. A crystalloid solution consisting of dissolved salts in the following concentrations: NaCl about 110–120 mM, KCl in a range from 3 mM to 5 mM, $MgCl_2$ in a range from 0.45 mM to 1.5 mM, $CaCl_2$ about 2.5 mM, sodium lactate about 28 mM, and glucose in a range from 5 mM to about 10 mM.

5,747,072
ADENOVIRAL-MEDIATED GENE TRANSFER TO SYNOVIAL CELLS IN VIVO

Beverly L. Davidson, Howell, and Blake J. Roessler, Ann Arbor, both of Mich., assignors to University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 100,646, Jul. 30, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,655

Int. Cl.^{6} A61K *48/00;* **C12N** *15/09;15/63*

U.S. Cl. 424—93.2 **2 Claims**

1. A method of reducing an inflammatory response in a joint of a subject comprising:
  (a) administering to the joint a therapeutically effect amount of a recombinant adenoviral vector comprising an expression control sequence operatively linked to a gene that encodes an IL-1 receptor antagonist; and
  (b) expressing said IL-1 receptor antagonist at a level sufficient to reduce an inflammatory response in said joint.

5,747,073
APPARATUS FOR PRODUCING COMPOSITE CYLINDERS

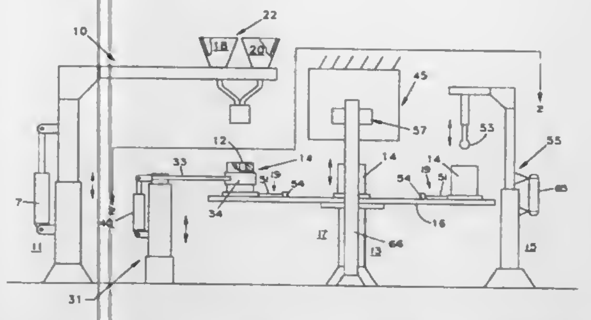
Bjorn Ola Alfons Pettersson, and Patrick W. Holmes, both of Huntsville, Ala., assignors to TecSyn, Inc., St. Catharines, Canada

Continuation of Ser. No. 549,426, Oct. 27, 1995, abandoned. This application May 30, 1997, Ser. No. 865,742

Int. Cl.^{6} B30B *11/02*

U.S. Cl. 425—78 **9 Claims**

1. Apparatus for forming a cylindrical member from powdered metal material comprising:



a molding tool having a mandrel and a pressurizable elastomeric member mounted circumferentially about said mandrel to form a single annular forming chamber;
a rotatable table having a plurality of molding tool support positions spaced therearound for sequentially rotating through a molding tool filling station at which said molding tool is filled with said powdered metal material, a pressurization station at which said molding tool is pressurized to bond said powdered metal materials and thereby form said cylindrical member, a removal station at which said cylindrical member is removed from said molding tool for sintering thereof, and a cleaning station at which said molding tool is cleaned;
a pressure vessel mounted in spaced relation above said table;
first support means carried at each said molding tool support position for supporting a said molding tool thereon on said table;
second support means mounted adjacent said table at said pressurization station to receive and support said molding tool thereon;
first molding tool displacement means disposed for horizontal reciprocal movement to move said molding tool from said table to said second support means and back to said table;
actuator means for reciprocal movement of said first molding tool displacement means; and
second molding tool displacement means for vertical reciprocal movement of said molding tool at said pressurization station to raise said molding tool into said pressure vessel for pressurization of said molding tool and to lower said molding tool down from said pressure vessel, whereby said first molding tool displacement means moves said molding back onto said table so that said molding tool may be sequentially moved to said tool removal and cleaning stations.

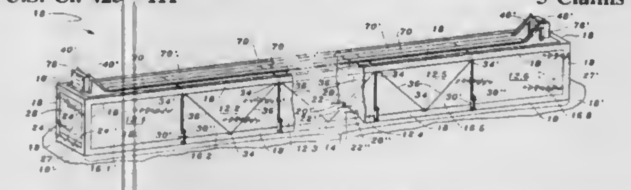
5,747,074
APPARATUS FOR THE MANUFACTURING OF PRESTRESSED REINFORCED CONCRETE RAILROAD TIES AND THE LIKE

David P. Ollendick, 335 Rio Grande Pl., San Ramon, Calif. 94583, and Robert W. Ollendick, P.O. Box 2567, Wickenburg, Ariz. 85358

Filed Feb. 2, 1995, Ser. No. 383,727

Int. Cl.^{6} B23B *19/00*

U.S. Cl. 425—111 **5 Claims**



1. Apparatus for use in the manufacturing of reinforced concrete railroad ties, comprising:
  elongated spine means;
  first and second bridge means respectively located adjacent one end of said spine means and adjacent the other end of said spine means, both of said bridge means extending transversely of said spine means;
  a first plurality of tie reinforcing member anchoring means;
  a second plurality of tie reinforcing member anchoring means;
  first collocating means for maintaining said first plurality of tie reinforcing member anchoring means in a predetermined collocation on said first bridge means;
  second collocating means for maintaining said second plurality of tie reinforcing member anchoring means in a predetermined collocation on said second bridge means;
  tensioning means for individually tensioning said tie reinforcing members;
  bridge interconnecting means for interconnecting a portion of said first bridge means remote from said first collocating means and a portion of said second bridge means remote from said second collocating means, whereby to maintain the distance between said collocating means against the stresses produced in said apparatus by the tensioning of a plurality of said reinforcing members between corresponding ones of said anchoring means.

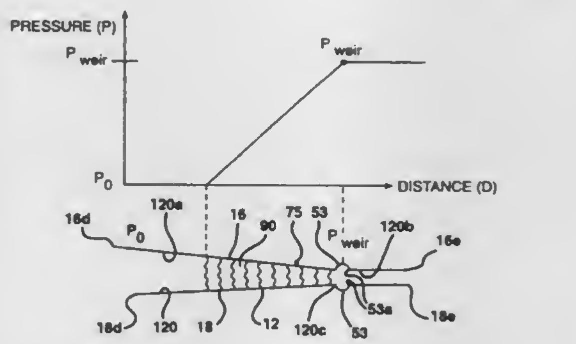
5,747,075
APPARATUS FOR RESIN IPREGNATED PULTRUSION

James V. Gauchel, and Richard N. Lehman, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Technology Inc., Summit, Ill.

Filed Jun. 7, 1995, Ser. No. 476,812

Int. Cl.^{6} B29C *70/52*

U.S. Cl. 425—114 **21 Claims**



1. An apparatus for resin injected pultrusion comprising:
an injection die comprising:
  a first die body having an inlet end for receiving a pultrusion reinforcement pack and an outlet end for discharging said reinforcement pack;
  a second die body having an inlet end for receiving said pultrusion reinforcement pack and an outlet end for discharging said reinforcement pack, said first die body and said second die body being coupled to one another to define a passage therebetween extending from said inlet ends of said first and second die bodies to said outlet ends of said first and second die bodies;
  said first and second die bodies defining a resin injection weir channel positioned between their respective inlet ends and outlet ends;
  at least one of said first and second die bodies having at least one port for injecting resin into said weir channel;
  said passage including a tapered entrance portion extending from said inlet ends of said first and second bodies down to said weir channel and an exit portion extending from said weir channel to said outlet ends of said first and second die bodies, said entrance portion having an angle of about 1° or less; and
  injection apparatus communicating with said port for injecting resin into said weir channel to impregnate said reinforcement pack, said resin being injected at a sufficiently high pressure such that the pressure in said weir channel is substantially equal to or greater than a compression pressure applied by said exit portion to the impregnated reinforcement pack.

5,747,076

ELECTRIC DRIVE WITH HYDRAULIC ASSIST IN AN INJECTION MOLDING MACHINE

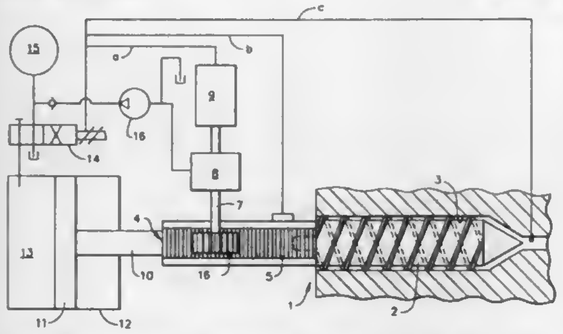
Christoph Jaroschek, Endingen, and Karl-Heinz Bourdon, Reute, both of Germany, assignors to Ferromatik Milacron Maschinenbau GmbH, Malterdingen, Germany

Filed Aug. 30, 1996, Ser. No. 706,030

Claims priority, application Germany, Sep. 1, 1995, 195 32 267.3

Int. Cl.⁶ B29C *45/77*

U.S. Cl. 425—145 **10 Claims**



1. An electric drive with hydraulic assist for moving a melting and injection screw in an injection molding machine, including an electric motor that produces axial advance movement of the screw via an appropriate gear train, and a piston that can be moved in a cylinder by pressure from a hydraulic fluid reservoir, wherein the movement of the piston can be used to supplement the axial movement created by the electric motor, characterized in that pressurization of the cylinder (13) by the hydraulic fluid reservoir (15) occurs upon reaching a defined control quantity that corresponds to a defined load condition on the electric motor (9) in which the pressure rise in cylinder (13) is proportional to the load of electric motor (9).

5,747,077

GRANULATING DEVICE FOR THERMOPLASTIC RESIN

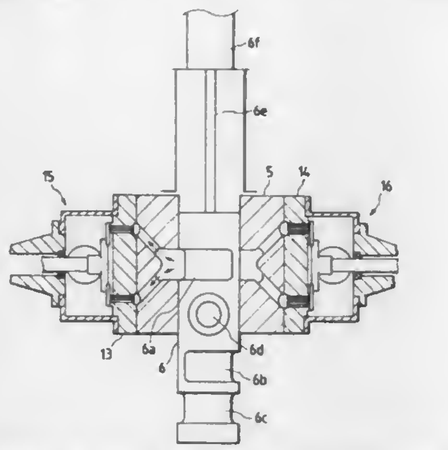
Minoru Yoshida; Hideki Mizuguchi; Nobuhisa Kobayashi, and Masaharu Ishida, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Nov. 13, 1996, Ser. No. 747,813

Claims priority, application Japan, Nov. 15, 1995, 7-296679

Int. Cl.⁶ B29C *47/30;* **B29B** *9/06*

U.S. Cl. 425—183 **14 Claims**



1. A granulating device for thermoplastic resin material, comprising:

a screw kneading and extruding machine for kneading, extruding and melting the thermoplastic resin material;

a die holder connected to a front end portion of said screw type kneading and extruding machine, said die holder including a passage through which the melted resin material flows, a change-over valve and at least two outlets, said passage selectively connected to said outlets with said change-over valve;

a first and a second dies, for forming the melted resin material into a plurality of pieces of string, connected respectively to said outlets to adapt to different ranges of viscosity of the melted resin material; and

a first and a second cutter units including cutters moved respectively along extruding planes of said first and second dies to cut the string-shaped resin material into small pieces, and cooling and solidifying sections for cooling and solidifying the small pieces of thermoplastic resin material;

wherein said change-over valve includes a first cutout portion adapting to communicate said passage with at least one of said outlets, a second cutout portion adapting to communicate said passage with at least the other one of said outlets, and a third cutout portion adapting to communicate said passage with all of said outlets.

5,747,078

LONGTERM ANTIMICROBIAL ACTIVITY OBTAINED BY SUSTAINED RELEASE OF HYDROGEN PEROXIDE

Sylvia Josefine De Jong, Delft; Ben Rudolf De Haan, Voorburg, and Hong Sheng Tan, Bleiswijk, all of Netherlands, assignors to Gist-brocades, N.V., Netherlands

Continuation of Ser. No. 969,153, Feb. 10, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 375,563

Claims priority, application European Pat. Off., Jun. 11, 1991, 91201442

Int. Cl.⁶ A23C *19/00*

U.S. Cl. 426—9 **6 Claims**

1. A food product comprising an immobilized composition containing at least one first enzyme which is an oxidoreductase that generates hydrogen peroxide from a substrate;

a second enzyme which is capable of generating said substrate from a precursor; and

a precursor for said second enzyme

wherein said first and second enzymes and said precursor are together immobilized in said composition with an immobilizing agent.

5,747,079

OXYGENATED BEVERAGE

Howard L. Hoffman, 3402 Waverley St., Palo Alto, Calif. 94306

Filed Dec. 12, 1996, Ser. No. 766,155

Int. Cl.⁶ A23L *2/26*

U.S. Cl. 426—67 **5 Claims**

1. A method of alleviating a condition of halitosis in a person, the method comprising contacting the person's oral cavity with a aqueous solution containing a supersaturated concentration of dissolved oxygen.

5,747,080

METHOD FOR THE PREPARATION OF POPPED CEREAL PRODUCTS ENRICHED WITH VITAMINS, MINERAL NUTRIENTS AND/OR TRACE ELEMENTS

Stefan Lemke, Grüner Grund 4a, D-23669 Timmendorfer Strand, and Angelos Sagredos, Lenhartzstrasse 6, D-20249 Hamburg, both of Germany

Filed Dec. 12, 1996, Ser. No. 766,594

Claims priority, application Germany, Dec. 14, 1995, 195 46 654.3

Int. Cl.⁶ A23L *1/302;1/304;1/18*

U.S. Cl. 426—72 **19 Claims**

1. A process for producing popped grain products enriched with vitamins, minerals and/or trace elements, comprising popping raw grain kernels in a container by the action of heat or microwaves with or without stirring, wherein before or during popping of the raw grain kernels a predetermined amount of vitamins and/or minerals and/or trace elements, dissolved or dispersed in one or more suitable animal and/or vegetable fats and/or oils and/or sugar and/or table salt as a carrier substance is placed in the container together with the grain kernels and is subjected for 1 to 5 minutes to treatment either at a temperature from 130° to 280° C. or with microwaves at 400 to 1500 watts, whereby at least most of the amount of vitamins and/or minerals and/or trace elements used, and the carrier substance, are absorbed by the popping grain kernels and are distributed uniformly in said popped grain kernels, to provide a ready-to-eat popcorn product enriched with micronutrients.

5,747,081

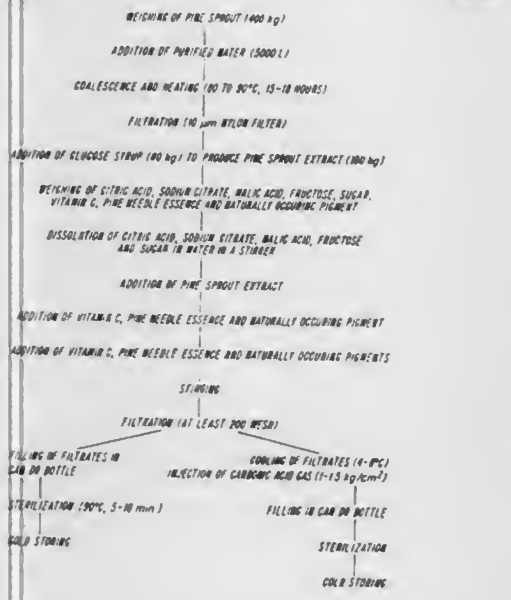
PROCESS FOR PRODUCING A BEVERAGE COMPOSITION CONTAINING PINE SPROUT EXTRACT

Sung Il Lee, Incheon; Soo Min Park; Jeong Whan Kim, both of Seoul; Ho Kim, GoYang, and Woon Young Gong, Seoul, all of Rep. of Korea, assignors to Cheil Foods & Chemicals, Inc., Seoul, Rep. of Korea

Division of Ser. No. 540,356, Oct. 6, 1995. This application Jan. 23, 1997, Ser. No. 786,342

Int. Cl.⁶ A23L *1/30;2/00*

U.S. Cl. 426—72 **3 Claims**


WEIGHING OF PINE SPROUT (400 kg)
ADDITION OF PURIFIED WATER (5000 L)
COALESCENCE AND HEATING (80 TO 90°C, 15-18 HOURS)
FILTRATION (10 μm NYLON FILTER)
ADDITION OF GLUCOSE SYRUP (80 kg) TO PRODUCE PINE SPROUT EXTRACT (100 kg)
WEIGHING OF CITRIC ACID, SODIUM CITRATE, MALIC ACID, FRUCTOSE, SUGAR, VITAMIN C, PINE NEEDLE ESSENCE AND NATURALLY OCCURING PIGMENT
DISSOLATION OF CITRIC ACID, SODIUM CITRATE, MALIC ACID, FRUCTOSE AND SUGAR IN WATER IN A STIRRER
ADDITION OF PINE SPROUT EXTRACT
ADDITION OF VITAMIN C, PINE NEEDLE ESSENCE AND NATURALLY OCCURING PIGMENT
ADDITION OF VITAMIN C, PINE NEEDLE ESSENCE AND NATURALLY OCCURING PIGMENTS
STIRRING
FILTRATION (AT LEAST 200 MESH)
FILLING OF FILTRATES IN CAN OR BOTTLE
COOLING OF FILTRATES (4-8°C)
INJECTION OF CARBONIC ACID GAS (1-1.5 kg/cm²)
STERILIZATION (90°C, 5-10 min)
FILLING IN CAN OR BOTTLE
COLD STORING
STERILIZATION
COLD STORING

1. A process for producing a beverage composition containing 0.2 to 0.5% of pine sprout extract with 0.04 to 0.1% of pine needle essence, 0.1 to 0.5% of vitamin C, 3 to 4% of white sugar, 5 to 6% of fructose, 0.1 to 0.2% of citric acid, 0.03 to 0.05% or malic acid and 0.04 to 0.05% of sodium citrate, the said percentages being based on the total weight of the composition, which comprises:

coalescing pine sprout and water by heating them to the temperatures between 80° C. and 90° C. for 15 to 18 hours;

filtrating the coalescents;

concentrating the filtrates;

mixing the resulting concentrates with glucose syrup to obtain pine sprout extract;

mixing the resulting pine sprout extract with the above additives to obtain the beverage composition.

5,747,082

PACKAGE FOR PERISHABLE FOOD AND HORTICULTURAL PRODUCTS

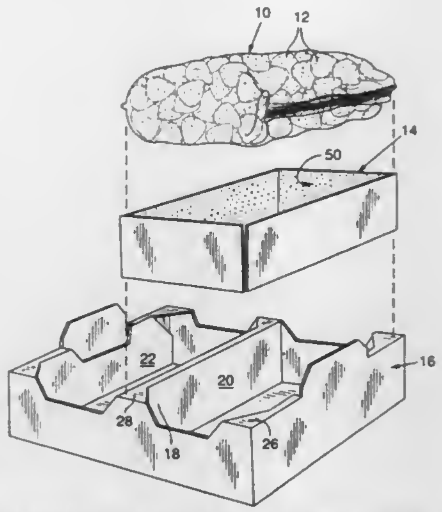
Stan Louis Floyd, 25810 SE. 396th St., Enumclaw, Wash. 98022; Herbert Donald Muise, 1100 Irving St. SW., Tumwater, Wash. 98502, and Mark A. Stanish, 1119 33rd Ave. S., Seattle, Wash. 98144

Filed Sep. 5, 1990, Ser. No. 577,993

Int. Cl.⁶ B65D *81/00;85/00*

U.S. Cl. 426—109 **35 Claims**

1. A package manually transportable by a single individual for perishable food and horticultural products comprising:



a cooling element including a liquid holding portion;

a closable container for enclosing products therein having an interior and exterior, the container restricting the exchange of gases between the products within the container and the exterior of the container to provide a modified atmosphere environment therein of an increased carbon dioxide concentration and decreased oxygen concentration relative to the concentration in air when the container is closed and a controlled flow of gas between the interior and exterior of the container when the container is closed;

the liquid holding portion of the cooling element being positioned outside the interior of the container and the exterior of the container being positioned in close proximity to at least a portion of the liquid holding portion of the cooling element;

the cooling element and container being transportable by a single individual; and

whereby evaporation of liquid from the liquid holding portion of the cooling element enhances the cooling of the container and the products therein.

5,747,083

DEVICE OF THE FEEDING-BOTTLE TYPE

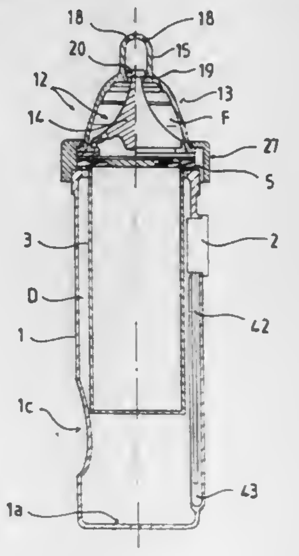
Jean-Louis Raymond, 2, rue Chanzy, 66250 Saint-Laurent-de-la-Salanque; Jean-Luc Nierga, 2, rue Olivier-de-Serres, 66430 Bompas, both of France, and Pedro Planas, Bjos Freixa, 39, 08021 Barcelona, Spain

Continuation of Ser. No. 969,820, Jan. 21, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,713

Claims priority, application France, Jul. 20, 1990, 90 09549

Int. Cl.⁶ A61J *9/00*

U.S. Cl. 426—117 **11 Claims**



1. A device of the feeding-bottle type, comprising:

an outer tubular body having a closed end and an open end, and a body opening disposed at the open end;

a flexible bag having a closed end and a bag opening, the flexible bag disposable in the outer tubular body and, when placed in the outer tubular body, forming a space between the outer tubular body and the flexible bag;

means, on the outer tubular body, for admitting ambient air into the space between the outer tubular body and the flexible bag as the contents of the flexible bag are discharged;

a teat including a base disposed at a first end, a nipple with outlet perforations disposed at an opposite end, and an outer deformable casing extending between the nipple and the base, the teat being disposed in front of the outer tubular body and in front of the bag opening;

an intermediate non-return check valve, disposed between the bag opening and the base of the teat defining a dispensing chamber together with the outer deformable casing of the teat, for allowing one way flow of liquid from the bag into the dispensing chamber;

a core disposed within the dispensing chamber and having a base disposed adjacent to the intermediate check valve and a conical shape extending to a second end;

at least one aperture formed in the core and establishing a fluid flow path between the flexible bag and the dispensing chamber through the intermediate check valve; and

a second check valve integral with the second end of the core, the second check valve disposed in the nipple between the dispensing chamber and the outlet perforations of the nipple, wherein the second check valve allows a passage of liquid toward the outlet perforations, and opposes an entrance of air into the dispensing chamber;

the second check valve being seated in a narrowing of the nipple, the narrowing forming a seat for the second check valve; and

elastic means, carried by the core, for allowing movement of the second check valve in a direction between the base and the nipple and tending to seat the second check valve on the narrowing of the nipple.

5,747,084

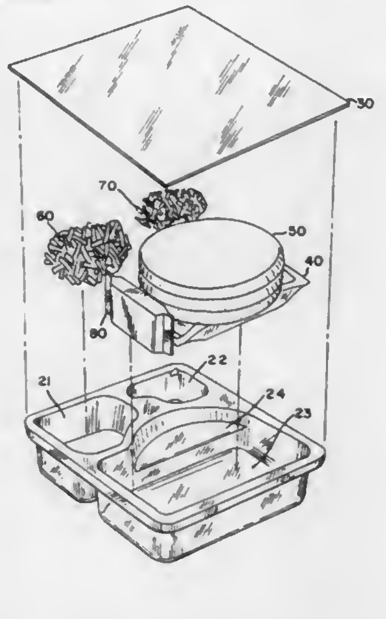
READY-TO-ASSEMBLE, READY-TO-EAT PACKAGED PIZZA

Stuart A. Cochran, Tarrytown, N.Y.; Steven J. Goll, McFarland, Wis.; Howard C. Lippincott, Madison, Wis., and Gary A. Winkler, Cottage Grove, Wis., assignors to Kraft Foods, Inc., Madison, Wis.

Filed Nov. 28, 1995, Ser. No. 563,845

Int. Cl.^{6} B65D *85/00*

U.S. Cl. 426—120 **14 Claims**



10. A kit for making or assembling a ready-to-eat pizza, said kit comprising a base tray having a plurality of compartments; one of said compartments includes a shelf defining said compartment into an upper portion and a lower portion; a sauce packaged in an envelope and placed in said lower portion of said one compartment; a baked pizza crust placed within said upper portion of said one compartment and being partially supported by said sauce envelope in said lower portion of said one compartment; a first topping consisting of a cheese topping, a second topping selected from the group consisting of a cheese topping and a noncheese topping; said first and second toppings are placed within respective other separate ones of said compartments of said tray; and a top fitted and sealed to said base tray to thereby hermetically seal said baked, crust and toppings from the atmosphere and from each other.

5,747,085

CONTINUOUS VESSEL DEFLECTION MONITOR DEVICE

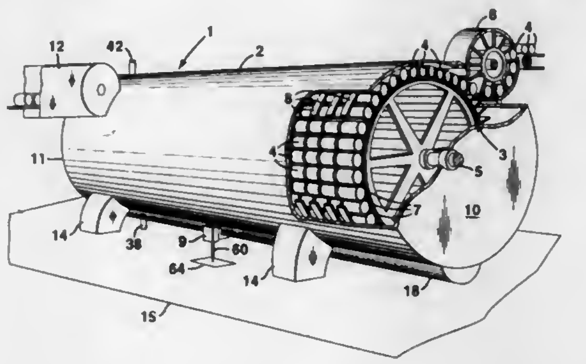
Joost Veltman, Aptos; Andrew Carl Prins, and Scott R. Cavanaugh, both of Madera, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Divisloa of Ser. No. 505,138, Jul. 21, 1995, Pat. No. 5,685,216.

This application May 20, 1997, Ser. No. 859,339

Int. Cl.^{6} A23L *1/00;1/0534;3/00;3/06*

U.S. Cl. 426—233 **10 Claims**



8. A method for processing filled containers, comprising the steps of:

attaching a linear motion detector to a vessel;

introducing the filled containers into the vessel;

rotating the filled containers around the vessel by a rotating means;

moving the filled containers from a first end of the vessel towards a second end of the vessel;

removing the filled containers from the vessel; and

sending electrical signals from the linear motion detector to a control box as the filled containers pass through the vessel.

5,747,086

METHOD OF COOKING A FOOD PRODUCT USING A MODE FILTERING STRUCTURE

John Richard Bows, Wellingsborough; Renoo Avinash Blindt, Northants; Robert Hurling, Bedford, and James Thomas Mullin, Northants, all of Great Britain, assignors to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

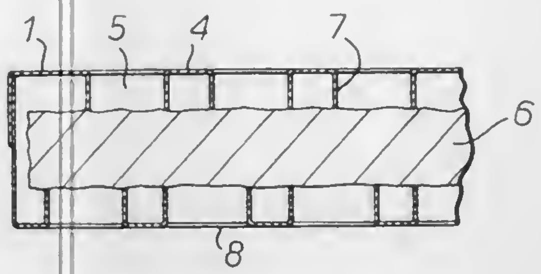
Continuation of Ser. No. 309,498, Sep. 23, 1994, abandoned. This application Jun. 18, 1996, Ser. No. 665,641

Claims priority, application European Pat. Off., Sep. 24, 1993, 93307567

Int. Cl.^{6} A23L *1/01*

U.S. Cl. 426—234 **5 Claims**

1. A method of enhancing the heating and cooking of a crumb-coated food product by microwave energy comprising the steps of:



packaging the food product in a mode filtering structure comprising a base mode filtering member defining an upward opening tray with a bottom and sidewalls for receiving and holding the food product to be heated, and a lid mode filtering member with a downwardly extending portion and a top which covers the upward opening of the tray, each of the base mode filtering member and lid mode filtering member being provided with a plurality of supports so that the food is spaced from both the base and the lid by an air gap of from 1 to 6 mm between the surface of the food product and the mode filtering structure; and

placing the package of food product in a microwave oven and generating an electric field strength greater that 20 kV/m, but below the breakdown voltage of air, to heat the food product and obtain a crisp, crumb-coated cooked food product.

5,747,087

METHOD FOR THE PRODUCTION OF VEGETABLE SNACKS

Peder Fosbøl, Lyngby; Birgitte Korremann, Vanløse, and Henrik Ullum, Karlslunde, all of Denmark, assignors to Snacko A/S, Ballerup, Denmark

Continuation of Ser. No. 318,659, May 18, 1995, abandoned. This application Nov. 22, 1996, Ser. No. 754,862

Int. Cl.^{6} A23L *1/216*

U.S. Cl. 426—242 **15 Claims**

1. Method for producing vegetable snacks without using fats by heat treatment in a pre-drying zone, a treatment zone and a post-drying zone, comprising:

providing sliced vegetable objects of substantially equal thickness on a conveyor belt in a single layer;

conveying the objects through the pre-drying zone, and, while in the pre-drying zone, thermally treating the objects at a temperature which is high enough and a period of time which is long enough to form a thin shell on the surface of the object;

conveying the objects from the pre-drying zone and through the treatment zone and, while in the treatment zone, treating the objects on both sides with infrared heat radiation at a higher temperature than in the pre-drying zone and for so long that puffing of the objects is achieved; and

conveying the objects from the treatment zone and through the post-drying zone and, while in the post-drying zone, further thermally treating the objects at a temperature which is lower than that of the pre-drying zone until the objects reach a dry-matter content above 85%.

5,747,088

METHOD OF PRODUCING FRUIT JUICES AND AN EDIBLE INFUSED SOLID FRUIT PRODUCT

LeRoy W. Fletcher, 100 - 2nd Ave., Zillah, Wash. 98953

Filed Jul. 3, 1996, Ser. No. 675,538

Int. Cl.^{6} A23L *2/04*

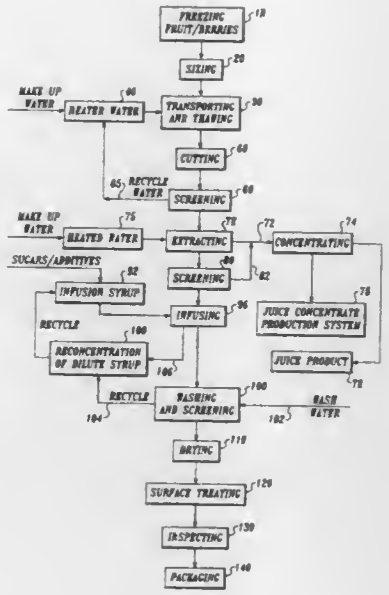
U.S. Cl. 426—425 **23 Claims**

1. A method of processing fruit into a solid product and a liquid product, the method comprising:

(a) exposing an inner portion of the fruit, said inner portion beneath an overlying skin;

(b) subjecting the fruit to a plurality of sequential pressure variations in a liquid medium, the pressure variations sufficient to significantly increase a rate of extraction of components of the fruit into the liquid medium, the liquid medium at a temperature sufficient to promote the rate of extraction without substantial denaturing of the fruit; and

(c) separating extracted fruit from a liquor comprising extracted fruit components.



5,747,089

METHOD OF MAKING MOLASSES PRODUCT HAVING LOW HYGROSCOPICITY AND SUFFICIENT NON-CAKING PROPERTIES

Helena Ljusberg, Höllviken, and Kerstin Pebrson, Löddeköpinge, both of Sweden, assignors to Danisco Sugar AB, Malmo, Sweden

PCT No. PCT/SE93/01101, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO94/14982, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 22, 1993, Ser. No. 464,717

Claims priority, application Sweden, Dec. 23, 1992, 9203901

Int. Cl.^{6} A23L *1/015*

U.S. Cl. 426—478 **10 Claims**

1. A process for manufacturing a high molecular weight molasses product having improved drying properties, which comprises:

feeding starting material molasses having a RT value of 8–45% and a color of at least 100,000 ICUMSA units to a membrane filtering plant having an inert membrane having a nominal cut off value of at least 2,000 dalton; and

filtering a low molecular weight fraction as a permeate from a high molecular weight fraction as a retentate, and collecting said high molecular weight fraction having a color of at least two times the color of the starting molasses or at least 200,000 ICUMSA units.

5,747,090

UNDECYLENATE DEODORANTS FOR ANIMAL FEEDS

Aime Menassa, Paris, and Henri Caupin, Versailles, both of France, assignors to Delta Agro Industries, Paris, and Atochem, Puteaux, both of France

Continuation of Ser. No. 902,484, Jun. 23, 1992, abandoned, which is a continuation of Ser. No. 629,848, Dec. 19, 1990, abandoned. This application Jan. 28, 1993, Ser. No. 13,537

Claims priority, application France, Dec. 19, 1989, 89 16794

Int. Cl.^{6} A23L *3/34*

U.S. Cl. 426—532 **16 Claims**

1. A composition of matter comprising (a) an animal foodstuff and (b) an effective foodstuff deodorizing amount of a polyoxyalkylene ester of undecylenic acid.

5,747,091

SWEETENED EXTRUDED FOOD PRODUCTS

Lisa Denhartog, Toronto, Canada; Christopher Robin Heath, Surrey, England; Sandra Mills Ketelsen, Fanwood, N.J.; Valerie Melega, Toronto, Canada; Gary Allen Miller, New Hope, Pa., and Joseph Michael Zannoni, Lawrenceville, N.J., assignors to Tate & Lyle Public Limited Company, London, England

Continuation of Ser. No. 307,829, Nov. 28, 1994, abandoned. This application Sep. 17, 1996, Ser. No. 714,826

Claims priority, application United Kingdom, Mar. 30, 1992, 9206920

Int. Cl.⁶ A23L *1/236*

U.S. Cl. 426—548 **13 Claims**

1. A sweetened cooked extruded food product having a bulk density and a total sweetness, the food product comprising:

a starch-containing vegetable material; and

a sweetener, substantially all of the sweetener being incorporated before extrusion, the sweetener comprising sucralose in an amount which provides at least 50% of the total sweetness,

wherein the total sweetness is equivalent to that provided by at least 12% sucrose, and the bulk density of the food product is less than that of the food product having the total sweetness provided by sucrose.

5,747,092

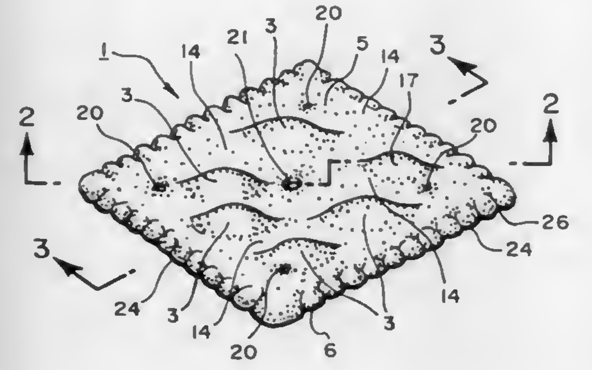
PRODUCTION OF CRISPY WHEAT-BASED SNACKS HAVING SURFACE BUBBLES

Julia M. Carey, Madison, N.J.; Mark J. Moisey, Center Valley, Pa.; Harry Levine; Louise Slade, both of Morris Plains, N.J.; Theresa E. Dzurenko, Parsippany, N.J.; Kevin McHugh, Oakland, N.J., and Ellen L. Zimmerman, Morristown, N.J., assignors to Nabisco Technology Company, Wilmington, Del.

Filed Apr. 25, 1996, Ser. No. 637,839

Int. Cl.⁶ A21D *2/18;* **A23L** *1/10*

U.S. Cl. 426—560 **32 Claims**



1. A method for the production of a baked, wheat-based snack having surface bubbles and a crispy texture comprising:

a) admixing wheat flour, a pregelatinized waxy maize starch in an amount of from about 3% by weight to about 20% by weight, based upon the weight of the wheat flour, a pregelatinized potato starch in an amount of from about 1.5% by weight to about 20% by weight, based upon the weight of the wheat flour, from 0% by weight to about 20% by weight of a modified potato starch, based upon the weight of the wheat flour, and water to hydrate said starches and to form a machinable dough, wherein the water content of said dough is from about 20% by weight to about 50% by weight, based upon the weight of the dough,

b) sheeting the dough,

c) forming the dough into pieces, and

d) baking the pieces to produce a plurality of surface bubbles in the baked pieces, said bubbles comprising air pockets and extending both above and below adjacent, generally flat, crispy, substantially unleavened areas of the baked pieces.

5,747,093

SUCROSE-FREE DIETARY FIBER COMPOSITION

Sabina W. Kaczmarczyk, 119 E. Main St., Somerville, N.J. 08876

Filed Mar. 31, 1997, Ser. No. 829,083

Int. Cl.⁶ A23L *1/212;1/0534*

U.S. Cl. 426—617 **16 Claims**

1. A sucrose-free, artificial sweetener-free dietary fiber composition which comprises:

(a) about 2 to about 95 percent methylcellulose by weight based on total weight of the composition;

(b) about 5 to about 40 percent natural coconut; and,

(c) 0 to about 93 percent non-sucrose, non- artificial sweetener containing inactive materials.

5,747,094

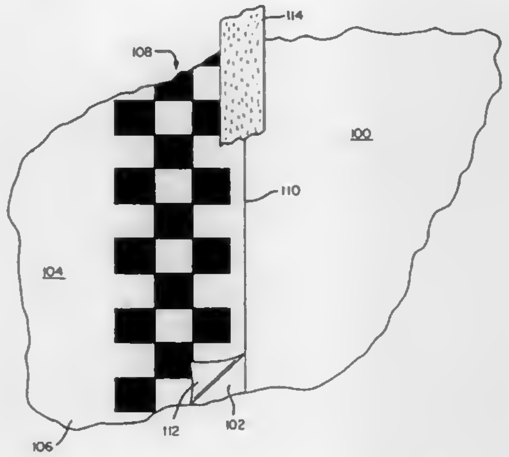
METHOD FOR CHECKING PAINT APPLIED TO A SURFACE

Kimm A. Liddell, Cincinnati, Ohio, assignor to Fibre Glass-Evercoat Company, Inc., Cincinnati, Ohio

Filed Jan. 29, 1996, Ser. No. 593,657

Int. Cl.⁶ B05D *1/32;3/12*

U.S. Cl. 427—8 **7 Claims**



1. A method for checking paint applied to a surface comprising the steps of:

forming a black and white pattern on a first side of a sheet of masking paper to form a patterned sheet of masking paper;

applying said patterned sheet of masking paper to an area adjacent a surface to be painted such that said black and white pattern is substantially adjacent said surface to be painted;

painting said surface to be painted and at least a portion of said black and white pattern substantially adjacent said surface to be painted; and

using the painted portion of said black and white pattern to determine the coverage and color of paint applied to said surface to be painted.

5,747,095

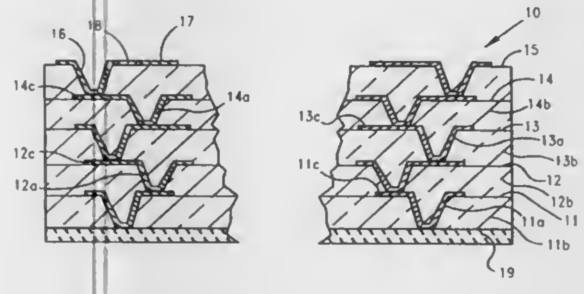
METHOD FOR REPAIRING DEFECTIVE ELECTRICAL CONNECTIONS ON MULTI-LAYER THIN FILM (MLTF) ELECTRONIC PACKAGES

Michael McAllister, Clintondale; Eric Daniel Perfecto, Poughkeepsie; James McDonald, Newburgh, all of N.Y.; Keshav Prasad, San Jose, Calif.; Gordon J. Robbins, Austin, Tex.; Chandrika Prasad, Wappingers Falls, N.Y.; Madhavan Swaminathan, and George Eugene White, both of Marietta, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 577,677, Dec. 21, 1995. This application Feb. 14, 1997, Ser. No. 800,945

Int. Cl.⁶ B05D *5/12*

U.S. Cl. 427—8 **10 Claims**



1. A method for repairing interconnections of multi-layer thin film structures or making engineering changes to the structures which structures comprise a series of layers comprising a dielectric having plated metal thereon in the form of wiring and via interconnections to the next layer and a top layer of the structure which has interconnecting vias to the lower layers and corresponding chip connection pads comprising the steps of:

building the multi-layer thin film structure layer by layer up to a layer adjacent to the top layer;

testing and/or inspecting the layer adjacent the top layer to determine interconnection faults in the multi-layer thin film structure;

forming the top layer comprising a dielectric and defining, vias, pads and via-pad connecting lines metallization;

depending on the defects determined in the multi-layer thin film structure obtained by testing the layer adjacent the top layer, defining the repair lines on the top surface needed to cure the defects and/or make engineering changes; and

forming the metallization and repair lines on the top surface to cure the defects and/or make engineering changes.

5,747,096

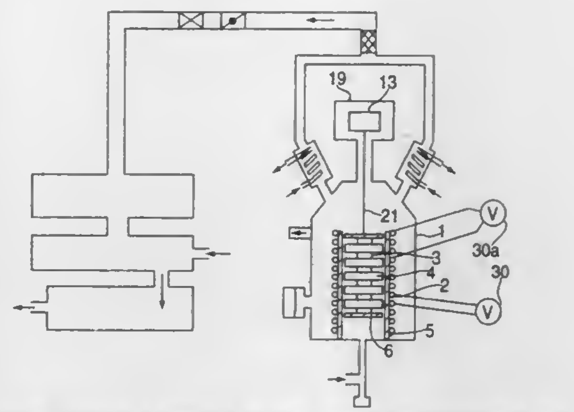
METHOD FOR MEASURING THE DEPOSITIONS, DENSIFICATION OF ETCHING RATE OF AN ELECTRICALLY CONDUCTIVE BODY

Ilan Golecki, Morris, and Dave Narasimham, Hunterdon, both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 359,172, Dec. 19, 1994, abandoned. This application Feb. 25, 1997, Ser. No. 805,794

Int. Cl.⁶ C23C *16/26*

U.S. Cl. 427—8 **10 Claims**



1. A method for determining a change from a first density to a second density of an electrically conductive porous solid structure comprising infiltrating said porous solid structure with a compound which upon decomposition forms an electrically conducting solid, decomposing said compound to form an electrically conducting solid within said porous structure and measuring a voltage or current communicated to the porous structure and the electrically conducting solid as a function of time during said infiltration and decomposition of said compound.

5,747,097

Patent Not Issued For This Number

5,747,098

PROCESS FOR THE MANUFACTURE OF PRINTED CIRCUIT BOARDS

Gary B. Larson, Cheshire, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Filed Sep. 24, 1996, Ser. No. 719,000

Int. Cl.⁶ B05D *5/12;* **H01B** *13/00;* **C25D** *5/02*

U.S. Cl. 427—58 **11 Claims**

1. A process for producing printed circuit boards, which process comprises the steps of:

1. drilling holes in a desired array in a copper clad laminate;
2. activating said holes to accept plating therein; thereafter
3. applying a resist to the surfaces of the laminate in an image-wise fashion to yield resist covered surfaces and exposed copper surfaces;
4. etching away the exposed copper surfaces;
5. plating the hole surfaces; and
6. stripping the resist;

wherein the foregoing steps are performed in the order given.

5,747,099

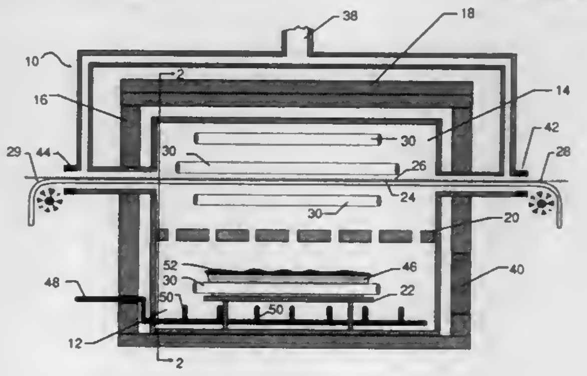
TWO CHAMBER REACTION FURNACE

Richard D. Blaugher, Evergreen, Colo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Jan. 5, 1996, Ser. No. 583,341

Int. Cl.⁶ B05D *5/12;* **C23C** *16/00*

U.S. Cl. 427—62 **10 Claims**

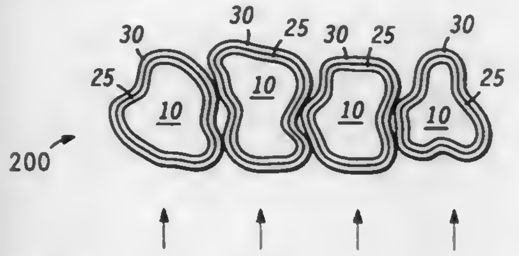


1. A process for simultaneously replacing a vaporizable reactant that has been lost from a length of reactant during annealing in a

reaction furnace wherein a vaporizable first reactant volatilizes at a first temperature and simultaneously replaces loss reactant of a length of a second reactant at a second temperature, comprising:

a) providing a substantially vertical two chamber reaction furnace comprising a lower chamber having an independently operable first heating means for heating the lower chamber and a gas inlet means for admitting a gas to create an ambient atmosphere, an upper chamber having an independently operable second heating means for heating the upper chamber, and a vapor permeable diffusion partition disposed between the lower chamber and the upper chamber, said upper chamber disposed above the lower chamber;
b) placing a vaporizable first reactant within the lower chamber;
c) placing a length of second reluctant within the upper chamber;
d) heating the lower chamber to a temperature of from about 700° C. to about 800° C. sufficient to vaporize the vaporizable first reactant within the lower chamber while admitting a gas through the gas inlet means to effectuate vaporization with vapor thereof passing through the partition into the upper chamber; and
e) simultaneously heating the upper chamber to a temperature of from about 800° C. to about 950° C. to anneal the length of said second reactant and cause a loss of a portion of the second reactant while simultaneously vaporizing the reactant of (d) on the length of the annealed second reactant to replace said portion of loss second reactant within the upper chamber.

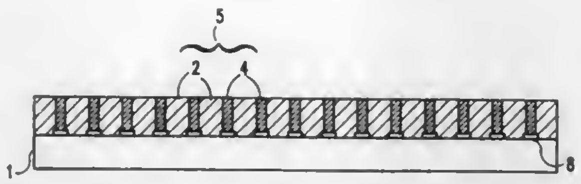
5,747,100
PHOSPHOR AND METHOD OF MAKING SAME
Ronald O. Petersen, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 645,406, May 13, 1996. This application Jan. 13, 1997, Ser. No. 783,838
Int. Cl.^{6} B05D *5/06*
U.S. Cl. 427—64 14 Claims



1. A method for making a phosphor comprising the steps of:
providing a particle of a UV-excitable light-emitting phosphor, the particle having an outer surface; and
coating the outer surface of the particle with an electron-excitable UV-emitting material.

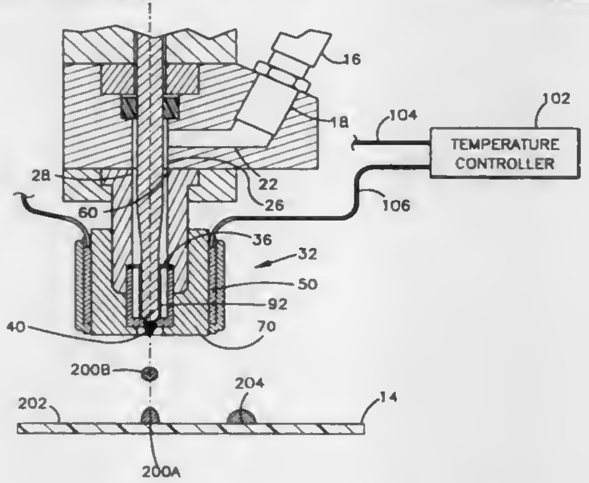
5,747,101
DIRECT CHIP ATTACHMENT (DCA) WITH ELECTRICALLY CONDUCTIVE ADHESIVES
Richard B. Booth, Williamson County, Tex.; Michael A. Gaynes; Robert M. Murcko, both of Broome County, N.Y.; Viswanadham Puligandla, Travis County, Tex.; Judith M. Roldan; Ravi Saraf, both of Westchester County, N.Y., and Jerzy M. Zalesinski, Crittenden County, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 190,507, Feb. 2, 1994, Pat. No. 5,543,585. This application Apr. 9, 1996, Ser. No. 630,033
Int. Cl.^{6} B05D *5/12*
U.S. Cl. 427—96 15 Claims

1. A method of making integrated circuit chips comprising the steps of:
applying an insulative thermoplastic adhesive paste, over a semiconductor wafer substrate having a plurality of chip sites and integrated circuits communicating with a matrix of conductive metal pads on a major surface of the substrate;
drying the insulative thermoplastic;



forming holes in the insulative thermoplastic layer at the metal pads;
filling the holes with a conductive thermoplastic adhesive paste; and
drying the conductive thermoplastic to form a dry composite adhesive layer dividing the wafer into a plurality of chips after forming the composite layer.

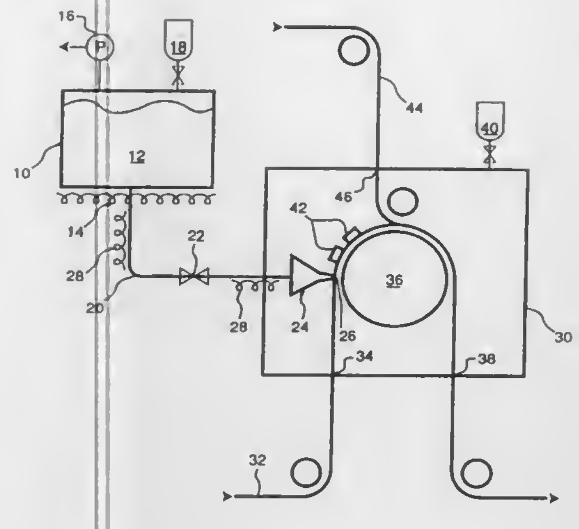
5,747,102
METHOD AND APPARATUS FOR DISPENSING SMALL AMOUNTS OF LIQUID MATERIAL
James C. Smith, Amherst; Patrick T. Hogan, Lorain, and Laurence B. Saidman, Avon Lake, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio
Continuation-in-part of Ser. No. 559,332, Nov. 16, 1995, which is a continuation-in-part of Ser. No. 607,126, Feb. 26, 1996. This application Jul. 17, 1996, Ser. No. 682,160
Int. Cl.^{6} B05D *5/12*
U.S. Cl. 427—96 32 Claims



6. A method of depositing a layer of liquid or viscous material on a substrate, said method comprising the steps of:
dispensing a stream of said liquid or viscous material through an outlet end of a nozzle with a valve;
stopping the stream of the liquid or viscous material by closing the valve so that the stream breaks away rapidly from the nozzle to form a droplet;
forming a plurality of the droplets of said liquid or viscous material when said stream of said liquid or viscous material breaks away from said nozzle; and
depositing said plurality of droplets onto said substrate at spaced, selective locations so that said plurality of droplets flow together into a uniform coating.

5,747,103
METHOD AND APPARATUS FOR PRINTIGN LITHIUM PATTERNS ON A PRESS
Chauncey T. Mitchell, Jr., Lakeland, Tenn.; David M. Good; Mark A. Shadle, both of Peachtree City, Ga., and Gerrit L. Verschuur, Lakeland, Tenn., assignors to Voxcom, Inc., Peachtree City, Ga.
Filed Apr. 10, 1997, Ser. No. 835,666
Int. Cl.^{6} B05D *5/12*
U.S. Cl. 427—123 34 Claims

1. A method of printing a succession of lithium patterns along a web comprising the steps of:



heating lithium to its molten state within a first confinement having a controlled environment;
advancing a web through a second confinement having a controlled environment;
maneuvering successive portions of the web past a chiller within a portion of the second confinement;
conveying the molten lithium from the first confinement to an opening within the second confinement;
dispensing discrete amounts of the molten lithium through the opening onto the successive portions of the web that are maneuvered past the chiller;
chilling the dispensed lithium to a solid state forming the succession of lithium patterns along the web; and
applying a seal over the lithium patterns to limit exposure of the lithium patterns to ambient environment.

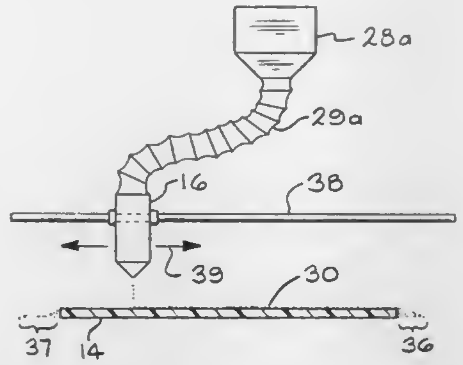
5,747,104
METHOD TO CONTROL FUGITIVE DUST AND SODIUM HYDROXIDE IN BAUXITE TAILINGS DISPOSAL PITS
Ronald G. Baebel, 9107 White Oak La., Houston, Tex. 77040
Filed Feb. 5, 1997, Ser. No. 794,415
Int. Cl.^{6} B05C *5/12*
U.S. Cl. 427—136 16 Claims

1. A method for treating the surface of a bauxite tailings disposal pit comprising applying a chemical composition to the surface of the pit, the composition comprising magnesium chloride or calcium chloride or mixtures thereof.

5,747,105
TRAVERSING NOZZLE FOR APPLYING GRANULES TO AN ASPHALT COATED SHEET
Thomas D. Haubert, Columbus, Ohio, assignor to Owens Corning Fiberglas Technology Inc., Summit, Ill.
Filed Apr. 30, 1996, Ser. No. 640,641
Int. Cl.^{6} B05D *1/02*
U.S. Cl. 427—186 20 Claims

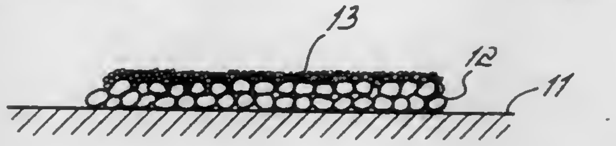
1. A method of applying granules to an asphalt coated sheet moving in a machine direction, the sheet having a first edge and a second edge, the method comprising providing a nozzle for discharging granules onto the sheet, mounting the nozzle for movement along a path which traverses the sheet and extends beyond the first and second edges defining first and second extension locations beyond the edges, and moving the nozzle along the path, wherein the step of applying the granules includes:

(a) beginning the discharge of the granules from the nozzle in the first extension location so that a constant flow rate of



granules is achieved while the nozzle is discharging granules in the first extension location,
(b) moving the nozzle across the first edge and along the path to apply granules moving the nozzles to the sheet
(c) moving the nozzle across the second edge while maintaining a constant flow of granules so that a constant flow of granules is discharged in the second extension location, and
(d) ending the discharge of the granules.

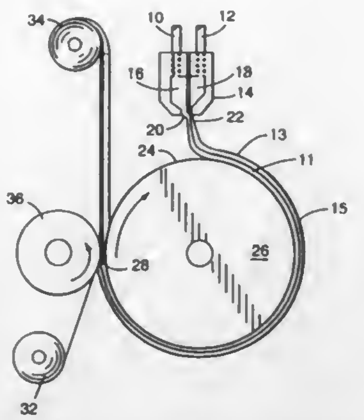
5,747,106
TWO STAGE POWDER APPLICATION METHOD
Masafumi Matsunaga, Tokyo, Japan, assignor to Nordson Corporation, Westlake, Ohio
PCT No. PCT/US94/02743, § 371 Date Feb. 26, 1996, § 102(e) Date Feb. 26, 1996, PCT Pub. No. WO94/21385, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 14, 1994, Ser. No. 513,893
Claims priority, application Japan, Mar. 15, 1993, 5-081440
Int. Cl.^{6} B05D *1/02*
U.S. Cl. 427—201 6 Claims



1. A method for powder coating a surface comprising the steps of:
a) applying to the surface, during a first coating stage, a first layer of powder particles having a first average diameter; and
b) applying to the first layer of powder particles, in a second coating stage subsequent to the first coating stage, a second layer of powder particles having a second average diameter smaller than the first average diameter so that at least some of the particles applied during the second coating stage fill spaces between particles applied during the first coating stage, thereby to form a coating on the surface comprising powder particles applied during the first and second stages.

5,747,107
METHOD OF APPLYING A HOT MELT COATING
Glen H. Bayer, Jr., Cottage Grove, and Timothy J. O'Leary, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 26, 1995, Ser. No. 548,897
Int. Cl.^{6} B05D *5/10*
U.S. Cl. 427—208.4 7 Claims

1. A method of applying a coating of hot melt polymeric material to a substrate, said method comprising the steps of:
providing a coating apparatus including an application roller having a cylindrical peripheral surface about an axis, means mounting the application roller for rotation about the axis, die means having a first elongate die outlet opening, and means for mounting the die means at a die position along the



cylindrical peripheral surface of the application roller with the die opening extending generally parallel to the axis of the application roller;

rotating the application roller about the axis to provide a first velocity and direction of movement for the peripheral surface of the application roller and movement of the peripheral surface of the application roller past the die opening;

extruding a hot melt polymeric material through the first die opening onto the peripheral surface of the rotating application roller to provide a first coating layer along the peripheral surface with a first surface of the first coating layer in contact with the peripheral surface of the rotating application roller;

conveying the substrate past the peripheral surface of the application roller at an application interface with generally the same direction of movement as the periphery of the application roller to cause transfer of the first coating layer to the substrate at the application interface with the first surface of the first coating layer on the side of the first coating layer opposite the substrate, the substrate being conveyed at a velocity greater than the peripheral surface velocity of the application roller to shear and reduce the thickness of the first coating layer on the substrate with respect to the thickness of the first coating layer on the peripheral surface of the application roller;

the velocity of the peripheral surface and spacing between the die position and the application interface along that peripheral surface providing a time interval of at least 0.12 second for movement of portions of the first coating layer from the die position to the application interface to afford relaxation and molecular reorientation of the hot melt polymeric material after said extruding step to facilitate shearing of the first coating layer at the application interface.

5,747,108

SUPER-CONCENTRATED LIQUID RINSE CYCLE FABRIC SOFTENING COMPOSITION

Amjad Farooq, Somerset, and Jeffrey Joseph Mastrull, Middlesex, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

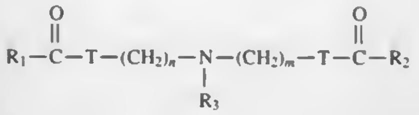
Filed Mar. 19, 1997, Ser. No. 818,694

Int. Cl.⁶ B05D *3/12*

U.S. Cl. 427—242 11 Claims

1. A concentrated, stable, pourable and water dispersible liquid fabric softener composition containing a perfume and having a viscosity of less than about 2,000 centipoise at 20° C. comprising an aqueous dispersion containing

(a) more than 35%, by weight, of a combination of softening components (A) and (B) wherein (A) is an inorganic or organic acid salt of a fabric softening compound of formula (I):



$$R_1-\overset{O}{\overset{\|}{C}}-T-(CH_2)_n-\underset{R_3}{\underset{|}{N}}-(CH_2)_m-T-\overset{O}{\overset{\|}{C}}-R_2 \qquad (I)$$

wherein

R_1 and R_2 independently represent C_{12} to C_{30} aliphatic hydrocarbon groups,

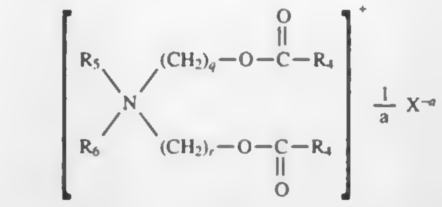
R_3 represents $(CH_2CH_2O)_pH$, CH_3 or H, T represents NH,

n=1 to 5,

m=1 to 5, and

p=1 to 10; and

(B) is a biodegradable fatty ester quaternary ammonium compound of formula (II):


(II)

wherein

each R_4 independently represents an aliphatic hydrocarbon group having from 8 to 22 carbon atoms,

R_5 represents $(CH_2)_s$ R_7 where R_7 represents an alkoxy carbonyl group containing from 8 to 22 carbon atoms, benzyl, phenyl, $(C_1–C_4)$—alkyl substituted phenyl, OH or H; R6 represents $(CH_2)_t$ R_8 where R_8 represents benzyl, phenyl, $(C_1–C_4)$ alkyl substituted phenyl, OH or H;

q, r, s and t, each independently, represent a number of from 1 to 3; and x is an anion of valence a;

the weight ratio of component (A) to component (B) being from about 5:1 to about 1:5, and with the proviso that at least 15% of hydrocarbon groups containing two or more carbon atoms in components (A) and (B) combined contain at least one unsaturated carbon to carbon bond;

(b) an aqueous solvent including an anti-gelling effective amount of electrolyte;

(c) a fatty alcohol ethoxylate in an amount sufficient to emulsify the perfume in the composition; and

(d) an effective amount of a polyethylene glycol polymer or a polyethylene glycol alkyl ether polymer having a molecular weight of at least about 200, said effective amount being sufficient to prevent gelation of the composition.

5,747,109

METHOD OF PREPARING SUPER-CONCENTRATED LIQUID RINSE CYCLE FABRIC SOFTENING COMPOSITION

Amjad Farooq, Somerset, and Jeffrey Joseph Mastrull, Middlesex, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

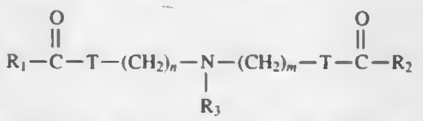
Filed Mar. 19, 1997, Ser. No. 818,697

Int. Cl.⁶ B05D *3/12*

U.S. Cl. 427—242 8 Claims

1. A method of preparing a concentrated stable, pourable and water-dispersible liquid fabric softening composition containing a perfume and having a viscosity of less than about 2,000 centipoise at 20° C., wherein the composition contains

(a) more than 35%, by weight, of softening components (A) and (B) wherein (A) is an inorganic or organic acid salt of a fabric softening compound of formula (I):



$$R_1-\overset{O}{\overset{\|}{C}}-T-(CH_2)_n-\underset{R_3}{\underset{|}{N}}-(CH_2)_m-T-\overset{O}{\overset{\|}{C}}-R_2 \qquad (I)$$

wherein R_1 and R_2 independently represent C_{12} to C_{30} aliphatic hydrocarbon groups,

R_3 represents $(CH_2CH_2O)_pH$, CH_3 or H,

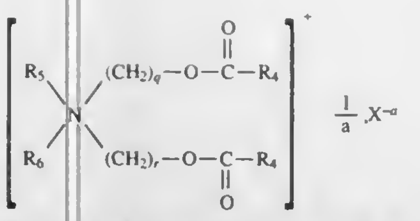
T represents NH,

n=1 to 5,

m=1 to 5, and

p=1 to 10; and

(B) is a biodegradable fatty ester quaternary ammonium compound of formula (II):


(II)

wherein each R_4 independently represents an aliphatic hydrocarbon group having from 8 to 22 carbon atoms,

R_5 represents $(CH_2)_s$ R_7 where R_7 represents an alkoxy carbonyl group containing from 8 to 22 carbon atoms, benzyl, phenyl,

$(C_1–C_4)$—alkyl substituted phenyl, OH or H; R_6 represents $(CH_2)_t$ R_8 where R_8 represents benzyl, phenyl, $(C_1–C_4)$ alkyl substituted phenyl, OH or H; q, r, s and t, each independently, represent a number of from 1 to 3; and x is an anion of valence a;

the weight ratio of component (A) to component (B) being from about 5:1 to about 1:5, and with the proviso that at least 15% of hydrocarbon groups containing two or more carbon atoms in components (A) and (B) combined contain at least one unsaturated carbon to carbon bond;

(b) an aqueous solvent including an anti-gelling effective amount of electrolyte;

(c) a fatty alcohol ethoxylate in an amount sufficient to emulsify the perfume in the composition; and

(d) an effective amount of a polyethylene glycol polymer or a polyethylene glycol alkyl ether polymer having a molecular weight of at least about 200, said effective amount being sufficient to prevent gelation of the composition, the method comprising the steps of:

(1) preparing an oil phase portion comprising said component (A) and said component (B), component (A) being in the form of a protonated or a non-protonated amine;

(2) preparing a water phase portion comprising an aqueous solution of said polyethylene glycol or polyethylene glycol alkyl ether polymer with the proviso that when component (A) is present in the oil phase portion in the form of a non-protonated amine, the water phase portion further contains an inorganic or organic acid capable of protonating component (A);

(3) heating said oil phase portion to a temperature above about 60° C. and then mixing same with the water phase portion to form a gel or thick emulsion;

(4) preparing an aqueous solution of said electrolyte and adding same with agitation to the gel or emulsion formed in step (3) to form a thin pourable emulsion;

(5) preparing an aqueous slurry comprising an emulsifying amount of said fatty alcohol ethoxylate and said perfume; and

(6) adding the slurry of step (5) under agitation to the emulsion of step (4) at a temperature above about 35° C. to provide a concentrated, stable and readily pourable perfume-containing softening composition.

5,747,110

POROUS WEBS

Alan Tallentire, Wilmslow, and Colin Samuel Sinclair, Manchester, both of United Kingdom, assignors to Bowater Packaging Limited, London, United Kingdom

PCT No. PCT/GB93/00070, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/14265, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 256,377

Claims priority, application United Kingdom, Jan. 14, 1992, 9200683

Int. Cl.⁶ B05D *1/12;3/12;5/00*

U.S. Cl. 427—244 13 Claims

1. A method of modifying a web of porous material comprising providing a substrate web of porous material having pores with a range of sizes; and treating at least a part of the material with a particulate material agent under conditions such that the agent is selectively incorporated in a minor portion of the total number of the pores, said minor portion being at the upper half of the size range; and wherein the material agent is selected from particulate materials which, when selectively incorporated, affect at least one property of the web selected from:

(i) ion exchange properties, the agent being an ion exchange resin;

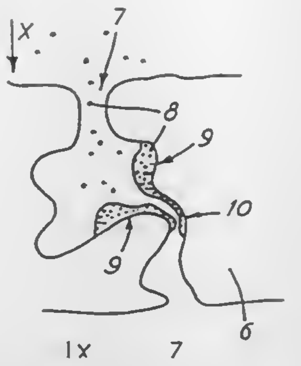
(ii) catalytic properties, the agent being a catalyst;

(iii) detectable marking or colouring, the agent being a pigment, dye, or other marking agent;

(iv) deodorising ability, the agent being an odour removing agent;

(v) absorption properties, the agent being an absorbent agent;

(vi) conductivity.



5,747,111

STEEL SHEET COATED WITH ZN-MG BINARY COATING LAYER EXCELLENT IN CORROSION RESISTANCE AND MANUFACTURING METHOD THEREOF

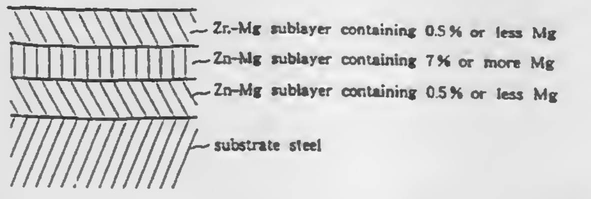
Yasushi Fukui; Masanori Matsuno; Hiroshi Tanaka; Tadaaki Miono; Kazushi Sakamoto; Yasumi Ariyoshi, and Minoru Saito, all of Sakai, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Division of Ser. No. 607,703, Feb. 27, 1996, Pat. No. 5,648,177. This application Jan. 24, 1997, Ser. No. 787,260

Claims priority, application Japan, Feb. 28, 1995, 7-65096; Oct. 18, 1995, 7-294736

Int. Cl.⁶ C23C *14/56;* **C21D** *9/50*

U.S. Cl. 427—250 7 Claims


Zn-Mg sublayer containing 0.5% or less Mg
Zn-Mg sublayer containing 7% or more Mg
Zn-Mg sublayer containing 0.5% or less Mg
substrate steel

1. A method of manufacturing a steel sheet coated with a Zn-Mg layer having one of a tri-layered or penta-layered structure comprising a first sublayer including a Zn-Mg alloy having a Mg concentration of about 0.5 wt. % or less, an intermediate sublayer including a Zn-Mg alloy having a Mg concentration of about 7 wt. % or more and an outermost sublayer including a Zn-Mg alloy having a Mg concentration of about 0.5 wt. % or less, wherein the sublayers are successively laminated on a substrate steel wherein a Zn-Fe or Zn-Fe-Mg alloy layer is formed at a boundary between the substrate steel and the Zn-Mg coating layer, said method comprising the steps of:

vapor depositing primary Zn on a surface of a steel sheet; and

successively vapor depositing Mg and Zn on said surface,

wherein a ratio of said primary Zn deposition to said Mg deposition is controlled to a value of about 1.5 or more.

5,747,112

PROCESS FOR THE PRODUCTION OF HEAT- AND CORROSION-RESISTANT POROUS METAL BODY

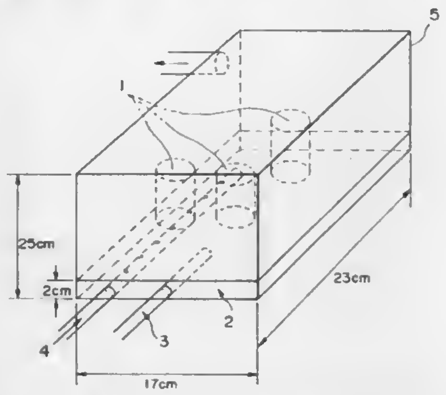
Toshiyasu Tsubouchi; Satoru Okamoto, and Tomohiko Ihara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation-in-part of Ser. No. 491,416, Jun. 16, 1995, Pat. No. 5,672,387. This application Sep. 9, 1996, Ser. No. 706,739

Claims priority, application Japan, Aug. 12, 1994, 6-190424; Dec. 28, 1994, 6-327996

Int. Cl.^{6} B01D *53/00*

U.S. Cl. 427—253 **5 Claims**



1. A process for the production of a heat- and corrosion-resistant porous metal body having at least a surface layer of metal, said process comprising

placing said body on or apart from a powder, said body not being embedded in said powder, said powder comprising NH_4Cl and chromium and/or a chromium compound in an amount of 15% to 35% by weight, calculated as chromium and based on said powder,

heating said powder and said body to 800° 1100° C. in a heating zone in the presence of a mixed gas comprising a generated gas and a reducing diluent gas, said generated gas resulting from heating said powder to 950° C. to 1100° C., and said reducing diluent gas being flowed into said heating zone substantially throughout said heating in an amount of 0.01 to 0.06 mol/min per 1 kg, in terms of Cr, of said chromium or chromium compound.

5,747,113

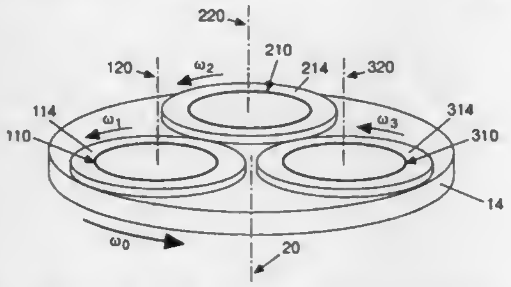
METHOD OF CHEMICAL VAPOR DEPOSITION FOR PRODUCING LAYER VARIATION BY PLANETARY SUSCEPTOR ROTATION

Charles Su-Chang Tsai, 2653 S. Daytona Ave., Hacienda Hts, Calif. 91745

Filed Jul. 29, 1996, Ser. No. 688,256

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 427—255.5 **10 Claims**



1. A chemical vapor deposition method for depositing at least one layer of material onto a plurality of substrates, comprising the steps of:

providing a reactor containing a planetary susceptor rotation means comprising a plurality of secondary susceptors for supporting said substrates, wherein said rotation means allows simultaneously at least two significantly different rotation rates for said secondary susceptors, and

rotating said secondary susceptors simultaneously at said two or more rotation rates during at least a portion of depositing said layer, wherein at least one of said two or more significantly different rotation rates is not zero.

5,747,114

PROCESS FOR THE EFFECT COATING OF GRAINED PLASTICS PARTS

Helga Stegen, Wuppertal; Joachim Blum, Remscheid, and Klaus-Günter Kerlin, Haan, all of Germany, assignors to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Germany

Filed Sep. 18, 1996, Ser. No. 710,476

Claims priority, application Germany, Sep. 23, 1995, 195 35 452.4

Int. Cl.^{6} B05D *3/02;5/06*

U.S. Cl. 427—380 **11 Claims**

1. A process for the effect coating of polar plastics parts, said parts having a grained surface, comprising:

a) applying a first coating layer, which is free from effect pigments and modified polyolefines, and which comprises a coating medium based on binder vehicle systems that may be dried physically and which contain one or more polyurethane resins and/or oligomeric urethanes and which do not chemically crosslink at 60° to 110° C., at a dry coat thickness of 5 to 40 μm,

b) drying at a drying temperature of 20° to 80° C. down to a residual content of 3 to 20% by weight of volatile fractions which are contained in the first coating layer at the drying temperature employed,

c) applying a second coating layer by overcoating the first coating layer wet-on-wet with a base lacquer containing effect-pigments,

d) drying at a drying temperature of 20° to 80° C. down to a residual content of 3 to 20% by weight of volatile fractions which are contained in the second coating laver at the drying temperature employed,

e) applying a third coating laver by overcoating the second coating layer wet-on-wet with a liquid clear lacquer which chemically crosslinks with the formation of covalent bonds at temperatures of 60° to 110° C., and

f) jointly drying or hardening the three coating layers at temperatures of 60° to 1100° C.

5,747,115

UV-CURABLE AND NON-VOLATILE PIGMENTED COATINGS

Barbara F. Howell, Arnold, and Karen M. Poole, Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

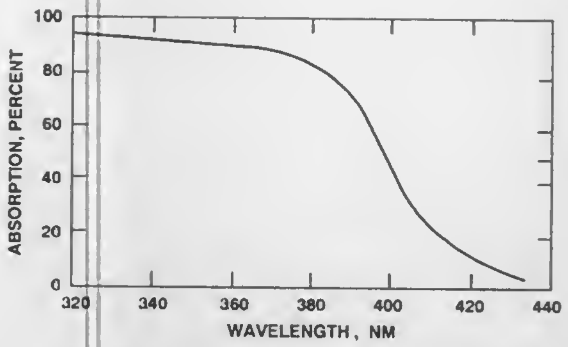
Continuation of Ser. No. 128,406, Sep. 30, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 397,014

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—514 **15 Claims**

2. A method for forming a pigmented organic coating on a metal surface comprising:

A. mixing the following components to form a resin mixture
  (1) a resin that is an aromatic urethane diacrylate, an aliphatic urethane diacrylate, a polyester tetra-acrylate, or an epoxy acrylate,
  (2) a photoinitiator that is
    (a) 2-hydroxy-2-methyl-1-phenyl-1-propanone and diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide in a 1:1 molar ratio,
    (b) 2-methyl-1-[4-(methylthio)phenyl]-2-(4-morpholinyl)-1-propanone,
    (c) 2-benzyl-2-(dimethylamino)-1-[4-(4-morpholinyl) phenyl]-1-butanone, or



    (d) N-cyclopropyl-N'-(1,1-dimethylethyl)-6-(methylthio)-1,3,5-triazine-2,4-diamine, and
  (3) a photosensitizer that is
    (a) isopropyl thioxanthone,
    (b) chlorothioxanthone, or
    (c) thioxanthone;

B. mixing a pigment that is titanium dioxide or a mixture of titanium dioxide and manganese ferrite with said resin mixture to form a spreadable composition wherein the pigment comprises from more than zero to 10 weight percent of the spreadable composition;

C. applying said spreadable composition to said metal surface to form a coating thereon; and

D. curing said coating with a radiation from a xenon lamp.

5,747,116

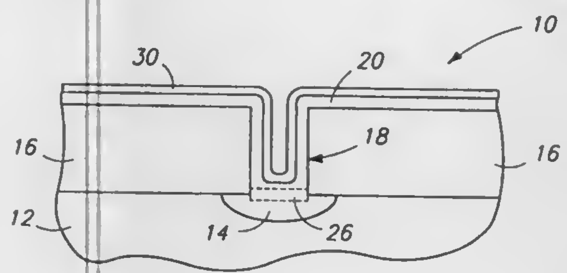
METHOD OF FORMING AN ELECTRICAL CONTACT TO A SILICON SUBSTRATE

Sujit Sharan, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 336,260, Nov. 8, 1994, Pat. No. 5,576,071, and Ser. No. 506,040, Jul. 24, 1995, Pat. No. 5,661,115. This application Jan. 16, 1996, Ser. No. 587,145

Int. Cl.^{6} C23C *16/56;* **H05H** *1/00*

U.S. Cl. 427—534 **29 Claims**



1. A method of forming an electrical contact to a substrate comprising the following steps:

placing a substrate having a silicon node to which electrical connection is to be made within a chemical vapor deposition reactor;

injecting a first titanium organometallic precursor to within the reactor having the substrate positioned therein, and maintaining the reactor at a temperature and a pressure which in combination are effective to deposit a first layer comprising titanium nitride onto the substrate over the node to a first thickness, the first layer of titanium nitride having incorporated carbon from the first titanium organometallic precursor, the first layer and silicon node defining a contact interface therebetween having a first electrical resistance;

after depositing the first layer, ceasing to inject the first titanium organometallic precursor into the reactor and first injecting a first component gas into the reactor and generating a first plasma from the first component gas within the reactor against the first layer, the first component gas and first plasma generated therefrom having a component which is effective when in an activated state to interact with a component of the deposited first layer to remove carbon from the first layer;

after depositing the first layer, exposing an interface of the titanium nitride and silicon node to conditions effective to transform such interface to a second electrical resistance which is lower than the first electrical resistance;

after the first plasma treatment, injecting a second titanium organometallic precursor to within the reactor, and maintaining the reactor at a temperature and a pressure which in combination are effective to deposit a second layer comprising titanium nitride over the first layer to a second thickness, the second layer of titanium nitride having incorporated carbon from the second titanium organometallic precursor; and

after depositing the second layer, ceasing to inject the second titanium organometallic precursor into the reactor and second injecting a second component gas into the reactor and generating a second plasma from the second component gas within the reactor against the first layer, the second component gas and second plasma generated therefrom having a component which is effective when in an activated state to interact with a component of the deposited second layer to remove carbon from the second layer.

5,747,117

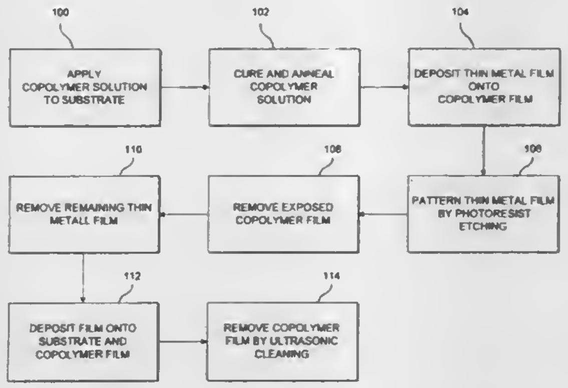
METHOD OF APPLYING A FILM TO A SUBSTRATE

Rand Dannenberg, Huntington, N.Y., assignor to Servo Corporation of America, Westbury, N.Y.

Filed Jun. 4, 1997, Ser. No. 869,130

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 427—535 **9 Claims**


100
APPLY COPOLYMER SOLUTION TO SUBSTRATE
102
CURE AND ANNEAL COPOLYMER SOLUTION
104
DEPOSIT THIN METAL FILM ONTO COPOLYMER FILM
110
REMOVE REMAINING THIN METALL FILM
108
REMOVE EXPOSED COPOLYMER FILM
106
PATTERN THIN METAL FILM BY PHOTORESIST ETCHING
112
DEPOSIT FILM ONTO SUBSTRATE AND COPOLYMER FILM
114
REMOVE COPOLYMER FILM BY ULTRASONIC CLEANING

1. A method of depositing a film onto a substrate in accordance with a predetermined pattern, comprising the steps of:

applying a solution onto a surface of a substrate, said solution being composed of a copolymer dissolved in a solvent;

curing and annealing said solution to form a copolymer film on said surface of said substrate;

depositing a thin metal film onto said copolymer film;

removing a portion of said thin metal film corresponding to said predetermined pattern so that said copolymer film is exposed in accordance with said predetermined pattern;

removing exposed surfaces of said copolymer film so that said substrate is exposed in accordance with said predetermined pattern;

removing any of said thin metal film remaining on said copolymer film;

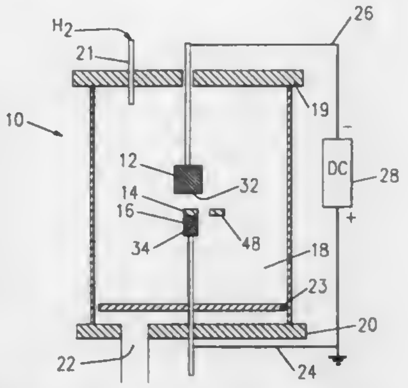
depositing a film onto said substrate and said copolymer film; and

removing said copolymer film from said substrate and any of said film deposited on said copolymer film so that said film remains on said substrate in accordance with said predetermined pattern.

5,747,118
PLASMA ENHANCED CHEMICAL TRANSPORT PROCESS FOR FORMING DIAMOND FILMS

Rointan F. Bunshah, Playa Del Rey; Hans J. Doerr, Westlake Village, and Shyankay Jou, Santa Monica, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 223,693, Apr. 6, 1994, abandoned.
This application Aug. 2, 1995, Ser. No. 510,483
Int. Cl.^{6} B05D *3/06;* **C23C** *16/00*
U.S. Cl. 427—577 **20 Claims**



1. A plasma enhanced chemical transport process for the formation of a diamond film on a substrate, the substrate being located on or near an anode in a dc circuit, the substrate being spaced from a carbon cathode and the anode, the substrate and the cathode being located within a vacuum chamber consisting essentially of the steps of:

a.) positioning the substrate at a distance from a lower surface of the cathode to form a gap of from about 0.4 to about 1.0 cm,

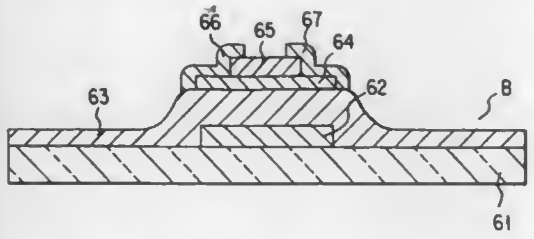
b.) evacuating substantially all of the gases from the vacuum chamber and then introducing sufficient substantially pure hydrogen gas into the chamber to bring the pressure in the chamber to the range from about 80 Torr to about 180 Torr, and

c.) applying a dc current to the circuit and across the gap between the anode and the cathode without the addition of an electron assisted discharge to form a hydrogen plasma in the gap, the current density at an upper surface of the anode being from about 0.5 to about 4.0 amp/cm^2.

5,747,119
VAPOR DEPOSITION METHOD AND APPARATUS

Noriyuki Hirata, Ayase, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 318,635, Oct. 5, 1994, abandoned.
This application Jan. 26, 1996, Ser. No. 592,614
Claims priority, application Japan, Feb. 5, 1993, 5-018930
Int. Cl.^{6} C23C *16/22; 16/46*
U.S. Cl. 427—585 **6 Claims**



1. A chemical vapor deposition method for applying a plurality of vapor-deposited films on a glass substrate, said method comprising the steps of:

vapor-depositing a first film formed of a first material on a glass substrate having a first temperature in a first film-forming chamber;

carrying the glass substrate from the first film-forming chamber to a second film-forming chamber having a heater that operates at a constant operating temperature;

promoting heat conduction between the glass substrate and the heater by setting a total vapor pressure in the second film-forming chamber to a range of from 0.1 Torr to 5 Torr;

controlling the glass substrate temperature, which is disposed in the second film-forming chamber, to a second temperature by changing the total vapor pressure in the second film-forming chamber while maintaining the total vapor pressure within the range of from 0.1 Torr to 5 Torr and while maintaining the operating temperature of the heater constant; and

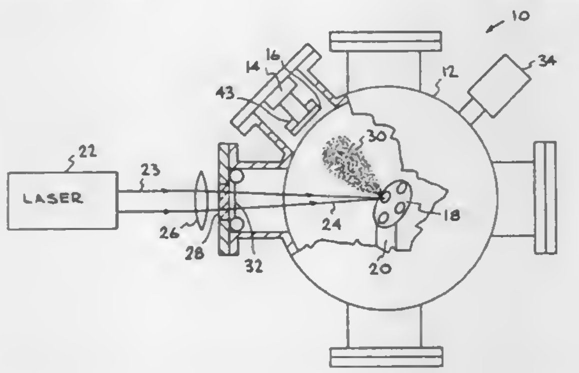
vapor-depositing a second film formed of a second material, which is different from the first material of the first film, on the glass substrate having the second temperature,

wherein said step of changing the glass substrate temperature to the second temperature is conducted in a shorter amount of time than had the total vapor pressure in the second film-forming chamber not been set to the range of from 0.1 Torr to 5 Torr.

5,747,120
LASER ABLATED HARD COATING FOR MICROTOOLS

William McLean, II, Oakland; Mehdi Balooch, and Wigbert J. Siekhaus, both of Berkeley, all of Calif., assignors to Regents Of The University Of California, Oakland, Calif.

Continuation of Ser. No. 624,231, Mar. 29, 1996, abandoned.
This application Feb. 11, 1997, Ser. No. 799,085
Int. Cl.^{6} B05D *3/06*
U.S. Cl. 427—596 **16 Claims**



1. A method for improving the useful lifetime of instruments and tools, comprising:

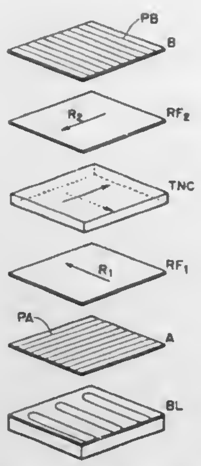
depositing by laser ablation in a visible light spectrum with a repetition rate of 500–10,000 Hz and with a deposition rate of 1000–5000 μm-cm^2/hr a film of diamond-like carbon to a thickness of not greater than about 20 nm on wear surfaces of said instruments and tools.

5,747,121
OPTICAL COMPENSATORY SHEET

Masaki Okazaki; Shigeki Yokoyama, and Masayuki Negoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 8, 1996, Ser. No. 598,278
Claims priority, application Japan, Feb. 8, 1995, 7-020583; Apr. 20, 1995, 7-094659; Jul. 27, 1995, 7-210212
Int. Cl.^{6} C09K *19/00*
U.S. Cl. 428—1 **10 Claims**

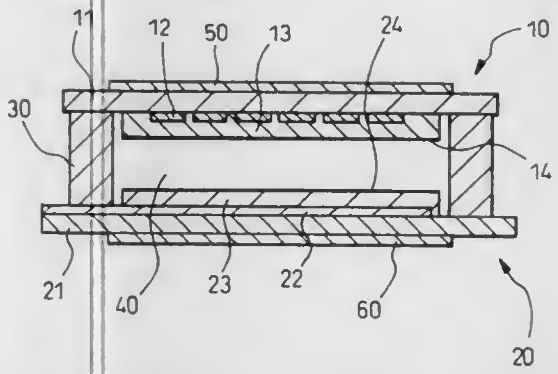
1. An optical compensatory sheet which comprises a transparent support, an orientation layer provided thereon and an optically anisotropic layer provided on the orientation layer, the orientation layer comprising a polymer and the optically anisotropic layer comprising a liquid crystalline compound, wherein the polymer of the orientation layer is chemically bonded to the liquid crystalline compound of the optically anisotropic layer via the interface of these layers.



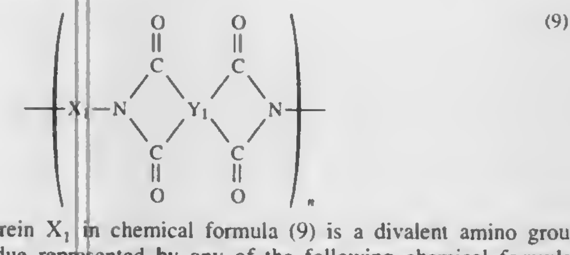
5,747,122
ANTIFERROELECTRIC LIQUID CRYSTAL CELL

Norio Yamamoto, Kariya; Takayuki Fujikawa, Ofu; Shunichi Koide, and Yoshiichi Suzuki, both of Tokyo, all of Japan, assignors to Nippondenso Co., Ltd., Aichi-pref., Japan

Filed Sep. 9, 1996, Ser. No. 709,663
Claims priority, application Japan, Mar. 8, 1996, 8-051868
Int. Cl.^{6} G02F *1/1337*
U.S. Cl. 428—1 **8 Claims**

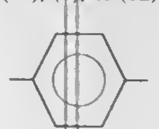


1. An antiferroelectric liquid crystal cell comprising two electrode plates and an antiferroelectric liquid crystal injected between the two electrode plates, both of said electrode plates having aligning films on their respective inner surfaces in contact with said antiferroelectric liquid crystal, wherein each of said aligning films is formed of polyimide film represented by the following chemical formula (9),



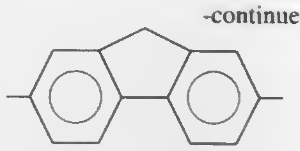
(9)

wherein X_1 in chemical formula (9) is a divalent amino group residue represented by any of the following chemical formulas (10), (11), (2), or (12),

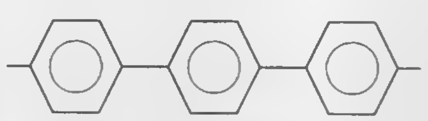


(10)

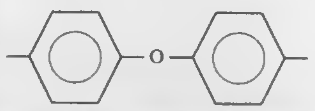
-continued



(11)

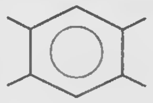


(2)

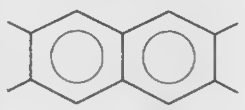


(12)

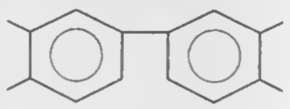
wherein Y_1 is a tetravalent carboxylate residue represented by any of the following chemical formulas (3) through (7),



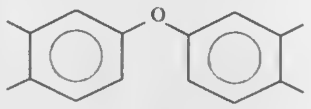
(3)



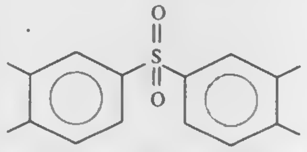
(4)



(5)



(6)



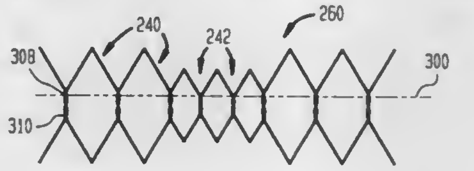
(7)

and wherein each of said aligning films has a thickness in the range of from 100 Å to less than 400 Å.

5,747,123
EXPANDABLE-COLLAPSIBLE ARTICLE HAVING A CONTOURED SURFACE

Ralph Fritzman, Sarasota, Fla., assignor to Cellular Designs Unlimited, Inc., Sarasota, Fla.

Division of Ser. No. 298,496, Aug. 30, 1994. This application Nov. 28, 1995, Ser. No. 563,331
Int. Cl.^{6} B32B *3/12*
U.S. Cl. 428—12 **24 Claims**



1. An expandable-collapsible article, comprising:

a series of interconnected, multi-sided cellular units formed from sheet material, each of said cellular units having an interior and being formed with at least one fold line which defines a peak;

said sides of adjacent cellular units collectively forming an exterior surface having a contoured appearance wherein the peaks of said cellular units are located in at least two different planes.

5,747,124
POLYAMIDE SAUSAGE CASINGS HAVING IMPROVED SKINNING CHARACTERISTICS

Dirk Pophusen, Walsrode, and Michael Hennig Cardinal von Widdern, Fallingbostel, both of Germany, assignors to Wolff Walsrode AG, Walsrode, Germany

Filed Aug. 2, 1996, Ser. No. 692,026

Claims priority, application Germany, Aug. 11, 1995, 195 29 603.6

Int. Cl.^{6} A22C *13/00*

U.S. Cl. 428—34.8 18 Claims

1. An at least 4-layer coextruded, biaxially stretched, tubular seamless casing for sausages to be heated in water and cooking-sausages, having improved tearing properties in the filled state associated with a decreased tendency to burst open when the sausage product is first cut, comprising at least two layers composed predominantly of aliphatic polyamide, which form the inner and outer surfaces of the tube, and at least two additional layers, which are enclosed by the inner and outer polyamide layers, with at least one of the enclosed layers acting as a water vapour barrier and having the structure of a polyolefin and at least one other of the enclosed layers acting as an oxygen barrier and consisting mainly of ethylene vinyl alcohol copolymers, the quotient of the tear resistance in the transverse direction to the tear resistance in the longitudinal direction lying between about 0.65 and 0.85, the degree of surface stretching of the film product being between about 8 and 11.

5,747,125
FIBROUS COMPOSITE CELLULOSIC FILM AND METHOD

John Markulin, Oak Lawn, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Jul. 18, 1996, Ser. No. 684,347

Int. Cl.^{6} D01D *5/00;* **A22C** *13/00*

U.S. Cl. 428—34.8 23 Claims

1. A method for producing a polyol-free cellulosic film composed of a regenerated cellulose matrix containing natural cellulose fibers comprising the steps of:

a) providing an extrudable thermoplastic composition composed of an aqueous solution of an amine oxide cellulose solvent, a nonderivatized cellulose solubilized in the solvent and an olefinic oxide polymer and the composition containing a uniform dispersion of unsolubilized cellulose fiber;
b) extruding a film of the thermoplastic composition;
c) washing the extruded thermoplastic composition with a non-solvent to remove the amine oxide cellulose solvent and thereby regenerate the solubilized non derivatized cellulose to form a wet gel film comprising a continuous phase of regenerated cellulose containing the olefinic oxide polymer and the unsolubilized cellulose fiber uniformly dispersed in the continuous phase;
d) contacting the wet gel film with a crosslinking agent; and
e) drying the wet gel film in the presence of the crosslinking agent to a moisture content sufficient to activate the agent and crosslink the regenerated cellulose and unsolubilized cellulose fibers and the amount of olefinic oxide polymer in the dry film being sufficient to plasticize the dry film so as to avoid the need for an addition of a polyol to plasticize the dry film.

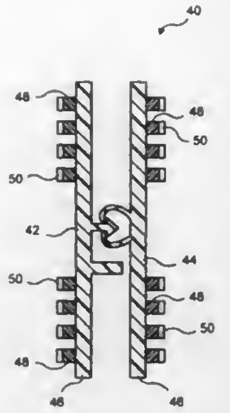
5,747,126
ULTRAVIOLET EXCITED FUSIBLE RIBS FOR PLASTIC ZIPPER PROFILES

Donald Van Erden, Wildwood, and Art Malin, Northbrook, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 6, 1995, Ser. No. 590,104

Int. Cl.^{6} B32B *3/06;* **B65D** *33/16*

U.S. Cl. 428—35.2 12 Claims



1. A closure for selectively opening and sealing the mouth of a reclosable bag, said closure comprising:

a first mutually interlocking profile and second mutually interlocking profile extruded from a polymeric resin material, said first and second mutually interlocking profiles including a web portion, an interlocking member on one side of said web portion, and at least one fusible rib of a polymeric resin material on the other side of said web portion, said at least one fusible rib on at least a portion thereof including an ultraviolet-light-excitable tracer material, so that said ribs may be visible under ultraviolet light and whereby upon bonding said closure to a bag material the region of said bond may be viewed under ultraviolet-light to determine that said ribs have fused to said bag material.

5,747,127
POLYESTER COMPOSITION FOR USE IN THERMOFORMING DUAL-OVENABLE TRAYS

Jack Edward Prince, North Canton, Ohio, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 350,292, Dec. 6, 1994, abandoned. This application Jan. 2, 1996, Ser. No. 582,039

Int. Cl.^{6} B29D *22/00;* **C08L** *67/02*

U.S. Cl. 428—35.7 12 Claims

1. A thermoformed, non-oriented, heat-set, thin-walled article, the composition consisting essentially of:

(a) from about 90 weight percent to about 94 weight percent polyethylene terephthalate having an intrinsic viscosity of at least 0.7 dl/g, as measured in a 60:40 phenol :tetrachloroethane mixed solvent system at 30° C.;
(b) from about 1 weight percent to about 3 weight percent of a polyethylene ionomer having a melt flow index as measured using ASTM Method D-1238 of less than 2 grams/10 minute;
(c) from about 5 weight percent to about 7 weight percent of a polyolefin with repeat units derived from olefin monomers containing 2 to 6 carbon atoms; and
(d) an effective amount of a heat stabilizer;

said article having a total crystallinity of from about 10 percent to about 40 percent.

5,747,128
RADIALLY SUPPORTED POLYTETRAFLUOROETHYLENE VASCULAR GRAFT

Carey V. Campbell, Flagstaff; James H. Chastain, Cottonwood; Alvaro J. Laguna, and Daniel B. Pond, both of Flagstaff, all of Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jan. 29, 1996, Ser. No. 592,912

Int. Cl.^{6} B29D *22/00;* **B32B** *1/08*

U.S. Cl. 428—35.7 81 Claims

1. A tube comprised of porous polytetrafluoroethylene having a microstructure of nodes interconnected by fibrils, said tube having a luminal surface, at least two first regions and at least two second regions wherein said second regions have a greater mean fibril length than said first regions when fibril lengths are measured at the luminal surface of the tube.

5,747,129
CHILD AND INFANT ENCLOSURE STRUCTURE

Adam G. Malofsky, Huntington; Bernard M. Malofsky, Bloomfield, both of Conn., and Paul R. Glassberg, Chester, N.J., assignors to Piccolino, LLC, Huntington, Conn.

Continuation-in-part of Ser. No. 307,924, Sep. 16, 1994, Pat. No. 5,561,874. This application Oct. 4, 1996, Ser. No. 727,855

Int. Cl.^{6} A47D *7/02*

U.S. Cl. 428—36.4 8 Claims

1. A child enclosure structure comprising a base and a multiside enclosing frame wherein said frame comprises solid composite sections made of lightweight, high modulus fiber-reinforced plastic matrix composite solid members having a weight of 0.30 pounds or less per lineal foot and wherein said plastic matrix is a thermoplastic resin or thermoset plastic resin with a minimum modulus of 250,000 psi; a minimum tensile strength of 6,000 psi; and a glass transition temperature of at least 50° C. and wherein said high modulus fiber reinforcement is selected from the group consisting of carbon fibers, aramid fibers, glass fibers, polyolefin fibers, boron fibers, and mixtures thereof.

5,747,130
INTERMEDIATE PRODUCT CAPABLE OF BEING FORMED INTO A BIAXIALLY ORIENTED POLYETHYLENE TEREPHTHALATE RESIN BOTTLE-SHAPED CONTAINER AND METHOD OF BLOW-MOLDING THE SAME

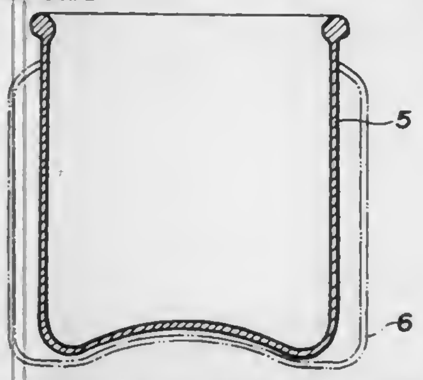
Horoaki Sugiura, Koto-ku; Fuminori Tanaka, Matsudo, and Daisuke Uesugi, Koto-ku, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 327,893, Oct. 24, 1994, Pat. No. 5,562,960, which is a continuation of Ser. No. 76,099, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 866,099, Apr. 6, 1992, Pat. No. 5,248,533, which is a continuation of Ser. No. 588,491, Sep. 6, 1990, abandoned, which is a continuation of Ser. No. 171,101, Mar. 21, 1988, abandoned, which is a division of Ser. No. 897,035, Aug. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 701,352, Feb. 13, 1985, abandoned. This application Jul. 18, 1996, Ser. No. 683,431

Claims priority, application Japan, Feb. 15, 1984, 59-26802

Int. Cl.^{6} B29C *49/18;49/08;* **B29D** *22/00*

U.S. Cl. 428—36.92 33 Claims



1. An intermediate product created during a process of blow-molding polyethylene terephthalate resin into a bottle-shaped container, comprising a biaxial-orientated, blow-molded, thermally contracted intermediate molded bottle-shaped product having essentially no residual stress and capable of being formed into a bottle-shaped container by subsequent blow-molding that is resistant to deformation caused by contents heated up to 70°–120° C.,

wherein the process includes a step of primary blow-molding a preform heated to a blow-molding temperature to produce a primary biaxial-orientated blow-molded bottle-shaped article and thermal contraction comprises heating said primary biaxial-orientated blow-molded bottle-shaped article to a temperature between about 130° C. to about 255° C. while allowing said primary article to shrink, said heating continuing for a period of time sufficient to remove essentially all residual stress.

5,747,131
PROCESS FOR BUNDLING AND/OR FIXING ARTICLES BY USE OF AN EXTENSIBLE PLASTIC TAPE

Karl W. Kreckel, Benzenbergweg, Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

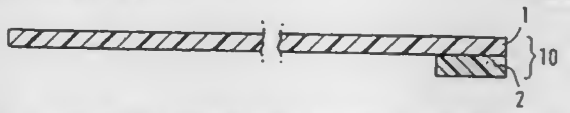
PCT No. PCT/US93/12581, § 371 Date Jun. 12, 1995, § 102(e) Date Jun. 12, 1995, PCT Pub. No. WO94/16950, PCT Pub. Date Aug. 4, 1994

PCT Filed Dec. 27, 1993, Ser. No. 481,249

Claims priority, application Germany, Jan. 19, 1993, 43 01 165.9

Int. Cl.^{6} C09J *7/02*

U.S. Cl. 428—40.1 32 Claims



1. A process for bundling and/or fixing of articles using an extensible plastic tape with two ends having a Young modulus of at least approximately 170 bars but less than 7,000 bars and an extensibility in longitudinal direction of at least approximately 150%, with a recovery of less than 50 percent after extension, at least portions of the length of said plastic tape being free of pressure sensitive adhesive, wherein

a. said plastic tape is permanently stretched, the permanently stretched tape is arranged around the articles to be bundled and/or fixated, and said ends of the tape are bound together;
b. or said plastic tape is permanently stretched, one of said ends is then fixed, and thereafter said permanently stretched plastic tape is arranged around the articles to be bundled and/or fixated, and the other of said ends is fixed;
c. and/or one of said ends of said plastic tape is fixed, said plastic tape is permanently stretched and arranged around the articles to be bundled and/or fixated, and the other of said ends is fixed.

5,747,132
AUTOMOBILE PAINT FILM-PROTECTIVE SHEET

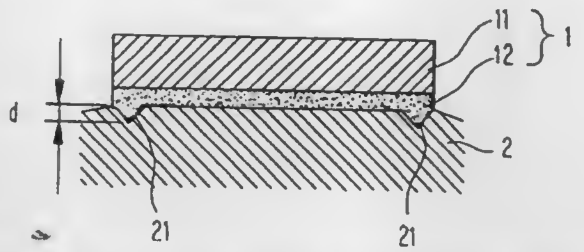
Komaharu Matsui; Mitrso Wakimoto; Takeshi Eda; Tadayoshi Tatsuno, all of Kanagawa; Yutaka Kuwabara, and Kenichi Shibata, both of Osaka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, and Nitto Denko Corporation, Osaka, both of Japan

Continuation of Ser. No. 900,293, Jun. 18, 1992, abandoned. This application Jan. 3, 1995, Ser. No. 368,401

Claims priority, application Japan, Jun. 19, 1991, 3-174617; Oct. 18, 1991, 3-299954; Oct. 18, 1991, 3-299955; May 19, 1992, 4-152717

Int. Cl.^{6} B32B *7/06*

U.S. Cl. 428—41.7 4 Claims

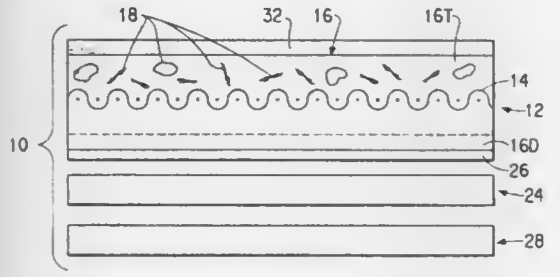


1. A sheet for protecting a melamine-alkyd, melamine-acrylic or urethane automotive paint film wherein said sheet comprises a plastic substrate having a thickness of 10 to 100 µm made of a polypropylene and polyethylene blend and having formed on one side thereof a layer of a rubber-based pressure-sensitive adhesive having a SP value of at least 1 larger or smaller than the automotive paint film, a dynamic modulus of from 4×10^5 to $7\times 10_6$ dyne/cm^2 at 60° C., an adhesion strength of 100 to 1,000 g/20 mm and a thickness of 5 to 50 µm, said adhesive comprising an isobutylene-based polymer which is not curable, whereby said

sheet has a ratio of (i) adhesion strength after exposure at 23° C. for 100 hours in a sunshine weatherometer to (ii) initial adhesion strength of 1.01 to 3.86.

5,747,133
DECORATIVE COMPOSITE FLOOR COVERINGS

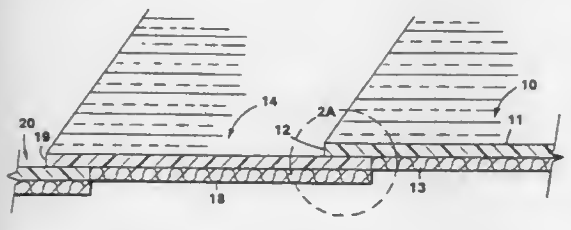
Yashavant Vinayak Vinod, Hockessin, and Wayne Curtis Whelchel, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 19, 1996, Ser. No. 770,192
Int. Cl.^{6} B32B *5/06;5/08*
U.S. Cl. 428—46 **20 Claims**



1. A composite floor covering comprising a decorative layer itself comprising a fabric base and a transparent plastic matrix, the plastic matrix having discrete fibrous structures embedded therein, the plastic matrix having predetermined melting and rheological characteristics associated therewith such that the fabric base and the fibrous structures remain substantially intact while the plastic matrix solidifies.

5,747,134
CONTINUOUS POLYMER AND FABRIC COMPOSITE

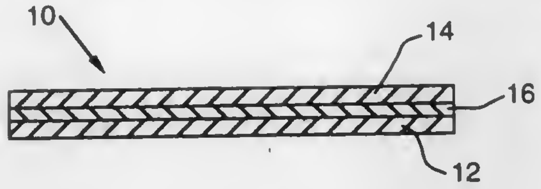
Abdeally Mohammed, Houston, and Lyndell Kyle Wynne, Kingwood, both of Tex., assignors to Reef Industries, Inc., Houston, Tex.
Continuation of Ser. No. 200,166, Feb. 18, 1994, abandoned. This application Aug. 28, 1996, Ser. No. 703,933
Int. Cl.^{6} B32B *7/00*
U.S. Cl. 428—57 **33 Claims**



1. A polymer and fabric composite comprising
- a first sheet of polymer;
- a fabric layer attached to the first polymer sheet covering substantially one side of the first polymer sheet leaving at least one strip along at least one edge of the polymer not backed with the fabric layer;
- the strip along at least one edge of the first polymer sheet providing at least one lip attachable to another sheet;
- a second polymer sheet; and
- the first polymer sheet attached by one of said lips to the second polymer sheet.

5,747,135
THIN FILM PRETREATMENT FOR MEMORY DISKS AND ASSOCIATED METHODS

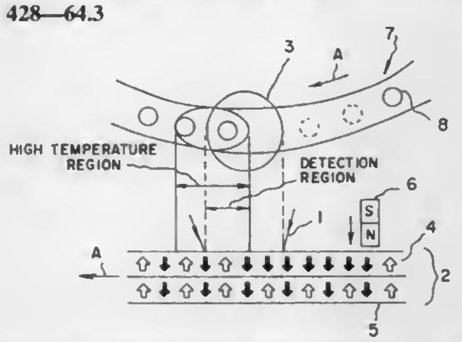
Dhruba J. Chakrabarti; Richard A. Hoffman, both of Export, and Craig L. Jensen, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Dec. 8, 1995, Ser. No. 569,344
Int. Cl.^{6} B32B *3/00*
U.S. Cl. 428—64.1 **65 Claims**



1. A memory media-ready substrate comprising:
- a substrate;
- a nickel-phosphorous hardening layer; and
- a film made of nonferromagnetic material, said film being disposed between said substrate and said hardening layer.

5,747,136
HIGH-DENSITY MAGNETO-OPTIC DISK AND METHOD OF MANUFACTURING THE SAME

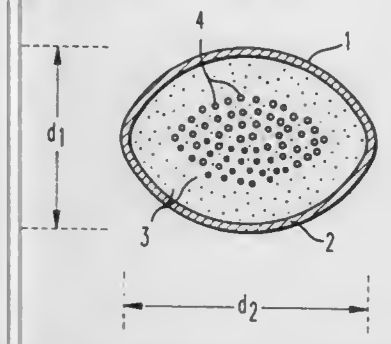
Keiji Shono; Yasunobu Hashimoto; Sumio Kuroda, and Ken Tamanoi, all of Kawasaki, Japan, assignors to Fujitsu, Ltd., Kawasaki, Japan
Continuation of Ser. No. 16,544, Feb. 11, 1993, abandoned. This application Sep. 20, 1994, Ser. No. 309,966
Claims priority, application Japan, Feb. 14, 1992, 4-027699
Int. Cl.^{6} G11B *5/66*
U.S. Cl. 428—64.3 **1 Claim**



1. A high-density magneto-optic disk comprising a substrate and a readout layer, each of which is transparent to a laser beam for reading out recorded data on a recording layer through a mask of magnetically induced super resolution on said readout layer, wherein
- a transparent substrate;
- said readout layer is formed of a bismuth-substituted garnet represented by a chemical formula $Bi_xR_{3-x}M_yFe_{5-y}O_{12}$ and is formed on the substrate;
- said recording layer is formed of a nonbismuth-substituted garnet represented by a chemical formula $R_3M_z Fe_{5-z}O_{12}$ and is formed on the readout layer and is magnetically coupled with the readout layer at the interface therebetween by an exchange interaction; and
- a reflection layer formed on the recording layer, for reflecting the laser beam passing through said readout layer and said recording layer, wherein x, y and z have values defined by $0<x<3$, $0\leqq y<2$ and $0\leqq z<2$, respectively, R represents an element selected from a group of yttrium and rare-earth elements, and M is selected from the group consisting of Ga and Al, wherein the readout layer has a smaller coercive force and a higher Curie temperature compared with those of the recording layer and the recording layer exhibits characteristics such that the angle of Faraday rotation thereof is 1/200 of that of the readout layer or less.

5,747,137
FLEXIBLE, COMPOSITE THERMOPLASTIC FILAMENT WHICH CONTAINS ENDLESS FIBRES AND PROCESS FOR PREPARING IT

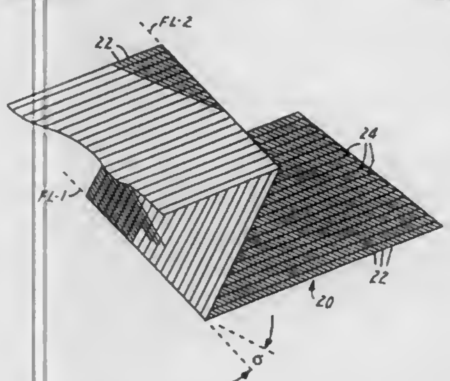
Domingo Cutolo, Gessate, and Erminio Zoppi, Codogno, both of Italy, assignors to Enirícerche S.p.A., and Enichem S.p.A., both of Milan, Italy
Continuation of Ser. No. 242,600, May 13, 1994, abandoned. This application Nov. 6, 1995, Ser. No. 554,103
Claims priority, application Italy, May 18, 1993, MI93A1010
Int. Cl.^{6} B32B *1/04*
U.S. Cl. 428—74 **13 Claims**



1. A flexible, composite, thermoplastic filament, which contains continuous fibers selected from the group consisting of carbon, fiberglass and aramid fibers, and which filament consists essentially of a flexible sheath of a thermoplastic polymer which coats a fiber bundle of fibers, which fiber bundle is impregnated with a thermoplastic powder, which is made of the same thermoplastic polymer coating said fiber bundle, said filament being obtained through a process consisting essentially of:
- a) unwinding a continuous fiber bundle from a bobbin,
- b) loosening the fiber bundle, in order to separate said bundle substantially into individual fibers,
- c) impregnating the individual fibers with a thermoplastic polymer powder, and
- d) recompacting the fiber bundle and providing a flexible sheltering sheath around the bundle, said bundle being made from a thermoplastic powder, by causing the fiber bundle to coaxially run through a tubular die having a cross-section of rhomboidal shape with mean diagonals equal to d_1 and d_2 wherein d_1/d_2 is less than 1.

5,747,138
MULTILAYER HOLLOW-FIBER BODY AND METHOD OF MAKING

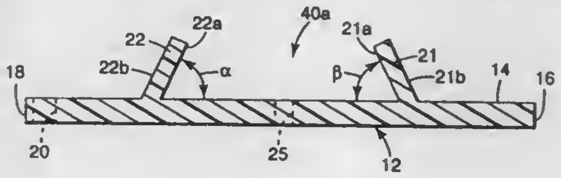
Ronald J. Leonard, Ann Arbor, Mich., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation of Ser. No. 565,439, Nov. 30, 1995, abandoned. This application Apr. 16, 1997, Ser. No. 822,523
Int. Cl.^{6} B32B *5/12*
U.S. Cl. 428—113 **20 Claims**



1. A multilayer hollow fiber'body comprising a single hollow fiber mat arranged in the form of a body comprising a plurality of hollow fiber plies;
- the mat being elongate and comprising hollow fibers and connecting fibers, the hollow fibers being held by the connecting fibers, the hollow fibers being disposed at regular intervals at an oblique angle relative to the direction of elongation of the mat; and
- the mat being repeatedly folded over on itself to form a multilayer hollow fiber body in which the hollow fibers of any ply of the multilayer hollow fiber body are disposed so as to cross the hollow fibers of an adjacent successive ply of the multilayer hollow fiber body.

5,747,139
COMPONENT CARRIER TAPE

James L. Schenz, Baytown Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 24, 1996, Ser. No. 590,857
Int. Cl.^{6} B65D *85/90*
U.S. Cl. 428—120 **24 Claims**

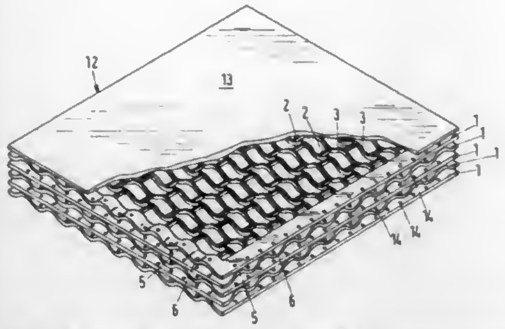


1. An elongated flexible carrier tape for transporting at least one component, the carrier tape having a length and comprising:
- a planar strip portion comprising a planar component-receiving surface and first and second longitudinal edge surfaces;
- at least two side walls longitudinally disposed along the length of the carrier tape and extending upwardly from the component-receiving surface between the first and second longitudinal edge surfaces, wherein each of the at least two side walls comprises an inner major surface; and
- at least one planar component-receiving area comprising an area of the strip portion bordered by the at least two side walls;
- at least one of the side walls being inclined inwardly toward the at least one component-receiving area forming an angle greater than 0 degrees but less than 90 degrees with the component-receiving surface of the carrier tape, wherein the at least one inclined side wall comprises a first end attached to the component-receiving surface and a second end spaced from the component-receiving surface and wherein the at least one inclined side wall is substantially planar between the first and second ends of the at least one inclined side wall,
- the inner major surface of the at least one inclined side wall and the inner major surface of at least one other side wall being capable of contacting a component inserted into the at least one component-receiving area to secure the component within the component-receiving area,
- the at least one inclined side wall being capable of being displaced to a position that allows a component to be inserted into the at least one component-receiving area, with subsequent recovery to a component-securing position,
- the at least one inclined side wall further being capable of being displaced from the component-securing position to a position that allows for removal of the component from the at least one component-receiving area.

5,747,140
FLAT UPHOLSTERED BODY

Siegfried Heerklotz, Am Berg 5, D-49143 Bissendorf, Germany
Filed Mar. 22, 1996, Ser. No. 620,524
Claims priority, application Germany, Mar. 25, 1995, 295 05 064.0
Int. Cl.^{6} A47C *7/28;7/35;* **F16F** *1/18*
U.S. Cl. 428—131 **27 Claims**

1. A generally flat body to be upholstered comprising at least one grid plate made of a resilient material, said grid plate including a plurality of solid portions which form the boundaries of a plurality of grid openings, said solid portions including a plurality of spaced wave sections each having a plurality of extremea in the form of



crests and valleys, and a plurality of spaced extended sections extending between said plurality of spaced wave sections, said extended sections connecting some of the extremea of one wave section to some of the extremea of a juxtaposed wave section disposed on one side of said one wave section and said extended sections connecting the other of the extremea of said one wave section to some of the extremea of a juxtaposed wave section disposed on the side of said one wave section which is opposite said one side such that said spaced wave sections and said spaced extended sections define said grid openings.

5,747,141

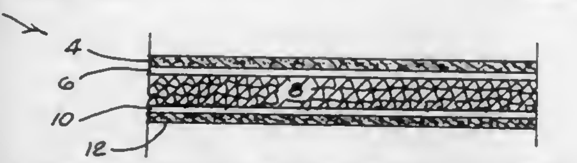
PAPERBOARD PACKAGING WITH AN IMPROVED SIZING LAYER INCLUDING A STYRENE MALEIC ANHYDRIDE BINDER FOR REDUCING EDGEWICKING

Robinson Camden Perkins Claytor, Covington, Va., assignor to Westvaco Copration, New York, N.Y.

Filed Jul. 17, 1995, Ser. No. 503,175

Int. Cl.^{6} B32B *5/24;9/06*

U.S. Cl. 428—143 **5 Claims**



1. A composite structure for paperboard packaging for reducing edgewicking, wherein said structure is consisting essentially of:

a first layer of particulate minerals;

a first layer of a sizing material including a styrene maleic anhydride binder for substantially reducing edgewicking located interior to said first layer of particulate minerals, wherein said binder has a concentration by weight of approximately 4%;

a paperboard layer located interior to said first layer of sizing material wherein said paperboard layer is further comprised of a furnish substantially of broke from coated two-side paperboard;

a second layer of said sizing material including said binder located interior to said paperboard layer; and

a second layer of particulate minerals located interior to said second layer of said sizing material.

5,747,142

FORMER FOR CORE SANDWICH IN COMPOSITE REINFORCED PLASTICS

Desmond Harold Bleasdale, Brookvale, Australia, assignor to Form-Rite Plastics Development Pty., Ltd., New South Wales, Australia

PCT No. PCT/AU94/00106, § 371 Date Oct. 20, 1995, § 102(e) Date Oct. 20, 1995, PCT Pub. No. WO94/20290, PCT Pub. Date Sep. 15, 1994

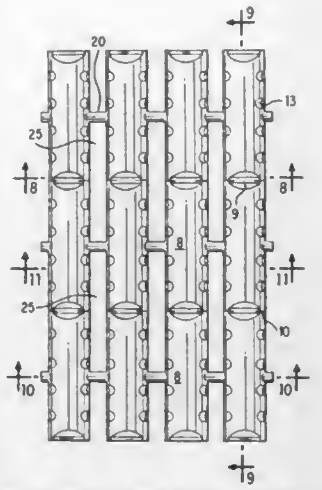
PCT Filed Mar. 8, 1994, Ser. No. 513,947

Claims priority, application Australia, Mar. 8, 1993, PL7688

Int. Cl.^{6} B32B *3/28*

U.S. Cl. 428—167 **16 Claims**

1. A former for use in a core sandwich of composite reinforced plastics material, the former comprising a plurality of transversely displaced parallel rib sections each of said rib sections jointed to adjacent and transversely displaced rib sections by a flexible bridge portion to define through openings in the former between each bridge portion and the rib sections, each rib section being divided into a plurality of sub-sections by a depression or groove formed in an upper surface of the rib section, the base of the groove forming a hinge or web section between each adjacent sub-section and having slits or openings in the side walls of the rib section extending between the base of the rib section and the base of each groove.



5,747,143

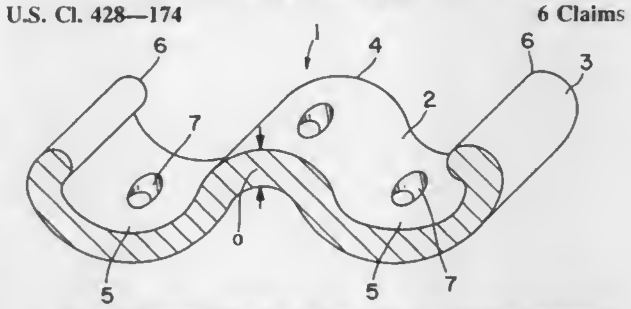
PACKING ELEMENT

Hassan Niknafs, Stow, Ohio, assignor to Norton Chemical Process Products Corporation, Stow, Ohio

Filed Jul. 8, 1996, Ser. No. 676,756

Int. Cl.^{6} B32B *1/00;* **B01D** *47/16*

U.S. Cl. 428—174 **6 Claims**



1. A mass transfer element having first and second, generally parallel, opposed major surfaces with length and breadth dimensions with said surfaces being separated by a thickness dimension, said element being deformed along parallel axes in the breadth dimension so as to provide, with respect to the first major surface, at least one convexity intermediate between and equidistant from the ends of the length dimension and an identical pair of opposed concavities adjacent the ends of the length dimension such that opposed ends of the element face generally towards one another and the radius of curvature of each concavity is smaller than the thickness dimension of the element at the ends of the length dimension.

5,747,144

COSTUMES WITH SEMI-RIGID FABRIC COMPONENTS AND METHOD OF MANUFACTURE OF SAME

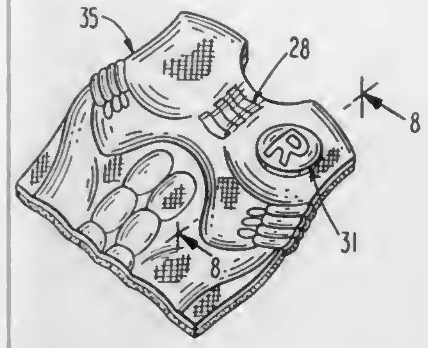
Marc P. Beige, North Hills, and John G. Kearns, Woodhaven, both of N.Y., assignors to Rubie's Costume Co., Inc., Richmond Hill, N.Y.

Filed Apr. 3, 1996, Ser. No. 626,970

Int. Cl.^{6} B32B *1/00*

U.S. Cl. 428—187 **21 Claims**

9. A three-dimensional costume component representing the pectoral and/or abdominal muscles of a well-toned human comprising:



a) a fabric layer; and

b) a foam layer; said fabric and foam layers being fused to form a laminated sheet which is vacuum molded.

5,747,145

COPOLYMER BLEND FOR TONER RECEIVER

Louis Joseph Sorriero, Rochester, and John J. Fitzgerald, Clifton Park, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

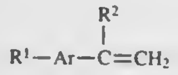
Filed Dec. 13, 1995, Ser. No. 572,213

Int. Cl.^{6} C03G *13/14*

U.S. Cl. 428—195 **15 Claims**

1. An electrophotographic toner receiver for thermally assisted transfer comprising a substrate having a layer of a thermoplastic polymer composition on the surface thereof, said polymer composition comprising a miscible blend of a first addition copolymer and a second addition copolymer, each said addition copolymer having a weight-average molecular weight of about 30,000 to 100,000 and a number-average molecular weight of about 5,000 to 50,000, and each comprising repeating units of

(1) at least one of an aromatic vinyl monomer of the structure,

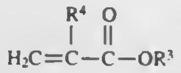


$$R^1-Ar-\overset{R^2}{\overset{|}{C}}=CH_2$$

wherein Ar is phenylene or naphthylene and R^1 and R^2 are H or lower alkyl; and

(2) at least one of

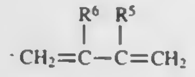
(a) an acrylic ester of the structure



$$H_2C=\overset{R^4}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-OR^3$$

wherein R^3 is linear or branched C_1–C_{10} alkyl and R^4 is H or lower alkyl, or

(b) a divinyl compound of the structure



$$CH_2=\overset{R^6}{\overset{|}{C}}-\overset{R^5}{\overset{|}{C}}=CH_2$$

wherein R^5 and R^6 are H, Cl, or CH_3,

said first addition copolymer further comprising repeating units of an acidic vinyl monomer and said second addition copolymer further comprising repeating units of a basic vinyl monomer.

5,747,146

PRINTING MEDIUM AND INK JET PRINT

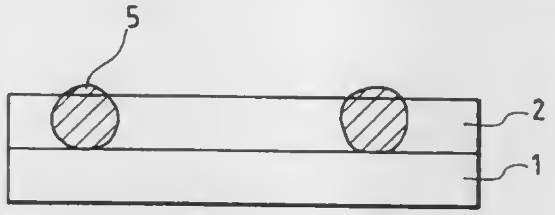
Akio Kashiwazaki; Masato Katayama, both of Yokohama, and Kenichi Moriya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 392,153

Claims priority, application Japan, Feb. 24, 1994, 6-026812; Mar. 14, 1994, 6-042449; Mar. 30, 1994, 6-060920; Aug. 3, 1994, 6-182300; Feb. 2, 1995, 7-015869; Feb. 2, 1995, 7-015871; Feb. 2, 1995, 7-015872

Int. Cl.^{6} B41M *5/00*

U.S. Cl. 428—206 **20 Claims**



1. A printing medium comprising a base material and an ink-receiving layer which comprises inorganic fine particles and a resin and is provided on the base material, wherein the inorganic fine particles partly project from a resin layer of the ink-receiving layer and are contained in a proportion of 0.05 to 3 parts per 100 parts of the resin in terms of solids.

5,747,147

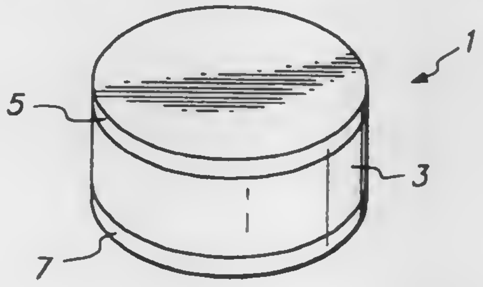
CONDUCTIVE POLYMER COMPOSITION AND DEVICE

Mark F. Wartenberg; John G. Lahlouh, both of San Jose, and James Toth, San Carlos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 408,769, Mar. 22, 1995, abandoned. This application Jan. 30, 1997, Ser. No. 789,962

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—209 **9 Claims**



1. An electrical device which comprises

(A) a resistive element composed of a conductive polymer composition which comprises

(1) at most 64% by volume of the total composition of a polymeric component having a crystallinity of at least 20%, and

(2) at least 36% by volume of the total composition of a particulate conductive filler which comprises carbon black, said carbon black having a DBP number of 60 to 120 $cm^3/100$ g; and

(B) two electrodes which are attached to the resistive element and can be connected to a source of electrical power,

the device having

(a) a resistance at 20° C., R_{20}, of at most 1.0 ohm,

(b) a resistivity at 20° C., ρ_{20}, of at most 1.0 ohm-cm, and

(c) a PTC anomaly from 20° C. to (T_m+5° C.) of at least 10^4, and the composition having been crosslinked to the equivalent of 1 to 20 Mrads.

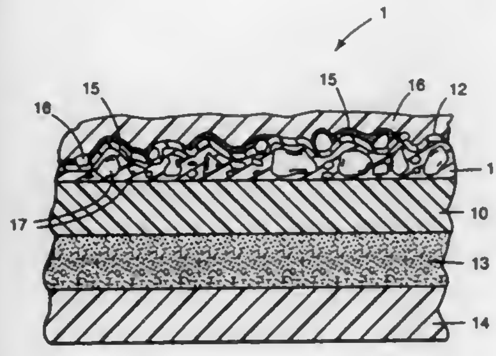
5,747,148
INK JET PRINTING SHEET

David Warner, Maplewood; Charles C. Lee, Little Canada, and Wu-Shyong Li, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 335,986, Nov. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 304,803, Sep. 12, 1994, abandoned. This application Nov. 6, 1995, Ser. No. 554,256

Int. Cl.^{6} B41M *5/00*

U.S. Cl. 428—212 **10 Claims**



1. An ink jet printing sheet comprising a substrate and an image receiving layer contacting the substrate,

wherein the image receiving layer comprises at least one protective penetrant layer of one composition and at least one ink jet receptor layer of a second composition wherein the ink jet receptor layer contacts the substrate and the protective penetrant layer contacts the ink jet receptor layer,

wherein each ink jet receptor layer and each protective penetrant layer contain dispersed particles or particulates of a size that causes protrusions from the protective penetrant layer,

wherein particles or particulates are present in both the ink jet receptor layer and the protective penetrant layer in the range of about 15 to about 25 percent by weight total solids,

and wherein the protrusions caused by dispersed particles or particulates in the ink jet receptor layer are visually distinguishable from the protrusions caused by dispersed particles or particulates in the protective penetrant layer.

5,747,149

Patent Not Issued For This Number

5,747,150
ELECTROSTATIC POWDER COATING METHOD

Masahiro Yamamoto, Tokyo; Akimitsu Uenaka, Suita, both of Japan; Tasaburo Ueno, Rocky River, Ohio, and Koichi Tsutsui, Kyoto, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 360,298, Dec. 21, 1994, abandoned. This application Sep. 16, 1996, Ser. No. 714,612

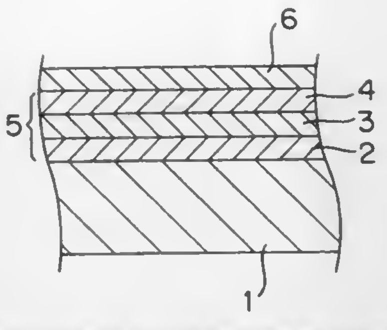
Claims priority, application Japan, Dec. 21, 1993, 5-322096

Int. Cl.^{6} B32B *7/02;27/36;* **B05D** *1/06;1/36*

U.S. Cl. 428—220 **13 Claims**

1. An electrostatic powder coating method comprising the steps of:

forming an undercoating film having a volume specific resistivity of not more than about $10^{13}\ \Omega\cdot$cm and a thickness of not more than 200 μm on a metal substrate, said undercoating film being formed of a plurality of layers wherein only a top layer of said plurality of layers includes a conductive material, the layers of said undercoating film between said metal substrate and said top layer being nonconductive; and



forming an overcoating layer on said top layer of said undercoating film by electrostatic powder coating.

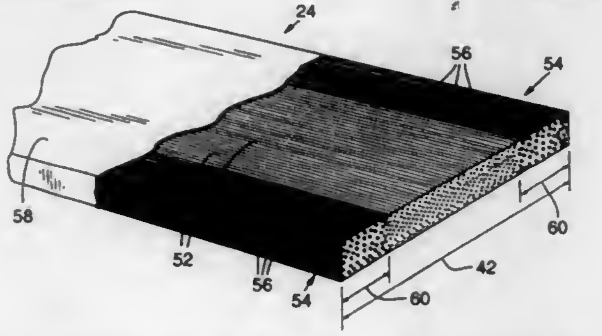
5,747,151
GLUE-LAMINATED WOOD STRUCTURAL MEMBER WITH SACRIFICIAL EDGES

Daniel A. Tingley, 3310 SW. Willamette Ave., Corvallis, Oreg. 97333

Filed May 9, 1996, Ser. No. 647,181

Int. Cl.^{6} E04C *3/12;3/18*

U.S. Cl. 428—299.1 **4 Claims**



1. A laminated wood structural load bearing member having a longitudinal axis, comprising:

plural elongate wood laminae each of which has a length and two major surfaces,

multiple synthetic reinforcements each having a length and two major surfaces formed of plural fiber strands held within a resin matrix, each synthetic reinforcement having a central portion formed only of a first material, the central portion having a top surface and a bottom surface forming the major surfaces of the synthetic reinforcement, and at least one outer longitudinal edge formed only of plural fiber strands of a second material, at least one major surface of each synthetic reinforcement being secured by nonepoxy bonding to a major surface of one of the wood laminae.

5,747,152
TRANSPARENT FUNCTIONAL MEMBRANE CONTAINING FUNCTIONAL ULTRAFINE PARTICLES, TRANSPARENT FUNCTIONAL FILM, AND PROCESS FOR PRODUCING THE SAME

Motohiro Oka; Mitsuru Tsuchiya; Norinaga Nakamura; Kiyotaka Takematsu; Yurie Ota; Hiroko Suzuki; Natsuko Yamashita; Hiroomi Katagiri; Hiroshi Yamada, and Toshio Yoshihara, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

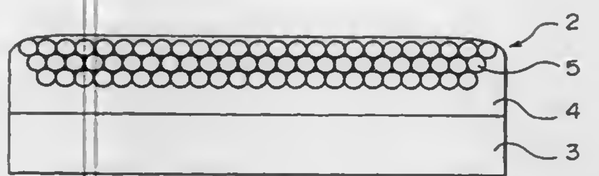
Filed Dec. 1, 1994, Ser. No. 352,129

Claims priority, application Japan, Dec. 2, 1993, 5-338941; Dec. 2, 1993, 5-338942; Aug. 31, 1994, 6-230801; Sep. 30, 1994, 6-261119; Oct. 20, 1994, 6-281198

Int. Cl.^{6} B32B *5/14*

U.S. Cl. 428—323 **14 Claims**

1. A transparent functional membrane, comprising:



a hard coat layer comprising a resin, said hard coat layer having a hardness of not less than H as measured by a pencil hardness test specified in JIS-K-5400; and

functional ultrafine particles having a size of not more than 200 nm, said ultrafine particles being dispersed in said hard coat layer such that said ultrafine particles are localized toward a surface of said hard coat layer,

wherein said hard coat layer has substantially no interface therein.

5,747,153
GLASS AND CERAMIC OBJECTS HAVING DURABLE LUSTROUS COATINGS AND METHODS OF PRODUCING

Harry C. McDaniel, 2400 Grandview Ave. #19, Cincinnati, Ohio 45206

Continuation of Ser. No. 335,070, Nov. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 68,775, Jun. 1, 1993, Pat. No. 5,366,763, which is a continuation-in-part of Ser. No. 894,826, Jun. 8, 1992, abandoned. This application Feb. 21, 1997, Ser. No. 805,033

Int. Cl.^{6} B05D *1/04;3/02;* **B32B** *5/16;19/04*

U.S. Cl. 428—324 **26 Claims**

1. A method of producing a durable lustrous coating on a vitreous surface of an article comprising:

(a) applying to the vitreous surface a coating of luster pigment consisting essentially of inorganic platelet-shaped particles having a metal oxide surface coating in an amount to provide a durable lustrous coating on the article of less than about 25 microns in thickness; and

(b) heating the vitreous surface to a sufficient temperature and for a sufficient time to fix the platelet-shaped particles of luster pigment thereto and provide the durable lustrous coating of less than about 25 microns in thickness.

5,747,154
ACRYLIC SHEET HAVING UNIFORM DISTRIBUTION OF COLORING AND MINERAL FILLER BEFORE AND AFTER THERMOFORMING

Ettore Minghetti; John E. Eitel, and Carol A. Wetter, all of Boone County, Ky., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 392,650, Feb. 23, 1995, Pat. No. 5,521,243, which is a continuation-in-part of Ser. No. 157,253, Nov. 26, 1993, abandoned. This application Mar. 22, 1996, Ser. No. 620,511

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—327 **4 Claims**

1. A thermoformable sheet or slab comprising a polymerized mixture, said mixture prior to polymerization comprising a methyl methacrylate syrup having dissolved within it about 10% to about 25% uncrosslinked polymethylmethacrylate, said syrup having dispersed within it y parts by weight chain terminator per hundred parts by weight of methylmethacrylate and 0.01 to 1.0 parts by weight crosslinking agent where x is the amount of crosslinking agent, and

y is no greater than $x+0.2$,

when x is 0.01 to 0.5, y is no less than 0.01, and

when x is 0.5 to 1.0, y is no less than $(0.58x-0.28)$, and

said mixture having dispersed within it solid particulates wherein said solid particles will pass through a sieve having openings of 90 microns, said solid particulates comprising about 20% to about 60%, based on the weight of the prepolymerized mixture, of alumina trihydrate, and wherein said thermoformable sheet or slab made from said polymerized mixture will have a minimum bending radius of less than three inches when said sheet or slab has a thickness of one-half inch.

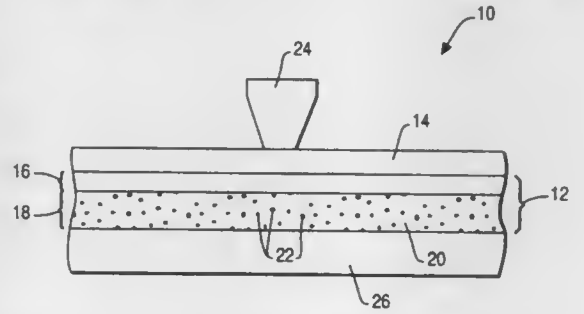
5,747,155
SMEAR AND SCRATCH RESISTANT THERMALLY TRANSFERABLE PRINTING RIBBONS AND METHODS OF MAKING THE SAME

Thomas C. Miller, Jr., Kettering, and Thomas J. Obringer, Vandalia, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 504,197, Jul. 19, 1995, abandoned. This application Feb. 4, 1997, Ser. No. 795,460

Int. Cl.^{6} B41M *5/26*

U.S. Cl. 428—327 **16 Claims**



1. A thermally transferable printing ribbon, comprising:

a backing element having a top surface;

a sub coat layer adhered to said top surface of said backing element, said sub coat layer including acrylic primer and dry silicone wherein said dry silicone is a micro-fine silicone resin having an average particle size of 0.5–3 microns and said sub coat layer having a top surface distal from said backing element; and

a printing layer adhered to said top surface of said sub coat layer, said printing layer including an interspersed distribution of black or colored pigments in a binder.

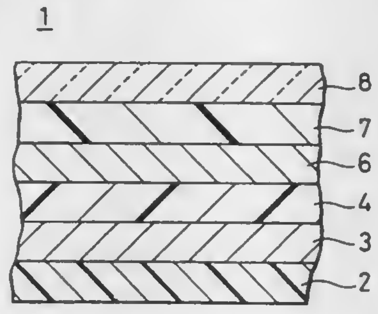
5,747,156
THERMOSENSITIVE MAGNETIC RECORDING MEDIUM

Hidetoshi Hashiba; Shoji Aoyagi; Hitoshi Fujii, and Kiyoshi Kojo, all of Hyogo, Japan, assignors to New Oji Paper Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1996, Ser. No. 632,161

Int. Cl.^{6} G11B *5/70*

U.S. Cl. 428—328 **18 Claims**



1. A thermosensitive magnetic recording medium for recording by a thermal head comprising a base, a magnetic recording layer and a thermosensitive recording layer, said thermosensitive recording layer comprising a binder and non-magnetic metal powder

/OL
2 10
ISS
1
MY
5
998
MI

particles having shape anisotropy and having a melting point not higher than the melting point of Al.

5,747,157
MAGNETIC RECORDING MEDIUM

Hiroshi Hashimoto; Yuichiro Murayama; Masaki Satake, and Tsutomu Okita, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 29, 1996, Ser. No. 705,268

Claims priority, application Japan, Aug. 30, 1995, 7-222041

Int. Cl.^{6} G11B *5/702*

U.S. Cl. 428—332 6 Claims

1. A magnetic recording medium including a non-magnetic support substrate and a magnetic layer formed on said support substrate, said magnetic layer comprising a dispersion of ferromagnetic fine powders in a binder, characterized in that:

said binder comprises a polyurethane resin that is a reaction product obtained by reacting a polyol and an organic diisocyanate as main starting materials,

said polyurethane resin containing as components of said polyol 15 to 40% by weight of the total quantity of urethane resin of a short-chain diol component with a cyclic structure, said short-chain diol component having a molecular weight of less than 500, and 10 to 50% by weight of the total quantity of urethane resin of a long-chain polyether polyol component, and further including a polar group-containing long-chain polyol component having a weight average molecular weight of 500 to 5,000.

5,747,158
CHEMICALLY ADSORBED MULTILAYER FILM

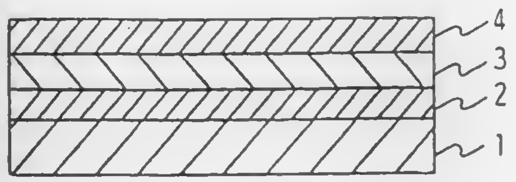
Norihisa Mino, Osaka, and Kazufumi Ogawa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 364,016, Dec. 27, 1994, abandoned, which is a continuation of Ser. No. 98,793, Jul. 29, 1993, abandoned. This application Apr. 18, 1997, Ser. No. 858,190

Claims priority, application Japan, Jul. 29, 1992, 4-202647

Int. Cl.^{6} B32B *7/04;17/06*

U.S. Cl. 428—333 7 Claims



1. A multilayer lubricating film, comprising
(i) a substrate,
(ii) a first chemically adsorbed monomolecular layer comprising carbon-chain molecules covalently bonded to at least one side of said substrate, and
(iii) a second chemically adsorbed monomolecular layer on the surface of the previously formed first chemically adsorbed layer, and wherein said second layer comprises
  (a) carbon-chain molecules and
  (b) monofunctional Z-bonds, wherein said second layer is bonded to said first layer via said monofunctional Z-bonds, where Z represents at least one element selected from the group consisting of Si, Ti, and Sn, and said second layer does not contain intermolecular crosslinks between juxtaposed molecules.

5,747,159
BULLET-RESISTANT TRANSPARENT PANEL, AND METHOD AND PRESS FOR MAKING SAME

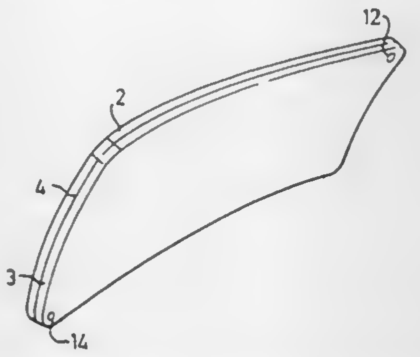
Joseph Labock, Bat Yam, Israel, assignor to M.R.M. International, Inc., Los Angeles, Calif.

PCT No. PCT/US93/01757, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/16872, PCT Pub. Date Sep. 2, 1993

Continuation-in-part of Ser. No. 843,337, Feb. 28, 1992, Pat. No. 5,229,204. This PCT application Feb. 26, 1993, Ser. No. 295,715

Int. Cl.^{6} B32B *7/12;* **E04B** *2/02*

U.S. Cl. 428—335 9 Claims



1. A transparent panel effective to block the penetration of a bullet when fired from the outer side of the panel but not when fired from the inner side of the panel, said transparent panel comprising: an outer transparent sheet of an acrylic resin having a thickness of 7.5–9 mm, and an inner transparent sheet of a polycarbonate resin having a thickness of 9.5–11 mm, said sheets being bonded together by a polyurethane transparent adhesive.

5,747,160
HIGH TENACITY PROPYLENE POLYMER FIBER AND PROCESS FOR MAKING IT

Leonardo Pinoca, Terni; Renato Africano, Ferrara, and Giancarlo Braca, Terni, all of Italy, assignors to Montell North America Inc., Wilmington, Del.

Filed May 14, 1996, Ser. No. 647,507

Claims priority, application Italy, May 15, 1995, MI95A0982

Int. Cl.^{6} G09B *3/00*

U.S. Cl. 428—364 4 Claims

1. A propylene polymer fiber having a tenacity greater than 50 cN/tex comprising a polypropylene composition consisting essentially of an olefin polymer (I) and a high molecular weight propylene polymer (II) having a weight average molecular weight of at least 50,000, a branching index less than 1 and a melt strength from 5 to 40 cN; said propylene polymer (II) being present in a concentration from 0.1% to 10% by weight with respect to the total weight of the composition.

5,747,161
GRAPHITE FILAMENTS HAVING TUBULAR STRUCTURE AND METHOD OF FORMING THE SAME

Sumio Iijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

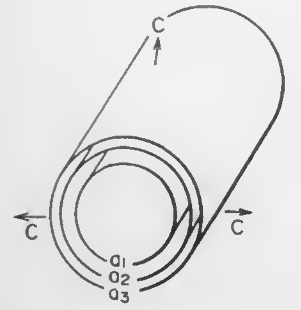
Continuation of Ser. No. 331,158, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 941,696, Sep. 8, 1992, abandoned. This application Oct. 22, 1996, Ser. No. 735,140

Claims priority, application Japan, Oct. 31, 1991, 3-313663

Int. Cl.^{6} B32B *9/00;* **D01F** *9/12;* **D02G** *3/00;* **C01B** *31/04*

U.S. Cl. 428—367 9 Claims

1. A graphite filament having a tubular structure and an outer diameter of 30 nm or less, said tubular structure comprising a



helical structure of carbon hexagons.

5,747,162
SUBSTRATES COATED WITH ANTIOXIDANT COMPOSITIONS AND METHOD FOR INHIBITING THE OXIDATION OF SUCH COMPOSITIONS APPLIED TO A SUBSTRATE

Chester S. Temple, McKees Rocks, and Luciano M. Parrinello, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 376,581, Jan. 23, 1995, Pat. No. 5,670,355. This application Feb. 7, 1997, Ser. No. 797,104

Int. Cl.^{6} B32B *27/34*

U.S. Cl. 428—395 29 Claims

1. A substrate having thereon the dried residue of a curable composition, the composition comprising (1) an antioxidant selected from the group consisting of (a) terpene materials; (b) vitamin materials different from the terpene materials; and (c) combinations thereof in an amount of about 0.001 weight percent to about 1 weight percent based upon the weight of the substrate, the substrate being selected from the group consisting of natural materials, thermoplastic materials, thermosetting materials, inorganic materials selected from the group consisting of silicates, aluminum oxide, silicon carbide, zinc oxide, basalt, mineral wool and magnesium carbonate, and combinations thereof; and (2) a film-forming material capable of forming a substantially uniform continuous coating on the substrate, the film-forming material being selected from the group consisting of polyolefins, polyamides, polyurethanes, polyesters, acrylic polymers, vinyl polymers, acetals, polyaryl sulfones, polyether sulfones, polyimides, polyetherketones, polyphenylene oxides, polyphenylene sulfides, polycarbonates, vinyl esters, epoxides, phenolics, aminoplasts and mixtures thereof.

5,747,163
POWDER FOR USE IN THERMAL SPRAYING

Richard M. Douglas, 116 Coral Bay Dr., League City, Tex. 77573

Continuation of Ser. No. 559,927, Nov. 17, 1995, abandoned, which is a continuation of Ser. No. 116,874, Sep. 3, 1993, abandoned. This application Dec. 12, 1996, Ser. No. 764,421

Int. Cl.^{6} C23C *4/04;4/06*

U.S. Cl. 428—404 14 Claims

1. A powder for use in a thermal spraying coating process, comprising metal carbide particles consisting essentially of a chromium carbide core coated at least partially with a layer consisting essentially of a nickel-chromium alloy containing the metal carbide dissolved therein, wherein the particles have been formed by heating a mixture of fine starting particles of the metal carbide in the presence of the nickel-chromium alloy under conditions effective to cause from about 60 to 90 wt. % of the starting metal carbide to dissolve therein, and wherein the relative amounts of the carbide and the nickel-chromium alloy are selected so that, upon cooling of a thermally sprayed coating made from the powder, substantially all of the metal carbide remains in solution in the nickel-chromium alloy.

5,747,164
CONDUCTIVE COMPOSITE PLASTIC SHEET AND CONTAINER

Takeshi Miyakawa; Mikio Shimizu, and Takeshi Nabeta, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 579,579

Claims priority, application Japan, Sep. 19, 1995, 7-239963; Sep. 19, 1995, 7-239964; Sep. 19, 1995, 7-239965; Sep. 19, 1995, 7-239966

Int. Cl.^{6} B32B *9/04*

U.S. Cl. 428—411.1 11 Claims

1. An electroconductive composite plastic sheet comprising a substrate sheet made of at least one thermoplastic resin selected from the group consisting of a polyphenylene ether resin combined with a polystyrene resin selected from the group consisting of a common polystyrene resin, an impact-resistant polystyrene resin, and mixtures thereof: a polystyrene resin selected from the group consisting of a common polystyrene resin, an impact-resistant polystyrene resin, and mixtures thereof; and an acrylonitrile/butadiene/styrene resin,

and having laminated on each side of the substrate sheet, an electroconductive resin composition consisting essentially of (A) at least one thermoplastic resin selected from the group consisting of a polyphenylene ether resin combined with a polystyrene resin selected from the group consisting of a common polystyrene resin, an impact-resistant polystyrene resin, and mixtures thereof; a polystrene resin selected from the group consisting of a common polystyrene resin, an impact-resistant polystyrene resin, and mixtures thereof; and an acrylonitrile/butadiene/styrene resin, (B) carbon black, and (C) an olefin resin selected from the group consisting of polyethylene, polypropylene, and copolymers of ethylene and α-olefin, and mixtures thereof, and wherein the melt flow index of said olefin resin is at least 0.1 g/10 min as measured at 190° C. under a load of 2.16 kg in accordance with JIS K-7210 or (C1) a resin obtained by hydrogenation of a styrene/diene block copolymer, said electroconductive resin composition containing from 5 to 50 parts by weight of (B) the carbon black per 1000 parts by weight of (A) the thermoplastic resin, and from 1 to 30 parts by weight of (C) the olefin resin or (C1) the resin obtained by hydrogenation of a styrene/diene block copolymer, per 100 parts by weight of the total amount of (A) the thermoplastic resin and (B) the carbon black, and the sheet having the electroconductive resin composition laminated on each side thereof having a surface resistivity of from 10^2 to $10^{10}\Omega$.

5,747,165

Patent Not Issued For This Number

5,747,166
AQUEOUS COATINGS AND PROCESSES FOR THE PRODUCTION OF AUTOMOBILE FINISHES

Stephan Schwarte, Emsdetten, and Horst Grosch, Leinach, both of Germany, assignors to BASF Corporation, Southfield, Mich.

Continuation of Ser. No. 211,276, Apr. 6, 1994, abandoned. This application May 14, 1996, Ser. No. 645,696

Claims priority, application Germany, Sep. 28, 1991, 41 32 430.7

Int. Cl.^{6} B32B *27/40*

U.S. Cl. 428—423.1 15 Claims

1. A method of improving the popping limit of an aqueous coating comprising a water-thinnable, hydroxyl-containing poly-

acrylate resin wherein the popping limit is improved by adding a blocked polyisocyanate or a mixture of blocked polyisocyanates to the coating in an amount so that the ratio between the OH equivalents and NCO equivalents is between 1.0:0.7 and 1.0:1.2;

wherein the water-thinnable polyacrylate resin is obtained by

(I) adding a component (a) comprising

(a1) 40 to 86.75% by weight of a (meth)acrylic acid ester which differs from (a2), is copolymerizable with (a2), (a3), (b1) and (b2) and is essentially free from carboxyl groups, or a mixture of such (meth)acrylic acid esters, and

(a2) 12 to 50% by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a3), (b1) and (b2), carries at least one hydroxyl group per molecule and is essentially free from carboxyl groups, or a mixture of such monomers, and

(a3) 0 to 25% by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a2), (b1) and (b2), is essentially free from carboxyl groups and differs from (a1) and (a2), or a mixture of such monomers,

and a component (b) comprising

(b1) 1.25 to 15% by weight of an ethylenically unsaturated monomer which carries at least one carboxyl group per molecule and is copolymerizable with (a1), (a2), (a3) and (b2), or a mixture of such monomers, and

(b2) 0 to 60% by weight of an ethylenically unsaturated monomer which is free from carboxyl groups and is copolymerizable with (a1), (a2), (a3), and (b1), or a mixture of such monomers,

successively or in portions in alternation to an organic solvent or solvent mixture and polymerizing these components in the presence of at least one polymerization initiator, and

(II) when the polymerization has ended, at least partly neutralizing the resulting polyacrylate resin and dispersing it in water, the sum of the amounts by weight of (a1), (a2), (a3), (b1), and (b2) always giving 100% by weight, and the nature and amount of (a1), (a2), (a3), (b1), and (b2) being chosen such that the polyacrylate resin has a hydroxyl number of 60 to 180, an acid number of 10 to 100, and a glass transition temperature (T_G) of − 40° C. to +60° C.

5,747,167

PROCESS FOR MAKING MOLDED POLYURETHANE LAMINATE ARTICLES

Steven R. Greene, 304 SW. 33nd Ave., Ocala, Fla. 34474
Filed Oct. 2, 1996, Ser. No. 725,099
Int. Cl.^{6} B32B *27/40*
U.S. Cl. 428—423.1 9 Claims

1. A method for producing a molded article comprising multiple adjacent layers of polyurethane wherein said method comprises preparing a mold for a master part wherein said master part has the size, shape, and surface topography of the molded article, and wherein said mold has multiple lids, each of which corresponds to one of said polyurethane layers, and wherein said method further comprises:

(a) forming a first polyurethane layer, the size and dimensions of which are determined by a first lid;

(b) removing said first lid;

(c) forming a second polyurethane layer adjacent to said first layer, wherein the size and dimensions of said second layer are determined by a second lid; and

(d) removing said molded article from said mold.

5,747,168

PROCESS AND MIXTURE FOR APPLYING A COATING MADE OF THE PRECIOUS STONE LAPIS LAZULI ON A SUBSTRATE AND SUBSTRATE THUS PRODUCED

Peter Mack, Kriegsmühle 11, Neckargemünd, Germany
PCT No. PCT/DE93/00922, § 371 Date May 9, 1995, § 102(e) Date May 9, 1995, PCT Pub. No. WO94/07963, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 29, 1993, Ser. No. 407,006
Claims priority, application Germany, Sep. 29, 1992, 42 32 583.8; Oct. 9, 1992, 42 34 020.9
Int. Cl.^{6} C09D *17/00;* **B05D** *7/24*
U.S. Cl. 428—425.8 12 Claims

1. Process for producing a coating containing a mixture made of the precious stone lapis lazuli on a substrate comprising the steps of:

mixing crystalline lapis lazuli precious stone pigment with a grain size of between 5 and 90 microns with a colorless vehicle in an amount effective to encapsulate the lapis lazuli, the vehicle comprising a self-curing or reaction-curing lacquer system selected from the group consisting of polyester lacquer, polyurethane lacquer, acrylic lacquer, and automotive lacquer in a one-layer lacquer or a two-layer lacquer, mixed with additional colorless lacquers;

mixing each 100 grams of said colorless vehicle with 25 to 80 grams of crystalline lapis lazuli precious stone pigment, and 1 to 6 grams of pyrite;

applying said mixture to the substrate;

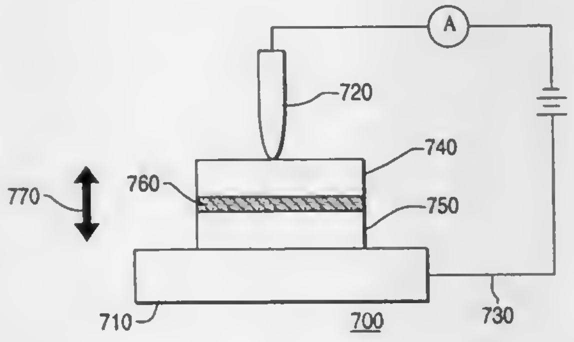
drying or curing said mixture on the substrate; and

grinding or polishing the mixture on the substrate.

5,747,169

FIELD-ASSISTED SEALING

Zhong Hui-Hugh Fan, Plainsboro; Aaron William Levine, Lawrenceville; Satyam Choudary Cherukuri, and Steven A. Lipp, both of Cranbury, all of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.
Filed Nov. 8, 1996, Ser. No. 745,766
Int. Cl.^{6} B32B *9/00*
U.S. Cl. 428—426 22 Claims

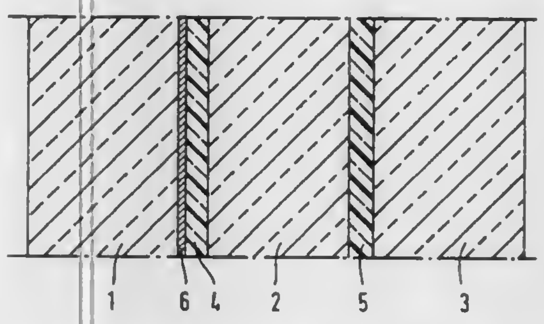


1. A method of bonding a glass substrate and a nonconductive substrate, wherein each substrate has a thickness of at least about 0.1 mm, comprising the steps of: (a) uniformly coating a surface of the nonconductive substrate with a field-assist bonding material; (b) contacting the coated surface with a conforming surface of the glass substrate; (c) heating the two substrates to a temperature no more than about 100° C. below the lowest annealing temperature of the two substrates; and (d) applying a voltage across the two substrates that is effective to accelerate the formation of the bond between the two substrates.

5,747,170

BOMBARDMENT-INHIBITING BULLETPROOF GLASS PANE FOR AUTOMOBILES

Ulrich Von Alpen, Aachen, and M. Gerd Sauer, Stolberg, both of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France
Continuation of Ser. No. 328,949, Oct. 25, 1994, abandoned. This application Jan. 28, 1997, Ser. No. 790,306
Claims priority, application Germany, Oct. 25, 1993, 43 36 321.0
Int. Cl.^{6} B32B *17/06;* **G02B** *5/08*
U.S. Cl. 428—426 12 Claims



1. In a bombardment-inhibiting bullet-proof glass pane comprising a laminate of a plurality of sheets of glass suitable as rear side and rear window panes of an automobile, the improvement comprising said pane having a total light transmittance of less than 15% in the infra red spectral range of from 780 to 1,200 and a transmission in the visible spectral range of 70% or less, said pane including an infra red filtering means facing outside of said laminate comprising a silicate glass sheet possessing low transmission in the infra red spectral range, or a partly transparent inorganic surface coating, or a combination thereof.

5,747,171

METHOD OF PROTECTING A SURFACE

Marek Tokarz, Kungälv; Michael Persson, Göteborg, both of Sweden, and Roman Kozlowski, Krakow, Poland, assignors to Eka Chemicals AB, Bohus, Sweden
Continuation of Ser. No. 211,167, May 27, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 635,207
Claims priority, application Sweden, Sep. 20, 1991, 9102737
Int. Cl.^{6} B32B *9/04*
U.S. Cl. 428—446 23 Claims

1. A method for protecting a porous material sensitive to corrosion caused by pollutants present in the atmosphere, comprising treating the surface of the material with an agent, said agent containing (i) substantially no solid particles with a diameter exceeding about 1 micron and (ii) more than 90% by weight of silica sol having an alkali metal content in the sol, expressed as Na_2O, of less than 0.1% by weight, said silica sol being either anionic, alkaline and stabilized with volatile cations or acidic and stabilized with H^+ions, to form a layer of gelled silica sol within the pores below the surface of the porous material.

5,747,172

ULTRAVIOLET AND ELECTRON BEAM CURABLE PROPENYL-ETHER SILICONE RELEASE COMPOSITIONS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.
Filed Aug. 30, 1995, Ser. No. 521,234
Int. Cl.^{6} B32B *9/04*
U.S. Cl. 428—447 14 Claims

1. A silicone composition comprising an alkenyl siloxy group selected from $MP^{\approx}$, $DP^{\approx}$, or $TP^{\approx}$where:

$MP^{\approx}((CH_3)CH{=}CH{-}O{-}(CH_2)_x{-}O{-}(CH_2)_y)_{3\text{-}a}R_a{-}SiO_{1/2}$;

$DP^{\approx}{=}((CH_3)CH{=}CH{-}O{-}(CH_2)_x{-}O{-}(CH2)_y)_{2\text{-}b}R_b{-}SiO_{2/2}$;

$Tp^{\approx}{=}((CH_3)CH{=}CH{-}O{-}(CH_2)_x{-}O{-}(CH2)_y){-}SiO_{3/2}$

Where x is a non-zero integer, y is zero or a non-zero integer, a is zero, one, or two, b is zero or one, and each R of said alkenyl siloxy group is an independently selected monovalent saturated or unsaturated hydrocarbon radical having from one to thirty carbon atoms.

5,747,173

Patent Not Issued For This Number

5,747,174

BIAXIALLY ORIENTED, LAMINATED POLYESTER FILM

Masahiro Kimura; Kohzo Takahashi; Naotake Kashiwakura, all of Otsu; Kenji Tsunasima, Kyoto, and Hirokazu Kurome, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan
Continuation of Ser. No. 527,481, Sep. 13, 1995, abandoned, which is a continuation of Ser. No. 140,016, Oct. 25, 1993, abandoned. This application Jan. 15, 1997, Ser. No. 783,791
Claims priority, application Japan, Feb. 25, 1992, 4-073228; Oct. 26, 1992, 4-311451; Oct. 26, 1992, 4-311452; Nov. 13, 1992, 4-328678
Int. Cl.^{6} B32B *27/06;27/36*
U.S. Cl. 428—480 2 Claims

1. A biaxially oriented, laminated polyester film having a Young's modulus of 10–250 kg/mm^2 and formed by laminating layers of a polyester B on both surfaces of a layer of a polyester A whose main constituent is an ethylene terepthalate having a glass transition temperature of not more than 50° C., wherein said polyester A contains a long-chain aliphatic dicarboxylic component having an alkylene group of a carbon number of not less than 8 at a content of 1–40 mol %.

5,747,175

LCP BLENDS

Erwin Dietz, and Axel Schönfeld, both of Hoechst Aktiengesellschaft, D-65926 Frankfurt am Main, Germany
Filed Apr. 1, 1997, Ser. No. 825,601
Claims priority, application Germany, Apr. 1, 1996, 196 12 973.7
Int. Cl.^{6} B32B *27/06;* **C08F** *20/00;* **C09K** *19/36*
U.S. Cl. 428—480 19 Claims

1. A liquid-crystalline polymer blend comprising at least two cholesteric liquid-crystalline polymers or at least one nematic liquid-crystalline polymer and at least one cholesteric liquid-crystalline polymer.

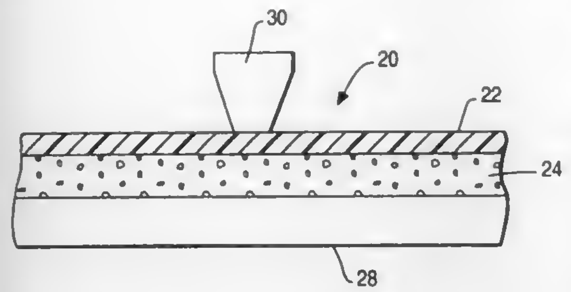
5,747,176

ULTRA HIGH SCRATCH AND SMEAR RESISTANT IMAGES FOR SYNTHETIC RECEIVERS

Shashi G. Talvalkar, Kettering, and Marion E. McCreight, West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Nov. 20, 1995, Ser. No. 560,563
Int. Cl.^{6} B41M *5/26*
U.S. Cl. 428—484 8 Claims

1. A thermal transfer ribbon for depositing scratch and smear resistant images on a synthetic resin receiving substrate with a thermal printer, said thermal transfer ribbon comprising:

a flexible substrate with a coating of a thermal transfer material positioned thereon, said thermal transfer material comprising a colored pigment dispersed in a binder, said binder comprising:



25 to 75 wt. %, based on total dry ingredients, of a water soluble, water dispersible or water emulsifiable thermoplastic resin having a softening point in the range of 95° C. to 250° C. and 10 to 50 wt. %, based on total dry ingredients, of a water dispersible or water emulsifiable wax, having a softening point in the range of 75° C. to 250° C., said wax and thermoplastic resin being sufficiently compatible such that the thermoplastic resin remains in an aqueous dispersion or emulsion containing 25 wt. % wax and 35 wt. % thermoplastic resin, based on the total weight of said aqueous emulsion or dispersion without precipitation;

wherein the thermoplastic resin is selected from the group consisting of sucrose benzoate, polyketone resins and styrene copolymers.

5,747,177

COLLECTED LUMBER, PROCESS FOR PRODUCING COLLECTED LUMBER AND COLLECTED LUMBER PRODUCING DEVICE

Tadashi Torimoto; Yasuhiro Asano; Tsunehiro Kohara, and Tetsuya Nishimura, all of Ogaki, Japan, assignors to Ibiden Co., Ltd., Japan

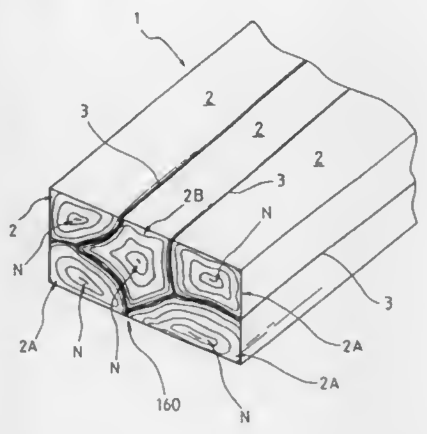
PCT No. PCT/JP94/00669, § 371 Date Jun. 1, 1995, § 102(e) Date Jun. 1, 1995, PCT Pub. No. WO95/02492, PCT Pub. Date Jan. 26, 1995

PCT Filed Apr. 21, 1994, Ser. No. 397,212

Claims priority, application Japan, Jul. 12, 1993, 5-195548

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—537.1 **37 Claims**



1. A collected lumber produced by heating a plurality of woods to soften said woods, compressing said softened woods in the presence therebetween of a reinforcing member for interconnection of said woods and an adhesive to thereby form said woods into a predetermined shape, and subjecting the formed wood body to a fixation treatment using a heating device.

5,747,178

DEPOSITION OF SILVER LAYER ON NONCONDUCTING SUBSTRATE

Billy Valter Sodervall, Markaryd, and Thomas Lundeberg, Lidingö, both of Sweden, assignors to Adtech Holding, St. Helier, Channel Islands

Continuation of Ser. No. 897,614, Jun. 10, 1992, Pat. No. 5,395,651, which is a continuation of Ser. No. 630,333, Dec. 13, 1990, abandoned, which is a continuation of Ser. No. 347,016, May 4, 1989, abandoned. This application Mar. 6, 1995, Ser. No. 399,281

Int. Cl.^{6} B32B *15/04;27/00*

U.S. Cl. 428—624 **35 Claims**

16. An article that resists microbial growth which is constructed of a nonconducting substrate, wherein said nonconducting substrate is coated over at least a portion of its surface area with an adhesive, antimicrobial, biocompatible coating consisting essentially of a layer of silver that has been stabilized by exposure to a solution containing the salt of one or more platinum group metals or gold or a combination thereof, wherein said coating is 2–2000 Å in thickness, and

wherein said silver layer is in colloidal form.

5,747,179

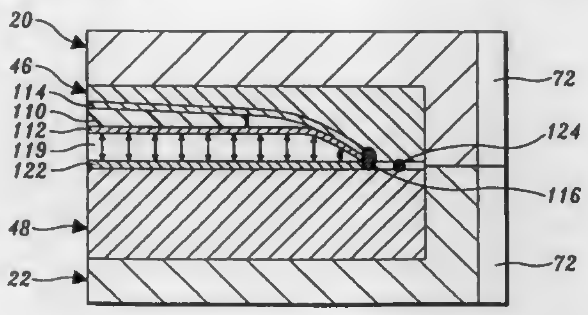
PACK FOR INDUCTIVELY CONSOLIDATING AN ORGANIC MATRIX COMPOSITE

Marc R. Matsen; Paul S. Gregg; Howard Martinson, all of Seattle, and Robert Snyder, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 169,655, Dec. 16, 1993, Pat. No. 5,530,227, which is a continuation-in-part of Ser. No. 777,739, Oct. 15, 1991, Pat. No. 5,410,132, and a continuation-in-part of Ser. No. 92,050, Jul. 15, 1993, Pat. No. 5,410,133, which is a division of Ser. No. 681,004, Apr. 5, 1991, Pat. No. 5,229,562. This application Jun. 5, 1995, Ser. No. 465,506

Int. Cl.^{6} B32B *15/08;* **B21D** *22/10;* **B65D** *73/00*

U.S. Cl. 428—586 **3 Claims**



1. A pack for enclosing an organic matrix composite prepreg in an induction heating operation to cure or to consolidate the prepreg, the pack having three metal sheets and comprising:

(a) a stack of the sheets arranged as two outer sheets and a central diaphragm sheet; the outer sheets being a material susceptible to induction heating;

(b) welds joining all three sheets together at their peripheries to define two pressurizable cavities separated by the diaphragm sheet, the prepreg being positioned in one of the cavities, the peripheral welds being able to withstand a pressure of about 250 psi;

(c) at least one port for each cavity through the weld or sheets for inserting pressurizing gas into a cavity or for evacuating a cavity.

5,747,180

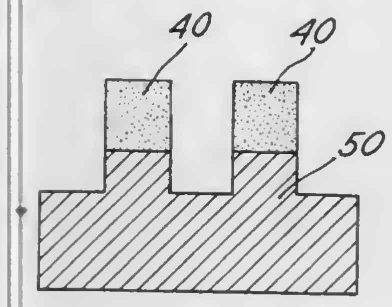
ELECTROCHEMICAL SYNTHESIS OF QUASI-PERIODIC QUANTUM DOT AND NANOSTRUCTURE ARRAYS

Albert E. Miller, Granger, and Supriyo Bandyopadhyay, South Bend, both of Ind., assignors to University of Notre Dame Du Lac, Notre Dame, Ind.

Continuation of Ser. No. 445,046, May 19, 1995, abandoned. This application Dec. 5, 1996, Ser. No. 760,322

Int. Cl.^{6} B32B *3/10;3/26;* **C25D** *11/02;11/18*

U.S. Cl. 428—601 **31 Claims**



1. A method of fabricating nanostructures, comprising the steps of:

electropolishing a single crystal substrate so as to form pits in said substrate;

anodizing said substrate to form an oxide layer having a plurality of pores thereon; and

depositing material within said pores.

5,747,181

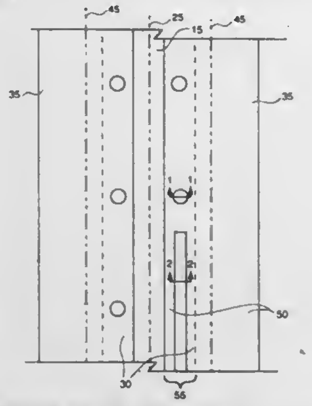
SUPERCONDUCTIVE ARTICLE AND METHOD OF MAKING

Thomas Robert Raber, East Berne, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 24, 1995, Ser. No. 505,937

Int. Cl.^{6} G12B *17/02;* **B32B** *3/10;7/04*

U.S. Cl. 428—614 **21 Claims**



1. A superconductive article, comprising:

a first metallic tape comprising a first superconductive portion, a first longitudinal axis and two opposed tape edge regions;

a second metallic tape comprising a second superconductive portion, a second longitudinal axis and two opposed tape edge regions, wherein one of the edge regions of said first tape overlaps and is in touching contact with one of the edge regions of said second tape, thereby forming an area for interconnecting said first tape and said second tape;

joining means providing a mechanical interconnection between said first tape and said second tape in the area for interconnecting; and

superconductive interconnection means providing a superconductive electrical interconnection between the first superconductive portion and the second superconductive portion in the area for interconnecting, wherein the mechanically and superconductively interconnected first and second tapes comprise a superconductive article.

5,747,182

MANUFACTURE OF ELECTROLUMINESCENT DEVICES

Richard Henry Friend; Andrew Bruce Holmes, both of Cambridge; Donal Donat Conor Bradley, New Wimpole; Paul Leslie Burn, Oxford, all of United Kingdom; Arno Kraft, Dusseldorf, Germany; Adam Richard Brown, Val Kenswaard, Netherlands; Jeremy Henley Burroughes, and Neil Clement Greenham, both of Cambridge, United Kingdom, assignors to Cambridge Display Technology Limited, Cambridge, United Kingdom

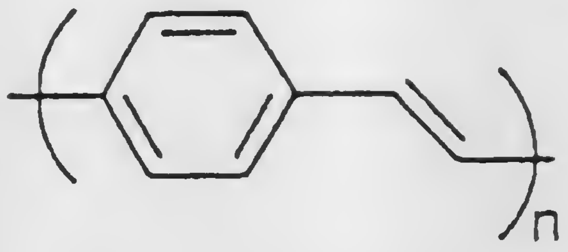
PCT No. PCT/GB93/01573, § 371 Date Apr. 3, 1995, § 102(e) Date Apr. 3, 1995, PCT Pub. No. WO94/03030, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 26, 1993, Ser. No. 379,503

Claims priority, application United Kingdom, Jul. 27, 1992, 9215928

Int. Cl.^{6} H05B *33/12;33/14*

U.S. Cl. 428—690 **21 Claims**



1. An electroluminescent device comprising:

a first charge carrier injecting layer capable of injecting positive charge carriers;

a first layer of a semiconductive conjugated polymer being a soluble conjugated polymer and having a band gap selected such that when excited radiation at a predetermined wavelength is emitted;

a second charge carrier injecting layer capable of injecting negative charge carriers;

means to enable an electric field to be applied across the said layers; and

arranged between the second charge carrier injecting layer and the first layer a second, barrier layer of an insoluble semiconductive conjugated polymer.

5,747,183

ORGANIC ELECTROLUMINESCENT LIGHT EMITTING MATERIAL AND DEVICE USING SAME

Song Shi, Phoenix; Franky So, Tempe, both of Ariz., and H. C. Lee, Calabasas, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1996, Ser. No. 743,257

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—690 **25 Claims**

1. An organic electroluminescent light emitting material characterized by an emitted light having a wavelength of between 4000 Å and 6000 Å, said light emitting material comprising a mixture of a first host emitting material adapted to emit light having a wavelength of between 4000 Å and 5000 Å, and a second host emitting material adapted to emit light having a wavelength of between 5000 and 6000 Å.

5,747,184

JOINING ELEMENT ON A LANTHANUM CHROMITE BASE FOR HIGH-TEMPERATURE FUEL CELLS AND HIGH-TEMPERATURE ELECTROLYSIS CELLS

Manfred Kurbjuhn, Friedrichshafen; Detlef Stolten, Muehlbofen, and Wolfgang Wagner, Deggenhausertal, all of Germany, assignors to Dornier GmbH, Friedrichshafen, Germany

Continuation of Ser. No. 632,774, Apr. 15, 1996, abandoned. This application Jul. 29, 1997, Ser. No. 901,939

Claims priority, application Germany, Apr. 15, 1995, 195 14 164.4

Int. Cl.^{6} H01M *2/00;8/02*

U.S. Cl. 429—31 **5 Claims**

1. A self-supporting joining element for planar high-temperature fuel cells or high-temperature electrolysis cells, consisting essentially of a material

$La_{1+\delta}Mg_xAl_yCr_{1-x-y}O_{3\pm\epsilon}$

wherein $0\leqq\delta\leqq0.1$;

$0.02\leqq x\leqq0.0$;

$0.1\leqq y\leqq0.25$; and

$0\leqq\epsilon\leqq0.1$;

and wherein the material has a linear thermal expansion of $\alpha_{20/1,000}=9.7$ to $10.4\cdot10^{-6}K^{-1}$; a linear swelling $\leqq0.06\%$ at 1,000° C. and $p_{02}=10^{-18}$ bar in air; an electrical conductivity $\sigma\geqq5$ Scm^{-1} in air at 1,000° C.; and an electrical conductivity $\sigma\geqq1$ Scm^{-1} in fuel gas with $p_{02}=10^{-16}$ bar at 1,000° C.

5,747,185

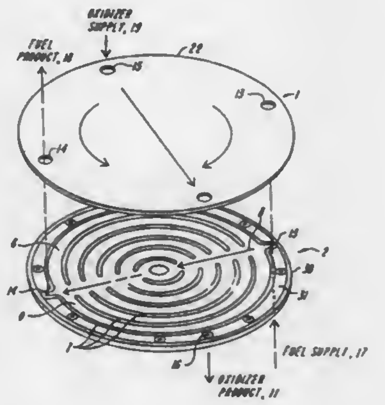
HIGH TEMPERATURE ELECTROCHEMICAL CONVERTER FOR HYDROCARBON FUELS

Michael S. Hsu, Lincoln, Mass., assignor to Ztek Corporation, Waltham, Mass.

Filed Nov. 14, 1995, Ser. No. 557,952

Int. Cl.^{6} H01M *8/02*

U.S. Cl. 429—44 **57 Claims**



1. An electrochemical converter, comprising

an electrolyte layer having a fuel electrode material on one side and an oxidizer electrode material on the other side,

an interconnector having opposed contact surfaces for providing an electrical connection with adjacent electrodes, and

means for introducing a fuel reactant to the fuel electrode and an oxidizer reactant to the oxidizer electrode,

wherein at least one of the interconnector, one of the contact surfaces of the interconnector, the fuel electrode, and the oxidizer electrode comprises a selected mixture containing at least chromium oxide and a metal oxide selected from the group consisting of beryllium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, and radium oxide, and wherein said mixture is a lanthanum-free mixture.

5,747,186

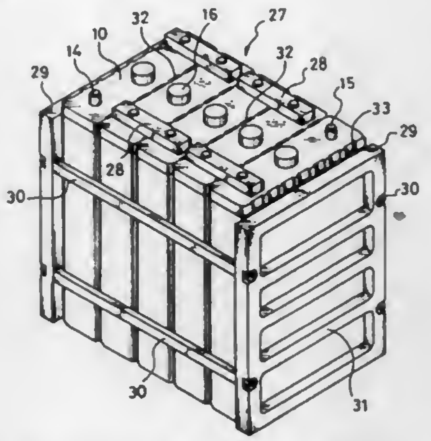
CELL AND MODULE BATTERY OF SEALED NICKEL-METAL HYDRIDE STORAGE

Nobuyasu Morishita, Fujiidera; Shinji Hamada, Hirakata; Hiromu Matsuda, Kawabe-gun, and Munehisa Ikoma, Shiki-gun, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Nov. 22, 1995, Ser. No. 562,132

Int. Cl.^{6} H01M *10/30*

U.S. Cl. 429—53 **13 Claims**



1. A cell for sealed nickel-metal hydride storage battery comprising:

a vessel made of a synthetic resin which accommodates a power-generating unit including:

a negative electrode composed mainly of hydrogen storage alloy,

a positive electrode composed mainly of a nickel oxide,

a separator placed between both electrodes, and

an alkaline electrolyte;

a lid for sealing an open end of said vessel, and

a resettable safety vent provided on said lid; wherein,

a hydrogen equilibrium pressure of said hydrogen storage alloy is 0.01–0.1 MPa at 45° C., when the atomic ratio of the absorbed hydrogen to the alloy H/M is 0.5,

an operation pressure of said safety vent is 0.2– 0.8 MPa, and

a pressure-resistant strength of the casing configured with said vessel and lid is in a range of 0.7–2.0 MPa and set higher than the operation pressure of the safety vent by 0.5 MPa or more.

5,747,187

LITHIUM BATTERY HAVING AN OVER-LOADING PREVENTING DEVICE

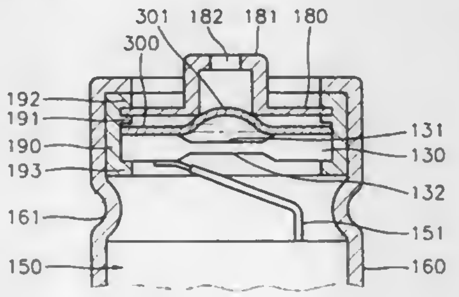
Sung Kwang Byon, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 24, 1996, Ser. No. 686,103

Claims priority, application Rep. of Korea, Jul. 28, 1995, 95-22739

Int. Cl.^{6} H01M *2/04;2/12*

U.S. Cl. 429—58 **13 Claims**



1. A battery comprising:

a case for containing electrolyte therein;

a winding assembly including anode and cathode electrodes so as to generate current;

a cover contacting said winding assembly so as to allow the current to flow;

a cap positioned on said cover and having an electrode portion for applying the current to a load; and

a switching means contactable with both said cover and said cap between said cover and said cap for electrically connecting said cover to said cap, wherein when the battery heats to above 80 degrees Celsius, said switching means becomes physically separated from said cap so as to electrically disconnect said cover from said cap,

wherein said switching means has a disk shape of a uniform thickness, a peripheral portion that contacts said cover to allow electric current to flow, and a semi-spherical protrusion formed at a center thereof to contact a bottom portion of said cap such that when the battery becomes heated to above 80 degrees Celsius, said protrusion flattens such that said switching means becomes physically separated from said cap and electrically disconnect said cap from said cover.

5,747,188

BATTERY WITH IMPROVED SAFETY DURING MECHANICAL ABUSE

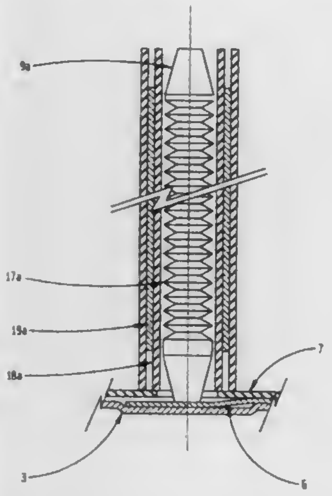
Ulrich Von Sacken, Coquitlam; Wendy Chow, Burnaby, and Allen Shkuratoff, North Vancouver, all of Canada, assignors to Moli Energy (1990) Limited, Canada

Continuation of Ser. No. 451,019, May 25, 1995, abandoned. This application Apr. 16, 1997, Ser. No. 838,179

Claims priority, application Canada, Aug. 5, 1994, 2129558

Int. Cl.^{6} H01M *10/02*

U.S. Cl. 429—61 **29 Claims**



1. A battery having an internal resistance comprising:

(a) a container;

(b) an active electrode assembly comprising a cathode electrode, an anode electrode and a separator, wherein an intrinsic internal short is created by the physical contact of the cathode electrode with the anode electrode upon application of increasing non-uniform pressure to said container, the net resistance of the intrinsic internal short decreasing as said applied non-uniform pressure is increased; and

(c) internal shorting means inside the container and geometrically configured with respect to the container and the active electrode assembly such that an extrinsic internal short is created by the physical contact of two battery components at opposite potential, wherein at most one component is an electrode of said cathode electrode and said anode electrode, upon application of increasing non-uniform pressure to said container.

5,747,189

SMART BATTERY

Bradley Alan Perkins, Mountain View, Calif., assignor to Valence Technology, Inc., Henderson, Nev.

Filed Jul. 22, 1992, Ser. No. 918,435

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 429—91 **8 Claims**

1. A configurable battery comprising:

a plurality of battery cells;

means for switchably connecting said plurality of battery cells in series according to one switching condition and in parallel according to another switching condition;

a microprocessor powered by at least one of said battery cells, responsive to electrical signals for causing said one switching condition and for causing said another switching condition;

a unitary housing inside of which said battery cells, said means for switchably connecting, and said control means are all disposed; and

means for communicating electrical signals representing a desired voltage from an exterior of said housing to said microprocessor.

5,747,190

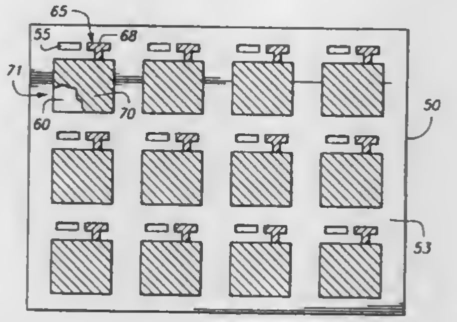
MULTILAYERED BATTERY HAVING A CURED CONDUCTIVE INK LAYER

Rickie C. Lake, Eagle, Id., assignor to Micron Communications, Inc., Boise, Id.

Division of Ser. No. 645,614, May 14, 1996, which is a continuation-in-part of Ser. No. 71,463, Jun. 2, 1993, Pat. No. 5,624,468. This application Apr. 15, 1997, Ser. No. 834,292

Int. Cl.^{6} H01M *6/40;2/30*

U.S. Cl. 429—124 **12 Claims**



1. A battery comprising:

a first nonconductive layer;

a first conductive layer against the first nonconductive layer;

a cathode against the first conductive layer;

a second nonconductive layer;

a second conductive layer against the second nonconductive layer, the second conductive layer comprising a cured conductive ink; and

an alkali metal attached to the second conductive layer.

5,747,191

MULTILAYERED BATTERY HAVING A CURED CONDUCTIVE INK LAYER

Rickie C. Lake, Eagle, Id., assignor to Micron Communications, Inc., Boise, Id.

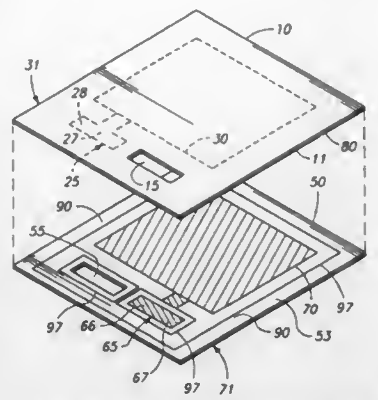
Division of Ser. No. 645,614, May 14, 1996, which is a continuation-in-part of Ser. No. 71,463, Jun. 2, 1993, Pat. No. 5,624,468. This application Apr. 15, 1997, Ser. No. 842,550

Int. Cl.^{6} H01M *6/40;2/30*

U.S. Cl. 429—124 **3 Claims**

1. A battery comprising:

a nonconductive layer;



a conductive layer against the nonconductive layer, the conductive layer comprising a cured conductive ink; and

a cathode against the conductive layer.

5,747,192

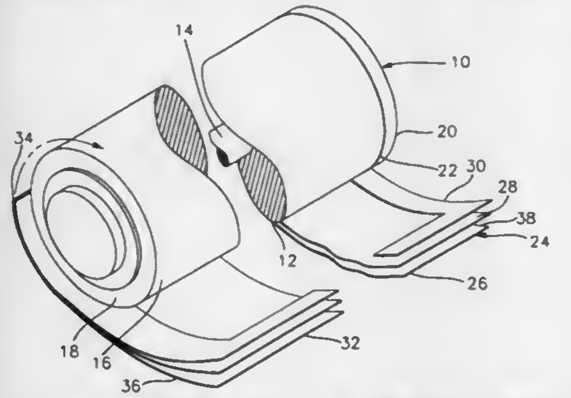
SINGLE PLY PSA LABELS FOR BATTERY APPLICATIONS

John F. Hughen, Rancho Cucamonga; Steven C. Kennedy, Fontana; Lon T. Spada, Walnut; Randolph W. Chan, La Cañada-Flintridge, and Carol A. Koch, San Gabriel, all of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 480,183, Jun. 7, 1995, abandoned. This application May 31, 1996, Ser. No. 656,438

Int. Cl.^{6} H01M *2/00;* **B32B** *1/00*

U.S. Cl. 429—163 **45 Claims**



1. A single ply label for labeling a dry cell battery, said battery having an elongate peripheral case extending along the battery length and defining an axis and opposed ends intersecting the axis and enclosing, with the case, a direct current, electrical energy providing core, said label formed of:

(a) an at least partially transparent, self supporting, substantially monoaxially oriented, heat shrinkable polymer film backing having an outer surface and an inner surface for facing the battery case, a width providing at opposed ends thereof, first and second edges for extending parallel to the axis of the battery, and a length for extending beyond the opposed ends of battery and providing at opposed ends thereof, third and fourth edges for extending normal to the axis of the battery, the width of the backing being sufficient for the backing to embrace the peripheral case of the battery and for the first and second edges to meet in at least abutting relationship, and the length of the backing being sufficient for the third and fourth opposed edges to lap over the opposed ends of the battery on heat shrinkage of the backing; said backing having a heat shrinkage predomninantly in the direction of width of the backing and in an amount up to about 60% in the direction of the width of the backing;

(b) an opaque pigmented layer comprised of an alkali resistant, electrically non-conductive ink applied to at least a portion of the inner surface of and supported by the backing, said layer exhibiting no perceptible change upon exposure to the action of 7.2N KOH for 24 hours; and

(c) an electrically non-conductive pressure-sensitive adhesive layer applied to and extending over the pigmented layer side of the backing at least along the first and second edges, said pressure-sensitive adhesive having a peel strength of at least about 2 Pli and sufficient shear strength to substantially prevent movement of an adhesively applied first edge of the backing to the case relative to an adhesively applied second edge of the backing on heat shrinkage of an adhesively applied backing.

5,747,193

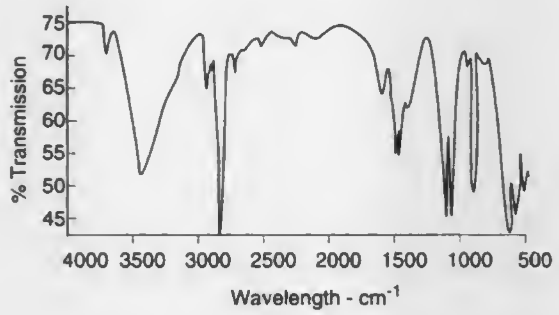
PROCESS FOR SYNTHESIZING LIXMNY04 INTERCALATION COMPOUNDS

Bernard Gerand; Dominique Larcher, both of Amiens, France, and Jean-Marie Tarascon, Martinsville, N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Jul. 11, 1996, Ser. No. 682,817

Int. Cl.^{6} H01M *4/50*

U.S. Cl. 429—224 **14 Claims**



11. A lithiated manganese oxide precursor synthesized by reacting lithium hydroxide, manganese dioxide, and at least one polyhydric alcohol characterized in that a) the X-ray diffraction pattern of said precursor comprises a predominant 001 line having a peak at the 2Θ angle of about 10° and subsidiary 002 and 003 lines having peaks at about 21° and 32°, respectively; and

b) the infrared spectrum of said precursor comprises CH_2 stretching in the 2800 to 2950 cm^{-1} region and C—C and C—O stretching in the 1000 to 1100 cm^{-1} region.

5,747,194

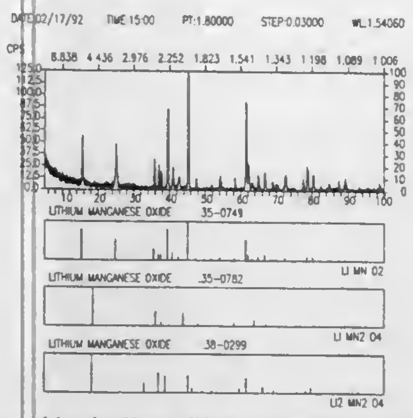
USE OF A STABLE FORM OF LIMNO$_2$ AS CATHODE IN LITHIUM CELL

Isobel J. Davidson, Orleans; Roderick S. McMillan, and John J. Murray, both of Gloucester, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Continuation of Ser. No. 559,603, Nov. 20, 1995, Pat. No. 5,629,112, which is a division of Ser. No. 429,001, Apr. 26, 1995, Pat. No. 5,506,078, which is a division of Ser. No. 104,639, Aug. 11, 1983, abandoned. This application Feb. 24, 1997, Ser. No. 803,799

Int. Cl.^{6} H01M *4/50;10/40*

U.S. Cl. 429—224 **14 Claims**



1. A secondary lithium ion electrochemical cell, comprising a lithium intercalation anode, a non-aqueous electrolyte including a lithium salt, a cathode and a separator between the anode and cathode, wherein the cathode consists of as initial active material, a single-phase compound of formula $LiMnO_2$ characterized by the specific orthorhombic crystal structure described by the space group Pmnm and unit cell dimensions a=4.572 Å, b=5.757 Å and c=2.805 Å, and by the X-ray diffraction pattern shown in FIGS. 1 and 2.

5,747,195

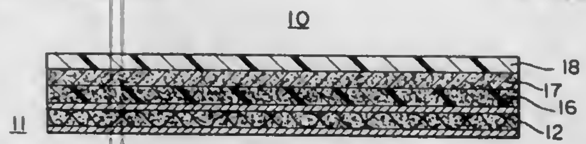
CURRENT COLLECTORS FOR HIGH ENERGY DENSITY CELLS

Mohammed Alamgir; Joseph B. Kejha, and Hung Chieh Shiao, all of c/o Lithium Technology Corp. 5115 Campus Dr., Plymouth Meeting, Pa. 19462

Filed May 6, 1996, Ser. No. 642,937

Int. Cl.^{6} H01M *4/70*

U.S. Cl. 429—235 **10 Claims**



1. A high energy density alkali metal cell which includes an anode, an electrolyte, and a cathode having current collecting base means, the improvement which comprises

said cathode base current collecting means is a fibrous net of carbon or graphite with a coating of metal only on the fibers, and adhering to said fibers, with voids between the fibers which can hold active materials if deposited therein.

5,747,196

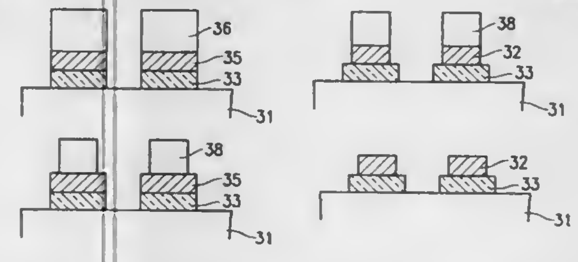
METHOD OF FABRICATING A PHASE-SHIFT PHOTOMASK

Fang-Ching Chao, Hsinchu, and Tien-Chiieh Li, Hsinchu Hsien, both of Taiwan, assignors to United Microelectronics Corporation, Taiwan

Filed Aug. 9, 1996, Ser. No. 695,300

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **4 Claims**



1. A method of fabricating a phase-shift photomask, comprising the steps of:

(1) preparing a transparent layer;

(2) forming a light-transmissive thin film over the transparent layer, the light-transmissive thin film having a specific refractive index;

(3) forming a light-blocking thin film over the light-transmissive thin film;

(4) forming a photoresist layer having a predefined pattern of openings, over the light-blocking thin film;

(5) using the photoresist layer as a mask, performing a first anisotropic etch on the light-transmissive thin film and the light-blocking thin film;

(6) performing an isotropic etch on the photoresist layer so as to uncover an edge part of specific width of the light-blocking thin film;

(7) using the etched photoresist layer as a mask, performing a second anisotropic etch on the light-blocking thin film; and

(8) removing the photoresist layer.

5,747,197

METHOD OF PREPARING A PHOTOTOOL

Norman M. Sweet, Waterford, Mich., assignor to Precision Coatings Inc., Walled Lake, Mich.

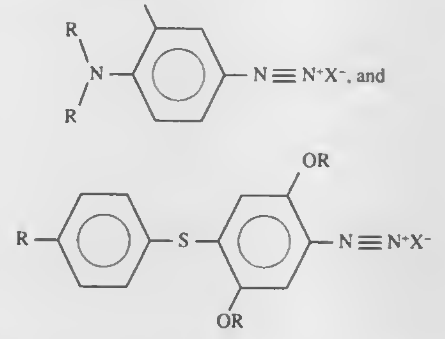
Filed Oct. 1, 1996, Ser. No. 724,189

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **18 Claims**

1. A method of generating a photo mask, said method including the steps of:

providing a sheet of an imaging medium, said medium including an azo dye therein, said dye being formed by the reaction of an aromatic coupling agent with a diazonium salt selected from the group consisting of:



wherein R is hydrogen or an alkyl, Y is a halogen and X is an anion; and

illuminating said imaging medium in an imagewise manner with a light having a wavelength of no more than 532 nm and an intensity which is sufficient to remove at least a portion of said azo dye from said medium.

5,747,198

RESIST PATTERN OF T-SHAPED CROSS SECTION

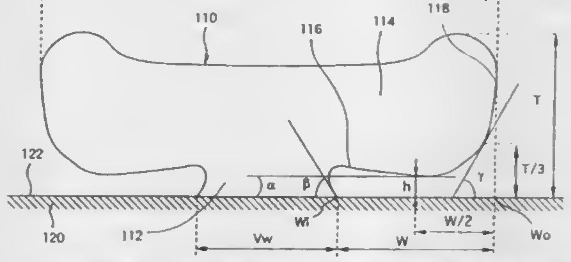
Akifumi Kamijima, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Division of Ser. No. 686,911, Jul. 26, 1996. This application Dec. 2, 1996, Ser. No. 758,676

Claims priority, application Japan, Jul. 26, 1995, 7-209950

Int. Cl.^{6} G03F *7/023;7/09*

U.S. Cl. 430—11 **7 Claims**



1. A substantially homogeneous resist pattern which is formed on a surface of a substrate from a resist composition comprising a

'OL
2 10
SS
1
MY
5
998
MI

positive resist compound containing a mixture of an alkali soluble phenol resin and a naphthoquinonediazide and a negative working agent added to the positive resist compound for imparting an image reversal function, wherein

the resist pattern has a T-shaped cross section including a stem portion extending from the substrate surface and substantially constituting the vertical bar of T and a cap portion connected to the stem portion, opposed to the substrate surface with a spacing and substantially constituting the horizontal bar of T,

provided that α is a minimum of the angle which is defined between a tangent at the lower edge of said cap portion opposed to the substrate surface and the substrate surface, and

h is the spacing between the lower edge of the cap portion and the substrate surface at an intermediate position between the crossing Wo between a line extending from the outermost edge of the cap portion perpendicular to the substrate surface and the substrate surface and the crossing Wi between the side edge of the stem portion and the substrate surface,

said minimum angle α and said spacing h fall within a range defined and encompassed by tetragon ABCD in a h-α graph wherein

A: $\alpha=0°$, $h=0.01$ μm,
B: $\alpha=20°$, $h=0.01$ μm,
C: $\alpha=20°$, $h=0.2$ μm, and
D: $\alpha=0°$, $h=0.3$ μm.

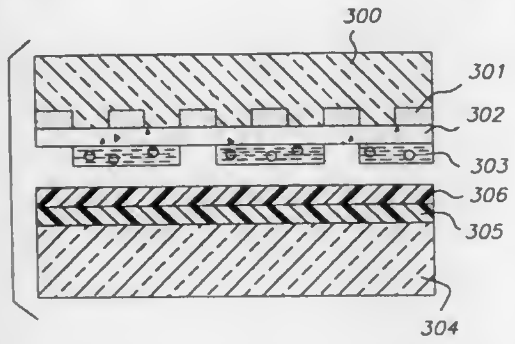
5,747,199
METHOD OF MAKING COLOR FILTER ARRAYS BY TRANSFERRING TWO OR MORE COLORANTS SIMULTANEOUSLY

Luther C. Roberts, Rochester, and David L. Losee, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1997, Ser. No. 788,108

Int. Cl.⁶ G02B *5/20*

U.S. Cl. 430—7 **28 Claims**



1. A method of making a color filter array on a first substrate having an array of pixels, comprising the steps of:

a) depositing and patterning a photoresist layer on the substrate layer to form selected openings over pixels in the array;

b) providing a plurality of two or more transferable colorant layers on a second substrate and positioning such transferable layers in transferable relationship with the first substrate;

c) simultaneously transferring the colorant materials from the plurality of transferable colorant layers to the photoresist layer on the first substrate; and

d) removing the patterned photoresist layer leaving behind the colorant materials in the position of the openings over the selected pixels.

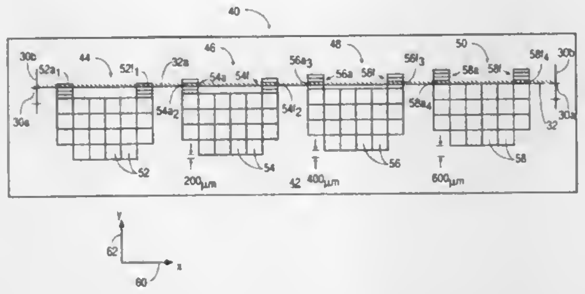
5,747,200
MASK STRUCTURE HAVING OFFSET PATTERNS FOR ALIGNMENT

Hiu F. Ip, and Ellick L. Ma, both of San Jose, Calif., assignors to Micrel, Incorporated, San Jose, Calif.

Filed Aug. 23, 1995, Ser. No. 518,633

Int. Cl.⁶ H01L *21/30*

U.S. Cl. 430—22 **6 Claims**



6. A method for selectively exposing a photoresist layer on a wafer to radiation using a mask having alignment keys and having a first mask pattern and a second mask pattern, said method comprising the steps of:

positioning said wafer in an original position;

aligning said first mask pattern of said mask to said wafer using first alignment keys, wherein said first mask pattern includes:

a first array of subfields arranged in a plurality of rows and columns, subfields in said first array being separated from adjacent subfields in said first array by scribe line regions, wherein certain columns of subfields in said first array of subfields are each shifted by one subfield in a direction parallel to said columns such that an end subfield in each of said certain columns is not opposing any other subfields in other columns of said first array;

first alignment keys formed in at least one of a plurality of rows forming alignment regions formed in each of said end subfield in each of said certain columns of said first array of subfields; and

first patterns formed in remaining subfields in said first array of subfields for selectively exposing a first section of said wafer to said radiation, wherein said first alignment keys are used to align said first array of subfields to said first section of said wafer;

exposing said wafer to radiation so that said first mask pattern causes a corresponding first image to impinge on a section of said wafer;

aligning said second mask pattern of said mask to said wafer using second alignment keys, wherein said second mask pattern includes:

a second array of subfields arranged in a plurality of rows and columns, arranged identically to the first array wherein subfields in said second array being separated from adjacent subfields in said second array by scribe line regions, wherein certain columns of subfields in said second array of subfields are each shifted by one subfield in a direction parallel to said columns of said second array such that an end subfield in each of said certain columns of said second array is not opposing any other subfields in other columns of said second array;

second alignment keys formed in at least one of a plurality of rows forming alignment regions formed in each of said end subfield in each of said certain columns of said second array of subfields;

second patterns formed in remaining subfields in said second array of subfields for selectively exposing said first section of said wafer to said radiation, wherein said second alignment keys are used to align said second array of subfields to said first section of said wafer, said second alignment keys being aligned with said first alignment keys on said first section of said wafer; and

exposing said wafer to radiation so that said second mask pattern causes a corresponding second image to impinge on said section of said wafer which had previously exposed.

5,747,201
CONTROLLING METHOD OF FORMING THIN FILM, SYSTEM FOR SAID CONTROLLING METHOD, EXPOSURE METHOD AND SYSTEM FOR SAID EXPOSURE METHOD

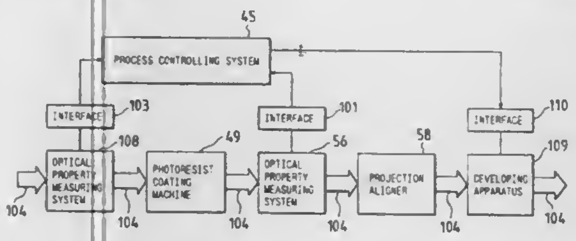
Yasuhiko Nakayama; Masataka Shiba, both of Yokohama, and Susumu Komoriya, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 77,896, Jun. 16, 1993, Pat. No. 5,409,538, which is a continuation of Ser. No. 594,351, Oct. 9, 1990, abandoned. This application Feb. 22, 1995, Ser. No. 392,196

Claims priority, application Japan, Apr. 13, 1990, 2-96443

Int. Cl.⁶ G03F *7/20;7/38;7/40;7/30*

U.S. Cl. 430—30 **13 Claims**


45
PROCESS CONTROLLING SYSTEM
INTERFACE
103
INTERFACE
101
INTERFACE
110
108
49
56
58
109
OPTICAL PROPERTY MEASURING SYSTEM
PHOTORESIST COATING MACHINE
OPTICAL PROPERTY MEASURING SYSTEM
PROJECTION ALIGNER
DEVELOPING APPARATUS
104
104
104
104
104
104

1. A controlling method of forming a thin film which comprises the steps of:

performing a first optical measurement of a substrate before formation of the thin film;

performing a second optical measurement of a substrate during a treatment of the thin film on the substrate;

correcting the second optical measurement to thereby determine an optical property of the substrate being treated; and, controlling a condition for treating the thin film based on the optical property of the thin film determined in the correcting.

12. A controlling method of forming a thin film which comprises the steps of:

performing a first optical measurement of a substrate before formation of the thin film;

performing a second optical measurement of the substrate after treatment of the thin film on the substrate;

correcting the second optical measurement to thereby determine an optical property of the substrate having been treated; and,

controlling a condition for treating the thin film based on the optical property of the thin film determined in the correcting;

wherein the first and second optical measurements are measured by use of first light having a first exposure wavelength and at least one kind of second light having a second wavelength different from the first exposure wavelength.

13. A method comprising the steps of:

measuring optical properties of a wafer to obtain a first measurement;

sending the first measurement to a process control system;

forming a thin film on the wafer by an apparatus under selected process conditions;

treating the wafer by the apparatus under the selected process conditions;

measuring the optical properties of the wafer having the thin film formed and treated thereon to obtain a second measurement;

sending the second measurement to the process control system;

correcting the second measurement in the process control system based on the first measurement;

calculating variations in the process conditions based on the correcting;

feeding the variations back to the apparatus; and,

controlling the process conditions of the apparatus according to the variations.

5,747,202
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES AND A PROJECTION EXPOSURE METHOD COMPRISING THE STEPS OF EXPOSING A TWO-DIMENSIONAL GRID PATTERN OR PATTERNS TO RADIATION AND PROJECTING AN IMAGE OF THE PATTERN OR PATTERNS ONTO A WAFER AT DIFFERENT FOCAL POSI

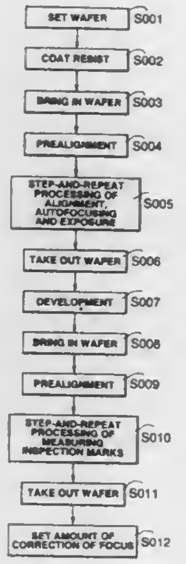
Hiroshi Tanaka, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 584,706, Jan. 11, 1996, abandoned, which is a continuation of Ser. No. 253,071, Jun. 2, 1994, abandoned. This application Sep. 11, 1997, Ser. No. 927,261

Claims priority, application Japan, Dec. 4, 1997, 5-163151

Int. Cl.⁶ C03C *5/02;* **G01B** *11/03*

U.S. Cl. 430—30 **7 Claims**



1. A method for manufacturing semiconductor devices comprising the steps of:

exposing a pattern for focus measurement, formed on a surface of a reticle and comprising a two-dimensional grid pattern, to radiation and projecting the pattern for focus measurement onto a plurality of regions of an inspection wafer at different focal positions of the wafer, on which a resist has been coated by a resist coating apparatus, using a projection exposure apparatus;

developing the two-dimensional grid pattern for focus measurement projected on the inspection wafer in the plurality of regions with a developing apparatus;

imaging with the projection exposure apparatus, the developed two-dimensional grid pattern in the plurality of regions to produce pixels of the developed two-dimensional grid pattern in each region, wherein $f(x,y)$ represents the value of a pixel of the developed two-dimensional grid pattern in each region at coordinate (x,y), $f(x-1,y)$ represents the value of a pixel of the developed two-dimensional grid pattern in each region at coordinate $(x-1,y)$, $f(x+1,y)$ represents the value of a pixel of the developed two-dimensional grid pattern in each region at coordinate $(x+1,y)$, $f(x,y-1)$ represents the value of a pixel of the developed two-dimensional grid pattern in each region at coordinate $(x,y-1)$, and $f(x,y+1)$ represents the value of a pixel of the developed two-dimensional grid pattern in each region at coordinate $(x,y+1)$;

producing image signals representing the imaged developed two-dimensional grid pattern in each region;

differentiating the image signals representing the imaged, developed two-dimensional grid pattern in each region to calculate the contrast of the imaged, developed two-dimensional grid pattern in each region to produce differential values of the image signals according to the equation;

$$Con(x,y)=|f(x-1,y)-f(x+1,y)|+|f(x,y-1)-f(x,y+1)|;$$

determining a differential histogram of the differential values for each region by calculating the frequency of occurrence of different differential values in each region, calculating the area of the histogram for each region above a predetermined differential value threshold, and defining an evaluation value for the contrast of the developed two-dimensional grid pattern for each region at different focal positions of the inspection wafer as the area of the histogram from that region above the predetermined differential value threshold;

determining the best focus position and the inclination of the plane of projection of the image of the pattern for focus measurement of the reticle by the distribution of evaluation values of the pattern with respect to the different focal positions of the wafer;

calculating a focus offset from the determined best focus position and an amount of correction of the inclination of the plane of projection from the determined inclination of the plane of projection of the image of the pattern for focus measurement of the reticle;

setting the focus offset and the amount of correction of the inclination of the plane of projection; and

coating the surface of a wafer with resist using the resist coating apparatus, exposing a pattern formed on the surface of the reticle to radiation and projecting the pattern onto the resist on the surface of the wafer using the projection exposure apparatus and using the set focus offset and amount of correction of the inclination of the plane of projection, and developing the resist using the developing apparatus.

5,747,203

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING CHARGE GENERATING LAYER WITH SPECIFIC POLYESTER

Mamoru Nozomi, Odawara, Japan; Osamu Murakami, Chesapeake, Va.; Masahiro Fuse, Odawara, and Makoto Furuune, Yokohama, both of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

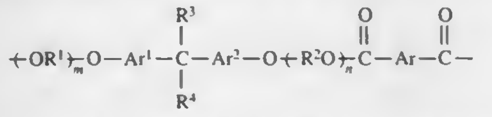
Filed Sep. 11, 1996, Ser. No. 712,285

Claims priority, application Japan, Sep. 12, 1995, 7-234242

Int. Cl.^{6} G03G *5/05*

U.S. Cl. 430—58 **11 Claims**

1. An electrophotographic photoreceptor comprising an electrically conductive substrate and at least a carrier generation layer and a carrier transport layer formed in that order on the substrate, wherein said carrier generation layer contains a polyester resin having a repeating structural unit of the following formula (I):



$$\left(OR^1\right)_m O-Ar^1-\underset{R^4}{\overset{R^3}{C}}-Ar^2-O\left(R^2O\right)_n \overset{O}{\overset{\|}{C}}-Ar-\overset{O}{\overset{\|}{C}}- \qquad (I)$$

wherein each of R^1 and R^2 is an alkylene group which may have a substituent; each of R^3 and R^4 is a hydrogen atom, an alkyl group which may have a substituent or an aryl group which may have a substituent, or R^3 and R^4 may together form a ring; Ar is an arylene group which may have a substituent; each of Ar^1 and Ar^2 is a phenylene group which may have a substituent; and each of m and n is from 0 to 10, provided that m and n are not simultaneously 0.

5,747,204

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR AND AROMATIC POLYCARBONATE RESIN FOR USE IN THE SAME

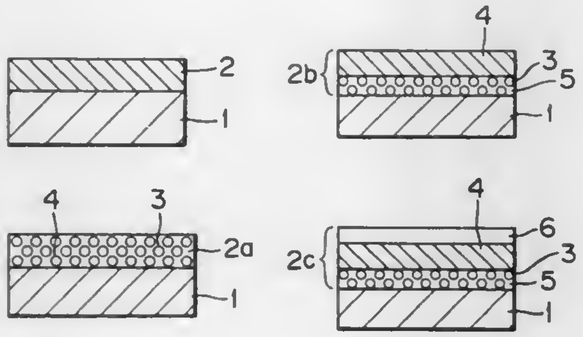
Mitsutoshi Anzai; Akihiro Imai, both of Kawasaki; Masaomi Sasaki; Hiroshi Tamura, both of Susono; Tomoyuki Shimada, Shizuoka-ken; Tetsuro Suzuki, Fuji, and Masafumi Ohta, Susono, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, and Hodogaya Chemical Co., Ltd., Kawasaki, both of Japan

Continuation-in-part of Ser. No. 562,154, Nov. 22, 1995, abandoned. This application Jun. 18, 1996, Ser. No. 665,702

Claims priority, application Japan, Nov. 25, 1994, 6-315721; Nov. 25, 1994, 6-315722; Sep. 22, 1995, 7-269175; Sep. 22, 1995, 7-269176; Nov. 29, 1995, 7-333992

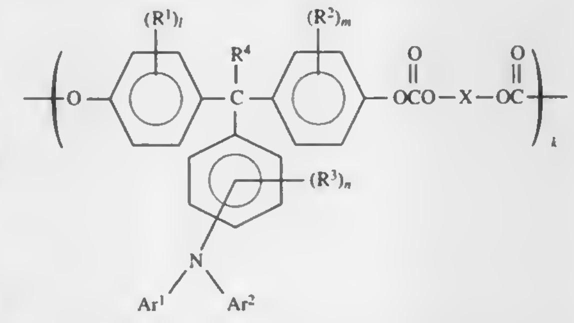
Int. Cl.^{6} G03G *5/047*

U.S. Cl. 430—59 **26 Claims**

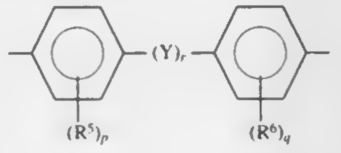


7. An electrophotographic photoconductor comprising an electroconductive support, and a photoconductive layer formed thereon comprising (i) a charge transport medium of an aromatic polycarbonate resin having a repeat unit of formula (I):

(I)



wherein R^1, R^2 and R^3 each is an alkyl group which may have a substituent, or a halogen atom; R^4 is a hydrogen atom, or an alkyl group which may have a substituent; Ar^1 and Ar^2 each is an aromatic hydrocarbon group which may have a substituent; l, m and n each is an integer of 0 to 4; k is an integer of 5 to 5,000; and X is a bivalent aliphatic group, a bivalent cyclic aliphatic group, or



in which R^5 and R^6 each is an alkyl group which may have a substituent, a halogen atom, or an aromatic hydrocarbon group; p and q each is an integer of 0 to 4; and r is 0 or 1, and when r is 1, Y is a straight-chain, branched or cyclic alkylene group having 1 to 12 carbon atoms, —O—, —S—, —SO—, —SO_2—, or —C(O)— containing (ii) a charge generation material.

5,747,205

PHOTOCONDUCTIVE IMAGING MEMBERS

Nan-Xing Hu, Oakville; Ping Liu, and Beng S. Ong, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

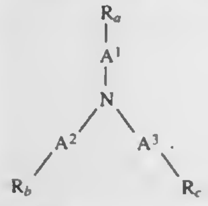
Filed Feb. 27, 1997, Ser. No. 807,487

Int. Cl.^{6} G03G *5/047*

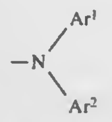
U.S. Cl. 430—59 **8 Claims**

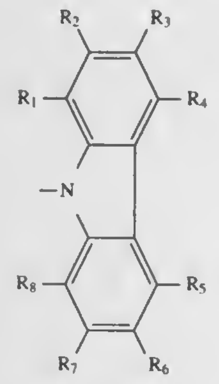
1. A photoconductive imaging member comprised of a starburst aromatic amine compound of the formula

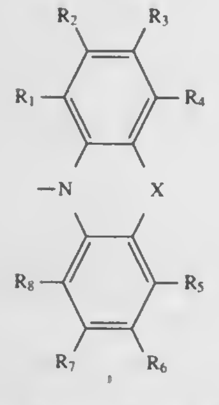
Formula (I)



wherein N is nitrogen; A^1 to A^3 each individually represent biaryl; R_a, R_b, and R_c independently represent one of the groups of the following formulas







wherein N is nitrogen; each Ar^1 and Ar^2 are aryl; R_1 to R_8 are substituents independently selected from the group consisting of hydrogen, halogen, hydrocarbon, and alkoxy; and X represents oxygen, sulfur, or an alkylene.

5,747,206

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Takeshi Agata; Akira Imai; Yasuo Yamamoto; Yutaka Sugizaki, and Katsuhiro Sato, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

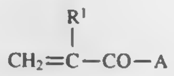
Filed Aug. 13, 1996, Ser. No. 698,006

Claims priority, application Japan, Aug. 15, 1995, 7-228618; Dec. 25, 1995, 7-336410

Int. Cl.^{6} G03G *15/04*

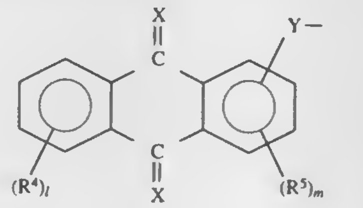
U.S. Cl. 430—64 **7 Claims**

1. An electrophotographic photoreceptor comprising a conductive substrate having thereon at least an undercoat layer and a photoconductive layer, wherein the photoconductive layer has a laminate structure comprising a charge generating layer and a charge transporting layer, and wherein the undercoat layer comprises a polymer compound prepared by using at least one monomer represented by formula (1):

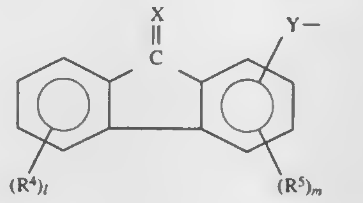


$$CH_2{=}\overset{R^1}{\overset{|}{C}}-CO-A \qquad (1)$$

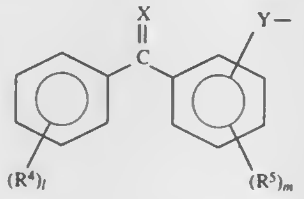
wherein R^1 represents a hydrogen atom or a methyl group; and A represents a group represented by formula (2), (3), (4), (5) or (6):



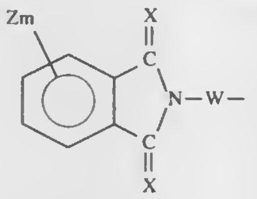
(2)



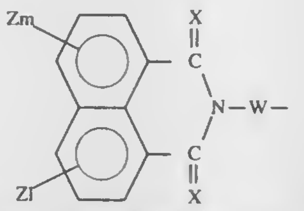
(3)



(4)



(5)



(6)

wherein X represents an oxygen atom, $C(CN)_2$, $C(CN)COOR^2$ or $C(COOR^2)(COOR^3)$; Y represents an oxygen atom or —$COO(CH_2)_nO$— in formulas (2) and (4), and an oxygen atom in formula (3); R^2 and R^3 each represent an alkyl group or an aryl group; R^4 and R^5 each represent an alkyl group, an aryl group, a halogen atom, a nitro group, an acyl group, or a cyano group; W represents —$(CH_2)_nO$— or —Ar—$(R)_k$—$COO(CH_2)_nO$—, wherein Ar represents an arylene group, R represents an alkylene group, and k represents 0 or 1; Z represents an alkyl group, an aryl group, a halogen atom, a nitro group, an acyl group, or a cyano group; n represents an integer of 1 to 20; and m and l each represent an integer of 0 to 2.

5,747,207

ELECTROPHOTOGRAPHIC APPARATUS WITH CHARGE INJECTION LAYER ON PHOTOSENSITIVE MEMBER

Seiji Mashimo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1996, Ser. No. 708,301

Claims priority, application Japan, Sep. 6, 1995, 7-229430

Int. Cl.^{6} G03G *5/147*

U.S. Cl. 430—66 **6 Claims**

1. An electrophotographic apparatus comprising:

a photosensitive member for bearing an image, said photosensitive member having a photosensitive layer and a charge injection surface layer outside of said photosensitive layer, said charge injection layer comprises a binder and electroconductive particles dispersed in the binder;

a charging member, contactable to said charge injection layer, for electrically charging said photosensitive member; and

wherein said charge injection layer has a volume resistivity which is smaller at a surface than inside thereof.

5,747,208

METHOD OF USING PHOTOSENSITIVE MEMBER COMPRISING THICK PHOTOSENSITIVE LAYER HAVING A SPECIFIED MOBILITY

Hideaki Ueda, Kishiwada, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Continuation of Ser. No. 650,554, May 20, 1996, abandoned, which is a division of Ser. No. 418,900, Apr. 7, 1995, abandoned, which is a continuation of Ser. No. 171,447, Dec. 22, 1993, abandoned. This application Aug. 8, 1997, Ser. No. 908,610

Claims priority, application Japan, Dec. 28, 1992, 4-348453; Dec. 1, 1993, 5-301987

Int. Cl.^{6} G03G *13/06;5/047*

U.S. Cl. 430—97 **13 Claims**

1. A method for developing an electrostatic latent image formed on a photosensitive member comprising forming an electrostatic latent image on an identical position of a laminated photosensitive member at a 0.5 second or less interval and, developing the electrostatic latent image, wherein the photosensitive member comprises a charge generating layer containing an organic charge generating material, said charge generating layer having a mobility in the charge generating layer of at least 1×10^{-8}cm^2/V.sec under an electrical field of 5×10^5V/cm and a space charge density of the charge generating layer of 1×10^{16}cm^{-3} or less; a charge transporting layer having a thickness of at least 35 μm and containing an organic charge transporting material, said charge transporting layer having a mobility (μ) of electrical charges satisfying the following formula:

$$\log \mu = A \times E^{1/2} + B \qquad [1]$$

in which E is an electrical field (V/μm), A represents a value of 0.11 or less and B is −5.9 or more; and a cylindrical substrate having a drum size of 50 mmΦ or less.

5,747,209

TONER FOR DEVELOPING ELECTROSTATIC IMAGES CONTAINING AROMATIC HYDROXYCARBOXYLIC ACID AND METAL COMPOUND OF THE AROMATIC HYDROXYCARBOXYLIC ACID

Tsuyoshi Takiguchi, Kawasaki; Kenji Okado, Yokohama; Masaaki Taya, Kawasaki; Ryoichi Fujita, Kawasaki; Makoto Kanbayashi, Kawasaki; Kohji Inaba, Yokohama; Wakashi Iida, Higashikurume; Kazunori Kato, Mitaka; Tetsuya Ida, Kawasaki, and Shinya Yachi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1996, Ser. No. 640,077

Claims priority, application Japan, May 2, 1995, 7-131189; Apr. 23, 1996, 8-123921

Int. Cl.^{6} G03G *9/00*

U.S. Cl. 430—106.6 **21 Claims**

1. A toner for developing electrostatic images, comprising: toner particles comprising (a) a binder resin, (b) a colorant or magnetic material, (c) an aromatic hydroxycarboxylic acid (A), and (d) a metal compound of the aromatic hydroxycarboxylic acid (A); wherein (c) the aromatic hydroxycarboxylic acid (A) and (d) the metal compound of the aromatic hydroxycarboxylic acid (A) are contained in a weight ratio of 1:99 to 10:90.

5,747,210

ELECTROSTATIC IMAGE DEVELOPING TONER AND METHOD FOR PRODUCING THE TONER

Shigeru Emoto; Kumi Hasegawa; Youichi Maekawa; Kazuhito Watanabe, and Kouki Katoh, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 26, 1996, Ser. No. 703,402

Claims priority, application Japan, Aug. 24, 1995, 7-239237; Jan. 11, 1996, 8-020563

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—109 **20 Claims**

1. An electrostatic image developing toner, comprising:

a polyester binder resin comprising at least one polyol crosslinked with at least one polycarboxyl group, wherein at least one of said polyol is an oxyalkylether of a novolak phenol resin; and

said polyester binder resin contains 5 to 20% by weight of components having a weight-average molecular weight greater than about 1×10^7 and is essentially free of a tetrahydrofuran-insoluble portion.

5,747,211

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Masayuki Hagi, Takatsuki; Junichi Tamaoki, Sakai; Takeshi Arai, Akashi, and Hiroyuki Fukuda, Kobe, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 20, 1997, Ser. No. 803,252

Claims priority, application Japan, Feb. 20, 1996, 8-031964; Feb. 29, 1996, 8-043272

Int. Cl.^{6} G03G *9/097*

U.S. Cl. 430—110 **23 Claims**

1. A toner for developing electrostatic latent images comprising:

(a) colored resin particles which include a binder resin and a colorant; and

(b) hydrophobic titania micro particles which are obtained by surface treating of anatase-type titania micro particles having average primary particle size of 30 to 90 nm with a hydrophobicity imparting agent and satisfy following relationship:

$$S = 1125/D + k$$

wherein S expresses BET specific surface area (m^2/g) of hydrophobic titania micro particles, D expresses average primary particle size (nm) of anatase-type titania micro particles, and k expresses a constant of 0 to 60.

5,747,212

FUSING SYSTEM WITH AMINO FUNCTIONAL GROUPS IN SILOXANE RELEASE AGENT FOR USE WITH TONERS AND FUSING MEMBERS REACTIVE WITH AMINE GROUPS

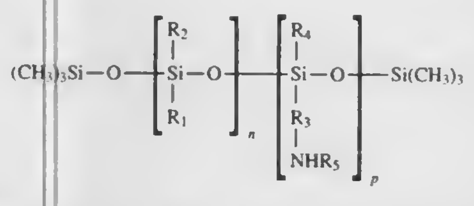
Samuel Kaplan, 1974 Finley Rd., Webster, N.Y. 14568-9787; David H. Pan, 10 Westfield Commons, Rochester, N.Y. 14625; George J. Heeks, 72 Oakcrest Dr., Rochester, N.Y. 14617; Clifford O. Eddy, 248 Shorewood Dr., Webster, N.Y. 14581-1321; Che C. Chow, 286 Valley Green Dr., Penfield, N.Y. 14526; Santokh S. Badesha, 48 Bromley Rd., Pittsford, N.Y. 14534; Arnold W. Henry, 43 Deer Creek Rd., Pittsford, N.Y. 14534, and Donald A. Seanor, 264 Garnsey Rd., Pittsford, N.Y. 14534

Continuation-in-part of Ser. No. 164,853, Dec. 10, 1993, abandoned. This application Sep. 29, 1994, Ser. No. 315,004

Int. Cl.^{6} G03G *15/20*

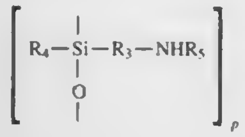
U.S. Cl. 430—124 **12 Claims**

1. An imaging system comprising means to form an unfused toner image on a substrate surface by use of a toner, said toner being susceptible to reaction with amines, fusing means to fuse said toner to said substrate surface comprising a fuser member and a backup pressure member to fuse said toner to said substrate surface as said substrate is transported between said fuser member and said pressure member, said fuser member comprising a thermally stable FKM hydrofluoroelastomer fusing surface and means to deliver a release agent to said substrate surface, said release agent comprising a fluid amino functional oil containing an active molecule having the following formula I:



$$(CH_3)_3Si{-}O{-}\left[\begin{matrix}R_2\\ |\\ Si{-}O\\ |\\ R_1\end{matrix}\right]_n\left[\begin{matrix}R_4\\ |\\ Si{-}O\\ |\\ R_3\\ |\\ NHR_5\end{matrix}\right]_p{-}Si(CH_3)_3$$

where 50≦n≦200, P is from 1 to 5 and R_1, R_2 and R_3 are selected from the group consisting of alkyl and arylalkyl radicals having 1 to 18 carbon atoms; R_4 is selected from the group consisting of alkyl having 1 to 18 carbon atoms, arylalkyl radicals having 1 to 18 carbon atoms and a polyorganosiloxane chain having 1 to 100 diorganosiloxy repeat units; and R_5 is selected from the group consisting of hydrogen, alkyl and arylalkyl radicals having 1 to 18 carbon atoms, with the proviso that in at least 85% of the active molecules of the above formula I in said fluid amino functional oil contains the amino functional siloxane chains of the following formula II have p equal to 1 and wherein when p is from 2–5 the amino functional siloxane chains of the following formula II



$$\left[\begin{matrix} & | & & \\ R_4{-} & Si & {-}R_3{-}NHR_5 \\ & | & & \\ & O & & \\ & | & & \end{matrix}\right]_p$$

are situated at random along the active molecule, said fluid amino functional oil having predominantly monoamino functionality per active molecule to interact with said hydrofluoroelastomer fusing surface to provide an interfacial barrier layer to said toner and a low surface energy film to release said toner from said fusing surface.

5,747,213

IMAGE FORMING METHOD AND HEAT FIXING METHOD USING A TONER INCLUDING A WAX

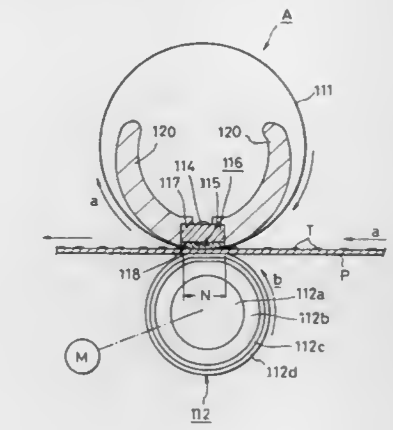
Kenji Okado; Ryuichiro Maeyama, and Kouji Inaba, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1996, Ser. No. 654,691

Claims priority, application Japan, May 31, 1995, 7-156771; Jan. 26, 1996, 8-031223

Int. Cl.^{6} G03G *13/20*

U.S. Cl. 430—124 **140 Claims**



1. An image forming method comprising the steps of:

forming an electrostatic latent image on a latent image holding member;

developing the electrostatic latent image by using a color toner to form a toner image;

transferring the toner image onto a recording material; and

fixing the toner image to the recording material by a heat fixing device comprising a heating member in contact with the toner image;

wherein the color toner comprises at least a binder resin, a colorant, and wax, the wax having a molecular weight distribution measured by gel permeation chromatography (GPC), which has a ratio of the weight average molecular weight (Mw) to the number average molecular weight (Mn) of 1.45 or less, and a solubility parameter (SP value) of 8.4 to 10.5,

wherein at least the surface of the heating member is formed with a copolymer having at least tetrafluoroethylene as a repeating unit in a main chain of the copolymer and a fluoroalkyl group in side chains of the copolymer, and

contact angles between the wax and the surface of the heating member at 100° C. and 200° C. satisfy the following relations:

$$60° \leqq A \leqq 80°$$

$$10° \geqq B - A \geqq 3°,$$

wherein A is a contact angle between the wax and the surface of the heating member at 100° C., and B is a contact angle between the wax and the surface of the heating member at 200° C.

5,747,214

METHOD OF FORMING AN ELECTROPHOTOGRAPHIC COLOR TRANSFER IMAGE AND APPARATUS USED THEREFOR

Eiichi Kato; Yusuke Nakazawa, and Sadao Osawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

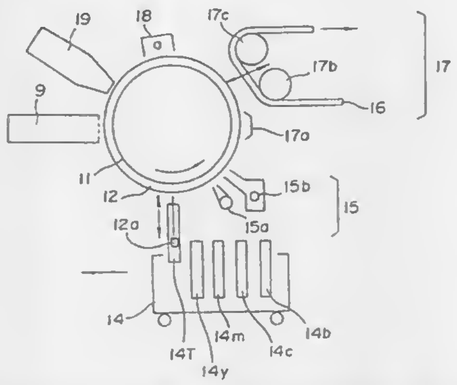
PCT No. PCT/JP94/00487, § 371 Date Nov. 25, 1994, § 102(e) Date Nov. 25, 1994, PCT Pub. No. WO94/23345, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 25, 1994, Ser. No. 343,476

Claims priority, application Japan, Mar. 26, 1993, 5-090488; Mar. 30, 1993, 5-093832

Int. Cl.^{6} G03G *13/14;13/01;15/16*

U.S. Cl. 430—126 **11 Claims**



1. A method of forming an electrophotographic color transfer image comprising (i) a step of forming a peelable transfer layer on the surface of an electrophotographic light-sensitive element, (ii) a step of forming at least one color toner image by an electrophotographic process on the transfer layer, and (iii) a step of heat-transferring the toner image together with the transfer layer onto a receiving material, wherein prior to or simultaneously with the formation of the transfer layer a compound (S) which contains a fluorine atom and/or silicon atom is applied to the surface of the electrophotographic light-sensitive element to improve releasability of the surface of the electrophotographic light-sensitive element; wherein steps (i), (ii) and (iii) are in sequence; and wherein the peelable transfer layer is formed by an electrodeposition coating method which is carried out using grains comprising a resin (A) which has a glass transition point of not more than 140° or a softening point of not more than 180°, said grains being supplied between the electrophotographic light-sensitive element and an electrode placed in opposition to the light-sensitive element, and migrate due to electrophoresis according to potential gradient applied from an external power source to adhere to or electrodeposit on the electrophotographic light-sensitive element.

5,747,215

TONER COMPOSITIONS AND PROCESSES

Beng S. Ong, Mississauga; Walter Mychajlowskij, Georgetown, both of Canada; Grazyna E. Kmiecik-Lawrynowicz, Fairport, N.Y.; Raj D. Patel, Oakville, Canada; David J. Sanders, Oakville, Canada, and Stephan V. Drappel, Toronto, Canada, assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 825,451, Mar. 28, 1997. This application Apr. 29, 1997, Ser. No. 841,300

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—137 **20 Claims**

1. A process for the preparation of toner comprising

(i) blending (a) a colorant dispersion containing a first ionic surfactant and an optional charge control agent with (b) a latex blend comprised of linear polymer and crosslinked polymer particles, optional nonionic surfactant and a second ionic surfactant with a charge polarity opposite to that of said first ionic surfactant in said colorant dispersion;

(ii) heating the resulting mixture at about below the glass transition temperature (Tg) of the linear latex polymer to form toner sized aggregates; and

(iii) subsequently heating said aggregate suspension about above the Tg of the linear latex polymer to effect fusion or coalescence of said aggregates, and wherein said linear polymer is of an M_w of from about 20,000 to about 40,000.

5,747,216

PRESENSITIZED PLATE COMPRISING TWO PHOTOSENSITIVE LAYERS WHEREIN THE LAYER ADJACENT TO THE SUPPORT HAS A LOWER CONCENTRATION OF DYE THAN THE OTHER LAYER

Takuo Watanabe; Yasuhito Naruse, and Kotaro Yamasue, all of Shizuoka-ken, Japan, assignors to Fuji Photo Film Co, Ltd., Minami-ashigara, Japan

Filed Jun. 13, 1991, Ser. No. 714,568

Claims priority, application Japan, Jun. 15, 1990, 2-156743

Int. Cl.^{6} G03F *7/095;7/023*

U.S. Cl. 430—156 **15 Claims**

1. A presensitized plate which comprises a roughened and anodized aluminum support having provided thereon two positive working light-sensitive layers, one of which layers being a light-sensitive layer adjacent to or near the support and comprising an ester obtained by reacting 1,2-naphthoquinone-2-diazide-5-sulfonyl chloride with a polyhydroxy compound and an alkali-soluble resin that becomes soluble in a developer upon exposure to light and the other light-sensitive layer comprising an ester obtained by reacting 1,2-naphthoquinone-2-diazide-5-sulfonyl chloride with a polyhydroxy compound, an alkali-soluble resin and a dye that becomes soluble in a developer upon exposure to light, wherein a dye concentration in the light-sensitive layer adjacent to or near the support is lower than that in the other light-sensitive layer, and said two light-sensitive layers are obtained by (i) coating on the support a first photosensitive solution being free of a dye and containing the ester obtained by reacting 1,2-naphthoquinone-2 -diazide-5-sulfonyl chloride with a polyhydroxy compound, the alkali-soluble resin and a solvent to form the light-sensitive layer adjacent to or near the support, (ii) then coating a second photo-sensitive solution including the ester obtained by reacting 1,2 -naphthoquinone-2-diazide-5-sulfonyl chloride with a polyhydroxy compound, the alkali-soluble resin, the dye and a solvent to form the other light-sensitive layer, and (iii) then drying the light-sensitive layers thereby forming the two positive working light-sensitive layers.

2. A presensitized plate which comprises an aluminum support, a surface of which is grained and anodized, and two positive working light-sensitive layers on said surface, one of which layers being a light-sensitive layer adjacent to or near the support and comprising an o-naphthoquinone diazide compound and an alkali-soluble resin that becomes soluble in a developer upon exposure to light and the other light-sensitive layer comprising an o-naphthoquinone diazide compound, an alkali-soluble resin and a dye that becomes soluble in a developer upon exposure to light, wherein the o-naphthoquinone diazide compound contained in the two light-sensitive layers are identical, a dye concentration in the light-sensitive layer adjacent to or near the support is lower than that in the other light-sensitive layer, and said two light-sensitive layers are obtained by (i) coating on the support a first photo-sensitive solution being free of a dye and containing the o-naphthoquinone diazide compound, the alkali-soluble resin and a solvent to form the light-sensitive layer adjacent to or near the support, (ii) then coating a second photo-sensitive solution including the o-naphthoquinone diazide compound, the alkali-soluble resin, the dye and a solvent to form the other light-sensitive layer, and (iii) then drying the light-sensitive layers thereby forming the two positive working light-sensitive layers.

5,747,217

LASER-INDUCED MASS TRANSFER IMAGING MATERIALS AND METHODS UTILIZING COLORLESS SUBLIMABLE COMPOUNDS

Krzysztof A. Zaklika, St. Paul; Stanley C. Busman, Minneapolis, and Gregory D. Cuny, Woodbury, all of Minn., assignors to Minnesota Mining And Manufacturing Company, Saint Paul, Minn.

Filed Apr. 3, 1996, Ser. No. 627,305

Int. Cl.^{6} G03F *7/11*

U.S. Cl. 430—158 **18 Claims**

1. A thermal transfer donor element comprising a substrate having coated on at least a portion thereof, in one or more layers:

(a) a substantially colorless sublimable compound;

(b) a radiation absorber; and

(c) a thermal mass transfer material;

wherein the sublimable compound is free of acetylenic groups and has a 5% mass loss temperature of at least about 55° C. and a 95% mass loss temperature of no more than about 200° C. at a heating rate of 10° C./minute under a nitrogen flow of 50 ml/minute, and said sublimable compound has a melting point temperature that is at least about said 5% mass loss temperature and a peak thermal decomposition temperature that is at least about said 95% mass loss temperature.

5,747,218

POSITIVE PHOTORESIST COMPOSITION

Makoto Momota; Kenichiro Sato, and Shinji Sakaguchi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

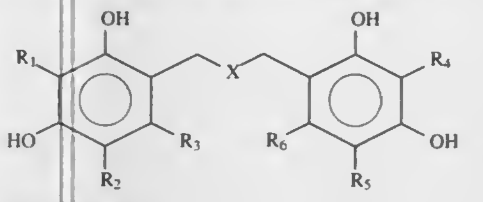
Filed Oct. 25, 1996, Ser. No. 736,206

Claims priority, application Japan, Apr. 27, 1995, 7-104307; Jan. 18, 1996, 8-006697

Int. Cl.^{6} G03F *7/023*

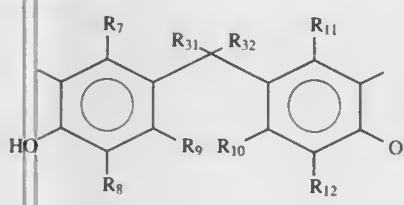
U.S. Cl. 430—192 **9 Claims**

1. A positive photoresist composition comprising an alkali-soluble resin and a 1,2-naphthoquinonediazide-5-(and/or -4-)sulfonic ester of a polyhydroxy compound represented by the following formula (I), the tetraester component of the 1.2 -naphthoquinonediazide-5-(and/or -4-)sulfonic ester of the polyhydroxy compound represented by formula (I) accounting for 50% or more of the entire pattern area determined by high-performance liquid chromatography using ultraviolet rays of 254 nm:

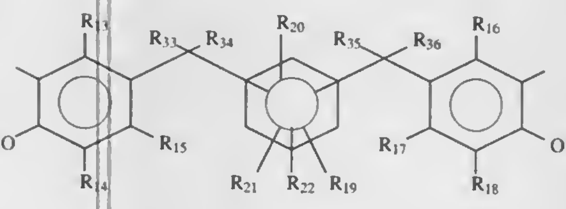


(I)

wherein X represents



or



R_1 to R_{18}, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, a cycloalkyl group, or an alkenyl group;

R_{19} and R_{20}, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkenyl group;

R_{21} represents a hydrogen atom, a hydroxyl group, a halogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkenyl group;

R_{22} represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, a cycloalkyl group, an alkenyl group, an alkoxy group; and

R_{31} to R_{36}, which may be the same or different, each represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and R_{31} and R_{32}, R_{33} and R_{34}, or R_{35} and R_{36} may be combined to form a 4 or 5-membered cycloalkane.

5,747,219

IMAGE-RECEIVING ELEMENTS

Robert L. Febonio, Hudson, N.H., and James A. Foley, Wellesley, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 9, 1997, Ser. No. 890,500

Int. Cl.^{6} G03C *8/52;8/26*

U.S. Cl. 430—215 **35 Claims**

1. An image receiving element for use in diffusion transfer process comprising a support carrying on the support:

an image-receiving layer; and

a clearing layer over said image-receiving layer, remote from said support, said clearing layer comprising nonylphenoxy-polyoxyethylene and polyoxyethylene stearate.

5,747,220

LIGHT SENSITIVE PLANOGRAPHIC PRINTING PLATE HAVING PARTICULAR DEPOSITED PARTICLES AND PROCESS FOR PRODUCING THE SAME

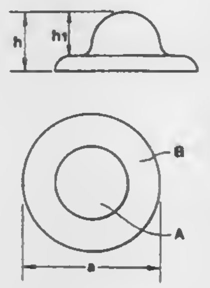
Katsuhiko Hidaka; Katsuhiro Kawabata, and Keiko Tamukai, all of Hasaki-machi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 630,255

Claims priority, application Japan, Apr. 11, 1995, 7-109957

Int. Cl.^{6} G03F *7/115*

U.S. Cl. 430—273.1 **12 Claims**



1. A light sensitive planographic printing plate comprising deposited particles on a sensitive layer, each of said deposited particles comprising a protuberant or bulging portion and a substantially flat base portion spreading around said protuberant or bulging portion, both said protuberant or bulging portion and said flat base portion being formed integrally with a same material.

5,747,221

PHOTOLITHOGRAPHY METHOD AND PHOTOLITHOGRAPHY SYSTEM FOR PERFORMING THE METHOD

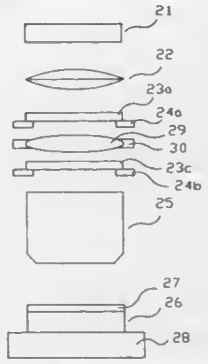
Chong-hoe Kim, Kyoungki-do; Myŏng-gun Kil, Taejŏn-jik'alshi; Won-t'aek Kwŏn, Seoul, and Kwang-chŏl Kim, Kyoungki-do, all of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Oct. 31, 1995, Ser. No. 550,754

Claims priority, application Rep. of Korea, Nov. 8, 1994, 1994-29191; Nov. 8, 1994, 1994-29192

Int. Cl.^{6} G03F *7/20*

U.S. Cl. 430—311 **5 Claims**



1. A photolithography method for imaging a wafer in the production of integrated circuits, the method comprising:

(a) providing a plurality of reticles each comprising an integrated circuit mask pattern, wherein each of said reticles includes a transparent substrate and an opaque area on said transparent substrate, and said integrated circuit mask patterns on said plurality of reticles are the same with respect to the shape of said integrated circuit mask patterns;

(b) providing a projection stepper apparatus which is adapted to receive said reticles and is further adapted to project light through said reticles;

(c) inserting said reticles into said stepper apparatus such that said reticles are positioned separately from one another along an optical path; and

(d) projecting light through said reticles to project said integrated circuit mask patterns of said reticles onto said wafer to form an image,

wherein a scattered portion of light, generated while passing though one of said reticles in the optical path, is filtered out by a subsequent one of said reticles such that an image of said integrated circuit mask pattern is projected onto the wafer with high resolution.

5,747,222

MULTI-LAYERED CIRCUIT SUBSTRATE AND MANUFACTURING METHOD THEREOF

Jae-chul Ryu, Kyungki-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyongsangnam-do, Rep. of Korea

Filed Sep. 11, 1996, Ser. No. 712,117

Claims priority, application Rep. of Korea, Sep. 12, 1995, 1995-29688

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—312 **9 Claims**

1. A method of manufacturing a multi-layered circuit substrate, comprising the steps of:

applying a photosensitive insulating layer over a principal surface of a substrate;

exposing and developing said photosensitive insulating layer to form a photosensitive insulating layer of a predetermined pattern and pattern spaces:

forming a conductive layer by printing a conductive ink in at least some of the pattern spaces;

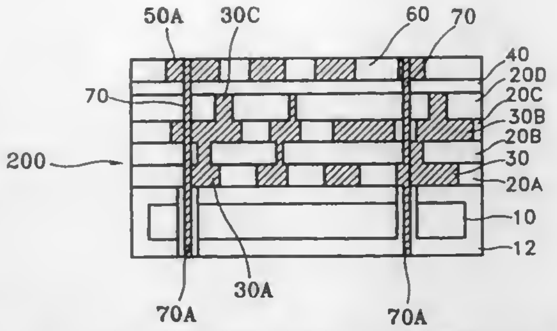
forming a plurality of layers, each layer comprising a photosensitive insulating layer of a predetermined pattern and pattern spaces and a conductive layer formed in at least some of said pattern spaces, by repeating the above exposing and forming steps;

coating an uppermost layer of the plurality of layers with an adhesive insulating layer;

forming a metallic thin-film on said adhesive insulating layer by thermal pressing;

etching said metallic thin-film to form a predetermined metallic thin-film pattern; and

forming a through hole into which a conductive material is implanted, the through hole extending from a top surface of said plurality of layers to a bottom surface of said plurality of layers and being formed in said substrate, conductive layers, photosensitive insulating layers, and metallic thin-film pattern to electrically connect said conductive layers to said metallic thin-film pattern.



5,747,223

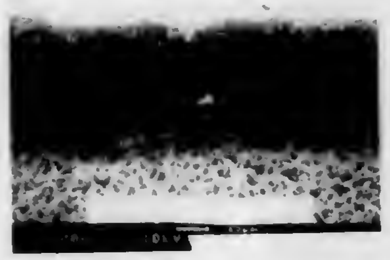
COMPOSITION FOR PHOTOIMAGING

Robert D. Allen, San Jose, Calif.; Richard Allen Day, Whitney Point, N.Y.; Donald Herman Glatzel, New Milford, Pa.; William Dinan Hinsberg, Fremont, Calif.; John Richard Mertz, Endicott; David John Russell, Apalachin, both of N.Y., and Gregory Michael Wallraff, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 467,993, Jun. 6, 1995, abandoned, which is a division of Ser. No. 793,889, Nov. 18, 1991, which is a continuation-in-part of Ser. No. 632,032, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 318,536, Mar. 3, 1989, Pat. No. 5,026,624, and a continuation-in-part of Ser. No. 292,173, Dec. 30, 1988, Pat. No. 4,940,651. This application Jul. 9, 1996, Ser. No. 677,230

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—325 **18 Claims**



1. A method of photopatterning an epoxy-glass laminate circuit board cured with dicyandiamide, comprising the following steps of:

(a) providing a single phase photoimaging composition comprising:

a photosensitive cationically polymerizable epoxy based imaging system comprising:

(i) an epoxy based resin system having solids comprising between about 28% and 57% by weight of a polyol resin having a molecular weight between 60.000 to about 130.000;

between about 43% and 72% by weight of a brominated epoxy resin of molecular weight from about 600 to 2500; and

(ii) from about 0.1 to about 15 parts by weight of a cationic photoinitiator capable of initiating polymerization in said epoxidized resin system upon exposure to actinic radiation;

said resin system being further characterized by having an absorbance of light in the 330 to 700 nm region of less than 0.1 for a 2 mil thick film;

(b) providing a printed epoxy-glass laminate substrate cured with dicyandiamide;

(c) coating the composition onto the printed substrate;

(d) drying the composition;

(e) exposing selected areas of the composition to the actinic radiation;

(f) developing the composition to pattern the composition; and

(g) curing the composition.

5,747,224

STOCK DEVELOPER SOLUTIONS FOR PHOTORESISTS AND DEVELOPER SOLUTIONS PREPARED BY DILUTION THEREOF

Mitsuru Sato; Masakazu Kobayashi, and Toshimasa Nakayama, all of Kanagawa-ken, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan

Division of Ser. No. 412,885, Mar. 29, 1995. This application Apr. 10, 1996, Ser. No. 630,622

Claims priority, application Japan, Mar. 31, 1994, 6-83650

Int. Cl.^{6} G03F *7/32*

U.S. Cl. 430—331 **9 Claims**

1. A method of preparing a oeveloper solution for photoresists comprising diluting a stock developer solution for photoresists that contains a lower alkyl quaternary ammonium base in a concentration of not less than 15 wt. %, and also contains at least one surfactant having a weight average molecular weight of 200 to 800 selected from the group consisting of (1) an alcohol/ethylene oxide adduct wherein the alcohol is at least one member selected from the group consisting of hexylene glycol and 3-methyl-3-methoxybutyl alcohol, (2) polyethylene glycol, (3) an alcohol/propylene oxide adduct, and (4) an alcohol/ethylene oxide/propylene oxide adduct.

5,747,225

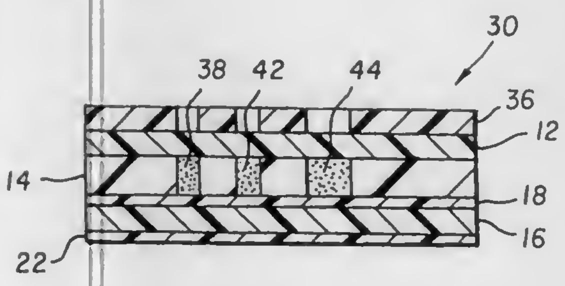
LIGHT SENSITIVE DEVICE

Joseph Anthony Manico, Rochester, and Richard Carroll Reem, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1995, Ser. No. 580,733

Int. Cl.^{6} G03B *17/18;* **G03C** *1/685;1/73*

U.S. Cl. 430—345 **30 Claims**



1. A light sensitive device comprising a base material and a layer of photochromic chemical dispersed in hydrophilic colloid wherein said device has a pattern of ultraviolet light absorbing material overlaying a portion of said layer of photochromic chemical wherein said ultraviolet absorbing material is in said pattern such that when said device is in sunlight photochromic material not overlayed by said ultraviolet light absorbing material is dark and photochromic material overlayed by the ultraviolet absorbing material is transparent.

5,747,226

PROCESSING MATERIAL AND HEAT-DEVELOPED IMAGE FORMATION METHOD USING THE SAME

Yoshisada Nakamura; Shun-ichi Ishikawa, and Kazuhiko Matsumoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1996, Ser. No. 703,743

Claims priority, application Japan, Aug. 28, 1995, 7-240445

Int. Cl.^{6} G03C *11/12*

U.S. Cl. 430—348 **3 Claims**

1. A method of forming images by heat development, comprising the steps of:

providing a fountain water for a heat-developable photosensitive material comprising silver halide and a developing agent; and

heating the photosensitive material in a condition that it is brought into face-to-face contact with a processing material comprising a long web support, wherein the support has a thickness of from 4 μm to 40 μm and has provided thereon a processing layer comprising a base or a precursor of bases, to form images on the photosensitive material.

5,747,227

METHOD OF FORMING COLORED IMAGES

Kiyoshi Kawai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

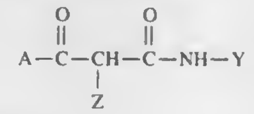
Continuation of Ser. No. 53,199, Apr. 28, 1993, abandoned. This application Sep. 15, 1994, Ser. No. 305,298

Claims priority, application Japan, Apr. 28, 1992, 4-134520

Int. Cl.^{6} G03C *7/407*

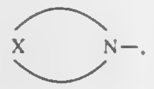
U.S. Cl. 430—363 **22 Claims**

1. A method of forming a colored image using a silver halide color photographic photosensitive material comprising a support, having thereon at least three silver halide photosensitive layers which have different color sensitivities and which contain amounts of yellow, magenta, and cyan color forming couplers effective to form visible yellow, magenta, and cyan dye images, respectively, wherein an amount of at least one yellow dye forming coupler effective to form a visible yellow dye image and represented by formula (I) is included in at least one yellow color forming coupler containing photosensitive layer of the silver halide color photosensitive material, and the photosensitive material is exposed using a laser scanning exposure system in which the exposure time per picture element is less than 10^{-4} seconds and subsequently subjected to color development processing:



$$A-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle Z}{|}}{CH}-\overset{\overset{\displaystyle O}{\|}}{C}-NH-Y \qquad (I)$$

wherein A represents



X represents an organic group which is required, together with the nitrogen atom, to form a nitrogen containing heterocyclic ring, Y represents an aromatic group or a heterocyclic group, and Z represents a group which is eliminated when a coupler which is represented by formula (I) reacts with an oxidation production of a developing agent.

OL
2 10
SS
1
MY
5
998
MI

5,747,228

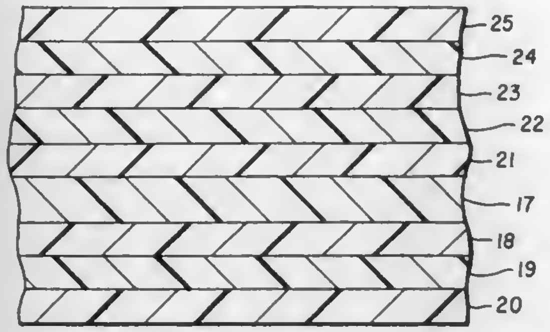
METHOD FOR PROVIDING A COLOR DISPLAY IMAGE USING DUPLITIZED COLOR SILVER HALIDE PHOTOGRAPHIC ELEMENTS

Anne E. Bohan; John M. Buchanan, and Richard P. Szajewski, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1997, Ser. No. 834,591

Int. Cl.^{6} G03C *7/407*

U.S. Cl. 430—380 **37 Claims**



1. A method for providing a color display image comprising the steps of:

A) color developing an imagewise exposed light sensitive silver halide color photographic element exhibiting a sensitivity of at least ISO 25, and comprising a support having thereon at least two color recording units,

each of said at least two color recording units being sensitive to a distinct region of the electromagnetic spectrum, and comprising at least one silver halide emulsion layer having light sensitive silver halide emulsion grains in reactive association with a compound capable of forming an image dye during a color development step, thereby providing at least two such silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum in said element,

wherein said support is interposed between two of said silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum,

with a color developer having a pH of from about 9 to about 12, and comprising a color developing agent at from about 0.01 to about 0.1 mol/l, and bromide ion at up to about 0.5 mol/l, at a temperature at or above about 30° C. for up to about 4 minutes, to provide a developed image,

B) scanning said developed image to form density representative digital signals for said at least two color recording units, and

C) digitally manipulating said density representative digital signals formed in step B to correct either or both interimage interactions and gamma mismatches among said at least two color recording units so as to produce a digital record of a corrected color image.

5,747,229

SOLID DEVELOPING COMPOSITION FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND PROCESSING METHOD EMPLOYING THE SAME

Takuji Hasegawa, Hino, Japan, assignor to Konica Corporation, Japan

Filed Jan. 30, 1997, Ser. No. 791,376

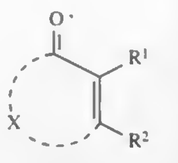
Claims priority, application Japan, Feb. 9, 1996, 7-023879

Int. Cl.^{6} G03C *5/30*

U.S. Cl. 430—465 **9 Claims**

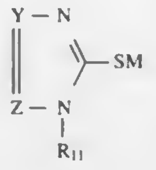
1. A solid developing composition for processing a silver halide photographic light sensitive material, wherein the composition contains a compound represented by the following formula (1) and a compound represented by the following formula (2), formula (1) and formula (2) being present in effective amounts to provide stable photographic performance without deterioration of image tone,

formula (1)



wherein R_1 and R_2 independently represent a hydroxy group, an amino group, an acylamino group, an alkylsulfonylamino group, an arylsulfonylamino group, an alkoxycarbonylamino group, a mercapto group or an alkylthio group; and X represents an atomic group necessary to form a 5- or 6-membered ring,

formula (2)



wherein Y and Z independently represent N or CR_{12} in which R_{12} represent a hydrogen atom or a substituted or unsubstituted alkyl or aryl group; and R_{11} represents an alkyl or aryl group, each having at least one sulfo, carboxyl or hydroxy group as a substituent; and M represents a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a group capable of being released under alkaline condition.

5,747,230

PHOTOGRAPHIC SILVER HALIDE COLOUR MATERIAL HAVING IMPROVED GRANULARITY AND DYE HUE

John Arthur Bee, Carpenders Park; John Kenneth Charles Kempster, Stanmore, and Gareth Evans, Hollybush Close, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1995, Ser. No. 577,636

Claims priority, application United Kingdom, Dec. 24, 1994, 9426277; Oct. 14, 1995, 9521088

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—503 **13 Claims**

1. A photographic silver halide color print material comprising a support and yellow, magenta and cyan dye image forming layer units comprising at least one silver halide emulsion layer and at least one dye image-forming coupler which material contains a total silver halide coverage less than 150 mg/^{2} (as silver) and wherein the grain size (average volume in cubic microns) of the emulsion(s) is less than $1.0(\mu m)^3$ in the yellow image forming unit and less than $0.125(\mu m)^3$ in the magenta image forming unit and wherein each layer unit of the material has a dye image-forming efficiency (E) of above 30 where:

$$E = \frac{\text{Dye image Dmax}}{\text{Silver coverage (g/m}^2\text{)}}$$

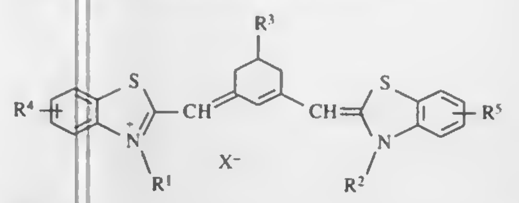
wherein the emulsion(s) of the cyan dye image forming layer unit have a silver coverage less than 50 mg/m^2, and an average grain size less than $0.064(\mu m)^3$ and comprise means for increasing the speed of the cyan dye image forming unit emulsion(s) to a level sufficient to provide a cyan image having the desired neutral color balance relationship with the yellow and magenta images formed on exposure and processing, and

wherein said means for increasing the speed of the cyan dye image forming unit emulsion(s) is selected from:

(a) sulphur sensitisation of the emulsion grains,

(b) a spectral sensitising dye or supersensitising combination; and

(c) a combination of a dye of formula (I):



(I)

wherein:

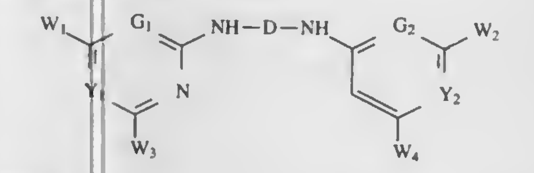
R^1 and R^2 are each an alkyl which may be substituted with a sulpho, carboxy or hydroxy group;

R^3 is hydrogen or an alkyl or aryl group;

R^4 and R^5 are hydrogen or one or more substituents; and

X^- is a counterion if required;

and a compound of formula (II):



(II)

wherein:

D is a divalent aromatic moiety;

W_1 and W_2 are independently a hydrogren or halogen atom or a hydroxy, amino, alkylamino, arylamino, cycloalkylamino, heterocyclicamino, mercapto, alkylthio, arylthio, or aryl group any of which may be substituted;

G_1 and G_2 are each N or CH; and

Y_1 and Y_2 are each N or CH;

provided that at least one of G_1 and Y_1 is N and at least one of G_2 and Y_2 is N.

5,747,231

SILVER HALID PHOTOGRAPHIC MATERIAL

Takehiko Sato; Hiroo Takizawa, and Osamu Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 515,227, Aug. 15, 1995, abandoned.

This application Aug. 26, 1996, Ser. No. 701,534

Claims priority, application Japan, Aug. 17, 1994, 6-214330

Int. Cl.^{6} G03C *1/053*

U.S. Cl. 430—514 **11 Claims**

1. A silver halide photographic material comprising a support having thereon hydrophilic colloid layers with at least one layer thereof containing at least one water-insoluble polymer which is a polymer containing an aromatic ring and having a backbone chain and a number average molecular weight of 4,000 or less, wherein the weight percentage of the aromatic ring in a molecule of the polymer is 40% or more based on the weight of the polymer molecule, and wherein the aromatic ring is in the backbone chain or at a side position with respect to the backbone chain in the polymer.

5,747,232

MOTION IMAGING FILM COMPRISING A CARBON BLACK-CONTAINING BACKING AND A PROCESS SURVIVING CONDUCTIVE SUBBING LAYER

Charles C. Anderson, Penfield, and Mario D. DeLaura, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1997, Ser. No. 806,371

Int. Cl.^{6} G03C *1/825;1/85;1/835*

U.S. Cl. 430—514 **14 Claims**

1. A motion imaging film comprising:

a support having, in order, on one side thereof a process surviving electrically conductive layer, at least one silver halide emulsion layer and a protective overcoat; and having, in order, on the opposite side thereof a carbon black-containing backing layer comprising an alkali-soluble polymer binder and conductive carbon black, wherein the process surviving electrically conductive layer has a resistivity of less than $5 \times 10^9\ \Omega/\square$.

5,747,233

USE OF INDOLEINE-CYANINEDISULPHONIC ACID DERIVATIVES

Ralph Lonsky, Neustadt, and Lutz Uwe Lehmann, Seelze, both of Germany, assignors to Riedel-De Haen Aktiengesellschaft, Seelze, Germany

Continuation of Ser. No. 504,107, Jul. 19, 1995, abandoned.

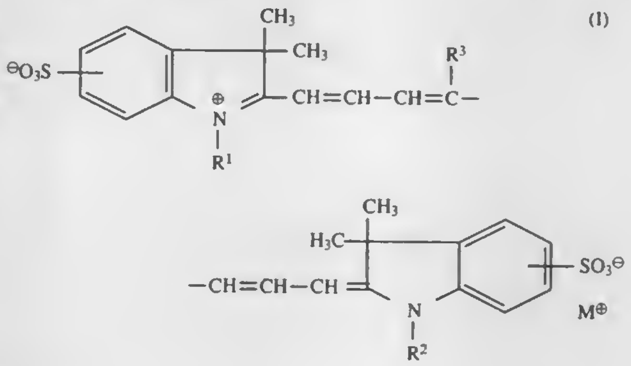
This application May 15, 1997, Ser. No. 856,890

Claims priority, application Germany, Jul. 29, 1994, 44 26 892.0

Int. Cl.^{6} G03C *1/06;1/815;1/825*

U.S. Cl. 430—522 **8 Claims**

1. A recording material which contains, in at least one hydrophilic colloidal layer, an infrared absorbing agent comprising a dyestuff of the general formula I



(I)

in which

R^1, R^2 and R^3 independently of one another are hydrogen, $(C_1–C_6)$-alkyl which is unsubstituted or monosubstituted by halogen or phenyl, or unsubstituted or mono- or di-substituted phenyl, and R^3 furthermore is also halogen or $(C_3–C_7)$-cycloalkyl, but wherein no sulpho or sulphonate groups, no carboxyl or carboxylate groups and no sulphato groups may occur as a substituent in phenyl groups, wherein the sulphonate groups are in the 5- position of the terminal indole rings,

and $M^\oplus$ is a monovalent cation or one equivalent of a polyvalent cation, but excluding those compounds of general formula I in which, simultaneously, the sulphonate groups are in the 5-positions of the two indole systems, R^1 and R^2 are methyl, R^3 is hydrogen and $M^\oplus$ is $Na^\oplus$ or ½ $Ni^{2\oplus}$, that compound in which, simultaneously, the sulphonate groups are in the 6-positions of the two indole systems, R^1 and R^2 are methyl, R^3 is hydrogen and $M^\oplus$ is $K^\oplus$, and that compound of the general formula I in which, simultaneously, the sulphonate groups are in the 5-positions of the two indole systems, R^1 and R^2 are ethyl, R^3 is methyl and $M^\oplus$ is $K^\oplus$.

5,747,234

PHOTOGRAPHIC ELEMENT

Ronald Myron Wexler; Robert Owen James; Vito A. DePalma; John Francis Decory, all of Rochester, and Lloyd A. Lobo, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1996, Ser. No. 667,263

Int. Cl.^{6} G03C *11/06;1/76*

U.S. Cl. 430—523 **13 Claims**

1. A photographic element comprising a support, a light-sensitive layer on one side of the support, and on the other side of the support, at least one backing layer and a protective outermost

OL
2 10
SS
1
MY
5
998
MI

lubricating layer, the protective layer comprising a solid wax and a non-ionic fluorinated surfactant in an amount less than the compatibility limit of the surfactant in the wax, said protective layer being coated from a mixture of an aromatic solvent and at least one lower alkyl alcohol.

5,747,235

SILVER HALIDE LIGHT SENSITIVE EMULSION LAYER HAVING ENHANCED PHOTOGRAPHIC SENSITIVITY

Samir Y. Farid, Rochester; Jerome R. Lenhard, Fairport; Chin H. Chen, Mendon; Annabel A. Muenter, Rochester; Ian R. Gould, Pittsford; Stephen A. Godleski, Fairport, and Paul A. Zielinski, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 592,826, Jan. 26, 1996, abandoned. This application Oct. 30, 1996, Ser. No. 739,921

Int. Cl.^{6} G03C *1/09*

U.S. Cl. 430—583 **48 Claims**

1. A photographic element comprising at least one silver halide emulsion layer in which the silver halide is sensitized with a compound of the formula:

$$A-(L-XY)_k$$
$$\text{or}$$
$$(A-L)_k-XY$$

wherein A is a silver halide adsorptive group that contains at least one atom of N, P, S, Se, or Te that promotes adsorption to silver halide, and L represents a linking group containing at least one C, N, S or O atom, k is 1 or 2 and XY is an fragmentable electron donor moiety in which X is an electron donor group and Y is a leaving group other than hydrogen, and wherein:

1) XY has an oxidation potential between 0 and about 1.4 V; and
2) the oxidized form of XY undergoes a bond cleavage reaction to give the radical X$^\bullet$ and the leaving fragment Y.

2. A photographic element comprising at least one silver halide emulsion layer in which the silver halide is sensitized with a compound of the formula:

$$A-(L-XY)_k$$
$$\text{or}$$
$$(A-L)_k-XY$$

wherein A is a silver halide adsorptive group that contains at least one atom of N, S, Se, or Te that promotes adsorption to silver halide, and L represents a linking group containing at least one C, N, S or O atom and XY is a fragmentable electron donor moiety in which X is an electron donor group and Y is a leaving group other than hydrogen, and wherein:

1) XY has an oxidation potential between 0 and about 1.4 V;
2) the oxidized form of XY undergoes a bond cleavage reaction to give the radical X$^\bullet$ and the leaving fragment Y; and
3) the radical X$^\bullet$ has an oxidation potential $\leqq -0.7$ V.

5,747,236

SILVER HALIDE LIGHT SENSITIVE EMULSION LAYER HAVING ENHANCED PHOTOGRAPHIC SENSITIVITY

Samir Y. Farid, Rochester; Jerome R. Lenhard, Fairport; Chin H. Chen, Mendon; Annabel A. Muenter, Rochester; Ian R. Gould, Pittsford; Stephen A. Godleski, Fairport; Paul A. Zielinski, Rochester, and Charles H. Weidner, Ontario, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 592,106, Jan. 26, 1996, abandoned. This application Oct. 30, 1996, Ser. No. 740,536

Int. Cl.^{6} G03C *1/08*

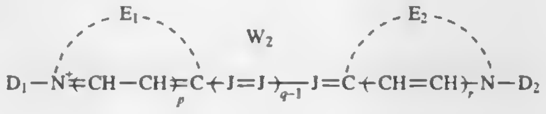
U.S. Cl. 430—583 **23 Claims**

1. A photographic element comprising a support and at least one silver halide emulsion layer in which the silver halide is sensitized with a fragmentable electron donor of the formula X—Y, wherein X is an electron donor moiety and Y is a leaving group other than hydrogen, and wherein:

1) X—Y has an oxidation potential between 0 and about 1.4 V; and
2) the oxidized form of X—Y undergoes a bond cleavage reaction to give the radical X$^\bullet$ and the leaving fragment Y.

20. A photographic element according to claim **1** or claim **2**, wherein the emulsion layer further contains a sensitizing dye.

21. A photographic element according to claim **20**, wherein the sensitizing dye is selected from dyes of formula (VIII) through (XII):



wherein:

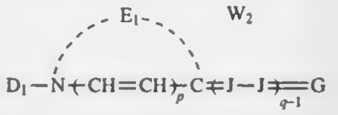
E$_1$ and E$_2$ represent the atoms necessary to form a substituted or unsubstituted hetero ring and may be the same or different, each J independently represents a substituted or unsubstituted methine group,

q is a positive integer of from 1 to 4,

p and r each independently represents 0 or 1,

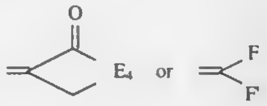
D$_1$ and D$_2$ each independently represents substituted or unsubstituted alkyl or unsubstituted aryl, and

W$_2$ is a counterion as necessary to balance the charge;

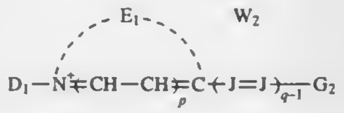


(IX)

wherein E$_1$, D$_1$, J, p, q and W$_2$ are as defined above for formula (VIII) and G represents

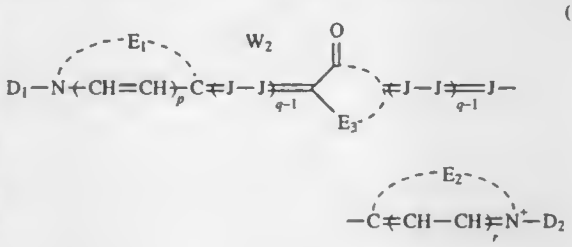


wherein E$_4$ represents the atoms necessary to complete a substituted or unsubstituted heterocyclic nucleus, and F and F' each independently represents a cyano radical, an ester radical, an acyl radical, a carbamoyl radical or an alkylsulfonyl radical;



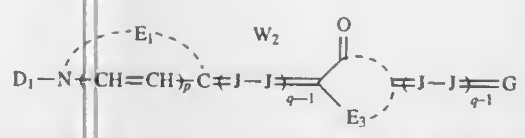
(X)

wherein D$_1$, E$_1$, J, p, q and W$_2$ are as defined above for formula (VIII), and G$_2$ represents a substituted or unsubstituted amino radical or a substituted or unsubstituted aryl radical;



(XI)

wherein D$_1$, E$_1$, D$_2$, E$_1$, J, p, q, r and W$_2$ are as defined for formula (VIII) above, and E$_3$ is defined the same as E$_4$ for formula (IX) above;



(XII)

wherein D$_1$, E$_1$, J, G, p, q, r and W$_2$ are as defined above for formula (VIII) above and E$_3$ is as defined for formula (XI) above.

5,747,237

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shinichiro Fukui, and Koichi Kuno, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1996, Ser. No. 649,758

Claims priority, application Japan, May 16, 1995, 7-140127

Int. Cl.^{6} G03C *1/485*

U.S. Cl. 430—596 **4 Claims**

1. A silver halide photographic material comprising a support having at least one pre-fogged direct positive emulsion layer on at least one side of the support,

wherein silver halide grain formation of the emulsion is carried out in the presence of a silver halide solvent,

the emulsion contains at least one of an Rh salt, an Ru salt and a polybromoiridium salt, and

at least one compound selected from the group consisting of compounds represented by the following formulae (I), (II) and (III) is added to the emulsion while the silver halide photographic material is prepared:

$$R-SO_2S-M \quad (I)$$

$$R-SO_2S-R^1 \quad (II)$$

$$R-SO_2S-L_m-SSO_2-R^2 \quad (III)$$

wherein R, R^1 and R^2 are the same or different, and each represents an aliphatic group, an aromatic group or a heterocyclic group;

M represents a cation;

L represents a divalent linking group; and

m represents 0 or 1.

5,747,238

Patent Not Issued For This Number

5,747,239

SYNTHETIC PEPTIDES SPECIFIC FOR THE DETECTION OF ANTIBODIES TO HCV, DIAGNOSIS OF HCV INFECTION AND PREVENTIONS THEREOF AS VACCINES

Chang Yi Wang, Great Neck, and Barbara Hosein, New York, both of N.Y., assignors to United Biomedical, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 719,819, Jun. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 667,275, Mar. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 651,735, Feb. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 558,799, Jul. 26, 1990, Pat. No. 5,106,726, which is a continuation-in-part of Ser. No. 510,153, Apr. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 481,348, Feb. 16, 1990, abandoned. This application Jun. 17, 1994, Ser. No. 262,037

Int. Cl.^{6} C12Q *1/70;* **C07K** *14/18*

U.S. Cl. 435—5 **3 Claims**

1. A peptide composition for detecting the presence of antibodies to hepatitis C virus (HCV) in body fluids comprising a peptide having an amino acid sequence AA$_{2273}$-AA$_{2332}$ from HCV Pep11 (SEQ ID NO:11).

1. a segment of the peptide having specific immunoreactivity to antibodies to HCV and containing at least 27 amino acids from the N-terminus at AA$_{2273}$ to the C-terminus;
2. a conjugate of the peptide; and
3. a polymer of the above peptide.

5,747,240

EPITOPE MAPPING OF THE C33 REGION OF HCV

John A. Kink, 1454 Carriage La., Lake Villa, Ill. 60046; Terence E. Ryan, 234 Florence Ct., Libertyville, Ill. 60048; John A. Todd, 212 Mainsail Dr., Grayslake, Ill. 60030, and Badr Saeed, 205 Bingham Cir., Mundelein, Ill. 60060

Continuation of Ser. No. 972,061, Nov. 5, 1992, abandoned, which is a continuation of Ser. No. 789,093, Nov. 7, 1991, abandoned. This application Mar. 28, 1995, Ser. No. 411,913

Int. Cl.^{6} C12Q *1/70;* **G01N** *33/53;33/551;* **C07K** *14/18*

U.S. Cl. 435—5 **10 Claims**

1. An immunodominant polypeptide encoded by the hepatitis C NS 3 gene consisting of

a recombinant protein consisting of the carboxy-terminal 102 amino acid fragment of the c33c region of NS3.

5,747,241

DIAGNOSTIC REAGENT FOR HEPATITIS C

Tatsuo Miyamura; Izumu Saito; Shizuko Harada, all of Tokyo-to, and Yoshikazu Honda, Kamakura, all of Japan, assignors to Japan as represented by Director General of Agency of National Institute of Health, Tokyo, Japan

Division of Ser. No. 325,630, Oct. 19, 1994, which is a continuation of Ser. No. 956,993, Oct. 6, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,806

Claims priority, application Japan, Oct. 8, 1991, 3-260824

Int. Cl.^{6} G01N *33/576;* **C12P** *21/02;* **C07K** *14/18*

U.S. Cl. 435—5 **6 Claims**

1. A diagnostic reagent for hepatitis C, which detects anti-second envelope protein/first non-structural protein, E2/NS1, antibodies in a sample, said reagent consisting essentially of a protein represented by an amino acid sequence selected from SEQ ID NOS:2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, and 22, said protein being produced by a mammalian cell, wherein said protein comprises a sugar chain.

5,747,242

DIAGNOSTIC KITS AND METHODS FOR DETECTING ANTIBODIES TO LAV VIRUSES

Marc Alizon; Pierre Sonigo, both of Paris; Simon Wain-Hobson, Montigny les Bretonneux, and Luc Montagnier, Le Plessis Robinson, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 656,796, Feb. 19, 1991, which is a division of Ser. No. 38,332, Apr. 13, 1987, Pat. No. 5,034,511. This application Jun. 6, 1995, Ser. No. 466,907

Claims priority, application European Pat. Off., Jun. 23, 1986, 86401380

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **16 Claims**

1. A method for the in vitro detection of an antibody directed against a lymphadenopathy associated virus in a human body fluid, comprising the steps of contacting said body fluid with an isolated or synthetic peptide, and then detecting the immunological reaction between said peptide and said antibody,

wherein said isolated or synthetic peptide comprises an amino acid sequence that is a fragment of the following amino acid sequence:

-continued

```
                                    SP
        10          20          30
MRARGIERNC  QNWWKWG---  -IMLLGILMT

                                   OMP
        40          50          60
CSAADNLWVT  VYYGVPVWKE  ATTTLFCASD

        70          80          90
AKSETEAHN   IWATHACVPT  DPNPQEIALE

       100         110         120
NVTENFNMWK  NNMVEQMHED  IISLWDQSLK

       130         140         150
PCVKLTPLCV  TLNSCDE--L  RNNGTMGNNV

       160         170         180
TTEEKG----  ---MKNCSFN  VTTVLKDKKQ

       190         200         210
QVYALFYRLD  IVPIDNDSST  -NSTNYRLIN

       220         230         240
CNTSAITQAC  PKVSFEPIPI  HYCAPAGFAI

       250         260         270
LKCRDKKFNG  TGPCTNVSTV  QCTHGIRPVV

       280         290         300
STQLLLNGSL  AEEEVIIRSE  NLTNNAKNII

       310         320         330
AHLNESVKIT  CARPYQNTRQ  RTPI--GLGQ

       340         350         360
SLYTTKS-RS  IIGQAHCNIS  RAQWSKTLQQ

       370         380         390
VARKLGTLL-  -NKTIIKFKF  SSGGDPEITT

       400         410         420
HSFNCGGEFF  YCNTSGLFNS  TWNISAWNNI

       430         440         450
TESNNSTNTN  ITLQCRIKQI  IKMVAGR-KA

       460         470         480
IYAPPIERNI  LCSSNITGLL  LTRDGGIN--

       490         500         510
NSTNETFRPG  GGDMRDNWRS  ELYKYKVVQI

       520         530         540
EPLGVAPTRA  KRRVVEREKR  AIGL-GAMFL

       550         560         570
GFLGAAGSTM  GARSVTLTVQ  ARQLMSGIVQ

       580         590         600
QQNLLRAIE   AQQHLLQLTV  WGIKQLQARI

       610         620         630
LAVERYLKDQ  QLLGIWGCSG  KHICTTNVPW

       640         650         660
NSSWSNRSLN  ETWQNMTWME  WEREIDNYTG

       670         680         690
LIYSLIEESQ  TQQEKNEKEL  LELDWWASLW

       700         710         720
NWFSITQWLW  YIKIFIMIIG  GLIGLRIVFA

       730         740         750
VLSLVNRVRQ  GYSPLSFQTL  LPAPRGP-DR

       760         770         780
PEGTEEEGGE  RGRDRSVRLL  NGFSALIWDD

       790         800         810
LRSLCLFSYH  RLRDLILIAV  RIVELLGRRG

       820         830         840
WDILKYLWNL  LQYWSQELRN  SASSLFDTTA

       850         860         870
IAVAEGTDRV  IEIIQRACRA  VLNIPRRIRQ

GLERSLL
```

wherein, in said amino acid sequence, A is alanine, C is cysteine, D is aspartic acid, E is glutamic acid, F is phenylalanine, G is glycine, H is histidine, I is isoleucine, K is lysine, L is leucine, M is methionine, N is asparagine, P is proline, Q is glutamine, R is arginine, S is serine, T is threonine, V is valine, W is tryptophan, and Y is tyrosine,

wherein said fragment comprises at least one amino acid sequence selected from the group consisting of amino-acyl residues 37–130, amino-acyl residues 211–289, amino-acyl residues 488–530, amino-acyl residues 490–620, amino-acyl residues 680–700, amino-acyl residues 1–530, amino-acyl residues 34–530, and amino-acyl residues 531–877 of an envelope glycoprotein of LAV_{ELI} virus, and

wherein the hyphens represent a gap introduced to align the sequence with LAV_{BRU} as set forth in FIG. 3.

5,747,243

RETROVIRUS DETECTION METHOD

Harry E. Gruber; Douglas J. Jolly, both of San Diego, Calif., and Hwei-Sing Kwang, Hastings, Nebr., assignors to University of California, Alameda, Calif.

Division of Ser. No. 106,145, Aug. 13, 1993, Pat. No. 5,503,974, which is a continuation of Ser. No. 16,664, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 373,458, Jun. 30, 1989, abandoned. This application Mar. 22, 1996, Ser. No. 621,016

Int. Cl.^{6} C12Q *1/70;* G01N *33/53;33/567*

U.S. Cl. 435—5 **9 Claims**

1. A method of testing for the presence or amount of a retrovirus in a specimen comprising the steps of:

(a) exposing a replication defective retroviral vector having a marker sequence to the specimen such that the retrovirus can complement the replication defective retroviral vector and produce a recombinant retrovirus carrying the marker sequence;

(b) testing for the production of a recombinant retrovirus; and

(c) detecting the presence of the marker sequence in the recombinant retrovirus as an indication of the presence of a retrovirus in the specimen.

5,747,244

NUCLEIC ACID PROBES IMMOBILIZED ON POLYSTYRENE SURFACES

Patrick Sheridan, San Leandro; Chu-An Chang, Piedmont; Joyce Running, Concord, and Michael S. Urdea, Alamo, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Dec. 23, 1991, Ser. No. 813,338

Int. Cl.^{6} C12Q *1/68;* C07H *21/04;* C07K *17/08;* C08L *89/00*

U.S. Cl. 435—6 **6 Claims**

1. An article of manufacture for use in a solution phase nucleic acid sandwich hybridization assay comprising a polystyrene surface having a polypeptide adsorbed thereon and a nucleic acid probe covalently bonded to the polypeptide via a base-stable bifunctional crosslinking agent.

5,747,245

NUCLEIC ACIDS ENCODING FAS ASSOCIATED PROTEINS AND SCREENING ASSAYS USING SAME

John C. Reed, Carlsbad, and Takaaki Sato, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Filed Jun. 14, 1994, Ser. No. 259,514

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/02;21/04*

U.S. Cl. 435—6 **9 Claims**

1. An isolated nucleic acid molecule comprising the nucleotide sequence shown in FIG. 13 (SEQ ID NO:2) encoding a mammalian PTP-BAS type 4, which is related to a protein tyrosine phosphatase originally isolated from basophils (PTP-BAS).

5,747,246

PROCESS FOR DETERMINING THE QUANTITY OF A DNA FRAGMENT OF INTEREST BY A METHOD OF ENZYMATIC AMPLIFICATION OF DNA

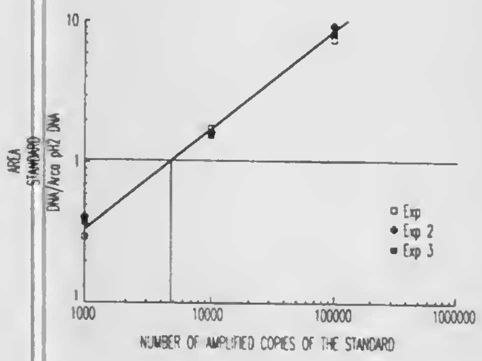
Christophe Pannetier, Paris; Madeleine Cochet, Fontenay-Aux-Roses; Sylvie Darche, Brunoy, and Philippe Kourilsky, Paris, all of France, assignors to Institute National de la Sante et de la Recherche Medicale (INSERM), Paris, and Institut Pasteur, Paris Cedex, both of France

Continuation of Ser. No. 882,980, May 14, 1992, abandoned. This application Jun. 21, 1994, Ser. No. 263,413

Claims priority, application France, Nov. 15, 1991, 91 14089

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **27 Claims**



1. A process for determining in vitro the quantity of a DNA fragment of interest in a sample, comprising the steps of:

adding a standard DNA fragment to said sample, each of said standard DNA fragment and said DNA fragment of interest having 5' and 3' ends, said 5' and 3' ends of said standard DNA fragment being identical to said 5' and 3' ends of said DNA fragment of interest, respectively; thus permitting amplification with a set of two primers, said standard DNA fragment and said DNA fragment of interest having a site which differs in sequence, in size, or in both sequence and in size, by at least one nucleotide but not more than approximately 10%,

co-amplifing said standard DNA fragment and said DNA fragment of interest with said set of primers to saturation,

elongating said saturated standard DNA fragment and said saturated DNA fragment of interest in the presence of a DNA polymerase using a first labeled primer and a second labeled primer, where said first labeled primer hybridizes specifically to said standard DNA fragment downstream from said 5' end of said standard DNA fragment and upstream of said site which differs in sequence, in size, or in both sequence and in size, and said second labeled primer hybridizes specifically to said DNA fragment of interest downstream from said 5' end of said DNA fragment of interest and upstream of said site which differs in sequence, in size, or in both sequence and in size, to obtain a labeled standard DNA fragment having a first label and labeled DNA fragment of interest having a second label, and

determining the ratio of said standard DNA fragment to said DNA fragment of interest.

5,747,247

SPECTROSCOPIC HELICASE ASSAY

Stephen C. Kowalczykowski, and Angela K. Eggleston, both of Davis, Calif., assignors to The Regents of The University of California, Oakland, Calif.

Filed Jul. 25, 1994, Ser. No. 280,020

Int. Cl.^{6} C12Q *1/68;* C12P *19/34*

U.S. Cl. 435—6 **18 Claims**

1. A continuous, kinetic spectroscopic method for detecting helicase activity in a sample, said method comprising the steps of:

(a) incubating a mixture comprising a sample, a known initial amount of double-stranded nucleic acid comprising hybridized complementary single-stranded nucleic acid, and a luminescent marker,

wherein said marker is bound to said double stranded nucleic acid and present at a concentration whereby said marker is capable of at least 5-fold greater luminescent intensity in the presence of said double-stranded nucleic acid than in the presence of a molar-equivalence of unhybridized said complementary single-stranded nucleic acid, and said concentration is within a concentration range within which the measured activity of one or more control helicases is independent of marker concentration,

under conditions under which one or more control helicases would be capable of converting at least a detectable portion of said initial amount of double-stranded nucleic acid into unhybridized said complementary single-stranded nucleic acid;

whereby a final amount of said double-stranded nucleic acid is formed;

(b) exposing said mixture to light capable of inducing luminescence from said marker;

(c) detecting the intensity of said luminescence from said mixture;

wherein the intensity of said luminescence from said mixture correlates with said final amount of double-stranded nucleic acid in said mixture and the difference between said initial and said final amount of double-stranded nucleic acid correlates with the helicase activity of said sample.

5,747,248

DISCONTINUOUS PROBE DESIGN USING HYBRITOPE MAPPING

Mark L. Collins, Walnut Creek, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Filed Dec. 5, 1994, Ser. No. 349,316

Int. Cl.^{6} C12Q *1/68;1/70*

U.S. Cl. 435—6 **12 Claims**

1. A method of determining a discontinuous probe that binds to a known nucleotide sequence in a target nucleic acid, the discontinuous probe comprising (i) at least two binding oligonucleotides that are each complementary to a distinct region of the target nucleic acid, which constitute the best target region for an oligonucleotide probe covalently joined optionally by (ii) an organic linker molecule the method comprising the steps of:

(a) determining at least first and second binding oligonucleotides that are complementary to first and second regions of the target nucleic acid, the first and second oligonucleotides binding more strongly to the target nucleic acid than other oligonucleotides that are complementary to other regions of the target nucleic acid and wherein the first and second regions are non-contiguous;

(b) covalently linking at least the first and second binding oligonucleotides determined in step (a) in at least two combinations optionally with organic linker molecules to obtain a set of candidate discontinuous probes;

(c) contacting each candidate discontinuous probe with the target nucleic acid under conditions permitting specific hybridization of oligonucleotides to the target: and

(d) determining the presence or absence of specific discontinuous probe-target binding between each of the discontinuous probes and the target nucleic acid to indicate whether each discontinuous probe binds the target nucleic acid, thereby determining or detecting one or more discontinuous probes, wherein step (a) comprises the steps of

(a_1) obtaining a plurality of oligonucleotides, each of the oligonucleotides comprising a first nucleotide sequence which is complementary to a sequence within the known nucleotide sequence, and the oligonucleotides having overlapping first nucleotide sequences wherein the first sequence of each of the oligonucleotides in the plurality of oligonucleotides overlaps the sequence of another oligonucleotide in the plurality of oligonucleotides by from one to four nucleotides;

(a_2) contacting each of the oligonucleotides with the target nucleic acid under conditions permitting specific hybridization of oligonucleotides to the target;

(a_3) determining the presence or absence of specific oligonucleotide-target binding between each of the oligonucleotides and the target nucleic acid to indicate whether each oligonucleotide binds within the known nucleotide sequence; and

(a_4) selecting at least two binding oligonucleotides that bind most strongly to the target nucleic acid.

5,747,249

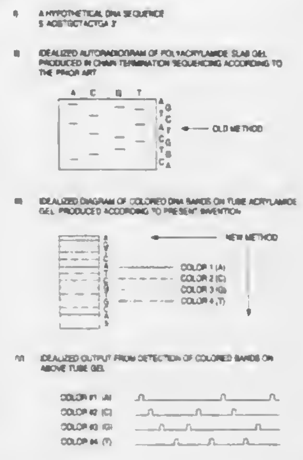
AUTOMATED DNA SEQUENCING TECHNIQUE

Lloyd M. Smith, Madison, Wis.; Leroy E. Hood, Seattle, Wash.; Michael W. Hunkapiller, San Carlos, Calif.; Tim J. Hunkapiller, Seattle, Wash., and Charles R. Connell, Redwood City, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 898,019, Jun. 12, 1992, abandoned, which is a continuation of Ser. No. 660,160, Feb. 21, 1991, abandoned, which is a continuation of Ser. No. 106,232, Oct. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 722,742, Apr. 11, 1985, abandoned, and a continuation-in-part of Ser. No. 689,013, Jan. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 570,973, Jan. 16, 1984, abandoned. This application Dec. 21, 1994, Ser. No. 361,176

Int. Cl.⁶ C12Q ***1/68;*** **C12P** ***19/34;*** **C07H** ***21/04***

U.S. Cl. 435—6 **56 Claims**


A HYPOTHETICAL DNA SEQUENCE
IDEALIZED AUTORADIOGRAM OF POLYACRYLAMIDE SLAB GEL PRODUCED IN CHAIN TERMINATION SEQUENCING ACCORDING TO THE PRIOR ART
A C G T
OLD METHOD
IDEALIZED DIAGRAM OF COLORED DNA BANDS ON TUBE ACRYLAMIDE GEL PRODUCED ACCORDING TO PRESENT INVENTION
NEW METHOD
COLOR 1 (A)
COLOR 2 (C)
COLOR 3 (G)
COLOR 4 (T)
IDEALIZED OUTPUT FROM DETECTION OF COLORED BANDS ON ABOVE TUBE GEL
COLOR #1 (A)
COLOR #2 (C)
COLOR #3 (G)
COLOR #4 (T)

1. A method of separating and detecting tagged polynucleotides which comprises:

providing a plurality of polynucleotides, each tagged with a chromophore or fluorophore;

resolving to separate one of the plurality of tagged polynucleotides from other tagged polynucleotides differing by a single nucleotide using an electrophoretic procedure capable of resolving tagged polynucleotides differing by a single nucleotide; and

detecting the resolved tagged polynucleotides by means of the chromophore or fluorophore.

5,747,250

PROBE FOR TUMOUR DIAGNOSTICS OR TUMOUR THERAPY

Peter Gruss, Göttingen, Germany, and Catharina Maulbecker, Zürich, Switzerland, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Berlin, Germany

PCT No. PCT/EP93/02051, § 371 Date Mar. 27, 1995, § 102(e) Date Mar. 27, 1995, PCT Pub. No. WO94/03196, PCT Pub. Date Feb. 17, 1994

PCT Filed Aug. 2, 1993, Ser. No. 381,841

Claims priority, application Germany, Aug. 3, 1992, 42 25 569.4

Int. Cl.⁶ C12Q ***1/68;*** **C12P** ***19/34;*** **C07H** ***21/02;21/04***

U.S. Cl. 435—6 **13 Claims**

1. A method for determining presence of a transformed cell in a sample comprising contacting said sample with a nucleic acid probe which specifically hybridizes to a gene which encodes a protein selected from the group consisting of Pax-1, Pax-3, Pax-4, Pax-5, Pax-6, Pax-7, Pax-8, HuP1, HuP2, HuP48, prd, BSH5, BSH9, Pox neuro and Pox mesa, or with an antibody which specifically binds to the encoded protein, wherein expression of said gene or presence of said protein is indicative of a transformed cell in said sample.

5,747,251

POLYMERASE CHAIN REACTION ASSAYS TO DETERMINE THE PRESENCE AND CONCENTRATION OF A TARGET NUCLEIC ACID IN A SAMPLE

Dennis A. Carson, Del Mar, and Hitoshi Kohsaka, San Diego, both of Calif., assignors to The Regents of the University of California, Alameda, Calif.

Continuation of Ser. No. 354,449, Dec. 12, 1994, abandoned, which is a continuation of Ser. No. 88,077, Jul. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 958,291, Oct. 8, 1992, abandoned. This application May 16, 1995, Ser. No. 442,141

Int. Cl.⁶ C12Q ***1/68;1/70;*** **C12P** ***19/34;*** **C07H** ***21/04***

U.S. Cl. 435—6 **32 Claims**

1. A method for determining the concentration of at least one target nucleic acid from a sample known to contain or suspected of containing the target nucleic acid, which method comprises:

(a) selecting a competitor nucleic acid of the same length as the target nucleic acid which varies in sequence from the target nucleic acid by the presence of one or more adjacent nucleotides not found in the target nucleic acid;

(b) selecting at least two primers for use in amplification of the target nucleic acid and the competitor nucleic acid and modifying one primer by attaching a coupling agent to the 5' end thereof;

(c) coamplifying a known quantity of the competitor nucleic acid with any target nucleic acid present in the sample in an appropriate polymerase chain reaction protocol using the selected primers so that the resulting polymerase chain reaction products will consist of a binding strand having the coupling agent attached thereto and a complementary strand without a coupling agent attached thereto;

(d) placing aliquots of the polymerase chain reaction products onto a solid phase support to which a reactant is tightly bound, wherein the reactant is capable of forming tight bonds with the coupling agent attached to the binding strands and with the solid phase support to form a bridge between the coupling agent and solid phase support, wherein each tight bond is stable under denaturing alkaline conditions;

(e) causing binding to occur between the coupling agent and the reactant, thus immobilizing the binding strands onto the solid phase support;

(f) separating the complementary strands of the polymerase chain reaction products from the immobilized binding strands and removing substantially all of the complementary strands from the aliquots with an alkaline denaturing wash;

(g) placing a sequence-specific hybridization probe complementary to said target nucleic acid and another sequence-specific probe complementary to at least the region of the competitor nucleic acid which varies in sequence from the target nucleic acid, both of which probes have different hybridization detection tags attached thereto, into the diluted aliquots under hybridizing conditions to form nucleic acid/probe hybrids;

(h) adding a reagent capable of interacting with the hybridization detection tag to the aliquots to generate a measurable signal and measuring the signal to determine the concentration of nucleic acid/probe hybrids therein; and

(i) calculating the concentration of any of the target nucleic acid present in the sample.

5,747,252

NUCLEIC ACID PROBES AND AMPLIFICATION OLIGONUCLEOTIDES FOR NEISSERIA SPECIES

Yeasing Yang, San Diego; Gary Bee, Vista, and Sherrol McDonough, San Diego, all of Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Filed Jun. 7, 1995, Ser. No. 484,607

Int. Cl.⁶ C12Q ***1/68;*** **C12P** ***19/34;*** **C07H** ***21/02;21/04***

U.S. Cl. 435—6 **111 Claims**

1. A nucleic acid hybridization assay probe, comprising an oligonucleotide of less than 100 nucleotides able to form a detectable hybrid with a *Neisseria meningitidis* subtype L target nucleic acid region and unable to form a detectable hybrid with the nucleic acid of *Neisseria gonorrhoeae* under stringent hybridization conditions, wherein said target region is selected from the group consisting of:

SEQ ID NO. 12;
SEQ ID NO. 28;
SEQ ID NO. 16; and
SEQ ID NO. 26.

5,747,253

COMBINATORIAL OLIGOMER IMMUNOABSORBANT SCREENING ASSAY FOR TRANSCRIPTION FACTORS AND OTHER BIOMOLECULE BINDING

David J. Ecker, Leucadia; Tim Vickers, Oceanside, and Pete Davis, Carlsbad, all of Calif., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 357,396, Dec. 16, 1994, which is a continuation-in-part of Ser. No. 196,103, Feb. 22, 1994, which is a continuation-in-part of Ser. No. 749,000, Aug. 23, 1991, abandoned. This application Feb. 8, 1995, Ser. No. 386,141

Int. Cl.⁶ C12Q ***1/68;*** **G01N** ***33/53;*** **C07H** ***21/00***

U.S. Cl. 435—6 **68 Claims**

1. A method for determining the sequence of an oligonucleotide having specific binding activity for a transcription factor comprising the steps of:

(a) preparing a group comprising a plurality of sets of oligonucleotides, each oligonucleotide comprising at least four nucleotides, by:

  i. defining a common position in the oligonucleotides of the sets,

  ii. synthesizing said sets of oligonucleotides such that each set has a different nucleotide in said common position, the nucleotides which are not in said common position being randomized, and

  iii. modifying the oligonucleotides of the sets of oligonucleotides with linker moieties for attaching the oligonucleotides to a solid support;

(b) incubating each of said sets of oligonucleotides with the transcription factor under binding conditions to form oligonucleotide-transcription factor complexes;

(c) attaching the sets of oligonucleotides to a solid support via the linker moiety;

(d) separating bound from unbound transcription factor;

(e) detecting the binding of transcription factor to each set of oligonucleotides attached to solid support where greatest binding is indicative of highest specific binding activity;

(f) selecting the set having the highest activity;

(g) preparing a further group comprising a plurality of sets of oligonucleotides, each of the sets having in the previous common position the nucleotide appearing in the previously defined common position in the selected one of the previous group of sets; each set of said further group of sets having a different nucleotide in an additional common position, the nucleotides in the position of the oligonucleotide which are not in a common position being randomized;

(h) modifying the oligonucleotides of the sets of oligonucleotides with linker moieties for attaching the oligonucleotides to a solid support;

(i) incubating each of said sets of oligonucleotides with the transcription factor under binding conditions to form oligonucleotide-transcription factor complexes;

(j) attaching the sets of oligonucleotides to a solid support via the linker moiety;

(k) separating bound from unbound transcription factor;

(l) detecting the binding of transcription factor to each set of oligonucleotides attached to solid support where greatest binding is indicative of highest specific binding activity;

(m) selecting the set having the highest activity; and

(n) performing steps (g) through (m) iteratively until the sequence of at least one oligonucleotide having specific binding activity for the transcription factor has been determined.

5,747,254

PROMOTION OF HIGH SPECIFICITY MOLECULAR ASSEMBLY

Brian Wylie Pontius, Palo Alto, Calif., assignor to The Board of Trustees of Leland Stanford Jr. University, Stanford, Calif.

Continuation of Ser. No. 621,424, Nov. 30, 1990, Pat. No. 5,474,911, which is a continuation-in-part of Ser. No. 557,227, Jul. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 444,179, Dec. 1, 1989, Pat. No. 5,015,569. This application Aug. 23, 1995, Ser. No. 518,377

Int. Cl.⁶ C12Q ***1/68***

U.S. Cl. 435—6 **17 Claims**

1. A method for accelerating the association rate constant for members of primary binding pairs in the absence of aggregate formation by the primary binding pairs, said method comprising (a) attaching complementary members of secondary binding pairs to the members of primary pairs where the secondary binding pairs have a k_a larger than the k_a of the primary binding pairs; and (b) placing the members in an aqueous solution under conditions which permit binding between members of the primary binding pairs.

5,747,255

POLYNUCLEOTIDE DETECTION BY ISOTHERMAL AMPLIFICATION USING CLEAVABLE OLIGONUCLEOTIDES

Sydney Brenner, Cambridge, England, assignor to Lynx Therapeutics, Inc., Hayward, Calif.

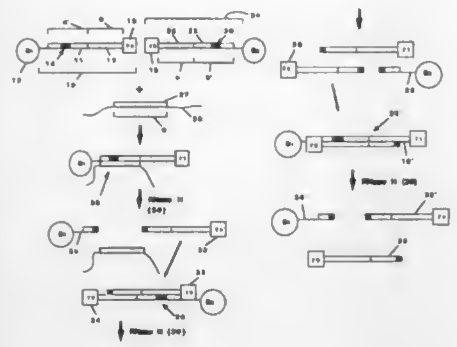
Filed Sep. 29, 1995, Ser. No. 536,743

Int. Cl.⁶ C12Q ***1/68;*** **C12P** ***19/34***

U.S. Cl. 435—6 **10 Claims**

1. A method of detecting a target polynucleotide, the method comprising the steps of:

(a) providing a first oligonucleotide having



(i) a nucleotide sequence complementary to a portion of a target polynucleotide and

(ii) a scissile linkage within said portion which is cleavable by a selected cleaving agent whenever the first oligonucleotide forms a perfectly matched duplex with said portion such that a first fragment is released from the first oligonucleotide, the first fragment having a nucleotide sequence complementary to said portion of the target polynucleotide;

(b) providing a second oligonucleotide having

(i) a nucleotide sequence identical to that of said portion of the target polynucleotide and

(ii) a scissile linkage within said portion which is cleavable by a selected cleaving agent which may be the same as or different from said first cleaving agent whenever the second oligonucleotide forms a perfectly matched duplex with the first fragment such that a second fragment is released from the second oligonucleotide, the second fragment having a nucleotide sequence complementary to said portion of the first oligonucleotide;

(c) maintaining the first oligonucleotide and the second oligonucleotide in substantial physical separation such that the formation of perfectly matched duplexes between any first oligonucleotides and any second oligonucleotides is inhibited and such that released first fragments may diffusibly communicate with the second oligonucleotides and released second fragments may diffusibly communicate with the first oligonucleotides; and

(d) exposing the first and second oligonucleotides to the target polynucleotide in the presence of said cleaving agent(s) under conditions effective to cleave said scissile linkages when said duplexes are formed, and

(i) wherein duplexes between the first oligonucleotide and the portion of the target polynucleotide, duplexes between the first oligonucleotide and the second fragment, and duplexes between the second oligonucleotide and the first fragment are stable, and

(ii) wherein duplexes between cleaved first oligonucleotides and the second fragments and duplexes between cleaved second oligonucleotides and the first fragments are unstable, such that an increase in the concentrations of the first and second fragments is an indication of the presence of the target polynucleotide.

5,747,256

HOMOGENEOUS DNA PROBE TITRATION ASSAY

Cheng F. Yan, Irvine, and Fredrick S. Yein, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 19, 1995, Ser. No. 579,039

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/24*

U.S. Cl. 435—6 **24 Claims**

1. A method for detecting the presence or amount of a target polynucleotide sequence of interest in a test sample, comprising the steps of:

a) forming a reaction mixture by combining in an assay medium:

(i) a first reagent comprising a first probe bound to a solid particle, the first probe comprising a first single stranded nucleic acid fragment complementary to a first of two separated strands of a selected segment of the target polynucleotide sequence; and

(ii) an aliquot of the test sample suspected of containing the target polynucleotide sequence;

wherein the concentration of the test sample is in excess to the concentration of the first probe;

b) subjecting the reaction mixture under denaturing conditions rendering the target polynucleotide sequence in the sample to be single stranded;

c) exposing the reaction mixture under hybridization conditions to cause hybridization between the first probe and the first strand of the selected segment of the target polynucleotide sequence;

whereby in the presence of the target polynucleotide, substantially all of the first probe will be hybridized to the first strand of the selected segment of the target polynucleotide sequence;

d) adding to the reaction mixture a second reagent, the second reagent comprising a second probe bound to a solid particle, the second probe comprising a second single stranded nucleic acid fragment with the same nucleotide sequence as the second strand of the selected segment of the target polynucleotide sequence, whereby the second probe is complementary to the first probe, and

whereby the first and second probes are complementary to mutually exclusive portions of the target polynucleotide sequence;

e) incubating the reaction mixture under hybridization conditions a sufficient time;

wherein the absence of the target polynucleotide, the first probe and the second probe can hybridize with each other, whereby the reaction mixture becomes sufficiently turbid;

wherein the presence of the target polynucleotide, the second probe can hybridize with the second single strand of the selected segment of the target polynucleotide;

whereby the hybridization of the first probe with the first strand of the selected segment of the target polynucleotide produces substantially no change in the turbidity of the reaction mixture, and combination of the second probe with the second strand of the selected segment of the target polynucleotide produces substantially no change in the turbidity of the reaction mixture; and

f) detecting the change in turbidity of the reaction mixture, wherein the change in turbidity correlates with the presence of the target polynucleotide in the sample.

5,747,257

GENETIC MARKERS AND METHODS FOR THE DETECTION OF *ESCHERICHIA COLI* SEROTYPE-0157:H7

Mark Anton Jensen, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 29, 1996, Ser. No. 608,881

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **7 Claims**

1. A method of determining whether an unknown microorganism is a member of the *Escherichia coli* 0157:H7 serotype, comprising analyzing the genomic DNA of said unknown microorganism to detect the presence of a nucleic acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO.: 2, and a diagnostic marker fragment thereof, whereby the presence of said nucleic acid sequence indicates said unknown microorganism is a member of said *Escherichia coil* 0157:H7 serotype.

5,747,258

DETECTION OF HALOGENATED PRECURSORS INCORPORATED INTO DNA

Zbigniew D. Darzynkiewicz, Chappaqua; Xun Li, Yorktown Hights; Frank N. Traganos, New York, and Myron R. Melamed, Dobbs Ferry, all of N.Y., assignors to New York Medical College, Valhalla, N.Y.

Continuation of Ser. No. 249,394, May 26, 1994, abandoned. This application Jun. 20, 1996, Ser. No. 667,294

Int. Cl.^{6} C12Q *1/68;1/02;* **G01N** *21/75;21/76*

U.S. Cl. 435—6 **19 Claims**

1. A method for determining the phase of cell cycle in a sample of cells, comprising the steps of:

(a) exposing a sample of cells to a halogenated precursor under conditions appropriate to incorporate the precursor into the DNA within the cells of the sample which cells are replicating DNA;

(b) exposing the cells to ultraviolet light to induce photolysis of the DNA within the cells at the site of the precursor incorporation so as to generate a single DNA strand break containing a terminus at the sites;

(c) fixing the cells;

(d) exposing the cells to a deoxynucleotide associated with a fluorochrome which deoxynucleotide is capable of binding specifically to the terminus and to an exogenous enzyme catalyzing such binding under conditions such that the deoxynucleotide binds to the DNA at the terminus;

(e) detecting the fluorescence of the labelled DNA within the cells;

(f) determining the amount of the incorporated precursor within the DNA from the amount of the fluorescence detected;

(g) determining the amount of newly synthesized DNA in the cells from the amount of the incorporated precursor; and

(h) determining the phase of the cell cycle from the amount of newly synthesized DNA.

5,747,259

MATERIALS AND METHODS FOR SPECIES-SPECIFIC DETECTION OF MYCOBACTERIUM KANSASII NUCLEIC ACIDS

Qimin You, Cockeysville, Md., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 17, 1996, Ser. No. 682,218

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **16 Claims**

1. A method for species-specific detection of *M. kansasii* nucleic acids comprising:

a) hybridizing a probe to the *M. kansasii* nucleic acids, the probe consisting of at least fifteen consecutive nucleotides of sequence, at least any one of SEQ ID NOs:3–5 any one of SEQ ID NOs:11–21 a complement of any one of SEQ ID NOs:3–5 or a complement of any one of SEQ ID NOs: 11–21, and;

b) detecting the *M. kansasii* nucleic acids by detecting probe hybridization.

3. The method of claim 1 wherein probe hybridization is detected by means of a detectable label.

4. A method for species-specific detection of *M. kansasii* nucleic acids comprising:

a) hybridizing to the *M. kansasii* nucleic acids an amplification primer consisting of a target binding sequence and, optionally, a sequence for amplification of the target nucleic acid, the target binding sequence consisting of at least fifteen consecutive nucleotides of any one of SEQ ID NOs:3–5, any one of SEQ ID NOs: 11–21, a complement of any one of SEQ ID NOs:3–5 or a complement of any one of SEQ ID NOs:11–21;

b) amplifying the *M. kansasii* nucleic acids by extension of the hybridized amplification primer, and;

c) detecting the amplified *M. kansasii* nucleic acids.

5,747,260

METHOD OF PROGNOSING CHRONIC NEURODEGENERATIVE PATHOLOGY FOLLOWING A HEAD INJURY

Gareth Wyn Roberts, Harlow, England; David Ian Graham, and James Alan Ramsey Nicoll, both of Glasgow, Great Britain, assignors to SmithKline Beecham p.l.c., Brentford, England

PCT No. PCT/EP95/02828, § 371 Date Feb. 25, 1997, § 102(e) Date Feb. 25, 1997, PCT Pub. No. WO96/03656, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 13, 1995, Ser. No. 776,356

Claims priority, application United Kingdom, Jul. 27, 1994, 9415073

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **5 Claims**

1. A method of prognosing in a head-injured subject or a subject who may be at risk of sustaining a head injury for the likelihood that a head injury might give rise to a chronic neurodegenerative pathology which could result in neuropsychological, psychiatric or neurological deficits, the method comprising detecting, using an in vitro or ex vivo assay, the presence or absence of the ApoE isoform ApoE4 or of DNA encoding for the ApoE isoform ApoE4 in the subject, the presence of at least one ApoE4 allele being prognostic of increased risk for neuropsychological, psychiatric or neurological deficits in a head injured patient or one at risk of sustaining a head injury and the absence of an ApoE4 allele being prognostic of minimal increased risk for neuropsychological, psychiatric or neurological deficits.

5,747,261

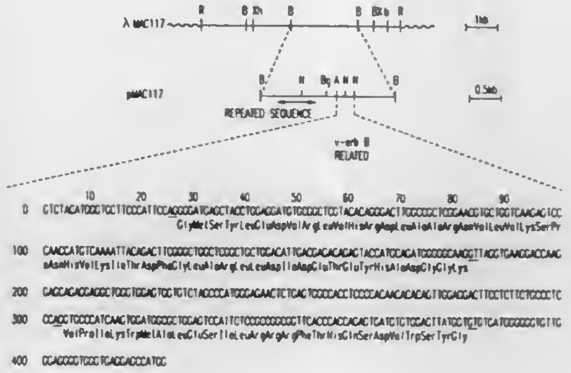
PROTEIN RELATED TO BUT DISTINCT FROM EGF RECEPTOR AND ANTIBODIES REACTIVE THEREWITH

C. Richter King, Washington, D.C.; Matthias H. Kraus, Bethesda, Md., and Stuart A. Aaronson, Great Falls, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 110,791, Oct. 21, 1987, which is a continuation-in-part of Ser. No. 836,414, Mar. 5, 1986, abandoned. This application Nov. 1, 1991, Ser. No. 786,598

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.1 **2 Claims**



1. A purified MAC117 polypeptide having at least in part the following amino acid sequence:

GlyMetSerTyrLeuGluAspValArgLeuValHisArgAspLeuAlaAlaArgAsn ValLeuValLysSerProAsnHisValLysIleThrAspPheGlyLeuAlaArgLeuLeu AspIleAspGluThrGluTyrHisAlaAspGlyGlyLysValProIleLysTrpMetAla LeuGluSerIleLeuArgArgArgPheThrHisGlnSerAspValTrpSerTyrGly.

5,747,262

NEUROLOGICAL DRUG SCREENS

Lindsay Hinck; Kasuko Masu; Masayuki Masu, all of San Francisco; David Leonardo, SF, and Marc Tessier Lavigne, San Mateo, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 16, 1995, Ser. No. 551,874

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.1 6 Claims

1. A method for identifying an agent which modulates the binding of a netrin to a netrin receptor, the method comprising the steps of:

(a) forming a mixture comprising an isolated mammalian netrin and an isolated mammalian netrin receptor selected from the group consisting of "Deleted in Colorectal Carcinoma" (DCC) and neogenin;

(b) incubating said mixture in the presence of an agent; and

(c) detecting in the incubated mixture of step (b) the level of specific binding between said netrin and said netrin receptor,

wherein a difference in the detected level of specific binding of said netrin to said netrin receptor in the presence of said agent relative to the level of specific binding in the absence of said agent indicates that said agent modulates the binding of said netrin to said netrin receptor.

5,747,263

Patent Not Issued For This Number

5,747,264

METHOD OF DIAGNOSING AND MONITORING PROSTATE CANCER

Carl J. Schmidt, Exton; Frank Tobin, Broomall, and Francis E. Wilkinson, Malvern, all of Pa., assignors to SmithKline Beecham Corporation, King of Prussia, Pa.

Continuation-in-part of Ser. No. 691,479, Aug. 2, 1996, abandoned. This application Sep. 16, 1996, Ser. No. 714,744

Int. Cl.^{6} C07K *16/00;* **G01N** *33/53;33/567;* **C12Q** *1/00*

U.S. Cl. 435—7.1 5 Claims

1. A diagnostic and monitoring method for prostate cancer comprising:

measuring the level of Type II phospholipase A_2 (PLA_2) polypeptide in cells tissues and bodily fluids of an individual, wherein Type II PLA_2 polypeptide level higher than three standard deviations above normal control is associated with the presence of prostate cancer.

5,747,265

METHOD FOR MEASURING THE AMOUNT OF A CELL-ASSOCIATED MOLECULE

George H. Parsons, Arlington; Margaret A. Johns, Waltham, both of Mass., and Arthur E. Rugg, Londonberry, N.H., assignors to T Cell Diagnostics, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 968,793, Oct. 30, 1992, abandoned. This application May 14, 1993, Ser. No. 62,442

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.2 12 Claims

1. A method for measuring the amount of a cell-associated molecule in a sample from a subject comprising the steps of:

(a) spotting and drying a selected amount of a liquid biological sample from a subject onto a filter paper collection device to produce a stable, dried biological sample spot which can be stored;

(b) contacting the filter paper collection device with the dried biological sample spot with a selected diluent and lysis reagent for a selected period of time at a selected temperature to produce a solubilized sample;

(c) recovering a selected amount of said solubilized sample;

(d) contacting said solubilized sample with at least one binding partner specific for a cell-associated molecule under conditions which allow specific binding; and

(e) measuring the amount of any specific binding that occurs of a component in the sample with said at least one binding partner, wherein the amount of specific binding indicates the amount of the cell-associated molecule in the sample,

wherein the cell associated molecule being measured is selected from the group consisting of CD4, CD8, CD3, CD19, CD2 and CD54.

5,747,266

ASSAY AND METHOD FOR DETERMINING NEWBORN RISK FOR SUDDEN INFANT DEATH SYNDROME

Peter G. Beach, 6780 SW. 205th Ct., Portland, Oreg. 97007

Continuation of Ser. No. 100,667, Aug. 2, 1993, Pat. No. 5,556,759. This application Sep. 16, 1996, Ser. No. 710,316

Int. Cl.^{6} G01N *33/537;33/543;33/564*

U.S. Cl. 435—7.9 2 Claims

1. An assay kit for detecting the quantity of a newborn baby's IgM-anti-IgG (MAG) comprising:

a first binding agent having specific affinity for IgM;

a first solid support treated so that it adsorbs the first binding agent and associated IgM:

a second binding agent having specific affinity for IgG: and

a detection mechanism for determining the quantity of second binding agent bound to IgG, wherein the detection mechanism includes a second solid support having a surface and a third binding agent bound to the surface of the second solid support the third binding agent having specific affinity for IgG.

5,747,267

METHOD FOR IDENTIFYING A G PROTEIN COUPLED GLUTAMATE RECEPTOR AGONIST AND ANTAGONIST

Eileen Ranae Mulvihill; Frederick Stamner Hagen; Khaled M. Houamed, and Wolfhard Almers, all of Seattle, Wash., assignors to Zymogenetics, Inc., and The Board of Regents of the University of Washington, both of Seattle, Wash.

Continuation of Ser. No. 101,676, Aug. 3, 1993, abandoned, which is a continuation of Ser. No. 672,007, Mar. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 648,481, Jan. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 626,806, Dec. 12, 1990, abandoned. This application May 31, 1995, Ser. No. 455,602

Int. Cl.^{6} G01N *33/53;33/566;* **C12N** *15/12;* **C07K** *14/705*

U.S. Cl. 435—7.21 7 Claims

1. A method for identifying a mammalian G protein coupled glutamate receptor agonist, which comprises:

incubating a eukaryotic cell comprising a cloned DNA molecule encoding the mammalian G protein coupled glutamate receptor with a compound, wherein the cloned DNA molecule hybridizes at high stringency to an oligonucleotide of 60 or more contiguous nucleotides of SEQ. ID. NO:1 or its complement, and wherein the eukaryotic cell expresses the mammalian G protein coupled glutamate receptor from the cloned DNA;

detecting a change in the activity of a mammalian G protein coupled glutamate receptor second messenger system compared to said cell not incubated with the compound or a eukaryotic cell not expressing the mammalian G protein coupled glutamate receptor, wherein the second messenger system is an inositol triphosphate/diacyl glycerol-protein kinase C system, an adenylate cyclase/cyclic AMP-dependent protein kinase system or a guanylate cyclase and cGMP-dependent protein kinase system; and,

relating a change in activity with the ability of the compound to act as a mammalian G protein coupled glutamate receptor agonist.

5,747,268

TUMOR MARKER CONTROL

Kathryn Herring, Miami, and Denise Sandberg, Davie, both of Fla., assignors to Dade International Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 52,001, Apr. 22, 1993, abandoned, This application Dec. 8, 1994, Ser. No. 351,869

Int. Cl.^{6} G01N *33/574:33/53*

U.S. Cl. 435—7.23 13 Claims

1. A control for the determination of tumor markers comprising a mixture of:

(a) a base material comprising human serum or plasma having reduced lipids;

(b) a plurality of tumor markers said tumor markers comprising at least PSA and ACTH wherein the PSA and ACTH in the control each have a reconstituted stability of at least thirty days at about −20 C.

5,747,269

DETERMINATION OF PEPTIDE MOTIFS ON MHC MOLECULES

Hans-Georg Rammensee, Tübingen, Germany; Kirsten Falk; Olaf Rötzschke, both of Sommerville, Mass.; Stefan Stevanović , Plankstadt, and Günther Jung, Tübingen, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Göttingen, Germany

PCT No. PCT/EP92/01072, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994, PCT Pub. No. WO92/21033, PCT Pub. Date Nov. 26, 1992

PCT Filed Apr. 15, 1992, Ser. No. 146,145

Claims priority, application Germany, May 17, 1991, 41 16 256.0

Int. Cl.^{6} G01N *33/531;33/68*

U.S. Cl. 435—7.24 12 Claims

1. A method for the determination of allele-specific peptide motifs on molecules of the major histocompatibility complex (MHC) os classes I or II, comprising the steps of:

a) lysing cells which contain MHC molecules to produce a cell extract,

b) separating the MHC molecules on which peptide mixtures are located from the cell extract by immunoprecipitation,

c) separating a peptide mixture from the MHC molecules or other protein components,

d) sequencing the resulting peptide mixture, and

e) deriving the allele-specific peptide motif from the sequencing of the peptide mixture.

5,747,270

METHOD OF SCREENING FOR SILICONE-SPECIFIC HYPERSENSITIVITY

Emmanuel Ojo-Amaize, Glendora, Calif., assignor to Specialty Laboratories, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 245,975, May 18, 1994, abandoned. This application Apr. 6, 1995, Ser. No. 418,637

Int. Cl.^{6} G01N *33/567*

U.S. Cl. 435—7.24 4 Claims

1. A method of screening for potential hypersensitivity to a silicone polymer antigen in a non-sensitized subject who has not received a silicone gel implant, comprising the steps of:

(a) obtaining a sample of lymphocytes from said non-sensitized subject;

(b) contacting said lymphocytes with silicone polymer antigen for a period of time sufficient to produce sensitized lymphocytes;

(c) recovering said sensitized lymphocytes:

(d) further contacting said sensitized lymphocytes with said silicone polymer antigen for a period of time sufficient to indicate a proliferative response of said sensitized lymphocytes; and

(e) quantitating said proliferative response wherein an elevated response is comparison to controls is indicative of potential hypersensitivity to said silicone polymer antigen in said non-sensitized subject.

5,747,271

METHOD FOR IDENTIFYING INDIVIDUALS SUFFERING FROM A CELLULAR ABNORMALITY SOME OF WHOSE ABNORMAL CELLS PRESENT COMPLEXES OF HLA-A2/TYROSINASE DERIVED PEPTIDES, AND METHODS FOR TREATING SAID INDIVIDUALS

Thierry Boon-Falleur; Vincent Brichard; Aline Van Pel; Etienne De Plaen; Pierre Coulie; Jean-Christope Renauld, all of Brussels, Belgium, and Thomas Wölfel, Mainz, Germany, assignors to Ludwig Institute For Cancer Research, New York, N.Y.

Division of Ser. No. 295,227, Aug. 24, 1994, abandoned, which is a continuation of Ser. No. 994,928, Dec. 22, 1992, abandoned. This application Apr. 23, 1996, Ser. No. 636,676

Int. Cl.^{6} G01N *33/53;33/566;33/567;* **C12N** *5/08*

U.S. Cl. 435—7.24 2 Claims

2. Method for identifying an abnormal cell which presents a complex of HLA-A2/tyrosinase derived peptide on its surface comprising contacting a sample of abnormal cells with a cytolytic T cell specific for said complex and determining lysis of said abnormal cells as a determination of cells which present said complex.

5,747,272

DETECTION OF SHIGA-LIKE TOXINS OF ENTEROHEMORAGIC *ESCHERICHIA COLI*

Alison O'Brien, Bethesda, Md.; Susanne Ward Lindgren, Portland, Oreg.; Liyanage Parakrama Perera, Rockville, Md.; Nancy A. Strockbine, Lithonia, Ga., and Angela Ruth Melton-Celsa, Sterling, Va., assignors to Henry M. Jackson Foundation for the Advancement of Military Medicine, Rockville, Md.

Continuation of Ser. No. 195,066, Feb. 14, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 412,231

Int. Cl.^{6} G01N *33/569;33/53*

U.S. Cl. 435—7.37 25 Claims

1. A diagnostic kit for the detection of Shiga-like toxins comprising

an SLT antibody reagent comprising an antibody specific to Shiga-like toxin, type I, and an antibody specific to Shiga-like toxin, type II, in aqueous solution; and

a detection reagent comprising a chemiluminescent 2,3-dihydro-1,4-phthalizinedione and a sensitivity enhancer capable of enhancing the sensitivity of the chemiluminescent 2,3dihydro-1,4-phthalizinedione reaction.

15. A method of qualitatively or quantitatively determining the presence or amount of substantially all Shiga-like toxins in a test sample which comprises, in the first step, contacting the test sample with a SLT antibody reagent comprising an antibody specific to Shiga-like toxin, type I and an antibody specific to Shiga-like toxin, type II, in aqueous solution; in a second step, contacting the product of the first step with a detection reagent; and in a third step, determining the specific binding of said SLT antibody reagent as a determination of the Shiga-like toxins in the test sample.

5,747,273

IMMUNOASSAY OF TOTAL INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN-1

M. Javad Khosravi, Toronto, Canada; Jehangir Mistry, League City, Tex., and Anastasia Diamandi, Toronto, Canada, assignors to Diagnostic Systems Laboratories, Inc., Webster, Tex.

Filed May 7, 1996, Ser. No. 643,830
Int. Cl.^{6} G01N *33/543*

U.S. Cl. 435—7.94 **17 Claims**

1. An immunoassay method for the detection of total insulin-like growth factor binding protein- 1 in a fluid comprising the steps of:

a) contacting a sample of fluid suspected of containing insulin-like growth factor binding protein-1 with a first capture antibody that binds to total insulin-like growth factor binding protein-1 to form a complex, wherein said first capture antibody is unaffected by the degree of phosphorylation of insulin-like growth factor binding protein-1, and wherein said first capture antibody is bound to a solid carrier, said solid carrier being insoluble in said fluid;

b) contacting the complex with a second detecting antibody, wherein said second detecting antibody is unaffected by the degree of phosphorylation of insulin-like growth factor binding protein-1 and wherein said second detecting antibody is labeled;

c) separating said solid carrier from said fluid sample and unreacted second detecting antibody;

d) measuring either the amount of labeled second detecting antibody associated with the solid carrier or the amount of unreacted labeled second detecting antibody; and

e) relating the amount of labeled antibody measured with the amount of labeled antibody measured for a control sample prepared in accordance with steps (a)–(d), said control sample being known to be free of insulin-like growth factor binding protein, to determine the presence of total insulin-like growth factor binding protein in said fluid sample, or relating the amount of labeled antibody measured with the amount of labeled antibody measured for samples containing known amounts of insulin-like growth factor binding protein prepared in accordance with steps (a)–(d) to determine the concentration of total insulin-like growth factor binding protein in said fluid sample.

5,747,274

METHOD AND DEVICE FOR DIAGNOSING AND DISTINGUISHING CHEST PAIN IN EARLY ONSET THEREOF

George Jackowski, Inglewood, Canada, assignor to Spectral Diagnostics Inc., Toronto, Canada

Continuation of Ser. No. 420,298, Apr. 11, 1995, Pat. No. 5,604,105, which is a continuation-in-part of Ser. No. 26,453, Mar. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 695,381, May 3, 1991, Pat. No. 5,290,678. This application Sep. 5, 1996, Ser. No. 697,690
Claims priority, application Canada, Oct. 12, 1990, 2027434
Int. Cl.^{6} G01N *33/573;33/558*

U.S. Cl. 435—7.94 **25 Claims**

1. A method for determining if a patient presenting with chest pain is undergoing a cardiac event and, if so, if the cardiac event is an unstable angina or a myocardial infarction, comprising

a. detecting the presence of increased levels of at least three different markers of cardiac damage present in a blood, serum, or plasma sample from the patient after onset of chest pain, wherein:

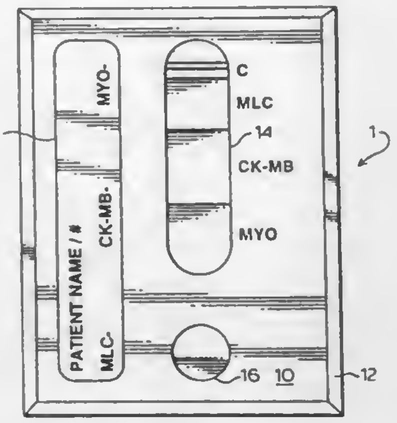
i. a first marker is an ischemic marker;

ii. a second marker is released from cardiac tissue only as a result of myocardial infarction; and

iii. a third marker is a cardiac-specific ischemic marker;

by contacting the sample with three antibodies, one of which one is specific for each of the markers, wherein one of the markers to which the antibodies bind is released before about six hours after the onset of chest pain and detecting binding of the antibody to the marker, whereby the presence of increased levels of a marker in the sample is indicated by binding of the marker with the respective antibody; and

b. correlating the presence or absence of increased levels of each of the three markers with the presence or absence of unstable angina or myocardial infarction.



5,747,275

PROTEIN KINASE REQUIRED FOR RAS SIGNAL TRANSDUCTION

Gerry Rubin, Berkeley; Marc Therrien, Union City; Henry Chang, Berkeley; Felix Karim, El Cerrito, and David Wassarman, San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 571,758, Dec. 13, 1995, Pat. No. 5,700,675. This application Aug. 12, 1997, Ser. No. 909,984
Int. Cl.^{6} C12Q *1/48;* **C12P** *21/06;* **C07K** *1/00;* **C07H** *21/04*

U.S. Cl. 435—15 **6 Claims**

1. A method of identifying compounds which modulate the binding of a kinase suppressor of ras (Ksr) to a natural intracellular binding target, said method comprising the steps of:

forming a mixture comprising:
a Ksr,
a natural intracellular Ksr binding target, and
a candidate agent;

incubating said mixture under conditions whereby, but for the presence of said agent, said Ksr selectively binds said binding target at a first binding affinity;

detecting a second binding affinity of said Ksr to said binding target,

wherein a difference between said first and second binding affinity indicates that said agent modulates the binding of a Ksr to a natural intracellular binding target.

5,747,276

SCREENING METHODS FOR THE IDENTIFICATION OF NOVEL ANTIBIOTICS

James A. Hoch, La Jolla, and Shaoming Huang, San Diego, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

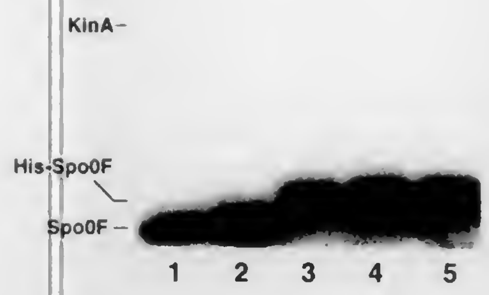
Filed Sep. 15, 1995, Ser. No. 528,737
Int. Cl.^{6} C12Q *1/18;1/50;1/16;* **G01N** *33/53*

U.S. Cl. 435—32 **16 Claims**

1. An assay method for identifying antibiotic or antimicrobial agents, comprising:

a. affixing a substrate onto a solid support;

b. admixing said solid phase-affixed substrate with a sensor protein, a high-energy phosphate source, and a test sample, wherein said substrate comprises a bacterial protein or polypeptide molecule that includes one or more histidine residues attached to its N-terminus;



c. allowing said admixture to incubate for a predetermined period of time; and

d. examining said admixture after said incubation in order to determine the effect of said test sample upon the activity of said sensor protein.

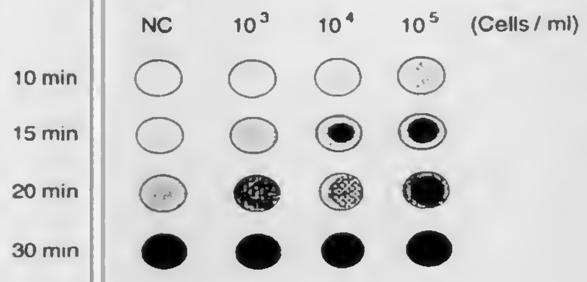
5,747,277

PROCESS FOR DETECTING MICROORGANISMS

Masakazu Tsuchiya, Ako, Japan, assignor to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 24, 1996, Ser. No. 685,546
Claims priority, application Japan, Jul. 31, 1995, 7-214200
Int. Cl.^{6} C12Q *1/04;1/54;1/26;1/00*

U.S. Cl. 435—34 **4 Claims**



1. A process for detecting microorganisms which comprises filtering a sample containing microorganisms through a filter, washing the filter, reacting the residue on the filter with an insect hemolymph containing inactive factors of the pro-phenol oxidase cascade, and detecting microorganisms in the sample on the basis of the color change.

5,747,278

DNA ENCODING INWARD RECTIFIER, G-PROTEIN ACTIVATED, MAMMALIAN, POTASSIUM KGA CHANNEL AND USES THEREOF

Henry A. Lester; Nathan Dascal, both of South Pasadena; Nancy F. Lim, Pasadena; Wolfgang Schreibmayer, South Pasadena, and Norman Davidson, Sierra Madre, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 21, 1993, Ser. No. 66,371
Int. Cl.^{6} C12N *15/12;* **C07K** *38/17*

U.S. Cl. 435—69.1 **17 Claims**

1. Nucleic acid comprising an isolated KGA nucleic acid encoding an inward rectifier, G-protein activated, mammalian, potassium KGA channel protein which is endogenously expressed in a mammalian cell, wherein said KGA nucleic acid is capable of hybridizing under low stringency conditions to a nucleic acid having the sequence set forth in Seq ID No:1 or its complement and wherein said KGA nucleic acid is further characterized by its ability to cause a change in potassium conductance across a Xenopus oocyte cell membrane when expressed therein.

5,747,279

NUCLEIC ACID MOLECULES ENCODING KAPPA$_3$ OPIOID RECEPTORS, RECEPTORS ENCODED THEREBY, AND USES THEREOF

Gavril W. Pasternak, and Ying-Xian Pan, both of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Nov. 5, 1993, Ser. No. 147,949
Int. Cl.^{6} C12N *15/09*

U.S. Cl. 435—69.1 **8 Claims**

1. A host cell transfected with a vector which comprises a nucleic acid encoding kappa$_3$ opioid receptor having the amino acid sequence set forth in SEQ ID NO:2.

5,747,280

HUMAN VASCULAR IBP-LIKE GROWTH FACTOR

Gregg A. Hastings, Rockville, and Craig A. Rosen, Latonsville, both of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Jun. 5, 1995, Ser. No. 464,339
Int. Cl.^{6} C12N *15/12*

U.S. Cl. 435—69.1 **22 Claims**

1. An isolated polynucleotide comprising a polynucleotide having at least 95% identity to a member selected from the group consisting of:

(a) a polynucleotide encoding a polypeptide comprising the amino acid sequence from amino acid 1 to 163 of SEQ ID NO:2; and

(b) the complement of (a).

5,747,281

SYSTEM USEFUL FOR THE PRODUCTION OF PROTEINS FROM RECOMBINANT DNA IN SINGLE CELLED ORGANISMS

Michael L. Shuler, and David B. Wilson, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 471,900, Mar. 12, 1990, which is a continuation of Ser. No. 353,203, May 12, 1989, abandoned, which is a continuation of Ser. No. 655,281, Sep. 28, 1984, abandoned. This application Jun. 7, 1995, Ser. No. 472,485
Int. Cl.^{6} C12P *21/00;* **C12N** *15/00*

U.S. Cl. 435—69.1 **24 Claims**

1. A method for producing a protein, said method comprising:

providing non-leaky cells comprising a gene encoding a protein and an inducible promoter controlling expression of the gene;

culturing the non-leaky cells under conditions effective for the non-leaky cells to undergo exponential growth; and

inducing protein expression in the exponentially growing non-leaky cells at expression levels effective to prevent complete formation of outer membranes of the exponentially growing cells, whereby leaky cells are formed and protein is released from the leaky cells.

5,747,282

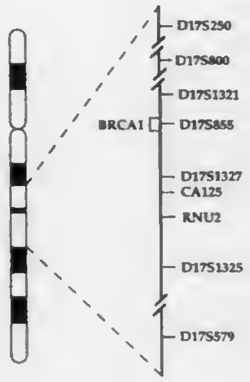
17Q-LINKED BREAST AND OVARIAN CANCER SUSCEPTIBILITY GENE

Mark H. Skolnick; David E. Goldgar; Yoshio Miki; Jeff Swenson; Alexander Kamb; Keith D. Harshman; Donna M. Shattuck-Eidens; Sean V. Tavtigian, all of Salt Lake City, Utah; Roger W. Wiseman, and P. Andrew Futreal, both of Durham, N.C., assignors to Myraid Genetics, Inc.; University of Utah Research Foundation, both of Salt Lake City, Utah, and The United States of America as represented by the Secretary of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 409,305, Mar. 24, 1995, abandoned, which is a continuation-in-part of Ser. No. 348,824, Nov. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 308,104, Sep. 16, 1994, which is a continuation-in-part of Ser. No. 300,266, Sep. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 289,221, Aug. 12, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 483,554

Int. Cl.^{6} C12P *21/06;* **C12Q** *1/68;* **C07H** *21/04*

U.S. Cl. 435—69.1 **20 Claims**



1. An isolated DNA coding for a BRCA1 polypeptide, said polypeptide having the amino acid sequence set forth in SEQ ID NO:2.

5,747,283

BASOPHIL GRANULE PROTEINS

Randy W. Scott, Cupertino, Calif.; Gerald J. Gleich, Rochester, Minn., and Craig G. Wilde, Foster City, Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif., and Mayo Foundation for Medical Education and Research, Rochester, Minn.

Division of Ser. No. 245,853, May 19, 1994, Pat. No. 5,476,839, which is a continuation of Ser. No. 943,813, Sep. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 551,263, Jul. 10, 1990, abandoned. This application Dec. 18, 1995, Ser. No. 573,675

Int. Cl.^{6} C12P *21/06;* **C12N** *1/20;* **C07H** *21/04*

U.S. Cl. 435—69.1 **9 Claims**

1. An isolated polynucleotide which polynucleotide or its complement encodes a human basophil granule protein (BGP), the BGP comprising an N-terminal amino acid sequence selected from the group consisting of:

Asp-Ile-Gly-Pro-Asp-Gln-His-Thr-Ser-Arg-Pro-Trp-Gly-Gln-Thr (SEQ ID NO: 1);
Asp-Val-Lys-Lys-Asp-Met-Glu-Val-Ser-Cys-Pro-Asp-Gly-Tyr-Thr (SEQ ID NO:2);
Val-Met-X-Pro-Asp-Ala-Arg-Ser-X-Arg-Pro-Asp-Gly-X-Thr (SEQ ID NO:3);
Ala-Ile-Tyr-X-Arg-Ile-Pro-X-X-Ile-Ala-Gly-Glu-Phe-Arg-Tyr-Gly-Thr-Val-Tyr-Tyr-Gln-Gly-Ser-Leu (SEQ ID NO:4);
Tyr-Pro-Gln-Leu-Ala-Ile-Asn (SEQ ID NO:6);
Ser-Ile-Gly-Phe-Val-Glu-Val-X-Leu-Val-Leu (SEQ ID NO:7);
Ala-Pro-Ala-Leu-Thr-Ile-Ser-Asn-Gln (SEQ ID NO:9);
Asp-Ile-Gly-Pro-Asp-Gln-His-Thr-Ser-X_1-Pro-X2-Gly-Gln-Thr-Arg-X-Pro-Gln-Leu-Thr-Gly-Gly-Glu-Ala-X-Val (SEQ ID NO: 10);
Arg-Asp-Val-Pro-Pro-Asp-X-Val-Val-Ser-X-Pro-Ser-Ser-Asp-Thr (SEQ ID NO:11);
Gly-Pro-Pro-Thr-Phe-Asn-Lys-Ile-Thr-Pro-Asn-Asp-Ala-Asp-Phe (SEQ ID NO: 14);
Ala-Ile-Gln-Cys-Pro-X3-Ser-Gln-Phe-X4-X5-Pro-X6-Phe-Leu-Ala-Thr-Gly-Val-Met (SEQ ID NO: 15);
Asp-Ile-Pro-Glu-Val-Cys-Phe-Asn (SEQ ID NO: 16);
Asp-Pro-Gly-Glu-Val-Lys-Ala-Leu-Pro-Met-Gln (SEQ ID NO: 17);
Lys-Pro-Gln-Met-Phe-Thr-Ile-X-Gln-Asn-X-Ala-Thr-Trp-Met (SEQ ID NO:23);
Lys-Ile-Gly-Gly-Phe-Glu-Val-Thr-Asp-Val-Phe-Ala-Pro-Val-Met-Ala (SEQ ID NO: 19);
Ile-Leu-Gly-Val-Phe-X-Val-Glu-Gln-X-Phe-Ser-Phe-X-Leu (SEQ ID NO:20);
Asp-Pro-Pro-Thr-Phe-Asn-Lys-Ile-Thr-Pro-Asn-Leu-Leu-Glu-Phe-Ala-Asp-Gly-Leu-Tyr-Lys-Gln-Glu (SEQ ID NO:21); and
Ser-Glu-Leu-Thr-Lys-Met-Asn-Gln-Arg-Ser-Phe (SEQ ID NO:22);

where each X, X_1, X_2, X_3, X_4, X_5, and X_6 independently represents a variable amino acid residue.

5,747,284

Patent Not Issued For This Number

5,747,285

DNA COMPRISING REGULATORY REGIONS FROM GENE Y OF *PENICILLIUM CHRYSOGENUM*

Roelof Ary Lans Bovenberg, Rotterdam; Adrianus Wilhelmus Hermanus Vollebregt, and Pieter Van Solingen, both of Naaldwijk, all of Netherlands, assignors to Gist-Brocades, NV., Netherlands

Continuation of Ser. No. 855,418, Mar. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 305,532, Feb. 1, 1989, Pat. No. 5,108,918. This application Mar. 8, 1994, Ser. No. 207,900

Claims priority, application European Pat. Off., Dec. 23, 1991, 91203400

Int. Cl.^{6} C12N *15/62;15/80*

U.S. Cl. 435—69.7 **17 Claims**

1. An isolated DNA comprising a nucleotide sequence obtainable from gene Y which regulates transcription initiation of a DNA sequence of interest operably joined to said nucleotide sequence.

5,747,286

POLYNUCLEOTIDES ENCODING A TRANSCRIPTIONAL RESPONSE REGULATOR OF *STREPTOCOCCUS PNEUMONIAE*

Nicola Gail Wallis, Wayne, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa., and SmithKline Beecham p.l.c., Brentford, England

Filed May 1, 1997, Ser. No. 850,117

Int. Cl.^{6} C12N *15/31;15/74*

U.S. Cl. 435—69.1 **32 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence encoding a response regulator polypeptide having an amino acid sequence that is at least 80% identical over its entire length to the amino acid sequence set forth in SEQ ID NO:2,

whereby said encoded amino acid sequence is identical to SEQ ID NO:2 except that it may include up to 20 amino acid alterations per each 100 amino acids of SEQ ID NO:2,

wherein said alterations are selected from the group consisting of amino acid deletions, substitutions, or insertions, and

wherein said alterations may occur at the amino terminus or the carboxyl terminus of SEQ ID NO:2 or may occur anywhere between said termini, interspersed either 5 individually among the amino acid sequence of SEQ ID NO:2 or in one or more contiguous groups within the amino acid sequence of SEQ ID NO:2.

5,747,287

METHOD FOR THE HIGH LEVEL EXPRESSION, PURIFICATION AND REFOLDING OF THE OUTER MEMBRANE GROUP B PORIN PROTEINS FROM *NEISSERIA MENINGITIDIS*

Milan S. Blake, New York, N.Y.; Joseph Y. Tai, Fort Washington, Pa.; Huilin L. Qi, New York, N.Y.; Shu-Mei Liang, Bethesda, Md.; Lucjan J. J. Hronowski, Laurel, Md., and Jeffrey K. Pullen, Columbia, Md., assignors to The Rockefeller University, New York, N.Y., and North American Vaccine, Inc., Beltsville, Md.

Continuation of Ser. No. 431,264, Apr. 28, 1995, abandoned,. This application Jun. 17, 1997, Ser. No. 877,109

Int. Cl.^{6} C07K *1/00;* **C12P** *21/06;* **C12N** *15/00;* **A61K** *39/05*

U.S. Cl. 435—69.1 **13 Claims**

1. A method for producing a meningococcal group B porin protein-polysaccharide conjugate comprising:

(a) providing a recombinantly produced, purified and refolded meningococcal group B porin from *E. coli* host cells, wherein said refolded porin is produced by a process comprising:
  (i) expressing the mature porin in *E. coli* transfected with a gene coding for said mature porin to produce the mature porin in the form of inclusion bodies;
  (ii) isolating said inclusion bodies;
  (iii) suspending and dissolving said isolated inclusion bodies in an aqueous solution of a denaturant;
  (iv) diluting the solution obtained in step (iii) with a detergent; and
  (v) passing said diluted solution obtained in step (iv) through a gel filtration column;
  whereby said refolded porin is obtained;
(b) obtaining a *N. meningitidis* capsular polysaccharide; and
(c) conjugating said refolded porin of step (a) to said polysaccharide of step (b).

5,747,288

PROTEIN KINASE REQUIRED FOR RAS SIGNAL TRANSDUCTION

Gerry Rubin, Berkeley; Marc Therrien, Union City; Henry Chang, Berkeley; Felix Karim, El Cerrito, and David Wassarman, San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 571,758, Dec. 13, 1995, Pat. No. 5,700,675. This application Jun. 12, 1997, Ser. No. 909,983

Int. Cl.^{6} C12P *21/06;* **C12N** *1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—69.1 **6 Claims**

1. An isolated nucleic acid encoding a kinase suppressor of ras (Ksr) protein.

5,747,289

Patent Not Issued For This Number

5,747,290

PROCESS FOR THE PRODUCTION OF RECOMBINANT POLYPEPTIDES

John Spencer Emtage, Marlow, England, and Malcolm Roy Brandon, Ivanhoe East Melbourne, Australia, assignors to Southern Cross Biotech Party, Ltd, Victoria, Australia

Continuation of Ser. No. 134,946, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 984,244, Dec. 1, 1992, abandoned, which is a continuation of Ser. No. 717,179, Jun. 18, 1991, abandoned, which is a division of Ser. No. 480,051, Feb. 14, 1990, abandoned, which is a continuation of Ser. No. 148,519, Jan. 26, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 468,824

Claims priority, application United Kingdom, Jan. 28, 1987, 8701848

Int. Cl.^{6} C12P *21/02;* **C07H** *21/04;* **C12N** *15/70*

U.S. Cl. 435—69.4 **9 Claims**

1. A process for the production of a recombinant polypeptide having porcine growth hormone activity, said process comprising:

(a) providing a dual-origin host-vector expression system comprising (i) a recombinant plasmid expression vector selected from the group consisting of pMG935, pMG936, pMG939 and pMG940 which encode a recombinant polypeptide which retains procine growth hormone activity, wherein said vector is replicated, transcribed and translated in a unicellular organism, and (ii) a unicellular organism;
(b) introducing said recombinant plasmid expression vector into said unicellular organism by a method selected from the group consisting of transformation, transduction and transfection;
(c) culturing said organism having said recombinant plasmid expression vector introduced therein; and
(d) expressing said recombinant polypeptide having porcine growth hormone activity.

5,747,291

BIFUNCTIONAL UROKINASE VARIANTS WITH IMPROVED FIBRINOLYTIC CHARACTERISTICS AND THROMBIN INHIBITING EFFECT

Gerd J. Steffens, Aachen; Stephan Wnendt, Aachen-Forst; Johannes Schneider, Stolberg; Regina Heinzel-Wieland, and Derek John Saunders, both of Aachen, all of Germany, assignors to Gruenenthal GmbH, Aachen, Germany

Division of Ser. No. 93,741, Jul. 20, 1993. This application Sep. 27, 1996, Ser. No. 720,012

Claims priority, application Germany, Jul. 15, 1993, 43 23 754.1

Int. Cl.^{6} C12N *9/72;15/58;15/70;* **A61K** *38/48*

U.S. Cl. 435—69.6 **9 Claims**

1. A plasmid for use in producing a bifunctional urokinase variant corresponding to the formula I

$$M4\text{-}X_1\text{—}Y_1$$

wherein

M4 represents the amino acid sequence from ^{47}Ser to ^{411}Leu of the unglycosylated prourokinase as set forth in SEQ ID NO:83,

X_1 represents a peptide bond, or
  a peptide sequence selected from the group consisting of
  Ser-Pro-Pro-Ser-Pro-Pro-Gly-Gly-Phe (SEQ ID NO:1),
  Ser-Pro-Pro-Ser-Pro-Pro-Ser-Pro-Pro-Gly-Gly-Phe (SEQ ID NO:2), and
  Ser-Pro-Pro-Ser-Pro-Pro-Ser-Pro-Pro-Gly-Gly-Phe-Gly (SEQ ID NO:3),
  or a peptide sequence of formula II

$$Ser\text{-}X_2\text{-}X_3\text{-}X_4\text{-}X_5\text{-}X_6\text{-}X_7$$

wherein X_2 is Pro or Leu, X_3 is Val or Pro, $X_4$is Lys, Val, Arg, Gly or Glu, X_5 is Ala, Val, Gly, Leu or Ile, X_6 is Phe, Trp, Tyr or Val and X_7 is a peptide bond or Gly, and

Y_1 represents a peptide sequence selected from the group consisting of

Y_2-Arg-Pro-Y_3-Gly-Gly-Gly-Gly-Asn-Gly-Asp-Phe-Glu-Glu-Ile-Pro-Glu-Glu-Tyr-Leu-Y_4 (SEQ ID NO:4),

Y_2-Arg-Pro-Phe-Leu-Leu-Arg-Asn-Pro-Asn-Asp-Lys-Tyr-Glu-Pro-Phe-Trp-Glu-Asp-Glu-Glu-Lys-Asn-Glu (SEQ ID NO:5), and

Y_2-Arg-Pro-Ser-Ser-Glu-Phe-Glu-Glu-Phe-Glu-Ile-Asp-Glu-Glu-Glu-Lys (SEQ ID NO:6)

wherein Y_2 is Pro or Val, Y_3 is Leu or a peptide bond, and

Y_4 is Gln or a hydroxyl group; said plasmid comprising an operon which comprises a regulatable promotor, a Shine-Dalgarno sequence effective as ribosomal binding site, a start codon, a synthetic structural gene for the bifunctional urokinase variant, and downstream of said structural gene, at least one terminator; and said plasmid being suitable for expressing said bifunctional urokinase variant in strains of *Escherichia coli*.

5,747,292

CHIMERIC CYTOKINE RECEPTORS IN LYMPHOCYTES

Philip D. Greenberg, Mercer Island, and Brad H. Nelson, Seattle, both of Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Continuation-in-part of Ser. No. 43,389, Apr. 6, 1993, abandoned. This application May 31, 1994, Ser. No. 244,468

Int. Cl.^{6} C07K *14/715;19/00;* **C12N** *15/62*

U.S. Cl. 435—69.7 **42 Claims**

1. A chimeric receptor comprising a first chimeric peptide chain, said first peptide chain comprising an extracellular domain derived from cytokine receptor A-R that binds cytokine A, joined, via a transmembrane domain, to a cytoplasmic domain derived from cytokine receptor B-R that binds cytokine B, where cytokine receptor A-R and cytokine receptor B-R are different receptors, wherein cytokine B is a cytokine that is normally required by a lymphocyte for growth and proliferation and wherein the chimeric receptor expressed in said lymphocyte lessens the growth dependency of the lymphocyte on cytokine B in the presence of cytokine A and wherein, if cytokine receptor A-R or B-R is hetero-oligomeric, then the chimeric receptor comprises at least first and second of said peptide chains, wherein said peptide chains are different from each other and are each chimeric.

5,747,293

INTIMIN-LIKE PROTEINS OF *E. COLI*

Gordon Dougan, and Gad Frankel, both of London, England, assignors to Imperial College of Science, Technology & Medicine, London, United Kingdom

Filed Mar. 23, 1995, Ser. No. 409,452

Int. Cl.^{6} C07K *14/245;14/00;14/24*

U.S. Cl. 530—402 **6 Claims**

1. A protein which is MBP-Int$_{EPEC280}$ fusion protein.

3. A protein which is MBP-Int$_{EHEC275}$ fusion protein.

5,747,294

COMPOSITIONS AND METHODS FOR THE PREVENTION AND DIAGNOSIS OF LYME DISEASE

Richard A. Flavell, Killingworth; Fred S. Kantor, Orange; Stephen W. Barthold, Madison, and Erol Fikrig, Guilford, all of Conn., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 682,355, Apr. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 602,551, Oct. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 538,969, Jun. 15, 1990, abandoned. This application Oct. 7, 1994, Ser. No. 320,161

Int. Cl.^{6} C12P *21/08;* **C07K** *16/12;* **A61K** *39/02;39/395*

U.S. Cl. 435—70.21 **9 Claims**

3. A process for selecting an antibody which protects an immunocompetent animal against Lyme disease and related disorders as caused by *B. burgdorferi* infection comprising the steps of:

(a) immunizing a mouse of strain C3H/He with the antibody;

(b) challenging the immunized mouse with *B. burgdorferi*; and

(c) selecting the antibody which protects the immunized mouse against infection and Lyme disease.

5,747,295

ANTIBIOTIC GE 2270 FACTORS B_1, B_2, C_1, C_2, D_1, D_2, E AND T

Enrico Selva, Gropello Cairoli; Paolo Tavecchia, Rho; Ermenegildo Restelli, Gerenzano; Pietro Ferrari, Garbagnate Milanese, all of Italy, and Maurizio Denaro, Cincinnati, Ohio, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Division of Ser. No. 311,288, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 144,102, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 920, Jan. 6, 1993, abandoned, which is a continuation of Ser. No. 856,857, Mar. 24, 1992, abandoned, which is a continuation of Ser. No. 665,612, Mar. 15, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,177

Claims priority, application European Pat. Off., Mar. 8, 1990, 90104409; Oct. 22, 1990, 90120214

Int. Cl.^{6} C12P *21/04;1/00*

U.S. Cl. 435—71.3 **1 Claim**

1. An antibiotic factor that has been separated from the antibiotic GE 2270 complex and is present as an individual factor in which said individual antibiotic factor is selected from the group consisting of antibiotic GE 2270 factor B_1, antibiotic GE 2270 factor B_2, antibiotic GE 2270 factor C_1, antibiotic GE 2270 factor C_2, antibiotic GE 2270 factor D_1, antibiotic GE 2270 factor D_2, antibiotic GE 2270 factor E, and antibiotic GE 2270 factor T; in which each of said individual antibiotic factors has the following characteristics:

A) Ultraviolet absorption spectra exhibiting the following absorption maxima:

	80 max (nm)
ANTIBIOTIC GE 2270 FACTORS B_1, B_2, C_1, C_2, D_1, D_2 AND E:	
0.1M HCl	245–250 (shoulder) 300–315
0.1M KOH	245–250 (shoulder) 300–315
Phosphate buffer pH 7.38	245–250 (shoulder) 300–315
Methanol	245–250 (shoulder) 300–315
ANTIBIOTIC GE 2270 FACTOR T:	
0.1M HCl	250 280 (shoulder) 345 (shoulder)
0.1M KOH	240 (shoulder) 290 (shoulder) 345 (shoulder)
Phosphate buffer pH 7.38	250 (shoulder) 310 (shoulder) 345 (shoulder)
Methanol	240 (shoulder) 275 (shoulder) 290 (shoulder) 311 335 (shoulder)

B) Infrared absorption spectra (antibiotic GE 2270 factors D_1, D_2, E and T) in nujol mull exhibiting the following absorption maxima $\nu(cm^{-1})$:

Factor D_1: 3700-3100; 3020-2750 (nujol); 1645; 1570-1490; 1460 and 1375 (nujol); 1305; 1260-1100; 1100-870; 840; 800; 760; 720 (nujol); 700

Factor D_2: 3700-3100; 3020-2750 (nujol); 1645; 1570-1490; 1460 and 1375 (nujol); 1305; 1260-1100; 1100-870; 840; 800; 760; 720 (nujol); 700

Factor E: 3700-3100; 3020-2750 (nujol); 1645; 1570-1490; 1460 and 1375 (nujol); 1305; 1260; 1250-1070; 1015; 985-900; 840; 800; 760; 740; 720 (nujol); 700

Factor T: 3700-3120; 3100; 3020-2750 (nujol); 1655; 1570-1490; 1460 and 1375 (nujol); 1410; 1300; 1240; 1200-1000; 980; 930; 890; 840; 805; 765; 745; 720 (nujol); 700

C) ^{1}H-NMR spectrum (antibiotic GE 2270 factors D_1, D_2, E and T) exhibiting the following groups of signals in DMSO-d_6 (hexadeuterodimethyl-sulfoxide) using TMS as the internal standard (0.00 ppm) [δ, ppm, m] (s=singlet, br s=broad singlet, d=doublet, dd=doublet of doublets, t=triplet, m=multiplet, Py=pyridine, Tz=thiazole)

Factor D_1 (recorded at 500 MHz): 8.88, d, (NH); 8.70, d, (2NH's); 8.57, s, 8.50, s, 8.25, s, 8.21, s and 7.35, s, (CH's of 5 thiazoles); 8.40, m, (glycine NH); 8.28-8.21, m, (pyridine CH's); 7.32-7.20, m, (aromatic CH's and primary amide NH); 7.00, s, 6.64, s, 6.53, s, (primary amide NH's); 5.95, d, (OH); 5.29-5.15, m, (αCH's); 5.04, m, (phenylserine βCH); 4.81, m and 4.56, m, (oxazoline CH_2); 4.30-3.80, m, (CH_2 of glycine and prolineamide CH's); 2.72, m, and 1.43, m, (CH_2 of asparagine); 2.60, s, (CH_3); 2.21-1.91, (m), (isopropyl CH and prolineamide CH's); 0.90 (d) and 0.86 (d), (valine CH_3)

Factor D_2 (recorded at 500 MHz): 9.00, d, (NH); 8.69, br s (2NH's); 8.59, s, 8.53, s, 8.29, s and 7.35, s, (thiazole CH's); 8.38, m, (glycine NH); 8.40 and 8.26 (m), (Py.CH's); 7.37-7.18, m, (aromatic CH's, primary amide NH); 6.97, s, (primary amide NH); 6.03, d and t, (2 OH's); 5.28-5.16, m (αCH's); 5.03, m, (βCH); 4.97, m, [CH_2(OH)]; 4.79 and 4.55, m (CH_2 of oxazoline); 3.97-3.76, m, (CH_2 of glycine and CH's of prolineamide); 2.71, m and 1.28, m, (CH_2 of N-methylasparagine); 2.18-1.89, m, (isopropyl CH and prolineamide CH_2's); 0.88, d and 0.84 d (valine CH_3'S)

Factor E (recorded at 500 MHz): 8.95, d, (NH); 8.73, d, (NH); 8.60, s, (Tz.CH); 8.57, d, (NH); 8.53, s, (Tz.CH); 8.42, m, (Py.CH's); 8.31, m, (NH); 8.28, m, (Py.CH); 8.24, s, (Tz.CH); 7.33, s, (Tz.CH); 7.31-7.20, m, (aromatic CH's, primary amide NH); 6.98, s, 6.91, s, 6.62, s, (primary amide NH's); 6.04, d, (OH); 5.95, t, (OH); 5.28-5.14, m (αCH's), 5.03, m, (βCH); 4.99, m, [CH_2(OH)]; 4.81, dd and 4.57, dd, (oxazoline CH_2); 4.26 (m) and 3.79 (m), (glycine CH_2); 4.25, m, 3.98, m, 3.82, m, (prolineamide CH's); 2.77, m, and 1.25, m, (CH_2 of asparagine); 2.60, s, (CH_3); 2.20, m, and 1.89, m, (valine βCH and CH_2 of prolineamide); 0.90, d, 0.84, d, (valine CH_3's)

Factor T (recorded at 250 MHz): 8.95, d, (NH); 8.70, d, (2NH's); 8.66, s, 8.65, s, 8.60, s, 8.30, s and 7.38, s, (CH's of 4 thiazoles and 1 oxazole); 7.35-7.24, m, (aromatic CH's and primary amide NH); 6.68 (primary amide NH); 5.96, d, (OH); 5.34-5.18, m (αCH's); 5.05, m, (βCH); 5.03, S, [CH_2(OCH_3)]; 4.32, m and 3.82, m, (CH_2 of glycine); 4.48, m, 4.04, m and 3.63, m, (CH's of prolineamide); 3.40, s, (OCH_3); 2.73, m and 1.41, m, (CH_2 of N-methylasparagine); 2.60, s, (CH_3); 2.49, d, (CH_3 of N-methylasparagine); 2.27-1.88, m (isopropyl CH and CH_2 of prolineamide); 0.89, d, (CH_3 of valine)

D) Retention times (R_t) (antibiotic GE 2270 factors B_1, B_2, C_1, C_2, D_1, D_2, E and T) in the following reverse phase HPLC system:

Column: Bakerbond® C8 (5 μm) 4.6×250 mm (Bakerbond is a trade name for reverse phase octylsilyl silica gel HPLC columns supplied by J. T. Baker Research Product, Phillisburg, N.J. 08865 USA)

Flow rate: 1.8 ml/min

Phase A: CH_3CN:tetrahydrofuran:40 mM $HCOONH_4$ 40:40:20

Phase B: CH_3CN:tetrahydrofuran:40 mM $HCOONH_4$ 10:10:80

Elution: linear gradient from 20% to 30% of Phase A in 20 min

Detection: UV 254 nm are as reported below:

Antibiotic GE 2270 factor	Retention time relative to factor A (R_t 16.6 min)	R_t (min)
E	0.52	8.62
D_1	0.56	9.36
D_2	0.59	9.72
C_1	0.65	10.78
C_2	0.79	13.10
B_1	0.85	14.18
B_2	0.97	16.08
T	1.19	19.68

E) The main FAB-MS peaks [obtained on a Kratos MS-50 double focusing mass spectrometer, using 8 kV accelerating voltage and a saddle field atom gun with Xe gas (2×10^{-5} torr pressure indicated on the source ion gauge) at 6 kV voltage and 1 mA current, the sample being mixed with a thioglycerol matrix containing 0.1M acetic acid] are as indicated below:

Antibiotic GE 2270 factor	FAB-MS M + 1 ion
E	1262
D_1	1232
D_2	1276
C_1	1246
C_2	1276
B_1	1276
B_2	1260
T	1288

and in which each of said individual antibiotic factors is produced by:

1) cultivating *Planobispora rosea* ATCC 53773, under aerobic conditions in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen, and inorganic salts, for a period of time sufficient to produce the antibiotic GE 2270 complex;

2) recovering said antibiotic GE 2270 complex from the medium, and;

3) separating and isolating said individual antibiotic factor from the antibiotic GE 2270 complex.

5,747,296

METHOD OF DETECTING NEUTOPHIL INHIBITORY FACTOR MIMICS

Matthew Moyle, Escondido, Calif.; David L. Foster, Brighton, Mass., and George P. Vlasuk, Carlsbad, Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 151,064, Nov. 10, 1993, which is a continuation-in-part of Ser. No. 60,433, May 11, 1993, which is a continuation-in-part of Ser. No. 996,972, Dec. 24, 1992, which is a continuation-in-part of Ser. No. 881,721, May 11, 1992, abandoned. This application Dec. 23, 1993, Ser. No. 173,510

Int. Cl.^{6} G01N *33/53;* **A61K** *39/002;* **C07K** *14/44*

U.S. Cl. 435—72 **21 Claims**

1. A method of detecting in a sample the presence of a Neutrophil Inhibitory Factor mimic wherein said Neutrophil Inhibitory

Factor mimic competes with Neutrophil Inhibitory Factor for binding to CD11b/CD18 receptor and is characterized as having neutrophil inhibitory activity, eosinophil inhibitory activity or both such activities, which comprises contacting said sample with CD11b/CD18 receptor and Neutrophil Inhibitory Factor and detecting amount of a Neutrophil Inhibitory Factor and/or Neutrophil Inhibitory Factor mimic bound to CD11b/CD18 receptor wherein decreased binding of Neutrophil Inhibitory Factor or Neutrophil Inhibitory Factor mimic relative to a control indicates presence of Neutrophil Inhibitory Factor mimic and wherein said Neutrophil Inhibitory Factor includes an amino acid sequence selected from the group consisting of:

(a) Arg-X_1-X_2-Phe-Leu-X_3-X_4-His-Asn-Gly-Tyr-Arg-Ser-X_5-Leu-Ala-Leu-Gly-His-X_6-X_7-Ile [SEQ. ID. NO. 1], wherein X_1 is Leu or Arg, X_2 is Gln, Lys or Arg; X_3 is Ala or Arg; X_4 is Leu or Met; X_5 is Lys, Arg, Leu or Ile; X, is Val or Ile; and X_7 is Ser, Gly or Asn;

(b) Ala-X_8-X_9-Ala-Ser-X_{10}-Met-Arg-X_{11}-Leu-X_{12}-Tyr-Asp-Cys-X_{13}-Ala-Glu-X_{14}-Ser-Ala-Tyr-X_{15}-Ser-Ala [SEQ. ID. NO. 2], wherein X_8 is His or Pro; X_9 is Thr, Arg or Ser; X_{10} is Arg or Lys; X_{11} is Ile or Tyr; X_{12} is Asp, Lys or Glu; X_{13} is Asp or Glu; X_{14} is Gly, Lys or Arg; and X_{15} is Glu, Met, Thr or Val;

(c) Ser-X_{16}-Phe-Ala-Asn-X_{17}-Ala-Trp-Asp-X_{18}-Arg-Glu-Lys-X_{19}-Gly-Cys-Ala-Val-Val-X_{20}-Cys [SEQ. ID. NO. 3], wherein X_{16} is Asn or Asp; X_{17} is Val or Leu; X_{18} is Ala or Thr; X_{19} is Leu, Val or Phe; and X_{20} is Thr, Lys or Asn;

(d) His-Val-Val-Cys-His-X_{21}-X_{22}-Pro-Lys [SEQ. ID. NO. 4], wherein X_{21} is Tyr or Ile; X_{22} is Gly or no residue;

(e) Ile-Tyr-X_{23}-X_{24}-Gly-X_{25}-Pro-Cys-X_{26}-X_{27}-Cys-X_{28}-X_{29}-Tyr [SEQ. ID. NO. 5], wherein X_{23} is Thr, Ser, Lys or Glu; X_{24} is Thr, Val or Ile; X_{25} is Val, Lys or Thr; X_{26} is Arg, Ser or Asp; X_{27} is Asn, Gly, Asp or Arg; X_{28} is Asn, Ser or Thr; and X_{29} is Gly, Glu or Asp; and

(f) Cys-X_{30}-X_{31}-Asp-X_{32}-Gly-Val-Cys-X_{33}-Ile [SEQ. ID. NO. 6], wherein X_{30} is His, Ile or Asn; X_{31} is Ala, Pro or Asp; X_{32} is Glu, Val, Asp or Ile; and X_{33} is Ile, Val or Phe.

5,747,297

INDUSTRIAL PHARMACEUTICAL AND COSMETICS APPLICATIONS FOR CULTURED PLANT CELL GUMS

Adrienne Elizabeth Clarke, Parkville; Antony Bacic, Eltham, and Alan Gordon Lane, Parramatta, all of Australia, assignors to Bio Polymers Pty. Ltd., Melbourne, and Commonwealth Scientific and Industrial Research Organisation, Campbell, both of Australia

Continuation-in-part of Ser. No. 920,688, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 415,263, Oct. 25, 1989, Pat. No. 5,133,979. This application Mar. 23, 1995, Ser. No. 409,737

Claims priority, application Australia, Feb. 26, 1987, PI0556/87; Sep. 22, 1987, PI4502/87

Int. Cl.^{6} C12P *19/00;* **C12N** *5/00*

U.S. Cl. 435—72 **54 Claims**

1. A process for manufacturing an industrial, pharmaceutical or cosmetic product, said process excluding food manufacturing, which process comprises a step of including a viscosifying agent, thickening agent, gelling agent, emulsifying agent, suspending agent, stabilizing agent, encapsulating agent, flocculating agent, film-forming agent, sizing agent, adhesive agent, binding or coating agent, lubricating agent, water retention agent or coagulation agent or any combinations of such agents in the manufactured product, wherein a cultured plant cell gum of a vascular plant produced by suspension culture of cells of a plant selected from the group consisting of Nicotiana, Pyrus, Phleum, Lolium, Hibiscus, Lycopersicon, Panicum, Mesembryanthemum, Actindia, Sida, Medicago, Trifolium, Solanum, and Cichorium is used as said agent.

5,747,298

DNA POLYMERASE WITH PROOF-READING 3'-5' EXONUCLEASE ACTIVITY *BACILLUS STEAROTHERMOPHILUS*

Guo Fan Hong, Shanghai, China, and Feng Zhai, deceased, late of Shanghai, China, by Fudi Ni, executor, assignors to Shanghai Institute for Biochemistry, Chinese Academy of Sciences, China

Filed Oct. 18, 1995, Ser. No. 544,643

Claims priority, application China, Nov. 17, 1994, 94-1-13990.5

Int. Cl.^{6} C12P *19/34;* **C12N** *9/12;1/20*

U.S. Cl. 435—91.1 **6 Claims**

6. A method of sequencing a DNA strand comprising the steps of:

i) hybidizing a primer to a DNA template to be sequenced;

ii) extending the primer using a thermostable *Bacillus stearothermophilus* DNA polymerase which has proofreading 3'–5' exonuclease activity, such that the DNA polymerase functions to excise mismatched nucleotides from the 3' terminus of the DNA strand at a faster rate than the rate at which the DNA polymerase functions to remove nucleotides matched correctly with nucleotides of the template, in the presence of nucleotide bases dATP, dGTP, dCTP and dTTP, or their analogs, and ddNTP chain terminators; and

iii) sequencing a DNA strand.

5,747,299

ANERGY GENES

Debra Bloom, Mountain View; C. Garrison Fathman, Portola Valley, and Sarah Slaymaker, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 265,100, Jun. 23, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 486,955

Int. Cl.^{6} C12P *19/34;* **C12Q** *1/68;* **G01N** *33/00;* **C07H** *21/02*

U.S. Cl. 435—91.2 **4 Claims**

1. A method for identifying anergic T-cells in a T-cell composition subjected to a T-cell activating agent, said method comprising:

detecting expression of cysteine string protein by said T-cells, whereby the absence of expression is indicative of anergy.

5,747,300

TREHALOSE AND ITS PRODUCTION AND USE

Tomoyuki Nishimoto; Hiroto Chaen; Toshiyuki Sugimoto, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kaguku Kenkyujo, Okayama, Japan

Division of Ser. No. 503,426, Jul. 17, 1995, abandoned. This application Mar. 22, 1996, Ser. No. 620,172

Claims priority, application Japan, Jul. 19, 1994, 6-187901; Apr. 24, 1995, 7-120387

Int. Cl.^{6} C12P *19/04*

U.S. Cl. 435—101 **12 Claims**

1. A process for producing trehalose comprising:

cultivating in a nutrient culture medium with maltose a microorganism capable of producing a maltose/trehalose conversion enzyme which produces trehalose from maltose but not from sucrose; and

collecting trehalose from the resultant culture.

5,747,301

D-SORBITOL DEHYDROGENASE

Tatsuo Hoshino, Kamakura; Setsuko Ojima, Fujisawa, and Teruhide Sugisawa, Yokohama, all of Japan, assignors to Roche Vitamins Inc., Parsippany, N.J.

Filed Feb. 26, 1996, Ser. No. 606,807

Claims priority, application European Pat. Off., Feb. 27, 1995, 95102748

Int. Cl.^{6} C12P *19/02;* **C12N** *9/02;9/04;1/00*

U.S. Cl. 435—105 **11 Claims**

1. A homogenous D-sorbitol dehydrogenase enzyme from a microorganism of the genus Gluconobacter or Acetobacter which enzyme catalyzes the oxidation of D-sorbitol to L-sorbose and which is further characterized by:

a) a molecular weight of 800,000±50,000;

b) a structure consisting of ten homologous subunits having a molecular weight of 79,000±5,000, each;

c) the ability of the enzyme to oxidize D-sorbitol to L-sorbose at a pH in the range of pH 5.5 to 8.0; and

d) an optimum pH at which the enzyme oxidizes D-sorbitol to L-sorbose which is in the range from pH 6.0 to 7.0.

5,747,302

PREPARATION OF THIOLS WITH FOOD-ACCEPTABLE MICRO-ORGANISMS

Tuong Huynh-Ba, Pully; Daniel Jaeger, St-Cierges, and Walter Matthey-Doret, Belmont S/Lausanne, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Oct. 24, 1996, Ser. No. 736,261

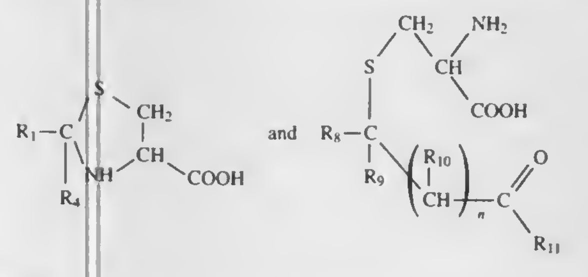
Claims priority, application European Pat. Off., Oct. 25, 1995, 95202889

Int. Cl.^{6} C12P *17/00;11/00;* **C12N** *1/16*

U.S. Cl. 435—117 **22 Claims**

1. A process for food-acceptable preparation of flavorant compounds comprising:

obtaining a cysteine S-complex having a formula selected from the group consisting of



wherein

R_1 is selected from the group consisting of H, C_{1-7} alkyls, phenyl, benzyl, 2-R_2-2-R_3-vinyl, 5-R_2-furan-2-yl and 5-R_2-thiofuran-2-yl wherein R_2 and R_3 are selected from the group consisting of H and CH_3, and

R_4 is selected from the group consisting of H and CH(OH)R_7, wherein R_7 is selected from the group consisting of H, C_{1-4} alkyls and phenyl, or

R_1 and R_4, in combination, comprise a structure selected from the group consisting of 2-R_5-5-R_6-tetra-hydrofuran-3 -ylidene and 2-R_5-5-R_6-2,3-dihydrofuran-3-ylidene wherein R_5 and R_6 are selected from the group consisting of H and CH_3,

R_8, R_9 and R_{10} are selected from the group consisting of H and C_{1-4} alkyls,

R_{11} is selected from the group consisting of H, C_{1-4} alkyls, phenyl, C_{1-4} alkoxys and C_{1-4} alkylaminos, and

n is selected from the group consisting of 0 and 1:

combining the complex with a medium comprising a yeast microorganisms which are food-acceptable and selected from the group consisting of *Saccharomyces cerevisiae*, brewer's yeast, *Candida versatilis*, *Debaromyces hansenii*, *Saccharomyces bayanus* and *Saccharomyces rouxii* to obtain a complex-containing medium and incubating the complex-containing medium to split the complex to yield a product-containing reaction medium comprising compounds comprising a thiol and at least one metabolite compound; and

isolating a product from the product-containing reaction medium which comprises the compounds to obtain a flavorant product.

5,747,303

INTERMEDIATES OF PEPTIDE ANTAGONISTS OF NEUROTENSIN

Jean-Jacques Debernard, Marolles En Brie; Catherine Dubertret, Sevres; Gérard Helynck, Choisy Le Roi; Jean Leboul, Gometz La Ville, and Jean-Paul Martin, Colombes, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony Cedex, France

PCT No. PCT/FR95/00642, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO95/32217, PCT Pub. Date Nov. 30, 1995

PCT Filed May 17, 1995, Ser. No. 737,697

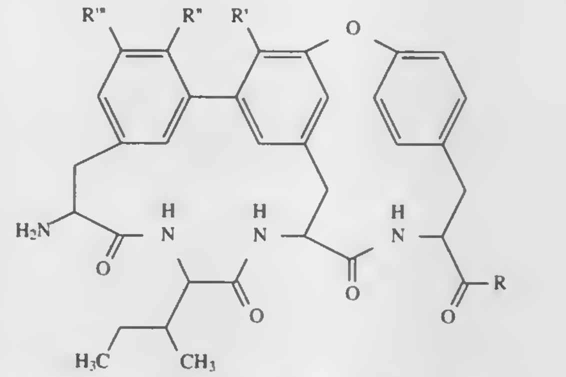
Claims priority, application France, May 20, 1994, 94 06166

Int. Cl.^{6} C07D *267/22;245/04*

U.S. Cl. 435—119 **10 Claims**

1. A purified compound of the formula:

(I)



in which R represents a hydroxyl, alkyloxy, phenylalkyloxy or —NH—CH_2—COOH radical, R' and R" are identical and each represent a hydroxyl or methoxy radical and R'" represents a hydrogen, bromine, chlorine or iodine atom or a nitro radical, it being understood that the alkyl and alkyloxy radicals and portions contain 1 to 4 carbon atoms in a straight or branched chain, or a salt thereof.

5,747,304

FUNGICIDAL AGENTS LL-15G256γ,δ, AND ϵ PRODUCED BY LL-15G256 (*HYPOXYLON OCEANICUM*)

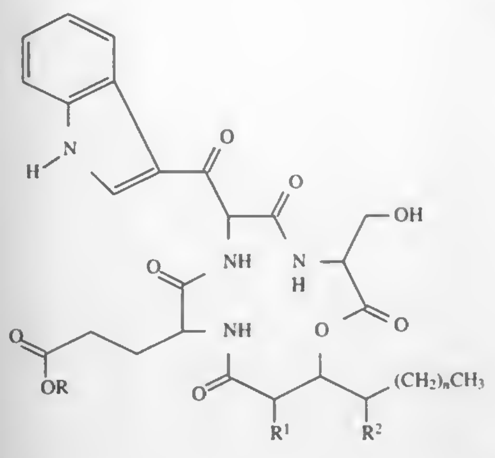
Gerhard Schlingmann, Hillburn, N.Y.; Lisa Milne, Haddonfield, N.J.; Cedric J. Pearce, Chapel Hill, N.C.; E. B. Gareth Jones, Portsmouth Polytechnic, United Kingdom, and David A. Albaugh, Trenton, N.J., assignors to American Cyanamid Company, Madison, N.J.

Filed Jun. 2, 1995, Ser. No. 460,331

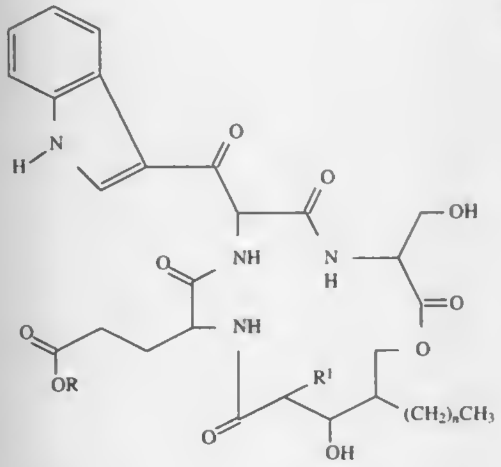
Int. Cl.^{6} C12P *17/10;21/04;* **A61K** *38/06;* **C07K** *5/00*

U.S. Cl. 435—121 **14 Claims**

11. A process for producing an antifungal compound Formula I or II:



Formula I



Formula II

wherein

n is 3 to 10;

R is hydrogen, C_1–C_4 alkyl or a pharmaceutically acceptable salt cation selected from the group consisting of sodium, potassium, calcium, lithium, magnesium, ammonium and tetra(C_1–C_4)alkyl ammonium;

R^1 is hydrogen or methyl; and

R^2 is hydrogen or methyl;

which comprises aerobically fermenting the fungus *Hypoxylon oceanicum* LL-15G256 NRRL 21363 or mutants thereof which produce said antifungal compounds in a liquid medium containing assimilable sources of carbon, nitrogen and inorganic salts, until substantial antifungal activity is imparted to said medium and then recovering said antifungal compound therefrom.

5,747,305

MONOGLYCERIDE PRODUCTION VIA ENZYMATIC GLYCEROLYSIS OF OILS IN SUPERCRITICAL CO_2

Michael A. Jackson, Morton, Ill., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 10, 1996, Ser. No. 679,368

Int. Cl.^{6} C12P *7/64*

U.S. Cl. 435—134 **10 Claims**

1. A method for producing monoglycerides comprising the steps of:

A) reacting a non-immobilized aliphatic primary or secondary alcohol with a triglyceride under non-aqueous conditions in the presence of a lipase catalyst and supercritical CO_2 in amounts and under conditions effective for production of monoglycerides; and

B) separating the glyceride-containing reaction product therefrom.

5,747,306

PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID USING ELECTRODIALYSIS

Masahide Oka, Kawanishi; Kenkichi Yoneto, and Takamasa Yamaguchi, both of Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 271,940, Jul. 8, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 517,660

Claims priority, application Japan, Jul. 9, 1993, 5-170247

Int. Cl.^{6} C12P *7/60*

U.S. Cl. 435—138 **2 Claims**

1. In a microbial process for producing 2-keto-L-gulonic acid (2KGA) by fermentation or microbial cell reaction with a microorganism capable of producing 2KGA selected from the group consisting of *Pseudogluconobacter saccharoketogenes* K591s (FERM BP-1130), *Pseudogluconobacter saccharoketogenes* TH14-86 (FERM BP-1128), *Pseudogluconobacter saccharoketogenes* 12-5 (FERM BP-1129) *Pseudogluconobacter saccharoketogenes* 12-15 (FERM BP-1132), *Pseudogluconobacter saccharoketogenes* 12-4 (FERM BP-1131), and *Pseudogluconobacter saccharoketogenes* 22-3 (FERM BP-1133), by mixed culture with bacteria selected from the group consisting of *Bacillus cereus* IFO 3131, *Bacillus licheniformis* IFO 12201, *Bacillus megaterium* IFO 12108, *Bacillus pumilus* IFO 12090, *Bacillus amyloliquefaciens* IFO 3022, *Bacillus subtilis* IFO 13719, *Bacillus circulans* IFO 3967, *Pseudomonas trifolii* IFO 12056, *Pseudomonas maltophilia* IFO 12692, *Proteus inconstans* IFO 12930, *Citorobacter freundii* IFO 13544, *Enterobacter cloacae* IFO 3320, *Erwinia herbicola* IFO 12686, *Xanthomonas pisi* IFO 13556, *Xanthomonas citri* IFO 3835, *Flavobacterium menigosepticum* IFO 12535, *Micrococcus varians* IFO 3765 or *Escherichia coli* IFO 3366, the improvement which comprises separating continuously, by electrodialysis, from the fermentation broth or microbial cell reaction mixture, the produced 2KGA in a free form or as a salt thereof with a univalent or bivalent low molecular-weight cation selected from the group consisting of Li^+, Na^+, K^+, Ca^{2+}, Mg^{2+} and NH_4^+ as the counter ion of the 2-keto-L-gulonate anion.

5,747,307

MASON-PFIZER MONKEY RETROVIRAL PACKAGING DEFECTIVE VECTORS

Andrew Michael Lindsay Lever, Cambridge, England, and Eric Hunter, Birmingham, Ala., assignors to Syngenix Limited, Cambridge, England

PCT No. PCT/GB93/00417, § 371 Date Aug. 26, 1994, § 102(e) Date Aug. 26, 1994, PCT Pub. No. WO93/17118, PCT Pub. Date Sep. 2, 1993

PCT Filed Mar. 1, 1993, Ser. No. 295,737

Claims priority, application United Kingdom, Feb. 28, 1992, 9204350; Apr. 16, 1992, 9208489; Sep. 2, 1992, 9219935

Int. Cl.^{6} C12N *15/00;15/63;5/06*

U.S. Cl. 435—172.3 **12 Claims**

1. A vector comprising a polynucleotide sequence which encodes MPMV (Mason-Pfizer Monkey Virus) proteins, said polynucleotide sequence comprising an MPMV leader sequence which is a deletion mutant of SEQ ID NO. 2, wherein said MPMV leader sequence has an effective deletion of nucleotides which results in MPMV RNA transcribed from said vector being packaging defective, said deletion occurring between the MPMV primer-binding site at nucleotides 348–365 of SEQ ID NO. 2 and the MPMV 5' major splice donor at nucleotides 475–480 of SEQ ID NO. 2.

5,747,308

RECOMBINANT DNA METHOD

Christopher Robert Bebbington, and Geoffrey Thomas Yarranton, both of Berkshire, United Kingdom, assignors to Celltech Therapeutics Limited, Berkshire, United Kingdom

Continuation of Ser. No. 234,596, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 100,345, Aug. 2, 1993, abandoned, which is a continuation of Ser. No. 848,965, Apr. 27, 1992, abandoned. This application Feb. 7, 1995, Ser. No. 385,063

Claims priority, application United Kingdom, Oct. 25, 1989, 8924021; WIPO, Oct. 25, 1990, WOX/GB90/01640

Int. Cl.^{6} C12N *15/00;5/06;15/85;* **C12P** *21/06*

U.S. Cl. 435—172.3 **13 Claims**

1. A method, for obtaining a eukaryotic cell containing in its DNA multiple copies of GS gene, comprising:

transfecting a eukaryotic glutamine auxotroph with a GS gene;

selecting transfected cells containing the GS gene; and

culturing the selected transfected cells in a medium which lacks glutamine or in which the amount of glutamine is progressively depleted, in the absence of a toxic GS inhibitor;

the GS gene being of a character such that, or the conditions employed during the culturing step being such that, the GS gene is so transcribed such that cells in which the GS gene has been amplified survive in preference to cells in which the GS gene has not been amplified.

5,747,309

BACTERIAL VACCINES USING VACCINE STRAINS OF PATHOGENIC BACTERIA

Brenda J. Allan, and Andrew A. Potter, both of Saskatoon, Canada, assignors to University of Saskatchewan, Canada

Continuation of Ser. No. 115,683, Sep. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 939,496, Sep. 4, 1992, abandoned. This application Apr. 7, 1995, Ser. No. 418,520

Int. Cl.^{6} C12N *15/00;1/00;1/20;* **A61K** *39/108*

U.S. Cl. 435—172.3 **83 Claims**

1. A vaccine strain of *E. coli,* wherein said vaccine strain is an attenuated virulent strain of *E. coli* comprising a fur mutation, said mutation providing attenuation of the virulence of said *E. coli* strain, wherein said strain retains its immunogenic properties so as to be protectively immunogenic.

5,747,310

GENE INTEGRATION INTO CHROMOSOMES OF *LACTOBACILLUS DELBRUECKII* SPECIES AND INTEGRANTS THEREOF

Takashi Sasaki; Yasuko Sasaki; Yoshiyuki Ito, and Kumi Otsu, all of Kanagawa, Japan, assignors to Meiji Milk Products Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 193,055, Mar. 4, 1994, abandoned. This application Dec. 4, 1996, Ser. No. 760,335

Claims priority, application Japan, Jul. 10, 1992, 4-183972

Int. Cl.^{6} C12N *15/63;1/21*

U.S. Cl. 435—172.3 **9 Claims**

1. A method for integrating a gene into chromosomal DNA of a strain of *Lactobacillus delbrueckii* species, comprising the following three steps:

(1) two genomic DNA fragments on both sides of the site to be integrated on the chromosomal DNA of a *Lactobacillus delbrueckii* species are ligated upstream and downstream, respectively, of a gene to be integrated, and the resulting ligated DNA fragment is inserted into vector pAMβ1, a self transmissible plasmid, to construct an integration plasmid;

(2) introducing the plasmid constructed in step 1 into a strain of *Lactobacillus delbrueckii* species by a conjugal transfer method to obtain transconjugants exhibiting erythromycin resistance that comprise said plasmid integrated into chromosomal DNA;

(3) subculturing the obtained transconjugants under non-selective conditions in the absence of erythromycin, selecting clones which have become sensitive to erythromycin as a result of losing the DNA sequence derived from pAMβ1 plasmid by homologous recombination, and finally, from the erythromycin sensitive clones obtained, selecting gene integrants in which the gene to be integrated remains in the chromosomal DNA of the strain of *Lactobacillus delbrueckii* species.

5,747,311

PROCESS FOR CHEMICAL MODIFICATION OF REACTANTS BY MICROBES

William J. Jewell, Ithaca, N.Y., assignor to Microgen Corporation, Ithaca, N.Y.

Filed Aug. 22, 1995, Ser. No. 517,276

Int. Cl.^{6} C12N *11/00;11/14;* **C02F** *3/00;3/02*

U.S. Cl. 435—176 **23 Claims**

1. A process for chemical modification of a reactant by microbes, said process comprising:

providing a particulate material dispersed in a dispersing fluid wherein the particulate material has a specific gravity less than the specific gravity of the dispersing fluid and wherein the particulate material comprises a polymeric carrier and microbes attached to the carrier; and

establishing a flow of the reactant through the particulate material,

wherein the flow is effective to contact the reactant with the microbes for a time sufficient to chemically modify the reactant,

provided that, when said process is carried out under conditions conducive to anaerobic microbe viability, the particulate material has an operating interfacial surface area of from about 2,000 to about 240,000 square meters per cubic meter of particulate material volume and

provided that, when said process is carried out under conditions conducive to aerobic microbe viability, the particulate material has an operating interfacial surface area of from about 1,000 to about 30,000 square meters per cubic meter of reactor volume.

5,747,312

HUMAN ALKB POLYPEPTIDE

Ying-Fei Wei, Darnestown, and Granger G. Sutton, III, Columbia, both of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Division of Ser. No. 463,975, Jun. 5, 1995, Pat. No. 5,618,717. This application Jan. 15, 1997, Ser. No. 783,266

Int. Cl.^{6} C12N *9/00;* **C12P** *21/06;19/56;* **C07H** *17/00*

U.S. Cl. 435—183 **19 Claims**

1. An isolated polypeptide comprising:

an amino acid sequence encoded by a polynucleotide which is at least 95% identical to a polynucleotide encoding amino acids 2 to 307 of SEQ ID NO:2.

5,747,313

DNA ENCODING HISTIDYL TRNA SYNTHETASE FROM *STREPTOCOCCUS PNEUMONIAE*

Elizabeth Jane Lawlor, Malvern, Pa., assignor to SmithKline Beecham Corp., Phila., Pa., and SmithKline Beecham p.l.c., Brentford, England

Filed Apr. 18, 1997, Ser. No. 844,055

Claims priority, application United Kingdom, Apr. 18, 1996, 9607993

Int. Cl.^{6} C07H *21/04;* **C12N** *9/00;15/00;1/20*

U.S. Cl. 435—183 **26 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

- (a) a polynucleotide having at least a 95% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO: 2;
- (b) a polynucleotide having at least a 97% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO: 2;
- (c) a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO: 2;
- (d) a polynucleotide hybridizing under stringent conditions to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO: 2;
- (e) a polynucleotide having at least a 95% identity to a polynucleotide encoding the same mature polypeptide expressed by the histidyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (f) a polynucleotide having at least a 97% identity to a polynucleotide encoding the same mature polypeptide expressed by the histidyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (g) a polynucleotide encoding the same mature polypeptide expressed by the histidyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (i) a polynucleotide which is complementary to the polynucleotide of (a), (b), (c), (d), (e), (f) or (g).

5,747,314

VALYL TRNA SYNTHETASE POLYNUCLEOTIDES OF STREPTOCOCCUS

Elizabeth Jane Lawlor, Malvern, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa., and SmithKline Beecham p.l.c., Brentford, England

Filed Apr. 18, 1997, Ser. No. 844,064

Claims priority, application United Kingdom, Apr. 18, 1996, 9607991

Int. Cl.^{6} C12N *9/00;15/00;1/20;* **C07H** *21/04*

U.S. Cl. 435—183 **43 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

- (a) a polynucleotide having at least a 95% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2, 7, 8 or 10;
- (b) a polynucleotide having at least a 97% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2; 7, 8 or 10
- (c) a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2, 7, 8 or 10;
- (d) a polynucleotide hybridizing under stringent conditions to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2, 7, 8 or 10;
- (e) a polynucleotide having at least a 95% identity to a polynucleotide encoding the same mature polypeptide expressed by the valyl tRNA synthetase gene contained in NCIMB Deposit No. 40794;
- (f) a polynucleotide having at least a 97% identity to a polynucleotide encoding the sane mature polypeptide expressed by the valyl tRNA synthetase gene contained in NCIMB Deposit No. 40794;
- (g) a polynucleotide encoding the same mature polypeptide expressed by the valyl tRNA synthetase gene contained in NCIMB Deposit No. 40794;
- (h) a polynucleotide which is complementary to the polynucleotide of (a), (b), (c), (d), (e), (f) or (g).

5,747,315

DNA ENCODING ASPARTYL TRNA SYNTHETASE FROM *STREPTOCOCCUS PNEUMONIAE*

Elizabeth Jane Lawlor, Malvern, Pa., assignor to SmithKline Beecham Corp., Phila., Pa., and SmithKline Beecham p.l.c., Brentford, England

Filed Apr. 18, 1997, Ser. No. 844,280

Claims priority, application United Kingdom, Apr. 18, 1996, 9607993

Int. Cl.^{6} C07H *21/04;* **C12N** *9/00;15/00;1/20*

U.S. Cl. 435—183 **26 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

- (a) a polynucleotide having at least a 95% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2;
- (b) a polynucleotide having at least a 97% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2;
- (c) a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2;
- (d) a polynucleotide hybridizing under stringent conditions to a polynucleotide encoding a polypeptide comprising the amino acid sequence of the reference sequence of SEQ ID NO:2;
- (e) a polynucleotide having at least a 95% identity to a polynucleotide encoding the same mature polypeptide expressed by the aspartyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (f) a polynucleotide having at least a 97% identity to a polynucleotide encoding the same mature polypeptide expressed by the aspartyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (g) a polynucleotide encoding the same mature polypeptide expressed by the aspartyl tRNA synthetase gene contained in NCIMB Deposit No. 40771;
- (i) a polynucleotide which is complementary to the polynucleotide of (a), (b), (c), (d), (e), (f) or (g).

5,747,316

Patent Not Issued For This Number

5,747,317

HUMAN TELOMERASE GENE

Zhaodan Cao, Pacifica, Calif., assignor to Tularik Inc., South San Francisco, Calif.

Filed Jul. 8, 1996, Ser. No. 676,967

Int. Cl.^{6} C12N *9/12;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—194 **10 Claims**

1. An isolated nucleic acid comprising SEQ ID NO:3, or a portion thereof at least 36 bases in length and immediately flanked by a native flanking region fewer than 10 kb and encoding a telomerase protein p105 (SEQ ID NO:1) domain having human telomerase-specific activity.

5,747,318

MITOGEN ACTIVATED C-FOS REGULATING KINASE, FRK

Tiliang Deng, Gainesville, Fla., and Michael Karin, San Diego, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 315,067, Sep. 29, 1994. This application Sep. 9, 1996, Ser. No. 707,873

Int. Cl.^{6} C12N *9/12;* **A61K** *38/46;38/47*

U.S. Cl. 435—194 **1 Claim**

1. An isolated polypeptide:

- a) having a molecular weight of about 88 kD as determined by reducing SDS-PAGE;
- b) having serine and threonine kinase activity; and
- c) phosphorylating the c-Fos activation domain at amino acid residue Thr 232.

5,747,319

HUMAN MRNA EDITING ENZYME

Janice Au-Young, Berkeley; Phillip R. Hawkins, Mountain View, and Jennifer L. Hillman, San Jose, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jul. 25, 1996, Ser. No. 687,895

Int. Cl.^{6} C12N *9/22;15/63;5/00;* **C07H** *21/04*

U.S. Cl. 435—199 **7 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,747,320

GLUCOSE AND CELLOBIOSE TOLERANT β-GLUCOSIDASE FROM *CANDIDA PELTATA*

Badal C. Saha, Peoria, and Rodney J. Bothast, East Peoria, both of Ill., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 2, 1996, Ser. No. 691,757

Int. Cl.^{6} C12N *9/24;9/42;1/00*

U.S. Cl. 435—209 **14 Claims**

1. A glucose tolerant and cellobiose tolerant β-glucosidase produced by *Candida peltata* NRRL Y-21603 and which is isolated from cells thereof, wherein said β-glucosidase is effective for hydrolysis of cellobiose to glucose.

5,747,321

MUTANT *STAPHYLOCOCCUS AUREUS* V8 PROTEASES

Masayuki Yabuta, Tatebayashi, and Kazuhiro Ohsuye, Ohta, both of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Jun. 3, 1996, Ser. No. 657,192

Claims priority, application Japan, Jun. 2, 1995, 7-170086

Int. Cl.^{6} C12N *9/52;15/00;1/20;* **C07H** *21/04*

U.S. Cl. 435—220 **24 Claims**

1. A mutant *Staphlococcus aureus* V8 protease comprising an amino acid sequence from the Valine at amino acid position 125 to the Aspartic acid at amino acid position 336 in SEQ ID NO: 3, wherein the Aspartic acid at amino acid position 168 is replaced with Glutamic acid, the Asparagine at amino acid position 195 is replaced with Serine, and/or the Lysine at amino acid position 271 is replaced with Arginine.

5,747,322

RECOMBINANT CRAB COLLAGENASE

Charles S. Craik, San Francisco, Calif., and Christopher A. Tsu, Boulder, Colo., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 9, 1996, Ser. No. 650,129

Int. Cl.^{6} C12N *9/64;9/48;9/50*

U.S. Cl. 435—226 **11 Claims**

1. An isolated procollagenase having an amino acid sequence of SEQ ID NO: 5.

5,747,323

RETROVIRAL VECTORS COMPRISING A VL30-DERIVED PSI REGION

Jean-Luc Darlix, Chaponost, and Christophe Torrent, Sainte Foy Les Lyon, both of France, assignors to Institut National de la Sante et de la Recherche Medicale (INSERM), Paris, France

Continuation of Ser. No. 999,262, Dec. 31, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 301,718

Int. Cl.^{6} C12N *7/01;5/10;* **C07H** *21/04*

U.S. Cl. 435—235.1 **16 Claims**

1. An isolated DNA fragment which promotes encapsidation of a retroviral vector, and which has a psi sequence of at most 400 nucleotides, wherein said psi sequence consists of a fragment of SEQ ID NO: 1 beginning at one of the nucleotides in positions 1–10 and ending at one of the nucleotides in positions 41–400.

5,747,324

SELF-ASSEMBLED, DEFECTIVE, NON-SELF-PROPAGATING LENTIVIRUS PARTICLES

Gail P. Mazzara, Winchester; Bryan Roberts, Cambridge; Dennis L. Panicali, Acton; Linda R. Gritz, Somerville, all of Mass.; Virginia Stallard, Sequim, Wash., and Anna Mahr, Natick, Mass., assignors to Therion Biologics Corporation, Cambridge, Mass.

Continuation of Ser. No. 360,027, Jun. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 205,454, Jun. 10, 1988, abandoned. This application Dec. 21, 1992, Ser. No. 994,171

Int. Cl.^{6} C12N *15/86;15/63;* **A61K** *39/21;* **C07K** *14/155*

U.S. Cl. 435—236 **18 Claims**

1. A plasmid vector for insertion of lentivirus DNA sequences into a pox virus vector by in vivo recombination, the plasmid vector comprising:

- (a) a prokaryotic origin of replication, so that the plasmid vector may be amplified in a prokaryotic host cell:
- (b) a gene encoding a marker which allows selection of prokaryotic host cells that contain the plasmid vector;
- (c) at least two DNA sequences from a single species of lentivirus, wherein one of the lentivirus DNA sequences is the gag gene and the other of the lentivirus DNA sequences is the pol gene, such that each gene is operably-linked to a separate eukaryotic transcriptional promoter capable of directing the co-expression of gag and pol proteins that self-assemble into a defective, non-self-propagating lentivirus particle; and
- (d) pox virus DNA sequences flanking (c), wherein the pox virus DNA sequences are homologous to a region of the genome of a pox virus vector to allow in vivo recombination between the plasmid vector and the pox virus vector, thereby inserting (c) into the pox virus vector.

5,747,325

DEVICES COMPRISING GENETICALLY ENGINEERED βCELLS

Christopher B. Newgard, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 312,120, Sep. 26, 1994, which is a division of Ser. No. 162,044, Dec. 3, 1993, which is a continuation-in-part of Ser. No. 819,326, Jan. 13, 1992, Pat. No. 5,427,940, which is a continuation-in-part of Ser. No. 710,038, Jun. 3, 1991, abandoned. This application May 26, 1995, Ser. No. 452,667

Int. Cl.^{6} C12N *15/17;5/00;21/04;* **A61K** *1/50*

U.S. Cl. 435—240.2 **29 Claims**

1. An artificial β cell device, comprising a population of engineered cells that secrete insulin, wherein cells of the population comprise a glucokinase gene encoding low affinity, high Km glucokinase (hexokinase IV), an insulin gene and a GLUT-2 glucose transporter gene, wherein at least one of said genes is a

recombinant gene, wherein the cell population is positioned into a selectively permeable membrane.

5,747,326

ISOLATED NUCLEIC ACID MOLECULES WHICH ENCODE MAMMALIAN α2,8 POLYSIALYL TRANSFERASES

Rita Gerardy-Schahn, Hiddenhausen, Germany; Minoru Fukuda; Jun Nakayama, both of San Diego, Calif., and Matthias Eckhardt, Hanover, Germany, assignors to La Jolla Cancer Research Foundation, La Jolla, Calif., and Boehringer Mannheim GmbH, Penzberg, Germany

Filed Jul. 17, 1995, Ser. No. 503,133

Int. Cl.^{6} C12N *15/00;15/63;9/10;* **C07H** *21/04*

U.S. Cl. 435—240.2 19 Claims

1. Isolated nucleic acid molecule which encodes a mammalian α2,8 polysialyl transferase.

5,747,327

PHOSPHOLIPASE D GENE ORIGINATED FROM PLANT

Jun Ueki, and Shinji Morioka, both of Shizuoka, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP94/01627, § 371 Date Jul. 26, 1995, § 102(e) Date Jul. 26, 1995, PCT Pub. No. WO95/09234, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 30, 1994, Ser. No. 446,794

Claims priority, application Japan, Sep. 30, 1993, 5-267884

Int. Cl.^{6} C12N *1/20;9/20;* **C07H** *21/04;* **C12P** *21/06*

U.S. Cl. 435—252.3 23 Claims

1. A cloned DNA which encodes phospholipase D originated from a plant, wherein said DNA comprises a nucleotide sequence selected from the group consisting of nucleotides 182–2617 of SEQ ID NO:1 and nucleotides 107–2542 of SEQ ID NO:3 or a sequence complementary thereto or a sequence which specifically hybridizes to said cloned DNA or said complementary sequence in a hybridization solution containing 0.5M sodium phosphate buffer, pH 7.2, containing 7% SDS, 1 mM EDTA and 100 mg/ml of salmon sperm DNA at 65° C. for 16 hours and washing twice at 65° C. for twenty minutes in a washing solution containing 0.5×SSC and 0.1% SDS.

5,747,328

MICROBIAL SYSTEM FOR FORMALDEHYDE SENSING AND REMEDIATION

Timothy J. Donohue, Middleton; Robert D. Barber, Cross Plains, and Vern Witthuhn, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 28, 1996, Ser. No. 608,241

Int. Cl.^{6} C07H *21/04;* **C12N** *1/21*

U.S. Cl. 435—252.3 24 Claims

9. A *Rhodobacter sphaeroides* cell comprising:

a non-native genetic construct comprising a protein-encoding indicator gene, a transcriptional adhI promoter from *R. sphaeroides* operably linked to the indicator gene, and a cis-acting adhI operator from *R. sphaeroides* operably linked to the promoter;

a protein that senses formaldehyde; and

a trans-acting regulatory protein that modulates transcription of the indicator gene from the transcriptional promoter in response to a signal from the protein that senses formaldehyde.

wherein the promoter and operator together specifically direct transcription of the indicator gene when the cell is exposed to formaldehyde.

5,747,329

GLUTAMYLCYSTEINE SYNTHETASE LIGHT SUBUNIT

Alton Meister; Chin-Shiou Huang, and Mary E. Anderson, all of New York, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 45,808, Apr. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 765,211, Sep. 25, 1991, abandoned, which is a continuation of Ser. No. 464,871, Jan. 16, 1990, abandoned. This application Dec. 5, 1994, Ser. No. 350,325

Int. Cl.^{6} C12N *1/20;9/00;* **C12D** *21/06;* **C07H** *21/04*

U.S. Cl. 435—252.33 40 Claims

1. An isolated nucleic acid molecule encoding mammalian gamma-glutamylcysteine synthetase.

5,747,330

ANTIBIOTIC PRODUCING MICROBE

Enrico Casareto, Verona; Massimo Leoni; Enrico Ronzio, both of Milan, and Ambrogio Magni, Osnago CO, all of Italy, assignors to Poli Industria Chimica, Italy

Filed Jun. 5, 1996, Ser. No. 658,653

Int. Cl.^{6} C12N *1/14;* **C12P** *21/04*

U.S. Cl. 435—254.1 1 Claim

1. A biologically pure culture of the cyclosporin-producing microbe deposited as provisional accession number I-1714, Collection Nationale de Cultures de Microorganisms, Institut Pasteur.

5,747,331

PROCESS AND APPARATUS FOR THE PURIFICATION OF GASES

Tarja Terttu Hartikainen; Pertti Juhani Martikainen; Arvo Aukusti Juhani Ruuskanen, all of Kuopio; Kari Antero Mutka, Jyväskylä ; Timo Martti Tapio Nyrönen, Palokka; Markku Tapio Källström, Jyväskylä , and Minna Kristiira Vanhatalo, Vaajakoski, all of Finland, assignors to Vapo Oy, Jyvaskyla, Finland

PCT No. PCT/FI95/00140, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO95/24960, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 16, 1995, Ser. No. 714,133

Claims priority, application Finland, Oct. 7, 1994, 944710; Mar. 16, 1996, 941247

Int. Cl.^{6} B01D *53/34;53/00;53/36;53/22;* **C01B** *17/16;* **C12M** *1/04;* **C12N** *1/20*

U.S. Cl. 435—266 27 Claims

1. A process for the removal of sparingly-soluble gaseous substances from a gas by bringing said gas into contact with microorganisms capable of degrading said sparingly-soluble gaseous substances, characterized in that said gas containing said sparingly-soluble gaseous substance is led into a microbe suspension containing microorganisms capable of degrading said substance such that said gas forms small bubbles in said microbe suspension, on the surface of which bubbles the microorganisms are able to degrade the sparingly-soluble gaseous substance, and, if needed, the gas which has risen to the surface of said suspension is directed to another similar or different biodegradation stage.

5,747,332

METHODS FOR PURIFYING AND SYNTHESIZING HEAT SHOCK PROTEIN COMPLEXES

Erik S. Wallen; Jan Roigas, and Pope L. Moseley, all of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Sep. 20, 1996, Ser. No. 717,239

Int. Cl.^{6} C07K *14/435;17/00;* **A61L** *38/17;* **G01N** *30/02*

U.S. Cl. 435—272 23 Claims

1. A method for purifying heat shock protein complexes comprising the steps of:

adding a heat shock protein complex comprising a heat shock protein associated with at least one member of the group consisting of peptides, polypeptides, denatured proteins and antigens associated therewith to ADP matrix column containing an ADP matrix to bind the heat shock protein complexes to the ADP matrix; and

adding a buffer containing ADP to the column to remove the heat shock protein complexes in an elution product.

5,747,333

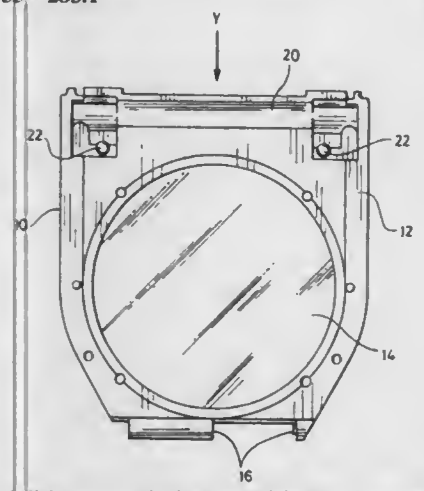
CULTURE OF MICRO-ORGANISMS

Diana DeMello Jungmann-Campello, Manchester, and Uri Friedlaender, London, both of England, assignors to Jencons (Scientific) Limited, Bedfordshire, England

Filed Dec. 12, 1996, Ser. No. 764,056

Int. Cl.^{6} C12M *3/00*

U.S. Cl. 435—283.1 20 Claims



1. A Petri dish support device comprising two opposed portions, a space defined between said opposed portions, and a sheet of material having marked thereon a matrix, said sheet being located in the space defined between said opposed portions, the support device being adapted to secure a Petri dish above the marked matrix, the matrix being visible through the base of the Petri dish.

5,747,334

RANDOM PEPTIDE LIBRARY

Brian K Kay; Dana M. Fowlkes, both of Chapel Hill; Nils B. Adey, and Andrew B. Sparks, both of Carrboro, all of N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation-in-part of Ser. No. 176,500, Dec. 30, 1993, Pat. No. 5,498,538, which is a continuation of Ser. No. 13,416, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 854,133, Mar. 19, 1992, abandoned, which is a continuation of Ser. No. 480,420, Feb. 15, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 189,331

Int. Cl.^{6} C12N *15/09;5/10;15/62*

U.S. Cl. 435—320.1 13 Claims

1. A library of recombinant vectors in which each vector encodes one of a plurality of heterofunctional fusion proteins comprising:

(a) a binding domain encoded by an oligonucleotide comprising unpredictable nucleotides in which the unpredictable nucleotides are arranged in one or more contiguous sequences, wherein the total number of unpredictable nucleotides is greater than or equal to 60 and less than or equal to 600, wherein the unpredictable nucleotides have the potential to encode all 20 naturally occurring amino acids, and wherein the coding strand of the unpredictable nucleotides comprises the formula $(NNB)_{n+m}$ where

N is A, C, G or T;

B is G, T or C; and

n and m are integers,

such that $20 \leqq n+m \leqq 200$;

wherein the binding domain is encoded by a double stranded oligonucleotide assembled by annealing a first nucleotide sequence of the formula 5' X $(NNB)_n$ J Z 3', with a second nucleotide sequence of the formula

$3'Z'OU(NNV)_mY5'$

at corresponding positions Z and Z',

where X and Y are restriction enzyme recognition sites, such that $X \neq Y$;

N is A, C, G or T;

B is G, T or C;

V is G, A or C;

n is an integer, such that $10 \leqq n \leqq 100$;

m is an integer, such that $10 \leqq m \leqq 100$;

Z and Z' are each a sequence of 6, 9 or 12 nucleotides, such that Z and Z' are complementary to each other: and

J is A, C, G, T or nothing;

O is A, C, G, T or nothing; and

U is G, A, C or nothing; provided, however, if any one of J, O or U is nothing then J, O and U are all nothing; and converting the annealed oligonucleotides to a double stranded oligonucleotide; and

(b) an effector domain encoded by an oligonucleotide sequence encoding a protein or peptide that enhances expression or detection of the binding domain,

said library being capable of being screened to identify a heterofunctional fusion protein having specificity for a ligand of choice.

5,747,335

RIBOZYMES

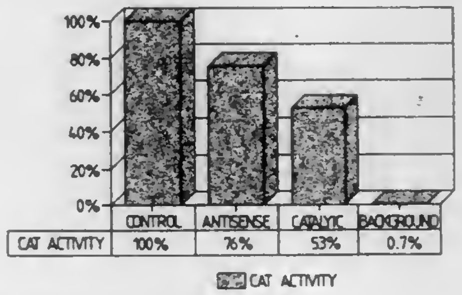
James Phillip Haseloff, O'Connor; Wayne Lyle Gerlach, Hughes; Philip Anthony Jennings, West Chatswood, and Fiona Helen Cameron, Forestville, all of Australia, assignors to Gene Shears Pty. Limited, North Ryde, Australia

Continuation of Ser. No. 967,693, Oct. 27, 1992, Pat. No. 5,494,814, which is a continuation of Ser. No. 926,148, Aug. 5, 1992, Pat. No. 5,254,678, and a continuation-in-part of Ser. No. 536,625, Aug. 14, 1990, abandoned. This application Feb. 8, 1994, Ser. No. 195,073

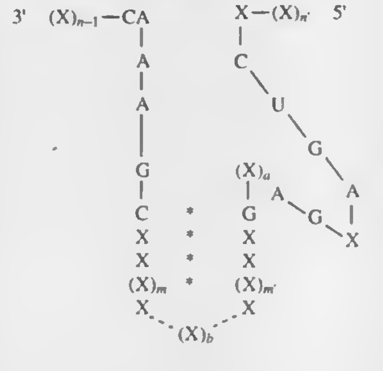
Claims priority, application Australia, Dec. 15, 1987, PI 5911/87; Aug. 19, 1988, PI 9950/88; Sep. 9, 1988, PJ 0353/88; Nov. 7, 1988, PJ 1333/88; Aug. 14, 1990, PJ 1304/88

Int. Cl.^{6} C12N *15/85;* **C12Q** *1/68*

U.S. Cl. 435—325 29 Claims



1. A compound having the formula:



wherein each X represents a ribonucleotide which may be the same or different;

wherein each of $(X)_{n-1}$ and $(X)_{n'}$,represents an oligoribonucleotide having a predetermined sequence which is (a) capable of hybridizing with a plant RNA target sequence to be cleaved and (b) does not naturally occur covalently bound to the sequences C-A-A-A-G-C- and X-C-U-G-A-, respectively, such RNA target sequence not being present within the compound;

- wherein each of n−1 and n' represents an integer which defines the number of ribonucleotides in the oligonucleotide with the proviso that the sum of n+n' is greater than or equal to 14;
- wherein each * represents base pairing between the ribonucleotides located on either side thereof;
- wherein each solid line represents a chemical linkage providing covalent bonds between the ribonucleotides located on either side thereof;
- wherein a represents an integer which defines a number of ribonucleotides with the proviso that a may be 0 or 1 and if 0, the A located 5' of $(X)_a$ is bonded to the G located 3' of $(X)_a$;
- wherein each of m and m' represents an integer which is greater than or equal to 1;
- wherein each of the dashed lines independently represents either a chemical linkage providing covalent bonds between the ribonucleotides located on either side thereof or the absence of any such chemical linkage; and
- wherein $(X)_b$ represents an oligoribonucleotide which may be present or absent with the proviso that b represents an integer which is greater than or equal to 2 if $(X)_b$ is present.

5,747,336

CLONED HUMAN GENES FOR MUSCARINIC ACETYLCHOLINE RECEPTORS AND CELLS LINES EXPRESSING SAME

Tom I. Bonner, Chevy Chase; Mark Robert Brann, Bethesda, both of Md., and Noel J. Buckley, London, England, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 944,747, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 581,538, Sep. 12, 1990, abandoned, which is a continuation of Ser. No. 241,971, Sep. 8, 1988, abandoned. This application Aug. 29, 1994, Ser. No. 294,869

Int. Cl.^{6} C12N *15/85;15/63;* **C07H** *21/04*

U.S. Cl. 435—325 **8 Claims**

1. An isolated DNA molecule encoding the amino acid sequence of human m5 subtype muscarinic acetylcholine receptor shown in FIGS. 5A and 5B.

5,747,337

FACTOR VIII COAGULANT POLYPEPTIDES AND MONOCLONAL ANTIBODIES TO THEM

Theodore S. Zimmerman, and Carol A. Fulcher, both of La Jolla, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 210,639, Mar. 18, 1994, abandoned, which is a continuation of Ser. No. 33,070, Mar. 10, 1993, abandoned, which is a continuation of Ser. No. 649,367, Jan. 31, 1991, abandoned, which is a continuation of Ser. No. 386,107, Jul. 28, 1989, abandoned, which is a division of Ser. No. 778,297, Sep. 20, 1985, Pat. No. 4,857,635, which is a continuation of Ser. No. 556,508, Nov. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 481,105, Mar. 31, 1983, abandoned. This application Jun. 5, 1995, Ser. No. 462,114

Int. Cl.^{6} C07K *16/36;17/00;* **G07N** *5/18*

U.S. Cl. 435—337 **17 Claims**

1. A hybridoma cell line having ATCC Accession No. HB 10147.

5,747,338

METHOD AND CONSTRUCT FOR SCREENING FOR INHIBITORS OF TRANSCRIPTIONAL ACTIVATION

Klaus Giese, Castro Valley, and Jalme Escobedo, Alamo, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 689,926, Aug. 15, 1996. This application Sep. 25, 1996, Ser. No. 719,577

Int. Cl.^{6} C12N *5/10*

U.S. Cl. 435—348 **45 Claims**

1. A collision construct comprising a nucleic acid molecule that comprises:

- a) a first regulatory sequence that comprises a first promoter;
- b) a reporter gene that is under transcriptional control of the first promoter; and
- c) a second regulatory sequence that comprises a second promoter;
- wherein the first promoter is different from the second promoter, and direction of transcription under the first promoter is opposite to direction of transcription under the second regulatory sequence, and
- wherein regulation of the second promoter alters expression of the reporter gene.

5,747,339

NON-A, NON-B HEPATITIS VIRUS GENOMIC CDNA AND ANTIGEN POLYPEPTIDE

Hiroto Okayama, Minoo; Isao Fuke, Takamatsu; Chisato Mori, Kanonji; Akihisa Takamizawa, Kanonji, and Iwao Yoshida, Kanonji, all of Japan, assignors to Research Foundation for Microbial Diseases of Osaka, Osaka, Japan

Continuation of Ser. No. 99,706, Jul. 30, 1993, abandoned, which is a division of Ser. No. 769,996, Oct. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 635,451, Dec. 28, 1990, abandoned. This application Oct. 18, 1994, Ser. No. 324,977

Claims priority, application Japan, Jun. 25, 1990, 2-167466; Aug. 31, 1990, 2-230921; Nov. 9, 1990, 2-305605

Int. Cl.^{6} A61K *39/29;39/00;39/12;* **C07K** *14/00*

U.S. Cl. 435—350 **2 Claims**

1. An isolated polypeptide comprising an amino acid sequence coded for by the nucleotide sequence from nucleotide 2520 to nucleotide 3350 of SEQ ID NO: 1.

5,747,340

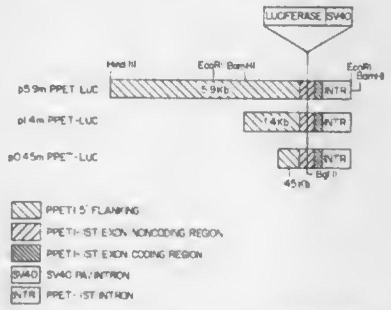
TARGETED GENE EXPRESSION USING PREPROENDOTHELIN-1 PROMOTERS

Dror Harats, Ramat-Gan, Israel; Hiroki Kurihara, Toyko, Japan; Paula Nanette Belloni, Moss Beach, and Charles Elliott Sigal, San Francisco, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 254,015, Jun. 3, 1994, abandoned. This application Feb. 28, 1995, Ser. No. 395,742

Int. Cl.^{6} C12N *5/00;15/00;* **C07H** *21/04*

U.S. Cl. 435—375 **15 Claims**



1. A vector for expression of a nucleic acid casette comprising a murine preproendothelin-1 gene 5'-flanking segment, the first exon of the preproendothelin-1 gene, and a nucleic acid cassette, wherein the nucleic acid cassette is located within the first exon, in sequential and positional relationship for expression of the nucleic acid cassette.

5,747,341

CULTURE MEDIA HAVING LOW OSMOLARITY FOR ESTABLISHING AND MAINTAINING HORMONE-SECRETING CELLS IN LONG-TERM CULTURE

Ann Janice Brothers, Fairfax, Canada, assignor to Pacific Biomedical Research, Inc., Torrence, Calif.

Continuation-in-part of Ser. No. 167,862, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 719,977, Jun. 24, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 486,737

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—404 **8 Claims**

1. A cell culture medium having an osmolarity of about 248 mOsm to about 280 mOsm and:

- (I) a basal medium comprising essential minerals, salts, vitamins, amino acids, and lipids,
  - (ii) a buffering system,
  - (iii) glutamine in the amount of 6.35 mM to about 8.35 mM,
  - (iv) at least one energy source selected from the group consisting of lactate and pyruvate,
  - (v) EDTA in the amount of about 16 μM to about 25 μM,
  - (vi) myo-Inositol in the amount of about 0.27 mM to about 0.37 mM,
  - (vii) reduced glutathione in the amount of 1.7 mM to about 2.6 mM,
  - (viii) zinc in the amount of about 0.0027 mM to about 0.00604 mM, and
  - (ix) a-tocopherol in the amount of about 160 IU to about 240 IU per liter of medium.

5,747,342

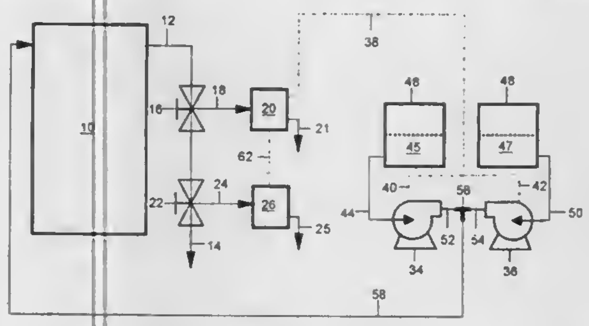
METHODS AND APPARATUS FOR MONITORING AND CONTROLLING PH PHOSPHATE AND SODIUM TO PHOSPHATE RATIO IN BOILER SYSTEMS OPERATING WITH CAPTIVE ALKALINITY

John D. Zupanovich, Wexford, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 558,575, Oct. 31, 1995, abandoned. This application Sep. 22, 1997, Ser. No. 935,273

Int. Cl.^{6} G01N *31/16;31/22;33/18*

U.S. Cl. 436—55 **8 Claims**



1. A method for monitoring and/or controlling pH, phosphate concentration and sodium to phosphate ratio in a boiler system using captive alkalinity, comprising the steps of:

- a) determining the phosphate concentration of said system by using flow injection analysis (FIA);
- b) substantially simultaneously determining the pH of said system by a pH meter;
- c) transmitting a value corresponding to the determined phosphate concentration of the system and a value corresponding to the determined pH of the system directly to one of a computer or controller;
- d) calculating the sodium to phosphate ratio by one of said computer or said controller based upon the values corresponding to the determined phosphate concentration of the system and the determined pH of the system; and
- e) automatically controlling the feed rate of at least one water treatment chemical being added to said system based upon the calculated sodium to phosphate ratio and the values corresponding to the determined phosphate concentration of the system and the determined pH of the system so as to maintain the pH, phosphate concentration and sodium to phosphate ratio within desired ranges through one of said computer or said controller.

5,747,343

LEUKOCYTE CLASSIFICATION REAGENT

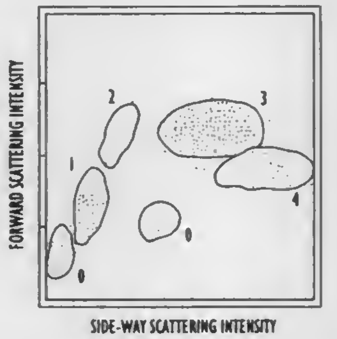
Katsuhiro Tsuchiya; Yutaka Nagai, and Mami Ikeda, all of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 550,861

Claims priority, application Japan, Oct. 31, 1994, 6-266573

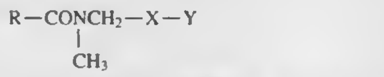
Int. Cl.^{6} G01N *33/48*

U.S. Cl. 436—63 **19 Claims**



11. A process for classifying of leukocytes which comprises the steps of:

- (A) adding a leukocyte classification reagent to a blood sample solution to lyse erythrocytes present in said blood sample solution and producing a hemolysate; and
- (B) subjecting the hemolysate of step (A) to flow cytometry to measure forward optical scattering and side-way optical scattering thereby producing a distribution diagram which classifies the leukocytes into a plurality of groups,
- wherein said reagent consists essentially of at least one surface agent selected from the group consisting of a coconut fatty acid anionic active agent and an amphoteric active agent in an amount effective to classify leukocytes by lysing erythrocytes and acting upon leukocytes, wherein said coconut fatty acid anionic active agent is represented by the formula (3):



$$R-\underset{\displaystyle CH_3}{\underset{|}{CON}}CH_2-X-Y \qquad (3)$$

wherein R represents an alkyl or alkylene group having 8 to 18 carbon atoms, X represents CH_2SO_3 or COO and Y represents Na, K, NH_4 or $HN(CH_2CH_2OH)_3$.

5,747,344

DEVICE AND METHOD FOR SCREENING FECAL OCCULT BLOOD SPECIMENS

Iain G.M. Cleator, 1051 Laurier Avenue, Vancouver, B.C., Canada, V6 H1Y2

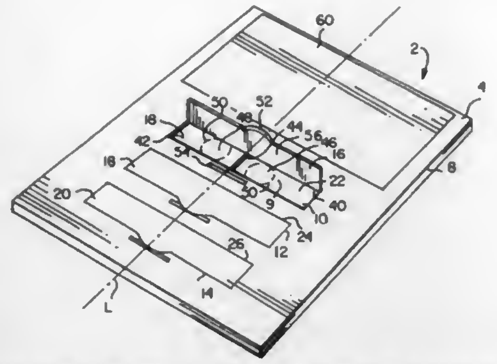
Filed Jun. 5, 1996, Ser. No. 658,543

Int. Cl.^{6} G01N *33/72*

U.S. Cl. 436—66 **13 Claims**

12. A method of analyzing a specimen using a specimen testing device including a first panel; a first and second aperture in said first panel; a second panel mounted opposite to said first panel; a

OL
2 10
SS
1
MY
5
998
MI



third and fourth aperture in said second opposite to said first and second apertures in said first and second apertures having first and second portions disposed on first panel, first and second panels having a longitudinal axis; a sheet disposed between said first and second panels for receiving a specimen through said first and second apertures in said first panel, said sheet in each of said opposite sides of said longitudinal axis for receiving the specimen, said first portion containing a first reagent for reaction with the specimen; a first aperture cover mounted on said first panel and overlying said first aperture in said first panel; a second aperture cover mounted on said first panel and overlying said second aperture in said first panel; a third aperture cover mounted on said second and and overlying said first portion of said sheet; a fourth aperture cover mounted on said second panel and overlying said second portion of said sheet; said first and second aperture covers on said first panel being hingedly mounted along a hinge line extending transversely of said longitudinal axis; said third and fourth aperture covers on said second panel being hingedly mounted along a hinge line extending parallel to said longitudinal axis; wherein opening of said third aperture cover on said second panel exposes said first portion containing said reagent for reaction with the specimen, and opening of said fourth aperture on said second panel exposes said second portion for further analysis of the specimen received thereon

said method comprising:

- (a) obtaining the specimen;
- (b) opening the first aperture cover on said first panel to expose said first and second portions of said sheet;
- (c) smearing a portion of said specimen on said first and second portions of said sheet through said first aperture;
- (d) closing said first aperture cover to overlie said first aperture of said first panel;
- (e) opening said third aperture cover on said second panel to expose said first portion of said sheet carrying said specimen and said first reagent;
- (f) applying a second reagent to said exposed first portion of said sheet;
- (g) observing a color change corresponding to a positive test condition upon reaction of the first reagent with the specimen; and
- (h) selectively opening said fourth aperture cover on said second panel and removing said second portion of said sheet, wherein the specimen is subjected to further testing.

5,747,345

CALCIUM SPECIFIC DIAZA-18-CROWN-6-ETHER CHROMOIONOPHORES

Wayne Woodrow Weber, II, Honeoye Falls; Calvin Roman Messing, Spencerport, and Margaret Elizabeth Logan, Rochester, all of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

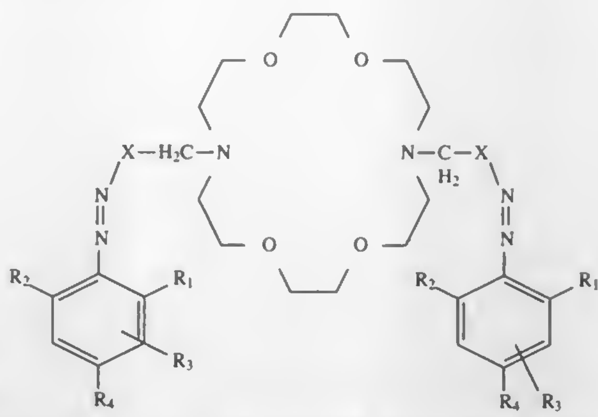
Filed Aug. 15, 1996, Ser. No. 698,316

Int. Cl.^{6} G01N *33/20*

U.S. Cl. 436—74 **14 Claims**

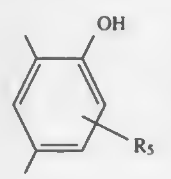
12. A method for quantitative determination of calcium ions which comprises:

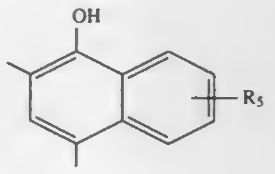
- (a) contacting a liquid sample suspected of containing calcium ions with a chromoionophore compound of the formula:

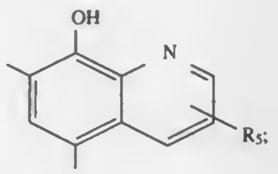


I

wherein X is a phenol, naphthol or quinolinol moiety selected from those of the formulae:







R_1, R_2, R_3, R_4 and R_5 are independently selected from hydrogen, halo, cyano, nitro, (C_1–C_6) alkyl, (C_2–C_8) acyl, acetamido, mercapto, trifluoromethyl, aryl, and substituted aryl wherein the aryl moiety is selected from phenyl and naphthyl and the aryl substituent is selected from halo, cyano, nitro, (C_1–C_6) alkyl, (C_2–C_8) acyl, phenyl, acetamido, mercapto, and trifluoromethyl; provided that when X is phenol, at least one of R_1 and R_2 is an electron withdrawing group selected from halo, cyano, nitro, acyl of 2 to 8 carbon atoms, mercapto, and triflouromethyl, and provided that when X is phenol and R_5 is hydrogen, R_1 or R_2 in combination with R_4 are not both nitro;

wherein said compound of Formula I has absorption at a wavelength greater than about 580 nm when complexed with calcium ion, and is soluble in organic coupler solvents; and

- (b) determining colorimetrically the quantitative presence of calcium in the sample by measuring the optical density change resulting from the complexation of calcium ions with the compound of formula I.

5,747,346

DETECTION OF NOVEL CARBOHYDRATES DIRECTLY ASSOCIATED WITH CHRONIC ALCOHOLISM

Raju K. Pullarkat; Premila S. Pullarkat, and Simhachalam Raguthu, all of Staten Island, N.Y., assignors to Research Foundation for Mental Hygiene, Inc., Albany, N.Y.

Continuation-in-part of Ser. No. 751,539, Aug. 29, 1991, abandoned. This application May 27, 1994, Ser. No. 259,730

Int. Cl.^{6} G01N *33/00;30/90;30/02;21/77*

U.S. Cl. 436—94 **71 Claims**

1. An assay method for diagnosing chronic alcoholism in a person being tested for alcoholism, comprising the steps of:

- (a) obtaining a body fluid sample from the person being tested; said sample obtained at least 7 days after the person has terminated alcohol consumption;
- (b) reacting an aliquot of the test sample with a reagent comprising diphenylamine, aniline, and phosphoric acid, or DAP reagent;
- (c) comparing the resulting colorimetric reaction of the DAP reagent in the test person's sample with a control sample from a person who is non-alcoholic and non-diabetic such that a color in the test sample relative to the control sample indicates that:
  - i) ethyl β-glucuronide is present in the test person's sample, said ethyl β-glucuronide being a diagnostic biomarker of chronic alcoholism; and said ethyl β-glucuronide being detectable in the person's sample at least 7 days after the person has terminated the consumption of alcohol; and
  - ii) the person being tested is a chronic alcoholic.

5,747,347

LABELLED CARBOHYDRATES AND THEIR USE IN ASSAYS

David Harry Hawke, Newportville, Pa.; Rajesh Bhikhu Parekh, Oxford, United Kingdom; Paul Goulding, and Stephen Alexander Charles, both of Oxon, United Kingdom, assignors to Oxford Glycosystems Ltd., Abingdon, Oxon, United Kingdom

PCT No. PCT/GB94/01116, § 371 Date Mar. 19, 1996, § 102(e) Date Mar. 19, 1996, PCT Pub. No. WO94/28423, PCT Pub. Date Dec. 8, 1994

PCT Filed May 20, 1994, Ser. No. 545,790

Claims priority, application United Kingdom, May 20, 1993, 9310467

Int. Cl.^{6} G01N *33/00;* **C07H** *1/00;* **C08B** *35/00*

U.S. Cl. 436—94 **14 Claims**

1. A method for distinguishing between carbohydrates or glycoconjugates in a mixture thereof comprising labelling each carbohydrate or glycoconjugate in the mixture at the reducing terminal with a —NR—Ph—CO— group to produce hydrophilic fluorescently labelled saccharide molecules having a formula selected from the group consisting of oligo—CH_2—NR—Ph—CON(R')$_2$ and oligo—CH_2—NR'—CO—Ph—NHR, and separating the fluorescently labelled saccharide molecules through detection of the fluorescent label, wherein R and R' are independently selected from the group of H and C_1 to C_6 alkyl and Ph is phenylene.

5,747,348

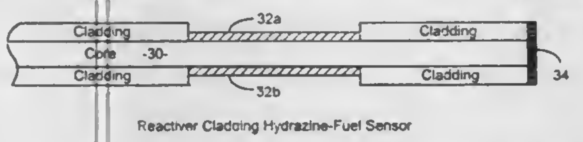
DIODE LASER INTERROGATED FIBER OPTIC HYDRAZINE-FUEL SENSOR

Bernardo Jaduszliwer, Santa Monica; Charles M. Klimcak, Hawthorne, and Gary L. Loper, Huntington Beach, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Division of Ser. No. 490,443, Jul. 5, 1995, Pat. No. 5,567,622. This application Sep. 27, 1996, Ser. No. 720,129

Int. Cl.^{6} G01N *21/78*

U.S. Cl. 436—106 **4 Claims**



1. A sensor for detecting the presence of a hydrazine fuel gas by optical absorption and reflection of an interrogating optical pulse communicated through an optic fiber, said sensor comprises

- an optic fiber including a fiber optic end,
- a phosphomolybdic acid (PMA) reagent disposed at said fiber optic end for reacting to the presence of said hydrazine fuel gas, said reaction characterized by changing said optical absorption and reflection of said optical pulse causing amplitudinal changes of said optical pulse when reflected back through the optic fiber, said hydrazine fuel gas selected from the group consisting of hydrazine, monomethylhydrazine, and unsymmetrical dimethylhydrazine, and
- a porous glass medium integrally formed at said fiber optic end and for containing said reagent.

5,747,349

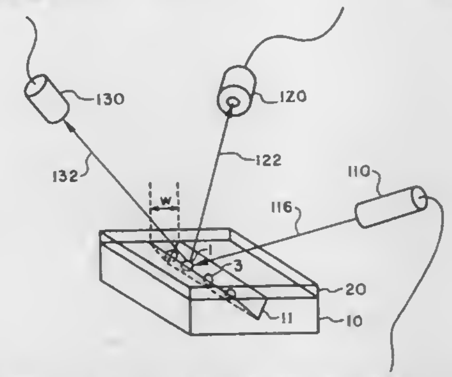
FLUORESCENT REPORTER BEADS FOR FLUID ANALYSIS

Ger van den Engh, and Bernhard H. Weigl, both of Seattle, Wash., assignors to University of Washington, Seattle, Wash.

Filed Mar. 20, 1996, Ser. No. 621,170

Int. Cl.^{6} G01N *33/00;21/01;21/64*

U.S. Cl. 436—172 **47 Claims**



1. A method of measuring the concentration of a first analyte in the fluid bulk of a sample fluid, comprising the steps of:

- mixing a plurality of a first type of reporter beads with said sample fluid, each said reporter bead comprising:
  - a substrate bead; and
  - a plurality of a first type of reporter molecule immobilized on or in said substrate bead;
  - wherein an optical property of said reporter molecules is a function of the concentration of said first analyte;
- flowing said sample fluid through the measurement zone of a flow cytometer such that said reporter beads flow in substantially a single file;
- measuring said optical property of said reporter molecules; and
- obtaining the concentration of said first analyte from said optical property.

5,747,350

SYSTEM FOR DOSING LIQUIDS

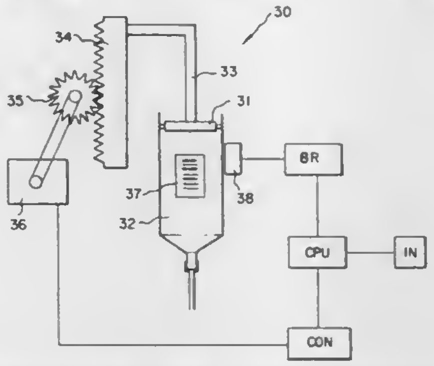
Stephan Sattler, Preisenberg, Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 221,010, Apr. 1, 1994, abandoned. This application May 7, 1997, Ser. No. 852,572

Claims priority, application Germany, Apr. 2, 1993, 43 10 808.3

Int. Cl.^{6} G01N *35/10*

U.S. Cl. 436—180 **26 Claims**



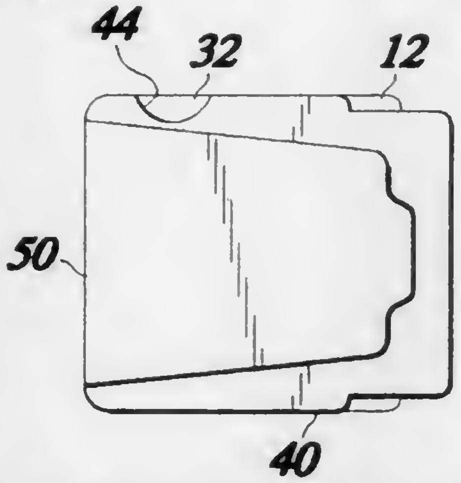
16. Method of analysis using a system for dosing liquids, said method comprising the steps of:

- reading in diameter data for a specific inner diameter of a dosing device containing the liquid to be dosed, said dosing device having a rigid tube-shape with said specific inner diameter being measured for said dosing device,
- reading in specific dosage data for a dosage to be conducted;
- calculating a dosing displacement from the diameter and dosage data read in; conducting said dosing displacement of liquid from the dosing device to introduce a predetermined amount of liquid into a sample, and detecting at least one signal resulting therefrom; and

evaluating the analysis using the amount of liquid displaced from the dosing device and the detected signal.

5,747,351
IMMUNOCHEMICAL-BASED TEST DEVICE WITH LIFT AND TWIST SPECIMEN FULL TAB

Goodarz Sahneh Hemmati, Santa Clara, Calif., assignor to SmithKline Diagnostics, Inc., Palo Alto, Calif.
Filed Jun. 7, 1995, Ser. No. 480,572
Int. Cl.^{6} G01N *33/543*
U.S. Cl. 436—514 **22 Claims**



1. An immunochemical-based test device for insertion of a chromatographic member, comprising:
- a test strip receiving member for inserting a chromatographic test strip therein, the test strip receiving member having an external viewing window to view the inserted chromatographic test strip; and
- a sample collection member coupled to the test strip receiving member, the sample collection member having a port for applying a test sample to an accessible pad located in a first position, the pad being repositionable to an inverted position, the pad forming a face section of the sample collection member for contacting the chromatographic test strip as the test strip receiving member is brought into opposition to the sample collection member.

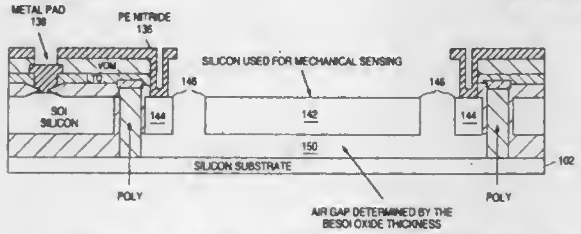
5,747,352
REAGENTS AND METHODS FOR THE RAPID AND QUANTITATIVE ASSAY OF PHARMACOLOGICAL AGENTS

Cheng F. Yan, Irvine; Chan S. Oh, Chino Hills, and Anthony K. Cheng, Anaheim, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed May 23, 1994, Ser. No. 248,479
Int. Cl.^{6} G01N *33/547*
U.S. Cl. 436—533 **25 Claims**

1. An assay for determining the presence of a target analyte in a test sample comprising the steps of:
- (A) forming a reaction mixture by contacting a test sample with:
  - (i) a bidentate reagent comprising a biotin member, an analyte member, and a spacer member between said biotin and analyte members, wherein:
    - (a) said biotin member of said reagent is bound to a biotin-binding agent selected from the group consisting of avidin and streptavidin; said biotin-binding agent being covalently bound to a solid support, said solid support being a latex particle having a particle size of about 38 to 100 nanometers;
    - (b) said analyte member of said reagent is capable of specifically binding to an antibody capable of binding to a target analyte;
    - (c) said intermediate spacer member is sufficient in length to permit said analyte member to bind to the antibody and said biotin member to bind to the biotin-binding agent; and
  - (ii) said antibody;
- (B) incubating said reaction mixture under conditions sufficient to permit the formation of a complex between said bidentate reagent and said antibody; and
- (C) measuring the extent of any formation of said complex using nephelometric or turbidimetric means, said extent being inversely proportional to the concentration of said target analyte in said sample.

5,747,353
METHOD OF MAKING SURFACE MICRO-MACHINED ACCELEROMETER USING SILICON-ON-INSULATOR TECHNOLOGY

Rashid Bashir, Santa Clara, and Abul E. Kabir, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Division of Ser. No. 633,197, Apr. 16, 1996, abandoned. This application Mar. 11, 1997, Ser. No. 814,352
Int. Cl.^{6} H01L *21/265*
U.S. Cl. 437—21 **10 Claims**

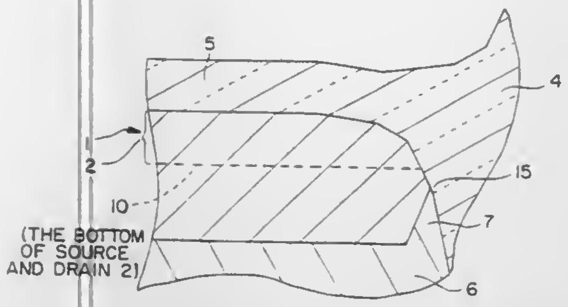


1. A method of making a monolithic accelerometer which includes a sensor and associated signal conditioning circuitry, comprising:
- preparing a silicon-on-insulator (SOI) wafer, wherein the SOI wafer includes a substrate wafer, a silicon layer, and an oxide layer positioned in between the substrate wafer and the silicon layer;
- forming a buried layer for use in fabricating the signal conditioning circuitry in the silicon layer of the SOI wafer;
- defining a location for the sensor on the silicon layer of the SOI wafer;
- defining a location for a sensor trench in the silicon layer on each side of the defined sensor location;
- etching the sensor trenches on each side of the sensor location down to the oxide layer of the SOI wafer;
- filling the sensor trenches with polysilicon;
- processing the SOI wafer to form the signal conditioning circuitry;
- etching the polysilicon in the sensor trenches down to the substrate wafer; and
- etching the oxide layer surrounding the silicon layer in the defined sensor location.

5,747,354
SEMICONDUCTOR DEVICE HAVING AN IMPROVED ANTI-RADIOACTIVITY AND METHOD OF FABRICATING THE SAME

Kousuke Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Division of Ser. No. 307,487, Sep. 16, 1994, which is a continuation of Ser. No. 1,831, Jan. 8, 1993, abandoned. This application May 10, 1996, Ser. No. 644,307
Claims priority, application Japan, Jan. 9, 1992, 1964/1992
Int. Cl.^{6} H01L *21/265*
U.S. Cl. 437—40 **5 Claims**

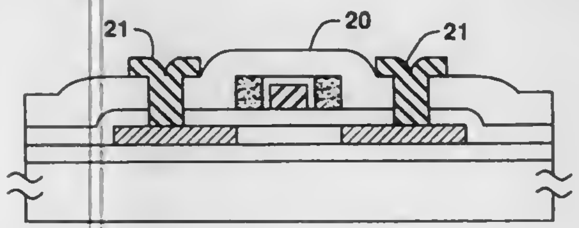
1. A method of forming a MOS field effect transistor with an anti-radioactivity, said method comprising the steps of:



- forming a field oxide film over a surface of a semiconductor substrate having a first conductivity type except over an active region of said semiconductor substrate;
- forming a gate insulation film over said active region of said semiconductor substrate;
- selectively forming leak guard diffusion regions of said first conductivity type in an upper region of said semiconductor substrate and along regions abutting inside edges of said field oxide films so that each of said leak guard diffusion regions has a bottom which is shallower in level than a bottom of said field oxide film, and that each of said leak guard diffusion regions has a first contact surface in direct contact with said gate insulation film and a second contact surface in direct contact with a bottom half part of said inside edge of said field oxide film, where said bottom half part is embedded into said semiconductor substrate;
- selectively forming a gate electrode on said gate insulation film so that said gate electrode extends between said inside edges of said field oxide films and over a part of each of said leak guard diffusion regions; and
- selectively forming source and drain diffusion regions of a second conductivity type, by a self-alignment technique using said gate electrode and said field oxide film as masks, both in an upper region of said semiconductor substrate and in upper regions of said leak guard diffusion regions except under said gate electrode so that said source and drain diffusion regions extend except under said gate electrode and so that each of said source and drain diffusion regions has a bottom which is shallower in level than said bottom of each of said leak guard diffusion regions and further shallower in level than a bottom of said second contact surface, and each of said source and drain diffusion regions has a third contact surface in direct contact with a top half portion of said bottom half part of said inside edge where a bottom of said third contact surface is shallower in level than said bottom of said second contact surface.

5,747,355
METHOD FOR PRODUCING A TRANSISTOR USING ANODIC OXIDATION

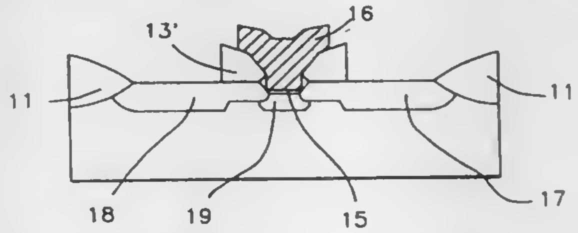
Toshimitsu Konuma; Akira Sugawara, and Takahiro Tsuji, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan
Division of Ser. No. 219,378, Mar. 29, 1994, abandoned. This application May 31, 1995, Ser. No. 455,151
Claims priority, application Japan, Mar. 30, 1993, 5-096667
Int. Cl.^{6} H01L *21/786*
U.S. Cl. 437—41 **20 Claims**



1. A process for producing a transistor comprising:
- forming a gate insulating film on a semiconductor region formed on a substrate;
- forming a first film capable of anodic oxidation on said gate insulating film;
- forming a second film on said first film;
- patterning said first film and said second film to form a gate electrode comprising a material of said first film and a mask comprising a material of said second film;
- forming an anodic oxide mainly on a side surface of said gate electrode by passing an electric current through said gate electrode with said mask remaining on said gate electrode;
- removing said mask;
- forming an anodic oxide at least on a top surface of said gate electrode by passing an electric current through said gate electrode after removing step; and
- introducing an impurity into said semiconductor region using as a mask said gate electrode and at least the anodic oxide formed on said side surface,
- wherein a thickness of the anodic oxide formed on the side surface is larger than that of the anodic oxide formed on the top surface.

5,747,356
METHOD FOR MANUFACTURING ISRC MOSFET

Jong Duk Lee, Department of Electronics Engineering College of Engineering, Seoul National, University, Shin Lim-dong, Kwanak-ku, Seoul; Kuk Jin Chun, Seoul; Byung Gook Park, Seoul, and Jeong Ho Lyu, Seoul, all of Rep. of Korea, assignors to Korea Information & Communication Co., Ltd., and Jong Duk Lee, both of Seoul, Rep. of Korea
Filed Dec. 5, 1996, Ser. No. 760,490
Claims priority, application Rep. of Korea, Dec. 6, 1995, 1995-48511
Int. Cl.^{6} H01L *21/265*
U.S. Cl. 437—44 **6 Claims**



1. A method for manufacturing an inverted-sidewall recessed-channel metal-oxide-semiconductor field effect transistor, comprising the steps of:
- forming an isolating layer on a silicon substrate through the LOCOS process in order to form the boundaries among the neighboring elements;
- depositing a mask oxide layer over the whole silicon substrate;
- exposing only the part of the silicon substrate for forming the channel and shallow junction of source/drain layers;
- depositing a first nitride layer over the resultant substrate;
- dry-etching the said first nitride layer so as to form a first nitride side-wall;
- forming an oxide layer being recessed into the channel by an oxidation process;
- wet-etching away the said first nitride side-wall;
- forming two doped layers for the shallow source/drain by an ion-implantation process;
- depositing a second nitride layer over the resultant substrate;
- dry-etching the said second nitride layer and the oxide layer so as to form a second nitride side-wall;
- forming a doped layer between the two doped layers for adjusting the threshold voltage and preventing the punchthrough phenomenon by an ion-implantation process;
- forming a gate oxide layer on the doped layer
- depositing a poly-silicon layer over the resultant substrate
- forming a poly-silicon gate by a lithography process and a dry-etching process;
- etching away the mask oxide layer; and,
- ion-implanting for thick source/drain junction.

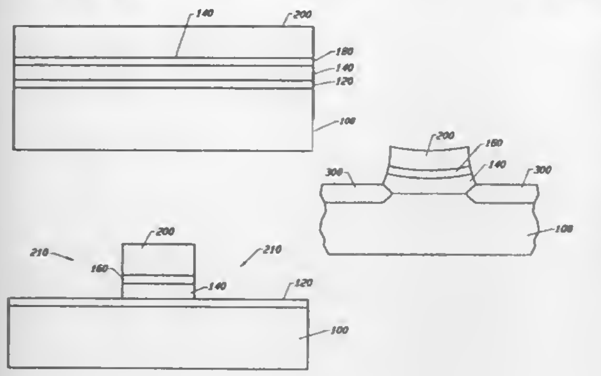
5,747,357
MODIFIED POLY-BUFFERED ISOLATION

Wen-Doe Su, Hsinchu, Taiwan, assignor to Mosel Vitelic, Inc., Hsinchu, Taiwan

Filed Sep. 27, 1995, Ser. No. 534,778

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—69 **16 Claims**



1. A method of forming a semiconductor integrated circuit, said method comprising steps of:

- providing a semiconductor substrate having a top surface;
- forming a pad oxide layer overlying said top surface;
- forming a polysilicon layer overlying said pad oxide layer;
- forming a first silicon nitride layer overlying said polysilicon layer said first silicon nitride being made by reacting a nitrogen source with said polysilicon layer to form a substantially pinhole free layer;
- forming a second silicon nitride layer overlying said silicon nitride layer, said second silicon nitride layer being much thicker than said first layer of silicon nitride; and
- patterning said second silicon nitride layer, said first silicon nitride layer, and said polysilicon layer to define a mask, said mask comprising exposed regions of said pad oxide layers
- forming field isolation oxide regions in said exposed regions and removing said mask said field isolation oxide regions being free from substantial polysilicon residues on edges of said isolation oxide regions.

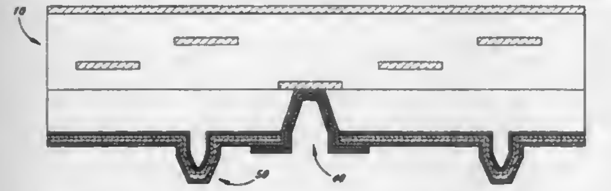
5,747,358
METHOD OF FORMING RAISED METALLIC CONTACTS ON ELECTRICAL CIRCUITS

Robin E. Gorrell, and Paul J. Fischer, both of Eau Claire, Wis., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed May 29, 1996, Ser. No. 655,017

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—183 **6 Claims**



1. A method of forming at least one raised metallic contact on an electrical circuit, said method comprising the following steps:

- providing a composite base substrate which is defined by at least a first conductive layer, a dielectric material and a second conductive layer;
- removing a portion of the first conductive layer to expose the dielectric material;
- removing said exposed portion of the dielectric material to the second conductive layer, thereby forming a depression;
- depositing at least one layer of conductive material on at least side wall portions of said depression;
- removing said second conductive layer; and
- completely removing said dielectric material to said first conductive layer thereby forming a raised metallic contact which extends perpendicularly away from said first conductive layer.

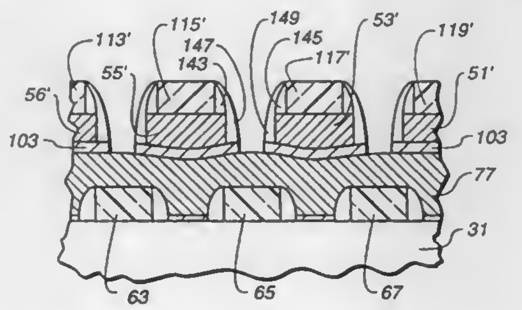
5,747,359
METHOD OF PATTERNING POLYSILICON LAYERS ON SUBSTRATE

Jack H. Yuan, Cupertino; Eliyahou Harari, Los Gatos; Henry Chien, and Gheorghe Samachisa, both of San Jose, all of Calif., assignors to SanDisk Corporation, Sunnyvale, Calif.

Division of Ser. No. 248,735, May 25, 1994, Pat. No. 5,661,053. This application Jan. 23, 1997, Ser. No. 787,852

Int. Cl.^{6} H01L *21/8247;21/465*

U.S. Cl. 437—186 **1 Claim**



1. A method of patterning both of first and second polysilicon layers deposited on a semiconductor substrate with an insulating layer therebetween, comprising the steps of:

- depositing a dielectric layer on the second polysilicon layer,
- anisotropically etching the dielectric layer in a pattern, thereby forming openings therein with sidewalls substantially perpendicular to an upper surface of the second polysilicon layer,
- forming first dielectric spacers along the sidewalls of the dielectric layer, thereby to reduce a size of the openings therein,
- etching the second polysilicon layer through the reduced size openings of the dielectric layer, thereby forming openings in the second polysilicon layer which have sidewalls,
- forming second dielectric spacers over the first spacers and along the sidewalls of the openings in the second polysilicon layer, thereby to reduce a size of the openings in the second polysilicon layer, and
- etching the first polysilicon layer through the reduced size openings in the second polysilicon layer.

5,747,360
METHOD OF METALIZING A SEMICONDUCTOR WAFER

Jaim Nulman, Palo Alto, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

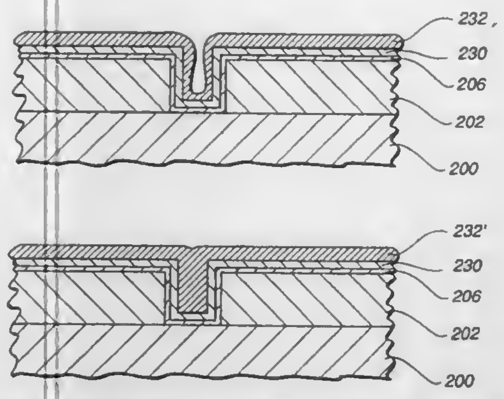
Continuation-in-part of Ser. No. 122,851, Sep. 17, 1993, Pat. No. 5,443,995. This application May 11, 1995, Ser. No. 439,363

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 437—189 **27 Claims**

1. A method of simultaneously metallizing the surface of a semiconductor wafer and filling contact-holes, comprising the steps in the order listed of:

- providing a semiconductor wafer;
- forming an insulating layer over the semiconductor wafer;
- forming a contact-hole through the insulating layer;
- depositing a layer of an alloy including copper and an Alloy Material, the alloy being deposited in a single step from a single target formed of both the copper and the Alloy Material, the deposition being continued for a time period such that only a portion of the contact-hole is filled with the layer of the alloy; and
- depositing a layer of copper over the layer of alloy substantially filling the contact-hole thereby.



5,747,361
STABILIZATION OF THE INTERFACE BETWEEN ALUMINUM AND TITANIUM NITRIDE

Luc Ouellet, Granby, Canada, assignor to Mitel Corporation, Kanata, Canada

Continuation of Ser. No. 140,080, Jun. 15, 1994, abandoned. This application Oct. 16, 1995, Ser. No. 543,497

Claims priority, application Canada, May 1, 1991, 2041730

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 437—190 **12 Claims**

1. A method of making a semiconductor device comprising the steps of:

- a) depositing a first interconnect layer of a first metal on a substrate;
- b) forming a barrier layer having an upper surface on said first interconnect layer to prevent hillock formation during subsequent processing at an elevated temperature of at least 350° C., said barrier layer comprising a compound of a second metal;
- c) depositing a dielectric layer directly onto said upper surface of said barrier layer; and
- d) subsequently subjecting said device to said elevated temperature of at least 350° C. for subsequent processing;
- wherein said first interconnect layer is an alloy pre-saturated with said second metal in amount at least equal to the limit of solid solubility of the second metal in said first metal at said particular elevated temperature at which said subsequent processing takes place.

5,747,362
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE IN WHICH A LAYER OF MATERIAL IS DEPOSITED ON THE SURFACE OF A SEMICONDUCTOR WAFER FROM A PROCESS GAS

Jan Visser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

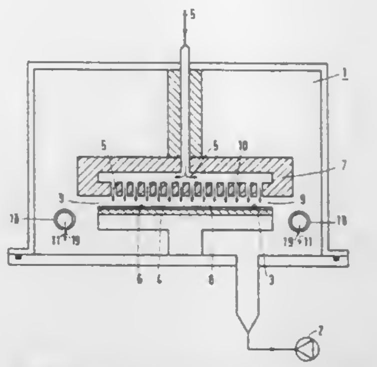
Continuation of Ser. No. 961,760, Oct. 16, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,105

Claims priority, application European Pat. Off., Oct. 18, 1991, 91202701

Int. Cl.^{6} C30B *25/14*

U.S. Cl. 437—225 **4 Claims**

1. A method of manufacturing a semiconductor device, comprising depositing a layer of material on a surface of a semiconductor wafer from a process gas in a reactor chamber which is kept at low pressure by a pump, arranging the wafer parallel to a gas distribution plate in the reactor chamber to form a planar process space which has a circumferential open connection with the reactor chamber, then introducing the process gas into the process space through inlet openings in the gas distribution plate, and introducing an auxiliary gas into the reactor chamber around the open connection to create in the open connection a gas pressure which is substantially equal to that in the process space, providing a ring projecting around and beyond the wafer and aligning an upper surface of said ring substantially coplanar with said surface of the wafer, said ring being provided adjoining the wafer and forming a lateral prolongation of the process space in conjunction with the gas distribution plate, and providing the prolongation of the process space with a length which is greater than a distance between the gas distribution plate and the wafer.



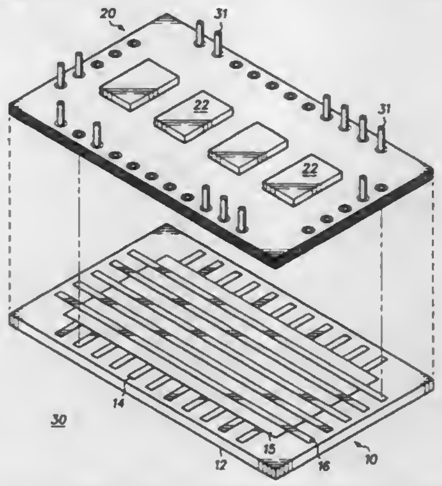
5,747,363
METHOD OF MANUFACTURING AN INTEGRATED ELECTRO-OPTICAL PACKAGE

Chengping Wei, Gilbert; Song Q. Shi, Phoenix, both of Ariz., and Hsing-Chung Lee, Calabasas, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 660,829, Jun. 10, 1996, Pat. No. 5,703,394. This application Jul. 8, 1997, Ser. No. 889,724

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—5 **13 Claims**



6. A method of fabricating an integrated electro-optical package comprising the steps of:

- providing a supporting substrate;
- patterning a first layer of conductive material on the supporting substrate, thereby defining a plurality of electrically conductive strips;
- positioning a continuous layer of organic material overlying the first layer of conductive material;
- patterning a second layer of conductive material orthogonal to the first layer of conductive material and overlying the continuous layer of organic material, thereby defining a plurality of metallized strips and a plurality of pixels of an organic light emitting device;
- positioning a printed circuit board to overly the second layer of conductive material, having contained thereon at least one driver and control circuit and having formed therein a plurality of plated through hole vias;
- positioning a conductive epoxy to electrically interconnect the plurality of pixels defined by the first layer of conductive

OL
2 10
SS
1
MY
5
998
MI

material and the second layer of conductive material with the at least one driver and control circuit; and

sealing the organic light emitting device to the printed circuit board.

5,747,364

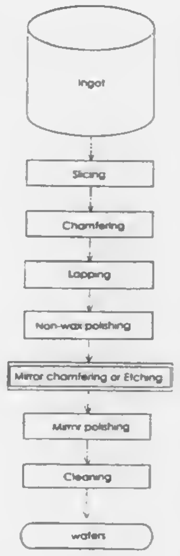
METHOD OF MAKING SEMICONDUCTOR WAFERS AND SEMICONDUCTOR WAFERS MADE THEREBY

Nobuyuki Akiyama, Hiratsuka; Fumitaka Kai, Miyazaki; Masahiko Maeda, Miyazaki; Hirofumi Hajime, Miyazaki, and Naoki Yamada, Miyazaki, all of Japan, assignors to Komatsu Electronic Metals Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1997, Ser. No. 824,301

Int. Cl.^{6} H01L *21/322;21/302*

U.S. Cl. 438—14 **3 Claims**



1. A method of making semiconductor wafers comprising:

slicing an ingot into a plurality of wafers;

chamfering peripheral portions of said wafers;

lapping sliced faces of said wafers in order to flatten said wafers;

non-wax polishing one side or double sides of each said wafer by using a template one side by one side;

mirror chamfering or etching on the peripheral portions of said wafers;

mirror polishing the one side or the double sides of each said wafer; and

cleaning said wafers.

5,747,365

METHOD FOR PREPARING SEMICONDUCTOR CHIP AS SEM SPECIMEN

Wonder D. Wang; Shean-Ren Horng, and Fei-Chi Huang, all of Hsinchu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Aug. 1, 1996, Ser. No. 691,087

Int. Cl.^{6} G01R *31/26;* **H01L** *21/66*

U.S. Cl. 438—17 **10 Claims**

1. A method for grinding a semiconductor chip to a selected section line for viewing a defect or other target with a scanning electron microscope, comprising the following steps.

selecting an edge of the chip for the grinding operation, said edge being identified as the grinding edge.

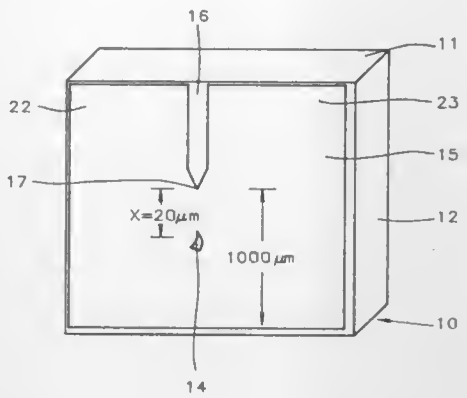
coating the top surface of the chip with a conductive material while masking a region extending from the edge opposite the grinding edge to a position short of the target, whereby the top surface of the chip is given a conductive path in a U shaped pattern,

connecting conductors to the ends of the U shaped pattern and making a first measurement of the resistance of the path,

grinding the chip at said grinding edge, whereby the overlying conductive material is removed, the amount of said grinding being sufficient to produce a measurable increase in the resistance of the path,

making a second measurement of the resistance of the path, and

monitoring the resistance of the path while grinding the chip grinding edge until the resistance of the path reaches a final resistance value calculated from the first and second measurements for the resistance when the coating has been removed by grinding to the selected section line.



5,747,366

METHOD OF FABRICATING A SURFACE EMITTING SEMICONDUCTOR LASER

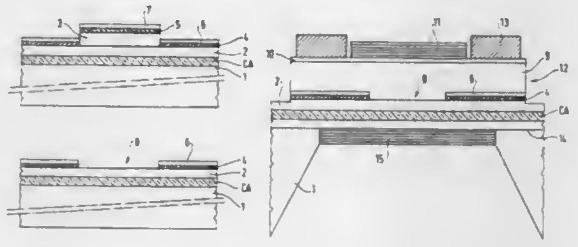
François Brillouet, Clamart; Léon Goldstein, Chaville; Joël Jacquet, Limours; Antonina Plais, Paris, and Paul Salet, Clamart, all of France, assignors to Alcatel Alsthom Compagnie Generale D'Electricite, Paris Cedex, France

Filed Dec. 26, 1996, Ser. No. 773,355

Claims priority, application France, Dec. 27, 1995, 95 15544

Int. Cl.^{6} H01L *21/00;* **H01S** *3/19*

U.S. Cl. 438—44 **7 Claims**



1. A method of fabricating a surface emitting semiconductor laser formed on a first doped III–V element substrate, said laser including a resonant cavity delimited by mirrors and containing an active layer and an electrical confinement layer, in said method the formation of said electrical confinement layer comprises the following steps:

growing a localized aluminum alloy layer above said active layer so that an opening area is provided on top of which one of said mirrors is to be formed,

performing at least one step of epitaxial regrowth of a second doped III–V element substrate, and

performing lateral oxidation of said localized aluminum alloy layer.

5,747,367

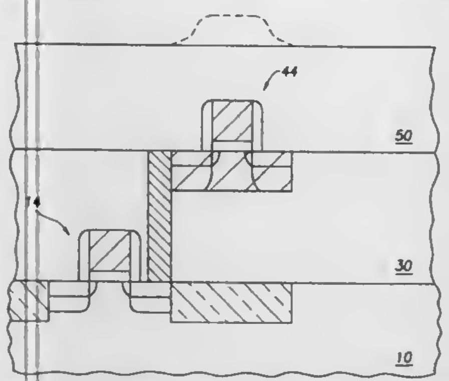
MULTI-LEVEL TRANSISTOR FABRICATION METHOD WITH HIGH PERFORMANCE SOURCE/DRAIN CONNECTION

Daniel Kadosh, Austin, and Mark I. Gardner, Cedar Creek, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 9, 1996, Ser. No. 731,075

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—152 **21 Claims**



1. A method for interconnecting a source of a first transistor to a drain of a second transistor, comprising:

providing a first transistor comprising a gate conductor formed upon a first topography and a source region formed within said first topography at one side of said gate conductor;

depositing a dielectric across said first topography;

forming a trench within said layer of dielectric and filling said trench with a polysilicon;

etching an opening through said dielectric to said source region;

filling said opening with a metal, wherein said metal contacts a drain side of said polysilicon; and

implanting dopants within said drain side of said polysilicon to form a drain region of a second transistor.

5,747,368

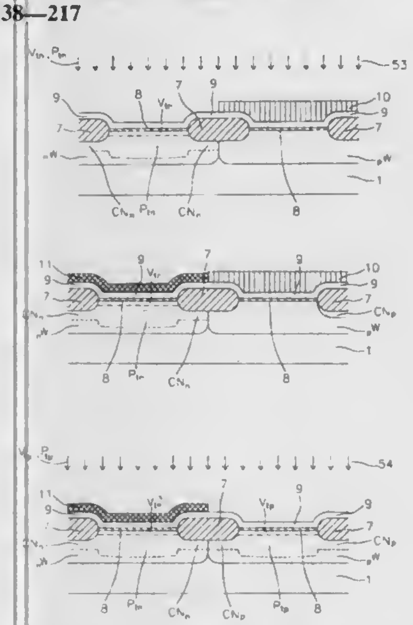
PROCESS FOR MANUFACTURING CMOS DEVICE

Ching-Nan Yang, Jung-He, and Li-Chun Peng, Hsin-Chu Shian, both of Taiwan, assignors to Mosel Vitelic Inc., Hsin Chu, Taiwan

Filed Oct. 3, 1996, Ser. No. 720,762

Int. Cl.^{6} H01L *21/8238*

U.S. Cl. 438—217 **33 Claims**



1. A process for manufacturing a CMOS device on a silicon substrate, said CMOS device having at least a p-type and an n-type MOS region therein, comprising:

(a) forming an isolation layer to isolate and define a pair of exposed active areas and forming the n-type and p-type MOS regions each under one of the pair of exposed active areas;

(b) forming a gate oxide on said active areas;

(c) forming a gate conducting layer over said gate oxide;

(d) forming a photoresist layer on said gate conducting layer;

(e) removing a portion of said photoresist layer located over one of said p-type and said n-type MOS regions and executing a first ion implantation in order to form a first channel stop in said one of said p-type and said n-type MOS regions and to regulate a first threshold voltage of said one of said p-type and said n-type MOS regions;

(f) selectively forming an oxide layer over said one of said p-type and said n-type MOS regions;

(g) eliminating a remaining portion of said photoresist layer and executing a second ion implantation in order to form a second channel stop on said other one of said p-type and said n-type MOS regions and to regulate a second threshold voltage of said other one of said p-type and said n-type MOS regions; and

(h) eliminating said oxide layer on said one of said p-type and said n-type MOS regions and forming gates, sources, and drains in said CMOS device, including patterning and etching said gate conducting layer.

5,747,369

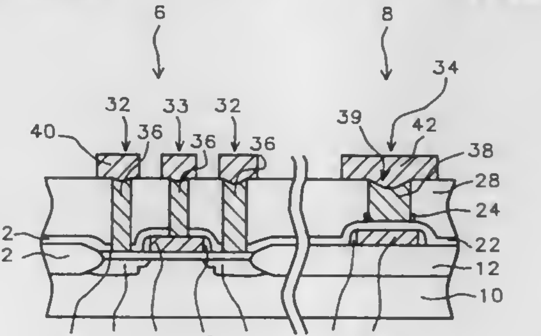
FORMATION OF A CAPACITOR USING A SACRIFICIAL ETCH STOP

Arjun Kumar Kantimahanti; Chivukula Subrahmanyam, and Mei Sheng Zhou, all of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore

Filed Jan. 13, 1997, Ser. No. 782,706

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—241 **30 Claims**



1. A method of forming a capacitor on a silicon wafer comprising:

(a) providing a silicon wafer;

(b) forming a first insulative layer on said silicon wafer;

(c) forming a first conductive layer over said first insulative layer;

(d) patterning said first conductive layer to form a first plate of said capacitor, said first plate having means for connection to external circuitry;

(e) forming a second insulative layer over said first conductive layer;

(f) depositing an etch-stop layer over said second insulative layer;

(g) depositing a first photoresist layer over said wafer;

(h) patterning said first photoresist layer to protect said first plate;

(i) removing said etch-stop layer not protected by said first photoresist layer;

(j) removing said first photoresist layer;

(k) depositing a third insulative layer over said silicon wafer;

(l) depositing a second photoresist layer over said silicon wafer;

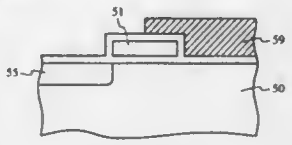
(m) patterning said second photoresist layer to define a second plate of said capacitor;

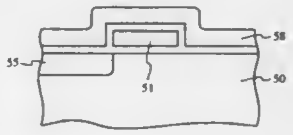
(n) etching said third insulative layer with a unidirectional etching technique, thereby creating a first opening and exposing said etch-stop layer;

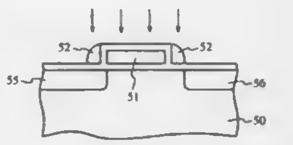
(o) removing said second photoresist layer;
(p) removing said etch-stop layer from said first opening;
(q) depositing a second conductive layer over said silicon wafer;
(r) etching said second conductive layer with a unidirectional etching technique, thereby leaving a plug of said second conductive layer in said first opening which comprises said second plate of said capacitor;
(s) depositing a third conductive layer; and
(t) patterning said third conductive layer thereby forming a connective wiring stripe to said plug.

5,747,370
METHOD OF MANUFACTURING A NON-VOLATILE SEMICONDUCTOR DEVICE

Byung-Il Lee, Daejeon-si, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea
Filed Nov. 6, 1995, Ser. No. 554,219
Claims priority, application Rep. of Korea, Nov. 5, 1994, 94-28981
Int. Cl.^{6} H01L *21/8247*
U.S. Cl. 438—267 **5 Claims**





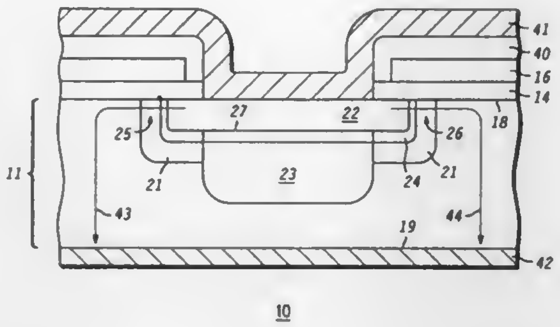


1. A method for manufacturing a non-volatile semiconductor memory device, comprising the steps of:
(a) forming a control gate on an insulated semiconductor substrate;
(b) forming an insulating layer on the control gate;
(c) forming a mask over a portion of the control gate adjacent to a region where a drain region is to be formed and over the region where the drain region is to formed, and doping the substrate so as to form a source region;
(d) removing the mask, forming a polysilicon layer on the entire exposed surface, and carrying out an anisotropic etching so as to form a side wall floating gate on at least the side of the control gate adjacent to the region where the drain region is to be formed; and
(e) doping the substrate using the control gate and the side wall floating gate as a mask, wherein the drain region is formed in the substrate.

5,747,371
METHOD OF MANUFACTURING VERTICAL MOSFET

Francine Y. Robb; Stephen P. Robb, both of Tempe; Jean-Michel Reynes, Phoenix, and Li-Hsin Chang, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 22, 1996, Ser. No. 684,802
Int. Cl.^{6} H01L *21/336*
U.S. Cl. 438—273 **20 Claims**

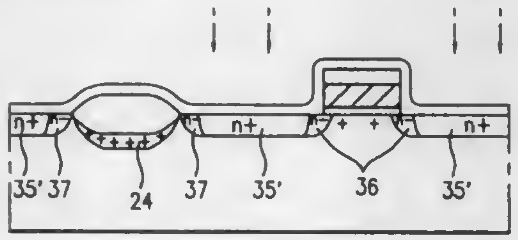
1. A method of manufacturing a semiconductor device comprising:
providing a semiconductor substrate;



forming a first doped region in the semiconductor substrate, the first doped region having a first conductivity type;
annealing the first doped region;
forming a second doped region in the first doped region after annealing the first doped region, the second doped region having a second conductivity type different from the first conductivity type;
annealing the first and second doped regions; and
damaging a portion of the first doped region to reduce a lifetime of minority carriers in the first doped region, the portion of the first doped region adjacent to the second doped region.

5,747,372
SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING SAME

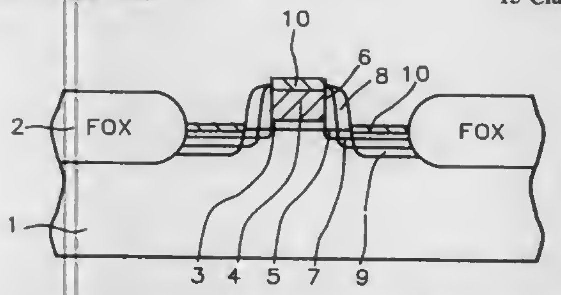
Geun Lim, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea
Filed Aug. 5, 1996, Ser. No. 692,133
Claims priority, application Rep. of Korea, Dec. 26, 1995, 1995 56313
Int. Cl.^{6} H01L *21/336*
U.S. Cl. 438—298 **20 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:
defining an active region and a field region on a semiconductor substrate having a low impurity concentration of a first conductivity type;
forming a first conductivity type region of high impurity concentration at the field region and a field insulation film on the first conductivity type region of high impurity concentration;
forming a gate insulation film on the active region, a gate electrode on the gate insulation film, and a first insulation film on the gate electrode;
forming a second insulation film on the semiconductor substrate, the field insulation film, and the first insulation film;
forming a third insulation film at sides of the gate electrode and over the field region;
forming a second conductivity type region of high impurity concentration on the semiconductor substrate between the gate electrode and the field insulation film using the third insulation film and the gate electrode as a mask; and
forming a second conductivity type region of low impurity concentration between the gate electrode and the second conductivity type region of high impurity concentration, and between the field insulation film and the second conductivity type region of high impurity concentration using the gate electrode and the field insulation film as a mask after removing the third insulation film.

5,747,373
NITRIDE-OXIDE SIDEWALL SPACER FOR SALICIDE FORMATION

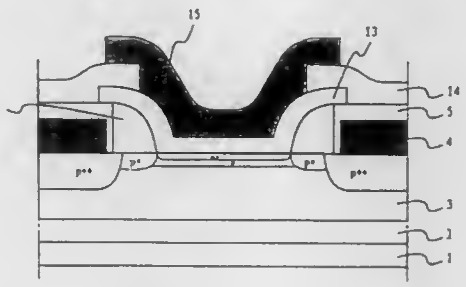
Chen-Hua Yu, Hsin-chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan
Filed Sep. 24, 1996, Ser. No. 719,233
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 438—305 **15 Claims**



1. A method of fabricating a MOSFET device, on a semiconductor substrate, using a silicon nitride—silicon oxide, double insulator spacer, and featuring a lightly doped source and drain region, a medium doped source and drain region, and a heavily doped source and drain region, comprising the steps:
forming field oxide regions in said semiconductor substrate;
growing a gate insulator layer on regions of said semiconductor substrate, not covered by said field oxide regions;
growing a polysilicon layer on said gate insulator layer and on said field oxide regions;
patterning of said polysilicon layer to create a polysilicon gate structure, on said gate insulator layer;
ion implanting a first conductivity imparting dopant into a region of said semiconductor substrate, not covered by said polysilicon gate structure, and not covered by said field oxide region, to create said lightly doped source and drain region;
depositing a silicon oxide layer on said polysilicon gate structure, on said lightly doped source and drain region, and on said field oxide regions;
anisotropic etching of said silicon oxide layer to create a silicon oxide spacer, on the sides of said polysilicon gate structure;
ion implanting a second conductivity imparting dopant into a region of said semiconductor substrate, not covered by said polysilicon gate structure, not covered by said silicon oxide spacer, and not covered by said field oxide region, to create said medium doped source and drain region;
deposition of a silicon nitride layer on said polysilicon gate structure, on said silicon oxide spacer, on said medium doped source and drain region, and on said field oxide regions;
anisotropic etching of said silicon nitride layer to create a silicon nitride spacer, resulting in said silicon nitride—silicon oxide, double insulator spacer, on the sides of said polysilicon gate structure;
ion implanting a third conductivity imparting dopant into a region of said semiconductor substrate, not covered by said polysilicon gate structure, not covered by said silicon nitride—silicon oxide, double insulator spacer, and not covered by said field oxide regions, to create said heavily doped source and drain regions;
a first anneal cycle, performed using a rapid thermal anneal procedure, at a temperature between about 800° to 1100° C. for a time of about 5 to 120 sec., used to activate the dopants in said heavily doped source and drain region, in said medium doped source and drain region, and in said lightly doped source and drain region;
a buffered hydrofluoric acid, titanium pre-clean procedure, for a time between about 5 to 120 sec;
depositing a titanium layer on the exposed top surface of said polysilicon gate structure, on the exposed top surface of said heavily doped source and drain region, on the surface of said silicon nitride—silicon oxide, double insulator spacer, and on said field oxide regions;
a second anneal cycle used to form a titanium silicide layer on the exposed top surface of said polysilicon gate structure, and on the exposed top surface of said heavily doped source and drain region, while leaving said titanium layer, unreacted on the surface of said silicon nitride—silicon oxide, double insulator spacer, and on the surface of said field oxide regions; and
removal of unreacted, said titanium layer, from the surface of said silicon nitride—silicon oxide, double insulator spacer, and from said field oxide regions, resulting in a polycide gate structure, comprised of said titanium silicide, layer overlying said polysilicon gate structure, and of said titanium silicide layer, overlying said heavily doped source and drain region.

5,747,374
METHODS OF FABRICATING BIPOLAR TRANSISTORS HAVING SEPARATELY FORMED INTRINSIC BASE AND LINK-UP REGIONS

Hee-Seog Jeon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Nov. 27, 1996, Ser. No. 757,802
Claims priority, application Rep. of Korea, Dec. 28, 1995, 95-61307
Int. Cl.^{6} H01L *21/331*
U.S. Cl. 438—309 **12 Claims**



1. A method of fabricating a bipolar transistor, the method comprising:
forming a layer of a second conductivity type semiconductor material on a substrate of a first conductivity type semiconductor material so as to provide an extrinsic collector region of the bipolar transistor; then
forming a first conductive layer of polysilicon material on the layer of second conductivity type semiconductor material opposite the substrate; then
patterning the first conductive layer to define a sidewall of a window which exposes a portion of the region of a second conductivity type semiconductor material; then
forming an insulating layer on the sidewall and the exposed portion of the region of second conductivity type semiconductor material; then
forming a first mask on the insulating layer which exposes a region of the insulating layer corresponding to a link-up region of the bipolar transistor; then
implanting a first impurity ion of a first conductivity type through the insulating layer using the first mask to form a link-up region; then
removing the first mask; then
forming a sidewall spacer on the sidewall; and then
implanting a second impurity ion of the first conductive type using the sidewall spacer as a mask; then
diffusing the ions implanted by said step of implanting a second impurity to form an intrinsic base region; and
diffusing ions from the polysilicon region into the region of second conductivity type semiconductor material so as to provide an extrinsic base region of the bipolar transistor; and
forming an emitter region of the second conductivity type between the link-up regions.

5,747,375

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

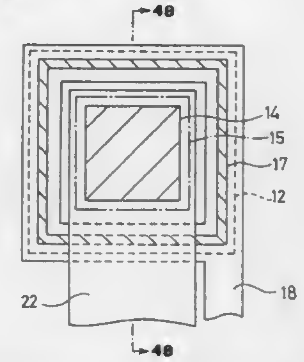
Satoru Kaneko, Kumagaya, and Toshiyuki Ohkoda, Ohra-gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 509,749, Aug. 13, 1995, Pat. No. 5,565,699, which is a continuation of Ser. No. 278,135, Jul. 21, 1994, abandoned. This application Jul. 1, 1996, Ser. No. 673,052

Claims priority, application Japan, Jul. 22, 1993, 5-181564

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—396 **4 Claims**



1. A method of manufacturing a semiconductor integrated circuit device, said method comprising:
depositing an insulating film on a semiconductor substrate;
opening contact holes in said insulating film;
depositing a silicon nitride film on said insulating film in said contact holes by LPCVD at a temperature between 700° C. and 800° C. so as to deform edges of said contact holes in said insulating film to be rounded and smooth; and
removing said silicon nitride film on said insulating film in said contact holes of said insulating film.

5,747,376

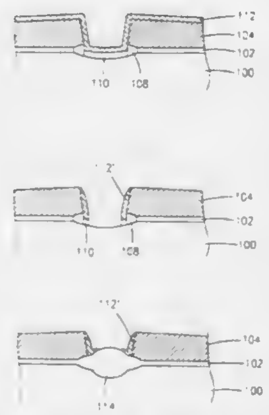
METHOD FOR FABRICATING ISOLATION LAYER OF SEMICONDUCTOR DEVICE

Sang-Don Lee, Cheongju, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-do, Rep. of Korea

Filed Dec. 27, 1996, Ser. No. 777,352

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—443 **20 Claims**



1. A method for fabricating an isolation layer of a semiconductor device, the method comprising the steps of:
defining an active region and an isolation region on a substrate;
forming an active pattern on the active region of the substrate, the active pattern forming step including forming a first insulating layer over the substrate and a first oxidation stop layer over the first insulating layer;
growing a first isolation layer over the substrate corresponding to the isolation region;
selectively etching the first isolation layer using the first oxidation stop layer as a mask;
forming a sidewall spacer including a second insulating layer and a second oxidation stop layer formed on the second insulating layer, the sidewall spacer being adjacent to the active pattern including a remaining portion of the first isolation layer; and
growing a second isolation layer over the substrate.

5,747,377

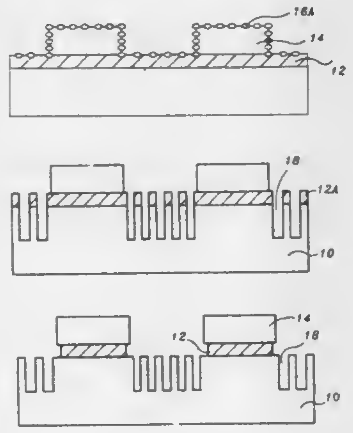
PROCESS FOR FORMING SHALLOW TRENCH ISOLATION

Shye-Lin Wu, Hsinchu, Taiwan, assignor to Powerchip Semiconductor Corp., Hsinchu, Taiwan

Filed Sep. 6, 1996, Ser. No. 709,169

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—444 **18 Claims**



1. A process for forming a trench isolation region in a substrate, said process comprising:
forming a pad oxide layer on the substrate;
patterning silicon nitride on said pad oxide layer, said patterned silicon nitride defining an active area;
forming hemispherical grain silicon on said patterned silicon nitride, on sidewalls of said patterned silicon nitride, and on an exposed portion of pad oxide layer;
forming a plurality of oxide islands on the portion of the substrate not covered by said patterned silicon nitride by removing portions of said pad oxide layer, said patterned silicon nitride and said hemispherical grain silicon serving as mask;
removing portions of the substrate, said oxide islands serving as mask; and
oxidizing the resulting exposed substrate.

5,747,378

METHOD OF DAMAGE FREE DOPING FOR FORMING A DRAM MEMORY CELL

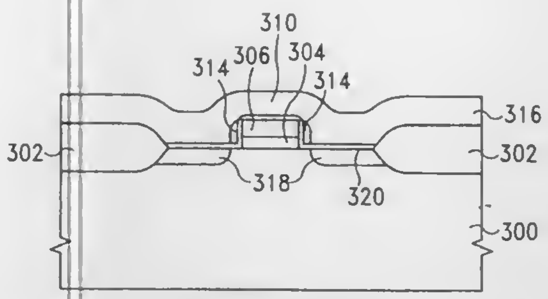
Der-Tsyr Fan, Tanshul; Chon-Shin Jou, Tainan, and Ting-S. Wang, Hsinchu, all of Taiwan, assignors to Mosel Vitelic Inc., Hsinchu, Taiwan

Filed May 27, 1997, Ser. No. 863,402

Int. Cl.^{6} H01L *21/22*

U.S. Cl. 438—563 **19 Claims**

1. A method of forming a dynamic random access memory comprising the steps of:
forming a field oxide layer to define an active area;
forming a gate oxide layer on a substrate;
forming a polysilicon layer on said gate oxide layer;
forming a photoresist layer on said polysilicon layer to define a gate electrode region;



removing a portion of said polysilicon layer and said gate oxide layer using said photoresist as an etching mask to form a gate electrode;
removing said photpresist layer;
forming a dielectric layer on said gate electrode and said substrate;
anisotropic etching said dielectric layer to form sidewall spacers on the sidewalls of said dielectric layer;
forming a phosphoric silicate glass on said gate electrode and said substrate;
performing an annealing process to form a source and a drain regions by the phosphorous ions of said phosphoric silicate glass diffusing into said substrate; and
performing thermal oxidation process to form a thermal oxide layer on said substrate and said gate electrode.

5,747,379

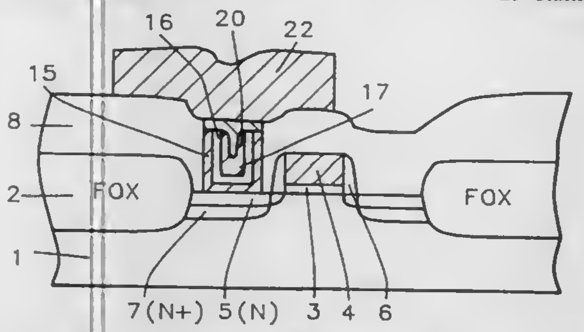
METHOD OF FABRICATING SEAMLESS TUNGSTEN PLUG EMPLOYING TUNGSTEN REDEPOSITION AND ETCH BACK

Yuan-Chang Huang, and Kuan-Hui Chang, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsinchu, Taiwan

Continuation of Ser. No. 583,920, Jan. 11, 1996, abandoned. This application Jun. 3, 1997, Ser. No. 868,472

Int. Cl.^{6} H01L *21/283*

U.S. Cl. 438—586 **23 Claims**



1. A method for fabricating a MOSFET device, on a semiconductor substrate, using a metal filled contact hole, to provide electrical contact between an underlying conductive region, on a semiconductor substrate, and an overlying interconnect metallization structure, comprising the steps of:
providing said underlying conductive region, on said semiconductor substrate;
depositing a dielectric layer on said semiconductor substrate, including depositing said dielectric layer on said underlying conductive region;
photolithographic processing to open a region in a photoresist layer, exposing said dielectric layer, directly overlying a specific area of said underlying conductive region;
anisotropic etching of said dielectric layer, in opened region of said photoresist layer, to create a contact hole, between about 0.30 to 0.50 μM, in diameter, in said dielectric layer, to said specific area of said underlying conductive region;
removing said photoresist layer;
surface cleaning of said specific area, of said underlying conductive region;
depositing an adhesive layer, to a thickness between about 200 to 500 Angstroms, on top surface of said dielectric layer, on sides of said contact hole, and on said specific area, of said underlying conductive layer;
depositing a barrier layer, to a thickness between about 500 to 1000 Angstroms, on said adhesive layer;
depositing a first metal layer, on said barrier layer, filling said contact hole, resulting in a seam in the center of said first metal layer, in said contact hole;
removing said first metal layer, said barrier layer, and said adhesive layer, from top surface of said dielectric layer, forming a first metal plug, comprised of said first metal layer, with said seam in center of said first metal layer, of said barrier layer, and of said adhesive layer, in said contact hole;
anisotropic etching of said first metal plug, to recess said first metal plug, in said contact hole, below the top surface of said dielectric layer, with said adhesive layer, said barrier layer, and said first metal layer, all recessed to the same level below the top surface of said dielectric layer, wherein anisotropic etching of said first metal plug, changes said seam, in center of said first metal layer, to a void, in the center of said first metal layer;
depositing a second metal layer on said first metal plug, completely filling said void, in center of said first metal layer, in said contact hole, and depositing said second metal layer on the top surface of said dielectric layer;
removing said second metal layer from top surface of said dielectric layer, forming a composite metal plug, in said contact hole;
depositing an interconnect metallization layer on top surface of said dielectric layer, and on said composite metal plug; and
patterning of said interconnect metallization layer, to form said metal interconnect structure.

5,747,380

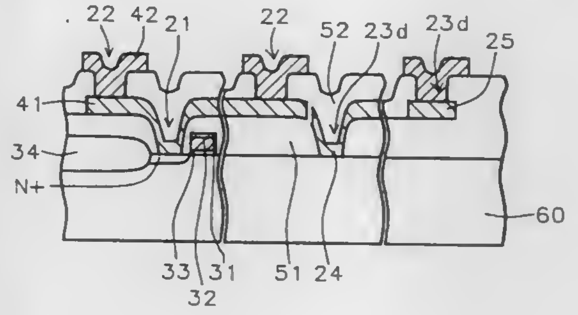
ROBUST END-POINT DETECTION FOR CONTACT AND VIA ETCHING

Chen-Hua Yu, and Syun-Ming Jang, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Feb. 26, 1996, Ser. No. 606,833

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 438—599 **24 Claims**

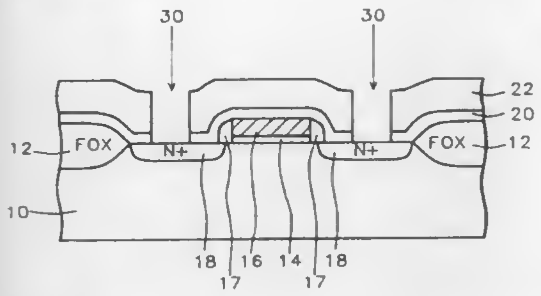


1. A method for improving the end-point detection for contact hole etching in multilayer metallurgy of submicron IC devices comprising the steps of:
providing a semiconductor substrate having devices formed within its surface;
depositing interconnect metal onto said substrate surface;
patterning local interconnect regions and dummy regions on said substrate;
depositing oxide layer over said substrate and covering said interconnect metal under thereof;
etching contact holes and dummy holes through the thickness of said oxide layer; and
depositing first level metal into contact and dummy holes.

5,747,381
TECHNIQUE FOR THE REMOVAL OF RESIDUAL SPIN-ON-GLASS (SOG) AFTER FULL SOG ETCHBACK

Lin-June Wu, Hsin-Chu; Chen-Hua Douglas Yu, Keeling, and Jin-Yuan Lee, Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsinchu, Taiwan

Filed Feb. 12, 1996, Ser. No. 599,770
Int. Cl.^{6} H01L *21/4763*
U.S. Cl. 438—624 **21 Claims**

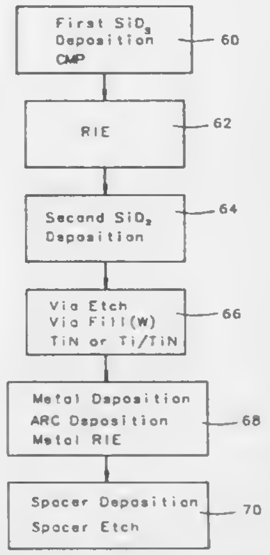


1. A method for removing residual spin-on-glass (SOG) from a layer of dielectric material deposited on a substrate comprising:
providing a substrate covered with a layer of dielectric material having residual areas of SOG on its surface said residual areas of SOG resulting from an anisotropic etch of said SOG; and
etching said residual areas with an aqueous etchant.

5,747,382
TWO-STEP PLANARIZATION PROCESS USING CHEMICAL-MECHANICAL POLISHING AND REACTIVE-ION-ETCHING

Yung-Sheng Huang; Long-Sheng Yeou; Ji-Chung Huang, and Chang-Song Lin, all of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-chu, Taiwan

Filed Sep. 24, 1996, Ser. No. 719,232
Int. Cl.^{6} H01L *21/316*
U.S. Cl. 438—624 **23 Claims**

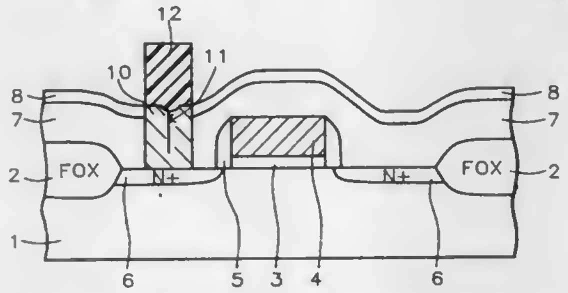


1. A method for forming a planar insulating layer over a metal pattern having line spacings of less than 1.5 microns on a silicon wafer comprising:
(a) providing a silicon wafer having a metal pattern having line spacings of less than 1.5 microns formed over its surface;
(b) forming a surface smoothing layer over said silicon wafer;
(c) depositing a first insulating layer over said silicon wafer whereby voids are formed within said first insulating layer over said line spacings of less than 1.5 microns;
(d) removing a first thickness of said first insulating layer by chemical-mechanical-polishing(CMP) whereby the surface of said first insulating layer is planarized without exposing said voids; then
(e) removing a second thickness of said first insulating layer by a dry etching technique whereby said voids are exposed; and
(f) depositing a second insulating layer over said silicon wafer.

5,747,383
METHOD FOR FORMING CONDUCTIVE LINES AND STACKED VIAS

Li-Chun Chen, and Chih-Heng Shen, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan

Filed Sep. 5, 1995, Ser. No. 523,329
Int. Cl.^{6} H01L *21/441*
U.S. Cl. 438—648 **19 Claims**

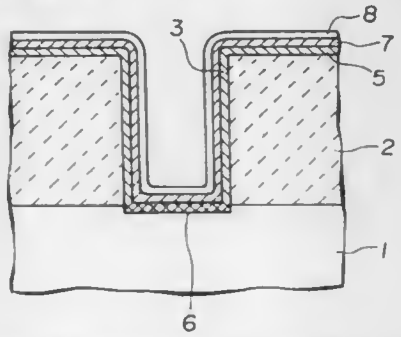


1. A method of fabrication of an interconnection layer in an integrated circuit comprising:
depositing a conducting material layer on an insulating layer and into contact openings formed at the sites where it is desired to make electrical contact to the underlying circuit element;
etching of said conducting material layer by vertical etching to said insulating layer while leaving in some regions remaining conductive material layer, but without overetching said conductive material layer into said contact openings;
forming at said contact opening sites, a protective mask layer, consisting of magnesium oxide or silicon oxide, having the reverse image of the mask used to etch said contact openings;
additional etching of said conducting material layer by vertical etching to remove said remaining conductive material layer; and
removing said protective mask layer, consisting of magnesium oxide or silicon oxide.

5,747,384
PROCESS OF FORMING A REFRACTORY METAL THIN FILM

Takaaki Miyamoto, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Dec. 21, 1995, Ser. No. 576,685
Claims priority, application Japan, Dec. 26, 1994, 6-323187
Int. Cl.^{6} H01L *21/44*
U.S. Cl. 438—685 **4 Claims**



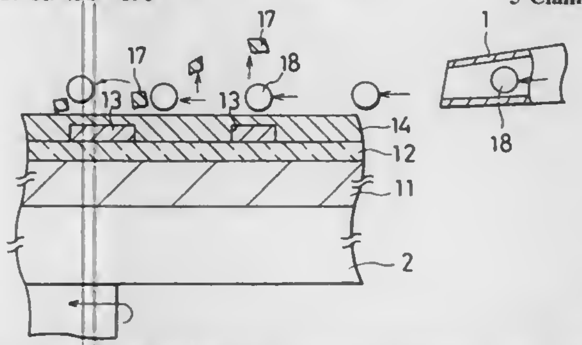
1. A process of forming a refractory metal film on a substrate by subjecting a gaseous mixture containing a halide of a refractory

metal and a hydrogen gas to a plasma chemical vapor deposition, comprising the steps of:
adjusting a mixing ratio of said halide of the refractory metal to said hydrogen gas to a first small value at an initial stage of the process; and
subsequent to said initial stage of the process, adjusting said mixing ratio of said halide of the refractory metal to said hydrogen gas to a second large value, larger than said first small value;
further comprising the steps of subjecting said substrate to a plasma treatment by using at least one gaseous material selected from the group consisting of a hydrogen gas, a silane gas and an argon gas to remove native oxide film on the substrate; and successively treating the surface of said substrate with a gaseous mixture containing a hydrogen gas and said halide of the refractory metal to remove the native oxide film deposited on a surface of the aluminum-series material of said substrate.

5,747,385
METHOD OF PLANARIZING INTERLAYER DIELECTRIC

Kouji Torii, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 26, 1996, Ser. No. 687,843
Claims priority, application Japan, Jul. 28, 1995, 7-193706
Int. Cl.^{6} H01L *21/469*
U.S. Cl. 438—690 **5 Claims**



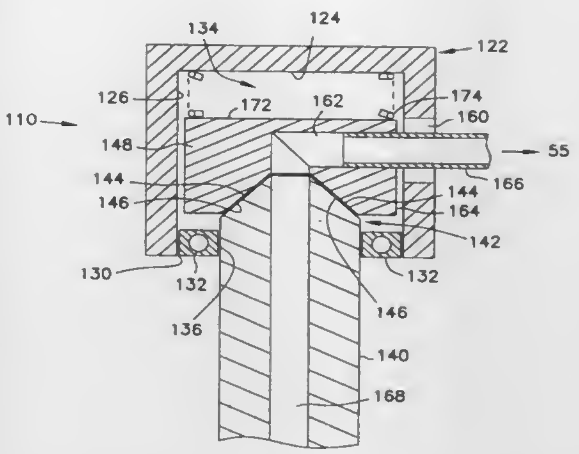
1. A method of planarizing an interlayer dielectric layer, said method comprising the steps of:
(a) preparing a semiconductor substructure;
(b) forming an insulating layer on a chief surface of said substructure;
(c) forming an interconnection layer having conductive lines on said insulating layer;
(d) forming an interlayer dielectric layer on said insulating layer so as to cover said interconnection layer, said dielectric layer having protrusions at positions corresponding to said underlying conductive lines of said interconnection layer;
(e) forming a patterned resist film on said interlayer dielectric layer so as to have an inverted geometric shape relative to that of said interconnection layer;
(f) selectively etching said interlayer dielectric layer to thereby partially remove tops of said protrusions by a predetermined depth using said patterned resist film as a mask; and
(g) emitting a beam of solid particles so as to collide with remaining parts of said protrusions of said interlayer dielectric layer so as to destroy and remove said remaining parts of said protrusions so as to planarize said interlayer dielectric layer.

5,747,386
ROTARY COUPLING

Scott E. Moore, Meridian, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 3, 1996, Ser. No. 724,905
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 438—692 **21 Claims**

17. A method of delivering fluid from a remote, non-rotary fluid source to a rotary component of an apparatus, said method comprising:

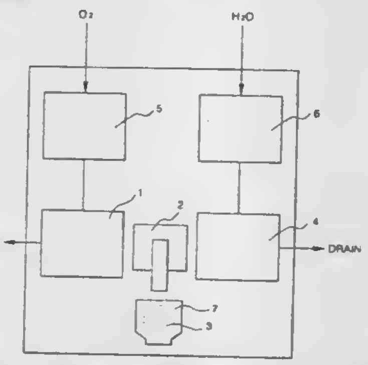


providing a housing with a chamber therein and a housing passage opening into said chamber at one end and communicating with said fluid source at an opposite end;
inserting a coupling end of a rotary shaft into said chamber, wherein said rotary shaft has at least one shaft passage formed longitudinally through said shaft which opens into said coupling end and communicates with said apparatus;
providing a coupling interface within said chamber for abutting against said coupling end of said rotary shaft;
biasing said coupling end of said rotary shaft and said coupling interface into contact with one another such that said at least one shaft passage and said housing passage in combination define at least a portion of a continuous fluid process line between said apparatus and said fluid source.

5,747,387
REMOVAL METHOD OF ORGANIC MATTER AND SYSTEM FOR THE SAME

Koutarou Koizumi, Kodaira; Sukeyoshi Tsunekawa, Iruma; Kazubiko Kawai, Kodaira; Maki Shimoda, Hachiouji; Katsuhiko Itoh, Nishitama-gun; Haruo Itoh, Hino, and Akio Saito, Isogo-ku, all of Japan, assignors to Hitachi, Ltd., and Hitachi Microcomputer System Ltd., both of Tokyo, Japan

Filed Aug. 25, 1995, Ser. No. 519,399
Claims priority, application Japan, Sep. 1, 1994, 6-208363
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 438—708 **8 Claims**



1. A method of removing organic matter of a photoresist layer patterned on a surface of a semiconductor wafer afier processing of said wafer, characterized in that said photoresist layer is first removed by ozone-containing gas, or ozone-containing gas and ultraviolet ray, at a temperature greater than 100° C.; said semiconductor wafer is thereafter cleaned by pure water; the semiconductor wafer is cleaned with water within ten minutes after the photoresist layer is removed by ozone-containing gas, or ozone-containing gas and ultraviolet ray; and prior to removal of the photoresist layer, ion implantation has been performed as said processing of the semiconductor wafer.

5,747,388

ANTIREFLECTION LAYER AND PROCESS FOR LITHOGRAPHICALLY STRUCTURING A LAYER

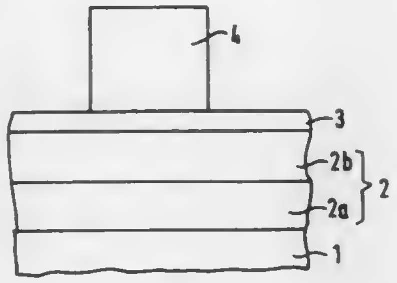
Karl-Heinz Küsters, St. Cloud, France; Paul Küpper, Glonn, Germany; Günther Czech, and Hellmut Joswig, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 20, 1995, Ser. No. 406,669

Claims priority, application Germany, Sep. 18, 1992, 42 31 312.0

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 438—723 **12 Claims**



1. In a process for structuring a layer on a semiconductor substrate using a photoresist mask and an etching process, the improvement which comprises:

applying an aSi/aSiN double layer as an antireflection layer before generating the photoresist mask; and

adjusting a layer thickness d of the aSi layer to essentially satisfy a condition $d \geqq -\ln (I/I_o)/\alpha(\lambda)$, where $\alpha(\lambda)$ is an absorption coefficient of the aSi layer at an exposure wavelength λ and $(1-I/I_o)$ is a given absorption in the antireflection layer.

5,747,389

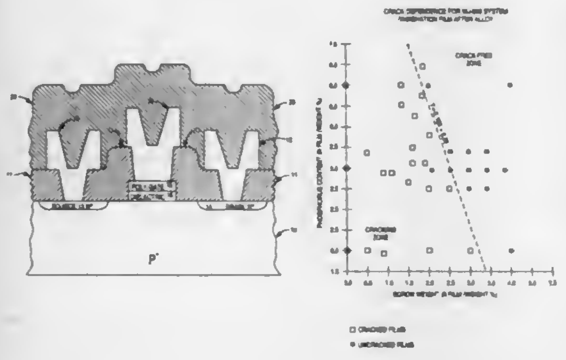
CRACK RESISTANT PASSIVATION LAYER

John K. Chu, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 693,694, Apr. 30, 1991, abandoned. This application May 26, 1992, Ser. No. 890,287

Int. Cl.^{6} H01L *21/469*

U.S. Cl. 438—783 **13 Claims**



1. A method of forming a semiconductor device comprising the steps of:

(a) providing a circuit on a substrate, said substrate including at least one metalization layer; and

(b) depositing a BPSG passivation layer over said metalization layer, said passivation layer preventing said circuit from being scratched and contaminated, said passivation layer including a predetermined amount of boron, said passivation layer being the uppermost layer of said device.

5,747,390

HARD TISSUE BONE CEMENTS AND SUBSTITUTES

Kevln Cooper, Warren; Chao C. Chen, Edison, and Angelo Scopelianos, Whitehouse Station, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 416,383, Apr. 6, 1995, abandoned, which is a division of Ser. No. 346,652, Nov. 30, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 603,570

Int. Cl.^{6} A61F *2/28;* **B32B** *27/36*

U.S. Cl. 442—59 **2 Claims**

1. A biocompatible coated substrate, comprising:

an absorbable substrate selected from the group consisting of woven meshes, nonwoven meshes, knitted meshes, yarns and fibers, said substrate comprising absorbable polyesters formed from aliphatic lactone monomers selected from the group consisting of p-dioxanone, ε-caprolactone, glycolide, lactide (*l, d, dl, meso*), delta-valerolactone, beta-butyrolactone, epsilon-decalactone, 2,5-diketomorpholine, pivalolactone, alpha, alpha-diethylpropiolactone, ethylene carbonate, ethylene oxalate, 3-methyl-1,4-dioxane-2,5-dione, 3,3-diethyl-1,4-dioxan-2,5-dione, gamma-butyrolactone, 1,4-dioxepan-2-one, 1,5-dioxepan-2-one, 1,4-dioxan- 2-one, 6,8-dioxabicycloctane-7-one, and combinations thereof, and

b) a coating comprising a resorbable hard tissue osteoconductive or osteoinductive calcium containing, non-fibrous, powdered compound wherein the calcium containing compound comprises a member selected from the group consisting of mono-, di-, octa-, a-tri-, b-tri-, and tetra-calcium phosphate, hydroxyapatite, fluorapatite, calcium sulfate, calcium fluoride, and calcium oxide and wherein the calcium containing compound has a particle size of about 100 microns to about 500 microns; and,

a suitable carrier comprising water, saline, water soluble polyethylene glycols, or combinations thereof.

5,747,391

BACKED NONWOVENS PREPARED FROM SYNTHETIC FIBERS

Werner Neubach, Ludwigshafen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 376,949, Jan. 20, 1995, abandoned. This application Dec. 27, 1996, Ser. No. 775,058

Claims priority, application Germany, Jan. 26, 1994, 44 02 187.9

Int. Cl.^{6} D04H *1/64*

U.S. Cl. 442—70 **4 Claims**

1. A nonwoven fabric comprising synthetic fibers bonded with a crosslinked polymer or melamine resin containing SiO_2, the weight ratio of polymer:SiO_2 ranging from about 3:1 to 1:3 and the weight ratio of melamine resin:SiO_2 ranging from about 10:1 to 1:1, the nonwoven fabric having been produced by applying to an unbonded nonwoven fabric a bonding composition consisting of an aqueous solution or dispersion of

a) a croselinkable polymer with thermosetting properties based on
  i) styrene/butadiene or acrylate and crosslinking components, or
  ii) copolymers acrylic acid ester, acrylamides and acrylonitrile together with styrene and butadiene, or

b) a melamine resin or a modified melamine resin and

c) aqueous colloidal silica particles having diameters of 1– 100 nm and BET surface areas of 50–1000 m^2/g

and subsequently drying to crosslink said resin or crosslinkable polymer.

5,747,392

STAIN RESISTANT, WATER REPELLANT, INTERPENETRATING POLYMER NETWORK COATING-TREATED TEXTILE FABRIC

Han Xiong Xiao, Bloomfield; Peng Geng, Detroit, and Kurt C. Frisch, Grosse Ils, all of Mich., assignors to Hi-Tex, Inc., Farmington Hills, Mich.

Filed Nov. 19, 1996, Ser. No. 752,429

Int. Cl.^{6} B32B *27/02*

U.S. Cl. 442—82 **12 Claims**

1. A transfer-printable, water repellant and stain resistant synthetic textile fabric, comprising:

a) a synthetic textile fabric;

b) at least one fabric coating comprising, prior to drying on said fabric,
  b)i) an aqueous urethane latex;
  b)ii) an aqueous acrylic latex;
  b)iii) a fluorochemical; wherein the ratio of b)i) to b)ii) is from 90/10 to 10/90, and the ratio of b)i) and b)ii) to b)iii) is from about 1/99 to 45/55; and
  b)iv) a cross-linking agent; wherein the ratio of b)i), b)ii) and b)iii) to b)iv) is from about 99/1 to about 80/20.

5,747,393

TEXTILE FABRIC FOR SEAT COVERS OR CUSHIONS, IN PARTICULAR FOR SEATS IN MOTOR VEHICLES

Petra Eckel, Neuwled; Edgar Pelz, Esslingen, and Bernd Potzler, Marktbreit, all of Germany, assignors to Lohmann GmbH & Co. KG, Neuwied, Germany

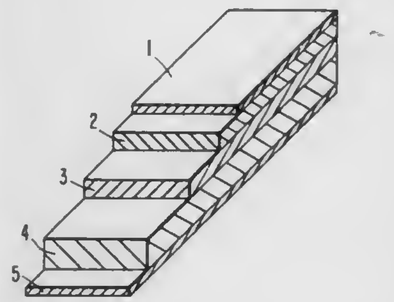
PCT No. PCT/EP95/00030, § 371 Date Sep. 16, 1996, § 102(e) Date Sep. 16, 1996, PCT Pub. No. WO95/19882, PCT Pub. Date Jul. 27, 1995

PCT Filed Jan. 5, 1995, Ser. No. 682,634

Claims priority, application Germany, Jan. 24, 1994, 94 01 121 U

Int. Cl.^{6} B32B *5/02*

U.S. Cl. 442—272 **14 Claims**



1. A textile fabric for seat covers or cushions, in particular for seats in motor vehicles, particularly designed for achieving a climatizing effect, characterized in that it is composed of several plies of textile fabrics in a sandwich-like arrangement and comprises the following plies:

a) a first ply (1) facing towards the body and which has moisture-transporting and moisture distributing properties, respectively, and which consists of a woven or knitted fabric of synthetic staple fibres or filaments;

b) a ply (2) located thereunder, likewise having moisture-transporting and moisture distributing properties, respectively, and which consists of a needle-punched nonwoven of synthetic staple fibers,

c) a third ply (3)located thereunder, having absorbent and storing properties, and which consists of a needle-punched nonwoven fabric of synthetic and/or natural staple fibers; and

d) a fourth ply (4) located thereunder, having cushioning and rear-ventilating properties, and which consists of a thermobonded nonwoven of synthetic staple fibers.

5,747,394

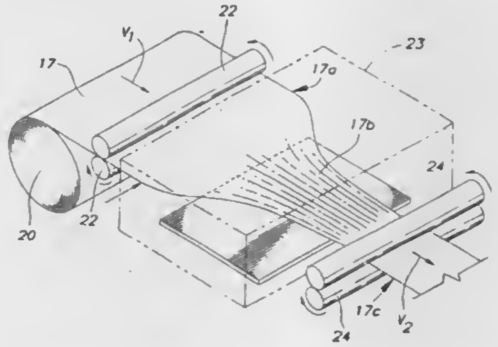
POST-TREATMENT OF LAMINATED NONWOVEN CELLULOSIC FIBER WEBS

Charles B. Hassenboehler, Jr., and Larry C. Wadsworth, both of Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation of Ser. No. 218,984, Mar. 28, 1994, Pat. No. 5,441,550, which is a continuation of Ser. No. 37,228, Mar. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 858,182, Mar. 26, 1992, Pat. No. 5,244,482. This application Aug. 15, 1995, Ser. No. 515,244

Int. Cl.^{6} D04H *3/08*

U.S. Cl. 442—328 **28 Claims**



1. A planar nonwoven web consolidated and elastic in the cross-direction, of a precursor nonwoven web comprising randomly deposited nonelastomeric thermoplastic fibers, uniaxially drawn and heat set, wherein the uniaxial heating and drawing are carried out by passing the precursor web into an oven at a temperature between the softening temperature and the melting point of the thermoplastic fibers at a first linear feed velocity and withdrawing the precursor web from the oven at a second linear output velocity and wherein the second velocity exceeds the first feed velocity, whereby a majority of the fibers are aligned generally in the direction of draw and a minority of segments of fibers are disposed crosswise or transversely to the direction of draw, whereby the web is longitudinally elongated and heat set with respect to the precursor and has a maximum pore size of less than 80% of that of the precursor web and a reduced pore size distribution by at least 20%.

5,747,395

COBALT GLASS COMPOSITIONS FOR COATINGS

Peter John Smith, and Harbans Kaur Maugat, both of Kidlington, United Kingdom, assignors to Cookson Matthey Ceramlcs & Materials Limited, London, United Kingdom

PCT No. PCT/GB94/02105, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/09131, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 28, 1994, Ser. No. 619,558

Claims priority, application United Kingdom, Sep. 28, 1993, 9319971

Int. Cl.^{6} C03C *10/04;8/04*

U.S. Cl. 501—5 **9 Claims**

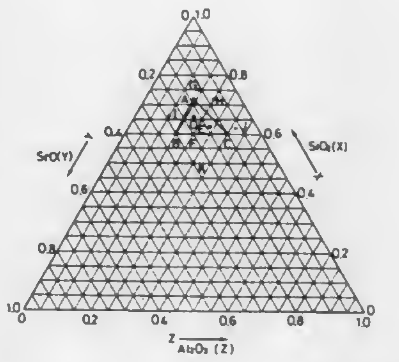
1. An article which is decorated with a glass composition which contains a crystalline $(Co,Zn)_2SiO_4$ phase, which is essentially free from lead and cadmium and which consists essentially of the following components:

	Weight percent
SiO_2	30–70
B_2O_3	1–25
Al_2O_3	0–10
Bi_2O_3	0–50

-continued

	Weight percent	
CoO	5–15	
At least one of		
Li_2O	0–10	
Na_2O	0–20	1–30 (in total)
K_2O	0–20	
optionally one or more of MgO, CaO, SrO or BaO		
	0–15	
ZnO	5–20	
ZrO_2	up to 10	
TiO_2	0–1	
optionally one or more of SnO_2, WO_3, MoO_3 or Nb_2O_5		
	0–5	
optionally one or more of Y_2O_3, La_2O_3 or CeO_2		
	0–5	
P_2O_5	0–5.	

5,747,396
GLASS AND CERAMIC SUBSTRATE USING THE SAME
Toshinobu Miyakoshi, and Hiroaki Hasegawa, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Feb. 12, 1997, Ser. No. 798,103
Claims priority, application Japan, Feb. 29, 1996, 8-043745; Dec. 3, 1996, 8-337444
Int. Cl.^{6} C03C *14/00;3/091*
U.S. Cl. 501—32 **10 Claims**



10. A ceramic substrate consisting essentially of (1) 65 to 85 vol % of a glass composition comprising 55 to 67 mol % of silicon oxide, 3 to 11 mol % of aluminum oxide, 16 to 26 mol % of boron oxide, and 3 to 11 mol % of at least one oxide selected from the group consisting of strontium oxide, calcium oxide, magnesium oxide, and zinc oxide, the molar percents of the respective oxides being calculated as SiO_2, Al_2O_3, B_2O_3, SrO, CaO, MgO, and ZnO, respectively, and (2) the balance of a filler selected from the group consisting of strontium feldspar, alpha-quartz, alumina, mullite, and mixtures thereof.

5,747,397
OPTICAL GLASS
Donald M. McPherson, Oakland, and Steven C. Murray, Santa Cruz, both of Calif., assignors to Bay Glass Research, Berkeley, Calif.
Filed Nov. 4, 1996, Ser. No. 743,058
Int. Cl.^{6} C03C *3/15*
U.S. Cl. 501—51 **14 Claims**

1. An optical glass consisting essentially of, in mole percent, 0–40% SiO_2, 5–30% TiO_2, 10–60% B_2O_3, 0–30% Al_2O_3, 0–25% GeO_2, 0–25% Y_2O_3, 0–10% ZrO_2, 0–20% Ga_2O_3, 0–10% WO_3, 0–9% MoO_3, 0–8% ZnO, 0–7% SnO_2 0–5% Ta_2O_5, and 20–42% Ln_2O_3, where the rare-earth oxide, Ln_2O_3 is one or more selected from the following group: Er_2O_3, Nd_2O_3, Dy_2O_3, Sm_2O_3, Ho_2O_3, La_2O_3, Gd_2O_3, Yb_2O_3, Tb_2O_3, Eu_2O_3, Tm_2O_3, Pr_2O_3, Ce_2O_3; and with the compositional limits, in mole percent, further defined by the following equalities; $SiO_2+B_2O_3+GeO_2+P_2O_5 \geqq +\%$, $Ln_2O_3+Y_{2O}$ 20–42%, $TiO_2+A_2O_3+ZrO_2+ZnO+SnO_2+Ga_2O_3+Nb_2O_5 \leftrightarrows Ta_2O_5+WO_3+MoO_3=10–37\%$, $TiO_2+Al_2O_3=10–36\%$, TiO_2+SiO_2 (with $GeO_2=0$) =15–75%, $TiO_2+SiO_2+GeO_2=$ 29–60%, and $TiO_2+SiO_2+GeO_2+B_2O_3=48–80\%$.

5,747,398
NEUTRAL COLORED GLASS COMPOSITIONS
Paige L. Higby; Dean E. Vernacotola, both of Maumee, and Bret E. Penrod, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio
Filed Nov. 5, 1996, Ser. No. 744,242
Int. Cl.^{6} C03C *3/087;6/04;6/00*
U.S. Cl. 501—66 **3 Claims**

1. A neutral colored soda-lime-silica glass composition comprising on a weight percent basis: 65–80% SiO_2, 10–20% Na_2O, 5–15% CaO, 0–10% MgO, 0–5% Al_2O_3, 0–5% K_2O, 0–5% B_2O_3 and 0–5% BaO and colorants consisting essentially of from about 0.1 to about 0.7 weight percent Fe_2O_3 (total iron), and either from about 0.1 to about 1.0 weight percent of a compound selected from the group consisting of titanium dioxide, vanadium pentoxide, and ceric oxide, or alternatively from about 0.1 to about 2.0 weight percent of a combination of colorants selected from said group, and having a ferrous value of less than 35 percent, wherein said glass, at a nominal 3 millimeter thickness, has a visible light transmittance (Illuminant C) of at least 80%, and a direct solar heat transmittance of about 50 to about 81%.

5,747,399
GLASS FOR A FLUORESCENT LAMP
Hiroyuki Kosokabe, and Koichi Hashimoto, both of Shiga, Japan, assignors to Nippon Electric Glass Co., Ltd., Otsu, Japan
Filed Sep. 10, 1996, Ser. No. 711,804
Claims priority, application Japan, Sep. 14, 1995, 7-262350; Oct. 9, 1995, 7-287939
Int. Cl.^{6} C03C *3/093;4/12*
U.S. Cl. 501—67 **6 Claims**

1. A glass used for a fluorescent lamp consisting essentially, by weight, of SiO_2 55–79%, B_2O_3 12.5–25%, Al_2O_3 0.5–10%, $Li_2O+Na_2O+K_2O$ 1–16%, ZrO_2 0.01–5%, and $TiO_2+PbO+Sb_2O_3$ 0.05–11%.

5,747,400
METHOD OF DRYING LINING REFRACTORY MATERIAL FOR INSTRUMENT/APPARATUS
Tadao Sasaki, Takarazuka; Hideaki Ohashi, Toyota; Akio Ueda, Seto; Norio Honda, and Hiroyuki Suzuki, both of Toyota, all of Japan, assignors to Nippon Crucible Co., Ltd, Japan
Filed Jul. 16, 1996, Ser. No. 683,783
Claims priority, application Japan, Oct. 28, 1995, 7-303604
Int. Cl.^{6} C04B *35/00*
U.S. Cl. 501—94 **10 Claims**

1. A method of drying a lining refractory material for lining of an instrument/apparatus used at a high temperature for a high temperature molten substance or a high temperature atmosphere, said method comprising the steps of:

preparing a colored monolithic refractory material by mixing a powder of a raw material containing ceramics with a coloring agent, and kneading said powder with a liquid and a binder;

covering a portion of an instrument/apparatus being in contact with a high temperature molten substance or exposed to a high temperature atmosphere, with said refractory material;

heating said refractory material; and

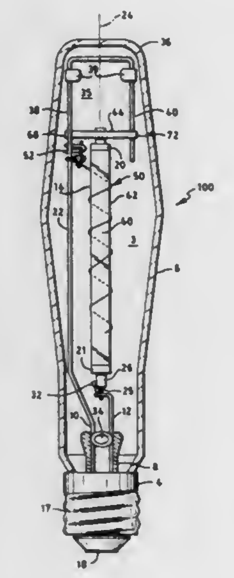
visually observing a tone of said refractory material, varying with an increase in heating temperature, and adjusting the heating temperature and heating time on the basis of the observed tone, thereby allowing moisture and gas contained in said refractory material to be evaporated.

5,747,401
CERIUM AND ZIRCONIUM OXIDES, MIXED OXIDES AND SOLID SOLUTIONS HAVING IMPROVED THERMAL STABILITY
Jean Pierre Cuif, Princeton, N.J., assignor to Rhone-Poulenc Inc., Cranbury, N.J.
Filed Oct. 15, 1996, Ser. No. 730,554
Int. Cl.^{6} C04B *35/48;* **C01G** *57/00;25/02;* **C01F** *17/00*
U.S. Cl. 501—103 **30 Claims**

1. A composition comprising cerium oxides, zirconium oxides, mixed oxides or solid solutions thereof produced by a method comprising the steps of:

a) forming a mixture comprising cerium and zirconium mixed oxides, cerium oxides, zirconium oxides, cerium and zirconium solid solutions or mixtures thereof;
b) washing or impregnating the mixture with at least one alkoxylated compound having greater than 2 carbon atoms; and
c) calcining the washed or impregnated mixture.

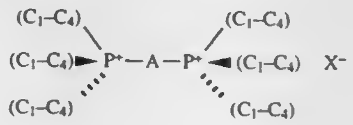
5,747,402
TRANSLUCENT POLYCRYSTALLINE ALUMINA AND METHOD OF MAKING SAME
George Wei, Weston; Arlene Hecker, Beverly, and David Goodman, Amesbury, all of Mass., assignors to OSRAM Sylvania Inc., Danvers, Mass.
Continuation of Ser. No. 681,566, Jul. 29, 1996, Pat. No. 5,631,201. This application Jan. 31, 1997, Ser. No. 792,472
Int. Cl.^{6} H01J *61/30;17/18;* **C04B** *35/115*
U.S. Cl. 501—152 **5 Claims**



1. An arc tube for a high pressure sodium lamp, said arc tube comprising: magnesia in an amount of about 0.020 to 0.050 wgt. percent; terbium oxide; and up to about 0.035 wgt. percent yttria; and the balance alumina, the terbium oxide being present in an effective amount to substantially cause the formation of terbium aluminate second phase during lamp manufacture.

5,747,403
ORGANOPHILIC, QUATERNARY PHOSPHONIUM ION-EXCHANGED SMECTITE CLAYS
Stephen A. Boyd, and Ravi Kukkadapu, both of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.
Division of Ser. No. 384,967, Feb. 7, 1995, Pat. No. 5,587,084. This application Apr. 17, 1996, Ser. No. 633,547
Int. Cl.^{6} B01J *29/04*
U.S. Cl. 502—62 **3 Claims**

1. A quaternary phosphonium ion-exchanged colloidal clay including a quaternary diphosphonium ion-exchanged cation of the formula



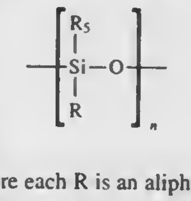
wherein

X$^-$ is selected from the group consisting of Cl$^-$, Br$^-$ and I$^-$;

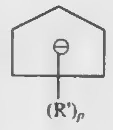
A is selected from the group consisting of an alkylene group containing 1 to 20 carbon atoms and phenyl; and (C_1–C_4) denotes an alkyl group having 1–4 carbon atoms.

5,747,404
POLYSILOXANE SUPPORTED METALLOCENE CATALYSTS
Sandor Nagy, Grand Island, and John A. Tyrell, Williamsville, both of N.Y., assignors to Lyondell Petrochemical Company, Houston, Tex.
Filed May 28, 1996, Ser. No. 654,435
Int. Cl.^{6} C08F *4/64*
U.S. Cl. 502—104 **12 Claims**

1. A catalyst having the formula



where each R is an aliphatic from C_1 to C_6 or an aromatic from C_6 to C_{10}, each R_5 is H, R, or L', each L' is $LM'L_rX_{3-r}$ or two L' groups form the bridge —$LM'X_{2-r}L_r$—, each L is a ligand having the formula



where each R' is a C_1 to C_{20} hydrocarbyl group, p is 0 to 4, X is chlorine or bromine, M' is zirconium, titanium, or hafnium, n is 5 to 500, the ratio of R to H+L' in R_5 is 0 to 100, the ratio of H to L in R_5 is 0 to 4, and r is 0 to 1.

5,747,405

CATALYST COMPOSITIONS AND PROCESS FOR PREPARING POLYOLEFINS

Ian Raymond Little, Hampton, and John Paul McNally, Spencers Wood, both of England, assignors to BP Chemicals Limited, London, England

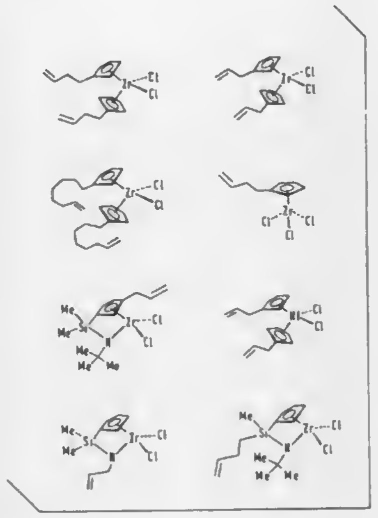
Continuation of Ser. No. 112,099, Aug. 26, 1993, abandoned.

This application May 2, 1996, Ser. No. 641,702

Claims priority, application United Kingdom, Sep. 4, 1992, 9218814; Apr. 20, 1993, 9308078

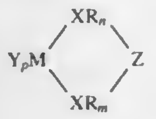
Int. Cl.^{6} C08F *4/642*

U.S. Cl. 502—113 **14 Claims**



1. A catalyst composition for use in the polymerization of olefins comprising: (a) at least one polymerization catalyst designated (A) selected from the group consisting of a Ziegler-Natta catalyst, a Group IVA metal compound, a Group VA metal compound and a Group VIA metal compound, (A) not being a metallocene of formula I or II of b; and (b) a polymer of an olefin and at least one metallocene of the general formula I or II

$$M[XR_n]_xY_p \qquad (I)$$



(II)

$$\begin{array}{ccc} & XR_n & \\ Y_pM & & Z \\ & XR_m & \end{array}$$

wherein R is a monovalent or divalent 1–20 carbon hydrocarbyl, or a 1–20 carbon hydrocarbyl containing substituent oxygen, silicon, phosphorus, nitrogen or boron atoms with the proviso that at least one R group contains a polymerizable olefinic group containing 3 to 20 carbon atoms, and when there are two or more R groups present they may be the same or different, and when R is divalent it is directly attached to M, and replaces a Y ligand, wherein

X is cyclopentadienyl or indenyl nucleus,

M is a Group IVA metal,

Y is a monovalent anionic ligand,

and for formula I,

n is an integer of 1 to 10

x is either 1 or 2, and

when x=1, p= 0 to 3,

when x= 2, p= 0 to 2

and for formula II

n and m are integers or 0 such that n+ m≧ 1, p= 0–2, and

Z is a radical selected from the group consisting of a C_1 to C_4 alkylene, a dialkyl germanium, an alkyl phosphine, an amine, bis-dialkyl silyl, and bis-dialkylgermanyl containing a hydrocarbyl group having 1 to 4 carbon atoms.

5,747,406

CATALYST COMPOSITION FOR THE PRODUCTION OF OLEFIN POLYMERS

Walter Thomas Reichle, Warren; Xinmin Yang, Somerset, and Frederick John Karol, Belle Mead, all of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jan. 10, 1997, Ser. No. 782,504

Int. Cl.^{6} C08F *4/64*

U.S. Cl. 502—117 **7 Claims**

1. A catalyst composition comprising the reaction product of:

a) a monocycloalkadienyl catalyst precursor having the formula:

$$LMX_x \qquad (I)$$

wherein:

M is Ti, Zr, or Hf;

L is a cycloalkadienyl ligand selected from the group consisting of cyclopentadienyl indenyl, and fluorenyl optionally substituted with one or more hydrocarbyl groups containing 1 to 20 carbon atoms;

each X is independently hydrogen, an aryl, alkyl, alkenyl, alkylaryl, or arylalkyl radical having 1–20 carbon atoms, a hydrocarboxy radical having 1–20 carbon atoms, a halide, a nitrogen containing radical having 1–20 carbon atoms, or Q_2YZ, wherein each Q is independently selected from the group consisting of —O—, —NR—, —CR_2— and —S—; Y is either C or S; and Z is selected from the group consisting of —OR, —NR_2, —CR_3, —SR, —SiR_3, —PR_2, —H, and aryl groups, with the proviso that when Q is —NR— then Z is selected from the group consisting of —OR, —NR_2, —SR, —SiR_3, —PR_2 and —H; and

x is 2, 3, or 4 depending upon the valence state of M;

b) an activity enhancing cycloalkadiene; and

c) an activating cocatalyst.

5,747,407

METHOD OF MAKING A ZIEGLER-NATTA OLEFIN POLYMERIZATION CATALYST

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1996, Ser. No. 705,367

Int. Cl.^{6} B01J *31/00;37/00;* **C08F** *4/02;4/60*

U.S. Cl. 502—26 **43 Claims**

1. A process comprising: (1) combining a first transition metal compound and a metal halide, in a solvent, to form a solution; (2) contacting said solution with a precipitating agent to form a solid catalyst intermediate wherein said precipitating agent comprises a sufficient amount of both a Lewis acid and an ether to effect the precipitation of said catalyst intermediate; and (3) contacting said solid catalyst intermediate with a second transition metal compound to produce a catalyst composition.

5,747,408

SUPPORTED CATALYSTS CONTAINING RHENIUM AND ALUMINIUM, PREPARATION THEREOF AND USE THEREOF FOR THE METATHESIS OF OLEFINS

Dominique Commereuc, Meudon, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Nov. 6, 1995, Ser. No. 554,351

Claims priority, application France, Nov. 4, 1994, 94 13349

Int. Cl.^{6} B01J *31/00;* **C07C** *6/00*

U.S. Cl. 502—171 **21 Claims**

1. A catalyst comparising a support and at least one rhenium/aluminum compound of the formula:

$$O_3Re—O—[Al(OR)(L)_x—O]_n—ReO_3$$

wherein R is an aryl residue of up to 40 carbon atoms, optionally substituted by at least one alkyl group, alkoxy group or halogen, L is synthesis solvent, x is equal to 0 or 1 and n is an integer of from 1 to 10.

5,747,409

CATALYTIC COMPOSITIONS BASED ON COMPOUNDS OF RHENIUM AND ALUMINIUM, PREPARATION THEREOF AND USE THEREOF FOR THE METATHESIS OF OLEFINS

Dominique Commereuc, Meudon, France, assignor to Institut Francais Du Petrole, Rueil Malmaison, France

Filed Nov. 6, 1995, Ser. No. 554,439

Claims priority, application France, Nov. 4, 1994, 94 13347

Int. Cl.^{6} B01J *31/00;31/32;31/14;* **C07C** *6/02*

U.S. Cl. 502—171 **23 Claims**

1. A catalyst composition comprising at least one unsupported rhenium/aluminum compound of the formula:

$$O_3Re—O—[Al(OR)(L)_x—O]_n—ReO_3$$

wherein R is aryl of up to 40 carbon atoms, optionally substituted by alkyl, alkoxy or halogen, n is an integer of from 1 to 10, x is equal to 0 or 1 and L represents synthesis solvent.

5,747,410

EXHAUST GAS CLEANER AND METHOD OF CLEANING EXHAUST GAS

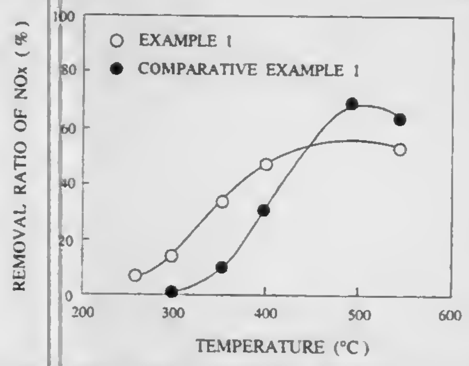
Gyo Muramatsu; Kazuhiko Ogiwara; Kiyohide Yoshida; Akira Abe; Naoko Irite; Shoji Mochida, and Katsuji Onai, all of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Division of Ser. No. 336,908, Nov. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 84,983, Jul. 2, 1993, abandoned. This application May 18, 1995, Ser. No. 444,273

Claims priority, application Japan, Jul. 3, 1992, 4-200638; Oct. 5, 1992, 4-290760; Oct. 15, 1992, 4-302840; Oct. 15, 1992, 4-302891; Oct. 15, 1992, 4-302899; Oct. 23, 1992, 4-309433; Nov. 13, 1992, 4-328895; Nov. 20, 1992, 4-335478; Nov. 24, 1992, 4-336583; Dec. 25, 1992, 4-358235; Dec. 25, 1992, 4-358316; Dec. 25, 1992, 4-358348; Jan. 13, 1993, 5-020566; Dec. 24, 1993, 5-347504

Int. Cl.^{6} B01J *23/70;23/72;8/02;* **C01B** *21/00*

U.S. Cl. 502—348 **23 Claims**



1. An exhaust gas cleaner for cleaning an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which consists essentially of

a first catalyst and a second catalyst, and optionally a heat-resistant substrate for supporting said first catalyst and said second catalyst,

wherein said first catalyst consists essentially of 0.1–15 weight % (on a metal basis) of a first catalytically active component supported by a porous inorganic oxide body and consisting essentially of Ag or an oxide thereof;

wherein said second catalyst consists essentially of 0.5–20 weight (on a metal basis) of a second catalytically active component supported by a porous inorganic oxide body and consisting essentially of (i) at least one alkali metal element, (ii) at least one element selected from the group consisting of Cu, Co, Mn and V and (iii) at least one rare earth element; all of said percentages being based on the amount (100 weight %) of said porous inorganic oxide body; and

wherein said first and second catalysts are mixed together.

5,747,411

SUPPORTED CATALYSTS WHICH ARE SUITABLE FOR AMMONOXIDATION

Lothar Karrer, Pfungstadt; Frank-Friedrich Pape, Kleinniedesheim; Ulrich Köhler, Mannheim; Rainer Becker, Bad Dürkheim; Peter Weidlich, Mannheim; Michael Hüllmann, Bensheim, and Heinz-Josef Kneuper, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 10, 1995, Ser. No. 513,740

Claims priority, application Germany, Aug. 12, 1994, 44 28 595.7

Int. Cl.^{6} B01J *23/18;23/22;* **C07C** *253/24*

U.S. Cl. 502—353 **17 Claims**

1. A supported catalyst which is suitable for ammonoxidation, comprising

a) a support material which essentially comprises aluminum oxide, silicon dioxide, titanium dioxide and/or zirconium dioxide, and

b) an active material which comprises, as essential components, vanadium and antimony in oxidic form

wherein the support material is spherical or approximately spherical and has a bulk density of from 0.6 to 1.2 kg/l.

5,747,412

THERMOGRAPHIC MATERIAL WITH OUTMOST ANTISTATIC LAYER

Luc Leenders, Herentals; Geert Defieuw, Bonheiden; Bart Horsten, Rumst, and Hans Strijckers, Oudergem, all of Belgium, assignors to AGFA-Gervaert N.V., Mortsel, Belgium

Filed Nov. 29, 1996, Ser. No. 753,794

Claims priority, application European Pat. Off., Nov. 27, 1995, 95203244.9; Nov. 27, 1995, 95203246.9; Dec. 27, 1995, 95203634.1; Jun. 1, 1996, 96201528.5

Int. Cl.^{6} B41M *5/28*

U.S. Cl. 503—201 **15 Claims**

14. A thermographic recording process comprising the steps of: (i) bringing an outermost layer of a thermographic recording material comprising a thermosensitive element, a support and an outermost antistatic layer, said thermosensitive element comprising comprising a substantially light-insensitive organic silver salt, an organic reducing agent for said substantially light-insensitive organic silver salt in thermal working relationship therewith and a binder, into contact with a heat source; (ii) applying heat from said heat source imagewise to said thermographic recording material while maintaining mutual contact to but with relative movement between said thermographic recording material and said heat source; and (iii) separating said thermographic recording material from said heat source, wherein said outermost antistatic layer is an organic layer with a resistivity of $<10^{10}\Omega/\square$ at a relative humidity of 30% and comprises a polythiophene with conjugated polymer backbone in the presence of a polymeric polyanion compound and a hydrophobic organic polymer having a glass transition value (T_g) of at least 40° C., said polythiophene being present at a coverage of at least 0.001 g/m^2 and the weight ratio of said polythiophene to said hydrophobic organic polymer being in the range of 1/10 to 1/1000.

OL
2 10
SS
1
MY
5
998
MI

5,747,413
REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL AND METHOD OF FORMING AND ERASING IMAGES

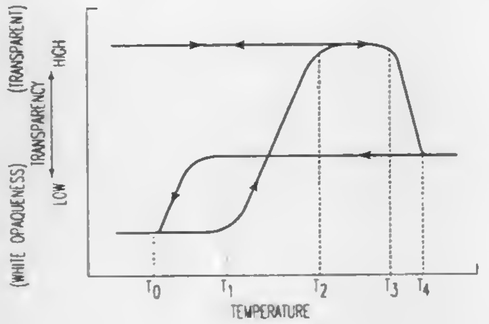
Tetsuya Amano, Numazu; Yoshihiko Hotta, Mishima; Makoto Kawaguchi, Numazu; Kazumi Suzuki, Shizuoka-ken, and Fumihito Masubuchi, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 522,364, Sep. 28, 1995, abandoned. This application Mar. 31, 1997, Ser. No. 829,147

Claims priority, application Japan, Jan. 28, 1994, 6-026177

Int. Cl.^{6} B41M *5/36*

U.S. Cl. 503—201 **52 Claims**



1. A reversible thermosensitive recording material comprising a support, and a thermosensitive layer provided on said support and including, as main ingredients, a resin matrix which has a low softening point which is greater than the crystallization point of the below-defined organic low molecular weight material and an organic low molecular weight substance which is particulate dispersed in said resin matrix, wherein the transparency of said thermosensitive layer reversibly changes depending on the temperature thereof, characterized in that said reversible thermosensitive recording material has a rate of change in heating temperature for the initiation of transparentization of 13% or less.

5,747,414
THERMAL RECORDING SHEET

Naomi Ogino, Tokyo; Takashi Oomori, Iwaki; Hiroshi Ueda, Tokyo; Yoshimi Midorikawa, Tokyo, and Yutaka Wakita, Tokyo, all of Japan, assignors to Nippon Paper Industries, Ltd., Tokyo, Japan

Filed Jun. 14, 1996, Ser. No. 662,255

Claims priority, application Japan, Jun. 15, 1995, 7-147973

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—207 **19 Claims**

1. A thermal recording sheet comprising a substrate having thereon a thermal color developing layer comprising a colorless or pale colored basic achromatic dye and an organic color developer, said thermal color developing layer containing aluminium hydroxide and an urea-formaldehyde resin pigment.

5,747,415
SUBBING LAYER FOR ANTISTATIC LAYER ON DYE-RECEIVING ELEMENT USED IN THERMAL DYE TRANSFER

Bruce Crinean Campbell; Thomas William Martin, both of Rochester; Ronald Stewart King; David Randall Williams, both of Fairport, all of N.Y., and Frederick W. Hesser, Marietta, Pa., assignors to Eastman Kodak Company, Rochester, N.Y., and Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 14, 1996, Ser. No. 663,960

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **20 Claims**

8. A process of forming a dye transfer image comprising:

a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a binder, and

b) transferring a dye image to a dye-receiving element to form said dye transfer image,

wherein said dye-receiving element comprises a support having on the front side thereof, in order, a biaxially-oriented composite film laminated thereto and a dye image-receiving layer, said composite film comprising a microvoided thermoplastic core layer and at least one substantially void-free thermoplastic surface layer, said support having on the back side thereof, in order, a biaxially-oriented film laminated thereto, a subbing layer and an antistatic layer, said subbing layer comprising an acrylic monomer, an acrylic homopolymer, an acrylic copolymer, a mixture of polyethylenes and a copolymer or terpolymer of polypropylene, or polypropylene having at least 0.1 g/m^2 of titanium dioxide, the ratio of thickness of the back side film to the composite film being from about 0.45 to about 1.0.

5,747,416
HERBICIDAL AND INSECTICIDAL PROTEIN-POLYSACCHARIDE DELIVERY COMPOSITIONS AND METHODS FOR CONTROLLING PLANT AND INSECT POPULATIONS

Blaise McArdle, 17 Leonard St., Annisquam, Mass. 01930-1321

Continuation-in-part of Ser. No. 523,162, Sep. 5, 1995, Pat. No. 5,591,473, which is a continuation-in-part of Ser. No. 263,001, Jun. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 89,268, Jul. 8, 1993, abandoned. This application Aug. 16, 1996, Ser. No. 699,578

Int. Cl.^{6} A01N *25/10;3/02;* **C05G** *5/00*

U.S. Cl. 504—115 **37 Claims**

1. A controlled release plant protection agent delivery composition for controlling a population of plants or related vegetation in dry, moist, semi-aquatic, or aquatic environments comprising: (a) at least one protein-polysaccharide complex composition comprising: between about 90% to 99.5% by weight of a water-soluble polysaccharide impregnated with between about 10% to 0.5% by weight of a substantially water-insoluble protein, and (b) at least one plant protection agent, said protein-polysaccharide complex and said plant protection agent being present in a total amount effective to control or fertilize a target population of vegetation or to control a target population of pests by ground or aerial application techniques. and wherein said composition is an admixture formed by mixing the protein-polysaccharide complex composition and the plant protection agent.

5,747,417
METHOD FOR PRODUCING PESTICIDE COMPOSITION

Pontus Harju-Jeanty, Mustasaari, and Torbjörn Ahlskog, Vaasa, both of Finland, assignors to Hoechst Schering AgrEvo GmbH, Germany

PCT No. PCT/FI95/00108, § 371 Date Aug. 29, 1996, § 102(e) Date Aug. 29, 1996, PCT Pub. No. WO95/23505, PCT Pub. Date Sep. 8, 1995

PCT Filed Feb. 28, 1995, Ser. No. 700,401

Claims priority, application Finland, Mar. 1, 1994, 940968

Int. Cl.^{6} A01N *25/04;47/22*

U.S. Cl. 504—116 **6 Claims**

1. A method for preparing oil-in-water herbicide suspensions containing at least one carbamoyl oxyphenyl carbamate herbicide, wherein either: a) oil is emulsified with a water-emulsifier solution, and then mixed with said herbicide, or (b) oil is emulsified with a water-emulsifier-herbicide mixture, characterized in that said emulsifying is performed in a high power dispersing machine with a circumferential blade speed of between about 7 to 20 m/s, such that the mean oil drop size of said emulsion is less than 5 micrometers and wherein the emulsion includes at least one surfactant selected from the group consisting of alkyl sulfates and derivatives thereof, sulfonic acid compounds, sulfonate compounds, phosphoric acid esters and salts. polyethoxylated amines, amides, fatty acids, alkenoxilated phenols and alkanols, polyglycol ethers, fat-alcohol alkene oxide concentrates, alkyl amino acids, imidazoline amphotensides, and block copolymers;

wherein said emulsion does not include a sucroglyceride surfactant.

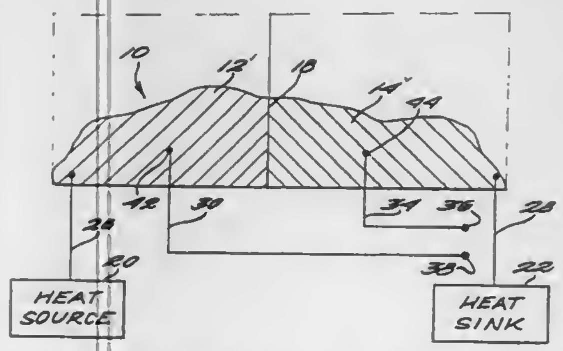
5,747,418
SUPERCONDUCTING THERMOELECTRIC GENERATOR

John D. Metzger, Eaton's Neck, N.Y., and Mohamed S. El-Genk, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 336,050, Nov. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 43,457, Apr. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 841,169, Feb. 25, 1992, abandoned. This application Oct. 17, 1996, Ser. No. 732,945

Int. Cl.^{6} H01L *39/06;39/22;35/04;35/14*

U.S. Cl. 505—160 **21 Claims**



1. A device for producing electricity, comprising:

a pair of thermoelectric materials, said pair comprising a conductor and a semiconductor;

said conductor having a length and a critical temperature, said conductor conducting electricity substantially without resistance when the temperature of said conductor is less than said critical temperature;

said semiconductor having a length substantially equal to that of said conductor and touching said conductor so as to maximize an overlap between said semiconductor and said conductor, said overlap defining a substantial boundary between said conductor and said semiconductor;

a heat sink in thermal contact with said conductor; and

a heat source in thermal contact with said semiconductor, said heat source and said heat sink maintaining a first temperature in said conductor and a second temperature in said semiconductor, said first temperature being less than said critical temperature so that said conductor conducts electricity substantially without resistance, said second temperature being higher than said first temperature so that a temperature gradient is established across substantially the entirety of said boundary, said temperature gradient resulting in an electrical potential between said conductor and said semiconductor.

5,747,419
PLANT GROWING AGENT COMPRISING IRON FERROCYANIDE COMPLEXES AND PLANT GROWING METHOD

Shoichi Ishimoto, and Toshio Hattori, both of Tokyo, Japan, assignors to Ishimoto Agri-Tech Research Corp., Tokyo, Japan

Filed Jan. 28, 1997, Ser. No. 790,364

Claims priority, application Japan, Jan. 31, 1996, 8-037349

Int. Cl.^{6} A01N *59/16;* **C05C** *9/00;* **C05D** *9/02*

U.S. Cl. 504—187 **10 Claims**

1. A plant growing agent comprising:

a blue pigment that contains, as a main ingredient, a compound represented by the following formula:

$MFe[Fe(CN)_6]$.

(wherein M is an alkali metal or an ammonium group, and one Fe is of divalent, while the other Fe is of trivalent); and

a substance for changing the cuticular of the surface layer of a plant so as to facilitate permeation of the blue pigment into the interior of the tissue of the plant.

5,747,420
TETRAZOLINONES

Toshio Goto, Shimotsgua-gun; Seishi Ito; Kazuhiro Ukawa, both of Oyama; Yukiyoshi Watanabe, Saitama; Shin-ichi Narabu, Ibaraki, and Akihiko Yanagi, Tochigi, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

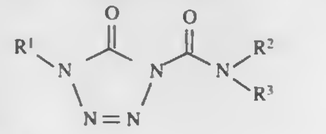
Filed Nov. 3, 1995, Ser. No. 552,900

Claims priority, application Japan, Nov. 11, 1994, 6-301604

Int. Cl.^{6} C07D *257/06;295/104;403/06;413/06*

U.S. Cl. 504—209 **11 Claims**

1. A tetrazolinone derivative of the formula:



(I)

wherein

R^1 is alkyl substituted by halogen, and

R^2 and R^3 each independently is alkyl, alkenyl, alkynyl, cycloalkyl which may optionally be substituted, phenyl or substituted phenyl, or

R^2 and R^3 together with the N-atom to which they are attached, are a 5- or 6-membered heterocyclic ring which may optionally be substituted.

5,747,421
FORMYLAMINOPHENYLSULFONYLUREAS, PREPARATION PROCESSES AND USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Gerhard Schnabel, Groβwallstadt; Lothar Willms, Hofheim; Klaus Bauer, Hanau; Hermann Bieringer, Eppstein, and Christopher Rosinger, Hofheim, all of Germany, assignors to Hoechst Schering Agrevo GmbH, Berlin, Germany

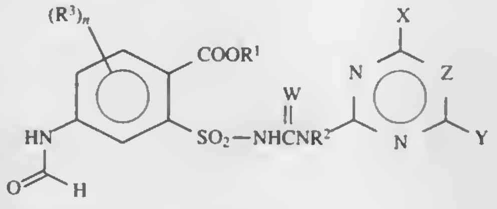
Filed May 30, 1995, Ser. No. 453,978

Claims priority, application Germany, Jun. 1, 1994, 44 19 259.2; Mar. 20, 1995, 195 10 078.6

Int. Cl.^{6} C07D *239/69;* **A01N** *43/54*

U.S. Cl. 504—214 **17 Claims**

1. A compound of the formula (I)



(I)

wherein

R^1 is H, $(C_1–C_{12})$-alkyl, $(C_2–C_{12})$-alkenyl or $(C_2–C_{12})$-alkynyl, $(C_3–C_6)$-cycloalkyl or phenyl, each of the last mentioned alkyl-containing radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, $(C_1–C_3)$-alkoxy, $(C_1–C_3)$-haloalkoxy, $(C_3–C_6)$-cycloalkyl, $(C_1–C_3)$-alkylthio, $(C_1–C_3)$-alkylsulfinyl, $(C_1–C_3)$-alkylsulfonyl and phenyl, which is unsubstituted or substituted by one or more identical or different radicals selected from the group consisting of halogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-haloalkoxy, nitro and cyano, and

a saturated heterocyclic radical having 3 to 7 ring atoms and having 1 hetero ring atom from the group consisting of N, O and S, or a heterocyclic radical selected from piperazinyl dioxolanyl and morpholinyl the radical being unsubstituted or substituted by one or more radicals from the group consisting of halogen, $(C_1–C_3)$-alkyl, $(C_1–C_3)$-haloalkyl and oxo, and in the case of cyclic radicals also $(C_1–C_4)$-alkyl and $(C_1–C_4)$-haloalkyl,

or is a saturated heterocyclic radical having 3 to 7 ring atoms and having 1 hetero ring atom from the group consisting of N, O and S, or a heterocyclic radical selected from piperazinyl, dioxolanyl and morpholinyl the radical being unsubstituted or substituted by one or more radicals from the group consisting of halogen, $(C_1–C_3)$-alkyl, $(C_1–c_3)$-haloalkyl and oxo,

R^2 is H, $(C_1–C_6)$-alkyl or $(C_1–C_6)$-alkoxy,

R^3 is halogen, $(C_1–C_6)$-alkyl, $(C_1–C_6)$-haloalkyl, $(C_1–C_6)$-alkoxy, $(C_1–C_6)$-haloalkoxy, NO_2, CN, NH_2 or mono- or di-$(C_1–C_4)$-alkylamino, each independently of other radicals R^3 if n is 2 or 3,

n is 0, 1, 2 or 3,

W is an oxygen or sulfur atom, p1 X and Y independently of one another are halogen, $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkoxy or $(C_1–C_6)$-alkylthio, each of the three last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, $(C_1–C_4)$-alkoxy and $(C_1–C_4)$-alkylthio, or are $(C_3–C_6)$-cycloalkyl, $(C_2–C_6)$-alkenyl, $(C_2–C_6)$-alkynyl, $(C_2–C_6)$-alkenyloxy, $(C_2–C_6)$-alkynyloxy, mono- or di-$[(C_1–C_4)$-alkyl]-amino, and

Z is CH.

5,747,422
SUBSTITUTED 2-PHENYLPIRIDINES

Peter Schäfer, Ottersheim; Gerhard Hamprecht, Weinheim; Elisabeth Heistracher, Ludwigshafen; Ralf Klintz, Gruenstadt; Hartmann König, Heidelberg; Helmut Walter, Obrigheim; Karl-Otto Westphalen, Speyer, and Ulf Misslitz, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/00008, § 371 Date Jul. 3, 1997, § 102(e) Date Jul. 3, 1997, PCT Pub. No. WO96/21646, PCT Pub. Date Jul. 18, 1996

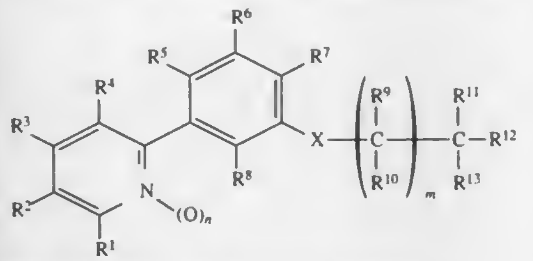
PCT Filed Jan. 4, 1996, Ser. No. 860,031

Claims priority, application Germany, Jan. 13, 1995, 195 00 911.8

Int. Cl.^{6} A01N *43/40;* **C07D** *213/89*

U.S. Cl. 504—244 **11 Claims**

1. A substituted 2-phenylpyridine of the general formula I



I

where the variables have the following meanings:

n is 0 or 1;

R^1, R^3 and R^4 independently of one another are

hydrogen, halogen, $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl, hydroxyl, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, nitro, amino, Cl-C_4-alkylamino, di-$(C_1–C_4$-alkyl)-amino, mercapto, $C_1–C_4$-alkylthio, $C_1–C_4$-haloalkylthio, cyano, carboxyl, aminocarbonyl, $(C_1–C_4$-alkylamino)carbonyl or di-$(C_1–C_4$-alkyl)-aminocarbonyl;

R^2 is hydrogen, halogen, $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl, cyano, nitro, amino, hydroxyl, $C_1–C_4$-haloalkoxy, mercapto, $C_1–C_4$-alkylthio, $C_1–C_4$-haloalkylthio, $C_1–C_4$-alkylsulfinyl, $C_1–C_4$-haloalkylsulfinyl, $C_1–C_4$-alkylsulfonyl or $C_1–C_4$-haloalkylsulfonyl;

R^5 is hydrogen, halogen or cyano;

R^6 and R^8 independently of one another are hydrogen or halogen;

R^7 is hydrogen, cyano, nitro, hydroxyl, trifluoromethylsulfonyloxy, halogen, $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl, $C_1–C_4$-alkoxy or $C_1–C_4$-haloalkoxy;

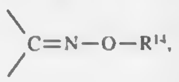
X is oxygen or sulfur,

R^9 and R^{10} independently of one another are hydrogen or $C_1–C_4$-alkyl;

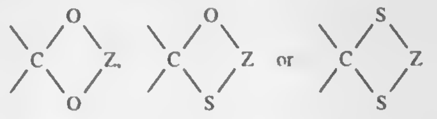
m is 1, 2, 3 or 4;

R^{11} is $C_1–C_6$-alkyl, $C_3–C_6$-cycloalkyl, C_1-C_4-haloalkyl having one to five halogen atoms, $C_2–C_4$-alkenyl, $C_2–C_4$-haloalkenyl having one to three halogen atoms, $(C_1–C_4$-alkoxy)carbonyl, $(C_1–C_4$-alkoxy)carbonyl-$(C_1–C_4$-alkyl), unsubstituted or mono- to trisubstituted phenyl, unsubstituted or mono- or disubstituted thienyl, furanyl, tetrahydrofuranyl, pyrrolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, pyridyl or pyrimidyl, where the substituents selected in each case are from the group consisting of nitro, cyano, halogen, $C_1–C_4$-alkyl and $C_1–C_4$-alkoxy;

R^{12} and R^{13} independently of one another are $C_1–C_4$-alkoxy or $C_1–C_4$-alkylthio or, together with the common carbon atom to which they are bonded, are the carbonyl group, a group


$>C=N-O-R^{14},$

where R^{14} is hydrogen, $C_1–C_4$-alkyl, $C_2–C_6$-alkenyl, $C_2–C_6$-haloalkenyl having one to three halogen atoms, $(C_1–C_4$-alkoxy)carbonyl-$(C_1–C_4$-alkyl) or benzyl, or a heterocycle



where Z is an ethylene or trimethylene chain in which, if desired, one to four hydrogen atoms can be substituted by $C_1–C_4$-alkyl or $(C_1–C_4$-alkoxy)carbonyl in each case,

or the agriculturally utilizable salts of the compounds I.

5,747,423
HERBICIDAL 6-THIENYL AND 4-THIENYL PYRIMIDINES

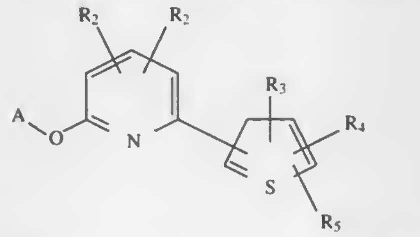
Stefan Scheiblich; Thomas Maier, both of Mainz; Helmut Siegfried Baltruschat, Schweppenhausen, all of Germany, and Joseph Luke Pont, Lawrenceville, N.J., assignors to American Cyanamid Company, Parsippany, N.J.

Filed Jul. 15, 1996, Ser. No. 680,193

Int. Cl.^{6} C07D *401/04;401/14;* **A01N** *43/40;43/66*

U.S. Cl. 504—251 **8 Claims**

1. A compound comprising 6-thienyl pyridines of formula I:



(I)

wherein

A represents an optional substituted phenyl group or an optionally substituted 5- or 6- membered nitrogen-containing heteroaromatic group selected from the group consisting of pyrazolyl, imidazolyl, triazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidyl, pyridazinyl, isoxazolyl, isothiazolyl and triazinyl; in which the optional substituents include halogen atoms, and nitro, cyano, amino, hydroxyl, C_{1-4} alkyl, C_{1-4}-alkoxy, C_{1-4}-haloalkyl, C_{1-4} haloalkenyl, C_{1-4} haloalkoxy, C_{1-4}-haloalkylthio and halosulfanyl groups;

R_1 and R_2 independently represents a hydrogen atom, a halogen atom, an optionally substituted alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, dialkoxyalkyl, alkoxyalkoxy, alkylthio, amino, alklamino, dialkylamino, or an alkoxyamino group;

in which the optional substituents are selected from the group consisting of phenyl, halogen atoms, nitro, cyano, hydroxyl, C_{1-4}-alkoxy, C_{1-4} haloalkoxy and C_{1-4}-alkoxycarbonyl; and in which the moieties comprising an alkyl, alkenyl or alkynyl group contain 1 to 6 carbon atoms; or formamidino group;

R_3, R_4, and R_5 independently represents a hydrogen atom, a halogen atom, an optionally substituted alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxy, alkoxyalkoxy, alkylthio, haloalkylthio alkylsulphonyl or alkylsulfinyl group;

in which the optional substituents are selected from phenyl, halogen atoms, nitro, cyano, hydroxyl, C_{1-4} alkoxy, C_{1-4}-haloalkoxy and C_{1-4}-alkoxycarbonyl groups; and in which the moieties comprising an alkyl, alkenyl or alkynyl group contain 1 to 6 carbon atoms; or a nitro, cyano or SF_5 group.

5,747,424
HERBICIDAL 4-SUBSTITUTED ISOXAZOL

David Alan Roberts; Susan Mary Cramp; Derek Ian Wallis, all of Ongar, England, and Jean-Paul Bulot, Dardilly, France, assignors to Rhone-Poulenc Agriculture Ltd., Ongar, England

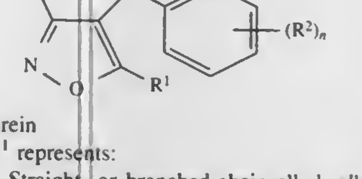
Division of Ser. No. 460,093, Jun. 2, 1995, Pat. No. 5,656,573, which is a continuation of Ser. No. 108,792, Aug. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 850,035, Mar. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 580,795, Sep. 11, 1990, abandoned, said Ser. No. 108,792 is a continuation-in-part of Ser. No. 850,031, Mar. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 790,175, Nov. 12, 1991, abandoned, said Ser. No. 108,792 is a continuation-in-part of Ser. No. 742,381, Aug. 8, 1991, abandoned, Ser. No. 850,128, Mar. 12, 1992, abandoned, and Ser. No. 850,424, Mar. 12, 1992, abandoned. This application May 1, 1997, Ser. No. 848,909

Claims priority, application United Kingdom, Sep. 11, 1989, 8920519

Int. Cl.^{6} A01N *43/80;* **C07D** *261/06*

U.S. Cl. 504—271 **14 Claims**

1. A process for the preparation of a compound of the formula:



(I)

wherein

R^1 represents:

Straight- or branched-chain alkyl, alkenyl or alkynyl having up to 6 carbon atoms, optionally substituted by one of more halogens;

or cycloalkyl having from 3 to 6 carbon atoms, optionally bearing one or more substituents selected from the group consisting of R^{93}, halogen and $-CO_2R^{96}$, wherein R^{93} and R^{96} are defined below; or

cycloalkenyl having 5 or 6 carbon atoms, optionally bearing one or more substituents selected from the group consisting of R^{93}, halogen and $-CO_2R^{96}$, wherein R^{93} and R^{96} are defined below; or

an aryl or aralkyl group of the formula$(R^2)_q$phenyl $(—CR^{93}R^{94}—)_p$, wherein R^2, q, p, R^{93} and R^{94} are as defined below ro

a member selected from the group consisting of $—CO_2R^{93}$ and $—COR^{93}$, wherein R^{93} is as defined below;

R^2 represents:

a member selected from the group consisting fo nitro, cyano, halogen, R^{95}, $—S(O)_mR^{95}$, $—SO_2NR^{93}R^{94}$, $—CO_2R^{93}$, $—COR^{93}$,$—CONR^{93}R$

L, $— CSNR^{93}R^{94}$, $—CSNR^{93}R^{94}$, $—OR^{95}$ and $C_1–C_3$ alkyl substituted by $—OR^{95}$, wherein R^{93}, R^{94}, R^{95} and m are defined below;

n represents an integer from 1 to 5;

Q represents C=O;

R^{93} and R^{94}, which are the same or different each represents:

hydrogen or straight- or branched-chain alkyl having up to 6 carbon atoms, optionally substituted by one or more halogens;

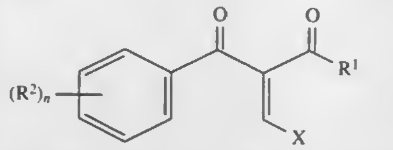
R^{95} represents:

straight or branched-chain alkyl having up to 6 carbon atoms, optionally substituted by one or more halogens;

R^{96} is as defined for R^{93} but does not represent hydrogen;

m represents zero, 1 or 2;

with the proviso that when R^1 is methyl, then $(R^2)_n$ cannot be 4-fluoro; said process comprising reacting a compound of the formula



(II)

wherein R^1, R^2 and n are as defined above, and X is O-alkyl or N,N-dialkyl, with hydroxylamine or a salt of hydroxylamine, in the presence of a solvent.

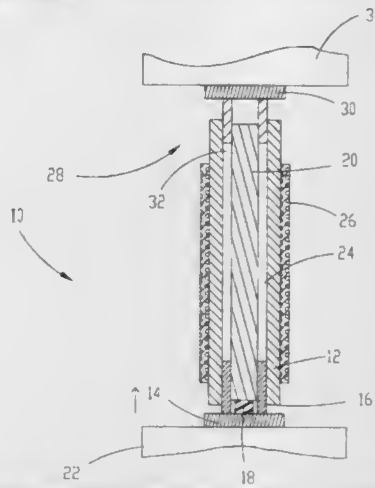
5,747,425
HIGH T_C SUPERCONDUCTOR MAGNETIC SHIELDS AND METHOD OF MAKING SAME

Ying Xin; Wangsong He, both of Lawrence; Michael S. P. Lucas, Manhattan; Xin Fei, Lawrence, all of Kans., and Yi-Han Kao, Williamsville, N.Y., assignors to Midwest Supercooductivity Inc., Lawrence, Kans.

Continuation of Ser. No. 281,611, Jul. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 101,574, Aug. 3, 1993, abandoned. This application Oct. 7, 1996, Ser. No. 726,623

Int. Cl.^{6} H05K *9/00;* **H01L** *39/00*

U.S. Cl. 505—150 **31 Claims**



1. A superconducting magnetic shield comprising a self-sustaining body formed by uniaxial compression of superconducting ceramic particles in a compression chamber defined in part by circumscribing shape-retaining solid wall structure disposed about said particles, said uniaxial compression being carried out while said solid wall structure retains the shape thereof, said shield having a critical applied magnetic field value of at least about 50 Gauss at 77 K and having a shielding factor attenuation rate of from about 40 to about 180 dB, and said body having a thickness

of from about 0.5–10 mm, and said particles including Tl-containing high T_c superconducting ceramic particles.

5,747,426

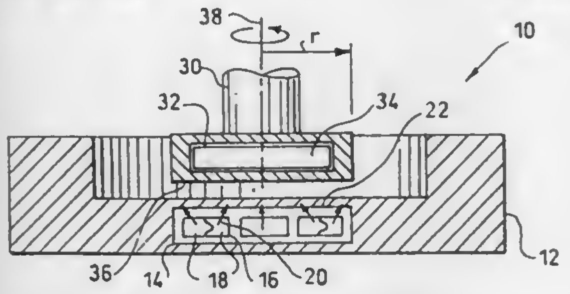
HIGH PERFORMANCE MAGNETIC BEARING SYSTEMS USING HIGH TEMPERATURE SUPERCONDUCTORS

Robert G. Abboud, Barrington Hills, Ill., assignor to Commonwealth Research Corporation, Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 483,458

Int. Cl.⁶ H02K *7/09*

U.S. Cl. 505—166 **41 Claims**



1. A structure for magnetic bearings, comprising:

- a superconducting assembly comprising at least one superconducting magnetic member, said superconducting magnetic member having a support face and containing at least one domain, each of said domain including respective domain C-axis vectors;
- a magnetic assembly comprising at least one magnetic member, said magnetic member having a thrust face opposing said support face and including a reference axis having a direction perpendicular to said thrust face;
- a magnetic field between said superconducting assembly and said magnetic assembly, said magnetic field characterized by a plurality of flux lines, each of said flux lines intersecting said support face at an intersecting point, each of said flux lines having a flux slope at said intersecting point;
- said structure having an arrangement wherein said superconducting magnetic member includes at least one domain C-axis vector alignment angularly disposed relative to said reference axis, such that at least one of said C-axis vectors is aligned with at least one of said flux slope;
- said arrangement providing at least one stabilizing force.

5,747,427

PROCESS FOR FORMING A SEMICONDUCTIVE THIN FILM CONTAINING A JUNCTION

Norio Homma, Hokkaido, and Tadataka Morishita, Tokyo, both of Japan, assignors to Hokkaido Electric Power Co., Inc., and International Superconductivity Technology Center, both of Japan

Continuation of Ser. No. 450,523, May 25, 1995, abandoned, which is a continuation-in-part of Ser. No. 216,763, Mar. 22, 1994, abandoned, which is a continuation of Ser. No. 969,795, Oct. 30, 1992. This application Apr. 26, 1996, Ser. No. 638,286

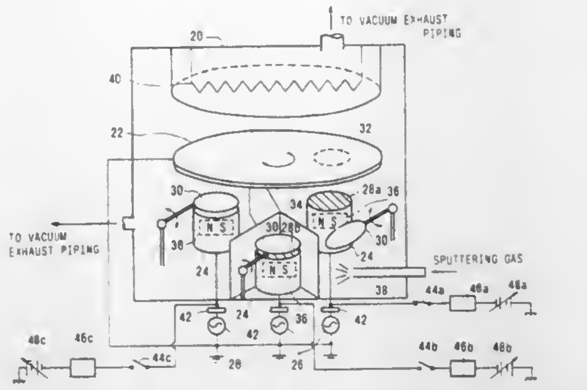
Claims priority, application Japan, Nov. 15, 1991, 3-300820

Int. Cl.⁶ C23C *14/34*

U.S. Cl. 505—476 **12 Claims**

1. A process for forming a composite junction film in which a composite oxide target is sputtered by means of a sputtering method using a discharge frequency, said process comprising the steps of:

- forming a first crystalline oxide $YBa_2Cu_3O_x$ film, wherein an oxygen ratio in the first oxide film is $6.35<x<7$, said first $YBa_2Cu_3O_x$ film exhibiting superconductivity at a first temperature range; and
- forming a second crystalline oxide $YBa_2Cu_3O_y$ film, wherein an oxygen ratio in the second oxide film is $6<y<6.35$, said second $YBa_2Cu_3O_y$ film being semiconductive, but in the first temperature range where said first film exhibits superconductivity, said second film has increased resistance so that said second film is effective as an insulator;
- wherein said first oxide film and said second oxide film are sequentially formed so as to be contiguous to each other, in a sputtering apparatus where a first target and a first target cathode voltage are used to form the first oxide film, and a second target and a second target cathode voltage are used to form the second oxide film, and wherein during said formation of said first oxide film and said second oxide film, the absolute value of the first target cathode voltage is greater than the absolute value of said second target cathode voltage while maintaining RF power, RF frequency in a range from approximately 13.56 MHz to 94.92 MHz, substrate temperature, sputtering gas, and sputtering gas pressure at the same conditions.



5,747,428

SOLID LUBRICANT FOR LOW AND HIGH TEMPERATURE APPLICATIONS

Behrooz A. Khorramian, 130 Woodridge Pl., Leonia, N.J. 07605-1625

Filed Mar. 10, 1997, Ser. No. 812,672

Int. Cl.⁶ C10M *13/00*

U.S. Cl. 508—151 **11 Claims**

1. A dry, solid multi-component lubricant coating deposited on the surface of substrate material thereof, said multi-component coating comprising:

- a first layer of chromium silicide or chromium carbide deposited on said substrate; and
- a second layer of soft lubricant selected from the group consisting of tungsten disulfide, niobium disulfide, molybdenum disulfide, tantalum disulfide, tungsten diselenide, niobium diselenide, molybdenum diselenide, and tantalum diselenide deposited on said chromium silicide or chromium carbide a third layer which is a noble metal deposited on the said second layer.

5,747,429

FLUID COMPOSITION FOR USE IN FLUID COUPLINGS CONTAINING AT LEAST ONE FERROCENE DERIVATIVE

Tomohiro Katoh; Hitoshi Oenoki; Hironari Ueda; Mikirou Arai, and Toshiaki Kuribayashi, all of Saitama-ken, Japan, assignors to Tonen Corporation, Tokyo, Japan

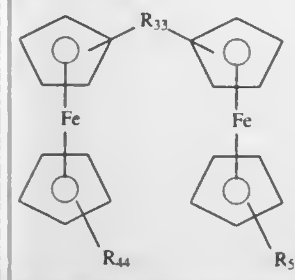
Filed Dec. 27, 1995, Ser. No. 579,342

Claims priority, application Japan, Dec. 27, 1994, 6-339960

Int. Cl.⁶ C10M *139/06*

U.S. Cl. 508—208 **10 Claims**

1. A fluid composition for use in fluid couplings, comprising an organopolysiloxane base oil having a viscosity of 50 mm^2/s to 20,000 mm^2/s at 25° C., said base oil containing at least one ferrocene derivative in an amount such that iron from said ferrocene is present in said composition in an amount of 10 ppm to 5,000 ppm, said at least one ferrocene derivative being selected from the group consisting of C_{6-25} cycloalkenyl ferrocene, and compounds of general formula (2A)



(2A)

wherein R_{33} is a divalent hydrocarbon group having 2–25 carbon atoms and R_{44} and R_{55} are each independently selected from the group consisting of C_{2-25} alkyl, alkenyl, cycloalkyl, cycloalkenyl, and wherein one of R_{44} and R_{55} can be a hydrogen atom.

5,747,430

LUBRICANT COMPOSITION

Shozo Matsushita, and Naomi Suzuki, both of Saitama-Ken, Japan, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

PCT No. PCT/US95/09564, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO96/03480, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 8, 1995, Ser. No. 750,263

Claims priority, application Japan, Jul. 28, 1994, 6-176315

Int. Cl.⁶ C10M *133/00;139/00;141/10*

U.S. Cl. 508—209 **3 Claims**

1. A lubricant composition comprising 1 ppm to 500 ppm of organo polysiloxane with a viscosity of 1,000 mm^2/s at 40° C. and 1 ppm to 5,000 ppm of tetra poly alkylene oxide amine in a base oil having a viscosity of 10 mm^2/s to 700 mm^2/s at 40° C.

5,747,431

LUBRICANT COMPOSITIONS

James Taylour, Warrington, England, and Eberhard Glozbach, Werz, Germany, assignors to Diversey Lever Inc., Plymouth, Mich.

PCT No. PCT/CA95/00024, § 371 Date Feb. 3, 1997, § 102(e) Date Feb. 3, 1997, PCT Pub. No. WO95/19412, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 12, 1995, Ser. No. 682,751

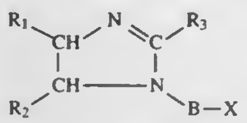
Claims priority, application United Kingdom, Jan. 12, 1994, 9400436

Int. Cl.⁶ C10M *173/02*

U.S. Cl. 508—283 **19 Claims**

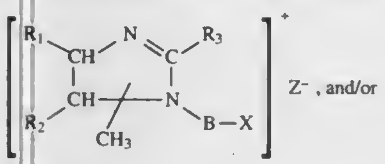
1. A concentrate comprising an aqueous carrier, the concentrate, upon dilution with additional water forming a lubricant for use on a conveyor track, which concentrate comprises the following components:

(a) (i) a cyclic imidazoline of the general formula (I):



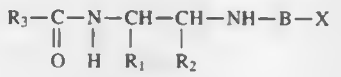
(I)

(a) (ii) an cyclic imidazoline of the general formula (II):



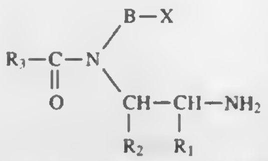
(II)

(a) (iii) an amide of the general formula (III) or (IV):



$$R_3-\underset{\underset{O}{\|}}{C}-\underset{\underset{H}{|}}{N}-\underset{\underset{R_1}{|}}{CH}-\underset{\underset{R_2}{|}}{CH}-NH-B-X \qquad (III)$$

or



(IV)

wherein R_1, R_2, and R_3 are the same or different and are each —H or —A —Y, in which A is a C_7 to C_{20} saturated or unsaturated, linear or branched chain alkylene group, B is a C_1 to C_{20} saturated or unsaturated, linear or branched chain alkylene group, Y is H, NH_2, OH, or $COOM_1$ in which M_1 is H or a Group 1 metal ion, and X is H, NH_2, OH, $COOM_2$ or $—NH—CO—R_4$, in which M_2 is the same or different from M_1 and is H or a Group 1 metal ion and R_4 is a C_1 to C_{20} saturated or unsaturated, linear or branched chain alkyl group and, in the cyclic imidazoline of general formula (II), the CH_3 ring substituent is present at position 1 or 3 of the ring, and Z^- is an anion; and

(b) an amount of acid sufficient to render the cyclic imidazoline or amide soluble in water, said acid (b) an amount of a carboxylic acid having up to 6 carbon atoms.

5,747,432

PRESS MOLDING OIL AND METHOD OF MANUFACTURING PRESS-MOLDED PRODUCTS BY USING THE SAME

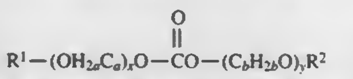
Masao Hayashi, Shiga; Go Minami, Osaka; Kuniaki Matsunaga, Tochigi; Tsuyoshi Fujii, Tokyo, and Takashi Hayashi, Chiba, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 28, 1996, Ser. No. 608,447

Int. Cl.⁶ C10M *141/02*

U.S. Cl. 508—462 **4 Claims**

1. Press-molding oil comprising alkyl carbonate shown in the following Chemical Formula A as an active ingredient:



$$R^1-(OH_{2a}C_a)_xO-\overset{\overset{O}{\|}}{C}O-(C_bH_{2b}O)_yR^2 \qquad \text{(Chemical Formula A)}$$

- wherein a and b are an integer from 1 to 6; x and y are an integer from 0 to 30; R^1 and R^2 are an alkyl group, cycloalkyl group, alkylphenyl group, or alkylbenzyl group having from twelve to sixteen carbon atoms and straight or branched alkyl chains, and further comprising an antioxidant in an amount of 0.01 to 1 wt %,
- wherein the press-molding oil is suitable for press-molding of shadow masks to be used for cathode-ray tubes, which were not yet subjected to a gas blackening process.

5,747,433

OIL CONCENTRATES OF POLYMERS WITH IMPROVED VISCOSITY

Carmen V. Luciani, Wickliffe; Richard M. Lange, Euclid, and Joseph G. Seebauer, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jul. 15, 1996, Ser. No. 683,556

Int. Cl.⁶ C10M *157/00*

U.S. Cl. 508—479 **24 Claims**

1. A composition comprising:

- (a) about 2 to about 20 percent by weight of a block copolymer comprising a vinyl aromatic comonomer moiety and second comonomer moiety;
- (b) an oil of lubricating viscosity; and

(c) a non-ionic surface active agent, soluble in said oil, comprising at least one ester or ether group, in an amount sufficient to reduce the viscosity of the composition of said block copolymer in said oil;

wherein the total amount of polymer species in the composition, exclusive of the non-ionic surface active agent, is less than 30 percent by weight.

5,747,434
ENZYMATIC PROCESS FOR PREPARING A SYNTHETIC ESTER FROM A VEGETABLE OIL

Merja Lämsä, Merimasku; Yu-Yen Linko; Pekka Linko, both of Espoo, and Esa Uosukainen, Helsinki, all of Finland, assignors to Raisio Yhtyma Oyj, Raisio, Finland

PCT No. PCT/FI95/00478, § 371 Date Mar. 4, 1997, § 102(e) Date Mar. 4, 1997, PCT Pub. No. WO96/07751, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 7, 1995, Ser. No. 793,991

Claims priority, application Finland, Sep. 7, 1994, 944119

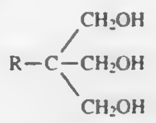
Int. Cl.^{6} C10M *141/02*

U.S. Cl. 508—485 **20 Claims**

1. An enzymatic process for preparing a synthetic ester from a vegetable oil, comprising

transesterification of said vegetable oil by reacting it with a lower alkanol to form a mixture of lower alkyl esters of fatty acids,

a second transesterification reaction wherein the obtained mixture of esters is reacted in the presence of a lipase triacylglycerol acylhydrolase; EC 3.1.1.3. with a no beta hydrogen polyol of the formula



wherein R is a C_1–C_6 alkyl group or a —CH_2OH group, and recovering the synthetic ester obtained.

5,747,435
MILD FOAMING AND CONDITIONING DETERGENTS

Amrit M. Patel, Dayton, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 17, 1996, Ser. No. 682,494

Int. Cl.^{6} C11D *1/12;1/88;1/94;9/36*

U.S. Cl. 510—119 **33 Claims**

1. A clear, ultra mild, aqueous, foaming and conditioning detergent composition comprising by weight,

A. about 5% to about 40% of a detersive surfactant mixture of:
  (1) about 2% to about 14% of an anionic detergent selected from the group consisting of C_8–C_{18} alkyl sulfates, C_8–C_{18} alkyl ethenoxy ether sulfate containing 1 to 5 ethenoxy groups in the molecule, C_8–C_{18} acyl isethionates, C_{10}–C_{20} allyl sulfonates, C_{10}–C_{22} alkene sulfonates, and mixtures thereof;
  (2) about 0.5% to about 5% of an anionic hydrotropic, C_1–C_3 alkyl benzene sulfonate or C_5–C_6 alkyl sulfate; and
  (3) about 2.5% to about 21% of an amphoteric surfactant selected from the group consisting of C_8–C_{18} alkyl betaines, and sulfobetaines, C_8–C_{18} alkyl amido, C_2–C_3 alky betaines and sulfobetaines, C_8–C_{18} alkyl amphoacetates, C_8–C_{18} alkyl amphopropionates, and mixtures thereof;

B. about 0.05% to about 9% by weight of a water-insoluble conditioning agent which is soluble in said detersive surfactant mixture and which comprises 0.05% to 5% of a complex of essentially equimolar amounts of a C_8–C_{18} $(EtO)_{1\text{-}10}$ carboxylic acid, and a C_8–C_{18} alkyl $(EtO)_{0\text{-}10}$ dimethyl amine and at least one member selected from the group consisting of:
  (1) 0.25% to 3% of a water-insoluble silicone which is soluble in said aqueous detersive surfactant mixture and is selected from the group consisting of polydimethylsiloxane polyether copolymers, polydimethylsiloxanes containing an amino substituent, polydimethylsiloxanes containing at least one ammonia substituent and mixtures thereof;
  (2) a mixture of the water-insoluble conditioning agent with about 0.1 to 1.0% of a polyquaternary compound selected from the group consisting of a quaternized cellulosic polymer and a mixture of the quaternized cellulosic polymer with a non-cellulosic quaternary conditioning polymer; and
  (3) a mixture of the water-insoluble conditioning agent and B(1) with about 0.1 to 1.0% of a polyquaternary compound selected from the group consisting of a quaternized cellulosic polymer and a mixture the quaternized cellulosic polymer with a non-cellulosic quaternary conditioning polymery; and

C. the balance of an aqueous medium; the sum of the moles of anionic detergent and anionic benzene sulfonate being substantially equal to the sum of the moles of amphoteric detergent and catonic conditioning agent at a pH in the range of 5.5 to 7.0 and said composition being effective to deliver said conditioning agent in water insoluble form at use concentrations of the composition in water.

5,747,436
LOW STATIC CONDITIONING SHAMPOO

Amrit M. Patel, and Suman K. Chopra, both of Dayton, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 14, 1997, Ser. No. 783,159

Int. Cl.^{6} A61K *7/075*

U.S. Cl. 510—124 **14 Claims**

1. An effective conditioning shampoo composition which is free of conditioning amounts of silicone conditioning agents comprising by weight:

A. about 5% to about 40% of a detersive surfactant mixture of:
  (1) an anionic detergent selected from the group consisting of C_8-C_{18} alkyl sulfates, C_8–C_{18} alkyl ethenoxy ether sulfates containing 1 to 12 ethenoxy groups in the molecule, C_8–C_{18} acyl isethionates, C_{10}–C_{20} alkyl sulfonates, C_{10}–C_{22} alkene sulfonates, and mixtures thereof; and
  (2) an amphoteric surfactant selected from the group consisting of C_8–C_{18} alkyl betaines, and sulfobetaines, C_8–C_{18} alkyl amido, C_2–C_3 alkyl betaines and sulfobetaines, C_8–C_{18} alkyl amphoacetates, C_8–C_{18} alkyl amphopropionates, and mixtures thereof; the weight ratio of said anionic detergent to said amphoteric detergent being in the range of about 10:1 to 0.8:1;

B. about 0.05% to about 6% of a conditioning agent is selected from the group consisting of:
  (1) 0.05% to 5% of a complex of essentially equimolar amounts of a C_8–C_{18} $(EtO)_{1-10}$ carboxylic acid, and a C_8–C_{18} alkyl $(EtO)_{0-10}$ dimethyl amine;
  (2) 0.05% to 1.0% of a polyquaternary compound selected from the group consisting of a quaternized cellulosic polymer and a mixture of said quaternized cellulosic polymer with a non-cellulosic quaternary conditioning polymer; and
  (3) mixtures of the foregoing;

C. 0.1% to 1% of a static control mixture of:
  (1) a quaternary ammonium salt having the formula R_9, R_{10}, R_{11}, R_{12} N^+X^- wherein R_9 is a C_{14}–C_{18} alkyl, R_{10} and R_{11} are each a C_1–C_4 alkyl, R_{12} is C_1–C_4 alkyl or benzyl and X^- is a salt forming cation selected from the group consisting of chloride, bromide, methosulfate and ethosulfate; and
  (2) a di-quaternary ammonium salt having the formula $(R_{13})_2R_{14}R_{15}N^+X^-$ wherein R_{13} is a C_{14}–C_{18} alkyl or alkylene group and R_{14} and R_{15} are each a C_1–C_4 alkyl group or a $(CH_2CH_2O)_nH$ group with at least one of R_{14} and R_{15} being a $(CH_2CH_2O)_nH$ group, n is an integer from 2 to 20 and X is a cation as set forth in C(1) above; the weight ratio of the monoalkyl quaternary salt to dialkyl quaternary salt being from about 1:4 to 4:1; and

D. the balance being an aqueous medium; said compositions exhibiting enhanced antistatic properties as compared to the same compositions containing either said monoalkyl quaternary salt or said dialkyl quaternary salt as the sole antistatic ingredient.

5,747,437
CLEANING COMPOSITIONS BASED ON 1,1,1,2,2,4,4-HEPTAFLUOROBUTANE AND C_1-C_3 ALCOHOLS

Pascal Michaud, Saint-Gratien, France, assignor to Elf Atochem S.A., France

Filed Oct. 30, 1996, Ser. No. 739,602

Claims priority, application France, Oct. 31, 1995, 95 12843

Int. Cl.^{6} C11D *7/50;* **C23G** *5/028*

U.S. Cl. 510—177 **15 Claims**

1. An azeotropic or azeotrope-like composition consisting essentially of, by weight of said composition, about 90–99% of 1,1,1,2,2,4,4-heptafluorobutane, about 1–10% of methanol, and optionally a stabilizer, wherein said composition has a boiling point of about 30.6° C. at normal pressure.

5,747,438
MACHINE DISHWASHING DETERGENT CONTAINING COATED PERCARBONATE AND AN ACIDIFICATION AGENT TO PROVIDE DELAYED LOWERED PH

Fiona Susan MacBeath, Newcastle, United Kingdom, assignor to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/12246, § 371 Date Apr. 19, 1996, § 102(e) Date Apr. 19, 1996, PCT Pub. No. WO95/12657, PCT Pub. Date May 11, 1995

PCT Filed Oct. 21, 1994, Ser. No. 633,764

Claims priority, application European Pat. Off., Nov. 3, 1993, 93308800

Int. Cl.^{6} C11D *7/08;7/18*

U.S. Cl. 510—224 **11 Claims**

1. A particulate solid machine dishwashing composition comprising:

(a) from 3% to 40% by weight of an alkali metal percarbonate bleach coated with a mixed salt comprising an alkali metal carbonate and an alkali metal sulphate salt;

(b) from 0.5% to 15% by weight of a peroxyacid bleach precursor;

(c) from 0.1% to 40% by weight of an acidification agent;

(d) from 0.05% to 10% by weight of a corrosion inhibitor;

wherein the acidification agent is provided with a coating enabling the delayed release of said acidification agent, the coating comprising an inner coating comprising wax and an outer coating comprising silica such that the pH of said composition as a 1% solution in water at 20° C. is from 9.5 to 13.0 prior to release of said acidification agent, and such that the pH of said composition as a 1% solution in water at 20° C. is from 9.3 to 7.0 subsequent to complete release of said acidification agent.

5,747,439
AQUEOUS SODIUM SALT METAL CLEANER

Steven Dunn, Flemington, and Gale A. Byrnes, Califon, both of N.J., assignors to Church & Dwight Co, Inc., Princeton, N.J.

Filed Apr. 2, 1996, Ser. No. 626,543

Int. Cl.^{6} C11D *3/10;3/04;3/08;3/28*

U.S. Cl. 510—255 **29 Claims**

1. An alkali metal cleaning composition comprising a carbonate salt, wherein the carbonate salt comprises a sodium carbonate salt or sodium bicarbonate salt; a surfactant; and a water soluble sodium silicate salt anticorrosion agent, said carbonate salt comprises from about 15 to about 30 wt. % of the dry composition and said surfactant comprises from about 5 to about 30 wt. % of the dry composition, wherein a solution of the composition has a pH of about 8.0 to less than 11.0 and the composition has a phosphate content based on phosphorous of less than 3 wt. % relative to the total weight of the dry composition, said alkali metal cleaning composition is free of acrylic acid polymers having a molecular weight of 100,000 or greater.

5,747,440
LAUNDRY DETERGENTS COMPRISING HEAVY METAL ION CHELANTS

Patti Jean Kellett; Eugene Paul Gosselink, and Christopher Mark Perkins, all of Cincinnati, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

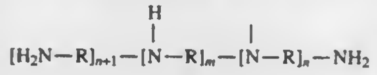
Filed Jan. 30, 1996, Ser. No. 594,073

Int. Cl.^{6} C11D *3/26*

U.S. Cl. 510—276 **4 Claims**

1. A laundry composition comprising:

a) at least 0.001% to about 5% by weight, of a heavy metal chelant comprising:
  i) a modified polyamine having a backbone of the formula



$$[H_2N-R]_{n+1}-[\overset{\overset{H}{|}}{N}-R]_m-[\overset{|}{N}-R]_n-NH_2$$

wherein R is C_2–C_{22} alkylene, C_3–C_{22} alkyl substituted alkylene, —CH_2 $CH(OH)CH_2$—, —$(R^1O)_xR^1$—, —$CH_2CH(OH)CH_2O(R^1O)_x$— $CH_2CH(OH)CH_2$—, and mixtures thereof; R^1 is C_2–C_6 alkylene, C_3–C_6 alkyl substituted alkylene, and mixtures thereof; and

  ii) from about 0.5% to less than 45% of the polyamine backbone NH and OH units are substituted by one or more units independently selected from:

a) units having the formula

—$CR^3R^4R^5$

wherein each R^3, R^4, and R^5 is independently selected from the group consisting of hydrogen, —$(CH_2)_y(L)_zR^6$, and mixtures thereof provided that one R^3, R^4, or R^5 is not a hydrogen atom, wherein R^6 is —CO_2H, —$C(NH)NH_2$, —$C(SH)S$, —$C(O)NHOH$, —$C(NOH)NH_2$, —CH $_2P(O)(OH)_2$, —$OP(O)(OH)_2$, and mixtures thereof; L is —NH—, —S—, and mixtures thereof;

b) units having the formula —$C(O)CH_2N(CH_2CO_2H)_2$, —$C(O)CH_2N(CH_2CO_2H)CH_2CH_2N(CH_2CO_2H)_2$, —$(CH_2)_pCH(CO_2H)N(CH_2CO_2H)_2$, and mixtures thereof;

m is from 2 to about 700, n is from 0 to about 350, p is from 1 to 20, x is from 1 to 100, y is from 0 to 3, z is 0 or 1; and

b) at least about 0.1% by weight, of a detersive surfactant selected from the group consisting of anionic, cationic, nonionic, zwitterionic, ampholytic surfactants, and mixtures thereof.

5,747,441
ENCAPSULATED BLEACH PARTICLES

Bastiaan Domburg; Anshu M. Gupta; Hendrik de Ruijter, all of Vlaardingen, and Antonius Henricus J. Strijbosch, Maassluis, all of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Sep. 26, 1996, Ser. No. 720,281

Claims priority, application European Pat. Off., Oct. 16, 1995, 95202784

Int. Cl.^{6} C11D *7/54;* **B05D** *7/00*

U.S. Cl. 510—375 **9 Claims**

1. Dry free-flowing encapsulated bleach particle, comprising:

(a) 1–30% by weight of a coating including a gelled polymer material which is an alginate wherein at least 10% by weight of the gelled polymer material is cross-linked with alkaline earth metal ions;

(b) 99–70% by weight of a core material selected from the group consisting of a peroxygen bleach compound, a bleach catalyst, and a peroxygen bleach precursor, and the core material being surrounded by the coating.

/OL
2 10
SS
1
MY
5
998
MI

5,747,442

STICK PRETREATER COMPOSITIONS CONTAINING HYDROPHOBICALLY MODIFIED POLAR POLYMERS

Barbara Helen Bory, Fort Lee; Walter Joseph Lunsmann, Whitehouse Station; Dennis Stephen Murphy, Leonia; Tamara Padron, and Lucia Victoria Salas, both of North Bergen, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Jan. 25, 1996, Ser. No. 591,750

Int. Cl.^{6} C11D *17/00;3/37*

U.S. Cl. 510—475 **12 Claims**

1. A stick pretreater composition comprising surfactants:

a) about 30 to about 80 wt. % of a nonionic surfactant;

b) about 1 to about 20 wt. % of an anionic soap having an unsaturation range of from 0 to 5% based on the total fatty acid in the composition, the anionic soap selected from the group consisting of an alkali metal or alkanol ammonium salt of aliphatic alkane- or alkene monocarboxycilic acids and mixtures thereof; and

c) 0.1% to 10% by wt. of a polymer having

1) a hydrophilic backbone comprising a polymer of a nonionic unit selected from from the group consisting of

i) one or more ethylenically unsaturated non-cyclic hydrophilic monomers selected from the group consisting of unsaturated C_{1-6} acids, ethers, alcohols, aldehydes, ketones or esters;

ii) one or more polymerizable hydrophilic cyclic monomer units,

iii) one or more non-ethylenically unsaturated polymerizable hydrophilic monomers selected from the group consisting of glycerol and other polyhydric alcohols, and

iv) mixtures thereof,

wherein said polymer is optionally substituted with one or more amino, amine amide, sulphonate, sulphate, phosphonate, hydroxy, carboxyl or oxide groups to specify one monomer only and

2) a tail comprising monomers having pendant hydrophilic groups and pendent hydrophobic groups,

said polymer having a MW of 1,000 to 20,000, wherein the molar ratio of backbone hydrophilic group to pendant hydrophobic group is less than 20.

5,747,443

FABRIC SOFTENING COMPOUND/COMPOSITION

Errol Hoffman Wahl, Cincinnati; Toan Trinh, Maineville; Eugene Paul Gosselink, Cincinnati; James Carey Letton, Forest Park, and Mark Robert Sivik, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 11, 1996, Ser. No. 679,694

Int. Cl.^{6} C11D *1/62;1/645;3/50*

U.S. Cl. 510—515 **27 Claims**

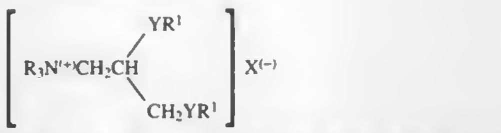
1. Biodegradable fabric softener actives having formulas selected from the group consisting of:

1.

$$[(R)_{4-m}-N^{(+)}-[(CH_2)_n-Y-R^1]_m]\ X^{(-)} \tag{1}$$

wherein each R substituent is hydrogen or a short chain C_1–C_6 alkyl or hydroxyalkyl group; each m is 2 or 3; each n is from 1 to about 4; each Y is —O—(O)C—, —(R)N—(O)C—, —C(O)—N(R)—, or —C(O)—O—; the sum of carbons in each R^1, plus one when Y is —O—(O)C— or —(R)N—(O)C—, is C_6–C_{22}, but no more than one R^1, or YR^1, sum being less than about 12 and then the other R^1, or YR^1, sum is at least about 16, with each R^1 comprising a long chain C_5–C_{21}branched alkyl or unsaturated alkyl, optionally substituted, the ratio of branched alkyl to unsaturated alkyl being from about 5:95 to about 95:5, and for the unsaturated alkyl group, the Iodine Value of the parent fatty acid of this R^1 group is from about 20 to about 140, and wherein the counterion, X^-, can be any softener-compatible anion;

2. softener having the formula:



$$\left[R_3N^{(+)}CH_2CH\begin{matrix} YR^1 \\ \\ CH_2YR^1 \end{matrix} \right] X^{(-)} \tag{2}$$

wherein each Y, R, R^1, and $X^{(-)}$ have the same meanings as before; and

3. mixtures thereof,

the softener active optionally containing up to about 20% of mono-long chain softener in which one YR^1 group is —OH, —N(R)H, or —C(O)OH.

5,747,444

METHOD OF TREATING GRAFT-VERSUS-HOST DISEASE

John Stephen Haskill, Chapel Hill, N.C., and Peter Ralph, Orinda, Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 425,232, Apr. 18, 1995, which is a continuation of Ser. No. 791,474, Nov. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 594,827, Oct. 9, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,811

Int. Cl.^{6} A61K *38/16*

U.S. Cl. 514—2 **6 Claims**

1. A method for treating graft-versus-host disease in a patient comprising administering to a patient in need of treatment for said disease an effective amount of a recombinant IL-1 receptor antagonist having the amino acid sequence of SEQ ID NO: 2.

5,747,445

THERAPEUTIC PREPARATION FOR INHALATION

Kjell Göran Erik Bäckström; Carl Magnus Olof Dahlbäck, both of Lund; Peter Edman, Bjärred, and Ann Charlotte Birgit Johansson, Lund, all of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

Continuation-in-part of Ser. No. 265,372, Jun. 23, 1994, Pat. No. 5,518,998. This application Jan. 4, 1996, Ser. No. 583,205

Int. Cl.^{6} A61K *38/28*

U.S. Cl. 514—4 **35 Claims**

1. A therapeutic preparation the active ingredients of which consist of (A) insulin and (B) a bile salt which enhances the absorption of insulin in the lower respiratory tract, in the form of a dry powder suitable for inhalation from a dry powder inhaler, wherein at least 50% of the total mass of active ingredients consists of (a) particles having a diameter of up to 10 microns or (b) agglomerates of such particles.

5,747,446

MODIFIED POLYPEPTIDES WITH INCREASED BIOLOGICAL ACTIVITY

Arthur J. Sytkowski, Arlington, Mass., assignor to Beth Israel Deaconess Medical Center, Boston, Mass.

Continuation-in-part of Ser. No. 216,259, Mar. 22, 1994, Pat. No. 5,580,853. This application Nov. 26, 1996, Ser. No. 756,134

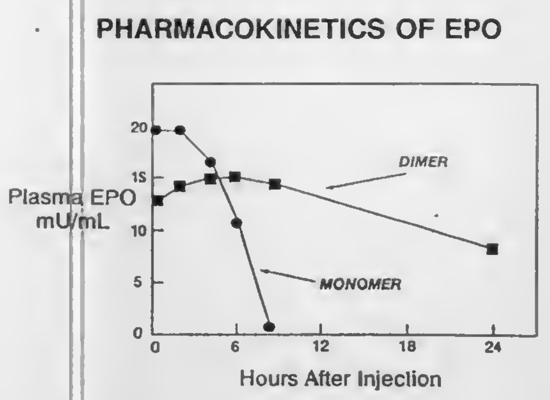
Int. Cl.^{6} A61K *38/16;38/22;* **C07K** *1/10;14/505*

U.S. Cl. 514—8 **33 Claims**

1. A biologically active erythropoietin homodimer comprising two erythropoietin polypeptides covalently linked by at least one thioether bond, wherein:

a) the first erythropoietin polypeptide comprises an erythropoietin polypeptide with a heterobifunctional cross-linking reagent-containing a free sulfhydryl group attached to the erythropoietin polypeptide; and

b) the second erythropoietin polypeptide comprises an erythropoietin polypeptide with a heterobifunctional cross-linking reagent containing a maleimido group attached to the erythropoietin polypeptide, wherein said heterobifunctional cross-linking reagent is selected from the group consisting of: γ-maleimidobutyric acid N-hydroxysuccinimide ester, m-maleimidobenzoyl-N-hydroxysuccinimide ester, ϵ-maleimidocaproic acid N-hydroxysuccinimide ester, 4-(p-maleimidophenyl)butyric acid N-hydroxysuccinimide ester, and β-maleimidoproprionic acid N-hydroxysuccinimide ester, and at least one thioether bond forms between the free sulfhydryl group of the first erythropoietin polypeptide and the maleimido group of the second erythropoietin polypeptide.



PHARMACOKINETICS OF EPO

5,747,447

STABLE POLYPEPTIDE COMPOSITION

Robert L. Swift; Charles P. Du Mee, both of Foster City, and Anne Randolph, Burlingame, all of Calif., assignors to COR Therapeutics, South San Francisco, Calif.

Continuation of Ser. No. 55,636, Apr. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 876,625, Apr. 30, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,661

Int. Cl.^{6} A61K *38/00;38/02;* **C07K** *5/00;7/00*

U.S. Cl. 514—9 **20 Claims**

1. A method of storage-stabilizing a substantially pure platelet aggregation inhibitor (PAI) polypeptide comprising preparing a liquid solution consisting essentially of said polypeptide in a citrate buffer by dissolving said polypeptide in said citrate buffer to form a storage-stable solution having a pH of from about 5.0 to about 5.5.

5,747,448

DERIVATIVES OF CYCLODEPSIPEPTIDE PF 1022

Makoto Ohyama; Maki Ohishi; Yumiko Okada, all of Odawara; Masao Koyama, Yokohama; Shinjiro Sumi; Yasushi Murai, both of Odawara; Masayuki Takagi; Tadaaki Okada, both of Yokohama; Osamu Sakanaka, Odawara; Toshio Yoneta, Odawara; Katsuharu Iinuma, Odawara, and Seiji Shibahara, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

PCT No. PCT/JP94/00252, § 371 Date Sep. 8, 1995, § 102(e) Date Sep. 8, 1995, PCT Pub. No. WO94/19334, PCT Pub. Date Sep. 1, 1994

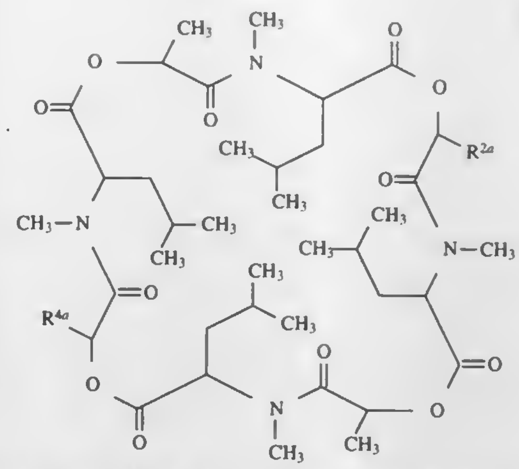
PCT Filed Feb. 18, 1994, Ser. No. 505,213

Claims priority, application Japan, Feb. 19, 1993, 5-029498; Feb. 19, 1993, 5-029505

Int. Cl.^{6} A61K *38/15;* **C07K** *11/02*

U.S. Cl. 514—11 **12 Claims**

1. A cyclodepsipeptide represented by the following general formula:



(1-i-a)

wherein R^{2a} and R^{4a} are each a cyclohexylmethyl group or benzyl group, provided that at least one of R^{2a} and R^{4a} is a cyclohexylmethyl group.

5,747,449

BOVINE PANCREATIC TRYPSIN INHIBITOR DERIVED INHIBITORS OF FACTOR XA

Ignace Lasters, Antwerpen; Marc De Maeyer, Groot-Bijgaarden, both of Belgium, and William Charles Ripka, San Diego, Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 913,232, Jul. 13, 1992. This application Jul. 1, 1993, Ser. No. 86,630

Int. Cl.^{6} A61K *38/57;* **C07K** *14/81*

U.S. Cl. 514—12 **3 Claims**

1. A compound derived from bovine pancreatic trypsin inhibitor which inhibits Factor Xa with an inhibition constant less than 50 nM selected from the group consisting of:

BPTI (13Ile 15Arg 17Tyr 19Thr 39Leu 46Glu),
BPTI (1Ala 13Ile 15Arg 17Tyr 19Thr 39Leu 46Glu),
BPTI (1Ala 13Ile 15Arg 17Tyr 19Thr 39Leu),
BPTI (1Ala 13Ile 15Arg 17Tyr 19Thr 39Leu 46Glu),
BPTI (1Ala 13Ile 15Arg 17Tyr 19Thr 32Arg 39Leu 46Glu),
BPTI (1Ala 11Glu 13Ile 15Arg 17Tyr 19Thr 39Leu 46Glu),
BPTI (1Ala 13Ile 15Arg 17Tyr 39Leu),
BPTI (1Ala 13Phe 15Arg 17Tyr 39Thr 39Leu),
BPTI (1Ala 13Ile 15Arg 17Tyr 19Thr 39Phe),
BPTI (1Ala 13Ile 15Arg 17Phe 19Thr 39Leu),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Tyr),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Ile),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Trp),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Phe),
BPTI (1Ala 15Arg 17Tyr 19Thr 39His),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Ser),
BPTI (1Ala 15Arg 17Tyr 19Thr 39Val),
BPTI (15Arg 16Gly 17Trp 18Phe 9Arg 20Gln),
BPTI (13Ile 15Arg 16Gly 17Trp 18Phe 19Arg 20Gln 39Leu),
BPTI (11Glu 13Ile 15Arg 16Gry 17Trp 18Phe 19Arg 20Gln 39Leu),
BPTI (15Arg 16Ala 17His 18Ile 19Thr 20Thr),
BPTI (13Ile 15Arg 16Ala 17His 18Ile 19Thr 20Thr 39Leu),
BPTI (11Glu 13Ile 15Arg 16Ala 17His 18Ile 19Thr 20Thr 39Leu),
BPTI (15Arg 16Ala 17His 18His 19Leu 20Val),
BPTI (13Ile 15Arg 16Ala 17His 18His 19Leu 20Val 39Leu),
BPTI (11Glu 13Ile 15Arg 16Ala 17His 18His 19Leu 20Val 39Leu),
BPTI (15Arg 16Ala 17His 18His 19Arg 20Glu),
BPTI (13Ile 15Arg 16Ala 17His 18His 19Arg 20Glu 39Leu),
BPTI (11Glu 13Ile 15Arg 16Ala 17His 18His 19Arg 20Glu 39Leu),
BPTI (15Arg 16Ala 17His 18Ile 19Arg 20Gln),
BPTI (13Ile 15Arg 16Ala 17His 18Ile 19Arg 20Gln 39Leu),
BPTI (11Glu 13Ile 15Arg 16Ala 17His 18Ile 19Arg 20Gln 39Leu),

BPTI (15Arg 16Gly 17His 18His 19Arg 20Glu 26Asn),
BPTI (13Ile 15Arg 16Gly 17His 18His 19Arg 20Glu 26Asn 39Leu),
BPTI (11Glu 13Ile 15Arg 16Gly 17His 18His 19Arg 20Glu 26Asn 39Leu),
BPTI (15Arg 16Ala 17Tyr 18Phe 19Asn 20Leu),
BPTI (13Ile 15Arg 16Ala 17Tyr 18Phe 19Asn 20Leu 39Leu),
BPTI (11Glu 13Ile 15Arg 16Ala 17Tyr 18Phe 19Asn 20Leu 39Leu),
BPTI (15Arg 16Ala 17His 18Val 19Arg 20His),
BPTI (13Ile 15Arg 16Ala 17His 18Val 19Arg 20His 39Leu), and
BPTI (11Glu 13Ile 15Arg 16Ala 17His 18Val 19Arg 20His 39Leu)
BPTI (13Ile 15Arg 17Asn 18Phe 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ser 18Phe 19Asn 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ala 18Phe 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 16Ser 17Tyr 18Phe 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ser 18Phe 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17His 18Tyr 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ser 18Phe 19Thr 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ser 18Tyr 19Thr 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ser 18Tyr 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Met 18Phe 19His 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ile 18Tyr 19Val 39Leu 46Glu)
BPTI (13Ile 15Arg 17Asn 18Phe 19Asn 39Leu 46Glu)
BPTI (13Ile 15Arg 17Tyr 18Tyr 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ala 18Phe 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Leu 18His 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ile 18Tyr 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Ala 18Phe 19Asn 39Leu 46Glu)
BPTI (13Ile 15Arg 17Phe 18Tyr 19Lys 39Leu 46Glu)
BPTI (13Ile 15Arg 17Leu 18Tyr 19Lys 39Leu 46Glu)
BPTI (11Asp 15Arg 17Leu 18His 19Leu 34Tyr 39Leu 46Glu)
BPTI (11Pro 13Tyr 15Arg 17Leu 18His 19Leu 34Thr 39His 46Glu)
BPTI (11Thr 13Pro 15Arg 17Leu 18His 19His 34Phe 39Phe 46Glu)
BPTI (11Pro 13Ile 15Arg 17Leu 18His 19Pro 34His 39Leu 46Glu)
BPTI (11Val 13Ile 15Arg 17Leu 18His 19Thr 34Ser 39Phe 46Glu)
BPTI (11ser 13Leu 15Arg 17Leu 18His 19Lys 34Tyr 39Tyr 46Glu)
BPTI (11Leu 13Ile 15Arg 17Leu 18His 19Thr 34Ser 39Leu 46Glu)
BPTI (11Pro 13Ile 15Arg 17Leu 18His 19Lys 34His 39Phe 46Glu)
BPTI (11Ser 13Leu 15Arg 17Leu 18His 19Lys 34Tyr 39Phe 46Glu)
BPTI (11Pro 13Ile 15Arg 17Leu 18His 19Lys 34Tyr 39Met 46Glu)
BPTI (11Glu 13Met 15Arg 17Ile 18His 19Lys 34Thr 39Met 46Glu)
BPTI (11Pro 13Val 15Arg 17Leu 18His 19Lys 34Ser 39Gln 46Glu)
BPTI (11Arg 13Val 15Arg 17Ile 18His 19Lys 34Leu 39Met 46Glu)
BPTI (11Pro 13Leu 15Arg 17Leu 18His 19Lys 34Tyr 39Tyr 46Glu)
BPTI (11Ala 13Tyr 15Arg 17Leu 18His 19Lys 34Tyr 39Phe 46Glu)
BPTI (11Arg 13Val 15Arg 17Ile 18His 19Gln 34Ile 39Met 46Glu)
BPTI (11Thr 13Tyr 15Arg 17Leu 18His 19Lys 34Tyr 39Phe 20 46Glu)
BPTI (11Thr 13Ile 15Arg 17Leu 18His 19Lys 34Trp 39Leu 46Glu)
BPTI (11Gl 13Ile 15Arg 17Leu 18His 19Lys 34Met 39Leu 46Glu)
BPTI (11Pro 13Ile 15Arg 17Leu 18His 19Lys 34Tyr 39Met 46Glu)
BPTI (11Glu 13Leu 15Arg 17Leu 18His 19Lys 34Tyr 39Phe 46Glu)
BPTI (11Glu 13Phe 15Arg 17Tyr 18Phe 19Lys 34Thr 39Phe 46Glu)
BPTI (11Val 13Asp 15Arg 17Tyr 18Phe 19Lys 35Phe 39Leu 46Glu)
BPTI (11Glu 13Phe 15Arg 17His 18Phe 19Lys 32Ser 39Phe 46Glu)
BPTI (9Ala 11Glu 13Tyr 15Arg 17Tyr 18Ile 19Lys 23Phe 34His 39Phe 46Glu)
BPTI (11Thr 13His 15Arg 17Phe 18Phe 19Thr 39Phe 46Glu)
BPTI (11Thr 13His 15Arg 17Tyr 18Phe 19Lys 34Ile 39Phe 46Glu)
BPTI (9Ala 11Glu 13Phe 15Arg 17Tyr 18Phe 39Phe 46Glu)
BPTI (10His 11Ser 13Ile 15Arg 17Tyr 18Phe 19Thr 34His 39Phe 46Glu)
BPTI (11Glu 13Ile 15Arg 17Leu 18Phe 19Thr 34His 39Leu 46Glu)
BPTI (10Ser 11Glu 13Ile 15Arg 17Tyr 18His 19Lys 39Leu 46Glu)
BPTI (11Glu 13Asn 15Arg 17Phe 18Phe 19Arg 34Ile 39Leu 46Glu)
BPTI (11Leu 13Ile 15Arg 17Tyr 18Leu 19Lys 34Tyr 39Leu 46Glu)
BPTI (11Glu 13Asn 15Arg 17Tyr 18Leu 19Lys 34Ala 39Phe 46Glu)
BPTI (11Glu 13Ile 15Arg 17Tyr 18Phe 19Lys 34Ser 39Phe 46Glu)
BPTI (11Glu 13Ile 15Arg 17Phe 18Asn 19Lys 39Leu 46Glu)
BPTI (8Ser 11Ala 13Ile 15Arg 17Tyr 19Lys 34Tyr 39Phe 46Glu)
BPTI (11Glu 13Ile 15Arg 17Leu 18His 19Lys 34Tyr 39Leu 46Glu)
BPTI (11Glu 13Ile 15Arg 17Tyr 18Phe 19Lys 34Glu 39Leu 46Glu).

5,747,450
MICROORGANISM AND INSECTICIDE

Michio Ohba, Fukuoka; Hidenori Iwahana; Ryoichi Sato, both of Tokyo; Nobukazu Suzuki, Ibaraki; Katsutoshi Ogiwara, Ibaraki; Kazunobu Sakanaka, Ibaraki; Hidetaka Hori, Kanagawa; Shouji Asano, and Tadaaki Kawasugi, both of Ibaraki, all of Japan, assignors to Kubota Corporation, Ibaraki, Japan

Division of Ser. No. 915,203, Jul. 23, 1992, Pat. No. 5,359,048. This application Jul. 8, 1994, Ser. No. 272,887

Claims priority, application Japan, Aug. 2, 1991, 3-193810

Int. Cl.^{6} C07K *14/325*

U.S. Cl. 514—12 **2 Claims**

1. A recombinant or substantially pure coleopteran-active toxin, wherein said toxin has an amino acid sequence that is at least 75% the same as the amino acid sequence of SEQ ID NO. 2, or a coleopteran-active part thereof.

5,747,451
PEPTIDE DERIVATIVES HAVING BINDING ACTIVITY TO MODIFIED LOW DENSITY LIPOPROTEIN

Toshiki Tanaka, Osaka; Takefumi Doi, Ibaraki; Haruki Nakamura, Toyonaka; Takeshi Imanishi, Nara, and Tatsuhiko Kodama, Tokyo, all of Japan, assignors to Protein Engineering Research Institute, Osaka, Japan

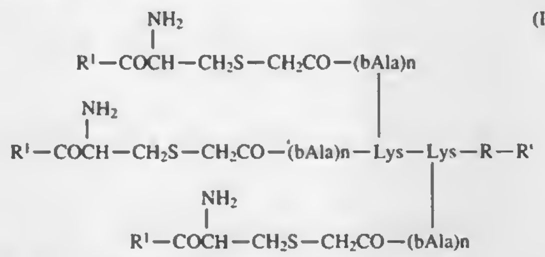
Filed Feb. 28, 1995, Ser. No. 395,816

Claims priority, application Japan, Nov. 22, 1994, 6-288465

Int. Cl.^{6} A61K *38/16;38/10;* **C07K** *14/00;7/00*

U.S. Cl. 514—12 **10 Claims**

1. A compound represented by the formula (I):



(I)

wherein bAla is β-alanine;

R^1 is a group selected independently from peptide residues represented by the formula:

$$(\text{Gly-Pro-4Hyp})_q\text{-}R^2\text{-}(\text{Gly-Pro-4Hyp})_q\text{-}R^3$$

wherein 4Hyp is 4-hydroxyproline,

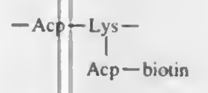
R^2 is a peptide residue having 9 to 72 amino acids,

R^3 is an optionally modified glycine residue, and

q is an integer selected independently from 1 to 10;

n is an integer of 0 to 4;

R is a peptide residue having 0 to 5 amino acids or a group represented by the formula:



$$-\text{Acp}-\underset{\substack{|\\ \text{Acp}-\text{biotin}}}{\text{Lys}}-$$

wherein Acp is 6-aminocaproic acid; and

R' is a tyrosine compound usable in a quantitative determination of the compound of the formula I.

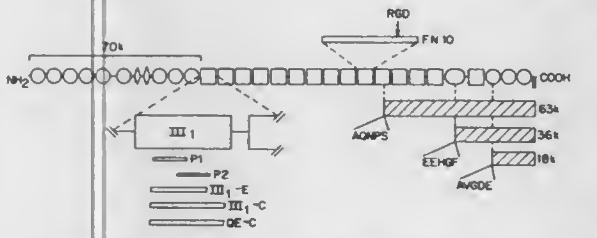
5,747,452
METHOD OF MODULATING TUMOR CELL MIGRATION USING FIBRONECTIN TYPE III PEPTIDES

Erkki I. Ruoslahti, Rancho Santa Fe, and Alex Morla, Carlsbad, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 340,812, Nov. 17, 1994, Pat. No. 5,629,291, which is a continuation of Ser. No. 21,626, Feb. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 829,462, Jan. 31, 1992, Pat. No. 5,453,489. This application Jun. 1, 1995, Ser. No. 459,064

Int. Cl.^{6} A61K *38/39;* **C07K** *14/78*

U.S. Cl. 514—12 **5 Claims**



1. A method of inhibiting tumor cell migration in a cellular system, comprising contacting a tumor cell with an effective amount of a P1 polypeptide (Sequence ID No. 2).

5,747,453
METHOD FOR INCREASING THE ELECTROTRANSPORT FLUX OF POLYPEPTIDES

Leslie A. Holladay, Mountain View, and Kevin R. Oldenburg, Fremont, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Jun. 6, 1995, Ser. No. 468,275

Int. Cl.^{6} A61K *38/00;38/04;* **A01N** *1/30;* **C07K** *7/00*

U.S. Cl. 514—12 **16 Claims**

1. A method of delivering an agent through a body surface by electrotransport comprising the steps of:

providing a bioactive polypeptide analog having 10–50 amino acid residues and at least one substituted amino acid residue having a lower Pα value disrupting at least one α-helical segment; and,

delivering said polypeptide analog through the body surface with an electrotransport device.

5,747,454
CHROMOGRANIN PEPTIDES

Ruth Hogue Angeletti, New Rochelle, and John Russell, Bronx, both of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 75,391, Jun. 9, 1993, Pat. No. 5,514,775. This application Jun. 16, 1995, Ser. No. 491,544

Int. Cl.^{6} A61K *38/00;* **C07K** *5/00;7/00;16/00*

U.S. Cl. 514—12 **17 Claims**

1. A synthetic chromogranin A peptide having the amino acid sequence:

X-A-Ile-Val-Glu-Val-Ile-B-Asp-C-Leu-B-Lys-Pro-B-Pro-Met -Pro-Val-B-Lys-Glu-A-Y (SEQ ID NO:1),

wherein:

X is X1 or acetyl-X1, wherein X1 is:

Lys-,
Met-Lys-,
Val-Met-Lys-,
Glu-Val-Met-Lys-,
Thr-Glu-Val-Met-Lys-,
Asp-Thr-Glu-Val-Met-Lys-,
Gly-Asp-Thr-Glu-Val-Met-Lys-,
Lys-Gly-Asp-Thr-Glu-Val-Met-Lys-,
Asn-Lys-Gly-Asp-Thr-Glu-Val-Met-Lys-,
Met-Asn-Lys-Gly-Asp-Thr-Glu-Val-Met-Lys-, or
Pro-Met-Asn-Lys-Gly-Asp-Thr-Glu-Val-Met-Lys-,

A is Cys or lanthionine;

B is Ser or Ala;

C is Thr or Ala; and

Y is -Phe-Glu or -Phe-Glu-D-Thr.

5,747,455
ENDOTOXIN BINDING AND NEUTRALIZING PROTEIN AND USES THEREOF

Norman R. Wainwright, Falmouth, and Thomas J. Novitsky, E. Falmouth, both of Mass., assignors to Associates of Cape Cod, Inc., Falmouth, Mass.

Division of Ser. No. 264,244, Jun. 22, 1994, Pat. No. 5,594,113, which is a continuation of Ser. No. 883,457, May 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 701,501, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 480,957, Feb. 16, 1990, abandoned, which is a division of Ser. No. 210,575, Jun. 23, 1988, abandoned. This application Aug. 30, 1996, Ser. No. 704,872

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—12 **4 Claims**

1. A method for reducing endotoxin contamination of a material suspected of containing endotoxin, comprising contacting said material with the endotoxin binding molecule having SEQ ID NO: 3 to form a complex between endotoxin and the endotoxin binding molecule, and separating said complex from said sample.

5,747,456
CONTINUOUS LOW-DOSE ADMINISTRATION OF PARATHYROID HORMONE OR ITS AGONIST

Michael Chorev, Brookline, and Michael Rosenblatt, Newton Centre, both of Mass., assignors to Beth Israel Deaconess Medical Center, Boston, Mass.

Continuation-in-part of Ser. No. 359,293, Dec. 19, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 724,539

Int. Cl.^{6} C07K *14/00;* **A61K** *51/00;* **G01N** *33/534*

U.S. Cl. 514—12 **21 Claims**

1. A method of promoting bone formation in a human patient, said method comprising administering continuously to said patient PTH, PTHrP, or an agonist thereof for a period of at least one month at a dosage between 10 and 400 units/24 hrs.

5,747,457
LINEAR ADHESION INHIBITORS

Alfred Jonczyk, Darmstadt, Germany; Brunhilde Felding-Habermann, La Jolla, Calif.; Beate Diefenbach, Darmstadt, and Friedrich Rippmann, Heidelberg, both of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Filed Oct. 27, 1994, Ser. No. 329,820

Claims priority, application Germany, Oct. 28, 1993, 43 36 758.5

Int. Cl.^{6} A61K *38/00;38/04;* **C07K** *5/00;16/00*

U.S. Cl. 514—13 **22 Claims**

1. A linear peptide of formula I

$$\text{X-A-Cys}(R^1)\text{-B-Z} \qquad \text{I,}$$

wherein

X is H or Ac, wherein Ac is C_{1-10}-alkanoyl, C_{8-10}-aralkanoyl or C_{7-11}-aroyl;

A is absent or is Asp or a peptide fragment selected from a group consisting of Ala-Asp, Thr-Ala-Asp, Lys-Thr-Ala-Asp (SEQ ID NO:1), Lys-Thr-Ala-Asn(SEQ ID NO:2), Lys-Thr-Gly-Asp (SEQ ID NO:3), Lys-Ala-Ala-Asp (SEQ ID NO:4), Arg-Thr-Ala-Asp (SEQ ID NO:5), Ser-Ala-Asp, Gln-Ser-Ala-Asp (SEQ ID NO:6), Gly-Lys-Thr-Ala-Asp (SEQ ID NO:7), Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:8), Ile-Ser-Ala-Gly (SEQ ID NO:9), Arg-Ser-Ala-Gly (SEQ ID NO:10), Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:11), Tyr-Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:12), Asp-Tyr-Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:13), Gly-Lys-Thr-Cys-Asp (SEQ ID NO:14), Asp-Asp-Tyr-Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:15), Gly-Lys-Thr-Cys(Trt)-Asp (SEQ ID NO:16), Met-Asp-Asp-Tyr-Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:17) and Asp-Met-Asp-Asp-Tyr-Cys-Asn-Gly-Lys-Thr-Ala-Asp (SEQ ID NO:18);

B is absent or is Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Orn, Phe, 4-Hal-Phe, Pro, Ser, Thr, Trp, Tyr or Val or is an N-methylated derivative of the amino acid residues mentioned, or is a peptide fragment selected from the group consisting of Pro-Arg, Pro-Arg-Asn, Pro-Arg-Asn-Pro (SEQ ID NO:19), Pro-Arg-Asn-Pro-His (SEQ ID NO:20), Pro-Arg-Asn-Pro-His-Lys (SEQ ID NO:21), Pro-Arg-Asn-Pro-His-Lys-Gly (SEQ ID NO:22), Pro-Arg-Asn-Pro-His-Lys-Gly-Pro (SEQ ID NO:23), Pro-Arg-Asn-Pro-His-Lys-Gly-Pro-Ala (SEQ ID NO:24) and Pro-Arg-Asn-Pro-His-Lys-Gly-Pro-Ala-Thr (SEQ ID NO:25), in which only one of the residues A or B can be absent;

Z is OH, OR^2, NH_2, NHR^2 or $NR_2{}^2$;

R^1 is H, R^2, Trt, Dpm or Bzl;

R^2 is C_{1-6}-alkyl; and

Hal is F, Cl, Br or I, or

a physiologically acceptable salt thereof.

5,747,458

UROKINASE RECEPTOR LIGANDS

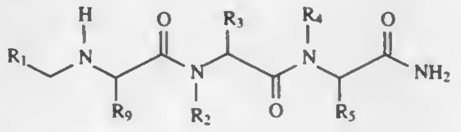
Steve Rosenberg; Kerry L. Spear, both of Oakland, and Eric J. Martin, El Cerrito, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Jun. 7, 1995, Ser. No. 485,021

Int. Cl.^{6} A61K *38/06;38/07*

U.S. Cl. 514—18 **20 Claims**

1. A compound of the formula:



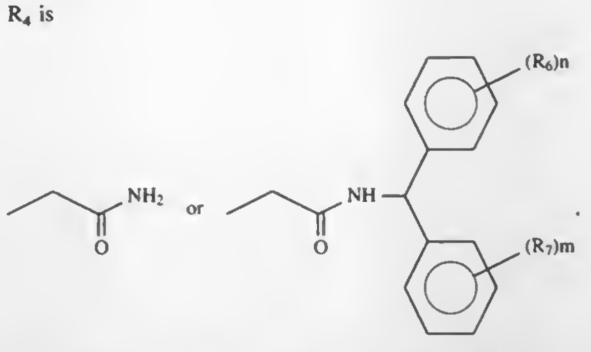
where

R_1 is lower alkyl, lower alkenyl, lower alkynyl, aryl, aralkyl, aryl-alkenyl, aryl-alkynyl, aryl-cycloalkyl, unsubstituted or substituted with 1–3 substituents selected from the group consisting of halo, OH, NH_2, lower alkyl, halo-lower alkyl, lower alkoxy, lower alkylamino, lower alkylthio, CN or NO_2;

R_2 is aryl or aralkyl, unsubstituted or substituted with 1–3 substituents selected from the group consisting of halo, OH, NH_2, CN, NO_2, lower alkyl, halo-lower alkyl, lower alkoxy, lower alkylamino, lower alkylthio, and cycloalkyl;

R_3, R_5 and R_9 are each independently H or lower alkyl;

R_4 is



where R_6 and R_7 are each independently H, OH, NH_2, CN, NO_2, lower alkyl, halo-lower alkyl, lower alkoxy, lower alkylamino, lower alkylthio, or cycloalkyl, and n and m are each independently an integer from 1 to 3 inclusive;

and pharmaceutically acceptable acid addition salts thereof.

5,747,459

METHOD FOR INSURING ADEQUATE INTRACELLULAR GLUTATHIONE IN TISSUE

W. Bruce Rowe, Evanston; David A. Mark, Oak Park, and David C. Madsen, Libertyville, all of Ill., assignors to Nestec, Ltd., Vevey, Switzerland

Continuation of Ser. No. 659,111, Jun. 3, 1996, abandoned, which is a continuation of Ser. No. 306,133, Sep. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 650,222, Feb. 4, 1991, abandoned. This application Feb. 7, 1997, Ser. No. 795,150

Int. Cl.^{6} A23J *1/20;* **A23C** *23/00;35/00*

U.S. Cl. 514—18 **20 Claims**

1. A method for increasing intracellular glutathione levels in a stressed patient comprising the steps of enterally administering to the patient a therapeutically effective amount of a denatured and at least partially hydrolyzed protein that includes at least 2.1% cysteine by caloric content.

5,747,460

METHOD OF TREATMENT AND PROPHYLAXIS OF VENOUS THROMBOSIS

Ruth Elvy Bylund, Västra Frölunda, and Ann-Catrine Elisabet Teger-Nilsson, Mölndal, both of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

Continuation of Ser. No. 984,884, Dec. 2, 1992, Pat. No. 5,614,499. This application Jun. 7, 1995, Ser. No. 484,426

Claims priority, application Sweden, Dec. 4, 1991, 9103612

Int. Cl.^{6} A61K *38/05*

U.S. Cl. 514—19 **1 Claim**

1. A method of treatment or prophylaxis of venous thrombosis in a mammal in need of such treatment or prophylaxis, which comprises administering to the mammal a therapeutically effective amount of HOOC-CH_2-(R)Cha-Pic-Nag or a stereoisomer thereof or a physiologically acceptable salt thereof.

5,747,461

SYNERGISTIC ADMINISTRATION OF CYCLOSPORINE AND FRUCTOSE DIPHOSPHATE

Angel K. Markov, 5973 Hanging Moss Rd., Jackson, Miss. 39206

Filed Jul. 26, 1994, Ser. No. 280,374

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—23 **3 Claims**

1. A method of suppressing an allograft rejection response in a recipient of transplanted tissue, comprising the administration of:

(a) a cyclosporine compound, at a pharmacologically acceptable dosage which is effective in suppressing a T-type lymphocyte cell activation response after an organ transplant operation; and,

(b) fructose-1,6-diphosphate, at a pharmacologically acceptable dosage which acts in a synergistic manner with the cyclosporine compound, thereby reducing the dosage of the cyclosporine compound which is required to effectively suppress a T-type lymphocyte cell activation response after an organ transplant operation.

5,747,462

PHARMACEUTICALLY ACTIVE COMPOUNDS AND THEIR USE

Victoria M. Fuentes, Santiago, Chile, assignor to Laboratorio CHile S.A., Santiago, Chile

Filed Aug. 16, 1995, Ser. No. 516,009

Int. Cl.^{6} A61K *35/78;31/70;* **C07H** *1/08*

U.S. Cl. 514—23 **18 Claims**

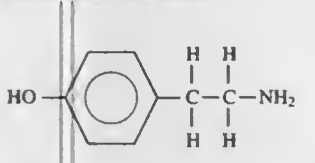
1. A composition derived from a plant of the Cactaceae family, said composition consists essentially of a mixture of:

a) an aromatic amine of formula $C_8H_{11}O_2N$, selected from:

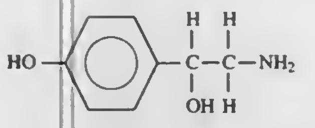
1-R-hydroxy-1-(-4-hydroxy-phenyl-)-2-amino-ethane

1-S-hydroxy-1-(-4-hydroxy-phenyl-)-2-amino-ethane

with molecular structures:



1-S-hydroxy-1-(-4-hydroxy-phenyl-)-2-amino-ethane



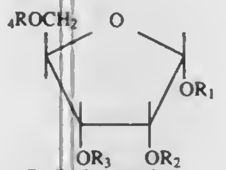
1-R-hydroxy-1-(-4-hydroxy-phenyl-)-2-amino-ethane respectively;

b) a disaccharide of formula $C_{10}H_{18}O_9$; selected from:

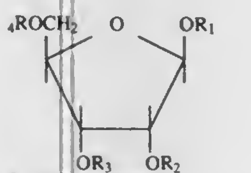
n1-O-(α,β)-(D, L)-ribofuranosyl-(α,β)-(D,L)-ribofuranose;

Where: n1=carbon 1, 2, 3, 5;

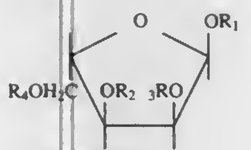
with molecular structures:



α-D-ribofuranosyl

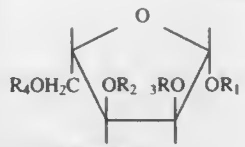


β-D-ribofuranosyl



α-L-ribofuranosyl

-continued



β-L-ribofuranosyl

respectively,

wherein, when any one of R1, R2, R3 and R4, in the respective, α-D-ribofuranosyl, α-D-ribofuranosyl, α-L-ribofuranosyl, β-L-ribofuranosyl, is selected from:

1-O-α-D-RIBOFURANOSE;
2-O-α-D-RIBOFURANOSE;
3-O-α-D-RIBOFURANOSE;
5-O-α-D-RIBOFURANOSE;
1-O-β-D-RIBOFURANOSE;
2-O-β-D-RIBOFURANOSE;
3-O-β-D-RIBOFURANOSE;
5-O-β-D-RIBOFURANOSE;
1-O-α-L-RIBOFURANOSE;
2-O-α-L-RIBOFURANOSE;
3-O-α-L-RIBOFURANOSE;
5-O-α-L-RIBOFURANOSE;
1-O-β-L-RIBOFURANOSE:
2-O-β-L-RIBOFURANOSE;
3-O-β-L-RIBOFURANOSE:
5-O-β-L-RIBOFURANOSE;

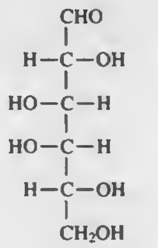
the remaining R1, R2, R3 and R4 are each H, respectively, in the α-D-ribofuranosyl, β-D-ribofuranosyl, α-L-ribofuranosyl, β-L-ribofuranosyl, respectively; and

c) one or more structural isomers of the monosaccharides of:

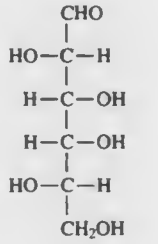
i) galactose, with formula $C_6H_{12}O_6$; selected from:

D-galactose; α-D-galactopyranose; β-D-galactopyranose; α-D-galactofuranose; β-D-galactofuranose; L-galactose; α-L-galactopyranose; β-L-galactopyranose; α-L-galactofuranose; β-L-galactofuranose

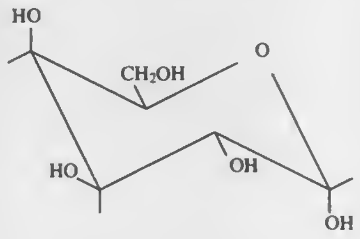
with molecular structures:



D-galactose

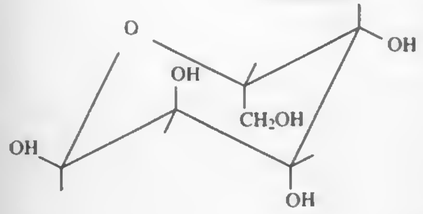


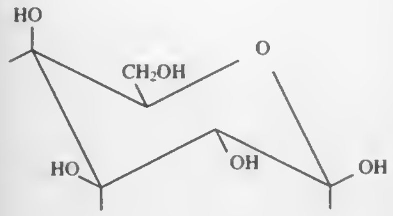
L-galactose

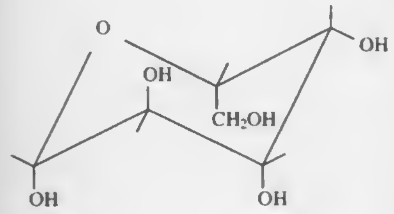


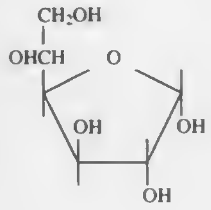
α-D-galactopyranose

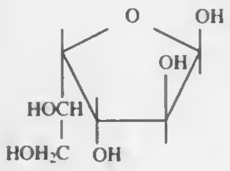
-continued

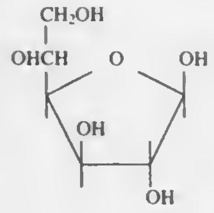

α-L-galactopyranose

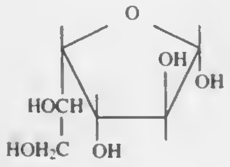

β-D-galactopyranose


β-L-galactopyranose


α-D-galactofuranose


α-L-galactofuranose


β-D-galactofuranose

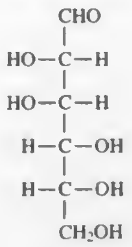

β-L-galactofuranose

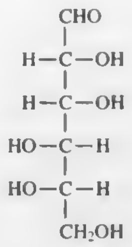
respectively;

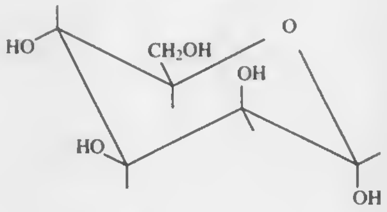
ii) mannose with formula $C_6H_{12}O_6$; selected from:

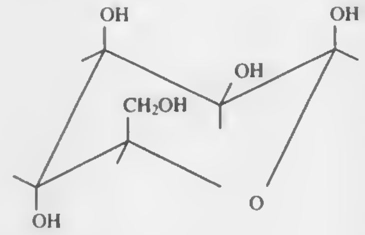
D-mannose; α-D-mannopyranose; β-D-mannopyranose; α-D-mannofuranose; β-D-mannofuranose; L-mannose; α-L-mannopyranose; β-L-mannopyranose; α-L-mannofuranose; β-L-mannofuranose

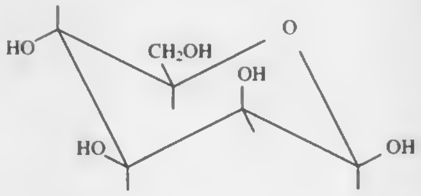
with molecular structures:

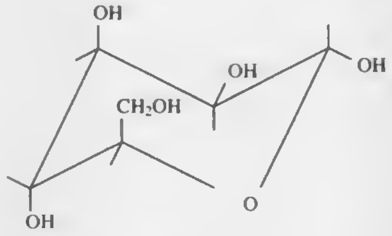

D-mannose

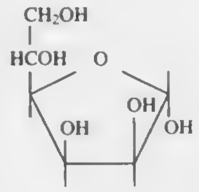

L-mannose

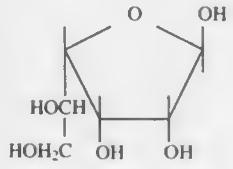

α-D-mannopyranose


α-L-mannopyranose

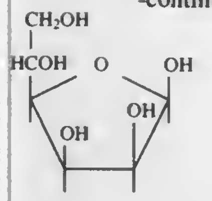

β-D-mannopyranose

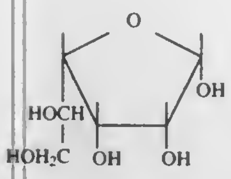

β-L-mannopyranose


α-D-mannofuranose


α-L-mannofuranose

-continued


β-D-mannofuranose


β-L-mannofuranose

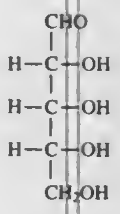
respectively

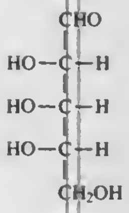
iii) ribose with formula $C_5H_{10}O_5$; selected from:

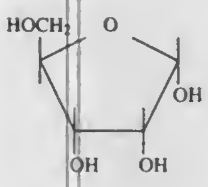
D-ribose; α-D-ribofuranose; β-D-ribofuranose

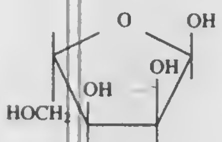
L-ribose; α-L-ribofuranose; β-L-ribofuranose

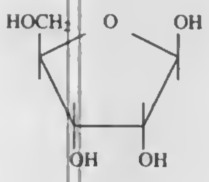
with molecular structures:

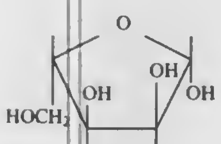

D-ribose


L-ribose


α-D-ribofuranose


α-L-ribofuranose


β-D-ribofuranose


β-L-ribofuranose

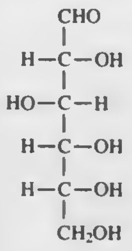
respectively;

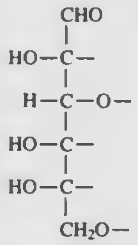
iv) glucose with formula $C_6H_{12}O_6$; selected from:

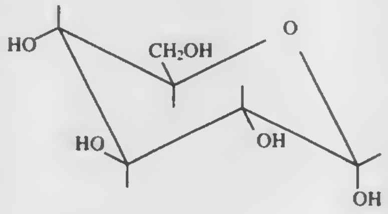
D-glucose; α-D-glucopyranose; β-D-glucopyranose; α-D-glucofuranose; β-D-glucofuranose

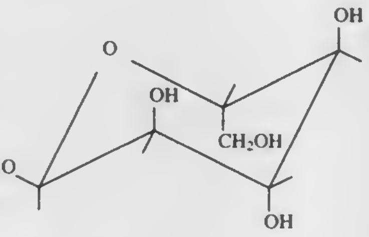
L-glucose; α-L-glucopyranose; β-L-glucopyranose; α-L-glucofuranose; β-L-glucofuranose

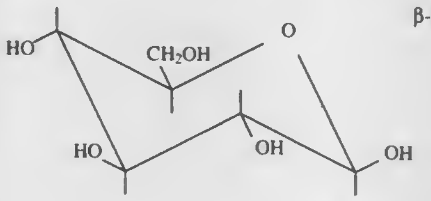
with molecular structures:

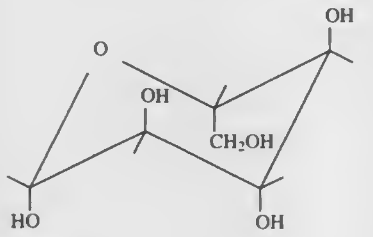

D-glucose

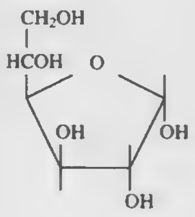

L-glucose


α-D-glucopyranose


α-L-glucopyranose

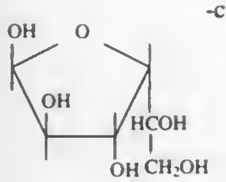

β-D-glucopyranose


β-L-glucopyranose

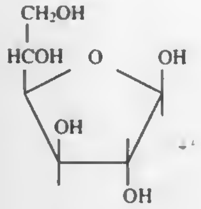

α-D-glucofuranose

VOL
2 10
SS
1
MY
5
998
MI

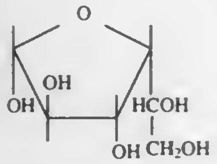
-continued



α-L-glucofuranose



β-D-glucofuranose



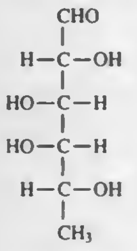
β-L-glucofuranose

respectively;

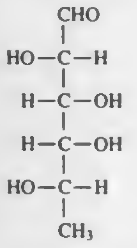
v) fucose with formula $C_6H_{12}O_5$; selected from:

D-fucose, δ6-deoxy-D-galactose; α-D-fucopyranose, δ6-deoxy-α-D-galactopyranose; β-D-fucopyranose, δ6-deoxy-β-D-galactopyranose; α-D-fucofuranose, δ6-deoxy-α-D-galactofuranose; β-D-fucofuranose, δ6-deoxy-β-D-galactofuranose L-fucose, δ6-deoxy-L-galactose; α-L-fucopyranose, δ6-deoxy-α -L-galactopyranose; β-L-fucopyranose, δ6-deoxy-β-L-galactopyranose; α-L-fucofuranose, δ6-deoxy-α -L-galactofuranose; β-L-fucofuranose, δ6-deoxy-β-L-galactofuranose;

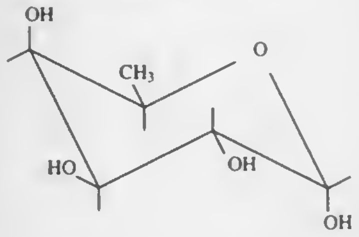
with molecular structures:



D-fucose, σ 6-deoxy-D-galactose

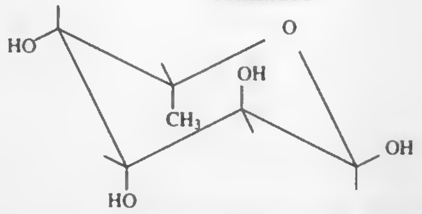


L-fucose σ 6-deoxy-L-galactose

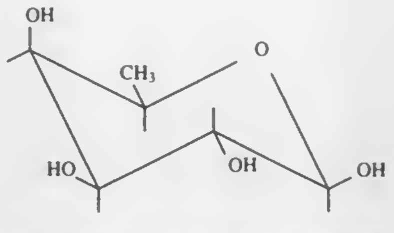


α-D-fucopyranose, σ 6-deoxy-α-D-galactopyranose

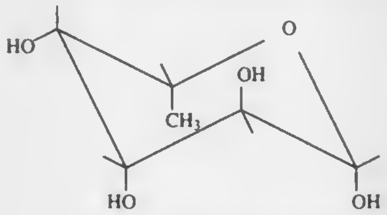
-continued



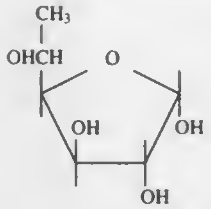
α-L-fucopyranose, σ 6-deoxy-α-L-galactopyranose



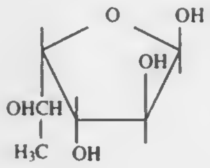
β-D-fucopyranose, σ 6-deoxy-β-D-galactopyranose



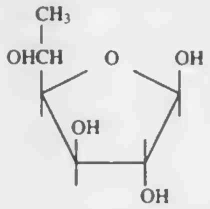
β-L-fucopyranose, σ 6-deoxy-β-L-galactopyranose



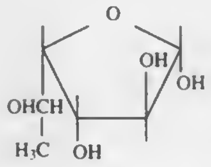
α-D-fucofuranose, σ 6-deoxy-α-D-galactofuranose



α-L-fucofuranose, σ 6-deoxy-α-L-galactofuranose



β-D-fucofuranose, σ 6-deoxy-β-D-galactofuranose



β-L-fucofuranose, σ 6-deoxy-β-L-galactofuranose

respectively;

wherein said monosaccharides are in any one of:

(1) a pyranoside ring form,

(2) a furanoside ring form, and

(3) an aldehyde open chain form; and

in any of the stereoisomeric and optical isometric forms thereof.

5,747,463

MALONATE DERIVATIVES OF GLYCOLIPIDS AS CELL ADHESION INHIBITORS

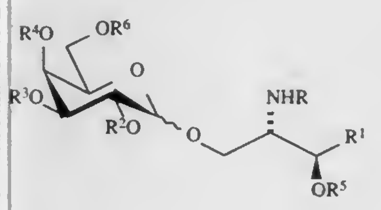
Anne Marinier, Kirkland, and Alain Martel, Delson, both of Canada, assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Oct. 2, 1996, Ser. No. 725,147

Int. Cl.^{6} A61K *31/70;* C07H *15/00*

U.S. Cl. 514—25 **20 Claims**

1. A compound of the formula



wherein

R is an acyl residue of a fatty acid:

R^1 is —(CH=CH)$_m$—(CH$_2$)$_n$—CH$_3$;

R^2, R^3, R^4, R^5 and R^6 each are independently hydrogen, unsubstituted or substituted (lower)alkanoyl, arylalkyl or arylcarbonyl wherein said substituent is selected from the group consisting of halogen, C_{1-4} alkyl, trifluoromethyl, hydroxy and C_{1-4} alkoxy provided that one of R^2, R^3, R^4 and R^6 substituents is —(CH$_2$)$_p$—CH(CO$_2$R^7)$_2$;

m is an integer of 0 or 1;

n is an integer of from 5 to 14 inclusive;

p is an integer of from 2 to 6 inclusive; and

R^7 is hydrogen, a hydrolyzable ester group or a cation to form a non-toxic pharmaceutically acceptable salt;

or a solvate or hydrate thereof.

5,747,464

DIETARY SUPPLEMENT INCORPORATING β-SITOSTEROL AND PECTIN

Jackie Ray See, Fullerton, Calif., assignor to Bio-Sphere Technology, Inc., Reno, Nev.

Continuation of Ser. No. 430,136, Apr. 26, 1995, abandoned, which is a continuation of Ser. No. 83,340, Jun. 25, 1993, abandoned. This application Jul. 23, 1996, Ser. No. 685,209

Int. Cl.^{6} A61K *31/705;31/715;* C08B *37/06*

U.S. Cl. 514—26 **18 Claims**

1. A composition for inhibiting absorption of fat and cholesterol from the gut, said composition comprising β-sitosterol and apple pectin combined to form a β-sitosterol/apple pectin complex, wherein said composition is substantially insoluble in the human stomach and capable of passing through the stomach substantially intact.

5,747,465

SUGAR DERIVATIVES OF MACROLIDES

Kevin Koch, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

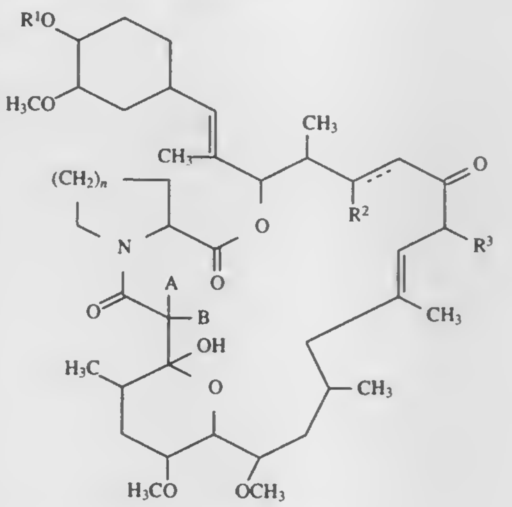
PCT No. PCT/US93/00470, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO93/18050, PCT Pub. Date Sep. 16, 1993

PCT Filed Jan. 28, 1993, Ser. No. 284,504

Int. Cl.^{6} A61K *31/70;* C07H *17/08*

U.S. Cl. 514—28 **22 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof;

wherein n is 1 or 2;

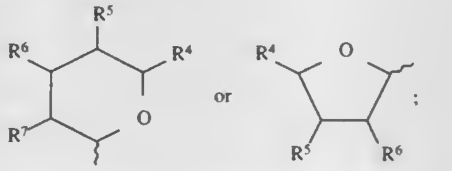
the dotted line represents an optional double bond in the case where R^2 is H;

A and B are taken separately and are each independently H or OH, or A and B are taken together and form =O;

R^2 is H, (C_2–C_5)alkanoyloxy or —OR^0;

R^3 is (C_1 to C_3)alkyl or allyl;

R^1 and R^0 are each H,



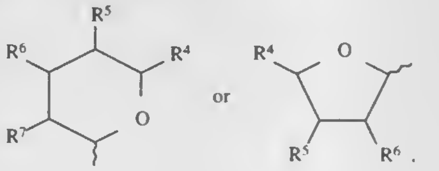
R^4 is, for each occurrence, independently —CO$_2$R^8, —CO$_2$H, —CH$_2$OH, H, —CH$_3$, —CONH$_2$, —CONHR^8, —CONR$_2^8$, —CH$_2$OCOR^8, —CH$_2$OCO$_2$R^8, —CH$_2$OCONHR^8, —CH$_2$OCONR$_2^8$ or —CH$_2$OR^8;

R^5, R^6 and R^7 are, for each occurrence, independently (C_1 to C_4) alkoxy, benzyloxy, —OH, —OCOR^8, —OCO$_2$R^8 or —OSi(R^9)$_3$;

R^8 is (C_1 to C_6)alkyl, (C_3 to C_6)cycloalkyl, allyl, pyridyl, thienyl, benzyl, benzyl substituted with one to five halogen atoms, —OH groups, or (C_1 to C_4)alkoxy groups, phenyl or phenyl substituted with one to five halogen atoms, —OH groups or (C_1 to C_4) alkoxy groups; and

R^9 is, for each occurrence, independently (C_1 to C_4)alkyl, phenyl or benzyl; provided that

when R' is H, then R^2 is —OR^0 and R^0 is



17. A method for treating resistance to transplantation in a mammal in need of such treatment comprising administering to said mammal a resistance to transplantation treating effective amount of a compound according to claim 1 or a pharmaceutically-acceptable salt thereof.

5,747,466

3-DEOXY-3-DESCLADINOSE DERIVATIVES OF ERYTHROMYCINS A AND B

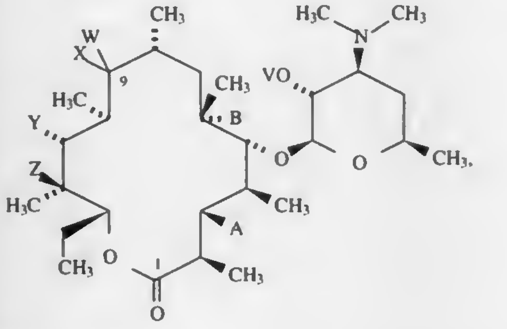
Richard L. Elliott, Grayslake; Yat Sun Or, Libertyville; Daisy Pireh, Lincolnshire, all of Ill., and Daniel T. Chu, Santa Clara, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 10, 1996, Ser. No. 729,269

Int. Cl.^{6} A61K *31/70;* **C07H** *17/08*

U.S. Cl. 514—29 **18 Claims**

1. A compound, or a pharmaceutically acceptable salt or ester thereof, having a formula selected from the group consisting of:



(I)

wherein:

A is hydrogen, —O(C═S)—SR^1, or —O(C═S)—OR^1, wherein R^1 is selected from the group consisting of:
  (a) C_1–C_6-alkyl,
  (b) aryl-C_1–C_6-alkyl,
  (c) substituted aryl-C_1–C_6-alkyl,
  (d) aryl, and
  (e) heteroaryl;

B is hydrogen, hydroxy, or methoxy;

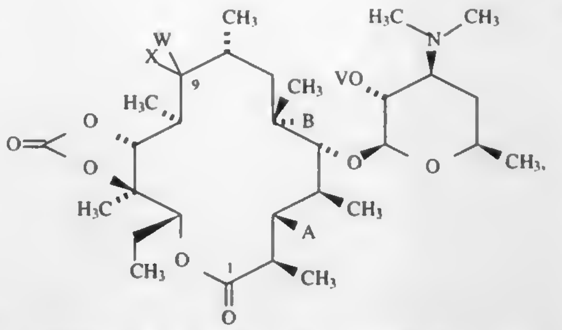
V is hydrogen or a hydroxy-protecting group;

W is hydrogen; and X is selected from the group consisting of:
  (a) NR^{2}R^3, wherein R^2 and R^3 are independently selected from the group consisting of hydrogen, C_1–C_6-alkyl, C_1–C_6-alkylamino, aryl-C_1–C_6-alkyl or heteroaryl-C_1–C_6-alkyl, or wherein R^2 and R^3 are taken together with the nitrogen atom to which they are attached to form a 5-to-7-membered saturated ring; and
  (b) NR4—(C═O)—R^1, wherein R^1 is as described above and R^4 is hydrogen or C_1–C_6-alkyl; or

W and X are taken together and represent ═O, ═N—O—R^2, wherein R^2 is as described above, or ═N—R^5, wherein R^5 is selected from the group consisting of:
  (a) hydrogen,
  (b) C_1–C_6-alkyl,
  (c) substituted C_1–C_6-alkyl,
  (d) —$(CH_2)_m$—L—$(CH_2)_n$—M—CH_2—H, wherein m=1–6, n=1–6, L and M are both oxygen, L is oxygen and M is absent, or M is oxygen and L is absent,
  (e) —$(CH_2)_m$—L-aryl-M—$(CH_2)_n$—H, wherein m=1–6, n=1–6, L and M are both oxygen, L is oxygen and M is absent, or M is oxygen and L is absent, and
  (f) —$(CH_2)_m$L—$(CH_2)_n$—M-aryl-H, wherein m=1–6, n=1–6, L and M are both oxygen, L is oxygen and M is absent, or M is oxygen and L is absent;

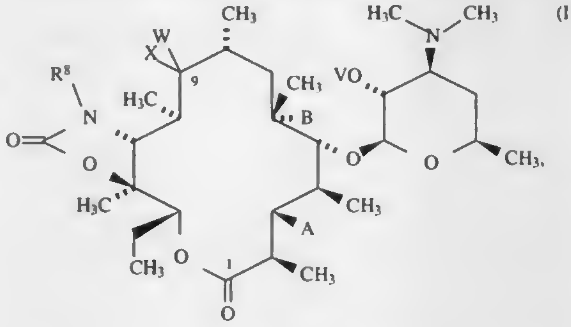
Y is —OH, or —OR^6 wherein R^6 is a hydroxy-protecting group; and

Z is hydrogen, —OH, or —OR^7 wherein R^7 is a hydroxy-protecting group;



(II)

wherein A, B, V, W and X are as defined above; and



(III)

wherein A, B, V, W, and X are as defined above, and R^8 is selected from the group consisting of:
(a) hydrogen,
(b) C_1–C_6-alkyl,
(c) aryl,
(d) aryl-C_1–C_6-alkyl,
(e) heteroaryl-C_1–C_6-alkyl,
(f) cycloalkyl,
(g) cycloalkyl-C_1–C_6-alkyl,
(h) —NH—R^9, wherein R^9 is selected from the group consisting of:
  (aa) C_1–C_6-alkyl,
  (bb) aryl-C_1–C_6-alkyl,
  (cc) heteroaryl-C_1–C_6-alkyl,
  (dd) C_3–C_7-cycloalkyl,
  (ee) C_3–C_7-cycloalkyl-C_1–C_6-alkyl,
  (ff) —CO—C_1–C_6-alkyl,
  (gg) —CO-aryl, and
  (hh) —CO—C_1–C_6-alkyl-aryl-; and
(i) —N═CH—R^{10}, wherein R^{10} is selected from the group consisting of:
  (aa) C_1–C_6-alkyl,
  (bb) aryl,
  (cc) aryl-C_1–C_6-alkyl,
  (dd) heteroaryl-C_1–C_6-alkyl,
  (ee) C_3–C_7-cycloalkyl, and
  (ff) C_3–C_7-cycloalkyl-C_1–C_6-alkyl.

12. A method for treating bacterial infections in a patient in need of such treatment, comprising administering to the patient a therapeutically effective amount of a compound according to claim 1.

5,747,467

ERYTHROMYCINS

Constantin Agouridas, Nogent sur Marne; François Bretin, Ozoir la Ferriere, and Jean-François Chantot, Nogent sur Marne, all of France, assignors to Roussel Uclaf, France

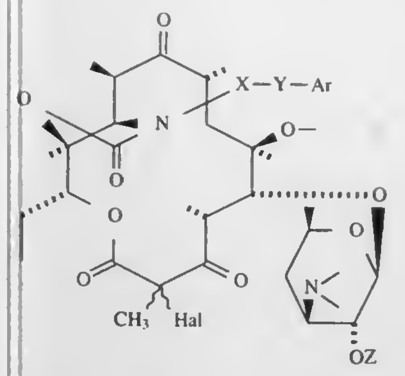
Filed Dec. 19, 1996, Ser. No. 767,954

Claims priority, application France, Dec. 22, 1995, 95-15322

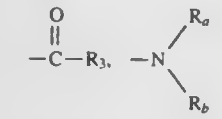
Int. Cl.^{6} A61K *31/70;* **C07H** *17/08*

U.S. Cl. 514—29 **17 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein X is selected from the group consisting of —$(NH)_a$—, —CH_2—, —SO_2— and —O—, a is 0 or 1, Y is selected from the group consisting of —$(CH_2)_3$—, —$(CH_2)_4$— and —(CH_2)-5- Ar is heterocyclic selected from the group consisting of thienyl, furyl, pyrrolyl, thiazolyl, oxazoyl, imidazolyl, thiadiazolyl, pyrazolyl, isopyrazolyl, pyridyl, pyrimidyl, pyridazinyl, pyrazinyl indolyl, benzofuranyl, benzothiazyl and quinolyl or aryl optionally substituted with at least one member of the group consisting of —OH, chlorine, —NO_2, —ON,



and

alkyl, alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, alkythio, alkenylthio, alkynylthio, -N-alkyl, -N-alkenyl and N-alkynyl of up to 12 carbon atoms, R_a and R_b individually are hydrogen or alkyl of up to 12 carbon atoms, R_3 is selected from the group consisting of alkyl of 1 to 12 carbon atoms, carbocyclic aryl, carbocyclic aryloxy, carbocyclic arylthio and heterocyclic aryl, heterocyclic aryloxy and heterocyclic arylthio of 5 to 6 ring members containing at least one hetero atom, selected from the group consisting of oxygen, sulfur and nitrogen, Hal is halogen, Z is hydrogen or acyl of an organic carboxylic acid and their non-toxic, pharmaceutically acceptable addition salts.

5,747,468

CATIONIC UNSATURATED SACCHARIDES AND POLYMERS PREPARED THEREFROM, AND THEIR USE

Reinhard Dönges, Bad Soden, and Rudolf Ehrler, Flörsheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 26, 1996, Ser. No. 703,201

Claims priority, application Germany, Aug. 25, 1995, 195 31 264.3

Int. Cl.^{6} A61K *31/70;7/06;* **C07H** *5/06*

U.S. Cl. 514—42 **6 Claims**

1. A deoxyaminosaccharide compound represented by formula I

$$R^5R^4C{=}CR^3{-}CH_2{-}N^{\oplus}R^1R^2{-}CH_2{-}CR^3{=}CR^4R^5X^{\ominus} \qquad (I)$$

in which

R^1 is a deoxysaccharide radical having 1 to 20 monomer units,

R^2 has the same meaning as R^1 or is C_1–C_{20}-alkenyl, C_1–C_4-hydroxyalkyl, C_1–C_4-alkylphenyl or a polyoxyethylene, polyoxypropylene or polyethyleneimine group having in each case 1 to 10 ethylene oxide, propylene oxide or ethyleneimine units,

R^3, R^4 and R^5 are hydrogen or methyl and

X is a halogen, tosylate or allyl-sulfate ion.

5,747,469

METHODS AND COMPOSITIONS COMPRISING DNA DAMAGING AGENTS AND P53

Jack A. Roth, Houston, Tex.; Toshiyoshi Fujiwara, Okayama, Japan; Elizabeth A. Grimm, Houston, Tex.; Tapas Mukhopadhyay, Houston, Tex.; Wei-Wei Zhang, Houston, Tex., and Laurie B. Owen-Schaub, Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 145,826, Oct. 29, 1993, which is a continuation-in-part of Ser. No. 960,513, Oct. 13, 1992, which is a continuation-in-part of Ser. No. 665,538, Mar. 6, 1991, abandoned. This application Apr. 25, 1994, Ser. No. 233,002

Int. Cl.^{6} A61K *48/00;* **C12N** *5/00;15/00*

U.S. Cl. 514—44 **105 Claims**

1. A method of killing a tumor cell in a patient in need thereof, comprising directly administering to said tumor cell therapeutically effective amounts of a viral vector and a DNA damaging agent, wherein said viral vector comprises a DNA sequec encoding p53 operatively linked to a promoter, and wherein expression of said p53 and DNA damage result in the killing of said tumor cell.

5,747,470

METHOD FOR INHIBITING CELLULAR PROLIFERATION USING ANTISENSE OLIGONUCLEOTIDES TO GP130 MRNA

Kathleen Becherer; Nanibhushan Dattagupta, both of San Diego, Calif., and Yathi M. Naidu, Park Ridge, Ill., assignors to Gen-Probe Incorporated, San Diego, Calif.

Filed Jun. 7, 1995, Ser. No. 484,518

Int. Cl.^{6} A01N *43/04*

U.S. Cl. 514—44 **46 Claims**

1. A method of inhibiting or reducing cytokine-induced cellular proliferation of cells in vitro comprising:

a) providing an oligonucleotide, said oligonucleotide being up to 100 nucleotide bases in length and comprising a contiguous nucleotide base sequence selected from the group consisting of:

SEQ. ID. NO. 1	GGCCCAGCGC GACTCCGCGG GCCTT,
SEQ. ID. NO. 2	CCTGTAGATT CAGTGGTGAG,
SEQ. ID. NO. 3	ACACAAACTG CAGTGAAATT AGAATG,
SEQ. ID. NO. 4	TACATGAAAA TAATCCATAC ATT,
SEQ. ID. NO. 5	GTTTATGATA GTATATTGCT CCTTA,
SEQ. ID. NO. 6	CCATAAACATT CTGTTCAAGC TGTC,
SEQ. ID. NO. 7	TGCCCATTCA GATTTTAAAG TGAAG,
SEQ. ID. NO. 8	GCTTTGCAAT CAGCAAACTT GTGTGT,
SEQ. ID. NO. 9	TACAGGATCA AAATTGATAT GATCTGATGT AACC,
SEQ. ID. NO. 10	GGCATCTTTG GTCCTATATT G,
SEQ. ID. NO. 11	AGGATCTGGA ACATTAGGC, and
SEQ. ID. NO. 12	GCTCGAAGTG TTTTGTGAAG,

wherein said oligonucleotide inhibits or reduces cytokine-induced cellular proliferation of cells in vitro; and

b) contacting a cell with said oligonucleotide in vitro under conditions such that said oligonucleotide is delivered within said cell.

5,747,471

CATIONIC AMPHIPHILES CONTAINING STEROID LIPOPHILIC GROUPS FOR INTRACELLULAR DELIVERY OF THERAPEUTIC MOLECULES

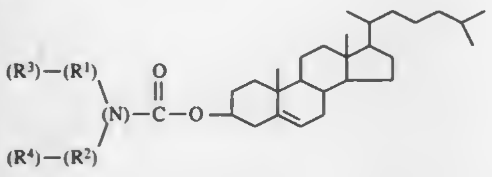
Craig S. Siegel, Woburn; David J. Harris, Lexington; Edward R. Lee, Quincy; Shirley C. Hubbard, Belmont; Seng H. Cheng, Wellesley; Simon J. Eastman, Marlboro; John Marshall, Milford; Ronald K. Scheule, Hopkinton; Mathieu B. Lane, Cambridge, and Eric A. Rowe, Malden, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 352,479, Dec. 9, 1994. This application Oct. 11, 1995, Ser. No. 540,867

Int. Cl.^{6} A61K *48/00;31/56;31/70;* **B01F** *17/28*

U.S. Cl. 514—44 **20 Claims**

1. A cationic amphiphile capable of facilitating transport of a biologically active molecule into a cell, said amphiphile having the structure



wherein:

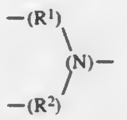
R^3 is H, or a saturated or unsaturated aliphatic group;

R^1 is an alkylamine, or a polyalkylamine;

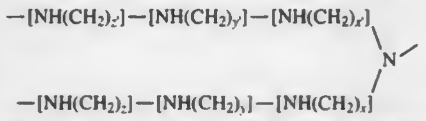
R^4 is H, or a saturated or unsaturated aliphatic group;

R^2 is an alkylamine, or a polyalkylamine;

wherein R^1 and R^2 are the same or different; and the



group thereof is selected from the group consisting of:


—[NH(CH₂)z']—[NH(CH₂)y']—[NH(CH₂)x']
N
—[NH(CH₂)z]—[NH(CH₂)y]—[NH(CH₂)x]

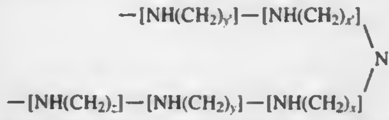
(A)

wherein the total number of nitrogen and carbon atoms in an

R^3-[NH(CH$_2$)$_{z'}$]—[NH(CH$_2$)$_{y'}$]—[NH(CH$_2$)$_{x'}$] group, or in an

R^4-[NH(CH$_2$)$_z$]—[NH(CH$_2$)$_y$]—[NH(CH$_2$)$_x$] group, is less than 40,

each of x, x', y, y', z and z' is a whole number other than 0 or 1, and at least one of x, x', y, y', z and z' is 3 or 4;



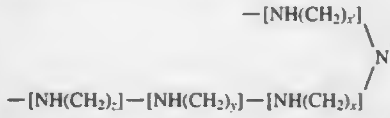
(B)

wherein the total number of nitrogen and carbon atoms in an

R^3—[NH(CH$_2$)$_{y'}$]—[NH(CH$_2$)$_{x'}$] group, or in an

R^4—[NH(CH$_2$)$_z$]—[NH(CH$_2$)$_y$]—[NH(CH$_2$)$_x$] group, is less than 40,

each of x, x', y, y' and z is a whole number other than 0 or 1, and at least one of x, x', y, y' and z is 3 or 4;



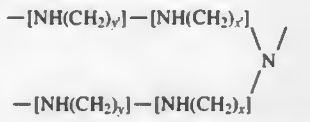
(C)

wherein the total number of nitrogen and carbon atoms in an

R^3—[NH(CH$_2$)$_{x'}$] group, or in an

R^4—[NH(CH$_2$)$_z$]—[NH(CH$_2$)$_y$]—[NH(CH$_2$)$_x$] group, is less than 40,

each of x, x', y and z is a whole number other than 0 or 1, and at least one of x, x', y and z is 3 or 4;



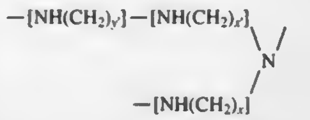
(D)

wherein the total number of nitrogen and carbon atoms in an

R^3—[NH(CH$_2$)$_{y'}$]—[NH(CH$_2$)$_{x'}$] group, or in an

R^4—[NH(CH$_2$)$_y$]—[NH(CH$_2$)$_x$] group, is less than 40,

each of x, x', y and y' is a whole number other than 0 or 1, and at least one of x, x', y and y' is 3 or 4;



(E)

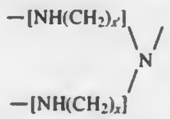
wherein the total number of nitrogen and carbon atoms in an

R^3—[NH(CH$_2$)$_{y'}$]—[NH(CH$_2$)$_{x'}$] group, or in an

R^4—[NH(CH$_2$)$_x$] group, is less than 40,

each of x, x' and y' is a whole number other than 0 or 1, and at least one of x, x' and y' is 3 or 4,

except that x, x' and y' are not 3, 4, and 3 respectively;



(F)

wherein the total number of nitrogen and carbon atoms in an

R^3—[NH(CH$_2$)$_{x'}$] group, or in an

R^4—[NH(CH$_2$)$_x$] group, is less than 40,

each of x and x' is a whole number other than 0 or 1, and at least one of x and x' is 3 or 4,

except that x and x' are not, together, 3 and 4; and

(G)

wherein R^1 and/or R^2 according to any of structures (A) to (F) are replaced by —[NH(CH$_2$)$_z$]—[NH(CH$_2$)$_y$]—[NH(CH$_2$)$_x$]—[NH(CH$_2$)$_w$]—, the total number of nitrogen and carbon atoms in said R^3–R^1 or R^4–R^2 group is less than 40, each of w, x, y and z is a whole number other than 0 or 1, and at least one of w, x, y and z is 3 or 4.

5,747,472

THERAPEUTIC METHODS FOR USING ARA-G DERIVATIVES

Thomas Anthony Krenitsky, Chapel Hill; Devron Randolph Averett, Raleigh; George Walter Koszalka, Chapel Hill, and Gerald Wolberg, Cary, all of N.C., assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 224,343, Apr. 7, 1994, Pat. No. 5,492,897, which is a division of Ser. No. 731,969, Jul. 18, 1991, abandoned. This application May 31, 1995, Ser. No. 456,186

Claims priority, application United Kingdom, Jul. 19, 1990, 9015914

Int. Cl.^{6} A61K *32/70*

U.S. Cl. 514—45 **11 Claims**

1. The method of treating a mammal having lymphocytic leukemia which comprises administering to said mammal an effective treatment amount of the compound 2-amino-6-methoxy-9-(β-D-arabinofuranosyl)-9H-purine.

5,747,473

L-NUCLEOSIDE ANALOGUES AND PHARMACEUTICAL COMPOSITIONS

Björn Olof Classon, Stockholm; Bengt Bertil Samuelsson, Onsala; Ingemar Sven-Anders Kvarnström, Linköping; Lars Göran Svansson, and Stefan Carl Tore Svensson, both of Linköping, all of Sweden, assignors to Medivir AB, Huddinge, Sweden

Division of Ser. No. 30,168, May 20, 1993, Pat. No. 5,473,063. This application Aug. 18, 1995, Ser. No. 516,551

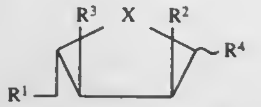
Claims priority, application Sweden, Oct. 2, 1990, 9003151

Int. Cl.^{6} C07H *19/10;19/20;* **A61K** *31/70*

U.S. Cl. 514—45 **14 Claims**

1. A compound of the formula

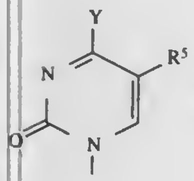
1B



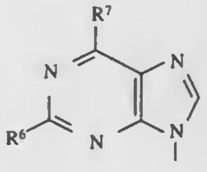
wherein X is O, S, SO, SO$_2$, CH$_2$; R^1 is OH, O—PO(OH)$_2$, O—PO(OH)—O—PO—(OH)$_2$, O—PO(OH)—O—PO(OH)—O—PO(OH)$_2$ or (CH$_2$)$_n$OCH$_2$PO(OH)$_2$ wherein n is 0–2;

R^2 is H and R^3 is CH$_3$, CH$_2$OH, CH$_2$OCH$_3$, CH$_2$SH, CH$_2$F or CH$_2$N$_3$; or R^3 is H and R^2 is CH$_3$, CH$_2$OH, CH$_2$OCH$_3$, CH$_2$SH, CH$_2$F or CH$_2$N$_3$;

R^4 is



or



Y is OH, NH$_2$ and R^5 is CH=CH$_2$, C≡CH, CH=CH—CH$_3$, C≡C—CH$_3$, thien-2-yl, thien-3-yl, H, CH$_3$, C$_2$H$_5$, CH$_2$CH$_2$CH$_3$ or CH(CH$_3$)$_2$;

R^6 and R^7 are the same or different and are H, F, Cl, OH, NH$_2$ or SH;

in the form of a mixture of α- and β-anomers or in the form of an α- or β-anomer; and pharmaceutically acceptable salts thereof.

5,747,474

IMMUNOSUPPRESSION BY ADMINISTRATION OF N^6,N^6-DISUBSTITUTED CAMP'S, ANALOGUES THEREOF, AND RELATED NUCLEOSIDES

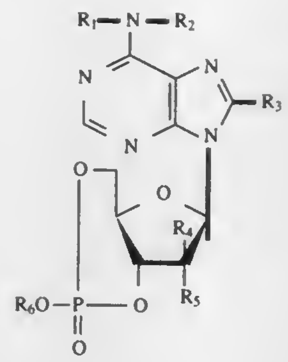
Emmanuel A. Ojo-Amaize, Glendora; Howard B. Cottam, Fallbrook, and Ganesh D. Kini, San Diego, all of Calif., assignors to Immune Modulation, Inc., Santa Monica, Calif.

Filed Jul. 29, 1996, Ser. No. 688,002

Int. Cl.^{6} A61K *31/70*

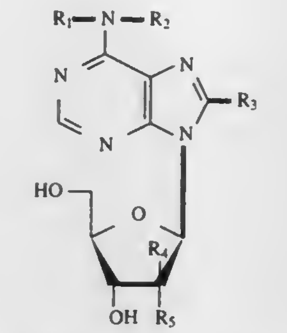
U.S. Cl. 514—46 **6 Claims**

1. A method for inducing immunosuppression in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a composition comprising a compound or agonist having one of the following structures:



I

or



II

wherein

R_1, R_2 are same or different or in any independent combination of R_1=H, —(CH$_2$)$_n$OH where n= 1–5; C$_{1\text{-}12}$ alkyl, substituted or unsubstituted, straight chain or branched, with 0–6 double bonds;

R_3, R_4, R_5 are the same or different or may be selected in any independent combination of H, Cl, Br, F, I, NH$_2$, NHR$_1$, N(R$_1$)$_2$, OH, OR$_1$, SH, and SR$_1$

R_6=H, NH$_4^+$, Na$^+$ and any other physiologically acceptable cation; or

R_6=N-alkyl(mono, di or tri substituted) linear or branched chain C$_{1\text{-}6}$.

5,747,475

CHITOSAN-DERIVED BIOMATERIALS

Robert E. Nordquist, Oklahoma City; Wei R. Chen, Norman; Raoul Carubelli, and Robert Adams, both of Oklahoma City, all of Okla., assignors to Wound Healing of Oklahoma, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 416,158, Apr. 4, 1995. This application Oct. 2, 1996, Ser. No. 720,685

Int. Cl.^{6} A61K *31/73;* **C08B** *37/08*

U.S. Cl. 514—55 **19 Claims**

1. An immunoadjuvant comprising a suspension or a solution of glycated chitosan.

5,747,476

TREATMENT OF EQUINE PROTOZOAL MYELOENCEPHALITIS

Meri Charm Russell, Des Moines, Iowa, and Clara K. Fenger, Lexington, Ky., assignors to Mortar & Pestle Veterinary Pharmacy, Inc., Des Moines, Iowa

Filed Jul. 17, 1996, Ser. No. 683,507

Int. Cl.^{6} A61K *31/505;* **C07D** *239/48*

U.S. Cl. 514—275 **48 Claims**

1. A method of treating a Sarcocystis infection in an equine in need of such treatment which comprises administering to the equine therapeutically effective amounts of pyrimethamine and a sulfonamide, provided that the method does not also include the absence of known therapeutic amounts of trimethoprim.

5,747,477

AZO DERIVATIVES OF 5-AMINOSALICYLIC ACID

Elena Carceller, Sant Cugat; Pere J. Jimenez, Tarragona; Jordi Salas, Montornes del Valles; Carmen Almansa, Barcelona; Javier Bartroli, Barcelona; Manel Merlos, Barcelona; Marta Giral, Barcelona; Dolors Balsa, Barcelona; Rosa Ferrando, Barcelona; Julian Garcia-Rafanell, Barcelona, and Javier Forn, Barcelona, all of Spain, assignors to J. Uriach & Cia S.A., Barcelona, Spain

PCT No. PCT/EP96/03921, § 371 Date May 8, 1997, § 102(e) Date May 8, 1997, PCT Pub. No. WO97/09329, PCT Pub. Date Mar. 13, 1997

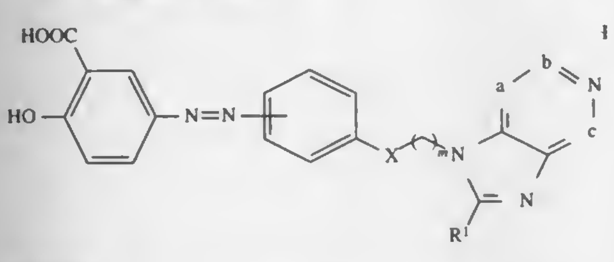
PCT Filed Sep. 6, 1996, Ser. No. 836,125

Claims priority, application Spain, Sep. 8, 1995, 95 01752; Oct. 11, 1995, 95 01967

Int. Cl.^{6} A61K *31/655;* **C07D** *471/04*

U.S. Cl. 514—150 **16 Claims**

1. A compound of formula I:



I

wherein:

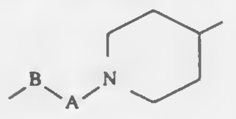
the 4-hydroxy-3-carboxyphenylazo moiety may be at the 3- or 4-position of the benzene ring;

m represents 1 or 2;

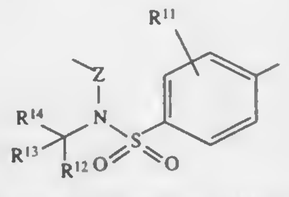
R^1 represents C$_{1-4}$ alkyl or C$_{3-7}$ cycloalkyl;

a, b and c represent CR^2, wherein each R^2 independently represents hydrogen or C$_{1-4}$ alkyl;

X represents a group of formula (i) or (ii):



(i)

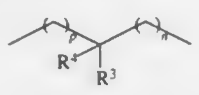


(ii)

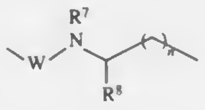
wherein these groups are bound to the phenyl ring in formula I via B and Z, respectively;

A represents —CO—, —SO$_2$—, —NHCO— or —OCO—,

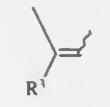
B represents a group of formula (iii), and when A represents —CO— or —SO$_2$—, B may also represent a group of formula (iv), (v), (vi) or (vii);



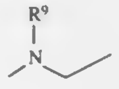
(iii)



(iv)

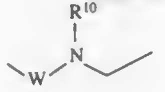


(v)



(vi)

-continued



(vii)

n represents 0, 1, 2 or 3;

p represents 0 or 1;

R^3 represents hydrogen, C$_{1-4}$ alkyl, C$_{1-4}$ haloalkyl, C$_{3-7}$ cycloalkyl, C$_{1-4}$ alkoxy-C $_{1-4}$ alkyl or aryl;

R^4 represents hydrogen, C$_{1-4}$ alkyl, —COOR^5 or —CONR^{5}R^6, and when A represents —CO— or —SO$_2$—, then R^4 can also represent —NR^{5}R^6, —NR^{7}C(=O)OR^5, —NR^{7}C(=O)R^5, —NR^{7}C(=O)NR^{5}R^6 or —NR^{7}SO$_2$R^5;

or R^3 and R^4 together form a C$_{2-6}$ polymethylene chain;

R^5 represents C$_{1-4}$ alkyl, aryl or aryl-C$_{1-4}$ alkyl;

R^6 and R^7 independently represent hydrogen or C$_{1-4}$ alkyl;

W represents —OC(=O)—, —C(=O)—, —NR^{6}C(=O)— or —SO$_2$—;

R^8 represents aryl;

R^9 represents C$_{1-4}$ alkyl, C$_{3-7}$ cycloalkyl, -C(=O)OR^5, —C(=O)R^5, —C(=O)NR^{5}R^6, or —SO$_2$R^5;

R^{10} represents C$_{1-4}$ alkyl, C$_{3-7}$ cycloalkyl, aryl, or aryl-C$_{1-4}$ alkyl;

Z represents —(CH2)$_q$CO— or —(CH$_2$)$_r$—;

q represents 0, 1 or 2;

r represents 1 or 2;

R^{11} represents hydrogen or halogen;

R^{12} and R^{13} independently represent hydrogen, C$_{1-6}$ alkyl, C$_{3-7}$ cycloalkyl or C$_{3-7}$ cycloalkyl-C$_{1-6}$ alkyl;

or R^{12} and R13 together form a C$_{2-6}$ polymethylene chain;

R^{14} represents —COR^{15}, —COOH, —COOR^{15}, —CONR^{16}R^{17}, —C$_{1-6}$ alkyl-OR^{15}, —C$_{1-6}$ alkyl-OC(=O)R^{15} or —C$_{1-6}$ alkyl-OC(=O)NR^{16}R^{17};

R^{15} represents C$_{1-6}$ alkyl, C$_{2-6}$ alkenyl, C$_{2-6}$ alkynyl, C$_{3-7}$ cycloalkyl or C$_{1-6}$ haloalkyl;

R^{16} and R^{17} independently represent hydrogen or any of the meanings disclosed for R^{15};

aryl, whenever appearing in the above definitions, represents phenyl or phenyl substituted with 1, 2, 3 or 4 groups independently selected from halogen, C$_{1-4}$ alkyl, C$_{1-4}$ alkoxy, hydroxy, C$_{1-4}$ haloalkyl, C$_{1-4}$ haloalkoxy, C$_{1-4}$ alkylcarbonyl, C$_{1-4}$ alkylcarbonyloxy, C$_{1-4}$ alkoxycarbonyl, C$_{1-4}$ alkylsulfonyl, C$_{1-4}$ alkylsulfinyl, C$_{1-4}$ alkylthio, or C$_{1-4}$ alkylcarbonylamino;

and the salts and solvates thereof.

5,747,478

VITAMIN D3 ANALOGS FOR THE TREATMENT OF PSORIASIS AND SEBACEOUS GLAND DISEASES

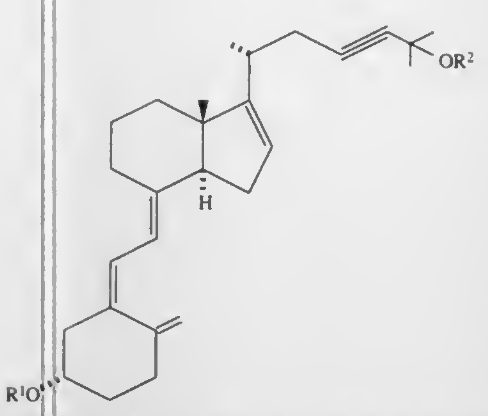
Thomas I. Doran, West Orange, N.J., and John Arthur McLane, New Haven, Conn., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 255,012, Jun. 7, 1994, Pat. No. 5,393,900, which is a division of Ser. No. 155,663, Nov. 22, 1993, Pat. No. 5,342,833, which is a continuation of Ser. No. 979,133, Nov. 20, 1992, abandoned. This application Nov. 23, 1994, Ser. No. 344,421

Int. Cl.^{6} A61K *31/59*

U.S. Cl. 514—167 **9 Claims**

1. A method of treating psoriasis comprising administering to a host in need of such treatment an effective amount of a compound of the formula



I

wherein R^1 and R^2 are hydrogen or acyl; provided that only one of R^1 and R^2 is hydrogen with the proviso that R^1 is not (4-phenyl) benzoyl, when R^2 is hydrogen.

5,747,479

VITAMIN D3 ANALOGS USEFUL FOR REVERSING THE PHOTODAMAGE IN SUN-EXPOSED SKIN

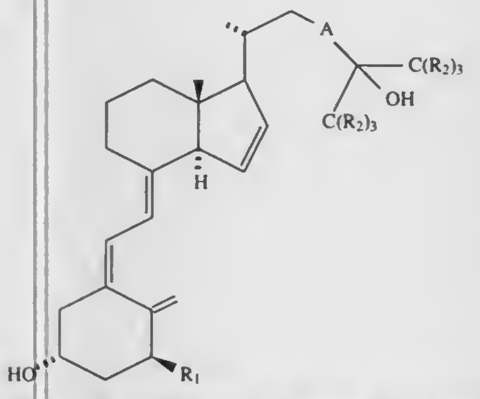
Graeme Findlay Bryce, and Milan Radoje Uskokovic, both of Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 11, 1996, Ser. No. 766,537

Int. Cl.^{6} A61K *31/59*

U.S. Cl. 514—167 **13 Claims**

1. A method of treating the conditions associated with photodamaged skin comprising topically administering a compound of the formula



I

wherein R$_1$ is hydrogen, hydroxy or fluorine, R$_2$ is hydrogen or halogen and A is —C≡C—, —C=C— or —CH$_2$—CH$_2$—, provided that when A is —CH$_2$—CH$_2$—, R$_2$ is hydrogen to an area of the skin in need of said treatment, said compound of formula I being applied to said area in an amount effective to reverse the effects of photodamage in said area.

5,747,480

ORAL CONTRACEPTIVE

Michael J. Gast, Phoenixville, Pa., assignor to American Home Products Corporation, Madison, N.J.

Filed Apr. 17, 1997, Ser. No. 839,286

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—179 **26 Claims**

1. A method of contraception which comprises administering to a female of child bearing age for 28 consecutive days.

a first phase combination of a progestin at a daily dosage equivalent in progestational activity to 40–125 μg levonorgestrel and an estrogen at a daily dosage equivalent in estrogenic activity to 10–20 μg ethinyl estradiol for 3–8 days beginning on day 1 of the menstrual cycle, wherein the same dosage of the progestin and estrogen combination is administered in each of the 3–8 days,

a second phase combination of a progestin at a daily dosage equivalent in progestational activity to 40–125 μg levonorgestrel and an estrogen at a daily dosage equivalent in estrogenic activity to 10–20 μg ethinyl estradiol, for 4–15 days beginning on the day immediately following the last day of administration of the first phase combination, wherein the same dosage of the progestin and estrogen combination is administered in each of the 4–15 days,

a third phase combination of a progestin at a daily dosage equivalent in progestational activity to 40–125 μg levonorgestrel and an estrogen at a daily dosage equivalent in estrogenic activity to 10–20 μg ethinyl estradiol, for 4–15 days beginning on the day immediately following the last day of administration of the second phase combination, wherein the same dosage of the progestin and estrogen combination is administered in each of the 4–15 days, and

an estrogen phase estrogen at a daily dosage equivalent in estrogenic activity to 10–20 μg ethinyl estradiol, for 3–5 days beginning on the day immediately following the last day of administration of the third phase combination, wherein the same dosage of the estrogen is administered in each of the 3–5 days,

provided that the daily dosage of the combination administered in the first phase is not the same as the daily dosage of the combination administered in the second phase and that the daily dosage of the combination administered in the second phase is not the same as the daily dosage of the combination administered in the third phase.

5,747,481

HETEROCYCLIC COMPOUNDS

Tine Krough Jørgensen, Herlev; Knud Erik Andersen, Smørum; Henrik Sune Andersen, København Ø; Rolf Hohlweg, Kvistgaard; Peter Madsen, Bagsværd, and Uffe Bang Olsen, Vallensbæk, all of Denmark, assignors to Novo Nordisk A/J, Bagsvaerd, Denmark

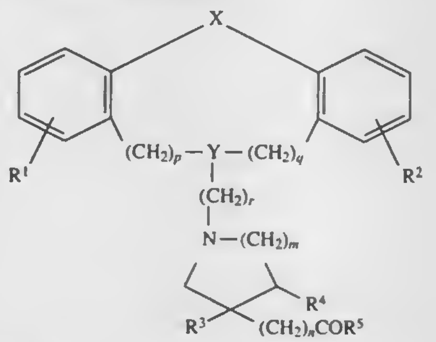
Division of Ser. No. 623,807, Mar. 29, 1996. This application May 27, 1997, Ser. No. 863,749

Claims priority, application Denmark, Apr. 7, 1995, 0403/95; Sep. 11, 1995, 1006/95

Int. Cl.^{6} A61K *31/40;31/445;* **C07D** *207/12;211/60*

U.S. Cl. 514—183 **25 Claims**

1. A compound of formula I



(I)

wherein

R^1 and R^2 independently are hydrogen, halogen, trifluoromethyl, hydroxy, C$_{1-6}$-alkyl or C$_{1-6}$-alkoxy;

Y is —CH$_2$—N—CH$_2$—, —CH$_2$—N—CH$_2$—, —(C=O)—N—CH$_2$—, or —CH$_2$—N—(C=O)—, wherein only the underscored atoms participate in the ring system;

X is —O—, —S—, —O—CH$_2$—, —CH$_2$—O—, —S—CH$_2$—, —CH$_2$—S—, or —(S=O)—, provided that the ring containing X and Y contains at least 8 members;

p is 0 or 1;

q is 0 or 1;

r is 1, 2 or 3;

m is 1 or 2;

n is 1 when m is 1 and n is 0 when m is 2;

R^3 and R^4 each represents hydrogen or may—when m is 2—together represent a bond; and

R^5 is —OH or C_{1-6}-alkoxy; or

a pharmaceutically acceptable salt thereof.

5,747,482
METHODS AND COMPOSITIONS TO INHIBIT KERATINOCYTE PROLIFERATION

Lawrence R. Bernstein, 380 Willow Rd., Menlo Park, Calif. 94025

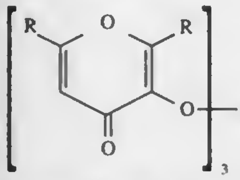
Filed Jul. 30, 1996, Ser. No. 688,565
Int. Cl.^{6} A61K *31/555*

U.S. Cl. 514—184 **17 Claims**

1\. A method for inhibiting proliferation of keratinocytes in mammalian skin which method comprises:

(a) identifying sites of excessive proliferation of keratinocytes in mammalian skin; and

(b) applying to the skin sites identified in (a) above a topical pharmaceutical composition comprising a pharmaceutical excipient acceptable for topical application and an effective amount of a neutral gallium chelate of 3-hydroxy-4-pyrone represented by formula 1:



1

to inhibit proliferation of keratinocytes, and

wherein each R is independently selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms.

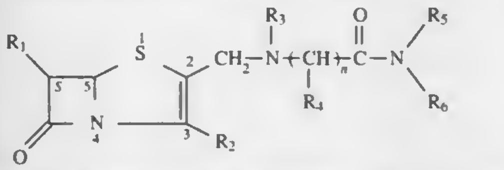
5,747,483
PENEM DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Maria Altamura, Florence; Federico Maria Arcamone, Nerviano; Enzo Perrotta, Florence; Vittorio Pestellini; Piero Sbraci, both of Florence, and Giuseppe Cascio, Monza, all of Italy, assignors to A. Menarini Industrie Farmaceutiche Riunite, Florence, and Istituto Lusofarmaco D'Italia, Milan, both of Italy

Filed Mar. 17, 1995, Ser. No. 414,081
Claims priority, application Italy, Sep. 17, 1992, MI92A0181
Int. Cl.^{6} E07D *499/861;* **A61K** *31/43*

U.S. Cl. 514—195 **8 Claims**

1\. Penem derivatives of general formula (I), wherein



(I)

R_1 is selected from the group consisting of H, a C_1–C_6 alkyl, a C_1–C_6 alkoxy, a C_3–C_7 cycloalkyl, and an optionally protected C_1–C_6 hydroxyalkyl;

R_2 is selected from the group consisting of a carboxyl group, free or esterified with a group easily activated *in vivo*, and a carboxylate anion;

$R_3$is selected from the group consisting of H and a C_1–C_4 alkyl optionally substituted with a methyl, ethyl, propyl, butyl, pentyl, cyclopentyl, cyclohexyl, phenyl, benzyl, OH, C_1–C_6 alkoxy, carboxyamidic, carboxyester, or carbamoyloxy group;

$R_4$is selected from the group consisting of H, a C_1–C_6 alkyl, a C_1–C_6hydroxyalkyl, a C_1–C_6 mercaptoalkyl, a C_1–C_6 aminoalkyl, a C_1–C_6 alkyl substituted by a quaternary ammonium group, a C_1–C_6 carboxyalkyl, a C_3–C_7 cycloalkyl, a C_6– C_{10} aryl, a C_6–C_{10} aryl C_1–C_6alkyl all these groups optionally substituted with a methyl, ethyl, propyl, butyl, pentyl, cyclopentyl, cyclohexyl, phenyl, benzyl, OH, C_1–C_6 alkoxy, carboxyamidic, carboxyester, or carbamoyloxy group) and the side chain of a natural alpha amino acid

or R_3 and R_4 linked together form a heterocyclic ring selected from the group consisting of 1-aziridene, 1-pyrrolidine, 1-azetidine, 1-piperidine, 4-morpholine, 1-piperazine, and 4-methyl-1-piperazine, optionally substituted with a methyl, ethyl, propyl, butyl, pentyl, cyclopentyl, cyclohexyl, phenyl, benzyl, OH, C_1–C_6 alkoxy, carboxyamidic, carboxyester, or carbamoyloxy group; and

$R_5$and R_6independently from one another are selected from the group consisting of H, a C_1–C_6 alkyl, a C_1–C_6 hydroxyalkyl, a C_1–C_6 mercaptoalkyl, a C_1–C_6 aminoalkyl, a C_2–C_6 alkenyl, a C_3–C_7 cycloalkyl, a C_6–C_{10} aryl, a C_6–C_{10} aryl C_1–C_6 alkyl, C_1–C_6 alkyl C_6–C_{10} aryl, and a C_1–C_6 alkyl carboxyamide wherein the alkyl group can be linear or branched (all these groups optionally substituted with a methyl, ethyl, propyl, butyl, pentyl, cyclopentyl, cyclohexyl, phenyl, benzyl, OH, C_1–C_6 alkoxy, carboxyamidic, carboxyester, or carbamoyloxy group)

or R_5 and R_6 taken together form a heterocyclic ring selected from the group consisting of 1-aziridene, 1-pyrrolidine, 1-azetidine, 1-piperidine, 4-morpholine, 1-piperazine, 4-methyl-1-piperazine, optionally substituted with a methyl, ethyl, propyl, butyl, pentyl, cyclopentyl, cyclohexyl, phenyl, benzyl, OH, C_1–C_6 alkoxy, carboxyamidic, carboxyester, or carbamoyloxy group;

n is an intiger from 1 to 3;

and pharmaceutically acceptable salts thereof.

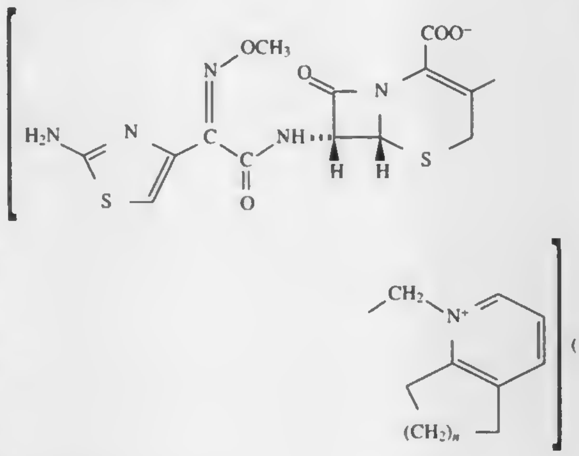
5,747,484
CRYSTALLINE CEPHAM ACID ADDITION SALTS AND PROCESSES FOR THEIR PREPARATION

Rudolf Lattrell, Königstein; Walter Dürckheimer, Hattersheim, and Peter Schmid, Stuttgart, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 1, 1995, Ser. No. 551,480
Claims priority, application Germany, Nov. 10, 1994, 44 40 141.8
Int. Cl.^{6} A61K *31/545;* **C07D** *501/46*

U.S. Cl. 514—202 **9 Claims**

1\. A compound of the formula I



(I)

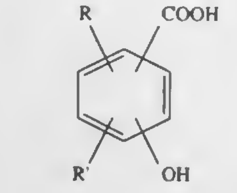
in which

n is equal to 1 or 2 and

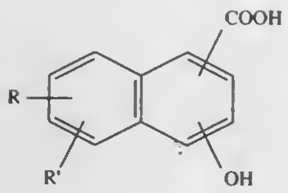
m is 0.4–2.6, and where

X is the anion of a phenolic carboxylic acid of the formulae II a–d

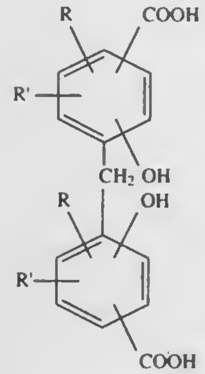
IIa



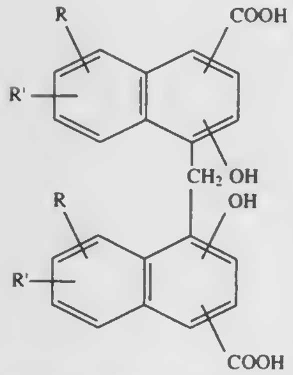
IIb



IIc

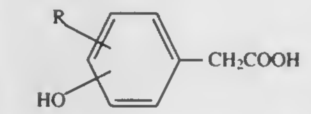


IId



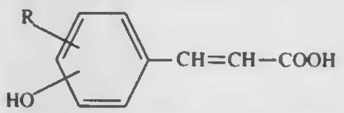
or the anion of a hydroxyphenylacetic acid of the formula III

III



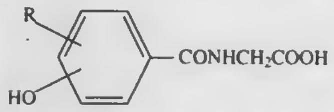
or the anion of a hydroxycinnamic acid of the formula IV

IV



or the anion of a hydroxyhippuric acid of the formula V

V



where R and R' independently of one another are hydrogen, carboxyl, hydroxyl, halogen, a straight-chain or branched saturated or unsaturated aliphatic C_1–C_5-alkyl radical or C_1–C_5-alkoxy radical and where X can also be X/2 in the case of a diprotic acid.

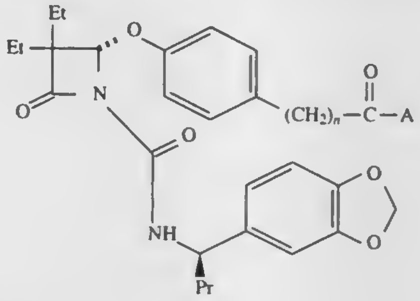
5,747,485
SUBSTITUTED AZETIDIONES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

James Doherty, Montvale; Conrad Dorn, Plainfield; Philippe Durette, New Providence; Paul Finke, Milltown; Malcolm Maccoss, Freehold; Sander Mills, Woodbridge; Shrenik Shah, Metuchen; Soumya Sahoo, Old Bridge; William Hagmann; Jeffrey Hale, both of Westfield, and Thomas Lanza, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 416,771, Apr. 13, 1995, abandoned.
This application Jun. 5, 1997, Ser. No. 848,076
Int. Cl.^{6} A61K *31/395*

U.S. Cl. 514—210 **10 Claims**

1\. A method of treating an elastase mediated disease selected from the group consisting of emphysema, bronchial inflammation, chronic bronchitis, cystic fibrosis, and acute respiratory distress syndrome in a patient having said disease comprising the administration of a non-toxic therapeutically effective amount of a compound of Formula



when n and A are:

n A
1 4-morpholinyl,
2 1—$N(CH_3)CH_2CH_2N(CH_3)_2$,
3 0—$N(CH_3)CH_2CH_2N(CH_3)_2$,
4 0—$N(Et)_2$,
5 0—$N(CH_3)$(n-Bu),
6 0 4-methyl-1-piperazinyl,
7 0—$N(CH_3)CH_2CH_2N(CH_3)CH_2Ph$,
8 0 4-cyclopropyl-1-piperazinyl,
9 0 1-piperazinyl,
10 0 4-(2-hydroxyethyl)-1-piperazinyl, or
11 0 4-morpholinyl.

5,747,486
THIENOPYRIDINE OR THIENOPYRIMIDINE DERIVATIVES AND THEIR USE

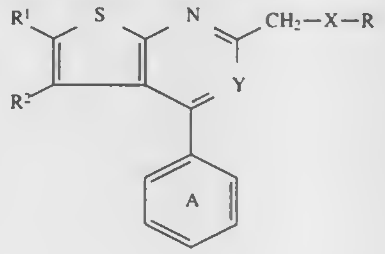
Takashi Sohda, Osaka; Haruhiko Makino, and Atsuo Baba, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

PCT No. PCT/JP95/02271, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO96/14319, PCT Pub. Date May 17, 1996

PCT Filed Nov. 7, 1995, Ser. No. 571,915
Claims priority, application Japan, Nov. 8, 1994, 6-273801; Dec. 22, 1994, 6-320055
Int. Cl.^{6} A61K *31/54;31/535;* **C07D** *401/02;403/02*

U.S. Cl. 514—211 **27 Claims**

1\. A compound represented by the formula (1):



(1)

OL
2 10
SS
1
MY
5
998
MI

wherein R^1 and R^2 independently stand for a hydrogen atom, a halogen atom or an optionally substituted alkyl group, or R^1 and R^2 may be combined to form a 5- to 7 -membered ring; Y stands for a nitrogen atom or C-G, G stands for an optionally esterified carboxyl group; X stands for an oxygen atom, an optionally oxidized sulfur atom or $—(CH_2)_q—$ (q denotes an integer of 0 to 5); R stands for an optionally substituted heterocyclic group or an optionally substituted amino group; and ring A may optionally be substituted, or a salt thereof.

5,747,487
TRICYCLIC BENZAZEPINE VASOPRESSIN ANTAGONISTS

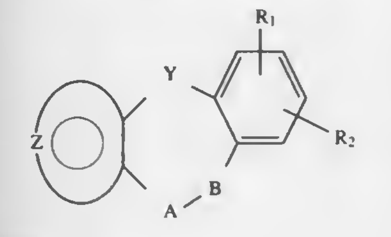
Jay Donald Albright, Nanuet, and Marvin Fred Reich, Suffern, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Continuation-in-part of Ser. No. 254,823, Jun. 13, 1994, Pat. No. 5,512,563, which is a continuation-in-part of Ser. No. 100,003, Jul. 29, 1993, abandoned. This application Apr. 25, 1996, Ser. No. 638,067

Int. Cl.⁶ A61K *31/55;* **C07D** *223/00;513/02*

U.S. Cl. 514—215 **77 Claims**

1. A compound selected from Formula I:

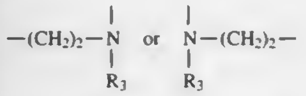


Formula I

wherein;

Y is a bond;

A-B is

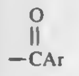

$-(CH_2)_2-\underset{R_3}{N}$ or $\underset{R_3}{N}-(CH_2)_2-$

R_1 is H, halogen (chlorine, fluorine, bromine, iodine), OH, —S-lower alkyl (C_1–C_3), —SH, —SO lower alkyl (C_1–C_3), —SO_2 lower alkyl (C_1–C_3), —CO lower alkyl (C_1–C_3), —CF_3, lower alkyl (C_1–C_3), —O lower alkyl (C_1–C_3), —NO_2, —NH_2, —NHCO lower alkyl (C_1– C_3), —N—[lower alkyl (C_1–C_3)]$_2$, SO_2NH_2, —SO_2NH lower alkyl (C_1–C_3), or —SO_2N [lower alkyl (C_1– C_3)]$_2$;

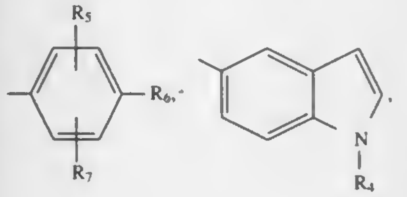
R_2 is H, Cl, Br, I, F, —OH, lower alkyl (C_1– C_3), —O lower alkyl (C_1–C_3); or

R_1 and R_2 taken together are methylenedioxy or ethylenedioxy;

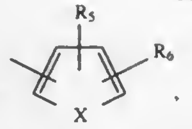
R_3 is the moiety


$-\overset{O}{\overset{\|}{C}}Ar$

wherein Ar is a moiety selected from the group

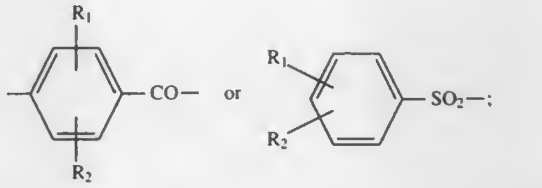


-continued



and X is selected from O, S, —NCH_3, or —N—$COCH_3$;

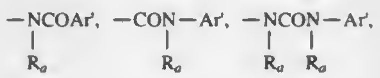
R_4 is selected from H, lower alkyl (C_1–C_3), —CO—lower alkyl (C_1–C_3), SO_2 lower alkyl (C_1–C_3), or the moieties of the formulae:

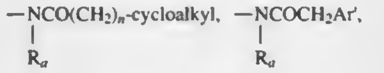


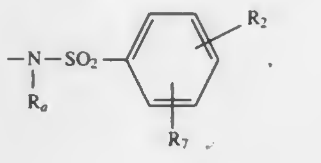
R_5 is H, —CH_3, —C_2H_5, Cl, Br, F, —O—CH_3, or —O—C_2H_5;

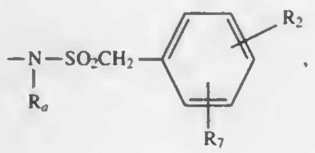
R_6 is selected from:

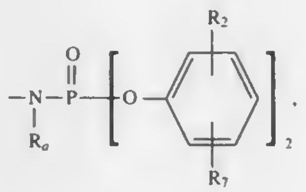
(a) moieties of the formula:

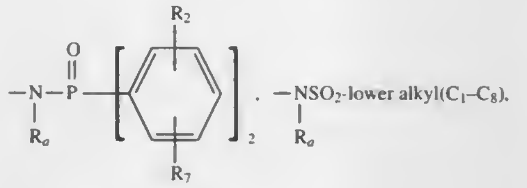

$-\underset{R_a}{N}COAr'$, $-CO\underset{R_a}{N}-Ar'$, $-\underset{R_a}{N}CO\underset{R_a}{N}-Ar'$,


$-\underset{R_a}{N}CO(CH_2)_n\text{-cycloalkyl}$, $-\underset{R_a}{N}COCH_2Ar'$,

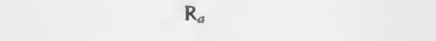








$-\underset{R_a}{N}SO_2\text{-lower alkyl}(C_1-C_8)$,


$-CH_2COAr'$, or $-\underset{R_a}{N}SO_2\text{-lower alkenyl}(C_1-C_8)$,

wherein

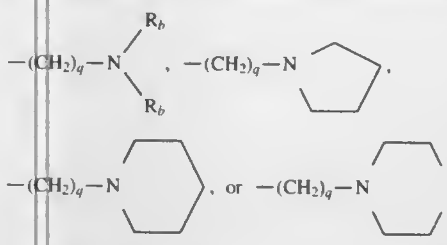
cycloalkyl is defined as C_3–C_6 cycloalkyl, cyclohexenyl or cyclopentenyl;

R_2 is as hereinbefore defined;

n is 0–2;

R_7 is H, —CH_3, —CH_2H_5, Cl, Br, F, —OCH_3, —OC_2H_5, or —CF_3;

R_a is hydrogen, CH_3, C_2H_5, moieties of the formulae:

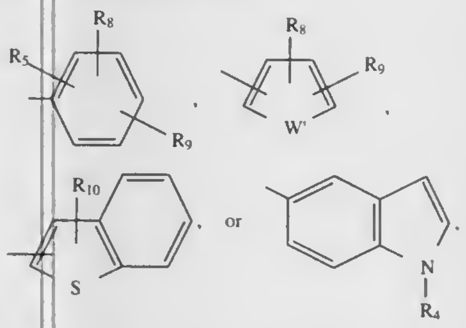


—$(CH_2)_2$—O—lower alkyl (C_1–C_3) or —CH_2CH_2OH;

q is one or two;

R_b is hydrogen, —CH_3 or —C_2H_5;

Ar' is selected from the group:



wherein

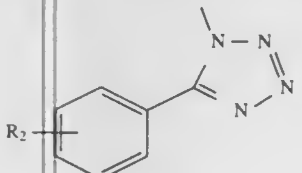
R_4, R_5 are as hereinbefore defined;

R_8 and R_9 are independently hydrogen, lower alkyl (C_1–C_3), O-lower alkyl (C_1–C_3), S-lower alkyl (C_1–C_3), —CF_3, —CN, —OH, —SCF_3, —OCF_3, halogen, NO_2, amino, or —NH-lower alkyl (C_1–C_3);

R_{10} is selected from halogen, hydrogen, or lower alkyl (C_1–C_3);

W' is selected from O, S, NH, N-lower alkyl (C_1–C_3), —NCO-lower alkyl (C_1–C_3), or NSO_2-lower alkyl (C_1–C_3); or

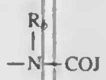
(b) a moiety of the formula:



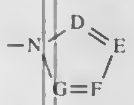
where

R_2 is as hereinbefore defined;

(c) a moiety of the formula:

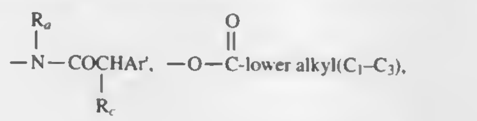

$-\overset{R_b}{N}-COJ$

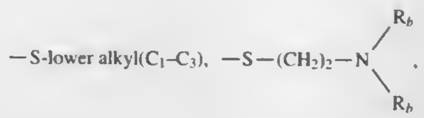
wherein J is R_a, lower alkyl (C_1–C_8) branched or unbranched, lower alkenyl (C_2–C_8) branched or unbranched, —O-lower alkyl (C_1–C_8) branched or unbranched, —O-lower alkenyl (C_2–C_8) branched or unbranched, tetrahydrofuran, tetrahydrothiophene, or —CH_2-K wherein K is halogen, —OH, tetrahydrofuran, tetrahydrothiophene or the heterocyclic ring moiety:

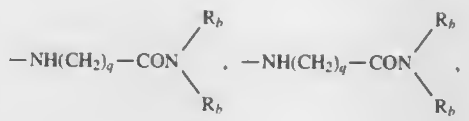


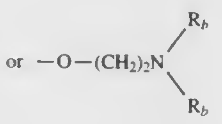
wherein D, E, F and G are selected from carbon or nitrogen and wherein the carbon atoms may be optionally substituted with halogen, (C_1–C_3)lower alkyl, hydroxy, —CO-lower alkyl (C_1–C_3), CHO, (C_1–C_3)lower alkoxy, or —CO_2-lower alkyl (C_1–C_3), and R_a and R_b are as hereinbefore defined;

(d) a moiety selected from those of the formulae:


$-\underset{R_c}{\overset{R_a}{N}}-COCHAr'$, $-O-\overset{O}{\overset{\|}{C}}\text{-lower alkyl}(C_1-C_3)$,







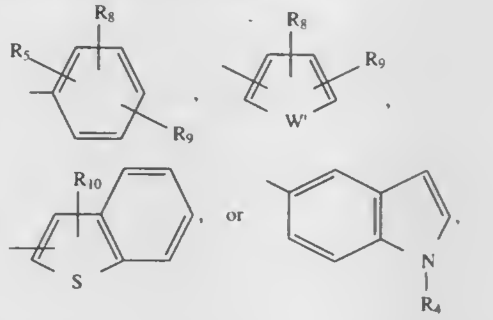
wherein

R_c is selected from halogen, (C_1–C_3) lower alkyl, —O-lower alkyl (C_1–C_3) or OH;

R_b is as hereinbefore defined;

q is 1 or 2;

wherein Ar' is selected from the group:



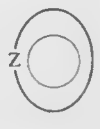
R_7 is hydrogen, —CH_3, —C_2H_5, Cl, Br, F, —OCH_3, —OC_2H_5, or —CF_3;

R_8 and R_9 are independently hydrogen, lower alkyl (C_1–C_3), O-lower alkyl (C_1–C_3), S-lower alkyl (C_1–C_3), —CF_3, —CN, —OH, —SCF_3, —OCF_3, halogen, NO_2, amino, or —NH-lower alkyl (C_1–C_3);

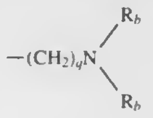
R_{10} is selected from the group of halogen, hydrogen, or lower alkyl (C_1–C_3);

W' is selected from O, S, NH, N-lower alkyl (C_1– C_3), —NCO-lower alkyl (C_1–C_3), or NSO_2-lower alkyl (C_1–C_3);

the moiety



represents a fused thiazole ring or fused substituted thiazole ring optionally substituted by one or two substituents selected from (C_1–C_3) lower alkyl, halogen, formyl, (C_1–C_3) lower alkoxy or a moiety of the formula:



q is one or two;
or a pharmaceutically acceptable salt, ester or prodrug thereof.

5,747,488

2-ARYL-5,11-DIHYDRO-6H-DIPYRIDO[3,2-B:2',3'-E][1, 4]DIAZEPINES AND THEIR USE IN THE TREATMENT OF HIV INFECTION

Karl D. Hargrave, Brookfield, and John R. Proudfoot, Newtown, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Filed Dec. 18, 1996, Ser. No. 769,081

Int. Cl.^{6} C07D *243/06;401/14;* **A61K** *31/415;31/55*

U.S. Cl. 514—219 **3 Claims**

1. 8-Ethyl-1-methyl-10-(4-pyrazolyl)imidazo[2',3':6,5]dipyrido [3,2-b:2',3'-e] [1,4]diazepine, or a pharmaceutically acceptable addition salt thereof.

5,747,489

ARYLALKYL-THIADIAZINONES

Rochus Jonas; Michael Wolf, both of Darmstadt, and Michael Klockow, Rossdorf, all of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Germany

Filed Jan. 26, 1996, Ser. No. 592,659

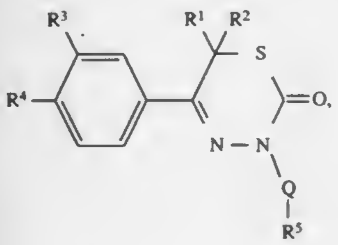
Claims priority, application Germany, Jan. 28, 1995, 195 02 699.3

Int. Cl.^{6} A61K *31/54;* **C07D** *285/18*

U.S. Cl. 514—222.5 **8 Claims**

1. An arylalkyl-thiadiazinone compound of formula I

I



wherein

R^1 and R^2 are each independently H or A,

R^3 and R^4 are each independently —OH, —OR^{10}, —S—R^{10}, —SO—R^{10}, —SO$_2$—R^{10}, Hal, methylenedioxy, —NO$_2$, —NH$_2$, —NHR^{10} or —NR^{10}R^{11},

R^5 is a phenyl radical which is unsubstituted or is mono- or disubstituted by R^6 and/or R^7,

Q is absent or is C$_{1-6}$-alkylene,

R^6 and R^7 are each independently —NH$_2$, —NR^{8}R^9, —NHR$_{10}$, —NR^{10}R^{11}, —NO$_2$, Hal, —CN, —OA, —COOH or —COOA,

R^8 and R^9 are each independently H, C$_{1-8}$-alkanoyl optionally substituted by 1–5 fluorine and/or chlorine atoms, —COOA, —S—A, —SO—A, —SO$_2$A, —CONH$_2$, —CONHA, —CONA$_2$, —CO—COOH, —CO—COOA, —CO—CONH$_2$, —CO—CONHA or —CO—CONA$_2$,

A is C$_{16}$-alkyl optionally substituted by 1–5 fluorine and/or chlorine atoms,

R^{10} and R^{11} are each independently A, C$_{3-7}$—cycloalkyl, C$_{4-8}$-methylenecycloalkyl or C$_{2-8}$-alkenyl, and

Hal is F, Cl, Br or I,
or a physiologically acceptable salt thereof.

5,747,490

ALPHA 1B ADRENERGIC RECEPTOR ANTAGONISTS

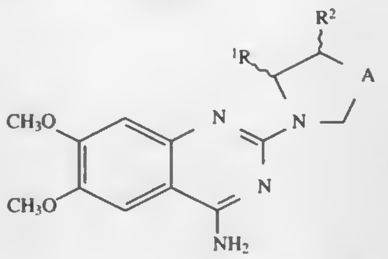
Mark G. Bock, Hatfield; William C. Lumma, Pennsburg, and Michael A. Patane, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 19, 1996, Ser. No. 716,041

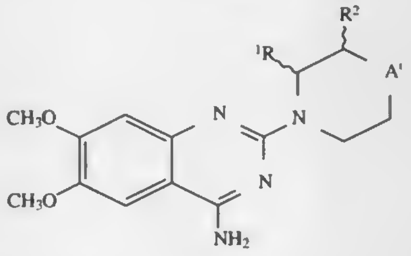
Int. Cl.^{6} A61K *31/535;* **A01N** *43/60;* **C07D** *415/00;239/72*

U.S. Cl. 514—233.8 **17 Claims**

1. A compound of the formula



or



wherein

A is selected from CR^{3}R^8, N—R^3, O, S or SO$_2$;

A' is selected from CR^{3}R^8 or N—R^3.

R^1 and R^2 are each independently selected from hydrogen, CN, C(O)R^4, CH$_2$OR^4, CH$_2$NR^{4}R^5, CONR^{4}R^5, CO$_2$R^4 or SO$_2$R^4, provided that R^1 and R^2 are not both hydrogen;

R^3 is selected from hydrogen, CN, OR^6, NR^{6}R^7, C(O)R^4, CO$_2$R^4, CONR^{4}R^5, Het or (CH$_2$)$_m$Ar where Ar is unsubstituted, mono-, di- or tri-substituted Ar and where the substituents on Ar are independently selected from OR^4, NR^{4}R^5, halogen, C$_{1-8}$ alkyl, CF$_3$, nitro or CN;

R^4 and R^5 are each independently selected from hydrogen, CH$_2$CF$_3$, C$_{1-8}$ alkyl, C$_{3-8}$ cycloalkyl, Het or (CH$_2$)$_m$Ar, where Ar is unsubstituted, mono-, di- or tri-substituted Ar and where the substituents on Ar are independently selected from OR^6, halogen, NR^{6}R^7, C$_{1-8}$ alkyl, CF$_3$ or C$_{3-8}$ cycloalkyl;

R^6 and R^7 are each independently selected from hydrogen, CH$_2$CF$_3$, C$_{1-8}$ alkyl or C$_{3-8}$ cycloalkyl;

R^8 is selected from hydrogen, C$_{1-8}$ alkyl, CF$_3$, C$_{3-8}$ cycloalkyl, Het or (CH$_2$)$_m$Ar where Ar is unsubstituted, mono-, di- or tri-substituted Ar and where the substituents on Ar are independently selected from OR^4, NR^{4}R^5, halogen, C$_{1-8}$ alkyl, CF$_3$, nitro or CN;

Ar is selected from phenyl, naphthyl, furanyl, thiazolyl, pyrrolyl, thienyl, 2-, 3-or 4-pyridyl, or chromanyl;

Het is an unsubstituted, mono- or di-substituted heterocyclic ring selected from tetrahydrofuranyl, pyrrolidinyl, piperidinyl, piperazinyl or morpholinyl, where the substituents on Het are independently selected from hydroxyl, C$_{1-8}$ alkyl, CF$_3$, halogen, CN, nitro, C$_{1-4}$ alkoxy, amino or CO$_2$-C$_{1-4}$ alkyl;

m is an integer from zero to three;

and the pharmaceutically acceptable salts thereof.

5,747,491

MORPHOLINE DERIVATIVES AND THEIR USE AS ANTAGONISTS OF TACHIKININS

Karen Elizabeth Haworth; Eileen Mary Seward, both of Bishops Stortford; Christopher John Swain, Duxford, and Martin Richard Teall, Bishops Stortford, all of United Kingdom, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

PCT No. PCT/GB95/00983, § 371 Date Nov. 1, 1996, § 102(e) Date Nov. 1, 1996, PCT Pub. No. WO95/30674, PCT Pub. Date Nov. 16, 1995

PCT Filed May 1, 1995, Ser. No. 737,035

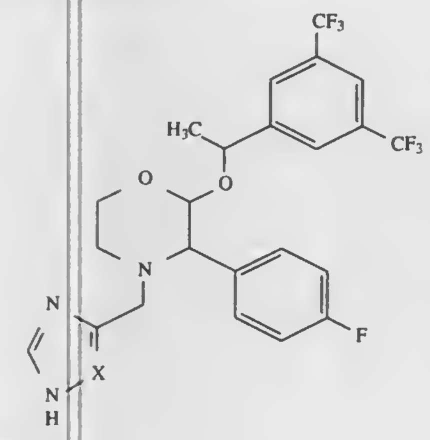
Claims priority, application United Kingdom, May 5, 1994, 9408960; May 5, 1994, 9408963

Int. Cl.^{6} A61K *31/535;* **C07D** *413/06*

U.S. Cl. 514—236.2 **7 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt or prodrug thereof:

(I)



wherein
X is N.

5,747,492

HETEROATOM SUBSTITUTED BENZOYL DERIVATIVES THAT ENHANCE SYNAPTIC RESPONSES MEDIATED BY AMPA RECEPTORS

Gary S. Lynch, Irvine, and Gary A. Rogers, Santa Barbara, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

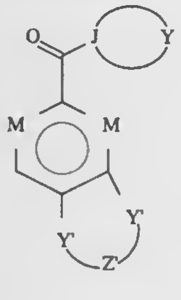
PCT No. PCT/US93/06916, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995, PCT Pub. No. WO94/02475, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 23, 1993, Ser. No. 374,584

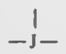
Int. Cl.^{6} A61K *31/495;* **C07D** *401/10*

U.S. Cl. 514—249 **10 Claims**

1. A compound having the structure:

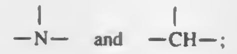


wherein:



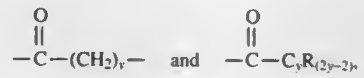
$$-\overset{|}{J}-$$

is selected from:



$$-\overset{|}{N}- \quad \text{and} \quad -\overset{|}{C}H-;$$

—Y— is selected from:



$$-\overset{O}{\overset{\|}{C}}-(CH_2)_y- \quad \text{and} \quad -\overset{O}{\overset{\|}{C}}-C_yR_{(2y-2)},$$

wherein y is 3, 4, or 5; and

—(CR$_2$)$_x$— and —C$_x$R$_{(2x-2)}$—,

wherein x is 4, 5, or 6;

—R is hydrogen or a straight chain or branched chain alkyl group having 1–6 carbon atoms;

each —M— is independently selected from:
—C(H)— and
—C(Z)—, wherein Z is selected from: —R and —OR;

each —Y'— is independently selected from:
—NR— and
—N═; and

—Z'— is selected from:
—(CR$_2$)$_z$—, wherein z is 1, 2, or 3, and
—C$_{Z'}$R$_{(2Z'-1)}$—, wherein z' is 1 or 2,
—C$_2$R$_2$—.

5,747,493

DOPAMINE RE-UPTAKE INHIBITOR

Takayuki Namiki; Toshihiro Morimoto; Kenichi Kishii; Nobuyuki Kawakatsu; Makoto Kimura; Kyoko Yamasaki; Mariko Onoda; Yuji Yoshiko; Kazunori Harada; Masayuki Yanagi; Takeshi Yamamoto; Masato Inazu, and Masaki Mitani, all of Yokohama, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

PCT No. PCT/JP94/00728, § 371 Date Dec. 21, 1995, § 102(e) Date Dec. 21, 1995, PCT Pub. No. WO95/00149, PCT Pub. Date Jan. 5, 1995

PCT Filed Apr. 28, 1994, Ser. No. 557,167

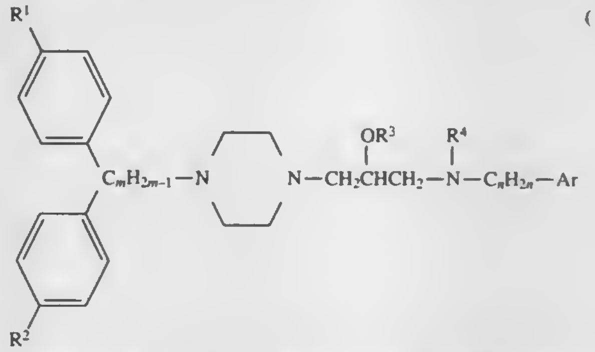
Claims priority, application Japan, Jun. 25, 1993, 5-155564

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—255 **10 Claims**

1. A method for inhibiting dopamine re-uptake in a mammal comprising administering an effective amount of a compound represented by the following formula (1) or a physiologically acceptable salt thereof:

(1)



wherein R^1 and R^2 may be identical with or different from each other and mean individually a hydrogen or halogen atom, R^3 denotes a hydrogen atom, or an alkyl or acyl group, R^4 represents a hydrogen atom, or an alkyl, acyl, alkylsulfonyl or optionally esterified carboxyl group, Ar means a phenyl or nitrogen-containing monocyclic heteroaromatic group which may have 1 to 3 substituents selected from halogen atoms, or alkyl, alkoxy, nitro, amino, alkylamino or hydroxyl groups, m stands for a number of 1 to 5, and n stands for a number of 0 to 5.

OL
2 10
SS
1
MY
5
998
MI

5,747,494
PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF DEPRESSIVE DISORDERS

Nadia Medjad, and Martine Billardon, both of Suresnes, France, assignors to U C B S.A., Brussels, Belgium
Filed Jun. 28, 1996, Ser. No. 672,920
Int. Cl.^{6} A61K *31/495;* **C07D** *241/04*
U.S. Cl. 514—255 **7 Claims**

1. A method for treating a depressive disorder which comprises administering to a patient in need thereof a therapeutically effective amount of a combination of

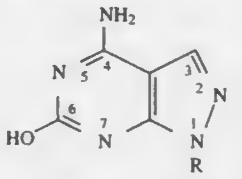
(i) hydroxyzine, an individual optical isomer thereof, or a pharmaceutically acceptable salt thereof, and

(ii) at least one therapeutic substance which is a serotonin uptake inhibitor selected from the group consisting of fluoxetine, fluvoxamine, between fluoxetine and fluvoxamine an individual optical isomer thereof or a pharmaceutically acceptable salt thereof.

5,747,495
METHOD FOR TREATING HYPERTENSION USING PYRAZOLOPYRIMIDINE DERIVATIVES

Hiroshi Maeda, 3-21-19, Hotakubo, Kumamoto-shi, Kumamoto 862; Takaaki Akaike, Kumamoto; Yoichi Miyamoto, Ibaraki, and Masaki Yoshida, Kumamoto, all of Japan, assignors to Hiroshi Maeda, Kumamoto, Japan
Filed Aug. 21, 1996, Ser. No. 700,848
Claims priority, application Japan, Aug. 22, 1995, 7-213292
Int. Cl.^{6} A61K *31/505*
U.S. Cl. 514—258 **10 Claims**

1. A method for treating hypertension, which comprises administering to a patient in need thereof a therapeutically effective amount of a compound according to the Formula (I):



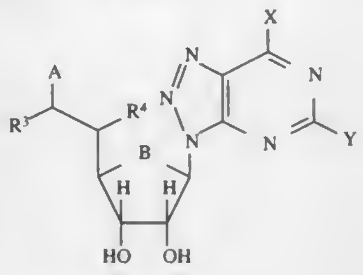
(I)

where R is hydrogen atom, alkyl group, alkoxyl group or aryl group.

5,747,496
INHIBITORS OF PLATELET AGGREGATION

David Cox; Anthony Ingall, both of Loughborough, and Paul Willis, West Bridgford, all of England, assignors to Astra Pharmaceuticals Limited, Herts, England
PCT No. PCT/SE96/00911, § 371 Date Oct. 31, 1996, § 102(e) Date Oct. 31, 1996, PCT Pub. No. WO97/03084, PCT Pub. Date Jan. 30, 1997
PCT Filed Jul. 4, 1996, Ser. No. 737,005
Claims priority, application United Kingdom, Jul. 11, 1995, 9514074; Oct. 5, 1995, 9520311; Nov. 8, 1995, 9522837
Int. Cl.^{6} C07H *19/16;* **C07D** *487/04;403/04;* **A61K** *31/505*
U.S. Cl. 514—258 **19 Claims**

1. A compound of the formula (I)



(I)

wherein

B is O or CH_2;

X is selected from NR^1R^2, SR^1, and C_1–C_7 alkyl;

Y is selected from SR^1, NR^1R^2, and C_1–C_7 alkyl;

R^1 and R^2 is each and independently selected from H, or C_1–C_7 alkyl where one methylene within the chain may optionally be replaced by O, S or NH, and in which the alkyl chain may be optionally substituted by one or more of OH, SH, NH_2 or halogen;

R^3 and R^4 are both H, or R^3 and R^4 together form a bond;

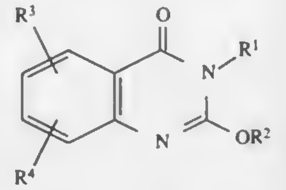
A is COOH, $C(O)NH(CH_2)_pCOOH$, $C(O)N[(CH_2)_qCOOH]_2$, $C(O)NHCH(COOH)(CH_2)_rCOOH$, or 5-tetrazolyl, wherein p, q and r is each and independently 1, 2 or 3;

as well as pharmaceutically acceptable salts and prodrugs thereof.

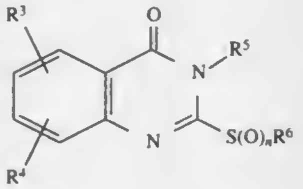
5,747,497
FUNGICIDAL FUSED BICYCLIC PYRIMIDINONES

James Francis Bereznak, Aston, Pa.; Zen-Yu Chang, Hockessin, Del.; Thomas Paul Selby, and Charlene Gross Sternberg, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
PCT No. PCT/US94/04965, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO94/26722, PCT Pub. Date Nov. 24, 1994
PCT Filed May 10, 1994, Ser. No. 545,827
Int. Cl.^{6} A61K *31/505;31/495;* **C07D** *239/86;239/95*
U.S. Cl. 514—259 **19 Claims**

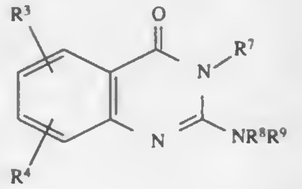
1. A compound of Formula I, II or III



I



II



III

wherein:

n is 0, 1 or 2;

Q is independently O or S;

R^1 is C_3–C_{10} alkyl; C_3–C_5 cycloalkyl; C_4–C_{10} alkenyl; C_4–C_{10} alkynyl; C_1–C_{10} haloalkyl; C_3–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_2–C_{10} alkoxyalkyl; C_2–C_{10} alkylthioalkyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; cyclopropylmethyl; C_5–C_{10} cycloalkylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} haloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_1–C_{10} alkyl substituted with $NR^{11}R^{12}$, nitro, cyano or phenyl optionally substituted with R^{14}, R^{15}, and R^{16}; C_1–C_{10} alkoxy; C_1–C_{10} haloalkoxy; C_1–C_{10} alkylthio; C_1–C_{10} haloalkylthio; $NR^{11}R^{12}$; or pyridyl, furanyl, thienyl, naphthyl, benzofuranyl, benzothienyl or quinolinyl each optionally substituted with R^{14}, R^{15}, and R^{16};

R^2 is C_1–C_{10} haloalkyl; C_3–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; C_4–C_{10} cycloalkylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} haloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_3–C_{10} cyanoalkyl; C_2–C_{10} nitroalkyl; C_1–C_{10} alkyl substituted with CO_2R^{11}, $NR^{11}R^{12}$ or phenyl substituted with R^{13}, R^{15}, and R^{16}; phenyl optionally substituted with R^{13}, R^{15}, and R^{16}; $—N{=}CR^{11}R^{11}$; or $—NR^{11}R^{12}$; or

R^1 and R^2 are taken together to form $—CH_2(CH_2)_mCH_2—$;

m is 1–4;

R^3 is halogen; C_1–C_8 alkyl; C_3–C_8 cycloalkyl; C_2–C_8 alkenyl; C_2–C_8 alkynyl; C_1–C_8 haloalkyl; C_3–C_8 haloalkenyl; C_3–C_8 haloalkynyl; C_1–C_8 alkoxy; C_1–C_8 haloalkoxy; C_3–C_8 alkenyloxy; C_3–C_8 alkynyloxy; C_1–C_8 alkylthio; C_3–C_8 alkenylthio; C_3–C_8 alkynylthio; C_1–C_8 alkylsulfinyl; C_1–C_8 alkylsulfonyl; C_2–C_8 alkoxyalkyl; C_2–C_8 alkylthioalkyl; C_2–C_8 alkylsulfinylalkyl; C_2–C_8 alkylsulfonylalkyl; C_4–C_8 cycloalkylalkyl; C_3–C_8 trialkylsilyl; nitro; $NR^{11}R^{12}$; C_5–C_8 trialkylsilylalkynyl; or phenyl optionally substituted with at least one R^{13};

R^4 is hydrogen; halogen; C_1–C_4 alkyl; C_1–C_4 haloalkyl; C_1–C_4 alkoxy; or C_1–C_4 haloalkoxy;

R^5 is C_3–C_5 alkyl; C_7–C_{10} alkyl; C_4–C_7 alkenyl; C_3–C_5 alkynyl; C_1–C_{10} haloalkyl; C_5–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_2–C_{10} alkoxyalkyl; C_2–C_{10} alkylthioalkyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; C_4–C_{10} cycloalkylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} haloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_1–C_{10} alkyl substituted with $NR^{11}R^{12}$, nitro or phenyl optionally substituted with at least one of R^{14}, R^{15}, and R^{16}; C_2–C_{10} alkyl substituted with cyano; C_1–C_{10} alkoxy; C_1–C_{10} haloalkoxy; C_1–C_{10} alkylthio; C_1–C_{10} haloalkylthio; $NR^{11}R^{12}$; or phenyl, furanyl, thienyl, naphthyl, benzofuranyl or benzothienyl each optionally substituted with R^{14}, R^{15}, and R^{16};

R^6 is C_1–C_{10} haloalkyl; C_3–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; C_4–C_{10} cycloalkylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} haloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_2–C_{10} nitroalkyl; or C_3–C_{10} alkyl substituted with CO_2R^{11}, $NR^{11}R^{12}$ or phenyl optionally substituted with R^{13}, R^{15}, and R^{16}; or phenyl optionally substituted with R^{13}, R^{15}, and R^{16}; or

R^5 and R^6 are taken together to form $—CH_2(CH_2)_mCH_2—$;

R^7 is C_3–C_{10} alkyl; C_3–C_7 cycloalkyl; C_4–C_7 alkenyl; propynyl; C_5–C_{10} alkynyl; C_2–C_{10} haloalkyl; C_3–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_2–C_{10} alkoxyalkyl; C_2–C_{10} alkylthioalkyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} haloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_1–C_{10} alkyl substituted with $NR^{11}R^{12}$ or nitro; C_2–C_{10} alkyl substituted with cyano; C_1–C_{10} alkoxy; C_1–C_{10} haloalkoxy; C_1–C_{10} alkylthio; C_1–C_{10} haloalkylthio; $NR^{12}R^{17}$; or phenyl, pyridyl, furanyl, thienyl, naphthyl, benzofuranyl, benzothienyl or quinolinyl each optionally substituted with R^{14}, R^{15}, and R^{16};

R^8 is hydrogen; C_1–C_4 alkyl; or $—C({=}O)R^{10}$;

R^9 is C_3–C_7 cycloalkyl; C_3–C_{10} haloalkenyl; C_3–C_{10} haloalkynyl; C_3–C_{10} alkoxyalkyl; C_2–C_{10} alkylthioalkyl; C_2–C_{10} alkylsulfinylalkyl; C_2–C_{10} alkylsulfonylalkyl; C_4–C_{10} cycloalkylalkyl; C_4–C_{10} alkenyloxyalkyl; C_4–C_{10} alkynyloxyalkyl; C_4–C_{10} (cycloalkyl)oxyalkyl; C_4–C_{10} alkenylthioalkyl; C_4–C_{10} alkynylthioalkyl; C_6–C_{10} (cycloalkyl)thioalkyl; C_2–C_{10} haloalkoxyalkyl; C_4–C_{10} baloalkenyloxyalkyl; C_4–C_{10} haloalkynyloxyalkyl; C_4–C_{10} alkoxyalkenyl; C_4–C_{10} alkoxyalkynyl; C_4–C_{10} alkylthioalkenyl; C_4–C_{10} alkylthioalkynyl; C_4–C_{10} trialkylsilylalkyl; C_1–C_{10} alkyl substituted with $NR^{11}R^{12}$; C_2–C_{10} nitroalkyl; pyridyl, furanyl, thienyl or naphthyl each optionally substituted with R^{14}, R^{15}, and R^{16}; $—N{=}CR^{11}R^{11}$; $—NR^{12}R^{17}$; $—OR^{12}$; or $—NC({=}Q)NR^{11}R^{12}$; or R^3 and R^4 are both iodine and R^9 is phenyl optionally substituted with R^{14}, R^{15}, and R^{16};

or

R^7 and R^9 are taken together to form $—CH_2(CH_2)_mCH_2—$;

R^{10} is hydrogen; C_1–C_4 alkyl; C_1–C_4 alkoxy; or $NR^{11}R^{12}$;

R^{11} is independently hydrogen; C_1–C_4 alkyl; or phenyl optionally substituted with at least one R^{13};

R^{12} is independently hydrogen; C_1–C_8 alkyl; or phenyl optionally substituted with at least one R^{13}; or

R^{11} and R^{12} are taken together to form $—CH_2CH_2CH_2CH_2—$, $—CH_2(CH_2)_3CH_2—$, $—CH_2CH_2OCH_2CH_2—$, $—CH_2CH(Me)CH_2$ $CH(Me)CH_2—$ or $—CH_2CH(Me)OCH(Me)CH_2—$;

R^{13} is independently halogen; C_1–C_4 alkyl; C_1–C_4 alkoxy; C_1–C_4 haloalkyl; nitro; or cyano;

R^{14} is independently C_1–C_6 alkyl; C_1–C_6 alkoxy; C_1–C_6 haloalkyl; halogen; C_2–C_8 alkynyl; C_1–C_6 thioalkyl; phenyl or phenoxy each optionally substituted with at least one R^{13}; cyano; nitro; C_1–C_6 haloalkoxy; C_1–C_6 haloalkylthio; C_2–C_6 alkenyl; C_2–C_6 haloalkenyl; acetyl; CO_2Me; or $N(C_1$–C_2 $alkyl)_2$;

R^{15} is independently methyl; ethyl; methoxy; methylthio; halogen; or trifluoromethyl;

R^{16} is independently halogen; and

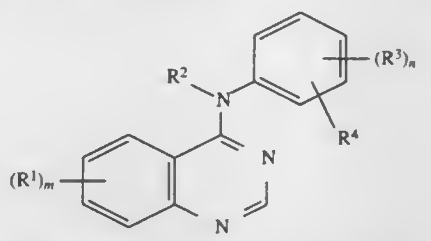
R^{17} is independently C_1–C_8 alkyl; or phenyl optionally substituted with at least one R^{13}; or

an N-oxide or agriculturally-suitable salt thereof.

5,747,498
ALKYNYL AND AZIDO-SUBSTITUTED 4-ANILINOQUINAZOLINES

Rodney C. Schnur, Nonank, Conn., and Lee D. Arnold, Westborough, Mass., assignors to Pfizer Inc., New York, N.Y.
Filed May 28, 1996, Ser. No. 653,786
Int. Cl.^{6} A61K *31/495;31/505;* **C07D** *239/70;239/94*
U.S. Cl. 514—259 **32 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof wherein:

X is halo or hydroxy;

m is 1, 2, or 3;

each R^1 is independently selected from the group consisting of hydrogen, halo, hydroxy, hydroxyamino, carboxy, nitro, guanidino, ureido, cyano, trifluoromethyl, and $-(C_1$–C_4 alkylene)-W-(phenyl) wherein W is a single bond, O, S or NH;

or each R^1 is independently selected from R^9 and C_1–C_4 alkyl substituted by cyano, wherein R^9 is selected from the group consisting of R^5, —OR^6, —NR^6R^6, —$C(O)R^7$, —$NHOR^5$, —$OC(O)R^6$, cyano, A and —YR^5; R^5 is C_1–C_4 alkyl; R^6 is independently hydrogen or R^5; R^7 is R^5, —OR^6 or —NR^6R^6; A is selected from piperidino, morpholino, pyrrolidino, 4-R^6-piperazin-1-yl, imidazol-1-yl, 4-pyridon-1-yl, -(C_1–C_4 alkylene)(CO_2H), phenoxy, phenyl, phenylsulfanyl, C_2–C_4 alkenyl, and -(C_1–C_4 alkylene)$C(O)NR^6R^6$; and Y is S, SO, or SO_2; wherein the alkyl moieties in R^5, —OR^6 and —NR^6R^6 are optionally substituted by one to three halo substituents and the alkyl moieties in R^5, —OR^6 and —NR^6R^6 are optionally substituted by 1 or 2 R^9 groups, and wherein the alkyl moieties of said optional substituents are optionally substituted by halo or R^9, with the proviso that two heteroatoms are not attached to the same carbon atom;

or each R^1 is independently selected from —$NHSO_2R^5$, phthalimido-(C_1–C_4) -alkylsulfonylamino, benzamido, benzenesulfonylamino, 3-phenylureido, 2-oxopyrrolidin-1-yl, 2,5-dioxopyrrolidin-1-yl, and R^{10}-(C_2–C_4) -alkanoylamino wherein R^{10} is selected from halo, —OR^6, C_2–C_4 alkanoyloxy, —$C(O)R^7$, and —NR^6R^6; and wherein said —$NHSO_2R^5$, phthalimido-(C_1–C_4-alkylsulfonylamino, benzamido, benzenesulfonylamino, 3-phenylureido, 2-oxopyrrolidin-1-yl, 2,5-dioxopyrrolidin-1-yl, and R^{10}-(C_2–C_4)-alkanoylamino R^1 groups are optionally substituted by 1 or 2 substituents independently selected from halo, C_1–C_4 alkyl, cyano, methanesulfonyl and C_1–C_4 alkoxy;

or two R^1 groups are taken together with the carbons to which they are attached to form a 5–8 membered ring that includes 1 or 2 heteroatoms selected from O, S and N;

R^2 is hydrogen or C_1–C_6 alkyl optionally substituted by 1 to 3 substituents independently selected from halo, C_1–C_4 alkoxy, —NR^6R^6, and —SO_2R^5;

n is 1 or 2 and each R^3 is independently selected from hydrogen, halo, hydroxy, C_1–C_6 alkyl, —NR^6R^6, and C_1–C_4 alkoxy, wherein the alkyl moieties of said R^3 groups are optionally substituted by 1 to 3 substituents independently selected from halo, C_1–C_4 alkoxy, —NR^6R^6, and —SO_2R ; and,

R^4 is azido or -(ethynyl)-R^{11} wherein R^{11} is hydrogen or C_1–C_6 alkyl optionally substituted by hydroxy, —OR^6, or —NR^6R^6.

5,747,499

ANTI-CANCER COMPOUNDS

Vassilios Bavetsias, Sutton; Francis Thomas Boyle, Cangleton, both of England; Laurent Francois Andre Hennequin, Reims Cedex, France, and Jonathan Hugh Marriott, Sutton, England, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB95/01016, § 371 Date Oct. 29, 1996, § 102(e) Date Oct. 29, 1996, PCT Pub. No. WO95/30673, PCT Pub. Date Nov. 16, 1995

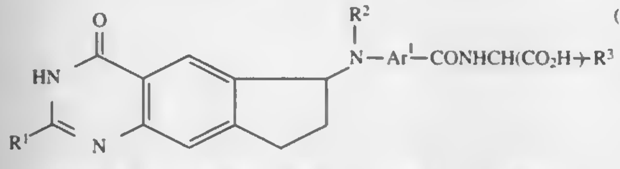
PCT Filed May 4, 1995, Ser. No. 732,273

Claims priority, application United Kingdom, May 5, 1994, 9408936

Int. Cl.^{6} A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—267 **13 Claims**

1. A cyclopentaquinazoline of the formula (I):



(I)

wherein R^1 is hydrogen, amino, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} hydroxyalkyl or C_{1-4} fluoroalkyl;

wherein R^2 is hydrogen, C_{1-4} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl, C_{2-4} hydroxyalkyl, C_{2-4} halogenoalkyl or C_{1-4} cyanoalkyl;

Ar^1 is phenylene, thiophenediyl, thiazolediyl, pyridinediyl or pyrimidinediyl which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, cyano, trifluoromethyl, C_{1-4} alkyl and C_{1-4} alkoxy; and

wherein R^3 is a group of the formula:

$$—A^1—Ar^2—A^2—Y^1$$

in which A^1 is a bond between the α-carbon atom of the group —$CONHCH(CO_2H)$— and Ar^2 or is a C_{1-2} alkylene group;

Ar^2 is phenylene, tetrazoldiyl, thiophenediyl, thiazolediyl, pyridinediyl or pyrimidinediyl which in the case of phenylene may optionally bear one or two substituents on the ring selected from halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy;

A^2 is a C_{1-3} alkylene or C_{2-3} alkenylene group; and

Y^1 is carboxy, tetrazol-5-yl, N-(C_{1-4} alkylsulphonyl)carbamoyl, N-(phenylsulphonyl)carbamoyl which may optionally bear one or two substituents on the phenyl ring selected from the group consisting of halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy, tetrazol-5-ylthio, tetrazol-5-ylsulphinyl or tetrazol-5-ylsulphonyl; or

Y^1 is a group of the formula:

$$—CON(R)CH(Y^2)Y^3$$

in which R is hydrogen, C_{1-4} alkyl, C_{3-4} alkenyl or C_{3-4} alkynyl;

Y^2 is carboxy, tetrazol-5-yl, N-(C_{1-4} alkylsulphonyl)carbamoyl, N-(phenylsulphonyl)carbamoyl which may optionally bear one or two substituents on the phenyl ring selected from the group consisting of halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy, tetrazol-5-ylthio, tetrazol-5-ylsulphinyl or tetrazol-5-ylsulphonyl; and

Y^3 is the residue of a naturally occurring amino acid $NH_2CH(CO_2H)Y^3$; or

Y^3 is a group of the formula:

$$—A^4—CO_2H$$

in which A^4 is a C_{2-6} alkylene group other than ethylene;

wherein R^3 is a group of the formula:

$$—A^5—CON(R)CH(Y^4)Y^5$$

in which A^5 is a C_{1-6} alkylene group and R is as defined above;

Y^4 is carboxy, tetrazol-5-yl, N-(C_{1-4} alkylsulphonyl)carbamoyl, N-(phenylsulphonyl)carbamoyl which may optionally bear one or two substituents on the phenyl ring selected from the group consisting of halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy, tetrazol-5-ylthio, tetrazol-5-ylsulphinyl or tetrazol-5-ylsulphonyl; and

Y^5 is the residue of a naturally occurring amino acid $NH_2CH(CO_2H)Y^5$ provided that when R is hydrogen and Y^4 is carboxy it is not the residue of glutamic acid; or

Y^5 is a group of the formula:

$$—A^4—CO_2H$$

in which A^4 is as defined above; or

Y^5 is a group of the formula:

$$—A^6—Ar^3—A^7—Y^6$$

in which A^6 is a bond between the α-carbon atom of the group —A^5—$CON(R)CH(Y^4)$— and Ar^3 or is a C_{1-2} alkylene group;

Ar^3 is phenylene, tetrazoldiyl, thiophenediyl, thiazolediyl, pyridinediyl or pyrimidinediyl which in the case of phenylene may optionally bear one or two substituents on the ring selected from halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy;

A^7 is a C_{1-3} alkylene or C_{2-3} alkenylene group; and

Y^6 is carboxy, tetrazol-5-yl, N-(C_{1-4} alkylsulphonyl)carbamoyl, N-(phenylsulphonyl)carbamoyl which may optionally bear one or two substituents on the phenyl ring selected from the group consisting of halogeno, nitro, C_{1-4} alkyl and C_{1-4} alkoxy, tetrazol-5-ylthio, tetrazol-5-ylsulphinyl or tetrazol-5-ylsulphonyl; or

wherein R^3 is a group of the formula:

$$—A^8—X—Ar^4$$

in which A^8 is a C_{1-4} alkylene group;

X is sulphinyl, sulphonyl or methylene;

and Ar^4 is 1,2,3-triazol-4-yl, 1,2,4-triazol-3-yl or, except when X is methylene, tetrazol-5-yl;

the compound (I) optionally being in the form of a pharmaceutically acceptable salt or ester.

5,747,500

ANTIVIRAL 2, 4-PYRIMIDINEDIONE DERIVATIVES

Jong-Chan Son; III-Young Lee, both of Daejeon; Byung-Il Bae, Seoul; Jeong-Sik Han; Joong-Kwon Choi, both of Daejeon, and Yung-Bok Chae, Seoul, all of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

PCT No. PCT/KR94/00178, § 371 Date Jun. 18, 1996, § 102(e) Date Jun. 18, 1996, PCT Pub. No. WO95/18109, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 20, 1994, Ser. No. 656,354

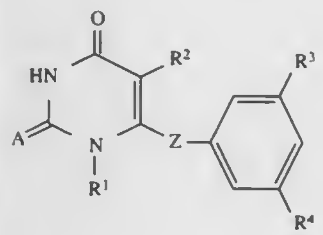
Claims priority, application Rep. of Korea, Dec. 21, 1993, 93-28908; Dec. 21, 1993, 93-28909; May 11, 1994, 94-10262; May 11, 1994, 94-10263; May 11, 1994, 94-10264; Nov. 10, 1994, 94-29388

Int. Cl.^{6} C07D *239/54;239/56;* **A61K** *31/505*

U.S. Cl. 514—274 **5 Claims**

1. A 2,4-pyrimidinedione compound of formula(I):

(I)



wherein:

R^1 represents an allyl, propargyl, substituted allyl group represented by $CH_2CH{\equiv}CR^5R^6$ or substituted propargyl group represented by $CH_2C{=}CR^7$, wherein R^5, R^6 and R^7 are each independently a hydrogen atom; a methyl group optionally substituted with a halogen atom, C_{1-10} carbonyloxy, hydroxy, azido, cyano, amino, phenyl, C_{1-3} alkoxy or benzyloxy radical; C_{2-10} alkyl; cyclopropyl; phenyl; or C_{2-10} ester group;

R^2 represents a halogen atom, a C_{1-15} alkyl, C_{3-6} cycloalkyl, C_{2-8} alkenyl, C_{2-8} alkynyl or benzyl group;

R^3 and R^4 represent independently a hydrogen or halogen atom, or a hydroxy, C_{1-3} alkyl, fluoromethyl, C_{1-3} alkoxy, amino, C_{2-6} alkylester or C_{2-7} alkylamide group;

A represents an oxygen or sulfur atom; and

Z represents an oxygen or sulfur atom; a carbonyl group; an amino group; or a methylene group optionally substituted with one or more selected from the group consisting of a halogen atom, and a cyano, a hydroxy, an azido, an amino, a C_{1-3} alkylamide, a C_{1-4} ester, and a nitro groups,

or a pharmaceutically acceptable salt thereof.

5,747,501

INDOLE DERIVATIVES

John Eugene Macor, Salem, Conn., and Martin James Wythes, Sutton, United Kingdom, assignors to Pfizer, Inc., New York, N.Y.

PCT No. PCT/US93/01967, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/20073, PCT Pub. Date Oct. 14, 1993

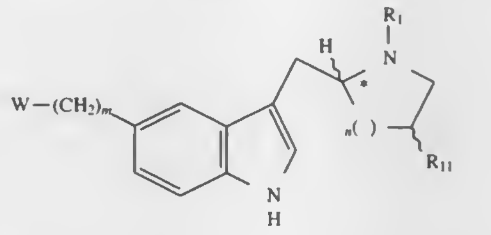
Continuation-in-part of Ser. No. 864,737, Apr. 7, 1992. This PCT application Mar. 10, 1993, Ser. No. 295,798

Int. Cl.^{6} A61K *31/40;* **C07D** *413/14*

U.S. Cl. 514—376 **22 Claims**

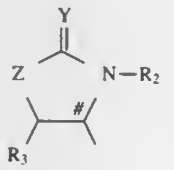
1. A compound of the formula

I

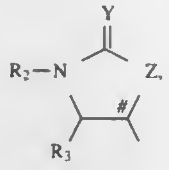


where W is

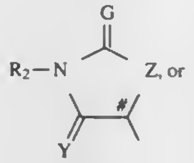
(i)



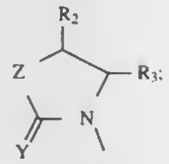
(ii)



(vi)



(vii)



n is 0 or 1; m is 0, 1, 2, or 3: Y and G are each independently oxygen or sulfur; Z is —O—; R_1 is hydrogen, C_1 to C_8 alkyl, substituted C_1 to C_8 alkyl substituted with one hydroxy, C_3 to C_8 alkenyl, C_3 to C_8 alkynyl, aryl, C_1 to C_3 alkylaryl, or —Q—R_4; R_2 and R_3 are each independently hydrogen, C_1 to C_6 alkyl, aryl, or C_1 to C_3 alkylaryl; R_4 is cyano, trifluoromethyl, —COR_9, —CO_2R_9, —$CONR_9R_{10}$, —OR_9, —$SO_2NR_9R_{10}$, or —$S(O)_qR_9$; R_9 and R_{10} are each independently hydrogen, C_1 to C_8 alkyl, C_1 to C_3 alkylaryl, aryl, or R_9 and R_{10} may together be taken to form a three- to seven-membered alkyl ring or a three- to seven-membered heteroalkyl ring having 1 heteroatom of O; Q is C_1 to C_3 alkyl; R_{11} is hydrogen, —OR_{12}, or —$NHCOR_{12}$; R_{12} is hydrogen, C_1 to C_6 alkyl, aryl, or C_1 to C_3 alkyl-aryl; q is 0, 1, or 2; a first chiral carbon is designated by an asterisk; a second chiral carbon is designated by #; the above alkyl, alkenyl, alkynyl, and alkylene moieties of other groups are linear, branched, cyclic, or be linear or branched and containing cyclic moieties; and the above aryl groups and the aryl moieties of the above alkyl-aryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one nitro or one to three groups selected from C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, and C_1 to C_4 alkoxy and the pharmaceutically acceptable salts thereof.

5,747,502
PROCESS FOR PREPARING BENZO[C]PHENANTHRIDINIUM DERIVATIVES, NOVEL COMPOUNDS PREPARED BY SAID PROCESS, AND ANTITUMOR AGENTS

Miyoji Hanaoka, Kanazawa; Hisao Ekimoto; Fumiko Kobayashi, both of Tokyo; Yukio Irie, Maebashi; Katsutoshi Takahashi, Tokyo; Masanobu Suzuki, Omiya; Takeshi Nakanishi, Yono; Osamu Kogawa, Kashiwa, and Keizou Ishikawa, Iwatsuki, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

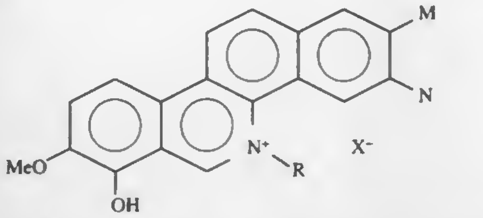
Continuation-in-part of Ser. No. 784,699, Oct. 30, 1991, abandoned, and Ser. No. 621,848, Dec. 4, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 851,853

Claims priority, application Japan, Dec. 13, 1989, 1-321503; Nov. 7, 1990, 2-299844; Jun. 11, 1991, 3-165174; Jun. 11, 1991, 3-165175

Int. Cl.⁶ A61K *31/44;* **C07D** *471/00*

U.S. Cl. 514—280 **12 Claims**

1. A pharmaceutical composition comprising as an effective ingredient a benzo[c]phenanthridinium derivative of the general formula A:



(A)

wherein M and N together form a methylenedioxy group, X^- represents a hydrogen acid residue, and R represents a lower alkyl group and pharmaceutically acceptable additives.

5,747,503
SELECTIVE INHIBITORS OF BIOGENIC AMINE TRANSPORTERS

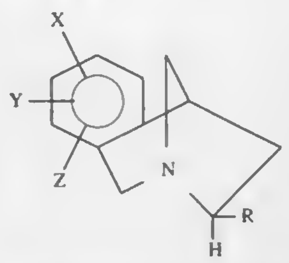
Richard Rothman, Silver Spring, Md.; Frank I. Carroll, Durham, N.C.; Bruce Blough, Raleigh, N.C., and Samuel W. Mascarella, Hillsborough, N.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C., and Researc Triangle Institute, Research Triangle Park, N.C.

Division of Ser. No. 203,222, Feb. 28, 1994, Pat. No. 5,574,060, which is a continuation-in-part of Ser. No. 105,747, Aug. 12, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 746,517

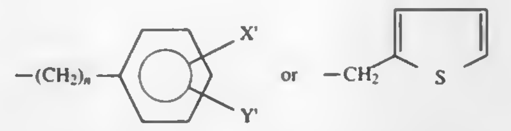
Int. Cl.⁶ C07D *221/22;* **A61K** *31/46*

U.S. Cl. 514—294 **70 Claims**

1. A compound having the structure:



wherein X, Y, and Z are independently H, Cl, Br, F, OCH_3, I, or an alkyl group having 1 to 6 carbon atoms; and R is



wherein n is 0 to 6, X' and Y' are independently H, Cl, F, CH_3, C_2H_5° C_3H_7, C_4H_9, OCH_3, OH, CF_3, OCF_3, NO_2, NH_2, $N(CH_3)_2$, $NHCOCH_3$, NCS, $NHCOCH_2Br$, or N_3, and $(CH_2)_n$ if present, may be substituted with OH, OCH_3, or an alkyl or alkenyl group having 1 to 3 carbon atoms.

5,747,504
METHOD OF TREATING CARDIAC INSUFFICIENCY USING ANGIOTENSIN-CONVERTING ENZYME INHIBITORS

Rainer Henning, Hattersheim am Main; Hansjörg Urbach, Kronberg/Taunus; Volker Teetz, Hofheim am Taunus; Rolf Geiger, Frankfurt am Main, and Bernward Schölkens, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

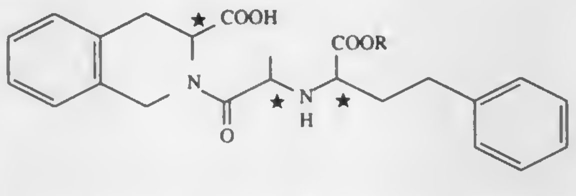
Continuation of Ser. No. 445,543, May 22, 1995, Pat. No. 5,684,016, which is a division of Ser. No. 359,860, Dec. 20, 1994, which is a division of Ser. No. 188,745, Jan. 31, 1994, Pat. No. 5,403,856, which is a continuation of Ser. No. 920,173, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 636,001, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 313,491, Feb. 22, 1989, abandoned, which is a continuation of Ser. No. 721,705, Apr. 10, 1985, abandoned. This application Sep. 6, 1996, Ser. No. 709,286

Claims priority, application Germany, Apr. 12, 1984, 34 13 710.6

Int. Cl.⁶ A61K *31/47*

U.S. Cl. 514—307 **3 Claims**

1. A method for treating cardiac insufficiency in a mammal comprising the step of administering to a mammal in recognized need of, and for the purpose of said treatment, an amount of an angiotensin-converting enzyme inhibitor effective for said treatment, said angiotensin-converting enzyme inhibitor having the formula I:



in which R is hydrogen, methyl, ethyl or benzyl; or a pharmaceutically acceptable salt thereof.

5,747,505
HETEROCYCLIC ARYL-, ALKYL- AND CYCLOALKYLACETAMIDES

Richard Connell, Trumbull, Conn.; Siegfried Goldmann, Wuppertal, Germany; Ulrich Müller, Wuppertal, Germany; Martin Beuck, Erkrath, Germany; Hilmar Bischoff, Wuppertal, Germany; Dirk Denzer, Wuppertal, Germany; Rudi Grützmann, Solingen, Germany, and Stefan Wohlfeil, Hilden, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

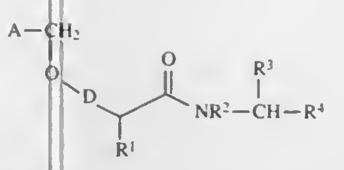
Filed Sep. 20, 1996, Ser. No. 717,027

Claims priority, application Germany, Sep. 29, 1995, 19536378.7

Int. Cl.⁶ C07D *215/12;217/12;409/12;* **A61K** *31/47*

U.S. Cl. 514—307 **8 Claims**

1. Heterocyclic-substituted acetamide compounds of the formula (I):



(I)

in which

- A represents quinolyl or isoquinolyl, each of which is optionally substituted up to 3 times by identical or different substituents independently selected from the group consisting of halogen, nitro, cyano, trifluoromethyl, hydroxyl, carboxyl or straight-chain or branched alkyl, alkoxy, acyl or alkoxycarbonyl each having up to 8 carbon atoms,
- D represents naphthyl, cycloalkyl having 3 to 6 carbon atoms, pyridyl, furyl, thienyl or azetidinyl, each of which is optionally substituted up to 2 times by identical or different substituents independently selected from the group consisting of halogen, cyano, hydroxyl or straight-chain or branched alkyl or alkoxy each having up to 4 carbon atoms,
- R^1 represents hydrogen, cycloalkyl having 3 to 10 carbon atoms or straight-chain or branched alkyl having 1 to 10 carbon atoms, or represents phenyl which is optionally substituted up to 2 times by identical or different substituents independently selected from the group consisting of halogen, cyano, hydroxyl or straight-chain or branched alkyl or alkoxy each having up to 4 carbon atoms,
- R^2 represents hydrogen or straight-chain or branched alkyl having up to 3 carbon atoms,
- R^3 represents hydrogen, straight-chain or branched alkyl having up to 5 carbon atoms, benzyl, or cycloalkyl having 3 to 7 carbon atoms, or represents phenyl, pyridyl, furyl, or thienyl, each of which is optionally substituted up to 3 times by identical or different substituents independently selected from the group consisting of halogen, nitro, phenyl, hydroxyl or straight-chain or branched alkyl or alkoxy each having up to 6 carbon atoms,
- R^4 represents hydrogen or a group of the formula $—CH_2OH$ or $—CH_2—O—CO—R^5$,

in which

- R^5 represents hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl which is optionally substituted up to 3 times by identical or different substituents independently selected from the group consisting of halogen, hydroxyl, cyano or straight-chain or branched alkyl or alkoxy each having up to 4 carbon atoms,

and salts thereof.

5,747,506
ISOQUINOLINE COMPOUNDS, COMPOSITIONS CONTAINING THEM AND THEIR PHARMACEUTICAL USES

Reto Naef, Rheinfelden, Switzerland, assignor to Novartis AG, Basel, Switzerland

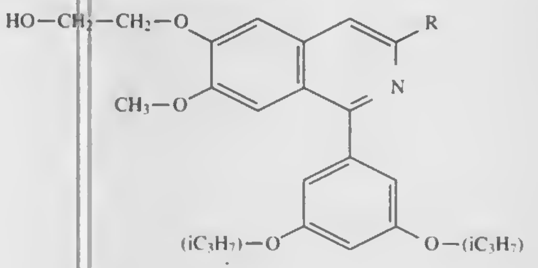
Continuation of Ser. No. 472,042, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 333,699, Nov. 3, 1994, abandoned. This application Dec. 20, 1996, Ser. No. 771,556

Claims priority, application United Kingdom, Nov. 5, 1993, 9322828

Int. Cl.⁶ C07D *217/16;* **A61K** *31/47*

U.S. Cl. 514—307 **16 Claims**

1. A compound of formula I



(I)

wherein R is ethyl or n-propyl, or a physiologically-hydrolyzable and -acceptable ester thereof, or an acid addition salt of such a compound or ester.

5,747,507
CARDIO-PROTECTIVE AGENT

Ichiro Ikegaki, Miyazaki-ken, and Toshio Asano, Shizuoka-ken, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP93/01128, § 371 Date Feb. 9, 1995, § 102(e) Date Feb. 9, 1995, PCT Pub. No. WO94/03171, PCT Pub. Date Feb. 17, 1994

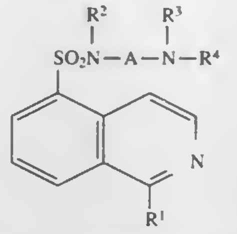
PCT Filed Aug. 10, 1993, Ser. No. 379,561

Claims priority, application Japan, Aug. 10, 1992, 4-212680

Int. Cl.⁶ A61K *31/47*

U.S. Cl. 514—312 **12 Claims**

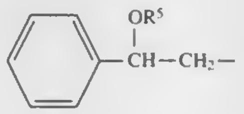
1. A method for the prophylaxis and treatment of a myocardial disease which is caused by the influence of ischemia, or ischemia and reperfusion, and which results in the necrosis of myocardial cells, comprising administering to a patient suffering from or diagnosed to be susceptible to the myocardial disease an effective amount of an isoquinolinesulfonamide derivative represented by formula (I) or a pharmaceutically acceptable acid addition salt thereof:



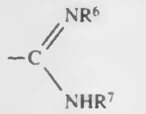
(I)

wherein R^1 represents a hydrogen atom, a chlorine atom or a hydroxyl group, and wherein:

- when R^1 is a hydrogen atom, A represents a C_2–C_6 alkylene group, which is unsubstituted or substituted with at least one substituent selected from the group consisting of a C_1–C_{10} alkyl group, a cinnamyl group, a phenyl group and a benzyl group; R^2 represents a hydrogen atom or a cycloalkyl group having 6 carbon atoms or less; R^3 represents a hydrogen atom, a straight or branched C_1–C_6 alkyl group, a cinnamyl group, a phenyl group or a benzyl group; or R^2 and R^3 together form an alkylene group having 4 carbon atoms or less, which is unsubstituted or substituted with at least one substituent selected from the group consisting of a C_1–C_{10} alkyl group, a phenyl group and a benzoyl group; and R^4 represents a hydrogen atom, a straight or branched C_1–C_6 alkyl group, a phenyl group, a benzyl group, a benzoyl group, a cinnamyl group, a cinnamoyl group, a furoyl group, a group represented by the formula:



wherein R^5 represents a straight or branched C_1–C_6 alkyl group, or an amidino group represented by the formula:



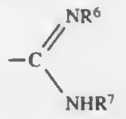
$$-C\begin{matrix}\nearrow NR^6 \\ \searrow NHR^7\end{matrix}$$

wherein each of R^6 and R^7 independently represents a hydrogen atom or a methyl group,

or R^6 and R^7 together form a C_2–C_4 alkylene group; or R^3 and R^4 together with a neighboring nitrogen atom form a 5 or

6-membered heterocyclic group, which group optionally contains an oxygen atom; and

when R^1 is a chlorine atom or a hydroxyl group, A represents a C_2–C_6 alkylene group, which is unsubstituted or substituted with at least one C_1–C_6 alkyl group; each of R^2 and R^3 independently represents a hydrogen atom, a straight or branched C_1–C_6 alkyl group or a cycloalkyl group having 6 carbon atoms or less, or R^2 and R^3 together form an ethylene or a trimethylene group, which is unsubstituted or substituted with at least one C_1–C_6 alkyl group; and R^4 represents a hydrogen atom, a C_1–C_6 alkyl group or an amidino group represented by the formula:



$$-\mathrm{C}(=\mathrm{NR}^6)-\mathrm{NHR}^7$$

wherein each of R^6 and R^7 independently represents a hydrogen atom or a methyl group.

5,747,508

AMIDINOHYDRAZONES OF KETONES DERIVED FROM BENZO[B]FURAN, METHODS FOR THEIR PRODUCTION, AND PHARMACEUTICALS CONTAINING THESE COMPOUNDS

Peter Richter, Greifswald; Martin Elsner, Bielefeld, and Barbara Vogt, Berlin, all of Germany, assignors to Helopharm G. Petrik GmbH, Berlin, Germany

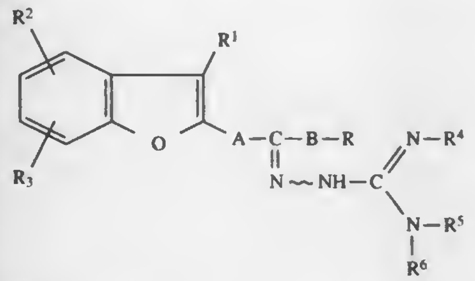
Filed Dec. 6, 1996, Ser. No. 761,505

Claims priority, application Germany, Dec. 7, 1995, 195 47 263.2

Int. Cl.^{6} A61K *31/34;* **C07D** *307/81*

U.S. Cl. 514—320 **5 Claims**

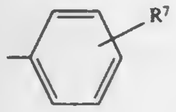
1. An amidinohydrazone of the general formula I, or a mixture thereof

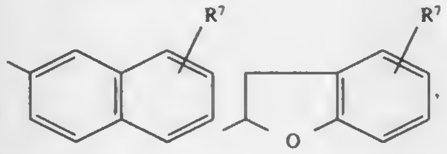


I

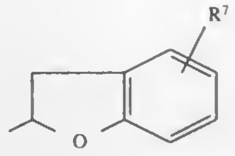
wherein

R is a linear or branched alkyl or dialkyl aminoethyl group containing up to 6 C atoms, or one of the residues





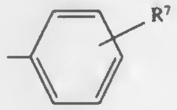
wherein R^7 represents a hydrogen atom, a halogen atom, a linear or branched alkyl or alkoxy group containing up to 6 C atoms, an aralkyl or aralkoxy group containing up to 9 C atoms, a cyano, nitro, methane sulfonamido, acetylamino, trifluoromethyl, trifluoromethoxy, amino, or (1H-imidazole-1-yl) group, provided that R is not

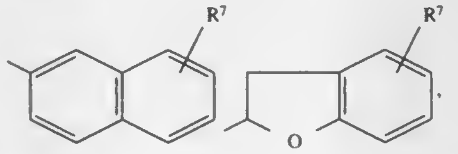


for any compound when A and B are not present,

A and B independently represent either $(CH_2)_n$ or $(CH{=}CH)_m$, with n=0, 1 or 2 and m=0 or 1,provided that m or n is not zero for A when both B is $(CH{=}CH)_1$ and R^4 with R_5 forms a heterocyclic ring,

R^1 is a hydrogen atom, an amino, a linear or branched alkyl residue containing up to 6 C atoms, an aralkyl residue containing up to 9 C atoms, a methane sulfonamido, acetylamino, cyano, (1H-imidazole-1-yl) residue, or one of the residues



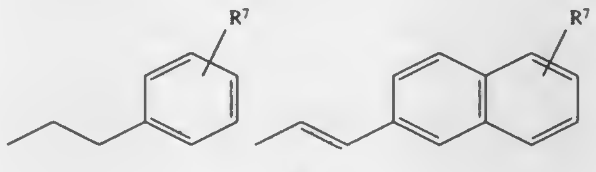


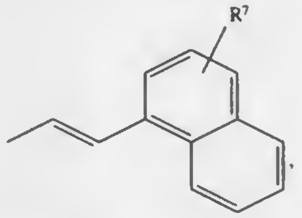
wherein

R^7 is as defined above,

R^2 and R^3 independently represent a hydrogen atom, a linear or branched alkyl or alkoxy group containing up to 6 C atoms, an aralkyl or aralkoxy group containing up to 9 C atoms, a halogen atom, a cyano, nitro, methane sulfonamido, acetylamino, trifluoromethyl, trifluoromethoxy, amino or (1H-imidazole-1-yl) group

R^4 is a hydrogen atom, a linear or branched alkyl group containing up to 6 C atoms, an aralkyl group containing up to 9 C atoms, or one of the residues,

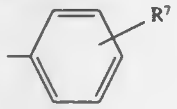




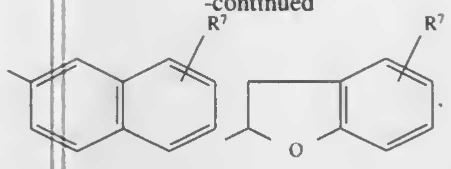
wherein

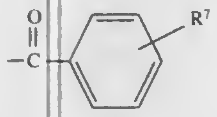
R^7 is as defined above,

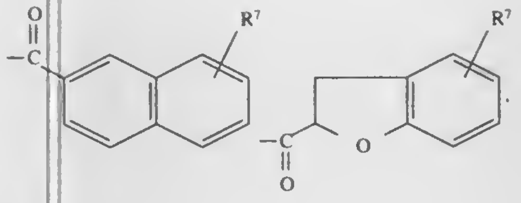
R^5 and R^6 independently represent a hydrogen atom, a linear or branched alkyl, alkanoyl, or alkylsulfonyl residue containing up to 6 C atoms, an aralkyl residue containing up to 9 C atoms, a (4-methylphenyl)sulfonyl, a trifluoroacetyl, or one of the residues



-continued







wherein

R^7 is as defined above,

or R^4 and R^5 jointly represent an ethylene or propylene fragment,

or R^5 and R^6, together with the N atom, represent a piperidino, morpholino, or piperazino residue,

and wherein the zig-zagged bond in the structure of amidinohydrazone indicates that the compound is present in the form of the (Z) or (E) isomer, or mixtures of isomers,

or a salt formed with one or several physiologically tolerable acids.

5,747,509

METHOD FOR LOWERING PLASMA LEVELS OF LIPOPROTEIN(A)

Katalin Kauser, El Sobrante, and Gabor M. Rubanyi, Alamo, both of Calif., assignors to Schering Aktiengesellschaft, Berlin, Germany

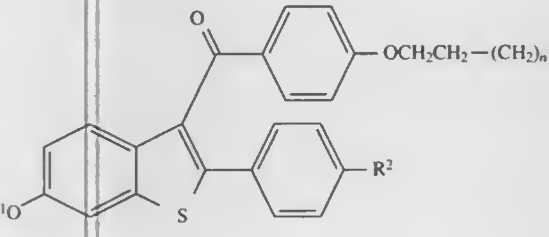
Filed Jun. 3, 1996, Ser. No. 657,237

Int. Cl.^{6} A61K *31/445;31/40*

U.S. Cl. 514—324 **4 Claims**

1. A method of lowering plasma levels of Lp(a) in a human, which method comprises administering to the human in need thereof an effective amount of a compound of formula (I):

(I)



wherein

n is 0, 1 or 2:

R^1 is hydrogen, alkyl, alkanoyl, cycloalkanoyl, (alkoxy)alkanoyl, aroyl, aryloxycarbonyl;

R^2 is hydrogen, hydroxy, halo, alkoxy, alkanoyloxy, cycloalkanoyloxy, (alkoxy)alkanoyloxy, aroyloxy, aryloxycarbonyloxy;

R^3 is pyrrolidinyl or piperidinyl;

or a pharmaceutically acceptable salt thereof.

5,747,510

PHARMACEUTICAL UNIT DOSAGE FORMULATIONS

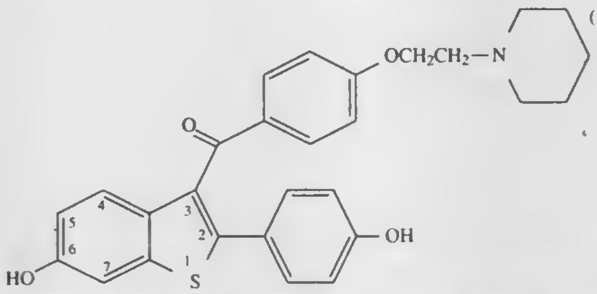
Michael W. Draper, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 422,417, Apr. 14, 1995, Pat. No. 5,641,790, which is a division of Ser. No. 205,012, Mar. 2, 1994, Pat. No. 5,478,847. This application Jan. 27, 1997, Ser. No. 788,984

Int. Cl.^{6} A61K *31/44;* **C07D** *409/00*

U.S. Cl. 514—333 **14 Claims**

1. A pharmaceutical formulation in daily dosage unit form comprising, per daily dosage unit, an amount within the range of about 55 to about 150 mg of a compound of formula I



(I)

or a pharmaceutically acceptable salt or solvate thereof, said formulation in dosage unit form being adapted for oral administration in the form of a capsule or tablet.

5,747,511

BENZOTHIOPHENE ANALOGS AS ANTIVIRAL AGENTS

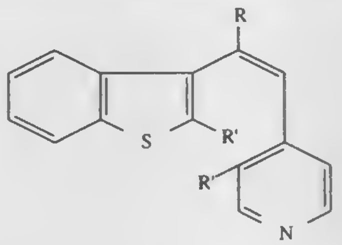
Elmer J. Reist, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Division of Ser. No. 101,371, Aug. 2, 1993, Pat. No. 5,424,315. This application Apr. 21, 1995, Ser. No. 426,262

Int. Cl.^{6} C07D *409/06;* **A61K** *31/44*

U.S. Cl. 514—337 **28 Claims**

1. A compound having the structural formula (I)



[I]

wherein:

the R' are both hydrogen; and

R is selected from the group consisting of

—$COOR^1$ where R^1 is H, lower alkyl or phenyl,

—$CONHR^1$, and

—NHR^2 where R^2 is selected from the group consisting of H, lower alkyl, and —$COOR^3$ where R^3 is lower alkyl or trifluoromethyl.

5,747,512

USE OF COTININE TO ALLEVIATE TOBACCO WITHDRAWAL SYNDROME

Robert M. Keenan, Baltimore, Md., and Dorothy K. Hatsukami, Golden Valley, Minn., assignors to Pharmaco Behavioral Associates, Inc., Minneapolis, Minn.

Continuation of Ser. No. 885,314, May 18, 1992, Pat. No. 5,596,007. This application Aug. 1, 1996, Ser. No. 691,888

Int. Cl.^{6} A61K *31/44*

U.S. Cl. 514—343 **11 Claims**

1. A therapeutic method to reduce or eliminate the increased appetite or weight gain associated with cessation of nicotine or

tobacco use, comprising administering an amount of cotinine or a pharmaceutically acceptable salt thereof to a human in need of such treatment, which amount is effective to reduce or eliminate said increased appetite or weight gain.

5,747,513
DERIVATIVES OF 2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENE ACTIVE ON THE CARDIOVASCULAR SYSTEM

Stefania Montanari; Paolo Cavalleri, and Francesco Santangelo, all of Milan, Italy, assignors to Zambon Group, S.P.A., Vicenza, Italy

PCT No. PCT/EP94/02981, § 371 Date Apr. 30, 1996, § 102(e) Date Apr. 30, 1996, PCT Pub. No. WO95/07885, PCT Pub. Date Mar. 23, 1995

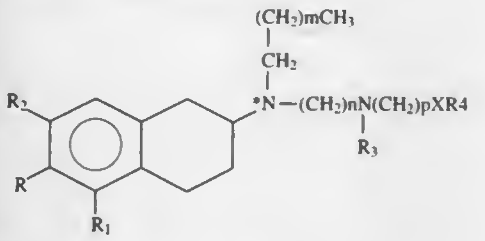
PCT Filed Sep. 7, 1994, Ser. No. 605,136

Claims priority, application Italy, Sep. 14, 1993, MI93A1973

Int. Cl.^{6} C07D *233/84;* **A61K** *31/38*

U.S. Cl. 514—351 **10 Claims**

1. A compound of formula



1

wherein

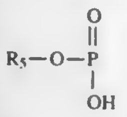
R is a hydrogen atom or an OY group;

R_1 is a hydrogen atom or an OY' group,

R_2 is a hydrogen atom or an OY" group;

provided that at least one of R, R_1 and $R_2$is hydrogen but R, R_1 and R_2 are not contemporaneously hydrogen atoms and R_1 and R_2 are not contemporaneously OY' or OY" groups respectively;

Y, Y' and Y", the same or different, are a hydrogen atom or an acyl group derived from an optionilly substituted aliphatic, aromatic or heteroaromatic carboxylic acid, from an optionally substituted carbonic or carbamic acid or for a phosphoric acid of the formula



$$R_5-O-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OH}{|}}{P}}$$

wherein

R_5 is a hydrogen atom, a C_1–C_6 alkyl optionally substituted by one or more groups selected from the group consisting of hydroxy, alkoxy, acyloxy, amino, carboxy and alkoxycarbonyl; or a phenyl;

m is an integer selected from 1 or 2;

n is 3 to 8;

P is an integer of 2 to 4;

R_3 is a hydrogen atom or a C_1–C_4 alkyl;

R_4 is a phenyl optionally substituted by halogen atoms C_1–C_3 alkyl or alkoxy groups; or a 5- or 6-membered heteroaryl containing one or more heteroatoms selected from the group consisting of oxygen, nitrogen and sulphur, optionally substituted by halogen atoms, hydroxy groups, C_1–C_3 alkyl or alkoxy groups;

X is NH, S, SO, SO_2, CO, CF_2, or O; provided that when X is O, R_4. is different from phenyl; the asterisk marks an asymmetric carbon atom; and pharmaceutically acceptable salts thereof.

5,747,514
METALLOPROTEINASE INHIBITORS

Raymond Paul Beckett; Mark Whittaker; Andrew Miller, and Fionna Mitchell Martin, all of Cowley, United Kingdom, assignors to British Biotech Pharmaceuticals Limited, Oxford, England

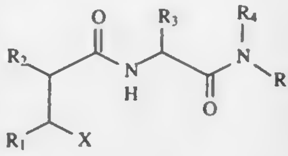
Filed Jul. 19, 1996, Ser. No. 685,330

Claims priority, application United Kingdom, Jan. 20, 1994, 9401034; Aug. 2, 1994, 9415619

Int. Cl.^{6} C07D *213/75;* **A61K** *31/44*

U.S. Cl. 514—352 **27 Claims**

1. A compound of formula (1)



(1)

wherein

X is a $—CO_2H$ or —CONHOH group;

R_1 is hydrogen; $(C_1–C_6)$alkyl; $(C_2–C_6)$alkenyl; phenyl; substituted phenyl; phenyl$(C_1–C_6)$alkyl; substituted phenyl$(C_1–C_6)$alkyl; heterocyclyl; substituted heterocyclyl; heterocyclyl$(C_1–C_6)$alkyl; substituted heterocyclyl$(C_1–C_6)$alkyl; a group BSO_nA— wherein n is 0, 1 or 2 and B is hydrogen or a $(C_1–C_6)$alkyl, phenyl, substituted phenyl, heterocyclyl, $(C_1–C_6)$acyl, phenacyl or substituted phenacyl group, and A represents $(C_1–C_6)$alkyl; amino; protected amino; acylamino; OH; SH; $(C_1–C_6)$alkoxy; $(C_1–C_6)$alkylamino; di-$(C_1–C_6)$alkylamino; $(C_1–C_6)$alkylthio; aryl$(C_1–C_6)$alkyl; amino$(C_1–C_6)$alkyl; hydroxy$(C_1–C_6)$alkyl, mercapto$(C_1–C_6)$alkyl or carboxy$(C_1–C_6)$alkyl wherein the amino-, hydroxy-, mercapto- or carboxyl-group are optionally protected or the carboxyl-group amidated; lower alkyl substituted by carbamoyl, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, di(lower alkyl)amino, or carboxy-lower alkanoylamino;

R_2 is a $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl$(C_1–C_6)$alkyl, heteroaryl$(C_1–C_6)$alkyl, cycloalkyl$(C_1–C_6)$alkyl or cycloalkenyl$(C_1–C_6)$alkyl group, any one of which may be optionally substituted by one or more substituents selected from $(C_1–C_6)$alkyl, $—O(C_1–C_6)$alkyl, $—S(C_1–C_6)$alkyl, halo and cyano (CN);

R_3 is:

$(C_1–C_6)$alkyl, benzyl, hydroxybenzyl, benzyloxybenzyl, $(C_1–C_6)$alkoxybenzyl, or benzyloxy$(C_1–C_6)$alkyl group; or

the characterising group of a natural a amino acid, in which any functional group may be protected, any amino group may be acylated and any carboxyl group present may be amidated; or

a group $-(Alk)_nR_6$ where Alk is a $(C_1–C_6)$alkyl or $(C_2–C_6)$alkenyl group optionally interrupted by one or more —O—, or —S— atoms or $—N(R_7)—$ groups where R_7 is a hydrogen atom or a $(C_1–C_6)$alkyl group, n is 0 or 1, and R_6 is an optionally substituted cycloalkyl or cycloalkenyl group; or

a benzyl group substituted in the phenyl ring by a group of formula $—OCH_2COR_8$ where R_8 is hydroxyl, amino, $(C_1–C_6)$alkoxy, phenyl$(C_1–C_6)$alkoxy, $(C_1–C_6)$alkylamino, di($(C_1–C_6)$alkyl)amino, phenyl$(C_1–C_6)$alkylamino, the residue of an amino acid or acid halide, ester or amide derivative thereof, said residue being linked via an amide bond, said amino acid being selected from glycine, α or β alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, tryptophan, serine, threonine, cysteine, methionine, asparagine, glutamine, lysine, histidine, arginine, glutamic acid, and aspartic acid;

a heterocyclic$(C_1–C_6)$alkyl group, either being unsubstituted or mono- or di-substituted in the heterocyclic ring with halo, nitro, carboxy, $(C_1–C_6)$alkoxy, cyano, $(C_1–C_6)$alkanoyl, trifluoromethyl$(C_1–C_6)$alkyl, hydroxy, formyl, amino, $(C_1–C_6)$alkylamino, di-$(C_1–C_6)$alkylamino, mercapto, $(C_1–C_6)$alkylthio, hydroxy$(C_1–C_6)$alkyl, mercapto$(C_1–C_6)$alkyl or $(C_1–C_6)$alkylphenylmethyl; or

a group $CR_aR_bR_a$ in which:

each of R_a, R_b and R_c is independently hydrogen, $(C_1–C_6)$alkyl, $C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl$(C_1–C_6)$alkyl, $((C_3–C_8)$cycloalkyl, the foregoing being subject to the proviso that R_a, R_b and R_c are not all hydrogen; or

R_c is hydrogen, $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl$(C_1–C_6)$alkyl, or $(C_3–C_8)$cycloalkyl, and R_a and R_b together with the carbon atom to which they are attached from a 3- to 8-membered cycloalkyl or a 5- to 6-membered heterocyclic ring; or R_a, R_b and R_c together with the carbon atom to which they are attached form a tricyclic ring; or

R_a and R_b are each independently $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl$(C_1–C_6)$alkyl, or a group as defined for R_c below other than hydrogen, or R_a and R_b together with the carbon atom to which they are attached form a 3- to 8-membered cycloalkyl or a 3- to 8-membered heterocyclic ring, and R_c is hydrogen, —OH, —SH, halogen, —CN, $—CO_2H$, $(C_1–C_4)$perfluoroalkyl, $—CH_2OH$, $—CO_2(C_1–C_6)$alkyl, $—O(C_1–C_6)$alkyl, $—O(C_1–C_6)$alkenyl, $—S(C_1–C_6)$alkyl, $—SO(C_1–C_6)$alkyl, $—SO_2(C_1–C_6)$alkyl, $—S(C_2–C_6)$alkenyl, $—SO(C_2–C_6)$alkenyl, $—SO_2(C_2–C_6)$alkenyl or a group —Q—W wherein Q represents a bond or —O—, —S—, —SO— or $—SO_2—$ and W represents a phenyl, phenylalkyl, $((C_3–C_8)$cycloalkyl, $(C_3–C_8)$cycloalkylalkyl, $(C_4–C_8)$cycloalkenyl, $(C_4–C_8)$cycloalkenylalkyl, heteroaryl or heteroarylalkyl group, which group W may optionally be substituted by one or more substituents independently selected from, hydroxyl, halogen, —CN, $—CO_2H$, $—CO_2(C_1–C_6)$alkyl, $—CONH_2$, $—CONH(C_1–C_6)$alkyl, $—CONH(C_1–C_6alkyl)_2$, —CHO, $—CH_2OH$, $(C_1–C_4)$perfluoroalkyl, $—O(C_1–C_6)$alkyl, $—S(C_1–C_6)$alkyl, $—SO(C_1–C_6)$alkyl, $—SO_2(C_1–C_6)$alkyl, $—NO_2$, $—NH_2$, $—NH(C_1–C_6)$alkyl, $NH((C_1–C_6(alkyl)_2$, $—NHCO(C_1–C_6)$alkyl, $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, $((C_3–C_8)$cycloalkyl, $(C_4–C_8)$cycloalkenyl, phenyl or benzyl;

R_4 is a phenyl or 5- or 6-membered heteroaryl ring wherein any ring nitrogen atom may be oxidised as an N-oxide, which may be optionally fused to a benzene ring or to a 5-, 6- or 7 -membered heterocyclic ring, and wherein any of the rings may be optionally substituted by:

(a) one or more substituents independently selected from hydroxyl, halogen, —CN, $—CO_2H$, $—CO_2(C_1–C_6)$alkyl, $—(C_1–C_6)$alkyl$—CO_2(C_1–C_6)$alkyl, $—CONH_2$, $—CONH(C_1–C_6)$alkyl, $—CON((C_1–C_6)alkyl)_2$, —CHO, $—CH_2OH$, $—(C_1–C_4)$perfluoroalkyl, $—O(C_1–C_6)$alkyl, $—S(C_1–C_6)$alkyl, $—SO(C_1–C_6)$alkyl, $—SO_2(C_1–C_6)$alkyl, $—NO_2$, NH_2, $—NH(C_1–C_6)$alkyl, $—N((C_1–C_6)alkyl)_2$, and $—NHCO(C_1–C_6)$alkyl, or

(b) a group selected from $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, $(C_3–C_8)$cycloalkyl, $(C_4–C_8)$cycloalkenyl, phenyl, benzyl, heteroaryl or heteroarylmethyl any of which groups may be optionally substituted with one or more substituents selected from halogen, hydroxyl, amino, carboxyl, $(C_1–C_4)$perfluoroalkyl, $(C_1–C_6)$alkyl, $—O(C_1–C_6)$alkyl or $—S(C_1–C_6)$alkyl;

R_5 is hydrogen or a $(C_1–C_6)$alkyl group;

or a salt, hydrate or solvate thereof, PROVIDED THAT R_4 is not 2-pyridyl or 2-thiazolyl when R_1 is hydrogen, R_2 is n-pentyl, R_3 is iso-propyl, and R_5 is hydrogen.

5,747,515
HETEROCYCLIC COMPOUNDS AND COMPOSITIONS HAVING NEVROPHARMACOLOGICAL POTENTIAL

Robin Bernad Boar, Herts; Alan John Cross, Surrey; Duncan Alastair Gray, Powys, and Richard Alfred Green, Oxon, all of United Kingdom, assignors to Astra Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE94/00664, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO95/01967, PCT Pub. Date Jan. 19, 1995

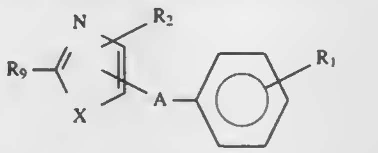
PCT Filed Jul. 5, 1994, Ser. No. 379,467

Claims priority, application Sweden, Jul. 6, 1993, 9302333

Int. Cl.^{6} A61K *31/415;31/42;* **C07D** *263/32;277/24*

U.S. Cl. 514—359 **7 Claims**

1. A compound having the general formula (1)



(1)

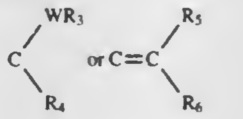
wherein:

X is O, S. or Se;

R_1 is one or more groups selected from H, lower alkyl, lower acyl, halogen, lower alkoxy, CF_3, OH, NO_2 or NR_7R_8 where R_7 and R_8 independently are H, lower alkyl or lower acyl;

R_2 is H, lower alkyl, lower alkoxy-lower alkyl, aryl-lower alkyl or CF_3;

R_9 is H, lower alkyl, lower alkoxy-lower alkyl, aryl-lower alkyl, CF_3 or NR_7R_8; and A is



wherein

W is O, S, NH or N-lower alkyl;

R_3 is H, lower alkyl or lower acyl;

R_4 is lower aklyl, aryl-lower alkyl or lower perfluoroalkyl;

R_5 and R_6 independently are H, lower alkyl, or aryl-lower alkyl; geometric and optical isomers and racemates thereof where such isomers exist, as well as pharmaceutically acceptable acid addition salts thereof and solvates thereof.

5,747,516
DIHYDROAZOLE COMPOUNDS AND THEIR USE FOR CONTROLLING FUNGAL PLANT DISEASES

Richard James Brown, Newark; King-Mo Sun, Hockessin, and Deborah Ann Frasier, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

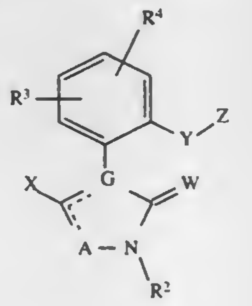
PCT No. PCT/US94/09525, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/14009, PCT Pub. Date May 26, 1995

PCT Filed Aug. 30, 1994, Ser. No. 640,884

Int. Cl.^{6} A61K *31/41;31/42;31/415;31/425*

U.S. Cl. 514—359 **7 Claims**

1. A compound selected from Formula 1, and agriculturally suitable salts thereof,



1

wherein:

A is O; N; NR^5; or CR^{14};

G is C or N; provided that when G is C, A is O or NR^5 and the floating double bond is attached to G; and when G is N, A is N or CR^{14} and the floating double bond is attached to A;
W is O;
X is OR^1;
R^1 is C_1–C_3 alkyl;
R^2 is H or C_1–C_2 alkyl;
R^3 and R^4 are H;
R^5 is H; C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_2–C_6 alkenyl; C_2–C_6 haloalkenyl; C_2–C_6 alkynyl; C_2–C_6 haloalkynyl; C_3–C_6 cycloalkyl; C_2–C_4 alkylcarbonyl; C_2–C_4 alkoxycarbonyl; or benzoyl optionally substituted with R^{13};
Y is —O—; —CH=CH—; $—CH_2O—$; $—OCH_2—$; $—CH_2O—N{=}C(R^7)—$; or $—CH_2OC({=}O)NH—$; and the directionality of the Y linkage is defined such that the moiety depicted on the left side of the linkage is bonded to the phenyl ring and the moiety on the right side of the linkage is bonded to Z;
R^7 is H; C_1–C_3 alkyl; or C_1–C_3 haloalkyl;
Z is phenyl optionally substituted with one of R^9, R^{10}, or both R^9 and R^{10};
R^9 is 1–2 halogen; C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_1–C_6 alkoxy; C_1–C_6 haloalkoxy; C_1–C_6 alkylthio; C_3–C_6 cycloalkyl; $CO_2(C_1$–C_6 alkyl); $NH(C_1$–C_6 alkyl); $N(C_1$–C_6 alkyl$)_2$; or cyano; or R^9 is phenyl, phenoxy, pyridinyl, pyridinyloxy, pyrimidinyl, or pyrimidinyloxy each optionally substituted with one of R^{11}, R^{12}, or both R^{11} and R^{12};
R^{10} is halogen; C_1–C_4 alkyl; C_1–C_4 haloalkyl; C_1–C_4 alkoxy; nitro; or cyano;
R^{11} and R^{12} are each independently halogen; C_1–C_4 alkyl; C_1–C_4 haloalkyl; C_1–C_4 alkoxy; C_1–C_4 haloalkoxy; nitro; or cyano;
R^{13} is halogen; C_1–C_3 alkyl; C_1–C_3 haloalkyl; C_1–C_3 alkoxy; C_1–C_3 haloalkoxy; nitro; or cyano; and
R^{14} is H; halogen; C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_2–C_6 alkenyl; C_2–C_6 haloalkenyl; C_2–C_6 alkynyl; C_2–C6 haloalkynyl; or C_3–C_6 cycloalkyl.

5,747,517
BENZYLIDENE RHODANINES

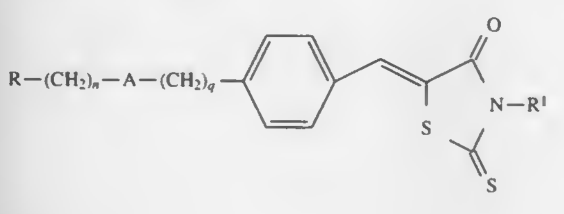
Jill A. Panetta, Zionsville; Michael L. Phillips, Indianapolis; Jon K. Reel, Carmel; John K. Shadle, Fishers; Sandra K. Sigmund, Indianapolis; Richard L. Simon, and Celia A. Whitesitt, both of Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 213,873, Mar. 16, 1994. This application Sep. 11, 1996, Ser. No. 710,102

Int. Cl.^{6} C07D *277/34;* **A61K** *31/425*

U.S. Cl. 514—369 **16 Claims**

1. A compound of the formula



wherein:
n is 0, 1, 2, 3, or 4;
q is 0, 1, 2, 3, or4;
A is —O—, —NH—, or $—S(O)_m—$;
where m is 0, 1, or 2;
R^1 is hydrogen, C_1–C_6 alkyl, di(C_1–C_6 alkyl)amino-, amino, (C_1–C_6 alkyl)amino-, cyano(C_1–C_6 alkyl)-, or carboxy(C_1–C_6 alkylidene)-;
R is phenyl, oxazolyl, benzophenonyl, or naphthyl optionally substituted with one or more substituents selected from the group consisting of
C_1–C_{10} alkyl, C_2–C_{10} alkanoyl, hydroxy, nitro, rhodanine, C_2–C_{10} alkanoyloxy, hydrogen, phenyl, phenyl(C_1–C_6 alkylidenyl)-, heterocycle, heterocycle(C_1–C_6 alkylidenyl)-, unsaturated heterocycle, unsaturated heterocycle(C_1–C_6 alkylidenyl)-, halo, C_1–C_{10} alkylamino, C_1–C_{10} alkoxy, benzoyl, and C_1–C_{10} alkylthio,
said phenyl, phenyl(C_1–C_6 alkylidenyl)-, benzoyl, heterocycle, heterocycle(C_1–C_6 alkylidenyl)-, unsaturated heterocycle(C_1–C_6 alkylidenyl)-, rhodanine, and unsaturated heterocycle moieties being optionally substituted with one or more halo, C_1–C_6 alkyl, hydroxy, carboxy, or C_1–C_6 alkoxy groups;
with the proviso that if q is 0, R^1 is hydrogen, and n is 0 or 2, then R is not unsubstituted phenyl;
or a pharmaceutically acceptable salt thereof.

5,747,518
SUBSTITUTED THIOPHENE DERIVATIVE AND AGRICULTURAL AND HORTICULTURAL FUNGICIDE CONTAINING THE SAME AS ACTIVE INGREDIENT

Yukihiro Yoshikawa; Kanji Tomiya; Hiroyuki Katsuta; Hideo Kawashima; Osamu Takahashi; Shunichi Inami; Yuji Yanase; Junro Kishi; Hitoshi Shimotori, and Naofumi Tomura, all of Chiba-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 3, 1996, Ser. No. 627,929

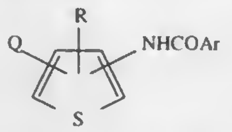
Claims priority, application Japan, Apr. 11, 1995, 7-085601; Dec. 27, 1995, 7-340480

Int. Cl.^{6} A61K *31/415;31/425;31/38;31/44*

U.S. Cl. 514—403 **17 Claims**

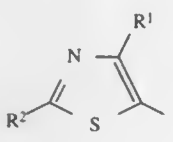
1. A substituted thiophene compound of the formula (1)

(1)



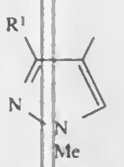
wherein Q is a hydrogen atom, fluorine atom, chlorine atom, bromine atom, iodine atom, methyl group, trifluoromethyl group, methoxy group, methylthio group, methylsulfonyl group, methylsulfoxy group, nitro group or amino group; R is a straight or branched alkyl group having 1–12 carbon atoms, straight or branched halogenalkyl group having 1–12 carbon atoms, straight or branched alkenyl group having 2–10 carbon atoms, straight or branched halogenoalkenyl group having 2–10 carbon atoms, alkoxyalkyl group having 2–10 carbon atoms, alkylthioalkyl group having 2–10 carbon atoms, cycloalkyl group having 3–10 carbon atoms, halogen substituted cycloalkyl group having 3–10 carbon atoms, or a phenyl group which can be substituted with 1–3 substituents; the 1–3 substituents of said phenyl group are selected from a hydrogen atom, alkyl group having 1–4 carbon atoms, alkenyl group having 2–4 carbon atoms, alkynyl group having 2–4 carbon atoms, cycloalkyl group having 3–6 carbon atoms, alkoxy group having 14 carbon atoms, halogenalkoxy group having 1–4 carbon atoms, alkylthio group having 1–4 carbon atoms, alkylsulfoxy group having 1–4 carbon atoms, alkylsulfonyl group having 1–4 carbon atoms, halogen atom, cyano group, acyl group having 24 carbon atoms, alkoxycarbonyl group having 2–4 carbon atoms, amino group or amino group substituted with alkyl group having 1–3 carbon atoms; R and the group —NHCOAr are at adjacent positions on the thiophene ring; and Ar is a group of one of the following formulae (A1) to (A8):

(A1)

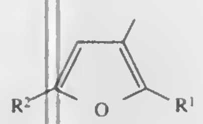


-continued

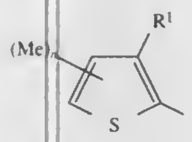
(A2)



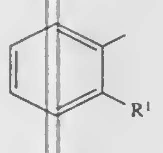
(A3)



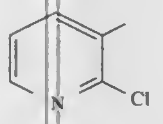
(A4)



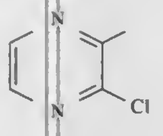
(A5)



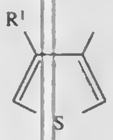
(A6)



(A7)



(A8)



wherein R^1 is a trifluoromethyl group, difluoromethyl group, methyl group, ethyl group, chlorine atom, bromine atom or iodine atom, R^2 is a hydrogen atom, methyl group, trifluoromethyl group or amino group, and n is an integer of 0–2.

5,747,519
SYNERGISTIC TERMITICIDAL COMPOSITION OF PYRETHROID AND N-PHENYL-PYRAZOLE

Hiroshi Kodama, Wakayama; Yasuhiro Wada, and Rikio Yamaguchi, both of Osaka, all of Japan, assignors to Rhone-Poulenc Agrochimie, Lyon Cedex, France

PCT No. PCT/EP95/00601, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO95/22902, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 20, 1995, Ser. No. 700,520

Claims priority, application Japan, Feb. 27, 1994, 6-052798

Int. Cl.^{6} A01N *37/34;43/56*

U.S. Cl. 514—407 **20 Claims**

1. A termiticidal combination comprising (a) bifenthrin and (b) 5-amino-3-cyano- 1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulphinylpyrazole, in a combined synergistic termiticidally effective amount, the ratio by weight of (a) to (b) being between 0.1 and 10.

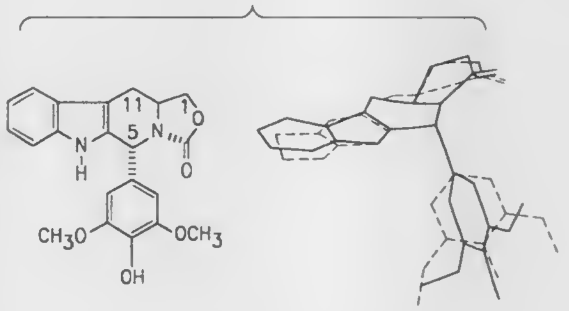
5,747,520
TOPOISOMERASE II INHIBITORS AND THERAPEUTIC USES THEREFOR

Yves Pommier, 5620 Southwick St., Bethesda, Md. 20817; Timothy Lee MacDonald, 2625 Jefferson Park Clr., and Jose S. Madalengoitia, 249 No. 8, Colonnade Dr., both of Charlottesville, Va. 22903

Division of Ser. No. 965,922, Oct. 23, 1992, Pat. No. 5,622,960, which is a continuation-in-part of Ser. No. 868,408, Apr. 14, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,754

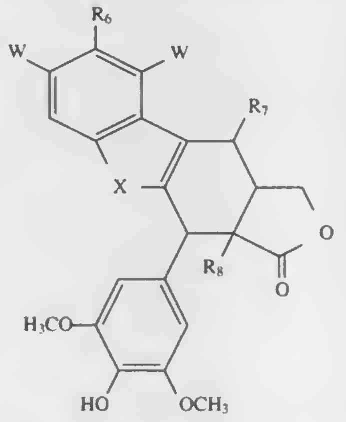
Int. Cl.^{6} A01N *43/38;* **C07D** *487/00;307/77*

U.S. Cl. 514—412 **7 Claims**

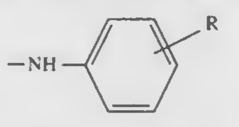


1. A compound that inhibits topoisomerase II catalytic activity and that is represented by the formula of compound:

(D)



wherein
(i) R_6 denotes F, Cl, Br, CN, OH, NH_2 or H;
(ii) R_7 denotes H, OH, the formula



wherein R denotes H, OH, F, Br, Cl, NO_2, NH_2, CN, OCH_3, or $CO_2CH_2CH_3$;
R_7 also denotes the formula

$$—T—(CH_2)_nZ$$

wherein
T denotes NH or O;
Z denotes NH_2, OH, $N(CH_3)_2$, or $N(CH_2CH_2Cl)$;
n is 2, 3 or 4; and
R_7 may be derivatized with a 4,6 o-protected sugar;
(iii) R_8 denotes H or OH;
(iv) W and W' are the same or different and denote, respectively, H or F; and
(v) X denotes NH, S or O.

VOL 210 ISS 1 MY 5 1998 UMI

5,747,521
N-CINNAMOYL-2-METHYL-5-METHOXY-3-INDOLEACETIC ACID ESTER, AND PHARMACEUTICAL PREPARATION CONTAINING THE SAME

Eui Hwan Cho; Sun Gan Chung, both of Seoul; Kyou Heung Lee, and Si Kyung Park, both of Kyungki-do, all of Rep. of Korea, assignors to Samjin Pharm. Co., Ltd., Seoul, Rep. of Korea

PCT No. PCT/KR93/00038, § 371 Date May 4, 1995, § 102(e) Date May 4, 1995, PCT Pub. No. WO94/06769, PCT Pub. Date Mar. 3, 1994

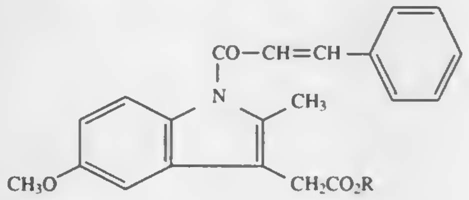
PCT Filed May 6, 1993, Ser. No. 403,794

Claims priority, application Rep. of Korea, Sep. 16, 1992, 92-16823

Int. Cl.⁶ A61K *31/405;* **C07D** *405/12;209/26*

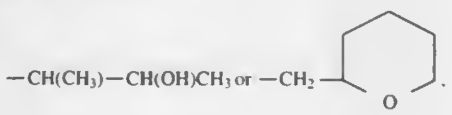
U.S. Cl. 514—420 **2 Claims**

1. A compound represented by the following formula



wherein R is

$-CH_2CH=CH-CH_2OH,$



5,747,522
AMINO ACID DERIVATIVES

Leo Alig, Kaiseraugst; Paul Hadvary, Biel-Benken; Marianne Hürzeler, Däniken; Marcel Müller, Frenkendorf; Beat Steiner, Bättwil, and Thomas Weller, Basel, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

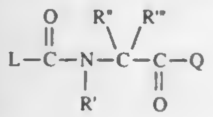
Division of Ser. No. 310,016, Sep. 21, 1994, Pat. No. 5,658,928, which is a division of Ser. No. 854,135, Mar. 19, 1992, Pat. No. 5,378,712. This application May 25, 1995, Ser. No. 452,614

Claims priority, application Switzerland, Mar. 26, 1991, 910/91; Jan. 22, 1992, 176/92

Int. Cl.⁶ A61K *31/40;31/445;31/395;* **C07D** *207/08*

U.S. Cl. 514—423 **9 Claims**

1. A compound of the formula

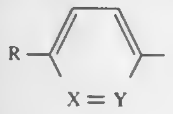


$$L-\overset{O}{\overset{\|}{C}}-\underset{R'}{\underset{|}{N}}-\overset{R''\;\;R'''}{C}-\underset{O}{\underset{\|}{C}}-Q$$

I

wherein

L is a group of the formula



L¹

or

$R''\text{-}NH(CH_2)_t$ L²

R is amidino or guanidino, each of X and Y is CH,

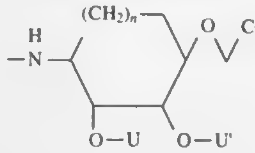
R″ is hydrogen or amidino,

t is an integer between 2 and 6,

R' and R" together with the N atom and C atom to which they are attached form an optionally substituted 4- to 6-membered ring;

R"' is hydrogen or optionally substituted lower alkyl;

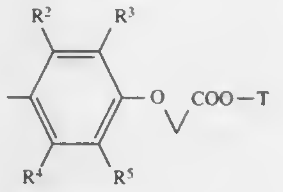
Q is a group of the formula



Q⁴

$-N(V')CH_{2v}-C(V'',V''')CH_2OCH_2COO\text{-}T$ Q⁸

or



Q⁹

n is the number 0 or 1,

v is an integer between 0 and 3,

T and T' are hydrogen or a lower-alkyl or phenyl-lower-alkyl group which is cleavable under physiological conditions,

V to V"' are hydrogen or lower-alkyl,

U and U' are hydrogen, $C_{1\text{-}6}$alkanoyl or aroyl,

Ar is aryl and

R^2 to R^5 are hydrogen, lower-alkyl, lower-alkoxy, halogen or a group $-OCH_2COO\text{-}T'$ or

R^2 and R^3 together with the phenyl group to which they are attached form a 1-naphthyl group,

as well as hydrates or solvates and physiologically usable salts thereof.

5,747,523
SUBSTITUTED ETHYL α,α-DIARYLMETHYL ETHER DERIVATIVES

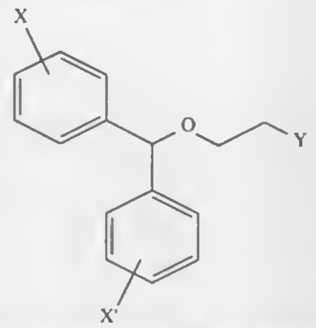
Paul F. Jackson, Bel Air, Md., assignor to Guilford Pharmaceuticals Inc., Baltimore, Md.

Filed Jan. 24, 1996, Ser. No. 590,641

Int. Cl.⁶ A01N *43/36;* **C07D** *207/30;207/18;207/04*

U.S. Cl. 514—427 **21 Claims**

1. A compound of the formula:



I

or a pharmaceutically acceptable salt thereof, wherein:

X and X' are independently selected from the group consisting of one or more hydrogen, halo, C_1–C_6 alkyl, C_1–C_6, alkenyl, C_1–C_6 alkynyl, aryl, hydroxy, and alkoxy; and

Y is a pyrrolidine, pyrroline or pyrrole radical which is unsubstituted or substituted with one or more substituents selected from the group consisting of C_1–C_6 alkyl, carbonyl, keto, ester, cyclohexyl, and cyclohexadienyl.

5,747,524
CANNABINOID RECEPTOR ANTAGONISTS

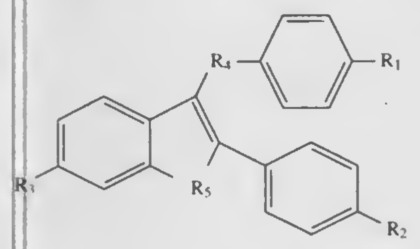
George J. Cullinan, Trafalgar; Kennan J. Fahey, and Gary A. Koppel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 477,964, Jun. 7, 1995, Pat. No. 5,596,106, which is a continuation-in-part of Ser. No. 275,895, Jul. 15, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 724,101

Int. Cl.⁶ A61K *31/38*

U.S. Cl. 514—443 **15 Claims**

1. A method of antagonising one or more of the actions of anandamide at cannabinol-1 receptors in a mammal, which comprises administering an effective amount of a compound of formula



I

in which:

R^1 is C_1–C_4 alkoxy, trifluoromethylsulfonyloxy, hydroxy or cyano;

R^2 and R^3 are each independently C_1–C_4 alkyl or C_1–C_4 alkoxy;

R^4 is CO, CHOH or CH_2; and

R^5 is O or S, provided that when R^1 is hydroxy, R^5 is O.

5,747,525
MEDICINAL THIOPHENE COMPOUNDS

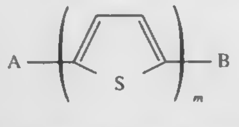
Ching-Te Chang, Taipei; Kuo-Mou Chen, Hsinchu; Wann-Huang Liu, Hsinchu; Fen-Lan Lin, Hsinchu, and Rong-Tsun Wu, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Continuation-in-part of Ser. No. 302,278, Sep. 8, 1994, Pat. No. 5,602,170, which is a continuation-in-part of Ser. No. 838,516, Feb. 19, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,253

Int. Cl.⁶ A61K *31/38*

U.S. Cl. 514—444 **3 Claims**

1. A method of treating tumor sensitive to a compound of the formula below, said method comprising administering to a subject in need thereof a pharmaceutical composition which contains an effective amount of a compound of the following formula:



wherein m is 2–4; and each of A and B, independently, is H, $C_{1\text{-}7}$ alkyl, $C_{2\text{-}7}$ alkenyl, $C_{2\text{-}7}$ alkynyl, $(CH_2)_nCHO$, $(CH_2)_oCOOH$, $C_{1\text{-}7}$ alkoxy, $C_{2\text{-}7}$ alkoxyalkyl, $C_{1\text{-}7}$ hydroxyalkyl, CN, NO_2, halogen, $CH(OR^1)_2$, $CO.R^1$, NR^2R^3 or its acid salt, $CO.NR^2R^3$, $CHR^1NR^2R^3$ or its acid salt, $CH{=}NR^2$, $C{\equiv}CR^4$, $CR^1{=}CR^5R^6$, $CO.CH{=}CHR^7$, $CH{=}CHR^8$, or $COOR^9$; in which each of n and o, independently, is 0–4; R^1 is $C_{1\text{-}4}$ alkyl or $C_{1\text{-}4}$ acyl; each of R^2 and R^3, independently, is H, $C_{1\text{-}4}$ alkyl, or $C_{1\text{-}4}$ hydroxyalkyl; R^4 is H, $C_{1\text{-}4}$ alkyl, $C_{2\text{-}4}$ alkenyl, COR^2, $COOR^{10}$, $C_{1\text{-}4}$ hydroxyalkyl or its acid ester or 2-tetrahydropyranyl ether, $C_{1\text{-}4}$ dihydroxyalkyl or its acid ester or 2-tetrahydropyranyl ether, $C_{1\text{-}4}$ halogenated alkyl; OR^1, or NHR^7; each of R^5 and R^6, independently, is H, CHO, COR^1, COOH, $COOR^9$, CN, or halogen; R^7 is H, $C_{1\text{-}4}$ alkyl, 2-thienyl, phenyl, mono-substituted phenyl, or di-substituted phenyl; R^8 is $COOR^2$, CO.CHO, $C_{1\text{-}4}$ hydroxyalkyl or its acid ester or 2-tetrahydropyranyl ether; and R^9 is H, $C_{1\text{-}4}$ alkyl, phenyl, mono-substituted phenyl, di-substituted phenyl, or 2-thienyl.

5,747,526
ANTI-HIV /AIDS CHEMO(C)-, IMMUNO(I)-, OR CI-THERAPY USING TUR (OR RELATED COMPOUNDS) AND/OR NVA (OR EPV)

Ariel C. Hollinshead, 3637 Van Ness St. NW., Washington, D.C. 20008-3130

Filed Jan. 25, 1996, Ser. No. 591,756

Int. Cl.⁶ A61K *31/38;39/12*

U.S. Cl. 514—448 **9 Claims**

1. A method for inhibiting HIV replication in an HIV positive or AIDS patient comprising the step of administering an effective amount of thiophenoyl urea to the patient.

5,747,527
FURANOEREMOPHILANE AND EREMOPHILANOLIDE SESQUITERPENES FOR TREATMENT OF DIABETES

Wayne D. Inman, Belmont; Steven Row King, Moss Beach; Joseph L. Evans, San Francisco, and Jian Luo, Brisbane, all of Calif., assignors to Shaman Pharmaceuticals, Inc., South San Francisco, Calif.

Filed Jun. 6, 1995, Ser. No. 479,049

Int. Cl.⁶ A61K *31/35;31/355*

U.S. Cl. 514—453 **13 Claims**

1. A method for reducing the blood glucose of a mammal, comprising administering to said mammal a hypoglycemically effective amount of a composition comprising an isolated or a purified compound selected from the group consisting of epicacalone, cacalone, compound 3, cacalol, dimaturin and pharmaceutically acceptable salts thereof; and a physiologically acceptable carrier.

5,747,528
CHROMAN DERIVATIVES AS ANTI-OXIDANTS

Bharat Kakidas Trivedi, Farmington Hills, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

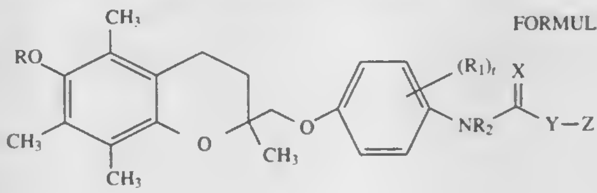
Filed Jan. 24, 1997, Ser. No. 788,534

Int. Cl.⁶ C07D *311/04;* **A61K** *31/35*

U.S. Cl. 514—456 **19 Claims**

1. A method for the treatment of inflammation, atherosclerosis, restenosis, immune disorders, and transplant rejection in mammals in need thereof comprising administering to such mammal an effective amount of a compound of Formula I

FORMULA I



wherein:

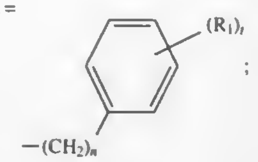
R=Hydrogen or $-CH_2-$ phenyl;

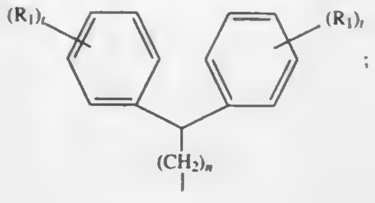
R_2=Hydrogen or lower alkyl of from 1–4 carbon atoms;

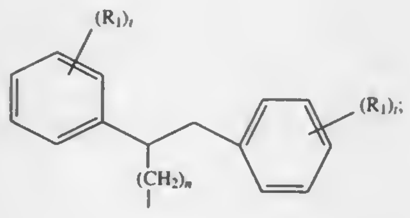
X=Oxygen or Sulfur;

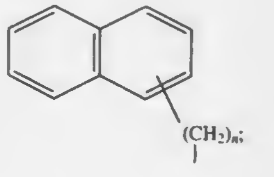
Y=$(CH_2)_n$ or —NR' where R' is hydrogen, alkyl of from 1 to 12 carbon atoms or aryl of from 6 to 10 carbon atoms, or Z;

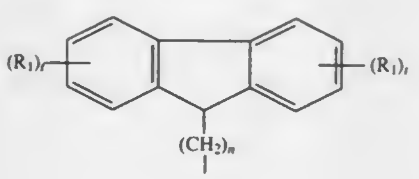
Z=











or —$(CH_2)_n$ alkyl of from 1 to 12 carbon atoms;
wherein n=0, 1 or 2;
t=0, 1, 2 or 3; and
R_1 is:
- alkyl of from 1 to 4 carbon atoms, hydroxy,
- alkoxy of from 1 to 4 carbon atoms, halogen,
- —CF_3,
- —CN,
- —NH_2,
- —N $(CH_3)_2$,
- —CH_2N $(CH_3)_2$,
- —COOH,
- —COO Alkyl of from 1 to 4 carbon atoms
- —CH_2NH—C (CH_3) $(CH_2OH)_2$,
- —CH_2—Morpholine,
- —OCH_2—CO_2CH_3,
- —OCH_2—$CO_2C_2H_5$, or
- —$O(CH_2)_2$—N (C_2H_5)

or a pharmaceutically acceptable salt thereof.

5,747,529
ANTINEOPLASTIC CYCLOLIGNAN DERIVATIVES

Marina Gordaliza; Maria Angeles Castro; Arturo San Feliciano; Jose Maria Migel del Corral; Maria Luisa Lopez, all of Salamanca, and Dolores G. Gravalos, Madrid, all of Spain, assignors to Universidad de Salamanca, Salamanca, Spain

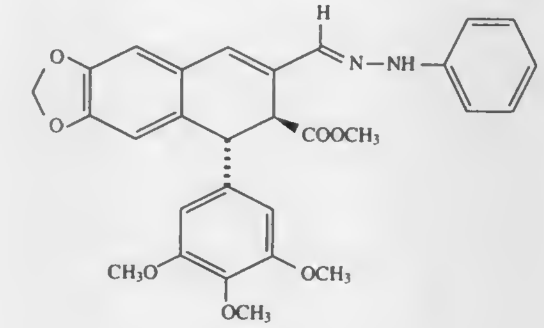
Filed Nov. 13, 1995, Ser. No. 558,128

Claims priority, application United Kingdom, Nov. 14, 1994, 9422946

Int. Cl.^{6} A61K *31/36;* **C07D** *317/70*

U.S. Cl. 514—463 **2 Claims**

1. The compound LL-16, which has the following formula.



5,747,530
AROMATIC DIBENZOFURAN COMPOUNDS AND PHARMACEUTICAL/COSMETIC COMPOSITIONS COMPRISED THEREOF

Bruno Charpentier, Biot, and Bruno Bernard, Neuilly sur Seine, both of France, assignors to Centre International de Recherches Dermatologiques Galderma, Valbonne, France

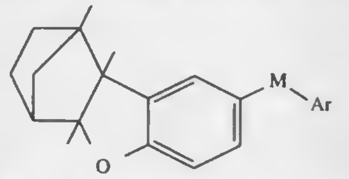
Filed Oct. 30, 1995, Ser. No. 550,335

Claims priority, application France, Oct. 28, 1994, 94 12989

Int. Cl.^{6} A01N *43/08;* **C07D** *311/78;405/00*

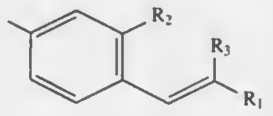
U.S. Cl. 514—468 **44 Claims**

1. A dibenzofuran compound having the structural formula (I):

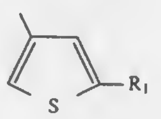


(I)

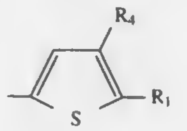
wherein Ar is a radical having one of the following formulae (II)–(VI):



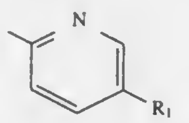
(II)



(III)

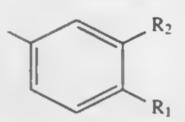


(IV)



(V)

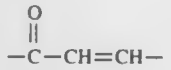
-continued



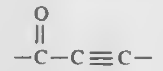
(VI)

wherein M is a bivalent radical selected from among those of the following formulae, with the proviso that said formulae can be oriented from left to right or vice versa:

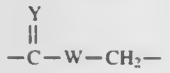
$-CR_5R_6-$ (a)



$-\overset{O}{\overset{\|}{C}}-CH=CH-$ (b)



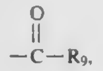
$-\overset{O}{\overset{\|}{C}}-C\equiv C-$ (c)



$-\overset{Y}{\overset{\|}{C}}-W-CH_2-$ (d)

$-CR_5R_6-CH_2-W-$ (e)

with the proviso that, when M is a radical of formula (a), Ar cannot be a radical of formula (VI); R_1 is:
- (i) a hydrogen atom,
- (ii) a —CH_3 radical,
- (iii) a radical —$(CH_2)_m$—O—R_8,
- (iv) a radical —OR_8,
- (v) a radical



$-\overset{O}{\overset{\|}{C}}-R_9,$

a radical —$S(O)_tR_9$, with m, t, R_8 and R_9 having the definitions given below; R_2 is a hydrogen atom or a radical —OR_8, with R_8 having the definition given below; R_3 is a hydrogen atom or a lower alkyl radical; R_4 has the same definition as R_1, with the proviso that at least one of the two radicals R_1 and R_4 is a hydrogen atom; R_5 and R_6 are independently a hydrogen atom, a lower alkyl radical or a radical —$(X)_n$—$(CH_2)_p$—R_7, with the proviso that R_5 and R_6 may together form an oxo (=O) group, a thioxo (=S) or oxime group, a group (R_{11}—O—N=), an epoxy or cyclopropyl group, a cycloalkyl group optionally substituted by a halogen atom or a lower alkyl radical, or a dioxolane (—O—$(CH_2)_q$O—) group wherein q is equal to 2 or 3, with X, n, p, R_7 and R_{11} having the definitions given below; R_7 is a hydrogen atom or a radical —$(CO)_r$—R_{10} with r and R_{10} having the definitions given below; R_8 is a hydrogen atom, a lower alkyl radical or a lower acyl radical; R_9 is (i) a hydrogen atom, (ii) a radical —N(R'R"), or (iii) a radical —OR_{11}, with R', R" and R_{11} having the definitions given below; R_{10} is a hydrogen atom, an alkyl radical, an alkenyl radical, an alkynyl radical, an aryl radical, a radical —OR_{11}, or a radical —N(R'R"), with R', R" and R_{11} having the definitions given below; R_{11} is a hydrogen atom, an alkyl radical having from 1 to 20 carbon atoms, a mono- or polyhydroxyalkyl radical, an optionally substituted aryl or optionally substituted aralkyl radical, a sugar residue or an amino acid or peptide residue; R' and R", which may be identical or different, are each a hydrogen atom, a lower alkyl radical, a mono- or polyhydroxyalkyl radical, an optionally substituted aryl radical, an optionally substituted aralkyl radical or an amino acid or peptide or sugar residue, with the proviso that R' and R" may together form a heterocycle; W is an oxygen or sulfur atom or a group —NR_{12}, with R_{12} having the definition given below; R_{12} is a hydrogen atom or a —CH_3 radical; and X and Y are each independently an oxygen atom or a sulfur atom; m and p which are integers vary independently from 0 to 10, with the proviso that when R_7 is a radical (CO) $(CO)_r$—R_{10} and R_{10} is a radical —OR_{11}, p cannot be 0; n and r independently have the value 0 or 1; and t is equal to 0, 1 or 2.

5,747,531
DIFLUOROPROSTACYCLINS

Yasushi Matsumura; Takashi Nakano; Mayumi Makino, and Yoshitomi Morizawa, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

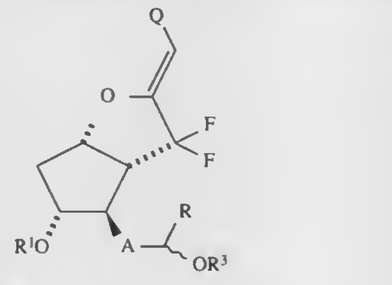
Division of Ser. No. 600,824, Feb. 13, 1996, Pat. No. 5,616,732, which is a division of Ser. No. 390,316, Feb. 17, 1995, Pat. No. 5,538,995. This application Oct. 31, 1996, Ser. No. 741,905

Claims priority, application Japan, Feb. 17, 1994, 20450/1994; Mar. 17, 1994, 46853/1994; Apr. 8, 1994, 71097/1994; Apr. 11, 1994, 71989/1994; Apr. 19, 1994, 80641/1994; Nov. 17, 1994, 283857/1994

Int. Cl.^{6} A01N *43/08*

U.S. Cl. 514—469 **9 Claims**

1. A difluoroprostacyclin of the following formula (IV):



(IV)

wherein
- A is an ethylene group, a vinylene group or an ethynylene group,
- R is a C_{4-10} branched alkyl group, a C_{3-8} cycloalkyl group, a C_{4-10} alkenyl group, or a C_{1-2} alkyl group substituted by a pheny group,
- Q is a monovalent organic group of the formula —B—Z wherein B is a lower alkylene group, a lower cycloalkylene group, a lower alkylene group containing a lower cycloalkylene group, a lower alkylene group containing an ether bond or a thioether bond, or a phenylene group, and Z is a carboxyl group, a formyl group, a hydroxyl group, or a group which can be converted to such a polar group, and
- each of R^1 and R^3, which are independent of each other, is a hydrogen atom or a protecting group for a hydroxyl group.

5,747,532
COMBINATIONAL THERAPEUTIC METHODS EMPLOYING NITRIC OXIDE SCAVENGERS AND COMPOSITIONS USEFUL THEREFOR

Ching-San Lai, Encinitas, Calif., assignor to Medinox, Inc., San Diego, Calif.

Filed Nov. 21, 1995, Ser. No. 561,594

Int. Cl.^{6} A61K *31/325*

U.S. Cl. 514—491 **33 Claims**

1. A method for directly or indirectly treating the production of species which induce the expression of inducible nitric oxide synthase in a subject, said method comprising:

co-administering to said subject an effective amount of a combination of at least one agent capable of directly or indirectly inactivating said species, or inhibiting production of said species, and at least one dithiocarbamate-containing nitric oxide scavenger.

5,747,533
USE OF ω-3-FATTY ACIDS

Nils Egberg, Lidingö; Carin Larsson-Backström, Stockholm; Jan Jakobsson, Djursholm, and Rolf Lundh, Huddinge, all of Sweden, assignors to Pharmacia & Upjohn Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE93/00146, § 371 Date Oct. 21, 1994, § 102(e) Date Oct. 21, 1994, PCT Pub. No. WO93/16691, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 23, 1993, Ser. No. 290,905

Claims priority, application Sweden, Feb. 24, 1992, 9200541

Int. Cl.^{6} A61K *31/22;31/355;31/34;31/20*

U.S. Cl. 514—549 20 Claims

1. Method for treating or preventing the development of disseminated intravascular coagulation (DIC), which comprises administering to a patient in need thereof a preparation containing an effective amount of w3-fatty acid, a salt or a derivative thereof.

5,747,534
LOBAPLATIN TRIHYDRATE

Eckhard Günther, Offenbach; Jens-Peter Wulf, Maintal; Jürgen Engel, Alzenau, and Bernhard Kutscher, Maintal, all of Germany, assignors to Asta Medica AG, Germany

Filed Sep. 16, 1996, Ser. No. 714,456

Claims priority, application Germany, Apr. 15, 1994, 44 15 263.9

Int. Cl.^{6} A61K *31/295;* **C07F** *15/00*

U.S. Cl. 514—492 6 Claims

1. Cis-[trans-1,2-cyclobutanebis (methylamine)-N,N']-[(2S)-lactate-O^1,O^2)-platinum (II) trihydrate.

2. A pharmaceutical composition containing an active ingredient cis-[trans1,2-cyclobutanebis (methylamine)-N,N']-[(2S)-lactate-O^1,O^2]-platinum (II) trihydrate together with conventional pharmaceutical excipients, diluents, or auxiliaries.

5,747,535
SELECTIVE THROMBIN INHIBITORS

Yeong Soo Oh; Sang Soo Kim; Sang Yeul Hwang; Mi Kyung Yun; Seong Ryul Hwang; Seong Won Hong; Yong Hee Lee; Yi Na Jeong; Koo Lee, and You Seung Shin, all of Daejeon, Rep. of Korea, assignors to LG Chemical Ltd., Seoul, Rep. of Korea

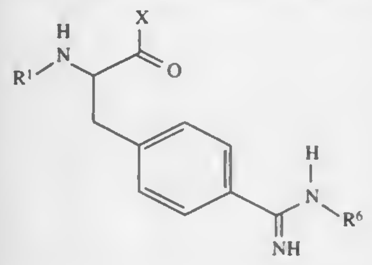
Filed Jan. 16, 1996, Ser. No. 586,208

Claims priority, application Rep. of Korea, Apr. 28, 1995, 1995-10383

Int. Cl.^{6} A61K *31/18;* **C07C** *311/18*

U.S. Cl. 514—507 5 Claims

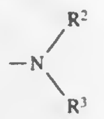
1. A compound represented by the following formula (I):



or its pharmaceutically acceptable salt, hydrate, solvate and isomer, in which

R^1 represents sulfonyl substituted with substituted or unsubstituted aryl,

X represents a group of formula



R^2 and R^3 independently of one another represent hydrogen; cycloakyl substituted or unsubstituted with carboxyl or alkoxycarbonyl; arylalkyloxy; hydroxy; or lower alkyl substituted or unsubstituted with carboxyl , alkoxycarbonyl or hydroxy, or formyl; lower alkyl; aryl substituted or unsubstituted with alkoxy or haloalkyl; or hydroxy-substituted lower alkyl, and

R^6 represents methyl or amino.

5,747,536
PHARMACEUTICAL COMPOSITION COMPRISING L-CARNITINE OR DERIVATIVE THEREOF AND TRIHYDROXY OR TETRAHYDROXYSTILBENE

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Oct. 2, 1996, Ser. No. 726,302

Claims priority, application Italy, Oct. 17, 1995, RM95A0687

Int. Cl.^{6} A61K *31/205;31/05*

U.S. Cl. 514—556 20 Claims

1. A pharmaceutical composition comprising (A) L-carnitine or alkanoyl L-carnitine wherein the alkanoyl group is straight or branched and contains 2–8 carbon atoms, or a pharmacologically acceptable salt thereof, and (B) a trihydroxy or tetrahydroxystilbene, as active ingredients; and a pharmacologically acceptable excipient therefor.

5,747,537
METHOD OF INHIBITING PARASITIC ACTIVITY

Jeffrey I. Gordon, Olivette; George W. Gokel, Chesterfield, both of Mo., and Paul T. Englund, Baltimore, Md., assignors to Washington University, St. Louis, Mo., and Johns Hopkins University, Baltimore, Md.

Filed Sep. 5, 1995, Ser. No. 523,301

Int. Cl.^{6} A61K *31/20*

U.S. Cl. 514—558 10 Claims

1. A method of inhibiting growth and viability of bloodstream trypanosome parasites having a GPI membrane anchor which comprises contacting said bloodstream trypanosome parasites with a compound selected from the group consisting of

CH_3—S—$(CH_2)_{11}$—COOH,
CH_3—CH_2—S—$(CH_2)_{10}$—COOH,
CH_3—$(CH_2)_3$—S—$(CH_2)_8$—COOH,
CH_3—$(CH_2)_4$—S—$(CH_2)_7$—COOH,
CH_3—$(CH_2)_5$—S—$(CH_2)_6$—COOH,
CH_3—$(CH_2)_6$—S—$(CH_2)_5$—COOH,
CH_3—$(CH_2)_7$—S—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_8$—S—$(CH_2)_3$—COOH,
CH_3—CH_2—S—$(CH_2)_2$—O—$(CH_2)_7$—COOH,
CH_3—CO—$(CH_2)_{11}$—COOH,
CH_3—$(CH_2)_2$—CO—$(CH_2)_9$—COOH,
CH_3—$(CH_2)_3$—CO—$(CH_2)_8$—COOH,
CH_3—$(CH_2)_4$—CO—$(CH_2)_7$—COOH,
CH_3—$(CH_2)_6$—CO—$(CH_2)_5$—COOH,
CH_3—$(CH_2)_8$—CO—$(CH_2)_3$—COOH,
CH_3—$(CH_2)_9$—CO—$(CH_2)_2$—COOH,
CH_3—O—CO—$(CH_2)_{10}$—COOH,
CH_3—$(CH_2)_2$—O—CO—$(CH_2)_8$—COOH,
CH_3—$(CH_2)_3$—O—CO—$(CH_2)_7$—COOH,
CH_3—$(CH_2)_5$—O—CO—$(CH_2)_5$—COOH,
CH_3—$(CH_2)_6$—O—CO—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_7$—O—CO—$(CH_2)_3$—COOH,
CH_3—$(CH_2)_8$—O—CO—$(CH_2)_2$—COOH,

O_2N—$(CH_2)_{12}$—COOH,
O_2N—$(CH_2)_{10}$—COOH,
Br—$(CH_2)_{12}$—COOH, and
Br—$(CH_2)_{13}$—COOH,
CH_3—CH_2—CH=CH—$(CH_2)_9$—COOH,
CH_3—$(CH_2)_5$—CH=CH—$(CH_2)_5$—COOH,
CH_3—$(CH_2)_6$—CH=CH—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_4$—CH=CH—CH=CH—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_5$—CH=CH—CH=CH—$(CH_2)_3$—COOH,
HC≡C—$(CH_2)_{11}$—COOH,
CH_3—$(CH_2)_2$—C≡C—$(CH_2)_8$—COOH,
CH_3—$(CH_2)_3$—C≡C—$(CH_2)_7$—COOH,
CH_3—$(CH_2)_4$—C≡C—$(CH_2)_6$—COOH,
CH_3—$(CH_2)_5$—C≡C—$(CH_2)_5$—COOH,
CH_3—$(CH_2)_6$—C≡C—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_7$—C≡C—$(CH_2)_3$—COOH,
CH_3—$(CH_2)_5$—C≡C—$(CH_2)_4$—COOH,
C_6H_5—$(CH_2)_7$—COOH,
C_6H_5—$(CH_2)_9$—COOH,
CH_3—CH_2—C_6H_4—$(CH_2)_7$—COOH,
CH_3—$(CH_2)_3$—O—C_6H_4—$(CH_2)_4$—COOH,
C_6H_5—$(CH_2)_{10}$—COOH,
CH_3—$(CH_2)_4$—O—C_6H_4—$(CH_2)_4$—COOH,
CH_3—$(CH_2)_3$—O—C_6H_4—CH=CH—$(CH_2)_3$—COOH,
C_5H_{11}—O—C_6H_4—CH=CH—$(CH_2)_2$—COOH,
2-Furyl-$(CH_2)_{10}$—COOH,
CH_3—$(CH_2)_6$-furyl-$(CH_2)_3$—COOH,
CH_3—$(CH_2)_5$-furyl-$(CH_2)_4$—COOH,
CH_3—$(CH_2)_4$-furyl-$(CH_2)_5$—COOH,
2-Thienyl-$(CH_2)_{10}$-COOH.

5,747,538
USE OF GINSENOSIDE R_o OR A PLANT EXTRACT CONTAINING SAME TO PROMOTE COLLAGEN SYNTHESIS

Alain Meybeck; Frédéric Bonte, both of Courbevoie; Marc Dumas, Colombes, and Catherine Chaudagne, Chatou, all of France, assignors to L.V.M.H. Recherche, Nanterre, France

PCT No. PCT/FR95/00326, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO95/25524, PCT Pub. Date Sep. 28, 1995

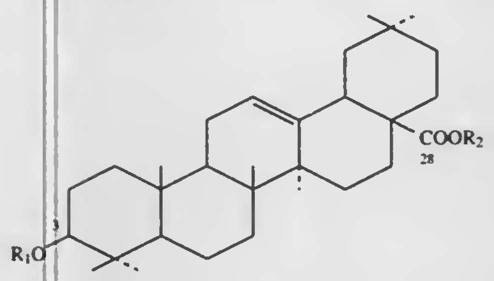
PCT Filed Mar. 17, 1995, Ser. No. 716,363

Claims priority, application France, Mar. 18, 1994, 94 03194

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 514—570 14 Claims

1. A method of treatment of a mammal comprising administering to said mammal an amount effective to stimulate the synthesis of collagen, of ginsenoside of formula:



wherein:

the substituent R_1 in the 3-position consists of the sugar residues beta-D-glucuronopyranoside and beta-D-glucopyranosyl linked together, represented by $GlcA^2Glc$, and the substituent R_2 in the 28-position is a beta-D-glucopyranosyl residue, represented by Glc; or a plant extract containing it.

5,747,539
FLUORINE-CONTAINING BENZOYLGUANIDINES

Dieter Dorsch, Ober-Ramstadt; Manfred Baumgarth, Darmstadt; Rolf Gericke, Seeheim; Klaus-Otto Minck, Ober-Ramstadt, and Norbert Beier, Reinheim, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

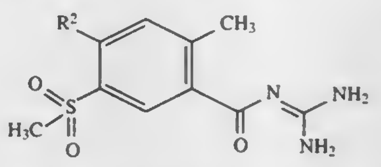
Filed May 15, 1996, Ser. No. 647,789

Claims priority, application Germany, May 16, 1995, 195 17 848.3

Int. Cl.^{6} C07C *279/22;* **A61K** *31/165;31/155*

U.S. Cl. 514—618 8 Claims

1. A fluorine-containing benzoylguanidine compound of the formula I



I

in which

R^2 is OCF_3 or CF_3 and their physiologically acceptable salts.

5,747,540
HIV PROTEASE INHIBITORS USEFUL FOR THE TREATMENT OF AIDS

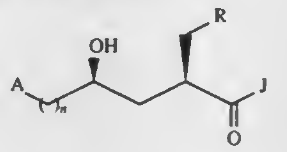
Craig A. Coburn, Skippack; Randall W. Hungate, Lansdale; Richard C. A. Isaacs, Harleysville; Joseph P. Vacca, Telford, and Mary Beth Young, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 21, 1996, Ser. No. 734,276

Int. Cl.^{6} A61K *31/165;31/38;* **C07D** *333/62;* **C07C** *203/00*

U.S. Cl. 514—622 11 Claims

1. A compound of the formula



I

Wherein

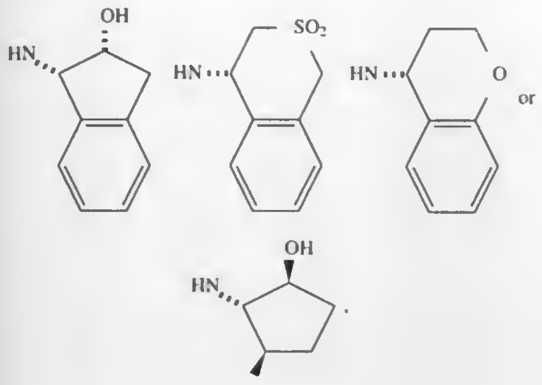
A is
- 1) aryl unsubstituted or substituted with one or more of
  - a) C_{1-4} lower alkyl;
  - b) hydroxy;
  - c) halo;
  - d) C_{1-4} lower or branched alkoxy;
  - e) C_{1-4} lower branched thioalkyl;
  - f) $COOR^1$;
  - g) $CONHR^1$;
  - h) SO_2NHR^1;
  - i) SO_2R^1; or
  - j) C_{1-4} lower hydroxyalkyl; or
- 2) a 5- to 10-membered mono or bicyclic heterocycle in which one or both heterocyclic rings contain an atom selected from N, O, or S, which heterocycle is unsubstituted or substituted with one or more of
  - a) C_{1-4} lower alkyl;
  - b) hydroxy;
  - c) halo;
  - d) C_{1-4} lower or branched alkoxy;
  - e) C_{1-4} lower branched thioalkyl;
  - f) $COOR^1$;
  - g) $CONHR^1$;
  - h) SO_2NHR^1;
  - i) SO_2R^1; or
  - j) C_{1-4} lower hydroxyalkyl; and

R is
- 1) aryl, unsubstituted or substituted with C_{1-4} lower alkyl, C_{1-4} lower alkoxy, or halo, or

2) C_{3-7} cycloalkyl; and

R^1 is C_{1-4} lower alkyl, C_{3-7}cycloalkyl or H; and

J is:



or pharmaceutically acceptable salt(s) thereof.

5,747,541
SUBSTITUTED BENZOYLGUANIDINES, A PROCESS FOR THEIR PREPARATION, THEIR USE AS MEDICAMENT OF DIAGNOSTIC AGENT, AND MEDICAMENT COMPRISING THEM

Andreas Weichert, Egelsbach; Joachim Brendel, Vilbel; Heinz-Werner Kleemann, Bischofsheim; Hans Jochen Lang, Hofheim; Jan-Robert Schwark, Frankfurt; Udo Albus, Florstadt, and Wolfgang Scholz, Eschborn, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

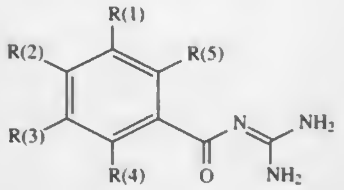
Continuation of Ser. No. 715,685, Sep. 18, 1996, abandoned. This application Jun. 12, 1997, Ser. No. 873,825

Claims priority, application European Pat. Off., Sep. 27, 1995, 95115240

Int. Cl.^{6} A61K *31/165;* **C07C** *231/02;235/50*

U.S. Cl. 514—622 **21 Claims**

1. A benzoylguanidine of the formula I



I

in which:

at least one of the substituents R(1), R(2) and R(3) is

R(6)—C(OH)$_2$—;

R(6) is perfluoroalkyl having 1, 2 or 3 carbon atoms, which is straight-chain or branched;

and the other substituents R(1), R(2) and R(3) are, independently of one another, hydrogen, OH, F, Cl, Br, I, alkyl having 1, 2, 3, 4, 5 or 6 carbon atoms, cycloalkyl having 3, 4, 5 or 6 carbon atoms, alkoxy having 1, 2, 3 or 4 carbon atoms or phenoxy,

which is unsubstituted or is substituted by 1–3 substituents chosen from the group consisting of F, Cl, methyl and methoxy;

or

the other substituents R(1), R(2) and R(3) are, independently of one another, alkyl-SO$_x$, —CR(7)═CR(8)R(9) or —C°CR(9);

x is zero, 1 or 2;

R(7) is hydrogen or methyl;

R(8) and R(9) are, independently of one another, hydrogen, alkyl having 1, 2, 3 or 4 carbon atoms, cycloalkyl having 3, 4, 5, 6, 7 or 8 carbon atoms or phenyl,

which is unsubstituted or is substituted by 1–3 substituents chosen from the group consisting of F, Cl, CF_3, methyl and methoxy;

or

the other substituents R(1), R(2) and R(3) are, independently of one another, phenyl, C_6H_5—(C_1–C_4)-alkyl, naphthyl, biphenylyl, quinolinyl, isoquinolinyl or imidazolyl,

where quinolinyl, isoquinolinyl or imidazolyl are bonded via C or N and where phenyl, C_6H_5—(C_1–C_4)-alkyl, naphthyl, biphenylyl, quinolinyl, isoquinolinyl and imidazolyl are unsubstituted or are substituted by 1–3 substituents chosen from the group consisting of F, Cl, CF_3, CH_3, methoxy, hydroxyl, amino, methylamino and dimethylamino;

or

the other substituents R(1), R(2) and R(3) are, independently of one another, SR(10), —OR(10) or —CR(10)R(11)R(12);

R(10) is —C_fH_{2f}—(C_3–C_8)-cycloalkyl, quinolinyl, isoquinolinyl, pyridinyl, imidazolyl or phenyl,

where the aromatic systems quinolinyl, isoquinolinyl, pyridinyl, imidazolyl and phenyl are unsubstituted or are substituted by 1–3 substituents chosen from the group consisting of F, Cl, CF_3, CH_3, methoxy, hydroxyl, amino, methylamino and dimethylamino;

f is zero, 1 or 2;

R(11) and R(12) are, independently of one another, defined as R(10), hydrogen or alkyl having 1, 2, 3 or 4 carbon atoms; and

R(4) and R(5) are, independently of one another, hydrogen, alkyl having 1, 2 or 3 carbon atoms, F, Cl, Br, I, CN, OR(13), NR(14)R(15) or —$(CH_2)_n$—$(CF_2)_o$—CF_3;

R(13), R(14) and R(15) are, independently of one another, hydrogen or alkyl having 1, 2, 3 or 4 carbon atoms;

n is zero or 1;

o is zero, 1 or 2;

or a pharmacologically acceptable salt thereof.

5,747,542
OXO-SUBSTITUTED TETRAHYDRONAPHTHALENE DERIVATIVES HAVING RETINOLD AND/OR RETINOID ANTAGONIST-LIKE BIOLOGICAL ACTIVITY

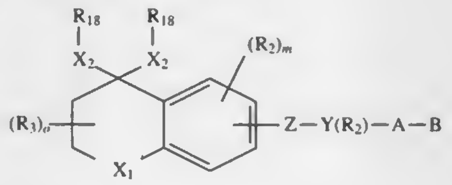
Vidyasagar Vuligonda, Irvine; Alan T. Johnson, Rancho Santa Margarita; Richard L. Beard, Newport Beach; Min Teng, Aliso Viejo; Tae K. Song, Long Beach; Harold N. Wong, Rancho Santa Margarita, and Roshantha A. Chandraratna, Mission Viego, all of Calif., assignors to Allergan, Irvine, Calif.

Filed Jun. 21, 1996, Ser. No. 667,666

Int. Cl.^{6} A61K *31/135;31/56;31/235;31/15*

U.S. Cl. 514—646 **21 Claims**

1. A compound of the formula



wherein

X_1 is $(C(R_1)_2)_n$ where R_1 is independently H or alkyl of 1 to 6 carbons, and n is an integer between 0 and 2;

X_2 is S or O;

Z is —N═N—, —N(═O)═N—, —N═N(═O)—, —$(CR_1{=}CR_1)_{n'}$— where n' is an integer having the value 0–5, —CO—NR_1—, —CS—NR_1—, —NR_1—CO, —NR_1—CS, —COO—, —OCO—; —CSO—; —OCS—; —CO—$CR_1{=}CR_1$—;

R_2 is hydrogen, lower alkyl of 1 to 6 carbons, F, Cl, Br, I, CR_3, fluoro substituted alkyl of 1 to 6 carbons, OH, SH, alkoxy of 1 to 6 carbons, or alkylthio of 1 to 6 carbons;

R_3 is hydrogen, lower alkyl of 1 to 6 carbons or F;

m is an integer having the value of 0–3;

o is an integer having the value of 0–4;

Y is a phenyl or naphthyl group, or heteroaryl selected from a group consisting of pyridyl, thienyl, furyl, pyridazinyl, pyrimidinyl, pyrazinyl, thiazolyl, oxazolyl, imidazoyl and pyrrazolyl, said phenyl and heteroaryl groups being optionally substituted with one or two R_2 groups, or

when Z is —$(CR_1{=}CR_1)_{n'}$— and n' is 3, 4, or 5 then Y represents a direct valence bond between said $(CR_2{=}CR_2)_{n'}$ group and B;

A is $(CH_2)_q$ where q is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof; $COOR_8$, $CONR_9R_{10}$, —CH_2OH, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —COR_7, $CR_7(OR_{12})_2$, $CR_7OR_{13}O$, or $Si(C_{1-6}alkyl)_3$, where R_7 is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons or trimethylsilylalkyl where the alkyl group has 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons, and

R_{18} is alkyl of 1 to 10 carbons, fluoro-substituted alkyl of 1 to 10 carbons, or the two R_{18} groups jointly form a ring having a total of 3 to 6 carbons, or the two X_2R_{18} groups jointly symbolize an oxo (═O) or a thio (═S) function, or a pharmaceutically acceptable salt of said compound, with the proviso that when X_1 is $[C(R_1)_2]n$, n is 1, Z is —CO—NR_1— or —$(CR_1{=}CR_1)_{n'}$— where n' is 1, and Y is phenyl then the two X_2R_{18} groups do not jointly symbolize an oxo (═O) group.

5,747,543
TREATMENT METHOD FOR CANCER

Lorne J. Brandes, 223 Cordova Street, Winnipeg, Manitoba, Canada, R3N 1A3

Continuation of Ser. No. 82,785, Jun. 28, 1993, which is a continuation-in-part of Ser. No. 711,975, Jun. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 627,863, Dec. 17, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 458,243

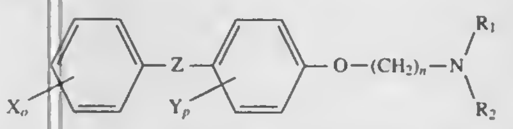
Claims priority, application United Kingdom, Feb. 17, 1993, 9303210

Int. Cl.^{6} A61K *31/135*

U.S. Cl. 514—651 **6 Claims**

1. A method for the treatment of cancer cells by chemotherapy in a human, which comprises:

(a) administering to said human a diphenyl compound of the formula:



wherein X and Y are each fluorine, chlorine or bromine, Z is an alkylene radical of 1 to 3 carbon atoms or a >C═O group, or the phenyl rings are joined to form a tricyclic ring, o and p are 0 or 1, R_1 and R_2 are each alkyl groups containing 1 to 3 carbon atoms or are joined together to form a hetero-ring which the nitrogen atom, and n is 1, 2 or 3 or a pharmaceutically-acceptable salt thereof, in an amount of from about 8 to about 240 mg/M^2 of animal to inhibit the binding of intracellular histamine in normal and subsequent cells, and

(b) about 30 to about 90 minutes subsequent to said administration of said diphenyl compound, administering to said human a chemotherapeutic agent(s) for the cancer cells in an amount toxic to the cancer cells, to achieve an enhanced toxic effect on the cancer cells from said chemotherapeutic agent(s) and to ameliorate the adverse effect of said chemotherapeutic agent(s) on normal cells.

5,747,544
METHOD OF USING PURE 3R-3'R STEREOISOMER OF ZEAXANTHIN TO TREAT OR PREVENT RETINAL DEGENERATION IN HUMANS

Kevin M. Garnett, St. Louis; Dennis L. Gierhart, High Ridge, and Luis H. Guerra-Santos, Ballwin, all of Mo., assignors to Applied Food Biotechnology, Inc., O'Fallon, Mo.

Filed Oct. 31, 1995, Ser. No. 550,665

Int. Cl.^{6} A61K *31/045*

U.S. Cl. 514—729 **14 Claims**

1. A method for treating macular degeneration in humans, comprising the step of administering, to a human patient who has been diagnosed as suffering from macular degeneration, a drug formulation which contains a 3R-3'R stereoisomer of zeaxanthin in a carrier substance which is suited for administration to humans, and which does not contain a substantial quantity of other undesired stereoisomers of zeaxanthin, wherein the 3R-3'R stereoisomer of zeaxanthin is present in a sufficient quantity to provide a therapeutic benefit in a human suffering from macular degeneration.

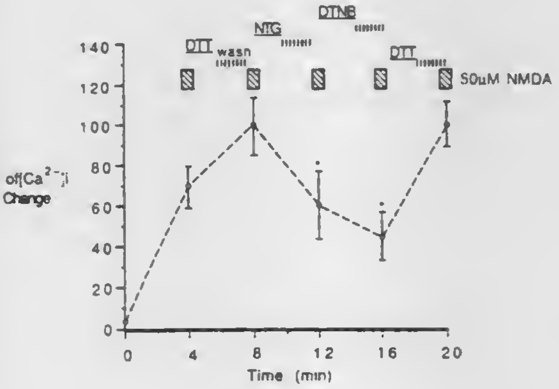
5,747,545
METHOD OF PREVENTING NMDA RECEPTOR COMPLEX-MEDIATED NEURONAL DAMAGE

Stuart A. Lipton, Newton, Mass., assignor to The Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 25,028, Mar. 2, 1993, Pat. No. 5,455,279, which is a continuation-in-part of Ser. No. 949,342, Sep. 22, 1992, Pat. No. 5,234,956, and Ser. No. 939,824, Sep. 3, 1992, Pat. No. 5,334,618, which is a continuation-in-part of Ser. No. 680,201, Apr. 4, 1991, abandoned, said Ser. No. 949,342 is a continuation of Ser. No. 688,965, Apr. 19, 1991, abandoned. This application Mar. 22, 1995, Ser. No. 407,973

Int. Cl.^{6} A61K *31/55*

U.S. Cl. 514—742 **1 Claim**



1. A method for a preliminary screen of candidate NMDA channel antagonists for safety and efficacy, said method comprising

a) determining the time period required for the candidate to induce blockade of NMDA-receptor-associate ion channels;

b) determining the time period required for loss of said blockade of ion channels when administration of the compound ceases; and

c) selecting a compound with time periods (a) and (b) that are shorter than the time periods characteristic of MK-801,

OL
2 10
SS
1
MY
5
998
MI

thereby enhancing the prospect that the candidate will be a clinically tolerated selective NMDA antagonist.

5,747,546

ION-EXCHANGE POLYMERS HAVING AN EXPANDED MICROSTRUCTURE

Marius W. Sorenson, Lake Jackson, Tex.; Robert A. Cipriano, Midland, Mich.; Jose J. Longoria, and John D. Weaver, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 31, 1996, Ser. No. 775,659

Int. Cl.^{6} C08F *8/32;* **C08J** *5/20*

U.S. Cl. 521—32 **12 Claims**

1. A cation-exchange fluoropolymer, prepared by a process comprising: (a) providing a cation-exchange fluoropolymer having an equivalent weight in the range of from 250 to 1000 and having counter-ions which are organic quaternary ammonium cations, and (b) exchanging at least 50 percent of such counter-ions with hydrogen ions or metal ions.

5,747,547

RECOVERY OF COMPONENTS FROM POLYESTER RESINS

Andrius Algimantas Naujokas, Webster, and William James Gamble, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1996, Ser. No. 687,883

Int. Cl.^{6} C08J *11/04*

U.S. Cl. 521—48.5 **6 Claims**

1. A process for depolymerizing polyester into its components the process comprising the steps of:

a) forming a melt of polyester in the dissolver;
b) transferring polyester from the dissolver to a reactor so that the melt flows through stages of the reactor from an entry point to an exit point;
c) introducing super-heated methanol into the reactor so that methanol travels through the reactor at either a countercurrent or crossflow direction to said polyester in the reactor;
d) causing methanol to contact the melt to depolymerize polyester into component monomers;
e) continuously removing component monomers and methanol from the reactor as a vapor phase; while
f) continuously removing impurities and contaminants from the reactor at the exit point.

5,747,548

COMPARTMENTED THERMOPLASTIC PELLETS

Rexford H. Bradt, Warsaw, Ind., assignor to Materials Research Innovations Corporation, Warsaw, Ind.

Division of Ser. No. 406,582, Mar. 20, 1995, Pat. No. 5,627,218. This application Mar. 14, 1997, Ser. No. 819,573

Int. Cl.^{6} C08J *9/232;9/24*

U.S. Cl. 521—57 **10 Claims**

1. A process for manufacturing reproducibily zoned and structured thermoplastic molding pellets comprising the steps of combining at least two dissimilar chemically interreactive, easy flowing thermoplastic moldable materials into an aggregated continuous form, and reducing the continuous form into identically shaped and structured individual pellets with the dissimilar materials isolated from one another within separate zones in the individual pellets.

5,747,549

FOAMED PARTICLES OF POLYPROPYLENE HOMOPOLYMER AND MOLDED ARTICLE OF THE FOAMED PARTICLES

Kazuo Tsurugai; Hisao Tokoro, both of Utsunomiya, and Masaharu Oikawa, Mibu-machi, all of Japan, assignors to JSP Corporation, Tokyo, Japan

PCT No. PCT/JP96/00943, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO96/31558, PCT Pub. Date Oct. 10, 1996

PCT Filed Apr. 5, 1996, Ser. No. 750,248

Claims priority, application Japan, Apr. 5, 1995, 7-104701

Int. Cl.^{6} C08J *9/22*

U.S. Cl. 521—60 **8 Claims**

1. Foamed particles comprising a polypropylene homopolymer as a base resin and having a tensile modulus of 15,000–25,000 kg/cm^2 and a crystal structure that an inherent peak and a high-temperature peak appear as endothermic peaks on a DSC curve obtained by differential scanning calorimetry of the foamed particles (said high-temperature peak means a peak which appears on the temperature side higher than a temperature corresponding to the inherent peak of endothermic peaks appearing on the DSC curve obtained by heating 2–4 mg of the foamed particles to 220° C. at a heating rate of 10° C./min by a differential scanning calorimeter), characterized in that a quantity of heat at said high-temperature peak is 30–60 J/g.

5,747,550

METHOD OF GENERATING A REACTIVE SPECIES AND POLYMERIZING AN UNSATURATED POLYMERIZABLE MATERIAL

Ronald Sinclair Nohr, Alpharetta, and John Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

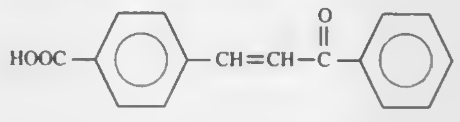
Filed Jun. 5, 1995, Ser. No. 465,655

Int. Cl.^{6} C08F *2/50*

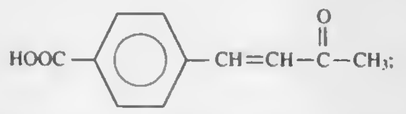
U.S. Cl. 522—34 **18 Claims**

1. A method of generating a reactive species, comprising:

providing a photoreactor, the photoreactor comprising a reactive species-generating photoinitiator covalently bonded to a wavelength-specific sensitizer, the sensitizer being represented by one of the following formulae:



or



the photoinitiator being covalently bonded by a substitution reaction at the carboxylic acid group of the sensitizer; and

irradiating the photoreactor.

5,747,551

UV CURABLE PRESSURE SENSITIVE ADHESIVE COMPOSITION

Mark A. Lewandowski, Marysville, and Anthony M. Chasser, Fort Gratiot, both of Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Continuation of Ser. No. 349,687, Dec. 5, 1994, abandoned. This application Aug. 22, 1996, Ser. No. 704,377

Int. Cl.^{6} C08F *2/50;* **C08L** *75/16;* **C09J** *109/00;175/14*

U.S. Cl. 522—95 **7 Claims**

1. A method comprising the steps of:

applying a UV curable pressure sensitive adhesive composition, comprising in weight percent:

(a) about 0.5% to about 10% photoinitiator agent.
(b) about 20% to about 50% of a polyurethane resin with a pendent acrylate functionality, and having a molecular weight (M_N) within the range of about 500 to about 2.000.000.
(c) about 10% to about 55% of an acrylate monomer, having a molecular weight within the range of about 50 to about 5.000,
(d) about ½% to about 10% of acrylated polybutadiene material having a molecular weight (M_N) within the range of about 4000 to about 6000, and
(e) about 0.1% to about 35% of a tackifier agent, to a substrate surface,

subjecting said adhesive composition to ultraviolet radiation,

positioning an object in contact with said adhesive composition to adhere said object in position on said substrate surface.

5,747,552

RADIANT ENERGY CURABLE ACRYLIC URETHANE PREPOLYMER RESIN COMPOSITIONS AND METHOD

Stuart B. Smith, Conyers, Ga., assignor to Hehr International Inc., Decatur, Ga.

Continuation-in-part of Ser. No. 629,894, Apr. 10, 1996. This application Sep. 12, 1996, Ser. No. 713,177

Int. Cl.^{6} C08F *2/46;226/02;212/08*

U.S. Cl. 522—96 **15 Claims**

1. An acrylic-urethane prepolymer composition adapted for addition as an additive diluent to an unsaturated resin composition, which prepolymer composition consists essentially of:

a) an acrylic-urethane liquid prepolymer prepared by the reaction of a about a stoichiometric amount or slight excess amount of diisocyanate with a high functionality hydroxyl-containing acrylate monomer;
b) a styrene monomer;
c) an inhibitor in an amount to retard the reaction of the prepolymer and the styrene monomer; and
d) a photoinitiator in an amount to promote the radiation polymerization of the unsaturated resin composition.

5,747,553

LOW PRESSURE ACRYLIC MOLDING COMPOSITION WITH FIBER REINFORCEMENT

Robert Guzauskas, West Palm Beach, Fla., assignor to Reinforced Polymer Inc., West Palm Beach, Fla.

Continuation-in-part of Ser. No. 429,139, Apr. 26, 1995, abandoned. This application Mar. 28, 1996, Ser. No. 621,723

Int. Cl.^{6} A61C *13/087;* **C08L** *1/02:33/00;77/10*

U.S. Cl. 523—115 **23 Claims**

1. A composition which comprises

a) a solid acrylic resin in particulate form and having an average particle size in the range of 0.005 mm to 0.1 mm and which is substantially free of benzoyl peroxide polymerization initiator and alkaline earth metal oxide fillers;
b) a liquid monomer or oligomer which cures to a thermoset resin in the presence of an activated free-radical polymerization initiator and within which said solid acrylic resin particles are soluble;
c) at least 10 wt % based on the total weight of the composition, of long fiber reinforcement having an aspect ratio (L/D) greater than 5:1 which is insoluble in the solid acrylic resin; and

a thermosetting catalyst is selected from the group consisting of cycloaliphatic azo compounds, t-butyl hydro peroxide, peroxy esters and perketals wherein said solid acrylic resin is

i) an amorphous and substantially linear and unbranched high molecular weight thermoplastic acrylic homopolymer, copolymer, or block copolymer;
ii) is used in an amount of at least 10 wt % based on the total weight of the composition;
iii) absorbs the liquid monomer or oligomer; and
iv) participates in the cure of the liquid monomer or oligomer to a thermoset resin.

5,747,554

INK COMPOSITIONS

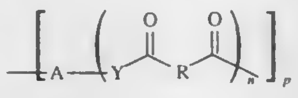
Guerino G. Sacripante, Oakville; Fatima M. Pontes, Mississauga; Stephan V. Drappel; Dominic A. Foucher, both of Toronto, and Marcel P. Breton, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1996, Ser. No. 624,273

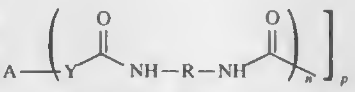
Int. Cl.^{6} C09D *5/00*

U.S. Cl. 523—161 **22 Claims**

1. An ink composition comprised of a polyesterified-dye (I) or polyurethane-dye (II) with a viscosity of from about 1 centipoise to about 20 centipoise at a temperature of from about 125° C. to about 165° C. and represented by the formulas



I



II

wherein A is an organic chromophore, Y is an oxyalkylene or poly(oxyalkylene), R is an arylene or alkylene, n represents the number of repeating segments, and is an integer of from about 2 to about 50, and p represents the number of chains per chromophore and is an integer of from about 1 to about 6.

5,747,555

WATER-BASED PUBLICATION GRAVURE INK

Gerald Wouch, Kalamazoo, Mich., and Gary Procknow, Chicago, Ill., assignors to R. R. Donnelley & Sons Co., Lisle, Ill.

Continuation-in-part of Ser. No. 576,835, Dec. 21, 1995, abandoned, which is a continuation of Ser. No. 392,093, Feb. 22, 1995, abandoned. This application Apr. 10, 1996, Ser. No. 629,829

Int. Cl.^{6} C09D *11/10*

U.S. Cl. 523—161 **7 Claims**

1. A method of making a water-based publication gravure ink comprising polyamide resin wherein the tendency of the polyamide resin to aggregate into a water-insoluble mass is overcome, the method comprising the steps of:

grinding a polyamide resin having a tendency to aggregate into a water-insoluble mass to produce a ground resin;

mixing water, a base, the ground resin and a colorant;

heating the water, the base, the ground resin and the colorant to a temperature not greater than about 150° F.;

milling the water, the base, the ground resin and the colorant to produce a color dispersion; and

mixing the color dispersion with an emulsion and water to produce an ink.

5,747,556

OPACIFIED PEARLESCENT MULTILAYER LOUVER FOR VERTICLE BLINDS

Paul Robert Schwaegerle, Oberlin, Ohio, assignor to The Geon Company, Avonlake, Ohio

Continuation of Ser. No. 858,385, Mar. 25, 1992, Pat. No. 5,194,209. This application Jan. 8, 1993, Ser. No. 1,993

Int. Cl.^{6} C09D *5/29*

U.S. Cl. 523—171 **2 Claims**

1. An opacified pearlescent composition comprising:

(a) at least one thermoplastic polymer matrix,
(b) an effective amount of at least one pearlescent pigment for providing pearlescent luster, and
(c) from 0.1 to 3 parts of titanium dioxide opacifying pigment per 100 parts by weight of said thermoplastic polymer, wherein a 4 mil thickness of said composition has a percent

reflectance ratio according to TAPPT method T 425 OM-86 of from about 60% to about 90%.

5,747,557

METHOD OF MANUFACTURING A CASTABLE EPOXY RESIN COMPOSITION COMPRISING ACRYLIC RUBBER PARTICLES PREDISPERSED IN AN ANHYDRIDE HARDENER

Koshi Hanyu, and Akira Yoshizumi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 292,764, Aug. 19, 1994, abandoned. This application Sep. 27, 1996, Ser. No. 722,339

Claims priority, application Japan, Aug. 20, 1993, 5-206073; Mar. 15, 1994, 6-044454

Int. Cl.⁶ C08L *63/00;33/06;* **C08G** *59/42;* **C08K** *3/22*

U.S. Cl. 523—201 **11 Claims**

1. A method of manufacturing a castable epoxy resin composition which comprises as components an epoxy resin, an acid anhydride in an amount sufficient for hardening, an inorganic filler, and acrylic rubber particles having a thermoplastic resin skin, said thermoplastic resin skin being 1 to 50 wt % of said acrylic rubber particles, wherein each of said acrylic rubber particles has epoxy groups on a surface thereof, and said acrylic rubber particles are present in an amount ranging between 2 and 40 parts by weight based on 100 parts by weight of said epoxy resin, wherein said inorganic filler is an alumina powder having a mean particle size by volume of 6 to 16 μm, and a particle size of at least 10 volume % of said alumina powder particles is 20 μm or greater and wherein at least 90 volume % of said rubber articles are dispersed as discrete particles with a particle size by volume of 1 μm or less, said method comprising the steps of:

preparing a modified hardener by mixing said acrylic rubber particles with at least a portion of said acid anhydride by using shearing force applying means in sufficient force to uniformly disperse said rubber particles in said acid anhydride; and

mixing said modified hardener and the remainder of said components.

5,747,558

HEAT-CURABLE, WATER-DISPERSIBLE RESIN COMPOSITION, PRODUCTION THEREOF, WATER-BASED PAINT COMPOSITION, METHOD OF COATING AND COATED ARTICLE

Tadahiko Nishi; Takeshi Takagi, both of Yawata, and Yoshitaka Okude, Hitakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 30, 1996, Ser. No. 777,510

Claims priority, application Japan, Dec. 28, 1995, 7-353212; Dec. 28, 1995, 7-353213

Int. Cl.⁶ C08L *51/08;* **C08F** *283/02*

U.S. Cl. 523—201 **17 Claims**

1. A heat-curable, water-dispersible resin composition which comprises

50 to 90% by weight of a film-forming polymer (A) obtained by copolymerizing an ethylenic monomer having a saturated hydrocarbon group having 6 to 18 carbon atoms, a hydroxy-containing ethylenic monomer, an acidic group-containing ethylenic monomer and another ethylenic monomer, and 50 to 10% by weight of a hydroxy-terminated polyester resin (B),

the sum total of said (A) and (B) being 100% by weight, said polyester resin (B) being grafted on said film-forming polymer (A) by transesterification, and at least part of the acidic groups in said film-forming polymer (A) being neutralized with a base (C).

5,747,559

POLYMERIC COMPOSITIONS

Robert S. Whitehouse, Lexington, and Thomas F. Reed, Andover, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Nov. 22, 1995, Ser. No. 563,283

Int. Cl.⁶ C08K *3/04*

U.S. Cl. 523—205 **33 Claims**

1. A polymer composition comprising:

25–75%, by weight, based on the total weight of the composition, of an ethylene containing polymer;

24–74%, by weight, based on the total weight of the composition, of a treated filler material; and

1–10%, by weight, based on the total weight of the composition, of a crosslinking agent;

wherein the treated filler material comprises 0.05–40%, by weight, based on the weight of the treated filler material, of a treating agent, and said treating agent is a polymer comprising acrylonitrile and at least one monomer selected from: butadiene, isoprene, ethylene, propene, butene, hexene, octene, styrene, vinyl toluene, alpha methyl styrene, vinylidene chloride, vinyl chloride, acrylic acid, a C_1–C_8 alkyl ester of acrylic acid, methacrylic acid, and a C_1–C_8 alkyl ester of methacrylic acid; with acrylonitrile comprising 0.5–55%, by weight, based on the weight of the treating agent.

5,747,560

MELT PROCESS FORMATION OF POLYMER NANOCOMPOSITE OF EXFOLIATED LAYERED MATERIAL

Brian R. Christiani, Maplewood, and MacRae Maxfield, Plainfield, both of N.J., assignors to AlliedSignal Inc., Morristown, N.J.

Continuation of Ser. No. 798,489, Nov. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 744,035, Aug. 12, 1991, abandoned. This application Aug. 7, 1996, Ser. No. 693,566

Int. Cl.⁶ C08J *3/20;* **C08K** *3/34*

U.S. Cl. 523—209 **26 Claims**

1. A composite material comprising:

a) a polymer matrix which comprises a melt processible polymer having a melt processing temperature equal to or greater than about 220° C., and

b) dispersed platelet particles having average thickness less than 50 Å and a maximum thickness of about 100 Å, and having an onium chemical species bonded to them, said chemical species selected from the group consisting of onium compounds of the formula

$$+NH_3R_1 \text{ and } +NH_2R_2R_3$$

wherein: R_1 has the formula $—(CHR_9Z)_q—R_8$ and R_2 and R_3 are the same or different and are organic radicals having at least about 4 carbon atoms; and R_2, and R_3 are alkyl, alkenyl, alkynyl, aryl, alkoxy, alkoxyalkyl, aryloxyalkyl, aryloxyaryl, cycloalkyl. cycloalkenyl, cycloalkynyl, alkanoylalkyl, alkylaryl, arylalkyl, amino, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylarylaminoalkyl, alkylsulfinyl, alkylsulfonyl, alkylthio, arylsulfinyl, arylsulfonyl, arylthio, alkoxycarbonylalkyl, a moiety of the formula:

$$—(CHR_9Z)_q—R_8$$

wherein R_8 is alkyl, cycloalkyl, or aryl, R_9 is hydrogen, alkyl, or aryl, q is an integer equal to or greater than 1, and Z is —O— or $—NR_{10}—$ where R_{10} is hydrogen, alkyl, aryl, or alkylsilane, or a moiety of the formula

$$—R_{11}—Z_1—R_{12}$$

or R_2 and R_3 together form a divalent moiety of the formula:

$$—R_{11}—,—R_{11}—Z_1—R_{11}, \text{ or } —R_{11}Z_1$$

completing an alicyclic ring, wherein $—R_{11}$ is alkylene,, alkenylene, alkynylene, and $—Z_1—$ is —O—, $—NR_{13}—$,— $+N(R_{13})_2—$, —S—, $—S(O)_2—$, —OC(O)—, or—$N(R_{13})C(O)—$; wherein R_{12} is alkyl, alkylaryl, alkoxyalkyl, alkenyl, alkynyl, aryl, cycloalkyl, or cycloalkenyl and R_{13} is hydrogen or alkyl having from 1 to 4 carbon atoms; wherein the onium compounds are either unsubstituted or have as substituents amino, alkenyl, oxide, acyloxy, hydroxy, isocyanato, ureido, halo, epoxy, epichlorohydrin, sulfuryl halide, mercapto, ester, $—NH_2$, $CONH_2$, $CH_2—X$ (where X is Cl, Br, or I), $—CH{=}CH_2$, —SH, S—M+, or O—M+ (where M+ is Na+, Li+, and K+) moieties, said platelet particles being present in an amount of from about 0.001 to about 60% by weight of the composite material.

5,747,561

SOLID SURFACE MODIFIER

Aleksandr Vitalievich Smirnov, #9 Rossoshanskay Street, 3 Apt. 5, Moscow, Russian Federation, 118535; Oleg Georgievich Orlov, #74, Apt. 47 Prospect Mira, Moscow, Russian Federation, 128722; Pyotr Nikolaevich Golipad, #10, Apt. 24 Vtoraya Baumanskaya Str., Moscow, Russian Federation, 107005; Yurii Nikolaevich Koriakin, #16 Rublevesk Shosse, Apt. 23, Moscow, Russian Federation, 121467, and Boris Mikhailovich Yegorov, #16 Rublevesk Shosse, Apt. 1, Moscow, Russian Federation, 121467

PCT No. PCT/US93/09482, § 371 Date Oct. 23, 1995, § 102(e) Date Oct. 23, 1995, PCT Pub. No. WO94/09074, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 4, 1993, Ser. No. 416,745

Claims priority, application Russian Federation, Oct. 14, 1992, 92-000551

Int. Cl.⁶ C08K *9/06;5/22;* **B05D** *3/02*

U.S. Cl. 523—212 **17 Claims**

1. A solid surface modifier which comprises:

a highly dispersed hydrophobic powder prepared by treating a finely divided material selected from the group consisting of silicas, perlite, talcum, hydrolyzed graphite, metal oxides, and mica-muscovite with an alkali or alkaline salt to preliminarily activate said finely divided material, and treating the activated finely divided material with an organic silylating agent;

a liquid silicon compound; and

a solvent.

5,747,562

INK AND COATING COMPOSITIONS CONTAINING SILICON-TREATED CARBON BLACK

Khaled Mahmud, Tyngsboro; James A. Belmont, Acton; Curtis E. Adams, Watertown, all of Mass., and John K. Foster, Windham, N.H., assignors to Cabot Corporation, Boston, Mass.

Filed Jun. 14, 1996, Ser. No. 663,693

Int. Cl.⁶ C08K *3/04;9/06;* **C09C** *1/56*

U.S. Cl. 523—215 **30 Claims**

1. A coating composition comprising a) an aggregate comprising a carbon phase and a silicon-containing species phase and b) an aqueous or non-aqueous solvent.

5,747,563

POLYETHYLENE GLYCOL TREATED CARBON BLACK AND COMPOUNDS THEREOF

Cindy L. Flenniken, Indianapolis, Ind.; Jameel Menashi, and Robert S. Whitehouse, both of Lexington, Mass., assignors to Cabot Corporation, Boston, Mass.

Continuation of Ser. No. 406,525, Mar. 20, 1995, abandoned. This application Jun. 30, 1997, Ser. No. 885,855

Int. Cl.⁶ C08K *9/04;5/06;3/04*

U.S. Cl. 523—215 **26 Claims**

1. A polymeric formulation comprising at least one polymer and a carbon black treated with at least one polyethylene glycol having a weight average molecular weight of from about 20,000 to about 1,000,000.

5,747,564

Patent Not Issued For This Number

5,747,565

POWDER COATING COMPOSITION

Kazuya Ono, Tokyo; Akira Yasuda, Soka, and Katsuji Kitagawa, Kasukabe, all of Japan, assignors to Somar Corporation, Japan

Continuation of Ser. No. 655,023, Feb. 14, 1991, abandoned. This application Mar. 1, 1993, Ser. No. 26,183

Claims priority, application Japan, Feb. 23, 1990, 2-43603

Int. Cl.⁶ C08L *63/00;* **C08F** *8/00*

U.S. Cl. 523—413 **4 Claims**

1. A powder coating composition having good penetrability and suitability for impregnation of rotor coil windings, said composition consisting essentially of:

(a) 100 parts by weight of a mixed epoxy resin having an epoxy equivalent of 800–2000 and including (a-1) diglycidyl ether of bisphenol A having an epoxy equivalent of 180–2500 and (a-2) a rubber-modified epoxy resin having an epoxy equivalent of 180–2500 and obtained by reaction of a diglycidyl ether of bisphenol A with a carboxyl terminated acrylonitrile-butadiene copolymer, wherein said copolymer is 1–4 wt. % of said mixed epoxy resin;

(b) a mixed curing agent consisting of (b-1) 0.05–5 parts by weight of an imidazole compound, (b-2) 0.5–10 parts by weight of dicyanodiamide and (b-3) 1–10 parts by weight of a dihydrazide of a dibasic carboxylic acid; and

(c) 50–100 parts by weight of silica.

5,747,566

WATER-INSOLUBLE AZO COLORANTS BASED ON AMINOQUINAZOLINEDIONES

Joachim Weber, Frankfurt, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

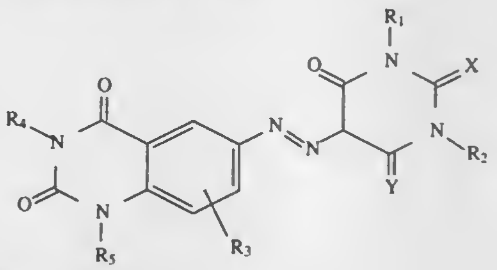
Filed Aug. 8, 1996, Ser. No. 694,162

Claims priority, application Germany, Aug. 9, 1995, 195 29 262.6

Int. Cl.⁶ C08K *5/3495;* **C03C** *17/00;* **C09D** *5/00;* **C09B** *29/52*

U.S. Cl. 524—93 **12 Claims**

1. A compound of the formula (I)



(I)

in which

X is an O or S atom or an imino group,

Y is an O atom or an imino group,

R_1 and R_2 are a hydrogen atom, C_1–C_4-alkyl, an unsubstituted phenyl group or a substituted phenyl group having 1 to 5 substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4-alkoxy, halogen, nitro, cyano, hydroxyl, CF_3, $CONH_2$, $CONH(C_5$–C_6-cycloalkyl), $CON(C_1$–C_4-alkyl$)_2$, $CONH(C_1$–$C_4)$-alkyl, $COO(C_1$–$C_4)$-alkyl, $COO(C_5$–C_6-cycloalkyl) and CONH(phenyl), with the proviso that at least one of the radicals R_1 or R_2 has one of the meanings mentioned which differ from hydrogen, R_3 is a hydrogen atom, a trifluoromethyl group, a halogen atom or a C_1–C_4-alkyl, a C_1–C_4-alkoxy, a nitro or a cyano group and

R_4 and R_5 independently of one another are a hydrogen atom, C_1–C_4-alkyl, phenyl or a substituted phenyl group having 1 to 5 substituents selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro, cyano, hydroxyl, CF_3, $CONH_2$, $CONH(C_5$–C_6-cycloalkyl), $CON(C_1$–C_4-alkyl$)_2$, $CONH(C_1$–C_4)-alkyl, $COO(C_1$–C_4)-alkyl, $COO(C_5$–C_6-cycloalkyl) and CONH(phenyl).

8. A method for pigmenting a substrate selected from the group consisting of polymers, lacquers, paints, printing inks, electropliotographic toners and developers, powders and powder coatings which can be sprayed triboelectrically or electrokinetically, and inks, comprising the step of incorporating a compound of the formula (I) as claimed in claim 1 into said substrates.

5,747,567
SILICONE ADHESIVE AND ORGANIC ADHESIVE COMPOSITES

Frank John Traver, Troy, and Duane Franklin Merrill, Ballston Spa, both of N.Y., assignors to General Elecric Company, Waterford, N.Y.

Continuation of Ser. No. 850,711, Mar. 13, 1992, abandoned, which is a division of Ser. No. 265,192, Oct. 31, 1988, Pat. No. 5,128,394. This application Jan. 15, 1993, Ser. No. 5,856

Int. Cl.⁶ C08F *8/00*

U.S. Cl. 524—110 **10 Claims**

1. A controlled-release adhesive composition comprising:
- (A) An interpenetrating pressure-sensitive adhesive mixture comprising:
  - (i) from about 50 to about 99% by weight organic pressure-sensitive adhesive, and
  - (ii) from about 1 to about 50%: by weight of silicone pressure-sensitive adhesive; and
- (B) an amount of silicone cross-linking agent effective to increase shear strength of the composite adhesive.

5,747,568
THERMOPLASTIC MOLDING MATERIAL

Wolfgang Fischer, Ludwigshafen, and Norbert Güntherberg, Speyer, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 29, 1996, Ser. No. 638,593

Claims priority, application Germany, May 4, 1995, 195 16 283.8

Int. Cl.⁶ C08K *5/15;5/36*

U.S. Cl. 524—110 **13 Claims**

1. A thermoplastic molding material consisting of
- A) 30–80% by weight, based on A+B, of an elastomeric grafting base comprising, based on A,
  - A1) 90–99.9% by weight of at least one alkyl acrylate where the alkyl radical is of 1 to 8 carbon atoms and
  - A2) 0.1–10% by weight of at least one polyfunctional, crosslinking monomer,

and
- B) 20–70% by weight, based on A+B, of a shell grafted onto the grafting base A and comprising, based on B,
  - B1) 0–100% by weight of a vinylaromatic monomer, preferably styrene, or alkylstyrenes, preferably α-methylstyrene, or
  - B2) 0–100% by weight of at least one polar, copolymerizable unsaturated monomer, preferably acrylonitrile, methyl methacrylate or phenylmaleimide,
  - the sum of B1 and B2 being 100% by weight,

and
- C) 0.001–1 part by weight, based on 100 parts by weight of A+B, of α-tocopherol

and
- D) from half to ten times the amount, based on C, of a thiodipropionic ester selected from dilauryl and distearyl thiodipropionate

and
- E) 0–95 parts by weight, based on 100 parts by weight of A+B+C+D+E, of a hard matrix consisting of, based on E,
  - E1) 60–90% by weight of styrene or α-methylstyrene and
  - E2) 10–40% by weight of acrylonitrile, the sum of E1 and E2 being 100% by weight, and
  - E3) 0–40 parts by weight, based on 100 parts by weight of E, of poly(methyl methacrylate)

and, optionally,
- F) conventional additives in amounts of from 0.1 to 30 parts by weight, based on 100 parts of the mixture (A+B+C+D+E+F).

5,747,569
COMPOSITION FOR FLAME-RETARDANT CAST PANELS MADE OF (METH)ACRYLIC POLYMERS AND PANELS OBTAINED FROM THIS COMPOSITION

Lucien Renard; Patrick Delprat, and Philippe Heim, all of Pau, France, assignors to Atohaas Holding C.V., Haarlem, Netherlands

Filed Nov. 5, 1996, Ser. No. 743,790

Claims priority, application France, Nov. 6, 1995, 95 13073

Int. Cl.⁶ C08K *5/52;5/49*

U.S. Cl. 524—140 **23 Claims**

1. A composition comprising:
- (a) at least one (meth)acrylic ester monomer and, optionally, an ethylenically unsaturated monomer copolymerizable with the (meth)acrylic acid ester monomer,
- (b) (meth)acrylic acid; and
- (c) at least one anhydrous phosphorus compound selected from the group consisting of phosphoric acids, phosphoric acid esters and mixtures thereof, optionally in combination with at least one optionally halogenated neutral phosphoric ester, and wherein:
  - i) said composition comprises, based on the total weight of components (a), (b) and (c), 65 to 85% by weight of compound (a);
  - ii) the proportions of compounds (b) and (c) are such that their weight ratio (b)/(c) is greater than 0.9; and
  - iii) the flame-retardancy coefficient (FRC) is greater than 0.95, as determined by the following formula:

$$0.025 \times \%\ \text{(meth)acrylic acid} + 0.13 \times \%\ \text{phosphoric acid} + 0.14 \times \%\ \text{OH-ester} + 0.20 \times \%\ \text{P-ester} + 1.17 \times \%\ \text{halogenated P-ester} \times \frac{\text{Halogen atom no.}}{\text{M (halogenated P-ester)}} = FRC.$$

5,747,570
WATER-ABSORBING RESIN COMPOSITION

Masashi Date, Osaka-fu; Keiji Tanaka, Kyoto-fu; Tsuyoshi Yuki, Kyoto-fu; Kenjiro Tsubota, Kyoto-fu, and Satoshi Tamabuchi, Osaka-fu, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto-fu, Japan

Filed Oct. 4, 1995, Ser. No. 539,084

Claims priority, application Japan, Dec. 6, 1994, 6-330608

Int. Cl.⁶ C08J *3/20;* **C08K** *5/04;5/06;5/09*

U.S. Cl. 524—161 **6 Claims**

1. A water-absorbing resin composition obtained by preparing a hydrogel of a water-absorbing resin (D) by polymerizing a water-soluble monomer having polymerizable unsaturated group (A) or, polymerizing a water soluble monomer having an unsaturated group (A) and a polysaccharide (B), in the presence of a crosslinking agent (C) and water, followed by adding a water-soluble thiol compound (E) at any stage after the polymerization.

5,747,571
HEAT STABLE MONOAZO RED PIGMENT COMPOSITIONS

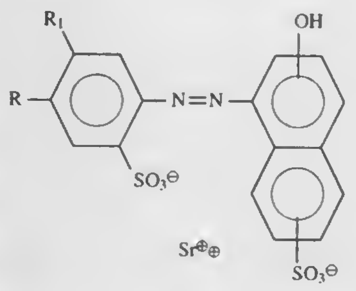
Amrit Bindra, Brecksville, Ohio, assignor to Engelhard Corporation, Iselin, N.J.

Division of Ser. No. 718,851, Sep. 24, 1996, Pat. No. 5,677,435. This application May 14, 1997, Ser. No. 856,220

Int. Cl.⁶ C09D *11/00;* **C09B** *63/00;* **C08K** *5/23*

U.S. Cl. 524—190 **20 Claims**

1. A plastic composition comprising a plastic material and a pigment composition comprising one or more compounds characterized by the formula:



wherein R and R_1 are independently hydrogen, chloro, methyl or ethyl groups.

5,747,572
RELEASABLE AQUEOUS COATING COMPOSITION AND METHOD OF TEMPORARILY PROTECTING FINISHED COATING FILM ON AUTOMOBILE BODY BY USE OF THE SAME

Seiji Kashiwada; Shouji Takahashi; Hiroshi Inoue; Kenya Suzuki; Hiromi Harakawa, and Fumiaki Nakao, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo-ken, Japan

PCT No. PCT/JP96/01167, § 371 Date Dec. 19, 1996, § 102(e) Date Dec. 19, 1996, PCT Pub. No. WO96/36671, PCT Pub. Date Nov. 21, 1996

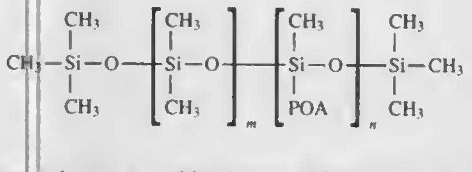
PCT Filed Apr. 26, 1996, Ser. No. 750,598

Claims priority, application Japan, May 19, 1995, 7-144255

Int. Cl.⁶ C08K *5/54*

U.S. Cl. 524—265 **14 Claims**

1. A releasable aqueous coating composition containing (A) a resin dispersion containing a carbonyl group-containing copolymer aqueous dispersion, which contains, as a monomer component, a carbonyl group-containing α,β-ethylenically unsaturated monomer (a) and a polyhydrazide compound in such a ratio that an amount of hydrazide group is in the range of 0.02 to 3.0 equivalents per one equivalent of carbonyl group in the emulsion particle, and (B) a release assistant consisting of a polyether-modified silicone oil represented by the following formula:



$$CH_3-\overset{CH_3}{\underset{CH_3}{Si}}-O-\left[\overset{CH_3}{\underset{CH_3}{Si}}-O\right]_m-\left[\overset{CH_3}{\underset{POA}{Si}}-O\right]_n-\overset{CH_3}{\underset{CH_3}{Si}}-CH_3$$

wherein m and n are a positive integer, POA represents polyether moiety due to ethylene oxide or propylene oxide modification, and oriented in a low layer portion of a releasable film formed from the releasable aqueous coating composition.

5,747,573
HIGH HEAT RESISTANT HOT MELT ADHESIVE

Lisa L. Ryan, Dayton, Minn., assignor to H. B. Fuller Licensing & Financing, Inc., St. Paul, Minn.

Continuation of Ser. No. 192,708, Feb. 7, 1994, abandoned. This application Nov. 16, 1995, Ser. No. 558,354

Int. Cl.⁶ C08K *5/09*

U.S. Cl. 524—270 **18 Claims**

1. A high heat resistant hot melt adhesive composition comprising:
- a) about 20–80 parts by weight of the adhesive of an amorphous polyalphaolefin butene-propylene-ethylene terpolymer;
- b) about 5–40 parts by weight of the adhesive if a solid benzoate plasticizer; and
- c) about 10–70 parts by weight of the adhesive of a tackifier,

wherein said adhesive composition has an elevated peel value of greater than about 160° F.

5,747,574
FLAME-RETARDED RESIN COMPOSITION AND INSULATED WIRE

Yasuo Kanamori, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 27, 1996, Ser. No. 722,642

Claims priority, application Japan, Sep. 29, 1995, 7-253225

Int. Cl.⁶ C08K *3/22*

U.S. Cl. 524—436 **4 Claims**

1. A flame-retarded resin composition comprising:
- component (A) comprising a multiple copolymer of alkyl acrylate or alkyl methacrylate, ethylene, and maleic anhydride;
- component (B) comprising a thermoplastic styrene elastomer having a tensile strength of 250 kgf/cm² or greater; and
- component (C) comprising a polyolefin resin selected from the group consisting essentially of a homopolymer of polyethylene, a copolymer of ethylene and an α-olefin, a copolymer of ethylene and an alkyl acrylate and a copolymer of ethylene and an alkyl methacrylate, wherein
- not less than 40 parts by weight nor more than 80 parts by weight of said component (A), not less than 5 parts by weight nor more than 30 parts by weight of said component (B) and a balance which is said component (C) are present to make 100 parts by weight,
- not less than 60 parts by weight nor more than 120 parts by weight of a metal hydroxide to 100 parts by weight of said components (A), (B) and (C) is present so that said composition is obtained, and
- said composition has a hardness of durometer D not less than 48 nor more than 58.

5,747,575
CRYSTALLINE THERMOPLASTIC RESIN COMPOSITION

Koji Nishida; Yoshihiro Kurasawa; Kiyoji Takagi, and Hironari Sano, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Nov. 1, 1996, Ser. No. 742,749

Claims priority, application Japan, Nov. 2, 1995, 7-285913

Int. Cl.⁶ C08K *3/34*

U.S. Cl. 524—443 **11 Claims**

1. A crystalline thermoplastic resin composition comprising (a) 100 parts by weight of a crystalline thermoplastic resin and (b) 0.01 to 11 parts by weight of a laminar structure of silicate, wherein said laminar structure of silicate is present in the form of crystal nuclei dispersed at a molecular level in said resin, having a thickness of 30 to 1,000 Å and having an aspect ratio of at least 20 as represented by a length-to-breadth ratio of said crystal nuclei, and wherein crystalline lamellae grow from said crystal nuclei in a vertical direction, said composition being obtained by melt-kneading said crystalline thermoplastic resin and said laminar

OL
2 10
SS
1
MY
5
998
MI

structure of silicate, said laminar of structure of silicate having been swollen with a solvent.

5,747,576
PROPYLENE RESIN COMPOSITIONS CONTAINING TALC

Yoshihiro Sobajima; Etsushi Akashige; Masahide Hamaura; Takeshi Hiramatsu, and Akira Yamaji, all of Mie, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 719,642, Sep. 25, 1996, abandoned. This application Sep. 17, 1997, Ser. No. 932,966

Claims priority, application Japan, Sep. 29, 1995, 7-253809; Sep. 6, 1996, 8-236617

Int. Cl.^{6} C08K *3/34*

U.S. Cl. 524—451 **7 Claims**

1. A propylene resin composition containing talc, consisting essentially of the following components (a), (b) and (c):
(a) 100 parts by weight of a propylene/ethylene block copolymer having a melt flow rate of 10 to 200 g/10 min, and containing 60 to 95% by weight of a crystalline propylene homopolymer part (Unit A part) and 5 to 40% by weight of an ethylene/propylene random copolymer part (Unit B part),
(b) 0.1 to 80 parts by weight of talc having an average particle size of 1.5 to 20 microns and an average aspect ratio of not less than 4, and
(c) 2 to 60 parts by weight of an ethylene/1-octene copolymer polymerized by using a metallocene catalyst, having a melt flow rate of more than 15 g/10 min and not more than 200 g/10 min, and a density of 0.85 to 0.90 g/cm^3, and containing 15 to 50% by weight of 1-octene.

5,747,577
CONDUCTIVE PARTICLES CONTAINING CARBON BLACK AND PROCESSES FOR THE PREPARATION THEREOF

Paul J. Gerroir; Nancy Ann Listigovers, both of Oakville; Michael F. Cunningham, Georgetown; Thomas E. Enright, Whitby, all of Canada, and John A. Creatura, Ontario, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1995, Ser. No. 579,107

Int. Cl.^{6} C08F *2/44;* **H01B** *1/06*

U.S. Cl. 524—458 **15 Claims**

1. A process for the preparation of conductive particles, comprising:
(a) mixing a monomer, carbon black, and a block copolymer, wherein said block copolymer comprises an A block that is miscible with the monomer, and a B block that anchors to the surface of the carbon black;
(b) adding a polymerization initiator to the mixture of step (a);
(c) effecting bulk polymerization of the mixture of step (b) until about 5 to about 30 weight percent of the monomer has been polymerized;
(d) dispersing the partially polymerized product in water; and
(e) polymerizing the resulting dispersion.

5,747,578
HETEROGENEOUS VINYL ACETATE/ETHYLENE DISPERSION

Ludwig Schmitz, Frankenthal; Stefan Hess, Gross-Gerau, and Bettina Gerharz, Mainz, all of Germany, assignors to Clariant GmbH, Frankfurt, Germany

Filed Jul. 30, 1996, Ser. No. 681,968

Claims priority, application Germany, Aug. 2, 1995, 195 28 380.5

Int. Cl.^{6} C08L *31/04;* **C08F** *218/08*

U.S. Cl. 524—502 **19 Claims**

1. A copolymer in dispersion or redispersible powder form which is stabilized by a protective colloid and has a glass transition temperature of –40° to 10° C. and an ethylene content of at least 30% by weight, based on the total weight of monomers used to make the copolymer, wherein the copolymer includes a heterogeneous build-up of copolymer particles, comprising
a first copolymer phase, which comprises vinyl acetate and greater than 40% by weight of ethylene, based on the total weight of monomers used to make this phase, and
a second copolymer phase, which comprises vinyl acetate and 5 to 40% by weight of ethylene, based on the total weight of monomers used to make this phase,
and wherein the copolymer is stabilized by the protective colloid.

5,747,579
CONTAINER SEALING COMPOSITIONS USING LATENT CROSS-LINKING AGENT

Peter John Blakeman, Bedford, and Terence Richard Johnson, Cambs, both of England, assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 672,685, Jun. 28, 1996, abandoned, which is a continuation of Ser. No. 414,396, Mar. 31, 1995, abandoned, which is a continuation of Ser. No. 127,289, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 945,574, Sep. 16, 1992, abandoned, which is a continuation of Ser. No. 713,627, Jun. 10, 1991, abandoned, which is a continuation of Ser. No. 465,106, Feb. 19, 1990, abandoned. This application Jan. 29, 1997, Ser. No. 790,181

Claims priority, application United Kingdom, Jun. 29, 1988, 8815489

Int. Cl.^{6} C08J *31/00*

U.S. Cl. 524—562 **8 Claims**

1. A container sealing latex composition consisting essentially of a latex of a rubbery polymer that is a carboxylated styrene butadiene elastomer formed by copolymerization with an ethylenically unsaturated acid selected from the group consisting of methacrylic acid, acrylic acid and itaconic acid;
a carboxylated stabilizer selected from the group consisting of a styrene maleic anhydride copolymer, resin acids, casein, and fatty acids or salts thereof, said carboxylated stabilizer being cross linked substantially only during or after drying of the latex container sealing composition; and
a latent cross-linking agent selected from the group consisting of zinc ammonium benzoate and zinc ammonium citrate, and

said agent being operative to cause substantial cross linking in the latex container sealing composition when dried as a gasket but not when the latex is in liquid form.

5,747,580
FORMULATED ETHYLENE/α-OLEFIN ELASTOMERIC COMPOUNDS

Kevin W. McKay, Baton Rouge; Robert R. Blanchard, Brusly; Edwin R. Feig, Baton Rouge, all of La., and Kyle G. Kummer, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 698,486, Aug. 15, 1996, abandoned, whlch is a continuation of Ser. No. 385,624, Feb. 9, 1995, abandoned, which is a division of Ser. No. 945,035, Sep. 15, 1992, Pat. No. 5,414,040. This application Jul. 23, 1997, Ser. No. 898,947

Int. Cl.^{6} C08J *3/24*

U.S. Cl. 524—576 **14 Claims**

1. A process of improving the physical properties of a cured formulated elastomeric composition, comprising the steps of:
(A) blending at least one substantially linear ethylene/C_4–C_{20} α-olefin copolymer with at least one curing agent and at least one filler to form an uncured composition, wherein the at least one substantially linear ethylene/C_4–C_{20} α-olefin copolymer is characterized as having:
i. a melt flow ratio, I_{10}/I_2, ≧5.63;
ii. a molecular weight distribution, M_w, defined by the equation: $M_w/M_n \leqq (I_{10}/I_2)-4.63$; and
iii. a critical shear rate at onset of surface melt fracture of at least 50 percent greater than the critical shear rate at the onset of surface melt fracture or having a processing index less than or equal to about 70% of the processing index of a linear ethylene/α-olefin copolymer having about the same I_2 and M_w/M_n:
(B) forming a structure with the uncured composition of (A), and
(C) curing the structure of (B).

5,747,581
ADHESIVE AND SEALING MATERIAL

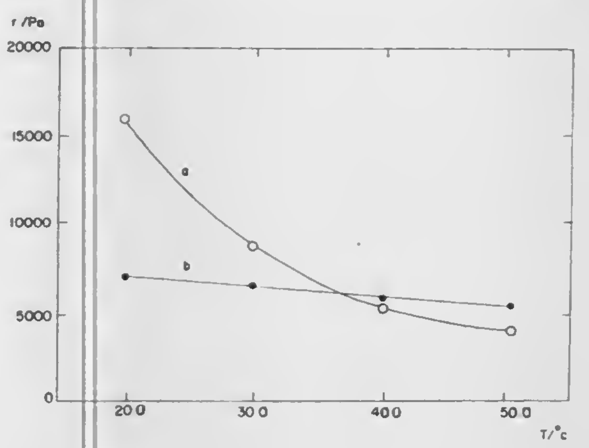
Manfred Proebster, Friedrich-Ebert-Str. 4, 69226 Nussloch, Germany, and Manfred Schumann, Burgstr. 24, 69121 Heidelberg, Germany

PCT No. PCT/EP93/01584, § 371 Date Dec. 21, 1995, § 102(e) Date Dec. 21, 1995, PCT Pub. No. WO95/00572, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 21, 1993, Ser. No. 564,363

Int. Cl.^{6} C08J *3/00;* **C08K** *3/20;* **C08L** *78/00;* **B65C** *9/25*

U.S. Cl. 524—590 **17 Claims**



1. An adhesive and sealant composition based on reactive prepolymers consisting of a filler and a) at least one reactive prepolymer which is liquid at room temperature and b) at least one other component which is solid at room temperature, liquid at a temperature above 50° C. and at least partially incompatible with the liquid prepolymer (a).

5,747,582
AQUEOUS COATING COMPOSITIONS AND THEIR USE FOR THE PREPARATION OF COATINGS THAT ARE PERMEABLE TO WATER VAPOR

Detlef-Ingo Schütze, Köln; Wilhelm Thoma, Leverkusen; Klaus Nachtkamp, Düsseldorf; Josef Pedain, Köln, and Reinold Schmitz, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

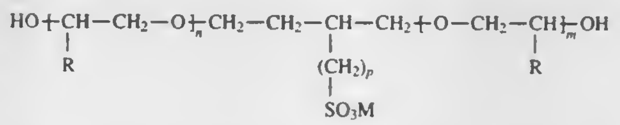
Continuation-in-part of Ser. No. 294,215, Aug. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 139,385, Oct. 19, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 460,178

Claims priority, application Germany, Oct. 29, 1992, 42 36 569.4

Int. Cl.^{6} C08J *3/00;* **C08K** *3/20;* **C08L** *75/00*

U.S. Cl. 524—591 **9 Claims**

1. A coating composition used for the preparation of coatings having a water vapor permeability of at least 2500 g/m^2 per day using the DS 2109 TM1 method comprising
(A) a polyurethane containing (1) from 0.1 to 75 meq per 100 g of polyurethane (A) of ionic groups and (2) 11 to 50% by weight, based on polyurethane (A), of polyethylene oxide —$(CH_2CH_2O)_n$— units having a sequence length n of from 2 to 25 incorporated into the main chain, wherein said polyurethane (A) is prepared from reactive components comprising
(I) one or more polyisocyanates,
(II) one or more polyols having a number average molecular weight of from 350 to 5000, with the proviso that if any such polyol is a sulfonated polyether diol having the formula



$$HO\left[\underset{R}{CH}-CH_2-O\right]_n CH_2-CH_2-\underset{\substack{(CH_2)_p\\ SO_3M}}{CH}-CH_2\left[O-CH_2-\underset{R}{CH}\right]_m OH$$

wherein R denotes hydrogen or an organic group having 1 to 8 carbon atoms, m and n independently represent the numbers 1 to 10, p represents the numbers 0, 1, or 2, and M denotes ammonium or the cation of an alkali metal, then at least one additional polyether polyol containing ethoxy groups must also be present, and
(III) one or more chain lengthening agents having a molecular weight of from 32 to 349; and
(B) from 30 to 80% by weight, based on the sum of components (A) and (B), of an aqueous phase.

5,747,583

Patent Not Issued For This Number

5,747,584

NONWOVEN MATERIALS COMPRISING BIODEGRADABLE COPOLYMERS

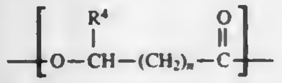
Isao Noda, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 608,233, Feb. 28, 1996, Pat. No. 5,685,756, which is a continuation-in-part of Ser. No. 465,046, Jun. 6, 1995, Pat. No. 5,618,855, Ser. No. 422,008, Apr. 13, 1995, Pat. No. 5,498,692, and Ser. No. 188,271, Jan. 28, 1994, abandoned, and a continuation of Ser. No. 472,353, Jun. 6, 1995, Pat. No. 5,502,116, and a continuation-in-part of Ser. No. 447,136, Jun. 1, 1995, Pat. No. 5,648,452, which is a continuation of Ser. No. 341,808, Nov. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 189,015, Jan. 28, 1994, abandoned, said Ser. No. 465,046 is a continuation of Ser. No. 370,738, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 247,539, May 23, 1994, abandoned, which is a continuation of Ser. No. 187,969, Jan. 28, 1994, abandoned, said Ser. No. 422,008 is a continuation of Ser. No. 371,665, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 306,349, Sep. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 247,539, said Ser. No. 472,353 is a continuation of Ser. No. 422,011, Apr. 13, 1995, abandoned, which is a continuation of Ser. No. 371,940, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 189,029, Jan. 28, 1994, abandoned. This application Feb. 13, 1997, Ser. No. 799,850

Int. Cl.⁶ C08F *2/32;* **D04H** *3/08*

U.S. Cl. 524—801 **7 Claims**

1. An adhesive dispersion comprising a biodegradable copolymer wherein the biodegradable copolymer comprises at least two randomly repeating monomer units wherein each randomly repeating monomer unit has the structure:



$$-\!\!\left[O-\overset{R^4}{\overset{|}{C}}H-(CH_2)_n-\overset{O}{\overset{\|}{C}}\right]\!\!-$$

wherein R^4 is H, or C_1 to C_{19} alkyl or C_1 to C_{19} alkenyl, and n is 1 to 4.

5,747,585

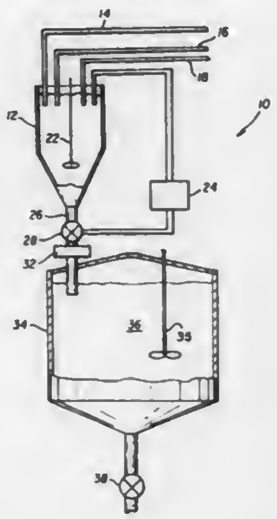
PROCESS FOR SYNTHESIZING LATEX POLYMERS FROM SOLID MONOMER PARTICLES

Paul Mitacek; Peter John Ghyzel, both of Rochester, and Tienteh Chen, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,449

Int. Cl.⁶ C08L *67/00*

U.S. Cl. 524—845 **37 Claims**



1. A process to form polymer latex from a water-insoluble, ethylenically unsaturated solid monomer, which is capable of undergoing free radical addition polymerization, which comprises the steps of: dispersing a water-insoluble, ethylenically unsaturated, solid monomer in water containing surfactant and water soluble initiator to form a stable solid monomer dispersion, and pumping the dispersion semi-continuously to a batch polymerization reactor where the solid monomer reacts to form a polymer latex, wherein said polymerization occurs at a temperature below the melting point of the solid monomer.

5,747,586

HIGH-IMPACT MOLDING COMPOUNDS BASED ON POLYISOBUTYLENE-CONTAINING POLYCARBONATE

Burkhard Köhler, Krefeld; Werner Tischer, Dormagen; Wolfgang Ebert, Krefeld; Richard Welder, Leverkusen; Thomas Scholl, Bergisch Gladbach, and Rolf Dhein, Krefeld, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Continuation of Ser. No. 500,427, Jul. 10, 1995, abandoned. This application Oct. 23, 1996, Ser. No. 740,028

Claims priority, application Germany, Jul. 20, 1994, 44 25 620.5

Int. Cl.⁶ C08L *69/00*

U.S. Cl. 525—67 **13 Claims**

1. Thermoplastic molding compounds consisting essentially of:

A) 10 to 30 parts by weight of polyisobutylene-modified aromatic polycarbonate, the percentage by weight of polyisobutylene telechels in the polymer as a whole being from 1 to 40% by weight, said polyisobutylene telechels being obtained by ozonolysis and having 1.8 to 2.5 functional groups per polymer chain,

B) 10 to 40 parts by weight of a graft polymer of a mixture of

B.1.1 50 to 95 parts by weight of styrene, a-methyl styrene, halogen- or methyl-nucleus-substituted styrene, or mixtures of these compounds and

B.1.2 5 to 50 parts by weight of acrylonitrile, methacrylonitrile, C_{1-8} alkyl methacrylates, C_{1-8} alkyl acrylate, maleic anhydride, C_{1-4}-alkyl- or phenyl-N-substituted maleic imides or mixtures of these compounds on

B.2 5 to 95 parts by weight of polymer based on diene and/or alkyl acrylate with a glass transition temperature below −10° C.,

D) 5 to 25 parts by weight of a copolymer of

D.1 50 to 98 parts by weight of styrene, α-methyl styrene, nucleus-substituted styrenes, or mixtures thereof and

D.2 50 to 2 parts by weight of acrylonitrile, methacrylonitrile, C_{1-8} alkyl methacrylates, C_{1-8} alkyl acrylates, maleic anhydride, N-substituted maleic imides or mixtures thereof, and

E) 20 to 70 parts by weight of aromatic polycarbonate, the sum of components A+ B+ D+ E being 100.

5,747,587

HCFC RESISTANT RESIN COMPOSITION

Sung-kook Kim, Kyungki-do, and Jin-whan Choi, Anyang, both of Rep. of Korea, assignors to Cheil Industries, Inc., Taegu, Rep. of Korea

Filed Oct. 8, 1996, Ser. No. 727,351

Claims priority, application Rep. of Korea, Jul. 19, 1996, 96-29089

Int. Cl.⁶ C08F *279/04;* **C08L** *55/02*

U.S. Cl. 525—87 **14 Claims**

1. A thermoplastic resin composition for preparing an internal box of a refrigerator, which comprises:

(A) a graft polymer obtained by grafting in emulsion polymerization 100 parts by weight of a monomer mixture comprising about 20 to about 30% by weight of a vinyl cyanide compound and about 80 to about 70% by weight of an aromatic vinyl compound to about 20 to about 60 parts by weight of a conjugated diene rubber;

(B) a graft polymer obtained by grafting in emulsion polymerization 100 parts by weight of a monomer mixture comprising about 20 to about 30% by weight of a vinyl cyanide compound and about 80 to about 70% by weight of an aromatic vinyl compound to about 20 to about 60 parts by weight of an acrylic rubber;

(C) a copolymer obtained by polymerizing a monomer mixture comprising about 40 to about 50% by weight of a vinyl cyanide compound and about 60 to about 50% by weight of an aromatic vinyl compound; and

(D) a copolymer obtained by polymerizing a monomer mixture comprising about 30 to about 35% by weight of a vinyl cyanide compound and about 70 to about 65% by weight of an aromatic vinyl compound,

wherein the ratio by weight of (A)+(B) to (C)+(D) is from 50:50 to 20:80, the ratio by weight of (A) to (B) is from 10:1 to 1:1, and the ratio by weight of (C) to (D) is from 10:1 to 5:2.

5,747,588

THERMOPLASTIC URETHANE ELASTOMETRIC ALLOYS

William H. Mann, Hopkinton, N.H., assignor to REFAC International, Ltd., New York, N.Y.

Division of Ser. No. 474,095, Jun. 7, 1995, Pat. No. 5,516,857, which is a continuation of Ser. No. 82,479, Jun. 25, 1993, abandoned. This application Jan. 24, 1996, Ser. No. 590,533

Int. Cl.⁶ C08L *75/08*

U.S. Cl. 525—129 **18 Claims**

1. A composition containing:

(a) from 5–95 wt. % of a first component of at least one first thermoplastic hot melt composition comprising a polyurethane having at least one phthalate plasticizer reacted therein formed by heating to a temperature of at least about 330° F. a reaction mixture comprising at least one isocyanate having a functionality less than about 2.2, at least one long chain polyol having an average molecular weight of from about 1000 to about 3000, at least one chain extender having a molecular weight of from about 52 to below 500 and at least one plasticizer, wherein said ingredients are present in amounts sufficient to meet the following formula:

$$\frac{A+B+C}{D} = 0.5 \text{ to about } 7.0$$

wherein A represents the equivalent weight of the long chain polyol x the moles thereof used; B represents the equivalent weight of the chain extender x the moles thereof used; C represents the equivalent weight of the isocyanate used; and D represents the grams of plasticizer, and

b) from 95–5 wt. % of a second component of at least one thermoplastic composition selected from the group consisting of a polyamide polyester, a polyether block amide, a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and acrylic acid or methacrylic acid, or a polymer

of vinyl chlorides said composition being prepared by melt mixing.

5,747,589

PROCESS FOR THE PRODUCTION OF POLYCARBONATE-POLYISOBUTYLENE BLOCK COCONDENSATES

Burkhard Köhler; Wolfgang Ebert, both of Krefeld; Klaus Horn, Dormagen; Richard Welder, Leverkusen, and Thomas Scholl, Bergisch Gladbach, all of Germany, assignors to Bayer AG, Leverkusen, Germany

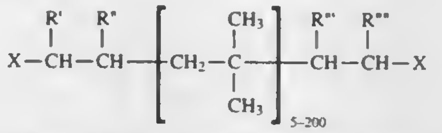
Continuation of Ser. No. 458,278, Jun. 2, 1995, abandoned. This application Mar. 12, 1997, Ser. No. 815,905

Claims priority, application Germany, Jun. 14, 1994, 44 20 656.9

Int. Cl.⁶ C08G *81/02;64/18*

U.S. Cl. 525—146 **3 Claims**

1. A process for the production of polycarbonate-polyisobutylene block cocondensates from thermoplastic polycarbonates and reactive polyisobutylene reactive with the polycarbonates, wherein thermoplastic polycarbonates with mean weight-average molecular weights M_w (determined by gel permeation chromatography) of 8000 to 200,000 and reactive polyisobutylenes of formula (I)



$$X-\overset{R'}{\overset{|}{C}}H-\overset{R''}{\overset{|}{C}}H-\!\!\left[CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}\right]_{5-200}\!\!-\overset{R'''}{\overset{|}{C}}H-\overset{R''''}{\overset{|}{C}}H-X \qquad (I)$$

where R', R", and R"' and R"" represent hydrogen or a C_1–C_3 alkyl group and at least two of these groups R' to R"" denote hydrogen and X is OH, NH_2, or NH-C_1–C_{16}-alkyl, and with $\bar{M}_n$ (number-average molecular weights determined by gel chromatography or by end group analysis) of 800 to 12,000, are mixed and fused at temperatures of 220° C. to 380° C. for between 0.5 minutes and 20 minutes, or are mixed by dissolution of the reactants in suitable solvents at temperatures between 15° C. and 200° C. and the solvents evaporated on a stripper-extruder and the mixture obtained fused at temperatures of 220° C. to 380° C. for between 0.5 minutes and 20 minutes.

5,747,590

ACRYLIC-MELAMINE-FUNCTIONALIZED OLIGOMER COATING COMPOSITION

Patrick Henry Corcoran, Cherry Hill; Isidor Hazan, Clementon, both of N.J., and Sapé Kwesi Quashie, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1996, Ser. No. 758,831

Int. Cl.⁶ C08L *61/28*

U.S. Cl. 525—155 **17 Claims**

1. In a coating composition which, when dry, has measurable values of hardness and mar resistance, comprising an organic liquid carrier and a film-forming binder formed from

(i) an acrylic polymer, I, of monomers selected from the group consisting of alkyl methacrylate; alkyl acrylate; and hydroxy alkyl acrylate or methacrylate; and having a weight average molecular weight of about 3,000 to 20,000;

(ii) a self-stabilized dispersed resin formed by polymerizing the following constituents:

(a) an acrylic polymer, II, of monomers selected from the group consisting of alkyl methacrylate; alkyl acrylate; hydroxy alkyl acrylate or methacrylate; and ethylenically unsaturated carboxylic acid, and having a weight average molecular weight of about 3,000 to 20,000; and

(b) monomers selected from the group consisting of alkyl methacrylate; alkyl acrylate; and hydroxy alkyl acrylate or methacrylate; wherein acrylic polymer, II, contains a monomer selected from the group consisting of glycidyl methacrylate; glycidyl acrylate; glycidyl methacrylate post-reacted with the carboxylic acid and glycidyl acrylate post-reacted with the carboxylic acid; and

(iii) an alkylated melamine formaldehyde crosslinking agent;

/OL
2 10
SS
1
MY
5
998
JMI

the improvement which comprises replacing at least 5% by weight of (i) with at least one crosslinkable, aliphatic oligomer having a weight average molecular weight less than 3,000;

whereby the mar resistance of the resulting dry coating is improved to at least about 85 percent, as measured by the 'rub-abrasion test', while maintaining a hardness value of at least about 9 knoop.

5,747,591

POLYMER BLENDS FOR USE IN MAKING MEDICAL DEVICES INCLUDING CATHETERS AND BALLOONS FOR DILATION CATHETERS

Ziyun Chen, Santa Clara; Tai Cheng, Mountain View; Ketan Muni; Udayan Patel, both of San Jose, and Robert Saltman, Redwood City, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 481,872, Jun. 7, 1995, abandoned, which is a division of Ser. No. 280,764, Jul. 25, 1994, Pat. No. 5,554,120. This application Oct. 31, 1996, Ser. No. 742,272

Int. Cl.^{6} A61M *25/10;25/00*

U.S. Cl. 525—176 **1 Claim**

1. A catheter balloon material formed from a polymeric blend, comprising:

about 10–95% by weight of the total blend composition of a first polymeric component selected from the group consisting of polyesters and polyamides, said polyesters being prepared from the group of dicarboxylic acids selected from aromatic dicarboxylic acids having from 8 to 14 carbon atoms and aliphatic dicarboxylic acids having from 2 to 12 carbons atoms, and at least one glycol selected from the group consisting of glycols having the formula $HO(CH_2)_nOH$, where n is an integer from 2 to 10, neopentyl glycol and cyclohexane dimethanol, and said polyamides being branched or straight chain polyamides having a molecular weight of at least 5000;

about 5–90% by weight of the total blend composition of a second polymer component having a Shore hardness less than 75 D, selected from the group consisting of polyolefins having a density less than 0.93, ethylene copolymers, polyester block copolymers, and polyamide block copolymers; and

wherein said catheter balloon material is irradiated to provide said catheter balloon material with a compliance of about 0.02–0.03 mm/atm as measured in terms of expansion per pressure applied to a balloon formed from said catheter balloon material at a mean burst pressure of about 19–20 atm.

5,747,592

THERMOPLASTIC POLYMER COMPOSITIONS AND THEIR PRODUCTION AND USE

Terrence Huff, Baytown, and James John McAlpin, Houston, both of Tex., assignors to Exxon Chemical Patents, Inc., Houston, Tex.

Filed Dec. 16, 1994, Ser. No. 357,635

Int. Cl.^{6} C08L *9/00*

U.S. Cl. 525—191 **32 Claims**

1. A thermoplastic polymer composition, comprising:

polypropylene in an amount of at least 50 wt % of the polymer component of said composition;

rubber in an amount of at least 20 wt % of the polymer component of said composition;

plastomer produced through metallocene catalysis in an amount of at least 4 wt % of the polymer component of said composition, said plastomer having a melt index in the range of 0.5 to 50 g/10 min, a density in the range of 0.86–0.92, and a MWD<3.5; and

optionally, a non polymeric component.

5,747,593

PROCESS FOR PRODUCING RUBBER-MODIFIED STYRENE RESIN

Masayuki Nozawa, Ichihara; Yasuji Shichijo, Kisarazu, and Masanari Fujita, Kisarazu, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/01088, § 371 Date Mar. 22, 1996, § 102(e) Date Mar. 22, 1996, PCT Pub. No. WO95/02618, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 5, 1994, Ser. No. 586,658

Claims priority, application Japan, Jul. 14, 1993, 5-195636

Int. Cl.^{6} C08F *279/02*

U.S. Cl. 525—193 **5 Claims**

1. A process for producing a rubber-modified styrene resin, comprising:

subjecting a raw material solution comprising 0 to 30 weight parts of a solvent blended with 100 weight parts of a mixed solution which is prepared by mixing a monovinyl monomer, a rubbery polymer and a styrene polymer in the ranges of 60 to 95 weight %, 3 to 10 weight %, and 2 to 30 weight %, respectively, and which is adjusted so that the relation of the content R (wt. %) of the rubbery polymer with the content Ps (wt. %) of the styrene polymer contained in said mixed solution satisfies $0.2<Ps/R<3$ and which is adjusted so that a rubber phase is not inverted, subjecting said raw material solution to pre-heating to 70° to 120° C. with a pre-heater so that the rubber phase inversion does not occur and the polymerization conversion rate of the monovinyl monomer is within the range of 10 weight % or less, and then

feeding continuously the raw material solution into a first plug flow reactor from one end thereof to carry out the rubber phase inversion while continuing the polymerization reaction to thereby form prescribed dispersed rubber particles,

feeding a polymerization solution drawn out of the other end of said first plug flow reactor successively into following plug flow reactors to enhance the polymerization conversion rate, and then

carrying out a devolatilization treatment to remove the unreacted monomer and the solvent.

5,747,594

POLYOLEFIN COMPOSITIONS EXHIBITING HEAT RESISTIVITY, LOW HEXANE-EXTRACTIVES AND CONTROLLED MODULUS

Jacquelyn A. deGroot; Lonnie G. Hazlitt; Pradeep Jain, all of Lake Jackson; Seema V. Karande, Missouri City; Laura K. Mergenhagen, Lake Jackson; Dan G. Moldovan, Danbury; Kenneth B. Stewart, and Nicole F. Whiteman, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 327,156, Oct. 21, 1994, abandoned. This application Jan. 27, 1997, Ser. No. 788,981

Int. Cl.^{6} C08L *23/16*

U.S. Cl. 525—240 **27 Claims**

1. A polymer mixture suitable for fabricating packaging films and coatings comprising

(A) from 15 to 60 weight percent, based on the total weight of the mixture, of at least one first ethylene polymer which is a substantially linear ethylene-alpha olefin polymer having a density in the range of 0.850 to 0.920 g/cc, wherein the substantially linear ethylene polymer is further characterized as having

i. a melt flow ratio, $I_{10}/I_2 \geqq 5.63$,

ii. a molecular weight distribution, M_w/M_n, as determined by gel permeation chromatography and defined by the equation: $(M_w/M_n) \leqq (I_{10}/I_2)-4.63$,

iii. a gas extrusion rheology such that the critical shear rate at onset of surface melt fracture for the substantially linear ethylene polymer is at least 50 percent greater than the critical shear rate at the onset of surface melt fracture for a linear ethylene polymer, wherein the substantially linear ethylene polymer and the linear ethylene polymer comprise the same comonomer or comonomers, the linear ethylene polymer has an I_2, M_w/M_n and density within ten percent of the substantially linear ethylene polymer and wherein the respective critical shear rates of the substantially linear ethylene polymer and the linear ethylene polymer are measured at the same melt temperature using a gas extrusion rheometer, and

iv. a single differential scanning calorimetry, DSC, melting peak between −30° and 150° C.; and

(B) from 40 to 85 weight percent, based on the total weight of the mixture, of at least one second ethylene polymer which is a homogeneously branched, heterogeneously branched linear, or non-short chain branched linear ethylene polymer having a density between 0.890 and 0.942 g/cc;

wherein the polymer mixture is characterized as having a density of from 0.890 to 0.930 g/cc, and a differential between the densities of the first ethylene polymer and the second ethylene polymer of at least 0.015 g/cc with the proviso that where the density of the first ethylene polymer is less than 0.887 g/cc, the density of the second ethylene polymer is greater than 0.920 g/cc, a Vicat softening point of at least 75° C., a compositional hexane extractive of less than 10 percent based on the total weight of the mixture; and

wherein

(a) a 0.038 mm thick coextruded sealant layer fabricated from the polymer mixture has a heat seal initiation temperature equal to or less than 100° C. and an ultimate hot tack strength of at least 2.56 N/cm, and

(b) the Vicat softening point of the polymer mixture is more than 6° C. higher than the heat seal initiation temperature of the coextruded sealant layer.

5,747,595

CATALYST FOR THE POLYMERIZATION OF OLEFINES AND PROCESSES FOR THE POLYMERIZATION OF OLEFINES USING THE SAME

Toshiya Saito; Takayuki Taki, both of Saitama-ken; Masashi Nakajima, Kanagawa-ken; Kunihiko Imanishi, Saitama-ken; Masahide Murata, Tokyo; Hiroyuki Ozaki; Kazukiyo Aiba, both of Saitama-ken, all of Japan; Masatoshi Ookura, League City, Tex., and Satoshi Ueki, Tokyo, Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Mar. 27, 1996, Ser. No. 622,751

Claims priority, application Japan, Mar. 28, 1995, 7-093219; Oct. 9, 1995, 7-286339; Feb. 8, 1996, 8-045601

Int. Cl.^{6} C08F *4/649;10/06*

U.S. Cl. 525—270 **14 Claims**

1. A catalyst for the polymerization of olfines, comprising a solid catalytic component obtained by prepolymerizing propylene in the presence of (A) a solid component containing magnesium, titanium, halogen and an electron-donating compound, (B) an organoaluminum compound, and (C) an alkylalkoxysilane,

characterized in that the catalyst comprises

a solid catalytic component obtained by prepolymerizing propylene in the presence of (A) said solid component, (B) an organoaluminum compound, and (C) an alkyltrialkoxysilane represented by the formula,

$$R^1Si(OR^2)(OCH_3)_2,$$

wherein R^1 represents a branched or cyclic alkyl group having 3 to 6 carbon atoms, and R^2 represents a branched alkyl, alkenyl or alkynyl group having 3 to 6 carbon atoms;

(B) an organoaluminum compound; and

(D) an alkyltrialkoxysilane represented by the formula,

$$R^3Si(OR^4)_2(OCH_3),$$

wherein R^3 represents a linear alkyl group having 3 to 6 carbon atoms, and R^4 represents a branched alkyl, alkenyl or alkynyl group having 3 to 5 carbon atoms.

5,747,596

GEL-FREE ALPHA-OLEFIN DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Jacob Emert, Brooklyn, N.Y.; Robert Dean Lundberg, Williamsburg, Va., and David John Lohse, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 338,287, Nov. 10, 1994, Pat. No. 5,578,237, which is a continuation of Ser. No. 991,837, Dec. 17, 1992, abandoned. This application Aug. 5, 1996, Ser. No. 693,936

Int. Cl.^{6} C10M *145/22;145/20;* **C08F** *255/02*

U.S. Cl. 525—298 **20 Claims**

1. A process for producing gel-free oil soluble dispersant additive composition for use in an oleaginous composition selected from lubricating oils and fuel oils, which comprises:

(A) providing an oil soluble polymer selected from α-olefin homopolymer and interpolymer, wherein said polymer has a number average molecular weight of from about 700 to about 10,000 and a polydispersity of from about 1 to about 5, and wherein at least about 30% of the chains of said polymer possess terminal ethenylidene unsaturation;

(B) providing monounsaturated carboxylic reactant suitable for grafting carboxylic acid producing moieties onto said polymer;

(C) contacting said polymer and said monounsaturated carboxylic reactant, in the presence of free radical initiator, under conditions and for a time suitable for grafting said polymer with carboxylic acid producing moieties randomly along the polymer chains of said polymer such that a grafted polymer is formed, wherein said grafted polymer is substituted with an average of from 1 to 3 carboxylic acid producing moieties per polymer chain and has a concentration of unreacted polymer of less than about 25 wt. %;

(D) providing at least one non-aromatic post-treating reactant suitable for reacting with the grafted polymer from step (C) through said carboxylic acid producing moieties, said reactant being selected from the group consisting of (i) amine compounds containing only a single reactive amino group per molecule, (ii) alcohol compounds containing only a single hydroxy group per molecule, (iii) polyamine compounds containing at least two reactive amino groups per molecule, (iv) polyol compounds containing at least two reactive hydroxy groups per molecule, (v) aminoalcohol compounds containing at least one reactive amino group and at least one reactive hydroxy group per molecule, and (vi) mixtures of (i) to (v); provided that when the post-treating reactant contains more than one reactive group per molecule, said post-treating reactant is used in combination with a chain-stopping or end-capping co-reactant capable of reacting with the grafted polymer from step (C) through said carboxylic acid producing moieties or with at least a portion of the reactive groups of said post-treating reactant containing more than one reactive group per molecule;

(E) contacting the grafted polymer from step (C) with said post-treating reactant or with said post-treating reactant and said chain-stopping or end-capping co-reactant from step (D) under conditions and for a time suitable for reacting said grafted polymer through said carboxylic acid producing moieties to form said oil soluble gel-free dispersant additive composition.

5,747,597

CURABLE RESIN COMPOSITION AND COATING MATERIAL COMPOSITION

Yukiko Fujita, Sakai; Shinya Ueno, Tokyo; Yoko Kawasaki, Kishiwada; Kumiko Fukakusa, Takaishi; Hidefumi Matsuya, Izumiotsu; Tomomasa Mitani, Izumi; Akira Komori, Hirakata, and Mika Matsumura, Izumiotsu, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Aug. 12, 1996, Ser. No. 695,440

Claims priority, application Japan, Sep. 25, 1995, 7-245980; Jul. 19, 1996, 6-190978

Int. Cl.^{6} C08L *67/07;* **C08F** *299/02;299/04;299/06*

U.S. Cl. 525—312 **6 Claims**

1. A radical-polymerizable curable resin composition comprising:

a polymer A containing a polymerizable unsaturated bonding group;

a polymerizable unsaturated monomer B; and

a curing agent C;

wherein, said polymer A comprises at least one compound selected from the group consisting of unsaturated polyester, epoxy(meth)acrylate, urethane (meth)acrylate, unsaturated polyester (meth)acrylate, and a macromonomer containing a polymerizable unsaturated bonding group at a molecular terminal thereof; said polymerizable unsaturated monomer B comprises as an essential component an oligoalkyl(C_2–C_4) ether(n=2–15)-monoalkoxy(C_1–C_{18})-(meth)acrylate; the curing agent comprises an organic peroxide, and the weight ratio of said polymer A to said polymerizable unsaturated monomer B is 70:30–15:85.

5,747,598

EPOXIDIZED SOLID ELASTOMERIC COPOLYMERS

Thomas S. Coolbaugh, Yardley, Pa.; Frederick Charles Loveless, Princeton, and Demetreos N. Matthews, North Edison, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 443,743, May 18, 1995, abandoned, which is a division of Ser. No. 361,072, Dec. 21, 1994, Pat. No. 5,457,161, which is a division of Ser. No. 225,681, Apr. 11, 1994, Pat. No. 5,376,722, which is a division of Ser. No. 29,507, Mar. 11, 1993, Pat. No. 5,306,780, which is a division of Ser. No. 952,127, Sep. 28, 1992, Pat. No. 5,268,427, which is a division of Ser. No. 466,233, Jan. 16, 1990, Pat. No. 5,187,236. This application Oct. 22, 1996, Ser. No. 734,988

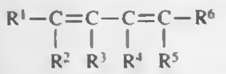
Int. Cl.^{6} C08F *297/04*

U.S. Cl. 525—314 **25 Claims**

1. An epoxidized solid block copolymer which prior to epoxidation comprises at least three alternating blocks

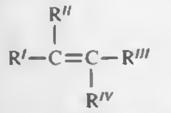
$$(I)_x—(B)_y—(I)_x$$

wherein I is a block of at least one polymerized conjugated diene having at least five (5) carbon atoms and the following formula



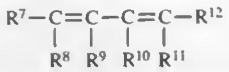
$$R^1-\underset{R^2}{\underset{|}{C}}=\underset{R^3}{\underset{|}{C}}-\underset{R^4}{\underset{|}{C}}=\underset{R^5}{\underset{|}{C}}-R^6 \qquad (1)$$

wherein R^1–R^6 are each hydrogen or a hydrocarbyl group, provided that at least one of R^1–R^6 is a hydrocarbyl group and provided that the structure of the residual double bond in the polymerized block I has the following formula



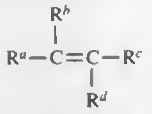
$$R^{\prime}-\overset{R^{\prime\prime}}{\overset{|}{C}}=\underset{R^{\prime V}}{\underset{|}{C}}-R^{\prime\prime\prime} \qquad (2)$$

wherein $R^{\prime}$, $R^{\prime\prime}$, $R_{\prime\prime\prime}$ and $R^{\prime V}$ are each hydrogen or a hydrocarbyl group, provided that either both $R^{\prime}$ and $R^{\prime\prime}$ are hydrocarbyl groups or both $R^{\prime\prime\prime}$ and $R^{\prime v}$ are hydrocarbyl groups, B is a block of a polymer of at least one conjugated diene different from the polymerized diene of the block I, having at least four (4) carbon atoms and the following formula



$$R^7-\underset{R^8}{\underset{|}{C}}=\underset{R^9}{\underset{|}{C}}-\underset{R^{10}}{\underset{|}{C}}=\underset{R^{11}}{\underset{|}{C}}-R^{12} \qquad (3)$$

wherein R^7–R^{12} are each hydrogen or a hydrocarbyl group, provided that the structure of the residual double bond in the polymerized block B has the following formula



$$R^a-\overset{R^b}{\overset{|}{C}}=\underset{R^d}{\underset{|}{C}}-R^c \qquad (4)$$

wherein R^a, R^b, R^c and Rd are each hydrogen (H) or a hydrocarbyl group, provided that one of R^a or R^b is hydrogen, one of R^c or R^d is hydrogen, and at least one of R^a, R^b, R^c or R^d is a hydrocarbyl group, x is 1 to 100, and y is 300 to 35,000.

5,747,599

THERMOSETTING COATING COMPOSITION

Kazuhiko Ohnishi, Yokohama, Japan, assignor to Kansai Paint Company, Limited, Amagaski, Japan

Continuation of Ser. No. 567,238, Dec. 5, 1995, abandoned. This application Aug. 27, 1997, Ser. No. 917,747

Claims priority, application Japan, Dec. 12, 1994, 6-307200; Jul. 25, 1995, 7-188753

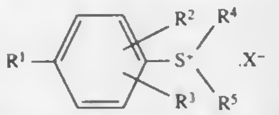
Int. Cl.^{6} C08G *59/18*

U.S. Cl. 525—327.3 **7 Claims**

1. A thermosetting powder coating composition consisting essentially of:

(A) a solid epoxy compound having a melting point of about 60° to about 200° C., and

(B) an aromatic sulfonium salt represented by the formula



(1)

wherein R^1 represents a hydroxyl group, each of R^2 and R^3 represents a hydrogen atom, R^4 represents a benzyl group, R^5 represents an alkyl group, and X^- represents SbF_6^-.

5,747,600

RECONSTITUTABLE POLYACRYLAMIDE MATERIALS AND METHODS FOR PRODUCING SAME

Ta-Yun Fang, 13755 N.W. Burton St., Portland, Oreg. 97229

Continuation of Ser. No. 267,147, Jun. 24, 1994, abandoned. This application Nov. 1, 1995, Ser. No. 551,551

Int. Cl.^{6} C08L *20/56;* **C08J** *3/075;* **C08K** *5/15;5/05*

U.S. Cl. 525—329.4 **20 Claims**

1. A method for producing a dehydrated reconstitutable polyacrylamide material, for use as a polyacrylamide gel sample in electrophoretic analysis, comprising

providing an acrylamide gel solution consisting essentially of a solution of an acrylamide monomer, a cross-linking agent, water and a predetermined amount of a stabilizer material, and excluding a buffer salt;

forming a polyacrylamide gel sample from said acrylamide gel solution, including said predetermined amount of said stabilizer material, in an intact condition, for use in electrophoretic analysis; and

dehydrating the polyacrylamide gel sample and thereby forming the dehydrated reconstitutable polyacrylamide material.

5,747,601

DIHYDROPYRIDINES AS VULCANIZATION ACCELERATORS FOR NATURAL OR SYNTHETIC RUBBERS

Fabio Broussard, Brusaporto; Mauro Adovasio, and José Roncalli, both of Bergamo, all of Italy, assignors to Great Lakes Chemical Italia S.r.l., Milan, Italy

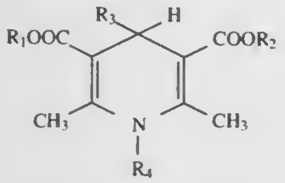
Filed Feb. 20, 1997, Ser. No. 803,276

Claims priority, application Italy, Mar. 7, 1996, MI96A0441

Int. Cl.^{6} C07D *211/78;* **C08F** *8/32*

U.S. Cl. 525—375 **16 Claims**

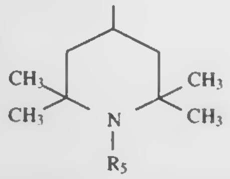
1. A vulcanization accelerator of the formula (I):



(I)

wherein:

R_1 and R_2, are each independently a straight or branched C_1–C_{18} alkyl radical; a straight or branched C_2–C_{18} alkenyl radical; a C_3–C_8 cycloalkyl radical; a C_7–C_{20} arylalkyl radical; or a moiety having the formula (II):



(II)

wherein R_5 represents a hydrogen atom or a straight or branched C_1–C_{18} alkyl radical; and

R_3 and R_4, are each independently a straight or branched C_1–C_{18} alkyl radical; a straight or branched C_2–C_{18}alkenyl radical; a C_7–C_{20} arylalkyl radical; a C_3–C_8 cycloalkyl radical; or a C_6–C_{18} aryl radical.

5,747,602

PRODUCTION PROCESS FOR MAKING HIGH MOLECULAR WEIGHT POLYDIOXOLANE

Takashi Namba, Suita; Hiroya Kobayashi, Minoo; Kenji Minami, Ohtsu; Hiroshi Itoh, Kobe; Toshiaki Kuriyama, and Masashi Yukitake, both of Suita, all of Japan, assignors to Nippon Shokubai., Ltd., Osaka, Japan

Continuation of Ser. No. 403,774, Mar. 24, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 777,064

Claims priority, application Japan, Jul. 29, 1993, 5-188039; Jul. 29, 1993, 5-188040; Mar. 24, 1994, 6-053612; Mar. 24, 1994, 6-053613; Jul. 15, 1994, 6-163907

Int. Cl.^{6} C08G *4/00;2/06;2/12;* **C08L** *59/04*

U.S. Cl. 525—398 **31 Claims**

1. A process for producing a high-molecular-weight polydioxolane, which comprises the steps of:

polymerizing 1,3-dioxolane using a polymerization catalyst comprising an effective amount of a heteropolyacid and a ketone at a sufficient temperature to polymerize said 1,3-dioxolane, wherein said catalyst comprises said ketone compound in the amount of about 10 to 50,000 parts by weight to about 100 parts by weight of said heteropolyacid; and

neutralizing the resulting polymerization reaction product using an organic amine and/or ammonia to produce a polymer having a number average molecular weight of about 50,000 to about 300,000.

5,747,603

POLYMERS USED IN ELASTOMERIC BINDERS FOR HIGH-ENERGY COMPOSITIONS

Jerald C. Hinshaw, Logan, and R. Scott Hamilton, Bear River City, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed May 19, 1987, Ser. No. 51,979

Int. Cl.^{6} C08G *65/32*

U.S. Cl. 525—403 **14 Claims**

1. A method for improving the curability of a hydroxyl-terminated polymer comprising.

providing an end-capping compound having the formula X—Q—$(CH_2)_n$—O—Z; wherein X is a group which reacts readily with the terminal hydroxyl groups of the polymer to attach said compound to said polymer; Z is a blocking group which does not react with free hydroxyl groups and which may be removed from the linked oxygen under conditions which do not detach the residue of said compound from the termini of said polymer; Q is nothing or is any chemical moiety which does not interfere with attachment of said compound to said polymer, removal of said Z moiety or subsequent curing of the end-capped polymer, and n is 1 or 2;

reacting said end-capping compound with said polymer; and

removing Z from said end-capped polymer to provide primary, unhindered hydroxyl groups at the termini of said end-capped polymer.

12. A method of preparing a cured elastomer comprising, end-capping/deblocking an hydroxyl-terminated polymer in accordance with the method of claim 1, and curing said polymer with an isocyanate having a functionality of 2 or greater.

5,747,604

POLYPHOSPHAZENES WITH UNSATURATED SIDE GROUPS USEFUL AS REACTION INTERMEDIATES, CROSS-LINKABLE POLYMERS, AND AS COMPONENTS OF INTERPENETRATING POLYMER NETWORKS

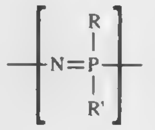
Harry R. Allcock, State College, Pa.; Karyn Visscher, Voorhees, N.J., and Young Baek Kim, Daejon, Rep. of Korea, assignors to The Penn State Research Foundation, University Park, Pa.

Filed Apr. 1, 1996, Ser. No. 589,747

Int. Cl.^{6} C08L *85/02;* **C08G** *79/02*

U.S. Cl. 525—417 **14 Claims**

1. A polyphosphazene comprising repeating units having the formula



$$-\!\!\left[N=\overset{R}{\overset{|}{\underset{R'}{\underset{|}{P}}}}\right]\!\!-$$

wherein R comprises the substituent group $—OCH_2CH{=}CHCH_3$ and R' comprises $—OC_6H_4OCH_2C_6H_5$.

9. An interpenetrating polymer network comprising an intimate mixture of

a) a polyphosphazene containing one or more side groups selected from the group consisting of 2-butenoxy and 4-allyloxyphenylphenoxy; and

b) a second polymer obtained from a monomer that has been polymerized within the crosslinked matrix of the polyphosphazene.

5,747,605

MIXTURES OF POLYMERS INCLUDING A HALOGEN-CONTAINING POLYMER AND COMPATIBILIZED WITH A GRAFTED ALIPHATIC POLYESTER

Patrice Breant, Serquigny, and Alain Bouilloux, Bernay, both of France, assignors to Elf Atochem S.A., France

Filed Nov. 8, 1995, Ser. No. 555,231

Claims priority, application France, Nov. 8, 1994, 94 13368

Int. Cl.⁶ C08F *20/00*

U.S. Cl. 525—437 **12 Claims**

1. Mixtures of polymers consisting essentially of:

one halogen-containing polymer

another polymer which has substantially no compatibility with said one halogen-containing polymer, and

a grafted aliphatic polyester as compatibilizer wherein (i) the halogen-containing polymer is selected from the group consisting of PVC, chlorinated PVC, plasticized PVC, PVC-based compounds, PVDF and its copolymers and PVF3 and (ii) which include another polymer selected from the group consisting of EVOH, PB and PA.

5,747,606

INCREASING THE MOLECULAR WEIGHT OF POLYESTERS AND PREMIX USEFUL FOR THIS PROCESS

Rudolf Pfaendner, Rimbach; Kurt Hoffmann, and Heinz Herbst, both of Lautertal, all of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

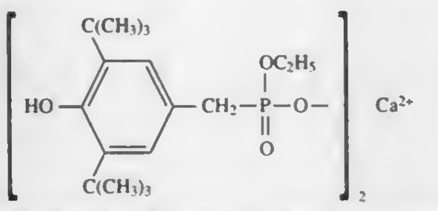
Continuation of Ser. No. 535,095, Oct. 18, 1995, abandoned. This application Jul. 11, 1997, Ser. No. 893,398

Claims priority, application Switzerland, Apr. 21, 1993, 1208/93

Int. Cl.⁶ C08F *283/00;* **C08G** *79/02;* **C08L** *85/02*

U.S. Cl. 525—438 **9 Claims**

1. A process for increasing the molecular weight of a polyester, which comprises heating a mixture of a crystalline and/or amorphous polyester blended with a difunctional epoxy resin and a sterically hindered hydroxyphenylalkylphosphonic half-ester of formula (I)



(I)

to above the melting point of said crystalline polyester or above the glass transition temperature of said amorphous polyester.

5,747,607

SHEET MOLDING COMPOSITION HAVING CONTROLLABLE THICKENING

William G. Hager, Westerville; Edward L. Wilson, Newark, and Paul R. Krumlauf, Thornville, all of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation-in-part of Ser. No. 364,355, Dec. 27, 1994, abandoned. This application Jun. 27, 1996, Ser. No. 673,778

Int. Cl.⁶ C08F *20/00*

U.S. Cl. 525—445 **16 Claims**

1. A sheet molding composition exhibiting controllable thickening including a thickening agent and an unsaturated polyester resin having an acid value of from about 50 to about 80 mg KOH/g resin, said resin formed from an unsaturated polyester having a weight average molecular weight of from about 500 to about 5,000 g/mole which has been endcapped with a monofunctional endcapper to block at least some of the chain ends of said polyester resin from reacting with said thickening agent; wherein the viscosity of said sheet molding composition after thickening is from about 6 to about 20 million cps.

5,747,608

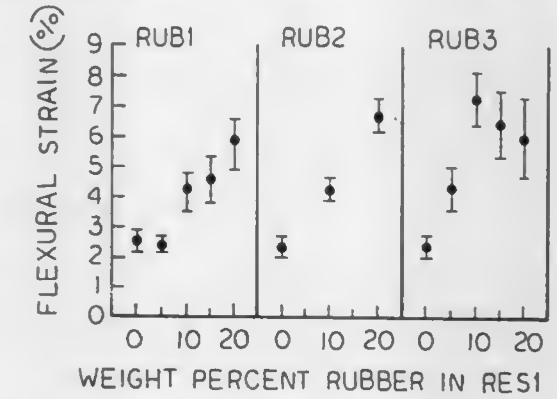
RUBBER-MODIFIED RIGID SILICONE RESINS AND COMPOSITES PRODUCED THEREFROM

Dimitris Elias Katsoulis; John Robert Keryk, both of Midland, Mich.; Frederick Jerome McGarry, Weston, Mass.; Randall Gene Schmidt, Midland, Mich.; Ramnath Subramanian, Wahteton, N. Dak.; Harold Lewis Vincent, Midland, Mich., and Bizhong Zhu, Somerville, N.J., assignors to Dow Corning Corporation, Midland, Mich., and Massachusetts Inst. Tech., Cambridge, Mass.

Filed Dec. 31, 1996, Ser. No. 775,661

Int. Cl.⁶ C08F *283/00*

U.S. Cl. 525—477 **20 Claims**



1. A rubber-modified rigid silicone resin comprising a copolymerized reaction product of:

(A) an organosilicon composition selected from the group consisting of:

(I) an organosilicone resin of the empirical formula

$$R^1_aR^2_bR^3_cSiO_{(4-a-b-c)/2}$$

wherein: a is a positive numerical value, b and c are zero or positive numerical values with the proviso that 0.8<(a+b+c)<=1.6, R^1, R^2 and R^3 are monovalent radicals independently selected from the group consisting of hydrogen, hydroxyl, alkyl, alkenyl, alkoxy, oximo, alkyloximo, aryloximo, aryl, alkylepoxide, arylepoxide, alkylcarboxyl, arylcarboxyl, alkylether, arylether, alkylamide, arylamide, alkyl amino and arylamino radicals; and

(II) hydrolyzable precursors of (I); and

(III) hydrolyzate formed from (II); and

(B) a silicone rubber of the empirical formula:

$$(R^4_{(3-p)}R^5_pSiO_{1/2})\,(R^4_2SiO_{2/2})_x\text{-}\{(R^4_{(q-2)}R^5_qSiO_{2/2})\,(R^4_2SiO_{2/2})_x\}_y(R^4_{(3-p)}R^5_pSiO_{1/2})$$

wherein each R^4 is a monovalent radical independently selected from the group consisting of alkyl and aryl radicals, each R^5 is a monovalent radical independently selected from the group consisting of hydrogen, hydroxyl, alkenyl, alkoxy, oximo, alkyloximo, aryloximo, alkylepoxide, arylepoxide, alkylcarboxyl, arylcarboxyl, alkylamide, arylamide, alkyl amino and arylamino radicals, p is 1, 2 or 3, q is 1 or 2, x is greater than or equal to 6, and y ranges from zero to 10; and said organosilicon composition (A) and said silicone rubber (B) being present in relative quantities such that said rubber-modified silicone resin has a Young's modulus of at least 6.9×10⁸ Pa.

5,747,609

METHOD FOR PRODUCING AN AROMATIC POLYCARBONATE HAVING IMPROVED MELT STABILITY

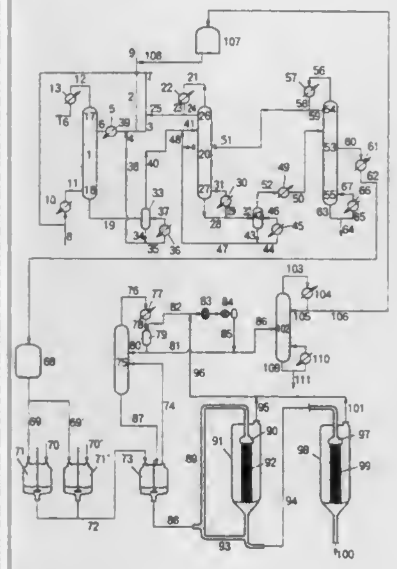
Kyosuke Komiya, and Shinsuke Fukuoka, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1997, Ser. No. 785,505

Claims priority, application Japan, Jan. 17, 1996, 8-005691

Int. Cl.⁶ C08F *2/00*

U.S. Cl. 526—68 **12 Claims**



1. A method for producing an aromatic polycarbonate, which comprises:

feeding a feedstock dialkyl carbonate and a feedstock phenol mixture of phenol (a) and phenol (b) which is different in supply source from said phenol (a) to a reactor to effect a reaction between said feedstock dialkyl carbonate and said feedstock phenol mixture in the presence of a catalyst, thereby producing diphenyl carbonate, and

polymerizing said diphenyl carbonate with an aromatic dihydroxy compound in a polymerizer to produce an aromatic polycarbonate while producing phenol as a by-product,

wherein said by-product phenol is used as said phenol (b), and wherein the content of said phenol (b) in said feedstock phenol mixture is from 70 to 99% by weight.

5,747,610

POLYMER OPTICAL FIBERS AND PROCESS FOR MANUFACTURE THEREOF

Mohammad W. Katoot, Roswell, Ga., assignor to KTH, LLC, Tucker, Ga.

Filed Jun. 21, 1996, Ser. No. 667,218

Int. Cl.⁶ C08F *12/08*

U.S. Cl. 526—73 **29 Claims**

1. A method of preparing a graded index preform rod comprising:

introducing at least two prepolymer compositions with different refractive indices into a polymerization vessel; and

causing a controlled polymerization of the prepolymer compositions so that the resulting graded index preform rod has a refractive index profile.

5,747,611

SPHERICAL POLYMER PARTICLES AND PROCESS FOR THEIR PRODUCTION

Satoshi Tanabe, Nagoya, Japan, assignor to Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 6, 1997, Ser. No. 796,372

Claims priority, application Japan, Feb. 16, 1996, 8-029118

Int. Cl.⁶ C08F *2/16;2/00*

U.S. Cl. 526—73 **16 Claims**

1. A spherical polymer particle having at least two peaks in its chromatogram obtained by gel permeation chromatography, wherein

the spherical polymer particle comprises radical polymerization polymer;

the spherical polymer particle is solid at a temperature at least between 20° C. and 25° C.; and

the spherical polymer particle has a particle diameter of from 3 µm to 10 µm.

5,747,612

PROCESS FOR TRANSITIONING BETWEEN INCOMPATIBLE POLYMERIZATION CATALYSTS

Agapios Kyriacos Agapiou, Humble; Michael Elroy Muhle, Kingwood, and Gary Thomas Renola, Seabrook, all of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Division of Ser. No. 218,277, Mar. 25, 1994, Pat. No. 5,442,019. This application May 19, 1995, Ser. No. 444,592

Int. Cl.⁶ C08F *2/38*

U.S. Cl. 526—82 **19 Claims**

1. A process for converting a continuous olefin polymerization reaction catalyzed by a Ziegler-Natta catalyst comprising a transition metal halide to one catalyzed by a metallocene catalyst, said process comprising the steps of:

a) discontinuing the introduction of Ziegler-Natta catalyst;
b) introducing a reversible catalyst killer;
c) introducing an irreversible catalyst killer; and
d) introducing the metallocene catalyst.

5,747,613

PROCESS FOR PRODUCING AROMATIC VINYL COMPOUND-BASED COPOLYMER

Mizutomo Takeuchi; Hajime Shouzaki, and Norio Tomotsu, all of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/01079, § 371 Date Jan. 2, 1996, § 102(e) Date Jan. 2, 1996, PCT Pub. No. WO95/01379, PCT Pub. Date Jan. 12, 1995

PCT Filed Jul. 1, 1994, Ser. No. 569,123

Claims priority, application Japan, Jul. 2, 1993, 5-164528

Int. Cl.⁶ C08F *4/80;210/02*

U.S. Cl. 526—134 **33 Claims**

1. A process for producing an aromatic vinyl compound-based copolymer comprising:

copolymerizing (a) an aromatic vinyl compound and (b) at least one compound selected from the group consisting of olefins, diolefins and alkynes in the presence of a polymerization catalyst comprising (A) a transition metal compound and (B) an ionic compound comprising a non-coordinate anion and a cation,

wherein said cation is selected from the group consisting of tri(toluyl)carbenium, tri(methoxyphenyl)carbenium, tri(chlorophenyl)carbenium, tri(fluorophenyl)carbenium, tri(xylyl)carbenium, [di(toluyl)phenyl]carbenium, [di(methoxyphenyl)phenyl]carbenium, [di(chlorophenyl)phenyl]carbenium, [toluyldi(phenyl)]carbenium, [methoxyphenyldi(phenyl)]carbenium, and [chlorophenyldi(phenyl)]carbenium.

12. A process for producing an aromatic vinyl compound-based copolymer comprising:

copolymerizing (a) an aromatic vinyl compound and (b) at least one compound selected from the group consisting of olefins, diolefins and alkynes in the presence of a polymerization catalyst comprising (A) a transition metal compound and (B) an ionic compound comprising a non-coordinate anion and a cation,

wherein said cation is selected from the group consisting of triphenylsilyl cation, trimethoxysilyl cation, tri(thioisopropyl-)silyl cation, trimethylsilyl cation, tri(methoxyphenyl)silyl cation, tri(toluyl)silyl cation and tri(chlorophenyl)silyl cation.

5,747,614

CATALYST FOR PRODUCING SYTRENIC POLYMER AND PROCESS FOR PRODUCING SYTRENIC POLYMER BY USING SAME

Mizutomo Takeuchi; Hajime Shouzaki, and Norio Tomotsu, all of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/01078, § 371 Date Jan. 2, 1996, § 102(e) Date Jan. 2, 1996, PCT Pub. No. WO95/01328, PCT Pub. Date Jan. 12, 1995

PCT Filed Jul. 1, 1994, Ser. No. 569,121

Claims priority, application Japan, Jul. 2, 1993, 5-164529

Int. Cl.^{6} A01J *31/00;* **C08F** *4/44;4/02;* **B01J** *37/00;31/00*

U.S. Cl. 526—160 **14 Claims**

1. A catalyst for producing a styrenic polymer which comprises a transition metal compound having one and only one π-ligand comprising only one indenyl group, said indenyl group bearing a substituent group at at least the 1-, 2-, or 3- positions of the indenyl ring, and wherein the transition metal is at least one metal selected from the group consisting of titanium, zirconium, hafnium, niobium and tantalum.

5,747,615

SLURRY-MIXED HEAT-CURABLE RESIN SYSTEMS HAVING SUPERIOR TACK AND DRAPE

Linas Norman Repecka, Lakewood, Calif., assignor to Cytec Technology Corp., Wilmington, Del.

Continuation of Ser. No. 14,062, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 595,501, Oct. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 187,819, Apr. 29, 1988, Pat. No. 5,003,018. This application Jun. 2, 1995, Ser. No. 460,169

Int. Cl.^{6} C08F *22/40;* **C08G** *73/12*

U.S. Cl. 526—262 **10 Claims**

1. A process for the preparation of heat-curable resin system comprising a reactive comonomer having a molecular weight of greater than 250 Daltons and an organic liquid reactive monomer, by the step of slurry mixing the reactive comonomer into the organic liquid reactive monomer under conditions such that:

(i) the reactive comonomer is substantially insoluble in the organic liquid reactive monomer,

(ii) the reactive comonomer and the organic liquid reactive monomer do not react to any substantial degree, and

(iii) a dispersion results of a continuous phase comprising the organic liquid reactive monomer and a discontinuous phase comprising the reactive comonomer in particulate form with a mean particle size of less than about 20 μm.

5,747,616

ETHYLENE-BASED COPOLYMERS AND THEIR USE AS FLOW IMPROVERS IN MINERAL OIL MIDDLE DISTILLATES

Hans-Joachim Müller, Grünstadt; Bernd Wenderoth, Birkenau; Albin Berger, Weisenheim; Dieter Littmann, Mannheim; Roger Klimesch, Alsbach-Hähnlein; Knut Oppenländer, Ludwigshafen; Bernd Lothar Marczinke, Speyer; Thomas Rühl, Frankenthal, and Marc Heider, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 615,175, Apr. 2, 1996, Pat. No. 5,684,108. This application Jun. 5, 1997, Ser. No. 869,971

Claims priority, application Germany, Oct. 2, 1993, 43 33 680.9; Dec. 6, 1993, 43 41 528.8; Dec. 8, 1993, 43 41 765.5; WIPO, Sep. 23, 1994, PCT/EP94/03179

Int. Cl.^{6} C08F *222/40;216/18;210/02;* **C10L** *1/22*

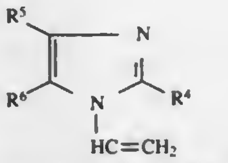
U.S. Cl. 526—262 **9 Claims**

1. An ethylene-based copolymer which is suitable as a flow improver for mineral oil middle distillates and is composed of:

a') from 50 to 95.5% by weight of ethylene,

b') from 4 to 30% by weight of one or more vinyl esters of C_2–C_6-monocarboxylic acids,

c') from 0.5 to 20% by weight of one or more vinylimidazoles of the formula II



(II)

wherein R^4, R^5 and R^6 may be identical or different and are each hydrogen or C_1–C_6-alkyl, or

from 0.5 to 20% by weight of one or more aminoalkyl vinyl ethers of the formula III

$$R^7R^8N—A^2—O—CR^9{=}CR^{10}R^{11} \qquad \text{(III)}$$

where

R^7 and R^8 are each C_1–C_6-alkyl

R^9, R^{10} and R^{11} are each hydrogen or C_1–C_6-alkyl and

A^2 is C_2–C_6-alkylene, and

d') from 0 to 10% by weight of one or more monomers which are copolymerizable with the monomers a') to c').

5,747,617

COPOLYMERS OF VINYL CHLORIDE, ALLYL GLYCIDYL ETHER, A VINYL ESTER AND AN UNSATURATED ORGANIC TRIFUNCTIONAL SILANE AND METHOD OF MAKING THE SAME

Anthony A. Parker; David A. Strickler, both of Toledo, and Hung S. Park, Avon Lake, all of Ohio, assignors to Libbey-Owens-Ford Co., Toeldo, Ohio

Continuation-in-part of Ser. No. 513,693, Aug. 11, 1995, Pat. No. 5,641,845. This application Oct. 4, 1996, Ser. No. 726,378

Int. Cl.^{6} C08F *224/00;218/08;214/06;216/12*

U.S. Cl. 526—273 **20 Claims**

1. A vinyl chloride copolymer constituted of particles prepared by the suspension polymerization of a monomer mixture consisting essentially of:

(a) vinyl chloride or a mixture of vinyl chloride and one or more other vinyl monomers copolymerizable therewith; and

(b) allyl glycidyl ether;

(c) a vinyl ester; and

(d) an unsaturated organic alkoxy functional silane,

wherein the average particle size of said polymer particles is between about 10 μm and about 250 μm.

5,747,618

ALLENE/ALKYNE COPOLYMERS

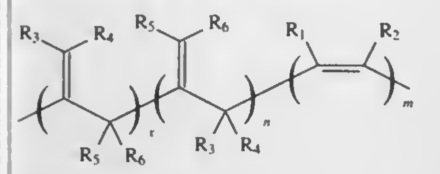
Bruce M. Novak, 495 Old Farm Rd., and Mitsuru Nakano, 500 Riverglade Dr. #K, both of Amherst, Mass. 01002

Filed Sep. 27, 1996, Ser. No. 724,164

Int. Cl.^{6} C08F *238/02*

U.S. Cl. 526—285 **25 Claims**

1. A linear copolymer having the formula:



wherein R_1 through R_6 are, independently, H, an alkyl, an aryl, a phenyl or substituted phenyl, an alkoxy, or an aryloxyl; and wherein x+n is less than or equal to 10,000, and m is less than or equal to 10,000.

5,747,619

WATER-SOLUBLE, CARBOXYL-CONTAINING COPOLYMERS, THE PREPARATION THEREOF AND THE USE THEREOF AS SCALE INHIBITOR

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Birgit Potthoff-Karl, Ludwigshafen; Karl-Heinz Buechner, Altlussheim; Marc Heider, Neustadt, and Hans-Juergen Raubenheimer, Ketsch, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/02721, § 371 Date Feb. 20, 1996, § 102(e) Date Feb. 20, 1996, PCT Pub. No. WO95/06074, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 16, 1994, Ser. No. 596,141

Claims priority, application Germany, Aug. 27, 1993, 43 28 817.0

Int. Cl.^{6} C08F *220/02;220/06;216/12;218/04;212/06*

U.S. Cl. 526—318.5 **4 Claims**

1. A method of scale inhibition comprising:

adding to a system in need thereof, a copolymer which is obtained by copolymerizing

(a) 30 to 80 mol % of monoethylenically unsaturated C_3–C_8-carboxylic acids, their anhydrides and/or their water-soluble salts,

(b) 10 to 50 mol % of C_2–C_8-olefins, styrene, alkylstyrenes, C_1–C_{10}-alkyl vinyl ethers and/or vinyl esters of saturated C_1–C_{10}-monocarboxylic acids and

(c) 0.01 to 20 mol % of vinyl ethers of alkoxylated C_1–C_{30}-alcohols in the presence of free radical polymerization initiators.

5,747,620

ETHYLENE COPOLYMER, THERMOPLASTIC RESIN COMPOSITION CONTAINING SAME, AND PROCESS FOR PREPARING ETHYLENE COPOLYMER

Shuji Machida; Härüo Shikuma; Ayami Hoshino, and Yutaka Takakura, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00256, § 371 Date Aug. 21, 1995, § 102(e) Date Aug. 21, 1995, PCT Pub. No. WO94/19381, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 21, 1994, Ser. No. 505,285

Claims priority, application Japan, Feb. 22, 1993, 5-032021; Mar. 15, 1993, 5-053695; Aug. 26, 1993, 5-211315; Dec. 28, 1993, 5-334402

Int. Cl.^{6} C08F *210/16;8/04;4/64*

U.S. Cl. 526—348.3 **16 Claims**

1. An ethylene copolymer which is derived from ethylene and an olefin having 3 to 20 carbon atoms and in which (1) any quaternary carbon atom is not present in a polymeric main chain; (2) the activation energy (Ea) of melt flow is in the range of 8 to 20 kcal/mol; and (3) a ratio between Huggins coefficients (k) of the copolymer and a straight-chain ethylene polymer having the same intrinsic viscosity [η] measured at a temperature of 135° C. in a decahydronaphthalene solvent meets the relation of the equation

$$1.12<k^1/k^2\leqq 5$$

wherein k^1 is the Huggins coefficient of the copolymer, and k^2 is the Huggins coefficient of the straight-chain ethylene polymer.

11. A process for preparing an ethylene copolymer which comprises the step of copolymerizing ethylene and at least one member selected from olefins having 3 to 20 carbon atoms in the presence of a catalyst comprising (a) a transition metal compound selected from transition metal compounds that provide a relation between a monomer charge composition when using ethylene and 1-octene having a molar ratio [M] of 1-octene/(ethylene+ 1-octene), and the product of a crystallization enthalpy (ΔH) and a melting point (Tm) of the produced copolymer that meets the equation

$$0\leqq \Delta H\cdot Tm\leqq 27{,}000-21{,}600\ [M]^{0.56}$$

(under polymerization conditions using the component (a) together with an aluminoxane), (b) a transition metal compound capable of forming a terminal vinyl group in the homopolymerization of ethylene or the copolymerization of ethylene and at least one member selected from olefins having 3 to 20 carbon atoms (under polymerization conditions using the component (b) together with the aluminoxane), and (c) a compound capable of forming an ionic complex from the abovementioned components (a) and (b) (the transition metal compounds of the components (a) and (b) are compounds containing metals in the groups 3 to 10 or a lanthanide series of the periodic table) wherein component (a) and component (b) are different from one another.

5,747,621

REACTOR BLEND POLYPROPYLENE, PROCESS FOR THE PREPARATION THEREOF AND PROCESS FOR PREPARING METALLOCENE LIGANDS

Luigi Resconi; Fabrizio Piemontesi, both of Ferrara, Italy, and Lin-Chen Yu, Hockessin, Del., assignors to Montell Technology Company BV, MS Hoofddorp, Netherlands

Filed Dec. 19, 1995, Ser. No. 574,495

Claims priority, application Italy, Dec. 20, 1994, MI94A2566; Dec. 20, 1994, MI94A2567

Int. Cl.^{6} C08F *10/06;4/642*

U.S. Cl. 526—351 **9 Claims**

1. A fractionable propylene polymer, directly obtainable from the polymerization reaction of propylene, having the following characteristics:

(a) a content of isotactic pentads (mmmm) comprised between 25 and 85%;

(b) a ratio $M_w/M_n<5$;

the fractionable propylene polymer containing from 10 to 70% by weight of a fraction soluble in boiling diethyl ether and having a content of isotactic pentads (mmmm) comprised between 5 and 25%, the fractionable propylene polymer further containing from 30 to 90% by weight of a boiling n-heptane insoluble fraction, soluble in xylene at 135° C., having a content of isotactic pentads (mmmm) comprised between 50 and 99%.

VOL 210 ISS 1 MY 5 1998 UMI

5,747,622

POLYMER HAVING SILICON ATOMS AND SULFONIUM SALT UNITS AND PHOTORESIST COMPOSITIONS CONTAINING THE SAME

Katsumi Maeda; Shigeyuki Iwasa; Kalchiro Nakano, and Etsuo Hasegawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

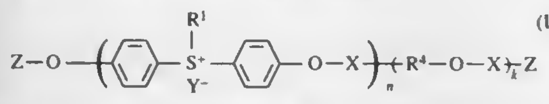
Continuation of Ser. No. 223,767, Apr. 6, 1994, abandoned. This application Feb. 12, 1997, Ser. No. 797,939

Claims priority, application Japan, Apr. 6, 1993, 5-078403; Aug. 18, 1993, 5-204357; Dec. 27, 1993, 5-329366

Int. Cl.^{6} C08G *77/06*

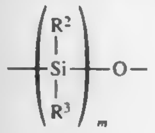
U.S. Cl. 528—12 **23 Claims**

1. A photoresist composition containing a polymer having silicon atoms and sulfonium salt units having a structure selected from the group consisting of the following formula (I):

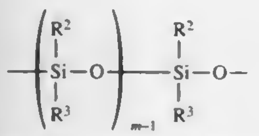


(I)

wherein n is a positive integer equal to 10 to 100 inclusive, k is 0 or a positive integer equal to 1 to 100 inclusive, a sum of n+k is a positive integer equal to 10 to 200 inclusive, a ratio of k/(n+k) is in a range of 0 to 0.9 inclusive, Y^- is a counter ion selected from the group consisting of $BF4^-$, AsF_6^-, SbF_6^-, PF_6^-, $CF_3SO_3^-$, Cl^-, Br^-, I^-, ClO_4^- and $CH_3SO_3^-$, R^1 is a radical selected from the group consisting of a phenyl group, C_1–C_6 alkyl-substituted phenyl group and C_1–C_6 alkyl group, R^4 is a divalent radical selected from the group consisting of a C_2–C_8 alkylene group and a phenylene group, Z is selected from the group consisting of a hydrogen atom and a trimethylsilyl group, and X is a divalent radical selected from the group consisting of the following formulae (II) and (III):

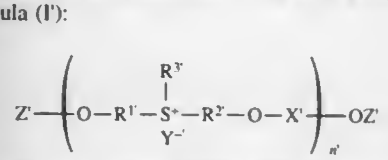


$$-\left(\underset{R^3}{\overset{R^2}{\mathrm{Si}}}\right)_m-O- \qquad \text{(II)}$$



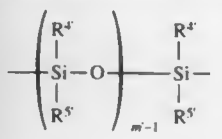
$$-\left(\underset{R^3}{\overset{R^2}{\mathrm{Si}}}-O\right)_{m-1}-\underset{R^3}{\overset{R^2}{\mathrm{Si}}}-O- \qquad \text{(III)}$$

wherein m is a positive integer equal to 1 to 10 inclusive and R^2 and R^3 can be the same or different, each being a radical selected from the group consisting of a phenyl group, C_1–C_6 alkyl-substituted phenyl group and C_1–C_6 alkyl group; and the following formula (I'):



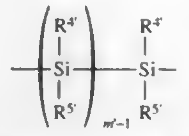
$$Z'-\left(O-R^{1'}-\underset{Y^{-'}}{\overset{R^{3'}}{S^+}}-R^{2'}-O-X'\right)_{n'}-OZ' \qquad \text{(I')}$$

wherein n' is a positive integer equal to 20 to 169 inclusive, $Y^{-'}$ is a counter ion selected from the group consisting of BF_4^-; AsF_6^-, SbF_6^-, PF_6^-, $CF_3SO_3^-$ Cl^-, Br^-, I^-, $ClO4^-$ and $CH_3SO_3^-$, $R^{1'}$ and $R^{2'}$ can be the same or different, each being a C_2–C_{10} alkylene group, $R^{3'}$ is a C_3–C_7 2-oxoalkyl group, Z' is selected from the group consisting of a hydrogen atom and a trimethylsilyl group, and X' is a divalent radical selected from the group consisting of the following general formulae (II') and (III'):



$$-\left(\underset{R^{5'}}{\overset{R^{4'}}{\mathrm{Si}}}-O\right)_{m'-1}-\underset{R^{5'}}{\overset{R^{4'}}{\mathrm{Si}}}- \qquad \text{(II')}$$

-continued



$$-\left(\underset{R^{5'}}{\overset{R^{4'}}{\mathrm{Si}}}\right)_{m'-1}-\underset{R^{5'}}{\overset{R^{4'}}{\mathrm{Si}}}- \qquad \text{(III')}$$

wherein m' is a positive integer equal to 1 to 10 inclusive and $R^{4'}$ and $R^{5'}$ can be the same or different, each being a radical selected from the group consisting of a C_1–C_8 alkyl group and a phenyl group.

5,747,623

METHOD AND COMPOSITION FOR FORMING CERAMICS AND ARTICLE COATED WITH THE CERAMICS

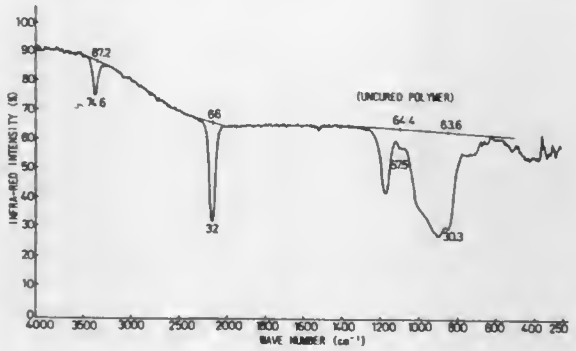
Hideki Matsuo; Masahiro Kokubo; Takashi Ohbayashi; Yuji Tashiro; Tadashi Suzuki; Masami Kizaki; Haruo Hashimoto; Yasuo Shimizu, all of Iruma-gun; Takaaki Sakurai, and Hiroyuki Aoki, both of Tokyo, all of Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Oct. 13, 1995, Ser. No. 543,157

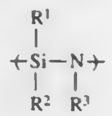
Claims priority, application Japan, Oct. 14, 1994, 6-249374; Dec. 16, 1994, 6-313425

Int. Cl.^{6} C04B *35/58*

U.S. Cl. 528—14 **3 Claims**



1. A composition for forming ceramics at a low temperature comprising a metal carboxylate-added polysilazane having a weight ratio of a metal carboxylate to a polysilazane ranging from 0.000001 to 2 and a number-average molecular weight of about 100 to 500,000, obtained by reacting a polysilazane with a metal carboxylate containing at least one metal selected from the group consisting of nickel, titanium, platinum, rhodium, cobalt, iron, ruthenium, osmium, palladium, iridium and aluminum, said polysilazane having a skeleton comprising the unit represented by the following general formula (I):



$$-\left(\underset{R^2}{\overset{R^1}{\mathrm{Si}}}-\underset{R^3}{\mathrm{N}}\right)- \qquad \text{(I)}$$

wherein

R^1, R^2 and RX each independently represents a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, a group other than the above and having a carbon atom directly attached to the silicon atom, an alkylsilyl group, an alkylamino group and an alkoxy group; with the proviso that at least one of R^1, R^2 and R^3 is a hydrogen atom.

5,747,624

PROCESS FOR REMOVING SILICONE COATINGS AND SEALANTS AND COMPOSITION THEREFORE

Slawomir Rubinsztajn, Schenectady, N.Y., and David C. Gross, Hoogerheide, Netherlands, assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 13, 1995, Ser. No. 556,558

Int. Cl.^{6} C08G *77/06*

U.S. Cl. 528—21 **8 Claims**

1. A process for depolymerizing a polymeric compound possessing one or more siloxane linkages comprising a silicone conformal coating comprising:

(a) forming a mixture of an M rich silicone and a depolymerization catalyst selected from the group of consisting of:
  i) $X_{3-p}(HO)_pP(NPX2)_nNP(O)X_2$, where X is a halogen selected from the group consisting of F, Cl, Br, and I and n is an integer ranging from 0 to 6 and p is 0 or 1; and
  ii) $X_3P(NPX_2)_mNPX_3(PX_6)$, where X is a halogen selected from the group consisting of F, Cl, Br, and I, and m is an integer ranging from 0 to 6;
  iii) $O(X)_{2-a}Y_aP(NPX2)_bNPX_{3-c}Y_c$ where b is an integer ranging from 0 to 8, a is 0 or 1, c is 0 or 1, X is a halogen selected from the group consisting of fluorine, chlorine, bromine, and iodine, Y is selected from the group consisting of OH, OR and RCO_2 where Z is alkyl or aryl;
  iv) $O(X)_{2-a}Y_aP(NPX2)_bNP(O)X_{2-c}Y_c$ where b is an integer ranging from 0 to 8, a is 0 or 1, c is 0 or 1, X is a halogen selected from the group consisting of fluorine, chlorine, bromine, and iodine, Y is selected from the group consisting of OH, OR and RCO_2 where Z is alkyl or aryl; and
  v) mixtures thereof, and
(b) contacting a silicone with said mixture whereby said polymeric compound is depolymerized wherein said silicone conformal coating is removed.

5,747,625

SILICATE GROUP-CONTAINING POLYIMIDE

Nobuyuki Furukawa; Takeshi Fujiyama, and Masatoshi Yuasa, all of Kitakyushu, Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/01039, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/33000, PCT Pub. Date Jul. 12, 1995

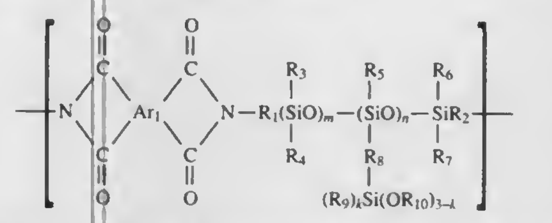
PCT Filed May 30, 1995, Ser. No. 750,322

Claims priority, application Japan, May 31, 1994, 6-140840

Int. Cl.^{6} C08G *77/26*

U.S. Cl. 528—26 **3 Claims**

1. A silicate group-containing polyimide having a repeated unit represented by the following Formula (1):



(1)

wherein Ar_1 represents a tetravalent organic group; R_1 and R_2 each are a single bond or represent an alkylene group having 1 to 4 carbon atoms or a phenylene group; R_3 to R_7, R_9 and R_{10} each represent a hydrocarbon group having 1 to 6 carbon atoms; R_8 represents an ethylene group or an alkylene group having 3 to 6 carbon atoms; m and n represent independently an integer of 1 to 10; and k represents an integer of 0 to 2.

5,747,626

SILYL TERMINATED SULFOPOLY(ESTER-URETHANE PAVEMENT MARKING COMPOSITIONS

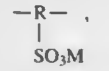
Larry R. Krepskl, White Bear Lake; Steven M. Heilmann, Afton; Daniel E. Mickus, Mahtomedi; Wayne K. Larson, Maplewood; Mark T. Gibson, Stillwater; Mark D. Purgett, Oakdale; Christopher J. Rueb, St. Paul, and Howell K. Smith, II, Grant Township, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 1, 1996, Ser. No. 609,877

Int. Cl.^{6} C08G *18/28*

U.S. Cl. 528—28 **22 Claims**

1. A paint comprising a sulfopoly(ester-urethane) polymer which comprises in its backbone at least one non-terminal arylene or alkylene group comprising a pendant sulfonic acid group or salt thereof, and a pigment, said sulfonic acid group or salt thereof having the formula



$$-\underset{SO_3M}{R}-\ ,$$

wherein R is a trivalent aliphatic or aromatic group and M is a cation, said aliphatic or aromatic group being bonded directly to ester groups, the polymer of said paint being terminated by at least one hydrolyzable silyl group, and said paint being an aqueous dispersion.

5,747,627

ROOM TEMPERATURE CURING POLYURETHANE COMPOSITIONS

Kazushi Kimura; Toshimitsu Takeda; Hiroyuki Hosoda; Kazunori Ishikawa, and Hiroyuki Okuhira, all of Hlratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/02684, § 371 Date Aug. 19, 1996, § 102(e) Date Aug. 19, 1996, PCT Pub. No. WO96/20231, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 26, 1995, Ser. No. 693,056

Claims priority, application Japan, Dec. 27, 1994, 6-326153; Dec. 27, 1994, 6-326154; May 17, 1995, 7-118678; Jul. 17, 1995, 7-180040; Aug. 29, 1995, 7-220113; Oct. 20, 1995, 7-272370

Int. Cl.^{6} C08G *18/16;18/22;18/32;18/38*

U.S. Cl. 528—59 **5 Claims**

1. A room temperature curing polyurethane composition which comprises a polyisocyanate compound or polyurethane prepolymer (A), an oxazolidine compound (B) having at least one oxazolidine ring and a compound (C) effective upon contact with water for accelerating the opening of the oxazolidine ring, said compound (C) being one or more compounds selected from the group consisting of (i) an organic silicic acid ester (ii) a mixture or adduct of a p-toluenesulfonyl isocyanate and another oxygen-containing or sulfur-containing organic compound, said oxygen-containing organic compound having one or more oxygen atoms in the form of ether or ester bonding, and said sulfur-containing organic compound having one or more sulfur atoms in the form of sulfide bonding and (iii) mixtures of (i) and (ii).

VOL
2 10
SS
1
MY
5
998
UMI

5,747,628
POLYISOCYANATES CONTAINING ETHER AND URETHANE GROUPS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN THE PRODUCTION OF POLYURETHANE LACQUERS

Lutz Schmalstieg, Köln; Hermann Gruber, Leverkusen; Bernd Riberi, Odenthal-Osenau, and Klaus Nachtkamp, Düsseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 2, 1992, Ser. No. 984,596

Claims priority, application Germany, Dec. 10, 1991, 41 40 660.5

Int. Cl.^{6} C08G *18/10;18/76;* **C07C** *269/02;271/26*

U.S. Cl. 528—60 **8 Claims**

1. Polyisocyanates based on a polyhydroxy polyether having a molecular weight of from about 350 to about 500 and tolylene diisocyanate containing ether and urethane groups having

a) an NCO content of from about 11.8 to about 14.4% by weight,
b) an average NCO functionality of from about 3.1 to about 4.0 and
c) a free tolylene diisocyanate content of less than about 0.1% by weight.

5,747,629
LOW SURFACE ENERGY POLYISOCYANATES AND THEIR USE IN ONE-OR TWO-COMPONENT COATING COMPOSITIONS

Philip E. Yeske, Köln, Germany; William E. Slack, Moundsville, W. Va., and Edward P. Squiller, Pittsburgh, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1996, Ser. No. 764,891

Int. Cl.^{6} C08G *18/28*

U.S. Cl. 528—70 **18 Claims**

1. A polyisocyanate adduct containing allophanate groups, fluorine and optionally isocyanurate groups that is prepared by reacting a compound a) which

i) is substantially free of hydroxyl groups and isocyanate groups,
ii) has an average of at least two urethane groups per molecule and
iii) contains 0 to 50% by weight of fluorine, based on the weight of the polyisocyanate adduct,

with an excess quantity, based on the equivalents of urethane groups, of a polyisocyanate b), which optionally contains fluorine, to form a polyisocyanate adduct and optionally removing at least a portion of the unreacted excess polyisocyanate b), provided that compound a) and polyisocyanate b) contain a total of at least 0.001% by weight, of fluorine, based on the weight of the polyisocyanate adduct.

5,747,630
POLYURETHANE BINDER FOR A MAGNETIC RECORDING MEDIUM

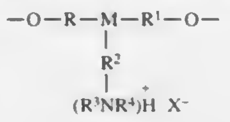
Charles J. Amirsakis, Lake Geneva, Wis., assignor to Morton International, Inc., Chicago, Ill.

Filed Mar. 13, 1997, Ser. No. 816,467

Int. Cl.^{6} C08G *18/46;18/50*

U.S. Cl. 528—71 **8 Claims**

1. A polyurethane incorporating at least one functionalized polyol selected from the group consisting of a polyesterdiol, polyetherdiol, a polycaprolactone diol, and a polycarbonate diol, which polyol incorporates a functional group having the formula:



$$-O-R-M(-R^2-\overset{+}{(R^3NR^4)H}\ X^-)-R^1-O-$$

FORMULA I

wherein M is a methylene group or nitrogen, R and R^1 are the same or different alkylene groups having from 1 to 7 carbon atoms, R^2 is an alkylene group having from 1 to 7 carbon atoms, and R^3 and R^4 are the same or different alkyl groups having from 1 to 7 carbon atoms, and X is an anion of a Brønsted acid in an amount such that the polyurethane contains from about 8 to about 32 gram moles of the functional group per 1×10^6 grams of the polyurethane.

5,747,631
PRECURSOR OF AMORPHOUS CARBON MOLDED ARTICLE

Shingo Sasaki, and Mutsunori Yamao, both of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Jul. 11, 1994, Ser. No. 272,850

Claims priority, application Japan, Aug. 11, 1993, 5-220706

Int. Cl.^{6} C08G *18/32*

U.S. Cl. 528—86 **4 Claims**

1. A process for producing an injection molded phenolic resin article containing no filler, wherein said article has a light transmittance of not less than 80% per mm of optical pass of visible light having a wavelength of 800 nm, has less than one void having a diameter of 100 μm or greater per cm^3, and has a metal content of not more than 200 ppm by weight, which comprises the following steps:

(a) molding a self-curing particulate phenolic resin by injection molding or injection compression molding at a sufficient temperature to cure said phenolic resin under a pressure of from 70 kg/cm^2 to 150 kg/cm^2, and controlling the water content of said phenolic resin to 1% by weight or less, and
(b) producing the phenolic resin article having a metal content of not more than 200 ppm by weight,

wherein said particulate phenolic resin has a particle size of not less than 50 μm, and a thermal plasticity of from 60 to 160 mm, as measured by the disc cure method, and wherein the individual particles thereof are coated with 0.2 to 5% by weight, based on the phenolic rein, of a metal-free low-surface tension compound having a melting point of from 30° to 160° C.

5,747,632
POLYCARBONATE RESIN WITH HIGH FLOWABILITY AND PROCESS FOR PRODUCING THE SAME

Takahiro Adachi, and Toshiaki Takata, both of Osaka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 744,315

Claims priority, application Japan, Nov. 27, 1995, 7-307481

Int. Cl.^{6} C08G *64/00*

U.S. Cl. 528—196 **9 Claims**

1. A polycarbonate resin with high flowability having a viscosity average molecular weight (Mv) of 13,000 to 20,000 and containing less than 1% by weight of low molecular weight carbonate compounds having a molecular weight of 1,000 or less and at least 10% by weight of a polycarbonate oligomer having a molecular weight in the range of 2,000 to 5,000.

5,747,633
RESIN COMPOSITION HAVING IMPROVED MECHANICAL PROPERTIES AND BIO-DISINTEGRATING PROPERTY AND CONTAINERS COMPRISING THEREOF

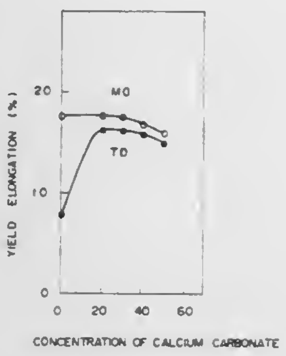
Takurou Ito, and Yoshitsugu Maruhashi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 343,985, Nov. 18, 1994, abandoned. This application Jun. 24, 1996, Ser. No. 668,717

Claims priority, application Japan, Nov. 18, 1993, 5-289624

Int. Cl.^{6} C08G *63/02*

U.S. Cl. 528—272 **8 Claims**



1. A resin composition having improved mechanical properties and bio-disintegrating property comprising a saturated polyester resin consisting essentially of a hydroxyalkanoate unit, a heat-moldable hydroxyl group-containing resin having a vinyl alcohol unit, and an alkaline earth metal carbonate, wherein the saturated polyester resin is present in an amount of from 20 to 85.5% by weight, the hydroxyl group-containing resin is present in an amount of from 2.5 to 45% by weight and the alkaline earth metal carbonate is present in an amount of from 10 to 50% by weight based upon a combined total weight of the saturated polyester resin, hydroxyl group-containing resin, and alkaline earth metal carbonate.

5,747,634
CONTINUOUS PROCESS FOR ACTIVATED ANIONIC LACTAM POLYMERIZATION

Eduard Schmid, Bonaduz, Switzerland, and Roman Eder, Filderstadt, Germany, assignors to EMS-Inventa AG, Zurich, Switzerland

Filed Jan. 21, 1997, Ser. No. 786,711

Claims priority, application Germany, Jan. 25, 1996, 196 03 303.9

Int. Cl.^{6} C08G *69/08;73/10*

U.S. Cl. 528—315 **22 Claims**

1. A continuous process for activated lactam polymerization, with the steps of

supplying lactam as well as catalyst and activator for the anionic lactam polymerization under anhydrous conditions to a heatable, continuously operating mixing and conveying device,
and heating the lactam to the process temperature with continuous mixing, and at least partial polymerization,
and shaping in a tool or delivering the melt as a strand, then cooling and pelletizing, characterized in that
the introduction of activator and catalyst into an anhydrous lactam melt is performed by the continuous dosing in of a liquid system in which both activator and catalyst are contained.

5,747,635
MODIFIED POLYASPARTIC ACIDS, PREPARATION THEREOF AND USE THEREOF

Matthias Kroner, Eisenberg; Heinrich Hartmann; Dieter Boeckh, both of Limburgerhof; Angelika Funhoff, Heidelberg; Richard Baur, Mutterstadt; Alexander Kud, Eppelsheim; Volker Schwendemann, Neustadt; Birgit Potthoff-Karl, Ludwigshafen, and Karl-Heinz Buechner, Altlussheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/01588, § 371 Date Jan. 3, 1995, § 102(e) Date Jan. 3, 1995, PCT Pub. No. WO94/01486, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 22, 1993, Ser. No. 360,684

Claims priority, application Germany, Jul. 3, 1992, 42 21 875.6

Int. Cl.^{6} C08G *69/10;* **A23B** *7/10;* **C08F** *20/54*

U.S. Cl. 528—328 **31 Claims**

1. Modified polyaspartic acids, prepared by polycocondensation of a mixture comprising

(a) from 1 to 99.9 mol % of aspartic acid with
(b) from 99 to 0.1 mol % of fatty acids, polybasic carboxylic acids, anhydrides of polybasic carboxylic acids, polybasic hydroxycarboxylic acids, monobasic polyhydroxycarboxylic acids, alkoxylated alcohols, alkoxylated amines, amino sugars, carbohydrates, sugarcarboxylic acids and mixtures thereof, excluding proteinogenic amino carboxylic acids, to give poly-condensates having K values of from 5 to 150

or by polymerizing (i) monoethylenically unsaturated monomers except styrene in the presence of (ii) polyaspartic acids and/or cocondensates of aspartic acid in the manner of a free-radically initiated graft polymerization to give graft polymers having K values of from 10 to 200,

wherein the K values are in each case determined by the method of H. Fikentscher at pH 7 and 25° C. on a 1% aqueous solution of the sodium salt.

5,747,636

Patent Not Issued For This Number

5,747,637
BIOABSORBABLE POLYMER AND PROCESS FOR PREPARING THE SAME

Hosei Shinoda; Masanobu Ajioka, both of Kanagawa-ken, and Kimitaka Chida, Aichi-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 28, 1996, Ser. No. 697,571

Claims priority, application Japan, Sep. 7, 1995, 7-230366

Int. Cl.^{6} C08G *63/08*

U.S. Cl. 528—354 **20 Claims**

1. A ternary block copolymer having a weight average molecular weight of 10,000–1,000,000 and consisting essentially of a polylactic acid segment, poly(ε-caprolactone) segment and polyglycolic acid segment, and being prepared by carrying out ring-opening polymerization of 20–1200 parts by weight of ε-caprolactone in the presence of 100 parts by weight of polylactic acid having one or more terminal hydroxyl groups and a weight average molecular weight of 2,000–500,000, in a first step, and carrying out in a second step addition and ring-opening polymerization of 15–1200 parts by weight of glycolide in the course of or

OL
2 10
SS
1
MY
5
998
MI

after completion of the ring-opening polymerization of ε-caprolactone.

5,747,638
PROCESS FOR THE PREPARATION OF A COPOLYMER OF CARBON MONOXIDE

Eit Drent; Frits Van Der Veer, and Rudolf Jacobus Wijngaarden, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 7, 1997, Ser. No. 813,769

Int. Cl.^{6} C08G *67/02*

U.S. Cl. 528—392 **10 Claims**

1. A process for the copolymerization of carbon monoxide with ethene and optionally another olefinically unsaturated compound in which process the monomers are copolymerized in the presence of a liquid diluent and a catalyst composition which is based on

(a) a Group VIII metal compound,

(b) an anion of an acid which is obtainable by combining a Brønsted acid with a Lewis acid, and

(c) an organic oxidant in a quantity of less than 30 moles per mole of Group VIII metal.

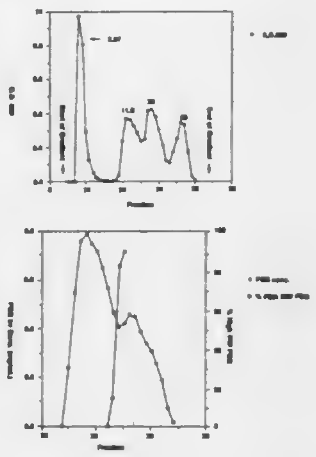
5,747,639
USE OF HYDROPHOBIC INTERACTION CHROMATOGRAPHY TO PURIFY POLYETHYLENE GLYCOLS

James Ervin Seely, Louisville, Colo., assignor to Amgen Boulder Inc., Boulder, Colo.

Filed Mar. 6, 1996, Ser. No. 611,918

Int. Cl.^{6} B01D *15/06*

U.S. Cl. 528—421 **16 Claims**



1. A process for purifying a polyethylene glycol (PEG), said process comprising:

(a) applying said PEG to a hydrophobic interaction chromatography (HIC) column, wherein said HIC utilizes polymeric resins wherein a hydrophobic pendant group selected from the group consisting of octyl, butyl, phenyl, and ether is located on the surface of a hydrophilic vinyl copolymer backbone resin; and

(b) selectively isolating the desired PEG form by utilizing elution conditions which allow for separation of the various PEG forms based on size.

5,747,640
CONTINUNOUS PROCESS FOR PREPARING POLYTETRAFLUOROETHLENE WET POWDER

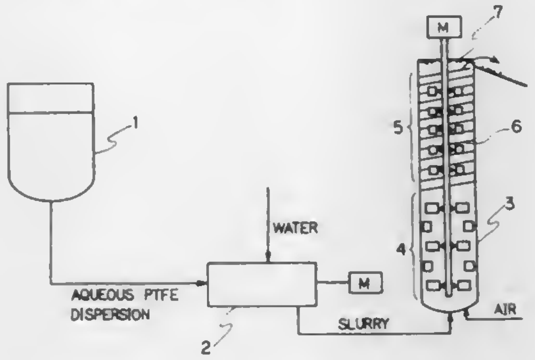
Tetsuya Higuchl, Ibaraki; Shunichi Nomura, Kyoto; Shigeru Ichiba, Ibarakl; Hiroshi Yamaguchi, Settsu; Masaomi Goromaru, Neyagawa; Akira Watanabe; Kazuhiro Takeda, both of Ibaraki; Mikio Morita, Kobe; Kazubisa Fujita, and Yasuyuki Moriyama, both of Ibaraki, all of Japan, assignors to Daikin Industries, Osaka, Japan

Continuation of Ser. No. 229,425, Apr. 12, 1994, abandoned, which is a continuation of Ser. No. 794,650, Nov. 18, 1991, abandoned, which is a continuation of Ser. No. 492,016, Mar. 12, 1990, abandoned. This application Oct. 2, 1995, Ser. No. 537,329

Claims priority, application Japan, Mar. 14, 1989, 1-61866

Int. Cl.^{6} C08F *6/18*

U.S. Cl. 528—502 F **9 Claims**



1. A continuous process for preparing polytetrafluoroethylene wet powder, which consists essentially of: continuously passing an aqueous dispersion of polytetrafluoroethylene fine particles prepared by emulsion polymerization through a pipe line mixer or a pipe line mill to form a slurry containing flocculated polytetrafluoroethylene; continuously supplying the slurry to a lower portion of a vertical agitator; continuously granulating the flocculated polytetrafluoroethylene in a granulating zone having multistate agitation blades mounted on a central vertical shaft inside the lower half of the vertical agitator; continuously shaping the granular polytetrafluoroethylene particles in a particle shaping zone having a spiral flow guide in the upper half of the vertical agitator; and continuously taking off polytetrafluoroethylene wet powder from an upper portion of the vertical agitator.

5,747,641
TAT-DERIVED TRANSPORT POLYPEPTIDE CONJUGATES

Alan Frankel, 21 Marinero Cir., #206, Tiburon, Calif. 94920; Carl Pabo, 18 Weldon Rd., Newton, Mass. 02158; James G. Barsoum, 9 Marlboro Rd., Lexington, Mass. 02173; Stephen E. Fawell, One Black Horse Ter., Winchester, Mass. 01890, and R. Blake Pepinsky, 30 Falmouth Rd., Arlington, Mass. 02174

Continuation of Ser. No. 235,403, Apr. 28, 1994, which is a continuation-in-part of Ser. No. 158,015, Nov. 24, 1993, abandoned, which is a continuation of Ser. No. 636,662, Jan. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 454,450, Dec. 21, 1989, abandoned, and a continuation-in-part of Ser. No. 235,403, which is a continuation-in-part of Ser. No. 934,375, Aug. 12, 1992, abandoned. This application May 25, 1995, Ser. No. 451,233

Int. Cl.^{6} C07K *2/00;14/00;14/025;14/155*

U.S. Cl. 530—300 **5 Claims**

1. A conjugate comprising a cargo moiety covalently linked to a transport moiety, wherein the transport moiety has the following characteristics:

(i) the presence of amino acids 49-57 of HIV tat protein;

(ii) the absence of amino acids 22-36 of HIV tat protein; and

(iii) the absence of amino acids 73-86 of HIV tat protein, and wherein the cargo moiety retains significant biological activity following transport moiety-mediated intracellular delivery.

5,747,642
MONOMERIC INSULIN ANALOG FORMULATIONS

Michael R. De Felippis, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 260,633, Jun. 16, 1994, Pat. No. 5,461,031. This application Jun. 1, 1995, Ser. No. 458,151

Int. Cl.^{6} C07K *14/62*

U.S. Cl. 530—304 **2 Claims**

1. Insulin analog-protamine crystals consisting essentially of: human insulin wherein Pro at position B28 is substituted with Lys, Leu, Val or Ala, and Lys at position B29 is Lys or Pro, des(B28–B30)-human insulin, or des(B27)-human insulin; protamine; zinc; and a phenolic derivative.

5,747,643
ANTIGENIC REGIONS OF TUMOR-LIBERATED PARTICLES (TLP) COMPLEXES AND ANTIBODIES AGAINST THE SAMES

Giulio Tarro, Naples, Italy, assignor to Instituto Farmacoterapico Italiano S.p.A., Italy

PCT No. PCT/IT93/00069, § 371 Date Dec. 22, 1994, § 102(e) Date Dec. 22, 1994, PCT Pub. No. WO94/01458, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 1, 1993, Ser. No. 351,284

Claims priority, application Italy, Jul. 3, 1992, RM92A0506

Int. Cl.^{6} A61K *38/04;* **C07K** *5/00;7/00;16/00*

U.S. Cl. 530—329 **4 Claims**

1. An antigenic peptide of a tumor liberated particle purified from a tumoral tissue, wherein the antigenic peptide is able to induce an immune serum which recognizes a 100 KDa tumor liberated particle, said 100 KDa tumor liberated particle comprising an antigenic amino acid sequence selected from the group consisting of SEQ ID NO. 1: Arg Thr Asn Lys Glu Ala Ser Ile SEQ ID NO. 2: Gly Ser Ala Xaa Phe Thr Asn; and SEQ ID NO. 3: Asn Gln Arg Asn Arg Asp.

5,747,644

Patent Not Issued For This Number

5,747,645
CYTOPLASMIC ANTIPROTEINASE-2 AND CYTOPLASMIC ANTIPROTEINASE-3 AND CODING SEQUENCES

Cindy A. Sprecher, Seattle, Wash., assignor to ZymoGenetics, Inc., Seattle, Wash.

Division of Ser. No. 385,500, Feb. 8, 1995. This application Apr. 30, 1997, Ser. No. 846,784

Int. Cl.^{6} C07K *14/81*

U.S. Cl. 530—350 **6 Claims**

1. An isolated mammalian cytoplasmic antiproteinase-3 (CAP-3) protein wherein said protein is homologous to the amino acid sequence depicted in Seq. ID No. 4.

5,747,646
POLYETHYLENE-PROTEIN CONJUGATES

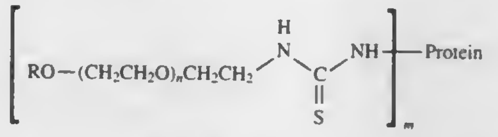
John Hakimi, Scarsdale; Patricia Kilian, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 767,000, Sep. 27, 1991, Pat. No. 5,595,732, which is a continuation-in-part of Ser. No. 674,001, Mar. 25, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 457,058

Int. Cl.^{6} C07K *1/00;* **A61K** *38/19;38/21*

U.S. Cl. 530—351 **12 Claims**

1. A physiologically active protein conjugate of the formula



$$\left[RO-(CH_2CH_2O)_nCH_2CH_2-NH-C(=S)-NH\right]_m-\text{Protein}$$

wherein R is lower alkyl; m and n form any combination of numbers such that the conjugate has at least a portion of the biological activity of the protein which forms the conjugate.

5,747,647
PROCESS FOR THE FRACTIONATION OF WHEY CONSTITUENTS

Francis Martin Stack, Mitchelstown; Mark Hennessy, Fermoy; Daniel Mulvihill, Ballincollig, and Brendan Thomas O'Kennedy, Dungarvan, all of Ireland, assignors to Dairygold Technologies Limited, Cork, Ireland

PCT No. PCT/IE95/00033, § 371 Date Mar. 14, 1997, § 102(e) Date Mar. 14, 1997, PCT Pub. No. WO95/34216, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 13, 1995, Ser. No. 750,675

Claims priority, application Ireland, Jun. 15, 1994, S940489

Int. Cl.^{6} C07K *1/14;16/04*

U.S. Cl. 530—365 **9 Claims**

1. A process for the recovery of whey constituents, comprising the steps of

(a) reducing the calcium content to below 120 parts per million (p.p.m.) on a dry matter basis;

(b) reducing the pH of the whey to between 1.8 and 3.4;

(c) heating the whey to between 71° C. and 98° C. for between 50 seconds and 95 seconds, followed by rapid cooling to about 10° C.;

(d) concentrating the whey to between 55% and 63% total solids at a temperature not exceeding 69° C.;

(e) cooling the whey for a period of time and at a temperature sufficient to permit crystallisation of lactose from the whey;

(f) separating the resulting lactose crystals from the remaining whey protein liquor;

(g) adjusting the pH of the whey protein liquor to a pH of between 4.3 and 4.7 at a temperature of less than 10° C. and then heating to a temperature of between 35° C. and 54° C. for between 1 and 3 hours;

(h) separating the resultant flocculant comprising enriched alpha-lactalbumin from the whey protein liquor comprising substantially pure beta-lactoglobulin; and

(i) purifying the alpha-lactalbumin enriched flocculant by washing with a solution isoionic with the whey protein liquor, adjusting to a pH of between 4.3 and 4.7 and refractionating the alpha-lactalbumin by centrifugation or filtration.

OL
2 10
SS
1
MY
5
998
MI

5,747,648

MODIFIED WHEAT GLUTENS AND USE THEREOF IN FABRICATION OF FILMS

Sukh Bassi, Atchison, Kans.; Cloduraldo C. Maningat, Platte City, Mo.; Rangaswamy Chinnaswamy, and Li Nie, both of Kansas City, Mo., assignors to Midwest Grain Products, Atchison, Kans.

Filed Mar. 12, 1996, Ser. No. 614,373

Int. Cl.^{6} A61K *35/78;* **C07K** *14/415;* **A23J** *1/00;* **C04B** *7/00*

U.S. Cl. 530—374 **14 Claims**

1. A flowable modified wheat gluten protein dispersion for use in producing wheat gluten protein-based films and comprising:

a modified wheat gluten protein product made from a high protein wheat gluten starting product, said staring product having at least about 85% by weight wheat gluten protein therein, said wheat gluten starting product treated with a reducing agent to give a modified wheat gluten protein comprising gliadin and glutenin fractions and having an average molecular weight of up to about 1000 kDa, said modified wheat gluten protein having substantially no heat denaturation; and

a liquid phase comprising water, a plasticizer and a member selected from the group consisting of acids and bases for promoting the dispersion of said modified wheat gluten protein in said liquid phase, said liquid phase being essentially free of alcohol.

5,747,649

ACELLULAR RED BLOOD CELL SUBSTITUTE

Lakshman R. Sehgal, Flossmoor; Richard E. De Woskin, Mount Prospect; Gerald S. Moss; Steven A. Gould, both of Highland Park; Arthur L. Rosen, Wilmette, and Hansa Sehgal, Flossmoor, all of Ill., assignors to Norhtfield Laboratories, Inc., Evanston, Ill.

Continuation of Ser. No. 31,563, Mar. 15, 1993, which is a continuation of Ser. No. 616,727, Nov. 21, 1990, Pat. No. 5,194,590, which is a continuation of Ser. No. 315,130, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 876,689, Jun. 20, 1986, Pat. No. 4,826,811. This application Jun. 7, 1995, Ser. No. 484,942

Int. Cl.^{6} A61K *35/14*

U.S. Cl. 530—385 **15 Claims**

1. Cross linked, polymerized hemoglobin produced from hemoglobin derived from human blood, the cross linked, polymerized hemoglobin having less than 0.5% of unmodified tetrameric hemoglobin.

5,747,650

P53AS PROTEIN AND ANTIBODY THEREFOR

Molly F. Kulesz-Martin, Buffalo, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 100,496, Aug. 2, 1993. This application May 10, 1996, Ser. No. 644,456

Int. Cl.^{6} C07K *16/22;16/30;16/32;16/06*

U.S. Cl. 530—387.7 **11 Claims**

1. An antibody specific for a protein designated p53as, which protein is functionally equivalent with an active known normal growth controlling protein p53 of a mammal, the final amino acids of p53as protein proximate the carboxy terminus being sufficiently different than the carboxy terminus final 50 amino acids of the p53 protein, so that the p53as lacks a negative regulatory domain of said p53 and so that the p53as contains an epitope unique to p53as not present in said p53, said antibody being reactive with said epitope and not being reactive with said p53, said p53as functioning as a growth regulator in a manner similar to active p53 within cellular environments where said p53 loses activity due to loss of sequence specific binding by activation of said p53 negative regulatory domain.

5,747,651

ANTIBODIES AGAINST TYROSINE KINASE RECEPTOR FLK-1

Ihor R. Lemischka, Princeton, N.J., assignor to The Trustees of Princeton University, Princeton, N.J.

Division of Ser. No. 252,498, Oct. 31, 1994, abandoned, which is a division of Ser. No. 55,269, Apr. 30, 1993, Pat. No. 5,367,057, which is a division of Ser. No. 977,451, Nov. 19, 1992, Pat. No. 5,270,458, which is a continuation-in-part of Ser. No. 975,049, Nov. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 906,397, Jun. 26, 1992, Pat. No. 5,621,090, which is a continuation-in-part of Ser. No. 813,593, Dec. 24, 1991, Pat. No. 5,185,438, which is a continuation-in-part of Ser. No. 793,065, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 728,913, Jun. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 679,666, Apr. 2, 1991, abandoned. This application Feb. 15, 1996, Ser. No. 601,891

Int. Cl.^{6} C07K *16/28;* **C12P** *21/08*

U.S. Cl. 530—387.9 **4 Claims**

1. Isolated antibodies that bind specifically to the extracellular portion of a protein tyrosine kinase that is flk-1.

5,747,652

ANTIBODY TO SMOOTH MUSCLE MYOSIN HEAVY CHAINS

Ryozo Nagai; Makoto Kuroo, both of Tokyo, and Hirohisa Kato, Choshi, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba-ken, Japan

Continuation of Ser. No. 163,407, Dec. 8, 1993, abandoned, which is a continuation of Ser. No. 768,075, Sep. 27, 1991, abandoned. This application Dec. 20, 1994, Ser. No. 360,127

Claims priority, application Japan, Mar. 28, 1989, 1-075884

Int. Cl.^{6} C07K *16/18*

U.S. Cl. 530—387.9 **9 Claims**

1. An antibody or antibody fragment which specifically binds to a single isoform of smooth muscle myosin heavy chain, said single isoform of smooth muscle myosin heavy chain being selected from the group consisting of SM-1, SM-2 and SM-3, said antibody or antibody fragment specifically binding within one of the following amino acid sequences (a), (b) or (c) contained in SM-1, SM-2 or SM-3, respectively:

(a) H_2N-RRGNETSFVPTRRSGGR
RVIENADGSEEEVDARDADFN
GTKSSE - COOH
(b) H_2N-RGPPPQETSQ - COOH
(c) H_2N-NRLRRGGPISFSSSRSGRPQ
LHIEGASLELSDDDTESKTSDVNE
TQPPQSE - COOH.

5,747,653

METHOD OF PRODUCING OF AN ANTIMENINGOCOCCIC HYPERIMMUNE GAMMA GLOBULIN AND GAMMA GLOBULIN PRODUCED BY METHOD

Concepción Campa Huergo, Havana City; Victoriano Gustavo Sierra Gonzalez, Villa Clara; María Mercedes Gutiérrez Vazcuez, Hauana; Gonzalo Bisset Jorrin, Havana City; Luis Guillermo Garcia Imia, Havana City; Gisela de la Caridad Puentes Rizo, Havana City; Maria del Carmen Sampedro Herrera, Havana City; Franklin Sotolongo Padrón, Havana City; Eloisa Xochitl Le Riverend Morales, Havana City, and Manuel Alfredo Galguera Dominguez, Villa Clara, all of Cuba, assignors to Centro Nacional De Biopreparados, Havana City, Cuba

Division of Ser. No. 152,938, Nov. 12, 1993, Pat. No. 5,597,572, which is a continuation of Ser. No. 767,341, Sep. 27, 1991, abandoned, which is a continuation of Ser. No. 225,859, Jul. 29, 1988, abandoned. This application Aug. 2, 1996, Ser. No. 692,055

Claims priority, application Cuba, Jul. 30, 1987, 125/87

Int. Cl.^{6} C07K *16/12;* **A61K** *39/40;39/095;* **A23J** *3/20*

U.S. Cl. 530—389.5 **10 Claims**

1. A method for producing antimeningococcic hyperimmune gamma-globulin which comprises:

1) vaccinating an adult with a vaccine against *Neisseria meningitidis* B pathogens prepared by the method steps performed in the following order of:
  a) extracting the vesicles of the outer membrane and protein antigenic complex weighing from 65 to 95 kD from live, active pathogens of group B serotypes with a treatment selected from the group consisting of:
    (i) treating with detergent,
    (ii) treating with detergent and ultrasound, and
    (iii) treating with detergent, enzymatic solution and ultrasound to create an extract;
  b) treating said extract to eliminate nucleic acids to create a treated extract;
  c) purifying said treated extract to separate as a fraction the said vesicles from the protein antigenic complex by a dissociative treatment with detergent solution, ultrasound, and column chromatography to produce purified protein antigenic complex;
  d) further purifying said purified protein antigenic complex by a chromatographic step from the group consisting of high performance liquid chromatography, affinity chromatography with monoclonal antibodies, hydrophobic chromatography, and ionic exchange chromatography, and combinations thereof, to obtain a further purified protein antigenic complex;
  e) combining said further purified protein antigenic complex with a fraction containing the vesicles by ultrasound treatment to anchor said further purified protein antigenic complex and vesicles to each other in an effective amount in a proportion of 15%±3% by weight to create an anchored protein complex; and,
  f) adding capsular polysaccharide and adjuvant to anchored protein complex of step (e), wherein the adjuvant is selected from the group consisting of aluminum hydroxide, aluminum phosphate, and calcium phosphate; and
  g) recovering the resultant vaccine;
2) drawing blood from the vaccinated adult;
3) separating from the blood drawn from the vaccinated adult of step 2) the antimeningococcic hyperimmune gamma-globulin plasma fraction from other compnents of the blood; the
4) purifying the plasma fraction to isolate to the antimeningococcic hyperimmune gamma-globulin.

5,747,654

RECOMBINANT DISULFIDE-STABILIZED POLYPEPTIDE FRAGMENTS HAVING BINDING SPECIFICITY

Ira H. Pastan; Byungkook Lee, both of Potomac; Sun-Hee Jung, Bethesda, and Ulrich Brinkmann, Kensington, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 14, 1993, Ser. No. 77,252

Int. Cl.^{6} C07K *19/00;16/46;14/725*

U.S. Cl. 530—391.7 **27 Claims**

2. An immunoglobulin fragment specifically binding a ligand comprising a light chain variable region which contains a cysteine at a single position 98, 99, 100, or 101 and a heavy chain variable region which contains a a single cysteine at position 43, 44, 45, 46 or 47, such positions being determined in accordance with the numbering scheme published by Kabat and Wu corresponding to a light chain and a heavy chain region, respectively, of an antibody; and further wherein the light chain variable region and the heavy chain variable region of the immunoglobulin fragment are connected through a disulfide bond between said cysteines.

5,747,655

NEURTURIN AND RELATED GROWTH FACTORS

Eugene M. Johnson, Jr.; Jeffrey D. Milbrandt; Paul T. Kotzbauer, and Patricia A. Lampe, all of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Division of Ser. No. 519,777, Aug. 28, 1995. This application Nov. 1, 1996, Ser. No. 742,035

Int. Cl.^{6} C07K *14/00;14/435;14/475*

U.S. Cl. 530—399 **19 Claims**

1. An isolated and purified neurturin polypeptide comprising SEQ ID NO:31, SEQ ID NO:32 or conservaively substituted variants thereof wherein said polypeptide promotes survival in superior cervical ganglion cells or nodose ganglion cells.

5,747,656

INDICATORS FOR DETERMINING THE PROTON CONCENTRATION OF STRONGLY ALKALINE AQUEOUS SOLUTIONS

Wolfgang Fischer, Darmstadt; Sylvia Baum, Griesheim; Thorsten Hartig, Gross-Zimmern, and Michael Schleehahn, Lindenfels, all of Germany, assignors to Merck Patent Gesellschaft Mit Beshrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP94/03156, § 371 Date Jun. 1, 1995, § 102(e) Date Jun. 1, 1995, PCT Pub. No. WO95/09894, PCT Pub. Date Apr. 13, 1995

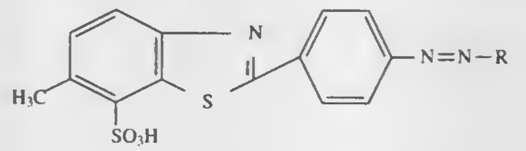
PCT Filed Sep. 21, 1994, Ser. No. 448,413

Claims priority, application Germany, Oct. 2, 1993, 43 33 696.5

Int. Cl.^{6} C09B *29/12;29/36;67/42;109/00*

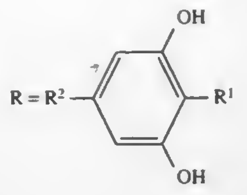
U.S. Cl. 534—683 **3 Claims**

1. A compound of the formula (I)



(I)

in which



bound to formula (I) at the 1, 2, 4 or 6 position and

R^1=H, OH, alkyl having 1–6 C atoms, alkanoyl having 2–7 C atoms, or a bond to formula (I).

R^2=H, alkyl having 1–6 C atoms or a bond to formula (I), wherein R^1 and R^2 both can not be H.

2. An indicator for determining the proton (H^+) concentration of strongly alkaline aqueous solutions, which contains at least one compound of the formula (I).

5,747,657

REACTIVE MONOAZO DYESTUFFS AND THE PROCESSES IN WHICH THEY ARE PRODUCED

Friedrich Lehr, Efringen Kirchen, Germany, assignor to Clariant Finance (BVI) Limited, Tortola, Virgin Islands (Br.)

PCT No. PCT/EP95/02779, § 371 Date Jan. 14, 1997, § 102(e) Date Jan. 14, 1997, PCT Pub. No. WO96/02593, PCT Pub. Date Feb. 1, 1996

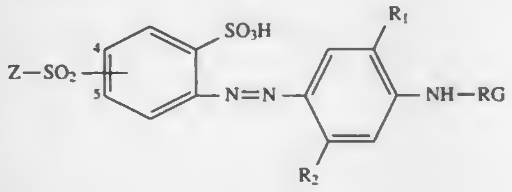
PCT Filed Jul. 14, 1995, Ser. No. 765,786

Claims priority, application Germany, Jul. 16, 1994, 44 25 222.6; Oct. 4, 1994, 44 35 380.4

Int. Cl.^{6} C09B *62/51;* **D06P** *1/38*

U.S. Cl. 534—635 **16 Claims**

1. A dyestuff according to the formula (I)

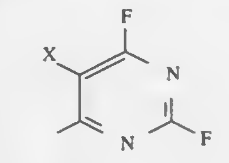


or a salt or a mixture thereof, wherein

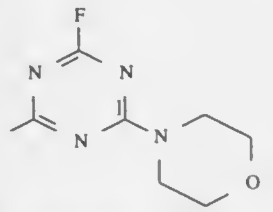
R_1 signifies hydrogen, methyl, methoxy or ethoxy

R_2 signifies hydrogen, methyl, $NHCONH_2$ or $NHCOCH_3$

RG signifies



formula (ii)



formula (iii)

X signifies hydrogen, Z signifies a group —CH=CH$_2$, —CH$_2$CH$_2$W or mixtures thereof wherein W is a leaving group removable by alkali, and —SO$_2$—Z may be bonded in a meta- or para- position with respect to the azo group when RG is of formula (ii) or formula (iii).

5,747,658

METHOD FOR THE OXIDATION OF CARBOHYDRATES

Sarah Veelaert, Antwerp, Belgium; Dirk De Wit, Bennekom, and Huibert Tournois, Rhenen, both of Netherlands, assignors to Instituut Voor Agrotechnologisch Onderzoek (ATO-DLO), Wageningen, Netherlands

PCT No. PCT/NL94/00272, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO95/12619, PCT Pub. Date May 11, 1995

PCT Filed Nov. 4, 1994, Ser. No. 640,743

Claims priority, application Netherlands, Nov. 4, 1993, 9301905

Int. Cl.^{6} C08B *31/18;33/08;35/08*

U.S. Cl. 536—18.5 **11 Claims**

1. A process for the oxidation of carbohydrates selected from disaccharides, oligosaccharides and polysaccharides possessing a glycol difunctional group, using a less than equivalent amount of periodate in an aqueous medium, comprising the steps of oxidizing the carbohydrates in a first chamber, concurrently regenerating the periodate continuously during the oxidation in a second reaction chamber, separate from the first chamber, and continuously feeding the regenerated periodate back to the first chamber during the oxidizing step, whereby the regenerated periodate is reused in the oxidizing step.

5,747,659

FUSION GENE PRODUCTS ENCODING AVIAN ALPHA SUBUNIT INHIBIN PROTEIN, OR AN IMMUNOGENIC FRAGMENT THEREOF, AND A CARRIER PROTEIN

William C. Fioretti, Colleyville, Tex.; Konstantin Kousoulas, Baton Route, and Daniel G. Satterlee, Prairieville, both of La., assignors to Agritech Technologies, Ltd., Grand Prairie, Tex.; Board of Supervisors of Louisana State Univ., and Agricultural & Mechanical College, both of Baton Rouge, La.

Division of Ser. No. 481,633, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 395,554, Feb. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 202,964, Feb. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,493

Int. Cl.^{6} C12N *1/21;5/10;15/11;15/63*

U.S. Cl. 536—23.4 **11 Claims**

1. A fusion gene product encoding a gene for the expression of avian alpha subunit inhibin protein, or an immunogenic fragment thereof, fused to a gene encoded for the expression of a carrier protein wherein the expressed avian alpha subunit inhibin protein, or immunogenic fragment thereof, fused to the carrier protein increases egg lay, accelerates onset of egg lay, accelerates onset of maximum egg lay, increases lifetime total egg lay, increases egg production, increases intensity of egg production, prolongs persistence of egg lay, improves egg shell quality, accelerates onset of puberty, accelerates onset of ovulation, prolongs persistence of ovulation, increases sperm production, accelerates onset of sperm production, accelerates onset of maximum sperm production, prolongs persistence of sperm production, improves sperm viability, increases testosterone production, increases ejaculate volume, or increases libido, when administered in an effective amount to a bird, comprising: a gene encoded for the expression of avian alpha subunit inhibin protein, or an immunogenic fragment thereof, fused to a gene encoded for the expression of a carrier protein.

5,747,660

NUCLEIC ACID ENCODING PROSTAGLANDIN $F_{2\alpha}$ RECEPTOR REGULATORY PROTEIN

David J. Orlicky, Denver, Colo., assignor to The University of Colorado, Boulder, Colo.

Filed Nov. 6, 1995, Ser. No. 554,612

Int. Cl.^{6} C12N *15/09;* **C07H** *21/00*

U.S. Cl. 536—23.5 **4 Claims**

1. An isolated nucleic acid molecule encoding a prostaglandin $F_{2\alpha}$ receptor regulatory protein (FPRP) comprising the amino acid sequence of SEQ ID NO:1.

5,747,661

RETINOID-INDUCIBLE RESPONSE ELEMENTS

Ronald M. Evans, La Jolla, Calif.; David J. Mangelsdorf, Duncanville, and Patricia J. Willy, Dallas, both of Tex., assignors to Howard Hughes Medical Institute, Chevy Chase, Md.

Filed Jan. 13, 1995, Ser. No. 373,935

Int. Cl.^{6} C12N *15/85*

U.S. Cl. 536—24.1 **5 Claims**

1. An isolated nucleic acid comprising a retinoid-inducible response element wherein said response element has the sequence: 5'-GGTTTA-AATA-AGTTCA; SEQ ID NO:4.

5,747,662

METHODS AND COMPOSITIONS FOR SECRETION OF HETEROLOGOUS POLYPEPTIDES

Laura C. Simmons, Burlingame, and Daniel G. Yansura, Pacifica, both of Calif., assignors to Genentech, Inc., S. San Francisco, Calif.

Filed Mar. 1, 1995, Ser. No. 398,617

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—24.1 **11 Claims**

1. A variant of the STII secretion signal sequence having the nucleic acid sequence comprising:

5'-TCTAGAGGTTGAGGTGATTTT ATG AAA AAG AAT ATC GCA TTT CTT CTT GCA TCT ATG TTC GTT TTT TCT ATT GCT ACA AAC GCS TAT GCM 3' (SEQ ID NO:15, wherein Y at position 81 is C).

5,747,663

PROCESS FOR THE DEPLETION OR REMOVAL OF ENDOTOXINS

Metin Colpan, Essen; Peter Moritz, Kerpen, and Joachim Schorr, Düssedorf, all of Germany, assignors to Qiagen GmbH, Hilden, Germany

PCT No. PCT/EP95/00391, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/21179, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 3, 1995, Ser. No. 687,522

Claims priority, application Germany, Feb. 7, 1994, 44 03 692.2; Jun. 25, 1994, 44 22 291.2; Sep. 1, 1994, 44 31 125.2; Sep. 14, 1994, 44 32 654.8

Int. Cl.^{6} C12P *19/34;* **C12N** *1/06*

U.S. Cl. 536—25.4 **18 Claims**

1. A process for the depletion or removal of endotoxins from preparations containing active ingredients designated for therapeutic use which are obtained from natural sources by genetic engineering and/or biotechnology by treatment with chromatographic material, comprising the sequential steps of:

lysing said natural sources and, optionally, centrifugation of the lysed natural sources, filtration of the lysed natural sources, or subjecting the lysed natural sources to affinity chromatography, in order to remove coarse cell debris, to effect lysed material;

incubating said lysed material with an aqueous salt solution and detergents to effect a separation;

subjecting the separation to anion exchange chromatography by applying the preparation to an anion exchange material, washing the anion exchange material with an aqueous salt solution, different from the aqueous solution with which the lysed material was incubated, and eluting from the anion exchange material said active ingredients;

purifying the eluted active ingredients.

5,747,664

N-PHENYL-2-CYANO-3-HYDROXYCROTONAMIDE DERIVATIVES

Rudolf Schleyerbach, Hofheim am Taunus; Robert Ryder Bartlett, Darmstadt, both of Germany; Elizabeth Anne Kuo, and Edward James Little, both of Swindon, Great Britain, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

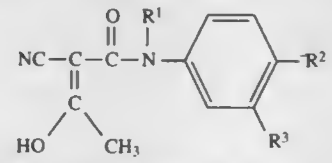
Continuation of Ser. No. 50,561, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 963,476, Oct. 21, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 350,740

Claims priority, application Germany, Oct. 23, 1991, 41 34 934.2

Int. Cl.^{6} C07C *255/17*

U.S. Cl. 558—392 **2 Claims**

1. An N-phenyl-2-cyano-3-hydroxycrotonamide of the formula I



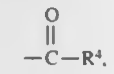
(I)

or its physiologically tolerable salts, in which

R^1 is:
  - a) a hydrogen atom or
  - b) (C_1–C_4)-alkyl, which is straight-chain or branched,

R^2 is a radical of the group:
  - a) $W(CH_2)_nCX_3$,
    - W is:
      - 1) an oxygen atom or
      - 2) a sulfur atom,
    - X is fluorine, chlorine, or iodine,
    - n is an integer from 1 to 3,
  - b) WCX_3,
    - W is:
      - 1) an oxygen atom or
      - 2) a sulfur atom,
    - X is fluorine, chlorine, or iodine,
  - c) CX_3, X is fluorine, chlorine, or iodine,
  - d) $(CH_2)_nCX_3$, X is fluorine, chlorine, or iodine, n is an integer from 1–3,
  - e) fluorine, chlorine, or iodine,
  - f) CN or
  - g) NO_2,

R^3 is (C_3–C_6)-cycloalkyl or



$$-\overset{\overset{\large O}{\|}}{C}-R^4.$$

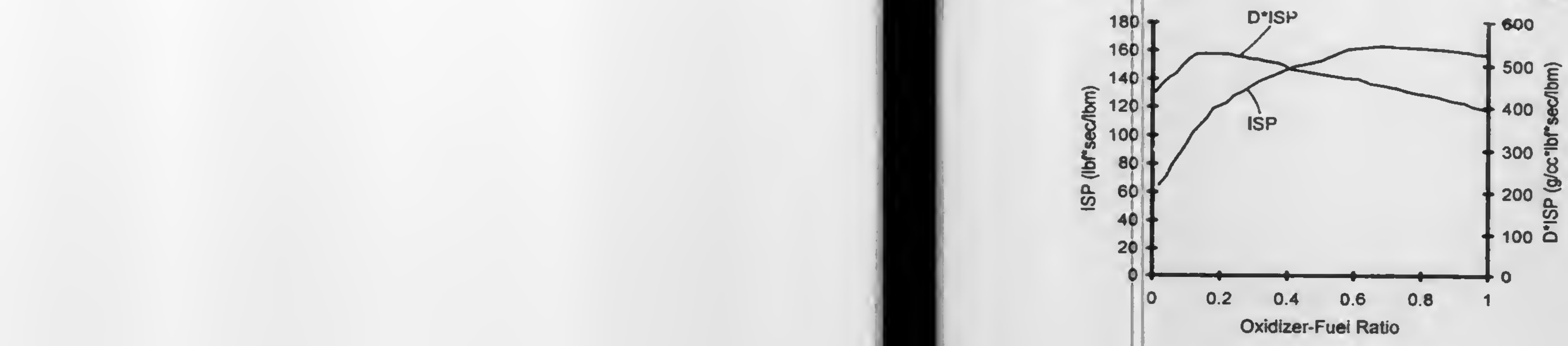
R^4 is:
  - 1) a hydrogen atom,
  - 2) (C_1–C_4)-alkyl, which is straight-chain or branched or,
  - 3) (C_3–C_6)-cycloalkyl.

5,747,665
TUNGSTEN AS A HYPERGOLIC FUEL GEL ADDITIVE
Darren M. Thompson, Madison, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1997, Ser. No. 850,732

Int. Cl.^{6} C06D *5/00*

U.S. Cl. 44—265 **4 Claims**



1. A thixotropic fuel gel composition comprising:

(i) tungsten having a particle size from about 0.5 micron to about 10 microns which is present in an amount from about 10 weight percent to about 92 weight percent of said thixotropic fuel gel composition;

(ii) a gellant of hydroxypropyl cellulose in an amount of 1.4% by weight;

(iii) an additive of dimethylurea in an amount of 0.1% by weight; and,

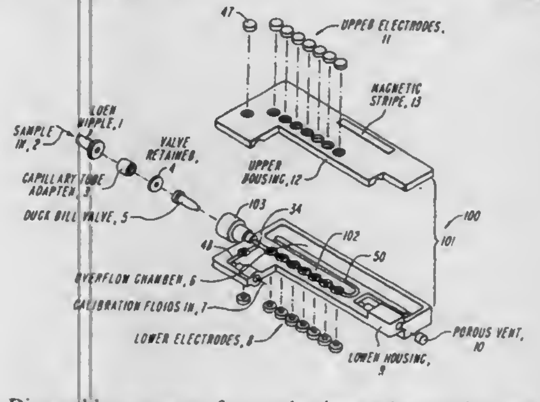
(iv) a liquid fuel of monomethylhydrazine in an amount from about 6.5 weight percent to about 88.5% weight percent.

5,747,666
POINT-OF-CARE ANALYZER MODULE
John P. Willis, 24 Whitney Rd., Shirley, Mass. 01464

Filed Mar. 26, 1997, Ser. No. 824,401

Int. Cl.^{6} G01C *17/38*

U.S. Cl. 73—1.02 **9 Claims**



1. Disposable apparatus for conducting patient testing and permitting multiple, two-point calibrated, test sequences, said apparatus comprising:

a disposable, sensing module having
  a sample receiving and analyzing station including
    a sample condition sensing electrode array operable to sequentially process a plurality of test sequences;
a calibration fluid connecting station, integral with said sensing module, for detachable connection to
  a first calibration fluid source; and
  a second calibration fluid source;
an analyte connecting station, integral with said sensing module, for detachable connection to an analyte source;
a flow passage network operable to sequentially transmit to said electrode array a test sequence set including
  an amount of a first calibration fluid from said first calibration fluid source;
  an analyte from said analyte source; and
  an amount of a second calibration fluid from said second calibration fluid source;
a sample and calibration fluid receiving chamber integral with said sensing module, said chamber being
  wholly internal of said sensing module,
  operable to receive and contain a plurality of said test sequence sets, and
  in continuous communication with said analyzing station;
said sensing module and integral sample and calibration fluid receiving chamber being separable from said first and second calibration fluid sources and disposable separately therefrom;
a first calibration fluid source detachably connected with said calibration fluid connecting station of said sensing module, with
  said first calibration fluid source being separable from said sensing module
  said sensing module being disposable separately from said first calibration fluid source and
  said first calibration fluid source being disposed externally of said sensing module;
a second calibration fluid source detachably connected with said calibration fluid connecting station of said sensing module, with
  said second calibration fluid source being separate from said first calibration fluid source,
  said second calibration fluid source being separable from said sensing module,
  said sensing module being disposable separately from said second calibration fluid source, and
  said second calibration fluid source being disposed externally of said sensing module;
said calibration fluid connecting station being disposed separately from and operably independent of, said analyte connecting station, with
  said calibration fluid connecting station being operable to receive calibration fluid from each of said first and second calibration fluid sources independent of said analyte connecting station; and
each of said first and second calibration fluid sources being disposed externally of, and separable from, said sensing module and integral sample and calibration fluid receiving chamber.

5,747,667
PARTICLE COUNTER VERIFICATION METHOD
Michael J. Sadar, Fort Collins, Colo., assignor to Hach Company, Loveland, Colo.

Filed May 19, 1997, Ser. No. 858,702

Int. Cl.^{6} G01N *15/02*

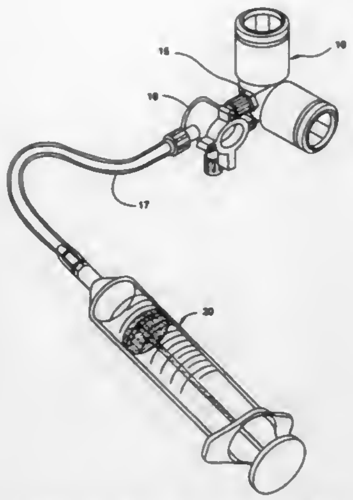
U.S. Cl. 73—1.02 **17 Claims**

1. A method for verifying the accuracy of the determination of an on-line particle counter without disconnecting it from a stream of liquid being tested, wherein the particle counter includes a detector capable of producing a display signal in response to the presence of a particle present in the liquid stream flowing past said detector, the method comprising the steps of:

(a) injecting a known volume of a liquid containing a known number and size of particles into said stream of liquid upstream from said detector within a defined period of time;

(b) observing the number of particles detected and displayed by said particle counter; and

(c) comparing the displayed number of particles prior to injection of said known volume of liquid with (i) the displayed



number of particles after said injection, and (ii) the known number of particles injected.

5,747,668

DIAGNOSTIC PROCESS FOR AN EXHAUST GAS SENSOR

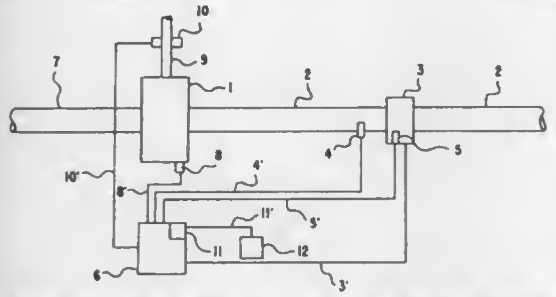
Wojciech Cianciara, Gruenthal, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1996, Ser. No. 699,224

Claims priority, application Germany, Aug. 17, 1995, 195 30 316.4

Int. Cl.^{6} F02B *77/08*

U.S. Cl. 73—1.06 **14 Claims**



14. A process for monitoring the functioning of an exhaust gas sensor disposed in a mixture-regulating circuit of an internal combustion engine, which comprises:

ascertaining a temperature of an exhaust gas sensor and comparing the temperature of the exhaust gas sensor with a temperature threshold value;

defining a first condition in which the temperature of the exhaust gas sensor exceeds the threshold value;

if the first condition is met, defining a second condition in which the temperature of the exhaust gas sensor remains above the temperature threshold value for a predetermined period of time or number of cycles;

outputting either a rich voltage representing a rich mixture composition or a lean voltage representing a lean mixture composition from the exhaust gas sensor as a function of a composition of a mixture to be supplied to the engine; and

if the first and second conditions are met during engine operation, evaluating the functioning of the exhaust gas sensor by:

detecting and comparing a value occurring for a rich voltage or a lean voltage with a respective diagnostic threshold value, and

concluding that the exhaust gas sensor is superannuated, if the respective diagnostic threshold value is not attained.

5,747,669

OXYGEN ELECTRODE AND ITS MANUFACTURE

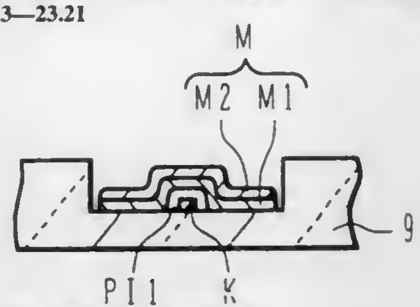
Hiroaki Suzuki, Tsukuba, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 18, 1996, Ser. No. 733,929

Claims priority, application Japan, Dec. 28, 1995, 7-342269; Sep. 4, 1996, 8-234415

Int. Cl.^{6} G01N *27/04;27/12;* **H05B** *03/06;* **A61B** *05/00*

U.S. Cl. 73—23.21 **39 Claims**



1. An oxygen electrode comprising:

an electrode substrate having an insulating surface;

a first electrode member formed on the insulating surface of said electrode substrate, said first electrode member including a first electrode, a first lead wire, and a first connection pad electrically connected together;

a second electrode member formed on the insulating surface of said electrode substrate, said second electrode member including a second electrode, a second lead wire, and a second connection pad electrically connected together;

an electrolyte layer disposed over said electrode substrate so as to form a conductive path between the first and second electrodes;

an oxygen permeable film disposed over said electrode substrate, covering said electrolyte layer;

first and second lead plates each having one end directly fixed to said electrode substrate;

a first connection member for connecting said first connection pad to said first lead plate;

a second connection member for connecting said second connection pad to said second lead plate; and

an insulating mold member surrounding around and fixed to said electrode substrate and covering said first and second connection pads, said each one end of said first and second lead plates, and said first and second connection members.

5,747,670

APPARATUS FOR DETECTING COMBUSTION STATE IN INTERNAL COMBUSTION ENGINE

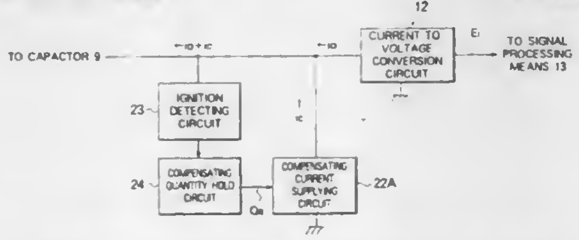
Yasuhiro Takahashi, and Wataru Fukui, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1996, Ser. No. 742,489

Claims priority, application Japan, Jun. 14, 1996, 8-154037

Int. Cl.^{6} G01L *23/22*

U.S. Cl. 73—35.08 **5 Claims**


12
TO CAPACTOR 9
←i0+ic
←i0
CURRENT TO VOLTAGE CONVERSION CIRCUIT
Ei
TO SIGNAL PROCESSING MEANS 13
23
IGNITION DETECTING CIRCUIT
ic
24
COMPENSATING QUANTITY HOLD CIRCUIT
Qn
COMPENSATING CURRENT SUPPLYING CIRCUIT
22A

1. An apparatus for detecting combustion state in an internal combustion engine including at least one engine cylinder, comprising:

at least one spark plug mounted in said engine cylinder;

an ignition coil for applying a high firing voltage to said spark plug for igniting an air-fuel mixture within said engine cylinder;

at least one high-voltage diode connected to one end of said spark plug for applying a bias voltage to said spark plug with a same polarity as that of said firing voltage;

bias voltage supply means for applying a bias voltage to said spark plug by way of said high-voltage diode;

ion current detecting means for detecting an ion current flowing through said spark plug under application of said bias voltage immediately after said ignition to thereby output an ion current detection signal;

an electronic control unit for determining combustion state of said internal combustion engine on the basis of said ion current detection signal; and

leakage current compensating means connected in parallel with said ion current detecting means,

wherein said leakage current compensating means supplies a compensating current for canceling out a leakage current flowing along a same path as said ion current, and

wherein said ion current detecting means outputs as said ion current detection signal only an ion current signal from which said leakage current has essentially been eliminated.

5,747,671

AXIAL FLOW PARTICLE SENSOR

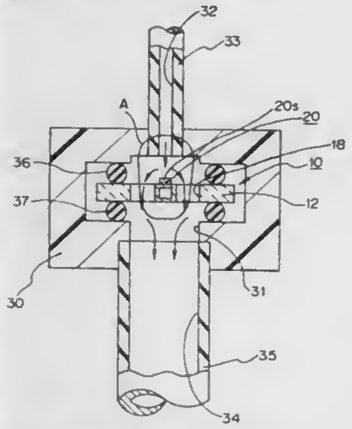
Toshikazu Hirota; Kazuyoshi Shibata, both of Nagoya, and Yukihisa Takeuchi, Nishikamo-gun, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 4, 1996, Ser. No. 726,172

Claims priority, application Japan, Oct. 20, 1995, 7-272205

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 73—61.75 **11 Claims**



1. An axial-flow particle sensor comprising:

a sensor element comprising a vibrating portion having a sufficient mass for responding to the collision of a solid particle in a fluid and a converter for detecting the vibration of said vibrating portion and converting the vibration to electric signals;

a housing for fixing said sensor element;

an inlet of fluid; and

an outlet of fluid;

wherein said outlet is located in the opposite side of said inlet relative to said sensor element, a throughhole is opened in at least a part of the circumference of said vibrating portion, and said vibrating portion of said sensor element is located at the extension of fluid flow formed at said inlet so that the fluid entering from said inlet flows through said throughhole and flows out from said outlet.

5,747,672

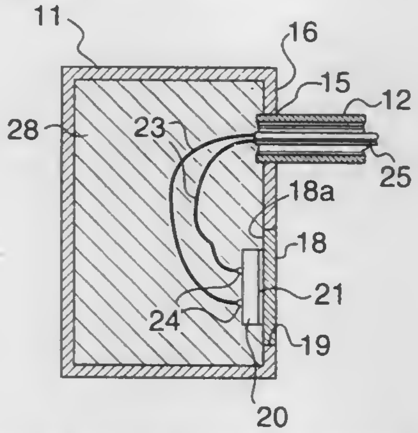
ULTRASONIC PROBES FOR USE IN HARSH ENVIRONMENTS

Luc Parent, Chicoutimi; Guy Peloquin, Jonquiere; Gilles Tremblay, St-Fulgence, and Andre Vaillancourt, Larouche, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 522,019, Aug. 31, 1995, abandoned. This application May 2, 1997, Ser. No. 850,642

Int. Cl.^{6} G01N *29/00*

U.S. Cl. 73—61.79 **9 Claims**



1. An ultrasonic device for detecting concentrations of solids or positions of solid/liquid interfaces in corrosive and scaling liquid media, comprising: at least one piezoelectric element provided with electrodes; electrical circuit elements connected to said electrodes for conveying electrical signals, in use, to and from control apparatus; an ultrasound-transparent window made of glassy carbon, said at least one piezoelectric element being adhered to an inner surface of said window; a matrix of epoxy resin embedding and surrounding said at least one piezoelecttric element and said electrodes while allowing ultrasonic waves to pass through said window to or from said at least one piezoelectric element; and an external protective cover forming an exterior of said device except at said window, said cover comprising natural rubber or a mixture of natural and synthetic rubber, having a porosity of less than 1%.

5,747,673

METHOD FOR MEASURING WITH GREAT PRECISION THE VOLUME VARIATION OCCURRING WHEN FLUID PHASES MIX IN ORDER TO DETERMINE PHYSICO-CHEMICAL CHARACTERISTICS

Philippe Ungerer, Creteil, and Jean-Fabrice Arnaud, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, and Elf Aquitaine Production, Courbevoie, both of France

Filed Sep. 27, 1996, Ser. No. 720,010

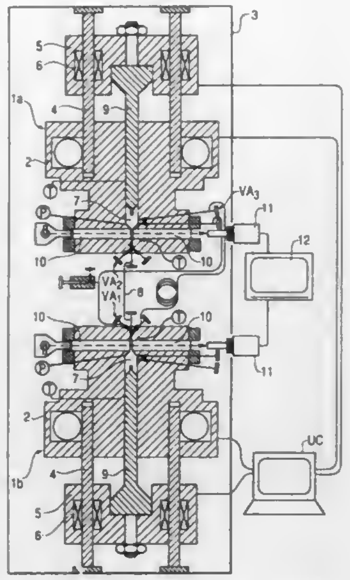
Claims priority, application France, Sep. 28, 1995, 95 11546

Int. Cl.^{6} G01N *33/20*

U.S. Cl. 73—61.41 **9 Claims**

1. A method for determining with precision a volume variation or excess volume (v^E) occurring when at least a liquid phase and at least a gas phase of a fluid mixture for determining physical-chemical parameters of the mixture, comprising using a containment cell placed in a thermostatically-controlled enclosure, including two independent chambers whose volumes can be modified by action of a motive means, and valves for controlling communication between the two chambers, detectors for measuring with precision volume variations of the two chambers and pressure detectors for measuring pressure respectively within the two chambers, wherein the excess volume (v^E) is determined by means of the steps:

a) molar volumes of respectively the liquid phase and the gas phase are determined, at an enclosure temperature, by feeding the gas and liquid phases respectively into the two chambers,



- for different pressure levels in the chambers obtained by action on the motive means,
- b) the valves are actuated and a homogeneous mixing of the phases is performed, and
- c) the motive means is operated so as to obtain the different pressure levels, and the volume variations between the volume of the gas and liquid phases after mixing and respective volumes of the two phases prior to mixing are measured by means of the detectors.

5,747,674

DEVICE FOR PERFORMING THERMODYNAMIC MEASUREMENTS ON MULTIPHASE FLUIDS AT VERY HIGH PRESSURES AND TEMPERATURES

Gérard Moracchini, Andilly; José Sanchez, Viarmes; Jean-Charles de Hemptinne, Vésinet, and Philippe Ungerer, Le Vésinet, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

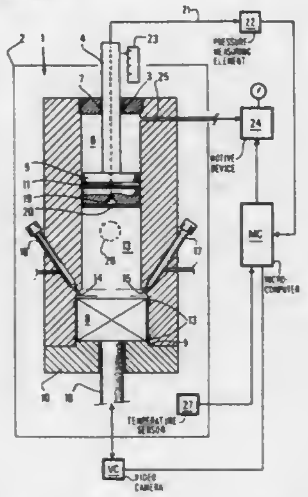
PCT No. PCT/FR95/01146, § 371 Date May 6, 1996, § 102(e) Date May 6, 1996, PCT Pub. No. WO96/07902, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 4, 1995, Ser. No. 640,740

Claims priority, application France, Sep. 9, 1994, 94 10784

Int. Cl.⁶ G01N *33/20*

U.S. Cl. 73—61.44 **21 Claims**



1. A device for measuring thermodynamic properties of a fluid sample at high pressures and high temperatures including a corrosive fluid sample comprising: a thermostatically controlled enclosure, a rigid containment body placed in the enclosure, provided with at least one elongated containment chamber of variable volume for containing the fluid sample, limited by a piston moving along a direction of elongation of the at least one elongated containment chamber and a control for controlling communications with outside of the at least one elongated containment chamber, a transparent block forming a terminal wall of one of the at least one elongated containment chamber, opposite the piston, a sealing device for fastening the transparent block to the rigid containment body, a display for viewing an inside of one of the at least one elongated chamber through the transparent block, a fluid control device including pipes controlled by valves, opening into the at least one elongated containment chamber in proximity of the transparent block and laterally shifted on either side of the direction of elongation of the at least one elongated containment chamber, and a device for selectively swivelling the at least one elongated containment chamber about a pin perpendicular to the direction of elongation of the at least one elongated containment chamber to shift an orifice of at least one of the pipes into or within a phase of the fluid sample.

5,747,675

METHOD FOR MEASURING THE THICKNESS OF A LAYER AND APPARATUS FOR CARRYING OUT THE METHOD

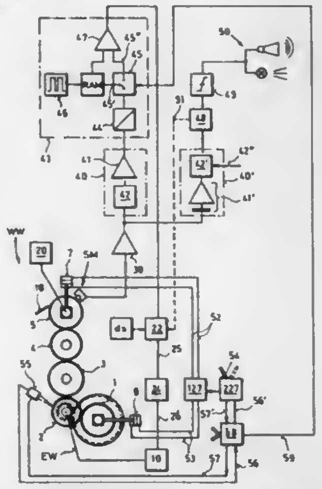
Hansueli Greminger, Niederuzwil, and Niklaus Schoenenberger, Herisau, both of Switzerland, assignors to Bühler AG, Uzwil, Switzerland

Continuation of Ser. No. 256,001, Jun. 13, 1994, Pat. No. 5,561,251. This application Mar. 18, 1996, Ser. No. 617,263

Claims priority, application Switzerland, Oct. 30, 1992, 3386/92

Int. Cl.⁶ B23Q *17/09*

U.S. Cl. 73—104 **5 Claims**



1. A measuring apparatus for measuring thickness of a layer of pasty ground material spread over a supporting surface moving with a support velocity and said layer having a free material surface, said measuring apparatus comprising:

- at least one measuring roll with a least one roll axis oriented crosswise to the direction of said support velocity, each measuring roll having a roll diameter and an outer roll surface rolling on top of said pasty layer, and each measuring roll having a contact area, wherein said outer roll surface is in contact with said free material surface which is moving with a free surface velocity corresponding to the support velocity;
- at least one holding means for holding each of said roll axis at a variable distance from said supporting surface, said holding means including at least one support means allowing movement of said at least one measuring roll normal to said supporting surface at said contact area;
- at least one excursion detector means for deducing a signal representative of at least one of the position and the movement of said at least one measuring roll relative to said supporting surface;
- means for filtering the signal to obtain waviness of the material surface; and
- means for comparing an amplitude of the waviness with a threshold.

5,747,676

METHOD AND DEVICE FOR DETERMINING THE SURFACE CONTOUR IN AN ELASTIC SEAT CUSHION DEFORMABLE FOR UNDER LOAD

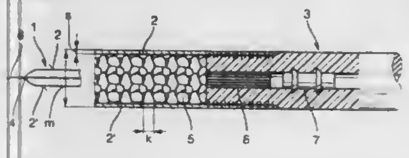
Eberhard Faust, Stuttgart; Wolfram Judenhahn, Leutenbach; Lothar Kassing, Nufringen; Karl Pfahler, Stuttgart, and Reiner Renz, Ostelsheim, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

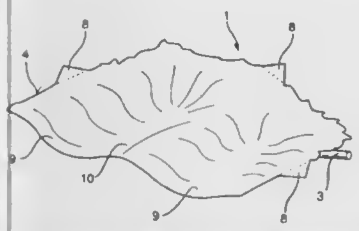
Filed Jan. 21, 1997, Ser. No. 786,447

Claims priority, application Germany, Jan. 20, 1996, 196 01 972.9

Int. Cl.⁶ G01B *5/28*

U.S. Cl. 73—105 **15 Claims**





1. A method for determining a surface contour of an elastic seat cushion, said contour being deformed under a load applied by a person seated on the seat cushion, the method comprising the steps of:

- placing a measuring mat on a surface of the seat cushion to be measured while in an unloaded state, said measuring mat being flexible in a pneumatically unloaded state while possessing a low natural rigidity in said pneumatically unloaded state, and being made rigid in any desired deformed state by applying a vacuum such that said desired deformed state of the measuring mat is preserved;
- after said placing step, applying a load to the seat cushion via one of a test subject sitting on said measuring mat and seat cushion and a seat punch simulating a sitting process;
- as a result of said applied load, deforming the measuring mat along with said seat cushion;
- applying a vacuum to the measuring mat so as to make the measuring mat rigid such that the deformed state of the measuring mat obtained corresponding to a deformed surface of the seat cushion is preserved before the load is released from the mat and seat cushion;
- after the test subject or the seat punch is removed from the measuring mat and seat cushion, removing the measuring mat from the seat cushion, said mat now being in a three-dimensionally deformed shape-fixed condition; and
- measuring the surface contour of said three-dimensionally deformed shape-fixed condition of the measuring mat via a multicoordinate measuring device.

5,747,677

APPARATUS AND METHOD FOR DETECTING PRESSURE IN AN ENGINE CYLINDER

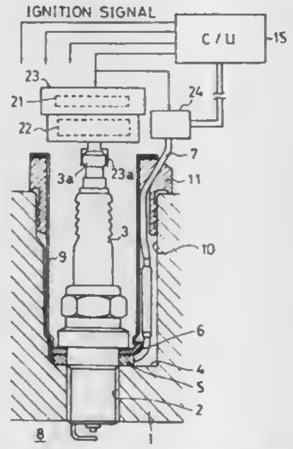
Naoki Tomisawa, and Kenichi Mori, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Continuation of Ser. No. 444,096, May 18, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 766,936

Claims priority, application Japan, May 27, 1994, 6-114997

Int. Cl.⁶ G01M *15/00*

U.S. Cl. 73—115 **7 Claims**



1. An apparatus for detecting pressure in an engine cylinder, comprising:

- a cylinder pressure sensor adapted to be inserted between an ignition plug screwed into an engine cylinder head and a bearing surface on which the ignition plug is mounted, the sensor outputting a detection signal corresponding to change in the pressure in the cylinder;
- a power transistor adapted to receive an ignition signal for controlling current to an ignition coil;
- a delay circuit adapted to receive the ignition signal that controls the power transistor for delaying the ignition signal and generating a masking signal for masking the detection signal from said cylinder pressure sensor; and
- a ground circuit for grounding an output line carrying the detection signal from the cylinder pressure sensor in response to the masking signal generated by the delay circuit.

5,747,678

METHOD FOR DETECTING CRANKSHAFT OSCILLATIONS

Anton Angermaier, Thann, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 8, 1995, Ser. No. 555,282

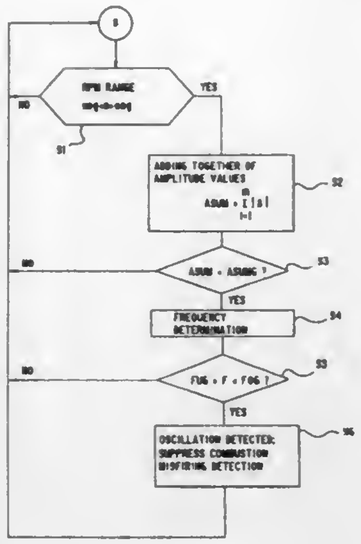
Claims priority, application European Pat. Off., Nov. 8, 1994, 94117627

Int. Cl.⁶ G01N *15/00*

U.S. Cl. 73—116 **8 Claims**

1. A method for detecting oscillations of a crankshaft of an internal combustion engine, which comprises:

- determining if an engine is within a predetermined rpm range;
- ascertaining an amplitude of a crankshaft vibration if the engine is within the predetermined rpm range;
- determining if the amplitude is greater than a limit value;
- ascertaining a frequency of the crankshaft vibration if the amplitude is greater than the limit value;
- determining if the frequency is within a predetermined frequency range; and
- ascertaining an oscillation of the crankshaft and suppressing for a predeterminable period of time a process for detecting combustion misfires by evaluating fluctuations in the crankshaft speed, if the frequency is within the predetermined frequency range.


RPM RANGE
NO
YES
S1
ADDING TOGETHER OF AMPLITUDE VALUES
ASUM = Σ |a|
S2
ASUM > ASUMG ?
S3
FREQUENCY DETERMINATION
S4
FUG < F < FOG ?
S5
OSCILLATION DETECTED; SUPPRESS COMBUSTION MISFIRING DETECTION
S6

5,747,679
METHOD FOR DETECTING COMBUSTION MISFIRES

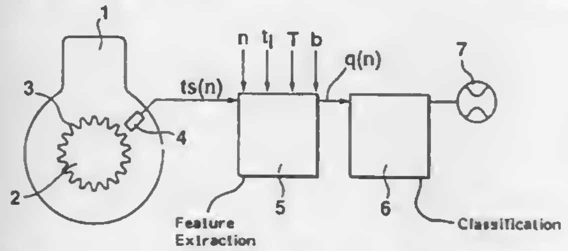
Hartmut Dietz, Stuttgart; Klaus Ries-Müller, Bad Rappenau, and Jürgen Förster, Chemnitz, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 25, 1996, Ser. No. 707,495

Claims priority, application Germany, Sep. 25, 1995, 195 35 376.5; Aug. 16, 1996, 196 32 903.5

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—116 **2 Claims**



1. A method for detecting misfires in the combustion of a z-cylinder four stroke internal combustion engine, the engine including a transducer wheel coupled to the crankshaft of the engine and rotating in phase synchronism with said crankshaft, the method comprising the steps of:

- causing said transducer wheel to have z/2 segments;
- scanning said segments with a sensor device to supply a segment-time signal reflecting the nonuniformity of the rotational movement of the crankshaft with respect to individual ones of the cylinders of the engine;
- forming rough-running values for each cylinder on the basis of the segment times with each of said rough-running values including a component occurring at the frequency of said crankshaft;
- filtering out said component by forming differences between segment times which are assigned to the same transducer wheel segment;
- then, comparing the filtered rough-running value to a threshold value;
- determining a misfire to be present when said filtered rough-running value exceeds said threshold value;
- for an even number of cylinders, detecting a segment time for each ignition;
- for an uneven number of cylinders, additionally detecting the segment time for the mechanically same segment shifted by one crankshaft revolution; and,
- forming the difference of segment times, which segment times were detected for segments each shifted by 360° crankshaft angle.

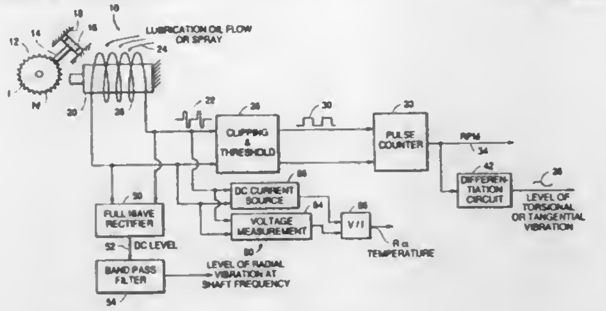
5,747,680
MULTIPLE PARAMETER SENSOR AND METHOD OF OPERATION THEREOF

Malcolm J. McArthur, Escondido, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 10, 1996, Ser. No. 630,572

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—117.3 **24 Claims**



1. A multiple parameter sensor comprising:

- a first part for rotation with a rotating member having a speed of rotation to be measured;
- a second part for generating a first signal in response to rotation of the rotating member, the second part being adapted to be mounted in a fixed position adjacent the first part and in response to the first signal producing a second signal representing the speed of rotation of the rotating member; and wherein
- the second part includes at least one circuit responsive only to the first signal with each circuit producing an additional signal, which is different than the first signal, with each additional signal being an output of one additional parameter of operation of a device associated with the rotating member; and
- each circuit modifies at least one frequency band of the first signal in producing the output signal.

5,747,681
COMBUSTION STATE-DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

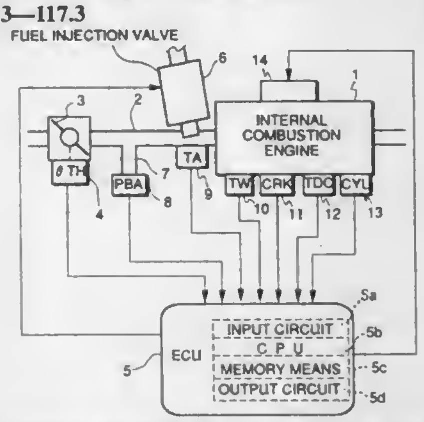
Shigetaka Kuroda, and Yuichi Shimasaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 322,506, Oct. 14, 1994, abandoned. This application Feb. 14, 1997, Ser. No. 801,926

Claims priority, application Japan, Oct. 15, 1993, 5-282024

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—117.3 **15 Claims**



1. A combustion state-detecting system for an internal combustion engine having at least one spark plug, and a crankshaft, comprising:

- crank angle signal-generating means for generating a crank angle signal with a predetermined period shorter than a firing period of said spark plug whenever said crankshaft rotates through a predetermined angle;

- engine speed-detecting means for detecting a value of rotational speed of said engine whenever said crank angle signal is generated;
- averaging means for continuously averaging values of the rotational speed of said engine which are detected by said engine speed-detecting means whenever said crank angle signal is generated to obtain an average value of rotational speed, over one rotation of the crankshaft at each predetermined angle of said crankshaft;
- difference amount-calculating means for calculating a difference amount between an updated value of said average value at one predetermined angle of said crankshaft calculated by said averaging means and a value of said average value calculated by said averaging means at a predetermined angle of said crankshaft corresponding to half a rotation of said crankshaft earlier; and
- combustion state-detecting means for detecting a combustion state of said engine based on said difference amount.

5,747,682
APPARATUS FOR DETERMINING AN ESTIMATED QUANTITY OF A STATE OF MOTION OF A VEHICLE

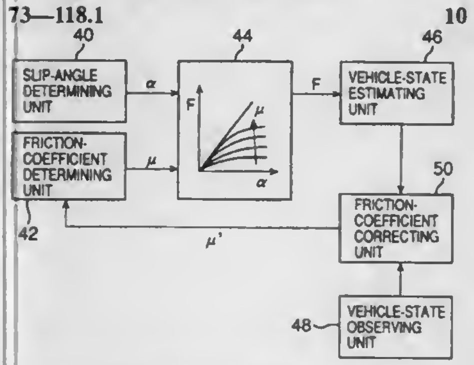
Yutaka Hirano, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 5, 1996, Ser. No. 743,225

Claims priority, application Japan, Nov. 24, 1995, 7-306281

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—118.1 **10 Claims**


40
44
46
SLIP-ANGLE DETERMINING UNIT
α
F
μ
VEHICLE-STATE ESTIMATING UNIT
FRICTION-COEFFICIENT DETERMINING UNIT
50
FRICTION-COEFFICIENT CORRECTING UNIT
42
μ'
48
VEHICLE-STATE OBSERVING UNIT

1. An apparatus for determining an estimated quantity of a state of motion of a vehicle, comprising:

- slip-angle determining means for determining a slip angle of a wheel of the vehicle;
- friction-coefficient determining means for determining a friction coefficient between a tire of the wheel and a road;
- tire characteristics means for generating a lateral force on the wheel from the slip angle and the friction coefficient based on predetermined tire characteristics;
- vehicle-state estimating means for determining an estimated quantity of the state of motion of the vehicle based on the lateral force from said tire characteristics means;
- vehicle-state observing means for detecting an observed quantity for the estimated quantity determined by said vehicle-state estimating means; and
- friction-coefficient correcting means for correcting the friction coefficient determined by said friction-coefficient determining means, based on a difference between the observed quantity and the estimated quantity, so that the lateral force output from said tire characteristics means is corrected by said corrected friction coefficient.

5,747,683
METHOD FOR DRIVE STABILITY ENHANCEMENT OF MULTI-UNIT VEHICLES

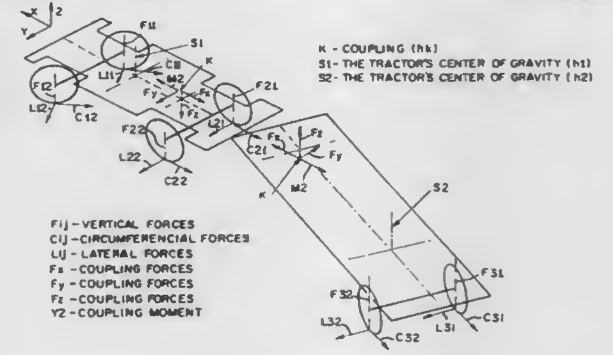
Eduard Gerum, Rosenbeim, Germany; Palkovics Laszlo, Budapest, Hungary; Akos Semsey, Budapest, Hungary, and Gabor Barta, Budapest, Hungary, assignors to Knorr-Bremse Systeme Fur Nutzfahrzeuge GmbH, Munich, Germany

Filed Feb. 27, 1997, Ser. No. 805,672

Claims priority, application Germany, Feb. 27, 1996, 96102864.4

Int. Cl.^{6} G01M *15/00;* G05B *19/00*

U.S. Cl. 73—118.1 **15 Claims**



1. A method of obtaining, in a combined vehicle control system, state variables of a towed vehicle of said vehicle combination which includes said towed and a towing vehicle coupled at a hitch and having sensors on said towing vehicle, the method comprising:

- adaptively estimating combined vehicle parameters, including hitch angle and hitch angle rate, using measured signals from said sensors on said towing vehicle;
- adaptively modeling combined vehicle parameters, including hitch angle and hitch angle rate, using measured signals from said sensors on said towing vehicle; and
- adaptively calculating state variables of said towed vehicle using said estimated combined vehicle parameters, said modeled combined vehicle parameters and said measured signals from said sensors.

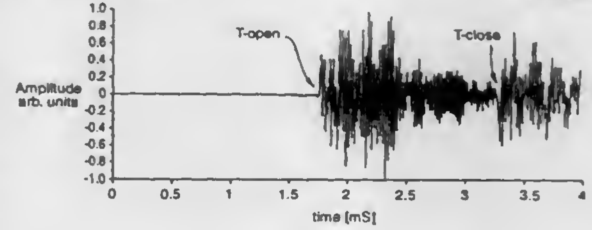
5,747,684
METHOD AND APPARATUS FOR ACCURATELY DETERMINING OPENING AND CLOSING TIMES FOR AUTOMOTIVE FUEL INJECTORS

Jeffrey B. Pace, Newport News; Vernon R. Warner, Wicomico, and Danny O. Wright, Cobbs Creek, all of Va., assignors to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Jul. 26, 1996, Ser. No. 686,935

Int. Cl.^{6} G01M *15/00;* G01L *3/26*

U.S. Cl. 73—119 A **6 Claims**



1. A method of determining opening and closing times of a fuel injector, the method comprising:

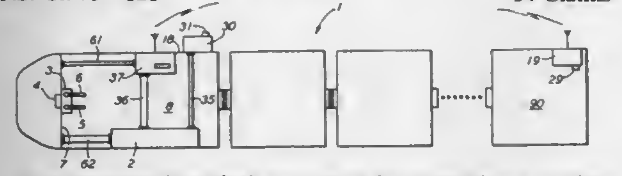
- (a) recording an accelerometer trace of a fuel injector stroke; and
- (b) determining the energy content of the accelerometer trace in accordance with the relation:

$$E(t) \equiv \lim_{t\to\infty} \int_{-T}^{T} [x(t)]^2 dt$$

(c) selecting a known point in time prior to opening or closing of the fuel injector;
(d) selecting a known point in time after opening or closing of the fuel injector; and
(e) determining the opening or closing time in accordance with a distance between a line connecting the known points prior to and after opening or closing of the fuel injector and the energy content, wherein the opening or closing time is the time at which the distance is maximum.

5,747,685
AUTOMATED TERMINAL TEST PROCEDURE

Elmer T. Skantar, East Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Jul. 20, 1995, Ser. No. 504,642
Int. Cl.^{6} B60T *17/22*
U.S. Cl. 73—121 **14 Claims**

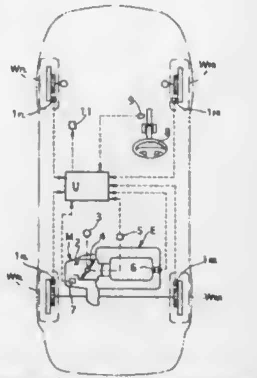


1. An automated terminal test system for conducting a terminal test of brake equipment on a train, such brake equipment being computer controlled and including a brake and a brake pipe; said system comprising:
(a) a test control box linkable to such computer controlled brake equipment of such train, said test control box having a control for activating said test control box and for applying and releasing such brake and for charging and venting such brake pipe upon appropriate manipulation;
(b) an end of train transceiver means connected to such brake pipe on a last railcar of such train for monitoring pressure within such brake pipe on such last railcar and for sensing movement of such last railcar and for communicating signals representative of such pressure monitored and such movement sensed;
(c) a head of train transceiver means linked to such computer controlled brake equipment and connected to such brake pipe on such head of train locomotive for monitoring pressure within such brake pipe on a head of train locomotive and for transmitting to such computer controlled brake equipment data pertaining to such pressure within such brake pipe on such head of train locomotive and for relaying to such computer controlled brake equipment data received from said end of train transceiver means pertaining to such pressure within such brake pipe on such last railcar and such movement of such last railcar; and
(d) a display means connected to such computer controlled brake equipment for displaying a plurality of information including such brake pipe pressure data generated by said head of train and said end of train transceiver means, such last railcar motion data generated by said end of train transceiver means, an indication of activation of said brake release initiator of said end of train transceiver means, and a terminal test mode message when such computer controlled brake equipment is operated in a terminal test mode, such computer controlled brake equipment being in said terminal test mode upon activation of said test control box;

wherein through such appropriate manipulation of said control, a railyard worker can apply and release such brake automatically and charge and vent such brake pipe automatically from outside such train.

5,747,686
TIRE PRESSURE-REDUCTION DETERMINING SYSTEM FOR WHEELS OF A VEHICLE

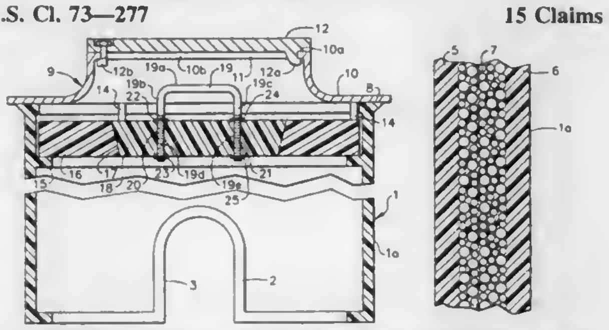
Takashi Nishihara; Shuji Shiraishi; Osamu Yamamoto, all of Saitama, and Osamu Yano, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 9, 1996, Ser. No. 729,235
Claims priority, application Japan, Oct. 11, 1995, 7-262684
Int. Cl.^{6} B60C *23/00;* **F02D** *29/02*
U.S. Cl. 73—146.2 **4 Claims**



1. A tire pressure-reduction determining system for wheels of a vehicle, comprising:
a driven wheel slip rate calculating means (M1) for calculating driven wheel slip rates (λL and λR) based on follower wheels speeds (VWNL and VWNR) and driven wheel speeds (VWDL and VWDR);
a driven wheel torque calculating means (M2) for calculating a driven wheel torque (TQDW) based on an engine torque;
a driven wheel slip rate estimating means (M4) for estimating a characteristic variation in driven wheel slip rates (λL and λR) relative to the driven wheel torque (TQDW) based on the driven wheel slip rates (λL and λR) and the driven wheel torque (TQDW);
a rotation-number ratio calculating means (M5) for calculating rotation-number ratios (CVWL and CVWR) between follower wheels (W_{FL} and W_{FR}) and driven wheels (W_{RL} and W_{RR}) said driven wheel slip rates (λL and λR) at the time when the driven wheel torque is zero, from said variation characteristic estimated by said driven wheel slip rate estimating means (M4); and
a tire pressure-reduction determining means for determining a reduction in pressure of tires fitted to the follower wheels (W_{FL} and W_{FR}) and tires fitted to the driven wheel (W_{RL} and W_{RR}) by comparing the rotation-number ratios (CVWL and CVWR) calculated by said rotation-number ratio calculating means (M5) with a predetermined reference value.

5,747,687
IN-GROUND RECEPTACLE FOR FLUID METER AND VALVES

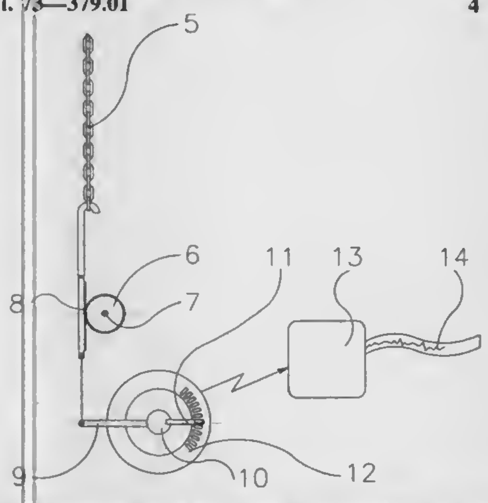
Daniel J. Edwards, and Mark J. Edwards, both of Mt. Sterling, Ky., assignors to Mid-States Plastics, Inc., Mt. Sterling, Ky.
Filed Mar. 11, 1996, Ser. No. 613,872
Int. Cl.^{6} G01F *15/10;15/14*
U.S. Cl. 73—277 **15 Claims**



1. An in-ground receptacle for at least one of a fluid meter and a valve, said receptacle comprising a continuous wall defining a chamber for said at least one of said fluid meter and said valve, said wall comprising a co-molded structure having a smooth plastic inner layer, a smooth plastic outer layer and an intermediate plastic layer having high thermal insulative properties, said receptacle having an upper end and a lower end, and an openable closure for said upper end of said receptacle permitting inspection of and access to said at least one of said fluid meter and said valve.

5,747,688
DYNAMOMETER FOR DETERMINING HUMAN FORCE

Yuriy Krementsov, 110-11 Queens Blvd., Forrest Hills, N.Y. 11375
Filed Oct. 15, 1996, Ser. No. 730,034
Int. Cl.^{6} G01L *3/24*
U.S. Cl. 73—379.01 **4 Claims**

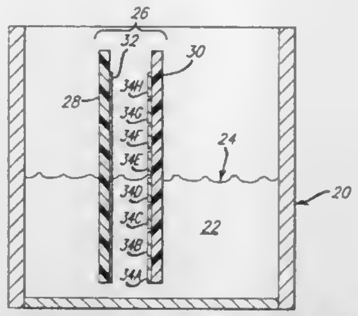


1. A dynamometer for determining a force applied by a human, comprising a pulling element adapted to be pulled by a user; indicating means indicating a force applied by a user to said pulling element; transmission means for connecting said pulling element with said indicating means so that said indicating means indicate the force in response to the application of force by a user to said pulling element; and means for recording a course of changes of the force over time and connected with said transmission means, said signal producing means being formed as a rheostat having a handle connected with said first transmission element; a central core provided with an electrical contact and turnable by said handle, and an outer ring having a changing radial cross-section and contactable by said contact upon the displacement of said first transmission element, so that when said electrical contract is turned and provides a contact between said core and different portions of said ring having a different thicknesses said signal producing means produce different electrical signals and supply them to said strip-chart recorder.

5,747,689
FLUID LEVEL SENSING SYSTEM

Richard Joseph Hampo, Livonia; Paul Theodore Momcilovich, Carleton, and Ross Maxwell Stuntz, Birmingham, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Dec. 9, 1996, Ser. No. 762,083
Int. Cl.^{6} G01F *1/56*
U.S. Cl. 73—304 C **14 Claims**

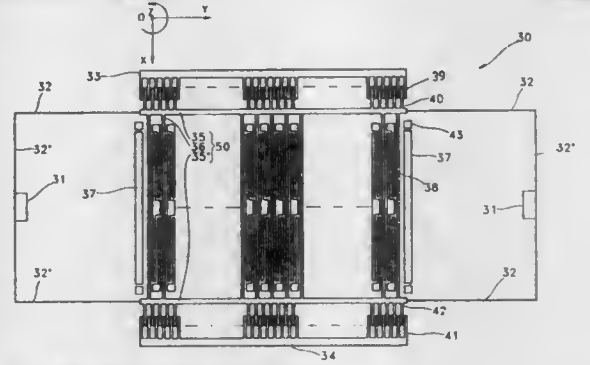
1. A method for measuring fluid level using a sensor comprising a first plate having continuous electrically conductive material and a second plate having electrically conductive material disposed in segments, said electrically conductive material of said first plate in opposition to said electrically conductive material of said second plate, said method comprising:



immersing said sensor in said fluid with at least one said segment completely immersed in said fluid and at least one said segment completely out of said fluid;
sequentially energizing said segments; and
detecting times of voltage transitions of a first signal at said first plate, relative to said sequential energizing of said segments, as an indication of said fluid level;
wherein said step of detecting times of voltage transitions further comprises eliminating negative-going portions of said first signal to create a positive signal; and
wherein said step of detecting times of voltage transitions further comprises inverting said positive signal to create an inverted signal and combining said inverted signal and said first signal to create a bipolar signal.

5,747,690
VIBRATORY MICROGYROSCOPE

Kyu-yeon Park; Chong-won Lee; Young-ho Cho, all of Taejon, and Ci-moo Song, Sungnam, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, and Korea Advanced Institute of Science and Technology, Taejon, both of Rep. of Korea
Filed Dec. 26, 1996, Ser. No. 773,990
Claims priority, application Rep. of Korea, Dec. 27, 1995, 95-59491
Int. Cl.^{6} G01P *9/00*
U.S. Cl. 73—504.12 **7 Claims**

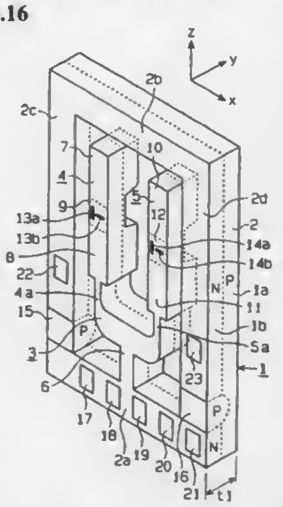


1. A microgyroscope comprising:
a substrate;
a vibratory structure having first and second stripe portions disposed in parallel with each other in which first and second combs are formed at one side of said first and second stripe portions respectively, and a plurality of connecting portions for connecting said first and second stripe portions;
elastic means for elastically supporting said vibratory structure to be spaced from said substrate at a predetermined gap;
driving means, having a third comb interposed between said first comb of said first stripe portion, for applying said vibratory structure in one direction due to an electrostatic force;
sensing means, having a fourth comb interposed between said second comb of said second stripe portion, for sensing the movement of said vibratory structure driven by said driving means through a change of capacitance; and
a plurality of sensing electrodes, disposed between said connecting portions of said vibratory structure on the same plane as that of said vibratory structure to be spaced from said sub-

OL
2 10
SS
1
MY
5
998
MI

strate at a predetermined gap, for sensing displacement of said vibratory structure due to Coriolis force through a change of capacitance.

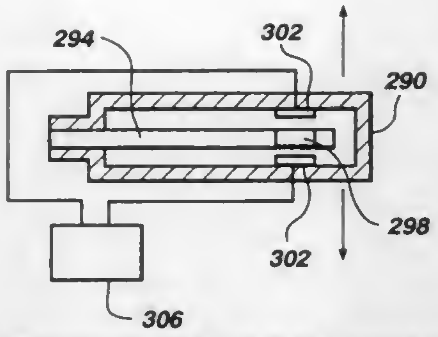
5,747,691
ANGULAR VELOCITY SENSOR APPARATUS
Yoshimi Yoshino, Anjo, and Kenzi Kato, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Mar. 7, 1996, Ser. No. 612,394
Claims priority, application Japan, Mar. 8, 1995, 7-048848
Int. Cl.^{6} G01P *3/44*
U.S. Cl. 73—504.16 **31 Claims**



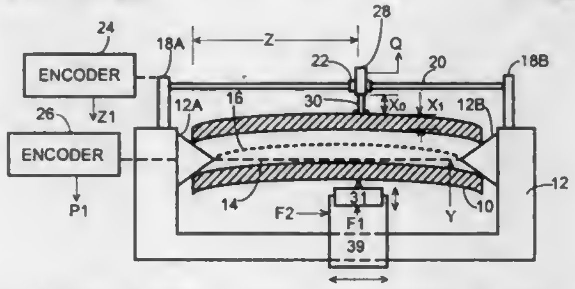
1. An angular velocity sensor apparatus comprising:
a vibratory element having arms in a tuning-fork shape extending parallel to each other, said vibratory element being composed of semiconductor substance, each of said arms having a thin portion disposed between thick portions so that said arm is capable of bending at said thin portion in a direction perpendicular to a plane including said arms;
an exciting means for exciting said vibratory element so that said arms of said vibratory element vibrate in an excitation direction in said plane and perpendicular to said arms; and
strain sensitive elements disposed on said thin portions of said respective arms, each of said strain sensitive elements detecting a bend of said respective arms responsive to an applied angular velocity.

5,747,692
SENSOR SYSTEM FOR DETERMINING ACCELERATION
Stephen C. Jacobsen, and David L. Wells, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah
Division of Ser. No. 480,018, Jun. 7, 1995, Pat. No. 5,594,330, which is a division of Ser. No. 898,216, Jun. 12, 1992, Pat. No. 5,481,184, which is a continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882, which is a continuation-in-part of Ser. No. 647,659, Jan. 28, 1991, Pat. No. 5,106,455. This application Nov. 7, 1996, Ser. No. 745,000
Int. Cl.^{6} G01P *15/08*
U.S. Cl. 73—514.25 **2 Claims**

1. A system for determining acceleration comprising
a housing having an inside wall,
an elongate flexible rod disposed in the housing, one end being attached to the housing and the other end being free to move when the housing is accelerated, and
means disposed on the inside wall of the housing for determining the direction and degree of movement of the rod when the housing is accelerated.



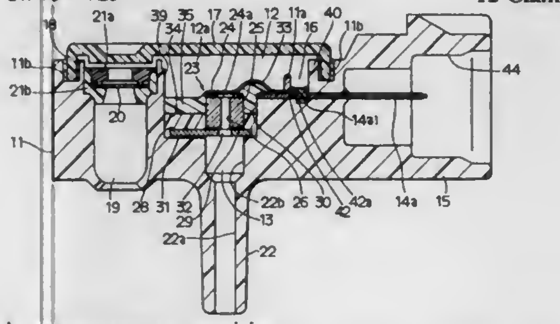
5,747,693
SYSTEM FOR TAKING TRANSVERSE MEASUREMENTS
Agostino Abbate, Clifton Park; Julius Frankel, Renssalaer, and Mark Doxbeck, Troy, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. No. 540,617, Oct. 25, 1995, abandoned, which is a continuation of Ser. No. 373,126, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 972,340, Nov. 6, 1992, abandoned. This application Sep. 4, 1996, Ser. No. 707,362
Int. Cl.^{6} G01N *29/10*
U.S. Cl. 73—622 **17 Claims**



1. A system for taking transverse measurements of a gun barrel with a coaxial bore, and for machining a cylindrical outer surface of said gun barrel while monitoring straightness and wall thickness, comprising;
base means for rotatably holding said gun barrel;
mandrel means operatively connected to said base means for rotating said gun barrel about a predetermined axis of rotation;
carriage means operatively attached to said base means for linearly moving said carriage means parallel to said predetermined axis of rotation;
linear shaft encoder means for providing a linear signal indicating the position of said carriage means relative to said base means;
base shaft encoder means operatively coupled to said mandrel means for providing a digital signal indicating the angular rotation of said gun barrel;
ultrasonic assembly means operatively mounted on said carriage means and which linearly moves with said carriage and which comprises;
(a) stream means for projecting a stream of liquid against said cylindrical outer surface of said gun barrel;
(b) ultrasonic transducer means for transmitting an ultrasonic wave into said stream of liquid and for detecting an ultrasonic wave returning in said stream of liquid, said ultrasonic transducer means having a transducer terminal for exchanging signals signifying the occurrence of ultrasonic waves transmitted into and returning from said stream;

tool support means horizontally slideably positioned on said base means operatively for holding a tool for machining said gun barrel in response to signals received from said ultrasonic transducer means;
control means electrically coupled to said transducer terminal for (a) exchanging signals with said ultrasonic transducer means, (b) initiating transmission of an ultrasonic wave into said stream, and (c) receiving a signal signifying return of ultrasonic waves in said stream, said control means being operable to provide a sense signal signifying the operation of said ultrasonic assembly means; and signal processing means electrically coupled to said carriage means and said control means for providing in response to said linear signal from said linear shaft encoder means and said sense signal, an evaluation signal signifying the dimensioning of said gun barrel.

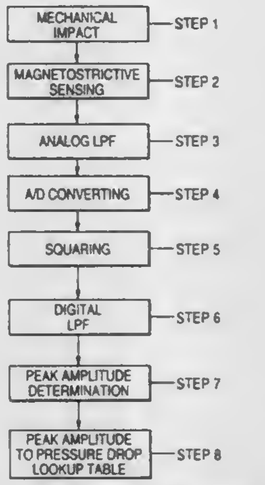
5,747,694
PRESSURE SENSOR WITH BARRIER IN A PRESSURE CHAMBER
Horonobu Baba, Obu; Tiaki Mizuno, Toyota; Masahito Imai, Chita; Yuichi Yokoyama; Masaki Takakuwa, both of Toyohashi, and Yasuki Shimoyama, Nukata-gun, all of Japan, assignors to Nippondenso Co., Ltd., Japan
Filed Jul. 26, 1996, Ser. No. 686,601
Claims priority, application Japan, Jul. 28, 1995, 7-193883; Jul. 28, 1995, 7-193884; Jul. 31, 1995, 7-195598
Int. Cl.^{6} G01L *9/00*
U.S. Cl. 73—723 **12 Claims**



1. A pressure sensor comprising:
a resin housing forming a reference pressure chamber and a measurement pressure chamber, said housing having a barrier wall disposed to define, in said reference pressure chamber, a main chamber and a subchamber on opposite sides of said barrier wall, said measurement pressure chamber being opposite to said main chamber, said reference pressure chamber having an inlet for introducing an atmospheric air thereinto;
a pressure sensitive element fixed to said resin housing to define said main chamber and said measurement pressure chamber, said pressure sensitive element having a distortion detection portion;
a terminal integrally formed by an insert molding for penetrating said barrier wall and said resin housing, a first end portion thereof being located at said main chamber, a second end portion thereof being exposed to an outside of said resin housing, a part of said terminal between said first and second end portions being located at said subchamber;
a wire for electrically connecting said distortion detection portion to said first end portion of said terminal; and
a gel potted into said main chamber in such a manner that said gel covers said pressure sensitive element, said wire and said first end portion of said terminal.

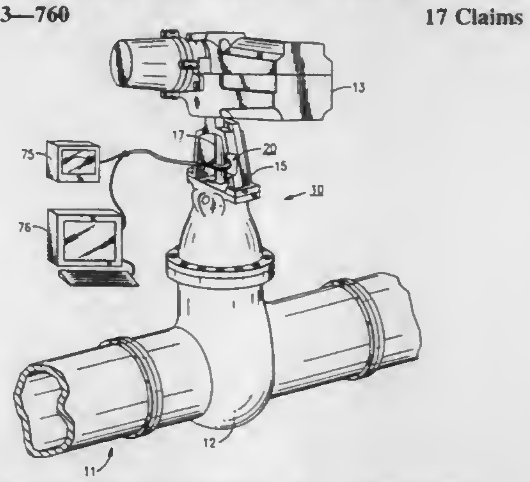
5,747,695
Patent Not Issued For This Number

5,747,696
METHOD OF NON-INVASIVELY MONITORING PRESSURE OF A COMPRESSED GAS IN A CLOSED CONTAINER
Hegeon Kwun, San Antonio, Tex.; Michael Allen Piskie, Royal Oak, and Tony Gloutsos, Brighton, both of Mich., assignors to Temic Bayern-Chemie Airbag GmbH, Aschau, Germany
Filed Oct. 28, 1996, Ser. No. 738,498
Int. Cl.^{6} G01L *9/10*
U.S. Cl. 73—728 **18 Claims**



1. A method for non-invasively monitoring a pressure of a compressed gas inside a closed container having an outside wall, comprising:
forming a magnetic circuit through a portion of the outside wall of the container;
generating a transient stress in the outside wall of the container;
detecting magnetic flux amplitude changes in the magnetic circuit created by the transient stress in the outside wall of the container;
producing data representing the magnetic flux amplitude changes; and
monitoring pressure changes from a nominal pressure by evaluating the data representing the magnetic flux amplitude changes.

5,747,697
VALVE STEM THRUST MEASURING DEVICE
William T. Johnson, and Daniel J. Hare, both of Oswego, N.Y., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.
Filed Oct. 16, 1996, Ser. No. 732,974
Int. Cl.^{6} G01B *15/30;* **G01L** *1/00;* **G01N** *3/00*
U.S. Cl. 73—760 **17 Claims**



1. A strain apparatus for detecting stress experienced by a structural member that includes

OL
2 10
SS
1
MY
5
998
MI

a support collar having a pair of coacting half sections that are connected by a hinge means so that the half sections can close about a structural member,

said support collar further including a central opening that complements the cross sectional shape of the structural member, and a closure means for securing the half sections in pressure contact against the structural member,

a pair of spaced apart contact pads located along the central opening portion of each half section that are arranged to contact the structural member in pressure engagement when the half sections are closed about the structural member,

a thin flexible ligament mounted upon each half section between the spaced apart contact pads that is arranged to contact the structural member in pressure engagement along with the contact pads when the half sections are closed about the structural member:

a strain gage coupon mounted upon each ligament having strain gage means whereby any change in the structural member geometry is applied directly to said strain gage means, and

said contact pads and said ligaments being integral with the half sections.

5,747,698

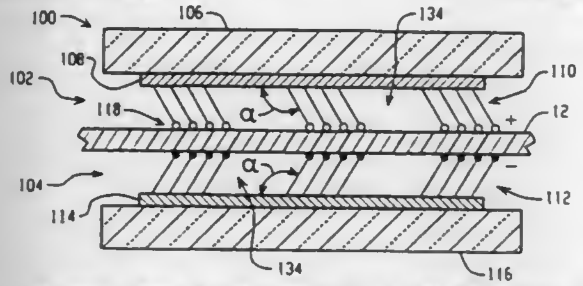
CAPACITIVE Z-AXIS STRAIN GAUGE

William Bert Spillman, Jr., Charlotte, Vt., and Eric M. Weissman, Russell Township, Ohio, assignors to Simmonds Precision Products Inc., Akron, Ohio

Filed Apr. 24, 1996, Ser. No. 637,024

Int. Cl.⁶ G01B *7/16;* **G01N** *3/00*

U.S. Cl. 73—780 **34 Claims**



1. A strain gauge device comprising: a capacitor having two spaced conductive surfaces, and a dielectric material between said conductive surfaces with a dielectric constant that varies in relation to strain normal to said surfaces, said dielectric material comprising a layer of linear molecules attached endwise to at least one of said conductive surfaces.

5,747,699

METHOD OF MEASURING TORSIONAL STRESSES AND/OR AXIAL STRESSES ON A ROTATING SHAFT OR ON A COMPARABLE WORKPIECE

Günter Ebi, Hansengelstrasse 20, D-79801 Hohentengen, Germany

PCT No. PCT/DE95/00934, § 371 Date Jan. 21, 1997, § 102(e) Date Jan. 21, 1997, PCT Pub. No. WO96/02815, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 12, 1995, Ser. No. 776,895

Claims priority, application Germany, Jul. 20, 1994, 44 25 503.9

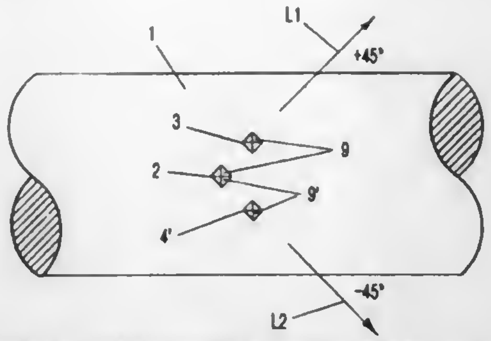
Int. Cl.⁶ G01L *3/00*

U.S. Cl. 73—800 **20 Claims**

1. A method for measuring torsional stress and axial stress of a rotating workpiece, said method comprising the steps of:

arranging at a surface of the workpiece at least two reflector pairs such that connecting lines between reflectors of each reflector pair are slanted relative to one another;

rotating the workpiece about an axis of rotation;



impinging a coherent laser light onto the at least two reflector pairs to produce reflected and interfering light beam pairs for each one of the reflector pairs;

determining a phase difference between the light beams of each light beam pair; and

calculating the torsional stress and axial stress from the phase difference.

5,747,700

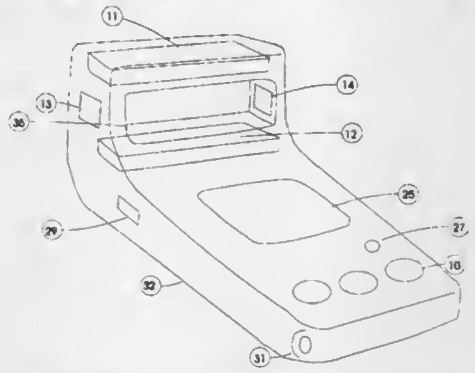
PORTABLE ELECTRONIC FLOW METER

Robert Wood, 396 Raven Hill, Ottawa, Ontario, Canada, K2A 0J6

Filed Oct. 23, 1996, Ser. No. 736,332

Int. Cl.⁶ G01F *1/58*

U.S. Cl. 73—861.12 **19 Claims**



19. A portable device for measuring fluid flow and for assisting navigation of a diver comprising:

a) a substantially waterproof housing having a handle portion and a tube portion having an aft end and a fore end in fluid communications, the tube portion for accepting conductive fluid at the fore end thereof and for allowing the fluid to pass through the tube portion and exit at an aft end thereof;

b) a DC power supply disposed within the housing and for providing power to the device;

c) a pair of coils disposed on different sides of the tube portion of the housing between the aft end and the fore end thereof for allowing fluid outside the housing to pass therebetween, said coil and said fluid for generating a measurable field;

d) a switch for providing power from the power supply to the pair of coils in a first mode of operation and for preventing power from being supplied to the pair of coils in a second mode of operation;

e) a first conducting sensor and a second conducting sensor disposed outside the housing for sensing the measurable field within fluid passing outside the housing proximate the coils and for providing a first signal and a second signal, respectively, corresponding to the sensed measurable field;

f) measuring means coupled to receive the first signal and the second signal and for determining a measurement of fluid flow rate in dependence upon at least an aspect of the first and second signals and for providing a third signal in dependence upon the measurement; and

g) display means for displaying information indicative of fluid flow rate in dependence upon the third signal.

5,747,701

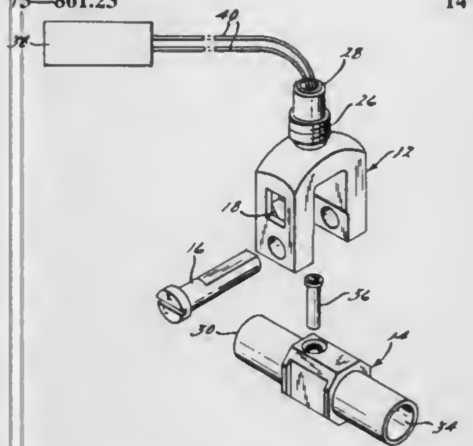
ULTRASONIC VORTEX FLOWMETER HAVING REMOTE SIGNAL PROCESSING

David Winsor Marsh, N. Scituate, R.I.; Lars Oscar Rosaen, Plymouth, and Eric J. Rosaen, Ann Arbor, both of Mich., assignors to Asahi/America, Inc., Malden, Mass.

Continuation-in-part of Ser. No. 662,037, Jun. 12, 1996. This application Jan. 16, 1997, Ser. No. 784,712

Int. Cl.⁶ G01F *1/32*

U.S. Cl. 73—861.23 **14 Claims**



1. A vortex flowmeter comprising:

a sensor housing connected about a fluid flow conduit;

means disposed within said conduit for generating vortices in the flow of fluid;

a transmitter positioned within said sensor housing for propagating an ultrasonic wave through said vortices;

an ultrasonic receiver positioned within said sensor housing for receiving said propagated wave;

a phase detector means disposed within a circuit housing remotely located from said sensor housing, said phase detector means being connected to said transmitter and receiver for producing an output representative of any phase difference between the transmitted wave and the received wave;

processor means disposed within said circuit housing and responsive to said phase detector means output for determining the fluid flow rate as a function of the phase difference caused by said vortices;

an optimal phase range detecting means disposed within said circuit housing and connected to said phase detector means for detecting if said phase difference is approximately 0 degrees or 180 degrees; and

a phase shifting means disposed within said circuit housing and connected to said optimal phase range detecting means for shifting the phase of the transmitter signal supplied to said phase detecting means by substantially 90 degrees.

5,747,702

DIAGNOSTIC DEVICE FOR HYDRAULIC CIRCUIT

George D. Kadlicko, Mississauga, Canada, assignor to Microhydraulics, Inc., Canada

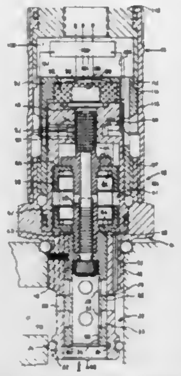
Filed Feb. 6, 1996, Ser. No. 597,618

Claims priority, application Canada, Feb. 6, 1995, 2141897

Int. Cl.⁶ G01F *1/26*

U.S. Cl. 73—861.53 **11 Claims**

1. A hydraulic diagnostic device for measuring and indicating parameters in a hydraulic circuit comprising a body, a fluid conduit in said body having an inlet and an outlet, a flow transducer to measure fluid flow in said conduit including a piston slidable within said body and cooperating with said body to present a variable orifice in said conduit, a position sensor located in said body and monitoring movement of said piston to provide a first signal indicative of the position thereof relative to said body, a pressure transducer located in said body and in fluid communication with said conduit to monitor fluid in said conduit and provide a second signal indicative of a pressure of fluid being monitored, a temperature transducer to monitor the temperature of fluid flowing in said conduit between said inlet and outlet and provide a third signal indicative of the temperature of fluid in said conduit, each of said transducers being independently operable to generate respective signals indicative.



5,747,703

METHOD AND APPARATUS FOR MONITORING VARIATION IN THE CURRENT VALUE OF A RATE OF FLUID FLOW THROUGH A FLOW METER

François Plisson, Buc; Philippe Janet, Eragny-sur Oise, and Frédéric Puybaret, Colombes, all of France, assignors to Schlumberger Industries S.A., Montrouge, France

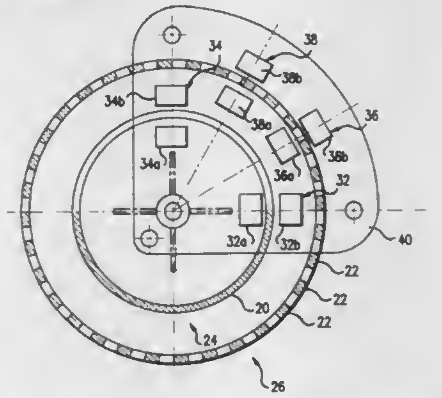
PCT No. PCT/FR94/01396, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO95/16189, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 30, 1994, Ser. No. 656,182

Claims priority, application France, Dec. 7, 1993, 93 14664

Int. Cl.⁶ G01F *15/00*

U.S. Cl. 73—861.77 **32 Claims**



1. A method of monitoring variation in the current value of a rate of fluid flow through a fluid meter which includes a measurement unit and a rotary shaft connected to said measurement unit and suitable for rotating about its own axis when a volume of fluid passes through the measurement unit, the method consisting in detecting rotary movements rather than rotation of the shaft at a sampling frequency that is variable between two frequencies in application of a predetermined sampling relationship according to corresponding predetermined fluid flow rate values, and in electronically processing bits corresponding to detection and to non-detection of a rotary movement of the shaft at said sampling frequencies in order to determine the current value of the fluid flow rate over a continuum of flow rates and relative to the predetermined fluid flow rate values included in said continuum of flow rates.

5,747,704
METER FOR FLOWING MEDIA

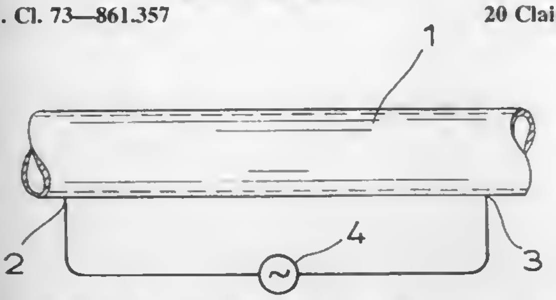
Ronald van der Pol, Venlo, Netherlands, assignor to Krohne Messtechnik GmbH & Co., KG, Germany

Filed Oct. 6, 1995, Ser. No. 540,203

Claims priority, application Germany, Oct. 7, 1994, 44 35 809.1

Int. Cl.⁶ G01F *1/84*

U.S. Cl. 73—861.357 **20 Claims**



1. A meter for flowing media which operates according to the Coriolis principle, with at least one conduit conducting the flowing medium, with an electric current supplied from a voltage source flowing through at least a section of the conduit and/or the flowing medium, with at least one oscillation generator acting on said conduit, said oscillation generator formed by the electric current flowing through the conduit and/or the flowing medium and an external magnetic field surrounding at least a section of the conduit and with at least one transducer detecting Coriolis forces and/or Coriolis oscillations based on Coriolis forces characterized in that the amplitude of the oscillation of said conduit can be derived from the voltage drop over said conduit.

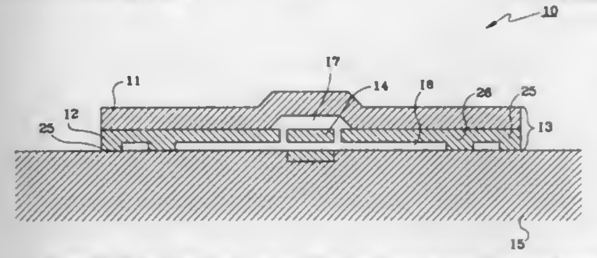
5,747,705
METHOD FOR MAKING A THIN FILM RESONANT MICROBEAM ABSOLUTE

William R. Herb, and David W. Burns, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 31, 1996, Ser. No. 778,375

Int. Cl.⁶ G01L *1/10*

U.S. Cl. 73—862.59 **31 Claims**



1. A method for making a thin film resonant microbeam sensor, comprising:

- forming a first low temperature oxide layer on a silicon substrate;
- masking the first low temperature oxide layer;
- etching the first low temperature oxide layer to define a vacuum cavity reference region and anchor regions;
- forming a first polysilicon layer on the low temperature oxide layer;
- forming a second low temperature oxide layer on the first low temperature oxide layer and the silicon substrate;
- masking the second low temperature oxide layer to define the channel layer to form at least one etch channel to and through the vacuum cavity reference anchor regions;
- etching the second low temperature oxide layer;
- forming a first polysilicon layer on the channel layer;
- forming a masking layer on the first polysilicon layer to define at least one beam;
- etching the second polysilicon layer to form the at least one beam;
- forming a third low temperature oxide over the at least one beam;
- masking the third low temperature layer to define an upper cavity over the beam;
- etching the third low temperature oxide layer to form the upper cavity;
- forming a third polysilicon layer on the second polysilicon layer and on the remaining third low temperature layer; and
- applying sacrificial etch to remove the remaining portions of the first, second and third low temperature oxide layers.

5,747,706

Patent Not Issued For This Number

5,747,707
MEASURING DEVICE FOR REFINERS

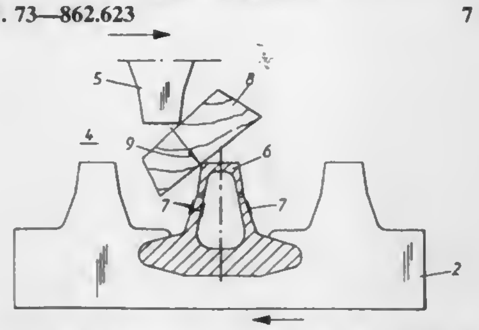
Ola Johansson, Timrå, and Olof Kjellqvist, Sundsvall, both of Sweden, assignors to Sunds Defibrator Industries AB, Sweden

Filed Aug. 16, 1996, Ser. No. 698,810

Claims priority, application Sweden, Aug. 21, 1995, 9502892

Int. Cl.⁶ G01L *1/04*

U.S. Cl. 73—862.623 **7 Claims**



1. Refining apparatus comprising first and second relatively rotatable refining disks defining a refining gap therebetween, said refining disks including a plurality of radial refining bars extending along at least part of said refining gap, and at least one of said plurality of refining bars comprising a sensor bar including sensing means for sensing a deformation of said sensor bar during said refining at a plurality of points along said sensor bar.

5,747,708
RETRACTABLE BATCH REACTOR SAMPLER

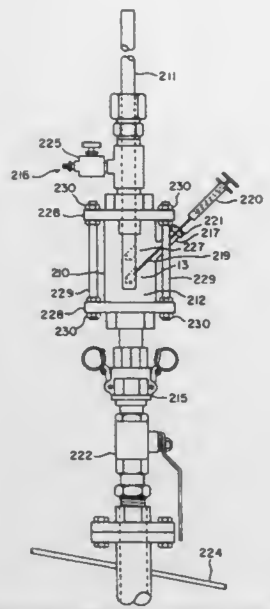
Franz Josef Weiberth, Belle Mead, N.J., assignor to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 384,999, Feb. 7, 1995, abandoned. This application Nov. 8, 1996, Ser. No. 745,765

Int. Cl.⁶ G01N *1/12*

U.S. Cl. 73—863.81 **2 Claims**

1. A retractable batch reactor sampler which comprises a sampling rod and a sampler chamber unit in which the sampler chamber unit is at least partially constructed of a transparent or translucent material, and wherein the sampler chamber has at a first end a means for attaching the sampler chamber unit to a reactor and has at a second end a gland element which supports the sampling rod while allowing the rod to slide through the sampler chamber unit wherein the gland element has an internal seal which allows the sampling rod to slide but provides and air tight seal, between the ends of the sampler chamber unit are positioned a means for controlling the content of the atmosphere within the batch reactor sampler unit, and an alignment element wherein the alignment element is a translucent or transparent tube or pipe which is fixed, to the side of the sampler chamber at about a 45 deg. angle with a first end opening into the sample chamber unit and the second end fitted with a septum; and wherein the sampling rod has a first end extending through the gland element and a second end which passes into the sampler chamber, between the ends of the sampler rod are a multiplicity of sample cavities which are bored into the sampling rod for receiving samples from the reactor, and wherein the complete length of the rod including the cavities is of uniform diameter.



5,747,709
REPETITIVE PIPETTE

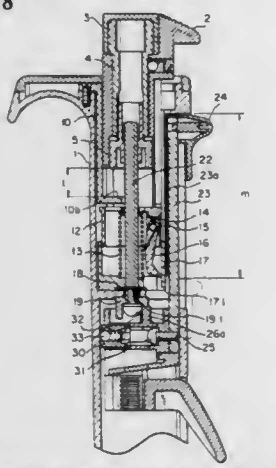
Yuuji Oshikubo, Tokyo, Japan, assignor to Nichiryo Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1996, Ser. No. 714,698

Claims priority, application Japan, Mar. 7, 1996, 8-050491

Int. Cl.⁶ B01L *3/02*

U.S. Cl. 73—864.18 **6 Claims**



1. A repetitive pipette wherein a rack shaft vertically and movably provided in a pipette body is connected to a plunger of a syringe unit, and a vertically movable and pivotable pawl member repetitively moves downward and meshes with said rack shaft to feed said plunger downward by a predetermined feed pitch at each time, thereby effecting repetitive pipetting, and wherein said predetermined feed pitch for said rack shaft can be variably set by pipetted quantity variably setting means, said repetitive pipette comprising:

- a vertically movable push button provided on said pipette body;
- a rotary control knob for variably setting a pipetted quantity, said rotary control knob being provided in coaxial relation to said push button so as to be vertically movable together with said push button as one unit and rotatable relative to said push button;
- a pawl retaining member for retaining said pawl member, said pawl retaining member being vertically movable together with said push button as one unit;
- a spring for upwardly biasing said pawl retaining member, push button and rotary control knob; and
- a pawl stroke varying rotary cam having a plurality of first cam step portions for variably setting a position from which said pawl member starts pivoting toward said rack shaft to mesh with it, said pawl stroke varying rotary cam being rotated together with said rotary control knob as one unit to allow one of said first cam step portions to correspond to said pawl member selectively;
- said pipetted quantity variably setting means comprising said rotary control knob and said pawl stroke varying rotary cam.

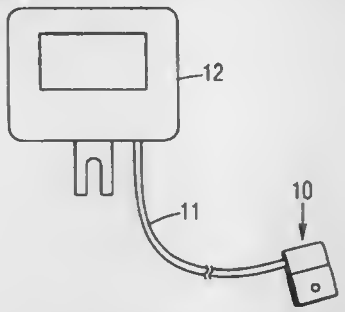
5,747,710
PULSE SENSOR CLIP

Edward Carmichael, 4373 Sequoyah Rd., Oakland, Calif. 94605

Filed Dec. 16, 1996, Ser. No. 767,476

Int. Cl.⁶ G01D *21/00*

U.S. Cl. 73—866.5 **11 Claims**



1. A pulse sensor device, comprising: an electrically conductive body member; a cable-mounting hole extending into said body member; a pin hole intersecting said cable-mounting hole, said pin hole extending between said cable-mounting hole and an exterior surface of said body member; an electrical sensor cable having one end positioned in said cable-mounting hole, said cable including a conductor surrounded by an insulator; and a retaining pin positioned in said pin hole, said retaining pin being driven into said conductor through said insulator of said sensor cable so as to retain said sensor cable within said cable-mounting hole and to provide a direct conductive path between said conductor and said electrically conductive body member thereby forming a pulse sensor for measuring electrical pulses.

5,747,711
BODY FOR STRINGED MUSICAL INSTRUMENT

Jack D. Cavaness, 107 Shady Dr., Hendersonville, and Deanne E. Cavaness, 1030 Woody La., Goodlettsville, both of Tenn. 37075

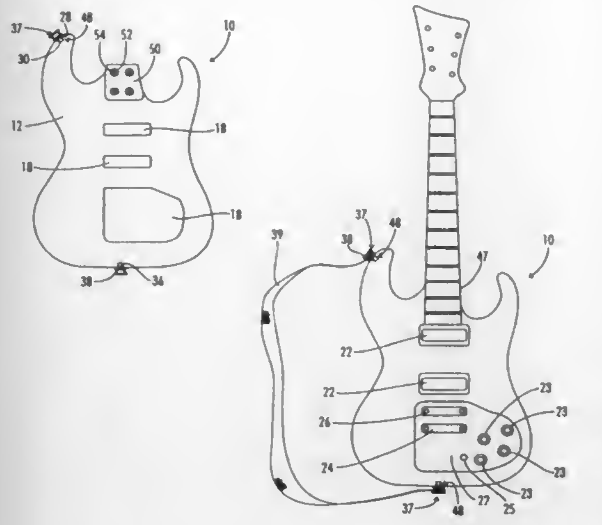
Filed Mar. 19, 1996, Ser. No. 617,684

Int. Cl.⁶ G10D *3/00*

U.S. Cl. 84—291 **14 Claims**

1. A body for a stringed musical instrument, comprising:

- a front, a back and sides rigidly attached to define a watertight interior;
  - the front having at least one opening projecting into the interior of the body and merging with the body to form a watertight chamber for housing electronic control components within the interior of the body;
- means for filling and draining the body; and
- attachment means for attaching the body to a neck of the stringed instrument,
  - wherein the attachment means further comprises at least one post extending from a recess formed in the body and at



least one fastener, the at least one post having a longitudinal bore for receiving the at least one fastener.

5,747,712
PEG FOR A STRINGED INSTRUMENT

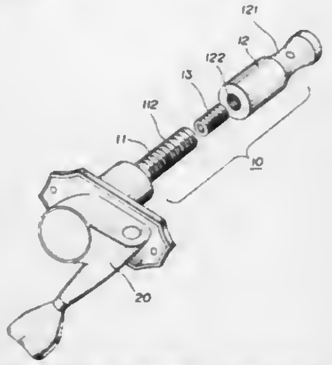
Takao Goto, Isezaki, Japan, assignor to Gotoh Gut Yugen Kaisha, Isezaki, Japan

Filed Mar. 14, 1997, Ser. No. 818,663

Claims priority, application Japan, Mar. 29, 1996, 8-111793

Int. Cl.^{6} G10D *3/14*

U.S. Cl. 84—306 **20 Claims**



1. A peg for a stringed instrument, comprising:

a winding shaft comprising a base shaft portion having a free end and an adjustable shaft portion having a bottom surface, said adjustable shaft portion being in threaded engagement with said free end of said base shaft portion;

a worm gear, said base shaft portion being connected with said worm gear;

a fixing screw member located in said base shaft portion that is axially engageable with said bottom surface of said adjustable shaft portion.

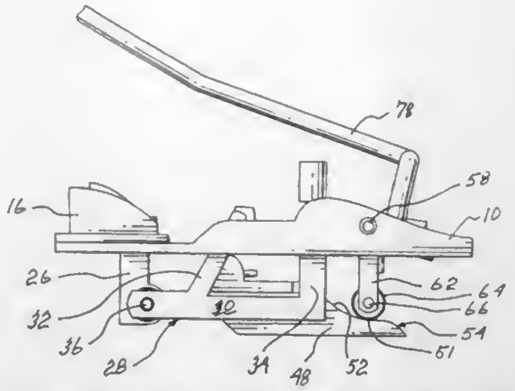
5,747,713
TREMOLO

Andrew Clement, Box 20, 30 Route 257, Gould, Quebec, Canada, J0B 2Z0

Continuation of Ser. No. 499,518, Nov. 10, 1995, abandoned, which is a continuation of Ser. No. 116,570, Sep. 7, 1993, abandoned. This application Jun. 27, 1997, Ser. No. 884,020

Int. Cl.^{6} G10D *3/12*

U.S. Cl. 84—313 **8 Claims**



1. A tremolo device for use with a musical instrument having a plurality of strings, said device comprising a housing, a first pivotable member being rotatably mounted on said housing, string mounting means on said first pivotable member for mounting one end of at least one string thereon such that a pivotable movement in a first direction will cause an increase in tension on said string and a pivotable movement in a second direction will cause a decrease in tension on said string, said first pivotable member having a cam surface associated therewith, said cam surface having a center point, an upwardly extending cam surface portion having a decreasing radius on a first side of said center point and a downwardly extending cam surface portion having an increasing radius on a second side of said center point, a second pivotable member rotatably mounted on said housing, an arm extending outwardly from said second pivotable member and having a free end thereof adapted to contact said cam surface, the arrangement being such that pivotable movement of said second pivotable member will cause said free end of said arm to move along said cam surface to permit pivotable movement of said first pivotable member to thereby cause a change of tension on said string.

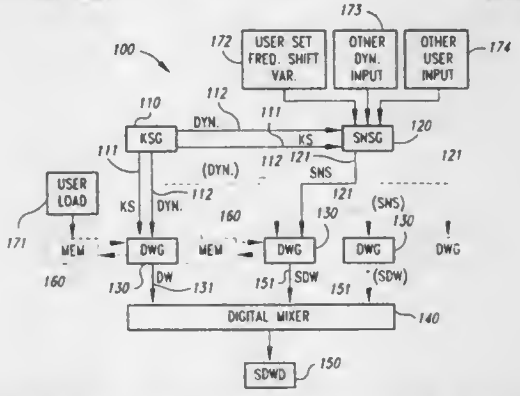
5,747,714
DIGITAL TONE SYNTHESIS MODELING FOR COMPLEX INSTRUMENTS

James Kniest, Edmonds, and Jay Dee Petersen, Seattle, both of Wash., assignors to James N. Kniest, Edmonds, Wash.

Filed Nov. 16, 1995, Ser. No. 558,362

Int. Cl.^{6} G10H *7/00*

U.S. Cl. 84—604 **6 Claims**



1. A digital tone synthesizer having stored digitally sampled note data, the note data having been sampled at a sampling frequency F, with a sample period of 1F, the digital tone synthesizer comprising:

a DSP clock operating at a DSP clock frequency;

a slot count incrementer for incrementing in a slot counter a slot count of a selectable number of slots n, each slot having a slot duration defined by a selectable number of DSP clock ticks T;

a system clock operating at a system clock frequency equal to a whole number P multiple of the sampling frequency, the system clock producing system clock ticks;

a reset counter for counting P system clock ticks and thereupon effecting a reset signal to the slot counter.

5,747,715
ELECTRONIC MUSICAL APPARATUS USING VOCALIZED SOUNDS TO SING A SONG AUTOMATICALLY

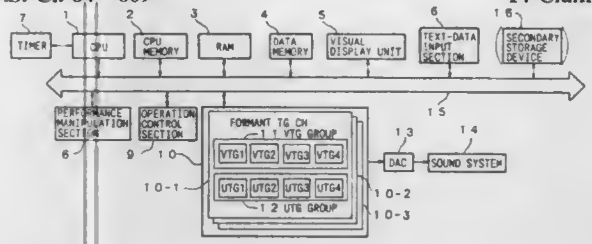
Shinichi Ohta, and Masashi Hirano, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Aug. 1, 1996, Ser. No. 691,089

Claims priority, application Japan, Aug. 4, 1995, 7-218241

Int. Cl.^{6} G10H *1/36;1/42*

U.S. Cl. 84—609 **14 Claims**



1. An electronic musical apparatus comprising:

storage means for storing lyric data and melody data;

allocation means, which is occasionally activated based on a relationship between the lyric data and the melody data, for allocating generation of a plurality of syllables demanded by the lyric data to a time between the beginning of a desired single note and the beginning of a next note within notes constructing a melody designated by the melody data;

reading means for reading out the lyric data in accordance with the melody data; and

sounding means for sequentially sounding phonemes designated by the lyric data in accordance with the melody designated by the melody data,

whereby when the allocation means is activated, the plurality of syllables are sequentially sounded corresponding to the desired single note.

5,747,716
MEDLEY PLAYBACK APPARATUS WITH ADAPTIVE EDITING OF BRIDGE PART

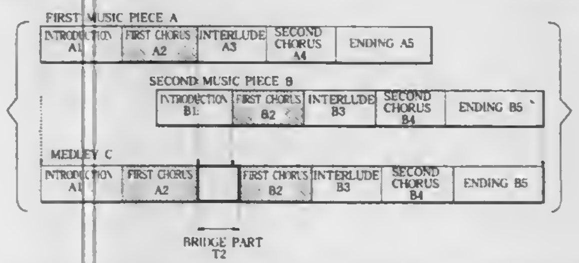
Shuichi Matsumoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 22, 1997, Ser. No. 787,442

Claims priority, application Japan, Jan. 23, 1996, 8-009591

Int. Cl.^{6} G10H *1/26;1/42*

U.S. Cl. 84—609 **16 Claims**



9. A method of playing back a medley in a medley playback apparatus comprised of a storage device that stores a plurality of performance data corresponding to a plurality of music pieces, and a generator device that is fed with the performance data to generate musical tones to thereby play back the corresponding music piece, the method comprising the steps of:

designating at least a first music piece and a second music piece among the plurality of the stored music pieces;

mutilating first performance data corresponding to the first music piece so as to produce a preceding compact part thereof;

mutilating second performance data corresponding to the second music piece so as to produce a succeeding compact part thereof;

creating intermediate performance data based on the first performance data and the second performance data so as to produce a bridge part connecting between the preceding compact part and the succeeding compact part; and

sequentially feeding the generator device with the mutilated first performance data, the intermediate performance data and the mutilated second performance data to thereby play back a desired medley composed of a sequence of the preceding compact part, the bridge part and the succeeding compact part.

5,747,717

Patent Not Issued For This Number

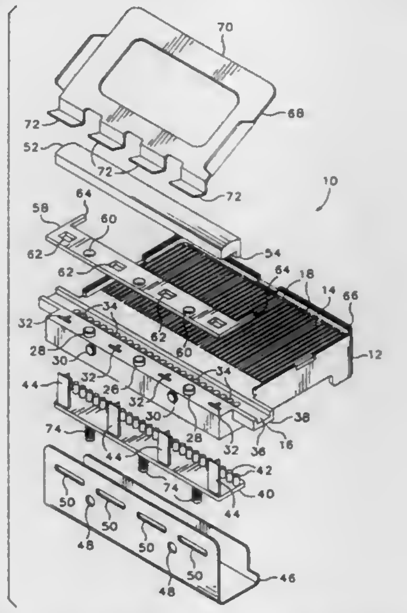
5,747,718
APPARATUS AND METHOD FOR LOADING ITEMS INTO COMPONENT HOLDER

Eugene F. Bill, Oroville; Fred B. Blodgett, Chico; Jerry D. Brand, Oroville; Steven J. Koch, Oroville; Lester V. Rodriques, Oroville; Alan D. Schufeldt, Oroville; Steven R. Shields, Oroville, and Ronald L. Smith, Oroville, all of Calif., assignors to Blount, Inc., Montgomery, Ala.

Filed Feb. 14, 1996, Ser. No. 599,962

Int. Cl.^{6} F42B *33/00*

U.S. Cl. 86—23 **23 Claims**



1. Apparatus for loading items into a component holder strip having openings for receiving such items, comprising:

(a) a tray,

(b) a lever pivotally coupled to the tray,

(c) a strip receptacle having a plurality of openings and configured to receive and hold such strip,

(d) a seating bar having a portion oriented toward the receptacle;

(e) a biasing member coupled to the seating bar to bias the seating bar away from the strip receptacle, and wherein actuation of the lever moves the seating bar toward the strip receptacle such that items properly oriented adjacent a component holder strip located in the strip receptacle are pressed into the holder strip by the seating bar, and

(f) a pin strip having a plurality of pins thereon, the pin strip being positioned adjacent the openings and biased by the biasing member such that the pins extend into the openings.

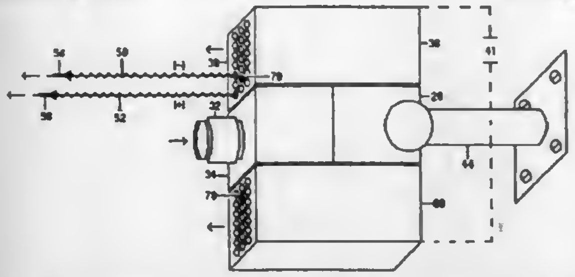
5,747,719
ARMED TERRORIST IMMOBILIZATION (ATI) SYSTEM

H. Werner Bottesch, RD#6, Box 374, Danville, Pa. 17821

Filed Jan. 21, 1997, Ser. No. 786,636

Int. Cl.^{6} B64D *1/04*

U.S. Cl. 89—1.1 **19 Claims**



1. A surveillance system for detecting the presence of one or more human beings carrying one or more weapon objects within the confines of a designated area of surveillance, comprising,

metal sensing means for detecting the presence of a weapon object carried by one or more of the human beings within the area of surveillance,

at least one optical imaging means adapted to produce data representing successive image frames arranged for optically tracking, in frame by frame, sequence the one or more human beings on whom the one or more weapon objects have been detected, and

computer means connected to said metal sensing means and said imaging means and having program means for effecting the initial detection of the one or more weapon objects by said metal sensing means, and for enabling said imaging means to track the movement of the one or more human beings carrying the weapons objects within the area of surveillance.

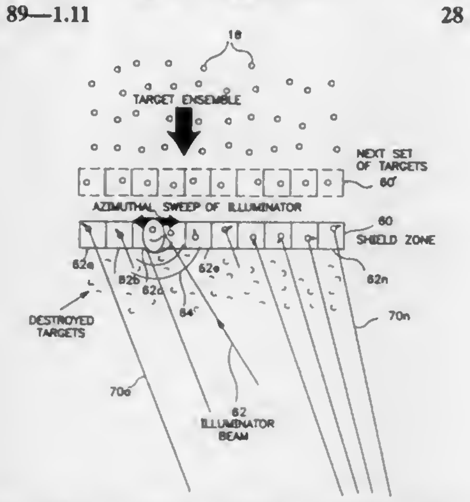
5,747,720
TACTICAL LASER WEAPON SYSTEM FOR HANDLING MUNITIONS

Alvin D. Schnurr, Los Angeles; Charles W. Clendening, Jr., Torrance; Josef Shwartz, Beverly Hills, and Richard H. Moyer, Rolling Hills Estates, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 1, 1995, Ser. No. 485,550

Int. Cl.^{6} B64O *1/04*

U.S. Cl. 89—1.11 **28 Claims**



1. A laser weapon system operable for detecting and engaging a plurality of moving objects which may represent potential threats, said system comprising:

means for detecting a presence of a plurality of said moving objects;

means for selecting a shield zone that covers a limited number of said plurality of objects, said shield zone covering only a portion of a potential coverage zone of the system;

means for detecting a relative location of individual objects within said selected shield zone;

laser source means for producing a plurality of high energy laser beams which are operable for simultaneously engaging a group of said plurality of said objects, said plurality of high energy laser beams being deployed from substantially a common location, each of said laser beams being independently controlled within a designated region of said shield zone and said laser beams engaging different ones of said objects within said selected shield zone; and

beam control means for independently controlling each of said plurality of laser beams so that individual ones of said laser beams engages and attempts to damage or destroy individual ones of said targets within said shield zone.

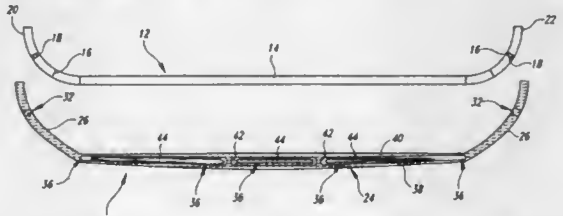
5,747,721
BALLISTIC SHIELD

Dale M. Speakes, Auburn, and Dee Raymond Cole, Seattle, both of Wash., assignors to Creative Aeronautical Accessories, Inc., Bellevue, Wash.

Filed Feb. 20, 1997, Ser. No. 806,241

Int. Cl.^{6} B64D *7/00*

U.S. Cl. 89—36.11 **2 Claims**



1. An external ballistic shield for removable mounting on the exterior of an aircraft fuselage for protecting cockpit equipment and occupants, comprising:

a shell sized and shaped to conform to and shield a portion of the aircraft fuselage, said shell having a top wall and a bottom wall and one or more side walls that form one or more compartments, each of said one or more compartments having an opening associated therewith to permit unobstructed access thereto;

one or more removable ballistic-resistant inserts sized and shaped to be slidably received within said one or more compartments;

means for releasably securing said inserts within said one or more compartments such that said inserts can be readily, manually inserted into and removed from said one or more compartments; and

means for removable mounting of said shell to the lower sides of the aircraft fuselage such that a space of sufficient size is created between said shell and the aircraft fuselage to enable deflection of said shell upon ballistic impact without damaging the aircraft fuselage.

5,747,722
DETONATORS HAVING MULTIPLE-LINE INPUT LEADS

Ernest L. Gladden, Granby, and Ronald M. Dufrane, North Granby, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Jan. 11, 1996, Ser. No. 548,815

Int. Cl.^{6} C06C *5/06;5/00*

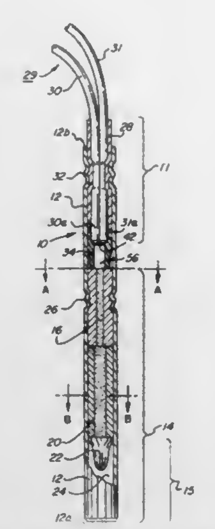
U.S. Cl. 102—275.11 **13 Claims**

1. A detonator having an output section and comprising:

a shell defining an enclosure;

a target charge comprising at least an explosive output charge disposed within the shell at the output section of the detonator; and

an input lead extending into the detonator and secured therewithin, the input lead having at least two signal transmission input lines which extend into the shell and terminate in signal-emitting ends disposed within the shell in signal transmission relation with the target charge.



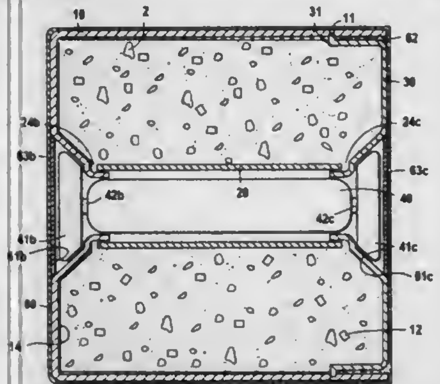
5,747,723
MODULAR ARTILLERY CHARGE SYSTEM

Gregory Buckalew, Budd Lake; Lydia Chang, MOrris Plains, both of N.J.; Richard Cirincione, East Stroudsburg, Pa.; Robert Garufi, Fairfield, N.J.; Warren Graham, Landing, N.J.; Philip Hui, Parsippany, N.J.; James Rutkowski, Hackettstown, N.J., and Scott Westley, Flanders, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1996, Ser. No. 756,863

Int. Cl.^{6} F42B *5/00*

U.S. Cl. 102—282 **18 Claims**



1. An artillery charge system module, comprising:

a hollow, cylindrical combustible body, having an open end and a closed end with a center hole, said body being substantially rigid, said body closed end incorporating a concentrically positioned body center core ignition interface having a conical first surface joined to a flat second surface which connects to a third tubular surface;

a tube having a first cavity, a first open end, and a second open end;

a hollow, cylindrical, combustible cap, having an open end and a closed end with a center hole, said open end of said cap being concentrically attached to said open end of said body, said closed end of said cap having a concentrically disposed cap center core interface therein having a first conical cap surface, a second flat cap surface, and a third tubular cap surface therein;

said tube being concentrically positioned in said body to define a second cavity between said body and said tube;

said first open end of said tube being in contact with said body closed end core interface third tubular surface, and said second open end of said tube being in contact with said cap closed end core interface third tubular cap surface;

an energetic propellant material, placed within said second cavity;

a core igniter bag, positioned inside said first cavity;

said core igniter bag having a first end and a second end;

a body end igniter bag operatively disposed in said body closed end in juxtaposition with said conical first surface of said body center core ignition interface;

a cap end igniter bag operatively disposed in said cap closed end in juxtaposition with said first conical surface of said cap center core ignition interface;

means for attaching said body end igniter bag to said first end of said core igniter bag; and

means for attaching said cap end igniter bag to said second end of said core igniter bag.

5,747,724
SHOT PELLETS FOR GAME HUNTING ON WET MARSHLANDS AND METHOD OF MANUFACTURING SUCH SHOT

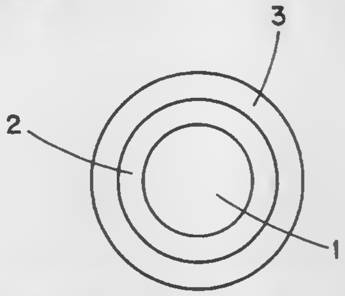
Per-Olov Lindgren, Fauske, Norway; Karl-Erik Johansson, Skellefteå, Sweden; Kjell-Åke Johansson, Skellefteå , Sweden, and Karin Paulsson, Skelleftehamn, Sweden, assignors to Boliden Mineral AB, Skelleftehamn, Sweden

Filed Oct. 23, 1996, Ser. No. 727,500

Claims priority, application Sweden, Mar. 28, 1995, 9501125

Int. Cl.^{6} F42B *7/04*

U.S. Cl. 102—459 **6 Claims**



1. Shot pellets for hunting on wet marshlands and corresponding wet areas, characterized by an inner core of copper or copper alloy and an outer layer of silver or silver alloy applied electrochemically thereto and entirely covering the copper surface of the inner core.

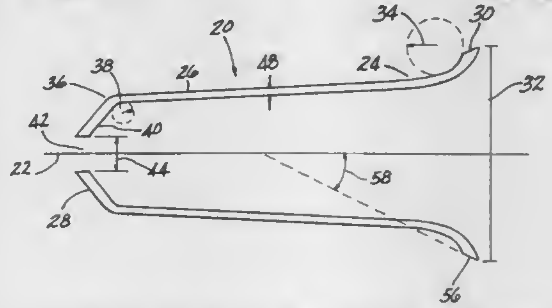
5,747,725
PRE-MOLDED AFT SEAL FOR DISCARDING SABOT PROJECTILES

W. Brian Stewart, Lancaster; Donald R. Osment, East Petersburg, and John W. Duchek, Red Lion, all of Pa., assignors to Primex Technologies, Inc., Red Lion, Pa.

Filed May 17, 1996, Ser. No. 649,392

Int. Cl.^{6} F42B *14/06*

U.S. Cl. 102—521 **10 Clalms**



1. A pre-molded aft seal for an armor piercing fin stabilized discarding sabot (APFSDS) projectile comprising:

a plastic sleeve made from a material selected from the group consisting of thermoplastic polyurethane and thermoplastic

OL
2 10
SS
1
MY
5
998
MI

polyester elastomer and effective to seal said APFSDS projectile from combustion products,

said plastic aft sleeve further comprises:

an outwardly flanged first portion having a radius of curvature of from about 1 inch to 2 inches;

a constantly decreasing diameter second portion; and

an inwardly flanged substantially conical third portion connected to said second portion by a curved portion having a radius of curvature of from about 0.01 inch to 0.09 inch.

5,747,726

Patent Not Issued For This Number

5,747,727
METHOD OF MAKING A THERMOCOUPLE

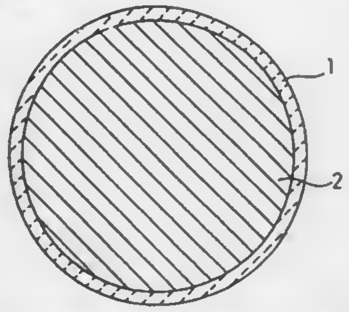
Kazuo Sawada; Shinji Inazawa, and Kouichi Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 442,386, May 16, 1995, abandoned, which is a division of Ser. No. 325,536, Oct. 18, 1994, Pat. No. 5,498,296, which is a continuation-in-part of Ser. No. 839,754, Apr. 7, 1992, abandoned. This application Apr. 25, 1997, Ser. No. 845,576

Claims priority, application Japan, Aug. 9, 1990, 2-213366; Jul. 22, 1991, 3-181096; Jul. 23, 1991, 3-182604

Int. Cl.⁶ H01L *35/34;* **C25D** *9/08;13/00*

U.S. Cl. 136—201 **25 Claims**



1. A method of manufacturing a thermocouple, comprising the following steps:

(a) preparing a sol by hydrolytic reaction and polymerization reaction of a compound selected from the group consisting of metal alkoxides and metal carboxylic esters;

(b) adding to said sol at least one of an organic compound salt and an inorganic salt;

(c) dipping a thermocouple element in said salt-containing sol;

(d) energizing said thermocouple element as a cathode for bonding thereto precursor particulates of metal oxide from said sol; and

(e) after said step (d), forming a metal oxide containing layer essentially consisting of at least one metal oxide on said thermocouple element by heating said thermocouple element having said particulates bonded thereto.

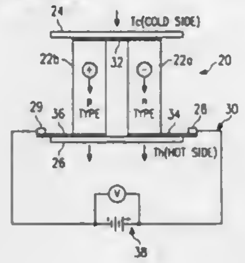
5,747,728
ADVANCED THERMOELECTRIC MATERIALS WITH ENHANCED CRYSTAL LATTICE STRUCTURE AND METHODS OF PREPARATION

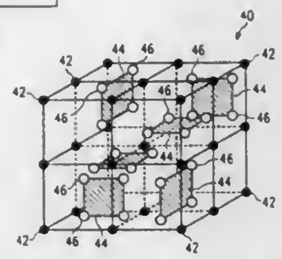
Jean-Pierre Fleurial, Duarte; Thierry F. Caillat, Pasadena, and Alexander Borshchevsky, Santa Monica, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 189,087, Jan. 28, 1994, Pat. No. 5,610,366, which is a continuation-in-part of Ser. No. 101,901, Aug. 3, 1993. This application Mar. 29, 1995, Ser. No. 412,700

Int. Cl.⁶ H01L *35/18*

U.S. Cl. 136—203 **24 Claims**





1. A thermoelectric devices comprising:

a first material comprising a skutterudite-type crystal lattice structure having thirty-two atomic crystallographic sites including eight metal atom sites and twenty-four non-metal atom sites, the first material further comprising a first amount of a first type of dopant; and

a second material electrically connected to the first material and comprising a second amount of a second type of dopant.

5,747,729
PROPELLANTS WITH A HIGH SPECIFIC IMPULSE, COMPRISING FURAZANE DERIVATIVES

Alain Chassaing, Vert Le Petit, and Bernard Finck, Corbeil, both of France, assignors to Societe Nationale Des Poudres Et Explosifs, Paris Cedex, France

Filed May 27, 1997, Ser. No. 863,243

Claims priority, application France, Jun. 28, 1996, 96 08051

Int. Cl.⁶ C06B *45/10*

U.S. Cl. 149—19.1 **9 Claims**

1. Solid propellant with high specific impulse, comprising especially a binder, at least one energetic filler and various additives, characterized in that the energetic filler is chosen essentially from the group of dinitrated bifurazanes consisting of 3,3'azoxybis(4-nitrofurazane) ($C_4N_8O_7$), 3,3'-azobis(4-nitrofurazane) ($C_4N_8O_6$) and 3,3'-bis(4-nitrofurazane) ($C_4N_6O_6$).

5,747,730
PYROTECHNIC METHOD OF GENERATING A PARTICULATE-FREE, NON-TOXIC ODORLESS AND COLORLESS GAS

Robert S. Scheffee, Lorton, Va.; Robert Lee Thibodeau, Knoxville, Tenn., and Brian K. Wheatley, Marshall, Va., assignors to Atlantic Research Corporation, Gainesville, Va.

Continuation-in-part of Ser. No. 414,469, Mar. 31, 1995, abandoned. This application Jun. 7, 1996, Ser. No. 663,009

Int. Cl.⁶ C06B *31/32;21/00;* **B60R** *21/28*

U.S. Cl. 149—47 **10 Claims**

1. A pyrotechnic method of generating an essentially particulate-free, non-toxic, odorless and colorless gas comprising the steps:

a) providing a gas generator having an enclosed chamber with exit ports,

b) disposing within said chamber, a solid eutectic propellant solution comprising gas-generative effective amounts of ammonium nitrate (AN) and at least one of aminoguanidine nitrate (AGN) and guanidine nitrate (GN), and effective stabilizing amounts of polyvinyl alcohol (PVA) and either potassium nitrate (KN) or potassium perchlorate (KP) as the sole source of gas, and

c) providing said solid eutectic solution also as the means for igniting the propellant eutectic solution upon detecting that the pressure chamber is being subjected to a sudden deceleration, whereby gas is essentially instantly generated and conducted through the exit ports of said chamber.

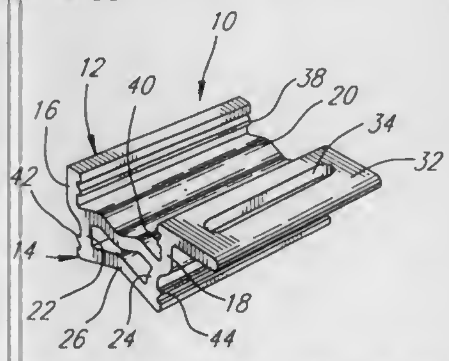
5,747,731
SPACING DEVICE FOR UTILITY WIRE

Gaston LaCasse, St-Henri-de-Lévis, Canada, assignor to IPL, Inc., St-Damien-de-Bellechasse, Canada

Filed May 12, 1997, Ser. No. 854,328

Int. Cl.⁶ H02G *7/00*

U.S. Cl. 174—40 CC **8 Claims**



1. A device for assembly with more than one similarly constructed devices for spacing a utility wire from a supporting cable comprising: a body formed of plastics material and defining a top portion and a bottom portion; said top portion having a U-shaped configuration defined by opposite sides and a bottom wall adapted to receive thereon said utility wire; said bottom portion consisting of opposite side walls and of a bottom wall adapted to receive thereagainst said supporting cable; said opposite sides of said top portion having facing inner walls spaced from one another a distance allowing nesting therein of the bottom portion of a superposed similarly constructed device; means securing said bottom portion in a nested position with the top portion of a superposed device whereby the spacing of said utility wire resting on the bottom wall of the uppermost device of said assembly of said constructed devices from said supporting cable bearing against the bottom wall of the lowermost device of said assembly may be varied by nesting a corresponding number of said constructed devices.

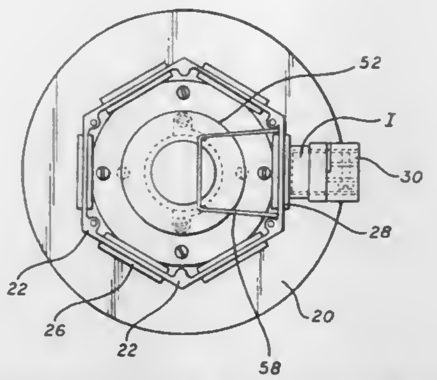
5,747,732
FIRE-RATED FURNITURE FEED POKE-THROUGH FITTING

John Bera, Kinnelon, and John E. Kohaut, Port Murray, both of N.J., assignors to Raceway Components, Inc., Paterson, N.J.

Continuation of Ser. No. 967,703, Oct. 27, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 306,962

Int. Cl.⁶ H02G *3/28*

U.S. Cl. 174—48 **46 Claims**



1. A poke-through service fitting, adapted to be installed in an opening formed at a selected location in a floor, for enabling source service cables, positioned below the floor, to pass through the fitting, for activation of services by the service cables, and for retarding the transmission of heat and flame from a fire through the floor opening and fitting to the floor, comprising:

(a) an insert, for insertion in the floor opening, and for retarding the transmission of heat and flame from a fire through the floor opening and the fitting to the floor;

(b) a service head, adapted to be connected to the insert and to extend above the floor, which includes a plurality of sides, greater than four, each facing outwardly, in which each side includes an outlet, for enabling one of the service cables to pass therethrough, for activation of services by the service cables; and

(c) means for connecting the service head to the insert.

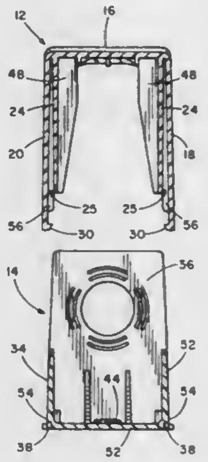
5,747,733
WIRING DUCT ENTRANCE FITTING ENCLOSURE

Randall T. Woods, 343 Sundance Dr., Bartlett, Ill. 60103, and Robert Nicoli, 906 Strieff La., Glenwood, Ill. 60425

Filed Mar. 3, 1997, Ser. No. 810,719

Int. Cl.⁶ H02G *3/04*

U.S. Cl. 174—48 **13 Claims**



1. A wiring duct raceway entrance fitting comprising:

a base member having at least one side projection extending from some portion of a longitudinal side of the base member; and

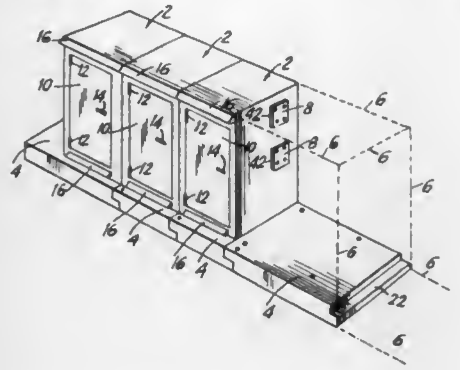
a cover having a top wall, at least one side wall depending from a longitudinal edge of the top wall, and at least one side rib depending from the top wall and disposed interiorly of the at least one side wall such that a substantial portion of the at least one side projection is retained within a side receiving area defined between the at least one side wall and the at least one side rib, wherein planar surface contact is generated between the at least one side wall and the at least one side projection, and between the at least one side rib and the at least one projection.

5,747,734
UNIVERSAL MODULAR HOUSING SYSTEM

Mark L. Kozlowski, Muncie, Ind., and Ross Whiteaker, New Smyrna Beach, Fla., assignors to Siemens Stromberg-Carlson, Boca Raton, Fla.

Filed Sep. 7, 1993, Ser. No. 91,500
Int. Cl.^{6} H01J *5/00*

U.S. Cl. 174—50 **29 Claims**



1. A field expandable modular housing system for housing equipment, the modular housing system comprising:

a plurality of modular housings each having a top, bottom, right side, left side, front and back, said front and back each including substantially large openings for permitting easy access to the interior of said each of said housings;

mounting bracket means included in each of said housings rigidly attached to inside surfaces of the right and left sides, for providing supports to which equipment can be secured at selected locations;

fan box means secured to the inside surface of the top of each of said housings, for receiving a predetermined electrical fan for circulating cooling air through said each of said housings;

a cable trough secured between said fan box means and said back opening of each of said housings, and oriented with its longitudinal axis aligned with the width of said each of said housings;

an air exhaust port cut through an uppermost portion of the front of each of said housings;

said fan box means including an air exhaust duct coupled to said air exhaust port of said each of said housings;

an air intake port cut through a lowermost portion of the front of each of said housings for permitting outside air to be drawn into said each of said housings, circulated therethrough, and exhausted from said exhaust port;

hinged front and back doors mounted upon the front and back of each of said housings for selectively closing off or exposing the front and back openings of said each of said housings;

cable access holes cut through the left and right sides of said housings, at least proximate respective ends of said cable trough;

bolt holes through the sides of each of said housings for permitting said housing to be selectively bolted together for expanding said housing system, whereby said cable access holes of juxtaposed ones of said housings are opposing one another, for permitting electrical cables to pass therebetween from said cable trough of said juxtaposed ones of said housings, for interconnecting electrical apparatus within said housings; and

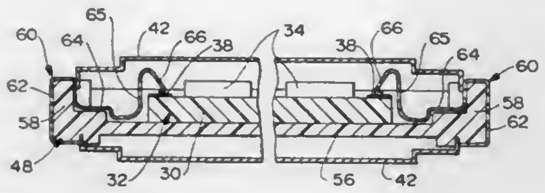
cover plate means secured to the sides of said housings, for covering or sealing off exposed ones of said cable access holes of at least end positioned ones of said housings of the housing system.

5,747,735
GROUNDING CLIP FOR IC CARDS

Wei-Sun Chang, Peitou Taipei, and Liu-Yuan Chen, Kaohsiung, both of Taiwan, assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 354,989, Dec. 13, 1994, abandoned. This application Mar. 6, 1997, Ser. No. 812,182
Int. Cl.^{6} H05K *5/02*

U.S. Cl. 174—51 **5 Claims**



1. An IC card kit adapted for receiving a circuit board assembly, said circuit board assembly including a generally planar substrate having two generally parallel surfaces with an electrical circuit and a plurality of electrical components mounted on one of the surfaces, the electrical circuit including a grounding circuit, the card kit comprising:

a substantially rectangular frame having support means thereon adapted for supporting the circuit board assembly;

a receptacle connector adapted to be mounted at an edge of the circuit board assembly and electrically coupled to the electrical circuit;

a pair of cover panels adapted for sandwiching the circuit board assembly therebetween; and

a conductive grounding clip independent of the cover panels adapted for mounting on the frame and having

  a spring arm with a down-turned hook portion adapted for resiliently engaging a portion of the grounding circuit on said one of the surfaces of the substrate, and

  a body portion adapted to be secured to and extend in a single direction along an outside surface of the frame,

  wherein the spring arm is configured to engage a portion of the grounding circuit on said one of the surfaces while resiliently and removably latching the circuit board assembly to the frame

whereby the spring arm holds the circuit board assembly to the frame and secures the circuit board assembly in a supported position on the frame prior to assembly of the cover panels.

5,747,736

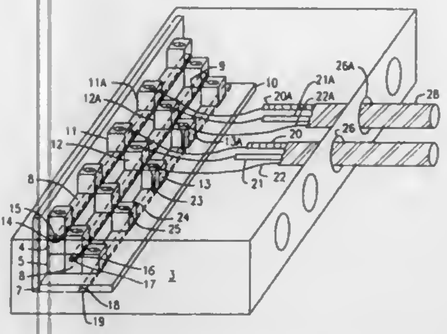
Patent Not Issued For This Number

5,747,737
INTERNALLY CONNECTED JUNCTION BOX

Keith David Waehner, Allegany, N.Y., assignor to Keith D. Waehner, Allegany, N.Y.

Filed Feb. 16, 1996, Ser. No. 602,925
Int. Cl.^{6} H02G *3/12*

U.S. Cl. 174—59 **1 Claim**



1. An internally connected electrical junction box comprising:

a junction box made of nonconductive material, having a base of lateral dimension and a circumferential wall;

a plurality of horizontal rectangular blocks having a dimension of length less than said lateral dimension of said base of said junction box said blocks being, placed on said base of said junction box in parallel spaced relation in back, middle and front rows, the back row having three of the horizontal rectangular blocks, one placed substantially above the other to form a wall, the middle row having two of the horizontal rectangular blocks, one placed substantially above the other to form a shorter wall, and the front row having a single one of the horizontal rectangular blocks;

a plurality of mounting blocks placed at regular intervals or stations along uppermost one of the rectangular blocks in each row, each said mounting block providing means for receiving a connecting wire, the connecting wires being of three types: hot wires, neutral wires, and ground wires, said mounting blocks in the back row receiving said hot wires, said mounting blocks in the middle row receiving said neutral wires, and said mounting blocks in the front row receiving said ground wires;

the plurality of horizontal rectangular blocks having portions defining a bore through entire length of each said block, and having a metal rod made of conductive material contained in the bore of each said rectangular block, providing means for connecting said intervals or stations internally;

a set screw disposed in threaded relation to each said mounting block, having a flat head exposed at top of said mounting block, providing means to receive the electrical connecting wire to secure the connecting wire in said mounting block and to interconnect the connecting wire with said metal rod;

means for connecting the connecting wire held in place by said set screw at one of the mounting blocks to the connecting wire secured at another of said intervals or stations; and

a plurality of openings in said circumferential wall, each of said openings positioned opposite one of said intervals or stations on said rectangular blocks, so that one of the connecting wires of selected diameter can be inserted through one of said plurality of openings to one of said intervals or stations opposite one of said openings; whereby a plurality of said connecting wires can be inserted into said openings for interconnection in said mounting blocks.

5,747,738
METHOD OF APPLYING WALL COVERING TO A PLATE COVER

Terry E. Indoe, 6714 Center Rd., Valley City, Ohio 44280

Filed Apr. 8, 1997, Ser. No. 835,856
Int. Cl.^{6} H05K *5/03*

U.S. Cl. 174—66 **10 Claims**

1. A method of applying non self-adhesive wall covering to an outlet plate cover, comprising the steps of:

a) providing

  (I) an outlet plate cover having a face, a back, and outer edges,

  (ii) a piece of non self-adhesive wall covering of a size sufficient to cover at least the face of the outlet plate cover,

  (iii) an adhesive sheet of a size sufficient to cover at least the face of the outlet plate cover and having first and second sides, said sheet having a contact adhesive on each of the first and second sides,

  (iv) a first and a second release sheet covering the adhesive on the first and second sides, respectively, of the adhesive sheet, each of the release sheets having a pre-perforated section,

b) removing the pre-perforated section from the first release sheet to reveal adhesive;

c) adhering the first side of the adhesive sheet to the face of the outlet plate cover;

d) removing the pre-perforated section from the second release sheet to reveal adhesive;

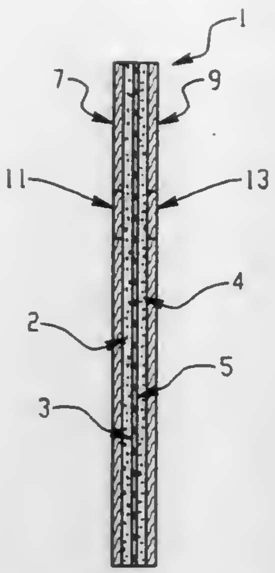
e) adhering the piece of wall covering to the second side of the adhesive sheet;

f) removing a remainder of the first release sheet;

g) adhering a remainder of the first side of the adhesive sheet to the face of the outlet plate cover;

h) removing a remainder of the second release sheet; and

I) adhering a remainder of the piece of wall covering to a remainder of the second side of the adhesive sheet.

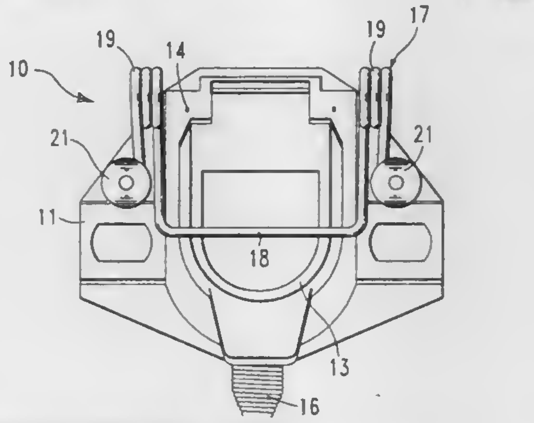


5,747,739
ELECTRICAL OUTLET BOX

Larry Moeller, 144 Ulsterville Rd., Pine Bush, N.Y. 12566

Filed Jun. 5, 1995, Ser. No. 463,727
Int. Cl.^{6} H02G *3/14*

U.S. Cl. 174—67 **6 Claims**



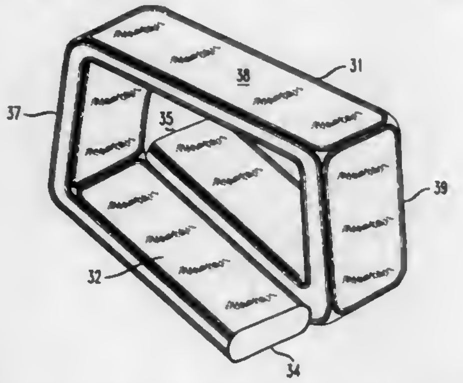
1. An electrical outlet box comprising:

a plate having an opening therethrough to provide access to an electrical outlet for receipt of a cable with a plug at its end;

a cover pivotally mounted on the plate and having an interior and exterior surface;

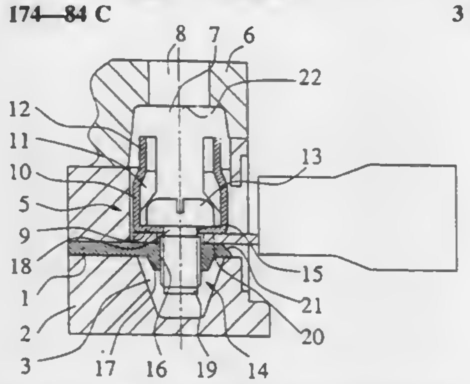
a first spring for normally biasing the interior surface of the cover against the plate to enclose the opening when the outlet is not in use; and a second spring affixed to the plate having a section so positioned as to be spaced from the cover when the outlet is not in use and to bias the interior surface of the cover against the cable so as to prevent the plug from falling out of the outlet when the outlet is in use.

5,747,740
HELICAL SURFACE-MOUNTED TEST POINT
William H. Gordon, 8 Maple La., Mine Hill, N.J. 07801
Filed Apr. 23, 1996, Ser. No. 636,527
Int. Cl.⁶ H01B *1/02;* H01R *9/00*
U.S. Cl. 174—68.1 **15 Claims**



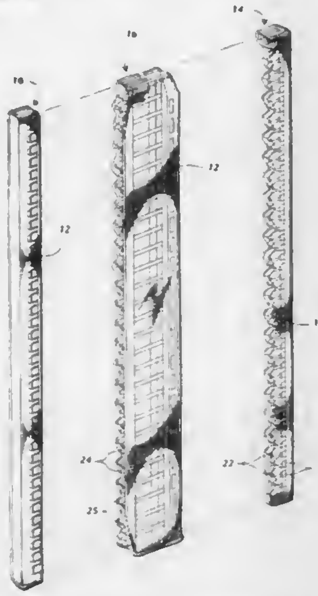
11. A continuous wire loop test point for mounting on a solderable pad on a substrate, the loop wire comprising:
(a) a base section comprising first and second end sections of the wire loop defining a planar support for the test point, each of the end sections extending alongside each other in opposite directions in a first plane and terminating in respective first and second ends pointing in opposite directions at first and second sides, respectively, of the base section;
(b) first and second support sections of the wire loop extending upwardly from the first and second end sections at the second and first sides, respectively, of the base section; and
(c) a bridging section of the wire loop integrally joining the first support section to the second support section and extending in a second plane substantially parallel to the first plane.

5,747,741
SCREW TERMINAL FOR AN ELECTRICAL CONNECTION OF CABLES OR WIRES
Ing. Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer
Filed Apr. 30, 1996, Ser. No. 640,053
Claims priority, application Austria, Jun. 16, 1995, 1034/95
Int. Cl.⁶ H01R *4/34*
U.S. Cl. 174—84 C **3 Claims**



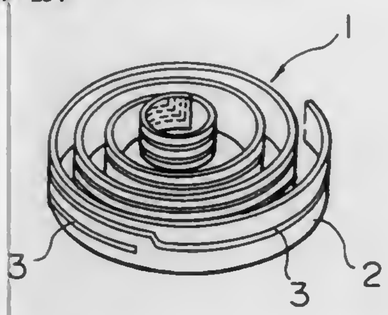
1. A screw terminal for an electrical connection of an eye of a cable, the terminal comprising
(a) a casing having a longitudinal axis,
(b) a first clamping plate axially movably but not rotatably mounted in the casing, the axial movement of the first clamping plate being limited by an inner surface of the casing, the first clamping plate defining a taphole and comprising
(1) laterally bent up spring tongues,
(c) a second clamping plate fixedly mounted in the casing,
(1) the second clamping plate defining a taphole axially aligned with the taphole in the first clamping plate, and
(d) a clamping screw for axially moving the first clamping plate between a closed position and an open position limited by the inner casing surface wherein the space between the first clamping plate and the second clamping plate has a maximum axial length, the clamping screw comprising
(1) a screwhead held in the open position between the spring tongues of the first clamping plate and
(2) an axially extending shaft passing first through the taphole of the first clamping plate and then through the taphole of the second clamping plate in the closed position, the shaft comprising a threaded section engaging the tapholes, the maximum axial length of the space between the first clamping plate and the second clamping plate being smaller than an axial length of the threaded section, a constricted neck between the screwhead and the threaded section, the neck having an axial length at least equal to the thickness of the first clamping plate, and a threadless free end having a diameter smaller than the diameter of the tapholes and an axial length not exceeding the thickness of the first clamping plate.

5,747,742
PROTECTIVE WRAPPING FOR SPLICED CABLE CONNECTORS
Edward Dennis Nelson, Stone Mountain, Ga., assignor to Lucent Technologies, Inc., Murry Hill, N.J.
Filed Oct. 16, 1995, Ser. No. 543,460
Int. Cl.⁶ H01R *4/00*
U.S. Cl. 174—84 R **6 Claims**



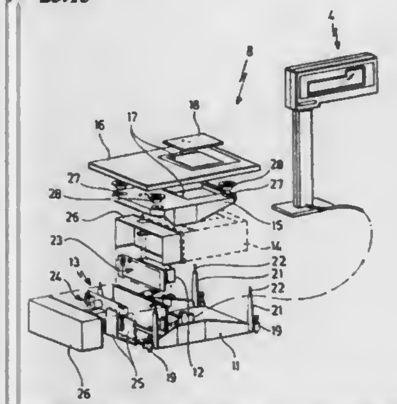
1. A connector assembly for connecting two or more conductors, said assembly comprising
a plurality of connector parts adapted to be fitted together to form the connector assembly;
each of said connector parts being individually and completely enclosed in a protective covering prior to the forming of the connector assembly, said coverings comprising a heat shrink thermoplastic film;
wherein said two or more conductors and said plurality of connector parts can be fitted together through said coverings.

5,747,743
COIL-SHAPED FLEXIBLE PRINTED CIRCUIT BOARD
Miki Kato; Yukinori Tamano, both of Kariya; Katsumi Kobayashi, Anjo, and Michiyuki Noba, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 2, 1995, Ser. No. 382,590
Claims priority, application Japan, Feb. 4, 1994, 6-012394; Oct. 20, 1994, 6-255482
Int. Cl.⁶ H05K *1/00*
U.S. Cl. 174—254 **12 Claims**



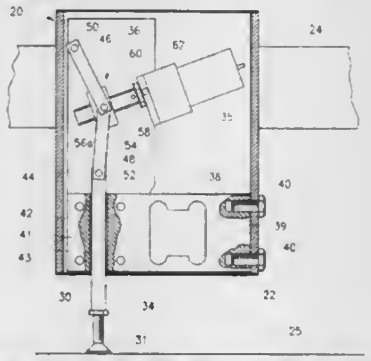
1. A coil-shaped flexible printed circuit board having a prescribed outer diameter comprising:
a base sheet of synthetic resin;
a conductive pattern formed on said synthetic resin base sheet for exerting a coiling force on said base sheet; and
an insulation layer of synthetic resin mounted on said base sheet to cover said conductive pattern;
at least one of said base sheet, conductive pattern, and insulation layer being processed to have a retaining force after they are formed into a coil shape having a prescribed outer diameter, wherein said coiling force exerted by said conductive pattern causes said flexible printed circuit board to assume said coil shape.

5,747,744
WEIGHING DEVICE FOR THE POINT-OF-SALE OF A RETAIL OUTLET
Horst Kraft, Balingen; Horst Purr, Tennenbronn, and Edgar Engelhardt, Balingen, all of Germany, assignors to Bizerba GmbH & Co. KG, Balingen, Germany
PCT No. PCT/EP94/01872, § 371 Date Dec. 11, 1995, § 102(e) Date Dec. 11, 1995
PCT Filed Jun. 8, 1994, Ser. No. 557,123
Claims priority, application Germany, Jun. 10, 1993, 43 19 299.8
Int. Cl.⁶ G01G *19/40;21/22*
U.S. Cl. 177—25.15 **14 Claims**



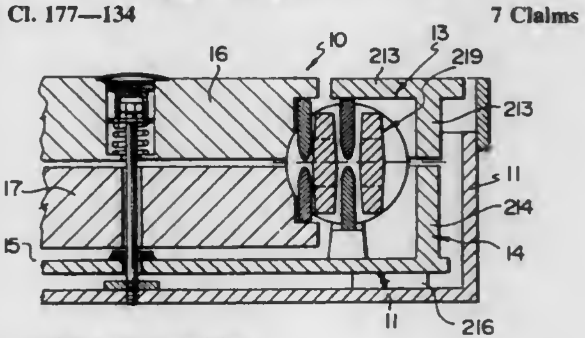
1. An electronic checkout system for weighing and scanning articles including in combination:
a support cradle having a first side and a spaced-apart, opposite second side;
a scanner disposed on said support cradle adjacent said first side;
an electronic circuit, including means for determining the price of articles being weighed, disposed on said support cradle adjacent said second side;
a single weighing cell secured to said support cradle between said scanner and said electronic circuit, said single weighing cell being disposed closer to said second side than said first side and providing an output to said electronic circuit; and
a rigid subplatter, having an aperture formed therethrough, supported solely on said single weighing cell and extending toward said first side such that said aperture overlies said scanner.

5,747,745
WEIGHTING DEVICE FOR BEDRIDDEN PATIENTS
Eli Neuman, Magdiel, Israel, assignor to Tedea-Huntleigh Intl. Ltd., Herzliya, Israel
Filed Jul. 26, 1995, Ser. No. 506,768
Int. Cl.⁶ G01G *19/52;19/08;19/00*
U.S. Cl. 177—132 **16 Claims**



1. A weighing device for bedridden patients comprising:
a housing for attachment to a lower portion of a bed;
a load cell mounted at one end thereof to said housing;
means retractably extendable from said housing to support the bed thereon, said support means being connected to said load cell at a second end thereof such that said load cell is deflected under the weight of the bed when said support means is extended so as to carry said bed weight, said load cell being unloaded when said support means is retracted,
said load cell producing an output signal representative of the bed weight.

5,747,746
RESTRAINT SYSTEM FOR WEIGHT SCALES
Terry Bergan, and Dwaine Friesen, both of Saskatchewan, Canada, assignors to International Road Dynamics, Inc., Saskatchewan, Canada
Filed Jan. 11, 1996, Ser. No. 584,401
Claims priority, application Canada, Oct. 12, 1995, 2160418
Int. Cl.⁶ G01G *21/23*
U.S. Cl. 177—134 **7 Claims**



1. A weigh scale comprising:
(A) a frame assembly which includes:
(i) a fixed outer peripheral rectangular frame, said fixed outer peripheral rectangular frame having an outer upper frame

member a lower base frame member, an outer lower frame member which is integral with said lower base frame member, and

(ii) a mounting frame, and a central rectangular movable platform, said central movable platform comprising a central inner upper platform and a central inner lower platform, an interconnection assembly for interconnecting said fixed outer peripheral rectangular frame to said central rectangular movable platform,

(iii) said interconnection assembly including four torque-transmitting arms, one of said torque-transmitting arms being located at each end and along each side of said fixed outer peripheral rectangular frame, a mounting assembly for mounting said torque-transmitting arms between said outer upper frame member and said outer lower frame member and between said central inner upper platform and said central inner lower platform, and

(iv) a central load measuring device provided in said central movable scale platform,

said weigh scale further comprising:

(B) a securing system for securing said central movable platform to said fixed outer, peripheral frame and to said mounting frame,

said securing system including:

a first through-hole passing through said central inner lower platform;

a second through-hole passing through said outer lower frame member, said second through-hole being aligned with said first through-hole; and

at least one securing element having a dead-end cylindrical bore extending downwardly from the upper face of said central inner upper platform, a first hole piercing the bottom of said dead-end cylindrical bore, a compression spring seated within said dead-end cylindrical bore a third through-hole passing through said compression spring, said third through-hole being aligned with said first through-hole and with said second through-hole, and a securing bolt disposed within said dead-end cylindrical bore and threadably secured to said mounting frame, said securing bolt passing concentrically through said third through-hole, through said compression spring, through said first through-hole and through said second through-hole.

5,747,747

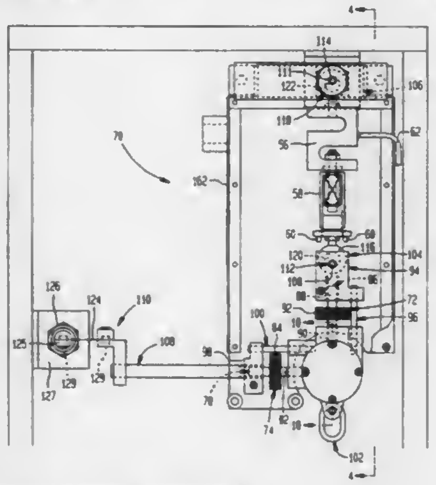
CONTINUING BELT-TYPE CONVEYOR AND MEANS FOR WEIGHING CONTENTS TRANSPORTED THEREON

Peter B. Cadou, Chagrin Falls; John C. Homer, III, Newbury, and Kevin A. Alexeff, Seven Hills, all of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 23, 1996, Ser. No. 590,154

Int. Cl.^{6} G01G *19/00;21/10*

U.S. Cl. 177—145 **42 Claims**



1. A weigh assembly comprising:

a weigh roller having first and second ends;

a first weigh subassembly disposed about said first end of said weigh roller for compensating for variations in the load passing over said weigh roller and being capable of weighing the load passing over said weigh roller, said first weigh subassembly including a first means for controlling the vertical position of said first end of said weigh roller and a first means for controlling the horizontal position of said first end of said weigh roller; and

a second weigh subassembly disposed about said second end of said weigh roller for compensating for variations in the load passing over said weigh roller and being capable of weighing the load passing over said weigh roller, said second weigh subassembly including a second means for controlling the vertical position of said second end of said weigh roller and a second means for controlling the horizontal position of said second end of said weigh roller.

5,747,748

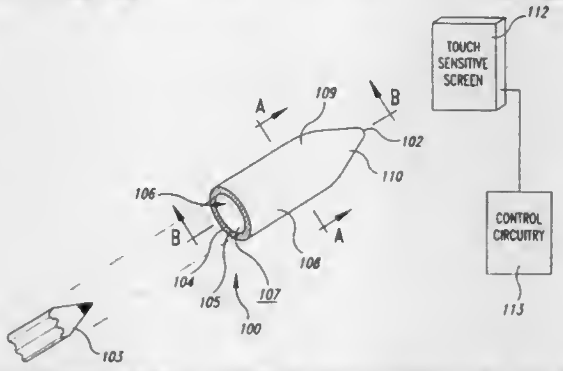
STYLUS SHEATH FOR USE WITH TOUCH-SENSITIVE SCREENS

Robert A. Zigler, Marysville, Wash., assignor to Intermec Corporation, Everett, Wash.

Filed Jul. 26, 1996, Ser. No. 690,197

Int. Cl.^{6} G08C *21/00;* **G09G** *3/02*

U.S. Cl. 178—18 **30 Claims**



1. A sheath capable of being used and enclosing an end of a stylus having a first diameter and a touch-sensitive screen having a first hardness, comprising:

an elongated member extending in a longitudinal direction between a distal end and a proximal end, the member having an exterior surface generally tapering between the proximal and distal ends to reach a tip at the distal end, and having an interior volume having a second diameter and capable of securely and removably receiving the end of the stylus when inserted through a proximal opening,

wherein the second diameter is less than the first diameter and wherein the proximal opening expands transversely at the proximal end of the sheath as a result of the difference between the first and second diameters,

wherein the elongated member is formed at least partially of an elastomeric material having a second hardness, and wherein the second hardness is less than the first hardness.

5,747,749

ACOUSTIC LOGGING TO IDENTIFY OIL FLOW RATE

Adam Bednarczyk, Carrollton; Robert E. Maute, Richardson, and Laird B. Thompson, Dallas, all of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

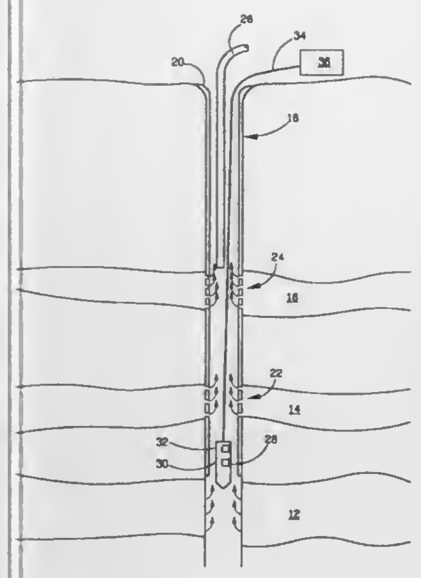
Filed Dec. 11, 1996, Ser. No. 764,403

Int. Cl.^{6} G01V *1/40;* **G01F** *1/20*

U.S. Cl. 181—102 **24 Claims**

1. An apparatus for measuring fluid flow in a flow line comprising:

means for directing a beam of acoustic energy toward said fluid flow;



means for receiving reflection signals of said beam of acoustic energy;

means for rectifying said reflection signals;

means for defining two areas of said rectified reflection signals;

means for integrating said rectified reflected signals under each of said two areas to provide area integration values and to determine the portion of said fluid flow that is liquid; and

means for determining a ratio of said integration values of said two areas of said envelop of said rectified reflection signals to determine gas content in said fluid flow.

5,747,750

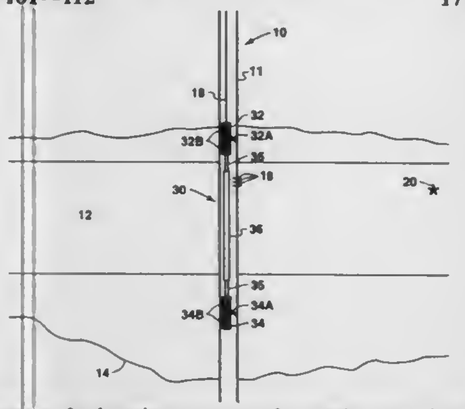
SINGLE WELL SYSTEM FOR MAPPING SOURCES OF ACOUSTIC ENERGY

Jeffrey R. Bailey, Houston, and Marion M. Ringo, League City, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 31, 1994, Ser. No. 298,610

Int. Cl.^{6} G01V *1/00*

U.S. Cl. 181—112 **17 Claims**



1. Apparatus for locating a source of acoustic waves in the earth, comprising:

an elongated body having an axis and a plurality of segments and being adapted to be connected to a wireline to allow placing the apparatus in a well;

a plurality of receivers comprising separate segments of the body, each receiver having a radius and including retractable means for exerting a force for clamping the receiver in the well and having three orthogonal seismic sensors, each sensor producing an electrical signal responsive to an acoustic wave impinging thereon; and

electronic means including a plurality of voltage controlled oscillators, each oscillator having a selected mid-range frequency, the electronic means being disposed in a segment of the elongated body and being capable of converting the electrical signal from each seismic sensor to a frequency modulated signal.

5,747,751

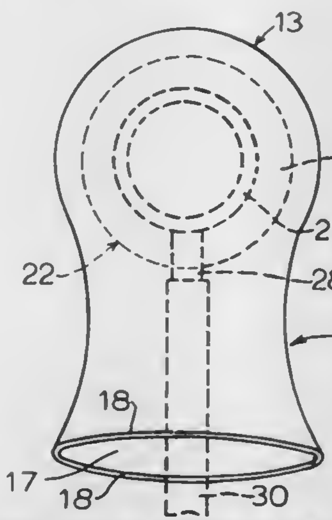
DISPOSABLE COVER FOR STETHOSCOPE HEAD

Judith C. Weckerle, 4711 Rolling Wood Dr., Durham, N.C. 27713, and Kathleen L. Weaver, 110 Mel Oaks Dr., Chapel Hill, N.C. 27516

Filed Dec. 4, 1996, Ser. No. 760,185

Int. Cl.^{6} A61B *7/02;19/02*

U.S. Cl. 181—131 **6 Claims**



1. A disposable cover for a stethoscope head having a round diaphragm portion of a first diameter and, optionally, a round bell portion of a second diameter which is smaller than said first diameter, and a stem extending outwardly therefrom, said disposable cover comprising:

(a) a seamless casing formed from a substantially thin, sound transmitting, flexible and stretchable sheet material which is substantially impervious to body fluids;

(b) said seamless casing having an open end of a dimension when not stretched that is sufficient to permit introduction of the stethoscope head slidingly into the casing, a tapered neck section adjacent to the open end with a narrowest dimension thereof which when not stretched is smaller than the first diameter of said diaphragm portion of the stethoscope head and a receiving section located outwardly and adjacent to the tapered neck section and of a dimension when not stretched to slidingly receive and envelope the stethoscope head, the narrowest dimension of the tapered neck section when not stretched also being smaller than the open end

(c) said open end further comprising a reinforcing edge.

5,747,752

STETHOSCOPE WITH DISPOSABLE CHESTPIECE

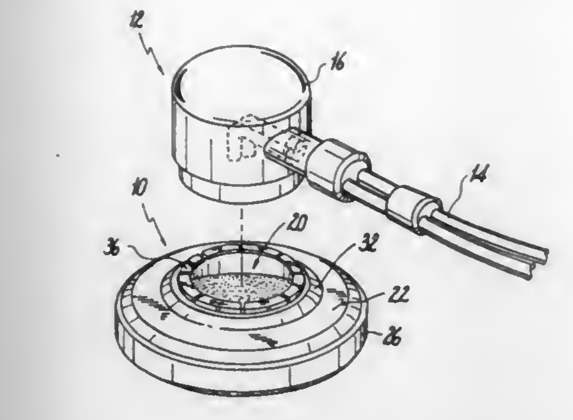
Irwin Selinger, Old Westbury, N.Y., assignor to Graham-Field, Inc., Hauppauge, N.Y.

Filed Jan. 30, 1997, Ser. No. 792,582

Int. Cl.^{6} A61B *7/02*

U.S. Cl. 181—131 **4 Claims**

1. A stethoscope having a pair of elongated flexible ear tubes, having a head at one end and a chestpiece connected to said head, said chestpiece comprising a unitary body defining a sound chamber having at least one pair of opposed spaced walls connected by a peripheral wall of treater rigidity than said pair of walls, and one of said walls being formed as a diaphragm, the other of said walls having hole therein, said hole and said head having cooperating means for removably attaching said chestpiece to said head.



5,747,753

MUFFLER FOR AN INTERNAL COMBUSTION ENGINE, PARTICULARLY A SINGLE-CYLINDER DIESEL ENGINE

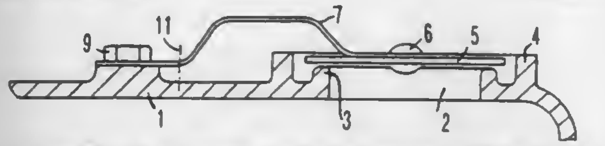
Erich Eder, Vornbach/Inn, Germany, assignor to Motorenfabrik Hatz GmbH & Co., Vornbach/Inn, Germany

Filed Jan. 16, 1996, Ser. No. 587,674

Claims priority, application Germany, Jul. 15, 1993, 43 23 642.1

Int. Cl.^{6} F01N *7/18*

U.S. Cl. 181—282 **11 Claims**



1. A muffler for an internal combustion engine, particularly for a single-cylinder diesel engine, comprising a muffler housing, a baffle plate and a leaf spring, said muffler housing being provided with an inlet opening and an outlet opening for exhaust gas, wherein the baffle plate is oscillatingly mounted by means of the leaf spring to the muffler housing in that one end of the leaf spring is connected to the muffler housing at a distance from the outlet opening and the baffle plate is fastened to the other end of the leaf spring, and wherein the baffle plate is disposed on the outside of the muffler housing at a slight distance from the outlet opening.

5,747,754

METHOD AND APPARATUS FOR TAKING SEISMIC MEASUREMENTS

Bjørnar Svenning, Ålgård; Tormod Hals, Trondheim, and Bjarne Bugten, Hundhamaren, all of Norway, assignors to Den Norske Stats Oljeselskap A.S, Stavanger, Norway

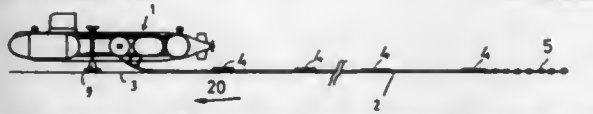
PCT No. PCT/NO94/00043, § 371 Date Aug. 24, 1995, § 102(e) Date Aug. 24, 1995, PCT Pub. No. WO94/19707, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 21, 1994, Ser. No. 507,293

Claims priority, application Norway, Feb. 25, 1993, 930686

Int. Cl.^{6} G01V *1/053;1/047;1/20;1/38*

U.S. Cl. 181—401 **18 Claims**



1. A method of taking seismic measurements comprising the steps of:

providing a plurality of spaced apart seismic detecting sensors, each having a geophone unit, which carries at least one geophone for detecting seismic activities;

flexibly suspending one end of each geophone unit to a carrier frame so that the geophone units are substantially pivotally movable relative to the carrier frames;

serially spacing and linking the carrier frames with a power supplying cable;

resting the carrier frames on a desired location of a floor covered with water;

vibrating the geophone units, wherein the flexible suspension of the geophone units relative to the carriers enables free ends of the geophone units to embed into the floor;

ceasing the vibration to maintain the geophone units stationary and partly embedded in the floor; and

measuring the seismic activities thereafter.

5,747,755

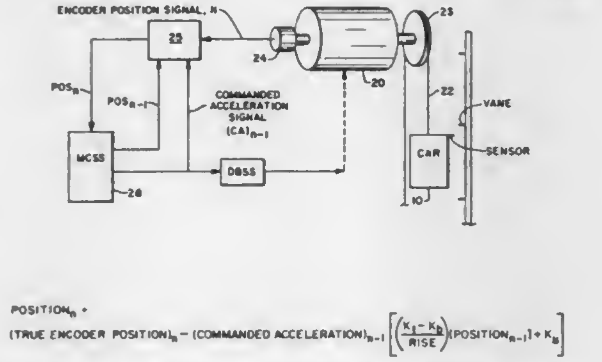
ELEVATOR POSITION COMPENSATION SYSTEM

Steven D. Coste, Berlin, and Jeff Izard, Bolton, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Dec. 22, 1995, Ser. No. 575,797

Int. Cl.^{6} B66B *1/34;3/00*

U.S. Cl. 187—394 **2 Claims**


ENCODER POSITION SIGNAL, N
23
24
25
20
22
VANE
POS$_n$
POS$_{n-1}$
COMMANDED ACCELERATION SIGNAL (CA)$_{n-1}$
MCSS
DBSS
CAR
SENSOR
26
10
POSITION$_n$ =
(TRUE ENCODER POSITION)$_n$ − (COMMANDED ACCELERATION)$_{n-1}$ [((K$_t$−K$_b$)/RISE)(POSITION$_{n-1}$)+K$_b$]

1. An elevator car position compensation arrangement comprising:

a car coupled to a motor by means of ropes;

means for driving the motor;

uncompensated signal generating means for generating an uncompensated car position signal; and

compensated signal generating means for generating a compensated car position signal, said compensated signal generating means including instructions and data for generating a car position signal according to the following relationship:

$$\text{Position}_n=(\text{True Encoder Position})_n-(\text{Commanded Acceleration})_{n-1}[((K_t-K_b)/\text{Rise})(\text{Position}_{n-1})+K_b]$$

Where:

True Encoder Position$_n$=Current uncompensated/true position from driving machine shaft encoder (e.g., mm)

Position$_n$=Current position reference value based on driving machine encoder feedback used for position control (e.g., mm)

Position$_{n-1}$=Previous position reference value based on driving machine encoder feedback (e.g., mm).

Rise=Maximum value of Position (where minimum value of Position is zero) (e.g., mm).

Commanded Acceleration$_{n-1}$=Acceleration most recently commanded by the motion controller to the drive system (meters per second)

K$_t$=Slip and Stretch per unit acceleration expected at the top of the hoistway

K$_b$=Slip and Stretch per unit acceleration expected at the bottom of the hoistway.

5,747,756

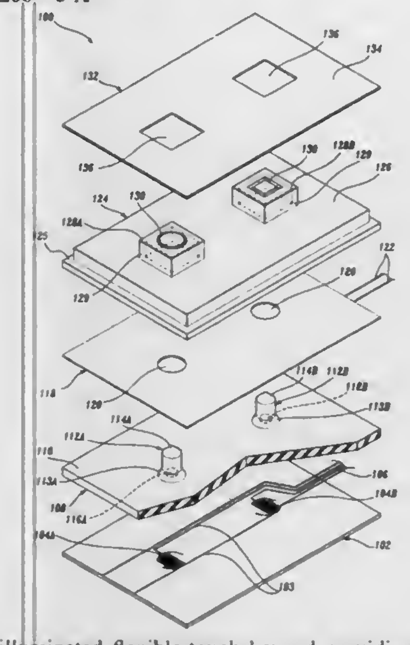
ELECTROLUMINESCENT BACKLIT KEYPAD

Todd Jay Boedecker, Auburn, Wash., assignor to GM Nameplate, Inc., Seattle, Wash.

Filed Sep. 10, 1996, Ser. No. 711,275

Int. Cl.^{6} H01H *9/20*

U.S. Cl. 200—5 A **30 Claims**



1. An illuminated flexible-touch keypad providing at least one key, the key being illuminated with a substantially uniform light intensity, the keypad comprising:

(a) a circuitry layer having conductors thereon;

(b) an actuator layer overlying the circuitry layer, the actuator layer having a nonconductive base web and at least one translucent post, the post protruding up from the base web and arranged to be substantially aligned with a corresponding conductor on the circuitry layer;

(c) an electroluminescent panel overlying the actuator layer, the electroluminescent panel containing at least one aperture substantially aligned with and established to receive a corresponding post of the actuator layer, and through which the post protrudes; and

(d) a flexible surface layer overlying the electroluminescent panel, at least one portion of the surface layer comprising at least one key, the portion comprising one key being substantially aligned with a corresponding post of the actuator layer.

5,747,757

TAMPER RESISTANT MEMBRANE SWITCH

Anthony J. Van Zeeland, Mesa, Ariz., and Robert S. Bielik, Waukesha, Wis., assignors to Monopanel Technologies, Inc., West Allis, Wis.

Filed Sep. 10, 1996, Ser. No. 711,507

Int. Cl.^{6} H01H *13/70;1/10*

U.S. Cl. 200—5 A **20 Claims**

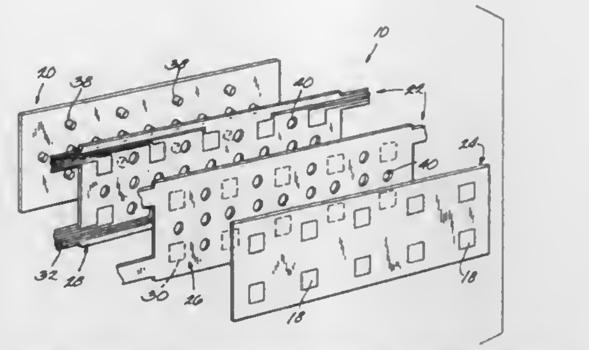
1. A membrane switch assembly comprising:

a backer plate;

a membrane switch subassembly disposed over the backer plate, the membrane switch subassembly including a plurality of individual switch elements;

a metallic overlay disposed over the membrane switch subassembly and deflectable toward the backer plate in response to an applied actuating force, and

structure between the backer plate and the metallic overlay for confining deflection of the metallic overlay to areas substantially adjacent the applied actuating force so that substantially only single ones of the individual switch elements are actuated in response to application of the actuating force.



5,747,758

KEYBOARD ARRANGEMENT

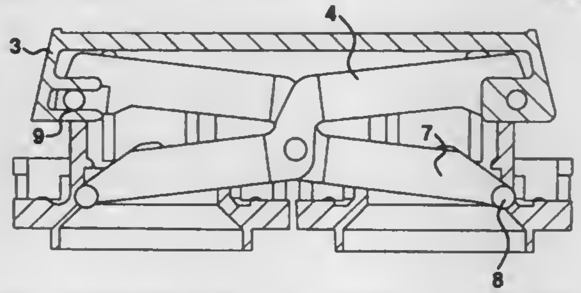
Gerhard Hochgesang, Neustadt a. d. Seale, and Andrea Grosse, Dietzhausen, both of Germany, assignors to Preh-Werke GmbH & Co. KG, Bad Neustadt, Germany

Filed Sep. 27, 1996, Ser. No. 720,015

Claims priority, application Germany, Sep. 28, 1995, 195 36 071.0

Int. Cl.^{6} H01H *9/20*

U.S. Cl. 200—5 A **3 Claims**



1. A keyboard apparatus for a large, multicontact, moveable key of a keyboard, said the keyboard apparatus including:

a scissor apparatus arranged between the moveable key and immovable parts of the keyboard for preventing key tilt upon off-center application of force to the moveable key, said scissor apparatus comprising scissor arms with guide pins protruding outwardly therefrom;

immovable guide-slot walls attached to said immovable parts of the keyboard for defining guide slots for receiving and guiding said guide pins of said scissor arms;

wherein the scissor arms are formed as springs for allowing spring axial movement of said guide pins, with outer ends of said guide pins having inclined surfaces relative to planes perpendicular to axes of said pins, for engaging the guide-slot walls during mounting of the scissor arms to thereby cause said scissor arms to spring inwardly until said guide pins clear said guide walls and snap into said guide slots under spring action of said scissor arms.

5,747,759

CONTROL UNIT FOR VEHICLE CLIMATE CONTROL

Karl Lochmahr, Vaihingen, and Werner Rauland, Pforzheim, both of Germany, assignors to Behr GmbH & Co., Stuttgart, Germany

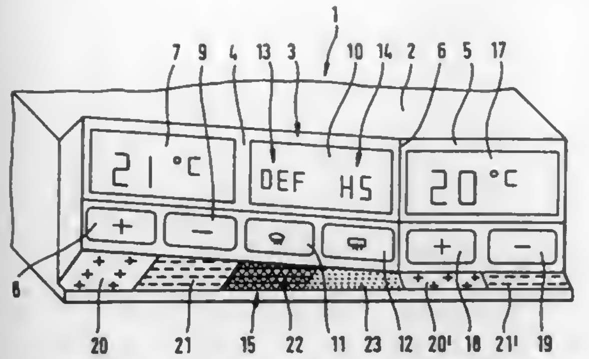
Filed Oct. 25, 1996, Ser. No. 736,693

Claims priority, application Germany, Oct. 31, 1995, 195 40 553.6

Int. Cl.^{6} H01H *9/18;* **G08B** *6/00*

U.S. Cl. 200—5 R **20 Claims**

1. A control unit suitable for controlling a motor vehicle heating and/or air conditioning system, comprising:



a plurality of control elements located on a control surface and having symbols, respectively assigned to the control elements, for visually displaying the operation of each of the control elements; and

an orientation strip arranged on the control surface and adjoining the control elements, the orientation strip comprising identification zones assigned to respective control elements and having respective, differently characterized, haptically coded surfaces.

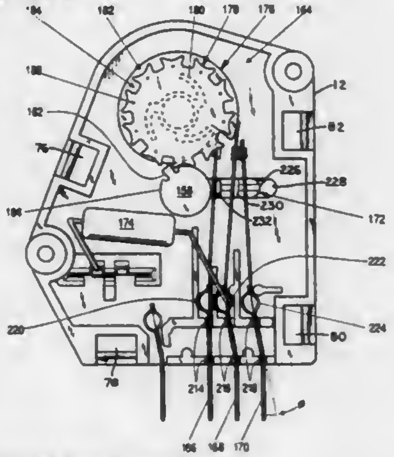
5,747,760
TIMER WITH IMPROVED GENEVA DRIVE MECHANISM

Edwin L. Skarivoda, Manitowoc, Wis., assignor to Paragon Electric Company, Inc., Two Rivers, Wis.

Filed Jul. 10, 1996, Ser. No. 678,073

Int. Cl.^{6} H01H ***7/00;43/00***

U.S. Cl. 200—38 R **19 Claims**



1. An electrical timer, comprising:
an electrical motor;
a gear train coupled to the electrical motor having a plurality of gears including a first geneva drive gear;
a geneva wheel having a plurality of cusps spaced a first angular distance apart coupled to the gear train;
a cam with a cam actuating surface; and
a clutch coupling the geneva wheel to the cam wherein the clutch provides a plurality of indexable operating positions.

5,747,761
MANUALLY RESETTABLE SHOCK SENSOR SWITCH

Soichiro Masuda, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

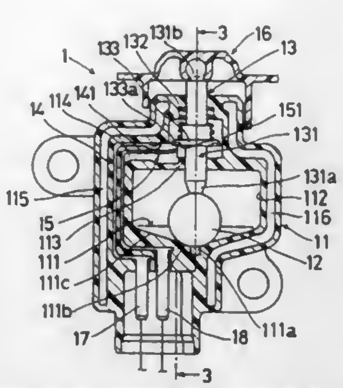
Filed Sep. 27, 1996, Ser. No. 722,823

Claims priority, application Japan, Sep. 29, 1995, 7-253861

Int. Cl.^{6} H01H ***35/14***

U.S. Cl. 200—61.45 R **18 Claims**

1. A shock sensor comprising:
a housing having a conically shaped bottom portion that converges to a bottom end;



a ball positioned in the housing and movable along the conically shaped bottom portion of the housing when a shock exceeding a predetermined level is applied to the shock sensor;
a supporting member movably mounted in the housing for pushing the ball against the bottom end of the conically shaped bottom portion of the housing in the absence of a shock exceeding the predetermined level and for being separated from the ball to release the ball when a shock exceeding the predetermined level is applied to the shock sensor;
an elastic member disposed between the housing and the supporting member for biasing the supporting member against the ball:
a fixed electrode fixed within the housing; and
a movable electrode connected to and movable with the supporting member so that with the supporting member in one position the fixed electrode and the movable electrode are connected to one another to define a connected state and with the supporting member in another position the fixed electrode and the movable electrode are disconnected from one another to define a disconnected state.

5,747,762
OSCILLATION SWITCH AND A PORTABLE ELECTRICALLY DRIVING MACHINE WITH THE OSCILLATION SWITCH

Kenji Fukuda, and Osamu Asano, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

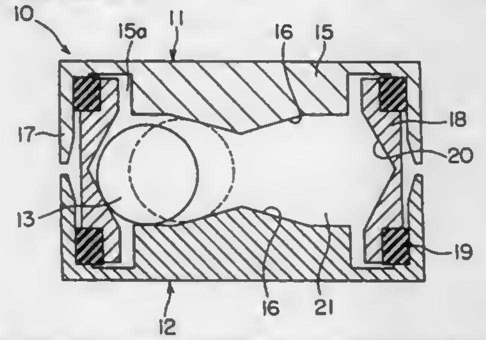
PCT No. PCT/JP94/02226, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO95/32514, PCT Pub. Date Nov. 30, 1995

PCT Filed Dec. 27, 1994, Ser. No. 737,676

Claims priority, application Japan, May 24, 1994, 6-109431

Int. Cl.^{6} H01H ***35/02***

U.S. Cl. 200—61.45 R **7 Claims**



1. An oscillation switch comprising an annular member electrically insulated at at least both end portions thereof, a pair of disc-shaped electrodes provided on said both end portions of said annular member and having opposed inner surfaces separated from each other at a distance and defining a space therebetween, each of said inner surfaces having a central portion, a projection formed on said central portion of said inner surface of at least one of said disc-shaped electrodes, said distance being a minimum substantially between said central portions of said inner surfaces of said electrodes, said inner surface of the other electrode being undepressed, and a plurality of balls made of an electrically conducting material and disposed in said space, each of said balls having a diameter larger than said minimum distance and smaller than a distance between opposed portions of said disc-shaped electrodes with which said projection is not provided.

5,747,763
FITTING STRUCTURE OF ROTARY CONNECTOR AND SWITCH

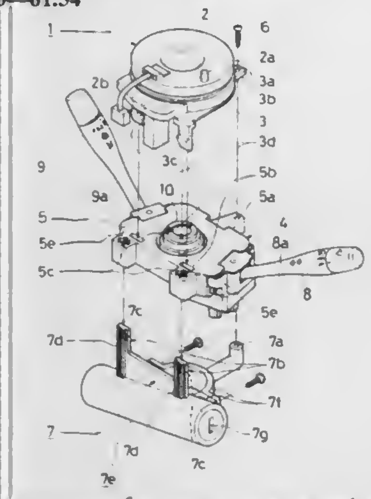
Norio Uchiyama, and Yoshio Hattori, both of Tokyo, Japan, assignors to Niles Parts Co., Ltd., Japan

Filed Jun. 26, 1996, Ser. No. 670,669

Claims priority, application Japan, Nov. 24, 1995, 7-329669

Int. Cl.^{6} H01H ***9/00***

U.S. Cl. 200—61.54 **7 Claims**



1. A fitting structure of a rotary connector and a switch, comprising:
a rotary connector (1) having a resilient engagement plate (*3d*) to be snap-fitted to a base (5) of a switch (4);
said base (5) having a first engagement portion (*5b*) engaging with said resilient engagement plate (*3d*) of said rotary connector (1) and a second engagement portion (*5c*) engaging with an engagement protuberance (*7b*) of a bracket (7) fixed to a steering column; and
said bracket (7) having said engagement protuberance (*7b*);
wherein said second engagement portion (*5c*) includes a resilient pawl plate (*5e*) engaging with an engagement portion (*7c*) formed on said engagement protuberance (*7b*), and a protrusion (*5f*) engaging with a longitudinal groove (*7d*) formed on said engagement protuberance (*7b*).

5,747,764
ELECTRIC POWER SWITCH FOR A VACUUM CLEANER WHICH HAS A SUCTION CONTROL FUNCTION

Chang-Woo Son, and Yang-Rae Kim, both of Incheon, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

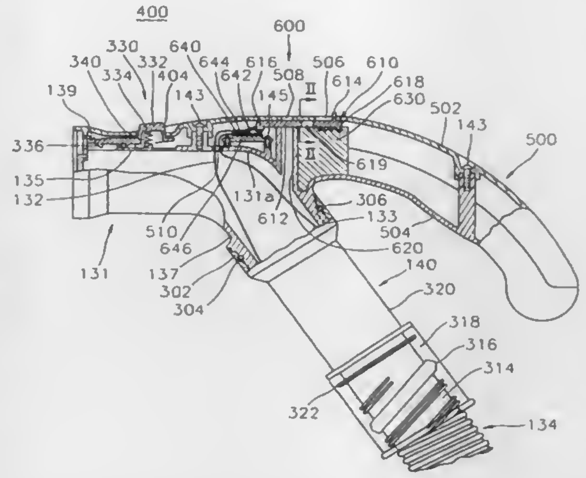
Filed Jan. 30, 1997, Ser. No. 792,161

Claims priority, application Rep. of Korea, May 17, 1996, 1996-16698

Int. Cl.^{6} H01H ***9/06***

U.S. Cl. 200—61.86 **20 Claims**

1. An electric power switch for a vacuum cleaner, said electric power switch comprising:
an air suction passage for introducing an atmospheric air into the vacuum cleaner, said air suction passage being installed in a handle of the vacuum cleaner and extending from a one side wall of a pipe hose toward a cover of the handle in order to communicate with the pipe hose of the vacuum cleaner;
an operation knob for allowing said air suction passage to selectively communicate with an air suction port which is



formed through the cover, said operation knob being installed in a space between said air suction passage and the cover;
a first supporting member for setting a displacement of said operation knob and for slideably supporting said operation knob, said first supporting member extending from a bottom wall of the handle toward the cover in a direction parallel with said air suction passage;
a plurality of electric terminals for applying an electric voltage to a motor of the vacuum cleaner by receiving a pressing force from said operation knob; and
a second supporting member for supporting said electric terminals.

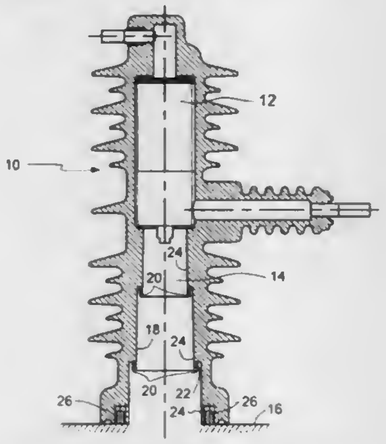
5,747,765
VERTICAL ANTITRACKING SKIRTS

E. Fred Bestel, West Allis, and Paul Newcomb Stoving, South Milwaukee, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 13, 1996, Ser. No. 713,864

Int. Cl.^{6} H01H ***33/02***

U.S. Cl. 218—155 **8 Claims**



1. An encapsulation for an interrupter, comprising:
a main body that includes an internal cavity;
said internal cavity including a space at a first end thereof for the interrupter;
said internal cavity including an internal wall extending from the interrupter space to a second end of the encapsulation;
means at the second end of the encapsulation for mounting the encapsulation;
said internal wall including a convolution;
the convolution separates a first internal wall section from a second internal wall section;
said first internal wall section being closer to the interrupter space than the second internal wall section; and

said first internal wall section having a smaller diameter than said second internal wall section.

5,747,766

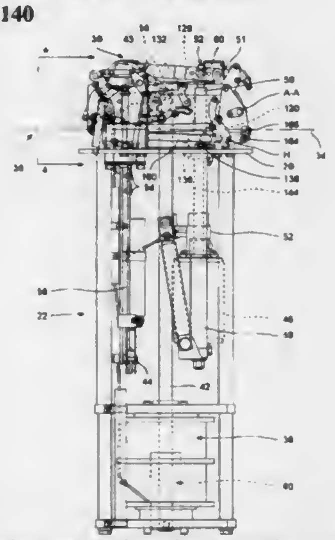
OPERATING MECHANISM USABLE WITH A VACUUM INTERRUPTER

Ronald Arvid Waino, South Milwaukee, and Daniel James Schreiber, New Berlin, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 33,087, Mar. 16, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,592

Int. Cl.^{6} H01H *33/66*

U.S. Cl. 218—140 13 Claims



1. An operating mechanism for producing controlled linear motion at at least one of a plurality of stations wherein said controlled linear motion is utilized to independently open and close linearly moveable electrical contacts, said mechanism including means for producing a dynamic motive force at each of said stations, a first static energy storage means for opening the electrical contacts, a second static energy storage means for closing the electrical contacts, means for releasing said static energy of said first and said second static energy storage means to carry out the opening and closing of said contacts, and to provide an unvarying uniform high force required from making contact and up to and at contact separation, and means for preloading said first static energy storing means prior to releasing the static energy of the second static energy storage means.

5,747,767

EXTENDED WATER-INJECTION NOZZLE ASSEMBLY WITH IMPROVED CENTERING

Wayne Stanley Severance, Darlington, and Duane Norman Winterfeldt, Clio, both of S.C., assignors to The ESAB Group, Inc., Florence, S.C.

Filed Sep. 13, 1995, Ser. No. 527,526

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.5 22 Claims

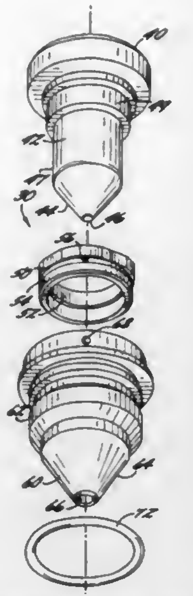
1. A plasma arc torch characterized by the ability to produce a bevel cut or weld and a cut or weld within a concavity on the top surface of a workpiece while maintaining a relatively short standoff distance from the workpiece, said torch comprising

a torch body defining a longitudinal discharge axis,

an electrode secured to said torch body, said electrode comprising a discharge end,

a gas-constricting and water-injection nozzle assembly mounted adjacent said discharge end of said electrode, said nozzle assembly comprising

a nozzle base having a bore therethrough coaxially aligned with the longitudinal discharge axis defined by said torch body,



an outer shell positioned radially outwardly of said nozzle base and having a bore therethrough coaxially aligned with the longitudinal discharge axis defined by said torch body and having at least one opening therethrough, said outer shell being positioned to define a fluid passageway between said nozzle base and said outer shell terminating at the bore thereof, and

an annular swirl ring positioned between said nozzle base and said outer shell, said swirl ring having at least one opening therethrough,

means for generating an electrical arc extending from said discharge end of said electrode,

means for supplying a flow of a gas from an external source to create a vortical flow of gas adjacent said discharge end of said electrode to generate a plasma flow extending along the longitudinal discharge axis, through the bore in said nozzle base and through the bore in said outer shell, and

means for supplying a flow of fluid from an external source through said at least one opening in said outer shell, through said at least one opening in said swirl ring, and through said fluid passageway to create a vortical flow of fluid to constrict said plasma flow extending along the longitudinal discharge axis defined by said torch body,

and wherein said swirl ring is press-fit onto said nozzle base and said outer shell is press-fit onto said swirl ring to center and maintain the concentricity of the bore in said outer shell relative to the bore in said nozzle base.

5,747,768

DEVICE FOR GUIDING AND FEEDING AT LEAST TWO SHEET BLANKS PREVIOUSLY BROUGHT EDGE TO EDGE TO FORM A JOINT PLANE FOR ENERGY BEAM WELDING

Gilles Peru, Dunkerque, and Philippe Henry, Mercy-le-Bas, both of France, assignors to Sollac, Puteaux, France

Filed Oct. 20, 1995, Ser. No. 546,359

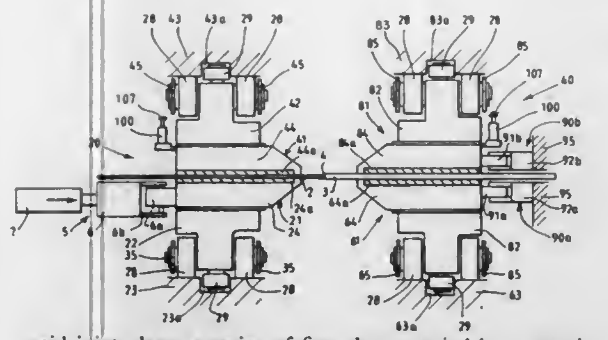
Claims priority, application France, Nov. 28, 1994, 94 14230

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.63 40 Claims

1. Device for guiding and feeding at least two sheet blanks previously brought edge to edge to form a joint plane welded by means of a high energy density beam, which comprises:

a first unit and a second unit for supporting and feeding said sheet blanks in a direction toward said beam, said units being disposed on opposite sides of said joint plane and movable in synchronism with each other, each unit comprising in combination:



a first runway defining a horizontal reference plane, a series of carriages articulated together in a vertical plane and mounted to be movable relative to said runway in a direction parallel to said joint plane, a series of first shoes carried by respective ones of said carriages and constituting a substantially continuous surface of contact with a first face of said sheet blanks,

a second runway defining a horizontal reference plane, a series of second shoes disposed in facing relative to said first shoes, support means for supporting said second shoes relative to said second runway such that said second shoes are movable relative to said second runway in a direction parallel to said joint plane, said second shoes constituting a substantially continuous surface of contact with a second face of said sheet blanks on the opposite side of said sheet blanks to said first face;

means for moving said first shoes of said first unit relative to said respective carriages in a direction perpendicular to said joint plane and for moving said second shoes of said first unit relative to said second runway in a direction perpendicular to said joint plane;

said device further comprising in combination:

means cooperative with said first shoes of said first unit for shifting said first shoes of said first unit in a direction perpendicular to said joint plane for exerting a lateral pressure on said edges to be welded of said sheet blanks;

and means cooperative with said second shoes of each unit for exerting a substantially vertical force on and clamping the respective sheet blanks said means for exerting a substantially vertical force being separated from said means for shifting said first shoes for exerting said lateral pressure on said edges to be welded of said sheet blanks.

5,747,769

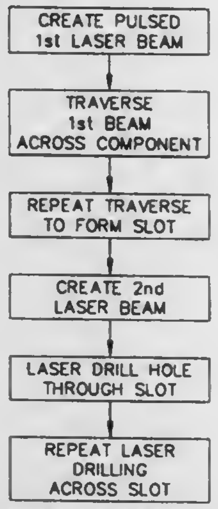
METHOD OF LASER FORMING A SLOT

Todd J. Rockstroh; John M. Crow, both of Maineville; Ching-Pang Lee, and James D. Risbeck, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 13, 1995, Ser. No. 555,653

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.71 20 Claims



CREATE PULSED 1st LASER BEAM
TRAVERSE 1st BEAM ACROSS COMPONENT
REPEAT TRAVERSE TO FORM SLOT
CREATE 2nd LASER BEAM
LASER DRILL HOLE THROUGH SLOT
REPEAT LASER DRILLING ACROSS SLOT

1. A method for forming a slot in a metal component having first and second opposite surfaces spaced apart at a thickness, comprising the steps of:

effecting a first laser beam having a pulse rate and power to vaporize said metal;

traversing said first laser beam across said first surface at a feed rate so that each beam pulse vaporizes said metal at a spot; and

said pulse rate and feed rate being effective so that successive spots do not substantially overlap each other; and

repeating said traversing step in a series of passes so that said spots collectively form a continuous blind slot in said metal component to a depth below said first surface and having a width, and a length greater than said width.

5,747,770

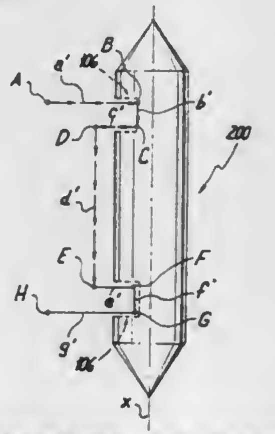
METHOD OF ENERGY BEAM FORMING SURGICAL INCISION MEMBERS

Michael W. Bogart, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 17, 1995, Ser. No. 545,191

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.72 15 Claims



1. A method of forming a surgical incision member from needle stock, comprising the steps of:

a) providing a needle blank including an elongated body portion having first and second end portions, the elongated body portion defining a longitudinal axis;

b) directing an energy beam at a first peripheral contact surface point of the body portion; and

c) maneuvering the energy beam along a path having at least a longitudinal component to a second peripheral contact surface point of the body portion whereby needle material disposed along the path of the energy beam is removed thereby forming a notched portion on the body portion.

5,747,771

METHOD AND APPARATUS FOR FORMING BLIND SLOTS INCLUDING LASER MELTING AND GAS VORTEX

William O'Neill, Liverpool, England, assignor to The BOC Group PLC, Windlesham, England

Filed Apr. 12, 1996, Ser. No. 631,868

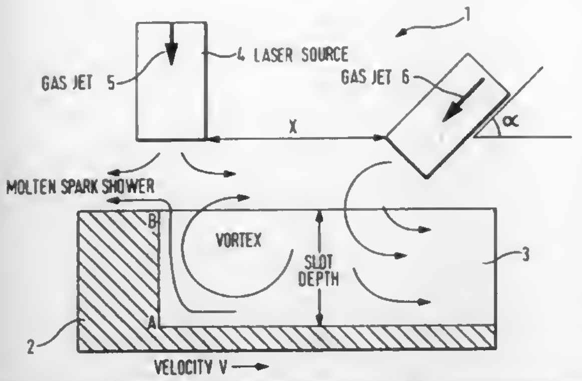
Claims priority, application United Kingdom, Apr. 13, 1995, 9507719

Int. Cl.^{6} B23K *26/14*

U.S. Cl. 219—121.84 10 Claims

1. A method of machining a blind slot in a surface of a workpiece comprising the steps of heating the surface of the workpiece above its melting temperature and directing at least two gas streams such that they together with a base of the slot create a

/OL
2 10
SS
1
MY
5
998
MI



vortex with a definite rotational direction for removing molten material from the slot.

5,747,772
LASER MARKING METHOD INCLUDING RASTER SCANNING OF RAPIDLY REWRITTEN LIQUID CRYSTAL MASK

Yukinori Matsumura, Isehara, and Hirokazu Tanaka, Hiratsuka, both of Japan, assignors to Komatsu Ltd., Kanagawa, Japan

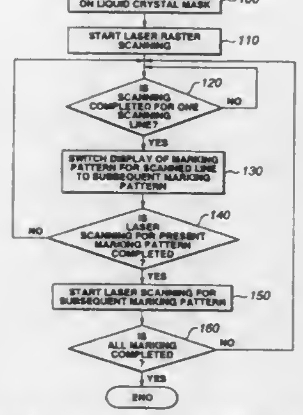
PCT No. PCT/JP95/01087, § 371 Date Feb. 18, 1997, § 102(e) Date Feb. 18, 1997, PCT Pub. No. WO96/05936, PCT Pub. Date Feb. 29, 1996

PCT Filed Jun. 2, 1995, Ser. No. 793,830

Claims priority, application Japan, Aug. 19, 1994, 6-195559

Int. Cl.^{6} B23K *26/06*

U.S. Cl. 219—121.85 **4 Claims**


START
DISPLAY MARKING PATTERN ON LIQUID CRYSTAL MASK
100
START LASER RASTER SCANNING
110
IS SCANNING COMPLETED FOR ONE SCANNING LINE?
120
NO
YES
SWITCH DISPLAY OF MARKING PATTERN FOR SCANNED LINE TO SUBSEQUENT MARKING PATTERN
130
IS LASER SCANNING FOR PRESENT MARKING PATTERN COMPLETED ?
140
NO
YES
START LASER SCANNING FOR SUBSEQUENT MARKING PATTERN
150
IS ALL MARKING COMPLETED ?
160
NO
YES
END

1. A method of laser marking in which a laser beam is raster-scanned over a liquid crystal mask on which a required marking pattern is displayed and an object is marked by the laser beam that has passed through the liquid crystal mask, wherein each scanning line of the liquid crystal mask is scanned by the laser beam while displaying a first marking pattern, each scanning line being switched to display a second marking pattern directly after being scanned by the laser beam.

5,747,773
ARC WELDER POWER SOURCE

David C. Griffin; Dale T. Wiersema; Richard A. Eldridge, and William R. Klingbeil, all of Florence, S.C., assignors to The ESAB Group, Inc., Florence, S.C.

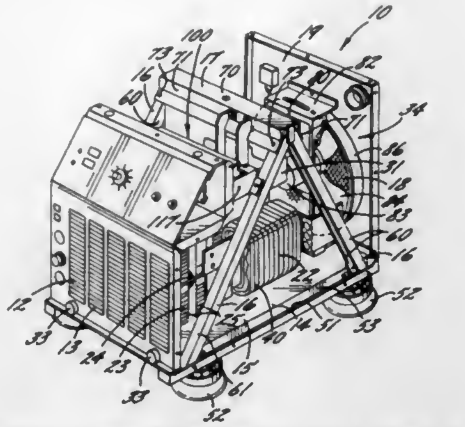
Filed Dec. 18, 1995, Ser. No. 573,927

Int. Cl.^{6} B23K *9/10*

U.S. Cl. 219—130.1 **41 Claims**

1. A power source apparatus for supplying electrical power for an arc welder or the like and comprising:

a frame comprising;



- a generally rectangular base member which defines front and rear edges and opposite side edges,
- a first pair of support members each having a lower end and an upper end, wherein said lower ends are mounted adjacent to one of said side edges of said base member in a spaced apart relation, and wherein said upper ends are positioned adjacent each other so as to define an inverted V-shaped configuration;
- a second pair of support members each having a lower end and an upper end, wherein said lower ends of said second pair are mounted adjacent to the other of said side edges of said base member in a spaced apart relation, and wherein said upper ends of said second pair are positioned adjacent each other so as to define an inverted V-shaped configuration; and
- a cross member extending transversely between the respective upper ends of said first and second pairs of support members, said cross member comprising an inverted channel defining an upper wall and a pair of depending sidewalls secured to the respective upper ends of each of said support members; and

a power circuit supported on said frame and comprising an electrical input line, a transformer having a primary side connected to said input line and a secondary side, at least one rectifier connected to said secondary side of said transformer, and an output line connected to said one rectifier.

5,747,774
HEAT FIXING APPARATUS WITH TEMPERATURE CONTROL BASED ON AC POWER WAVES

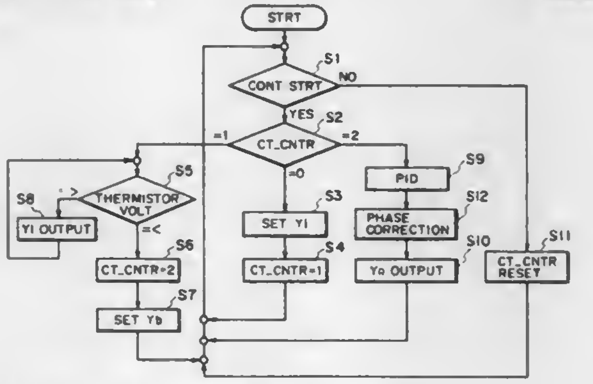
Hidenobu Suzuki; Takashi Soya; Takashi Nakahara; Yasumasa Nashida; Tomoko Nanbu, all of Kawasaki, and Hiroshi Takazawa, Urayasu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 392,263, Feb. 22, 1995, abandoned. This application Dec. 26, 1996, Ser. No. 780,128

Claims priority, application Japan, Feb. 22, 1994, 6-049752

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—216 **3 Claims**



1. An image heating apparatus, comprising:

a heater;

a temperature detecting element for detecting a temperature of said heater;

AC power supply control means for controlling a number of waves of AC power supplied to said heater so that the temperature detected by said temperature detecting element is maintained at a predetermined temperature, said control means determining the number of waves in accordance with a variable reference wave number and a difference between the predetermined temperature and the temperature detected by said temperature detecting element; and

reference wave number changing means for changing the reference wave number in accordance with a temperature changing rate of said heater, wherein said reference wave number changing means changes the reference wave number when the temperature detected by said temperature detecting element is greater than the predetermined temperature and the temperature changing rate is greater than a predetermined rate, or when the temperature detected by said temperature detecting element is less than the predetermined temperature and the temperature changing rate is less than the predetermined rate.

5,747,775
HIGH SPEED OVEN

Hideki Tsukamoto; Akio Ueoka, and Hiroshi Matsuo, all of Tokyo, Japan, assignors to Fujimak Corporation, Tokyo, Japan

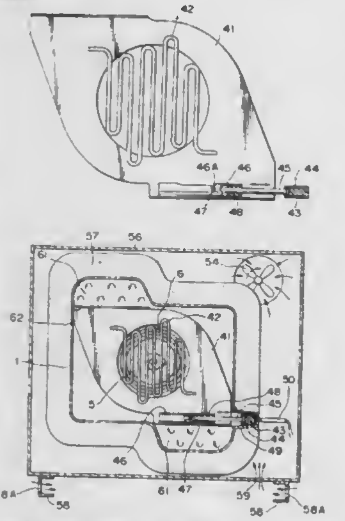
PCT No. PCT/JP94/01710, § 371 Date May 22, 1995, § 102(e) Date May 22, 1995, PCT Pub. No. WO95/10788, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 13, 1994, Ser. No. 436,453

Claims priority, application Japan, Oct. 14, 1993, 5-055564 U; Oct. 14, 1993, 5-055630 U; Oct. 14, 1993, 5-256726; Oct. 14, 1993, 5-256727; Oct. 14, 1993, 5-257258; Sep. 5, 1994, 6-210961

Int. Cl.^{6} F24L *15/36*

U.S. Cl. 219—400 **3 Claims**



1. A fan guard removably fixed to an inside of a heating chamber, in front of a means for generating heated air which is to be transmitted into the inside of the heating chamber, comprising:

- a switch activation means for activating a means, positioned at an outside of the heating chamber, for allowing generation of the heated air when said fan guard is fixed to the heating chamber,
- said switch activation means constituting a part of a means for fixing the fan guard to the heating chamber,
- said switch activation means being adapted to be engaged with an attachment place provided on a corresponding position on a wall surface of the heating chamber,
- said means for allowing generation of the heated air being disposed at a position at the outside of the heating chamber corresponding to said corresponding position of said attachment place.

5,747,776

Patent Not Issued For This Number

5,747,777
HEATER CONTROL DEVICE

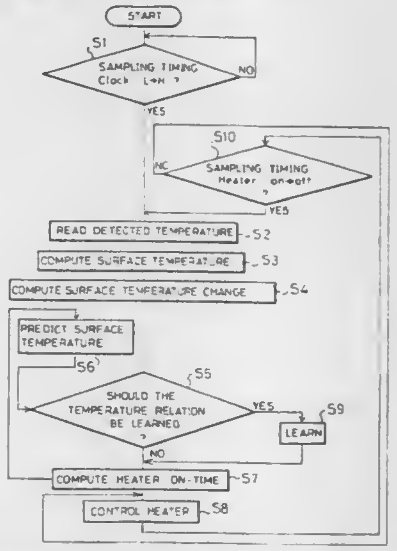
Teruhiko Matsuoka, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 4, 1996, Ser. No. 628,128

Claims priority, application Japan, Apr. 7, 1995, 7-082975

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—497 **15 Claims**


START
S1
SAMPLING TIMING Clock L→H ?
NO
YES
S10
SAMPLING TIMING Heater on→off ?
NO
YES
READ DETECTED TEMPERATURE
S2
COMPUTE SURFACE TEMPERATURE
S3
COMPUTE SURFACE TEMPERATURE CHANGE
S4
PREDICT SURFACE TEMPERATURE
S6
S5
SHOULD THE TEMPERATURE RELATION BE LEARNED ?
YES
S9
LEARN
NO
COMPUTE HEATER ON-TIME
S7
CONTROL HEATER
S8

1. A heater control device for controlling a heater whose heat is conducted to heat-radiating means and emitted from said heat-radiating means, comprising:

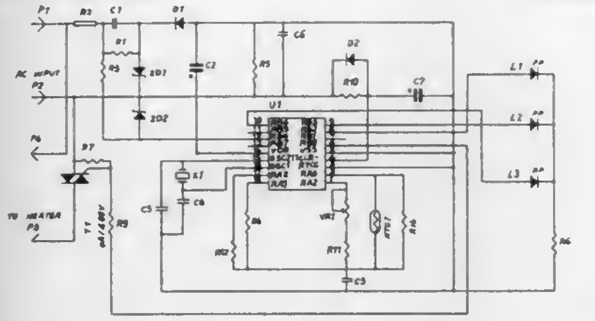
- temperature detecting means for detecting a surface temperature of said heat-radiating means;
- temperature change outputting means for outputting a change in a surface temperature of said heat-radiating means, during a predetermined period of time;
- heater on-time computing and controlling means, provided with a first fuzzy neural network for learning to minimize an error between a first target value and an actual output when the first target value is given as a teaching data, for computing and controlling the heater on-time in response to said temperature detecting means and said temperature change outputting means by use of said first fuzzy neural network;
- predicting means, provided with a second fuzzy neural network for learning to minimize an error between a second target value and an actual output when the second target value is given as a teaching data, for predicting a surface temperature of said heat-radiating means at next detection of the surface temperature when said heater is turned on and controlled in response to the heater on-time, by use of said second fuzzy neural network, in response to said temperature detecting means, said temperature change outputting means, and said heater on-time computing and controlling means;
- judging means for comparing a predetermined upper limit temperature of the surface of said heat-radiating means, the predicted surface temperature computed by said predicting means, and an actual surface temperature detected by said temperature detecting means, and for judging whether or not said first and second fuzzy neural networks should carry out the learning; and
- target value setting means for setting the first and second target values with respect to said first and second fuzzy neural networks respectively, based on the upper limit surface temperature, the predicted surface temperature, and the actual temperature, when said judging means judges to carry out the learning.

5,747,778

HOT MELTING IRON HAVING A SAFETY CONTROL CIRCUIT BOARD

Jung-Yang Liu, 68, Lane 766, Chin Hsing Rd, Taichung, Taiwan

Filed Jan. 5, 1996, Ser. No. 583,610
Int. Cl.^{6} H05B *1/02*
U.S. Cl. 219—506 3 Claims



1. A hot melting iron comprising:
- an iron plate having an appendage extending at an upward acute rearward angle;
- a handle connected to said appendage of said iron plate, said handle
  - having a symmetrically curved structure throughout a length thereof, and
  - defining four holes therethrough;
- a control electrical circuit board accommodated within said handle, said control electrical circuit board including
  - a temperature setting knob passing through one of the four holes in said handle for controlling a variable resistor, whereby an user may select a temperature for operation with said temperature setting knob,
  - a central processing unit electrically connected to said variable resistor, said central processing unit having a timer,
  - an output control device electrically connected to said central processing unit,
  - a heater connected to said output control device,
  - a sensor for monitoring said heater and electrically connected to said central processing unit, and
  - an indicator electrically connected to said central processing unit, said indicator having three light emitting diodes of different colors, each of said three light emitting diodes passing through one of the four holes in said handle,
- wherein said central processing unit
  - analyzes said control electrical circuit board when power is provided and when the iron is in a normal state,
  - causes the iron to be heated according to the set temperature, and
  - cuts off power to the iron and controls the emitting diodes to flash immediately when a measurement of said sensor does not change according to a set condition within a set time as indicated by said timer.

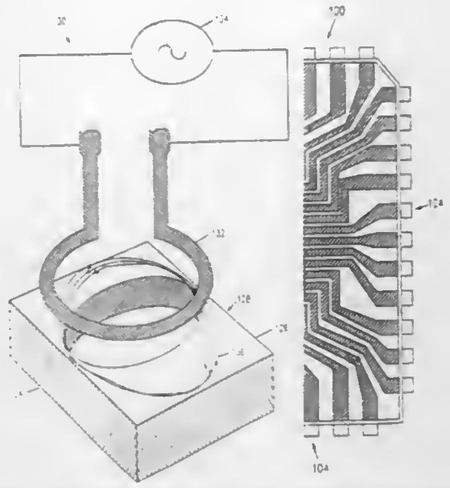
5,747,779

METHOD OF FUSING AND PROGRAMMING FUSE FRAME

Chainarong Asanasavest, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 364,133, Dec. 27, 1994, Pat. No. 5,523,617. This application Feb. 2, 1996, Ser. No. 597,471
Int. Cl.^{6} H05B *6/02;* H01L *23/495*
U.S. Cl. 219—603 15 Claims

1. A method of fusing a fuse bar in a lead frame, said fuse bar supportably connecting an internal lead to an external lead, said method comprising generating an eddy current within said fuse bar thereby fusing the fuse bar, said fuse bar comprising a first end attached to the internal lead, a second end attached to an external lead, and two side sections electrically connecting the first end to the second end and constructed so that an aperture is formed therebetween, said side sections having side section widths substantially smaller than end widths of said first and second ends whereby the side sections fuse first thereby breaking the current path without fusing either the external lead or the internal lead.

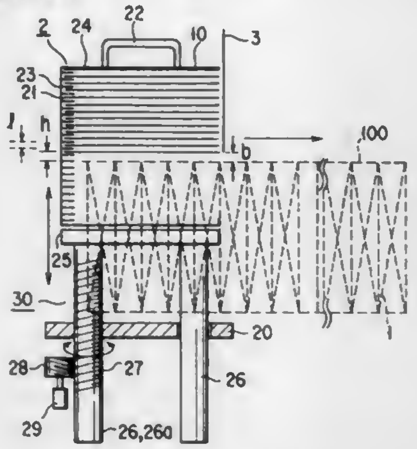


5,747,780

APPARATUS FOR CONVEYING AND PROCESSING A WAFER IN A PHYSICALLY CONTACT-FREE STATE

Yoshiyuki Shioyama, Kawasaki; Masako Hori, Yokohama, and Koji Kimura, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1996, Ser. No. 600,639
Claims priority, application Japan, Feb. 14, 1995, 7-049092
Int. Cl.^{6} H05B *6/10*
U.S. Cl. 219—648 7 Claims



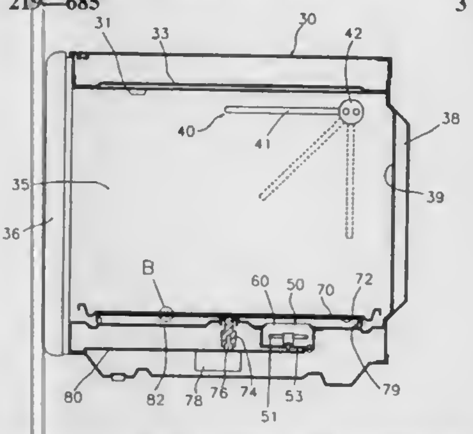
1. A semiconductor manufacturing apparatus comprising:
- a wafer feeding unit having a wafer cassette for storing a plurality of wafers, the wafer cassette further including an opening through which the plurality of wafers are removed;
- a wafer stopper for allowing only one wafer to be removed at a time through the opening of the wafer cassette;
- a wafer conveying unit having a row of alternating-current electromagnets for levitating the wafers to remove a wafer from the wafer cassette through the opening of the wafer cassette and the wafer stopper, and for conveying the removed wafer; and
- a reaction chamber for receiving the conveyed wafer and for heating the received wafer.

5,747,781

MICROWAVE OVEN WITH TURNTABLE AND SWINGABLE ELECTRICAL HEATER

Byeong-Jun Kim; Jae-Soo Kim; Sang-Kee Min; Byung-Nam Choi, and Hyung-Ki Park, all of Incheon, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 25, 1996, Ser. No. 755,610
Claims priority, application Rep. of Korea, Dec. 22, 1995, 95-54258
Int. Cl.^{6} H05B *6/78;* F24C *7/02*
U.S. Cl. 219—685 3 Claims



1. A microwave oven with turntable and swingable electrical heater comprising:
- an upper heater installed to an upper portion of a cooking chamber located inside of the microwave oven for transmitting heat toward the center of said cooking chamber;
- a bracket fixed to a side plate of said cooking chamber, and formed with a pair of lugs spaced apart from each other substantially 60° along the swinging direction of said upper heater;
- a bushing fitted into said bracket for being rotatable therein, and being received with said upper heater piercing therethrough along a rotating shaft line;
- a guiding plate fixed to one plane of said bushing for being rotatable with said bushing, and formed with a groove in an area corresponding to said lugs; and
- a lower heater installed to a lower plane of a bottom plate of said cooking chamber formed with a plurality of heat-radiating holes, and shaped as an alphabet "U" for transmitting the heat to a turnable installed within said cooking chamber.

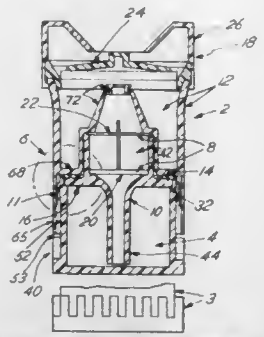
5,747,782

DEVICE AND PROCESS FOR MAKING COFFEE AND ESPRESSO BEVERAGES IN MICROWAVE OVEN

Mario Orrico, 6137 N. Harlem Ave., Chicago, Ill. 60631; Ron Farhadieh, 352 63rd St., Willowbrook, Ill.; Rudy Avramovich, 125 E. Sunnyside Ave., Libertyville, Ill. 60048, and Stuart Koford, 19W281 Paul Revere La., Oak Brook, Ill. 60521

Continuation of Ser. No. 458,309, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 37,814, Mar. 26, 1993, abandoned. This application Mar. 5, 1996, Ser. No. 610,840
Int. Cl.^{6} H05B *6/80;* A47J *31/10*
U.S. Cl. 219—689 16 Claims

1. An espresso device for making espresso beverages in a microwave oven, the espresso device having: a water reservoir capable of containing a liquid; a filter apparatus for holding an espresso particulate substance; and having at least one filter for substantially retaining the particulate substance while permitting the passage of liquid and steam; a funnel having a filter compartment for mounting the filter apparatus, a spout extending downwardly into the water reservoir; and a funnel flange which connects the filter compartment to the spout; a filtrate reservoir detachably connectable to the water reservoir, the funnel connected to the water reservoir such that the filter apparatus is generally intermediate the water reservoir and filtrate reservoir, a filtrate splash cover detachably connected to the filtrate reservoir for deflecting liquid into the filtrate reservoir: and a pressure relief valve for relieving pressure within the device during heating in a microwave oven wherein the water reservoir has an upper portion with a reservoir ledge, and the device further having a substantially annular space formed between the funnel flange and the upper portion when the funnel flange is positioned on the reservoir ledge, the filtrate reservoir having a ring bottom; the funnel flange having a top surface, a gasket positioned between the ring bottom and top surface in an arrangement normally sealing and overlapping the annular space such that upon a pressure exceeding a predetermined level in the water reservoir, the gasket will deform resiliently to form a passageway for liquid and steam through the annular space to the exterior of the espresso device; whereby, upon heating with microwave energy during normal operation, the liquid and steam located in the water reservoir is pressurized and directed through the spout and the filter apparatus containing the espresso particulate substance, and into the filtrate reservoir.

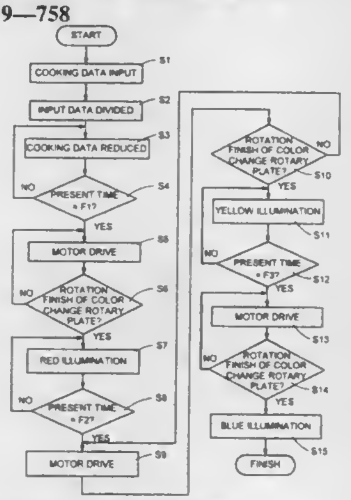


5,747,783

METHODS AND APPARATUS FOR CHANGING THE COLOR OF ILLUMINATION OF A COOKING CHAMBER OF A MICROWAVE OVEN

Soon-Hwan Myung, Suwon; Sang-Jin Kim, Anyang; Chya-Hyung Lee, Suwon; Jea-Wook Park, and Ho Seok Yun, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 5, 1996, Ser. No. 626,142
Claims priority, application Rep. of Korea, Apr. 7, 1995, 95-8119; Jun. 30, 1995, 95-15980; Dec. 7, 1995, 95-47508
Int. Cl.^{6} H05B *6/68*
U.S. Cl. 219—758 9 Claims



1. A microwave oven comprising:
- a cooking chamber;
- a magnetron for supplying high frequency waves to the cooking chamber for cooking food therein;
- an illumination mechanism for illuminating the cooking chamber with different respective colors of light, comprising:
  - a main plate mounted for rotation about an axis, the main plate including a plurality of through-holes formed therein and arranged in circumferentially spaced relationship about the axis of rotation,

- a plurality of differently colored light-transmitting sheets disposed across respective ones of the through-holes,
- a light source arranged such that the light transmitting sheets are selectively positionable in a path of light emitted from the light source,
- an electric motor connected to the main plate for rotating the main plate about the axis, and
- a detector connected to the control mechanism for detecting a position of the main plate and supplying signals to the control mechanism for controlling operation of the motor to orient a selected one of the light-transmitting sheets in the light path;

a control mechanism connected to the motor to drive the motor and rotate the main plate for progressively changing the colors of illumination in accordance with the progress of a cooking operation.

5,747,784

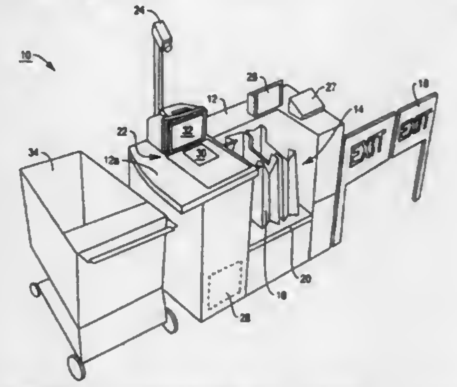
METHOD AND APPARATUS FOR ENHANCING SECURITY IN A SELF-SERVICE CHECKOUT STATION

Joanne S. Walter, and Tracy L. Flynn, both of Alpharetta, Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 22, 1996, Ser. No. 735,424

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 235—383 **18 Claims**



1. A self-service checkout station comprising:
- a scanner which generates a first signal when the scanner detects a machine readable code associated with an item;
- a sensor which generates a second signal when the sensor detects a motion used to scan the item across the scanner;
- a recorder which generates a visual recording of the motion used to scan the item across the scanner; and
- a processing unit coupled to the scanner, the sensor and the recorder which causes the recorder to playback the visual recording on a display monitor when the processing unit receives the second signal but not the first signal.

5,747,785

INTEGRATED HAND-HELD BAR CODE PROCESSING DEVICE CAPABLE OF AUTOMATIC SCAN AND DATA DISPLAY

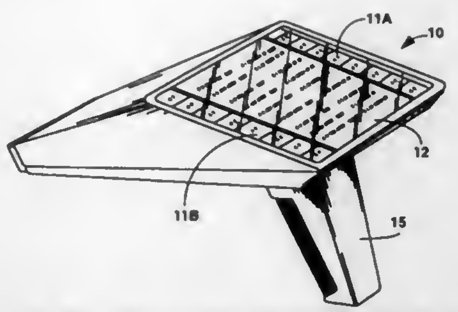
Phillip Miller, 4114 Sunshine St., SW., Cedar Rapids, Iowa 52401; Jerry L. Walter, 387 St. Olaf St., SW., Cedar Rapids, Iowa 52404; Darrell L. Boatwright, 5731 Michael Dr. NE., Cedar Rapids, Iowa 52402, and Darald R. Schultz, 3861 Trailridge Rd. SE., Cedar Rapids, Iowa 52403

Division of Ser. No. 371,747, Jan. 12, 1995, which is a continuation of Ser. No. 257,433, Jun. 8, 1994, abandoned, which is a continuation of Ser. No. 832,052, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 600,053, Oct. 17, 1990, abandoned, which is a continuation of Ser. No. 136,097, Dec. 21, 1987, abandoned, said Ser. No. 832,052 is a continuation-in-part of Ser. No. 305,302, Jan. 31, 1989, abandoned. This application May 30, 1995, Ser. No. 453,210

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **24 Claims**

1. In a data capture system, a portable hand-held data terminal comprising:



- (a) a generally planar terminal undersurface, said terminal undersurface positioned to be directed away from a user when the data terminal is being held;
- (b) an inclined surface having a display to display information to a user, said inclined surface being inclined relative to said undersurface;
- (c) an integrated automatic indicia reader capable of reading optical indicia located externally of the data terminal positioned on an end of the terminal which is distal relative to the user;
- (d) a pressure sensitive screen to accept input of data by application of pressure to a given area of said pressure sensitive screen by the user; and
- (e) wherein said display is directed generally upwardly and rearwardly toward a user's face, so as to be readily visible to the user, when said integrated automatic indicia reader is directed forwardly, and not generally upwardly or downwardly, toward optical indicia to be read.

5,747,786

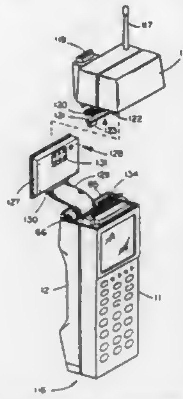
COMMUNICATION MODULE FOR A DATA CAPTURE SYSTEM

Keith K. Cargin, Jr.; Ronald L. Mahany; Dennis A. Durbin; Darrell L. Boatwright, all of Cedar Rapids; Stephen J. Kelly, Marion; Darald R. Schultz, and William T. Gibbs, both of Cedar Rapids, all of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Division of Ser. No. 289,322, Aug. 11, 1994, Pat. No. 5,515,303, which is a continuation of Ser. No. 984,980, Nov. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 921,449, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 707,954, May 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 364,594, Jun. 7, 1989, abandoned, and a continuation-in-part of Ser. No. 364,902, Jun. 8, 1989, abandoned, and a continuation-in-part of Ser. No. 339,330, Apr. 14, 1989, abandoned, said Ser. No. 289,322 is a continuation-in-part of Ser. No. 777,393, Jan. 7, 1992, Pat. No. 5,410,141. This application Jun. 2, 1995, Ser. No. 460,413

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **8 Claims**



1. In a data capture system, a communication module comprising:
- (a) a housing;
- (b) a mount to detachably attach the communication module to a hand-held data terminal;
- (c) an electrical connector to electrically couple the communication module to a hand held data terminal;
- (d) a radio frequency transceiver housed within said housing; and
- (e) a reader module connector to connect a reader module to the communication module.

5,747,787

DATA SYMBOL READING DEVICE

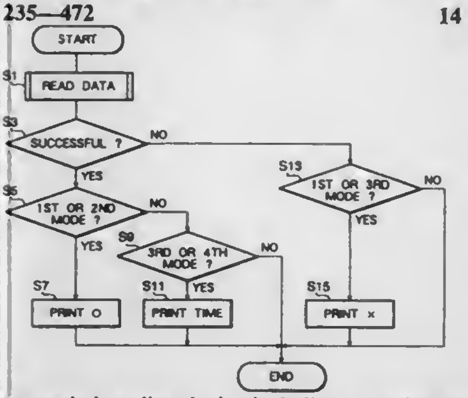
Takeharu Shin; Shuzo Seo; Nobuhiro Tani; Makoto Nukui, and Yukihiro Ishizuka, all of Tokyo, Japan, assignors to Asashi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1996, Ser. No. 631,107

Claims priority, application Japan, May 17, 1995, 7-144117

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **14 Claims**



1. A data symbol reading device including a reading head, said reading head forming an opening, said opening contacting a symbol reading surface on which a data symbol is positioned, said data symbol reading device comprising:
- an optical system forming an image of said data symbol;
- imaging means for outputting an image signal corresponding to said image formed by said optical system;
- decoding means for decoding said image signal, said decoding means outputting said decoded image signal to a determining means for determining if said data symbol has been correctly decoded; printing means capable of printing a plurality of predetermined codes on said symbol reading surface proximate to said data symbol in response to said determining means determining that said data has been correctly decoded; and
- a print mode selection system which selects one of a plurality of printing modes such that the printing means prints none or at least one of the predetermined codes in response to the printing mode selected by the print mode selection system:
- said plurality of printing modes including a first mode in which the printing means prints a first predetermined code in response to the determining means determining that the data symbol is read properly, and the printing means prints a second predetermined code in response to the determining means determining that the data symbol is not read properly:
- a second mode in which the printing means prints the first predetermined code in response to the determining means determining that the data symbol is read properly, and the printing means prints nothing in response to the determining means determining that the data symbol is not read properly:
- a third mode in which the printing means prints a time when the data symbol was read in response to the determining means determining that the data symbol is read properly and the printing means prints the second predetermined code in response to the determining means determining that the data symbol is not read properly; and
- a fourth mode in which the printing means prints the time when the data symbol was read in response to the determining means determining that the data symbol is read properly. and the printing means prints nothing in response to the determining means determining that the data symbol is not read properly.

5,747,788

SOLID STATE IMAGE SENSOR WITH REINFORCED FRINGE ELECTRIC FIELD AT ITS CHARGE TRANSFER SECTION

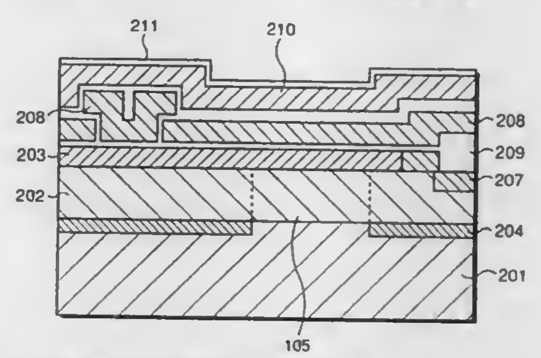
Yasutaka Nakashiba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 29, 1996, Ser. No. 624,968

Claims priority, application Japan, Mar. 31, 1995, 7-075061

Int. Cl.^{6} H01L *27/00;* **H04N** *3/14*

U.S. Cl. 250—208.1 **5 Claims**



1. A solid state image sensor comprising:
- a photoelectric conversion section for accumulating a signal charge in accordance with a quantity of incident light;
- a vertical charge transfer section which reads said signal charge from said photoelectric conversion section;
- a horizontal charge transfer section to which said signal charge is inputted from said vertical charge transfer section;
- said vertical charge transfer section and said horizontal charge transfer section being disposed in a first semiconductor layer and a second semiconductor layer which are joined together; and
- an output section which outputs said signal charge transferred from said horizontal charge transfer section to an element external to said solid state image sensor;
- at least one of said vertical charge transfer section and said horizontal charge transfer section having an electric field reinforcing region in which a depletion layer is extended in a depth-wise direction thereby reinforcing a fringe electric field, said electric field reinforcing region being provided at a region where said second semiconductor layer forms a well region.

5,747,789

METHOD FOR INVESTIGATION OF DISTRIBUTION OF PHYSIOLOGICAL COMPONENTS IN HUMAN BODY TISSUES AND APPARATUS FOR ITS REALIZATION

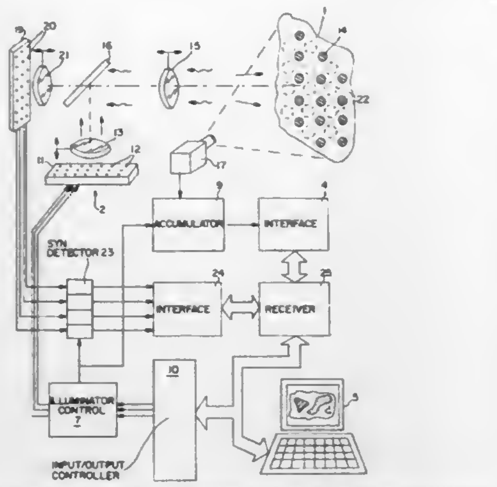
Eduard E. Godik, Midland Park, N.J., assignor to Dynamics Imaging, Inc., Devon, Pa.

Continuation of Ser. No. 160,396, Dec. 1, 1993, abandoned. This application Jul. 11, 1996, Ser. No. 678,786

Int. Cl.^{6} A61B *5/00;* **G01N** *21/00*

U.S. Cl. 250—208.1 **12 Claims**

1. An apparatus for the investigation of distribution of physiological components in human body tissues over a preselected area of the body comprising:
- illumination means for providing electromagnetic radiation to illuminate the preselected area of the body at one or more spectral bands;
- control means operably connected to said illumination means for modulating said illumination means in both frequency and amplitude;
- photodetector means for receiving and recording spatial distribution of intensity of electromagnetic radiation reflected from said preselected area of the body;
- accumulator means operably connected to said control means and said photodetector means for:



forming sequences of video images over a preselected period of time from said recorded spatial distribution of intensity of said reflected electromagnetic radiation from said preselected area of the body;

subtracting a reference video image from any video image from said sequences of video images resulting in sequences of subtracted video images; and

accumulating said sequences of subtracted video images for processing in a computer;

display means operably connected to said computer for displaying, based upon said sequences of subtracted video images, the distribution of physiological components in human body tissues over the preselected area of the body; and

interface means for coordinating said control means with said photodetector means and said accumulator means by said computer.

5,747,790
SOLID STATE IMAGING DEVICE AND METHOD OF MANUFACTURING SAME

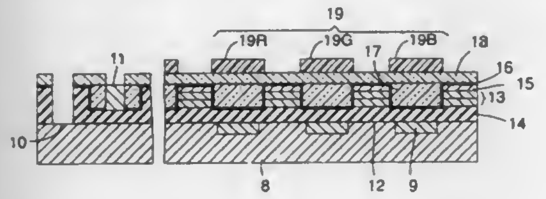
Koji Shimomura, Uji, and Yoshikazu Sano, Osaka, both of Japan, assignors to Matsushita Electronics Corporation, Japan

Continuation of Ser. No. 342,694, Nov. 21, 1994, abandoned, which is a division of Ser. No. 132,386, Oct. 6, 1993, Pat. No. 5,404,005. This application Nov. 15, 1996, Ser. No. 751,032

Claims priority, application Japan, Oct. 6, 1992, 4-267098; Oct. 6, 1992, 4-267099

Int. Cl.^{6} H01J ***40/14;*** **H01L** ***27/14***

U.S. Cl. 250—208.1 **21 Claims**



1. A solid state imaging device comprising:

a semiconductor substrate having a light-receiving section;

a transparent flattening layer on the semiconductor substrate; and

a color filter of synthetic photosensitive material, formed on the transparent flattening layer by using water as a solvent.

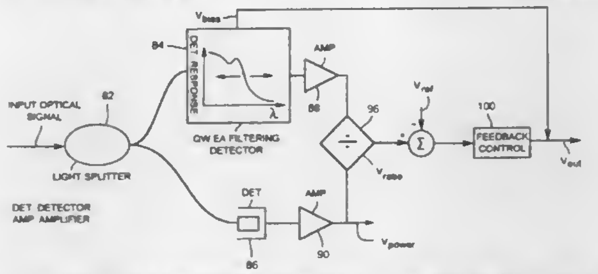
5,747,791
METHOD AND DEVICES FOR WAVELENGTH AND POWER DEMODULATION BASED ON THE USE OF A QUANTUM WELL ELECTROABSORPTION FILTERING DETECTOR

Trenton G. Coroy, #103 - 1480 Pickering Parkway, Pickering, Ontario, Canada, LIV 3V7

Filed Apr. 25, 1996, Ser. No. 637,446

Int. Cl.^{6} H01J ***40/14***

U.S. Cl. 250—214 R **33 Claims**



1. A device for measuring properties of an input light signal, comprising;

a) light signal detection means comprising a quantum well photodiode having at least one planar quantum well and an absorption edge, said light signal detection means having an output;

b) reference detection means having an output, and means for impinging a portion of an input light signal on said reference detection means and another portion of the input light signal on said light signal detection means at an effective angle with respect to said planar quantum well;

c) signal processing means, the outputs of the light signal detection means and reference detection means being connected to said signal processing means which combines said outputs in a preselected manner, said signal processing means having an output signal indicative of the combined outputs; and

d) biasing means for biasing said quantum well photodiode for tuning the absorption edge of said quantum well photodiode.

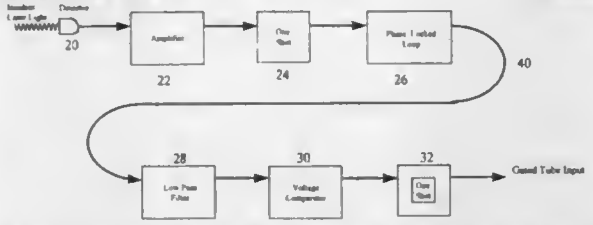
5,747,792
CIRCUIT AND METHOD FOR PREVENTING LASER JAMMING OF NIGHT VISION GOGGLES

Kevin G. Kintz, McKinney, Tex., and Mark D. Rogers, Ballwin, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 30, 1996, Ser. No. 697,875

Int. Cl.^{6} H01J ***40/14;31/50***

U.S. Cl. 250—214 VT **17 Claims**



9. A circuit for preventing laser jamming of night vision goggles having a gated image intensifier device and a display for displaying an intensified image of a scene, including:

means for detecting laser pulses and producing respective electrical pulses in response thereto; and,

means for gating off the gated image intensifier device in synchronism with said electrical pulses in order to thereby prevent said laser pulses from affecting the intensified image of the scene displayed by the display, wherein the gating means includes:

a phase locked loop for producing a PLL output signal synchronized with said laser pulses;

means for comparing said PLL output signal with a prescribed reference voltage to generate a comparator output signal

having a first level when said PLL output signal is greater than said prescribed reference voltage, and a second level when said PLL output signal is not greater than said prescribed reference voltage; and,

means for applying said comparator output signal to said gated image intensifier device.

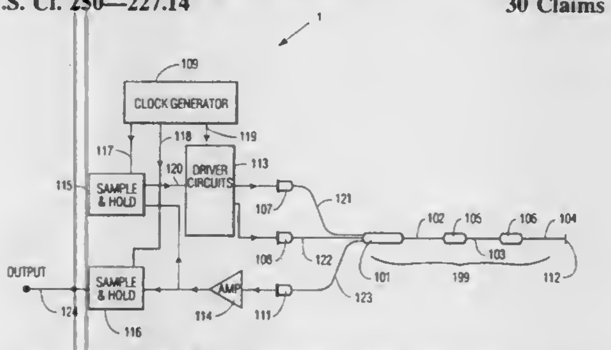
5,747,793
VARIABLE LIGHT SOURCE COMPENSATED OPTICAL FIBER SENSING SYSTEM

William J. Sundburg, Warren, and Weiman Shi, Piscataway, both of N.J., assignors to Advanced Fiber Optechs, Inc., Linden, N.J.

Filed Oct. 4, 1995, Ser. No. 539,035

Int. Cl.^{6} H01J ***5/16***

U.S. Cl. 250—227.14 **30 Claims**



1. An analog, optical-fiber sensing system comprising:

an optical-fiber network with at least one optical fiber, said network having a first end and a second end;

a first light source optically coupled to said first end of said optical-fiber network for generating and introducing into said first end of said optical-fiber network a reference light having a first wavelength;

a second light source optically coupled to said first end of said optical-fiber network for generating and introducing into said first end of said optical-fiber network a sensing light having a second wavelength;

a filter located at said second end of said optical-fiber network, said filter reflecting said reference light back through said optical-fiber network and transmitting said sensing light;

a sensor optically coupled to said second end of said optical-fiber network, said filter being positioned between said second end of said optical-fiber network and said sensor, said sensor variably modulating said sensing light back through said optical-fiber network, optical characteristics of said sensor varying as a function of a selected environmental parameter to be measured;

a detector optically coupled to said first end of said optical-fiber network for detecting respective intensities of the reflected reference light and the modulated sensing light; and

a controller for adjusting the intensities of said reference light and said sensing light generated by said first light source and said second light source, respectively, in response to a variation between the intensity of the reflected reference light and a predetermined intensity.

5,747,794
SCANNING DEVICE FOR EVALUATING CLEANLINESS AND INTEGRITY OF MEDICAL AND DENTAL INSTRUMENTS

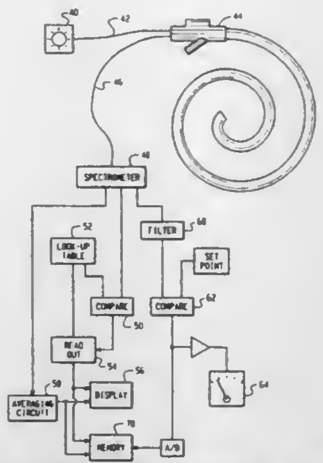
Paul S. Malchesky, Painesville Township, Ohio, assignor to Steris Corporation, Mentor, Ohio

Filed Oct. 16, 1996, Ser. No. 732,038

Int. Cl.^{6} H01J ***5/16***

U.S. Cl. 250—227.23 **18 Claims**

1. An apparatus for inspecting devices and instruments for residues, the apparatus comprising:



a light source which provides illumination, conveys the illumination along a transmission light path, and illuminates a surface to be examined;

a spectrophotometer which receives light reflected from the examined surface, spectrally analyses the reflected light, and produces a signal indicative of a spectrum of the reflected light.

5,747,795
PHOTOELECTRIC DETECTOR FOR A REGISTER CONTROL DEVICE WITHIN A ROTARY PRINTING MACHINE

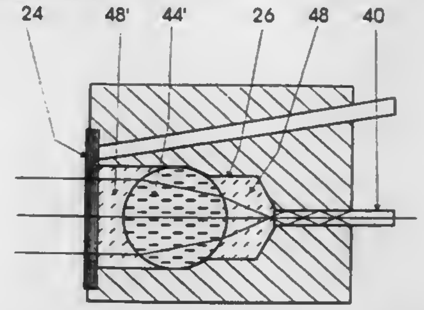
Patrick Monney, Mex, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed May 7, 1996, Ser. No. 643,880

Claims priority, application Switzerland, May 8, 1995, 01304/95

Int. Cl.^{6} G02B ***6/32;*** **G01N** ***21/86***

U.S. Cl. 250—227.24 **12 Claims**



1. In a photoelectric detector for a register control device within a rotary printing machine for a web, said detector comprising a row of scanning devices arranged in front of the web transverse to the travelling direction for scanning marks on the web, the improvements comprising each scanning device comprising a separate optical scanning fiber and means for focusing an image, each scanning fiber receiving light and transmitting it to a corresponding photodiode situated in the machine, each means for focusing the image being a spherical lens mounted on a base stop located in a corresponding recess in a row of recesses within a housing arranged in the vicinity of the web, each recess having a bottom with the end of the corresponding optical fiber aligned therewith, and a space of the recess extending between the lens and the end of the fiber being filled by a block of glue of optical quality to couple the lens to the end of the fiber.

VOL
210
SS
1
MY
5
998
MI

5,747,796

WAVEGUIDE TYPE COMPACT OPTICAL SCANNER AND MANUFACTURING METHOD THEREOF

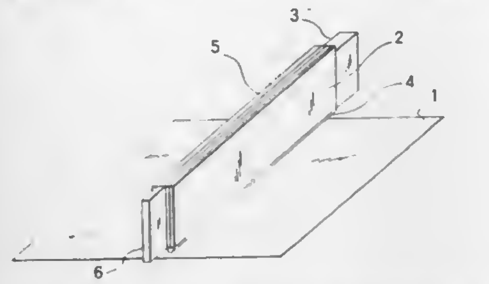
David Heard, Kashiwa; Noboru Ohtani, Tokyo; Yutaka Unuma, Matsudo, and Manabu Fujimoto, Kashiwa, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 9, 1996, Ser. No. 677,141

Claims priority, application Japan, Jul. 13, 1995, 7-177732; Jul. 13, 1995, 7-177733; Jul. 13, 1995, 7-177734; Jul. 14, 1995, 7-178825

Int. Cl.^{6} H01J *5/16*

U.S. Cl. 250—227.26 **4 Claims**



1. A compact optical scanner for scanning the image of an object while this object image is inputted and read;

the compact optical scanner comprising:

a substrate having a face opposite to the object to input the object image and a face with aligned CCD elements for reading the object image; and

plural optical waveguides for transmitting the inputted image to the CCD elements and arranged within said substrate such that one end of each of the optical waveguides is arranged on the substrate face opposite to said object and the other end of each of the optical waveguides is coupled into each of the CCD elements;

the compact optical scanner being constructed such that said substrate is constructed from a polymer;

each of said optical waveguides is constructed by a polymer as a material having a refractive index higher than that of said polymer of the substrate;

each of said optical waveguides has two bent portions having a bending angle of 90 degrees; and

each of the optical waveguides is vertically arranged on the substrate face opposite to said object and the face with aligned CCD elements at both ends of each of the optical waveguides.

5,747,797

ROTATION INFORMATION DETECTING APPARATUS AND SCALE FOR USE IN THE SAME

Muneo Fujita, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1996, Ser. No. 625,707

Claims priority, application Japan, Apr. 5, 1995, 7-104825

Int. Cl.^{6} G01D *5/34*

U.S. Cl. 250—231.14 **26 Claims**

1. A rotation information detecting apparatus comprising:

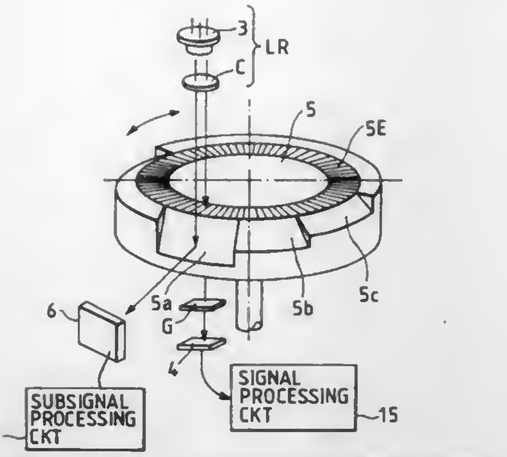
a scale having a cylinder member and a grating portion provided on said cylinder member over an entire circumference thereof;

a light projecting unit for applying a light beam to said grating portion;

a first light receiving unit having at least one sensor, said first light receiving unit being disposed so as to receive a light beam from said light projecting unit which has passed through a first area of said grating portion and a second area of said grating portion, incremental relative rotation information between said scale, and a unit including said light projecting unit and said first light receiving unit being obtained by light reception of said first light receiving unit;

a plurality of inclined surfaces provided substantially over the entire circumference of said scale, each of said inclined faces being adapted such that an angle of inclination thereof differs from that of the inclined face adjacent thereto; and

a second light receiving unit having at least one sensor, said second light receiving unit receiving a light beam from said light projecting unit which is one of reflected and refracted by at least one of said plurality of inclined faces, absolute rotation position information of said scale relative to said light projecting unit and said second light receiving unit being obtained by the light reception of said second light receiving unit.



5,747,798

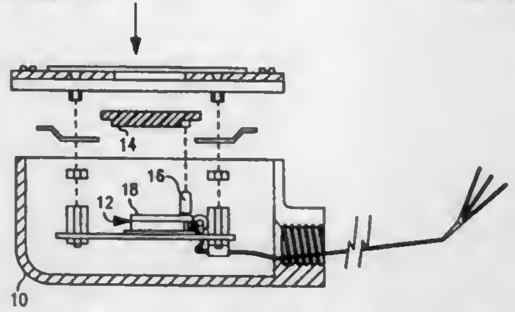
PHOTOCELL CHECKER

Howard T. Smith, Winnetka, Calif., assignor to Hughey & Phillips, Inc., Simi Valley, Calif.

Filed Jul. 19, 1996, Ser. No. 684,409

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—239 **20 Claims**



1. A system for continuously checking a photocell comprising:

(a) a housing configured to receive and electrically connect a photocell;

(b) a light-transmitting diffuser in a wall of the housing; and

(c) a light source in the housing and directed at the diffuser.

5,747,799

METHOD AND DEVICE FOR THE INTRODUCTION OF IONS INTO THE GAS STREAM OF AN APERTURE TO A MASS SPECTROMETER

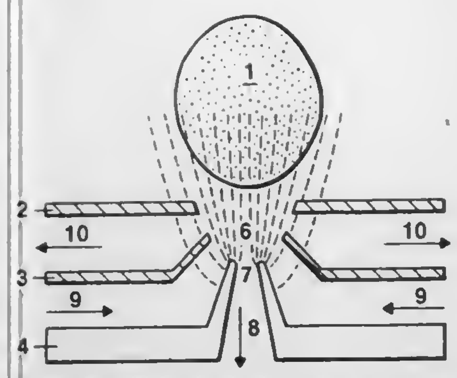
Jochen Franzen, Bremen, Germany, assignor to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed May 30, 1996, Ser. No. 656,893

Claims priority, application Germany, Jun. 2, 1995, 195 20 276.7

Int. Cl.^{6} B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—288 **14 Claims**



11. Ion inlet apparatus for the transportation of ions from a vacuum-external gas cloud into the vacuum system of a mass spectrometer, containing a capillary and a voltage supply, the apparatus comprising: a conductive ring-shaped electrode located on the outside of the mass spectrometer through which the ions pass on the way to a funnel-shaped isolating inlet path that leads to the entrance of the capillary, the ring electrode being supplied with an ion-attracting electrical potential by connection to the voltage supply, and generating an electrostatic guidance field between the gas cloud and the inlet aperture which has field lines that are primarily concentrated on the ring-shaped electrode.

5,747,800

THREE-DIMENSIONAL QUADRUPOLE MASS SPECTROMETER

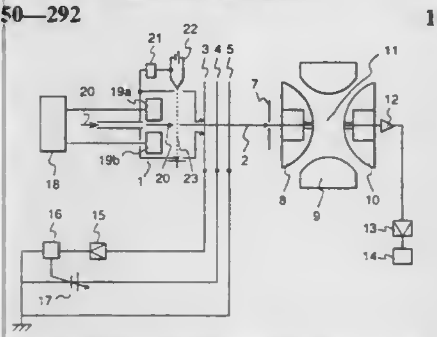
Masayoshi Yano, and Kohei Mochizuki, both of Hitachinaka, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 13, 1996, Ser. No. 749,269

Claims priority, application Japan, Dec. 13, 1995, 7-324478

Int. Cl.^{6} H01J *49/42*

U.S. Cl. 250—292 **19 Claims**



1. A three-dimensional quadrupole mass spectrometer comprising: an ion former for forming ions;

electrodes for forming an electric field in a three-dimensional ion confining space;

a voltage controller for forming a three-dimensional quadrupole electric field in the three-dimensional ion confining space by applying a periodic voltage to the electrodes such that said ions formed by the ion former are confined into the three-dimensional ion confining space, wherein the voltage controller controls the periodic voltage such that said ions having a desired mass/charge ratio are emitted from the three-dimensional ion confining space;

a detector for detecting an estimated amount of said ions existing in the three-dimensional ion confining space by detecting the ions before entering the three-dimensional ion containing space; and

a restrictor to restrict ion density being introduced to the three-dimensional ion confining space.

5,747,801

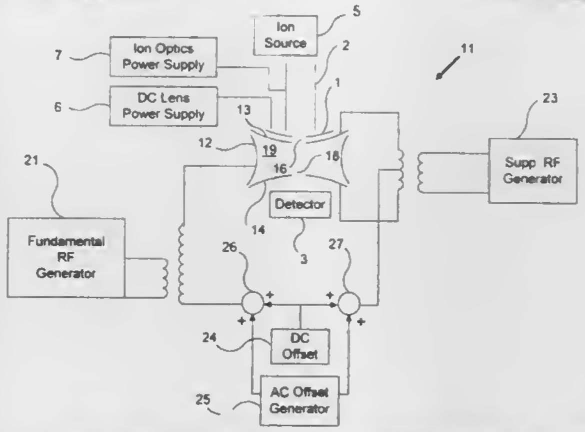
METHOD AND DEVICE FOR IMPROVED TRAPPING EFFICIENCY OF INJECTED IONS FOR QUADRUPOLE ION TRAPS

Scott T. Quarmby, and Richard A. Yost, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Jan. 24, 1997, Ser. No. 788,155

Int. Cl.^{6} H01J *49/42*

U.S. Cl. 250—292 **24 Claims**



1. A quadrupole ion trap mass spectrometer having a ring electrode and endcap electrodes defining a trap volume into which sample ions are injected, wherein said ion trap mass spectrometer comprises:

means for applying voltages to said electrodes to generate a three-dimensional trapping field within said ion trap; and

means for applying a periodic time varying voltage;

wherein the application of said periodic time varying voltage increases the trapping efficiency of the injected ions by altering the kinetic energy or arrival time of the injected ions.

5,747,802

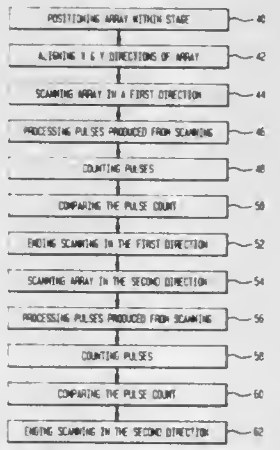
AUTOMATED NON-VISUAL METHOD OF LOCATING PERIODICALLY ARRANGED SUB-MICRON OBJECTS

Norbert Arnold, New Hempstead; Klaus Hummler; Ernest Levine, both of Poughkeepsie, all of N.Y., and Rainer Weiland, Flintsbach, Germany, assignors to Siemens Aktiengesellschaft, and International Business Machines Corporation

Filed Mar. 29, 1996, Ser. No. 626,192

Int. Cl.^{6} G01N *23/00;* **H01J** *37/00*

U.S. Cl. 250—307 **20 Claims**


POSITIONING ARRAY WITHIN STAGE
40
ALIGNING X & Y DIRECTIONS OF ARRAY
42
SCANNING ARRAY IN A FIRST DIRECTION
44
PROCESSING PULSES PRODUCED FROM SCANNING
46
COUNTING PULSES
48
COMPARING THE PULSE COUNT
50
ENDING SCANNING IN THE FIRST DIRECTION
52
SCANNING ARRAY IN THE SECOND DIRECTION
54
PROCESSING PULSES PRODUCED FROM SCANNING
56
COUNTING PULSES
58
COMPARING THE PULSE COUNT
60
ENDING SCANNING IN THE SECOND DIRECTION
62

1. A method for locating a particular sub-micron object within an array of periodically arranged sub-micron objects utilizing a scanning tool operating in a linear graphical mode, said method comprising the steps of:

scanning the array with said scanning tool for generating a plurality of pulses that correspond to the sub-micron objects contained within the array; and

counting said plurality of pulses in order to locate the particular object within the array.

5,747,803
METHOD FOR PREVENTING CHARGING EFFECT AND THERMAL DAMAGE IN CHARGED-PARTICLE MICROSCOPY

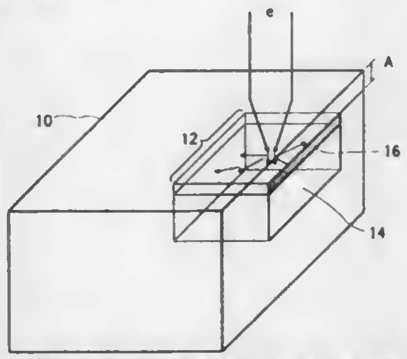
Yih-Yuh Doong, Kaohsiung, Taiwan, assignor to United Microelectronics Corporation, Taiwan

Filed Jan. 27, 1997, Ser. No. 789,626

Claims priority, application Taiwan, Nov. 26, 1996, 85114622

Int. Cl.^{6} H01J *37/26*

U.S. Cl. 250—307 **8 Claims**



1. A method for inspecting an IC chip by a charged-particle microscope without incurring charging effect and thermal damage to the chip, the method comprising the steps of:

(1) cutting a portion of the chip as a sample;

(2) outlining a target area on said sample;

(3) forming a cavity beneath said target area, said cavity being dimensioned substantially equal to said target area and separated from said target area by a predetermined thickness, said cavity having a top wall which is opposite to said target area over the thickness;

(4) forming a coating of electrical and heat conductive material on the top wall of said cavity; and

(5) orienting said sample in such a manner as to allow a charged-particle beam from the charged-particle microscope to strike said target area and subsequently encounter said coating of electrical and heat conductive material on the top wall of said cavity beneath said target area.

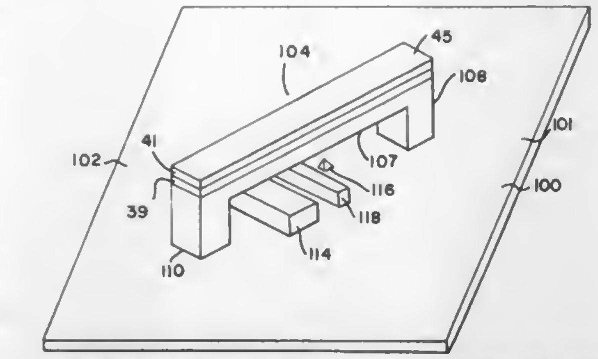
5,747,804
METHOD AND APPARATUS FOR SENSING INFRARED RADIATION UTILIZING A MICRO-ELECTRO-MECHANICAL SENSOR

Ronald L. Williams, Fallbrook, and Paul R. Norton, Santa Barbara, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 13, 1996, Ser. No. 713,560

Int. Cl.^{6} G01J *5/00*

U.S. Cl. 250—338.1 **25 Claims**



1. An infrared radiation detection device, comprising:

a semiconductor substrate;

a tunneling electrode on said substrate;

a counter electrode of a first solid material, said counter electrode extending from said substrate;

a second solid material disposed on said counter electrode, said second solid material having a coefficient of expansion different than said first solid material; and

an infrared absorbing material disposed on said second solid material;

wherein said counter electrode is suspended above said substrate at a distance from said tunneling electrode so that a tunneling current flows between said counter electrode and said tunneling electrode in response to a bias voltage applied across said counter electrode and said tunneling electrode.

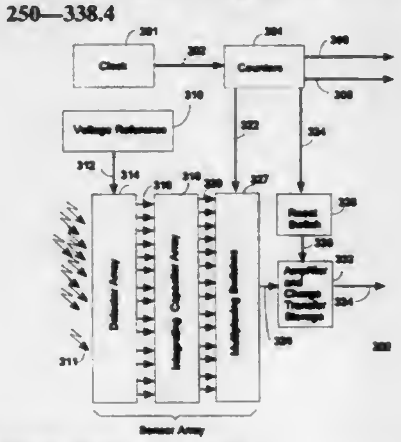
5,747,805
FULLY INTEGRATING RESISTIVE ARRAY ELECTRONIC MULTIPLEXOR

Robert C. Youngquist, Cocoa, Fla., assignor to New England Photoconductor Corp., Norton, Mass.

Filed Apr. 10, 1996, Ser. No. 630,276

Int. Cl.^{6} H01L *31/09*

U.S. Cl. 250—338.4 **18 Claims**



1. A sensing means comprising:

at least one means for detecting an event as a variable resistance;

at least one means for converting the variable resistance into charge;

at least one means for accumulating the charge over a time period; and

at least one means for transferring the accumulated charge; the transferring means permitting further accumulating of charge while also resetting the accumulating means, thereby providing for continuous detection.

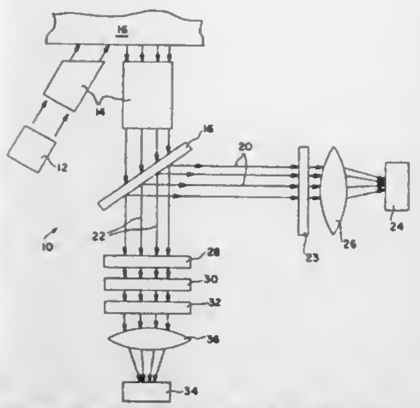
5,747,806
METHOD AND APPARATUS FOR MULTI-SPECTRAL ANALYSIS IN NONINVASIVE NIR SPECTROSCOPY

Gamal Khalil, Chandler, Ariz., and Stephen F. Malin, Chanhassen, Minn., assignors to Instrumentation Metrics, Inc, Tempe, Ariz.

Filed Feb. 2, 1996, Ser. No. 596,409

Int. Cl.^{6} G01N *21/35*

U.S. Cl. 250—339.12 **23 Claims**



1. An apparatus for determining the concentration of an analyte in a sample, comprising:

(a) means for irradiating the sample with incident radiation containing a plurality of distinct, nonoverlapping regions of wavelengths in the range of approximately 1100 to 3500 nm;

(b) means for collecting reflected radiation emerging from the sample and directing said reflected radiation into first and second light paths, wherein the first light path comprises radiation from a first region of wavelengths;

(c) first filter means disposed in the first light path, wherein the first filter means is capable of selectively passing radiation having substantially no correlation with the concentration of the analyte;

(d) first detection means for receiving selectively passed radiation emerging from the first filter means, and means for converting the same into a signal representative of the intensity of said radiation;

(e) adjustable filter means disposed in the second light path, wherein the adjustable filter means attenuates the intensity of radiation in the second light path;

(f) principal analyte filter means capable of receiving attenuated radiation emerging from the adjustable filter means, and selectively passing one or more independent wavelengths therefrom, wherein the said one or more independent wavelengths are specifically correlated with the concentration of the analyte;

(g) second filter means capable of receiving the one or more independent wavelengths emerging from the principal analyte filter means and attenuating the intensity of each independent wavelength;

(h) second detection means for receiving the attenuated independent wavelengths emerging from the second filter means; and

(i) means for converting the detected wavelengths into a signal representative of the intensity of said wavelengths.

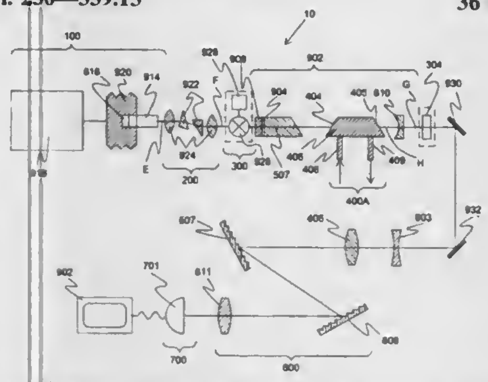
5,747,807
DIODE LASER-PUMPED LASER SYSTEM FOR ULTRA-SENSITIVE GAS DETECTION VIA INTRACAVITY LASER SPECTROSCOPY (ILS)

George H. Atkinson, and Esmail Mehdizadeh, both of Tucson, Ariz., assignors to Innovative Lasers Coropration, Tucson, Ariz.

Continuation-in-part of Ser. No. 522,963, Sep. 1, 1995. This application Jul. 3, 1996, Ser. No. 675,605

Int. Cl.^{6} G01N *21/35*

U.S. Cl. 250—339.13 **36 Claims**



1. A gas detection system for detecting the presence of gaseous species in a gas sample comprising:

(a) a laser cavity;

(b) an ion-doped crystal therein having two ends;

(c) a semiconductor diode laser located outside said laser cavity which has an output which optically excites said ion-doped crystal, thereby producing an output beam which exits said laser cavity;

(d) beam shaping optics located outside said laser cavity which shapes said output of said semiconductor diode laser;

(e) means for containing said gas sample in said laser cavity, said output beam of said ion-doped crystal passing through said gas sample prior to exiting said laser cavity; and

(f) a detector assembly including therein a detector, wherein said output beam of said ion-doped crystal after exiting said laser cavity is directed to said detector assembly for determining the presence and/or concentration of gaseous species in the gas sample.

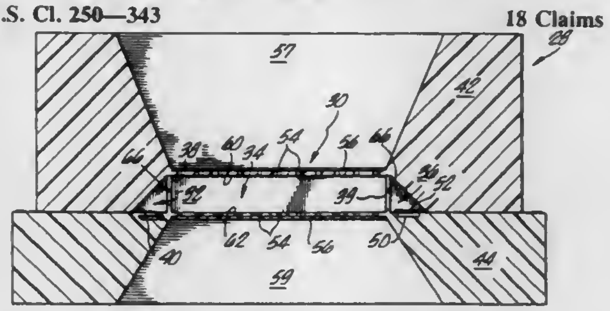
5,747,808
NDIR GAS SENSOR

Jacob Y. Wong, Goleta, Calif., assignor to Engelhard Sensor Technologies, Iselin, N.J.

Continuation of Ser. No. 518,134, Aug. 22, 1995, abandoned, which is a continuation-in-part of Ser. No. 284,914, Aug. 2, 1994, Pat. No. 5,444,249, which is a continuation of Ser. No. 195,523, Feb. 14, 1994, abandoned. This application Jun. 13, 1996, Ser. No. 662,981

Int. Cl.^{6} G01N *21/35*

U.S. Cl. 250—343 **18 Claims**



1. An improved NDIR gas sensor, comprising:

a. a first semiconductor material substrate;

b. a second semiconductor material substrate attached to the first substrate;

c. an optical waveguide formed between the first and second substrates;

d. a light source integrally formed on one of the substrates and positioned at one end of the optical waveguide;

e. a light detector integrally formed on one of the substrates and positioned at the end of the optical waveguide opposite the light source;

f. a bandpass filter interposed in the optical path between the light source and light detector;

g. a pair of windows interposed in the optical path between the light source and light detector so as to define therebetween a sample chamber within the waveguide and thermally isolate the light source and light detector, the pair of windows being micromachined from one of the semiconductor material substrates, and wherein the sample chamber extends along an indirect path; and

h. means for permitting diffusion of gas into and out of the sample chamber.

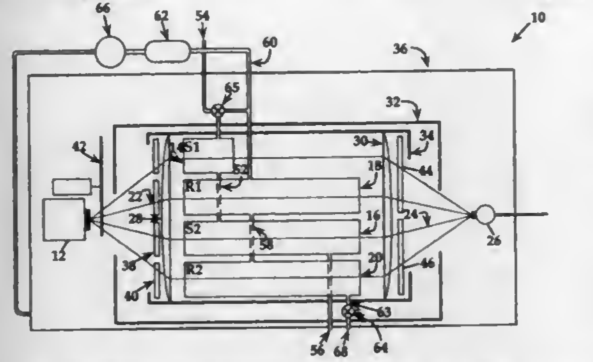
VOL
210
SS
1
MY
5
998
MI

5,747,809
NDIR APPARATUS AND METHOD FOR MEASURING ISOTOPIC RATIOS IN GASEOUS SAMPLES
Donald J. Eckstrom, Portola Valley, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jun. 11, 1996, Ser. No. 661,482

Int. Cl.^{6} G01N *21/31;21/35;21/61*

U.S. Cl. 250—345 **23 Claims**



1. An apparatus for measuring the ratio of first and second isotopic species of an analyte molecule in a gaseous sample by non-dispersive IR spectroscopy, comprising

at least one source of IR radiation;

first and second, interconnected sample cells containing the gaseous sample;

at least one reference cell free of the analyte molecule;

at least one IR detector;

means for providing four optical paths of said radiation impinging on said at least one detector, said optical paths comprising

a first sample path traversing the first sample cell and having a first wavelength range characteristic of the first isotopic species,

a first reference path traversing a reference cell and having a first wavelength range characteristic of the first isotopic species,

a second sample path traversing the second sample cell and having a second wavelength range characteristic of the second isotopic species, and

a second reference path traversing a reference cell and having a second wavelength range characteristic of the second isotopic species;

means for directing radiation through each of said cells;

shutter means effective to permit radiation to traverse each of said paths in rapid succession; and

means for directing radiation from each of said paths onto said at least one detector;

whereby the ratio of said isotopic species is determined by comparison of the intensity of radiation impinging on said at least one detector from said paths.

17. A method for measuring the ratio of first and second isotopic species of an analyte molecule in a gaseous sample by non-dispersive IR spectroscopy, comprising

transmitting IR radiation through four optical paths which impinge on at least one IR detector, said optical paths comprising

a first sample path traversing a first sample cell containing the gaseous sample and having a first wavelength range characteristic of the first isotopic species,

a first reference path traversing a reference cell free of the analyte molecule and having a first wavelength range characteristic of the first isotopic species,

a second sample path traversing a second sample cell, which is interconnected with said first sample cell, and having a second wavelength range characteristic of the second isotopic species, and

a second reference path traversing a reference cell free of the analyte molecule and having a second wavelength range characteristic of the second isotopic species;

determining the concentration of the first isotopic species from the intensity of radiation received at the detector from the first sample path relative to the intensity of radiation received at the detector from the first reference path;

determining the concentration of the second isotopic species from the intensity of radiation received at the detector from the second sample path relative to the intensity of radiation received at the detector from the second reference path; and

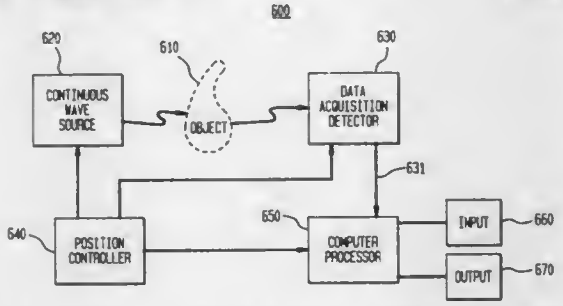
determining from said concentrations the ratio of said isotopic species in the gaseous sample.

5,747,810
SIMULTANEOUS ABSORPTION AND DIFFUSION TOMOGRAPHY SYSTEM AND METHOD USING DIRECT RECONSTRUCTION OF SCATTERED RADIATION
John Carl Schotland, Wynnewood, Pa., assignor to Univ. of Pennsylvania

Filed May 15, 1995, Ser. No. 449,537

Int. Cl.^{6} G01N *21/64*

U.S. Cl. 250—358.1 **4 Claims**



1. A method for generating absorption and diffusion images of an object comprising the steps of

irradiating the object with a continuous wave source of radiation,

measuring a transmitted intensity due predominantly to diffusively scattered radiation wherein said transmitted intensity is related to an absorption coefficient and a diffusion coefficient by an integral operator, and

directly reconstructing the images by executing a prescribed mathematical algorithm, determined with reference to said integral operator, on said transmitted intensity, said step of directly reconstructing including the step of computing an absorption kernel and a diffusion kernel.

5,747,811

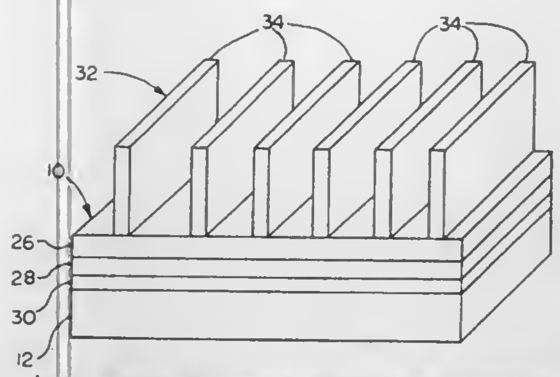
Patent Not Issued For This Number

5,747,812
SCATTER FILTER FOR EMISSION TOMOGRAPHY
Frank P. DiFilippo, Mayfield Heights, Ohio, assignor to Picker International, Inc., Cleveland, Ohio

Filed Nov. 21, 1996, Ser. No. 752,588

Int. Cl.^{6} G01T *1/164*

U.S. Cl. 250—363.1 **19 Claims**



1. A gamma camera used for positron emission tomography of a body, the camera having a detector, which includes a relatively large scintillation crystal, and a scatter filter, the filter discriminating between primary gamma rays which are emitted by a radionuclide and scattered gamma rays which result from a primary ray being absorbed by a part of the body being absorbed by a part of the body being imaged and re-radiated at a lower energy, the filter including:

a first layer of a first material positioned in front of a detector of a gamma camera and having a relatively low attenuation of primary gamma rays and a relatively high attenuation of scattered gamma rays, and

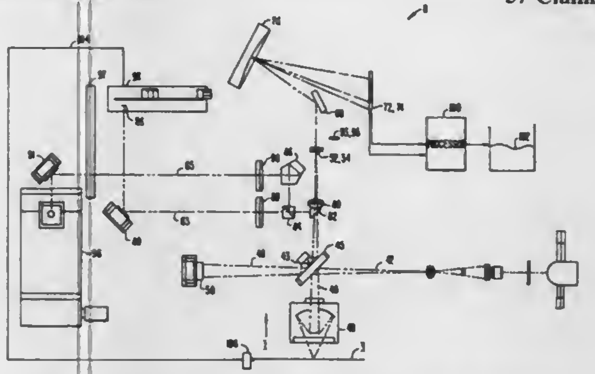
a plurality of strips of the first material positioned between the body being imaged and the first layer of the filter, the strips of material absorbing primary gamma rays which arrive at the detector at selected angles of incidence.

5,747,813
BROADBAND MICROSPECTRO-REFLECTOMETER
Adam E. Norton, Palo Alto; Chester L. Mallory, Campbell; Hung V. Pham, San Jose, and Paul Rasmussen, Livermore, all of Calif., assignors to KLA-Tencop. Corporation, San Jose, Calif.

Continuation of Ser. No. 899,666, Jun. 16, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,482

Int. Cl.^{6} G01N *21/33*

U.S. Cl. 250—372 **57 Claims**



1. In an optical system having a platform for supporting a sample, an apparatus for determining the relative reflectance spectrum of a selected area on the sample, comprising:

a light source for emitting a first beam;

a beam splitter for splitting said first beam into a reference beam and a sample beam, said beam splitter being a totally reflecting mirror;

a focussing means for focussing said sample beam at a focal point, the platform movable with respect to said focussing means;

a reference spectroscopic means for detecting a reference spectrum of said reference beam;

a sample spectroscopic means for detecting a reflected spectrum of a reflection of said sample beam, said reflection reflecting off the sample over the selected area; and

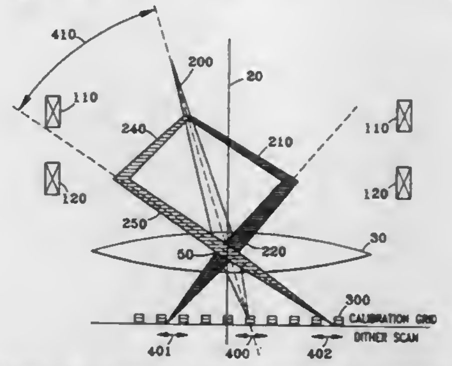
a computation means for comparing said reflected spectrum and said reference spectrum to determine a relative reflectance spectrum.

5,747,814
METHOD FOR CENTERING A LENS IN A CHARGED-PARTICLE SYSTEM
Michael Stuart Gordon, Somers, and Paul F. Petric, Brewster, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1996, Ser. No. 761,170

Int. Cl.^{6} H01J *37/147*

U.S. Cl. 250—398 **9 Claims**



1. A method for improving a resolution of a charged-particle beam lithographic system, said system having at least two alignment deflectors for adjusting an incident angle of the charged particle beam scanning a target, the method comprising the steps of:

a) aligning said charged particle beam into the center of a lens to produce a nominal tilt angle of said charged particle beam with respect to an optical axis of said lens;

b) pivoting said charged particle beam about the center of said lens by a double deflection of said charged particle beam alignment;

c) determining the resolution of said charged particle beam while said charged particle beam scans across said target;

d) applying a square wave toggle to said nominal tilt angle to generate a two-state pivot angle; and

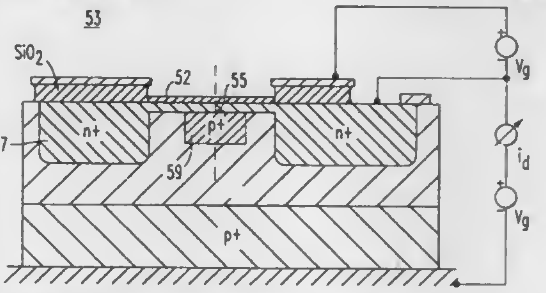
e) adjusting said nominal tilt angle until the resolution of said charged particle beam is identical for both states of said two-state pivot angle.

5,747,815
MICRO-MINIATURE IONIZER FOR GAS SENSOR APPLICATIONS AND METHOD OF MAKING MICRO-MINIATURE IONIZER
Robert M. Young, Pittsburgh; Carl B. Freidhoff, Murrysville; Timothy T. Braggins, and Thomas V. Congedo, both of Pittsburgh, all of Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 320,472, Oct. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 124,873, Sep. 22, 1993, Pat. No. 5,386,115. This application Jul. 24, 1996, Ser. No. 685,649

Int. Cl.^{6} B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—423 R **7 Claims**



1. A mass spectrograph gas ionizer comprising:

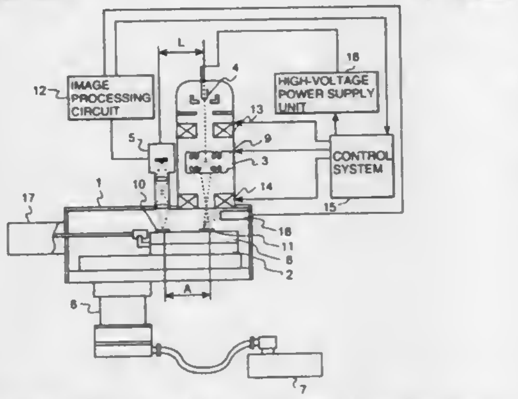
a semiconductor substrate having a first planar surface;

a cavity formed within the first planar surface of said semiconductor substrate, the cavity having an inlet through which a

VOL
2 10
SS
1
MY
5
998
MI

sample of gas to be analyzed is drawn and an outlet through which the sample of gas is passed; and
a plurality of gas ionizers formed within the cavity for ionizing the sample gas, said plurality of gas ionizers being reverse-bias p-n junction diodes,
said reverse-bias p-n junction diodes having an alkali halide salt layer formed thereon.

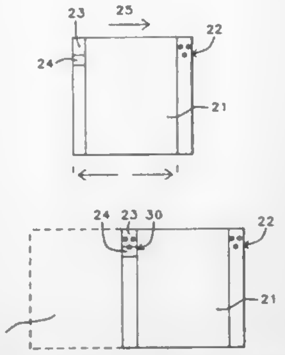
5,747,816
CHARGED PARTICLE BEAM APPARATUS
Toshiei Kurosaki, Hitachinaka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 25, 1996, Ser. No. 670,047
Claims priority, application Japan, Jul. 5, 1995, 7-169759
Int. Cl.^{6} H01J *37/22;37/28*
U.S. Cl. 250—491.1 **18 Claims**



1. A charged particle beam apparatus having a charged particle beam optical system comprising:
a generator generating a charged particle beam;
a deflector deflecting the charged particle beam;
a stage on which a specimen is mounted:
a microscope optical system for irradiating light onto said specimens;
first and a second fiducial patterns, associated respectively with said charged particle beam and said optical system, provided on any one of said specimen and said stage on which said specimen is mounted,
means for detecting said first and second fiducial patterns separately by using the charged particle beam optical system and the optical system, respectively so as to measure positions of said first and second fiducial patterns, and means for calibrating a distance between an optical axis of said charged particle beam optical system and said optical system is calibrated on the basis of said measured positions.

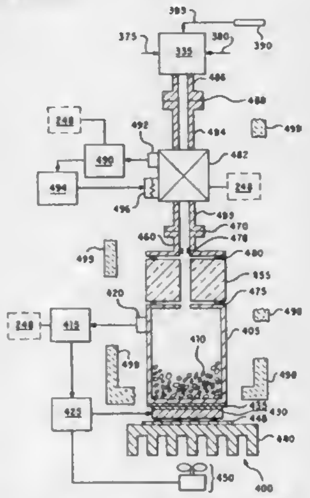
5,747,817
ONE-STEP METHOD FOR ON-LINE LITHOGRAPHIC PATTERN INSPECTION
Wen-Jye Chung, Hsin-chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan
Filed Sep. 9, 1996, Ser. No. 709,899
Int. Cl.^{6} G03F *7/20*
U.S. Cl. 250—492.2 **8 Claims**

1. A photocleaving structure, located within a photoresist mask, comprising:
an opaque area;
an attenuating area, comprising a uniform layer of semi-transparent material, that transmits a percentage of actinic radiation directed through it; and



a straight line boundary between the opaque and attenuating areas.

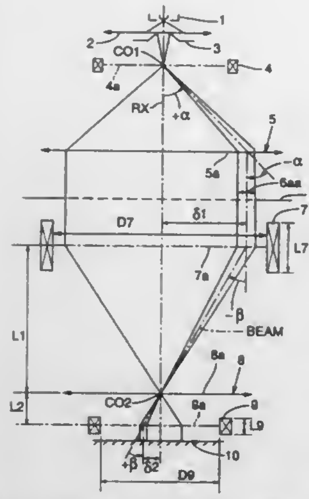
5,747,818
THERMOELECTRIC COOLING IN GAS-ASSISTED FIB SYSTEM
Michael A. Cecere, San Jose, Calif., assignor to Schlumberger Technologies Inc., San Jose, Calif.
Filed Oct. 21, 1996, Ser. No. 734,746
Int. Cl.^{6} H01J *37/317*
U.S. Cl. 250—492.21 **20 Claims**



1. Apparatus for supplying a jet of chemical vapor at a substantially constant rate, comprising:
a. a crucible (**405**) for containing a quantity of chemical (**410**);
b. a hollow needle (**390**);
c. a flow path (**455, 460, 470, 482, 484, 486**) from the crucible to the hollow needle;
d. a Peltier element (**430**) in thermal communication with the crucible; and
e. a temperature control circuit (**415, 420, 425**) responsive to temperature in the crucible for powering the Peltier element so as to maintain temperature of the crucible substantially constant.

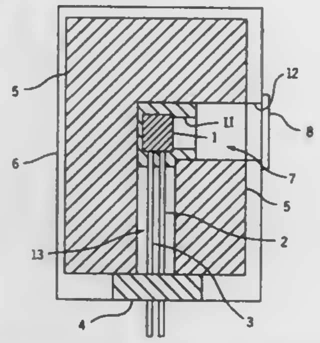
5,747,819
CHARGED PARTICLE BEAM TRANSFER DEVICE EXHIBITING LOW ABERRATION
Mamoru Nakasuji, Yokohama, and Hiroyasu Simizu, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Oct. 30, 1996, Ser. No. 739,816
Claims priority, application Japan, Nov. 1, 1995, 7-285118
Int. Cl.^{6} H01J *37/317*
U.S. Cl. 250—492.23 **20 Claims**

1. A charged particle beam transfer device for transferring a pattern defined by a reticle onto a substrate surface, the device comprising on an optical axis:



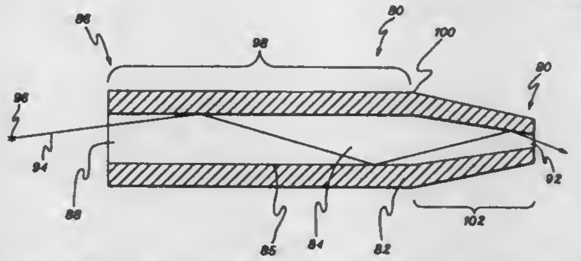
(a) a projection lens operable to focus a particle beam, after the beam has passed through a subfield of a reticle, onto a substrate surface;
(b) a first deflector operable to deflect the charged particle beam relative to the optical axis, after the beam has passed through the subfield of the reticle, to cause the beam to pass at least in the center of the projection lens as the beam propagates toward the substrate surface; and
(c) a second deflector situated between the projection lens and the substrate surface, the second deflector being operable to deflect the charged particle beam relative to the optical axis, after the beam has passed at least in the center of the projection lens, to direct the beam to a region on the substrate surface corresponding to the subfield.

5,747,820
INFRARED RADIATION SOURCE FOR A GAS ANALYZER AND METHOD FOR GENERATING INFRARED RADIATION
Kai Karlsson; Timo Meriläinen, both of Helsinki; Kurt Weckström, Espoo, and Seppo Poikolainen, Vantaa, all of Finland, assignors to InstrumenTarium Corp., Finland
Filed Jul. 7, 1995, Ser. No. 499,177
Claims priority, application Finland, Jul. 11, 1994, 943305
Int. Cl.^{6} G01J *3/10*
U.S. Cl. 250—504 R **16 Claims**



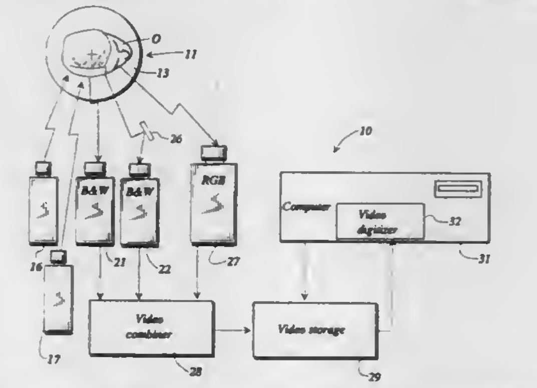
1. An infrared radiation source for a gas analyzer, the radiation provided by the source being passed through a gas to be analyzed to a detector (**10**), said source comprising:
a radiant element (**1**) emitting infrared radiation when heated by electrical energization thereof;
elements (**2, 3**) for passing electric energy to said radiant element (**1**);
thermal insulation material (**5**) partially enclosing said radiant element while providing a path for the infrared radiation from the element to the detector (**10**); and
a radiant surface (**11**) positioned in close proximity to said radiant element (**1**) and within the partial enclosure of the radiant element provided by the thermal insulating material;
said radiant surface being heated by the insulated radiant element (**1**) so that the radiation emitted by the radiant surface comprises at least 20% of the total infrared radiation output flux of the infrared radiation source.

5,747,821
RADIATION FOCUSING MONOCAPILLARY WITH CONSTANT INNER DIMENSION REGION AND VARYING INNER DIMENSION REGION
Brian R. York, San Jose, Calif.; Oi-fan Xiao, Albany, and Ning Gao, Guilderland, both of N.Y., assignors to X-Ray Optical Systems, Inc., Albany, N.Y.
Filed Aug. 4, 1995, Ser. No. 511,482
Int. Cl.^{6} G21K *1/00*
U.S. Cl. 250—505.1 **17 Claims**



1. Apparatus for focusing short wavelength radiation, comprising a hollow monocapillary having an inlet and an outlet, said short wavelength radiation entering at said inlet and exiting at said outlet, said monocapillary comprising:
a first region of constant inner dimension along the length thereof; and
at least one other region of varying inner dimension along the length thereof, wherein said at least one other region is shorter in length than said first region, and wherein an inner surface of each of said first region and said at least one other region is generally smooth for essentially total external reflection and made of a material that minimizes absorption of short wavelength radiation.

5,747,822
METHOD AND APPARATUS FOR OPTICALLY DIGITIZING A THREE-DIMENSIONAL OBJECT
Michael J. Sinclair, Atlanta, Ga., and Frank E. Vitz, Lincoln, Mass., assignors to Georgia Tech Research Corporation, Atlanta, Ga.
Continuation of Ser. No. 329,501, Oct. 26, 1994, abandoned. This application Sep. 18, 1996, Ser. No. 710,459
Int. Cl.^{6} G01B *11/00*
U.S. Cl. 250—559.19 **16 Claims**



1. An apparatus for digitizing an object for creating a three-dimensional digital model of the object, the apparatus comprising:
means for rotating the object about a rotation axis;

first and second light source means positioned and oriented for directing a planar sheet of light toward the object along an illumination plane, said illumination plane being substantially parallel to and substantially intersecting said rotation axis;

first detector means positioned to one side of said illumination plane and oriented for detecting light reflected along a first detection plane from the object for creating a plurality of first side contours as the object rotates;

second detector means positioned to a side of said illumination plane, opposite said one side, for detecting light reflected along a second detection plane from the object for creating a plurality of second side contours as the object rotates; and

combining and evaluating means for combining said first side contours and said second side contours for generating a plurality of composite contours and for evaluating said composite contours for creating a three-dimensional digital model of the object.

5,747,823

TWO-DIMENSIONAL CODE MARK DETECTING METHOD AND APPARATUS THEREFOR

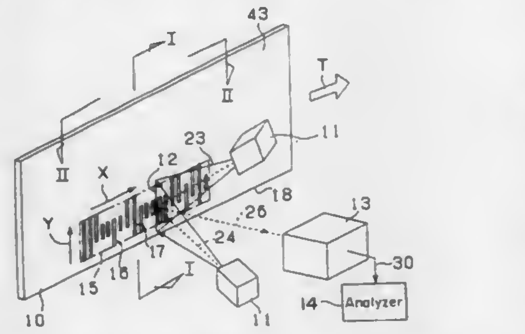
Tomoaki Ishitsuka, Kyoto-fu; Toshio Oshima, Osaka; Hirofumi Noguchi, and Mitsunari Kano, both of Seto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka-fu, and Hitachi, Ltd., Tokyo-to, both of Japan

Filed Aug. 8, 1996, Ser. No. 694,259

Claims priority, application Japan, Aug. 8, 1995, 7-224725

Int. Cl.⁶ G01N *21/86*

U.S. Cl. 250—559.44 **6 Claims**



1. A method of detecting information from a code marking formed on a carrier by illuminating the code marking with illuminating light and detecting an emission from an illuminated position on which the illuminated light is projected, wherein said code marking is a two-dimensional code marking bearing the information in a first and a second direction that are perpendicular to each other, the method comprising the steps of:

forming an illuminated area at the illuminated position in a fine ribbon-like shape having a length that is greater than a maximum possible width of the code marking in the first direction and smaller than a minimum possible information width in the second direction; and

illuminating the code marking by moving the code marking or the illuminated area in a direction parallel to the second direction while traversing the code marking with the illuminated area in the first direction.

5,747,824

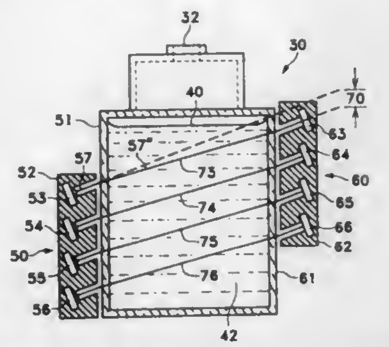
APPARATUS AND METHOD FOR SENSING FLUID LEVEL

Christopher C. Jung, Mission Viejo, and Nader Nazarifar, Laguna Hills, both of Calif., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 566,218, Dec. 1, 1995, abandoned. This application May 7, 1997, Ser. No. 852,792

Int. Cl.⁶ G01F *23/00*

U.S. Cl. 250—577 **22 Claims**



1. An apparatus for detecting a fluid level contained within a transparent fluid reservoir having an outer surface, the apparatus comprising:

a) a plurality of radiant sources positioned vertically outside of the outer surface of the reservoir so that the radiant sources do not contact the fluid, each of the radiant sources emitting a beam of energy into the reservoir substantially along a transmission path that is angled so that the beam of energy does not penetrate an air/fluid interface; and

b) a plurality of receivers positioned vertically outside of the outer surface of the reservoir so that the receivers do not contact the fluid, each receiver being aligned along the transmission path of one of the plurality of radiation sources.

5,747,825

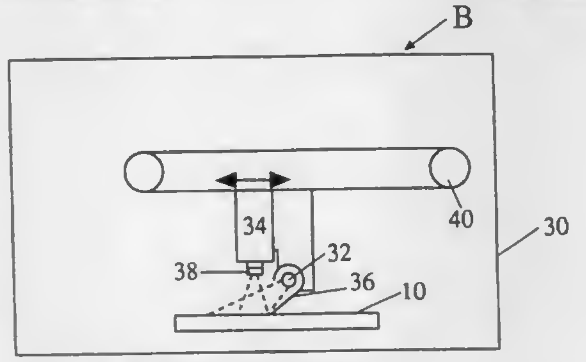
SHADOWGRAPHIC X-RAY IMAGER WITH TDI CAMERA AND PHOTO STIMULABLE PHOSPHOR PLATE

David L. Gilblom, and Peter S. Castro, both of Los Altos, Calif., assignors to Picker International, Inc., Highland Heights, Ohio

Filed Nov. 20, 1992, Ser. No. 979,199

Int. Cl.⁶ G01N *23/04*

U.S. Cl. 250—586 **10 Claims**



1. An x-ray diagnostic system comprising:

a source of x-rays;

a stimulable phosphor plate disposed across a subject receiving region from the x-ray source for being stimulated with x-rays therefrom to store a latent image which is stored until subsequently developed by illuminating the stimulable phosphor plate with light of a predetermined developing wavelength which causes the stored latent image to be converted into a light image of a characteristic wavelength;

a time delay and integration camera mounted displaced from the x-rays for integrating the light image from at least a first portion of a first surface of the stimulable phosphor plate, the time delay and integration camera including a light sensitive array and a lens displaced from the first surface for focusing the light image from the first surface of the stimulable phosphor plate directly onto the light sensitive array;

a means for moving the stimulable phosphor plate along a single plane from the x-ray source to the time delay and integration camera;

a filter disposed adjacent the lens for blocking light of the predetermined developing wavelength and passing light of the characteristic wavelength;

a light source for illuminating the portion of the first surface of the stimulable phosphor plate viewed by the time delay and integration camera with light of the predetermined wavelength for developing the stored latent x-ray image on the stimulable phosphor plate and causing the characteristic wavelength light image which is viewed and integrated by the time delay and integration camera.

5,747,826

PHOTOEMITTER ELECTRON TUBE, AND PHOTODETECTOR

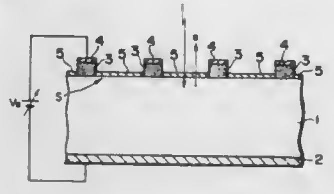
Minoru Niigaki; Toru Hirohata; Tuneo Ihara, and Masami Yamada, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

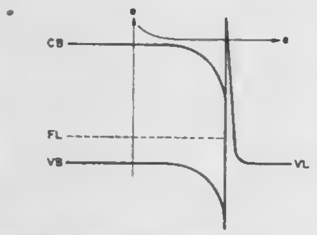
Continuation of Ser. No. 299,664, Sep. 2, 1994, Pat. No. 5,591,986. This application Jun. 27, 1996, Ser. No. 671,195

Claims priority, application Japan, Sep. 2, 1993, 5-218609; Sep. 10, 1993, 5-226237

Int. Cl.⁶ H01L *29/47*

U.S. Cl. 257—10 **22 Claims**





1. A photoemission device, comprising:

a p-type semiconductor for absorbing incident photons to excite photoelectrons;

an insulator layer being layered on and in direct contact with one surface of said p-type semiconductor said insulator having a predetermined pattern so as to expose a predetermined region of said one surface of said p-type semiconductor;

a metal layer layered on and in direct contact with said one surface of said p-type semiconductor, said metal layer coating said exposed region of said one surface on which said insulator layer is not layered;

a lead electrode layered on said insulator layer and being spaced from said metal layer through said insulator layer; and

a contact layer for applying a predetermined polarity voltage between said lead electrode and another surface of said p-type semiconductor, said contact layer being formed on said another surface;

wherein the photoelectrons excited by the incident photons entering said p-type semiconductor and moving toward said one surface of said p-type semiconductor are made to be emitted through said metal layer by an electric field produced between said lead electrode and said one surface of said P-type semiconductor by said predetermined polarity voltage.

5,747,827

OPTOELECTRONIC SEMICONDUCTOR DEVICE HAVING A MINIBAND

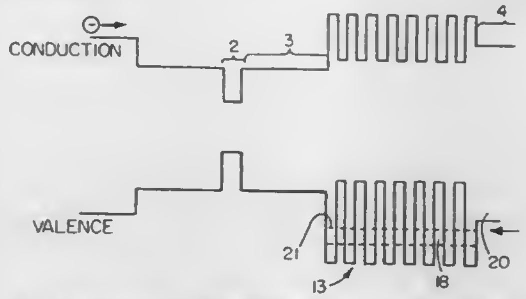
Geoffrey Duggan, Oxfordshire, United Kingdom; Nobuaki Teraguchi, Nara-ken, Japan; Judy Megan Rorison, Cheltenham, United Kingdom, and Yoshitaka Tomomura, Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1996, Ser. No. 612,294

Claims priority, application United Kingdom, Mar. 8, 1995, 9504666

Int. Cl.⁶ H01L *29/06;31/0328;31/0336;31/072*

U.S. Cl. 257—15 **33 Claims**



1. An optoelectronic semiconductor device for emitting light including an active region, a first superlattice region and a guiding region disposed between the active region and the first superlattice region, the first superlattice region having a repeating pattern of first and second semiconductor regions which define a plurality of quantum wells separated from each other by quantum barriers, the pattern repeat period being sufficiently small so as to form a miniband within the first superlattice region, wherein the carriers are transported through the miniband and light is emitted due to interband recombination of injected electrons and holes.

5,747,828

SEMICONDUCTOR DEVICE WITH INCREASED DISTANCE BETWEEN CHANNEL EDGES AND A GATE ELECTRODE

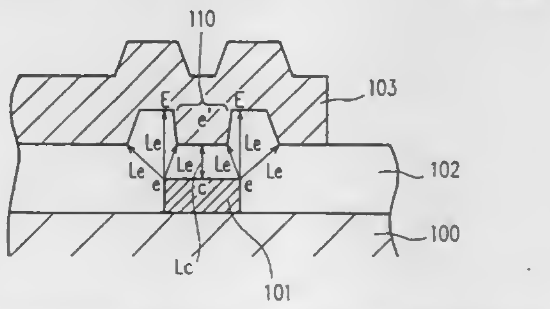
Akihiro Hata; Takashi Funai, both of Tenri, and Masahiro Adachi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1996, Ser. No. 623,559

Claims priority, application Japan, Mar. 30, 1995, 7-074135

Int. Cl.⁶ H01L *29/76*

U.S. Cl. 257—66 **7 Claims**



1. A semiconductor device comprising a substrate having an insulating surface and a thin film transistor formed on the substrate, wherein the thin film transistor has a semiconductor island including a channel region and source/drain regions, a gate insulating film formed on the semiconductor island and a gate electrode covering the channel region of the semiconductor island interposing the gate insulating film therebetween,

VOL
2 10
SS
1
MY
5
998
UMI

wherein the gate insulating film includes a first insulating film covering side faces and a whole upper face of the semiconductor island, and a second insulating film being formed on the first insulating film and having an opening positioned above the channel region, wherein the first insulating film is a continuous film, and

wherein a distance between an edge of the semiconductor island in the channel region and the gate electrode is larger than a distance between a central portion of the channel region and the gate electrode.

5,747,829
DIELECTRIC ISOLATED HIGH VOLTAGE SEMICONDUCTOR DEVICE

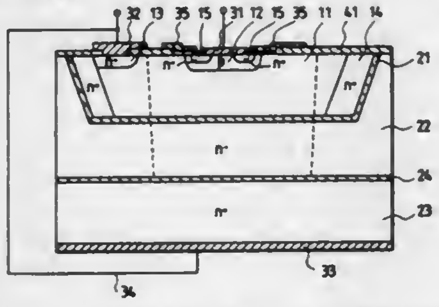
Naoki Sakurai, and Yoshitaka Sugawara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 451,265, May 30, 1995, abandoned, which is a division of Ser. No. 147,314, Nov. 5, 1993, Pat. No. 5,463,243. This application Jul. 15, 1997, Ser. No. 895,086

Claims priority, application Japan, Nov. 6, 1992, 4-296786

Int. Cl.⁶ H01L *29/76;31/036;31/112*

U.S. Cl. 257—66 **9 Claims**



1. A dielectric isolated high voltage semiconductor device having a supporter including stacked layers of a first semiconductor layer of a first conductivity type and a second semiconductor layer with a higher impurity concentration than said first semiconductor layer, a first insulating film interposed between said second semiconductor layer and said first semiconductor layer, and at least one semiconductor island which is buried in said first semiconductor layer so as to have a surface exposed outside of said semiconductor device, in which a second insulating film is interposed between said at least one semiconductor island and said first semiconductor layer, and surrounding said at least one semiconductor island,

wherein said at least one semiconductor island comprises a first island layer of said first conductivity type, a second island layer of a second conductivity type with a higher impurity concentration than said first island layer, said second island layer extending into said first island layer from a surface of said at least one island, a third island layer of said first conductivity type with a higher impurity concentration than said first island layer, extending into said first island layer from a surface of said at least one island at a place apart from said second island layer, and a first electrode and a second electrode provided at said second island layer and said third island layer, respectively,

wherein a fourth island layer of said first conductivity type with a higher impurity concentration than said first island layer is provided at an inside sidewall surface of said second insulating film surrounding said at least one semiconductor island.

5,747,830
SEMICONDUCTOR DISPLAY DEVICE WITH A HYDROGEN SUPPLY AND HYDROGEN DIFFUSION BARRIER LAYERS

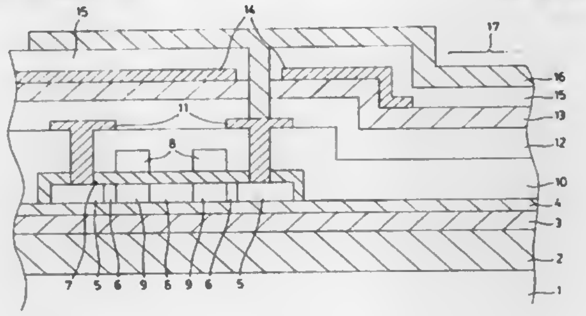
Akira Okita, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1996, Ser. No. 714,440

Claims priority, application Japan, Sep. 14, 1995, 7-236866; Sep. 12, 1996, 8-241935

Int. Cl.⁶ H01L *29/04;31/036*

U.S. Cl. 257—72 **25 Claims**



1. A display device comprising:

an active matrix substrate comprising;

- a hydrogen supply layer located above a semiconductor region in such a manner that said hydrogen supply layer is apart from said semiconductor region,
- a hydrogen diffusion barrier layer made of a high melting point metal or a compound thereof, said hydrogen diffusion barrier layer being located on said hydrogen supply layer in such a manner that said hydrogen diffusion barrier layer is contacted with said hydrogen supply layer,
- a pixel electrode located on said hydrogen diffusion barrier layer via an insulating layer, in which said hydrogen diffusion barrier layer also serves as a light blocking layer,

an opposite substrate located opposite said active matrix substrate; and

a liquid crystal material disposed between said active matrix substrate and said opposite substrate.

5,747,831
SIC FIELD-EFFECT TRANSISTOR ARRAY WITH RING TYPE TRENCHES AND METHOD OF PRODUCING THEM

Werner Loose, Neuhausen; Jacek Korec, Moerfelden-Walldorf; Ekkehard Niemann, Maintal, and Alfred Boos, Mainz, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

PCT No. PCT/EP95/02496, § 371 Date Feb. 28, 1996, § 102(e) Date Feb. 28, 1996, PCT Pub. No. WO96/01500, PCT Pub. Date Jan. 18, 1996

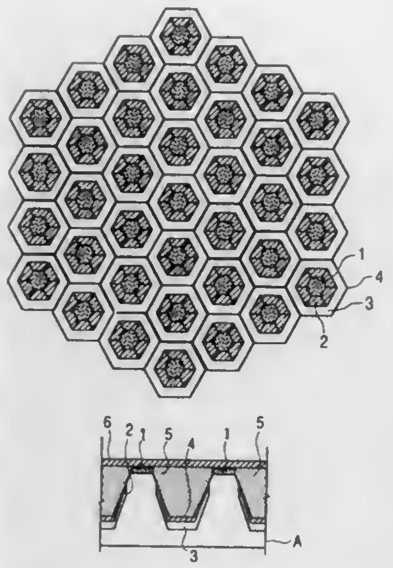
PCT Filed Jun. 27, 1995, Ser. No. 612,906

Claims priority, application Germany, Jul. 1, 1994, 44 23 068.0

Int. Cl.⁶ H01L *31/0312*

U.S. Cl. 257—77 **22 Claims**

1. An arrangement of SiC field-effect transistors, each having a source contact, a gate contact and a drain contact, formed on a semiconductor wafer and wherein: the source contacts are disposed on an upper surface of the semiconductor wafer, the drain contacts are disposed on a flat underside of the semiconductor wafer, the gate contacts are disposed in trenches formed in the semiconductor wafer and extend from the upper surface and which surround respective source electrodes of the field-effect transistors in ring fashion, and the gate contacts are connected to one another on bottom faces of the trenches.



5,747,832
LIGHT-EMITTING GALLIUM NITRIDE-BASED COMPOUND SEMICONDUCTOR DEVICE

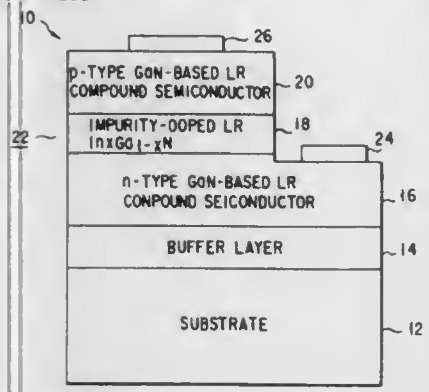
Shuji Nakamura; Takashi Mukai, and Narubito Iwasa, all of Anan, Japan, assignors to Nichia Chemical Industries, Ltd., Japan

Division of Ser. No. 153,153, Nov. 17, 1993, Pat. No. 5,578,839. This application Jun. 10, 1996, Ser. No. 661,138

Claims priority, application Japan, Nov. 20, 1992, 4-335556; Jan. 8, 1993, 5-18122; Jan. 8, 1993, 5-18123; Mar. 5, 1993, 5-70873; Mar. 5, 1993, 5-70874; May 17, 1993, 5-114542; May 17, 1993, 5-114543; May 17, 1993, 5-114544

Int. Cl.⁶ H01L *33/00*

U.S. Cl. 257—103 **9 Claims**


10
26
p-TYPE GaN-BASED LR COMPOUND SEMICONDUCTOR
20
IMPURITY-DOPED LR InxGa1-xN
18
22
24
n-TYPE GaN-BASED LR CONPOUND SEICONDUCTOR
16
BUFFER LAYER
14
SUBSTRATE
12

9. A light-emitting gallium nitride-based compound semiconductor device comprising:

- a double-heterostructure including a light-emitting layer comprising a III–V Group gallium nitride-based compound semiconductor containing indium, gallium and nitrogen provided between an n-type gallium nitride-based compound semiconductor layer, and a p-type gallium nitride based compound semiconductor layer containing gallium, aluminum and nitrogen, doped with an impurity comprising magnesium, said p-type layer having a magnesium concentration of $1\times10^{18}/cm^3$ to $1\times10^{21}/cm^3$; and
- a contact layer comprising a gallium nitride-based III–V Group semiconductor and provided over said p-type layer, said contact layer being doped with magnesium.

5,747,833
APPARATUS FOR DRIVING INDUCTION MOTOR

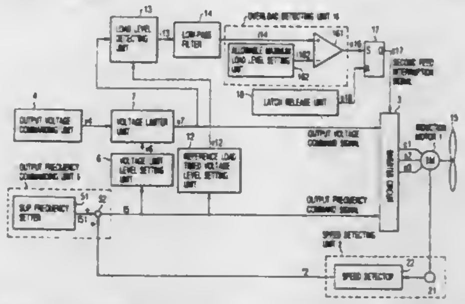
Yoshihiro Fujisaki, Matsubara; Shinichi Emura, Neyagawa, and Kazuyuki Takada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1996, Ser. No. 654,707

Claims priority, application Japan, Aug. 28, 1995, 7-218539

Int. Cl.⁶ H02P *5/28*

U.S. Cl. 318—808 **5 Claims**


13
LOAD LEVEL DETECTING UNIT
14
LOW-PASS FILTER
OVERLOAD DETECTING UNIT 16
161
162
17
S
R
Q
LATCH RELEASE UNIT
18
4
OUTPUT VOLTAGE COMMANDING UNIT
7
VOLTAGE LIMITER UNIT
6
VOLTAGE LIMIT LEVEL SETTING UNIT
12
OUTPUT FREQUENCY COMMANDING UNIT 5
SLIP FREQUENCY SETTER
51
52
OUTPUT VOLTAGE COMMAND SIGNAL
OUTPUT FREQUENCY COMMAND SIGNAL
3
INDUCTION MOTOR 1
IM
15
SPEED DETECTING UNIT 2
SPEED DETECTOR
22
21

1. A driving apparatus of an induction motor driven under slip frequency control including speed detecting means for detecting a rotation speed of said induction motor, an inverter circuit for feeding an AC voltage to said induction motor on the basis of an output voltage command signal and an output frequency command signal, output voltage commanding means for applying the output voltage command signal to said inverter circuit, and output frequency commanding means for applying to said inverter circuit the output frequency command signal in the form of a frequency signal obtained by adding a predetermined slip frequency to a frequency signal delivered out of said speed detecting means and conforming to the rotation speed of said induction motor, said driving apparatus comprising:

- voltage limit level setting means for setting an upper limit value of the output voltage of said inverter circuit in accordance with the output signal of said output frequency commanding means or the output signal of said speed detecting means;
- voltage limiter means for restricting the upper limit of the output voltage of said inverter circuit by restricting the output signal of said output voltage commanding means on the basis of a set value of said voltage limit level setting means; and
- voltage slow-up means for converting the output signal of said output voltage commanding means into a signal which increases at a gradual slope with the lapse of time elapses when that output signal rises and which serves as the output voltage command signal inputted to said inverter circuit.

5,747,834
ADJUSTABLE BIPOLAR SCR HOLDING VOLTAGE FOR ESD PROTECTION CIRCUITS IN HIGH SPEED BIPOLAR/BICMOS CIRCUITS

Julian Zhiliang Chen, 5759 Pineland Dr., Dallas, Tex. 75231; Ajith Amerasekera, 1800 Lake Crest La., Plano, Tex. 75023, and Thomas A. Vrotsos, 1201 Ashland Dr., Richardson, Tex. 75080

Filed Sep. 26, 1996, Ser. No. 721,289

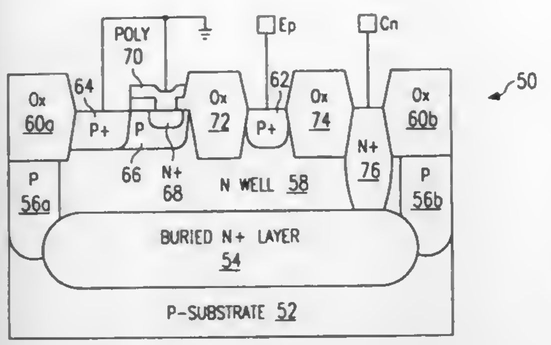
Int. Cl.⁶ H01L *29/74;31/111*

U.S. Cl. 257—111 **13 Claims**

1. A structure protecting a circuit from electrostatic discharge, comprising:

- a. a first semiconductor layer **52** formed from a semiconductor material of a first conductivity type;
- b. a second semiconductor layer **54** overlying at least a portion of said first semiconductor layer **52**, said second semiconductor layer **54** being formed from a material having a conductivity type opposite that of said first semiconductor layer;
- c. a third semiconductor layer **58** at least partially overlying said second semiconductor layer **54**, said third semiconductor

OL
2 10
SS
1
MY
5
998
MI



layer having a conductivity type similar to that of said second semiconductor layer **54**;

d. at least two laterally spaced first implant regions **62** and **64** positioned adjacent to said third semiconductor layer **58**, said implant regions having a common conductivity type;

e. a second implant region **66** interposed between said at least two first implant regions **62** and **64**;

f. a third implant region **68** contacting at least a portion of said second implant region **66** and having a conductivity type opposite that of said second implant region;

g. a fourth implant region **76** laterally spaced from said third implant region **68** and having a common conductivity type as said second implant region, said first **62**, second **66** and third **68** implant regions, along with said third semiconductor layer **58** defining a Bipolar silicon controlled rectifier that is activatable by a triggering circuit comprising a current biasing device **100** and a resistor **106**.

5,747,835
SERIAL ARRANGEMENT OF PHOTOTHYRISTORS

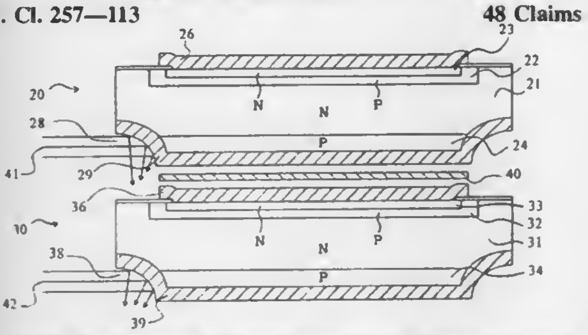
Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Sep. 11, 1995, Ser. No. 526,508

Claims priority, application France, Sep. 16, 1994, 94 11338

Int. Cl.^{6} H01L *29/74;31/111*

U.S. Cl. 257—113 **48 Claims**



1. A serial arrangement of photosensitive components, comprising:

a first photosensitive component having a first photosensitive junction, the first photosensitive component including first and second surfaces and at least one peripheral surface extending between the first and second surfaces of the first photosensitive component, the first photosensitive junction being disposed along the first surface of the first photosensitive component at a distance from the at least one peripheral surface of the first photosensitive component;

a second photosensitive component having a second photosensitive junction, the second photosensitive component including first and second surfaces and at least one peripheral surface extending between the first and second surfaces of the second photosensitive component, the second photosensitive junction being disposed along the first surface of the second photosensitive component, the second surface of the second photosensitive component contacting the first surface of the first photosensitive component, the second surface of the second photosensitive component having a notch extending from the at least one peripheral surface of the second photosensitive component by a distance equal to at least the distance from the at least one peripheral surface of the first photosensitive component to the first photosensitive junction.

5,747,836
SEMICONDUCTOR INTEGRATED CIRCUIT PROVIDED WITH THYRISTOR

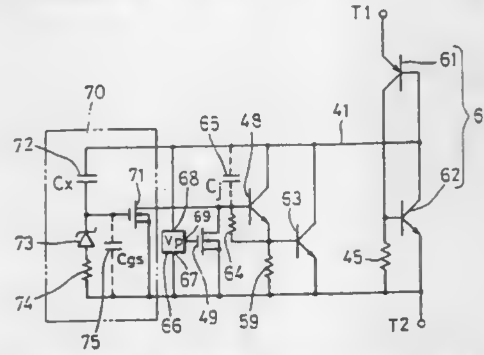
Mitsuru Mariyama, Kitakatsuragi-gun, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1996, Ser. No. 712,563

Claims priority, application Japan, Sep. 11, 1995, 7-233037; Jul. 12, 1996, 8-183701

Int. Cl.^{6} H01L *29/74;31/111*

U.S. Cl. 257—119 **11 Claims**



1. A semiconductor integrated circuit provided with a thyristor which is integrated with a gate drive circuit on one and the same semiconductor chip, comprising:

a dV/dt circuit which includes:

a MOSFET having a drain electrode and a source electrode which are connected between input terminals of the gate, drive circuit;

a capacitor having one end connected to a gate terminal of the thyristor and another end connected to a gate electrode of the MOSFET;

a constant voltage device connected between the gate electrode and source electrode of the MOSFET; and

a resistor connected in series to the constant voltage device between the gate electrode and source electrode of the MOSFET.

5,747,837
SEMICONDUCTOR DEVICE HAVING INPUT PROTECTIVE FUNCTION

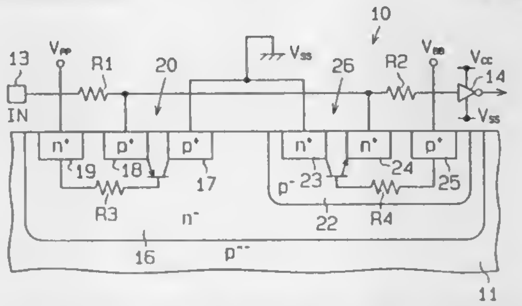
Akihiro Iwase; Tomio Nakano, and Teruo Seki, all of Kasugai, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 10, 1996, Ser. No. 763,262

Claims priority, application Japan, Dec. 12, 1995, 7-323006

Int. Cl.^{6} H01L *27/06*

U.S. Cl. 257—173 **5 Claims**



1. A semiconductor device having input protection on an input terminal thereto, said semiconductor device being coupled to a high-potential power supply and a low-potential power supply, said semiconductor device comprising:

a semiconductor substrate having a first conducting type;

a first semiconductor region defined in said semiconductor substrate and having a second conducting type, said second conducting type being different from said first conducting type;

first and second diffusion regions defined in a part of said first semiconductor region and respectively having said first conducting type;

a first transistor formed by using said first semiconductor region as a base, said first diffusion region as a collector, and said second diffusion region as an emitter;

a second semiconductor region defined in another part of said first semiconductor region and having said first conducting type;

third and fourth diffusion regions defined in said second semiconductor region and respectively having said second conducting type; and

a second transistor formed by using said second semiconductor region as a base, said third diffusion region as a collector, and said fourth diffusion region as an emitter;

wherein said first and third diffusion regions are connected to one of said high-potential power supply and said low-potential power supply, said second and fourth diffusion regions are connected to said input terminal, said first semiconductor region is connected to a third power supply having a voltage higher than the voltage of said high-potential power supply, and said second semiconductor region is connected to a fourth power supply having a voltage lower than the voltage of said low-potential power supply.

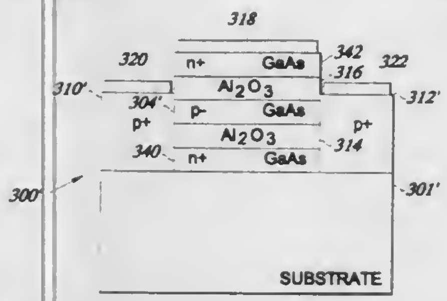
5,747,838
ULTRA-LOW PHASE NOISE GAAS MOSFETS

Umesh Kumar Mishra, Santa Barbara, and Steven P. DenBaars, Goleta, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 27, 1996, Ser. No. 758,240

Int. Cl.^{6} H01L *31/0328;31/0336;31/072;31/109*

U.S. Cl. 257—192 **25 Claims**



1. A field effect semiconductor device, comprising:

an aluminum oxide passivation layer;

a channel region deposited over the passivation layer; and

an aluminum oxide gate oxide layer formed over the channel region.

5,747,839
CHEMICAL SENSING TRENCH FIELD EFFECT TRANSISTOR

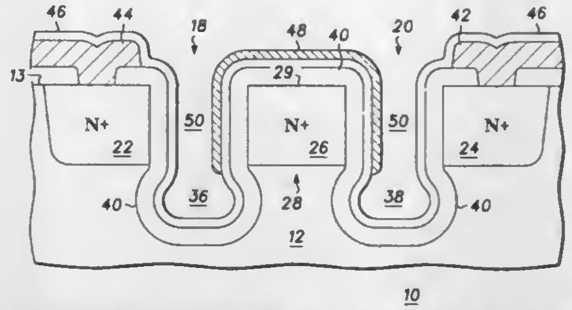
Jonathan H. Hammond, Scottsdale, and Young Sir Chung, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1996, Ser. No. 720,513

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—253 **6 Claims**

1. A field effect transistor for measuring a change in a surface potential of a gate electrode due to exposure to a fluid, said field effect transistor comprising:



a semiconductor substrate having a first trench and a second trench disposed on opposite sides of a ridge protruding upward between said first trench and said second trench, wherein said first trench has a first fluid gap, said second trench has a second fluid gap, and each of said first trench and said second trench has a ridge sidewall disposed on said ridge and an outer sidewall disposed opposite said ridge sidewall;

a first source region and a first drain region disposed on said outer sidewall of said first trench; and

a second source region and a second drain region disposed on said outer sidewall of said second trench, wherein said gate electrode has a first portion disposed overlying said ridge sidewall of said first trench and a second portion overlying said ridge sidewall of said second trench.

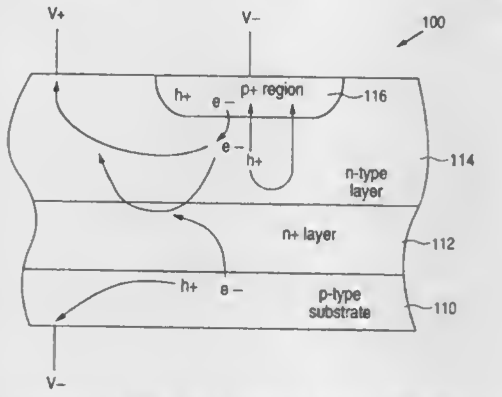
5,747,840
PHOTODIODE WITH IMPROVED PHOTORESPONSE BEHAVIOR

Richard Billings Merrill, Daly City, Calif., assignor to Foveonics, Inc., Cupertino, Calif.

Filed Oct. 21, 1996, Ser. No. 734,114

Int. Cl.^{6} H01L *31/06*

U.S. Cl. 257—233 **13 Claims**



1. A photodiode formed in a semiconductor substrate of a first conductivity type, the photodiode comprising:

a first layer of semiconductor material of a second conductivity type formed on the substrate;

a second layer of semiconductor material of the second conductivity type formed on the first layer of semiconductor material, the first layer having a greater concentration of dopants than the second layer of semiconductor material; and

a region of the first conductivity type formed in the second layer of semiconductor material,

the second layer having a thickness such that, when exposed to a white light source, a number of electron-hole pairs formed in the region and the second layer from red photons is approximately equal to a number of electron-hole pairs formed in the region and the second layer from blue photons.

5,747,841

CIRCUIT ARRANGEMENT, AND JUNCTION FIELD EFFECT TRANSISTOR SUITABLE FOR USE IN SUCH A CIRCUIT ARRANGEMENT

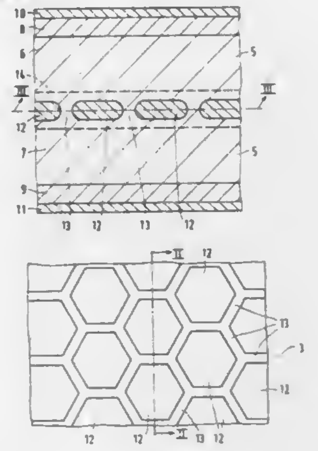
Adriaous W. Ludikhuize, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, NY, N.Y.

Filed Dec. 19, 1995, Ser. No. 574,830

Claims priority, application European Pat. Off., Dec. 20, 1994, 94203688

Int. Cl.^{6} H01L *29/772*

U.S. Cl. 257—266 **13 Claims**



1. A circuit arrangement for operating a load by means of a supply voltage, provided with

input terminals for connection to poles of a supply voltage source,

a circuit portion for limiting an input current which passes through the input terminals during operation as a result of the supply voltage, which circuit portion comprises a semiconductor element with two main electrodes which is connected to junction points in the circuit arrangement such that the input current flows through the two main electrodes, characterized in that the semiconductor element comprises:

a semiconductor body of substantially a first conductivity type wherein the main electrodes are provided at two mutually opposed surfaces of the semiconductor body and each comprise a zone adjoining the respective surface and having a higher doping concentration than an adjoining portion of the semiconductor body which is situated between the more highly doped zones, the doping of the portion between the highly doped zones being chosen such that current saturation occurs when the voltage between the main electrodes rises further than a given voltage;

the semiconductor body further incudes buried zones of the second conductivity type opposed to said first conductivity type, the buried zones being situated in the semiconductor body in said portion between said zones of higher doping concentration, forming an electrically floating gate electrode and defining interposed portions of a channel, the main electrodes forming the source and drain electrodes of the transistor; and

the semiconductor body further comprises a region which is provided with generating centres for minority carriers and which is situated at a distance from the buried zones of the second conductivity type which is at most equal to the diffusion length in the more weakly doped portion of the first conductivity type.

5,747,842

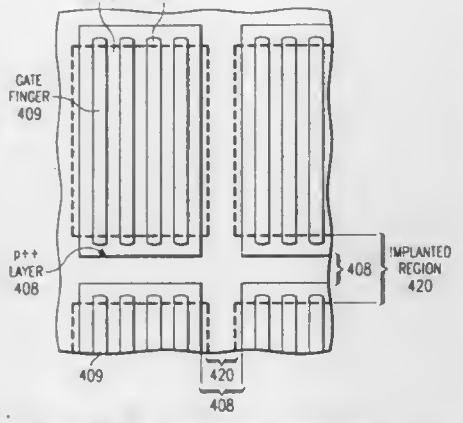
EPITAXIAL OVERGROWTH METHOD AND DEVICES

Donald L. Plumton, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 159,353, Nov. 29, 1993, Pat. No. 5,554,561, which is a continuation-in-part of Ser. No. 56,004, Apr. 30, 1993, Pat. No. 5,712,189. This application Jun. 7, 1995, Ser. No. 472,791

Int. Cl.^{6} H01L *29/80*

U.S. Cl. 257—266 **5 Claims**



1. A vertical field effect transistor, comprising:

(a) a plurality of parallel gate fingers buried in a semiconductor body containing dopands of a first conductivity type, said gate fingers containing only dopants of a second conductivity type opposite said first conductivity type;

(b) a connecting structure containing dopants only of said second conductivity type and buried in said body and spaced from said gate fingers; and

(c) a region of said body connecting said gate fingers to said connecting structure, said region containing dopants for both said first and said second conductivity types with the concentration of said dopants of said second conductivity type exceeding that of said dopants of said first conductivity type.

5,747,843

SEMICONDUCTOR MEMORY DEVICE

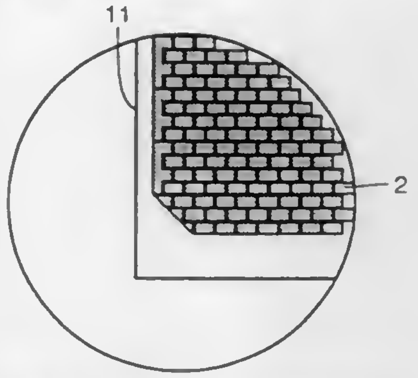
Hiroshi Matsuo; Shinya Watanabe; Yuichi Yokoyama, and Shinya Inoue, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Hyogo, both of Japan

Filed Jun. 21, 1996, Ser. No. 667,684

Claims priority, application Japan, Nov. 9, 1995, 7-291223

Int. Cl.^{6} H01L *27/108;* **G11C** *5/02;13/00*

U.S. Cl. 257—296 **9 Claims**



5. A semiconductor memory device, comprising:

a semiconductor substrate;

a memory cell block of a dynamic random access memory provided on said semiconductor substrate; and

said memory cell block including a storage node-block being a plurality of storage nodes gathered in a block,

a corner portion of said storage node-block being cut off.

5,747,844

DYNAMIC SEMICONDUCTOR MEMORY DEVICE WITH HIGHER DENSITY BIT LINE/WORD LINE LAYOUT

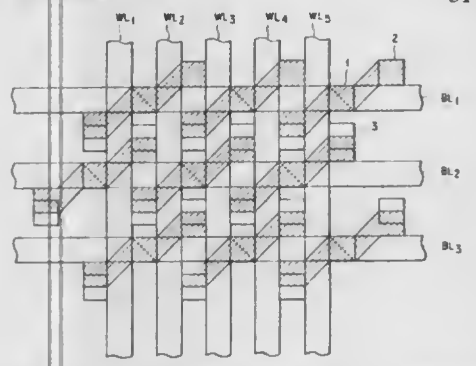
Masami Aoki; Takashi Yamada, both of Yokohama, Japan; Hiroshi Takato, Wappingers Falls, N.Y.; Tohru Ozaki, Tokyo, Japan; Katsuhiko Hieda, and Akihiro Nitayama, both of Wappingers Falls, N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 402,570, Mar. 13, 1995, Pat. No. 5,578,847, which is a continuation of Ser. No. 92,681, Jul. 16, 1993, abandoned. This application Oct. 24, 1996, Ser. No. 736,279

Claims priority, application Japan, Jul. 17, 1992, 4-190994

Int. Cl.^{6} H01L *27/108*

U.S. Cl. 257—296 **31 Claims**



11. A dynamic semiconductor memory device, comprising:

a semiconductor substrate;

a plurality of memory cells each formed of a MOS transistor and a capacitor which is formed on said semiconductor substrate and has a storage node contact;

a plurality of word lines formed on said semiconductor substrate, spaces being provided between adjacent word lines and including odd-numbered and even-numbered spaces;

a plurality of bit lines formed on said semiconductor substrate to intersect said word lines, said bit lines including odd-numbered and even-numbered bit lines; and

a plurality of bit line contacts formed under said bit lines with each respective bit line contact being commonly used by two respective memory cells of said plurality of memory cells, two respective storage node contacts of said two respective memory cells connected to each respective bit line contact being arranged across each bit line connected to said respective bit line contact, a combination of each respective bit line contact and said two memory cells forming an element region, those of said bit line contacts which electrically connect to said even-numbered bit lines to said memory cells being arranged in said even-numbered spaces and those of said bit line contacts which electrically connect to said odd-numbered bit lines to said memory cells being arranged in said odd-numbered spaces, wherein

respective element regions are arranged in parallel,

said storage node contact of one of said two memory cells connected to a first bit line contact and said storage node contact of one of said two memory cells connected to a second bit line contact, which is formed under the same bit line as said first bit line contact and is adjacent thereto, are arranged across the bit line,

and said storage node contacts of said memory cells, which are respectively connected to an adjacent two of said bit line contacts connected to the same bit line and which are respectively connected to an adjacent two of said word lines, are arranged to sandwich the same bit line, and are arranged at the same space between said adjacent two of said word lines.

5,747,845

SEMICONDUCTOR MEMORY DEVICE WITH MEMORY CELLS EACH HAVING TRANSISTOR AND CAPACITOR AND METHOD OF MAKING THE SAME

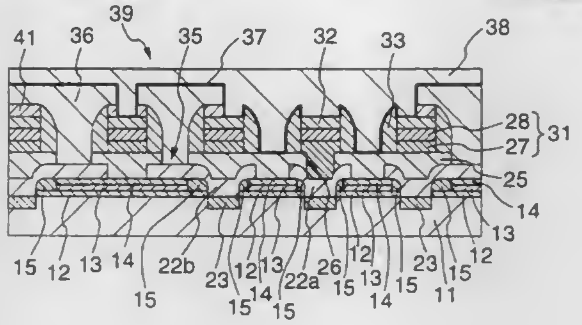
Shoichi Iwasa, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 20, 1996, Ser. No. 700,082

Claims priority, application Japan, Aug. 22, 1995, 7-236122

Int. Cl.^{6} H01L *27/08;29/76;29/94;31/119*

U.S. Cl. 257—306 **36 Claims**



1. A semiconductor memory device comprising:

an element isolation structure for defining a plurality of element active regions isolated by said element isolation structure;

a plurality of memory cells formed on a surface of a semiconductor substrate, each memory cell including a transistor having a pair of impurity diffusion layers and a gate electrode, and a capacitor, said transistor being formed in one of said element active regions;

a first insulating film formed to cover the transistors of the memory cells;

a plurality of word lines formed on the surface of said semiconductor substrate and extending parallel to each other, each word line being connected to the gate electrode of the transistor of at least one of the memory cells;

a plurality of bit lines each connected to one of the pair of impurity diffusion layers of the transistor of at least a selected one of the memory cells through a first contact hole formed in said first insulating film, a conductive film being formed on a top surface of each of said bit lines with a second insulating film interposed therebetween;

a lower electrode of the capacitor of each of said memory cells formed at a predetermined position on said first insulating film, said lower electrode being electrically connected to said conductive film formed on one of said bit lines and also to the other of the pair of impurity diffusion layers of the transistor of the associated memory cell through a second contact hole formed in said first insulating film;

a first pad film of a conductive material provided for electrically connecting each of said bit lines to one of the pair of impurity diffusion layers of the associated transistor; and

a second pad film of a conductive material provided for electrically connecting said lower electrode of the capacitor to the other of the impurity diffusion layers of the associated transistor;

wherein said conductive film formed on the top surface of each of said bit lines is formed by a material having a lower etching rate than that of said first insulating film in etching for said second contact hole in said first insulating film and wherein said second pad film extends over said element isolation structure up to a portion corresponding to a space between adjacent two of said bit lines.

OL
2 10
SS
1
MY
5
998
MI

5,747,846
PROGRAMMABLE NON-VOLATILE MEMORY CELL

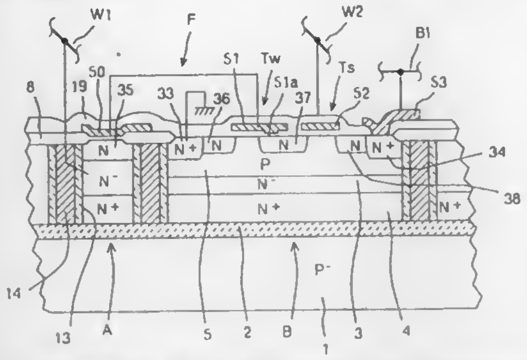
Makio Iida, Ichinomiya; Tetsuo Fujii, Toyohashi, and Yoshihiko Isobe, Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 23, 1994, Ser. No. 346,287

Claims priority, application Japan, Nov. 25, 1993, 5-295475

Int. Cl.^{6} H01L *27/10*

U.S. Cl. 257—314 **13 Claims**



1. A programmable non-volatile memory cell, comprising:
a MOS transistor including a gate electrode defined on a surface of a semiconductor substrate;
a floating electrode including said gate electrode section and a capacity electrode section;
a control electrode comprising a semiconductor region disposed directly under said capacity electrode section, and an insulating film interposed between said semiconductor region and said capacity electrode section; and
an insulator buried in said semiconductor substrate so as to abut a side and bottom of said semiconductor region composing said control electrode, thereby partially surrounding said semiconductor region of said control electrode.

5,747,847
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE, METHOD FOR MANUFACTURING THE SAME, AND LOGICAL CIRCUIT

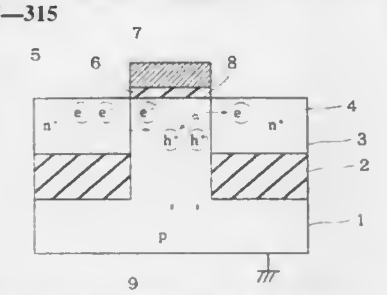
Hiroyuki Morinaka; Kimio Ueda, and Koichiro Mashiko, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1996, Ser. No. 708,269

Claims priority, application Japan, Mar. 18, 1996, 8-060795

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—315 **10 Claims**



1. A semiconductor integrated circuit device, comprising:
a substrate;
an insulating layer formed on said substrate;
a semiconductor layer of a first conductivity type formed on said insulating layer;
first and second semiconductor regions of a second conductivity type selectively formed on an upper surface of said semiconductor layer;
a gate insulating film formed on said upper surface of said semiconductor layer between said first and second semiconductor regions;
a gate electrode formed on said gate insulating film;
wherein a portion of said semiconductor layer provided below said gate electrode includes a channel region of a transistor being formed by said gate electrode and said first and second semiconductor regions, and first carriers are flowing in the channel region from the first semiconductor region to the second semiconductor region; and
wherein said insulating layer includes a carrier drainable region below said gate electrode, the carrier drainable region being capable of draining second carriers having a charge opposite to that of the first carriers from said channel region, said second carriers arising while said first carriers and flowing in said channel region.

5,747,848
NONVOLATILE MEMORY DEVICES INCLUDING ARRAYS OF DISCRETE FLOATING GATE ISOLATION REGIONS

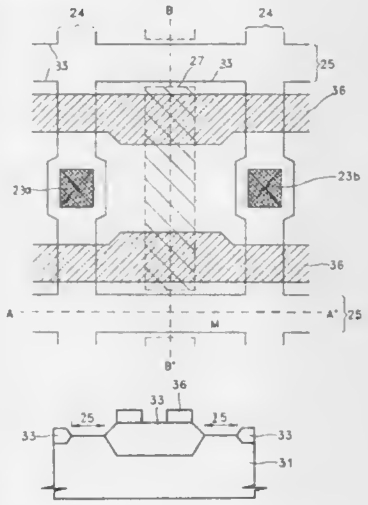
Jong-weon Yoo, and Keon-soo Kim, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 18, 1996, Ser. No. 769,589

Claims priority, application Rep. of Korea, Dec. 27, 1995, 95-59506

Int. Cl.^{6} H01L *29/788;27/108*

U.S. Cl. 257—316 **8 Claims**



1. A nonvolatile memory device comprising:
a substrate;
an array of field isolation regions in the substrate, the array of field isolation regions defining a plurality of spaced apart first active regions in the substrate, which extend along the substrate in a first direction, the array of field isolation regions also defining a plurality of spaced apart second active regions in the substrate, which extend along the substrate in a second direction which is orthogonal to the first direction;
a plurality of bit line contacts in each of the first active regions, a respective bit line contact being located between adjacent second active regions;
a plurality of spaced apart control gates, extending along the substrate in the second direction, a respective control gate being located between a bit line contact and a second active region; and
an array of floating gate isolation regions, a respective one of which is on a respective one of the array of field isolation regions, the floating gate isolation regions extending on the corresponding field isolation region along the first direction;
wherein the floating gate isolation regions are longer than the corresponding field isolation regions, along the first direction, so that the floating gate isolation regions extend onto the second active regions.

5,747,849
NONVOLATILE MEMORY DEVICE HAVING BURIED DATA LINES AND FLOATING GATE ELECTRODE ON BURIED DATA LINES

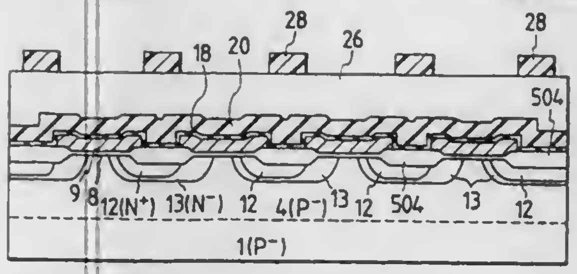
Kenichi Kuroda, Tachikawa; Kazuyoshi Shiba, Kodaira, and Akinori Matsuo, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corp., both of Tokyo, Japan

Division of Ser. No. 470,008, Jun. 6, 1995, Pat. No. 5,548,146, which is a continuation of Ser. No. 138,510, Oct. 20, 1993, abandoned. This application Jun. 25, 1996, Ser. No. 669,938

Claims priority, application Japan, Oct. 29, 1992, 4-314014; Apr. 27, 1993, 5-123531

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—321 **46 Claims**



1. A semiconductor memory device comprising:
a semiconductor substrate having a main surface;
word lines formed over said main surface and extending in a first direction;
a plurality of memory cells, each memory cell comprised of a single MISFET which includes a first gate insulating film formed over said main surface, a floating gate electrode formed over said first gate insulating film, a second gate insulating film formed over said floating gate electrode, a control gate electrode formed over said second gate insulating film, first and second semiconductor regions formed in said substrate, and a channel forming region formed in said substrate and between said first and second semiconductor regions,
wherein said first and second semiconductor regions of said memory cell are extended under said first gate insulating film and under said floating gate electrode thereof, said second semiconductor region having an impurity concentration lower than that of said first semiconductor region, and
wherein said memory cells are arranged in said first direction and a second direction, perpendicular to said first direction, the control gate electrodes of said memory cells which are arranged in said first direction are, respectively, integrally formed with corresponding ones of said word lines;
buried lines formed in said substrate and extending in said second direction,
wherein said buried lines are formed commonly for adjacent memory cells arranged in said first direction and are integrally formed with said first and second semiconductor regions such that a first semiconductor region of a memory cell is integrally formed, at a first end of said channel forming region thereof, with a second semiconductor region of a memory cell adjacent to said memory cell in said first direction, such that a second semiconductor region of a memory cell is integrally formed, at a second, opposite end of said channel forming region thereof, with a first semiconductor region of another memory cell adjacent to said memory cell in said first direction, and
wherein said buried lines are extended in said second direction in such a manner that said buried lines are integrally formed with said first and second semiconductor regions of said memory cells arranged in said second direction; and
first insulating films each formed on a corresponding buried line and each having a film thickness greater than that of said first gate insulating film,
wherein in said memory cell said floating gate electrode has a first and a second end portion apart from each other in said first direction such that said first end portion and said second end portion are extended over one of said first insulating films formed on said first semiconductor region and over another one of said first insulating films formed on said second semiconductor region of said memory cell, respectively,
wherein said first semiconductor region of a memory cell is spaced apart, in said first direction, from a first gate insulating film of a memory cell adjacent to said memory cell in said first direction,
wherein, when a first negative voltage, a first positive voltage and a second voltage, more positive than said first negative voltage, are applied to one word line, one buried line and other word lines, respectively, in a write operation, electrons are transferred from a floating gate electrode of a memory cell associated with said one word line to a first semiconductor region of said memory cell associated with said one buried line by electron tunneling through a first gate insulating film of said memory cell, and
wherein, when a second positive voltage and a third voltage, more negative than said second positive voltage, are applied to said word line and said buried line, respectively, in an erasing operation, electrons are transferred from said substrate to said floating gate electrode by electron tunneling through said first gate insulating film.

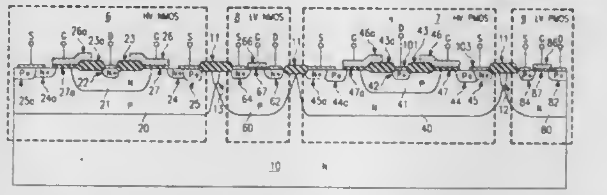
5,747,850
EXTENDED DRAIN RESURF LATERAL DMOS DEVICES

Chia-Cu Peter Mei, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 474,951, Jun. 7, 1995, abandoned, which is a division of Ser. No. 224,948, Apr. 8, 1994, Pat. No. 5,498,554. This application Jan. 29, 1997, Ser. No. 790,124

Int. Cl.^{6} H01L *29/792;29/76;29/94;31/062*

U.S. Cl. 257—328 **6 Claims**



1. A high voltage transistor for operation at a predetermined drain to source voltage, with an $R_{ds(on)}$ resistance, comprising:
a well formed in a semiconductive substrate, the well having a first impurity concentration level of a first type;
a source region formed in the well having a second impurity concentration level of a second type;
a tank contact region operable to connect a voltage on the source region to the well;
a drift region formed in the well having a third impurity concentration of the second type, the drift region is spaced apart from the source region so that a channel region is formed in a portion of the well that extends to near the top surface of the semiconductive substrate between the drift region and the source region, the channel region having the first impurity concentration level of the first type, and wherein the third impurity concentration of the drift region is higher than the first impurity concentration of the channel region, whereby a resistivity of the drift region is low in response to the third impurity concentration of the drift region;
a gate electrode formed above a portion of the source region, a portion of the drift region, and the channel region;
a drain formed in the drift region located a first distance from channel region, the first distance is greater than a depletion region formed in the drift region when the predetermined drain to source voltage is applied across the drain and the tank contact region; and
whereby a resistance of the drift region between the edge of the drain region and the edge of the depletion region is low in response to the low resistivity of the drift region, such that $R_{ds(on)}$ is thereby minimized.

5,747,851

SEMICONDUCTOR DEVICE WITH REDUCED BREAKDOWN VOLTAGE BETWEEN THE GATE ELECTRODE AND SEMICONDUCTOR SURFACE

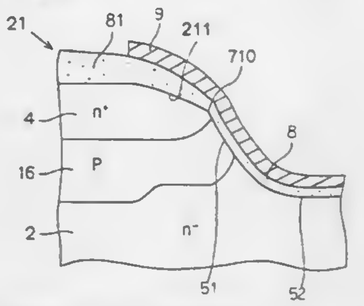
Yutaka Tomatsu, Okazaki, and Mitsuhiro Kataoka, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1996, Ser. No. 723,804

Claims priority, application Japan, Sep. 29, 1995, 7-253940; Jun. 20, 1996, 8-159716

Int. Cl.^{6} H01L *29/76;29/94;31/062*

U.S. Cl. 257—330 **22 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a first conductivity type semiconductor layer at a side of a main-surface thereof, said semiconductor layer having a groove structure which is disposed at said main-surface and has a bottom part, a slanting inlet part where said main-surface of said semiconductor layer sinks gradually to said bottom part, and a sidewall part forming a sidewall of said groove structure and joining said slanting inlet part and said bottom part, wherein a curving portion where said slanting inlet part and said sidewall part are inflectionally connected is formed at a boundary of said slanting inlet part and said sidewall part;

a gate insulating film formed along said groove structure; and

a gate electrode disposed along said groove structure and on said gate insulating film,

wherein said gate insulating film has a first interface defined with an inner surface of said groove structure and a second interface defined with a lower surface of said gate electrode; and

wherein said gate insulating film is formed such that a radius of curvature in a vicinity of said curving portion on said second interface is controlled to be larger than a radius of curvature of a portion contiguous to said curving portion on said first interface.

5,747,852

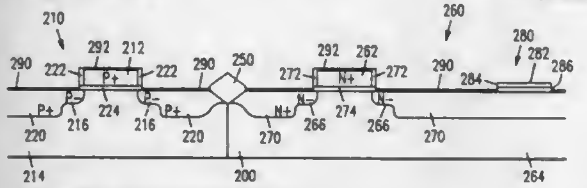
LDD MOS TRANSISTOR WITH IMPROVED UNIFORMITY AND CONTROLLABILITY OF ALIGNMENT

Kuang-Yeh Chang, Los Gatos, Calif.; Mark I. Gardner, Cedar Creek, and Fred Hause, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 451,784, May 26, 1995, abandoned. This application May 21, 1997, Ser. No. 861,190

Int. Cl.^{6} H01L *27/088*

U.S. Cl. 257—336 **14 Claims**



1. A MOS transistor comprising:

a semiconductor substrate of a first conductivity type having a substantially planar surface;

a gate insulating layer formed on the substantially planar surface of the semiconductor substrate;

a gate electrode formed on the gate insulating layer on the substantially planar surface of the semiconductor substrate, the gate electrode and the gate insulating layer having substantially straight vertical lateral sides;

a nitride layer having a substantially uniform thickness formed on the substantially straight vertical lateral sides of the gate electrode;

a lightly doped source region and a lightly doped drain region of a second conductivity type complementary to the first conductivity type formed in the semiconductor substrate, the lightly doped source region and lightly doped drain region being self-aligned to the gate electrode; and

a heavily doped source region and a heavily doped drain region of the second conductivity type formed in the semiconductor substrate, the heavily-doped regions having a heavier doping dosage than the lightly doped regions, the heavily doped source region and heavily doped drain region being self-aligned a controlled distance lateral to the gate electrode and having a doping profile that is substantially straight and vertical.

5,747,853

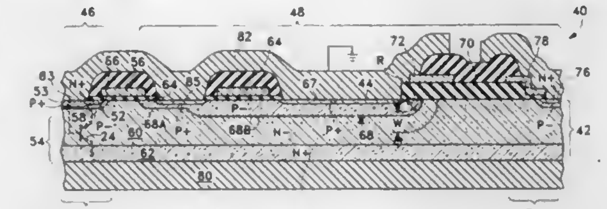
SEMICONDUCTOR STRUCTURE WITH CONTROLLED BREAKDOWN PROTECTION

Koon Chong So, San Jose; Fwu-Iuan Hshieh, Saratoga; Danny C. Nim, San Jose; True-Lon Line, Cupertino, and Yan Man Ysui, Union City, all of Calif., assignors to MegaMos Corporation, San Jose, Calif.

Filed Aug. 7, 1996, Ser. No. 693,950

Int. Cl.^{6} H01L *23/62*

U.S. Cl. 257—355 **18 Claims**



1. An semiconductor structure having active circuits characterized by an electrical breakdown during one mode of operation, comprising:

a substrate including an epitaxial layer of one conductivity type, said substrate having a major surface;

an annular region of an opposite conductivity type disposed in said epitaxial layer and adjacent said major surface, said annular region being disposed surrounding and spaced from said active circuits, said annular region having a cross-sectional profile including a shallow portion and a deep portion, said deep portion being higher in doping concentration and including a radius of curvature larger than the corresponding doping concentration and radius of curvature, respectively, of any other region, including said shallow portion, disposed in said eptiaxial layer so as to dissipate the electrical breakdown in said annular region in the event of breakdown occurrence during said mode of operation, thereby diverting any breakdown in the active circuits; and

conductive means disposed in electrical contact with said annular region.

5,747,854

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

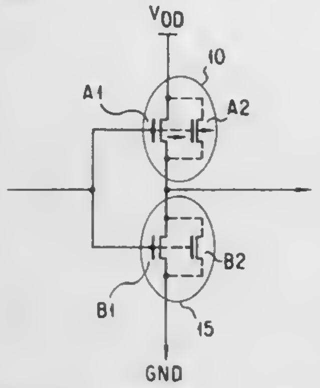
Hiroshi Gotou, Tokyo, Japan, assignor to NKK Corporation, Japan

Filed Oct. 26, 1995, Ser. No. 548,736

Claims priority, application Japan, Oct. 31, 1994, 6-290618; Nov. 30, 1994, 6-321639; Aug. 31, 1995, 7-223880

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—368 **2 Claims**



1. A CMOS inverter comprising:

a plurality of MOS transistors of first and second conductivity types series-connected between reference power supply terminals, for receiving an input signal at the gate of each of said MOS transistors and outputting an inverted signal from a connection node of the series connection;

wherein at least one of said MOS transistors of the first conductivity type and the second conductivity type comprises at least two adjacent discrete channel regions of one conductivity type, a common source and a common drain of an opposite conductivity type formed with the discrete channel region of the one conductivity type disposed therebetween, a gate insulation film having at least two adjacent regions having different threshold values and formed of a gate insulation material with partially different thicknesses formed on the discrete channel region of the one conductivity type, and a common gate formed on the gate insulation film.

5,747,855

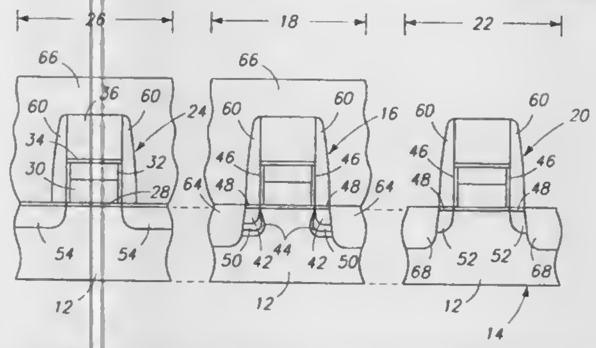
CMOS INTEGRATED CIRCUITRY WITH HALO AND LDD REGIONS

Charles H. Dennison, Meridian, and Mark Helm, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 631,249, Apr. 12, 1996, Pat. No. 5,683,927, which is a continuation of Ser. No. 503,419, Jul. 17, 1995, Pat. No. 5,534,449. This application Jan. 14, 1997, Ser. No. 782,248

Int. Cl.^{6} H01L *29/76;29/94;31/062*

U.S. Cl. 257—369 **4 Claims**



1. CMOS circuitry formed on a semiconductor substrate, the CMOS circuitry comprising:

an NMOS transistor device comprising:

- an NMOS transistor gate over said semiconductor substrate,
- NMOS halo regions within the semiconductor substrate, the NMOS halo regions extending to an NMOS halo region depth within the semiconductor substrate;
- NMOS first LDD regions within the semiconductor substrate, the NMOS first LDD regions extending to an NMOS first LDD region depth within the semiconductor substrate;
- NMOS second LDD regions within the semiconductor substrate, the NMOS second LDD regions extending to an NMOS second LDD region depth within the semiconductor substrate, and a PMOS transistor device comprising:
  - a PMOS transistor gate over the semiconductor substrate; and
  - PMOS halo regions within the semiconductor substrate, the PMOS halo regions extending to a PMOS halo region depth within the semiconductor substrate, the PMOS halo region depth being generally equal to the NMOS first LDD region depth.

5,747,856

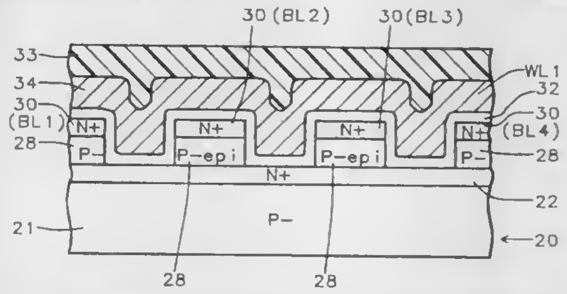
VERTICAL CHANNEL MASKED ROM MEMORY CELL WITH EPITAXY

Ling Chen, Sunnyvale, Calif.; Sung-Mu Hsu, I-Lan, and Weng Liang Fang, Hsin-chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Continuation of Ser. No. 559,108, Nov. 16, 1995, which is a division of Ser. No. 332,908, Nov. 1, 1994, Pat. No. 5,510,287. This application Apr. 10, 1997, Ser. No. 827,633

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—390 **26 Claims**



1. A semiconductor device formed on a doped semiconductor substrate having a surface on which common source FET devices are formed comprising:

said semiconductor device including a source region layer on said surface of said semiconductor substrate,

a pattern of spaced apart, doped silicon epitaxial regions on said source region layer,

a plurality of drain regions formed on the top surface of each of said silicon epitaxial regions, said drain regions comprising portions of bit lines,

said epitaxial regions and said drain regions forming stacks on said source region layer leaving exposed surfaces of said source region layer between said stacks,

a conformal gate oxide layer formed covering exposed surfaces of said device including top surfaces and sidewalls of said drain regions comprising bit lines, the sidewalls of said epitaxial regions and said exposed surfaces of said source region layer between said stacks, said gate oxide layer extending conformally down along the sidewalls of said stacks,

a transverse word line conductor layer containing silicon over said conformal gate oxide layer, said transverse word line conductor layer extending across said stacks,

an implant region in a said epitaxial region for source contact and metal interconnect,

said drain regions, said source region layer and said epitaxial regions forming a plurality of FET transistors in said device, and

a code ion implant region in said device.

5,747,857

ELECTRONIC COMPONENTS HAVING HIGH-FREQUENCY ELEMENTS AND METHODS OF MANUFACTURE THEREFOR

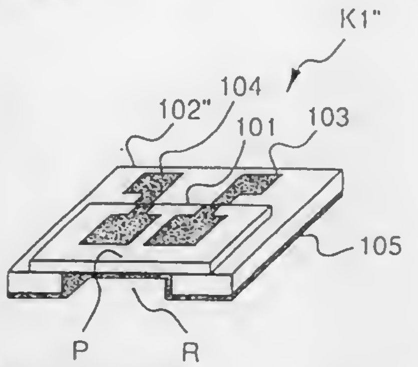
Kazuo Eda, Nara; Yutaka Taguchi, Osaka; Akihiro Kanaboshi, Neyagawa, and Tetsuyoshi Ogura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 81,805, Jun. 23, 1993, abandoned, Ser. No. 137,843, Oct. 15, 1993, abandoned, and Ser. No. 131,375, Oct. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 849,609, Mar. 11, 1992, abandoned, and Ser. No. 942,269, Sep. 9, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 182,561

Claims priority, application Japan, Mar. 13, 1991, 3-47872; Jun. 23, 1992, 4-164451; Jun. 23, 1992, 4-164452; Jul. 1, 1992, 4-174014; Jul. 3, 1992, 4-176605; Oct. 5, 1992, 4-266158; Oct. 13, 1992, 4-274002; Oct. 13, 1992, 4-274003; Oct. 20, 1992, 4-281473; Oct. 20, 1992, 4-281474

Int. Cl.^{6} H01L *41/10;41/08*

U.S. Cl. 257—416 **63 Claims**



1. A quartz device comprising:
a quartz plate made of quartz and having first and second surfaces;
a first excitation electrode deposited on said first surface of said quartz plate;
a second excitation electrode deposited on said second surface of said quartz plate opposing said first excitation electrode;
a holding plate made of a material having a thermal expansion coefficient substantially equal to that of said quartz plate, said holding plate having a surface held via direct bonds, which are free of organic adhesives, to a surface of said quartz plate: and
a housing substrate having a recess, a portion of said quartz plate being connected to a portion of said holding plate by direct bonds free of organic adhesives, a portion of said holding plate being connected to a portion of said housing substrate by direct bonds free of organic adhesives, and a major portion of said quartz plate which is subject to vibration hanging over said recess of said housing substrate.

5,747,858

ELECTRONIC COMPONENT HAVING AN INTERCONNECT SUBSTRATE ADJACENT TO A SIDE SURFACE OF A DEVICE SUBSTRATE

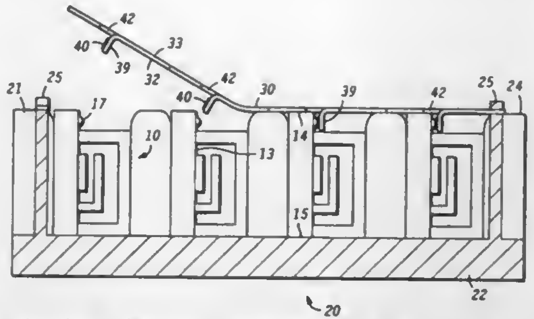
George W. Hawkins, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1996, Ser. No. 723,817

Int. Cl.^{6} H01L *29/82*

U.S. Cl. 257—417 **30 Claims**

1. An electronic component comprising:
a first substrate having a device surface and a side surface adjacent to the device surface, the first substrate comprised of a semiconductor substrate;
an electronic device supported by the first substrate;
electrical contacts electrically coupled to the electronic device and supported by the device surface of the first substrate; and
an electrically insulative substrate having an interconnect surface and a plurality of electrically conductive traces overlying the interconnect surface, the plurality of electrically conductive traces electrically coupled to the electrical contacts, the electrically insulative substrate supported by the side surface of the first substrate.



5,747,859

MAGNETIC DEVICE AND MAGNETIC SENSOR USING THE SAME

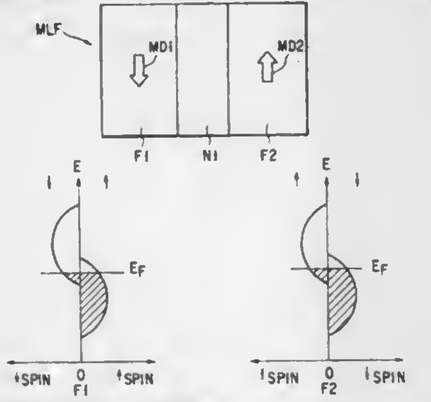
Koichi Mizushima, Kamakura; Teruyuki Kinno, Kawasaki; Takashi Yamauchi, and Koichiro Inomata, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 19, 1996, Ser. No. 699,326

Claims priority, application Japan, Sep. 1, 1995, 7-225625; Jul. 18, 1996, 8-189366

Int. Cl.^{6} H01L *29/82;29/84;* **G11B** *5/127;5/33*

U.S. Cl. 257—421 **6 Claims**



1. A magnetic device comprising:
a multilayered film having a first magnetic film and a nonmagnetic film;
an electron collecting section including a semiconductor layer connected to said first magnetic film via a Schottky junction; and
an electron injecting section including a second magnetic film connected to said nonmagnetic film via a tunnel junction member.

5,747,860

METHOD AND APPARATUS FOR FABRICATING SEMICONDUCTOR DEVICE WITH PHOTODIODE

Mitsuhiro Sugiyama, and Tsutomu Tashiro, both of Tokyo, Japan, assignors to Nec Corporation, Tokyo, Japan

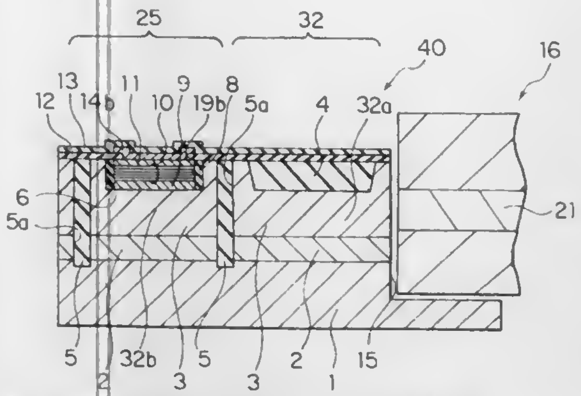
Filed Mar. 8, 1996, Ser. No. 613,077

Claims priority, application Japan, Mar. 13, 1995, 7-052700

Int. Cl.^{6} H01L *31/0232*

U.S. Cl. 257—432 **20 Claims**

1. A semiconductor device having a photodiode comprising:
a silicon substrate;
a photodiode formed on the surface of said silicon substrate, which has a photo absorbing layer formed on the surface of said substrate;



an isolation region for isolation of said photodiode;
an optical waveguide formed on the surface of said substrate adjacent said photodiode across said isolation region, and including a first layer, a second layer formed below said first layer and a third layer formed below said second layer, said first layer and said third layer being formed of materials having a refraction index which is smaller than a refraction index of said second layer, said second layer and said third layer being extended below said photo absorbing layer so that light is introduced below this photo absorbing layer after passing through the second layer and said isolation region,
whereby an incident light at said side surface of said second layer is led beneath said photo absorbing layer and along said second layer.

5,747,861

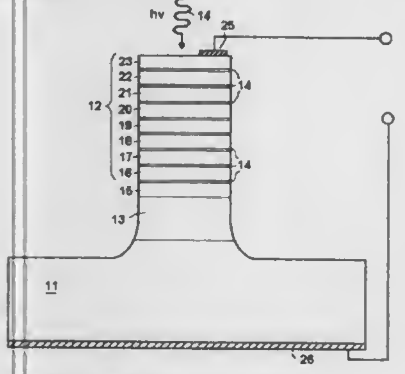
WAVELENGTH DISCRIMINATING PHOTODIODE FOR 1.3/1.55 μM LIGHTWAVE SYSTEMS

Andrew Gomperz Dentai, Atlantic Highlands, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 3, 1997, Ser. No. 778,922

Int. Cl.^{6} H01L *31/0232;31/00*

U.S. Cl. 257—435 **15 Claims**



1. A discriminating photodiode comprising:
a semiconductor substrate,
a photodiode overlying the substrate and integrated therewith,
said photodiode being responsive to light at a wavelength of 1.55 μm, the invention characterized by a multilayer absorbing structure overlying said photodiode and integrated therewith, said multilayer absorbing structure comprising multiple absorbing layers of semiconductor material having a bandgap wavelength greater than 1.3 μm, with each layer separated by a barrier layer of semiconductor material having a bandgap greater than 1.3 eV.

5,747,862

SPIN-POLARIZED ELECTRON EMITTER HAVING SEMICONDUCTOR OPTO-ELECTRONIC LAYER WITH SPLIT VALENCE BAND AND REFLECTING MIRROR

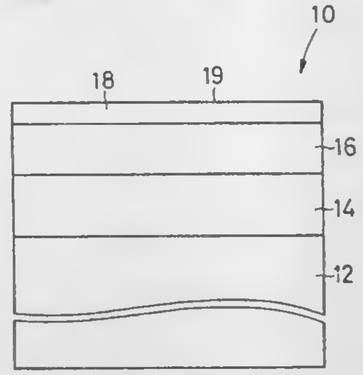
Katsumi Kishino, Susukinodainidanchi 1-204,8, Susukino 2-chome, Midori-ku, Yokohama-shi, Kanagawa-ken, and Toshihiro Kato, Kasugai, both of Japan, assignors to Katsumi Kishino, Yokohama, and Daido Tokushuko Kabushiki Kaisha, Nagoya, both of Japan

Filed Sep. 22, 1993, Ser. No. 124,624

Claims priority, application Japan, Sep. 25, 1992, 4-280822; Oct. 22, 1992, 4-308259; Oct. 22, 1992, 4-308260

Int. Cl.^{6} H01L *31/0304*

U.S. Cl. 257—436 **3 Claims**



1. An electron emitting element comprising:
a semiconductor opto-electronic layer having a split valence band, said opto-electronic layer emitting a beam of spin-polarized electrons from an emitting surface thereof upon incidence of an excitation laser radiation upon said emitting surface; and
a reflecting mirror formed on one of opposite sides of said opto-electronic layer remote from said emitting surface, said reflecting mirror reflecting said laser radiation and cooperating with said emitting surface to effect multiple reflection therebetween of said laser radiation,
and wherein said reflecting mirror comprises a multilayered reflecting mirror including a plurality of pairs of alternating $p\text{-Al}_{0.6}\text{Ga}_{0.4}\text{As}$ layers and $p\text{-Al}_{0.1}\text{Ga}_{0.9}\text{As}$ layers.

5,747,863

INFRARED SOLID-STATE IMAGE PICKUP DEVICE AND INFRARED SOLID-STATE IMAGE PICKUP APPARATUS EQUIPPED WITH THIS DEVICE

Masahiro Shoda, Gyoda, Japan, assignor to Nikon Corporation, Tokyo, Japan

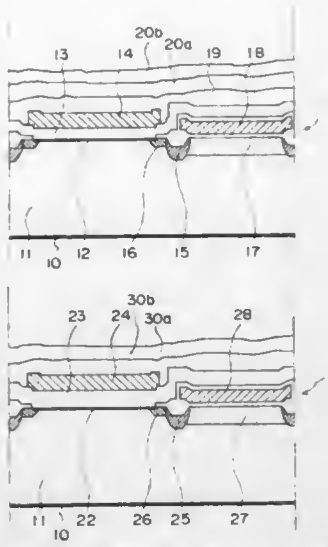
Filed Jul. 8, 1996, Ser. No. 676,804

Int. Cl.^{6} H01L *31/00;31/0232*

U.S. Cl. 257—440 **13 Claims**

1. An infrared solid-state image pickup device comprising:
a substrate which is transparent with respect to infrared light;
a first light receiving element formed on said substrate and including
a first photoelectric conversion portion formed on a first major surface of said substrate,
a first infrared transparent insulating layer formed on said first photoelectric conversion portion, and
a first reflecting layer formed on said first infrared transparent insulating layer,
a first optical cavity with a first predetermined optical distance being formed between said first photoelectric conversion portion and said first reflecting layer; and
a second light receiving element formed on said substrate and including
  a second photoelectric conversion portion formed on said first major surface of said substrate,
  a second infrared transparent insulating layer formed on said second photoelectric conversion portion, and

OL
2 10
SS
1
MY
5
998
MI



- a second reflecting layer formed on said second infrared transparent insulating layer.
- a second optical cavity with a second predetermined optical distance, which is different from said first predetermined optical distance by more than 100 nm, being formed between said second photoelectric conversion portion and said second reflecting layer;

wherein said first predetermined optical distance is set such that a valley in sensitivity to light incident to said first optical cavity exists at a predetermined wavelength within a predetermined wavelength range in a sensitivity curve of said first optical cavity, and

light within said wavelength range being photoelectrically convertible by said second light receiving element, and

wherein said first and second photoelectric conversion portions convert light incident from a second major surface of said substrate, which is opposite to said first major surface, and transmitted through said substrate.

5,747,864
LIGHT RECEIVING ELEMENT AND A METHOD OF FABRICATING THE SAME

Takeshi Kitatani, Hitachi; Yoshiaki Yazawa, Hitachioota; Junko Minemura, Kodaira; Akira Sato, Takahagi, and Terunori Warabisako, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 280,997, Jul. 27, 1994, abandoned. This application Jul. 31, 1996, Ser. No. 688,741

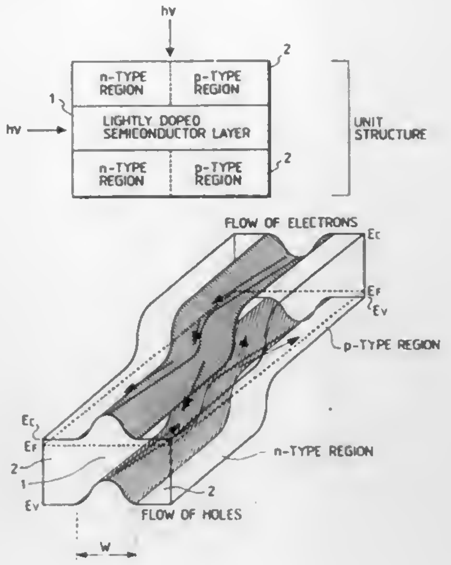
Claims priority, application Japan, Aug. 6, 1993, 5-196058

Int. Cl.^{6} H01L *29/04;31/075*

U.S. Cl. 257—458 **11 Claims**

1. A light receiving element comprises a plurality of unit structures each having two pn junction semiconductor layers; and a lightly doped semiconductor layer having a low impurity density, lower than those of p-type regions and n-type regions of the two pn junction semiconductor layers, and which is sandwiched between the two pn junction semiconductor layers;

- wherein the p-type regions of the pn junction semiconductor layers are disposed opposite to each other on opposite sides of the lightly doped semiconductor layer, respectively, and the n-type regions of the pn junction semiconductor layers are disposed opposite to each other on opposite sides of the lightly doped semiconductor layer, respectively;
- wherein the unit structures are formed so that the pn junctions thereof are perpendicular to the surface of a substrate; and
- wherein said plurality of unit structures are arranged regularly in the horizontal direction on the substrate, pn junctions whose impurity density is higher than that of the unit structure are formed between the unit structures, and said pn junctions are connected to the p-type regions and the n-type regions, respectively.



5,747,865
VARACTOR DIODE CONTROLLABLE BY SURFACE LAYOUT DESIGN

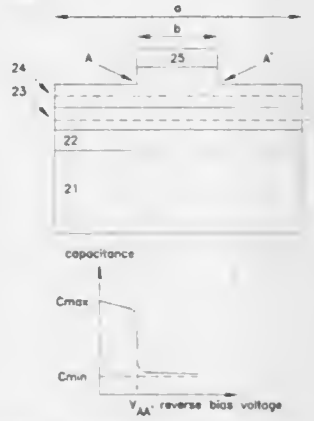
Dong-Wook Kim; Jeong-Hwan Son; Song-Cheol Hong, and Yeong-Se Kwon, all of Daejeon-shi, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Daijeon-Shi, Rep. of Korea

Continuation of Ser. No. 507,772, Jul. 26, 1995, abandoned. This application Feb. 18, 1997, Ser. No. 802,012

Claims priority, application Rep. of Korea, Jul. 26, 1994, 1994-18057

Int. Cl.^{6} H01L *29/93*

U.S. Cl. 257—480 **11 Claims**



1. An area-variable varactor diode, comprising:

- a semiconductor substrate;
- a doped semiconductor region on said substrate forming a diode with another region, said semiconductor region having a stepped profile so as to cause a stepped variation in depletion region area under conditions of changing voltage when a depletion region surface passes a step in said stepped profile.

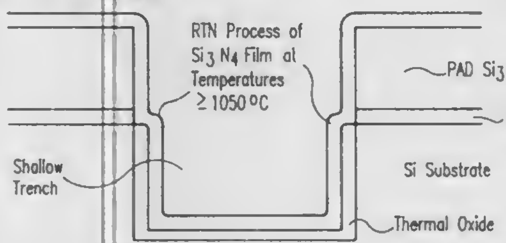
5,747,866
APPLICATION OF THIN CRYSTALLINE SI_3N_4 LINERS IN SHALLOW TRENCH ISOLATION (STI) STRUCTURES

Herbert Ho, Washingtonville; Erwin Hammerl, Stromville; David M. Dobuzinsky, Hopewell Junction; Herbert Palm, Wappingers Falls, all of N.Y.; Stephen Fugardi, New Milford, Conn.; Atul Ajmera, Wappinger, N.Y.; James F. Moseman, Dover Plains, N.Y., and Samuel C. Ramac, Wappingers Falls, N.Y., assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 531,844, Sep. 21, 1995. This application Jan. 21, 1997, Ser. No. 785,322

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—506 **13 Claims**



1. An improved shallow trench isolation (STI) structure for submicron integrated circuit devices comprising:

- a shallow trench of 0.5 μm or less etched in a silicon substrate; and
- a thin crystalline Si_3N_4 liner 5 to 10 nm thick in said shallow trench.

5,747,867
INTEGRATED CIRCUIT STRUCTURE WITH INTERCONNECT FORMED ALONG WALLS OF SILICON ISLAND

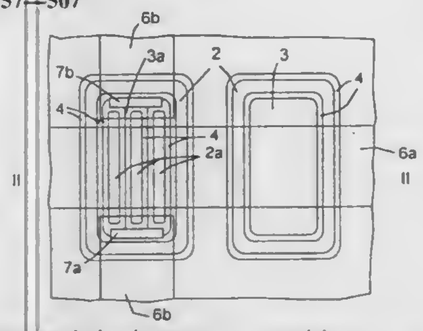
Klaus-Guenter Oppermann, Holzkirchen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 15, 1995, Ser. No. 573,359

Claims priority, application Germany, Jan. 9, 1995, 19500392.6

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—507 **11 Claims**



1. An integrated circuit structure, comprising:

- an SOI substrate that encompasses a silicon wafer, an insulating layer arranged on the SOI substrate and a monocrystalline silicon layer arranged on the insulating layer;
- insulating trenches that respectively extend from a surface of the monocrystalline silicon layer down onto the insulating layer and that define silicon islands in the monocrystalline silicon layer, said silicon islands being respectively completely surrounded by respective insulating trenches and being thereby insulated from one another; and
- at least one interconnect segment formed in one of the silicon islands by a diffusion zone arranged along surrounding trench walls of the insulating trench associated with said one of the silicon islands.

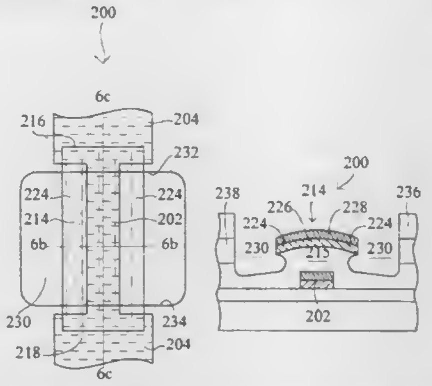
5,747,868
LASER FUSIBLE LINK STRUCTURE FOR SEMICONDUCTOR DEVICES

Chitranjan N. Reddy, Los Altos Hills, and Ajit K. Medhekar, San Jose, both of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.

Filed Jun. 26, 1995, Ser. No. 494,890

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—529 **5 Claims**



1. In a semiconductor device employing at least one fuse window defined by a window perimeter, the fuse window being situated over at least one laser fusible link that is openable by a laser having a minimum spot size, an over-etch protected laser fusible link structure, comprising:

- a plurality of laser fusible links, each said fusible link having a link length extending along a length direction and a link width extending along a width direction;
- a first dielectric layer conformally covering said laser fusible links;
- for each laser fusible link, an etch mask member disposed on said first dielectric layer vertically aligned over its respective laser fusible link, each said etch mask member having a mask length extending in the length direction and a mask width extending in the width direction, the mask width being greater than or equal to the link width of its respective fusible link and less than or equal to the minimum spot size of the laser; and
- the etch mask members extend beyond the window perimeter in the length direction, the window perimeter extending beyond the etch mask members in the width direction.

5,747,869
REDUCED PITCH LASER REDUNDANCY FUSE BANK STRUCTURE

Kirk Prall; Tod S. Stone, and Paul S. Zagar, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

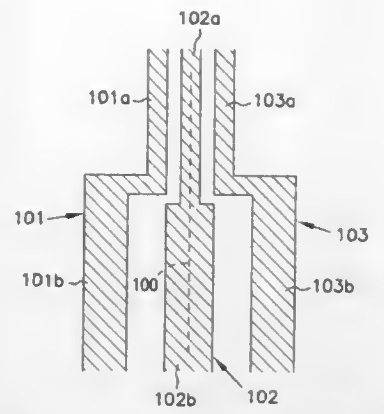
Division of Ser. No. 577,468, Dec. 22, 1995, Pat. No. 5,636,172. This application Apr. 1, 1997, Ser. No. 831,389

Int. Cl.^{6} H01L *27/10;29/00*

U.S. Cl. 257—529 **11 Claims**

1. An integrated circuit laser fuse system comprising:

- a plurality of laser fuse banks, each laser fuse bank comprising:
  - a center fuse having a narrow end, a wide end, and a common centerline;
  - a first outer fuse having a narrow end and a wide end, located adjacent to the center fuse such that the narrow end of the first outer fuse is adjacent to the narrow end of the center fuse and the wide end of the first outer fuse is adjacent to the wide end of the center fuse, the wide end of the first outer fuse is laterally offset from the narrow end of the first outer fuse; and
  - a second outer fuse having a narrow end and a wide end, located adjacent to the center fuse and on the side of the center fuse opposite the first outer fuse such that the narrow end of the second outer fuse is adjacent to the narrow end of the center fuse and the wide end of the second outer fuse is adjacent to the wide end of the center fuse, and the wide



end of the second outer fuse is laterally offset from the narrow end of the second outer fuse.

5,747,870
MULTI-CHIP MODULE INDUCTOR STRUCTURE

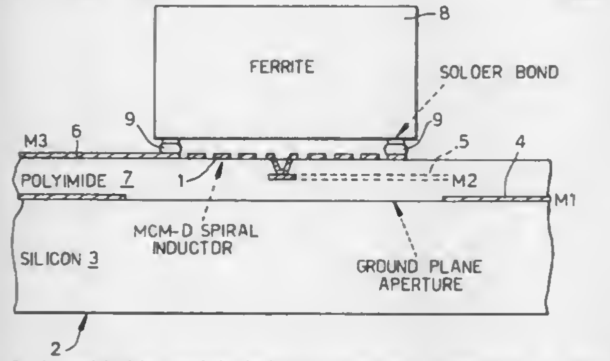
David John Pedder, Warwickshire, Great Britain, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Jun. 8, 1995, Ser. No. 483,462

Claims priority, application United Kingdom, Jun. 30, 1994, 9413145

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—531 **1 Claim**



1. A multi-chip module inductor structure, comprising: a substantially planar substrate of electrically insulating material; a multilayer metallization/insulation structure formed on said substrate and comprising at least a lower metallization layer, a layer of electrically insulating material formed over said lower metallization layer, and an upper metallization layer formed over said layer of electrically insulating material; an inductor defined in at least said upper metallization layer; a substantially planar chip of ferrite material having upper and lower major surfaces; a plurality of solder bond pads defined in said upper metallization layer and a like plurality of solder bond pads formed on said lower major surface of said chip of ferrite material; and means, including a like plurality of solder bump connections, for attaching said chip of ferrite material over said planar inductor and in spaced relationship therewith.

5,747,871
BIPOLAR TRANSISTOR HAVING A SELF-ALIGNED BASE ELECTRODE AND METHOD FOR MANUFACTURING THE SAME

Kyu-Hong Lee; Jin-Hyo Lee, and Jong-Sun Lyu, all of Yusong-ku, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

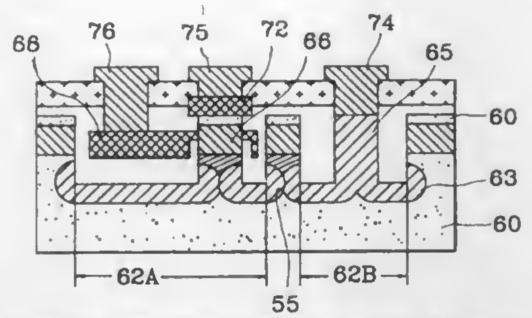
Filed Aug. 13, 1996, Ser. No. 696,256

Claims priority, application Rep. of Korea, Dec. 15, 1995, 1995-50517

Int. Cl.^{6} H01L *27/082;27/102;29/70;31/11*

U.S. Cl. 257—586 **6 Claims**

1. A bipolar transistor, comprising:



a conductive semiconductor substrate having first and second pillars formed in first and second trenches each having a predetermined depth for defining an activated region and a collector region;

a conductive impurities diffusing layer formed in the semiconductor substrate at a lower portion of the first and second trenches and at an isolation wall between the first and second trenches;

a conductive base layer formed from the first pillar;

a self-aligned base contact electrode insulated from the conductive impurities diffusing layer, connected to the conductive base layer through a base connecting portion and formed within the first trench wherein the connecting base portion is formed between the self-aligned based contact electrode and the conductive base layer is positioned at a sidewall of the first pillar, and is positioned to contact only a part of a sidewall of the self-aligned base contact electrode within the first trench;

a conductive emitter layer formed on the base layer; and

a collector contact electrode having a conductive type the same as the conductive impurities diffusing layer and formed by the second pillar of the second trench.

5,747,872
FAST POWER DIODE

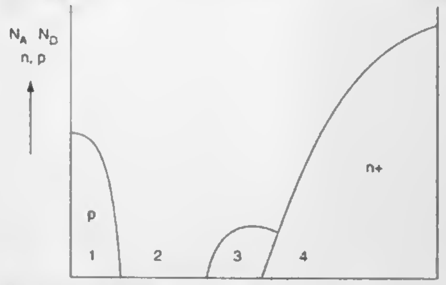
Josef Lutz, Nurenberg; Marianne Kinne, Altdorf, and Heinz-Juergen Mueller, Nurenberg, all of Germany, assignors to Semikron Elektronic GmbH, Nurenberg, Germany

Filed Jun. 20, 1995, Ser. No. 492,731

Claims priority, application Germany, Jun. 20, 1994, 44 21 529.0

Int. Cl.^{6} H01L *29/167;29/207;29/227;31/0288*

U.S. Cl. 257—611 **16 Claims**



11. A fast power diode, comprising:

a highly doped p^+ layer;

a weakly doped n^- layer;

a highly doped n^+ layer;

said weakly doped n^- layer being between said highly doped p^+ layer and said highly doped n^+ layer;

a recombination center within said weakly doped n^- layer and adjacent to said highly doped n^+ layer; and

said recombination center being treated by heavy metal diffusion and irradiation.

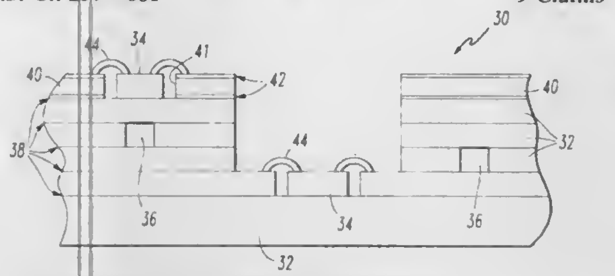
5,747,873
TECHNIQUE FOR FABRICATING HYBRID HIGH-TEMPERATURE SUPERCONDUCTOR-SEMICONDUCTOR CIRCUITS

Salvador H. Talisa, Edgewood; Michael A. Janocko, Monroeville; Deborah P. Partlow, Export, all of Pa., and Andrew J. Piloto, Columbia, Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Sep. 27, 1996, Ser. No. 721,927

Int. Cl.^{6} H01L *39/00*

U.S. Cl. 257—661 **9 Claims**



1. An electronic device assembly, comprising:

at least one semiconductor component;

at least one superconductor component which includes substrate material and superconducting material provided on the substrate material;

a low temperature cofireable ceramic material having at least one metalization layer contained within the body of said low temperature cofireable ceramic material; and

wherein the low temperature cofireable ceramic material serves as both a substrate carrier for the superconductor substrate material as well as a mounting material for the at least one semiconductor component.

5,747,874
SEMICONDUCTOR DEVICE, BASE MEMBER FOR SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE UNIT

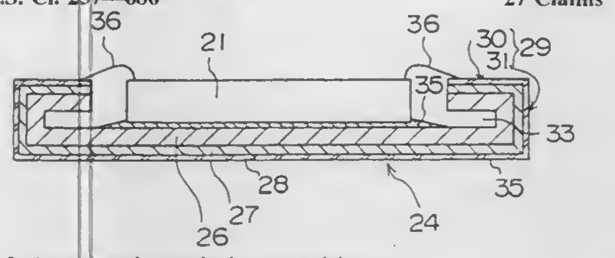
Masaaki Seki; Michio Sono; Ichiro Yamaguchi; Kazuhiko Mitobe; Lim Cheang Hai; Koki Otake; Susumu Abe; Junichi Kasai, all of Kawasaki; Masao Sakuma, Tochigi; Yoshimi Suzuki, Tochigi, and Yasuhiro Shinma, Tochigi, all of Japan, assignors to Fujitsu Limited, and Fujitsu Automation Limited, both of Kawasaki, Japan

Filed Sep. 18, 1995, Ser. No. 529,784

Claims priority, application Japan, Sep. 20, 1994, 6-225412; Sep. 20, 1994, 6-255413

Int. Cl.^{6} H01L *23/02*

U.S. Cl. 257—686 **27 Claims**



1. A semiconductor device comprising:

a semiconductor element;

a semiconductor device base member having an element mounting portion on which the semiconductor element is mounted;

external connection terminals provided on the semiconductor device base member and electrically connected to the semiconductor element; and

a resin sealing the semiconductor element,

the semiconductor device base member comprising a base part and lead parts supported by the base part, wherein the base part and lead parts are integrally formed,

the lead parts being electrically connected to the external connection terminals,

the semiconductor device base member having bent portions defined by bending the semiconductor device base member, wherein the lead parts are located on outer sides of the semiconductor device base member, the bent portions being located in edge portions of the semiconductor device base member.

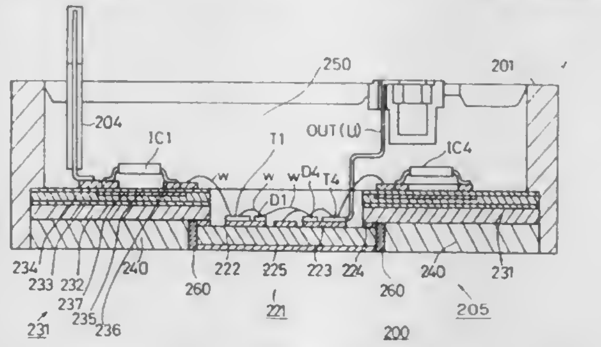
5,747,875
SEMICONDUCTOR POWER MODULE WITH HIGH SPEED OPERATION AND MINIATURIZATION

Seiichi Oshima, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 305,395, Sep. 13, 1994, abandoned. This application Jul. 2, 1996, Ser. No. 675,337

Int. Cl.^{6} H01L *23/043;23/10*

U.S. Cl. 257—687 **18 Claims**



1. A semiconductor power module comprising a box type housing storing a power switching semiconductor element repeating cutoff and connection of a current to be supplied to a load in response to a control signal,

a bottom portion of said housing comprising a power substrate being integrally provided with:

a power substrate body formed of a single layer and containing a heat-resistant insulating material;

a thermally and electrically conductive power interconnection pattern being bonded to an upper major surface of said power substrate body to be connected with said power switching semiconductor element;

a thermally conductive plate being formed of a single layer and directly bonded to a lower major surface of said power substrate body, said plate being formed of a material substantially identical to that of said power interconnection pattern; and

said plate being exposed on a lower surface of said housing;

wherein said heat-resistant insulating material is ceramic,

wherein said power interconnection pattern substantially consists of a copper material and is arranged on said upper major surface of said power substrate body in metallization bonding, and

wherein said plate substantially consists of a copper material and is arranged on said lower major surface of said power substrate body in metallization bonding;

wherein said bottom portion of said housing comprises a control substrate having:

a control substrate body substantially consisting of an insulator,

an electrically conductive control interconnection pattern being arranged on an upper major surface of said control substrate body and connected with a control circuit element for producing said control signal and supplying the same to said power switching semiconductor element, and

a plate type pressing member forming a multilayer structure with said control substrate body, said plate type pressing member having rigidity,

said control substrate being arranged around said power substrate and engaged with an edge portion of said power substrate.

VOL
2 10
SS
1
MY
5
998
MI

5,747,876

SEMICONDUCTOR DEVICE AND SEMICONDUCTOR MODULE

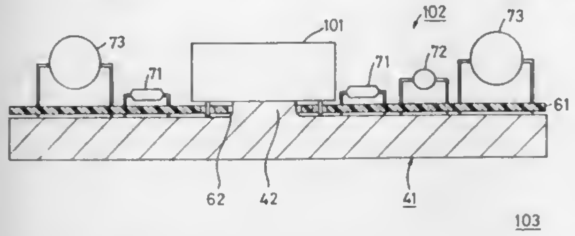
Gourab Majumdar; Satoshi Mori; Sukehisa Noda; Tooru Iwagami; Yoshio Takagi, and Hisashi Kawafuji, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1996, Ser. No. 680,614

Claims priority, application Japan, Nov. 30, 1995, 7-312559

Int. Cl.^{6} H01L *23/22;23/24*

U.S. Cl. 257—687 **20 Claims**



1. A semiconductor device, comprising:
a thermally conductive heat sink having an upper heat sink surface and an oppositely directed lower heat sink surface;
an insulating substrate having a lower substrate surface mounted on said upper heat sink surface and an oppositely directed upper substrate surface;
a patterned electrically conductive foil mounted on the upper substrate surface;
a power semiconductor element mounted on said patterned electrically conductive foil;
an electrically insulating case surrounding at least said insulating substrate, said patterned electrically conductive foil, and said power semiconductor element and having an opening in a bottom portion of the case, said heat sink fitted in and filling said opening with the lower heat sink surface being exposed to an atmosphere outside said case; and
at least one electrically conductive external terminal having one end electrically connected to said patterned electrically conductive foil surrounded by the case and a second end protruding from the case in a direction in which said lower heat sink surface faces.

5,747,877

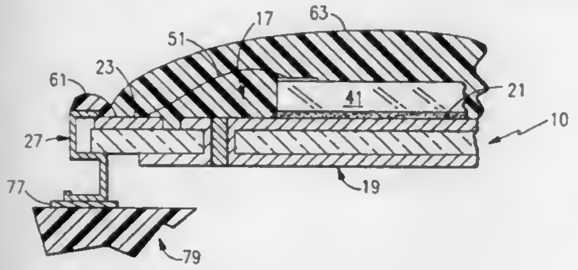
SEMICONDUCTOR CHIP PACKAGE WITH ENHANCED THERMAL CONDUCTIVITY

James Warren Wilson, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 336,437, Nov. 9, 1994, Pat. No. 5,561,322. This application Jun. 27, 1996, Ser. No. 671,429

Int. Cl.^{6} H01L *23/06*

U.S. Cl. 257—703 **14 Claims**



1. A semiconductor chip package comprising:
a substrate including first and second opposing surfaces and at least one hole extending through said substrate to interconnect said first and second opposing surfaces;
a first thermally and electrically conductive layer located on said first surface of said substrate;
a second thermally and electrically conductive layer located on said second surface of said substrate;
a semiconductor chip located on said first thermally and electrically conductive layer in a thermally coupled manner;
a layer of circuitry located on said first surface of said substrate at a predetermined distance from said first thermally and electrically conductive layer and electrically isolated from said first thermally and electrically conductive layer, said semiconductor chip being electrically coupled to said layer of circuitry located on said first surface;
at least one thermally and electrically conductive member located within said hole of said substrate for thermally and electrically coupling said first and second thermally and electrically conductive layers such that heat generated by said semiconductor chip will pass from said first thermally conductive layer to said second thermally conductive layer through said thermally and electrically conductive member; and
means for electrically coupling said layer of circuitry on said first surface of said substrate to circuitry on an external circuitized substrate.

5,747,878

OHMIC ELECTRODE, ITS FABRICATION METHOD AND SEMICONDUCTOR DEVICE

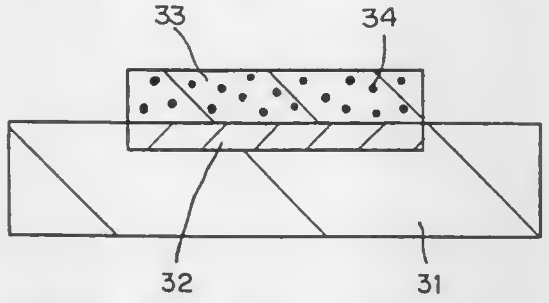
Masanori Murakami; Takeo Oku, both of Kyoto, and Akira Otsuki, Shiga, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 282,488, Aug. 1, 1994, abandoned. This application Mar. 24, 1997, Ser. No. 822,060

Claims priority, application Japan, Aug. 11, 1993, 5-237122

Int. Cl.^{6} H01L *23/48;23/52*

U.S. Cl. 257—745 **19 Claims**



1. An ohmic electrode, comprising:
a regrown III-V compound semiconductor layer regrown from a III-V compound semiconductor body;
said regrown III-V compound semiconductor layer having a higher impurity concentration than said III-V compound semiconductor body, and
a NiGe film arranged on said regrown III-V compound semiconductor layer and including particles of a precipitate which are a compound of at least one element selected from a group consisting of Au, Pt, Pd and Ag and a group III element constituting said III-V compound semiconductor body, said precipitate having a melting point of 400° C. or higher.

5,747,879

INTERFACE BETWEEN TITANIUM AND ALUMINUM-ALLOY IN METAL STACK FOR INTEGRATED CIRCUIT

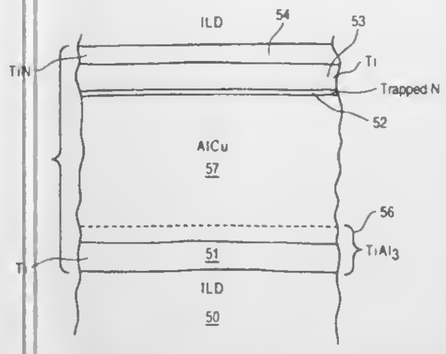
Rajiv Rastogi, Portland, Oreg.; Sandra J. Underwood, Albuquerque, N. Mex., and Harry H. Fujimoto, Sunnyvale, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 536,238, Sep. 29, 1995, abandoned. This application Jun. 28, 1996, Ser. No. 672,413

Int. Cl.^{6} H01L *23/48;29/40;23/52;29/12*

U.S. Cl. 257—751 **9 Claims**

1. A metal stack for use as an interconnecting structure in an integrated circuit comprising:
a base layer of titanium;
a bulk conductor layer in contact with the base layer; and,
a capping layer of titanium in contact with the bulk conductor layer, this region of the capping layer adjacent to the bulk conductor layer including an entrapped layer of nitrogen-disposed between the bulk conductor layer and the capping layer of titanium, the entrapped layer of nitrogen formed without the formation of titanium nitride between the bulk conductor layer and the capping layer of titanium.



5,747,880

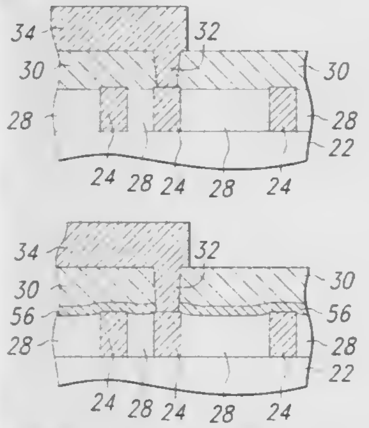
INTERCONNECT STRUCTURE WITH AN INTEGRATED LOW DENSITY DIELECTRIC

Robert H. Havemann, Garland; Shin-Puu Jeng, Plano; Bruce E. Gnade, Rowlett, and Chih-Chen Cho, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 473,840, Jun. 7, 1995, abandoned, which is a division of Ser. No. 246,432, May 20, 1994, Pat. No. 5,488,015. This application Nov. 18, 1996, Ser. No. 751,901

Int. Cl.^{6} H01L *21/47;21/471;23/532*

U.S. Cl. 257—759 **12 Claims**



1. A semiconductor device which comprises:
(a) first and second horizontally adjacent conductors formed on a substrate;
(b) a porous dielectric between said first and second conductors, said porous dielectric having an average height of 75% to 150% the height of said conductors, said porous dielectric having a porosity in the range of 30% to 95% and an average pore diameter of less than 80 nm; and
(c) a non-porous dielectric layer deposited over said first and second conductors and said porous dielectric, said non-porous layer having a height at least 50% the height of said conductors as measured over said conductors, whereby the capacitive coupling between conductors on the same level is substantially reduced compared to a solid silicon dioxide dielectric and the mechanical properties of a solid interlayer dielectric are substantially preserved.

5,747,881

SEMICONDUCTOR DEVICE, METHOD OF FABRICATING THE SAME AND COPPER LEADS

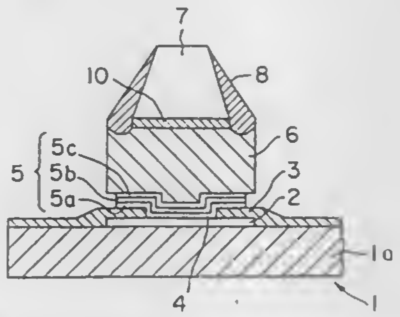
Eiichi Hosomi, Kawasaki; Hiroshi Tazawa, Ichikawa; Chiaki Takubo, Tokyo-to, and Koji Shibasaki, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Jan. 30, 1996, Ser. No. 593,622

Claims priority, application Japan, Feb. 1, 1995, 7-035959; Dec. 12, 1995, 7-346405

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—762 **28 Claims**



1. A semiconductor device comprising:
a semiconductor chip;
an Au bump formed on the semiconductor chip; and
a Cu lead bonded to the Au bump through a bonding part,
wherein said Cu lead has a Cu core and a plated Sn layer formed on the CU core, and said bonding part is formed by bonding the Cu lead to the Au bump, and is formed of an Au-CU-Sn alloy of a ternary system, and wherein the Au—Cu—Sn alloy of the ternary system has an Au-rich single-phase structure including 15 atomic % Sn or less and 25 atomic % Cu or less.

5,747,882

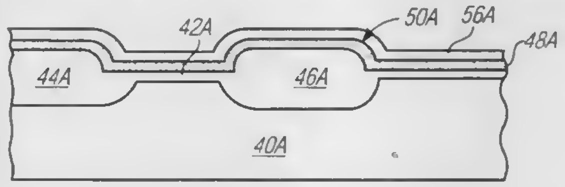
DEVICE INCLUDING MEANS FOR PREVENTING TUNGSTEN SILICIDE LIFTING, AND METHOD OF FABRICATION THEREOF

Hsingya Arthur Wang, Saratoga; Mark T. Ramsbey, Sunnyvale, and Yu Sun, Saratoga, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 7, 1996, Ser. No. 744,962

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—768 **4 Claims**



1. A semiconductor device comprising:
a semiconductor body;
an oxide layer on the semiconductor body;
a nitrogen doped silicon-based layer on the oxide layer; and
a silicide layer over and in contact with the doped silicon-based layer;
wherein only a portion of the silicon-based layer is doped adjacent the surface thereof near the silicide layer.

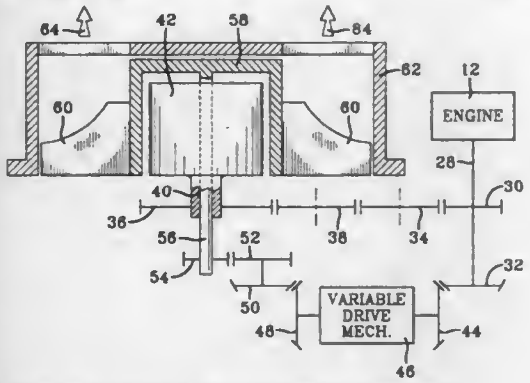
5,747,883
FAN AND GENERATOR VARIABLE SPEED DRIVE MECHANISM

Michael Frederick Hammer, Carmel, and Robert Franklin Combs, Mulberry, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 23, 1996, Ser. No. 652,738

Int. Cl.^{6} H02P *9/04*

U.S. Cl. 290—1 B **3 Claims**



1. A fan and generator drive assembly comprising:

a prime mover having a power output shaft;

a generator having an input shaft;

a fan having a central cavity housing said generator and an input member coaxial with the generator input shaft;

a planetary gear mechanism comprised of a first planetary member drivingly connected with the generator input shaft, a second planetary member drivingly connected with said fan input member, and a third planetary member drivingly connected with a second input shaft disposed coaxially with the generator input shaft;

means including said planetary gear mechanism for rotating the generator at a first speed relative to the power output shaft; and

variable speed means for rotating said second input shaft at a variable speed relative to the generator input shaft.

5,747,884
ARRANGEMENT FOR OPERATING AN ADJUSTMENT DRIVE

Klaus Voehringer, Malsch, and Klaus Spinner, Buehl, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

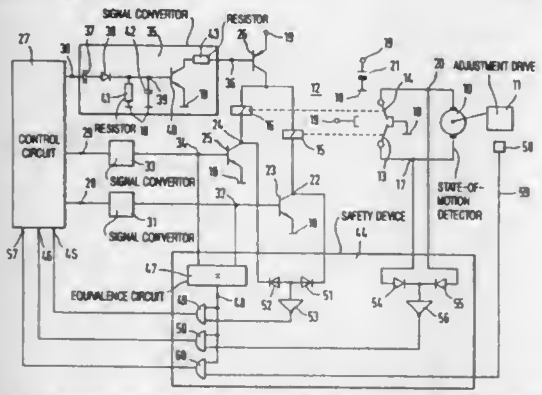
PCT No. PCT/DE96/00334, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO96/31812, PCT Pub. Date Oct. 10, 1996

PCT Filed Feb. 29, 1996, Ser. No. 716,180

Claims priority, application Germany, Apr. 7, 1995, 195 13 157.6

Int. Cl.^{6} H02P *1/00*

U.S. Cl. 307—10.1 **17 Claims**



1. An arrangement for operating an adjustment drive which has a relay-controlled change-over facility for the right-handed rotation/left-handed rotation of a positioning motor, comprising a first semiconductor switch to supply current to a first relay winding and a second semiconductor switch to supply current to a second relay winding, and wherein at least one third semiconductor switch is present which is connected in series with the first relay winding and in series with the second relay winding and which blocks or enables the current flow through the relay windings by being turned on or off; and, a control circuit for turning on the at least one third semiconductor switch and enabling the current flow through the relay windings only if the first or the second semiconductor switch is turned on.

5,747,885
CENTRAL LOCKING SYSTEM FOR MOTOR VEHICLES

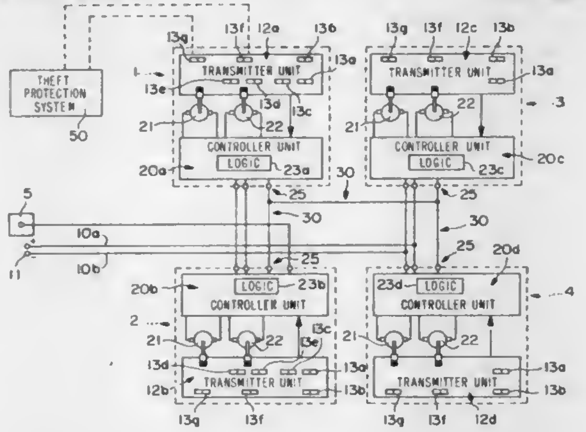
Ulrich Dochtermann, Lauffen; Peter Fein, Wildberg; Robert Klinar, Bietigheim-Bissingen, and Werner Philipps, Ludwigsburg, all of Germany, assignors to ITT Automotive Europe GmbH, Frankfurt am Main, Germany

Continuation of Ser. No. 351,326, Dec. 12, 1994, abandoned. This application Jun. 19, 1995, Ser. No. 492,341

Claims priority, application Germany, Jun. 12, 1992, 42 19 212.9

Int. Cl.^{6} G05D *3/00*

U.S. Cl. 307—10.2 **28 Claims**



1. Central locking system for motor vehicles, with a plurality of actuators, each of which has a signal transmitter unit, which sends data signals to a control unit as a function of current condition parameters of at least one of a monitored opening and an operating element of a motor element, or as a function of externally input command signals, the control unit generates control signals from said data signals which bring about the locking and unlocking of the openings of the motor vehicle, characterized in that each and every actuator of the central locking system has a separate control unit, to which the data signals of the signal transmitter unit of its actuator as well as selected data signals of the signal transmitter units of the other actuators of the central locking system are sent.

5,747,886
PNEUMATIC ANTITHEFT APPARATUS WITH ALARM

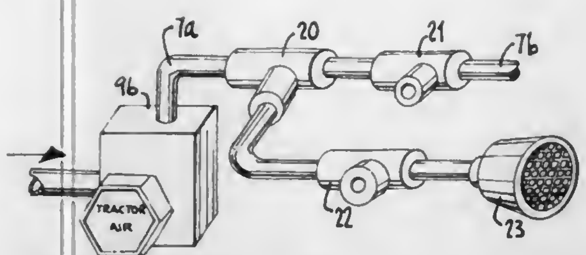
William Parr, 51 Trinity St., Newton, N.J. 07860, and Harry L. Davis, Box 361, Hamburg, N.J. 07419

Continuation-in-part of Ser. No. 389,708, Feb. 2, 1995, abandoned. This application Feb. 14, 1997, Ser. No. 800,756

Int. Cl.^{6} B60T *17/16*

U.S. Cl. 307—10.2 **15 Claims**

1. An antitheft device for a vehicle's pneumatic system having a fluid conduit leading from a source of pneumatic pressure to a brake release mechanism, the source providing pneumatic pressure to the brake release mechanism to permit operation of the vehicle, the antitheft device comprising:



at least one key-operated manually controllable valve means disposed along the fluid conduit, the valve means having at least two positions including a first position at which the fluid conduit is open through the valve from the source to the brake release mechanism for permitting operation of the vehicle with the valve means in the first position, and a second position at which the fluid conduit is closed from the source to the brake release mechanism for disabling operation of the brake release mechanism with the valve means in the second position, said valve means further comprising a branch to which the source is coupled by the valve means in said second position;

a pneumatic alarm coupled to the branch;

a switch operatively connected to the pneumatic system and having an activated position for releasing the pneumatic pressure from the source and a deactivated position for preventing flow from the source, the switch being held in the activated position so long as a predetermined threshold pressure is available from the source and remaining deactivated when the pressure from the source is below the threshold pressure;

a vent coupled to the branch and in pneumatic communication therewith, the vent sized to depressurize the system below the threshold pressure within a predetermined time interval;

the pneumatic alarm sounding and the vent depressurizing the pneumatic system below the threshold pressure in response to attempted operation of the vehicle with the valve means in the second position, whereby the brake release mechanism is disabled and the switch assumes the deactivated position.

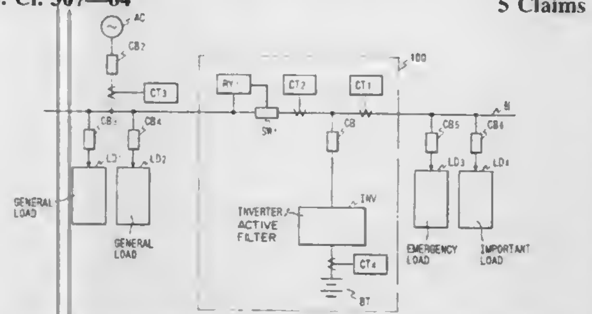
5,747,887
MULTI-FUNCTION ELECTRIC POWER CONVERSION SYSTEM

Toshiyuki Takanaga; Yasuo Taguchi, both of Tokyo; Seiji Sadayoshi, Kanagawa; Mikio Kato, Kanagawa, and Kazuo Kuroki, Kanagawa, all of Japan, assignors to Kundenko Co., Ltd., Tokyo, and Fuji Electric Co., Ltd., Kanagawa, both of Japan

Filed Mar. 17, 1993, Ser. No. 32,244

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 307—64 **5 Claims**



1. A multi-function electric power conversion system which is interconnected to an electric power system having an important load to which electric power must be continuously supplied without interruption, and which is connected through an AC semiconductor switch to a commercial power source provided for said electric power system, said electric power conversion system comprising:

a power conversion unit, connected to said electric power system, which can be placed selectively in a forward conversion operation mode and in a reverse conversion operation mode;

a DC energy storing unit connected to the DC side of said power conversion unit; and

abnormal condition detecting means for detecting abnormal conditions of said commercial power source including a supply of power to meet a demand in excess of a predetermined value, and a loss of power or a drop in voltage from said commercial power source.

wherein when said commercial power source is operating normally, said powerconversion unit is placed in the forward conversion operation mode to operate as an active filter for the electric power system, to charge said DC energy storing unit when at least some discharge thereof has occurred, when excess demand is placed on said commercial power source, said power conversion unit terminates the charging operation and is placed in the reverse conversion operation mode to convert power from the DC energy storing unit for application to the electric power system thereby meeting excess demand and cutting the peak in the power demand on said commercial power source, and

when said abnormal condition detecting means detects a loss of power or severe drop in voltage from said commercial power source, said AC semiconductor switch is turned off, so that said power conversion unit is placed in a reverse conversion operation mode to operate as an uninterruptable power system, whereby electric power is supplied to said important load without interruption.

5,747,888
BACK UP SYSTEM FOR THE SUPPLY OF VOLTAGE IN TELEVISION CABLE SYSTEMS

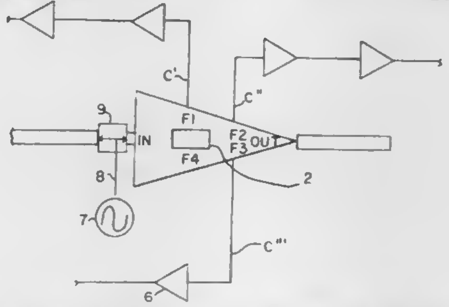
David Zilberberg, 11a Pataistreet, Tel-Aviv 69973, Israel

Continuation of Ser. No. 543,942, Oct. 17, 1995, abandoned. This application Jul. 23, 1997, Ser. No. 898,969

Claims priority, application Israel, Oct. 18, 1995, 111321

Int. Cl.^{6} H04H *7/00*

U.S. Cl. 307—66 **21 Claims**



1. In a one way back-up system for the supply of electric voltage to main trunk and secondary line extender amplifiers within a television cable system in the case of electricity faults, wherein each main trunk comprises switching means, said switching means switching between two AC voltage sources, one of said AC sources being the local power supply source and the other of said AC sources being the second back-up power supply source positioned from said local power supply source and located near a neighboring trunk amplifier, with said switching means being actuated when an electricity fault occurs in the local power supply source of electricity to said trunk amplifier thereby switching said source of electricity to said trunk amplifier to the other of said AC sources located near a neighboring trunk amplifier having an electrical supply.

5,747,889
REDUNDANT POWER SUPPLY AND STORAGE SYSTEM

Michael B. Raynham, Los Gatos, and Myron R. Tuttle, Santa Clara, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1996, Ser. No. 688,912

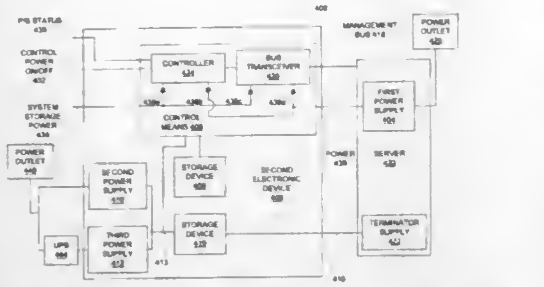
Int. Cl.^{6} H02J *3/06*

U.S. Cl. 307—80 **13 Claims**

1. A redundant power supply interconnect system comprising:

a first electronic device including a first power supply;

OL
210
SS
1
MY
5
998
MI



- a second electronic device including a first control means, a second power supply and a third power supply, wherein the second power supply means and the third power supply means are connected to the first control means and provide redundant power supply to the second electronic device and the control means thereof; and
- a first management bus, the first management bus electrically coupling the first electronic device to the control means of the second electronic device,

wherein the first power supply of the first electronic device is electrically coupled to the control means of the second electronic device via a power bus to provide an additional redundant power supply for the second electronic device.

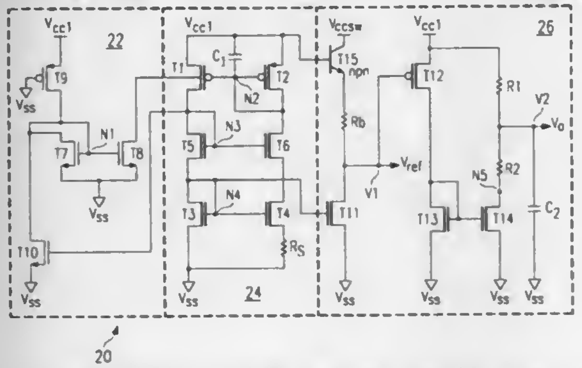
5,747,890

POWER SUPPLY SWITCH REFERENCE CIRCUITRY

Rong Yin, Coppell, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 5, 1995, Ser. No. 464,082
Int. Cl.^{6} H02J *1/00*

U.S. Cl. 307—87 **19 Claims**



1. A power supply switching circuit for switching power supplies to a load, the power supply switching circuit comprising:

- a switching circuit connected to two power supplies supplying two voltages, a primary power supply and a secondary power supply, the primary power supply providing a first voltage and the secondary power supply providing a second voltage, the first voltage being a variable voltage wherein the switching circuit is controlled by a control signal, the control signal causing one of the two power supplies to be connected to the load, wherein one of the two voltages is connected to the load;
- a reference circuit including:
  - means for generating a first reference voltage utilizing the first voltage and a switched voltage, the switched voltage being switched between the first voltage and the second voltage, wherein the first voltage reference has a first slope; and
  - means for generating a second reference voltage utilizing the first voltage, wherein the second reference voltage has a second slope that is selected to provide a crossing point with the first reference voltage,

wherein the switching circuit switches between the two power supplies in response to an occurrence of a crossing point between the first reference voltage and the second reference voltage.

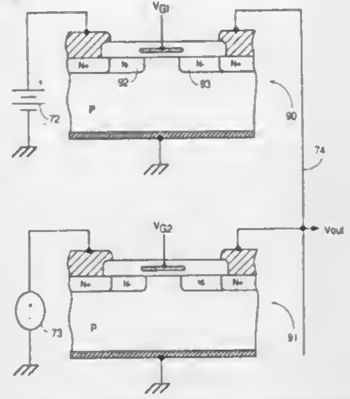
5,747,891

METHOD OF BLOCKING BIDIRECTIONAL FLOW OF CURRENT

Richard K. Williams, Cupertino, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.

Continuation of Ser. No. 159,900, Nov. 30, 1993, Pat. No. 5,536,977. This application Apr. 23, 1996, Ser. No. 636,367
Int. Cl.^{6} H01L *29/76*

U.S. Cl. 307—87 **15 Claims**



1. A method of blocking a flow of current between a first terminal and a second terminal, respective voltages at the first and second terminals varying such that during a first time interval a first voltage at the first terminal is greater than a first voltage at the second terminal and during a second time interval a second voltage at the second terminal is greater than a second voltage at the first terminal, the method comprising the steps of:

- providing a MOSFET, the MOSFET comprising a first region of a first conductivity type separated from a second region of the first conductivity type by a body region of a second conductivity type, the MOSFET further comprising a gate separated from a channel region of the body region by a dielectric layer, wherein neither the first region nor the second region is shorted by the body region;
- conducting said first terminal to said first region;
- connecting said second terminal to said second region;
- maintaining the body region at at least one potential such that neither a PN junction between the first region and the body region nor a PN junction between the second region and the body region is forward-biased so as to conduct a current as the voltages at the first and second terminals vary;
- biasing the gate so as to block a flow of current between the first and second regions in a first direction during the first time interval; and
- biasing the gate so as to block a flow of current between the first and second regions in a second direction during the second interval.

5,747,892

GALVANIC ISOLATOR FAULT MONITOR

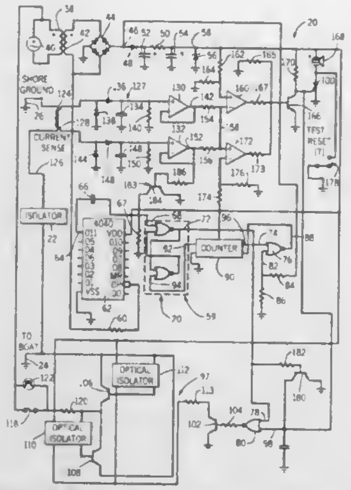
Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Lake Forest, Ill.

Filed Jan. 6, 1997, Ser. No. 779,930
Int. Cl.^{6} H01B *7/28*

U.S. Cl. 307—95 **23 Claims**

1. A monitor for a galvanic isolator that protects a submersible metal marine propulsion unit from corrosion, the monitor comprising:

- a test current supply circuit for supplying a test current to the galvanic isolator;
- a current sensing circuit for sensing the amount of test current passing through the galvanic isolator; and
- an alarm in communication with the current sensing circuit, the alarm providing a detectible output when the test current passing through the galvanic isolator is outside an acceptable range.



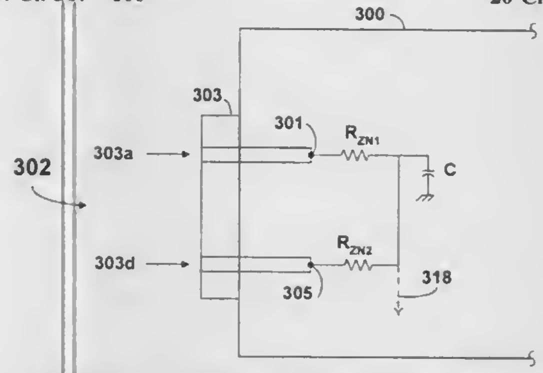
5,747,893

TERMINATION SCHEME FOR TWISTED-WIRE PAIRS

Arthur T. Bennett; Stephen L. Baum, both of Dallas County; Scott K. Rubenstein, Denton County, and Gary A. Randall, Tarrant County, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed May 10, 1996, Ser. No. 644,228
Int. Cl.^{6} H04B *3/30*

U.S. Cl. 307—100 **20 Claims**



1. A terminator for terminating a twisted-wire pair, comprising:

- a conductive junction that electrically shorts the wires of the twisted-wire pair together; and
- a resistor coupled between said conductive junction and ground.

5,747,894

FACTORY AUTOMATION CONNECTOR AND WORK PALLET

Junji Hirai; Yoshiji Hiraga, and Kenji Nomura, all of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Kitakyushu, Japan

PCT No. PCT/JP95/00392, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO95/24722, PCT Pub. Date Sep. 14, 1995

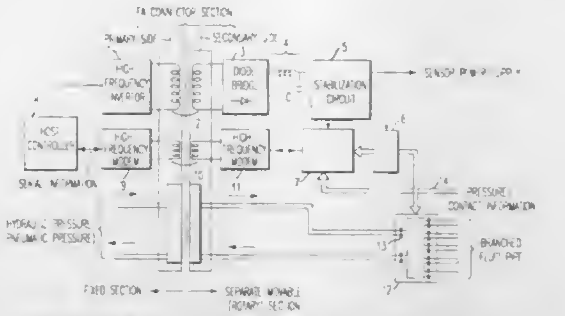
PCT Filed Mar. 9, 1995, Ser. No. 704,543

Claims priority, application Japan, Mar. 11, 1994, 6-067749
Int. Cl.^{6} B23Q *3/155*

U.S. Cl. 307—104 **3 Claims**

1. An FA connector for transmitting electric power, electric signals and fluid between a primary side and a secondary side, comprising:

- a primary side coupler including a fluid coupler for coupling two fluid pipes, an electromagnetic coupler including an electric signal transmitting section arranged on the inner side and an electric power feeding section arranged on the outer side



  coaxially with said electric signal transmitting section for transmitting electric signals and electric power, respectively, in a contactless way to a secondary side coupler by high frequency electromagnetic induction, and a high frequency invertor for generating electric power to be transmitted to the secondary side; and
- a secondary side coupler including a fluid coupler for coupling two fluid pipes, an electromagnetic coupler including an electric signal receiving section arranged on the inner side and an electric power receiving section arranged on the outer side coaxially with said electric signal receiving section for receiving electric signals and electric power in a contactless way from said primary side coupler, and a conversion section for converting the electric signals and the electric power transmitted from the primary side to the secondary side into electric signals and electric power for a load to be driven on the secondary side.

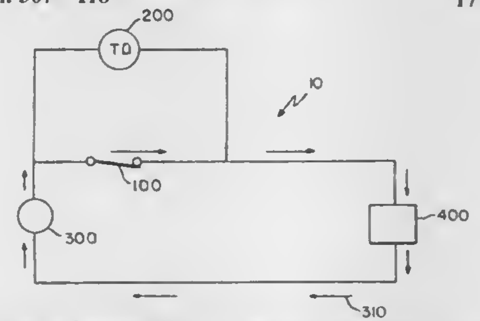
5,747,895

SYSTEM FOR TEMPORARILY PRESERVING SIGNAL-FLOW AROUND A SIGNAL SWITCH

Aram Minassian, Watertown, Mass., assignor to United Electric Controls Company, Watertown, Mass.

Filed Jun. 7, 1995, Ser. No. 476,639
Int. Cl.^{6} H01H *35/18*

U.S. Cl. 307—118 **17 Claims**



1. A system for temporarily preserving a signal-flow to a device, the system comprising:

- a power supply;
- a switch for normally connecting the device to said power supply, said switch opening and interrupting a connection between said power supply and the device upon an occurrence of a triggering condition; and
- a time-delay relay connected in parallel with said switch and configured to be energized for a set period of time to preserve signal-flow from the power supply to the device when the connection between said power supply and the device is interrupted when said switch disconnects the power supply from the device;
- the set period of time having a predetermined length whereby, when the switch disconnects the power supply from the device for at least an entire length of the set period of time, the time-delay relay will de-energize at an end of the set period of time thereby disconnecting the power supply from the device; and
- if the triggering condition ceases prior to the end of the set period of time, the switch will close and the time-delay relay

VOL
210
SS
1
MY
5
998
UMI

will de-energize thereby allowing signal flow from the power supply to the device without any interruption.

5,747,896

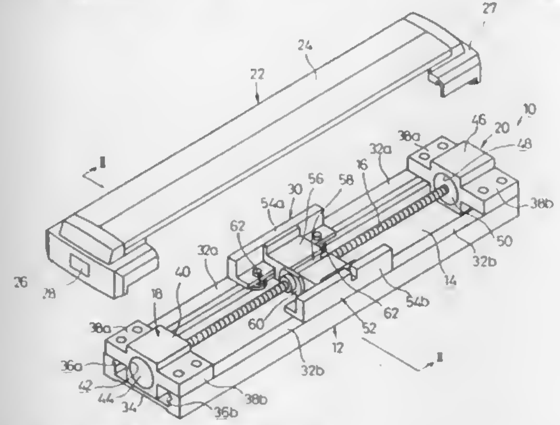
ELECTRIC ACTUATOR

Shigekazu Nagai, Ibaraki-ken, and Tadasu Kawamoto, Okayama, both of Japan, assignors to SMC Kabushiki Kaisha, Shimbashl, Japan

Filed Sep. 5, 1996, Ser. No. 711,687

Int. Cl.^{6} H02N *7/06;* **F16H** *27/02;1/18*

U.S. Cl. 310—20 **8 Claims**



1. An electric actuator comprising:

an elongate base;

a slide mechanism having a slide table slidably mounted on said elongate base for longitudinal displacement therealong;

rotational power means fixedly mounted on a longitudinal end of said elongate base, for displacing said slide table longitudinally along said elongate base;

detecting means fixedly mounted on an opposite longitudinal end of said elongate base, for detecting a rotational quantity of said rotational power means;

power transmitting means connected to said slide mechanism, said rotational power means, and said detecting means, for transmitting rotational power from said rotational power means to said slide table; and

guide means integrally mounted on said base, for guiding said slide table longitudinally along said elongate base.

5,747,897

STEPPING MOTOR HAVING IMPROVED CONSTRUCTION TO REDUCE PARTS AND FACILITATE MANUFACTURE

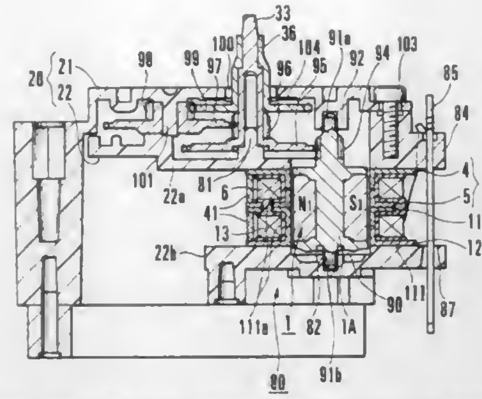
Toru Iwasa; Akio Ito, and Yoshiyuki Ariki, all of Saitama, Japan, assignors to Jeco Co., Ltd., Japan

Filed Dec. 18, 1996, Ser. No. 768,429

Claims priority, application Japan, Dec. 28, 1995, 7-343392

Int. Cl.^{6} H02K *37/00;15/00*

U.S. Cl. 310—49 R **9 Claims**



1. A stepping motor comprising:

a magnet rotor (**1**) on which magnetic poles of opposite polarities are alternately, equidistantly arranged in a circumferential direction;

four annular stators (**4**, **5**, **11**, **12**) having the same inner diameter and the same outer diameter and concentrically arranged at predetermined gaps in an axial direction of said magnet rotor, every adjacent two of said four annular stators being paired;

excitation coils (**6**, **13**) respectively wound on the pairs of said annular stators; and

a U-shaped yoke (**41**) arranged adjacent to outer circumferential surfaces of said annular stators,

wherein each of said annular stators constituting said respective pairs has an annular plate having the inner diameter and a central hole in which said magnet rotor is to be inserted, and pole teeth that form magnetic pole portions separated from said magnet rotor at a predetermined gap,

said pole teeth of one annular stator of a given pair extend from said annular plate to be perpendicular to the other annular stator of said given pair, and are equidistantly arranged around said central hole to be shifted from said pole teeth of the other annular stator by a half pitch,

an appropriate number of mounting holes are formed in each annular plate at predetermined spaces in the circumferential direction, and said mounting holes formed in said annular plates of said annular stators (**5**, **11**) of different pairs that are arranged back to back are located at the same positions,

wherein said four annular stators are assembled into a molded stator body (**80**) with a non-conductive molding material such that an insulating layer of the molding material is formed on the surfaces that do not oppose said magnet rotor of said annular stators constituting said respective pairs and onto which said excitation coils are wound,

said molding material is continuous through said mounting holes formed in said annular plates of said annular stators of said different pairs that are arranged back to back, and

said U-shaped yoke is fitted between opposing surfaces of said annular plates of said annular stators (**4**, **12**) that are at opposing ends of said molded stator body, and around approximately one-half of the circumference of said annular stators.

5,747,898

METHOD FOR DRIVING STEPPING MOTOR OF MULTIPHASE HYBRID TYPE

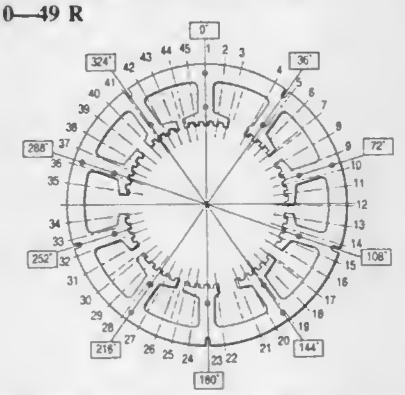
Noriyuki Yoshimura, and Kenji Yoshida, both of Nagano, Japan, assignors to Minebea Co., Ltd., Kitasaku-gun, Japan

Continuation of Ser. No. 313,131, Nov. 17, 1994, abandoned. This application Feb. 12, 1997, Ser. No. 798,787

Claims priority, application Japan, Feb. 1, 1993, 5-036056

Int. Cl.^{6} H02K *37/04*

U.S. Cl. 310—49 R **2 Claims**



1. A multi-phase hybrid type stepping motor comprising;

a rotor provided with at least one permanent magnet magnetized in a rotating direction of a rotary shaft,

two pole caps mounted to both ends of the permanent magnet respectively, each of the pole caps being made of a soft magnetic material and having a plurality (NR) of teeth

arranged at equal intervals on the circumferential surface thereof, the teeth of the two pole caps being displaced by ½ of a teeth pitch (½ Tp) from each other;

a plurality of stator segments of an asymmetrical form disposed around the rotor, each of the asymmetrical stator segments having ten fixed magnetic poles thereof extending inwardly and radially, each of the fixed magnetic poles having a winding wound thereon with no taps and being provided with two or more small teeth arranged at equal intervals of the same pitch as of the teeth of the rotor, the total number (NS) of the small teeth of the asymmetrical stator segment being determined by $NS=5x(n0+n1)$, where **n0** is the number of the small teeth on each of five of the ten fixed magnetic poles and **n1** is the number of the small teeth on each of the remaining five fixed magnetic poles and **n1** does not equal **n0**, the fixed magnetic poles with the **n1** small teeth being arranged alternately with the fixed magnetic poles with the **n0** small teeth, the **n1** small teeth pole and the **n0** small teeth pole being disposed opposite to each other about the axis of the rotary shaft, the relation between the total number (NR) of the teeth of the rotor and the total number (NR) of the small teeth of the stator segment being expressed by $NS \geqq 0.8NR$ (NS being greater than or equal to 0.8NR), a difference between NR and NS being calculated from $NR-NS=K(S0-S1)+10(S1-1+B)$ where K is an integer from 2 to 5, **S0** and **S1** are smallest possible integers or may be equal, and B is a fraction of 1 so that 10B (ten times B) is always an integer,

the ten stator windings on their respective fixed magnetic poles being coupled to one another in a circular order of **P1**, **P6**, **P5**, **P10**, **P9**, **P4**, **P3**, **P8**, **P7** and **P2**, five terminals disposed between **P1** and **P2**, **P5** and **P6**, **P9** and **P10**, **P3** and **P4**, and **P7** and **P8** respectively, and by polarization of the ten fixed magnetic poles at each step of the rotating movement, N and S poles of the same number being generated and one or more pairs of the adjacent fixed magnetic poles being turned to S.

5,747,899

Patent Not Issued For This Number

5,747,900

ELECTRIC MOTOR WITH AN AIR-COOLING SYSTEM

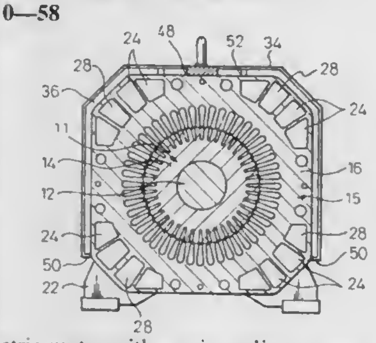
Kosei Nakamura; Yukio Katsuzawa, and Junichi Nagai, all of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Oct. 13, 1995, Ser. No. 542,901

Claims priority, application Japan, Nov. 4, 1994, 6-271206

Int. Cl.^{6} H02K *9/00;1/32*

U.S. Cl. 310—58 **5 Claims**



1. An electric motor with an air-cooling system, comprising:

a rotor;

a stator having a stator core encircling said rotor with a gap being defined therebetween;

a plurality of air passages formed directly in said stator core and extending generally axially along an outer periphery of the stator core;

a covering member fixed to said stator and at least partially covering an outer peripheral surface of said stator core so as to define a cavity at least partially encircling said stator core in fluidic communication with said air passages; and

a blower unit disposed at one end of the motor to allow for blowing ambient air, surrounding said motor, into said cavity, whereby the air flows from said cavity into said air passages to absorb heat generated in said stator and then is discharged from said air passages out of the motor.

5,747,901

ELECTRIC MOTOR AND METHOD OF MAKING THE SAME

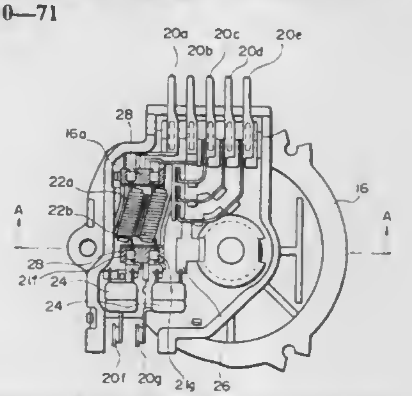
Yoshibiko Harada, Kosai; Masashi Nakata, Toyohashi; Akio Oshiro, and Seiichi Murakami, both of Hamamatsu, all of Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Filed Jun. 2, 1995, Ser. No. 459,428

Claims priority, application Japan, Oct. 12, 1994, 6-272862

Int. Cl.^{6} H02K *11/00;9/00;5/10*

U.S. Cl. 310—71 **4 Claims**



1. A reduction gear mechanism for an electric motor comprising:

a reduction gear housing and

a gear cover detachably mounted for covering said reduction gear housing, said gear cover having an outer receiver on a side of said gear cover opposite said reduction gear housing for receiving at least one electric part and at least one connection plate, said electric part preventing noise due to sparks, said connection plate having a connection portion connected to said electric part, said gear cover having at least one opening therethrough, said opening located adjacent to said connection portion for receiving a removable pressure member from outside said outer receiver, wherein said electric part is connected to said connection portion by said pressure member, said opening allowing air to communicate with said reduction gear housing.

5,747,902

ROTARY APPARATUS

Muneaki Takara, 19-20, Oroku 1-chome, Naha-shi, Okinawa 901-01, Japan

PCT No. PCT/JP92/01394, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/09589, PCT Pub. Date May 13, 1993

PCT Filed Oct. 28, 1992, Ser. No. 232,171

Claims priority, application Japan, Jun. 17, 1992, 4-183215

Int. Cl.^{6} H02K *7/02;7/10;11/00*

U.S. Cl. 310—75 D **8 Claims**

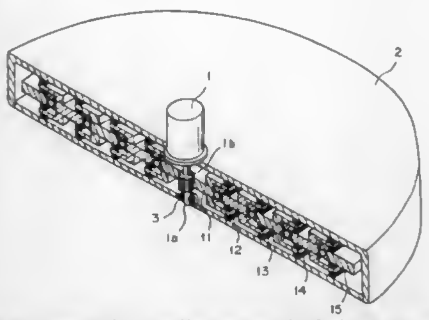
1. A rotary apparatus comprising:

a central rotor centrally arranged so as to be rotatable;

a plurality of ring-shaped rotors arranged concentrically with said central rotor in a relationship spaced apart from each other so as to be rotatable coaxially with said central rotor about its rotational axis; and

magnetic coupling means disposed between adjacent rotors of the plurality of ring-shaped rotors for magnetically coupling the adjacent rotors to each other with a repelling magnetic force,

OL
2 10
SS
1
MY
5
998
MI



- wherein the magnetic coupling means includes a group of magnetic poles disposed on each facing surfaces of the adjacent rotors,
- wherein the group of magnetic poles includes a plurality of magnetic poles disposed on the surface of each of the adjacent rotors spaced circumferentially from each other, each magnetic pole having the same polarity as that of the adjacent magnetic pole,
- wherein the group of the magnetic poles disposed on the facing surface of one of the adjacent rotors has the same polarity as the group of magnetic poles disposed on the opposite surface of the other adjacent rotor so as to create repelling magnetic forces between the adjacent groups of magnetic poles, and
- wherein the groups of magnetic poles disposed on the facing surfaces of the adjacent rotors are opposite in polarity to a subsequent group of magnetic poles disposed on the facing surfaces of one of the adjacent rotors.

5,747,903

MOTOR-GEAR DRIVE UNIT, PARTICULARLY FOR AN AUTOMOBILE WINDOW LIFTER DRIVE OR THE LIKE, IN WHICH A MOTOR-GEAR SHAFT IS MOUNTED

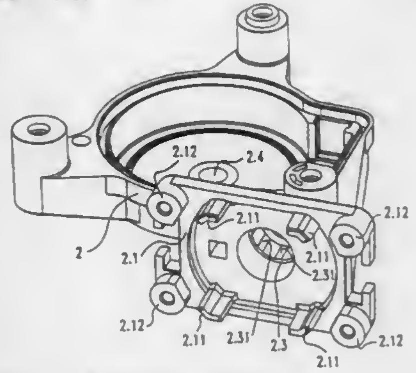
Peter Klingler, Neubrunn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 23, 1996, Ser. No. 701,956

Claims priority, application Germany, Aug. 25, 1995, 295 13 700 U

Int. Cl.^{6} H02K ***7/116;*** **E04F** ***15/10***

U.S. Cl. 310—75 R **18 Claims**



1. A motor-gear drive unit, comprising:
- a motor housing;
- a gear case adjoining said motor housing; and
- a motor-gear shaft projecting from an orifice of said motor housing into said gear case; wherein
- said motor-gear shaft is mounted in said motor housing in a first bearing;
- said motor-gear shaft is mounted in said gear case in a second bearing in the form of a cylindrical bearing;
- said gear case consists essentially of a plastic part having an axially loadable bearing orifice with circumferential, plastic radially projecting shaped webs for securing said cylindrical bearing; and
- said cylindrical bearing is pressed into the bearing orifice axially in bearing contact with a press fit relative to said shaped webs.

5,747,904

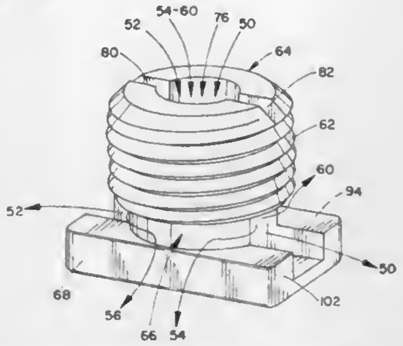
LOW PROFILE MOISTURE DRAIN PLUG WITH DIVERSE DRAIN PATHS FOR AN ELECTRIC MOTOR

Douglas H. Sudhoff, and Donald Howard Williams, both of Madison, Ind., assignors to Reliance Electric Industrial Company, Cleveland, Ohio

Filed Oct. 18, 1996, Ser. No. 731,337

Int. Cl.^{6} H02K ***5/10***

U.S. Cl. 310—88 **8 Claims**



1. A moisture drain plug adapted to be inserted into a moisture drain hole defined in a housing wall of an electric motor, the moisture drain plug comprising:
- a body member defining an inner end and an outer end and including an internal passageway having an inner end and an outer end and extending intermediate said inner end of the body member and said outer end of the body member, a portion of the body member configured to be received in the drain hole having dimensions substantially equivalent to dimensions of the drain hole, the outer end of the body member having dimensions less than the dimensions of the drain hole to define a peripheral passageway between the outer end of the body member and the drain hole and a first radial groove in said body member connecting said internal passageway with said peripheral passageway; and,
- an outer cover member having an inner surface of larger dimensions than the dimensions of the drain hole and radially extending from said outer end of said body member, said inner surface of said outer cover member having a second radial groove extending across said outer cover member to open at the outer periphery of said outer cover member, said second radial groove being connected to said internal passageway and to said peripheral passageway;
- whereby, when said drain plug is inserted within said drain hole in said housing, said internal passageway and said second radial groove define a first continuous but curved moisture drain path extending first through said internal passageway and then through said second radial groove and further, said peripheral passageway and said internal passageway define a second continuous but curved moisture drain path extending first through said internal passageway, then exiting said housing through said first radial groove and said peripheral passageway.

5,747,905

HERMETIC MOTOR DRIVEN FLUID APPARATUS HAVING IMPROVED INSULATING STRUCTURE

Junichi Yabushita; Shinichi Otake, both of Isesaki, and Yuji Yoshii, Takasaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

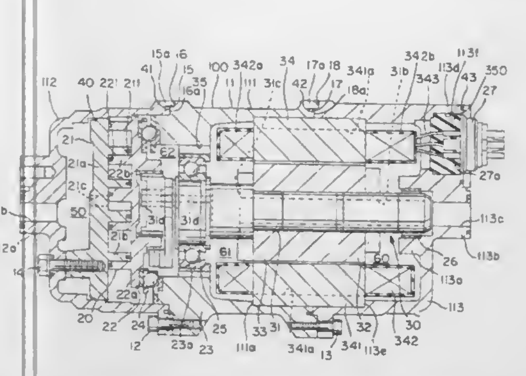
Continuation of Ser. No. 194,092, Feb. 8, 1994, Pat. No. 5,514,922. This application May 30, 1995, Ser. No. 453,682

Claims priority, application Japan, Feb. 8, 1993, 5-3314 U; Feb. 8, 1993, 5-20137

Int. Cl.^{6} H02R ***15/14***

U.S. Cl. 310—89 **28 Claims**

1. In a hermetic motor driven fluid apparatus comprising a housing; a compression mechanism disposed within said housing; and a drive mechanism disposed within said housing, said drive mechanism comprising a drive shaft operatively connected to said compression mechanism, and a motor operatively connected to said drive shaft for rotating said drive shaft, the improvement comprising:



- a portion of a surface of said housing being insulatingly covered by a film of an electrical insulation material.

5,747,906

ELECTROACOUSTIC TRANSDUCER

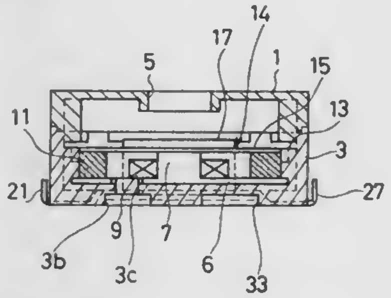
Kazushige Tajima, and Yoshio Imahori, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan

Filed Nov. 15, 1996, Ser. No. 746,719

Claims priority, application Japan, Nov. 17, 1995, 7-323693

Int. Cl.^{6} H02K ***5/00***

U.S. Cl. 310—89 **13 Claims**



1. An electroacoustic transducer comprising:
- a lead frame formed into a predetermined shape;
- an outer case integrated with said lead frame and having an opening;
- a drive section including a coil arranged inside said outer case; and
- lands formed by exposing a part of said lead frame through an outer surface of said outer case,
- wherein said coil has coil terminals leading out of said outer case through said opening in said outer case and connected to said lands.

5,747,907

BACKUP BEARINGS FOR POSITIVE RE-CENTERING OF MAGNETIC BEARINGS

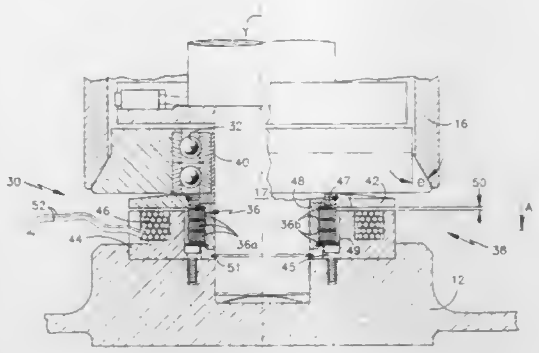
Robin M. Miller, Ellington, Conn., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Dec. 29, 1995, Ser. No. 581,705

Int. Cl.^{6} H02K ***7/08;7/09;7/10***

U.S. Cl. 310—90 **7 Claims**

1. A flywheel system used to store kinetic energy, said flywheel system comprising:
- a housing enclosing a vacuum chamber;
- a stationary shaft disposed within said housing;
- a rotating flywheel assembly disposed about said stationary shaft;



- an electric machine for transferring electric power into said flywheel assembly when said flywheel assembly is acting as a motor, said electric machine also generating electric energy from the stored kinetic energy in order to transfer said electric energy out of said flywheel assembly;
- at least one main bearing disposed about said stationary shaft; and
- a backup bearing assembly, said backup bearing assembly comprising:
  - i) a first member disposed about said shaft, said first member having at least one bearing disposed substantially therein;
  - ii) a second member spaced from said first member and disposed about said shaft, said second member having at least one bearing disposed substantially therein, said bearing of said second member having an inner diameter;
  - iii) a compression spring compressed against a shoulder of said shaft at one end, and further compressed at an opposite end against said bearing disposed within said second member, wherein said spring member forces said backup bearing assembly into an inoperative position, out of contact with said flywheel assembly; and
  - iv) an actuator assembly for moving said second member and said at least one bearing disposed substantially therein upon failure of said main bearings, said actuator assembly including a piston, said piston attached to said inner diameter of said at least one bearing disposed substantially within said second member, wherein activation of said actuator assembly exerts a force on said second member and said at least one bearing disposed substantially therein, wherein said force exerted by said actuator assembly employs said second member and said at least one bearing longitudinally along said shaft, into an operative position, in contact with said flywheel assembly, while allowing said bearing therein to rotate freely.

5,747,908

MOTOR INCLUDING AN APPARATUS FOR MOUNTING A ROTOR AND STATOR COIL TO A PRINTED CIRCUIT BOARD

Ryoji Saneshige, and Koji Kuyama, both of Yonago, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

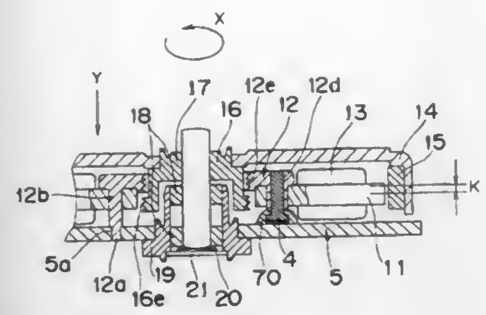
Filed Aug. 4, 1995, Ser. No. 511,443

Claims priority, application Japan, Aug. 5, 1994, 6-184444

Int. Cl.^{6} H02K ***5/00***

U.S. Cl. 310—91 **15 Claims**

1. A motor comprising:
- a stator core having an insulating portion;
- a stator coil wound around said insulating portion of said stator core;
- a printed circuit board for supplying electricity to said stator coil, said printed circuit board including a hole and a solder land;
- a holder, connected to said stator core, having a first projection and a second projection.



wherein said first projection is hollow and extends through a first through hole formed in said stator core, and said second projection extends through a second through hole formed in said stator core and into said hole formed in said printed circuit board so as to position and fix said stator core relative to said printed circuit board; and

a terminal pin having a portion which is inserted into said hollow first projection of said holder, a portion around which said stator coil is wound, and a step portion fixed to said solder land of said printed circuit board so that said terminal pin and said solder land are electrically conductive.

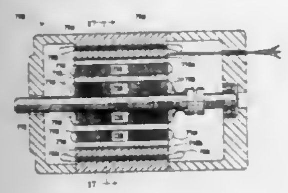
5,747,909
HYBRID ALTERNATOR

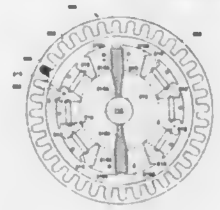
Charles D. Syverson, North Mankajo, Minn., and Willard P. Franois, Wallingford, Conn., assignors to Ecoair Corp., New Haven, Conn.

Filed Mar. 14, 1996, Ser. No. 616,106

Int. Cl.^{6} H02K *21/12;21/14;19/12*

U.S. Cl. 310—156 **24 Claims**





1. A hybrid alternator comprising:

a stator; and

a rotor mounted for rotation within the stator and separated therefrom by an air gap, said rotor having a rotor core including a plurality of rotor field poles defining a plurality of magnetic poles, adjacent ones of the magnetic poles having alternating north and south magnetic fields, the plurality of magnetic poles comprising a plurality of permanent magnet poles and a plurality of electromagnetic poles, each permanent magnet pole being defined by a permanent magnet radially extending from the rotor core, said plurality of permanent magnet poles comprising two sets of diametrically positioned permanent magnet poles, each permanent magnet being positioned within the rotor perimeter between a pair of adjacent rotor field poles to form adjacent permanent magnet poles.

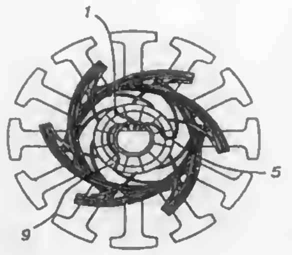
5,747,910
BRUSHLESS MOTOR

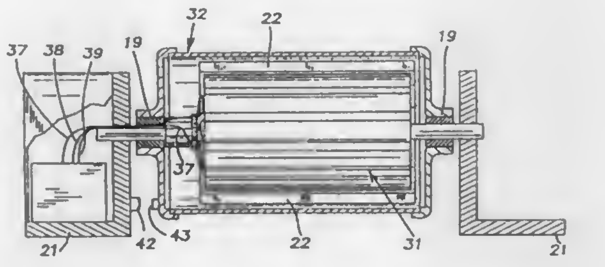
Lambert Haner, 1975 Wynwood Dr., Rocky River, Ohio 44116

Continuation of Ser. No. 275,619, Jul. 14, 1994, abandoned, which is a continuation of Ser. No. 980,304, Nov. 23, 1992, Pat. No. 5,336,956. This application Sep. 27, 1995, Ser. No. 534,592

Int. Cl.^{6} H02K *1/10;3/00*

U.S. Cl. 310—180 **4 Claims**





1. A dynamoelectric machine comprising a central armature with a core centered on an axis, the core having a periphery and a plurality of generally axially oriented slots spaced angularly about its periphery, a field winding in the core slots, the field winding comprising a plurality of separate coils, the coils each being electrically connected in a closed ring circuit that encircles the core axis, a set of three conductor leads connected to the ring circuit of coils, each of the conductor leads being connected at a point in the ring circuit that is angularly spaced on the ring circuit about 120° from the other of said leads, a housing shell surrounding the armature, bearing means for supporting the armature and the housing shell for relative rotation therewith, the housing shell and armature dynamoelectrically interacting when there is relative rotation between the housing shell and the armature and there is three phase electrical power in the winding, means connected for supplying three phase electrical power to said three conductor leads, including means to regulate the frequency of said three phase power in response to the rotational speed of said housing shell.

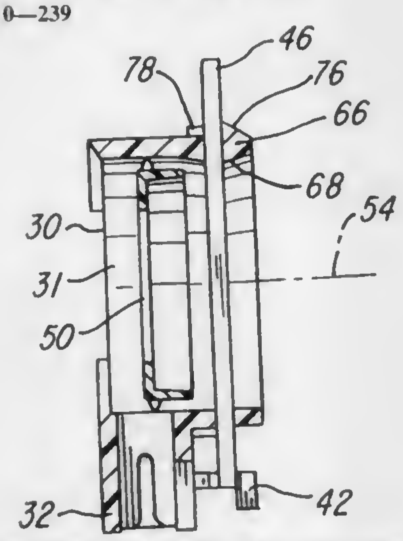
5,747,911
BRUSH HOLDER

Ned L. Kikly, Vandalia, Ohio, assignor to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Filed Sep. 30, 1994, Ser. No. 315,426

Int. Cl.^{6} H02K *13/00*

U.S. Cl. 310—239 **12 Claims**



1. A brush holder for a motor, said brush holder having an opening therethrough, comprising:

(a) at least one brush box for housing a brush biased radially toward said opening:

(b) a brush retainer releasably attached to an annular wall defining said opening; wherein said brush retainer prevents said brush from entering said opening a specified amount when said brush retainer is releasably attached to said annular wall; and

(c) means for capturing said brush retainer once said brush retainer is displaced axially from said annular wall,

said capturing means comprising at least two leg members located within said annular wall of said brush holder wherein said leg members have a detent surface located adjacent an inner surface of said annular wall, and

said leg members each having a defined slot on an outer surface thereof, wherein a substantially ring-shaped member is retainable within said slots.

5,747,912
SWITCHED RELUCTANCE MOTOR

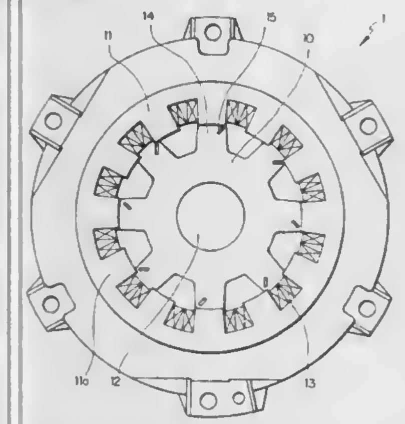
Masafumi Sakuma, Chiryu; Akemi Ookawa, Chita-gun, and Takahiro Myouga, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 29, 1995, Ser. No. 564,584

Claims priority, application Japan, Nov. 29, 1994, 6-295428

Int. Cl.^{6} H02K *19/10;1/22*

U.S. Cl. 310—261 **6 Claims**



1. A switched reluctance motor comprising:

an annular stator having a plurality of pole portions that are circularly arranged and defined by wire coils; and

a rotor rotatably disposed in an inside space of the annular stator and having a plurality of pole protrusions;

wherein current is alternately supplied to the wire coils of the pole portions of the stator, the pole portions being opposed to said pole protrusions of the rotor during rotation of the rotor, and

each of said pole protrusions of the rotor having a weak magnetic portion formed by a groove whose outer circumference is entirely contained within a leading edge portion of each of said pole protrusions, said weak magnetic portion having a shape extending generally from a leading outer point to a tailing inner point and that is formed by a material having a weaker magnetism than a material forming other portions of the rotor,

whereby each weak magnetic portion provides a stable torque output while reducing a magnetic attractive force between each of said stator pole portions and each of said rotor pole protrusions in a radial direction.

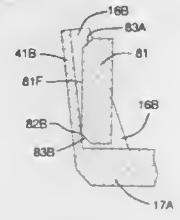
5,747,913
ROTOR FOR HYBRID GENERATOR HAVING IMPROVED MAGNET RETENTION

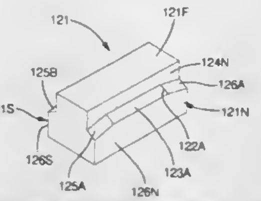
Dale Alan Amlee, Indianapolis, Ind.; Michael Frank Matouka, Shelby Township, Mich.; Richard Allen Rausch, and Keith Otipoby, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 440,410, May 12, 1995, abandoned. This application Dec. 3, 1996, Ser. No. 757,120

Int. Cl.^{6} H02K *1/22*

U.S. Cl. 310—263 **8 Claims**





1. A rotor assembly for a hybrid alternator comprising:

a shaft, first and second claw-pole segments formed of magnetic material carried by said shaft, said first claw-pole segment having a plurality of first circumferentially spaced and axially extending pole fingers, said second claw-pole segment having a plurality of second circumferentially spaced and axially extending pole fingers, said first and second claw-pole segments oriented on said shaft such that said pole fingers of said first and second claw-pole segments are interleaved in spaced relationship, a rotor core formed of magnetic material carried by said shaft interposed between said claw-pole segments having opposite ends respectively engaging said claw-pole segments, a field coil disposed about said rotor core, and a plurality of permanent magnets, each permanent magnet having a pair of longitudinally opposite ends and interposed between a respective pair of adjacent opposing pole fingers, each pole finger engaged during rotation of the rotor with a respective permanent magnet at a retention interface between each pole finger and the respective permanent magnet, the permanent magnets being shaped to ensure that radially outward flexure of the pole fingers results in the retention interfaces being established at areas longitudinally inboard from said longitudinally opposite ends of the permanent magnets.

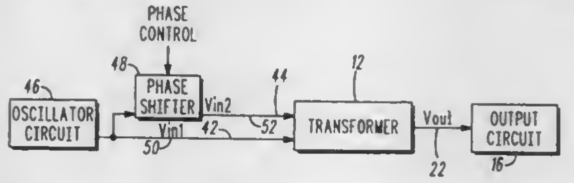
5,747,914
DRIVING CIRCUIT FOR MULTISECTIONAL PIEZOELECTRIC TRANSFORMERS USING PULSE-POSITION-MODULATION/PHASE MODULATION

Jin Huang, Hoffman Estates; Pallab Midya, Schaumburg, and Brian M. Mancini, Carol Stream, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 5, 1997, Ser. No. 795,530

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—318 **19 Claims**



1. A transformer circuit for driving a piezoelectric transformer having piezoelectrically interfering multiple-input driving sections, comprising:

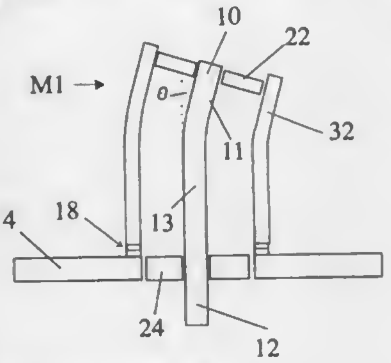
OL
2 10
SS
1
MY
5
998
MI

an input circuit providing at least two driving signals having an externally controlled adjustable phase relationship therebetween, the driving signals being at a substantially resonant frequency of the piezoelectric transformer and being applied to the input driving sections such that an adjustment in the phase relationship between the driving signals causes a corresponding adjustment in gain at an output of the piezoelectric transformer, the transformer maintaining operating efficiency over substantially a full range of gain adjustments; and
an output circuit coupled with the output of the transformer.

5,747,915
BENT SHAFT MOTOR

Gilbert L. Benavides, Albuquerque, N. Mex., assignor to Sandia Corporation, Albuquerque, N. Mex.

Filed Aug. 19, 1996, Ser. No. 699,279
Int. Cl.⁶ H01L *41/08*
U.S. Cl. 310—331 19 Claims

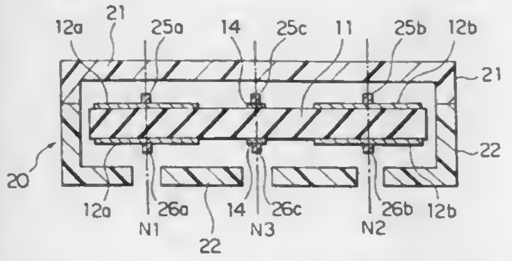


1. A bent shaft motor, comprising:
a base;
a drive shaft which is rotable relative to said base wherein said drive shaft comprises a straight portion aligned with a main axis and an offset portion that is offset with respect to said main axis; and
compliant drive means extending between said base and said offset portion of said drive shaft wherein sequentially flexing of said drive means drives said offset portion along a generally circular path in a plane perpendicular to the main axis to rotate said drive shaft.

5,747,916
PACKAGED PIEZOELECTRIC TRANSFORMER UNIT

Mitsuhiro Sugimoto; Yuji Kondo; Koichi Zama, and Yuko Sato, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,060
Claims priority, application Japan, Feb. 28, 1995, 7-039912
Int. Cl.⁶ H01L *41/053*; H03H *9/10*
U.S. Cl. 310—348 6 Claims

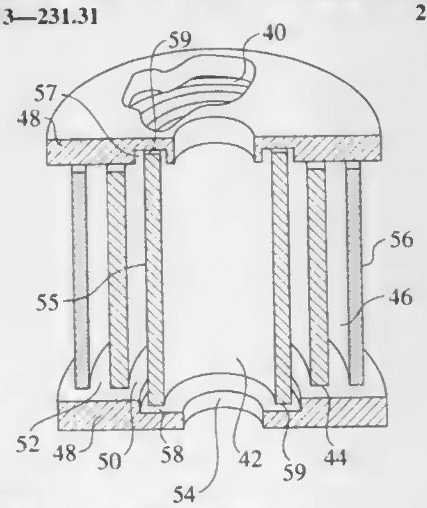


1. A piezoelectric transformer unit for transforming an input voltage into an output voltage, said piezoelectric transformer unit comprising:
a package which defines a hollow space therein;
a piezoelectric transformer element accommodated in the hollow space of the package;
a plurality of input electrodes attached to said piezoelectric transformer element;
a plurality of input conductive leads electrically connected to said input electrodes and extended through the package outside of the package, the input conductive leads having an eigen frequency higher than an audible frequency;
a plurality of output electrodes attached to said piezoelectric transformer element and remote from said input electrodes; and
a plurality of output conductive leads electrically connected to said output electrodes and extended through the package outside of the package, said output conductive leads having an eigen frequency higher than an audible frequency;
the package being of resin material, the input conductive leads and the output conductive leads molded to the package to provide molded portions supported by the resin material.

5,747,917
DOUBLE-WALLED MIRCROWAVE PLASMA BASED APPLICATOR

Harald Herchen, Fremont, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Feb. 14, 1996, Ser. No. 601,477
Int. Cl.⁶ H01J *17/26;61/28;7/24;* H05B *31/26*
U.S. Cl. 313—231.31 23 Claims



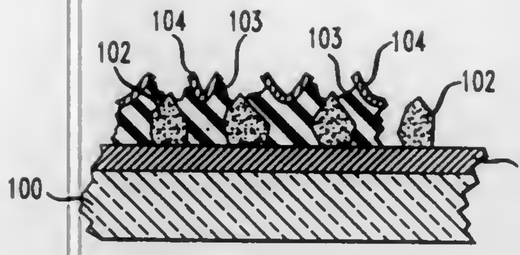
1. A plasma applicator, comprising:
a first member in which a plasma is generated;
a second member that surrounds said first member, wherein a first gap is defined therebetween across which thermal energy generated by said plasma in said first member may radiate, said thermal energy also radiating through said second member; and
a third member that surrounds said second member, wherein a second gap is defined therebetween through which a coolant fluid is circulated that absorbs said thermal energy radiated from said first member across said first gap.

5,747,918
DISPLAY APPARATUS COMPRISING DIAMOND FIELD EMITTERS

Chang-Beom Eom, Durham, N.C.; Sungho Jin, Millington, N.J.; Gregory Peter Kochanski, Dunellen, N.J.; Mark Thomas McCormack, Summit, N.J., and Yiu-Huen Wong, Summit, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 220,077, Mar. 30, 1994, abandoned. This application Dec. 6, 1995, Ser. No. 567,867
Int. Cl.⁶ H01J *1/30*
U.S. Cl. 313—309 13 Claims

10. An article comprising field emission display means comprising:



a) a multi-pixel cathode, a given pixel having an area and comprising a multiplicity of spaced apart emitter bodies on a support;
b) an anode that is spaced apart from the cathode and comprises light emitting means;
c) a gate disposed between said anode and cathode; and
d) means for applying a voltage between said cathode and gate such that electrons are emitted from at least some of said emitter bodies and impinge on said light emitting means;

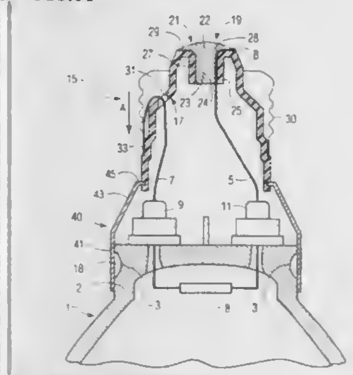
CHARACTERIZED IN THAT

e) the emitter bodies of the given pixel are substantially randomly positioned on the support and comprise diamond, a given emitter body having relatively sharp features effective for facilitating electron emission from the emitter body;
f) said gate comprises a patterned metal layer disposed on insulating material that partially encloses said given emitter body, with a portion of said emitter body protruding from said insulating material, the protruding portion being spaced from the patterned metal layer and disposed within an aperture in the patterned metal layer, with the given emitter body being the only emitter body having a protruding portion within the given aperture.

5,747,919
ELECTRIC LAMP HAVING A HYBRID SKIRTED LAMP BASE

Harish F. Gandhi, Morgantown; Walter A. Boyce, Fairmont, and David R. Woodward, Morgantown, all of W. Va., assignors to Philips Electronics North America Corporation, NY, N.Y.

Continuation-in-part of Ser. No. 366,135, Dec. 29, 1994, Pat. No. 5,568,009. This application Jun. 28, 1996, Ser. No. 671,890
Int. Cl.⁶ H01J *5/60*
U.S. Cl. 313—318.01 31 Claims

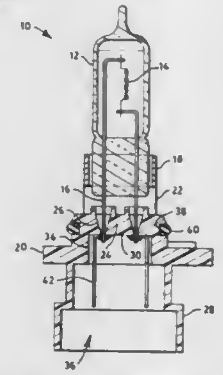


1. An electric lamp comprising
a lamp envelope including a pressed glass reflector body defining a lamp axis,
a light source within said lamp envelope which is energizable for emitting light,
a lamp base having lamp contacts electrically connected to said light source, one of said lamp contacts comprising a threaded shell and
a skirt secured to said reflector body and carrying said lamp base, characterized in that:
said skirt includes a metallic skirt portion mechanically secured to said reflector body and a plastic skirt portion fixed to said metallic skirt portion, said plastic portion including a first part carrying said threaded shell and a second part extending axially past said threaded shell toward said reflector body, said metallic skirt portion including parts integrally molded in said plastic skirt portion and extending transverse to said lamp axis.

5,747,920
LAMP CAPSULE WITH ROTARY SWAGED LUG CONNECTORS

Daniel D. Devir, South Sutton, and Charles M. Coushaine, Ringe, both of N.H., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Sep. 26, 1996, Ser. No. 720,256
Int. Cl.⁶ H01J *5/58*
U.S. Cl. 313—318.09 4 Claims



1. A lamp capsule with lug connectors comprising:
a) a lamp bulb having at least one extending lead,
b) a holder having an internal wall with a passage formed in the wall, with the lead positioned to extend through the passage; and a
c) a lug with a foot portion positioned adjacent the internal wall, and having a hole formed in the foot, and aligned with respect to the wall passage, with the lead positioned to extend through the foot hole, and with a rotary swage formed in the lug, around the lead, so that a portion of the lug is pressed into intimate contact with the lead thereby mechanically locking and electrically coupling the lead to the lug.

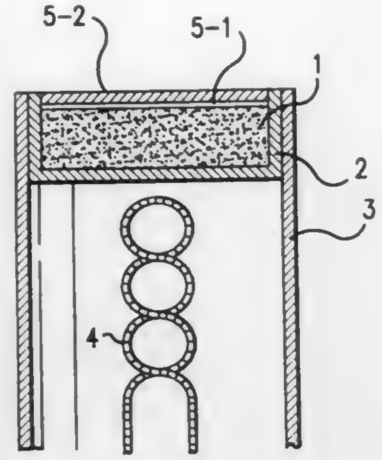
5,747,921
IMPREGNATION TYPE CATHODE FOR A CATHODE FOR A CATHODIC RAY TUBE

Yeoung Ku Kim, Jeonranam-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 318,376, Oct. 5, 1994, abandoned. This application Mar. 17, 1997, Ser. No. 819,020
Claims priority, application Rep. of Korea, Oct. 5, 1993, 20489/1993
Int. Cl.⁶ H01J *19/06;1/14*
U.S. Cl. 313—346 R 6 Claims

1. An impregnation type cathode for a cathode ray tube comprising a porous cathode piece having electron emission material impregnated therein, said porous cathode piece has a layer of elemental W and elemental Sc on the surface thereof and a layer of alloy formed of at least two elements of a group of elements

VOL
2 10
SS
1
MY
5
998
MI



consisting of Ir, Os, Ru, and Re on the layer of elemental W and elemental Sc.

5,747,922
COLOR PICTURE TUBE AND IN-LINE ELECTRON GUN WITH FOCUSING ELECTRODES HAVING ELONGATED THROUGH HOLES

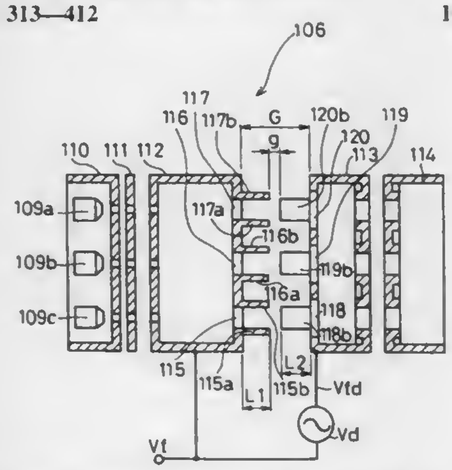
Masahiko Sukeno, Hyogo, and Yasuyuki Ueda, Osaka, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 517,314, Aug. 21, 1995, abandoned. This application May 22, 1997, Ser. No. 861,910

Claims priority, application Japan, Aug. 23, 1994, 6-197102; Oct. 12, 1994, 6-245745

Int. Cl.^{6} H01J *29/50;29/70*

U.S. Cl. 313—412 **14 Claims**



1. A color picture tube comprising a funnel, a panel, a phosphor screen disposed inside of said panel, a shadow mask disposed in the vicinity of said phosphor screen and an in-line electron gun disposed in a neck part of said funnel, and wherein:

said electron gun has three cathodes which are arranged in a horizontal direction, a control electrode, an accelerating electrode, a first focusing electrode, a second focusing electrode and a final accelerating electrode;

three electron beam through holes, which are arranged on an end face of said first focusing electrode facing said second focusing electrode, are formed to have a vertically oblong rectangular shape;

three electron through holes, which are arranged on an end face of said second focusing electrode facing said first focusing electrode, are formed to have a horizontally oblong rectangular shape;

a protrusion is provided in the vicinity of each longer side of each electron beam through hole on end faces of both of said first focusing electrode and said second focusing electrode that face each other, protruding toward the other focusing electrode, the longer side having a length greater than the distance the protrusion extends along the longer side, and a sum of the height of one of the protrusions provided on said first focusing electrode and the height of one of the protrusions provided on the second focusing electrode is less than a distance between said end faces of said first and second focusing electrodes;

a predetermined focusing voltage is applied to said first focusing electrode;

a compound voltage, in which a dynamic voltage which gradually increases corresponding to an increase of deflection angle of electron beams is superimposed on said focusing voltage, is applied to said second focusing electrode.

5,747,923
MAGNETIC MATRIX DISPLAY DEVICE AND COMPUTER SYSTEM FOR DISPLAYING DATA THEREON

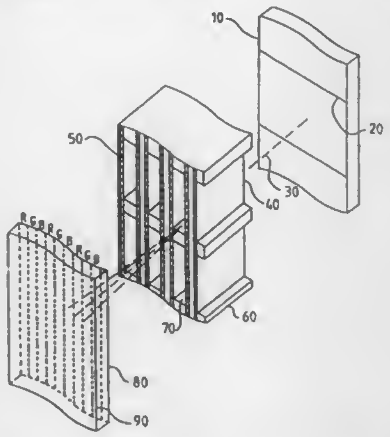
John Beeteson, Skelmorlie, and Andrew Knox, Kilbirnie, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1996, Ser. No. 675,009

Claims priority, application United Kingdom, Aug. 25, 1995, 9517465; Mar. 8, 1996, 9604997

Int. Cl.^{6} H01J *29/70*

U.S. Cl. 313—431 **29 Claims**



1. A display device comprising: cathode means for emitting electrons; a permanent magnet; a two dimensional array of channels extending between opposite poles of the magnet; the magnet generating, in each channel, a magnetic field for forming electrons from the cathode means into an electron beam; a screen for receiving the electron beam from each channel, the screen having a phosphor coating facing the side of the magnet remote from the cathode, the phosphor coating comprising a plurality of pixels each corresponding to a different channel; grid electrode means disposed between the cathode means and the magnet for controlling flow of electrons from the cathode means into each channel; and, alignment means for aligning electron beams from the channels with corresponding pixels of the phosphor coating.

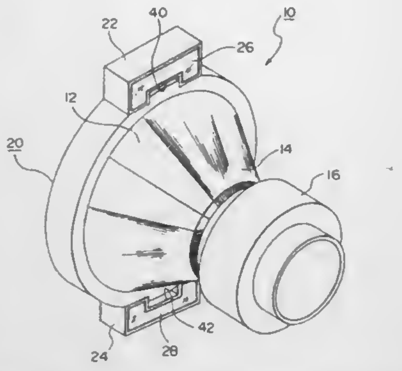
5,747,924
PICTURE DISTORTION CORRECTING APPARATUS

Yoshihiko Usami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 23, 1996, Ser. No. 681,540

Int. Cl.^{6} H01J *29/70*

U.S. Cl. 313—431 **4 Claims**



1. A picture distortion correcting apparatus for correcting picture distortion in a cathode ray tube, said apparatus comprising:

a pair of magnets attached to upper and lower portions of a front cover located at a front end of a cathode ray tube opposite a neck thereof, each of said pair of magnets having a generally longitudinal body with respective magnetic pole ends directed away and offset from a longitudinal axis of said longitudinal body such that said magnetic pole ends of each of said pair of magnets are closer to a central longitudinal axis of said cathode ray tube than said longitudinal axis of said longitudinal body of each of said pair of magnets.

5,747,925
ELECTRON GUN FOR CATHODE RAY TUBE

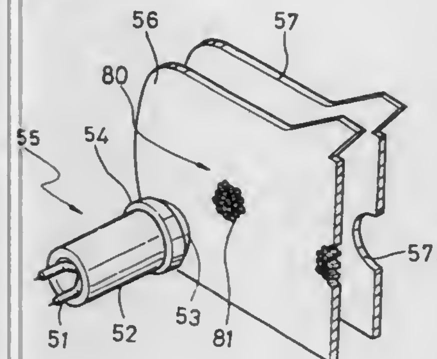
Hyeong-dong Kim, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 12, 1995, Ser. No. 570,985

Claims priority, application Rep. of Korea, Dec. 28, 1994, 94-38292

Int. Cl.^{6} H01J *29/46:29/70*

U.S. Cl. 313—446 **5 Claims**



1. A triode for an electron gun for a cathode ray tube comprising:

a cathode having an electron emitting material layer, a control electrode, and a screen electrode, the control electrode including a plurality of through hole regions for an electron beam, each through hole region having a plurality of through holes facing the electron emitting material layer of the cathode, the screen electrode having a plurality of through holes corresponding to the plurality of through hole regions, respectively.

5,747,926
FERROELECTRIC COLD CATHODE

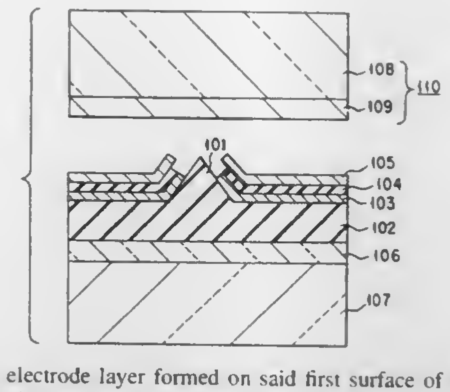
Masayuki Nakamoto, Chigasaki, and Hiromichi Ohashi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 8, 1996, Ser. No. 612,577

Claims priority, application Japan, Mar. 10, 1995, 7-051608

Int. Cl.^{6} H01J *1/62:1/02:1/16;19/10*

U.S. Cl. 313—495 **20 Claims**



1. A ferroelectric cold cathode comprising;

a ferroelectric layer formed of a ferroelectric material and having an emitter which is a projection having a sharp tip portion on a first surface of the ferroelectric layer;

a first electrode layer formed on said first surface of the ferroelectric layer and having an opening allowing said sharp tip portion of the emitter to be exposed therethrough; and

a second electrode layer formed on a second surface of the ferroelectric layer, wherein said second surface is opposite said first surface.

5,747,927
DISPLAY DEVICE

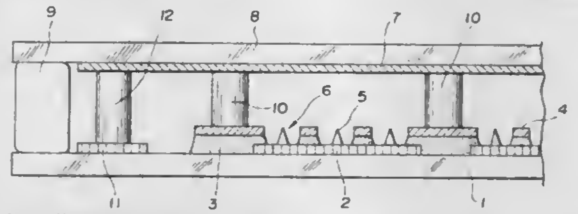
Mamoru Namikawa; Satoshi Yoshimura, and Kenichi Honda, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Mar. 8, 1996, Ser. No. 612,681

Claims priority, application Japan, Mar. 9, 1995, 7-077105

Int. Cl.^{6} H01J *1/62;63/04;1/88;19/42*

U.S. Cl. 313—495 **7 Claims**



1. A display device comprising:

an anode substrate provided thereon with at least one phosphor-deposited anode electrode;

a cathode substrate provided thereon with at least cold cathodes of a microsize;

a seal member arranged between said anode substrate and said cathode substrate so as to space said anode substrate and cathode substrate from each other at a predetermined interval in a manner to be opposite to each other and form sealing between said anode substrate and said cathode substrate to a degree sufficient to form an envelope which is evacuated to a high vacuum; and

a plurality of supports arranged between said anode substrate and said cathode substrates so as to hold said anode substrate and cathode substrate spaced from each other at a predetermined interval;

a part of said plurality of supports being formed to be conductive so as to act as conductive supports.

5,747,928
FLEXIBLE PANEL DISPLAY HAVING THIN FILM TRANSISTORS DRIVING POLYMER LIGHT-EMITTING DIODES

Howard R. Shanks; Stanley G. Burns, and Frank R. Jeffrey, III, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

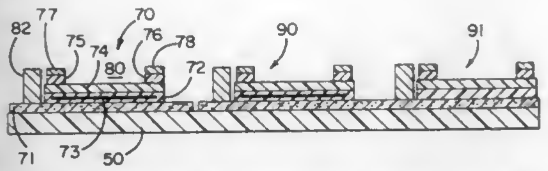
Filed Oct. 7, 1994, Ser. No. 320,029

Int. Cl.^{6} H05B *33/12*

U.S. Cl. 313—498 **9 Claims**

1. A solid state electronic light emitting display device of non-planar configuration and having driving transistors distributed in a

OL
2 10
SS
1
MY
5
998
MI



display area and sharing pixels with light-emitting display elements, the display device comprising, in combination:
- a non-planar substrate;
- at least one metallization and interconnect layer carried by the substrate;
- an interface carried by the substrate and including semiconductor devices configured and interconnected for selectively driving the pixels of the display device, the interface being connected to the interconnect layer;
- the display area on the substrate being divided into a plurality of pixels, each pixel including:
  - a thin film transistor including layers of α-Si:H and dielectric forming a transistor structure having sufficient current capacity for driving a light-emitting means in the associated pixel;
  - a first electrode connected to and driven by the thin film transistor, the first electrode covering the majority of the pixel area;
  - a light-emitting polymer deposited on the first electrode;
  - a transparent electrode covering the light-emitting polymer such that said electrodes and said polymer form said light-emitting means by injecting carriers into the polymer under the control of the thin film transistor;
  - the thin film transistor being connected to the interconnect layer for receipt of drive signals from the interface; and
- the interconnect layer being configured to interconnect the interface with the thin film transistors for selective energization of the respective thin film transistors and thereby selective illumination of the pixels.

5,747,929
ELECTROLUMINESCENCE ELEMENT AND METHOD FOR FABRICATING SAME

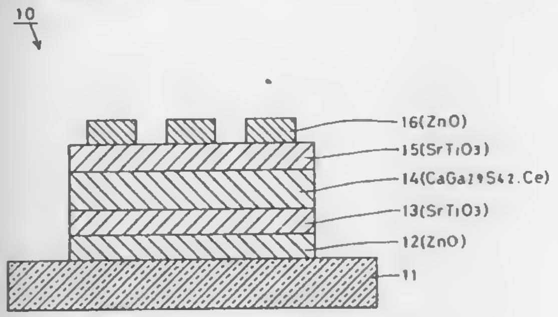
Akira Kato, Kariya; Masayuki Katayama, Handa; Nobuei Ito, Chiryu, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 6, 1995, Ser. No. 523,938

Claims priority, application Japan, Sep. 7, 1994, 6-213978; May 18, 1995, 7-119805

Int. Cl.^{6} H01J *1/63*

U.S. Cl. 313—503 **17 Claims**



1. An electroluminescence element comprising:
- a substrate;
- a first electrode deposited on said substrate;
- a first insulating layer deposited on said first electrode;
- a luminescent layer deposited on said first insulating layer, said luminescent layer having a chemical formula $CaGa_xS_y$ (where $2.1 \leqq x \leqq 3.5$ and $Y \geqq 4$), being doped with Ce as a luminescent center, and being formed from a target in which $CaGa_2S_4$ having a Ce-containing compound added thereto is mixed with a Ga-containing compound;
- a second insulating layer deposited on said luminescent layer; and
- a second electrode deposited on said second insulating layer.

5,747,930
ORGANIC THIN FILM ELECTROLUMINESCENT DEVICE

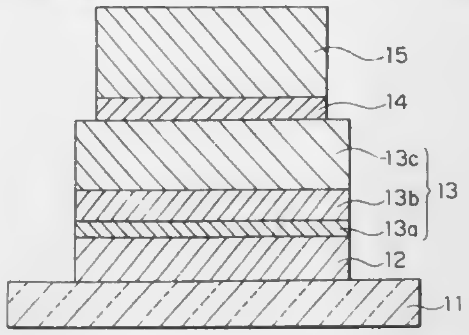
Koji Utsugi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 17, 1995, Ser. No. 443,174

Claims priority, application Japan, May 17, 1994, 6-101468

Int. Cl.^{6} H05B *33/00*

U.S. Cl. 313—504 **7 Claims**



1. An organic thin film electroluminescent diode comprising:
- an anode;
- a cathode including a metal or alloy, the metal or alloy having a work function greater than or equal to 4 eV, the cathode further including 0.01 to 5 mol % of scandium and 0.01 to 0.3 mol % of alkali metal; and
- an organic thin film layer disposed between said anode and cathode and having at least one light emitting layer.

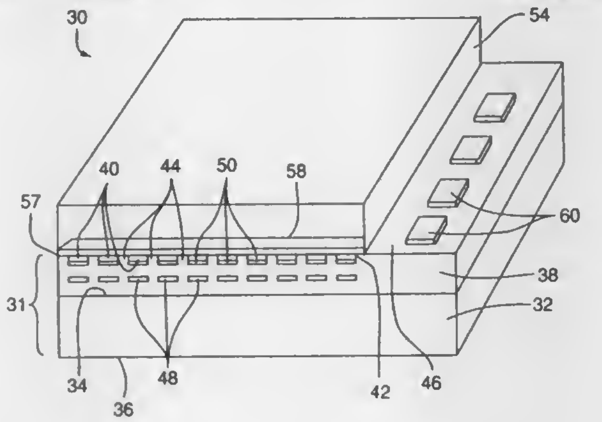
5,747,931
PLASMA DISPLAY AND METHOD OF MAKING SAME

George Herbert Needham Riddle, Princeton; Ashok Naryan Prabhu, East Windsor; Dennis Lee Matthies, Princeton, all of N.J., and Attiganal Narayanaswamy Sreeram, Lansdale, Pa., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed May 24, 1996, Ser. No. 655,328

Int. Cl.^{6} H01J *17/49*

U.S. Cl. 313—581 **16 Claims**



1. A display comprising:
- a back panel having a metal substrate having a surface and a body of glass with a surface on said surface of the body;
- a plurality of spaced, parallel channels in the surface of the body with upstanding ribs between the channels;

- a plurality of spaced, parallel first electrodes on said body with each first-electrode extending along the bottom surface of each of the channels;
- a transparent front panel extending across the back panel and seated on and secured to the back panel; and
- a plurality of spaced, parallel second electrodes between the front panel and the back panel and extending substantially orthogonally to the first electrodes.

5,747,932
PLASMA DISPLAY DEVICE WITH CATHODE INSULATING LAYER

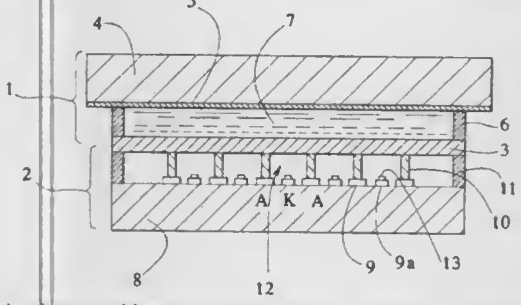
Masatake Hayashi, and Shigeki Miyazaki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1996, Ser. No. 644,956

Claims priority, application Japan, May 12, 1995, 7-166766

Int. Cl.^{6} H01J *17/49*

U.S. Cl. 313—582 **11 Claims**



1. A plasma addressed display device having a plasma cell, comprising:
- a first substrate and a second substrate applied for forming the plasma cell;
- a plurality of plasma electrodes which serve as anode electrodes and cathode electrodes, said plurality of plasma electrodes being provided on said first substrate, pairs of said anode electrodes and said cathode electrodes being provided parallel to each other to form discharge channels; and
- insulating layers provided on said cathode electrodes to partially cover said cathode electrodes to expose a plurality of discharge locations arranged along a length of each of said cathode electrodes, said insulating layers being free of said second substrate to define a space between said insulating layers and said second substrate.

5,747,933
MOIRE INTERFERENCE DETECTION FOR RASTER-SCANNED CATHODE RAY TUBE DISPLAYS

John Beeteson, Skelmorlie, and Andrew Knox, Kilirnie, both of United Kingdom, assignors to International Business Machines Corp., Armonk, N.Y.

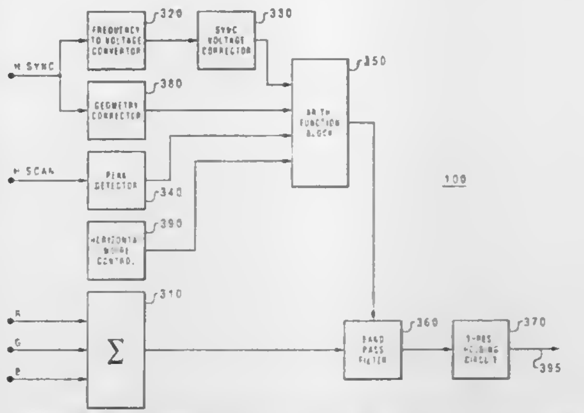
Filed Apr. 19, 1995, Ser. No. 424,829

Claims priority, application United Kingdom, Oct. 14, 1994, 9420729

Int. Cl.^{6} H01J *29/00*

U.S. Cl. 315—1 **26 Claims**

1. Moire interference detection apparatus for a raster-scanned cathode ray tube display, the apparatus comprising:
- a band-pass filter for generating an output signal in response to a signal indicative of the pixel frequency of a displayed image in a direction of raster scan falling within the pass band of the filter; and
- control means for varying the center frequency of the pass band of the band-pass filter in dependence on an active video period of the displayed image in said direction of raster scan, spacing of adjacent phosphor elements of the cathode ray tube display in said direction of raster scan, and a scan size in said direction of raster scan.



5,747,934
LIGHTING SWITCH ASSEMBLY WITH INTERNAL DAYTIME RUNNING LIGHT CONTROL CIRCUIT

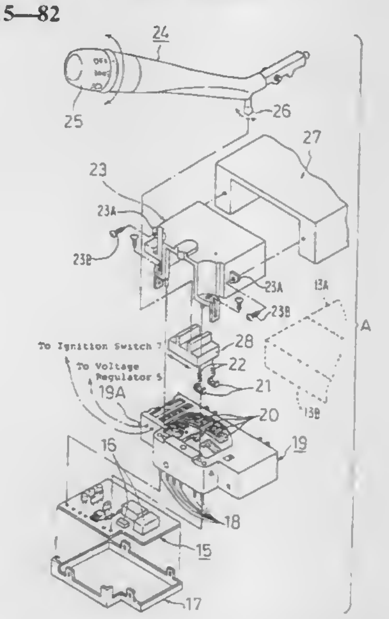
Harushige Yamamoto, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Aug. 16, 1996, Ser. No. 698,856

Claims priority, application Japan, Dec. 28, 1995, 7-353046

Int. Cl.^{6} B60Q *1/02*

U.S. Cl. 315—82 **13 Claims**



1. A lighting switch assembly with an internal daytime running light control circuit, comprising:
- a base attached to a vehicle steering column;
- a lighting switch assembly (A) having on-off switches (**4**, **14**) connected to a headlamp (**1**);
- a printed circuit board (**15**) mounted to the lighting switch assembly (A);
- electric elements (**16**) mounted to the printed circuit board (**15**) and adapted to form daytime running light control circuits (**3**, **13**), said electric elements (**16**) being directly connected to said on-off switches (**4**, **14**); and
- means for releasably attaching said lighting switch assembly (A) to said base.

5,747,935

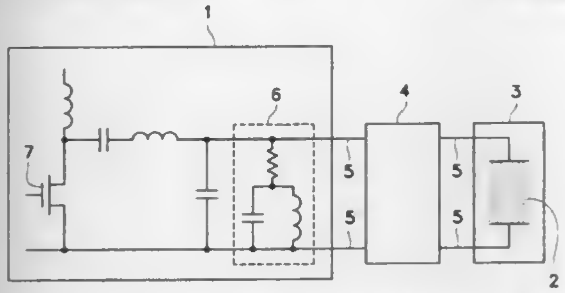
METHOD AND APPARATUS FOR STABILIZING SWITCH-MODE POWERED RF PLASMA PROCESSING

Robert M. Porter, Fort Collins, and Michael L. Mueller, Loveland, both of Colo., assignors to Advanced Energy Industries, Inc., Fort Collins, Colo.

Continuation of Ser. No. 869,794, Apr. 16, 1992, abandoned. This application Oct. 14, 1994, Ser. No. 318,777

Int. Cl.^{6} H01J *7/24*

U.S. Cl. 315—111.51 **49 Claims**



1. A method of stably delivering power to a processing plasma through an alternating signal comprising the steps of:

a. generating an alternating signal at a fundamental frequency by a switch-mode power supply;

b. transmitting said alternating signal into the processing plasma; while

c. affirmatively absorbing energy at substantially other than the fundamental frequency by electrical circuitry.

5,747,936

ION IMPLANTATION APPARATUS WITH IMPROVED POST MASS SELECTION DECELERATION

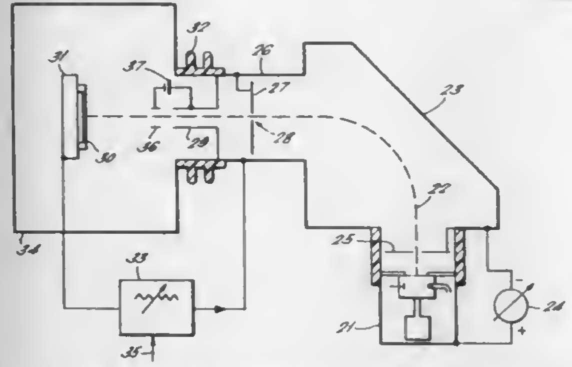
Bernard Harrison, Copthorne, and Frederick G. Plumb, Horsham, both of England, assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Nov. 25, 1996, Ser. No. 758,134

Claims priority, application United Kingdom, Nov. 23, 1995, 9523982

Int. Cl.^{6} G21K *5/04*

U.S. Cl. 315—111.81 **9 Claims**



1. An ion implantation apparatus comprising a holder for a substrate to be implanted, a source of ions for implanting in the substrate, a flight tube through which ions from the source fly towards the substrate holder, an acceleration supply connected to provide an acceleration bias between the source and the flight tube to accelerate ions to a predetermined energy in excess of the desired implantation energy, a controllable current path connected to conduct net beam current absorbed by the substrate or the substrate holder from the substrate holder to the flight tube, said current path being controllable to produce a controlled potential drop over said current path while conducting only the net beam current, thereby providing a deceleration bias between the substrate holder and the flight tube, and a controller operative to control said current path to maintain said deceleration bias to decelerate ions to the desired implantation energy.

5,747,937

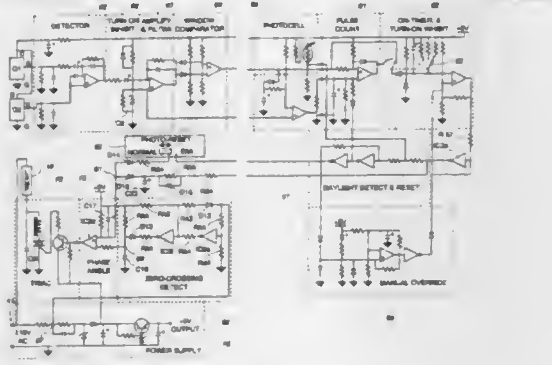
TWO-LEVEL SECURITY LIGHTING SYSTEM

David L. Wiesemann, Benton Township, Berrien County, Mich.; Daniel E. Schaaf, Michigan City, Ind., and Wai-Shing P. Ko, Kwai Chung, Hong Kong, assignors to Heath Company, Inc., Benton Harbor, Mich.

Continuation of Ser. No. 600,823, Feb. 13, 1996, Pat. No. 5,598,066. This application Oct. 30, 1996, Ser. No. 739,638

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—159 **7 Claims**



1. A lighting system comprising:

a motion sensor for sensing motion;

a photocell for sensing the presence or absence of daylight;

a lamp;

a housing for carrying said motion sensor, said photocell and said lamp;

means for connecting said lamp to a source of external electrical power; and

a control circuit for electrically connecting said connecting means to said motion sensor and said photocell for enabling said lamp to be illuminated by said motion sensor or said photocell, said control circuit allowing for manual override of said motion sensor and said photocell to enable said lamp to be illuminated by an external switch.

5,747,938

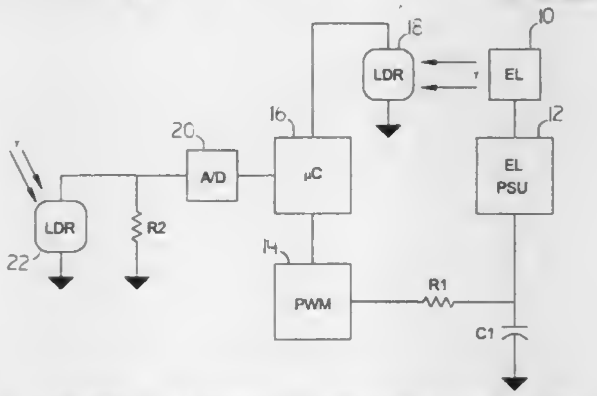
AUTOMATIC CONTROL ELECTROLUMINESCENT BACKLIGHT PANEL

Paul Beard, Milpitas, Calif., assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 324,648, Oct. 18, 1994, Pat. No. 5,568,016. This application May 22, 1995, Ser. No. 445,494

Int. Cl.^{6} G09G *3/10*

U.S. Cl. 315—169.3 **12 Claims**



1. An apparatus for automatically controlling the backlighting of a display, comprising:

a backlight for providing a light output for backlighting the display;

a first light detector disposed proximate to said backlight for detecting the light output of said backlight;

a second light detector for detecting the level of ambient light;

a controller operatively connected to said first and second light detectors, said controller for controlling the light output of said backlight based upon the detected light output of said backlight and the detected level of ambient light; and

wherein the light output of said backlight is increased as the level of ambient light decreases and is decreased as the level of ambient light increases.

5,747,939

PLASMA DISPLAY PANEL WITH CONTROL RESISTANCE VALUES FOR RESTRICTING CURRENT FLOW INTO THE CATHODES

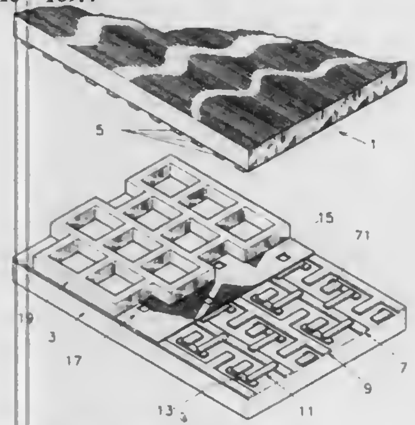
Dae-il Kim, Kyungki-do; Nac-koo Kim; Kyung-min Kim, both of Seoul, and Dong-cheol Jeong, Kyungki-do, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 18, 1996, Ser. No. 767,350

Claims priority, application Rep. of Korea, Dec. 21, 1995, 95-53509

Int. Cl.^{6} H01J *17/34*

U.S. Cl. 315—169.4 **7 Claims**



1. A plasma display panel, comprising:

two substantially parallel plates;

a plurality of bus lines disposed on one of the plates, each of the bus lines having a plurality of electrodes connected thereto;

a resistance layer connected between each electrode and its respective bus line;

lattice walls positioned on the bus lines to prevent crosstalk between discharge cells;

a plurality of trigger electrodes disposed in substantially the same plane as the bus lines, at least one of the trigger electrodes being formed between a pair of the bus lines; and

a dielectric layer disposed between said lattice walls and said trigger electrodes.

5,747,940

MULTI-DIMENSIONAL CONTROL OF ARRAYED LIGHTS TO PRODUCE SYNCHRONIZED DYNAMIC DECORATIVE PATTERNS OF DISPLAY, PARTICULARLY FOR FESTIVAL AND CHRISTMAS LIGHTS

Renato M. Openiano, 934 Fuchsia La., San Diego, Calif. 92154

Filed Jan. 11, 1996, Ser. No. 585,209

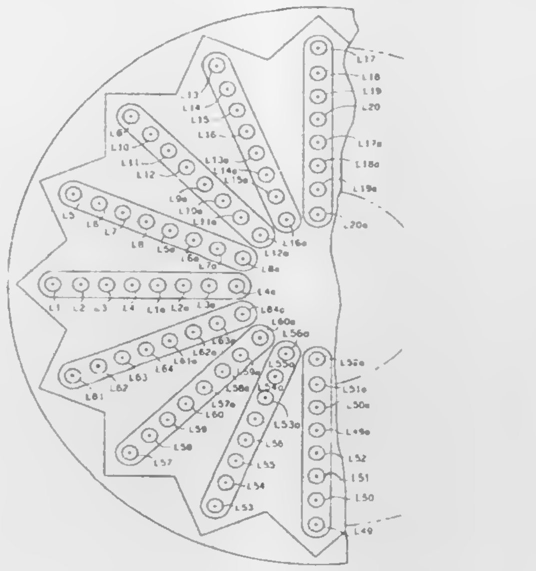
Int. Cl.^{6} F21P *1/02*

U.S. Cl. 315—185 S **37 Claims**

1. An electrical system electrically connected between a system voltage and a system ground for producing decorative patterns of display in a multiplicity of lights, the system comprising:

a multiplicity of arrayed lights each for emitting illumination when electrically connected between the system voltage and the system ground;

a plurality of voltage distribution buses, each connected to an associated plurality of the arrayed lights, and each selectively electrically connected to the system voltage so as to carry the system voltage to the arrayed lights of the associated plurality;



a plurality of ground buses, each connected to an associated plurality of the arrayed lights, and each selectively electrically connected to the system ground so as to carry the system ground to the arrayed lights of the associated plurality;

means for selectively electrically connecting one or more of the plurality of voltage buses to the system voltage, and also for selectively electrically connecting one or more of the plurality of ground buses to the system ground, so that those individual ones of all the multiplicity of lights that are electrically connected between both a system-voltage-connected one of the plurality of voltage busses, and also to a system-ground-connected one of the plurality of ground buses, will emit illumination while other individual ones of the multiplicity of lights not then so connected will not then illuminate;

wherein selected ones of the multiplicity of arrayed lights are illuminated, producing a display.

5,747,941

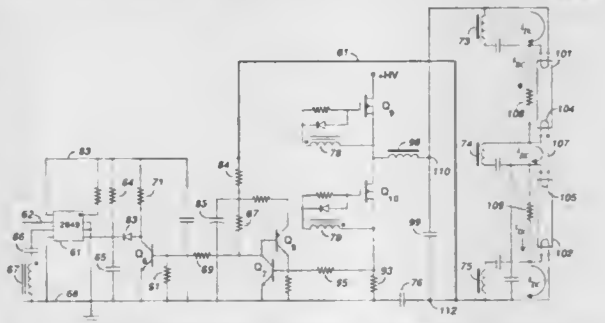
ELECTRONIC BALLAST THAT MONITORS DIRECT CURRENT THROUGH LAMP FILAMENTS

Peter W. Shackle, Arlington Heights; Randy G. Russell, Glen Ellyn, both of Ill.; Kent E. Crouse, Haltom City, Tex., and Ronald J. Bezdon, Schaumburg, Ill., assignors to Energy Savings, Inc., Schaumburg, Ill.

Filed Dec. 7, 1995, Ser. No. 568,623

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—224 **5 Claims**



1. An electronic ballast for powering a gas discharge lamp, said ballast comprising:

a variable frequency inverter having a series resonant, parallel loaded output, said inverter producing high frequency pulses having a direct current component;

said inverter including a resistive path in parallel with the resonant capacitor in said series resonant, parallel loaded output, said loath including means for connecting at least one filament of said lamp in series with said path;

a control circuit coupled to said inverter, said control circuit including a sense capacitor charged by the direct current component through said resistive path;

said control circuit operating said inverter at a first frequency near the resonant frequency of said series resonant, parallel loaded output when the voltage on said sense capacitor is greater than a predetermined voltage;

said control circuit operating said inverter at a second frequency when the voltage on said sense capacitor is less than said predetermined voltage, wherein said second frequency is higher than said first frequency.

5,747,942

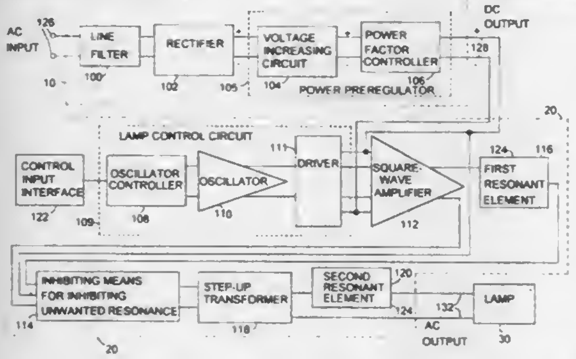
INVERTER FOR AN ELECTRONIC BALLAST HAVING INDEPENDENT START-UP AND OPERATIONAL OUTPUT VOLTAGES

Krishnappa Ranganath, Schaumburg, Ill., assignor to Enersol Systems, Inc., Hoffman Estates, Ill.

Filed Jul. 10, 1996, Ser. No. 677,467

Int. Cl.⁶ H05B *37/02*

U.S. Cl. 315—224 **35 Claims**



1. An electronic ballast for energizing a gas-discharge lamp, the electronic ballast comprising:

a square-wave amplifier having a square-wave amplifier input and a square-wave amplifier output;

a lamp control circuit including an oscillator; the oscillator oscillating at any oscillator frequency within an entire oscillator frequency range during a start-up mode of the lamp, the lamp control circuit providing a signal at the oscillator frequency to the square-wave amplifier input;

a resonant circuit coupled to the square-wave amplifier output; the resonant circuit having a resonant frequency, a relative frequency difference between the oscillator frequency and the resonant frequency determining the luminance of the lamp during an operational mode of the lamp;

a step-up transformer having a primary winding and a secondary winding; the primary winding receiving electromagnetic energy from the square-wave amplifier output; a ratio of primary winding turns to secondary winding turns selected to provide a transformer secondary voltage that equals or exceeds a start-up threshold voltage of the lamp, the ratio depending upon a transformer primary voltage.

5,747,943

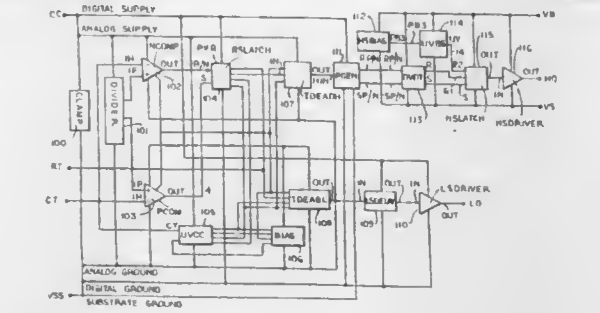
MOS GATE DRIVER INTEGRATED CIRCUIT FOR BALLAST CIRCUITS

Talbott M. Houk, Culver City, and Peter N. Wood, Rolling Hills Est., both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 299,561, Sep. 1, 1994, Pat. No. 5,550,436. This application Aug. 26, 1996, Ser. No. 703,215

Int. Cl.⁶ H05B *41/00*

U.S. Cl. 315—225 **5 Claims**



1. An integrated circuit for driving first and second MOS gated power devices which are connected in a half bridge circuit, said integrated circuit having a first d.c. terminal connectable to a positive d.c. supply potential and a second d.c. terminal connectable to a ground potential, said integrated circuit comprising:

a voltage clamp circuit connected between said first and second d.c. terminals for clamping said positive d.c. supply potential at a predetermined value;

a voltage divider circuit connected in parallel with said voltage clamp circuit between said first and second d.c. terminals for producing first and second voltage reference levels at respective first and second taps;

a timer circuit for producing oscillating signals for driving said first and second MOS gated power devices at a frequency determined by an external resistor and an external capacitor connectable to respective resistor and capacitor input terminals of said integrated circuit, said timer circuit comprising first and second comparators having positive inputs connected to said first and second taps of said voltage divider circuit, respectively, and having negative inputs connected to said capacitor input terminal, said first and second comparators having outputs connected to logic circuitry for generating high side and low side logic level output signals of opposite polarity, said timer circuit including dead time delay circuitry for preventing the simultaneous conduction of said first and second MOS gated power devices;

a level shifting circuit connected to said high side logic level output signal for converting said high side logic level output signal to a high voltage level signal of the same frequency;

a high side driver connected to said level shifting circuit for receiving said high voltage level signal and applying said high voltage level signal to said first MOS gated power device;

a low side driver connected to said logic circuitry for receiving the low side logic level signal and applying said low side logic level signal to said second MOS gated power device; and

an undervoltage monitor means for monitoring said positive d.c. supply potential and for disabling said timer circuit and thereby preventing the generation of said high side and low side logic level output signals during an initial power up of said integrated circuit when said d.c. supply potential is below a first predetermined voltage level.

5,747,944

FLASH DEVICE HAVING PLURAL EMISSION MODES IN ONE OF WHICH A FLASH INDUCTOR IS SELECTIVELY SHORT-CIRCUITED

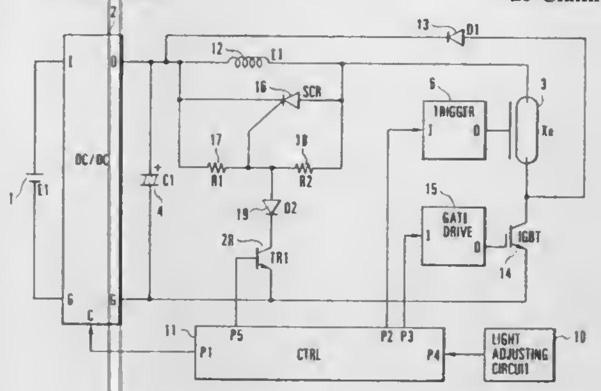
Yoshihito Harada, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha

Filed Dec. 1, 1995, Ser. No. 566,149

Claims priority, application Japan, Dec. 7, 1994, 6-303868

Int. Cl.⁶ H05B *37/02*

U.S. Cl. 315—241 P **28 Claims**



4. A flash device having a capacitor arranged to store flashing energy, an inductance element and a flash tube arranged to discharge, through the inductance element, an electric charge stored in said capacitor, comprising:

a) a switching element arranged to form an electric current path disposed in parallel to said inductance element; and

b) a selection circuit arranged to selectively allow said switching element to act, in accordance with a flash emission mode.

5,747,945

ELECTRODELESS DISCHARGE LAMP UTILIZING INDUCED ELECTRIC FIELD GENERATED BY A HIGH FREQUENCY ELECTROMAGNETIC FIELD

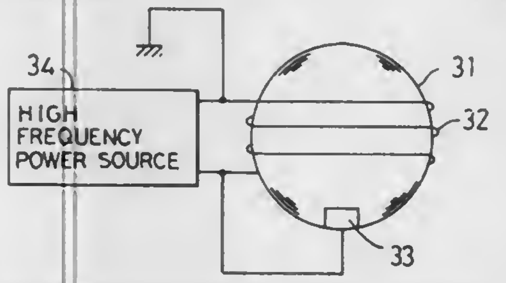
Shin Ukegawa; Shigeaki Wada; Atsunori Okada; Shingo Higashisaka, and Miki Kotani, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 327,498, Oct. 21, 1991, abandoned, which is a continuation of Ser. No. 190,215, Feb. 1, 1994, Pat. No. 5,367,226, which is a continuation of Ser. No. 928,419, Aug. 12, 1992, abandoned. This application Oct. 4, 1996, Ser. No. 726,234

Claims priority, application Japan, Aug. 14, 1991, 3-203090; Oct. 15, 1991, 3-265625; Dec. 13, 1991, 3-329245; Dec. 13, 1991, 3-329250

Int. Cl.⁶ H05B *37/02*

U.S. Cl. 315—248 **8 Claims**



1. An electrodeless discharge lamp apparatus comprising:

a lamp tube having first and second oppositely disposed portions;

a discharge gas sealed within the lamp tube;

an induction coil, including at least a single loop, disposed around an outer periphery of the lamp tube spaced from the first and second oppositely disposed portions;

a first high frequency power source for supplying a high frequency current to the induction coil to generate a high frequency electromagnetic field acting upon the discharge gas in the lamp tube;

a foil auxiliary electrode disposed adjacent to the lamp tube, substantially equidistant from points on the induction coil adjacent to the first portion of the lamp tube, the foil auxiliary electrode being electrostatically coupled to an interior space within the lamp tube; and

a second high frequency power source including means for applying, while supplying the high frequency current from the first high frequency power source to the induction coil, a high frequency voltage to the foil auxiliary electrode for generating a preliminary discharge of the discharge gas in the lamp tube, the preliminary discharge being initiated adjacent to the first portion of the lamp tube, extending across the lamp tube to the second portion of the lamp tube, and influenced, at a distal end disposed adjacent to the second portion of the lamp tube, by the electromagnetic field generated by the induction coil to generate an annular excitation luminescence, and means for continuing supplying the high frequency voltage to the foil auxiliary electrode until the annular excitation luminescence is generated.

5,747,946

GAS DISCHARGE LAMPS AND SYSTEMS

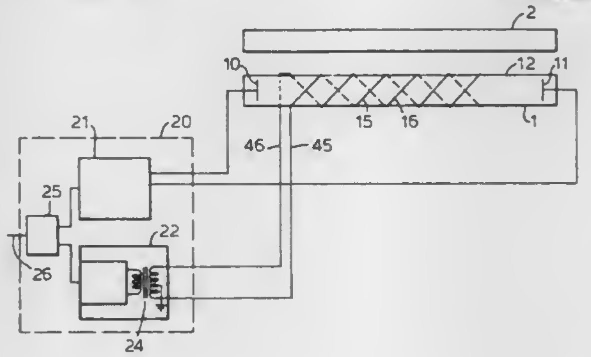
Peter Michael Tyler, Woodmancote, England, assignor to Smiths Industries Public Limited Corporation, London, England

Filed Sep. 10, 1996, Ser. No. 709,818

Claims priority, application United Kingdom, Sep. 21, 1995, 9519283

Int. Cl.⁶ G05F *1/00*

U.S. Cl. 315—291 **19 Claims**



1. A gas discharge lamp comprising: an elongate envelope filled with a discharge gas; a pair of electrodes located at opposite ends of the envelope for causing discharge within the envelope; and a pair of glow mode electrodes extending along a part at least of the length of the envelope, wherein said glow mode electrodes are elongate conductive members wound helically about the envelope such that any point on one conductive member has a corresponding point located diametrically opposite on the other member.

5,747,947

GAIN CONTROLLED CONTROL SIGNAL BASED ON SENSED LAMP CURRENT

Moon Seong Hak, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Aug. 15, 1995, Ser. No. 515,225

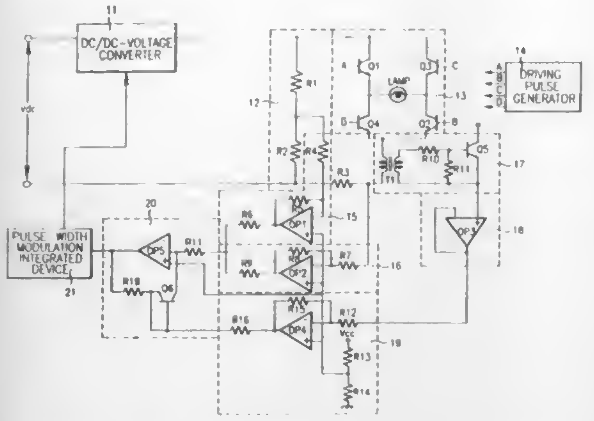
Claims priority, application Rep. of Korea, Aug. 25, 1994, 94 21076

Int. Cl.⁶ H05B *37/02*

U.S. Cl. 315—308 **20 Claims**

1. A multi-output apparatus for a projection TV lamp comprising:

OL
2 10
SS
1
MY
5
998
MI



a DC/DC-voltage converter for converting an input DC voltage into the driving level of a lamp;

a voltage dividing portion for dividing the output voltage of said DC/DC-voltage converter into output voltage 1 (OV1) and output voltage 2 (OV2) at a predetermined ratio;

a driving pulse generator for generating the driving pulse for driving the lamp;

a lamp driving portion for switching the output voltage of said DC/DC-voltage converter according to the driving pulse output from said driving pulse generator so as to alternately supply a driving power to the lamp forward or reversely;

a voltage feeding-back portion for comparing the output voltage OV1 of said voltage dividing portion with a reference voltage, and feeding back the output to a power input stage;

a current feeding-back portion for comparing a driving current supplied to the lamp with the reference voltage so as to feed back the driving current to the power input port;

a current detecting portion for detecting the driving current supplied to the lamp so as to output a voltage corresponding thereto;

an error amplifying portion for comparing the voltage output from said current detecting portion so as to differentially amplify the voltage;

a gain controller comprising: a) an operation amplifier for comparing the output voltages of the voltage feeding-back portion and current feeding-back portion with a reference voltage and outputting a voltage corresponding to their difference and b) a means for attenuating the input voltage of said operation amplifier in proportion with the output voltage level of said error amplifying portion and outputting the result to a pulse-width modulation integrated device; and

a pulse-width modulation integrated device for outputting a pulse-width modulation signal to said DC/DC-voltage converter according to the output voltage of said gain controller so as to vary the output of the lamp.

5,747,948
CONVERGENCE CORRECTION

John Barrett George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 493,595, Jun. 22, 1995, abandoned, which is a continuation of Ser. No. 241,025, May 11, 1994, abandoned. This application May 15, 1997, Ser. No. 856,732

Int. Cl.^{6} G09G *1/28;* **H01J** *29/51;* **H04N** *3/23*

U.S. Cl. 315—368.18 **26 Claims**

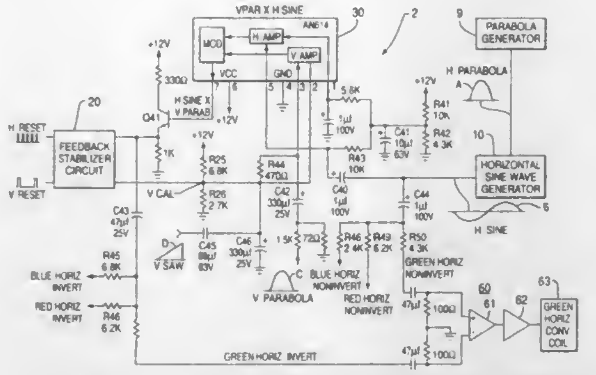
1. A correction circuit for a cathode ray tube displaying images subject to distortions, said circuit comprising:

means for generating a vertical rate waveform having a generally parabolic shape;

means for clamping said vertical rate waveform to a point of reference potential during a vertical retrace period;

means for combining a first horizontal rate waveform of a generally sinusoidal waveshape, having opposite peak values during horizontal trace, with said vertical rate waveform to define a correction signal; and

means for generating a dynamic magnetic field in said cathode ray tube responsive to said correction signal, said correction signal correcting inner pincushion distortion.



5,747,949
CRT FOCUSING CIRCUIT WITH INDIVIDUALLY CONTROLLED SWITCHES DEVELOPING AN APPROXIMATE PARABOLIC WAVEFORM

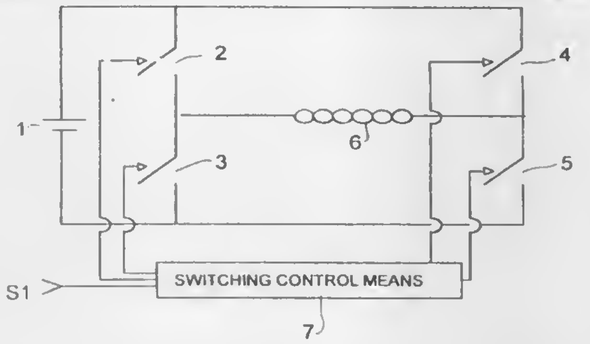
Takaaki Gyoten, Kobe, and Masahiro Kawashima, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1995, Ser. No. 569,279

Claims priority, application Japan, Dec. 9, 1994, 6-305985

Int. Cl.^{6} H01J *29/58*

U.S. Cl. 315—382.1 **18 Claims**



1. An electromagnetic focusing circuit for a cathode-ray tube comprising:

a power source having a positive electrode and a negative electrode;

a focusing coil having a first terminal and a second terminal;

first switching means connected between the positive electrode of said power source and the first terminal of said focusing coil;

second switching means connected between the negative electrode of said power source and the first terminal of said focusing coil;

third switching means connected between the positive electrode of said power source and the second terminal of said focusing coil;

fourth switching means connected between the negative electrode of said power source and the second terminal of said focusing coil;

switching control means for individually turning each switching means on or off according to a command determining the current flowing in said focusing coil producing a one-directional focusing current of trapezoidal waveform approximating a desirable parabolic waveform.

5,747,950
STEERING SYSTEM FOR VEHICLES OR SHIPS

Welm Friedrichsen, Nordborg, and Aksel Baagø Jepsen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

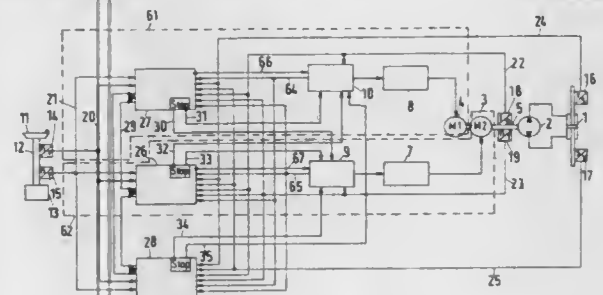
PCT No. PCT/DK93/00389, § 371 Date Jun. 1, 1995, § 102(e) Date Jun. 1, 1995, PCT Pub. No. WO94/13523, PCT Pub. Date Jun. 23, 1994

PCT Filed Nov. 30, 1993, Ser. No. 446,684

Claims priority, application Germany, Dec. 11, 1992, 42 41 849.6

Int. Cl.^{6} G05B *9/03*

U.S. Cl. 318—5 **18 Claims**



1. A steering system for vehicles or ships having a steering handwheel and a steering element with no mechanical linkage line therebetween, a steering handwheel sensor device, a steering element sensor device and a control arrangement which, in dependence on output signals of the sensor devices, operates an electromechanical transducer connected for operating the steering element, and in which the control arrangement has at least two independent control units independently connected to said transducer and a fault-monitoring device, said fault monitoring device including means to preclude a defective control unit from influencing the steering element, said electromechanical transducer having at least one electric motor which drives at least one reversible drive shaft, and including one or more sensors which produce signals in dependence on at least one of the rotational speed, the direction of rotation and the angular position of the drive shaft.

5,747,951
VIBRATION MOTOR WITH A ROTOR/STATOR INTERFACE MADE OF SHAPE MEMORY ALLOY

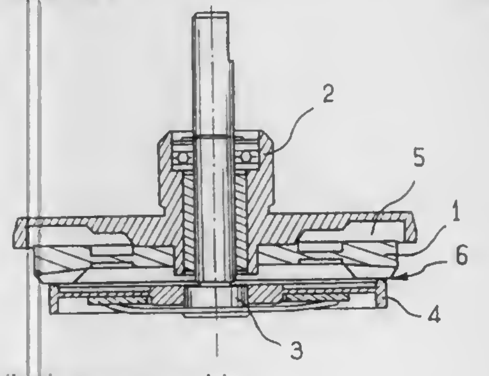
Jean Thierry Audren, St Remy les Chevreuse, France, assignor to SFIM Industries, Massy, France

Filed Nov. 29, 1996, Ser. No. 758,527

Claims priority, application France, Nov. 30, 1995, 95 14169

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 318—114 **12 Claims**



1. A vibration motor comprising:

a stator;

a rotor;

excitation means for deforming said stator in a vibratory mode and for enabling it to rotate the rotor;

a contact layer located between said stator and said rotor, said contact layer being formed, at least in part, of shape memory alloy.

5,747,952
LINEAR MOTOR, APPARATUS, ARMATURE COIL CURRENT SUPPLY CIRCUIT FOR LINEAR MOTOR, AND METHOD OF SUPPLYING CURRENT TO ARMATURE COIL OF LINEAR MOTOR

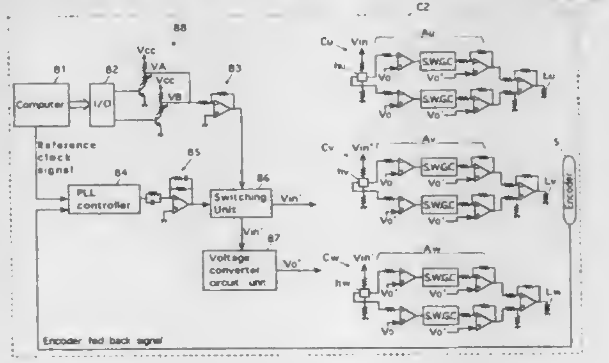
Makoto Izawa, Kariya, and Katsuhiro Nanba, Okazaki, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Mar. 31, 1997, Ser. No. 831,331

Claims priority, application Japan, Apr. 2, 1996, 8-079864

Int. Cl.^{6} H02K *41/00*

U.S. Cl. 318—135 **22 Claims**



1. A linear motor apparatus comprising:

a stator extending in a predetermined direction and having a field magnet for driving;

a movable piece having an armature coil opposed to said field magnet, and being reciprocatable along said stator;

a Hall element disposed at a portion on said movable piece opposed to said field magnet for outputting a voltage signal depending on an intensity and a direction of a magnetic field formed by said field magnet as well as a Hall element reference input voltage supplied thereto;

a correction circuit for producing an output signal by correcting an output signal issued from said Hall element to have a cycle equal to that of said Hall element output signal and a constant maximum amplitude depending on said Hall element reference input voltage; and

a current supply circuit for supplying a current, depending on the output voltage issued from said correction circuit, to said armature coil for producing a driving force of said movable piece.

5,747,953
CORDLESS, BATTERY OPERATED SURICAL TOOL

Chris Philipp, Portage, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Mar. 29, 1996, Ser. No. 626,252

Int. Cl.^{6} H02P *1/00*

U.S. Cl. 318—139 **26 Claims**

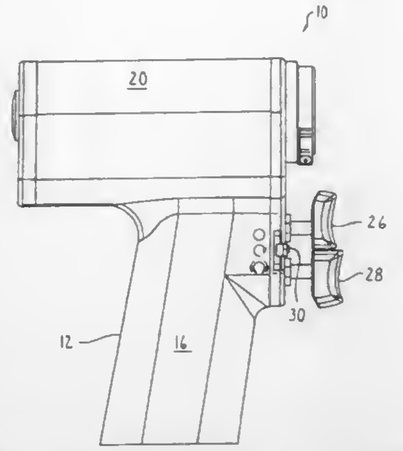
1. A powered surgical tool including:

a tool housing;

a motor disposed in said tool housing, said motor being actuatable in response to an application of energization signals thereto;

a motor control module disposed in said tool housing and connected to said motor, said motor control module having a motor control module housing that is fully enclosed and a motor control circuit contained in said motor control module housing, said motor control circuit being configured to supply the energization signals to said motor in response to at least a first motor command signal; and

/OL
2 10
ISS
1
MY
5
998
MI



a switch assembly attached to said tool housing adjacent said module control module housing, said switch assembly including: a first actuatable switch that extends outside of said tool housing; a first magnet attached to said first switch and disposed inside of said tool housing adjacent said motor control module housing and configured to move with the displacement of said first switch; and a first magnetic field sensor disposed in said motor control module housing and positioned adjacent said first magnet, said first magnetic field sensor being configured to generate said first motor command signal to said motor control circuit based on movement of said first magnet.

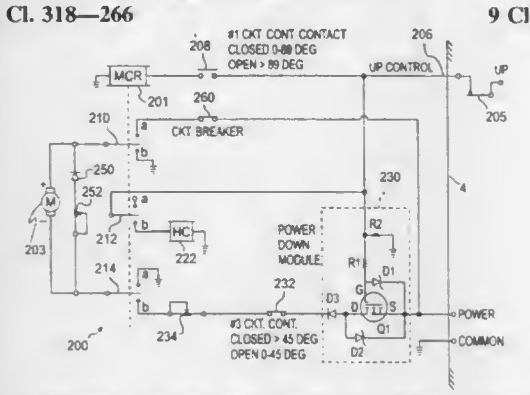
5,747,954
HIGHWAY CROSSING GUARD MECHANISM CONTROLLER

Richard S. Jones, West Columbia, and N. Rodgers Williamson, Jr., Leesville, both of S.C., assignors to Union Switch & Signal Inc., Pittsburgh, Pa.

Filed Jan. 30, 1997, Ser. No. 790,777

Int. Cl.^{6} B61L *29/08*

U.S. Cl. 318—266 **9 Claims**



1. A highway crossing gate control for driving a gate arm between an up position and a down position in response to an up signal and a power supply comprising:

a permanent magnetic DC motor mechanically connected to drive such gate arm up when rotated in a direction and to drive such gate arm down when rotated in a direction opposite to said direction;

a first controller switch connected to receive the up signal, having an open state only when the gate arm is in the up position and a closed state only when the gate arm is in a position other than the up position;

a motor control relay connected to said first controller switch, to be energized in response to the up signal when said first controller switch is in said closed state;

a hold clear device for maintaining the gate arm in the up position, said hold clear device to be energized in response to the up signal only when said motor control relay is de-energized;

said motor control relay having a first contact set having a first contact connected to a side of the armature of said motor upon energization of said motor control relay, and having a second contact connected to said side of the armature only when said motor control relay is de-energized;

said motor control relay having a second contact set having a first contact connected to receive the up signal upon energization of said motor control relay, and having a second contact connected to receive the up signal when said motor control relay is de-energized;

said motor control relay having a third contact set having a first contact connected to the opposite side of said armature when said motor control relay is energized and having a second contact connected to said opposite side of said armature when said motor control relay is de-energized;

a switching circuit connected between a power supply and said second contact of said third contact set, such that said switching circuit has an open state in response to the up signal, and otherwise, a closed state, thereby to provide an electrical circuit path between said second contact of said third contact set and said second contact of said first contact set when said switching circuit is in said closed state.

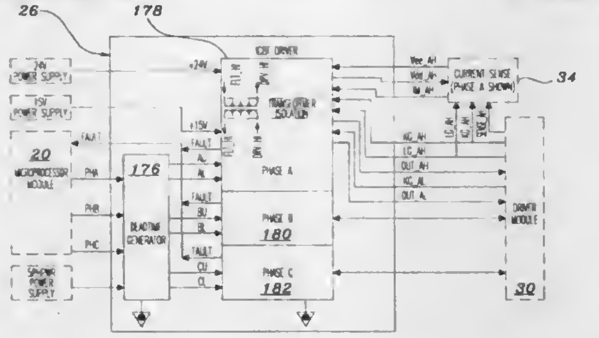
5,747,955
CURRENT SENSING MODULE FOR A VARIABLE SPEED AC MOTOR DRIVE FOR USE WITH A TREADMILL

John T. Rotunda, Bothell; Lester A. Hass, Duvall, and Victor Pipinich, Seattle, all of Wash., assignors to Quinton Instrument Company, Bothell, Wash.

Continuation of Ser. No. 414,400, Mar. 31, 1995, abandoned. This application Sep. 19, 1997, Ser. No. 934,044

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—434 **21 Claims**



1. An AC drive motor system for a treadmill having a microprocessor module, predriver module and driver module therein to provide pulse width modulated signals to a drive motor and a current sensing circuit therein, the circuit including;

a fast sense circuit for detecting the occurrence of a first current in excess of a predetermined value for an AC drive motor system to prevent rapid damage to said AC drive motor system wherein said fast sense circuit senses the current of pulse width modulated signals between the driver module and the drive motor wherein said signals have controlled cycles and when said current of said sensed signal is greater than a predetermined threshold, said fast sense circuit sends a fault signal to said predriver module to close a switch for the remainder of said cycle of said sensed signal; and

a slow sense circuit to detect the occurrence of a second current in excess of a predetermined value which is caused by a gradual fault condition wherein said fault condition results from the increased frictional resistance to the rotation of the walk belt of a treadmill on a treadmill deck.

5,747,956
METHOD OF CONTROLLING THE RPM OF A MOTOR

Hubert Lamm, Kappelrodeck, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

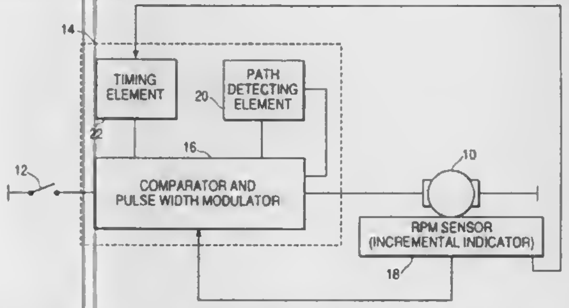
PCT No. PCT/DE94/00106, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO94/19863, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 4, 1994, Ser. No. 318,720

Claims priority, application Germany, Feb. 18, 1993, 43 04 960.5

Int. Cl.^{6} G05B *11/28*

U.S. Cl. 318—599 **13 Claims**


14
TIMING ELEMENT
20
PATH DETECTING ELEMENT
22
16
12
10
COMPARATOR AND PULSE WIDTH MODULATOR
RPM SENSOR (INCREMENTAL INDICATOR)
18

1. A method of setting the rpm of an electric motor comprising the steps of: supplying operating voltage to the electric motor via a controllable power output stage; supplying a pulse width modulated control signal to the power output stage to control the voltage supplied to the motor, and an rpm of the motor; continuously measuring an actual rpm of the electric motor using a measuring device and providing an output corresponding to a measured actual rpm value; comparing the output corresponding to the measured actual rpm value to a predetermined reference rpm value; and, if, as a result of a comparison, the value of the reference rpm is not reached, changing the pulse width of the control signal until the reference rpm value is reached only if the measured actual rpm value is less than the predetermined reference rpm value.

5,747,957
METHOD OF CONTROLLING VECTORS IN MOTOR AND VECTOR-CONTROLLING INVERTER DEVICE

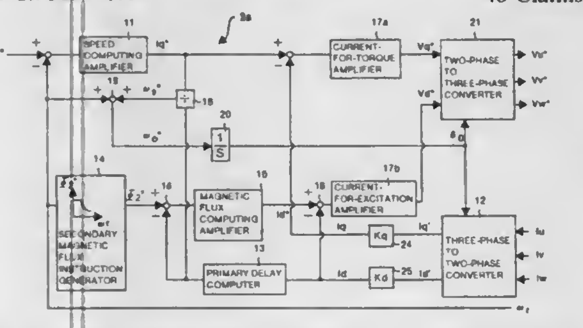
Takahiro Hayashida, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1996, Ser. No. 743,662

Claims priority, application Japan, Apr. 25, 1996, 8-105803

Int. Cl.^{6} H02P *5/41*

U.S. Cl. 319—799 **48 Claims**


11
3a
17a
21
SPEED COMPUTING AMPLIFIER
CURRENT-FOR-TORQUE AMPLIFIER
TWO-PHASE TO THREE-PHASE CONVERTER
19
20
14
15
16
17b
18
12
MAGNETIC FLUX COMPUTING AMPLIFIER
CURRENT-FOR-EXCITATION AMPLIFIER
SECONDARY MAGNETIC FLUX INSTRUCTION GENERATOR
13
Kq
24
Kd
25
THREE-PHASE TO TWO-PHASE CONVERTER
PRIMARY DELAY COMPUTER

25. A vector-controlling inverter device in a motor by detecting a primary current in the motor driven by an inverter circuit with a current detector, dividing a value for the primary current detected with said current detector to a current detection value for torque and a current detection value for excitation, and dividing an instruction value for the primary current to a current instruction value for torque and a current detection value for excitation for controlling the motor; wherein said inverter device has a means for changing apportion between the current detection value for torque and the current detection value for excitation obtained from said primary current detection value and changes the rated torque characteristics for the motor according to change of the apportion.

5,747,958
CIRCUIT ARRANGEMENT FOR POWERING A TWO-PHASE ASYNCHRONOUS MOTOR

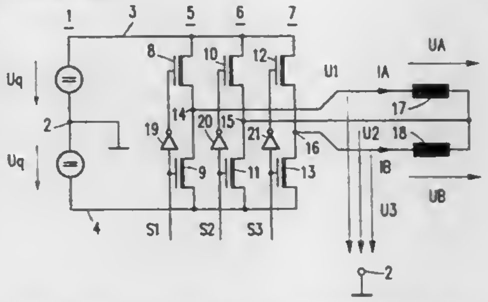
Heinz Van Der Broeck, Zülpich, and Matthias Wendt, Würselen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1996, Ser. No. 645,440

Claims priority, application Germany, May 26, 1995, 195 19 370.9

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—747 **5 Claims**



1. A power supply circuit for a two-phase asynchronous motor having two windings at preset physical angle there-between, said power supply circuit comprising three switching stages respectively having first, second and third nodes, a first of said motor windings being coupled between the first and second nodes and a second of said motor windings being coupled between the second and third nodes, and voltage supply means coupled to said switching stages for respectively supplying first, second and third periodic voltages U1, U2 and U3 at the first, second and third nodes, said voltages having substantially the same fundamental frequency; said power supply circuit being characterized in that:

the voltage U2 at the second node has a rectangular waveform;

the voltages U1, U3 at the first and third nodes have a phase angle there-between corresponding to said preset physical angle, and each alternates between time intervals in which the voltage is at a constant level and time intervals in which the voltage is pulse modulated in correspondence with a selected duty cycle and at a frequency which is high relative to said fundamental frequency; and

the pulse modulated intervals of each of the first and third node voltages U1, U3 coincide with the constant voltage intervals of the other of said voltages, and the pulses in the pulse modulated intervals have a duty cycle which corresponds with a desired amplitude ratio of the voltages produced by the node voltages across the first and second motor windings.

5,747,959
METHOD OF CONTROLLING ELECTRIC VEHICLE DRIVEN BY AN INTERNAL COMBUSTION ENGINE

Katsuhiko Iijima, and Shigenori Kinoshita, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, and Mitsubishi Heavy Industries, Ltd., Tokyo, both of Japan

Division of Ser. No. 289,559, Aug. 12, 1994, Pat. No. 5,629,596, which is a division of Ser. No. 957,179, Oct. 7, 1992, Pat. No. 5,368,116. This application Sep. 20, 1996, Ser. No. 710,762

Claims priority, application Japan, Oct. 8, 1991, 3-289133

Int. Cl.^{6} H02P *3/18*

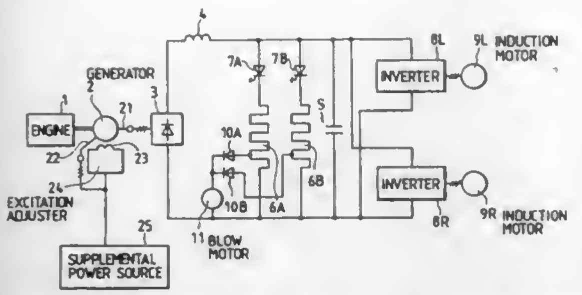
U.S. Cl. 318—762 **5 Claims**

1. A method of controlling the brake operation of a vehicle having an AC generator driven by an internal combustion engine, comprising:

a first step of converting the output of the AC generator to DC voltage;

a second step of employing an intermediate DC circuit for conditioning the DC voltage;

a third step of converting a DC output of the intermediate DC circuit to an AC voltage;



- a fourth step of employing AC induction motors for driving wheels of the vehicle with the AC voltage converted by the third step; and
- a fifth step of employing at least one semiconductor switch connected in series with at least one braking resistor in the intermediate DC circuit for consuming power during vehicle braking;

wherein the second step includes the steps of:
  - maintaining the DC voltage at a first constant DC voltage when the vehicle is operated at a speed between zero and a first speed greater than zero;
  - increasing the DC voltage in accordance with the vehicle speed when the vehicle speed is between the first speed and a second speed greater than the first speed; and
  - maintaining the DC voltage at a second constant DC voltage when the vehicle speed is greater than the second speed;

wherein the fifth step includes the steps of:
  - turning on the semiconductor switch to keep the value of the braking resistor at a constant resistance when the vehicle speed is between the first speed and a third speed greater than the second speed;
  - operating the semiconductor switch in a chopping operation to increase the value of the braking resistor to greater than the constant resistance when the vehicle speed is below the first speed; and
  - increasing the value of the braking resistor above the constant resistance when the vehicle speed is greater than the third speed; and
  - further including the step of maintaining the output voltage from the AC generator at a constant AC voltage throughout the preceding steps, the constant AC voltage being determined such that the DC voltage of the first step is less than the first constant DC voltage.

5,747,960

COMPUTER CONTROLLED GEARSHIFT WITH AUTOMATIC CLUTCH ACTUATOR FOR VEHICLES WITH MANUAL GEARBOXES

Saulo Quaggio, Sáo Paulo, Brazil, assignor to Saulo Quaggio, Sao Paulo, Brazil

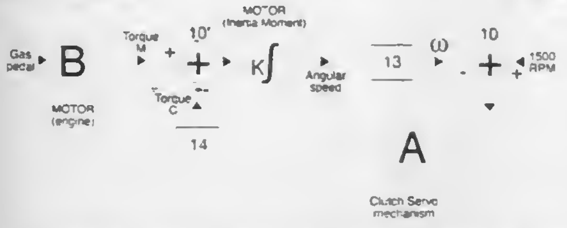
PCT No. PCT/BR94/00021, § 371 Date Jul. 22, 1996, § 102(e) Date Jul. 22, 1996, PCT Pub. No. WO95/02857, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 5, 1994, Ser. No. 583,068

Claims priority, application Brazil, Jul. 8, 1993, 9302458

Int. Cl.^{6} B60K *20/00;* **G05G** *9/00*

U.S. Cl. 318—625 **11 Claims**



1. A computer controlled gearshift system with automatic clutch actuator for vehicles with manual gearboxes, including servo mechanisms, electric sensors, magnetic sensors, resistive potentiometric sensors, electric actuators, connected to and controlled by a central microprocessor controller unit, that performs instructions to automate gearshifts and clutch actuation in a manual gearbox equipped vehicle, in such a way to enable it to behave like an automatic transmission vehicle, said system comprising steps of:
  - continuously adjusting clutch movement by a twin servo mechanism clutch movement action setup at any point of its travel range by furnishing, through a digital-to-analog converter output an engaging or a disengaging signal that is fed to a non-inverting input of an electronic summing circuit that is further fed in it's two other inverting inputs with feedback signals coming from the clutch closed-loop servo motor axle rotation, wherein one of said two other inputs is proportional to its angular speed of rotation, and the other one is proportional to it's angular position;
  - routing the electronic summing circuit result to a power amplifier that drives the direct current motor in one of the two possible senses of rotation that occurs in each movement of engaging or disengaging, wherein
  - while a M torque by gas pedal position of said vehicle and its movements that reflects driver intentions that further control B block—Motor, said M torque being supplied to the non-inverting input of a mechanical summing device, wherein, when unloaded, represents the delayed inertia moment vehicle motor axle RPM and, at the vehicle departure from stop when a threshold RPM level is reached by the vehicle motor B block and detected at the electronic summing device;
  - controlling the clutch servo mechanism actuator (A) with said electronic summing device to engage the clutch that, by its turn, supplies a C torque represented by the instantaneous vehicle inertia moment as an inverted input of the mechanical summing device, thereby opposing it to the motor furnished M torque which reduces it as it is affected by the vehicles weight plus load inertia moment, allowing a new motor axle angular speed to be established;
  - measuring again by the motor RPM sensor to obtain a new angular value w that when compared to threshold RPM reference level at the electronic summing circuit;
  - supplying a signal (positive or negative) by said electronic summing circuit to the clutch servo mechanism, whereby its axle is moved clockwise or counterclockwise in order to maintain the C torque opposed to the M torque in such a way that the measured B block vehicle motor RPM remains close to the RPM reference level until this level is definitely surpassed by the vehicle motor RPM when the engaging action is definitely completed; and
  - providing, with a minimum of two gearshift, fixed steps servo mechanism employing positioning feedback.

5,747,961

BEAT FREQUENCY MOTOR POSITION DETECTION SCHEME FOR TUNING FORK GYROSCOPE AND OTHER SENSORS

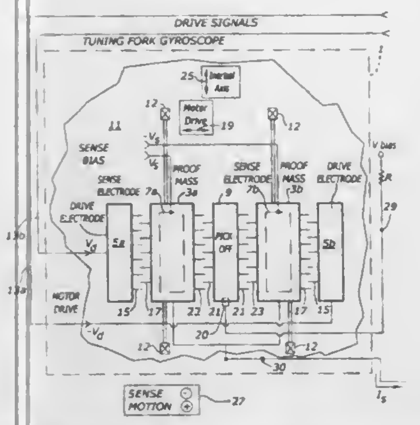
Paul A. Ward, Roslindale, and Anthony S. Kourepenis, Acton, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Oct. 11, 1995, Ser. No. 541,079

Int. Cl.^{6} G01P *15/14*

U.S. Cl. 318—646 **21 Claims**

1. Apparatus for detection of rotational motion comprising:
- at least one flexure supported proof mass;
- an out-of-plane motion sense electrode disposed below said proof mass, said out-of-plane sense electrode disposed on a substrate;
- a drive electrode operationally connected to said proof mass and operative to vibrate said proof mass in a plane of vibration;
- an in-plane pick-off operationally connected to said proof mass in the plane of vibration;
- a source of bias for said in-plane pick-off, said bias having one of an AC and AC+DC component(s); and



- an output signal indicative of motor amplitude provided by said in-plane pick-off.

5,747,962

METHOD AND APPARATUS FOR INCREASING THE STARTING TORQUE OF A TWO-PHASE SWITCHED RELUCTANCE MOTOR

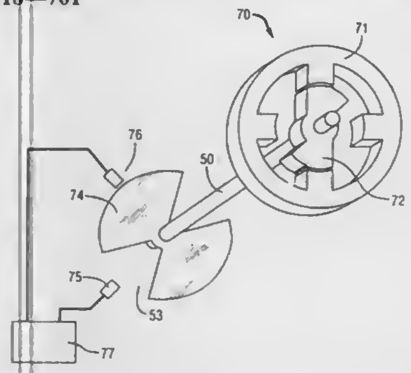
Norman Neilson Fulton, Leeds, United Kingdom, assignor to Switched Reluctance Drives Limited, Harrogate, United Kingdom

Filed Jun. 7, 1995, Ser. No. 486,940

Claims priority, application United Kingdom, Mar. 21, 1995, 9505655

Int. Cl.^{6} H02P *6/02*

U.S. Cl. 318—701 **31 Claims**



1. A method of operating a two-phase switched reluctance motor to produce torque in a desired direction, the motor including a rotor, a first phase winding and a second phase winding, the method comprising the acts of:
  - over a first range of rotor positions, energizing the first phase winding individually to produce torque in a desired direction;
  - over a second range of rotor positions, energizing the second phase winding individually to produce torque in the desired direction; and
  - over a third range of rotor positions, energizing both phase windings simultaneously such that both of the phase windings will produce torque in the desired direction to produce increased and smoother torque;
  - wherein the first, second, and third ranges of rotor positions are selected such that, for each phase winding and for each rotation of the rotor, the range of rotor positions in which each phase winding is energized is greater than the range of rotor positions in which each phase winding is not energized.

5,747,963

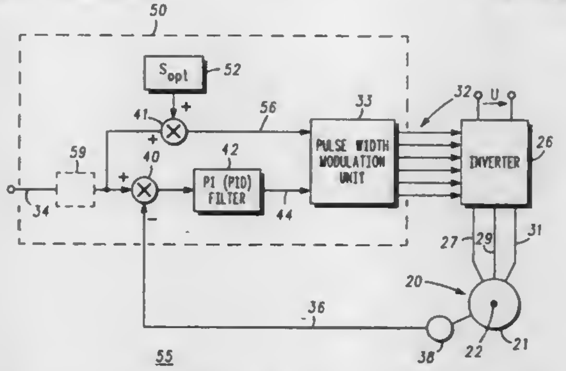
METHOD FOR CONTROLLING AN ELECTRIC MOTOR AND ELECTRIC APPARATUS

Radim Visinka, Olesnice, Czechoslovakia, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1996, Ser. No. 718,034

Int. Cl.^{6} H02P *5/28*

U.S. Cl. 318—807 **10 Claims**



1. A method for controlling an electric motor having a rotor and a stator, said method comprising the steps of determining an excitation frequency by adding a predetermined optimal slip frequency of said electric motor to a desired rotational frequency of said rotor and supplying said motor with a signal having said excitation frequency.

5,747,964

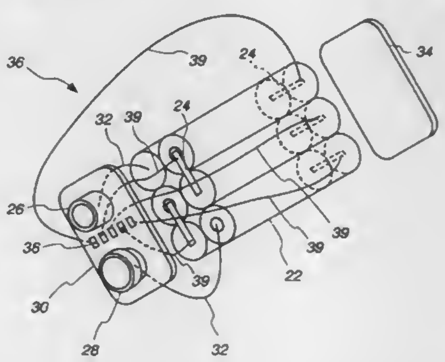
RECHARGEABLE BATTERY AND CHARGING SYSTEM

Robert R. Turnbull, Buchanan, Mich., assignor to Packard Bell NEC, Sacramento, Calif.

Continuation of Ser. No. 200,015, Feb. 22, 1994, abandoned. This application Jan. 17, 1997, Ser. No. 785,474

Int. Cl.^{6} H01M *10/46*

U.S. Cl. 320—2 **24 Claims**



1. A rechargeable multiple cell battery comprising:
- a plurality of serially connected cells, each having a positive and negative terminal,
- a plurality of conductive straps for connecting said positive and negative terminals from different cells together to form a series connection among said plurality of cells defining a voltage between a first positive terminal of one of said cells and a second negative terminal from another cell representing the sum of the individual cell voltages and further defining intermediate terminals between said first and second terminals, said intermediate terminals representing the junction between the series connected cells;
- a housing for housing said plurality of cells;

VOL
2 10
SS
1
MY
5
998
MI

an external positive and negative terminal, electrically connected to said first and second terminals, respectively, said external positive and negative terminals carried externally by said housing; and

a plurality of external auxiliary terminals carried externally by said housing, said external auxiliary terminals being electrically connected to said intermediate terminals.

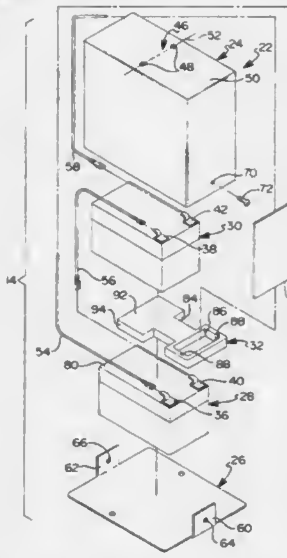
5,747,965
BATTERY PACK FOR POWERED MOTION FURNITURE

Larry P. LaPointe, Temperance, and Jonathan R. Saul, Erie, both of Mich., assignors to La-Z-Boy Incorporated, Monroe, Mich.

Filed Mar. 12, 1996, Ser. No. 613,588

Int. Cl.⁶ H01M *10/46;2/10;* **B60K** *1/00*

U.S. Cl. 320—5 **20 Claims**



8. A battery pack for use with powered motion furniture, said powered motion furniture including a first component movable relative to a second component, and an electric motor connectable to a power source, said electric motor having a drive member coupled to said first component and a power supply cord electrically connectable to a power source, said battery pack comprising:

a housing defining a cavity, said housing including connecting means for coupling said housing to the powered motion furniture;

a first battery disposed within said cavity;

a second battery disposed within said cavity and electrically connected with said first battery;

a circuit board for regulating the charging and discharging of said first and second batteries, said circuit board electrically connected to each of said first and second batteries and electrically connectable to the electric motor;

support means disposed in said cavity for securing said circuit board within said cavity; and

an umbilical cord electrically connected to said circuit board and connectable to the electric motor, said circuit board regulating the charging and discharging of said first and second batteries by selectively permitting a battery charging current to flow through said umbilical cord from the electric motor to said first and second batteries and a battery discharging current to flow through said umbilical cord from said first and second batteries to the electric motor.

5,747,966
BATTERY CHARGING/DISCHARGING APPARATUS WITH SERIAL BATTERY CONNECTION

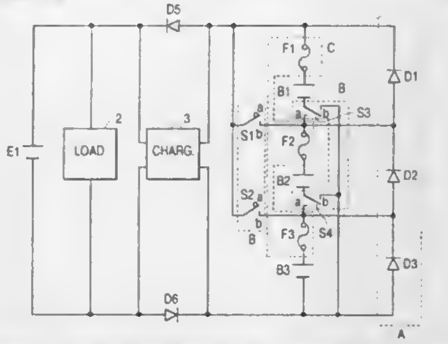
Yoshiji Minamoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 15, 1994, Ser. No. 306,371

Claims priority, application Japan, Jan. 13, 1994, 6-001815

Int. Cl.⁶ H01M *10/46*

U.S. Cl. 320—6 **2 Claims**



1. A battery charging/discharging apparatus for a plurality of batteries, comprising:

a charger coupled to the plurality of batteries, to charge the plurality of batteries;

fuses respectively connected to the plurality of batteries; and

switches coupled to the plurality of batteries to connect the batteries in a parallel connection with said charger for charging, so that the fuses are connected in a parallel connection with the charger, and each fuse and corresponding battery are connected in a serial connection with the charger, and to connect the batteries in a serial connection for discharging.

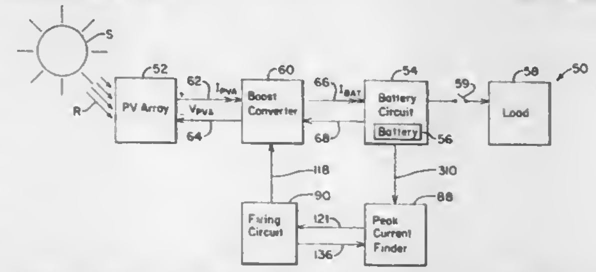
5,747,967
APPARATUS AND METHOD FOR MAXIMIZING POWER DELIVERED BY A PHOTOVOLTAIC ARRAY

Eduard Muljadi, and Roger W. Taylor, both of Golden, Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Feb. 22, 1996, Ser. No. 605,351

Int. Cl.⁶ H01M *10/46;10/44*

U.S. Cl. 320—39 **48 Claims**



1. Apparatus for controlling electric power that is generated by a photovoltaic cell and delivered to a battery that has positive and negative terminals, wherein the photovoltaic cell also has positive and negative terminals and the photovoltaic cell generates an electric voltage between its positive and negative terminals and a corresponding electric current flowing out of its positive terminal when radiation is incident on the photovoltaic cell, and wherein the battery has an electric voltage between its positive and negative terminals that is approximately constant during a predetermined time period, comprising:

converter means electrically connected to the photovoltaic cell and to the battery for electrically connecting and disconnecting the photovoltaic cell to and from the battery, for controlling and varying the electric voltage generated between the positive and negative terminals of the photovoltaic cell, and for generating and controlling an electric current that flows through the battery such that the electric power generated by the photovoltaic cell is at a maximum during the time period when the electric current flowing through the battery is at a maximum during the time period, said converter means including a switch means for controlling when said converter means electrically connects the photovoltaic cell to the battery and when said converter means electrically disconnects the photovoltaic cell from the battery, wherein said switch means has a first state of operation and a second state of operation such that when said switch means is operating in its first state of operation the photovoltaic cell is electrically connected to the battery and when said switch means is operating in its second state of operation the photovoltaic cell is electrically disconnected from the battery;

peak current determining means coupled to the battery for determining when the electric current flowing through the battery is at a maximum and for generating an electric signal when the electric current flowing through the battery is at a maximum; and

switch control means electrically connected to said switch means and to said peak current determining means for controlling when said switch means is operating in said first state of operation and when said switch means is operating in said second state of operation, wherein said switch control means is responsive to said electric signal generated by said peak current determining means.

21. Method of controlling electric power generated by a photovoltaic cell and delivered to a battery that has positive and negative terminals, wherein the photovoltaic cell also has positive and negative terminals and the photovoltaic cell generates an electric voltage between its positive and negative terminals and a corresponding electric current flowing out of its positive terminal when radiation is incident on the photovoltaic cell, and wherein the battery has an electric voltage between its positive and negative terminals that is approximately constant during a predetermined time period, comprising the steps of:

electrically coupling the photovoltaic cell and the battery such that an electric current flows through the battery, varying the electric voltage generated between the positive and negative terminals of the photovoltaic cell will result in varying of the electric current flowing through the battery, and such that the electric power generated by the photovoltaic cell during the time period is at a maximum when the electric current flowing through the battery during the time period is at a maximum;

varying the electric voltage between the positive and negative terminals of the photovoltaic cell during a first portion of the time period;

determining when the electric current flowing through the battery is at a maximum during said first portion of the time period; and

maintaining the electric voltage between the positive and negative terminals of the photovoltaic cell for a second portion of the time period such that said determined maximum electric current flowing through the battery is maintained during said second portion of the time period.

5,747,968
LITHIUM POLYMER BATTERY CHARGER APPARATUS

Lauren V. Merritt, Sunnyvale; Vincent L. Teofilo, Los Gatos; Roger Paul Hollandsworth, Boulder Creek; Zaid B. Rodriguez, Sunnyvale, and Jack G. Lovgren, Milpitas, all of Calif., assignors to Lockheed Martin Corp. Missiles & Space, Sunnyvale, Calif.

Filed Jan. 11, 1996, Ser. No. 584,798

Int. Cl.⁶ H02J *7/00*

U.S. Cl. 320—119 **4 Claims**

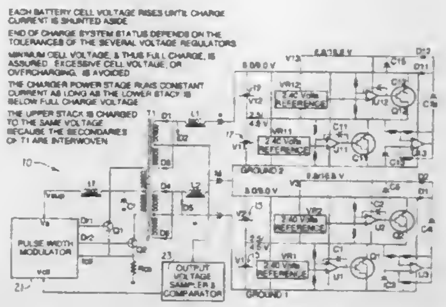
2. A lithium polymer charger apparatus for charging a plurality of equal charge point lithium polymer battery cells, said apparatus comprising,

a plurality of equal charge point lithium polymer battery cells,

each of the lithium polymer battery cells having a fully charged condition,

a transformer having one primary winding and a plurality of equally matched secondary windings,

each of the secondary windings connected to at least one lithium polymer battery cell,


EACH BATTERY CELL VOLTAGE RISES UNTIL CHARGE CURRENT IS SHUNTED ASIDE
END OF CHARGE SYSTEM STATUS DEPENDS ON THE TOLERANCES OF THE SEVERAL VOLTAGE REGULATORS
MINIMUM CELL VOLTAGE, & THUS FULL CHARGE, IS ASSURED. EXCESSIVE CELL VOLTAGE, OR OVERCHARGING, IS AVOIDED
THE CHARGER POWER STAGE RUNS CONSTANT CURRENT AS LONG AS THE LOWER STACK IS BELOW FULL CHARGE VOLTAGE
THE UPPER STACK IS CHARGED TO THE SAME VOLTAGE BECAUSE THE SECONDARIES OF T1 ARE INTERWOVEN
T1
D1
L1
VR12
2.40 Volts REFERENCE
U12
Q12
VR11
2.40 Volts REFERENCE
U11
GROUND 2
VR2
2.40 Volts REFERENCE
U2
Q2
VR1
2.40 Volts REFERENCE
U1
Q1
GROUND 1
10
PULSE WIDTH MODULATOR
OUTPUT VOLTAGE SAMPLER & COMPARATOR
23
21

control means for controlling the voltage on the primary winding to produce a voltage in each secondary winding which is effective to charge each lithium polymer battery cell and to bring each lithium polymer battery cell to said fully charged condition,

charge terminating means for discontinuing the charging when all of the cells have been fully charged, and

wherein multiple lithium polymer battery cells are connected in series with a secondary winding and including detecting means for detecting when a particular lithium polymer battery cell is nearing full charge and wherein, in response to the detecting means detecting that a particular lithium polymer battery cell is nearing full charge, the control means shunt sufficient current around that cell to avoid overcharging that cell and continue the shunting until all of the cells have been fully charged.

5,747,969
METHOD OF CHARGING A RECHARGEABLE BATTERY WITH PULSES OF A PREDETERMINED AMOUNT OF CHARGE

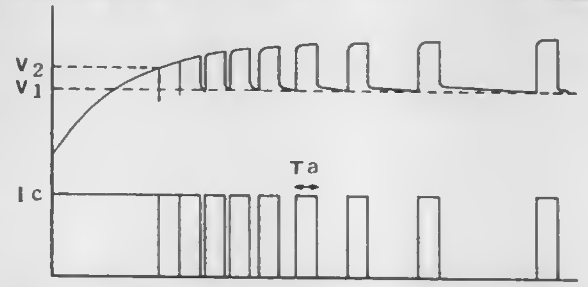
Mikitaka Tamai, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 13, 1996, Ser. No. 748,631

Claims priority, application Japan, Nov. 21, 1995, 7-302950

Int. Cl.⁶ H01M *10/44;10/46*

U.S. Cl. 320—141 **35 Claims**



1. A method of charging a rechargeable battery comprising:

pulse charging the rechargeable battery by

detecting battery voltage of the rechargeable battery,

determining whether the battery voltage is equal to or less than a first prescribed voltage,

charging the battery by applying a predetermined amount of charge to the battery when the battery voltage is determined to be equal to or less than the first prescribed voltage, wherein the predetermined amount of charge is based on an amount of charging current and a pulse time period, and

suspending charging of the battery after the predetermined amount of charge has been applied to the battery,

wherein the detecting, determining, charging, and suspending are sequentially performed a plurality of times, the first prescribed voltage is the same each of the plurality of times, and the predetermined amount of charge is the same each of the plurality of times.

20. A method of charging a rechargeable battery comprising:

pulse charging the rechargeable battery by

detecting battery voltage of the rechargeable battery,

determining whether the battery voltage is equal to or less than a first prescribed voltage.

charging the battery by applying an amount of charge to the battery when the battery voltage is determined to be equal to or less than the first prescribed voltage, wherein the amount of charge is based on an amount of charging current and a pulse time period and wherein the pulse time period is based on the detected battery voltage, and

suspending charging of the battery after the amount of charge has been applied to the battery,

wherein the detecting, determining, charging, and suspending are sequentially performed a plurality of times such that the battery voltage gradually increases, the first prescribed voltage is the same each of the plurality of times, and the amount of charge is gradually reduced by reducing the pulse time period each of the plurality of times so that the pulse time period is inversely proportional to the battery voltage as the battery voltage gradually increases.

5,747,970

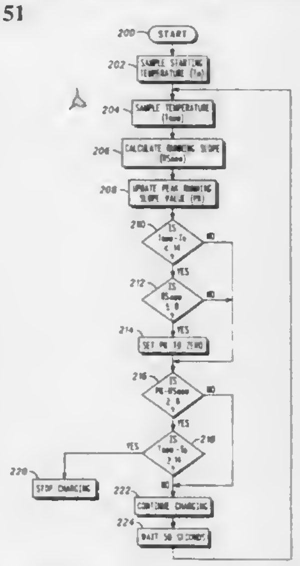
BATTERY CHARGER CHARGING TIME CONTROL

Robert Michael Johnson, Jr., Lake Zurich, and Monefax Joseph Gilot, Addison, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1996, Ser. No. 718,797

Int. Cl.⁶ H02J *7/04;* **G01N** *27/2116*

U.S. Cl. 320—151 **14 Claims**



1. A circuit for charging a battery, comprising:

a temperature signal input for inputting a temperature signal indicative of a temperature of the battery;

a switch having an input to couple to a power source and an output for coupling to the battery, the switch to selectively supply power to the output under control of a control signal; and

a controller coupled to the temperature signal input and to the switch to generate the control signal, the controller calculating a rate of change of the temperature signal and storing a peak rate of change value during a battery charging interval, the controller to generate the control signal to control the switch to disable charging of the battery when the rate of change drops below the peak rate of change value by a temperature rate of change threshold amount.

5,747,971

POSITION AND VELOCITY SENSORLESS CONTROL FOR A MOTOR GENERATOR SYSTEM OPERATED AS A MOTOR USING EXCITER IMPEDANCE

Gregory I. Rozman, Rockford; Albert L. Markunas, Roscoe; Michael J. Hanson, Loves Park, and Leland E. Weber, Winnebago, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 8, 1996, Ser. No. 694,081

Int. Cl.⁶ H02K *29/06*

U.S. Cl. 322—10 **21 Claims**

1. A motor generator system comprising:

a prime mover for driving an output shaft;

a main motor and generator having a rotor, driven by the output shaft, for producing electrical power on at least one output winding in response to the prime mover rotating the output shaft and for driving the output shaft in response to operation as a motor;

an exciter having a rotor, driven by the output shaft, for applying excitation to a field winding of the main motor generator during operation for producing electrical power on the at least one output winding and for applying current to the field winding of the main motor generator to produce a magnetic field in the field winding during operation of the main motor generator as a motor;

circuitry, responsive to current in a field winding of the exciter, for producing an output signal representing a position of the rotor of the main motor generator; and

a main inverter, responsive to the output signal, for commutating application of current to the at least one output winding to control operation of the main motor generator during operation as a motor.

5,747,972

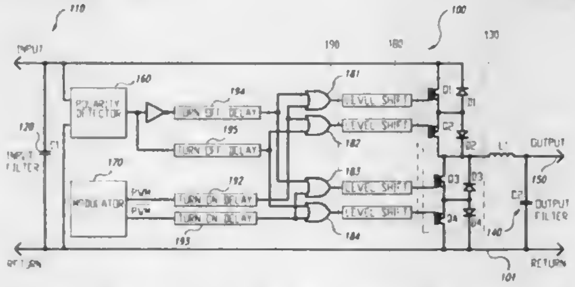
METHOD AND APPARATUS FOR ELECTRONIC POWER CONTROL

David F. Baretich, Lake Oswego, Oreg., and Gregory P. Wiegand, Poulsbo, Wash., assignors to MicroPlanet Ltd., Poulsbo, Wash.

Filed Jan. 11, 1995, Ser. No. 371,512

Int. Cl.⁶ G05F *1/613;1/44*

U.S. Cl. 323—223 **13 Claims**



1. A single stage AC to AC power controller for controlling an AC input voltage to a load, the input voltage having one or more phases, the controller comprising:

a circuit comprised of four independently controllable switches and at least one inductor, one such circuit for each input line to be regulated, the switches and inductor(s) of the circuit arranged in a conventional power regulator topology, whereby a selected regulator topology may be implemented, depending upon the position of the inductor(s) with respect to the switches and to the input voltage;

the controller further comprising logic control having a polarity detector in parallel with the input voltage, the polarity detector having two outputs; and

a duty cycle modulator having two outputs; each of the outputs of the polarity detector and of the duty cycle modulator being inverted with respect to one another;

wherein the logic control separately controls each switch so that there is always an electrically conducting path through the switches wherein there is at least one switch conducting.

5,747,973

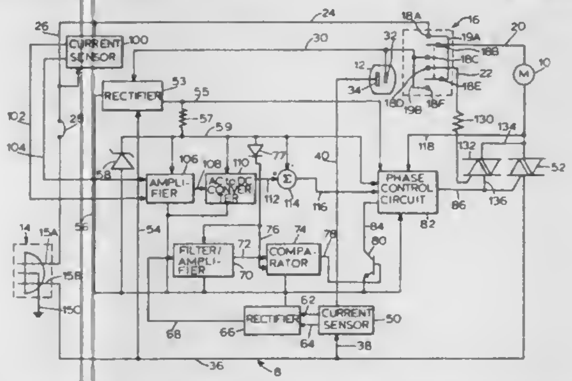
CURRENT REGULATING SWITCH CIRCUIT

James M. Robitaille; Robert L. Crevling, Jr., and Mark E. Baer, all of Williamsport, Pa., assignors to Shop Vac Corporation, Williamsport, Pa.

Filed Dec. 11, 1996, Ser. No. 763,805

Int. Cl.⁶ G05F *1/10;* **H02J** *1/00*

U.S. Cl. 323—239 **26 Claims**



1. A regulating switch circuit for conditioning operation of a first load upon operation of a second load wherein the first load and the second load consume electrical energy from a power source, the regulating switch circuit comprising:

means for detecting the operation of the second load;

means for sensing an amount that a parameter of the electrical energy supplied to at least one of the first and second loads exceeds a predetermined level;

a load control device coupling at least one of the first and second loads to the power source, wherein the load control device has a control terminal; and

a control circuit coupled to the control terminal of the load control device and responsive to the sensing means and the detecting means to variably adjust the electrical energy supplied by the power source to at least one of the first and second loads to limit the parameter of the electrical energy to the predetermined level.

5,747,974

INTERNAL SUPPLY VOLTAGE GENERATING CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE

Jun-Young Jeon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 12, 1996, Ser. No. 664,952

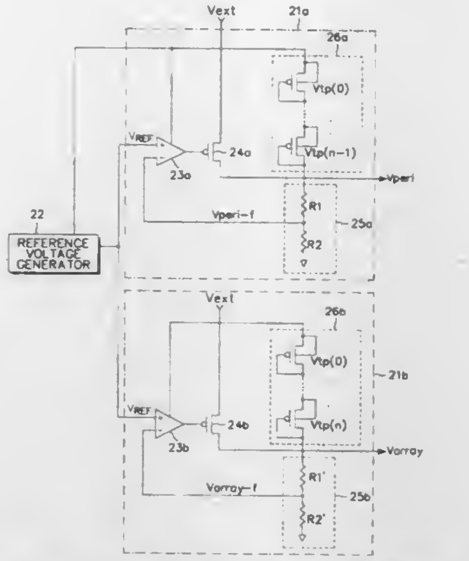
Claims priority, application Rep. of Korea, Jun. 12, 1995, 15394/1995

Int. Cl.⁶ G05F *1/59*

U.S. Cl. 323—269 **10 Claims**

1. A circuit for generating internal supply voltages from an external supply voltage, comprising:

a first internal voltage generating circuit having an input coupled to the external supply voltage and an output generating a first internal supply voltage, the first internal supply voltage clamped at a first clamping voltage for a given external supply voltage;



a second internal voltage generating circuit having an input coupled to the external supply voltage and an output generating a second internal supply voltage, the second internal supply voltage clamped at a second clamping voltage offset below the first clamping voltage for the external supply voltage.;

a first voltage boosting circuit coupled between the external supply voltage and the output of the first internal voltage generating circuit; and

a second voltage boosting circuit coupled between the external supply voltage and the output of the second internal voltage generating circuit,

the first and second voltage boosting circuit boosting the first and second internal supply voltage as the external supply voltage increases above the external supply voltage while maintaining the first and second internal supply voltage at the given offset voltage.

5,747,975

OVERLOAD PROTECTION CIRCUIT FOR MOS POWER DRIVERS

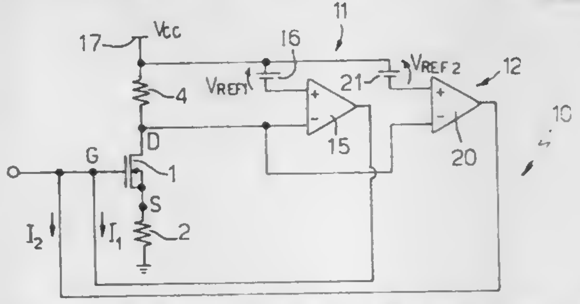
Francesco Colandrea, Segrate, and Vanni Poletto, Casale Monferrato, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 21, 1995, Ser. No. 408,014

Claims priority, application European Pat. Off., Mar. 22, 1994, 94830125

Int. Cl.⁶ G05F *1/569;* **H02H** *7/00*

U.S. Cl. 323—276 **29 Claims**



1. An overload protection circuit for a MOS power driver, the MOS power driver having a control terminal at a control potential and supplied with a drive current, said protection circuit comprising:

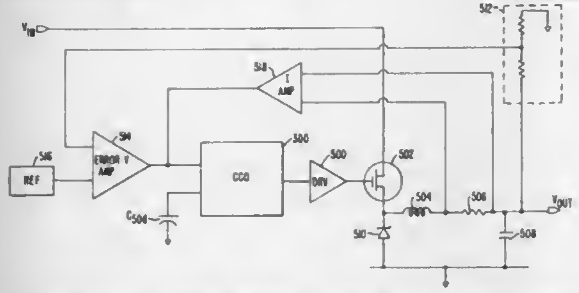
OL
2 10
SS
1
MY
5
998
MI

- a slow regulating loop for measuring an electrical quantity related to said drive current, and for generating a current limiting signal for regulating said control potential; and
- a fast regulating loop, connected parallel to said slow regulating loop, for detecting rapid variations in said drive current and for generating a rapid control signal for reducing the control potential;

wherein said slow regulating loop has a first gain, a high degree of precision, and is stable; and said fast regulating loop has a second gain which is greater than the first gain.

5,747,976
CONSTANT ON-TIME ARCHITECTURE FOR SWITCHING REGULATORS

Hok-Tung Wong, San Jose, and Charles L. Vinn, Milpitas, both of Calif., assignors to Raytheon Company, Del.
Filed Mar. 26, 1996, Ser. No. 622,098
Int. Cl.⁶ G05F *1/56*
U.S. Cl. 323—282 **16 Claims**

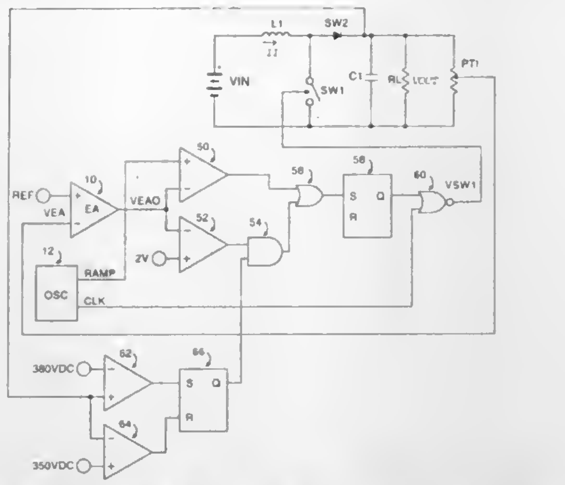


1. A switching voltage regulator circuit having an input terminal and an output terminal comprising:
- an inductor coupled between the circuit input terminal and the circuit output terminal;
- a switch element coupled to said inductor;
- a current-controlled oscillator having an output terminal coupled to a control terminal of said switch element, said current-controlled oscillator comprising:
  - a comparator having a first input terminal coupled to a reference signal, a second input terminal, and an output terminal;
  - an adjustable current source coupled to said second input terminal of said comparator;
  - a fixed current source coupled to said second input terminal of said comparator;
  - a timing capacitor coupled to said second input terminal of said comparator, said timing capacitor being charged and discharged by said adjustable current source and said fixed current source; and
- an error circuit having a first terminal coupled to the circuit output terminal and an output terminal coupled to said current-controlled oscillator.

5,747,977
SWITCHING REGULATOR HAVING LOW POWER MODE RESPONSIVE TO LOAD POWER CONSUMPTION

Jeffrey H. Hwang, Saratoga, Calif., assignor to Micro Linear Corporation, San Jose, Calif.
Continuation of Ser. No. 413,249, Mar. 30, 1995, abandoned. This application Aug. 25, 1997, Ser. No. 917,205
Int. Cl.⁶ G05F *1/56*
U.S. Cl. 323—284 **9 Claims**

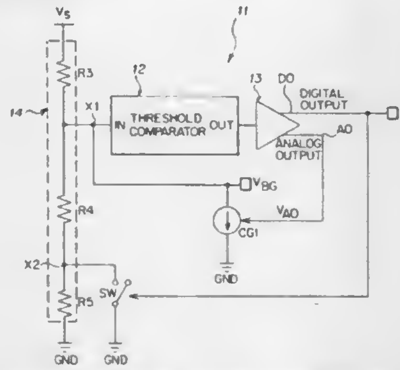
1. An apparatus for drawing power from an input source and supplying a voltage to a load device, comprising:
- a. means for drawing power from the input source comprising a switch for controlling charging of an inductor with a current and discharging the inductor;
- b. means for delivering a voltage to the load device wherein the voltage is formed by a storage device coupled to receive the current;



- c. means for forming an error signal coupled to the storage device, wherein the error signal is representative of a difference between a level of the voltage formed by the storage device and a desired voltage level;
- d. means for comparing the error signal to a periodic ramp signal having a fixed frequency for controlling a duty cycle of the switch, the means for comparing coupled to the means for forming;
- e. means for determining coupled to the load device for determining when the load device enters a light load period wherein the load device enters a light load period when the error signal falls below a light load threshold level; and
- f. means for temporarily disabling coupled to the means for determining and to the means for drawing power for temporarily disabling the means for drawing power when the load device enters a light load period.

5,747,978
CIRCUIT FOR GENERATING A REFERENCE VOLTAGE AND DETECTING AN UNDER VOLTAGE OF A SUPPLY AND CORRESPONDING METHOD

Roberto Gariboldi, Lacchiarella, and Francesco Pulvirenti, Acireale, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, and Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, both of Italy
Filed Mar. 22, 1996, Ser. No. 622,459
Claims priority, application European Pat. Off., Mar. 24, 1995, 95830111
Int. Cl.⁶ G05F *3/16*
U.S. Cl. 323—313 **24 Claims**

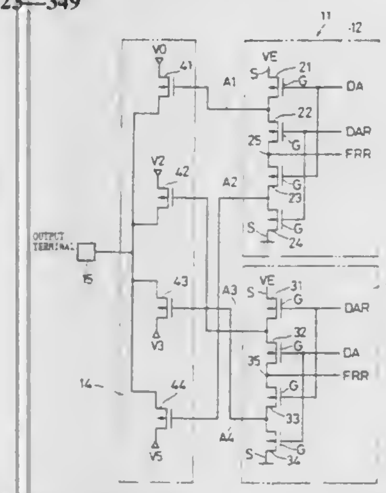


17. A circuit for generating a reference voltage and for detecting a drop in a supply voltage comprising:
- means for comparing a voltage input to a threshold input and for producing an output indicative of the comparison;
- means for producing a voltage equal to a predetermined fraction of the supply voltage, the voltage produced applied as the voltage input to the means for comparing; and

- means for feeding back the output of the means for comparing to the threshold input of the means for comparing, the means for feeding back further including
- means responsive to the output of the means for comparing, for extracting from the threshold input a current;
- buffer means for receiving the output indicative of the comparison and having an output; and
- switch means connected to the means for producing a voltage equal to a predetermined fraction of the supply voltage and responsive to the output of the buffer means, for changing the predetermined fraction of the supply voltage produced by the means for producing a voltage equal to a predetermined fraction of the supply voltage.

5,747,979
MULTIPLE VALUE VOLTAGE OUTPUT CIRCUIT AND LIQUID CRYSTAL DISPLAY DRIVING CIRCUIT

Atsushi Nagai, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 11, 1996, Ser. No. 678,329
Claims priority, application Japan, Sep. 12, 1995, 7-234322; Sep. 27, 1995, 7-249512
Int. Cl.⁶ G05F *1/12*
U.S. Cl. 323—349 **6 Claims**

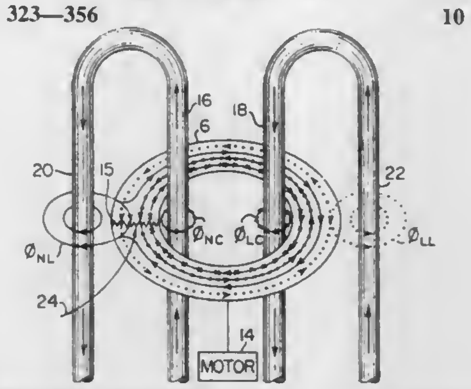


1. A multiple value voltage output circuit which selectively outputs one of plural voltages in accordance with a first input signal whose level is shifted at intervals of a predetermined period from a first power source potential to a second power source potential or from the second power source potential to the first power source potential, and in accordance with a second input signal whose level is determined to be one of the first and second power source potentials at intervals of a predetermined reference period shorter than the predetermined period, the multiple value voltage output circuit comprising:
- plural first switching devices each having one end connected to a corresponding voltage among the plural voltages and another end connected to an output terminal in common; and
- a control circuit for outputting a control signal by which one of the plural first switching devices is put into conduction state, and the others of the plural first switching devices are put into cutoff state,

wherein the control circuit comprises a logic circuit for each first switching device composed of two second switching devices which are cascade-connected to each other, either of the cascade-connected second switching devices is put into conduction state in accordance with the second input signal, the first or second power source potential is supplied to one end of the cascade-connected second switching devices, the first input signal is supplied to the other end of the cascade-connected second switching devices, and a potential of the node of the cascade-connected second switching devices is used as the control signal for the corresponding first switching device.

5,747,980
DIFFERENTIAL TRANSFORMER CORRECTION BY COMPENSATION

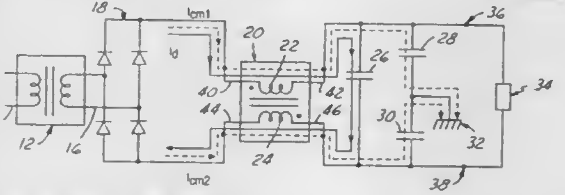
Bernard Gershen, Centerport, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed May 30, 1995, Ser. No. 453,608
Int. Cl.⁶ H01F *15/04*
U.S. Cl. 323—356 **10 Claims**



1. A differential transformer comprising a toroidal core formed of magnetic material which displays a non-uniform permeability resulting in a compromised differential signal detection ability including means for correcting said differential signal detection ability by compensation, said differential transformer further comprising:
- a phase wire including a line end and a load end, said phase wire extending through a center of said magnetic core for transporting a first current in a first direction;
- a neutral wire including a line end and a load end, said neutral wire extending through said magnetic core center for transporting a second current in a second direction, said second direction substantially opposite said first direction; and
- a shunt wire coupled in series with a single component comprising a resistor to further adjust an amount of said shunt current portion, said shunt wire having first and second ends, said shunt wire being electrically connected at its first and second ends to one of said phase and neutral wires to form a path for shunting a portion of one of said first and second currents outside said magnetic core ensuring that first and second signals generated in said transformer as a result of said currents are substantially adjusted.

5,747,981
INDUCTOR FOR AN ELECTRICAL SYSTEM

Robert J. Callanan, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 2, 1996, Ser. No. 758,717
Int. Cl.⁶ H01F *27/24;27/26*
U.S. Cl. 323—362 **18 Claims**



1. An inductor comprising:
- a core defining a first electromagnetic path, a second electromagnetic path and a third electromagnetic path, said first and second magnetic paths distinct from one another, said third electromagnetic path substantially closing said first and said second electromagnetic paths;
- a first electrical coil wound about at least a portion of said first electromagnetic path; and
- a second electrical coil wound about at least a portion of said second electromagnetic path;

wherein said first electromagnetic path contains a first air gap and said second electromagnetic path contains a second air gap.

/OL
2 10
SS
1
MY
5
998
MI

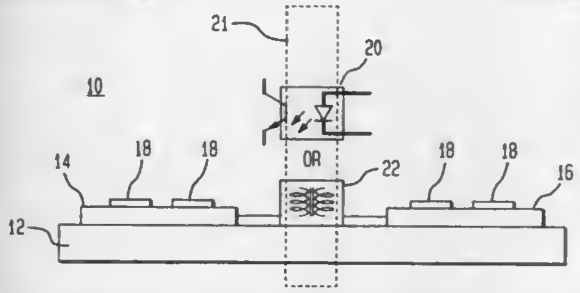
5,747,982
MULTI-CHIP MODULES WITH ISOLATED COUPLING BETWEEN MODULES

Douglas John Dromgoole, San Diego, Calif.; Anatoly Feygenson, Hillsboro; Robert Charles Frye, Piscataway, both of N.J.; Ashraf Wagih Lotfi, Rowlett, Tex., and King Llen Tal, Berkeley Heights, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 5, 1996, Ser. No. 761,047

Int. Cl.^{6} G05F *5/00;* **H03H** *7/00*

U.S. Cl. 323—902 **11 Claims**



1. A silicon-on-silicon dual multi-chip module apparatus comprising:

a circuit board having a voltage isolation boundary;

a pair of multi-chip modules commonly disposed on said circuit board for use as a single coupled circuit, wherein said pair of multi-chip modules comprises a primary side multi-chip module and a secondary side multi-chip module;

said primary side multi-chip module mounted on said circuit board on one side of said voltage isolation boundary, said primary side multi-chip module including at least one integrated circuit chip;

said secondary side multi-chip module mounted on said circuit board on the other side of said voltage isolation boundary, said secondary side multi-chip module including at least one integrated circuit chip; and

an isolation coupling device for transmitting and receiving signals between said primary and secondary side multi-chip modules across said voltage isolation boundary.

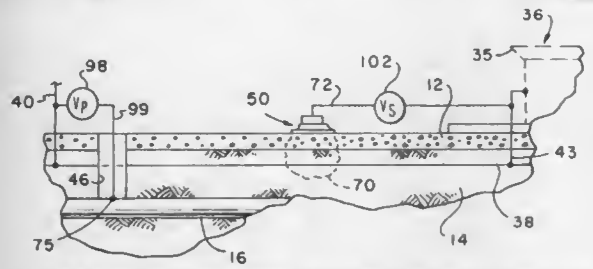
5,747,983
APPARATUS AND METHOD FOR MEASURING POTENTIALS THROUGH PAVEMENTS FOR BURIED PIPELINE CATHODIC PROTECTION SYSTEMS

Pedro F. Lara, Dallas, and Mark W. Mateer, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 361,758, Dec. 22, 1994, Pat. No. 5,596,267. This application Sep. 9, 1996, Ser. No. 710,000

Int. Cl.^{6} G01R *27/26*

U.S. Cl. 324—71.1 **5 Claims**



1. Apparatus for establishing electrical conductivity between a reference electrode and soil under a pavement layer comprising:

a first container including a permeable bottom closure and means for supporting a first reference electrode in electrically conductive engagement with said bottom closure, said first container being operable to be supported on the surface of a pavement layer over a predetermined point for establishing electrical conductivity between the soil under said pavement layer and said first reference electrode; and

a quantity of electrolyte disposed in said first container and permeating said bottom closure and said layer of pavement to provide ion transport between said first reference electrode and said soil under said pavement.

5,747,984
SWITCHING COMPONENT FOR DETECTING CONTACT EROSION

Dietrich Amft, Chemnitz; David-Walter Branston, Effeltrich; Jörg Kieser, Forchheim, and Reinhard Maler, Herzogenaurach, all of Germany, assignors to Siemens Aktiengesellschaft

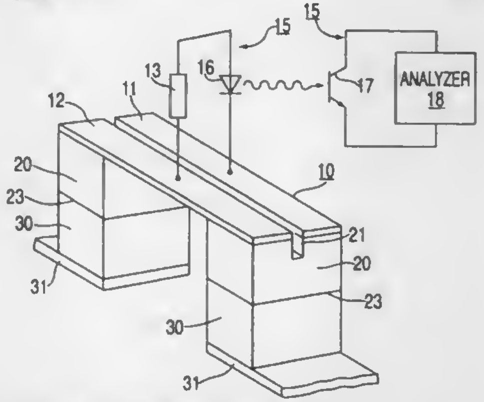
PCT No. PCT/DE94/00244, § 371 Date Sep. 22, 1995, § 102(e) Date Sep. 22, 1995, PCT Pub. No. WO94/22153, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 10, 1994, Ser. No. 525,796

Claims priority, application Germany, Mar. 22, 1993, 43 09 177.6

Int. Cl.^{6} G01R *31/00;* **H01H** *71/04*

U.S. Cl. 324—71.2 **24 Claims**



1. A switching component comprising:

at least two contact parts mounted on a contact carrier in a switch housing; and

means for monitoring contact erosion of the at least two contact parts, the means for monitoring being coupled to the contact carrier,

wherein the contact carrier is divided and the at least two contact parts are slotted at a rear side thereof and are mounted on the divided contact carrier.

5,747,985
OPTICAL-ELECTRONIC DEMAND METER USING OPTICAL METERING OUTFIT

Won-Bin Lee, Seoul; Hong-Keun Cho, Taejeon; Chung-Moo Song, Seoul; Yo-Hee Kim, Kyunggi-Do, and Young-Soo Kim, Kyungaangnam-Do, all of Rep. of Korea, assignors to Korea Electric Power Corporation, Seoul, Rep. of Korea

Filed Jun. 26, 1996, Ser. No. 670,423

Claims priority, application Rep. of Korea, Nov. 10, 1995, 95-45770

Int. Cl.^{6} G01R *11/63;31/00*

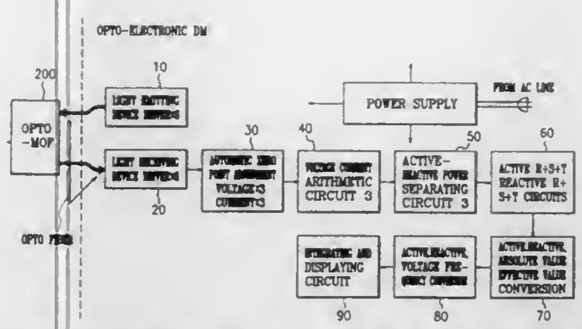
U.S. Cl. 324—103 R **6 Claims**

1. An optical-electronic demand meter, comprising:

a light emitting device driving circuit for driving a light emitting device, said light emitting device sending light rays through an optical fiber to an optical metering outfit (MOF);

a light receiving device and a light receiving circuit for receiving optical voltage and current signals as modulated optical signals roms said MOF through an optical fiber to convert said optical signals into electrical signals;

a zero point adjusting circuit for adjusting the converted electrical voltage and current signals of said light receiving circuit to make the central point of the signal positioned at an electrical zero point;



a multiplying circuit for multiplying the output voltage and current signals of said zero point adjusting circuit to form power signals;

an active/reactive power separating circuit for separating the power signals of said multiplying circuit into active power signals and reactive power signals;

a power summing circuit for summing the active and the reactive power of said active/reactive power separating circuit for respective phases;

an effective value converting circuit for converting the absolute values of the active power and the reactive power of said power summing circuit into effective values;

a voltage/frequency converting circuit for generating pulses of frequencies corresponding to the output of said effective value converting circuit;

an integrating and displaying circuit for calculating and integrating the pulse signals of said voltage/frequency converting circuit, and for storing and displaying the integrated data; and

a power source circuit for supplying power to the above mentioned circuits, and including a battery backup circuit for ensuing operation time for storing the data during a power failure.

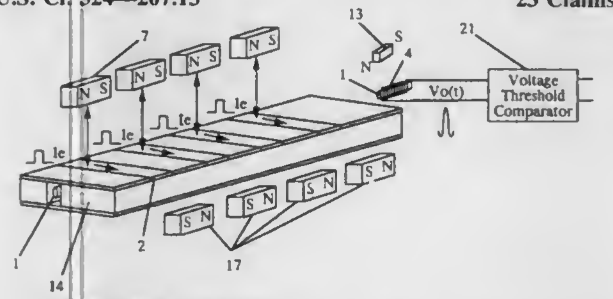
5,747,986
ARRAY SENSORS BASED ON THE MAGNETROSTRICTIVE DELAY LINE TECHNIQUE

Evangelos Hristoforou, c/o V. Mantzikas, P.O. Box 3884, IO2IO Athens, Greece

Filed May 6, 1992, Ser. No. 880,174

Int. Cl.^{6} G01B *7/14;* **G01R** *33/02;* **G08C** *21/00;* **G01L** *1/00*

U.S. Cl. 324—207.13 **23 Claims**



1. A sensor array comprising:

a plurality of parallel stress-current annealed sensing magnetostrictive delay lines made of a magnetostrictive material,

a plurality of parallel pulsed current conductors located at right angles to each one of said magnetostrictive delay lines, the crossing point of each one of said pulsed current conductors and each one of said magnetostrictive delay lines defining an acoustic stress point of origin of the sensor array,

means for generating current pulses in said plurality of parallel pulsed current conductors, each one of said current pulses causing an acoustic stress at each one of said acoustic stress points of origin propagating along each one of said magnetostrictive delay lines,

a plurality of magnetoresistive devices, each one of said magnetoresistive devices being located at a receiving point of each one of said magnetostrictive delay lines, each one of said magnetostrictive delay lines and each one of said pulsed current conductors and each one of said magnetoresistive devices defining a magnetic circuit of the sensor array, a change of magnetic flux being induced at each one of said plurality of magnetoresistive devices, as a result of each one of said plurality of acoustic stresses propagating along each one of said magnetostrictive delay lines, said change of magnetic flux producing a pulsed voltage output at the two ends of each one of said plurality of magnetoresistive devices,

a plurality of means for inducing a change in said magnetic circuit and in one of said pulsed voltage outputs, each one of said means for inducing a change in said magnetic circuit being located at any point of each one of said magnetostrictive delay lines, said point being a sensing point of the sensor array,

a plurality of small field magnets close to each one of said receiving points of said magnetostrictive delay lines to maximise each one of said pulsed voltage outputs,

means for measuring the value of pulse width T of each one of said pulsed voltage outputs, said means being connected at said two ends of each one of said plurality of magnetoresistive devices and obtaining said pulsed voltage outputs therefrom, including a voltage threshold comparator to monitor said value of pulse width T of each one of said pulsed voltage outputs, said value being normalized by means of multiplying it with a weight factor, said weight factor being selected to be the inverse maximum pulse width of the corresponding said pulsed voltage output, said weight factor being retrieved from a previously electronically stored weight factor table.

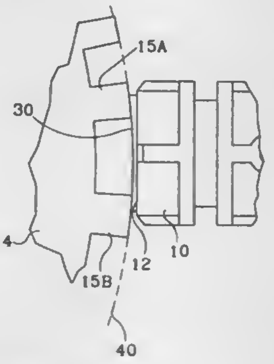
5,747,987
SENSOR WITH AN ARCUATE ABRADABLE RIB USED FOR POSITIONING

Paul E. Smith, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 1, 1996, Ser. No. 691,224

Int. Cl.^{6} G01B *7/30;* **G01P** *3/44;3/488;1/02*

U.S. Cl. 324—207.13 **7 Claims**



1. A sensor, comprising:

a component which is sensitive to a preselected parameter;

a housing structure, said component being disposed within said housing structure, said housing structure having a sensing face which is disposable proximate a rotatable object, said component being disposed within said housing structure proximate said sensing face and being selected to be responsive to movement of said rotatable object; and

a rib attached to said sensing face, said rib having an arcuate surface facing the rotatable object being shaped to conform to an outer arcuate surface of said rotatable object and prevent said sensing face from being disposed closer to said rotatable object than a preselected distance.

5,747,988

METHOD AND APPARATUS FOR FLAW DETECTION BY LEAKAGE FLUXES AND LEAKAGE FLUX SENSOR

Toshiyuki Suzuma, Osaka, Japan, assignor to Sumitomo Metal Industires Limited, Osaka, Japan

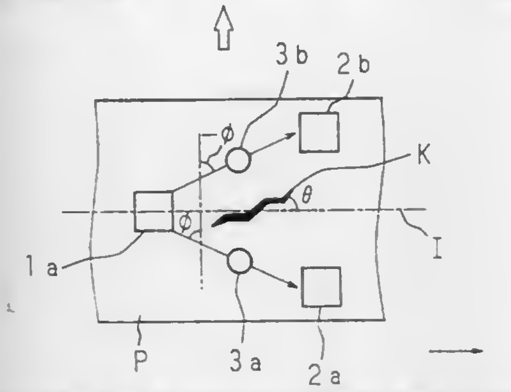
PCT No. PCT/JP95/01254, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO96/00386, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 22, 1995, Ser. No. 549,674

Claims priority, application Japan, Jun. 23, 1994, 6-142032; May 31, 1995, 7-133408; Jun. 5, 1995, 7-137798; Jun. 9, 1995, 7-143696

Int. Cl.⁶ G01N *27/83*

U.S. Cl. 324—232 **3 Claims**



2. An apparatus for flaw detection by leakage fluxes in which an object material is magnetized by a pair of magnet poles and leakage fluxes are detected by a sensor interposed between said two magnet poles while searching for a flaw of the object material in a predetermined flaw-detection direction, comprising:

a first pair of magnet poles positioned for magnetizing the object material in a direction different from the flaw-detection direction;

a second pair of magnet poles for magnetizing the object material in a direction different from the magnetization direction and flaw-detection direction in predetermined spaced relation from the magnetization area of said two magnet poles in the flaw-detection direction;

two sensors each of which is disposed between each of said first and second pairs of magnet poles for sensing magnetic flux;

means for calculating the output ratio between said two sensors;

means for determining the tilt angle of the target flaw on the basis of a predetermined relationship between the output ratio and the flaw tilt angle on the one hand and the calculated output ratio on the other hand;

means for correcting the amplitude of the output signals of said two sensors on the basis of a predetermined relationship between the flaw tilt angle and the amplitude change rate of the sensor output signal on the one hand and the tilt angle of the flaw determined on the other hand; and

means for calculating the depth of the flaw on the basis of the corrected amplitude of the output signals.

5,747,989

APPARATUS FOR NON-DESTRUCTIVELY DETECTING A NUGGET FOR SPOT WELDING

Takashi Kimura, Nagoya, and Kaneyasu Arakawa, Ichinomiya, both of Japan, assignors to Kyokutoh Co., Ltd., Aichi, Japan

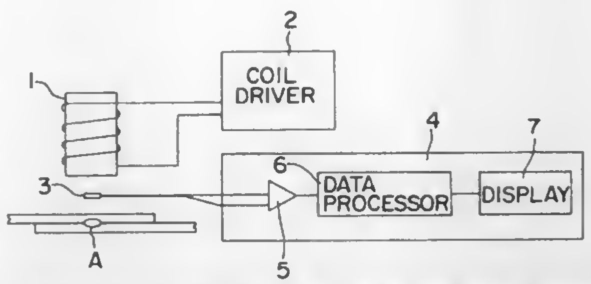
Filed Nov. 7, 1995, Ser. No. 551,776

Claims priority, application Japan, Nov. 11, 1994, 6-015069 U

Int. Cl.⁶ G01N *27/72;* **G01R** *33/12*

U.S. Cl. 324—235 **2 Claims**

1. An apparatus for detecting a nugget for spot welding, said apparatus comprising a driving coil which applies a pulsed alternating positive and negative magnetic field to a spot welded nugget and a magnetism sensing element provided between said driving coil and said spot welded nugget, said magnetism sensing element for detecting, between an occurrence of positive and negative magnetic field pulses, variations in magnetic flux density arising in the vicinity of said nugget as a result of said pulsed alternating positive and negative magnetic field.



5,747,990

Patent Not Issued For This Number

5,747,991

CAPACITANCE TYPE ACCELERATION SENSOR

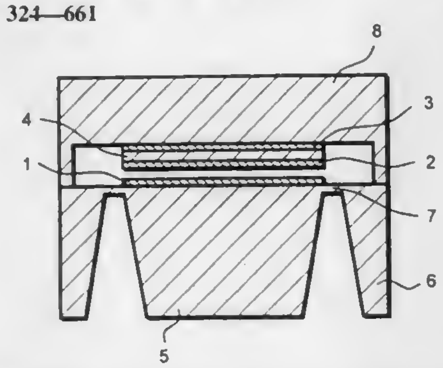
Natsuko Ito, and Hiroyuki Okada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 12, 1995, Ser. No. 541,266

Claims priority, application Japan, Oct. 27, 1994, 6-263757

Int. Cl.⁶ G01P *15/125*

U.S. Cl. 324—661 **9 Claims**



1. A capacitance type acceleration sensor comprising:

a fixed electrode which is stationary with respect to a stopper and which constitutes one of a first and a second electrodes:

a movable electrode which is stationary with respect to a mass section and which constitutes the other of said first and second electrodes; and

a reference electrode whose distance with respect to one of said first and second electrodes is not caused to be changed by acceleration;

an insulating film disposed between said fixed electrode and said reference electrode, said insulating film having the same thermal expansion coefficient as that constituting said stopper,

said fixed electrode, said movable electrode and said reference electrode being disposed in an overlapping position in a direction in which said acceleration is detected.

5,747,992

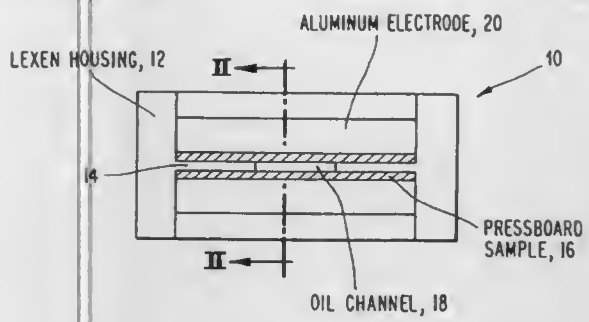
MATERIALS CHARACTERIZATION CELL FOR POLARIZATION SPECTRUM AND STREAMING ELECTRIFICATION MEASUREMENTS

Michael A. Brubaker, and George K. Frimpong, both of Raleigh, N.C., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Filed Jun. 7, 1995, Ser. No. 484,571

Int. Cl.⁶ G01N *27/22*

U.S. Cl. 324—663 **1 Claim**



1. A materials characterization cell, comprising:

(a) a housing;

(b) a rectangular channel disposed in said housing, said channel permitting the static or dynamic passage of oil through said housing;

(c) a first sample of insulation material disposed in said housing adjacent to said channel;

(d) a first planar electrode plate disposed in said housing adjacent to said first sample;

(e) a second sample of said insulation material said second sample being disposed in said housing adjacent to said channel and opposite said first sample; and

(f) a second planar electrode plate disposed in said housing adjacent to said second sample: said first and second electrode plates being disposed in said housing in spaced parallel relationship with respect to said rectangular channel, whereby a capacitor having a prescribed geometry is formed by said electrodes samples and channel.

5,747,993

MOVEMENT ACTUATOR/SENSOR SYSTEMS

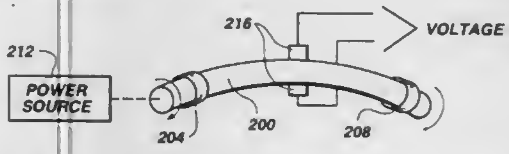
Stephen C. Jacobsen, and David L. Wells, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Division of Ser. No. 480,018, Jun. 7, 1995, Pat. No. 5,594,330, which is a division of Ser. No. 898,216, Jun. 12, 1992, Pat. No. 5,481,184, which is a continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882, which is a continuation-in-part of Ser. No. 647,659, Jan. 28, 1991, Pat. No. 5,106,455.

This application Nov. 7, 1996, Ser. No. 745,002

Int. Cl.⁶ G01R *29/22*

U.S. Cl. 324—109 **1 Claim**



1. An electricity generator comprising

an elongate, flexible filament, made of piezoelectric material, and disposed in an arc-shaped locus of points to rotate about the locus.

means for causing the filament to rotate to thereby cause development of voltages in the filament, and

wiper means disposed in sliding contact with the filament to conduct the voltages developed in the filament.

5,747,994

BOARD EXCHANGE MECHANISM FOR SEMICONDUCTOR TEST SYSTEM

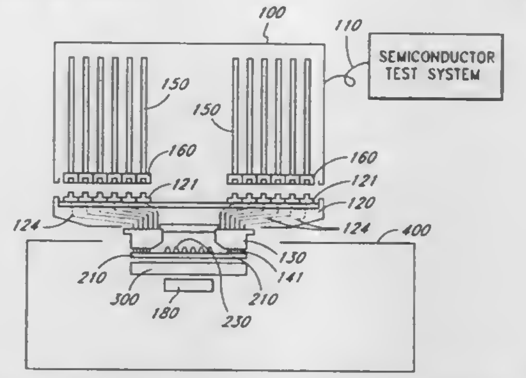
Kazunari Suga, Goyoda, Japan, assignor to Advantest Corp., Tokyo, Japan

Filed Apr. 26, 1996, Ser. No. 638,037

Claims priority, application Japan, Apr. 28, 1995, 7-129849

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—158.1 **1 Claim**



1. A board exchange mechanism for a semiconductor test system having a plurality of test channels, said board exchange mechanisms is used for performing a self-diagnosis test, comprising:

a test head connected to said semiconductor test system and having a plurality of print circuit boards corresponding to said plurality of test channels;

a wafer prober having a pin card for electrically contacting a semiconductor wafer to be tested for supplying test signals from said semiconductor test system to said semiconductor wafer and transmitting output signals from said semiconductor wafer to said semiconductor test system;

a performance board for interfacing said plurality of print circuit boards and said pin card when said test head and said wafer prober are mechanically connected with each other;

a self-diagnosis board which is sized equal to the size of said pin card of said wafer prober;

wherein said pin card is replaced with said self-diagnosis board prior to a self-diagnosis test while said test head and said wafer prober remain mechanically connected with each other, and said performance board interfacing said plurality of print circuit boards and said self-diagnosis board.

5,747,995

MAGNETIC POSITION MEASURING DEVICE USING HALL ELEMENTS AS SENSORS AND METHOD FOR ITS OPERATION

Alfons Spies, Seebruck, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Sep. 18, 1996, Ser. No. 715,648

Claims priority, application Germany, Sep. 30, 1995, 195 36 661.1

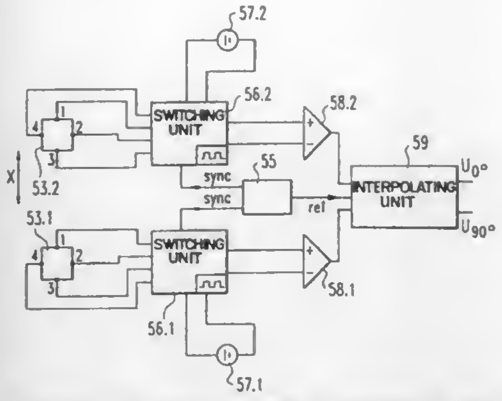
Int. Cl.⁶ G01B *7/14;* **G01D** *5/14:3/28;* **G01R** *33/07*

U.S. Cl. 324—207.2 **12 Claims**

12. A magnetic position measuring device for determining the relative position of two objects which are movable with respect to each other, wherein a magnetic graduation is scanned by at least two Hall elements for generating position-dependent output signals, wherein the Hall elements each have at least one supply voltage and one measuring voltage connector, the device comprising:

at least one switching unit which periodically interchanges the supply voltage and measuring voltage connectors of each Hall element with each other;

at least one synchronization unit which synchronizes the periodic interchange of the supply voltage and measuring voltage connectors of the different Hall elements with each other; and



an oscillator unit assigned to the synchronization unit which provides a periodic clock signal which determines the switching frequency.

5,747,996

DEVICE FOR DETERMINING THE SPATIAL POSITION OF A SENSOR ELEMENT WHICH IS DISPLACEMENT RELATIVE TO A REFERENCE ELEMENT

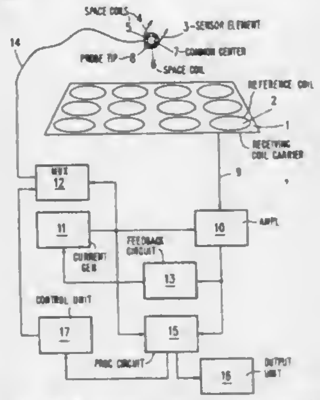
Manfred H. Fuchs, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 401,067, Mar. 8, 1995, abandoned. This application Jun. 20, 1996, Ser. No. 667,287

Claims priority, application Germany, Mar. 9, 1994, 44 07 785.8

Int. Cl.^{6} G01B *7/004;* **G01R** *33/02;* **G06K** *11/16;* **A61B** *5/05*

U.S. Cl. 324—207.17 **19 Claims**



1. A device for determining the spatial position of a sensor element which is spatially displaceable relative to a reference element, comprising:

three sensor element coils which are arranged in the sensor element, consist of at least one wire turn and are wound about a common center;

at least three reference element coils which are arranged in the reference element spaced apart from each other and consist of at least one wire turn, said reference element coils all facing in substantially the same direction;

a current generator for exciting the sensor element coils or the reference element coils by means of a presettable excitation alternating current;

a processing circuit for voltages induced in the reference element coils in response to the current generator exciting the sensor element coils or in the sensor element coils in response to the current generator exciting the reference element coils, which processing circuit comprises an arithmetic circuit that calculates, on the basis of the induced voltages, distance coordinates x_m, y_m, and z_m of the center of the sensor element coils in a coordinate system associated with the reference element; and

a feedback circuit which controls the excitation currents in dependence on the amplitude of the induced voltages.

5,747,997

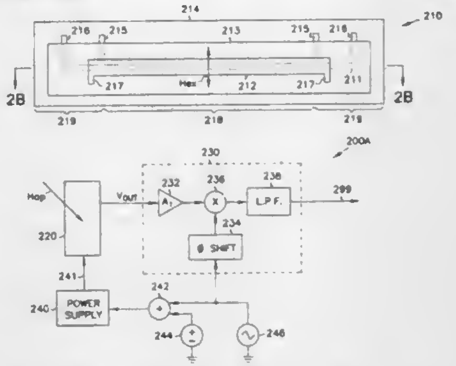
SPIN-VALVE MAGNETORESISTANCE SENSOR HAVING MINIMAL HYSTERESIS PROBLEMS

E. Dan Dahlberg, Roseville, and Timothy J. Moran, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 5, 1996, Ser. No. 655,222

Int. Cl.^{6} G01R *33/09;* **G01C** *17/00*

U.S. Cl. 324—252 **10 Claims**



1. A thin film magnetic compass comprising;

a substrate;

a pinned-layer spin-valve magnetoresistive device on the substrate forming a magnetic core;

an excitation strip on the magnetoresistive device;

a driving circuit coupled to the excitation strip that provides a drive signal for producing an oscillating magnetic field that drives the magnetic core into magnetic saturation using the excitation strip and then allows the magnetic core to come out of saturation;

a sensing circuit that measures a sensor output signal from the magnetoresistive device the sensor output signal including a signal component representative of an external applied magnetic field.

5,747,998

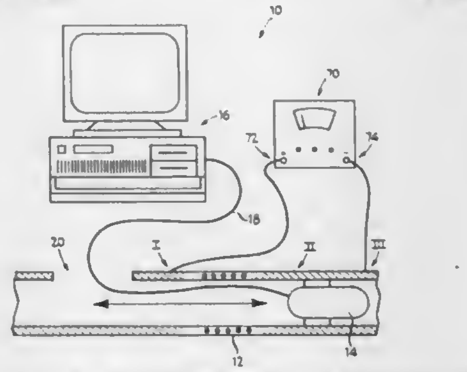
APPARATUS FOR DETECTING ANOMALIES IN PIPES

J. Thomas Fowler, Marblehead, Mass., and Steven S. Carroll, South Hampton, N.H., assignors to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 241,031, May 10, 1994, Pat. No. 5,479,100. This application May 24, 1995, Ser. No. 449,814

Int. Cl.^{6} G01R *33/00;33/12;* **G01N** *27/72;27/82*

U.S. Cl. 324—263 **6 Claims**



1. An apparatus for detecting anomalies in a ferrous pipe structure, comprising:

sensor means for positioning within and movement along an interior of the ferrous pipe structure;

means operably associated with the sensor means for imposing one or more magnetic fields into the ferrous pipe structure, the means for imposing one or more magnetic fields being operably disposed substantially externally to the pipe structure, and including means for applying an electrical current directly to the pipe structure, so as to create a magnetic field in the ferrous pipe structure, said means for imposing one or more magnetic fields including

means for imposing a first magnetic field, from an external source, onto the ferrous pipe structure and

means for imposing a second magnetic field of reversed polarity relative to the first magnetic field, from an external source, onto the ferrous pipe structure;

means operably associated with the sensor means for detecting magnetic fields emanating from the ferrous pipe structure, whether due to remnant induction in the ferrous pipe structure or to magnetic fields imposed by the means to impose magnetic fields;

means for generating data signals corresponding to the magnetic fields detected by the means to detect magnetic fields;

control means for receiving and processing the data signals generated by the sensor means, and for converting the data signals into information from which a user may determine the presence and characteristics of anomalies in the ferrous pipe structure, including

- means for simultaneously measuring any magnetic fields emanating from the ferrous pipe structure as a result of an imposition of a magnetic field from the means for imposing a first magnetic field, from an external source, onto the ferrous pipe structure and
- means for simultaneously measuring any magnetic fields emanating from the ferrous pipe structure as a result of an imposition of a magnetic field from the means for imposing a second first magnetic field, from an external source, onto the ferrous pipe structure and
- means for comparing the remnant magnetic field measured with the magnetic fields measured after imposition of first and second magnetic fields to yield data representative of anomalies in the ferrous pipe structure at the desired location;
- means for communicating the data signals generated by the sensor means to the control means; and
- means for propelling the sensor means along the interior of the ferrous pipe structure.

5,747,999

FEED CONTROL ELEMENT USED IN SUBSTRATE INSPECTION AND METHOD AND APPARATUS FOR INSPECTING SUBSTRATES

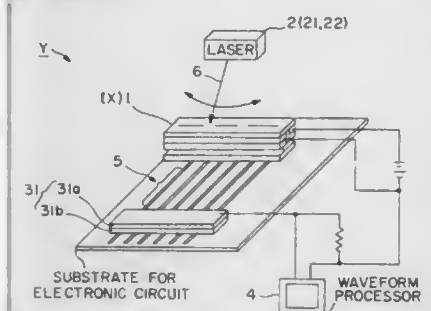
Syuuzi Yamaoka, Fukuyama, Japan, assignor to Okano Hitech Co., Ltd., Hiroshima, Japan

Filed Jul. 7, 1995, Ser. No. 512,066

Claims priority, application Japan, Aug. 15, 1994, 6-225484; Feb. 21, 1995, 7-057949

Int. Cl.^{6} G01R *31/308*

U.S. Cl. 324—501 **6 Claims**



1. A voltage feed control means for a substrate inspection apparatus wherein a non-contact type detection is performed for defects in circuit patterns formed on a substrate and for improper mountings of circuit components connected to circuit patterns,

said feed control means being a feed control element which forms an electrostatic capacitive coupling between said feed control element and a circuit pattern that is to be inspected and to individually feed a voltage to each circuit pattern by irradiating the circuit pattern with a pulse-modulated laser beam, wherein

said feed control element is formed such that a first laminated assembly, which consists of a first transparent electrode **12** and a light conductive film **13**, and a second laminated assembly, which consists of a transparent electrode **12** and a resistance film **14**, are installed side by side between a glass member **11**, which is provided on a pulse-modulated laser beam irradiation side, and an insulator **16**, which is provided on a circuit pattern side; respective end surfaces of said first and second laminated assemblies are separated with an insulating gap **17** in between; and an anisotropic conductor **15** is installed on said insulating gap **17** so as to be located on said insulator **16** side, thus closing off one end of said insulating gap **17**,

said feed control element being thus constructed as a block unit that has a laminated structure.

5,748,000

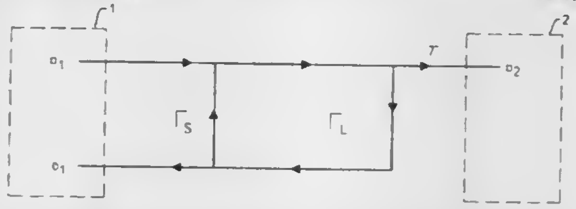
ERROR CORRECTION METHOD FOR TRANSMISSION MEASUREMENTS IN VECTOR NETWORK ANALYZERS

David Vernon Blackham, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 1, 1996, Ser. No. 691,062

Int. Cl.^{6} G01R *27/04*

U.S. Cl. 324—601 **7 Claims**



1. A method for correcting transmission measurements of a device under test in a vector network analyzer having a source port and a load port, the method comprising the steps of:

measuring a source reflection coefficient based on at least one reflection standard connected to the source port;

measuring transmission tracking when a thruline standard is connected between the source port and the load port;

measuring a load reflection coefficient when the thruline standard is connected between the source port and the load port;

measuring a transmission coefficient when the device under test is connected between the source port and the load port; and

correcting the measured transmission coefficient according to the measured transmission tracking, the measured load reflection coefficient and the measured source reflection coefficient.

5,748,001

METHOD AND APPARATUS FOR FAST RESPONSE AND DISTORTION MEASUREMENT

Richard C. Cabot, Lake Oswego, Oreg., assignor to Audio Precision, Inc., Beaverton, Oreg.

Division of Ser. No. 419,058, Apr. 7, 1995, Pat. No. 5,649,304, which is a continuation of Ser. No. 86,550, Jul. 1, 1993, abandoned, which is a continuation of Ser. No. 764,142, Sep. 20, 1991, abandoned. This application Dec. 12, 1996, Ser. No. 763,534

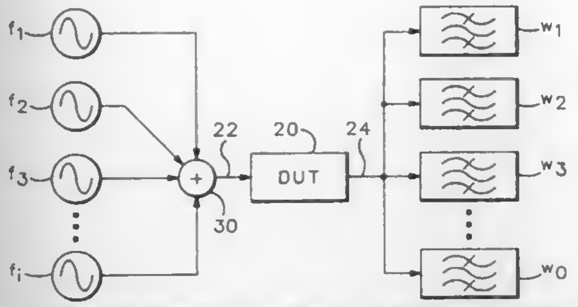
Int. Cl.^{6} G01R *23/20*

U.S. Cl. 324—624 **4 Claims**

1. A method for measuring the signal transfer characteristics of a signal transfer device under test, the device under test having an input and an output, comprising the steps of:

(a) defining a plurality of unique combinations of substantially sinusoidal test signals selected so as to determine the signal transfer characteristics of said device under test, the frequencies of said test signals being integer multiples of a common frequency;

(b) applying one of said unique combinations of test signals to the input of the device under test;



(c) acquiring a signal from the output of the device under test;

(d) performing a time-to-frequency transform on said acquired signal to obtain the spectral characteristics thereof; and

(e) combining amplitudes of frequency components in said acquired signal, except those which were present in said test signals, to obtain a measurement of non-linear effects in the device under test, wherein said step of combining includes root square summing said amplitudes of said frequency components in said acquired signal to compute a measurement of total distortion plus noise, wherein said root square summing is applied to a plurality of frequency bands of said acquired signal and the results are displayed as a function of said frequency bands.

5,748,002

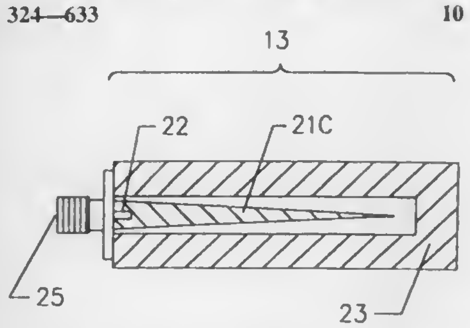
RF PROBE FOR MONTORING COMPOSITION OF SUBSTANCES

Bentley N. Scott, Garland, and Samuel R. Shortes, Highland Village, both of Tex., assignors to Phase Dynamics Inc., Richardson, Tex.

Filed Jan. 26, 1996, Ser. No. 592,716

Int. Cl.⁶ G01N *22/00;* G01R *27/32*

U.S. Cl. 324—633 **10 Claims**



1. A system for detecting the composition and microstructure of materials, comprising:

an RF oscillator, which includes a gain element connected to provide substantial gain at frequencies greater than 100 MHz, and a feedback path, coupling the output of said gain element to the input thereof, said feedback path including a tunable resonant circuit; and

an electromagnetic propagation structure

which is RF-coupled to said RF oscillator

and in which electromagnetic wave propagation is electrically loaded by a portion of the material to be characterized,

said propagation structure including a distributed impedance transformation section which includes at least one tapered element and which is itself also electrically loaded by proximity to a portion of the material; and

circuitry connected to monitor the frequency of said oscillator to ascertain changes in the composition or microstructure of the material.

5,748,003

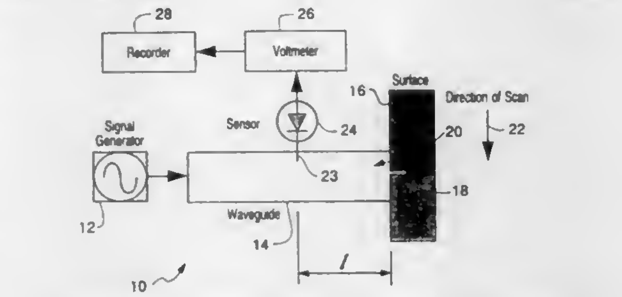
MICROWAVES USED FOR DETERMINING FATIGUE AND SURFACE CRACK FEATURES ON METAL SURFACES

Reza Zoughi, Ft. Collins, Colo.; Chin-Yung Yeh, Taipei, Taiwan; Stoyan I. Ganchev, and Christian Huber, both of Ft. Collins, Colo., assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Continuation-in-part of Ser. No. 459,280, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 36,941, Mar. 25, 1993, which is a continuation of Ser. No. 960,238, Oct. 13, 1992, Pat. No. 5,216,372, which is a continuation of Ser. No. 737,344, Jul. 29, 1991, abandoned. This application May 14, 1996, Ser. No. 645,761

Int. Cl.⁶ G01R *27/04*

U.S. Cl. 324—644 **12 Claims**



1. A method for measuring one or more crack dimensions in a microwave reflective surface, comprising:

transmitting a microwave first signal;

reflecting said first signal from said microwave reflective surface to produce a second signal;

detecting a crack using at least one of said first signal and said second signal obtained by a microwave receiving device;

moving said microwave receiving device relative to the crack; and

determining information related to at least one of a first tip, a width and a depth of the crack, after said moving step, and in which said determining step includes at least one of the following:

analyzing a number of voltage related values obtained using said microwave receiving device during said moving step, when determining the presence of the first tip of the crack,

relying on at least one dimension of said microwave receiving device and at least two voltage related values obtained using said microwave receiving device during said moving step, when determining the width of the crack, and

scanning across a width of the crack using said microwave receiving device and analyzing at least one voltage related value obtained while scanning, when determining the depth of the crack.

5,748,004

RESET SWITCH FOR A MICROMACHINED DEVICE

Thomas W. Kelly, South Easton, and John Memishian, Newton, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Mar. 15, 1996, Ser. No. 616,876

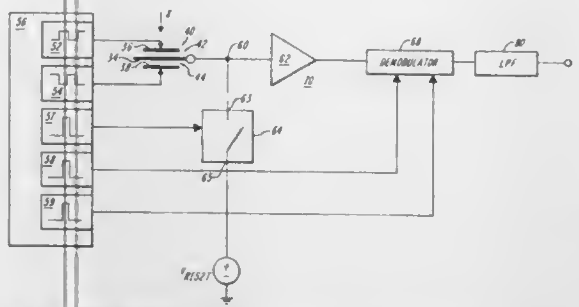
Int. Cl.⁶ G01P *15/125;* G01R *27/26*

U.S. Cl. 324—661 **18 Claims**

1. A device comprising:

first and second electrodes for receiving respective first and second periodic signals having equal amplitude, period T, and 180° out of phase with respect to each other;

a movable electrode between the first and second electrodes, the first, second, and movable electrodes forming a differential capacitor with the first electrode and the movable electrode forming a first capacitor, and the second electrode and the movable electrode forming a second capacitor, the capacitances of the first and second capacitors changing in response to movement by the movable electrode;



a DC voltage source; and

a reset switch having a first port coupled to the DC voltage source, a second port coupled to the movable electrode, and a control port responsive to a reset signal for periodically closing the reset X switch synchronously with the periodic signals so that the DC voltage source resets the DC voltage on the movable electrode when the reset switch is closed.

5,748,005

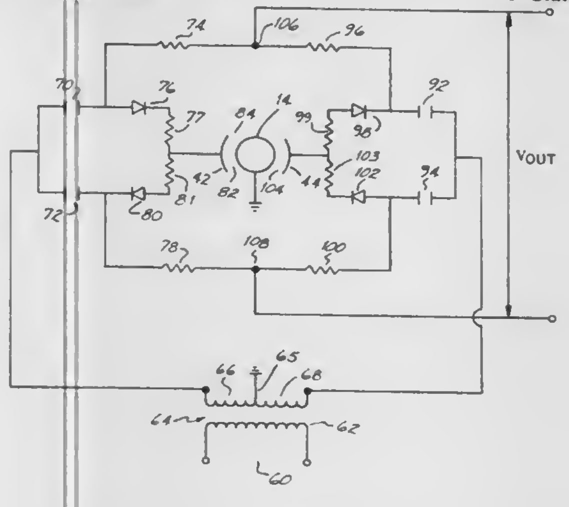
RADIAL DISPLACEMENT SENSOR FOR NON-CONTACT BEARINGS

John A. McCormick, and Herbert Sixsmith, both of Norwich, Vt., assignors to Creare, Inc., Hanover, N.H.

Filed Oct. 31, 1995, Ser. No. 550,709

Int. Cl.⁶ G01R *29/00*

U.S. Cl. 324—662 **9 Claims**



1. An apparatus for sensing radial displacement of a member comprising:

a first electrical parameter sensor located proximate a first side of said member, said member being displaceable with respect to said first sensor along a first axis, said electrical parameter varying an electrical response of said sensor as a function of the distance between said first sensor and said member;

a second electrical parameter sensor located proximate a second side of said member, said member being displaceable with respect to said second sensor along said first axis, said electrical parameter varying an electrical response of said sensor as a function of the distance between said second sensor and said member;

means for coupling a first high frequency, AC electrical signal to said first sensor;

means for coupling a second high frequency, AC electrical signal to said second sensor, said second AC electrical signal being out-of-phase with respect to said first AC electrical signal; and

means for summing said electrical response of said first sensor to said first electrical signal with the response of said second sensor to said second electrical signal to produce a deviation signal and to cancel AC ripple, said deviation signal being indicative of the displacement of the member from a position equidistant from said first sensor and said second sensor.

5,748,006

HIGH-FREQUENCY-TRANSMISSION PRINTED WIRING BOARD, PROBE CARD, AND PROBE APPARATUS

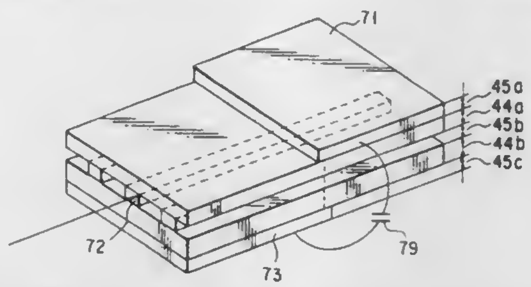
Kunio Sano, Yamanashi-ken, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Nov. 8, 1995, Ser. No. 555,286

Claims priority, application Japan, Nov. 9, 1994, 6-300259

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—754 **20 Claims**



1. A printed wiring board having a plurality of transmission paths for transmitting a high-frequency signal, comprising:

first and second insulating layers;

a plurality of signal lines disposed between said first and second insulating layers and respectively extending along said transmission paths;

a first reference conductive plate opposing said signal lines through said first insulating layer and applied with a first direct-current reference potential;

a second reference conductive plate opposing said signal lines through said second insulating layer and applied with a second direct-current reference potential which is different from the first direct current reference potential and

a capacitor coupling the first and second reference conductive plates such that said first and second reference conductive plates are short circuited for a high frequency wave;

wherein said first and second reference conductive plates are arranged to be substantially offset from each other along each of said transmission paths, each of said transmission paths is substantially formed of a first portion constituted by a pair of one of said signal lines and said first reference conductive plate and a second portion constituted by a pair of said one of said signal lines and said second reference conductive plate, said first and second reference conductive plates are arranged to overlap each other at a boundary of said first and second portions of each of said transmission paths, and an overlapping amount of the first and second reference conductive plates is set such that an impedance of said boundary of each of said transmission paths is substantially equal to that of each of said first and second portions of each of said transmission paths.

5,748,007

UNIVERSAL TEST AND BURN-IN SOCKET ADAPTABLE TO VARYING IC MODULE THICKNESS

Paul Mathew Gaschke, Wappinger Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 12, 1996, Ser. No. 662,406

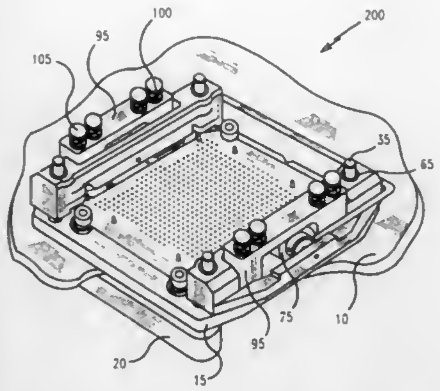
Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—755 **22 Claims**

1. A socket assembly for holding an integrated circuit module during testing or burn-in comprising:

a printed circuit board;

mounted on said printed circuit board, an interposer means provided with electrical contacts;



non-retractable jaw means engaging opposing sides of said module, for urging said module against said interposer means, said jaw means permitting said module to be inserted under said jaw means without requiring a retracting motion of said jaw means;

camming means for controlling the movement of said jaw means; and

bridging means responsive to said camming means for providing said jaw means with a compliant clamping force, wherein said jaw means allows said module to be exposed to forced convective cooling from at least two opposing sides and top of said module.

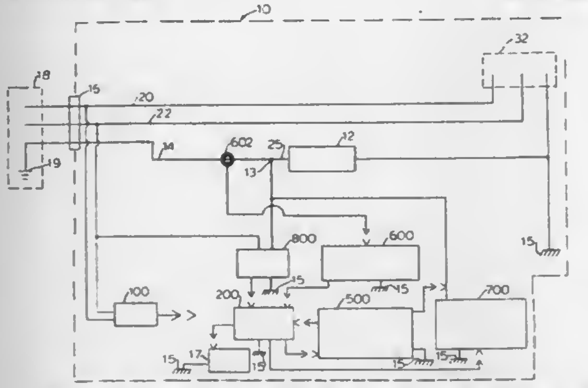
5,748,008
ELECTRICAL INTEGRITY TEST SYSTEM FOR BOATS

Keith W. Landreth, 5701 Hadrian Dr., Durham, N.C. 27703

Filed Dec. 6, 1995, Ser. No. 568,186

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—763 24 Claims



1. An auxiliary system for testing selected components of an on-board electrical system for a boat which electrical system is connected to a grounded AC shore power distribution system and includes as part of the boat's on-board electrical system an on-board galvanic isolator connected on one side through an AC grounding conductor to an on-shore earth ground and on an opposite side to a DC ground forming part of the boat's on-board electrical system, said galvanic isolator being made up of elements normally operative to block passage of DC currents through said galvanic isolator in both directions and to permit passage of AC currents through said galvanic isolator to said earth ground, comprising:

(a) first circuit means electrically referenced with respect to said DC ground for applying a DC voltage of selected first polarity across said galvanic isolator and of sufficient magnitude to establish what would be expected to be a normal voltage drop corresponding thereto;

(b) second circuit means for indicating whether the voltage drop across said galvanic isolator when said DC voltage of said first polarity and magnitude is applied thereto corresponds to that to be normally expected;

(c) third circuit means electrically referenced with respect to said DC ground for applying a DC voltage of selected second polarity opposite said first polarity across said galvanic isolator and of sufficient magnitude to establish what would be expected to be a normal voltage drop corresponding thereto;

(d) fourth circuit means for indicating whether the voltage drop across said galvanic isolator when said DC voltage of said second polarity and magnitude is applied thereto corresponds to that to be normally expected;

(e) switching means adapted to operate said first, second, third and fourth circuit means; and

(f) a DC power source operative to provide said DC voltage.

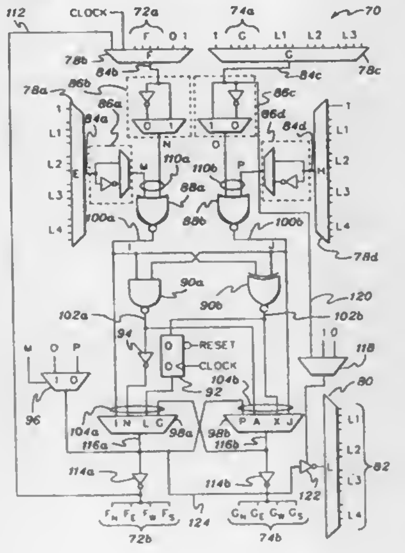
5,748,009
PROGRAMMABLE LOGIC CELL

Allan Robert Bertolet, Williston; Kim P. N. Clinton, Essex Junction; Christine Marie Fuller, Williston; Scott Whitney Gould, South Burlington; Steven Paul Hartman, Jericho; Joseph Andrew Iadanza, Hinesburg; Frank Ray Keyser, Colchester; Eric Ernest Millham, St. George; Timothy Shawn Reny, Underhill Center; Brian A. Worth, Milton; Gulson Yasar, South Burlington, and Terrance John Zittritsch, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 460,481, Jun. 2, 1995, Pat. No. 5,646,546.
This application Sep. 9, 1996, Ser. No. 707,840

Int. Cl.^{6} H03K *19/177*

U.S. Cl. 326—39 15 Claims



1. A programmable logic cell comprising at least first and second logic outputs, the first logic output having a first multiplexer corresponding thereto, the second logic output having a second multiplexer corresponding thereto, each of said first and second multiplexers having a plurality of inputs and an output, the output of each of said first and second multiplexers being connected to its corresponding logic output, said programmable logic cell further comprising:

a connection from the output of the second multiplexer to a first one of the plurality of inputs of the first multiplexer.

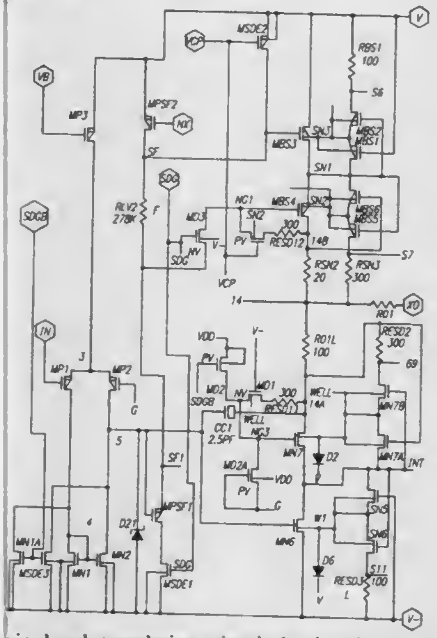
5,748,010
LOGIC SIGNAL LEVEL TRANSLATION APPARATUS HAVING VERY LOW DROPOUT WITH RESPECT TO THE POWERING RAILS

Yusuf A. Haque, San Jose, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Continuation of Ser. No. 414,357, Mar. 30, 1995, abandoned.
This application Jan. 3, 1996, Ser. No. 582,227

Int. Cl.^{6} H03K *19/0175;19/094*

U.S. Cl. 326—80 5 Claims



1. A logic level translation circuit having low dropout with respect to the powering rails comprising:

a first circuit coupled between first, second and third power supply terminals, the first circuit being a circuit for receiving an input logic signal referenced to the voltage levels of the first and second power supply terminals and for providing an intermediate logic signal referenced to the voltage levels of the first and third power supply terminals;

a second circuit coupled between the third and a fourth power supply terminal, the second circuit being a circuit for receiving the intermediate logic signal and for providing an output logic signal on an output terminal referenced to the voltage levels of the third and fourth power supply terminals;

the second circuit including a tri-state power down capability responsive to power down signals;

the second circuit also including circuitry coupled to the output terminal for determining the voltage of the body of field effect transistors driving the output logic signal to prevent pn junctions associated with the field effect transistors from becoming forward biased upon the voltage of the output terminal being driven to voltages outside the voltage range of the third and fourth voltages.

5,748,011
OUTPUT BUFFER CIRCUIT

Makoto Takahashi, Yokohama, and Kazutaka Nogami, Ichikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

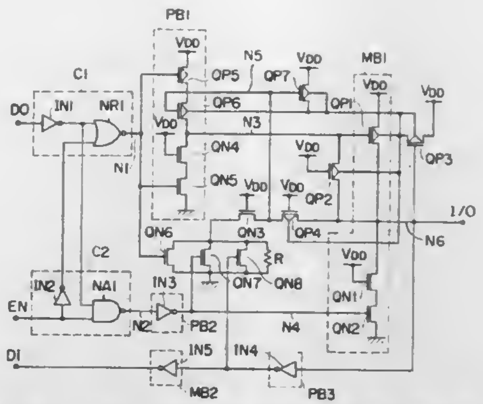
Filed Aug. 22, 1996, Ser. No. 701,675

Claims priority, application Japan, Aug. 22, 1995, 7-213464

Int. Cl.^{6} H03K *19/094;19/0175*

U.S. Cl. 326—83 16 Claims

1. An output buffer circuit, comprising:



a pre-buffer control circuit for inputting data and an enable signal, and for outputting a first pre-buffer control signal and a second pre-buffer control signal;

a first pre-buffer circuit for inputting the first pre-buffer control signal outputted by said pre-buffer control circuit and outputting a first signal, including:

- a first P-channel type MOS transistor having a gate for inputting the first pre-buffer control signal;
- a first N-channel type MOS transistor having a gate connected to a first supply voltage terminal;
- a second P-channel type MOS transistor having a gate connected to a first node;
- a second N-channel type MOS transistor having a gate for inputting the first pre-buffer control signal; and
- said first and second P-channel type MOS transistors and said first and second N-channel type MOS transistors being all connected in series between the first supply voltage terminal and a second supply voltage terminal, and the first signal being outputted from a second junction node between one end of said second P-channel type MOS transistor and one end of said first N-channel type MOS transistor;

a second pre-buffer circuit for inputting the second pre-buffer control signal outputted by said pre-buffer control circuit and outputting a second signal;

a main buffer circuit for inputting the first and second signals and outputting a third signal from an output terminal, including:

- a third P-channel type MOS transistor having a gate for inputting the first signal;
- a third N-channel type MOS transistor having a gate connected to the first supply voltage terminal;
- a fourth N-channel type MOS transistor having a gate for inputting the second signal; and
- said third P-channel type MOS transistors and said third and fourth N-channel type MOS transistor being all connected in series between the first supply voltage terminal and a second supply voltage terminal, and a third junction node between one end of said third P-channel type MOS transistor and one end of said third N-channel type MOS transistor being connected to the output terminal;

a fourth P-channel type MOS transistor having a source connected to the first supply voltage terminal, a gate connected to the output terminal, and a drain connected to an N-type substrate;

a fifth P-channel type MOS transistor having a source connected to the second node, a gate connected to the first supply voltage terminal, and a drain connected to the output terminal; and

a sixth P-channel type MOS transistor having a source connected to the output terminal, a gate connected to the first supply voltage terminal, and a drain connected to the first node.

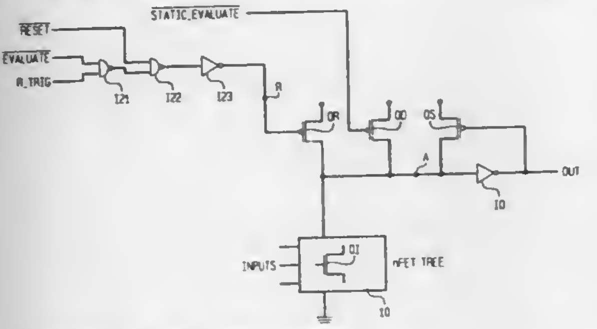
VOL
2 10
SS
1
MY
5
998
UMI

5,748,012
METHODOLOGY TO TEST PULSED LOGIC CIRCUITS IN PSEUDO-STATIC MODE

Michael Patrick Beakes, Yorktown Heights, N.Y.; Barbara Alane Chappell; Terry Ivan Chappell, both of Portland, Oreg.; Bruce Martin Fleischer, Mt. Kisco; Rudolf Adriaan Haring, Cortlandt Manor, both of N.Y.; Talal Kamel Jaber, Autin, and Edward Seewann, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 5, 1996, Ser. No. 583,300
Int. Cl.⁶ H03K *19/003*

U.S. Cl. 326—93 **15 Claims**



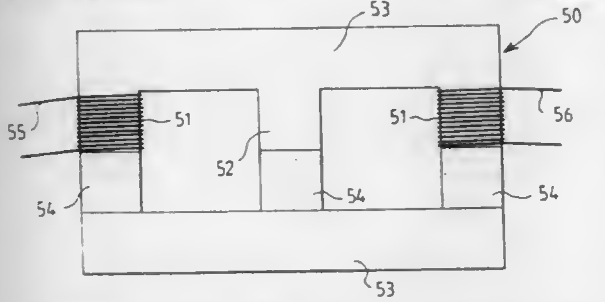
1. A dynamic circuit, comprising:
- a logic tree having one or more data inputs and an evaluation node;
- a reset circuit connected to the evaluation node and responsive to a reset signal;
- a reset inhibiting circuit coupled to the reset circuit, and responsive to a reset inhibiting signal;
- a static evaluate circuit coupled to the evaluation node of the logic tree, and responsive to a mode select signal.

5,748,013
COMBINED MAGNETIC CORE

François Beauclair, Chaville; Jean-Pierre Delvinquier, Les Ulis; Richard Lebourgeois, Villebon sur Yvette; Michel Pate, Nozay, and Claude Rohart, Palaiseau, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 23, 1996, Ser. No. 735,595
Claims priority, application France, Oct. 24, 1995, 95 12493
Int. Cl.⁶ H01F *27/08;17/06;27/24;* **C04B** *35/04*

U.S. Cl. 336—233 **12 Claims**



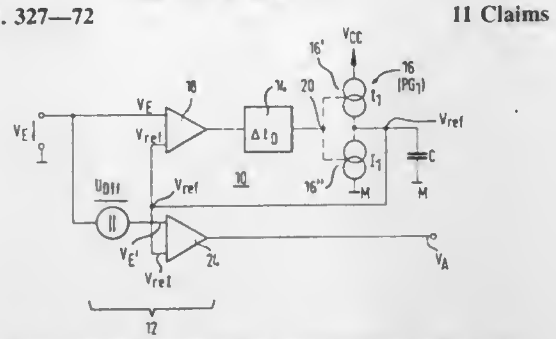
1. A magnetic core comprising a body made of polycrystalline magnetic ceramic and at least one localized gap made of a composite magnetic material, wherein the composite magnetic material is made of wafers having main faces and polycrystalline magnetic ceramic embedded in a dielectric binder and oriented with their main faces substantially parallel to the magnetic field.

5,748,014
EDGE DETECTOR

Erich Bayer, Ergolding, Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Germany

Filed Jun. 7, 1995, Ser. No. 475,444
Claims priority, application European Pat. Off., Mar. 31, 1995, 95104827
Int. Cl.⁶ H03K *5/153*

U.S. Cl. 327—72 **11 Claims**



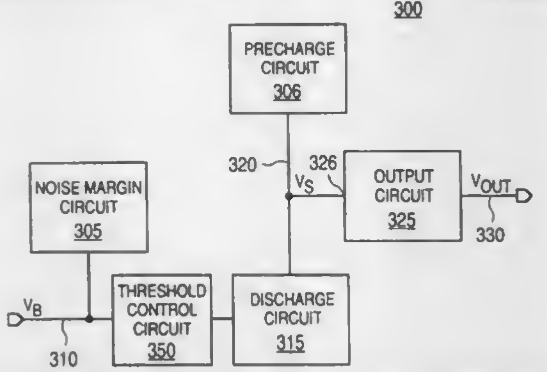
1. An edge detector for producing output signals in dependence on positive and/or negative edges of an input signal, characterized by a control circuit (**10**), by which a reference signal level (V_{ref}) available at a storage element (C) may be continuously assimilated at a predeterminable first level change rate (PG_1) to the input voltage level (V_E) , by at least one comparison circuit (**12**, **12'**), which supplies an output signal (V_A, V_A') indicative of the occurrence of an edge, when the input voltage level (V_E) changes by at least a predeterminable relative threshold value (U_{off}) in relation to the reference voltage level (V_{ref}) and by a delay means (**14**) comprised in the control circuit (**10**), whose delay time (Δt_D) causing a delay in the assimilation of the reference voltage level is selected to be equal to the ratio of the predeterminable relative threshold value (U_{off}) to the predeterminable first level change rate (PG_1).

5,748,015
LOW VOLTAGE SINGLE ENDED DYNAMIC SENSE AMPLIFIER

Kenway W. Tam, Cupertino, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jul. 1, 1996, Ser. No. 675,247
Int. Cl.⁶ G01R *19/00*

U.S. Cl. 327—51 **19 Claims**



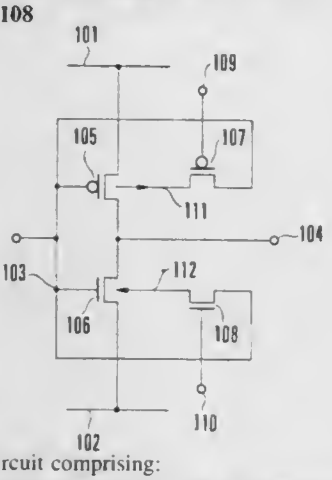
3. A sense amplifier circuit for sensing a state of a first node, the sense amplifier circuit comprising:
- an output circuit having an input node and an output, the output for indicating a state of the first node in response to a voltage level at the first node;
- a precharge circuit coupled to the input node, the precharge circuit for charging the input node to a precharge voltage level;
- a discharge circuit coupled to the first node and the input node, the discharge circuit for discharging the input node from the precharge voltage level to the voltage level of the first node;
- a threshold control circuit coupled to the first node, wherein the threshold control circuit comprises:
- a first transistor having a first flow node, a second flow node, and a control node wherein, the second flow node is coupled to a first supply voltage and the control node is coupled to the first node;
- a second transistor having a first flow node, a second flow node and a control node, wherein the second flow node is coupled to a second supply voltage and the control node is coupled to a tap node located between a noise margin circuit and the first supply voltage, wherein
  - the first flow node of the first transistor and the first flow node of the second transistor are coupled to each other and an input of the discharge circuit such that the input of the discharge circuit receives the discharge input voltage from the coupled first flow nodes of the first and second transistors and the discharge circuit couples the input node to the first node when the discharge input voltage from the threshold control circuit exceeds a first threshold voltage; and
  - the noise margin circuit is coupled to the first node, the noise margin circuit for charging the first node to a second voltage level that is greater than the first threshold voltage by a predetermined noise margin voltage.

5,748,016
DRIVER CIRCUIT

Susumu Kurosawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 20, 1996, Ser. No. 618,778
Claims priority, application Japan, Mar. 22, 1995, 7-062339
Int. Cl.⁶ H03K *19/003;19/0185*

U.S. Cl. 327—108 **11 Claims**



1. A driver circuit comprising:
- a pair of complementary MOS (CMOS) transistors connected in series between power supply voltage value and ground voltage value and configured to receive an input signal; and
- a pair of control transistors configured to receive said input signal and to change a threshold voltage state of each transistor of the pair of CMOS transistors by applying a plurality of voltages to body terminals of the pair of CMOS transistors depending upon an ON/OFF state of each transistor of the pair of CMOS transistors.

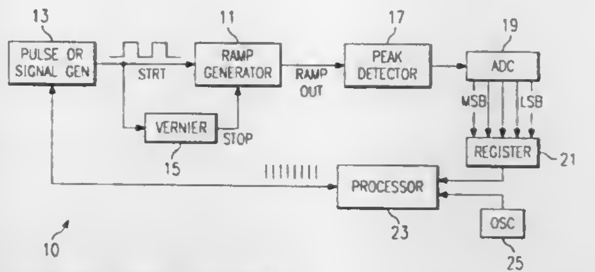
5,748,017
METHOD AND APPARATUS FOR DETERMINING LINEARITY OF A RAMP SIGNAL

Michael C. Storey, Garland, and Lawane Luckett, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1996, Ser. No. 684,532
Int. Cl.⁶ H03K *4/08*

U.S. Cl. 327—131 **5 Claims**

1. A method for determining the linearity of a ramp signal comprising the steps of:
- sampling signal level values of a plurality of equal time sections of the ramp signal using a vernier delay to sweep the entire section;



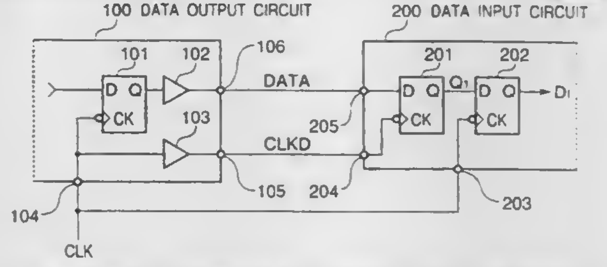
- storing said signal level values;
- generating a data set for each section of said plurality of equal time sections that contains ramp error and vernier delay error; and
- comparing said data set for each section of said plurality of equal time sections to said data set for the other equal time sections of the ramp signal to determine ramp differences to determine ramp error.

5,748,018
DATA TRANSFER SYSTEM FOR AN INTEGRATED CIRCUIT, CAPABLE OF SHORTENING A DATA TRANSFER CYCLE

Toru Ishikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1997, Ser. No. 790,800
Claims priority, application Japan, Jan. 30, 1996, 8-013865
Int. Cl.⁶ H03L *7/00*

U.S. Cl. 327—154 **7 Claims**



1. A data transfer system for use in an integrated circuit, including a data output circuit for outputting data and a data input circuit for receiving said data,
- said data output circuit comprising a data outputting means for outputting data to be transferred, in synchronism with an external clock signal supplied from an external, and a clock delay means receiving said external clock signal for outputting a delayed clock signal which is delayed from said external clock signal by a delay amount equal to a data delay amount of said data outputting means, and
- said data input circuit including a first stage for receiving said data to be transferred outputted from said data outputting means of said data output circuit, in synchronism with said delayed clock signal supplied from said clock delay means of said data output circuit, and a second stage for fetching the data received in said first stage, in synchronism with said external clock signal.

5,748,019
OUTPUT BUFFER DRIVER WITH LOAD COMPENSATION

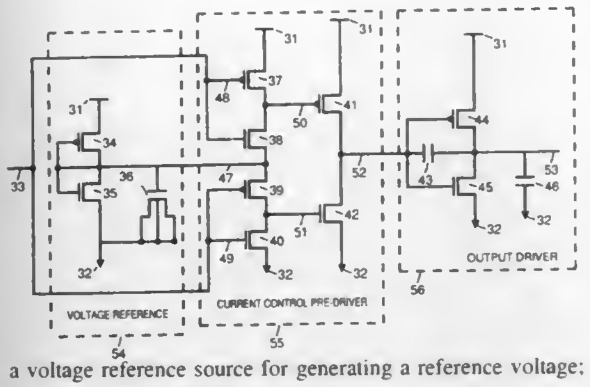
Belle Wong; Donald Lee, and Derwin Mattos, all of San Jose, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed May 15, 1997, Ser. No. 856,973
Int. Cl.⁶ H03K *5/12*

U.S. Cl. 327—170 **8 Claims**

1. A circuit for producing a buffered output, comprising:
- a power source;
- a ground;
- a circuit input for receiving an input signal;
- a circuit output for producing an output signal;

/OL
2 10
SS
1
MY
5
998
MI



a voltage reference source for generating a reference voltage;

a current control pre-driver, including:

- a first current source, coupled to the power source, the first current source having a first control input,
- a second current source, coupled to the ground, the second current source having a second control input, and,
- control logic, coupled to the circuit input, to the voltage reference source, to the first control input of the first current source and to the second control input of the second current source, the control logic,
  - in response to a first voltage value of the input signal on the circuit input, turning off the second current source and turning on the first current source by coupling the reference voltage to the first control input of the first current source, and
  - in response to a second voltage value of the input signal on the circuit input, turning off the first current source and turning on the second current source by coupling the reference voltage to the second control input of the second current source; and,

an output driver comprising:

- driver circuitry coupled to the circuit output, and
- feedback capacitance, including,
  - a first end coupled to the first current source and to the second current source, and,
  - a second end coupled to the circuit output.

5,748,020

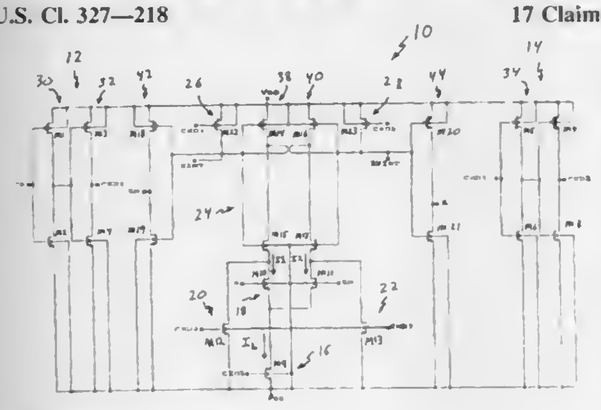
HIGH SPEED CAPTURE LATCH

Iain Ross Mactaggart, Eden Prairie; James R. Welch, Maple Grove, both of Minn., and Alan Fiedler, Palo Alto, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Feb. 2, 1996, Ser. No. 595,821

Int. Cl.⁶ H03K *19/096*

U.S. Cl. 327—218 **17 Claims**



1. A latch comprising:

a latch clock input;

a boost clock input;

first and second voltage supply terminals;

a current steering circuit having first and second differential control terminals which control current through first and second current paths;

a switched current source coupled between the current steering circuit and the first voltage supply terminal and having a control terminal coupled to the latch clock input;

a latch element coupled between the second voltage supply terminal and the current steering circuit and having a latch output;

a first boost current source coupled to the first current path between the latch element and the current steering circuit and having a control terminal coupled to the boost clock input; and

a second boost current source coupled to the second current path between the latch element and the current steering circuit and having a control terminal coupled to the boost clock input.

5,748,021

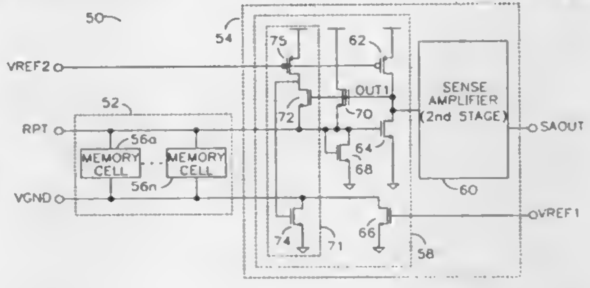
SENSE AMPLIFIER DESIGN WITH DYNAMIC RECOVERY

Jeffery Scott Hunt, Ackerman, and Satish C. Saripella, Starkville, both of Miss., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Nov. 21, 1996, Ser. No. 754,177

Int. Cl.⁶ H03K *5/08;17/16*

U.S. Cl. 327—312 **20 Claims**



1. A circuit having a read line, a ground line, a first reference line and a second reference line comprising:

- a first stage configured to generate a first output in response to said read line, said ground line and said first and second reference lines, wherein said first stage comprises: (i) a pullup section (ii) a pulldown section and (iii) a recover section for limiting a gate to source voltage of said pulldown section, wherein said pulldown section and said recover section provide a non-transitioning signal at the first output during a glitch condition on the ground line; and
- a second stage configured to provide a second output in response to said first output.

5,748,022

INPUT CIRCUIT

Kouji Takeda, Beppu, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

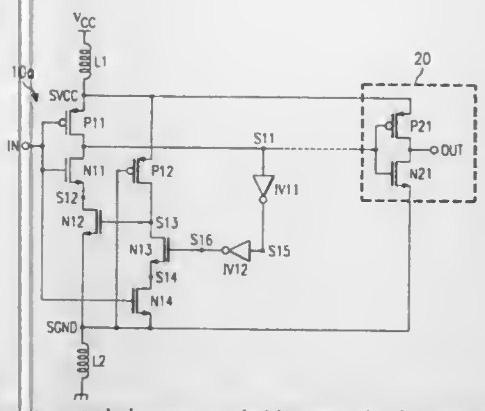
Filed Oct. 31, 1995, Ser. No. 550,700

Int. Cl.⁶ H03K *5/08;17/16*

U.S. Cl. 327—313 **3 Claims**

1. An input circuit for converting input signals having first and second levels, received on an input line, into output signals of the opposite level at an output node, comprising:

- a first transistor having a control electrode coupled to the input line, which goes ON when the input signals are at the second level, for coupling the output node to a first level power source;
- a second transistor having a control electrode coupled to the input line, which goes ON when the input signals are at the first level, and couples the output node to a second level power source;
- a third transistor coupled between the second transistor and the second level power source having a control electrode coupled to a first node and which goes ON when the first node is at the first level;



- a current control element coupled between the first node and the first level power source; and
- fourth and fifth transistors coupled in series between the first node and the second level power source, which go ON when signals of the first level are fed to a control electrode;
- the control electrode of the fourth transistor being coupled to the output node and the control electrode of the fifth transistor being coupled to the input line.

5,748,023

INTEGRATOR WITH OUTPUT-COMPENSATING CAPABILITY

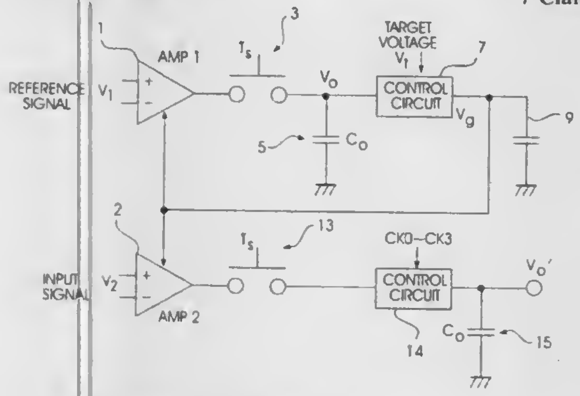
Martin Hassner, 1610 Portola Ave., Palo Alto, Calif. 94306; Seiji Koyama, 3-25-6-201, Chuorinkan, Yamato-shi, Kanagawa-ken, Japan; Tohru Nozawa, 4-9, Yutaka-chou, Sagamihara-shi, Kanagawa-ken, Japan; Asao Terukina, 8-27-13-201, Kamishoyagi, Yamato-shi, Kanagawa-ken, Japan, and Tamura Tetsuya, 1-7-1, Tsukimino, Yamato-shi, Kanagawa-ken, Japan

Filed Jun. 24, 1996, Ser. No. 668,887

Claims priority, application Japan, Aug. 18, 1995, 7-210339

Int. Cl.⁶ G06G *7/64*

U.S. Cl. 327—336 **7 Claims**



1. A signal integrator, comprising:

- a first integrator having a first amplifier, for integrating a reference voltage during an integrating period;
- a second integrator having a second amplifier, for integrating an input signal during said integrating period; and
- control means coupled to said first and second integrators for outputting a control signal, said control signal regulating a gain of said first amplifier and a gain of said second amplifier.

5,748,024

LEVEL CONVERTOR

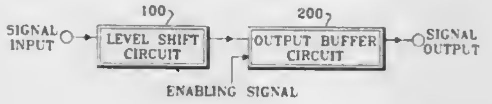
Yutaka Takahashi; Manabu Niiyama, and Yoshiki Goto, all of Sendai, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

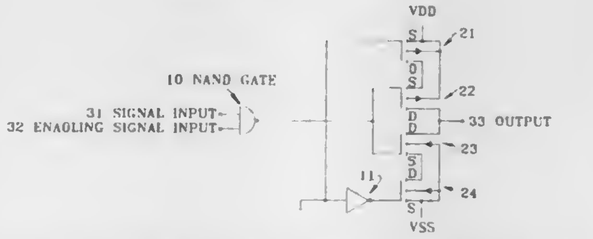
Filed Sep. 19, 1995, Ser. No. 530,483

Claims priority, application Japan, Feb. 22, 1995, 7-033218

Int. Cl.⁶ H03K *19/02*

U.S. Cl. 327—333 **8 Claims**





1. A level converter provided between first and second circuits which act with different power supply voltages, respectively, for converting a first voltage level of a first output signal of the first circuit to a second voltage level which corresponds to an operational voltage level of the second circuit, the level converter comprising:

- a level shift circuit, operatively connected to the first circuit, for receiving and converting the first output signal of the first voltage level from the first circuit to a second output signal of the second voltage level; and
- a buffer circuit, operatively connected to the level shift circuit, including
- a NAND gate having a first input terminal, to which the second output signal of the second voltage level is supplied from the level shift circuit and a second input terminal, to which a control signal is supplied, for outputting a NAND logic output of the second output signal and the control signal, and
- an inverter circuit for receiving the NAND logic output from the NAND gate and outputting an inverted output, said inverted output being fixed to a low logic level when the control signal has a low logic level,
- wherein the second circuit is a register circuit which sets a buffered output of the buffer circuit by a timing of the control signal.

5,748,025

METHOD AND APPARATUS FOR PROVIDING HIGH VOLTAGE WITH A LOW VOLTAGE CMOS INTEGRATED CIRCUIT

Yong-Gee Ng, and Jeff Greason, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

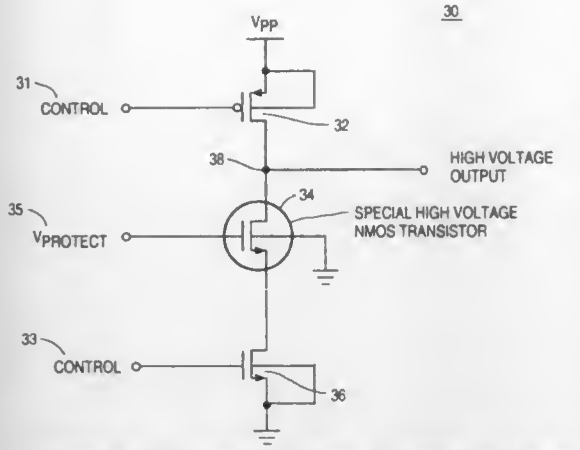
Filed Mar. 29, 1996, Ser. No. 623,969

Int. Cl.⁶ H03K *19/0175;17/10*

U.S. Cl. 327—333 **30 Claims**

1. A device for providing a high voltage to a node of a low voltage integrated circuit, the device comprising:

- a pull up circuit coupled between the high voltage and the node, the pull up circuit configured to pull the node up to approximately the high voltage; and
- a pull down circuit coupled between the node and a second voltage, the pull down circuit configured to pull the node down to a third voltage, the pull down circuit including series coupled first and second n-channel transistors, the first n-channel transistor having a first substrate junction breakdown voltage, the second n-channel transistor having a second substrate junction breakdown voltage wherein the first



substrate junction breakdown voltage is greater than the second substrate junction breakdown voltage.

5,748,026

CIRCUIT FOR CONVERTING LEVEL OF LOW-AMPLITUDE INPUT

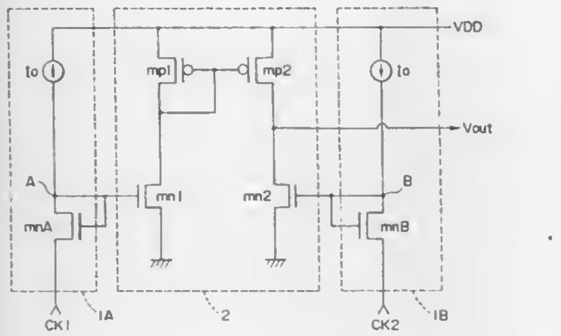
Toshikazu Maekawa, and Yuji Hayashi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 524,782, Sep. 7, 1995, abandoned, which is a continuation of Ser. No. 156,838, Nov. 24, 1993, abandoned. This application Feb. 5, 1997, Ser. No. 796,039

Claims priority, application Japan, Nov. 25, 1992, 4-338123; Jun. 25, 1993, 5-180788

Int. Cl.^{6} H03K *19/0185*

U.S. Cl. 327—333 **10 Claims**



1. A level converting circuit for converting a digital input signal from a first level to a second level, said circuit comprising:

a level converting means for converting the digital input signal having at least a first phase of a relatively low first amplitude to a digital output signal having a relatively high amplitude with respect to the digital input signal, said output signal having a same logical state as the first phase of the input signal, said level converting means comprising a first input transistor having a threshold voltage; and

a detecting/offsetting means for detecting the threshold voltage of the first input transistor and adding an offset voltage based on the detected threshold voltage to the first phase of the digital input signal to create an offset digital input signal and applying the offset input signal to a gate of said first input transistor of the level converting means, wherein said level converting means further comprises a second input transistor which receives the second phase of the input signal which is opposite in phase to the first phase of the digital input signal.

5,748,027

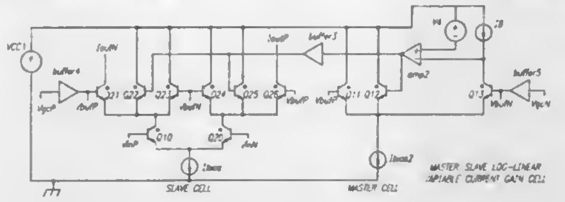
LOW POWER, HIGH LINEARITY LOG-LINEAR CONTROL METHOD AND APPARATUS

Robert S. Cargill, Portland, Oreg., assignor to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Filed Feb. 3, 1997, Ser. No. 794,836

Int. Cl.^{6} H03G *11/08;* **G06G** *7/12*

U.S. Cl. 327—350 **13 Claims**



1. A log-linear gain control circuit comprising:

a log-linear master control circuit providing a control voltage; and,

a log-linear slave circuit referenced to the control voltage and responsive to an input signal to provide an output signal having a gain controlled by a gain control signal.

5,748,028

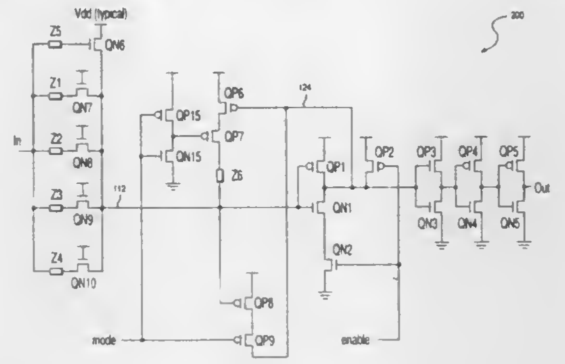
METHOD AND APPARATUS FOR MULTI-LEVEL INPUT VOLTAGE RECEIVER CIRCUIT

Douglas Ele Martin, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1996, Ser. No. 741,731

Int. Cl.^{6} H03K *17/04*

U.S. Cl. 327—374 **5 Claims**



1. A receiver circuit, comprising:

first stage circuitry for receiving an input signal, wherein the first stage circuitry includes:

a first stage output node,

first pullup circuitry coupled to an input node and the first stage output node for driving a voltage on the first stage output node in response to the input signal, and

circuitry for overvoltage protection coupled to the input node; and

second stage circuitry coupled to the first stage output node, wherein the second stage circuitry includes:

second pullup circuitry coupled to the first stage output node for driving the voltage on the first stage output node in response to the input signal, and

circuitry for disabling the second pullup circuitry when the receiver is used in a high voltage input signal mode, so that the second pullup circuitry, when disabled, will not oppose the input signal driving the first stage output node voltage downward.

5,748,029

MOS TRANSISTOR SWITCHING CIRCUIT WITHOUT BODY EFFECT

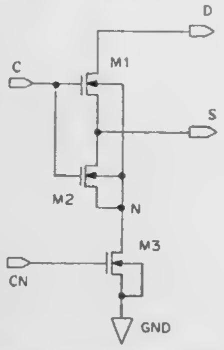
Luciano Tomasini, Monza; Rinaldo Castello, Arcore; Giancarlo Clerici, Vimodrone, and Ivan Bietti, Casalromano, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 29, 1996, Ser. No. 624,126

Claims priority, application European Pat. Off., Mar. 31, 1995, 95830122

Int. Cl.^{6} H03K *17/687*

U.S. Cl. 327—389 **17 Claims**



1. A switching circuit having first and second connection terminals comprising:

a first transistor having first, second and command terminals and a substrate, the first and second terminals of the first transistor being connected to the first and second connection terminals of the switching circuit;

a second transistor having first, second and command terminals and a substrate, the first terminals of the first and second transistors being connected, the command terminals of the first and second transistors being connected and the substrates of the first and second transistors being connected; and

a third transistor connected in series with the second transistor, having first, second and command terminals and a substrate, the first terminal of the third transistor being connected to the second terminal of the second transistor, and the second terminal and substrate of the third transistor being connected to a reference potential.

5,748,030

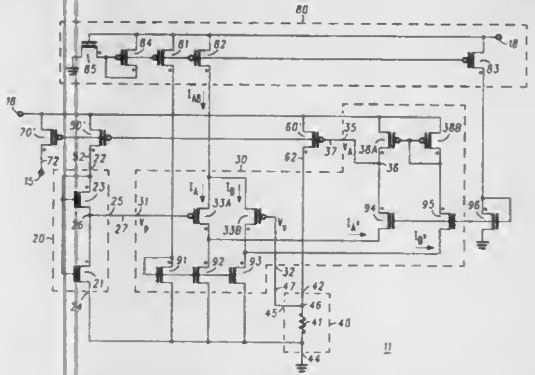
BIAS GENERATOR PROVIDING PROCESS AND TEMPERATURE INVARIANT MOSFET TRANSCONDUCTANCE

Vladimir Koifman, Rishon-Lezion; Yachin Afek, Kfar Saba, and Israel Kashat, Netanya, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 19, 1996, Ser. No. 699,283

Int. Cl.^{6} H03K *3/011*

U.S. Cl. 327—513 **12 Claims**



1. An apparatus having a bias generator for neutralizing thermal drift in a main circuit by supplying a bias current to said main circuit, characterized in that it comprises:

a first and a second variable current source for providing first and second auxiliary currents, respectively;

a third variable current source for providing the bias current;

an output terminal coupled to said third variable current source, said output terminal being provided for coupling the main circuit to said bias generator;

a differential amplifier for supplying a control signal to said first, second and third variable current sources,

a measurement unit being coupled to a first input of said differential amplifier for supplying a measurement signal, said measurement unit being coupled to said first variable current source and conducting the first auxiliary current to a reference potential; and

a substantially temperature invariant element being coupled to a second input of said differential amplifier for providing a reference signal, said element being coupled to said second variable current source.

5,748,031

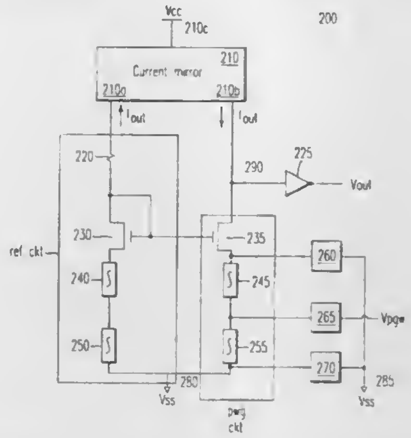
ELECTRICAL LASER FUSE HYBRID CELL

Scott C. Best, Sunnyvale, Calif., assignor to Cypress Semiconductor, Corporation, San Jose, Calif.

Filed Feb. 1, 1996, Ser. No. 595,545

Int. Cl.^{6} G11C *7/00;* **H01H** *37/76*

U.S. Cl. 327—525 **19 Claims**



1. An apparatus for programming a hybrid fuse circuit comprising:

a reference circuit for generating a reference current;

a current mirror having reference input and at least one current output,

wherein said reference input is coupled to said reference circuit, and said current mirror generates an output current for each of said at least one current output in response to said reference current; and

a programming circuit coupled to each of said at least one current output of said current mirror to receive said output current generated by said current mirror, said programming circuit including,

an output, and

a laser fuse and an electrical fuse coupled in a serial order,

wherein one of said laser fuse and said electrical fuse is capable of being blown during programming, and said programming circuit generates an output signal having a first voltage level or a second voltage level dependent on whether one of said laser fuse and said electrical fuse is blown.

VOL
2 10
SS
1
MY
5
998
UMI

5,748,032
CHARGE PUMPING CIRCUIT FOR GENERATING A HIGH OUTPUT VOLTAGE

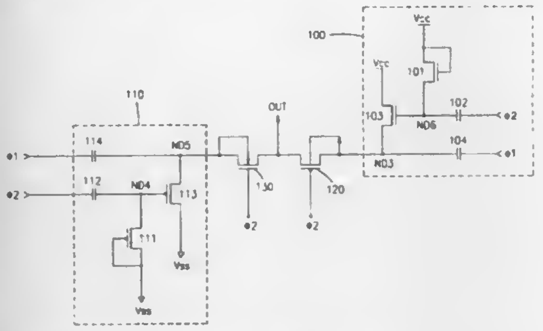
Joon-Hyun Baek, Kyungki-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Jan. 2, 1996, Ser. No. 581,789

Claims priority, application Rep. of Korea, Oct. 25, 1995, 37037/1995

Int. Cl.^{6} H03K *3/01*

U.S. Cl. 327—536 **24 Claims**



1. A charge pumping circuit comprising:
a) a first clock booster means, responsive to first and second clock signals, for changing a first voltage in a positive direction to a first predetermined level and for changing a second voltage in a negative direction to a second predetermined level such that a difference in magnitude of the first and second predetermined levels is greater than a difference in magnitude of the first and second voltages, wherein said first clock booster means includes
 i) a first positive direction pumping means for changing the first voltage in the positive direction to the first predetermined level in response to said first and second clock signals,
 ii) a first negative direction pumping means for changing the second voltage in the negative direction to the second predetermined level in response to the first and second clock signals, and
 iii) first switching means, coupled to said first positive and negative direction pumping means, for switching an output signal at an output terminal of said first clock booster means between the first and second predetermined levels in response to the second clock signal; and
b) a first pumping means, coupled for receiving the first voltage, for amplifying the first voltage to a third predetermined voltage level in response to one of the first and second predetermined levels outputted as the output signal at the output terminal of said first clock booster means.

5,748,033
DIFFERENTIAL POWER BUS COMPARATOR

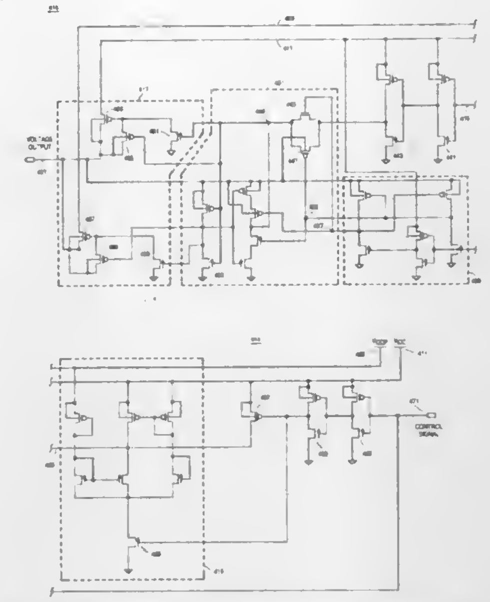
Golnaz Kaveh; Gregory F. Taylor, both of Portland, and Jeffrey E. Smith, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 26, 1996, Ser. No. 621,652

Int. Cl.^{6} G05F *3/02*

U.S. Cl. 327—545 **11 Claims**

1. A device for generating an output voltage for an integrated circuit comprising:
a comparator coupled to a plurality of voltage potentials and a control signal, the control signal enabling the comparator to generate a select signal in response to the plurality of voltage potentials, the comparator drawing substantially no power when not generating the select signal;
a latch coupled to the comparator and the control signal, the control signal enabling the latch to latch the select signal; and
a multiplexor coupled to receive the select signal from the latch and the plurality of voltage potentials, the multiplexor generating the output voltage in response to the select signal.



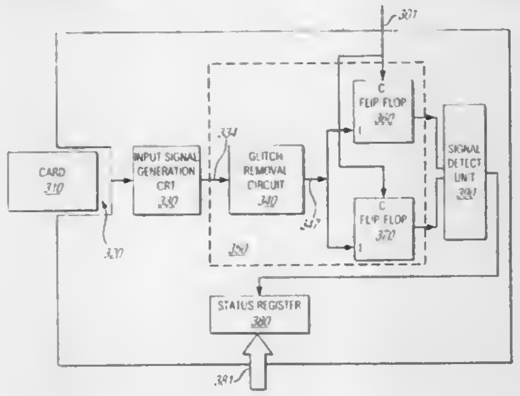
5,748,034
COMBINATIONAL LOGIC CIRCUIT, SYSTEM AND METHOD FOR ELIMINATING BOTH POSITIVE AND NEGATIVE GLITCHES

Venkateswarrao Ketineni, Fremont, and Daniel G. Bezzant, Pleasanton, both of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Continuation of Ser. No. 486,555, Jun. 7, 1995, abandoned. This application Sep. 16, 1996, Ser. No. 714,509

Int. Cl.^{6} H03K *5/00*

U.S. Cl. 327—551 **5 Claims**



1. A host adapter comprising:
a card slot for receiving a personal computer (PC) circuitry card;
an input signal generation circuit coupled to said card slot for generating input signals including input card receipt and card removal signals to indicate whether said card slot has received said PC card or said PC card has been removed from said slot, wherein said input signals include a plurality of positive or negative glitches;
a glitch removal circuit coupled to said input signal generation circuit to receive and monitor said input card signals in order to remove said positive and negative glitches on said input card signals, said glitch removal circuit generating a deglitched input card signal;
a first flip flop coupled to said glitch removal circuit to receive a positive edge of said deglitched input card signal indicating the receipt of said PC card in said card slot, said first flip flop producing a card receipt signal responsive to the receipt of said PC card in said card slot;
a second flip flop coupled to said glitch removal circuit to receive a negative edge of said deglitched input card signal indicating the removal of said PC card from said card slot, said second flip flop generating a card removal output signal responsive to the removal of said PC card from said card slot; and
a logic signal generation unit coupled to said first and said second flip flops to receive said card receipt signal and said card remove signal respectively from said first and said second flip flops, said logic signal generating unit generating a corresponding output signal to indicate which of said card receipt and said card remove signals have been received in said host adapter.

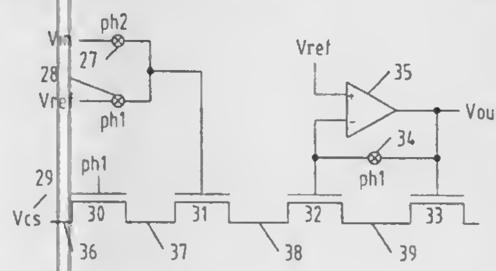
5,748,035
CHANNEL COUPLED FEEDBACK CIRCUITS

Charles F. Neugebauer, Palo Alto, Calif., assignor to Arithmos, Inc., Santa Clara, Calif.

Filed May 27, 1994, Ser. No. 250,709

Int. Cl.^{6} G06G *7/26*

U.S. Cl. 327—562 **38 Claims**



1. A circuit for processing a first input signal into an output signal, wherein the circuit has at least a reset operation and a signal processing operation, comprising:
an amplifier having at least one input terminal and at least one output terminal;
a first channel coupled semiconductor (CCSC) device having a gate and substrate region located beneath the gate of the first CCSC device, wherein the gate of the first CCSC device is electrically connected to the first input signal during the signal processing operation;
a second CCSC device having a gate and a substrate region located beneath the gate of the second CCSC device, wherein the gate of the second CCSC device is electrically connected to the input terminal of the amplifier;
a third CCSC device having a gate and a substrate region located beneath the gate of the third CCSC device, wherein the gate of the third CCSC device is electrically connected to the output terminal of the amplifier, wherein the substrate regions of the first, second and third CCSC devices are electrically connected to permit electric charge to be conducted between the substrate regions of the first, second and third CCSC devices when the gate of the first CCSC device is electrically connected to the first input signal, whereby the substrate regions of the first, second and third CCSC devices and the electrical connections between the substrate regions define a channel and wherein the amplifier and the second and third CCSC devices are connected in a negative feedback configuration; and
at least one channel reset device, wherein the channel reset device electrically connects a source of charge to the channel during the reset operation.

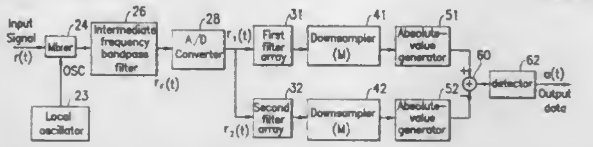
5,748,036
NON-COHERENT DIGITAL FSK DEMODULATOR

Tsai-Pao Lee, Kaohsiung; Kwang-Cheng Chen, Taipei, and Chin-Lin Yang, Hsinchu, all of Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Jul. 30, 1996, Ser. No. 688,429

Int. Cl.^{6} H04L *27/148*

U.S. Cl. 329—300 **25 Claims**



20. A signal processing method for demodulating a N-ary FSK modulated input signal to obtain output data, in which the N-ary FSK modulation has N symbols, and the input signal includes a plurality of symbol intervals, wherein each symbol interval has a symbol, the method comprising the steps of:
digitizing the input signal, wherein a sample number in each symbol interval satisfies an equation $M \geqq 2K+1$, wherein K is the interval number of a carrier of the input signal in each symbol interval;
filtering the input signal by the spectrums of the N symbols of the N-ary FSK modulation, respectively;
lowering the sample value in each symbol interval for the input signal after filtering, so that merely one sample value is included therein;
calculating the absolute value of the sample value included in each symbol interval for the input signal which has the sample value thereof lowered; and
deciding the symbols represented by each symbol interval according to the sample value which has the absolute value thereof calculated, so as to obtain output data.

5,748,037
RADIO TRANSMITTER POWER AMPLIFIER CALIBRATION

Mark Rozental, Rehovot; Ilan Yehezkel Horowitz, Nes-Ziona, and Moshe Ben-Ayun, Holon, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

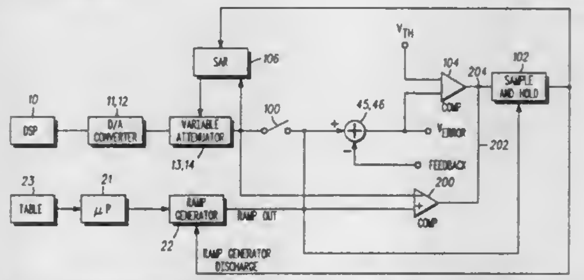
PCT No. PCT/IB95/00144, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO95/24766, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 8, 1995, Ser. No. 722,120

Claims priority, application United Kingdom, Mar. 11, 1994, 9404665

Int. Cl.^{6} H03F *1/26*

U.S. Cl. 330—2 **10 Claims**



9. A radio transmitter comprising a power amplifier (**36**) having an input and an output, controlled input signal generating means (**22**) for supplying a signal to the input, output monitoring means (**104**) for determining when the amplifier commences clipping, memory means (**23**) for storing a maximum input signal value and control means (**21**) arranged to provide an input signal to the amplifier, wherein the control means are arranged to store in said memory means a maximum input signal value and to control the input signal generating means to generate periodically an increasing input signal up to a value not exceeding said stored value, where the stored value represents an input signal value below a value at which clipping will commence.

VOL
2 10
SS
1
MY
5
998
MI

5,748,038

METHOD FOR AMPLIFIER TRAINING IN A LINEAR POWER AMPLIFIER

Dragan Boscovic; Stephen Valentine, both of Basingstoke, United Kingdom; Babak Bastani, Plantation, Fla., and Anthony Wray, Basingstoke, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

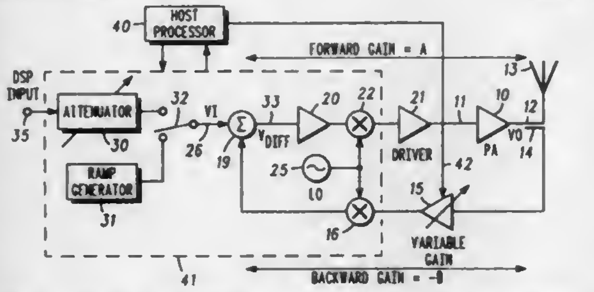
PCT No. PCT/EP95/00753, § 371 Date Dec. 26, 1995, § 102(e) Date Dec. 26, 1995, PCT Pub. No. WO95/24765, PCT Pub. Date Sep. 14, 1995

Continuation of Ser. No. 545,660, Dec. 26, 1995, abandoned. This PCT application Mar. 2, 1995, Ser. No. 873,872

Claims priority, application United Kingdom, Mar. 9, 1994, 9404560

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 330—2 **13 Claims**



11. A method of amplitude training to determine an optimum operating point of a linear amplifier linear power amplifier comprising the steps of:

inputting a training signal into the linear power amplifier;

adapting a parameter of the training signal in response to an output signal from the linear power amplifier in successive iterations of the training signal; and

determining an optimum operating point of the linear power amplifier in accordance with at least one parameter adaptation,

wherein the adapted parameter is one of a rate of change of input signal level, time duration, rate of change and time duration of the input training signal.

5,748,039

Patent Not Issued For This Number

5,748,040

FULLY DIFFERENTIAL HIGH GAIN CASCODE AMPLIFIER

Ka Yin Leung, Austin, Tex., assignor to Crystal Semiconductor Corporation, Austin, Tex.

Continuation of Ser. No. 503,312, Jul. 17, 1995, abandoned. This application Nov. 6, 1996, Ser. No. 749,383

Int. Cl.^{6} H03F *3/45*

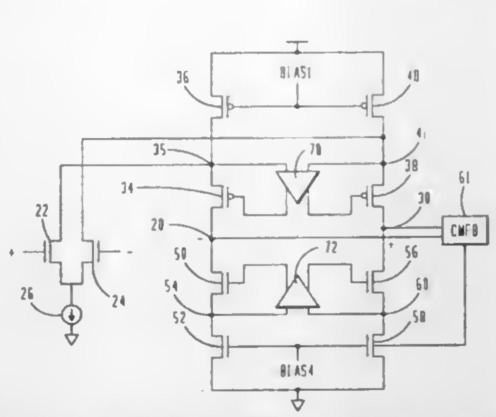
U.S. Cl. 330—253 **26 Claims**

1. A cascoded differential amplifier, comprising:

first and second differential output legs connected between positive and negative power supply rails and each having an output;

an input differential driving circuit for receiving a differential input signal and driving said first and second differential output legs;

said first and second differential output legs having a cascoded transistor configuration with at least first and second primary cascoded transistors in each of said first and second differential output legs connected between said associated output and one of said power supply rails with said first primary cascoded transistor having the source/drain path thereof connected between said associated power supply rail and a voltage node and said second primary cascoded transistor having



the source/drain path thereof connected between said voltage node and said associated output; and

bias circuitry for biasing said first and second primary cascoded transistors, said first primary cascoded transistor biased to a substantially V_{on} voltage level, with said substantially V_{on} voltage level being substantially the V_{on} voltage of said first primary cascoded transistor and said second primary cascoded transistor being gain boosted with a gain boost differential amplifier driving the gate thereof with a gain of −A to multiply the output gain of the cascoded differential amplifier by the gain of −A, said gain boost differential amplifier having positive and negative differential inputs with the negative input thereof connected to said voltage node and the positive input thereof connected to a voltage that is substantially identical to the voltage on said voltage node, said gain boost differential amplifier connected in a negative feedback configuration.

5,748,041

AGC AMPLIFIER CIRCUIT USING TRIPLE-TAIL CELL

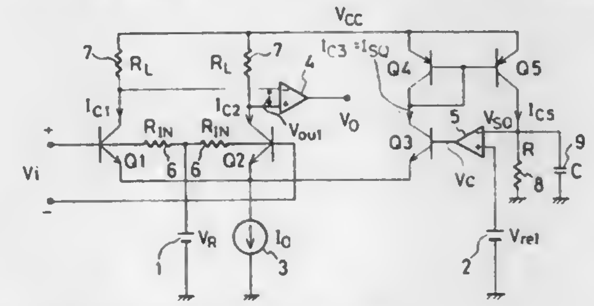
Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 8, 1996, Ser. No. 629,199

Claims priority, application Japan, Jul. 14, 1995, 7-201680

Int. Cl.^{6} H03F *3/45;* **H03G** *3/30*

U.S. Cl. 330—254 **15 Claims**



1. An AGC amplifier circuit comprising:

a triple-tail cell including first, second, and third transistors whose emitters or sources are coupled together;

said first and second transistors forming a differential transistor-pair;

said first, second and third transistors being driven by a single tail current;

bases or gates of said first and second transistors forming input ends of said triple-tail cell to be applied with an input signal to be amplified;

collectors or drains of said first and second transistors forming output ends of said triple-tail cell from which an amplified output signal with a variable gain is derived;

a collector or drain of said third transistor forming an output end of said triple-tail cell from which a rectified output signal is derived;

a base or gate of said third transistor forming an input end of said triple-tail cell to be applied with a gain control signal; and

means for producing said gain control signal, using said rectified output signal, and for negatively feeding back said gain control signal to said differential transistor-pair, thereby providing automatic gain control.

5,748,042

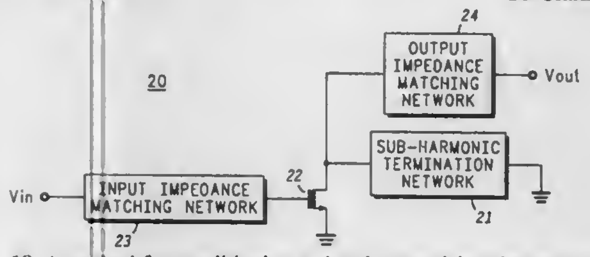
METHOD FOR ALTERING A DIFFERENCE FREQUENCY SIGNAL AND AMPLIFIER CIRCUIT THEREOF

George B. Norris, Phoenix; Joseph Staudinger, Gilbert, and Gary W. Sadowniczak, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 26, 1996, Ser. No. 686,876

Int. Cl.^{6} H03F *1/32*

U.S. Cl. 330—277 **20 Claims**


24
OUTPUT IMPEDANCE MATCHING NETWORK
Vout
20
SUB-HARMONIC TERMINATION NETWORK
22
Vin
INPUT IMPEDANCE MATCHING NETWORK
23
21

18. A method for conditioning a signal, comprising the steps of:

receiving an input signal of a first frequency;

receiving an undesired signal of a second frequency;

generating an interference signal from the undesired signal and a transmit signal, wherein the interference signal has a difference frequency signal component; and

reducing the amplitude of the difference frequency signal component of the interference signal with a sub-harmonic termination, thereby linearizing the signal.

5,748,043

DIGITAL PLL FREQUENCY SYNTHESIZER

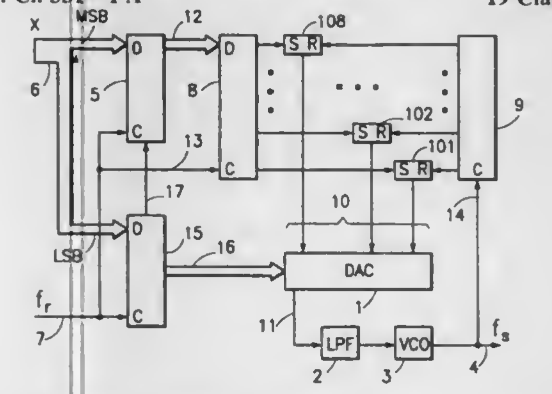
Vitali Ivanovich Koslov, Flat 3, 28 Radvanskov Ukraini Avenue, Kiev, Ukraine, 254215

PCT No. PCT/US94/04880, § 371 Date Nov. 1, 1996, § 102(e) Date Nov. 1, 1996, PCT Pub. No. WO95/30202, PCT Pub. Date Nov. 9, 1995

PCT Filed May 3, 1994, Ser. No. 737,351

Int. Cl.^{6} H03L *7/085;7/18*

U.S. Cl. 331—1 A **19 Claims**



1. A frequency synthesizer, comprising:

a) a digital to analog converter having a first plurality of digital inputs and an analog output;

b) a low pass filter having an input and an output, said analog output of said digital to analog converter being coupled to said input of said low pass filter;

c) a controllable oscillator having an input and an output, said output of said low pass filter being coupled to said input of said controllable oscillator, and the output of the controllable oscillator being the output of said frequency synthesizer;

d) a first accumulator having a data input, a data output, and a clock input, said data input coupled to a first data bus and said clock input coupled to a reference clock;

e) a first phase splitter having a data input, a plurality of outputs, and a clock input, said data input being coupled to said data output of said first accumulator and said clock input being coupled to said reference clock;

f) K number of RS flip-flops, each having an S input, an R input, and an output, each of said K number of RS flip-flops being coupled by its S input to a respective one of said plurality of outputs of said phase splitter, and each of said K number of RS flip-flops being coupled by its output to a respective one of said first plurality of digital inputs of said digital to analog converter;

g) a pulse distributor having a clock input said clock input being coupled to said output of said controllable oscillators and W number of outputs each being coupled to the R input of a respective K/W number of flip-flops, where K/W is an integer.

5,748,044

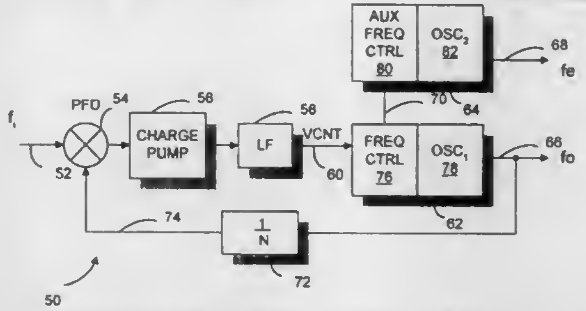
DUAL VCO PHASE-LOCKED LOOP

Yuan Xue, Fremont, Calif., assignor to Silicon Motion, Inc., San Jose, Calif.

Filed Oct. 11, 1996, Ser. No. 731,242

Int. Cl.^{6} H03L *7/08;* **G09G** *5/12*

U.S. Cl. 331—2 **10 Claims**



1. A dual VCO phase-locked loop system adapted for locking to an external reference signal and having a first voltage-controlled oscillator controlled by a loop control voltage, such that an output of the first voltage-controlled oscillator is phase-locked to the external reference signal, the system including a second oscillator whose output frequency is proportional to a combination of the loop control voltage and a sum of compensating current functions permitting the second oscillator to track the frequency of the reference signal over defined operating ranges of ambient temperature, supply voltage and semiconductor manufacturing process variation.

5,748,045

DIGITAL PLL CIRCUIT

Kiyoshi Tateishi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 18, 1996, Ser. No. 664,620

Claims priority, application Japan, Jul. 6, 1995, 7-170837

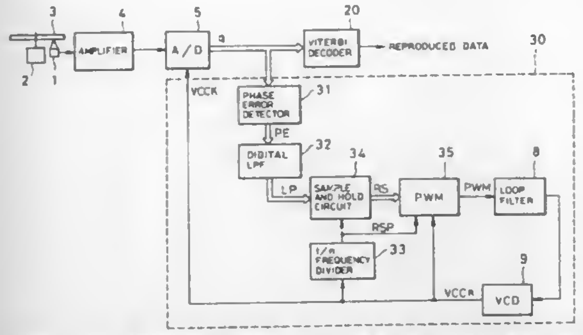
Int. Cl.^{6} H03L *7/06;7/08*

U.S. Cl. 331—17 **4 Claims**

1. A digital PLL circuit for use in a recorded information reproducing apparatus having an A/D converter for sampling a read signal read from a recording medium at a timing corresponding to a reproduction clock signal to sequentially acquire sample values and decoding means for acquiring reproduced data based on said sample values, said PLL circuit comprising:

phase error detecting means for detecting a phase error in said read signal based on said sample values to obtain a phase error signal;

OL
2 10
ISS
1
MY
5
998
MI



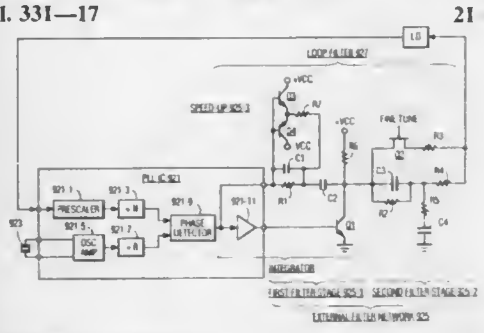
phase error averaging means for producing an average phase error signal corresponding to said phase error signal;

sample and hold means for sampling said average phase error signal for each predetermined clock signal and outputting a resultant signal as a sampled average phase error signal;

a pulse width modulation circuit for generating a pulse width modulation signal having a pulse width corresponding to said sampled average phase error signal for every period of said predetermined clock signal; and

clock generating means for generating a clock signal with a frequency corresponding to a voltage level of said pulse width modulation signal and outputting said clock signal as said reproduction clock signal.

5,748,046
PHASE LOCKED LOOP WITH CONTROLLABLE RESPONSE TIME
David Mark Badger, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Continuation of Ser. No. 798,669, Feb. 12, 1997, abandoned, which is a continuation of Ser. No. 579,783, Dec. 28, 1995, abandoned. This application Jun. 25, 1997, Ser. No. 882,129
Int. Cl.^{6} H03L *7/093*
U.S. Cl. 331—17 **21 Claims**



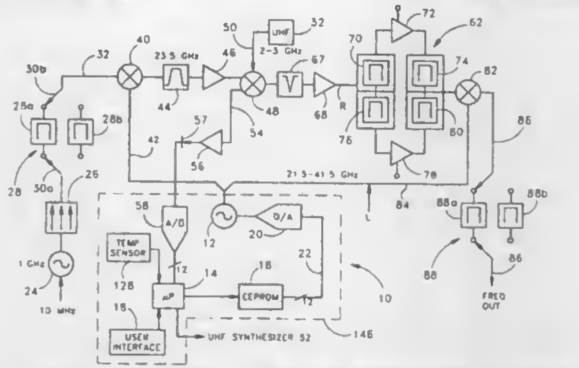
1. Apparatus, comprising:

a closed loop arrangement including a controlled oscillator for generating a controlled oscillator signal having a frequency controlled in response to an oscillator control signal, a source of a signal representing a reference frequency, means for generating an error signal representing the phase and frequency relationship between said controlled oscillator signal and said signal representing said reference frequency, and a loop filter for filtering said error signal to generate said oscillator control signal; and

means for generating a mode indicating control signal for controlling the mode of operation of said closed loop arrangement;

said loop filter of said closed loop arrangement including an amplifier and a first filter section coupled in a negative feedback configuration to form an integrator, a second filter section coupled in cascade with said integrator, and a filter control section coupled to said second filter section for modifying the operation of said second filter section in response to said mode indicating control signal.

5,748,047
MICROWAVE FREQUENCY GENERATOR AND METHOD OF GENERATING A DESIRED MICROWAVE FREQUENCY SIGNAL
Warren E. Guthrie, Wheaton, and Gary S. Garbe, Schaumburg, both of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Aug. 15, 1996, Ser. No. 689,874
Int. Cl.^{6} H03L *1/02;7/00;7/16;* **H04B** *1/26*
U.S. Cl. 331—19 **24 Claims**



1. A microwave frequency synthesizer arrangement for generating quickly a desired predetermined output frequency signal that has reduced spurious frequency signals and which comprises:

oscillator means to generate a determinable frequency signal;

means responsive to said determinable frequency signal received from the oscillator means to generate a predetermined Intermediate Frequency (IF) signal;

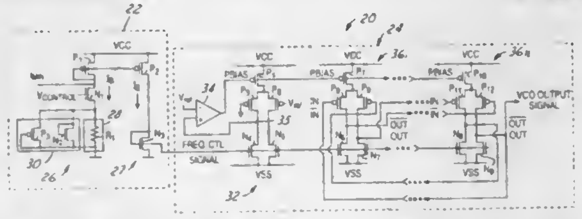
means to generate a determinable ultrahigh frequency (UHF) signal within a predetermined bandwidth;

means responsive to the IF signal and to the UHF signal to generate a resultant output frequency signal;

means responsive to the resultant frequency signal and to the determinable frequency signal generated by the oscillator means to generate the desired predetermined frequency signal; and

means to switch the resultant frequency signal into one of at least two channels, each channel having a predetermined bandwidth that precludes a spurious frequency signal appearing in the desired predetermined output frequency signal.

5,748,048
VOLTAGE CONTROLLED OSCILLATOR (VCO) FREQUENCY GAIN COMPENSATION CIRCUIT
Nathan Y. Moyal, Austin, Tex., assignor to Cypress Semiconductor Corporation, San Jose, Calif.
Filed Dec. 12, 1996, Ser. No. 766,389
Int. Cl.^{6} H03B *5/04;* **H03L** *7/099*
U.S. Cl. 331—34 **18 Claims**



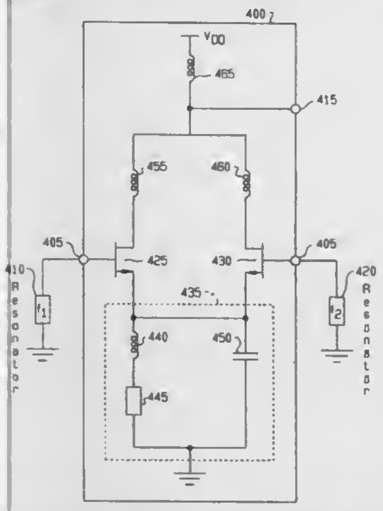
16. A method of operating a voltage controlled oscillator (VCO), said method comprising the steps of:

(A) generating a VCO output signal having a frequency value responsive to a biasing current signal;

(B) converting an input control signal to a control current signal in a first state wherein a first rate of increase of said control current signal is substantially proportional to a rate of increase of said input control signal; and,

(C) converting said input control signal to said control current signal in a second state wherein a second rate of increase of said control current signal is substantially non-linear relative to said rate of increase of said input control signal to thereby reduce a variation in a frequency gain characteristic of said VCO with respect to variations in temperature.

5,748,049
MULTI-FREQUENCY LOCAL OSCILLATORS
John Thomas Bayruns, Middlesex; Raymond Mitchell Waugh, Phillipsburg; Phillip W. Wallace, Bernardsville; Robert J. Bayruns, Middlesex, and Thomas D. DeNigris, Livingston, all of N.J., assignors to Anadigics, Inc., Warren, N.J.
Filed Nov. 23, 1994, Ser. No. 344,753
Int. Cl.^{6} H03B *5/00;* **H04B** *1/26*
U.S. Cl. 331—49 **42 Claims**



13. A multiple-frequency local oscillator having a plurality of LO input ports for coupling to a plurality of resonators, respectively, and an LO output port, each of such plurality of resonators having a resonant frequency, said local oscillator operating to provide at the LO output port an LO output signal at any one of such resonant frequencies, said local oscillator comprising:

a plurality of field effect transistors (FETs) coupled via their gate terminals to respective LO input ports for coupling to respective resonators, the source terminals of the FETs being connected together and coupled to a low reference potential via a common source impedance load, the drain terminals of the FETs being connected together to the LO output port and being coupled to a DC power supply via a common drain impedance load; and

means for controlling said plurality of FETs such that only one of said FETs is selectively turned on while the others are turned off, whereby such LO output signal is at the resonant frequency of the resonator coupled to said selected FET.

5,748,050
LINEARIZATION METHOD AND APPARATUS FOR VOLTAGE CONTROLLED OSCILLATOR
Michael B. Andersnn, Colorado Springs, Colo., assignor to Symbios Logic Inc., Fort Collins, Colo.
Filed Mar. 29, 1996, Ser. No. 625,452
Int. Cl.^{6} H03B *5/00*
U.S. Cl. 331—57 **2 Claims**

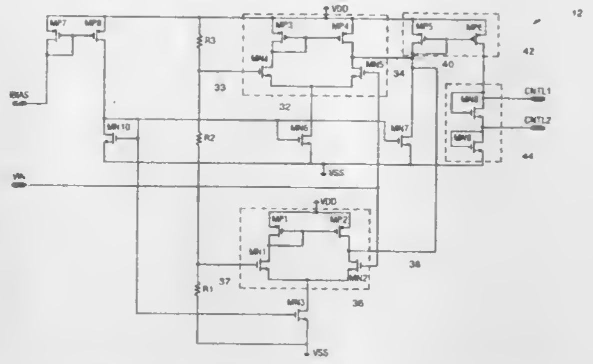
1. A voltage controlled oscillator circuit, comprising:

a first differential amplifier having a first and second input, and an output;

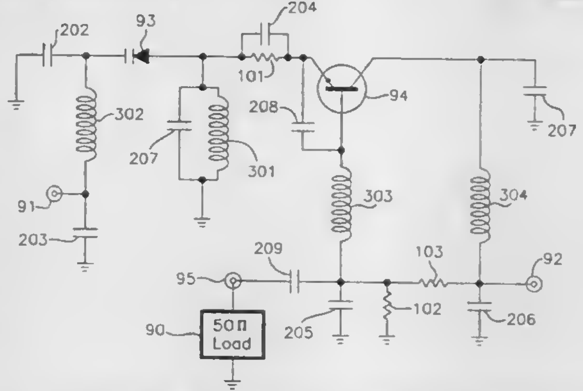
a second differential amplifier having a first and second input, and an output;

a voltage signal coupled to the first input of the first differential amplifier and the first input of the second differential amplifier; and

a voltage circuit providing a first and second voltage, the second voltage being different than the first voltage, wherein the first voltage is coupled to the second input of the first differential amplifier and the second voltage is coupled to the second input of the second differential amplifier, wherein the output of the first differential amplifier is operatively coupled to the output of the second differential amplifier to form a summed output and wherein the summed output is operatively coupled to an oscillator having a clock output with a frequency that generally increases linearly with respect to an increase in voltage of the voltage signal.



5,748,051
LOW PHASE NOISE UHF AND MICROWAVE OSCILLATOR
Charles Lewis, San Diego, Calif., assignor to Z-Communications, Inc., San Diego, Calif.
Filed May 16, 1996, Ser. No. 648,909
Int. Cl.^{6} H03B *5/12;5/18*
U.S. Cl. 331—117 R **14 Claims**



1. An oscillator circuit exhibiting low phase noise characteristics for use in UHF and microwave applications, comprising:

a transistor having a collector, an emitter and a base;

a first capacitor connected between the collector of the transistor and a common potential;

a first inductor having a first terminal and a second terminal, said first terminal connected to the junction between the first capacitor and the collector;

a second capacitor connected on one side to the second terminal of the first inductor and on the other side to a common potential;

a first resistor having a first terminal and a second terminal, said first terminal being connected to the junction between the first inductor and the second capacitor;

a second resistor connected between the second terminal of the first resistor and a common potential;

a third capacitor connected between a common potential and the junction formed by the first resistor and the second resistor;

a D.C. supply voltage terminal connected to the junction formed by the first inductor, the second capacitor and the first resistor;

a fourth capacitor having a first and second terminal, the first terminal being connected to the junction formed by the first resistor, the second resistor and the third capacitor and the second terminal being connected to the load input which will receive the oscillating signal;

/OL
2 10
SS
1
MY
5
998
MI

a second inductor having a first terminal and a second terminal, the first terminal being connected between the junction formed by the first resistor, the second resistor, the third capacitor and the fourth capacitor and the second terminal of the second inductor being connected to the base of the transistor;

a fifth capacitor connected between the junction formed by the base and the second inductor and the emitter of the transistor;

a sixth capacitor having a first plate and a second plate, the first plate being connected to the junction formed by the emitter of the transistor and the fifth capacitor;

a third resistor provided with a first and a second terminal, the first terminal of the third resistor being connected the junction of the emitter of the transistor, the fifth capacitor and the first plate of the sixth capacitor, and the second terminal of the second terminal of the third resistor being connected to the second plate of the sixth capacitor; and

a resonating means connected to the junction between the second terminal of the third resistor and the sixth capacitor.

5,748,052
NONRECIPROCAL CIRCUIT ELEMENT

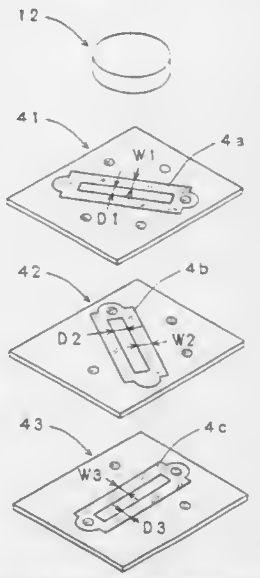
Takashi Hasegawa, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 439,485, May 11, 1995, Pat. No. 5,638,032. This application Feb. 10, 1997, Ser. No. 798,498

Claims priority, application Japan, May 12, 1994, 6-098766

Int. Cl.^{6} H01P *1/383*

U.S. Cl. 333—1.1 **12 Claims**



1. A nonreciprocal circuit element comprising:

a plurality of central electrodes arranged in mutually intersecting directions, each of said central electrodes having a first end and a second end, at least two of said central electrodes having respective dimensions which are unequal;

a first grounding electrode disposed adjacent the central electrodes such that the respective distances from the central electrodes to the first grounding electrode are unequal;

a second grounding electrode disposed adjacent the central electrodes on a side thereof opposite the first grounding electrode, such that the respective distances from the central electrodes to the second grounding electrode are unequal;

first and second ferrite bodies disposed respectively between the central electrodes and the first and second grounding electrodes;

a permanent magnet disposed adjacent to the second grounding electrode on a side thereof opposite the second ferrite body; and

the first ends of the central electrodes defining respective ports having substantially equal respective inductances, the second ends of the central electrodes being connected to one of the grounding electrodes;

wherein each said central electrode has a pair of strips, and at least two of the central electrodes have unequal strip spacings, the strip spacings of the central electrodes nearest the ferrite bodies being the narrowest and the strip spacing of the intermediate central electrode being the widest.

5,748,053
SWITCHING CIRCUIT

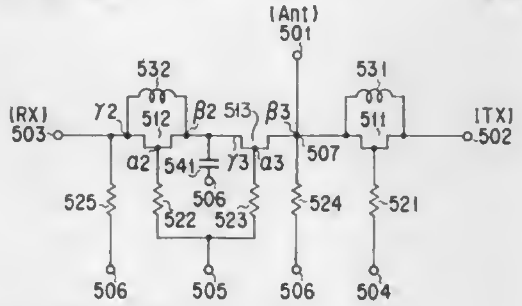
Atsushi Kameyama, Sagamihara; Katsue Kawakyu, Kawasaki, and Yoshiko Ikeda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1996, Ser. No. 723,229

Claims priority, application Japan, Sep. 28, 1995, 7-250410; Jun. 7, 1996, 8-145355

Int. Cl.^{6} H03H *7/48*

U.S. Cl. 333—103 **20 Claims**



1. A switching circuit comprising:

a first transmission path;

a first input/output terminal connected to one end of said first transmission path;

a second input/output terminal connected to the other end of said first transmission path, said first transmission path including a first field effect transistor having a first conduction path which is connected at one end to said first input/output terminal; a second field effect transistor having a second conduction path which is connected at one end to the other end of the first conduction path of said first field effect transistor and connected at the other end to said second input/output terminal; and a first inductor connected in parallel with the first conduction path of said first field effect transistor, said second field effect transistor being devoid of a paralleled inductor;

a second transmission path connected at one end thereof to said second input/output terminal;

a third input/output terminal, which is isolated from said first input/output terminal, connected to the other end of said second transmission path; and

means for decreasing a difference between a voltage applied to the first conduction path of said first field effect transistor and a voltage applied to the second conduction path of said second field effect transistor, when said first and said second transistors are in an OFF state.

5,748,054
HIGH FREQUENCY HYBRID SWITCH OPERABLE IN ANTENNA DIVERSITY TYPE PORTABLE TELEPHONE

Ken Tonegawa, Kyoto; Norio Nakajima, Takatsuki; Mitsuhide Kato; Koji Tanaka, both of Shiga-ken; Tatsuya Ueda, Kyoto, and Koji Furutani, Shiga-ken, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 29, 1996, Ser. No. 593,360

Claims priority, application Japan, Jan. 30, 1995, 7-012693

Int. Cl.^{6} H01P *1/15;* **H04B** *1/44*

U.S. Cl. 333—104 **23 Claims**

1. A high frequency hybrid switch comprising: first, second, third and fourth ports; a first high frequency switch circuit for switching a connection established between the first port and the third port; and a second high frequency switch circuit for selecting one of two connections respectively established between the first port and the fourth port, and between the second port and the fourth port; wherein:

said first high frequency switch circuit includes:

a first diode connected between said first port and said third port;

capacitors respectively connected between said first port and said first diode, and between said third port and said first diode; two series circuits each including a distributed constant signal line and a capacitor, which are connected between a reference potential and respective junction points between said first diode and said capacitors connected to said first diode; and

first and second control voltage terminals each connected to a respective junction point between one of said distributed constant signal lines and the capacitor series-connected to the respective distributed constant signal line; and

said second high frequency switch circuit includes:

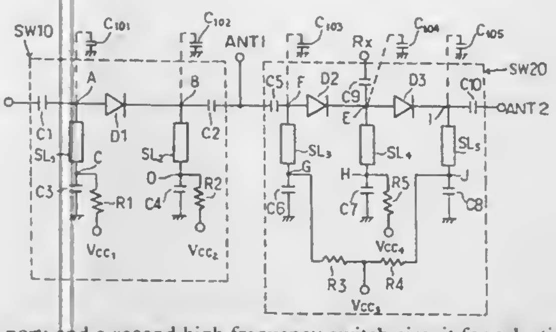
a second diode connected between said first port and said fourth port;

a third diode connected between said second port and said fourth port;

first, second and third capacitors respectively connected between said fourth port and said second and third diodes, between said first port and said second diode between said second port and said third diode; and

three series circuits each including a distributed constant signal line and a capacitor, which are connected between the reference potential and respective junction points defined between the first, second and third capacitors, and said second and third diodes; and

third, fourth and fifth control voltage terminals connected to respective junction points between each of said distributed constant signal lines and the corresponding capacitor series-connected thereto.



5,748,055
MICROWAVE SWITCH

Göran Ors, Pärlröksgången, Sweden, assignor to Sivers Lab Aktiebolag, Kista, Sweden

PCT No. PCT/SE95/00722, § 371 Date Dec. 30, 1996, § 102(e) Date Dec. 30, 1996, PCT Pub. No. WO96/00988, PCT Pub. Date Jan. 11, 1996

PCT Filed Jun. 27, 1995, Ser. No. 765,722

Claims priority, application Sweden, Jun. 29, 1994, 9402308

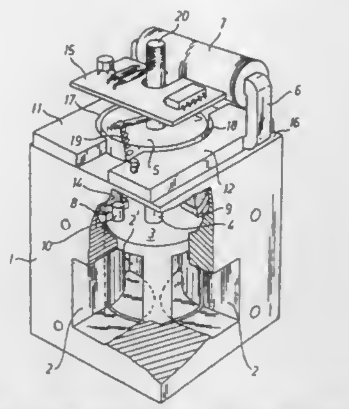
Int. Cl.^{6} H01B *1/10;5/12*

U.S. Cl. 333—106 **10 Claims**

1. A microwave switch comprising a switch housing having side walls in which wave guide terminals are provided and a switch rotor carried by a shaft which is mounted on bearings in said housing and being rotatable between switch positions defined by stop means limiting the rotation of the switch rotor to a maximum of 180°, and an electromagnetic driving device having a permanent magnetic rotor part fixed directly onto the shaft of the switch rotor and having diametrically positioned magnetic poles of opposite polarities, and a stator part comprising an electric driving coil arranged on a magnetic yoke connected with two poles shoes, said stop means comprising a stop element on said switch rotor and impact elements provided in said switch housing, characterized by

said stop means comprising a shock absorbing disc being resiliently arranged in said switch housing and carrying in one single unit said impact elements defining in combination with said stop element the angle of rotation of the switch rotor, and

said impact elements and said disc being symmetrically arranged in relation to said shaft, said disc performing thereby a damping movement changing directions at the impact of said stop element against said respective impact elements.



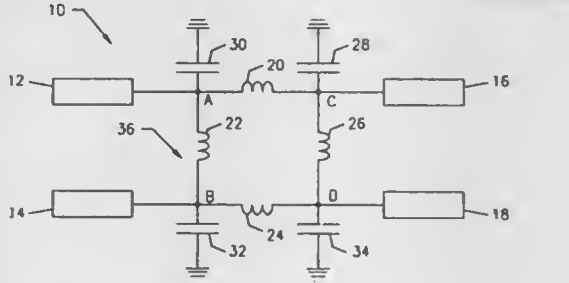
5,748,056
COMPACT 90° MONOLITHIC GAAS COUPLER FOR WIRELESS APPLICATIONS

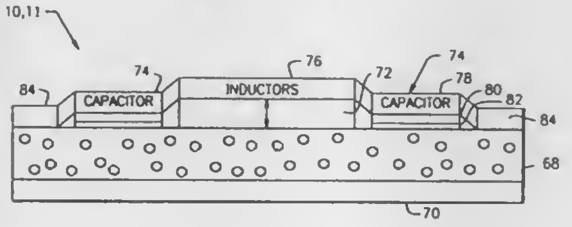
Inder J. Bahl, Roanoke, Va., assignor to ITT Industries, Inc., White Plains, N.Y.

Filed Oct. 2, 1996, Ser. No. 720,674

Int. Cl.^{6} H01P *5/16*

U.S. Cl. 333—112 **18 Claims**





1. A lumped element coupler device for wireless microwave applications of the type including input ports and output ports disposed over a semiconductive substrate, a plurality of inductors and capacitors arranged in a predetermined configuration and coupled between said ports, wherein the improvement therewith comprising:

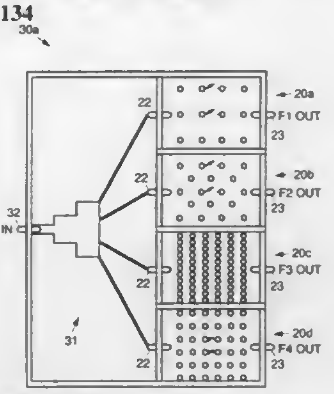
a layer of dielectric material disposed between said inductors and said substrate for improving the performance of said coupler device by reducing the dissipation losses and enhancing the frequency response, wherein said dielectric layer has a dielectric constant which is less than the dielectric constant of said substrate.

5,748,057
PHOTONIC BANDGAP CRYSTAL FREQUENCY MULTIPLEXERS AND A PULSE BLANKING FILTER FOR USE THEREWITH

Hector J. De Los Santos, Inglewood, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Jun. 3, 1996, Ser. No. 656,742
Int. Cl.^{6} H01P *5/12*

U.S. Cl. 333—134 **16 Claims**



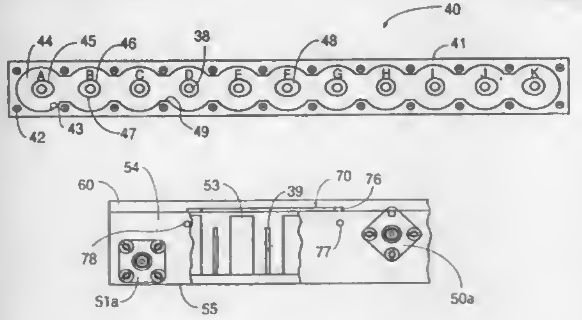
1. A pulse blanking filter comprising:
a wave launching antenna;
a waveguide-like cavity;
a receiving antenna;
a photonic bandgap crystal disposed in the waveguide-like cavity that comprises a dielectric substrate having upper and lower metal boundaries that define lengths of dielectric members therein, and at least one switch interconnecting pairs of dielectric members formed in the substrate.

5,748,058
CROSS COUPLED BANDPASS FILTER

Richard D. Scott, Socorro, N. Mex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 3, 1995, Ser. No. 383,264
Int. Cl.^{6} H01P *1/205;7/06*

U.S. Cl. 333—202 **19 Claims**



1. A cross coupled bandpass filter comprising:
a filter housing having a series of spaced resonators positioned therein along at least one longitudinal axis of the filter, said resonators each including a conductive rod upstanding from a bottom wall of said housing, said housing having an upper wall including a longitudinal slot at one longitudinal edge of the upper wall; and
at least one coaxial cable portion having a first connecting section extending along the upper wall of said housing displaced from the at least one longitudinal axis, said connecting section being embedded into said slot, said cable portion having integral end sections including an inner conductor of said coaxial cable portion, extending at an angle from the at least one longitudinal axis variously in a spaced-gap proximity to the conductive rods of a selected first two of said series of resonators, said first two of the resonators having at least one other resonator of said series of resonators extending therebetween such that a finite pole is realized on at least a highside skirt of the filter response.

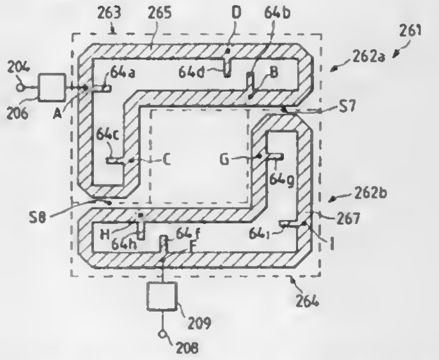
5,748,059
PLANE TYPE STRIP-LINE FILTER IN WHICH STRIP LINE IS SHORTENED AND DUAL MODE RESONATOR IN WHICH TWO TYPES MICROWAVES ARE INDEPENDENTLY RESONATED

Hiroyuki Yabuki; Michiaki Matsuo, both of Kawasaki; Morikazu Sagawa, Tokyo, and Mitsuo Makimoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 598,541, Feb. 8, 1996, which is a division of Ser. No. 317,505, Oct. 4, 1994, Pat. No. 5,534,831. This application Dec. 31, 1996, Ser. No. 775,772

Claims priority, application Japan, Oct. 4, 1993, 5-247845; Dec. 22, 1993, 5-325070; Aug. 11, 1994, 6-189496
Int. Cl.^{6} H01P *1/203;7/08*

U.S. Cl. 333—204 **1 Claim**



1. A strip line filter for resonating and filtering a microwave, comprising:
a first one-wavelength L loop-shaped strip line resonator having a uniform line impedance for resonating and filtering a microwave according to a first resonance mode in which electric voltages at both a first coupling point and a second coupling point spaced 180 degrees in electric length apart from the first coupling point are maximized and respectively resonating and filtering the microwave according to a second resonance mode in which electric voltages at both a third coupling point spaced 90 degrees in electric length apart from the first coupling point and a fourth coupling point spaced 180 degrees in electric length apart from the third coupling point are maximized, the first one-wavelength L loop-shaped strip line resonator having a first parallel coupling line between the first and third coupling points and a second parallel coupling line between the second and fourth coupling points;
a microwave inputting element for inputting the microwave to the first coupling point of the first one-wavelength L loop-shaped strip line resonator to resonate the microwave according to the first resonance mode in the first one-wavelength L loop-shaped strip line resonator;
a second one-wavelength L loop-shaped strip line resonator having the same uniform line impedance as that of the first one-wavelength L loop-shaped strip line resonator for resonating and filtering the microwave according to the first resonance mode in which electric voltages at both a fifth coupling point and a sixth coupling point spaced 180 degrees in electric length apart from the fifth coupling point are maximized and respectively resonating and filtering the microwave according to the second resonance mode in which electric voltages at both a seventh coupling point spaced 90 degrees in electric length apart from the fifth coupling point and an eighth coupling point spaced 180 degrees in electric length apart from the seventh coupling point are maximized, the second one-wavelength L loop-shaped strip line resonator having a third parallel coupling line between the fifth and seventh coupling points and a fourth parallel coupling line between the sixth and eighth coupling points, the third parallel coupling line being electromagnetically coupled to the second parallel coupling line of the first one-wavelength L loop-shaped strip line resonator to transfer the microwave resonated according to the first or second resonance mode in the first one-wavelength L loop-shaped strip line resonator to the second one-wavelength L loop-shaped strip line resonator, and the fourth parallel coupling line being electromagnetically coupled to the first parallel coupling line of the first one-wavelength L loop-shaped strip line resonator to transfer the microwave resonated according to the first resonance mode in the second one-wavelength L loop-shaped strip line resonator to the first one-wavelength L loop-shaped strip line resonator in which the microwave is resonated according to the second resonance mode; and
a microwave outputting element for outputting the microwave resonated according to the second resonance mode in the second one-wavelength L loop-shaped strip line resonator.

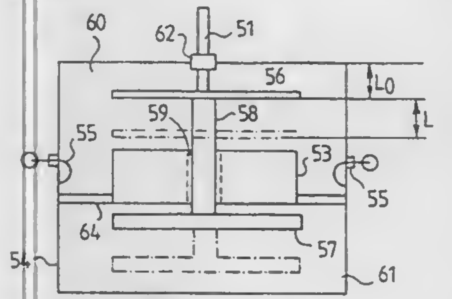
5,748,060
DIELECTRIC RESONATOR HAVING TWO PLANAR SURFACES WITH RESPECTIVE ADJUSTMENT PLATES PARALLEL THERETO

Veli-Matti Särkkä, Oulunsalo, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI95/00546, § 371 Date Jun. 4, 1996, § 102(e) Date Jun. 4, 1996, PCT Pub. No. WO96/11510, PCT Pub. Date Apr. 18, 1996

PCT Filed Oct. 4, 1995, Ser. No. 640,799
Claims priority, application Finland, Oct. 5, 1994, 944662
Int. Cl.^{6} H01P *7/10*

U.S. Cl. 333—235 **2 Claims**



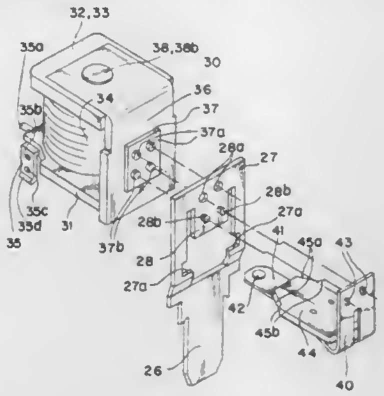
1. A dielectric resonator, comprising:
a dielectric resonator disc having two planar surfaces;
a frequency controller comprising an adjustment mechanism and an electrically conductive adjustment plate, which is substantially parallel with one of said two planar surfaces of said dielectric resonator disc, and movable by means of said adjustment mechanism in a perpendicular direction with respect to said resonator disc for adjusting the resonance frequency by changing the distance between said conductive adjustment plate and said one of said two planar surfaces of said dielectric resonator disc;
an electrically conductive casing for said dielectric resonator disc and said frequency controller;
said frequency controller further comprising a dielectric adjustment plate, which is substantially parallel with the other of said two planar surfaces of said dielectric resonator disc and connected to said adjustment mechanism, so that said dielectric adjustment plate is movable in said perpendicular direction with respect to said other of said two planar surfaces, for changing the distance between said dielectric adjustment plate and said other of said two planar surfaces of said dielectric resonator disc simultaneously and to the same extent as the distance between said conductive adjustment plate and said one of said two planar surfaces, but in an opposite direction; and
said conductive adjustment plate and said dielectric adjustment plate having frequency adjustment curves, which are substantially similar, but opposite with regard to the slope of adjustment, so that a combined slope of frequency adjustment of the frequency controller resulting from combining said frequency adjustment curves is substantially linear.

5,748,061
ELECTROMAGNETIC RELAY

Kazuhiro Tsutsui, and Seiji Imamura, both of Kyoto, Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Jan. 9, 1997, Ser. No. 780,811
Claims priority, application Japan, Jun. 9, 1996, 8-001369
Int. Cl.^{6} H01H *51/22*

U.S. Cl. 335—83 **6 Claims**



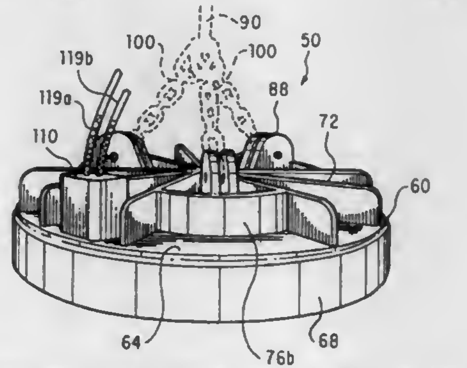
1. An electromagnetic relay, comprising:
a base;
a fixed contact terminal attached to the base, the fixed contact terminal having a fixed contact;
an electromagnetic block attached to the base, the electromagnetic block having a yoke;
a movable contact terminal attached to the yoke;
a coil terminal electrically connected to the electromagnetic block;
a hinged spring attached to the movable contact terminal;
a movable metal armature attached to the hinged spring;
a movable head attached to the movable metal armature;
a movable contact formed integrally with the movable head; and
a flat protruding segment between the yoke and the movable contact terminal,
wherein the flat protruding segment is a spacer.

5,748,062
FABRICATED ELECTRIC LIFTING MAGNET

Jay Albert Kirkpatrick, 9302 Lakeland Dr., Richmond, Va. 23229

Filed Jun. 6, 1996, Ser. No. 659,179
Int. Cl.^{6} H01F *7/20*

U.S. Cl. 335—294 **29 Claims**



26. A fabricated electric lifting magnet casing comprised of a plurality of individual components that are welded together, said components including:
a flat, structural steel, top plate having a first surface and a second surface facing in a direction opposite of the first surface;
a plurality of structural steel stiffener members, said stiffener members having first ends that are welded to each other to define an integral support frame, apart from the top plate, said stiffener members extending radially outward from the location where the first ends are welded to each other, the stiffener

/OL
2 10
SS
1
MY
5
998
JMI

members having a height, a width and a length, the length being substantially longer than the height and the width, said stiffener members being welded to the first surface of the top plate along the lengths of the stiffener members;

an outer side wall located at an outer circumference of said top plate and welded to the second surface of said top plate; and

a central core welded to a central portion of said second surface of said top plate.

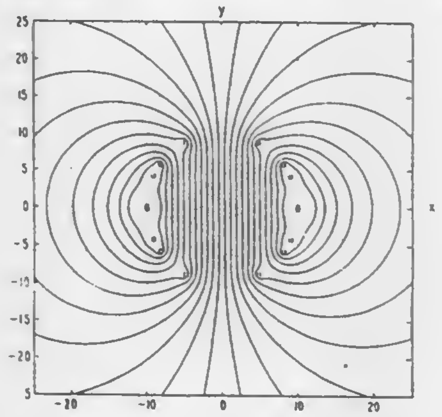
5,748,063
GENERATING HIGHLY UNIFORM ELECTROMAGNETIC FIELD CHARACTERISTICS

James T. Crow, Albuquerque, N. Mex., assignor to Sandia Corporation, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 455,819, May 31, 1995, which is a continuation-in-part of Ser. No. 328,849, Oct. 25, 1994, Pat. No. 5,640,287. This application Apr. 25, 1996, Ser. No. 637,952

Int. Cl.⁶ H01F *5/00*

U.S. Cl. 335—299 6 Claims



1. An apparatus for generating an electromagnetic field having a region of homogeneity of a characteristic of said electromagnetic field, said apparatus comprising:

a central axis of said apparatus; and

at least eight conductive pathways disposed about and substantially parallel to said central axis, azimuthal locations, current or charge magnitudes, and distances from said central axis of said conductive pathways being substantially defined by: solutions to one or more equations selected from the group consisting of

$$\underset{j=1}{\overset{J}{C}} \left\{ 0.5 I_0/R_0^{q(j+1)} + \sum_{n=1}^{N} I_n \cos[q(j+1)\phi_n]/R_n^{q(j+1)} = 0 \right\}$$

and

$$\underset{j=1}{\overset{J}{C}} \left\{ \sum_{n=1}^{N} I_n \sin[q(j+1)\phi_n]/R_n^{q(j+1)} = 0 \right\}$$

where N is a number of conductive pathways, $Ø_n$ are the azimuthal locations of said conductive pathways, R_n are the distances from said central axis of said conductive pathways, I_n are the current or charge magnitudes, J is an integer equal to one less than a total number of conductive pathways in said apparatus, C is a collection of J equations to be solved, all identical except that running index j changes from 1 to J from equation to equation, Σ is a sum of N terms in each equation over index n, q is a positive integer, and a number of planes of symmetry of said apparatus is less than 2q;

wherein said characteristic comprises a characteristic selected from the group consisting of rate of rotation, field magnitude, radial gradient, and higher order radial derivatives of field magnitude.

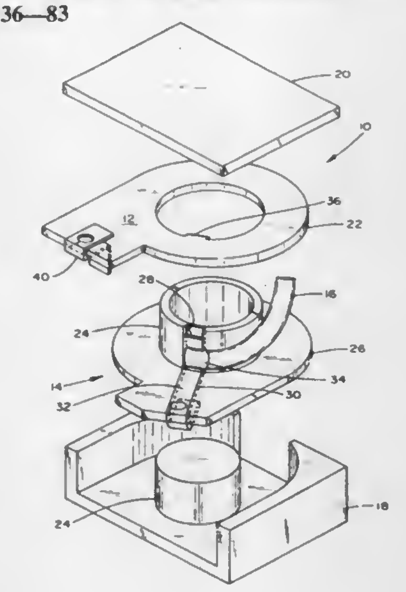
5,748,064
LOW PROFILE REACTOR

Robert E. Smeenge, Rolling Meadows; George F. Pierce, Palatine, and Samuel J. Cicero, Island Lake, all of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Feb. 22, 1996, Ser. No. 605,411

Int. Cl.⁶ H01F *15/10;27/30*

U.S. Cl. 336—83 11 Claims



1. A low profile reactor comprising:

a. a two piece bobbin, including first and second bobbin pieces, which is designed to provide for the making of a connection to an interior terminal end of a reactor coil, wherein the first bobbin piece includes a first bobbin flange, and the second bobbin piece includes a center post providing a cylindrical winding surface and a second bobbin flange, and the center post of the second bobbin piece is provided with a first recessed groove in the winding area, and the second bobbin flange is provided with a second recessed groove;

b. a start terminal positioned in the first and second recessed grooves below the surfaces of the center post and the second bobbin flange;

c. a reactor coil comprising a conductor wound upon the center post, and wherein an inner terminal end of the reactor coil conductor is electrically connected to the start terminal; and

d. a ferrite core comprising a ferrite core base having a center post, and a ferrite core top, wherein the first and second bobbin flanges are shaped to conform to the ferrite core base and top, with the coil being locked in place therein and prevented from rotating.

5,748,065
CHIP INDUCTOR

Shunji Hashimoto, Kadoma; Mikio Taoka, Neyagawa, and Hideo Nakano, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1995, Ser. No. 412,562

Claims priority, application Japan, Mar. 30, 1994, 6-060887

Int. Cl.⁶ H01F *27/02;27/30*

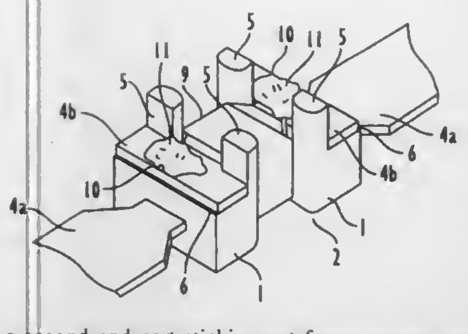
U.S. Cl. 336—96 8 Claims

1. A chip inductor comprising:

(a) a bobbin having a first square-shaped flange at one end thereof and a second square-shaped flange at an opposite end [of the two ends] thereof;

(b) a pair of metal plate terminals, one of said pair of metal plate terminals comprising:

(1) a first end part sticking out from a side surface of said first square-shaped flange;



(2) a second end part sticking out from an upper surface of said first square-shaped flange, and being bent along said upper surface of said first square-shaped flange; and

(3) a buried part buried and bent inside said first square-shaped flange; and

the other of said pair of metal plate terminals comprising:

(1) a first end part sticking out from a side surface of said second square-shaped flange;

(2) a second end part sticking out form an upper surface of said second square-shaped flange, and being bent along said upper surface of said second square-shaped flange; and

(3) a buried part buried and bent inside said second square-shaped flange;

(c) a winding having a pair of ends, said winding disposed around said bobbin,

wherein one end of said winding is connected to said second end part of said one metal plate terminal and another end of said winding is connected to said second end part of said other metal plate terminal.

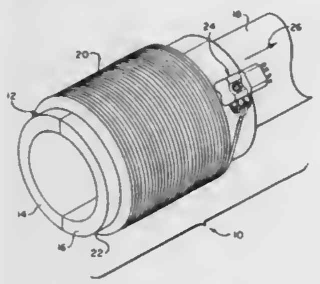
5,748,066
CARTRIDGE MOTION INITIATOR WITH REPLACEABLE LINK WIRE CONTROLLER

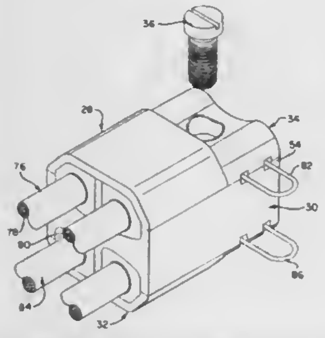
Andrew J. Holt, Camarillo, Calif., assignor to G & H Technology, Inc., Camarillo, Calif.

Filed Sep. 9, 1996, Ser. No. 711,219

Int. Cl.⁶ H01H *37/00;71/18;* **B23Q** *1/68*

U.S. Cl. 337—1 13 Claims





1. Apparatus for controlled releasing of an object to move under continuously applied force, comprising:

at least two separable members releasably engaging the object to restrain object motion;

a spring wire coil arranged about the members holding the object therewithin; and

first and second electrically destructible wires fixedly mounted on one of said members and physically engaging an end portion of the coil spring wire maintaining the coil about the object;

said first and second destructible wires on being subjected to an electric current of predetermined magnitude and at least one of the said wires destructing releases the wire coil and members allowing the object to move.

5,748,067
FUSE WITH LOW-MELTING POINT METAL AND STRUCTURE FOR HOLDING THE FUSE

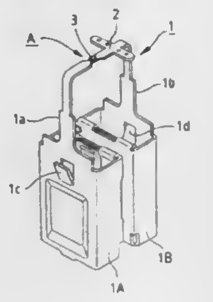
Takashi Ishii, and Naoki Matsuoka, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

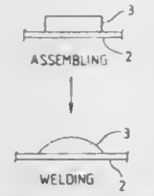
Filed Dec. 19, 1996, Ser. No. 770,146

Claims priority, application Japan, Dec. 20, 1995, 7-331904; Sep. 2, 1996, 8-231942

Int. Cl.⁶ H01H *85/04*

U.S. Cl. 337—160 9 Claims





1. A fuse with a low-melting point metal, comprising:

a pair of box-type terminals; and

a fusing portion comprised of a high-melting point fusible metal element for coupling said pair of box-type terminals in a form of a link, and a low-melting point fusible metal element disposed at a substantially center portion of said high-melting point fusible metal element and containing a reducing element, whereby welding properties are improved by removal of surface oxides.

5,748,068
FUSE BOX

Hirotaka Kiyota, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 769,828

Claims priority, application Japan, Dec. 20, 1995, 7-331903

Int. Cl.⁶ H01H *85/22*

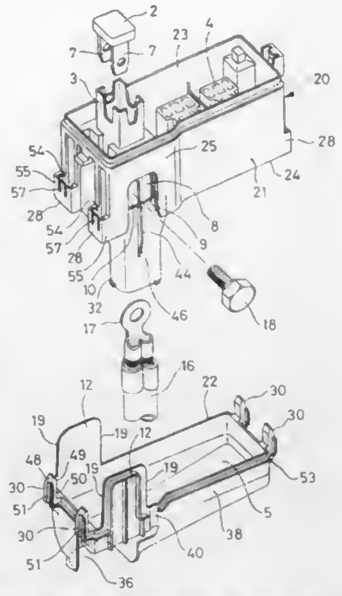
U.S. Cl. 337—208 8 Claims

1. A fuse-box comprising:

a box body including a fuse receiving portion for receiving a fuse having fuse terminals extending therefrom, a bottom portion of said box body having a bottom opening for receiving at least one connection terminal connected to a cable, and opposite side portions of said box body each having a side opening through which a screw is insertable for interconnecting said connection terminal to one of said fuse terminals;

a lower cover for covering said bottom opening and said side openings after said terminals have been interconnected, said lower cover including a bottom surface which covers said bottom opening, and opposing side covers for covering each said side opening; and

VOL
210
ISS
1
MY
5
1998
UMI



a cable fixing member projecting downwardly from said box portion, wherein said cable extends downwardly from said box body through a cable lead-out opening provided in said bottom surface of said lower cover, and wherein said cable is secured to said cable fixing member.

5,748,069

RESISTIVE FILM

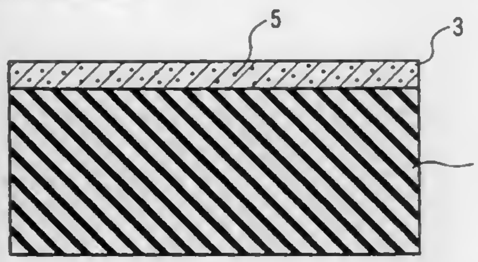
Heinz Dimigen; Claus-Peter Klages, both of Hamburg; Rainer Veyhl, Heide; Klaus Taube, Hamburg; Rudolf Thyen, Bothkamp; Hubertus Hübsch, Hamburg, and Eckart Boettger, Soltau, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 455,617, May 31, 1995, abandoned, which is a division of Ser. No. 76,044, Jun. 15, 1993, abandoned. This application Feb. 25, 1997, Ser. No. 805,527

Claims priority, application Germany, Jun. 16, 1992, 42 19 649.3

Int. Cl.^{6} H01C *1/012*

U.S. Cl. 338—308 **11 Claims**



1. A resistor for use as a discrete component, said resistor comprising a resistive layer of a thickness of 50nm–5nm provided on a substrate, said resistive layer having a resistivity in excess of 1000μΩcm., a temperature coefficient of −100–+100 ppm K and comprising 40–95 at% of carbon, 4–60 at% of at least one non-carbide forming metal and 1–30 at% of hydrogen.

5,748,070

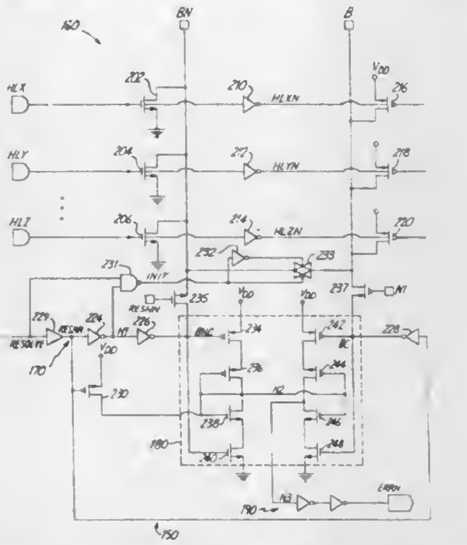
HIGH SPEED METHOD AND APPARATUS FOR DETECTING ASSERTION OF MULTIPLE SIGNALS

Gordon W. Priebe, Champlin, and Myron Buer, Eden Prairie, both of Minn., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 527,660, Sep. 13, 1995, Pat. No. 5,610,573. This application Aug. 15, 1996, Ser. No. 689,906

Int. Cl.^{6} G06F *7/02*

U.S. Cl. 340—146.2 **21 Claims**



1. A detection system for detecting at least two of a plurality of input signals being asserted simultaneously, comprising:

- first and second buffers for asserting a maximum voltage differential between two bit line signals;
- a charge coupling device coupled between the two bit line signals and having a conducting state and a non-conducting state, the charge coupling device temporarily coupling charge between the two bit line signals when in the conducting state;
- an array of voltage modifying devices, each receiving a corresponding one of the input signals for decreasing the voltage differential between the bit line signals when a corresponding input signal is asserted, the array of voltage modifying devices reversing the polarity of the voltage differential when at least two of the input signals are asserted; and
- a differential comparator coupled to the bit line signals for detecting the voltage differential between the bit line signals and for asserting an error signal if the polarity is reversed.

5,748,071

HIGH SPEED COMPARATOR WITH PROGRAMMABLE REFERENCE

Yair Orbach, Lev-Hashomron; Eitan Zmora, Jerusalem, and Dror Halahmi, Tel Aviv, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

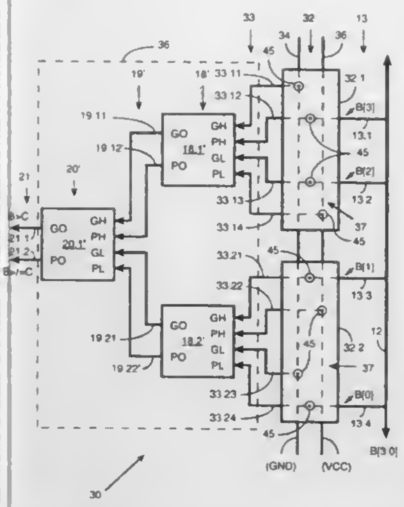
Filed Nov. 12, 1996, Ser. No. 746,512

Int. Cl.^{6} G06F *7/02*

U.S. Cl. 340—146.2 **14 Claims**

1. An apparatus for comparing a dynamic value against a fixed reference value, the dynamic and reference values being in digital form, comprising:

- a source of the dynamic value;
- a decoder for comparing the dynamic value and a further value related to the reference value to produce a result indicative of the relative magnitude of the dynamic value and the reference value; and
- at least one connection cell between the source and the decoder, said connection cell comprising programmable connections between leads coupled to the decoder and leads coupled to the source and leads coupled to logic HIGH or logic LOW for making up the further value, the further value and reference value having a predetermined relationship.



5,748,072

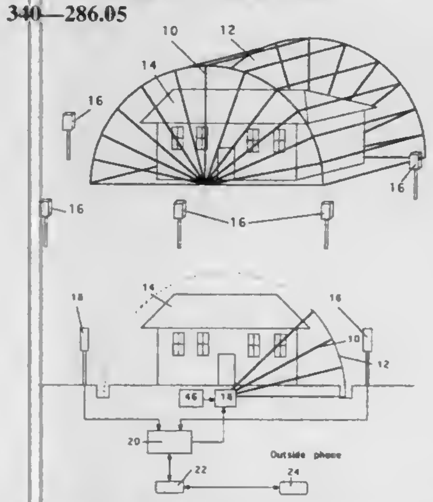
APPARATUS FOR FIRE PROTECTION

Hui Wang, 38855 Litchfield Cir., Fremont, Calif. 94536

Filed Feb. 7, 1996, Ser. No. 597,955

Int. Cl.^{6} G08B *00/00*

U.S. Cl. 340—286.05 **9 Claims**



1. An apparatus for fire protection, comprising:

- a foldable frame provided outside of a house or building;
- a covering means supported by said foldable frame;
- a driving means for unfolding said foldable frame and said covering means to isolate said house or building from outside;
- a fire detecting means provided outside of said house or building for detecting fire;
- a computing means for collecting fire information from said fire detecting means, for sending commands to said driving means to unfold or fold said foldable frame and said covering means.

5,748,073

ELECTRONIC GOAL DETECTOR

James D. Crawford, 6821 176th Street, Surrey, B.C., Canada, V3S 4G6

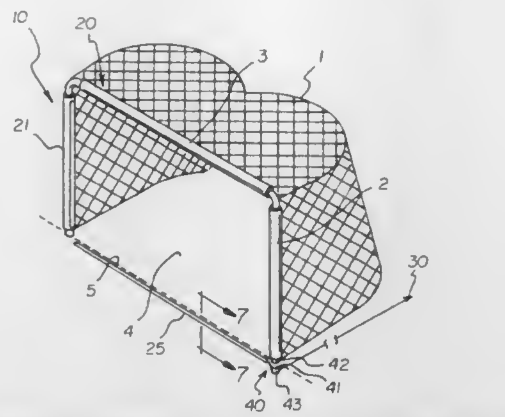
Filed May 29, 1997, Ser. No. 865,609

Int. Cl.^{6} G08B *23/00*

U.S. Cl. 340—323 R **10 Claims**

1. An electronic goal detector for a hockey goal having a pair of spaced apart and substantially parallel goal posts and an upper cross bar being extended between said goal posts, said hockey goal being positioned along a goal line of a hockey playing surface such that a goal plane is formed by said goal line, said cross bar and said goal posts, said electronic goal detector comprising:

- a first sensing means for detecting a puck passing through a goal plane, said first sensing means being for mounting to a hockey goal;
- a second sensing means for detecting a puck passing through a goal plane, said sensing means being for embedding within a hockey playing surface; and
- a deactivation means for deactivating said first sensing means and said second sensing means when the hockey goal is moved off the goal line of the hockey playing surface.



5,748,074

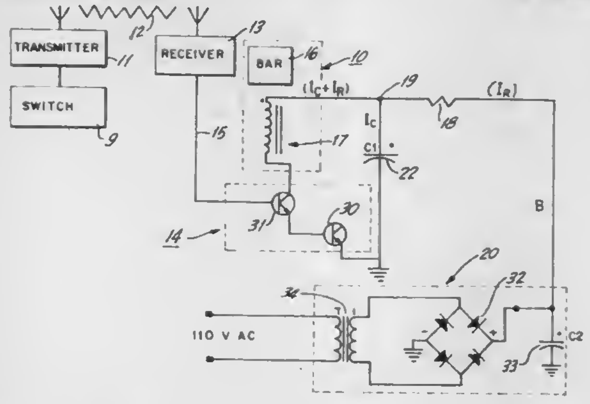
ELECTRONIC DOOR CHIME

Marc Chomet, Huntington, N.Y., assignor to Fred M. Schildwachter & Sons, Inc., Bronx, N.Y.

Filed Nov. 12, 1996, Ser. No. 747,912

Int. Cl.^{6} G08B *3/00*

U.S. Cl. 340—328 **19 Claims**



1. A door chime system comprising a radio transmitter and a radio receiver, the door chime transmitter comprising:

- (a) a manually operable switch having open and closed positions;
- (b) a radio transmitter means to generate and transmit a radio signal when the manually operable switch is operated to be in the closed position;

the door chime radio receiver comprising:

- (c) a radio receiver means to receive the radio signal from the transmitter and to generate a control signal in response thereto;
- (d) a dc power source, said power source having a limited current pulse capacity of less than 700 milliamperes;
- (e) chime means to generate a tone sound when struck;
- (f) a solenoid responsive to an output electrical current pulse for striking the chime means, said solenoid capable of being energized only with a current pulse value greater than the current pulse capacity of said power source;
- (g) an electronic switch having a normally open and closed positions and being connected to, and controlled by, the control signal from the radio receiver;

(h) a capacitor in series with the electronic switch, the electronic switch when closed discharging said output electrical pulse stored in said capacitor to said solenoid;

(i) a resistor means coupled to said battery to provide a charging current to said capacitor when said electronic switch is open, said resistor means having a value of resistance that limits the charging current to said capacitor to the pulse current capacity of said power source;

(j) wherein said electronic switch, when closed, discharges said current charge on said capacitor to thereby operate said solenoid.

5,748,075

CONTROL UNIT WITH AN AIR PRESSURE DETECTOR FOR A VEHICLE PASSENGER PROTECTION SYSTEM

Josef Dirmeyer, Bodenwöhr; Heinrich Probst, Tegernheim; Peter Bauer; Robert Gruber, both of Regensburg; Gerhard Mader, Thalmassing; Manfred Frimberger, Kläham, and Lorenz Pfau, Regensburg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

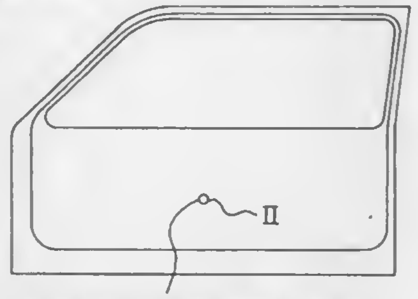
PCT No. PCT/DE93/01059, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO94/11223, PCT Pub. Date May 26, 1994

PCT Filed Nov. 5, 1993, Ser. No. 592,370

Claims priority, application Germany, Nov. 11, 1992, 9215382 U; Jul. 6, 1993, 43 22 488.1

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—436 **16 Claims**



PIEZO-RESISTIVE PRESSURE SENSOR
CENTRALLY MOUNTED IN THE INSIDE
DOOR PANEL.

1. In combination with a vehicle having a body with a side, a control assembly for a passenger protection system of the vehicle which is to be tripped upon the occurrence of a traffic accident with a side impact, the control assembly comprising:

at least one detector adapted to detect a pressure rise in a hollow body, said at least one detector being mounted in a largely enclosed side portion of the side of the vehicle body defining the hollow body; and

a control unit connected to and receiving signals from said at least one detector, said control unit evaluating a sudden and largely adiabatic air pressure rise detected by said detector upon a side impact collision.

5,748,076

APPARATUS FOR ALARMING OF AN ABNORMALITY OF TIRE AIR PRESSURE

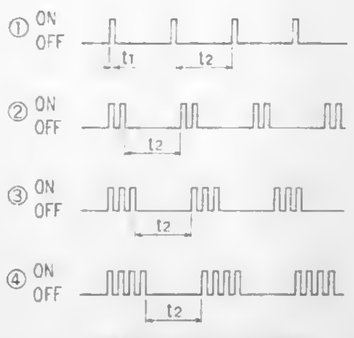
Hiroto Horie, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, and Sumitomo Electric Industries, Ltd., Osaka-fu, both of Japan

Filed Sep. 22, 1995, Ser. No. 532,222

Claims priority, application Japan, Sep. 27, 1994, 6-231621

Int. Cl.⁶ B60C *23/00;23/02*

U.S. Cl. 340—442 **7 Claims**



EXAMPLE OF DISPLAY PATTERNS

1. An apparatus for alarming of an abnormality in a tire air pressure detection system for each of at least one tire, comprising a detection mechanism capable of detecting an abnormality in the detection system, and only one alarm display mechanism capable of displaying a plurality of display patterns, said alarm display mechanism having a display element, wherein

said display element is switched between on and off states in predetermined sequences, and

each of said plurality of display patterns is different from one another and has a unique predetermined sequence, to inform of a plurality of different kinds of information corresponding to said plurality of display patterns, said plurality of different kinds of information including detection of at least an abnormality with respect to a first tire of said at least one tire and of an abnormality with respect to a second tire of said at least one tire.

5,748,077

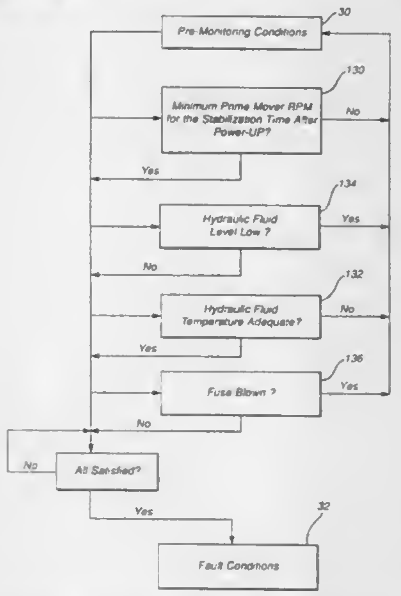
HYDRAULIC LEAK DETECTION SYSTEM

Calvin Brandt, Elk River, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Continuation of Ser. No. 242,176, May 13, 1994, abandoned. This application Jan. 7, 1997, Ser. No. 779,377

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—450 **14 Claims**



30
Pre-Monitoring Conditions
130
Minimum Prime Mover RPM for the Stabilization Time After Power-UP?
No
Yes
134
Hydraulic Fluid Level Low ?
Yes
No
132
Hydraulic Fluid Temperature Adequate?
No
Yes
136
Fuse Blown ?
Yes
No
No
All Satisfied?
Yes
32
Fault Conditions

1. A monitoring, warning and safety system for a hydraulic system, comprising:

(a) sensing means for measuring one or more predetermined parameters of said system and producing sensor signals indicative of measurements obtained for said one or more physical parameters;

(b) monitoring means, connected with said sensing means, for receiving the sensor signals and determining whether an abnormal condition indicative of loss of hydraulic fluid is present in the hydraulic system based on the sensor signals and for producing responsive signals indicative of an abnormal condition;

(c) reacting means, connected with said monitoring means, for reacting to an indication of abnormal condition related to hydraulic system fluid loss; and

(d) wherein the hydraulic system comprises a closed system having a prime mover driving a hydraulic pump drawing fluid from a reservoir and a return line for returning said fluid to the reservoir, said sensing means comprising an RPM sensor in communication with the prime mover and a flow meter connected in the hydraulic system return line.

5,748,078

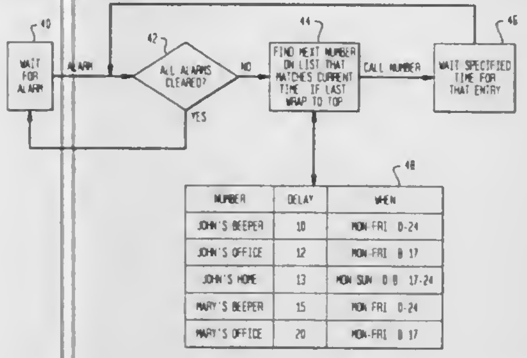
ALARM ALERTING METHOD AND APPARATUS

Carlos Escolar, East Windsor, N.J., assignor to AT&T Corp, Middletown, N.J.

Filed May 16, 1997, Ser. No. 857,661

Int. Cl.⁶ G08B *29/12;27/00*

U.S. Cl. 340—506 **21 Claims**



1. A method for alerting personnel in response to an alarm signal from an automated system, comprising the steps of:

a. receiving the alarm;

b. searching a list of contact numbers, wherein each contact number has a corresponding contact person, delay time, and a contact day and time for when each contact number should be used;

c. matching a current day and time with a contact day and time from said list;

d. notifying a contact person corresponding to said matched contact day and time using a contact number corresponding to said matched day and time;

e. determining whether the alarm has been reset within a delay time corresponding to said matched contact day and time, and if not, repeating steps (c)(e) using a next contact number from said list having a contact day and time that matches said current day and time.

5,748,079

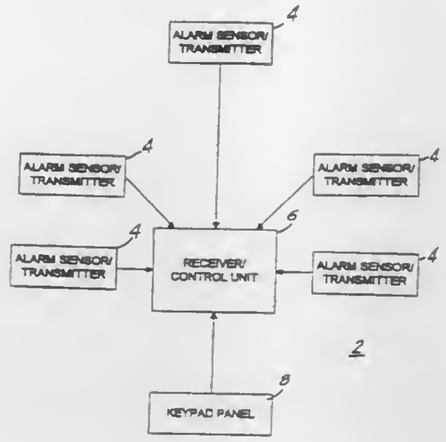
ALARM COMMUNICATIONS SYSTEM WITH INDEPENDENT SUPERVISION SIGNAL ANALYSIS

Kenneth L. Addy, Massapequa, N.Y., assignor to Pittway Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 650,292, May 20, 1996. This application Jul. 24, 1996, Ser. No. 685,716

Int. Cl.⁶ G08B *1/08*

U.S. Cl. 340—539 **13 Claims**



ALARM SENSOR/ TRANSMITTER
4
ALARM SENSOR/ TRANSMITTER
4
ALARM SENSOR/ TRANSMITTER
4
6
ALARM SENSOR/ TRANSMITTER
4
RECEIVER/ CONTROL UNIT
ALARM SENSOR/ TRANSMITTER
4
2
8
KEYPAD PANEL

13. A receiving station for use in a data communications system comprising a plurality of remote devices, each of said remote devices having a transmitter for transmitting supervision signals and non-supervision signals, said receiving station comprising:

a) means for receiving said supervision signals and said non-supervision signals;

b) first processing means for providing at a first sensitivity level a first output signal representative of said received signal;

c) second processing means for providing at a second sensitivity level a second output signal representative of said received signal, said second sensitivity level being lower in magnitude than said first sensitivity level;

d) means for determining if said received signal is a supervision signal or a non-supervision signal; and

e) means for comparing said first output signal to said second output signal to determine if they are correlated.

5,748,080

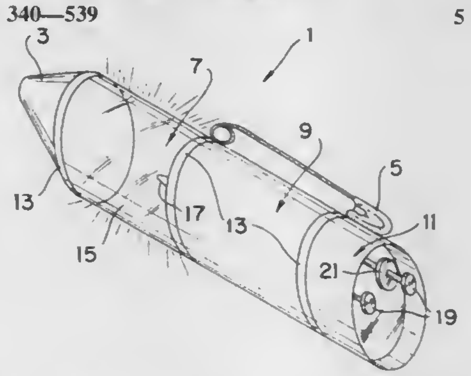
OVERBOARD SAFETY DEVICE

Charles Matthew Clay, 1451 Joyce Rd., Mobile, Ala. 36618

Filed Sep. 30, 1996, Ser. No. 723,089

Int. Cl.⁶ G08B *1/08*

U.S. Cl. 340—539 **5 Claims**



1. A water activated safety apparatus comprising:

a water tight housing having a rechargeable self-contained electric power source;

a water activated light source powered by said power source and located within said housing, said light source being activated by the presence of water external to the housing; and

means for recharging said power source and sensing the presence of water external housing water, said means having a probe extending externally from the housing with inner and outer contacts to both permit the recharging of the power source and to sense the presence of water to activate the light source.

5,748,081

MULTI-FUNCTIONAL ANTI-THEFT SUPERVISING ASSEMBLY

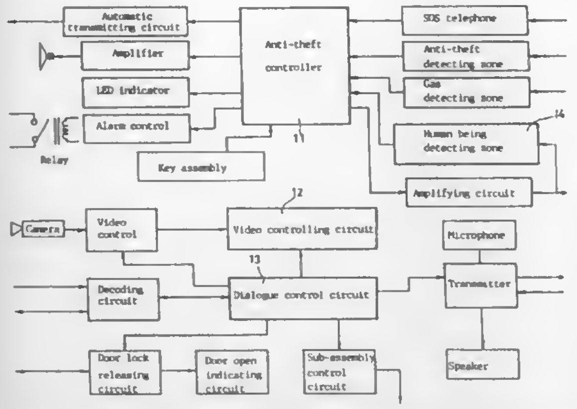
Edward Lin, 1F, 359 Chung-Yang N. Rd. Sec. 2, Pei-Tou, Taipei, Taiwan

Filed Apr. 29, 1996, Ser. No. 638,586

Int. Cl.⁶ G08B *13/18*

U.S. Cl. 340—555 **10 Claims**

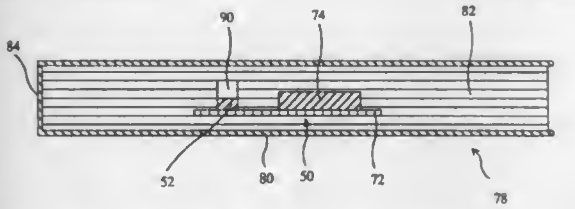
1. A multi-function supervising assembly, comprising:



- image providing means for providing images of a first remote site at a base site;
- communication means for communicating between said base site and said first remote location and for communicating between said base site and a second remote location;
- unlocking means for unlocking a door separating said base site from said first remote site in response to an unlocking signal generated at said base site;
- control means for controlling said image providing means, said communication means and said unlocking means;
- means for detecting a gas leak at said base site and for generating a gas leak signal indicative thereof;
- means for detecting a fire at said base site and for generating a fire signal indicative thereof;
- means for detecting the presence of a person in said base site and for generating a presence signal indicative thereof;
- means for receiving an emergency signal from said second remote site; and
- warning means for producing a warning signal in response to said gas leak signal, said fire signal, said presence signal or said emergency signal.

5,748,082
LIGHT SENSITIVE SWITCH FOR ALERTING DEVICES
Kenneth Ray Payne, 5673 Descartes Cir., Boynton Beach, Fla. 33437

Filed Nov. 29, 1994, Ser. No. 347,554
Int. Cl.^{6} G08B *13/14; G09F 1/00*
U.S. Cl. 340—568 **20 Claims**

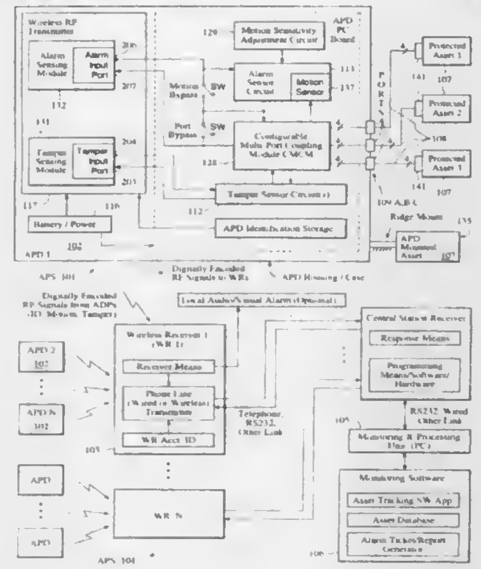


1. An alerting device for use with a printed publication having at least a first page and a second page, the second page being positioned substantially coincident to the first page when the publication is closed, the alerting device comprising:

- an altering circuit integrally formed on a single circuit board, the altering circuit including:
- a photosensor that generates a detection signal when exposed to ambient light;
- an activation circuit coupled to the photosensor; and
- an annunciator coupled to the activation circuit, the activation circuit enabling operation of the annunciator to produce an alert signal in response to the detection signal indicating detection of ambient light and opening of the publication.

5,748,083
COMPUTER ASSET PROTECTION APPARATUS AND METHOD
Anthony J. Rietkerk, Hollister, Calif., assignor to Security Solutions Plus, Santa Clara, Calif.

Filed Mar. 11, 1996, Ser. No. 615,784
Int. Cl.^{6} G08B *13/14*
U.S. Cl. 340—568 **21 Claims**

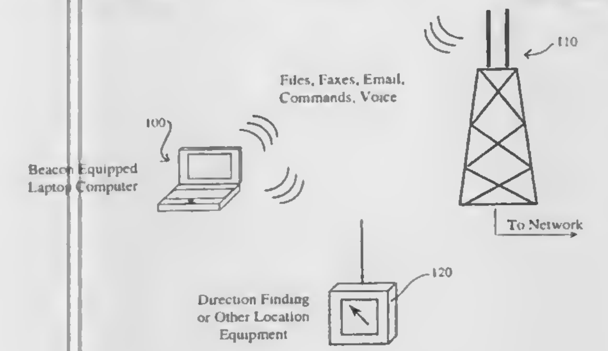


1. An asset protection system (APS) for protecting an asset comprising:

- (A) a battery-powered self-contained asset protection device (APD) including:
  - (a) a housing having a case portion and a cover portion fastenable to said case portion to form an enclosure;
  - (b) means for storing a unique asset protection device identifier;
  - (c) a wireless radio-frequency transmitter disposed internal to said enclosure, including an alarm sensing module for receiving alarm circuit detection signals and a tamper sensing module for receiving tamper circuit detection signals, and for transmitting APD status information including transmitting information indicating that an alarm condition is sensed, that a tamper condition is sensed, and said unique APD identifier;
  - (d) said alarm sensing module being responsive to a first predetermined change in voltage/current characteristics at input terminals of said alarm module to transmit an alarm sensed signal, and said tamper sensing module being responsive to a second predetermined threshold change in voltage/current characteristics at input terminals of said tamper module to transmit a tamper sensed signal;
  - (e) an alarm detection circuit disposed internal to said enclosure for detecting an alarm condition, including an adjustable sensitivity motion detection circuit internal to said APD for detecting mechanical motions of said APD and an attached asset, said alarm detection circuit being coupled to said alarm sensing module input terminals and providing a voltage/current characteristic greater than or equal to said predetermined voltage/current characteristic at said input terminals when an alarm condition is detected;
  - (f) a tamper detection circuit disposed internal to said enclosure for detecting a tamper condition, including a first switch disposed internal to said enclosure and extending partially through said enclosure to contact said asset for detecting physical removal of said APD and first switch from said asset and a second switch disposed entirely within said enclosure for detecting removal of said cover from said enclosure, said tamper detection circuit being coupled to said tamper sensing module input terminals and providing a voltage/current characteristic greater than or equal to said predetermined tamper voltage/current characteristic at said input terminals when a tamper condition is detected; and
  - (g) a configurable multi-port coupling circuit disposed internal to said enclosure including a plurality of asset coupling ports having at least two terminals for coupling a plurality of assets to said APD, and at least one port by-pass switch for selectively disabling one of said plurality of ports not being used to protect an asset.

5,748,084
DEVICE SECURITY SYSTEM
Jeremy M. Isikoff, 5840 Cameron Run Terr., #1527, Alexandria, Va. 22303

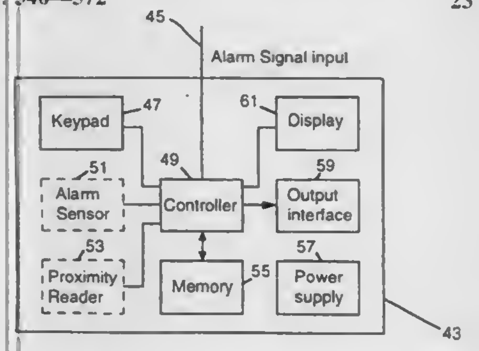
Filed Nov. 18, 1996, Ser. No. 751,842
Int. Cl.^{6} G08B *13/14*
U.S. Cl. 340—568 **18 Claims**


110
Files, Faxes, Email, Commands, Voice
100
Beacon Equipped Laptop Computer
To Network
120
Direction Finding or Other Location Equipment

1. A security system for a laptop computer of the type having a processor and a power supply with a memory and applications programs for data handling, such system including a beacon containing at least one of a receiver and a transmitter, security logic for determining when the laptop has been stolen or tampered with, and security means in said beacon responsive to a determination by the security logic for selectively controlling elements of said laptop computer to secure data stored therein, wherein said security means includes means for removing said data from memory and transmitting said data.

5,748,085
ELECTRONIC ARTICLE SURVEILLANCE EVENT MONITORING SYSTEM
Dennis W. Davis, 10740 Eland St., Boca Raton, Fla. 33428, and John Lucio, 1212 Hidden Ridge #3049, Irving, Tex. 75038

Filed Apr. 15, 1996, Ser. No. 631,148
Int. Cl.^{6} G08B *13/14*
U.S. Cl. 340—572 **23 Claims**

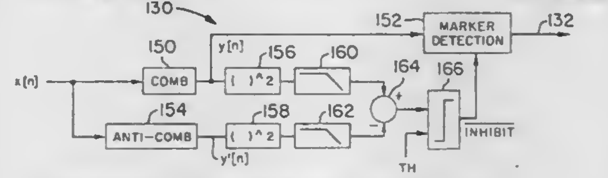


1. A monitoring system for use with an electronic article surveillance system, said monitoring system comprising at least one monitoring device further comprising:

- a) user interface means;
- b) alarm signal sensing means;
- c) event and data recording means;
- d) data communication means; and
- e) power supply means,
- said user interface means allowing the entry into said monitoring system of event related information associated with the operation of said electronic article surveillance system, said alarm signal sensing means allowing said monitoring system to record an alarm event, said event and data recording means providing for the retrievable storage of said event related information and times of event occurrences, said data communication means providing for the downloading of said stored event related information, said power supply means providing electrical power for the operation of said monitoring system.

5,748,086
ELECTRONIC ARTICLE SURVEILLANCE SYSTEM WITH COMB FILTERING AND FALSE ALARM SUPPRESSION
Dale R. Bettine, Coral Springs, and Thomas J. Frederick, Coconut Creek, both of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 557,628, Nov. 14, 1995, abandoned. This application Apr. 29, 1996, Ser. No. 639,691
Int. Cl.^{6} G08B *13/14*
U.S. Cl. 340—572 **18 Claims**



1. An electronic article surveillance system, comprising:

- means for generating and radiating an interrogation signal at a predetermined frequency in an interrogation zone;
- antenna means for receiving a signal present in the interrogation zone; and
- signal processing means for processing the signal received by the antenna means, the signal processing means including:
  - first comb filter means for comb-filtering the signal received by the antenna means to produce a first filtered signal;
  - detection means for receiving the first filtered signal and for generating a detection signal at times when the first filtered signal indicates that an electronic article surveillance marker is present in the interrogation zone;
  - second comb filter means for comb-filtering the signal received by the antenna means to produce a second filtered signal, the second comb filter means having a frequency-response characteristic different from a frequency-response characteristic of said first comb filter means; and
  - inhibit means, responsive to said first and second filtered signals, for selectively inhibiting the detection means from generating the detection signal.

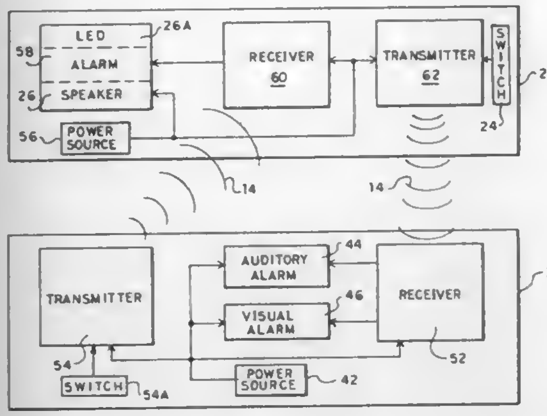
5,748,087
REMOTE PERSONAL SECURITY ALARM SYSTEM
Thomas R. Ingargiola, 432 Peters Blvd., Brightwaters, N.Y. 11718, and William Milidantri, 127 Suffolk Ave., North Babylon, N.Y. 11704

Filed Aug. 1, 1996, Ser. No. 701,499
Int. Cl.^{6} G08B *21/00*
U.S. Cl. 340—573 **12 Claims**

6. A radio frequency communication system between at least two persons for remote signalling when one of the persons exceeds a predetermined boundary limit comprising:

- first housing means carried by the first person having: primary transmitter means for emanating a find signal, having a demand actuator for selectively causing said find signal to emanate;

VOL
210
ISS
1
MY
5
1998
UMI



secondary receiver means for receiving any one of a first secondary transmitter location signal, a second secondary transmitter location signal, and both said first and second secondary transmitter location signals, and generating a secondary alarm signal in response thereto when the received signals indicate said boundary limits have been exceeded; and

secondary alarm means for generating an audio alarm responsive to said secondary alarm signal;

second housing means worn by the second person having:

first and second primary receiver means for receiving said find signal emanated from said primary transmitter means and for generating a primary alarm signal in response to said received find signal;

first and second primary alarm means respectively coupled to said first and second primary receiver means, each receiving said respective alarm signal and each generating a respective alarm in response thereto;

first and second secondary transmitter means each continuously generating a location signal,

whereby said first primary receiver means, said first primary alarm means, and said first secondary transmitter are integrally contained in a first shoe worn by the second person; and said second primary receiver means, said second primary alarm means, and said second secondary transmitter are integrally contained in a second shoe worn by the second person.

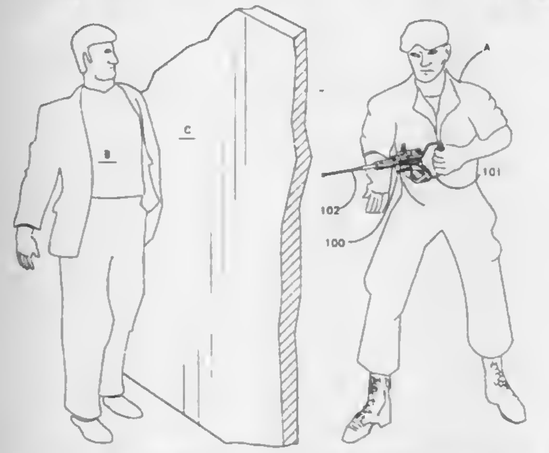
5,748,088
DEVICE AND METHOD USING DIELECTROKINESIS TO LOCATE ENTITIES

Thomas L. Afilani, Electroscopes, 2401 Reach Rd., Suite 301, Williamsport, Pa. 17701

Filed Nov. 27, 1996, Ser. No. 758,248

Int. Cl.^{6} G08B *23/00*

U.S. Cl. 340—573 **30 Claims**



1. A device for locating an entity of a predetermined type, said device comprising:

a housing having an interior with a first dielectric material therein; and

a sinuous rod forming a handle, said rod having a first end extending from said interior of said housing and out a rear end of said housing, wherein said housing and said' handle are constructed such that said device reacts to a unique non-uniform electric field squared spatial gradient three-dimensional pattern exhibited by said entity to produce a dielectrophoretic force and a quantifiable manifestation of said force on said device that indicates a specific direction relative to said entity.

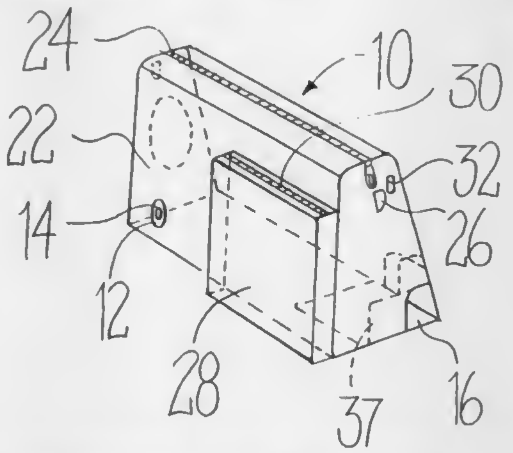
5,748,089
PORTABLE PERSONAL SECURITY SYSTEM

Edric Sizemore, 325 W. 118th St., Chicago, Ill. 60628

Filed Aug. 13, 1996, Ser. No. 696,374

Int. Cl.^{6} G08B *13/00*

U.S. Cl. 340—574 **27 Claims**



1. A portable personal security system having a carrying strap and a compartment within which personal items may be carried, said compartment having an opened and closed position, the system comprising:

audio alarm generating means for emitting an audio alarm when activated;

visual alarm generating means for emitting a conspicuous and highly visible visual signal when activated; and

an externally accessible alarm panic switch having a activated and inactivated position for selectably and simultaneously activating the audio alarm means and the visual alarm means when the compartment is in the closed position to attract the attention of nearby persons.

5,748,090
OPTICAL FLAMEOUT DETECTOR

Stephen E. Borg, Norfolk; James W. West; Robert M. Lawrence, both of Hampton; Samuel E. Harper, Jr., and David W. Alderfer, both of Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

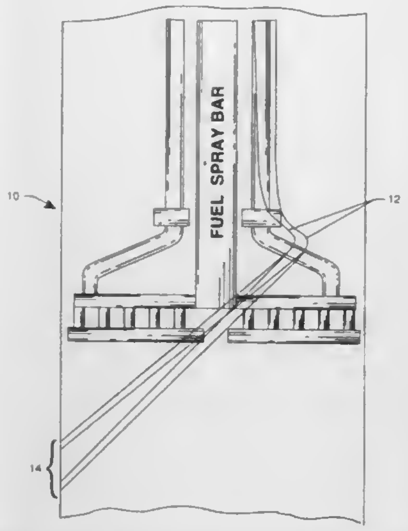
Continuation of Ser. No. 518,853, Aug. 24, 1995, abandoned, which is a continuation of Ser. No. 141,294, Oct. 19, 1993, abandoned. This application Jul. 16, 1997, Ser. No. 892,833

Int. Cl.^{6} G08B *17/12*

U.S. Cl. 340—578 **5 Claims**

1. A device for detecting a flameout in a fuel-supplied combustion chamber, comprising:

an ultraviolet optical detector providing a measurement of the change in intensity of a flame within the ultraviolet region of the light spectrum;



a visible light optical detector providing a measurement of the change in intensity of a flame within the visible region of the light spectrum;

a pair of fiber optic probes having a field of view between 0° and 16°, each fiber optic probe having approximately the same field of view, located within the combustion chamber to respectively couple each optical detector to the light source;

an evaluating means for evaluating the measurements provided by the optical detectors; and

a signal providing means for providing a FLAME OFF signal when the evaluating means determines that a flameout has occurred.

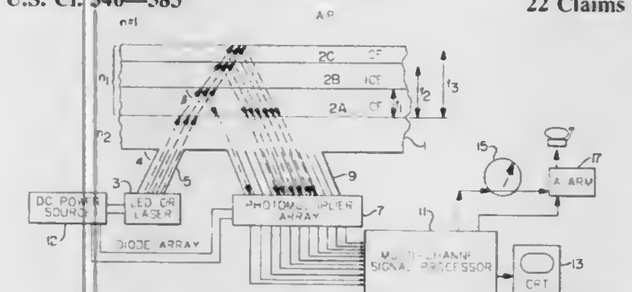
5,748,091
FIBER OPTIC ICE DETECTOR

John Jungwoo Kim, Riverside, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Oct. 4, 1996, Ser. No. 726,102

Int. Cl.^{6} G08B *19/02*

U.S. Cl. 340—583 **22 Claims**



1. Apparatus for monitoring the thickness of a semi-transparent material within a gaseous environment, comprising:

a detector window, having front and back sides, and being of a first predetermined thickness;

said front side of said detector window for supporting the semi-transparent material whose thickness is to be monitored;

light beam directing means for directing a plurality of individual light beams at said detector window at a first predetermined angle to said back side of said detector window;

said light beam directing means comprising a plurality of first optical fibers displaced in position relative to one another so as to be distributed longitudinally along the back side of said detector window;

light beam detector array means spaced from said light beam directing means;

said light beam detector array means comprising:

a plurality of second optical fibers for receiving light propagating at a second predetermined angle to said back side of said detector window, said second predetermined angle being opposite in direction relative to said back side of said detector window as said first predetermined angle; and

said second optical fibers being displaced in position from one another relative to said back side of said detector window so as to be distributed longitudinally along said detector window; and

at least a plurality of longitudinally displaced light detectors optically coupled to respective ones of said plurality of second optical fibers whereby light propagating into a second optical fiber is coupled to a corresponding one of said light detectors;

each said light detector producing an electrical output signal in dependence upon the intensity of incident light; and

means for monitoring the spatial distribution of light represented by said light detectors to indicate the thickness of said semi-transparent material.

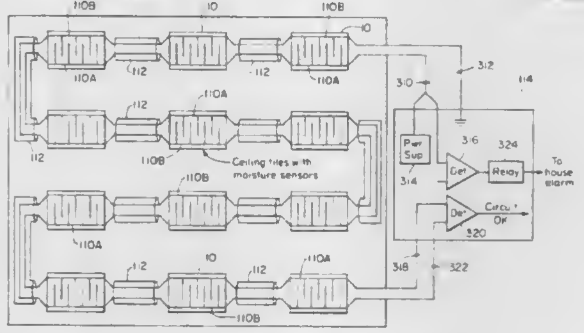
5,748,092
CEILING TILE MOISTURE DETECTION SYSTEM

Marc J. Arsenault, 98 Oxbow Rd., Charlton, Mass. 01507, and Aaron C. DerMarderosian, Sr., 376 Lincoln St., Lexington, Mass. 02173

Filed Apr. 24, 1996, Ser. No. 637,309

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—604 **12 Claims**



1. A ceiling moisture detection system, comprising:

detection electrodes located on ceiling tiles; and

a controller which generates an alarm condition signal in response to moisture contacting the electrodes and wherein the controller comprises a continuity verification circuit for determining whether the detection electrodes are properly connected to each other.

5,748,093
ELECTRICAL SURGE PROTECTION SYSTEM WITH CONDITION MONITORING

S. Keith Swanson, and Tom Miller, both of Santa Barbara, Calif., assignors to Joslyn Electronic Systems Corporation, Goleta, Calif.

Filed Mar. 19, 1996, Ser. No. 618,342

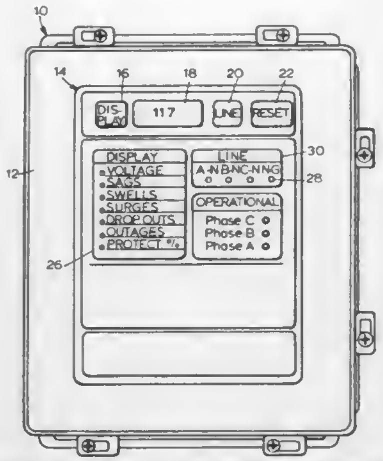
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—659 **28 Claims**

23. A surge protection system comprising:

a plurality of surge protection devices for the protection of a power line, each of said surge protection devices being in either a ready state in which said surge protection device provides surge protection or an inoperable state in which said surge protection device does not provide surge protection, said surge protection devices providing a level of surge protection based upon how many of said surge protection devices are in said ready state and how many of said surge protection devices are in said inoperable state;

means associated with said surge protection devices for generating a signal indicative of said level of surge protection, said generating means comprising means for comparing a comparison signal indicative of the number of said surge protec-



tion devices which are in said ready state with a plurality of different threshold values; and

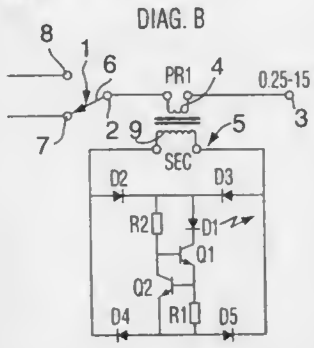
means coupled to said generating means for displaying a visual indication of said level of surge protection.

5,748,094

SWITCH WITH CURRENT FLOW DETECTOR

Graham Neathway, Almonte, and Bill Kiss, Ottawa, both of Canada, assignors to Ridgeway Research Corporation, Kanata, Canada

Filed Sep. 26, 1996, Ser. No. 721,220
Int. Cl.⁶ G08B *21/00*
U.S. Cl. 340—660 **4 Claims**



1. A switch arrangement for use in an AC circuit wired in a three-way switch mode for supplying power to a load, comprising:

a first terminal for connection to an external line, second and third terminals for connection respectively to corresponding terminals of a second like switch, and a switch contact for selectively connecting said first terminal to either one of second and third terminals;

a transformer having a primary winding connected between said first terminal and said external line, and a secondary winding deriving an output voltage therefrom;

a full-wave rectifier deriving a rectified voltage from said output voltage, said full-wave rectifier comprising two pairs of diodes arranged in a bridge;

a light-emitting diode receiving said rectified voltage from said rectifier;

a first series combination formed by said light-emitting diode, a first transistor and a resistor, said first series combination being connected between respective common points of each pair of diodes;

a current limiter provided by a second series combination formed by a second transistor and a second resistor, said second series combination being connected in parallel with said first series combination, a common point of said second transistor and said further resistor being connected to a base of said first transistor to shunt excess base current from said first transistor and thereby limit the current flowing through said light emitting diode; and

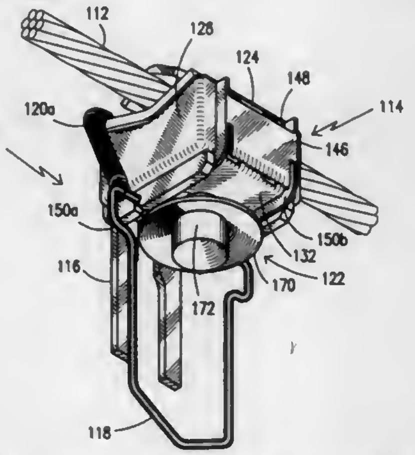
the ratio of turns of said windings of said transformer being such that said rectified voltage energizes said light-emitting diode when power is supplied to said load over its normal operating range.

5,748,095

MINI FAULTED CIRCUIT INDICATOR UNIT

Hendrik Horstmann, Ratingen, Germany, assignor to Dipl.-Ing H. Horstmann GmbH, Germany

Filed Jul. 15, 1996, Ser. No. 680,454
Int. Cl.⁶ G08B *21/00*
U.S. Cl. 340—664 **13 Claims**



1. A faulted circuit indicator unit for detecting an abnormally high electric current in an overhead cable, comprising:

a substantially rectangularly-shaped housing formed of front and back walls, opposed side walls, a closed bottom wall, and an open top mouth portion, said front and back walls, opposed side walls, and closed bottom wall all being integrally connected together so as to define a cavity;

current sensing means disposed in said housing for detecting the high current in the cable;

a lid member for covering the open mouth portion of said housing so as to seal the current sensing means within said housing in a fluid-tight engagement;

an L-shaped clamping bracket formed of a shorter leg portion and a longer leg portion which is joined to the shorter lea portion;

a channel formed in the back wall of said housing which receives slidably therein the longer leg portion of said clamping bracket;

an indication device being joined to the closed bottom wall of said housing and including a visible indicator responsive to said current sensing means to produce a visual flashing light in the presence of the high current which is visible through a small aperture formed in the bottom wall thereof; and

said indication device including an opaque hood whose central portion is connected to the bottom wall of said housing and a transparent stem joined also to the central portion of said hood and extending downwardly therefrom through which the flashing light is transmitted radially outwardly in all directions,

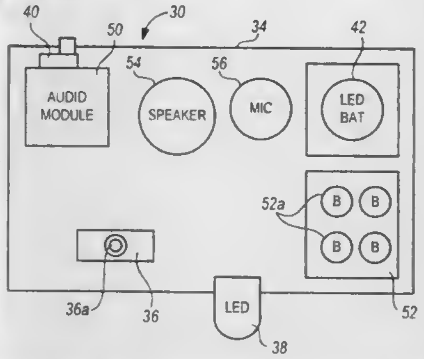
whereby the flashing light will be visually observable at a predetermined distance from all of the sides of the faulted circuit indicator unit when viewed from below the closed bottom wall of said housing.

5,748,096

TOILET BOWL ILLUMINATION DEVICE INCLUDING AUDIBLE ANNUNCIATOR FOR REMINDING USER TO MOVE TOILET SEAT FROM UPPER RETRACTED POSITION TO LOWER SEATING POSITION AFTER USE

Laurel G. Kaufer, 24267 Martha St., Woodland Hills, Calif. 91367

Filed Nov. 19, 1996, Ser. No. 752,214
Int. Cl.⁶ G08B *21/00*
U.S. Cl. 340—686 **16 Claims**



1. An illuminating and annunciating device for a toilet having a bowl, and a seat which is movable between a lower seating position and an upper retracted position, the device comprising:

an illumination unit for illuminating the bowl;

an annunciator unit for generating an audible indication which reminds a user to move the seat from the retracted position to the seating position after use; and

a sensor for activating the illumination unit and the annunciator unit when the seat is in the retracted position; and de-activating the illumination unit and the annunciator unit when the seat is in the seating position;

in which the annunciator unit comprises an audio module for playing back said audible indication as a recorded audio sequence; and

the audio module is configured to selectively record an audio sequence.

5,748,097

METHOD AND APPARATUS FOR STORING THE BOOM OF A WORK VEHICLE

David L. Collins, Burlington, Iowa, assignor to Case Corporation, Racine, Wis.

Filed Feb. 28, 1997, Ser. No. 808,312
Int. Cl.⁶ G08B *21/00*
U.S. Cl. 340—686 **20 Claims**

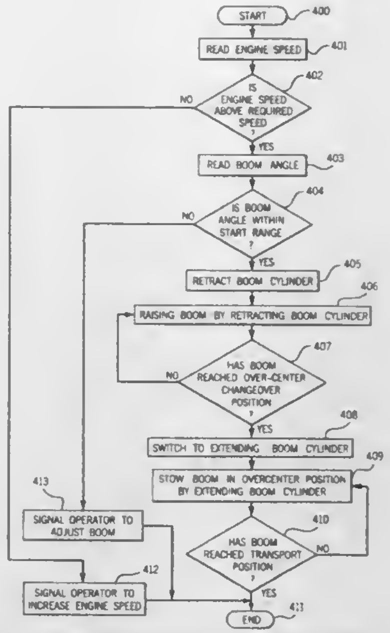
1. An apparatus for storing a boom pivotally mounted to a vehicle, the apparatus comprising:

a boom actuator adapted to actuate the boom;

a boom sensor configured to provide a boom signal representative of the position of the boom actuator with respect to a stable reference point of the vehicle;

an actuator control assembly responsive to a control signal and adapted to manipulate the position of the boom by retracting or extending the boom cylinder; and

a controller responsive to the boom signal and configured to provide the control signal to the actuator control assembly so the boom is automatically driven from an initial position extended at least partially away from the vehicle to a transport position in a relatively closer proximity to the vehicle by retracting the boom cylinder to drive the boom from the initial position to a transition position and then extending the boom cylinder to drive the boom from the transition position into the transport position.


START
400
READ ENGINE SPEED
401
IS ENGINE SPEED ABOVE REQUIRED SPEED ?
402
NO
YES
READ BOOM ANGLE
403
IS BOOM ANGLE WITHIN START RANGE ?
404
NO
YES
RETRACT BOOM CYLINDER
405
RAISING BOOM BY RETRACTING BOOM CYLINDER
406
HAS BOOM REACHED OVER-CENTER CHANGEOVER POSITION ?
407
NO
YES
SWITCH TO EXTENDING BOOM CYLINDER
408
STOW BOOM IN OVERCENTER POSITION BY EXTENDING BOOM CYLINDER
409
HAS BOOM REACHED TRANSPORT POSITION ?
410
NO
YES
413
SIGNAL OPERATOR TO ADJUST BOOM
412
SIGNAL OPERATOR TO INCREASE ENGINE SPEED
END
411

5,748,098

EVENT CORRELATION

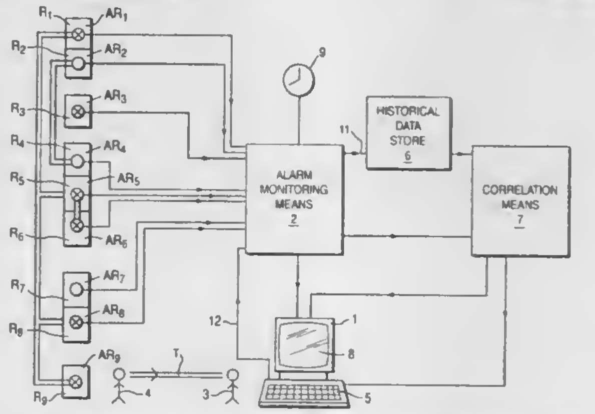
Andrew Grace, Suffolk, United Kingdom, assignor to British Telecommunications public limited company, London, England

PCT No. PCT/GB94/00344, § 371 Date Aug. 29, 1995, § 102(e) Date Aug. 29, 1995, PCT Pub. No. WO94/19912, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 22, 1994, Ser. No. 507,314

Claims priority, application European Pat. Off., Feb. 23, 1993, 93301293

Int. Cl.⁶ G06F *15/177;* H04Q *1/00*
U.S. Cl. 340—825.16 **21 Claims**



14. A self-learning adaptive network management system comprising:

network condition detectors distributed within the network and disposed to generate respectively corresponding alarm signals in response to detected abnormalities;

an alarm monitoring means connected to receive said alarm signals and to assign the occurrence of each to an associated time;

a historical data storage means connected to receive and store historical data representing the identity of alarm signals historically received in the past from the network;

correlation means connected to process said stored historical data and generate statistical data therefrom representing the probability of a predetermined plurality of predetermined alarm signals independently occurring within the same time window by chance; and means for using said statistical data to identify and display concurrently received new incoming alarm signals that are most probably not independent occurrences but, instead, are most probably inter-dependent related alarm conditions.

5,748,099

Patent Not Issued For This Number

5,748,100

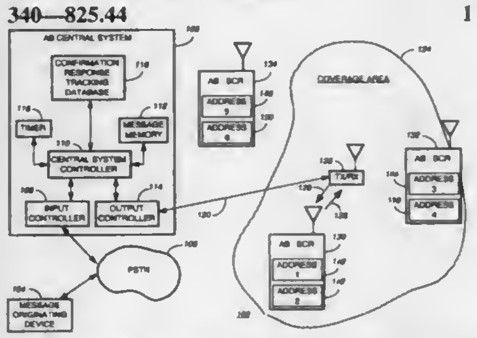
RELIABLE WIRELESS MESSAGE DISTRIBUTION SYSTEM

Jose Gutman, Boynton Beach, and James A. Wright, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 6, 1995, Ser. No. 539,891

Int. Cl.⁶ H04Q *7/14*

U.S. Cl. 340—825.44 **1 Claim**



1. A method in an acknowledge-back wireless selective call system capable of transmitting multi-recipient acknowledge-back pages destined for reception by a plurality of selective call transceivers and single-recipient acknowledge-back pages destined for reception by a one selective call transceiver of the plurality of selective call transceivers, the method comprising the steps of:

(a) wirelessly transmitting a multi-recipient acknowledge-back page;

(b) receiving the multi-recipient acknowledge-back page by a plurality of selective call transceivers;

(c) at each of the plurality of selective call transceivers, in response to decoding of a page as a multi-recipient page, delaying the transmission of an acknowledgment signal responsive to the multi-recipient acknowledge-back page until after a single-recipient acknowledge-back page is separately, individually received by each of the plurality of selective call transceivers;

(d) subsequent to the step of wirelessly transmitting the multi-recipient acknowledge-back page, wirelessly transmitting a single-recipient acknowledge-back page destined for reception by a one selective call transceiver of the plurality of selective call transceivers;

(e) receiving the single-recipient acknowledge-back page by the one selective call transceiver; and

(f) at the one selective call transceiver, in response to decoding of a page as a single-recipient acknowledge-back page, wirelessly transmitting a single acknowledgment signal including information indicating a message reception status for the multi-recipient acknowledge-back page received at step (b), and information indicating a message reception status for the single-recipient acknowledge-back page received at step (e).

5,748,101

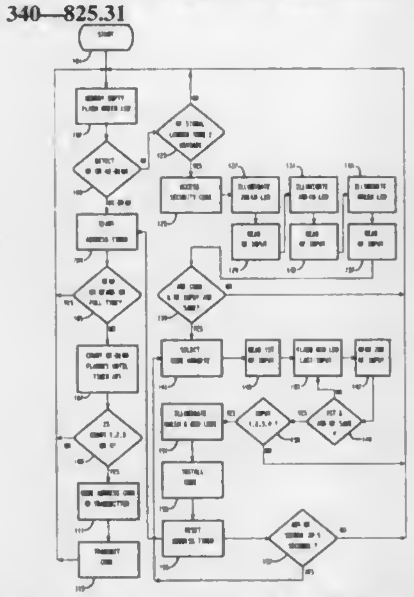
CONCEALED ACCESS ENTRY SYSTEM FOR A VEHICLE

Mark Christensen, 2625 E. Sean, Fresno, Calif. 93720, and Alfred L. Fischer, 2202-A Pacific Ave., Costa Mesa, Calif. 92627

Continuation of Ser. No. 147,988, Nov. 4, 1993, abandoned. This application Jun. 21, 1995, Ser. No. 492,945

Int. Cl.⁶ G06F *7/04;* **B60R** *25/00*

U.S. Cl. 340—825.31 **5 Claims**



1. A process of programming and actuating an access control transmitter comprising the steps of:

actuating a portable access transmitter in the vicinity of an antenna connected to a memory having at least two memory addresses and an access code associated with each memory address, wherein the portable access transmitter generates a coded signal, wherein said portable access transmitter is first actuated a multiple number of times to indicate a memory address and then actuated to transfer an access code using the coded signal generated by the portable access transmitter to said memory via a connected radio receiver;

actuating a switch;

selecting a memory address from said at least two memory addresses in said memory based upon the actuation of said switch;

transmitting a radio frequency signal modulated with said selected access code.

5,748,102

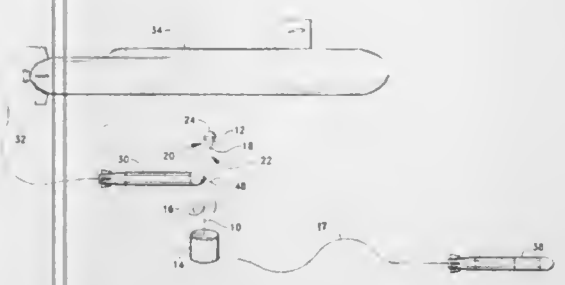
APPARATUS FOR INTERCONNECTING AN UNDERWATER VEHICLE AND A FREE FLOATING COMMUNICATIONS POD

Thomas D. Barron, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1995, Ser. No. 530,394

Int. Cl.⁶ H04B *13/02*

U.S. Cl. 340—850 **18 Claims**



1. Apparatus for interconnecting an unmanned underwater vehicle and a free-floating communications pod, said apparatus comprising:

a communications c able depending from said pod and extending to a buoy of less buoyancy than said pod, such that said cable is adapted to extend generally vertically in a column of water between said pod and said buoy, said buoy being in communication with a distal station;

a mobile unmanned underwater vehicle having therein guidance means for directing said vehicle to said cable; communication components disposed in said pod and in said vehicle adapted to abut each other to place said vehicle and said pod in communication with each other;

connector means mounted on a forward-most portion of said vehicle and adapted t o intercept said cable, said connector means being further adapted to permit said cable to slide therethrough as said vehicle continues movement after said intercept of said cable, said connector means comprising only one capture box having only one conically shaped recess therein, said pod having a conically shaped portion, said capture box recess being adapted to receive said pod portion forward of said forward-most portion of said vehicle upon engagement of said vehicle capture box with said pod, said capture box being provided with a forward facing opening adapted to receive said cable upon the intercept of said cable and a slot extending from said opening through said recess to a cable feed-through channel disposed at least in part astern of said recess wherein said cable is permitted said sliding movement through said box, said slot extending around an apex of said conical recess to said disposition astern of said recess, said channel being spaced from said apex; and

complementary alignment means on said vehicle capture box and said pod adapted to cause the vehicle capture box to engage the pod in a preselected orientation and azimuth to align said communication components of said vehicle capture box with said communication components of said pod;

whereby said vehicle is placed in communication with said pod.

5,748,103

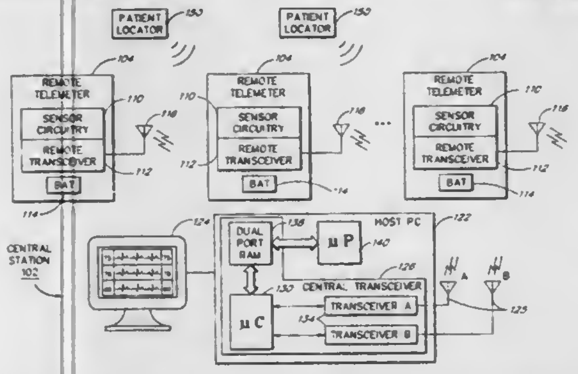
TWO-WAY TDMA TELEMETRY SYSTEM WITH POWER CONSERVATION FEATURES

Terry E. Flach, Altadena, and Michael D. Stoop, Aliso Viejo, both of Calif., assignors to Vitalcom, Inc., Tustin, Calif.

Filed Jul. 9, 1996, Ser. No. 677,068

Int. Cl.⁶ G08C *19/72*

U.S. Cl. 340—870.07 **24 Claims**



1. In a two-way TDMA telemetry system in which a plurality of remote telemeters transmit telemetry data, including real-time waveform data, to a data receiving station during respective telemetry timeslots of a TDMA frame, and in which the data receiving station transmits control data to the telemeters during at least one control timeslot of the TDMA frame, a method of extending the battery life of a first remote telemeter that transmits continuous real-time waveform data to the data receiving station, the method comprising, during the TDMA frame:

(a) providing battery power to active transmitter components of the first remote telemeter during a first telemetry timeslot which corresponds to the remote telemeter, to thereby allow the first remote telemeter to transmit telemetry data, including the continuous real-time waveform data, to the data receiving station during said first telemetry timeslot;

(b) providing battery power to at least one active receiver component of the first remote telemeter during said at least one control timeslot, to thereby allow the remote telemeter to receive control information from the data receiving station; and

(c) maintaining said active transmitter and receiver components in respective low-power states during a plurality of telemetry timeslots which correspond to other remote telemeters of the system;

the method thereby conserving battery power during timeslots for which the remote telemeter is neither transmitting nor receiving data.

5,748,104

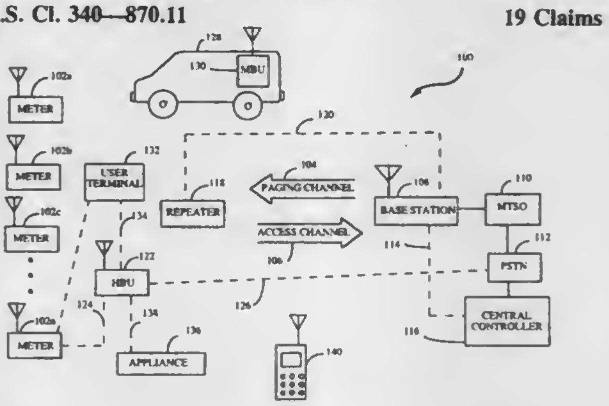
WIRELESS REMOTE TELEMETRY SYSTEM

Panayotis Argyroudis; Gwain Bayley, both of San Diego; Matthew S. Grob, La Jolla; Marc Phillips, and Samir S. Soliman, both of San Diego, all of Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Jul. 11, 1996, Ser. No. 682,819

Int. Cl.⁶ G08C *19/04*

U.S. Cl. 340—870.11 **19 Claims**



10. A method of remote telemetering in a code-division multiple access (CDMA) communication system in which a first base station having a CDMA random access channel and a CDMA paging channel communicates with a remote telemetry device and a central controller, said CDMA random access channel for carrying a plurality of reporting messages and said CDMA paging channel for carrying a plurality of control messages, said method comprising the steps of:

measuring, at said remote telemetry device, a local parameter;

transmitting, from said remote telemetry device, a first of said plurality of reporting messages over said CDMA random access channel in response to said measurement;

receiving, in said central controller, said first reporting message;

generating, in said local controller, a first of said plurality of control messages;

transmitting said first control message over said CDMA paging channel; and

receiving, in said remote telemetry device, said first control message.

5,748,105

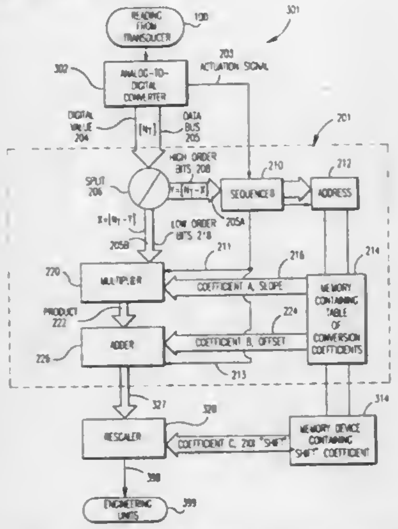
FAST TECHNIQUE FOR CONVERTING SAMPLED ANALOG MEASUREMENTS OF A PHYSICAL QUANITY TO VALUES EXPRESSED IN ENGINEERING UNIT FORMAT

Christopher P. J. Kelly, Loveland, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Division of Ser. No. 267,020, Jun. 14, 1994, Pat. No. 5,581,247, which is a continuation of Ser. No. 792,981, Nov. 15, 1991, abandoned. This application Sep. 9, 1996, Ser. No. 709,594

Int. Cl.^{6} G08C *19/16*

U.S. Cl. 340—870.21 **5 Claims**



1. A method for converting an analog voltage value representing a physical quantity being measured, to a value expressed in an engineering unit format, the method comprising the steps of:

storing in a memory a value representing a line segment slope coefficient and a value representing a line segment offset coefficient, wherein said line segment slope coefficient and said line segment offset coefficient are pre-scaled by a predetermined scale factor prior to being stored in said memory;

converting the analog voltage value into a digital value;

separating said digital value into a predetermined number of high order bits and a predetermined number of low order bits, wherein said high order bits and said low order bits together comprise a total number of bits of said digital value, and wherein said high order bits act as an addressing means for fetching said line segment slope coefficient and line segment offset coefficient from said memory;

multiplying said low order bits with said line segment slope coefficient to generate a value representing a product of the multiplication;

adding said product and said line segment offset coefficient fetched from said memory to generate a value representing a sum, said sum being the value expressed in the engineering unit format; and

re-scaling said sum by said predetermined scale factor to correct for pre-scaling.

5,748,106

METHOD AND APPARATUS FOR CONTROLLING TRANSPONDER SIGNALING

Richard J. Schoenian, Kokomo, and Alan Lee Strader, Noblesville, both of Ind., assignors to Delco Electronics Corp., Kokomo, Ind.

Filed Mar. 25, 1996, Ser. No. 622,530

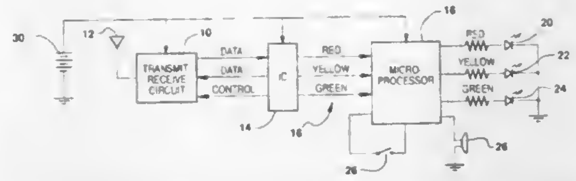
Int. Cl.^{6} G08G *1/00*

U.S. Cl. 340—928 **6 Claims**

1. A battery powered transponder for a vehicle for activating appropriate indicators in response to transmitted data comprising:

a receiver for receiving transmitted data;

a circuit for producing indicator signals in response to the data;



a processor responsive to the indicator signals and coupled to the indicators;

a pushbutton switch coupled to an input of the processor; and the processor is programmed to

activate a selected indicator for a predetermined initial display period in response to an indicator signal to display the transmitted data, and deactivate the selected indicator upon expiration of said predetermined initial display period,

reactivate the selected indicator for a period when the pushbutton switch is operated within a predetermined reactivation interval following the expiration of said predetermined initial display period; and

test the transponder by activating all of the indicators at the same time when the push button switch is operated after the predetermined reactivation interval has expired.

5,748,107

METHOD AND APPARATUS FOR LOCATING AN AVAILABLE PARKING FACILITY

Ulrich Kersken, Hildesheim, and Hinrich Claussen, Diekholzen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

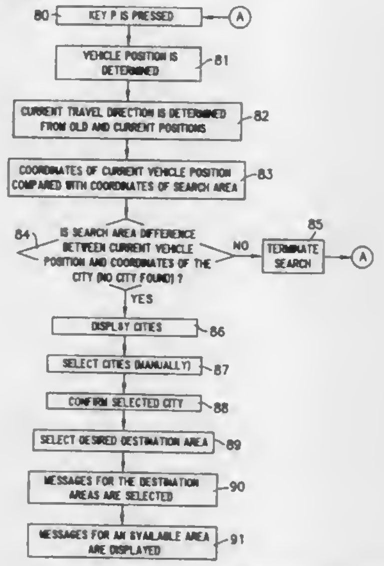
PCT No. PCT/DE95/01122, § 371 Date Mar. 24, 1997, § 102(e) Date Mar. 24, 1997, PCT Pub. No. WO96/09615, PCT Pub. Date Mar. 28, 1996

PCT Filed Aug. 24, 1995, Ser. No. 809,572

Claims priority, application Germany, Sep. 23, 1994, 44 33 982.8

Int. Cl.^{6} G08G *1/09*

U.S. Cl. 340—905 **13 Claims**


80
KEY P IS PRESSED
A
VEHICLE POSITION IS DETERMINED
81
CURRENT TRAVEL DIRECTION IS DETERMINED FROM OLD AND CURRENT POSITIONS
82
COORDINATES OF CURRENT VEHICLE POSITION COMPARED WITH COORDINATES OF SEARCH AREA
83
84
IS SEARCH AREA DIFFERENCE BETWEEN CURRENT VEHICLE POSITION AND COORDINATES OF THE CITY (NO CITY FOUND) ?
NO
85
TERMINATE SEARCH
A
YES
DISPLAY CITIES
86
SELECT CITIES (MANUALLY)
87
CONFIRM SELECTED CITY
88
SELECT DESIRED DESTINATION AREA
89
MESSAGES FOR THE DESTINATION AREAS ARE SELECTED
90
MESSAGES FOR AN AVAILABLE AREA ARE DISPLAYED
91

1. A method for locating at least one available parking facility for a motor vehicle, comprising the steps of:

requesting parking data corresponding to the at least one available parking facility;

determining a current position of the motor vehicle using a locating system when the parking data is requested;

receiving the parking data related to the at least one available parking facility corresponding to at least one assigned town code;

predetermining a search area corresponding to the current vehicle position;

selecting the at least one assigned town code of at least one town positioned in the search area;

at least one of optically outputting and acoustically outputting at least one town name corresponding to the at least one selected town code;

selectively choosing at least one of a destination area and a district from the at least one town name using an input device, the destination area being divided into predetermined districts, the input device including a key arrangement, each of the districts being assigned to a key of the key arrangement, the key arrangement being associated with a geographical location of the districts;

selecting at least one message associated with the at least one available parking facility for the selected district; and

outputting at least one of the at least one available parking facility corresponding to the at least one message.

5,748,108

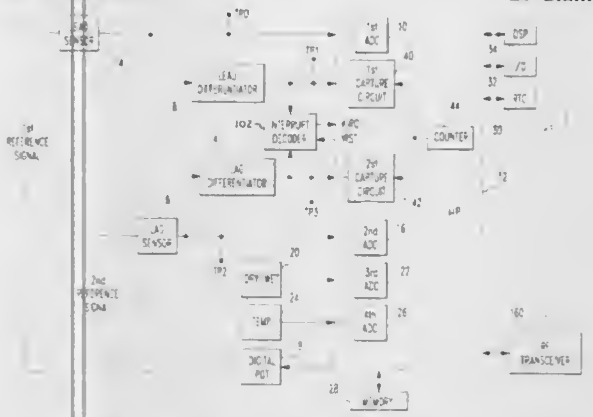
METHOD AND APPARATUS FOR ANALYZING TRAFFIC AND A SENSOR THEREFOR

Harry R. Sampey, Farmington; Jeffrey A. Geary, Normalville, and James H. Schimpf, Derry, all of Pa., assignors to Nu-Metrics, Inc., Uniontown, Pa.

Filed Jan. 10, 1997, Ser. No. 781,320

Int. Cl.^{6} G08G *1/01*

U.S. Cl. 340—933 **20 Claims**



1. An apparatus for detecting vehicles passing a fixed position, the apparatus comprising:

a first magnetic field detector for generating a first analog signal indicative of changes in magnetic field strength adjacent the first detector in response to a vehicle passing thereby;

a differentiating circuit for differentiating the first analog signal and for producing a first output that changes binary states in response to detecting a predetermined change in the differentiated first analog signal;

a counter which accumulates values at a predetermined rate; and

a processor for storing a counter value for each change in the binary state of the first output of the differentiating circuit, for converting into a first time series profile the stored counter values corresponding to the changes in the first output of the differentiating circuit and for accumulating and storing a count of passing vehicles.

5,748,109

APPARATUS AND METHOD FOR NAVIGATING VEHICLE TO DESTINATION USING DISPLAY UNIT

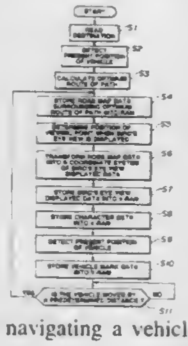
Akio Kosaka, Ebina; Okihiko Nakayama, Yokohama; Yoshitaka Yatsugi, Zama; Norimasa Kishi; Masaki Watanabe, both of Yokohama, all of Japan; Kiyomichi Yamada, rue des Trois Ponts, Belgium; Masayasu Iwasaki, Sagamihara, and Hiroshi Tsuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Dec. 23, 1994, Ser. No. 362,647

Claims priority, application Japan, Dec. 27, 1993, 5-333496; Dec. 27, 1993, 5-333497; Dec. 27, 1993, 5-333498; Mar. 16, 1994, 6-045809

Int. Cl.^{6} G08G *1/123*

U.S. Cl. 340—995 **33 Claims**



1. An apparatus for navigating a vehicle using a display unit, comprising:

a) road map storing means for storing a road map data related to a road map, the road map data including road network image data and character data related to the road map;

b) vehicle position detecting means for detecting a present position of the vehicle;

c) vehicle destination setting means through which a destination the vehicle is desired to reach is set on the road map;

d) start point setting means for setting a start point of location on the road map at which the vehicle is to start on the basis of the detected position of the vehicle;

e) route of travel setting means for setting a route of travel on the road map from the start point to the set destination; and

f) display control means for controlling an image of the road map surrounding the set route of travel which is displayed on the display unit in a form of a bird's eye view such that the bird's eye as a viewing point is referenced at a predetermined position on a raised plane from said road map and offset in a direction opposite to the set destination with respect to the present position of the vehicle being displayed to appear to a user as looking down over the road map from the bird's eye, said road network image data being displayed on the display unit in a perspective view from the bird's eye view image of the road map and the character data being displayed on the display unit as plane data at a constant size regardless of a position of the displayed image screen on the display unit with respect to the present position of the vehicle.

5,748,110

ANGULAR INPUT INFORMATION SYSTEM RELATIVE TO A TABLET FOR DETERMINING AN INCLINE ANGLE OF A POINTER OR STYLUS

Yasushi Sekizawa, and Takahiko Funahashi, both of Otonemachi, Japan, assignors to Wacom Co., Ltd., Japan

Continuation-in-part of Ser. No. 421,270, Apr. 13, 1995. This application Jul. 10, 1995, Ser. No. 500,086

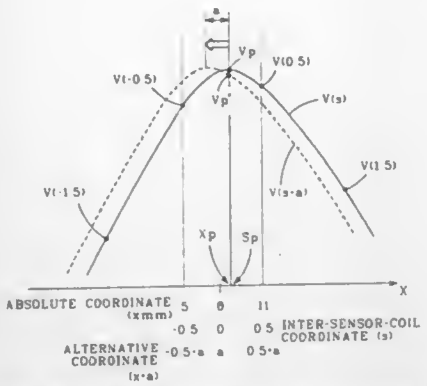
Claims priority, application Japan, May 18, 1995, 7-143882

Int. Cl.^{6} H03M *1/00*; G08C *21/00*

U.S. Cl. 341—5 **22 Claims**

1. A coordinate detecting device including a sensor section made of a plurality of sensor coils arranged side by side in both X-axis and Y-axis directions so as to constitute a sensor plane, a position indicator housing an electromagnetic coupling means, and a coordinate detecting means for detecting at least coordinates indicated

VOL
2 10
SS
1
MY
5
998
MI



by the position indicator by detecting the distribution of induced voltages occurring in the sensor coil in the direction of each axis by means of interaction between the electromagnetic coupling means and the sensor coil, the coordinate detecting device comprising:

an induced voltage distribution converting means for converting one of a main peak induced voltage distribution and a sub-peak induced voltage distribution so as to be similar to the other one when an error arises in a predetermined function of a set of induced voltages including the main peak induced voltage and the sub-peak induced voltage because of a difference between the main peak induced voltage distribution and the sub-peak induced voltage distribution within the detection width of one sensor coil resulting from the movement of the position indicator; and

an angle information detecting means for calculating a tilt angle of the position indicator in the direction of each axis by the use of a predetermined function of a set of induced voltages including a main peak induced voltage and a sub-peak induced voltage which are obtained from (i) said one induced voltage distribution which had been converted by the induced voltage distribution converting means, and (ii) the other induced voltage distribution.

5,748,111

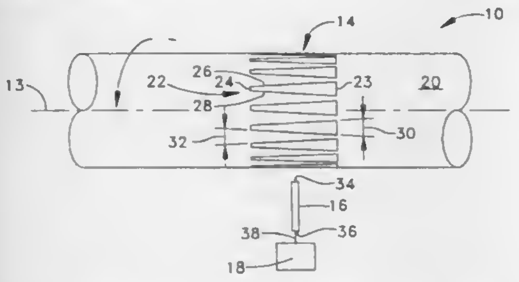
APPARATUS FOR MONITORING THE SPEED AND AXIAL POSITION OF A ROTATING MEMBER

Kent C. Bates, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 29, 1996, Ser. No. 625,022

Int. Cl.⁶ H03M *1/22*

U.S. Cl. 341—11 7 Claims



1. An apparatus for monitoring the speed and position of a rotating member, the apparatus comprising:

a grating pattern on a peripheral surface portion of the rotating member;

a sensor positioned for detecting the grating pattern on the rotating member; and

a processor operatively connected to the sensor for calculating the speed and axial position of the rotating member.

5,748,112

POSITION RECOGNITION ARRANGEMENT FOR A SELECTOR LEVER IN MOTOR VEHICLES

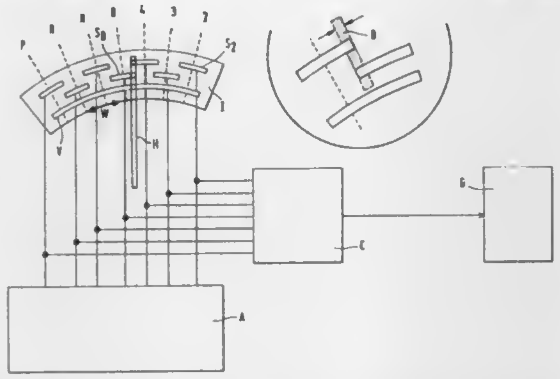
Hans Glonner, Pfaffenhofen, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

Filed Jun. 10, 1996, Ser. No. 664,194

Claims priority, application Germany, Jun. 22, 1995, 195 22 656.9

Int. Cl.⁶ H03M *1/22*

U.S. Cl. 341—17 18 Claims



1. A position recognition arrangement for a selector lever in a motor vehicle, which selector lever has a plurality of valid selectable positions, said position recognition arrangement comprising a plurality of distinct recognition switches which correspond to respective of said valid selectable positions of the selector lever, wherein said recognition switches of one of said valid selectable positions and said recognition switches of an adjacent of said valid selectable positions are actuated simultaneously in a transition area between said one of said valid selectable positions and adjacent of said valid selectable positions.

5,748,113

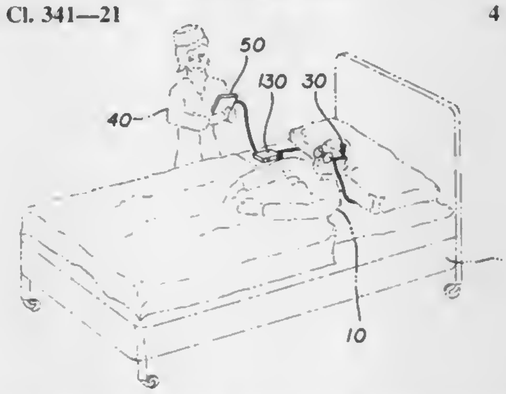
METHOD AND APPARATUS FOR COMMUNICATION

William C. Torch, 75 Pringle Way, Suite 701, Reno, Nev. 89502

Filed Aug. 19, 1996, Ser. No. 699,670

Int. Cl.⁶ H03K *17/94*

U.S. Cl. 341—21 4 Claims



1. A method of communication which includes: a first person imparting movement to at least one eyelid of the first person; detecting said eyelid movement by a detecting means including radio frequency and bio-feedback; transmitting said detection to a detection interpreting means; interpreting the detection of the eyelid movement by said interpreting means; and communicating the results of said interpreting to a second person.

5,748,114

FLAT INPUT KEYBOARD FOR DATA PROCESSING MACHINES OR THE LIKE AND PROCESS FOR PRODUCING THE SAME

Matthias-Reinhard Koehn, jahnstr. 8, 12347 Berlin, Germany

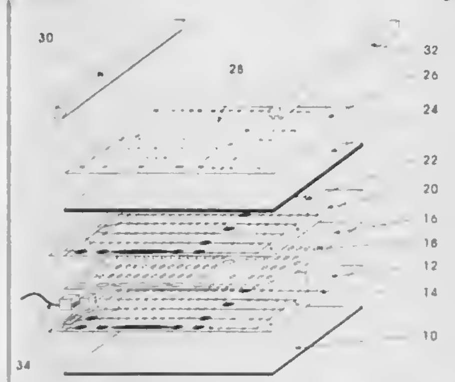
PCT No. PCT/DE94/01297, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/12208, PCT Pub. Date May 4, 1995

PCT Filed Oct. 25, 1994, Ser. No. 632,413

Claims priority, application Germany, Oct. 26, 1993, 9316733 U; Jul. 12, 1994, 44 24 496.7

Int. Cl.⁶ H03K *17/94;* H03M *11/00*

U.S. Cl. 341—22 51 Claims



1. Flat input keyboard for data processing machines or the like, which, starting on the side facing away from the operation side, has a supporting layer (10), an electric switching system (12, 16, 20) with electric contact spots corresponding to a keyboard pattern and a flexible elastic covering layer (26) having a keyboard pattern and provided on the operation side facing away from the electric switching system wherein the supporting layer (10), the multi layer electric switching system (12, 16, 20) and the covering layer (26) are interconnected at least along their circumference, wherein the electric switching system (12, 16, 20) is provided with desired bending lines, which are formed through segmentation (17) of individual or several sheet layers of the electric switching system.

5,748,115

METHOD OF INPUTTING DIRECTIONAL INFORMATION

Gert Siegle, Berlin, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

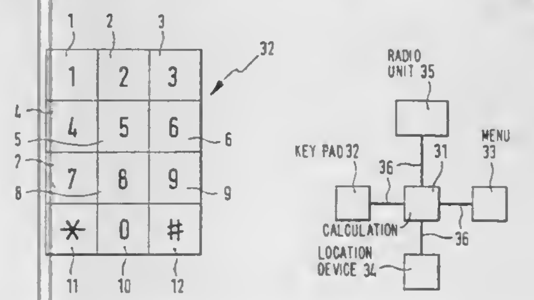
PCT No. PCT/DE95/01009, § 371 Date Feb. 14, 1997, § 102(e) Date Feb. 14, 1997, PCT Pub. No. WO96/05481, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 3, 1995, Ser. No. 793,821

Claims priority, application Germany, Aug. 16, 1994, 44 28 928.6

Int. Cl.⁶ H03K *17/94;* H03M *11/00*

U.S. Cl. 341—22 6 Claims



1. A method of inputting directional information into a radio unit (35) and/or navigation unit having a calculation apparatus (31) that is connected to a memory (33) and to a numerical keypad (32) that is made up of four rows of keys, arranged one above another in the form of a rectangle, with three keys each, characterized in that cardinal points are allocated to the keys (1, 2, 3) of the first row and the first (4) and last key (6) of the second row and the keys (7, 8, 9) of the third row of the numerical keypad (32); and that special functions are allocated to the keys (11, 10, 12) of the fourth row and to the second key (5) of the second row; and that after actuation of a special key of the numerical keypad (32), directional information is entered by actuating a key (1, 2, 3, 4, 6, 7, 8, 9), and the input of directional information is terminated by actuating a special key.

5,748,116

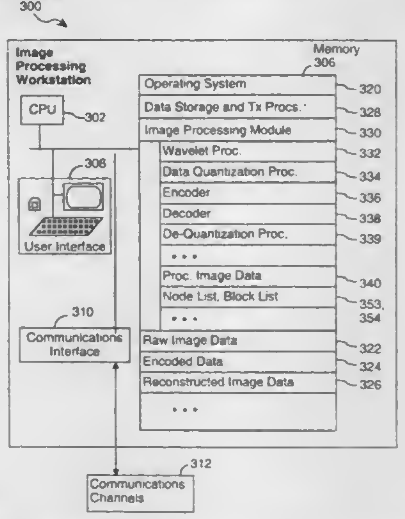
SYSTEM AND METHOD FOR NESTED SPLIT CODING OF SPARSE DATA SETS

Charles K. Chui, Palo Alto, and Rongxiang Yi, Sunnyvale, both of Calif., assignors to Teralogic, Incorporated, Menlo Park, Calif.

Filed Nov. 27, 1996, Ser. No. 758,590

Int. Cl.⁶ H03M *7/00*

U.S. Cl. 341—50 22 Claims



1. A method of encoding a specified data array, comprising the steps of:

successively identifying successively smaller blocks of data within the specified data array; wherein said data blocks are identified in a predefined order;

processing each identified data block by:

  determining a maximum number of bits required to represent any single data value in said identified data block;

  when said determined maximum number is equal to zero, outputting data indicating said identified data block contains only zero values;

  when said determined maximum number is not equal to zero, and said identified data block contains more than a predefined threshold number of data values, outputting data indicating said determined maximum number; and

  when said determined maximum number is not equal to zero, and said identified data block does not contain more than said predefined threshold number of data values, outputting data representing each of said data values in said identified data block;

wherein said data output by said method is output in an order corresponding to said predefined order that data blocks are identified.

/OL
2 10
SS
1
MY
5
998
MI

5,748,117

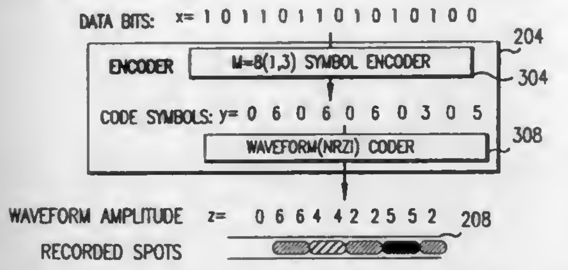
M=8 (1,3) RUNLENGTH LIMITED CODE FOR MULTI-LEVEL DATA

Steven W. McLaughlin, Rochester, N.Y., assignor to Optex Corporation, Rockville, Md.

Filed May 12, 1995, Ser. No. 440,197

Int. Cl.^{6} H03M *7/00*

U.S. Cl. 341—59 **12 Claims**


DATA BITS: x= 1 0 1 1 0 1 1 0 1 0 1 0 1 0 0
204
ENCODER
M=8(1,3) SYMBOL ENCODER
304
CODE SYMBOLS: y= 0 6 0 6 0 6 0 3 0 5
308
WAVEFORM(NRZI) CODER
WAVEFORM AMPLITUDE z= 0 6 6 4 4 2 2 5 5 2
208
RECORDED SPOTS

1. A method for encoding a series of binary input data bits x into an M=8 run-length limited (1,3) code having a rate R=3/2 to produce a series of code symbols y, the method comprising the steps of receiving at a two-state encoder an input data bit set x_i . . . x_{i+2} to be encoded into the M=8 run-length limited (1,3)code, and generating in said encoder a code symbol set y_i, y_{i+1} based on said input data bit set x_i . . . x_{i+2} according to the following mapping table:

STATE 0

INPUT	OUTPUT	NEXT STATE
000	01	0
001	02	0
010	03	0
011	04	0
100	05	0
101	06	0
110	07	0
111	00	1

STATE 1

INPUT	OUTPUT	NEXT STATE
000	01	0
001	03	0
010	04	0
011	05	0
100	10	1
101	30	1
110	50	1
111	70	1

wherein said code symbol set y_i, y_{i+1} is generated based on the input data bit set x_i . . . x_{i+2}, and the current state of said two-state encoder when said data bit set x_i . . . x_{i+2} is received.

5,748,118

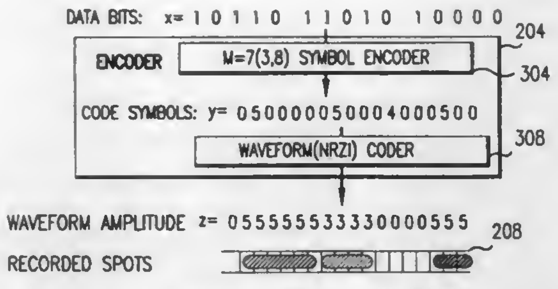
M=7 (3,8) RUNLENGTH LIMITED CODE FOR MULTI-LEVEL DATA

Steven W. McLaughlin, Rochester, N.Y., assignor to Optex Corporation, Rockville, Md.

Filed May 12, 1995, Ser. No. 440,227

Int. Cl.^{6} H03M *7/00*

U.S. Cl. 341—59 **12 Claims**


DATA BITS: x= 1 0 1 1 0 1 1 0 1 0 1 0 0 0 0
204
ENCODER
M=7(3,8) SYMBOL ENCODER
304
CODE SYMBOLS: y= 0 5 0 0 0 0 0 5 0 0 0 4 0 0 0 5 0 0
308
WAVEFORM(NRZI) CODER
WAVEFORM AMPLITUDE z= 0 5 5 5 5 5 5 3 3 3 3 0 0 0 0 5 5 5
208
RECORDED SPOTS

1. A method for encoding a series of binary input data bits x into an M=7 run-length limited (3,8) code having a rate R=5/6, to produce a series of code symbols y, the method comprising the steps of receiving at a five-state state encoder an input data bit set x_i . . . x_{i+4} to be encoded into the M=7 run-length limited (3,8) code, and generating in said encoder a code symbol set y_i . . . y_{i+5} based on said input data bit set x_i . . . x_{j+4} according to the following mapping table:

STATE 0

INPUT	OUTPUT	NEXT STATE
0	000001	0
1	000002	0
2	000003	0
3	000004	0
4	000005	0
5	000006	0
6	000010	0
7	000020	0
8	000030	0
9	000040	0
10	000050	0
11	000060	0
12	000100	0
13	000200	0
14	000300	0
15	000400	0
16	000500	0
17	000600	0
18	000100	1
19	000200	1
20	000300	1
21	000400	1
22	000500	1
23	000600	1
24	000100	2
25	000200	2
26	000300	2
27	000400	2
28	000500	2
29	000600	2
30	000000	3
31	000000	4

STATE 1

INPUT	OUTPUT	NEXT STATE
0	001000	2
1	002000	2
2	003000	2
3	004000	2
4	005000	2
5	006000	2
6	001000	3
7	002000	3
8	003000	3
9	004000	3
10	005000	3
11	006000	3
12	001000	4
13	002000	4
14	003000	4
15	004000	4
16	005000	4
17	006000	4
18	010000	2
19	020000	2
20	030000	2
21	040000	2
22	050000	2
23	060000	2
24	010000	3
25	020000	3
26	030000	3
27	040000	3
28	050000	3
29	060000	3
30	020000	4
31	040000	4

STATE 2

INPUT	OUTPUT	NEXT STATE
0	010002	0
1	010003	0
2	010004	0
3	010005	0
4	010006	0
5	020001	0
6	020002	0
7	020003	0
8	020004	0
9	020005	0
10	020006	0
11	030001	0
12	030002	0
13	030003	0
14	030004	0
15	030005	0
16	030006	0
17	040001	0
18	040002	0
19	040003	0
20	040004	0
21	040005	0
22	040006	0
23	050001	0
24	050002	0
25	050003	0
26	050004	0
27	050005	0
28	050006	0
29	060002	0
30	060003	0
31	060004	0

STATE 3

INPUT	OUTPUT	NEXT STATE
0	100002	0
1	100003	0
2	100004	0
3	100005	0
4	100006	0
5	200001	0
6	200002	0
7	200003	0
8	200004	0
9	200005	0
10	200006	0
11	300001	0
12	300002	0
13	300003	0
14	300004	0
15	300005	0
16	300006	0
17	400001	0
18	400002	0
19	400003	0
20	400004	0
21	400005	0
22	400006	0
23	500001	0
24	500002	0
25	500003	0
26	500004	0
27	500005	0
28	500006	0
29	600002	0
30	600003	0
31	600004	0

STATE 4

INPUT	OUTPUT	NEXT STATE
0	100020	0
1	100030	0
2	100040	0
3	100050	0
4	100060	0
5	200010	0
6	200020	0
7	200030	0
8	200040	0
9	200050	0
10	200060	0
11	300010	0
12	300020	0
13	300030	0
14	300040	0
15	300050	0
16	300060	0
17	200010	0
18	400020	0
19	400030	0
20	400040	0
21	400050	0
22	400060	0
23	500010	0
24	500020	0
25	500030	0
26	500040	0
27	500050	0
28	500060	0
29	600020	0
30	600030	0
31	600040	0

wherein said code symbol set y_i . . . y_{i+5} is generated based on the input data bit set x_i . . . x_{i+4} and the current state of said five-state encoder when said data bit set x_i . . . x_{i+4} is received.

5,748,119

DEVICES AND METHODS FOR CHANNEL-ENCODING AND CHANNEL-DECODING OF DIGITAL DATA

Jung-wan Ko, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

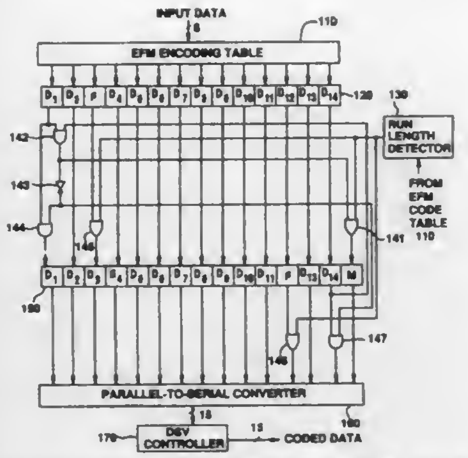
Filed Sep. 18, 1996, Ser. No. 715,427

Claims priority, application Rep. of Korea, Sep. 18, 1995, 95-30447

Int. Cl.^{6} H03M *7/00*

U.S. Cl. 341—59 **37 Claims**

1. A method for channel-encoding digital data into a (d, k, m, n) code where d indicates a minimum runlength constraint, k indicates a maximum runlength constraint, m indicates a number of



bits of an input word, and n indicates a number of bits of a code word, said method comprising the steps of:

(a) encoding at least one m-bit input word into a channel code having more than m but less than n bits by using a predetermined encoding table;

(b) concatenating two consecutive channel codes, provided by said encoding step, by adding a (d–1)-bit merging sequence to produce n-bit code words;

(c) assigning the (n-d)th bit of a first channel code of said consecutive channel codes and the (d+1)th bit of a second channel code of said consecutive channel code as identifying bits; and

(d) adjusting said two consecutive channel codes and said merging sequence depending on d and k constraints; wherein the merging sequence and the last bit of said first channel code and the first bit of said second channel code are converted when said d constraint is violated, and said identifying bits and said merging sequence are converted when said k constraint is violated.

5,748,120

SAMPLING FREQUENCY CONVERTING DEVICE AND MEMORY ADDRESS CONTROL DEVICE

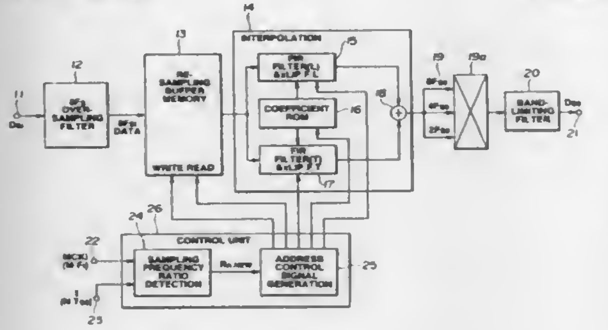
Nobuyuki Yasuda, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 377,115, Jan. 23, 1995, Pat. No. 5,617,088. This application Mar. 31, 1997, Ser. No. 829,332

Claims priority, application Japan, Jan. 26, 1994, 6-007124; Jan. 28, 1994, 6-008366; Jan. 28, 1994, 6-008367

Int. Cl.⁶ H03M *7/00*

U.S. Cl. 341—61 **1 Claim**


14
INTERPOLATION
13
15
12
RE-SAMPLING BUFFER MEMORY
FIR FILTER(U) & ILLP F.L.
11
8Fs OVER-SAMPLING FILTER
8Fs DATA
COEFFICIENT ROM
16
18
19
19a
20
BAND-LIMITING FILTER
Dout
21
FIR FILTER(L) & ILLP F.L.
17
WRITE READ
24
26
CONTROL UNIT
22
SAMPLING FREQUENCY RATIO DETECTION
ADDRESS CONTROL SIGNAL GENERATION
25
23

1. A device for converting a sampling frequency of an input signal into an arbitrary sampling frequency, comprising:

storage means for storing the input signal;

interpolation means for interpolating the signal read out from said storage means; and

control means for generating a current sampling frequency ratio between the current sampling frequency of the input signal and the arbitrary sampling frequency and a new sampling frequency ratio between the sampling frequency of the input signal and the arbitrary sampling frequency based on the current sampling frequency ratio for suppressing jitter components and for performing sampling frequency conversion, said control means generating a control signal for controlling an address signal of said storage means and interpolation factors of said interpolation means and effecting sampling frequency conversion by controlling said storage means and said interpolation means based on the generated control signal controlling the address signal;

wherein said interpolation means is constituted by an FIR filter; and

wherein said control means comprises sampling frequency ratio detection means for detecting the current sampling frequency ratio between the sampling frequency of the input signal and the arbitrary sampling frequency and detecting the new sampling frequency ratio based on a current detected sampling frequency ratio value and a past detected sampling frequency ratio value, said control means controlling said storage means and said interpolation means based on the new sampling frequency ratio from said sampling frequency ratio detection means.

5,748,121

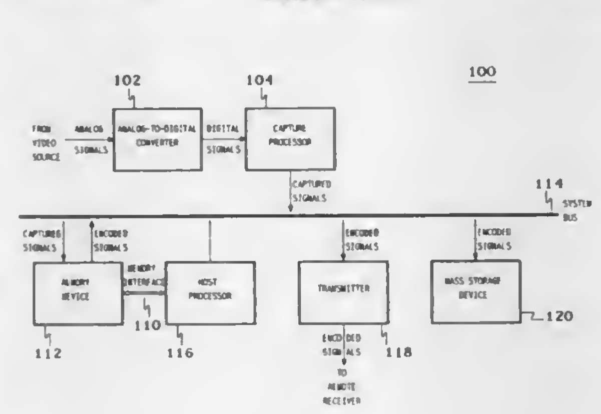
GENERATION OF HUFFMAN TABLES FOR SIGNAL ENCODING

Joseph N. Romriell, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 6, 1995, Ser. No. 568,247

Int. Cl.⁶ H03M *7/40;7/30*

U.S. Cl. 341—65 **36 Claims**



1. A computer-implemented process for generating Huffman tables for encoding signals, comprising the steps of:

(a) providing a plurality of training sets of signals;

(b) defining the plurality of training sets as a group of training sets;

(c) generating a group Huffman table corresponding to the group of training sets;

(d) generating a new group Huffman table defining an additional group of training sets;

(e) redistributing the plurality of training sets among the groups based on the group Huffman tables; and

(f) repeating steps (d) and (e) until a desired number of group Huffman tables are generated.

5,748,122

DATA PROCESSING APPARATUS AND DATA PROCESSING METHOD

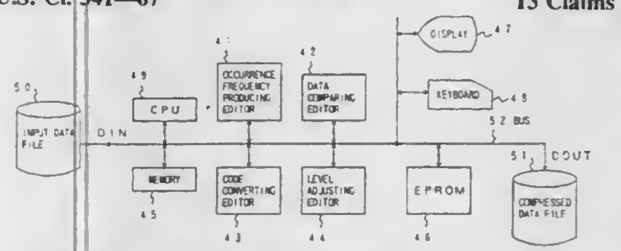
Akio Shinagawa, Kawasaki; Hitoshi Ohno, and Yuko Abe, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 505,760, Jul. 21, 1995, Pat. No. 5,635,932. This application Mar. 3, 1997, Ser. No. 813,943

Claims priority, application Japan, Oct. 17, 1994, 6-251016; Oct. 17, 1994, 6-251017

Int. Cl.⁶ H03M *7/40*

U.S. Cl. 341—67 **13 Claims**



1. A data compressing apparatus comprises:

a data producing means for counting an occurrence frequency of each of types of pieces of input data to be compressed and producing an occurrence frequency table formed of a plurality of occurrence frequencies of the types of the input data to be compressed;

a data predicting means for predicting an occurrence of a piece of next input data input to the data producing means subsequent to a piece of input data of which a type is just counted by the data producing means; and

a data converting means for converting the types of pieces of input data according to the occurrence prediction of the next input data in the data predicting means on condition that a type of a piece of input data is converted into a piece of compressed data having a shorter bit length as an occurrence probability of the type of the input data is higher and on condition that a type of a piece of input data is converted into a piece of compressed data having a longer bit length as an occurrence probability of the type of the input data is lower.

5,748,123

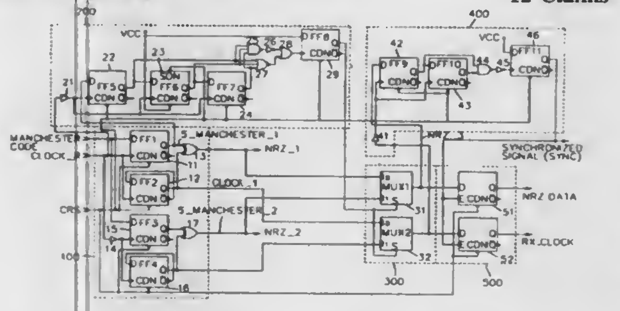
DECODING APPARATUS FOR MANCHESTER CODE

Wonro Lee, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Jan. 19, 1996, Ser. No. 587,741

Int. Cl.⁶ H03M *7/12*

U.S. Cl. 341—70 **12 Claims**



12. A method for decoding an asynchronous Manchester Code comprising the steps of:

receiving the asynchronous Manchester Code and a received clock signal;

sampling the asynchronous Manchester Code with the received clock signal to produce a synchronous Manchester Code and an NRZ code;

tolerance checking the synchronous Manchester code and outputting a detection signal;

multiplexing the NRZ code in accordance with the detection signal to produce a multiplexed NRZ code;

synchronizing the multiplexed NRZ code to produce a sync detection signal; and

outputting an output NRZ data, synchronized with the received clock signal, in accordance with the multiplexed NRZ code and the sync detection signal.

5,748,124

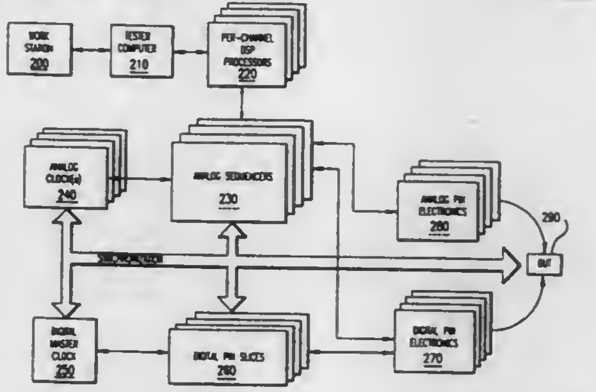
ANALOG CHANNEL FOR MIXED-SIGNAL-VLSI TESTER

Daniel Rosenthal, Saratoga; Kannan Konath, Fremont, both of Calif.; Robert Whyte, Ringwood, United Kingdom; Eric Norton, Cupertino, and Stuart Robert Pearce, San Jose, both of Calif., assignors to Schlumberger Technologies Inc., San Jose, Calif.

Division of Ser. No. 510,397, Aug. 1, 1995, Pat. No. 5,646,521. This application Dec. 9, 1996, Ser. No. 762,395

Int. Cl.⁶ H03M *1/10*

U.S. Cl. 341—120 **17 Claims**



1. A method of operating a multi-channel, mixed-signal tester to simultaneously test the signal-to-noise ratio of a digital-to-analog converter (DAC) and the signal-to-noise ratio of an analog-to-digital converter (ADC), comprising the steps of:

a. in a first channel of the tester, testing the DAC by applying a digital representation of a test signal to the DAC, digitizing an analog signal received from the DAC in response to the applied digital representation, performing a fast-Fourier transform of the digitized analog signal in a DSP, and computing a signal-to noise ratio of the DAC, and

b. in a second channel of the tester, testing the ADC by preparing digital data representing an analog test signal, preparing from the digital data an analog test signal and applying the analog test signal to the ADC, receiving data produced by the ADC in response to the applied analog test signal, performing a fast-Fourier transform of the data received from the ADC in a DSP, and computing a signal-to noise ratio of the ADC.

5,748,125

DIGITAL DELAY INTERPOLATOR CIRCUIT

Carl Cederbaum, Fleurie; Philippe Girard, Corbell-Essones, and Patrick Mone, St. Fargeau-Ponthierry, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1996, Ser. No. 751,286

Claims priority, application European Pat. Off., Jan. 23, 1996, 96480006

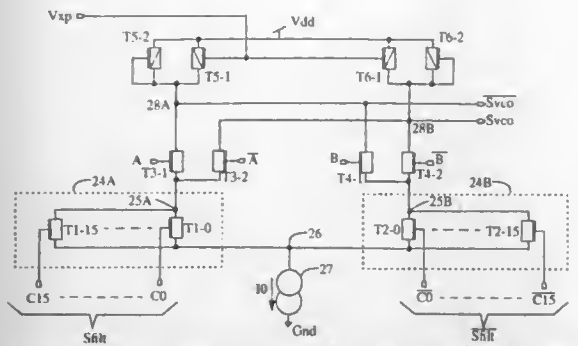
Int. Cl.⁶ H03M *1/66*

U.S. Cl. 341—136 **5 Claims**

1. A totally digital delay interpolator circuit (23) driven by the true and complement phases of a digital N-bit comprising

a first pair of NFET devices (T3-1, T3-2) having a common source forming a first node (25A) whose respective gates are driven by the true and complement phases of a first input signal (A);

OL
2 10
SS
1
MY
5
998
MI



a second pair of NFET devices (**T4-1**, **T4-2**) having a common source forming a second node (**25B**) whose respective gates are driven by the true and complement phases of a second input signal (B);

a first array (**24**A) comprised of a plurality of N NFET devices (**T1-0**, . . .) connected in parallel whose the commom drain is connected to said first node and the common source is connected to a current source (**27**) at a common node (**26**); the gate of each NFET device of the first array being driven by the respective N bits (c**0**, . . .) of the control signal true phase; and,

a second array (**24**B) comprised of a plurality of N NFET devices (**T2-0**, . . .) connected in parallel whose the common drain is connected to said second node and the common source is connected to said current source (**27**) at said common node (**26**); the gate of each NFET device of the second array being driven by the respective N bits (c**0**, . . .) of the control signal complement phase.

5,748,126

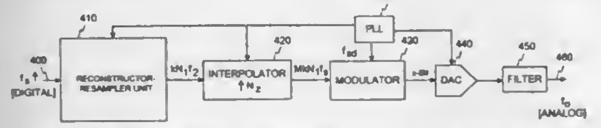
SIGMA-DELTA DIGITAL-TO-ANALOG CONVERSION SYSTEM AND PROCESS THROUGH RECONSTRUCTION AND RESAMPLING

Chingwo Ma, Danville; Inging Yang, Milpitas, and Wei-Chan Hsu, San Jose, all of Calif., assignors to S3 Incorporated, Santa Clara, Calif.

Filed Mar. 8, 1996, Ser. No. 612,691

Int. Cl.^{6} H03M *3/00*

U.S. Cl. 341—143 **33 Claims**



1. In a digital-to-analog conversion system including an input of a digital data signal, having a sampling frequency, and including a digital-to-analog converter and a modulator operating at a fixed clock rate regardless of the sampling frequency, a method to convert the digital data signal to an analog data signal comprising the steps of:

- receiving the digital data signal at a signal input line;
- reconstructing and resampling the digital data signal to generate a resampled data signal, the reconstructing and resampling further comprising
  - upsampling the digital data signal to generate an upsampled digital data signal; and
  - curve-fitting the upsampled digital data signal using polynominal interpolation to generate the resampled data signal;
- performing noise-shaping on the resampled data signal to generate a x-bit data signal;
- converting the x-bit digital data signal to the analog data signal; and
- outputting the analog data signal.

5,748,127

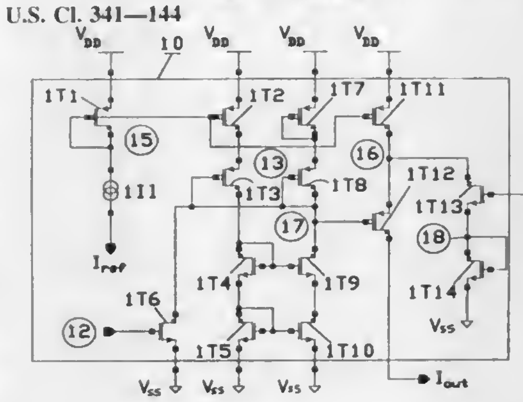
TWO CASCODED TRANSISTOR CHAINS BIASING DAC CURRENT CELLS

Jaideep Prakash, Dallas; John Paul Norsworthy, Lucas, and Bruce Andrew Doyle, Richardson, all of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Dec. 22, 1995, Ser. No. 579,073

Int. Cl.^{6} H03M *1/66*

U.S. Cl. 341—144 **10 Claims**



1. A digital-to-analog converter circuit comprising:

(A) a biasing stage for mirroring a reference current to bias a switching transistor independent of manufacturing process variations, wherein said biasing stage comprises a first cascoded transistor chain and a second cascoded transistor chain; and

(B) a current cell for receiving the mirrored reference current comprising:
  (1) the switching transistor;
  (2) a digital input node; and
  (3) an analog current output node,

wherein the switching transistor switches a current either to a shunt path to ground potential or the output node depending on the input at the input node.

5,748,128

REDUCED CURRENT QUADRATIC DIGITAL/ANALOG CONVERTER WITH IMPROVED SETTLING-TIME

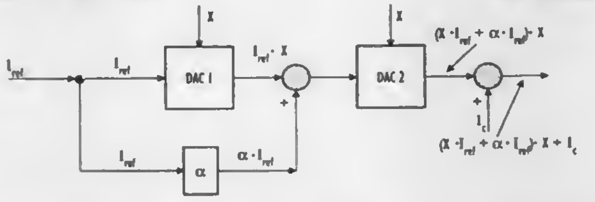
Melchiorre Bruccoleri, Genova; Marco Demicheli, Binago; Giuseppe Patti, Favara, and Valerio Pisati, Bosnasco, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed May 13, 1996, Ser. No. 645,457

Claims priority, application European Pat. Off., May 15, 1995, 95830197

Int. Cl.^{6} H03M *1/16*

U.S. Cl. 341—144 **20 Claims**



1. A digital/analog quadratic converter (DACQ) comprising a pair of current scaling digital/analog converters (DAC**1**, DAC**2**) having the same number of stages (bits) and functionally connected in cascade, each employing DAC employs the same number of binarily scaled current sources that my be selected by a certain digital datum or word (X) of said number of bits and an R-2R resistive network, a reference current (Iref) being forced on a high impedance input node of the first converter (DAC**1**), first means for summing an output current of the first converter (Iref*X) with a current multiple of said reference current (α*Iref), and second means for summing an output current ((X*Iref+α*Iref)*X) of the second converter (DAC**2**) with a constant current (Ic) to produce an output current defined by a quadratic function $(Iref*X^2+\alpha*Iref*X+Ic)$ of said digital datum (X).

characterized in that

said first means consists of a direct coupling of the output node of the first converter (DAC**1**) with a node of said R-2R resistive network of said second converter corresponding to the least significant bit stage of said R-2R network of the second converter (DAC**2**), on which node said current of multiple value (X*Iref) is summed.

5,748,129

ANALOG TO DIGITAL CONVERTER CIRCUIT

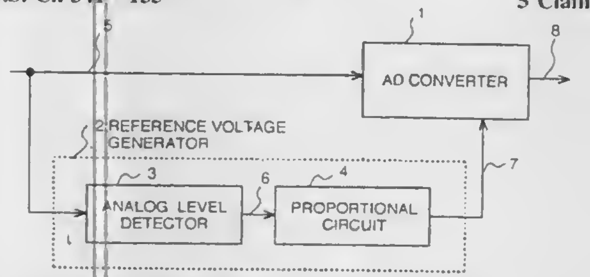
Soichi Tsumura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 20, 1995, Ser. No. 560,648

Claims priority, application Japan, Nov. 25, 1994, 6-315773

Int. Cl.^{6} H03M *1/18*

U.S. Cl. 341—155 **5 Claims**



1. An analog to digital converter circuit comprising:

an analog to digital converter for converting an input analog signal to a digital signal in accordance with a reference voltage; and

a reference voltage generator for generating said reference voltage in proportion to an intensity level of said input analog signal, said reference voltage generator comprising:
  an analog level detector for detecting the intensity level of said input analog signal; and
  a proportional circuit, responsive to said analog level detector, for generating said reference voltage in proportion to said intensity level detected by said analog level detector.

5,748,130

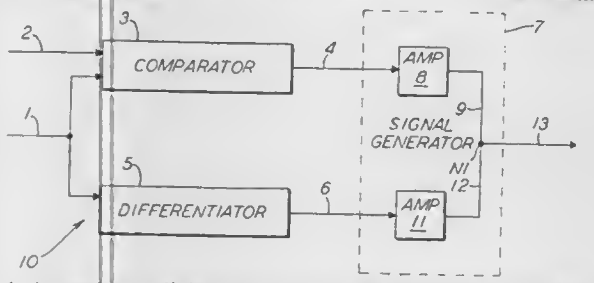
ANALOG TO DIGITAL CONVERTER HAVING MULTI-STATE OUTPUT

Michael F. Wicnienski, 36903 Carol La., Lake Villa, Ill. 60046

Filed Apr. 15, 1996, Ser. No. 632,652

Int. Cl.^{6} H03M *1/36*

U.S. Cl. 341—155 **20 Claims**



1. An analog to digital converter for interpreting a first numerical value of a first physical quantity, such first numerical value of such first physical quantity depending upon a second numerical value of a second physical quantity, said analog to digital converter producing an output, for each of such second numerical value of such second physical quantity, said output indicative of a third physical quantity indicative of such first physical quantity in relation to such second physical quantity, said analog to digital converter comprising:

(a) means for making a first determination as to whether such first numerical value of such first physical quantity is in excess of a predetermined reference value;

(b) means for making a second determination as to whether such first numerical value of such first physical quantity is increasing or decreasing with such second numerical value of such second physical quantity;

(c) means for generating said output based on said first determination and on said second determination, said output being a digital output having one of at least four alternative values;
  a first one of said alternative values if such first value of such first physical quantity is in excess of such predetermined reference value and such first value of such first physical quantity is increasing with such second numerical value of such second physical quantity;
  a second one of said alternative values if such first value of such first physical quantity is in excess of such predetermined value and such first value of such first physical quantity is decreasing with such second numerical value of such second physical quantity;
  a third one of said alternative values if such first value of such first physical quantity is less than such predetermined value and such first value of such first physical quantity is decreasing with such second numerical value of such second physical quantity;
  a fourth one of said alternative values if such first value of such first physical quantity is less than such predetermined value and such first value of such first physical quantity is increasing with such second numerical value of such second physical quantity; and

(d) means for communicating said output as an output from said analog to digital converter.

5,748,131

A/D CONVERTING CIRCUIT

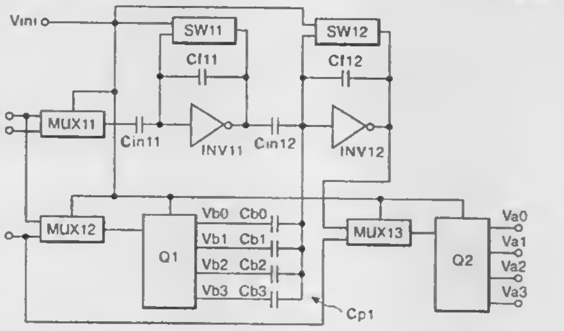
Kazunori Motohashi; Guoliang Shou; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, and Yozan, Inc., Tokyo, both of Japan

Filed Sep. 17, 1996, Ser. No. 710,307

Claims priority, application Japan, Sep. 18, 1995, 7-263574

Int. Cl.^{6} H03M *1/12*

U.S. Cl. 341—155 **2 Claims**



1 An A/D converting circuit comprising:

i) a first capacitance to which an analog input voltage is inputted;

ii) a first MOS inverter circuit connected to an output of said first capacitance, with linear relationship between input and output;

iii) a first quantizing circuit to which said analog input voltage is inputted for outputting an quantized output of said analog input voltage, said first quantizing circuits comprising a plurality of stages of thresholding circuits each of which comprises a MOS inverter for quantizing having a predetermined threshold and a capacitive coupling for quantizing having a plurality of parallel capacitances connected to an input of said MOS inverter for quantizing, said capacitive coupling for quantizing receiving said input voltage and inverted output of upper thresholding circuits, said MOS inverter for quantizing in each thresholding circuits inverting an output of said capacitive coupling for quantizing when said output exceeds said threshold;

iv) a capacitive coupling for output to which outputs of said first MOS inverter and of said first quantizing circuit are inputted;

v) a second MOS inverter circuit inputted to which an output of said capacitive coupling for output is inputted, with substantially the same characteristics as said first MOS inverter circuit; and

vi) a second quantizing circuit an output of said second MOS inverter is inputted for quantizing said output of said second MOS inverter, said second quantizing circuits comprising a plurality of stages of thresholding circuits each of which comprises of MOS inverter for quantizing having a predetermined threshold, and a capacitive coupling for quantizing having a plurality of parallel capacitances connected to an input of said MOS inverter for quantizing, said capacitive coupling for quantizing receiving said input voltage and inverted output of upper thresholding circuits, said MOS inverter for quantizing in each thresholding circuits inverting an output of said capacitive coupling for quantizing when said output exceeds said threshold.

characterized in that a supply voltages of said first and second MOS inverter circuits are settled higher than a supply voltage of said MOS inverter for quantizing.

5,748,132

INTERPOLATION TYPE A/D CONVERTER

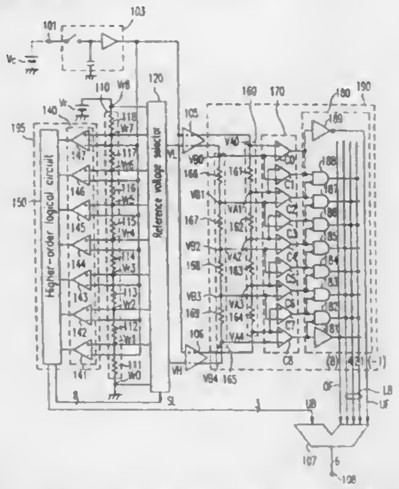
Akira Matsuzawa, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 15, 1996, Ser. No. 679,796

Claims priority, application Japan, Jul. 17, 1995, 7-179815

Int. Cl.⁶ H03M *1/12*

U.S. Cl. 341—156 **8 Claims**



1. An A/D converter for receiving an input voltage and outputting a digital signal representing a level of the input voltage by a number n (where n is a natural number equal to or larger than 2) of upper bits and a number m (where m is a natural number equal to or larger than 2) of lower bits, comprising:

reference voltage generation means for generating a plurality of reference voltages;

upper bit generation means for generating the upper bits by comparing the input voltage with the plurality of reference voltages;

selection means for selecting a first voltage equal to or higher than the input voltage and a second voltage equal to or lower than the input voltage from the plurality of reference voltages;

first differential amplification means for amplifying a difference between the first voltage and the input voltage and outputting an amplified voltage;

second differential amplification means for amplifying a difference between the second voltage and the input voltage and outputting an amplified voltage;

lower bit generation means for generating the lower bits by using the output voltage of the first differential amplification means and the output voltage of the second differential amplification means; and

synthesis means for generating the digital signal by synthesizing the upper bits with the lower bits.

5,748,133

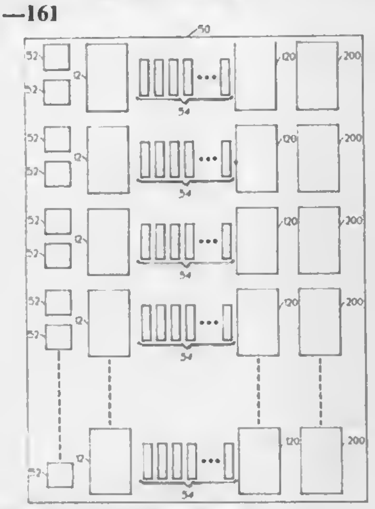
ANALOG TO DIGITAL CONVERTER

Robert J. Distinti, Fairfield, Conn., assignor to Intellectual Property Development Associates of Connecticut, Incorporated, Trumbull, Conn.

Continuation of Ser. No. 410,227, Mar. 24, 1995, which is a division of Ser. No. 883,251, May 13, 1992, Pat. No. 5,402,125, which is a division of Ser. No. 714,246, Jun. 12, 1991, Pat. No. 5,202,687. This application Jun. 12, 1996, Ser. No. 662,934

Int. Cl.⁶ H03M *1/38*

U.S. Cl. 341—161 **45 Claims**



1. An integrated circuit, comprising:

a substrate;

a plurality of analog signal processing circuit functional blocks disposed on said substrate and comprising at least one first type of analog signal processing circuit functional block and at least one second type of analog signal processing circuit functional block;

an auto-zero function disposed on said substrate for reducing a magnitude of an offset signal; and

programmable signal paths disposed on said substrate that are preprogrammed for coupling together selected ones of said first and second types of analog signal processing circuit functional blocks into a desired circuit configuration.

5,748,134

METHOD AND APPARATUS FOR CONVERTING AN ANALOG SIGNAL INTO DIGITAL FORMAT

Paul Wilkinson Dent, Stehag, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Mar. 1, 1996, Ser. No. 609,715

Int. Cl.⁶ H03M *1/40*

U.S. Cl. 341—172 **28 Claims**

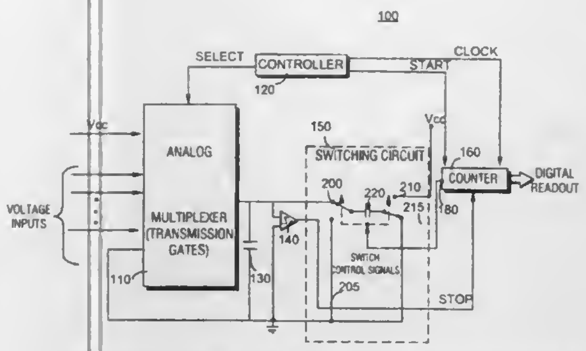
1. An analog to digital converter, comprising:

a first capacitor connected at a first terminal to an analog signal to charge the capacitor in accordance with a current voltage level of the analog signal and at a second terminal to ground;

a second capacitor; and

electronic control circuitry for alternately connecting the second capacitor between the first capacitor and a power supply to remove increments of charge from the first capacitor until the first capacitor is discharged including:

a switching circuit connected to the first terminal of the first capacitor, to ground, and to the power supply including:



a first pair of switches with one switch connected to a first terminal of the second capacitor and the other switch connected to a second terminal of the second capacitor, and

a second pair of switches with one switch connected to a first terminal of the second capacitor and the other switch connected to a second terminal of the second capacitor,

wherein the electronic control circuitry generates switching control signals alternately connecting the second capacitor through the first pair of switches between ground and the power supply and through the second pair of switches between the first terminal of the first capacitor and ground to remove the increments of charge from the first capacitor, and

wherein a number of removed increments of charge associated with discharging the first capacitor is used to generate a digital value corresponding to the current voltage level of the analog signal.

5,748,135

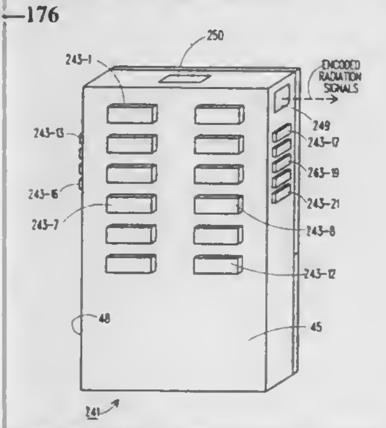
WIRELESS REMOTE CONTROL TRANSMITTER FOR USE WITH CONSUMER ENTERTAINMENT ELECTRONICS APPLIANCE

Irving M. Kriegsman, 250 Baldwin Ave., Framingham, Mass. 01701; Edward M. Kriegsman, 103 Richard Rd., Holliston, Mass. 01746, and Daniel S. Kriegsman, 67 Arlington St., Apt. 1, Newton, Mass. 02158

Continuation-in-part of Ser. No. 984,184, Nov. 20, 1992, Pat. No. 5,534,865. This application Jul. 8, 1996, Ser. No. 676,438

Int. Cl.⁶ H04B *10/00*

U.S. Cl. 341—176 **10 Claims**



1. A wireless remote control transmitter for remotely controlling the operation of consumer entertainment electronics appliance, said wireless remote control transmitter comprising:

a. a housing, said housing including a front,a top end, a bottom end and a first side, said front being wider than said first side, said first side including a window;

b. means disposed within said housing for outputting a control signal through said window on said first side recognizable by the consumer entertainment electronics appliance in response to a command received from a keyboard, and

c. keyboard means for inputting commands to said outputting means, said keyboard means including a keyboard.

5,748,136

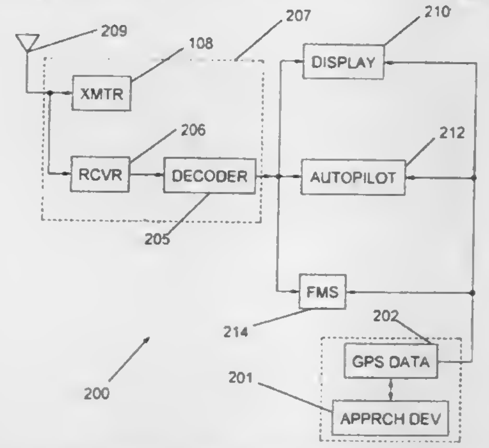
ELECTRONIC LANDMARK ENHANCEMENT TO GPS BASED NAVIGATION SYSTEMS

Gregory M. Fischer, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 22, 1995, Ser. No. 532,448

Int. Cl.⁶ G01S *13/91*

U.S. Cl. 342—33 **6 Claims**



1. An aircraft landing system comprising:

a global positioning system on board an aircraft for generating a present position report for the aircraft;

an interrogating radar, coupled to the aircraft for providing an interrogating signal in a predetermined direction, with respect to a flight direction of the aircraft;

a radar-activated passively powered runway beacon disposed at a predetermined location near an aircraft runway which transmits a unique identification signal when interrogated by the aircraft; and

a receiver disposed upon the approaching aircraft which receives the unique identification signal.

5,748,137

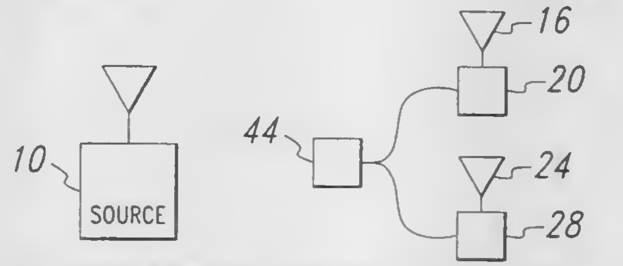
WIRELESS FLYWHEEL SYNCHRONIZATION METHOD

Loek d'Hont, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 8, 1996, Ser. No. 646,881

Int. Cl.⁶ G01S *13/78*

U.S. Cl. 342—42 **14 Claims**



1. A wireless flywheel for synchronizing signal transmissions, comprising:

a master source for periodically transmitting synchronization pulses;

a first reader module having a quartz crystal and a receiver, said first module having a fixed interrogation cycle;

second reader module having a quartz crystal and a receiver, said second module having a different fixed interrogation cycle than said first module; and

wherein said interrogation cycle of said first reader and said interrogation cycle of said second reader is reset upon receipt of a synchronization pulse from said master source resulting in said first reader transmitting interrogation pulses at times other than when the second reader is transmitting interrogation pulses.

VOL 210
ISS 1
MY 5
1998
UMI

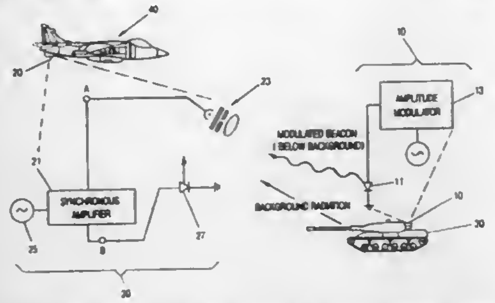
5,748,138
SYNCHRONOUS IDENTIFICATION OF FRIENDLY TARGETS

John M. Telle, 126 Shady Oak Cir., Tijeras, N. Mex. 87059, and Stutz A. Roger, 5 Kiowa La., Los Alamos, N. Mex. 87544

Filed Sep. 30, 1996, Ser. No. 724,119

Int. Cl.^{6} G01S *13/78*

U.S. Cl. 342—45 **20 Claims**



1. An identification of friend or foe targeting means comprising:

(a) a transceiver; and

(b) a remotely located beacon attached to a blackbody radiation source, the beacon comprising a radiating source in electrical communication with an amplitude modulator and a power source, the amplitude modulator, the radiating source and the power source within and secured to a compact housing, the radiating means adapted to transmit radiation at a predetermined frequency approximately equal to or less than the frequency generated by the blackbody radiation source to send and receive masked transmitted communication signals within the frequency generated by the blackbody radiation source.

5,748,139
RADAR TRANSPONDER

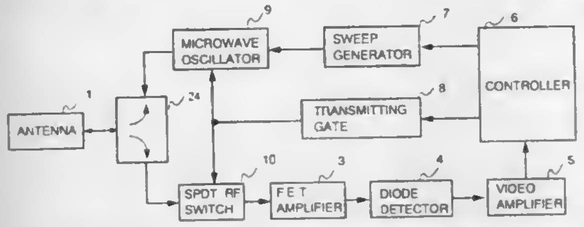
Youichi Kawakami, and Tohru Dochi, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1996, Ser. No. 647,800

Claims priority, application Japan, May 26, 1995, 7-128131

Int. Cl.^{6} G01S *13/76*

U.S. Cl. 342—51 **15 Claims**



1. A radar transponder for transmitting a transmit signal during a transmitting period after receiving a receive signal during a receiving period, comprising:

a transmit/receive antenna;

a receiving circuit for receiving the receive signal during the receiving period;

a selector connected to the transmit/receive antenna for selecting and connecting the transmit signal to the transmit/receive antenna during the transmitting period and for selecting and connecting the receive signal from the transmit/receive antenna to the receiving circuit during the receiving period; and

a radio frequency switch connected between the selector and the input of the receiving circuit for terminating the transmit signal to ground before the input of the receiving circuit during the transmitting period and for passing the receive signal through to the input of the receiving circuit during the receiving period.

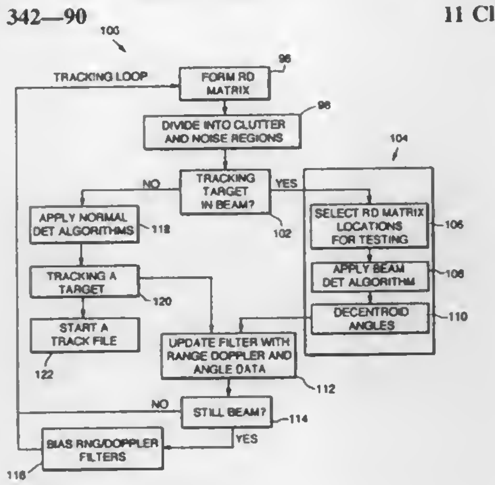
5,748,140
SYSTEM FOR TRACKING RADAR TARGETS IN BACKGROUND CLUTTER

Michael B. Schober, Tucson, Ariz., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Mar. 28, 1996, Ser. No. 627,813

Int. Cl.^{6} G01S *13/72*

U.S. Cl. 342—90 **11 Claims**



1. A radar system comprising:

means for detecting radar targets in clutter using magnitude and angular position information obtained from return signals and

means for tracking and updating the positions of said targets with respect to the position of the radar system, said means for tracking including angle means for extracting target angle information from clutter angle information when the target is in clutter.

5,748,141
RADAR DEVICE WITH REDUCED POWER EMISSION

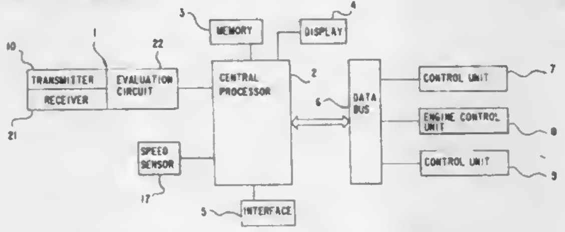
Alfred Hoess, Tegernheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1996, Ser. No. 694,104

Claims priority, application Germany, Aug. 8, 1995, 195 29 173.5

Int. Cl.^{6} G01S *13/93*

U.S. Cl. 342—109 **12 Claims**



1. A radar device secured to a vehicle, comprising:

a transmitter for broadcasting continuously frequency-modulated radar signals over a time range, the time range being fixed as a function of a speed of the vehicle and being longer at a higher speed and shorter at a lower speed;

a receiver for receiving the radar signals; and

an evaluation circuit for comparing the transmitted and received radar signals to ascertain information about the surroundings.

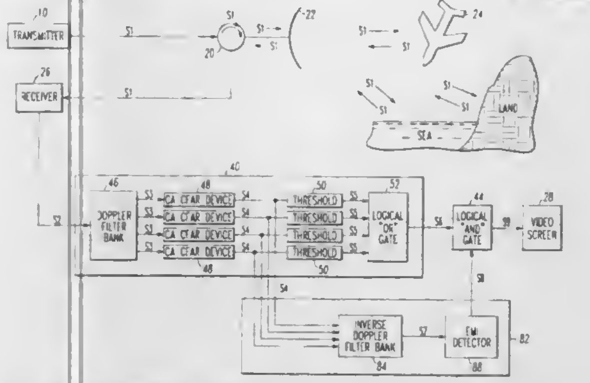
5,748,142
PULSE DOPPLER RADAR SYSTEM WHICH IDENTIFIES AND REMOVES ELECTROMAGNETIC INTERFERENCE

Paul E. Rademacher, Setauket, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Dec. 20, 1996, Ser. No. 772,160

Int. Cl.^{6} G01S *7/292;13/53*

U.S. Cl. 342—159 **6 Claims**



1. A radar system for identifying an object of interest, said radar system comprising:

a transmitter means for producing a first signal, where said first signal includes a plurality of pulses separated by a pulse repetition interval (PRI), where each PRI contains a plurality of range cells;

a duplexer means for receiving and processing signals, where said duplexer means receives said first signal from said transmitter;

an antenna, where said antenna receives said first signal from said duplexer means and transmits said first signal into the atmosphere, receives a second signal reflected by objects present in the atmosphere, and routes said second signal to said duplexer;

a receiving means for receiving said second signal from said duplexer, where said receiving means samples said second signal at all range cells, and develops a third signal;

a clutter filtering means for filtering a clutter component from said third signal at all frequencies and developing a fourth signal which is free from clutter;

an electromagnetic interference (EMI) detection means for identifying EMI present in said fourth signal and developing a fifth signal which is free from EMI;

a logic means for comparing said fourth and fifth signal to produce a sixth signal which is free from both clutter and EMI; and

a display means for receiving and displaying said sixth signal.

5,748,143
ADAPTIVE POST-DOPPLER SEQUENTIAL BEAM PROCESSOR

William L. Melvin, Jr., Rome, and Michael C. Wicks, Utica, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 9, 1996, Ser. No. 762,359

Int. Cl.^{6} G01S *13/53;7/292*

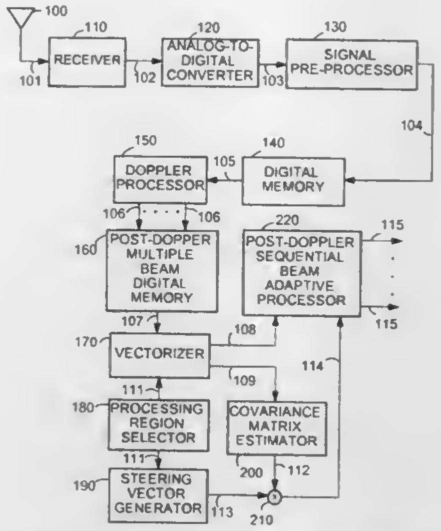
U.S. Cl. 342—162 **20 Claims**

1. In a system for processing signals that employs a single receive channel, a method for space-time adaptive processing of said signals comprising the steps of:

receiving a plurality of signals from an area potentially containing at least one target;

moving said single receive channel to combine said plurality of signals into a plurality of groups, each of said groups representing a distinct processing interval that corresponds to a distinct spatial orientation;

correlating an interference component of said signals over a plurality of said distinct processing intervals, whereby said step of correlating yields correlated interference for each of said distinct processing intervals; and


100
110
120
130
101
RECEIVER
102
ANALOG-TO-DIGITAL CONVERTER
103
SIGNAL PRE-PROCESSOR
104
150
140
DOPPLER PROCESSOR
105
DIGITAL MEMORY
106
106
220
115
160
POST-DOPPER MULTIPLE BEAM DIGITAL MEMORY
POST-DOPPLER SEQUENTIAL BEAM ADAPTIVE PROCESSOR
115
107
108
170
VECTORIZER
114
109
111
180
PROCESSING REGION SELECTOR
COVARIANCE MATRIX ESTIMATOR
111
200
112
190
STEERING VECTOR GENERATOR
113
210

canceling said correlated interference by adaptively combining said plurality of signals by means of an adaptive filter, whereby interference obscuring said at least one target is reduced.

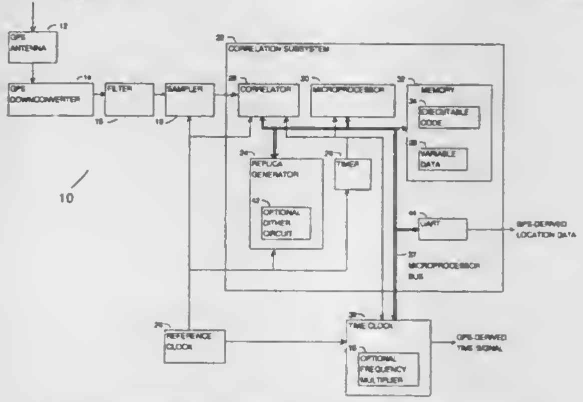
5,748,144
GPS TIMING RECEIVER USING OVERSAMPLING

Eric B. Rodal, Morgan Hill, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Jan. 26, 1996, Ser. No. 592,051

Int. Cl.^{6} H04B *7/185;* G01S *5/02*

U.S. Cl. 342—357 **12 Claims**



1. A global positioning system (GPS) receiver, including:

a filter for receiving a GPS signal having a GPS pseudorandom (PRN) code, for filtering said GPS signal, and for issuing a filtered GPS signal having an information bandwidth;

a sampler, coupled to the filter, for oversampling the filtered GPS signal with a first clock signal having a first clock rate at least ten times the information bandwidth and providing an oversampled GPS signal;

correlation means, coupled to the sampler, for correlating said oversampled GPS signal to an internally generated replica signal having a replica PRN code synchronized to said first clock signal, for measuring a time difference between said GPS PRN code and said replica PRN code, and providing a time adjustment signal representative of said measured time difference; and

a time clock for receiving said first clock signal and said time adjustment signal, generating a time signal synchronized to said first clock signal and having a time signal rate lower than said first clock rate, and providing a GPS-derived time signal by delaying said time signal according to said time adjustment signal by a multiple of the period of said first clock signal that most closely compensates for said measured time difference.

5,748,145

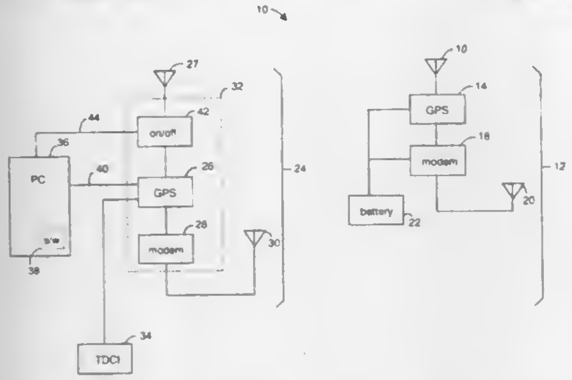
REAL-TIME KINEMATIC INITIALIZATION TEST SYSTEM

Nicholas C. Talbot, Cupertino; Michael T. Allisnn, Santa Clara, both of Calif., and Peter Griffioen, Clayton, Australia, assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Continuation of Ser. No. 528,506, Sep. 13, 1995, Pat. No. 5,610,614. This application Dec. 4, 1996, Ser. No. 759,407

Int. Cl.^{6} G01S *5/02;* **G01C** *21/00*

U.S. Cl. 342—357 **4 Claims**



1. A real-time kinematic (RTK) system tester, comprising:

a personal computer/workstation computer platform providing for the resident execution of an RTK engine for a target satellite navigation receiver; and

a post-processor for processing data forward and backward from a selected point in a log of base-station data and rover-station data;

wherein, said RTK engine simulates real-time processing by accepting base-station data and rover-station data and simulates losses of satellite signal lock and provides for logging of statistical initialization information generated by said RTK engine that is relevant to a baseline solution and said solution's associated errors.

5,748,146

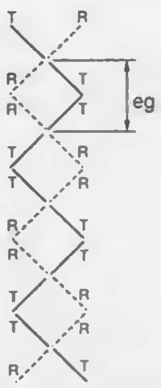
PARALLAX INDUCED POLARIZATION LOSS TO REDUCE SIDELOBE LEVELS

Carl E. Grove, Sauquoit, N.Y., and Lisa K. Thielking Slaski, Orlando, Fla., assignors to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1996, Ser. No. 699,768

Int. Cl.^{6} H01Q *3/24;3/22*

U.S. Cl. 342—372 **4 Claims**



1. A process of optimizing sidelobe reduction in an array of pairs of transmitting and receiving antenna elements that emit an antenna pattern at a predetermined wavelength, said antenna pattern containing a main beam and sidelobes, said process comprising the steps of:

identifying pairs of transmitting and receiving antenna elements that contribute chiefly to sidelobe emission to produce sets of identified pairs.

adjusting a separation distance between the transmitting and receiving antenna elements of the identified pairs to induce thereby a polarization mismatch in the sidelobes of the antenna pattern and null thereby said sidelobes in which said transmitting antenna elements of said set of identified pairs are offset by one quarter wavelength from their corresponding receiving antenna elements in said adjusting step;

testing the antenna pattern of the array to measure the sidelobes; and

repeating the adjusting and testing steps until an optimum performance level is achieved.

5,748,147

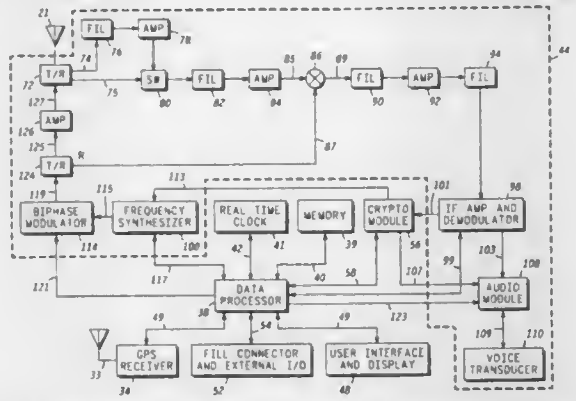
POSITION LOCATING RESCUE TRANSCEIVER

Robert Henry Bickley, 8123 E. Cholla St., Scottsdale, Ariz. 85260; Taul Aragaki, 4729 E. Voltaire Ave., Phoenix, Ariz. 85032; Leland Lem Moy, 6047 E. Calle Camelia, Scottsdale, Ariz. 85251, and Ray Owen Waddoups, 1510 E. Gable, Mesa, Ariz. 85204

Continuation-in-part of Ser. No. 103,177, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 845,903, Mar. 4, 1992, abandoned. This application Aug. 31, 1994, Ser. No. 299,029

Int. Cl.^{6} G01S *3/02*

U.S. Cl. 342—457 **58 Claims**



1. A transceiver, said transceiver being a portable radio transceiver, said transceiver comprising:

first radio receiver and a second radio receiver, a radio transmitter and an antenna supported by a common housing, wherein said first radio receiver receives first signals from a first geolocation means for determining location information and high accuracy clocking information, wherein said location information describes a location of said transceiver;

clock means, supported by said common housing and coupled to said first radio receiver, said clock means for providing timing and frequency control signals, said clock means slaved to said high accuracy clocking information;

message encryption means, supported by said common housing and coupled to said first radio receiver, for encrypting said location information using an alterable private encryption key to provide an encrypted transceiver location information prior to transmission to a communication system, wherein said radio transmitter is coupled to said antenna and said message encryption means and receives timing and frequency control signals from said clock means, said radio transmitter for sending another signal containing said encrypted transceiver location information to said communication system, and wherein said second radio receiver receives second signals from said communication system.

5,748,148

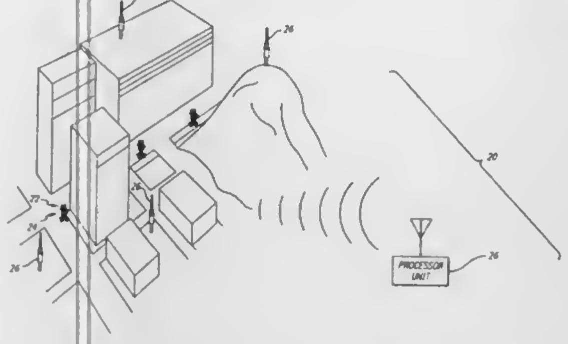
POSITIONAL INFORMATION STORAGE AND RETRIEVAL SYSTEM AND METHOD

Stephen J. Heiser; Joanna Mary Malvino, both of Fremont; Charles M. Wohl, Long Beach, and Fausto Poza, Menlo Park, all of Calif., assignors to H.M.W. Consulting, Inc., Freemont, Calif.

Filed Sep. 19, 1995, Ser. No. 531,219

Int. Cl.^{6} G01S *3/02*

U.S. Cl. 342—457 **10 Claims**



1. A system for storing and retrieving positional information of a subject wearing a positional detection unit and moving within an operating environment of the system comprising:

a positional detection unit adapted to receiving signals including coordinate information, to process said coordinate information to generate positional information including a position fix of the positional detection unit, and to transmit said positional information at varying time intervals as determined by magnitudes of said signals and changes in a position of said positional detection unit within the operating environment;

a plurality of receiver/transmitter units (R/T units) adapted to transmit said signals including coordinate information and to receive and transmit said positional information; and

a processor unit adapted to receive said positional information from said plurality of R/T units and to process said positional information to track an absolute position of said positional detection unit within the operating environment.

5,748,149

SURFACE MOUNTING ANTENNA AND ANTENNA APPARATUS

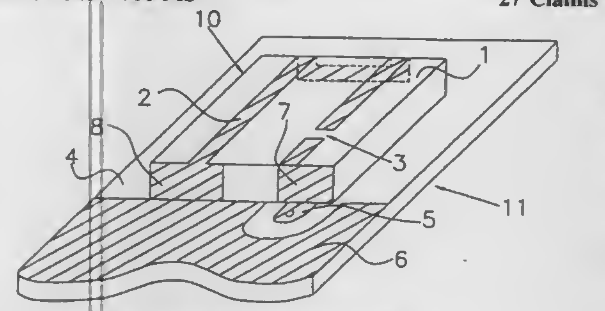
Kazunari Kawahata, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

Filed Oct. 2, 1996, Ser. No. 724,793

Claims priority, application Japan, Oct. 4, 1995, 7-257874

Int. Cl.^{6} H01Q *1/38;1/24*

U.S. Cl. 343—700 MS **27 Claims**



1. A surface mounting antenna comprising:

a base member having two main surfaces, two end faces and two side faces;

a radiation electrode, the radiation electrode being routed from one end face of said base member back to the end face through at least one of a side face, one main surface, and the other end face; and

a gap for applying a capacitance in the radiation electrode formed in said radiation electrode such that said radiation electrode is divided by said gap;

wherein one end of said radiation electrode is connected to a ground terminal and the other end is connected to a power-supplying terminal.

5,748,150

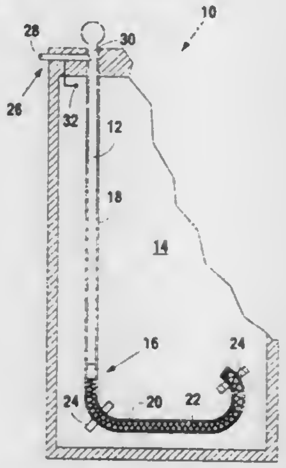
RETRACTABLE ANTENNA ASSEMBLY

Charles Albert Rudisill, Apex, N.C., assignor to Ericsson, Inc., Research Triangle Park, N.C.

Filed Apr. 4, 1996, Ser. No. 627,448

Int. Cl.^{6} H01Q *1/24*

U.S. Cl. 343—702 **7 Claims**



1. A retractable antenna assembly, comprising:

an antenna having a lower portion and being movable between a fully extended position and a fully retracted position;

a body structure adapted for supporting said antenna when the antenna is at said extended position and protectively enclosing said antenna when the antenna is at said retracted position;

a guide member disposed within said body structure and having a first portion adapted to slidably receive at least a portion of said antenna therein and a second portion communicating with said first portion, said second portion being disposed in nonlinear relationship with said first portion;

a compressible spring disposed within said second portion of the guide member and arranged to provide a bias force against said lower portion of said antenna to urge the antenna to said fully extended position; and

means for selectively maintaining said antenna at said fully retracted position.

5,748,151

LOW RADAR CROSS SECTION (RCS) HIGH GAIN LENS ANTENNA

Samuel C. Kingston, Salt Lake City; Robert B. Burdoin, Sandy, both of Utah, and David Lamensdorf, Arlington, Mass., assignors to Lockheed Martin Corporation, Bethesda, Md.

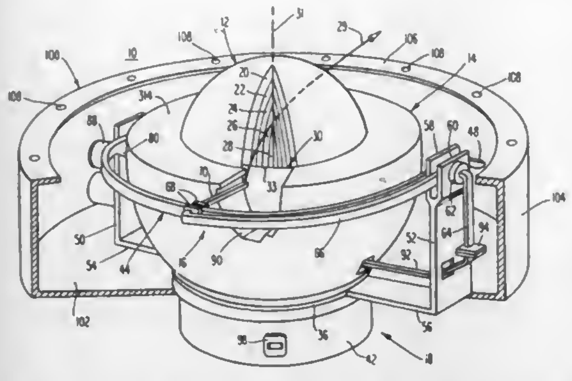
Filed Dec. 17, 1980, Ser. No. 217,378

Int. Cl.^{6} H01Q *19/06*

U.S. Cl. 343—753 **6 Claims**

1. A low radar cross section (RCS) lens antenna arrangement comprising:

a lens means having a dielectric radial gradient and formed substantially spherical such that RF energy transmitted in a plane configuration to said lens and having a direction of travel prior to impinging said lens which is perpendicular to said plane passes through said lens means so as to be focused onto a focal point on the surface of said lens opposite the intersection of said plane wave and said lens;



first and second RF absorbing means formed to absorb RF energy impinging thereon; said first RF absorbing means designed to absorb energy comprising energy reflected internally in said lens; said second RF absorbing means designed to absorb RF energy passing through said lens; and

an antenna feed located within said second RF absorbing means and having an aperture adjacent a predetermined focal point on the surface of said lens whereby RF energy focused on said predetermined focal point is captured by said antenna feed and not absorbed by said second absorbing means.

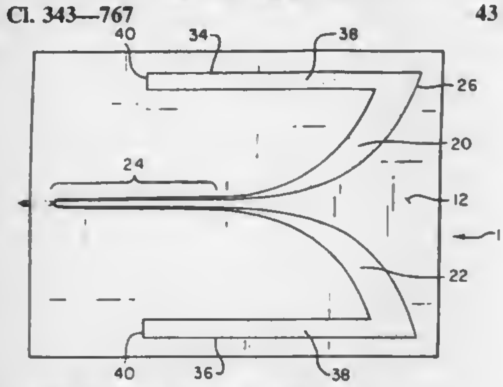
5,748,152
BROAD BAND PARALLEL PLATE ANTENNA

John R. Glabe, Ramona, and Edward L. Pelton, San Diego, both of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Dec. 27, 1994, Ser. No. 365,046

Int. Cl.⁶ H01Q *13/10*

U.S. Cl. 343—767 **43 Claims**



1. A broadband slot antenna, comprising:

a generally planar electrically conductive sheet;

a portion of the conductive sheet being removed to form a single slot, said slot including a pair of symmetrical slot sections having facing edges separated by an unbroken extent of said conductive sheet, and a linking portion of the slot interconnecting the two slot sections at a first end of each slot section;

said conductive sheet having a transition portion extending away from the first ends of the slot sections where the facing edges of the slot sections are substantially parallel to one another, and beyond the transition portion where the facing edges of the slot sections continuously curve away from each other to form a radiating aperture therebetween;

an electromagnetic energy absorbing body enclosing the electrically conductive sheet, slot sections, and linking portion leaving one major side of the conductive sheet and slot sections free;

a conductive plate disposed above and grounded to said conductive sheet; and

a resistive card abutting and extending from a side of said conductive plate that is proximate to the radiating aperture of the facing edges of the slot sections for minimizing the dispersal of electromagnetic radiation that would otherwise scatter from the side of said conductive plate.

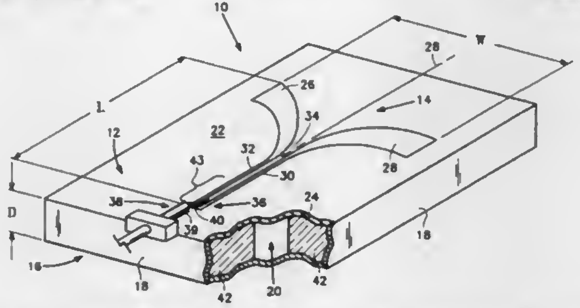
5,748,153
FLARED CONDUCTOR-BACKED COPLANAR WAVEGUIDE TRAVELING WAVE ANTENNA

William Edward McKinzie, III, Culver City, and Tracy Lynn Anderson, Whittier, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation of Ser. No. 336,028, Nov. 8, 1994, abandoned. This application Jun. 26, 1996, Ser. No. 669,857

Int. Cl.⁶ H01Q *13/08*

U.S. Cl. 343—767 **23 Claims**



1. A coplanar waveguide traveling wave antenna for receiving and transmitting electromagnetic waves comprising:

(a) a dielectric substrate;

(b) a coplanar waveguide structure disposed on the substrate;

(c) a plate for concentrating a substantial portion of the energy radiated by the antenna in a half-space adjacent the exterior of the coplanar waveguide structure, said plate being separated from the substrate and the coplanar waveguide structure and substantially parallel thereto; and,

(d) a feed electrically coupled to the coplanar waveguide structure for transmitting electromagnetic energy to and from the antenna.

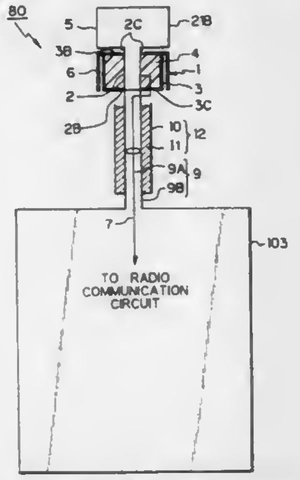
5,748,154
MINIATURE ANTENNA FOR PORTABLE RADIO COMMUNICATION EQUIPMENT

Yasuhiro Yokota, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 953,379, Sep. 30, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,424

Int. Cl.⁶ H01Q *1/24;9/04*

U.S. Cl. 343—702 **8 Claims**



1. A miniature antenna for a radio communication equipment including a portable transmitter/receiver, a pocket telephone, or a mobile telephone of a low power type, and said miniature antenna mounted on a casing thereof, said miniature antenna comprising:

a semi-coaxial dielectric resonator having a) a metal case, b) a center conductor having one end in contact with said metal case, and c) a dielectric material filling between said metal case and said center conductor, said metal case mounted on said casing and said center conductor connected to a power supply line in said casing, and

said center conductor including a radiator formed by extending said center conductor and projecting from said metal case through a hole provided on an upper portion of said metal case.

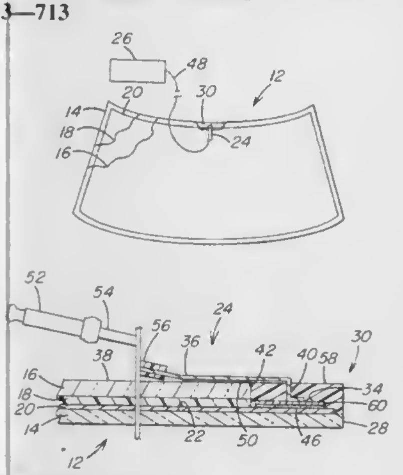
5,748,155
ON-GLASS ANTENNA AND CONNECTOR ARRANGEMENT

Randy R. Kadunce, New Kensington; Robert T. Shumaker, Jr., Manorville, and Peter T. Dishart, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1995, Ser. No. 527,593

Int. Cl.⁶ H01Q *1/32*

U.S. Cl. 343—713 **25 Claims**



1. A glass antenna comprising:

a first glass sheet having a notch area cut out along a portion of an edge;

second glass sheet secured in overlaying relation to said first sheet;

a transparent, electroconductive coating supported on an inner major surface of said second sheet between said first and second sheets forming at least one transparent electroconductive antenna element, said electroconductive coating further having a coating portion which extends within said notch area;

a connector having a first section secured to said inner major surface of said second sheet and overlaying an area of said coating portion of said electroconductive coating within said notch area, a second section with selected portions extending along an outer major surface of said first sheet, and a third section extending through said notch area and interconnecting said first and second sections;

filler material within said notch area to secure said connector within said notch area and to seal said notch area, wherein said first and third sections of said connector are sealed within said filler material; and

a terminal assembly positioned at an end of said second section to allow connection of said electroconductive coating to a transmitting and/or receiving device.

5,748,156
HIGH-PERFORMANCE ANTENNA STRUCTURE

John G. Weber, Boulder Creek, Calif., assignor to Chaparral Communications, San Jose, Calif.

Continuation of Ser. No. 420,909, Apr. 11, 1995, abandoned, which is a continuation of Ser. No. 203,442, Feb. 28, 1994, abandoned. This application May 16, 1996, Ser. No. 649,928

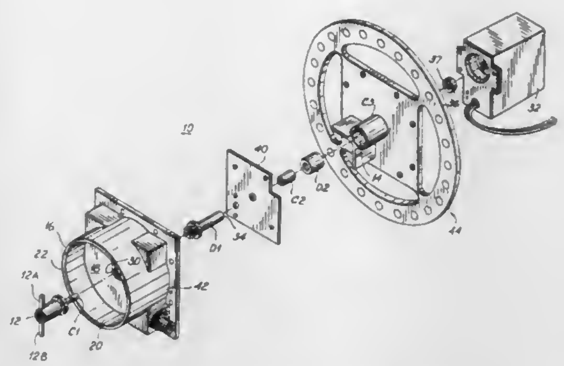
Int. Cl.⁶ H01Q *3/00*

U.S. Cl. 343—762 **7 Claims**

1. Antenna structure comprising:

an antenna;

a first conductor connected to and extending from said antenna;



a first dielectric mounted around said first conductor;

a second conductor mounted around said first dielectric;

a second dielectric mounted around said second conductor; and

a third conductor mounted around said second dielectric;

said first, second and third conductors being electrically insulated from one another;

said first and second conductors forming a first part of a coaxial transmission line;

said first dielectric maintaining a uniform spacing between said first and second conductors;

said second and third conductors defining a second part of said coaxial transmission line in series with said first part of said coaxial transmission line; and

said second dielectric electrically enlarging said second part of said coaxial transmission line;

whereby the physical dimensions of said structure can be reduced without sacrifice of its electrical properties.

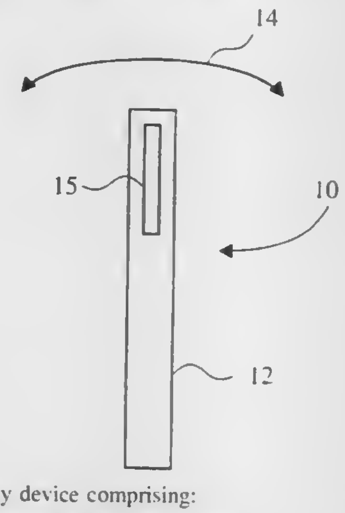
5,748,157
DISPLAY APPARATUS UTILIZING PERSISTENCE OF VISION

Richard O. Eason, RFD 5, Box 240K, Bangor, Me. 04401

Filed Dec. 27, 1994, Ser. No. 364,312

Int. Cl.⁶ G09G *3/20*

U.S. Cl. 345—31 **25 Claims**



24. A display device comprising:

a support constructed for cyclic motion;

an array of lights mounted on the support for sweeping across a region of space during the cyclic motion of the support;

a controller coupled to the lights for turning on and off the respective lights of the array;

a periodically actuated switch coupled to the controller for measuring the time interval or cycle time period of a cycle of the cyclic motion of the support and for indicating initiation of a cycle;

said controller being programmed for synchronizing the turning on and off of respective lights of the array according to the time interval or cycle time period of a cycle of the cyclic

OL
2 10
SS
1
MY
5
998
MI

motion of the support for forming an image across the region of space swept by the array of lights using persistence of vision of a viewer;

wherein the image is at least one graphic image; and

wherein the controller is programmed to cause animation of the graphic image in successive sweeps of the support.

5,748,158

APPARATUS AND METHOD FOR DISPLAYING OPERATING STATES AND CHARACTERISTICS OF A COMPUTER SYSTEM VIA ICONS AND ALPHANUMERIC REPRESENTATIONS

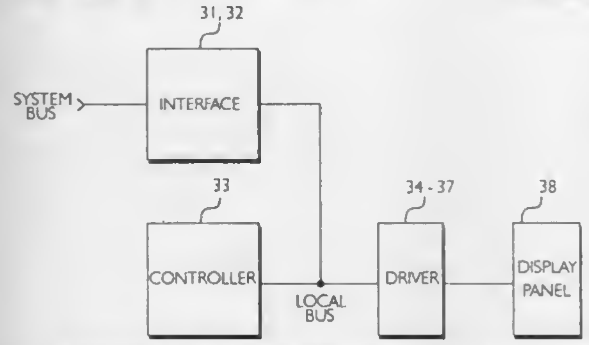
Sung-Soo Kim, Kyunggi-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 23, 1996, Ser. No. 605,898

Claims priority, application Rep. of Korea, Feb. 24, 1995, 3700/1995

Int. Cl.⁶ G06F *1/00*

U.S. Cl. 345—33 **14 Claims**



1. An apparatus for displaying an operating state of a computer, said apparatus comprising:

a controller for providing output of a read signal to receive data signals from a local bus, said controller analyzing said data signals and providing output of a display signal representative of said operating state of said computer based on the analysis of said data signals;

interface means for receiving said data signals from a system bus, storing said data signals, and providing output of said data signals to said local bus in response to said read signal provided from said controller;

driving means for providing output of grid driving signals and segment driving signals in response to said display signal provided from said controller; and

a display panel for variably providing iconic displays and a plurality of alphanumeric displays indicating said operating state of said computer in accordance with said grid driving signals and said segment driving signals provided from said driving means.

5,748,159

DISPLAY

Takashi Nishio; Chiharu Koshio; Kunimoto Tsuchiya, and Tetsuya Matsumoto, all of Yamanashi-ken, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 5, 1996, Ser. No. 628,759

Claims priority, application Japan, Apr. 7, 1995, 7-082408

Int. Cl.⁶ G09G *3/30*

U.S. Cl. 345—76 **3 Claims**

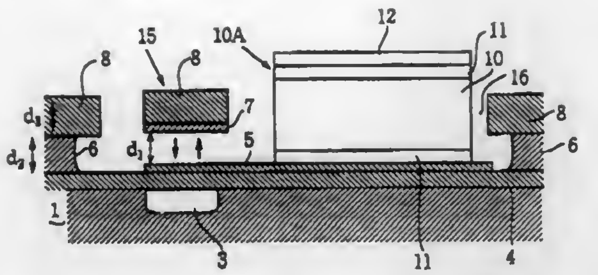
1. A display comprising:

a plurality of select electrodes as line electrodes;

a plurality of address electrodes as column electrodes;

a pixel provided at each intersection of the select electrode and the address electrode;

a mechanical electrostatic switch provided for connecting the pixel with the select electrode and the address electrode;



the electrostatic switch being provided to be operated by electrostatic charge stored between a part of the select electrode and a part of the address electrode;

said part of the address electrode being formed into a beam.

5,748,160

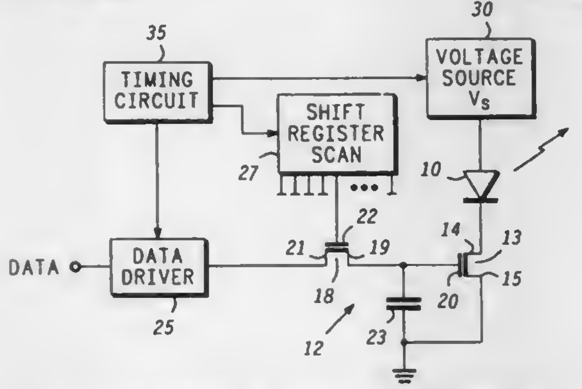
ACTIVE DRIVEN LED MATRICES

Chan-Long Shieh, Paradise Valley, Ariz.; Hsing-Chung Lee, Calabasas, Calif., and Franky So, Tempe, Ariz., assignors to Mororola, Inc., Schaumburg, Ill.

Filed Aug. 21, 1995, Ser. No. 517,222

Int. Cl.⁶ G09G *3/32*

U.S. Cl. 345—82 **17 Claims**



1. Active drive apparatus for a matrix of light emitting devices comprising:

a voltage source constructed to repetitiously supply a multi-step voltage waveform when activated;

a matrix including a plurality of rows of light emitting devices and a plurality of columns of light emitting devices, each light emitting device having a first contact connected to the voltage source and a second contact;

a plurality of semiconductor switches, one each associated with each light emitting device, each semiconductor switch having a first current carrying terminal connected to the second contact of the associated light emitting device and a second current carrying terminal connected to a common terminal, each semiconductor switch further having first and second activating input terminals, and each semiconductor switch being constructed to complete a circuit between the first and second current carrying terminals only when activating signals are supplied to both of the first and second activating input terminals; and

a column driver circuit having a plurality of column outputs one each associated with each column of light emitting devices, all of the first activating terminals of each semiconductor switch associated with the light emitting devices in each specific column of light emitting devices being connected together and to the associated column output of the plurality of column outputs;

a row driver circuit having an output all of the second activating terminals of each semiconductor switch associated with the light emitting devices in each specific row of light emitting devices being connected together and to the output of the row driver circuit;

timing circuitry connected to the voltage source, the column driver circuit and the row driver circuit, the timing circuit being constructed to control the row driver circuit to provide an activating signal to each row in sequence and to control the column driver circuit to provide an activating signal to each column for each activating signal applied to a row, each activation or addressing of all of the light emitting devices in the matrix being a sub-frame; and

the timing circuit being further constructed to control the column and row driver circuits and the voltage source and to supply a next sequential step of the multi-step voltage waveform each time a sub-frame is completed, a frame being completed when all of the multi-step voltages of the waveform are supplied.

5,748,161

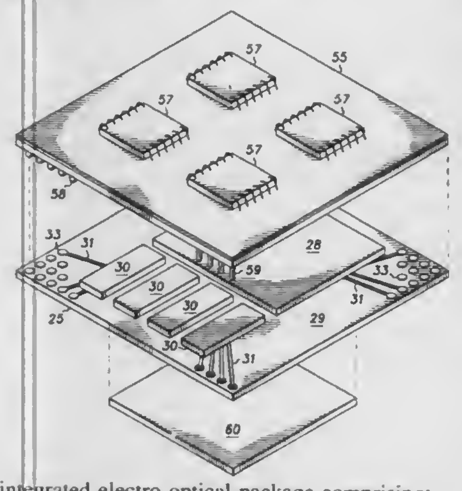
INTEGRATED ELECTRO-OPTICAL PACKAGE WITH INDEPENDENT MENU BAR

Michael S. Lebby, Apache Junction, and Ronald J. Nelson, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1996, Ser. No. 610,533

Int. Cl.⁶ G09G *3/34*

U.S. Cl. 345—84 **33 Claims**



1. An integrated electro-optical package comprising:

a first light emitting device display chip comprised of an optically transparent substrate with an array of light emitting devices formed on a major surface and cooperating to generate a complete image, the light emitting devices being positioned in rows and columns to define all pixels of the complete image and operably connected to a plurality of connection pads adjacent outer edges of the optically transparent substrate;

at least one additional light emitting device display chip comprised of an optically transparent substrate with an array of light emitting devices formed thereon, constructed to emit light of a different wavelength than the light emitting devices of the first light emitting device display chip, cooperating to generate a complete image, the light emitting devices being positioned in rows and columns to define all pixels of the complete image and operably connected to a plurality of connection pads adjacent outer edges of the optically transparent substrate;

a mounting substrate defining an optically transparent central portion, substantially coextensive with the complete image generated by the first light emitting device display chip and the complete image generated by the at least one additional light emitting device display chip, having a plurality of connection pads formed on a surface surrounding the optically transparent central portion and a plurality of connection pads formed on a surface about a periphery of the mounting substrate in electrical cooperation with the plurality of connection pads surrounding the optically transparent central portion, the plurality of connection pads of the first light emitting device display chip and the at least one additional light emitting device display chip being bump bonded to the plurality of connection pads surrounding the optically transparent central portion on the mounting substrate; and

a plurality of driver circuits connected to the first light emitting device display chip and the at least one additional light emitting device display chip through the connection pads on the mounting substrate, and the plurality of connection pads on the optically transparent substrate of the first light emitting device display chip and the at least one additional light emitting device display chip.

5,748,162

LOW VOLTAGE LIQUID CRYSTAL DISPLAY DEVICE

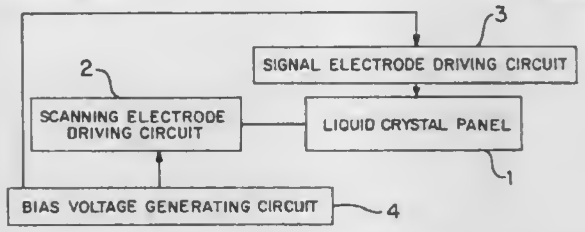
Takayoshi Hanami, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

Filed Mar. 22, 1995, Ser. No. 409,051

Claims priority, application Japan, Mar. 23, 1994, 6-052246

Int. Cl.⁶ G02F *1/13*

U.S. Cl. 345—87 **19 Claims**


3
SIGNAL ELECTRODE DRIVING CIRCUIT
2
SCANNING ELECTRODE DRIVING CIRCUIT
LIQUID CRYSTAL PANEL
1
BIAS VOLTAGE GENERATING CIRCUIT
4

1. A liquid crystal device comprising: a liquid crystal panel having a pair of substrates provided inside a pair of opposing polarizers, the substrates having opposing electrodes, and a liquid crystal layer provided between the substrates and composed of a nematic liquid crystal material having a twisted helical structure; and a driving circuit for driving the liquid crystal panel; wherein the liquid crystal material has the helical structure twisted by at least 180 degrees and the driving circuit includes means for driving the liquid crystal panel on a time divisional driving basis in which a bias value "a" is greater than or equal to 2 and less than 4.

5,748,163

DITHERING PROCESS FOR PRODUCING SHADED IMAGES ON DISPLAY SCREENS

Robin S. Han, Saratoga, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 813,036, Dec. 24, 1991, abandoned. This application May 17, 1993, Ser. No. 61,804

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—88 **18 Claims**

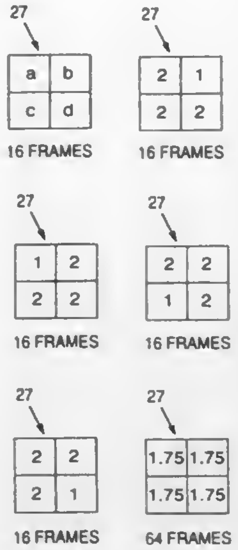
4. A method of simulating non-monochrome display of images on a display device that has an array of picture elements each having only two display states, an ON state and an OFF state, comprising the steps of:

modulating an ON/OFF duty cycle of each picture element of the array of picture elements during a multi-frame display sequence according to attribute information of respective picture element data to be displayed; and

coordinating the timing of ON/OFF and OFF/ON state transitions of picture elements within each of a plurality of predetermined display neighborhoods throughout the array of picture elements such that the state transitions occur substantially uniformly in space and time, within each display neighborhood, during the multi-frame display sequence

wherein said multiframe sequence is M×N frames in duration, M and N being integers, wherein said multiframe sequence is logically divided into M sub-sequences each N frames in duration, wherein M×N+1 display shades are realized by causing the ON/OFF duty cycle of each picture element to have a value within the set {0, 1/M×N, 2/M×N . . . M×N/M×N}, and

VOL
2 10
SS
1
MY
5
998
MI



wherein the ON/OFF duty cycle of each picture element during each of said M N-frame sub-sequences of said M×N sequence is caused to have a value within the set {0, 1/M, 2/M . . . M/M}.

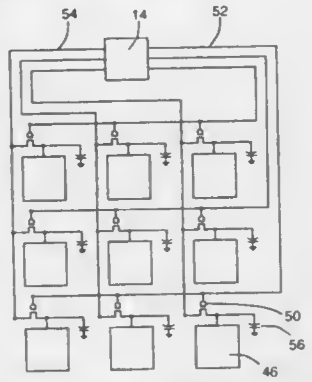
5,748,164
ACTIVE MATRIX LIQUID CRYSTAL IMAGE GENERATOR

Mark A. Handschy, Boulder, and Michael R. Meadows, Nederland, both of Colo., assignors to Displaytech, Inc., Longmont, Colo.

Filed Dec. 22, 1994, Ser. No. 362,665

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—89 **57 Claims**



1. A system for producing modulated light having gray scale, said system comprising:

(a) an active matrix liquid crystal spatial light modulator having
  (i) light modulating means including a layer of ferroelectric liquid crystal material which is designed to switch between ON and OFF states, and
  (ii) active matrix means including VLSI circuitry for dividing said layer of liquid crystal material into an array of individual liquid crystal pixels and for causing each of said pixels of liquid crystal material to modulate light individually by switching between said ON and OFF states in a way that depends upon the data which the VLSI circuitry is written, said VLSI circuitry of said active matrix means including an array of subcircuits, each subcircuit of which is dedicated to and defines a specific one of said pixels, said active matrix means dividing said layer of liquid crystal material into an array of immediately adjacent pixels, each of which has a maximum light modulating area of at most 100 square microns, said layer of ferroelectric liquid crystal material being maintained at a substantially uniform thickness of at most approximately 2 microns, whereby the size of said pixels can be made smaller than would be the case if the layer of liquid crystal were much thicker, for example of the order of 6 microns as required by nematic liquid crystal material in spatial light modulators;

(b) illumination means including a light source for directing light from said source into said pixel-divided layer of ferroelectric liquid crystal material in a specific way; and

(c) means for writing said VLSI circuitry with preselected data in accordance with a particular data ordering scheme such that said circuitry, in response to the data, causes said pixels of liquid crystal material to individually switch between their ON and OFF states and therefore modulate light from said source in a way which, depending upon said data, produces a specific overall pattern of gray scale light, said particular data ordering scheme being such that said data writing means writes each of said subcircuits, and therefore each of said pixels, with preselected data in a predetermined successive order, timewise, such that none of said subcircuits require auxiliary data storage buffer circuitry and therefore the complexity of said array of subcircuits can be reduced.

5,748,165
IMAGE DISPLAY DEVICE WITH PLURAL DATA DRIVING CIRCUITS FOR DRIVING THE DISPLAY AT DIFFERENT VOLTAGE MAGNITUDES AND POLARITY

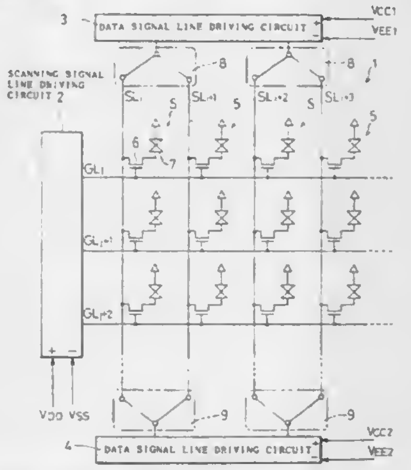
Yasushi Kubota, Sakurai; Hiroshi Yoneda, Ikoma, and Kenichi Katoh, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1994, Ser. No. 363,017

Claims priority, application Japan, Dec. 24, 1993, 5-326430; Nov. 9, 1994, 6-275302

Int. Cl.⁶ G09G *3/22*

U.S. Cl. 345—96 **23 Claims**


3
DATA SIGNAL LINE DRIVING CIRCUIT
VCC1
VEE1
SCANNING SIGNAL LINE DRIVING CIRCUIT 2
8
8
1
SLi
SLi+1
SLi+2
SLi+3
5
5
5
5
6
7
GLj
GLj+1
GLj+2
VDD VSS
9
9
4
DATA SIGNAL LINE DRIVING CIRCUIT
VCC2
VEE2

1. An image display device comprising:

a plurality of pixels disposed in a matrix form;

a plurality of scanning signal lines, each scanning signal line connected to one row of the pixels;

a plurality of data signal lines, each data signal line connected to one column of the pixels;

a scanning signal line driving circuit for driving each scanning signal line with a scanning signal;

a plurality of data signal line driving circuits, each individually powered by a power source of a different voltage magnitude, for applying input video signals of a first polarity to a first group of the data signal lines and applying video signals of a second polarity, different from the first polarity, to a second group of data signal lines, and inverting the polarity of the video signals applied to the first and second groups of the data signal lines in every predetermined data display period; and

means for switching a connection combination of the plurality of data signal line driving circuits between the first group and the second group of the data signal lines every predetermined data display period by switching connection of terminals of the plurality of data signal line driving circuits between data signal lines belonging to one of the first and second groups and data signal lines belonging to another of the first and second groups every predetermined data display period.

5,748,166
ADDRESSING FERROELECTRIC LIQUID CRYSTAL DISPLAYS

Jonathan Rennie Hughes, and Michael John Towler, both of Malvern, Great Britain, assignors to The Secretary of State for Defense, Hampshire, United Kingdom

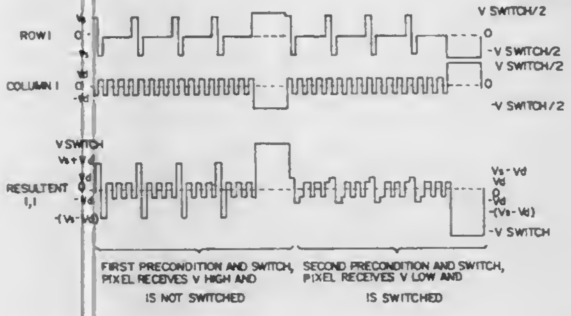
PCT No. PCT/GB94/00749, § 371 Date Mar. 13, 1996, § 102(e) Date Mar. 13, 1996, PCT Pub. No. WO94/27275, PCT Pub. Date Nov. 24, 1994

PCT Filed Apr. 8, 1994, Ser. No. 545,760

Claims priority, application United Kingdom, May 8, 1993, 9309502

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—97 **9 Claims**



1. A method of multiplex addressing a ferroelectric liquid crystal display formed by the intersections of an m set of electrodes and an n set of electrodes across a layer of smectic liquid crystal material to provide an m×n matrix of addressable pixels comprising the steps of:

generating row and column waveforms comprising voltage pulses of various dc amplitude and sign for applying to the m and n sets of electrodes through driver circuits to address each pixel;

applying row of waveforms comprising a plurality of dc pulses of both positive and negative polarity to each of the m electrodes while applying column waveforms comprising a plurality of dc pulses of both positive and negative polarity to each of the n electrodes to precondition the liquid crystal material over several cycles of positive and negative pulses at each pixel by applying two different rms levels of ac bias to the pixels, a first rms level at pixels required to be switched and a second rms level to the other pixels;

applying a dc switching pulse simultaneously to all m and n electrodes associated with the pixels required to be switched;

whereby all pixels required to be switched are switched by the dc switching pulse to the required state and other pixels remain unswitched.

5,748,167
DISPLAY DEVICE FOR SAMPLING INPUT IMAGE SIGNALS

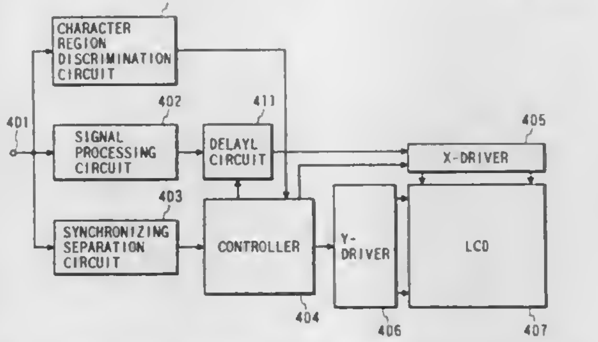
Gaku Watanabe, Tokyo, and Yasuyuki Yamazaki, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1996, Ser. No. 635,457

Claims priority, application Japan, Apr. 21, 1995, 7-118939; May 1, 1995, 7-128773; Jul. 7, 1995, 7-194053; Jul. 14, 1995, 7-200214

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—98 **56 Claims**


412
CHARACTER REGION DISCRIMINATION CIRCUIT
402
411
401
SIGNAL PROCESSING CIRCUIT
DELAYL CIRCUIT
405
X-DRIVER
403
SYNCHRONIZING SEPARATION CIRCUIT
CONTROLLER
Y-DRIVER
LCD
404
406
407

12. A display device which performs sampling of image signals for colors different from each other and which applies the sampled signals to pixels of colors different from each other arranged in an adjacent relation, comprising:

a first circuit for supplying a mode switching signal for switching a sampling mode; and

a second circuit for changing a sampling timing according to the mode switching signal, wherein

when a character is to be displayed, the image signals for colors different from each other inputted in time series are sampled simultaneously and supplied to the pixels for colors different from each other arranged in the adjacent relation, and

when non-character contents are to be displayed, the image signals for colors different from each other inputted in time series are sampled in sequence and supplied to the pixels for colors different from each other arranged in adjacent relation.

5,748,168

Patent Not Issued For This Number

5,748,169
DISPLAY DEVICE

Haruhiko Okumura, Fujisawa, and Goh Itoh, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1996, Ser. No. 615,161

Claims priority, application Japan, Mar. 15, 1995, 7-056091

Int. Cl.⁶ G06G *3/36*

U.S. Cl. 345—100 **33 Claims**

1. A display device comprising:

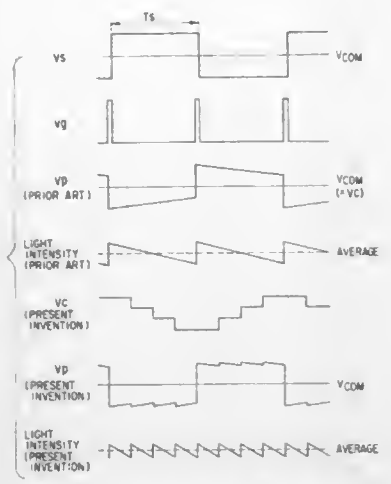
a substrate;

a plurality of address lines arranged in a horizontal direction on the substrate;

a plurality of signal lines, arranged in a vertical direction on the substrate, for transmitting an image signal;

a plurality of pixels, arranged in a matrix at intersections between the plurality of address lines and the plurality of signal lines on the substrate, each pixel including a display element, and a switch element which is connected between a corresponding one of the plurality of signal lines and the display element and which is controlled to be on or off by a corresponding one of the plurality of address lines; and

/OL
2 10
SS
1
MY
5
998
MI



compensating means for supplying, through the corresponding one of the plurality of address lines to the display element, a compensation signal for compensating a change in potential, the potential being applied to the display element while the switch element is controlled to be on, in a period between just after the switch element is controlled to be off and before the switch element is controlled to be on again, in order to compensate the chance in the potential.

5,748,170
DISPLAY DRIVING APPARATUS WITH AUTOMATIC DRIVE VOLTAGE OPTIMIZATION

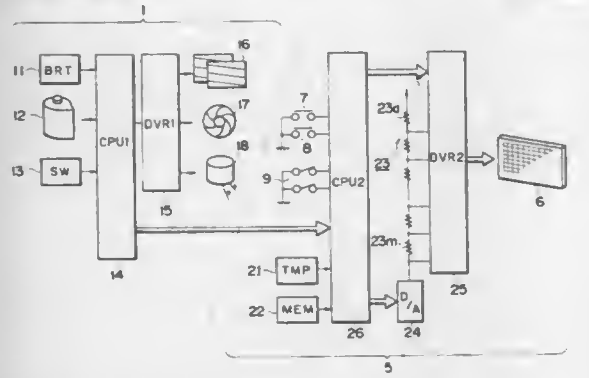
Tetsuro Goto, Funabashi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 339,290, Nov. 10, 1994, abandoned, which is a continuation of Ser. No. 10,988, Jan. 29, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 482,850

Claims priority, application Japan, Feb. 3, 1992, 4-047469; Feb. 3, 1992, 4-047470; Feb. 3, 1992, 4-047471

Int. Cl.^{6} G09G *3/34*

U.S. Cl. 345—101 **13 Claims**



1. A display driving apparatus comprising:

an electro-optical display;

a temperature detection unit for detecting an ambient temperature of said electro-optical display;

a voltage generation portion for generating a voltage to be applied to said electro-optical display;

a changing portion for changing a value of the voltage generated by said voltage generation portion;

a memory for storing a plurality of groups of voltage values for a corresponding plurality of predefined temperature classifications, each group of voltage values including plurality of voltage values;

an updating portion for updating the groups of voltage values stored in said memory to include most recent changed voltage values;

a processing portion for executing statistical processing of the updated groups of voltage values stored in said memory; and

a controller for causing said voltage generation portion to generate a voltage based on a detected ambient temperature and a processing result of the statistical processing of an updated group of stored voltage values for a temperature classification corresponding to the detected ambient temperature.

5,748,171
LIQUID CRYSTAL DISPLAY

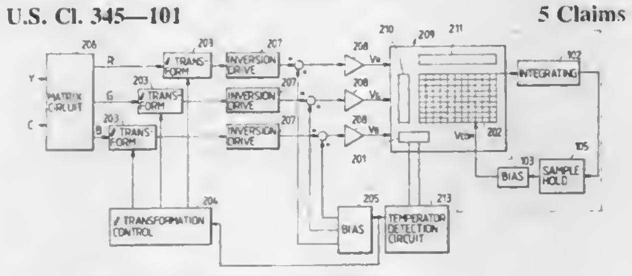
Akira Ishizaki, Atsugi, and Katsuhisa Ogawa, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 385,723, Feb. 8, 1995, abandoned, which is a continuation of Ser. No. 22,509, Feb. 25, 1993, abandoned. This application Nov. 19, 1996, Ser. No. 753,046

Claims priority, application Japan, Feb. 28, 1992, 4-075880; Feb. 28, 1992, 4-075978

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—101 **5 Claims**



1. A liquid crystal display comprising:

a plurality of pixels each including a liquid crystal, a pixel electrode and a common electrode, wherein said liquid crystal is sandwiched between said pixel electrode and said common electrode, and said pixel electrode is driven by a voltage that is inverted periodically;

a monitoring pixel for monitoring a voltage applied thereto;

an integrating circuit for integrating the voltage applied to the monitoring pixel according to an inversion period; and

a bias circuit for applying to the common electrode of said monitoring pixel, a bias voltage regulated so that a result of the integration becomes zero,

wherein said liquid crystal display further comprises:

a liquid crystal display unit including a liquid crystal driven by three primary color image signals;

a temperature detection element for detecting a temperature of said liquid crystal display unit;

a γ-transformation circuit for γ-transforming each of the three primary image color signals independently;

a γ-transformation control means for controlling the γ-transformation for each of the three primary color image signals independently, based on a relation between transmittance for each of three primary color lights corresponding to the three primary color image signals and a voltage applied to the liquid crystal, according to the temperature detected by said temperature detection element; and

a second bias circuit for combining the three primary color image signals with a second bias voltage regulated independently for each of the three primary color image signals, based on the relation between transmittance for each of the three primary color lights and the voltage applied to the liquid crystal, according to the temperature detected by said temperature detection element, so that transmittance characteristics of the liquid crystal do not change with temperature.

5,748,172
MIRROR DRIVING METHOD AND APPARATUS OF MICRO-MIRROR ARRAY

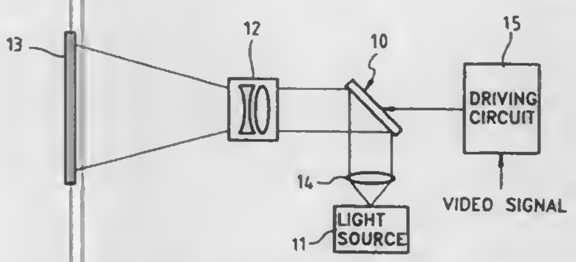
Ci-moo Song, Sungnam; Chul-woo Lee, Seoul, and Han-ki Cho, Suwon, all of Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 25, 1996, Ser. No. 591,785

Claims priority, application Rep. of Korea, Feb. 25, 1995, 95-3760

Int. Cl.^{6} G09G *3/34*

U.S. Cl. 345—111 **21 Claims**



1. A mirror driving method of a micro-mirror array provided with a plurality of mirror members each of which is pivotally supported, said method comprising the steps of:

(a) applying a magnetic field uniformly throughout to said plurality of mirror members; and

(b) selecting a mirror member among said plurality of mirror members according to an image signal and allowing an electrical current to flow through the selected mirror member by applying electric current to conductive means attached to one surface of each mirror member,

wherein the selected mirror member is pivoted by means of an electromagnetic force between said applied magnetic field and electrical current so as to deflect incident light.

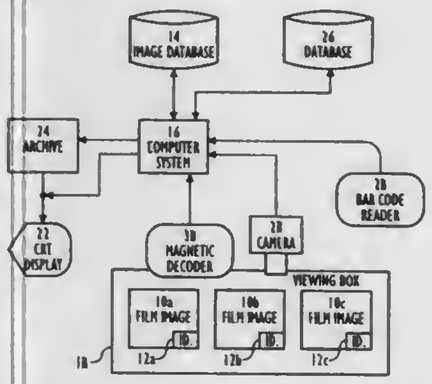
5,748,173
HYBRID DISPLAY FOR SIMULTANEOUS SIDE-BY-SIDE REVIEW OF RADIOGRAPHS

David Gur, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Feb. 29, 1996, Ser. No. 609,989

Int. Cl.^{6} E09G *1/06*

U.S. Cl. 345—115 **33 Claims**



1. A method of simultaneous display of a radiograph film and a digital image associated therewith, the method comprising:

loading the film in a viewing box;

automatically obtaining identification information from the film; and

associating the film with a specific digital image in an image database based on the identification information automatically obtained from the film.

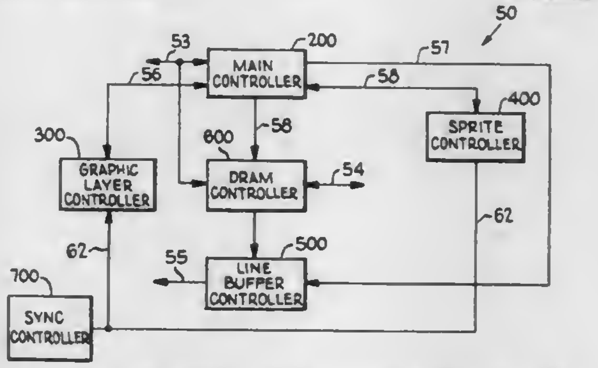
5,748,174
VIDEO DISPLAY SYSTEM INCLUDING GRAPHIC LAYERS WITH SIZABLE, POSITIONABLE WINDOWS AND PROGRAMMABLE PRIORITY

Wai-sing Wong, TSZ Wan Shan; Kam-chi Chao, and Chi-ming Fong, both of Tai Po, all of Hong Kong, assignors to VTech Electronics, Ltd., Hong Kong

Continuation of Ser. No. 549,306, Oct. 27, 1995, abandoned, which is a continuation of Ser. No. 204,062, Mar. 1, 1994, abandoned. This application Dec. 11, 1996, Ser. No. 763,871

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—118 **6 Claims**



1. A graphic video display system including at least one graphic layer having a two-dimensional array of displayable elements, a subset of which is visually displayable as pixels upon a video display, the video display comprising a plurality of horizontal scan lines including a first horizontal scan line, a last horizontal scan line, and a current horizontal scan line corresponding to a horizontal scan line to be next displayed, the graphic video display system comprising:

a first memory means for storing a digital representation of the displayable elements of the at least one graphic layer;

a second memory means for storing a digital representation of the current horizontal scan line to be next displayed, said second memory means storing only a single horizontal scan line of data at any given time;

horizontal sequencing means for sequencing from the first horizontal scan line to the last horizontal scan line of the video display;

at least one programmable window means for specifying a subset of the graphic layer stored within the first memory means to be displayed, the programmable window means including means for specifying both horizontal boundaries and vertical boundaries of the subset of the graphic layer to be displayed;

means for comparing the value of the current horizontal scan line with the specified vertical boundaries to determine whether a region defined by the specified vertical boundaries of the subset of the graphic layer to be displayed overlaps with the current horizontal scan line;

means associated with the comparing means for reading from the first memory means a region of the graphic layer which overlaps with the current horizontal scan line;

means associated with the reading means for determining a linear segment of the region of the graphic layer read from the first memory means by the reading means which overlaps with the current horizontal scan line and is positioned between the specified horizontal boundaries;

means coupled to the reading means for writing to the second memory means only the segment of the region of the graphic layer read from the first memory means by the reading means which overlaps with the current horizontal scan line and is positioned between the specified horizontal boundaries; and

means for displaying an image representative of the current contents of the second memory means upon a corresponding horizontal scan line of the video display;

whereby only the subset of the graphic layer specified as displayable by the programmable window means is displayed upon the video display, as specified by the horizontal and vertical boundaries.

5,748,175

LCD DRIVING APPARATUS ALLOWING FOR MULTIPLE ASPECT RESOLUTION

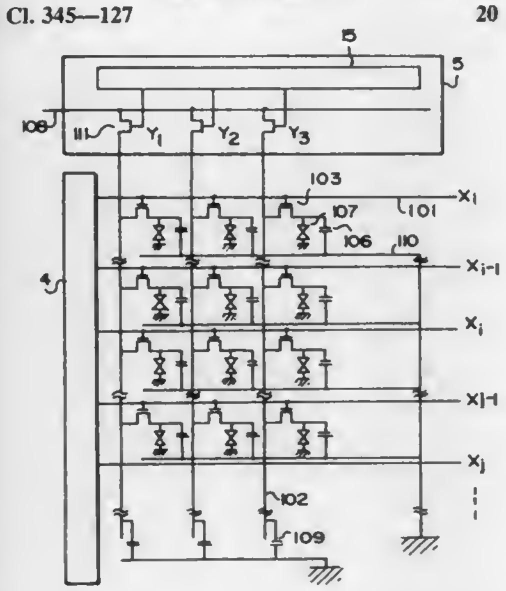
Takayuki Shimada, Yamatokoriyama; Yasunobu Akebi, Yamabe-gun, and Yutaka Takafuji, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1995, Ser. No. 523,444

Claims priority, application Japan, Sep. 7, 1994, 6-213962

Int. Cl.^{6} H04N *3/27*

U.S. Cl. 345—127 **20 Claims**



20. A driving circuit for sequentially scanning a plurality of scanning signal lines, the driving circuit comprising a shift register having a plurality of unit registers and nodes,

each of the plurality of unit registers being connected to the corresponding scanning signal line,

a start signal input to a node being sequentially shifted to an adjacent unit register based on a standard signal when a control signal is at a first state such that a first portion of scanning signal lines are driven and the driving circuit operates in a first display mode; and

the start signal input to another node being sequentially shifted to an adjacent unit register based on the standard signal when the control signal is at a second state such that a second portion of the scanning signal lines are driven and the driving circuit operates in a second display mode.

5,748,176

MULTI-VARIABLE COLORIMETRIC DATA ACCESS BY ITERATIVE INTERPOLATION AND SUBDIVISION

Jay S. Gondek, Camas, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 20, 1995, Ser. No. 504,406

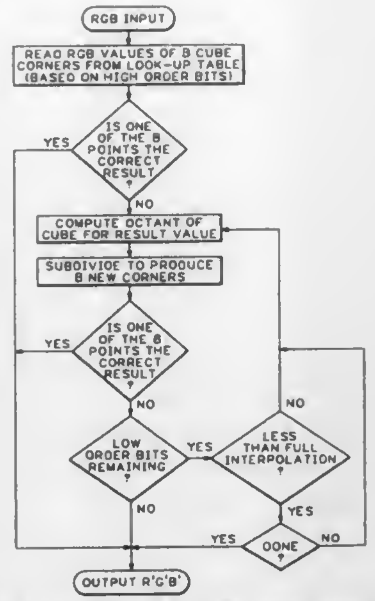
Int. Cl.^{6} G06T *11/40*

U.S. Cl. 345—131 **5 Claims**

1. A method for storing, accessing, interpolating, and outputting a digital data point from a predetermined number of output digital data points stored as a color map in three dimensions in order to display an output color coordinated to an input color, comprising the steps of:

a. storing a first predetermined number of data points as a contiguous 9×9×9 cubic memory construct such that a predetermined corner of each cubic memory construct is accessible using a three bit designator string from an eight bit digital data word for each of said three dimensions;

b. receiving three eight bit digital data words indicative of said input color;


RGB INPUT
READ RGB VALUES OF 8 CUBE CORNERS FROM LOOK-UP TABLE (BASED ON HIGH ORDER BITS)
IS ONE OF THE 8 POINTS THE CORRECT RESULT ?
YES
NO
COMPUTE OCTANT OF CUBE FOR RESULT VALUE
SUBDIVIDE TO PRODUCE 8 NEW CORNERS
IS ONE OF THE 8 POINTS THE CORRECT RESULT ?
YES
NO
LOW ORDER BITS REMAINING ?
YES
NO
LESS THAN FULL INTERPOLATION ?
NO
YES
DONE ?
YES
NO
OUTPUT R'G'B'

c. accessing a cube having a predetermined position designated by said three bit designator string from said three eight bit digital data words;

d. accessing a first subcube of said cube, said first subcube having a predetermined corner designated by three predetermined bits, one from each of said three eight bit digital data words;

e. repeating step d. for said first subcube to access a second subcube of said firs subcube;

f. repeating step e. for each three predetermined bit code of said three eight bit digital data words;

g. outputting a data point from a final subcube designated; and

h. displaying said output data point.

5,748,177

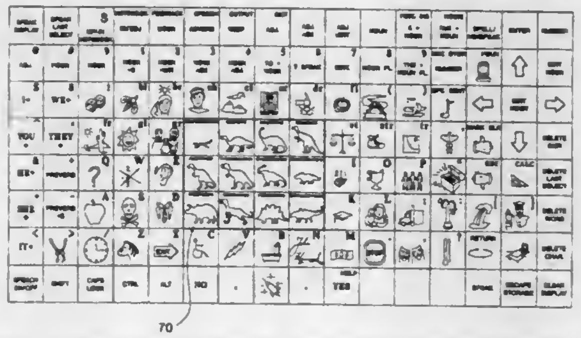
DYNAMIC KEYBOARD AND METHOD FOR DYNAMICALLY REDEFINING KEYS ON A KEYBOARD

Bruce R. Baker, Pittsburgh, Pa.; Brian Yoder, Waxhaw, N.C.; David Hershberger, Millersburg; Barry Romich, Wooster, both of Ohio; Eric H. Nyberg, III, and Robert V. Conti, both of Pittsburgh, Pa., assignors to Semantic Compaction Systems, Pittsburgh, Pa.

Filed Jun. 7, 1995, Ser. No. 487,661

Int. Cl.^{6} G09G *5/00;5/36*

U.S. Cl. 345—133 **144 Claims**



65. A method for dynamically redefining a displayed keyboard, comprising the steps of:

(a) detecting selection of at least one of a plurality of keys of the displayed keyboard, each of the plurality of keys including a displayed polysemous symbol defined to correspond thereto;

(b) comparing the corresponding polysemous symbol of each at least one detected key of step (a), in sequential order of detection, to a first set of a plurality of prestored symbol sequences, each including at least one symbol in a predetermined sequence and an associated prestored message;

(c) comparing the corresponding polysemous symbol of each at least one detected key of step (a), in sequential order of detection, to a second set of a plurality of prestored symbol sequences in response to the sequenced at least one corresponding symbol failing to match any of the first set of prestored symbol sequences in step (b);

(d) embellishing display of a corresponding displayed symbol of at least one of the plurality of keys of the displayed keyboard in response to the at least one corresponding symbol matching one of the second set of prestored symbol sequences in step (c) to thereby dynamically redefine the corresponding displayed symbol;

(e) detecting selection of one of the at least one key including a corresponding embellished symbol;

(f) comparing the corresponding polysemous symbol of each at least one detected key of step (a) and the corresponding embellished symbol of step (e), in sequential order of detection, to a third set of a plurality of prestored symbol sequences, each including at least one symbol and one embellished symbol in a predetermined sequence; and

(g) dynamically redefining at least a portion of the displayed keyboard in response to the at least one corresponding polysemous · symbol and corresponding embellished symbol matching one of the third set of the plurality of prestored symbol sequences in step (f).

5,748,178

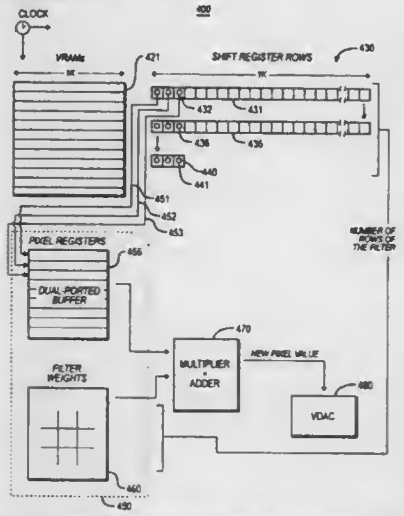
DIGITAL VIDEO SYSTEM AND METHODS FOR EFFICIENT RENDERING OF SUPERIMPOSED VECTOR GRAPHICS

Raymond Drewry, Menlo Park, Calif., assignor to Sybase, Inc., Emeryville, Calif.

Filed Jul. 18, 1995, Ser. No. 503,757

Int. Cl.^{6} G09G *5/36*

U.S. Cl. 345—138 **44 Claims**



1. In a video system for processing digital images, said system including a memory bank having a number of rows, each row of said memory bank storing in cells a number of pixels for a digital image, a method for rendering in real time an enhanced version of said digital image, the method comprising:

(a) storing a filter template for enhancing rendering of each pixel of said digital image based on values of neighboring pixels, said filter template being divided into a number of rows, each row of the filter template having a number of cells for storing pixel weightings;

(b) at a pre-selected clock interval, shifting out in raster order successive pixels stored in said memory bank into a shift register, said shift register being divided into a number of logical shift register rows, the number of logical shift register rows being equal to or greater than the number of rows of said filter template, said logical shift register rows being divided into a number of cells, the number of cells of some of said logical shift register rows being equal to or greater than the number of cells stored in one of said rows of said memory bank, so that neighboring pixels of a particular pixel are stored logically together in said logical shift register rows;

(c) at said pre-selected clock interval, copying pixel values from a number of initial cells from each of said logical shift register rows to a number of pixel registers, said number of initial cells copied from each of said logical shift register rows being equal to or greater than the number of cells in each row of said filter template;

(d) at said pre-selected clock interval, generating a new pixel value by applying said pixel weightings of said filter template to corresponding pixel values copied to said pixel registers; and

(e) rendering in real time as said digital image is being outputted for display on a display device an enhanced version of said digital image by repeating steps (b)–(d) for all pixels of said digital image.

5,748,179

LCD DEVICE HAVING DRIVING CIRCUITS WITH MULTILAYER EXTERNAL TERMINALS

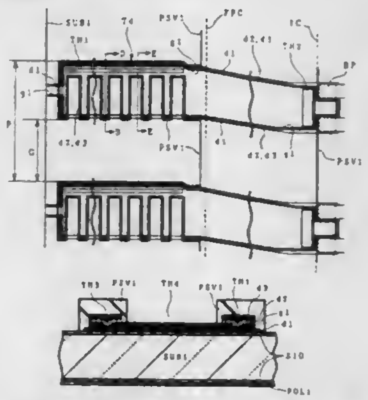
Hikaru Ito; Masataka Natori; Masahiko Suzuki; Kimitoshi Ohgiichi, all of Mobara; Kuniyuki Matsunaga, Yokohama; Junichi Ohwada, Mobara; Masumi Sasuga, Mobara, and Shiro Ueda, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1996, Ser. No. 645,484

Claims priority, application Japan, May 15, 1995, 7-115583; Sep. 11, 1995, 7-232290

Int. Cl.^{6} G02F *1/1345*

U.S. Cl. 349—152 **13 Claims**



1. A liquid crystal display device having driving circuits mounted on a substrate, comprising:

two transparent insulating substrates which are disposed to confront each other through a liquid crystal layer;

plural liquid crystal driving circuits which are mounted in a flip-chip style on a surface of one of said substrates which is located at the side of said liquid crystal layer;

a flexible board for inputting a signal to each of said liquid crystal driving circuits; and

plural input wires which are provided on the surface of said one substrate at the side of said liquid crystal layer, and which serve to connect output terminals of said flexible board to input terminals of said liquid crystal driving circuits, wherein each of said input wires includes a first metal layer in the vicinity of the surface of said one substrate, a transparent conductive film which is laminated on said first metal layer and connected to the input terminals of said liquid crystal driving circuits and the output terminals of said flexible board, said transparent conductive film having open portions in the neighborhood of the input terminals of said liquid crystal driving circuits and in the neighborhood of the output terminals of said flexible board, a second metal layer which is at least partially laminated on said transparent conductive film and which is connected to said first metal layer at said open portions, and a protection film which is disposed to cover at least said second metal layer.

5,748,180
POINTING DEVICE FOR CONTROLLING CURSOR MOVEMENT ON DISPLAY

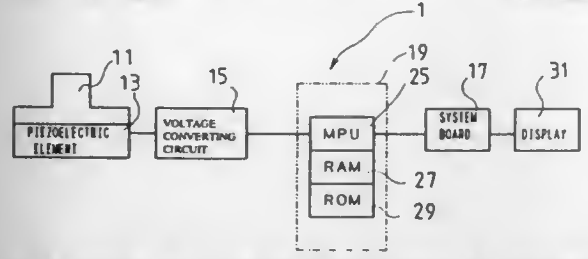
Atsuomi Inukai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 3, 1994, Ser. No. 333,838

Claims priority, application Japan, Nov. 5, 1993, 5-276983

Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—161 **15 Claims**



15. A pointing device having a stick member for controlling cursor movement on a display, the pointing device comprising:
- piezoelectric elements arranged in the stick member, each of the piezoelectric elements converting a stress exerted to the stick member into a voltage;
- a voltage converting circuit for converting the voltage produced in the piezoelectric element into a digital signal corresponding to the voltage;
- a control part having a memory for detecting the voltage based on the digital signal from the voltage converting circuit and storing the detected voltage in the memory; and
- a system board for controlling cursor movement on the display based on an electric signal corresponding to the voltage stored in the memory.

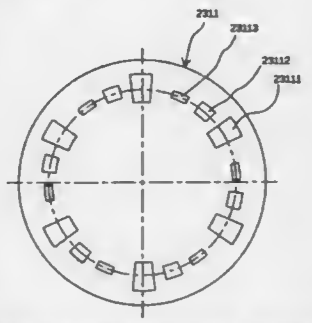
5,748,181
CURSOR CONTROLLING APPARATUS AND ITS DIRECTION DETECTION METHOD

Alex Fu; David Wang, and Chris Wu, all of Taipei Hsien, Taiwan, assignors to Primax Electronics Ltd., Taipei Hsien, Taiwan

Filed Jul. 1, 1994, Ser. No. 270,012

Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—165 **12 Claims**



1. A method used in a cursor controlling apparatus for detecting a direction that a cursor should move on a monitor, comprising steps of:
- converting movement of the cursor controlling apparatus into rotational movement of a grid wheel in each of an X- and a Y-direction, wherein each grid wheel has at least three holes with three different sizes for transmitting light emitting from a respective light source to a respective photo detector;
- intermittently receiving light passing through the grid wheels to obtain a single series of light with at least three different light intensity levels in each of the X- and the Y-direction;
- generating a series of voltage signals having at least three different voltage waveforms respectively responsive to said series of light; and
- determining a cursor moving direction by comparing the different voltage waveforms.

5,748,182
COORDINATES INPUT APPARATUS CONNECTED TO IMAGE PROCESSING SYSTEM

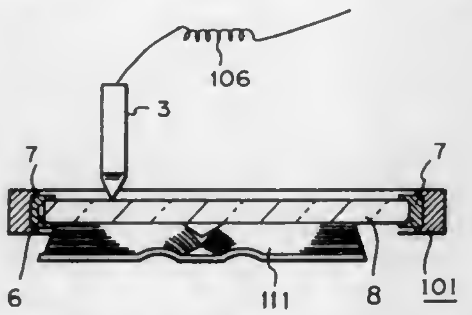
Masashi Ohashi, and Shinnosuke Taniishi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 924,797, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 581,144, Sep. 10, 1990, abandoned, which is a continuation of Ser. No. 180,450, Apr. 12, 1988, abandoned. This application Sep. 14, 1994, Ser. No. 305,818

Claims priority, application Japan, Apr. 15, 1987, 62-90880

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—173 **10 Claims**



1. A coordinate input apparatus adapted to be connected to an image processing system which has a reader for reading an image recorded on a recording medium, and which edits the read image and outputs editing area information corresponding to the editing, said coordinate input apparatus comprising:
- a coordinate input member, located above the reader, for enabling coordinate input for a document placed under said coordinate input member and for a document placed above said coordinate input member;
- single platewave detecting means, in contact with said coordinate input member, for detecting a propagated platewave generated from a platewave generating means into said coordinate input means directly or via the recording medium;
- display means, united with said coordinate input member, for displaying information of the recording medium; and
- control means for supplying to the image processing system editing instruction information regarding the information displayed by said display means corresponding to coordinates on said coordinate input member whereby designation of the editing instruction information can be executed for a document placed on any one of both faces of said coordinate input member.

5,748,183
INFORMATION PROCESSING APPARATUS

Yuichiro Yoshimura, Kamakura; Atsushi Tanaka, Kawasaki; Ryozo Yanagisawa, Chiba-ken; Katsuyuki Kobayashi, Yokohama; Masaki Tokioka, Fujisawa, and Hajime Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

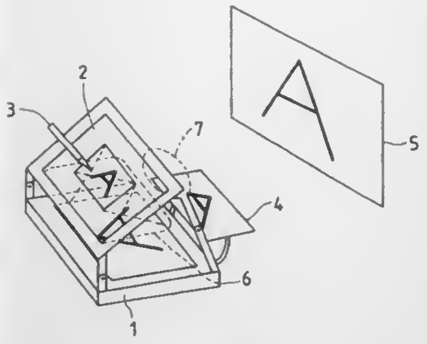
Filed Jul. 6, 1995, Ser. No. 499,008

Claims priority, application Japan, Jul. 7, 1994, 6-156166

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—173 **9 Claims**

1. An information processing apparatus comprising:
- projection means for protecting an image;
- coordinate input means including a plate having a focusing plane for focusing the image projected by said projection means as a visible image, with said plate formed by a member having a half-mirror surface on the focusing plane, said coordinate input means also simultaneously reflecting the projected image and pointing a position on said plate to input a coordinate;
- control means for controlling the image defined by the coordinate inputted by said coordinate input means for the projection by said projection means; and



- focusing means for focusing the image reflected by said plate on a predetermined projection plane as a visible image.

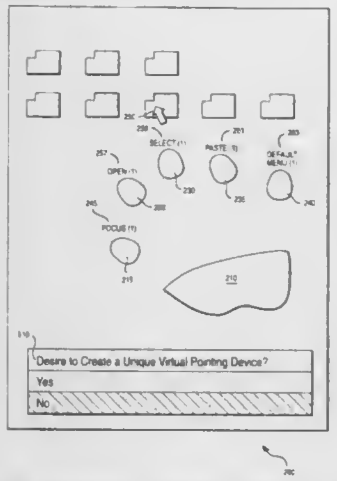
5,748,184
VIRTUAL POINTING DEVICE FOR TOUCHSCREENS

Johnny Meng-Han Shieh, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1996, Ser. No. 654,487

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—173 **11 Claims**



1. A method for directing a computer system, having at least a processor, memory, and touchscreen, to create a virtual pointing device on the touchscreen, comprising the steps of:
- (a) detecting a handprint of a hand placed on the touchscreen;
- (b) determining if pre-defined characteristics exist for the handprint based on the shape and size of the handprint;
- (c) if pre-defined characteristics exist for the handprint, creating a virtual pointing device under at least a portion of the hand in accordance with the pre-defined characteristics; and
- (d) if pre-defined characteristics do not exist, creating a generic virtual pointing device under the at least a portion of the hand.

5,748,185
TOUCHPAD WITH SCROLL AND PAN REGIONS

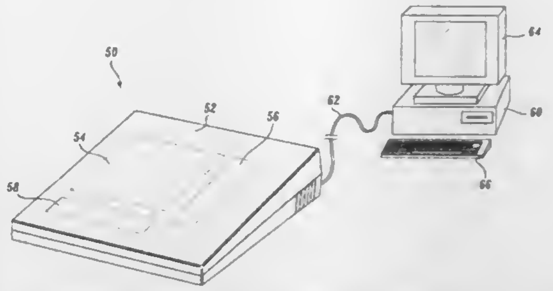
Allan H. Stephan, Seattle; Brent N. LaPorte, Bellevue; Stephen B. Powers, Seattle, and Mark McNeely, Mercer Island, all of Wash., assignors to Stratos Product Development Group, Seattle, Wash.

Filed Jul. 3, 1996, Ser. No. 674,837

Int. Cl.^{6} G09G *1/00;5/00*

U.S. Cl. 345—173 **28 Claims**

21. A touchpad user input device coupled to a computer for controlling functions of a graphical user interface operating on a display area on a computer monitor display screen associated with the computer, the touch-sensitive user input device comprising:



- (a) a first control region that is not within any display area of the display screen, the first control region generating a first control signal in response to a force and a movement of the force applied by a user within the first control region, the first control signal linked to the control of a cursor in the graphical user interface to allow the user to control the cursor; and
- (b) a second control region that is not within any display area of the display screen and is disposed adjacent the first control region, the second control region generating a second control signal in response to a force and a movement of the force applied by a user within the second control region, the second control signal linked to a second function in the graphical user interface to allow the user to control the second function.

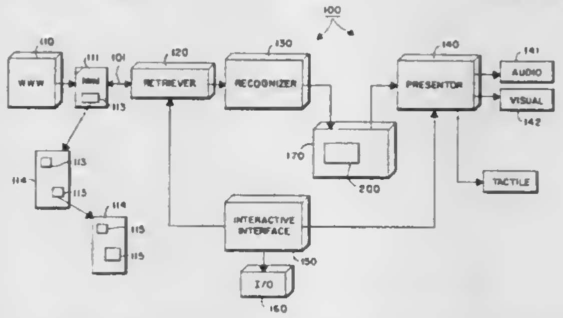
5,748,186
MULTIMODAL INFORMATION PRESENTATION SYSTEM

T. V. Raman, Cambridge, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 2, 1995, Ser. No. 537,563

Int. Cl.^{6} G06T *1/00*

U.S. Cl. 345—302 **26 Claims**



1. A computer implemented method for interactively presenting an electronically encoded multi-media document, the document including marks to indicate a structure of the document, comprising the steps of:
- receiving the document via a network;
- converting the document to a common intermediate representation, the common intermediate representation stored in a memory of a computer system in the form of a hierarchical attribute tree having a plurality of document objects, the document objects representing the document, the structure of the document, and procedures which can operate on the document;
- presenting the common intermediate representation using a plurality of user communication modalities according to the hierarchical attribute tree; and
- receiving control signals from a user using the plurality of user communication modalities, while presenting the common intermediate representation to enable the user to control the presentation of the document.

/OL
2 10
SS
1
MY
5
998
MI

5,748,187

SYNCHRONIZATION CONTROL OF MULTIMEDIA OBJECTS IN AN MHEG ENGINE

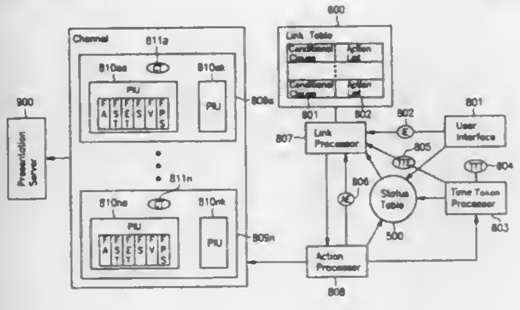
Jin-Suk Kim; Sung-Been Cho; Hae-Won Lee; Byeong-Won Jin, and Sung-Yul Park, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, and Korea Telecommunication Authority, Seoul, both of Rep. of Korea

Filed Nov. 22, 1995, Ser. No. 562,190

Claims priority, application Rep. of Korea, Dec. 13, 1994, 94-33908

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 345—302 **8 Claims**



6. A method for synchronization control of multimedia objects in a MHEG engine for presenting multimedia information and which comprises a status table for representing the process status of MHEG objects for presentation of multimedia information, a link table for storing conditional clauses which enable the MHEG objects to be presented and addresses of the MHEG objects associated therewith, a presentation server for receiving presentation information from a synchronization controller to present multimedia information, said method comprising the steps of:

checking the conditional clauses in said link table to retrieve an action behavior to be subsequently executed and transferring the retrieved action behavior to an action processor, upon occurrence of an event, when the synchronization controller starts its operation for presentation of multimedia in the MHEG engine,

wherein said step of checking the conditional clauses includes the steps of:

starting the operation of the synchronization controller when the MHEG engine is ready to provide the initial presentation (S1);

checking whether at least one of an action event, an interaction event, and a time token event is generated as the synchronization controller starts its operation (S2);

changing the time token status in the status table and executing said checking step (S2) again after waiting until the time token event is generated by a time token processor, if no event is generated (S3);

checking whether there is any satisfied conditional clause of the conditional clauses in the link table, if at least one event is generated (S4); and

executing said checking step (S2) again if there is no satisfied conditional clause, and initializing a parameter "i" to 1 if there is a satisfied conditional clause (S5);

synchronizing multimedia for each of associated channels by executing the action behavior transferred by said checking step; and

presenting multimedia information by transferring them to said presentation server in sequence based on synchronization information on frames within the channels inputted by said synchronizing step.

5,748,188

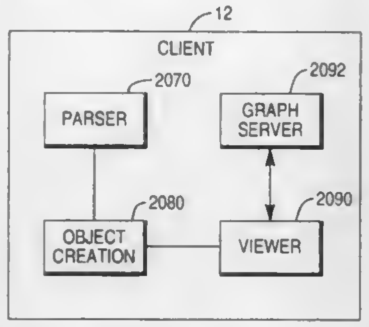
HYPERTEXT MARKUP LANGUAGE (HTML) EXTENSIONS FOR GRAPHICAL REPORTING OVER AN INTERNET

Yih-Shiuan Hu, Alpharetta, and Tejwansh S. Anand, Roswell, both of Ga., assignors to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 542,266, Oct. 12, 1995. This application Oct. 31, 1996, Ser. No. 742,003

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 345—326 **6 Claims**



1. A system for displaying a graph on a computer system comprising:

- (a) a network for connecting a plurality of computer systems;
- (b) a server computer system comprising:
  - (i) means for selecting a graph type from a plurality of available graph types;
  - (ii) means for generating graph elements representative of attributes of the selected graph type;
  - (iii) means for transmitting the graph type and the graph elements onto the network;
- (c) a client computer system comprising:
  - (1) a video display;
  - (2) means for receiving the graph type and the graph elements from the network;
  - (3) means for extracting the attributes from the graph elements;
  - (4) means for extracting graph data from the graph elements;
  - (5) means for generating an object from the attributes, the object representative of the graph type and the graph elements to be displayed on the video display; and
  - (6) means for displaying the object on the video display.

5,748,189

METHOD AND APPARATUS FOR SHARING INPUT DEVICES AMONGST PLURAL INDEPENDENT GRAPHIC DISPLAY DEVICES

John Trueblood, 9439 Fairgrove La., #206, San Diego, Calif. 92129

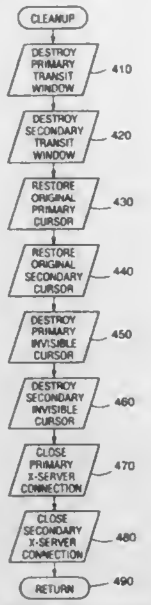
Filed Sep. 19, 1995, Ser. No. 531,209

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 345—331 **23 Claims**

1. A method of sharing a cursor control device amongst first and second graphic display devices, said cursor control device generating data for controlling a first cursor on said graphic display devices, said method comprising the steps of:

- (1) defining a first transition window in said first graphic display device and a second, mating transition window in said second graphic display device,
- (2) determining when said first cursor has been moved into a first position in said first transition window,
- (3) when said first cursor enters said first transition window, drawing a second cursor on said second graphic display device at a predetermined second position corresponding to said first position on said first graphic display device,
- (4) when said first cursor enters said transition window, automatically repositioning said first cursor to a third position on said first graphic display device corresponding to said predetermined second position on said second graphic display device,
- (5) when said first cursor has entered said transition window, masking said first cursor on said first screen so that it does not appear, and
- (6) after said first cursor has entered said transition window, sending simulations of said data generated by said cursor control device to said second graphic display device.


CLEANUP
DESTROY PRIMARY TRANSIT WINDOW
410
DESTROY SECONDARY TRANSIT WINDOW
420
RESTORE ORIGINAL PRIMARY CURSOR
430
RESTORE ORIGINAL SECONDARY CURSOR
440
DESTROY PRIMARY INVISIBLE CURSOR
450
DESTROY SECONDARY INVISIBLE CURSOR
460
CLOSE PRIMARY X-SERVER CONNECTION
470
CLOSE SECONDARY X-SERVER CONNECTION
480
RETURN
490

5,748,190

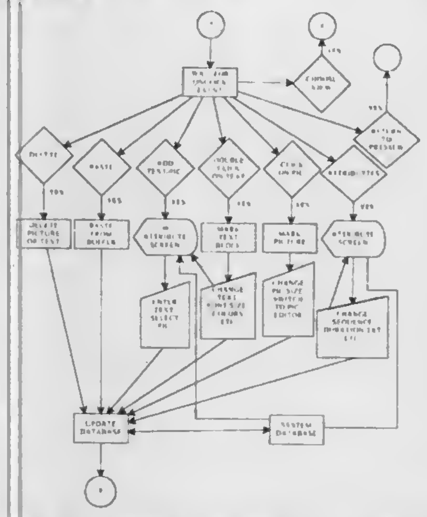
PRESENTATION SYSTEM FOR INDIVIDUAL PERSONAL COMPUTERS IN A PERSONAL COMPUTER NETWORK

Reidar Kjorsvik, Skaarer, Norway, assignor to WiseVision AS, Oslo, Norway

Filed Sep. 5, 1995, Ser. No. 524,297

Int. Cl.⁶ G06T *1/00*

U.S. Cl. 345—329 **14 Claims**



1. A system for presenting information to a plurality of individual personal computers formed into a personal computer network, the personal computers capable of conventional computer task operation, comprising:

a system database accessible to the personal computers in the network for storing at least one presentation sequence which includes a selected sequence of images suitable for display on a personal computer screen, wherein the presentation sequence is distinct from and secondary to the conventional computer task operations of the personal computers and is composed around a selected topic;

a system administration module, capable of communicating with said system data base, for composing said presentation sequence;

messenger module means in each personal computer in the network for obtaining the presentation sequence from the system data base and for controlling the display of said presentation sequence on the screen of the messenger module's associated personal computer, wherein the presentation sequence is displayed on the screen only when said associated personal computer has been on but unused for a pre-selected period of time; and

means at each personal computer, initiated by a user thereof, for returning the personal computer to its conventional computer task operation during the display of the presentation sequence, thereby terminating the display of the presentation sequence.

5,748,191

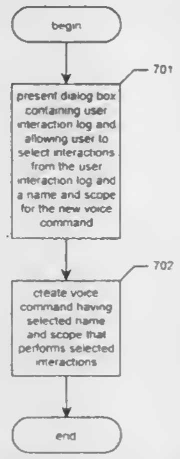
METHOD AND SYSTEM FOR CREATING VOICE COMMANDS USING AN AUTOMATICALLY MAINTAINED LOG INTERACTIONS PERFORMED BY A USER

Michael J. Rozak, Issaquah, and James H. Spoltman, Snohomish, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jul. 31, 1995, Ser. No. 508,388

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—333 **19 Claims**


begin
701
present dialog box containing user interaction log and allowing user to select interactions from the user interaction log and a name and scope for the new voice command
702
create voice command having selected name and scope that performs selected interactions
end

1. A method in a computer system for creating a voice command that reproduces a sequence of user input events received in the computer system, the method comprising the steps of:

receiving in the computer system a plurality of user input events;

automatically storing a plurality of the received user input events;

receiving from the user an instruction to create a voice command from received user input events; and

in response to receiving the instruction:

- displaying a visual indication of each of a plurality of the stored user input events,
- permitting the user to select one or more user input events for which visual indications are displayed,
- receiving from the user a name for the voice command, and
- creating a voice command that reproduces the user input events selected by the user when audio data corresponding to the voice command name is received in the computer system.

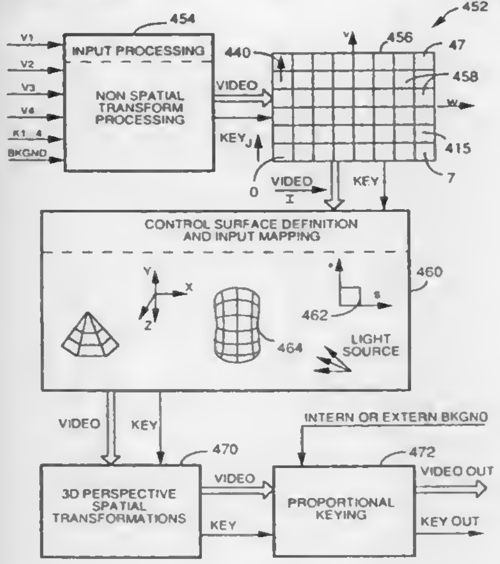
5,748,192
VIDEO SPECIAL EFFECTS SYSTEM WITH GRAPHICAL OPERATOR INTERFACE

Dennis Allen Lindholm, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 810,758, Dec. 18, 1991, Pat. No. 5,592,599. This application Nov. 4, 1996, Ser. No. 743,266

Int. Cl.^{6} G06T *15/50*

U.S. Cl. 345—425 **19 Claims**



1. A video special effects system comprising:

an operator interface receiving commands from an operator commanding a transformation of a video image and outputting operator command signals that are indicative of the operator commands;

a digital data processor coupled to receive the operator command signals and respond thereto by generating image transformation command signals commanding image transformations determined in response to the operator command signals, the digital data processor defining a control surface having an orientation and position relative to a view plane, defining an orientation and position of the video image on the control surface and generating the image transformation command signals to represent a transformation of the video image to a projection of the video image from the defined orientation and position on the control surface to the view plane; and

a video processor coupled to receive a set of video signals representing an input image and the image transformation command signals and in response thereto generate a set of output video signals representing an output image having a transformation relative to the input image commanded by the image transformation command signals.

5,748,193
FLAT PATTERN IMAGE GENERATION OF INTERNAL STRUCTURE DATA

Noboru Higashi, and Koichi Sano, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1995, Ser. No. 514,266

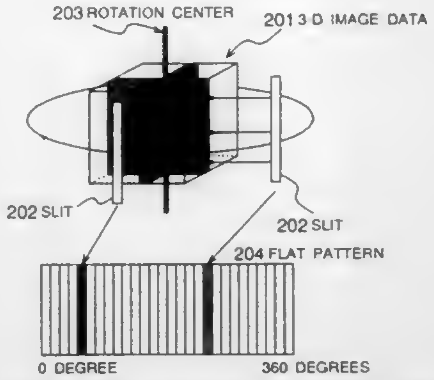
Claims priority, application Japan, Aug. 11, 1994, 6-189247

Int. Cl.^{6} G06T *15/10*

U.S. Cl. 345—427 **3 Claims**

1. A flat pattern generating method for generating a flat pattern from three-dimensional image data of an object having a hollow structure, comprising:

a step (1) of determining a locus within said hollow structure along which a viewing point is moved;



a step (2) of providing said viewing point at a certain point on said locus and determining a plane orthogonal to said locus and including said viewing point;

a step (3) of rotating said viewing point by a predetermined angle up to an angular range of 360 degrees in said determined plane so as to visualize the internal structure of said object from said viewing point, thereby producing an image of one line;

a step (4) of moving said viewing point along said locus and repeating said step (3), thereby producing a series of images of one line each; and

a step (5) of linearly arranging said generated series of images of one line each to produce a two-dimensional image.

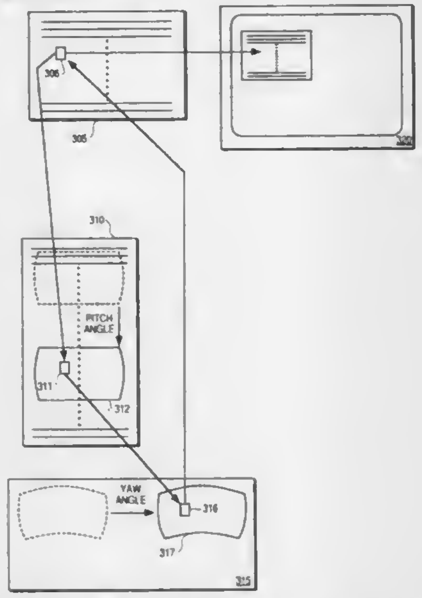
5,748,194
RENDERING PERSPECTIVE VIEWS OF A SCENE USING A SCANLINE-COHERENT LOOK-UP TABLE

Shenchang Eric Chen, Saratoga, Calif., assignor to Live Picture, Inc., Scotts Valley, Calif.

Filed May 8, 1996, Ser. No. 647,018

Int. Cl.^{6} G06T *3/00*

U.S. Cl. 345—427 **13 Claims**



1. A method for displaying a perspective view of a scene, the method comprising the steps of:

mapping a viewing plane having a plurality of scanlines to a portion of a look-up table that has environment map indices stored therein;

locating pixel values in a portion of an environment map based on the environment map indices in the portion of the look-up table, the environment map representing the projection of the scene onto a surface of revolution;

writing the pixel values located in the portion of the environment map into the viewing plane;

rendering the viewing plane onto a display device:

wherein the lookup table is arranged in rows of storage locations, each storage location corresponding to a point on a surface of extrusion, the surface of extrusion being concentric with the surface of revolution; and

wherein coordinates of points on the surface of revolution that correspond to points on the surface of extrusion are stored in the storage locations in the look-up table to provide the environment map indices.

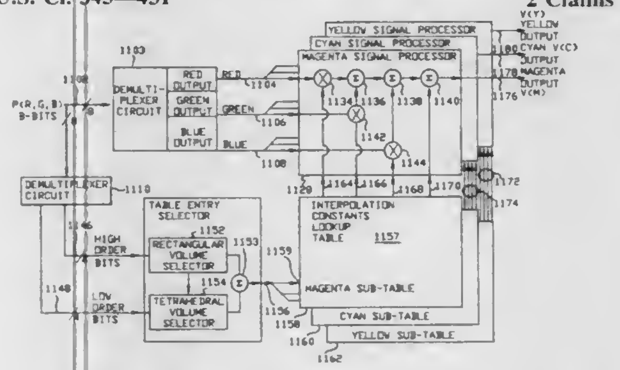
5,748,195
METHOD AND MEANS FOR EVALUATING A TETRAHEDRAL LINEAR INTERPOLATION FUNCTION

Sigfredo Isamael Nin, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 968,643, Oct. 29, 1992, ahandoned. This application Aug. 18, 1995, Ser. No. 516,732

Int. Cl.^{6} G06T *5/00*

U.S. Cl. 345—431 **2 Claims**



1. An arithmetic apparatus for converting an input color signal to an output color signal, said apparatus approximating a value v of a function having a domain input in a first three-dimensional color space and a range output in a second four-dimensional color space, the domain input being divided into a plurality of rectangular volumes, each said rectangular volume being further subdivided into a plurality of tetrahedra, each said tetrahedron having four vertices, vertices of each of the tetrahedra comprising sample domain input points p, each said sample domain input point p having a set of coordinates in the first color space, the apparatus comprising:

an input port to accept from an input device an input signal corresponding to an input image pixel of the input device, said input signal being represented by a set of coordinates for a domain input point P situated within the first three-dimensional color space, the point P having coordinates x, y, and z, such that x represents a first color component in the first three-dimensional color space, y represents a second color component in the first three-dimensional color space, and z represents a third color component in the first three-dimensional color space;

a first demultiplexer for separating the domain input point P into a demultiplexed output comprising first, second and third color components;

a memory containing a tetrahedral interpolation constants table, said table including:

the domain input divided into a plurality of tetrahedral volumes, each tetrahedral volume having four vertices i, each vertex i having vertex coordinates $x(i,j)$ in the first three-dimensional color space and an associated range output value v at the vertex i of $v(i,k)$;

a matrix T comprising the inverse of an $n \times n$ matrix X multiplied by an $n \times m$ matrix V; wherein matrix X comprises matrix components $X(i,j)$ defined as $X(i,j)=x(i+1,j)-x(0,j)$ for $0 \leqq j \leqq n-1$ and $0 \leqq j \leqq m-1$, and wherein matrix V comprises matrix components $V(i,k)$ defined as $V(i,k)=v(i+1,k)-v(0,k)$ for $0 \leqq i \leqq n-1$ and $0 \leqq k \leqq m-1$;

a vector t comprising vector components $t(k)$ wherein $t(k)=v(0,k)-x(0,k)^*T$ for $0 \leqq k \leqq m-1$;

wherein the tetrahedral interpolation constants table is structured to map between each tetrahedra vertex and first, second, and third multiplicative constants that comprise corresponding components of the matrix T, and to also map between each tetrahedra vertex and an additive constant comprising a corresponding component of the vector t, wherein each constant includes first, second, and third color components;

a selector coupled to the input port and the memory for selecting the tetrahedron containing the point p; and

a signal processor coupled to the memory and to the demultiplexer output for producing an output signal corresponding to an image pixel of an output device and represented by an output signal value v in the second four-dimensional color space, the output signal value v having a first color constituent a, a second color constituted b, a third color constituent c, and a fourth color constituent d; the signal processor including first signal processor associated with the first color component for producing a first color output representative of the first color constituent a, a second signal processor associated with the second color component for producing a second color output representative of the second color constituent b, a third signal processor associated with the third color component for producing a third color output representative of the third color constituent c, and a fourth signal processor for producing a forth color output, representative of the fourth color constituent; each of the first, second, third and fourth signal processor means including:

(i) first multiplication means for producing a first product by multiplying the first component of the demultiplexer output by a corresponding component of the first multiplicative constant;

(ii) second multiplication means for producing a second product by multiplying the second component of the demultiplexer output by a corresponding component of the second multiplicative constant;

(iii) third multiplication means for producing a third product by multiplying the third component of the demultiplexer output by a corresponding component of the third multiplicative constant;

(iv) first summing means for producing a first sum by adding the first product to the second product;

(v) second summing means for producing a second sum by adding the first sum to the third product;

(vi) third summing means for producing a third sum by adding the second sum to a corresponding component of the additive constant; the third sum comprising a color output for the respective color constituent;

wherein the set of coordinates for the selected domain input point p is expressed as an 8 bit number having four high order bits and four low order bits, the four high order bits indicating a particular one of said plurality of rectangular volumes which includes the selected domain input point p, the four low order bits indicating a particular one of said plurality of tetrahedral volumes which includes the selected domain input point p; the arithmetic apparatus further including a second demultiplexer, having a second demultiplexer input and a second demultiplexer output, to separate a domain input point p at the second demultiplexer input into four low order bits and four high order bits at the second demultiplexer output, the second demultiplexer input being coupled to the input port, the second demultiplexer output being coupled to the selector, the selector further including:

(i) rectangular volume selector responsive to the four high order bits to select the particular one of said plurality of rectangular volumes; and

(ii) tetrahedral volume selector responsive to the four low order bits to select the particular one of said plurality of tetrahedral volumes.

5,748,196

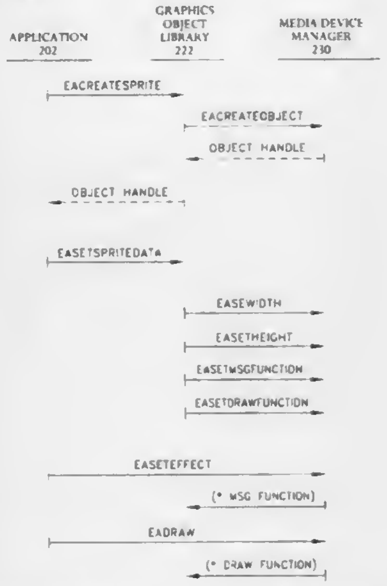
IMPLEMENTING BRANCHING OPERATIONS AT PROCESSING INTERSECTIONS IN INTERACTIVE APPLICATIONS

Rohan G. F. Coelho; Alan Packer, both of Portland, and Gary Baldes, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 388,699, Feb. 15, 1995, Pat. No. 5,646,866. This application Dec. 6, 1995, Ser. No. 568,023

Int. Cl.^{6} G06T *11/00*

U.S. Cl. 345—433 27 Claims



1. A computer-implemented process for handling branching operations during an interactive application, comprising the steps of:

(a) identifying, by a computer, a possible processing intersection during real-time implementation of the interactive application, wherein:

the processing intersection corresponds to two or more possible processing paths; and

each processing path is associated with one or more streams of signals;

(b) preprocessing, by the computer, each stream of signals of the processing intersection during real-time implementation of the interactive application before reaching the processing intersection;

(c) selecting, by the computer, one of the processing paths upon reaching the processing intersection in response to flow of the interactive application; and

(d) further processing, by the computer, the one or more streams of signals associated with the selected processing path.

5,748,197

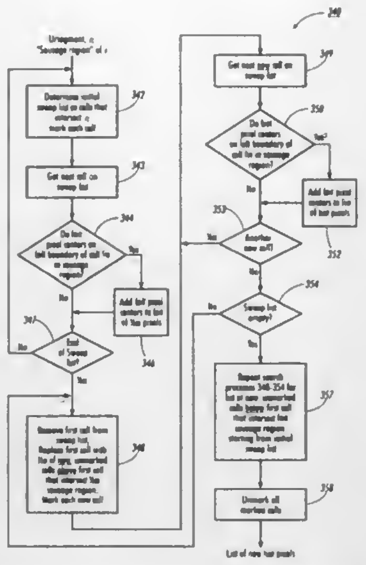
DYNAMIC COMPUTATION OF A LINE SEGMENT ARRANGEMENT USING FINITE PRECISION ARITHMETIC FOR USE IN A PROCESSOR CONTROLLED SYSTEM

Leonidas John Guibas, and David H. Marimont, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1995, Ser. No. 581,669

Int. Cl.^{6} G06T *3/00*

U.S. Cl. 345—438 15 Claims



1. For a processor-controlled system capable of operating on and displaying arrangements of line segments in a plane, a method for dynamically producing an output partition data structure representing said arrangement of line segments, said output partition data structure induced by an input unrounded line segment; the input unrounded line segment being represented by a set of real coordinates in the plane, the output partition data structure indicating an output rounded line segment representing the input line segment by a set of finite precision coordinates; the method comprising:

receiving data indicating the an input unrounded line segment and a signal to insert the unrounded input line segment into an input partition data structure indicating a first partition of the plane;

accessing the input partition data structure; the input partition data structure including data indicating a prior set of unrounded line segments; the prior set of unrounded line segments including a boundary set of unrounded line segments forming a rectangular boundary lying on the plane; locations in the input partition data structure being capable of being specified with reference to a finite precision grid of tiles superimposed on the plane; each tile having a position included therein referred to as an integral point having finite precision coordinates; the input unrounded line segment having real coordinates specifying a position within the rectangular boundary;

determining a plurality of tiles in the finite precision grid related to the input unrounded line segment using the prior set of unrounded line segments; the plurality of tiles in the finite precision grid related to the input unrounded line segment being hereafter referred to as a plurality of

related hot pixels; each related hot pixel including an endpoint of the input unrounded line segment or at least one point on an unrounded line segment included in the input partition data structure.

for each related hot pixel, performing a rounding operation using the input unrounded line segment; the rounding operation replacing real coordinates of a nonintegral point on an unrounded line segment located within the boundary of the related hot pixel with the finite precision coordinates of the integral point of the related hot pixel; the rounding operation causing an unrounded line segment to be split into two fragment line segments, each referred to individually as a fragment and collectively as a polysegment, having a vertex at the integral point in the related hot pixel; each fragment produced by the rounding operation being referred to as belonging to the unrounded line segment from which it was produced;

adding the fragments of the polysegment to the input partition data structure to produce an updated output partition data structure;

storing the input unrounded line segment in the output partition data structure; the input unrounded line segment being associated in the output partition data structure with all of the fragments belonging to the unrounded line segment from which it was produced; and

displaying an arrangement of line segments using said output partition data structure.

5,748,198

POLYGON DATA CONVERSION DEVICE, THREE-DIMENSIONAL SIMULATOR APPARATUS, AND POLYGON DATA CONVERSION METHOD

Masaki Takeda, Toshima-ku, and Komei Kato, Yokohama, both of Japan, assignors to Namco Ltd., Tokyo, Japan

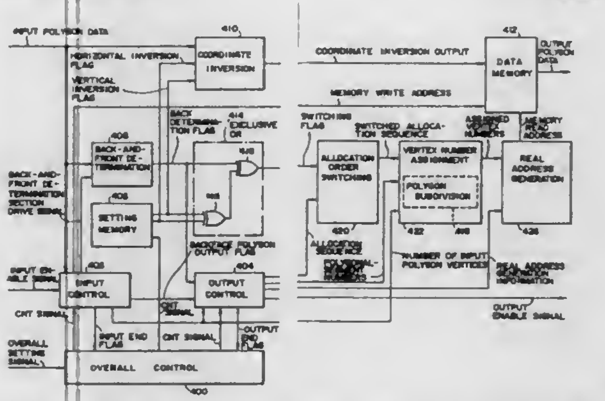
PCT No. PCT/JP95/01204, § 371 Date Feb. 15, 1996, § 102(e) Date Feb. 15, 1996, PCT Pub. No. WO95/35554, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 16, 1995, Ser. No. 596,349

Claims priority, application Japan, Jun. 17, 1994, 6-159271

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—441 22 Claims



1. A polygon data conversion device that converts polygon data which is input thereto into polygon data of a predetermined format and outputs said converted polygon data, comprising:

coordinate inversion means for horizontally inverting vertex coordinates of an input polygon based on a horizontal inversion flag that is information specifying whether or not horizontal inversion is to be performed;

switching means for switching a sequence of numbers allocated to vertices of said polygon based on said horizontal inversion flag; and

output means for outputting horizontally inverted vertex coordinates in accordance with said switched vertex number allocation sequence; and

wherein said coordinate inversion means horizontally inverts said vertex coordinates of said input polygon when said horizontal inversion flag is true; and

said switching means switches said vertex number allocation sequence to reverse backface and frontface of said polygon, when said horizontal inversion flag is true.

5,748,199

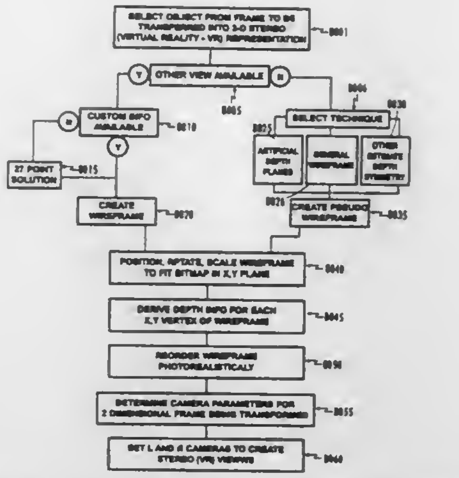
METHOD AND APPARATUS FOR CONVERTING A TWO DIMENSIONAL MOTION PICTURE INTO A THREE DIMENSIONAL MOTION PICTURE

Charles S. Palm, Westlake Village, Calif., assignor to Synthonics Incorporated, Westlake Village, Calif.

Filed Dec. 20, 1995, Ser. No. 576,922

Int. Cl.^{6} G06T *15/00*

U.S. Cl. 345—473 18 Claims


SELECT OBJECT FROM FRAME TO BE TRANSFERRED INTO 3-D STEREO (VIRTUAL REALITY - VR) REPRESENTATION
OTHER VIEW AVAILABLE
Y
N
CUSTOM INFO AVAILABLE
N
Y
27 POINT SOLUTION
CREATE WIREFRAME
SELECT TECHNIQUE
ARTIFICIAL DEPTH PLANES
GENERAL WIREFRAME
CREATE PSEUDO WIREFRAME
POSITION, ROTATE, SCALE WIREFRAME TO FIT BITMAP IN X,Y PLANE
DERIVE DEPTH INFO FOR EACH X,Y VERTEX OF WIREFRAME
REORDER WIREFRAME PHOTOREALISTICALLY
DETERMINE CAMERA PARAMETERS FOR 2 DIMENSIONAL FRAME BEING TRANSFORMED
SET L AND R CAMERAS TO CREATE STEREO (VR) VIEWING

1. A method for converting at least one two dimensional first image comprising part of a motion picture into a three dimensional stereo representation of the first image, comprising:

a. for at least one object within said first image, identifying a view of said object from a second image of said motion picture;

b. using the first image and the second image to construct a three dimensional wireframe representation of said object;

c. transforming said wireframe representation to approximately match the size and orientation of said object in said first image;

d. replacing said object of said first image with a transformed wireframe representation of said object to produce a composite image; and

e. capturing two views of said composite image to form a three dimensional stereo representation of the first image.

5,748,200

IMAGE DISPLAYING APPARATUS

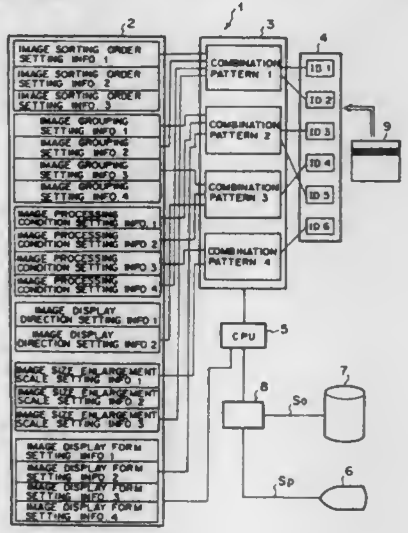
Takeshi Funahashi, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 22, 1996, Ser. No. 620,257

Claims priority, application Japan, Mar. 23, 1995, 7-063892

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—507 9 Claims


1
2
3
4
IMAGE SORTING ORDER SETTING INFO 1
IMAGE SORTING ORDER SETTING INFO 2
IMAGE SORTING ORDER SETTING INFO 3
IMAGE GROUPING SETTING INFO 1
IMAGE GROUPING SETTING INFO 2
IMAGE GROUPING SETTING INFO 3
IMAGE GROUPING SETTING INFO 4
IMAGE PROCESSING CONDITION SETTING INFO 1
IMAGE PROCESSING CONDITION SETTING INFO 2
IMAGE PROCESSING CONDITION SETTING INFO 3
IMAGE PROCESSING CONDITION SETTING INFO 4
IMAGE DISPLAY DIRECTION SETTING INFO 1
IMAGE DISPLAY DIRECTION SETTING INFO 2
IMAGE SIZE ENLARGEMENT SCALE SETTING INFO 1
IMAGE SIZE ENLARGEMENT SCALE SETTING INFO 2
IMAGE SIZE ENLARGEMENT SCALE SETTING INFO 3
IMAGE DISPLAY FORM SETTING INFO 1
IMAGE DISPLAY FORM SETTING INFO 2
IMAGE DISPLAY FORM SETTING INFO 3
IMAGE DISPLAY FORM SETTING INFO 4
COMBINATION PATTERN 1
COMBINATION PATTERN 2
COMBINATION PATTERN 3
COMBINATION PATTERN 4
ID 1
ID 2
ID 3
ID 4
ID 5
ID 6
9
CPU
5
8
So
7
Sp
6

1. An image displaying apparatus, wherein desired pieces of image display mode setting information are selected from a plurality of kinds of image display mode setting information for setting a display mode, in which images are displayed, and wherein the images are displayed in a desired display mode in accordance with the selected pieces of image display mode setting information comprising:

i) a first storage means for storing the plurality of kinds of image display mode setting information,

ii) a second storage means for storing various combination patterns of the plurality of kinds of image display mode setting information, which are stored in said first storage means,

iii) an input means for inputting identification information,

iv) a first selection means for selecting a combination pattern, which corresponds to the inputted identification information,

/OL
2 10
SS
1
MY
5
998
JMI

from said second storage means and in accordance with the inputted identification information,

v) a second selection means for selecting pieces of image display mode setting information stored in said first storage means, which correspond to the selected combination pattern, from said first storage means and in accordance with the selected combination pattern, and

vi) a display means for displaying the images in a display mode, which corresponds to the selected pieces of image display mode setting information.

5,748,201

SEMICONDUCTOR MEMORY DEVICE HAVING MULTIPLE MODES THAT ALLOW THE CELL ARRAY TO BE DIVIDED INTO A VARIABLE NUMBER OF PORTIONS

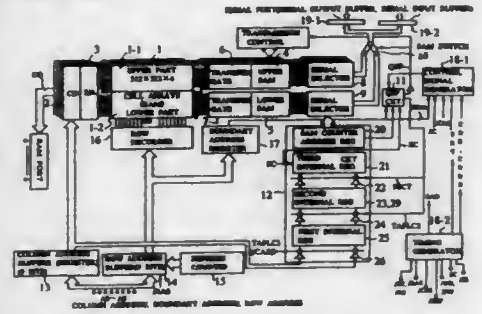
Shigeki Nagasaka, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Mar. 16, 1995, Ser. No. 405,497

Claims priority, application Japan, Mar. 16, 1994, 6-045585

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 345—509 **7 Claims**



1. A semiconductor memory device comprising:

a serial input output buffer;

a RAM cell array having a plurality of DRAM cells arranged in a matrix; and

a SAM cell array having a plurality of SAM cells arranged in a line, the SAM cells corresponding to the DRAM cells in one row,

wherein in a first mode, the SAM cell array is divided into N first portions each having boundaries, data stored in the SAM cells being transferred to the serial input output buffer sequentially until the SAM cells in the boundaries of the first portions are transferred to the serial input output buffer,

in a second mode, the SAM cell array is divided into M (N>M, where N and M are positive integers) second portions each having boundaries, data stored in the SAM cells being transferred to the serial input output buffers sequentially until the SAM cells in the boundaries of the second portions are transferred to the serial input output buffer, and

the semiconductor memory device further comprises a detecting means for detecting changes from the first mode to the second mode and from the second mode to the first mode, and a controlling means for receiving an output of the detecting means and controlling the operation of the SAM cell array in a composite mode made up of a split transfer SRT mode, a CBRS (CAS before RAS refresh stop) mode, and a CBR (CAS before RAS refresh option reset) mode on the basis of the output of the detecting means.

5,748,202

IMAGE DATA PROCESSOR FOR PROCESSING PIXEL DATA IN BLOCK BUFFER

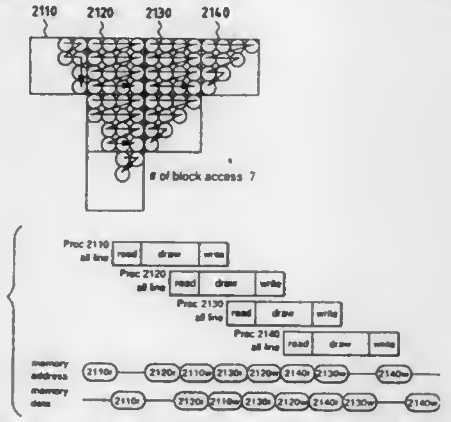
Yasuhiro Nakatsuka, Toukai-mura; Keisuke Nakashima, Hitachi; Shigeru Matsuo, Hitachinaka; Masahisa Narita, Hitachi; Koyo Katsura, Hitachioota; Hidehito Takewa, Hitachi, and Tomoaki Aoki, Oomiya-machi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Engineering Co., Ltd., Ibaraki, both of Japan

Filed Jul. 5, 1995, Ser. No. 498,055

Claims priority, application Japan, Jul. 8, 1994, 6-157183; Sep. 5, 1994, 6-210923; Sep. 20, 1994, 6-224740

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 345—514 **16 Claims**



1. A data processor, comprising: a block buffer for holding pixel data accessed from a memory in block units, and processing means responsive to the processing status of pixel data of every one of respective rows in said block buffer for executing a command with regard to image processing to effect processing of the pixel data.

5,748,203

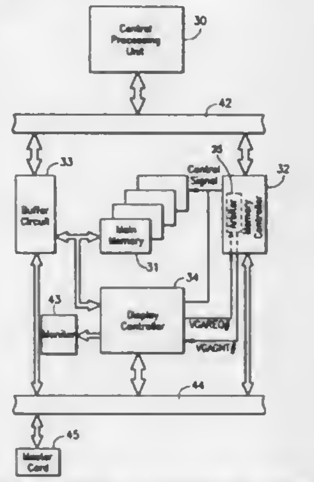
COMPUTER SYSTEM ARCHITECTURE THAT INCORPORATES DISPLAY MEMORY INTO SYSTEM MEMORY

Tsan-Bih Tang, and Chih-Chan Yen, both of Hsinchu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Mar. 4, 1996, Ser. No. 610,456

Int. Cl.^{6} G06F *13/16*

U.S. Cl. 345—521 **1 Claim**



1. A computer architecture incorporating display memory into system memory, comprising:

a memory for storing both system data and display data;

a memory controller, connected to the memory, for controlling access of the system data; and

a display controller, connected to the memory, for controlling access of the display data, wherein the display controller includes means for providing to the memory controller a request signal requesting use of the memory, and the memory controller includes means for providing to the display controller a grant signal granting use of the memory to the display controller for arbitrating control of the memory by the display controller and the memory controller;

means for refreshing the memory, the refreshing means including means for generating a request signal by the display controller for causing a refresh operation; and including means for carrying out a refresh operation after a data access request from the display controller and before a grant is received by the display controller.

5,748,204

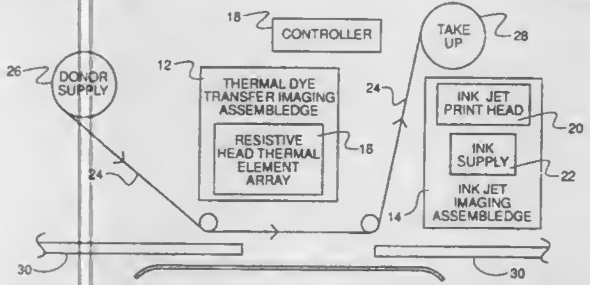
HYBRID IMAGING SYSTEM CAPABLE OF USING INK JET AND THERMAL DYE TRANSFER IMAGING TECHNOLOGIES ON A SINGLE IMAGE RECEIVER

Daniel J. Harrison, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1996, Ser. No. 639,582

Int. Cl.^{6} B41J *2/01;2/325;2/485*

U.S. Cl. 347—2 **7 Claims**


18
CONTROLLER
TAKE UP
28
26
DONOR SUPPLY
12
THERMAL DYE TRANSFER IMAGING ASSEMBLEDGE
RESISTIVE HEAD THERMAL ELEMENT ARRAY
16
24
INK JET PRINT HEAD
20
INK SUPPLY
22
INK JET IMAGING ASSEMBLEDGE
14
24
30
30

1. A hybrid imaging system capable of using both ink jet technology and thermal dye transfer technology for producing images on a dye-receiving element of the type having a support and a polymeric dye image-receiving layer that contains an organic acid capable of reprotonating the deprotonated cationic dye from both ink jet ink and dye-donor ribbon; said printer comprising:

means for defining a print path adapted to accept such a dye-receiving element;

a dye-receiving element transport mechanism adapted to advance a dye-receiving elements along the print path;

an ink jet imaging assemblage located along the print path for selectively producing images on the dye-receiving element using ink jet inks having a dye dispersed in an aqueous ink. the dye being a deprotonated cationic dye which is capable of being reprotonated to a cationic dye having an N-H group which is part of a conjugated system;

a thermal dye transfer imaging assemblage located along the print path for selectively producing images on the dye-receiving element using thermal dye transfer technology and a dye-donor element; and

control means for controlling imaging of image data by the ink jet imaging assemblage and the thermal dye transfer imaging assemblage on the dye-receiving element.

5,748,205

INKJET PRINTER

Marc Duperrier, Fiez, Switzerland, assignor to OCD S.A., Yverdon, Switzerland

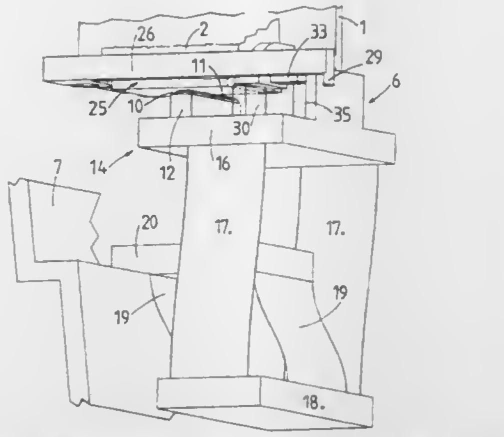
Filed Feb. 13, 1996, Ser. No. 600,371

Claims priority, application Switzerland, Feb. 22, 1995, 513/95

Int. Cl.^{6} B41J *2/165*

U.S. Cl. 347—29 **7 Claims**

1. In an inkjet printer comprising a movable carriage (**1**) having a printing head (**2**) interchangeable with at least one printing head (**3**) of another type, the printer comprising a frame (**7**) and a maintenance station (**6**) having at least two types of covers (**10**, **11**)



adapted to be applied to the printing head (**2**, **3**) of the type to which they are adapted; the improvement wherein the maintenance station (**6**) comprises a cover support (**14**) on which the covers (**10**, **11**) are disposed side by side in a direction perpendicular to the direction of movement (**15**) of the carriage, said support (**14**) being arranged so as to carry out a first translatory movement relative to the frame (**7**) in a direction parallel to said perpendicular direction to position one of the covers (**10**, **11**) facing the printing head (**2**, **3**) plugged into the carriage (**1**), and a second translatory movement relative to the frame in a second direction perpendicular to said perpendicular direction making such an angle with the direction of movement (**15**) of the carriage that the selected cover (**10**, **11**) facing the plugged-in head (**2**, **3**) on the carriage (**1**) will be applied against this plugged-in head during said second translatory movement.

5,748,206

PRINTER

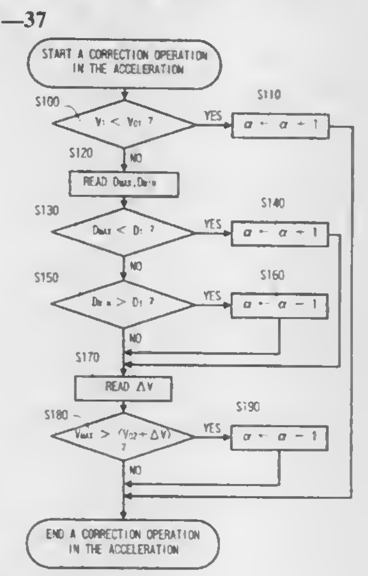
Toshiyuki Yamane, Chiryu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 16, 1996, Ser. No. 766,345

Claims priority, application Japan, Jan. 24, 1996, 8-031446

Int. Cl.^{6} B41J *23/00;21/16*

U.S. Cl. 347—37 **23 Claims**



1. A printer, comprising:

a print head that moves along a recording medium to print images on the recording medium;

a motor for driving the print head for movement;

a motor control means for controlling an operating speed of the motor during an acceleration phase and a printing phase of a printing cycle;

moving speed detecting means for detecting a moving speed of the print head during each phase; and

motor speed correcting means which for comparing the moving speed of the print head detected by the moving speed detecting means with a predetermined desired moving speed during the acceleration phase, and for directing the motor speed correcting means to correct the operating speed of the motor in a present printing cycle on the basis of a result of the comparison to provide a desired operating speed to which the motor control means adjusts the operating speed of the motor in a next printing cycle.

5,748,207

INK JET RECORDING SYSTEM FOR PREVENTING BLURRING AT COLOR BOUNDARY PORTION

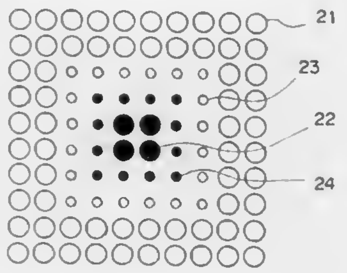
Toshiharu Inui; Naoji Otsuka, both of Yokohama; Mamoru Sakaki, Yamato; Jiro Moriyama; Nobuyuki Kuwabara, both of Kawasaki; Isao Ebisawa; Hiroshi Tajika, both of Yokohama; Atsushi Arai; Hisao Yaegashi, both of Kawasaki; Kentaro Yano, Yokohama; Kiichiro Takahashi, Kawasaki; Osamu Iwasaki, Tokyo, and Daigoro Kanematsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1993, Ser. No. 143,122

Claims priority, application Japan, Oct. 30, 1992, 4-292640; Oct. 30, 1992, 4-293009; Oct. 30, 1992, 4-293017; Oct. 8, 1993, 5-253050

Int. Cl.^{6} B41J *2/21;2/145;2/15*

U.S. Cl. 347—43 **50 Claims**



50. An ink jet recording apparatus for recording an image on a recording medium, comprising:

an ink jet recording head having a plurality of ejection portions associated with a plurality of color inks, for recording the image on the recording medium by ejecting the color inks in accordance with an input image information;

image recording means for recording a plurality of record pixels in a predetermined region along a color boundary defined by a color difference in units of record pixels of the image, by causing said recording head to eject the ink in an ejection amount which is smaller than an ejection amount of the ink for a region which is not the color boundary when at least one of record pixels of different colors adjacent to the color boundary is formed by at least two said inks.

5,748,208

COLOR INK JET RECORDING METHOD

Yaeko Uchiyama, deceased, late of Suwa, by Kazuhiro Uchiyama, sole heir; Masaaki Itano, Suwa, and Hiroko Hayashi, Suwa, all of Japan, assignors to Seiko Epson Corporation, Tokyo-to, Japan

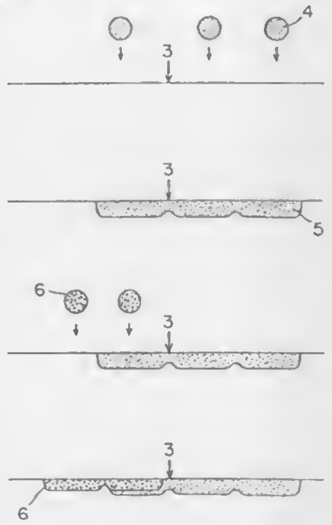
PCT No. PCT/JP93/00680, § 371 Date Apr. 19, 1994, § 102(e) Date Apr. 19, 1994, PCT Pub. No. WO93/24330, PCT Pub. Date Dec. 9, 1993

PCT Filed May 24, 1993, Ser. No. 182,017

Claims priority, application Japan, May 22, 1992, 4-130269; Jun. 11, 1992, 4-152385; Sep. 10, 1992, 4-242221; Dec. 28, 1992, 4-348848

Int. Cl.^{6} B41J *2/21;* **G01D** *11/00*

U.S. Cl. 347—43 **8 Claims**



1. A color ink jet recording method for printing on a recording medium containing a portion to be rendered black and a color portion, the portion to be black being in contact with the color portion in a color image to be formed, said method comprising the steps of:

a) printing first at least one color ink on a subportion of the portion to be black which subportion is in contact with the color portion on the recording medium, whereby the portion to be black is partially printed with the at least one color ink,

b) printing a black ink on the portion to be black which is partially printed with the at least one color ink according to the previous step, said at least one color ink having a surface tension at 20° C. of less than 40 dyn/cm and the black ink having a surface tension at 20° C. of 40 dyn/cm or more.

5,748,209

THERMAL INK JET TAB CIRCUIT HAVING A PLURALITY OF TRACE GROUPS WHEREIN ADJACENT TRACES IN EACH GROUP ARE STAGGERED

Terri I. Chapman, Escondido; Hai Q. Tran, San Diego, and Brian J. Keefe, La Jolla, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1994, Ser. No. 331,784

Int. Cl.^{6} B41J *2/01*

U.S. Cl. 347—50 **4 Claims**

1. An ink jet pen comprising:

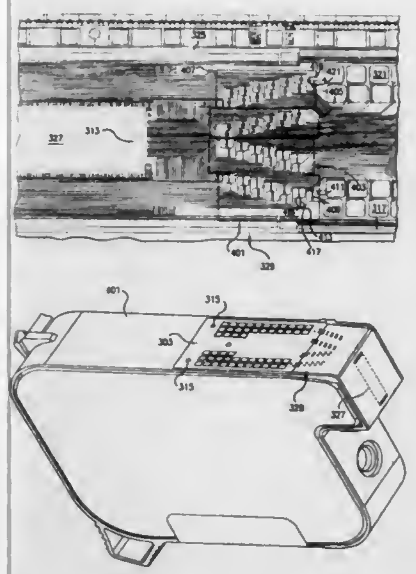
a pen body housing having an ink storage compartment therein and having outer surfaces which are contoured to mate with an ink jet printer;

a flexible TAB circuit operationally secured to the pen body such that terminal pads on the TAB circuit mate with corresponding contacts on the ink jet printer;

the TAB circuit having a plurality of active traces where the active traces are formed into trace groups and where the traces which form a trace group are arranged in a staggered pattern such that clearance areas are formed between adjacent traces;

a plurality of interconnect conductors disposed between adjacent traces; and

trace isolating openings disposed in said clearance areas for electrically separating interconnect conductors disposed between adjacent traces.



5,748,210

INK JET TYPE RECORDING UNIT WITH AN IMPROVED CARRIAGE STRUCTURE

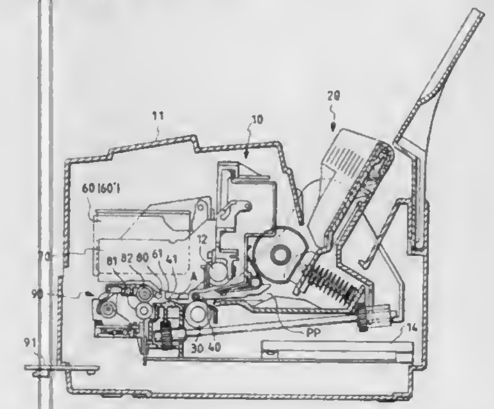
Kohji Watanabe; Satoshi Fujioka; Fujio Akahane; Yoshikatsu Yamamoto; Susumu Murayama; Takayuki Okuda; Masanori Yoshida, and Atsushi Nishizawa, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 2, 1995, Ser. No. 552,520

Claims priority, application Japan, Nov. 2, 1994, 6-293908; Jan. 23, 1995, 7-027329; May 24, 1995, 7-149643

Int. Cl.^{6} B41J *2/14;2/16*

U.S. Cl. 347—50 **21 Claims**



1. An ink jet printer, characterized by comprising:

an ink jet type recording head for jetting printing ink towards a printing sheet to print given data thereon;

a carriage on which said ink jet type recording head is detachably mounted;

a substantially flat-plate-shaped first electrical connecting section provided on said carriage;

a substantially flat-plate-shaped second electrical connecting section provided on said ink jet type recording unit, so as to be connected to said first electrical connecting section under pressure;

an energizing member adapted to connect said first electrical connecting section to said second electrical connecting section under pressure; and

a moving mechanism which,

when said ink jet type recording unit is mounted on said carriage, moves said first electrical connecting section towards said second electrical connecting section so that said first and second electrical connecting sections are connected to each other under pressure by said energizing member, and

when said ink jet type recording unit is removed from said carriage, moves said first electrical connecting section away from said second electrical connecting section against the elastic force of said energizing member.

5,748,211

RECORDING HEAD AND RECORDING APPARATUS

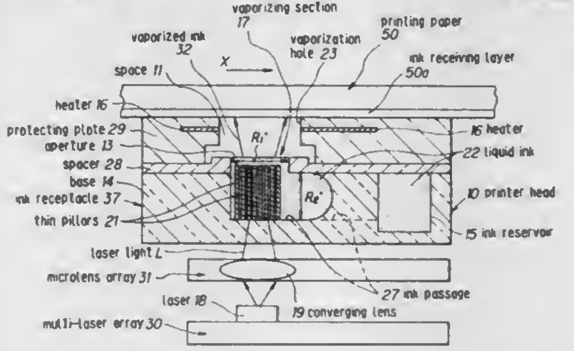
Kenji Shinozaki, and Hideki Hirano, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 4, 1995, Ser. No. 434,853

Claims priority, application Japan, May 6, 1994, 6-117570

Int. Cl.^{6} B41J *2/14*

U.S. Cl. 347—51 **10 Claims**



1. A recording head which vaporizes a recording substance and transfers the vaporized recording substance onto a medium on which information is to be recorded, the recording head comprising:

a base;

a protecting plate secured to the base;

a spacer wall secured between the base and the protecting plate;

a recording substance reservoir in said base;

a vaporizing section having an opening in said protecting plate and a single aperture in said spacer wall through which vaporized recording substance is emitted said vaporizing section aperture having a radius;

a passage in said base in fluid communication with said reservoir and said vaporizing section, said passage having a radius and cross section with a radius; and

heating means in said protecting plate for vaporizing said recording substance; wherein

the recording substance is supplied from said reservoir to said vaporizing section through said passage,

the radius of said aperture in said spacer wall is smaller than the radius of the cross section of said passage, a ratio of said radius of said aperture to said radius of said passage being over 1:1.5 and said radius of said aperture being 5 micro-meters to 300 micro-meters.

5,748,212

IMAGE FORMING APPARATUS HAVING A CHARGED PARTICLE CONTROL DEVICE WITH A SELECTIVELY INSULATING ARRANGEMENT

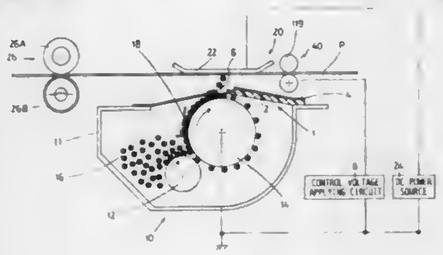
Osamu Takagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

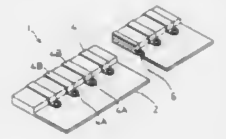
Filed Jun. 20, 1994, Ser. No. 262,493

Claims priority, application Japan, Aug. 19, 1993, 5-204933

Int. Cl.⁶ B41J *2/06*

U.S. Cl. 347—55 **30 Claims**





1. An image forming apparatus for forming an image with toner on a supporter comprising:

toner supply means for supplying charged toner to the image supporter;

toner flow control means for controlling flow of the charged toner from the toner supply means to the supporter, the toner flow control means having a first side and a second side, wherein the first side contacts the toner supply means, the toner flow control means including apertures for passage of the charged toner and control electrodes disposed on the second side adjacent to each of the apertures, each of the control electrodes comprising a first portion and a second portion;

voltage supply means electrically connected to the control electrodes for applying a control voltage to said control electrodes to form an electric field near each of the apertures to control passage of the charged toner; and

shielding means disposed adjacent to the second portion of the control electrodes for shielding the electric field formed between the second portion of each of the control electrodes and the toner supply means,

wherein only the first portion contributes to formation of the electric field for controlling the toner flow when the control voltage is applied to the control electrodes by the voltage supply means, and the second portion is shielded from forming the electric field capable of controlling the toner flow by the shielding means, and

wherein the toner flow control means includes a first insulating flat plate for mounting the control electrodes thereon, and the shielding means comprises a second insulating flat plate disposed on the first insulating flat plate provided between the second portions of the control electrodes and the toner supply means, the second insulating flat plate comprising a layer having a low dielectric constant that is equal to or lower than a dielectric constant of the first insulating flat plate.

5,748,213

INK JET HEAD HAVING PLURAL ELEMENTAL SUBSTRATES, APPARATUS HAVING THE INK JET HEAD, AND METHOD FOR MANUFACTURING THE INK JET HEAD

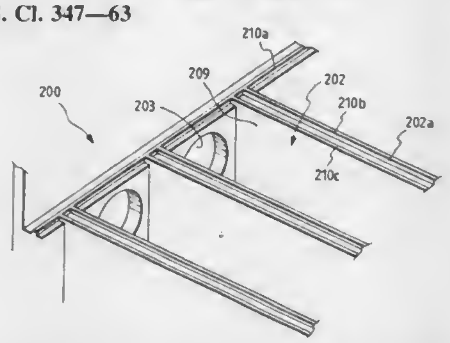
Seiichiro Karita, Yokohama; Hiroshi Sugitani, Machida; Yutaka Koizumi, Yokohama; Toshio Kashino, Chigasaki; Haruhiko Terai; Akira Goto, both of Yokohama; Kouichi Omata, Kawasaki; Hiroki Tajima, Machida; Kiyomitsu Kudo; Shin Ishimatsu, both of Yokohama, and Masaru Iketani, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1995, Ser. No. 549,200

Claims priority, application Japan, Oct. 28, 1994, 6-265552; Oct. 28, 1994, 6-265553

Int. Cl.⁶ B41J *2/05*

U.S. Cl. 347—63 **14 Claims**



1. An ink jet head for discharging ink, comprising:

a plurality of elemental substrates having a plurality of discharge energy generating elements arranged in an array for generating discharge energy for discharging ink; and

a grooved member having a plurality of walls joined with said plurality of elemental substrates arranged to constitute ink paths each corresponding to each of said discharge energy generating elements, said ink paths being formed by joining said walls of the grooved member under pressure with said plurality of elemental substrates arranged,

wherein among said plurality of walls, a plurality of ribs are formed on the bottom of each said wall arranged on each boundary between said elemental substrates, and configured along said boundary line to contact each of different elemental substrates, respectively.

11. A method for manufacturing ink jet head, comprising the following steps of:

arranging in an array a plurality of elemental substrates having a plurality of discharge energy generating elements arranged in line to generate the discharge energy for discharging ink;

forming a grooved member by forming a plurality of walls for constituting ink paths corresponding to each of said discharge energy generating elements, and a plurality of ribs on the bottom of said walls; and

arranging the ribs of each wall positioned on each boundary between said elemental substrates to be in contact with different elemental substrates to join the grooved member and elemental substrates under pressure.

5,748,214

INK JET RECORDING HEAD

Minoru Usui; Kazuhiko Hara; Yoshio Miyazawa; Yuji Tanaka; Fujio Akahane; Takahiro Katakura; Shinri Sakai; Yasushi Kishida; Tomoaki Abe; Toshiki Usui; Takeo Seino, and Yoshikatsu Yamamoto, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

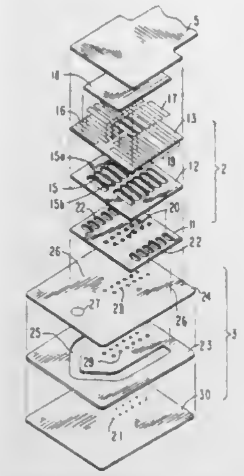
Filed Aug. 3, 1995, Ser. No. 510,996

Claims priority, application Japan, Aug. 4, 1994, 6-204326; Aug. 23, 1994, 6-222562; Aug. 25, 1994, 6-201088; Sep. 1, 1994, 6-208898; Dec. 21, 1994, 6-335620; Apr. 5, 1995, 7-104768

Int. Cl.⁶ B41J *2/45*

U.S. Cl. 347—70 **14 Claims**

1. An inkjet recording head integrally formed by sequentially laminating:



a resilient plate for forming a vibration member having piezoelectric vibration elements on a surface thereof;

a pressure producing chamber forming plate for forming pressure producing chambers with a surface thereof sealed by the resilient plate;

a seal plate an other surface of the pressure producing chamber forming plate and having therethrough a plurality of communication paths and ink supply communication paths, each communication path and each ink supply communication path communicating with a selected corresponding pressure producing chamber at a respective end portion of the pressure producing chamber;

an ink supply constricted port forming plate having first ink supply constricted ports for imparting fluid resistance to ink supply paths to the pressure producing chambers and having communication paths communicating with the pressure producing chambers;

a reservoir chamber forming plate having a reservoir chamber communicating with the pressure producing chambers through the ink supply constricted ports and communication paths communicating with the pressure producing chambers, and

a nozzle plate sealing other surface of the reservoir chamber forming plate and having nozzles connected to the pressure producing chambers through the communication paths, such that

each ink supply communication path is formed so that one end thereof is arranged outside a region confronting the pressure producing chamber at a region confronting the reservoir chamber; and

each first ink supply constricted port is positioned at a portion of the ink supply communication path, the portion being remotest from the pressure producing chamber.

5,748,215

INK-JET PRINTER INCLUDING INK CARTRIDGE WITH OPTIMUM SNOUT AND ALIGNMENT SURFACES

David W. Swanson, Escondido; George T. Kaplinsky, San Diego; James G. Salter, Sacramento, and W. Wistar Rhoads, Escondido, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 995,221, Dec. 22, 1992, abandoned. This application Jun. 28, 1995, Ser. No. 496,044

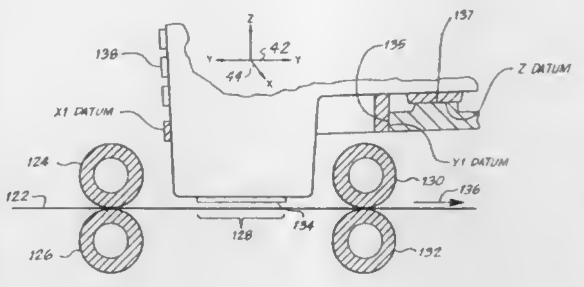
Int. Cl.⁶ B41J *2/175;2/01*

U.S. Cl. 347—87 **1 Claim**

1. An ink-jet printer, comprising:

a printer carriage carrying an ink-jet cartridge and positioning the cartridge at a print area for ink-jet printing of ink droplets onto a surface of a print medium, said carriage including respective X, Y and Z carriage datum alignment surfaces;

print medium advancement apparatus for advancing print medium along a print media path to said print area, said apparatus including an input set of media control rollers/wheels and an output set of media control rollers/wheels, the print medium being engaged and driven between said input set of rollers/wheels and said output set of rollers/wheels, and



wherein said ink cartridge comprises:

an outer casing suitable for mounting in said printer carriage;

an inner expandable ink reservoir completely surrounded by said outer casing, said reservoir formed by at least one flexible wall member and a rigid frame for holding a supply of ink in the ink cartridge;

a spring member located inside of said reservoir, said spring member including plate means engageable with said flexible wall member for creating negative pressure in said reservoir; and

a snout structure incorporated as part of said outer casing and located adjacent to and extending outwardly from said inner expandable ink reservoir for transferring ink along a passage through a filter to a printhead, and wherein said outer casing includes an outer frame member of a first material for holding the printhead at the snout structure and including respective X, Y and Z cartridge datum alignment surfaces which are engageable against corresponding ones of the carriage datum alignment surfaces, and further includes side cover members of a second material for protecting said reservoir and snout means;

and wherein said outer casing has a casing dimension along a media advance direction, said snout structure has a snout dimension along said media advance direction, and said snout dimension is truncated relative to said casing dimension to permit close positioning of the input and output sets of rollers/wheels adjacent the printhead and thereby facilitate secure positioning of print media in said print area by said sets of media control roller/wheels;

and wherein said X, Y and Z cartridge datum alignment surfaces are vertically displaced above said input and output sets of rollers/wheels so that said cartridge and carriage datum alignment surfaces do not interfere with said close positioning of the sets of rollers/wheels.

5,748,216

INKJET PRINT CARTRIDGE HAVING VALVE CONNECTABLE TO AN EXTERNAL INK RESERVOIR FOR RECHARGING THE PRINT CARTRIDGE

Joseph E. Scheffelin; David S. Hunt, both of San Diego; Mark E. Young, Escondido; Elizabeth Zapata, San Diego; Alfred Zepeda, San Marcos; Christopher J. Shultz, San Diego, and Jon Fong, Manhattan Beach, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 314,978, Sep. 29, 1994, abandoned, and a continuation-in-part of Ser. No. 322,848, Oct. 13, 1994, Pat. No. 5,621,445, and a continuation-in-part of Ser. No. 503,756, Jul. 18, 1995, abandoned, which is a continuation-in-part of Ser. No. 717,735, Jun. 16, 1991, Pat. No. 5,359,353, said Ser. No. 322,848 is a continuation-in-part of Ser. No. 171,321, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 750,360, Aug. 27, 1991, Pat. No. 5,280,300. This application Mar. 14, 1996, Ser. No. 616,829

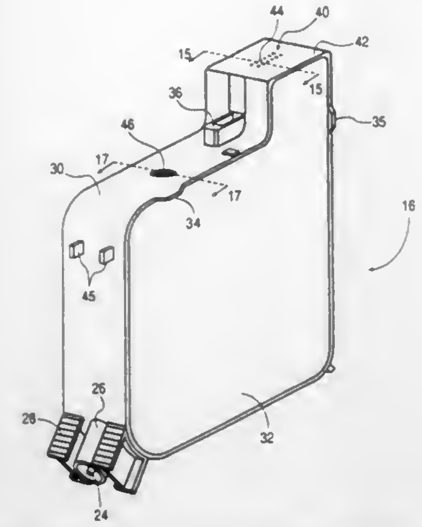
Int. Cl.⁶ B41J *2/175*

U.S. Cl. 347—87 **20 Claims**

1. An inkjet printing system comprising:

a print cartridge having a print cartridge body;

a first reservoir for ink within said body;



a printhead supported on said body in fluid communication with said first reservoir; and

an ink recharge port on said body for refilling said first reservoir with ink after said ink in said first reservoir has been at least partially depleted, said ink recharge port being sealed by a first valve, said first valve being actuated to be in an opened state or a closed state, said closed state providing a fluid seal of said first reservoir, said opened state providing fluid communication between an external ink reservoir and said first reservoir when said external ink reservoir is connected to said first valve, said first valve allowing no ambient air to enter said first reservoir when in fluid communication with said external ink reservoir,

actuation of said first valve to be in said opened state occurring automatically upon engaging said external ink reservoir with said first valve, actuation of said first valve to be in said closed state occurring automatically by disengaging said external ink reservoir from said first valve.

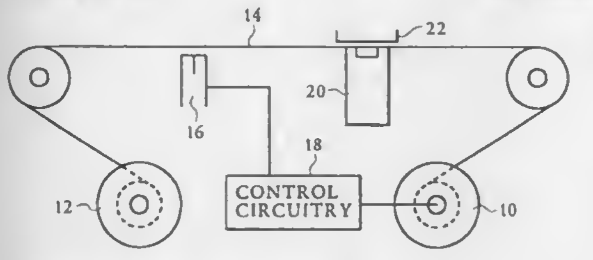
5,748,217
CHARGE COMPENSATION CIRCUIT FOR AN ELECTROSTATIC WRITING HEAD

Arthur E. Bliss, Sunnyvale, Calif., assignor to Phoenix Precision Graphics, Inc., Sunnyvale, Calif.

Filed Nov. 16, 1995, Ser. No. 558,876

Int. Cl.^{6} G03G *15/01;* **B41J** *2/05*

U.S. Cl. 347—141 **20 Claims**



1. An electrostatic printer, comprising:

a supply of dielectric material;

an electrostatic head means for writing an electrostatic image strip on said dielectric material, said head means including a linear array of closely spaced electrodes, positioned proximate to said dielectric material;

means, electrically coupled to said head means, for charging each said electrode of said linear array to a predetermined voltage, with each said electrode maintaining said charge for a predetermined charge time to produce an electrostatic latent image strip on said dielectric material;

control means, electrically coupled to said head means, for independently controlling the charge time of different ones of said electrodes to provide differing charge times to said electrodes of said linear array;

means coupled to said supply and head means, for synchronizing motion of said head means with said dielectric material forming a pattern of abutting strips; and

means, adjacent to said head means, for applying fluid developer to said latent image, thereby producing a visible image.

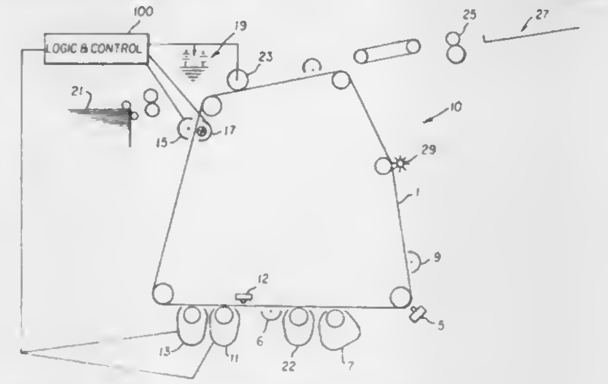
5,748,218
METHOD FOR FORMING TONER IMAGES WITH TWO DISTINCT TONERS

Eric C. Stelter, Pittsford; Joseph E. Guth, Holley, and W. Charles Kasiske, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1996, Ser. No. 583,732

Int. Cl.^{6} G03G *15/00;* **B41J** *2/385*

U.S. Cl. 347—158 **14 Claims**



1. An image forming method comprising:

forming a first electrostatic image of a first polarity on a first side of a photoconductive image member;

applying a first toner of the first polarity to the first electrostatic image to form a first toner image on said first side;

imagewise exposing the image member from a second side of the image member opposite the first side to form a second electrostatic image in registration with the first toner image; and

applying a second toner of a second polarity opposite the first polarity to the second electrostatic image to form a second toner image in registration with the first toner image.

5,748,219
ELECTROTHERMAL RECORDER

Yehuda Alt, Tel Aviv, Israel, assignor to Thermopol, Inc., Chicago, Ill.

Filed Dec. 9, 1994, Ser. No. 353,084

Int. Cl.^{6} B41J *2/315;2/32;* **G01D** *15/10*

U.S. Cl. 347—171 **12 Claims**

1. An electrothermal recorder comprising:

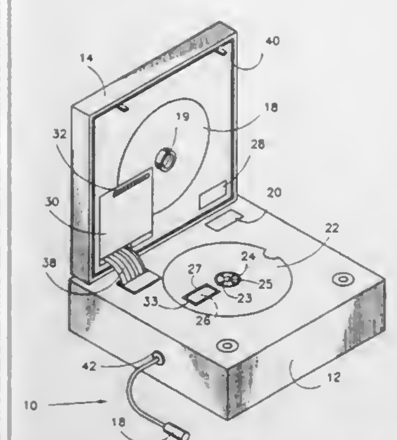
a thermosensitive recording surface of a circular recording card which moves at a preselected, controlled, rate along a circular time axis;

an electrothermal print head having an array of separately activated electrothermal printing elements engaging said thermosensitive recording surface along a recording axis generally perpendicular to said time axis;

a probe for sensing a magnitude of a preselected parameter and generating an output responsive to the sensed magnitude;

a controller which generates command signals responsive to the output from said probe to said printhead for selectively activating the electrothermal elements of said printhead to thermoprint an indication of the sensed magnitude on said thermosensitive recording surface at a particular location on said time axis;

a housing having a site for mounting said recording card;



a cover pivotably mounted on said housing and adapted for covering said mounting site, when the cover is closed, and uncovering said mounting site, when the cover is open; and

an environment sealing member mounted between said housing and said cover.

5,748,220
THERMAL LINE-PRINTER HEAD

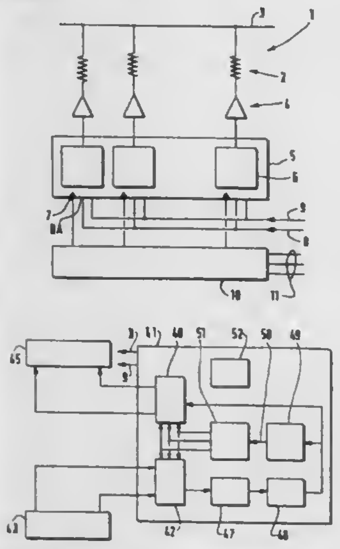
Salvador Garcia, Argenteuil; Patrick Vegeais, Paris, and Alain Frederic, Cergy, all of France, assignors to Societe d'Applications Generales d'Electricite, France

Filed Aug. 4, 1994, Ser. No. 285,949

Claims priority, application France, Aug. 4, 1993, 93 09611

Int. Cl.^{6} B41J *2/355;* **H04N** *1/024*

U.S. Cl. 347—181 **8 Claims**



1. Line head (**1**) thermal printing apparatus including a plurality of printing heating elements (**2**) interactively connected to individual activation means (**7, 8**) and memory points (**6; 46**) in a printing register (**5; 45**) said printing heating elements being adapted to print, under control of the individual activation means (**7, 8**) and by means of the memory points (**6; 46**) of the printing register (**5; 45**) successive lines of points on a medium being printed which is driven in advance against the head (**1**), said apparatus includes means (**10; 40**) for individual write addressing of the memory points (**6; 46**).

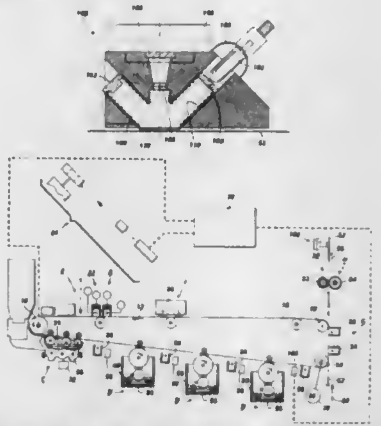
5,748,221
APPARATUS FOR COLORIMETRY GLOSS AND REGISTRATION FEEDBACK IN A COLOR PRINTING MACHINE

Vittorio Castelli; Edward J. Solcz, both of Yorktown Heights; John J. Ricciardelli, Poughkeepsie, all of N.Y.; Harold Anderson, Rancho Palos Verdes, Calif., and Harold Brown, New City, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1995, Ser. No. 551,306

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—232 **13 Claims**



1. A multi-function sensor for measuring registration, gloss and colorimetric values of a test patch image printed on a substrate in a multi-color printing machine, comprising:

a first detector for determining a colorimetric value of the image and generating a signal indicative thereof;

a second detector for determining a gloss value of the image and generating a signal indicative thereof; and

a third detector for determining a registration value between a plurality of color separations in the image and generating a signal indicative thereof;

a fourth detector for internal sensor parameter compensation.

5,748,222
LASER ANGROXING HEAD EMPLOYING ACOUSTO-OPTIC MODULATOR

Simon H. Roberts, London, Great Britain, assignor to ZED Instruments Ltd., Surrey, United Kingdom

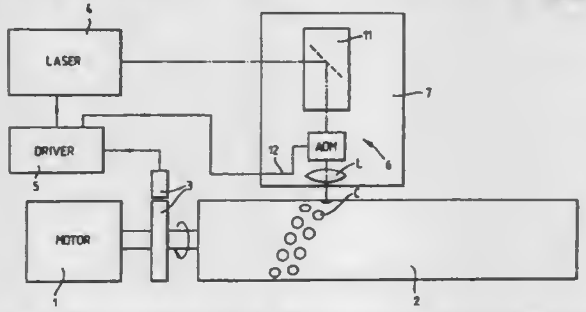
PCT No. PCT/GB93/01235, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/25387, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 10, 1993, Ser. No. 341,536

Claims priority, application United Kingdom, Jun. 11, 1992, 9212456; Sep. 2, 1992, 9218567

Int. Cl.^{6} B41T *2/47;* **G01D** *15/14;* **G02B** *26/00;27/00*

U.S. Cl. 347—241 **31 Claims**



1. A laser engraving head (**6**) for use in an apparatus for preparing a medium for use in a printing process, including an acousto-optic modulo (AOM) for deflecting laser beams, means (L) for focusing the deflected laser beams onto a surface of the medium, and a stop (**50**) arranged to provide an optical dump for an unwanted order output from the modulator, characterised in that the means for focusing (L) are arranged telecentrically with respect

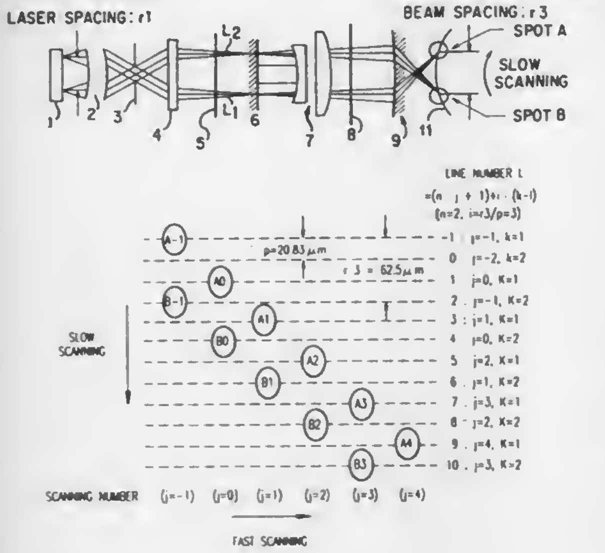
to the deflected laser beams, an exit pupil (P) defined by a range of deflected beams being located at a back focal plane of the means for focusing, and in that the head further comprises a plurality of interchangeable beam expanders (**20**) mounted within the head (**6**), a selected one of the beam expanders (**20**) being movable into a path of the laser beams between the modulator and the means for focusing in order to provide a desired cell size.

5,748,223
IMAGE WRITING APPARATUS HAVING A MULTI-BEAM SCANNING OPTICAL SYSTEM FOR IMPROVING THE QUALITY OF REPRODUCED IMAGES

Masao Ito, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1995, Ser. No. 541,699
Claims priority, application Japan, Apr. 20, 1995, 7-094898
Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—241 **8 Claims**



1. An image writing apparatus comprising:

a laser array including a plurality of laser diodes modulated independently; and

a multi-beam scanning optical system having a deflector which deflects a plurality of laser beams produced by said laser diodes and operating on the laser beams deflected by said deflector to scan different scanning lines on a scanning surface thereby to write an image on the scanning surface,

wherein said multi-beam scanning optical system is designed such that a number of the plurality of laser beams n and a spacing of the scanning lines p resulting from the scanning of the laser beams meet the condition of formula:

$$1/(n\cdot p)\geqq 4 \textit{ line pairs per millimeter}$$

and wherein said multi-beam scanning optical system is designed for interlace-scanning such that the interlace-scanning period i, which is defined to be a spacing of adjoining beams r3 divided by p, and the number of laser beams n are prime natural numbers with each other.

5,748,224

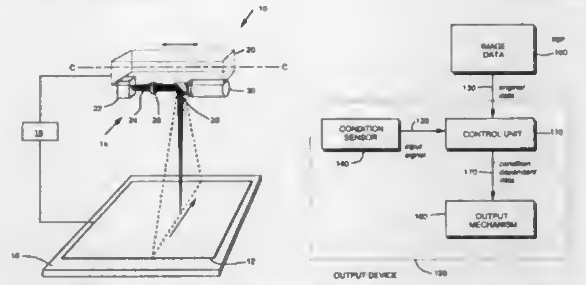
Patent Not Issued For This Number

5,748,225
CONDITION SENSITIVE METHOD AND APPARATUS FOR IMAGING A LITHOGRAPHIC PRINTING PLATE

Leah Ziph-Schatzberg, No. Andover, Mass., assignor to Agfa Division, Bayer Corporation, Wilmington, Mass.

Filed Mar. 31, 1995, Ser. No. 414,393
Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—262 **36 Claims**



1. A method for producing an image on a receiving material, comprising the steps of:

(a) sensing a condition of an image receiving material on which an image is to be formed by an imaging beam;

(b) adjusting the imaging beam according to the sensed condition of the image receiving material to compensate for a change in a condition sensitive characteristic of the image receiving material due to a difference between the sensed condition and a reference condition of the image receiving material; and

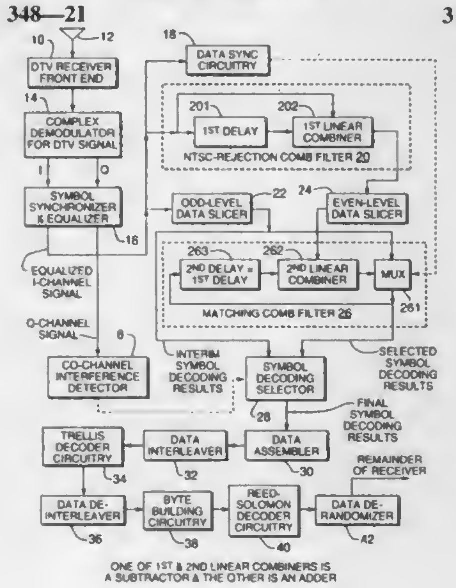
(c) forming the image on the image receiving material with the adjusted imaging beam.

5,748,226
DIGITAL TELEVISION RECEIVER WITH ADAPTIVE FILTER CIRCUITRY FOR SUPPRESSING NTSC CO-CHANNEL INTERFERENCE

Allen LeRoy Limberg, Vienna, Va., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 12, 1996, Ser. No. 746,520
Int. Cl.^{6} H04N *5/38*

U.S. Cl. 348—21 **31 Claims**



ONE OF 1ST & 2ND LINEAR COMBINERS IS A SUBTRACTOR & THE OTHER IS AN ADDER

1. A method of symbol decoding a stream of 2N-level symbols each having a symbol epoch of a specified length in time, which said stream of 2N-level symbols is susceptible to being accompanied by artifacts of co-channel interfering analog television signal, said method generating final symbol decoding results and comprising the steps of:

comb filtering said stream of 2N-level symbols to generate a comb filter response with (4N−1)-level symbols from which any said artifacts of co-channel interfering analog television signal are suppressed, said step of comb filtering including substeps of

delaying said stream of 2N-level symbols by a prescribed number of said symbol epochs to generate a delayed stream of 2N-level symbols and

linearly combining said stream of 2N-level symbols and said delayed stream of 2N-level symbols, in an addition procedure for generating first linear combining results as said comb filter response with (4N−1)-level symbols;

data-slicing said stream of 2N-level symbols to generate interim symbol decoding results;

data-slicing said comb filter response with (4N−1)-level symbols to generate supplemental symbol decoding results;

delaying selected symbol decoding results by a prescribed number of said symbol epochs to generate delayed selected symbol decoding results;

linearly combining said supplemental symbol decoding results with said delayed selected symbol decoding results, in accordance with a subtraction procedure carried out in a modulo-2N arithmetic for generating second linear combining results;

selecting said interim symbol decoding results to be said selected symbol decoding results at prescribed times and otherwise selecting said second linear combining results to be said selected symbol decoding results;

determining when said stream of 2N-level symbols is currently accompanied by artifacts of co-channel interfering analog television signal of sufficient strength that said selected symbol decoding results are less likely to be in error than said interim symbol decoding results and when said stream of 2N-level symbols is not currently accompanied by artifacts of co-channel interfering analog television signal of sufficient strength that said selected symbol decoding results are less likely to be in error than said interim symbol decoding results;

choosing said interim symbol decoding results as said final decoding results, responsive to it being determined said stream of 2N-level symbols is not currently accompanied by artifacts of co-channel interfering analog television signal of sufficient strength that said selected symbol decoding results are less likely to be in error than said interim symbol decoding results; and

choosing said selected symbol decoding results as said final decoding results, responsive to it being determined said stream of 2N-level symbols is currently accompanied by artifacts of co-channel interfering analog television signal of sufficient strength that said selected symbol decoding results are less likely to be in error than said interim symbol decoding results.

5,748,227

Patent Not Issued For This Number

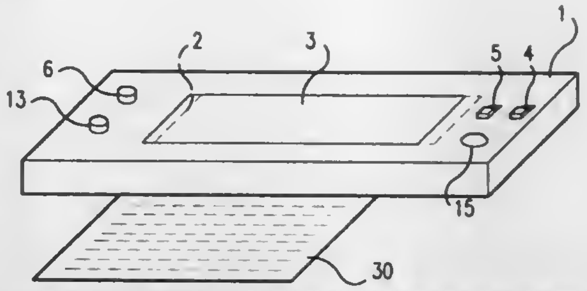
5,748,228
IMAGE INFORMATION ENLARGING READING DEVICE

Kenichi Kobayashi; Selgo Makida; Yoshio Nishihara, and Naoki Hiji, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 667,911, Jun. 27, 1996, abandoned, which is a continuation of Ser. No. 428,013, Apr. 25, 1995, abandoned. This application May 8, 1997, Ser. No. 853,335
Claims priority, application Japan, May 27, 1994, 6-136620
Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—63 **7 Claims**

1. An image information enlarging device for assisting a reader comprising:



a planar body having a top surface, a bottom surface parallel to the top surface, and at least one side surface, each of said top and bottom surfaces having a surface area greater than the surface area of the at least one side surface;

image inputting means forming the bottom surface of the body, wherein said image inputting means is a non-mechanical scanning two-dimensional contact type image sensor;

image displaying means forming most of the top surface of the body for displaying all or a part of the image information inputted by said image inputting means; and

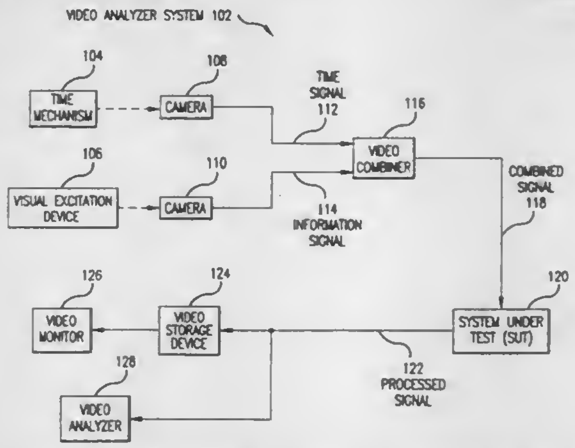
an image inputting portion of said image inputting means and a displaying portion of said image displaying means, said displaying portion being positioned directly over and substantially parallel to said image inputting portion and the image information inputted, the information enlarging device further comprising means for enlarging information input by said image inputting portion of said image inputting means and displayed by said displaying portion of said image displaying means.

5,748,229
SYSTEM AND METHOD FOR EVALUATING VIDEO FIDELITY BY DETERMINING INFORMATION FRAME RATE

Edward J. Stoker, Plano, Tex., assignor to MCI Corporation, Washington, D.C.

Filed Jun. 26, 1996, Ser. No. 670,865
Int. Cl.^{6} H04N *17/00*

U.S. Cl. 348—180 **11 Claims**



1. A method of evaluating video fidelity, comprising the steps of:

(1) sampling a time mechanism to thereby obtain a time video signal;

(2) sampling a visual excitation device to thereby obtain an information video signal;

(3) superimposing the time video signal over the information video signal to thereby produce a combined video signal;

(4) transmitting the combined video signal over a system under test (SUT), wherein a processed video signal exits from the SUT; and

(5) analyzing the processed signal to thereby evaluate the video fidelity of the SUT.

VOL
2 10
ISS
1
MY
5
998
MI

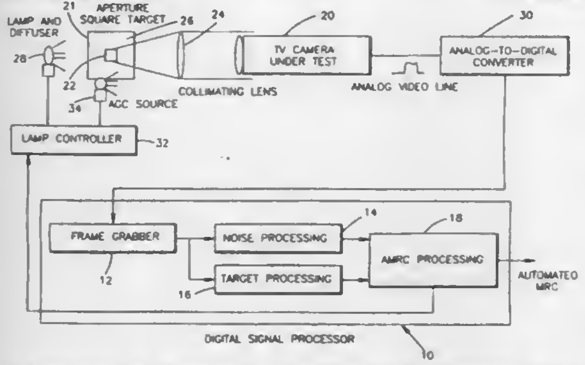
5,748,230
AUTOMATED MINIMUM RESOLVABLE CONTRAST (AMRC) TEST

Harold J. Orlando, Costa Mesa; Michael L. Pappas, Anaheim, and Marco A. Lopez, Villa Park, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Oct. 27, 1995, Ser. No. 549,587

Int. Cl.^{6} H04N *17/00;17/02*

U.S. Cl. 348—187 **20 Claims**



1. Apparatus for automatically performing the Minimum Resolvable Contrast (MRC) test on an image sensor, such as a TV camera, comprising:

target means for producing a test image to be sensed by said image sensor under test;

luminance means for illuminating said target means and producing a number of frames of said test image at different luminance levels for input to said image sensor;

means for processing video signals, indicative of an image frame, output by said image sensor in response to sensing a test image frame from said target means, comprising:

means for sensing DC response and noise characteristics from said image frame indicative video signals and producing DC response and noise data signals indicative thereof;

means for sensing said image frame indicative video signals and generating a Modulation Transfer Function (MTF) signal in response thereto; and

means for collecting and processing said noise and target data signals and said MTF function signal for a number of image frames at different target luminance levels and outputting signals indicative of said collected signals;

means, using said collected signals, for calculating the values

$$AMRC(N) = SNR_{TH}\left[\frac{\alpha}{2\Delta f_v t\epsilon}\right]^{1/2}\frac{N}{R_{SF}(N)}\;\frac{\left[\beta_T(N)\,\frac{(2-AMRC(N))}{2}\,(V_{total}^2-V_p^{\,2})+V_p^{\,2}\right]^{1/2}}{V_{SIG}}$$

and producing an automated MRC output signal indicative of said values, where:

SNR_{TH} is threshold signal to noise ratio;

Δf_v is video bandwidth (Hz);

t is observer eye integration time (sec);

ϵ is target bar aspect ratio (length to width);

α is display aspect ratio;

N is target frequency (TV lines per picture height);

$R_{SF}(N)$ is system square wave response (measured only at one luminance level);

$$B_T(N) = \frac{\int_0^N |R_{OT}(N)|^2 dN}{N}$$

is noise filter function perpendicular to the target bars, where

R_{OT} (N) is the sine wave response of components after the noise insertion point;

V_{SIG}, is the mean signal voltage at the target luminance level relative to the dark level;

V_{total}, is the total rms noise at the target luminance level; and

V_p, is the rms noise at the dark level, including all noise components not due to signal.

5,748,231
ADAPTIVE MOTION VECTOR DECISION METHOD AND DEVICE FOR DIGITAL IMAGE STABILIZER SYSTEM

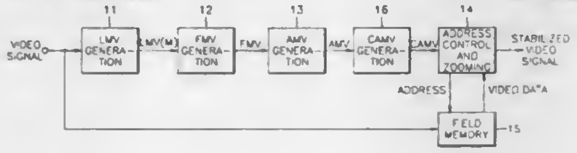
Yong-Chul Park, Incheon; Joon-Ki Paik, and Dong-Wook Kim, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 7, 1993, Ser. No. 72,785

Claims priority, application Rep. of Korea, Oct. 13, 1992, 18833/1992; Feb. 27, 1993, 2996/1993

Int. Cl.^{6} H04N *5/228*

U.S. Cl. 348—208 **70 Claims**



1. An image stabilization device having a memory for storing image data in fields, and a control portion for correcting motion of image data stored in said memory by a received accumulated motion vector, said image stabilization device comprising:

local motion vector generation means for receiving image data, converting said received image data into binary edge data, sequentially generating correlation data in local motion estimation areas by matching patterns of said edge data of current field and previous field, and sequentially generating respective local motion vectors of said local motion estimation areas and respective statistical variables descriptive of said local motion vectors by analyzing said generated correlation data, said statistical variables including the respective isolativity of each of said local motion vectors from other local motion vectors within the same field and including the respective instability of each of said local motion vectors in each most recent field respective to a field just previous;

field motion vector generation means for receiving said local motion vectors and statistical variables, generating a respective isolation weight for each said local motion vector that is of decreased value with increased isolativity and is zero for isolativity beyond a predefined value, generating a respective stability weight signal that is of decreased value with increased instability, generating a respective output weight signal for each said local motion vector by additively combining its respective isolation and respective stability weights and generating a respective field motion vector by weighted averaging of the local motion vectors within each field, said weighted averaging including a multiplying of each of said local motion vectors within each field by a corresponding one of said output weight signals to form a product that selectively is included or is not included at all within a vector sum of weighted local motion vectors within each field, which vector sum is divided by a sum of the weights just of said weighted local motion vectors included in said vector sum in order to generate said respective field motion vector; and

accumulated motion vector generation means for receiving said field motion vector and generating said accumulated motion vector by accumulating said received field motion vector into an attenuated response to the previous accumulated motion vector supplied by

attenuator means included within said accumulated motion vector generation means.

5,748,232
IMAGE SENSOR AND DRIVING METHOD FOR THE SAME

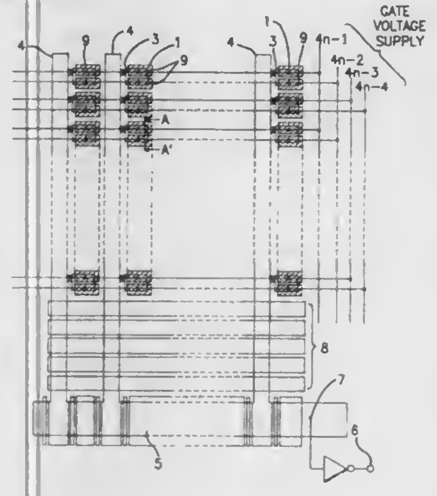
Kazuo Konuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 479,402, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 216,955, Mar. 24, 1994, abandoned. This application May 16, 1997, Ser. No. 857,584

Claims priority, application Japan, Apr. 6, 1993, 5-078432

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—219 **8 Claims**



1. An image sensor, comprising:

a plurality of light receiving pixel elements, each of said plurality of light receiving elements including a light receiving face for photo-electrically converting incident light into a signal charge, and for accumulating said signal charge;

a plurality of signal charge transfer gates, each of said plurality of signal charge transfer gates being formed without overlapping with the light receiving face of each of said plurality of light receiving pixel elements, for reading out the signal charge accumulated in each of said plurality of light receiving pixel elements;

a light receiving area made of a plurality of unit cells, each unit cell of said plurality of unit cells comprising one of said plurality of light receiving pixel elements and one of said plurality of signal charge transfer gates, said plurality of unit cells being disposed in matrix form at an equal spatial periodic distance;

outputting means connected to said plurality of signal charge transfer gates for sequentially outputting the signal charges read from the said plurality of unit cells in a time series relationship;

a plurality of groups of at least two adjacent, non-overlapping pixel electrodes, each of said plurality of groups being disposed above a respective light receiving face of each of said plurality of light receiving pixel elements at an equal spatial periodic distance, said spatial periodic distance of said pixel electrodes being shorter than a spatial periodic distance between said plurality of unit cells, said adjacent, non-overlapping pixel electrodes having an insulating film interposed therebetween; and

application voltage applying means for applying predetermined voltages of different phases to each of said plurality of groups of pixel electrodes.

5,748,233
IMAGE SIGNAL CODING DEVICE OF ELECTRONIC STILL CAMERA

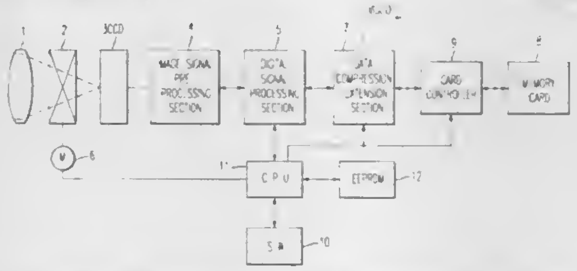
Tatsutoshi Kitajima, Kodaira, and Yasushi Yamamoto, Ebina, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 635,875

Claims priority, application Japan, Apr. 18, 1995, 7-092597

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—220 **4 Claims**


1
2
3CCD
4
5
7
9
8
IMAGE SIGNAL PRE PROCESSING SECTION
DIGITAL SIGNAL PROCESSING SECTION
DATA COMPRESSION EXTENSION SECTION
CARD CONTROLLER
MEMORY CARD
6
11
CPU
EEPROM
12
10

1. An image signal coding device of an electronic still camera, comprising:

compressing/coding means for performing:

first fixed-length coding wherein a multi-value image signal obtained by photography is compressed and coded by an initial scale factor, and

second fixed-length coding wherein a scale factor to be used is found and determined by shifting a value of said initial scale factor on a scale factor table in accordance with a code amount of said multi-value image signal coded by said first fixed-length coding and said multi-value image signal is compressed and coded by said determined scale factor;

memory means for storing at least one of as image recording mode and a compression rate mode when the photography is carried out and storing a value of a scale factor used in correspondence with said image recording mode and/or said compression rate mode set when the photography is carried out; and

control means for, when an image recording mode or a compression rate mode set whenever photography is carried out is detected and coincides with any one of modes which has been already stored in said memory means, reading the value of a scale factor which has been already stored in said memory means and corresponds to the detected mode and setting this value of the read scale factor as the value of said initial scale factor.

5,748,234
VIDEO PROCESSING SYSTEM AND METHOD

Louis A. Lippincott, Roebling, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 13, 1994, Ser. No. 305,201

Int. Cl.^{6} H04N *5/30*

U.S. Cl. 348—222 **18 Claims**

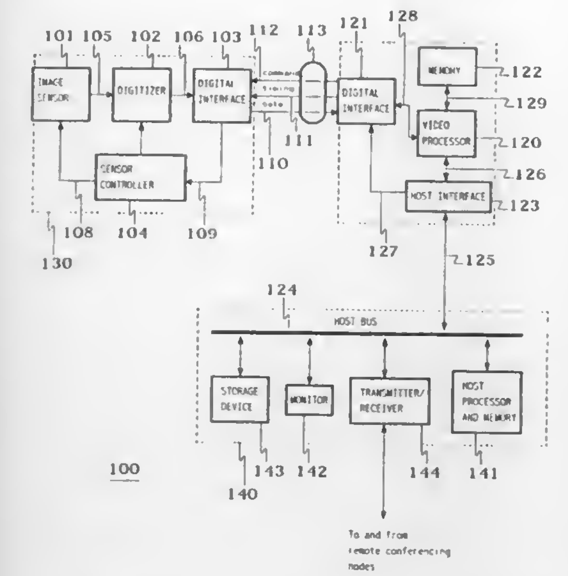
1. A method for processing video signals, comprising the steps of:

(a) transmitting a first capture signal from a video processing system to a video camera;

(b) receiving a first video frame from the video camera by the video processing system in response to the first capture signal;

(c) processing the first video frame with the video processing system; and

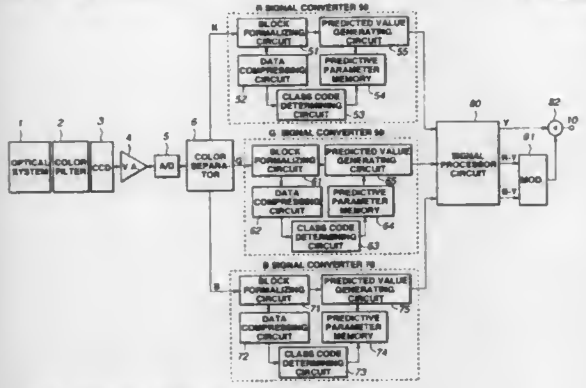
VOL
210
SS
1
MY
5
998
MI



(d) transmitting a second capture signal to the video camera at a time during the processing of the first video frame to request a second video frame.

5,748,235
IMAGING APPARATUS INCLUDING MEANS FOR CONVERTING RED, GREEN, AND BLUE SIGNAL COMPONENTS OF STANDARD RESOLUTION TO RESPECTIVE HIGH RESOLUTION SIGNAL COMPONENTS

Tetsujiro Kondo, and Kunjo Kawaguchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
PCT No. PCT/JP95/01740, § 371 Date Apr. 26, 1996, § 102(e) Date Apr. 26, 1996, PCT Pub. No. WO96/07275, PCT Pub. Date Mar. 7, 1996
PCT Filed Aug. 31, 1995, Ser. No. 632,476
Claims priority, application Japan, Aug. 31, 1994, 6-206958
Int. Cl.⁶ H04N *7/01*
U.S. Cl. 348—222 **4 Claims**



1. An imaging apparatus comprising:

imaging means for receiving light emanated from an object through a color filter and converting it into an analog video signal;

a single analog-to-digital converter for converting the analog video signal into a digital video signal;

separating means for separating the digital video signal from the single analog-to-digital converter into an R signal component, a G signal component, and a B signal component;

first converting means for converting the R signal component from the separating means to a high resolution R signal component, second converting means for converting the G signal component from the separating means to a high resolution G signal component, and third converting means for converting the B signal component from the separating means to a high resolution B signal component, each of the high resolution R signal component, the high resolution G signal component, and the high resolution B signal component being higher in resolution than the respective original signal component; and

signal processing means for receiving and processing the high resolution R signal component from the first converting means, the G signal component from the second converting means, and the B signal component from the third converting means to yield a luminance signal as well as a chrominance signal;

wherein each of the first, second, and third converting means comprises:

block formalizing means for grouping the signal component input to the converting means into blocks;

compressing means for compressing data of each block determined by the block formalizing means;

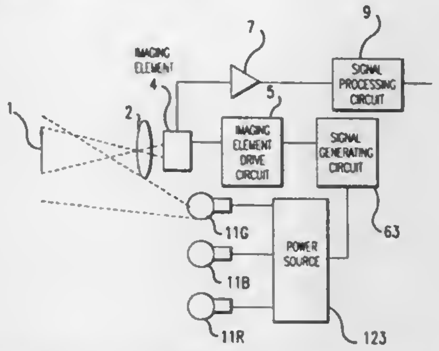
class detecting means for specifying a class of the block by examining a pattern of levels of the compressed data and producing a signal indicative of the class;

a predictive parameter memory for holding predictive parameters for use in converting the signal component input to the converting means into the high resolution signal component and for selecting the predictive parameters in response to the class indication signal from the class detecting means; and

predictive operating means for subjecting the signal component input into the converting means to a predictive operation with the predictive parameters from the predictive parameter memory to produce the high resolution signal component.

5,748,236
COLOR MIXING PREVENTION AND COLOR BALANCE SETTING DEVICE AND METHOD FOR A FIELD-SEQUENTIAL COLOR TELEVISION CAMERA

Kiyoshige Shibazaki, Higashimurayama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 352,797, Dec. 1, 1994, Pat. No. 5,548,333. This application Jun. 13, 1996, Ser. No. 663,364
Claims priority, application Japan, Dec. 10, 1993, 5-341491; Dec. 14, 1993, 5-342402; Dec. 15, 1993, 5-342907
Int. Cl.⁶ H04N *9/04*
U.S. Cl. 348—270 **12 Claims**


IMAGING ELEMENT
1
2
3
4
5
7
9
SIGNAL PROCESSING CIRCUIT
IMAGING ELEMENT DRIVE CIRCUIT
SIGNAL GENERATING CIRCUIT
11G
11B
11R
POWER SOURCE
63
123

1. An image processing system comprising:

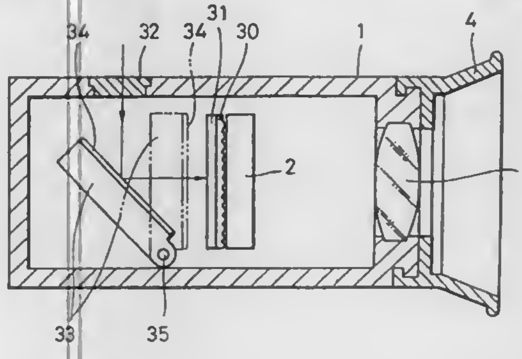
a color separating device that chromatically separates light from an object into a plurality of different colors;

an imaging element that receives separated light from the color separating device, photoelectrically converts the separated light into a converted load, and accumulates the converted load to output image signals corresponding to the chromatically separated light; and

a load discharging signal generating device that sends load discharging signals to said imaging element, wherein said load discharging signals control timing for discharging a load accumulated in a period when light having more than two colors enters said imaging element.

5,748,237
BACKLIGHTING AND COLOR CONTROL ARRANGEMENT FOR LCD TYPE VIDEO CAMERA VIEWFINDER HAVING MULTIPLE BACKLIGHTING SOURCES

Toshiaki Ueda, Saitama; Katsuhiko Ueno, Kanagawa; Yoshihiro Ono, Saitama, and Toshio Koyama, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 355,183, Dec. 8, 1994, abandoned. This application Feb. 4, 1997, Ser. No. 796,384
Claims priority, application Japan, Dec. 20, 1993, 5-320040
Int. Cl.⁶ H04N *5/222;9/64*
U.S. Cl. 348—333 **16 Claims**



1. A video camera comprising:

a lens for condensing light from an object;

an image sensor for converting light from said lens into an electric signal;

a signal processing circuit for converting the electric signal output from said image sensor into a predetermined video signal;

a liquid crystal display unit for displaying the video signal output from said signal processing unit;

first and second backlighting means for applying light to a rear surface of said liquid crystal display unit and for illuminating an image produced by said liquid crystal display unit in response to the video signal, said first backlighting means including a selectively energizable backlight which is pivotally mounted and which has a reflection surface formed on a front surface thereof, said backlight being movable between:

(a) an inclined position wherein the backlight is de-energized and is oriented with respect to said second backlighting means in a manner that light from said second backlighting means is reflected off the reflection surface against the rear surface of said liquid crystal display, and

(b) an upright position wherein the backlight is energized, and oriented with respect to said second backlighting means in a manner that light from said second backlighting means is blocked, and light from the selectively energizable backlight is directed against the rear surface of said liquid crystal display;

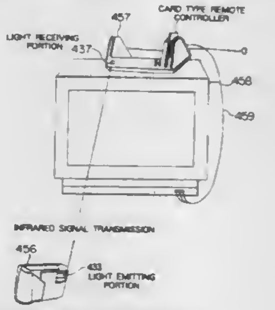
detecting circuit means for detecting external light intensity;

means for adjusting the video signal in white light balance to compensate for a difference in color temperature between light from said first backlighting means and light from said second backlighting means; and

controlling means for controlling the position of said first backlighting means on the basis of detections by said detecting circuit.

5,748,238
VIDEO CAMERA

Manabu Wakabayashi; Kenji Ogiro, both of Yokohama; Takanori Nishiyama, Mitaka; Hiroto Takita, Higashikurume; Yutaka Takami, Yokohama; Hironobu Satoh, Yokohama; Takesuke Maruyama, Yokohama; Masahiko Yatsu, Chigasaki; Kenji Kobayashi, Yokohama; Shigeyuki Itoh, Kawasaki; Kenji Matsumoto, and Iwao Aizawa, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 27,940, Mar. 8, 1993, Pat. No. 5,565,919. This application Jun. 18, 1996, Ser. No. 665,497
Claims priority, application Japan, Mar. 12, 1992, 4-053800; Apr. 13, 1992, 4-092690; Aug. 28, 1992, 4-229718; Sep. 29, 1992, 4-259330; Oct. 7, 1992, 4-268419; Oct. 13, 1992, 4-274538
Int. Cl.⁶ H04N *5/225;5/232*
U.S. Cl. 348—373 **8 Claims**



1. A video camera system comprising:

a video camera including,

means for converting a video signal and an audio signal to an electric-video signal and an electric-audio signal, respectively,

a VTR for recording/reproducing said electric-video signal and electric-audio signal,

means for modulating said electric-video signal and said electric-audio signal

opto-converting means for converting the modulated electric-video and electric-audio signals to provide an optical signal, and

means for controlling said opto-converting means to be operable when said video camera does not record said electric-video and electric-audio signal from said converting means,

a VTR station including,

means for receiving said optical signal,

converting means for converting said optical signal thus received to an electrical signal and thereafter for demodulating said electrical signal to provide said electric-video signal and said electric-audio signal, and

means responsive to said converting means for outputting said electric-video and electric-audio signals.

5,748,239
METHOD AND APPARATUS FOR CAPTURING A STORED PREEXISTING IMAGE ON A USER'S IMAGE RECORDING MEDIUM

Kevin John Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 356,027, Dec. 14, 1994, abandoned. This application Jan. 24, 1997, Ser. No. 789,172
Int. Cl.⁶ H04N *5/225*
U.S. Cl. 348—373 **6 Claims**

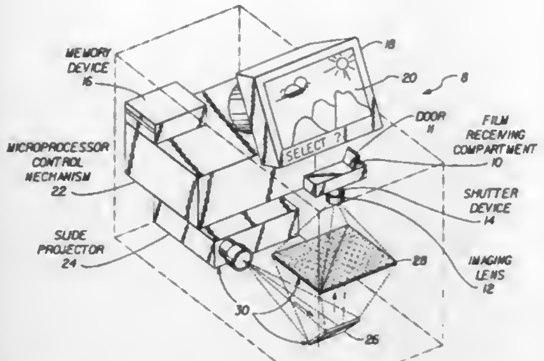
1. An interactive stored image capture system for use by a camera user comprising:

film acceptance means for accepting insertion of a camera user's film medium;

means for storing a plurality of preexisting images display means for generating a human viewable display of selected ones of said preexisting images;

interactive selection means for enabling selection of one or more of said preexisting images by said camera user in response to viewing said displayed preexisting images;

VOL
2 10
SS
1
MY
5
998
MI



means for projecting said selected preexisting images;
means for capturing said projected images onto said camera user's film medium; and
film return means for returning said film medium to the camera user upon completion of said image capture.

5,748,240

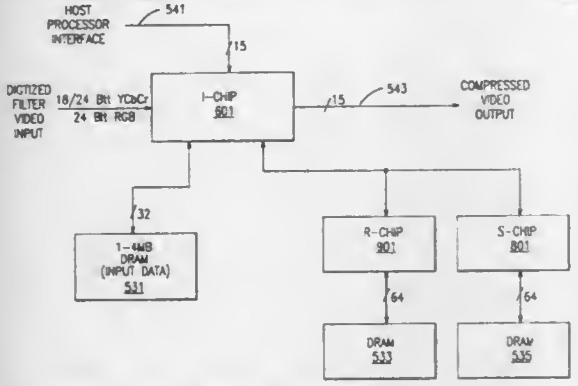
OPTIMAL ARRAY ADDRESSING CONTROL STRUCTURE COMPRISING AN I-FRAME ONLY VIDEO ENCODER AND A FRAME DIFFERENCE UNIT WHICH INCLUDES AN ADDRESS COUNTER FOR ADDRESSING MEMORY ADDRESSES

Jeffery Dean Carr, Vestal, and John Michael Sutton, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1996, Ser. No. 616,328

Int. Cl.^{6} H04N *7/12;11/02;11/04*

U.S. Cl. 348—384 **1 Claim**



1. A digital video encoder system having:

a. an I-frame only video encoder module for generating an I-frame containing bit stream, said module having a host interface, a pixel interface for receiving pixel data from a pixel bus, a frame memory interface for receiving and sending frame data, a Discrete Cosine Transform processor, a quantization unit, a variable length encoder, a FIFO buffer, and a compressed store interface; and

b. a second module for generating I-frame, B-frame, and P-frame containing bit streams, second said module having a reference memory interface, motion estimation and compensation means, inverse quantization, and inverse discrete cosine transformation means for inverting a picture for said motion estimation and compensation means, and further including a frame difference unit having a bit blockable 7 bit address counter for addressing memory addresses for each picture at

(1) every address;
(2) every other 4 addresses by every_other_4_addr= counter (1 to 3, 0, 4, 5);
(3) each line 4 times in a row by sequential_addr(0 to 5)= counter(0 to 5); or
(4) 64 lines of two words each, each line 2 times in a row by 2_write_addr(0 to 5), respectively= counter (0 to 5).

5,748,241

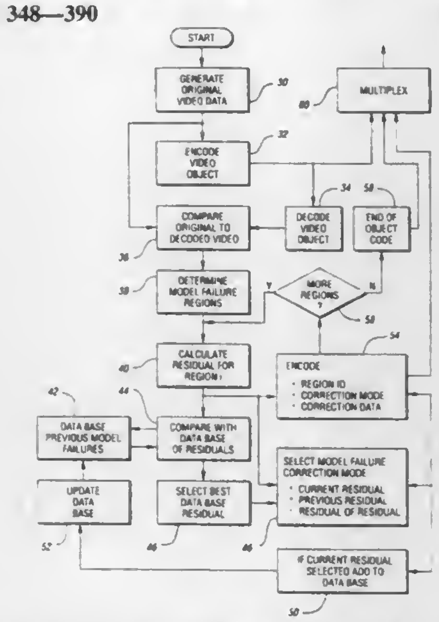
RESIDUAL CODING OF MODEL FAILURE REGIONS IN COMPRESSED VIDEO SEQUENCES

Ronnie R. Burns, Irvine, and Ram Nagarajan, Los Angeles, both of Calif., assignors to HE Holdings, Inc.

Filed Dec. 13, 1996, Ser. No. 768,165

Int. Cl.^{6} H04N *7/24*

U.S. Cl. 348—390 **10 Claims**


START
GENERATE ORIGINAL VIDEO DATA
30
MULTIPLEX
60
ENCODE VIDEO OBJECT
32
COMPARE ORIGINAL TO DECODED VIDEO
DECODE VIDEO OBJECT
END OF OBJECT CODE
34
58
36
DETERMINE MODEL FAILURE REGIONS
38
MORE REGIONS ?
Y
N
56
CALCULATE RESIDUAL FOR REGION
40
ENCODE
· REGION ID
· CORRECTION MODE
· CORRECTION DATA
54
42
DATA BASE PREVIOUS MODEL FAILURES
COMPARE WITH DATA BASE OF RESIDUALS
44
SELECT MODEL FAILURE CORRECTION MODE
· CURRENT RESIDUAL
· PREVIOUS RESIDUAL
· RESIDUAL OF RESIDUAL
UPDATE DATA BASE
52
SELECT BEST DATA BASE RESIDUAL
46
48
IF CURRENT RESIDUAL SELECTED ADD TO DATA BASE
50

1. A method for residual coding the model failure regions in compressed video sequences comprising:

storing a database of previous model failures;
encoding original video data to generate encoded video data;
decoding said encoded video data to generate model video data;
comparing said model video data with said original video data to generate at least one model failure region when the difference between the original video data and the model video data exceeds a predetermined value;
calculating residuals for each of said at least one model failure region to generate a current residual for said at least one region;
comparing said current residual with residuals stored in said database of previous model failures relative to said at least one model failure region;
selecting from said database the best of said residuals of said previous model failures;
selecting a model failure correction mode from at least the residual stored database of previous model failures or said current residual;
encoding said selected model failure correction mode to generate encoded model failure correction data;
repeating the steps from said step of calculating residuals to said step of encoding said selected model failure mode until each model failure region has been encoded; and
multiplexing said encoded video data and said encoded selected model failure mode to form a bit string of encoded data.

5,748,242

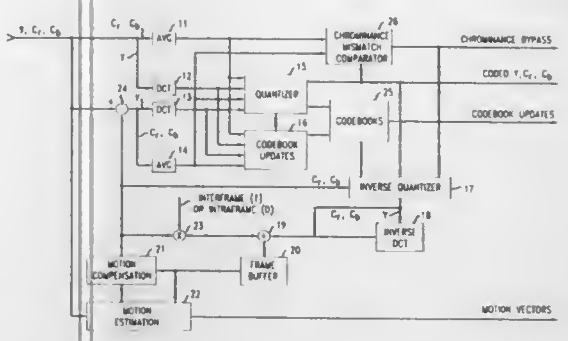
COLOR VIDEO VECTOR QUANTIZATION WITH CHROMINANCE CODEBOOK BYPASS

Christine Irene Podilchuk, Bridgewater, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 25, 1995, Ser. No. 519,867

Int. Cl.^{6} H04N *7/28*

U.S. Cl. 348—391 **24 Claims**



1. A method of coding a color video signal with use of a vector quantization codebook, the color video signal comprising a succession of frames, each of the frames comprising one or more frame portions, each of the frame portions comprising luminance information and chrominance information, the codebook comprising a plurality of entries, each codebook entry comprising a luminance vector and a chrominance vector, each of the luminance vectors representative of luminance information and each of the chrominance vectors representative of chrominance information, the method comprising the steps of:

generating a codebook index signal based on at least the luminance information of one of the frame portions of one of the frames, the codebook index signal representative of one of the luminance vectors and one of the chrominance vectors;
determining a first coding error based on said one of the chrominance vectors represented by the codebook index signal;
coding the luminance information of said one of the frame portions of one of the frames with use of the codebook index signal; and
generating a chrominance codebook bypass signal based on a comparison of the first coding error and a threshold value, the chrominance codebook bypass signal indicating whether the chrominance information of said one of the frame portions of one of the frames has been coded with use of the codebook.

5,748,243

METHOD FOR ENCODING AND DECODING MOTION PICTURE AS A FUNCTION OF ITS NON-LINEAR CHARACTERISTIC

Terubiko Suzuki, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

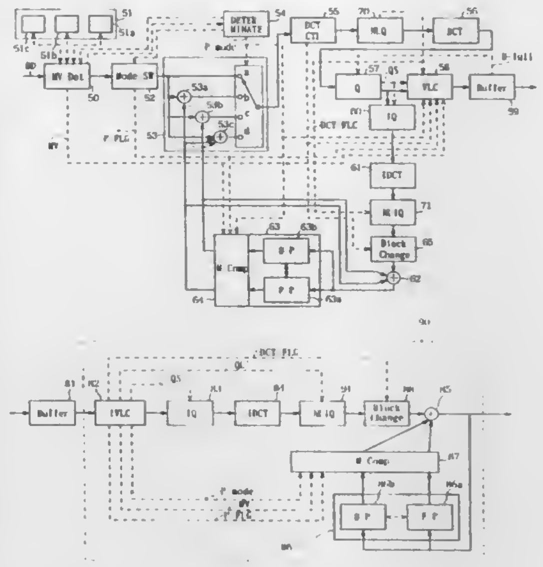
PCT No. PCT/JP94/01868, § 371 Date Sep. 20, 1995, § 102(e) Date Sep. 20, 1995, PCT Pub. No. WO95/13682, PCT Pub. Date May 18, 1995

PCT Filed Nov. 7, 1994, Ser. No. 481,395

Claims priority, application Japan, Nov. 8, 1993, 5-303565

Int. Cl.^{6} H04N *7/32;7/30*

U.S. Cl. 348—405 **28 Claims**



1. A method for encoding picture signal, comprising the steps of:

non-linearly quantizing at least a part of a signal band of a specified picture signal in accordance with a non-linear characteristic to generate a first quantization coefficient;
converting said first quantization coefficient in specified block units to generate a conversion coefficient;
quantizing said conversion coefficient to generate a second quantization coefficient; and
variable-length encoding said second quantization coefficient.

5,748,244

ADAPTIVE RUNLENGTH CODING BASED ON ZERO AND NON-ZERO SUBBLOCKS

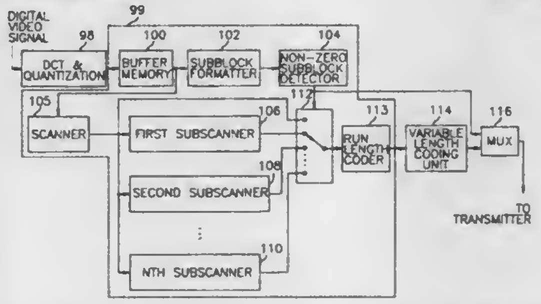
Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 27, 1996, Ser. No. 622,225

Claims priority, application Rep. of Korea, Mar. 28, 1995, 95-6617

Int. Cl.^{6} H04N *7/30*

U.S. Cl. 348—403 **4 Claims**



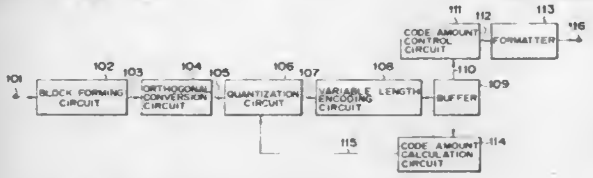
1. A method, for use in a video signal encoding system, for encoding a block of a digital video signal, comprising the steps of:

transforming the block of the digital video signal into a block transform coefficients;
converting the block of transform coefficients into a block quantized coefficients;
dividing the block of quantized coefficients into a predetermined number of subblocks;
classifying each subblock of quantized coefficients as either a zero subblock having only zero valued quantized coefficients or a non-zero subblock having at least one non-zero quantized coefficient; and
providing a predetermined sequence of quantized coefficients based on the relationship between the zero subblocks and the non-zero subblocks, the predetermined sequence of the quantized coefficients consisting of quantized coefficients included in the non-zero subblocks;
runlength coding the predetermined sequence of the quantized coefficients to thereby provide a set of runlength coded data; and
variable length coding the runlength coded data.

5,748,245

ENCODING APPARATUS FOR ENCODING INPUT INFORMATION DATA WHILE CONTROLLING A CODE QUANTITY OF ENCODED INFORMATION DATA

Tetsuya Shimizu, Yokohama, and Yoshitaka Takeuchi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha
Continuation of Ser. No. 218,637, Mar. 28, 1994, abandoned.
This application May 28, 1996, Ser. No. 653,975
Claims priority, application Japan, Mar. 29, 1993, 5-093560; Mar. 29, 1993, 5-093561; Sep. 17, 1993, 5-255110
Int. Cl.⁶ H04N *7/30*
U.S. Cl. 348—405 **23 Claims**


101
102
BLOCK FORMING CIRCUIT
103
104
ORTHOGONAL CONVERSION CIRCUIT
105
106
QUANTIZATION CIRCUIT
107
108
VARIABLE LENGTH ENCODING CIRCUIT
109
BUFFER
110
111
112
CODE AMOUNT CONTROL CIRCUIT
113
FORMATTER
116
114
CODE AMOUNT CALCULATION CIRCUIT
115

1. An encoding apparatus comprising:
- a) input means for inputting sample information data;
- b) block forming means for forming blocks of the information data input by said input means;
- c) encoding means for encoding information data in the blocks formed by said block forming means;
- d) detection means for detecting a code quantity of encoded data on a unit basis of a predetermined number of blocks formed by said block forming means, the predetermined number being greater than one;
- e) one-dimension processing means for applying one-dimension processing to the encoded data corresponding to the predetermined number of blocks formed by said block forming means; and
- f) deletion means for deleting at least a portion of the encoded data in accordance with the encoded data processed by said one-dimension processing means and in accordance with an output of said detection means.

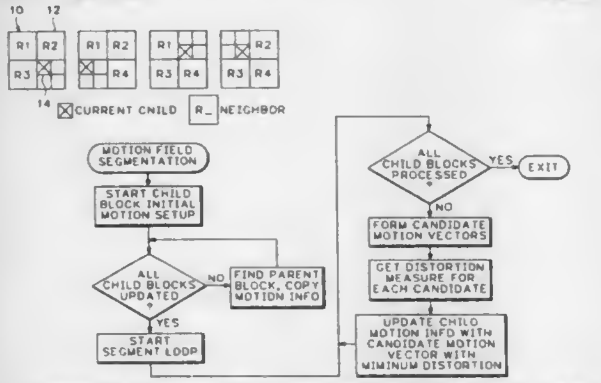
5,748,246

Patent Not Issued For This Number

5,748,247

REFINEMENT OF BLOCK MOTION VECTORS TO ACHIEVE A DENSE MOTION FIELD

Shane Ching-Feng Hu, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.
Filed Apr. 8, 1996, Ser. No. 629,421
Int. Cl.⁶ H04N *7/30;7/32*
U.S. Cl. 348—413 **3 Claims**

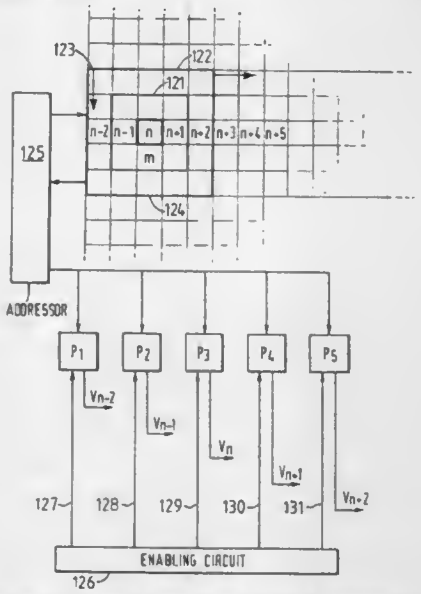

10
12
R1
R2
R3
R4
14
CURRENT CHILD
R_ NEIGHBOR
MOTION FIELD SEGMENTATION
START CHILD BLOCK INITIAL MOTION SETUP
ALL CHILD BLOCKS UPDATED ?
NO
FIND PARENT BLOCK, COPY MOTION INFO
YES
START SEGMENT LOOP
ALL CHILD BLOCKS PROCESSED ?
YES
EXIT
NO
FORM CANDIDATE MOTION VECTORS
GET DISTORTION MEASURE FOR EACH CANDIDATE
UPDATE CHILD MOTION INFO WITH CANDIDATE MOTION VECTOR WITH MIMINUM DISTORTION

1. A method of refining block motion vectors for a video image sequence to achieve a dense motion field comprising the steps of:
- subdividing a parent block of pixels from the video image sequence into a plurality of child block groups;
- for each child block within a child block group, searching for a motion vector for the child block according to a defined measure as a function of candidate motion vectors associated with the parent block and each neighboring child block group; and
- repeating the subdividing and searching steps with each child block group as the parent block until the defined measure for the motion vector is less than a specified threshold or the child block represents a single pixel from the video image sequence, the resulting motion vector being the refined block motion vector for the child block.

5,748,248

REAL TIME MOTION VECTOR PROCESSING OF IMAGE DATA

Ian Parke, Suffolk, England, assignor to British Telecommunications public limited company, London, England
Continuation of Ser. No. 169,136, Dec. 17, 1993, abandoned.
This application Nov. 6, 1995, Ser. No. 554,099
Claims priority, application United Kingdom, Jul. 30, 1993, 9315775
Int. Cl.⁶ H04N *7/32*
U.S. Cl. 348—416 **18 Claims**

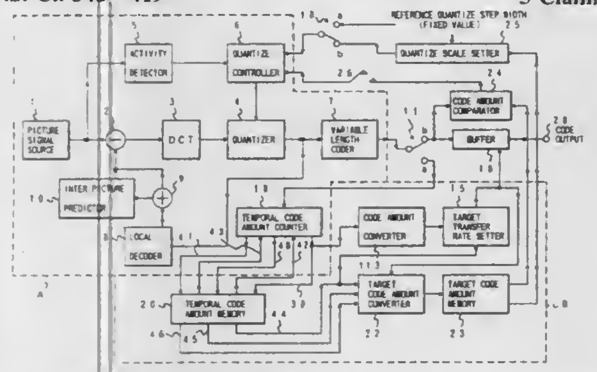


1. A method of coding image data from a sequence of frames in a video signal, said method involving the generation of motion vectors for video predictive coding, the method comprising:
- a reference video frame of said video signal;
- a first step of comparing each of a plurality of blocks of pixels of a first video frame of the signal with block-sized regions of the reference video frame lying within a search area and generating a first-frame motion vector for each block whereby a plurality of first-frame motion vectors are generated;
- a second step of comparing each block of pixels of a second video frame of the signal, the first video frame temporally between the reference video frame and the second video frame, with block-sized regions of the reference video frame lying within a first offset search area, said first offset search area having an offset corresponding to the value of the first-frame motion vector generated for the corresponding block of the first video frame, to produce a second-frame motion vector for that block, a plurality of blocks of the second video frame being compared in parallel to produce a plurality of second-frame motion vectors;
- sequentially reading image data lying within an extended region containing said first offset search areas; and
- for each block of the second video frame, in response to the first-frame motion vector generated for the corresponding block of the first video frame, enabling the second comparing step only for image data which lie within said first offset search area for said each block of the second video frame.

5,748,249

VARIABLE TRANSFER RATE CONTROL CODING APPARATUS

Mitsuaki Fujiwara, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Jun. 23, 1995, Ser. No. 494,258
Claims priority, application Japan, Jun. 24, 1994, 6-165946
Int. Cl.⁶ H04N *7/12*
U.S. Cl. 348—419 **5 Claims**



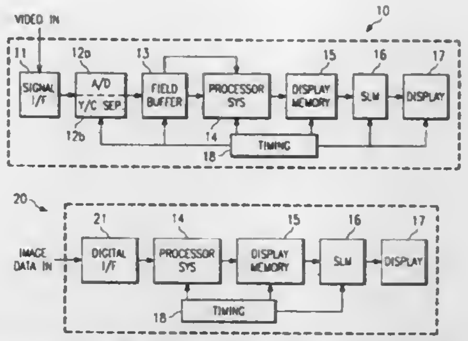
1. A variable transfer rate coding apparatus for coding moving picture signals of groups of pictures, comprising:
- a quantizer for quantizing the picture signals under control of quantization step width per group of pictures;
- a coder for coding the quantized picture signals, the coding being executed twice per group of pictures by a first coding and a second coding;
- code amount obtaining means for obtaining a first code amount of the coded picture signals per group of pictures coded by the first coding and a second code amount of picture data included per group of pictures;
- first determining means, in response to the first code amount, for calculating a total code amount of the picture signals of the groups of pictures and comparing the total code amount with a reference total code amount, to decide a first target code amount per group of pictures in order that the total code amount becomes a maximum amount within the reference total code amount;
- second determining means, in response to the first target code amount and the second code amount, for determining a second target code amount of the picture data included in each group of pictures in accordance with the maximum amount; and
- control means for varying the quantization step width on the basis of the second target code amount for the second coding by the coder.

5,748,250

VIDEO DISPLAY SYSTEM WITH DIGITAL DE-INTERLACING

Vishal Markandey, Dallas, and Robert J. Gove, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 178,976, Jan. 7, 1994, abandoned.
This application Sep. 25, 1995, Ser. No. 533,409
Int. Cl.⁶ H04N *7/01*
U.S. Cl. 348—451 **20 Claims**

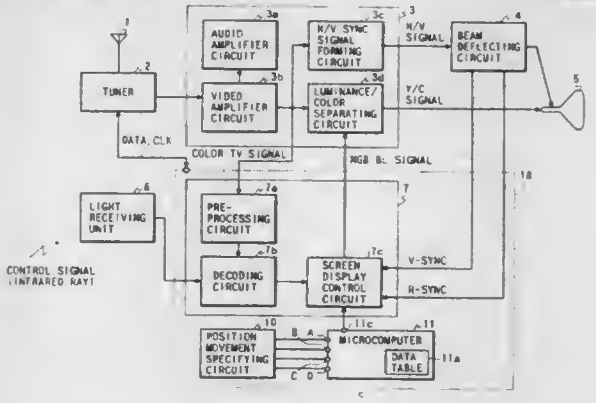
1. A line generator for a digital display system that receives fields of pixel data representing a video input signal and displays frames that have more lines than said fields, comprising:
- a motion detector for executing a set of motion detection instructions, said motion detection instructions including instructions for selecting at least one neighboring pixel of a current pixel, calculating a difference between values of said neighboring pixel in said current field and a second previous field relative to said current field, calculating a difference between values of said current pixel in a future field relative to said current field and a previous field relative to said current field, and calculating a weighted average of said differences, thereby obtaining a motion value;
- a first pixel generator for generating new pixel values from pixel data of said current field;
- a second pixel generator for generating new pixel values from pixel data of at least one temporally adjacent field; and
- a selector for selecting between outputs of said first pixel generator and said second pixel generator, in response to a motion value.



5,748,251

APPARATUS WITH A BUILT-IN TELETEXT BROADCASTING DECODER AND TELETEXT DISPLAY ADJUSTMENT APPARATUS

Shouichirou Nishimura, Daito, Japan, assignor to Funai Electric Co., Ltd., Osaka, Japan
Filed Jan. 13, 1995, Ser. No. 372,349
Claims priority, application Japan, Jan. 14, 1994, 6-015837
Int. Cl.⁶ H04N *5/445*
U.S. Cl. 348—468 **9 Claims**



1. An apparatus with a built-in teletext broadcasting decoder which has a teletext broadcasting signal processing section for displaying character data multiplexed with a video signal in such a manner that the character data is superimposed on an image formed by the video signal, said apparatus comprising:
- movement-instruction-data setting means for setting movement instructing data to move the position of a character display of a teletext broadcast by a predetermined amount;
- character display moving means for moving the position of the character display by said predetermined amount of movement corresponding to the movement instructing data set by said movement-instructing-data setting means.

5,748,252

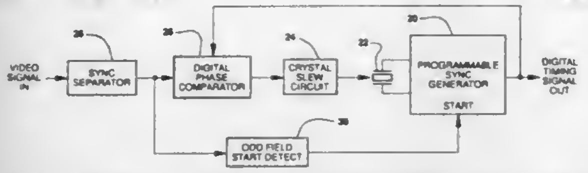
METHOD AND APPARATUS FOR SYNCHRONIZING INTERNAL AND EXTERNAL VIDEO SIGNALS

Kenneth George Draves, Russiaville, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 20, 1996, Ser. No. 603,108

Int. Cl.^{6} H04N *9/475*

U.S. Cl. 348—516 **9 Claims**



1. A method of synchronizing a programmable sync generator output with an external video signal where the sync generator frequency is controlled by a voltage controlled oscillator comprising the steps of:

- detecting the beginning of a frame in the video signal by digitizing the video signal,
  - monitoring the digitized signal for determining the beginning of a frame,
  - producing a start pulse for starting the sync generator at the beginning of a frame, and
  - after one start pulse is produced, inhibiting any additional start pulses so long as the video signal is present;
- starting the sync generator when the frame begins so that initially the sync generator output signal is synchronized with the video signal;
- comparing the phases of the output signal and the video signal and generating a voltage according to phase differential; and
- adjusting the voltage controlled oscillator with the generated voltage to null the phase differential, whereby the output signal is synchronized with the external video signal.

5,748,253

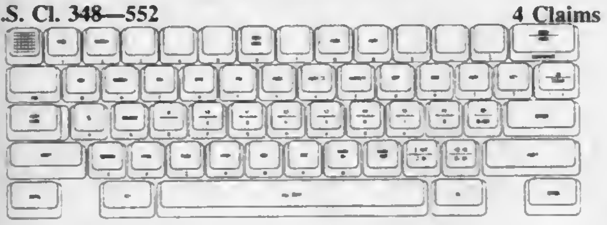
DIRECT KEYBOARD ACCESS TO VIDEO EDITING SOURCE MATERIAL

Mark Chatinsky, Los Angeles, and Bruce Kuchta, Canyon Country, both of Calif., assignors to ASC Audio Video Corporation, Burbank, Calif.

Filed Oct. 12, 1995, Ser. No. 542,046

Int. Cl.^{6} H04N *5/222*

U.S. Cl. 348—552 **4 Claims**



1. A method of sourcing a video clip in a video editing system having a storage device for storing a plurality of randomly accessible video clips, a display screen and a keyboard, said method comprising the steps of:

- designating a set of most relevant clips from among the plurality of randomly accessible video clips;
- displaying at least one identifying image of each member of the set of most relevant clips on the display screen;
- assigning each member of the set of most relevant clips to a respective predetermined key on the keyboard;
- depressing the predetermined key corresponding to a desired member of the set of most relevant clips;
- providing the desired member as the source clip to the video editing system.

5,748,254

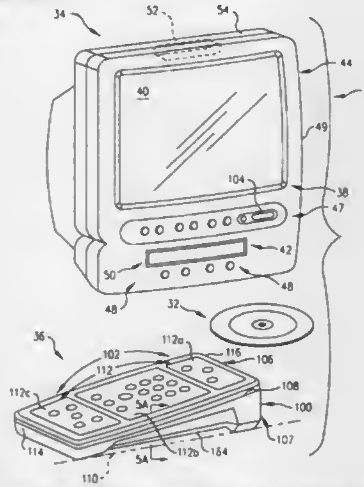
SYSTEMS WITH A REMOTE CONTROL IN WHICH INFORMATION CAN BE RETRIEVED FROM AN ENCODED, LASER READABLE DISC

Robert G. Harrison, and Robert D. Lamson, both of Seattle, Wash., assignors to Coach Master International Corporation, Seattle, Wash.

Division of Ser. No. 505,969, Jul. 24, 1995. This application Dec. 8, 1995, Ser. No. 569,310

Int. Cl.^{6} H04N *7/00*

U.S. Cl. 348—552 **26 Claims**



1. An information retrieval and display system which comprises the combination of:

- a module comprising a player for a disc with laser readable data stored thereon and a screen for displaying information read from said disc;
- a disc as aforesaid operatively associated with said player; and
- means for controlling the operation of said module in a first, television viewing mode and in a second, information accessing mode and for switching the operation of said module between said television viewing mode and said information accessing mode;
- the data stored on said disc corresponding to: (a) a hierarchy of menus, and (b) items of information;
- the means for controlling the operation of said disc player being incorporated in a remote control; and
- said remote control comprising:
- a casing;
- means in said casing for outputting function-associated signals to a controlled device;
- user-manipulatable control means supported in and accessible through openings in said casing for activating the signal outputting means; and
- means sealing said openings to keep foreign substances from reaching the interior of the casing.

5,748,255

INTERFACE SYSTEM FOR A TELEVISION RECEIVER

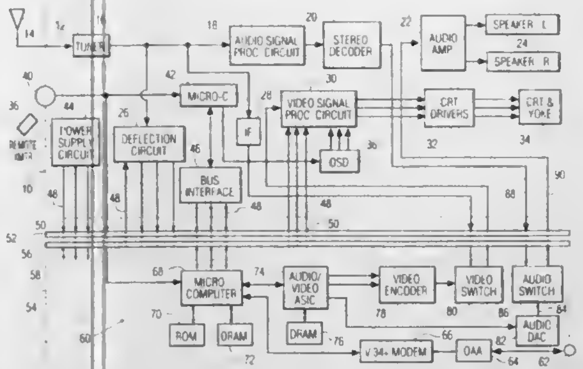
Larry D. Johnson; Joseph W. Memory, Jr., and Anthony F. Prudic, all of Knoxville, Tenn., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 777,368, Dec. 27, 1996, abandoned, which is a continuation-in-part of Ser. No. 362,037, Dec. 22, 1994, Pat. No. 5,592,234. This application Sep. 15, 1997, Ser. No. 931,061

Int. Cl.^{6} H04N *5/44*

U.S. Cl. 348—553 **10 Claims**

1. An interface system for a television receiver, said television receiver comprising a tuner for receiving and selectively tuning to a television signal, a deflection circuit coupled to said tuner for generating deflection signals from synchronization signals contained in said television signal, an audio signal processing circuit coupled to said tuner for processing an audio signal contained in said television signal, a video signal processing circuit coupled to said tuner for processing a video signal contained in said television signal, a display coupled to said deflection circuit and said video signal processing circuit for displaying said video signal in dependence on said deflection signals, and a power supply circuit for supplying operating power to each of the above components, wherein said interface system comprises:



- standard bus means having M leads separately connected to said audio signal processing circuit, said deflection circuit, said video signal processing circuit and said power supply circuit, where M is an integer greater than one;
- connector means having M contacts connected, respectively, to said M leads in said standard bus means; and
- circuit board means accessible by a user of said television receiver, said circuit board means having plug means connectable to said connector means, said plug means having N contacts corresponding, respectively, to at least some of the M contacts in said connector means, where N is an integer less than or equal to M, and circuit means connected to said N contacts in said plug means, said circuit means, when connected through said plug means, said connector means and said standard bus means to at least one of the audio signal processing circuit, the video signal processing circuit, the deflection circuit and the power supply circuit in the television receiver, modifies the operation of said television receiver thereby providing additional features for the user, wherein said television receiver further comprises a remote control receiver for receiving remote control signals from a remote control transmitter, and a microcomputer for controlling said television receiver at least partly in response to signals from said remote control receiver, and wherein said standard bus includes leads connected to said remote control receiver and to said microcomputer, characterized in that said circuit means on said circuit board means comprises:
- a telephone line interface connector for connecting the circuit board means to a telephone line;
- a modem for receiving incoming signals from said telephone line and for sending outgoing signals to said telephone line;
- a further microcomputer coupled to said modem for generating said outgoing signals and for processing said incoming signals, said further microcomputer having a first memory connected thereto having stored therein an operating program, and a second memory connected thereto for temporarily storing data signals; and
- audio/video signal generating means coupled to said further microcomputer for generating audio and video signals at least in part from said data signals stored in said second memory and from said received incoming signals;

wherein said further microcomputer is connected to said microcomputer and to said remote control receiver via said plug means and said connector means, and said audio/video signal generating means is connected to said audio signal processing circuit and said video signal processing circuit via said plug means and said connector means, whereby said audio/video signal generating means alternatively supplies video signals for said video signal processing circuit and audio signals for said audio signal processing circuit under control of said further microcomputer which, in turn, is controlled by remote control signals received by said remote control receiver from said remote control transmitter.

5,748,256

SUBTITLE DATA ENCODING/DECODING METHOD AND APPARATUS AND RECORDING MEDIUM FOR THE SAME

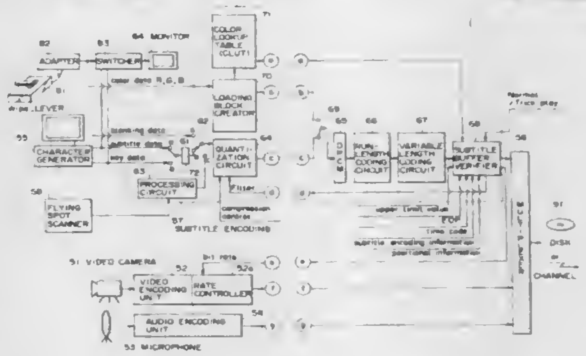
Ikuo Tsukagoshi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1996, Ser. No. 619,001

Claims priority, application Japan, Mar. 23, 1995, 7-088607

Int. Cl.^{6} H04N *9/74;5/278*

U.S. Cl. 348—589 **30 Claims**



1. A subtitle encoding apparatus for use in a video image transmission system having an input bit stream including subtitle data and video image data, said apparatus comprising:

- a color lookup table having addresses for accessing display data;
- means for creating loading blocks including changeover position information from position information representing relative positions of pixel data in a video image by sampling the input bit stream at a frame interval, said changeover position information being used to update a change position located in the video image, wherein a current address for accessing said color lookup table is changeable to a next address every frame period so that different display data are accessed at the change position indicated by said changeover position information, said changeover position information also being used to delay the update of the change position and further being used to set a length of said delay;
- means for encoding the subtitle data as a function of said color lookup table to form pixel data blocks; and
- means for forming data blocks from said loading blocks and said pixel data blocks for transmission.

5,748,257

PICTURE INFORMATION DETECTING APPARATUS FOR A VIDEO SIGNAL

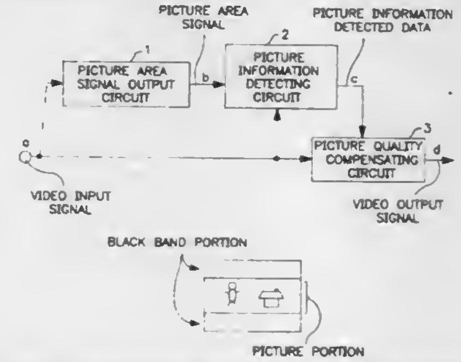
Minoru Kawabata, Sakai, and Atsuhisa Kageyama, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 418,014, Apr. 6, 1995, abandoned. This application May 7, 1997, Ser. No. 852,670

Claims priority, application Japan, Apr. 15, 1994, 6-077091

Int. Cl.^{6} H04N *5/20;5/46*

U.S. Cl. 348—615 **8 Claims**


PICTURE AREA SIGNAL
PICTURE INFORMATION DETECTED DATA
1
2
PICTURE AREA SIGNAL OUTPUT CIRCUIT
b
PICTURE INFORMATION DETECTING CIRCUIT
c
3
a
PICTURE QUALITY COMPENSATING CIRCUIT
d
VIDEO INPUT SIGNAL
VIDEO OUTPUT SIGNAL
BLACK BAND PORTION
PICTURE PORTION

1. A picture information detecting apparatus for an input video signal comprising:

means for locating a portion of the input video signal corresponding to an area, which is bordered by at least one band having a width said input video signal having an aspect ratio and a corresponding picture quality, from which the picture information is obtained;

means for detecting, independent of said aspect ratio of said input video signal, the picture information from the located area; and

means for adjusting a corresponding picture quality of the input video signal in the located area using the detected picture information.

5,748,258
APPARATUS AND METHOD FOR PROCESSING A VIDEO SIGNAL

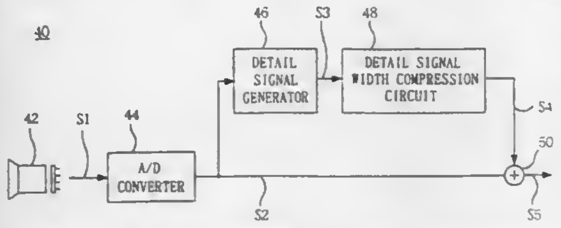
Ichiro Tanji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 20, 1995, Ser. No. 575,389

Claims priority, application Japan, Dec. 28, 1994, 6-339564

Int. Cl.^{6} H04N *5/208*

U.S. Cl. 348—625 **40 Claims**



1. Apparatus for processing a video signal, comprising:

detail signal generating means for generating a detail signal from a video signal;

peak detecting means for detecting a maximum amplitude level of a plurality of samples of said detail signal; and

modifying means for modifying an amplitude level of one of said samples of said detail signal as a function of the ratio of the amplitude level of said one sample to said detected maximum amplitude level to produce a modified detail signal.

5,748,259
SCREEN SIZE CONTROL CIRCUIT ACCORDING TO A POWER ON OR OFF CONDITION OF A TELEVISION

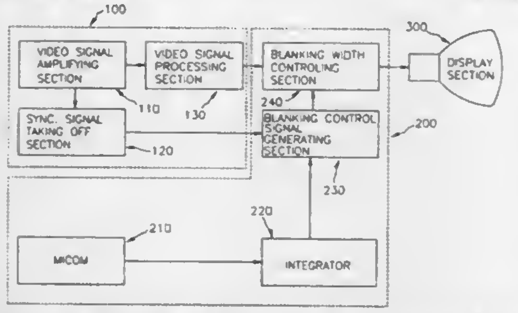
Kwon-Hag Kang, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed May 30, 1996, Ser. No. 655,165

Claims priority, application Rep. of Korea, May 30, 1995, 95-13764; May 30, 1995, 95-13765; May 30, 1995, 95-13766; May 30, 1995, 95-13767; May 30, 1995, 95-13779

Int. Cl.^{6} H04N *3/24*

U.S. Cl. 348—634 **26 Claims**


100
VIDEO SIGNAL AMPLIFYING SECTION
VIDEO SIGNAL PROCESSING SECTION
BLANKING WIDTH CONTROLING SECTION
300
DISPLAY SECTION
110
130
240
SYNC. SIGNAL TAKING OFF SECTION
120
BLANKING CONTROL SIGNAL GENERATING SECTION
200
230
220
210
MICOM
INTEGRATOR

1. A circuit for controlling a screen size of a television according to a state of power, comprising:

a signal processing means for generating a composite video signal from a television broadcasting signal received from an antenna;

a control signal generating means, including:

a MICOM for generating a PWM signal increasing or decreasing linearly according to a power condition for controlling the screen size;

an integrating means for generating said control voltage by integrating said PWM signal;

a blanking control signal generating means for generating said blanking control signal synchronized by said synchronizing signal according to said control voltage, and

a blanking width controlling means for generating said composite video signal controlled in said blanking width by inputting said blanking control signal and said composite video signal; and

a display means for displaying said composite video signal controlled in said blanking width.

5,748,260
LUMINANCE AND CHROMINANCE SIGNAL SEPARATING APPARATUS

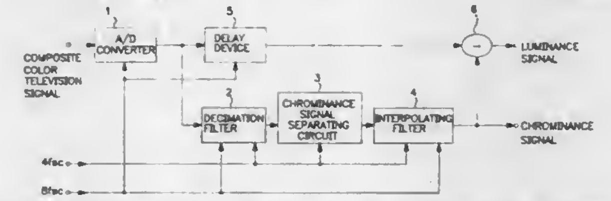
Takahisa Hatano, Sapporo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 24, 1995, Ser. No. 393,804

Claims priority, application Japan, Feb. 25, 1994, 6-027936

Int. Cl.^{6} H04N *9/78*

U.S. Cl. 348—663 **5 Claims**



1. A luminance and chrominance signal separating apparatus comprising:

A/D converting means for A/D converting an input composite color television signal to a digital video signal with a frequency of eight times a subcarrier frequency of said input composite color television signal;

decimation filtering means including a low pass filter for converting the digital video signal into a further signal with a frequency of four times the subcarrier frequency of said input composite color television signal;

chrominance signal separating means select one of a plurality of filters for extracting a chrominance signal with the frequency of four times the subcarrier frequency of said input composite color television signal, from the further signal;

interpolating filtering means for low pass filtering the chrominance signal and converting said filtered chrominance signal into an additional signal with the frequency of eight times the subcarrier frequency of said input composite color television signal;

delay means for delaying said digital video signal to generate a delayed signal having a delay time corresponding to total delay times of said decimation filtering means, said chrominance signal separating means and said interpolating filtering means; and

subtracting means for subtracting said additional signal from the delayed signal and outputting a luminance signal.

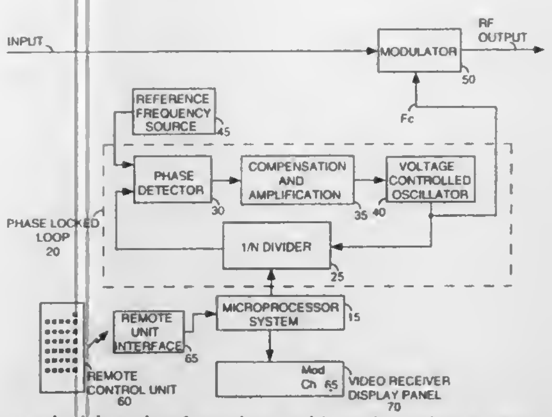
5,748,261
VIDEO RECEIVER USER CHANNEL SELECTION CONTROL OF AN RF MODULATOR

Michael Anthony Pugel, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indlanapolis, Ind.

Division of Ser. No. 384,299, Feb. 6, 1995, Pat. No. 5,541,671. This application Mar. 20, 1996, Ser. No. 618,956

Int. Cl.^{6} H04N *5/40*

U.S. Cl. 348—724 **12 Claims**



1. A video signal receiver for modulating a carrier with received input information to provide a modulated output signal compatible with a television signal receiver, said carrier being located in a television broadcast band associated with a single video transmission standard, said video receiver including apparatus comprising:

means for generating channel carriers at carrier frequencies within said band, and having a control input and an output for providing a generated channel carrier in response to a control signal applied to said control input;

first user operated means providing a first control signal to said control input of said generating means for manually selecting a generated channel carrier in said band;

second user operated means providing a second control signal to said control input of said generating means for manually selecting a manufacturer preselected available channel carrier in said band as an alternative to said channel carrier selected by said first means, said manufacturer preselected available channel carrier being predetermined to allow said user to ensure channel compatibility with a television receiver coupled to said video receiver upon activation of said second user operated means; and

means, having an input coupled to said output of said generating means, for modulating a generated carrier selected by said first means or a carrier selected by said second means with said received input information to provide said modulated output signal; wherein

said channel carrier selected by said first user operated means is a channel carrier other than said manufacturer preselected available channel carrier.

5,748,262
METHOD OF DIGITIZATION OF INTERMEDIATE FREQUENCY SIGNALS IN PARTICULAR TELEVISION SIGNALS, AND DEVICE FOR IMPLEMENTATION OF THE METHOD

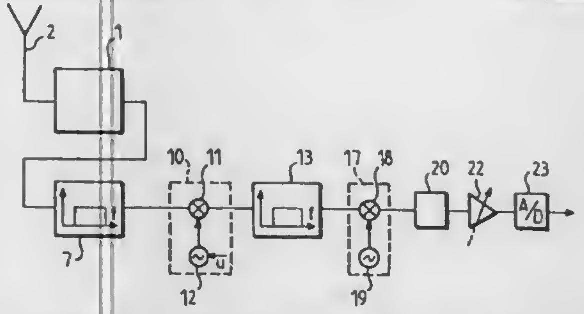
Werner Boie, Brigachtal, Germany, assignor to Thomson Multimedia S.A., Courbevoie, France

Filed May 14, 1996, Ser. No. 645,765

Claims priority, application France, May 23, 1995, 95 06111

Int. Cl.^{6} H04N *5/44;5/46*

U.S. Cl. 348—726 **10 Claims**



1. Method of digitization of signals, having a bandwidth that can change from one standard to another and of which one of the frequency limits of this band is substantially constant, wherein before converting the analog signal into a digital signal, the signals of channels (S_{if}^{N+1}. S_{if}^{N-1}) adjacent to the frequency band of the signal to be digitized are eliminated in three steps comprising:

in a first step, signals (S_{if}^{N+1}) of channels adjacent to said substantially constant frequency limit are eliminated by filtering, the filtering characteristics being that whatever the bandwidth of the signal to be digitized that may change from one standard to another, this signal to be digitized is maintained on its variable frequency limit side by the filtering;

in a second step, said signal to be digitized is transposed in frequency, by an amount determined by its bandwidth, such that in the transposed signal, the variable frequency limit of said frequency band of the signal to be digitized has a substantially constant value; and

in a third step, the signals of channels adjacent to the transposed signal are eliminated by filtering, choosing the filtering characteristics such that this transposed signal is maintained, whatever the bandwidth of the signal to be processed.

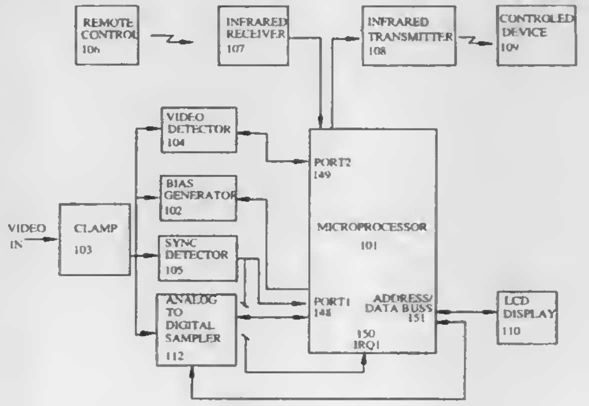
5,748,263
SYSTEM FOR AUTOMATICALLY PRODUCING INFRARED CONTROL SIGNALS

Bradley E. Ball, 4912 Frieze Cir., Taylorsville, Utah 84118

Filed Mar. 7, 1995, Ser. No. 399,591

Int. Cl.^{6} H04N *5/44*

U.S. Cl. 348—734 **10 Claims**



1. A system for automatically producing infrared remote control signals comprising:

a. a start means for determining the start of a commercial message;

wherein said start means, connected to a clamped video signal, determines the presence of video information by using a variable serration sampled black level bias signal, a comparator and a microprocessor enabled detector; and

b. an end means for determining the end of said commercial message;

wherein said end means, connected to said clamped video signal, samples said clamped video signal to determine the average scene content stability over a fixed time interval; the information of said scene content is then combined with continuously updated historical commercial data and other user defined variables to determine the end of a commercial message; and

c. a signal processing means for receiving and storing user activated infrared signals; and

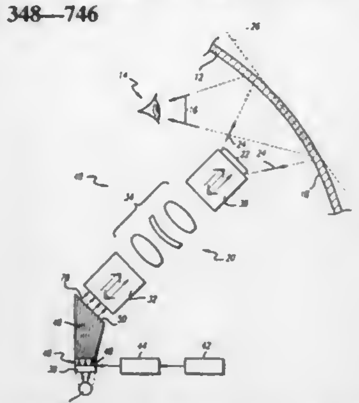
wherein user said signal processing means receives and interprets user activated infrared signals received as user responses to communications sent to the user by a communication means; and wherein said signal processing means produces a first user-specified sequence of infrared remote control signals whenever said start means determines that said commercial message has started; and wherein said signal processing means produces a second user-specified sequence of infrared remote control signals whenever said end means determines that a commercial message has ended; and

said communication means receives and transmits standard RS232 signals; and

wherein said communication means uses said RS232 signals to communicate with the user through a display device.

VOL
2 10
SS
1
MY
5
998
MI

5,748,264
DISTORTION CORRECTED DISPLAY
Ronald G. Hegg, Vista, Calif., assignor to Hughes Electronics, Los Angeles, Calif.
Filed Jan. 10, 1995, Ser. No. 370,719
Int. Cl.^{6} H04N *3/22;3/26*
U.S. Cl. 348—746 **33 Claims**



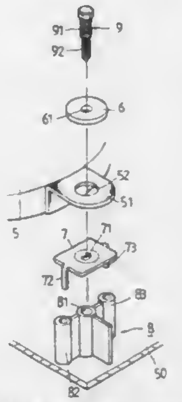
1. An image-projection display which includes an image projector projecting light to form an image, and means defining an imaging surface from which at least a portion of said light is reflected to be viewed as an image by a user of the display, said display including off-axis projection factors distorting a rectilinear projected image so that the user of the display would perceive an image with distorted rectilinearity, and the projector portion providing a projected image with compensatory image distortion so that the user of the display sees an image with substantially restored rectilinearity, said image-projection display comprising:

an image source for receiving a rectilinear image signal and providing a first image in response thereto;

a projector optical portion for receiving said first image from said image source and for providing a second image with said compensatory image distortion, said projector portion projecting said compensatorily-distorted second image to said imaging surface;

means for physically dislocating selected image elements (pixels) of one of said first image or said second image to compensatorily distort said second image, wherein said means for physically dislocating selected image pixels includes said image source having a fiber optic corrector element with a multitude of optical fibers extending therethrough and cooperatively defining opposite faces of said corrector element.

5,748,265
PICTURE TUBE FIXING DEVICE
Deng-Nan Lin, No. 35, Li Lin E. Rd., Ch'iao Tou Hsiang, Kao Hsiung Hsien, Taiwan
Filed Feb. 13, 1996, Ser. No. 601,148
Int. Cl.^{6} H04N *5/645;5/64*
U.S. Cl. 348—825 **6 Claims**



1. A device for fixing a picture tube having a lug on a shell of a screen, said lug having a through hole, said device comprising:

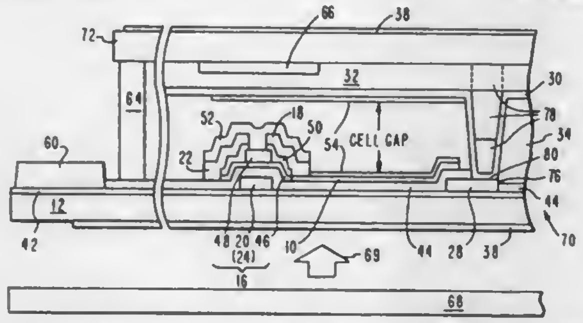
a washer means having a through hole aligning with said through hole of said lug of said picture tube;

a threaded means having an upper shank having a radius larger than that of said through hole of said washer means, and a lower shank having a radius smaller than that of said upper shank, the upper and lower shanks being threaded in the same direction;

a prop means mounted on said shell of said screen for receiving said threaded means and fixing said lug of said picture tube thereon with said threaded means; and

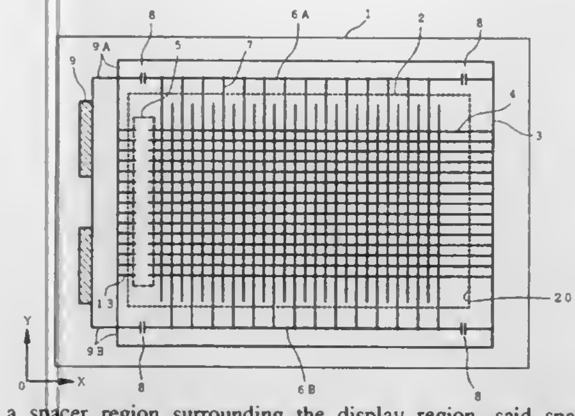
an adjusting means adjustably extending from a top of and confined against rotation by said prop means for compensating a space between said lug and said prop means thus fixing said picture tube through said lug, wherein said adjusting means has a through hole with a thread enabling said adjusting means to be raised to contact against said lug of said picture tube while said threaded means is screwed on.

5,748,266
COLOR FILTER, LIQUID CRYSTAL DISPLAY PANEL, LIQUID CRYSTAL DISPLAY, AND LIQUID CRYSTAL DISPLAY PANEL MANUFACTURING METHOD
Manabu Kodate, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 11, 1996, Ser. No. 615,012
Claims priority, application Japan, Mar. 10, 1995, 7-050749
Int. Cl.^{6} G02F *1/1339;1/1343*
U.S. Cl. 349—39 **10 Claims**



1. A color filter and common electrode carried by a facing substrate for assembly with an array substrate to form a liquid crystal display panel, the color filter comprising a plurality of pillars formed higher than other portions of the color filter for contact with objects formed on the array substrate to specify a cell gap, wherein the pillars are covered with the common electrode.

5,748,267
COMMON GATE LINE LAYOUT METHOD FOR LIQUID CRYSTAL DISPLAY DEVICE WITH GATE SCANNING DRIVER CIRCUIT ON A DISPLAY SUBSTRATE
Masataka Natori, Mobara, Japan; Shunichi Kumaoka, Cupertino, Calif., and Shiro Ueda, Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 22, 1995, Ser. No. 517,930
Claims priority, application Japan, Sep. 7, 1994, 6-213664
Int. Cl.^{6} G02F *1/1333;1/136;1/1345;1/13*
U.S. Cl. 349—40 **21 Claims**



1. A liquid crystal display device having two substrates opposed across a liquid crystal, wherein at least one of the two substrates is transparent, comprising:

a set of parallel gate lines extending in an x-direction over a surface of one of said substrates,

a set of parallel drain lines extending in the y-direction over the surface of one substrate and being insulated from said gate lines;

a gate scanning driver circuit connected to individual ones of said gate lines outside of a display region in which said gate lines and said drain lines intersect; and

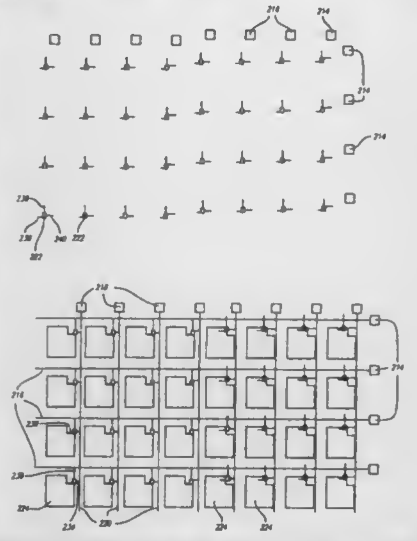
a spacer region surrounding the display region, said spacer region being interposed between the gate scanning driver circuit and the display region on one side of the display region,

wherein said parallel gate lines extend through a mounting area from the gate scanning driver circuit through the spacer region into said display region on said one side of the display region,

wherein said parallel gate lines further extend past the spacer region outside of said display region on another side of the display region, and

wherein said parallel gate lines are anodized in an area where the gate lines extend past the spacer region on said another side of the display region, and are unanodized in said mounting area where the gate lines extend beyond the spacer region to the gate scanning driver circuit on said one side of the display region.

5,748,268
QUASI-TILED ACTIVE MATRIX DISPLAY
Michael H. Kalmanash, Los Altos, Calif., assignor to Kaiser Aerospace & Electronics Co., San Jose, Calif.
Filed Mar. 30, 1995, Ser. No. 413,689
Int. Cl.^{6} G02F *1/136*
U.S. Cl. 349—47 **21 Claims**



1. An improved method for fabricating an Active Matrix Liquid Crystal display device, said method including the steps of:

a. fabricating on a first single crystal silicon film wafer, circuits comprising individual pixel transistors arranged in a predetermined orthogonal matrix array of rows and columns, each of said pixel transistors including a gate, a source and a drain and tabs respectively connected to each;

b. bonding said wafer to a preselected area of a transparent substrate;

c. selectively removing all of said wafer from said substrate except for said pixel transistors and said conductive tabs;

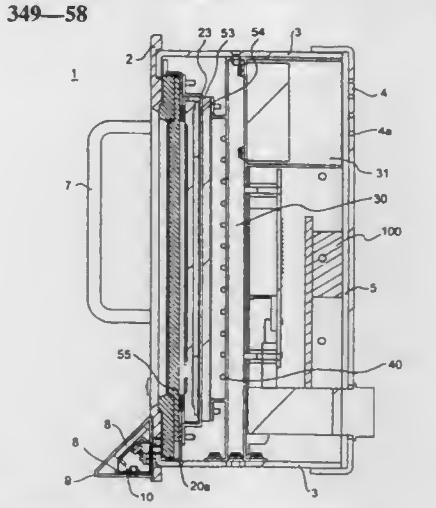
d. depositing conductive column driver lines each interconnecting all corresponding pixel transistor conducting tabs on said substrate in the corresponding column so that each column line contacts an appropriate conductive tab of every transistor in the column;

e. depositing row driver lines each interconnecting all corresponding pixel transistor conducting tabs on said substrate in the corresponding row so that each row line contacts an appropriate conductive tab of every transistor in the row; and

f. depositing transparent and conductive pixel electrodes on said substrate in an orthogonal matrix, each said electrode being in contact with one of said conductive tabs of a corresponding pixel transistor;

whereby the placement of pixel transistors and conductive lines is out of the viewing area allocated by the AMLCD display, said viewing area being defined by said pixel electrode areas.

5,748,269
ENVIRONMENTALLY-SEALED, CONVECTIVELY-COOLED ACTIVE MATRIX LIQUID CRYSTAL DISPLAY (LCD)
David Bennitt Harris, Howard County; Barry Morris Mathieu, Prince Georges County; Jeffrey Alan Dobratz, Montgomery County; Mark Allen Uehling, Prince Georges County, and Robert Charles Kull, Montgomery County, all of Md., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Nov. 21, 1996, Ser. No. 754,324
Int. Cl.^{6} G02F *1/1335;1/1333*
U.S. Cl. 349—58 **20 Claims**



20. An integrated computer system including:

a power supply;

a display unit powered by said power supply, said display unit comprising:

an environmentally-sealed enclosure having a removable cover, and housing a liquid crystal display screen, said removable cover serving as an integral heat sink for said power supply, the power supply being mounted on the internal surface of the cover;

backlighting means for backlighting said display screen; and

a cooling plenum for conductively and convectively cooling the backlighting means, said backlighting means being mounted directly on a surface of said plenum.

OL
2 10
SS
1
MY
5
998
MI

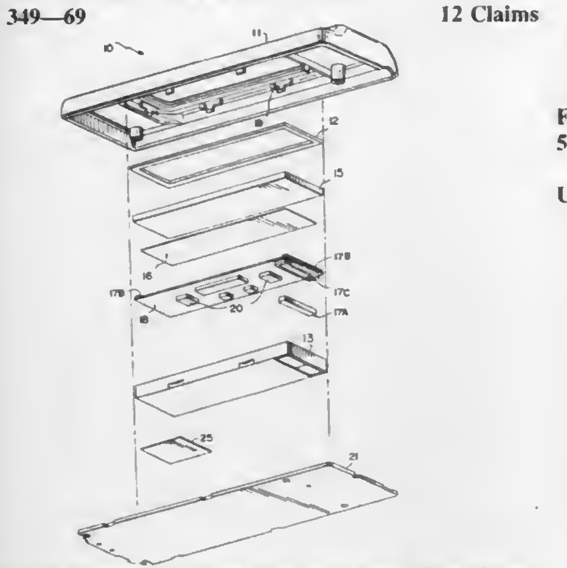
5,748,270
LCD WITH ELECTROLUMINESCENT BACKLIGHTING

Dwight D. Smith, Lynchburg, Va., assignor to Ericsson, Inc., Research Triangle Park, N.C.

Filed Jun. 25, 1996, Ser. No. 668,472

Int. Cl.^{6} G02F *1/1333;1/1345*

U.S. Cl. 349—69 **12 Claims**



1. An LCD assembly for connection to a main circuit board, comprising:
a frame, and
an LCD material layered on an electroluminescent material layered on a driver circuit board, all within the frame, said driver circuit board having two sides, one side having a main elastomeric conductive strip electrically connecting the main circuit board, and the other side having two additional elastomeric conductive strips electrically connected, respectively, to said LCD material.

5,748,271
ELECTROLUMINESCENT DEVICE HAVING ELECTROLUMINESCENT COMPOUND AND LIQUID CRYSTALLINE COMPOUND

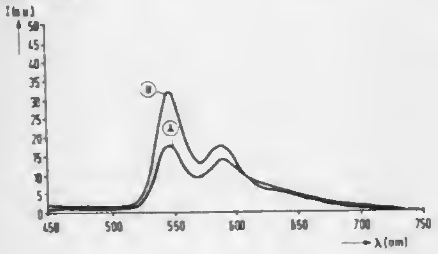
Rifat A.M. Hikmet; David B. Braun; Aemilianus G.J. Staring; Hermannus F.M. Schoo, and Johan Lub, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1996, Ser. No. 700,909

Claims priority, application European Pat. Off., Aug. 21, 1995, 95202250

Int. Cl.^{6} G02F *1/1335;* **H05B** *33/14*

U.S. Cl. 349—69 **7 Claims**



1. An electroluminescent device comprising an anisotropic active layer of an oriented electroluminescent organic compound, said layer situated between two electrode layers, at least one electrode layer being transparent to light to be emitted, and, in operation, said device emitting polarized light, wherein the oriented electroluminescent compound is mixed with an oriented liquid-crystalline compound.

5,748,272
METHOD FOR MAKING AN OPTICAL DEVICE USING A LASER BEAM INTERFERENCE PATTERN

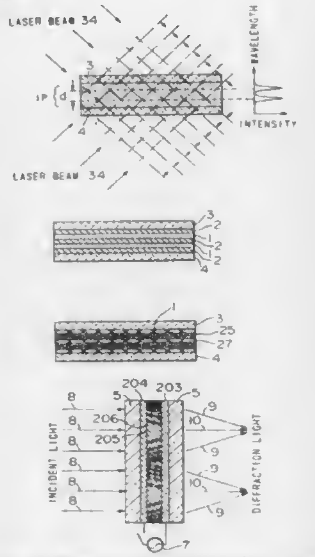
Keiji Tanaka; Kinya Kato, both of Iruma; Shinji Tsuru, Higashimurayama, and Shigenobu Sakai, Tama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 198,811, Feb. 18, 1994. This application Jun. 10, 1996, Ser. No. 661,018

Claims priority, application Japan, Feb. 22, 1993, 5-31721; Feb. 23, 1993, 5-33221; Apr. 27, 1993, 5-100596; Sep. 20, 1993, 5-233253; Nov. 26, 1993, 5-296287

Int. Cl.^{6} G02F *1/1333*

U.S. Cl. 349—86 **11 Claims**



1. A method for making an optical device comprising the steps of:
(a) preparing a pair of transparent electrodes;
(b) disposing a mixture solution containing a light hardenable polymer material and a liquid crystal material between said pair of transparent electrodes;
(c) irradiating said mixture solution with a plurality of process laser beams, each process laser beam being oriented at a specific process angle with respect to an incident surface of said optical device and said plurality of process laser beams forming an interference pattern in said mixture solution; and
(d) controlling the rate of hardening of said light hardenable polymer material to generate a plurality of optical elements formed by said interference pattern having at least one periodicity in inter-element spacings, thereby forming said optical device which regulates reflection, transmission and diffraction of incident light entering said optical device by the application of an electrical field on said pair of transparent electrodes.

5,748,273
METHOD AND DEVICE FOR RECORDING INFORMATION, AND METHOD FOR MEASURING THE TRANSMITTANCE OF LIQUID CRYSTALS, WHICH IS APPLIED TO RECORDING INFORMATION

Masato Okabe, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

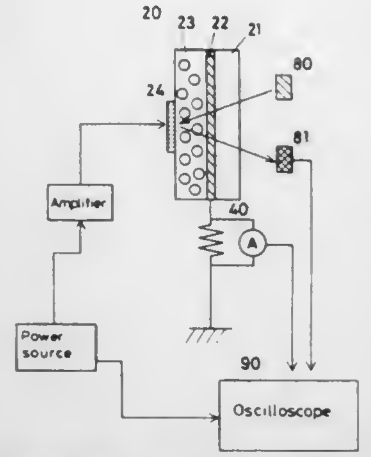
Division of Ser. No. 233,812, Apr. 26, 1994, Pat. No. 5,555,205. This application Jun. 17, 1996, Ser. No. 668,119

Claims priority, application Japan, Apr. 27, 1993, 5-101277; Apr. 30, 1993, 5-104225; Sep. 3, 1993, 5-220072; Sep. 3, 1993, 5-220074; Nov. 26, 1993, 5-296921

Int. Cl.^{6} G02F *1/1333;1/13*

U.S. Cl. 349—86 **10 Claims**

1. A method for recording information comprising oppositely facing across an air gap a photoelectric sensor and a liquid crystal recording medium, said photoelectric sensor having a photoconductive layer formed on a transparent electrode, and said liquid crystal recording medium in which a polymer dispersion type of liquid crystal recording layer having liquid crystals dispersed and fixed in a resin is formed on an electrode, and applying voltage between the electrodes simultaneously with exposure to image-carrying light, thereby recording the image on said liquid crystal recording medium, characterized in that the resistivity of said liquid crystal recording layer and the conductivity of said photoelectric sensor in a dark place are measured prior to recording the image, and the voltage to be applied between said electrodes is preset on the basis of the measurements of the resistivity of said liquid crystal recording layer and the conductivity of said photoelectric sensor in a dark place.



5,748,274
LCD HAVING A VOLTAGE BEING APPLIED TO THE LC IN THE CHIRAL NEMATIC PHASE PRIOR TO THE DISPLAY DRIVING

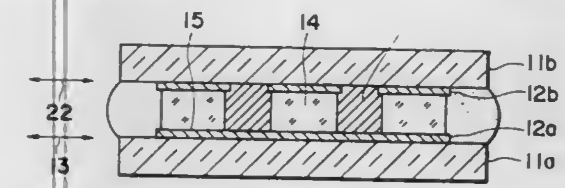
Osamu Taniguchi; Shinjiro Okada, both of Kawasaki; Yutaka Inaba, Kawaguchi; Hitoshi Shindo, and Hirofumi Shibata, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 294,603, Aug. 23, 1994, Pat. No. 5,438,443, which is a continuation of Ser. No. 5,406, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 652,494, Feb. 8, 1991, abandoned, which is a continuation of Ser. No. 344,446, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 919,379, Oct. 16, 1986, abandoned. This application Mar. 20, 1995, Ser. No. 406,484

Claims priority, application Japan, Oct. 18, 1985, 60-233036

Int. Cl.^{6} G02F *1/141;1/1339;1/13*

U.S. Cl. 349—133 **5 Claims**



1. A liquid crystal device comprising:
a pair of substrates and a chiral smectic liquid crystal disposed between the pair of substrates in a thickness small enough to suppress formation of a helical structure of said chiral smectic liquid crystal; wherein at least one of said pair of substrates has been subjected to a uniaxial aligning treatment; and said chiral smectic liquid crystal is a liquid crystal assuming cholesteric phase on a higher temperature side than chiral smectic phase, said liquid crystal being placed in an alignment state formed by cooling through the cholesteric phase into the chiral smectic phase and by applying to the liquid crystal in the chiral smectic phase prior to display driving an AC voltage sufficient to increase display contrast.

5,748,275
LIQUID CRYSTAL DISPLAY DEVICE AND LIQUID CRYSTAL DISPLAY APPARATUS

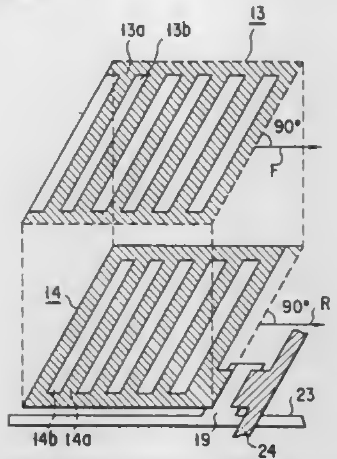
Makiko Sato; Yuzo Hisatake; Ryoichi Watanabe, and Hitoshi Hatoh, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 1, 1995, Ser. No. 566,038

Claims priority, application Japan, Dec. 1, 1994, 6-298496

Int. Cl.^{6} G02F *1/1343*

U.S. Cl. 349—144 **24 Claims**



1. A liquid crystal display device comprising:
a first substrate supporting a plurality of pixels, each having an electrode;
a second substrate having an electrode and arranged such that said electrode of said first substrate opposes said electrode of said second substrate;
a nematic liquid crystal composition layer held between said first and second substrates; and
means for aligning liquid crystal molecules of the nematic liquid crystal composition in one direction on surfaces of said first and second substrates,
wherein said electrode of the first substrate in each pixel includes a plurality of stripe-shaped conductive layers each having a width not more than 50 μm, a distance between said conductive layers being not more than 50 μm, and at least two of said conductive layers being electrically connected in at least part of an area in said pixel,
said electrode of the second substrate consists of a continuous conductive film, and
a distance RS between said conductive layers and a distance D between said electrode of said first substrate and said electrode of second substrate satisfy the following inequality:

$$\tan(\pi/9) \leqq RS/2D \leqq \tan(7\pi/18).$$

5,748,276
LIQUID CRYSTAL DISPLAY UNIT WITH A PLURALITY OF SUBPIXELS

Mitsuhiro Uno, Neyagawa; Yoneharu Takubo, Toyonaka; Katsuhiko Kumagawa; Satoshi Asada, both of Neyagawa, and Naomi Takada, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 450,622, May 25, 1995, Pat. No. 5,610,739. This application Dec. 9, 1996, Ser. No. 762,419

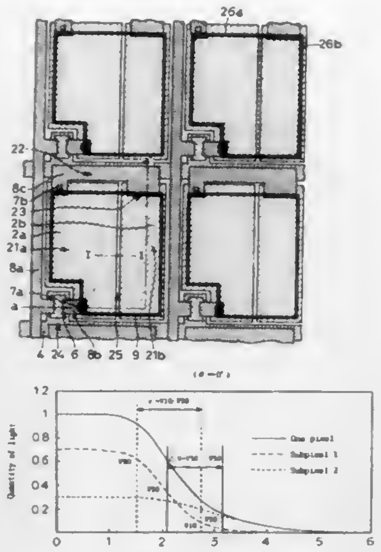
Claims priority, application Japan, May 31, 1994, 6-118828; Dec. 2, 1994, 6-299595; Dec. 22, 1994, 6-320277; Jan. 30, 1995, 7-012138

Int. Cl.^{6} G02F *1/1343;* **G09G** *3/36*

U.S. Cl. 349—144 **6 Claims**

1. A liquid crystal display unit comprising:
two insulating substrates;
a liquid crystal layer sandwiched between said two insulating substrates;
a plurality of pixels arranged in a matrix;
at least two subpixels in each pixel; and

/OL
2 10
SS
1
MY
5
998
JMI



means for applying voltage to a liquid crystal layer of each subpixel; wherein voltage applied to a liquid crystal layer of one subpixel is different from voltage applied to a liquid crystal layer of another subpixel; and wherein a ratio of display area between said subpixels and a difference in driving voltage of said subpixels are controlled so that the correlation between quantity of light and signaling voltage is monotonously falling or monotonously rising; said pixel being observed at an angle of 0°-40° inclined from an axis perpendicular to said insulating substrates along a long axis of liquid crystal molecules positioned in a middle layer of said liquid crystal layer with no application of voltage.

5,748,277

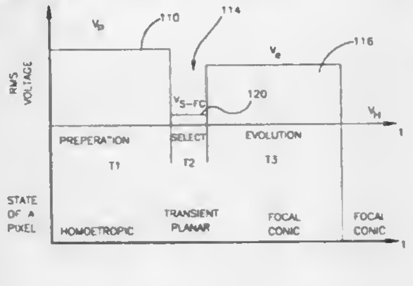
DYNAMIC DRIVE METHOD AND APPARATUS FOR A BISTABLE LIQUID CRYSTAL DISPLAY

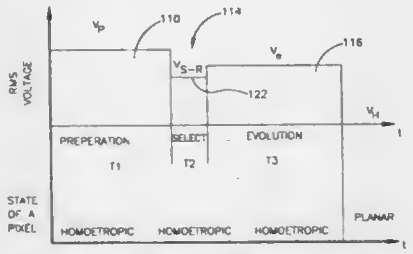
Xiao-Yang Huang, Kent; Philip J. Bos, Hudson, and Deng-Ke Yang, Stow, all of Ohio, assignors to Kent State University, Kent, Ohio

Filed Feb. 17, 1995, Ser. No. 390,068

Int. Cl.^{6} C09K *19/02;* **G09G** *3/36;5/00*

U.S. Cl. 349—169 **25 Claims**





1. A method of addressing a bistable chiral nematic liquid crystal material disposed between electrodes arranged on opposed sides of said liquid crystal and adapted to selectively apply an electric field through said liquid crystal material, said method comprising the steps of energizing said electrodes to establish a preparation voltage across said liquid crystal during a preparation phase, thereafter energizing said electrodes to establish a selection voltage across said liquid crystal during a selection phase for selecting a final display state for said liquid crystal, next energizing said electrodes to establish an evolution voltage across said liquid crystal during an evolution phase, and thereafter permitting said liquid crystal to exhibit the final display state.

5,748,278

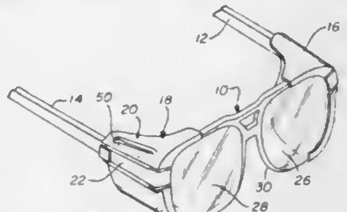
EYEGLASS SHIELD FOR REMOVABLE ATTACHMENT TO EYEGLASS LENS FRAMES

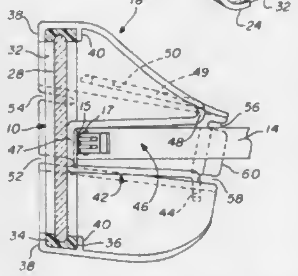
Bennie F. Simmons, Sr., Lewisville, Tex., assignor to Safety Optical Service Company, Lewisville, Tex.

Filed Aug. 8, 1996, Ser. No. 695,088

Int. Cl.^{6} G02C *7/10;* **A61F** *9/02*

U.S. Cl. 351—44 **15 Claims**





1. A full sideshield for removable attachment to an eyeglass frame front portion having a pair of spaced eyeglass lens holders, the lens holders having a front and a back and a pair of temples attached to a corresponding mounting bracket hinge projection from each side of the lens holder for holding the eyeglass frame on the head of a user, said sideshield having an inside and an outside and forming a semicircle around the eyeglass lens holder in front of an eye cavity of the user to provide at least partial eye protection at the top, bottom, and side of the eye, the sideshield comprising:

- a generally arcuate-shaped sideshield having a periphery for generally conforming to the shape of the eyeglass lens holder and having a top portion, bottom portion, and a side portion integrally formed as a single unit;
- a first flange portion extending from said sideshield at least partially in front of and substantially parallel to said eyeglass lens holder;
- a second flange portion spaced from said first flange portion and extending from said sideshield at least partially behind said eyeglass lens holder and substantially parallel to the first flange portion to secure said eyeglass lens holder between said first and second flange portions; and
- a resilient, detachable fastener for removably attaching each sideshield to a respective eyeglass lens holder in a fixed relationship, without movement, as said temples are moved toward each other.

5,748,279

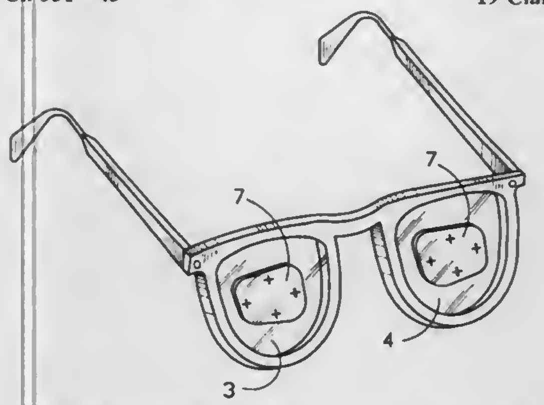
KIT FOR MOMENTARY CORRECTION OF VISION TO AID IN THE SELECTION OF EYEGLASS FRAMES

Mitchel Glanzbergh, 5116 Llano Dr., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 661,043, Jun. 10, 1996, abandoned. This application Feb. 10, 1997, Ser. No. 795,254

Int. Cl.^{6} G02C *7/16*

U.S. Cl. 351—45 **19 Claims**



1. An apparatus for use in conjunction with multiple pairs of eyeglasses to be tested by a wearer, each pair of the eyeglasses including a first blank lens and a second blank lens so that the first blank lens is in front of a first eye of the wearer and the second blank lens is in front of a second eye of the wearer when the pair of eyeglasses are worn by the wearer, the apparatus comprising:

a. a first corrective device for correcting the vision of the first eye of the wearer, the first corrective device formed of thin film having a first surface, a second surface, and a circumference with a reusable adhesive affixed to the first surface and a removal and affixing means attached to at least a portion of the circumference the first corrective device, the size of the first corrective device being less than the size of the first blank lens of each of said multiple pairs of eyeglasses, the first corrective device removably attachable at its first surface to a portion of a surface of the first blank lens of a selected pair of eyeglasses so that the wearer will see through the first blank lens and the first corrective device when the selected pair of eyeglasses are worn by the wearer;

b. a second corrective device for correcting the vision of the second eye of the wearer, the second corrective device formed of thin film having a first surface, a second surface, and a circumference with a reusable adhesive affixed to the first surface and a removal and affixing means attached to at least a portion of the circumference the second corrective device, the size of the second corrective device being less than the size of the second blank lens of each of the multiplicity of eyeglasses, the second corrective device removably attachable at its first surface to a portion of a surface of the second blank lens of said selected pair of eyeglasses so that the wearer will see through the second blank lens and the second corrective device when said selected pair of eyeglasses are worn by the wearer; and

c. the first corrective device being rapidly removable from the first blank lens of said selected pair of eyeglasses through the removal and affixing means and rapidly removably attachable to a portion of the first blank lens of another pair of eyeglasses, and the second corrective device being rapidly removable from the second blank lens of said selected pair of eyeglasses through the removal and affixing means and rapidly removably attachable to a portion of the second blank lens of the other pair of eyeglasses so that the wearer will see through the first blank lens and the first corrective device and the second blank lens and the second corrective device when the other pair of eyeglasses are worn by the wearer.

5,748,280

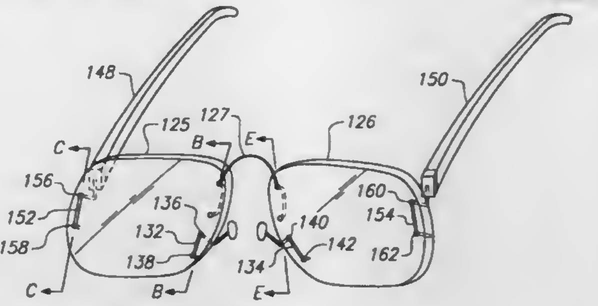
RIMLESS EYEGLASSES HAVING A SINGLE WIRE BRIDGE AND REMOVABLE LENSES

Pat Herman, Aptos, Calif., assignor to Eyes For You Inc., Aptos, Calif.

Filed Sep. 30, 1996, Ser. No. 724,500

Int. Cl.^{6} G02C *1/02;5/14*

U.S. Cl. 351—110 **21 Claims**



1. Rimless eyeglasses, comprising:

a first lens and a second lens, each lens having a pair of openings for securing a bridge, said pair of openings including a first opening and a second opening;

a wire having a bridge section, a first c-shaped section formed at a first end of said bridge section, and a second c-shaped section formed at a second end of said bridge section, wherein each of said first and second c-shaped sections has an end inserted in said second opening and a section extending through said first opening.

5,748,281

CONNECTING DEVICE PARTICULARY FOR EYEGLASSES

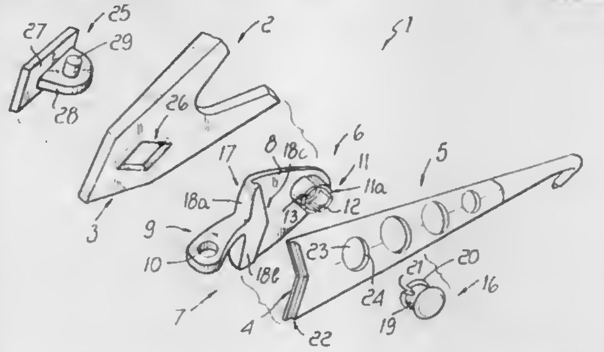
Luciano Simioni, and Sergio Menegon, both of Montebelluna, Italy, assignors to Killer Loop S.p.A., Pederobba, Italy

Filed Jun. 7, 1996, Ser. No. 659,848

Claims priority, application Italy, Jun. 14, 1995, TV95A0071

Int. Cl.^{6} G02C *5/14*

U.S. Cl. 351—121 **23 Claims**



1. A combination of an eyeglass temple member and an eyeglass front member, and a connecting device being interconnected between said temple member and said front member such as to mutually pivotally connect said temple member and said front member, said connecting device comprising a pivot connection, and the combination further comprising an interconnection arrangement between said connecting device and said temple member, said interconnection arrangement comprising:

at least one male part connected with one of said connecting device and said temple member; and

at least one female part connected with the other one of said connecting device and said temple member;

wherein said male part is accommodated in said female part so as to connect said connecting device and said temple member;

and wherein said male part is elastically deformable such that upon mutually interconnecting said connecting device and said temple member)said male part elastically deforms while being inserted into said female part and subsequently said male part connects with said female part in a snap-together manner.

5,748,282
MULTIFOCAL CONTACT LENS

Michael H. Freeman, Wales, United Kingdom, assignor to Pilkington Barnes Hind, Inc., Sunnyvale, Calif.

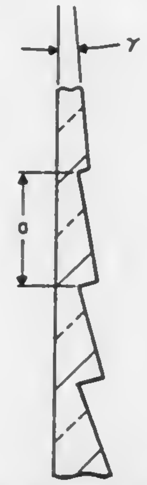
PCT No. PCT/US94/00918, § 371 Date Oct. 5, 1995, § 102(e) Date Oct. 5, 1995, PCT Pub. No. WO94/17435, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 25, 1994, Ser. No. 495,463

Claims priority, application United Kingdom, Jan. 27, 1993, 9301614

Int. Cl.^{6} G02C *7/04*

U.S. Cl. 351—161 **20 Claims**



1. A multifocal contact lens having diffractive power in which at least one image at one order is produced by diffraction and that image as seen by the eye through one part of the lens is differentiated from the same image at the same order as seen by the lens through another part of the lens by having a different intensity of light.

5,748,283
LIGHT-SOURCE DEVICE FOR EXPOSURE AND LIGHT-SOURCE DEVICE FOR IMAGE READING

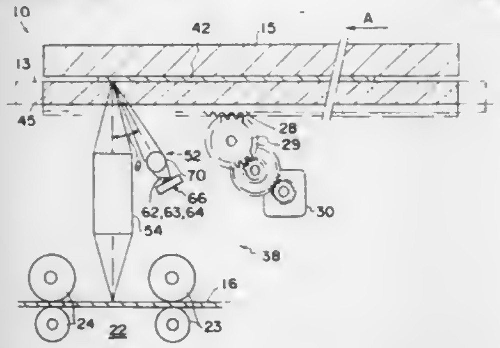
Hiroshi Sunagawa; Atsushi Uejima; Osamu Iwasaki, and Takaaki Aihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 24, 1996, Ser. No. 719,981

Claims priority, application Japan, Sep. 26, 1995, 7-247558

Int. Cl.^{6} G03B *27/72;27/32;27/52;27/54*

U.S. Cl. 355—35 **20 Claims**



1. A light-source device for irradiating the surface of an original with light while being moved relative to the original and focusing light reflected from or transmitted through the surface of the original onto a photosensitive material so as to subject the photosensitive material to slit exposure, comprising:

light-emitting elements for emitting three colors having different light-emitting wavelengths,

each element of said light-emitting elements being linearly arranged at predetermined intervals and disposed at right a angle to the direction in which said original is conveyed,

the element numbers of each color of said light-emitting elements being set based on a ratio between outputs of said three-color light-emitting elements at their light-emitting wavelengths when said three-color light-emitting elements are caused to emit light at the maximum rated outputs and a ratio between sensitivities of the photosensitive material at the light-emitting wavelengths in such a manner that when at least said two-color light-emitting elements of said three-color light-emitting elements are caused to emit light at the maximum rated outputs, densities of colors on the photosensitive material, which are exposed by said light-emitting elements and are developed, are substantially identical to each other.

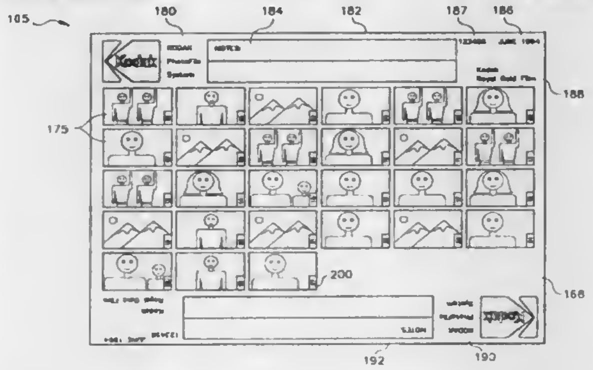
5,748,284
INDEX PRINT

Joseph Anthony Manico, Rochester; Thomas Richard Roule, Mendon; William Davis Loveland, Penfield, and Barton Anthony Pricola, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1995, Ser. No. 413,148

Int. Cl.^{6} G03B *27/32;27/52*

U.S. Cl. 355—39 **6 Claims**



1. A photographic index print, comprising:

a recording sheet having a top edge and a bottom edge;

between said top and bottom edges, a plurality of positive images on said recording sheet, said positive images corresponding to respective images on a photographic image recording medium, said plurality of positive images being oriented either right-side-up toward said top edge or up-side-down toward said bottom edge, depending on an orientation of the recording medium in a photographic camera in which the respective images were exposed;

a top header on said recording sheet, said top header having visible information relating to said plurality of positive images, said visible information being oriented right-side-up toward said top edge;

a bottom header on said recording sheet, said bottom header having further visible information relating to said plurality of positive images, said further visible information being oriented up-side-down toward said bottom edge; and

a plurality of reference symbols on said recording sheet, at least one reference symbol being positioned relative to each of said plurality of positive images, said at least one reference symbol being oriented on said recording sheet to be read without being up-side-down when said positive images are viewed right-side-up, whether said positive images are oriented toward said top edge or said bottom edge on said recording sheet,

whereby a person viewing said index print can orient said positive images right-side-up and be able to read not only said at least one reference symbol relative to each of said plurality of positive images, but also one of said top header and said bottom header, without either said at least one reference symbol or said one header being up-side-down as read.

5,748,285
PHOTOGRAPHIC PRINTING APPARATUS AND METHOD FOR ACCURATELY PRINTING FRAME NUMBERS ON PRINT PAPER

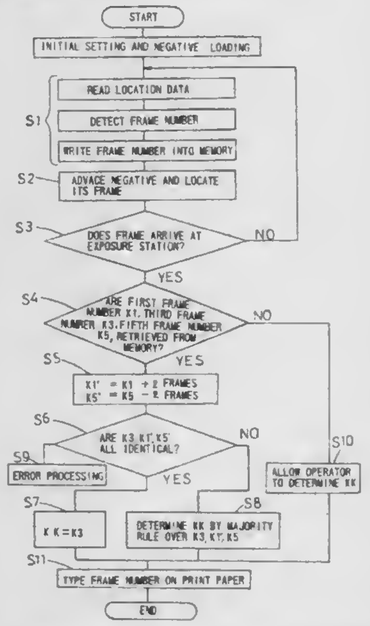
Toshiro Akira, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Oct. 24, 1995, Ser. No. 547,540

Claims priority, application Japan, Oct. 27, 1994, 6-264143

Int. Cl.^{6} G03B *27/46*

U.S. Cl. 355—39 **2 Claims**


START
INITIAL SETTING AND NEGATIVE LOADING
S1
READ LOCATION DATA
DETECT FRAME NUMBER
WRITE FRAME NUMBER INTO MEMORY
S2
ADVACE NEGATIVE AND LOCATE ITS FRAME
S3
DOES FRAME ARRIVE AT EXPOSURE STATION?
NO
YES
S4
ARE FIRST FRAME NUMBER K1, THIRD FRAME NUMBER K3, FIFTH FRAME NUMBER K5, RETRIEVED FROM MEMORY?
NO
YES
S5
K1' = K1 + 2 FRAMES
K5' = K5 − 2 FRAMES
S6
ARE K3, K1', K5' ALL IDENTICAL?
NO
YES
S9
ERROR PROCESSING
S10
ALLOW OPERATOR TO DETERMINE KK
S7
K K = K3
S8
DETERMINE KK BY MAJORITY RULE OVER K3, K1', K5
S11
TYPE FRAME NUMBER ON PRINT PAPER
END

1. A method of determining location data for a plurality of image frames on a negative film having a lengthwise extending track upon which location data of each frame is recorded, wherein the negative film is transferred through a photographic printing apparatus during which location data is read for each image frame of the negative film in a sequential manner, and during which frames of the negative film and determined location data are simultaneously printed on a photosensitive material at an exposure station, said method comprising the steps of:

sequentially storing the location data read for image frames of the negative film;

conducting calculations on at least three of the location data stored, by said storing step with reference to a particular frame of the negative film which is positioned at the exposure station;

determining the location data of said particular frame of the negative film which is positioned at the exposure station by selecting one of the at least three calculated location data which is identical for a maximum of the at least three calculated location data; and

repeating said storing, conducting calculations and determining steps for each image frame of the negative film that is positioned at the exposure station.

5,748,286
METHOD AND APPARATUS FOR PRINTING PHOTOGRAPHS OF DIFFERENT FORMATS

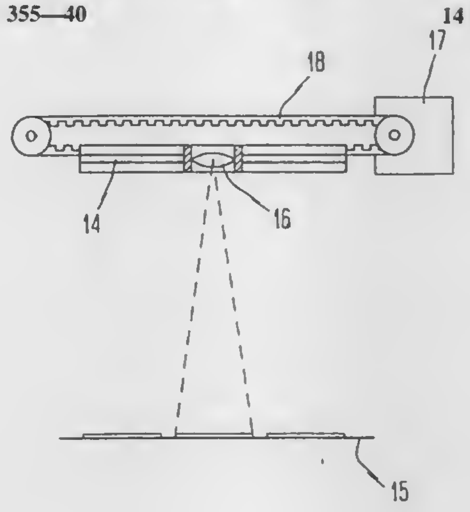
Hans-Georg Schindler, Holzkirchen; Hans-Jurgen Rauh, Strasslach-Dingh; Manfred Fursich, Taufkirchen; Magos Vasilios, Unterhaching; Wilhelm Nitsch; Rainer Deutsch, both of München; Klaus-P. Hartmann, Schondorf; Leonhard Huber, Glonn; Gerhard Benker, Icking, and Reimund Münch, München, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1995, Ser. No. 444,913

Claims priority, application Germany, May 27, 1994, 44 18 602.9

Int. Cl.^{6} G03B *27/52;27/44*

U.S. Cl. 355—40 **14 Claims**



1. In a method of producing photographic prints in different photographic formats with different reproduction scales on a strip of printing stock from a series of negative images on a film strip, said method using a printing mechanism to focus light passed through the negative images onto the printing stock and using a negative image scanner which scans a plurality of image areas to determine the optical density at such areas for the purpose of establishing printing light quantities, said method producing panorama photographic prints from panorama negative images, which panorama negative images differ in image height from a regular negative image height on the film strip, said method comprising the steps of:

(a) scanning the negative images on the film strip to determine the optical densities of image areas therein;

(b) analyzing the density values obtained by the scanner to determine the negative image height, wherein panorama images are determined when (1) the density values associated with the areas along the longitudinal borders of a negative image do not exceed the density values of a mask by more than a prescribed minimum that can be ascribed to noise, and (2) at least one of (i) the density values associated with a central area of the image exceed the mask density values, and (ii) the density values from the central area exceed the longitudinal border values, by a prescribed minimum;

(c) printing negative images of a first format in one reproduction scale on one section of the strip of printing stock during a first pass of the film strip through the printing mechanism;

(d) automatically readjusting the printing mechanism to change the reproduction scale to that of a second format; and

(e) printing negative images of the second format on a subsequent section of the strip of printing stock during another pass of the film strip through the printing mechanism.

5,748,287

PHOTOGRAPHIC FILM REPRODUCING APPARATUS USING OBJECT BRIGHTNESS AND EXPOSURE CORRECTION AMOUNT TO DEVELOP PHOTOGRAPHED IMAGES

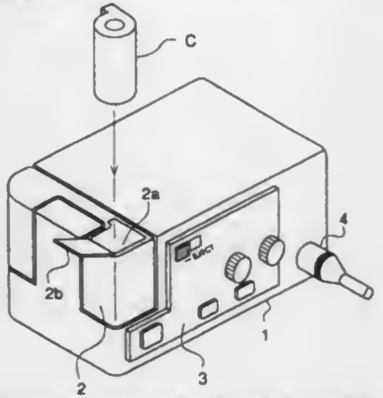
Yoshiharu Takahashi; Yasutoshi Fujii; Keiichi Kawazu; Seiichi Isoguchi; Kohichi Yamaguchi, and Katsuya Nagaishi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 4, 1995, Ser. No. 566,888

Claims priority, application Japan, Dec. 9, 1994, 6-306351; Dec. 9, 1994, 6-306352

Int. Cl.⁶ G03B *27/00*

U.S. Cl. 355—40 **11 Claims**



1. An apparatus for reproducing a photographed image on each frame of developed photographic roll film, wherein each frame includes an image region on which the photographed image is provided and a memory region in which information regarding the photographed image is stored, comprising:

- an image reader for photoelectrically reading the photographed image on the image region and for outputting image signals;
- an information reader for reading the information stored in the memory region, the information including photographing information provided at the time of photographing a subject image, the photographing information being brightness information for the photographed image;
- a processing circuit for processing the image signals based on the brightness information; and
- a monitor having a screen for displaying an image corresponding to the processed image signals on the screen, the processing circuit changing brightness of the displayed image on the screen in accordance with the brightness of the photographed image,
- wherein when the brightness of the photographed image is a middle brightness, the brightness of the photographed image is used as reference brightness for the displayed image, wherein when the brightness of the photographed image is a high brightness, the brightness of the displayed image is set higher than the reference brightness, and wherein when the brightness of the photographed image is a low brightness, the brightness of the displayed image is set lower than the reference brightness.

5,748,288

LIGHTING ASSEMBLY, EXPOSURE APPARATUS AND EXPOSURE METHOD EMPLOYING THE LIGHTING ASSEMBLY

Hiroyuki Nagano; Takashi Inoue, both of Osaka; Hiroshi Yamashita; Takeo Sato, both of Kanagawa, and Keiji Fujita, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

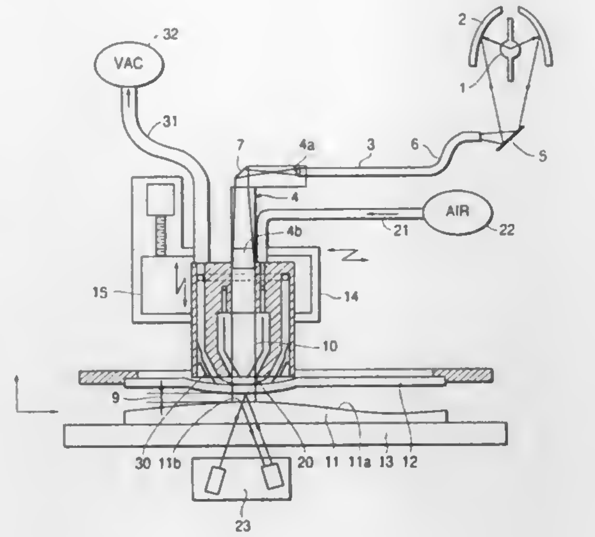
Filed Mar. 8, 1996, Ser. No. 613,027

Claims priority, application Japan, Mar. 8, 1995, 7-048865

Int. Cl.⁶ G03F *7/20*

U.S. Cl. 355—53 **21 Claims**

1. A lighting assembly for projecting an image onto a surface of a substrate, said lighting assembly comprising:



- a light source;
- a condensing-reflecting member for condensing light from said light source;
- an optical integrator, having a receiving end and an emitting end, for receiving light from said light source, causing the light to attain a homogeneous light intensity distribution, and emitting the homogeneously distributed light from said emitting end;
- a projection lens system, having a receiving end and a projecting end, for receiving the homogeneously distributed light emitted by said optical integrator, and projecting the homogeneously distributed light from said projecting end; and
- an image transcribing mask disposed adjacent said projecting end of said projection lens system.

5,748,289

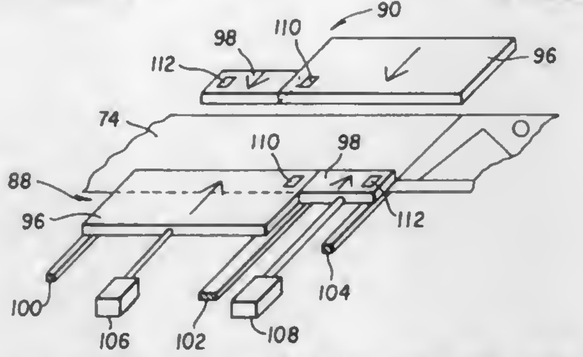
APPARATUS AND METHOD FOR PRODUCING PHOTOGRAPHIC PRINTS WITH WRITE-ON BORDERS

Joseph Anthony Manico, Rochester; David Lynn Patton, Webster, and Paul Henry Forest, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1996, Ser. No. 705,468

Int. Cl.⁶ G03B *27/58;27/62*

U.S. Cl. 355—74 **18 Claims**



1. A method for producing photographic prints with write-on borders from filmstrips having images with varying orientation from image to image or from filmstrip to filmstrip or both, comprising the steps of:

- (a) intermittently conveying a filmstrip through a filmstrip print gate;
- (b) determining an orientation of an image on the filmstrip for which a photographic print is to be made with a write-on border;

- (c) in response to determining the orientation of the image, selecting an edge of the image upon which to provide a write-on border on a photographic print to be made of the image;
- (d) at a photographic paper print gate, selectively masking an edge of the paper print gate which corresponds to the selected edge in step (c); and
- illuminating the image at the filmstrip print gate to project the image onto a photographic paper at the paper print gate to expose said paper to said image while masking said one edge to block block exposure of said edge to said image
- whereby the photographic paper will have a write-on border along only the selected edge.

5,748,290

METHOD AND APPARATUS FOR FEEDING AND WINDING PLURAL FILM

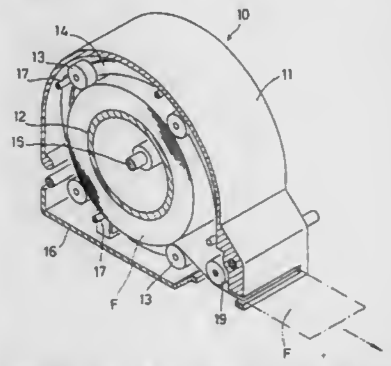
Hiroto Nakao, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Oct. 6, 1995, Ser. No. 540,179

Claims priority, application Japan, Oct. 7, 1994, 6-244203

Int. Cl.⁶ G03B *27/62;27/64*

U.S. Cl. 355—75 **11 Claims**



1. A film storage device provided in a photoprinting device having a scanner unit and an exposure unit at a film discharge port of said exposure unit, said film storage device comprising:

- a magazine case provided at said film discharge port of said exposure unit;
- a motor-driven film take-up core rotatably mounted in said magazine case;
- a plurality of film take-up guides provided around said film take-up core so that free ends thereof are movable toward and away from an axis of said film take-up core;
- a plurality of rollers each carried by a respective said take-up guide at said free end thereof;
- said film take-up guides being adapted to guide and wind films around said film take-up core, said rollers being spring-biased toward said axis of said film take-up core; and
- a film introducing guide provided at a film inlet port of said magazine case for guiding films discharged from said exposure unit into said magazine case.

5,748,291

FILM LOADING DEVICE

Robert Joseph Cameron, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

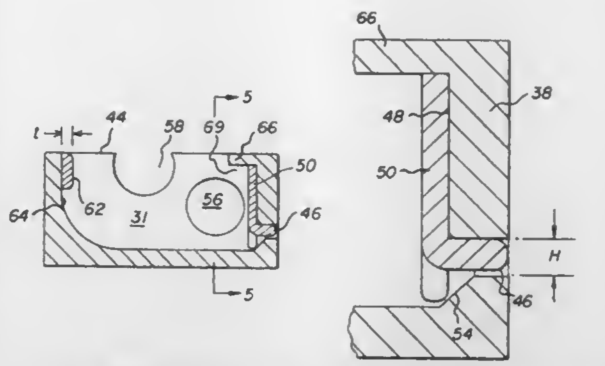
Filed Jun. 6, 1996, Ser. No. 659,484

Int. Cl.⁶ G03B *27/62*

U.S. Cl. 355—75 **16 Claims**

1. A film loading holder for loading a filmstrip contained in a film cartridge having a non-light-tight film exit/entry opening into a photofinishing apparatus designed to receive film from a cartridge having a light-tight opening, said holder comprising;

a chamber formed in said holder, said chamber being shaped so as to receive and retain therein a film cartridge having a



non-light-tight film exit/entry opening, said chamber also being shaped so as to provide a light-tight region around said exit/entry opening, said chamber having a front wall and a back wall, said front wall having a light-tight opening adjacent said exit/entry opening such that the filmstrip within said cartridge can be passed through said light-tight opening, said back wall having a compressible pad for retaining said film cartridge placed within said chamber;

wherein a thin layer of material is placed around said light-tight opening in said front wall, said thin layer of material extending into said light-tight opening, above said light-tight opening and on each lateral side of said light-tight opening.

5,748,292

COUPLING MECHANISM FOR USE IN A SEMI-OPENABLE DOCUMENT PRESSER OF AN IMAGE FORMING APPARATUS

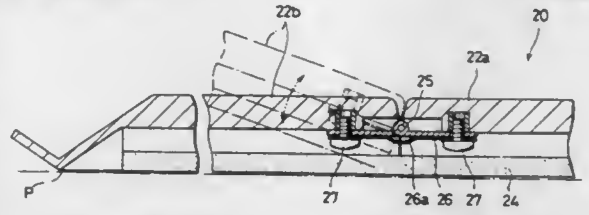
Kotaro Kawasaki, and Kazumi Noda, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka-fu, Japan

Filed Jul. 25, 1996, Ser. No. 686,991

Claims priority, application Japan, Aug. 17, 1995, 7-209719

Int. Cl.⁶ G03B *27/62*

U.S. Cl. 355—75 **13 Claims**



1. A coupling mechanism for use in a semi-openable document presser of an image forming apparatus, the document presser including a main presser member for covering a rear half portion of an upper surface of the apparatus and an auxiliary presser member for covering a front half portion of the upper surface of the apparatus, the main presser member being attached to the apparatus pivotally at a rear end of the main presser member, the coupling mechanism comprising:

- a coupler provided between the main and auxiliary presser members for coupling the main and auxiliary presser members with each other in such a manner as to allow the auxiliary presser member to rotate in an opening direction relative to the main presser member when receiving a predetermined external force exerted by an operator and to provide the main and auxiliary presser members with a restoring force for straightening the auxiliary and main presser members with respect to each other when not receiving the predetermined external force.

VOL
210
ISS
1
MY
5
1998
UMI

5,748,293
ADJUSTABLE DOCUMENT HANDLER FOR REPRODUCTION APPARATUS

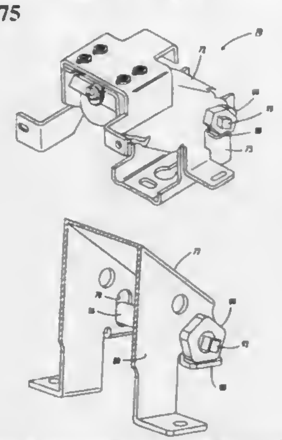
Jamie Crawford, Kirkella; Steven Powell, Aberdare, and John Michael Walker, Lower Caldecote, all of United Kingdom, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1996, Ser. No. 738,746

Claims priority, application United Kingdom, Oct. 31, 1995, 9522257

Int. Cl.^{6} G03B *27/62*

U.S. Cl. 355—75 **15 Claims**



1. In a document reproduction apparatus with a document imaging platen and with a document handler which is pivotally mounted to said document reproduction apparatus with a mounting mechanism so that said document handler normally closely overlies said imaging platen for normally engaging documents at said imaging platen with a lower portion of said document handler; the improvement in said mounting mechanism comprising;

a resettable stepwise spacing adjustment system integral said mounting mechanism for setting a selected spacing between said document handler and said imaging platen from a plurality of discrete steps of different predetermined said spacings,

said stepwise spacing adjustment system having a manual step selection system for easily manually selecting a selected one of said plurality of discrete steps of preset spacings,

to provide an improved said document handler mounting mechanism with simpler and more accurate adjustment and maintenance of a desired spacing between said document handler and said imaging platen.

5,748,294
OPTICAL-AXIS ADJUSTING DEVICE FOR A VEHICLE LIGHT RADAR SERVICE

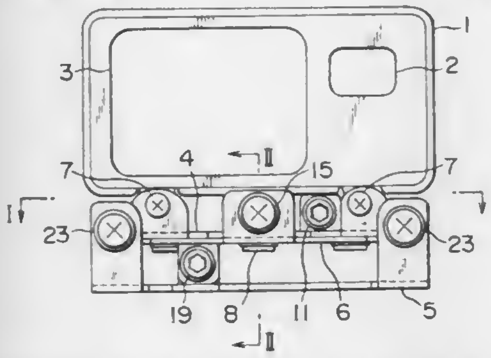
Koji Katayama, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1996, Ser. No. 626,326

Claims priority, application Japan, Oct. 13, 1995, 7-265737

Int. Cl.^{6} B60T *7/16;* **E04G** *3/00;* **G01C** *3/08;* **G01B** *11/26*

U.S. Cl. 356—4.01 **5 Claims**



1. An optical-axis adjusting device for a vehicle light radar device which has a light-transmitting window for irradiating a beam of light to an object of measurement and a light-receiving window for receiving reflected light from said object, said optical-axis adjusting device comprising:

vertical adjusting means provided at a front of said light radar device for adjusting a vertical irradiating direction of said beam of light; and lateral adjusting means provided at the front of said light radar device for adjusting a lateral irradiating direction of said beam of light.

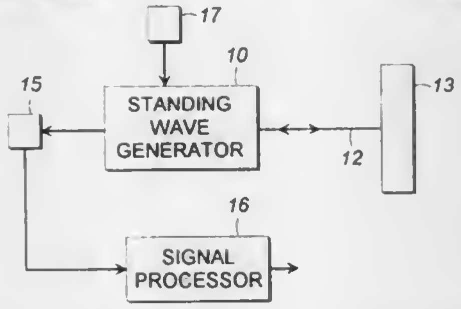
5,748,295
METHOD AND APPARATUS FOR DETERMINING THE RANGE, DIRECTION AND VELOCITY OF AN OBJECT

Brian W. Farmer, Norcross, Ga., assignor to University of Georgia Research Foundation, Athens, Ga.

Filed Jul. 31, 1996, Ser. No. 688,706

Int. Cl.^{6} G01C *3/08;* **G01P** *3/36*

U.S. Cl. 356—5.09 **20 Claims**



1. An apparatus for determining the range, direction and velocity of an object, said apparatus comprising:

a standing wave generator for generating standing waves and for projecting the standing waves onto the object;

means for detecting the standing waves generated by the standing wave generator and standing waves resulting from interference between the standing waves generated by the standing wave generator and standing waves reflected from the object and for producing electrical signals in response to the standing waves detected;

means for processing the electrical signals produced by said means for detecting the standing waves, said means for processing being electrically coupled to said means for detecting the standing waves for receiving the electrical signals produced by said means for detecting the standing waves, wherein a frequency modulated electrical signal is supplied to said standing wave generator for causing said standing wave generator to generate a frequency modulated standing wave having a frequency which is equal to or greater than π times the highest frequency at which the optical path between the object and said apparatus is modulating, and wherein causing said standing wave generator to generate a frequency modulated standing wave having a frequency equal to or greater than π times the highest frequency at which the optical path between the object and said apparatus is modulating prevents aliasing; and

means for determining a mode hop rate of said standing wave generator and for determining the range, direction and velocity of the object with respect to said apparatus based on the determined mode hop rate of said standing wave generator.

5,748,296
METHOD AND DEVICE FOR IN SITU QUANTIFICATION, BY REFLECTOMETRY, OF THE MORPHOLOGY OF A LOCALIZED REGION DURING ETCHING OF THE SURFACE LAYER OF A THIN-FILM STRUCTURE

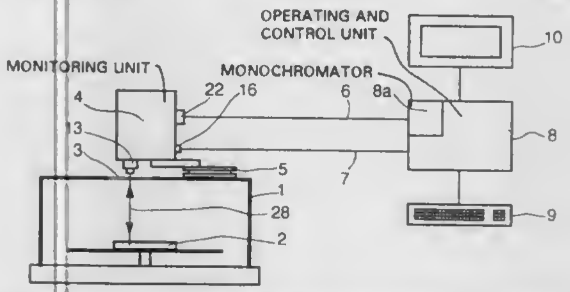
Jean Canteloup, Monthlery, France, assignor to Sofie Instruments, Arpajon, France

Filed Jul. 31, 1996, Ser. No. 691,816

Claims priority, application France, Aug. 2, 1995, 95 09422

Int. Cl.^{6} G01J *3/42*

U.S. Cl. 356—72 **12 Claims**



1. Method for real-time, in situ monitoring of the morphology of a localized region during etching of the surface layer of a thin-film structure to detect transition to a following layer, said method utilizing a video camera which has a matrix sensor and an objective, said objective having an optical axis, the thin-film structure being enclosed in a vacuum processing chamber which includes a window on its upper wall, said method including the steps of:

sending an illumination light beam of predetermined spectrum onto the localized region, the beam following an optical path centred on the optical axis of the objective of a video camera and passing through the window of the processing chamber to reach the localized region;

sending the light beam reflected by the localized region, which follows the said optical path, on the one hand to the matrix sensor of the video camera through a filter whose characteristic wavelength is chosen so as to reduce the effect on the light signal of the sources present in the chamber other than the illumination light beam or to accentuate the effect on the signal of a light intensity modification by the sources present in the chamber and, on the other hand, to an optical disperser or interference filter, respectively and successively through a selection diaphragm and a fibre-optic cable;

performing, with the aid of the optical disperser or of the interference filter, a spectral analysis of the reflected light beam with a view to detecting the transition to the following layer, during etching, by reflectometry in a specific analysis region forming part of the localized region.

5,748,297
ENDPOINT DETECTING APPARATUS IN A PLASMA ETCHING SYSTEM

Jong-Wook Suk; Jin-Ho Park; Shin-Hyun Park, and Chang-Sik Kim, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Dec. 6, 1996, Ser. No. 761,788

Claims priority, application Rep. of Korea, Dec. 13, 1995, 95-49160

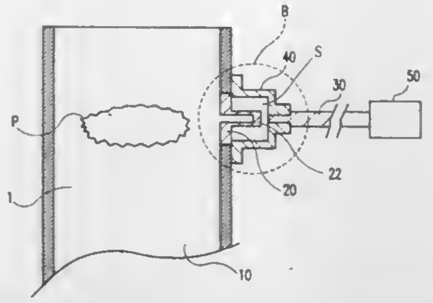
Int. Cl.^{6} G01N *21/62*

U.S. Cl. 356—72 **7 Claims**

1. A system for detecting an endpoint in a plasma etching system having a plasma reaction chamber, said system comprising:

a detection window provided at a wall of said reaction chamber, said detection window protruding outwardly from said reaction chamber wall;

a detecting apparatus disposed separately from said reaction chamber;



an optical cable for transmitting light to said detecting apparatus, said light being generated during an etching process and transmitted through said detection window to said optical cable;

a bracket for fixedly holding said detection window and said optical cable with respect to each other, said bracket being attached to an outer surface of said wall; and

means, externally arranged to said reaction chamber, for reducing intensity of an electric field formed between the bracket and said reaction chamber.

5,748,298
LIGHT RECEIVING OPTICAL SYSTEM HAVING A LIGHT SELECTOR INTEGRAL WITH A LENS AND PARTICLE ANALYZER INCLUDING THE SAME

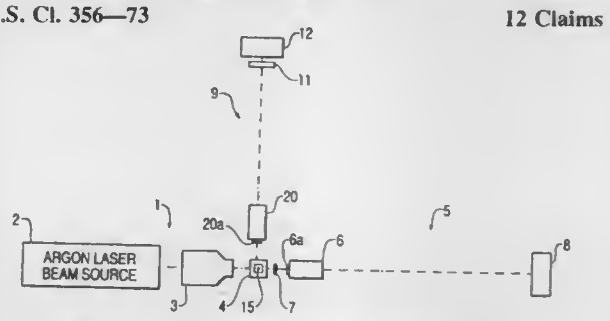
Hideo Kusuzawa, Kobe, Japan, assignor to Toa Medical Electronics Co., Ltd., Hyogo, Japan

Filed Sep. 13, 1996, Ser. No. 713,650

Claims priority, application Japan, Sep. 14, 1995, 7-236798; Sep. 14, 1995, 7-236799

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—73 **12 Claims**



1. A light receiving optical system comprising:

a light receiving lens; and

a beam stopper, integrally provided on said light receiving lens, for blocking part of the light incident to said light receiving lens at a predetermined portion including a center of an entrance surface of said light receiving lens.

5,748,299
METHOD AND SYSTEM FOR DETECTING DIRT ON OPTICAL FIBRES

Sasan Esmaeili, Solna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 12, 1996, Ser. No. 710,187

Claims priority, application Sweden, Sep. 29, 1995, 9503365

Int. Cl.^{6} G01B *9/02*

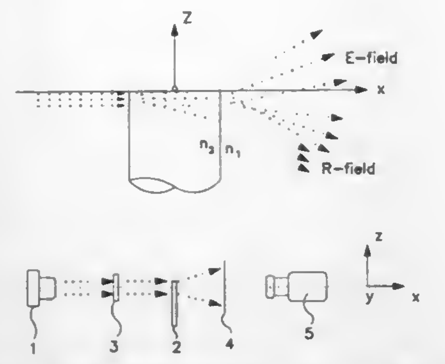
U.S. Cl. 356—73.1 **14 Claims**

1. A method of detecting dirt on an optical fibre, comprising the steps of:

illuminating a mantle surface and a cut surface of an optical fibre end with coherent light to create dirt-dependent interference;

imaging the resultant dirt-dependent interference on a screen as an interference pattern; and

/OL
2 10
SS
1
MY
5
998
MI



comparing said interference pattern with a reference image pattern of a clean optic fibre end, wherein a difference in said patterns indicates the presence of dirt.

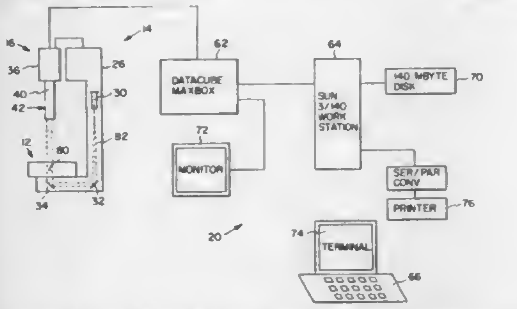
5,748,300
METHOD AND SYSTEM FOR AUTOMATICALLY INSPECTING OPHTHALMIC LENSES

Joseph Wilder, Princeton, N.J., and David Dreyfuss, Kettering, Ohio, assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 425,690, Apr. 19, 1995, abandoned, which is a continuation of Ser. No. 995,281, Dec. 21, 1992, abandoned. This application Sep. 12, 1996, Ser. No. 712,245

Int. Cl.^{6} G01B *9/00*

U.S. Cl. 356—124 **36 Claims**



1. A method for automatically inspecting an ophthalmic lens which includes an annular edge portion having generally circumferential inner and outer edges, comprising:

directing a light beam through the lens and onto an array of pixels to form images thereon of the inner and outer edges of the annular edge portion;

assigning to each pixel a data value representing the intensity of the light beam on the pixel; and

processing said data values according to a predetermined program to determine if the lens contains any one or more of a plurality of predetermined conditions;

wherein the processing step includes the steps of

i) identifying a center point on the pixel array and a radius of a first circle having a circumference generally commensurate with the image of the outer edge of the annular edge portion,

ii) identifying a center point on the pixel array and a radius of a second circle having a circumference generally commensurate with the image of the inner edge of the annular edge portion,

iii) determining a distance between the center points of the first and second circles,

iv) comparing said distance to a predetermined distance value, and

v) identifying the lens as being decentered if said distance is greater than said predetermined distance value.

5,748,301
DEVICE AND PROCESS FOR THE GEOMETRIC INSPECTION OF WHEELED VEHICLES

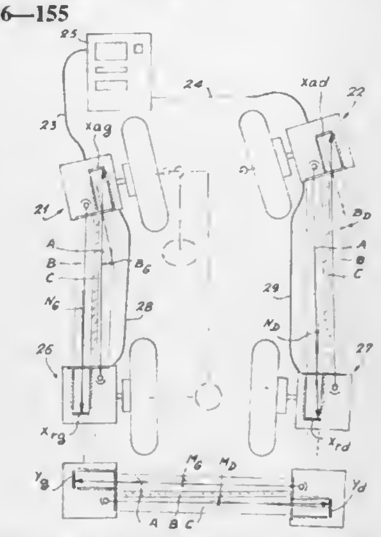
Patrice Muller, Chartres; Paul Coetsier, Pomponne, and Denis Douine, Lagny Sur Marne, all of France, assignors to Muller BEM, Chartres, France

Filed Apr. 28, 1995, Ser. No. 431,410

Claims priority, application France, Apr. 28, 1994, 94 05159

Int. Cl.^{6} G01B *11/26;11/275*

U.S. Cl. 356—155 **20 Claims**



1. Apparatus for geometric inspection of wheeled vehicles, comprising:

at least two casings facing each other and each comprising at least one light source and at least one optical receiver located behind a means for defining an image, said means being sensitive to radiation from the light source of the other opposite casing, the light source (**12**) of a first casing defining with the optical receiver (**13**) of a second opposite casing a first active spatial zone (A), the light source (**8**) of said second casing defining with the optical receiver (**14**) of said first casing a second active spatial zone (B) and the two said active spatial zones (A, B) being separated by a space (C) of predetermined width (d) in such a way that the first active spatial zone (A) does not intersect the second active spatial zone (B), thus permitting simultaneous operation of the two casings without mutual interference; and

a central unit (**25**, UC) connected by communication means to measuring casings (**21**, **22**; **40**, **41**) or measuring arms (**26**, **27**; **42**, **43**) of which each comprises a control keyboard (**31***a*) permitting the control of the central unit (UC) from the corresponding said casing (**40**, **41**) or arm (**42**, **43**);

wherein at least one said casing (**40**, **41**) or arm (**42**, **43**; **100**, **101**; **110**, **111**) is connected to and communicates with a wheel pivoting plate (P) supplying an outlet electrical signal representative of the angular position of a vehicle wheel.

5,748,302
OPTICAL POWER METER

Yasushi Unno, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1997, Ser. No. 799,461

Claims priority, application Japan, Feb. 22, 1996, 8-035279

Int. Cl.^{6} G01J *1/44*

U.S. Cl. 356—224 **3 Claims**

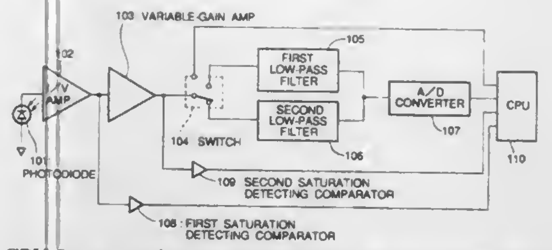
1. An optical power meter, comprising:

a photodiode for outputting an electrical current proportional to the optical power of an input optical beam;

an I/V amp for converting the output electrical current from said photodiode into a voltage;

a variable-gain amp for amplifying the output voltage of said I/V amp;

an A/D converter for converting the output voltage of said variable-gain amp into a digital signal;



a CPU for processing the digital signal outputted from said A/D converter;

a first saturation detecting comparator for detecting saturation of an output voltage level of said I/V amp; and

a second saturation detecting comparator for detecting saturation of an output voltage level of said variable-gain amp;

wherein

said CPU switches the gains of said I/V amp and said variable-gain amp based on output signals from said first saturation detecting comparator and said second saturation detecting comparator.

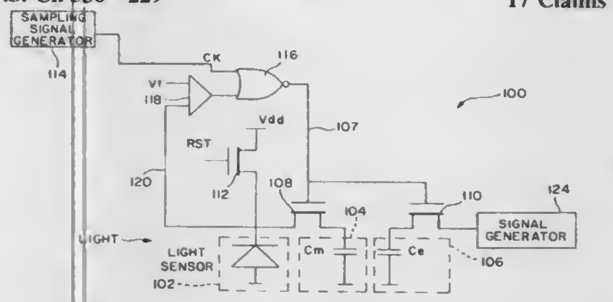
5,748,303
LIGHT SENSING DEVICE

Jean-Charles Korta, Mesa; Derek L. Davis; William J. Spaw, both of Phoenix, all of Ariz., and Lawrence T. Clark, Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 31, 1996, Ser. No. 775,833

Int. Cl.^{6} G01J *1/10*

U.S. Cl. 356—229 **17 Claims**



1. A light sensing device comprising:

at least one light sensor configured to be exposed to a light image and responsive thereto to generate a first signal;

a measuring device coupled to said at least one light sensor;

a sampling generator configured to generate a sampling signal to said measuring device, said sampling signal being inhibited when said first signal is lesser than or equal to a predetermined value; and

wherein upon inhibition of said sampling signal, said measuring device retaining a measure of said first signal.

5,748,304
MEASURING INSTRUMENT FOR REFLECTOMETRIC MEASUREMENTS

Aimo Heinonen, Espoo, Finland, assignor to Conrex Automation Oy, Mikkeli, Finland

PCT No. PCT/FI95/00044, § 371 Date Nov. 4, 1996, § 102(e) Date Nov. 4, 1996, PCT Pub. No. WO95/20758, PCT Pub. Date Aug. 3, 1995

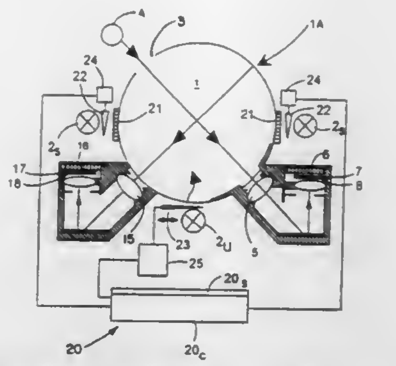
PCT Filed Jan. 30, 1995, Ser. No. 687,463

Claims priority, application Finland, Jan. 28, 1994, 940442

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—236 **8 Claims**

1. A measuring instrument for reflectometric measurements of a specimen, comprising:



a spherical measuring chamber provided with a specimen aperture so that illumination of the specimen placed in said specimen aperture is diffuse;

at least two light sources, including a first visible light source substantially emitting light having a wavelength greater than about 380 nm, and a UV light source substantially emitting light having a wavelength less than about 380 nm, the UV source being provided with an attenuating stop so that UV light intensity is independently controllable of visible light intensity;

a measuring channel provided with optics and a first photometer, to direct light reflected by the specimen to the first photometer;

a reference channel provided with optics and a second photometer to direct light from the measuring chamber to the second photometer; and

a signal processing and calculating device for processing and comparing light intensity values observed by the first and second photometers.

5,748,305
METHOD AND APPARATUS FOR PARTICLE INSPECTION

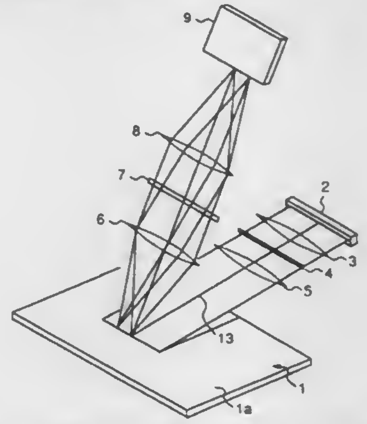
Ken Shimono; Tatsuo Nagasaki, both of Hirakata; Kenji Takamoto, Neyagawa; Masami Ito, Moriguchi, and Kanji Nishii, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Jun. 28, 1996, Ser. No. 670,851

Claims priority, application Japan, Jun. 30, 1995, 7-166208

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—237 **36 Claims**



1. A method of foreign particles inspection comprising:

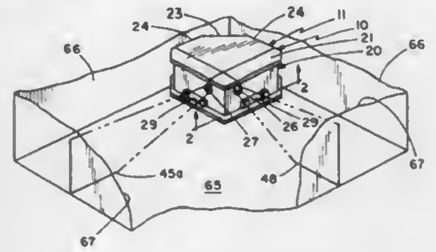
illuminating an inspection surface of an inspected object with a beam, which is one of an s-polarized light and a p-polarized light relative to the inspection surface of the inspection object, in such a manner that an optical axis of the beam intersects the inspection surface at an angle of not less than 1° and less than 5°; and

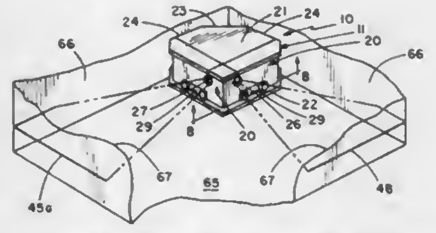
detecting, as an indication of foreign particles, a component of reflected and scattered light which occurs from the beam and which is the other of the s-polarized light and the p-polarized light, wherein said detecting is about a detection optical axis

OL
2 10
SS
1
MY
5
998
MI

which makes an acute angle with the inspection surface and which makes a differential angle of 30° or less with the optical axis of the beam.

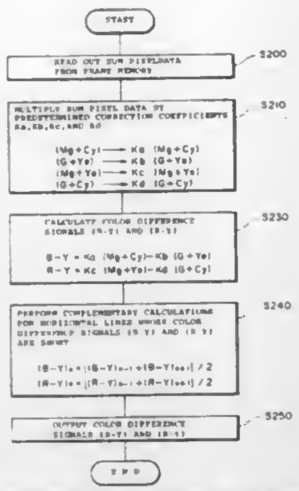
5,748,306
VISUAL ALIGNMENT INSTRUMENT
Daniel P. Louis, 657 Barber La., Joliet, Ill. 60435
Filed Feb. 12, 1997, Ser. No. 799,769
Int. Cl.^{6} G01C *5/00;* **G01B** *11/26*
U.S. Cl. 356—247 **18 Claims**





1. A visual alignment instrument comprising an instrument body frame, a first refracting light lens positioned on the said frame and adapted to convert a first beam of light from a light beam generator into a projected plane of light, a second refracting light lens positioned said frame and adapted to convert said first beam of light from said light beam generator into a projected light plane at an angle to said first plane of light, said light beam generator secured to said frame and generating said first beam of light relative to said frame, means for selectively and alternately positioning said first and second lenses in three positions relative to said body frame out of the path of said first light beam to respectively provide an intermediate unaltered light beam or alternatively two intermediate light beams each respectively located along one of said planes, and reflecting means in the path of said first light beam beyond said selective means for deflecting a portion of the power of any selected one of said intermediate beams to divide said first beam into dual output diverging beams of the same physical character of said selected intermediate beam to provide three selectable alignment indication output beams relative to said instrument.

5,748,307
IMAGE PICKUP APPARATUS
Hideo Nakamura, and Haruki Furuta, both of Suwa, Japan, assignors to Chinon Kabushiki Kaisha, Nagano, Japan
Filed Dec. 26, 1996, Ser. No. 773,437
Claims priority, application Japan, Jan. 5, 1996, 8-000271; Jan. 18, 1996, 8-006615
Int. Cl.^{6} H04N *9/73;5/76*
U.S. Cl. 358—296 **5 Claims**


START
READ OUT SUM PIXELDATA FROM FRAME MEMORY
S200
MULTIPLY SUM PIXEL DATA BY PREDETERMINED CORRECTION COEFFICIENTS Ka, Kb, Kc, AND Kd
(Mg+Cy) → Ka (Mg+Cy)
(G+Ye) → Kb (G+Ye)
(Mg+Ye) → Kc (Mg+Ye)
(G+Cy) → Kd (G+Cy)
S210
CALCULATE COLOR DIFFERENCE SIGNALS (B-Y) AND (R-Y)
B-Y = Ka (Mg+Cy)-Kb (G+Ye)
R-Y = Kc (Mg+Ye)-Kd (G+Cy)
S230
PERFORM COMPLEMENTARY CALCULATIONS FOR HORIZONTAL LINES WHOSE COLOR DIFFERENCE SIGNALS (B-Y) AND (R-Y) ARE SHORT
S240
OUTPUT COLOR DIFFERENCE SIGNALS (B-Y) AND (R-Y)
S250
END

1. An image pickup apparatus comprising:

a color image pickup element in which a first pixel column having a plurality of pixels with cyan and yellow pixel color filters alternately arranged in a horizontal line direction and a second pixel column having a plurality of pixels with magenta and green pixel color filters alternately arranged in the horizontal line direction are alternately arranged in a vertical direction, each pair of said first pixel column and said second pixel column constitute each horizontal line, pixel signals generated by the plurality of pixels are combined in units of first and second pixel columns, and pixel signals of two pixels adjacent in the vertical direction are mixed and output, thereby performing horizontal scanning and reading of a sum pixel signal for each horizontal line;

an A/D converter for converting each sum pixel signal read from said color image pickup element into digital sum pixel data; and

a storage medium for storing said sum pixel data output from said A/D converter in correspondence with a pixel arrangement of said color pickup element,

wherein an arithmetic operation for adjusting a white balance of said sum pixel data stored in said storage medium is performed, said arithmetic operation comprising:

multiplications of said sum pixel data by white balance adjustment correction coefficients unique thereto,

calculation of a first color difference signal of each pixel in accordance with the multiplied sum pixel data corresponding to magenta and cyan and the multiplied sum pixel data corresponding to green and yellow,

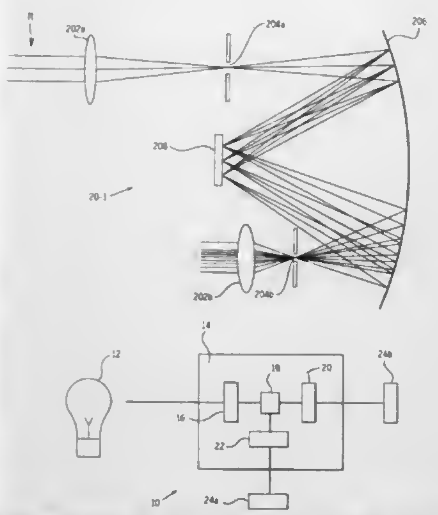
calculation of a second color difference signal of each pixel in accordance with the multiplied sum pixel data corresponding to magenta and yellow and the multiplied sum pixel data corresponding to green and cyan,

adding and averaging said second color difference signals adjacent to each other in the vertical direction to calculate a first complementary color difference signal for a pixel column of said first color difference signal serving as a signal between said second color difference signals, and

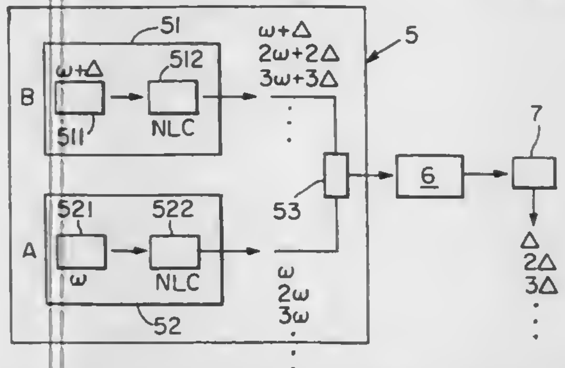
adding and averaging said first color difference signals adjacent to each other in the vertical direction to calculate a second complementary color difference signal for a pixel column of said second color difference signal serving as a signal between said first color difference signals.

5,748,308
PROGRAMMABLE STANDARD FOR USE IN AN APPARATUS AND PROCESS FOR THE NONINVASIVE MEASUREMENT OF OPTICALLY ABSORBING COMPOUNDS
John M. Lindberg, Grayslake, and Robert Eric Heinz, Lake Bluff, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Feb. 2, 1996, Ser. No. 595,675
Int. Cl.^{6} G01J *3/04;3/28*
U.S. Cl. 356—310 **9 Claims**

1. A noninvasive process of determining the concentration of an optically absorbing compound in a biological sample comprising comparing a spectrum of light passing through the sample with a spectrum of light passing through a programmable standard and correlating the spectra to determine the concentration of the compound, said programmable standard comprising (1) a dispersive element; (2) a spatial filter aligned to receive light from the dispersive element; and (3) a means for recombining the light which is reflected from the spatial filter, said means for recombining the light being optically aligned to receive light from the spatial filter.



5,748,309
COHERENT PERIODICALLY PULSED RADIATION SPECTROMETER
D. W. van der Weide, Newark, Del., and Fritz Keilmann, Martinsried, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften, Germany
Filed Oct. 19, 1995, Ser. No. 545,136
Claims priority, application Germany, Oct. 20, 1994, 44 37 575.1
Int. Cl.^{6} G01J *3/28*
U.S. Cl. 356—326 **15 Claims**



1. A spectroscopy method for determining spectroscopic properties of a specimen (6) said method using coherent periodically pulsed radiation, comprising the steps of:

emission of a periodically pulsed beam (A) with a repetition frequency ω by a first source of radiation (**51**);

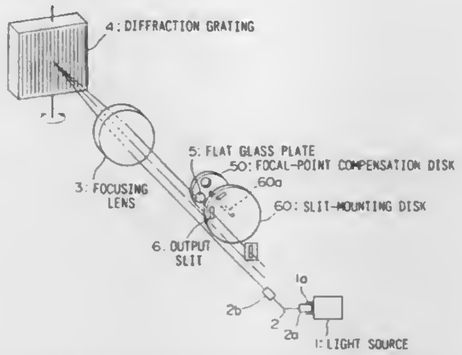
emission of a periodically pulsed beam (B) having a repetition frequency $\omega+\Delta$ by a second source of radiation (**52**), wherein a component Δ is smaller than ω, said periodically pulsed radiation being formed from said beams (A,B);

wherein each pulse of said pulsed beams (A) and (B) being formed by components ω, 2ω, 3ω, . . . and $(\omega+\Delta)$, $2(\omega+\Delta)$, $3(\omega+\Delta)$, . . . , which are higher multiples of the repetition frequencies, respectively;

combination of said pulsed beams (A) and (B) into a common time-coherent beam and simultaneous irradiation of said specimen (6) by said common time-coherent beam; and

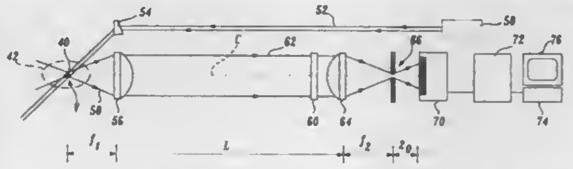
simultaneous detection of radiation being transmitted or reflected by said specimen (6) due to said irradiation to a detector means (7) in which amplitudes of frequency components Δ, 2Δ, . . . , $n\Delta$ are determined, which amplitudes allow the determination of said spectroscopic properties at frequencies corresponding to $\omega+\Delta$, $2(\omega+\Delta)$, . . . , $n(\omega+\Delta)$.

5,748,310
OPTICAL SPECTRUM SEPARATION APPARATUS
Kenichi Fujiyoshi, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan
Filed Jan. 30, 1997, Ser. No. 791,512
Claims priority, application Japan, Jan. 31, 1996, 8-016041
Int. Cl.^{6} G01J *3/06;3/18*
U.S. Cl. 356—334 **7 Claims**



1. An optical spectrum separation apparatus having an input section for introducing an input beam for spectrum separation; an optical diffraction means for diffracting said input beam into component beams; a focusing section for focusing a component beam onto an optical output means for generating an output beam having a specific wavelength, wherein a focal-point adjusting means for adjusting a focal distance of said focusing section in correspondence with said specific wavelength is introduced in an optical path of said component beam between said focusing section and said optical output means so as to generate said output beam having said specific wavelength.

5,748,311
APPARATUS AND METHOD OF PARTICLE GEOMETRY MEASUREMENT BY SPECKLE PATTERN ANALYSIS
Oliver Hamann, Holzhaeuser Weg 41c, 21217 Seevetal, and Reinhard Ulrich, Alte Rennbahn 2, 21244 Buchholz, both of Germany
Filed Mar. 11, 1996, Ser. No. 614,937
Int. Cl.^{6} G01N *15/02;21/00*
U.S. Cl. 356—336 **24 Claims**



1. A method of measuring geometric properties of individual particles one at a time in a volume containing many particles, the method comprising:

(a) illuminating the volume containing many particles including an individual particle to be measured with a beam of electromagnetic radiation, the beam having a width wider than a largest dimension of the individual particle to be measured;

(b) detecting an intensity distribution of electromagnetic radiation back-scattered from the individual particle in the volume; and

(c) analyzing the detected intensity distribution to determine the geometric properties of the individual particle.

OL
2 10
ISS
1
MY
5
998
MI

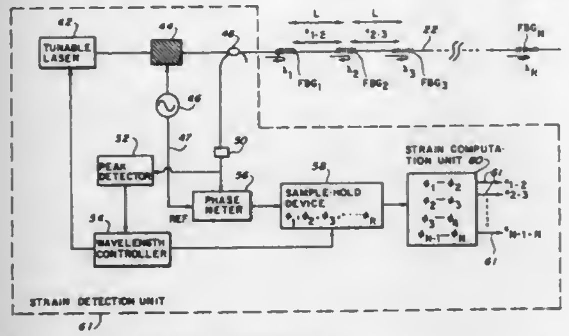
5,748,312
SENSING APPARATUS AND METHOD FOR DETECTING STRAIN BETWEEN FIBER BRAGG GRATING SENSORS INSCRIBED INTO AN OPTICAL FIBER

Alan D. Kersey, Fairfax Station, and Michael A. Davis, Arlington, both of Va., assignors to United States of American as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1995, Ser. No. 530,044

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **12 Claims**



1. A sensing apparatus comprising:

a fiber inscribed with a first fiber Bragg grating sensor and a second fiber Bragg grating sensor; and

a strain detection unit detecting the strain between the first fiber Bragg grating sensor and the second fiber Bragg grating sensor;

wherein the strain detection unit detects the strain on the first fiber Bragg grating sensor and the strain on the second fiber Bragg grating sensor in addition to the strain between the first fiber Bragg grating sensor and the second fiber Bragg grating sensor.

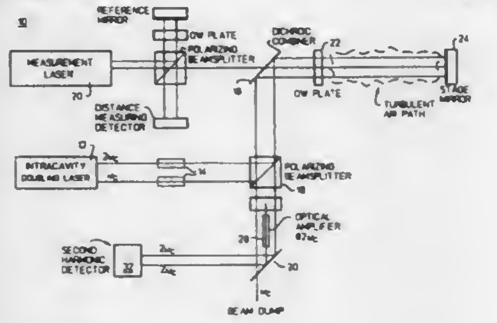
5,748,313
SIGNAL-TO-NOISE RATIO OF SECOND HARMONIC INTERFEROMETERS

Paul Zorabedian, Mt. View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1996, Ser. No. 746,683

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **10 Claims**



1. A correction apparatus comprising:

a doubling laser means for generating a first and a second optical beam, wherein the first optical beam is at a fundamental frequency and the second optical beam is at a second harmonic frequency;

a phase modulator, receiving the first and second optical beams, being operative to phase modulate the first and second optical beams;

a beam splitter, receiving the modulated first and second optical beams;

a doubling crystal stage, positioned near the beam splitter, being operative to generate a third beam at the second harmonic frequency;

an optical amplifier, positioned near the doubling crystal stage, being operative to amplify the amplitude of the third optical beam;

a filter, positioned near the optical amplifier, being operative to receive the first, second, and third optical beams and to transmit the second and third optical beams; and

a second harmonic detector positioned near the filter.

5,748,314
CORRELATION FUNCTION MEASUREMENT METHOD AND APPARATUS, AND WAVE SOURCE IMAGE VISUALIZATION METHOD AND APPARATUS BASED ON CORRELATION FUNCTION MEASUREMENT

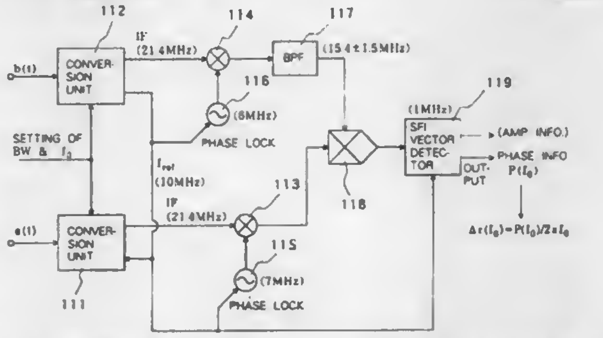
Hitoshi Kitayoshi, Tokyo, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 746,293

Claims priority, application Japan, Nov. 8, 1995, 7-289848; Nov. 8, 1995, 7-289851

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—346 **16 Claims**



1. A correlation function measurement method for measuring a correlation function between a first observation signal and a second observation signal in a predetermined observation frequency band, comprising the steps of:

limiting the first observation signal to the observation frequency band to perform a frequency conversion of the first observation signal into a signal of a first frequency;

limiting the second observation signal to the observation frequency band to perform a frequency conversion of the second observation signal, based on a reference frequency signal same as that used upon the frequency conversion to the first frequency, to a signal of a second frequency having a predetermined frequency difference from the first frequency; and

multiplying the signal of the first frequency and the signal of the second frequency and performing vector detection, based on the reference frequency signal, for a difference frequency component between the two signals.

5,748,315
OPTICAL INTERFERENCE MEASURING APPARATUS AND METHOD FOR MEASURING DISPLACEMENT OF AN OBJECT HAVING AN OPTICAL PATH SEPARATING SYSTEM

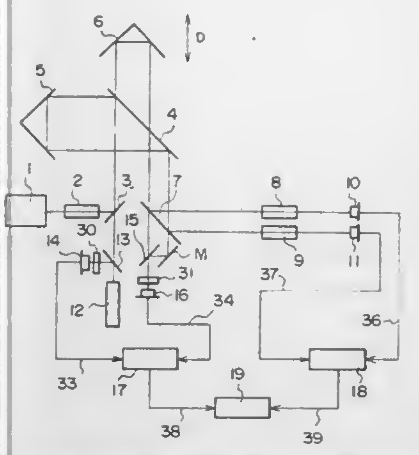
Hitohsi Kawai, Kawasaki; Jun Kawakami, Yamato, and Kouichi Tsukihara, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 25, 1996, Ser. No. 621,362

Claims priority, application Japan, Mar. 23, 1995, 7-064537; Mar. 7, 1996, 8-079515

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—349 **29 Claims**



1. An apparatus in which measurement light propagated through a measurement optical path including a measurement reflector which is at least movable along said measurement optical path and reference light propagated through a reference optical path including a fixed reference reflector are made to interfere with each other so as to measure a displacement of said measurement reflector, said apparatus comprising:

a light emitting system for emitting, along an identical optical path, first light having a predetermined frequency and second light and third light respectively having frequencies which are different from each other;

a main polarization separator which divides said first light into a first measurement light component included in said measurement light introduced into said measurement optical path and a first reference light component included in said reference light introduced into said reference optical path which are polarized light components different from each other, and divides said second light into a second measurement light component included in said measurement light and a second reference light component included in said reference light which are polarized light components different from each other, and divides said third light into a third measurement light component included in said measurement light and a third reference light component included in the reference light which are polarized light components different from each other;

a frequency separating system for separating, in terms of frequency, the measurement light propagated through said measurement optical path into said first measurement light component and said second and third measurement light components, while separating, in terms of frequency, the reference light propagated through said reference optical path into said first reference light component and said second and third reference light components;

a first interference light generating system for generating first interference light from said first reference light component and said first measurement light component;

a second interference light generating system for generating second interference light by converting one of the frequencies of said second measurement light component and said third measurement light component so as to substantially coincide with the other of the frequencies of said second measurement light component and said third measurement light component;

a third interference light generating system for generating third interference light by converting one of the frequencies of said second reference light component and said third reference light component so as to substantially coincide with the other of the frequencies of said second reference light component and said third reference light component;

an optical path separating mechanism for spatially separating, with respect to at least said second light and third light, an optical path of said measurement light which enters said second interference light generating system after being propagated through said measurement optical path and an optical path of the reference light which enters said third interference light generating system after being propagated through said reference optical path from each other; and

a computing unit which, based on information about fluctuation in refractive index in said measurement optical path and reference optical path measured from said second interference light and third interference light, corrects information about displacement of said measurement reflector obtained from said first interference light so as to determine an amount of displacement of said measurement reflector.

5,748,316
DETECTOR FOR WAVELENGTH OF EXCIMER LASER

Osamu Wakabayashi, Hiratsuka, and Yukio Kobayashi, Isehara, both of Japan, assignors to Komatsu, Ltd., Hiratsuka, Japan

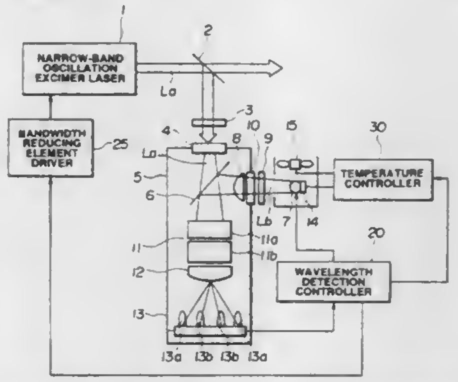
PCT No. PCT/JP94/01766, § 371 Date Apr. 18, 1996, § 102(e) Date Apr. 18, 1996, PCT Pub. No. WO95/11432, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 20, 1994, Ser. No. 637,657

Claims priority, application Japan, Oct. 20, 1993, 5-265053

Int. Cl.^{6} G01B *9/08*

U.S. Cl. 356—352 **13 Claims**


1
2
NARROW-BAND OSCILLATION EXCIMER LASER
La
BANDWIDTH REDUCING ELEMENT DRIVER
25
3
4
10
15
30
8
9
La
5
6
TEMPERATURE CONTROLLER
Lb
7
14
20
11
11a
11b
12
WAVELENGTH DETECTION CONTROLLER
13
13a
13b
13b
13a

1. A wavelength detector in which a reference light emitted from a reference light source using a low-pressure mercury lamp having an oscillation wavelength of 253.7 nm and a sample light are made incident, and an absolute wavelength of the sample light is determined on the basis of the incident lights, characterized in that a specific isotope of mercury having a purity of at least 49% is sealed in the low-pressure mercury lamp used as the reference light source and said mercury lamp is operated so as not to exceed a surface temperature of 40° C.

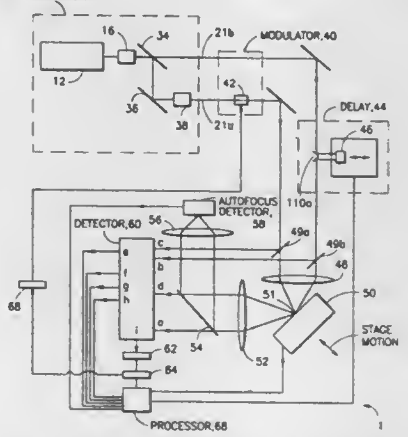
5,748,317
APPARATUS AND METHOD FOR CHARACTERIZING THIN FILM AND INTERFACES USING AN OPTICAL HEAT GENERATOR AND DETECTOR

Humphrey J Maris, Barrington, R.I., and Robert J Stoner, Duxbury, Mass., assignors to Brown University Research Foundation, Providence, R.I.

Filed Jan. 21, 1997, Ser. No. 786,706

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—357 **19 Claims**



1. A non-destructive system for characterizing an interface between two layers of a sample, comprising:

means for a generating a sequence of optical pump pulses at a frequency f_1 and for directing the sequence of pump pulses to an area of the surface of the sample;

means for generating a sequence of optical probe pulses at a frequency f_2 and for directing the sequence of probe pulses to a same or different area of the surface of the sample, wherein

f_1 is not equal to f_2 for continuously varying a delay between the generation of a pump pulse and the generation of a probe pulse; and

means for measuring, at a rate given by one of (f_1-f_2) or (f_1+f_2), at least one transient optical response of the structure to the sequence of pump pulses by detecting a change in a characteristic of a reflected or transmitted portion of the sequence of probe pulses, and for associating the detected change with a Kapitza resistance of the interface.

5,748,318

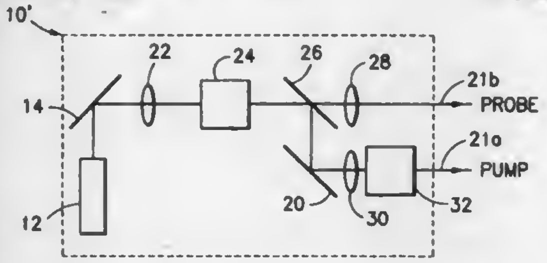
OPTICAL STRESS GENERATOR AND DETECTOR

Humphrey J. Maris, Barrington, R.I., and Robert J. Stoner, Duxbury, Mass., assignors to Brown University Research Foundation, Providence, R.I.

Filed Aug. 6, 1996, Ser. No. 689,287

Int. Cl.^{6} G01B *11/02*

U.S. Cl. 356—381 **22 Claims**



1. A method for characterizing a structure, comprising the steps of:

applying first electromagnetic radiation to the structure for creating propagating stress pulses within the structure;

applying second electromagnetic radiation to the structure at a plurality of different incidence angles so as to intercept the propagating stress pulses;

sensing a reflection or transmission of the second electromagnetic radiation from the structure at the plurality of incidence angles;

associating a change in the reflection of the second electromagnetic radiation over time with a value of an optical characteristic of the structure, and determining in accordance with the value of the optical characteristic the velocities of the propagating stress pulses; and

optionally determining the elastic modulus of the structure in accordance with the determined velocities of the propagating stress pulses.

5,748,319

METHOD FOR SENSING COMPLETE REMOVAL OF OXIDE LAYER FROM SUBSTRATE BY THERMAL ETCHING WITH REAL TIME

Jong-Hyeob Baek; Bun Lee; Sung-Woo Choi, all of Daejeon, and Jin-Hong Lee, Seoul, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Jun. 28, 1996, Ser. No. 671,842

Claims priority, application Rep. of Korea, Dec. 20, 1995, 1995-52675

Int. Cl.^{6} G01B *11/06*

U.S. Cl. 356—382 **4 Claims**

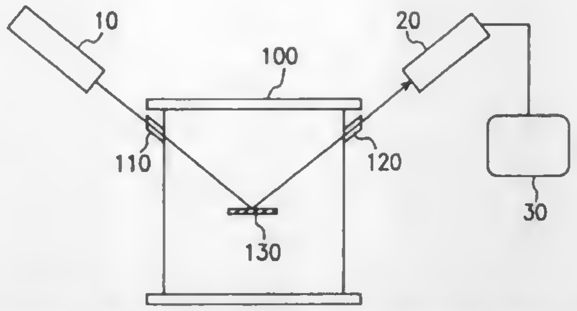
1. A method for determining the completion of removal of an oxide layer from a semiconductor substrate in real time, said method comprising the steps of:

placing a semiconductor substrate having an oxide layer formed thereon into a growing chamber;

heating said substrate to a predetermined temperature level;

injecting an oxide layer etching gas into said growing chamber;

irradiating laser beams onto said substrate; and



analyzing the periods of reflected laser beams so as to sense the completion of etching of said oxide layer.

5,748,320

WIRING PATTERN LINE WIDTH MEASURING APPARATUS

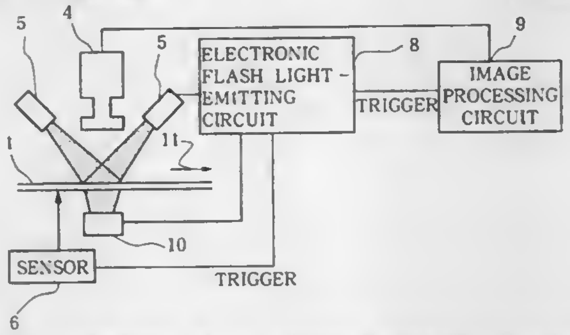
Kazuo Moriya, Ageo, Japan, assignor to Mitsui Mining & Smelting Co. Ltd., Tokyo, Japan

Filed Feb. 6, 1997, Ser. No. 794,393

Claims priority, application Japan, Feb. 16, 1996, 8-052534

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—385 **8 Claims**



1. A wiring pattern line width measuring apparatus which measures the line widths of a wiring pattern obtained by etching a metal foil, comprising:

first illumination means for illuminating said wiring pattern from one side with a light beam having a first wavelength;

second illumination means for illuminating said wiring pattern from the other side with a light beam having a second wavelength which is different from the first wavelength; and

measuring means for obtaining information of a line width by the light beam having the first wavelength and information of a line width by the light beam having the second wavelength, on the basis of the light beams having the first and second wavelengths which advance, at the same time point, in the direction from said wiring pattern simultaneously illuminated by said first and second illumination means to said other side.

5,748,321

POSITION AND ORIENTATION TRACKING SYSTEM

Barry L. Burks, Oak Ridge; Fred W. DePiero, Knoxville; Gary A. Armstrong, Oak Ridge; John F. Jansen, Knoxville; Richard C. Muller, Oak Ridge, and Timothy F. Gee, Riceville, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

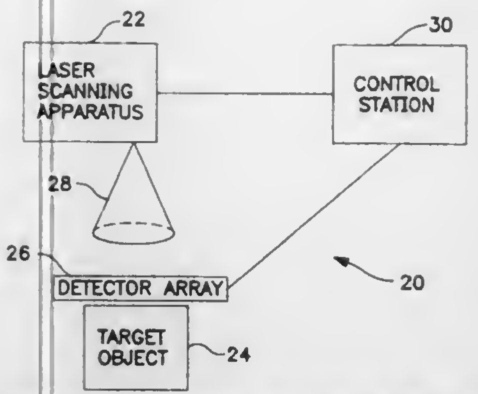
Filed May 7, 1996, Ser. No. 646,187

Int. Cl.^{6} G01B *11/10*

U.S. Cl. 356—386 **23 Claims**

1. A system for tracking the position and orientation of a moving target object, comprising:

(A) laser scanning means for scanning the moving target object and generating direction information;



(B) detection means carried by the moving target object for detecting scanning of the moving target object by the laser scanning means and generating a detection signal; and

(C) control means for controlling the laser scanning means based on the direction information and the detection signal while the target object is moving.

5,748,322

METHOD AND APPARATUS FOR QUALITY INSPECTION OR MOLDED OF FORMED ARTICLES

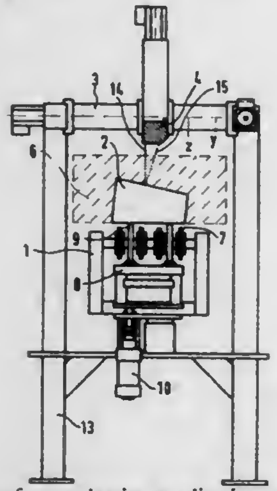
Wolfgang Konder, Trier, and Heinz-Peter Wollscheid, Gusterath, both of Germany, assignors to Laeis + Bucher GmbH, Trier, Germany

Filed Oct. 10, 1995, Ser. No. 541,556

Claims priority, application Germany, Oct. 10, 1994, 9416307 U; Mar. 31, 1995, 195 12 188.0

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—394 **14 Claims**



1. An apparatus for conducting quality inspection of molded or formed articles produced in a molding or forming machine, pursuant to a prescribed desired dimensional form, said apparatus comprising:

evaluation means for evaluating the quality of an article by comparing at least one actual dimensional parameter of the actual dimensional form of the article with a corresponding desired parameter of the desired form, said evaluation means including

a device which provides a desired-data signal which represents the desired dimensional parameter; and

a sensing device for sensing the molded or formed article, and for providing an actual-data signal representing an actual dimensional parameter corresponding to the desired dimensional parameter, said sensing device including

at least one triangulation sensor which is movable along a sensing path which path is selectively chosen and depends on the desired dimensional form and the actual dimensional parameters to be inspected, wherein said triangulation sensor generates, by triangulation, a spatial coordinate value (z) of a position on a surface of said article with respect to the triangulation sensor in a direction defined by the propagation of a measuring light beam, said spatial coordinate value (z) being derived from a back-scattered light produced by the measuring light beam when incident on said article; and

a register device for registering spatial coordinate values of the triangulation sensor as the triangulation sensor moves along the sensing path,

said apparatus further comprising a conveyor device associated with the sensing device, for bringing the molded/formed articles into a prescribed position relative to the sensing path, a lifting device being associated with the conveyor device, for engaging the molded/formed articles at a plurality of locations on said articles and lifting said molded/formed articles above the conveyor device into said prescribed position relative to the sensor device, in which said quality inspection of said molded or formed article is conducted.

5,748,323

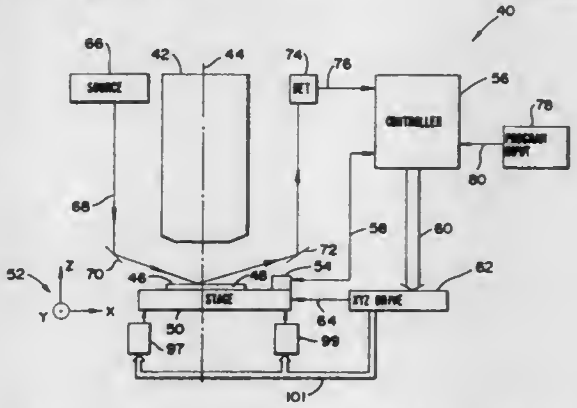
METHOD AND APPARATUS FOR WAFER-FOCUSING

Harry J. Levinson, Sunnyvale, Calif., assignor to Advanced Micro Devices, Sunnyvale, Calif.

Filed Jan. 23, 1997, Ser. No. 788,124

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—399 **12 Claims**



1. A method for improving focus on an area of a surface of a material to be processed in a lithographic system, said method comprising:

(a) scanning said surface to obtain uncorrected surface height data;

(b) determining periodic height variation data from said uncorrected data;

(c) subtracting said periodic height variation data from said uncorrected surface height data to create corrected surface height data;

(d) calculating optimum focus height data from said corrected surface height data; and

(e) setting the height of said surface to an optimum focus height corresponding to said optimum focus height data.

5,748,324

BICHROMATIC METHOD AND APPARATUS FOR DETECTING PEACH PIT FRAGMENTS

M. Scott Howarth, Pueblo, Colo.; Robin D. Tillett, and Christine R. Bull, both of Bedfordshire, England, assignors to Atlas Pacific Engineering Company, Pueblo, Colo.

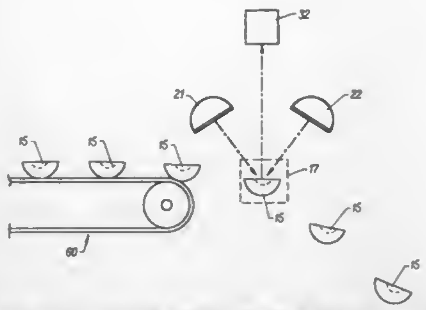
Filed Jul. 14, 1995, Ser. No. 502,679

Int. Cl.^{6} G01J *3/46;* B07C *5/00*

U.S. Cl. 356—425 **18 Claims**

1. A method of detecting the presence or absence of pit fragments in pitted peach halves comprising the steps:

orienting pitted peach halves to a cup-up position on a conveyor,



- conveying said oriented pitted peach halves to an inspection station at a relatively high speed of up to 45 peach halves per second,
- continuously illuminating each of said peach halves at said inspection station to generate diffusely reflected light from the surface of each peach half,
- separating said reflected light into first and second beams,
- filtering said first beam to extract a first wavelength band,
- filtering said second beam to extract a second wavelength band,
- acquiring first and second image signals of each peach half from said first and second wavelength bands, respectively,
- combining said image signals from said first and second wavelength bands, and
- using said combined image signals to determine the presence or absence of pit fragments in each of said peach halves.

5,748,325

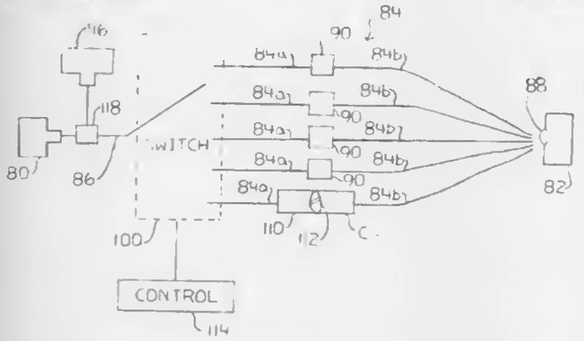
GAS DETECTOR FOR PLURAL TARGET ZONES

John Tulip, 11625 Edinboro Rd., Edmonton, Alberta, Canada, T6G 1S2

Filed Sep. 11, 1995, Ser. No. 526,573

Int. Cl.^{6} G01N ***21/61***

U.S. Cl. 356—437 **9 Claims**



1. A gas detector for detecting gas in physically separate target zones, the gas detector comprising:

- a laser transmitter comprising a tunable laser diode;
- a laser receiver for receiving light transmitted by the laser transmitter after traversing a light path that includes one of the target zones, the laser receiver including means for producing output signals that are unaffected by variations in the length of the light path;
- a signal analyzer for analyzing output signals from the laser receiver to give an indication of whether gas is present in a target zone;
- plural single-mode optical light guides, each single-mode optical light guide being capable of forming a distinct guided light path between the laser transmitter and the laser receiver traversing one of the target zones; and
- single-mode optical switch means positioned between the laser transmitter and the single-mode optical light guides for selecting one of the single-mode optical light guides to complete a guided light path between the laser transmitter and the laser receiver for the detection of gas in the target zone traversed by the selected one of the single-mode optical light guides.

5,748,326

INSTANT SPECIAL EFFECTS ELECTRONIC CAMERA

Ian Thompson-Bell, Litlington; Michael Roger Cane, Cambridge; Michael Andrew Beadman, Royston, all of United Kingdom; David J. Ciganko, Hamburg, N.Y.; Stephen John Love, Over, United Kingdom, and Paul Diminic Priestman, London, England, assignors to Fisher-Price Inc., E. Aurora, N.Y.

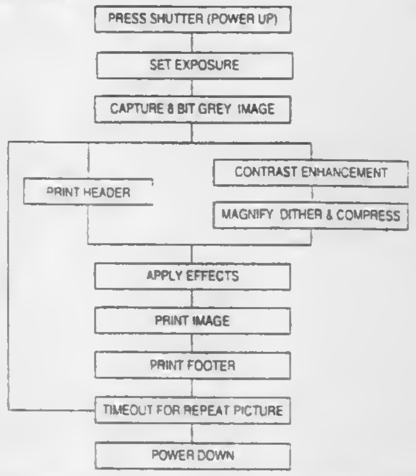
PCT No. PCT/US94/13803, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO95/16323, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 2, 1994, Ser. No. 656,285

Claims priority, application United Kingdom, Dec. 7, 1993, 9325076

Int. Cl.^{6} H04N ***1/21;*** **G03B** ***15/00***

U.S. Cl. 358—296 **8 Claims**



1. An electronic camera for providing instant hard copy pictures, comprising:

- an image sensor including a plurality of photosensors arranged in an array for providing analog image data outputs proportional to the intensity of light incident on the respective photosensors, said image sensor further including additional processing circuitry;
- an analog to digital converter for digitizing the analog image data outputs of said photosensor array;
- a memory for storing the digitized image data from said image sensor;
- a microcontroller coupled with said image sensor, said microcontroller operable to retrieve said digitized image data from said memory by way of said image sensor and to prepare said digitized image data for printing, wherein said microcontroller processes said image data in accordance with special effects information;
- a printer operating under control of said microcontroller to provide a hard copy picture; and
- a replaceable special effects cartridge having read-only memory for storing said special effects information.

5,748,327

IMAGE COMMUNICATING APPARATUS WITH DIRECT SUPPLY OF POWER FROM A BATTERY TO VARIOUS UNITS

Hisashi Toyoda; Toshio Kenmochi; Yosuke Ezumi, all of Yokohama, and Takeshi Tsukamoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 150,985, Nov. 12, 1993, abandoned. This application Mar. 26, 1997, Ser. No. 824,330

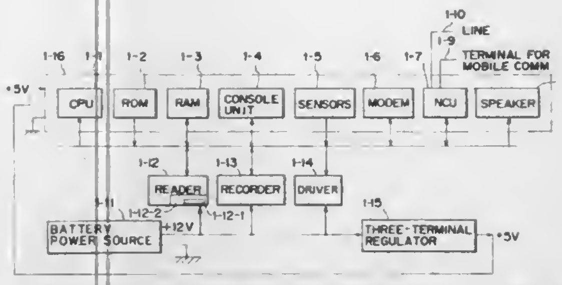
Claims priority, application Japan, Nov. 12, 1992, 4-302542

Int. Cl.^{6} H04N ***1/00;1/024;*** **G05F** ***1/46***

U.S. Cl. 358—296 **8 Claims**

1. An image reading apparatus comprising:

- reading means for reading a document sheet image, said reading means including an image sensor which has a three-terminal regulator; and



- a battery power supply which supplies power to said three-terminal regulator.

5,748,328

COLOR IMAGE PROCESSING APPARATUS WHICH FORMS DOT IMAGES AT VARYING POSITIONS ON A SCANNING LINE

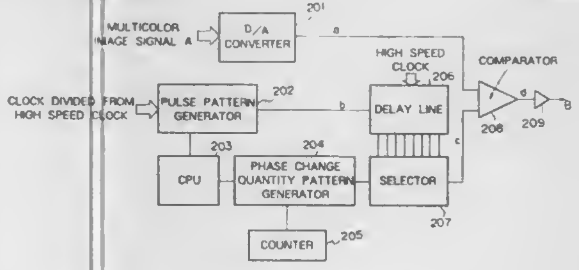
Akihiro Usami; Yoshinori Mochida, both of Yokohama; Atsutomo Yoshizawa; Yoshinori Ikeda, both of Kawasaki; Kazuhisa Kemmochi, Machida; Yukio Nagase, Kawasaki; Shinobu Arimoto, Yokohama; Masanori Yamada, Kawasaki; Hajime Suzuki, Yokohama, and Katsuhito Kato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 259,123, Jun. 13, 1994, Pat. No. 5,469,266, which is a continuation of Ser. No. 945,584, Sep. 16, 1992, abandoned, which is a continuation of Ser. No. 642,279, Jan. 15, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,643

Claims priority, application Japan, Jan. 19, 1990, 2-8370; Jan. 26, 1990, 2-16555; Jan. 26, 1990, 2-16561; Feb. 2, 1990, 2-22238; Jul. 10, 1990, 2-181771

Int. Cl.^{6} H04N ***1/40;1/29;1/46***

U.S. Cl. 358—298 **32 Claims**



1. A color image processing apparatus comprising:

- arranging means for arranging intervals between dot positions on a scanning line at which dots are formed;
- shifting means for shifting the dot positions on the scanning line by a shifting amount, wherein at least one of the intervals and the shifting amount for a first color component are different from an interval and a shifting amount of a second color component; and
- control means for controlling said arranging means and said shifting means so that n (n≧3) adjacent dot positions at which the first color component and the second color component overlap correspond to vertices of a substantially regular polygon having n vertices.

5,748,329

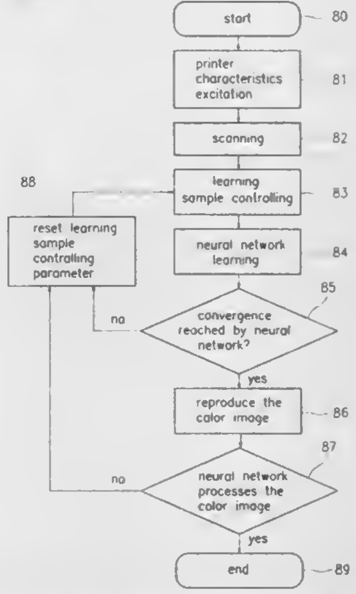
METHOD AND APPARATUS FOR ADAPTIVE COLOR SCANNING/PRINTING DATA CORRECTION EMPLOYING NEURAL NETWORKS

Gao-Wei Chang, Tainan, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 8, 1996, Ser. No. 612,574

Int. Cl.^{6} H04N ***1/40;1/46;*** **G03F** ***3/08;15/18***

U.S. Cl. 358—298 **17 Claims**


start
80
printer characteristics excitation
81
scanning
82
learning sample controlling
83
neural network learning
84
85
convergence reached by neural network?
no
yes
88
reset learning sample controlling parameter
reproduce the color image
86
87
neural network processes the color image
no
yes
end
89

1. A method for adaptive color scanning/printing data correction, wherein a color scanning/printing system includes a color image inputting device, a neural network, and a color image outputting device, said inputting device being connected to said neural network, and said neural network being connected to said outputting device, said method comprising the steps of:

- providing pre-selected test color image patterns to said color image outputting device for outputting a first output image;
- inputting said first output image to said inputting device to obtain color data of said first output image, and processing a learning sample generated with said color data by said neural network;
- said neural network subsequently taking the average of the data values of all the color picture elements within a neighborhood in the predetermined vicinity of each input color picture element, and taking the average data value of all the color picture elements within the corresponding neighborhood of the corresponding output color picture element, so as to constitute a learning sample pair including the averaged color data values of input and output gamuts respectively; and
- said neural network processing said generated learning sample pair to perform a neural network learning procedure.

5,748,330

METHOD OF CALIBRATING A DIGITAL PRINTER USING COMPONENT TEST PATCHES AND THE YULE-NIELSEN EQUATION

Shen-ge Wang, Fairport, N.Y., and Charles M. Hains, Altadena, Calif., assignors to Xerox Corporation, Stamford, Conn.

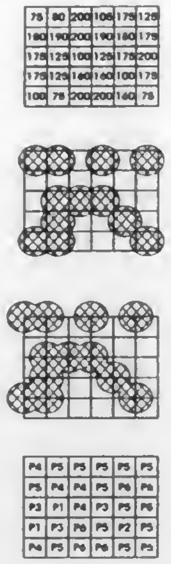
Filed May 5, 1997, Ser. No. 850,462

Int. Cl.^{6} H04N ***1/40;1/46;*** **G06K** ***9/36***

U.S. Cl. 358—298 **7 Claims**

1. A method of calibrating a digital printer, comprising the steps of:

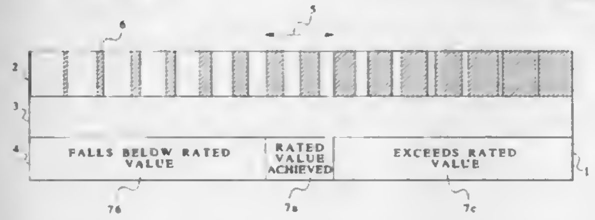
- causing the digital printer to print a set of component test patches on a medium, each component test patch representing a unique repetitive pattern of dots relative to a grid;
- measuring a reflectance of each component test patch;



- deriving a relationship between a measured reflectance of each component test patch and an area of ink coverage of each component test patch;
- creating image data operative of the digital printer to create a halftone area of a desired reflectance according to a halftone technique;
- parsing the image data creating the halftone area as a composite of small areas, each small area being associated with a component test patch;
- determining a reflectance associated with the halftone area based on summing a derived area of ink coverage of each small area forming the halftone area.

5,748,331
PROCESS CONTROL STRIP AND METHOD FOR RECORDING

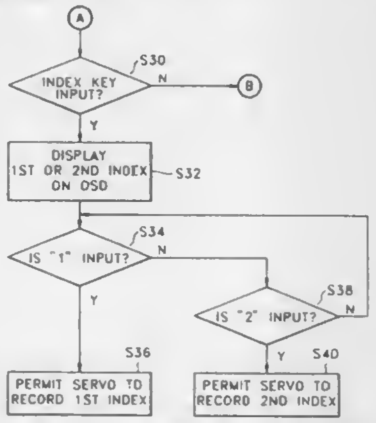
Thomas Köhler, Mücke, Germany, assignor to Linotype-Hell AG, Eschborn, Germany
PCT No. PCT/DE96/00363, § 371 Date Mar. 6, 1997, § 102(e) Date Mar. 6, 1997, PCT Pub. No. WO96/27821, PCT Pub. Date Sep. 12, 1996
PCT Filed Mar. 2, 1996, Ser. No. 732,299
Claims priority, application Germany, Mar. 4, 1995, 195 07 665.6
Int. Cl.⁶ G03B *27/32;* **B32B** *7/02*
U.S. Cl. 358—302 **18 Claims**



1. A system for visual monitoring of an exposure process for a recording material, comprising:
- a process control strip having coarse signal elements having a size substantially constant given process fluctuations, and fine signal elements having a size which changes given process fluctuations;
- said control strip having a first stripe extending in a direction of a greatest expanse of the process control strip and having a tonal value wedge with process-independent reference tonal values as said coarse signal elements that change in the stripe direction;
- said control strip having a second stripe proceeding parallel to the first stripe and having a raster with fine raster points as said fine signal elements that represent a uniform, highly process-dependent tonal value; and
- an exposer for exposing the control strip on the recording material.

5,748,332
VIDEO REPEAT REPRODUCTION METHOD AND APPARATUS

Yong-soo Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Jul. 27, 1994, Ser. No. 281,087
Claims priority, application Rep. of Korea, Nov. 30, 1993, 1993-25940
Int. Cl.⁶ H04N *5/76*
U.S. Cl. 358—335 **14 Claims**



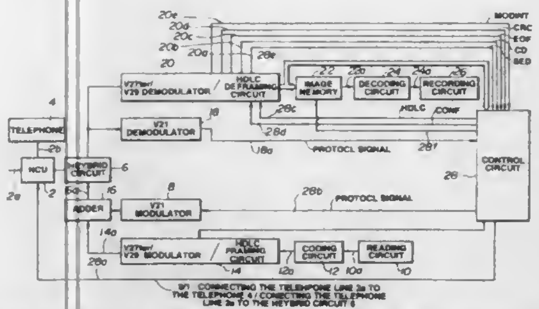
A
INDEX KEY INPUT?
S30
N
B
Y
DISPLAY 1ST OR 2ND INDEX ON OSD
S32
IS "1" INPUT?
S34
N
Y
IS "2" INPUT?
S38
N
Y
S36
S40
PERMIT SERVO TO RECORD 1ST INDEX
PERMIT SERVO TO RECORD 2ND INDEX

1. A method for repeatedly reproducing a desired interval of a video signal recorded on a recording medium using a video recording and reproducing apparatus, said method comprising the steps of:
- recording on the recording medium a first index signal at a start point and a second index signal at an end point of a desired repeat reproduction interval while displaying a reproduced picture, wherein said first and second index signals are distinct from one another;
- detecting said first and second index signals recorded on the recording medium in said recording step and displaying both the detected first and second index signals on a screen; and
- repeatedly reproducing the interval on which said first and second index signals have been recorded by a desired number of times when a repeat reproduction command is applied.

5,748,333
IMAGE COMMUNICATION APPARATUS HAVING THE FUNCTION OF ECM (ERROR CORRECTION MODE COMMUNICATION)

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 370,353, Jan. 9, 1995, abandoned, which is a continuation of Ser. No. 150,825, Nov. 12, 1993, abandoned. This application Jul. 29, 1996, Ser. No. 688,223
Claims priority, application Japan, Dec. 11, 1992, 4-331976
Int. Cl.⁶ H04N *1/40;1/00*
U.S. Cl. 358—445 **19 Claims**

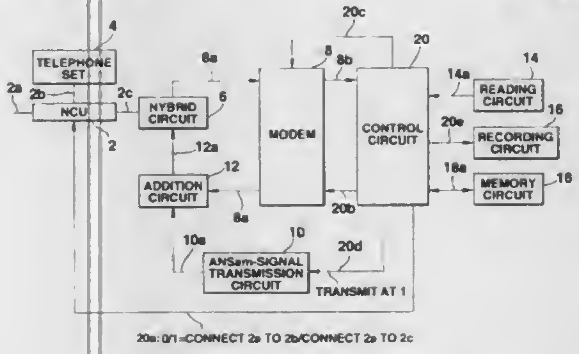
1. An image communication apparatus operable in an error correction communication mode, comprising:
- means for receiving image data, and for outputting received image data in byte units;
- an image memory for storing at least one page of image data;
- control means for inputting the image data from said receiving means, and for storing the input image data into said image memory; and



- a bus connecting said receiving means, said image memory and said control means,
- wherein received image data is passed from said receiving means to said storage means in an operation wherein each byte unit of the received image data passes over said bus twice.

5,748,334
FACSIMILE APPARATUS CAPABLE OF PERFORMING A STANDARD PROCEDURE AND A NON-STANDARD PROCEDURE

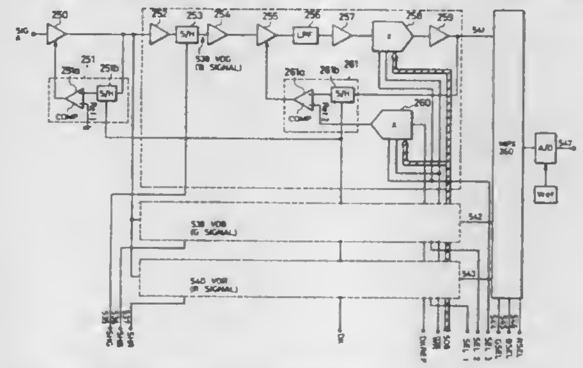
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 7, 1996, Ser. No. 729,723
Claims priority, application Japan, Oct. 20, 1995, 7-297772
Int. Cl.⁶ H04N *1/32*
U.S. Cl. 358—435 **10 Claims**



1. A facsimile apparatus capable of performing a standard procedure and a non-standard procedure, said apparatus comprising:
- image communication means for communicating image data with a communication partner in accordance with the ITU-T (International Telecommunication Union-Telecommunication) recommendation;
- means for setting, into a first procedure signal of the standard procedure, first information indicating that said apparatus has a function of communicating image data in accordance with the ITU-T recommendation by using the non-standard procedure;
- first sending means for sending the first procedure signal of the standard procedure to the communication partner;
- second sending means for sending a second procedure signal of the non-standard procedure to the communication partner,
- wherein a presence of the first information in the first procedure signal enables the communication partner to consider the second procedure signal and an absence of the first information in the first procedure signal disables the communication partner from considering the second procedure signal.

5,748,335
IMAGE READING APPARATUS WITH A/D CONVERSION AND ADJUSTMENT THEREOF

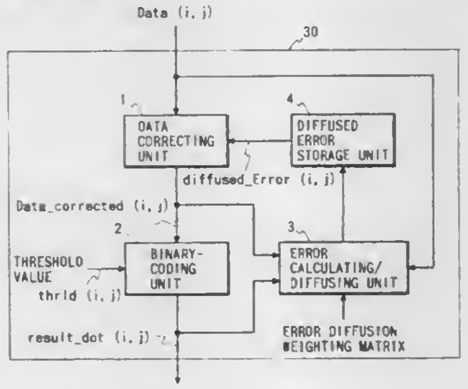
Toshio Honma, Kawasaki; Nobuo Matsuoka, Yokohama; Shizuo Hasegawa; Yasumichi Suzuki, both of Tokyo; Hiroshi Itagaki, Yokohama, and Kenji Sasahara, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 274,351, Jul. 13, 1994, Pat. No. 5,596,427, which is a continuation of Ser. No. 636,441, Dec. 31, 1990, abandoned, which is a division of Ser. No. 144,049, Jan. 14, 1988, Pat. No. 5,121,230. This application Jun. 5, 1995, Ser. No. 464,079
Claims priority, application Japan, Jan. 19, 1987, 62-009471; Jan. 19, 1987, 62-009472; Jan. 19, 1987, 62-009473
Int. Cl.⁶ H04N *1/00*
U.S. Cl. 358—445 **24 Claims**



1. An adjusting apparatus comprising:
- a) input means for inputting analog data:
- b) quantizing means for quantizing the analog data into multilevel digital data with a predetermined quantizing step:
- c) first means for adjusting the analog data in a discrete manner through a step smaller than the quantizing step: and
- d) second means for adjusting the analog data in accordance with the digital data obtained through said quantization.

5,748,336
IMAGE PROCESSING METHOD AND IMAGE PROCESSING APPARATUS

Toshiaki Kakutani, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 7, 1996, Ser. No. 726,689
Claims priority, application Japan, Oct. 6, 1995, 7-260582; Jun. 21, 1996, 8-161282
Int. Cl.⁶ H04N *1/40;* **G06K** *9/36;9/38;9/46*
U.S. Cl. 358—458 **15 Claims**



1. An image processing method for converting multi-gradation image data into two-gradation image data by employing an error diffusion method, the image processing method comprising the steps of:
- (1) adding a diffusion error derived from at least one pixel which has already been binary-coded and is located near a pixel of

interest to multi-gradation image data of this pixel of interest to thereby obtain corrected data;

(2) comparing the corrected data with a threshold value and converting the corrected data into two-gradation image data for indicating any one of a dot ON and a dot OFF;

(3) calculating a quantizing error corresponding to a difference between the corrected data and a first evaluation value corresponding to the two-gradation image data;

(4) diffusing the quantizing error to a plurality of pixels which have not yet been binary-coded and are located near the pixel of interest; and

(5) varying the first evaluation value corresponding to the two-gradation image data indicative of the dot ON in accordance with the multi-gradation image data of the pixel of interest.

5,748,337

FACSIMILE DEVICE HAVING A PRINTING FUNCTION

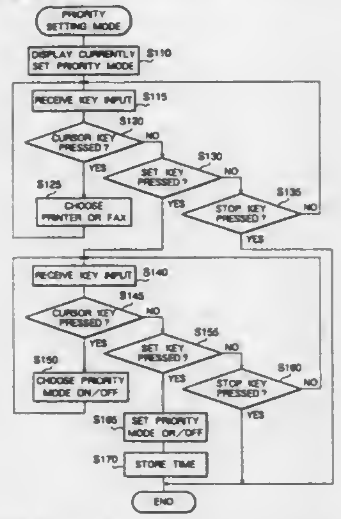
Fumihiro Minamizawa, Toyoake, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi-Ken, Japan

Filed Mar. 27, 1996, Ser. No. 624,799

Claims priority, application Japan, Mar. 27, 1995, 7-067630

Int. Cl.^{6} H04N *1/32;1/00*

U.S. Cl. 358—468 **26 Claims**



1. A facsimile device having a printer function, said facsimile device capable of receiving a facsimile data from another facsimile device and a computer data from a data processing device, said facsimile device comprising:

means for setting a priority operating mode, one of said computer data and said facsimile data being a high priority data and the other of said computer data and said facsimile data being a low priority data in accordance with said priority operating mode;

a buffer;

a means for directing said low priority data to said buffer, said low priority data being stored in said buffer in response to reception thereof when said facsimile device operates in the high priority mode;

means for setting at least one time out period, wherein said facsimile device is released from said priority operating mode after said time out period has elapsed; and

means for selecting one of said at least one time out periods in accordance with whether said facsimile device is receiving said high priority data.

5,748,338

MANUAL SCANNING TYPE IMAGE SCANNER

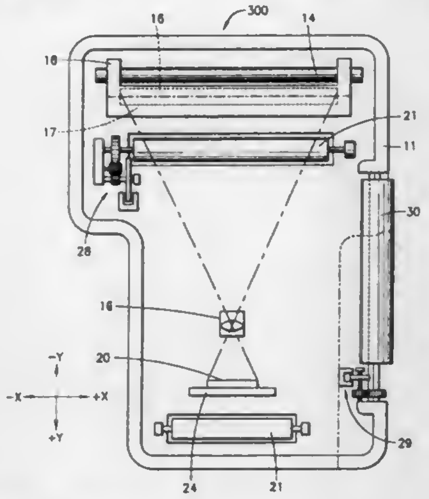
Tangloo Lee, Yamato, Japan, assignor to SMK Corporation, Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 551,790

Claims priority, application Japan, Jul. 21, 1995, 7-206735

Int. Cl.^{6} H04N *1/024;1/04;* **G06K** *9/22*

U.S. Cl. 358—473 **36 Claims**



1. A scanner, comprising:

a housing;

an X-direction roller rotatably supported in a fixed position on said housing; and

a Y-direction roller rotatably supported in a fixed position on said housing;

said Y-direction roller being positioned with respect to said housing so that said Y-direction roller can rest on a surface to support said housing and permit said housing to be rolled on said surface in a Y-direction supported by said Y-direction roller;

said housing having an image digitizer, with an optical path, positioned in said housing to image and digitize a portion of said surface subtended by a width of said optical path;

said X-direction roller being positioned with respect to said housing so that said X-direction roller is remote from said surface when said housing is supported on said Y-direction roller;

said X-direction roller being positioned with respect to said housing so that said X-direction roller can rest on said surface to support said housing and permit said housing to be rolled on said surface in an X-direction supported by said X-direction roller; and

said X-direction being substantially perpendicular to said Y-direction.

5,748,339

IMAGE SENSING APPARATUS

Masao Suzuki, Tokyo; Kazuyuki Matoba, Fukuoka, and Norihiro Nanba, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 440,116, May 12, 1995, Pat. No. 5,644,410, which is a continuation of Ser. No. 213,975, Mar. 16, 1994, abandoned. This application Mar. 3, 1997, Ser. No. 810,259

Claims priority, application Japan, Mar. 19, 1993, 5-085575

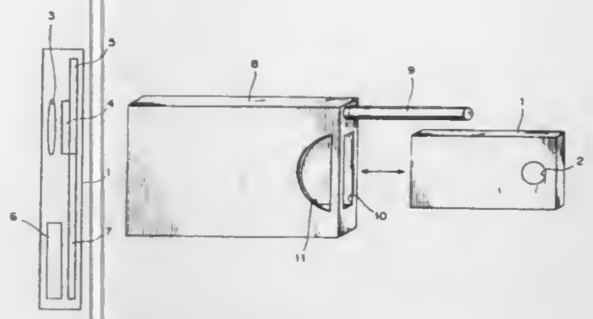
Int. Cl.^{6} H04N *1/40*

U.S. Cl. 358—473 **44 Claims**

1. An image sensing apparatus comprising:

an information device having an insertion port at its predetermined surface; and

an image sensing cartridge, which has at least an image sensing system, capable of being loaded in and unloaded from the information device by being inserted in the insertion port,



where an image sensing operation becomes possible by connecting said information device with said image sensing cartridge;

said image sensing cartridge having an image sensing opening for introducing light to the image sensing system, the diameter of which is larger than the shortest side of said insertion port.

5,748,340

IMAGE READING APPARATUS CAPABLE OF RAPID TRANSITION FROM A STANDBY MODE TO A STABLE OPERATIONAL MODE

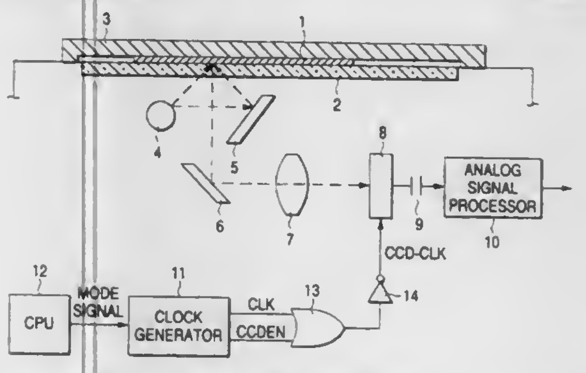
Mitsuo Shimizu, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1995, Ser. No. 570,601

Claims priority, application Japan, Dec. 16, 1994, 6-312829

Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—482 **3 Claims**



1. An image reading apparatus, comprising:

means for applying light to an object to obtain an optical image;

photoelectric conversion means for converting the optical image from said applying means into an electrical signal;

means for driving said photoelectric conversion means;

driving-interrupting means for interrupting the driving of said photoelectric conversion means by said driving means, said driving-interrupting means stopping the supply of a clock signal imparted to said photoelectric conversion means during a non-reading period when the optical image is not read; and

output-signal-level determining means for determining an output signal, which is imparted to a circuit in a subsequent stage of said photoelectric conversion means, to be at a predetermined level by setting to a low level a reset pulse for the clock signal the supply of which is stopped, and imparting the same to said photoelectric conversion means.

5,748,341

METHOD OF AND APPARATUS FOR DETERMINING WHETHER AN ORIGINAL IS PRESENT IN A READOUT REGION

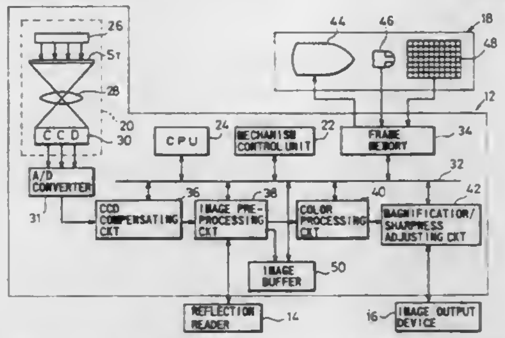
Seiichiro Morikawa, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1993, Ser. No. 77,042

Claims priority, application Japan, Jun. 19, 1992, 4-159928

Int. Cl.^{6} H04N *1/40;1/04*

U.S. Cl. 358—488 **15 Claims**



1. A method of determining whether an original is present in a readout region, comprising the steps of:

(a) defining a plurality of zones in said readout region, each of the plurality of zones includes a plurality of dots;

(b) scanning the readout region to obtain image data therefrom;

(c) determining a variance of said image data in said plurality of zones; and

(d) comparing said variance with a predetermined threshold value to determine whether an original is present in said readout region.

5,748,342

IMAGE PROCESSING APPARATUS AND METHOD

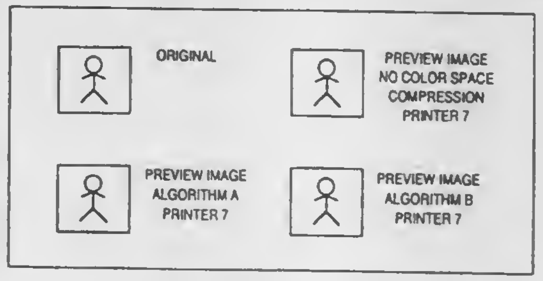
Akihiro Usami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1995, Ser. No. 421,866

Claims priority, application Japan, Apr. 18, 1994, 6-079025

Int. Cl.^{6} H04N *1/46;* **G03F** *3/10*

U.S. Cl. 358—500 **29 Claims**


ORIGINAL
PREVIEW IMAGE NO COLOR SPACE COMPRESSION PRINTER 7
PREVIEW IMAGE ALGORITHM A PRINTER 7
PREVIEW IMAGE ALGORITHM B PRINTER 7

1. An image processing apparatus comprising:

input means for inputting color image data representing an input color image;

color gamut mapping means for performing a color gamut mapping on the color image data, based on one of a plurality of color gamut mapping methods;

generating means for generating color image data representing a preview image corresponding to an output image reproduced by a color image forming unit; and

control means for performing control so as to simultaneously display preview images, on which the color gamut mapping has been performed based on the plurality of color gamut mapping methods, and a preview image, on which the color gamut mapping has not been performed, with respect to the same color image data.

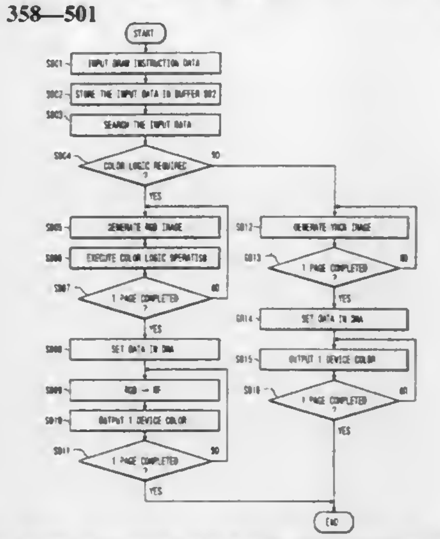
VOL 210
ISS 1
MY 5
1998
UMI

5,748,343
IMAGE PROCESSING APPARATUS AND METHOD

Jun Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 339,166, Nov. 10, 1994, abandoned.
This application May 16, 1997, Ser. No. 857,902
Claims priority, application Japan, Nov. 12, 1993, 5-283172
Int. Cl.^{6} H04N *1/32*

U.S. Cl. 358—501 **29 Claims**


START
S001 INPUT DRAW INSTRUCTION DATA
S002 STORE THE INPUT DATA IN BUFFER 802
S003 SEARCH THE INPUT DATA
S004 COLOR LOGIC REQUIRED ?
NO
YES
S005 GENERATE RGB IMAGE
S006 EXECUTE COLOR LOGIC OPERATION
S007 1 PAGE COMPLETED ?
S008 SET DATA IN DMA
S009 RGB → CMY
S010 OUTPUT 1 DEVICE COLOR
S011 1 PAGE COMPLETED
S012 GENERATE YMCK IMAGE
S013 1 PAGE COMPLETED ?
S014 SET DATA IN DMA
S015 OUTPUT 1 DEVICE COLOR
S016 1 PAGE COMPLETED
END

1. An image processing apparatus for receiving input color information from information processing means, performing a color process, and outputting the color-processed information to image forming means, said apparatus comprising:

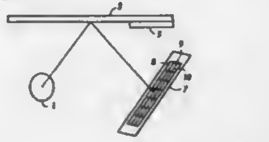
- determination means for determining whether the input color information requires a draw operation;
- first image generation means for performing image generation in a first signal form when said determination means determines that the draw operation is required; and
- second image generation means for performing image generation in a second signal form when said determination means determines that the draw operation is not required,
- wherein said determination means determines whether an image overlapping portion is present.

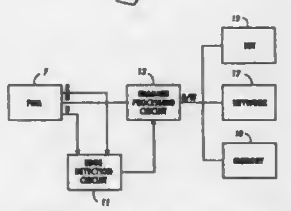
5,748,344
SYSTEM AND METHOD FOR DETERMINING A LOCATION AND ORIENTATION IN A BLACK AND WHITE DIGITAL SCANNER

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 25, 1995, Ser. No. 533,123
Int. Cl.^{6} H04N *1/40;1/04;1/46*

U.S. Cl. 358—505 **5 Claims**





1. A method for digitally scanning a document, comprising the steps of:

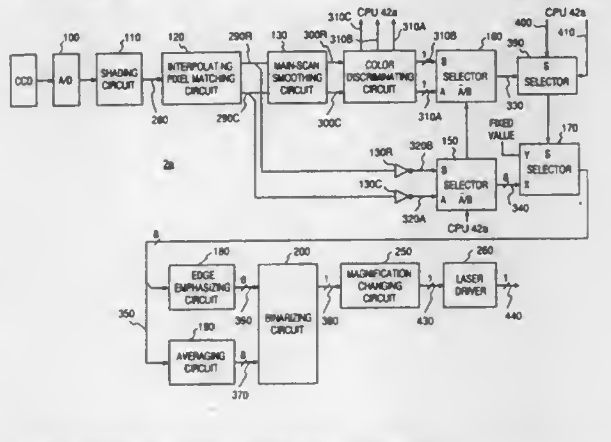
- (a) providing a backdrop portion having a predetermined color;
- (b) scanning the backdrop portion and document with a first set of photosites that perceive the backdrop portion as being nearly black to determine an edge of the document;
- (c) scanning the backdrop portion and document with a second set of photosites that perceive the backdrop portion as being nearly white to produce digital image data relating to an image on the document;
- (d) determining if a transparency mode command has been entered by a user; and
- (e) causing said step (b) to be bypassed when said transparency mode command has been entered.

5,748,345
IMAGE PROCESSING APPARATUS FOR PERFORMING IMAGE PROCESSING ACCORDING TO COLORS OF INPUT IMAGE

Hidenori Ozaki, Kawasaki, and Hideaki Shimizu, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 117,679, Sep. 8, 1993, abandoned.
This application Feb. 28, 1995, Ser. No. 396,062
Claims priority, application Japan, Sep. 8, 1992, 4-239405
Int. Cl.^{6} H04N *1/46*

U.S. Cl. 358—537 **39 Claims**


CCD
A/D
SHADING CIRCUIT
INTERPOLATING PIXEL MATCHING CIRCUIT
MAIN-SCAN SMOOTHING CIRCUIT
COLOR DISCRIMINATING CIRCUIT
SELECTOR
FIXED VALUE
CPU 42a
EDGE EMPHASIZING CIRCUIT
AVERAGING CIRCUIT
BINARIZING CIRCUIT
MAGNIFICATION CHANGING CIRCUIT
LASER DRIVER

1. An image processing apparatus comprising:

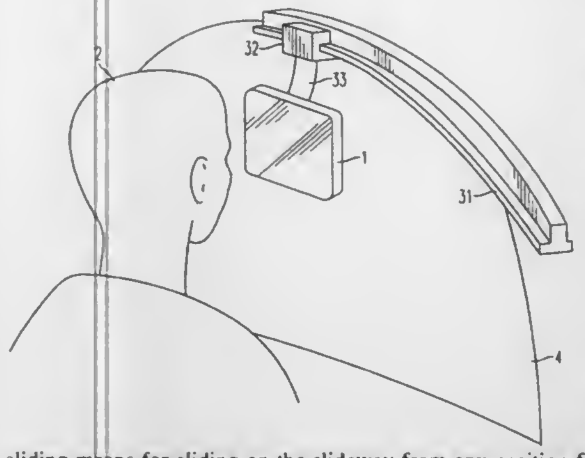
- color separating means for separating colors of an input image to output color image data;
- smoothing means for smoothing the color image data outputted from said color separating means;
- discriminating means for discriminating areas of a color image on the basis of the smoothed color image data from said smoothing means; and
- image processing means for processing the input image in accordance with the discrimination result from said discriminating means,
- wherein said image processing means is operable in either a first image processing mode or a second image processing mode, these modes being different from each other with respect to image processing of areas discriminated by said discriminating means, and wherein said smoothing means changes a degree of smoothing in accordance with the image processing mode of said image processing means.

5,748,346
DEVICE FOR STOWING AWAY A HOLOGRAPHIC MIRROR, NOTABLY FOR AIRCRAFT

Jean-François David, Merignac, and Jean-Pierre Gerbe, Pessac, both of France, assignors to Sextant Avionique, Meudon la Foret, France

Continuation of Ser. No. 409,719, Mar. 24, 1995, abandoned.
This application May 12, 1997, Ser. No. 855,787
Claims priority, application France, Mar. 25, 1994, 94 03549
Int. Cl.^{6} G02B *5/32;27/01;7/182*

U.S. Cl. 359—15 **18 Claims**



1. A device for stowing away a holographic mirror, comprising:

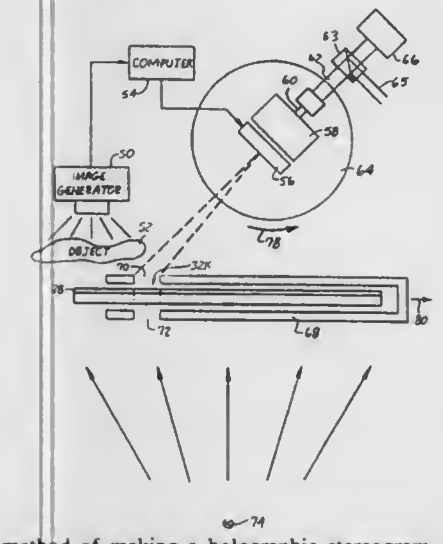
- at least one curved slideway located above an operator,
- sliding means for sliding on the slideway from any position for viewing the mirror to a given position when the mirror is stowed away, said sliding means being fixedly joined to the holographic mirror, and
- means continuously secured to an upper portion of the mirror for holding the mirror in position when the mirror is stowed away wherein the slideway is fixed to the mechanical structure of a windscreen of an aircraft and wherein said sliding means includes means for moving said mirror along the structure of the windscreen to one side of the field of vision of the operator when the mirror is stowed away and wherein said means continuously secured to the upper portion of the mirror includes a linking arm which continuously interconnects said upper portion of the mirror and said sliding means.

5,748,347
IMAGE RECORDING MEDIUM AND METHOD OF MAKING SAME

Ronald R. Erickson, Brooklyn, N.Y., assignor to Hologram Technology International, Inc., Brooklyn, N.Y.

Continuation of Ser. No. 277,401, Jul. 19, 1994, abandoned.
This application Sep. 10, 1996, Ser. No. 710,074
Int. Cl.^{6} E03H *1/26*

U.S. Cl. 359—23 **73 Claims**



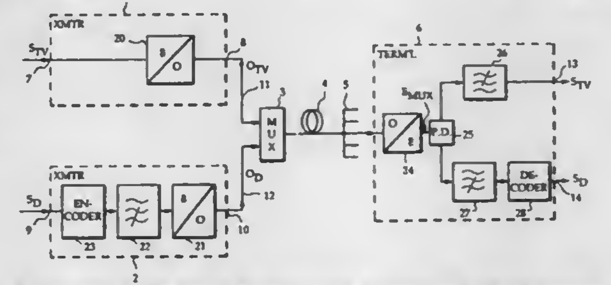
1. A method of making a holographic stereogram, comprising the steps of holographically recording on a section of an undeveloped layer of a recording medium through a mask a plurality of two-dimensional images from three-dimensional image data, each of said images corresponding to a view of an object at a particular angular orientation; rotationally displacing an object beam carrying one of said images to correspond to a location of said mask, a location of said object beam corresponding to a location of a reference beam; pre-distorting said object beam, said pre-distorting step including transforming a cross-section of said object beam substantially into a first predetermined shape and first orientation at a first distance from said image after being incident on said image, and transforming a cross-section of said object beam substantially into at least a second predetermined shape and at least a second orientation at at least a second distance from said image after being incident on said image; and correlating a location of said mask to said angular orientation of said image in said object beam with respect to a normal plane of reference.

5,748,348
OPTICAL COMMUNICATION SYSTEM FOR CABLE-TELEVISION SIGNALS AND FOR SUBSCRIBER-ASSIGNED SIGNALS

Rolf Heidemann, Tamm; Gustav Veith, Bad Liebenzell, and Jurgen Otterbach, Leonberg, all of Germany, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Nov. 6, 1995, Ser. No. 554,272
Claims priority, application Germany, Oct. 31, 1994, 44 38 942.6
Int. Cl.^{6} H04J *14/02*

U.S. Cl. 359—125 **16 Claims**



1. An optical communication system comprising a first transmitting device (**1**) for converting a first electric signal (S_{TV}), whose spectrum lies in a first frequency band FB1, to a first optical signal (O_{TV}), a second transmitting device (**2**) for converting a second electric signal (S_D), whose spectrum lies in a second frequency band (FB2), to a second optical signal (O_D), and a coupling device (**3**) for coupling the optical signals (O_{TV}, O_D) into an optical fiber network (**4**, **5**) having at least one optical network termination (**6**) connected thereto, characterized in that the second transmitting device (**2**) comprises means (**22**, **23**) for processing the second electric signal (S_D) for concentrating the energy of the second electric signal (S_D) on a subband of the second frequency band (FB2) which is different from the first frequency band (FB1), and that the optical network termination (**6**) comprises an optical-to-electrical transducer (**24**), for converting the received optical signals (O_{TV}, O_D) to an electric multiplex signal (E_{MUX}), and separating and processing means (**25**, **26**, **27**, **28**) for recovering the first and second electric signals (S_{TV}, S_D) from the electric multiplex signal (E_{MUX}).

5,748,349
GRATINGS-BASED OPTICAL ADD-DROP MULTIPLEXERS FOR WDM OPTICAL COMMUNICATION SYSTEM

Victor Mizrahi, Columbia, Md., assignor to Ciena Corp., Linthicum, Md.

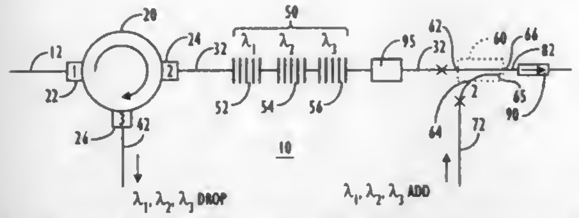
Filed Mar. 27, 1996, Ser. No. 622,957
Int. Cl.^{6} H04J *14/02*

U.S. Cl. 359—130 **13 Claims**

1. An optical add-drop multiplexer for a wavelength division multiplexed optical communication system comprising:

- an optical circulator having at least first, second, and third circulator ports configured such that optical signals which enter the first circulator port exit the circulator at the second circulator port and optical signals which enter the second circulator port exit the circulator at the third circulator port;

/OL
2 10
ISS
1
MY
5
998
JMI


20
12
22
24
26
32
42
50
λ_1 λ_2 λ_3
52
54
56
10
95
62
32
60
66
82
65
90
2
64
72
$\lambda_1, \lambda_2, \lambda_3$ DROP
$\lambda_1, \lambda_2, \lambda_3$ ADD

a first optical transmission path optically communicating with the first circulator port for carrying a wavelength division multiplexed optical signal which includes one or more optical signals to be dropped from the transmission path;

a second optical transmission path optically communicating with the second circulator port, the second optical transmission path having positioned therein a set of one or more Bragg gratings which is configured to reflect one or more optical wavelengths included in a wavelength division multiplexed optical communication signal carried by the first optical transmission path, the set of one or more gratings configured such that the wavelengths are reflected in an order from shortest wavelength to longest wavelength, the wavelengths being reflected towards the second circulator port to be output by the circulator through the third circulator port, the reflected wavelengths corresponding to optical channels to be dropped from a wavelength division multiplexed optical communication signal;

a third optical transmission path optically communicating with the third circulator port, the third optical transmission path configured to receive optical wavelengths output by the third circulator port corresponding to channels to be dropped from a wavelength division multiplexed optical communication signal;

an optical coupler having first and second coupler input ports and one coupler output port and configured such that optical signals which enter the first and second input port are combined and output to the coupler output port, the second optical transmission path optically communicating with the first coupler input port for transmitting a wavelength division multiplexed optical communication signal from the second optical transmission path to the first coupler input port;

a fourth optical transmission path optically communicating with the second coupler input port and configured to carry optical wavelengths to be added to through channels from the first optical transmission path;

a fifth optical transmission path optically communicating with the coupler output port for receiving the combined optical signals from the first coupler input port and the second coupler input port, the combined optical signals corresponding to a wavelength division multiplexed optical communication signal which includes the through channels from the first optical transmission path and the optical channels added from the fourth optical transmission path;

the coupler and the fourth optical transmission path being configured such that optical signals carried by the fourth optical path do not optically communicate with the second transmission path and the set of Bragg gratings positioned in the second transmission path.

5,748,350

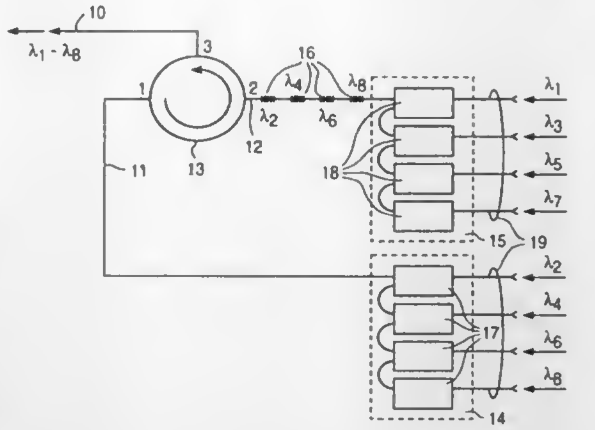
DENSE WAVELENGTH DIVISION MULTIPLEXER AND DEMULTIPLEXER DEVICES

Jing-Jong Pan, Milpitas; Simon X. F. Cao, San Mateo; Yuan Shi, San Jose, and Donna S. Yu, Danville, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Jun. 19, 1996, Ser. No. 667,998

Int. Cl.⁶ H04J *14/02*

U.S. Cl. 359—130 **32 Claims**



1. A wavelength division multiplexer/demultiplexer connected to a plurality of first optical fibers for carrying optical signals at predetermined wavelengths, each predetermined wavelength different from another, and to a second optical fiber for carrying optical signals at all of said predetermined wavelengths, said wavelength division multiplexer/demultiplexer comprising

an optical circulator having at least three ports, said optical circulator serially passing optical signals received at one port to another port, one of said ports connected to said second optical fiber;

a plurality of bandpass wavelength division units, each bandpass wavelength division unit connected to one of said remaining ports and to a set of said first optical fibers, said bandpass wavelength division unit passing optical signals between said set of first optical fibers and said one of said remaining ports;

each of said bandpass wavelength division units comprising a plurality of bandpass wavelength division couplers, each bandpass wavelength division coupler connected to one of said first optical fibers for transmitting optical signals at a predetermined wavelength; and

at least one set of fiber Bragg gratings connected between a port and a bandpass wavelength division unit, each fiber Bragg grating having a narrow wavelength reflection band about a predetermined wavelength and arranged so that optical signals at wavelengths differing from predetermined wavelengths of said set of first optical fibers connected to said bandpass wavelength division unit are blocked and reflected.

5,748,351

OPTICAL POWER DETECTOR, AND MULTI-LEVEL DIGITAL TRANSMISSION SYSTEM INCORPORATING THE SAME

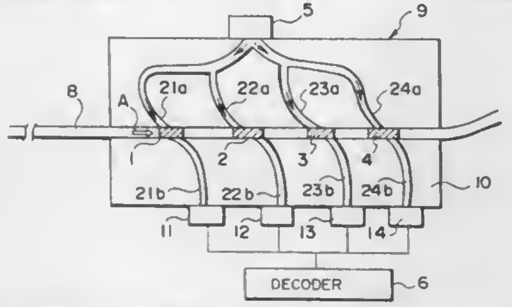
Masahito Morimoto, Tokyo, Japan, assignor to The Furukawa Electric Co. Ltd., Tokyo, Japan

Filed Feb. 26, 1996, Ser. No. 606,859

Claims priority, application Japan, Feb. 27, 1995, 7-063443

Int. Cl.⁶ H04B *10/158*

U.S. Cl. 359—193 **8 Claims**



1. An optical power detector, comprising:

a light transmission path into an entry end of which a beam of received light is incident;

a plurality of saturable absorbers, each of which has its own pair, differing in steps, of a first threshold value and a second threshold value which is greater than said first threshold value, and is substantially opaque to light of optical intensity below said first threshold value and substantially transparent to light of optical intensity above said second threshold value, disposed in series along said light transmission path;

a probe light source for directing a beam of probe light to be incident upon each of said saturable absorbers in a direction crosswise to said light transmission path for said received light beam, when said received light beam is being transmitted along said light transmission path to be incident upon said saturable absorbers in order;

for each of said plurality of saturable absorbers, a probe light reception section which receives its said probe light beam via said saturable absorber due to said received light beam passing through said saturable absorber, and which does not receive its said probe light beam via said saturable absorber due to said received light beam being absorbed by said saturable absorber;

and an optical power read out means which detects whether or not probe light is received by each of said probe light reception sections which correspond to said saturable absorbers, thereby determines for each one of said plurality of saturable absorbers whether or not said received light beam has passed through it, and thus reads out the optical power of said received light beam.

5,748,352

OPTICAL SCANNING DEVICE

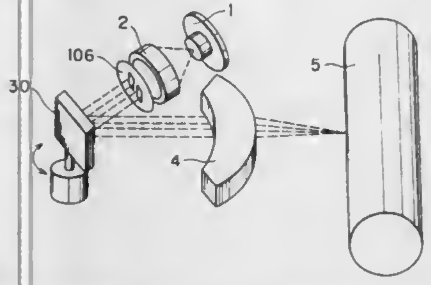
Yutaka Hattori, Kuwana, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 358,095, Dec. 16, 1994, abandoned. This application May 22, 1996, Ser. No. 651,574

Claims priority, application Japan, Dec. 17, 1993, 5-317741

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—196 **12 Claims**



1. An optical scanning device for scanning light beams onto a photosensitive body, the device comprising:

a light source for selectively emitting light beams of a predetermined first intensity and of a predetermined second intensity lower than the first intensity and the light source is operated for emitting light beams in a desired operating condition so as to selectively emit light beams of the predetermined first and second intensities, the light source including a semiconductor laser capable of emitting a laser beam when applied with a drive current, the laser having a driving characteristic in which an intensity of the laser beam increases at a first rate as a value of the drive current increases in a first current range higher than a predetermined threshold value and the intensity of the laser beam increases at a second rate as the value of the drive current increases in a second current range lower than the predetermined threshold value, the first rate being higher than the second rate, the semiconductor laser emitting the first intensity upon being applied with a drive current of a first current value and emitting a laser beam of the second intensity upon being applied with a drive current of a second current value, the first current value being higher than the second current value and a range between the first and second current values being substantially located within the first current range;

a deflection device for deflecting the light beams emitted from the light source in a scan;

a photosensitive body positioned so that the light beams deflected by the deflection device becomes incident on a surface of the photosensitive body, the photosensitive body having a predetermined photosensitivity to form an image on the surface of the photosensitive body upon being exposed to a light beam of predetermined first exposure amount and without forming an image on the surface of the photosensitive body upon being exposed to a light beam of a predetermined second exposure amount;

a condensing means for gathering light from the light source and directing the light toward the surface of the photosensitive body; and

a diaphragm positioned between the light source and the deflection device for receiving the light beam having the first and second intensities from the light source, a center portion of the diaphragm being formed with an aperture, the diaphragm including a cover portion blocking a center portion of light emitted from the light source from passing through the aperture, a size of the cover portion relative to a size of the aperture resulting in the light beam having the predetermined first and second exposure amounts being directed to the photosensitive body,

wherein the size of the cover portion relative to the size of the aperture is selected dependent on both the photosensitivity of the photosensitive body and the first and the second current values, whereby the light beam having the predetermined first and second exposure amounts is directed to the photosensitive body.

5,748,353

MARKING APPARATUS HAVING FEEDBACK-CONTROLLED ROTATIONAL LASER BEAM

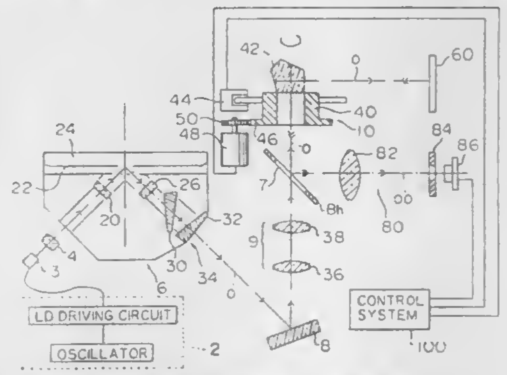
Fumio Ohtomo; Hiroyuki Nishizawa; Jun-ichi Kodaira, and Kenichirou Yoshino, all of Tokyo, Japan, assignors to Topcon Corporation, Tokyo, Japan

Division of Ser. No. 511,619, Aug. 7, 1995, Pat. No. 5,583,685, which is a continuation-in-part of Ser. No. 141,047, Oct. 26, 1993, Pat. No. 5,517,023. This application Aug. 14, 1996, Ser. No. 696,687

Claims priority, application Japan, Oct. 27, 1992, 4-289042

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—197 **6 Claims**



1. A laser beam irradiation apparatus comprising:

a laser source for emitting a laser beam;

laser beam projecting means for projecting the laser beam;

scanning means for moving said laser beam projecting means and scanning the laser beam along a laser scanning path;

reflecting means having at least one reflection zone for reflecting the laser beam projected by said projecting means in a direction substantially parallel to the incident laser beam;

laser beam detecting means for detecting a return laser beam reflected from said reflecting means in a direction substantially parallel to the incident laser beam and producing an output based on detection of the return laser beam;

memory means for storing the direction of movement of said scanning means when said laser beam detecting means produces the output based on detection of the return laser beam; and

/OL
2 10
SS
1
MY
5
998
MI

control means for controlling movement of said scanning means and for pausing the scanning of the laser beam in a particular direction depending on the direction stored in said memory means.

5,748,354

REFLECTION-TYPE SCANNING OPTICAL SYSTEM

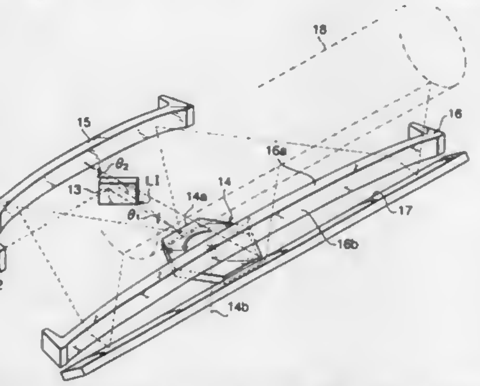
Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1997, Ser. No. 790,532

Claims priority, application Japan, Feb. 5, 1996, 8-042059

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—205 **7 Claims**



1. A reflection type scanning optical system that forms scanning lines on an imaging surface, said system comprising:
- a light source that emits a light beam;
- a deflector for deflecting and scanning the light beam emitted from said light source;
- a first imaging optical system, between said light source and said deflector, that has a positive power in an auxiliary scanning direction for converging a light beam from said light source to form a linear image at a position between said deflector and said imaging surface; and
- a second imaging optical system that converges said light beam deflected by said deflector to form a beam spot on said imaging surface, said second imaging optical system including a curved surface mirror having a positive power mainly in a main scanning direction and an anamorphic lens having a positive power mainly in said auxiliary scanning direction, wherein said light beam from said deflector is reflected by said curved surface mirror and is then transmitted through said anamorphic lens.

5,748,355

MULTI-BEAM LASER EXPOSURE UNIT HAVING ANAMORPHIC LENS COMPRISING THREE LENSES

Takashi Shiraishi, Sagamihara, and Masao Yamaguchi, Kawaguchi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

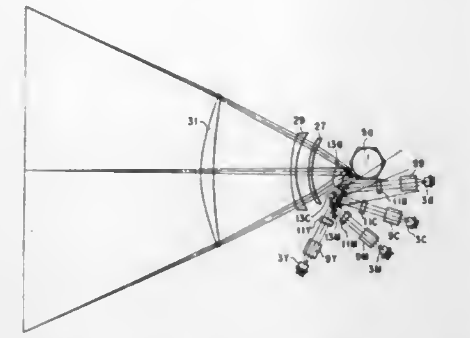
Filed Sep. 13, 1995, Ser. No. 527,781

Claims priority, application Japan, Nov. 9, 1994, 6-274949

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—206 **8 Claims**

1. A multi-beam laser exposer unit, comprising:
- light beam sources;
- deflecting means, having reflective surfaces rotatable around a rotatable axis, for deflecting light beams emitted from said light beam sources in a predetermined direction;
- pre-deflection optical means, provided between said deflecting means and each of said light beam sources, for converting the light beams from said light beam sources to a convergent light beam in a direction parallel to a rotational axis of each surface of said deflecting means, and to a convergent light beam in a direction perpendicular to the rotational axis of each surface of said deflecting means so as to be guided to said reflective surfaces of said deflecting means; and
- post-deflection optical means having an optical axis and three lenses, said lenses having positive, negative, and positive power, respectively, nearby the optical axis and in the direction parallel to the rotational axis of each surface of said deflecting means, said lenses having positive, negative, and positive power, respectively, nearby the optical axis and in the direction perpendicular to the rotational axis of each surface of said deflecting means, each positive power in the perpendicular direction being larger than that of the parallel direction, and each of said lenses having a function of image-forming each of said light beams deflected by said deflecting means to be scanned on a predetermined image surface at a uniform speed, and a function of correcting influence of variation of an inclination of the reflective surface on a position of the light beams scanned on the image surface.



5,748,356

OPTICAL SCANNING APPARATUS

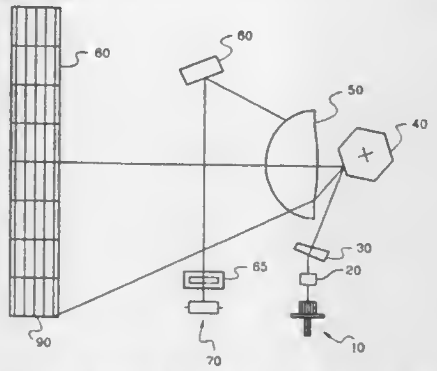
Chang Jin Park, Kyunggi-Do; Dong Hoon Kang, and Chul Woo Lee, both of Seoul, all of Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Nov. 30, 1995, Ser. No. 565,293

Claims priority, application Rep. of Korea, Nov. 30, 1994, 94 32729

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—207 **8 Claims**



1. An optical scanning apparatus, comprising a light source emitting a beam of light, a collimator lens through which said beam is emitted, a rotating polygon mirror transmitting said beam toward an image formation plane;
- a compound prism provided between the collimator lens and the rotating polygon mirror for converging the emitted beam toward a subscanning direction while deflecting the emitted beam toward a mainscanning direction; and
- an axis-symmetric aspherical lens provided between the polygon mirror and the image formation plane, and having a spherical surface in the subscanning direction.

5,748,357

OPTICAL DETECTING APPARATUS

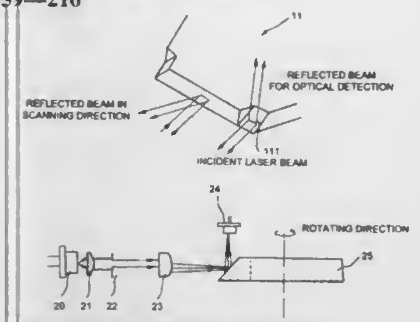
Chang Jin Park, Suwon, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 5, 1996, Ser. No. 691,939

Claims priority, application Rep. of Korea, Nov. 30, 1995, 95-45359

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—216 **5 Claims**


11
REFLECTED BEAM FOR OPTICAL DETECTION
REFLECTED BEAM IN SCANNING DIRECTION
111
INCIDENT LASER BEAM
24
ROTATING DIRECTION
25
20
21
22
23

1. An optical detecting apparatus comprising:
- a light source for emitting laser beams;
- a collimator lens and a cylindrical lens for collecting the laser beams;
- a mirror having first faces arranged in a polygon for rotating the mirror and reflecting some of the collected laser beams from the first faces, whereby each of the faces provides an effective width of scanning of the laser beams;
- reflecting means on the mirror respectively with the first faces and having second faces optically at a different angle from the first faces for reflecting others of the collected laser beams; and
- an optical detector spaced from the mirror for detecting the others of the collected laser beams reflected from the second faces and producing synchronizing signals when the others of the collected laser beams reflected from the second faces are detected before or after the effective width of scanning.

5,748,358

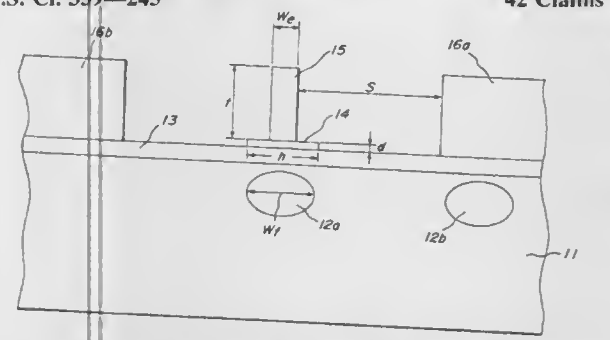
OPTICAL MODULATOR WITH OPTICAL WAVEGUIDE AND TRAVELING-WAVE TYPE ELECTRODES

Tohru Sugamata; Yasuyuki Miyama, and Takashi Shinriki, all of Funabashi, Japan, assignors to Sumitomo Osaka Cement Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1997, Ser. No. 873,404

Int. Cl.^{6} G02F *1/03*

U.S. Cl. 359—245 **42 Claims**



1. A waveguide type optical modulator comprising a substrate made of a material having an electrooptical effect, at least one optical waveguide formed in a surface region of said substrate, lightwave to be modulated being propagated along said optical waveguide, a buffer layer formed on the surface of the substrate, electrodes of traveling-wave type comprising a hot electrode applying a microwave and at least one ground electrode provided on said buffer layer, said hot and ground electrodes being extended in parallel with said optical waveguide, characterized in that said hot electrode has a width W_e smaller than a width W_f of said optical waveguide, and that an electric field adjusting region is provided between the hot electrode and the buffer layer, said electric field adjusting region having a width h not smaller than the width W_e of the hot electrode.

5,748,359

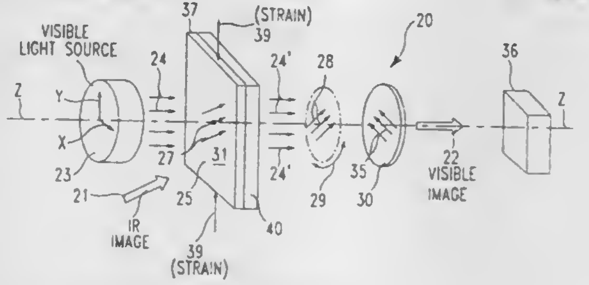
INFRARED/OPTICAL IMAGING TECHNIQUES USING ANISOTROPICALLY STRAINED DOPED QUANTUM WELL STRUCTURES

Paul H. Shen, North Potomac; Mitra Dutta, Silver Spring; Michael Wraback, Rockville, all of Md., and Jagadeesh Pamulapati, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 21, 1996, Ser. No. 754,004

Int. Cl.^{6} G02F *1/03*

U.S. Cl. 359—248 **21 Claims**



1. A polarization rotator comprising:
- a semiconductor substrate;
- a multiple quantum well structure (MQW) mounted on said substrate, said MQW having a heterostructure of un-doped barrier layers and doped quantum well layers, and said MQW having a uniaxial compressive strain in the plane of said layers such that said doped quantum well layers have anisotropic radiation absorption characteristics at a first frequency;
- a first source of radiation at said first frequency directed normal to said layers and linerally polarized in the plane of said layers, and having radiation components directed parallel to and perpendicular to the direction of said strain; and
- a second source of radiation at a second frequency directed at said MQW such that radiation absorption at said second frequency lowers the free carrier population of said doped quantum well layers and increase radiation absorption at said first frequency.

5,748,360

DECELERATING AND FOCUSING ION BEAM DEVICE

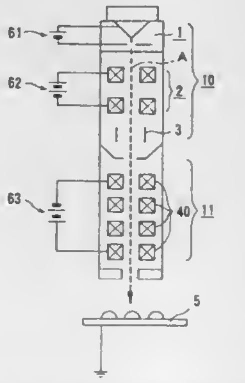
Toyohiro Chikyou, and Nobuyuki Koguchi, both of Ibaraki, Japan, assignors to National Research Institute for Metals, Tsukuba, Japan

Filed Mar. 4, 1996, Ser. No. 610,232

Claims priority, application Japan, Mar. 6, 1995, 7-045647

Int. Cl.^{6} G02B *26/08;* **G01K** *1/08*

U.S. Cl. 359—298 **5 Claims**



1. A device for decelerating and focusing ion beams, said device comprising:

an ion source for producing ion beams;

a focusing lens system comprising a plurality of focusing lenses for thinning the ion beams produced by the ion source and accelerating the ion beams by an electric potential difference between said ion source and said focusing lens system;

a multiple decelerating lens system provided with a plurality of decelerating lenses for decelerating the ion beams;

and a deflecting lens, disposed between said focusing lens system and said multiple decelerating lens system, for controlling the advancing direction of the ion beams.

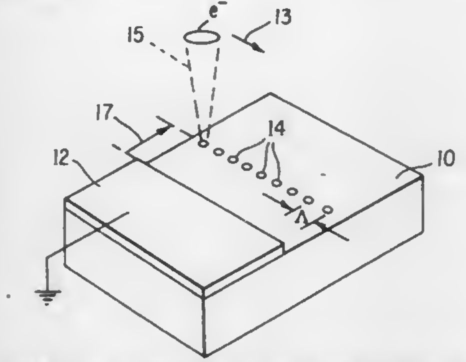
5,748,361
FERROELECTRIC CRYSTAL HAVING INVERTED DOMAIN STRUCTURE

Mool C. Gupta, Webster; Alan C. G. Nutt, and Venkatraman Gopalan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1996, Ser. No. 686,134

Int. Cl.^{6} G02F *1/37*

U.S. Cl. 359—332 **5 Claims**



1. A method of forming ferroelectric domain regions in a ferroelectric crystal cut so that the polarization direction (Z direction) is in the plane of the crystal, comprising the steps of:

a) forming a conductive ground electrode on the surface of the plane and having an edge perpendicular to the z direction or the polarization direction, in an X-cut or Y-cut crystal plane; and

b) electron beam bombarding the plane of the crystal in particular spots to deposit a charge such that the electric field created between the edge of the electrode and the spots is in a direction opposite to the crystal polarization direction and causing the inversion of the crystal polarization direction between the charge spot and the electrode.

5,748,362
FREQUENCY CONVERTER, WITH VERY HIGH EFFICIENCY, IN GUIDED OPTICS

Dominique Delacourt, Clamart; Jean-Patrick Truffer, Bures Sur Yvette; Dominique Papillon, Magny les Hameaux, and Michel Papuchon, Villebon Palaiseau, all of France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR95/01677, § 371 Date Aug. 21, 1996, § 102(e) Date Aug. 21, 1996, PCT Pub. No. WO96/20426, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 15, 1995, Ser. No. 693,221

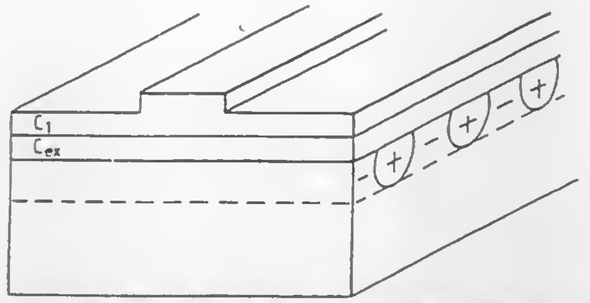
Claims priority, application France, Dec. 23, 1994, 94 15588

Int. Cl.^{6} G02F *1/39*

U.S. Cl. 359—332 **10 Claims**

1. Frequency converter comprising a guide of refractive index n_g, supplied by one or more light waves of frequency ω_n, also comprising a non-linear medium (NLM) of index n_s (less than n_g) in which the condition for phase matching between non-linear polarization generated by incident waves and created waves at frequencies ω_{em} is satisfied over a depth D of the non-linear medium by periodic modulation of a parameter involved in the non-linear interaction, said depth being defined in a plane perpendicular to an axis of propagation of the incident and created waves, said waves being confined in the two directions perpendicular to their axis of propagation, and said waves having spatial overlap in the plane perpendicular to the axis of propagation of said waves, on the one hand of a non-linear polarization generated by the k_ith-order guided modes of the incident waves and on the other hand of the l_jth-order guided modes of the created waves, characterized in that:

the converter comprises a layer C_{ex} lying at the surface of the non-linear medium, said layer C_{ex} having an index n_{eg} close to the index n_g of the guide, and a second layer C_1 of refractive index N lying above the layer C_{ex}, wherein the layer C_1 is a symmetrization layer of refractive index less than n_g and close to n_s so as to increase the spatial overlap of the non-linear polarization in a region lying above the depth D of the medium (NLM) generated by the fundamental modes of the incident waves and the fundamental modes of the created waves.



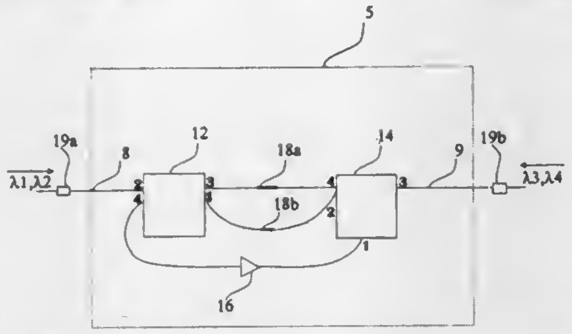
5,748,363
WAVELENGTH DEPENDENT CROSSOVER SYSTEM FOR BI-DIRECTIONAL TRANSMISSION

Gary Stephan Duck, Nepean, and Joseph Ip, Kanata, both of Canada, assignors to Fitel Inc., Nepean, Canada

Filed Nov. 30, 1995, Ser. No. 566,442

Int. Cl.^{6} H01S *3/00;* **H04B** *10/16;* **G02B** *6/00*

U.S. Cl. 359—341 **12 Claims**



1. An amplifying device having two input/output ports comprising:

(a) a first circulator having at least 4 ports;

(b) a second circulator having at least 4 ports;

(c) first wavelength selective means disposed between a first and a second port of the first and second circulator respectively;

(d) second wavelength selective means disposed between a third and fourth port of the first and second circulator respectively, the first and second wavelength selective means substantially transmitting light of a first wavelength and substantially reflecting light of a second predetermined wavelength; and,

(e) amplifying means, disposed between two other ports of the first and second circulators, said amplifying means being disposed along a path that is provided to carry light of first and second wavelength.

the first and second circulators being arranged to receive two wavelengths of oppositely propagating light of at least the first and second wavelength and in cooperation with the first and second wavelength selective means and to direct the first and second oppositely propagating light in a same direction through the amplifying means,

elements (a)–(e) constituting means for extinguishing reflections back into said input/output ports of normally outgoing optical signals without substantially interfering with light being processed in said device.

5,748,364
AMPLIFIED TELECOMMUNICATION SYSTEM FOR WAVELENGTH-DIVISION MULTIPLEXING TRANSMISSIONS

Fausto Meli, Piacenza, and Giacomo Stefano Roba, Cogoleto, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

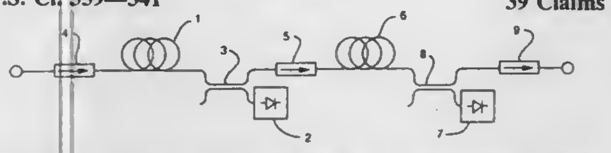
Continuation of Ser. No. 367,719, Jan. 19, 1992, abandoned.

This application Jan. 29, 1997, Ser. No. 788,457

Claims priority, application Italy, Apr. 14, 1994, MI94A0712

Int. Cl.^{6} H01S *3/00*

U.S. Cl. 359—341 **39 Claims**



1. An active optical fiber for use in a laser-pumped optical telecommunications amplifier comprising:

a core;

at least one main fluorescent dopant in said core; and

at least one secondary dopant in said core, said main dopant said secondary dopant having relative characteristics such that emission power of the fiber in a predetermined wavelength band includes a main emission peak and a secondary emission peak when optical pumping energy is supplied to the fiber, the emission power at the secondary emission peak not exceeding by more than 1 dB the emission power at all wavelengths between the main emission peak and the secondary emission peak, wherein said main fluorescent dopant is erbium in the form of an oxide, and wherein said secondary dopant includes an oxide of aluminium, an oxide of germanium, and an oxide of lanthanum.

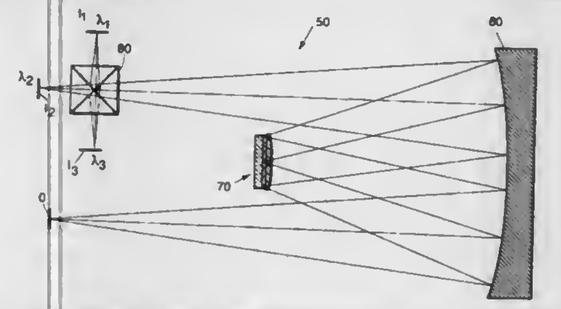
5,748,365
CATADIOPTRIC ONE-TO-ONE TELECENTRIC IMAGE COMBINING SYSTEM

Chungte W. Chen, Irvine, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Mar. 26, 1996, Ser. No. 621,572

Int. Cl.^{6} G02B *17/00;21/00*

U.S. Cl. 359—366 **22 Claims**



1. A catadioptric one-to-one optical relay system, comprising:

a spherical concave primary mirror;

a convex secondary mirror;

a zero power doublet for axial color correction; and

an optical means for spectral division;

wherein said primary mirror, said secondary mirror, said doublet and said spectral division means are arranged such that light from an object is first collimated by the primary mirror and passes through the doublet to reflect from the secondary mirror, the reflected light passing through the doublet again and directed onto the primary mirror again, the primary mirror refocusing the light to form a relayed image, the optical division means located in front of the relayed image to divide the relayed image into first, second and third spectral band images.

5,748,366
SURGICAL MICROSCOPE

Koji Yasunaga; Hiroshi Fujiwara, both of Hachioji; Masami Hamada, Akishima; Takashi Fukaya; Masahiko Kinukawa, both of Sagamihara; Tomonori Ishikawa; Masanori Kaneda, both of Hachioji, and Takeshi Okada, Ina, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

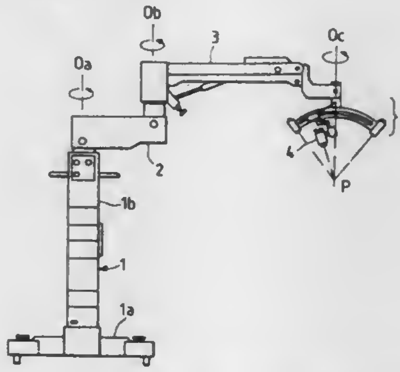
Continuation of Ser. No. 238,693, May 5, 1994, abandoned.

This application Dec. 26, 1995, Ser. No. 578,386

Claims priority, application Japan, May 7, 1993, 5-106427; Oct. 22, 1993, 5-264787

Int. Cl.^{6} G02B *21/00;21/36;21/26;21/06*

U.S. Cl. 359—368 **7 Claims**



1. A surgical microscope system having a microscope body comprising:

an observation optical system capable of changing an observation direction with a point on an observation optical axis of the microscope body as a swivel center, an observation focal point of said observation optical system being movable relative to said swivel center;

focal point position movement control means for moving the focal point for identifying the focal position of the microscope body with the swivel center:

focal position detecting means for detecting the focal point position of the microscope body;

control means for storing a signal representative of a reference focal point position which is generated by said focal position detecting means and used as a reference and for comparing said reference focal point position with an output from said focal point position detecting means; and

focal point position moving means for moving the focal point position on the basis of an output of said control means.

5,748,367
ILLUMINATING DEVICE FOR A STEREO MICROSCOPE

Christian Lücke; Gunther Sümmerer, and Hartmut Gärtner, all of Oberkochen, Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Oct. 18, 1995, Ser. No. 544,794

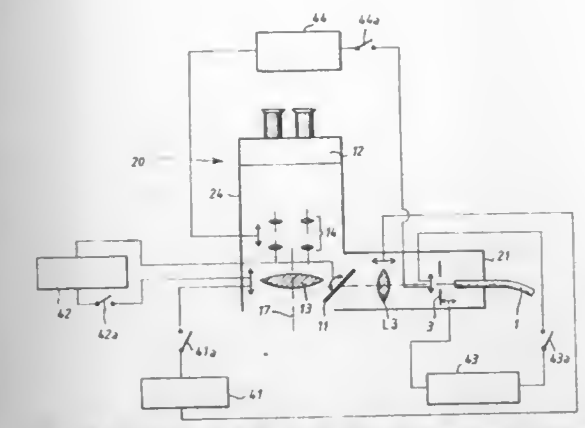
Claims priority, application Germany, Oct. 13, 1994, 44 36 575.6

Int. Cl.^{6} G02B *21/06;21/00;21/20;15/14*

U.S. Cl. 359—385 **13 Claims**

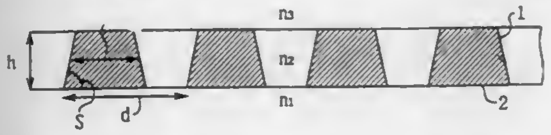
7. Illuminating device for a stereo microscope having imaging optics including an objective with variable imaging focal intercepts, comprising:

VOL 210
ISS 1
MY 5
1998
MI



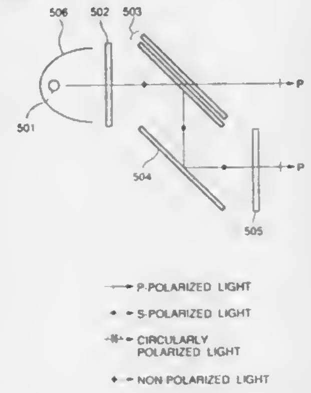
an optical system separate from said imaging optics for illuminating an object, said optical system providing an illuminating focal intercept variation,
said optical system being coupled to said imaging optics such that said illuminating focal intercept is in agreement with said imaging focal intercept of said objective,
a fiber optic light guide,
at least one illuminated field diaphragm arranged in front of said fiber optic light guide on its exit side,
said optical system being arranged in front of said fiber optic light guide on its exit side and having at least one displaceable optical element that is displaceable along an optical axis for adjustment of said illuminating focal intercept,
said optical system including a first and a second lens group which effect an imaging of said illuminated field diaphragm to infinity, followed by a third and fourth lens group, which effect focusing of said illuminated field diaphragm in an object plane, said third lens group comprising said displaceable optical element,
said objective comprising displaceable objective elements, and
a drive unit for said displaceable objective elements,
said first coupling means including a worm and a worm wheel connected thereto, said worm wheel being arranged to be driven by said drive unit to convert rotary motion into an axial motion of said worm wheel, said third lens group of said optical system being connected to said worm wheel.

5,748,368
POLARIZATION OPTICAL ELEMENT
Hitoshi Tamada; Shuichi Matsumoto, both of Kanagawa; Noriaki Nishi, Chiba, and Kimihiro Saito, Saitama, all of Japan, assignors to Sony Corporation, Japan
Filed Dec. 21, 1995, Ser. No. 576,686
Claims priority, application Japan, Dec. 29, 1994, 6-340382
Int. Cl.⁶ G02B *5/30*
U.S. Cl. 359—486 13 Claims



1. A polarization optical element for polarizing an incident light beam, comprising:
a light source producing a light beam with a wavelength between 0.4 and 1.0 μm; and
a grid composed of a plurality of elongated metal parts formed on a substrate on which said light beam is incident; wherein:
said elongated metal parts each have a cross section, said cross section having a base, sides and top;
said grid satisfies the conditions of $0.2<h/d<0.9$, $0.5<b/d<0.9$, and $70°<s<100°$, where
"h" is the thickness of said cross section measured from said base to said top;
"b" is the width of the cross section, measured along a line passing 0.5 h away from, and in parallel with, said base;
"d" is the grid period; and
"s" is the angle between said base and a side of the cross section.

5,748,369
POLARIZING BEAM SPLITTER AND AN ILLUMINATING DEVICE PROVIDED WITH THE SAME
Hideo Yokota, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 139,438, Oct. 20, 1993, abandoned. This application Sep. 28, 1995, Ser. No. 535,790
Claims priority, application Japan, Oct. 29, 1992, 4-291497
Int. Cl.⁶ G02B *5/30*
U.S. Cl. 359—487 18 Claims



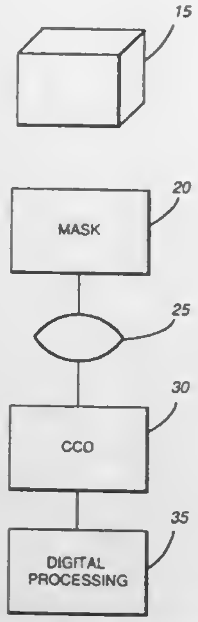
1. A device for illuminating an object to be illuminated with light from a light source, said device comprising:
a transparent flat plate;
beam splitting films provided on opposite surfaces of said transparent flat plate, wherein each of said beam splitting films has a transmittance characteristic such that transmittance of P-polarized light is different from transmittance of S-polarized light,
wherein a transmitted light from one of said beam splitting films includes said P-polarized light and said S-polarized light, and a reflected light of said one of said beam splitting films contains substantially only a single polarization direction of light;
wherein the other one of said beam splitting films resplits said transmitted light from said one of said beam splitting films to produce a transmitted light of said other one of said beam splitting films, and
a polarization changing plate for making the polarization direction of said transmitted light of said other one of said beam splitting films be the same as said single polarization direction of light.

5,748,370

Patent Not Issued For This Number

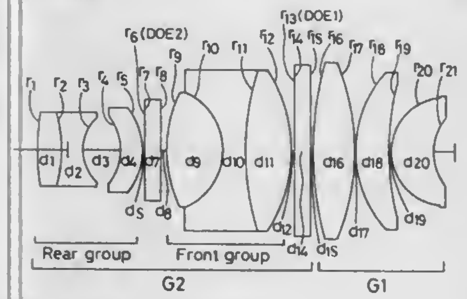
5,748,371
EXTENDED DEPTH OF FIELD OPTICAL SYSTEMS
Wade Thomas Cathey, Jr., Boulder, and Edward Raymond Dowski, Jr., Lafayette, both of Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.
Continuation of Ser. No. 384,257, Feb. 3, 1995, abandoned. This application Mar. 17, 1997, Ser. No. 823,894
Int. Cl.⁶ G02B *5/18*
U.S. Cl. 359—558 21 Claims

19. Apparatus for increasing the depth of field of an incoherent optical system having an optical transfer function, the optical system having a lens for focussing incoherent light that is received from an object into an image plane, and having storing means for storing a representation of the light image that is incident at the image plane, the apparatus comprising:



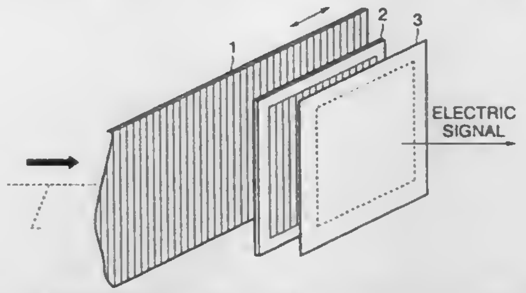
an optical mask positioned between the object and the storing means, the mask being constructed and arranged to alter the optical transfer function of the optical system such that the altered optical transfer function is substantially insensitive to the unknown distance between the object and the lens over a greater range of object distances than was provided by the unaltered optical transfer function; and
analog filter depth of field post-processing means connected to the storing means for restoring the stored representation of the incident light image by reversing the alteration of the optical transfer function accomplished by the optical mask.

5,748,372
HIGH NUMERICAL APERTURE AND LONG WORKING DISTANCE OBJECTIVE SYSTEM USING DIFFRACTION-TYPE OPTICAL ELEMENTS
Junichi Kitagawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan
Filed Apr. 17, 1996, Ser. No. 633,529
Claims priority, application Japan, Apr. 17, 1995, 7-090908
Int. Cl.⁶ G02B *5/18;3/08;21/02*
U.S. Cl. 359—565 15 Claims



1. An objective system comprising:
a first diffraction type of optical element having a diffraction action;
a second diffraction type of optical element located at an image side of said first diffraction type of optical element; and
at least one cemented lens having a cemented surface, wherein said at least one cemented lens is located between said first and second diffraction type of optical elements.

5,748,373
SCALE AND ENCODER INCLUDING DIFFERENTLY SPACED PATTERN LINES
Kazuhiro Hane, Miyagi, and Atsushi Ieki, Gifu, both of Japan, assignors to Okuma Corporation, Aichi, Japan
Filed Apr. 17, 1996, Ser. No. 633,500
Claims priority, application Japan, Apr. 17, 1995, 7-114034
Int. Cl.⁶ G02B *5/18;* **G01B** *9/02*
U.S. Cl. 359—575 5 Claims



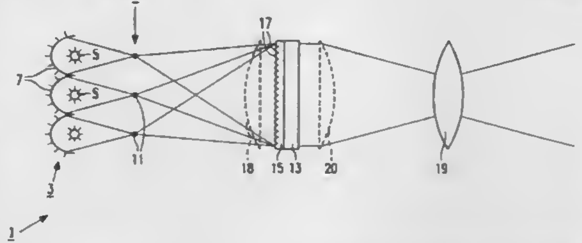
1. A scale having a grating pattern comprising a plurality of pattern lines therein, said pattern lines having widths determined so as to remove high-order distortion components with a distribution of said pattern lines, and said pattern lines including, for removing given A-order and B-order distortion components, pattern lines with widths W and W' that are given by

$$\text{pattern line width } W=P\times(n/A+(1+2m)/2B)$$

$$\text{pattern line width } W'=P\times(n/A-(1+2m)/2B)$$

where n and m are integers, wherein A and B are different numbers of distortion components to be removed, and wherein P is the pattern line period.

5,748,374
PICTURE DISPLAY DEVICE
Jacobus H. M. Neijzen; Adrianus J. S. M. De Vaan, and Martinus V. C. Stroomer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 27, 1996, Ser. No. 757,530
Claims priority, application European Pat. Off., Dec. 1, 1995, 95203312
Int. Cl.⁶ G02B *27/10*
U.S. Cl. 359—621 4 Claims



1. A picture display device comprising an illumination system, a picture display panel provided with a matrix of n pixels and having a pitch p_p, and a projection lens system, the illumination side of the picture display panel provided with a microlens array comprising m microlenses and having a pitch p_m, wherein: the illumination system comprises N illumination elements which are arranged in an array, have a pitch p_1 and generate light simultaneously, in which $N<<M.n$ and $p_1>>p_m, p_p$, the microlens array and the picture display panel are arranged in a telecentric configuration, and it holds for the pitch P_1 of the array of illumination elements and the pitch p_p of the picture display panel that:

$$M{\cdot}p_1=p_p$$

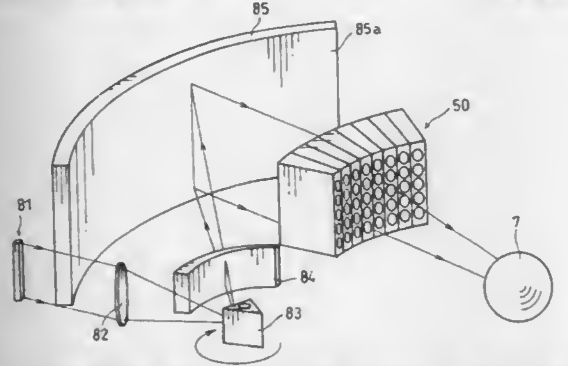
and for the pitch p_m of the microlens array and the pitch p_p of the picture display panel:

OL
2 10
ISS
1
MY
5
998
MI

$$p_m = x \cdot p_p$$

in which M is the magnification of the microlens array and x is an integer.

5,748,375
MAGNIFYING LENS AND DISPLAY APPARATUS
Shinji Yamana, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 8, 1996, Ser. No. 746,264
Claims priority, application Japan, Nov. 9, 1995, 7-291476
Int. Cl.^{6} G02B *27/10;27/02*
U.S. Cl. 359—622 **50 Claims**



1. A magnifying lens for magnifying an object so that a magnified image of the object is visible to naked eye, said magnifying lens comprising a plurality of compound lenses, which is formed by opposite two-dimensional negative lens array and a two-dimensional positive lens array, the two-dimensional negative lens array having a plurality of negative lenses, the two-dimensional positive lens array having a plurality of the positive lenses, each of said compound lenses having a pair of the opposite negative and positive lenses, the negative lenses being provided so that respective principal planes of the negative lenses are on a same first plane, the positive lenses being provided so that respective principal planes of the positive lenses are on a same second plane,

wherein each pair of the negative and positive lenses is provided so that a straight line connecting the respective principal points of the negative and positive lenses intersects substantially at a point (Xc) a distance (Sc) between the point (Xc) and the first plane of the two-dimensional negative lens array satisfying the following equation:

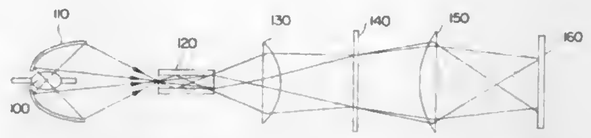
$$Sc = \frac{So \cdot Sd \cdot f2}{(So + f1)Sd - (f1 + f2)So}$$

where So (So<0) represents a distance from the first plane of the two-dimensional negative lens array to the object, Sd (Sd>0) represents a distance from the first plane of the two-dimensional negative lens array to the second plane of the two-dimensional positive lens array, f1 (f1<0) represents a focal distance of the negative lens, and f2 (f2>0) represents a focal distance of the positive lens.

5,748,376
HIGH OPTICAL THROUGHPUT LIQUID-CRYSTAL PROJECTION DISPLAY SYSTEM
Kun-Wei Lin, Hsinchu Hsien; Han-Ping D. Shieh, Hsinchu; San-Ming Chen, Taipei; Kuang-Vu Chen, Taipei Hsien, and Chong-Min Chang, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed Apr. 17, 1996, Ser. No. 633,449
Int. Cl.^{6} G02B *27/14;5/30;* **G02F** *1/1335;* **F21V** *7/04*
U.S. Cl. 359—629 **12 Claims**

1. A liquid-crystal projection display system, comprising:

a double-layer square-pillar-like integrator, including an inner layer and an outer layer, having a polarization-separating thin film formed between the inner layer and the outer layer:



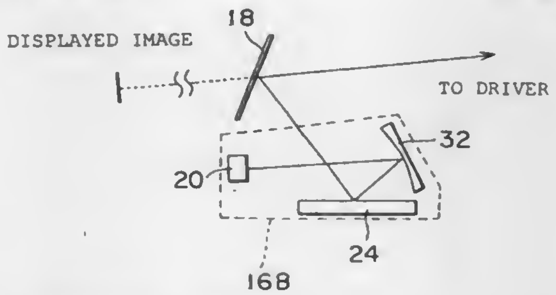
a converging light source for generating light converged at a point near one end surface of the double-layer square-pillar-like integrator, so that most of the light emitted from the light source enters the double-layer square-pillar-like integrator, and different polarized light is transmitted by being totally reflected off of surfaces of the inner layer and the outer layer respectively;

a first lens for forming real light spots on an image plane from virtual light spots formed by totally reflecting the different polarized light transmitted in the double-layer square-pillar-like integrator;

a polarization rotator located at the image plane, for optionally rotating the polarization angle of the real light spots which have a certain polarization, so that the polarization angles of all the real light spots are identical; and

a second lens for evenly converging and projecting light beams from the light spots with an identical linear polarization to overlay on an object.

5,748,377
HEADUP DISPLAY
Tsuyoshi Matsumoto; Yoshihiro Mizuno; Keiichi Omata, and Shin Eguchi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Jun. 20, 1996, Ser. No. 666,907
Claims priority, application Japan, Oct. 26, 1995, 7-278519
Int. Cl.^{6} G02B *27/14*
U.S. Cl. 359—633 **11 Claims**



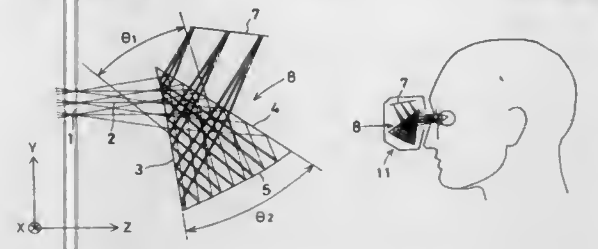
1. A headup display comprising:

a light emission-type display source;

a first concave mirror located so as to reflect light emitted from said display source, said first concave mirror having an aspherical reflecting surface, said first concave mirror having a lateral focal length contributing to lateral enlargement of a displayed image and a longitudinal focal length contributing to longitudinal enlargement of said displayed image, said lateral focal length being shorter than said longitudinal focal length; and

a combiner located so as to reflect the light reflected on said first concave mirror toward an observer in a mobile unit, said combiner having a longitudinal focal length contributing to longitudinal enlargement of said displayed image and a lateral focal length contributing to lateral enlargement of said displayed image, said longitudinal focal length of said combiner being shorter than said lateral focal length of said combiner.

5,748,378
IMAGE DISPLAY APPARATUS
Takayoshi Togino, Konganei, and Koichi Takahashi, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jul. 12, 1996, Ser. No. 678,970
Claims priority, application Japan, Jul. 14, 1995, 7-178657
Int. Cl.^{6} G02B *27/14*
U.S. Cl. 359—633 **18 Claims**



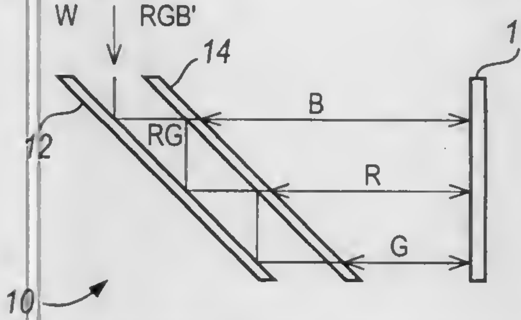
1. An image display apparatus comprising an image display device for displaying an image, and an ocular optical system for projecting the image displayed by said image display device and for leading the projected, image to an observer's eyeball,

said ocular optical system having at least three optical surfaces, wherein a space formed by said at least three optical surfaces is filled with a medium having a refractive index larger than 1,

said at least three optical surfaces being defined as a first surface, a second surface, and a third surface, respectively, in order in which light rays pass in backward ray tracing from said observer's eyeball to said image display device, and

said at least three optical surfaces being disposed such that light rays pass in said backward ray tracing from said observer's eyeball pass through the first surface and are reflected by the second surface and further reflected by the third surface, which is a reflecting surface having positive power, and the light rays reflected by said third surface are reflected by said first surface and pass through said second surface to reach said image display device.

5,748,379
OPTICAL ENGINES FOR TRICOLOR PROJECTORS HAVING CO-PLANAR LIKE OPTICAL ELEMENTS
Kenneth E. Salsman, Brush Prairie; Amjad I. Malik, Vancouver, both of Wash., and Gary B. Kingsley, Tigard, Oreg., assignors to Delta America Ltd., Fremont, Calif.
Filed Aug. 20, 1996, Ser. No. 705,708
Int. Cl.^{6} G02B *27/14*
U.S. Cl. 359—634 **27 Claims**



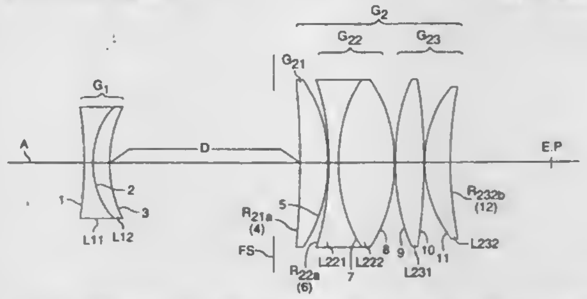
1. In an optical engine for splitting a white light beam into at least a first and a second color light beam, for modulating the first and second color light beams and for recombining the modulated color light beams to produce a modulated polychromatic output light beam, the improvement comprising:

a first dichroic mirror element group including plural dichroic mirrors positioned and oriented in coplanar relationship with one another;

a first turning mirror element group including plural turning mirrors positioned and oriented in coplanar relationship with one another, said first dichroic mirror element group and said first turning mirror element group cooperating to split white light into plural color beams and to direct the same outwardly away from said first dichroic mirror element group; and

a light valve group including plural light valves positioned and oriented in coplanar relationship with one another, said light valve group being positioned and oriented to receive plural color beams directed from said first dichroic mirror element group.

5,748,380
EYEPIECE LENS WITH LONG EYE RELIEF
Mitsuhiro Yanari, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Sep. 20, 1996, Ser. No. 717,397
Claims priority, application Japan, Sep. 21, 1995, 7-267848
Int. Cl.^{6} G02B *25/00*
U.S. Cl. 359—646 **10 Claims**



1. An eyepiece lens, comprising, in order from the objective lens side:

(a) a first lens group G_1 having a negative refractive power and a focal length F1, a second lens group G_2 having a positive refractive power and a focal length F2, and a field stop situated between the first and second lens groups, the first and second lens groups being separated from each other by an axial air-space distance D;

(b) the first lens group G_1 comprising a cemented negative lens including two lens elements cemented together;

(c) the second lens group G_2 comprising, in order from the objective lens side, a positive meniscus lens element G_{21} having a concave surface oriented objectivewise; a cemented lens G_{22} comprising two lens elements cemented together and having a most objectivewise lens surface that is a concave surface oriented objectivewise; and a lens subgroup G_{23} having a positive refractive power and comprising a positive meniscus lens element having a concave surface oriented eyewise; and

(d) the eyepiece lens satisfying the following Conditional Expressions:

$$-4.5 \leqq F_1/F \leqq -2.0$$

$$1.0 < F_2/F \leqq 3.0$$

$$2.5 \leqq D/F \leqq 5.0$$

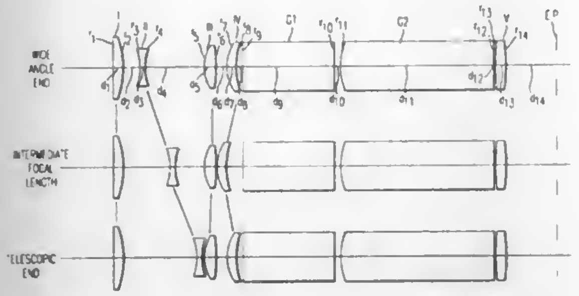
wherein F is the overall focal length of the eyepiece lens.

5,748,381
REAL IMAGE TYPE ZOOM FINDER OPTICAL SYSTEM
Nobuaki Ono, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 28, 1995, Ser. No. 535,869
Claims priority, application Japan, Oct. 20, 1994, 6-281377
Int. Cl.^{6} G02B *15/14;25/00;3/00*
U.S. Cl. 359—647 **3 Claims**

1. A real image type zoom finder optical system comprising:

an objective optical system including:

/OL
2 10
SS
1
MY
5
998
MI



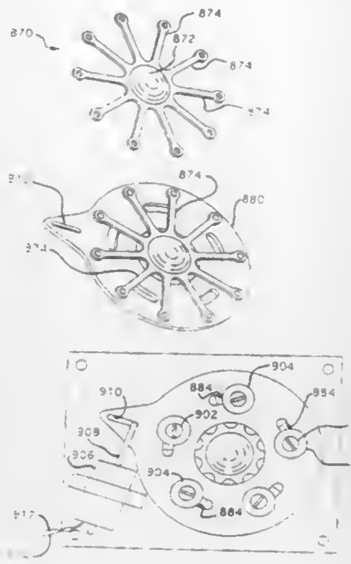
- a first lens group having positive refracting power;
- a second lens group having negative refracting power and constructed by a single lens using an aspherical surface as at least one optical face, wherein a zooming operation is performed from a wide angle end to a telescopic end by moving said second lens group from the object side to an eyepiece side on an optical axis of the real image type zoom finder optical system;
- a third lens group having positive refracting power; and
- a fourth lens group having positive refracting power wherein a changed in diopter of a finder caused by the zooming operation of said second lens group is corrected by an axial movement of said fourth lens group;
- the first to fourth lens groups being sequentially arranged from an object side;
- the objective optical system having positive refracting power as a whole;
- an erect orthoscopic image optical system arranged after the objective optical system; and
- an eyepiece optical system having positive refracting power and arranged after the erect orthoscopic image optical system;
- the real image type zoom finder optical system being constructed such that a real image formed by said objective optical system is focused and formed within said erect orthoscopic image optical system; and
- the following conditional expression

$$1.25\leqq|f_w/f_2|\leqq1.45$$

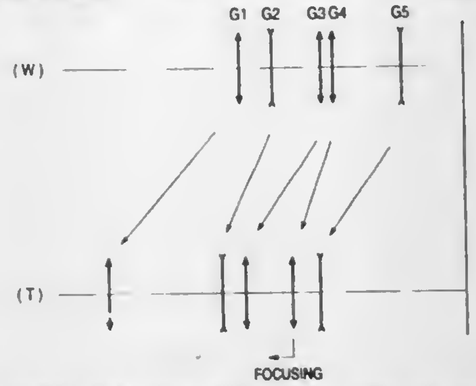
is satisfied when f_w is a focal length of said objective optical system at the wide angle end and f_2 is a focal length of said second lens group.

5,748,382
SYSTEM FOR STRETCHING A SOLID FLEXIBLE LENS
Francis J. Maguire, Jr., 33 Colby Dr., East Hartford, Conn. 06108
Division of Ser. No. 1,736, Jan. 7, 1993, Pat. No. 5,422,653. This application Jun. 5, 1995, Ser. No. 462,503
Int. Cl.^{6} G02B *15/14;3/12*
U.S. Cl. 359—676 **3 Claims**

1. System for varying the magnification of a lens, comprising;
- an optically clear flexible solid in the form of a thin lens having a plurality of legs radiating therefrom in a same plane as said optically clear flexible solid;
- a first mount for mounting the optically clear flexible solid with ends of the legs fixed on the mount in said same plane; and
- a second mount for rotatably mounting with respect to the first mount and having rollers thereon for bearing against the plurality of legs upon rotation of the second mount with respect to the first mount for pulling the legs in said same plane and thereby stretching the optically clear flexible solid for thinning the form of the thin lens.



5,748,383
VARIABLE FOCAL LENGTH OPTICAL SYSTEM
Motoyuki Ohtake, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Sep. 25, 1996, Ser. No. 721,578
Claims priority, application Japan, Nov. 14, 1995, 7-319485; Feb. 22, 1996, 8-059971
Int. Cl.^{6} G02B *15/14;3/02;9/60;9/34*
U.S. Cl. 359—683 **15 Claims**



1. A variable focal length optical system comprising, in succession from an object side, a first lens unit G1 having a positive refractive power, a second lens unit G2 having a negative refractive power, a third lens unit G3 having a positive refractive power, a fourth lens unit G4 having a positive refractive power, and a fifth lens unit G5 having a negative refractive power,
- wherein when a focal length is varied from a maximum wide-angle state to a maximum telephoto state, at least said fifth lens unit G5 moves toward the object side, a first variable air gap between said first lens unit G1 and said second lens unit G2 increases, a second variable air gap between said second lens unit G2 and said third lens unit G3 decreases, a third variable air gap between said third lens unit G3 and said fourth lens unit G4 increases, and a fourth variable air gap between said fourth lens unit G4 and said fifth lens unit G5 decreases,
- said second lens unit G2 at least has a negative sub lens unit G21 which is disposed at a position closest to the object side and has a negative refractive power, and a sub lens unit G22 which is disposed on the image side of said negative sub lens unit G21, and

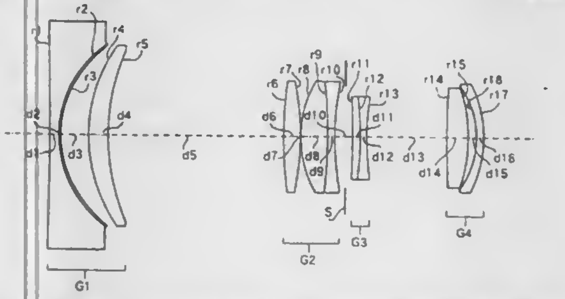
said optical system satisfies the following conditions:

$$0.3<\beta 2r\cdot\beta 2w<1.0$$

$$0.08<D2/fw<0.16$$

where β2w is the lateral magnification of said second lens unit G2 in the maximum wide-angle state, β2t is the lateral magnification of said second lens unit G2 in the maximum telephoto state, D2 is the air gap along the optical axis between said negative sub lens unit G21 and said sub lens unit G22 in said second lens unit G2, and fw is the focal length of the entire optical system in the maximum wide-angle state.

5,748,384
ZOOM LENS
Takayuki Sensui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1996, Ser. No. 715,476
Claims priority, application Japan, Sep. 20, 1995, 7-266458
Int. Cl.^{6} G02B *15/14;3/02*
U.S. Cl. 359—686 **5 Claims**



1. A zoom lens comprising a negative first lens group, a positive second lens group, a negative third lens group and a positive fourth lens group, arranged in this order from an object side, whereupon when zooming from a wide-angle extremity towards a telephoto extremity, all of said lens groups are moved so that a distance between said first and said second lens groups is reduced, a distance between said second and said third lens groups is increased, and a distance between said third and said fourth lens groups is reduced, and said zoom lens satisfying the following relationships:

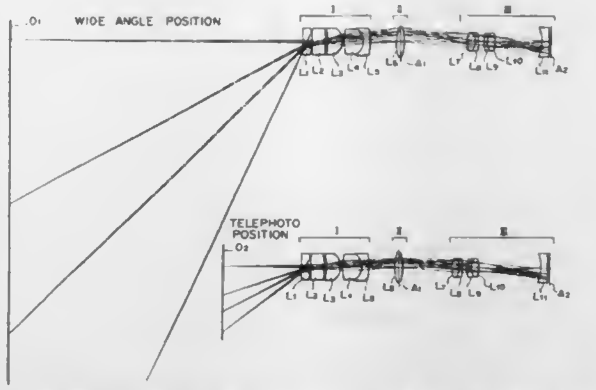
$$1.0<z2/z234<1.5$$

$$Fw>3.4$$

where z2 represents a ratio obtained by dividing a lateral magnification of said second lens group at said telephoto extremity by a lateral magnification of said second lens group at said wide-angle extremity, z234 represents a ratio obtained by dividing a resultant lateral magnification of said second through fourth lens groups at said telephoto extremity by a lateral magnification of said second through fourth lens groups at said wide-angle extremity, and Fw represents an F-number of said zoom lens at said wide-angle extremity.

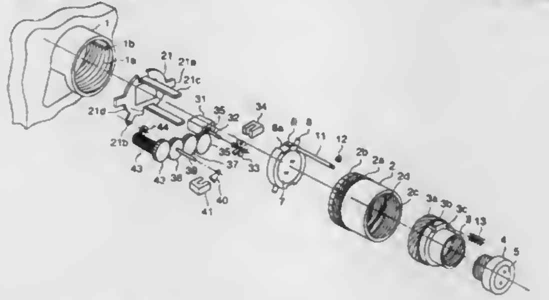
5,748,385
OBJECTIVE LENS FOR VARIABLE FIELD ANGLE ENDOSCOPE
Hitoshi Miyano, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan
Filed Jul. 24, 1995, Ser. No. 505,961
Claims priority, application Japan, Aug. 9, 1994, 7-187332
Int. Cl.^{6} G02B *15/14;21/02*
U.S. Cl. 359—691 **17 Claims**

1. An objective lens system for use in a variable field angle endoscope, comprising:
- a front set of lenses having a positive power with a fixed position relative to a front end of the endoscope;



- a rear set of lenses having a positive power and movable with respect to the front end of the endoscope between a first position and a second position;
- wherein a first image of a subject produced by the front set of lenses at a first image formation position is formed as a second image of the subject at a second image formation position by means of the rear set of lenses, and a distance between the first and second image formation positions is substantially constant during movement of the rear set of lenses between said first position and said second position, whereby focus adjustment of the endoscope lens system is maintained during movement of said rear set of lenses from said first position to said second position.

5,748,386
ZOOM LENS BARREL INCLUDING A MECHANISM FOR MOVING LENS GROUPS
Haruki Nakayama; Yuichi Honda, and Toshio Imaizumi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Division of Ser. No. 226,562, Apr. 12, 1994, Pat. No. 5,668,670. This application Jan. 15, 1997, Ser. No. 782,665
Claims priority, application Japan, Apr. 30, 1993, 5-104456
Int. Cl.^{6} G02B *15/14*
U.S. Cl. 359—694 **10 Claims**



1. A zoom lens barrel comprising:
- a zoom lens including a first lens group and a second lens group located farther from an object than said first lens group;
- a first lens frame for holding said first lens group therein;
- a second lens frame for holding said second lens group therein;
- a cam barrel having a helicoid for engaging said first lens frame;
- a first cam groove disposed on said cam barrel;
- a second cam groove disposed on said cam barrel;
- a cam pin, disposed on said second lens frame, for engaging said first and second cam grooves,
- wherein said cam pin engages said first cam groove while a focusing operation is conducted and said cam pin engages said second cam groove while a focal length switching operation is conducted; and
- a moving mechanism for moving said first and second lens groups,
- wherein said moving mechanism stepwise switches focal length of said zoom lens by moving said first and second lens groups, said moving mechanism adjusting a focal point of said zoom lens by moving said first and second lens groups

VOL 210 ISS 1 MY 5 1998 UMI

while changing a gap between said first and second lens groups after a predetermined focal length is selected.

5,748,387
ZOOM LENS SYSTEM

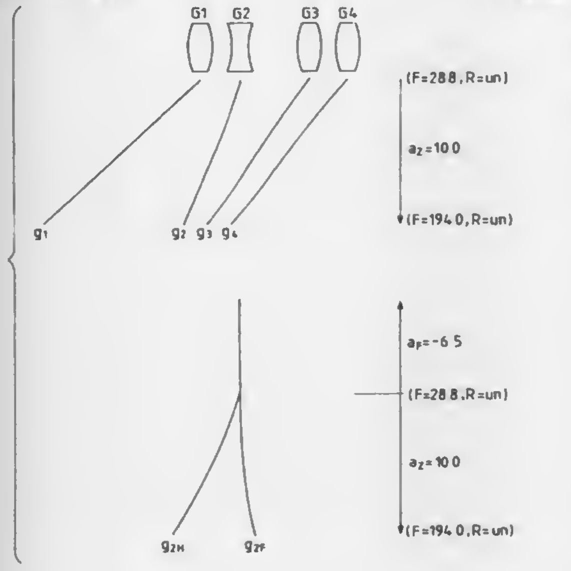
Kiyotaka Inadome, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 12, 1997, Ser. No. 798,836

Claims priority, application Japan, Feb. 23, 1994, 8-35994; Feb. 15, 1996, 8-27182

Int. Cl.⁶ G02B *15/14;15/22;7/02;* **G03B** *17/00*

U.S. Cl. 359—699 **8 Claims**



1. A zoom lens system in which a movement locus of a focusing lens unit is defined by synthesizing a focus cam and a zoom compensation cam so as to achieve an in-focus state by a substantially constant amount of rotation for an identical object distance independently of a zooming state upon expression of a predetermined movement locus for zooming by an amount of movement, in a direction of an optical axis, of lens units, and an angle of rotation of a rotatable lens barrel, said zoom lens satisfying the following conditional formulas at least at the telephoto end:

$$1.00<\gamma_{xR}/\gamma_{xO}$$

$$4.50<\Delta X_{TR}/\Delta X_{WR}<10.00$$

$$-1.00<a_F/a_Z<-0.60$$

where

γ_{xO}: the ratio (dBf/dx) of an amount dBf of infinitesimal movement of an imaging plane to an amount dx of infinitesimal movement, in the direction of the optical axis, of said focusing lens unit at an infinity in-focus point

γ_{xR}: the ratio (dBf/dx) of an amount dBf of infinitesimal movement of an imaging plane to an amount dx of infinitesimal movement, in the direction of the optical axis, of said focusing lens unit at a closest in-focus point

Δx_{WR}: an amount of movement, in the direction of the optical axis, of said focusing lens unit required for focusing from an infinity position to a closest distance position at a wide-angle end

Δx_{TR}: an amount of movement, in the direction of the optical axis, of said focusing lens unit required for focusing from an infinity position to a closest distance position at a telephoto end

a_Z: an amount of rotation of said focusing lens unit on said focus cam corresponding to zooming from the wide-angle end to the telephoto end

a_F: an amount of rotation corresponding to focusing from an infinity in-focus state to a closest in-focus state.

5,748,388
LENS BARREL HAVING A ROTATING BARREL AND LINEAR MOVING BARREL

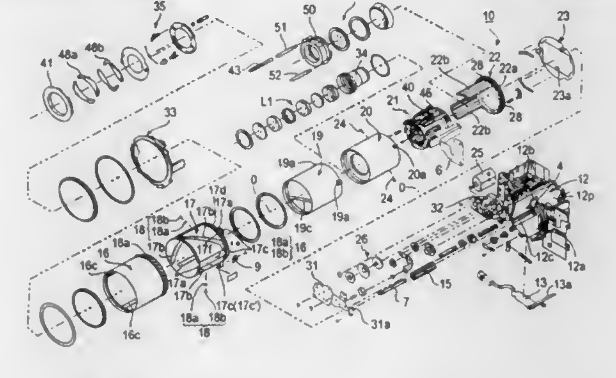
Hiroshi Nomura; Kazuyoshi Azegami, and Takamitsu Sasaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1997, Ser. No. 781,594

Claims priority, application Japan, Jan. 26, 1996, 8-012317; Jan. 26, 1996, 8-012320

Int. Cl.⁶ G02B *15/14;7/02*

U.S. Cl. 359—700 **10 Claims**



1. A lens barrel comprising:
a rotational barrel driven to rotate about an optical axis of said lens barrel, said rotational barrel having a plurality of guide grooves formed on an inner periphery;
a linear moving barrel guided for movement along said optical axis, said linear moving barrel being guided for movement without rotating about said optical axis;
a unit secured inside said linear moving barrel; and
a plurality of follower pins securing said unit to said linear moving barrel, said plurality of follower pins each projecting outwardly from an outer periphery of said linear moving barrel to engage said plurality of guide grooves, respectively, so that said linear moving barrel is moved along said optical axis relative to said rotational barrel when said rotational barrel is driven to rotate.

5,748,389
OPTICAL PEDESTAL AND METHOD FOR USING THE SAME

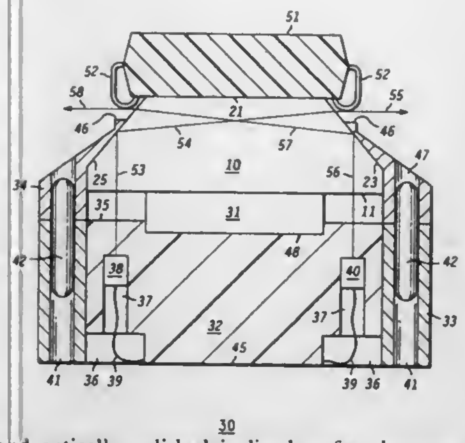
Marcus J. Gering, Mesa; Gordon O. Berg; David C. Lehnen, both of Tempe, and Joseph W. Frisbie, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1996, Ser. No. 723,819

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—811 **20 Claims**

16. A vision inspection station, comprising: an optical pedestal, which comprises:
a first surface for receiving a work piece;
a second surface substantially parallel to the first surface;
a first optically polished inclined surface between the first surface and the second surface; and



a second optically polished inclined surface between the first surface and the second surface and opposite to the first optically polished inclined surface;
a light-blocking mask adjacent the second surface of the optical pedestal, the light-blocking mask blocking, at least partially, a transmission of light into the optical pedestal through the second surface;
a translucent light diffuser adjacent the light-blocking mask; and
a light source attached to the translucent light diffuser.

5,748,390
IMAGING LENS SYSTEM

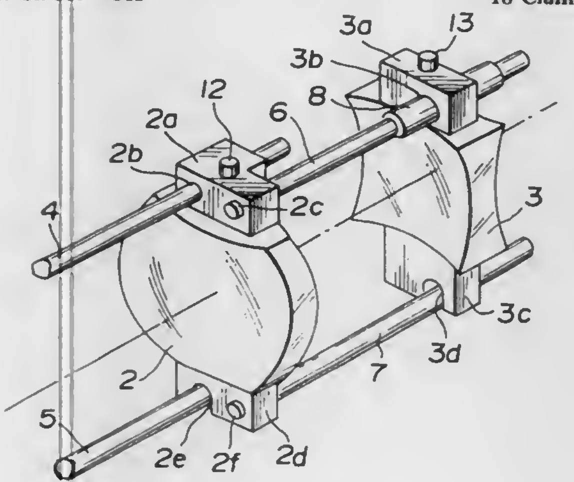
Tamotsu Koiwai, Akiruno; Sumlo Kawai, Hachioji; Tatsuo Kitazawa, Hino, and Hisashi Goto, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1997, Ser. No. 786,201

Claims priority, application Japan, Jan. 24, 1996, 8-010311

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—811 **18 Claims**



14. An imaging lens system comprising:
a lens having at least an area which transmits an imaging flight flux; and
a lens support formed at an edge of the lens, the lens support comprising a hollow sleeve secured in a through-hole and a notch, and a shaft passing through the through-hole and the notch, the through-hole and the notch being formed outside the imaging light flux transmitting area and within a phantom circle in which the lens is inscribed.

5,748,391
CAMERA WITH VIBRATION COMPENSATION DEVICE HAVING ANTI-VIBRATION LENS URGING MECHANISM AND FEED SCREW MECHANISM

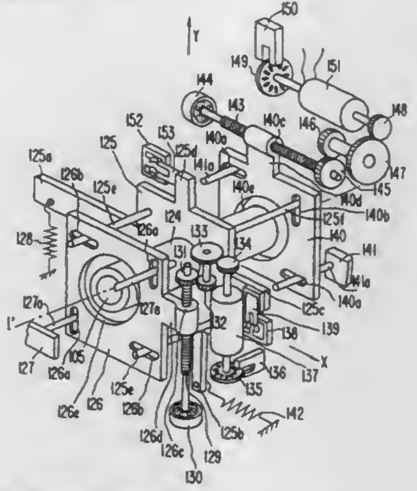
Etsuo Tanaka; Hiroshi Okano, both of Tokyo, and Akira Katayama, Koganei, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 377,728, Jan. 25, 1995, abandoned. This application May 22, 1996, Ser. No. 651,315

Claims priority, application Japan, Apr. 27, 1994, 6-090307; Apr. 27, 1994, 6-090324

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—813 **20 Claims**



1. A lens apparatus comprising:
an optical system which is shiftable to compensate for vibrations affecting the lens apparatus; and
a feed screw mechanism having a helical groove and including a male portion and a female portion which cooperate, via the helical groove, to shift the optical system, the feed screw mechanism having an angle of friction and the helical groove having a lead angle that is smaller than the angle of friction.

5,748,392
OPTICAL VOLTAGE SENSOR, GROUP OF OPTICAL PARTS AND METHOD OF MANUFACTURING SAME

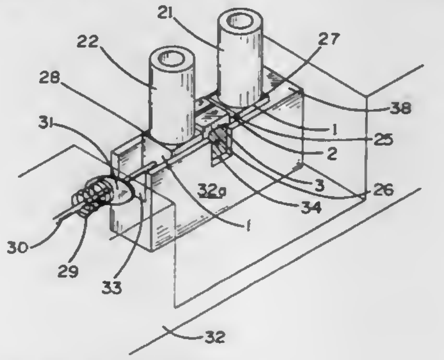
Hidenobu Hamada, Amagasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1996, Ser. No. 753,495

Claims priority, application Japan, Nov. 27, 1995, 7-307022

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—819 **15 Claims**



1. An optical device, comprising:
a first end optical part defining an optical axis;
a second end optical part positioned along the optical axis, the first end optical part and the second end optical part being bound together; and
at least one intermediate optical part positioned along the optical axis and sandwiched between the first end optical part and the second end optical part such that the position of the at least

VOL
210
ISS
1
MY
5
1998
UMI

one intermediate optical part is fixed relative to the first and second end optical parts by, at least in part, friction without bonding thereof.

5,748,393

MOUNTING ARRANGEMENT

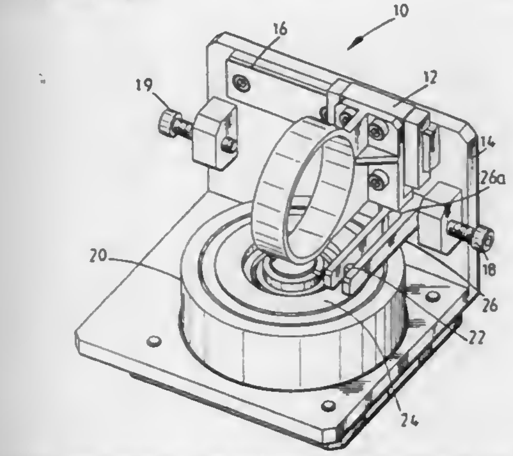
Hywel Edwards, Wales, United Kingdom, assignor to Pilkington P.E. Limited, Wales, United Kingdom

Filed Mar. 19, 1997, Ser. No. 821,666

Claims priority, application United Kingdom, Mar. 20, 1996, 9605861

Int. Cl.^{6} G02B *7/02*

U.S. Cl. 359—822 **12 Claims**



11. A lens mounting arrangement for permitting movement of a lens to an accurately defined first position, the arrangement comprising:

a track including a first stop at a first end of the track;

a lens carriage moveable along the track;

drive means coupled to the carriage for moving the carriage along the track and into contact with the stop, the stop defining said first position; and

a coupling provided between the drive means and the carriage including a resilient link.

5,748,394

LENS DRIVING DEVICE

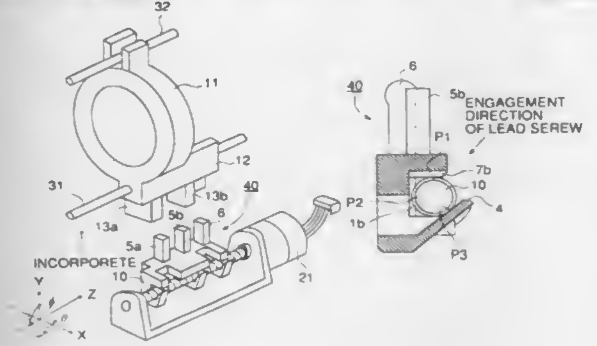
Yoshio Shimazaki, and Tetsuji Emura, both of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Jul. 22, 1996, Ser. No. 681,119

Claims priority, application Japan, Jul. 26, 1995, 7-190488

Int. Cl.^{6} G02B *15/00;15/14*

U.S. Cl. 359—823 **6 Claims**



1. A lens driving device comprising:

(a) a lens frame for holding a photographic lens;

(b) a guide member for guiding the lens frame in a direction of an optical axis of the lens;

(c) a lead screw for moving the lens frame in the optical axis direction, said lead screw having a rotational axis;

(d) a drive source for rotating the lead screw;

(e) a carriage in pressure contact with the lead screw for converting rotational motion of the lead screw to linear motion in a direction parallel to the optical axis direction which is a moving direction of the guide member, and

(f) at least three pressure contact points between the carriage and the lead screw, said pressure contact points being positioned about said rotational axis of said lead screw such that when said pressure contact points are projected onto a plane which is perpendicular to said rotational axis of said lead screw, there are at least three pressure contact points on said plane.

5,748,395

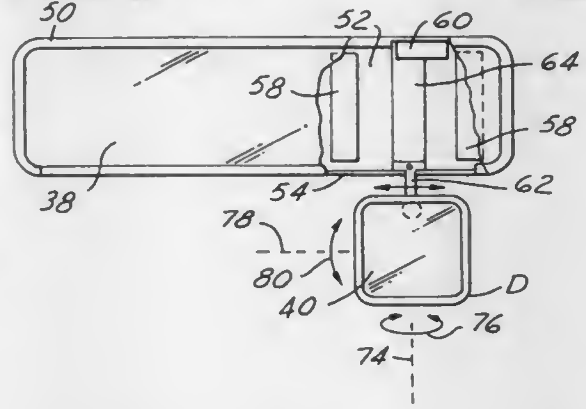
REAR VIEW MIRROR WITH STOWABLE DUAL VIEW MIRROR

Anthony J. Rendi, Jr., Canton, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Continuation of Ser. No. 539,897, Oct. 6, 1995. This application Apr. 28, 1997, Ser. No. 847,805

Int. Cl.^{6} G02B *5/08;7/182*

U.S. Cl. 359—841 **6 Claims**



1. A dual plane rear view mirror assembly for a passenger compartment of an automotive vehicle, comprising:

a housing having a cavity therein with an opening in a bottom surface thereof leading to the cavity and a transversely running slot on the bottom of the housing connected with the opening;

attachment means for attaching said housing to an internal surface of the passenger compartment;

a first mirror attached on a side of the housing generally facing a rear portion of the vehicle so as to reflect a first field of view from a first plane;

a second mirror attached to the housing for movement between a stowed position concealed within the cavity and a second field of view from a second plane;

a rod attached on a first end to the first mirror and on a second end to the second mirror, the first end having a ball thereon fitted into a socket in the second mirror for receiving the ball therein to allow the second mirror to rotate and pivot with respect to the first mirror when in the deployed position, the rod movable within the slot when the second mirror is in the deployed position so as to permit the second mirror to be transversely adjustable with respect to the first mirror; and

a latch mechanism for latching the second mirror in the stowed position and for allowing movement of the secondary mirror between the stowed position and the deployed position.

5,748,396

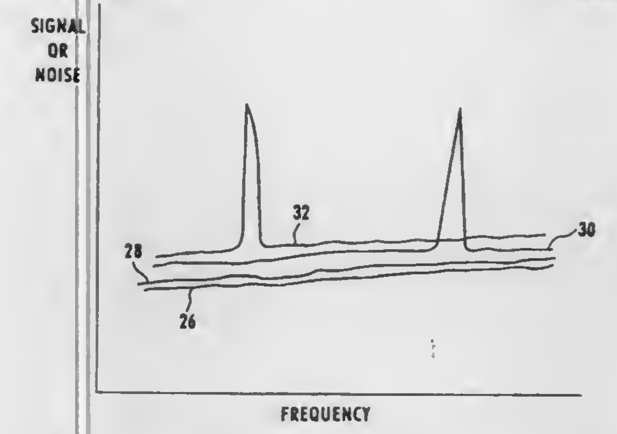
ARRANGEMENT AND METHOD FOR OPTIMIZING THE RECORDED SIGNAL TO NOISE RATIO IN CONTACT RECORDING SYSTEMS

Richard K. Milo, Lake Forest, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 13, 1995, Ser. No. 557,771

Int. Cl.^{6} G11B *27/00;21/02*

U.S. Cl. 360—31 **22 Claims**



1. A method of optimizing a recorded signal to noise ratio (SNR) in a recording system, comprising:

positioning read and write transducers with respect to a recording medium to have a contact pressure with the recording medium;

recording information on the medium with the write transducer to produce a recording;

measuring a noise level of the first recording to determine a SNR of the first recording;

adjusting the contact pressure of the write transducer to reduce the contact pressure of the write transducer with the recording medium;

recording information on the recording medium with the write transducer to produce a new recording;

measuring the noise level of the new recording to determine the SNR of the new recording; and

repeating the steps of adjusting the contact pressure of the write transducer, recording information and measuring the SNR of the new recording, until the measured noise level reaches approximately a minimum value to achieve a maximum value of the SNR.

5,748,397

AUDIO SIGNAL PROCESSING APPARATUS AND RECORDING AND/OR REPRODUCING APPARATUS FOR A TAPE-SHAPED RECORDING MEDIUM

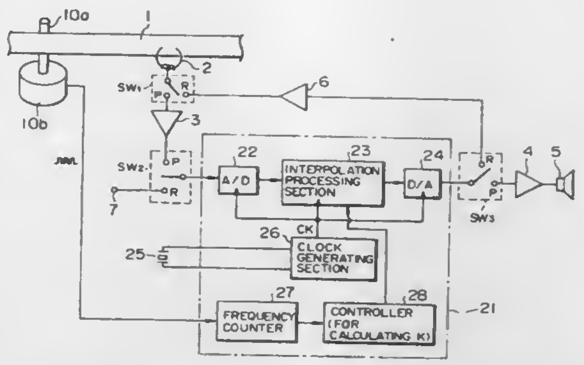
Eiichi Yamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 490,974, Jun. 15, 1995, abandoned. This application Feb. 14, 1997, Ser. No. 801,099

Claims priority, application Japan, Jun. 24, 1994, 6-164947

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—32 **7 Claims**



1. A recording and/or reproducing apparatus for a tape-shaped recording medium, the apparatus comprising:

a recording and/or reproducing head for recording and/or reproducing analog signals on and/or from the tape-shaped recording medium;

detecting means for detecting a variation in a transport speed of the tape-shaped recording medium relative to a rated transport speed and generating a cycle fluctuation coefficient; and

compensating means connected to the detecting means and the recording and/or reproducing head for modifying the analog signals read out from or to be recorded on the tape-shaped recording medium by the head based on the cycle fluctuation coefficient from the detecting means so as to compensate for the variation in the transport speed of the tape-shaped recording medium relative to the rated transport speed and outputting compensated analog signals or supplying the compensated analog signals to the head,

wherein the compensating means comprises:

clock pulse generating means;

A/D conversion means connected to the recording and/or reproducing head and the clock pulse generating means for converting the analog signals read from or to be recorded on the tape-shaped recording medium by the head into digital data in response to clock pulses from the clock pulse generating means; and

signal converting means connected to the A/D conversion means and the detecting means for converting the digital data from the A/D conversion means to the compensated analog signals based on the cycle fluctuation coefficient so as to compensate for the variation in the transport speed of the tape-shaped recording medium relative to the rated transport speed, and

wherein the signal converting means comprises:

interpolation means connected to the A/D conversion means and the detecting means for performing interpolation processing on the digital data from the A/D conversion means and outputting interpolated digital signals based on the cycle fluctuation coefficient, whereby the interpolated digital signals represent a digital signal that would be obtained if the tape-shaped recording medium was transported at the rated transport speed; and

D/A conversion means connected to the interpolation means for converting the interpolated digital signals from the interpolation means into the compensated analog signals.

5,748,398

METHOD FOR WRITING SERVO SIGNALS ONTO A MAGNETIC DISK AND MAGNETIC DISK DRIVE EQUIPPED WITH MAGNETIC DISK(S) HAVING SERVO PATTERN RECORDED BY THE METHOD

Yosuke Seo, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 275,373, Jul. 15, 1994, abandoned. This application Jun. 18, 1996, Ser. No. 665,531

Claims priority, application Japan, Jul. 21, 1993, 5-180148

Int. Cl.^{6} G11B *5/09;5/516*

U.S. Cl. 360—51 **3 Claims**

1. A method for writing servo signals, comprising the steps of:

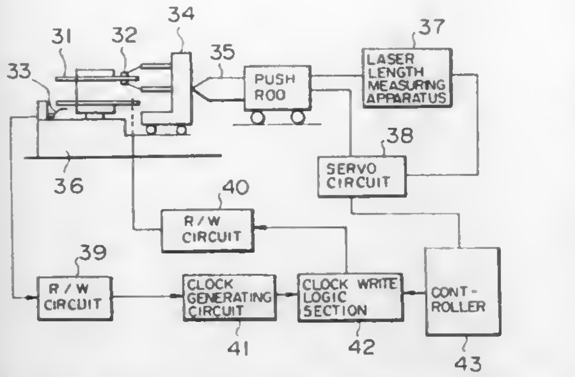
mounting a magnetic disk on which a clock signal has been recorded in at least a part thereof into a magnetic disk drive;

reading out the clock signal from said magnetic disk by using a data recording/reproducing magnetic head;

forming a recording clock on the basis of said read-out clock signal and detecting position information on said magnetic disk; and

positioning the magnetic head on the basis of said position information and writing a servo pattern onto the magnetic disk on the basis of said recording clock;

VOL
2 10
SS
1
MY
5
998
MI



wherein the detection of said position information includes executing a phase detection for a reference clock read out from a fixed head using said read-out clock signal.

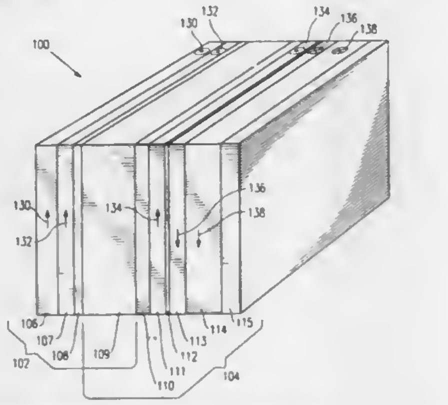
5,748,399
RESETTABLE SYMMETRIC SPIN VALVE

Hardayal Singh Gill, Portola Valley, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1997, Ser. No. 855,141

Int. Cl.^{6} G11B *5/03;5/39*

U.S. Cl. 360—66 **30 Claims**



1. An apparatus for reading data, comprising:

a first antiferromagnetic layer having magnetic spin structure aligned in a first direction;

a first ferromagnetic pinned layer abutting the first antiferromagnetic layer and having a magnetization direction pinned parallel to the first direction by the first antiferromagnetic layer;

a first non-magnetic conductor layer abutting the first antiferromagnetic layer;

a ferromagnetic free layer abutting the first non-magnetic conductor layer;

a second non-magnetic conductor layer abutting the ferromagnetic free layer;

a second ferromagnetic pinned layer abutting the second non-magnetic conductor layer and having a magnetization direction pinned parallel to the first direction;

an exchange coupling layer abutting the second ferromagnetic layer; and

a third ferromagnetic pinned layer abutting the exchange coupling layer and having a magnetization direction pinned antiparallel to the first direction;

the exchange coupling layer exhibiting a predetermined level of exchange coupling with the second and third ferromagnetic pinned layers sufficient to pin magnetization directions of the second and third ferromagnetic pinned layers in antiparallel directions relative to each other.

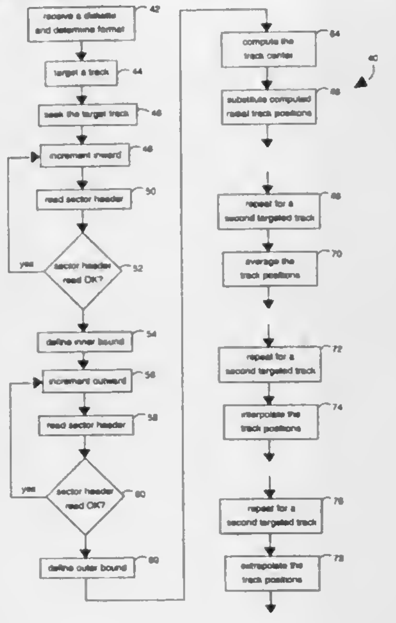
5,748,400
METHOD OF COMPENSATING FOR THE MISREGISTRATION OF THE RADIAL TRACK POSITIONS OF A FLOPPY DISKETTE IN A DISK DRIVE

Lance Leslie Flake, and Gregory Black Shonle, both of Boulder, Colo., assignors to Optics Research, Inc., Boulder, Colo.

Filed Jun. 3, 1996, Ser. No. 660,007

Int. Cl.^{6} G11B *5/596*

U.S. Cl. 360—77.02 **9 Claims**


receive a diskette and determine format
42
target a track
44
seek the target track
46
increment inward
48
read sector header
50
yes
sector header read OK?
52
define inner bound
54
increment outward
56
read sector header
58
yes
sector header read OK?
60
define outer bound
60
compute the track center
64
40
substitute computed radial track positions
66
repeat for a second targeted track
68
average the track positions
70
repeat for a second targeted track
72
interpolate the track positions
74
repeat for a second targeted track
76
extrapolate the track positions
78

1. A method for accessing data on a diskette by a disk drive with a head actuator, the method comprising the steps of:

receiving a diskette into a disk drive and determining the logical format type of the data written on the diskette;

targeting any recorded track on any surface of the diskette that has both inner and outer adjacent tracks;

moving a head actuator in said drive to an expected position for the first targeted track according to a factory precalibration;

stepping said head actuator inward by a fraction of the width of a standard track pitch;

attempting to read a sector header prerecorded on said first targeted track;

repeating the previous two steps of stepping inward and attempting to read if the reading of the sector header has succeeded;

determining the radial position at which such inward stepping results in the failure of the reading of the sector header and defining such radial position as the inner boundary of said first targeted track;

stepping said head actuator outward by a fraction of the width of said standard track pitch;

attempting to read said sector header prerecorded on said first targeted track;

repeating the previous two steps of stepping outward and attempting to read as long as the reading of the sector header succeeds;

determining the radial position at which such outward stepping results in the failure of the reading of the sector header and defining such radial position as the outer boundary of said first targeted track; and

computing a track center as a point between such inner and outer boundaries.

5,748,401
SECTOR SERVO SYSTEM DATA RECORDING/ REPRODUCING APPARATUS WITHOUT ID PORTION

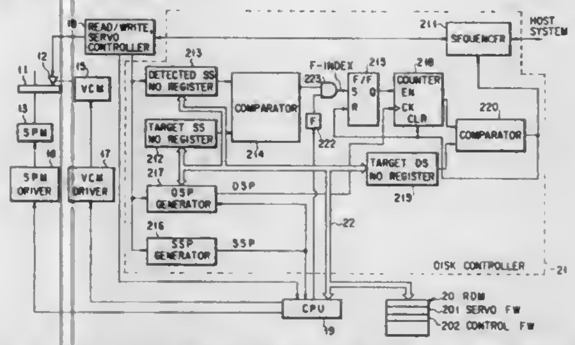
Yasumasa Kawai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Sep. 18, 1995, Ser. No. 529,870

Claims priority, application Japan, Jan. 31, 1995, 7-014495

Int. Cl.^{6} G11B *5/596*

U.S. Cl. 360—78.14 **10 Claims**



1. A data recording/reproducing apparatus using a disk-like recording medium including a plurality of tracks arranged on concentric circles, a plurality of servo areas radially arranged at equal intervals, and plural data sectors provided in a user area between the servo areas, said servo areas having a servo sector number, the apparatus comprising:

means for obtaining a target servo sector number of a target servo sector including a data sector from which recording/reproducing is to be started, and a pseudo target data sector number which indicates an ordinal of the data sector in the target servo sector;

means for reading the servo sector number from the servo area, and comparing the servo sector number thus read out with the target servo sector number;

means for outputting a data sector pulse at a timing of each data sector; and

means for counting the data sector pulse after said comparing means has detected equality between the numbers, and starting recording/reproducing when a counted value is equal to the pseudo target data sector number;

wherein said obtaining means comprises a table for storing a target servo sector number and a pseudo target data sector number with respect to a physical address, and obtains the target servo sector number and the pseudo target data sector number, with reference to the table.

5,748,402
PINCH ROLLER DRIVING APPARATUS

Myoung-soo Choi, Anyang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation of Ser. No. 417,958, Apr. 6, 1995, abandoned.

This application Jan. 24, 1997, Ser. No. 788,964

Claims priority, application Rep. of Korea, Apr. 8, 1994, 94-7334; Aug. 31, 1994, 94-21896

Int. Cl.^{6} G11B *15/29*

U.S. Cl. 360—85 **14 Claims**

1. A pinch roller driving apparatus for pressing a pinch roller against a capstan shaft using the revolving force of a loading motor placed on a deck, comprising:

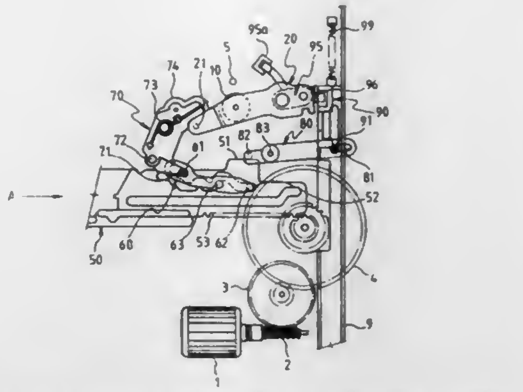
a slide member slidingly disposed on the deck to be reciprocated in a linear manner by said loading motor;

an arm member rotatably connected to the deck to be raised and lowered for rotatably supporting the pinch roller;

ascending/descending means for raising and lowering said arm member along a first direction, while being ganged with the reciprocation of said slide member;

a rotating mechanism which rotates by a predetermined angle in order to rotate said arm member lowered by said ascending/descending means, while being ganged with the reciprocation of said slide member, to move the pinch roller in a second direction that is perpendicular to said first direction to contact the pinch roller with the capstan shaft; and

elastic means for elastically pressing the pinch roller contacted with the capstan shaft by said rotating mechanism.



5,748,403
MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING A CASSETTE HOLDER WITH GUIDE PINS

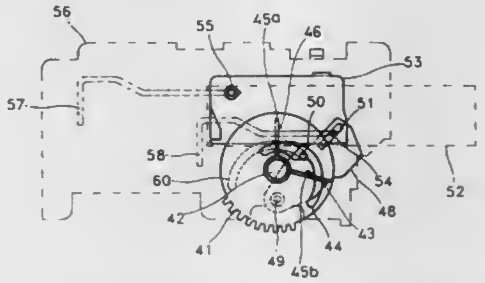
Jae-soo Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 25, 1996, Ser. No. 736,946

Claims priority, application Rep. of Korea, Dec. 30, 1995, 95-69762

Int. Cl.^{6} G11B *5/008*

U.S. Cl. 360—96.5 **5 Claims**



1. A magnetic recording and reproducing apparatus, comprising:

a pair of side chassis having predetermined guide slots; and:

a cassette holder assembly, said cassette holder assembly including a cassette holder having guide pins movably inserted into said guide slots, an arm member installed on an inner side of each of said chassis and each of said arm members having a slot into which a respective one of the guide pins of said cassette holder is inserted, with at least one of said arm members having a guide protrusion, a cam gear installed between said at least one arm member and a corresponding one of said side chassis and having a cam groove into which said guide protrusion of said at least one arm member is inserted and said cam groove having a pressing portion which rotates said at least one arm member according to a position of rotation of said cam gear, an elastic member which is extended across the cam groove formed in said cam gear and having one end portion which elastically controls movement of said guide protrusion according to the rotation of said at least one arm member when said cam gear stops and another end portion of said elastic member which elastically presses the guide protrusion of said at least one arm member when said cam gear rotates.

OL
2 10
SS
1
MY
5
998
MI

5,748,404

MAGNETIC RECORDING/REPRODUCING DEVICE WITH CHASSIS SUPPORT STRUCTURE

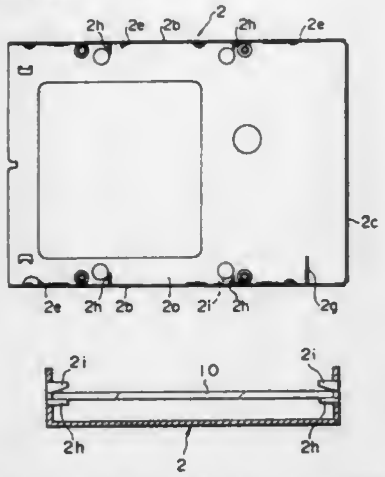
Toru Sawada, Fukushima-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1996, Ser. No. 710,223

Claims priority, application Japan, Sep. 18, 1995, 7-238797; Sep. 26, 1995, 7-247925

Int. Cl.⁶ G11B *17/02;* **H05K** *7/14*

U.S. Cl. 360—99.01 **3 Claims**



1. A magnetic recording/reproducing device comprising:

a top cover having a flat top face and a side face formed at each side edge of the top face, each side face being formed by bending a portion of said top cover substantially at right angles at each side edge;

a bottom cover having a flat bottom face and a side face formed at each side edge of said bottom cover, each side face being formed by bending a portion of said bottom cover substantially at right angles at each side edge; and

a mechanism body, including a chassis, accommodated in said top cover and said bottom cover;

wherein said bottom cover has a supporting portion and a stopper portion formed on each side face of said bottom cover by press-cutting a portion of each side face to form an opening, the supporting portion and the stopper portion of each side face being inwardly bent along a vertical line of each side face in order to clamp the chassis between the supporting portion and the stopper portion.

5,748,405

Patent Not Issued For This Number

5,748,406

ROTATIONAL DRIVING APPARATUS FOR DISKS HAVING A MAGNET DISPOSED ON A MOTOR MOUNTING BASE SURFACE TO ABSORB RADIAL DEFLECTIONS

Takao Morimoto, and Tatsunori Fujiwara, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 747,568

Claims priority, application Japan, Jun. 18, 1996, 8-157263

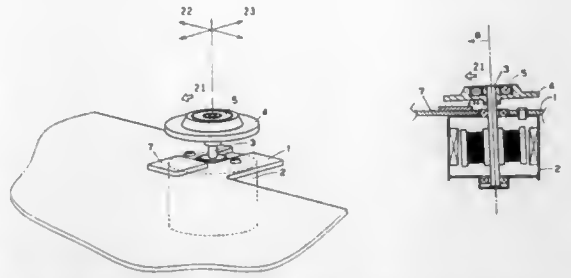
Int. Cl.⁶ G11B *23/00;25/04*

U.S. Cl. 360—99.12 **8 Claims**

1. A rotational driving apparatus for disks, comprising:

a motor mounting base;

a motor attached to said motor mounting base;



a turn table made of a non-magnetic material and attached to a rotational motor shaft, for supporting a disk thereon;

a turn table magnet disposed on said turn table, for holding a disk placed on said turn table; and

a magnetic plate member disposed on an uppermost surface of said motor mounting base and under said turn table so as to protrude from the uppermost surface of said motor mounting base toward a lower surface of said turn table, for generating a magnetic force in cooperation with said turn table magnet so as to exert a transverse force on said turn table, the transverse force acting on said rotational motor shaft, thereby tilting said rotational motor shaft at a certain angle.

5,748,407

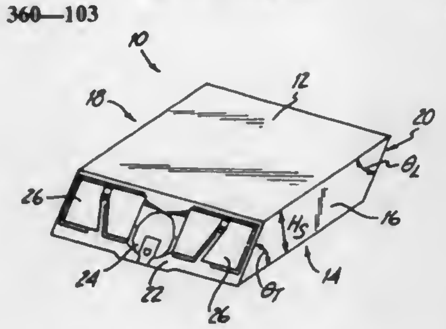
SLIDER WITH OBLIQUE LEADING AND TRAILING EDGES

Mark James Schaenzer, Eagan, and Ronald Henry Wrase, Burnsville, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 2, 1996, Ser. No. 675,384

Int. Cl.⁶ G11B *5/60*

U.S. Cl. 360—103 **8 Claims**



1. A slider for use in a disc drive data storage system comprising:

an air bearing surface formed substantially in a plane;

a top surface oriented substantially parallel to the plane of the air bearing surface;

a substantially planar trailing edge surface extending from the air bearing surface to the top surface such that the trailing edge surface forms a first oblique angle with the plane of the air bearing surface; and

a substantially planar leading edge surface extending from the top surface to the air bearing surface such that the leading edge surface forms a second substantially oblique angle with the top surface.

5,748,408

FLIGHT SLIDER FOR MAGNETIC RECORDING

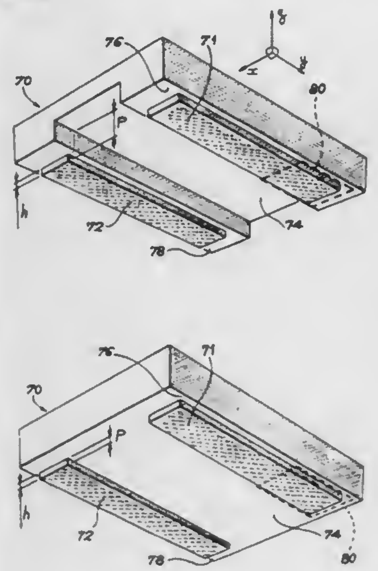
Gérard Barrois, Le Fontanil; Marcel Dominiak, Grenoble; Jean-Marc Fedeli, and Christian Pisella, both of Beaucroissant, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 288,432, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 960,868, Oct. 14, 1992, abandoned. This application Oct. 7, 1996, Ser. No. 726,968

Claims priority, application France, Oct. 30, 1991, 91 13424

Int. Cl.⁶ G11B *5/60*

U.S. Cl. 360—103 **14 Claims**



1. A slider assembly supporting a head in a flying relationship with respect to a moving magnetic recording medium, said slider assembly having:

a support structure including a laterally extending rear surface extending continuously in a single plane between opposite sides of the support structure wherein the opposite sides each extend along the entire length of the support structure,

at least one rail carried by said support structure so as to be substantially perpendicular to said rear surface said rail defining a face of a substantially continuous width which faces toward said recording medium, said rail having a front part and a rear part relative to a direction of motion of said moving recording medium,

said head comprising a planar head and being located at said rear part of said rail and between said face of said at least one rail and said support structure, said at least one rail having a step-shaped, etched indentation on said rear part which extends from a rear edge end of the rail to said rear surface of said support structure and around the entire periphery of said rail such that the step-shaped indentation includes a surface that is parallel to the opposite side surfaces of the support structure, a rear portion of the indentation being in proximity with said head wherein the height of the indentation is between 0.2 and 4 μm and wherein said rear surface extends rearwardly of said at least one rail and interconnects the opposite sides of the support structure as well as interconnects a first rear corner and a second rear corner of said support structure.

5,748,409

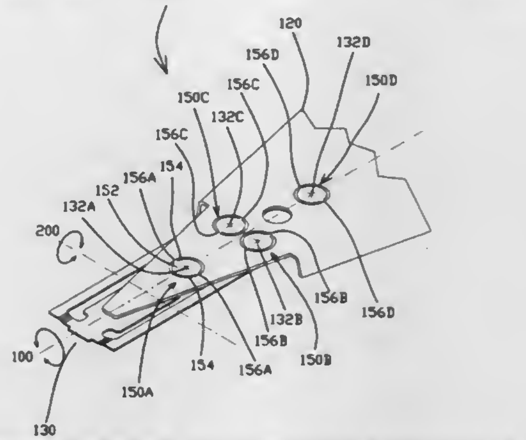
WELDING STRESS ISOLATION STRUCTURE FOR HEAD SUSPENSION ASSEMBLIES

Mark T. Girard; Jeffry S. Bennin, and David A. Ziegler, all of Hutchinson, Minn., assignors to Hutchinson Technology Incorporated, Hutchinson, Minn.

Continuation of Ser. No. 400,851, Mar. 8, 1995, abandoned. This application Mar. 19, 1997, Ser. No. 821,709

Int. Cl.⁶ G11B *5/48*

U.S. Cl. 360—104 **32 Claims**



32. A suspension assembly for placing a head assembly over the surface of a rotatable data storage device in a disk drive at predetermined roll and pitch angles, the roll angle measured in relation to a roll axis generally aligned with a longitudinal axis of the suspension assembly and the pitch angle measured in relation to a pitch axis perpendicular to the roll axis, the suspension assembly comprising:

a plurality of suspension assembly elements bonded together by a plurality of weld points;

wherein at least one of the weld points on at least one of the suspension assembly elements is isolated by a welding stress isolation structure, each of the welding stress isolation structures having

a generally flat welding area, wherein the weld point is within the welding area, and

at least one aperture through the suspension assembly element positioned between perimeter edges of the suspension assembly element and in close proximity to the weld point, the aperture for reducing the propagation of stresses from the weld point to a remaining portion of the suspension assembly element.

5,748,410

SLOTTED FLEX CIRCUIT FOR A DISK DRIVE ACTUATOR

John C. Briggs, Layton; Robert S. Patterson, and Jason Dewey, both of Ogden, all of Utah, assignors to Iomega Corporation, Roy, Utah

Filed Nov. 15, 1996, Ser. No. 749,999

Int. Cl.⁶ G11B *5/55;21/08*

U.S. Cl. 360—106 **17 Claims**

1. A linear actuator for carrying read/write heads of a disk drive into engagement with a recording medium, the linear actuator comprising:

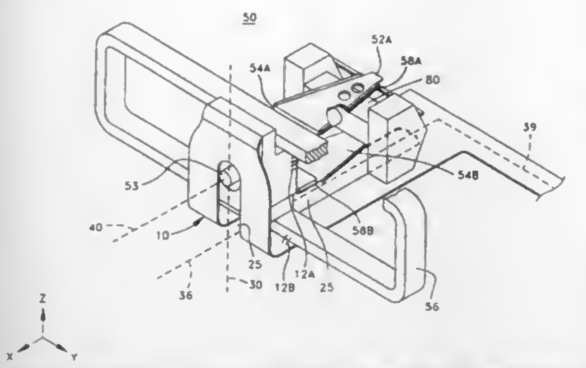
(a) a carriage assembly having at least one actuator arm being mounted to at least one of the read/write heads;

(b) an outer return path magnetically coupled to the carriage assembly for driving the carriage assembly between an operational position and a retracted position;

(c) a central guide track disposed within the outer return path, the central guide track defining a center axis that is collinear with a central guide track centerline, the carriage assembly being linearly moveable along the guide track; and,

(d) a flex circuit member having one end electrically coupled to at least one of the read/write heads and an other end electri-

VOL
210
SS
1
MY
5
998
UMI



cally coupled to a computer interface, the flex circuit member having a slot for passing the central guide track therethrough, and wherein the flex circuit member has mass distributed substantially equally on each side of a vertical plane being coincident with the center axis of the central guide track.

5,748,411
HEAD DRUM ASSEMBLY OF A VIDEO CASSETTE RECORDER WITH AUDIO AND CONTROL HEADS MOUNTED ON UPPER AND LOWER STATIONARY DRUMS OF HEAD DRUM

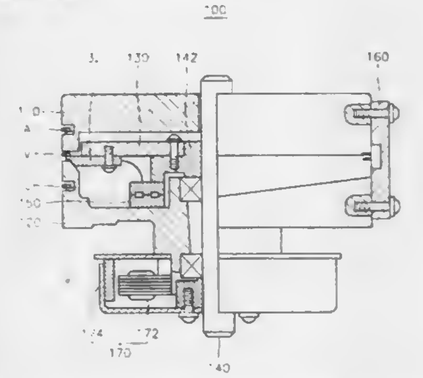
Sung-Soo Hwang, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

Filed Mar. 28, 1997, Ser. No. 825,372

Claims priority, application Rep. of Korea, Mar. 28, 1996, 96-8778

Int. Cl.⁶ G11B *5/52*

U.S. Cl. 360—107 **2 Claims**



1. A head drum assembly of a video cassette recorder, said head drum assembly comprising:

an audio head for recording and reproducing an audio signal on/from a magnetic tape;

a control head for recording and reproducing a control signal on/from the magnetic tape;

a plurality of video heads for recording and reproducing a video signal on/from said magnetic tape;

a stationary drum having said audio head at an outer periphery thereof, with a predetermined angle of inclination;

a fixed drum having said control head at an outer periphery thereof, with a predetermined angle of inclination;

a bracket for connecting said stationary drum with said fixed drum;

a rotary drum having said plurality of video heads at an outer periphery thereof, positioned between said stationary drum and said fixed drum, and fixed to a rotary shaft for a rotation thereof;

a transformer for electrically connecting said plurality of video heads, and installed between said rotary drum and said fixed drum; and

a motor for rotating said rotary shaft.

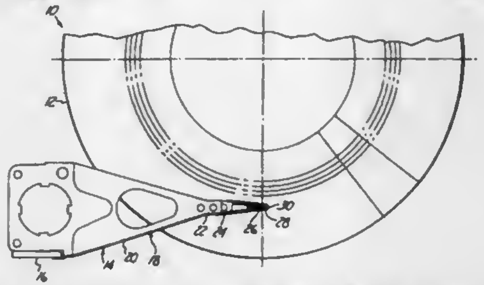
5,748,412
METHOD AND APPARATUS FOR PROTECTING MAGNETORESISTIVE SENSOR ELEMENT FROM ELECTROSTATIC DISCHARGE

Edward S. Murdock, Edina; John C. Heitke, Burnsville, and Kevin J. Schulz, Apple Valley, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 20, 1995, Ser. No. 580,059

Int. Cl.⁶ G11B *5/127*

U.S. Cl. 360—113 **16 Claims**



1. In a magnetoresistive head assembly having a slider, a magnetoresistive sensor element on the slider for detecting data on a disc adjacent the slider, the magnetoresistive sensor element having an operating voltage within a design voltage range, a detection circuitry, and first and second electrical conductors for electrically connecting the magnetoresistive sensor element to the detection circuitry to form an electrical circuit between the magnetoresistive element and the detection circuitry, the first and second electrical conductors providing signals to the detection circuitry representing data detected by the magnetoresistive sensor element, at least a portion of the first and second electrical conductors being located on the slider, an improvement comprising:

a device mounted or fabricated directly on the slider electrically coupled between the first and second electrical conductors, the device exhibiting a non-linear voltage-current relationship to provide an electrical resistance which varies in relationship to an electrical voltage between the first and second electrical conductors the electrical resistance of the device being high to impede a current between the first and second conductors on the slider when the voltage between the first and second electrical conductors on the slider is within the design voltage range and being low to conduct a current between the first and second conductors on the slider when the voltage between the first and second electrical conductors is outside the design voltage range.

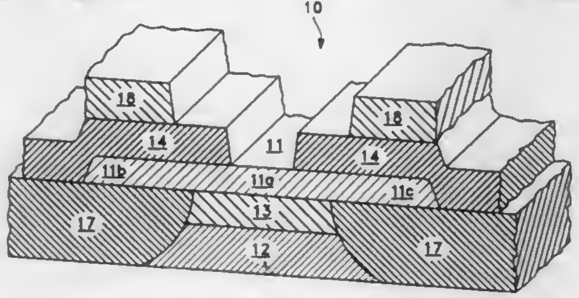
5,748,413
MAGNETORESISTIVE REAS TRANSDUCER WITH EXCHANGE BIASING OF MAGNETORESISTIVE SENSOR AND SOFT ADJACENT LAYER

Marcos M. Lederman, and Samuel W. Yuan, both of San Francisco, Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Jun. 4, 1996, Ser. No. 657,999

Int. Cl.⁶ G11B *5/30*

U.S. Cl. 360—113 **6 Claims**



1. A magnetoresistive transducer assembly comprising:

a layer of magnetoresistive material having a center active region and end regions spaced from said active region; said end regions having top surfaces, bottom surfaces and end surfaces;

a layer of antiferromagnetic material in contact with said top surfaces and said bottom surfaces of said layer of magnetoresistive material to magnetically pin said top surfaces and said bottom surfaces by magnetic exchange coupling;

a soft magnetic layer spaced from said magnetoresistive layer and having end regions; and

a layer of antiferromagnetic material in contact with said end regions of said soft magnetic layer to pin said end regions of said soft magnetic layer by magnetic exchange coupling.

5,748,414
MAGNETORESISTIVE ELEMENT ASSEMBLY WITH LONGITUDINAL BIAS

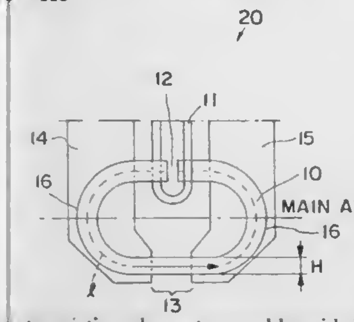
In Eung Kim, Seoul, and A. M. Choukh, Kyunggi-do, both of Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Kyonggi-do, Rep. of Korea

Continuation-in-part of Ser. No. 366,082, Dec. 29, 1994. This application Jul. 23, 1996, Ser. No. 685,084

Claims priority, application Rep. of Korea, Jun. 24, 1994, 94/14597

Int. Cl.⁶ G11B *5/39*

U.S. Cl. 360—113 **3 Claims**



1. A magnetoresistive element assembly with longitudinal bias, said assembly comprising:

a magnetoresistive element formed into an elongated ellipse-like shape, said magnetoresistive element having a sense region, a gap, and two end regions, said end regions separated from each other by said gap placed therebetween;

a bias coil to produce a longitudinal bias in said magnetoresistive element of a level sufficient to maintain said sense region in a single domain state, said bias coil disposed about the magnetoresistive element except the sense region; and

spaced conductor leads electrically connected to said magnetoresistive element within said sense region and separated from each other with said gap portion therebetween.

5,748,415
MAGNETORESISTIVE HEAD WITH A MAGNETORESISTIVE FILM SHAPED TO PROVIDE AN IMPROVED READ SENSITIVITY PROFILE

Jodie Ann Christner, and Earl Albert Cunningham, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 357,478, Dec. 16, 1994, abandoned. This application Oct. 29, 1996, Ser. No. 739,240

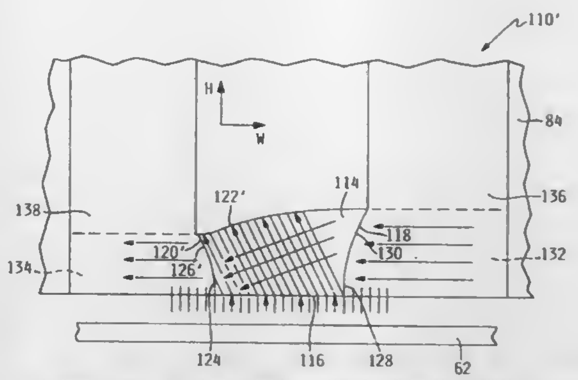
Int. Cl.⁶ G11B *5/39;5/127*

U.S. Cl. 360—113 **14 Claims**

1. A magnetoresistive head, comprising:

an insulation layer:

a magnetoresistive film provided over said insulation layer, said magnetoresistive film having a bottom edge to be positioned adjacent to a magnetic medium, and first side with a first outside edge, and a second side with a second outside edge, said first outside edge having a lower portion substantially perpendicular to said bottom edge and an upper portion extending in a direction that forms an obtuse angle with said bottom edge so that said magnetoresistive film narrows toward said bottom edge, wherein said magnetoresistive film has a top edge opposite said bottom edge, and a height between said bottom and top edges measured in a direction perpendicular to said bottom edge narrowing from said second outside edge to said first outside edges



a first lead layer provided over said insulation layer and electrically connected to said magnetoresistive film at said first outside edge; and

a second lead layer provided over said insulation layer and electrically connected to said magnetoresistive film at said second outside edge.

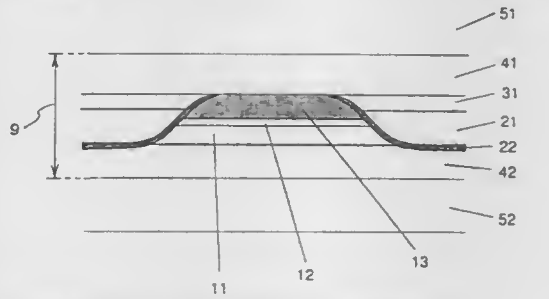
5,748,416
MAGNETORESISTIVE PLAYBACK HEAD

Masahiro Tobise, Saitama-ken; Chiharu Mitsumata; Hisayuki Miura, both of Tochigi-ken; Tetsurou Kawai, Saitama-ken, all of Japan, and Simon Liao, Santa Barbara, Calif., assignors to Hitachi Metals Ltd., Tokyo, Japan, and Applied Magnetics Corporation, Goleta, Calif.

Filed Mar. 19, 1997, Ser. No. 821,182

Int. Cl.⁶ G11B *5/39*

U.S. Cl. 360—113 **26 Claims**



1. A magnetoresistive playback head comprising:

a magnetoresistive film having a first thickness;

a shunt film on said magnetoresistive film, said shunt film having a second thickness;

a soft magnetic bias film on said shunt film, said shunt film in a sandwich relationship between said magnetoresistive film and said soft magnetic bias film, said soft magnetic bias film having a third thickness;

a stacked stripe comprising said magnetoresistive film, said shunt film, and said soft magnetic bias film, said stacked stripe having a transverse direction across said first, second, and third thicknesses, and a longitudinal direction substantially orthogonal to said transverse direction, said stacked stripe having a first end and a second end at said longitudinal direction;

a permanent magnet film;

an electrode film disposed on said permanent magnet film to form a bilayer stacked in said transverse direction;

said stacked stripe is disposed with said bilayer at each of said first and second ends;

an upper insulating layer disposed over said stacked stripe and said bilayer at each of said first and second ends;

OL
2 10
ISS
1
MY
5
998
MI

- a lower insulating layer disposed under said stacked stripe and said bilayer at each of said first and second ends;
- a playback track region is formed by said stacked stripe disposed between said bilayer at each of said first and second ends;
- said SAL film applies a transverse bias magnetic field and said permanent magnet film applies a longitudinal bias magnetic field to said playback track region;
- said permanent magnetic film has a coercive force squareness ratio of 0.6 or higher; and
- a composite magnetic field formed from said longitudinal and said transverse bias magnetic fields from said playback track region comprises a coercive force slanted at approximately 45 degrees.

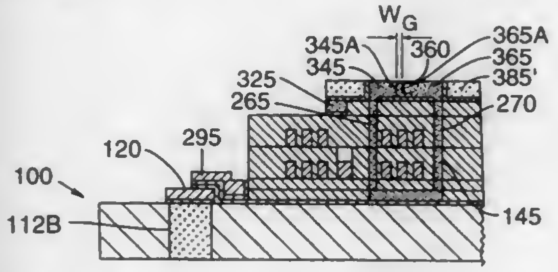
5,748,417
THIN FILM MAGNETIC HEAD INCLUDING LAYERED MAGNETIC SIDE POLES

Arun Malhotra, San Jose; Jane Ang, San Mateo; G. Robert Gray, Fremont, and James Watterston, Sunnyvale, all of Calif., assignors to AIWA Research and Development, Inc., Fremont, Calif.

Continuation of Ser. No. 297,186, Aug. 26, 1994, abandoned. This application May 1, 1996, Ser. No. 641,345

Int. Cl.^{6} G11B *5/147*

U.S. Cl. 360—126 **10 Claims**



1. A thin film magnetic head comprising:
- a substrate;
- a seed layer of electrically conductive material coupled to the substrate;
- a photoresist insulative layer coupled to the seed layer and patterned to enclose an open region;
- a lower magnetic layer plated onto the seed layer in the open region, the lower magnetic layer having first and second opposed ends;
- a plurality of first and second side pole magnetic layers built-up by plating magnetic layer upon magnetic layer at the first and second opposed ends of the lower magnetic layer to form respective first and second magnetic side poles extending from the lower magnetic layer to a magnetic side pole upper end, the seed layer being a common seed for plating the plurality of first and second side pole magnetic layers;
- first and second coil layers, each including a plurality of coil elements formed around one of the first and second magnetic side poles, the first and second coil layers being disposed respectively at a lower level and a higher level within a range of levels extending from the lower magnetic layer to the magnetic side pole upper end;
- first and second upper magnetic pole elements respectively coupled to the upper ends of the first and second magnetic side poles and mutually extending toward an interior gap area, the first upper magnetic pole element and the first magnetic side pole being coupled in an integral form and the second upper magnetic pole element and the second magnetic side pole being coupled in an integral form;
- a gap region of nonmagnetic material coupled between the first and second upper magnetic pole elements;
- an insulative pedestal layer formed at a level of an uppermost built-up layer of the first and second side pole magnetic layers; and
- a frame of magnetic material patterned around the insulative pedestal layer.

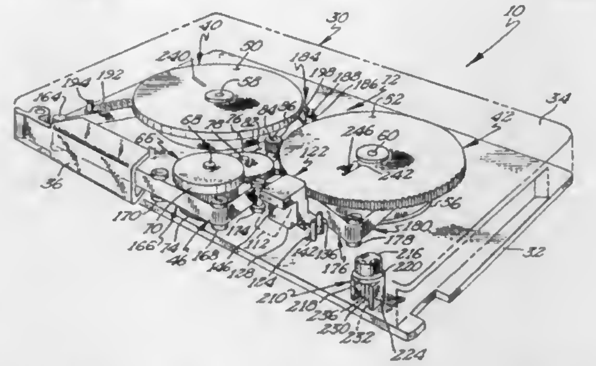
5,748,418
MAGNETIC TAPE RECORDING HEAD CLEANING APPARATUS

Edward E. Griffin, Edina; Jeffrey S. Thiessen, Plymouth; Hector F. Gonzalez, Rochester; Edwin W. Hazzard, Rochester, and Stephen A. Nunn, Rochester, all of Minn., assignors to Geneva Group of Companies, Inc., Minneapolis, Minn.

Continuation of Ser. No. 66,570, May 25, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,809

Int. Cl.^{6} G11B *5/41*

U.S. Cl. 360—128 **7 Claims**



1. Apparatus for removal of contaminants from a read/write head of a tape drive of a computer data backup system, wherein the tape drive includes BOT/EOT indicator means comprising a pair of light emitters and a pair of light sensors, the tape drive and said apparatus cooperating to provide a coupled light path from each light emitter to its respective sensor, said apparatus comprising:
- a housing;
- a supply of cleaning tape;
- a supply reel for holding said supply of cleaning tapes;
- a take-up reel for holding used cleaning tape;
- means for providing a predetermined cleaning tape pathway between said supply and take-up reels;
- means for receiving rotational driving power from the power source for the tape drive of the computer data backup system and for transmitting the received driving power to said take-up reel so as to pull said cleaning tape from said supply reel past the head without any driving contact with the cleaning tape, thereby cleaning the head and winding the used cleaning tape onto said take-up reel, wherein said means for receiving and transmitting driving power comprises a gear reduction system for reducing the speed of the cleaning tape past the head to a pre-selected speed; and
- wherein said housing completely encloses said supply of cleaning tape, supply reel, take-up reel, path means, predetermined tape pathway and said receiving and transmitting means;
- a reflector, said reflector being positioned within said housing so as to couple the light provided by each of the light emitters with its respective light sensor;
- a shutter movable from a rest position when said apparatus is not positioned to clean the head to an operational position when said apparatus is positioned to clean the head, said shutter blocking the light path of one of said light emitters to its respective sensor when in said operational position;
- means for moving said shutter between said rest and said operational positions; and
- wherein said shutter moving means comprises:
  - means for biasing said shutter in said rest position; and
  - said cleaning tape, said cleaning tape bearing against said shutter in opposition to said biasing means such that when said cleaning tape exerts a force in opposition to the force exerted by said biasing means sufficient to overcome the biasing means force and move said shutter from said rest position to said operational position.

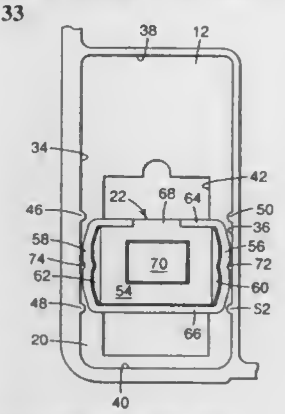
5,748,419
WRITE PROTECT MECHANISM WITH SPRING ELEMENT FOR DATA STORAGE DISKETTE AND FABRICATION METHOD

Lee M. Langseth, Wahpeton, N. Dak.; James J. Wulfing, Stillwater; David L. Hubbling, Breckenridge, both of Minn., and Jerome V. Gagnier, Wahpeton, N. Dak., assignors to Imation Corp., Oakdale, Minn.

Filed Aug. 17, 1995, Ser. No. 516,166

Int. Cl.^{6} G11B *23/03;15/04;19/04*

U.S. Cl. 360—133 **21 Claims**



19. A data storage diskette comprising:
- a diskette housing;
- a data storage medium contained in the diskette housing; and
- a write protect mechanism formed in the diskette housing, the write protect mechanism including:
  - a channel formed in the diskette housing, the channel including first and second side walls along a length thereof,
  - an indicator element movable along the length of the channel, the indicator element including a major portion and first and second peripheral portions, the first peripheral portion forming a first spring member having two ends, both ends being attached to the major portion, wherein the major portion and the first peripheral portion define a first aperture therebetween, and the second peripheral portion having two ends, both ends being attached to the major portion, wherein the major portion and the second peripheral portion define a second aperture therebetween;
- wherein the first ad second spring members are integrally molded with the indicator element, and further wherein the first spring member is biased against only the first side wall of the channel and the second spring member is biased against the second side wall of the channel.

5,748,420
ULTRA-HIGH CAPACITY REMOVABLE MEDIA CARTRIDGE CONFIGURED TO PREVENT INSERTION IN A CONVENTIONAL FLOPPY DISK DRIVE

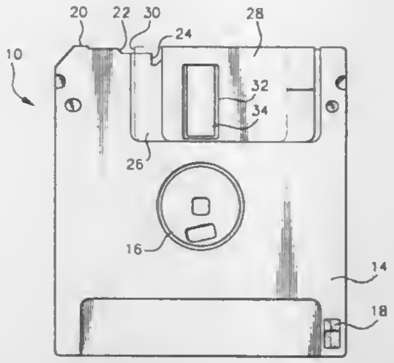
Lawrence K. C. Ko, Fremont, and John F. Kevill, La Honda, both of Calif., assignors to Swan Instruments, Inc., Santa Clara, Calif.

Filed Nov. 19, 1996, Ser. No. 752,476

Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—133 **22 Claims**

1. A removable media diskette cartridge of the type adapted to contain a flexible rotatable recording disk, the diskette cartridge configured for use with a floppy disk drive of a first type, the diskette cartridge further configured to prevent its use with a floppy disk drive of a second type, the diskette cartridge comprising:
- a first casing half comprising an outside surface, an inside surface and a front edge, the front edge of the first casing half including a first, flat portion and a second, recessed portion defining an indentation, the indentation for receiving an opening edge of a shutter opener, the shutter opener sliding along the indentation as the diskette cartridge is inserted into a floppy disk drive;



- a second casing half having an outside surface, an inside surface and a substantially flat front edge; and
- a shutter, movable on the diskette cartridge, the shutter having two sides and a front edge and formed to define a substantially rectilinear C-shaped cross-section, the shutter mounted such that one of the sides is adjacent the outside surface of the first casing half, the other side being adjacent the inside surface of the second casing half, the shutter positioned such that the flat front edge of the second casing half extends beyond the shutter front edge the shutter further positioned such that the shutter front edge extends outwardly from the second, recessed portion of the first casing half.

5,748,421
MAGNETIC RECORDING DISK

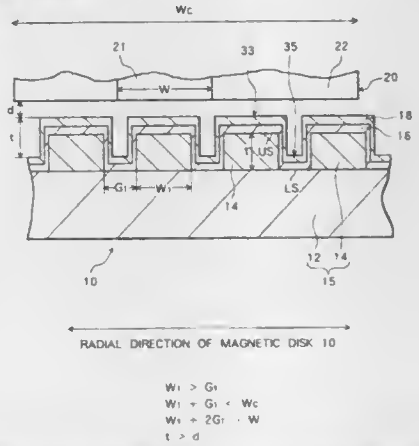
Kazunari Taki, and Riki Matsuda, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Continuation of Ser. No. 210,311, Mar. 17, 1994, abandoned. This application Oct. 22, 1996, Ser. No. 731,901

Claims priority, application Japan, Mar. 19, 1993, 5-060541; Mar. 19, 1993, 5-060542; Mar. 19, 1993, 5-060543; Mar. 19, 1993, 5-060544

Int. Cl.^{6} G11B *5/82*

U.S. Cl. 360—135 **8 Claims**



1. A magnetic recording disk, for recording information, said disk having an upper disk surface to confront a magnetic head and comprising:
- a circular-shaped non-magnetic glass substrate having a smooth upper substrate surface and a non-magnetic thin film provided on top of said smooth upper substrate surface, said non-magnetic glass substrate being provided with a plurality of tracks on said top of said smooth upper substrate surface, said plurality of tracks extending upwardly and in a circumferential direction, each track of the plurality of tracks having a band-shaped contour having an upper flat track surface and having a width in a radial direction perpendicular to the circumferential direction, the plurality of tracks being formed from the non-magnetic thin film and being juxtaposed in the

radial direction so that each pair of adjacent tracks is separated by an inter-track gap in the radial direction wherein said inter-track gap is formed by removal of the non-magnetic thin film so that the smooth upper substrate surface of the non-magnetic glass substrate is exposed at said inter-track gap, the width of each track, measured in the radial direction, being greater than the width of the associated inter-track gap;

a magnetic layer coating exposed surfaces of said tracks formed of said non-magnetic thin film and also coating exposed surfaces of said non-magnetic glass substrate; and

a protective layer coating said magnetic layer.

5,748,422

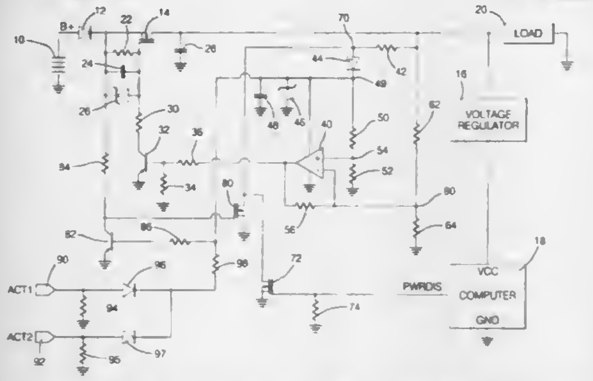
POWER LATCH CIRCUIT WITH OVERVOLTAGE PROTECTION

Bruce Allen Heaston, West Milton, and Robert John Disser, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1996, Ser. No. 724,989

Int. Cl.^{6} H02H *7/00*

U.S. Cl. 361—18 **3 Claims**



1. A power latch circuit for providing a regulated DC voltage from a DC electric power source to a computer, the power latch circuit comprising, in combination·

a series transistor and a voltage regulating circuit connected in series between the DC electric power source and the computer with the series transistor having an output terminal connected to the voltage regulating circuit to supply electric power therethrough and thus provide the regulated voltage to the computer when the series transistor is activated;

an activate input circuit activated by an activate input signal;

a feedback latch circuit activated by an output voltage of the series transistor;

an activate control circuit comprising an activating transistor connected to control the series transistor and responsive to activation of either of the activate input circuit and the feedback latch circuit to activate the activating transistor and thus the series transistor;

a deactivate transistor activatable by the computer in the absence of the activate input signal to deactivate the feedback latch circuit and thus also the activating transistor, the series transistor and the computer;

a hold-off transistor connected in parallel with the deactivate transistor, the hold-off transistor being separately activatable to prevent activation of the activating transistor in the absence of the activate input;

a hold-off deactivate circuit comprising an additional transistor not coupled to the activating transistor, the additional transistor being responsive to activation of either of the activate input circuit and the feedback latch circuit to maintain the hold-off transistor deactivated;

means for defining a fixed limit voltage; and

the activate control circuit comprising means for activating the activating transistor and series transistor in a switching mode when the output voltage of the series transistor does not exceed the fixed limit voltage and in a voltage regulating mode when the output voltage of the series transistor exceeds the fixed limit voltage, whereby an increase in the output voltage of the series transistor beyond the fixed limit voltage is reduced.

5,748,423

SYSTEM FOR LIMITING SHORT CIRCUIT CURRENT IN 3-PHASE ELECTRIC POWER NETWORKS

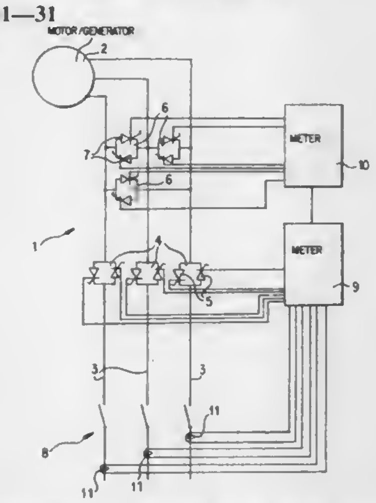
Norbert Hennchen, Bremen, Germany, assignor to Wind Strom Frisia GmbH, Minden, Germany

Filed Jul. 17, 1996, Ser. No. 682,257

Claims priority, application Germany, Jul. 17, 1995, 195 26 062.7

Int. Cl.^{6} H02H *7/08*

U.S. Cl. 361—31 **4 Claims**



3. An arrangement for limiting short-circuit current in a three-phase power line connected to at least one electromotive component which is one of a motor and a generator, said arrangement comprising:

at least one pair of series switches connected in each respective phase of the three-phase power line, said switches being formed by semiconductor switching elements connected in anti-parallel;

short-circuiting switches connected between respective pairs of phases of said three-phase power line at a location between the series switches and the electromotive component, said short-circuiting switches each comprising at least one pair of anti-parallel semiconductor switching elements;

a device for measuring at least one of a phase current and a current rise rate in each phase of said three-phase power line and, when a predetermined threshold is exceeded, causing said series switches to be electronically opened; and

a device for measuring differences between phase currents of said three-phase power line and, when a predetermined difference indicative of a short circuit is detected, actuating said short-circuiting switches such that current of said electromotive component is shunted away from a shorted phase and is prevented from flowing into the power lines.

5,748,424

ELECTRICAL PLUG RECEPTACLE

Jerry Hung, Taipei Hsien, Taiwan, assignor to Primax Electronics Ltd., Taipei Hsien, Taiwan

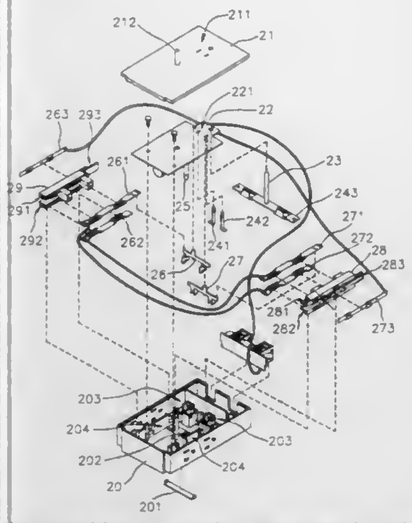
Filed Sep. 26, 1995, Ser. No. 534,119

Int. Cl.^{6} H01H *9/00*

U.S. Cl. 361—56 **18 Claims**

1. An electrical plug receptacle comprising:

a housing including a cover having a primary wall, and a perimeter wall each of which includes a plurality of prong-receiving apertures, and a plate opposite to said primary wall, having a pair of prong-projecting through holes and engaging with said cover so as to define an inner space of said housing;



a conducting attaching set passing through said pair of prong-projecting through holes from inside of said housing and adapted for attaching said electrical plug receptacle to a wall receptacle;

a retaining set encased in said housing, electrically connected to said conducting attaching set and corresponding to each said plurality of prong-receiving apertures for retaining therein a plug of an electrical appliance;

a circuit formed upon a printed circuit board (PCB), encased in said housing and electrically connected to said conducting attaching set for protecting said electrical appliance when there is a surge voltage, and wherein said conducting attaching set includes a conducting strip and a pillar respectively secured to said PCB; and

said retaining set including first and second conducting holding strips secured to said PCB and respectively corresponding to said plurality of prong-receiving apertures of said primary wall;

a holding pillar connected to said pillar of said attaching set and corresponding to said plurality of prong-receiving apertures of said primary wall;

a supporting piece provided with a plurality of flutes, a groove and a plurality of through holes respectively corresponding to said plurality of prong-receiving apertures of said perimeter wall;

third and fourth conducting holding strips respectively held in said plurality of flutes and electrically connected to said first and said second conducting holding strips; and a second holding pillar held in said groove of said supporting piece and electrically connected to said circuit formed upon said PCB, whereby said conducting attaching set, said retaining set and said circuit formed upon said PCB form an electrical path.

5,748,425

ELECTROSTATIC DISCHARGE CIRCUIT LAYOUT

Henrik Gutsch; Horst Häfner, both of Heilbronn; Hermann Hammel, Rot am See; Friedemann Schmidt, Stuttgart, and Jürgen Schnabel, Leingarten, all of Germany, assignors to Temic Telefunken microelectronic GmbH, Heilbronn, Germany

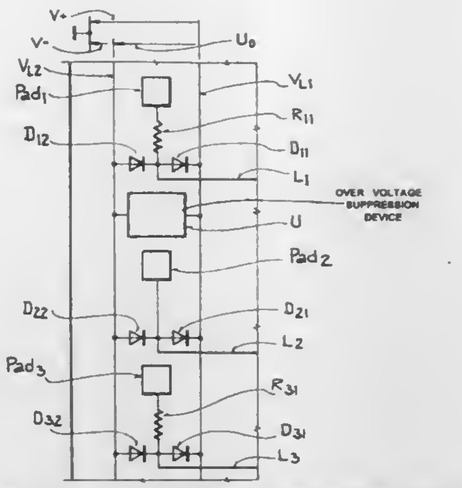
Filed Oct. 16, 1996, Ser. No. 732,994

Claims priority, application Germany, Oct. 20, 1995, 195 39 079.2

Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—56 **7 Claims**

1. A circuit layout comprising two supply lines (VL_1, VL_2), between which a supply voltage (U_0) is applied, as well as at least one circuit connection (Pad_1 . . . Pad_3), which is connected to the first and second supply lines (VL_1, VL_2), respectively, via a reverse biased diode (D_{11} . . . D_{32}) in order to protect the circuit layout against any damage caused by electrostatic discharges, wherein the circuit layout features at least one overvoltage suppression device (U) connecting the two supply lines (VL_1, VL_2), and wherein the overvoltage suppression device (U) is switched into a low impedance state in response to a steep rate increase in the supply voltage (U_0) applied between the two supply lines (VL_1, VL_2), thus counteracting any increase in the supply voltage (U_0).



5,748,426

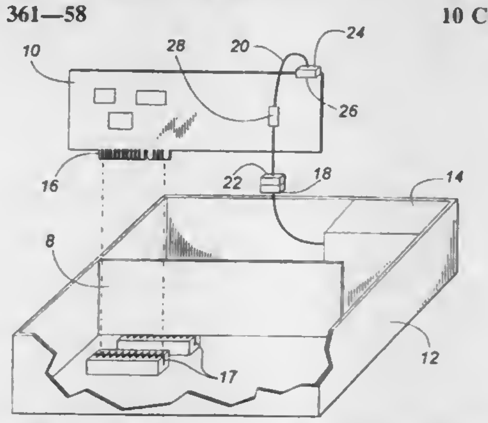
METHOD FOR INTERFACING TO A POWERED BUS

John Bedingfield, Largo, and Michael A. Hicks, St. Petersburg, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Apr. 29, 1996, Ser. No. 639,541

Int. Cl.^{6} H02H *9/00; 1/04*

U.S. Cl. 361—58 **10 Claims**



1. A method for interfacing a circuit card to a powered electrical bus, comprising the steps of:

applying a current to the circuit card using a first power conductor and a first return conductor that interface between a power source and a first electrical interface on the circuit card, wherein the step of applying the current disables a driver circuit, located on the circuit card, that electrically interfaces to the powered electrical bus;

interfacing the circuit card to the powered electrical bus, comprising a second power conductor and a second return conductor, by mating a second electrical interface on the circuit card to the powered electrical bus; and

enabling the driver circuit by removing the first power conductor and the first return conductor from the circuit card, after the second electrical interface is mated to the powered electrical bus.

5,748,427

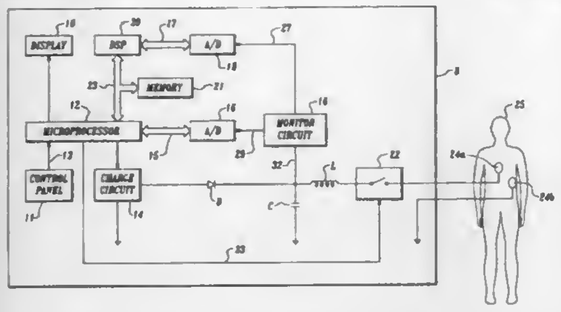
METHOD AND SYSTEM FOR DETECTING RELAY FAILURE

Daniel Yerkovich, Snohomish, and Stephen T. Vincent, Redmond, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Dec. 19, 1996, Ser. No. 770,629

Int. Cl.^{6} H02H *3/24*

U.S. Cl. 361—92 **20 Claims**



1. A method of detecting the failure of a relay coupled between an energy storage capacitor and a load following the discharge of a charge stored in the energy storage capacitor into the load by closing the relay, the method comprising the steps of:

(a) directing the relay to open after the discharge of the energy storage capacitor;
(b) delaying a period after directing the relay to open so that time is allowed for a rebound voltage to begin developing on the energy storage capacitor;
(c) measuring a voltage across the energy storage capacitor; and
(d) comparing the measured voltage with a threshold voltage, the relay having failed in a closed position if the measured voltage does not exceed the threshold voltage.

5,748,428

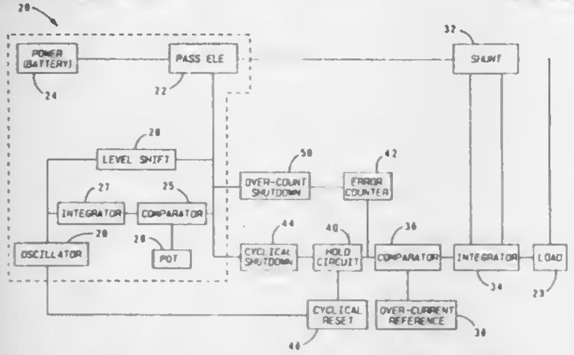
PULSE WIDTH MODULATION AND PROTECTION CIRCUIT

Jeffrey T. Kelley, Plymouth, and Bruce Wrenbeck, Dearborn, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jul. 28, 1995, Ser. No. 508,715

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—94 **20 Claims**



13. A method for protecting a pulse width modulator circuit from a current overload, said pulse width modulator circuit including a pass element alternately connecting and disconnecting a power supply to a load, said method including the steps of:

1) generating a cyclical input to said pass element to alternately connect and disconnect said power supply to said load, said pass element thereby generating a cyclical output having a duty portion and an off portion;
2) sensing current through said pass element during a duty portion;
3) comparing said current with a predetermined value;
4) generating a fault signal based upon said comparison of said current with said predetermined value;
5) abbreviating a plurality of consecutive duty portions of said pass element based upon a plurality of fault signals generated in said plurality of consecutive duty portions;
6) counting the number of fault signals;
7) comparing said number of fault signals with a predetermined number of faults;
8) switching off said pass element for a predetermined period of time after said plurality of abbreviated duty cycles based upon said comparison of said number of fault signals and said predetermined number; and
9) switching on said pass element after said predetermined period of time.

5,748,429

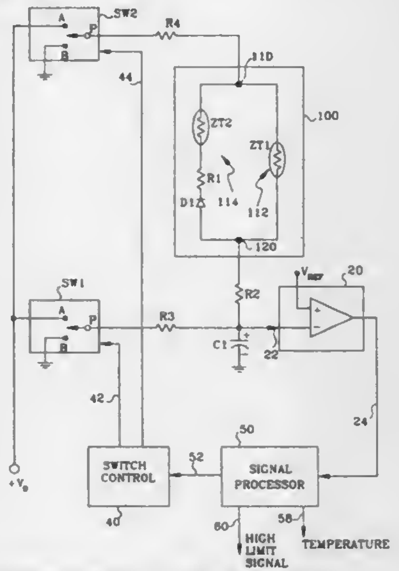
SELF CHECKING TEMPERATURE SENSING CIRCUIT

Scott M. Peterson, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 9, 1996, Ser. No. 707,878

Int. Cl.^{6} H02H *5/04*

U.S. Cl. 361—106 **11 Claims**



1. A temperature sensing circuit comprising:

first and second electrical circuit terminating means;

a first temperature sensing means electrically connected in a first series circuit between said first and second electrical circuit terminating means, said first temperature sensing means having an electrical impedance which increases with increasing temperature in accordance with a positive temperature coefficient characteristic;

a second series circuit electrically connected in parallel with said first series circuit, said second series circuit including an electrical series combination of,

a first resistor,

a second temperature sensing means having an electrical impedance which decreases with increasing temperature in accordance with a negative temperature coefficient characteristic, and

a current rectifying means, said current-rectifying means operative for permitting current to pass through said electrical series combination of said second series circuit in one direction, and to substantially block any current from passing therethrough in the opposite direction; and

wherein said electrical impedance of at least said first and second temperature sensing means and said first resistor are selected to have nominal values at a selected temperature such that the effective impedance of the parallel combination of said first and second series circuits characteristically exhibits a relatively low temperature coefficient of impedance in comparison to either of said first and second temperature sensing means alone.

5,748,430

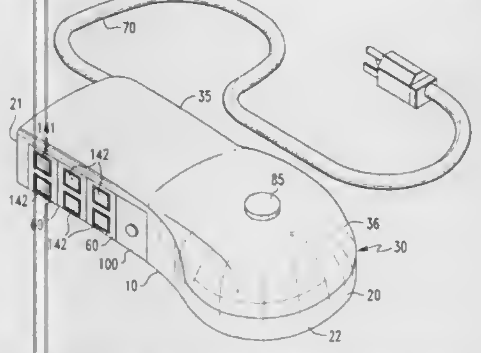
INTEGRATED HYBRID SURGE PROTECTOR ARCHITECTURE CONFIGURED TO ACCOMODATE MULTIPLE REPLACEABLE COMMUNICATION SIGNAL SURGE PROTECTION MODULES IN COMMON HOUSING WITH AC VOLTAGE RECEPTACLE TERMINAL STRIP

Anthony Owen Bird, Indian Harbour Beach, Fla., assignor to Atlantic Scientific Corporation, West Melbourne, Fla.

Filed Oct. 31, 1996, Ser. No. 741,128

Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—119 **20 Claims**



1. An electrical surge protection apparatus comprising:

a housing containing an AC voltage surge protection circuit having a reference ground conductor;

an AC voltage supply link coupled to said AC voltage surge protection circuit and having a connector configured to be coupled to a source of AC voltage external of said housing, and including a ground lead coupled to said reference ground conductor of said AC voltage surge protection circuit;

at least one AC voltage receptacle installed in a first portion of said housing, and being connected to said AC voltage surge protection circuit;

at least one communication signal surge protection circuit module installation slot in a second portion of said housing, said at least one communication signal surge protection module circuit slot providing access to said reference ground conductor and being configured to capture therein at least one removable communication signal surge protection circuit module; and

at least one communication signal surge protection circuit module installed in said at least one communication signal surge protection module slot, and containing an externally accessible communication signal input port, an externally accessible communication signal output port, and a communication signal surge protection circuit that is coupled between said communication signal input and output ports, and electrically connected to said reference ground conductor.

5,748,431

SOLENOID DRIVER CIRCUIT

Trent Lynn Goodnight, Waterloo, and Vijay Manilal Dharia, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

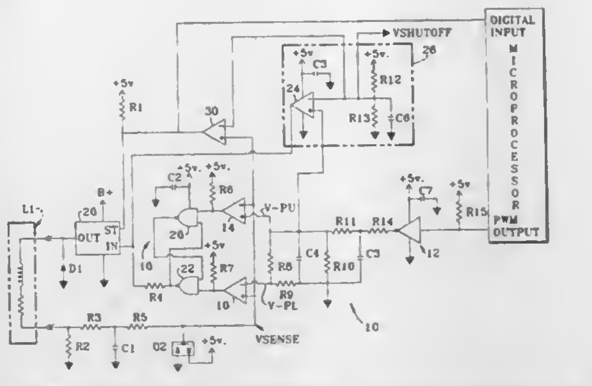
Filed Oct. 16, 1996, Ser. No. 731,472

Int. Cl.^{6} H01H *9/00*

U.S. Cl. 361—154 **7 Claims**

1. An electrical circuit for applying an oscillatory electrical current to a coil of a solenoid in order to cause the solenoid to move in response to an input signal, characterized by:

the circuit supplying the coil with a current which has variable upper and lower peak current values and wherein the lower peak current value is substantially a fixed percentage of the upper peak current value.



5,748,432

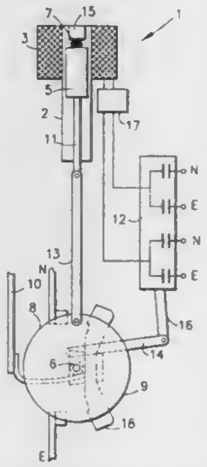
METHOD AND APPARATUS FOR PREVENTING COIL INDUCED DELAY IN A AUTOMATIC TRANSFER SWITCH

Walter Przywozny, Whippany, and Daniel Scheffer, Boonton, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Oct. 9, 1996, Ser. No. 727,245

Int. Cl.^{6} H01H *47/00*

U.S. Cl. 361—159 **9 Claims**



1. Apparatus for preventing retardation of the switching speed of an automatic transfer switch for selectively disconnecting a load from a first source of power and connecting the load to a second source of power, said automatic transfer switch comprising

a set of first source contacts connectable to said first source of power,

a set of second source contacts connectable to said second source of power,

an armature engageable with said set of first source contacts and said set of second source contacts and rotatable from a first position at which said armature closes said first source contacts and opens said second source contacts to connect the load to the first source of power and disconnect the load from the second source of power, to a second position at which said armature closes said second source contacts to connect the load to the second source of power and opens said first source contacts to disconnect the load from the first source of power, said armature traversing a top dead center position intermediate said first position and said second position, and

solenoid means having a pole piece, a coil surrounding said pole piece, and a plunger connected to the armature, said plunger being reciprocable for movement from a rest position distal from said pole piece with said armature at said first position, to an energized position proximate said pole piece with said armature at said top dead center position in response to the application of voltage to said coil for commencing movement

of said armature from said first position toward said second position, said plunger moving from said energized position back to said rest position as said armature rotates past said top dead center position to said second position,
coil voltage switch means responsive to the position of said armature for interrupting the application of power to said coil when said armature reaches a third position proximate said top dead center position,
coil current dissipation means, and
coil current shunt means operatively connected to said armature for shunting residual current caused by the collapsing field in said coil to said current dissipation means in response to said armature reaching said third position, whereby the momentum of the armature moves to said second position with movement of said plunger from said energized position back to said rest position free of the opposing force of the collapsing field.

5,748,433

METHOD OF ACCURATELY CONTROLLING THE ARMATURE MOTION OF AN ELECTROMAGNETIC ACTUATOR

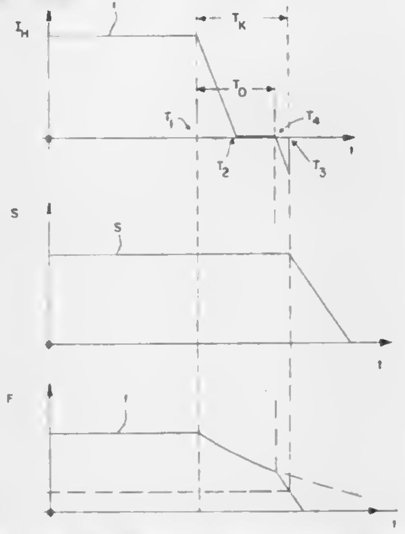
Ekkehard Schrey, Aachen; Lutz Kather, Würselen, and Frank Van Der Staay, Aachen, all of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany

Filed Jul. 22, 1996, Ser. No. 683,970

Claims priority, application Germany, Jul. 21, 1995, 195 26 681.1

Int. Cl.^{6} F01L *9/02*

U.S. Cl. 361—210 **1 Claim**



1. A method of electromagnetically controlling a motion of an engine cylinder valve, including the steps of
(a) providing an armature;
(b) directly attaching the armature to the engine cylinder valve;
(c) providing a resetting spring arrangement to act on the armature;
(d) providing two electromagnets between which the armature is movable against a resetting force of the resetting spring arrangement;
(e) passing an electric current through the solenoid of one of the electromagnets for holding the armature, during current flow, at said one electromagnet against the resetting force;
(f) interrupting the current flow through the solenoid of said one electromagnet at a desired moment for releasing the armature from said one electromagnet;
(g) at the end of a predetermined period which runs from said desired moment and during which the solenoid of said one electromagnet is currentless, impressing a current pulse of reverse polarity on the solenoid of said one electromagnet for launching the armature from said one electromagnet; and
(h) transferring forces applied by the resetting spring arrangement and the electromagnets to the armature directly to the engine valve from the armature.

5,748,434

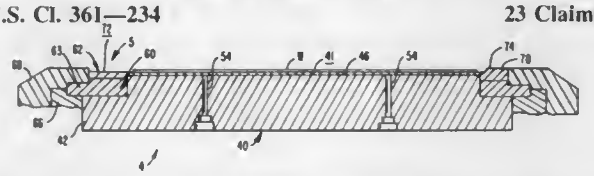
SHIELD FOR AN ELECTROSTATIC CHUCK

Kent Rossman, Sunnyvale; Brian Lue, Mountain View, and Fred C. Redeker, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 14, 1996, Ser. No. 663,886

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **23 Claims**



1. A wafer processing apparatus comprising:
an electrically insulating element having a substantially planar surface for receiving a wafer;
an electrically conductive element adjacent to a surface of the insulating element opposite the substantially planar surface;
a first shield member at least partially circumscribing the electrically conductive element; and
a second, separate shield member supported over the first shield member and positioned to at least partially circumscribe the electrically insulating element;
wherein the second shield member has a substantially smaller thermal mass than the first shield member.

5,748,435

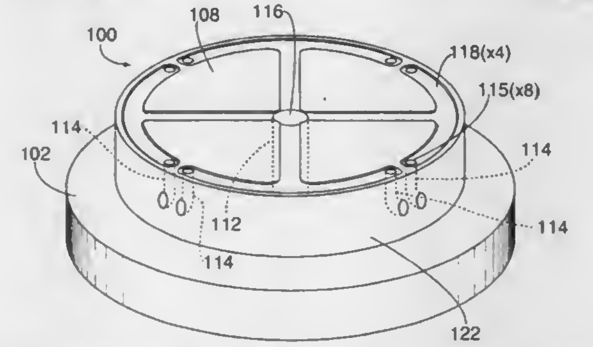
APPARATUS FOR CONTROLLING BACKSIDE GAS PRESSURE BENEATH A SEMICONDUCTOR WAFER

Vijay Parkhe, Sunnyvale, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 30, 1996, Ser. No. 774,664

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **14 Claims**



1. Apparatus for controlling backside gas pressure for a gas flowing between a wafer and a wafer support surface of a wafer support in a semiconductor wafer processing chamber comprising:
a gas inlet port extending through the wafer support for supplying gas to the wafer support surface; and
a plurality of exhaust ports, extending from the support surface through the wafer support, for exhausting the gas from the support surface into the chamber where the plurality of exhaust ports maintain a uniform backside gas pressure between the wafer and the wafer support surface.

5,748,436

CERAMIC ELECTROSTATIC CHUCK AND METHOD

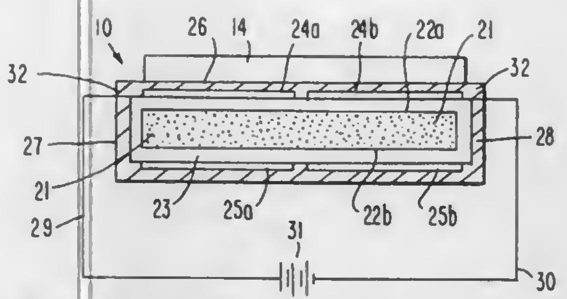
Junich Honma, Tokyo; Kotaro Mino, Himeji; Hisayuki Miyata, Ibo-gun, and Haruhide Inoue, Hiimeji, all of Japan, assignors to Advanced Ceramics Corporation, Lakewood, Ohio

Continuation-in-part of Ser. No. 725,130, Oct. 2, 1996. This application Jan. 21, 1997, Ser. No. 785,082

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **10 Claims**

1. An electrostatic chuck for electrostatically clamping a working member such as a semiconductor wafer to the chuck comprising: at least one conductive electrode, an insulating layer for separating said conductive electrode from said working member with said insulating layer composed of a composition containing pyrolytic boron nitiride (PBN) and a carbon dopant in an amount above 0 wt % and less than about 3 wt % such that its electrical resistivity is smaller than 10^{14} Ω-cm; and a source of voltage for generating an electrostatic field adjacent said working member so as to clamp said working member to said chuck.



5,748,437

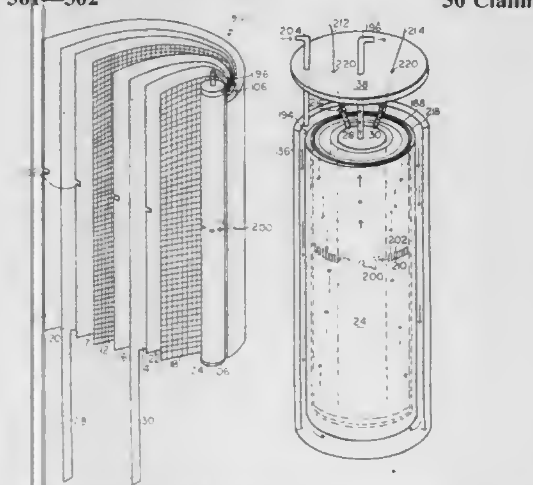
FLUID SEPARATION SYSTEM WITH FLOW-THROUGH CAPACITOR

Marc D. Andelman, 3 Fenimore Rd., Worcester, Mass. 01609

Division of Ser. No. 439,310, May 11, 1995, Pat. No. 5,547,581, which is a division of Ser. No. 194,609, Feb. 10, 1994, Pat. No. 5,415,768, which is a continuation-in-part of Ser. No. 27,699, Mar. 8, 1993, Pat. No. 5,360,540, which is a division of Ser. No. 819,828, Jan. 13, 1992, Pat. No. 5,200,068, which is a continuation-in-part of Ser. No. 792,902, Nov. 15, 1991, Pat. No. 5,192,432, which is a continuation of Ser. No. 512,970, Apr. 23, 1990, abandoned. This application May 28, 1996, Ser. No. 653,832

Int. Cl.^{6} H01G *4/35;* B01D *15/08*

U.S. Cl. 361—302 **50 Claims**



1. A fluid separator system for the electrical separation of a fluid containing separable components, which system comprises:
a) a housing having an inlet for the introduction of a fluid to be separated and an outlet for the withdrawal of separated components or reduced component fluid;
b) a flow-through electrical capacitor disposed in the housing, the capacitor comprising:
  i) a porous first high surface area electrically-conductive material layer to act as a stationary phase anode;
  ii) a porous second high surface area electrically-conductive material layer to act as a stationary phase cathode;
  iii) a spacer material layer between the anode and cathode to define a fluid flow channel to permit the fluid to contact the anode and cathode;
  iv) the first and second high surface area electrically-conductive material layers disposed to face each other externally on either side of the spacer material;
  v) a first electrically-conductive backing material layer;
  vi) a second electrically-conductive backing material layer;
  vii) the first and second electrically-conductive backing material layers disposed in electrical contact respectively with the first and second high surface area electrically-conductive material layers; and
  viii) electrical lead means from the anode and from the cathode; and
c) a direct current power source connected to the electrical lead means to supply electrical power to the anode and cathode to provide for the adsorption-desorption of selected components of the fluid by the first or second high surface area material layers.

5,748,438

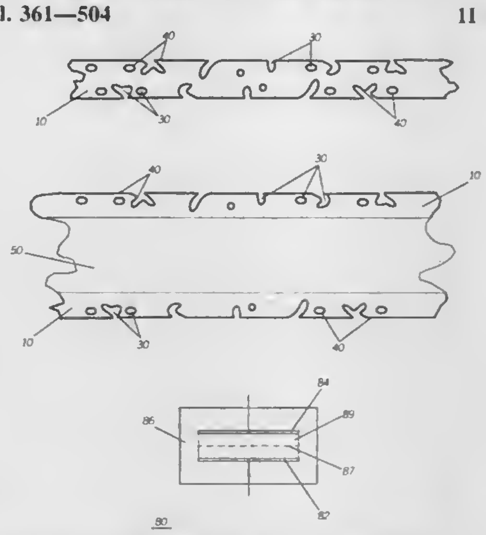
ELECTRICAL ENERGY STORAGE DEVICE HAVING A POROUS ORGANIC ELECTRODE

James L. Davis, Coral Springs; Melanie Williams, Deerfield Beach, and Robert W. Pennisi, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 131,225, Oct. 4, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 351,983

Int. Cl.^{6} H01G *9/02;9/00;* H01M *4/02*

U.S. Cl. 361—504 **11 Claims**



1. An electrical energy storage device, comprising:
two electrodes, each comprising a film of a carboxylic ion-exchange material dispersed in a microporous copolymer matrix, the film supported on a woven nylon substrate; and
a thin coating of one or more materials selected from the group consisting of aluminum, titanium, copper, tungsten, tantalum, nickel, rhodium, rhenium, and oxides or carbides thereof deposited in the microporous copolymer matrix;
said electrodes situated substantially parallel to each other, forming a gap between the electrodes; and
an electrolyte disposed in the gap between the electrodes.

5,748,439

CAPACITORS HAVING HIGH STRENGTH ELECTROLYTIC CAPACITOR SEPARATORS

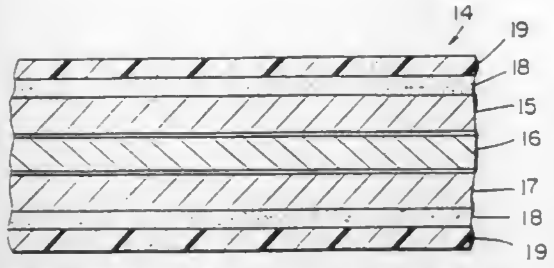
Douglas Robert MacFarlane, Elsternwick, and Alice Voelkel, Noble Park, both of Australia, assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Jun. 6, 1995, Ser. No. 467,041

Int. Cl.^{6} H01G *9/02;9/00*

U.S. Cl. 361—525 **24 Claims**

1. A low volume, high capacity storage device comprising an electrolytic capacitor having at least one anode layer, at least one cathode layer, and a spacer disposed therebetween, said spacer comprising mechanical separator means comprising kraft paper the thickness of which is no greater than about 35 μ and an elastomeric electrolyte comprising a crosslinking agent and at least one salt in



an ionically conductive carrier of high solvation power, wherein said separator means is impregnated with said electrolyte.

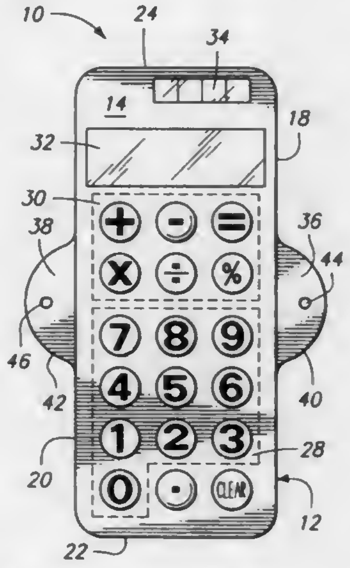
5,748,440
LARGE KEY CALCULATOR AND MOUNT

Lyndsy J. Frey, 24112 NE. 364 St., Yacolt, Wash. 98675

Filed Apr. 15, 1996, Ser. No. 632,740

Int. Cl.⁶ G06F *1/16;* **H05K** *7/14*

U.S. Cl. 361—683 **11 Claims**



1. A mountable calculator comprising:

a calculator body having a rectangular front wall and a back wall connected by opposing lateral sides and opposing longitudinal sides, said front wall positioned over and spaced from said back wall to provide a space therebetween;

a plurality of numeric keys;

a plurality of function keys, said numeric and function keys disposed on a front wall of body and sized greater then the fingertip size of an average user;

electronics means disposed in the space and operatively connected to said numeric and said function keys;

a display screen operatively connected to said electronics means for displaying numbers relating to the operation of the calculator;

means for connecting the back wall of the calculator body to a flat surface, wherein the means for connecting the back wall of the calculator body to a flat surface includes first and second wings integrally formed with said calculator body and extending from opposing sides said body, each of said wings having a screw receiving bore therethrough for screwing the wings to a surface.

5,748,441
NOTEPAD COMPUTER HAVING AN INTEGRATED VIDEO CAMERA

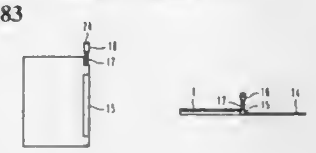
Axel Loritz, Tutzing, and Stefan Hillenmayer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

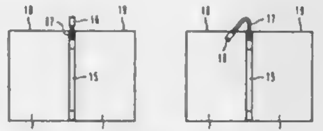
Filed Jun. 7, 1996, Ser. No. 660,428

Claims priority, application Germany, Jun. 22, 1995, 29510170.9 U

Int. Cl.⁶ G06F *1/16*

U.S. Cl. 361—683 **15 Claims**





1. A notepad computer comprising:

a housing having a flat surface arranged inside a flat frame;

a processor in said housing;

a flat input/output display screen arranged on the flat surface of the housing;

a cover constructed and arranged to cover the display screen when closed;

an articulated pivot axle connecting the cover to the housing along an edge of the housing, the axle having a cavity therein; and

a video camera retractably mounted in the cavity of the articulated pivot axle, for when removed from said cavity, generating video signals comprising an image of an object in a filed of view of said video camera for supply to said processor.

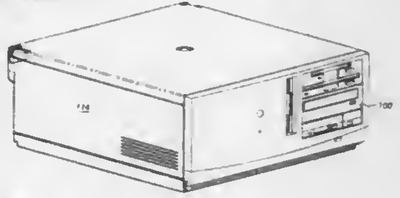
5,748,442
PERSONAL COMPUTER AND CHASSIS HAVING INTERCHANGEABLE TRIM PLATES FOR HORIZONTAL MODEL AND TOWER MODEL CONFIGURATION, ONE TRIM PLATE HAVING A LARGER PERIPHERY FOR USE AS A BASE PLATE

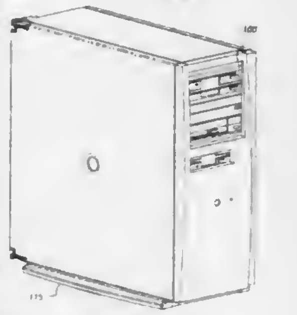
John Toor, Palo Alto, Calif., assignor to Palo Alto Design Group, Palo Alto, Calif.

Filed Nov. 8, 1995, Ser. No. 555,518

Int. Cl.⁶ G06F *1/16;* **H05K** *5/02*

U.S. Cl. 361—685 **9 Claims**





1. A computer system comprising:

a. a computer chassis;

b. a drive unit removably coupled to the computer chassis by entering a front of the computer chassis in either a first orientation relative to the computer chassis or a second orientation relative to the computer chassis wherein the second orientation is rotated 90 degrees relative to the first orientation;

c. a first trim plate removably attached to the computer chassis when the drive unit is in the first orientation wherein the first trim plate is a side trim plate; and

d. a second trim plate removably attached to the computer chassis when the drive unit is in the second orientation wherein the second trim plate is a base plate and further wherein a periphery of the second trim plate is larger than a periphery of the first trim plate.

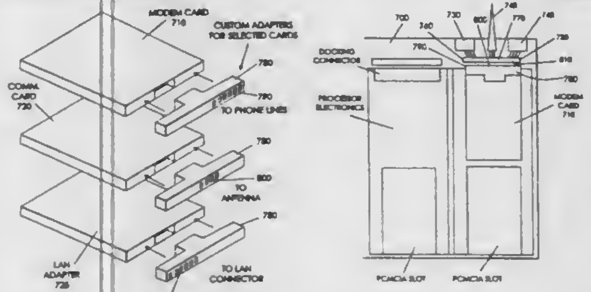
5,748,443
MATING ADAPTER BETWEEN A MODULE AND CHASSIS OF A COMPUTER PROCESSING SYSTEM

Ephraim Bemis Flint, Garrison; John Peter Karidis, Ossining; Gerard McVicker, Wappingers Falls, and William Edward Pence, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 368,188, Jan. 4, 1995, abandoned. This application Dec. 11, 1996, Ser. No. 763,654

Int. Cl.⁶ H05K *5/00;7/10;* **H01R** *25/00*

U.S. Cl. 361—686 **17 Claims**



1. In a computer having a chassis containing a processor, memory and a slot for housing a module coupled to said processor and memory via a bus, which slot has a connector for providing electrical contact between the module in the slot and an interface for a peripheral device, characterized by:

a) a plurality of slots in said chassis each for receiving any one of a plurality of different modules;

b) a multiplicity of different functioning modules each of which can be randomly installed in any empty one of the plurality of slots;

c) a number of peripheral device interfaces in the computer chassis each for coupling a peripheral device to one of the modules in the slots; and

d) an adapter interface means for coupling any of the peripheral device interfaces to the correct module when it is installed in any one of the slots whereby modules each with a different function can be randomly inserted into any slot and be connected to the proper peripheral device and none of the other peripheral devices.

5,748,444
PORTABLE ELECTRONIC APPARATUS HAVING FRAME WITH COOLING AIR FLOWING PASSAGE

Masami Honda, and Kazuya Shibasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1996, Ser. No. 616,075

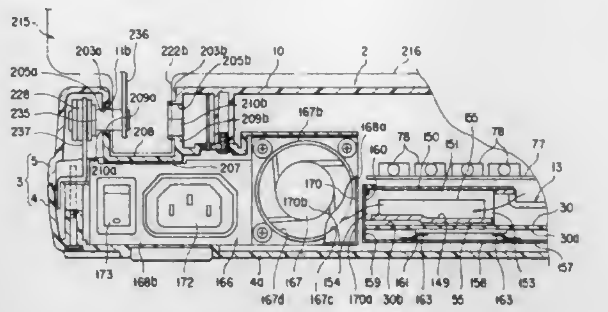
Claims priority, application Japan, Mar. 24, 1995, 7-066185

Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—687 **19 Claims**

1. A portable electronic apparatus comprising:

a box-shaped housing having a wall with exhaust ports formed therein;



a metal-made frame contained in said housing;

a circuit board supported by said frame, and contained in said housing;

a circuit element, mounted on said circuit board, and generating heat while operating; and

a fan, contained in said housing, for absorbing external cooling air into said housing,

wherein said frame has a heat receiving part at a position corresponding to said circuit element, wherein heat of said circuit element is transmitted to said heat receiving part, said heat receiving part having a cooling air passage to which air absorbed in said housing is guided, and cooling air passed through said cooling air passage is forcibly discharged to an outside of said housing from said exhaust ports through said fan.

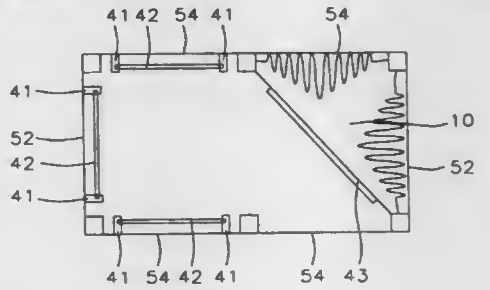
5,748,445
HEAT SINK AND CIRCUIT ENCLOSURE FOR HIGH POWER ELECTRONIC CIRCUITS

Michael John North; Christopher Hall; Thomas Mark Cyster, all of Taipei, and Chris C. Chen, Keelung, all of Taiwan, assignors to General Resources Corporation, Taipei, Taiwan

Filed Aug. 27, 1996, Ser. No. 697,702

Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—697 **15 Claims**



1. A circuit enclosure, comprising:

a bottom enclosure element;

air inlet means;

a top enclosure element;

air outlet means;

a number of air moving devices;

four corner posts wherein each said corner post has a first end and a second end, and said first end of each said corner post is attached to said bottom enclosure element, and said second end of each said corner post is attached to said top enclosure element;

two center posts wherein each said center post has a first end and a second end, said first end of each said center post is attached to said bottom enclosure element, and said second end of each said center post is attached to said top enclosure element;

a heat sink comprising a spine having a first surface and a second surface wherein a number of cooling fins emanate from said second surface of said spine, each said cooling fin has a tip, the intersection of planes formed by said tips of said cooling fins and said first surface forms a shape having a triangular cross section, and said heat sink is attached to two of said corner posts and one of said center posts;

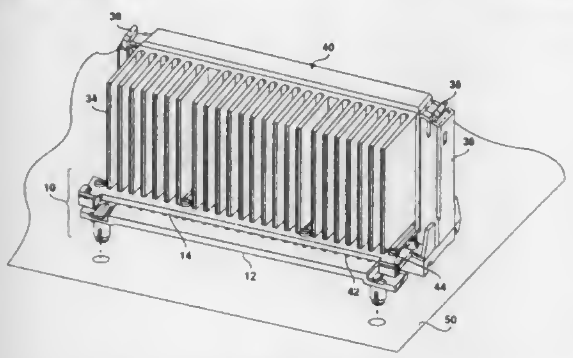
VOL
210
ISS
1
MY
5
1998
MI

- four side panels wherein each of said side panels is attached to one of said corner posts and one of said center posts;
- two end panels wherein each of said end panels is attached to two of said corner posts; and
- a control panel attached to one of said side panels or one of said end panels.

5,748,446
HEAT SINK SUPPORT

Rick Feightner, West Linn, and My-Hanh Nguyen, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 11, 1996, Ser. No. 764,609
Int. Cl.^{6} H05H *7/20*
U.S. Cl. 361—709 **14 Claims**



1. A heat sink support apparatus comprising:
- a base member having a plurality of dowels disposed on a bottom surface of the base member for securing the base member to a circuit board, the base member further having a plurality of necked pins disposed on a top surface of the base member;
- a top member having a plurality of cutouts disposed on a first edge of the top member for mating with the necked pins to render a plurality of fins of a heat sink captive, to prevent movement by the heat sink beyond a predetermined amount of tolerance allowed between the fins and the base and top members.

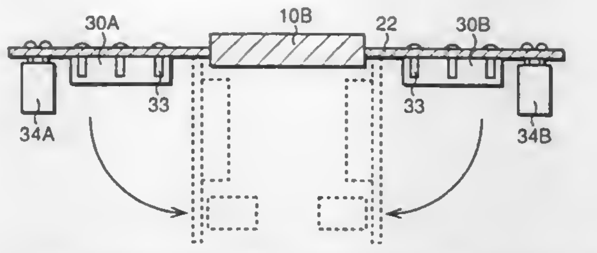
5,748,447

Patent Not Issued For This Number

5,748,448
SOLID-STATE IMAGE SENSOR ASSEMBLY WITH IMAGE SENSOR ELEMENT CHIP MOUNTED IN PACKAGE

Yasuaki Hokari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 604,416
Claims priority, application Japan, Feb. 21, 1995, 7-032173
Int. Cl.^{6} H05K *7/02;1/03;* **H01L** *31/0203;31/0232*
U.S. Cl. 361—749 **8 Claims**

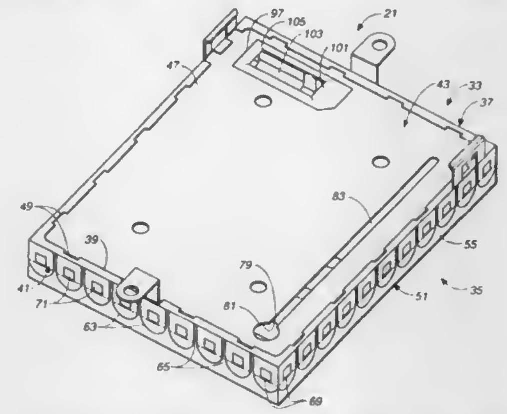


1. A solid-state image sensor which comprises:
- an image sensor element chip;
- a package which accommodates said image sensor element chip;
- a plurality of wiring patterns each of which is in a continuous seamless pattern having an inner side electrode portion disposed inside said package and used for electrical connection with said image sensor element chip, an outer side electrode portion disposed outside said package and used for electrical connection with circuit components, and a wiring portion disposed between said inner side electrode portion and said outer side electrode portion;
- a flexible printed wiring circuit board made of a light-shielding resin material, which carries said wiring patterns and which is capable of being bent;
- said flexible printed wiring circuit board carrying said image sensor element chip and extending through and out from said package, and said flexible printed wiring circuit board and said package being unitary formed.

5,748,449
ELECTRICAL ENCLOSURE FOR RADIO

Mohammed Tahmassebpur, Vancouver, Canada, assignor to Sierra Wireless, Inc., Richmond, Canada

Filed Apr. 20, 1995, Ser. No. 425,744
Int. Cl.^{6} H05K *5/04;9/00*
U.S. Cl. 361—753 **26 Claims**

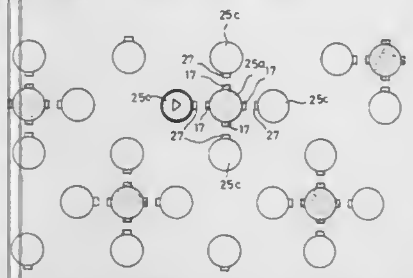


1. An electrical enclosure for a circuit board, comprising:
- a top part, the top part including a top shell having a top wall and a top side wall extending downwardly from and disposed around a periphery of the top wall, the top part further including one or more substantially rigid compression fingers extending downwardly from the top wall and disposed inwardly from the top side wall;
- a bottom part, the bottom part including a bottom shell having a bottom wall and a bottom side wall extending upwardly from and disposed around a periphery of the bottom wall, the bottom part further including one or more shield springs extending upwardly from the bottom wall and disposed inwardly from the bottom side wall; and
- the top part and the bottom part being attachable and detachable such that the top and bottom shells define a chamber, the compression fingers and the shield springs contacting top and bottom surfaces of the circuit board, respectively, to thereby suspend the circuit board in the chamber.

5,748,450
BGA PACKAGE USING A DUMMY BALL AND A REPAIRING METHOD THEREOF

Young-Gon Kim, and Dong-You Kim, both of Choongchungbook-Do, Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Apr. 23, 1996, Ser. No. 636,441
Claims priority, application Rep. of Korea, Oct. 19, 1995, 36169/1995
Int. Cl.^{6} H05K *7/02;* **H01R** *9/09*
U.S. Cl. 361—777 **18 Claims**

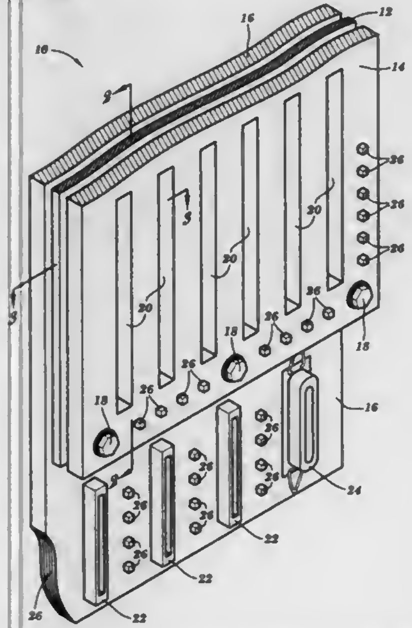


1. In a ball-grid-array (BGA) package having a semiconductor package of which an electrical connection terminal is exposed at a lower surface of an epoxy molding compound; an insulating film having a plurality of conductive solder balls, an upper surface of the plurality of conductive solder balls being electrically connected to the semiconductor package; and a printed circuit board being electrically connected to a lower surface of said solder balls;
- a dummy conductive solder ball not electrically connected among said plurality of conductive solder balls and disposed at a central part of an array of active ones of said conductive solder balls which are arranged in a radial manner at intervals of 90° around the dummy ball.

5,748,451
POWER DISTRIBUTION/STIFFENER FOR ACTIVE BACK PLANE TECHNOLOGIES

Gary Allen Thompson, Pine Island, and Charles Vernon Zenz, Sr., Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1996, Ser. No. 696,669
Int. Cl.^{6} H01R *23/70;9/09;4/66;* **H05K** *1/11*
U.S. Cl. 361—788 **29 Claims**

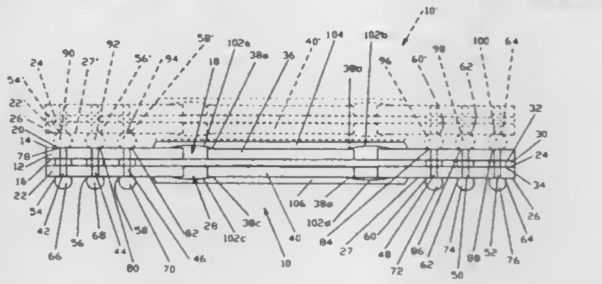


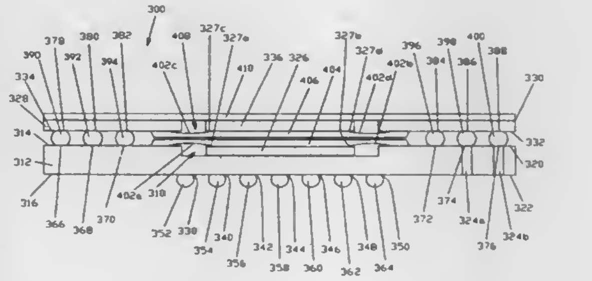
20. A backplane stiffener system mountable to an active backplane, comprising:
- a power stiffener having an internal power distribution system; and
- a connection device connecting said power stiffener to said active backplane wherein said connection device provides electrical conduction from said power stiffener to said active backplane.

5,748,452
MULTI-ELECTRONIC DEVICE PACKAGE

Joseph Michael Londa, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1996, Ser. No. 685,253
Int. Cl.^{6} H01R *23/72;* **H05K** *1/11*
U.S. Cl. 361—790 **10 Claims**





1. A multi-electric device package comprising:
- a first substrate having a first surface and an opposed second surface, said first surface including a first cavity extending from said first surface partially into said first substrate;
- a second layer of electrically conductive circuitry formed on said second surface of said first substrate wherein said second layer of circuitry is electrically coupled to said first layer of circuitry and wherein said second layer of circuitry is adapted for electrical coupling to a third external circuitized substrate;
- a first electronic device secured to said first substrate such that said first electronic device is positioned within said first cavity, said first electronic device electrically coupled to said first layer of circuitry;
- a second substrate having a first surface and an opposed second surface;
- a third layer of electrically conductive circuitry formed on said second surface of said second substrate;
- a second electronic device coupled to said second substrate, said second electronic device electrically coupled to said third layer of circuitry;
- a first encapsulant covering said first electronic device, said first cavity, and at least a portion of said first circuitry;
- a second encapsulant covering said second electronic device and at least a portion of said third circuitry; and
- wherein said first encapsulant is bonded to second encapsulant to attach first said substrate to said second substrate together along a common interface such that said second electronic device and said second surface of said second substrate faces said first electronic device and said first surface of said first substrate, and wherein said first layer of circuitry is electrically coupled to said third layer of circuitry.

5,748,453

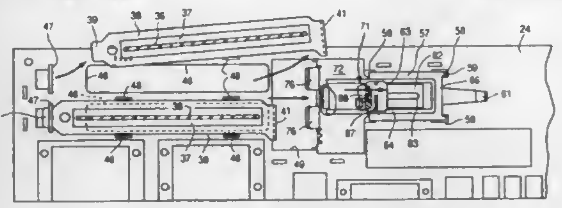
PCI EXPANSION CARD SLIDE-TYPE RETAINER

James M. Carney, Pepperell; Dave Desilets, Hopkinton, both of Mass.; Clifford Willis, Tracy; Alan Lee Winick, San Jose, both of Calif., and Christopher E. Chiodo, Andover, Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 1, 1996, Ser. No. 674,127

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—801 **28 Claims**



1. A retainer for retaining a cover comprising an enclosure having a panel formed with an opening, first means on said panel for retaining a first end of the cover on said panel at a first end of said opening, second means located at a second end of said opening opposite said first end at a position spaced laterally of said opening, said second means being slidable in a direction parallel to said opening from a first position retaining a second end of the cover on said panel to cover said opening to a second position remote from said second end of said cover, said panel being formed with a second opening adjacent said first-mentioned opening, said second means having a blanking portion closing said second opening when said second means is in first position.

5,748,454

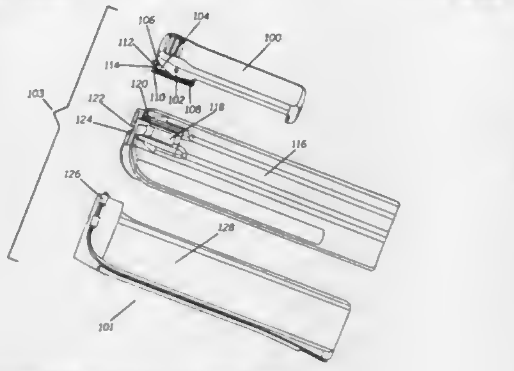
BATTERY CLIP ASSEMBLY FOR A COMMUNICATION DEVICE

Jerry R. Nichols, Boynton Beach; Craig F Siddoway, Davie; Faris S. Habbaba, Boca Raton, and Jorge L. Garcia, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 9, 1996, Ser. No. 709,958

Int. Cl.^{6} H04B *1/034*

U.S. Cl. 361—814 **12 Claims**



1. A communication device, comprising:
a radio housing;
a battery housing coupled to the radio housing, the battery housing including:
  a pair of slots;
  at least one post;
a belt clip coupled to the battery housing, the belt clip including:
  an attachment base; and
  a spring loaded latch coupled to the base;
the base including a pair of rails, the rails slidably engaging into the slots until the latch mates with the post; and
the radio housing including a stop for preventing disengagement of the belt clip from the communication device.

5,748,455

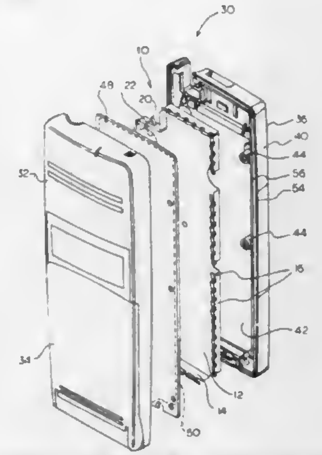
ELECTROMAGNETIC SHIELD FOR A RADIOTELEPHONE

John C. Phillips, Holly Springs, and Craig A. Phelps, Raleigh, both of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed Apr. 23, 1996, Ser. No. 636,860

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 361—818 **39 Claims**



1. An electromagnetic shield for shielding an electrical circuit disposed on a circuit board having a conductive strip extending around the electrical circuit, comprising:
a) a face;
b) a side wall extending around at least a portion of the face;
(c) a series of spring contacts extending from the side wall for electrical contact with the conductive strip extending around the circuit board, the spring contacts being flexible and movable up and down relative to the face of the shield and forming an integral one-piece construction with the side wall;
(d) each spring contact including a first tab that projects from the plane of the sidewall and a finger that extends from the first tab and flexes about a fold line extending between the first tab and the finger; and
(e) wherein the shield is installed between the circuit board and a housing and wherein the respective first tabs project outwardly from the sidewall and include upper edges that are engaged by the housing, causing the shield to be urged towards the circuit board where the spring contacts engage the conductive strip.

5,748,456

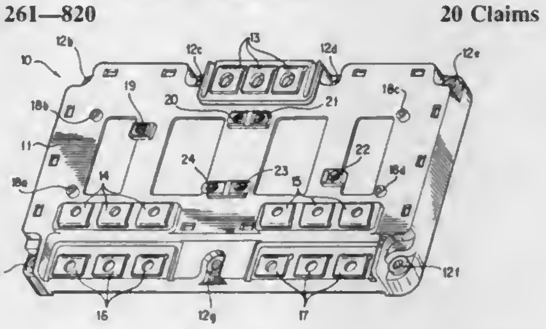
POWER SEMICONDUCTOR MODULE SYSTEM

Reinhold Bayerer, Reichelsheim, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland

Filed Nov. 24, 1995, Ser. No. 562,453

Int. Cl.^{6} H05K *7/00*

U.S. Cl. 261—820 **20 Claims**



1. Power semiconductor module system, comprising a plurality of types of power semiconductor modules which each contain one or more controllable power semiconductors and are each accommodated in a module housing with power connections and control connections which are passed to the outside, as well as a drive unit for each of the power semiconductor modules, which drive unit is accommodated in a separate housing and can be detachably connected to the associated power semiconductor module in such a manner that the drive signals which are passed from the drive unit at appropriate control signal outputs pass to the corresponding control connections of the power semiconductor module, the control connections of the power semiconductor modules each being arranged in a first fixed-position three-dimensional configuration, and the control signal outputs of the drive units each being arranged in a second fixed-position three-dimensional configuration which is superimposed on the first configuration, characterized in that the first and second configurations are the same for all the power semiconductor modules and drive units and in that the various power semiconductor modules and drive units are distinguished by the different wiring of the control connections and control signal outputs.

5,748,457

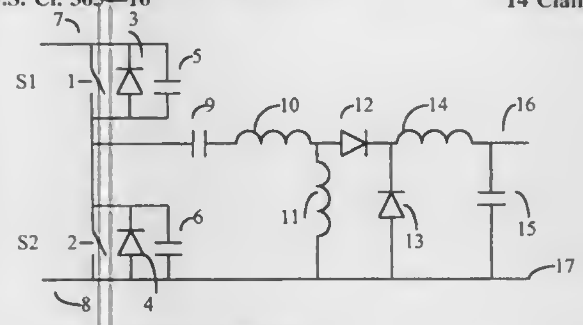
FAMILY OF ZERO VOLTAGE SWITCHING DC TO DC CONVERTERS

Franki Ngai Kit Poon, Flat 4, 12/F, Yee Mei House, Yee Kok Court, 341 Cheung Sha Wan Road, Kowloon, and Man Hay Pong, Flat G, 1st Floor, Tower 13A, South Horizons, Aplei Chau, both of Hong Kong

Filed Jan. 24, 1997, Ser. No. 787,295

Int. Cl.^{6} H02M *3/335;7/537*

U.S. Cl. 363—16 **14 Claims**



1. A power converter comprising:
a first input terminal and a second input terminal for connection to a DC source;
a first output terminal and a second output terminal for connection to a DC load;
a first and a second switch means each having at least a first and a second switch terminal, the first switch and the second switch being connected in series and coupled to the first and second input terminals;
a first diode connected in parallel with the first switch, with its cathode connected to the input terminal with higher potential;
a second diode connected in parallel with the second switch, with its anode connected to the input terminal with lower potential, the first and second diode may be combined part of the first and second switch respectively;
a first capacitor connected in parallel with the first diode;
a second capacitor connected in parallel with the second diode, the first and second capacitor may be combined part of the first and second switch respectively;
a first inductor is connected in series with a third capacitor, which is coupled to the node joining the first switch and the second switch; ,
means by which the first and second switches periodically and alternately closing, the first switch close for a first time period and the second switch close for a second time period, a third time period in which the two switches are open separates the end of the first time period and the beginning of the second time period, only one or none of the switches being closed at any given time, while a fourth time period separates the end of the second time period and the beginning of the first period, the third time period and the fourth time period being equal in magnitude;
means by which the first and second switches close when the voltage across the switch is substantially zero;
a second inductor with one of its two terminals connected to the series combination of the first inductor and the third capacitor, and the other terminal connected to the input terminal with lower potential;
a third diode with its cathode connected to the cathode of a fourth diode, and the anode of the third diode is connected to the node joining the second inductor and the series combination of the first inductor and the third capacitor;
said fourth diode with its cathode connected to the cathode of the third diode, and the anode of the fourth diode is connected to the node joining the input terminal with lower potential;
a third inductor which connects the node joining the cathodes of the third and the fourth diode to the output terminal with higher potential;
a fourth capacitor connected to the output terminals;
a connection connecting the output terminal with lower potential and the input terminal with lower potential.

5,748,458

AC/DC CONVERTER POWER SUPPLY CIRCUIT HAVING MULTIPLE RECTIFIERS

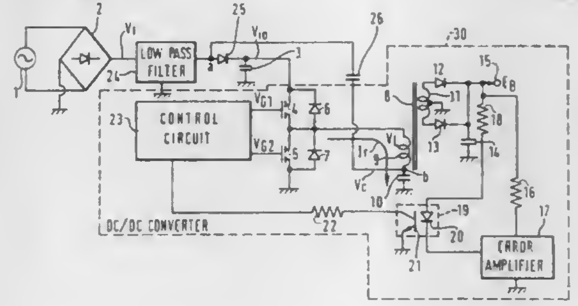
Masashi Ochiai, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1996, Ser. No. 599,262

Claims priority, application Japan, Feb. 10, 1995, 7-023031; Mar. 9, 1995, 7-049944

Int. Cl.^{6} H02M *3/335;7/5387*

U.S. Cl. 363—17 **17 Claims**



1. An AC/DC converter power supply circuit, comprising:
an AC power supply source for generating a source voltage;
a first rectifier for full-wave rectifying the AC power supply source voltage;
a second rectifier for further rectifying and smoothing the voltage rectified by the first rectifier;
a DC/DC converter for obtaining a desired rectified and smoothed DC voltage after converting the voltage rectified and smoothed in the second rectifier into a second AC voltage by a high frequency inverter; and
means for adding the second AC voltage generated by the high frequency inverter in the DC/DC converter to the first rectifier voltage from the first rectifier circuit.

5,748,459

ELECTRIC LEAKAGE CURRENT PREVENTION USING AN EQUIVALENT IMPEDANCE

Michio Yamada, and Hitoshi Kawaguchi, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1996, Ser. No. 767,860

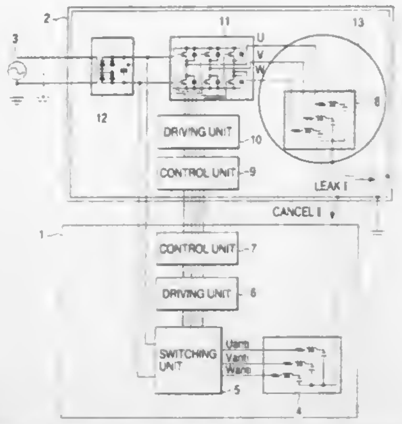
Claims priority, application Japan, Dec. 21, 1995, 7-333509; Sep. 27, 1996, 8-256493

Int. Cl.^{6} H02M *3/335;* **H02H** *3/04*

U.S. Cl. 363—21 **17 Claims**

1. An electric leakage preventive apparatus for use in an inverter device, comprising:
an equivalent impedance unit having an impedance equivalent to an impedance of a load with respect to an earthing leakage of

OL
2 10
ISS
1
MY
5
998
MI



the load driven by the inverter, one end of the equivalent impedance unit being earthed, and

inverted voltage applying means which is connected to the other end of the equivalent impedance unit for applying an anti-phase alternating current in synchronization with an AC voltage generated by the inverter to said equivalent impedance unit.

5,748,460
POWER SUPPLY APPARATUS

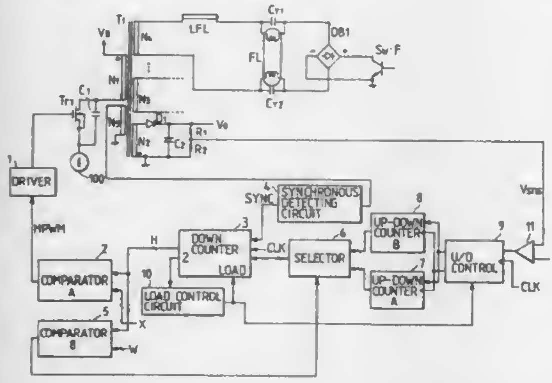
Tadashi Ishikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 581,204, Dec. 29, 1995, Pat. No. 5,612,857. This application Feb. 11, 1997, Ser. No. 798,626

Claims priority, application Japan, Jan. 11, 1995, 7-2691

Int. Cl.^{6} G06F *1/26*

U.S. Cl. 363—21 **6 Claims**



1. A power supply apparatus comprising:

a first comparator for comparing a detection value to detect a rectification output of a first predetermined winding of a transformer and a predetermined value;

first and second up/down counters in which counting up/down operations are switched by an output of said first comparator;

a selector for selecting outputs of said first and second up/down counters;

a sync circuit for generating a sync pulse at: a predetermined timing in accordance with an output of a second predetermined winding of said transformer;

a down counter for loading the output of said up/down counter selected by said selector at a generating timing of said sync pulse;

second and third comparators for comparing an output of said down counter and different predetermined digital values; and

a driving circuit for deciding a conduction timing of a switching device of a driving winding on the primary side of said transformer in accordance with an output of said second comparator,

wherein said selector selects either one of said first and second up/down counters in accordance with an output of said third comparator.

5,748,461
SMPS WITH LOW LOAD SWITCHING FREQUENCY STABILIZATION

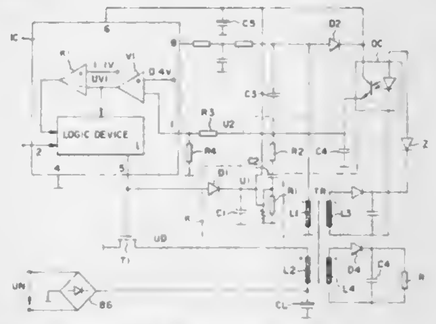
Peter Preller, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 19, 1996, Ser. No. 666,098

Claims priority, application Germany, Oct. 19, 1994, 44 37 459.3

Int. Cl.^{6} H02M *7/539*

U.S. Cl. 363—97 **7 Claims**



1. A switch-mode power supply, comprising:

a transformer having a primary winding and a secondary winding for connection of a load;

a switching transistor being connected in series with said primary winding of said transformer for applying a rectified voltage in a pulsed manner to said primary winding of said transformer;

a control device having:

- (a) an output connected to said switching transistor for controlling said switching transistor,
- (b) a signal input being connected to said transformer and being controlled by a voltage induced in said transformer,
- (c) a control signal input being controlled by a voltage coupled to a secondary voltage, and
- (d) a device connected between said control signal input and said output of said control device for inhibiting said switching transistor from switching on when a control error derived from the control signal has a magnitude being less than a threshold value; and

a coupling element coupling said output and said control signal input of said control device, said coupling element having a low-pass filter characteristic.

5,748,462
APPARATUS FOR CONTROLLING INVERTER RESISTANCE WELDING

Kyoji Moro, and Hiroshi Shimada, both of Chiba-ken, Japan, assignors to Miyachi Technos Corporation, Chiba-ken, Japan

Filed Jul. 31, 1996, Ser. No. 690,103

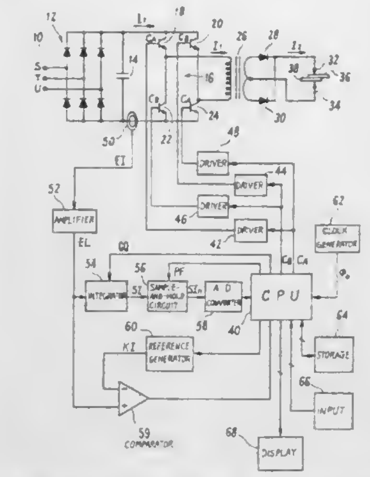
Claims priority, application Japan, Aug. 2, 1995, 7-216717; Aug. 10, 1995, 7-225934

Int. Cl.^{6} B23K *9/10;* H02M *3/335;3/24;7/36*

U.S. Cl. 363—97 **11 Claims**

1. An inverter resistance welding electric power supply control apparatus for controlling a switching operation of an inverter such that a primary or secondary current of an inverter resistance welding machine generally matches a desired preselected current value, comprising:

clock generating means for generating a clock that defines a switching cycle of the inverter, wherein said switching cycle occurs a plurality of times during a welding operation;



reference value preselecting means for preselecting a predetermined reference value corresponding to the preselected current value;

current detecting means for detecting a current during the welding operation and for generating a detected current signal representative thereof;

inverter controlling means for controlling the inverter for each switching cycle such that the inverter is turned on in response to a leading edge of the clock and such that the inverter is turned off either when said detected current signal from said current detecting means has reached said reference value or when the clock has reached a trailing edge thereof;

average current value measuring means for measuring, from said detected current signal, a plurality of average current values, one for each time said unit switching cycle occurs during the welding operation; and

output means for outputting, based on said plurality of average current values, current monitoring information useful to determine whether the welding operation has been performed normally or not.

5,748,463
GENERATING APPARATUS FOR VEHICLE

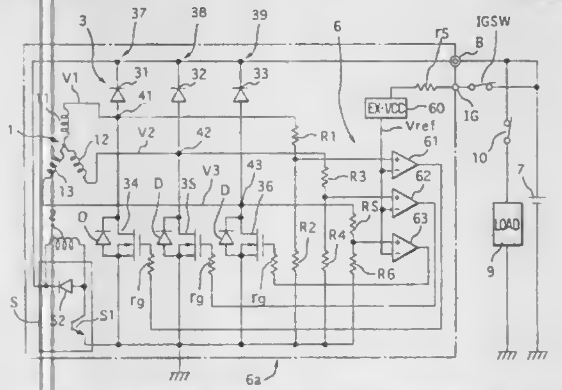
Toshio Tsutsui, Kariya; Hirohide Sato, Toyokawa, and Toshinori Maruyama, Anjo, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 4, 1996, Ser. No. 760,629

Claims priority, application Japan, Dec. 5, 1995, 7-316898; Sep. 13, 1996, 8-243302

Int. Cl.^{6} H02M *7/217*

U.S. Cl. 363—127 **13 Claims**



1. A generating apparatus for a vehicle including an AC generator having a field coil and armature coils driven by an engine, a bridge circuit having high-side and low-side rectifying elements connected between each terminal of said armature coils and a battery, a control unit for controlling a part of said high-side and low-side elements, a voltage regulator for regulating the output voltage of said bridge circuit to a first voltage level, wherein

said control unit comprises:

- an excessive-voltage-detecting-means, connected to said armature coils for producing an excessive-voltage signal when a giant-pulse-voltage generated in said armature coils exceeds a second voltage level which is a certain-level higher than said first voltage level; and
- a short-circuiting means, connected to said excessive voltage-detecting-means and said armature coils, for selectively short-circuiting a part of said armature coils, thereby suppressing said giant-pulse-voltage by turning on a portion of said rectifying elements according to said excessive-voltage signal.

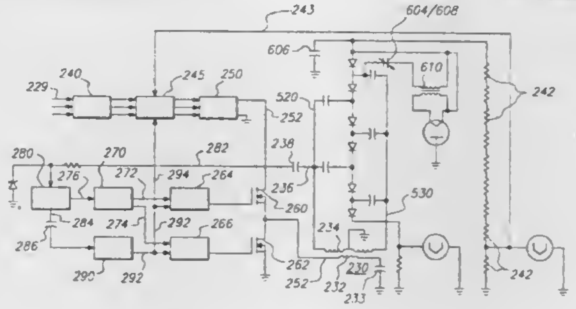
5,748,464
APPARATUS COMPRISING INDUCTIVE AND/OR POWER TRANSFER AND/OR VOLTAGE MULTIPLICATION COMPONENTS

Marlin Niles Schuetz, Raleigh, N.C., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 428,615, Apr. 25, 1995, Pat. No. 5,604,352. This application Dec. 21, 1996, Ser. No. 781,974

Int. Cl.^{6} H01R *31/06*

U.S. Cl. 363—131 **8 Claims**



1. Apparatus for irradiating a substrate comprising:

(i) a vacuum chamber including a transmission window which is located at a first end of said vacuum chamber;

(ii) a particle beam generator within said vacuum chamber; and

(iii) a particle beam accelerator, within said vacuum chamber, which accelerates and directs particles from said generator towards and through said transmission window, said apparatus comprising a high voltage AC power transfer apparatus having at least one of:

(i) a transformer having a first coil, which forms part of a first resonant circuit having a high frequency selectivity, and a second coil, which forms part of a second resonant circuit having a high frequency selectivity and having a predetermined resonant frequency,

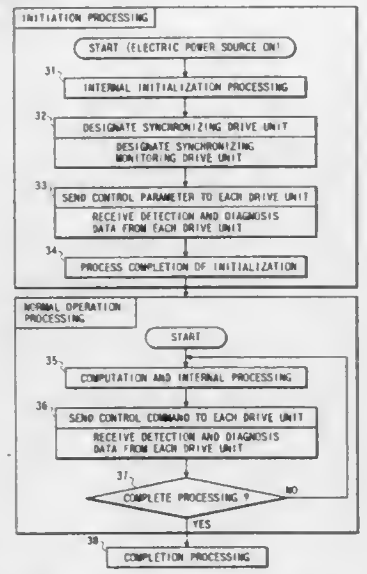
the coupling between said first and second coils being close to or at the critical coupling value; or

(ii) a phase locked loop generator, for generating a square wave electrical signal at a predetermined value of frequency and voltage, and at least one voltage gain solid state power driver connected to said generator for receiving and converting said square wave signal from said phase locked loop generator into a power signal having a square wave voltage profile, said driver being configured for connection to and for driving a first coil of a transformer.

/OL
2 10
ISS
1
MY
5
998
JMI

5,748,465
METHOD OF PROCESSING DATA IN NUMERICALLY CONTROLLED DRIVE UNIT

Yasushi Kaneko, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1996, Ser. No. 632,120
Claims priority, application Japan, Jul. 20, 1995, 7-184158
Int. Cl.⁶ G05B *11/18*
U.S. Cl. 364—132 **14 Claims**


INITIATION PROCESSING
START (ELECTRIC POWER SOURCE ON)
31
INTERNAL INITIALIZATION PROCESSING
32
DESIGNATE SYNCHRONIZING DRIVE UNIT
DESIGNATE SYNCHRONIZING MONITORING DRIVE UNIT
33
SEND CONTROL PARAMETER TO EACH DRIVE UNIT
RECEIVE DETECTION AND DIAGNOSIS DATA FROM EACH DRIVE UNIT
34
PROCESS COMPLETION OF INITIALIZATION
NORMAL OPERATION PROCESSING
START
35
COMPUTATION AND INTERNAL PROCESSING
36
SEND CONTROL COMMAND TO EACH DRIVE UNIT
RECEIVE DETECTION AND DIAGNOSIS DATA FROM EACH DRIVE UNIT
37
COMPLETE PROCESSING ?
NO
YES
38
COMPLETION PROCESSING

1. A method of processing data in a numerically controlled drive unit including at least one numerical control unit and a plurality of drive control units which have a data receiving section commonly connected with a data sending line through which data is sent from said numerical control unit and also have a data sending section and a data receiving section commonly connected with a data receiving line through which data is received by said numerical control unit, said method comprising the steps of:

sending a control command allotted to each drive unit from said numerical control unit to each drive unit through said data sending line in every predetermined control period;

controlling a drive section of each drive control unit by each drive control unit itself in accordance with the control command allotted to it;

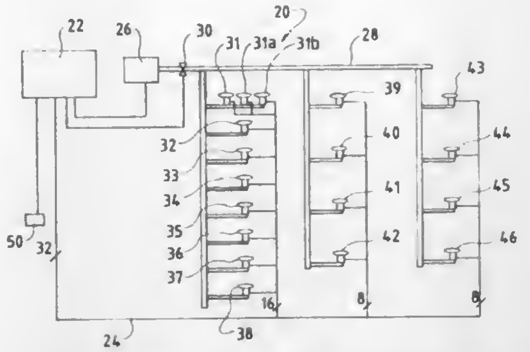
sending detection data of said drive section, said detection data representing a response of said drive section to said control command, to said data receiving line in accordance with the control period of said numerical control unit; and

receiving the detection data by one control unit sent from other drive control units in accordance with the control period of said numerical control unit, through said data receiving line so as to correct a synchronization error caused between said drive control units before the successive control period of said numerical control unit, wherein said data sending line is separate from said data receiving line.

5,748,466
ADAPTABLE CONTROL SYSTEM FOR A VARIABLE NUMBER OF SWITCHES

Patrick T. McGivern, Peoria; Bradley S. King, Princeville, and Steven Graham, Peoria, all of Ill., assignors to L. R. Nelson, Peoria, Ill.
Filed Sep. 8, 1995, Ser. No. 525,256
Int. Cl.⁶ G05B *11/01*
U.S. Cl. 364—146 **36 Claims**

1. A control system for controlling a variable number of zones of electrically-operated devices, each zone including at least one electrically-operated device, the control system comprising:



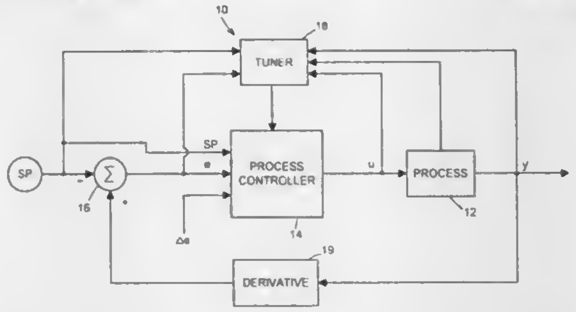
a processor unit including a memory for storing a user-defined program relating to selection and operation of the zones of electrically-operated devices, the processor unit generating command data in accordance with the user-defined program for the selection and operation of the zones of electrically-operated devices; and

a set of switches in communication with the processor unit, each switch capable of having the at least one electrically-operated device of a corresponding one of the zones connected thereto for operation of the connected electrically-operated device upon actuation of the switch;

wherein the processor unit ascertains the total number of switches in communication therewith by sending a query signal and receiving a signal in response to the query signal indicative of the total number of switches in communication therewith and limits the variable number of zones selected and controlled by the user-defined program to the ascertained total number of switches.

5,748,467
METHOD OF ADAPTING AND APPLYING CONTROL PARAMETERS IN NON-LINEAR PROCESS CONTROLLERS

S. Joe Qin; Michael G. Ott, both of Austin, and Wilhelm K. Wojsznis, Round Rock, all of Tex., assignors to Fisher-Rosemont Systems, Inc., Austin, Tex.
Filed Feb. 21, 1995, Ser. No. 391,717
Int. Cl.⁶ G05B *13/02*
U.S. Cl. 364—148 **41 Claims**



35. A method of controlling a process in response to a change in a set point and in response to a process characteristic, comprising the steps of:

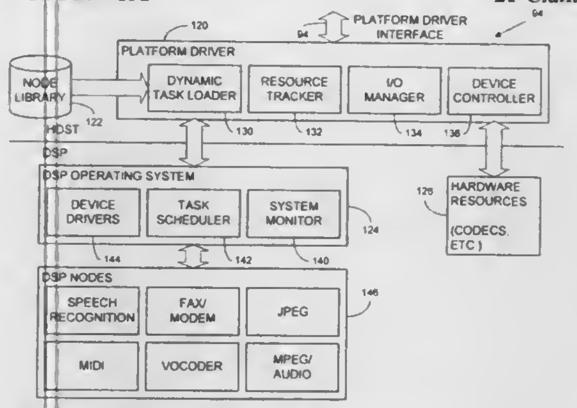
measuring the magnitude of the change in the set point;

developing a set of control parameters in response to the process characteristic and the measured magnitude of the change in the set point; and

controlling the process in accordance with a fuzzy logic control technique using the set of control parameters when the set point change has occurred.

5,748,468
PRIORITIZED CO-PROCESSOR RESOURCE MANAGER AND METHOD

Leo A. Notenboom, Woodinville; Benjamin A. Mejia, Seattle, and Curtis D. Smith, Issaquah, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.
Filed May 4, 1995, Ser. No. 434,789
Int. Cl.⁶ G05B *15/00*
U.S. Cl. 364—132 **21 Claims**



1. A computer system, comprising:

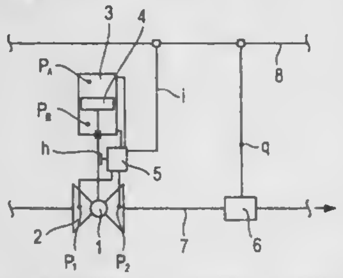
a host processor executing a plurality of applications;

a slave processor having a plurality of resources for performing operations requested by the applications, the slave processor having a multi-tasking operating system for controlling execution of a group of tasks loaded on the slave processor by the host processor; and

a slave processor resource manager in communication with the applications to receive requests from the applications to perform operations at associated priority rankings in a priority order using the slave processor, the operations being implemented in groups of one or more nodes, the nodes comprising tasks executable on the slave processor, the nodes being associated with resource requirements, and the slave processor resource manager being operative to allocate resources of the slave processor to perform the requested operations according to the priority ranking associated with the requested operations and resource requirements of the nodes implementing the operations, the allocation of resources by the slave processor resource manager controlling the nodes of which of the requested operations are loaded to execute on the slave processor.

5,748,469
METHOD AND APPARATUS FOR DETECTING A FAULT OF A CONTROL VALVE ASSEMBLY IN A CONTROL LOOP

Jouni Pyotsia, Helsinki, Finland, assignor to Neles Controls Oy, Helsinki, Finland
Continuation-in-part of Ser. No. 324,653, Oct. 18, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 699,781
Int. Cl.⁶ G05B *17/00*
U.S. Cl. 364—150 **10 Claims**



1. A method for determining the cause of a fault in an automatically operated valve assembly of the type having a plurality of elements including at least an actuator, a valve member and positioner controlled by a control signal, comprising the steps of:

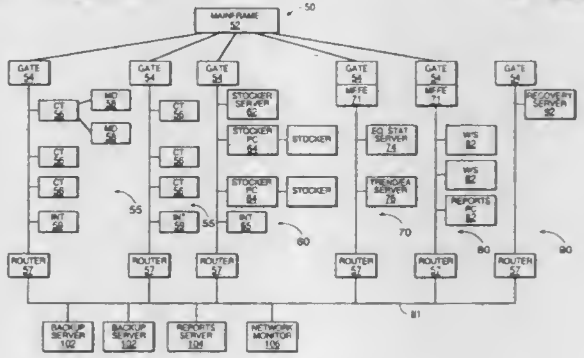
a) defining a mathematical model for operation of the control valve assembly including assigning values to critical parameters including at least the control signal and the position of the valve member,

b) deriving data corresponding to a plurality of values of the control signal and corresponding positions of the valve member,

c) correlating the mathematical model to the data measured from the control signal and the corresponding positions of the valve member to determine both if an operational deviation from the model exists in the valve assembly and the identity of the critical parameter and control valve element causing the deviation.

5,748,470
SEMICONDUCTOR PROCESSING BACKUP SYSTEM

Arthur L. Hager, III, Auburn; Brian E. Marchant, Woodside; Shouping Chuang, Carmichael, and Ki Duk Kim, Orangeville, all of Calif., assignors to NEC Electronics, Inc., Santa Clara, Calif.
Continuation of Ser. No. 236,609, May 2, 1994, abandoned. This application Feb. 5, 1996, Ser. No. 596,785
Int. Cl.⁶ G05B *9/02*
U.S. Cl. 364—187 **6 Claims**



1. A semiconductor processing system comprising

a first control device,

a processing portion, the processing portion including

a communications terminal, the communications terminal being coupled to the first control device, the communications terminal including an interceptor portion,

a manufacturing device, the manufacturing device being coupled to the communications terminal,

an interceptor controller, the interceptor controller being coupled to the interceptor portion;

a second control device, the second control device being coupled to the communications terminal; and

a stocker portion, the stocker portion being coupled to the first and second control devices, the stocker portion including

a stocker terminal, the stocker terminal including a stocker terminal interceptor portion,

a stocking device, the stocking device being coupled to the stocker terminal, and

a stocker interceptor controller, the stocker interceptor controller being coupled to the stocker terminal interceptor portion;

the interceptor portion and the interceptor controller together providing a processing portion interceptor module, the processing portion interceptor module receiving a first response from one of the first and second control devices, storing the response until a second response is received from the other of the first and second control devices, and comparing the first and second responses to independently determine whether a potential fault exists with one of the first and second control devices,

the stocker terminal interceptor portion and the stocker interceptor controller together providing a stocker interceptor module, the stocker interceptor module receiving a first response from one of the first and second control devices, storing the response until a second response is received from the other of the first and second control devices, and comparing the first and second responses to independently determine whether a potential fault exists with one of the first and second control devices,

the combination of the processing portion interceptor module, the stocker interceptor module, and the first and second control devices providing a backup system, the backup system providing continuous operation of the manufacturing system in the event that there is a fault with one of the first and second control devices.

5,748,471

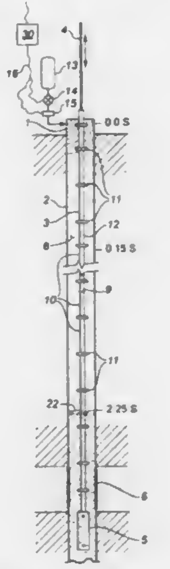
WELL COLLAR IDENTIFICATION METHOD

René Shoan Grande, Red Deer, Canada, assignor to Otatco, Inc., Calgary, Canada

Filed Mar. 29, 1996, Ser. No. 626,255

Int. Cl.⁶ G06F ***19/00***

U.S. Cl. 364—422 **16 Claims**



1. A method for counting collars associated with a tubing string extending from a wellhead into a casing string in a wellbore, said strings forming an annular space between them, said annular space containing a column of fluid having a fluid level, comprising:

- sending acoustic pulses down the annular space, detecting acoustic pulse reflections produced when each pulse contacts surfaces formed by variations in cross-sectional area of the annular space, and producing electrical signals indicative of the reflections;
- digitizing the electrical signals;
- storing each signal;
- processing the signals by applying a Wavelet Transform thereto to produce multiple resolutions of each signal, at least one resolution, the collar-resolution, of which has a transformed signal resolution sufficient to distinguish reflections emanating from collars, at least one other resolution, the kick-resolution, of which has a coarser resolution than said one resolution, said kick-resolution having a transformed signal resolution sufficient to distinguish reflections emanating from the fluid surface as kicks and repeat kicks;
- locating the kick and repeat kicks by seeking reflection maximums at the kick-resolution which qualify as singularities when synchronized against successively finer resolutions;
- counting reflection maximums, at the collar-resolution present in the interval between the wellhead and the fluid level kick; and
- reporting the depth of the fluid level measured in terms of the total number of collars counted.

5,748,472

PROCESS FOR CONTROLLING AN AUTOMATIC GEARBOX

Wolf Dieter Gruhle, Tettnang; Manfred Escher, Kressbronn; Friedemann Jauch, Meckenbeuren; Friedrich Reiter, and Peter Wendel, both of Kressbronn, all of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

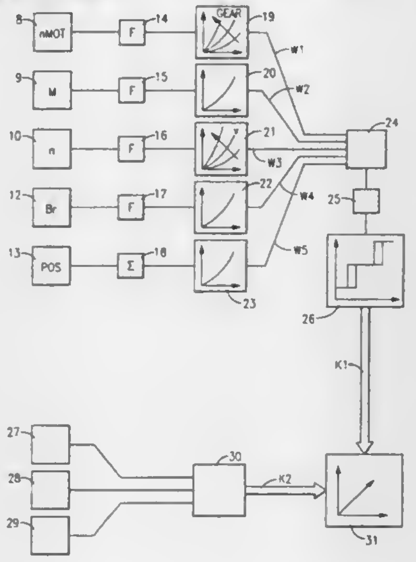
PCT No. PCT/EP94/01189, § 371 Date Oct. 17, 1995, § 102(e) Date Oct. 17, 1995, PCT Pub. No. WO94/24464, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 18, 1994, Ser. No. 549,843

Claims priority, application Germany, Apr. 20, 1993, 43 12 717.7

Int. Cl.⁶ B60K ***41/20;*** **F16H** ***61/02***

U.S. Cl. 364—424.08 **18 Claims**



1. A process for controlling an automatic transmission (3) of a vehicle having clutches controlled by an electronic control unit (5), said electronic control unit (5), during operation, receiving sensor signals (6 to 13), said process comprising the steps of:

- determining, from said sensor signals (6 to 13), a first parameter (K1) being indicative of a driving activity, said first parameter (K1) being determined from a weighted value of selector lever activity, a weighted value of excess engine torque, a weighted value of curve radius and a weighted value of brake activity;
- determining a second parameter (K2) being indicative of a driving state, and said second parameter (K2) being determined from an evaluation table (30) containing a city traffic driving state (27), a trailering driving state (28) and a mountain driving state (29);
- selecting a shifting program, from a plurality of possible shifting programs, based upon said first parameter (K1) and said second parameter (K2);
- totalling each start operation of the vehicle, each braking operation of the vehicle and each load change of the vehicle to generate a totalled sum;
- periodically reducing the totalled sum until reaching a minimum lower limit of zero; and
- setting the driving state to the city traffic driving state (27) as soon as the totalled sum exceeds a first limiting value.

5,748,473

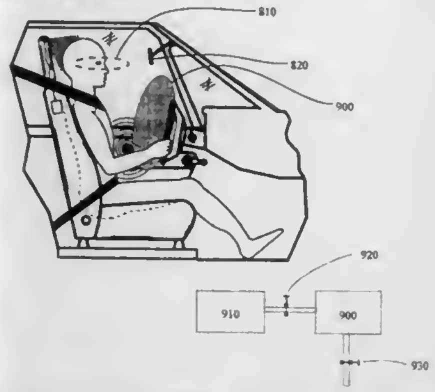
AUTOMATIC VEHICLE SEAT ADJUSTER

David S. Breed, Boonton Township, N.J., and Wilbur E. DuVall, Kimberling City, Mo., assignors to Automotive Technologies International, Inc., Denville, N.J.

Continuation-in-part of Ser. No. 239,978, May 9, 1994, which is a continuation-in-part of Ser. No. 40,978, Mar. 31, 1993, which is a continuation-in-part of Ser. No. 878,571, May 5, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,784

Int. Cl.⁶ B60R ***21/28***

U.S. Cl. 364—424.055 **20 Claims**



1. In a motor vehicle having a passenger compartment with interior surfaces, a seat on which an occupant sits, said compartment further having an airbag system with at least one deployable airbag mounted within said passenger compartment positioned to deploy between said occupant and said surfaces in the event of a crash of said vehicle, said airbag system having first control means for controlling the flow of gas into said airbag, a control system for said airbag system based on a morphological characteristic of said occupant comprising:

- (a) measurement means mounted in association with said seat for measuring at least one morphological characteristic of the occupant, said measurement means generating a first signal representative of said at least one measured morphological characteristic;
- (b) a processor comprising computational means for determining the desired flow of gas out of said airbag after initial inflation of said airbag for the occupant based on said at least one measured morphological characteristic, said processor providing a second signal representative of the desired flow of gas out of said airbag for the occupant;
- (c) first input means coupled to said measurement means and said processor for inputting said first signal into said processor;
- (d) second control means for controlling the flow of gas out of said airbag after initial inflation of said airbag; and
- (e) second input means coupled to said processor and said second control means for inputting said second signal into said second control means such that said second control means controls said gas flow out of said airbag based on said at least one measured morphological characteristic.

5,748,474

DRIVING-FORCE CONTROL SYSTEM FOR A VEHICLE

Katsuhiko Masuda; Jun Aoki, and Isamu Hashizume, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

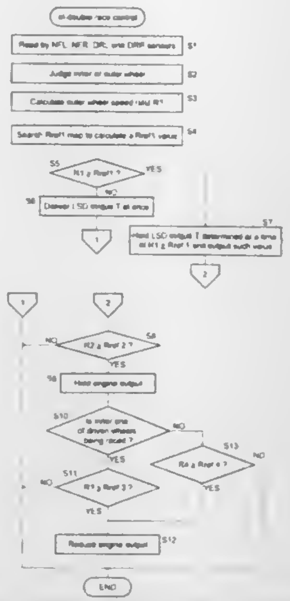
Continuation of Ser. No. 350,058, Nov. 29, 1994, abandoned. This application Feb. 3, 1997, Ser. No. 794,537

Claims priority, application Japan, Nov. 29, 1993, 5-298434

Int. Cl.⁶ B60K ***17/35***

U.S. Cl. 364—426.036 **16 Claims**

1. A driving-force control system for a vehicle having an engine and driven wheels driven by an output of said engine, said driving force control system for controlling an operation of a driving-force distributing device for adjusting a distribution of a driving force between said driven wheels, as well as for controlling an operation of an engine output suppressing device for suppressing the engine output for the driven wheels, said driving-force control system comprising:



- a first control means for maintaining a quantity of operation of said driving-force distributing device during racing of both said driven wheels at a value corresponding to a quantity of operation provided upon detection of the racing; and
- a second control means for enabling the operation of said engine output suppressing device, only when the quantity of operation of said driving-force distributing device is maintained by said first control means.

5,748,475

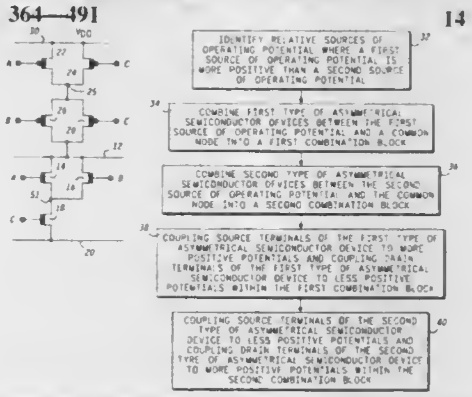
APPARATUS AND METHOD OF ORIENTING ASYMMETRICAL SEMICONDUCTOR DEVICES IN A CIRCUIT

Merit Y. Hong, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1995, Ser. No. 452,899

Int. Cl.⁶ G06F ***15/00;*** **H01L** ***27/10***

U.S. Cl. 364—491 **14 Claims**



VDD
A
B
C
25
12
20
IDENTIFY RELATIVE SOURCES OF OPERATING POTENTIAL WHERE A FIRST SOURCE OF OPERATING POTENTIAL IS MORE POSITIVE THAN A SECOND SOURCE OF OPERATING POTENTIAL
32
COMBINE FIRST TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICES BETWEEN THE FIRST SOURCE OF OPERATING POTENTIAL AND A COMMON NODE INTO A FIRST COMBINATION BLOCK
34
COMBINE SECOND TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICES BETWEEN THE SECOND SOURCE OF OPERATING POTENTIAL AND THE COMMON NODE INTO A SECOND COMBINATION BLOCK
36
COUPLING SOURCE TERMINALS OF THE FIRST TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICE TO MORE POSITIVE POTENTIALS AND COUPLING DRAIN TERMINALS OF THE FIRST TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICE TO LESS POSITIVE POTENTIALS WITHIN THE FIRST COMBINATION BLOCK
38
COUPLING SOURCE TERMINALS OF THE SECOND TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICE TO LESS POSITIVE POTENTIALS AND COUPLING DRAIN TERMINALS OF THE SECOND TYPE OF ASYMMETRICAL SEMICONDUCTOR DEVICE TO MORE POSITIVE POTENTIALS WITHIN THE SECOND COMBINATION BLOCK
40

1. A computer implemented method of orienting asymmetrical semiconductor devices in an integrated circuit, comprising the steps of:

- providing first and second operating potentials where said first operating potential is more positive than said second operating potential;
- combining a first type of asymmetrical semiconductor device between said first operating potential and a common node into a first combination block that includes only the first type of asymmetrical semiconductor device;
- combining a second type of asymmetrical semiconductor device between said common node and said second operating poten-

/OL
2 10
SS
1
MY
5
998
MI

tial into a second combination block that includes only the second type of asymmetrical semiconductor device;

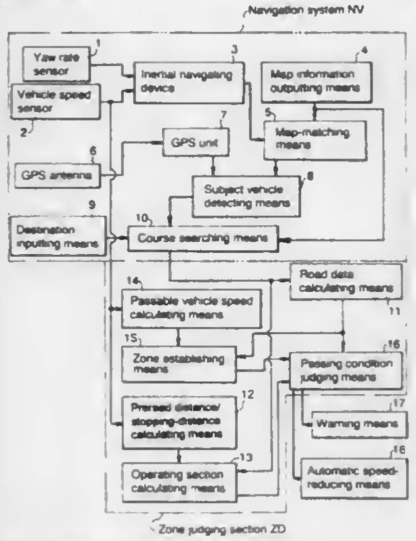
coupling a source terminal of one of said first type of asymmetrical semiconductor device to a first node operating at a first potential and coupling a drain terminal of said one of said first type of asymmetrical semiconductor device to a second node operating at a second potential less than said first potential in said first combination block; and

coupling a source terminal of one of said second type of asymmetrical semiconductor device to a third node operating at a third potential and coupling a drain terminal of said one of said second type of asymmetrical semiconductor device to a fourth node operating at a fourth potential greater than said third potential in said second combination block.

5,748,476
VEHICLE CONTROL SYSTEM

Hiroshi Sekine, and Kazuya Tamura, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 471,715
Claims priority, application Japan, Nov. 22, 1994, 6-288240
Int. Cl.⁶ G06F *165/00*
U.S. Cl. 364—449 **9 Claims**


Navigation system NV
Yaw rate sensor
1
Vehicle speed sensor
2
Inertial navigating device
3
Map information outputting means
4
Map-matching means
5
GPS unit
7
GPS antenna
6
Subject vehicle detecting means
8
Destination inputting means
9
Course searching means
10
Road data calculating means
11
Passable vehicle speed calculating means
14
Zone establishing means
15
Passing condition judging means
16
Preread distance/stopping-distance calculating means
12
Warning means
17
Operating section calculating means
13
Automatic speed-reducing means
18
Zone judging section ZD

1. A vehicle control system, comprising:

map information outputting means for outputting a map comprised of a plurality of coordinate points representing a road;

vehicle position detecting means for detecting a position of a vehicle on said map;

vehicle speed detecting means for detecting a vehicle speed;

operating-section calculation means for calculating an operating section in which it is determined whether said detected vehicle speed is appropriate while driving in said operating section;

passable vehicle speed calculation means for calculating a passable vehicle speed at a virtual vehicle position which is established in said operating section, based on said detected vehicle speed and a distance from said vehicle position to said virtual vehicle position;

zone establishing means for establishing a passage determining zone having said passable vehicle speed as a criterion based on said virtual vehicle position;

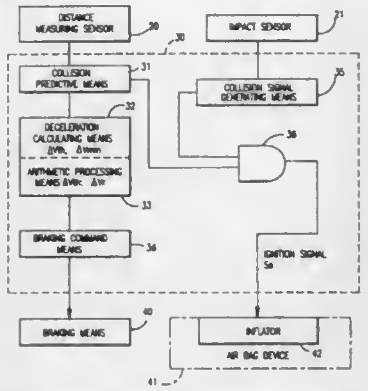
passing condition determining means for determining a passing condition by comparing said passage determining zone with a coordinate point located ahead of said virtual vehicle position within said operating section; and

vehicle control means for controlling said vehicle based on a result of the determination by said passing condition determining means.

5,748,477
VEHICLE COLLISION CONTROL SYSTEM

Shigeru Katoh, Tokyo, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 574,553
Claims priority, application Japan, Dec. 20, 1994, 6-335538
Int. Cl.⁶ G08G *1/16;* **B60T** *7/22*
U.S. Cl. 364—461 **5 Claims**


DISTANCE MEASURING SENSOR
20
IMPACT SENSOR
21
30
COLLISION PREDICTIVE MEANS
31
COLLISION SIGNAL GENERATING MEANS
35
32
DECELERATION CALCULATING MEANS ΔVth, ΔVmin
ARITHMETIC PROCESSING MEANS ΔVdc ΔW
33
36
BRAKING COMMAND MEANS
34
IGNITION SIGNAL Sa
BRAKING MEANS
40
INFLATOR
AIR BAG DEVICE
42
41

1. A vehicle collision control system comprising:

a distance measuring sensor for sensing a distance between a vehicle and an object existing in the running direction;

collision predictive means for predicting a collision based on a rate of distance change between the vehicle and the object and then outputting a collision predictive signal to a logic circuit when the collision is predicted;

deceleration calculating means for calculating a first limit deceleration as a maximum deceleration within a range allowing the vehicle to run while braking without losing its stability, and a second limit deceleration for making a speed at the collision lower than a survival space ensuring speed;

arithmetic processing means for successively comparing said first limit deceleration to said second limit deceleration which change according to the running of the vehicle after said collision predictive signal is outputted and then outputting a braking start signal when a predetermined comparative value is obtained;

braking command means for commanding a predetermined braking force to braking means upon receiving the braking start signal from said arithmetic processing means;

an impact sensor; and

collision signal generating means for outputting a collision occurrence signal to said logic circuit when said impact sensor senses the collision, wherein

when the collision predictive signal and the collision occurrence signal both are inputted to said logic circuit, said logic circuit outputs an ignition signal to an inflator of an air bag device.

5,748,478
OUTPUT MANAGEMENT OF PROCESSING IN A MANUFACTURING PLANT

Yirn-Sheng Pan, and Horng-Huei Tseng, both of Hsin chu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Mar. 17, 1997, Ser. No. 820,468
Int. Cl.⁶ G06F *19/00;* **G06G** *7/64;7/66*
U.S. Cl. 364—468.05 **32 Claims**

1. A method of output management of processing in a manufacturing plant with a plurality of stages during a running period comprises the steps as follows:

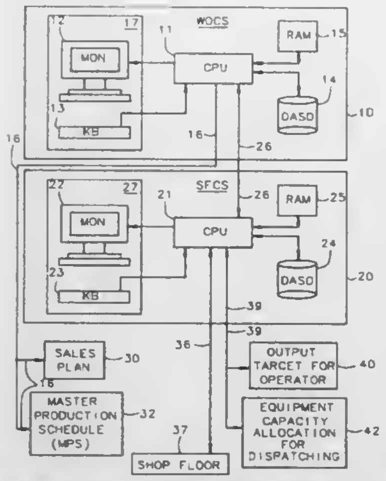
a) determine the stage In Flow (IF_{ij}) of Work In Process (WIP) in said plant,

b) determine the Out Flow (OF_{ij}) of Work In Process (WIP) in said plant,

c) calculate Flow Intensity (FL_{ij}) of said plant,

d) calculate plant equipment Capacity (C_{ij}),

e) calculate Equipment Capacity allocation (EC_{ij}) of said plant,



f) determine the bottleneck Stage Capacity (SC_{ij}) of stages in said plant,

g) determine the Rolling Output (O_{ij}) of said plant,

h) calculate plant Remaining Work In Process (RW_{ij}),

i) collect Daily Output (DO_{j}),

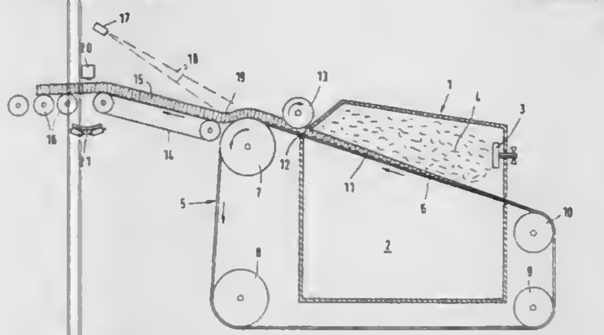
j) duplicate Remaining Work In Process (RW_{ij}) as Initial WIP (W_{ij}) for next day,

k) testing to determine whether said running period has ended and repeatedly looping back to step (a) until said running period has ended.

5,748,479
METHOD OF NEUTRALIZING HOT INCLUSIONS PRESENT IN A WEB OF MINERAL WOOL AND APPARATUS FOR CARRYING OUT THE METHOD

Gerd Weber, Neuburg, and Willi Biebel, Rennertshofen, both of Germany, assignors to Deutsche Rockwool Mineralwall-GmbH, Gladbeck, Germany

Filed Feb. 27, 1996, Ser. No. 607,891
Claims priority, application Germany, Mar. 4, 1995, 195 07 643.5
Int. Cl.⁶ C03G *13/06;* **C03B** *37/10*
U.S. Cl. 364—470.01 **20 Claims**



1. A method of neutralizing hot inclusions in a web of mineral wool which comprises:

(a) applying hot particles of mineral fibers onto mineral wool as it passes on a conveyer and discharging the resulting web from a collecting chamber;

(b) localizing hot inclusions in the web of mineral wool after delivery of the web from the collecting chamber by means of a sensor;

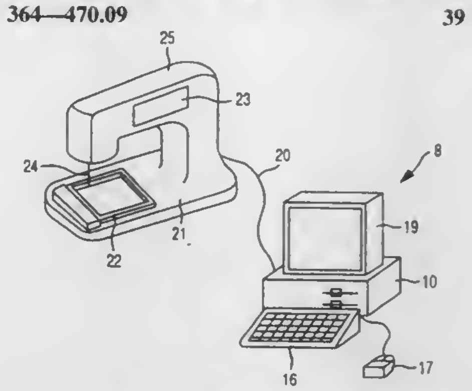
(c) directing a nozzle jet system on the mineral wool web at positions corresponding to those generated by the sensor means; and

(d) removing large inclusions from the mineral web by means of the nozzle jet system.

5,748,480
EMBROIDERY DATA PROCESSING APPARATUS

Masahiro Mizuno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 16, 1996, Ser. No. 680,775
Claims priority, application Japan, Jul. 21, 1995, 7-185672
Int. Cl.⁶ D05C *7/66;* **G06F** *19/00;* **G06G** *7/66*
U.S. Cl. 364—470.09 **39 Claims**



26. A system for processing embroidery data which are used to control a sewing machine to form stitches filling a n embroidery area and thereby produce an embroidery on at least one work sheet, the system comprising:

an outline-data obtaining device which obtains a plurality of sets of outline data each set of which defines a corresponding one of a plurality of outlines comprising a first outline and at least one second outline positioned inside said first outline;

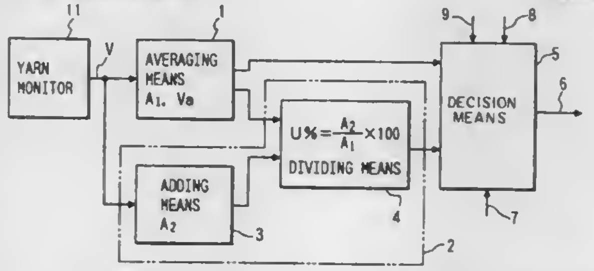
an attribute-data obtaining device which obtains, in connection with each of said outlines, a set of attribute data comprising at least one set of objective-area specifying data specifying at least one of an inside objective area and an outside objective area which are bounded by said each outline, independent of the other outlines; and

embroidery-area specifying means for specifying, as said embroidery data, at least one objective area bounded by at least one of said outlines.

5,748,481
DIAGNOSING METHOD OF YARN MONITOR AND APPARATUS THEREOF

Kazuhiko Nakade, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 21, 1994, Ser. No. 230,742
Claims priority, application Japan, Apr. 27, 1993, 5-125294
Int. Cl.⁶ G06F *19/00*
U.S. Cl. 364—470.14 **7 Claims**



6. A diagnosing method of a yarn monitor, comprising the steps of:

providing a plurality of yarn monitors;

having said yarn monitors monitor a supplied yarn and provide monitoring results via detection signals;

obtaining a yarn diameter average value and a yarn evenness by processing the detection signal from one of said yarn monitors, and judging that said one of said yarn monitors itself is abnormal in a case that the yarn diameter average value is abnormal and the yarn evenness is normal.

/OL
2 10
SS
1
MY
5
998
MI

5,748,482

APPARATUS FOR PRODUCING AN OBJECT HAVING AN ASPHERICAL SURFACE AND METHOD OF OPERATION THEREOF

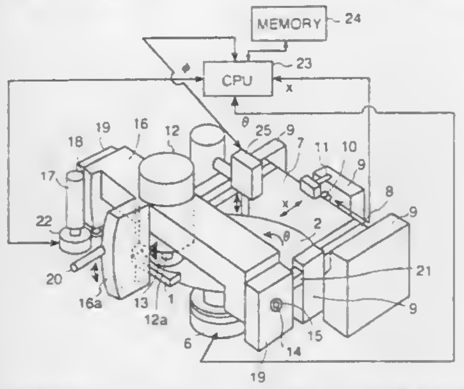
Takashi Nishimura, Mito, Japan, assignor to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jul. 19, 1996, Ser. No. 684,342

Claims priority, application Japan, Jul. 25, 1995, 7-189401

Int. Cl.^{6} G06F *19/00;* **B24B** *49/00*

U.S. Cl. 364—474.06 **15 Claims**



13. A method of producing an object having an aspherical surface, by using an apparatus having a rotary mechanism on which a workpiece is attached on a peripheral part of a rotary member rotating on a rotation shaft, a rectilinear motion mechanism for moving said rotary mechanism in one direction, a grinding mechanism for grinding a surface of said workpiece with a grinding part supported by a spindle movable in a sub-scanning direction of said workpiece to contact said workpiece, a swing mechanism for swinging said grinding part together with said spindle in a circular arc in the sub-scanning direction of said workpiece, said method comprising the steps of:

storing data which prescribes a target shape of said workpiece in data storage means;

measuring a shape of said workpiece attached to said rotary member of said rotary mechanism by using shape measurement means including estimating a ground surface of said workpiece, based on a rotation angle of said rotary mechanism, a swing angle of said swing mechanism and a horizontal position of said rectilinear motion mechanism;

comparing data of a surface shape of said workpiece which is being ground, as measured by said shape measurement means, with said data stored in said date storage means which prescribes said target surface shape of said workpiece; and

controlling said above-described mechanisms, data storage means and shape measurement means to grind said surface of said workpiece, based on results of said comparing, so that a difference between said measured surface shape of said workpiece and said target surface shape prescribed by said stored data converges toward zero.

5,748,483

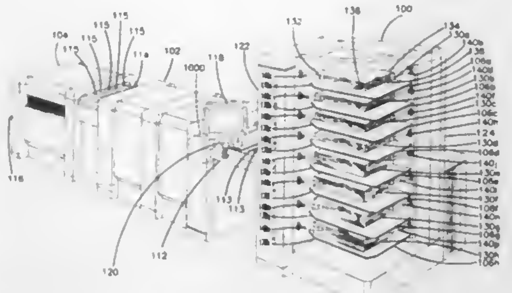
PRINTING SYSTEM

Michael M. Richardson, Eden Prairie; Allan C. Brittle, Jr., Wayzata; Lee B. Fiedler, Burnsville; Kent Gorham, Prior Lake; Jay R. Peterson, Eden Prairie; Gary T. Schultze, Burnsville; Chris J. Vetter, St. Paul, and Eugene G. Weiss, Minneapolis, all of Minn., assignors to Check Technology Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 354,654, Dec. 13, 1994, Pat. No. 5,644,494. This application Mar. 6, 1995, Ser. No. 399,126

Int. Cl.^{6} G06F *19/00;17/00*

U.S. Cl. 364—478.11 **13 Claims**



1. A modular printing system having a plurality of modules for processing sheets, the system comprising:

a collator module configured to retain the sheets, the collator module having a collator controller, sensors linked to the collator controller, the sensors being arranged to detect erroneously processed sheets, the collator controller being configured to generate an error signal in response to detection of an error, and a feed assembly for presenting the sheets;

a printer module configured to receive sheets presented by the feed assembly, the printer module having a printer controller and sensors linked to the printer controller, the sensors being arranged to detect erroneously processed sheets, and the printer controller being configured to generate an error signal in response to detection of an error; and

a system controller linked to the collator controller and the printer controller, the system controller being configured to generate and transmit scheduling signals thereby scheduling operation of the printing system for processing sheets, the system controller being further configured to generate error-recovery signals in response to error signals generated by the collator and printer controllers thereby causing the modular printing system to automatically recover from printer and collator errors.

5,748,484

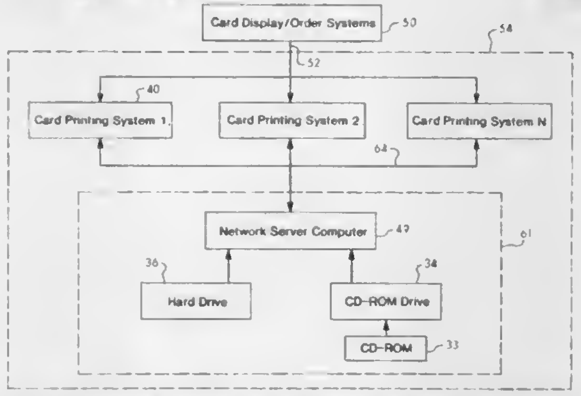
SYSTEM FOR PRINTING SOCIAL EXPRESSION CARDS IN RESPONSE TO ELECTRONICALLY TRANSMITTED ORDERS

Thomas G. Cannon, Encampment, Wyo., and Daniel L. DeHart, Loveland, Colo., assignors to Onkor, Ltd., Eastsound, Wash.

Continuation-in-part of Ser. No. 90,803, Jul. 12, 1993, Pat. No. 5,552,994, which is a continuation-in-part of Ser. No. 949,715, Sep. 23, 1992, Pat. No. 5,600,563. This application Feb. 7, 1996, Ser. No. 598,208

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—479.03 **39 Claims**



1. A system for printing social expression cards comprising:

a server having:

(a) means for electronically receiving order information for a selected card; and

(b) data storage means for storing a database describing each social expression card;

a card printing facility having:

(a) means for electronically retrieving said order information from said server;

(b) a printer; and

(c) processor means for selectively retrieving card description data for said selected card specified in said order information, and printing said database information for said selected card using said printer; and

at least one card display/order facility separate and remote from said card printing facility and said server having:

(a) means for accessing said card description database at said server;

(b) means for inputting card parameters;

(c) means for retrieving and visually displaying cards associated with said card parameters from said card description database at said server;

(d) means for inputting order information; and

(e) means for electronically transmitting said order information to said server.

5,748,485

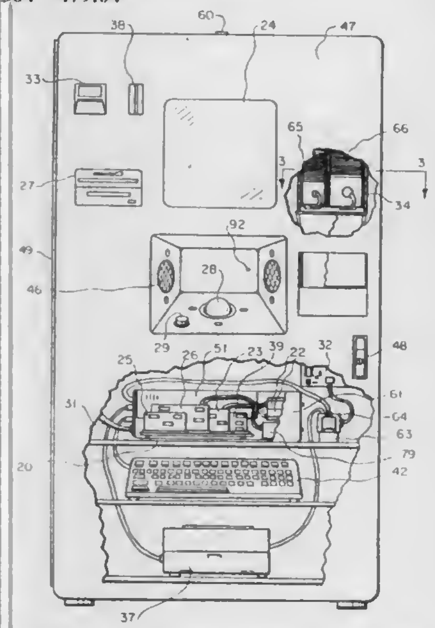
SOFTWARE VENDING MACHINE HAVING CD-ROM STORAGE

Lars K. Christiansen, Bluffdale; Mark H. Roberts, Midvale; David J. Griffiths, Spanish Fork, and Brent R. Adamson, Wendover, all of Utah, assignors to LaserVend, Inc., Orem, Utah

Filed Apr. 11, 1995, Ser. No. 420,122

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—479.04 **23 Claims**



5. A software program vending machine comprising:

a processor;

a bill acceptor for receiving paper money and for notifying said processor when paper money has been received;

an optically readable disk for storing a plurality of programs;

means under control of said processor for dispensing a blank diskette after said processor has received notification that money has been received;

a diskette drive under control of said processor for writing said blank diskette with a program;

a monitor under control of said processor for displaying a menu of program choices;

a trackball for manipulating a cursor displayed on said monitor such that said cursor indicates a particular program choice;

a button for identifying a specific program to be vended to said processor;

a sound card and loudspeaker device for instructing users in machine operation;

a sensor to sense the presence of a potential user near the machine; and

means operable by said sensor to begin an audio enticement sequence when a potential user is sensed near the machine.

5,748,486

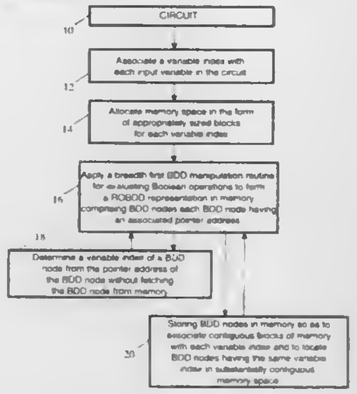
BREADTH-FIRST MANIPULATION OF BINARY DECISION DIAGRAMS

Pranav Ashar, Princeton, and Chao Cheong, Plainsboro, both of N.J., assignors to NEC USA, Inc., Princeton, N.J.

Filed Oct. 28, 1994, Ser. No. 331,075

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—488 **15 Claims**


CIRCUIT
10
Associate a variable index with each input variable in the circuit
12
Allocate memory space in the form of appropriately sized blocks for each variable index
14
Apply a breadth first BDD manipulation routine for evaluating Boolean operations to form a ROBDD representation in memory comprising BDD nodes each BDD node having an associated pointer address
16
18
Determine a variable index of a BDD node from the pointer address of the BDD node without fetching the BDD node from memory
Storing BDD nodes in memory so as to associate contiguous blocks of memory with each variable index and to locate BDD nodes having the same variable index in substantially contiguous memory space
20

1. A computer-aided design method of obtaining a reduced ordered binary decision diagram in memory comprising the steps of:

applying a breadth first binary decision diagram manipulation routine for evaluating Boolean operations to form a reduced ordered binary decision diagram representation in memory comprising binary decision diagram (BDD) nodes each BDD node having an associated pointer address;

determining a variable index of a BDD node from the pointer address of the BDD node without fetching the BDD node from memory; and

storing BDD nodes in memory so as to associate contiguous blocks of memory with each variable index and to locate BDD nodes having the same variable index in substantially contiguous memory space.

5,748,487

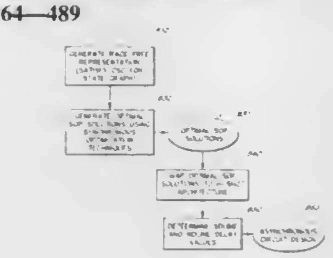
SYSTEM AND METHOD FOR GENERATING A HAZARD-FREE ASYNCHRONOUS CIRCUIT

Milton Hiroki Sawasaki, Sao Paulo, Brazil; Chantal Ykman-Couvreur, Brusell, Belgium; Bill Lin, Louvain, Belgium, and Hugo De Man, Louvain, Belgium, assignors to IMEC, Louvain, Belgium

Filed Jan. 31, 1995, Ser. No. 381,081

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—489 **13 Claims**



1. A method for generating a hazard-free asynchronous circuit representation of an asynchronous process, the method comprising the steps of:

generating a race-free representation of an asynchronous process;

deriving a logic solution from the representation, wherein the logic solution can be hazardous; and

/OL 2 10 SS 1 MY 5 998 MI

incorporating the logic solution in a flip-flop-based hazard-free asynchronous circuit representation, wherein said circuit representation produces a hazard-free output signal given a sum-of-products (SOP) logic solution to the asynchronous process, said circuit comprising:
a first RS latch having an input coupled to an output signal of an asynchronous flip-flop;
first and a second AND gate, each AND gate coupled to the first RS latch and the SOP solution;
a second RS latch coupled to the first and the second AND gates;
a filter coupled to the second RS latch for filtering hazardous signals;
a third RS latch coupled to the filter, for generating a hazard-free asynchronous output signal; and
a delay line coupled to the output signal and the input of the first RS latch.

5,748,488

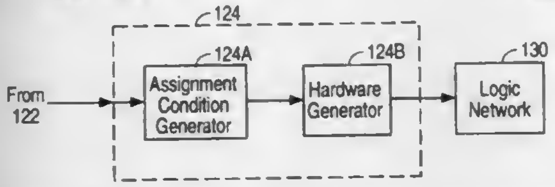
METHOD FOR GENERATING A LOGIC CIRCUIT FROM A HARDWARE INDEPENDENT USER DESCRIPTION USING ASSIGNMENT CONDITIONS

Brent L. Gregory, Sunnyvale, and Russell B. Segal, Mountain View, both of Calif., assignors to Synopsys, Inc., Mountain View, Calif.

Continuation of Ser. No. 632,439, Dec. 21, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 478,068

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—490 **14 Claims**



1. A method for converting a hardware independent user description of a logic circuit, that includes flow control statements, and directive statements that define levels of logic signals, into logic circuit hardware components comprising:
converting a flow control statement and a directive statement in the user description for a logic signal Q into an assignment condition for at least one of a plurality of functions including an asynchronous load function AL( ), an asynchronous data function AD( ), and a high impendance function Z( ); and
generating a hardware element using said assignment condition, wherein a type of said hardware element and a configuration of said hardware element is dependent upon the assignment condition.

5,748,489

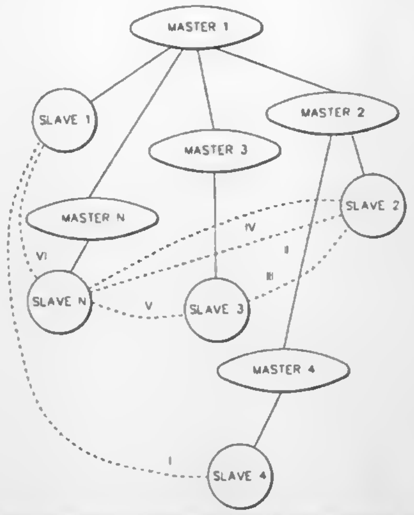
PARALLEL EXECUTION OF A COMPLEX TASK PARTITIONED INTO A PLURALITY OF ENTITIES

Harry John Beatty, Clinton Corners; Peter Claude Elmendorf, Kingston; Roland Roberto Gillis, Ulster Park, and Ira Pramanick, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 347,641, Nov. 30, 1994. This application May 30, 1995, Ser. No. 453,680

Int. Cl.^{6} G06F *17/50;13/16;13/18*

U.S. Cl. 364—489 **12 Claims**



1. A system for executing complex static timing tasks in a computer system comprising one or more processors, said system comprising:
means for partitioning a complex static timing task into a plurality of entities;
means for starting a master process and a slave process for each of at least two of said plurality of entities, wherein the master processes and the slave processes of the at least two of said plurality of entities together form a hierarchical arrangement of processes in said system, the hierarchical arrangement of processes having at least one of the master processes subservient to another of the master processes therein, wherein a slave process of one of said at least two of said plurality of entities is coupled to a slave process of one other entity of said at least two of said plurality of entities;
means for establishing a direct communication path between said coupled slave processes for communicating between said coupled slave processes independent of their respective master processes, the hierarchical arrangement of processes thereby having at least one pair of coupled slave processes from different master processes in direct communication with each other;
means for executing said master processes and said slave processes on said one or more processors, wherein said master processes schedule operations to be performed by their respective said slave processes for said complex static timing task and said slave processes perform said operations in parallel; and
means for providing a result of said operations performed in parallel to a user of said computer system.

5,748,490

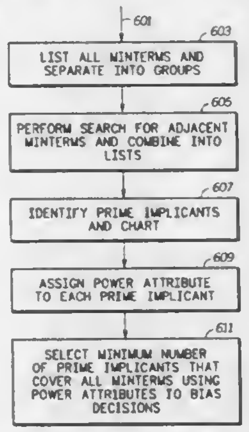
LOW POWER LOGIC MINIMIZATION FOR ELECTRICAL CIRCUITS

J. Greg Viot, and Oded Yishay, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1995, Ser. No. 548,929

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—489 **15 Claims**


601
603
LIST ALL MINTERMS AND SEPARATE INTO GROUPS
605
PERFORM SEARCH FOR ADJACENT MINTERMS AND COMBINE INTO LISTS
607
IDENTIFY PRIME IMPLICANTS AND CHART
609
ASSIGN POWER ATTRIBUTE TO EACH PRIME IMPLICANT
611
SELECT MINIMUM NUMBER OF PRIME IMPLICANTS THAT COVER ALL MINTERMS USING POWER ATTRIBUTES TO BIAS DECISIONS

1. A method for prioritizing each circuit solution of a group of valid circuit solutions effective to implement a given logic function, said method comprising the steps of:
identifying a plurality of prime implicant terms, said prime implicant terms corresponding to said valid circuit solutions, each of said prime implicant terms being effective to implement said given logic function;
determining a power consumption factor representative of the power requirements for each circuit solution of said group, said step of determining a power consumption factor further including a calculation of a probability of switching logic states for each of said prime implicant terms; and
prioritizing said group of valid circuit solutions in accordance with said determined power consumption factor.

5,748,491

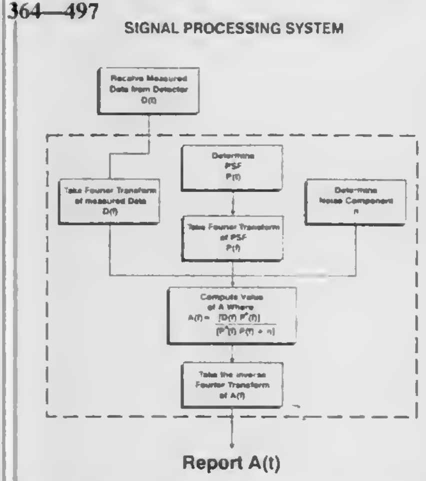
DECONVOLUTION METHOD FOR THE ANALYSIS OF DATA RESULTING FROM ANALYTICAL SEPARATION PROCESSES

Daniel B. Allison, Menlo Park, Calif., and James O. Bowlby, Jr., San Jose, Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Filed Dec. 20, 1995, Ser. No. 579,204

Int. Cl.^{6} G06F *17/14;17/11*

U.S. Cl. 364—497 **9 Claims**


SIGNAL PROCESSING SYSTEM
Receive Measured Data from Detector D(t)
Determine PSF P(t)
Take Fourier Transform of measured Data D(f)
Determine Noise Component n
Take Fourier Transform of PSF P(f)
Compute Value of A Where A(f) = (D(f) P*(f)) / (P*(f) P(f) + n)
Take the inverse Fourier Transform of A(f)
Report A(t)

1. A signal processing method in a signal processor for identifying sample zones in a signal including multiple overlapping sample zones resulting from a separation process comprising the steps of:
receiving a signal generated by a detector which monitors the results of an analytical separation process, such signal representing a plurality of partially separated sample zones;
determining a point-spread-function of the signal;
converting the signal and the point-spread function from a time domain representation to a frequency domain representation using a Fourier transform;
determining a noise component of the signal;
calculating the value of a result signal A(f) using the formula

$$A(f)=\frac{(D(f)P^*(f))}{P^*(f)P(f)+n},$$

where D(f) is the Fourier transform of the signal, P(f) is the Fourier transform of the point-spread-function, P*(f) is the complex conjugate of P(f), and n is the noise component of the signal; and
converting the result signal A(f) from a frequency domain representation to a time domain representation by performing an inverse Fourier transform.

5,748,492

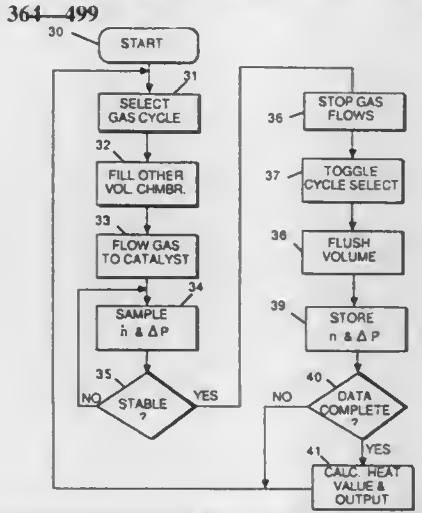
MEASURING HEATING VALUE USING CATALYTIC COMBUSTION

William H. Vander Heyden, Mequon, Wis., and Ronald Arthur Berg, Tulsa, Okla., assignors to Badger Meter, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 449,506, May 24, 1995, abandoned. This application Feb. 9, 1996, Ser. No. 599,003

Int. Cl.^{6} G01N *11/02*

U.S. Cl. 364—499 **16 Claims**



1. A method of measuring heating value of a combustible gas, wherein
a reference gas and a sample gas are brought into contact with a catalyst in separate cycles to cause flameless oxidation of the reference gas and the sample gas, respectively;
wherein a power level and a corresponding value for flow rate of the sample gas are detected;
said method further comprising:
varying a flow rate for the reference gas to the catalyst to obtain a changing power level for the catalyst;
detecting the flow rate of the reference gas at a selected power level more than a maximum electrical power supplied to the catalyst;
varying a flow rate for the sample gas to the catalyst to obtain a power level either equal to or proportional to the selected electrical power level for the reference gas;
detecting said flow rate for the sample gas at said power level at which the flow rate was detected for the reference gas; and
calculating the heating value of the sample gas in response to a ratio of reference gas flow rate and sample gas flow rate relative to the selected electrical power level.

5,748,493

LEVEL 1 GATEWAY FOR VIDEO DIAL TONE NETWORKS

Regina Lightfoot, New Carrollton, Md., and William Goodman, Collegeville, Pa., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

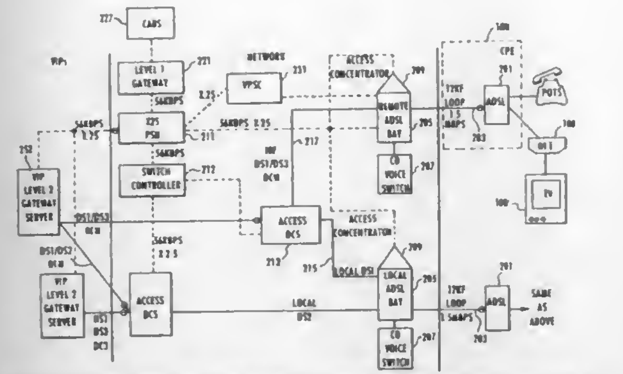
Division of Ser. No. 304,174, Sep. 12, 1994. This application Jul. 9, 1996, Ser. No. 677,294

Int. Cl.^{6} H04N *7/10*

U.S. Cl. 364—514 C **11 Claims**

1. In a communication network selectively providing broadband communication links between servers operated by a plurality of service providers and a plurality of subscriber terminals, a method comprising:
receiving a selection of one of the service providers at a gateway control element of the network from one of the subscriber terminals;
controlling the broadband communication network to attempt to establish a broadband communication link through the network between a server operated by the selected service provider and the subscriber's terminal;

OL
2 10
ISS
1
MY
5
998
MI



determining that the broadband communication link can not be established through the network;

transmitting a message indicating inability to establish the broadband communication link to the subscriber's terminal; and

in response to the transmitted message, providing a notice to the subscriber.

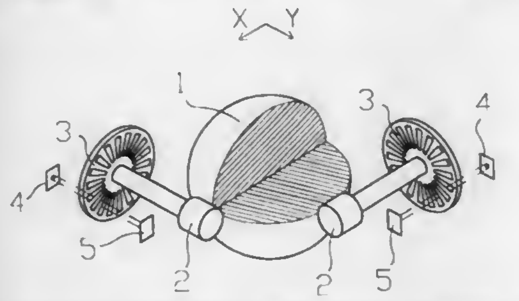
5,748,494
METHOD AND ARRANGEMENT FOR RESOLUTION ENHANCEMENT

Wen-San Ko, No. 2 Lane 419, Wu Fei St., Tainan, Taiwan

Filed May 22, 1996, Ser. No. 651,334

Int. Cl.^{6} G08C *21/00*

U.S. Cl. 364—525 **35 Claims**



1. A method for resolution enhancement of a coordinate input device, comprising the steps of

(a) receiving a predetermined number of light beams generating from a light source and passing through a rotating grating disc by a light detector;

(b) detecting the intensity of said light beams by said light detector so as to receive a continuous response voltage signal;

(c) converting said continues response voltage signal to a digital signal; and

(d) distinguishing said digital signal as at least three different detecting modes by means of a plurality of predetermined critical values for enhancing the resolution of said coordinate input device.

5,748,495
PLANT OPERATING AND MONITORING APPARATUS

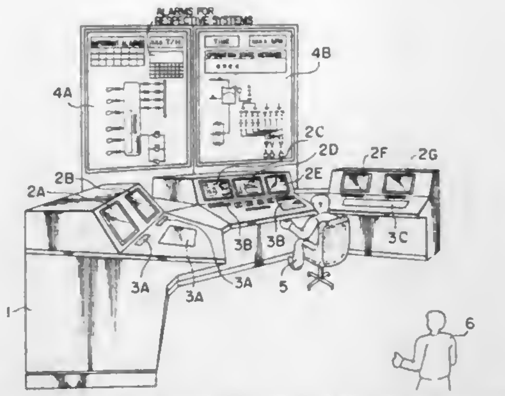
Setsuo Arita, Hitachiota; Tetsuo Ito, Hitachi; Yukiharu Ohga; Fumio Murata, both of Katsuta; Yulchi Higashikawa, Hitachi; Hideyuki Sato, Hitachi; Mitsuru Kudo, Hitachi, and Yuuzi Yamasawa, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 631,443, Dec. 21, 1990. This application May 30, 1995, Ser. No. 453,337

Int. Cl.^{6} G05B *19/00*

U.S. Cl. 364—550 **13 Claims**

1. An apparatus for operating and monitoring a plant, comprising:



a manipulating and monitoring panel means, including manipulating means and a first display device, for operating the plant which includes a plurality of systems;

a first display data producing means for displaying on said first display device plant information needed for an operator to perform manipulation or monitoring of components constituting the plant by said manipulating means;

a second display device, placed behind said manipulating and monitoring panel means and having a display screen whose size is larger than a size of a display screen of said first display device, for displaying a general configuration diagram of the plant and process variables indicative of operation states of said components of the plant; and

a second display data producing means including an abnormality decision means for determining, when an abnormality occurs in the plant, a system wherein the abnormality has occurred, said second display data producing means controlling a display content of said second display device,

wherein said second display data producing means controls said second display device in a manner that, when the plant is in a normal state, said second display device displays said general configuration diagram of the plant and said process variables, and when an occurrence of an abnormality in the plant is determined by said abnormality decision means, said second display device displays an alarm for each of said systems in which an abnormal condition has occurred in addition to said general configuration diagram of the plant and said process variables.

5,748,496
DIAGNOSIS SYSTEM

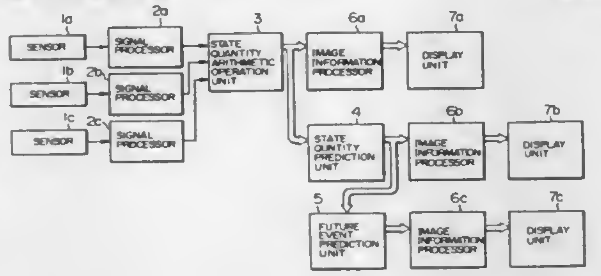
Fuminobu Takahashi, Katsuta; Masahiro Koike; Shunsuke Uchida, both of Hitachi; Haruo Fujimori, Hitachiota; Izumi Yamada, Ibaraki-ken; Takaharu Fukuzaki, Hitachi, and Makoto Nagase, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 247,888, May 23, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 700,043

Claims priority, application Japan, Jun. 4, 1993, 5-134572

Int. Cl.^{6} G21C *7/36*

U.S. Cl. 364—550 **17 Claims**


1a
SENSOR
2a
SIGNAL PROCESSOR
1b
SENSOR
2b
SIGNAL PROCESSOR
1c
2c
SENSOR
SIGNAL PROCESSOR
3
STATE QUANTITY ARITHMETIC OPERATION UNIT
6a
IMAGE INFORMATION PROCESSOR
7a
DISPLAY UNIT
4
STATE QUANTITY PREDICTION UNIT
6b
IMAGE INFORMATION PROCESSOR
7b
DISPLAY UNIT
5
FUTURE EVENT PREDICTION UNIT
6c
IMAGE INFORMATION PROCESSOR
7c
DISPLAY UNIT

1. A system for monitoring and diagnosing a plant state of a plant which includes a pressure vessel, comprising:

a display means for displaying a form of a present pressure vessel;

a predicting means for predicting a quantity of a state regarding temperature and pressure at a time after a predetermined time on a basis of a quantity of a fluid flow into or out of said pressure vessel and said quantity of a present state of said pressure vessel; and

an inferring means for inferring an undetectable form of a deformed pressure vessel after said predetermined time on a basis of said predicted quantity of a state regarding temperature and pressure at said time after said predetermined time obtained from said predicting means; wherein

said display means displays said undetectable form of the deformed pressure vessel inferred by said inferring means.

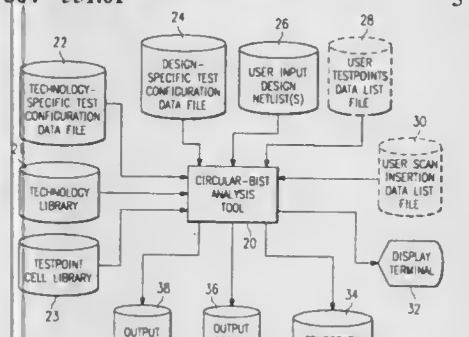
5,748,497
SYSTEM AND METHOD FOR IMPROVING FAULT COVERAGE OF AN ELECTRIC CIRCUIT

Kyl W. Scott, Murphy, and James M. Skidmore, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1994, Ser. No. 332,237

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 364—551.01 **5 Claims**


22
TECHNOLOGY-SPECIFIC TEST CONFIGURATION DATA FILE
24
DESIGN-SPECIFIC TEST CONFIGURATION DATA FILE
26
USER INPUT DESIGN NETLIST(S)
28
USER TESTPOINTS DATA LIST FILE
30
USER SCAN INSERTION DATA LIST FILE
21
TECHNOLOGY LIBRARY
CIRCULAR-BIST ANALYSIS TOOL
20
TESTPOINT CELL LIBRARY
23
DISPLAY TERMINAL
32
38
OUTPUT LOG FILE
36
OUTPUT DESIGN NETLIST
34
TEMPORARY DATA FILES

1. A computer implemented method for selecting testpoints to increase overall fault coverage of an electrical circuit, said computer including a memory and a display, comprising the steps of:

providing a netlist of a plurality of circuit design cells describing said electrical circuit in said memory of said computer, said netlist identifying a plurality of nodes and a plurality of connections between said plurality of nodes;

generating a scan path through said plurality of circuit design cells and said plurality of nodes in said netlist in response to a user request comprising the steps of ordering said plurality of circuit design cells to be scanned and inserting dummy scan cells into said scan path to eliminate register adjacency;

determining a fault grade associated with each of said plurality of nodes included in said scan path through said netlist;

measuring potential effectiveness of insertion of a testpoint at each of said plurality of nodes in response to said determining step;

selecting a first set of testpoints that enhance controllability of said electrical circuit described in said netlist in response to said measuring step;

selecting a second set of testpoints that enhance observability of said electrical circuit described in said netlist in response to said measuring step;

ranking said first set of testpoints and said second set of testpoints in accordance with said potential effectiveness thereby generating a third set of testpoints, each of said testpoints having an associated rank; and

repeatedly inserting one of said testpoints included in said third set of testpoints into said netlist in accordance with said associated rank until a desired fault coverage for said electrical circuit described in said netlist is obtained, thereby generating an updated netlist.

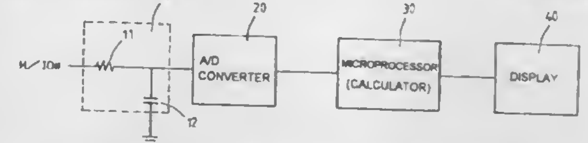
5,748,498
METHOD AND A DEVICE FOR DETECTING EXECUTION EFFICIENCY OF A CPU IN COMPUTER SYSTEM

Shao-Tsu Kung, Taipei, Taiwan, assignor to Compal Electronics, Inc., Taipei, Taiwan

Filed Jul. 5, 1995, Ser. No. 498,487

Int. Cl.^{6} G01B *7/00*

U.S. Cl. 364—551.01 **8 Claims**



1. A method for detecting execution efficiency of a CPU in a computer system, comprising the steps of:

A. monitoring memory/input/output signals of a bus of said computer system,

B. integrating said signals,

C. calculating a resultant ratio of said integrated signals to a high potential of said input/output/memory signal to determine said execution efficiency of said CPU, and

D. comparing said resultant ratio to a power consumption level of said CPU in a working state and a power consumption level of said CPU in a power-saving state to calculate a power consumption of said CPU.

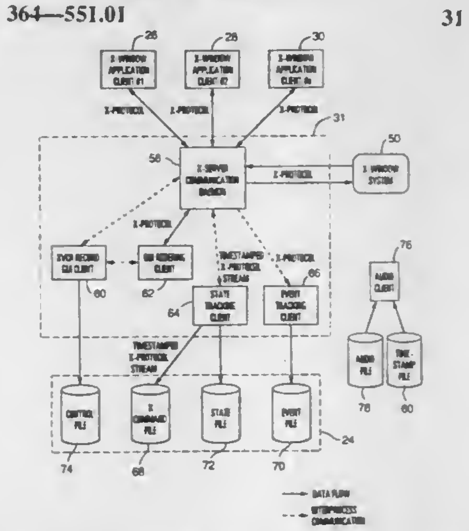
5,748,499
COMPUTER GRAPHICS DATA RECORDING AND PLAYBACK SYSTEM WITH A VCR-BASED GRAPHIC USER INTERFACE

John Trueblood, San Diego, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Sep. 19, 1995, Ser. No. 530,766

Int. Cl.^{6} H04L *12/28*

U.S. Cl. 364—551.01 **31 Claims**



9. A method of recording an X-Window session in which X-Window commands and events create a display on a display device that is coupled to a client program through a work station, said method comprising the steps of:

storing X-Window commands sent from said client program to said display device in a first memory file;

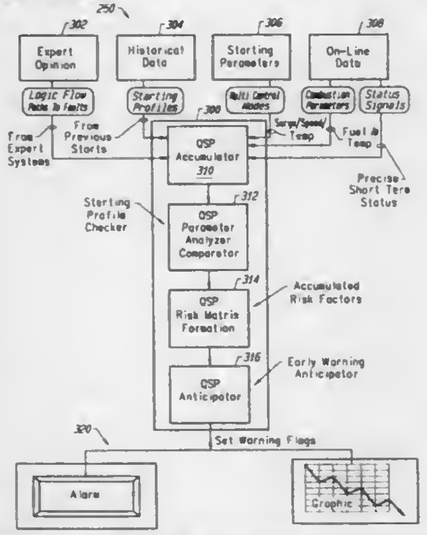
time stamping said X-Window commands in said first memory file with a first set of time stamps, at fixed intervals, storing state information in a second memory file, said state information comprising information from which the state of the display at said fixed interval can be determined;

time stamping said state information in said second memory file with a second set of time stamps;

VOL
210
ISS
1
MY
5
1998
UMI

wherein said work station further comprises audio means for providing audio data corresponding to said display on said display device, said method further comprising the steps of:
storing in a fourth memory file said audio data; and
storing in a fifth memory file time stamps corresponding to said audio data in said fourth memory file.

5,748,500
SYSTEM TO ASSESS THE STARTING PERFORMANCE OF A TURBINE
George Heinz Quentin, San Jose, Calif., and Robert Alfred Yannone, Lansdowne, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Nov. 14, 1995, Ser. No. 557,844
Int. Cl.^{6} G06F *11/00;* G01M *19/00*
U.S. Cl. 364—551.01 **27 Claims**

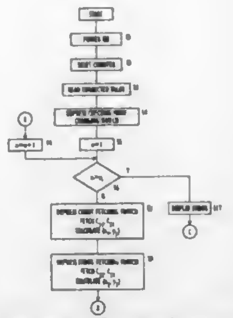


1. An apparatus to assess the performance of a start of a piece of equipment said apparatus comprising:
an accumulator to compare a set of on-line data signals corresponding to the starting performance of said piece of equipment to a set of normative starting parameters so as to identify a set of comparison signals;
a risk factor assessor to process said comparison signals and generate quality-of-start prediction signals corresponding to the likelihood of success of future starts of said piece of equipment; and
an anticipator to process said quality-of-start prediction signals and generate output signals, including control signal instructions for future starts of said piece of equipment, for use to improve the starting performance of said piece of equipment.

5,748,501
Patent Not Issued For This Number

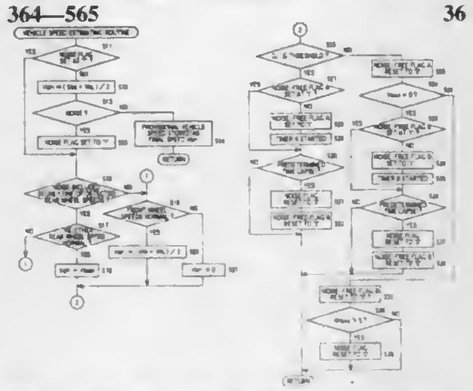
5,748,502
APPARATUS FOR MEASURING A FIGURE HAVING A CALIBRATION MODE AND METHOD FOR CALIBRATING A MEASURING APPARATUS
Akio Kubo, and Hiroshi Nemoto, both of Tokyo, Japan, assignors to Ushikata Mfg. Co., Ltd., Tokyo, Japan
Filed Sep. 1, 1995, Ser. No. 522,587
Int. Cl.^{6} G01B *7/008*
U.S. Cl. 364—560 **16 Claims**

1. An apparatus for measuring a figure, comprising:
a carriage mounted on a pair of wheels for movement along a predetermined plane;



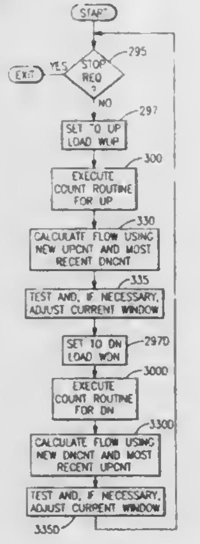
a measuring lever having a first end rotatably mounted to said carriage;
tracing means, mounted on a second end of said measuring lever, for tracing a figure to be measured;
computer means for calculating a value related to the figure using at least a plurality of present correction values of said apparatus, said computer means including means for calculating a plurality of new correction values from positions of a plurality of points of a reference figure, provided on a calibrating sheet, which are measured by tracing said plurality of points by said tracing means;
non-volatile memory means for storing said plurality of present correction values;
calibrating mode switching means, provided on said apparatus, for changing a mode of said apparatus between an operational mode and a calibrating mode;
correction value replacing means, provided on said apparatus, for replacing said plurality of present correction values in said non-volatile memory with said plurality of new correction values calculated by said computer means; and
said computer means converting coordinates of said positions of said plurality of points of said reference figure in a coordinate system of said apparatus, to coordinates of said positions in said coordinate system of said calibrating sheet.

5,748,503
APPARATUS FOR ESTIMATING VEHICLE SPEED BASED ON DETECTED WHEEL SPEED, WITHOUT INFLUENCE OF NOISE INCLUDED IN THE DETECTED WHEEL SPEED
Minoru Saeki, Toyota; Masaki Kawanishi; Yoshiaki Tsuchiya, both of Aichi-ken, and Tomokiyo Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 2, 1996, Ser. No. 674,482
Claims priority, application Japan, Jul. 4, 1995, 7-168455
Int. Cl.^{6} G01P *7/00*
U.S. Cl. 364—565 **36 Claims**



1. A vehicle speed detecting apparatus comprising:
a plurality of wheel speed detecting devices which correspond to respective groups of wheels of a motor vehicle each group consisting of at least one wheel and each of which detects a rotating speed of each wheel of the corresponding group; and
vehicle speed estimating means for estimating a running speed of said vehicle on the basis of at least one of the rotating speeds of the wheels detected by said wheel speed detecting devices, and according to a predetermined estimation rule,
and wherein said vehicle speed estimating means includes noise detecting means for determining whether a noise is included in at least one of outputs of said plurality of wheel speed detecting devices, and rule changing means for changing said predetermined estimating rule according to an output of said noise detecting means.

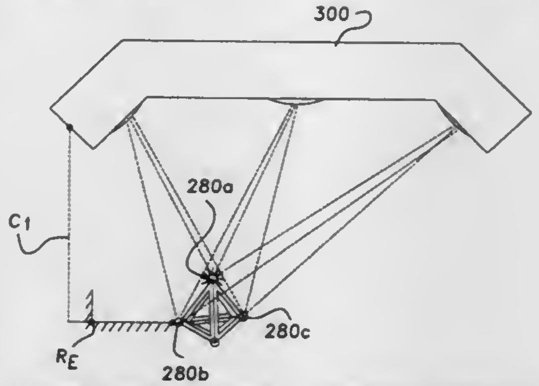
5,748,504
CALIBRATION METHOD FOR USE WITH ULTRASONIC FLOWMETERS
Peter Fletcher-Haynes, Lakewood, Colo., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Jun. 12, 1996, Ser. No. 662,080
Int. Cl.^{6} G01F *3/00*
U.S. Cl. 364—571.01 **20 Claims**


START
295
STOP REQ ?
YES
EXIT
NO
297
SET TO UP LOAD WUP
300
EXECUTE COUNT ROUTINE FOR UP
330
CALCULATE FLOW USING NEW UPCNT AND MOST RECENT DNCNT
335
TEST AND, IF NECESSARY, ADJUST CURRENT WINDOW
2970
SET TO DN LOAD WDN
3000
EXECUTE COUNT ROUTINE FOR DN
3300
CALCULATE FLOW USING NEW DNCNT AND MOST RECENT UPCNT
TEST AND, IF NECESSARY, ADJUST CURRENT WINDOW
3350

FLOW MEASUREMENT ROUTINE

10. A method for calibrating and using a fluid flow measuring apparatus of the type including first and second sound transducers for transmitting and receiving acoustic pulses along a path through said fluid, each of said transducers serving to transmit an acoustic output signal when driven by a suitable electrical input signal and to generate an AC output signal when driven by a suitable acoustic input signal, said apparatus having a first state in which said first transducer is a transmitting transducer and said second transducer is a receiving transducer, and a second state in which said second transducer is a transmitting transducer and said first transducer is a receiving transducer, including the steps of:
a) establishing a flow of said fluid through the apparatus at a first known flow rate;
b) for each of said first and second states, applying bursts of electrical drive pulses to the transmitting transducers, and deriving from the output signals of the receiving transducers upcount and downcount values indicative of the elapsed times between the drive pulses applied to the transmitting transducers and the zero crossings of the output signals of the receiving transducers;
c) storing said upcount and downcount values in a form that indicates the frequency of occurrence thereof;
d) applying to said stored upcount and downcount values at least one test to determine if said values have an acceptable distribution and, if said stored values pass said at least one test, using said stored values to determine a first calibration value for said apparatus;
e) establishing a flow of said fluid through said apparatus at a second known flow rate;
f) repeating step (b) for said second known flow rate;
g) using the results of step (f) to determine a second calibration value for said apparatus;
h) storing said first and second calibration values for use in calculating unknown flow rates from subsequently measured upcount and downcount values.

5,748,505
METHOD AND APPARATUS FOR CALIBRATING A NONCONTACT GAUGING SENSOR WITH RESPECT TO AN EXTERNAL COORDINATE SYSTEM
Dale R. Greer, Novi, Mich., assignor to Perceptron, Inc., Plymouth, Mich.
Filed Feb. 6, 1996, Ser. No. 597,281
Int. Cl.^{6} G01C *3/02*
U.S. Cl. 364—571.02 **33 Claims**

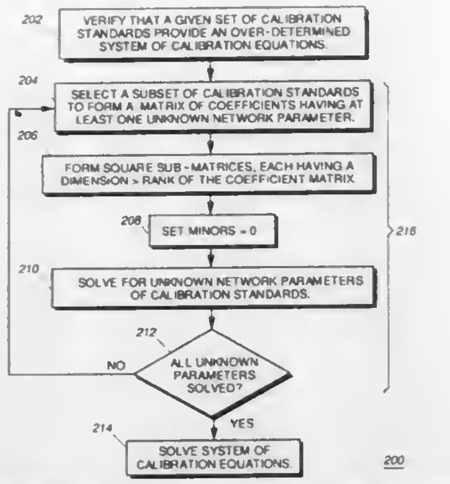


1. A sensor calibration system for calibrating a feature sensor with respect to an external reference frame, the feature sensor of the type having a sensing zone associated with a sensor reference frame comprising:
reference indicia disposed in fixed relation to said external reference frame;
a calibration sensor array having a calibration field of observation associated with an array reference frame, said calibration sensor array being positionable at vantage point such that said reference indicia is within the calibration field;
a reference target for placement within the observation field of said calibration sensor array and within the sensing zone of said feature sensor;
a coordinate translation system being adapted for coupling to said sensor array for collecting data from said reference indicia and for establishing a first relationship between the array reference frame and the external reference frame;
said coordinate translation system further being adapted for coupling to said sensor array and to said feature sensor for collecting data from the reference target and for establishing a second relationship between the array reference frame and the sensor reference frame; and
said coordinate translation system determining a third relationship between the external reference frame and the sensor reference frame, whereby the feature sensor is calibrated with respect to the external reference frame.

5,748,506
CALIBRATION TECHNIQUE FOR A NETWORK ANALYZER
David E. Bockelman, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed May 28, 1996, Ser. No. 653,861
Int. Cl.^{6} G01R *35/00*
U.S. Cl. 364—571.02 **20 Claims**

1. A method of calibrating a network analyzer, including the steps of:
providing and measuring sufficient calibration standards for an over-determined system of calibration equations; solving for unknown network parameters of the calibration standards utilizing the over-determined system of calibration equations by:

VOL 210
ISS 1
MY 5 1998
UMI


202
VERIFY THAT A GIVEN SET OF CALIBRATION STANDARDS PROVIDE AN OVER-DETERMINED SYSTEM OF CALIBRATION EQUATIONS.
204
SELECT A SUBSET OF CALIBRATION STANDARDS TO FORM A MATRIX OF COEFFICIENTS HAVING AT LEAST ONE UNKNOWN NETWORK PARAMETER.
206
FORM SQUARE SUB-MATRICES, EACH HAVING A DIMENSION > RANK OF THE COEFFICIENT MATRIX.
208
SET MINORS = 0
210
SOLVE FOR UNKNOWN NETWORK PARAMETERS OF CALIBRATION STANDARDS.
212
ALL UNKNOWN PARAMETERS SOLVED?
NO
YES
214
SOLVE SYSTEM OF CALIBRATION EQUATIONS.
216
200

selecting a matrix of coefficients from the over-determined system of calibration equations;

forming minors from the matrix of coefficients;

setting the minors equal to zero; and

solving for the unknown network parameters of the calibration standards; and

calibrating the network analyzer using the solved-for network parameters and the system of calibration equations.

5,748,507

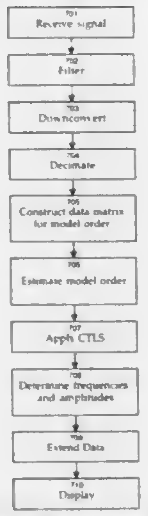
REAL-TIME SUPERRESOLUTION SIGNAL PROCESSING

Theagenis J. Abatzoglou, Cupertino; Lawrence K. Lam, San Jose; Homayoun Malek, Los Gatos, and John T. Reagan, Mountain View, all of Calif., assignors to Lockheed Martin Corporation, Sunnyvale, Calif.

Filed Aug. 6, 1996, Ser. No. 689,509

Int. Cl.^{6} H03M ***1/06***

U.S. Cl. 364—572 **10 Claims**



1. A superresolution signal processing method, comprising:

(a) receiving a signal;

(b) filtering the received signal through a plurality of filters to obtain a plurality of filtered signals;

(c) downconverting the filtered signals;

(d) estimating component frequencies and amplitudes of each filtered signal by:

(d.1) constructing a data matrix for model order estimation;

(d.2) performing model order estimation using the constructed data matrix;

(d.3) applying constrained total least squares to obtain a polynomial with a plurality of linear prediction coefficients;

(d.4) determining the roots of the obtained polynomial to obtain frequencies; and

(d.5) determining amplitudes of the obtained frequencies; and

e) outputting the estimated component frequencies and amplitudes of each filtered signal.

5,748,508

METHOD AND DEVICE FOR SIGNAL ANALYSIS, PROCESS IDENTIFICATION AND MONITORING OF A TECHNICAL PROCESS

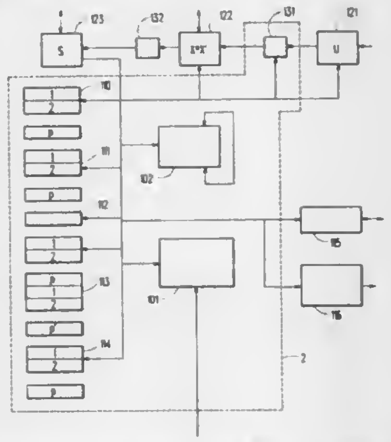
Michael-Alin Baleanu, Romerhofweg 47, D-85748 Garching, Germany

Filed Jun. 23, 1995, Ser. No. 494,594

Claims priority, application Germany, Dec. 23, 1992, 42 43 882.9

Int. Cl.^{6} G05B ***13/04;*** **G06F** ***17/15***

U.S. Cl. 364—578 **10 Claims**



1. Device for carrying out consistent, expanded, fast and collinearity-free multiple regression in recursive form, for the purpose of the analysis or control of a technical process, comprising:

a processor (**2**) calculating the best Q regression models from data in a memory for the correlation matrix (**123**) which can be obtained via the unit for correlation calculation (**132**) from the memory (**122**) for the covariance matrix, and the memory for the regressor variances (**115**) entered or calculated beforehand, which are utilized for correction of the diagonal elements of the correlation matrix, and

that the regression models are classified in terms of their residue variance by the regression unit (**102**) of the processor (**2**), which is bus-controlled by the control and addressing unit (**101**), the residual variance of the model, regressor numbers and coefficients being deposited in the memory (**116**) provided for that purpose, and

that a locking memory (**110**), a memory for the diagonal elements and the dependent column of the regression matrix (**111**), a memory for the recursion matrix (**113**) with the offset-memory (**112**) belonging to the recursion matrix and a memory for the regression numbers (**114**) are provided for the realization of the recursive method, and

that the regression unit (**102**) must perform several actions for the recursion level p, including

that first of all those regressors are determined which make a small contribution to the model, and if necessary the regressors are locked (**110**), the offset for the recursion matrix is stored (**112**), the regressor rows of the new recursion matrix (**113**) and the new diagonal elements and the dependent column (**111**) are calculated, and the residual regressor numbers (**114**) stored,

that those regressors, located within the collinearity cone of the current model, are determined and locked (**110**) with the help of the data from the memory for the regressor variances (**115**),

that the most significant regressor from those remaining is searched, that regressor is selected which yields the model with the smallest residual variance and at the same time passes the F test known from statistics, and

that, in the event of an unsuccessful search, the residual variance of the current model is utilized for the classification of this model between the best Qs, with the help of the residual variances of the models (**116**) already found, in which case, if the residual variance is smaller or equal to the largest stored residual variance, or currently less than Q models were found, the residual variance, the regression numbers and coefficients are stored in memory for the best models (**116**), and thereafter the regression unit (**102**) returns to the recursion level p−1, and its context is loaded from the corresponding memories (**110** through **114**),

that, in the event of a successful search for a significant regressor, the group of regressors within the collinearity cone of the best regressor is found with the values of the regressor variances (**115**),

that each of these regressors is incorporated into the model individually, one after the other, while the remaining ones from the collinear group remain locked (**110**), and with the precondition that none of the regression coefficients already found undergoes a sign change, the rows of the recursion matrix (**113**) for the new regressor and the new diagonal elements and the dependent column (**111**) are calculated and the recursion level p+1 selected,

that, after processing of the collinear regressors, the change is made to the recursion level p−1, its context being loaded from the corresponding memories (**110** through **114**).

5,748,509

ANALYSING A MATERIAL SAMPLE

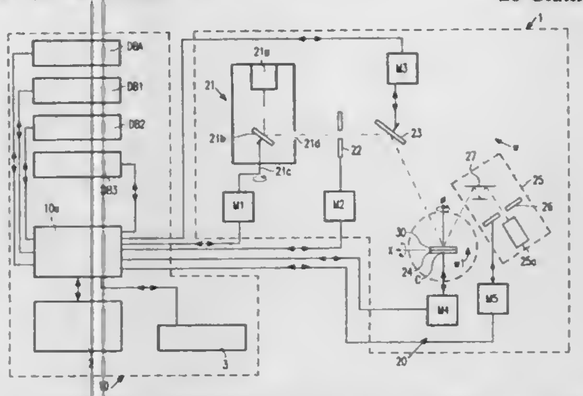
Paul F. Fewster, Brighton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 26, 1995, Ser. No. 495,054

Claims priority, application United Kingdom, Jun. 25, 1994, 9412839; Jan. 19, 1995, 9500999

Int. Cl.^{6} G06F ***15/20***

U.S. Cl. 364—578 **20 Claims**



2. A method for designing an experiment for analysing a material sample using radiation, comprising the following steps

using a computer system having a data base of analytical procedures for analysing a material sample by causing radiation to be incident on the sample and detecting radiation leaving the sample, and executing the following steps in the computer system,

requesting a user to input to the computer system information for identifying at least one desired parameter of the material sample which is of interest to the user,

determining from the information input by the user which of the analytical procedures in the data base may be used to obtain the desired information,

simulating at least one analytical procedure selected from the possible analytical procedures to produce a first simulation of radiation leaving the sample,

varying at least one desired parameter of interest to the user,

simulating the selected analytical procedure again after having varied the influence of the at least one desired parameter to produce a second simulation of radiation leaving the sample, and

comparing the first and second simulations to determine the area or areas where the difference between the first and second simulations is greatest to enable an experiment to be conducted in the area or areas most sensitive to the at least one desired parameter.

5,748,510

MULTIPLICATION CIRCUIT WITH SERIALLY CONNECTED CAPACITIVE COUPLINGS

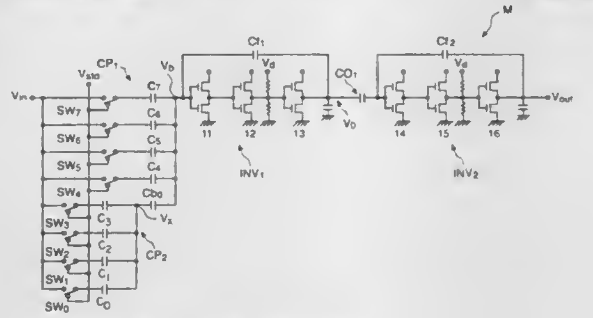
Guoliang Shou; Kazunori Motohashi; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Sep. 29, 1995, Ser. No. 536,244

Claims priority, application Japan, Sep. 30, 1994, 6-261615; Aug. 9, 1995, 7-224714

Int. Cl.^{6} G06J ***1/00***

U.S. Cl. 364—606 **2 Claims**



1. A multiplication circuit, comprising:

a plurality of switches which receive a common analog input voltage and a reference voltage, and alternatively output one of the analog input voltage and the reference voltage;

a first capacitive coupling having a first plurality of capacitors, each of said first plurality of capacitors being connected to a respective one of said switches;

a second capacitive coupling having a second plurality of capacitors, each of said second plurality of capacitors being connected to a respective one of said switches; and

a connecting capacitor, wherein one or more of said first capacitors in said first capacitive coupling is connected through said connecting capacitor to the second capacitive coupling.

5,748,511

MULTIPURPOSE HANDHELD ELECTRONIC COMPUTER

Silvano Mansutti, and Roberto Cardin, both of Padova, Italy, assignors to 4P S.r.l., Padova, Italy

PCT No. PCT/EP94/03333, § 371 Date Jun. 7, 1995, § 102(e) Date Jun. 7, 1995, PCT Pub. No. WO95/10810, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 10, 1994, Ser. No. 448,327

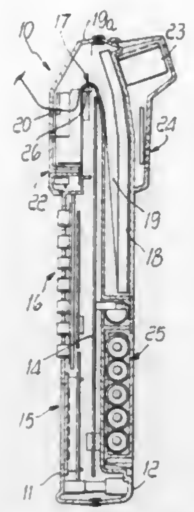
Claims priority, application Italy, Oct. 11, 1993, PD930114 U

Int. Cl.^{6} G06F ***1/16;3/00;13/00***

U.S. Cl. 364—708.1 **8 Claims**

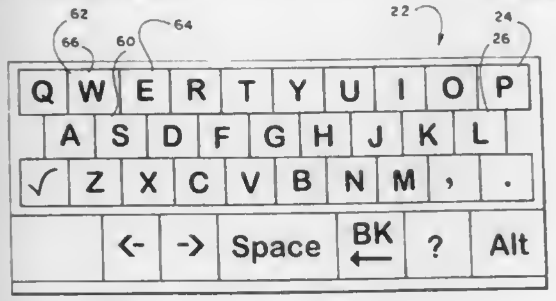
1. A multipurpose handheld electronic computer comprising, in a same box-like body (**10**), a keyboard (**16**), a display (**15**), a CPU (**14**), a work memory (**14**), a mass storage device (**14**), a communication port, single power supply means (**25**), a printer (**17**) accommodated in an openable compartment (**19**) of said body (**10**) and a bar code reader (**23**), said printer (**17**) and bar code reader (**23**) being both powered by said single power supply means (**25**), said printer printing on fanfold forms of single-copy or multi-copy paper, said fanfold forms of paper being housed into said box-like body, an out-of-paper and form-alignment sensor (**26**) being associated with said printer (**17**), said sensor (**26**) allowing said printer

/OL
2 10
ISS
1
MY
5
998
MI



to print said fanfold forms on multi-copy paper, pre-printed on the original and every attached copy.

5,748,512
ADJUSTING KEYBOARD
Garrett R. Vargas, San Carlos, Calif., assignor to Microsoft Corporation, Redmond, Wash.
Filed Feb. 28, 1995, Ser. No. 396,444
Int. Cl.^{6} G06F *3/00*
U.S. Cl. 364—709.12 **24 Claims**



1. A keyboard for a computer comprising:

a contact sensitive surface divided into areas to define keys for the keyboard wherein each key represents a character and the area of each key has a center point;

sensing means in conjunction with the contact sensitive surface for resolving contact with the contact sensitive surface to a contact point;

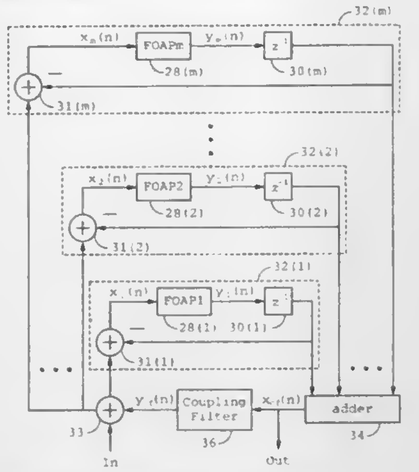
character selection means for selecting a character from the characters represented by the keys of the keyboard, the character selection means comprising:

contact point location means for determining the location of the contact point with respect to the nearest center points of a predetermined number of proximate keys and determining the distances of the contact point from the center points of each of the proximate keys;

occurrence frequency determination means for determining which character represented by the proximate keys has the greatest frequency of following a predetermined number of preceding characters previously selected by the character selection means; and

index calculation means for calculating a character index for each character represented by each proximate key as a function of the occurrence frequency and the distances of the contact point from the center points of each of the proximate keys.

5,748,513
METHOD FOR INHARMONIC TONE GENERATION USING A COUPLED MODE DIGITAL FILTER
Scott A. Van Duyne, Stanford, Calif., assignor to Stanford University, Stanford, Calif.
Filed Aug. 16, 1996, Ser. No. 699,126
Int. Cl.^{6} G06F *17/10*; G10H *1/12*
U.S. Cl. 364—724.17 **17 Claims**



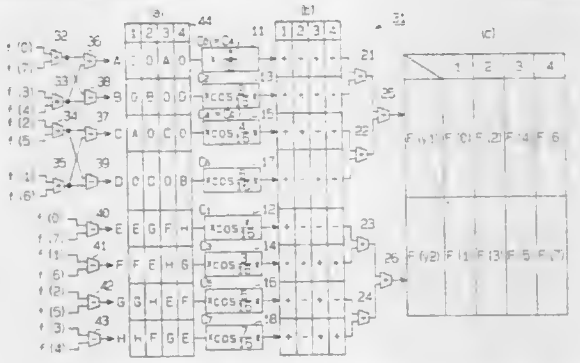
1. A coupled mode digital filter comprising:

a mode oscillator loop comprising a allpass filter and a delay, wherein the allpass filter is in series with the delay, wherein the mode oscillator loop is a negative feedback loop, and wherein the mode oscillator loop has a resonant mode at frequency f; and

a coupling filter adapted to attenuate signals at frequency f by a predetermined attenuation factor;

wherein the mode oscillator loop and the coupling filter are connected in series to form a positive feedback closed loop structure.

5,748,514
FORWARD AND INVERSE DISCRETE COSINE TRANSFORM CIRCUITS
Shigeyuki Okada, Hashima; Naoki Tanahashi, Gifu, and Hayato Nakashima, Gifu-ken, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Nov. 29, 1995, Ser. No. 564,480
Claims priority, application Japan, Nov. 30, 1994, 6-297350; Mar. 24, 1995, 7-066474; Oct. 27, 1995, 7-280926
Int. Cl.^{6} G06F *17/14*
U.S. Cl. 364—725.03 **27 Claims**



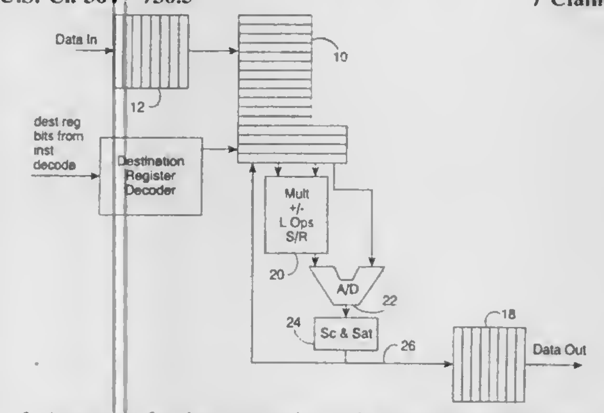
1. A one-dimensional inverse discrete cosine transform circuit comprising:

a group of multipliers for receiving plural pieces of input data externally supplied in parallel, each multiplier having a cosine constant to multiply with received input data; and

a group of adders/subtractors for receiving multiplication results from said multipliers and performing addition/subtraction thereon to produce output data, said output data being the results of an inverse discrete cosine transform of said input data;

wherein each of said multipliers is adapted to set a multiplication result to a positive value or a negative value in accordance with how said plural pieces of input data are distributed to said multipliers.

5,748,515
DATA PROCESSING CONDITION CODE FLAGS
Simon James Glass, and David Vivian Jaggar, both of Cherry Hinton, United Kingdom, assignors to Advanced RISC Machines Limited, Cambridge, United Kingdom
Filed Oct. 8, 1996, Ser. No. 727,225
Int. Cl.^{6} G06F *7/00;7/38*
U.S. Cl. 364—736.5 **7 Claims**



1. Apparatus for data processing, said apparatus comprising:

(i) a plurality of registers for storing data words to be manipulated, each of said registers having at least an N-bit capacity; and

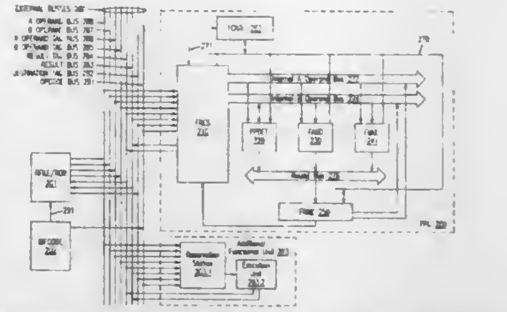
(ii) an arithmetic logic unit having an N-bit datapath and responsive program instruction words to perform arithmetic logic operations specified by said program instruction words; wherein

(iii) said arithmetic logic unit is responsive to at least one parallel operation program instruction word that separately performs a first arithmetic logic operation upon a first (N/2)-bit input operand data word and a second arithmetic logic operation upon a second (N/2)-bit input operand data word; and

(iv) said arithmetic logic unit sets a first set of condition code flags in dependence upon said first arithmetic logic operation and sets a second set of condition code flags in dependence upon said second arithmetic logic operation, wherein said arithmetic logic unit is responsive to a conditional select instruction that moves one of a first (N/2)-bit input operand data word stored in a first source register and a first (N/2)-bit input operand data word stored in a second source register to a destination register of said plurality of registers in dependence upon said first set of condition flags and moves one of a second (N/2)-bit input operand data word stored in a first source register and a second (N/2)-bit input operand data word stored in a second source register to said destination register in dependence upon said second set of condition flags.

5,748,516
FLOATING POINT PROCESSING UNIT WITH FORCED ARITHMETIC RESULTS
Michael D. Goddard, and Kelvin D. Goveas, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Sep. 26, 1995, Ser. No. 533,812
Int. Cl.^{6} G06F *7/00*
U.S. Cl. 364—748.03 **17 Claims**

1. A floating point processing unit comprising:



an arithmetic unit coupled between a floating point operand source and a round bus, said arithmetic unit being responsive to a normal result indication;

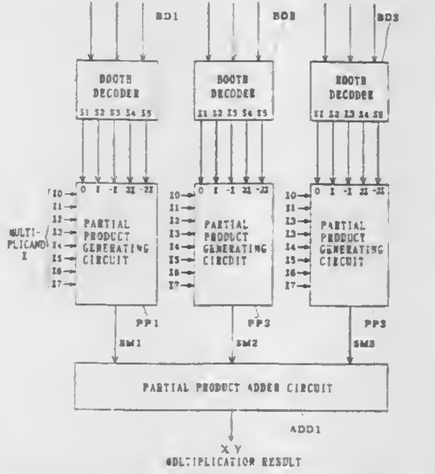
operand passing logic coupled between said floating point operand source and said round bus, said operand passing logic being responsive to a pass operand indication;

rounding logic coupled between said round bus and a result bus;

a forced result store coupled at an output port of said rounding logic to supply forced results without rounding in response to a forced result indication; and

operand characterization and control logic coupled to a floating point instruction source, to said arithmetic unit, to said operand passing logic, and to said forced result logic, wherein said control logic supplies one of said normal result indication, said pass operand indication, and said forced result indication, said pass operand indication and said forced result indication being supplied in response to respective first and second sets of predetermined combinations of floating point instructions and operand characterizations.

5,748,517
MULTIPLIER CIRCUIT
Nobuhiro Miyoshi, and Kazuya Yamanaka, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan
Filed Nov. 22, 1995, Ser. No. 562,100
Claims priority, application Japan, Feb. 24, 1995, 7-036911
Int. Cl.^{6} G06F *7/52*
U.S. Cl. 364—760.01 **5 Claims**



1. A multiplier circuit for generating a plurality of partial products of a multiplier Y and a multiplicand X by Booth's algorithm and adding the plurality of partial products to obtain a multiplicand result XY of said multiplier Y and said multiplicand X, comprising:

decode means receiving said multiplier Y for decoding said multiplier Y to output a plurality of partial product information groups indicating kinds of the partial products with said multiplicand X, said plurality of partial product information

/OL
2 10
SS
1
MY
5
998
MI

groups having a plurality of partial product information provided in a one-to-one correspondence for each kind of partial product, respectively;

partial product generating means receiving said multiplicand X and said plurality of partial product information groups for generating the plurality of partial products of said multiplicand X and said multiplier Y on the basis of said plurality of partial product information groups; and

partial product adding means receiving said plurality of partial products and adding said plurality of partial products to output said multiplication result XY;

wherein

in each of said plurality of partial product information groups, a piece of information in said plurality of partial product information is partial product **0**X information indicating whether the partial product is **0**X of multiplying the multiplicand X by 0 or not, and

said partial product adding means includes a plurality of adders each for performing an adding processing of its one input and another input, further receives a plurality of said partial product **0**X information in said plurality of partial product information groups, recognizes partial products of "0" from said plurality of partial products on the basis of said plurality of partial product **0**X information and, without effectively operating the 0 input adder of said plurality of adders receiving said recognized "0" partial product as one input in said plurality of adders, performs the adding processing in the other adders while outputting the other input of said 0 input adders directly as the outputs of said 0 input adders.

5,748,518
DATA PROCESSING DIVIDER

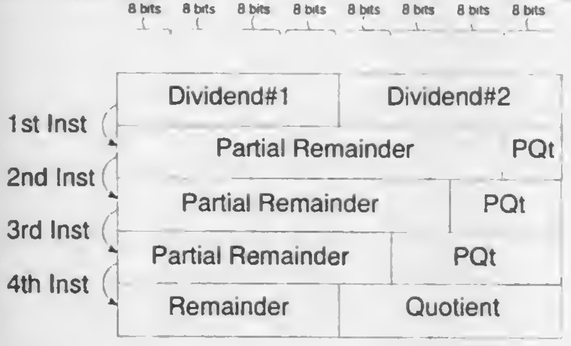
David Vivian Jaggar, Cherry Hinton, United Kingdom, assignor to Advanced Risc Machines Limited, Cherry Hinton, United Kingdom

Filed Aug. 3, 1995, Ser. No. 510,712

Claims priority, application United Kingdom, Dec. 21, 1994, 9425786

Int. Cl.^{6} G06F *7/52;9/302*

U.S. Cl. 364—764 **13 Claims**



1. Apparatus for processing data in response to instruction codes, said apparatus comprising:

a dedicated divider circuit responsive to a plurality of different divide instruction codes received from an instruction decoder to generate respective multi-bit portions of an X-bit quotient from a Y-bit dividend and a Z-bit divisor, each different divide instruction code corresponding to a respective different multi-bit portion of said X-bit quotient.

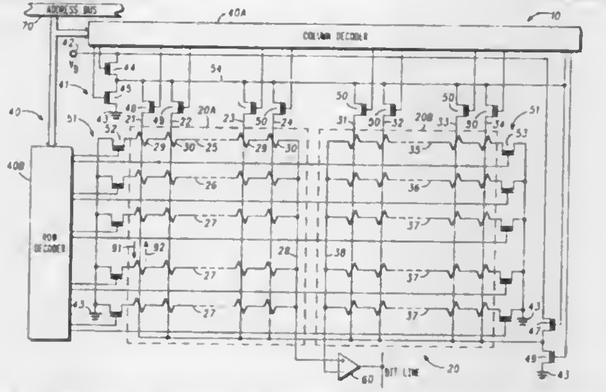
5,748,519
METHOD OF SELECTING A MEMORY CELL IN A MAGNETIC RANDOM ACCESS MEMORY DEVICE

Saied N. Tehrani, and Herbert Goronkin, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 13, 1996, Ser. No. 766,637

Int. Cl.^{6} H01L *21/78*

U.S. Cl. 365—98 **15 Claims**



6. A method of selecting a memory cell in a magnetic random access memory device having a plurality of memory cells arrayed on intersections of word lines and sense lines, comprising the steps of:

providing a sense current in the sense line;

providing a first word current in the word line;

comparing a potential on the sense line with a reference potential to provide an output; and

repeating the step of providing the first word current in the next word line and the step of comparing the potential on the sense line with the reference potential to provide the output.

5,748,520
SEMICONDUCTOR MEMORY DEVICE HAVING MINIMAL LEAKAGE CURRENT

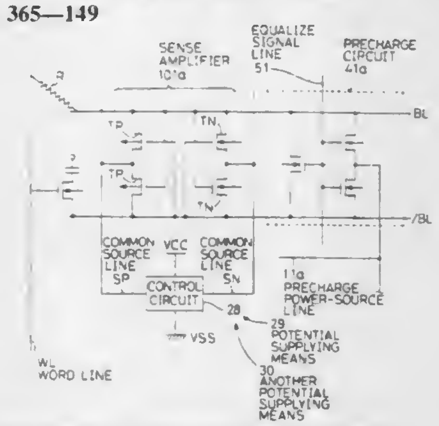
Hideo Asaka, and Hiroyuki Yamauchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co.Ltd., Osaka, Japan

Division of Ser. No. 420,875, Apr. 13, 1995, Pat. No. 5,594,701. This application Oct. 31, 1996, Ser. No. 741,618

Claims priority, application Japan, Apr. 15, 1994, 6-077513

Int. Cl.^{6} G11C *11/24*

U.S. Cl. 365—149 **2 Claims**



1. A semiconductor memory device comprising:

a memory cell including a capacitor and a transistor;

a word line for controlling the transistor of said memory cell;

a pair of bit lines onto which a signal is read from said memory cell:

a sense amplifier of flip-flop type including a first transistor of the conductivity type opposite to that of the transistor of said memory cell and a second transistor of the same conductivity type as that of the transistor of said memory cell, said sense amplifier operative for amplifying the signal read onto said pair of bit lines; and

two common source lines connected to the first and second transistors of said sense amplifier, respectively, so as to supply a specified potential to the corresponding transistor, said semiconductor memory device further comprising:

a potential supplying means for supplying, during a period in which said sense amplifier and said word line are inactive, a potential for cutting off said first transistor to the common source line connected to the first transistor, said potential being approximately equal to a potential of said word line which is inactive.

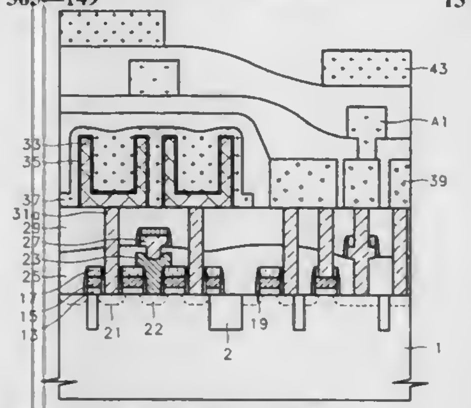
5,748,521
METAL PLUG CAPACITOR STRUCTURES FOR INTEGRATED CIRCUIT DEVICES AND RELATED METHODS

Kyu-pil Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 6, 1996, Ser. No. 746,129

Int. Cl.^{6} G11C *11/24;* H01L *27/108*

U.S. Cl. 365—149 **13 Claims**



1. A capacitor structure comprising:

a substrate;

an insulating layer on said substrate, said insulating layer having a contact hole therethrough extending from a surface of said substrate to a surface of said insulating layer opposite said substrate;

a metal plug in said contact hole wherein said metal plug comprises a conductive adhesion portion of a first material adjacent said substrate and a body portion of a second material on said conductive adhesion portion opposite said substrate wherein said first and second materials are different; and

a storage electrode on said insulating layer and in electrical contact with said metal plug so that said storage electrode is electrically connected to said substrate through said metal plug.

5,748,522
MEMORY ELEMENT OF THE MASTER-SLAVE FLIP-FLOP TYPE, CONSTRUCTED BY CMOS TECHNOLOGY

Christian Piguet, Neuchatel, and Jean-Marc Masgonty, Corcelles, both of Switzerland, assignors to Centre Suisse D'Electronique et de Microtechnique SA, Neuchatel, Switzerland

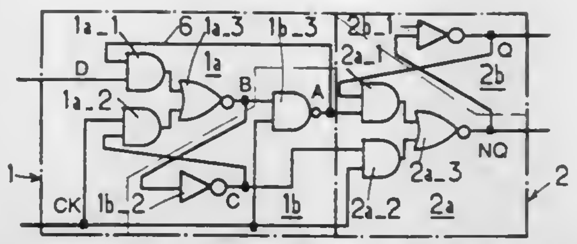
Filed Mar. 20, 1996, Ser. No. 618,970

Claims priority, application France, Mar. 21, 1995, 95 03280

Int. Cl.^{6} G11C *111/00*

U.S. Cl. 365—154 **25 Claims**

1. A master-slave flip-flop CMOS memory element able to transfer an input logic variable (D) to a true output variable (Q) and a complementary output variable (NQ) of the memory element under the control of a clock signal (CK), said memory element including a master flip-flop (**1**), a slave flip-flop (**2**) controlled by said master flip-flop by means of at least one transfer variable



(A,C) generated by said master flip-flop, said slave flip-flop (**2**) including a first gate (**2***a*) controlled by said at least one transfer variable (A,C), said clock signal (CK) and said true output variable (Q), so as to deliver said complementary output variable (NQ) at its output, and a second gate (**2***b*) controlled by said complementary output variable (NQ) and delivering said true output variable (Q) at its output, said master flip-flop (**1**) including a first gate (**1***a*) having inputs receiving said input logic variable (D), said clock signal (CK) and at least one third variable constituted by said at least one transfer variable (A,C) and having an output (B), said master flip-flop (**1**) also including a second gate (**1***b*) of inverting type controlled by the output (B) from said first gate (**1***a*) of the master flip-flop (**1**) and delivering at its output at least one of said transfer variables (A,C), wherein said first gate (**2***a*) of said slave flip-flop (**2**) includes, in order to accomplish the transfer of said input signal, not more than seven transistors.

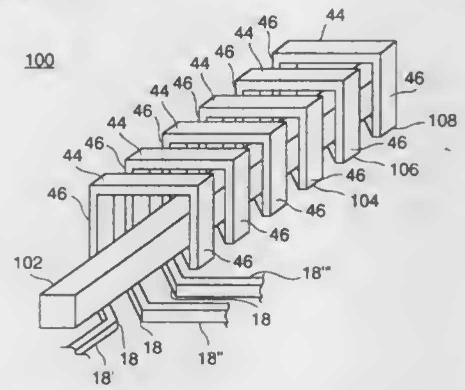
5,748,523
INTEGRATED CIRCUIT MAGNETIC MEMORY ELEMENT HAVING A MAGNETIZABLE MEMBER AND AT LEAST TWO CONDUCTIVE WINDING

Michael E. Thomas, Milpitas, and Irfan Saadat, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 654,798, May 29, 1996, abandoned, which is a continuation of Ser. No. 351,758, Dec. 8, 1994, abandoned, which is a continuation of Ser. No. 942,957, Sep. 10, 1992, abandoned. This application Jan. 22, 1997, Ser. No. 787,364

Int. Cl.^{6} G11C *11/155*

U.S. Cl. 365—171 **7 Claims**



2. A memory element comprising:

(a) a magnetizable member formed on a substrate;

(b) at least two conductive windings formed on said substrate and disposed substantially encompassing said magnetizable member, each of said conductive windings having a first end and a second end, each of said windings being connected at said first and second ends thereof to a conductive line in a memory array; and

(c) a sense conductive member formed on said substrate and disposed in proximity to said magnetizable member and electrically connected to a sense line of said memory array,

wherein said windings have a common axis.

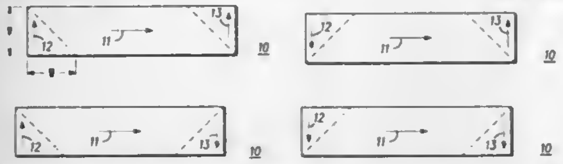
5,748,524
MRAM WITH PINNED ENDS

Eugene Chen, Gilbert; Saied N. Tehrani, Tempe; Ronald N. Legge, Scottsdale, and Xiaodong T. Zhu, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1996, Ser. No. 701,355

Int. Cl.⁶ G11C *11/15*

U.S. Cl. 365—173 **16 Claims**



6. A multi-layer, magnetic memory cell comprising:

a first layer of magnetic material;

a layer of nonmagnetic material positioned on the first layer of magnetic material;

a second layer of magnetic material positioned on the layer of nonmagnetic material so as to form a magnetic memory cell;

the magnetic memory cell having a width and a length so as to define opposed ends generally parallel to the width adjacent opposed extremities of the length, with the width being less than a width of magnetic domain walls within the layers of magnetic material so as to restrict major magnetic vectors in the layers of magnetic material to point substantially along the length of the layers of magnetic material; and

means positioned adjacent to at least one of the ends of the magnetic memory cell to pin magnetic end vectors in the magnetic material at the one end in a fixed direction.

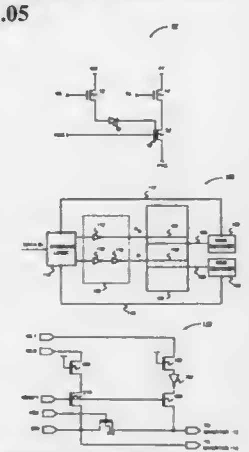
5,748,525
ARRAY CELL CIRCUIT WITH SPLIT READ/WRITE LINE

Jack T. Wong, Fremont; Fabiano Fontana, Santa Clara, and Susan Nguyen, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 379,102, Jan. 27, 1995, abandoned, which is a continuation of Ser. No. 137,434, Oct. 15, 1993, abandoned. This application May 6, 1996, Ser. No. 643,807

Int. Cl.⁶ G11C *16/06*

U.S. Cl. 365—185.05 **9 Claims**



1. An array cell circuit comprising:

a first transistor coupled to a write line for receiving a first control signal and for providing a second control signal, the first transistor having a source;

a second transistor having a floating gate, the source of the first transistor coupled to the floating gate of the second transistor, the second transistor being responsive to the second control signal and a third control signal so as to induce charges on the floating gate during a write cycle; and

a third transistor coupled to the second transistor for executing a read cycle, the third transistor also being coupled to a read line which is electrically isolated from the write line so as to minimize propagation delay of the array cell during the read cycle by reducing capacitance along the read line caused by the gate capacitance of the first transistor;

a row line driver circuit coupled to the read line, the row line driver circuit comprising first, second, and third inverters and being responsive to a read mode for driving the read line;

a row decoder circuit coupled to the write line, the row decoder circuit being responsive to a program mode for driving the write line; and

steering logic coupled between the row line driver circuit and the row decoder circuit, the steering logic comprising a first plurality of transistors and a fourth inverter coupled to the third inverter of the row line driver circuit for driving a first row line, a second plurality of transistors coupled to the second and third inverters of the row line driver circuit for driving a second row line, and a fourth transistor coupling the first plurality of transistors to the second plurality of transistors at first and second common nodes.

5,748,526
CIRCUIT FOR REPAIR OF FLASH MEMORY CELLS AND A METHOD OF REPAIR

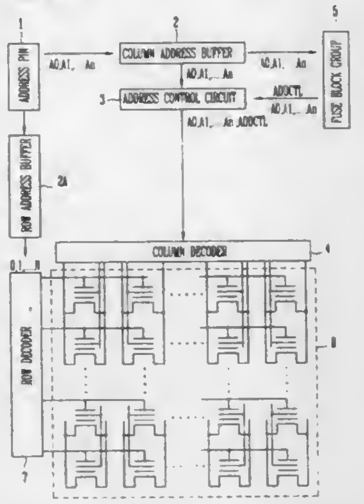
Jong Oh Lee, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Aug. 15, 1996, Ser. No. 698,514

Claims priority, application Rep. of Korea, Aug. 17, 1995, 95-25228

Int. Cl.⁶ G11C *16/04*

U.S. Cl. 365—185.09 **6 Claims**



1. A circuit for repair of flash memory cell comprising:

a column address buffer to which external addresses are input from an address pin;

an address control circuit to which external addresses via said column address buffer, internal addresses and address control signals generated from a fuse block group are inputted;

a column decoder for selecting a proper bit line at the time of each operation mode, said column decoder receiving an output of said address control circuit;

a row address buffer to which said external addresses outputted from said address pin is inputted;

a row decoder to which said external addresses through said row address buffer in inputted; and

a group of flash memory cells connected between said column decoder and row decoder.

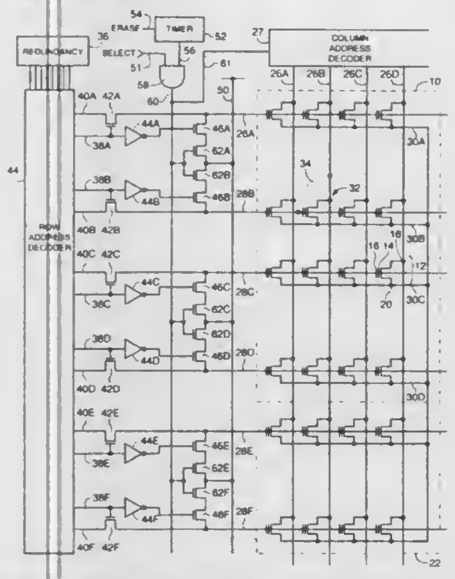
5,748,527
NONVOLATILE MEMORY HAVING TRANSISTOR REDUNDANCY

Roger R. Lee, and Fernando Gonzalez, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 393,578, Feb. 23, 1995, Pat. No. 5,559,742. This application Sep. 24, 1996, Ser. No. 710,917

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—185.09 **22 Claims**



1. A method of programming a nonvolatile memory array, said memory array comprising at least primary and redundant conductive lines each having memory elements therealong, said method comprising the steps of:

preprogramming all said memory elements along said primary and said redundant conductive lines;

subsequent to said step of preprogramming, erasing all said memory elements along said primary and redundant conductive lines; and

selecting a unique redundant signal path associated with said redundant conductive line to selectively program said memory elements along said redundant conductive line, wherein said memory elements along said primary conductive line are not read during any read cycle.

5,748,528
EEPROM MEMORY DEVICE WITH SIMULTANEOUS READ AND WRITE SECTOR CAPABILITIES

Giovanni Campardo, Bergamo; Lorenzo Bedarida, Vimercate; Giuseppe Fusillo, and Andrea Silvagni, both of Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed May 3, 1996, Ser. No. 642,813

Claims priority, application European Pat. Off., May 5, 1995, 95830183

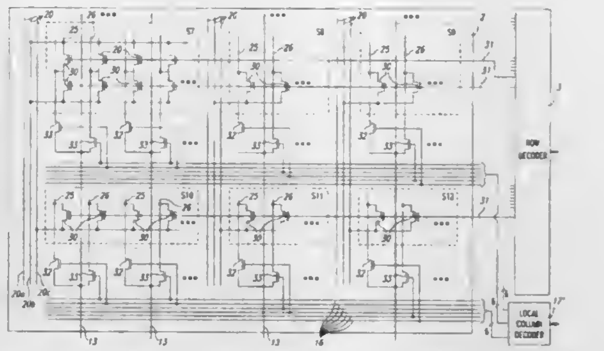
Int. Cl.⁶ G11C *16/06*

U.S. Cl. 365—185.13 **27 Claims**

1. A memory device comprising a number of memory cells grouped into a plurality of sectors,

each sector having a respective common source line;

all of the memory cells in a sector coupled to the respective common source line;



wherein the memory device comprises means for simultaneously addressing at least two said sectors of said memory array.

5,748,529
INTEGRATED CIRCUIT MEMORY DEVICES HAVING DIRECT READ CAPABILITY

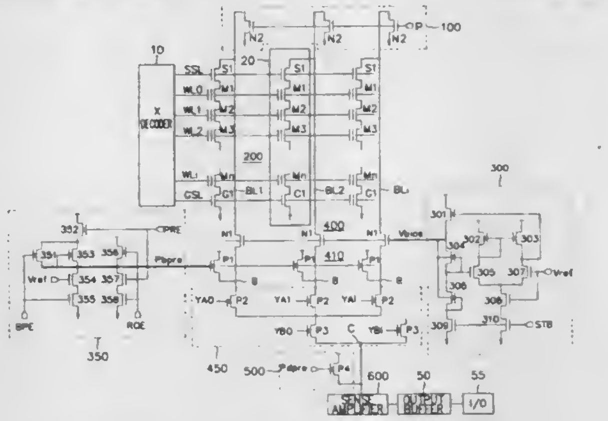
Hyong-Gon Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 14, 1996, Ser. No. 749,332

Claims priority, application Rep. of Korea, Nov. 15, 1996, 95-41506

Int. Cl.⁶ G11G *16/06*

U.S. Cl. 365—185.17 **18 Claims**



1. An integrated circuit memory device, comprising:

an array of memory cells arranged as a plurality of pages of memory cells electrically coupled to a respective plurality of word lines and a plurality of columns of memory cells electrically coupled to a respective plurality of bit lines;

means, electrically coupled to the plurality of bit lines, for precharging the plurality of bit lines in response to a first precharge signal;

a column selection circuit, electrically coupled to the plurality of bit lines, to selectively connect each of the plurality of bits lines one-at-a-time to an output thereof in response to a column address signal;

means, coupled to the output of the column selection circuit, for precharging the output of the column selection circuit in response to a second precharge signal; and

means, coupled to the output of the column selection circuit, for sensing a potential of the output of said column selection circuit and amplifying the sensed potential to first or second binary logic potentials which indicate a state of a memory cell in said array.

5,748,530
NON-VOLTILE MEMORY DEVICE, NON-VOLATILE MEMORY CELL AND METHOD OF ADJUSTING THE THRESHOLD VALUE OF THE NON-VOLATILE MEMORY CELL AND EACH OF PLURAL TRANSISTORS

Hiroshi Gotou, and Toshifumi Asakawa, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

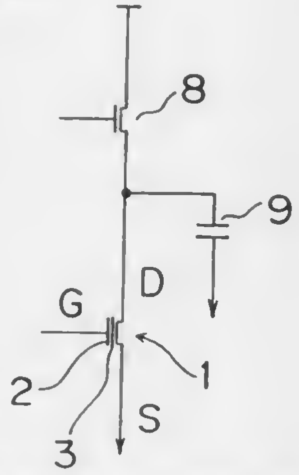
PCT No. PCT/JP94/00759, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/27295, PCT Pub. Date Nov. 24, 1994

PCT Filed May 11, 1994, Ser. No. 381,944

Claims priority, application Japan, May 11, 1993, 5-109573; Aug. 25, 1993, 5-210295; Nov. 29, 1993, 5-298103; Dec. 24, 1993, 5-327213

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.18 **61 Claims**



1. A non-volatile semiconductor memory device comprising:

a memory cell comprising a source, a drain, a floating gate and a control gate;

means for setting either one of the source and drain of the memory cell in a floating state at a potential higher than the potential of the other; and

means for applying a signal varying between a first potential and a second potential to the control gate of said memory cell to reduce charges stored in said floating gate,

wherein the second potential of said signal applied to said control gate is applied after the first potential is applied.

5,748,531
COMMON SOURCE LINE CONTROL CIRCUIT FOR PREVENTING SNAP BACK BREAKDOWN

Byeng-Sun Choi, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 28, 1996, Ser. No. 672,663

Claims priority, application Rep. of Korea, Jun. 30, 1995, 18962/1995; Dec. 7, 1995, 47558/1995

Int. Cl.^{6} G11C *11/34;7/00*

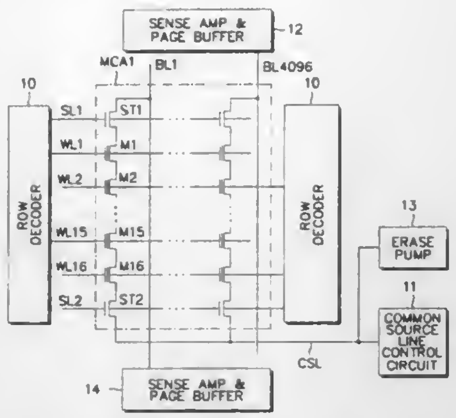
U.S. Cl. 365—185.18 **20 Claims**

1. A circuit for controlling a common source line in a semiconductor memory device, the circuit comprising:

a first transistor coupled between the common source line and a ground node;

a second transistor coupled between the first transistor and the ground node; and

a resistor coupled in series with the first transistor to reduce the voltage across the first transistor, thereby preventing snap back breakdown.



5,748,532
SEMICONDUCTOR NONVOLATILE MEMORY DEVICE AND COMPUTER SYSTEM USING THE SAME

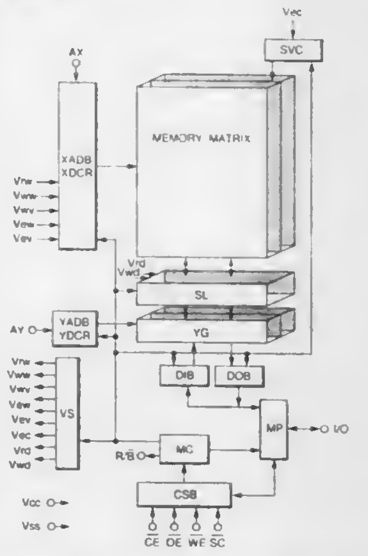
Toshihiro Tanaka, Akiruno; Masataka Kato, Koganei; Katsutaka Kimura, Akishima; Tetsuya Tsujikawa, Hamura; Kazuyoshi Oshima, Ome, and Kazuyuki Miyazawa, Hidaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 677,842

Claims priority, application Japan, Jul. 10, 1995, 7-173089; Jun. 6, 1996, 8-144176

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.18 **33 Claims**



1. A semiconductor nonvolatile memory device comprising:

a plurality of word lines;

a plurality of memory cells each of which has a control gate and a floating gate and which stores data as a threshold voltage;

an external data terminal to which data is applied; and

one external supply voltage terminal to which a positive supply voltage is applied,

wherein each of said plurality of memory cells is coupled to a corresponding word line of said plurality of word lines, and

wherein a read voltage to be applied to a selected word line in a read operation for outputting, through said external data terminal, data of memory cells coupled to said selected word line is higher than 0 V and is lower than said positive supply voltage applied to said one external supply voltage terminal.

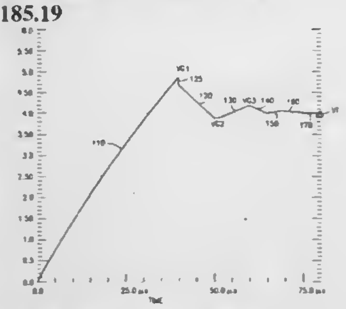
5,748,533
READ CIRCUIT WHICH USES A COARSE-TO-FINE SEARCH WHEN READING THE THRESHOLD VOLTAGE OF A MEMORY CELL

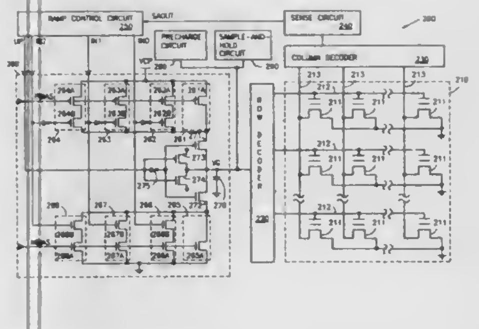
Frank M Dunlap, Palo Alto; Hock C. So, Redwood City, and Sau C. Wong, Hillsborough, all of Calif., assignors to inVoice Technology, Inc., Santa Clara County, Calif.

Filed Mar. 26, 1996, Ser. No. 622,332

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.19 **25 Claims**





1. A read circuit comprising:

a driver which is operable in a first mode to ramp up an output voltage which is applied to a gate in a selected memory cell during a read process and operable in a second mode to ramp down the output voltage which is applied to the gate in the selected memory cell during the read process;

a sense circuit which generates a first signal indicating whether the selected memory cell conducts a first current; and

a control circuit coupled to the sense circuit and the driver, wherein during the read process, the control circuit switches the driver between the first mode and second mode in response to changes in the first signal from the sense circuit.

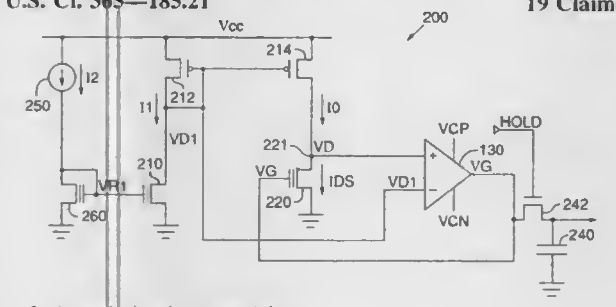
5,748,534
FEEDBACK LOOP FOR READING THRESHOLD VOLTAGE

Frank M. Dunlap, Palo Alto; Hock C. So, Redwood City, and Sau C. Wong, Hillsborough, all of Calif., assignors to Invox Technology, Campbell, Calif.

Filed Mar. 26, 1996, Ser. No. 622,333

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.21 **19 Claims**



1. A read circuit, comprising:

an amplifier;

means for connecting a node of a selected memory cell to an input terminal of the amplifier;

means for applying a current to the input terminal of the amplifier, the means for applying comprising:

a first transistor coupled between a supply voltage and the input terminal;

a second transistor having a gate and a drain coupled together and to the gate of the first transistor; and

a reference cell coupled in series with the second transistor between the supply voltage and ground; and

means for connecting an output terminal of the amplifier to a gate of the selected memory cell, wherein an output voltage of the amplifier, that is provided while the output terminal is connected to the gate and the input terminal is connected to the node, indicates a data value stored in the selected memory cell.

5,748,535
ADVANCED PROGRAM VERIFY FOR PAGE MODE FLASH MEMORY

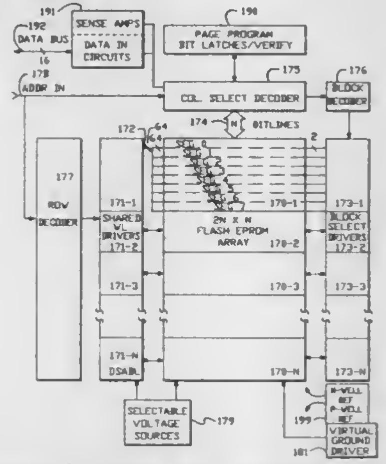
Tien-Ler Lin, Saratoga, Calif.; Kota Soejima; Jun Takahashi, both of Kawasaki, Japan; Chun-Hsiung Hung, Hsin-Chu, Taiwan; Kong-Mou Liou, San Jose, and Ray-Lin Wan, Milpitas, both of Calif., assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

PCT No. PCT/US95/00077, § 371 Date Mar. 4, 1996, § 102(e) Date Mar. 4, 1996, PCT Pub. No. WO96/21227, PCT Pub. Date Jul. 11, 1996

Continuation-in-part of Ser. No. 325,467, Oct. 26, 1994. This PCT application Jan. 5, 1995, Ser. No. 612,968

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—185.22 **26 Claims**



1. An apparatus for storing data, comprising:

a memory array having a plurality of floating gate cells;

supply circuits, coupled to the memory array, which apply voltages to the plurality of floating gate cells to read and program the plurality of floating gate cells in the memory array;

a plurality of bit latches, coupled to the memory array, which provide a buffer for storage of data to a set including at least a portion of a row of floating gate cells in the memory array;

control logic, coupled to the supply circuits and the bit latches, which controls the supply circuits to program the data in the plurality of bit latches to the set of floating gate cells; and

automatic data verify circuits, coupled to the memory array and the plurality of bit latches, which verify successful programming of the data to the set of floating gate cells in the memory array and provide a data verified signal when the row of plurality of floating gate cells pass data verify, the automatic data verify circuits including verify logic, coupled to the bit latches and floating gate cells in the memory array, which reads the memory data from the floating gate cells and resets the corresponding bit latches when the read data indicates a programmed state.

/OL
2 10
ISS
1
MY
5
998
MI

5,748,536
DATA READ CIRCUIT FOR A NONVOLATILE SEMICONDUCTOR MEMORY

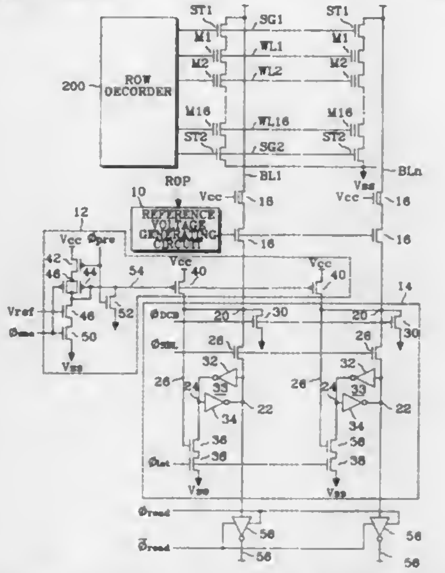
Suk-Chun Kwon, and Jim-Ki Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 28, 1996, Ser. No. 652,654

Claims priority, application Rep. of Korea, May 27, 1995, 13572/1995

Int. Cl.^{6} G11C *16/02*

U.S. Cl. 365—185.25 **22 Claims**



1. A data read circuit for a nonvolatile semiconductor memory having at least one bit line, and a plurality of memory transistors connected to said bit line, said circuit comprising:

at least one data sense line;

a precharge voltage circuit connected between said bit line and said data sense line, said precharge voltage circuit providing a precharge voltage on said bit line having a preselected precharge level;

a current supplying circuit which supplies a precharge current to said data sense line such that said bit line is precharged to said preselected precharge level in correspondence with said precharge voltage circuit, and which supplies a sense current to said data sense line such that the voltage variation of the bit line from said preselected precharge level based on data stored in a selected one of said memory transistors connected to said bit line is amplified in accordance with the corresponding voltage variation of said data sense line; and

a sense amplifier coupled to said data sense line which senses and latches said stored data according to said amplified voltage variation.

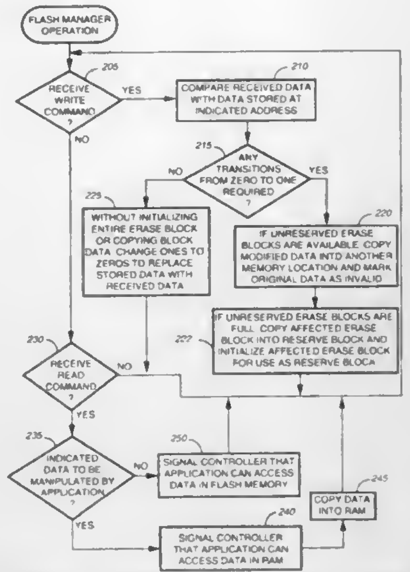
5,748,537
METHOD AND APPARATUS FOR STORING ITEMS IN FLASH MEMORY

Jeffrey Paul Garbers, 300 Buckingham Forest Ct., Roswell, Ga. 30075, and Dennis Drew Moseley, 313 Greenhouse Pkwy., Alpharetta, Ga. 30202

Filed Feb. 13, 1997, Ser. No. 799,907

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.33 **20 Claims**


FLASH MANAGER OPERATION
205
RECEIVE WRITE COMMAND ?
YES
NO
210
COMPARE RECEIVED DATA WITH DATA STORED AT INDICATED ADDRESS
215
ANY TRANSITIONS FROM ZERO TO ONE REQUIRED ?
NO
YES
225
WITHOUT INITIALIZING ENTIRE ERASE BLOCK OR COPYING BLOCK DATA CHANGE ONES TO ZEROS TO REPLACE STORED DATA WITH RECEIVED DATA
220
IF UNRESERVED ERASE BLOCKS ARE AVAILABLE COPY MODIFIED DATA INTO ANOTHER MEMORY LOCATION AND MARK ORIGINAL DATA AS INVALID
222
IF UNRESERVED ERASE BLOCKS ARE FULL COPY AFFECTED ERASE BLOCK INTO RESERVE BLOCK AND INITIALIZE AFFECTED ERASE BLOCK FOR USE AS RESERVE BLOCK
230
RECEIVE READ COMMAND ?
NO
YES
235
INDICATED DATA TO BE MANIPULATED BY APPLICATION ?
NO
250
SIGNAL CONTROLLER THAT APPLICATION CAN ACCESS DATA IN FLASH MEMORY
245
COPY DATA INTO RAM
YES
240
SIGNAL CONTROLLER THAT APPLICATION CAN ACCESS DATA IN RAM

16. A method for storing information in an electronic device including a flash memory, the method comprising the steps of:

storing an item in binary form in the flash memory at a location indicated by an address;

receiving a modified item to be stored in the location indicated by the address;

determining whether replacing the item with the modified item involves any bit transitions from zero to one; and

changing, when no bit transitions from zero to one are involved, selected bits in the location from one to zero to replace the item with the modified item without copying any of the information stored in the flash memory to a different memory location.

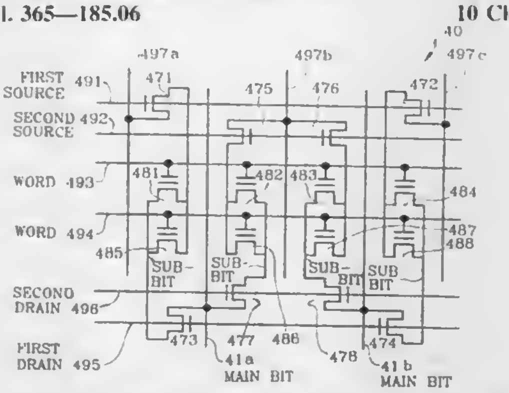
5,748,538
OR-PLANE MEMORY CELL ARRAY FOR FLASH MEMORY WITH BIT-BASED WRITE CAPABILITY, AND METHODS FOR PROGRAMMING AND ERASING THE MEMORY CELL ARRAY

Peter W. Lee, Saratoga, Calif.; Hsing-Ya Tsao, and Fu-Chang Hsu, both of Hsin-Chu, Taiwan, assignors to Aplus Integrated Circuits, Inc., Saratoga, Calif.

Continuation-in-part of Ser. No. 664,639, Jun. 17, 1996, and Ser. No. 676,066, Jul. 5, 1996. This application Nov. 14, 1996, Ser. No. 746,665

Int. Cl.^{6} G11L *16/00*

U.S. Cl. 365—185.06 **10 Claims**



9. A memory cell array comprising a matrix of basic circuits, each of said basic circuits including:

first and second word lines;

first and second drain control lines;

first and second main bit lines;

two rows and four columns of transistor cells, said transistor cells in each of said rows having gate terminals which are coupled to a respective one of said first and second word lines, said transistor cells in each of said columns having grounded source terminals, and drain terminals coupled to a respective one of first, second, third and fourth sub-bit lines;

a first drain control gate pair including first drain control gates with gate terminals coupled to said first drain control line, each of said first drain control gates further having a drain terminal coupled to a respective one of said first and third sub-bit lines, and a source terminal coupled to a respective one of said first and second main bit lines; and

a second drain control gate pair including second drain control gates with gate terminals coupled to said second drain control line, each of said second drain control gates further having a drain terminal coupled to a respective one of said second and fourth sub-bit lines, and a source terminal coupled to a respective one of said first and second main bit lines.

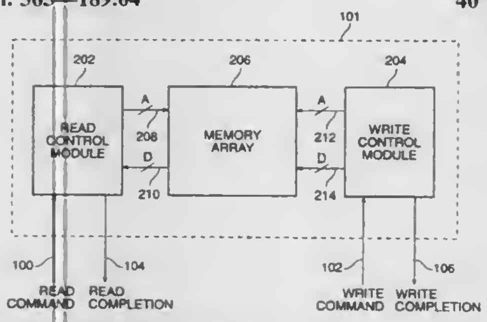
5,748,539
RECURSIVE MULTI-CHANNEL INTERFACE

Robert F. Sproull, Newton, Mass., and Ivan E. Sutherland, Santa Monica, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 5, 1997, Ser. No. 811,909

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.04 **40 Claims**



24. A memory system comprising:

a memory array; and

a first interface coupled to the memory array, the first interface comprising:

- a read command channel carrying read address, and coupled to the memory array,
- a write command channel carrying write address and write data, and coupled to the memory array,
- a read completion channel coupled to the memory array and carrying data read from the memory array, and
- a write completion channel coupled to the memory array and carrying a write completion signal,

wherein, the read command, write command, read completion, and write completion channels are independent channels permitting concurrent read and write operations.

5,748,540
PREVENTION OF ERRONEOUS OPERATION IN EQUALIZING OPERATION IN SEMICONDUCTOR MEMORY DEVICE

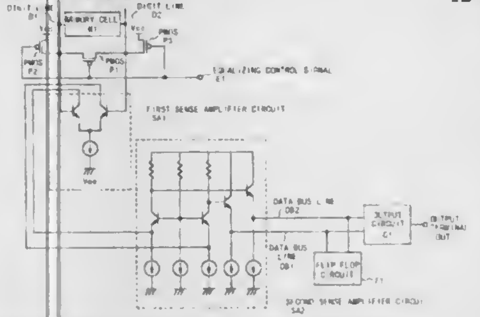
Michinori Sugawara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 18, 1996, Ser. No. 715,642

Claims priority, application Japan, Oct. 13, 1995, 7-291959

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **12 Claims**



1. A semiconductor memory device comprising:

a memory cell for storing data;

a sense amplifier amplifying the data read out from said memory cell to output the amplified data onto a pair of output signal lines in a complementary manner;

an output circuit connected to said pair of output signal lines, and outputting the data from the pair of output signal lines; and

a flip-flop circuit connected to the pair of output signal lines and connected in parallel to said output circuit, said flip-flop circuit becomes operable in response to an equalizing control signal.

5,748,541
LATCH CIRCUIT OPERATING IN SYNCHRONIZATION WITH CLOCK SIGNALS

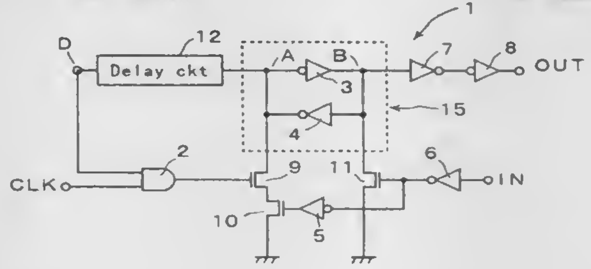
Koji Nii, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1996, Ser. No. 757,728

Claims priority, application Japan, May 16, 1996, 8-121741

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **20 Claims**



1. A latch circuit operating in synchronization with clock signals comprising:

a memory unit including a first inverter and a second inverter, the output terminal of said first inverter being connected to the input terminal of said second inverter and the output terminal of said second inverter being connected to the input terminal of said first inverter;

a first switching unit coupling the input terminal of said first inverter with the ground;

a second switching unit and a third switching unit connected together in series between the ground and the input terminal of said second inverter of said memory unit;

a first control unit for controlling said first switching unit according to binary data signals received from outside;

a second control unit for controlling said second switching unit according to said data signals;

a delay unit for transmitting, with delay, the signal level at the input terminal of said second inverter of said memory unit; and

a third control unit for controlling said third switching unit according to both the clock signals received from outside and the signal levels transmitted through said delay unit.

5,748,542
CIRCUIT AND METHOD FOR PROVIDING A SUBSTANTIALLY CONSTANT TIME DELAY OVER A RANGE OF SUPPLY VOLTAGES

Hua Zheng, and Jeffrey P. Wright, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Dec. 13, 1996, Ser. No. 766,745

Int. Cl.^{6} G11C *5/14*

U.S. Cl. 365—194 **23 Claims**

1. A circuit, comprising:

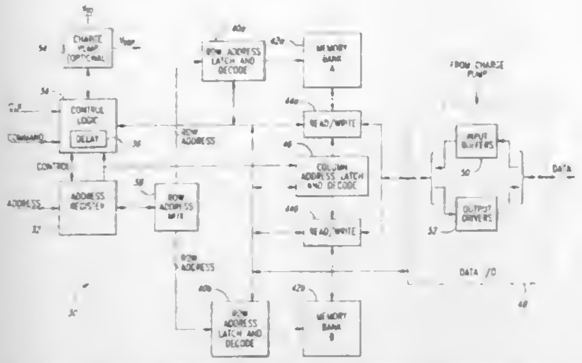
an input terminal operable to receive an input signal;

an output terminal operable to provide an output signal;

a supply terminal operable to receive a supply voltage;

a delay stage coupled between said input and output terminals, said delay stage operable to generate said output signal on said output terminal a predetermined delay time after receiving said input signal on said input terminal when said supply voltage has a predetermined value; and

VOL
210
ISS
1
MY
5
1998
UMI



a control stage coupled between said supply terminal and said delay stage, said control stage operable to regulate a supply current between said supply terminal and said delay stage such that the delay time of said delay stage remains substantially equal to said predetermined delay time as said supply voltage varies from said predetermined value.

5,748,543
SELF REPAIRING INTEGRATED CIRCUIT MEMORY DEVICES AND METHODS

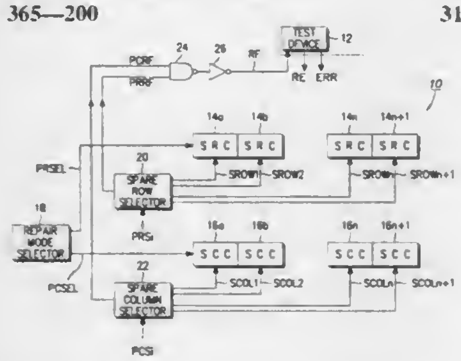
Sang-Bo Lee, Kyungki-do, and Soo-In Cho, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 29, 1996, Ser. No. 705,556

Claims priority, application Rep. of Korea, Aug. 31, 1995, 284131/1995

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—200 **31 Claims**



1. An integrated circuit memory device, comprising:

a plurality of normal memory cells;

a plurality of spare memory cells;

a plurality of spare substituting circuits, each of which is responsive to a defective normal memory cell address which is programmed therein, and which substitutes at least one spare memory cell for at least one defective normal memory cell which is located at the defective normal memory cell address which is programmed therein; and

sequential spare substituting circuit selecting means, connected to said plurality of spare substituting circuits and responsive to a defect indication signal from external to said integrated circuit memory device, for sequentially selecting a respective one of said spare circuits for programming with sequential ones of defective normal memory cell addresses.

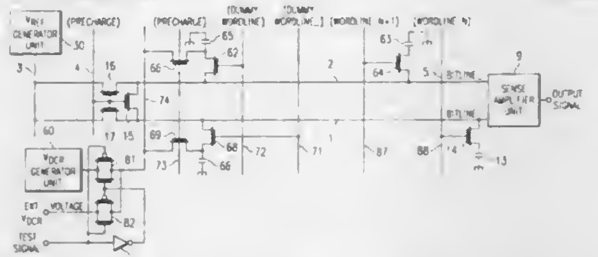
5,748,544
APPARATUS AND METHOD FOR REDUCING TEST TIME OF THE DATA RETENTION PARAMETER IN A DYNAMIC RANDOM ACCESS MEMORY

Masashi Hashimoto, Tsukaba, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 565,495, Nov. 30, 1995. This application Feb. 19, 1997, Ser. No. 801,984

Int. Cl.⁶ G11C *29/00*

U.S. Cl. 365—201 **2 Claims**



1. A storage cell in a dynamic random access memory, said storage cell comprising:

a sense amplifier;

a first and a second bitline coupled to said sense amplifier, said sense amplifier amplifying a difference in voltage between said first and said second bitline;

dummy capacitors coupled to both said first bitline and said second bitline;

a storage cell capacitor for storing a charge;

a switching means for controllably coupling said storage cell capacitor to said first or second bitline; and

a voltage generator charging said dummy capacitors to a first potential during operation of said storage cell, said voltage generator charging said dummy capacitors to a second potential during testing of said storage cell.

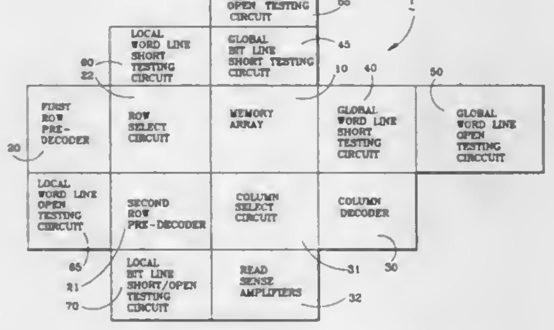
5,748,545
MEMORY DEVICE WITH ON-CHIP MANUFACTURING AND MEMORY CELL DEFECT DETECTION CAPABILITY

Peter W. Lee, Saratoga, Calif.; Hsing-Ya Tsao, and Fu-Chang Hsu, both of Hsin-Chu, Taiwan, assignors to Aplus Integrated Circuits, Inc., Saratoga, Calif.

Filed Apr. 3, 1997, Ser. No. 834,775

Int. Cl.⁶ G11C *7/00;8/00;29/00*

U.S. Cl. 365—201 **40 Claims**


GLOBAL BIT LINE OPEN TESTING CIRCUIT
55
1
LOCAL WORD LINE SHORT TESTING CIRCUIT
GLOBAL BIT LINE SHORT TESTING CIRCUIT
45
60
22
10
40
50
FIRST ROW PRE-DECODER
20
ROW SELECT CIRCUIT
MEMORY ARRAY
GLOBAL WORD LINE SHORT TESTING CIRCUIT
GLOBAL WORD LINE OPEN TESTING CIRCCUIT
LOCAL WORD LINE OPEN TESTING CIRCUIT
SECOND ROW PRE-DECODER
COLUMN SELECT CIRCUIT
COLUMN DECODER
65
21
70
LOCAL BIT LINE SHORT/OPEN TESTING CIRCUIT
READ SENSE AMPLIFIERS
31
30
32

1. A memory device with an on-chip manufacturing defect detection capability, comprising:

a memory array including a plurality of memory cells organized in rows and columns, a plurality of word lines interconnecting respectively said rows of said memory cells, and a plurality of bit lines interconnecting respectively said columns of said memory cells, one of said plurality of word lines and said plurality of bit lines being grouped into odd and even access lines, each of said even access lines being disposed between adjacent two of said odd access lines; and

a global access line short testing circuit including

first means connected to said even access lines and activable in a testing mode to pull said even access lines to a first logic state;

second means connected to said odd access lines and activable in the testing mode to pull said odd access lines to a second logic state opposite to the first logic state; and

a global access line short detector connected to one of said first and second means and activable in the testing mode to generate an output signal when said even access lines are pulled to the second logic state or when said odd access lines are pulled to the first logic state due to a short circuit between one of said even access lines and one of said odd access lines.

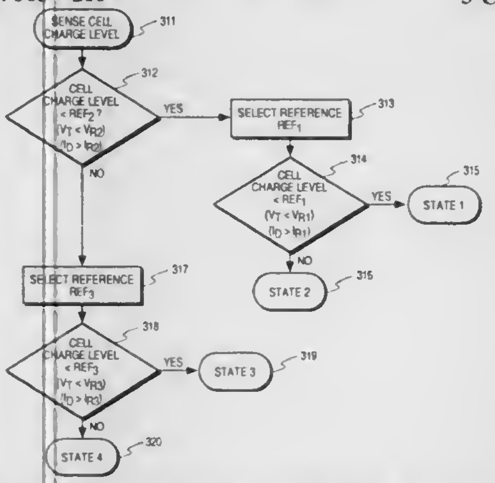
5,748,546
SENSING SCHEME FOR FLASH MEMORY WITH MULTILEVEL CELLS

Mark E. Bauer, Cameron Park; Sanjay Talreja, Folsom; Kevin W. Frary, Fair Oaks; Gregory Atwood, San Jose; Albert Fazio, Los Gatos, and Johnny Javanifard, Sacramento, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 728,094, Oct. 9, 1996, abandoned, which is a continuation of Ser. No. 252,680, Jun. 2, 1994, abandoned. This application Apr. 10, 1997, Ser. No. 827,670

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—210 **3 Claims**


SENSE CELL CHARGE LEVEL
311
CELL CHARGE LEVEL < REF₂? (V_T < V_{R2}) (I_D > I_{R2})
312
YES
NO
SELECT REFERENCE REF₁
313
CELL CHARGE LEVEL < REF₁ (V_T < V_{R1}) (I_D > I_{R1})
314
YES
STATE 1
315
NO
STATE 2
316
SELECT REFERENCE REF₃
317
CELL CHARGE LEVEL < REF₃ (V_T < V_{R3}) (I_D > I_{R3})
318
YES
STATE 3
319
NO
STATE 4
320

1. In a flash memory device including at least one flash electrically-erasable programmable read-only memory (EEPROM) cell having n bits indicative of 2^n states, each state corresponding to a predetermined range of cell charge levels, a method for determining a state of the flash EEPROM cell, the method comprising the steps of:

a) sensing a cell charge level of the flash EEPROM cell;

b) comparing using a first comparator the cell charge level of the flash EEPROM cell and a reference cell charge level of a selected first reference cell;

c) outputting from the first comparator a result of step b) indicative of a first one of the n bits in the flash EEPROM cell;

d) supplying the result of step b) to an input of a selector circuit, the selector circuit selecting one of a second reference cell and a third reference cell, wherein selection between the second and third reference cells is done in response to the result of step b), the second reference cell being selected if the cell charge level of the flash EEPROM cell is less than the reference cell charge level of the selected first reference cell, and the third reference cell being selected if the cell charge level of the flash EEPROM cell is greater than the reference cell charge level of the selected first reference cell;

e) comparing using a second comparator the cell charge level of the flash EEPROM cell to the selected one of a reference cell charge level of the second reference cell and a reference cell charge level of the third reference cell; and

f) outputting from the second comparator a result of step e) indicative of a second one of the n bits of the flash EEPROM cell wherein the first comparator continues to output the result of step b) while steps d), e), and f) are performed such that the first comparator outputs the first one of the n bits and the second comparator outputs the second one of the n bits simultaneously to indicate the state of the flash EEPROM cell.

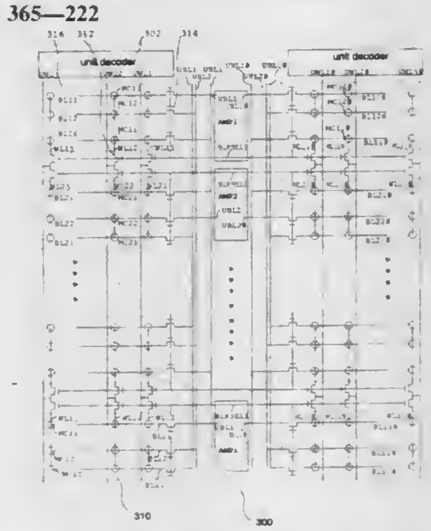
5,748,547
HIGH PERFORMANCE SEMICONDUCTOR MEMORY DEVICES HAVING MULTIPLE DIMENSION BIT LINES

Jeng-Jye Shau, 991 Amarillo Ave., Palo Alto, Calif. 94303

Filed May 24, 1996, Ser. No. 653,620

Int. Cl.⁶ G11C *00/00*

U.S. Cl. 365—222 **21 Claims**



1. A method for organizing 2M single-bit memory cells into 2N blocks, where M is a multiplication-product of N by I by J, and N, I and J are positive integers, the method comprising steps of:

(a) dividing said 2M single-bit memory cells into N pairs with each pair includes two symmetrical blocks where each of said block includes {J(j)×I} single-bit memory cells, and where j=1, 2, 3, . . . , N, and said positive integer I representing a bit length of a stored data;

(b) arranging said single-bit memory cells in each of said blocks into a J(j)-by-I two dimensional array and by connecting every I single memory cells with a first level bit line in a first bit-line direction and every J(j) single-memory cells by a first level word line wherein each said first level word lines and said first level bit lines intersect at one of said single-bit memory cells;

(c) connecting each of said I first level bit lines in each of said blocks to a corresponding multiple-block first level bit-lines, i.e., multiple-block bit-line-i where i=1, 2, 3, . . . I, wherein said multiple-block first-level bit lines being arranged in a second bit-line direction different from said first-bit line direction and each being connected to a corresponding cell-refreshing sense-amplifier-i where i=1, 2, 3, . . . I; and; (d) applying a block select signal to activate one of said J(j) first level word lines in one of said blocks, i.e., block-n where n is a positive integer ranging from 1 to N, and employing said I cell-refreshing sense amplifiers for detecting memory-cell signals from each of said first level I bit lines of said block n and a corresponding symmetrical block of said block-n, for reading data therefrom whereby said N blocks sharing said I cell-refreshing sense amplifiers.

VOL
210
SS
1
MY
5
998
MI

5,748,548

DEVICE FOR DETECTING A REDUCTION IN A SUPPLY VOLTAGE

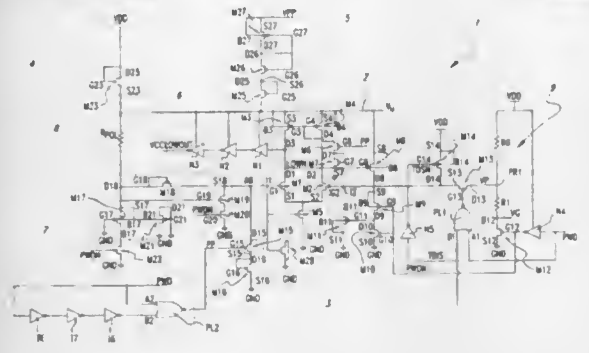
Silvia Padoan, Forli; Marco Olivo, Bergamo, and Carla Golla, Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 366,211, Dec. 22, 1994, Pat. No. 5,583,820. This application Sep. 9, 1996, Ser. No. 711,132

Claims priority, application European Pat. Off., Dec. 29, 1994, 93830537

Int. Cl.^{6} G11C *11/407*

U.S. Cl. 365—226 **9 Claims**



1. A circuit for detecting a threshold voltage in storage devices integrated to a semiconductor and for which a power supply above a certain value is provided, comprising:

a comparator connected between a voltage supply line and a signal ground, and having a first or reference input and a second or signal input, as well as an output terminal;

a generator of a stable voltage reference having an output connected to said first input and a supply voltage divider connected to the second input of the comparator and

means to feed said voltage supply line with the higher of the supply voltage value and the value of a programming voltage to the storage device.

5,748,549

SEMICONDUCTOR MEMORY DEVICE

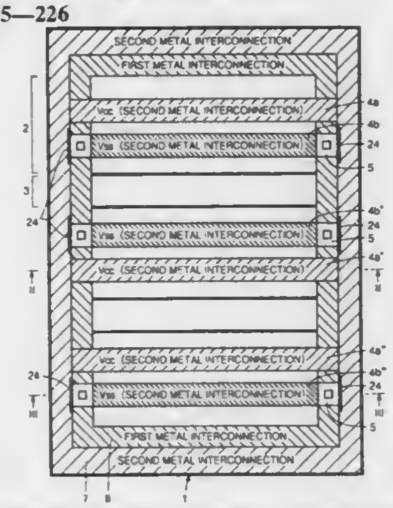
Osamu Kometani; Shoichi Wakano, and Mikio Asakura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan

Filed Oct. 23, 1996, Ser. No. 735,835

Claims priority, application Japan, May 27, 1996, 8-132015

Int. Cl.^{6} G11C *5/14*

U.S. Cl. 365—226 **2 Claims**


SECOND METAL INTERCONNECTION
FIRST METAL INTERCONNECTION
Vcc (SECOND METAL INTERCONNECTION)
Vss (SECOND METAL INTERCONNECTION)
Vcc (SECOND METAL INTERCONNECTION)
Vss (SECOND METAL INTERCONNECTION)
Vcc (SECOND METAL INTERCONNECTION)
Vss (SECOND METAL INTERCONNECTION)
FIRST METAL INTERCONNECTION
SECOND METAL INTERCONNECTION
4a
4b
24
5
4b'
24
5
4a'
4a''
4b''
24
5
2
3
24
24
7
8

1. A semiconductor device including a central circuit strip at a crossing of a row circuit strip having an arrangement of circuit cells along a first side of a chip and provided between memory array blocks and a column circuit strip having an arrangement of circuit cells along a second side, shorter than the first side, of the chip and provided between memory array blocks and having at least two interconnection layers, wherein

said central circuit strip includes:

a first interconnection frame provided on a semiconductor substrate to surround said central circuit strip along an edge of said central circuit strip, said first interconnection frame being formed of a first interconnection layer;

a second interconnection frame provided on said first interconnection frame with an insulating film therebetween to surround said central circuit strip along the edge of said central circuit strip, said second interconnection frame being formed of a second interconnection layer;

a supply line provided ins aid central circuit strip, formed of the second interconnection frame, and extending in parallel to an interconnection strip provided in said central circuit strip; and

a ground line provided in said central circuit strip, formed of the second interconnection frame and extending in parallel to said supply line,

both ends of said supply line being in contact with said second interconnection frame,

a gap being provided between both ends of said ground line and said second interconnection frame in order to avoid electrical connection between them,

said ground line and said first interconnection frame being connected, using a via hole provided ins aid insulating film.

5,748,550

MULTIPLE POWER LINE ARRANGEMENT FOR A SEMICONDUCTOR MEMORY DEVICE

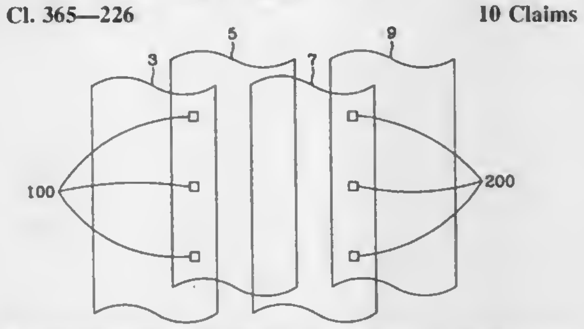
Jun-Young Jeon, Seoul, and Pil-Soon Park, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 4, 1996, Ser. No. 759,567

Claims priority, application Rep. of Korea, Dec. 4, 1995, 95-46426

Int. Cl.^{6} H01L *27/10*

U.S. Cl. 365—226 **10 Claims**



6. A multiple power line system which supplies external power source voltages into a semiconductor memory device, said power lines each providing a power source voltage which is different from the other in an exterior of a chip, said system comprising:

first and second metals for a first power line which are connected to each other such that said first metal for said first power line is in electrical contact with said second metal for said first power line; and

first and second metals for a second power line which are connected to each other such that said first metal for said second power line is in electrical contact with said second metal for said second power line;

wherein said first metal for said first power line is located adjacent to said first metal for said second power line;

wherein said second metal for said first power line is located adjacent to said second metal for said second power line; and

wherein said second metal for said first power line partially overlaps both said first metal for said first power line and said first metal for said second power line.

5,748,551

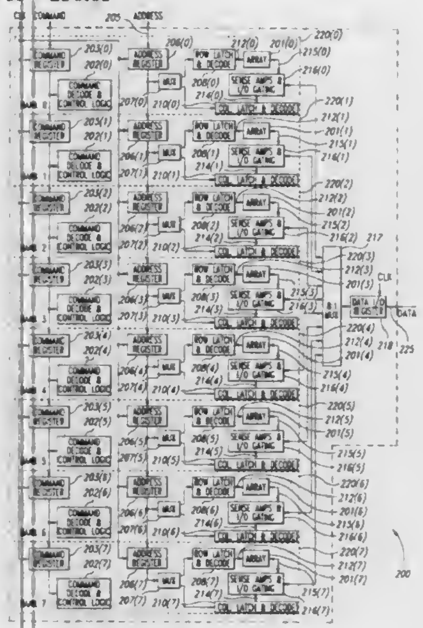
MEMORY DEVICE WITH MULTIPLE INTERNAL BANKS AND STAGGERED COMMAND EXECUTION

Kevin J. Ryan, Meridian, and Jeffrey P. Wright, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Dec. 29, 1995, Ser. No. 581,034

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.03 **24 Claims**



1. A memory device, comprising:

an array of memory cells operable to store data and arranged in a plurality of subarrays, each subarray having memory cells arranged in rows and columns;

a plurality of row activation circuits, each coupled to a corresponding one of the subarrays and operable to receive a row address and a first control signal, and operable to decode the row address and activate a row of memory cells identified by the row address in the corresponding subarray in response to the first control signal; and

a plurality of control circuits, each coupled to a corresponding one of said row activation circuits and providing the first control signal to activate the identified row, the identified row in each of the subarrays being activated at a respective one of a plurality of time intervals following an activation time.

5,748,552

DRAM IMPLEMENTATION FOR MORE EFFICIENT USE OF SILICON AREA

Michael G. Fung, Los Altos Hills, and Paul M-Bhor Chiang, Cupertino, both of Calif., assignors to Silicon Magic Corporation, Santa Clara, Calif.

Filed Aug. 26, 1996, Ser. No. 703,388

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.03 **17 Claims**

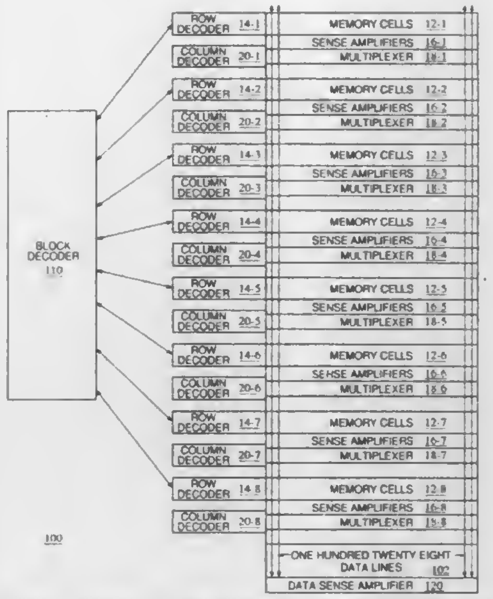
1. A dynamic random access memory comprising:

a memory block, the memory block further comprising a plurality of memory cells, the plurality of memory cells being arranged into a plurality of rows and a plurality of columns; and

a plurality of data lines proportional to the number of columns, each of the plurality of data lines being substantially parallel to the plurality of columns;

a row decoder coupled to the plurality of rows, for selecting one row of the plurality of rows for output; and

a column decoder coupled to the plurality of data lines, for selecting a portion of the plurality of columns for output, such that a portion of the plurality of memory cells is selected for output.



5,748,553

SEMICONDUCTOR MEMORY DEVICE HAVING EXTENDED MARGIN IN LATCHING INPUT SIGNAL

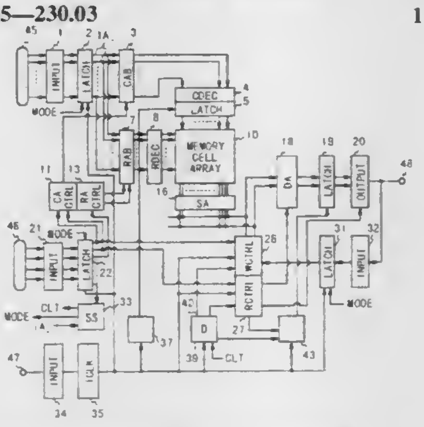
Mamoru Kitamura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 12, 1996, Ser. No. 712,875

Claims priority, application Japan, Sep. 26, 1995, 7-273616

Int. Cl.^{6} G11C *8/00;7/00*

U.S. Cl. 365—230.03 **17 Claims**



1. A semiconductor memory device comprising:

an internal clock signal generating section generating an internal clock signal from an external clock signal;

a latch section including an address latching circuit for latching an inputted address, a command latching circuit for latching an inputted command and a write data latching circuit for latching an inputted write data; and

a state setting section connected to and controlling said address latching circuit, said command latching circuit and said write data latching circuit, of said latch section, based on an address key latched by said address latching circuit and a mode setting command latched by said command latching circuit such that a time difference is selectively extended between a first timing of said internal clock signal and a second timing for each of an address, a command and a write data to be changed.

/OL
2 10
SS
1
MY
5
998
MI

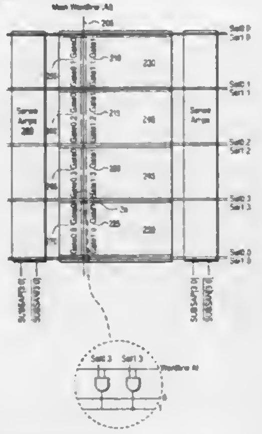
5,748,554
MEMORY AND METHOD FOR SENSING SUB-GROUPS OF MEMORY ELEMENTS

Richard M. Barth; Donald C. Stark, both of Palo Alto; Lawrence Lai, San Jose, and Wayne S. Richardson, Cupertino, all of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Filed Dec. 20, 1996, Ser. No. 771,303

Int. Cl.^{6} B11C *13/00*

U.S. Cl. 365—230.03 **30 Claims**



15. A memory comprising:

a plurality of word lines for selecting a row of a memory array, each word line comprising a plurality of segments, each segment spanning a portion of the distance of the word line;

a plurality of sets of sense amplifiers, each sense amplifier of the sets of sense amplifiers selectively coupled to one storage location associated with a word line, each set of sense amplifiers corresponding to a segment;

a first select logic for selecting during a sense operation at least one segment from a first word line and at least one segment from a second word line; and

a second select logic for selecting corresponding sets of sense amplifiers to access storage locations along the first segment and the second segment.

5,748,555
MEMORY ADDRESS PREVIEW CONTROL CIRCUIT

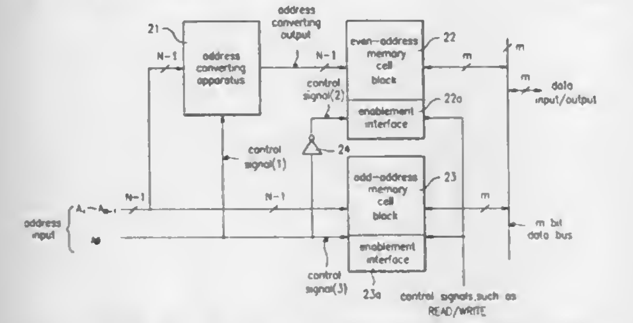
Soung Hwi Park, Pusan-si, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Aug. 27, 1996, Ser. No. 703,772

Claims priority, application Rep. of Korea, Dec. 27, 1995, 58892/1995

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.04 **25 Claims**



1. A memory for use with a computer, the memory receiving address information from the computer via an address bus, the memory comprising:

a first block of memory cells;

a second block of memory cells;

enablement means, operatively connected to the address bus, for simultaneously enabling a data exchange operation by one of the first and second memory cell blocks and enabling a non-data-exchange operation by the other memory cell block, based upon a single address on the address bus;

wherein a first portion of the address identifies one of the memory cell blocks and a second portion identifies a location within a memory cell block;

wherein the enablement means also is for simultaneously enabling the memory cell block identified by the first portion of the address for the data exchange operation and for enabling the other memory cell block for the non-data-exchange operation;

wherein the first memory cell block is an odd-address memory cell block;

wherein the second memory cell is an even-address memory cell block; and

wherein the first portion of the address identifies the address as either an odd address or an even address;

wherein each of the odd-address and the even-address memory cell blocks includes:

disable means, operatively connected to receive a disable signal, for disabling the memory cell block when the disable signal received thereby assumes a predetermined state;

wherein the enablement means includes:

address converter means, operatively connected between the data bus and the even-address memory cell, for converting an odd address to an immediately following even address and for passing an even-address unaltered;

and

an inverter inverting the first part of the address;

wherein the disable means of the odd-address memory cell block receives the first portion of the address as the disable signal; and

wherein the inverter is operatively connected between the address bus and the even-address memory block to invert the first part of the address,

the disable means of the even-address memory block receiving the inverted first part of the address as the disable signal.

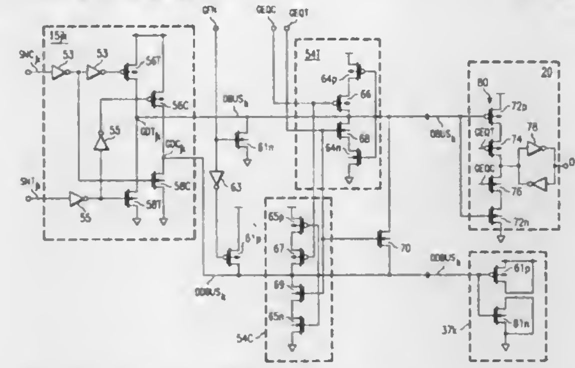
5,748,556
TRISTATABLE DRIVER FOR INTERNAL DATA BUS LINES

Narasimhan Iyengar, Plano, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 809,392, Dec. 17, 1991, abandoned. This application Dec. 31, 1996, Ser. No. 777,836

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.06 **25 Claims**



15. An integrated circuit, comprising:

an internal data bus including first and second internal data conductors;

a first plurality of sense amplifiers for amplifying a differential signal in said integrated circuit and presenting the amplified differential signal at first and second sense nodes;

means for selecting one of said first plurality of sense amplifiers for communication of its amplified differential signal to said first data conductor so that unselected ones of said first plurality of sense amplifiers bias their first and second sense nodes to a precharge voltage;

a first plurality of data drivers, each associated with one of said first plurality of sense amplifiers, each of said first plurality of data drivers comprising:

a first pull-up transistor having a conduction path connected in series between a first power supply node and said first internal data conductor, and having a control electrode;

a first pull-down transistor having a conduction path connected in series between a second power supply node and said first internal data conductor, and having a control electrode;

means for connecting the first sense node of the associated one of said first plurality of sense amplifiers to the control electrode of said first pull-up transistor in such a manner that said first pull-up transistor is turned off responsive to said first sense node of the associated one of said first plurality of sense amplifiers at said precharge voltage; and

means for connecting the second sense node of the associated one of said first plurality of sense amplifiers to the control electrode of said first pull-down transistor in such a manner that said first pull-down transistor is turned off responsive to said second sense node of the associated one of said first plurality of sense amplifiers at said precharge voltage;

an output stage connected to said first internal data conductor of said data bus, said output stage comprising an output driver for driving a terminal to a logic level responsive to the voltage on said first internal data conductor;

a second plurality of sense amplifiers for amplifying a differential signal in said integrated circuit and presenting the amplified differential signal at first and second sense nodes; and

a second plurality of data drivers, each associated with one of said second plurality of sense amplifiers, each of said second plurality of data drivers comprising;

a pull-up transistor having a conduction path connected in series between said first power supply node and said second data conductor and having a control electrode;

a pull-down transistor having a conduction path connected in series between said second power supply node and said second data conductor, and having a control electrode;

means for connecting the first sense node of the associated one of said second plurality of sense amplifiers to the control electrode of said pull-up transistor in such a manner that said pull-up transistor is turned off responsive to said first sense node of the associated one of said second plurality of sense amplifiers at said precharge voltage; and

means for connecting the second sense node of the associated one of said second plurality of sense amplifiers to the control electrode of said pull-down transistor in such a manner that said pull-down transistor is turned off responsive to said second sense node of the associated one of said second plurality of sense amplifiers at said precharge voltage;

wherein said selecting means also selects one of said second plurality of sense amplifiers for communication of its amplified differential signal to said second data conductor so that unselected ones of said second plurality of sense amplifiers bias their first and second sense nodes to a precharge voltage.

5,748,557
ADDRESS BUFFER FOR HIGH-SPEED ADDRESS INPUTTING

Bok-Moon Kang, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 770,250

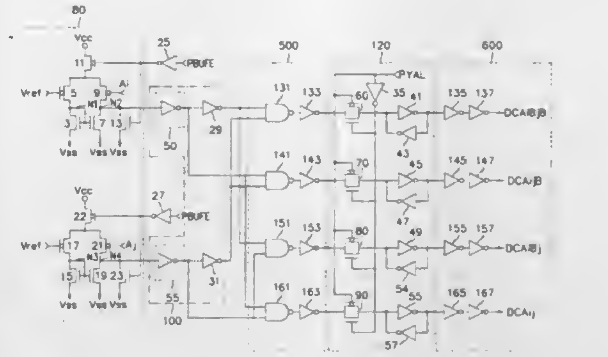
Claims priority, application Rep. of Korea, Dec. 27, 1995, 59448/1995

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.08 **12 Claims**

1. An address buffer for inputting an address for assigning a memory cell in a semiconductor memory device, comprising:

one or more address input means connected between a power supply voltage and a ground voltage, for amplifying a given number of addresses received from an external device to



thereby provide a stable level of outputs in response to an address input enable signal;

a delay circuit having inputs connected with the outputs of said address input means, for converting the outputs of said address input means into a stable logic level and delaying the outputs by a given time interval for a delivery in conformity with the addressing time;

an address predecoder connected with the outputs of said delay circuit, for providing a decoded address according to a predetermined logic combination of the outputs of said delay circuit;

a transmission latch circuit coupled to said address predecoder, for transmitting and latching the decoded address from said address predecoder in accordance with an address latch signal; and

an output driver coupled to said transmission latch circuit, for driving the decoded address output from said transmission latch circuit in a stable level for a delivery to a memory cell.

5,748,558
SEMICONDUCTOR MEMORY DEVICE

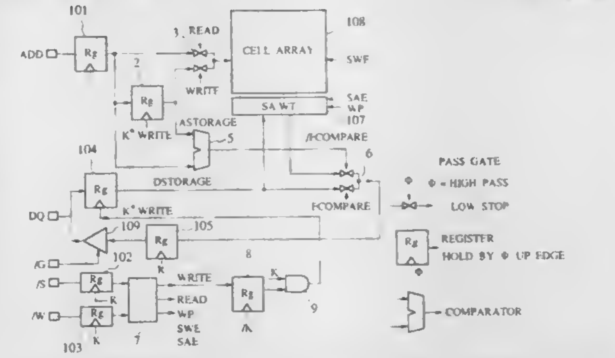
Azuma Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 31, 1995, Ser. No. 508,754

Claims priority, application Japan, Jul. 29, 1994, 6-178464

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **16 Claims**



1. A semiconductor memory device of a static random access memory employing a late write system wherein access operations are effected in synchronous with a clock signal and data is written in succeeding write cycle after a write address is defined, comprising:

a first address holding circuit for fetching, holding and outputting an address signal in synchronous with said clock signal;

a second address holding circuit for fetching, holding and outputting a write address signal of address signals held in said first address holding circuit in synchronous with said clock signal;

an address selection circuit for selecting either a first address signal held in said first address holding circuit as an address signal supplied to an accessed cell or a second address signal held in said second address holding circuit;

/OL 2 10 ISS 1 MY 5 998 /MI

- a data holding circuit for fetching, holding and outputting write data;
- a comparator circuit for comparing said first address signal with said second address signal; and
- an output data selection circuit for selecting said write data held in said data holding circuit if said first address signal coincides with said second address signal in a comparison result by said comparator circuit and for selecting read data read out from said accessed cell unless said first address signal coincides with said second. address signal, and for outputting selected data as output data.

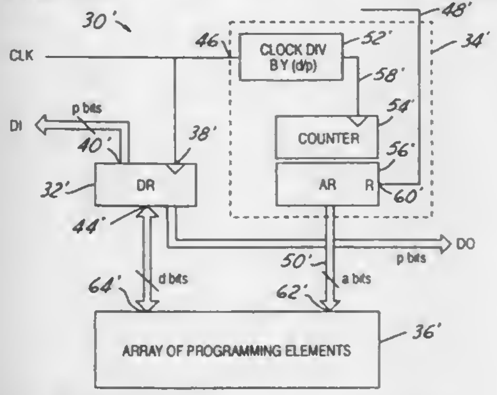
5,748,559

CIRCUIT FOR HIGH SPEED SERIAL PROGRAMMING OF PROGRAMMABLE LOGIC DEVICES

S. Babar Raza, Sunnyvale, and James B. MacArthur, Santa Clara, both of Calif., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jan. 17, 1996, Ser. No. 587,659
Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **32 Claims**



1. A circuit comprising:

- a first register having (i) a first input coupled to a first clock, (ii) a first bus output, (iii) a divider circuit configured to divide said clock by a predetermined value to present an output and (iv) a counter having an input coupled to said output of said divider means and an output, said counter for progressing to a new value in response to said input, said first register for decoding a unique address location presented at said first bus output;
- a second register having a first input coupled to said first clock, a second input coupled to a data input, a second bus output and a first output providing a data input/output, said second register for presenting data at said second bus output; and
- an array of programming elements having an address input coupled to said first bus output, a data input/output coupled to said second bus output, said array of programming elements for reading/writing data from said second register to a portion of said array of programming elements defined by said unique address location received by said address input.

5,748,560

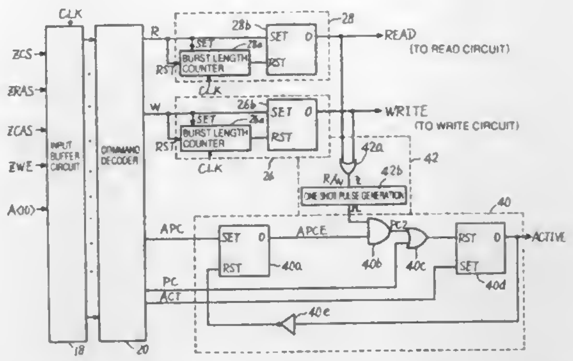
SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE WITH AUTO PRECHARGE OPERATION EASILY CONTROLLED

Seiji Sawada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1996, Ser. No. 740,175
Claims priority, application Japan, Dec. 25, 1995, 7-336783
Int. Cl.^{6} G11C *8/00;7/00*

U.S. Cl. 365—233 **11 Claims**

1. A synchronous semiconductor memory device comprising:



- internal activation signal generation means responsive to an externally applied memory cell select operation commence designating signal in synchronization with a clock signal applied externally and periodically, for rendering active an internal operation activation signal for activating a memory cell select operation,
- access operation activation signal generation means responsive to an externally applied access designating signal in synchronization with the clock signal, for rendering an internal access operation activation signal for activating an access operation,
- precharge activation signal generation means responsive to a precharge designating signal applied simultaneously with said access designating signal, for rendering active an internal precharge activation signal for deactivating the memory cell select operation, and
- internal operation inactivation means coupled to said internal activation signal generation means, said access operation activation signal generation means and said precharge activation signal generation means and responsive to inactivation of said access operation activation signal and the activated internal precharge activation signal for rendering said internal operation activation signal inactive.

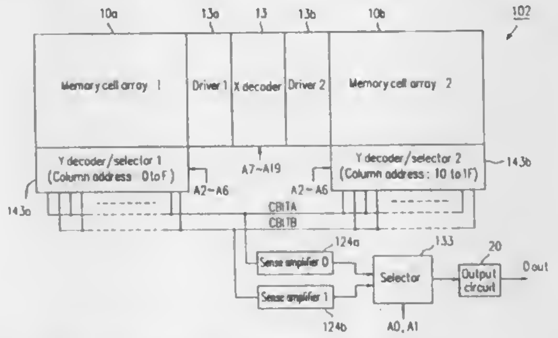
5,748,561

SEMICONDUCTOR MEMORY DEVICE WITH FAST SUCCESSIVE READ OPERATION

Yasuhiro Hotta, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 459,792, Jun. 2, 1995, Pat. No. 5,619,473. This application Nov. 1, 1996, Ser. No. 742,338
Claims priority, application Japan, Aug. 23, 1994, 6-198498
Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—238.5 **6 Claims**



1. A semiconductor memory device comprising:

- a memory cell array having a plurality of memory cells, the memory cell array being divided into at least two portions along a row direction;
- row selector for selecting rows of the at least two portions of the memory cell array, the selected rows corresponding to a row address of an input address;
- column selector for selecting a column of the memory cell array corresponding to a first column address of the input address, and selecting a column of the memory cell array corresponding to a second column address different from the first column address of the input address;
- a sense amplifier for sensing data stored in the memory cells, the sense amplifier including first and second sense amplifier groups;
- wherein the row selector selects a row corresponding to a row address successive to the row address of the input address when the first column address of the input address is a predetermined column address.
- the first sense amplifier group senses data read from a first plurality of memory cells corresponding to the row address of the input address and the first column address of the input address.
- the second sense amplifier group senses data read from a second plurality of memory cells corresponding to the row address of the input address and the second column address, and the device has a page mode for rapidly switching and outputting data from the plurality of memory cells which have been read in parallel to the sense amplifier in accordance with the input address.

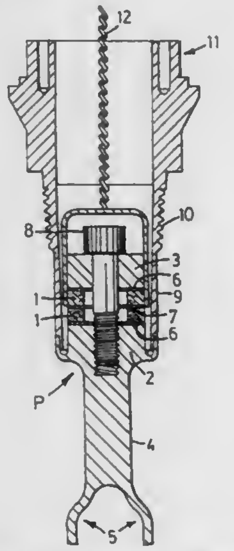
5,748,562

LEVEL DETECTOR FOR SOLIDS

Bogdan Cherek, and Jean-Pierre Pawliw, both of Peterborough, Canada, assignors to Milltronics Ltd., Peterborough, Canada

Filed Apr. 8, 1997, Ser. No. 841,991
Int. Cl.^{6} G01S *15/08*

U.S. Cl. 367—124 **3 Claims**



1. A vibratory probe for detecting a threshold level of solids within a vessel, comprising an ultrasonic acoustic transducer assembly having a resonant frequency, the assembly being supported within the vessel and including a coupling member adapted to couple the transducer acoustically to the solids at the threshold level, a transmitter for generating repeated bursts of high-frequency electrical energy and applying them to the transducer, the bursts being of sufficient amplitude to render the assembly self cleaning of adherent solids, a receiver coupled to the transducer for measuring the amplitude of ringing of the transducer after cessation of each burst, and a comparator comparing the amplitude of such ringing at a predetermined interval after a burst with a predetermined threshold level.

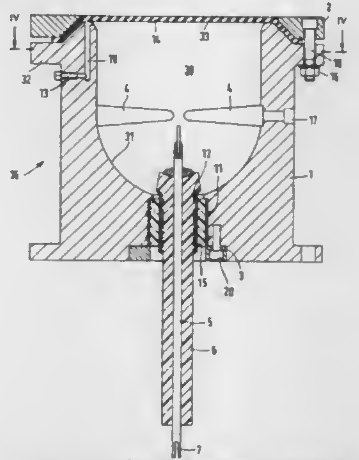
5,748,563

ENERGY CONVERTER FOR GENERATING HIGH-POWER PULSES

Jurgen Hofmann, Salzwedel, Germany, assignor to TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH, Unterlüss, Germany

Filed Aug. 27, 1996, Ser. No. 703,872
Claims priority, application Germany, Sep. 1, 1995, 195 32 219.3
Int. Cl.^{6} H04R *23/00*

U.S. Cl. 367—147 **6 Claims**



1. An energy converter for generating a high-power pulse for comminuting or deforming a substance, comprising

- (a) a housing defining a single chamber having an elliptical inner wall and an open side;
- (b) an electrode assembly formed of a plurality of electrodes supported in said chamber and arranged to allow an electric discharge therebetween;
- (c) power supply means for applying a voltage to said electrode assembly for effecting an electric discharge between said electrodes to generate a high-power pulse of a µs duration with a peak pressure in a range between 200 and 1000 bar;
- (d) a fluid medium accommodated in said housing and being in contact with said electrode assembly for receiving said high-power pulse from said electrode assembly; and
- (e) a diaphragm attached to said housing and closing said open side for encapsulating said electrode assembly and said fluid medium in said chamber; said diaphragm having an inner surface oriented toward said chamber and being in contact with said fluid medium; said diaphragm having an outer surface oriented away from said chamber and being arranged for contacting a substance to be comminuted, whereby the high-power pulse transmitted from said fluid medium to said diaphragm is applied by said diaphragm directly to the substance in contact with said diaphragm.

5,748,564

AMPLIFIED ACOUSTO-OPTICAL VIBRATION SENSOR AND ULTRASONIC TRANSDUCER ARRAY

Deva Narayan Pattanayak, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

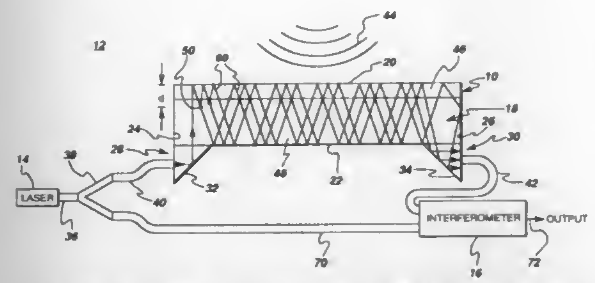
Filed Apr. 9, 1997, Ser. No. 831,585
Int. Cl.^{6} H04R *23/00;* **G01B** *11/02*

U.S. Cl. 367—149 **24 Claims**

1. An acousto-optical receiver element comprising:

- a damping volumetric region comprising a layer of optically transparent acoustically damping material, said damping region bounded by a sensing surface on one side of said damping material layer, and by a damping layer optical interface surface on the opposite side of said damping material layer;
- a scattering volumetric region comprising a material that is light scattering and light transmissive, said scattering volumetric region bounded by a scattering layer surface on one side of said scattering material layer contacting and defining an opti-

/OL
2 10
SS
1
MY
5
998
JMI



cal interface with said damping layer optical interface surface, and by an opposite surface defining the opposite side of said scattering material layer, at least portions of said opposite surface being internally light reflecting;

a light input port for introducing monochromatic light through said opposite surface into said scattering region for multiple internal reflections between said sensing surface and reflecting portions of said opposite surface; and

a light output port spaced from said light input port for receiving light from said scattering region through said opposite surface after said multiple internal reflections.

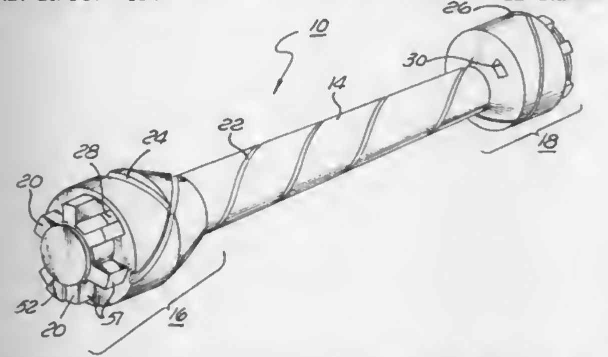
5,748,565
FLEXIBLE INTERLINK FOR HYDROPHONE ARRAY

Agop H. Cherbettchian, Santa Monica, and William P. Debley, Northridge, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed May 20, 1997, Ser. No. 859,435

Int. Cl.^{6} H04R *1/44*

U.S. Cl. 367—154 **22 Claims**



1. Apparatus for connecting a first sensor of the type that includes at least one cylindrical mandrel to a second sensor of the type that includes at least one cylindrical mandrel with a common optical fiber wound upon each of said mandrels, said apparatus comprising, in combination:

a) a flexible elongated member;

b) means for engaging a sensor located at each end of said member; and

c) said means including means for locking.

5,748,566
ULTRASONIC TRANSDUCER

J. Michael Goodson, Skillman, N.J., assignor to Crest Ultrasonic Corporation, Trenton, N.J.

Filed May 9, 1996, Ser. No. 644,843

Int. Cl.^{6} H04R *17/00*

U.S. Cl. 367—158 **10 Claims**

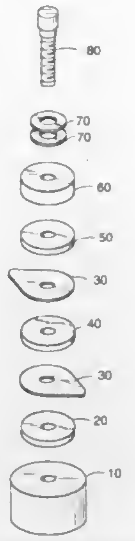
1. An apparatus for generating and transmitting ultrasonic wave energy comprising:

a base;

a piezo electric material;

a resonance enhancing disc formed of a ceramic material and positioned between the base and the piezoelectric material;

an electrode electrically coupled to the piezo electric material;



and a reflector positioned adjacent to the piezo electric material on a side opposite the resonance enhancing disc.

5,748,567
ACCELERATION SENSOR

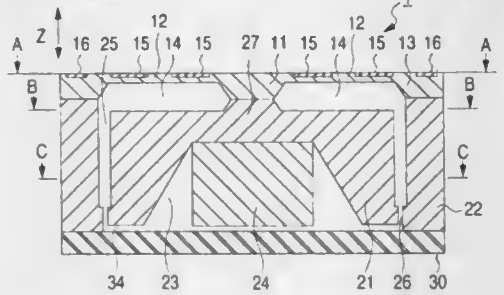
Masatomo Mori; Masahiro Nezu, both of Saitama; Tadao Matsunaga, Miyagi; Rokurou Naya, Kanagawa; Shougo Suzuki, Kanagawa, and Akihiro Azuma, Kanagawa, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, and Nihon Inter Electronics Corporation, Kanagawa, both of Japan

Filed Sep. 25, 1996, Ser. No. 721,579

Claims priority, application Japan, Dec. 20, 1995, 7-331700

Int. Cl.^{6} H04R *17/00*

U.S. Cl. 367—178 **20 Claims**



1. An acceleration sensor comprising:

a stationary section;

an acting section to which a force is applied in response to acceleration;

a flexible section through which the stationary section is coupled to the acting section;

a plurality of distortion sensing elements coupled to the flexible section;

a first weight having a hole with a bottom which is gradually smaller in width towards the bottom of the hole, the first weight being coupled to the acting section; and

a second weight, greater in specific gravity than the first weight, coupled to the bottom of the hole of the first weight.

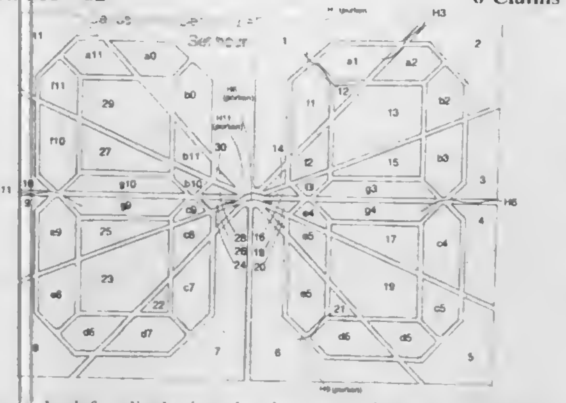
5,748,568
TIMEPIECE DISPLAY WHICH SUPERIMPOSES DIGITS AND GRAPHICS

Hal M. Harrison, 1556 NW 8th St., Boca Raton, Fla. 33486

Filed May 1, 1996, Ser. No. 641,416

Int. Cl.^{6} G04C *19/00;* G04B *19/00*

U.S. Cl. 368—82 **6 Claims**



1. A method for displaying the time on a timepiece display as one or more digits superimposed with a familiar or regular figure divided into a plurality of divisions, where the total area of said figure represents the 60 minutes of an hour and where one or more of said divisions appears displayed in part or all of the same area used by one or more of said digits, comprising the steps of:

(a) shading predetermined areas of the display to show said digits to represent the hour of the time;

(h) shading zero or more of said divisions so that the area of said figure apparently shaded at any one time represents the approximate fraction of the hour which has passed since the hour began; and

(c) filling said display for showing said digits as discrete from any parts of one or more shaded divisions with which they superimpose so that said digits are easily read.

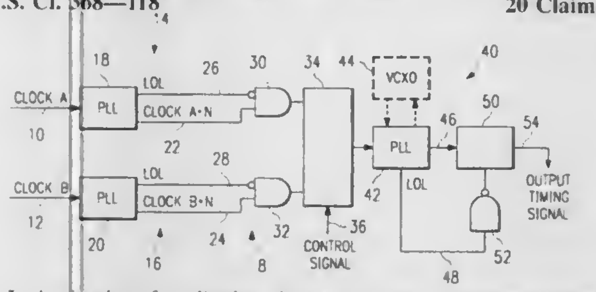
5,748,569
APPARATUS AND METHOD FOR CLOCK ALIGNMENT AND SWITCHING

Ioan V. Teodorescu, and Anthony Mazzurco, both of Plano, Tex., assignors to DSC Telecom L.P., Plano, Tex.

Filed Dec. 19, 1996, Ser. No. 769,370

Int. Cl.^{6} G04F *8/00;* H04L *7/00*

U.S. Cl. 368—118 **20 Claims**



1. A circuitry for aligning first and second redundant timing signals and switching therebetween, comprising:

a first phase-locked loop operable to receive the first redundant timing signal as input and to generate a multiplied first redundant timing signal;

a second phase-locked loop operable to receive the second redundant timing signal as input and to generate a multiplied second redundant timing signal;

a selecting and switching circuitry coupled to the first and second phase-locked loops, the selecting and switching circuitry operable to receive the multiplied first and second redundant timing signals and to designate one of the multiplied redundant timing signals as ACTIVE and the other as INACTIVE; and

a phase integrator coupled to the selecting and switching circuitry, the phase integrator operable to receive the ACTIVE timing signal and to integrate phase transients out of the ACTIVE timing signal when the ACTIVE and INACTIVE timing signal designations are switched.

5,748,570
TIME CORRECTION OF AN ELECTRONIC CLOCK

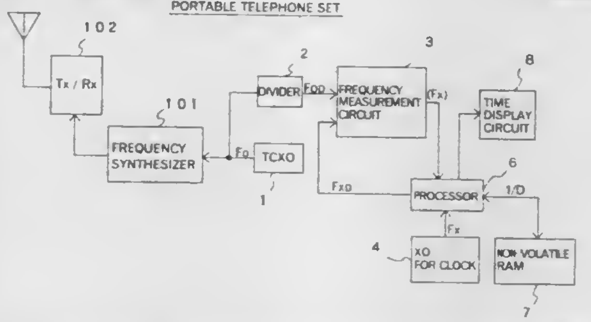
Motoyoshi Komoda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 443,309, May 17, 1995. This application Jan. 22, 1997, Ser. No. 786,256

Claims priority, application Japan, May 20, 1994, 6-131130

Int. Cl.^{6} G04G *3/02*

U.S. Cl. 368—202 **21 Claims**



1. An electronic clock incorporated in a portable radio communication apparatus, the electronic clock comprising:

first means for generating a first oscillation signal having a first frequency, the electronic clock operating based on the first oscillation signal;

second means for generating a second oscillation signal having a second frequency, which is for producing reference frequencies for radio communication, the second means being more accurate in frequency than the first means, wherein said second means comprises a temperature-compensated quartz oscillator (TCXO);

detection means for detecting a deviation of the first frequency from a predetermined frequency using the second frequency as a reference frequency;

storage means for storing the deviation;

display means for displaying at least hours, minutes, and seconds;

means for determining a current time point of said electronic clock; and

correction means for correcting time of the electronic clock, based on the deviation, at a single, predetermined time point of said electronic clock representing a correction timing point.

5,748,571
PLASTIC TOP SHELL

Werner Jackl, Coventry, R.I., assignor to Textron Inc., Providence, R.I.

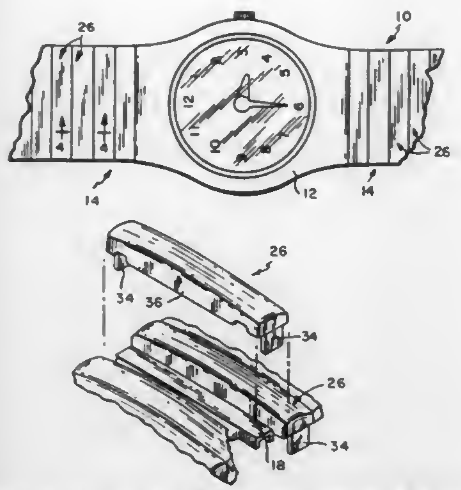
Filed May 20, 1992, Ser. No. 886,792

Int. Cl.^{6} G04B *27/00;* A44C *5/04;* F16G *13/00*

U.S. Cl. 368—282 **5 Claims**

1. For use on a metallic top link of an expansible watch band, said top link having a hollow box-like configuration with open ends and with top and bottom walls joined by side walls, a plastic top shell comprising: a molded body having a top surface and a bottom surface with end tabs protruding downwardly therefrom,

/OL
2 10
ISS
1
MY
5
998
/MI



said bottom surface having coplanar end portions adjacent to said ends tabs, said top and bottom surfaces defining a thickness therebetween which is greater than the thickness of said end tabs, said body being configured and dimensioned to overlie the top wall of said top link, said end tabs being bendable around the open ends of said top link to thereby firmly seat the coplanar end portions of said bottom surface against said top wall.

5,748,572
MAGNETO-OPTICAL RECORDING APPARATUS WITH AN OPTICAL ELEMENT PROVIDING A HIGH C/N RATIO

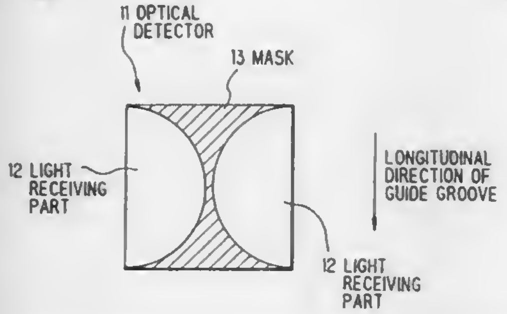
Masatsugu Ogawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 23, 1996, Ser. No. 590,123

Claims priority, application Japan, Jan. 23, 1995, 7-008016

Int. Cl.^{6} G11B *11/00;7/24*

U.S. Cl. 369—13 **7 Claims**



1. An optical element for a magneto-optical recording apparatus, comprising:

- a light receiving face for receiving incided light thereon, said incided light being reflected or transmitted on or through a magneto-optical recording medium; and
- a mask for masking a part of said light receiving face, said mask being formed such that it has a different configuration after being rotated 90 degrees around a center of said light receiving face and that a component of said inciding light with a small Kerr rotation angle is effectively masked, said light receiving face being masked to leave two arc areas, each of which is symmetrically disposed to a center line of said light receiving face in parallel with a guide groove on said magneto-optical recording medium and having a width, and

wherein said incided light is partially masked by said mask.

5,748,573
MAGNETIC HEAD DRIVING CIRCUIT, INCLUDING MAGNETIC HEAD COIL SWITCHING CIRCUITS AND A CONTROL PULSE GENERATOR FOR THE SWITCHING CIRCUITS, WHICH IS OPERABLE WITH RECORDING DATA TRANSFERRED AT A HIGHER THAN NORMAL TRANSFER RATE

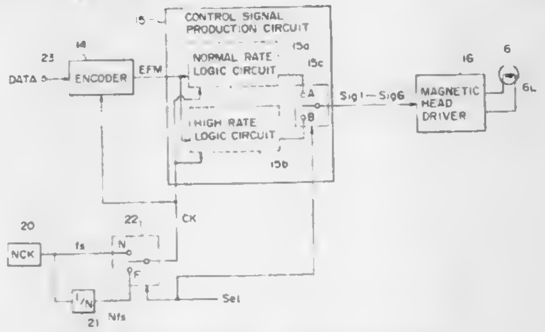
Takashi Ohmori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 565,008, Nov. 30, 1995, Pat. No. 5,654,943. This application Oct. 8, 1996, Ser. No. 727,054

Claims priority, application Japan, Dec. 7, 1994, 6-330385

Int. Cl.^{6} G11B *11/00;5/09*

U.S. Cl. 369—13 **3 Claims**



1. A magnetic head driving circuit, comprising:

- means for providing at least a first power source voltage and a second power source voltage, wherein said second power source voltage is of opposite polarity with respect to said first power source voltage;
- first switching means for switching connection to one end of a coil of a magnetic head at least between said first and second power source voltages;
- second switching means for switching connection to the other end of said coil of said magnetic head at least between said first and second power source voltages;
- control pulse production means for producing a control pulse for controlling said first and second switching means so that a total number of control pulses to be produced by said first and second switching means within a pulse reversal interval, which is given by n×T, of a recording signal may be smaller than n, T being a transfer rate of the recording signal, n being a positive integral number; and
- driving means for driving said first and second switching means in response to the control pulse from said control pulse production means.

5,748,574
DOUBLE FOCAL-POINT MAGNETO-OPTIC PICK-UP HEAD

Zu-Wen Chao, Shinchu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Apr. 16, 1997, Ser. No. 843,471

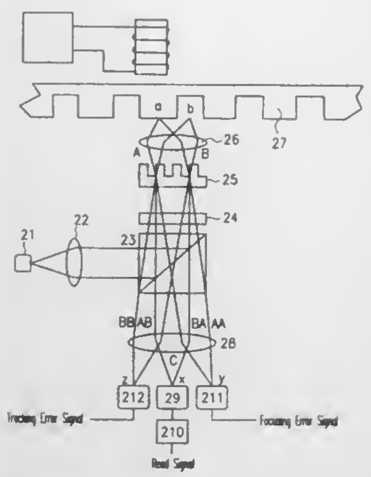
Claims priority, application Taiwan, Dec. 10, 1996, 85115284

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—13 **10 Claims**

1. A double focal-point magneto-optic pick-up head for reading data from an optical disc having at least one groove portion and one land portion which has a predetermined depth, said double focal-point magneto-optic pick-up head comprising:

- laser means for generating a laser beam which is linearly polarized;
- collimating lens means, optically coupled to said laser means, for collimating the laser beam generated by said laser means;
- a polarization beam splitter, optically coupled to said collimating lens means, for reflecting the laser beam from said collimating lens means to a first propagation path;
- a $\lambda/4$ plate, optically coupled on said first propagation path, for transforming the laser beam from said polarization beam splitter into a circularly polarized laser beam;



- a diffraction grating, optically coupled to said $\lambda/4$ plate, for diffracting the circularly polarized laser beam from said $\lambda/4$ plate into at least a first diffracted beam and a second diffracted beam;
- first light focusing means, optically coupled to said diffraction grating, for focusing said first and second diffracted beams onto the optical disc, said first diffracted beam being focused on a first focal point on the groove portion of the optical disc which is subjected to a magneto-optic effect, and said second diffracted beam being focused on a second focal point on the land portion of the optical disc which is not subjected to the magneto-optic effect, said first and second diffracted beams being subsequently reflected back from the optical disc and passing through said first light focusing means to said diffraction grating where said the reflected beam of said first diffracted beam is diffracted into a first signal beam and a second signal beam and the reflected beam of said second diffracted beam is diffracted into a third signal beam and a fourth signal beam, said first signal representing a focusing-error signal beam, said second and third signal beams being combined into an interference signal beam representative of a read signal beam, and said fourth signal representing a tracking-error signal beam, said read signal beam, focusing-error signal beam, and tracking-error signal beam subsequently passing through said $\lambda/4$ plate to said polarization beam splitter;
- second light focusing means, optically coupled to said polarization beam splitter on a second propagation path aligned with the first propagation path, for focusing said read signal beam, said focusing-error signal beam, and said tracking-error signal onto a first spot, a second spot, and a third spot respectively;
- first optical sensing means, mounted on said first spot, for generating a first electrical signal proportional to the intensity of said read signal beam;
- second optical sensing means, mounted on said second spot, for generating a second electrical signal proportional to the intensity of said focusing error signal beam; and
- third optical sensing means, mounted on said third spot, for generating a third electrical signal proportional to the intensity of said tracking error signal beam.

5,748,575
INFORMATION PROCESSING APPARATUS HAVING A MULTITASKING FUNCTION WITH ONE OR MORE OPTICAL DISCS

Howard Hong-Dough Lee, Bloomfield, Mich., assignor to Intellectual Science and Technology, Inc., Bloomfield, Mich.

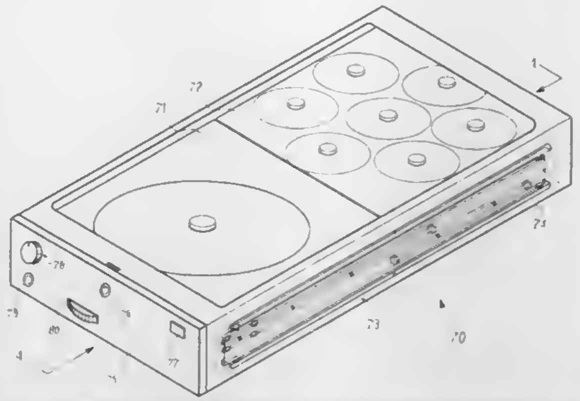
Filed Mar. 5, 1996, Ser. No. 613,806

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—30 **15 Claims**

1. An information processing apparatus with multitasking function, the information processing apparatus comprising:

(a) a plurality of turntables, each comprising a disc-setting table for mounting an optical disc;



(b) a plurality of optical units, each comprising a driving means and an optical read head, wherein said driving means is provided for moving said optical read head in a radial direction of said optical disc to a predetermined disc position on a surface of said optical disc;

(c) means for simultaneously controlling a plurality of said driving means to move a plurality of said optical read heads to a plurality of predetermined disc positions on at least two optical discs for retrieving information stored thereon;

(d) a plurality of signal-process systems for converting a plurality of information sets retrieved by said plurality of optical read heads from a compact disc format to the original state of the information; and

(e) data transmitting means for transmitting a plurality of the information sets converted by said plurality of signal-process systems to a host computer.

5,748,576
APPARATUS FOR RECORDING AND/OR REPRODUCING A RECORDING MEDIUM HAVING DATA CONTROL FUNCTION

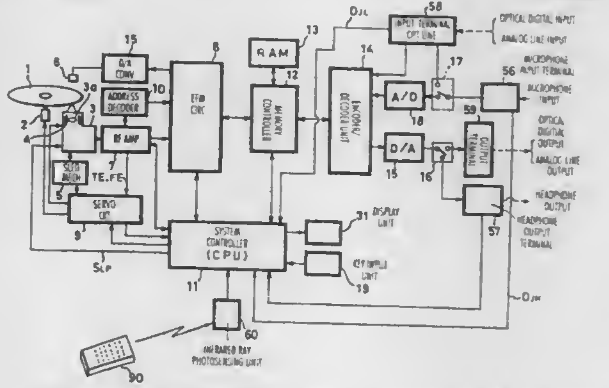
Tsuyoshi Kondo, Tokyo, and Hiroshi Mukawa, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Divisinn of Ser. No. 651,827, May 21, 1996, which is a division of Ser. No. 411,745, May 15, 1995. This application Apr. 3, 1997, Ser. No. 832,239

Claims priority, application Japan, Aug. 10, 1993, P5-216921; Nov. 25, 1993, P5-317531

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—32 **5 Claims**



1. An apparatus for recording and/or reproducing a recording medium, comprising:

- recording and reproducing means for recording or reproducing data on or from a recording medium in which management information for recording or reproducing data is recorded together with data;
- first designating means for designating a pause position of one data;
- means for controlling said recording and reproducing means based on said management information so that said recording and reproducing means records or reproduces data on or from said recording medium and rewriting said management infor-

/OL
2 10
SS
1
MY
5
998
MI

mation so as to combine two data provided before and after a divided position to a continuous data if said first designating means is operated when a scanning position of said recording and reproducing means is placed at said pause position under the reproducing condition such that said recording and reproducing means reproduces data from said recording medium; and

a microphone device connectable to said apparatus and having second designating means and wherein an output signal from said second designating means is supplied to said control means.

5,748,577

DEVICE FOR PLAYING BACK DISKS

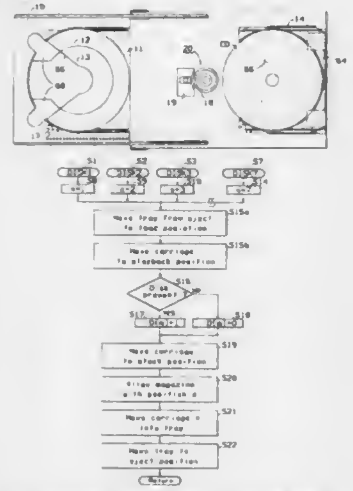
Kazuhiro Sakiyama, Saitama-ken, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Continuation of Ser. No. 626,649, Apr. 1, 1996, abandoned, which is a continuation of Ser. No. 216,925, Mar. 23, 1994, abandoned. This application Aug. 23, 1996, Ser. No. 697,428

Claims priority, application Japan, Mar. 23, 1993, 5-019212

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—36 **9 Claims**



1. A device for playing back disks, comprising:

a magazine for storing disks;

said magazine having at least first and second storage positions;

a loader having an eject position and a store position, and means for moving said loader between said eject position and said store position;

means for permitting a first disk to be placed in said loader when said loader is in said eject position;

means for selecting a selected one of said at least first and second storage positions;

means for detecting the presence of a disk in each of said at least first and second storage positions;

means for storing said first disk in another of said first and second storage positions, different from said selected one whereby, said another does not have a disk;

means for retrieving a second disk stored in said selected one of said first and second storage positions;

control means for controlling said means for storing, said means for retrieving, and said means for moving;

said control means including means for executing an operation including moving said loader from said eject position to said store position, storing said first disk in said another of said first and second storage positions different from said selected one, retrieving said second disk from said selected one and returning to said eject position with said second disk; and

said control means including means for automatically initiating and continuously executing said operation responsively to said selected one of said first and second storage position being selected when said loader is in said eject position and said first disk is present in said loader.

5,748,578

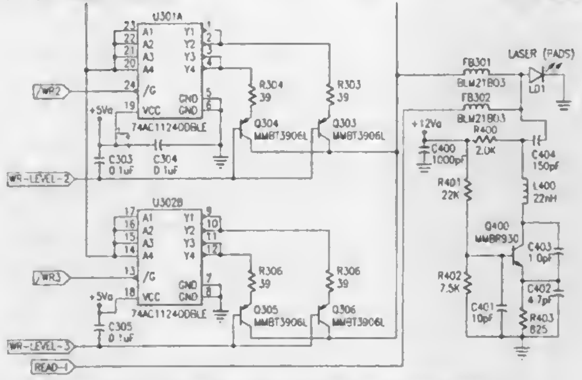
COLPITTS TYPE OSCILLATOR HAVING REDUCED RINGING AND IMPROVED OPTICAL DISC SYSTEM UTILIZING SAME

David L. Schell, Colorado Springs, Colo., assignor to Discovision Associates, Irvine, Calif.

Continuation-in-part of Ser. No. 376,882, Jan. 25, 1995. This application Apr. 11, 1995, Ser. No. 422,732

Int. Cl.^{6} G11B *7/00;* H03B *5/12*

U.S. Cl. 369—44.14 **63 Claims**



1. An improved Colpitts type oscillator, comprising:

a load circuit having a predetermined resistance;

a transistor having an emitter, a base, and a collector;

a split capacitor tank connected between said collector and ground across said emitter and said collector;

an electrical voltage supply; and

a load inductance in series with said load circuit between said collector and said voltage supply to mitigate oscillator ringing when write pulses are supplied to the junction between said load circuit and said load inductance.

5,748,579

OPTICAL PICKUP FOR MAGNETO OPTICAL RECORDING APPARATUS

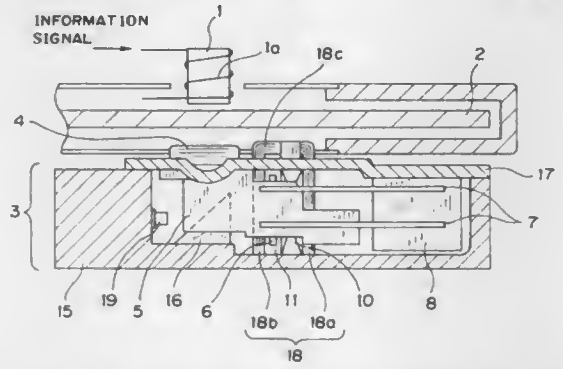
Takahiro Miyagi; Shigeru Takaya, and Yoshifumi Masunaga, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo-to, Japan

Filed Feb. 23, 1996, Ser. No. 606,313

Claims priority, application Japan, Feb. 24, 1995, 7-061974

Int. Cl.^{6} G11B *7/08*

U.S. Cl. 369—44.14 **4 Claims**



1. An optical pickup for a magneto optically recording information on a magneto optical disc in cooperation with a magnetic head, said optical pickup being disposed at one surface side of said magneto optical disc while said magnetic head being disposed at the other surface side of said magneto optical disc during a recording operation of said magneto optical disc, said optical pickup comprising:

a light emission means for emitting a light beam;

an optical system for guiding the emitted light beam;

an objective lens for covering and focusing the guided light beam onto said optical disc;

an actuator holding said objective lens and having a magnetic circuit for actuating said objective lens to move in focusing and tracking directions respectively of said magneto optical disc by a magnetic force generated by said magnetic circuit, said magnetic circuit including a magnetic flux generation means for generating a magnetic flux and a yoke for transmitting the generated magnetic flux in said magnetic circuit to generate the magnetic force, said magnetic circuit being located at a place offset from an axis of said objective lens;

a base plate, to which said actuator is attached, having a wall portion prescribing an aperture through which the light beam passing through said objective lens is transmitted, said base plate comprising a magnetic substance for shielding said magnetic circuit from said magnetic head, said yoke including a first portion, which extends from said base plate, a second Portion, which extends from said base Plate and is opposed to said first portion, and a U-shaped bottom portion integrally connected to said first portion at one end thereof and to said second portion at the other end thereof, such that said U shaped bottom portion extends from said base plate toward said magnet optical disc, each of said first and second portions extending in a direction away from said magneto optical disc; and

a body case having a wall prescribing an internal space and an opening, which opens toward said magneto optical disc and which is covered by said base plate. for accommodating said light emission means, said optical system and said magnetic circuit.

5,748,580

OBJECTIVE LENS ACTUATOR FOR OPTICAL HEAD

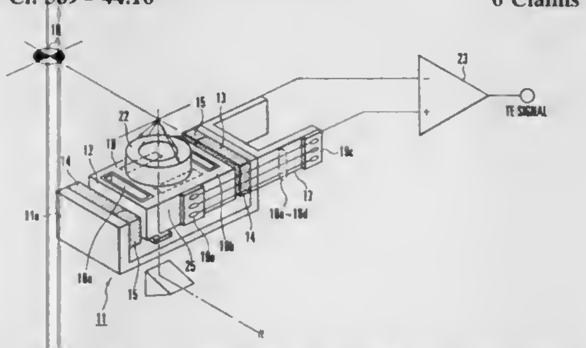
Tsutomu Matsui, Tokyo, Japan, assignor to NEC Corporation, Japan

Division of Ser. No. 473,306, Jun. 7, 1995, Pat. No. 5,663,840. This application Apr. 11, 1997, Ser. No. 837,283

Claims priority, application Japan, Jun. 14, 1994, 6-131516; Mar. 30, 1995, 7-73092

Int. Cl.^{6} G11B *7/095*

U.S. Cl. 369—44.16 **6 Claims**



1. An objective lens actuator for an optical head, comprising:

an objective lens, constituted by an aspherical plastic lens, on which a beam reflected by an optical disk is incident;

an objective lens holder, having a substantially square frame shape, for holding said objective lens;

a focusing coil wound on said objective lens holder;

a pair of tracking coils arranged on parallel side surfaces of said objective lens holder, respectively;

a plurality of wire springs for holding said objective lens holder with a degree of freedom in focusing and tracking directions;

a magnetic circuit, having a substantially closed magnetic circuit arrangement, for cooperating with said focusing and tracking coils to electromagnetically drive said objective lens holder; and

a pair of photosensors, arranged below an edge portion of said objective lens, for receiving, through the edge portion of said objective lens, a diffracted reflected beam which generates a tracking error signal and is obtained such that a beam emerging from a main portion of said objective lens is diffracted and reflected by a pre-groove optical disk.

5,748,581

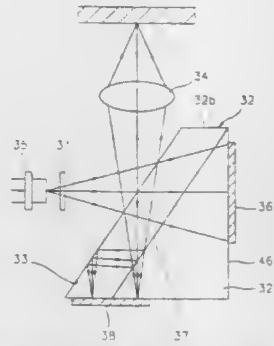
OPTICAL HEAD OF AN OPTICAL DISC RECORDING/REPRODUCING APPARATUS HAVING A POLYGONAL PRISM

Jin Tae Kim, 117-301 Jukong Apartment, 767 Sangkye 6-Dong, Noweon-Ku, Seoul, Rep. of Korea

Filed Feb. 15, 1996, Ser. No. 602,056

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—44.23 **13 Claims**



1. An optical head of an optical disc recording/reproducing apparatus for recording and reproducing an information on and from an optical disc, the optical head comprising:

a laser source for radiating a laser beam;

an objective lens;

a first light-receiving element; and

means for orienting the laser beam radiated from the laser source through the objective lens toward the optical disc and for orienting a reflected laser beam reflected by the optical disc toward the first light-receiving element, the orienting means comprising a polygonal prism having a first reflecting surface and a second reflecting surface, the polygonal prism comprising a half-cube prism and a parallelepiped prism, the parallelepiped prism having a first and a second longer-side legs, and a lower and an upper shorter-side legs, the half-cube prism having a hypotenuse, a rear leg, and a lower leg, the first longer-side leg of the parallelepiped prism being arranged to face the objective lens and the laser diode, the second longer-side leg of the parallelepiped prism being attached to the hypotenuse of the half-cube prism, the first longer-side leg forming the first reflecting surface and the second longer-side leg and the hypotenuse forming the second reflecting surface, the first light-receiving element providing data by detecting the reflected laser beam transmitted through the orienting means, so that the optical head records and reproduces the information on and from the optical disc and performs a focusing servo and a tracking servo of the objective lens based on the data.

5,748,582

INFORMATION RECORDING MEDIUM WHEREIN DIGITAL SYMBOLS ARE REPRESENTED BY DISCRETE SHIFT AMOUNTS OF A PIT EDGE AND TRACKING WOBBLING PITS ARE SHARED BETWEEN ADJACENT TRACKS AND INFORMATION RECORDING AND REPRODUCING APPARATUS THEREFOR

Seiji Kobayashi; Hiroshige Okamura, both of Kanagawa; Hisayuki Yamatsu, and Toshiyuki Kashiwagi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 465,253, Jun. 5, 1993, abandoned, which is a division of Ser. No. 133,156, Oct. 13, 1993, abandoned. This application Oct. 8, 1996, Ser. No. 729,800

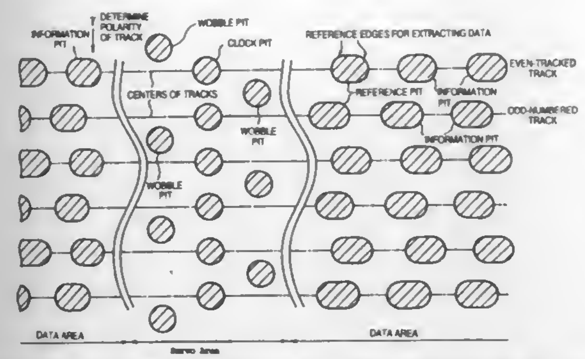
Claims priority, application Japan, Feb. 14, 1992, P59710; Jul. 10, 1992, P207074

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—44.26 **2 Claims**

1. An information recording medium for recording or reproducing digital information being represented by a series of discrete

VOL 210 ISS 1 MY 5 1998 UMI



digital symbols while rotating at a constant angular velocity, said information recording medium including:

- an information pit formed in the information recording medium such that one of a front edge and a rear edge of the information pit is shifted in a step-wise fashion by one of a finite number of shift amounts from a data independent predetermined reference position, wherein each of said finite number of shift amounts corresponds to one of said discrete digital symbols;
- tracking wobble pits disposed at positions displaced from a center of a track to an outer peripheral side of said track and an inner peripheral side of said track, such that said tracking wobble pits are commonly used in adjacent tracks.

5,748,583

INFORMATION RECORDING/REPRODUCING APPARATUS WITH COUNTER MEANS ACCESSIBLE BY SYSTEM AND SERVO PROCESSING UNITS

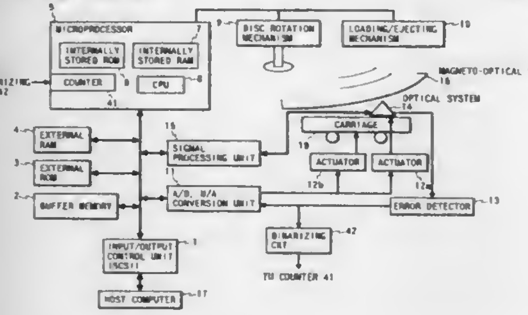
Hisatoshi Baba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1995, Ser. No. 522,117

Claims priority, application Japan, Sep. 2, 1994, 6-209827; Aug. 31, 1995, 7-223206

Int. Cl.⁶ G11B *20/00*

U.S. Cl. 369—44.28 **2 Claims**



1. An information recording/reproducing apparatus for executing recording of information on and/or reproduction of information from a recording medium, upon reception of an instruction from a host computer, said apparatus comprising:

- a single calculation means for, alternatively and time-divisionally, performing (i) a system processing for handling the instruction from the host computer and (ii) a seek processing for moving an information reproduction head to a target track; and
- a counter, incorporated into said calculation means,
- wherein, in the seek processing, the number of tracks which the head has traversed is counted, and, in the system processing, the number of tracks thus counted is monitored and the information to be reproduced by the head is prepared based on the monitored number of tracks.

5,748,584

OPTICAL DISK DEVICE HAVING A FOCUS OFFSET CONTROLLER

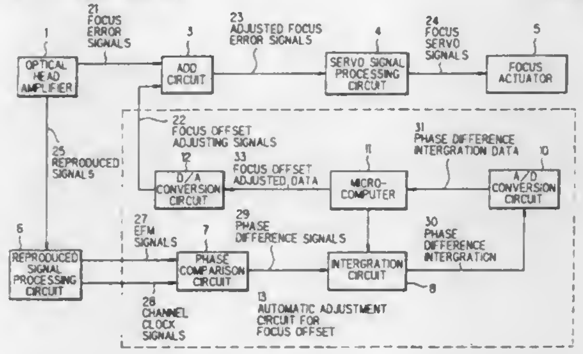
Etsuo Maezawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 21, 1996, Ser. No. 620,125

Claims priority, application Japan, Mar. 22, 1995, 7-062325

Int. Cl.⁶ G11B *7/095*

U.S. Cl. 369—44.29 **1 Claim**


1
21 FOCUS ERROR SIGNALS
3
23 ADJUSTED FOCUS ERROR SIGNALS
4
24 FOCUS SERVO SIGNALS
5
OPTICAL HEAD AMPLIFIER
ADD CIRCUIT
SERVO SIGNAL PROCESSING CIRCUIT
FOCUS ACTUATOR
22 FOCUS OFFSET ADJUSTING SIGNALS
25 REPRODUCED SIGNALS
12
33 FOCUS OFFSET ADJUSTED DATA
11
31 PHASE DIFFERENCE INTERGRATION DATA
10
D/A CONVERSION CIRCUIT
MICRO-COMPUTER
A/D CONVERSION CIRCUIT
6
27 EFM SIGNALS
7
29 PHASE DIFFERENCE SIGNALS
30 PHASE DIFFERENCE INTERGRATION
REPRODUCED SIGNAL PROCESSING CIRCUIT
PHASE COMPARISON CIRCUIT
INTERGRATION CIRCUIT
8
28 CHANNEL CLOCK SIGNALS
13 AUTOMATIC ADJUSTMENT CIRCUIT FOR FOCUS OFFSET

1. An optical disk device comprising: means for producing focus error signals regarding light applied to an optical disk; means for producing reproduced signals from the optical disk by means of the applied light; means for producing binary data signals of the reproduced signals and channel clock signals contained therein; phase difference production means for producing phase difference signals showing a difference in phase between the binary data signals and the channel clock signals; focus offset adjusting signal production means for producing focus offset adjusting signals according to the phase difference signals; and means for adding the focus offset adjusting signals to the focus error signals to produce focus servo signals, wherein the phase difference producing means comprises integration means, which calculates integration values of the phase difference for each given period, and the focus offset adjusting signal production means brings the focus offset adjusting signals to final focus offset adjusting signals while stepwise changing the focus offset adjusting signals from a preset initial value, said focus offset adjusting signal production means comprises means for stepwise changing the focus offset adjusting signals from the preset initial value, comparison means for successively comparing the resultant integration value provided by the integration means with a preceding integration value, minimum value detection means for determining a minimum value of the integration values based on the results of the comparison, and memory means for storing a focus offset adjusting signal corresponding to the detected minimum value, and the signal stored in the memory means is used as the final focus offset adjusting signals.

5,748,585

DISC APPARATUS FOR SELECTIVELY OUTPUTTING DATA FROM A DISC AND A MEMORY

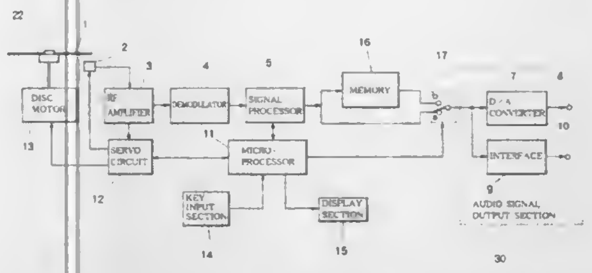
Manabu Tsukamoto; Nobuaki Hirai; Kazuhito Endo; Yoshinobu Ishida, and Masayuki Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 168,384, Dec. 17, 1993, abandoned. This application Jun. 17, 1994, Ser. No. 261,949

Claims priority, application Japan, Dec. 25, 1992, 4-359213; Feb. 10, 1993, 5-022556; Feb. 16, 1993, 5-026469; Apr. 12, 1993, 5-084534; Apr. 12, 1993, 5-084535; Sep. 24, 1993, 5-238353

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—47 **14 Claims**



1. A disc apparatus comprising:

- readout means for reading out data from a disc, said data including at least digital audio data;
- audio signal output means for producing an audio signal output in accordance with said digital audio data;
- memory means for storing said digital audio data read out from said disc by said readout means;
- switching means for switching said digital audio data supplied to said audio signal output means between said digital audio data stored in said memory means and said digital audio data currently being read out by said readout means; and
- control means for controlling said readout means and said memory means so that, prior to a playback start operation, said digital audio data of a first predetermined period from a beginning of at least one program are automatically read out by said readout means and stored in said memory means without a user having first selected a special operational mode, and for controlling said switching means so that, at a beginning of said playback start operation, said audio signal output means produces said audio signal output based on said digital audio data stored in said memory means, and for controlling said switching means so that, a second predetermined period after said start operation, said audio signal output means produces said audio signal output based on said digital audio data currently being read out by said readout means.

5,748,586

DATA RECORDING METHOD AND APPARATUS FOR MINIMIZING THE INFLUENCE OF INTER SYMBOL INTERFACE

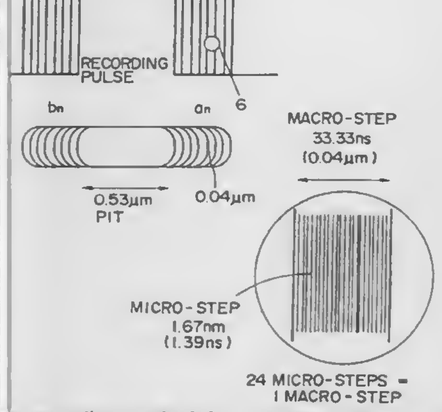
Seiji Kobayashi, Kanagawa, and Joost De Kock, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 136,311, Oct. 13, 1993, abandoned. This application Apr. 9, 1996, Ser. No. 629,907

Claims priority, application Japan, Oct. 13, 1992, 4-300470

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—48 **9 Claims**


440ns
33.33ns
RECORDING PULSE
6
bn
an
MACRO-STEP 33.33ns (0.04μm)
0.53μm PIT
0.04μm
MICRO-STEP 1.67nm (1.39ns)
24 MICRO-STEPS = 1 MACRO-STEP

1. A data recording method for recording data as a plurality of pits, the recording method comprising the steps of:

- defining a first position of an edge of a pit with a first width according to the data to be recorded;
- changing the first position of said edge by a second width to define a second position, the second position minimizing interference due to at least two other edges and the second width being smaller than said first width; and
- recording the pit on the recording medium so that the edge is recorded at the second position.

5,748,587

SPINDLE SERVO CIRCUIT IN HIGH-SPEED OPTICAL DISK REPRODUCER

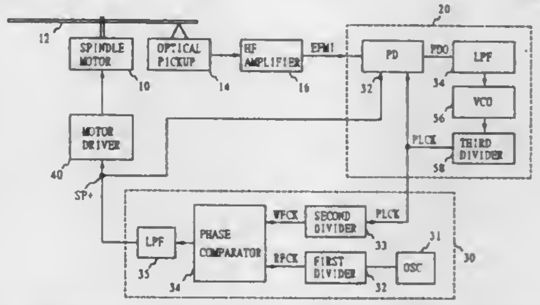
Tae-Hyeon Sim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 15, 1996, Ser. No. 678,593

Claims priority, application Rep. of Korea, Oct. 6, 1995, 95-34321

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—50 **5 Claims**



1. A spindle servo circuit in an optical disc reproducing apparatus comprising:

- a first phase comparator for comparing the phases of a reference clock signal and a reproduced frame clock signal and outputting a phase difference signal;
- a first low pass filter for generating a revolution speed control signal for a spindle motor by low-pass filtering the phase difference signal;
- a motor driving means for driving revolution of the spindle motor in response to the revolution speed control signal;
- a high frequency amplifier for amplifying and wave-shaping a high frequency signal reproduced from an optical disc which is rotated by the spindle motor and outputting a reproduced data signal;
- a phase locked loop circuit for generating a reproduced bit clock signal from the reproduced data signal during normal operation, and maintaining generation of the reproduced bit clock signal according to a previous state in response to the revolution speed control signal when over a predetermined speed; and
- a first divider for dividing the reproduced bit clock signal and generating said reproduced frame clock signal.

5,748,588

MEMORY CONTROLLER AND RECORDING APPARATUS WHICH ADDS DUMMY DATA TO COMPLETE A SECTOR OF DATA WHEN WRITING TO MEMORY

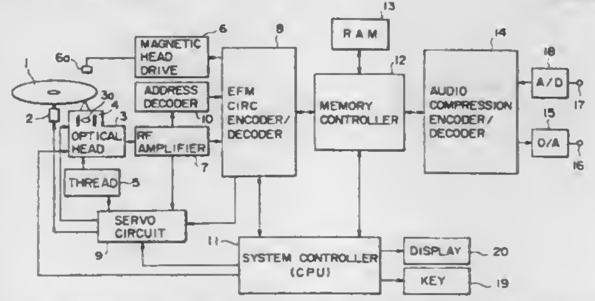
Yasuaki Maeda, Kanagawa, and Kosuke Nakamura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 526,945, Sep. 12, 1995, abandoned. This application Apr. 24, 1997, Ser. No. 840,012

Claims priority, application Japan, Sep. 20, 1994, 6-250209

Int. Cl.⁶ G11B *3/90*

U.S. Cl. 369—54 **3 Claims**



3. A memory controller for storing input data into a memory in units of sectors, comprising:

- dummy data generating means for generating dummy data in the form of a muting signal;

OL
2 10
SS
1
MY
5
998
MI

first selector means for selectively supplying other input data or the dummy data sent from the dummy data generating means to the memory;

dummy request signal generating means for generating a dummy data request signal;

second selector means for selectively supplying either a data request command signal or a dummy request signal from the dummy request signal generating means:

a controller for generating timing signals which are sent to the memory controller in accordance with either the dummy request signal or the request command signal;

selector control means for switching the first selector means and the second selector means, if the supply of input data is stopped before the amount of data reaches a complete sector while input data is supplied to the memory through the first selector means, and to supply data from the dummy data generating means via the first selector means to the memory and to supply the dummy data request signal from the dummy request signal generating means via the second selector means to the controller until the total amount of data stored in the memory reaches a complete sector.

5,748,589

DIAGNOSIS OF AN OPTICAL DISK APPARATUS USING A DIAGNOSTIC METHOD CONTAINED ON AN OPTICAL DISK MEDIUM

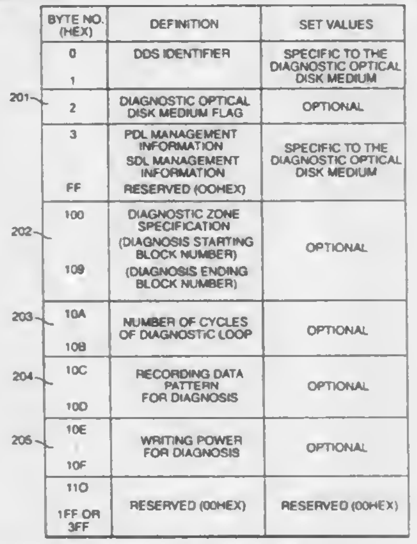
Kikuo Shimizu, Hiratsuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1996, Ser. No. 665,900

Claims priority, application Japan, Jun. 20, 1995, 7-152844

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—54 **22 Claims**


201
202
203
204
205

BYTE NO. (HEX)	DEFINITION	SET VALUES
0 1	DDS IDENTIFIER	SPECIFIC TO THE DIAGNOSTIC OPTICAL DISK MEDIUM
2	DIAGNOSTIC OPTICAL DISK MEDIUM FLAG	OPTIONAL
3 FF	PDL MANAGEMENT INFORMATION SDL MANAGEMENT INFORMATION RESERVED (OOHEX)	SPECIFIC TO THE DIAGNOSTIC OPTICAL DISK MEDIUM
100 109	DIAGNOSTIC ZONE SPECIFICATION (DIAGNOSIS STARTING BLOCK NUMBER) (DIAGNOSIS ENDING BLOCK NUMBER)	OPTIONAL
10A 10B	NUMBER OF CYCLES OF DIAGNOSTIC LOOP	OPTIONAL
10C 10D	RECORDING DATA PATTERN FOR DIAGNOSIS	OPTIONAL
10E 10F	WRITING POWER FOR DIAGNOSIS	OPTIONAL
110 1FF OR 3FF	RESERVED (00HEX)	RESERVED (00HEX)

1. An optical disk apparatus, comprising:

detecting means for detecting presence/absence of an optical disk;

disk rotating means for rotatably driving the optical disk;

an optical head for writing information on and reading information from the optical disk;

optical head position control means for controlling the position of the optical head relative to the optical disk;

a signal control system for controlling write signals representing information to be written by the optical head and read signals representing information read by the optical head; and

means for reading a predetermined read-only diagnostic identification information writing zone of the optical disk upon loading of the optical disk to thereby determine whether the optical disk is a diagnostic optical disk, and for selecting one of a diagnostic mode and a normal operating mode according to the determination.

5,748,590

APPARATUS FOR INSPECTING DISC RECORDING MEDIUM

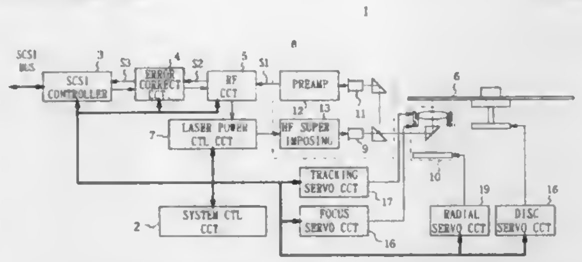
Yasuo Iwasaki; Toshiaki Ozaki, and Hiroyuki Miyawaki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 14, 1996, Ser. No. 696,509

Claims priority, application Japan, Aug. 18, 1995, 7-233525

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—58 **5 Claims**



1. An apparatus for inspecting a disc recording medium which inspects whether or not said disc recording medium has a defect, which has recording/reproducing means for recording and reproducing data in said disc recording medium, servo means for servo-controlling said recording/reproducing means to record said data in said disc recording medium in a predetermined state, and data reproducing means for reproducing data from the output of said reproducing means, said apparatus comprising:

data error detecting means for detecting an error of data reproduced by said disc recording medium;

servo error detecting means for detecting the existence of the instant change larger than the reference value of the servo error of said servo means;

signal drop-out detecting means for detecting the drop-out of high-frequency signal reproduced from said disc recording medium;

defect detecting means for detecting the existence of the defect of said disc recording medium based on the detected result of said data error detecting means, said servo error detecting means, and said signal drop-out detecting means; and

recording means for recording the defective portion of said disc recording medium in the management area of said disc recording medium in accordance with the detected result of said defect detecting means.

5,748,591

DISK DRIVE

Hidekazu Nakai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 24, 1996, Ser. No. 736,569

Claims priority, application Japan, Oct. 30, 1995, 7-282120

Int. Cl.^{6} G11B *3/90*

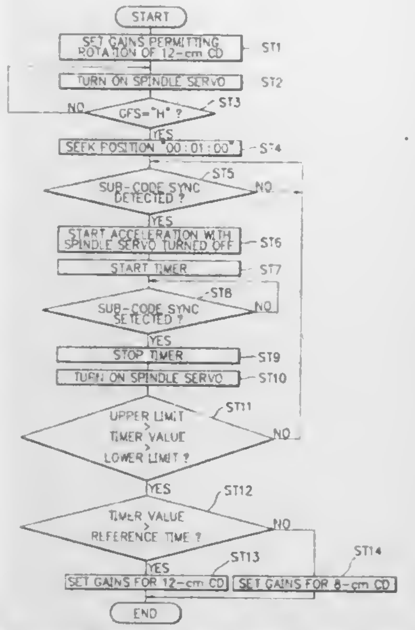
U.S. Cl. 369—58 **13 Claims**

1. A disk drive for reproducing data from one of a plurality of disks having different diameters, said disk drive comprising:

periodical signal detection means for detecting a periodical signal included in signals reproduced from the disk;

spindle servo means for controlling a spindle motor rotating the disk so that said periodical signal will appear at constant intervals in the signals reproduced from the disk;

acceleration means for positively accelerating said spindle motor for a predetermined time starting from a first point in time at which said periodical signal detection means detects said periodical signal appearing at substantially constant intervals in the signals reproduced from the disk rotated at a predetermined rotational speed;



time measurement means for measuring a time interval ranging from said first point in time to a second point in time at which said periodical signal detection means detects said periodical signal a second time; and

disk diameter determination means for determining the diameter of the disk by comparing the time interval measured by said time measurement means with a reference time.

5,748,592

DISK DRIVE APPARATUS AND DISK STORAGE MEDIUM FOR HIGH DENSITY RECORDING

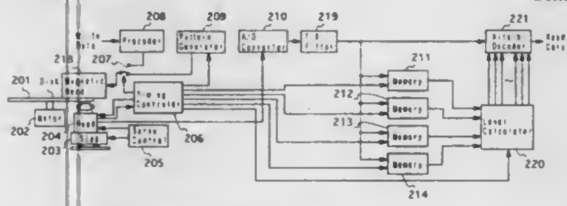
Yasumori Hino, Nara; Norio Miyatake, Hyogo; Masahiro Birukawa, and Tadashi Nakamura, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 4, 1997, Ser. No. 794,816

Claims priority, application Japan, Feb. 7, 1996, 8-021159

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—59 **9 Claims**



1. A disk drive apparatus, comprising:

means for writing three or more different states of record marks in a read track and adjacent tracks thereof on a disk storage medium;

means for detecting read levels of said record marks in said read track, said read levels including crosstalks of said adjacent tracks;

means for calculating every possible read level regarding every possible combination of said record marks in said read track and adjacent tracks thereof according to said detected read levels; and

means for performing most-liklihood decoding of read signal of written data in said disk storage medium in accordance with said possible read levels as reference levels.

5,748,593

DATA REPRODUCTION APPARATUS

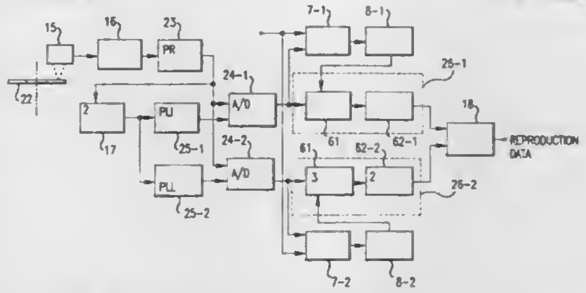
Shinichi Tanaka, Kanagawa-ken, and Isao Kimura, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 3, 1996, Ser. No. 660,196

Claims priority, application Japan, Jun. 2, 1995, 7-136781; Aug. 21, 1995, 7-211680

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—59 **14 Claims**



1. A data reproduction apparatus comprising:

a PR-equalizing circuit which equalizes reproduction signals recorded on a recording medium based on a partial response system and produces output signals in response thereto:

a binary coded circuit which changes output signals from said PR-equalizing circuit into binary signals;

a first clock generation circuit which generates a first clock signal synchronized to a front edge of said binary signals;

a second clock generation circuit which generates a second clock signal synchronized to a trailing edge of said binary signals;

a first A/D converter which samples the output signals from said PR-equalizing circuit based on said first clock signal and generates a first sample data;

a second A/D converter which samples the output signals from said PR-equalizing circuit based on said second clock signal and generates a second sample data;

a first decoding circuit which decodes said first sample data based on a first predetermined ideal amplitude value and generates first reproduced data;

a second decoding circuit which decodes said second sample data based on a second predetermined ideal amplitude value and generates second reproduced data; and

a synthesis circuit which synthesizes a signal from said first reproduced data output from said first decoding circuit and said second reproduced data output from said second decoding circuit.

5,748,594

RECORDING MEDIUM, RECORDING APPARATUS AND REPRODUCING APPARATUS

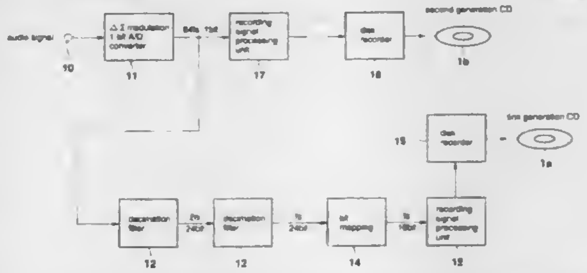
Ayataka Nishio, and Yasuhiro Ogura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1996, Ser. No. 693,440

Claims priority, application Japan, Aug. 9, 1995, 7-222748; Aug. 9, 1995, 7-222750

Int. Cl.^{6} G11B *5/76*

U.S. Cl. 369—59 **7 Claims**



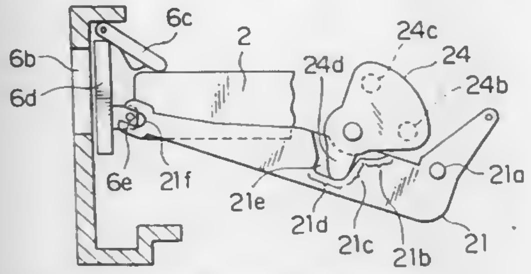
1. A recording apparatus for recording a first digital signal consisting of multi-bit data words sampled at a first sampling

OL
2 10
ISS
1
MY
5
998
MI

frequency to a first recording medium and a second digital signal consisting of 1 bit data words sampled at a second sampling frequency higher than the first sampling frequency to a second recording medium, comprising:
analog to digital converting means for converting an input analog signal to a one-bit data stream signal at the second sampling frequency;
down sampling and re-quantization means for converting the one-bit data stream signal sampled at the second sampling frequency to a multi-bit digital signal sampled at the first sampling frequency;
first recording signal processing means for processing the multi-bit digital signal for recording;
first recording means for recording the digital signal processed by the first signal processing means to the first recording medium;
second recording signal processor means for processing the one-bit data stream signal for recording; and
second recording means for recording the digital signal processed by the second signal processing means to the second recording medium.

5,748,595
CARTRIDGE LOADING MECHANISM WITH A DOOR CLOSING ASSEMBLY

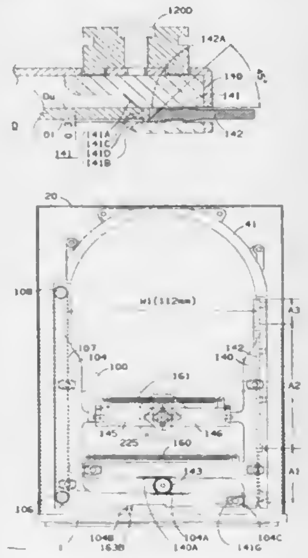
Yuji Nakajima, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 575,721, Dec. 18, 1995, abandoned. This application Aug. 19, 1996, Ser. No. 698,437
Claims priority, application Japan, Mar. 30, 1995, 7-97808; Oct. 3, 1995, 7-256464
Int. Cl.^{6} G11B *33/02;17/03*
U.S. Cl. 369—77.2 **4 Claims**



1. A cartridge loading mechanism comprising:
a loading base;
a cartridge holder for mounting a cartridge storing a recording medium thereinto;
a carrier for guiding said cartridge holder to a predetermined position at an inserting or ejecting time of the cartridge;
a swinging cam for swingably attaching said cartridge holder and said carrier to said loading base; and
a base plate for supporting said loading base;
the cartridge loading mechanism being constructed such that a first door for closing a cartridge insertion port at an unloading time of the cartridge is rotatably arranged in the vicinity of a front cover;
a second door for closing said cartridge insertion port at a loading time of the cartridge is slidably arranged in a direction perpendicular to an inserting/discharging direction of the cartridge;
a projection is formed in one portion of said swinging cam and extends radially outward from an attaching portion of the swinging cam, said attaching portion attaching the swinging cam to said loading base;
a lever has a groove portion in an end tip portion thereof, said groove portion being engaged with a boss portion formed on at least one of right-hand and left-hand sides of said second door;
said lever also having a shaft on a side opposite to said end tip portion, said shaft extending in the same direction as said attaching portion of said swinging cam;
said lever being rotatably attached to a hole formed on at least one of right-hand and left-hand side faces of said base plate such that the lever is moved in association with a vertical movement of said second door;
a first cam portion, a notch portion and a second cam portion are formed in said lever;
said first cam portion being constructed by a recessed portion formed in the shape of an arc having a length as a radius from said attaching portion to said projection with said attaching portion as a center;
the first cam portion comes into contact with said projection of said swinging cam in a position corresponding to a time when said cartridge holder is located in a position allowing unloading of the cartridge during which said end tip portion of said lever is located in a position for completely opening said second door;
the second cam portion comes in contact with said projection from a complete opening state of said second door to a closing state of said cartridge insertion port when said lever is rotated;
the notch portion comes in contact with said projection of said swinging cam in a position corresponding to a time when said cartridge holder is located in a position allowing loading of the cartridge during which the end tip portion of said lever is located in a position for completely closing said second door.

5,748,596
DISK CHANGER/PLAYER WITH DISK-EDGE GUIDE AND TRANSFER MECHANISM

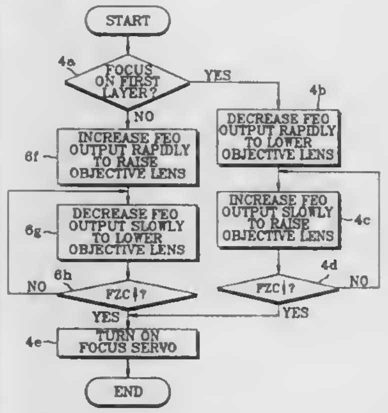
Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan
Filed Oct. 2, 1996, Ser. No. 725,137
Claims priority, application Japan, Oct. 11, 1995, 7-289282
Int. Cl.^{6} G11B *17/04;17/10*
U.S. Cl. 369—77.1 **44 Claims**



1. A device, for transporting, in a direction of travel, a recorded disk having a back surface, a recorded surface, and an edge surface, comprising:
a first guide having a first surface oriented to engage said edge surface at a first portion of said edge surface;
a second guide having a second surface oriented to engage said edge surface at a second portion of said edge surface substantially opposite said first portion of said edge surface;
said first guide having at least one guide surface;
means for urging said disk against said at least one guide surface;
means for rolling said disk along said at least one guide surface;
said at least one guide surface being such that said disk is forced toward a defined orientation relative to said direction of travel;
a disk storage magazine;
said disk storage magazine having at least one storage guide, alignable with said first disk guide, to guide said disk from said first and second disk guides into said disk storage magazine, said disk being guided by said storage guide after a position of initial engagement with said storage guide;
said means for urging having means for reducing a force of urging, as said disk is transported through said position of initial engagement, during a transporting from said first and second disk guides toward said storage guide, whereby said disk is made freer to align itself with said storage guide.

5,748,597
MULTI-LAYERED DISK FOCUSING METHOD AND APPARATUS

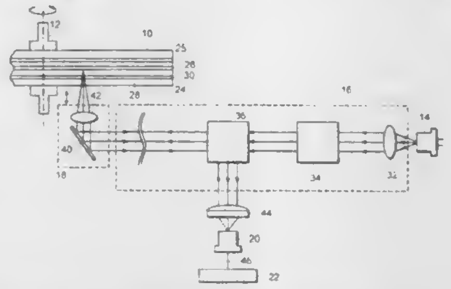
Nak-Seok Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Sep. 27, 1996, Ser. No. 719,702
Claims priority, application Rep. of Korea, Sep. 30, 1995, 33225/1995
Int. Cl.^{6} G11B *3/74*
U.S. Cl. 369—94 **5 Claims**


START
4a
FOCUS ON FIRST LAYER?
YES
NO
4b
DECREASE FEO OUTPUT RAPIDLY TO LOWER OBJECTIVE LENS
6f
INCREASE FEO OUTPUT RAPIDLY TO RAISE OBJECTIVE LENS
6g
DECREASE FEO OUTPUT SLOWLY TO LOWER OBJECTIVE LENS
INCREASE FEO OUTPUT SLOWLY TO RAISE OBJECTIVE LENS
4c
6h
NO
FZC↓?
4d
FZC↓?
NO
YES
YES
4e
TURN ON FOCUS SERVO
END

1. A method for focusing on a first layer or a second layer of a multi-layered disk according to the result of a detection of zero-crossing points of an S-curve focusing error signal by raising or lowering an objective lens through a change in a focus actuator voltage, said method comprising the steps of:
determining whether a focusing operation is to be performed on the first layer or on said second layer;
if it is determined in said determining step to perform a focusing on said first layer, rapidly decreasing said focus actuator voltage in order to lower said objective lens, and then slowly increasing said focus actuator voltage to bring said objective lens up slowly, and detecting the zero-crossing points of said focus actuator voltage to thereby focus on said first layer; and
if it is determined in said determining step to perform a focusing on said second layer, rapidly increasing said focus actuator voltage to raise said objective lens, and then slowly decreasing said focus actuator voltage to lower said objective lens slowly again, and detecting the zero-crossing points of said focus actuator voltage to thereby focus on said second layer.

5,748,598
APPARATUS AND METHODS FOR READING MULTILAYER STORAGE MEDIA USING SHORT COHERENCE LENGTH SOURCES

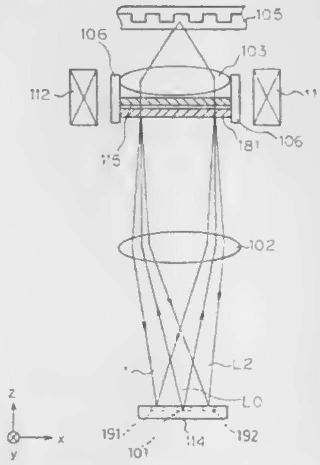
Eric A. Swanson, Acton, and Stephen R. Chinn, Westford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Dec. 22, 1995, Ser. No. 577,366
Int. Cl.^{6} G11B *3/74*
U.S. Cl. 369—94 **26 Claims**



1. An apparatus for reading data, comprising:
a) a source of light having a coherence length L_c; and
b) an optical system focusing said light from said source of light onto a preselected layer of an optical medium comprising at least two layers, each layer of said at least two layers containing data and having a spacing L,
wherein said spacing L is greater than a Rayleigh range L_r of the optical medium and the optical system thereby substantially reducing coherence between light reflecting from the preselected layer and light reflecting from each other of said at least two layers.

5,748,599
HOLOGRAPHIC OPTICAL DEVICE

Hiroaki Yamamoto, Katano; Tetsuo Saimi, Hirakata; Seiji Nishino, Osaka; Yoshiaki Komma, Kyoto, and Hidenori Wada, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan
Division of Ser. No. 495,137, Jun. 28, 1995. This application Jan. 17, 1997, Ser. No. 785,542
Claims priority, application Japan, Jun. 30, 1994, 6-149231
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—103 **11 Claims**



1. An optical head device comprising:
a radiation source for emitting a light beam,
imaging optics for converging said light beam from said radiation source to a minute spot on an information recording medium,
a holographic optical element for generating diffracted light beams of +n-th order and −n-th order (n: natural number) by diffracting a reflection light beam reflected by said information recording medium.

/OL
2 10
SS
1
MY
5
998
JMI

a first photodetector having plural areas for detecting a focus error signal and a tracking error signal on the basis of only a first diffracted light beam of +n-th order of said diffracted light beams, and

a second photodetector for detecting an information signal on the basis of only a second diffracted light beam of -n-th order of said diffracted light beams.

5,748,600
ROTATIONAL OPTICAL HEAD FOR OPTICAL RECORDING MEDIUM

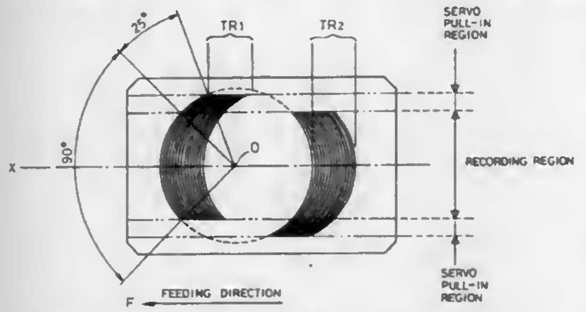
Manabu Sugano; Susumu Nomura; Naoharu Yanagawa, and Hiroshi Suzuki, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Apr. 10, 1996, Ser. No. 632,339

Claims priority, application Japan, Apr. 11, 1995, 7-110225

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—112 **6 Claims**



1. A pickup apparatus of an optical card comprising:

a fixed optical unit;

an objective lens for converging a light beam for recording and reproducing information emitted from said fixed optical unit onto an almost rectangular recording surface of a card-shaped recording medium;

light beam guiding means for guiding said light beam to said recording surface through said objective lens and for guiding a reflected light of said light beam from said recording surface to said fixed optical unit;

a rotational optical unit which is rotated in a manner such that said objective lens and said light beam guiding means are rotated integrally and a line perpendicular to said recording surface is set to a center of rotation, said rotational optical unit forming a pair of recording tracks for each rotation of said objective lens, the pair of recording tracks occupying angular sectors on the recording surface that are symmetric about the center of rotation; and

relative position changing means for changing a positional relation of said recording surface and said center of rotation along the major side direction on said rectangular recording surface, wherein when a recording angle on said recording surface is set to θ, a length of a line segment connecting the center of said objective lens and said center of rotation of the rotational optical unit is determined on the basis of a length in said major side direction on the recording surface and (1+ cosθ/2).

5,748,601
OPTICAL HEAD FOR USE WITH HIGH DENSITY OPTICAL DISK HAVING MULTI-VALUED DATA RECORDED IN THE DISK

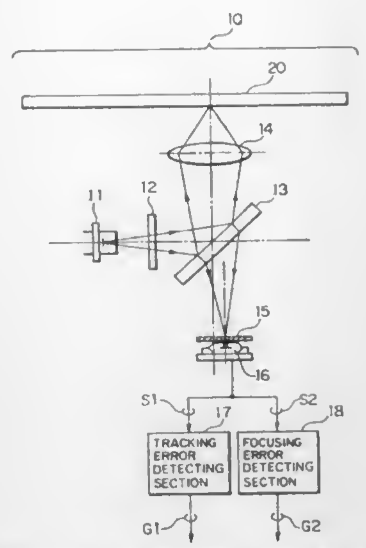
Jun-Ichi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 9, 1996, Ser. No. 728,304

Claims priority, application Japan, Oct. 13, 1995, 7-265514

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—112 **3 Claims**


10
20
14
11
12
13
15
16
S1
17
S2
18
TRACKING ERROR DETECTING SECTION
FOCUSING ERROR DETECTING SECTION
G1
G2

1. An optical head comprising a light source for emitting a light beam, a diffraction grating, disposed in association with said optical head, for diffracting the light beam to generate at least a pair of first-order diffracted beams, a first optical system for focusing the first-order diffracted beams onto an optical disk file having multi-value encoded data to generate a pair of reflected beams from the optical disk file, a second optical system for focusing the reflected beams at respective focal points to generate a pair of focused beams, a pin-hole member having a pin-hole at each of the focal points corresponding to each of said focused beams, a photodetector having at least a pair of detecting sections each for receiving a corresponding one of the pair of focused beams passing through respective pin-holes to generate detected signals based upon the respective focused beams, and a first calculating section for performing a calculation operation based upon the detected signals and for generating based upon said calculation operation a tracking error signal for tracking the optical head.

5,748,602
SINGLE-LENS OPTICAL PICK-UP HEAD FOR ACCESSING A DVD DISC AND A CD DISC BY SWITCHING BETWEEN TWO OPTICAL STATES

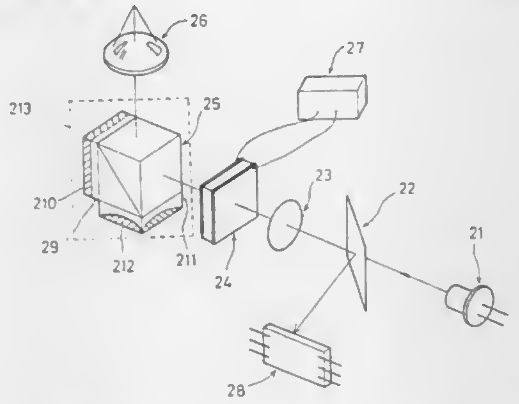
Zu-Wen Chao, Shinchu; Tsung-Ming Yang, Chilung; Shin-Ter Tsai, Taipei; Jau-Jiu Ju, Shinchu Hsien, and Pei-Yih Liu, Chichou Hsiang, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Dec. 11, 1996, Ser. No. 763,437

Claims priority, application Taiwan, Sep. 24, 1996, 8511689

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—112 **17 Claims**



1. A single-lens optical pick-up head for use in accessing both DVD and CD discs, comprising:

a laser diode for providing a first light beam having a polarization;

a beam splitter for receiving the first light beam in a first direction from said laser diode, and passing therethrough, in the first direction, a portion of the first light beam as a smaller second light beam;

a collimator disposed to receive and collimate the second light beam;

a polarizing light converter disposed to receive the second collimated light beam and output a third light beam;

a polarization controller for modulating said polarizing light converter so that the polarizing light converter selectively passes the second collimated light beam output as the third light beam, with or without converting the polarization thereof,

a polarization optical device disposed to receive the third light beam from said polarizing light converter and provide a fourth light beam in a second direction different from the first direction;

an objective lens, disposed to focus the fourth light beam on one of the discs which reflects the fourth beam from a surface of the disc back through said objective lens so as to provide a reflected light beam as a fifth light beam passing in a third direction opposite to the second direction, back through said polarization optical device which directs the fifth beam in a direction opposite to the first direction through said polarizing light converter, and said collimator to said beam splitter; and

a photodetector, for receiving a sixth light beam from said beam splitter as a reflected part of the fifth light beam, said photodetector providing an electric output signal based thereon.

5,748,603
OPTICAL PICKUP APPARATUS FOR DIFFERENT DISCS

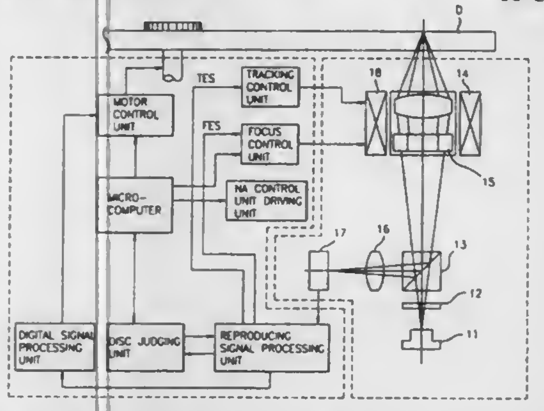
Jin Yong Kim, Kyungki-Do, and Seong Yun Jeong, Seoul, both of Rep. of Korea, assignors to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 775,453

Claims priority, application Rep. of Korea, Dec. 30, 1995, 68685/1995; Aug. 17, 1996, 34042/1996

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—112 **18 Claims**



1. An optical pickup apparatus for different discs, comprising:

an objective lens for focusing a beam onto optical discs each having different thicknesses; and

numerical aperture control means, through which said beam is passed, for controlling the numerical aperture of the objective lens in accordance with a thickness of an optical disk, said numerical aperture control means including

a lower transparent substrate,

an upper transparent substrate,

upper and lower patterned transparent electrodes formed on the lower transparent substrate and upper transparent substrate, respectively, for acting as a phase grating during an electric voltage supply thereto, and

a body of liquid crystal arranged between said transparent electrodes;

said upper transparent electrode having a first pattern defining a first non-zero period and said lower transparent electrode having a second pattern defining a second non-zero period.

5,748,604
CHANGER FOR INFORMATION CARRIERS, HOLDER SUITABLE FOR USE IN SAID CHANGER, AND SCANNING SYSTEM COMPRISING SAID HOLDER

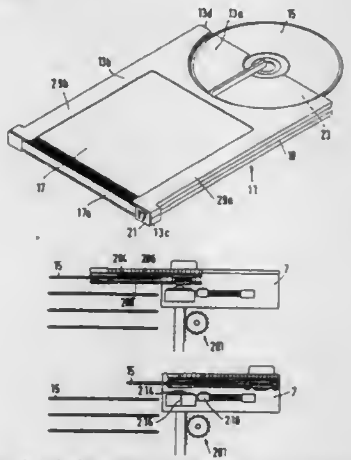
Gregg Flender, Quincy, Mass., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 401,065, Mar. 8, 1995, abandoned. This application Dec. 9, 1996, Ser. No. 762,259

Claims priority, application European Pat. Off., Mar. 31, 1994, 94200900

Int. Cl.^{6} G11B *17/10*

U.S. Cl. 369—192 **10 Claims**



1. A changer for information carriers, comprising a magazine section with a magazine for storing information carriers above one another along a vertical plane, and a scanning section extending parallel to said vertical plane and comprising means for inscribing and/or reading information to and/or from said carriers, characterized in that the magazine comprises holders disposed one above the other in said vertical plane for storing information carriers one above the other and for storing storage boxes for information carriers one above the other, each of which holders comprise a first holder part having a first supporting surface for supporting an information carrier which first holder part is disposed adjacent said scanning section, and a second holder part for storing a storage box for an information carrier, and having a second supporting surface for supporting the storage box which second holder part is disposed adjacent to and in substantially the same plane as said first holder part, means for moving said inscribing and/or reading means along said scanning section and means for providing access for said inscribing and/or reading means to an information carrier while said information carrier is not moved along said vertical plane.

5,748,605
ROTARY ARM-TYPE OPTICAL PICK-UP DRIVING DEVICE

Jong-wan Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 15, 1996, Ser. No. 751,054

Claims priority, application Rep. of Korea, Nov. 16, 1995, 95-41650; Dec. 27, 1995, 95-59533

Int. Cl.^{6} G11B *7/08*

U.S. Cl. 369—222 **15 Claims**

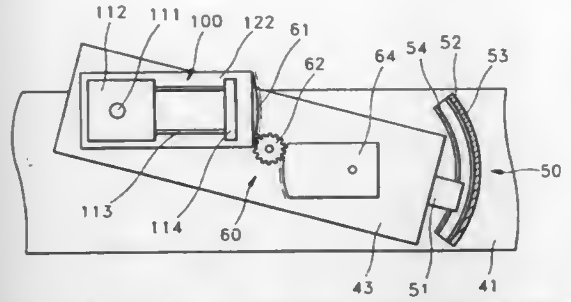
1. An optical pick-up driving device comprising:

a base;

a first guide pin formed on said base;

a rotary arm installed with respect to said base to rotate around said first guide pin;

/OL
2 10
ISS
1
MY
5
998
MI



rotation driving means, arranged along said rotary arm and said base, for rotating said rotary arm;

an optical pick-up assembly rotatably coupled through a second guide pin with said rotary arm to rotate around said second guide pin; and

interlocking means, which is interlocked with the rotation of said rotary arm, for rotating said optical pick-up assembly, wherein said interlocking means comprises:

an arc contact portion formed at one side of said optical pick-up assembly;

a rotary plate rotatably installed on said rotary arm and engaged with said arc contact portion; and

a fixed plate fixedly installed on said base by being combined with said first guide pin and engaged with said rotary plate.

5,748,606

OPTICAL DISC PLAYER DEVICE WITH A VIBRATION PREVENTION MECHANISM

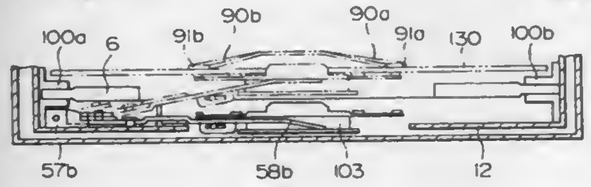
Yoshiaki Nakagawa, Yokohama; Takashi Suzuki, Tokyo; Seiji Nakama, Yokohama; Masataka Kaneda, Machida; Masakazu Kashikawa, Yokohama; Satoshi Kawata, Yokohama; Shunichi Iida, Yokohama; Hiroto Nishida, Ishikawa-ken, and Hiroyuki Matsuda, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 880,680, May 8, 1992. This application Mar. 6, 1995, Ser. No. 400,012

Claims priority, application Japan, Jun. 6, 1991, 3-134846; Jun. 6, 1991, 3-134847

Int. Cl.⁶ G11B *17/08*

U.S. Cl. 369—271 **6 Claims**



1. A disc player device comprising:

an elevator plate;

a slide plate slidably mounted on said elevator plate;

a pivotal member pivotally mounted on said elevator plate and pivotally move in response to the sliding movement of said slide plate so as to pivot toward and away from said elevator plate;

a clamper for supporting a disc thereon;

a pair of holder arms mounted on said pivotal member, said pair of holder arms being movable toward each other to hold said clamper therebetween, and movable away from each other to release said clamper; and

a movable member mounted on said pivotal member for movement in response to the sliding movement of said slide plate, said movable member coupling said pair of holder arms to said pivotal member for moving said pair of holder arms toward and away from each other in response to sliding movement of said slide plate.

5,748,607

OPTICAL DISC HAVING LARGE DISPLAY PATTERNS AND ITS MANUFACTURING APPARATUS

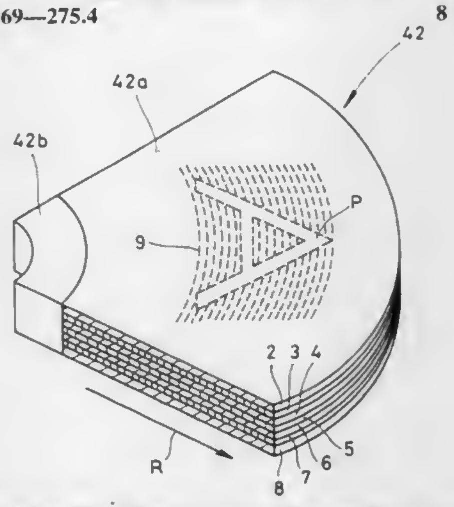
Hiroyuki Ohira; Nobuki Yamaoka, and Yutaka Murakami, all of Yamanashi, Japan, assignors to Pioneer Video Corporation, Yamanashi, and Pioneer Electronic Corporation, Tokyo, both of Japan

Filed Dec. 19, 1995, Ser. No. 575,080

Claims priority, application Japan, Jan. 12, 1995, 7-003363

Int. Cl.⁶ G11B *7/24;3/70*

U.S. Cl. 369—275.4 **8 Claims**



1. An optical disk having two recording surfaces on different sides of the disc on which pit trains are formed, wherein

one of the recording surfaces has concentrical or spiral recording tracks formed by pit trains carrying information signals;

the other of the recording surfaces has a display pattern area different from an adjacent area in reflection diffraction characteristic by including dummy pits in order to display a predetermined pattern; and

said display pattern area is formed by a mirror portion having no dummy pit.

5,748,608

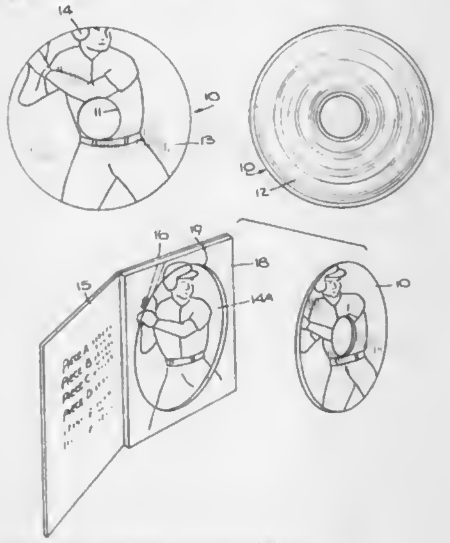
COMPACT DISC ALBUM

Donald Spector, 380 Mountain Rd., Union City, N.J. 07080

Continuation of Ser. No. 945,408, Sep. 16, 1992, Pat. No. 5,600,628, which is a continuation-in-part of Ser. No. 821,062, Jan. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 701,078, May 16, 1991, Pat. No. 5,090,561. This application Dec. 27, 1993, Ser. No. 173,045

Int. Cl.⁶ G11B *23/03;* B65D *85/57*

U.S. Cl. 369—291 **5 Claims**



1. A compact disc package comprising:

A. a compact disc having a predetermined thickness and diameter and an inner face and an outer face, the inner face of the disc having a recording thereon, the outer face being unrecorded; and

B. a panel formed of flexible material provided with a circular well having a bottom to receive the disc, so that the recorded inner face is adjacent the bottom, the well having a diameter substantially matching the diameter of the disc to effect frictional engagement therewith whereby the disc is pressed into and snugly nested in the well and can be popped out simply by flexing the panel to disengage the disc from the well, said well having a depth matching the thickness of the disc, the recorded face of the disc being laid against the bottom of the well, the unrecorded face being substantially flush with a corresponding surface of the panel.

5,748,609

DISC CARTRIDGE INCLUDING ELASTICALLY DEFORMABLE LID MEMBER AND ENGAGING MECHANISM FOR LOCKING LID MEMBER TO CARTRIDGE BODY

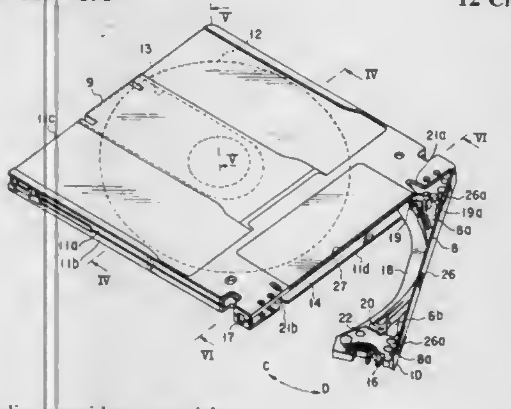
Satoshi Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 11, 1996, Ser. No. 730,295

Claims priority, application Japan, Oct. 13, 1995, 7-265857

Int. Cl.⁶ G11B *23/03*

U.S. Cl. 369—291 **12 Claims**



1. A disc cartridge comprising:

a cartridge body for storing a disc-like recording medium, said cartridge body being constructed and arranged to permit rotation of the recording medium when the recording medium is stored therein, said cartridge body having an opening portion for exposing a part of a surface of the recording medium and a disc inlet/outlet port for receiving the recording medium in and removing the recording medium from said cartridge body;

a shutter mounted on said cartridge body and slidable between an open position in which said opening portion is exposed and a closed position in which said opening portion is closed;

a lid member mounted on said cartridge body and rotatable between a closed position in which said lid member closes said disc inlet/outlet port and an open position in which said lid member opens said disc inlet/outlet port;

said cartridge body including an abutting portion that abuts against said lid member when said lid member is rotated to the closed portion;

said lid member having a first end portion pivotally supported on said cartridge body and a second end portion which is pivotable around said first end portion to move said lid member between the open and closed positions, said second end portion including a slanting surface which faces and is oblique to said abutting portion and which defines a clearance between said slanting surface and said abutting portion when said lid member is in the closed position and is not elastically deformed; and

an engaging mechanism that releasably locks said second end portion against said cartridge body to maintain said lid member in the closed position when said second end portion is positioned in the closed position and elastically deformed in a direction toward said abutting portion so as to eliminate the clearance.

5,748,610

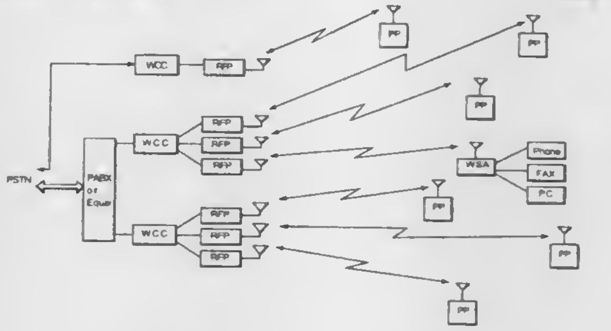
MULTI-APPLICATION WIRELESS DIRECT SEQUENCE SPREAD SPECTRUM DIGITAL CELLULAR TELEPHONE SYSTEM

Herman A. Bustamante, Millbrae, and Horen Chen, Saratoga, both of Calif., assignors to Stanford Telecommunications, Inc., Sunnyvale, Calif.

Filed May 8, 1995, Ser. No. 436,905

Int. Cl.⁶ H04T *11/00*

U.S. Cl. 370—208 **1 Claim**



1. A wireless OCDMA communication system in which there is a cluster of base stations (BS), and radio fixed parts (RFP), which are selectively controlled by a wireless cluster controller (WCC), said OCDMA communication system including frames of a time division duplex spread spectrum signal for two-way voice and/or data transmission, and a plurality of handsets, portable parts (PPs), and complex subscribers, each adapted to communicate selectively with said BS, or RFP, using said OCDMA communication system, and means to implement a variety of system configurations and provide a variety of levels of services, comprising:

a) a single base station and radio fixed part, and single portable part system for providing conventional telephone service,

b) a single base station and radio fixed part, and multiple portable parts for providing communications with a public switched network telephone,

c) a single base station and radio fixed part, and multiple portable parts for providing key system service with a proprietary interface or with an ISDN interface,

d) multiple base stations and radio fixed parts, and multiple portable parts for providing key system service with the capability of roaming and handover over an extended multiple cell service area,

e) multiple base stations and multiple radio fixed parts, and multiple portable parts interfacing to one or more PBXs for providing wide area network (WAN) coverage system capability, for a private network, and a Telepoint system capability for a public network,

f) multiple base stations and multiple radio fixed parts, and multiple portable parts for providing a wireless local loop capability,

g) multiple base stations and multiple radio fixed parts, and multiple portable parts together and subscriber terminals interfacing to the PSTN via satellite links for providing a wireless OCDMA telephone system capability, and

h) multiple base stations and multiple radio fixed parts, and multiple portable parts and subscriber terminals together with a wireless cable distribution system for providing wireless voice and data distribution system initially distributed via cable.

5,748,611

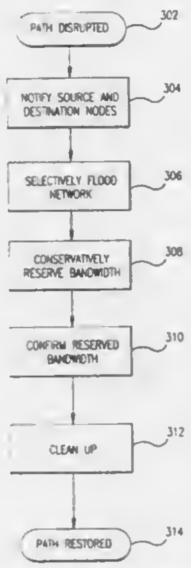
SYSTEM AND METHOD FOR RESTORING A TELECOMMUNICATIONS NETWORK USING CONSERVATIVE BANDWIDTH RESERVATION AND SELECTIVE MESSAGE REBROADCAST

John David Allen, Garland, Tex.; Ching-Hua Chow, Colorado Springs, Colo., and Jasvantrai C. Shah, Richardson, Tex., assignors to MCI Corporation, Washington, D.C.

Filed Jun. 27, 1996, Ser. No. 673,219

Int. Cl.^{6} H04L *12/24*

U.S. Cl. 370—224 **14 Claims**


PATH DISRUPTED
302
NOTIFY SOURCE AND DESTINATION NODES
304
SELECTIVELY FLOOD NETWORK
306
CONSERVATIVELY RESERVE BANDWIDTH
308
CONFIRM RESERVED BANDWIDTH
310
CLEAN UP
312
PATH RESTORED
314

1. In a network including at least one communications path connecting a first channel to a second channel, said path having a source node connected to said first channel, a destination node connected to said second channel, and at least one tandem node interconnecting said source and destination nodes, the nodes interconnected by spans, wherein each span connects two nodes and comprises at least one link, the links being either working links or spare links, a method for use in restoring a disrupted communications path, comprising the steps of:

(a) at the source node, broadcasting along all spans having spare links a first restoration message;

(b) at one of the tandem nodes, upon reception of said first restoration message from a first node, selectively rebroadcasting said first restoration message based on the number of times said one of the tandem nodes has received said first restoration message;

(c) at the destination node, upon reception of said first restoration message from a second node, sending a second restoration message to said second node for conservatively reserving bandwidth on a first span, said first span connecting the destination node to said second node; and

(d) at said one of the tandem nodes, upon reception of said second restoration message from a third node, sending said second restoration message to said first node, said second restoration message for conservatively reserving bandwidth on a second span connecting said one of said tandem nodes to said first node.

5,748,612

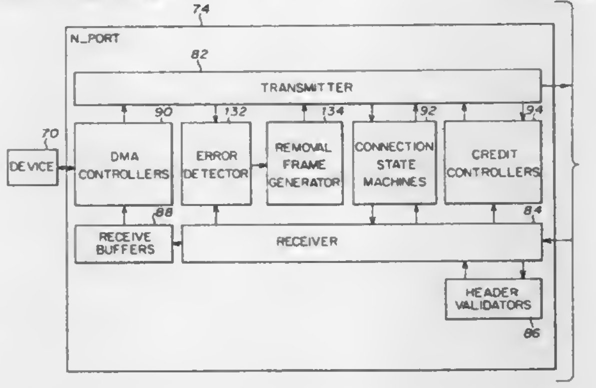
METHOD AND APPARATUS FOR IMPLEMENTING VIRTUAL CIRCUITS IN A FIBRE CHANNEL SYSTEM

Bent Stoevhase, Toronto, and Kumar Malavalli, Markham, both of Canada, assignors to McDATA Corporation, Broomfield, Colo.

Filed Aug. 10, 1995, Ser. No. 511,335

Int. Cl.^{6} H04J *3/16;3/14*

U.S. Cl. 370—230 **29 Claims**



1. In a component for being disposed in a communication system including at least one other component, an apparatus comprising:

means for establishing a virtual connection through the communication system between the component and the at least one other component;

receiving means for receiving information frames transmitted over the virtual connection from the at least one other component;

transmitting means for transmitting information frames over the virtual connection from the component to the at least one other component; and

a state machine, coupled to the transmitting means, that controls use of the virtual connection by the component, the state machine defining a live state of the virtual connection wherein a minimum bandwidth is guaranteed for transmission of information frames between the component and the at least one other component over the virtual connection, the state machine further defining a dormant state of the virtual connection wherein the minimum bandwidth is not guaranteed for the transmission of information frames between the component and the at least one other component over the virtual connection.

5,748,613

COMMUNICATION PACING METHOD

Erik Kilk, Battleground; Karen Van der Veer, Vancouver, both of Wash., and Leann M. MacMillan, West Linn, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 29, 1996, Ser. No. 626,224

Int. Cl.^{6} G06F *11/00;* **H04L** *12/56*

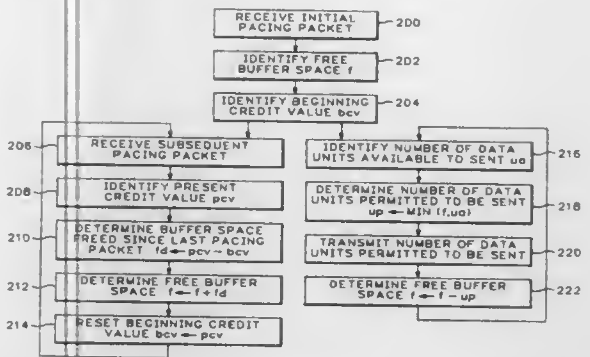
U.S. Cl. 370—231 **18 Claims**

1. A method of pacing a stream of data units transmitted from a data source to a specified buffered data destination having a determined number of available storage units upon initiating a communication, such data destination being configured to consume data units and thereby to free storage units for receipt of additional data units, the method comprising the steps of:

identifying a beginning credit value;

incrementing the beginning credit value with each storage unit freed to identify a present credit value;

transmitting data units to the data destination, the number of data units transmitted providing a transmission count, data unit transmission being limited to a transmission count which is no more than the determined number of available storage units;


RECEIVE INITIAL PACING PACKET
200
IDENTIFY FREE BUFFER SPACE f
202
IDENTIFY BEGINNING CREDIT VALUE bcv
204
206
RECEIVE SUBSEQUENT PACING PACKET
208
IDENTIFY PRESENT CREDIT VALUE pcv
210
DETERMINE BUFFER SPACE FREED SINCE LAST PACING PACKET fd ← pcv – bcv
212
DETERMINE FREE BUFFER SPACE f ← f + fd
214
RESET BEGINNING CREDIT VALUE bcv ← pcv
IDENTIFY NUMBER OF DATA UNITS AVAILABLE TO SENT uo
216
DETERMINE NUMBER OF DATA UNITS PERMITTED TO BE SENT up ← MIN (f,uo)
218
TRANSMIT NUMBER OF DATA UNITS PERMITTED TO BE SENT
220
DETERMINE FREE BUFFER SPACE f ← f – up
222

selectively updating the determined number of available storage units by determining the difference between the beginning credit value and the present credit value to identify a number of storage units freed since last identifying the beginning credit value, and determining the sum of the previously determined number of available storage units and the number of storage units freed to provide an updated determined number of available storage units; and

selectively updating the determined number of available storage units by determining the difference between the transmission count and the previously determined number of available storage units to provide an updated determined number of available storage units.

5,748,614

METHOD FOR SCHEDULING MESSAGE CELLS LEAVING AN ATM NODE

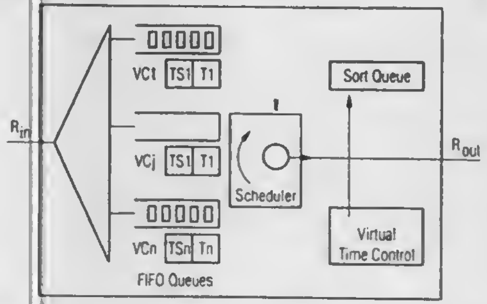
Eugen Wallmeier, Eichenau, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 6, 1996, Ser. No. 659,313

Claims priority, application European Pat. Off., Jun. 9, 1995, 95108916

Int. Cl.^{6} H04Q *11/04;* **H04L** *12/56*

U.S. Cl. 370—235 **1 Claim**



1. A method for scheduling message cells leaving an ATM node and belonging to virtual connections by means of an output controller allocated to each of outputs of the ATM node, comprising the steps of:

storing message cells to be transmitted via a respective output in connection individual FIFO-queues;

allocating two variables Ti, TSi to each of the FIFO-queues, where Ti defines a distance between consecutive message cells of a virtual connection i served at a rate $ri=1/Ti$, and TSi denotes a time stamp for a message cell at a head of a FIFO-queue i;

providing a virtual time variable VT;

monitoring peak cell rate individually for each of the virtual connections at an egress of the respective output controller;

serving the FIFO-queue with a lowest time stamp for transmitting the message cell at the head of that FIFO-queue only when $VT \geqq TSi$ and the peak cell rate for the respective virtual connection is not exceeded; and

updating the time stamp for the FIFO-queue if it is not empty with $TSi \leftarrow TSi+Ti$ after transmitting said message cell.

5,748,615

METHOD AND CIRCUIT ARRANGEMENT FOR FORWARDING MESSAGE CELLS TRANSMITTED VIA AN ATM COMMUNICATION EQUIPMENT TO A SERVING TRUNK

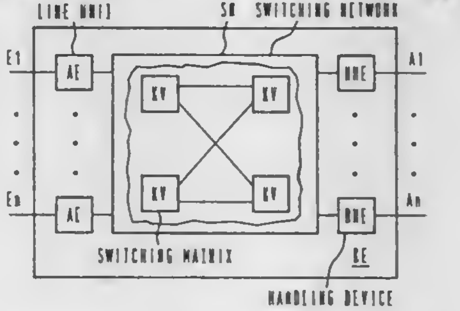
Michael Riedel, Dresden, and Herbert Heiss, Germering, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 4, 1996, Ser. No. 610,477

Claims priority, application Germany, Mar. 3, 1995, 195 07 570.6

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—238 **10 Claims**



1. A method for forwarding message cells transmitted via an ATM communication equipment operating according to an asynchronous transfer mode during virtual connections to a respective serving trunk for an associated respective virtual connection, comprising the steps of:

determining characteristic parameters for the respective virtual connection during a call setup according to traffic characteristic of a message cell stream to be transmitted;

determining a respective time interval for each message cell, in the message cell stream, based on the criterion of said characteristic parameters for forwarding each message cell transmitted via the ATM communication equipment to the respective serving trunk;

only calculating the time interval for a respective message cell with the forwarding of a message cell, in the message cell stream, immediately preceding said respective message cell in a common virtual connection;

the characteristic parameters for the individual connections being a peak bit rate, an upper limit of a sustainable bit rate, a burst tolerance and a cell delay variation;

determining a start time of the respective time interval according to a criterion of the peak bit rate, the burst tolerance and the cell delay variation; and

determining an end time of the respective time interval according to a criterion of the upper limit of the sustainable bit rate.

/OL
2 10
SS
1
MY
5
998
MI

5,748,616

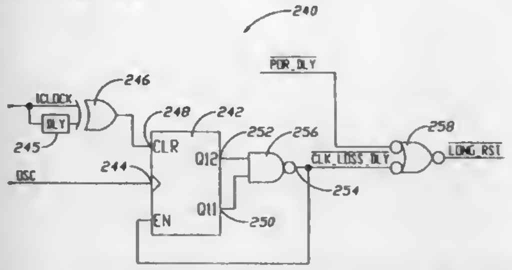
DATA LINK MODULE FOR TIME DIVISION MULTIPLEXING CONTROL SYSTEMS

Robert E. Riley, Jackson, Miss., assignor to Square D Company, Palatine, Ill.

Division of Ser. No. 305,253, Sep. 19, 1994, Pat. No. 5,553,070. This application Nov. 30, 1995, Ser. No. 565,534

Int. Cl.^{6} H04J *3/00*

U.S. Cl. 370—242 **13 Claims**



1. In a data link module with an integrated circuit having means for producing a data output signal representative of a data bus signal on a time division multiplexing basis for use in a time division multiplexing control system having a master synchronous clock for producing a master clock signal for establishing time division multiplexing frames, a clock loss output lock, comprising:

A. means for detecting loss of the master clock signal;

B. means for storing a signal representative of detection of loss of the master clock signal; and

C. means for inhibiting said output signal producing means from changing the state of the data output signal despite changes in the data bus signal in response to detecting loss of the master clock signal.

5,748,617

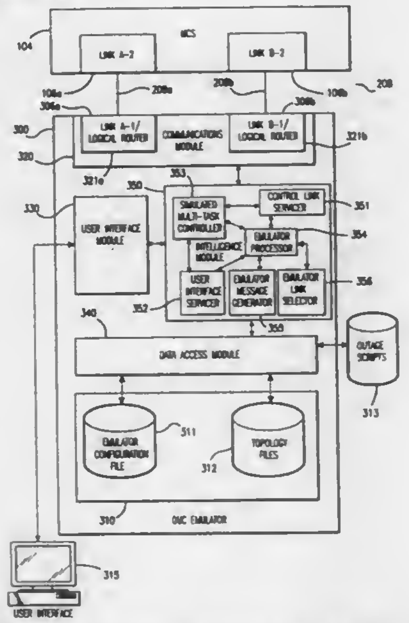
METHOD AND APPARATUS FOR EMULATING A DIGITAL CROSS-CONNECT SWITCH NETWORK

John V. McLain, Jr., Colorado Springs, Colo., assignor to MCI Corporation, Washington, D.C.

Filed May 1, 1996, Ser. No. 641,459

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 370—244 **37 Claims**



1. An emulator apparatus for emulating a digital cross-connect switch network to allow testing of a communication network monitor and control system (MCS) in the presence and absence of a selected network failure, the emulator apparatus comprising:

a communication module which communicates with the MCS over at least one emulator control link using a communications protocol substantially identical to a communications protocol used in the digital cross-connect switch network to communicate to the MCS;

a memory unit for storing emulated network data representative of the behavior and topology of the emulated digital cross-connect switch network in the presence and absence of the selected network failure; and

a processor coupled to said communication module and said memory unit, said processor sending emulator messages for the MCS to said communication module based on said emulated network data, said emulator messages emulating solicited and unsolicited messages that would be sent from the digital cross-connect switch network being emulated to the MCS in the presence and absence of the selected network failure.

5,748,618

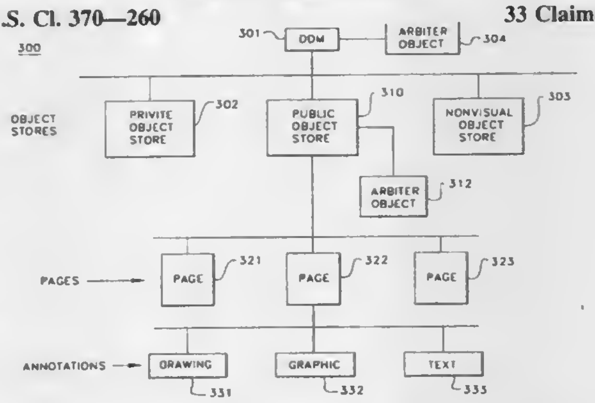
MULTILEVEL ARBITRATION IN A DATA CONFERENCE

Lewis V. Rothrock, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1995, Ser. No. 536,320

Int. Cl.^{6} H04Q *11/04*

U.S. Cl. 370—260 **33 Claims**



1. A method for arbitrating among requests for services affecting objects of a distributed data conference supported by a data conferencing system, the requests for services originating from a plurality of nodes of the data conferencing system, the method comprising the steps of:

(a) providing a hierarchical conference object structure having objects at a plurality of levels, wherein a distributed data manager object exists at a first level of the conference and at least one public object store exists at a second level of the conference, wherein the distributed data manager object is for containing the at least one public object store and the public object store is for containing at least one object at a third level of the conference;

(b) providing a first arbiter object for arbitrating requests that affect objects at the second level; and

(c) providing a second arbiter object for arbitrating requests that affect the at least one object at the third level that are contained by the at least one public object store;

wherein each object of the data conference contains data that specifically describes each said object and methods for manipulating data contained by each said object.

5,748,619

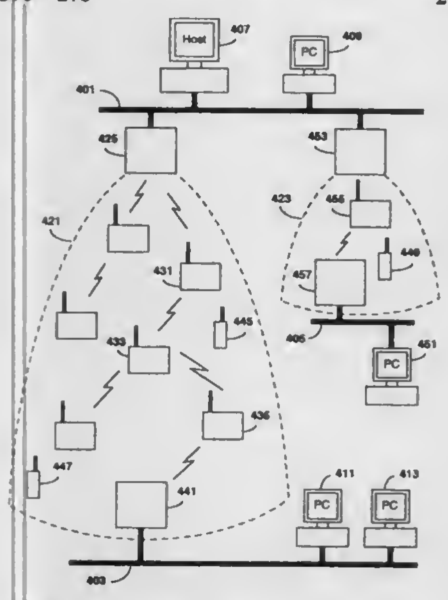
COMMUNICATION NETWORK PROVIDING WIRELESS AND HARD-WIRED DYNAMIC ROUTING

Robert C. Meier, 407 Sinclair Ave. SE., Cedar Rapids, Iowa 52403

Continuation of Ser. No. 318,154, Oct. 4, 1994, abandoned, and a continuation-in-part of Ser. No. 59,447, May 7, 1993, Pat. No. 5,428,636, Ser. No. 270,533, Jun. 5, 1994, and Ser. No. 255,848, Jun. 8, 1994, Pat. No. 5,394,436, which is a continuation-in-part of Ser. No. 968,990, Oct. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 769,425, Oct. 1, 1991, abandoned, said Ser. No. 318,154 is a continuation-in-part of Ser. No. 238,090, May 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 177,738, Jan. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 147,766, Nov. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 73,142, Jun. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 58,905, May 6, 1993, abandoned, said Ser. No. 59,447 is a continuation-in-part of Ser. No. 56,827, May 3, 1993, Pat. No. 5,295,154, which is a continuation of Ser. No. 769,425, said Ser. No. 270,533 is a continuation-in-part of Ser. No. 802,348, Dec. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 790,946, Nov. 12, 1991, abandoned. This application Dec. 26, 1996, Ser. No. 780,124

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 370—278 **29 Claims**



1. A communication system comprising:

a hard-wired communication network having a plurality of wired communication devices attached thereto, each of said plurality of wired communication devices communicating data as prescribed by a first communication protocol, and having a unique identifier for communicating data;

a wireless communication network having a plurality of wireless communication devices participating thereon in a hierarchical arrangement, each of said plurality of wireless communication devices communicating data as prescribed by a second communication protocol, and having a unique identifier for communicating data;

one of said plurality of wired communication devices comprises a wired access point which participates on the wireless communication network via the second communication protocol; and

when any one of said plurality of wired communication devices or said plurality of wireless communication devices communicates data to any other of said plurality of wired communication devices or said plurality of wireless communication devices, said any one of said plurality of wired communication devices or said plurality of wireless communication devices associates the unique identifier of the any other of said plurality of wired communication devices or said plurality of wireless communication devices with the data communicated for use by the first and second communication protocols for routing of the data to the any other of said plurality of wired communication devices or said plurality of wireless communication devices.

5,748,620

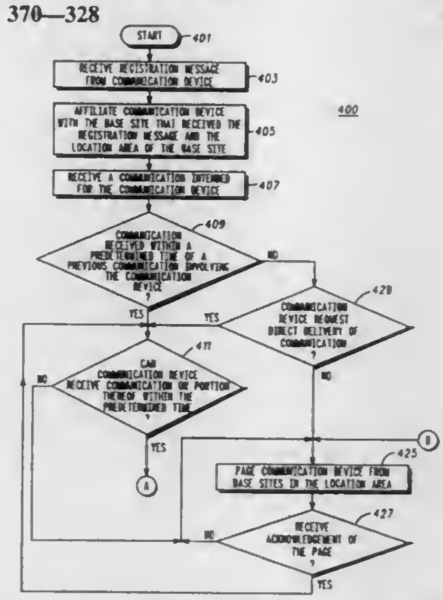
METHOD FOR PROVIDING COMMUNICATIONS TO A COMMUNICATION DEVICE IN A RADIO COMMUNICATION SYSTEM

Tomas Capurka, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1996, Ser. No. 640,291

Int. Cl.^{6} H04Q *7/34;7/36*

U.S. Cl. 370—328 **30 Claims**


START
401
RECEIVE REGISTRATION MESSAGE FROM COMMUNICATION DEVICE
403
AFFILIATE COMMUNICATION DEVICE WITH THE BASE SITE THAT RECEIVED THE REGISTRATION MESSAGE AND THE LOCATION AREA OF THE BASE SITE
405
400
RECEIVE A COMMUNICATION INTENDED FOR THE COMMUNICATION DEVICE
407
409
COMMUNICATION RECEIVED WITHIN A PREDETERMINED TIME OF A PREVIOUS COMMUNICATION INVOLVING THE COMMUNICATION DEVICE ?
NO
YES
420
COMMUNICATION DEVICE REQUEST DIRECT DELIVERY OF COMMUNICATION ?
YES
NO
411
CAN COMMUNICATION DEVICE RECEIVE COMMUNICATION OR PORTION THEREOF WITHIN THE PREDETERMINED TIME ?
NO
YES
A
B
425
PAGE COMMUNICATION DEVICE FROM BASE SITES IN THE LOCATION AREA
427
RECEIVE ACKNOWLEDGEMENT OF THE PAGE ?
NO
YES

1. In a communication system that includes a system controller, a plurality of base sites, and a communication device, the plurality of base sites serving respective service coverage areas, the service coverage areas being grouped into a plurality of location areas, a method for the system controller to provide packet data communications to the communication device, the method comprising the steps of:

a) receiving a registration message from the communication device via a first base site of the plurality of base sites;

b) affiliating the communication device with the first base site and a first location area of the plurality of location areas that includes a service coverage area of the first base site;

c) receiving a packet data communication intended for the communication device to produce a received communication;

d) determining whether the received communication was received within a first predetermined period of time after a previous packet data communication involving the communication device; and

e) when the received communication was received within the first predetermined period of time, transmitting at least a first portion of the received communication to the communication device via the first base site.

VOL
2 10
SS
1
MY
5
998
MI

5,748,621

DIGITAL MOBILE COMMUNICATION SYSTEM

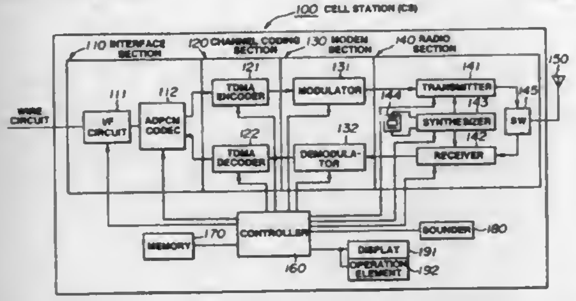
Atsushi Masuda, Sagamihara, and Takahiro Endo, Hachiouji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 8, 1996, Ser. No. 613,264

Claims priority, application Japan, Mar. 10, 1995, 7-051393; Mar. 10, 1996, 7-051394

Int. Cl.⁶ H04B *7/212*

U.S. Cl. 370—337 **9 Claims**



1. A mobile station in a digital mobile communication system having a master-slave mode to communicate with a cell station through a radio link and a mobile station-to-mobile station direct communication mode to directly communicate with another mobile station through a radio link, the mobile station comprising:

judging means for determining whether the another mobile station is busy and in communication with another device based on whether there is a reception of either one of a plurality of time division multiplex access (TDMA) frame signals being transmitted from the cell station for communication in the master-slave mode, and one of a plurality of TDMA frame signals being transmitted from the another mobile station for communication in the mobile station-to-mobile station direct communication mode; and

communication slot determination means for determining, when the judging means judges that the another mobile station is busy, a communication slot to be used for a called mobile station by detecting an idle communication slot on a TDMA signal frame of the busy station after establishing frame-synchronization between a timing of a TDMA signal frame of the mobile station and the TDMA signal frame of the busy station that is being received in the judging means and, when the judging means judges that the busy station does not exist, generates a timing of the TDMA signal frame at the mobile station and determines the communication slot on the TDMA signal frame of the mobile station, that is to be used for the called mobile station.

5,748,622

BURST ALIGNMENT PROCEDURE

Maria Teresa Garcia Vacas, Salamanca, Spain, assignor to Alcatel NV, Netherlands

PCT No. PCT/EP95/04662, § 371 Date Oct. 17, 1996, § 102(e) Date Oct. 17, 1996, PCT Pub. No. WO96/17452, PCT Pub. Date Jun. 6, 1996

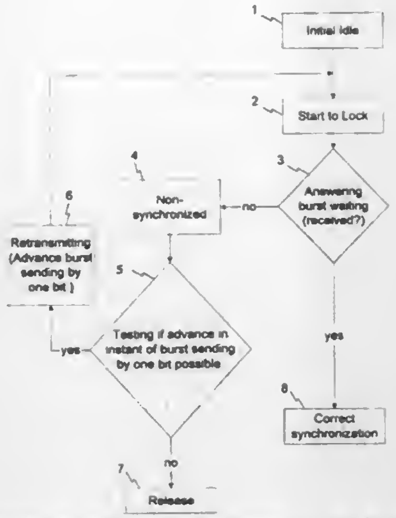
PCT Filed Nov. 27, 1995, Ser. No. 676,389

Claims priority, application Spain, Nov. 30, 1994, 9402471

Int. Cl.⁶ H04B *7/212*

U.S. Cl. 370—337 **5 Claims**

1. A burst alignment procedure in digital cordless communications systems with time division multiple access, between a cordless terminal (T) and its base station (BS), from which this cordless terminal (T) obtains its timebase reference; this procedure being characterised in that the cordless terminal (T) brings forward the instant of sending its bursts with respect to the reference received from the base station (BS) in the event that no answer is received, within a preset period of time, from the base station (BS) to a first burst transmitted by the cordless terminal (T) to its base station (BS).


1
Initial Idle
2
Start to Lock
3
Answering burst waiting (received?)
no
4
Non-synchronized
5
Testing if advance in instant of burst sending by one bit possible
yes
6
Retransmitting (Advance burst sending by one bit)
no
7
Release
yes
8
Correct synchronization

5,748,623

CODE DIVISION MULTIPLE ACCESS TRANSMITTER AND RECEIVER

Mamoru Sawahashi, Yokosuka, and Fumiyuki Adachi, Yokohama, both of Japan, assignors to NTT Mobile Communications Network, Inc.

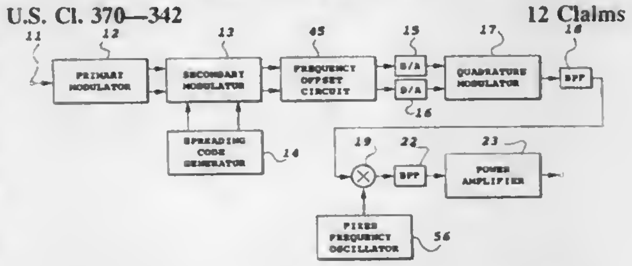
PCT No. PCT/JP94/01450, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO95/06987, PCT Pub. Date Mar. 9, 1995

PCT Filed Sep. 2, 1994, Ser. No. 428,203

Claims priority, application Japan, Sep. 3, 1993, 5-219897

Int. Cl.⁶ H04B *7/216*

U.S. Cl. 370—342 **12 Claims**



1. A code division multiple access transmitter comprising:

a primary modulator for carrying out primary modulation of transmission information, thereby generating a primary modulated I (In-phase) signal and a primary modulated Q (Quadrature) signal;

spreading code generating means for generating a spreading code which corresponds to a channel, and has a frequency higher than a rate of said transmission information;

a secondary modulator for performing spread modulation of said primary modulated I signal and said primary modulated Q signal using said spreading code, thereby outputting spread I-channel data and spread Q-channel data;

a frequency offset circuit for offsetting a center frequency of said spread I-channel data and of said spread Q channel data by a designated offset frequency, thereby outputting frequency offset data; and

a transmitting circuit for converting said frequency offset data into a transmitted signal, wherein said frequency offset circuit comprises:

a first signal generator for generating a cosine wave of a frequency corresponding to said designated offset frequency;

a second signal generator for generating a sine wave of the frequency corresponding to said designated offset frequency;

a first multiplier for multiplying said spread I-channel data by said cosine wave;

a second multiplier for multiplying said spread Q-channel data by said sine wave;

a first adder for summing an output of said first multiplier and an output of said second multiplier.

5,748,624

METHOD OF TIME-SLOT ALLOCATION IN A TDMA COMMUNICATION SYSTEM

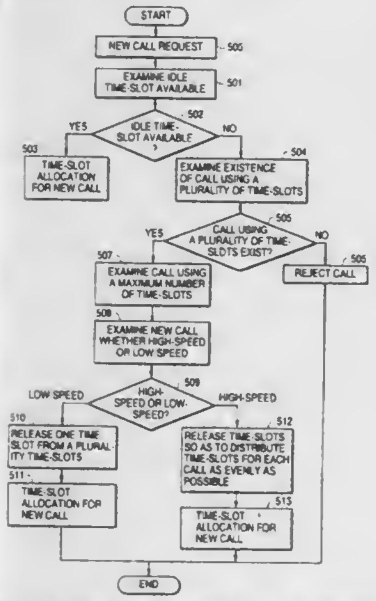
Takayuki Kondo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 31, 1996, Ser. No. 594,913

Claims priority, application Japan, Jan. 31, 1995, 7-013592

Int. Cl.⁶ H04B *7/212;* **H04J** *3/16*

U.S. Cl. 370—347 **10 Claims**


START
NEW CALL REQUEST
500
EXAMINE IDLE TIME-SLOT AVAILABLE
501
502
IDLE TIME-SLOT AVAILABLE ?
YES
NO
503
TIME-SLOT ALLOCATION FOR NEW CALL
504
EXAMINE EXISTENCE OF CALL USING A PLURALITY OF TIME-SLOTS
505
CALL USING A PLURALITY OF TIME-SLOTS EXIST?
YES
NO
506
REJECT CALL
507
EXAMINE CALL USING A MAXIMUM NUMBER OF TIME-SLOTS
508
EXAMINE NEW CALL WHETHER HIGH-SPEED OR LOW SPEED
509
HIGH-SPEED OR LOW-SPEED?
LOW SPEED
HIGH-SPEED
510
RELEASE ONE TIME SLOT FROM A PLURALITY TIME-SLOTS
511
TIME-SLOT ALLOCATION FOR NEW CALL
512
RELEASE TIME-SLOTS SO AS TO DISTRIBUTE TIME-SLOTS FOR EACH CALL AS EVENLY AS POSSIBLE
513
TIME-SLOT ALLOCATION FOR NEW CALL
END

6. A method of time-slot allocation for a communication in a time-division multiple access (TDMA) communication system which allocates one time-slot for a low transmission speed communication and a plurality of time-slots for a high-speed transmission speed communication in a TDMA frame, said method comprising the steps of:

detecting a request for new communication;

examining whether there are a sufficient number of idle time-slots currently available for the new communication;

selecting one of high transmission speed communication currently communicating in the TDMA communication system with a maximum allowable number of time-slots in one TDMA frame, and instructing a mobile terminal involved in the selected high transmission speed communication to suspend communication due to time-slot reallocation;

releasing at least one time-slot from the maximum allowable number of time-slots in the selected high transmission speed communication;

performing transmission speed adjustment for the selected high transmission speed communication, the adjustment depending on the number of time-slots being released,

informing the mobile terminal to resume communication with a reduced number of time-slots for the selected high transmission speed communication, the reduced number of time-slots not including the released time-slots; and

allocating at least one released time-slot from the selected high transmission speed communication to the new communication requested.

5,748,625

INTER-LAN CONNECTION METHOD USING ISDN

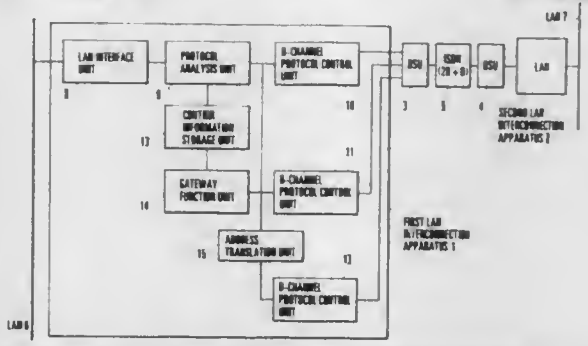
Akira Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 633,007, Apr. 16, 1996, abandoned, which is a continuation of Ser. No. 346,023, Nov. 29, 1994, abandoned. This application Feb. 14, 1997, Ser. No. 801,909

Claims priority, application Japan, Nov. 29, 1993, 5-298047

Int. Cl.⁶ H04L *12/46;12/66*

U.S. Cl. 370—353 **16 Claims**


LAN 7
LAN INTERFACE UNIT
8
PROTOCOL ANALYSIS UNIT
9
B-CHANNEL PROTOCOL CONTROL UNIT
10
CONTROL INFORMATION STORAGE UNIT
12
GATEWAY FUNCTION UNIT
14
B-CHANNEL PROTOCOL CONTROL UNIT
11
ADDRESS TRANSLATION UNIT
15
D-CHANNEL PROTOCOL CONTROL UNIT
13
DSU
3
ISDN (2B + D)
5
DSU
4
LAN
SECOND LAN INTERCONNECTION APPARATUS 2
FIRST LAN INTERCONNECTION APPARATUS 1
LAN 6

1. An inter-LAN connection apparatus for dynamically connecting a first LAN and a second LAN through an ISDN having at least two B channels and a D channel, said apparatus comprising:

a protocol analysis unit for processing a packet received from said first LAN into data and control information;

an address translation unit receiving said data from said protocol analysis unit and converting destination network address information from a packet frame of said packet into telephone number information of another inter-LAN connection apparatus associated with said second LAN;

a D-channel protocol control unit receiving said telephone number information from said address translation unit and processing said telephone number information to connect a first B-channel of said at least two B-channels of said ISDN, in a circuit switching mode, to said second LAN; and

a first B-channel protocol control unit receiving said data from said protocol analysis unit and transmitting said data, in a circuit switching mode, from said inter-LAN connection apparatus through said first B-channel of said at least two B channels of said ISDN upon connection to said second LAN;

said inter-LAN connection apparatus transmitting said control information, in a packet switching mode, through one of a second B-channel of said at least two B-channels or said D-channel, to dynamically maintain routing of connection.

5,748,626

ATM COMMUNICATION SYSTEM WITH HIGH SPEED CONNECTION-LESS SERVICE FUNCTION

Hiroshi Esaki, Kanagawa-ken; Takeshi Saito, and Shigeo Matsuzawa, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 456,698, Jun. 1, 1995, Pat. No. 5,583,865, which is a division of Ser. No. 230,539, Apr. 20, 1994, Pat. No. 5,450,406. This application Aug. 16, 1996, Ser. No. 689,920

Claims priority, application Japan, Apr. 20, 1993, 5-117928; Jun. 30, 1993, 5-162102

Int. Cl.⁶ H04L *12/46;12/56*

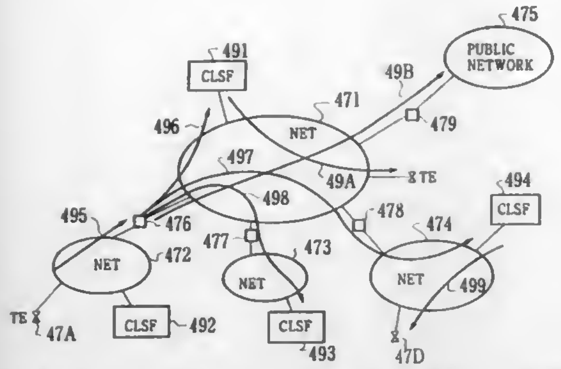
U.S. Cl. 370—355 **20 Claims**

1. An ATM communication system, comprising:

a plurality of networks, including ATM networks and a destination side network and containing a plurality of terminals, the plurality of networks inter-networking with each other, the destination side network containing a destination terminal; and

a plurality of connection-less service function means for managing connection-less datagram transmission in the plurality of networks, the plurality of connection-less service function

/OL
2 10
SS
1
MY
5
998
JMI



means including a destination side connection-less service function means which is associated with the destination side network;

wherein the connection-less datagram transmission from each terminal of the plurality of terminals to the destination terminal is performed by obtaining a connection identifier for identifying an ATM connection connected to the destination side connection-less service function means, and by transmitting a datagram from said each terminal to the destination side connection-less service function means through the ATM connection identified by the obtained connection identifier.

5,748,627

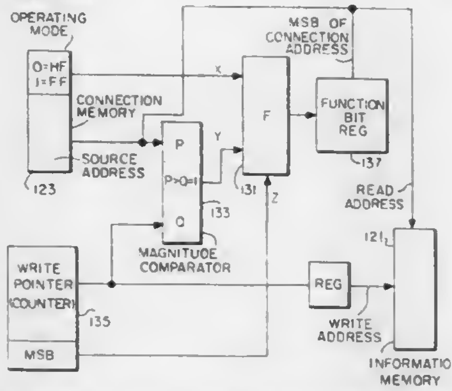
INTEGRATED NETWORK SWITCH WITH FLEXIBLE SERIAL DATA PACKET TRANSFER SYSTEM

Steven P. Weir, Petaluma, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 10, 1994, Ser. No. 257,885

Int. Cl.^{6} H04J *1/00*

U.S. Cl. 370—384 **3 Claims**



1. An integrated network switch including ports for connection to peripheral devices, and switching apparatus for selectively switching signals organized in frame format between ports, each port occupying a fixed time slot in the frame format, signalling in each time slot including data signalling, said switch including memory means for receiving and storing said data signalling wherein:

said network switch further includes an elastic store means for storing messages received from said peripheral devices, said elastic store means comprising,

a linear buffer means comprising a plurality of buffer sets, each buffer set having a predefined size determined as a product of a unit buffer size and the number of buffers assigned to a respective set for storing messages received from a peripheral device connected to a respective port,

said switch including means for receiving data signalling in a buffer set and detecting when a complete message has been received,

means for determining and storing the position in the buffer set corresponding to an end of a last complete message received,

means for determining and storing a last position read from the buffer set,

means for reading the buffer set to a position corresponding to the end of the last message received upon detection of a complete message,

means for updating a stored indication of the last position read from the buffer set,

means for updating a stored indication of the position in the buffer set corresponding to the end of the last complete message received, and

means for identifying a next write location in the buffer set at the end of the last complete message received,

wherein said elastic store means stores messages of varying lengths while permitting reading from the buffer set upon receipt of a completed message.

5,748,628

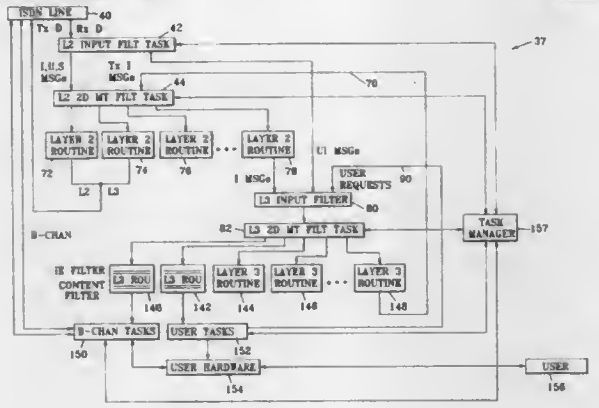
ISDN D-CHANNEL SIGNALING DISCRIMINATOR

Philip G. Ericson, West Hills, and Ray M. Ransom, Big Bear City, both of Calif., assignors to Interack Communications, Inc., Chatsworth, Calif.

Filed Nov. 5, 1996, Ser. No. 743,222

Int. Cl.^{6} H04J *3/12*

U.S. Cl. 370—384 **25 Claims**



12. A method of processing ISDN D-channel signals by a computer, during a terminal initialization procedure for an ISDN connection including the steps of:

(a) receiving ISDN D-channel signals containing current Information (I), Supervisory (S), Unnumbered (U) and Unnumbered Information (UI) messages;

(b) distributing legal I, S and U messages to a layer two subroutine;

(c) distributing legal UI messages to a layer three subroutine;

(d) upon receipt of the current I, S or U message, the layer two subroutine accessing a layer two data base having data which associates one of a plurality of predetermined subroutines with each set of predetermined layer two input events and states;

(e) comparing the layer two current input event and state associated with the current message received to the data in the data base; and,

(f) running the one predetermined subroutine which corresponds to the current state and input event.

5,748,629

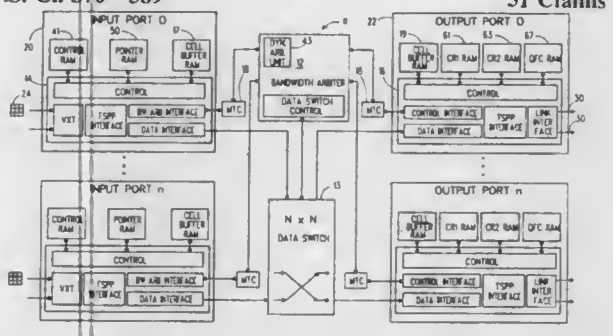
ALLOCATED AND DYNAMIC BANDWIDTH MANAGEMENT

Stephen A. Caldara, Sudbury; Stephen A. Hauser, Burlington; Thomas A. Manning, Northboro, all of Mass.; Robert B. McClure, Hollis, N.H., and Matthias L. Colsman, Cologne, Germany, assignors to Ascom Nexion Inc., Acton, Mass.

Filed Jul. 18, 1996, Ser. No. 683,152

Int. Cl.^{6} H04T *3/22*

U.S. Cl. 370—389 **51 Claims**



1. A data switch providing integrated services to data cells transmitted therethrough, each data cell identified as belonging to one of multiple service classes, said switch comprising:

plural input port processors, each for buffering and enqueuing input data cells and for transmitting said input data cells through said switch using either allocated or dynamic intra-switch bandwidth;

a bandwidth arbiter, in communication with said input port processors, for arbitrating said dynamic intra-switch bandwidth among said input port processors, and for tagging said input data cells as allocated or dynamic intra-switch bandwidth transmitted data cells;

plural output port processors, in communication with said input port processors and said bandwidth arbiter, each for buffering and enqueueing said tagged transmitted data cells, according to said tag and data cell service class information, in a prioritized manner; and

a switch fabric enabling said communication between said input port processors, said bandwidth arbiter, and said output port processors.

5,748,630

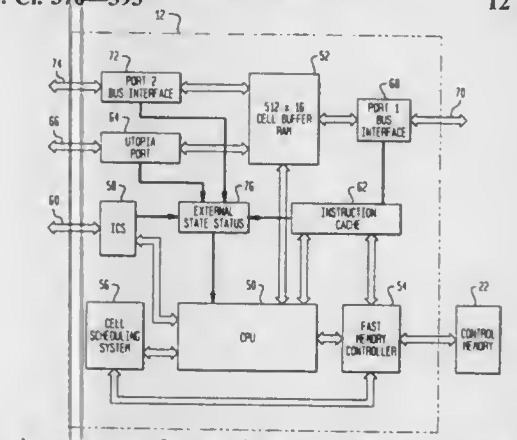
ASYNCHRONOUS TRANSFER MODE CELL PROCESSING SYSTEM WITH LOAD MULTIPLE INSTRUCTION AND MEMORY WRITE-BACK

Paul V. Bergantino, Arlington, and Daniel J. Lussier, Bellingham, both of Mass., assignors to Maker Communications, Inc., Waltham, Mass.

Filed May 9, 1996, Ser. No. 647,372

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—395 **12 Claims**



7. An apparatus for use in an asynchronous transfer mode (ATM) cell processing system, comprising:

a memory including a plurality of memory locations; and

a processor connected to the memory and including a register file having a plurality of registers, the processor executing a first instruction to load the contents of a subset of the plurality of memory locations into the register file, directing storage of a link between a given processor register in the register file and a corresponding memory location the contents of which were loaded into the given register in response to the first instruction, and executing a second instruction which performs an operation on the contents of the given register, the second instruction including an indicator directing that the result of the operation be automatically written back to the corresponding memory location indicated by the stored link.

5,748,631

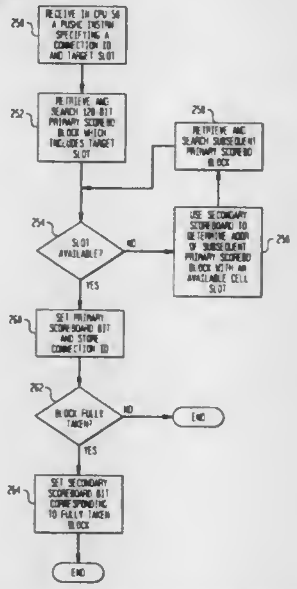
ASYNCHRONOUS TRANSFER MODE CELL PROCESSING SYSTEM WITH MULTIPLE CELL SOURCE MULTIPLEXING

Paul V. Bergantino, Arlington, and Daniel J. Lussier, Bellingham, both of Mass., assignors to Maker Communications, Inc., Waltham, Mass.

Filed May 9, 1996, Ser. No. 647,373

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—398 **9 Claims**


250
RECEIVE IN CPU 50 A PUSHC INSTRN SPECIFYING A CONNECTION ID AND TARGET SLOT
252
RETRIEVE AND SEARCH 128 BIT PRIMARY SCOREBD BLOCK WHICH INCLUDES TARGET SLOT
258
RETRIEVE AND SEARCH SUBSEQUENT PRIMARY SCOREBD BLOCK
254
SLOT AVAILABLE?
NO
YES
USE SECONDARY SCOREBOARD TO DETERMINE ADDR OF SUBSEQUENT PRIMARY SCOREBD BLOCK WITH AN AVAILABLE CELL SLOT
256
260
SET PRIMARY SCOREBOARD BIT AND STORE CONNECTION ID
262
BLOCK FULLY TAKEN?
NO
END
YES
264
SET SECONDARY SCOREBOARD BIT CORRESPONDING TO FULLY TAKEN BLOCK
END

1. A method of allocating cells in an asynchronous transfer mode (ATM) communication system, the method comprising the steps of:

providing first and second groups of bits with each bit in the first and second groups representing a cell time slot, wherein the value of a given bit in the first and second group of bits indicates whether or not the corresponding cell time slot has been scheduled for transmission;

servicing the scheduled time slots by checking the first group of bits for a bit corresponding to an available time slot, and if no bit corresponding to an available time slot is found, checking the second group of bits for a bit corresponding to an available time slot;

maintaining a count which is incremented each time a cell time slot represented by a bit in the first group is serviced, and decremented each time a bit in the second group corresponding to an idle slot is encountered but an idle slot is not transmitted; and

scheduling the available time slots represented by bits of the second group at a time determined in part by the count.

5,748,632

ATM SWITCHING APPARATUS

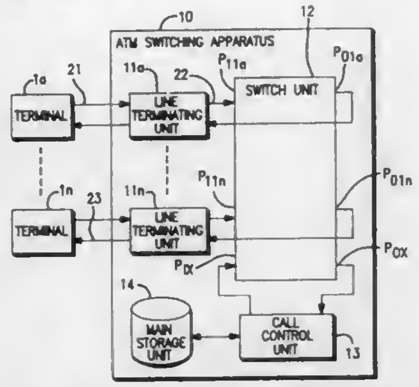
Masahiko Honda, and Yasuhiro Miyao, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1996, Ser. No. 676,501

Claims priority, application Japan, Jul. 7, 1995, 7-171898

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—399 **4 Claims**



3. An ATM switching apparatus including, a self-routing type switch unit for switching an input ATM cell entered from an input port of said self-routing type switch unit and outputting said cell to an output port of said self-routing type switch unit based on routing information stored in a header portion of said ATM cell, a plurality of ATM terminals for sending and receiving ATM cells for communication, and a plurality of line terminating units, each line terminating unit connecting each of said ATM terminals to respective ones of said input port of said self-routing type switch unit for transferring input ATM cells from said ATM terminals to said self-routing type switch unit and to respective ones of said output port of said self-routing type switch unit for receiving switched ATM cells from said self-routing type switch unit for routing to respective ones of said ATM terminals, said ATM switching apparatus comprising:

a call control unit comprising a main storage unit storing control information, said call control unit for allocating and reserving a logical channel coupling one of said ATM terminals and another ATM terminal in response to a call set-up request from said one ATM terminal, and for providing a channel identifier as a number for the logical channel reserved for the call and an output port number of said self-routing type switch unit corresponding to one of said line terminating units associated with said another ATM terminal to each of said one and another ATM terminals as channel identification information.

5,748,633

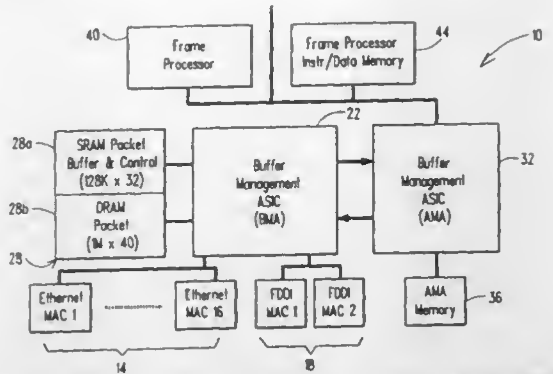
METHOD AND APPARATUS FOR THE CONCURRENT RECEPTION AND TRANSMISSION OF PACKETS IN A COMMUNICATIONS INTERNETWORKING DEVICE

Christopher P. Lawler, Wellesley, and David C. Ready, Sudbury, both of Mass., assignors to 3Com Corporation, Santa Clara, Calif.

Filed Jul. 12, 1995, Ser. No. 501,588

Int. Cl.^{6} H04L *12/46*

U.S. Cl. 370—401 **10 Claims**


40
Frame Processor
Frame Processor Instr/Data Memory
44
10
22
28a
SRAM Packet Buffer & Control (128K x 32)
28b
DRAM Packet (1M x 40)
Buffer Management ASIC (BMA)
Buffer Management ASIC (AMA)
32
28
Ethernet MAC 1
Ethernet MAC 16
FDDI MAC 1
FDDI MAC 2
AMA Memory
36
14
18

1. An internetworking device comprising:

a first MAC port operative in accordance with a first network protocol;

a second MAC port comprising one of a plurality of MAC ports within said internetworking device, said second MAC port being operative in accordance with a second network protocol;

a memory, in electrical communication with said first MAC port and said second MAC port; and

a frame processor, in electrical communication with said memory, said first MAC port, and said second MAC port,

said first MAC port being operative to receive a packet including a header and data in said first protocol and to store said packet in said memory,

said frame processor being operative to select said second MAC port from said plurality of MAC ports and to commence transmission of said packet from said memory to said second MAC port after reception of a predetermined portion of said packet in said memory and prior to the completion of reception of said packet in said memory if said first and second network protocols are the same; and

said frame processor being operative to commence transmission of a representation of said packet from said memory to said second MAC port after the completion of reception of said packet in said memory if said second network protocol differs from said first network protocol.

5,748,634

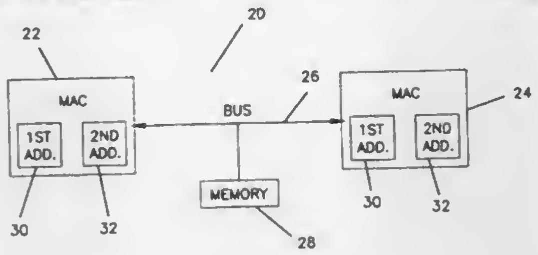
METHOD AND APPARATUS FOR IMPLEMENTING A TWO-PORT ETHERNET BRIDGE USING A SEMAPHORING TECHNIQUE

Michael A. Sokol, Rancho Cordova, and Kevin D. Ketchum, Folsom, both of Calif., assignors to Level One Communications, Inc., Sacramento, Calif.

Filed Sep. 14, 1995, Ser. No. 528,112

Int. Cl.^{6} H04L *12/46;12/66*

U.S. Cl. 370—402 **28 Claims**



1. A bridging device for routing packets between a receiving port and a destination port, comprising:

a receiving media access controller, the receiving media access controller receiving a data packet on a first port, the packet intended for a user with an address unassociated with users attached to the receiving media access controller;

at least one transmitting media access controller, the at least one transmitting media access controller having a second port, the second port associated with the address of the intended user designated by the packet being received on the first port;

a bus, disposed between the receiving and transmitting media access devices, for interconnecting the receiving and transmitting media access controllers;

a memory, coupled to the bus, for providing a common data structure for storing data packets received by the receiving media access controller prior to transmission by the transmitting media access controller;

a first unique address, programmed into the receiving and transmitting media access controllers, a receiving media access controller signaling to the first unique address in the transmitting media access controller to indicate receipt of a packet for transmission; and

a second unique address, programmed into the receiving and transmitting media access controllers, a transmitting media access controller signaling to the second unique address in the receiving media access controller to indicate transmission of the packet.

5,748,635

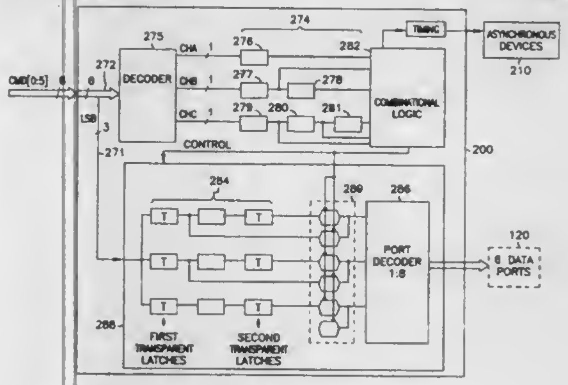
MULTIPORT DATAPATH SYSTEM

Mark Thomann, and Huy Thanh Vo, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 477,148, Jun. 7, 1995, Pat. No. 5,592,488. This application Nov. 8, 1996, Ser. No. 746,403

Int. Cl.^{6} G06F *15/80*

U.S. Cl. 370—465 **12 Claims**



1. A multiport system comprising:

a plurality of asynchronous input ports;

a plurality of asynchronous output ports;

a dynamic random access memory for storing data coming into and leaving from the system; and

a control interface for pipelined multiplexing of a plurality of port instructions issued to the system, the control interface comprising

an instruction decoder for decoding the plurality of port instructions;

an instruction pipeline connected to the instruction decoder for sequentially storing a plurality of issued port instructions; and

an instruction multiplexer connected to the instruction pipeline for coordinating simultaneous execution of the plurality of issued port instructions in the instruction pipeline;

wherein the instruction pipeline has storage for single cycle or multiple cycle port instructions issued to the system.

5,748,636

METHOD FOR TRANSMITTING SIGNALING INFORMATION WITHIN A BROADBAND ISDN COMMUNICATION NETWORK

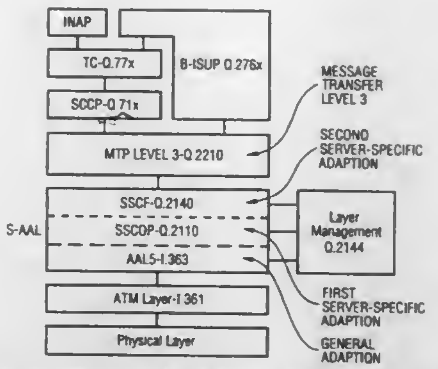
Klaus Gradischnig, Gauting, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 16, 1996, Ser. No. 696,590

Claims priority, application Germany, Aug. 17, 1995, 195 30 322.9

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—469 **3 Claims**



1. A method for transmitting signaling information on transmission links of a broadband ISDN communication network working according to asynchronous transfer mode (ATM), wherein signaling channels deviating from useful channels are employed and a signaling protocol corresponding to a broadband ISDN layer model is respectively defined on said signaling channels for set up and clear down of connections according to which a physical layer, an ATM layer, an ATM adaption layer and an application layer that controls the set up and clear down of connections are defined, a general adaption sub-layer, a first service-specific sub-layer that essentially serves for message protection and flow control, and a second sub-layer serving for adaption of said first service-specific sub-layer to the application layer and for implementation of a part of the signaling protocol being provided, comprising the steps of:

modifying protocol procedures defined by ITU Recommendation Q.2140 for the second sub-layer such that the second sub-layer, in response to a call request from an appertaining application layer, first effects a call set up initiated by the first sub-layer, immediately transmitting after the call set up has ensued, first information indicating readiness to operate via a signaling channel under consideration and without a previous proving phase that checks a transmission path;

monitoring the signaling channel for the appearance of second information corresponding to the first information and, upon detecting said second information signaling the appertaining application layer as confirmation of a successful call set up; and

in response to a call request transmitted via the signaling channel, the second sub-layer having the call request signaled to it from the appertaining, first sub-layer, and, after acceptance thereof, the second sub-layer immediately transmitting further information indicating readiness to operate over the signaling channel under consideration as confirmation of readiness to operate without a previous proving phase.

5,748,637

DTMF SIGNALING ON FOUR-WIRE SWITCHED 56 KBPS LINES

Daniel M. Joffe, North Plainfield, and Donald C. Panek, Jr., East Brunswick, both of N.J., assignors to Integrated Network Corporation, Bridgewater, N.J.

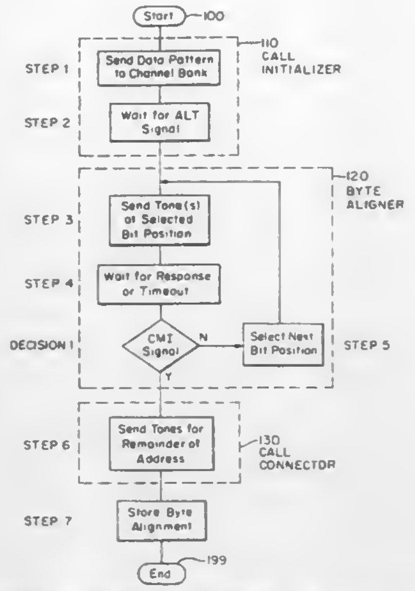
Continuation of Ser. No. 176,933, Jan. 3, 1994, Pat. No. 5,457,690. This application Oct. 6, 1995, Ser. No. 540,305

Int. Cl.^{6} H04J *3/06;* **H04M** *3/22*

U.S. Cl. 370—516 **29 Claims**

21. A system for a communication system which includes a digital network, the system comprising:

a plurality of call progress signals received from the digital network; and



a byte aligner to determine a boundary bit position of the bytes on the digital network in response to at least one received call progress signal.

5,748,638

METHOD FOR STORING SECURITY RELEVANT DATA

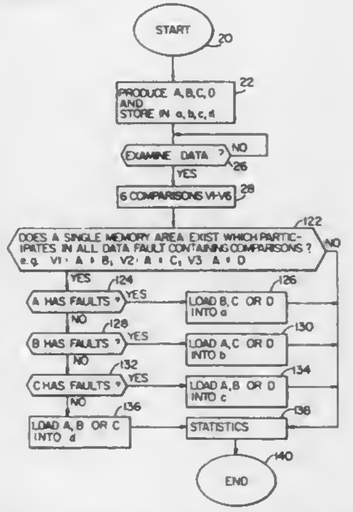
Stephan Gunther, and Christoph Kunde, both of Berlin, Germany, assignors to Francotyp-Postalia Aktiengesellschaft & Co., Birkenwerder, Germany

Filed Feb. 7, 1994, Ser. No. 192,839

Claims priority, application European Pat. Off., Mar. 11, 1993, 93103951

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—21.2 **20 Claims**



1. A method for storing security relevant data in a postage meter, in which method data (A, B, C, D) are stored in several memory areas (a, b, c, d), the data (A, B, C, D) are read out of the memory areas (a, b, c, d) and the data of one memory area is compared with the data of another memory area, and in which a memory area with faulty data is ascertained, if such memory area with faulty data exists, said method comprising the steps of:

storing the same data (A, B, C, D) in at least four memory areas (a, b, c, d),

making comparisons to compare the data (A, B, C, D) of each memory area (a, b, c, d) with the data (A, B, C, D) of the other memory areas (a, b, c, d) and to produce results indicating for each comparison whether the data compared is in agreement or not in agreement,

ascertaining a fault number (Z) which fault number (Z) indicates in how many of said comparisons lack of agreement is found between the compared data, and

processing the results of said comparisons and said fault number (Z) to determine the memory area or memory areas (a, b, c, d) with fault containing data (A, B, C, D).

5,748,639

MULTI-BIT TEST CIRCUITS FOR INTEGRATED CIRCUIT MEMORY DEVICES AND RELATED METHODS

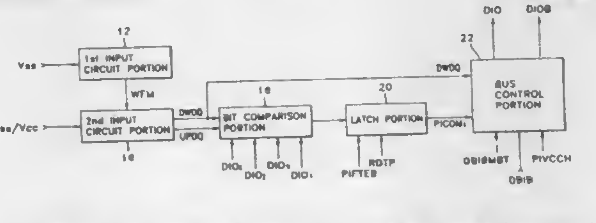
Myung-chan Chol, and Churoo Park, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 24, 1996, Ser. No. 637,358

Claims priority, application Rep. of Korea, Apr. 24, 1995, 95-9638

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—212 **12 Claims**



1. A method for testing a plurality of data bits in an integrated circuit memory device having a test circuit therein, said method comprising the steps of:

accepting the plurality of data bits at the test circuit;

comparing a first data bit and a second data bit from the plurality of data bits to determine if said first and second data bits have a common data value in response to a first test mode signal;

generating a first comparison signal responsive to said first test mode signal and responsive to said comparison of said first and second data bits wherein said first comparison signal has a first logic state when said first and second data bits have a common data value and a second logic state when said first and second data bits have different data values;

comparing a third data bit and a fourth data bit from the plurality of data bits to determine if said third and fourth data bits have a common data value responsive to a second test mode signal;

generating a second comparison signal responsive to said second test mode signal and responsive to said comparison of said third and fourth data bits wherein said second comparison signal has the first logic state when said third and fourth data bits have a common data value and the second logic state when said third and fourth data bits have different data values;

comparing said first, second, third, and fourth data bits to determine if said first, second, third, and fourth data bits have a common data value in response to a third test mode signal: and

generating a third comparison signal responsive to said third test mode signal and responsive to said comparison of said first, second, third, and fourth data bits wherein said third comparison signal has the first logic state when said first, second, third, and fourth data bits have a common data value and the second logic state when said first, second, third, and fourth data bits have different data values.

5,748,640

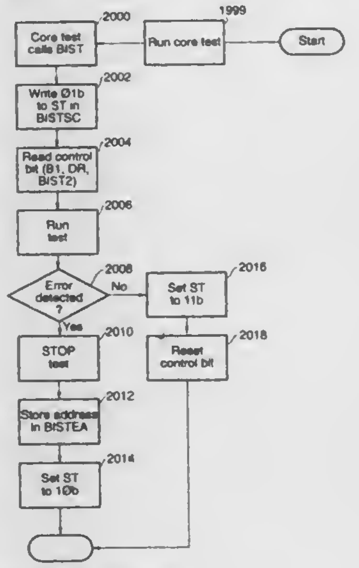
TECHNIQUE FOR INCORPORATING A BUILT-IN SELF-TEST (BIST) OF A DRAM BLOCK WITH EXISTING FUNCTIONAL TEST VECTORS FOR A MICROPROCESSOR

Chongjun (June) Jiang, Dallas; David A. Spilo, Austin; Timothy J. Baldwin, Austin; Robert D. Bryfogle, Austin, and Bobby I. Pinkerton, Jr., Austin, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Sep. 12, 1996, Ser. No. 711,864

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—21.3 **21 Claims**



1. A processing unit comprising:

a central processing unit (CPU) core;

a random access memory (RAM) array coupled to said CPU core;

a test unit operatively coupled to said CPU core and configured to run a CPU core functional test and concurrently run a RAM array test;

wherein said test unit is further coupled to a built-in-self-test status/control register, said built-in-self-test status/control register configured to initiate, responsive to said test unit, at least one test of said RAM array.

5,748,641

TEST CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE HAVING DATA SCRAMBLE FUNCTION

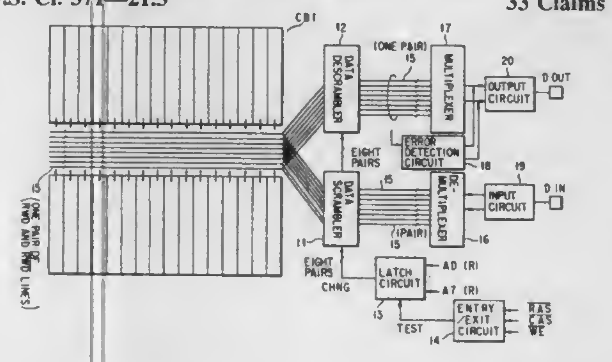
Takahashi Ohsawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 391,536, Feb. 21, 1995, abandoned. This application Mar. 7, 1997, Ser. No. 813,672

Claims priority, application Japan, Feb. 24, 1994, 6-026647

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—21.3 **33 Claims**



1. A semiconductor memory device having a data scramble circuit, comprising:

a plurality of data transmission lines connected to each of a plurality of memory cells;

signal latch means for latching a signal for setting a scramble condition of data transmitted through each of said plurality of data transmission lines;

data scrambling means for scrambling the data in accordance with the scramble condition; and

control means for determining a test mode, and transmitting the scramble condition signal from said signal latch means to said data scrambling means to operate said data scrambling means, wherein the data transmitted to one of said plurality of memory cells is independent from data transmitted to another one of said plurality of memory cells.

5,748,642

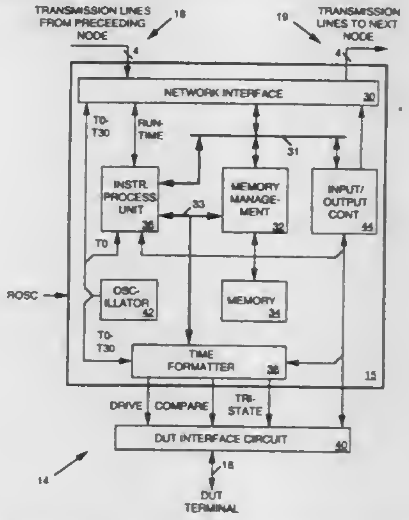
PARALLEL PROCESSING INTEGRATED CIRCUIT TESTER

Gary J. Lesmeister, Hayward, Calif., assignor to Credence Systems Corporation, Fremont, Calif.

Filed Sep. 25, 1995, Ser. No. 534,015

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.1 **7 Claims**



1. For an integrated circuit having a plurality of terminals for receiving test signals and for transmitting output signals generated by the integrated circuit, an apparatus for testing the integrated circuit by performing selected actions with respect to each of said terminals at predetermined times during a succession of test cycles of fixed duration, each of said actions being selected from a set comprising asserting a test signal, deasserting a test signal, and sampling an output signal, the integrated circuit tester comprising:

means for generating a periodic clock signal; and

a plurality of nodes, each node corresponding to a separate one of said terminals, each node comprising means receiving said clock signal for fixing the duration of each of said test cycles in relation to periods of said clock signal, each node executing algorithmic instructions during at least one of said test cycles for generating a command selecting one of said actions and indicating a time during a subsequent test cycle at which the selected action is to be taken, and each node responding to the generated command by carrying out the selected action with respect to its corresponding terminal at the indicated time during said subsequent test cycle.

/OL
2 10
SS
1
MY
5
998
JMI

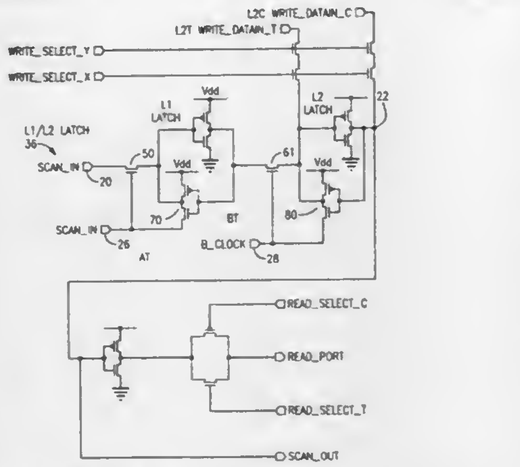
5,748,643
FAST SCAN GRA CELL CIRCUIT

Antonio Raffaele Pelella, Highland Falls; Peter Tsung-shib Liu, Hopewell Junction, and Gerard Joseph Scharff, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1996, Ser. No. 690,609

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.3 **7 Claims**



1. A fast scan GRA cell circuit, comprising:

a master/slave latch circuit having a L1 master latch circuit and an L2 slave latch circuit, said L1 master latch circuit having a first cross-coupled portion and a complementary write circuit coupled to said slave latch and having scan-in port coupled to pass a scan-in signal to an L1 pass gate transistor, an A_Clock terminal port connected to said L1 pass gate transistor, and a master feedback transistor circuit having a source also coupled directly to said A_Clock terminal port, and

further having a L2 slave latch whose input is an output from said master latch circuit, said L2 slave latch including a second cross-coupled portion and a complementary write circuit, said L2 slave latch circuit being coupled to receive signal resulting from said scan-in signal via said L1 latch circuit and an L2 pass gate transistor for testing of said master/slave latch circuit, a B_Clock terminal connected to said L2 pass gate transistor, and a slave feedback transistor circuit having a source also coupled directly to said B_Clock terminal port, whereby

both clock inputs during a scan function are connected respectively to their respective pass gate transistors and to the source of their respective feedback transistor's circuit's source.

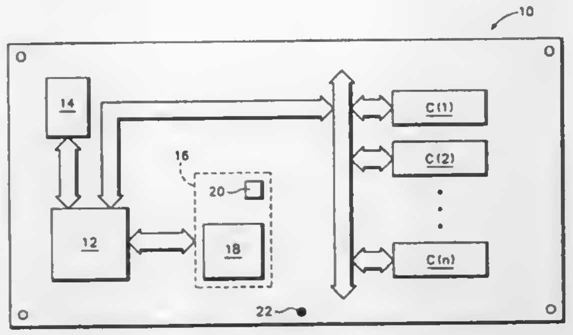
5,748,644
METHOD AND APPARATUS FOR PRODUCING SELF-DIAGNOSTIC INFORMATION FROM A CIRCUIT BOARD

Paul Szabo, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Nov. 26, 1996, Ser. No. 756,845

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—22.5 **11 Claims**



1. An electrical circuit for producing diagnostic information, comprising:

a memory adapted to store a sequence of diagnostic tests;

a processor coupled to said memory, said processor executing said sequence of diagnostic tests and recognizing a result of one or more thereof; and

a frequency generator coupled to said processor, for generating signals indicative of said result at a plurality of predetermined frequencies, wherein said predetermined frequencies are associated with corresponding events within said sequence of tests, said plurality of predetermined frequencies including a frequency within an audio band of frequencies and a frequency within a band of frequencies greater than said band of audio frequencies; and

a terminal coupled to said frequency generator for receiving said signals indicative of said result, and for coupling said signals indicative of said result to external apparatus for frequency measurement and display;

said processor, on recognizing said result in response to a completion of one of said tests, causes said frequency generator to generate a selected one of said signals indicative of said result comprising one of said plurality of predetermined frequencies associated with said events, wherein one of said signals indicative of result indicates a failure of one of said tests, and one of said signals indicative of result indicates a passing of one of said tests.

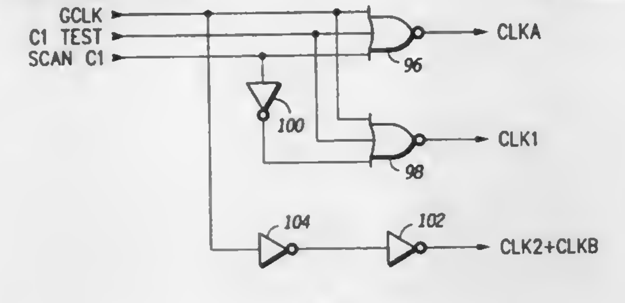
5,748,645
CLOCK SCAN DESIGN FROM SIZZLE GLOBAL CLOCK AND METHOD THEREFOR

Craig C. Hunter, and Russell A. Reininger, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 29, 1996, Ser. No. 654,981

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.31 **8 Claims**



94

1. A single clock scan design circuit for testing a synchronous circuit, the synchronous circuit comprising a plurality of latches, each one of the plurality of latches receiving a functional input and a scan input and generating an output, each one of the plurality of latches capturing the functional input responsive to the assertion of a first functional clock, each one of the plurality of latches capturing the scan input responsive to the assertion of a first test clock, each one of the plurality of latches launching captured data responsive to the assertion of a second functional clock, the single clock scan design circuit comprising:

first circuitry receiving a single clock and generating the first test clock therefrom responsive to at least one control signal;

second circuitry receiving the single clock and generating the first functional clock therefrom responsive to the at least one control signal; and

third circuitry receiving the single clock signal and generating the second functional clock from the at least one control signal.

5,748,646
DESIGN-FOR-TESTABILITY METHOD FOR PATH DELAY FAULTS AND TEST PATTERN GENERATION METHOD FOR PATH DELAY FAULTS

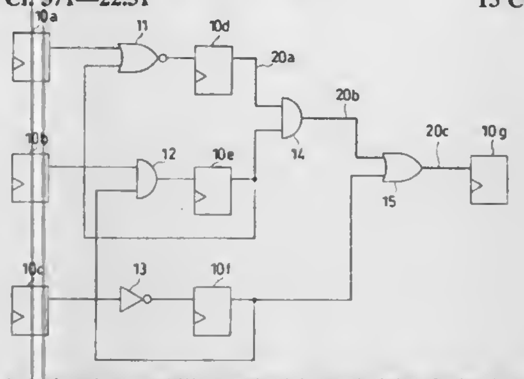
Toshinori Hosokawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 26, 1996, Ser. No. 697,510

Claims priority, application Japan, Feb. 2, 1996, 8-017489

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.31 **13 Claims**



1. A design-for-testability method for path delay faults, by which a given integrated circuit is changed in design to cause path delay faults therein to be easily testable, comprising the step of disposing, when said given integrated circuit contains a scan flip-flop for which logical values have been set in initial and transition patterns generated for test and which presents a contradiction in logical value, a value holding element for once holding an input data according to an external instruction at such a position as to hold an output data of said scan flip-flop in said integrated circuit.

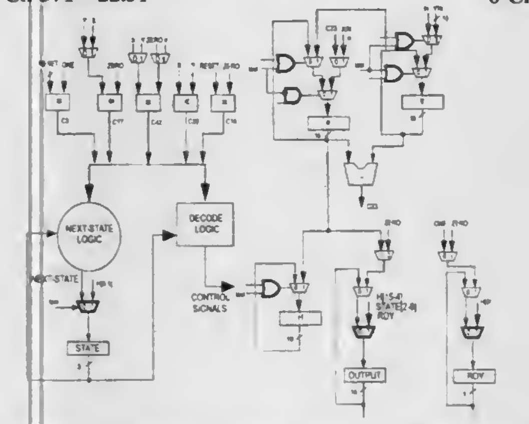
5,748,647
LOW COST TESTING METHOD FOR REGISTER TRANSFER LEVEL CIRCUITS

Subhrajit Bhattacharya, and Sujit Dey, both of Plainsboro, N.J., assignors to NEC USA, Inc., Princeton, N.J.

Filed Oct. 31, 1996, Ser. No. 741,990

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.31 **6 Claims**



1. A method for testing a register transfer specification of a circuit comprising the steps of:

extracting a connectivity graph from the register transfer specification;

generating an H-SCAN graph having a set of H-SCAN chains from the connectivity graph;

inserting a minimum number of multiplexors into the register transfer specification thereby creating the H-SCAN chains; and

converting given combinational test patterns into a set of sequential test patterns which can be applied to the circuit using all of said H-SCAN chains of the above steps.

5,748,648

Patent Not Issued For This Number

5,748,649
SYSTEM ENABLING A MAGNETIC CODE RECORDED ON A MAGNETIC TRACK TO BE PROPERLY DECODED IN THE FORM OF A BINARY MESSAGE

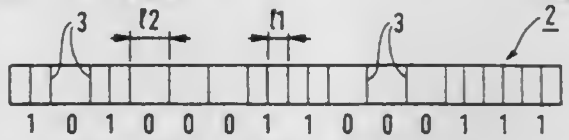
Jacques Michel, L'Hay les Roses, and Dominique Trouche, Montgeron, both of France, assignors to Compagnie Generale d'Automatisme CGA-HBS, Bretigny sur Orge, France

Filed Oct. 18, 1996, Ser. No. 733,452

Claims priority, application France, Oct. 20, 1995, 95 12368

Int. Cl.^{6} G11B *20/18*

U.S. Cl. 371—40.16 **11 Claims**



1. A system enabling a magnetic code recorded on a magnetic track deposited on a medium to be decoded properly in the form of a binary message, said magnetic code possibly including locatable spoiling over a length corresponding to a number b of bits referred to as an "error packet", said magnetic coding being of a type that causes elementary magnets to appear on the magnetic track of length $l_1=l\pm l/2$ and of length $l_2=2l\pm 2$, wherein a check structure in the form of a unitary packet of k bits is integrated in the message at a known location, said k bits being magnetically recorded on the track and being determined in such a manner that taken together, the message and the control structure constituting an n-bit word, belongs to a cyclic redundancy code C(n,n−k) generated by a relationship, wherein the location of the beginning of any spoiling encountered during reading, is determined by observing one or other of the following events:

a) a magnet of length>5l/2 is detected;

b) a magnet of length<l/2 is detected;

c) a continuous run comprising an odd number of magnets of length l_1 is detected;

wherein, in such an event, the magnetic decoding into binary units stops at decoded bit of rank N_1-1 corresponding to the last magnet of correct length preceding event a) or b) or to the last magnet of length l_2 preceding event c), the end of the spoiling being located in the same manner, but by reading the n-bit word in the opposite direction, thereby obtaining decoding in the opposite direction as far as the last properly decoded bit of rank N_2+1 counting from the same origin as for the bit of rank N_1-1, and wherein the non-decoded bits of ranks N_1 to N_2 included, of number $b=N_2-(N_1-1)$ are determined by applying circular permutation to the n bits so as to place the b non-decoded bits at the end of the configuration, and by applying said relationship for generating the cyclic redundancy code that was used to determine said k check structure bits to said configuration with the b missing bits being provisionally reset to zero, the b bits found by applying the relationship then being returned to their original position by a new circular permutation.

5,748,650
DIGITAL PROCESSOR WITH VITERBI PROCESS

David Mark Blaker, Emmaus; Gregory Stephen Ellard, Forest Park, and Muhammad Shafiul Mobin, Whitehall, all of Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Continuation of Ser. No. 153,391, Nov. 16, 1993, abandoned.

This application Nov. 5, 1996, Ser. No. 743,925

Int. Cl.^{6} G06F *11/10*

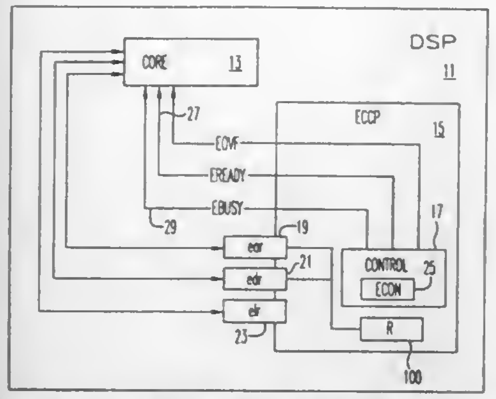
U.S. Cl. 371—43.1 **12 Claims**

1. An integrated circuit comprising:

a digital processor for performing a signal processing function;

an embedded co-processor implementing a complete Viterbi decoding function, said co-processor performing said Viterbi

OL
2 10
ISS
1
MY
5
998
MI



decoding function while said digital processor is concurrently performing the signal processing function;

an address register for addressing at least one of a plurality of internal memory mapped registers of said co-processor; and

a data register cooperating with the address register to read from and write to the at least one of the plurality of internal memory mapped registers;

wherein said co-processor operates under the control of said digital processor, commences operation upon receipt of a command from said digital processor and provides a signal to said digital processor when said co-processor is finished.

5,748,651

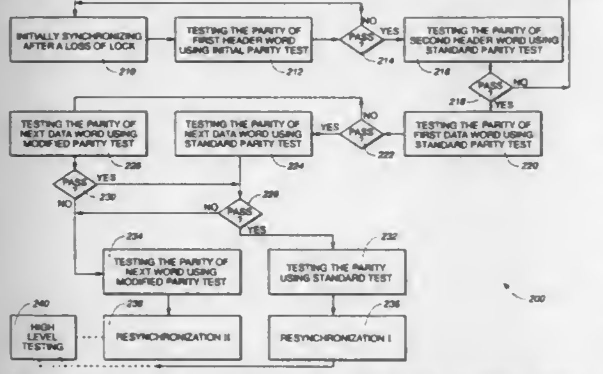
OPTIMUM UTILIZATION OF PSEUDORANGE AND RANGE RATE CORRECTIONS BY SATPS RECEIVER

Len Sheynblat, Belmont, Calif., assignor to Trumble Navigation Limited, Sunnyvale, Calif.

Filed May 5, 1995, Ser. No. 435,552

Int. Cl.^{6} H03M *13/00*

U.S. Cl. 371—49.1 **13 Claims**


INITIALLY SYNCHRONIZING AFTER A LOSS OF LOCK
210
TESTING THE PARITY OF FIRST HEADER WORD USING INITIAL PARITY TEST
212
PASS ?
NO
YES
214
TESTING THE PARITY OF SECOND HEADER WORD USING STANDARD PARITY TEST
216
PASS ?
NO
YES
218
TESTING THE PARITY OF NEXT DATA WORD USING MODIFIED PARITY TEST
226
TESTING THE PARITY OF NEXT DATA WORD USING STANDARD PARITY TEST
224
YES
PASS ?
NO
222
TESTING THE PARITY OF FIRST DATA WORD USING STANDARD PARITY TEST
220
PASS ?
YES
NO
230
NO
PASS ?
YES
228
234
TESTING THE PARITY OF NEXT WORD USING MODIFIED PARITY TEST
232
TESTING THE PARITY USING STANDARD TEST
200
240
HIGH LEVEL TESTING
238
RESYNCHRONIZATION II
236
RESYNCHRONIZATION I

8. A method of checking a partially damaged message using a parity mechanism, said method being used by a differential satellite positioning system (DSATPS), said partially damaged message being transmitted from a base to a rover, said method allows to recover data containing in said damaged message; each said message including a plurality of words; each said message including a header and a plurality of data words following said header, wherein said header includes a first header word and a second header word, wherein said first header word includes a specific PREAMBLE field; wherein said first header word indicates the start of a new message; and wherein said second header word provides the message frame length information; each said header word including n bits including m parity bits; each said data word including n bits including m parity bits; n and m being integers; said method comprising the steps of:

matching said PREAMBLE field in the data stream with said PREAMBLE data contained in the user receiver;

checking said first header word for an initial parity test;

checking said first header word for the station ID if said first header word does not pass the initial parity test;

checking said second header word of the initial parity test if said first header word does not pass the initial parity test and if said station ID contained in said message matches with the station ID contained in the user receiver;

acquiring the lock if said second header word passes the initial parity test and if said station ID contained in said message matches with the station ID contained in the user receiver;

testing the parity of each said current data word of said message using a standard parity test;

designating as a "hit" word said first data word if said first data word fails the standard parity test and designating as a "pass" word said first data word if said first data word passes the standard parity test;

testing the parity of each said data word following said "hit" data word using a modified parity test and testing the parity of each said data word following said "pass" data word using the standard parity test;

starting the resynchronization process; said process comprising the steps of:

searching for the PREAMBLE at the beginning of said current message;

checking said first header word and said second word of said current message for the initial parity test that does not require the knowledge of the last two bits d**29*** and d**30*** of said last data word of said preceding message;

checking said first header word for the station ID; and

reacquiring the lock if the PREAMBLE in said first header word of the current message is found, and if station ID contained in said message matches with the station ID contained in the user receiver, and if said first header word of said current message does not pass the initial parity test, and if said second header word of said current message passes the initial parity test that does not require the knowledge of the last two bits d**29*** and d**30*** of said first header word of said current message; and

assigning the "pass" or "fail" grade for each said header word and for each said data word, wherein the record of all "pass" and "fail" words is used for the higher level testing of the differential corrections.

5,748,652

APPARATUS FOR DETECTING AND CORRECTING CYCLIC REDUNDANCY CHECK ERRORS

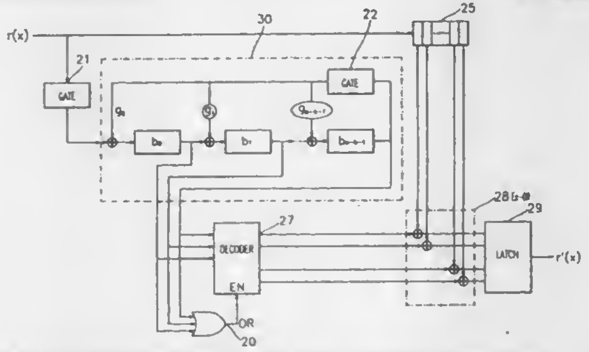
Jin-Tae Kim, Ichon-kun, Rep. of Korea, assignor to Hyundai Electronics Ind. Co., Ltd., Kyounggi-do, Rep. of Korea

Filed Jun. 14, 1996, Ser. No. 664,002

Claims priority, application Rep. of Korea, Jun. 29, 1995, 18247/1995

Int. Cl.^{6} G06F *11/10;* H03M *13/00*

U.S. Cl. 371—53 **9 Claims**



6. A cyclic redundancy check (CRC) circuit, comprising:

a buffer register for storing bits of a serial input data that may contain an error and outputting said serial input data as parallel input data;

a plurality of serially connected syndrome registers for creating redundant data from said serial input data;

a decoder for decoding an output from said plurality of serially connected syndrome registers;

an OR gate for enabling said decoder if any of said a plurality of serially connected syndrome registers are active; and

exclusive OR means for performing an exclusive OR function on each bit of said parallel input data with an output of said decoder when said decoder is enabled, wherein a result of said exclusive OR function corrects errors in the serially input data.

5,748,653

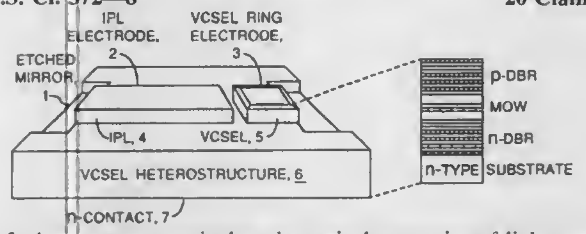
VERTICAL CAVITY SURFACE EMITTING LASERS WITH OPTICAL GAIN CONTROL (V-LOGIC)

Michael A. Parker, Liverpool; Richard J. Michalak, Manlius; James S. Kimmet, Rome; Douglas B. Shire, Ithaca, all of N.Y.; Paul D. Swanson, Santee, Calif., and Chung L. Tang, Ithaca, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 18, 1996, Ser. No. 616,979

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—8 **20 Claims**



1. Apparatus to manipulate the optical properties of light comprising:

means for generating a stimulated optical emission from a substantially planar substrate;

said means for generating including at least one first source of stimulated emission that emits out of a plane of said substrate;

said means for generating including further at least one second source of stimulated emission that emits parallel to said plane of said substrate; and

an optical emission from said second source interacting with at least a portion of said first source.

5,748,654

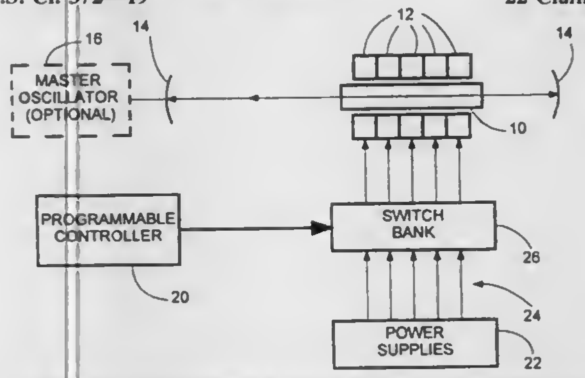
DIODE ARRAY PROVIDING EITHER A PULSED OR A CW MODE OF OPERATION OF A DIODE PUMPED SOLID STATE LASER

Leonard J. Marabella, Torrance; Jacqueline G. Berg, Glendale; Gerald W. Holleman, Manhattan Beach; Hagop Injeyan, Glendale, and James M. Zamel, Hermosa Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 17, 1996, Ser. No. 664,659

Int. Cl.^{6} H01S *3/098*

U.S. Cl. 372—19 **22 Claims**



1. For use in a diode pumped solid state laser, a switchable diode array, comprising:

a plurality, N, of sub-arrays of pump diodes, each sub-array having a plurality of diodes that are electrically connected in such a way as to be energized together;

a plurality of at least N switches for separately energizing the sub-arrays; and

a programmable controller coupled to the switches and operable in a pulsed mode in which the sub-arrays are energized and de-energized periodically, and in a continuous mode in which the sub-arrays are energized and de-energized sequentially to maintain at least one sub-array energized at any time.

5,748,655

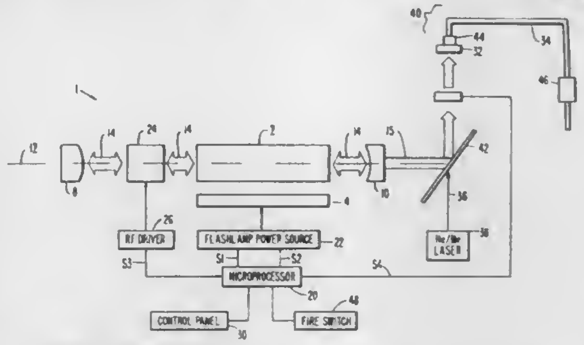
INTRACAVITY MODULATED PULSED LASER AND METHODS OF USING THE SAME

Michael J. Yessik, Burlingame, and Richard G. Thompson, Fairfield, both of Calif., assignors to American Dental Technologies, Southfield, Mich.

Continuation of Ser. No. 350,951, Dec. 7, 1994, Pat. No. 5,621,745, which is a continuation-in-part of Ser. No. 951,075, Sep. 25, 1992, Pat. No. 5,390,204. This application Feb. 7, 1996, Ser. No. 597,998

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—22 **5 Claims**



1. A laser comprising:

a totally reflective mirror and a partially reflective mirror disposed along an optical axis;

an amplification medium disposed along said optical axis between said mirrors;

a flashlamp disposed adjacent said amplification medium,

a flashlamp power source electrically coupled to said flashlamp;

a modulator having a variably controllable modulation gating frequency disposed along said optical axis between said amplification medium and one of said mirrors;

a control circuit electrically coupled to said flashlamp power source and to said modulator for triggering one or more pump pulse discharges by said flashlamp and for controlling said modulation gating frequency of said modulator, such that said laser, in response to each triggering of a pump pulse discharge by said flashlamp, generates an output burst comprising a plurality of sub-pulses having predetermined peak powers; and

a non-linear crystal disposed along said optical axis for converting said multi-pulsed burst outputs generated by said laser from a fundamental frequency to a second harmonic frequency.

5,748,656

LASER HAVING IMPROVED BEAM QUALITY AND REDUCED OPERATING COST

Tom A. Watson, Carlsbad; William N. Partlo, San Diego; Donald G. Larson, San Diego; Igor V. Fomenkov, San Diego; Anthony J. de Ruyter, San Diego, and Palash P. Das, Vista, all of Calif., assignors to Cymer, Inc., San Diego, Calif.

Filed Jan. 5, 1996, Ser. No. 583,302

Int. Cl.^{6} H01S *3/045*

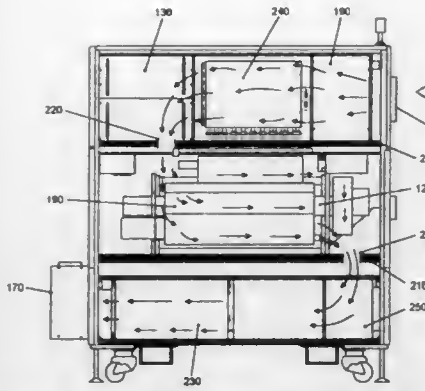
U.S. Cl. 372—35 **36 Claims**

1. A laser comprising

a) a discharge chamber for generating a laser beam;

b) a lasing gas within said discharge chamber;

VOL
210
ISS
1
MY
5
1998
UMI



c) a temperature sensor positioned to read the temperature of said lasing gas and thermally optimized by utilizing materials having a small thermal time constant, to generate a real-time temperature signal indicative of the lasing gas temperature; and

d) a heat exchange system positioned to add heat to or remove heat from the lasing gas, wherein the heat exchange system comprises a heat exchanger whose rate of heat exchange is continuously variable in response to the temperature signal, and the rate of heat exchange is adjusted in response to a real-time temperature signal from the temperature sensor.

5,748,657

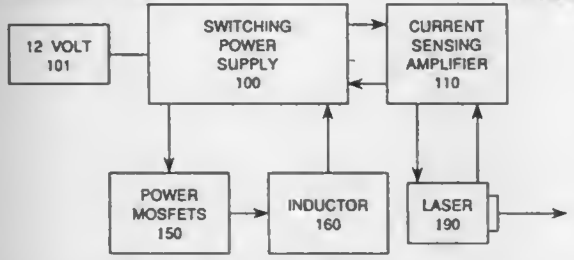
HIGH EFFICIENCY CONSTANT CURRENT LASER DRIVER

Mark W. Gaddis, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 26, 1996, Ser. No. 716,663

Int. Cl.^{6} H01S *3/00;* **A61B** *17/36*

U.S. Cl. 372—38 **4 Claims**



1. A constant current laser driver which provides a voltage output signal for a laser and which comprises:

a voltage source, which produces a standard voltage signal, wherein said voltage source comprises a direct current battery that produces said standard voltage signal at a voltage level selected between 6 and 12 volts;

a means for converting the standard voltage signal from said voltage source into said voltage output signal for said laser,

a means for adjusting said converting means so that said voltage output signal is maintained for said laser with a high power and constant current as said laser experiences varying load conditions, said adjusting means electrically connecting said converting means with said laser to conduct said voltage output signal thereto, said adjusting means providing a feedback adjustment signal to said converting means to maintain constant current levels in said voltage output signal.

5,748,658

SEMICONDUCTOR LASER DEVICE AND OPTICAL PICKUP HEAD

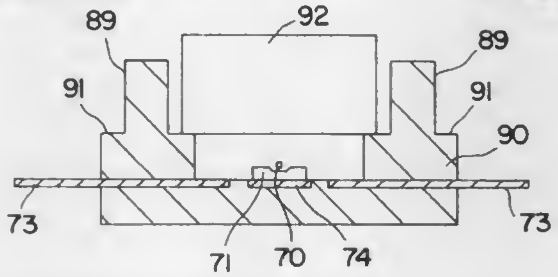
Hideyuki Nakanishi, Kyoto; Akira Ueno, Katano; Hideo Nagai, Takatsuki, and Akio Yoshikawa, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 188,142, Jan. 27, 1994, abandoned. This application Jan. 24, 1997, Ser. No. 789,199

Claims priority, application Japan, Oct. 22, 1993, 5-264575

Int. Cl.^{6} H01S *3/18*

U.S. Cl. 372—43 **33 Claims**



1. A semiconductor laser device comprising:

a first lead having a chip mounting part provided at the front end,

at least one second lead separated from the first lead,

a semiconductor substrate for a heat sink mounted on the chip mounting part,

a semiconductor laser element of plane emission type provided on a surface of the semiconductor substrate, wherein the semiconductor laser element is provided to emit a laser beam in a direction perpendicular to the surface of the semiconductor substrate,

laser beam detecting means for monitoring power of a laser beam emitted from the semiconductor laser element, formed on the surface of the semiconductor substrate beneath the semiconductor laser element,

connecting means for electrically connecting the electrode of the semiconductor laser element with the at least one second lead,

a frame body made of an insulating material surrounding the semiconductor laser element and the connecting means, the frame body defining an open space through which a laser beam emitted from the semiconductor laser element passes in a direction perpendicular to the surface of the chip mounting part, the frame body comprising a lower part, a middle part, and an upper part, the first lead and the second lead being fixed to the lower part in parallel to the surface of the open space, a step being formed at the middle part, and a projection having a curved surface being disposed at the upper part, and

photo detecting means for detecting light entering from outside said frame body, formed on the surface of the semiconductor substrate.

5,748,659

SEMICONDUCTOR LASER DEVICE

Tatsuya Kimura, and Masayoshi Takemi, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1995, Ser. No. 557,827

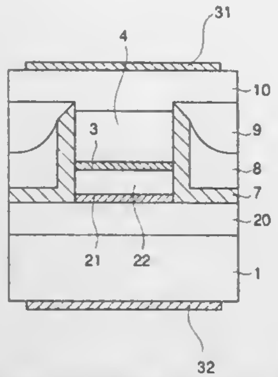
Claims priority, application Japan, Nov. 22, 1994, 6-287683

Int. Cl.^{6} H01S *3/19;* **H01L** *21/302*

U.S. Cl. 372—46 **8 Claims**

7. A semiconductor laser device comprising:

a waveguide including, successively, a first conductivity type InP first lower cladding layer, a first conductivity type InGaAsP mass-transport suppressing layer, a first conductivity type InP second lower cladding layer, an InGaAsP active layer, and a second conductivity type InP upper cladding layer for guiding a laser beam; and



current blocking layers confining current to the waveguide on opposite sides of the waveguide.

5,748,660

SAMPLE GRATING DISTRIBUTED BRAGG REFLECTOR LASER, VERY WIDELY MATCHABLE BY PHASE VARIATION AND PROCESS FOR USING THIS LASER

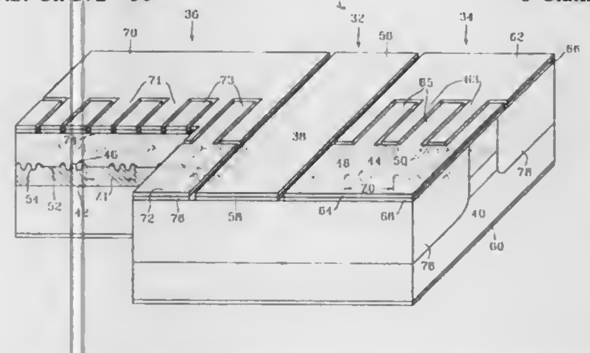
Franck Delorme, Villejuif, and Christophe Ougier, Paris, both of France, assignors to France Telecom, Paris, France

Filed Jul. 12, 1996, Ser. No. 679,120

Claims priority, application France, Jul. 25, 1995, 95 09004

Int. Cl.^{6} H01S *3/19;3/10;3/08*

U.S. Cl. 372—50 **8 Claims**



1. A sample grating distributed Bragg reflector laser, comprising:

at least one active section;

at least one first sample grating section disposed on a first side of said at least one active section;

at least one second sample grating section disposed on a second side of said at least one active section,

wherein each of said at least one first sample grating section and said at least one second sample grating section comprises at least one phase part adjacent to a respective at least one grating part; and

means for injecting current into said at least one phase part and independently into said at least one grating part.

5,748,661

INTEGRATED LATERAL DETECTOR AND LASER DEVICE AND METHOD OF FABRICATION

Philip Kiely; Paul Claisse, both of Gilbert, and Benjamin W. Gable, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1996, Ser. No. 684,203

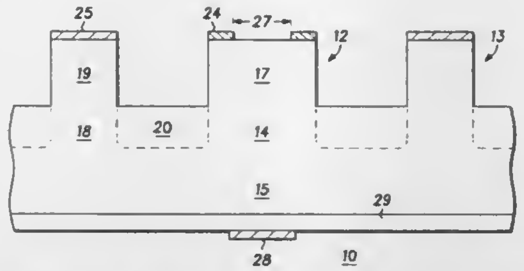
Int. Cl.^{6} H01S *3/19:3/10*

U.S. Cl. 372—50 **15 Claims**

1. A monolithically integrated semiconductor device comprising:

a substrate having a first mirror stack positioned thereon, an active region positioned on the first mirror stack, and a second mirror stack positioned on the active region;

a vertical cavity surface emitting semiconductor laser formed in the first mirror stack, the active region and the second mirror stack, a portion of the second mirror stack being removed to form a mesa defining the semiconductor laser and to define an encircling trench and shoulder;



a lateral detector formed by the first mirror stack, the active region and the second mirror stack in the encircling shoulder and positioned to at least partially encircle the semiconductor laser and having an active region coextensive with the active region of the semiconductor laser; and

an isolation region formed in coextensive portions of the active region in the encircling trench and including an implant that encircles the semiconductor laser, the isolation region separating the active region of the lateral detector from the active region of the semiconductor laser and acting as a waveguide for propagating lateral emissions from the semiconductor laser to the lateral detector.

5,748,662

LASER OSCILLATOR WITH STABILIZED POINTING

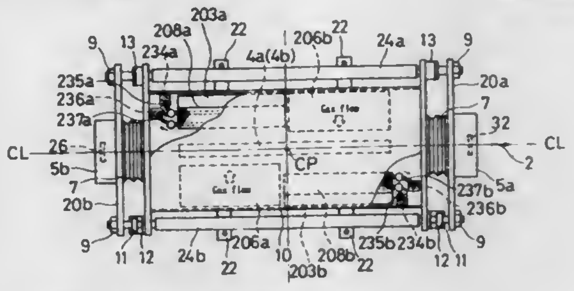
Satoshi Nishida, and Akihiro Otani, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 654,894, May 29, 1996, Pat. No. 5,675,598, which is a division of Ser. No. 432,946, May 1, 1995, Pat. No. 5,596,597. This application Mar. 27, 1997, Ser. No. 825,090

Claims priority, application Japan, May 16, 1994, 6-101372

Int. Cl.^{6} H01S *3/22;3/223*

U.S. Cl. 372—55 **6 Claims**



1. A laser oscillator comprising:

a casing sealingly containing a laser medium gas and having a longitudinal center line;

a pair of discharging electrodes oppositely disposed in the casing and in parallel to said center line so as to oscillate a laser beam by use of the laser medium gas;

a circulating means for circulating the laser medium gas in the casing;

a heat exchanger disposed in the casing to cool the laser medium gas that is heated by discharge generated by the discharging electrodes;

an inlet port disposed at a first position of the casing to supply a cooling medium to the heat exchanger; and

an outlet port disposed in the casing, at a second position substantially symmetrical to the first position of the inlet port in relation to the center line of the casing that is parallel to the discharging electrodes, to discharge the cooling medium out of the heat exchanger.

5,748,663

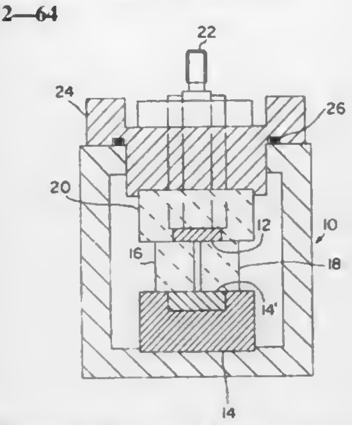
RETANGULAR DISCHARGE GAS LASER

Peter Chenausky, Avon, Conn., assignor to QSource, Inc., East Hartford, Conn.

Continuation of Ser. No. 562,998, Nov. 27, 1995, abandoned, which is a continuation-in-part of Ser. No. 361,729, Dec. 22, 1994, abandoned, which is a continuation of Ser. No. 255,463, Jun. 8, 1994, abandoned. This application Jun. 6, 1997, Ser. No. 870,857

Int. Cl.^{6} H01S *3/03*

U.S. Cl. 372—64 **78 Claims**



1. An RF excited gas laser having an optical axis, said laser comprising:

at least first and second spacially displaced electrodes;

a pair of spacially displaced nonconductive spacers, said spacers in part defining an elongated gaseous discharge region having a generally rectangular cross-section, said discharge region cross-section being perpendicular to said optical axis and being characterized by an average longer dimension and an average shorter dimension which is transverse to said longer dimension, the longer dimension being measured between the most widely spaced of said electrodes and the shorter dimension being between said spacers, the shorter dimension being sufficiently small to insure a rate of heat transfer from the discharge region to said spacers which will maintain a stable discharge;

a laser gas mixture at a pressure p disposed in said discharge region; and

means for applying RF power at an excitation frequency f to at least a first one of said electrodes to thereby establish an excitation electric field which is oriented generally transversely with respect to said shorter dimension whereby a plasma is created in said discharge region.

5,748,664

SOLID STATE LASER WITH POSITIVE THERMAL LENS

Malcolm Harry Dunn; Wilson Sibbett; Peter Rahlff Christian, all of Farnborough; Bruce David Sinclair, St. Andrews, and Michael Andrew Firth, Farnborough, all of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Hants, United Kingdom

PCT No. PCT/GB95/00916, § 371 Date Nov. 6, 1996, § 102(e) Date Nov. 6, 1996, PCT Pub. No. WO95/31022, PCT Pub. Date Nov. 16, 1995

PCT Filed Apr. 24, 1995, Ser. No. 737,277

Claims priority, application United Kingdom, May 6, 1994, 9409197

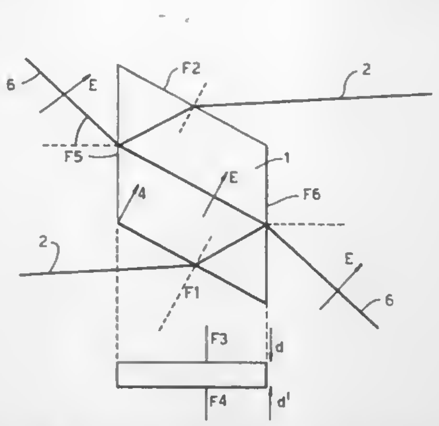
Int. Cl.^{6} H01S *3/091*

U.S. Cl. 372—75 **8 Claims**

1. An all-solid-state laser comprising:

a slab of gain medium,

a diode laser pump system configured in an end pumping geometry with the gain medium and a heat sink thermally contacted to the gain medium wherein the gain medium exhibits a negative bulk thermal lensing effect and that the diode laser pump system and the gain medium comprises a means for providing a positive thermal lens at the surface of the gain medium wherein the positive thermal lens overwhelms the negative bulk thermal lensing effect within the gain medium and the gain medium has a thickness which is as small as possible while permitting low clipping loss passage of a laser mode through the slab.



5,748,665

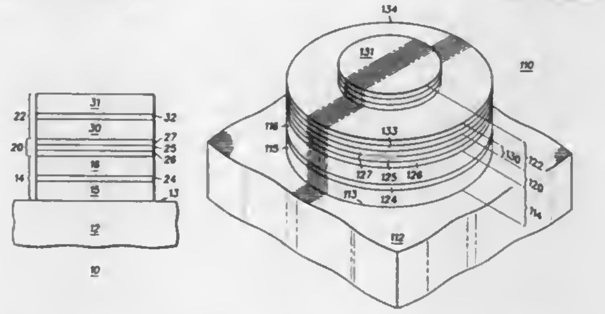
VISIBLE VCSEL WITH HYBRID MIRRORS

Wenbin Jiang, Phoenix, and Michael S. Lebby, Apache Junction, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 16, 1996, Ser. No. 586,391

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—96 **16 Claims**



1. A vertical cavity surface emitting laser for emitting visible light, the vertical cavity surface emitting laser comprising:

a first mirror stack including a first portion of a first epitaxially grown material system including alternating layers of AlAs and AlGaAs, a second portion of a second epitaxially grown material system positioned adjacent the active region and including InAlP and InAlGaP, and a third portion of the first mirror stack, the third portion being positioned intermediate the first and second portions and formed of a third material system wherein the third material system includes alternating layers of $Al_{x1}GaInP$ and $Al_{x2}GaInP$, wherein x1 and x2 represent different amounts of aluminum to provide pairs of layers with different indices of refraction;

an active region disposed on the first mirror stack; and

a second mirror stack disposed on the active region.

5,748,666

METHOD AND FURNACE FOR TREATMENT OF ASH

Karl-Hugo Andersson, Schlieren; Sven-Einar Stenkvist, Brugg, both of Switzerland, and Göran Wikström, Växjö, Sweden, assignors to Asea Brown Boveri AG, Baden, Switzerland

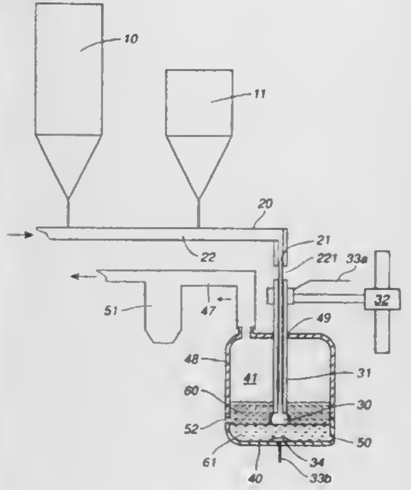
PCT No. PCT/SE94/01241, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/17981, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 22, 1994, Ser. No. 640,814

Claims priority, application Sweden, Dec. 27, 1993, 93404284; Mar. 30, 1994, 9401065

Int. Cl.^{6} F27D *17/00*

U.S. Cl. 373—9 **9 Claims**



1. A method for thermally treating ash containing pollutants selected from the group consisting of metals, inorganic salts and organic compounds in a direct current arc furnace which includes a furnace shell containing metal melt, a furnace roof positioned over the furnace shell to define a closed furnace chamber therewithin, a bottom contact positioned adjacent the furnace shell and in contact with the metal melt, and a hollow electrode which extends through the furnace roof to a lower end above the bottom contact, said method comprising the steps of:

(a) establishing a negative polarity in said hollow electrode and a positive polarity in said bottom contact such that a voltage between the lower end of said hollow electrode and said bottom contact creates a reducing arc from the lower end of the hollow electrode toward the metal melt in said furnace shell and said bottom contact,

(b) supplying said ash to said hollow electrode so as to fall into said arc and be rapidly heated to between 1350° and 1750° C. so that metals in said ash are partially reduced to form a first portion which is driven to the furnace chamber and a second portion which mixes with the metal melt, wherein inorganic salts in said ash are at least partially decomposed and driven to the furnace chamber, wherein organic compounds in said ash are broken. down and driven to the furnace chamber. and wherein remaining portions of said ash form a slag above said metal melt in said furnace shell.

(c) maintaining the furnace chamber at a temperature of over 1200° C. and a pressure of 1 to 10 mbar below ambient pressure external to the furnace,

(d) removing a gas stream containing gaseous pollutants from said furnace chamber for oxidation and cooling, and

(e) removing slag from said furnace shell and cooling said removed slag to form a glass or a material having a glass-like matrix which trap harmful pollutants.

5,748,667

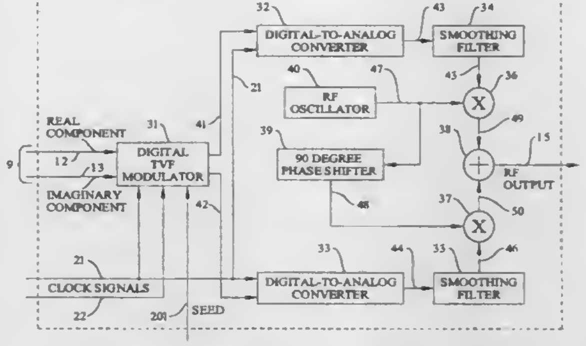
SPREAD SPECTRUM MODULATION USING TIME VARYING LINEAR FILTERING

Howard L. Dyckman, 365 Newton Rd., #C5, Warminster, Pa. 18974-5332

Filed Mar. 25, 1996, Ser. No. 621,400

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 375—200 **2 Claims**



1. A method for transmitting information by radio over a wide bandwidth, comprising the steps of:

1) inputting a data signal into a time varying filter modulator;

2) spreading the data signal in time and in frequency to produce a wideband signal;

3) modulating the wideband signal onto an RF carrier to provide an RF output signal; and

4) transmitting the RF output signal.

5,748,668

SPREAD SPECTRUM METHOD FOR TRANSMITTING AN INFORMATION SIGNAL AS A RADIO SIGNAL AT A HIGH SPEED

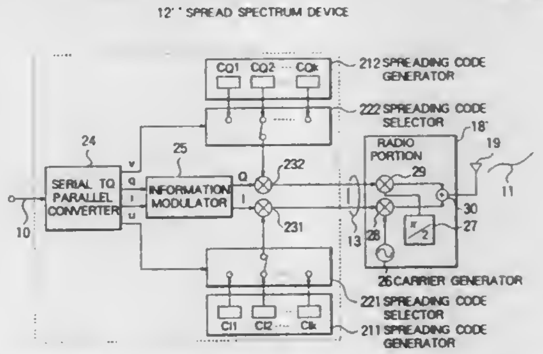
Hideho Tomita; Masahiro Ooki, and Yukitsuna Furuya, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 325,701, Oct. 19, 1994, Pat. No. 5,625,639. This application Feb. 11, 1997, Ser. No. 798,874

Claims priority, application Japan, Oct. 22, 1993, 5-265109

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 375—200 **10 Claims**


12'' SPREAD SPECTRUM DEVICE
CQ1
CQ2
CQk
212 SPREADING CODE GENERATOR
222 SPREADING CODE SELECTOR
18'
RADIO PORTION
19
24
SERIAL TO PARALLEL CONVERTER
25
INFORMATION MODULATOR
232
231
29
30
27
11
10
13
28
26 CARRIER GENERATOR
221 SPREADING CODE SELECTOR
CI1
CI2
CIk
211 SPREADING CODE GENERATOR

1. A method of spectrum spreading a serial information signal into a spectrum spread signal, said method comprising the steps of:

serial to parallel converting said serial information signal into a parallel signal of (i+q+u+v) bits, where each of i. q. u. and v represents a positive integer. i being equal to q;

carrying out information modulation on i bits among the (i+q+u+v) bits of said parallel signal and on q bits among the (i+q+u+v) bits of said parallel signal to produce first and second modulated information signals, respectively;

selectively producing, as a first selected spreading code, one of first spectrum spreading codes which are equal in number to 2^u and are different from one another, said one of the first spectrum spreading codes being specified by u bits of remaining (u+v) bits among the (i+q+u+v) bits of said parallel signal;

/OL
2 10
SS
1
MY
5
998
MI

selectively producing, as a second selected spreading code, one of second spectrum spreading codes which are equal in number to 2^v and are different from one another and from said first spectrum spreading codes, said one of the second spectrum spreading codes being specified by remaining v bits among the (i+q+u+v) bits of said parallel signal;

carrying out spectrum spreading on said first modulated information signal on the basis of said first selected spreading code to produce a first spectrum spread signal; and

carrying out spectrum spreading on said second modulated information signal on the basis of said second selected spreading code to produce a second spectrum spread signal;

said first and said second spectrum spread signals being for use collectively as said spectrum spread signal.

5,748,669

METHOD AND APPARATUS FOR TRANSMITTING INFORMATION CONVERTED TO SPREAD SPECTRUM SIGNAL

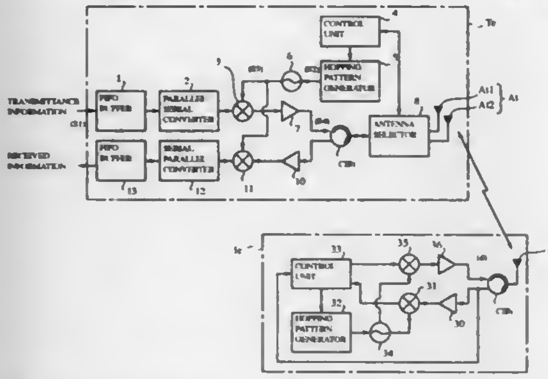
Katsuhiro Yada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 10, 1996, Ser. No. 630,759

Claims priority, application Japan, Apr. 27, 1995, 7-104262

Int. Cl.⁶ H04B *15/00;7/02;* **H04L** *1/02*

U.S. Cl. 375—202 **30 Claims**


Tr
CONTROL UNIT
4
HOPPING PATTERN GENERATOR
TRANSMITTANCE INFORMATION
RECEIVED INFORMATION
FIFO BUFFER
PARALLEL SERIAL CONVERTER
SERIAL PARALLEL CONVERTER
1
2
9
6
7
8
ANTENNA SELECTOR
At1
At2
At
13
12
11
10
Re
CONTROL UNIT
33
35
36
31
30
32
HOPPING PATTERN GENERATOR
34
Ar

28. An apparatus for transmitting information converted to a frequency hopping spread spectrum signal having a plurality of frequency components, said information being coded to furm a information signal represented by a sequence of bits before being converted to said frequency hopping spread spectrum signal, comprising:

pattern generating means for generating a pattern of frequency hopping;

signal producing means for producing said frequency hopping spread spectrum signal on the basis of said information signal and said pattern of frequency hopping; and

signal transmitting means for having said frequency hopping spread spectrum signal provided with a signal propagation character and transmitting said frequency hopping spread spectrum signal, said signal transmitting means operating to vary the signal propagation character of said frequency hopping spread spectrum signal in accordance with said pattern of frequency hopping.

5,748,670

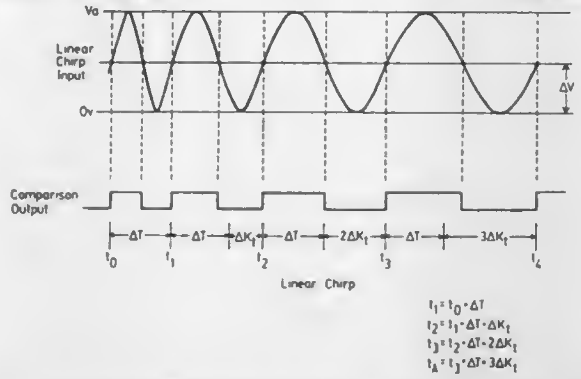
METHOD OF DEMODULATING CHIRP SPREAD SPECTRUM

Lyn R. Zastrow, Coppell, Tex., assignor to Zilog, Inc., Campbell, Calif.

Filed May 25, 1995, Ser. No. 450,974

Int. Cl.⁶ H04B *15/00;* **H04K** *1/00;* **H04L** *27/30*

U.S. Cl. 375—204 **12 Claims**



1. A circuit for demodulating an input chirp signal, the input chirp signal including pulses, the frequency of the input chirp signal increasing or decreasing over a period of time, the circuit comprising:

digital circuitry including a counter updated by a fixed frequency clock signal, the counter being adapted to produce a count indicative of the time period between pulses of the input chirp signal the digital circuitry including a digital filter includes minimum and maximum test registers loadable with minimum and maximum test values, the digital filter further including minimum test circuitry and maximum test circuitry connected to receive the minimum and maximum test values respectively from the minimum and maximum test registers, the minimum test circuitry adapted to produce a first signal indicating whether the count of the counter is less than the maximum value and the maximum test circuitry adapted to produce a second signal indicating whether the count of the counter is more than the minimum value; and

a processor electrically connected to the digital circuitry, said digital processor adapted to determine whether the frequency of the input chirp signal is increasing or decreasing over the period of time.

5,748,671

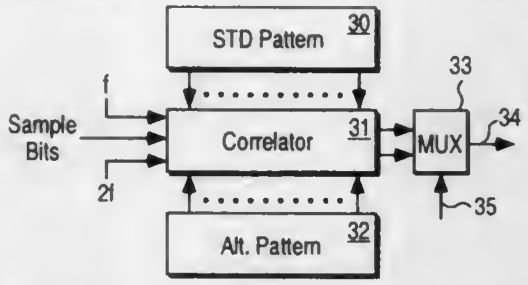
ADAPTIVE REFERENCE PATTERN FOR SPREAD SPECTRUM DETECTION

Philip H. Sutterlin, Saratoga, and J. Marcus Stewart, San Jose, both of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Filed Dec. 29, 1995, Ser. No. 580,623

Int. Cl.⁶ H04B *1/707*

U.S. Cl. 375—206 **1 Claim**



1. In a spread spectrum receiver where a received signal representing data bits is correlated with a first predetermined reference pattern to detect the data bits, an improved method comprising the steps of:

storing a second predetermined pattern for detecting the data bits which provide higher correlation values than the first predetermined reference pattern when the received signal has been subjected to certain distortion; and,

using the results of a correlation between the received signal and the second predetermined pattern when the correlation between the received signal and second predetermined pattern provides higher correlation values than the correlation between the received signal and the first predetermined reference pattern.

5,748,672

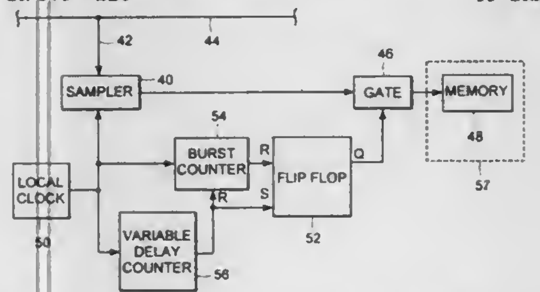
SYSTEM FOR MEASURING JITTER IN A NON-BINARY DIGITAL SIGNAL

Marc L. Smith, Sterling, and Fadi H. Daou, Milton, both of Mass., assignors to CenRad, Inc., Concord, Mass.

Filed Aug. 11, 1995, Ser. No. 514,011

Int. Cl.⁶ H04B *3/46*

U.S. Cl. 375—226 **15 Claims**



1. A jitter measuring system for measuring phase jitter of the transitions in a multiple-level digital signal, the system comprising:

A. a local clock,

B. sampling means for sampling the signal in synchronism with the local clock at a rate substantially greater than the symbol rate in the signal, thereby to provide a series of digital signal samples, each of which represents a value of the signal,

C. derivative means for

1) processing the signal samples to obtain a series of samples of the time derivative of signal, and

2) processing the derivative samples to provide a series of values of the timing of absolute maxima of the derivative, the timing values being samples of the waveform of the phase jitter.

5,748,673

DATA RECEIVING APPARATUS

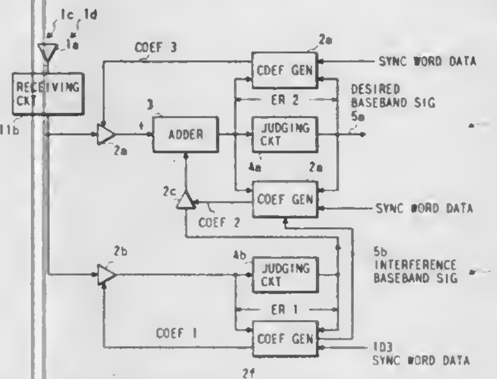
Sadaki Futagi, Sagamihara, and Mitsuru Uesugi, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 31, 1996, Ser. No. 594,536

Claims priority, application Japan, Jan. 31, 1995, 7-014799

Int. Cl.⁶ H03H *7/30;7/40*

U.S. Cl. 375—232 **17 Claims**



1. A data receiving apparatus comprising:

receiving means for receiving a desired radio wave signal including a desired baseband signal and an interference radio wave signal including an interference baseband signal, said desired radio wave signal and said interference radio wave signal having substantially the same frequency;

first weighting means for weighting an output of said receiving means with a first coefficient successively renewed such that said desired baseband signal is reproduced;

subtracting means coupled to said first weighting means;

first judging means coupled to said subtracting means;

second weighting means for weighting said baseband signal with a second coefficient successively renewed such that said interference baseband signal is reproduced;

second judging means coupled to said second weighting means; and

supplying means for supplying an output of said second judging means to said subtracting means, said subtracting means effecting a subtraction between an output of said first weighting means and an output of said supplying means.

5,748,674

DECISION-FEEDBACK EQUALIZER FOR DIGITAL COMMUNICATION SYSTEM

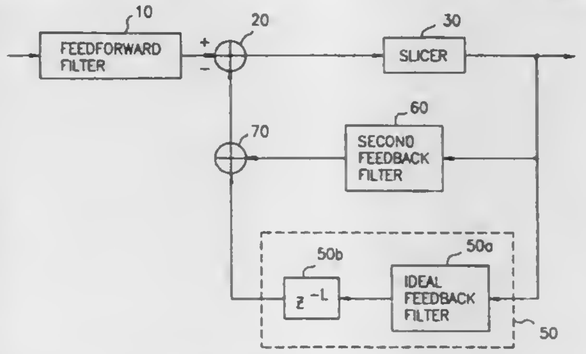
Il-Taek Lim, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-Do, Rep. of Korea

Filed Apr. 26, 1996, Ser. No. 639,924

Claims priority, application Rep. of Korea, Apr. 28, 1995, 10318/1995

Int. Cl.⁶ H03H *7/30;* **H03K** *5/159;* **H04B** *1/10*

U.S. Cl. 375—233 **7 Claims**



1. A decision-feedback equalizer having a subtractor for subtracting a summation of post-cursor ISI signals from a digital signal inputted thereto, and a slicer for slicing an output of the subtractor into a predetermined size of symbol, said decision-feedback equalizer comprising:

a first feedback filter, having a predetermined number of pipelining delays, for filtering output from the slicer, and for outputting a first post-cursor ISI signal;

a second feedback filter for filtering the output from the slicer, and for outputting a second post-cursor ISI signal within the predetermined pipelining delay number of the first feedback filter without a pipelining delay; and

an adder for adding the first and second post-cursor ISI signals to produce the summation ISI signal, and for outputting the summation ISI signal to the subtractor.

VOL
210
ISS
1
MY
5
1998
UMI

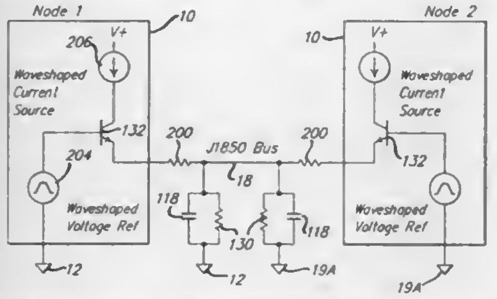
5,748,675
VEHICLE COMMUNICATIONS NETWORK WITH IMPROVED CURRENT SOURCING

Ronald F. Hormel, Clinton Township, and Frederick O. Miesterfeld, Troy, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Continuation-in-part of Ser. No. 252,706, Jun. 2, 1994, Pat. No. 5,432,817, which is a continuation-in-part of Ser. No. 951,989, Sep. 28, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 394,104

Int. Cl.^{6} H04B *1/38;* **H04L** *5/16*

U.S. Cl. 375—257 **10 Claims**



7. A multiple-node vehicle communications network comprising:
- a multiple access communications bus for communicating variable pulse width modulated encoded signals;
- a plurality of nodes interfacing with the communications bus, each node including a transceiver having a transmitter with an output circuit for producing a voltage output, the transmitter being operable to source current onto the bus when the voltage output exceeds a voltage potential seen on the bus; and
- a plurality of resistive elements, wherein one of the resistive elements is coupled between each transmitter and said communications bus for reducing a rate of change of current on the communications bus.

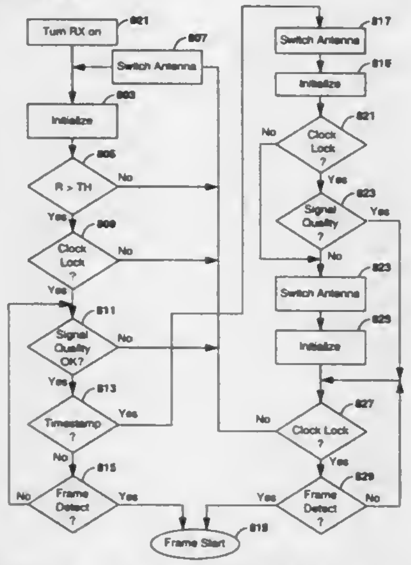
5,748,676
NETWORK UTILIZING MODIFIED PREAMBLES THAT SUPPORT ANTENNA DIVERSITY

Ronald L. Mahany, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed May 1, 1995, Ser. No. 431,993

Int. Cl.^{6} H04K *1/10;* **H04L** *27/28*

U.S. Cl. 375—260 **10 Claims**



1. A method for use in a communication network having a transmitter and a receiver that each have a separate housing, the receiver having a plurality of antennas, the transmitter and the receiver using a preamble of a communication packet to facilitate an antenna diversity protocol in the receiver, said method comprising the steps of:
- (a) transmitting by the transmitter a first bit sequence of a preamble;
- (b) transmitting by the transmitter a time stamp bit sequence of the preamble, the time stamp bit sequence identifiably distinct from the first bit sequence of the preamble, the time stamp bit sequence of the preamble being identifiable by the receiver for use in an antenna diversity protocol;
- (c) transmitting by the transmitter a second bit sequence of the preamble; and
- (d) transmitting by the transmitter the remainder of the communication packet.

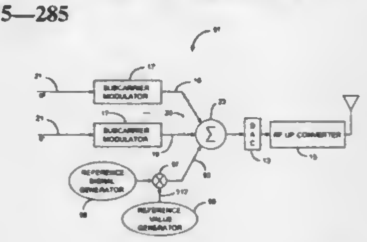
5,748,677
REFERENCE SIGNAL COMMUNICATION METHOD AND SYSTEM

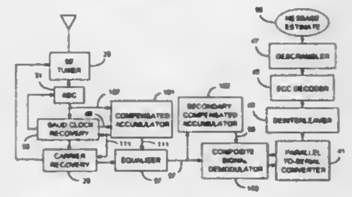
Derek D. Kumar, 2313 Blackthorn Dr., Champaign, Ill. 61821

Filed Jan. 16, 1996, Ser. No. 586,214

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 375—285 **14 Claims**





1. A communications system including a transmitter and a receiver which utilizes a modulated reference signal in order to reduce the effects of non-linearity and stationary interference on the recovery of the reference signal, the communications system comprising:
- a transmitter including at least one subcarrier modulator for generating at least one data modulated signal;
- said transmitter further including means for generating a modulated reference signal which varies from reference signal baud interval to reference signal baud interval in a predetermined manner based upon a sequence of reference values;
- a summer in said transmitter for summing the modulated reference signal and the at least one data modulated signal to form an overall composite signal;
- means for transmitting the overall composite signal from the transmitter to a receiver, the receiver including:
  - (i) means for cancelling the effect of the modulation of the reference signal thereby forming a substantially unmodulated reference signal;
  - (ii) a first accumulator for accumulating the unmodulated reference signal in order to determine a reference signal estimate; and
  - (iii) means for using said reference signal estimate for at least one of: facilitating baud clock recovery; facilitating carrier frequency recovery; and equalization.

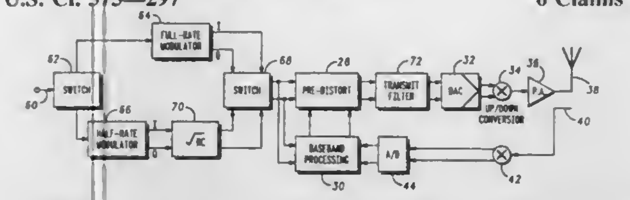
5,748,678
RADIO COMMUNICATIONS APPARATUS

Stephen Thomas Valentine, and Anthony John Wray, both of Basingstoke, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 13, 1995, Ser. No. 502,105

Int. Cl.^{6} H03F *1/32*

U.S. Cl. 375—297 **6 Claims**



1. Radio communications apparatus employing a training routine for optimising performance, the apparatus including;
- a modulator for modulating a radio channel with digital information, the modulator having an input for receiving digital data and providing at least one baseband output signal at a first data rate;
- a power amplifier for amplifying the at least one output signal fed from the modulator to provide at least one amplified output signal;
- a feedback loop for sampling a portion of the at least one amplified output signal provided by the power amplifier and for adjusting at least one of the amplitude and phase of the at least one baseband signal to compensate for distortion introduced by the power amplifier; and
- means for reducing the data rate of the at least one baseband signal during the training routine to reduce adjacent channel transmissions.

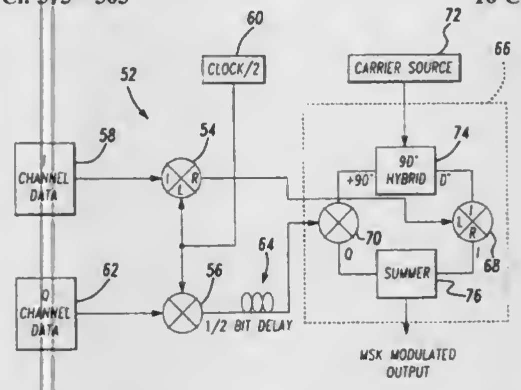
5,748,679
MODULATED CLOCK MSK MODULATOR FOR HIGH DATA RATE APPLICATIONS

Pascal G. Finkenbeiner, Torrance, Calif., and Thomas J. Kolze, Phoenix, Ariz., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 28, 1995, Ser. No. 430,570

Int. Cl.^{6} H04L *27/12*

U.S. Cl. 375—305 **16 Claims**



1. A minimum shift keying (MSK) modulator comprising:
- a clock device for generating a sinusoidal clock signal;
- an I channel data device for generating a sequence of I channel data bits;
- a Q channel data device for generating a sequence of Q channel data bits;
- a clock modulation device for modulating the clock signal with the I and Q channel data bits to shape the data bits by either inverting or non-inverting the sinusoidal clock signal, wherein the clock modulation device generates a sinusoidal I channel modulated clock signal and a sinusoidal Q channel modulated clock signal, said clock modulation device including a first biphase switch and a second biphase switch, said first biphase switch being responsive to inverted and non-inverted I channel data bits to selectively invert or non-invert the clock signal to create the I channel modulated clock signal and the second biphase switch being responsive to inverted and non-inverted Q channel data bits to selectively invert or non-invert the clock signal to create the Q channel modulated clock signal; and
- a carrier wave modulation device for modulating a carrier wave signal, said carrier wave modulation device being responsive to the I and Q channel modulated clock signals to generate an MSK modulated output signal including the I and Q data bits.

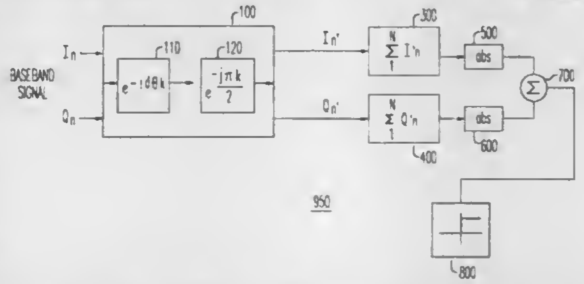
5,748,680
COARSE FREQUENCY BURST DETECTOR FOR A WIRELINE COMMUNICATIONS SYSTEM

Mohammad Shafiul Mobin, Whitehall, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 16, 1994, Ser. No. 357,804

Int. Cl.^{6} H04L *25/06;25/10*

U.S. Cl. 375—317 **9 Claims**



1. A method of detecting at the receiving end of a wireline communications system a frequency correction burst in a baseband signal transmitted via the wireline communications system, the frequency correction burst comprising a plurality of digital samples of a same binary value;

said method comprising the steps of:
- separately filtering orthogonal components of decoded signal samples derived from the baseband signal transmitted via the wireline communications system;
- constructively combining the magnitudes of the separately filtered orthogonal components; and
- thresholding the constructively combined magnitudes to detect the frequency correction burst.

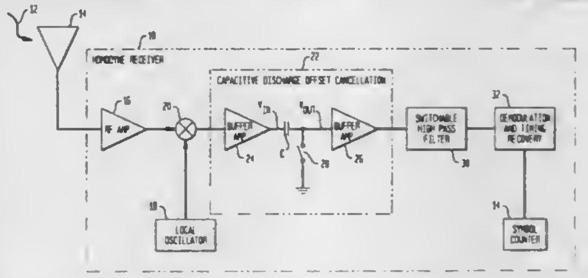
5,748,681
OFFSET CORRECTION FOR A HOMODYNE RADIO

Vittorio Comino, Keansburg; Gerard Joseph Foschini, South Amboy; Isam M. Habbab, Old Bridge; Sanjay Kasturia, Middletown; Jack Salz, Fair Haven, all of N.J.; Michael Edward Prise, Kirkland, Wash., and Ravi Subramanian, Palo Alto, Calif., assignors to Lucent Technologies Inc, Murrvay Hill, N.J.

Filed Oct. 27, 1995, Ser. No. 549,363

Int. Cl.^{6} H04L *25/06*

U.S. Cl. 375—319 **26 Claims**



1. A homodyne receiver device with DC offset correction comprising:
- demodulating means for demodulating an RF signal to produce a baseband signal, said baseband signal having a DC offset;

OL
2 10
SS
1
MY
5
998
MI

a dynamic offset correction circuit adapted to receive said baseband signal and to determine thereform a dynamic DC offset of said baseband signal and applying a dynamic offset correction to said baseband signal;

timing means for acquiring a timing signal from said baseband signal for synchronization to a transmitter; and

a switchable high pass filter having a first predetermined frequency cutoff and a second predetermined frequency cutoff adapted to receive said baseband signal, wherein said switchable high pass filter is selectively switched between said first predetermined frequency cutoff before synchronization and said second predetermined frequency cutoff after synchronization.

5,748,682

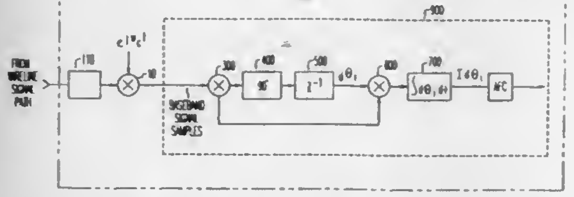
OSCILLATOR FREQUENCY OFFSET ERROR ESTIMATOR FOR COMMUNICATIONS SYSTEMS

Mohammad Shafiul Mobin, Whitehall, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 357,802, Dec. 16, 1994, abandoned. This application Jul. 3, 1996, Ser. No. 674,929

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 375—344 **20 Claims**



1. An integrated circuit for a receiving station of a communications system having an oscillator frequency offset error estimator that ioputs a predetermined frequency burst of binary symbols, the oscillator frequency offset error estimator comprising:

a phase shifter that adjusts a phase of at least one of two sets of successive predetermined frequency burst of binary symbols;

a phase comparator comparing the two sets of successive predetermined frequency burst of binary symbols to generate a plurality of frequency burst phase offsets, one of said two sets of successive predetermined frequency burst of binary symbols being provided to said phase comparator along a signal path through the phase shifter and a time delay; and

an accumulator coupled to said phase comparator that accumulates said plurality of frequency burst phase offsets generated by said phase comparator to generate an oscillator frequency error offset.

5,748,683

MULTI-CHANNEL TRANSCEIVER HAVING AN ADAPTIVE ANTENNA ARRAY AND METHOD

Paul Fielding Smith, North Richland Hills, and Robert Mark Harrison, Grapevine, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 366,283, Dec. 29, 1994, Pat. No. 5,579,341. This application Jul. 31, 1995, Ser. No. 509,122

Int. Cl.^{6} H04B *7/08*

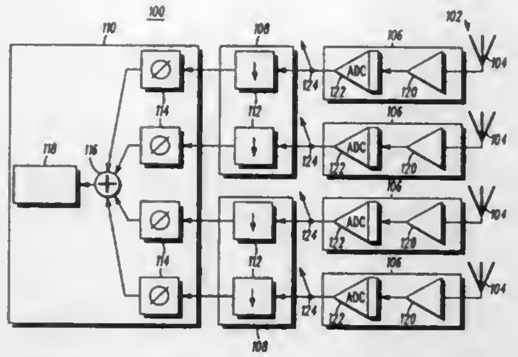
U.S. Cl. 375—347 **9 Claims**

1. A multi-channel receiver comprising:

a plurality of radio frequency processing elements, each radio frequency processing element comprising:

a radio frequency down converter having an input coupled to radio frequency signals received at one of a plurality of antenna elements of an antenna array and having an intermediate frequency signal output;

an analog-to-digital converter having an input coupled to the intermediate frequency signal output and a digital intermediate frequency signal output;



a digital splitter having an input coupled to the digital intermediate frequency output and a plurality of outputs;

a plurality of digital down-converters, each digital down-converter having an input coupled to one of the digital splitter outputs and a digital baseband frequency signal output;

and

a channel processing element comprising:

a plurality of phase selectors, each phase selector having an input coupled to one of the digital baseband frequency signal outputs and a phase selected output;

a summer having a plurality of inputs each coupled to the phase selected output of the phase selectors and a summed signal output; and

a channel processor, the channel processor having an input coupled to the summed signal output and a communication signal output.

5,748,684

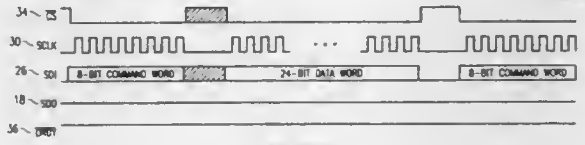
RESYNCHRONIZATION OF A SYNCHRONOUS SERIAL INTERFACE

Clifton W. Sanchez, Austin, Tex., assignor to Crystal Semiconductor, Inc., Austin, Tex.

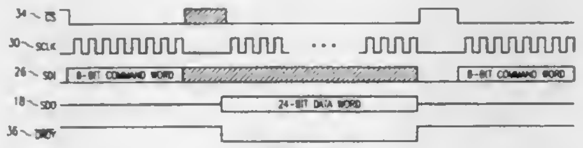
Continuation of Ser. No. 853,117, Mar. 18, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 255,828

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—357 **15 Claims**



WRITE OPERATION



READ OPERATION

1. A method for resynchronizing a synchronous serial communication channel between a controller and a peripheral, the data on said synchronous serial communication channel comprising a combination of command words and data words without any synchronization bits during normal operation, said method for resynchronizing comprises the steps of:

(a) transmitting a sequence of a repeating predetermined bit pattern from said controller, said repeating predetermined bit pattern being of a long enough duration such that said peripheral will decode at least a portion of said repeating predetermined bit pattern as a command word;

(b) resetting said peripheral upon receipt by said peripheral of said command word having bits according to said repeating predetermined bit pattern;

(c) transmitting from said controller, after the transmission of said predetermined bit pattern of said long enough duration, a different pattern than said repeating predetermined bit pattern and then normal serial data;

(d) detecting, in said peripheral, a first bit opposite to the logic state of the next bit in said predetermined bit pattern, and decoding the next series of bits as normal serial data.

5,748,685

Patent Not Issued For This Number

5,748,686

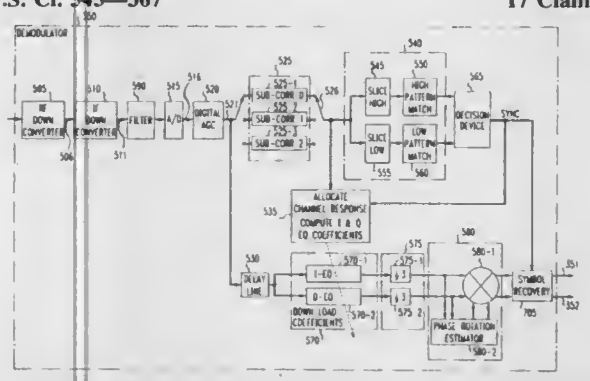
SYSTEM AND METHOD PRODUCING IMPROVED FRAME SYNCHRONIZATION IN A DIGITAL COMMUNICATION SYSTEM

Ehud Langberg, Ocean Township, and Jin-Der Wang, Ocean, both of N.J., assignors to Globespan Technologies, Inc., Red Bank, N.J.

Filed Apr. 4, 1996, Ser. No. 628,220

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 345—367 **17 Claims**



1. Apparatus for use in a communications receiver, the apparatus comprising:

receiver circuitry for providing a signal representative of a sequence of frames, each frame comprising a header portion and a data portion:

processing circuitry that both provides a frame synchronization signal and a characterization signal of a communications channel from the header portion of each frame, wherein the frame synchronization is representative of when a valid frame has been received and the characterization signal is used to generate values for a set of equalizer coefficients;

wherein the signal represents a sequence of N-dimensional symbols, where N>0, and the processing circuitry comprises:

a correlator for correlating the sequence of N-dimensional symbols with a plurality of predefined groups of pseudo-random number sequences to provide a correlator output signal; and circuitry for providing the frame synchronization signal upon detecting a match between the correlator output signal and a predetermined signal pattern.

5,748,687

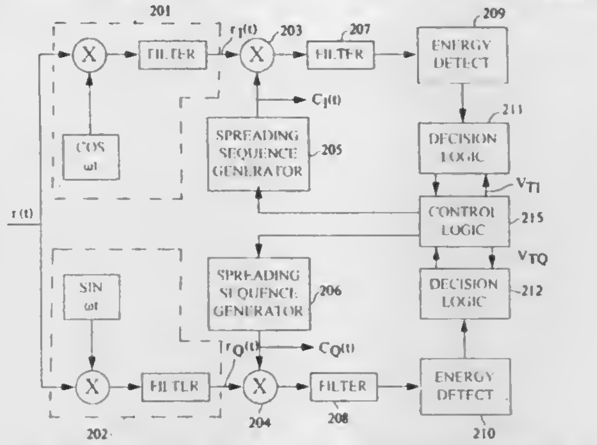
SPREADING CODE SEQUENCE ACQUISITION SYSTEM AND METHOD THAT ALLOWS FAST ACQUISITION IN CODE DIVISION MULTIPLE ACCESS (CDMA) SYSTEMS

Fatih Ozluturk, Port Washington, N.Y., assignor to InterDigital Technology Corp., Wilmington, Del.

Filed Jun. 27, 1996, Ser. No. 669,776

Int. Cl.^{6} H04L *7/00;27/30*

U.S. Cl. 375—367 **8 Claims**



1. A fast acquisition apparatus for quickly synchronizing a spreading code phase of a spread-spectrum communication system to a transmitted code signal having a transmitted in-phase (I) code signal and a transmitted quadrature (Q) code signal, said transmitted I-code signal including a first spreading code sequence and said transmitted Q-code signal including a second spreading code sequence; the transmitted I-code signal and the transmitted Q-code signal having a predetermined mutual code sequence phase offset value, the fast acquisition apparatus comprising:

receiving means for receiving the transmitted code signal and for separating, from the received code signal, the transmitted I-code signal and the transmitted Q-code signal;

correlating means for correlating code sequences with the transmitted code signal, and comprising an I-code signal correlator and a Q-code signal correlator;

a local code sequence generator responsive to a code control signal value to generate a local portion of the I-code sequence having an I-code phase value and a local portion of the Q-code sequence having a Q-code phase value; and

controller means for determining, obtaining and maintaining code sequence lock said controller means coupled to the I-code signal correlator, the Q-code signal correlator, and the local code sequence generator, said I-code signal correlator correlating said local portion of the I-code sequence with said transmitted I-code signal and generating an I-high value provided to said controller means when the I-code phase value of the local portion of the I-code sequence and a code phase value of the transmitted I-code signal have matching code phase values and said Q-code signal correlator correlating said local portion of the Q-code sequence with said transmitted Q-code signal and generating a Q-high value provided to said controller means when the Q-code phase value of the local portion of the Q-code sequence and a code phase value of the transmitted Q-code signal have matching code phase values;

wherein said controller means using said predetermined mutual code sequence phase offset value, generates the code control signal value to lock the I-code phase value of the local portion of the I-code sequence responsive to the I-high value and to set the Q-code phase value of the local portion of the Q-code sequence, and generates the code control signal value to lock the Q-code phase value of the local portion of the Q-code sequence responsive to the Q-high value and to set the I-code phase value of the local portion of the I-code sequence; and

VOL
210
ISS
1
MY
5
1998
UMI

said controller means is responsive to the absence of the I-high value and the Q-high value to generate the code control signal value which adjusts the I-code phase value and the Q-code phase value.

5,748,688

BIT-PATTERN DETECTOR

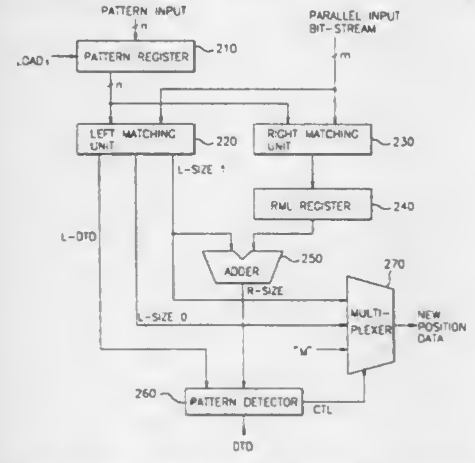
Su Hwan Kim, Seoul, and Seong Ok Bae, Kyungki-Do, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Choongcheongbuk-Do, Rep. of Korea

Filed Aug. 2, 1996, Ser. No. 691,530

Claims priority, application Rep. of Korea, Aug. 4, 1995, 24119/1995

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—368 **4 Claims**



1. A detector for detecting a bit pattern in a parallel bitstream input, comprising:

- left matching means for detecting bits in the parallel bitstream input matching the bit pattern, and for outputting a left detected signal, a position detected signal, and a left detected bit number in accordance with said detecting;
- right matching means for detecting bits in the parallel bitstream input matching the bit pattern and for outputting a right detected bit number in accordance with said detecting;
- adding means for adding said left detected bit number and said right detected bit number;
- pattern detecting means for outputting a pattern detection signal depending on said left detected signal and an output from said adding means, and for outputting a control signal; and
- multiplexing means for receiving a size signal corresponding to a length of the bitstream input, said position detected signal, said left detected bit number, and said control signal, and for selecting and outputting one of said size signal, said position detected signal, and said left detected bit number as a new detected position, based on said control signal.

5,748,689

SEALING DEVICE FOR AN INSTRUMENTATION COLUMN PENETRATING THE HEAD OF THE VESSEL OF A NUCLEAR REACTOR INSIDE AN ADAPTER

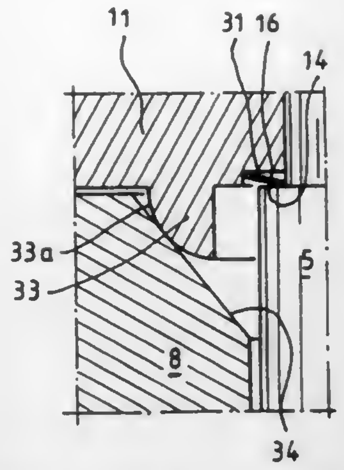
Jacques Malmasson, Evry, France, assignor to Framatome, Courbevoie, and ATEA Société Atlantique de Techniques Avancées, Carquefou, both of France

Filed Sep. 11, 1995, Ser. No. 526,250

Claims priority, application France, Sep. 9, 1994, 94 10815

Int. Cl.^{6} G21C *13/02;17/00*

U.S. Cl. 376—204 **4 Claims**



1. In a pressurized-water nuclear vessel having a head, a plurality of tubular adapters, each fixed into a penetration opening traversing said head and projecting outside the head, and at least one instrumentation column passing through one adapter of said plurality of adapters, a sealing device of said instrumentation column into said one adapter comprising:

- (a) a tubular bearing assembly fixed to an end of said adapter outside the head, in an axial extension of said adapter, and comprising a tubular section integral with the end of the adapter, a cover of annular shape attached to the tubular section and means for assembling the cover and the tubular section; and
- (b) at least one annular sealing gasket arranged between a bearing surface of the instrumentation column and an internal part of the cover of the tubular bearing assembly;
- (c) said cover comprising a spherical or toroidal bearing surface machined on a part of the cover projecting relative to a face of the cover pointing towards the tubular section; and
- (d) the tubular section comprising an internal bore having a part situated at the end of the tubular section constituting a frustoconical bearing surface of the tubular section;
- (e) said spherical bearing surface of said cover and said frustoconical bearing surface of said tubular section being symmetrical in revolution about an axis of the thermocouple column and providing sealing against the pressurized water of the reactor through direct metal-to-metal contact when said spherical and frustoconical surfaces are tightened on one another by the means for assembling the cover and the tubular section.

5,748,690

CONSTRUCTION METHOD OF NUCLEAR REACTOR REINFORCED CONCRETE CONTAINMENT VESSEL AND DIAPHRAGM FLOOR STRUCTURE OF NUCLEAR REACTOR REINFORCED CONCRETE CONTAINMENT VESSEL

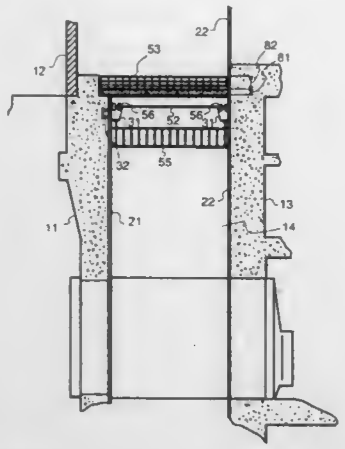
Tadashi Matsuura; Kouichi Ushiroda, both of Hitachi; Tatsuo Makita, Ushiku; Masakazu Nagase, Hitachi; Akinori Tajiri, Hitachi; Naoto Yoshida, Hitachi; Shigeru Nanba, Tokyo, and Koichi Saito, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., and Hitachi Plant Engineering & Construction Co., Ltd., both of Tokyo, Japan

Filed Mar. 12, 1996, Ser. No. 614,390

Claims priority, application Japan, Mar. 17, 1995, 7-058525

Int. Cl.^{6} G21C *13/00;21/00*

U.S. Cl. 376—260 **11 Claims**



8. A method of construction of a nuclear reactor reinforced concrete containment vessel, comprising of the steps of:

- providing a beam member for a diaphragm floor of said nuclear reactor reinforced concrete containment vessel;
- providing a plate member or a concrete mold frame over said beam member;
- arranging a first reinforcement member over said plate member or said concrete mold frame;
- pouring concrete, to a thickness less than a required thickness of said diaphragm floor of said nuclear reactor reinforced concrete containment vessel, on said plate member or said concrete mold frame and on said first reinforcement member to form a first concrete layer including said first reinforcement member;
- allowing said first concrete layer including said first reinforcement member to harden;
- arranging a second reinforcement member over said hardened first concrete layer;
- pouring concrete, to a thickness less than a required thickness of said diaphragm floor of said nuclear reactor reinforced concrete containment vessel, on said hardened first concrete layer and on said second reinforcement member to form a second concrete layer including said second reinforcement member;
- allowing said second concrete layer including said second reinforcement member to harden;
- arranging a third reinforcement member over said hardened second concrete layer;
- pouring concrete, to a thickness less than a required thickness of said diaphragm floor of said nuclear reactor reinforced concrete containment vessel, on said hardened second concrete layer and on said third reinforcement member to form a third concrete layer including said third reinforcement member; and
- allowing said third concrete layer including said third reinforcement member to harden;
- whereby said diaphragm floor of said nuclear reactor reinforced concrete containment vessel is formed to said required thickness.

5,748,691

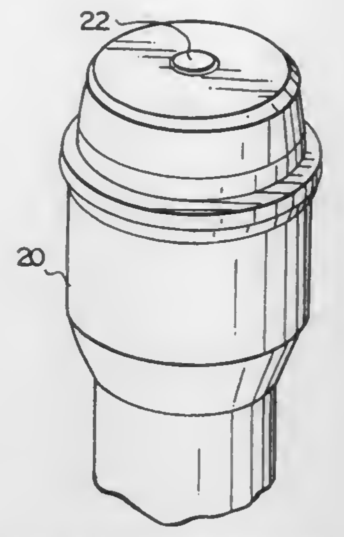
APPARATUS AND METHODS FOR SEALING END PLUGS FOR NUCLEAR FUEL RODS

John L. Harmon; William C. Peters; Robert A. Haughton, and Andrew A. Lingenfelter, all of Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 11, 1996, Ser. No. 613,488

Int. Cl.^{6} G21C *3/10*

U.S. Cl. 376—261 **17 Claims**



1. A method of sealing a solid three-dimensional end plug for a nuclear fuel rod wherein the end plug has an exterior end face and an interior end face on an opposite end of said end plug from said exterior face for registration with nuclear fuel within the fuel rod, comprising the step of, prior to securing the end plug to said nuclear fuel rod, forming a spot weld on said interior end face at a location substantially coincident with a long axis of said end plug passing through said interior and exterior end faces to seal said interior end face and prevent passage of fluid through any streamer passages in the end plug when secured to said nuclear fuel rod, the step of forming the spot weld being performed without the spot weld penetrating through the end plug from said interior face to said exterior end face.

5,748,692

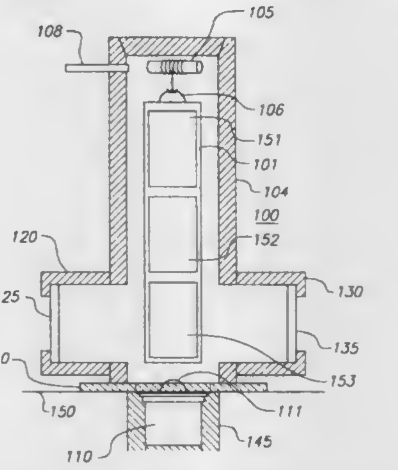
RACK LOADER AND METHOD FOR TRANSURANIC TRANSFERS INTO AND OUT OF STORAGE

Harold M. Burton, New Market, Md., assignor to Scientech Inc., Rockville, Md.

Filed Nov. 30, 1995, Ser. No. 565,338

Int. Cl.^{6} G21C *19/32;* **G21F** *7/00*

U.S. Cl. 376—272 **7 Claims**



1. A system for storing canisters of radioactive material, comprising:

- a storage tube disposed to accept such canisters, said storage tube having an open end;
- a shield plug removably disposed in said open end;
- a hoist conveyance adapted to remove said shield plug from said open end and to remove said canisters from said storage tube; and
- a shielding structure substantially surrounding said hoist conveyance and adapted to accept said shield plug upon removal of said shield plug from said open end, and to accept said canisters upon removal of said canisters from said storage tube.

5,748,693

SAFETY FEED FOR BORATING SYSTEM FOR A PRESSURIZED WATER REACTOR AND PROCESS FOR OPERATING SUCH A SYSTEM

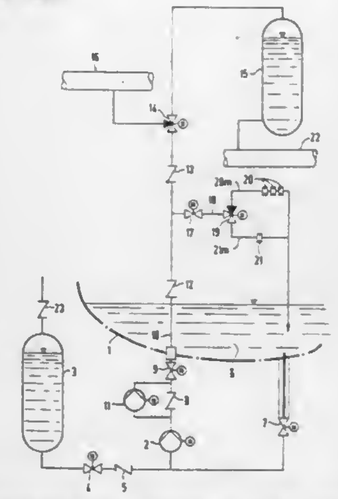
Heinz-Werner Hartmann, Buckenhof, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 24, 1996, Ser. No. 671,797

Claims priority, application Germany, Dec. 23, 1993, 43 44 323.0

Int. Cl.^{6} G21C *9/00*

U.S. Cl. 376—282 **7 Claims**



1. In combination with a pressurized water reactor, a safety feed and borating system for the pressurized water reactor, comprising:

- a safety feed pump;
- a parallel circuit connected in series with said safety feed pump, said parallel circuit being formed with a borating pump and a bypass line with a shutoff device connected in parallel with said borating pump;
- a feed bank connected downstream of said safety feed pump and said parallel circuit; and
- a branch system communicating with said feed bank, said branch system including at least two branch lines selectively connectable to said feed bank, a first one of said branch lines having a first throttle restriction for a large quantity and a second one of said branch lines having a second throttle restriction for a small quantity.

5,748,694

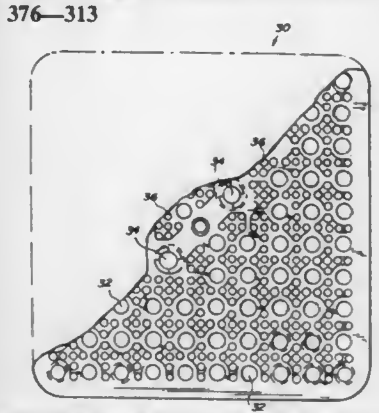
FUEL BUNDLE FILTER FOR A NUCLEAR REACTOR FUEL BUNDLE ASSEMBLY

Harold B. King, Wrightsville Beach, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1996, Ser. No. 621,595

Int. Cl.^{6} G21C *3/32;15/02*

U.S. Cl. 376—313 **11 Claims**



1. A debris filter plate for a nuclear reactor fuel bundle comprising:

- a substantially planar plate having a plurality of fuel rod holes in a predetermined array, each fuel rod hole adapted to receive a lower end of an associated fuel rod, said plate having web areas between said fuel rod holes, each web area formed with a plurality of smaller debris filter holes, at least one of said web areas partially cut from said plate to form a spring tab including said plurality of smaller debris filter holes pivotable out of the plane of said plate.

5,748,695

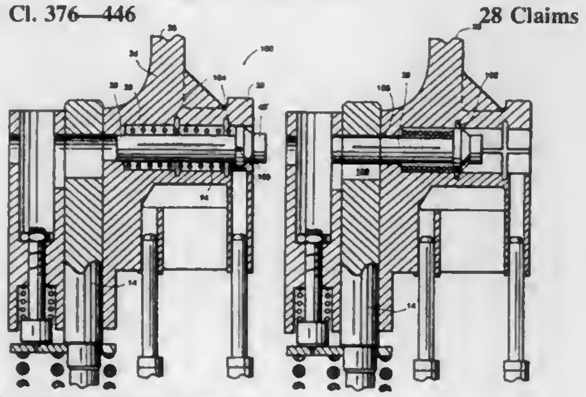
FUEL ASSEMBLY STRUCTURE SELECTIVELY USING CHANNEL AND COOLANT ROD FOR LOAD SUPPORT AND METHOD

Thomas G. Dunlap; Robert B. Elkins, and Mark J. Colby, all of Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 7, 1995, Ser. No. 551,769

Int. Cl.^{6} G21C *3/322*

U.S. Cl. 376—446 **28 Claims**



20. A fuel assembly comprising:

- a plurality of fuel rods;
- at least one coolant rod;
- a fuel assembly channel surrounding said plurality of fuel rods and said coolant rod;
- an upper tie plate disposed inside said fuel assembly channel and laterally supporting said fuel rods and said coolant rod; and
- a latch pin assembly selectively engageable with the fuel assembly channel and the coolant rod.

5,748,696

RADIATION COMPUTED TOMOGRAPHY APPARATUS

Hidehiro Fujita; Masatoshi Tomura, both of Otawara; Hisashi Tachizaki, Tochigi-ken; Hideki Fujimoto, Otawara; Manabu Hiraoka, Tochigi-ken; Masaharu Tsuyuki, Otawara; Naoko Hasegawa, Tochigi-ken; Tomoyasu Komori, Otawara; Makoto Suzuki, Tochigi-ken; Hiroshi Hori, Otawara, and Yasuo Maruyama, Utsunomiya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 348,101, Nov. 25, 1994, abandoned. This application Aug. 26, 1996, Ser. No. 703,088

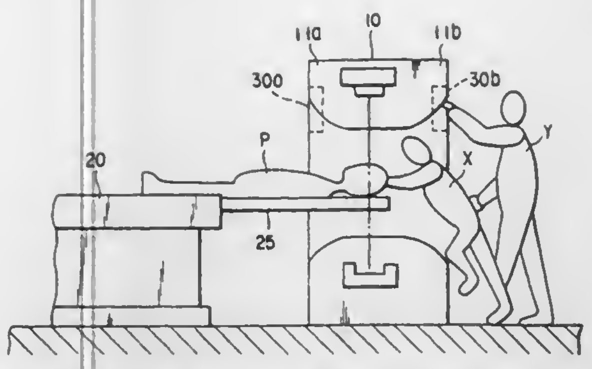
Claims priority, application Japan, Nov. 26, 1993, 5-296944; Nov. 26, 1993, 5-297021; Nov. 26, 1993, 5-297023

Int. Cl.^{6} A61B *6/08*

U.S. Cl. 378—4 **12 Claims**

1. A radiation computed tomography apparatus for obtaining a tomographic image of a patient, comprising:

- a couch;
- a top board which carries the patient and is slidably arranged on said couch;
- a gantry which has an opening and acquires projection data of the patient by guiding the patient carried on said top board into the opening;
- reconstruction means for reconstructing the tomographic image of the patient by reconstructing the projection data acquired by said gantry;
- display means for displaying the tomographic image of the patient reconstructed by said reconstruction means; and



- indication means for indicating at least one of a slice position and a slice width of the X-ray tomographic image on a body surface of the patient.

5,748,697

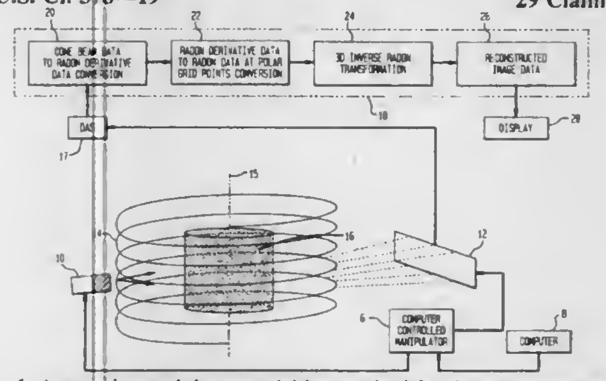
METHOD AND APPARATUS FOR ELIMINATING BOUNDARY ERRORS IN CONE BEAM IMAGING

Kwok C. Tam, Edison, N.J., assignor to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Dec. 20, 1996, Ser. No. 771,401

Int. Cl.^{6} A61B *6/03*

U.S. Cl. 378—19 **29 Claims**


20
22
24
26
CONE BEAM DATA TO RADON DERIVATIVE DATA CONVERSION
RADON DERIVATIVE DATA TO RADON DATA AT POLAR GRID POINTS CONVERSION
3D INVERSE RADON TRANSFORMATION
RECONSTRUCTED IMAGE DATA
18
DAS
17
DISPLAY
28
15
14
16
12
10
6
COMPUTER CONTROLLED MANIPULATOR
8
COMPUTER

1. A scanning and data acquisition method for three dimensional (3D) computerized tomography (CT) imaging of an object in a field of view radially centered on a predetermined axis, the method comprising the steps of:

- applying cone beam energy from a cone beam source to at least a portion of the object;
- defining a source scanning trajectory as a path traversed by the source;
- using the cone beam source, fixed relative to an area detector with both source and detector movably positioned relative to the object, to scan about the object;
- specifying the source scanning trajectory as a spiral path defining a plurality of spaced stages on a predetermined geometric surface surrounding the field of view such that each plane passing through the field of view intersects the scanning trajectory in at least one point and intersects the area detector along a line segment L that extends towards top and bottom edges of the area detector, the area detector comprising a plurality of detector elements arranged in an array of rows and columns and having a predetermined number M of rows of detector elements between the top and bottom edges that extend sufficiently along a direction generally parallel to the predetermined axis so as to span at least two consecutive stages of the spiral path having the largest spacing therebetween, plus an extra N rows of detector elements adjacent both of the top and bottom edges of the detector, where N is greater than or equal to 1;
- scanning at a plurality of positions along the source scanning trajectory to cause the detector elements of said area detector to acquire cone beam projection data corresponding to respective portions of the object;
- calculating Radon derivative data by processing line integral values from cone beam projection data in adjacent detector line segments L_1 and L_2 that are parallel to line segment L and translated in an orthogonal direction therefrom by an amount which is less than or equal to N times the spacing between said extra N rows of detector elements contained in said area detector, where N is greater than of equal to 1; and
- reconstructing an image of the object using said Radon derivative data.

5,748,698

Patent Not Issued For This Number

5,748,699

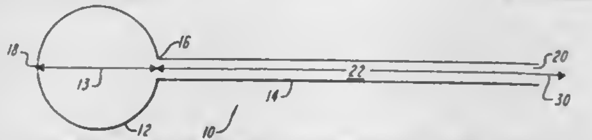
APPARATUS FOR APPLYING X-RAYS TO AN INTERIOR SURFACE OF A BODY CAVITY

Donald O. Smith, 16 Dewey Rd., Lexington, Mass. 02173

Filed Oct. 4, 1996, Ser. No. 725,732

Int. Cl.^{6} A61N *5/10*

U.S. Cl. 378—65 **43 Claims**



1. A balloon-tube assembly for stretching a body cavity to a predetermined shape, comprising:

- A. a tube extending along a central axis and having a proximal end and a distal end, said tube defining an interior channel extending along said central axis,
- B. an inflatable substantially inelastic balloon affixed to and extending from said tube at points near said distal end of said tube, said balloon when inflated defining a predetermined surface contour disposed about an interior region extending along a balloon axis, said interior channel and interior region of said balloon being contiguous, and said balloon axis intersecting said central axis near said distal end of said tube, and
- C. alignment means operative from said proximal end of said tube, for selectively aligning said balloon axis and said central axis to a predetermined angular orientation.

5,748,700

RADIATION THERAPY AND RADIATION SURGERY TREATMENT SYSTEM AND METHODS OF USE OF SAME

Joseph S. Shepherd, 2004 Le Droit Dr., South Pasadena, Calif. 91030, and Robert W. Rand, 521 N. Bristol Ave., Los Angeles, Calif. 90049

Division of Ser. No. 240,374, May 10, 1994, Pat. No. 5,537,452. This application Dec. 18, 1995, Ser. No. 574,107

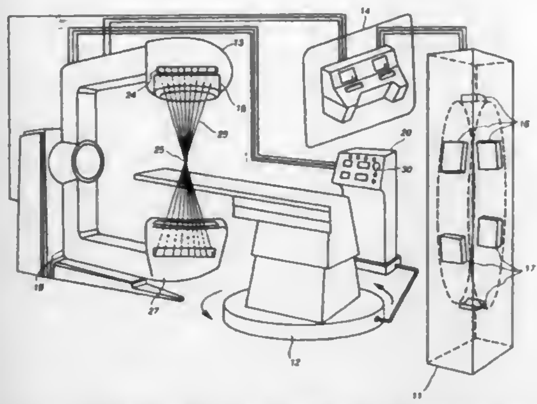
Int. Cl.^{6} A61N *5/10*

U.S. Cl. 378—65 **7 Claims**

1. A system for administering radiation to a patient comprising:

- (a) a command and control center further comprising a central processing unit which executes treatment planning software in order to determine a set of X, Y and Z radiation therapy target coordinates;
- (b) a patient three-dimensional visualization means which provides three-dimensional visualization information to said central processing unit for use in determining said set of X, Y and Z radiation therapy target coordinates;
- (c) a treatment table connected to said central processing unit and providing table position status to said central processing unit;
- (d) a radiation source beam assembly wherein
  - (i) said radiation source beam assembly includes a radiation source beam unit and

/OL
2 10
SS
1
MY
5
998
JMI



(ii) said radiation source beam assembly is positioned relative to said patient three-dimensional visualization means such that both three-dimensional visualization and radiation therapy treatment may be performed without removing said patient from said treatment table and

(e) a radiation beam catcher.

5,748,701

CATHODE SYSTEM FOR AN X-RAY TUBE

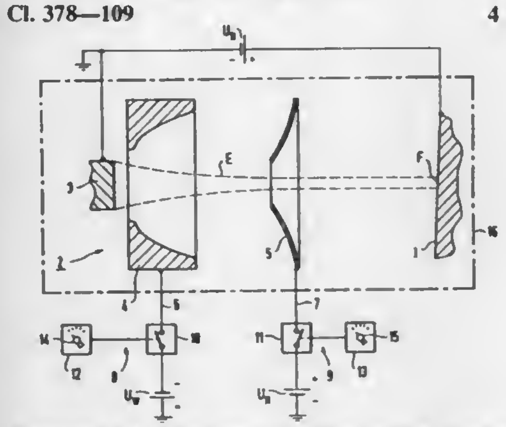
Norbert Mika, Buckenhof, and Hannjoerg Bittorf, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 520,412, Aug. 29, 1995, Pat. No. 5,617,464. This application Oct. 17, 1996, Ser. No. 732,922

Claims priority, application Germany, Aug. 29, 1994, 44 30 622.9

Int. Cl.⁶ H05G *1/34*

U.S. Cl. 378—109 **4 Claims**



1. A method for producing a selected electron current in an electron emission system having an electron emitter, an anode, and an electrode disposed between said electron emitter and said anode, said method comprising the steps of:

placing said electron emitter at a selected electron emitter potential relative to said anode;

switching said electrode to a selected electrode potential deviating from said electron emitter potential using switching pulses having a pulse-pause ratio; and

selecting said pulse-pause ratio of said switching pulses for producing said selected electron current between said electron emitter and said anode.

5,748,702

Patent Not Issued For This Number

5,748,703

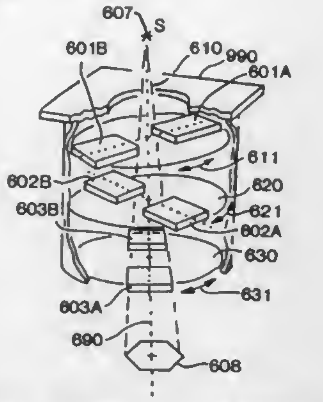
DYNAMIC COLLIMATOR FOR A LINEAR ACCELERATOR

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Continuation of Ser. No. 216,584, Mar. 22, 1994, abandoned. This application Jul. 23, 1996, Ser. No. 685,199

Int. Cl.⁶ G21C *1/02*

U.S. Cl. 378—152 **9 Claims**



1. A field-shaping collimator to be cooperatively connected to a radiation source which delivers radiation on a target volume inside a patient including:

a. a rotatable housing to attach to said radiation source and support said field-shaping collimator, said housing having essentially an axis which approximates the direction of the radiation beams from said radiation source, said radiation beams being oriented to aim at said target volume when said patient is to be radiated by said radiation source;

b. a first jaw tier, cooperatively connected to said housing and positioned at a first level along said axis, said first jaw tier including at least one first jaw tier moveable, straight edge jaw, which moves essentially perpendicular to said axis so as to intercept said radiation beam according to the position of said first jaw tier;

c. a second jaw tier, cooperatively connected to said housing and positioned at a second level along said axis, said second jaw tier including at least one second jaw tier moveable, straight edge jaw which moves essentially perpendicular to said axis so as to intersect said radiation beam according to the position of said second jaw tier moveable jaw; and,

d. a third jaw tier cooperatively connected to said housing and positioned at a third level along said axis, said third jaw tier including at least one third jaw tier moveable, straight edge jaw tier which moves essentially perpendicular to said axis so as to intersect said radiation beams according to the position of said third jaw tier moveable jaw;

such that, when in use, the field shape of said radiation beams at said target volume is varied according to said first, second, and third jaw tier moveable, straight edge jaw position so as to improve the quality of said irradiation to said target volume.

5,748,704

PERIPHERAL BONE DENSITOMETER

Richard B. Mazess; Jens Borg, both of Madison, and David L. Ergun, Verona, all of Wis., assignors to Lunar Corporation, Madison, Wis.

Filed Mar. 10, 1997, Ser. No. 814,800

Int. Cl.⁶ G01B *15/02*

U.S. Cl. 378—54 **9 Claims**

1. A compact peripheral x-ray densitometer for in vivo bone comprising:

(a) a first positioner to position a human heel with respect to the first positioner

(b) a second positioner to position a human forearm with respect to the second positioner;

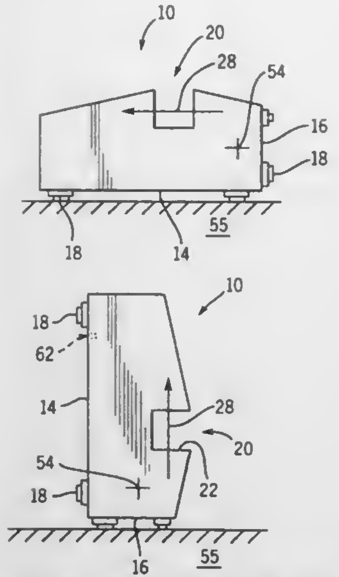
(c) a housing having receiving means for selectively receiving one of the first and second positioners in a predetermined position with respect to the housing the housing including a means for positioning and supporting the housing at a first angle for use of the first positioner and a second angle for use of the second positioner;

(d) a dual energy radiation source located within the housing aligned with said receiving means for directing radiant energy through bone as received by a positioner;

(e) a detector located within the housing aligned with said receiving means to receive the radiant energy after passage through the bone as received by the positioner to provide an electrical signal dependent on the received radiant energy for each of two energies;

(f) an image processing circuit providing a measure of the bone substantially independent of any surrounding soft tissue;

whereby an equalizing water bath that may interfere with the positioners is eliminated.



5,748,705

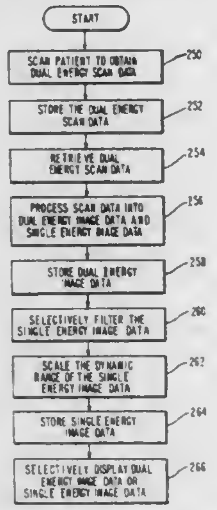
X-RAY BONE DENSITOMETRY

Jay A. Stein, Farmingham, and Noah Berger, Waltham, both of Mass., assignors to Hologic Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 345,069, Nov. 25, 1994, which is a continuation-in-part of Ser. No. 156,287, Nov. 22, 1993, Pat. No. 5,432,834. This application Sep. 8, 1995, Ser. No. 524,997

Int. Cl.⁶ H05G *1/64*

U.S. Cl. 378—196 **8 Claims**


START
SCAN PATIENT TO OBTAIN DUAL ENERGY SCAN DATA
250
STORE THE DUAL ENERGY SCAN DATA
252
RETRIEVE DUAL ENERGY SCAN DATA
254
PROCESS SCAN DATA INTO DUAL ENERGY IMAGE DATA AND SINGLE ENERGY IMAGE DATA
256
STORE DUAL ENERGY IMAGE DATA
258
SELECTIVELY FILTER THE SINGLE ENERGY IMAGE DATA
260
SCALE THE DYNAMIC RANGE OF THE SINGLE ENERGY IMAGE DATA
262
STORE SINGLE ENERGY IMAGE DATA
264
SELECTIVELY DISPLAY DUAL ENERGY IMAGE DATA OR SINGLE ENERGY IMAGE DATA
266

1. An x-ray bone densitometry system, which comprises:

a table having a movable support surface configured to support a patient;

an x-ray source and an x-ray detector positioned on opposite sides of said support surface so that a patient positioned on said support surface is between said x-ray source and said x-ray detector, said x-ray source and said x-ray detector being aligned in a fixed relationship relative to each other such that x-rays emitted from said source impinge said x-ray detector to produce dual energy scan data;

a processor coupled to said x-ray source, said x-ray detector and said table and configured to actuate movement of said support surface, to receive said dual energy scan data, to extract from said dual energy scan data dual energy image data and single energy image data, and to store said dual energy image data and said single energy image data in respective data records for selective display; and

at least one display connected to said processor for selectively displaying at least one of said dual energy image data and said single energy image data.

5,748,706

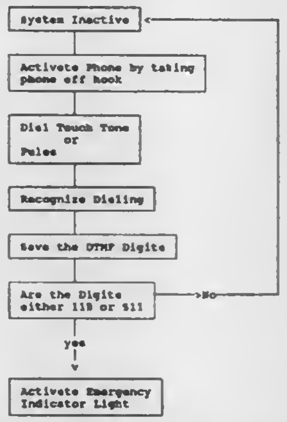
EMERGENCY SIGNAL DISPLAY ACTIVATION SYSTEM

Samuel D. Morgan, 1415 Palmer Dr., Blacksburg, Va. 24060, and Allen J. Jones, 304 Brittany La., Salem, Va. 24153

Filed Jun. 14, 1996, Ser. No. 664,182

Int. Cl.⁶ H04M *11/04*

U.S. Cl. 379—37 **16 Claims**


System Inactive
Activate Phone by taking phone off hook
Dial Touch Tone or Pulse
Recognize Dialing
Save the DTMF Digits
Are the Digits either 119 or 911
No
yes
Activate Emergency Indicator Light

1. A system for use in automatically activating an emergency locator signal member in response to dialing of a predetermined emergency telephone number, comprising:

a) an emergency locator signal member;

b) signal member switch means for activating said emergency locator signal member upon receipt of a signal code from a signal code generating means;

c) a telephone line, said telephone line having a first low voltage corresponding to an off-hook condition, and a second high voltage corresponding to an on-hook condition;

d) voltage detection means for detecting the transition from at least one of said on-hook voltage to off-hook voltage and off-hook voltage to on-hook voltage,

e) digit detecting means for detecting the dialing of a predetermined sequence of digits;

f) signal code generating means for generating a predetermined signal code in response to the detection of the dialing of a predetermined sequence of digits;

g) transmission means for transmitting said signal code from said signal code generating means to said signal member switch means.

/OL
2 10
SS
1
MY
5
998
JMI

5,748,707

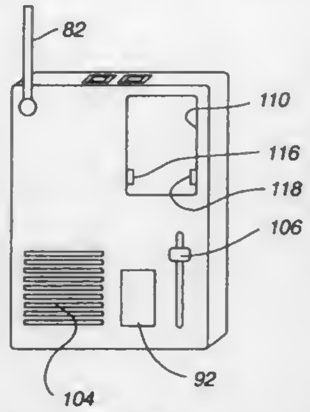
SPEAKERPHONE WITH REMOTE MICROPHONE HAVING SPEAKER CUT-OFF FOR HALF-DUPLEX OPERATION

Jon J Sanserino, 11559 Morrison St., North Hollywood, Calif. 91601

Filed Oct. 7, 1994, Ser. No. 320,183

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 379—61 **8 Claims**



1. A remote wireless speakerphone comprising:

a portable unit consisting essentially of a microphone to receive and audio signal, a radio signal transmitter, an antenna to transmit a corresponding radio signal and a battery to power said transmitter so that said transmitter can be carried on the person and transmit audio signals:

a base station, said base station having an antenna to receive signals from said transmitter and having a radio signal receiver therein to convert radio signals to audio signals, an interface circuit in said base station, said interface circuit being connected to receive audio signals from said receiver, means for direct connection to a telephone company line on said base station, said interface circuit being connected to said means for connection;

a ringer in said base station, said ringer being connected to said interface circuit so that when said line connection means has a ringer signal therein, said ringer emits a ringing signal, a loudspeaker in said base station, said loudspeaker being connected to emit audio signals corresponding to signals received at said telephone company line connection means, a logic circuit in said base station, said logic circuit being configured so that it passes a signal therethrough in only one direction at a time, said logic circuit being connected between said receiver and said interface circuit, said loudspeaker being connected to said logic circuit so that either said receiver is connected through said logic circuit and said interface circuit to said telephone line connection means or said telephone line connection means is connected through said interface circuit and said logic circuit to said loudspeaker to avoid feedback from said loudspeaker to said microphone.

5,748,708

VOICE-GENERATING TELEPHONE SET WITHOUT EXTERNAL POWER SUPPLY

Herman Chang, Hsinchu, Taiwan, assignor to Holtek Microelectronics, Inc., Hsinchu, Taiwan

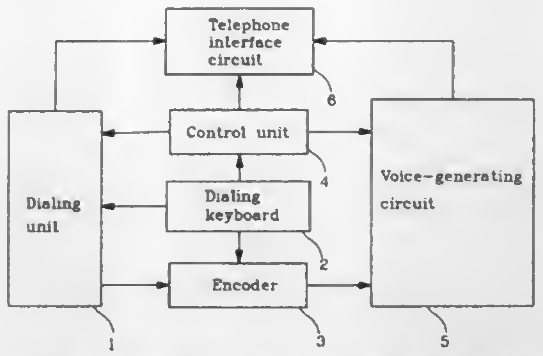
Filed Sep. 18, 1995, Ser. No. 529,922

Int. Cl.^{6} H04M *1/56;1/272*

U.S. Cl. 379—67 **1 Claim**

1. A voice-generating telephone set, said voice-generating telephone set powered by telephone line power only, comprising:

a dialing unit containing means for receiving keying signals from a dialing keyboard, means for sending out a pulse signal or a DTMF (dual-tone multi-frequency) signal, and a memory means for storing at least a number that has been dialed from said dialing keyboard, an XMUTE signal, a PO signal, and a DTMF signal corresponding to said dialed number, wherein when said PO signal is high, said dialing unit will not send out said pulse signal or said DTMF signal, thus maintaining an electric current loop between said said telephone set and a telephone switchboard in an off-hook state;



said dialing keyboard including a plurality of keys and a keyboard circuitry such that, when one of said keys is pressed, said dialing unit is triggered to store in said memory means data corresponding to said key being pressed, and, at the same time, a control unit is triggered to generate and send a control signal to a voice-generating circuit;

an encoder for receiving output from said dialing unit and said dialing keyboard, and encoding a keying signal into a multiple-bit binary value, which is then transmitted to said voice-generating circuit;

said control unit comprising input means for receiving said keying signal from said dialing keyboard, and output means for triggering said voice-generating circuit to pronounce said multiple-bit binary value, said control unit further comprising means to send a PO signal to said dialing unit when a handset is lifted off hook, so as to maintain said PO signal at high such that said dialing unit will not send out said pulse signal or said DTMF signal, thus maintaining an electric current loop between said telephone set and said telephone switchboard in said off-hook state;

a SND key in said dialing keyboard for, when it is being pressed, triggering said dialing unit to send one or more DTMF signals corresponding to said dialed number.

whereby when the handset is lifted from the hook, said control circuit send said PO signal to said dialing unit to hold off the sending of pulse or DTMF signals, thus allowing the telephone set to continue to receive electric current from the switchboard in an uninterrupted manner in said off-hook state; when said dialing keyboard is pressed, said dialing unit stores data corresponding to a pressed key, said control unit is triggered to generate and send a control signal to said voice-generating circuit to pronounce a multiple-bit word, which is obtained via an encoder based on the pressed key; finally, as SND key is pressed which interrupts said PO signal and causes said dialing unit to output the dialed number as desired pulse or DTMF signals.

5,748,709

PROGRAMMABLE ANSWERING MACHINE WITH MULTIPLE VOICE BOXES AND CALLER ID

Howard H. Sheerin, 1625 Larimer St., #1908, Denver, Colo. 80202

Filed Sep. 25, 1995, Ser. No. 533,343

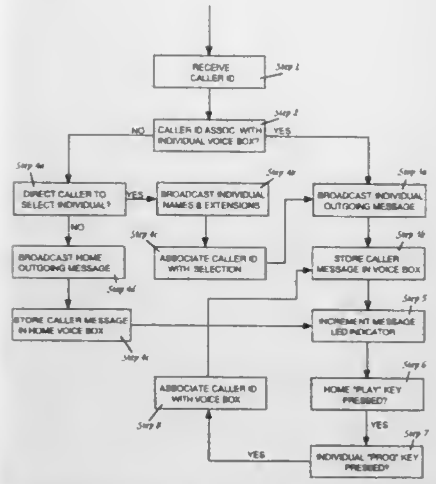
Int. Cl.^{6} H04M *1/65*

U.S. Cl. 379—67 **4 Claims**

1. A telephone answering machine, comprising:

(a) an input connected to receive information over a telephone line, the information comprising caller identification data and a caller message;

(b) a plurality of individualized storage devices, wherein the caller identification data is used to select one of the individualized storage devices to store the caller message;


RECEIVE CALLER ID
Step 1
Step 2
CALLER ID ASSOC WITH INDIVIDUAL VOICE BOX?
NO
YES
Step 4a
DIRECT CALLER TO SELECT INDIVIDUAL?
YES
Step 4b
BROADCAST INDIVIDUAL NAMES & EXTENSIONS
Step 3a
BROADCAST INDIVIDUAL OUTGOING MESSAGE
NO
Step 4c
BROADCAST HOME OUTGOING MESSAGE
Step 4d
ASSOCIATE CALLER ID WITH SELECTION
Step 3b
STORE CALLER MESSAGE IN VOICE BOX
STORE CALLER MESSAGE IN HOME VOICE BOX
Step 4e
Step 5
INCREMENT MESSAGE LED INDICATOR
Step 6
ASSOCIATE CALLER ID WITH VOICE BOX
HOME "PLAY" KEY PRESSED?
Step 8
YES
Step 7
YES
INDIVIDUAL "PROG" KEY PRESSED?

(c) an autonomous storage device for storing the caller message if the caller identification data has not been associated with one of the individualized storage devices;

(d) an identification data base for storing recorded identification data, the data base for comparing the caller identification data to the recorded identification data in order to automatically select one of the individualized storage devices for storing the caller message; and

(e) an outgoing message for directing a caller to select the individualized storage device to store the caller message, wherein:

the caller selects the individualized storage device by pressing a corresponding key on a numeric keypad of a telephone the caller is calling from; and

the caller identification data is automatically stored in the identification data base and associated with the individualized storage device that the caller selected.

5,748,710

METHOD, NETWORK, SYSTEM AND DEVICES FOR CENTRAL MANAGEMENT OF SPOKEN ANNOUNCEMENTS FOR DOWNLOAD ON DEMAND

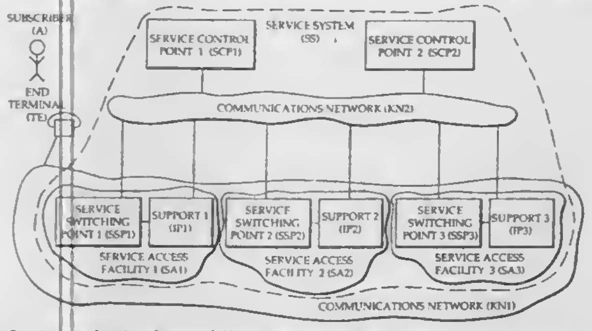
Wolfgang Lautenschlager, Weissach-Flacht, Germany, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Aug. 21, 1996, Ser. No. 701,082

Claims priority, application Germany, Sep. 2, 1995, 195 32 490.0

Int. Cl.^{6} H04M *3/50*

U.S. Cl. 379—88 **11 Claims**


SUBSCRIBER (A)
END TERMINAL (TE)
SERVICE SYSTEM (SS)
SERVICE CONTROL POINT 1 (SCP1)
SERVICE CONTROL POINT 2 (SCP2)
COMMUNICATIONS NETWORK (KN2)
SERVICE SWITCHING POINT 1 (SSP1)
SUPPORT 1 (IP1)
SERVICE SWITCHING POINT 2 (SSP2)
SUPPORT 2 (IP2)
SERVICE SWITCHING POINT 3 (SSP3)
SUPPORT 3 (IP3)
SERVICE ACCESS FACILITY 1 (SA1)
SERVICE ACCESS FACILITY 2 (SA2)
SERVICE ACCESS FACILITY 3 (SA3)
COMMUNICATIONS NETWORK (KN1)

1. A method of providing messages to subscribers relating to services of a communications network (KN1) wherein a message is sent from a service support system (IP1, . . . , IP3) to a subscriber (A) of the communications network (KN1) in response to a request message from a service control point (SCP1, SCP2), characterized in that the messages are managed centrally by the service control point (SCP1, SCP2), and that the messages are loaded from the service control point (SCP1, SCP2) into the service support system (IP1 to IP3) on demand.

5,748,711

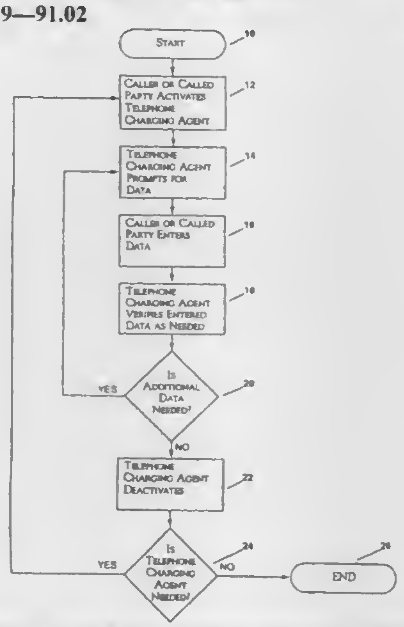
TELEPHONE TRANSACTION PROCESSING AS A PART OF CALL TRANSPORT

Gordon F. Scherer, Westerville, Ohio, assignor to Matrixx Marketing Inc., Cincinnati, Ohio

Filed Jun. 7, 1995, Ser. No. 472,150

Int. Cl.^{6} H04M *11/04*

U.S. Cl. 379—91.02 **16 Claims**


START
10
CALLER OR CALLED PARTY ACTIVATES TELEPHONE CHARGING AGENT
12
TELEPHONE CHARGING AGENT PROMPTS FOR DATA
14
CALLER OR CALLED PARTY ENTERS DATA
16
TELEPHONE CHARGING AGENT VERIFIES ENTERED DATA AS NEEDED
18
IS ADDITIONAL DATA NEEDED?
20
YES
NO
TELEPHONE CHARGING AGENT DEACTIVATES
22
IS TELEPHONE CHARGING AGENT NEEDED?
24
YES
NO
END
26

2. A telephone transaction processing system comprising:

a first telephone capable of initiating and receiving telephone calls;

a second telephone capable of initiating and receiving telephone calls;

a completed telephone call between a party at said first telephone and a party at said second telephone;

a transaction to be processed over said completed telephone call, said transaction involving the entry, retrieval, or modification of data related to said transaction; and

a transaction device integrated in the transport of said telephone call to facilitate processing of said transaction, said transaction device adapted to be activated by a party at said first telephone or a party at said second telephone.

5,748,712

FACSIMILE SYSTEM OF DISTINCTIVE RINGING TYPE CAPABLE OF AUTOMATIC FACSIMILE RECEPTION EVEN WHEN RECEIVED CALL SIGNAL CALLS TELEPHONE NUMBER FOR TELEPHONE RECEPTION

Yutaka Nonomura, Iwakura, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 25, 1994, Ser. No. 348,900

Claims priority, application Japan, Dec. 7, 1993, 5-306851

Int. Cl.^{6} H04M *1/64;11/00*

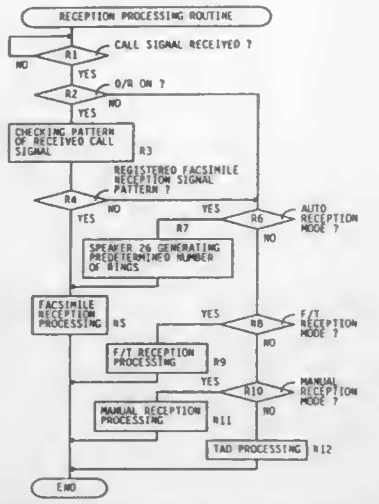
U.S. Cl. 379—93 **15 Claims**

1. A facsimile system of distinctive ringing type of a called party capable of effecting selective telephone and facsimile communications with a remote calling party calling one of a plurality of telephone numbers used by the facsimile system of said called party, said plurality of telephone numbers being called by respective call signals which are received from said remote calling party and which have respective different patterns, said facsimile system comprising:

pattern registering means for registering, as a facsimile reception pattern, the pattern of one of said call signals which is assigned to call one of said telephone numbers that is exclusively used to receive a facsimile signal from said remote calling party;

pattern determining means for determining whether a call signal which has been received by the facsimile system of said

VOL
210
ISS
1
MY
5
1998
UMI


RECEPTION PROCESSING ROUTINE
R1
CALL SIGNAL RECEIVED ?
NO
YES
R2
O/R ON ?
NO
YES
CHECKING PATTERN OF RECEIVED CALL SIGNAL
R3
REGISTERED FACSIMILE RECEPTION SIGNAL PATTERN ?
R4
NO
YES
R6
AUTO RECEPTION MODE ?
YES
NO
R7
SPEAKER 26 GENERATING PREDETERMINED NUMBER OF RINGS
FACSIMILE RECEPTION PROCESSING
R5
R8
F/T RECEPTION MODE ?
YES
NO
F/T RECEPTION PROCESSING
R9
R10
MANUAL RECEPTION MODE ?
YES
NO
MANUAL RECEPTION PROCESSING
R11
TAD PROCESSING
R12
END

called party has said facsimile reception pattern registered by said pattern registering means;

facsimile receiving means, responsive to said pattern determining means, for automatically processing said facsimile signal for recording of an image represented by said facsimile signal, if said pattern determining means determines that said received call signal has said facsimile reception pattern; and

conditional facsimile reception means, responsive to said pattern determining means, for automatically processing said facsimile signal for recording of said image, if said pattern determining means determines that said received call signal does not have said facsimile reception pattern and if one of at least one predetermined condition is satisfied.

5,748,713

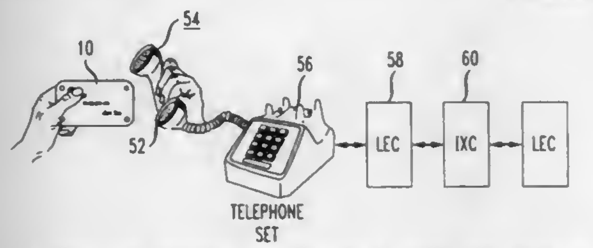
METHOD FOR AUTOMATICALLY INITIATING A CALLING CARD TELEPHONE CALL

Frank Kovacs, Jr., East Brunswick, N.J., assignor to AT&T Corp, Middletown, N.J.

Filed Sep. 20, 1996, Ser. No. 717,396

Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—95 **8 Claims**



1. A method for automatically initiating a calling card telephone call that requires the entry of a calling card carrier access telephone number and a card holder personal identification code, comprising the steps of:

placing a calling card, having the capability of generating a first and second sequences of DTMF signals corresponding to the calling card carrier access telephone number and calling card holder personal identification code, in proximity to a transmitter of a telephone handset that is off hook relative to its telephone set;

actuating the card a first time by contacting a first region thereon to cause the card to generate the first sequence of DTMF signals; and

actuating the card a second time by actuating a plurality of regions on the card to cause the card to generate the second sequence of DTMF signals corresponding to the card holder's personal identification code.

5,748,714

DATA COMMUNICATION APPARATUS FOR INFORMING A DESTINATION OF PERIODIC COMMUNICATION

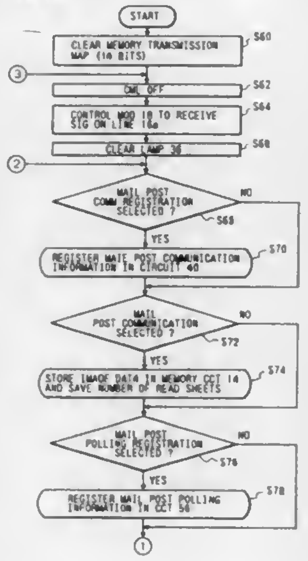
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 188,840, Jan. 31, 1994. This application Dec. 2, 1996, Ser. No. 758,467

Claims priority, application Japan, Feb. 1, 1993, 5-014856

Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—100.06 **18 Claims**


START
CLEAR MEMORY TRANSMISSION MAP (16 BITS)
S60
③
CML OFF
S62
CONTROL MOD 18 TO RECEIVE SIG ON LINE 16a
S64
CLEAR LAMP 36
S68
②
MAIL POST COMM REGISTRATION SELECTED ?
NO
S68
YES
REGISTER MAIL POST COMMUNICATION INFORMATION IN CIRCUIT 40
S70
MAIL POST COMMUNICATION SELECTED ?
NO
S72
YES
STORE IMAGE DATA IN MEMORY CCT 14 AND SAVE NUMBER OF READ SHEETS
S74
MAIL POST POLLING REGISTRATION SELECTED ?
NO
S76
YES
REGISTER MAIL POST POLLING INFORMATION IN CCT 56
S78
①

1. A data communication apparatus having a periodic communication mode comprising:

means for selecting a periodic communication mode for performing a first selected periodic communication with a selected destination, wherein, in the periodic communication mode, said apparatus transmits data to the selected destination at a predetermined time;

means, operative when the periodic communication mode is selected, for informing the selected destination that the first selected periodic communication is to be conducted; and

means, operative in response to reception of information from another data communication apparatus that a second selected periodic communication is to be conducted at a second time, for indicating to an operator at said apparatus that the second selected periodic communication is to be conducted at the second time.

5,748,715

METHOD OF COMMUNICATIONS BETWEEN TELEPHONE AND FACSIMILE APPARATUS AND FACSIMILE APPARATUS CAPABLE OF COMMUNICATIONS WITH TELEPHONE

Tetsuo Shinagawa, Odawara; Yumiko Watanabe, Tokyo; Akio Shinagawa, Hitachinaka, and Fumitaka Ito, Chiba-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 531,651

Claims priority, application Japan, Sep. 22, 1994, 6-228093; Sep. 29, 1994, 6-235307

Int. Cl.⁶ H04M *11/00*

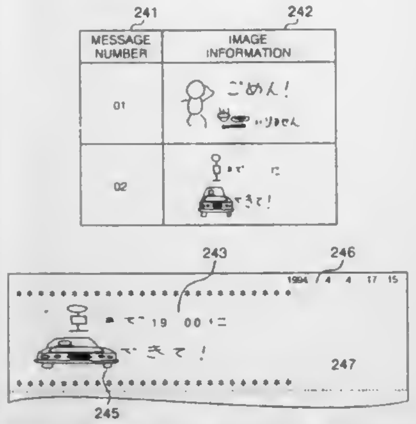
U.S. Cl. 379—100.13 **2 Claims**

1. A facsimile apparatus comprising:

dialing-signal detection means for detecting a dialing signal transmitted from a telephone line;

recorder means for printing image information;

image information memory means for storing therein a plurality of image information and unique numbers associated with said plurality of image information; and



control means for, when the dialing signal detected by said dialing-signal detection means indicates one of said unique numbers, performing control to cause acquisition of one of the image information stored by said image information memory means corresponding to said one unique number, and to cause said recorder means to print the acquired image information.

5,748,716

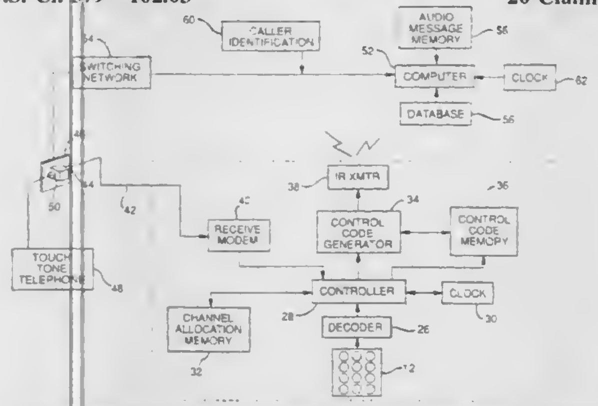
TELEPHONICALLY PROGRAMMABLE APPARATUS

Michael R. Levine, Boca Raton, Fla., assignor to Smart VCR Limited Partnership, Birmingham, Mich.

Continuation of Ser. No. 438,109, May 8, 1995, abandoned, which is a continuation of Ser. No. 185,308, Jan. 21, 1994, Pat. No. 5,414,756, which is a continuation of Ser. No. 904,553, Jun. 26, 1992, abandoned. This application Sep. 13, 1996, Ser. No. 713,900

Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—102.03 **20 Claims**



1. In a control device of the type having a control program and an alterable memory for storing parameters related to said control program, apparatus for remotely configuring the alterable memory through a telephone system having first and second terminal ends defining a transmission path, comprising:

means for electrically coupling said control device to said first terminal end also having a dual-tone multi-frequency (DTMP) transceiver connected thereto;

a computer system connected to said second terminal end, including a source of audio messages; and

an application program resident in said computer system, said program being operative, upon said first terminal end being connected to said second terminal end, to select certain of said audio messages for transmission to said second terminal end so that the audio messages are telephonically received at said first terminal end, said audio messages being selected to direct an operator at said first terminal end to enter responses relating to the operating environment of said control device, said responses causing said computer system to generate and transmit signals from said second terminal end to said control device which configure said alterable memory of said control device with said parameters.

5,748,717

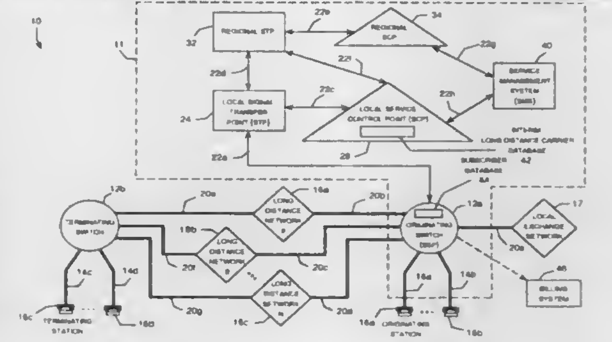
METHOD AND SYSTEM FOR ASSIGNING A COMMUNICATION TO A PREFERRED CARRIER FOR ACCOUNTING AND/OR COMMUNICATION ROUTING PURPOSES

Jim H. Chan, Roswell, and Nailesh B. Desai, Norcross, both of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Filed Jul. 19, 1996, Ser. No. 684,450

Int. Cl.⁶ H04M *15/00;15/06*

U.S. Cl. 379—120 **12 Claims**


10
11
32
REGIONAL STP
34
REGIONAL SCP
40
24
LOCAL SIGNAL TRANSFER POINT (STP)
LOCAL SERVICE CONTROL POINT (SCP)
SERVICE MANAGEMENT SYSTEM (SMS)
28
42

1. In an intelligent switched telecommunications network, a method for attributing a communication to a preferred carrier for accounting purposes, comprising the steps of:

- a. receiving a communication on a subscriber's line;
- b. in response to receiving the communication,
  - i. obtaining a carrier-of-record code associated with the subscriber's line,
  - ii. obtaining a preferred carrier code associated with the subscriber's line,
  - iii. comparing the carrier-of-record code with the preferred carrier code for a comparison result, and
  - iv. after the comparing step, determining the comparison result, the comparison result indicating either
    - that the preferred carrier is the same as a carrier-of-record associated with the carrier-of-record code, or
    - that the preferred carrier is a carrier associated with the preferred carrier code;
- c. based on the comparison result, creating an accounting record to attribute the communication to the preferred carrier; and
- d. repeating steps b–c for each communication received on the subscriber's line.

5,748,718

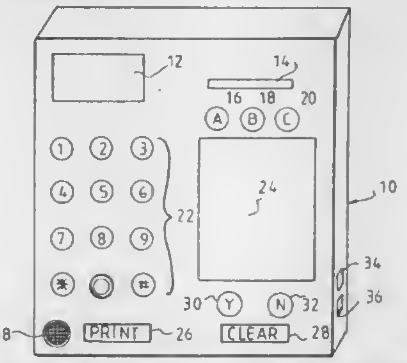
TELEPHONE MONITORING SYSTEM TO REDUCE CONSUMER PAYMENTS OF TELEPHONE BILL

Paul Manicone, 82-58 Eliot Ave., Middle Village, N.Y. 11379

Filed Jan. 17, 1995, Ser. No. 373,426

Int. Cl.⁶ H04M *15/00;15/06;1/56*

U.S. Cl. 379—131 **5 Claims**



1. A method of monitoring telephone usage which comprises the steps of:

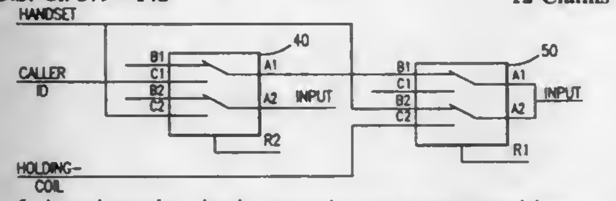
a) displaying a personal access code entry screen which prompts the user to enter an access code, which, upon being entered, allows;

OL
2 10
SS
1
MY
5
998
MI

b) pressing a first functional pushbutton one or more times to display information pertaining to a previous outgoing telephone call, wherein pressing said first functional pushbutton once displays information pertaining to the most recent outgoing telephone call and each subsequent keypress displays information pertaining to the next previous outgoing telephone call;
c) pressing a second functional pushbutton one or more times to display information pertaining to a previous incoming telephone call, wherein pressing said second functional pushbutton once displays information pertaining to the most recent incoming telephone call and each subsequent keypress displays information pertaining to the next previous incoming telephone call;
d) pressing a third functional pushbutton to display information pertaining to total telephone usage during a prior time period;
e) pressing a fourth functional pushbutton to display information pertaining to total telephone usage during the current time period;
f) pressing a fifth functional pushbutton to display a screen prompting the user to enter a telephone number, which, when entered, displays information pertaining to total telephone usage with the entered telephone number;
g) pressing a sixth functional pushbutton to display a screen prompting the user to enter a numerical amount to be used as a recommended cost limit, which, when entered, notifies the user when reached;
h) pressing a seventh functional pushbutton to display a screen prompting the user to enter a numerical amount to be used as a recommended call limit, which, when entered, notifies the user when reached;
i) pressing an eighth functional pushbutton to display a screen prompting the user to enter a beginning and ending date and time defining a specific time period, which, when entered, displays information pertaining to all outgoing calls made within the time period;
j) pressing a ninth functional pushbutton to display a screen prompting the user to enter a telephone number or numbers to be either 1) blocked from outgoing access, or 2) excluded from a general outgoing call block;
k) pressing a tenth functional pushbutton to enable a warning which is displayed when a telephone call reaches a predetermined cost limit; and
l) pressing an eleventh functional pushbutton to display information pertaining to all outgoing telephone calls made outside of the local area code.

5,748,719
RELAY CIRCUIT FOR TELEPHONE INTERFACE

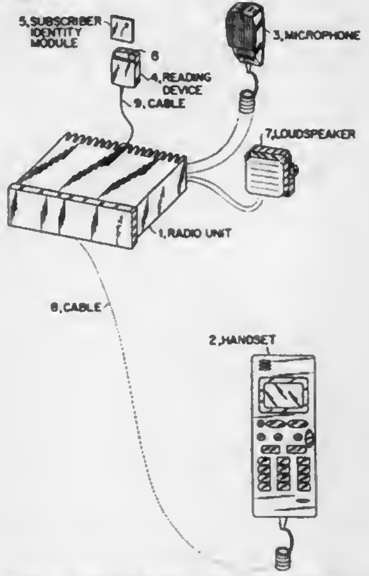
Robert F. Watts, Houston; Benjamin H. Skinker, Spring, and Kai Wang, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 22, 1995, Ser. No. 577,724
Int. Cl.^{6} H04M *1/56*
U.S. Cl. 379—142 **12 Claims**



1. A modem relay circuit connection apparatus comprising:
at least one input connection port for connection to an analog telephone line;
a first relay having at least one input connected to said input connection port and having at least two output connection ports and wherein said output connection ports are connected to said input connection port in response to a first control signal; and
a second relay having at least one input connected to at least one of said output connection ports of said first relay and having at least two output connection ports and wherein said output connection ports are connected to the input connection port of said second relay in response to a second control signal, said combination of said first relay and said second relay allows a caller identification to be enabled and disabled in accordance with said first control and said second control signal.

5,748,720
REMOVABLE SUBSCRIBER IDENTIFICATION MODULE FOR A MOBILE RADIO TERMINAL

John Andrew Loder, East Parramatta, Australia, assignor to Nokia Telecommunications Oy, Espoo, Finland
Continuation of Ser. No. 460,189, Jun. 2, 1995, which is a division of Ser. No. 224,572, Apr. 7, 1994. This application Aug. 7, 1996, Ser. No. 693,570
Int. Cl.^{6} H04M *15/00;17/00;11/00*
U.S. Cl. 379—144 **6 Claims**

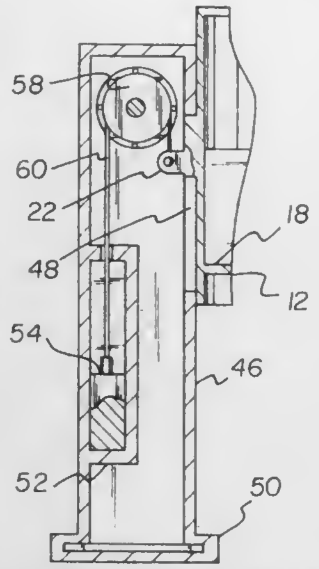


6. A removable subscriber identification module for a mobile radio terminal in a mobile radio network arranged to transmit a message containing charging information via said network and requesting said mobile radio terminal to send an acknowledgement in order to continue a call, said removable subscriber identification module comprising
means for storing data permanently related to an identification and authentication of a mobile subscriber;
means for checking by said subscriber identification module of a value of prepaid funds stored in said subscriber identification module,
means for preventing said subscriber identification module from sending said acknowledgement in response to checking by said made for checking when said value of prepaid funds is insufficient for a call, but allowing said subscriber identification module to send said acknowledgement in response to checking by said means for checking when said value of prepaid funds is sufficient for a call.

5,748,721
HANDICAP TELEPHONE WITH ASSOCIATED BOOTH

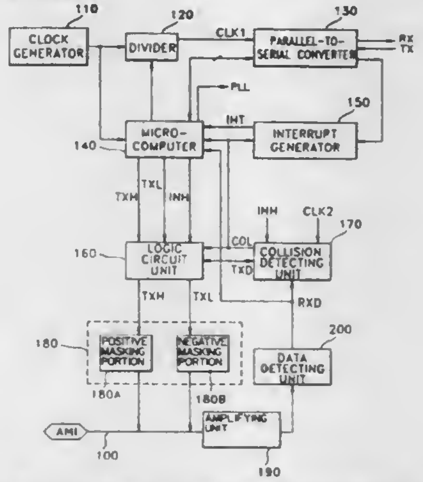
Bob S. DiCosmo, 894 New Haven Rd., Navgatuck, Conn. 06770, and Gary R. Tyszkiewicz
Filed Aug. 30, 1996, Ser. No. 705,949
Int. Cl.^{6} H04M *17/00*
U.S. Cl. 379—155 **6 Claims**

1. A new and improved handicap telephone with associated booth comprising, in combination:
a phone housing having an open horizontally situated generally oval bottom face, a closed horizontally situated generally oval top face, and a periphery formed therebetween with an open front face, a closed generally planar rear face, and a pair of arcuate closed side faces formed therebetween thus defining an interior space, the phone housing further including a light situated on a lower side of the top face for illuminating the interior space, a horizontal shelf coupled to the rear face adjacent the open bottom face and extended outwardly therefrom, a pair of speakers centrally situated on the side face faces within the interior space for emitting audio signals therefrom, and a coupling extension formed on an outer side of the rear face with an aperture formed therein;
a phone panel positioned within the interior space on the rear face of the phone housing adjacent the bottom face thereof with a top edge, a bottom edge, and a pair of side edges connecting the top edge and bottom edge, the phone panel including a numeric keypad for allowing a user to dial a specific phone number, a speaker situated above the keypad for allowing the input of audio signals, a coin mechanism situated adjacent the top edge thereof for negotiating payment for a telephone call, an elevating button situated adjacent the bottom edge thereof adapted to transmit an elevating signal upon the depression thereof, a descending button also situated adjacent the bottom edge thereof for transmitting a descending signal upon the depression thereof, and an on/off button situated on the bottom face, whereby upon the depression of the on/off button in combination with the negotiation of payment, a user may dial a telephone number on the keypad and further communicate with a second party without the use of hands; and
a vertical support having a front face, a rear face, a top face, a bottom face, and a pair of side faces formed therebetween thus defining an inner space, the front face having a vertical slot formed therein for allowing the coupling extension of the phone housing to be moved therein along a vertical axis, the vertical support further including a base plate formed on the bottom face thereof for allowing the main support to stand upright, a counterweight housing formed within the inner space on the rear face thereof with an aperture formed in an upper portion thereof, a counterweight located within the counterweight housing and adapted to be vertically maneuvered therein, a pulley motor situated within the inner space on one of the side faces and electrically connected to the elevating button and the descending button with the pulley motor having an associated horizontally orientated rotor with a pulley axially coupled thereto, and a pulley cable situated about the pulley having a first end fed through the aperture of the counterweight housing and connected to the counterweight and second end connected to the coupling extension, whereby the pulley motor is adapted to raise the phone housing upon the receipt of the elevating signal and further lower the phone housing upon the receipt of the descending signal.



5,748,722
COLLECTIVE-HOUSE CONTROL SYSTEM EMPLOYING AN INTERFACE CIRCUIT FOR ALTERNATIVE MARK INVERSION CONTROL COMMUNICATION

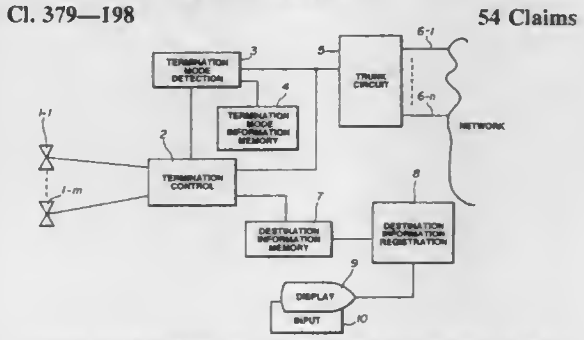
Jong-young Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea
Filed Jun. 7, 1996, Ser. No. 659,826
Claims priority, application Rep. of Korea, Jun. 7, 1995, 1995/14931
Int. Cl.^{6} H04M *1/60;* **H04J** *3/00;* **H04N** *7/14*
U.S. Cl. 379—160 **22 Claims**



13. An interface circuit for alternative mark inversion (AMI) control communication via a single coaxial line, comprising:
a data detecting unit which receives input AMI signals from said single coaxial line and detects first control data within said input AMI signal; and
a controlling unit operatively connected to said data detecting unit,
wherein said controlling unit receives said first control data from said data detecting unit and generates an output signal in accordance with said first control data and wherein said controlling unit inputs second control data and generates a first signal for generating an output AMI signal,
an AMI signal generating unit operatively connected to said controlling unit for receiving said first signal and generating said output AMI signal in accordance with said first signal.

5,748,723
TELEPHONE SYSTEM

Katsuyuki Hanai, Tama, and Shogo Ayame, Fuchu, both of Japan, assignors to Toshiba Corporation, Kanagawa-ken, Japan
Continuation of Ser. No. 401,042, Mar. 8, 1995, Pat. No. 5,602,904. This application Dec. 13, 1996, Ser. No. 766,279
Claims priority, application Japan, Mar. 9, 1994, 6-038342
Int. Cl.^{6} H04M *3/42*
U.S. Cl. 379—198 **54 Claims**


TERMINATION MODE DETECTION
3
5
TRUNK CIRCUIT
6-1
6-n
4
TERMINATION MODE INFORMATION MEMORY
NETWORK
1-1
2
TERMINATION CONTROL
1-m
7
DESTINATION INFORMATION MEMORY
8
DESTINATION INFORMATION REGISTRATION
9
DISPLAY
INPUT
10

1. A system for allocating an incoming call to a desired one of a plurality of destination candidates in response to data in at least one predetermined category concerning a caller of said incoming call in a private switched telephone system in which an exchange is connected to said plurality of destination candidates and has at

VOL
210
ISS
1
MY
5
1998
UMI

least one trunk connected to a public switched telephone network (PSTN), said PSTN providing a source address of said caller with said incoming call, the allocating system comprising:

means for registering a correspondence between data in said at least one predetermined category concerning each of prospective callers and a desired one of said plurality of destination candidates to generate a destination information table, each record of said table containing as an entry an analysis target part of a source address of each of said prospective callers and further comprising at least an identification of said desired one of said destination candidates; and

means, activated after a completion of operation of said registering means, for allocating said incoming call to the destination candidate associated in said destination information table with the entry identical to said analysis target part of said source address provided from said PSTN.

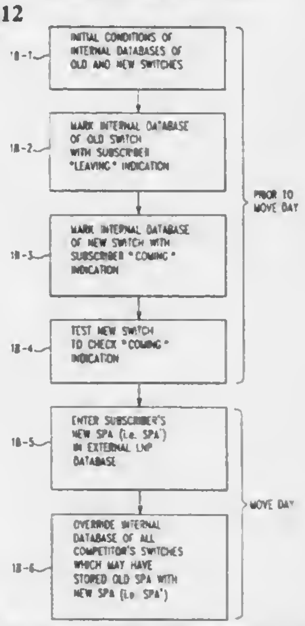
5,748,724
METHOD FOR TRANSFERRING A SUBSCRIBER TO A NEW LOCAL SERVICE PROVIDER

Edward Sonnenberg, Coral Springs, Fla., assignor to Siemens Stomberg-Carlson, Boca Raton, Fla.

Division of Ser. No. 497,281, Jun. 30, 1995. This application Sep. 1, 1995, Ser. No. 523,007

Int. Cl.⁶ H04M *3/42*

U.S. Cl. 379—212 4 Claims


18-1
INITIAL CONDITIONS OF INTERNAL DATABASES OF OLD AND NEW SWITCHES
18-2
MARK INTERNAL DATABASE OF OLD SWITCH WITH SUBSCRIBER "LEAVING" INDICATION
18-3
MARK INTERNAL DATABASE OF NEW SWITCH WITH SUBSCRIBER "COMING" INDICATION
18-4
TEST NEW SWITCH TO CHECK "COMING" INDICATION
PRIOR TO MOVE DAY
18-5
ENTER SUBSCRIBER'S NEW SPA (i.e. SPA') IN EXTERNAL LNP DATABASE
18-6
OVERRIDE INTERNAL DATABASE OF ALL COMPETITOR'S SWITCHES WHICH MAY HAVE STORED OLD SPA WITH NEW SPA (i.e. SPA')
MOVE DAY

2. A method for transferring a Subscriber of a current Local Service Provider to a future Local Service Provider comprising the steps of:

providing an External Local Number Portability Database storing a relationship between an NPA-NXX-XXXX directory number assigned to the Subscriber, a Service Provider Area (SPA) code, and a different exchange code NYY and line code YYYY of the Subscriber, such External Local Number Portability Database being adapted to convert therein the number, NPA-NXX-XXXX, dialed by a calling party into a converted number SPA-NYY-YYYY, where SPA is a three digit designation code assigned to each one of a plurality of Local Service Providers within a common Numbering Plan Area (NPA), each one of the plurality of Local Service Providers being assigned a different SPA code in the common Numbering Plan Area (NPA);

marking an internal database of a switch of the current Local Service Provider with a LEAVING indication;

querying the External Local Number Portability Database from the switch of the current Local Service Provider when such LEAVING indication is marked to determine whether the External Local Number Portability Database has been updated with a Service Provider Area (SPA') code of the future Local Service Provider; and,

if the External Local Number Portability Database has been updated, deleting call routing information from the switch of the current Local Service Provider and routing a call placed by the calling party to the Subscriber using the converted number SPA'-NYY-YYYY.

5,748,725
TELEPHONE SET WITH BACKGROUND NOISE SUPPRESSION FUNCTION

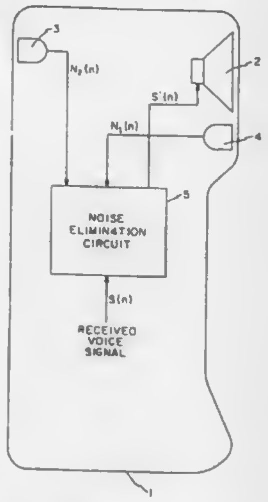
Masato Kubo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,516

Claims priority, application Japan, Dec. 29, 1993, 5-353601

Int. Cl.⁶ H04M *1/00;* G10K *11/16*

U.S. Cl. 379—387 3 Claims



1. A telephone set for suppressing background noise comprising:

a speaker for outputting a first voice signal;

a first microphone provided in the vicinity of said speaker, for generating a first voice band signal;

a second microphone for generating a second voice band signal including said background noise;

said noise elimination circuit comprising:

a level detector for comparing said received voice signal with a predetermined threshold value to output a control signal indicative of whether said received voice signal is equal to or higher than the predetermined threshold level;

a first adaptive filter for producing a third voice band signal based on said received voice signal and first tap coefficients and for updating said first tap coefficients based on said first voice band signal and an error signal when said control signal indicates that said received voice signal is higher than the threshold value;

a first subtracter for subtracting said third voice band signal from said first voice band signal to produce said error signal;

a second adaptive filter for producing said estimated background noise based on said second voice band signal and second tap coefficients and for updating said second tap coefficients when said control signal indicates that said received voice signal is lower than said threshold value; and

a second subtracter for subtracting said estimated background noise from said received voice signal to produce said first voice signal.

5,748,726
ECHO CANCELLER

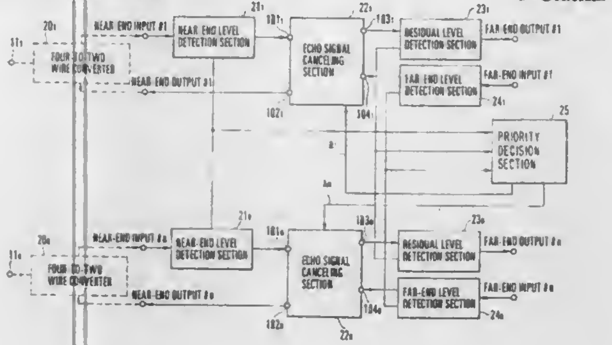
Yoshihiro Unno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 677,917

Claims priority, application Japan, Jul. 10, 1995, 7-173277

Int. Cl.⁶ H04M *9/00;* H04B *3/23*

U.S. Cl. 379—410 9 Claims


20₁
11₁
FOUR-TO-TWO WIRE CONVERTER
NEAR-END INPUT #1
NEAR-END OUTPUT #1
21₁
NEAR-END LEVEL DETECTION SECTION
101₁
102₁
22₁
ECHO SIGNAL CANCELING SECTION
103₁
104₁
23₁
RESIDUAL LEVEL DETECTION SECTION
FAR-END OUTPUT #1
FAR-END LEVEL DETECTION SECTION
FAR-END INPUT #1
24₁
25
PRIORITY DECISION SECTION
a₁
a_n
20ₙ
11ₙ
FOUR-TO-TWO WIRE CONVERTER
NEAR-END INPUT #n
NEAR-END OUTPUT #n
21ₙ
NEAR-END LEVEL DETECTION SECTION
101ₙ
102ₙ
ECHO SIGNAL CANCELING SECTION
22ₙ
103ₙ
104ₙ
23ₙ
RESIDUAL LEVEL DETECTION SECTION
FAR-END OUTPUT #n
FAR-END LEVEL DETECTION SECTION
FAR-END INPUT #n
24ₙ

1. An echo canceller comprising:

a plurality of echo signal canceling means independently provided to echo paths of a plurality of speech communication paths to learn and update estimated values of impulse responses on said echo paths and cancel echoes generated in said corresponding speech communication paths on the basis of the updated estimated values of the impulse responses;

a plurality of first level detection means for detecting levels of transmission speech signals which have been input from near-end speakers to said echo paths of said plurality of speech communication paths;

a plurality of second level detection means for detecting levels of residual signals obtained by removing echo components from the transmission speech signals which have been input from the near-end speakers to said echo paths of said plurality of speech communication paths;

a plurality of third level detection means for detecting levels of reception speech signals which have been input from far-end speakers to said echo paths of said plurality of speech communication paths; and

priority decision means for deciding priorities of said speech communication paths on the basis of a detection output from at least one of said first to third level detection means and selecting said echo signal canceling means in accordance with the decided priorities, thereby enabling a learning operation of the estimated values of the impulse responses on said echo paths,

wherein said priority decision means selects one of said echo signal canceling means in correspondence with a speech communication path having the highest priority for each sampling period, and remaining echo signal canceling means which are not selected generate pseudo echo signals for canceling echo signals by using the estimated values of the impulse response which have not been updated at a preceding sampling period.

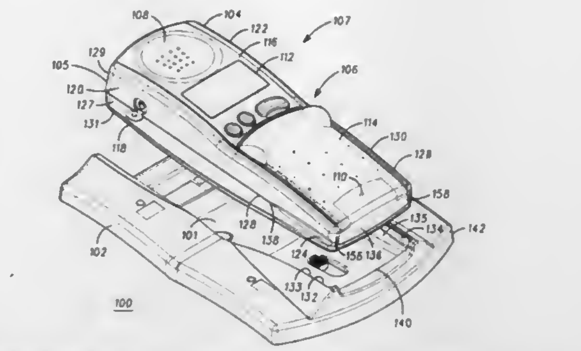
5,748,727
CORDLESS TELEPHONE APPARATUS SWITCHABLE BETWEEN DESKTOP AND WALL MOUNT

Louis J. Lundell, Buffalo Grove; Sang Y. Oh, Schaumburg, and Terron C. Newman, Country Club Hills, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 645,379, May 13, 1996, abandoned. This application Nov. 4, 1997, Ser. No. 970,965

Int. Cl.⁶ H04M *1/00*

U.S. Cl. 379—446 10 Claims



1. A telephone apparatus comprising:

a handset having a face and a back and a first side and a second side, the first side defining a first recess and the second side defining a second recess;

a base convertible between a vertical arrangement and a horizontal arrangement, the base being disposed on a substantially vertical surface in the vertical arrangement and being disposed on a substantially horizontal surface in the horizontal arrangement, the base including:

a housing molded to define a pocket, the pocket being sized to receive the handset;

a movable actuator having a first actuator position corresponding to the vertical arrangement and a second actuator position corresponding to the horizontal arrangement; and

a first detent disposed on a first side wall of the pocket and a second detent disposed on a second side wall of the pocket, the first detent and the second detent movable between a first configuration for the vertical arrangement and a second configuration for the horizontal arrangement in response to movement of the movable actuator between the first actuator position and the second actuator position, the first detent and the second detent in the first configuration engaging the handset to removably retain the handset in the pocket for the vertical arrangement, the first detent and the second detent in the second configuration disengaging the handset so that the detents do not interfere with the handset when the handset is withdrawn from the pocket in the horizontal arrangement,

the first detent engaging one of the first recess and the second recess and the second detent engaging the other of the first recess and the second recess when the handset is stored in the pocket so that the handset may be stored in the pocket with either the face or the back proximate the base.

5,748,728
SHIELD FOR CONCEALING OPERATION OF A KEYPAD

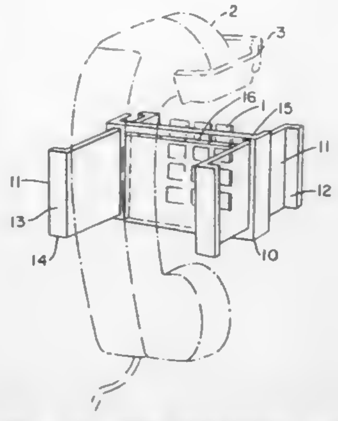
Robert L. Ginsberg, and Frances R. Ginsberg, both of Melville, N.Y., assignors to Phran-Tek Ltd., Oceanside, N.Y.

Continuation of Ser. No. 377,905, Jan. 25, 1995, abandoned. This application Oct. 28, 1996, Ser. No. 738,919

Int. Cl.⁶ H04M *1/00*

U.S. Cl. 379—447 19 Claims

1. A shield for concealing operation of a keypad, comprising a front member and at least one opaque side member, the opaque side member being mounted laterally adjacent to the keypad and the front member being movable between a stored position and a deployed position, the front member being positioned over the keypad when in the deployed position such that the entire keypad is manually operable and observable by a user located in front of the keypad, the front member defining a transparent, optically biased window which permits viewing of the entire keypad therethrough from a location directly in front of the window and which



obscures viewing of the keypad therethrough from locations not directly in front of the keypad, and wherein the front member and the at least one side member at least partially obstruct a line of sight to the keypad when viewed obliquely.

5,748,729

Patent Not Issued For This Number

5,748,730

Patent Not Issued For This Number

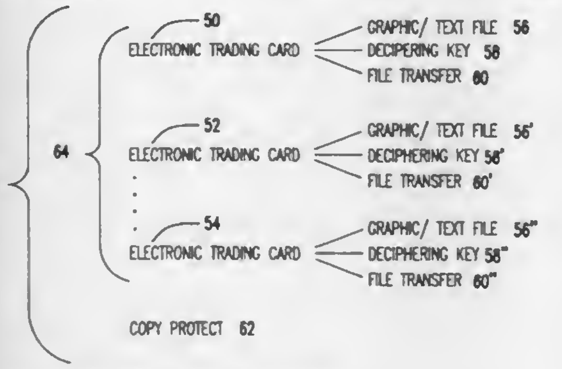
5,748,731

ELECTRONIC TRADING CARDS

Henry G. Shepherd, P.O. Box 70 Wilsondale St., Dover, Mass. 02030

Filed Jul. 2, 1996, Ser. No. 691,566
Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—4 **13 Claims**



1. Electronic trading cards, comprising:
a data storage device;
a plurality of electronic trading card files stored on said data storage device, each electronic trading card file including encrypted data relevant to a single member of a pool;
a plurality of deciphering key codes on said data storage device each of which is unique and which is associated with only one of said electronic trading card files, said deciphering key codes being required to decipher said encrypted data in said electronic trading card file;
a plurality of file transfer codes on said data storage device each of which is unique and which is associated with only one of said electronic trading card files, each of said file transfer codes being used to transfer a selected electronic trading card file, an associated deciphering key for said selected electronic trading card file, and an associated file transfer code for said selected electronic trading card file between a plurality of electronic storage mediums other than said data storage device, each of said file transfer codes, when electronically operated while said electronic trading card files are present in a storage medium other than said data storage device, cause at least one of the group consisting of said electronic trading card files, said deciphering key codes, and said file transfer code to be rendered unusable on said storage medium; and
copy protection code on said data storage device which allows at least one of the group consisting of said electronic trading card files, said deciphering key codes, and said file transfer codes to be copied from said data storage device a selected number of times.

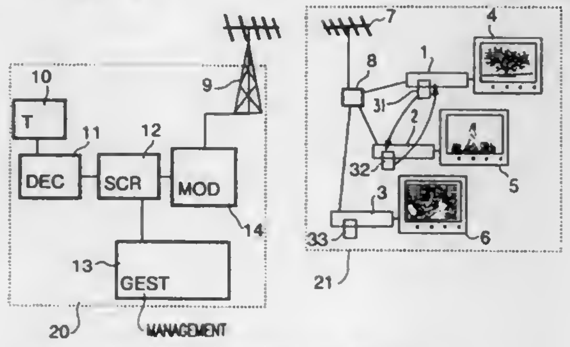
5,748,732

PAY TV METHOD AND DEVICE WHICH COMPRISE MASTER AND SLAVE DECODERS

Jacques Le Berre, Puteaux, France, and Bjorn Persson, Motala, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1996, Ser. No. 605,335
Claims priority, application France, Feb. 8, 1995, 9501449
Int. Cl.^{6} H04N *7/167;* **H04L** *9/00*

U.S. Cl. 380—10 **6 Claims**



1. A pay tv method, comprising the steps of:
arranging a master decoder and at least one slave decoder to be used with a slave smart card, where both decoders are located at a user's dwelling of a pay tv system, said master decoder for receiving an entitlement message from a central management device, said entitlement message containing data relating to the entitlements of a user which message can be exploited only by said master decoder and which message is protected by a cryptographic means and includes an identification code of the master decoder and data relating to the entitlements of at least one of said slave decoders;
decrypting and authenticating said entitlement message at the master decoder;
inserting the slave smart card into the master decoder; and
writing the slave entitlements to the slave smart card.

5,748,733

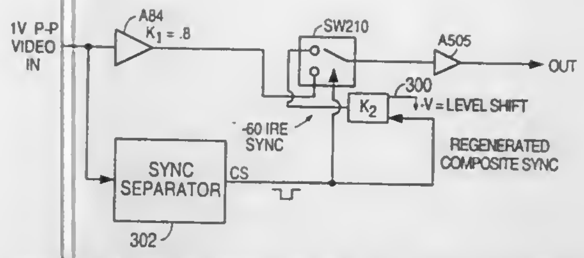
METHOD AND APPARATUS TO REDUCE EFFECTS OF CERTAIN COPY PROTECTION PURSES WITHIN A VIDEO SIGNAL

Ronald Quan, Cupertino, Calif., assignor to Macrovision Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 62,866, May 17, 1993, Pat. No. 5,583,936. This application Dec. 4, 1996, Ser. No. 753,970
Int. Cl.^{6} H04N *5/92*

U.S. Cl. 380—15 **23 Claims**

1. A method of disabling the effects of a copy protection video signal containing at least one pseudo sync pulse and at least one AGC pulse, the method comprising the step of:
modifying a ratio of pseudo sync and AGC pulse video information to composite sync, where said disabling does not remove said pseudo sync pulse.



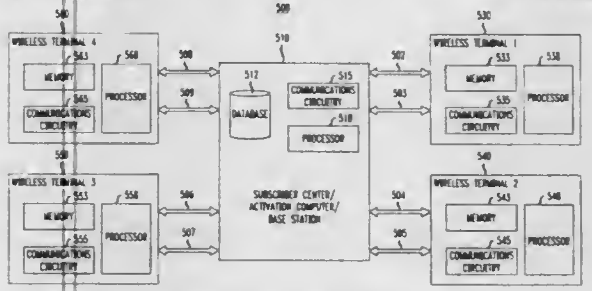
5,748,734

CIRCUIT AND METHOD FOR GENERATING CRYPTOGRAPHIC KEYS

Semyon Mizikovsky, Morganville, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 2, 1996, Ser. No. 626,734
Int. Cl.^{6} H04L *9/08;9/00*

U.S. Cl. 380—21 **35 Claims**



31. A wireless infrastructure, comprising:
a communications network having a base station for communicating signals via wireless communications channels;
a database, associated with said base station, for containing cryptographic keys, said cryptographic keys allowing transmission of encrypted signals from said base station;
a plurality of wireless terminals coupled to said base station via said wireless communications channels to allow communication of signals therebetween, each of said plurality of wireless terminals having a memory associated therewith for storing a cryptographic key allowing transmission of encrypted signals from said each of said plurality of wireless terminals to said base station; and
a key management system for independently generating cryptographic keys at said base station and a selected one of said plurality of wireless terminals, comprising:
  communications circuitry, associated with said base station and said selected one of said plurality of wireless terminals, for transmitting a first seed between said base station and said selected one of said plurality of wireless terminals during a first communications session and transmitting a second seed between said base station and said selected one of said plurality of wireless terminals during a second communications session temporally separated from said first communications session, and
  processor circuitry, associated with said base station and said selected one of said plurality of wireless terminals, for generating said cryptographic keys from said first and second seeds at both said base station and said selected one of said plurality of wireless terminals and storing one of said cryptographic keys in said database, said transmitting of said first and second seeds occurring during said temporally-separated first and second communications sessions, respectively.

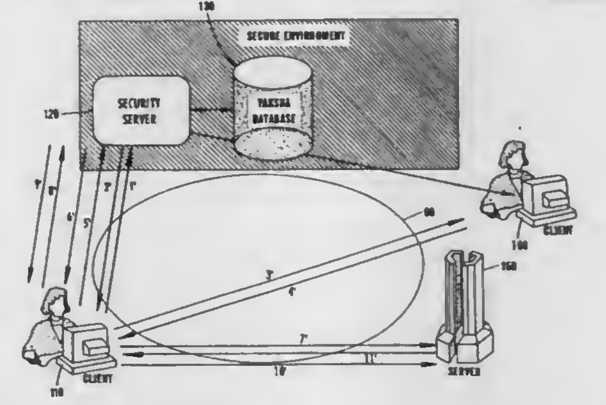
5,748,735

SECURING E-MAIL COMMUNICATIONS AND ENCRYPTED FILE STORAGE USING YAKSHA SPLIT PRIVATE KEY ASYMMETRIC CRYPTOGRAPHY

Ravi Ganesan, Arlington, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 277,376, Jul. 18, 1994, Pat. No. 5,557,678, and a continuation-in-part of Ser. No. 338,128, Nov. 9, 1994, Pat. No. 5,535,276. This application Jun. 7, 1996, Ser. No. 663,019
Int. Cl.^{6} H04L *9/08*

U.S. Cl. 380—21 **24 Claims**



1. A method for securing stored files in a system having a plurality of system users, each said user having an associated asymmetric crypto-key with a public key portion and a corresponding private key portion, each public key portion being accessible to the plurality of system users, each private key portion having a first private key portion known only to the associated user and a corresponding second private key portion known only to a security server, comprising the steps of:
identifying data for storage;
encrypting a symmetric crypto-key with the second private key portion of a first user crypto-key associated with a first user to form an encrypted key message;
obtaining the symmetric crypto-key by applying the first private key portion of the first user crypto-key to decrypt the encrypted key message;
encrypting said data with the symmetric crypto-key to form an encrypted file; and
storing the encrypted file and said encrypted key message.

5,748,736

SYSTEM AND METHOD FOR SECURE GROUP COMMUNICATIONS VIA MULTICAST OR BROADCAST

Suvo Mittra, 87 Mission Ridge Ct., Fremont, Calif. 94539

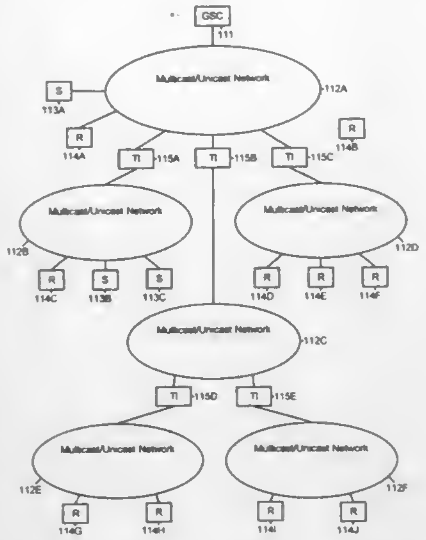
Filed Jun. 14, 1996, Ser. No. 665,195
Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—21 **43 Claims**

1. A system for implementing a secure multicast group in a scalable manner, said system including:
a group security controller which encrypts data with a first group key and causes the encrypted data to be multicast to a first sub-group; and
a number of trusted intermediary servers, wherein each of the trusted intermediary servers can encrypt data with a different group key and cause the differently encrypted data to be multicast to a different sub-group, wherein each said different group key is different from the first group key and each said different sub-group is different from the first subgroup, and wherein the group security controller and each of the trusted intermediary servers form a logical hierarchy of sub-groups which determine said secure multicast group, with the first sub-group at a top level of said hierarchy and each of the

OL 210 SS 1 MY 5 998 MI

VOL
2 10
SS
1
MY
5
998
MI


GSC
111
Multicast/Unicast Network
112A
S
113A
R
114A
R
114B
TI
115A
TI
115B
TI
115C
Multicast/Unicast Network
112B
R
114C
S
113B
S
113C
Multicast/Unicast Network
112D
R
114D
R
114E
R
114F
Multicast/Unicast Network
112C
TI
115D
TI
115E
Multicast/Unicast Network
112E
R
114G
R
114H
Multicast/Unicast Network
112F
R
114I
R
114J

sub-groups associated with a different one of the group security controller and the trusted intermediary servers.

5,748,737

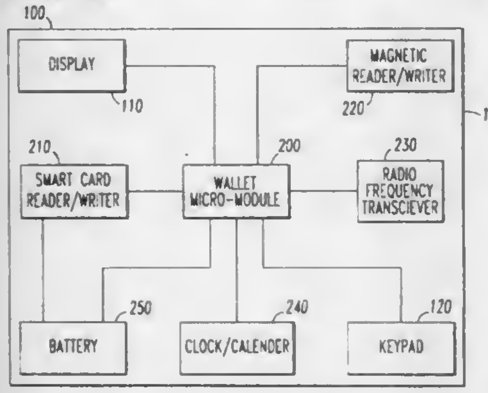
MULTIMEDIA ELECTRONIC WALLET WITH GENERIC CARD

Robert N. Daggar, 2214 Springwood Dr., Suite. T4, Reston, Va. 22091-2350

Filed Nov. 14, 1994, Ser. No. 339,694

Int. Cl.^{6} H04L *9/00;* **G06F** *17/60*

U.S. Cl. 380—24 **27 Claims**



10. An electronic wallet including a magnetic medium interface for transferring card data between the electronic wallet and a magnetic medium contained on a transaction card comprising:

storage means for storing the card data to be written to the transaction card, said card data being formatted to correspond to predetermined physical positions within the magnetic medium;

magnetic medium position detecting means for detecting the position of the magnetic medium contained on the transaction card and for generating position information corresponding to said detected position;

magnetic medium writing means for receiving said card data from said storage means and for writing said card data to the magnetic medium carried on the transaction card; and

processor means connected with said storage means, said magnetic medium position detecting means and said magnetic medium writing means for receiving said position information from said magnetic medium position detecting means and for transferring said card data corresponding to said position information from said storage means to said magnetic medium writing means.

5,748,738

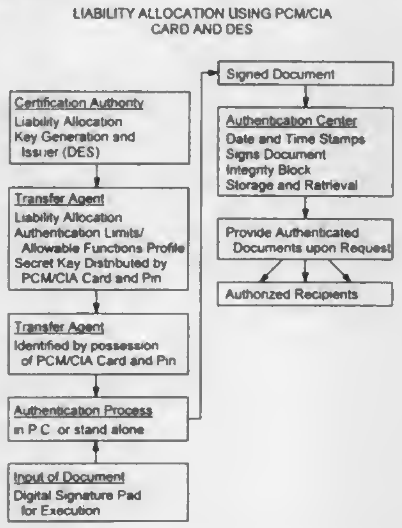
SYSTEM AND METHOD FOR ELECTRONIC TRANSMISSION, STORAGE AND RETRIEVAL OF AUTHENTICATED DOCUMENTS

Stephen F. Bisbee, Gibson Island; Jack J. Moskowitz, Ellicott City; Edward R. Sheehan, Sykesville; Douglas H. Trotter, and Michael W. White, both of Baltimore, all of Md., assignors to Document Authentication Systems, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 373,944, Jan. 17, 1995, Pat. No. 5,615,268. This application Sep. 15, 1995, Ser. No. 528,841

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—25 **16 Claims**


LIABILITY ALLOCATION USING PCM/CIA CARD AND DES
Certification Authority
Liability Allocation
Key Generation and Issuer (DES)
Transfer Agent
Liability Allocation
Authentication Limits/ Allowable Functions Profile
Secret Key Distributed by PCM/CIA Card and Pin
Transfer Agent
Identified by possession of PCM/CIA Card and Pin
Authentication Process
in P C or stand alone
Input of Document
Digital Signature Pad for Execution
Signed Document
Authentication Center
Date and Time Stamps
Signs Document
Integrity Block
Storage and Retrieval
Provide Authenticated Documents upon Request
Authorized Recipients

3. A method of executing a transaction by transferring an authenticated information object having a verifiable evidence trail, comprising the steps of:

signing, by a first entity, the information object with a first digital signature;

appending, by the first entity, a first certificate to the information object, wherein the first certificate relates at least an identity and a cryptographic key to the first entity;

authenticating the information object signed with the first digital signature and having appended the first certificate by a second entity, thereby forming an authenticated object, wherein the step of authenticating comprises:

validating the first digital signature and first certificate;

applying a date stamp and a time stamp to the information object signed with the first digital signature and having appended the first certificate; and

after the validating and applying steps, taking control of the validated stamped information object by signing the information object with a second digital signature of the second entity, appending a second certificate to the information object, and storing the validated stamped information object signed with the second digital signature and having the second certificate appended as the authenticated object, wherein the second certificate relates at least an identity and a cryptographic key to the second entity; and transferring the authenticated object to an entity in response to an instruction.

5,748,739

ACCESS CONTROL FOR SENSITIVE FUNCTIONS

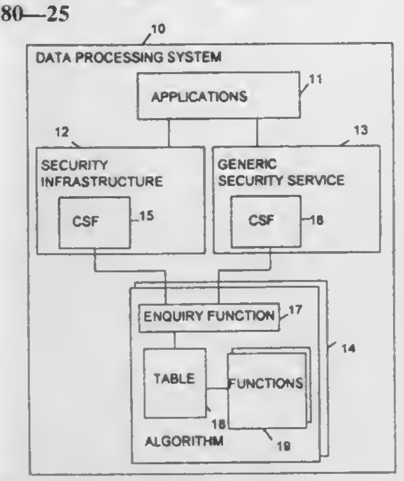
James Press, Biggleswade, England, assignor to International Computers Limited, London, England

Filed Oct. 16, 1995, Ser. No. 543,641

Claims priority, application United Kingdom, Nov. 5, 1994, 9422389

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—25 **5 Claims**



1. A data processing system comprising:

(a) a cryptographic support facility; and

(b) a cryptographic algorithm module, for use by said cryptographic support facility, said cryptographic algorithm module comprising an enquiry function, a plurality of cryptographic functions, and a function table containing pointers to said cryptographic functions;

(c) said cryptographic support facility comprising means for issuing a challenge to said enquiry function of said cryptographic algorithm module;

(d) said enquiry function of said cryptographic algorithm module comprising means for generating a response to said challenge and for returning said response to said cryptographic support facility along with an encrypted pointer to said function table; and

(e) said cryptographic support facility comprising means for checking said response, and for decrypting said encrypted pointer and thereby enabling use of said cryptographic algorithm module by said cryptographic support facility only when said response is equal to an expected response value.

5,748,740

METHOD, APPARATUS, SYSTEM AND FIRMWARE FOR SECURE TRANSACTIONS

Stephen M. Curry, Dallas; Donald W. Loomis, Coppell, and Christopher W. Fox, Dallas, all of Tex., assignors to Dallas Semiconductor, Dallas, Tex.

Filed Jan. 31, 1996, Ser. No. 594,983

Int. Cl.^{6} H04L *9/00;9/30*

U.S. Cl. 380—25 **27 Claims**

7. A system for communicating secure transactions, comprising:

a first module comprising:

input/output circuitry;

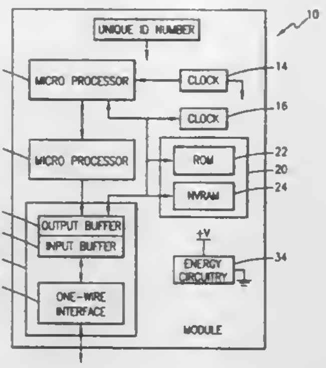
random number creating means for creating a random number; and

a first transaction group for requesting said random number creating means to create said random number and for providing said random number to said input/output circuitry; and

a service provider equipment comprising:

means for reading said random number from said input/output circuitry of said first module:

means for combining said random number with a first data and for encrypting the combination of said random number and said first data with a private key to produce a first certificate, whereby said input/output circuitry of said first module receives said first certificate.



5,748,741

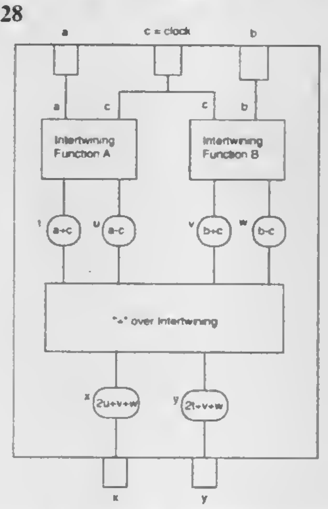
ENCODING TECHNIQUE FOR SOFTWARE AND HARDWARE

Harold Joseph Johnson, Nepean; Yuan Xiang Gu, Kanata; Becky Laiping Chan, Ottawa, and Stanley Taihai Chow, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 7, 1996, Ser. No. 611,968

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—28 **36 Claims**



1. A process of encoding an executable program design for tamper protection and concealment of information contained therein such that the encoded program design remains executable comprising steps of:

a) generating one or more checking cascades for each of one or more basic blocks of the executable program design, each checking cascade having at least as many operations as said each respective basic block and having a length and width for a preset security level;

b) inserting periodic checking codes distributed over said checking cascades, said checking codes for monitoring expected output of said checking cascades at predetermined points in said executable program design; and

c) intertwining said executable program design and said checking cascades so that outputs of said encoded executable program design depend upon all inputs of said executable program design and checking cascades.

OL
2 10
ISS
1
MY
5
998
MI

5,748,742
FRAUD DETECTION AND USER VALIDATION SYSTEM FOR MOBILE EARTH TERMINAL COMMUNICATION DEVICE

William R. Tisdale, and Charles E. Sigler, both of Reston, Va., assignors to AMSC Subsidiary Corporation, Reston, Va.

Filed Nov. 30, 1995, Ser. No. 565,036

Int. Cl.^{6} H04L *9/00;* **H04K** *1/00;* **G06F** *7/04;* **G07D** *7/00*

U.S. Cl. 380—49 **12 Claims**

1. In a mobile satellite system including a satellite communication switching office having a satellite antenna for receiving/transmitting a satellite message via a satellite from/to a vehicle using a mobile communication system, a satellite interface system, a central controller receiving/transmitting the satellite message from/to the satellite communication switching office issued from the vehicle via the satellite and the satellite interface system, a method of preventing a mobile communication system from fraudulently commissioning in the satellite communication system, said method comprising the steps of:

(a) requesting, by a user, to become a subscriber in a communication system;

(b) generating a first input signal by the mobile communication system;

(c) transmitting the first input signal from the mobile communication system to the central controller;

(d) generating a first security key having a first component in the central controller using a data encryption algorithm, the data encryption algorithm using the first input signal and a second input signal generated by a random number generator in the central controller;

(e) generating a third input signal responsive to the first input signal confirming receipt of the first input signal by the central controller;

(f) transmitting the third input signal from the central controller to the mobile communication system responsive to said transmitting step (c);

(g) generating a second security key having a second component in the mobile communication system using the data encryption algorithm, the data encryption algorithm using the first input signal and the second input signal independently generated in the mobile communication system; and

(h) verifying by the central controller when the mobile communication system initiates a communication that the mobile communication system is commissioned as a valid subscriber to be eligible for subsequent authentication in the communication system responsive to a comparison of the first component of the first security key with the second component of the second security key.

5,748,743
AIR CONDUCTION HEARING DEVICE

Eric L. Weeks, Manchester, Me., assignor to Ear Craft Technologies, Boothbay, Me.

Continuation-in-part of Ser. No. 26,545, Aug. 1, 1994, Pat. No. Des. 367,113. This application Feb. 6, 1995, Ser. No. 386,518

Int. Cl.^{6} H04R *25/00*

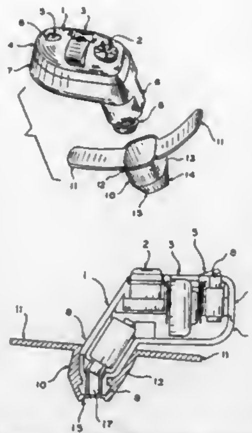
U.S. Cl. 381—68.6 **19 Claims**

1. An electronic hearing aid which is insertable into an ear canal comprising:

a first section having a top part containing input and control elements;

said first section tapering to a bottom part and encapsulating amplification circuitry and sound conduction channels;

a second tubular flexible section removably connectable to said first section and comprising a first end having a receiving opening for partially receiving the bottom part of said first section, a plurality of distending sections and a second end having a tapered and sealed distal end comprises a thin sound conduction membrane integrated within said distal end, a plurality of flaps attaching to said first end, and



wherein said second tubular flexible section is attached to said first section and the combination is insertable into the ear canal of a user with the plurality of distending sections and the plurality of flaps folded backwardly upon insertion.

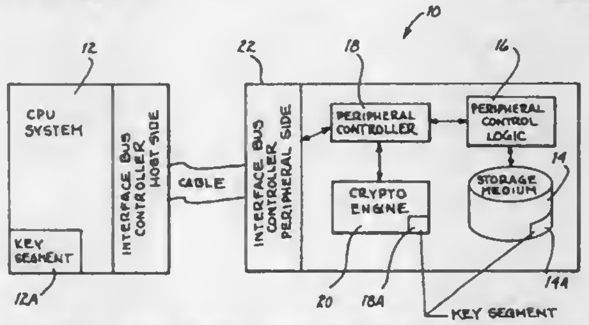
5,748,744
SECURE MASS STORAGE SYSTEM FOR COMPUTERS

Paul S. Levy, and Steve Cornelius, both of Chandler, Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 3, 1996, Ser. No. 657,826

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—52 **19 Claims**



1. A secure mass storage system comprising, in combination:

a Central Processing Unit (CPU) system;

mass storage means coupled to said CPU system for storing and transferring encrypted and non-encrypted data to and from said CPU system;

peripheral control logic means coupled to said mass storage means for reading said encrypted and non-encrypted data stored on said mass storage means;

peripheral controller means coupled to said peripheral control logic means for accessing said mass storage means;

cryptographic means coupled to said peripheral controller means for encrypting data to be stored on said mass storage means and for decrypting encrypted data stored on said mass storage means to be used by said CPU system;

bus controller means coupled to said peripheral controller means and to said CPU system for selecting a bus for transferring said encrypted and non-encrypted data to and from said mass storage means;

operating system means programmably stored in said CPU system for providing a command set for operation of said CPU system; user supplied key means programmably stored in said operating system means for accessing said encrypted data stored on said mass storage means; and

cipher utility means programmably stored in said operating system means for providing a command set extension to said command set of said operating system means for initializing said mass storage means to store encrypted data transferred from said cryptographic means, allowing selection of a keyphrase during initialization of said mass storage means, and for allowing a user of said system to input said keyphrase to unlock said user supplied key means for accessing said encrypted data stored on said mass storage means.

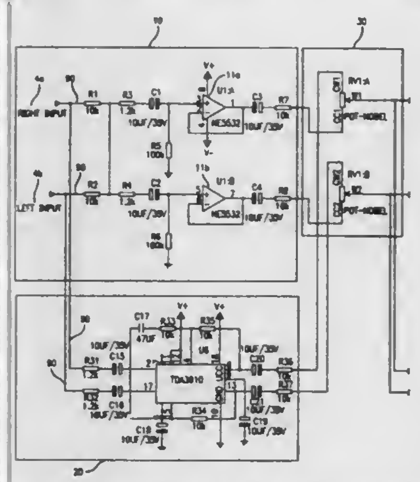
5,748,745
ANALOG VECTOR PROCESSOR AND METHOD FOR PRODUCING A BINAURAL SIGNAL

John C. Bedini, Coeur d'Alene, Id., assignor to Bedini Electronics, Inc., Coeur d'Alene, Id.

Filed Feb. 26, 1996, Ser. No. 607,237

Int. Cl.^{6} H04R *5/00*

U.S. Cl. 381—1 **10 Claims**



1. An analog vector processor for producing a binaural signal of an altered sound field wherein signal path connections have right and left channel input and output signals associated therewith, comprising:

a. a first duel-amplifier means for receiving said right and left channel input signals, said first duel-amplifier means producing a signal path which produces a mono signal;

b. a first spacial amplifier means for receiving said right and left channel input signals, said first spacial amplifier to produce a spacial signal;

c. the signal path from said first duel-amplifier means and said first spacial amplifier being connected to a signal mixer control means, said signal mixer control means having a mixer control circuit for mixing right and left channel signals for selecting a mono, stereo, spacial or binaural signal;

d. the signal path from said signal mixer control means being connected to a four-amplifier integrated circuit means for inverting and transposing the signal from the left channel to the right channel and for inverting and transposing the signal from the right channel to the left channel, the resulting inverted and transposed signals being out-of-phase at from 0° to 180°;

e. the signal path from said signal mixer control means being connected to a second spacial amplifier means to produce a spacial signal;

f. the signal path from said four-amplifier integrated circuit means being connected to a second dual-amplifier means providing a non-inverting mixer amplifier to maintain signal integrity in the selected phases;

g. the signal path from said second spacial amplifier means being connected to said second duel-amplifier means;

h. the signal path from said second duel-amplifier means being connected to a level-control means, said level-control means having a laser-trimmed potentiometer for dual tracking of said right and left channel signals; and

i. the signal path from said level-control means being connected to a third dual-amplifier means for providing a buffer and having a right channel and a left channel signal path outputs.

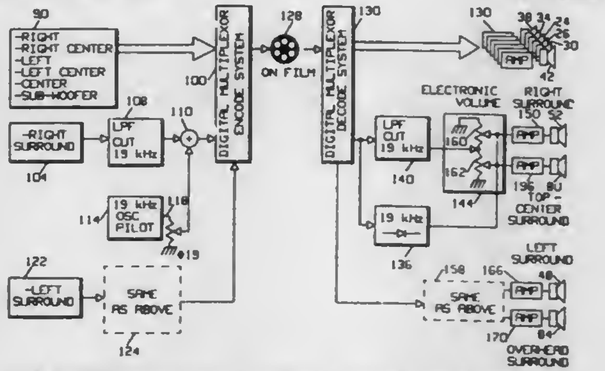
5,748,746
CEILING SPEAKER AND SIGNAL SOURCE

Yoshio Ozaki, Tokyo, Japan, and Michael J. Kohut, Ojai, Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Cinema Products Corporation, Culver City, Calif.

Continuation of Ser. No. 207,006, Mar. 7, 1994. This application Feb. 27, 1996, Ser. No. 607,618

Int. Cl.^{6} H04R *5/00*

U.S. Cl. 381—18 **4 Claims**



1. A multi-channel audio playback system, comprising:

a plurality of channels including at least a first side surround channel and a first upper surround channel;

a recording medium;

a first sound signal stored in said recording medium;

a first control signal stored in said recording medium and indicating the distribution of said first sound signal between said first side surround channel and said first upper surround channel;

means for reading and decoding said first sound signal from said recording medium;

means for playing back said first sound signal through the channels according to the distribution indicated by said first control signal; and

wherein the control signal comprises a 19 kHz pilot signal.

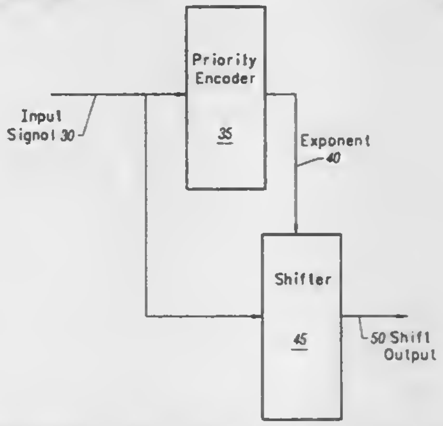
5,748,747
DIGITAL SIGNAL PROCESSOR FOR ADDING HARMONIC CONTENT TO DIGITAL AUDIO SIGNAL

Dana C. Massie, Capitola, Calif., assignor to Creative Technology, LTD, Singapore

Continuation of Ser. No. 544,862, Oct. 18, 1995, abandoned, which is a continuation of Ser. No. 905,559, Jun. 29, 1992, Pat. No. 5,524,074. This application Apr. 9, 1997, Ser. No. 838,750

Int. Cl.^{6} H03G *3/00*

U.S. Cl. 381—61 **9 Claims**



6. A digital signal processor for adding harmonic content to a stream of digital input values representing an arbitrary input audio signal to produce a stream of digital output values representing an output audio signal, comprising:

a priority encoder for determining a priority value based on a magnitude of one of said digital input values, said priority

VOL
210
SS
1
MY
5
998
MI

value being inversely related to a bit number representing the first bit from the left which differs in polarity from a sign bit; and

a bit shifter for bit shifting said digital input value by an amount of bits dependent on said priority value to produce a digital output value, whereby said stream of output values has increased harmonic content relative to said stream of input values.

5,748,748

APPARATUS AND METHOD FOR INFLUENCING OSCILLATIONS IN THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE AND APPARATUS AND METHOD FOR DETECTING DEFECTS IN A MOTOR VEHICLE

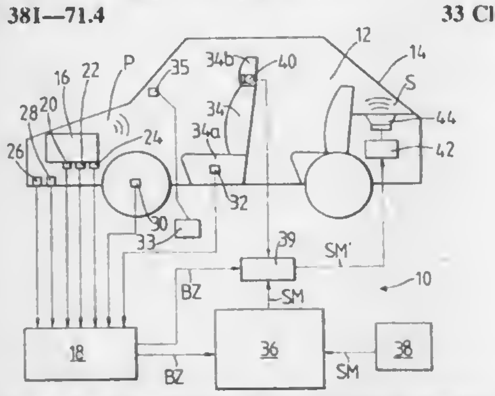
Matthias Fischer, Eltingshausen; Reinhard Feldhaus, Oerlenbach-Ebenhausen, and Andreas Orlamünder, Schweinfurt, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Aug. 23, 1996, Ser. No. 701,984

Claims priority, application Germany, Aug. 26, 1995, 195 31 402.6

Int. Cl.⁶ A61F *11/06*

U.S. Cl. 381—71.4 **33 Claims**



11. An apparatus for modifying noise oscillations transmitted to a passenger compartment of a vehicle, said noise oscillations being transmitted to said passenger compartment of said vehicle as a result of operation of said vehicle, said apparatus comprising:

memory means for storing a plurality of oscillation patterns;

first sensor means for determining at least one operating condition of said vehicle;

selector means for receiving said at least one operating condition from said first sensor means and for selecting an oscillation pattern from said plurality of oscillation patterns stored in said memory means based upon said at least one operating condition received from said first sensor means;

oscillation generation means for generating oscillations into said passenger compartment of said vehicle, said generated oscillations generated by said oscillation generation means corresponding to said selected oscillation pattern selected by said selector means from said plurality of oscillation patterns stored in said memory means;

second sensor means being positioned in said passenger compartment of said vehicle;

said second sensor means being for the detection of a resultant oscillation resulting from a superimposition of said noise oscillations and said oscillations generated in said passenger compartment of said vehicle by said oscillation generation means for a selected one of said plurality of determined oscillation patterns; and

oscillation pattern modification means for modifying said selected one of said plurality of oscillation patterns to minimize the amplitude of said resultant oscillation.

5,748,749

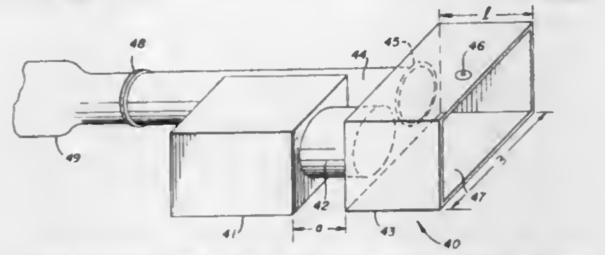
ACTIVE NOISE CANCELLING MUFFLER

Scott Miller, Baltimore, and J. Clay Shipps, Catonsville, both of Md., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Continuation-in-part of Ser. No. 240,429, May 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 37,755, Mar. 24, 1993, abandoned. This application Jun. 25, 1996, Ser. No. 670,111

Int. Cl.⁶ A61F *11/06;* **H03B** *29/00*

U.S. Cl. 381—71.5 **13 Claims**



1. An active noise canceling muffler system for use on stationary or vehicle applications which involve an exhaust pipe, said system comprising:

an active noise enclosure;

an active noise attenuator in said active enclosure adapted to produce a counter noise wave to cause destructive interference with a noise wave emanating from said exhaust pipe;

an adaptive controller connected to said active noise attenuator;

an extension duct connected to said active enclosure through a port and adapted to receive a terminus of said exhaust pipe so as to receive both said exhaust pipe gases, said noise and said counter noise at one end of said extension duct, said noise and counter noise combining to form a single plane wave at an opposite end of said extension duct; and

a transducer listening device on said extension duct and adapted to provide a residual signal to said adaptive controller to allow it to adjust said active noise attenuator to provide the necessary counter noise,

wherein a dipole is created where the noise and counter noise enter said duct extension, the shape of said duct extension forcing said dipole pattern into a plane wave adjacent said transducer listening device.

5,748,750

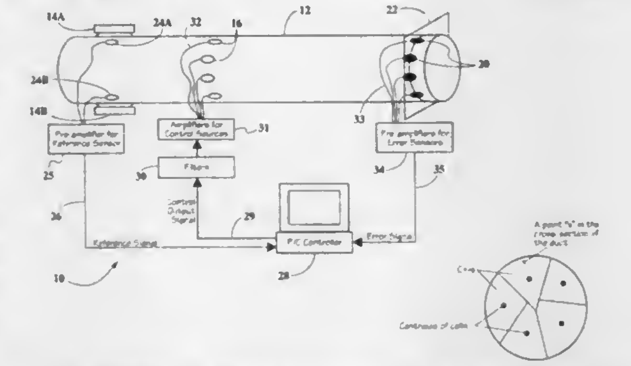
METHOD AND APPARATUS FOR ACTIVE NOISE CONTROL OF HIGH ORDER MODES IN DUCTS

André L'Espérance; Martin Bouchard; Bruno Paillard, all of Sherbrooke, Canada, and Catherine Guigou, Christiansburg, Va., assignors to Alumax Inc., Atlanta, Ga.

Continuation of Ser. No. 498,064, Jul. 5, 1995, abandoned. This application Jun. 10, 1997, Ser. No. 872,397

Int. Cl.⁶ A61F *11/06*

U.S. Cl. 381—71.5 **12 Claims**


14A
24A
32
16
12
22
20
24B
14B
Pre-amplifier for Reference Sensor
Amplifiers for Control Sources
31
33
Pre-amplifiers for Error Sensors
25
Filters
30
34
35
36
Control Output Signal
29
Reference Signal
P/C Controller
Error Signal
10
28
A point "x" in the cross-section of the duct
Cells
Centroids of cells

1. An apparatus for active noise control of high order modes in an undivided duct having a primary noise source, said apparatus comprising:

a plurality of error sensors located within the undivided duct in a plane which is perpendicular to the longitudinal axis of the duct;

a plurality of transducers disposed to direct sound waves into the duct, said plurality of transducers numbering at least as many as the number of said plurality of error sensors; and

controller means responsive to an input signal from said plurality of error sensors for sending a control signal to said plurality of transducers to attenuate the noise within said duct generated by said primary noise source.

5,748,751

SIGNAL AMPLIFIER SYSTEM WITH IMPROVED ECHO CANCELLATION

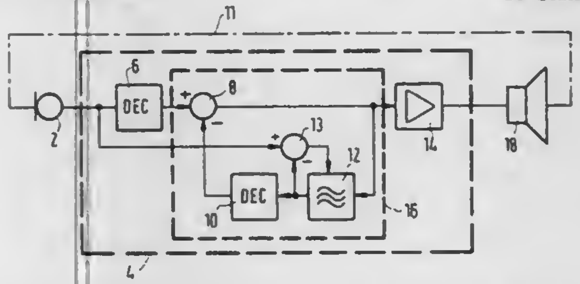
Cornelis P. Janse, and Patrick A. A. Timmermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 728,574, Oct. 10, 1996, which is a continuation of Ser. No. 416,277, Apr. 4, 1995, abandoned. This application Mar. 21, 1997, Ser. No. 822,958

Claims priority, application European Pat. Off., Apr. 12, 1994, 94200984

Int. Cl.⁶ H04B *15/00*

U.S. Cl. 381—93 **10 Claims**



1. A signal amplifier system comprising a pick-up element, a playback element, and a signal processing system, including echo cancellation means, for deriving an output signal for the playback element from an input signal produced by the pick-up element, said signal processing system comprising:

a. an input for receiving the input signal produced by the pick-up element;

b. an output for providing the output signal to the playback element;

c. a signal path coupling the input to the output;

d. subtracter means having a first input and an output via which said subtractor means is electrically connected in the signal path, and further having a second input, said subtracter means producing the output signal in response to signals applied to said first and second inputs;

e. time-variant decorrelation means having an input and an output via which said decorrelation means is electrically connected in the signal path in series with the subtracter means, said decorrelation means substantially effecting decorrelation between the input signal and the output signal; and

f. adaptive filter means having an input electrically connected to the signal path after the series-connected decorrelation and subtracter means for receiving the decorrelated output signal, and having an output for producing a compensation signal electrically connected to the second input of the subtracter means.

5,748,752

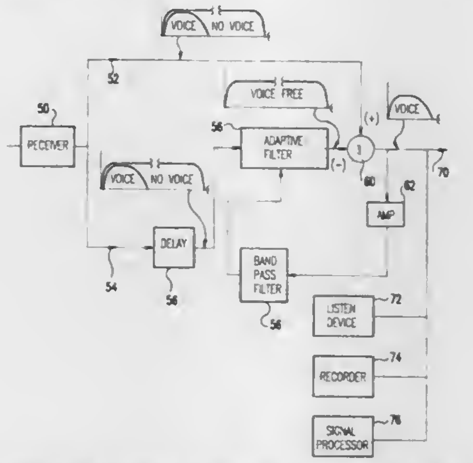
ADAPTIVE VOICE ENHANCING SYSTEM

James B. Reames, 6215 Old Keene Mill Ct., Springfield, Va. 22152-2324

Continuation of Ser. No. 362,882, Dec. 23, 1994, abandoned. This application Nov. 15, 1996, Ser. No. 749,733

Int. Cl.⁶ H04B *15/00*

U.S. Cl. 381—94.1 **2 Claims**



1. A system for listening to and/or recording at a site remote from a microphone the voice of a person speaking in a space which produces direct and reflected versions of an acoustic voice signal generated by said person and direct and reflected versions of acoustic audio signals generated by extraneous audio sources whose acoustic audio signal overlaps, at least in part, said acoustic voice signal, comprising in combination:

means for converting, including microphone means, a composite acoustic signal generated by a combination of direct and reflected versions of said acoustic voice signal, and direct and reflected versions of said acoustic audio signals to an electrical signal which includes a voice band component and a voice free component;

means for transmitting from said space to said site said electrical signal;

means, including filter means with a pass band outside the frequency band of the voice band component, for separating from the transmitted electrical signal a voice free signal;

an adaptive filter trained with said voice free signal on the basis of the temporal correlation among direct and reflected versions of said voice free signal extending in the band of said voice band component so that said adaptive filter passes from said electrical signal coupled as an input to said adaptive filter said acoustic audio signal and rejects the acoustic voice signal;

means for coupling as an input to said adaptive filter the transmitted electrical signal to generate as an output of said adaptive filter a version of said electrical signal free of said acoustic voice signal; and

means for subtracting from the transmitted electrical signal said version of said electrical signal free of said acoustic voice signal.

5,748,753

HIGH POWER AUDIO SUBWOOFER

Robert W. Carver, 330 Avenue A., Snohomish, Wash. 98290

Filed Jan. 2, 1996, Ser. No. 582,149

Int. Cl.⁶ H04R *3/00*

U.S. Cl. 381—96 **17 Claims**

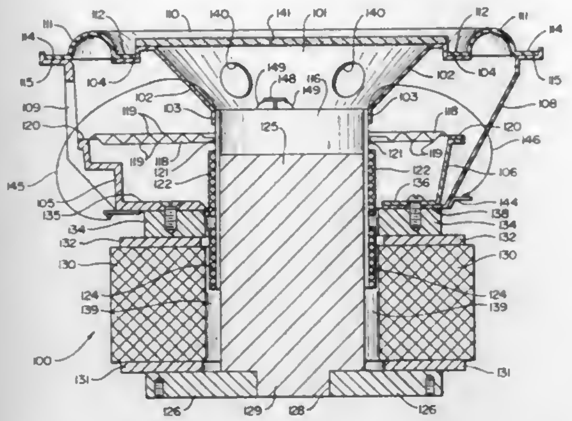
1. A high power audio subwoofer comprising, in combination:

a) a subwoofer cabinet, said cabinet being formed by a plurality of walls defining an enclosed volume of space;

b) an opening formed in at least one of said walls; and,

c) a driver assembly mounted within said cabinet on an axis extending coaxially through said opening, said driver assembly including:

OL
2 10
SS
1
MY
5
998
MI



i) means defining a driver frame fixedly mounted within said cabinet in coaxial surrounding relation to said axis;

ii) means defining a stationary magnetic pole fixedly mounted within said cabinet relative to said driver frame defining means, said pole defining means having a circular cross-sectional configuration with a diameter D;

iii) an annular magnet fixedly mounted on said driver frame surrounding and coaxial with said pole defining means, said magnet having an internal diameter greater than D and defining an annular magnetic gap between said pole defining means and said magnet;

iv) a cylindrical voice coil former positioned coaxially within said magnetic gap with said former being axially moveable relative to said pole defining means;

v) voice coil defining means wound about and affixed to said voice coil former and axially moveable within said magnetic gap upon axial movement of said voice coil former;

vi) amplifier means for alternately delivering positive and negative voltage swings to said voice coil defining means to shift said voice coil former axially within said annular magnetic gap in a first axial direction responsive to positive voltage swings delivered from said amplifier means and in a second and opposite axial direction in response to negative voltage swings delivered from said amplifier means;

vii) a driver cone having a large diameter end and a cylindrical apical end with said cylindrical apical end being affixed to one end of said cylindrical voice coil former and coaxial therewith, said cone extending axially beyond said polo defining means and having its large diameter end terminating in a plane at least closely proximate to said cabinet wall containing said opening, said cone's large diameter end having a maximum diameter less than the diameter of said opening; and,

viii) means defining a flexible resilient suspension system supporting said driver cone on said driver frame in a normally null position wherein said large diameter end of said driver cone lies in said plane, said flexible resilient suspension system defining means including: a) a flexible resilient edgeroll having a cross-sectional configuration defining a curved central portion terminating in inwardly and outwardly projecting peripheral flanges wherein said inwardly projecting peripheral flange is secured to said large diameter end of said driver cone and said outwardly projecting peripheral flange is secured to the free end of said driver frame; and b), an annular spider resilient support element having inner and outer peripheral edges and a non-linear cross-sectional configuration, said outer peripheral edge being secured to said driver frame and said inner peripheral edge being secured to said voice coil former, said flexible resilient edgeroll and said annular spider resilient support providing the sole support for said driver cone, said voice coil former, and said voice coil defining means, and being dimensioned so as to permit said driver cone, said voice coil former, and said voice coil defining means to move axially inward from said null position by a stroke distance of approximately 1.25" and axially outward from said null position by a stroke distance of approximately 1.25" defining a peak-to-peak stroke for said driver assembly of approximately 2.5";

wherein, upon energization of said voice coil defining means by delivery of one or positive and negative voltage swings from said amplifier means, a first magnetic field is created causing said voice coil former to be axially shifted inwardly relative to said magnet so as to shift said driver core, said voice coil former and said voice coil defining means axially inward relative to said opening in said cabinet wall, and upon energization of said voice coil defining means by delivery of the other of positive and negative voltage swings from said amplifier means, a second magnetic field is created causing said voice coil former to be shifted axially outward relative to said magnet so as to shift said driver cone, said voice coil former and said voice coil defining means axially outward relative to said opening.

5,748,754

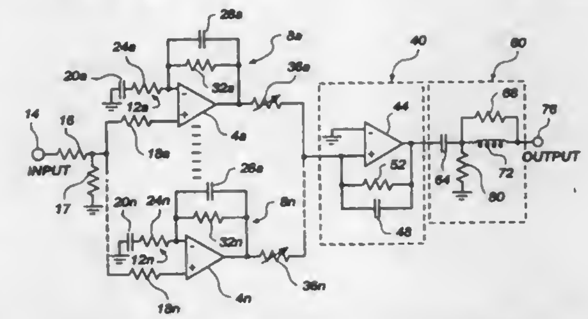
SOUND SYSTEM GAIN AND EQUALIZATION CIRCUIT

Clifford Maag, Provo, and Lance Parker, Orem, both of Utah, assignors to Night Technologies International, Provo, Utah

Continuation of Ser. No. 54,036, Apr. 28, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 523,277

Int. Cl.⁶ H03G *5/00;3/00*

U.S. Cl. 381—104 **14 Claims**



1. A voltage gain and equalization circuit for processing a received audio signal, comprising:

a plurality of operational amplifier means, each for processing and selectively amplifying a different frequency band of the audio signal to produce an output signal with generally no phase shift, and each including

an inverting input,

a non-inverting input for receiving the audio signal,

an output,

high pass filter means coupled between the inverting input and ground for determining the lower end of the frequency band processed by said each operational amplifier means,

low pass filter means coupled between the output and the inverting input for determining the upper end of the frequency band processed by said each operational amplifier means, and

summing means coupled to the outputs of each operational amplifier means for combining the output signals, each output signal passing a different frequency band of the audio signal thereof, to produce a resultant signal.

5,748,755

PICTURE CHECKS

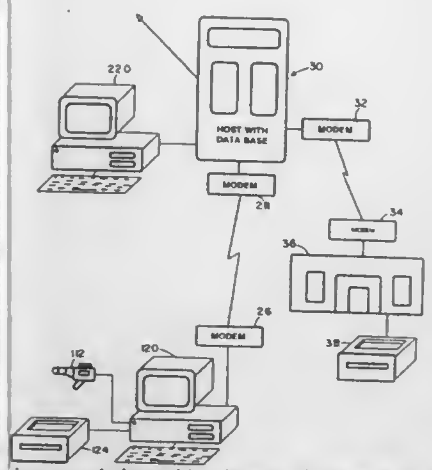
Thomas W. Johnson, E. Amherst, and John L. Muerle, Grand Island, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 880,033, May 8, 1992, abandoned. This application Apr. 25, 1996, Ser. No. 637,594

Int. Cl.⁶ H04N *1/00*

U.S. Cl. 382—115 **18 Claims**

1. A method of composing a personalized document with a picture of a user of the document on each document comprising the steps of:



a) capturing a real time video image of the user at a first site; immediately thereafter,

b) converting the image to a digital image file using a video image capture board mounted in a personal computer;

c) composing a portion of the personalized document as a graphics image file in the personal computer and adding personalized identifying data to the graphics image file;

d) merging the digital image file and graphics image file to form the document;

e) printing one or more of the personalized documents at the first site; and

f) transferring the digital image file via modem and storing said digital image file in a host computer data base at a second site remote from the first site; and

g) producing additional of the personalized documents at a document manufacturing plant remote from the first and second sites via communication with the host computer data base.

5,748,756

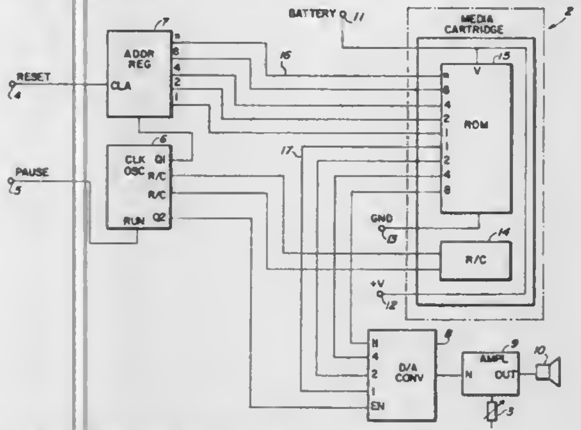
ENTERTAINMENT SYSTEM WITH SOUND STORAGE CARTRIDGE AND PLAYBACK DEVICE

Horacio Leal, Miami, and Israel Kaganas, Aventura, both of Fla., assignors to TLC Industries Inc., Hallandale, Fla.

Filed Oct. 16, 1996, Ser. No. 733,715

Int. Cl.⁶ G10D *5/00*

U.S. Cl. 381—118 **3 Claims**



1. A sound storage and playback system comprising:

a cartridge having memory means for storing digital data therein in accordance with a plurality of corresponding addresses,

a player device including:

address register means communicating with said memory means for identifying and actuating one of said plurality of addresses,

a digital to analog converter for converting said digital data to analog signals,

a data bus for delivering said digital data from said activated one of said plurality of addresses to said digital to analog converter,

amplifier means for receiving and amplifying said analog signals, and

a timing circuit for controlling alternating actuation of said address register means and said digital to analog converter, said timing circuit further incrementing said address register means to identify and activate a next sequential one of said addresses on said memory means, and

said timing circuit including a resistor/capacitor within said cartridge and a clocking oscillator in said slaver device communicating with said resistor/capacitor, said resistor/capacitor being structured to generate predetermined values to control operation of said clocking oscillator.

5,748,757

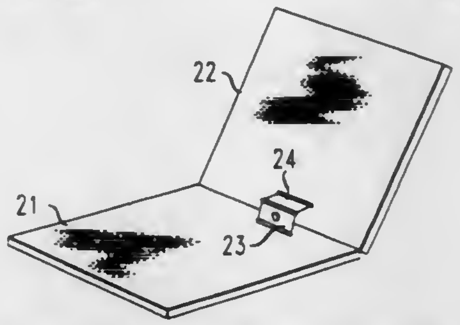
COLLAPSIBLE IMAGE DERIVED DIFFERENTIAL MICROPHONE

Robert Alfred Kubli, Milford, and James Edward West, Plainfield, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 27, 1995, Ser. No. 579,528

Int. Cl.⁶ H04R *25/00*

U.S. Cl. 381—168 **30 Claims**



1. An acoustic signal receiving apparatus comprising

a housing having an acoustically reflecting surface; and

a directional acoustic sensor unit having a first-order gradient response characteristic, the sensor unit mechanically coupled to the housing with use of a retractable member having a retracted position and an extended position,

such that, when the member is in the extended position, the sensor unit is positioned relative to the reflecting surface wherein acoustic interaction between the sensor unit and the reflecting surface causes an output of the sensor unit to have a second-order gradient response characteristic.

5,748,758

ACOUSTIC AUDIO TRANSDUCER WITH AEROGEL DIAPHRAGM

Lawrence C. Menasco, Jr., 245 E. Surfside Dr., Port Hueneme, Calif. 93041, and Jeffrey W. Menasco, 2340 Carol View Dr. #202 E, Cardiff by the Sea, Calif. 92007

Filed Jan. 25, 1996, Ser. No. 591,723

Int. Cl.⁶ H04R *25/00*

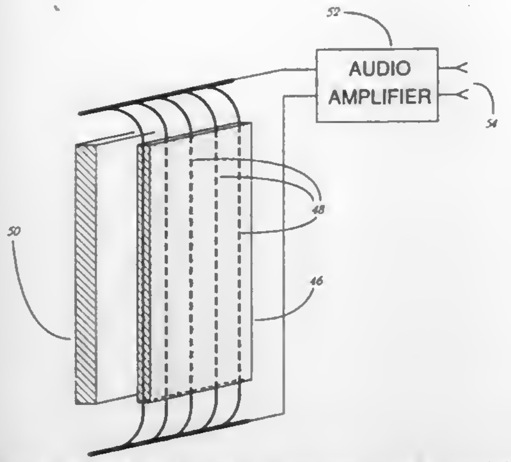
U.S. Cl. 381—176 **8 Claims**

2. A method of converting an acoustic signal to an electrical signal by an acoustic transducer comprising the steps of:

a) an aerogel diaphragm formed from material selected from the group consisting of aerogel and aerogel composites, and having at least one surface for acoustical interface, is induced to physically modulate in correspondence with an acoustic signal,

b) at least one conductor is embedded substantially within the bulk volume of said aerogel diaphragm, said conductor being integral to said bulk volume of said aerogel diaphragm, providing a direct correspondence of movement between said

VOL
210
ISS
1
MY
5
1998
UMI



aerogel diaphragm and said conductor, thereby modulating said embedded conductor in correspondence with said acoustic signal, said conductor also being configured to provide for an electrical field pickup or electrical field sensor or electrical field transducer means to generate an electrical signal in proportion to a change in strength of an electrical field,

c) said embedded conductor within said aerogel diaphragm is placed substantially in the presence of a permanent electrical field selected from the group consisting of magnetic fields and electrostatic fields, said permanent electrical field being held spatially constant in reference to said aerogel diaphragm and said embedded conductor within said aerogel diaphragm,

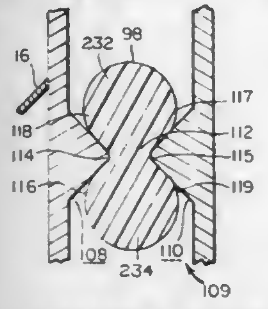
d) said acoustic signal physically modulates said embedded conductor within said aerogel diaphragm, causing said embedded conductor to spatially change position in reference to said permanent electrical field, thereby creating an apparent change in strength of field within said embedded conductor, said embedded conductor acting as said electrical pickup, thereby registers said change in strength of field as an electrical output signal in direct proportion to said acoustic signal.

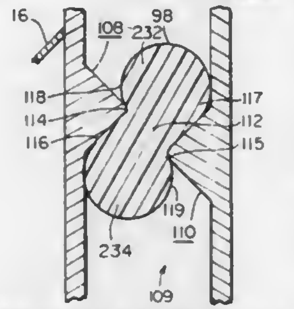
5,748,759
LOUD SPEAKER STRUCTURE
James Joseph Croft, Everett, and Robert C. Williamson, Mountlake Terrace, both of Wash., assignors to Carver Corporation, Lynnwood, Wash.

Filed Apr. 5, 1995, Ser. No. 417,206

Int. Cl.⁶ H04R *25/00*

U.S. Cl. 381—193 **37 Claims**





1. An apparatus for providing lateral support to a surround in a loud speaker, the loud speaker having a frame, a diaphragm and a compliant surround connected between the diaphragm and the frame, the surround having a meniscus formed therein such that the meniscus propagates along the surround as the diaphragm translates relative to the frame, the apparatus comprising:

a first support surface on the frame, the first support surface adjacent the surround and presenting a substantially continuous surface over which the meniscus of the surround will roll in response to the translation of the diaphragm relative to the frame; and

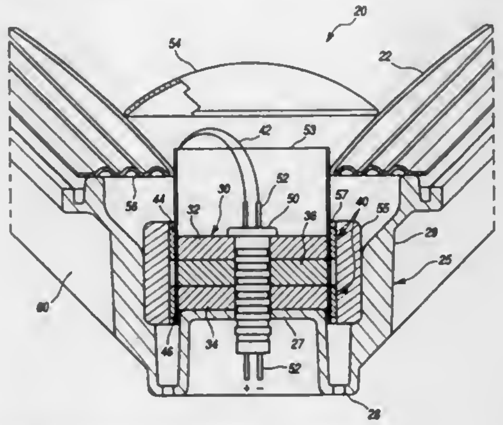
a second support surface attached to the diaphragm for movement therewith, the second support surface adjacent the surround and presenting a substantially continuous surface over which the meniscus of the surround will roll in the response to the translation of the diaphragm relative to the frame.

5,748,760
DUAL COIL DRIVE WITH MULTIPURPOSE HOUSING
Douglas J. Button, Champaign, Ill., assignor to Harman International Industries, Inc., Northridge, Calif.

Continuation of Ser. No. 423,308, Apr. 18, 1995, abandoned. This application Feb. 12, 1997, Ser. No. 798,124

Int. Cl.⁶ H04R *25/00*

U.S. Cl. 381—199 **24 Claims**



1. An electromagnetic transducer comprising:

a cone for producing sound vibrations in the air, said cone having a front and a back surface;

a permanent magnet with a front and a back surface, said magnet being thermally conductive;

a front steel pole plate with a front and a back surface arranged such that the back surface of said front pole plate is face-to-face with the front surface of said magnet;

a rear steel pole plate with a front and a back surface arranged such that the front surface of said rear pole plate is face-to-face with the rear surface of said magnet;

a non-magnetic cylinder, attached to the back surface of said cone and extending annularly around said front and said rear pole plates and said magnet;

a wire comprising a dual coil wrapped around said cylinder, said dual coil comprising a first coil portion wrapped around said cylinder even with said front pole plate and a second coil portion wrapped around said cylinder even with said rear pole plate such that current in each said coil portion flows in opposite directions;

an annular steel outer ring encompassing and flush with each of said front pole plate, said rear pole plate, and said magnet;

a housing providing a frame around said annular outer ring and supplying a pedestal attached to the back surface of said rear pole plate and supporting said rear pole plate, said front pole plate and said magnet;

said magnet and said rear and front pole plates each contain a hole in their respective centers;

a center plug extending axially through the holes in the centers of said magnet and said front and rear pole plates, said wire extending from the back surface of said rear pole plate through said center plug to the front surface of said front pole plate; and

wherein said housing and said outer ring act as a heat sink by providing a path for heat to flow from said outer ring and said rear pole plate into said housing from which housing the heat can dissipate.

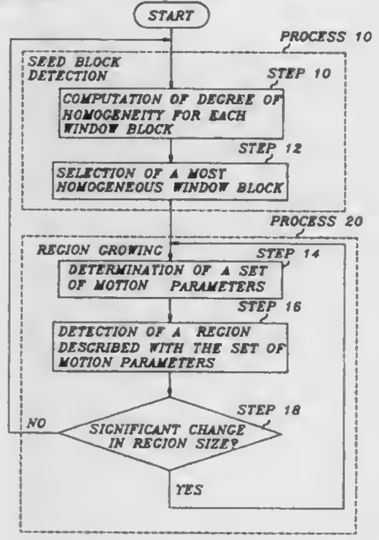
5,748,761
METHOD FOR SEGMENTING AND ESTIMATING A MOVING OBJECT MOTION
Gyu-Hwan Chang; Hae-Mook Jung, both of Seoul; Seong-Dae Kim, Daejeon; Jae-Gark Choi, Deajeon, and Si-Woong Lee, Deajeon, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 13, 1995, Ser. No. 502,229

Claims priority, application Rep. of Korea, Apr. 8, 1995, 95-8177

Int. Cl.⁶ G06T *7/20*

U.S. Cl. 382—107 **4 Claims**


START
PROCESS 10
SEED BLOCK DETECTION
STEP 10
COMPUTATION OF DEGREE OF HOMOGENEITY FOR EACH WINDOW BLOCK
STEP 12
SELECTION OF A MOST HOMOGENEOUS WINDOW BLOCK
PROCESS 20
REGION GROWING
STEP 14
DETERMINATION OF A SET OF MOTION PARAMETERS
STEP 16
DETECTION OF A REGION DESCRIBED WITH THE SET OF MOTION PARAMETERS
STEP 18
NO
SIGNIFICANT CHANGE IN REGION SIZE?
YES

1. A method, for use in an object-oriented analysis-synthesis coder, for segmenting an image, said image containing moving objects, of a current frame into the moving objects therein and describing each motion of the moving objects with a set of motion parameters, said method comprising the steps of:

(a) detecting a moving area having at least one pixel in the current frame by comparing the current frame with a preceding frame;

(b) detecting a motion vector for each pixel in the moving area by comparing the current frame with the preceding frame to generate a motion vector field;

(c) sliding window blocks on the motion vector field and computing the degree of homogeneity for each of the window blocks to select a most homogeneous window block as a seed block, wherein the degree of homogeneity for a window block is computed in accordance with an error function between a given set of motion vectors in the window block and an estimated set of motion vectors obtained from an optimal set of motion parameters for the window block;

(d) determining the optimal set of motion parameters for the seed block to provide a set of initial values;

(e) determining a revised region by a region growing process in the motion vector field, wherein the region growing process evaluates whether each motion vector contained in and around the seed block is describable with the set of initial values;

(f) determining a set of revised values for the set of motion parameters from the revised region;

(g) determining a newly revised region by the region growing process in the motion vector field, wherein the region growing process evaluates whether each motion vector contained in and around the revised region is describable with the set of revised values;

(h) repeating the steps (f) and (g) using the newly revised region until the difference between a current revised region and a previous revised region is less than a predetermined value, to thereby determine a set of final values for the set of motion parameters; and

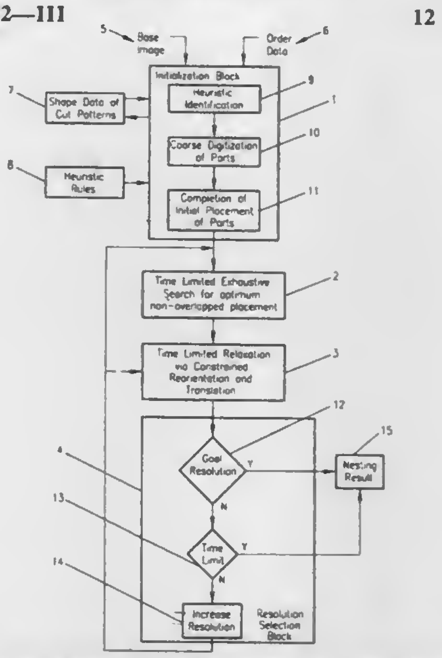
(i) repeating the steps (c) to (h) to determine a set of motion parameters for each of the moving objects.

5,748,762
HIERARCHICAL MULTI-RESOLUTION, MULTI-AGENT PARTS NESTING PROCESS
Allon Guez, 560 Sprague Rd., Penn Valley, Pa. 19072

Filed Mar. 1, 1996, Ser. No. 609,516

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—111 **12 Claims**


5
Base image
Order Data
6
Initialization Block
Heuristic Identification
9
1
7
Shape Data of Cut Patterns
Coarse Digitization of Parts
10
8
Heuristic Rules
Completion of Initial Placement of Parts
11
Time Limited Exhaustive Search for optimum non-overlapped placement
2
Time Limited Relaxation via Constrained Reorientation and Translation
3
12
15
4
Goal Resolution
Y
Nesting Result
N
13
Time Limit
Y
N
14
Increase Resolution
Resolution Selection Block

1. A hierarchical multi-resolution, multi-agent parts nesting process for achieving a local minima of wasted material based on an optimum yield value or a maximization of yield subject to a time limit value and parts and material constraints to obtain a real time final nesting result, comprising the steps of:

I)

(a) transmitting an image of an outline of a piece of material and related data to a processor to provide a low resolution image,

(b) storing a first set of information relating to a plurality of parts to a processor, said first set of information including a number of the plurality of parts to be arranged on the image to be cut from the piece of material and identification means for identifying types of parts to be cut,

(c) providing a die database having a second set of information, the second set of information including a plurality of shapes representing a plurality of dies,

(d) providing a set of heuristic rules, including priority instructions, a desired optimum yield value and a time limit value,

(e) integrating/correlating, via means associated with a processor, the first set of information, the second set of information and the heuristic rules for determining an initial placement of parts at a first gross resolution,

(f) simulating an initial placement of parts at the first gross resolution,

II) performing a search to obtain an optimum non-overlapped placement of the parts on the image based on the resolution by utilizing a time-limited exhaustive search technique; and,

III) performing time-limited relaxation via constrained reorienting and translating of the parts, thereby obtaining an adjusted optimum non-overlapped placement of the parts based on the optimum non-overlapped placement of the parts; and

IV) comparing the adjusted optimum non-overlapped placement of the parts with the desired optimum yield value, and, in response, either:

A) making the adjusted optimum non-overlapped placement of the parts, the final placement of the parts, thereby obtaining a final nesting result, or

VOL
2 10
SS
1
MY
5
998
UMI

- B) comparing the time limit value with a built in timer, and, in response, either:
  - I) making the adjusted placement of the parts the final placement of the parts, thereby obtaining a final nesting result; or
  - ii) (a) adjusting/increasing the resolution, thereby, obtaining a new resolution; and
  - (b) iteratively performing steps II), III) and IV) until a final nesting result is achieved,

wherein the final placement of the parts represents an optimal local minima of wasted material based on the optimum yield value, or represents maximization of yield subject to the time limit value.

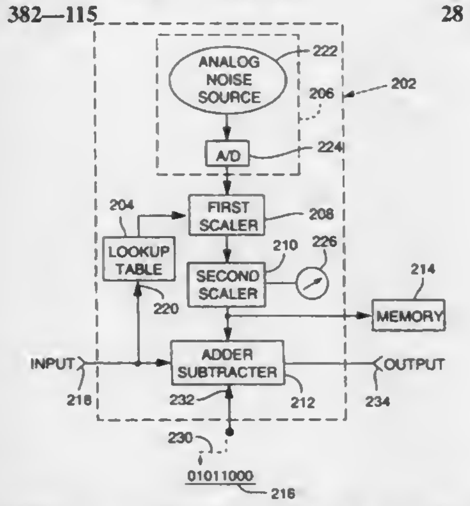
5,748,763
IMAGE STEGANOGRAPHY SYSTEM FEATURING PERCEPTUALLY ADAPTIVE AND GLOBALLY SCALABLE SIGNAL EMBEDDING

Geoffrey B. Rhoads, West Linn, Oreg., assignor to Digimarc Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 154,866, Nov. 18, 1993, abandoned, Ser. No. 215,289, Mar. 17, 1994, abandoned, and Ser. No. 327,426, Oct. 21, 1994. This application May 8, 1995, Ser. No. 436,134

Int. Cl.⁶ G11B *23/28*

U.S. Cl. 382—115 **28 Claims**



1. A method of processing input image data to steganographically encode a multi-bit identification code therein, thereby producing output image data, characterized by:

defining a global scaling parameter;

algorithmically determining, from the input image data, a first parameter for each of a first plurality of portions of the image data, said first parameter relating to the relative capability of said portion to conceal encoding thereof by the identification code;

encoding the identification code through a second plurality of portions of the image data to produce the output image data, said second plurality being a subset of the first plurality, the code in each of said second plurality of portions being encoded in accordance with both the first parameter corresponding to said each portion, and said global scaling parameter;

wherein the relative strength of the identification code through different portions of the output image changes both in accordance with characteristics of the input image, and globally in accordance with a global scale factor.

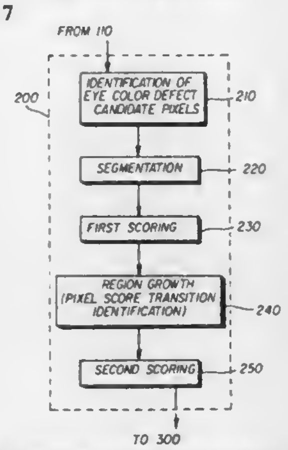
5,748,764
AUTOMATED DETECTION AND CORRECTION OF EYE COLOR DEFECTS DUE TO FLASH ILLUMINATION

Paul J. Benati, Webster; Robert T. Gray, Rochester, and Patrick A. Cosgrove, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 93,843, Jul. 19, 1993, Pat. No. 5,432,863. This application Apr. 3, 1995, Ser. No. 415,864

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—117 **20 Claims**


FROM 110
200
IDENTIFICATION OF EYE COLOR DEFECT CANDIDATE PIXELS
210
SEGMENTATION
220
FIRST SCORING
230
REGION GROWTH (PIXEL SCORE TRANSITION IDENTIFICATION)
240
SECOND SCORING
250
TO 300

1. A method of detecting for eye color defects of a subject in a digital image due to flash illumination, comprising the steps of:

- a) defining a spatial region within the digital image in which one or more eye color defects may exist, which region includes at least a portion of the subject's head;
- b) sampling pixels within such spatial region for their color content and comparing each such sample pixel with a plurality of threshold values which are representative of eye color defects to identify possible eye color defect pixels;
- c) segmenting the identified possible eye color defective pixels into one or more spatially contiguous groups;
- d) calculating a first score for each pixel of each segmented group and for each group based upon a plurality of features including group size, group shape, coloration, and brightness to identify eye color defect group candidates;
- e) selecting a seed pixel based on its score from each identified eye color defect group candidate and determining all the neighboring pixels which are within a predetermined score range of their neighboring pixels and those pixels in a group which represent a significant pixel score transition so that the determined transitions identify the outer boundary of an eye color defect group candidate; and
- f) calculating a second score for each pixel for each eye color defect group candidate based on a plurality of features including group size, group shape, coloration, and brightness to determine an actual eye color defect group.

5,748,765
MODIFYING A DATABASE USING A FINGERPRINT FORM

Harinder S. Takhar, Bemidji, Minn., assignor to Jasper Consulting, Inc., Bemidji, Minn.

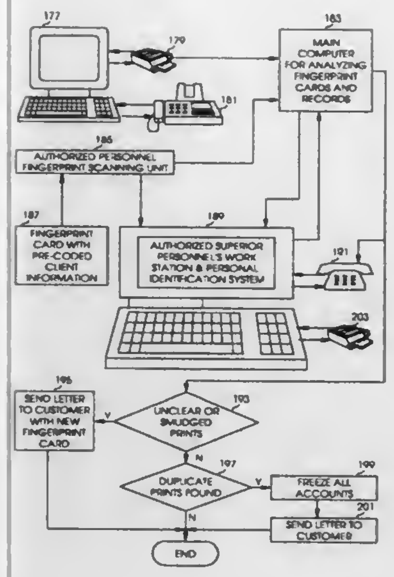
Division of Ser. No. 967,166, Oct. 27, 1992, abandoned. This application May 26, 1994, Ser. No. 249,796

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—124 **4 Claims**

1. A method for adding a user record to a centralized computer database using a fingerprint form comprising the steps of:

- (a) storing user account information in the user record in an electronic format in a computer database file;
- (b) marking the user record as being incomplete;
- (c) generating the fingerprint form by pre-encoding the user account information on the fingerprint form and providing the fingerprint form to a user, wherein the fingerprint form comprises an area for fingerprints;
- (d) obtaining on the fingerprint form a fingerprint from the user;


177
179
183
MAIN COMPUTER FOR ANALYZING FINGERPRINT CARDS AND RECORDS
181
185
AUTHORIZED PERSONNEL FINGERPRINT SCANNING UNIT
187
FINGERPRINT CARD WITH PRE-CODED CLIENT INFORMATION
189
AUTHORIZED SUPERIOR PERSONNEL'S WORK STATION & PERSONAL IDENTIFICATION SYSTEM
191
203
195
SEND LETTER TO CUSTOMER WITH NEW FINGERPRINT CARD
Y
UNCLEAR OR SMUDGED PRINTS
193
N
197
DUPLICATE PRINTS FOUND
Y
199
FREEZE ALL ACCOUNTS
N
201
SEND LETTER TO CUSTOMER
END

- (e) reading and electronically encoding a user fingerprint from the fingerprint form and storing the encoded user fingerprint in an electronic format in the computer database file, and associating the encoded user fingerprint with the encoded user account information in the user record in the computer database file;
- (f) analyzing the user fingerprint, and when the user fingerprint is illegible, notifying the user that the user fingerprint is illegible, providing a replacement fingerprint form to the user, and terminating the method;
- (g) when the user fingerprint is legible, searching and comparing the user fingerprint to all previously stored user fingerprints in the computer database file for a match;
- (h) when there is a match between the user fingerprint and one of the previously stored user fingerprints in the computer database file, marking the user records associated with the user fingerprint and the previously stored user fingerprint as frozen, notifying the associated users, and terminating the method; and
- (i) when there is no match between the user fingerprint and one of the previously stored user fingerprints in the computer database file, marking the user record stored in the computer database file as complete.

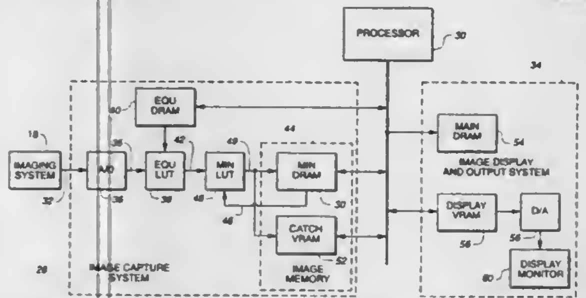
5,748,766
METHOD AND DEVICE FOR REDUCING SMEAR IN A ROLLED FINGERPRINT IMAGE

Daniel Frederick Maase, Campbell, and Thomas Frank Sartor, Sunnyvale, both of Calif., assignors to Identix Incorporated, Sunnyvale, Calif.

Filed Apr. 30, 1996, Ser. No. 640,006

Int. Cl.⁶ G06K *9/00;9/20*

U.S. Cl. 382—124 **22 Claims**



1. A method of reducing smear in a rolled fingerprint image represented by a rolled image array, comprising the steps of:

sequentially generating frames of an optical image signal which includes data values characteristic of light intensities of corresponding locations of an optical image, wherein the optical image includes a fingerprint image of a finger rolling on a surface;

determining, for each frame of the optical image signal, a freeze column representing a line positioned between leading and trailing edges of the fingerprint image and oriented transverse to a direction of roll of the rolling finger;

sequentially updating an interim array that is an accumulation of the frames of the optical image signal and characteristic of an interim image of a rolled fingerprint, a current update of the interim array being formed by reducing pixel values of the interim array by a portion of the difference between corresponding data values from a current frame of the optical image signal and the pixel values of the interim array if the corresponding data values of the current frame of the optical image signal are less than the pixel values of the interim array; and

generating the rolled image array by transferring portions of the interim array to the rolled image array, wherein the transferred portion of the current update of the interim array extends forward in the direction of finger roll from the freeze column determined from a preceding frame of the optical image signal that preceded the current frame of the optical image signal.

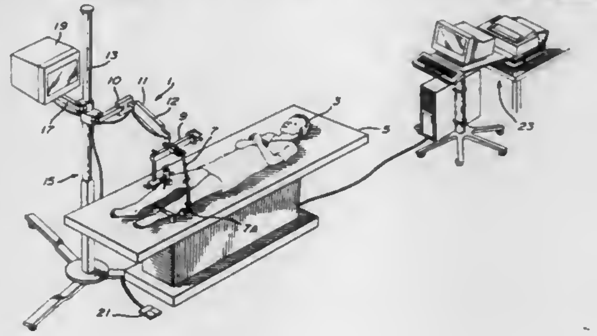
5,748,767
COMPUTER-AIDED SURGERY APPARATUS

Simon Raab, Longwood, Fla., assignor to Faro Technology, Inc., Lake Mary, Fla.

Continuation of Ser. No. 562,213, Jul. 31, 1990, Pat. No. 5,251,127, which is a continuation-in-part of Ser. No. 230,588, Aug. 10, 1988, abandoned, and a continuation of Ser. No. 593,469, Oct. 2, 1990, Pat. No. 5,305,203. This application Aug. 10, 1993, Ser. No. 104,199

Int. Cl.⁶ G06F *159/00*

U.S. Cl. 382—128 **40 Claims**



1. In a computer apparatus for computer aided surgery which assists a medical practitioner in employing a surgical instrument or implant during a surgical procedure being performed on a patient, the improvement comprising:

computer apparatus for converting, in real time, actual imaging data on the position and orientation of the patient to first signals and for converting, in real time, data on the position and orientation of the instrument or implant to second signals where position and orientation of at least one of the patient, instrument or implant is measured in real time; and

a display for simultaneously displaying, in real time, a relationship, based on the first and second signals, between the position and orientation of the patient on which the procedure is to be carried out and the position and orientation of the instrument or implant.

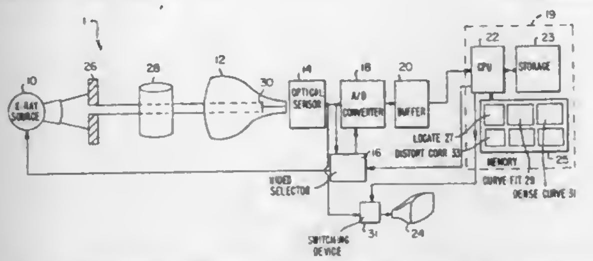
5,748,768

METHOD AND APPARATUS FOR CORRECTING DISTORTION IN AN IMAGING SYSTEM

Erlvada A. Sivers, Lake Oswego, Oreg.; Michael D. Silver, Northbrook, and Bruce M. Drawert, Vernon Hills, both of Ill., assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation of Ser. No. 968,684, Oct. 30, 1992, abandoned.
This application Oct. 7, 1994, Ser. No. 322,024
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—130 **31 Claims**



1. A system for correcting spatial distortions in an imaging system for imaging an object under test, the imaging system including a distortion measuring object and having a plurality of reference point attenuators at predetermined spaced locations in said distortion measuring object, a background measuring object, said correcting system comprising:

means for generating a first image frame of said distortion measuring object with said plurality of reference point attenuators at said locations, said first image frame having representations of said reference point attenuators, said first image frame including spatial distortion;

means for generating a second image frame of said background measuring object;

means for subtracting the two generated image frames to produce a subtracted image frame including spatial distortion; and

means for removing said spatial distortion, including:

means for automatically detecting approximate two-dimensional coordinates of said reference point attenuator representations in said subtracted image frame;

means for obtaining a plurality of smooth curves in two approximately orthogonal directions having curvatures fitted to the reference point attenuator representations;

means for determining refined two-dimensional coordinates in said subtracted image frame by locating intersections of said plurality of smooth curves;

means for generating a correction table including a two-dimensional correction coordinate corresponding to each refined two-dimensional coordinate in said subtracted image frame; and

means for correcting said distortion of an image of the object under test in accordance with said correction coordinates in the correction table, and for providing a corrected image of the object under test.

5,748,769

PATTERN RECOGNITION APPARATUS

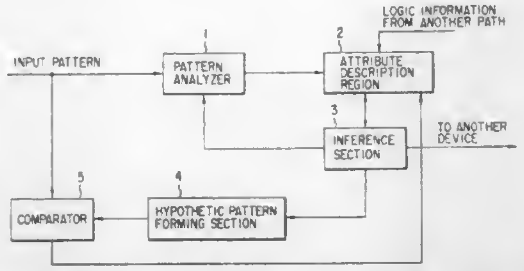
Kazuo Nishimura, Hadano, and Naotake Natori, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 227,626, Apr. 14, 1994, Pat. No. 5,490,223. This application Jul. 13, 1995, Ser. No. 502,173
Claims priority, application Japan, Jun. 22, 1993, 5-150443
Int. Cl.^{6} G06K *9/62*

U.S. Cl. 382—159 **14 Claims**

1. A pattern recognition apparatus comprising:

hypothetic pattern forming means for generating hypothetic patterns according to a generating rule including a hand movement characteristic model in response to an input pattern to be recognized until a hypothetic pattern with a predetermined degree of similarity to the input pattern is generated; and


LOGIC INFORMATION FROM ANOTHER PATH
1
2
INPUT PATTERN
PATTERN ANALYZER
ATTRIBUTE DESCRIPTION REGION
3
INFERENCE SECTION
TO ANOTHER DEVICE
5
4
COMPARATOR
HYPOTHETIC PATTERN FORMING SECTION

means for comparing the input pattern with the hypothetic pattern formed by said hypothetic pattern forming means to determine whether the predetermined degree of similarity has been achieved and to output similarity information when a hypothetic pattern has the predetermined degree of similarity to the input pattern.

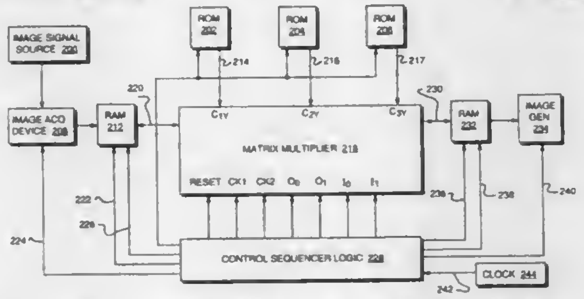
5,748,770

SYSTEM AND METHOD FOR COLOR RECOVERY USING DISCRETE COSINE TRANSFORMS

Ibrahim Hajjahmad, Malden; Michael L. Reisch, Carlisle; F. Richard Soini, Sudbury, and Munib A. Wober, Haverhill, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 159,795, Nov. 30, 1993, abandoned. This application May 15, 1995, Ser. No. 441,000
Int. Cl.^{6} G06K *9/00;* **H04N** *1/415*

U.S. Cl. 382—167 **6 Claims**



1. A color recovery method for use with an input image represented by a grid of pixels each having an actual red, green or blue color component where at least one of the pixels is missing one or more of the actual color components, the color recovery method comprising the steps of:

acquiring an image signal representing the input image;

generating pseudo-pixels offset from actual pixel locations;

for each color channel in each dimension, generating DECT coefficients of said image signal corresponding to the related actual color components by taking a discrete even cosine transformation (DECT) of the related actual color components and generating interpolated color components at each said pseudo-pixel by performing a modified IDECT on said DECT coefficients; and

producing an output image having full color resolution for each said pseudo-pixel by combining said interpolated color components.

5,748,771

LOOK-UP TABLE FORMING METHOD AND DEVICE

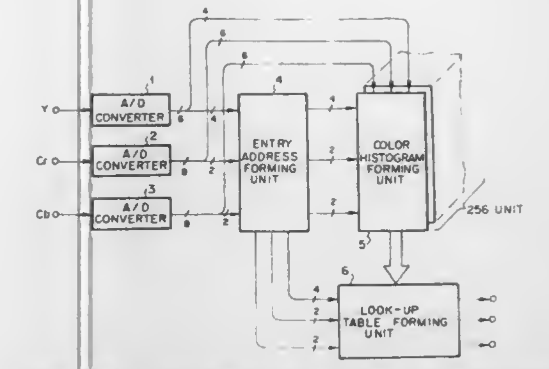
Shirou Fujiwara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1995, Ser. No. 561,898
Claims priority, application Japan, Nov. 24, 1994, 6-288510
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—168 **8 Claims**

1. A look-up table forming method, comprising the steps of:

extracting superordinate bits of brightness data and superordinate bits of each of a pair of color difference data from an image data in which totally (n+m) bits are allocated to both of brightness data and the pair of color difference data of each picture element, thereby forming an entry address of n bits, wherein n and m are positive integers;


4
8
8
1
4
Y
A/D CONVERTER
2
Cr
A/D CONVERTER
3
Cb
A/D CONVERTER
ENTRY ADDRESS FORMING UNIT
COLOR HISTOGRAM FORMING UNIT
256 UNIT
5
6
LOOK-UP TABLE FORMING UNIT

forming a color histogram representing a frequency distribution of a color of m bits on the basis of subordinate bits of the brightness data and subordinate bits of each of the pair of the color difference data in the image data which are roughly classified into 2^n colors;

selecting a color having a maximum frequency in the image data as a representative color for every entry address, respectively, on the basis of the color histogram; and

registering the representative color of every entry address, respectively, to form a look-up table.

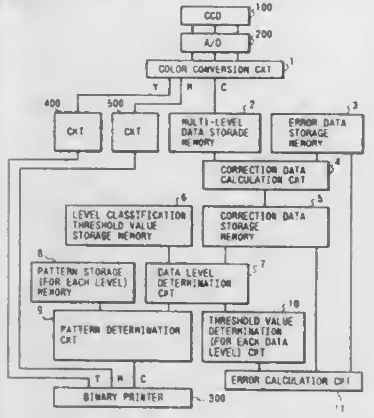
5,748,772

IMAGE PROCESSING METHOD AND APPARATUS INCLUDING AN ERROR CALCULATION FOR CALCULATING A DIFFERENCE BETWEEN THE VALUES OF ERROR CORRECTION DATA AND STORED REPRESENTATIVE VALUES

Takahiro Moro, Shiki; Katsumi Masaki; Ken Onodera, both of Yokohama; Takafumi Sawaki, Kawasaki, and Atsushi Ushiroda, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 276,312, Jul. 18, 1994, abandoned.
This application Feb. 3, 1997, Ser. No. 794,769
Claims priority, application Japan, Jul. 19, 1993, 5-178155
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—167 **8 Claims**


CCD
100
A/D
200
COLOR CONVERSION CKT
1
Y M C
400
500
CKT
CKT
2
MULTI-LEVEL DATA STORAGE MEMORY
3
ERROR DATA STORAGE MEMORY
CORRECTION DATA CALCULATION CKT
4
6
LEVEL CLASSIFICATION THRESHOLD VALUE STORAGE MEMORY
5
CORRECTION DATA STORAGE MEMORY
8
PATTERN STORAGE (FOR EACH LEVEL) MEMORY
DATA LEVEL DETERMINATION CKT
7
9
PATTERN DETERMINATION CKT
10
THRESHOLD VALUE DETERMINATION (FOR EACH DATA LEVEL) CKT
Y M C
ERROR CALCULATION CKT
BINARY PRINTER
300
11

1. An image processing apparatus comprising:

input means for inputting multi-level data;

arithmetic operating means for adding error data to the input multi-level data and for calculating error correction data;

selecting means for inputting the error correction data calculated by said arithmetic operating means and for selecting and outputting a predetermined dot pattern in accordance with the error correction data, the predetermined dot pattern being a dot pattern consisting of a plurality of pixels respectively arranged in two-dimensional directions;

a representative value storage memory in which representative values for each dot pattern have been stored;

error calculating means for calculating a difference between the value of the error correction data and the representative values stored in said representative value storage memory; and

storing means for storing the difference as error data into a memory,

wherein said input means inputs multi-level image data of a plurality of colors and said selecting means selects the dot pattern in which an arrangement of dots differs in accordance with the color of the multi-level image data.

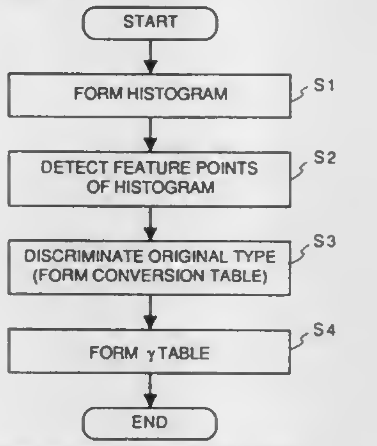
5,748,773

IMAGE PROCESSING APPARATUS

Hirobiko Tashiro; Yoshiyuki Suzuki, both of Yokohama; Hiroyuki Ichikawa; Satoru Kutsuwada, both of Kawasaki; Akio Itoh, Machida, and Yoshinori Abe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 18,391, Feb. 17, 1993, abandoned.
This application Nov. 17, 1994, Ser. No. 343,885
Claims priority, application Japan, Feb. 21, 1992, 4-035023; May 19, 1992, 4-126400
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—169 **18 Claims**


START
FORM HISTOGRAM
S1
DETECT FEATURE POINTS OF HISTOGRAM
S2
DISCRIMINATE ORIGINAL TYPE (FORM CONVERSION TABLE)
S3
FORM γ TABLE
S4
END

1. An image processing apparatus comprising:

first forming means for forming a histogram on the basis of input electrical signals;

detection means for detecting predetermined feature points from the formed histogram;

discrimination means for discriminating an image type of an original represented by the input electrical signals according to the detected predetermined feature points;

second forming means for forming a table for converting signal levels of the electrical signals according to the detected predetermined feature points based on the image type of the original discriminated by said discrimination means; and

selecting means for selecting, from the feature points detected by said detection means, at least one suitable feature point for forming the table in accordance with the image type discriminated by said discrimination means.

5,748,774

IMAGE PROCESSING METHOD AND APPARATUS HAVING A PLURALITY OF IMAGE PROCESSING MODES

Yukio Murata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

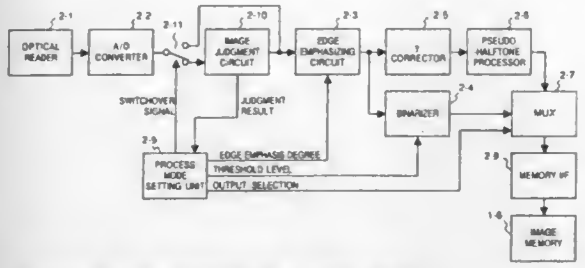
Continuation of Ser. No. 51,553, Apr. 23, 1993. This application May 23, 1995, Ser. No. 448,301
Claims priority, application Japan, Apr. 28, 1992, 4-109571
Int. Cl.^{6} H04N *1/40;1/32;* **G06K** *9/00*

U.S. Cl. 382—181 **46 Claims**

1. An image processing apparatus comprising:

setting means for manually setting at least one of plural kinds of image generation modes in advance of generating image data;

OL
2 10
ISS
1
MY
5
998
MI



input means for inputting an original image;

generation means for generating image data based on the original image input by said input means using either the image generation mode set by said setting means or another image generation mode in which image data suitable for a recognition process is generated;

discriminating means for discriminating whether or not the recognition process is to be applied to the original image input by said input means; and

control means for controlling a changeover of the image generation mode used in said generation means, between the image generation mode set by said setting means and the another image generation mode, in accordance with a discrimination result by said discrimination means, while the image data is generated by said generation means.

5,748,775
METHOD AND APPARATUS FOR MOVING OBJECT EXTRACTION BASED ON BACKGROUND SUBTRACTION

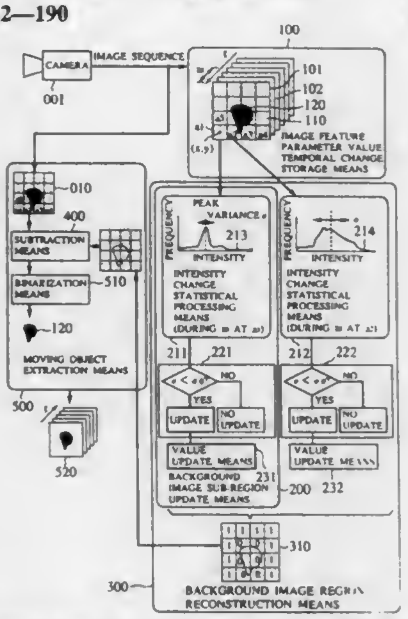
Megumu Tsuchikawa; Atsushi Sato; Akira Tomono, and Kenichiro Ishii, all of Kanagawaken, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,972

Claims priority, application Japan, Mar. 9, 1994, 6-037438; Feb. 17, 1995, 7-029220

Int. Cl.^{6} G06K *9/00;9/46*

U.S. Cl. 382—190 **40 Claims**


100
CAMERA
IMAGE SEQUENCE
001
101
102
120
110
(x,y)
IMAGE FEATURE PARAMETER VALUE TEMPORAL CHANGE STORAGE MEANS
010
400
SUBTRACTION MEANS
BINARIZATION MEANS
510
120
MOVING OBJECT EXTRACTION MEANS
500
520
PEAK
VARIANCE
213
FREQUENCY
INTENSITY
INTENSITY CHANGE STATISTICAL PROCESSING MEANS (DURING = AT a1)
214
INTENSITY CHANGE STATISTICAL PROCESSING MEANS (DURING = AT a2)
211
221
212
222
NO
YES
UPDATE
NO UPDATE
VALUE UPDATE MEANS
231
232
BACKGROUND IMAGE SUB-REGION UPDATE MEANS
200
310
300
BACKGROUND IMAGE REGION RECONSTRUCTION MEANS

1. A method of moving object extraction based on background subtraction, comprising the steps of:

(a) sequentially entering input images containing a moving object region to be extracted;

(b) storing temporal changes of image feature parameter values for sub-regions subdividing a frame of each input image entered at the step (a);

(c) statistically processing a temporal change of the image feature parameter values for each sub-region within a prescribed target region of the frame stored at the step (b) over a prescribed period of time t_0 to obtain at least one statistical quantity characterizing said temporal change, judging whether said temporal change is due to an illumination change or not according to said statistical quantity and a prescribed illumination change judging condition, and updating a background image value for said each sub-region by a new background image value according to the image feature parameter values for said each sub-region during the prescribed period of time t_0, so as to obtain a reconstructed background image;

(d) applying a subtraction processing to one of the input images entered at the step (a) and the reconstructed background image obtained at the step (c) to obtain a subtraction image; and

(e) applying a binarization processing to the subtraction image obtained at the step (d) to extract the moving object region from the input images entered at the step (a).

5,748,776
FEATURE-REGION EXTRACTION METHOD AND FEATURE-REGION EXTRACTION CIRCUIT

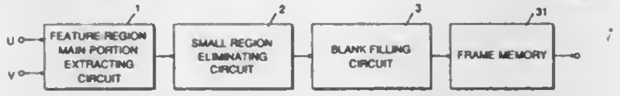
Shigeo Yoshida, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 276,205, Jul. 18, 1994, abandoned. This application Jul. 5, 1996, Ser. No. 675,810

Claims priority, application Japan, Jul. 19, 1993, 5-178250; Dec. 22, 1993, 5-323709

Int. Cl.^{6} G06K *9/46;9/66;9/00;9/34*

U.S. Cl. 382—195 **7 Claims**


1
2
3
31
U
V
FEATURE REGION MAIN PORTION EXTRACTING CIRCUIT
SMALL REGION ELIMINATING CIRCUIT
BLANK FILLING CIRCUIT
FRAME MEMORY

1. A method of extracting a feature-region from a color image for purposes of image transmission in a transmission system having finite transmission capacity, comprising the steps of:

defining a color difference coordinate system having two axes, and representing each pixel of said color image by two respective color difference signals in said system;

identifying at least one region of contiguous pixels, based on whether their color difference signal values fall within a predetermined value range, as a small color difference region defined within said color difference coordinate system;

extracting an image region having color difference signals within said color difference region as the feature-region to which to apply preferential treatment, compared to a remaining portion of said color image; and

allocating a greater part of said finite information transmission capacity to said extracted feature-region as said preferential treatment, and a remaining part of said capacity to a non-extracted portion of said color image.

5,748,777
APPARATUS AND METHOD FOR EXTRACTING OUTLINE DATA AND ENCODING IMAGE DATA USING THE OUTLINE DATA

Akihiro Katayama; Yoshihiro Ishida, and Junichi Yamakawa, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 8,609, Jan. 22, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 377,509

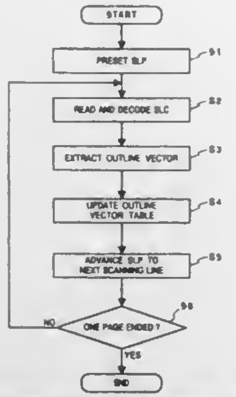
Claims priority, application Japan, Jan. 24, 1992, 4-010790; Apr. 30, 1992, 4-111750

Int. Cl.^{6} G06K *9/48;9/52*

U.S. Cl. 382—199 **40 Claims**

1. An outline data extraction apparatus for processing a raster-scan signal representing an image, and producing a signal representative of an outline of the image, said apparatus comprising:

input means for inputting image data including black and white pixels in a raster scanning form, in units of one scan line of image data;



a processor comprising extraction means for extracting vector data surrounding each black pixel in each scan line of the image data input by said input means, wherein said extracted vector data for each black pixel comprises a plurality of outline vectors surrounding each black pixel and incoming and outgoing vectors for each of said outline vectors, wherein an incoming vector of one of said outline vectors has an end point which is a start point of said one of said outline vectors, and wherein an outgoing vector of one of said outline vectors has a start point which is an end point of said one of said outline vectors

storage means for storing the vector data extracted by said extraction means into an outline vector table;

wherein said processor further comprises updating means for updating the incoming and outdoing vectors in the outline vector table for each of said outline vectors, both in the case when two incoming and outgoing vectors are present in the outline vector table for one of the outline vectors, and in the case when a vector in the outline vector table overlaps one of the outline vectors; and

a memory for registering the updated incoming and outgoing vectors stored in the outline vector table and outputting the updated outline vector table.

5,748,778
IMAGE PROCESSING APPARATUS AND METHOD

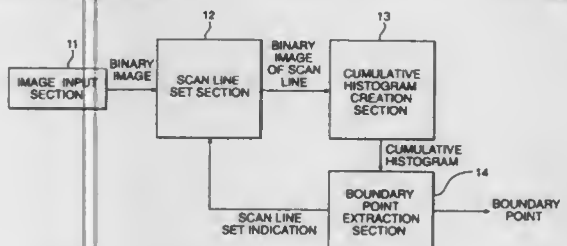
Kazunori Onoguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Sep. 5, 1995, Ser. No. 523,428

Claims priority, application Japan, Sep. 8, 1994, 6-214365

Int. Cl.^{6} G06K *9/00;9/48*

U.S. Cl. 382—199 **12 Claims**



1. Image processing apparatus, comprising:

scan line set means for arbitrarily setting a scan line on a binary image;

cumulative histogram creation means for examining each pixel on the scan line of the binary image and for creating a cumulative histogram display having a first axis representing a pixel position in the scan line and a second axis perpendicular to the first axis representing a cumulative value;

means for adding a predetermined value to the cumulative value on the second axis whenever a black pixel is detected on the scan line, wherein a position of the cumulative value corresponds to the pixel position on the scan line of the first axis; and

boundary point extraction means for extracting a pixel position on the scan line of the first axis corresponding to a point on a curve of the histogram, the histogram moving from a relatively flat part to a monotone increasing part at a predetermined angle with respect to a direction of the flat part and for detecting a point corresponding to the extracted pixel position from the binary image when a length of the relatively flat part is above a first threshold value and a length of the monotone increasing part is above a second threshold value, wherein the detected point is a boundary point which indicates a transition from the white pixel area to the black pixel area of the binary image.

5,748,779
METHOD AND APPARATUS FOR INPUTTING HANDWRITTEN ALPHANUMERIC CHARACTERS AND FOR DISPLAYING THE INPUT CHARACTERS

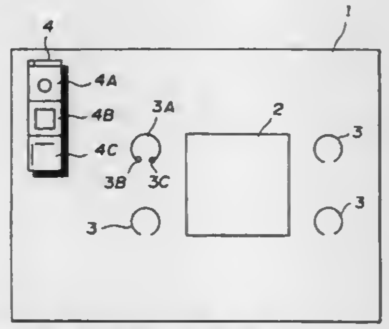
Katsuhiko Sakaguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 450,101, May 25, 1995, abandoned, which is a continuation of Ser. No. 93,952, Jul. 21, 1993, abandoned. This application Jun. 13, 1997, Ser. No. 874,545

Claims priority, application Japan, Jul. 31, 1992, 4-205105

Int. Cl.^{6} G06K *9/46*

U.S. Cl. 382—203 **25 Claims**



1. A figure input apparatus comprising:

coordinate input means for inputting coordinate points corresponding to a plurality of loci;

storage means for storing pixel data corresponding to said coordinate points input by said coordinate input means;

display means for displaying the plurality of loci;

selecting means for selecting one of the plurality of loci displayed on the display means;

input means for assigning a type of figure to the selected locus;

correct figure forming means for forming a correct figure by calculating characteristic points corresponding to the stored pixel data of the selected locus and based on the type of assigned figure; and

output means for outputting the formed correct figure.

5,748,780
METHOD AND APPARATUS FOR IMAGING, IMAGE PROCESSING AND DATA COMPRESSION

Salvatore J. Stolfo, 80 Kenilworth Rd., Ridgewood, N.J. 07450

Continuation-in-part of Ser. No. 224,273, Apr. 7, 1994. This application Jun. 14, 1994, Ser. No. 259,527

Int. Cl.^{6} G06K *9/36*

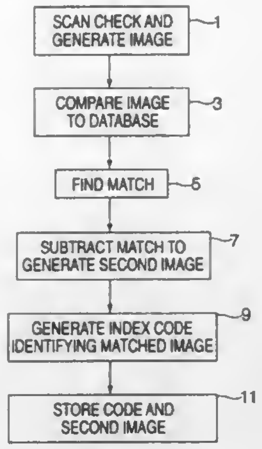
U.S. Cl. 382—232 **34 Claims**

1. A method for processing an image from a document, said method comprising the steps of:

(a) scaning the document, said scanning including creating a first digital image corresponding to said image on said document;

(b) searching a codebook comprising a plurality of stored digital images for one of said stored digital images which is present in at least a portion or portions of said first digital image;

VOL
210
ISS
1
MY
5
1998
UMI


SCAN CHECK AND GENERATE IMAGE
1
COMPARE IMAGE TO DATABASE
3
FIND MATCH
5
SUBTRACT MATCH TO GENERATE SECOND IMAGE
7
GENERATE INDEX CODE IDENTIFYING MATCHED IMAGE
9
STORE CODE AND SECOND IMAGE
11

(c) producing and storing an electronic index code that identifies said one of said stored digital images as being present in said at least a portion or portions of said first digital image;

(d) generating a second digital image comprising the portion or portions of said first digital image that are not present in said one of said stored digital images by separating said stored digital image from said first digital image; and

(e) preserving said second digital image, said stored electronic index code, and said codebook in a form such that said first digital image can be reproduced from the combination of said second digital image and said stored digital image.

5,748,781

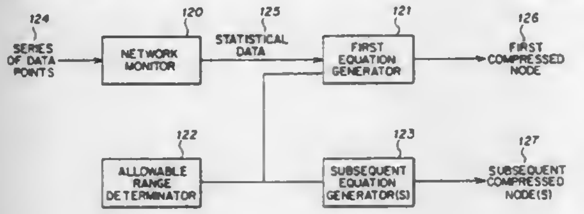
METHOD AND APPARATUS FOR DIGITAL DATA COMPRESSION

Utpal Datta, Bedford, and David G. Carlson, Nashua, both of N.H., assignors to Cabletron Systems, Inc., Rochester, N.H.

Filed Jan. 4, 1995, Ser. No. 368,414

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—232 **27 Claims**



12. A method for compressing data with a plurality of accuracies, comprising the steps of:

receiving original data;

storing the original data in a first compressed format having a first accuracy level;

storing the original data in a second compressed format having a second accuracy level;

reproducing the original data from the first compressed format, to create a first reproduced data set;

reproducing the original data from the second compressed format, to create a second reproduced data set; and

displaying the first reproduced data set and the second reproduced data set concurrently.

5,748,782

DEVICE FOR IMPLEMENTING A MESSAGE SIGNATURE SYSTEM AND CHIP CARD COMPRISING SUCH A DEVICE

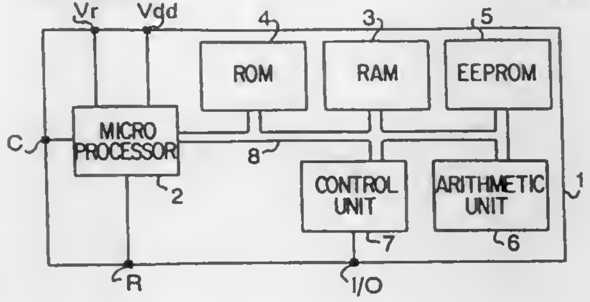
Ronald Ferreira, Paris, and Joseph Hoppe, Les Molieres, both of France, assignors to De La Rue Cartes Et Systems SAS, Paris, France

Filed Mar. 28, 1995, Ser. No. 412,172

Claims priority, application France, Mar. 30, 1994, 94 03773

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—232 **22 Claims**



1. A device for implementing message signature functions and signature authentication functions for signed messages in an RSA-type protected data exchange system, comprising:

an input source that receives an input; means for inhibiting using the message signature and the signature authentication functions for application to the input; and

means for comparing each message to be signed with a predetermined structure required for all coherent messages and for inhibiting the signature of a message which does not comply with said predetermined structure.

5,748,783

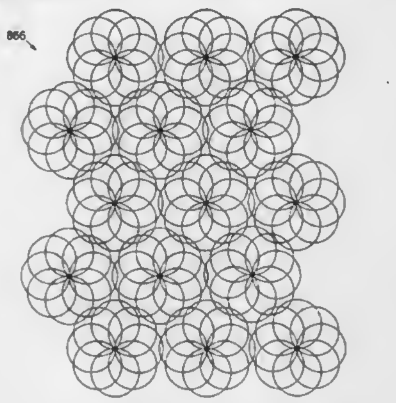
METHOD AND APPARATUS FOR ROBUST INFORMATION CODING

Geoffrey B. Rhoads, West Linn, Oreg., assignor to Digimarc Corporation, Portland, Oreg.

Filed May 8, 1995, Ser. No. 436,102

Int. Cl.^{6} G06T *9/00*

U.S. Cl. 382—232 **27 Claims**



QUEST FOR MOSAICED KNOT PATTERNS WHICH "COVER" AND ARE COEXTENSIVE WITH ORIGINAL IMAGE.
ALL ELEMENTAL KNOT PATTERNS CAN CONVEY THE SAME INFORMATION, SUCH AS A SIGNATURE, OR EACH CAN CONVEY A NEW MESSAGE IN A STEGANOGRAPHIC SENSE

1. In a method of steganographically processing an image signal to embed multi-bit information therein, an improvement comprising representing said information in the form of a plurality of partially overlapping quasi-rotationally symmetric patterns, and processing the image signal to imperceptibly enabled said plurality of partially overlapping quasi-rotationally symmetric patterns therein, wherein said quasi-rotational symmetry of the patterns facilitates detection of the multi-bit information from a resulting processed image signal if said processed image signal is corrupted by scaling or rotation operations.

5,748,784

MOVING IMAGE SIGNAL CODING APPARATUS AND CODED SIGNAL DECODING APPARATUS

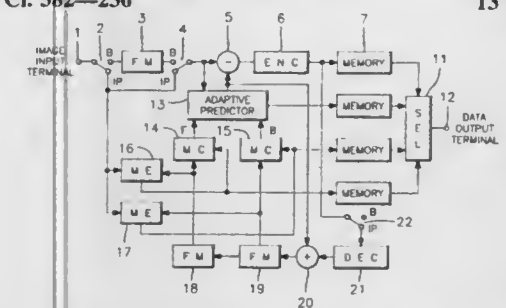
Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 324,481, Oct. 18, 1994, abandoned, which is a continuation of Ser. No. 972,564, Nov. 6, 1992, abandoned. This application Jun. 17, 1996, Ser. No. 666,687

Claims priority, application Japan, Nov. 8, 1991, 3-321368

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—236 **13 Claims**



1. A coding apparatus for coding moving image signals into block units, comprising:

image processing means for performing motion compensation between a plural number of frames in each block of a plurality of blocks which constitute one image screen, thereby outputting motion vector data, inter-image processing data indicative of what inter-image processing is performed, and image data, respectively;

a plurality of data memory means for storing multiple types of said motion vector data, said inter-image processing data, and said image data; and

transfer means for time division multiplexing said multiple types of said motion vector data, said inter-image processing data, and said image data, such that said multiple types of said motion vector data for a group of blocks are time multiplexed together in one time division, the inter-image processing data for said group of blocks is time multiplexed together in another time division, and said image data for said group of blocks is time multiplexed to a further time division, and thereby transferring the multiplexed data.

5,748,785

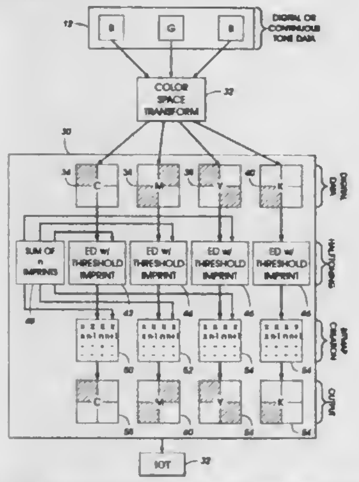
INTER-SEPARATION COLOR IMAGE PROCESSING USING ERROR DIFFUSION

David A. Mantell, Rochester, and Reiner Eschbach, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 720,257

Int. Cl.^{6} G06T *5/00;* **H04N** *1/405;1/52*

U.S. Cl. 382—237 **20 Claims**



1. A method for processing an input image including a plurality of input pixels each having a first number of possible input levels of optical density to form an output image including a plurality of separations each including a plurality of output pixels each having a second number of possible output levels of optical density, comprising:

generating a first threshold reference signal as a function of the output levels of optical density of a plurality of corresponding pixels each being selected from one of the plurality of separations;

modifying a current one of the plurality of input pixels in a current one of the plurality of separations in accordance with an error signal derived by processing previous ones of pixels in the current one of the plurality of separations;

generating a second threshold reference signal; and

forming one of the output pixels by comparing the modified current one of the plurality of input pixels to the generated first threshold reference signal and the generated second threshold reference signal.

5,748,786

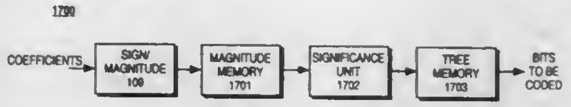
APPARATUS FOR COMPRESSION USING REVERSIBLE EMBEDDED WAVELETS

Ahmad Zandi, Cupertino, Calif.; James D. Allen, Thailand THX; Edward L. Schwartz, Sunnyvale, and Martin Boliek, San Francisco, both of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Filed Sep. 21, 1994, Ser. No. 310,146

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—240 **29 Claims**



1. A coder for encoding a plurality of data symbols comprising:

a wavelet transform;

a formatting unit coupled to receive a plurality of coefficients from the wavelet transform and to format the plurality of coefficients into a set of formatted coefficients;

a magnitude memory coupled to receive the set of formatted coefficients and configured to reorder coefficients in trees into an order based on significance, wherein the magnitude memory comprises

a plurality of storage areas, wherein each of the plurality of storage areas stores data for a distinct significance level,

a plurality of counters, wherein each of the plurality of counters is associated with one of the plurality of storage areas and counter values for each of the plurality of counters provide address locations in the plurality of storage areas for storage of the formatted coefficients and are incremented after storing an individual formatted coefficient;

a significance unit coupled to the formatting unit to generate a plurality of decisions in response to each of the set of formatted coefficients;

a memory mechanism coupled to receive the plurality of decisions from the significance unit; and

a coder coupled to the memory mechanism and configured to encode data.

5,748,787

HIERARCHY TYPE ENCODING/DECODING APPARATUS

Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 83,188, Jun. 29, 1993, abandoned. This application May 22, 1995, Ser. No. 446,319

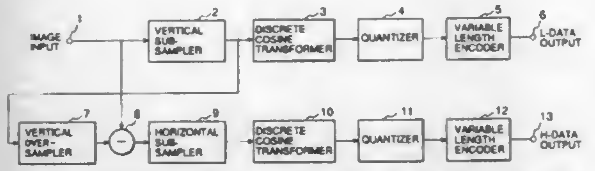
Claims priority, application Japan, Jun. 29, 1992, 4-194975

Int. Cl.^{6} G06T *9/00*

U.S. Cl. 382—240 **6 Claims**

1. A hierarchical encoding apparatus for hierarchically encoding an image, comprising

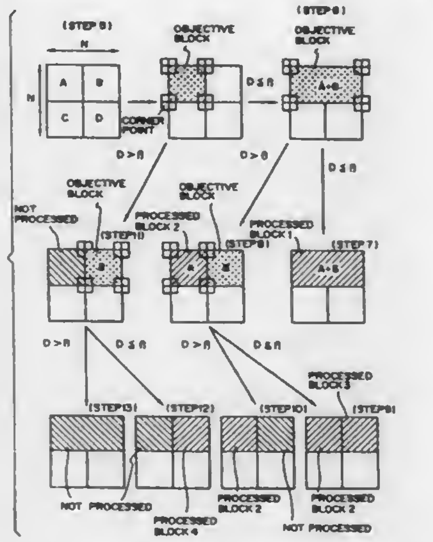
/OL
2 10
SS
1
MY
5
998
JMI



first sub-sampling means for sub-sampling an input signal in a first direction of two directions consisting of a vertical direction and a horizontal direction, to output a first coded signal containing a number of signal samples which is fewer than a number of signal samples in said input signal;
first encoding means for encoding said first coded signal to output first coded data;
first over-sampling means for interpolating said first coded signal in said first direction to output an over-sample signal containing the same number of signal samples as said input signal;
first subtracting means for subtracting said over-sample signal from said input signal to output a differential signal;
second sub-sampling means for sub-sampling said differential signal in the other direction of said two directions, to output a second coded signal having the same number of signal samples as said first coded signal; and
second encoding means for encoding said second coded signal to output second coded data.

5,748,788
IMAGE PROCESSING METHOD AND APPARATUS

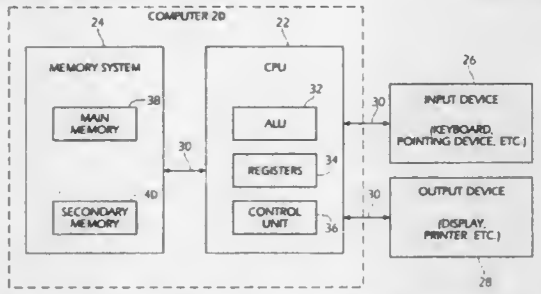
Takahiro Moro, Shiki, Japan, assignor to Cannon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 127,505, Sep. 28, 1993, abandoned. This application Aug. 28, 1996, Ser. No. 704,379
Claims priority, application Japan, Sep. 29, 1992, 4-259259
Int. Cl.^{6} G06K *9/36*
U.S. Cl. 382—243 **12 Claims**



1. An image processing method comprising the steps of:
inputting image data encoded in blocks of a first block size;
decoding the input image data so as to obtain decoded image data;
detecting an edge in the image data based on the decoded image data;
identifying a block of the decoded image data on the basis of a detection result in said detecting step, wherein the block identified in said identifying step has a second block size different from the first block size; and
eliminating a block distortion caused by encoding image data in blocks of the first block size, by correcting the decoded image data in the block identified in said identifying step.

5,748,789
TRANSPARENT BLOCK SKIPPING IN OBJECT-BASED VIDEO CODING SYSTEMS

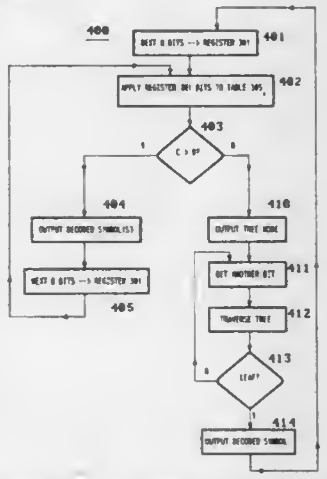
Ming-Chieh Lee, Bellevue, and Wei-ge Chen, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.
Filed Oct. 31, 1996, Ser. No. 741,949
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—243 **18 Claims**



1. In an object-based video coding method, a method for reducing coding overhead comprising:
separately encoding video objects in a sequence of video frames including:
separately encoding shape for each of the objects,
separately encoding texture for each of the objects, and
while coding texture for a first object, evaluating the shape of the first object to determine whether a transformation block in the first object is transparent based on the shape for the first object, and if so, then skipping texture coding for the transformation block; and
separately decoding video objects in the sequence of video frames including:
separately decoding shape for each of the objects,
separately decoding texture for each of the objects, and
while decoding texture for a first object, evaluating whether a transformation block in the first object is transparent based on the shape of the first object, and if so, then skipping texture decoding for the transformation block.

5,748,790
TABLE-DRIVEN STATISTICAL DECODER

Stuart J. Golin, East Windsor, N.J., assignor to Intel Corporation, Santa Clara, Calif.
Filed Apr. 5, 1995, Ser. No. 417,381
Int. Cl.^{6} G06K *9/36;9/46;* **H03M** *7/00;7/40*
U.S. Cl. 382—246 **16 Claims**

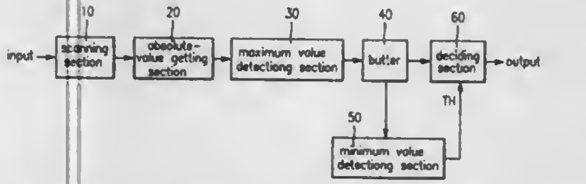


1. A computer-implemented method for decoding code words of an encoded bitstream associated with a variable-length code, the method comprising the steps of:
(a) forming with a processor a byte having BS bits in accordance with bits of the encoded bitstream and in accordance with any unused bits remaining after decoding a previous code word;

(b) applying the byte to a table means;
(c) if the byte comprises at least one complete code word, then:
(1) producing with the table means at least one decoded symbol corresponding to the at least one complete code word; and
(2) determining a plurality of unused bits comprised of bits of the byte not within the at least one complete code word; and
(d) if the byte does not comprise at least one complete code word, then:
(1) producing with the table means a node of a binary tree associated with the variable-length code in accordance with the byte, and
(2) traversing the binary tree starting from the node until a decoded symbol is produced.

5,748,791
APPARATUS FOR DECIDING DCT BLOCK CLASSES IN A DVCR

Yong Cheol Park, Kyungki-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea
Filed Jun. 3, 1996, Ser. No. 660,202
Claims priority, application Rep. of Korea, Jun. 14, 1995, 15712/1995
Int. Cl.^{6} G06K *9/36;9/46*
U.S. Cl. 382—250 **8 Claims**

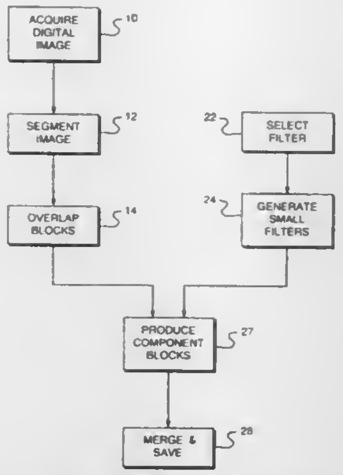

10
20
30
40
60
input
scanning section
absolute-value getting section
maximum value detectiong section
buffer
deciding section
output
TH
50
minimum value detectiong section

1. An apparatus for deciding DCT block classes in a DVCR comprising:
scanning & absolute-value getting means for scanning AC coefficients among coefficients of respective DCT blocks, and taking absolute values for said AC coefficients;
maximum value detecting means for sequentially comparing said AC coefficients of respective DCT blocks taking said absolute values in said scanning & absolute-value getting means, and obtaining the maximum values of respective DCT blocks;
minimum value detecting means for comparing respective maximum values of said plurality of DCT blocks obtained in said maximum value detecting means, and obtaining the minimum values; and
deciding means for comparing outputs of said minimum value detecting means as threshold values with outputs of maximum value detecting means, and determining said classes with respect to said DCT blocks.

5,748,792
LARGE KERNEL FILTERING USING A FIXED-SIZE BLOCK PROCESSOR

Munib A. Wober, Haverhill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Aug. 13, 1996, Ser. No. 696,172
Int. Cl.^{6} G06T *9/00;* **H04N** *1/415*
U.S. Cl. 382—250 **12 Claims**

1. A method for filtering a digital image, comprising the steps of:
segmenting said image into data blocks of a predetermined size;
overlapping adjacent said data blocks by a predetermined number of pixels;
providing a preselected filter kernel;
generating small filters by processing a preselected group of components of said filter kernel;



applying each said small filter to each said overlapped data block to produce component data blocks;.
merging and saving said component data blocks into filtered said data blocks according to a predetermined specific criteria, said filtered data blocks representing the filtered digital image.

2. A method for filtering a digital image, comprising the steps of:
segmenting said image into data blocks of a predetermined size;
overlapping adjacent said data blocks by a predetermined number of pixels;
generating DCT blocks by performing a discrete cosine transform (DCT) on each said overlapped data block;
providing a preselected filter kernel;
generating small filters by processing a preselected group of components of said filter kernel;
generating DOCT filters by performing a discrete odd cosine transformation (DOCT) on each said small filter;
generating mask multiplied blocks by mask multiplying each DCT block times each DOCT filter;
generating IDCT blocks by performing an inverse discrete cosine transform (IDCT) on each said mask multiplied block; and
merging and saving said IDCT blocks into filtered data blocks according to a predetermined specific criteria, said filtered data blocks representing the filtered digital image.

3. A method for filtering a digital image, comprising the steps of:
segmenting said image into data blocks of a predetermined size;
overlapping adjacent said data blocks by a predetermined number of pixels to generate overlapped blocks;
providing a large filter having predetermined large filter coefficients, said large filter represented by a large filter kernel having predetermined degrees of freedom;
generating a number of small filters, having small filter coefficients, to emulate said large filter by establishing a mathematical relationship between said large filter coefficients and said small filter coefficients;
producing component data blocks by point-by-point filtering of said overlapped blocks with said small filters; and
emulating filtering of the image with said large filter by combining said component data blocks.

8. An apparatus for filtering a digital image, comprising:
means for segmenting the image into data blocks of a predetermined size;
means for overlapping adjacent said data blocks by a predetermined number of pixels to generate overlapped blocks;
means for providing a large filter having predetermined large filter coefficients, said large filter represented by a large filter kernel having predetermined degrees of freedom;
means for generating a number of small filters, having small filter coefficients, to emulate said large filter by establishing a mathematical relationship between said large filter coefficients and said small filter coefficients;
means for producing component data blocks by point-by-point filtering of said overlapped blocks with said small filters; and
means for emulating filtering of the image with said large filter by combining said component data blocks.

OL
2 10
SS
1
MY
5
998
MI

5,748,793
QUICK IMAGE PROCESSOR OF REDUCED CIRCUIT SCALE WITH HIGH IMAGE QUALITY AND HIGH EFFICIENCY

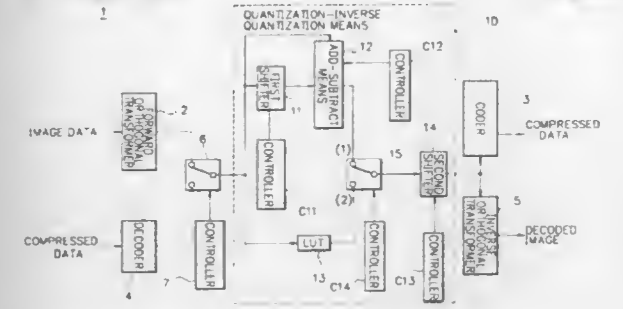
Tatsuya Sanpei, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1994, Ser. No. 312,511

Claims priority, application Japan, Sep. 28, 1993, 5-240971

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—251 **9 Claims**



1. An image processor carrying out a compression and an expansion of image data, comprising:

forward orthogonal transforming means for carrying out an orthogonal transform of image data for every data block to output first data;

decoding means for decoding compressed data to output second data;

quantization-inverse quantization means for carrying out either a quantization of the first data using quantization steps according to frequency components for coding to output third data or an inverse quantization of the second data using the quantization steps for decoding to output fourth data;

coding means for coding the third data to output compressed data; and

inverse orthogonal transforming means for carrying out an inverse orthogonal transform of the fourth data to output a decoded image,

the quantization-inverse quantization means including

first shifting means for carrying out a predetermined bit number shift of input data fed to the quantization-inverse quantization means;

add-subtract means for either adding or subtracting an output of the first shifting means to or from the input data;

look-up table means for storing multiplied input data according to a multiple determined by the predetermined bit number shift of the first shifting means and the adding or the subtracting of the add-subtract means; and

second shifting means for carrying out a predetermined bit number shift of an output of either the add-subtract means or the look-up table means.

5,748,794
IMAGE PROCESSING DEVICE

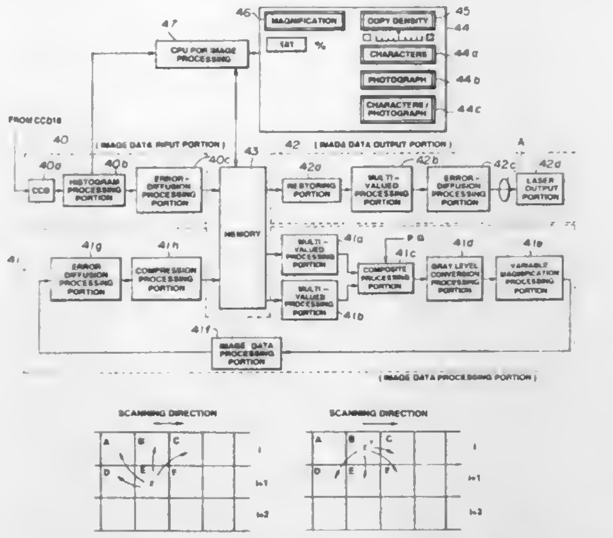
Hiroshi Maeda, Kashihara; Tatsuya Itoh, Nara, and Masatsugu Nakamura, Kashiba, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 152,975, Nov. 16, 1993. This application May 24, 1995, Ser. No. 449,542

Claims priority, application Japan, Nov. 24, 1992, 4-336642; Nov. 30, 1992, 4-345393; Mar. 10, 1993, 5-077712

Int. Cl.^{6} H04N *1/40*

U.S. Cl. 382—251 **10 Claims**


47
CPU FOR IMAGE PROCESSING
46
MAGNIFICATION
141 %
COPY DENSITY
CHARACTERS
PHOTOGRAPH
CHARACTER/PHOTOGRAPH
45
44
44a
44b
44c
FROM CCD18
40
IMAGE DATA INPUT PORTION
42
IMAGE DATA OUTPUT PORTION
A
40a
40b
40c
CCD
HISTOGRAM PROCESSING PORTION
ERROR-DIFFUSION PROCESSING PORTION
43
MEMORY
42a
RESTORING PORTION
MULTI-VALUED PROCESSING PORTION
ERROR-DIFFUSION PROCESSING PORTION
42c
42d
LASER OUTPUT PORTION
41
41g
41h
ERROR DIFFUSION PROCESSING PORTION
COMPRESSION PROCESSING PORTION
MULTI-VALUED PROCESSING PORTION
41a
41c
COMPOSITE PROCESSING PORTION
GRAY LEVEL CONVERSION PROCESSING PORTION
VARIABLE MAGNIFICATION PROCESSING PORTION
41d
41e
41f
41b
IMAGE DATA PROCESSING PORTION
IMAGE DATA PROCESSING PORTION
SCANNING DIRECTION
SCANNING DIRECTION
A
B
C
D
E
F
i
i+1
i+2

1. An image processing apparatus comprising:

fixed mode setting means for setting fixed thresholds of low gradational level for digital image data of high gradation representing an image and for setting fixed quantizing values on the basis of the fixed thresholds;

variable mode setting means for setting variable thresholds of low gradational level for the digital image data representing the image in accordance with image quality and for setting variable quantizing values on the basis of the variable thresholds;

mode selection means for selecting either a fixed mode or a variable mode for processing the digital image data representing the image;

gray level processing means for (a) quantizing all the digital image data representing the image using the fixed thresholds and the fixed quantizing values when the fixed mode is selected by said mode selection means and quantizing all the digital image data representing the image using the variable thresholds and the variable quantizing values when the variable mode is selected by said mode selection means, to provide quantized digital image data, (b) determining an error value between the digital image data representing the image and the quantized digital image data, and (c) distributing the error value of each attentional pixel of the quantized digital image data representing the image between pixels adjacent thereto; and

scanning means for scanning the image to provide the digital image data representing the image, the digital image data being provided by said scanning means with sampled white image data scanned from a reference white document,

said variable mode setting means determining a difference in a white level of the sampled white image data and a predetermined reference white level and setting the variable thresholds in accordance with the determined difference.

5,748,795
IMAGE DECODER USING ADJUSTABLE FILTERING

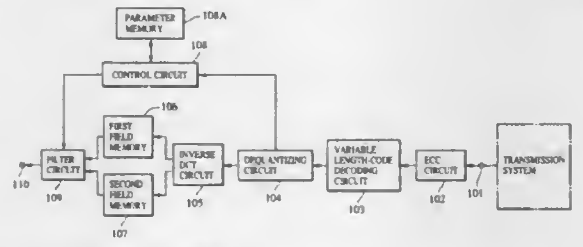
Shinji Ohnishi, and Akio Fujii, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1996, Ser. No. 596,558

Claims priority, application Japan, Feb. 7, 1995, 7-019064

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 382—251 **23 Claims**



1. A decoder comprising:

a) input means for inputting information data that has been coded by using a predetermined coding parameter and parameter data indicating the predetermined coding parameter;

b) decoding means for decoding the information data by using the parameter data; and

c) filter means for performing a filtering operation on the decoded data by said decoding means, filter characteristics of said filter means being set based on the the parameter data.

5,748,796
FUZZY LOGIC DEVICE FOR IMAGE NOISE REDUCTION

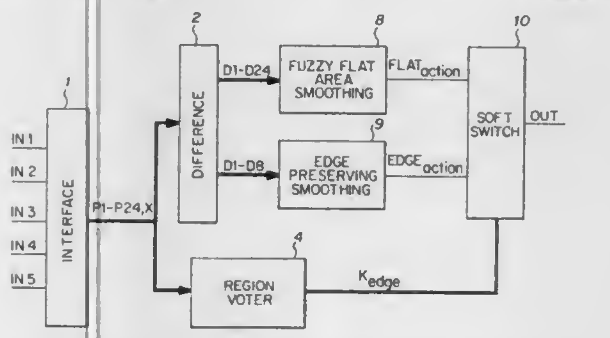
Laura Pennino, Trieste; Massimo Mancuso, Monza; Federico Travaglia; Rinaldo Poluzzi, both of Milan, and Gianguido Rizzotto, Civate, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, and Consorzio per la Ricerca sulla Microelecttronica nel Mezzogiorno, Catania, both of Italy

Filed Aug. 24, 1995, Ser. No. 519,056

Claims priority, application European Pat. Off., Aug. 25, 1994, 94830408

Int. Cl.^{6} H04N *1/40;1/38*

U.S. Cl. 382—254 **8 Claims**



1. A fuzzy logic device for image noise reduction, comprising:

interface means for receiving a gray level of a pixel to be processed and of neighboring pixels within an image;

difference means connected to said interface means for generating a difference between gray levels of said neighboring pixels and of said pixels to be processed:

fuzzy flat area smoothing means connected to said difference means for performing a low-pass smoothing of an almost homogeneous region defined by said pixel and said neighboring pixels including a positive adder for adding positive differences generated by said difference means,

a negative adder for adding negative differences generated by said difference means, and

second fuzzy processing means for making a fuzzy inference on the sums of said negative and said positive differences in order to generate the output of said fuzzy flat area smoothing means;

edge preserving smoothing means connected to said difference means for performing low-pass filtering on a high-frequency information region defined by said pixel and said neighboring pixels;

region voter means connected to said interface means for determining whether said region defined by said pixel and said neighboring pixels is almost homogeneous and outputting a measure representative of said determination; and

soft switching means connected to the outputs of said fuzzy flat area smoothing means and said edge preserving smoothing means for weighting outputs of said fuzzy flat area smoothing means and said edge preserving smoothing means on the basis of said measure.

5,748,797
APPARATUS AND METHOD FOR PROCESSING AN IMAGE USING EXPANSION TO CONNECT ISOLATED NEIGHBORING IMAGE INFORMATION FOLLOWED BY COMPRESSION

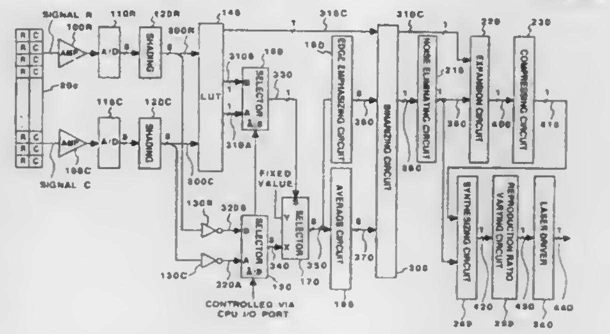
Masanori Sakai, and Hideaki Shimizu, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 295,152, Aug. 24, 1994, Pat. No. 5,495,348, which is a continuation of Ser. No. 671,450, Mar. 19, 1991, abandoned. This application Sep. 29, 1995, Ser. No. 536,849

Claims priority, application Japan, Mar. 22, 1990, 2-072646

Int. Cl.^{6} G06K *9/40;* **H04N** *1/58*

U.S. Cl. 382—256 **21 Claims**



1. An image processing apparatus comprising:

input means for inputting color information;

color separation means for separating the color information input by said input means into a plurality of color components;

contact point extracting means for extracting a contact point of a plurality of colors in accordance with the color components relating to said colors;

expanding means for expanding a size of the contact point extracted by said contact point extracting means;

compression means for compressing a size of the contact point expanded by said expanding means; and

processing means for processing the plurality of color components separated by said color separation means by using data of the contact point compressed by said compression means,

wherein said expanding means expands the contact point so that a plurality of isolated neighboring contact points will be connected to each other.

6. An image processing apparatus comprising:

input means for inputting image data;

binarizing means for binarizing the image data;

expanding means for expanding a size of an area represend by the image data which has been binarized by said binarizing means; and

compressing means for compressing a size of the area expanded by said expanding means; and

processing means for processing the image data representing the area compressed by said compressing means,

wherein said expanding means expands the area so that a plurality of neighboring isolated points will be connected to each other.

15. An image processing apparatus comprising:

input means for inputting color image data representing a plurality of colors;

extracting means for extracting a boundary area of the colors from the color image data;

expanding means for expanding a size of the boundary area extracted by said extracting means; and

compressing means for compressing a size of he boundary area expanded by said expanding means,

wherein said expanding means expands the boundary area so that a plurality of neighboring boundary areas will be connected to each other.

/OL
2 10
ISS
1
MY
5
998
JMI

5,748,798

METHOD AND SYSTEM FOR ADDING EFFECTS TO GRAY SCALE IMAGES

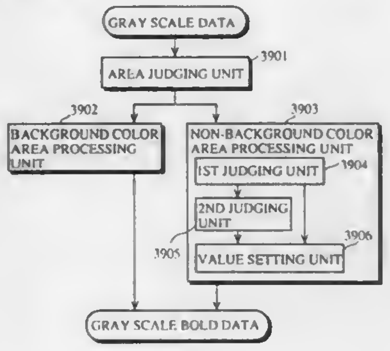
Masaru Nakai, Moriguchi; Taketo Yoshii, Amagasaki; Katsuyuki Morita, Ikeda; Yoshiyuki Miyabe, Osaka, and Mika Matsui, Hirakata, all of Japan, assignors to Matsushita Wlectric Ind., Osaka-fu, Japan

Filed Dec. 23, 1994, Ser. No. 363,373

Claims priority, application Japan, Dec. 28, 1993, 5-336368; Dec. 28, 1993, 5-336369

Int. Cl.^{6} G06K *9/44;9/40;* **H04N** *1/38;* **G06F** *15/00*

U.S. Cl. 382—258 **42 Claims**



1. A system for generating modified image data composed of destination pixels corresponding to source pixels in gray scale image data by applying a process adding effects to said gray scale image data, said system comprising:

color judging means for judging whether each source pixel has a background color or a non-background color;

assigning means for assigning a color level to each source pixel;

first processing means for setting, when said source pixel is judged to have the background color, a color level to a destination pixel in a corresponding position, said color level being calculated based on the color level of a plurality of pixels adjacent to said source pixel; and

second processing means for setting, when said source pixel is judged to have a non-background color, a color level calculated by a predetermined process to the destination pixel in a corresponding position.

5,748,799

IMAGE PROCESSING METHOD AND APPARATUS

Kazuo Shimura, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1996, Ser. No. 719,704

Claims priority, application Japan, Sep. 29, 1995, 7-252092

Int. Cl.^{6} G06T *5/00;* **G06K** *9/40;9/44*

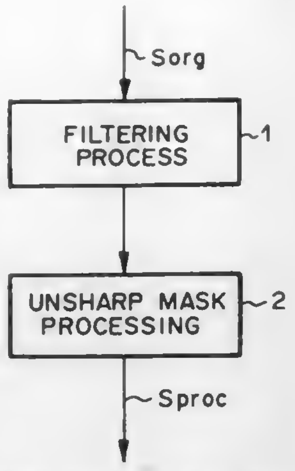
U.S. Cl. 382—260 **14 Claims**

1. An image processing method comprising the steps of:

i) carrying out a filtering process on an original image, which is constituted of a lattice-like array of picture elements, that are located at predetermined intervals along the rows and columns of the lattice-like array, by using a mask having a predetermined size and with respect to each of the picture elements of the original image, the mean value of the values of picture elements falling within the mask being calculated with the filtering process, a smoothed image represented by the thus calculated mean values being thereby obtained, and

ii) carrying out processing for emphasizing high frequency components of the original image in accordance with the smoothed image,

wherein the filtering process is carried out repeatedly on the smoothed image.



5,748,800

IMAGE READING DEVICE THAT SELECTIVELY PERFORMS EDGE CONTRAST ADJUSTMENT

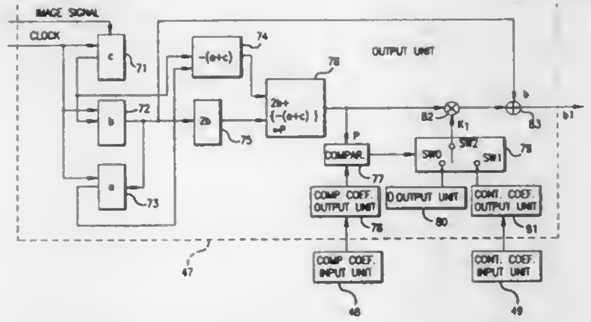
Souichi Ueta, and Hayato Hokoi, both of Kanagawa-Ken, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 12, 1994, Ser. No. 354,797

Claims priority, application Japan, Dec. 13, 1993, 5-311382; Aug. 12, 1994, 6-190225

Int. Cl.^{6} H04N *1/40;1/38;* **G06K** *9/40*

U.S. Cl. 382—266 **22 Claims**



1. An image reading device comprising:

a light source that illuminates an original document that is to be read;

a photosensor device including a plurality of photosensor elements, each of said photosensor elements outputting a signal corresponding to an amount of light received by said photosensor element from the original document; a calculation circuit coupled to said photosensor device, said calculation circuit performing a predetermined calculation using the signal output by a first one of said plurality of photosensor elements and the signal output by at least one of said plurality of photosensor elements arranged in a vicinity of said first photosensor element and outputting a calculation value;

a determination circuit coupled to said calculation circuit, said determination circuit outputting an edge contrast performance signal that indicates that an edge contrast operation is to be performed on the signal output by said first photosensor element when said calculation value is larger than a preset comparison coefficient; and

an edge contrast circuit coupled to said determination circuit, said edge contrast circuit performing an edge contrast operation on the signal output from said first one of said plurality of photosensor elements in accordance with the edge contrast performance signal output by said determination circuit.

5,748,801

METHOD OF SETTING THRESHOLD VALUES FOR EXTRACTING IMAGE DATA

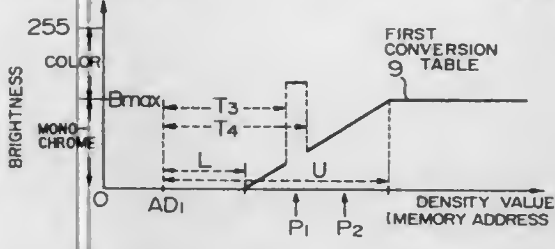
Yoshihiro Goto, Tokyo, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan

Continuation of Ser. No. 231,475, Apr. 22, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 767,284

Claims priority, application Japan, Apr. 22, 1993, 5-117625

Int. Cl.^{6} G06K *9/38*

U.S. Cl. 382—270 **6 Claims**



1. A method of setting threshold values for extracting a desired image region from image data having density values, the method comprising the steps of:

setting an upper limit of density values to be displayed in an image and a lower limit of density values to be displayed in the image, the upper limit and the lower limit thereby defining a window of density values to be displayed in the image, the window of density values being less than an entire range of the density values of the image data;

providing in memory a table having density values within the window of density values as addresses, brightness values to be displayed in color in the image as data for density values in a range of density values between a first threshold value and a second threshold value, and brightness values to be displayed in monochrome in the image as data for density values outside the range of density values between the first threshold value and the second threshold value;

extracting image data having density values falling within the window of density values from the image data;

displaying the extracted image data as an image using the table so that density values of the extracted image data in the range of density values between the first threshold value and the second threshold value are displayed as brightness values in color in the displayed image, and density values of the extracted image data outside the range of density values between the first threshold value and the second threshold value are displayed as brightness values in monochrome in the displayed image; and

changing at least one of the first threshold value and the second threshold value while the displayed image is being displayed using the table until a desired image region of the displayed image is displayed in color.

5,748,802

METHOD AND APPARATUS FOR THE ANALYSIS AND CORRECTION OF THE IMAGE GRADATION IN IMAGE ORIGINALS

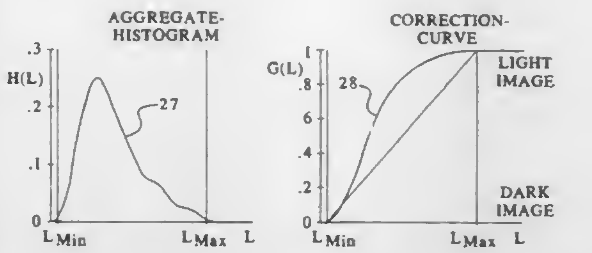
Kurt-Helfried Winkelman, Kiel, Germany, assignor to Linotype-Hell AG, Eschborn, Germany

Continuation of Ser. No. 43,253, Apr. 6, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,377

Claims priority, application Germany, Apr. 6, 1992, 42 11 469.1; Mar. 26, 1993, 43 09 878.9

Int. Cl.^{6} G06K *9/38*

U.S. Cl. 382—271 **26 Claims**



1. A method for analysis and correction of an image gradation characteristic of an image original, comprising the steps of:

generating image values relating to the image original by point-by-point and line-by-line, optoelectronic scanning with an image processing input device;

geometrically subdividing the image original into a plurality of sub-images, each sub-image having corresponding image values;

for each sub-image, separately identifying frequency distributions of the image values in the corresponding sub-images as a sub-image histogram for every sub-image;

evaluating the sub-image histograms of the individual sub-images and identifying sub-images critical for image gradation since they are identified as being high in structure wherein relatively large image value changes occur as compared to other of the sub-images which are lower, in structure wherein relatively smaller image value changes occur;

generating an aggregate histogram comprising a summation of frequency distributions of the image values in the critical sub-images from the sub-image histograms of the critical sub-images; and

generating a correction curve function from the aggregate histogram for correction of the image gradation characteristic of the image original for contrast correction.

5,748,803

METHOD AND APPARATUS FOR IMAGE VALUE CORRECTION IN OPTOELECTRONIC TRANSDUCERS

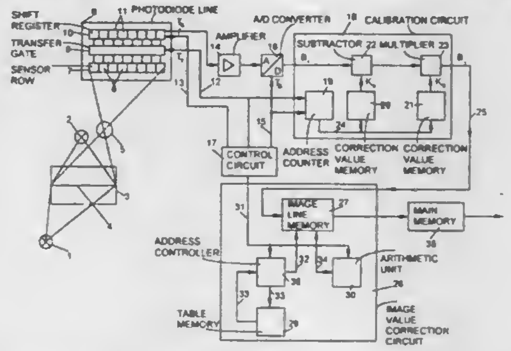
Rainer Schielke, Fleckeby, Germany, assignor to Linotype-Hell AG, Kiel, Germany

Filed Jan. 24, 1996, Ser. No. 590,813

Claims priority, application Germany, Nov. 22, 1995, 195 43 488.9

Int. Cl.^{6} H04N *1/40*

U.S. Cl. 382—275 **6 Claims**



1. A method for correction of image values of faulty sensor elements of an optoelectronic transducer comprising a plurality of sensor elements, comprising the steps of:

acquiring the image values by point-by-point and line-by-line optoelectronic scanning of an original with the sensor elements;

intermediately storing the image values scanned in the original scan line-by-scan line for image value correction in an image line memory that has a number of memory locations at least corresponding to a number of the sensor elements of the optoelectronic transducer;

allocating an identifier to each sensor element of the optoelectronic transducer;

callably storing the identifiers allocated to the faulty sensor elements in a table memory;

VOL
210
SS
1
MY
5
998
UMI

replacing an erroneous image value of a faulty sensor element by an image value calculated from image values of sensor elements neighboring the faulty sensor element; and

for avoiding errors at light/dark transitions in the scanned original, the erroneous image value of the faulty sensor element is fully corrected in areas of the original having nearly constant brightness values and is only relatively slightly corrected in regions of light/dark transitions in the original.

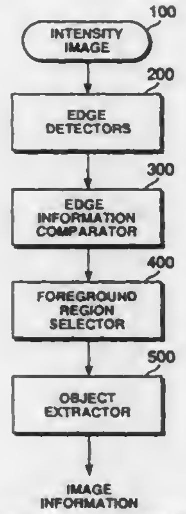
5,748,804
METHOD AND APPARATUS FOR PROCESSING IMAGES WITH SYMBOLS WITH DENSE EDGES

Stefan Surka, Sandy Hook, Conn., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Continuation of Ser. No. 883,853, May 14, 1992, abandoned. This application Aug. 26, 1994, Ser. No. 296,877

Int. Cl.^{6} G06T *7/00*

U.S. Cl. 382—291 **82 Claims**



1. A method for locating a predetermined pattern represented by a plurality of edges with an intensity image, comprising the steps of:

(A) analyzing said intensity image with at least two different two-dimensional edge detectors to detect a multiplicity of edges oriented in at least two different directional ranges and forming a plurality of feature images corresponding to each of said at least two directional ranges, wherein:

said step of forming a plurality of feature images further comprises the steps of:

forming at least two binary images each of said at least two binary images corresponding to one of said at least two directional ranges: and

generating at least two feature images from said at least two binary images; and

step (A) further comprises the step of determining magnitude information and a directional range for each of said detected edges and said step of forming said at least two binary images further comprises the steps of:

(i) selecting one of said detected edges for processing;

(ii) comparing said magnitude information corresponding to said selected edge to a first predetermined threshold and, if said magnitude information exceeds said first predetermined threshold then:

(a) selecting one of said at least two directional ranges which includes said directional range of said selected edge; and

(b) setting high a binary pixel in a selected binary image, said binary pixel holding a position in said selected binary image corresponding to the position of said selected edge in said intensity image, said selected binary image corresponding to said selected directional range; and

(iii) repeating steps (i)–(ii) for each of said detected edges;

(B) logically comparing on a pixel-by-pixel basis corresponding pixels from said plurality of feature images to form a composite feature image, wherein said logical comparison is adapted to identify edges in said intensity image that are arranged in accordance with said predetermined pattern; and

(C) locating said predetermined pattern in said intensity image by selecting, in response to said comparing step, at least one region from said composite feature image which correspondence to detected edges angularly oriented in accordance with said predetermined pattern.

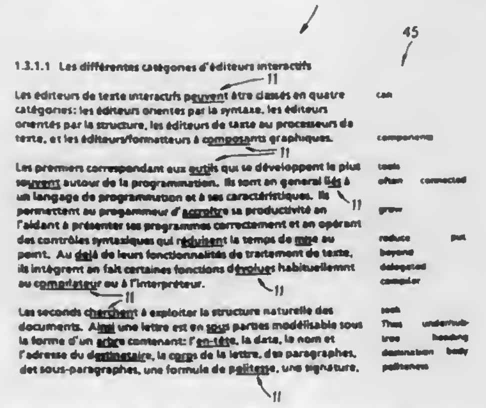
5,748,805
METHOD AND APPARATUS FOR SUPPLEMENTING SIGNIFICANT PORTIONS OF A DOCUMENT SELECTED WITHOUT DOCUMENT IMAGE DECODING WITH RETRIEVED INFORMATION

M. Margaret Withgott, Los Altos, Calif.; William Newman, Cambridge, England; Steven C. Bagley, Palo Alto, Calif.; Daniel P. Huttenlocher, Ithaca, N.Y.; Ronald M. Kaplan, Palo Alto, Calif.; Todd A. Cass, Cambridge, Mass.; Per-Kristian Halvorsen, Los Altos, Calif.; John Seely Brown, San Francisco, Calif., and Martin Kay, Menlo Park, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 795,419, Nov. 19, 1991, abandoned. This application Jul. 11, 1994, Ser. No. 272,452

Int. Cl.^{6} G06K *9/03*

U.S. Cl. 382—306 **31 Claims**


7
45
11
11
11
11
11
11
11

1.3.1.1 Les différentes catégories d'éditeurs interactifs

Les éditeurs de texte interactifs peuvent être classés en quatre catégories: les éditeurs orientés par la syntaxe, les éditeurs orientés par la structure, les éditeurs de texte ou processeurs de texte, et les éditeurs/formatteurs à composants graphiques.

Les premiers correspondant aux outils qui se développent le plus souvent autour de la programmation. Ils sont en général liés à un langage de programmation et à ses caractéristiques. Ils permettent au progammeur d'accroître sa productivité en l'aidant à présenter ses programmes correctement et en opérant des contrôles syntaxiques qui réduisent le temps de mise au point. Au delà de leurs fonctionnalités de traitement de texte, ils intègrent en fait certaines fonctions dévolues habituellemnt au compilateur ou à l'interpréteur.

Les seconds cherchent à exploiter la structure naturelle des documents. Ainsi une lettre est en sous parties modélisable sous la forme d'un arbre contenant: l'en-tête, la date, le nom et l'adresse du destinataire, le corps de la lettre, des paragraphes, des sous-paragraphes, une formule de politesse, une signature.

1. A method for electronically processing an electronic document image, comprising:

segmenting the document image into word units without decoding the document image, each word unit corresponding to a word in said document image;

identifying significant ones of said word units in accordance with at least one selected morphological image characteristic of said word units without determining their content other than said at least one selected morphological image characteristic; and

retrieving supplemental data related to the identified significant word units.

5,748,806
DESKEW CIRCUIT IN A HOST INTERFACE CIRCUIT

Stillman F. Gates, Los Gatos, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

Division of Ser. No. 964,532, Oct. 15, 1992. This application Jun. 7, 1995, Ser. No. 486,084

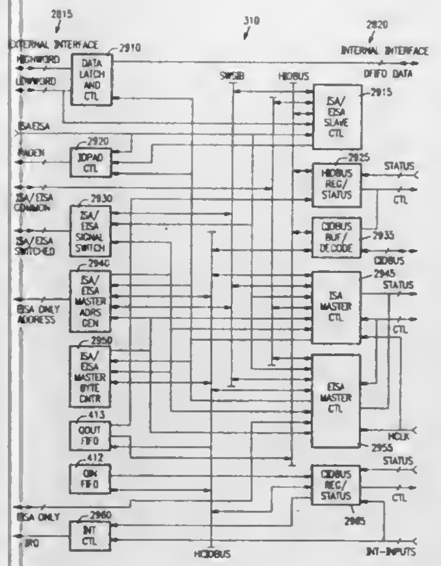
Int. Cl.^{6} G06F *13/14; 13/40*

U.S. Cl. 395—306 **1 Claim**

1. In an integrated circuit for using with an EISA computer bus having a signal START and a signal CMD when said signals START and CMD may overlap, a host comprising:

an EISA bus interface having:

an EISA start signal line wherein said EISA start signal line receives said signal START from said EISA computer bus;



an EISA CMD signal line wherein said EISA CMD signal line receives said signal CMD from said EISA computer bus;

a deskew circuit connected to said EISA start signal line and to said EISA CMD line, and having an output line wherein said deskew circuit receives said signals CMD and START as input signals on said EISA CMD signal line and said EISA CMD line, respectively, and generates an output signal on said output line that is the first of said signals CMD and START to be input to said deskew circuit thereby preventing overlap of said signals CMD and START within said host interface module.

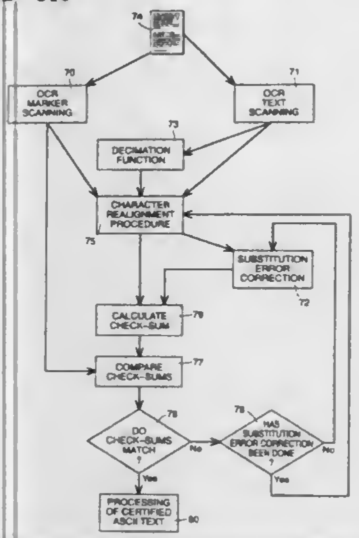
5,748,807
METHOD AND MEANS FOR ENHANCING OPTICAL CHARACTER RECOGNITION OF PRINTED DOCUMENTS

Daniel P. Lopresti, Hopewell, N.J., and Jonathan S. Sandberg, New York, N.Y., assignors to Panasonic Technologies, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 958,938, Oct. 9, 1992, abandoned. This application Oct. 15, 1993, Ser. No. 138,467

Int. Cl.^{6} G06K *9/03*

U.S. Cl. 382—310 **14 Claims**



1. A method for permitting machine-represented characters of a machine-represented document to be more accurately recovered when scanning a printed version of said document, comprising the steps of:

assigning a first binary value to each of a plurality of original machine-represented characters in said document;

printing said first binary values in machine-readable symbology and human recognizable characters corresponding to said original machine-represented characters in a printed version of said document;

scanning said printed version to recover machine-represented characters corresponding to said printed human-recognizable characters and to recover said first binary values;

assigning a second binary value to each of said recovered machine-represented characters; and

comparing said recovered first binary values to said second binary values to identify errors in said recovered machine-represented characters.

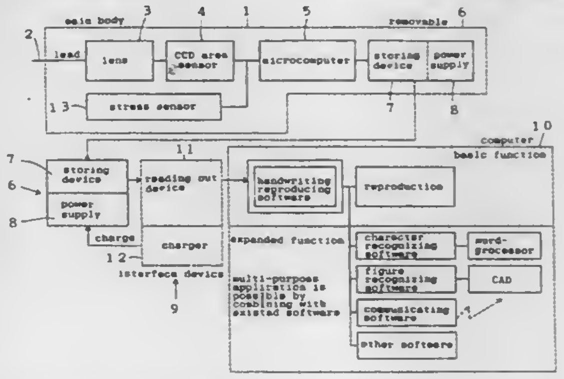
5,748,808
IMAGE REPRODUCING METHOD AND APPARATUS CAPABLE OF STORING AND REPRODUCING HANDWRITING

Toshio Taguchi; Kiyoshi Agusa, both of Kyoto; Shin-ichiro Yamamoto, Nagoya, and Hiroki Nakamura, Kyoto, all of Japan, assignors to Yashima Electric Co., Ltd., Kyoto, Japan

Filed Dec. 6, 1994, Ser. No. 354,130

Int. Cl.^{6} G06K *9/20*

U.S. Cl. 382—312 **14 Claims**



1. A handwriting storing and reproducing apparatus comprising;

writing device means for storing handwriting, including a writing section for writing handwriting on a medium for recording, an optical handwriting detection means for taking an image at a predetermined interval in a vicinity of said writing section on the medium and for sequentially detecting small images within a predetermined region which includes said writing section, and a storing means for sequentially storing the detected small images,

reading out means for sequentially reading out the small images from said storing means,

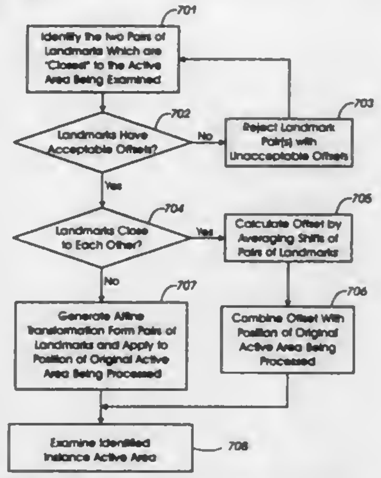
comparing means for comparing a just read out small image with a previously read out small image, and for judging whether or not both small image include partial handwritings which are coincident to one another, and

image processing means for overlapping the just read out small image to the previously read out small image in a condition that a partial handwriting in the just read out small image is exactly overlapped to a partial handwriting in the previously read out small image, so as to obtain a new image and to determine the new image as the previously read out small image, when both small images include the partial handwritings which are coincident to one another, and for repeating the overlapping at every reading out of a small image.

VOL
2 10
ISS
1
MY
5
998
JMI

5,748,809
ACTIVE AREA IDENTIFICATION ON A MACHINE READABLE FORM USING FORM LANDMARKS

David Edward Hirsch, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 426,354, Apr. 21, 1995, abandoned. This application Jun. 23, 1997, Ser. No. 880,202
Int. Cl.^{6} G06K *9/20*
U.S. Cl. 382—317 **14 Claims**


701
Identify the two Pairs of Landmarks Which are "Closest" to the Active Area Being Examined
702
Landmarks Have Acceptable Offsets?
No
703
Reject Landmark Pair(s) with Unacceptable Offsets
Yes
704
Landmarks Close to Each Other?
Yes
705
Calculate Offset by Averaging Shifts of Pairs of Landmarks
No
707
Generate Affine Transformation Form Pairs of Landmarks and Apply to Position of Original Active Area Being Processed
706
Combine Offset With Position of Original Active Area Being Processed
Examine Identified Instance Active Area
708

1. A method for identifying areas on an instance of a machine readable form to be examined for the presence of user made marks, said machine readable form void of predefined registration marks, said method comprising the steps of:

a) creating said machine readable form by performing the sub-steps of:
  composing said machine readable form having one or more active areas;
  analyzing an image of said machine readable form to identify one or more original landmarks, said original landmarks including text blocks, graphic blocks, horizontal bars and vertical bars; and
  storing location and identifying information for said one or more original landmarks and said active areas in a forms control file;
b) creating a bit-mapped representation of said instance of said machine readable form;
c) analyzing said bit-mapped representation of said instance of said machine readable form to identify one or more instance landmarks, said instance landmarks including text blocks, graphic blocks, horizontal bars and vertical bars;

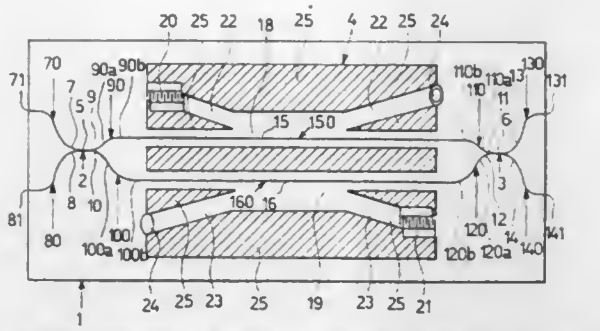
identifying an active area in said instance of a machine readable form by performing the steps of:

d) retrieving said forms control file;
e) comparing said one or more original landmarks from said forms control file with said one or more instance landmarks to obtain pairings of original landmarks with instance landmarks based on location and shape;
f) generating an offset based on said landmark pairings;
g) applying said offset to location information in said forms control file of an active area being processed;
h) examining said area identified in step g) as said active area.

5,748,810
ACOUSTO-OPTICAL TUNABLE WAVEGUIDE SWITCH HAVING BALANCED OPTICAL PATHS

Steffen Schmid, Milan, Italy, assignor to Pirelli Cavi S.p.A., Italy
Filed Oct. 1, 1996, Ser. No. 722,419
Int. Cl.^{6} G02B *6/10*
U.S. Cl. 385—7 **10 Claims**

1. An acousto-optical waveguide device, selective in wavelength, comprising a substrate in a birefringent and photoelastic material, on which there are obtained:


20 25 22 18 25 4 22 25 24
70 90a 90b 90 7 5 9 71
110b 110a 13 130 110 11 6 131
15 150
2 8 10 81 80 100 100a 100b
160 16
3 120 12 14 141 120b 120a 140
24 25 23 25 19 23 25 21
1

a) at least one polarization mode conversion stage of an optical signal in a preselected range of wavelengths, including
  a1) a first and a second optical path in an optical waveguide,
  a2) at least one first acoustic waveguide containing a part of at least one of said first and second optical path in the optical waveguide, and
  a3) first generating means of a surface acoustic wave associated with said first acoustic waveguide,
b) a first and a second polarization selective element, placed upstream and downstream, respectively, of said conversion stage and optically connected to said first and second optical path in the optical waveguide, capable of separating in said first and second optical path two polarization components of said optical signal;

characterized in that

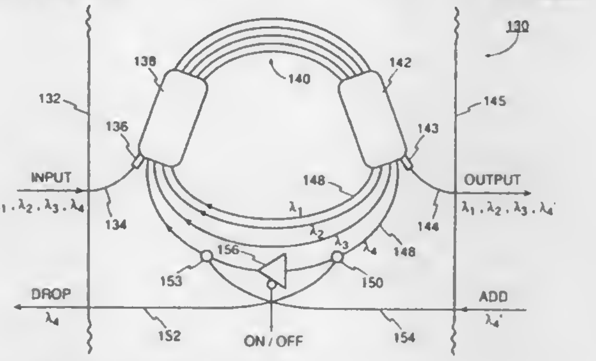
said first and second optical path in the optical waveguide have optical lengths that are different one from the other, the difference being equal to a preselected value represented by

$$d=\pm\lambda(k+m)$$

where d is the difference between the optical paths of the two optical waveguides,
λ is the wavelength of said optical signal,
k is a number greater than 0 but smaller than 1, and
m is 0 or an integer;
in order to create a phase shift between at least a first and a second parasitic component of said optical signal exiting from said second polarization selective element, such that said parasitic components undergo a destructive interference.

5,748,811
OPTICAL SWITCH

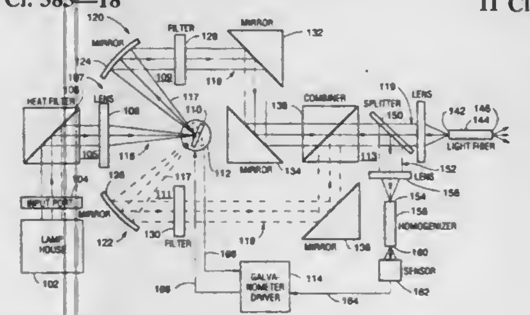
Martin Ronald Amersfoort, Eatontown, and Julian Bernard Donald Soole, Edison, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.
Continuation of Ser. No. 528,447, Sep. 14, 1995, Pat. No. 5,629,992. This application Jul. 1, 1996, Ser. No. 674,078
Int. Cl.^{6} G02B *6/26*
U.S. Cl. 385—15 **8 Claims**



1. An optical switch comprising:
a first and a second wavelength dispersive system, each comprising
at least one optical interaction region having a first side receiving an input signal on a substantially single-moded input waveguide and a second side from which an output signal is transmitted on a substantially single-moded output waveguide;
a wavelength dispersive element operatively associated with said at least one optical interaction region, and
a plurality of feedback waveguides linking said first and second sides; and
selective interchange elements connected between pairs of feedback waveguides of said first and second wavelength dispersive systems.

5,748,812
HIGH-SPEED OPTICAL SWITCH

Michael P. Buchin, 723 Southampton Dr., Palo Alto, Calif. 94303
Division of Ser. No. 353,532, Dec. 9, 1994, Pat. No. 5,535,293. This application Jul. 9, 1996, Ser. No. 677,407
Int. Cl.^{6} G02B *6/26*
U.S. Cl. 385—18 **11 Claims**

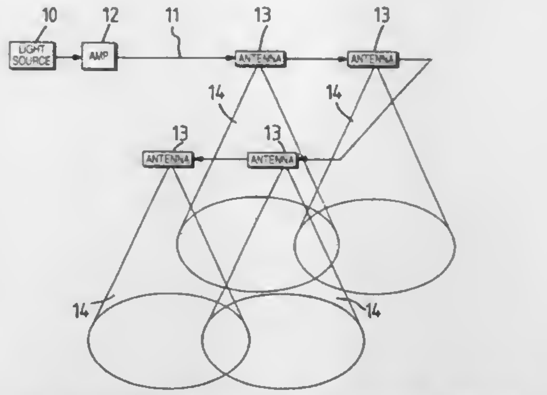


1. A high-speed optical switch, comprising:
a first light port;
a second light port;
focussing means for focussing light from the first light port at a focal point via a first optical path, and for focusing light from the second light port at a point at or near the focal point via a second optical path, the first optical path being angularly separated from the second optical path, wherein light focussed by said focusing means has a minimized spot size at or near the focal point;
a mirror located at or near the focal point; and
motor means, coupled to the mirror, for sequentially rotating the mirror back-and-forth between a first rotational position, at which the mirror reflects light from first light port into the second light port via the first optical path and the second optical path, and a second rotational position, at which the mirror reflects the light from the first light port to a location outside the second light port.

5,748,813
FREE SPACE OPTICAL COMMUNICATION SYSTEM

Stephen Anthony Cassidy, Suffolk; Peter Paul Smyth, Woodbridge; Douglas Lawrence Williams, and Trevor Keith White, both of Suffolk, all of United Kingdom, assignors to British Telecommunications pubic limited company, London, England
PCT No. PCT/GB93/01590, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO94/02997, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 28, 1993, Ser. No. 379,449
Claims priority, application European Pat. Off., Jul. 28, 1992, 92306885
Int. Cl.^{6} G02B *6/28*
U.S. Cl. 385—24 **35 Claims**

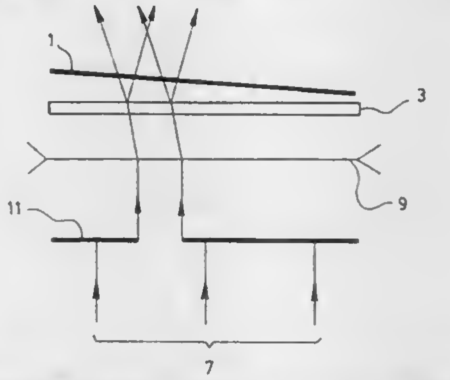
1. An optical communication system for free space communication comprising:
an optical source including means to modulate the optical output to provide an optical signal, said optical source being connected to an optical fibre to pass said signal therealong, the



optical fibre including antenna means including an optical fibre transmit portion having a core and a cladding;
said cladding of said optical fibre transmit portion including a flat surface extending along its length and means to couple light out of the optical fibre through said flat surface, and scattering means to incoherently scatter into free space light thus coupled out of the fibre; and
a plurality of said antenna means being provided at spaced intervals along the optical fibre.

5,748,814
METHOD FOR SPATIALLY CONTROLLING THE PERIOD AND AMPLITUDE OF BRAGG FILTERS

Yves Painchaud, Québec; Pierre Langlois, Ste-Catherine-de-la Jacques-Cartier; Pierre Galarneau; Alain Chandonnet, both of Cap-Rouge, and Jocelyn Lauzon, St-Augustin-de-Desmaures, all of Canada, assignors to Institut National D'Optique, Sainte-Foy, Canada
Filed Nov. 16, 1995, Ser. No. 558,372
Int. Cl.^{6} G02B *6/34;5/18*
U.S. Cl. 385—37 **2 Claims**



1. A method for impinging gratings in an optical medium that is sensitive to at least some wavelengths of electromagnetic radiation, said medium having a longitudinal axis, said method comprising the steps of:
  providing an optical phase mask of period Λ;
  laying said phase mask close to said optical medium;
  impinging a single beam of electromagnetic radiation on said phase mask such that said radiation is diffracted, thereby resulting in an interference pattern having a period P that is impinged into said optical medium;
  inserting a lens of focal length f placed at a distance d from said phase mask to produce a distribution of incidence angles on said phase mask such that said period of said interference pattern varies linearly along said longitudinal axis,
  inserting a slit between said single beam and said lens; and
  sliding said slit in a direction perpendicular to said beam at a variable velocity;

wherein:
  said single beam of electromagnetic radiation is impinged at an incidence angle ϕ with respect to normal incidence on said phase mask:

VOL
210
ISS
1
MY
5
1998
UMI

said phase mask is at an angle α with respect to said longitudinal axis of said optical medium; and

said incidence angle ϕ is equal to said angle α and is different from zero;

whereby said period P of said interference pattern can be altered by changing said incidence angle ϕ or said angle α.

5,748,815
OPTICAL COMPONENT ADAPTED TO MONITOR A MULTIWAVELENGTH LINK AND ADD-DROP MULTIPLEXER USING THIS COMPONENT, APPLICATION TO OPTICAL NETWORKS

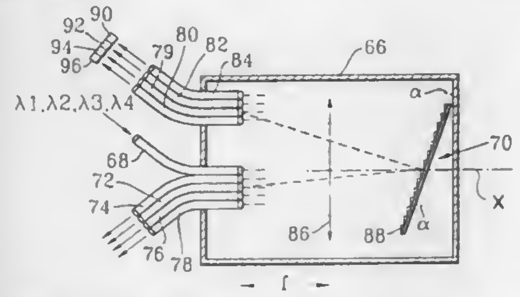
André Hamel, Lannion, and Daniel Laville, Perros Guirec, both of France, assignors to France Telecom, Paris, France

Filed Aug. 28, 1996, Ser. No. 703,945

Claims priority, application France, Sep. 1, 1995, 95 10302

Int. Cl.^{6} G02B *6/34*

U.S. Cl. 385—37 **7 Claims**



1. Optical component comprising:

an input optical fiber (**68**) for transmitting optical signals of different wavelengths with respect to one another,

a diffraction grating (**70**) for angularly dispersing each of these signals on several orders of diffraction, and

a first set of optical fibers (**72**, **74**, **76**, **78**) for respectively recovering the dispersed signals having different wavelengths with respect to one another and corresponding to a given order of diffraction, so as to transmit these signals,

this component being characterized in that it further includes a second set of optical fibers (**79**, **80**, **82**, **84**) for respectively recovering the same signals as those recovered by the fibers of the first set but corresponding to another order of diffraction so as to control the state of these recovered signals.

5,748,816
OPTICAL CAVITY FOR EXCLUSIVELY RECEIVING LIGHT PARALLEL TO AN OPTICAL AXIS

Zeljko Jaksic, Emmendingen; Hartmut Damm, Teningen, and Christof Meyer, Gutach, all of Germany, assignors to Sick AG, Germany

Continuation of Ser. No. 517,945, Aug. 22, 1995, abandoned. This application May 5, 1997, Ser. No. 851,051

Claims priority, application Germany, Aug. 30, 1994, 44-30778

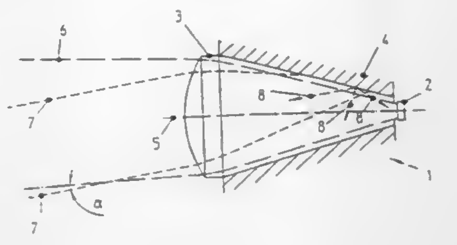
Int. Cl.^{6} G02B *6/26*

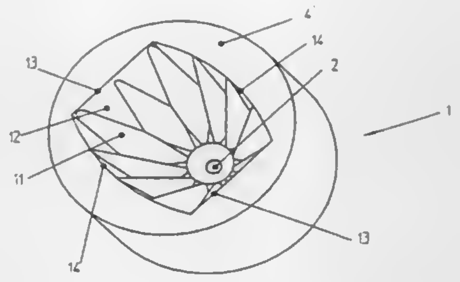
U.S. Cl. 385—39 **21 Claims**

1. An optical tube for coupling with optical transmitter or receiver elements for transmitting or receiving radiation directed parallel to an optical axis and having means for suppressing interfering radiation substantially non parallel to the optical axis comprising:

an optical cavity formed symmetrically about the optical axis, the optical cavity defining an open end for receiving radiation and a closed end communicating to the transmitter or receiver elements;

a transmitter or receiver element on the optical axis mounted to the closed end of the optical cavity for respectively transmitting or receiving radiation parallel to the optical axis;





the optical cavity having a shape for causing light parallel to the optical axis to be respectively reflected from the transmitter or reflected to the receiver;

interior reflecting ribs in the walls defining the optical cavity, the interior ribs having ridges each respectively disposed substantially along a plane extending through the optical axis for producing at least multiple wall reflections between the open end and the transmitter or receiver elements for at least attenuating radiation non parallel to the optical axis.

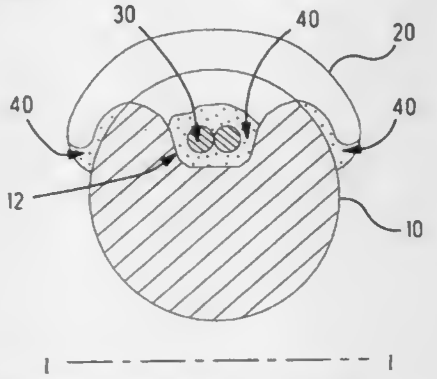
5,748,817
FIBER OPTIC COUPLER PACKAGE HAVING A COVER OVERLAPPING THE BASE

David Jisen Xu, Sunnyvale, and Sanjay Sudeora, Cupertino, both of Calif., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 28, 1996, Ser. No. 684,764

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—51 **11 Claims**



1. An optical fiber coupler package comprising:

an elongate base member having a longitudinal groove disposed therein, and

a cover member for said base member,

wherein said cover member is shorter in length than said base member and has a width sufficient to overlap said groove and a portion of an outer perimeter of said base member when placed so as to cover said base member.

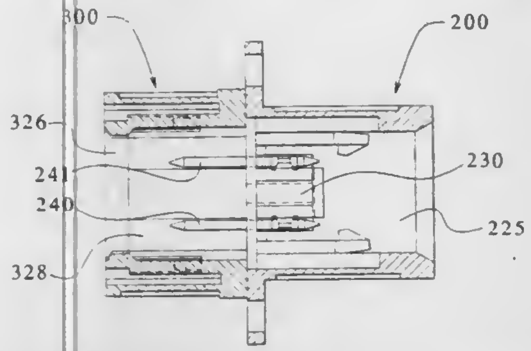
5,748,818
MASSIVE PARALLEL OPTICAL INTERCONNECT SYSTEM

Roger E. Weiss, 10 Mary Way, Foxborough, Mass. 02035; Daniel P. Vladic, 42643 Linden La., Antioch, Ill. 60002, and Philip W. Schofield, 1218 N. Euclid, Oak Park, Ill. 60302

Continuation-in-part of Ser. No. 577,508, Dec. 22, 1995. This application Jun. 24, 1996, Ser. No. 668,922

Int. Cl.^{6} G02B *6/38*

U.S. Cl. 385—59 **17 Claims**



1. An optical receptacle assembly comprising:

a first receptacle half including an alignment assembly having an alignment member having a first end mounted in the first receptacle half;

a second receptacle half forming a cavity and a second end of the alignment member of the first receptacle half protruding within the cavity of the second receptacle half; and

the first end of the alignment member engaging an edge of a ferrule of a first connector inserted into the first receptacle half and the second end of the alignment member engaging an aperture of a ferrule of a second connector inserted into the second receptacle half.

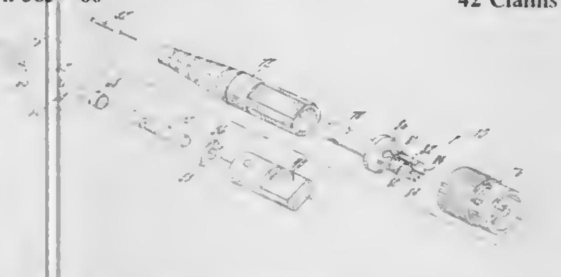
5,748,819
FIELD INSTALLABLE OPTICAL FIBER CONNECTOR AND AN ASSOCIATED METHOD OF FABRICATION

Otto I. Szentesi, Hickory, and Rodney A. Throckmorton, Conover, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Apr. 5, 1995, Ser. No. 417,312

Int. Cl.^{6} G02B *6/38*

U.S. Cl. 385—60 **42 Claims**



1. An optical fiber connector comprising:

a longitudinally extending ferrule having first and second opposed ends and a bore defined longitudinally therethrough, said ferrule also defining a fusion access slot which extends transversely across said ferrule from a first side of said ferrule to a bottom portion of the fusion access slot such that the bore opens into the fusion access slot, wherein the radial distance between the bottom portion of the fusion access slot and a second side of said ferrule, opposite the first side, is greater than a predetermined radial distance such that said ferrule remains structurally intact during use; and

an optical fiber stub disposed within the bore of said ferrule and extending from a first end adjacent the first end of said ferrule to a second end disposed within the fusion access slot defined by said ferrule;

wherein said ferrule is also adapted for receiving a second optical fiber which extends through the bore of said ferrule from the second end of said ferrule to the fusion access slot such that said ferrule maintains the second optical fiber and said optical fiber stub in general alignment so that the second optical fiber and said optical fiber stub can be fused within the fusion access slot.

5,748,820
COMPONENT FOR CONNECTION TO A MULTI-CORE FIBER, AND A METHOD OF MANUFACTURE

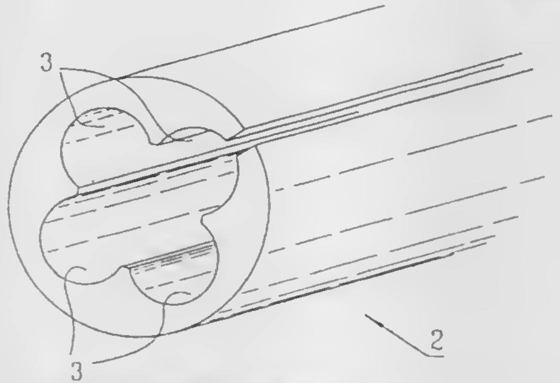
René Le Marer, Tregastel, and Gabrielle Perrin, Ploubezre, both of France, assignors to France Telecom, France

Filed Mar. 21, 1995, Ser. No. 408,269

Claims priority, application France, Mar. 24, 1994, 94 03467; Dec. 28, 1994, 94 15775

Int. Cl.^{6} G02B *6/00;6/36*

U.S. Cl. 385—76 **20 Claims**



1. A connection assembly comprising:

an optical connection component which includes a plurality of optical fibers each optical fiber having at least a light guide core surrounded by optical cladding, the fibers being united at a common end in such a manner that their claddings take up a mutually-tangential configuration the axes of their cores are disposed in a configuration that corresponds to that of the axes of a multi-core fiber to which said common end is to be connected, said fibers being free from one another at their opposite ends; and means for connecting the end of said component where its fibers are united to the end of a multi-core fiber.

5,748,821
ADAPTER ASSEMBLY FOR FIBER OPTIC CONNECTORS

Otto Schempp, Bad Rappenau, and Francesco Carabetta, Hassmersheim, both of Germany, assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 25, 1996, Ser. No. 668,658

Claims priority, application European Pat. Off., Aug. 9, 1995, 95112497

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—76 **6 Claims**

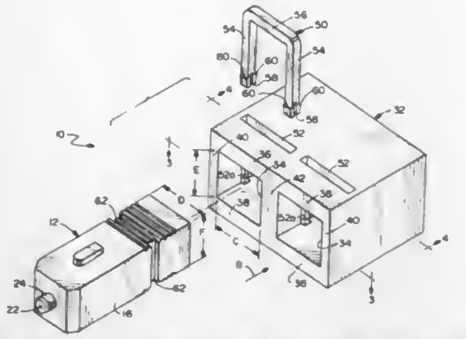
1. An adapter assembly for holding two individual fiber optic connectors in generally parallel side-by-side alignment, comprising:

a body having a pair of through passages adapted for holding said fiber optic connectors in a substantially side-by-side relationship when the connectors are inserted in an axial direction into the passages, the passages being transversely enlarged relative to the respective connectors to provide floating motion between the connectors and the body;

a holding clip insertable into a transverse opening in the body into engagement with each connector; and

complementary interengaging retention means between each holding clip and its respective connector to hold the connector

OL
2 10
SS
1
MY
5
998
MI



in its respective passage in the body, the retention means being configured to allow said floating motion between the connectors and the body.

5,748,822
OPTICAL MODULE FOR CONNECTING OPTICAL ELEMENT AND OPTICAL FIBER

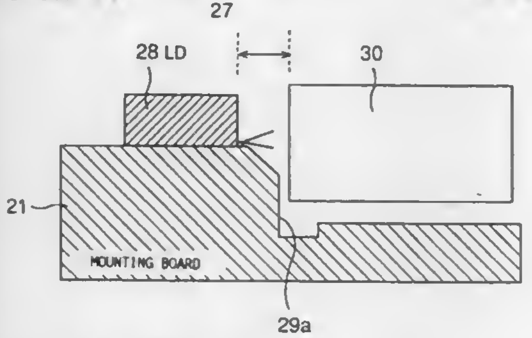
Kazunori Miura; Seimi Sasaki; Ryoichi Ochiai; Hideo Sumiyoshi, and Goji Nakagawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 12, 1996, Ser. No. 615,158

Claims priority, application Japan, Jul. 10, 1995, 7-173803

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—90 **47 Claims**



1. An optical module comprising:

a mounting board having an upper surface and a longitudinal optical axis parallel thereto;

an optical element supported on the upper surface of the mounting board and having an optical axis aligned with the longitudinal optical axis;

a groove extending longitudinally in the mounting board, centrally thereof and parallel to the optical axis, and having an open end at a first end of the mounting board and a closed end, longitudinally displaced from the first end at an internal position within the mounting board;

an optical fiber having an optical axis, the optical fiber inserted in and supported by the groove in the mounting board to align the optical axis thereof with the longitudinal optical axis, the groove having a vertical stopper surface therein, perpendicular to the longitudinal optical axis and displaced axially from the closed end of the groove, the vertical stopper surface abutted by a free, leading end of the optical fiber when inserted therein; and

a positioning mark provided on the mounting board and defining a mounting position of the optical element on the mounting board at which the optical element, with an optical axis thereof aligned with the longitudinal optical axis, is displaced by a prescribed longitudinal distance from a free, leading end of an inserted optical fiber as determined by the abutment thereof with the vertical stopper surface, the positioning mark being located adjacent to the closed end of the groove and at a prescribed distance from the stopper surface.

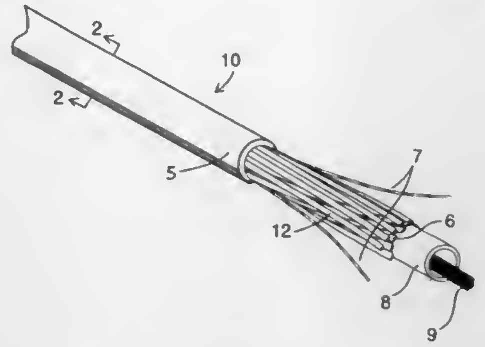
5,748,823
SINGLE-TUBE PLENUM RIBBON CABLE

Samuel D. Navé, Conover, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Jan. 30, 1997, Ser. No. 792,814

Int. Cl.^{6} G02B *6/44*

U.S. Cl. 385—113 **20 Claims**



1. An optical fiber cable, comprising:

a core comprising at least one optical fiber;

a core tube surrounding said core, said core tube comprising a non-halogenated polyolefin-based polymer material;

a jacket surrounding said core tube, said jacket being formed of chlorinated plastic material; and,

a plurality of dielectric strength members which are disposed between said core tube and said jacket, said cable having a maximum flame propagation of 5.0 feet or less, a peak optical density of 0.50 or less, and an average optical density of 0.15 or less, and each said optical fiber having a maximum change in attenuation of 0.20 dB or less when placed on a mandrel having a diameter of 254 mm at temperatures of −20° C. and +50° C., subjected to impact energy of 2.94 N m, subjected to a compressive load of 10 N/mm, or exposed to temperatures of −20° C. to +70° C.

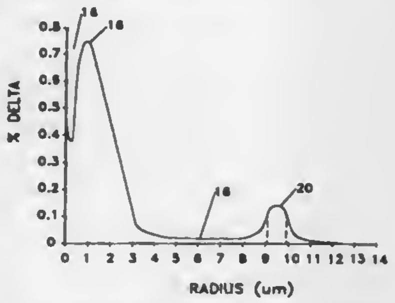
5,748,824
POSITIVE DISPERSION OPTICAL WAVEGUIDE

David K. Smith, Painted Post, N.Y., assignor to Corning Incorporated

Filed Nov. 17, 1995, Ser. No. 559,954

Int. Cl.^{6} G02B *6/22*

U.S. Cl. 385—124 **8 Claims**



1. A single mode optical waveguide fiber comprising:

a core region having a refractive index profile including three segments,

a first central segment having a maximum refractive index n_1, an index difference $\lambda_1\%$, and a radius a_1 measured from a point on the longitudinal axis of symmetry of said waveguide fiber, said central segment disposed substantially symmetrically about the longitudinal axis of symmetry,

a second segment, of annular shape disposed adjacent and around said central segment, having a maximum refractive index n_2, an index difference $\Delta_2\%$, and an outside radius r_2,

a third segment, of annular shape disposed adjacent and around said second segment, having a maximum refractive index n_3, an index difference $\Delta_3\%$, and a radius to the midpoint of said third segment r_3;

a clad layer, of annular shape disposed adjacent and around said third segment, having a maximum refractive index n_c;

wherein, $n_1>n_3>n_2\geqq n_c$, said central segment has an alpha refractive index profile and alpha is about 1, said second segment has a substantially.flat refractive index profile, and said third segment has a rounded step index profile, $\Delta_1\%\leqq 0.9\%$, $\Delta_2\% \leqq 0.024\%$, and $\Delta_3\% \leqq 0.2\%$, and the radii, r_1, r_2, and r_3 are chosen to provide an optical waveguide fiber characterized by,

$\lambda_o\leqq 1530$ nm, total dispersion slope<0.065 ps/nm_2—km over the range 1530 nm to 1570 nm, pin array bend loss <12 dB, mode field diameter $\leqq 7.4$ microns, $\lambda_c< 1450$, and total dispersion which is in the range of about 0.5 ps/nm-km to 3 ps/nm-km over wavelength range 1530 nm to 1570 nm.

5,748,825
LIQUID CRYSTAL OPTICAL WAVEGUIDE DISPLAY SYSTEM

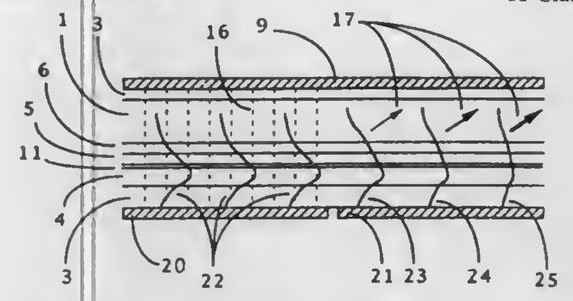
Marshall A. Rockwell, III, 303 Grenola St., Pacific Palisades, Calif. 90272

PCT No. PCT/US92/06418, § 371 Date Mar. 27, 1995, § 102(e) Date Mar. 27, 1995

PCT Filed Aug. 3, 1992, Ser. No. 379,519

Int. Cl.^{6} G02B *6/02*

U.S. Cl. 385—126 **11 Claims**



1. An optical waveguide display system comprising:

multiple, separate, elongated, integrally formed optical waveguide elements, each substantially longer than they are wide, configured to guide light along their length and having a channel extending lengthwise within each integrally formed optical waveguide element,

switching elements employing an electric field and placed along the length of each said separate, elongated, integrally formed optical waveguide element to allow light to be selectively removed from said separate, elongated, integrally formed optical waveguide elements and viewed, and

liquid crystal material forming a part of said switching elements and located within each of the channels of said separate, elongated, integrally formed optical elements,

said optical waveguide elements and liquid crystal material being formed into multiple separate monolithic fiber-like structures.

5,748,826
OPTICAL FIBER CORE

Ryuichiro Nagano, Tokyo; Yoichi Nagase, and Hajime Tamura, both of Gyoda, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, and Toyokuni Electric Cable Co., Ltd., both of Tokyo, Japan

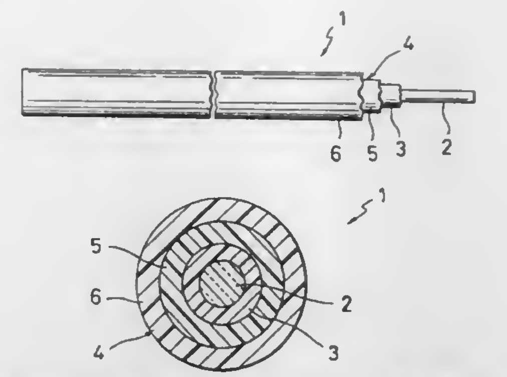
Filed Nov. 19, 1996, Ser. No. 754,445

Int. Cl.^{6} G02B *6/02;6/22*

U.S. Cl. 385—128 **4 Claims**

1. A jacketed optical fiber comprising:

an optical fiber;



an ultraviolet curable resinous layer covering an outside circumferential part of said optical fiber; and

a covering layer covering an outside circumferential part of said ultraviolet curable resinous layer, said covering layer including:

a first covering layer covering said outside circumferential part of said ultraviolet curable resinous layer, said first covering layer being formed of a flexible thermoplastic resin having a Young's modulus in the range of 5–100 N/mm^2; and

a second covering layer covering said outside circumferential part of said first covering layer, said first covering layer being formed of a thermoplastic resin which is semi-hard to hard having a Young's modulus in the range of 200–500 N/mm^2.

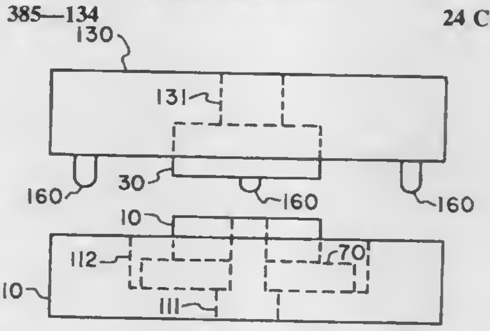
5,748,827
TWO-STAGE KINEMATIC MOUNT

Mark R. Holl, Seattle, and Roya R. Sabeti, Tacoma, both of Wash., assignors to University of Washington, Seattle, Wash.

Filed Oct. 23, 1996, Ser. No. 736,336

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—134 **24 Claims**



1. A two-stage mountable module for coupling with a two-stage kinematic mount, said mount having a macrostage mount and a microstage mount, said module comprising:

a macrostage module comprising a macrostage body and further comprising a plurality of macrostage alignment members positioned on said macrostage body;

a microstage module comprising a microstage body and further comprising three microstage kinematic members positioned on said microstage body; and

a compliant layer positioned between and in contact with said macrostage body and said microstage body:

wherein said macrostage and microstage modules are adapted to be removably coupled with said macrostage and microstage mounts, respectively.

VOL
210
SS
1
MY
5
998
MI

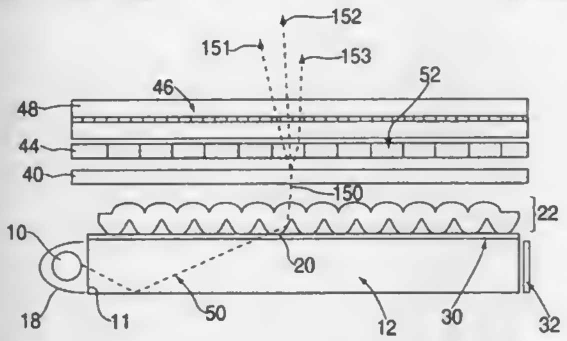
5,748,828
COLOR SEPARATING BACKLIGHT

Ivan B. Steiner, Ridgewood; Scott M. Zimmerman, Basking Ridge, and Karl W. Beeson, Princeton, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 376,709, Jan. 23, 1995, Pat. No. 5,555,329, which is a continuation-in-part of Ser. No. 149,912, Nov. 10, 1993, Pat. No. 5,396,350, Ser. No. 242,525, May 13, 1994, Pat. No. 5,428,468, and Ser. No. 321,368, Oct. 11, 1994. This application Jan. 13, 1997, Ser. No. 782,133

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—146 **11 Claims**



1. A backlight assembly for use in a flat panel electronic display, said display having a modulating means capable of providing an image to a remotely positioned observer, said backlight assembly comprising means for transmitting light and having a generally planar first surface; a reflecting means having at least one input surface optically coupled to said first surface for receiving a portion of light from said light transmitting means and for reflecting a portion of light so as to produce a collimated light output at a desired output angle; a diffraction means disposed between said reflecting means and said modulating means for accepting said collimated light and separating said light into at least one of red, blue and green light components and; light directing means for spatially directing said light components.

5,748,829
STILL IMAGE SIGNAL PROCESSING DEVICE EMPLOYING PEDESTAL LEVEL DATA

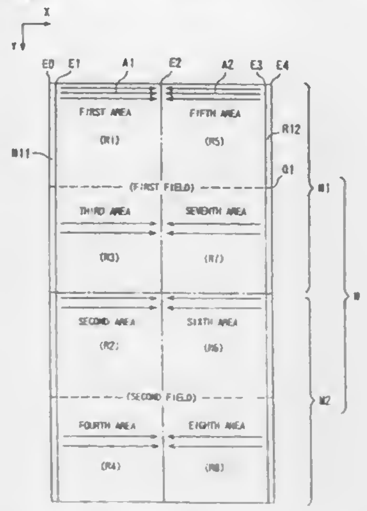
Yasuhiro Yamamoto, and Koichi Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251,577, May 31, 1994, abandoned. This application May 23, 1996, Ser. No. 652,171

Claims priority, application Japan, May 31, 1993, 5-153047

Int. Cl.^{6} H04N *5/91*

U.S. Cl. 386—46 **16 Claims**



1. A still image signal processing device, comprising:

- a memory for storing a first image signal generated in accordance with a first mode, said first image signal having image signal data and pedestal level data in one horizontal scanning period;
- means for writing said first image signal to said memory in such a manner that said pedestal level data and said image signal data are stored in an order in which said pedestal level data and said image signal data are inputted in said still image signal processing device; and
- first reading means for reading said first image signal from said memory to generate a second image signal in accordance with a second mode, said first reading means reading said first image signal in such a manner that said first image signal is divided into a first half and a latter half by a dividing line that passes through a center of said first image signal at a substantially right angle to a horizontal scanning line, said first reading means reading said latter half in a direction substantially parallel to said horizontal scanning line and opposite to a reading direction of said first half, which is substantially parallel to said horizontal scanning line, so that a blanking period of said second mode is formed in accordance with said pedestal level data, said pedestal level data comprising first pedestal level data provided in front of said image signal data, and second pedestal level data provided behind said image signal data.

5,748,830
COLOR SIGNAL PROCESSOR FOR REMOVING LEAKAGE COMPONENTS

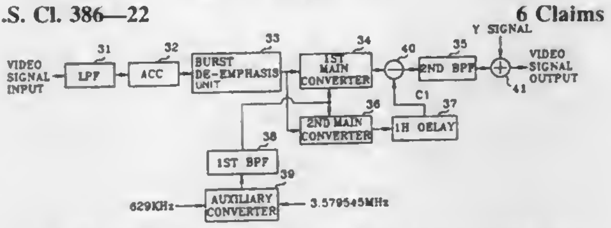
Soon-mo Jang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 10, 1996, Ser. No. 676,640

Claims priority, application Rep. of Korea, Jul. 10, 1995, 1995 20204

Int. Cl.^{6} H04N *17/00*

U.S. Cl. 386—22 **6 Claims**



1. A color signal processor for reproducing a video signal picked up from a recording medium, without generating a leakage component due to a harmonic wave, in which a color signal is separated from the video signal and is frequency converted according to a reference signal to thereby generate a frequency converted signal corresponding to an original color signal, said color signal processor for reproducing the video signal comprising:

- a one-horizontal line (1H) delay for delaying the frequency converted signal according to the reference signal by 1H thereby inverting the phase of the delayed signal by 180° and outputting a delayed signal;
- a subtracter for subtracting the delayed signal from the frequency converted signal thereby generating a pure color signal which does not include a leakage component due to a harmonic waves; and
- a main converter for frequency converting the color signal according to the reference signal thereby generating the frequency converted signal, and outputting the frequency converted signal to said subtracter and said 1H delay, said main converter comprising:
  - a first main converter for frequency converting the color signal according to the reference signal and outputting a first frequency converted signal to said subtracter; and
  - a second main converter for frequency converting the color signal according to the reference signal and outputting a second frequency converted signal to said 1H delay.

5,748,831
IMAGE REPRODUCING APPARATUS

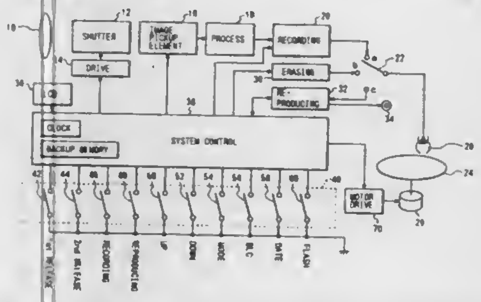
Ryoji Kubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 766,280, Sep. 27, 1991, abandoned. This application Jun. 14, 1994, Ser. No. 261,248

Claims priority, application Japan, Oct. 2, 1990, 2-264437; Oct. 2, 1990, 2-264440; Oct. 2, 1990, 2-264442

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 386—46 **6 Claims**



1. A reproducing apparatus for sequentially reproducing a plurality of still image information recorded on a recording medium, said apparatus comprising:

- reproducing means for reproducing the still image information recorded on the medium according to one of a plurality of reproducing modes, said reproducing means having (i) an interval reproducing mode for automatically and continuously reproducing the plurality of still image information at an arbitrary time interval and (ii) a normal reproducing mode for reproducing a single still image information;
- power supply means for supplying power to said reproducing means;
- mode designation means for designating one of the interval reproducing mode and the normal reproducing mode; and
- control means for controlling said reproducing means and said power supply means according to the reproducing mode designated by said mode designation means, said control means controlling said power supply means so that, when said mode designation means designates the interval reproducing mode, the power supply from said power supply means to said reproducing means continues until reproducing of all of the still image information recorded on the medium according to the interval reproducing mode is completed, and, when said mode designation means designates the normal reproducing mode, the power supply from said power supply means to said reproducing means continues for a predetermined time, during which the still image information recorded on the medium is reproduced according to the normal reproducing mode, and is terminated automatically, upon an elapse of the predetermined time.

5,748,832
VIDEO SIGNAL REPRODUCING SYSTEM

Koji Takahashi, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

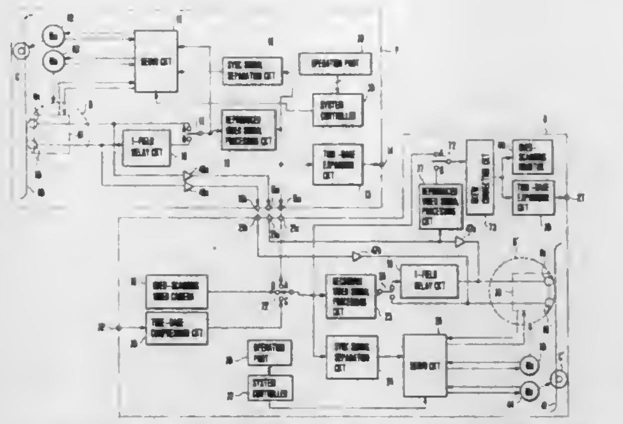
Continuation of Ser. No. 479,574, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 161,197, Dec. 2, 1993, abandoned, which is a continuation of Ser. No. 706,227, May 28, 1991, abandoned. This application Oct. 9, 1996, Ser. No. 731,120

Int. Cl.^{6} H04N *5/783*

U.S. Cl. 386—68 **17 Claims**

13. A video signal reproducing apparatus for copying a first tape-shaped recording medium on which time-base-compressed video signals corresponding to video signals for a given period of time are recorded in each of many tracks having different azimuth angles between adjacent tracks, comprising:

- a) transporting means for transporting the first tape-shaped recording medium a distance corresponding to N tracks (N: an integer which is not less than 2) per said given period of time;



- b) reproducing means for reproducing, by using N rotary heads (N: an integer which is not less than 2) having different azimuth angles between adjacent heads and being disposed in a closely adjacent state, the time-base-compressed video signals as N channel signals from N adjacent tracks formed on the first tape-shaped recording medium,
  - all of the time-base-compressed video signals recorded in the N adjacent tracks being reproduced at substantially the same time,
  - the time period for reproducing the video signals from the N adjacent tracks being shorter than the given period of time;
- c) output means for outputting said time-base-compressed video signals to a recording apparatus,
  - said recording apparatus receiving said time-base-compressed video signals from said first output means at substantially the same time to record, by using N rotary heads having different azimuth angles between adjacent heads and being disposed in a closely adjacent state, said time-base-compressed video signals on a second tape-shaped recording medium while forming N adjacent tracks on said second tape-shaped recording medium,
  - all of the time-base-compressed video signals being recorded onto the N adjacent tracks at substantially the same time; and
- d) output means for outputting the time-base-compressed video signals reproduced by the reproducing means in a state monitorable by a monitor means.

5,748,833
STILL VIDEO APPARATUS HAVING DATA SIGNAL SUPPRESSION

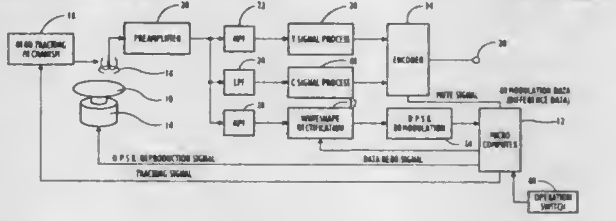
Koichi Sato, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 200,544, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 815,862, Jan. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 486,886, Mar. 1, 1990, abandoned. This application Feb. 28, 1995, Ser. No. 395,537

Claims priority, application Japan, Mar. 7, 1989, 1-54176; Mar. 7, 1989, 1-54177

Int. Cl.^{6} H04N *5/92;5/928;5/781*

U.S. Cl. 386—95 **50 Claims**



1. A still video apparatus comprising:

means for reading multiple recorded signals from a magnetic disk on which picture signals and data signals are recorded

VOL
2 10
SS
1
MY
5
998
MI

together such that said data signals are superimposed on said picture signals to form said multiple recorded signals;

means for extracting and reproducing said picture signals from the multiple recorded signals read by said reading means; and

means for extracting said data signals from said multiple recorded signals read by said reading means;

means for processing said data signals which have been extracted by said extracting means;

means for reproducing said data signals which have been extracted and processed; and

means for optionally controlling said processing means by an external operation, wherein said external operation selectively turns said processing of said data signals ON and OFF when said picture signals on a same track of said recording medium are repeatedly reproduced, thereby preventing video noise due to processing of said data signals, and wherein said data signals consist of signals other than video signals.

5,748,834

RECORDING/REPRODUCING SYSTEM WHEREIN AN ANALOG STEREO AUDIO FORMAT IS MAINTAINED AND HALF THE ANALOG STEREO SIGNAL IS REPLACED BY A DIGITAL STEREO AUDIO SIGNAL

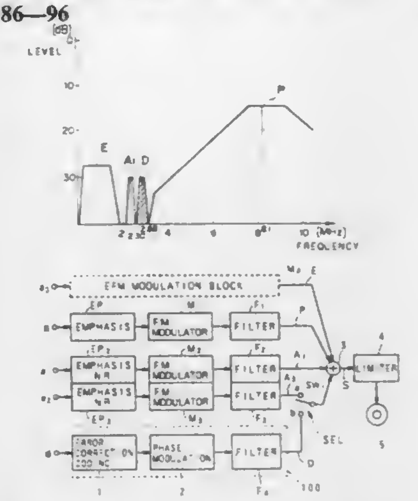
Haruhito Miyazaki, and Koichi Ishitoya, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Japan

Continuation of Ser. No. 341,066, Nov. 16, 1994, abandoned. This application Apr. 11, 1997, Ser. No. 835,962

Claims priority, application Japan, Nov. 19, 1993, 5-291071

Int. Cl.^{6} H04N *5/91;5/928;7/04;7/52*

U.S. Cl. 386—96 **12 Claims**



1. A video and audio information recording method of recording a plurality of analog audio signals in a stereo format to be recorded onto one record medium and multiplexed on a frequency axis by assigning the analog audio signals respectively to a plurality of channels prescribed by carrier waves which have frequencies different from each other, wherein a digital stereo audio signal is assigned to one of the plurality of channels in place of one audio signal so as to be multiplexed on the frequency axis, the digital stereo audio signal is sampled by a predetermined sampling frequency, and the carrier wave prescribing the channel assigned to the digital stereo audio signal has a frequency which is an integer multiple of the predetermined sampling frequency.

5,748,835

AUDIO SIGNAL DECODING APPARATUS AND METHOD FOR A DISC DRIVING SYSTEM

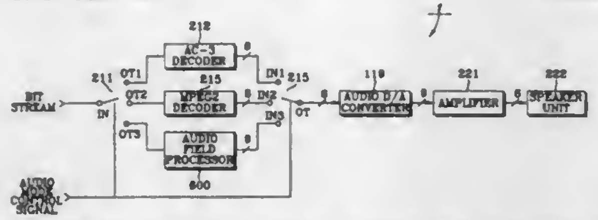
Hee-Soo Lee, Ahnsan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 30, 1996, Ser. No. 689,156

Claims priority, application Rep. of Korea, Sep. 29, 1995, 1995 33089

Int. Cl.^{6} H04N *5/91;5/928*

U.S. Cl. 386—104 **7 Claims**



1. An audio signal processor for selecting and processing an audio signal of one mode selected from an AC-3 mode, an MPEG2 mode and a PCM mode in a digital video disc player system for recording and an audio signal encoded in one format selected from a AC-3 format, an MPEG2 format and a PCM format and a video signal of an MPEG format, said processor comprising:

first switching unit whose input port is connected to an audio bit stream and switched by an audio mode control signal for outputting an audio signal of the AC-3 format to a first output port, outputting an audio signal of the MPEG2 format to a second output port and outputting a PCM audio signal to a third output port;

an AC-3 decoding unit connected to said first output port of said first switching unit for extending input compressingly encoded 6-channel audio data of said AC-3 format and then restoring the same into first 6-channel audio data;

an MPEG2 decoding unit connected to said second output port of said first switching unit for extending input compressingly encoded audio data of said MPEG2 format and then restoring the same into second 6-channel audio data;

a PCM processing unit connected to said third output port of said first switching unit for audio-field processing input 2-channel linear PCM audio data and then converting said 2-channel linear PCM audio data into third 6-channel audio data;

a second switching unit having a first input port connected to said AC-3 decoding unit, a second input port connected to said MPEG2 decoding unit and a third input port connected to said PCM processing unit, said second switching unit being switched by said audio mode control signal to selectively output audio signals of said first through third input ports to an output port;

a unit connected to said second switching unit for converting and outputting the audio signals output by said second switching unit into a 6-channel analog audio signal; and

a unit having six speakers for reproducing said 6-channel analog signal.

5,748,836

LOCKING MECHANISM FOR VAPORIZER ELECTRODE HOUSING UTILIZING ELECTRICAL PLUG PRONG AS KEY

Devin Lee Moore, Decatur; John A. McMillan, Atlanta, and Joseph J. Kopp, Jr., Decatur, all of Ga., assignors to Sunbeam Products, Inc., Delray Beach, Fla.

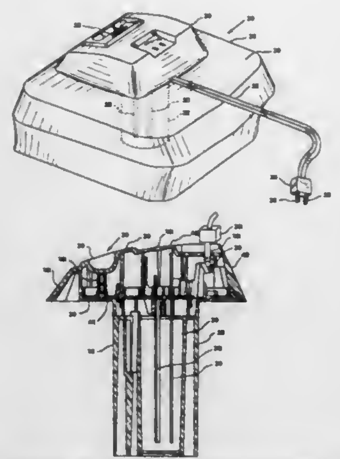
Filed Jan. 13, 1995, Ser. No. 372,588

Int. Cl.^{6} F22B *1/30;* **H05B** *3/60*

U.S. Cl. 392—337 **17 Claims**

1. A heating unit assembly for a vaporizer comprising:

(a) a heating unit housing having a body for protecting a heating element, a flange extending from the body, at least one projection extending from the flange and a post member also extending from the flange;



(b) a cover having at least one key aperture for a key to fit within; and

(c) a heating unit holder having at least one opening therein, and at least one flexible locking finger extending therefrom, the combination of the cover and the heating unit holder is mounted on the heating unit housing in a locked position such that the at least one projection extend through the at least one opening forming a connection between the combination of the cover and the heating unit holder and the heating unit housing and the at least one flexible locking finger engages the post member thereby locking the combination of the cover and the heating unit holder and the heating unit housing.

5,748,837

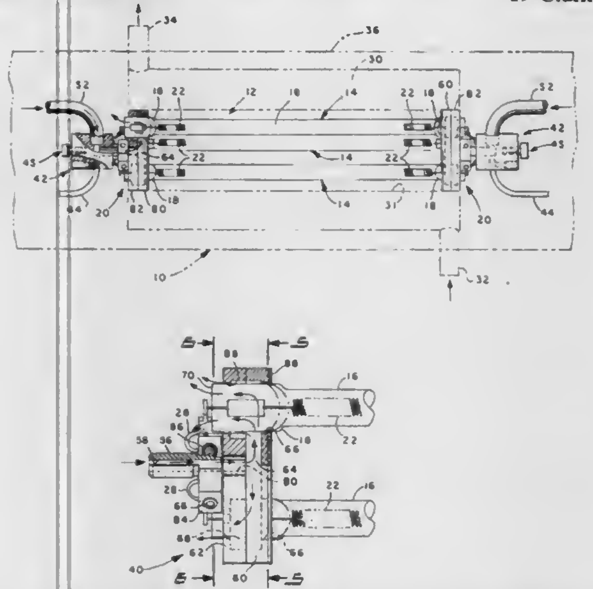
HIGH TEMPERATURE LAMP HEATER ASSEMBLY WITH COOLING OF LAMP BASE PORTIONS

Richard A. Lokar, Orwell, and Dennis J. Rezabek, Thompson, both of Ohio, assignors to Process Technology Inc, Mentor, Ohio

Filed Mar. 24, 1997, Ser. No. 823,133

Int. Cl.^{6} H05B *1/00;* **H01R** *33/02*

U.S. Cl. 392—411 **19 Claims**



1. A heater assembly for supporting and energizing a plurality of heating lamps each of which include a lamp portion and a base portion having one end which is connected to a power conductor comprising a socket assembly including first and second side plates which are connected together to define a manifold therebetween, said first and second side plates each including a plurality of openings therein for receiving a base portion of a lamp therein, each of said openings in said first side plate being aligned with an opening in said second side plate to allow a base portion of each lamp to pass through an opening in said first side plate and an aligned opening in said second side plate with said one end of the base portion disposed adjacent to said second side plate, said openings in said first side plate having a cross-sectional configuration which is substantially identical and equal in size to the cross-sectional configuration of the portion of the base portion which is disposed therein, each of said heating lamps being supported by said openings in said first and second side plates with the base portion of each lamp being disposed in said manifold and the one end of each base portion extending through an opening in said second side plate and being supported adjacent to said second side plate outside of said manifold, said openings in said second side plate having a cross-sectional configuration which is similar to and larger in area than the cross-sectional configuration of the base portion which is disposed therein, the difference in the cross-sectional area of the base portion of the lamp disposed within said opening in said second side plate and the cross-sectional area of the openings in said second side plate providing exit passageways from said manifold, an inlet for directing a source of cooling fluid into said manifold, said cooling fluid flowing into said manifold to cool the base portions of the heating lamps located in said manifold, said cooling fluid flowing from said manifold around the base portions of the heating lamps and through said exit passageways in said openings in said second side plate to further cool the base portions of the lamps and conductor means connected to the one end of each of the base portions of each heating lamp adjacent said second side plate.

5,748,838

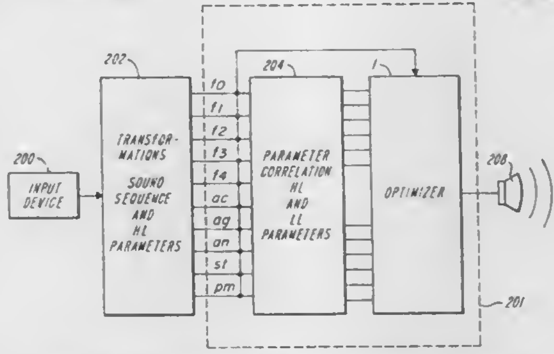
METHOD OF SPEECH REPRESENTATION AND SYNTHESIS USING A SET OF HIGH LEVEL CONSTRAINED PARAMETERS

Kenneth N. Stevens, Cambridge, Mass., assignor to Sensimetrics Corporation, Cambridge, Mass.

Continuation of Ser. No. 366,398, Dec. 29, 1994, abandoned, which is a continuation of Ser. No. 765,926, Sep. 24, 1991, abandoned. This application Aug. 22, 1996, Ser. No. 708,271

Int. Cl.^{6} G10L *9/02*

U.S. Cl. 395—2.7 **6 Claims**


200
INPUT DEVICE
202
TRANSFORMATIONS
SOUND SEQUENCE AND HL PARAMETERS
f0
f1
f2
f3
f4
ac
ag
an
st
pm
204
PARAMETER CORRELATION HL AND LL PARAMETERS
OPTIMIZER
208
201

1. A method for generating a signal corresponding to a sound sequence capable of being produced by a trachea and a vocal tract including a velopharyngeal port, a vocal fold, a glottal opening, and an intraoral cavity, said method comprising the steps of:

- a. for each sound sequence, determining values of each of a plurality of high level parameters, said high level parameters consisting essentially of:
  - i. each of the first four natural frequencies of the vocal tract when the velopharyngeal port is closed and when there is no acoustic coupling between the vocal tract and the trachea;
  - ii. the fundamental frequency of vocal fold vibration;
  - iii. the area of glottal opening;
  - iv. the area of narrowest vocal tract constriction for consonants;
  - v. the cross-sectional area of the velopharyngeal port;
  - vi. a stridency parameter measuring the effectiveness of noise generation due to obstacles to air flow in the vocal tract; and

VOL
210
ISS
1
MY
5
1998
UMI

vii. the change in intraoral pressure for obstruent consonants as a consequence of change in vocal tract volume;

b. deriving a plurality of low level parameters only from said high level parameters, by transforming said high level parameters using mapping relations into said low level parameters, the number of parameters in said plurality of low level parameters being at least twice the number of parameters in said plurality of high level parameters;

c. inputting said plurality of low level parameters into a speech synthesizer;

d. generating artificial speech from said plurality of low level parameters, said plurality of low level parameters being the only parameters required to generate said artificial speech.

5,748,839

QUANTIZATION OF INPUT VECTORS AND WITHOUT REARRANGEMENT OF VECTOR ELEMENTS OF A CANDIDATE VECTOR

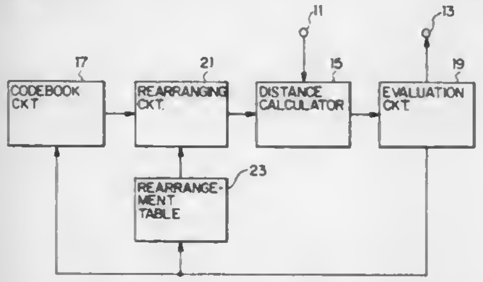
Masahiro Serizawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 21, 1995, Ser. No. 426,649

Claims priority, application Japan, Apr. 21, 1994, 6-083272

Int. Cl.^{6} G10L *5/00*

U.S. Cl. 395—2.31 **17 Claims**



1. A vector quantizing method of quantizing input vectors into output codes, said vector quantizing method comprising the steps of:

preparing a codebook circuit loaded with code vectors in accordance with codebook indexes with each code vector composed of a predetermined number of vector elements,

producing at least one candidate vector of said code vectors in response to a current index selected from said codebook indexes for each of said input vectors,

calculating distances between said each of input vectors and comparison vectors given by said at least one candidate vector to produce distance values representative of said distances, and

evaluating said distance values to select one of said comparison vectors as a selected vector that minimizes said distance values, said evaluating step producing a selected index indicative of said selected vector to successively produce said output codes with said selected index used as each output code,

wherein said vector quantizing method comprises the step of:

using, in said comparison vectors, (1) said at least one candidate vector as an unchanged vector without rearrangement of its vector elements and (2) said at least one candidate vector as a rearranged vector with rearrangement of its vector elements, in response to a rearrangement index,

wherein said evaluating step produces said selected index with no change of and with addition of said rearrangement index to said current index when said selected vector is said unchanged and said rearranged vectors, respectively.

5,748,840

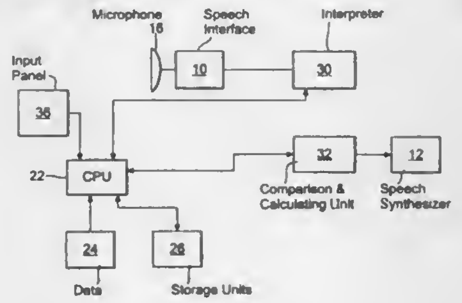
METHODS AND APPARATUS FOR IMPROVING THE RELIABILITY OF RECOGNIZING WORDS IN A LARGE DATABASE WHEN THE WORDS ARE SPELLED OR SPOKEN

Charles La Rue, La Canada, Calif., assignor to Audio Navigation Systems, Inc., Van Nuys, Calif.

Continuation-in-part of Ser. No. 999,062, Dec. 31, 1992, Pat. No. 5,454,062, which is a continuation-in-part of Ser. No. 675,632, Mar. 27, 1991, Pat. No. 5,274,560, which is a continuation-in-part of Ser. No. 621,577, Dec. 3, 1990, abandoned. This application May 9, 1995, Ser. No. 437,057

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 395—2.63 **12 Claims**



1. A method for identifying any one of a plurality of words using a programmed digital data processing system, each word having an audible form represented by a sequence of spoken speech elements, with each speech element having a respective position in the sequence, the digital data processing system being connected to means for receiving spoken speech elements of a word and interpreting each received speech element,

wherein there is a plurality of possible speech elements, each spoken speech element is a speech element α, each interpreted speech elements is a speech element β, and each spoken speech element a may be interpreted as any one of a plurality of different speech elements β, one of the speech elements β being the same as speech element α, said method comprising:

assigning to each of the possible speech elements a respective plurality of probabilities, $P_{\alpha\beta}$, that the speech element will be interpreted as a speech element β when a speech element a has been spoken;

storing data representing each word of the plurality of words, the data for each word including identification of each speech element in the word and identification of the respective position of each speech element in the sequence of speech elements representing the word;

in the means for receiving and interpreting, receiving a sequence of speech elements spoken by a person and representing one of the stored words, and interpreting each speech element of the spoken word and the position of each speech element in the sequence of spoken speech elements; and

comparing the interpreted speech elements with stored data representing each word of the plurality of words and performing a computation, using the probability, $P_{\alpha\beta}$, associated with each interpreted speech element β to identify the word of the plurality of words whose speech elements correspond most closely to interpreted speech elements.

5,748,841

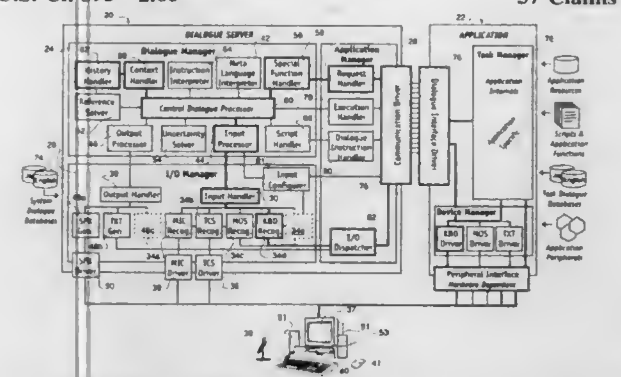
SUPERVISED CONTEXTUAL LANGUAGE ACQUISITION SYSTEM

Philippe Morin, 3449 Richland Dr., Apt. 8, Santa Barbara, Calif. 93105, and Jean-claude Junqua, 146 Santa Ana Ave., Santa Barbara, Calif. 93111

Continuation of Ser. No. 201,893, Feb. 25, 1994, abandoned. This application Apr. 10, 1997, Ser. No. 833,912

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 395—2.66 **37 Claims**



1. A supervised contextual restricted natural language acquisition system for computerized applications, comprising:

first means for defining and storing a dialogue history context;

second means for defining and storing a dialogue model;

third means for defining and storing at least one syntactic-semantic grammar;

fourth means responsive to said first, second and third means for building a language to individually represent both dialogue-specific expressions and application specific application expressions and means to represent said application-specific expressions as at least one prediction tree representing at least one possible dialogue that is semantically consistent with the stored dialogue history context and stored dialogue model and

fifth means to interpret said dialogue-specific expressions to supply instructions to the language acquisition system; and

user interface means for providing language assistance to the user based on said prediction tree.

5,748,842

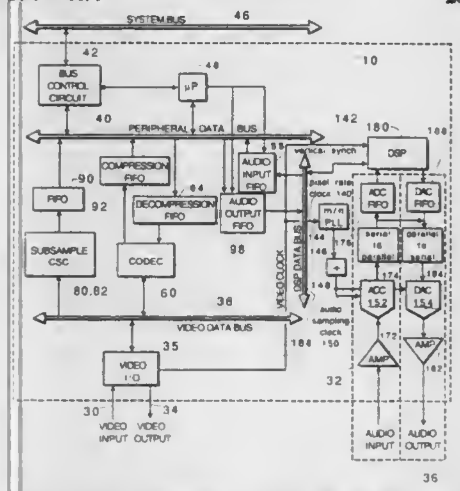
SYNCHRONIZING DIGITAL AUDIO TO DIGITAL VIDEO

Daniel J. Holmes, Marlboro; John W. Molnar, Chelmsford, and Morton H. Tarr, Bolton, all of Mass., assignors to Media 100 Inc., Marlboro, Mass.

Continuation of Ser. No. 49,987, Apr. 16, 1993, Pat. No. 5,506,932. This application Apr. 8, 1996, Ser. No. 629,528

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 395—2.79 **28 Claims**



1. An audio/video input/output (I/O) apparatus for acquiring digital audio samples from one or multiple channels of input audio and, alternately, synthesizing digital audio samples into one or multiple channels of output audio, the apparatus comprising:

a video I/O port circuit generating a video synchronization signal, said video I/O port circuit comprising a video input port configured to convert input analog video into digital video, and a video output port configured to synthesize output analog video from digital video; and

an audio I/O port circuit comprising a frequency synthesizer connected to receive said video synchronization signal from said video I/O port and configured to derive an audio sampling clock based on said video synchronization signal, an audio input port configured to sample and convert input analog audio into digital audio samples according to said sampling clock, and an audio output port configured to synthesize digital audio samples into output analog audio according to said sampling clock.

5,748,843

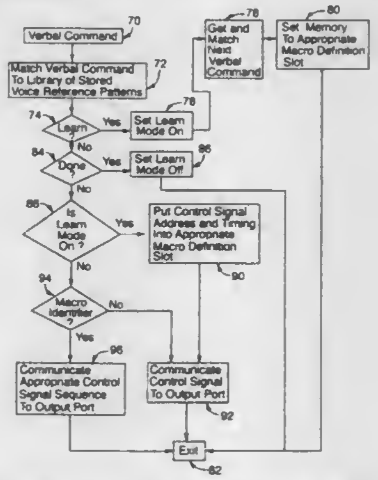
APPARATUS AND METHOD FOR VOICE CONTROLLED APPAREL MANUFACTURE

John C. Peck, Seneca, S.C.; Randy Rowland, Watkinsville, Ga., and Duanpei Wu, Clemson, S.C., assignors to Clemson University, Clemson, S.C.

Continuation-in-part of Ser. No. 155,100, Nov. 19, 1993, Pat. No. 5,375,063, which is a continuation of Ser. No. 763,347, Sep. 20, 1991, abandoned. This application Nov. 8, 1994, Ser. No. 336,290

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 395—2.84 **45 Claims**


Verbal Command
70
Match Verbal Command To Library of Stored Voice Reference Patterns
72
74
Learn ?
Yes
Set Learn Mode On
78
Get and Match Next Verbal Command
76
Set Memory To Appropriate Macro Definition Slot
80
No
84
Done ?
Yes
Set Learn Mode Off
86
No
88
Is Learn Mode On ?
Yes
Put Control Signal Address and Timing Into Appropriate Macro Definition Slot
90
No
94
Macro Identifier ?
No
Yes
96
Communicate Appropriate Control Signal Sequence To Output Port
Communicate Control Signal To Output Port
92
Exit
82

1. Apparel manufacturing system wherein an operator controls specific operations of an apparel manufacturing machine through verbal commands recognized by the system as distinct from other sounds in the environment of the system, the system comprising:

an apparel manufacturing device;

a recognizing and translating device, said recognizing and translating device configured to recognize the verbal command of the operator and to translate the verbal command into a digital control signal wherein said digital control signal includes an identification code corresponding to said apparel manufacturing device;

an input device, said input device being configured to input an operator's verbal command into said recognizing and translating device;

an interface device configured for presenting a digital control signal received from said recognizing and translating device to said apparel manufacturing device in a form recognized and accepted by said apparel manufacturing device, said recognizing and translating device being non-dependent on feedback signals indicating the actual operating condition of said apparel manufacturing device; and

an infrared light linkage configured for connecting said interface device in communication with said recognizing and translating device.

5,748,844

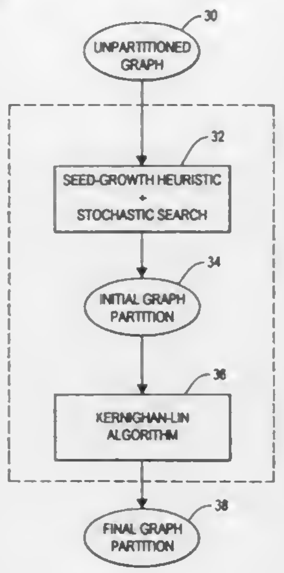
GRAPH PARTITIONING SYSTEM

Joseph W. Marks, Belmont, Mass., assignor to Mitsubishi Electric Information Technology Center America, Inc., Cambridge, Mass.

Filed Nov. 3, 1994, Ser. No. 333,728

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—10 **4 Claims**



1. Apparatus including a computer having storage for rearranging computer data in graph format in said storage by partitioning a graph having nodes couple together by edges, the partitioning being the result of using two initial sets of randomly chosen seed nodes, one set of seed nodes for each portion of the resulting partition, as opposed to a pair of seed nodes, one node for each portion of the resulting partition, with the final partition from the two initial sets of seed nodes providing an optimized arrangement of said nodes and edges in a final partition such that said final partition has a minimum cut size, comprising:

means including said computer for providing a nascent graph partition from an unpartitioned graph, including means for initially selecting a number of seed nodes of said unpartitioned graph for one portion of said nascent partition, and a disjoint number of seed nodes of said unpartitioned graph for another portion of said nascent partition, thus to form two initial sets, each having multiple nodes so as to be able to represent a much larger set of potential partitions of the original graph as compared with the number of potential partitions possible utilizing only one node per portion of the partition;

means including said computer for selecting unassigned nodes of said unpartitioned graph for each of said portions base on maximal connection of an unassigned node to nodes already in one of said portions, thereby to augment the nascent partition, and for ascertaining cut size for the resulting partition;

means including said computer for performing a stochastic search on said initial sets of seed nodes as opposed to performing a stochastic search on the nodes of a whole graph as it has been partitioned, thus to produce a partitioned graph; and,

means for outputting said partitioned graph to said computer storage.

5,748,845

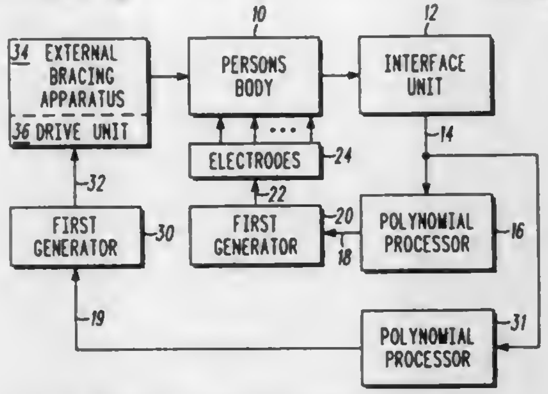
FES METHOD AND SYSTEM FOR CONTROLLING THE MOVEMENT OF A LIMB

Nicholas M. Labun, Chicago; Thomas J. McClaughry, Hoffman Estates, and Shay-Ping T. Wang, Long Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1995, Ser. No. 509,555

Int. Cl.^{6} G06F *15/18;* **A61N** *1/00*

U.S. Cl. 395—20 **11 Claims**



1. A limb stimulation system comprising:

an interface unit in communication with at least one limb of a person's body;

a first parallel processor responsive to the interface unit;

a second parallel processor responsive to the interface unit;

a first generator responsive to the first parallel processor;

a second generator responsive to the second parallel processor;

at least one electrode responsive to the first generator, the at least one electrode in communication with at least one muscle of the person's body;

a drive unit responsive to the second generator; and

a bracing apparatus responsive to the drive unit.

5,748,846

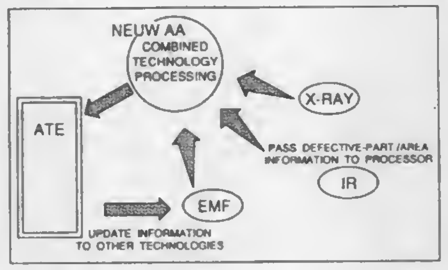
NEURAL ENGINEERING UTILITY WITH ADAPTIVE ALGORITHMS

Larry V. Kirkland, Ogden, and Jere D. Wiederholt, Layton, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1995, Ser. No. 517,002

Int. Cl.^{6} G06E *1/00;3/00*

U.S. Cl. 395—20 **8 Claims**


NEUW AA
COMBINED TECHNOLOGY PROCESSING
X-RAY
ATE
PASS DEFECTIVE-PART/AREA INFORMATION TO PROCESSOR
IR
EMF
UPDATE INFORMATION TO OTHER TECHNOLOGIES

1. An artificial intelligence diagnostic and test system which serves as an interface between a set of units under test and automatic test equipment which sends test signals to the units under test, said artificial intelligence diagnostic and test system monitoring reaction signals from said units under test to provide users with adjustable test and diagnostic sequences, said artificial intelligence diagnostic and test system comprising:

a means for selecting test sequences to be performed by said automatic test equipment on said units under test, said selecting means directing said automatic test equipment to send preselected test signals to said units under test on command,

a means for diagnosing said reaction signals from said units under test;

a means for providing users with both verbal control and machine message control of test activities, and

a means for interpreting alternative test technologies as they interact with said units under test, said alternative test technologies comprising infrared systems, radio frequency detection system and x-ray measurement systems which scan said units under test and provide said interpreting means with indicators of operability that do not require a response to a stimulus by said unit under test.

5,748,847

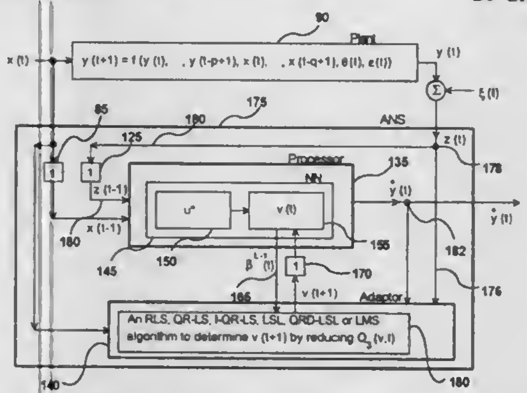
NONADAPTIVELY TRAINED ADAPTIVE NEURAL SYSTEMS

James Ting-Ho Lo, Ellicott City, Md., assignor to Maryland Technology Corporation, Ellicott City, Md.

Filed Dec. 21, 1995, Ser. No. 575,055

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—23 **20 Claims**


90
Plant
x (t)
y (t+1) = f (y (t), . y (t-p+1), x (t), . x (t-q+1), θ(t), ε(t))
y (t)
Σ
ξ (t)
175
85
190
ANS
125
z (t)
178
Processor
NN
135
z (t-1)
u*
v (t)
ŷ (t)
ŷ (t)
x (t-1)
180
150
145
155
182
β^{t-1}(t)
1
1
1
170
165
v (t+1)
Adaptor
176
An RLS, QR-LS, I-QR-LS, LSL, QRD-LSL or LMS algorithm to determine v (t+1) by reducing Q_3 (v,t)
140
180

1. An adaptive neural system for adaptive processing, said adaptive neural system comprising:

a neural network comprising:

at least one hidden nonlinear neuron;

a plurality of nonadaptively adjustable weights, whose operational values are obtained in a nonadaptive training of said neural network; and

a plurality of adaptively adjustable weights; and

adaptor means for adjusting the values of said adaptively adjustable weights during the operation of said adaptive neural system,

wherein at least one of said nonadaptively adjustable weights is a nonlinear weight local to one of said at least one hidden nonlinear neuron; and wherein a nonadaptive training criterion for said nonadaptive training is a function of said nonadaptively adjustable weights and the diversity variables associated with a plurality of typical values of the environmental parameter of said neural network's operating environment.

5,748,848

LEARNING METHOD FOR A NEURAL NETWORK

Volker Tresp, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1996, Ser. No. 699,329

Claims priority, application Germany, Aug. 21, 1995, 195 30 646.5

Int. Cl.^{6} G06F *15/18;* **G06E** *1/00*

U.S. Cl. 395—23 **13 Claims**

1. A learning method for training a recurrent neural network having a plurality of inputs and a plurality of outputs and at least one return line connecting an output to an input, comprising the steps of:

a) separating said at least one return line during training of the neural network and using the input connected to said return line as a training input together with the other inputs;

b) in a computer, interpreting input quantities supplied to the inputs of said neural network for training as a time series of a set of values of a variable input quantity representing respective values of the input quantity at discrete points in time;

c) in said computer identifying a statistical noise distribution of an uncorrelated noise of finite variance that has a chronological average of zero and is superimposed on the measured values;

d) in said computer generating a respective inputs values for any additional training inputs by, for each input value for each additional training input, treating the input value as a missing value in said time series, calculating a statistical missing value noise distribution according to said known noise distribution from at least one of said input quantity values neighboring the missing value in the time series and calculating said value of the missing value by replacing the missing value with at least two Monte Carlo samples of the missing value obtained according to the missing value noise distribution; and

e) training said neural network using said time series and a behavior of a technical system represented by the neural network.

5,748,849

NEURAL PROCESSOR COMPRISING DISTRIBUTED SYNAPTIC CELLS

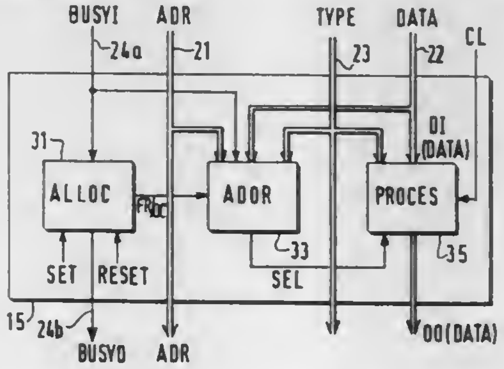
Jean Gobert, Mabons-Alfort, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 405,567, Mar. 16, 1995, abandoned, which is a continuation of Ser. No. 23,548, Feb. 26, 1993, abandoned. This application Jan. 6, 1997, Ser. No. 779,174

Claims priority, application France, Feb. 26, 1992, 92 02250

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—27 **12 Claims**



1. A neural processor operating to realize the function of neurons interconnected by respective synapses, each synapse forming a part of a particular neuron to evaluate the effect of a respective source neuron on the particular neuron and each synapse being a connection strength between a source and a destination neuron, the particular neuron communicating with a respective destination neuron comprising:

at least one concatenation of respective uniform programmable synaptic cells, the concatenation having an entry and an exit, the concatenation forming a data path between the entry and the exit, the respective uniform programmable synaptic cells each acting as a single one of the respective synapses, the uniform programmable synaptic cells in the concatenation being programmable to aggregate serially at least one group of cells that together form a single neuron, the number of cells in the at least one group also being programmable, each uniform programmable synapse being operative for selectively modifying data in the data path, each uniform programmable synaptic cell having:

a respective data input and a respective data output, the data input of each next one of the cells being connected to the data output of a preceding one of the cells, such that data is transferred along the concatenation,

a respective calculation unit for performing a respective data calculation on data received by the data input and producing selectively modified data at the data output, the calcu-

VOL 210
ISS 1
MY 5
1998
UMI

lation unit of each next cell multiplying data received by the next cell with a stored synaptic coefficient and accumulating the multiplication result thereof with a stored or received partial sum produced by a preceding one of the cells;

a respective memory, coupled to the respective calculation unit, for storing data received by the data input or produced as modified data by the calculation unit; and

bus means for communicating a programming instruction to each of the cells, the cells being connected in parallel to the bus means.

5,748,850
KNOWLEDGE BASE SYSTEM AND RECOGNITION SYSTEM

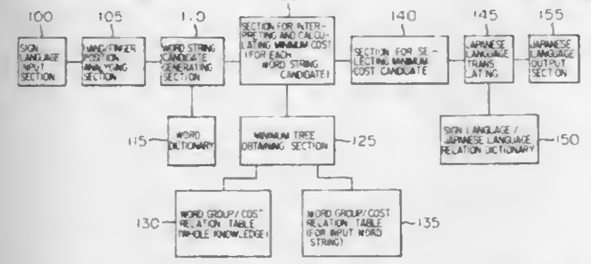
Akito Sakurai, Tsurugashima, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 464,208

Claims priority, application Japan, Jun. 8, 1994, 6-125963

Int. Cl.⁶ G06F *15/18*

U.S. Cl. 395—50 **10 Claims**


100
105
110
120
140
145
155
SIGN LANGUAGE INPUT SECTION
HAND/FINGER POSITION ANALYZING SECTION
WORD STRING CANDIDATE GENERATING SECTION
SECTION FOR INTERPRETING AND CALCULATING MINIMUM COST (FOR EACH WORD STRING CANDIDATE)
SECTION FOR SELECTING MINIMUM COST CANDIDATE
JAPANESE LANGUAGE TRANSLATING
JAPANESE LANGUAGE OUTPUT SECTION
115
WORD DICTIONARY
MINIMUM TREE OBTAINING SECTION
125
SIGN LANGUAGE / JAPANESE LANGUAGE RELATION DICTIONARY
150
130
WORD GROUP/COST RELATION TABLE (WHOLE KNOWLEDGE)
WORD GROUP/COST RELATION TABLE (FOR INPUT WORD STRING)
135

1. An inference method for use with a knowledge base storing therein knowledge, comprising the steps of:

representing input knowledge by either one of an undirected hypergraph or a directed hyperqraph including at least one hyperedge having at least two consequence nodes;

assigning to each hyperedge of said one hypergraph relating to said input knowledge, by reference to a cost relation table, an integer, a real value, or a vector value defined as a cost representing a degree of coherency or dependency between elements of knowledge;

executing an operation of obtaining a tree having a minimum cost covering a set of given nodes as knowledge elements of a word string representing the input knowledge to be processed or a tree having a cost providing extremal values of a function covering said given node set;

based on the result of said operation execution, among sub-hypergraphs of the hypergraphs satisfying logical expressions or predicates in which identifiers of nodes and edges of said one hypergraph are used as variables,

determining a sub-hypergraph having a minimum cost or having a cost providing extremal values of the function as the minimum cost tree one, and

inferring said determined minimum cost tree one as a tree structure for the input knowledge corresponding thereto from said knowledge base.

5,748,851
METHOD AND APPARATUS FOR EXECUTING SHORT-TERM PREDICTION OF TIMESERIES DATA

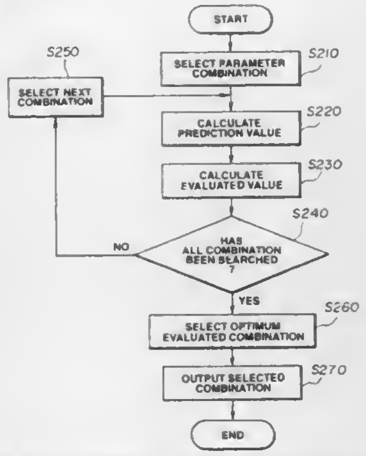
Tadashi Iokibe; Takayoshi Tanimura, and Yasunari Fujimoto, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 28, 1995, Ser. No. 395,980

Claims priority, application Japan, Feb. 28, 1994, 6-029411; Apr. 1, 1994, 6-064269

Int. Cl.⁶ G06F *15/18*

U.S. Cl. 395—51 **8 Claims**


START
S250
SELECT NEXT COMBINATION
SELECT PARAMETER COMBINATION
S210
CALCULATE PREDICTION VALUE
S220
CALCULATE EVALUATED VALUE
S230
S240
NO
HAS ALL COMBINATION BEEN SEARCHED
YES
SELECT OPTIMUM EVALUATED COMBINATION
S260
OUTPUT SELECTED COMBINATION
S270
END

5. A method for executing a short-term prediction of timeseries data under chaotic condition, comprising the steps of:

(a) storing, as sample data, measured values of timeseries data;

(b) selecting a value of each parameter to be a component of a data vector;

(c) generating the data vector from the detected values of the timeseries data according to the value of each parameter determined by said step (b) and obtaining a predicted value by reconstructing an attractor into a predetermined dimensional state space by embedding;

(d) storing the obtained predicted value;

(e) evaluating a prediction accuracy by comparing the detected value and the predicted value upon detecting the predicted value corresponding to the detected values of the timeseries data from said step (d);

(f) selecting a subset of the sample data at a predetermined time and a predetermined number of past data with respect to the sample data stored in said step (a);

(g) receiving a predicted value of the subset of the sample data on the basis of each combination of the parameters from said step (c); and

(h) comparing the predicted value of the subset of the sample data from said step (c) with an actual value of the subset of the sample data, said step (b) again executing to select an updated value of each of the parameters so that a prediction accuracy of the sample data takes a maximum value, and outputting the undated selected values of each of the parameters to said step (c),

wherein the updated selected values are used to update a state-space structure of the predetermined dimensional state space used in said step (c).

5,748,852
FUZZY-LOGIC CLASSIFICATION SYSTEM

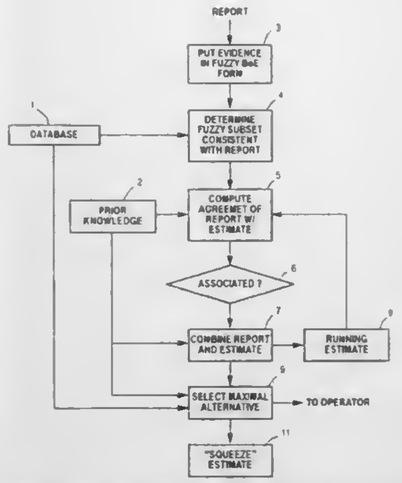
Ronald P. S. Mahler, Eagan, Minn., assignor to Lockheed Martin Corporation, Bethesda, Md.

Continuation of Ser. No. 308,010, Sep. 16, 1994, abandoned. This application Dec. 9, 1996, Ser. No. 762,645

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 395—61 **1 Claim**

1. A software algorithm process for operating a digital computer to probabilistically identify an object of unknown identity, whose possible identities are possibly subjective based on evidence that is also possibly subjective, wherein said algorithm employs input data information from external data sources and stored database information; wherein the said stored database information comprises:


REPORT
3
PUT EVIDENCE IN FUZZY BoE FORM
4
1
DATABASE
DETERMINE FUZZY SUBSET CONSISTENT WITH REPORT
2
5
PRIOR KNOWLEDGE
COMPUTE AGREEMET OF REPORT W/ ESTIMATE
6
ASSOCIATED ?
7
9
COMBINE REPORT AND ESTIMATE
RUNNING ESTIMATE
9
SELECT MAXIMAL ALTERNATIVE
TO OPERATOR
11
"SQUEEZE" ESTIMATE

A. an array representative of the possibly subjective object types that identify the possible identities of an observed object of unknown identity, and wherein said object types form a fuzzy body of evidence,

B. an array of object attributes arranged into attribute families which are believed to be observed from said object of unknown identity, each of which is a fuzzy subset of the total set of possible object types available to the attribute family to which it belongs, and

C. a signature collection representative of the possibly subjective attributes which are believed to be characteristic of the possible and possibly subjective object types, wherein said process comprises the steps of:

(1) obtaining said input data information which is descriptive of observed attributes that are believed to be associated with said object of unknown identity, and

(2) translating said input data information into a fuzzy body of evidence by computing:

(a) the belief that the observed attributes belong to a specified family of attributes,

(b) the belief in the existence of the observed object attributes, and

(i) the belief that the observed object attribute belongs to a specified family of attributes,

(ii) the belief in the existence of the observed object attribute, and

(iii) the degree of belief that attributes in the specified attribute family could be the observed object attribute,

(c) determining a running average of fuzzy bodies of evidence from said input data information which is consistent with said stored database information and is a running average fuzzy body of evidence itself,

(d) computing the probability agreement between said running average fuzzy body of evidence and said stored database information,

(e) combining combinable input data information and said stored database information and said running average fuzzy body of evidence,

(f) selecting the maximal alternative object type of said database by computing a posterior probability distribution of said possibly subjective object types and determining its maximal value,

(g) computing belief in defined fuzzy propositions,

(h) reducing the size of said running average fuzzy body of evidence, and

(i) computing the fuzzy intersections between said observed attributes and said signature attributes.

5,748,853
VACUUM CLEANER WITH FUZZY LOGIC CONTROL UNIT

Laurent Deschenes, Saint-Germain-la-Blanche-Herbe, France, assignor to Moulinex S.A., Paris, France

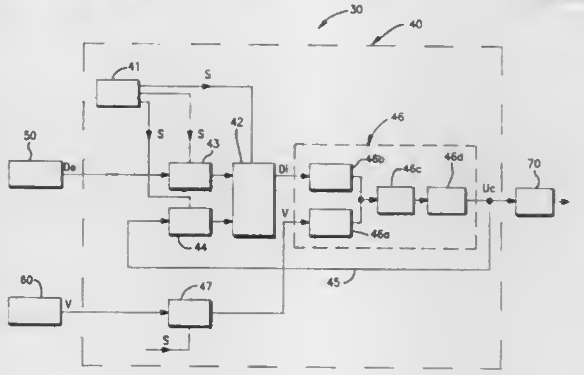
PCT No. PCT/FR95/00909, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997, PCT Pub. No. WO96/02179, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 7, 1995, Ser. No. 765,943

Claims priority, application France, Jul. 13, 1994, 94 08705

Int. Cl.⁶ G06F *17/00;* **A47L** *9/28*

U.S. Cl. 395—61 **9 Claims**



1. A vacuum cleaner comprising:

a housing having a dust compartment which contains a dust bag, having a suction compartment connected to the dust compartment through an air flow opening, and having a motor-fan group;

a dynamically displaceable suction member having a suction opening;

a suction nozzle having two ends, a first end being connected to the dust bag through a connection opening provided in the housing, and a second end being connected to the suction member; and

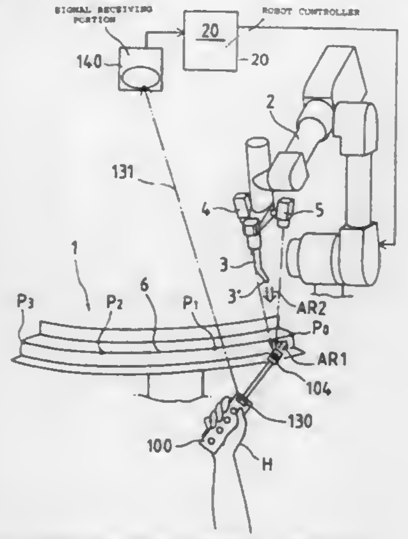
an automatic control device of power to the motor-fan group including means for detecting the nature of the floor having a detector of vacuum between the motor-fan group and the dust compartment, means for determining mean speed of said suction member, and fuzzy logic control means for providing fuzzy inference at an output of said means for detecting the nature of the floor and at an output of said means for detecting the dynamic displacement of said suction member, and for controlling power to said motor-fan group according to a result of said fuzzy inference, the result representing a relationship between the nature of the floor and the dynamic displacement of said suction member,

the automatic control device including means for calculating sequentially a diaphragm value, defined as a function of the suction opening and representative of the nature of the floor and of a degree of filling of the dust bag by means for determining successively: an air flow rate of the motor-fan group from a first table of correspondence between the vacuum and a control voltage of the motor-fan group; a pneumatic parameter obtained from a second table of correspondence between the vacuum and the air flow rate; and the diaphragm value correlated to the pneumatic parameter previously determined, the fuzzy logic control means for using the diaphragm value and the mean speed of the suction member as input variables and for outputting a control voltage of the motor-fan group, the control voltage being fed back to said means for calculating a diaphragm value.

OL
2 10
ISS
1
MY
5
998
MI

5,748,854
ROBOT POSITION TEACHING SYSTEM AND METHOD

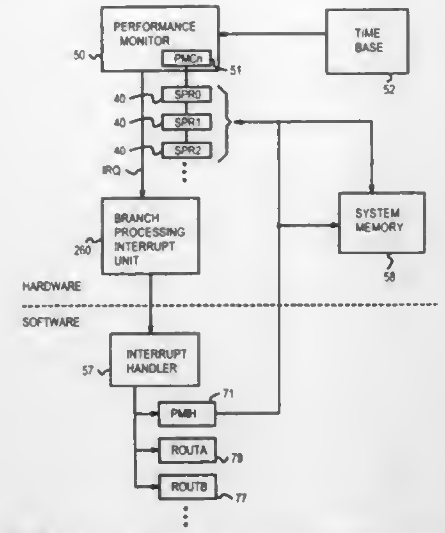
Atsushi Watanabe; Tomoyuki Terada, and Shinsuke Sakamoto, all of Yamanashi, Japan, assignors to Fanuc Ltd, Minamitsuru-gun, Japan
Filed Jun. 15, 1995, Ser. No. 490,761
Claims priority, application Japan, Jun. 23, 1994, 6-163295
Int. Cl.^{6} G06K *9/62;* G06F *15/46*
U.S. Cl. 395—93 **6 Claims**



1. A robot position teaching system, comprising:
a robot controller to control a robot;
a visual sensor to measure a three-dimensional position;
an image processing device to measure a position by processing and analyzing an image recognized by the visual sensor so as to transmit measurement data to the robot controller;
a position teaching unit having a grasping portion graspable by a hand of an operator, and an index visually recognizable by the visual sensor, fixed at a distal end of a rod-type body extending from the grasping portion;
said visual sensor being mounted on a hand of the robot to which a position is to be taught;
said grasping portion of said position teaching unit having a moving switch, a position teaching unit having a moving switch, a position teaching switch, and push buttons to selectively turn on or off the respective switches, said grasping portion accommodating a control portion to generate a signal corresponding to the selective ON/OFF state of the respective switches, and including a transmitting portion to transmit the signal generated in said control portion;
wherein said robot controller is connected to a signal receiving portion to receive the signal from said transmitting portion so that said robot controller moves the robot toward a position of the index measured by the image processing device at a given speed or less when said moving switch is turned on in response to action of one of the push buttons, while said robot controller stores a current position of the robot as teaching position data when said position teaching switch is turned on in response to action of another one of the push buttons.

5,748,855
METHOD AND SYSTEM FOR PERFORMANCE MONITORING OF MISALIGNED MEMORY ACCESSES IN A PROCESSING SYSTEM

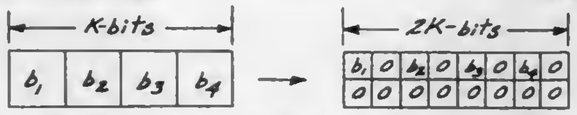
Frank Eliot Levine; Charles Philip Roth, and Edward Hugh Welbon, all of Austin, Tex., assignors to IInternational Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1995, Ser. No. 536,492
Int. Cl.^{6} G06F *12/04*
U.S. Cl. 395—800.23 **15 Claims**



1. A method for monitoring performance of a processing system, the processing system including at least one performance monitor counter (PMC) and at least one monitor mode control register (MMCR) to configure the operations of the at least one PMC, the method comprising:
- (a) identifying misaligned data items: and
- (b) determining a performance penalty due to misaligned data accesses during a predetermined sampling period, wherein step (b) further comprises:
  - (b1) determining a first difference value between the number of cycles required for misaligned loads and for aligned loads;
  - (b2) determining a second difference between a number of cycles required for misaligned stores and for aligned stores;
  - (b3) identifying the performance penalty as a combination of the first difference value for the counted number of misaligned loads and the second difference value for the counted number of misaligned stores.

5,748,856
METHOD FOR REDUCING PIXEL DENSITY ALONG A PLURALITY OF AXES OF A MULTIPLE DIMENSION IMAGE REPRESENTATION

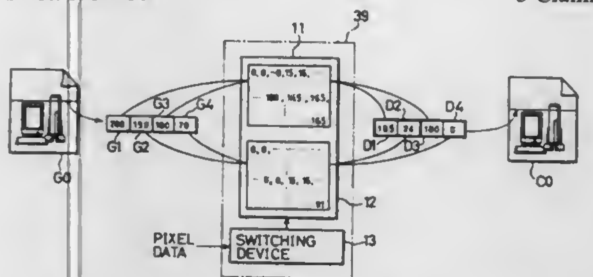
Alan E. Cariffe, San Diego; Anne P. Kadonaga, Del Mar; Steven L. Bass, San Diego, all of Calif., and Iue-Shuenn Chen, Singapore, Singapore, assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 925,723, Aug. 3, 1992, Pat. No. 5,559,930. This application Jul. 23, 1996, Ser. No. 685,077
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—102 **2 Claims**



2. In a swath type printer having a movable carriage for supporting a plurality of print elements which are controlled to print dots on a rectilinear array of pixels, a method for up scaling a first bit-mapped pixel data array logically organized in rows and columns to a second bit-mapped pixel data array logically arranged in rows and columns, wherein the resolution of the second bit-mapped pixel data array along each of the row and column axes is an integral multiple of the resolution of the first bit-mapped pixel data array, comprising the steps of:
- (A) for each bit in the first array, setting a corresponding bit in the second array to the contents of the bit in the first array, such that the locations of the printed pixels in the first pixel data array relative to each other are maintained in the printed pixels of the second pixel data array; and
- (B) setting each of the other bits in the second pixel data array to 0, whereby there is a one-to-one correspondence between the printed pixels in the second pixel data array and the printed pixels in the first pixel data array.

5,748,857
IMAGE GRADATION SETTING DEVICE FOR USE IN AN IMAGE FORMING APPARATUS

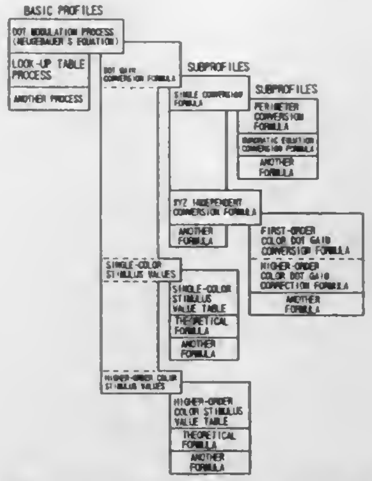
Koji Nakamura; Haruo Yamamoto, and Shuji Hayashi, all of Osaka, Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan
Filed Nov. 30, 1995, Ser. No. 565,429
Claims priority, application Japan, Dec. 7, 1994, 6-303722
Int. Cl.^{6} H04N *1/00;1/40*
U.S. Cl. 395—109 **5 Claims**



1. An image gradation setting device for use in an image forming apparatus including a light emitter for emitting light and a photosensitive drum capable of bearing a latent image having densities in accordance with emitted light amounts but having a characteristic steep rise in latent image gradation at a particular light amount, the latent image being represented by a predetermined number of imaging elements, each imaging element consisting of first to n-th imaging areas for representing latent image density corresponding to image data of a predetermined number of pixels, the image gradation setting device comprising:
an input portion for receiving image data of each pixel, the image data indicating one of a predetermined number of density levels;
a control density level determining portion for determining, based on received image data, a control density level indicative of a light amount for each of the first to n-th imaging areas of one imaging element, the control density level determining portion allotting only to the first imaging area a control density level in accordance with received image data if the received image data is equal to or lower than a predetermined reference density level, and respectively allotting to the first to n-th imaging areas control density levels in accordance with received image data if the received image data is larger than the predetermined reference density level, a minimum control density level of each of the second to n-th imaging areas being made to be larger than a particular control level equivalent to the particular light amount at which said steep rise in latent image gradation occurs, and a maximum control density level of each of the first to (n−1)-th imaging areas being made to be the particular control level smaller than a control density level equivalent to the predetermined reference density level; and
an output portion for outputting a determined control density level to the light emitter.

5,748,858
METHOD OF AND SYSTEM FOR PREDICTING REPRODUCED COLOR IMAGE

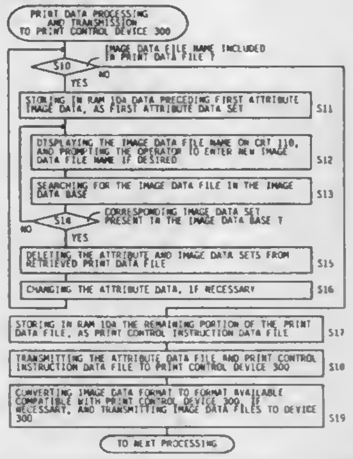
Shuichi Ohtsuka; Akira Yoda, and Yoshinori Usami, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 342,015, Nov. 16, 1994, abandoned.
This applicatinn Sep. 3, 1996, Ser. No. 697,932
Claims priority, application Japan, Nov. 17, 1993, 5-288344; Jan. 27, 1994, 6-007735
Int. Cl.^{6} G03F *3/10*
U.S. Cl. 395—109 **25 Claims**


BASIC PROFILES
DOT MODULATION PROCESS (NEUGEBAUER'S EQUATION)
LOOK-UP TABLE PROCESS
ANOTHER PROCESS
DOT GAIN CONVERSION FORMULA
SUBPROFILES
SINGLE CONVERSION FORMULA
SUBPROFILES
PERIMETER CONVERSION FORMULA
QUADRATIC EQUATION CONVERSION FORMULA
ANOTHER FORMULA
XYZ INDEPENDENT CONVERSION FORMULA
ANOTHER FORMULA
FIRST-ORDER COLOR DOT GAIN CONVERSION FORMULA
HIGHER-ORDER COLOR DOT GAIN CORRECTION FORMULA
ANOTHER FORMULA
SINGLE-COLOR STIMULUS VALUES
SINGLE-COLOR STIMULUS VALUE TABLE
THEORETICAL FORMULA
ANOTHER FORMULA
HIGHER-ORDER COLOR STIMULUS VALUES
HIGHER-ORDER COLOR STIMULUS VALUE TABLE
THEORETICAL FORMULA
ANOTHER FORMULA

1. A system for predicting a color image in producing a color printed material reproduced by one of a platemaking process and a printing process from processed input color image data by outputting a version of the color image corresponding to the color printed material, comprising:
printing condition profiles which represent printing conditions of an output medium and output conditions corresponding to at least one of: the platemaking process and printing process established as parameters;
data conversion profiles which represent color space data conversion formulas established for converting the processed input color image data into data in a color space of an image monitor device, said space data conversion formulas using the parameters represented by said printing condition profiles; and
converting means for converting the processed input color image data into the data in the color space of the image monitor device according to said color space data conversion formulas;
the arrangement being such that the version of the color image corresponding to the color printed material can be displayed from the data in the color space of the image monitor device.

5,748,859
METHOD AND DEVICE FOR TRANSMITTING AND PROCESSING PRINT DATA USED FOR PRINTER

Toshihiro Takayanagi, Okazaki; Kenji Yanase, and Kiyoji Muramatsu, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Division of Ser. No. 305,321, Sep. 15, 1994, Pat. No. 5,619,623.
This application Dec. 30, 1996, Ser. No. 777,045
Claims priority, application Japan, Sep. 21, 1993, 5-234476; Sep. 21, 1993, 5-234477; Sep. 21, 1993, 5-234478
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—109 **10 Claims**


PRINT DATA PROCESSING AND TRANSMISSION TO PRINT CONTROL DEVICE 300
IMAGE DATA FILE NAME INCLUDED IN PRINT DATA FILE ?
S10
NO
YES
STORING IN RAM 10A DATA PRECEDING FIRST ATTRIBUTE IMAGE DATA, AS FIRST ATTRIBUTE DATA SET
S11
DISPLAYING THE IMAGE DATA FILE NAME ON CRT 110, AND PROMPTING THE OPERATOR TO ENTER NEW IMAGE DATA FILE NAME IF DESIRED
S12
SEARCHING FOR THE IMAGE DATA FILE IN THE IMAGE DATA BASE
S13
CORRESPONDING IMAGE DATA SET PRESENT IN THE IMAGE DATA BASE ?
S14
NO
YES
DELETING THE ATTRIBUTE AND IMAGE DATA SETS FROM RETRIEVED PRINT DATA FILE
S15
CHANGING THE ATTRIBUTE DATA, IF NECESSARY
S16
STORING IN RAM 10A THE REMAINING PORTION OF THE PRINT DATA FILE, AS PRINT CONTROL INSTRUCTION DATA FILE
S17
TRANSMITTING THE ATTRIBUTE DATA FILE AND PRINT CONTROL INSTRUCTION DATA FILE TO PRINT CONTROL DEVICE 300
S18
CONVERTING IMAGE DATA FORMAT TO FORMAT AVAILABLE COMPATIBLE WITH PRINT CONTROL DEVICE 300, IF NECESSARY, AND TRANSMITTING IMAGE DATA FILES TO DEVICE 300
S19
TO NEXT PROCESSING

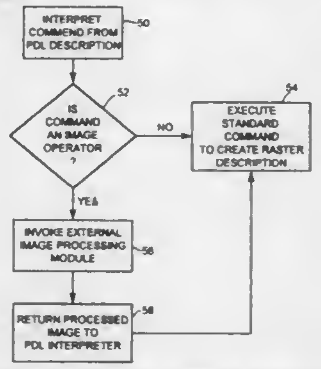
1. A method of transmitting print data from a computer to a print control device in a data transmission mode of the computer, for controlling a printer, said method comprising:

/OL
2 10
ISS
1
MY
5
998
JMI

a classifying step of classifying said print data into a plurality of sets of image data, and a plurality of sets of attribute data which accompany said sets of image data, respectively;
a replacing step of replacing each of at least one of said sets of image data by another set of image data stored in memory means, said another set of image data being included as a new set of image data in said print data;
a changing step of changing each of at least one of said sets of attribute data which accompanies said at least one set of image data, on the basis of said new set of image data included in said print data in said replacing step; and
a transmitting step of transmitting to said print control device said print data including said new set of image data and said set of attribute data changed in said changing step.

5,748,860
IMAGE PROCESSING DURING PAGE DESCRIPTION LANGUAGE INTERPRETATION

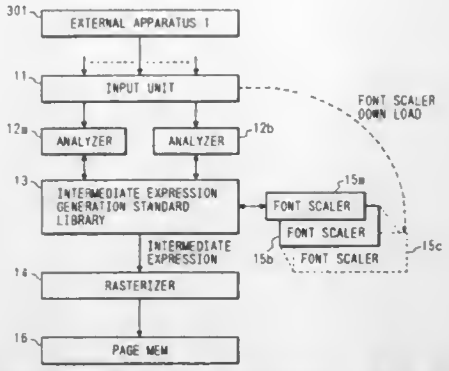
J. Thomas Shively, Hinsdale, Ill., assignor to R.R. Donnelley & Sons Company, Lisle, Ill.
Filed Jun. 6, 1995, Ser. No. 467,461
Int. Cl.^{6} G06K ***15/00***
U.S. Cl. 395—114 **43 Claims**


INTERPRET COMMEND FROM PDL DESCRIPTION
50
IS COMMAND AN IMAGE OPERATOR ?
52
NO
EXECUTE STANDARD COMMAND TO CREATE RASTER DESCRIPTION
54
YES
INVOKE EXTERNAL IMAGE PROCESSING MODULE
56
RETURN PROCESSED IMAGE TO PDL INTERPRETER
58

1. A system for performing an external image screening operation on an image defined by sampled image values to be rasterized, comprising:
a computer for generating a page description language description of the image; and,
an interpreter for executing the page description language description, including,
invoking means for calculating a coordinate transformation of the sampled image values and for invoking the external image screening operation to screen the image, and
receiving means for receiving the screened image from the external image screening operation, wherein the screened image is incorporated into a raster description of an output page.

5,748,861
IMAGE PROCESSING APPARATUS AND METHOD THEREFOR

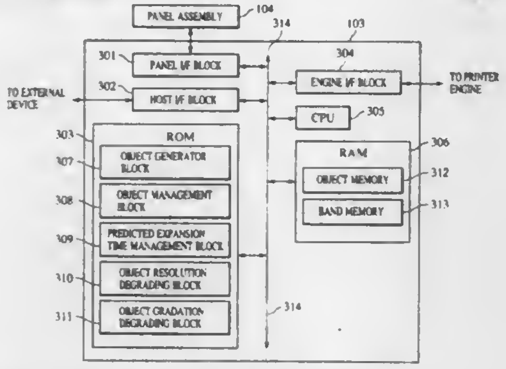
Masami Kashiwazaki, Kawasaki; Yukio Kanakubo, Kasukabe, and Hiroharu Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 18, 1993, Ser. No. 62,985
Claims priority, application Japan, May 18, 1992, 4-125134
Int. Cl.^{6} G06K ***15/00***
U.S. Cl. 395—110 **24 Claims**



7. An output method carried out in an output apparatus which has a memory for storing first non-dot pattern information and a first program used for generating a character dot pattern from the first non-dot pattern information and which receives a character code from an external apparatus, said method comprising the steps of:
determining whether a download command is received from the external apparatus;
controlling, in response to a determination that the download command is received from the external apparatus, the memory to store second non-dot pattern information and a second program used for generating a character dot pattern from the second non-dot pattern information, the character dot pattern corresponding to a character code received from the external apparatus, the second program and the second non-dot pattern information being downloaded from the external apparatus, the first and second programs being in respective different formats; and
generating, in response to a character code being received from the external apparatus, a corresponding character dot pattern using either one of (1) the first program and the first non-dot pattern information and (2) the second program and the second non-dot pattern information stored in the memory and outputting the generated character dot pattern,
wherein a character dot pattern generated using the first program in response to one received character code represents a same character as a character dot pattern generated using the second program in response to the same one received character code.

5,748,862
IMAGE PROCESSING APPARATUS AND METHOD

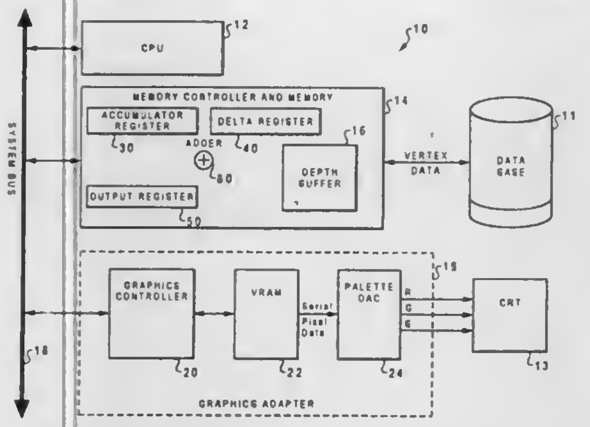
Takashi Ohno, and Jouji Ooki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisba, Tokyo, Japan
Filed Jan. 10, 1997, Ser. No. 780,942
Claims priority, application Japan, Jan. 11, 1996, 8-002960
Int. Cl.^{6} G06A ***15/00***
U.S. Cl. 395—115 **30 Claims**



1. An image processing apparatus comprising:
generating means for generating image data into a band memory on a per band basis in accordance with objects;
transmitting means for transmitting the per-band image data to output means in a manner such that generation of image data of one band by said generating means and transmission of image data of another band by said transmitting means are performed in parallel; and
determining means for determining the grade of the image data to be generated by said generating means, wherein when the grade determined by said determining means changes, said band memory is relocated and wherein said generating means generates per band image data for an entire page at the grade determined by said determining means.

5,748,863
METHOD AND SYSTEM FOR FAST INTERPOLATION OF DEPTH BUFFER VALUES IN A COMPUTER GRAPHICS DISPLAY SYSTEM

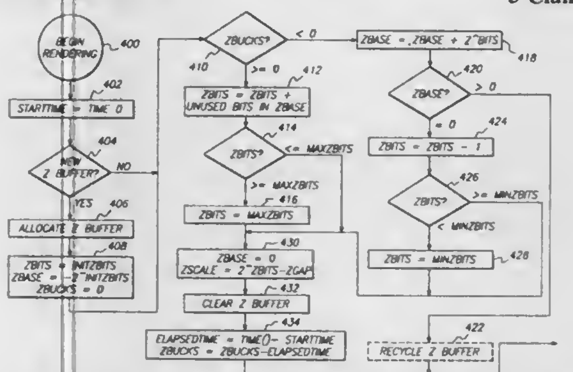
Gordon C. Fossum, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 6, 1995, Ser. No. 540,359
Int. Cl.^{6} G06T ***15/40***
U.S. Cl. 395—122 **32 Claims**



1. A method for fast interpolation of depth buffer values in a graphics system, the method comprising the steps of:
receiving an initial depth buffer value in a floating-point format having a sign bit, an exponent and a mantissa;
generating an accumulator value utilizing, among the sign bit, the exponent, and the mantissa, only the mantissa;
receiving a delta depth value;
performing an integer addition of the accumulator value to the delta depth value to produce a sum;
generating a depth buffer value for a display pixel from the sum, and the sign bit and exponent of the initial depth buffer value.

5,748,864
VIDEO BUFFER RECYCLING METHOD AND APPARATUS

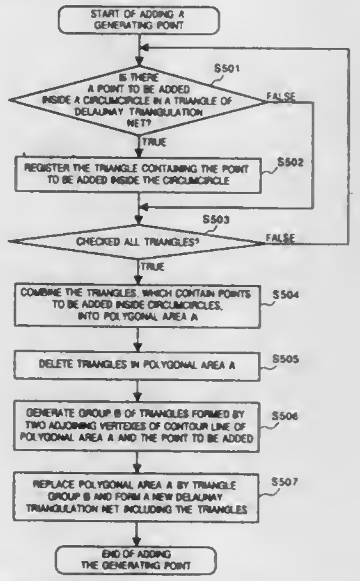
Kevin Martin, San Jose, Calif., assignor to Network Computing Devices, Mountain View, Calif.
Continuation of Ser. No. 985,283, Dec. 4, 1992. This application Jun. 7, 1995, Ser. No. 475,780
Int. Cl.^{6} G06T ***13/00;15/40***
U.S. Cl. 395—122 **5 Claims**



1. In a video display device having a processor and a Z buffer for rendering, a method for rendering a plurality of frames of three dimensional images each having one or more Z values, including a minimum Z value and a maximum Z value, without clearing the Z buffer between frames, the method comprising the steps of
clearing the Z buffer,
rendering the first frame,
adding an increment value to each Z value of the second frame to produce modified Z values, each modified Z value including in a non-distinct fashion the bits of the increment value and the bits of the Z value, the minimum modified Z value of the second frame being greater than the maximum Z value of the first frame, and
rendering the second frame in accordance with the modified Z values thereof.

5,748,865
RANGE IMAGE SHAPE MEASUREMENT USING HIERARCHICAL ORDERING OF MULTIRESOLUTION MESH DATA FROM DELAUNAY TRIANGULATION

Hiroyuki Yamamoto, Yokohama; Toshikazu Ohshima, Kawasaki, and Shinji Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 6, 1994, Ser. No. 300,997
Claims priority, application Japan, Sep. 3, 1993, 5-243838; Sep. 17, 1993, 5-231807; Nov. 18, 1993, 5-288965; Nov. 30, 1993, 5-299515
Int. Cl.^{6} G06T ***17/20***
U.S. Cl. 395—123 **30 Claims**


START OF ADDING A GENERATING POINT
S501
IS THERE A POINT TO BE ADDED INSIDE A CIRCUMCIRCLE IN A TRIANGLE OF DELAUNAY TRIANGULATION NET?
FALSE
TRUE
REGISTER THE TRIANGLE CONTAINING THE POINT TO BE ADDED INSIDE THE CIRCUMCIRCLE
S502
S503
CHECKED ALL TRIANGLES?
FALSE
TRUE
COMBINE THE TRIANGLES, WHICH CONTAIN POINTS TO BE ADDED INSIDE CIRCUMCIRCLES, INTO POLYGONAL AREA A
S504
DELETE TRIANGLES IN POLYGONAL AREA A
S505
GENERATE GROUP B OF TRIANGLES FORMED BY TWO ADJOINING VERTEXES OF CONTOUR LINE OF POLYGONAL AREA A AND THE POINT TO BE ADDED
S506
REPLACE POLYGONAL AREA A BY TRIANGLE GROUP B AND FORM A NEW DELAUNAY TRIANGULATION NET INCLUDING THE TRIANGLES
S507
END OF ADDING THE GENERATING POINT

1. An image processing method comprising:
an input step of interactively selecting and entering discrete points on an object in a 3-D space;
a generating step of generating a model having a 3-D geometrical shape by employing triangular patches making use of a Delaunay triangulation net in accordance with the discrete points entered in said input step;
said generating step comprising:
  a first updating step of adding a generating point, which has been entered in said input step, generating a triangular patch data including the added generating point and updating the Delaunay triangulation net;
  a second updating step of deleting an existing generating point by designating the point to be deleted, deleting a triangular patch data including the deleted generating point, and updating the Delaunay triangulation net;
  a third updating step of fixing a line segment connecting two points, which have been entered in said input step, as an edge of a triangle of a triangular patch data, and updating the Delaunay triangulation net; and
  a fourth updating step of selecting an existing fixed edge on a screen displaying the Delaunay triangulation net, releasing the fixed edge from the Delaunay triangulation net, and updating the Delaunay triangulation net;
  a storing step of storing the model generated in said generating step in a storing means; and
  a displaying step for providing a 3-D display of the object by using shape data selected from the pluarity of shape data stored in said storing means to change the resolution in accordance with the display condition of the object.

OL
210
ISS
1
MY
5
998
MI

5,748,866

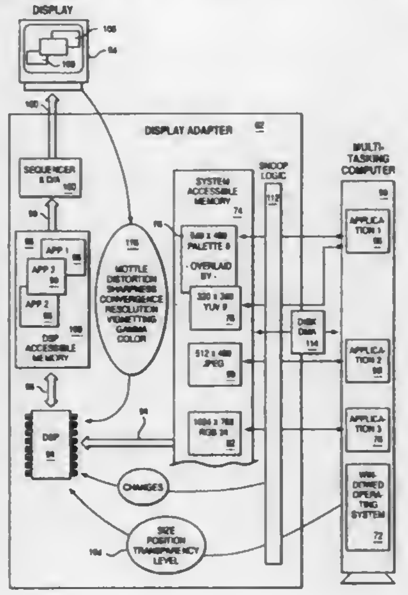
VIRTUAL DISPLAY ADAPTERS USING A DIGITAL SIGNAL PROCESSING TO REFORMAT DIFFERENT VIRTUAL DISPLAYS INTO A COMMON FORMAT AND DISPLAY

Albert Durr Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,337

Int. Cl.^{6} G06T *3/00*

U.S. Cl. 395—128 **53 Claims**



1. A method for use in a multitasking computer system operating a windowed operating system executing multiple applications comprising

- allocating different portions of a first memory for use by respective different ones of said applications as virtual display adapters each of said display adapters corresponding to a different video type or mode;
- storing a representation of an image in each of said portions of said first memory, each said image corresponding to a different one of said applications;
- reformatting under control of said operating system, each said image into a common second memory said reformatting including reformatting position data corresponding to an image window of at least one said applications and reformatting size data corresponding to an image window of at least one said application;
- and wherein said reformatting size data for a given said image comprised of a plurality of pixels comprises
  - A) converting brightness of each of said pixels to a value representative of lumens;
  - B) convolving said converted brightness with a sinc convolution function to generate corresponding convolved values; and
  - C) reconverting said convolved values from said values representative of lumens to values representative of signal output to said display as a function of gamma characteristics of said display; and
- generating a display corresponding to the contents of said second memory.

5,748,867

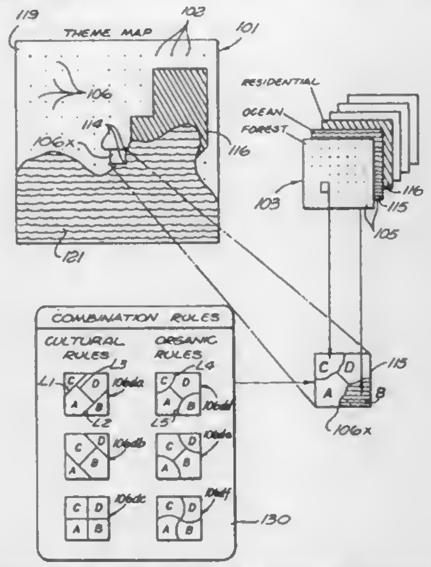
IMAGE TEXTURING SYSTEM HAVING THEME CELLS

Michael Cosman, South Jordan, and Thomas C. Brown, Salt Lake City, both of Utah, assignors to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Continuation-in-part of Ser. No. 837,827, Feb. 18, 1992, abandoned. This application Jul. 6, 1993, Ser. No. 88,447

Int. Cl.^{6} G06T *11/40*

U.S. Cl. 395—130 **35 Claims**



1. An image texturing system for generating simulated terrains or external scenes as for applications such as flight training, said image texturing system including an image generator for generating visual real-time images for display on a display device, said texturing system further comprising:

- means for storing a theme map having index identifiers defining a plurality of theme cells disposed in a grid pattern, wherein said theme cells have edges and corners, and wherein said index identifiers indicate geographic terrain characteristic themes and define said corners of said theme cells;
- means for storing terrain treatment arrays of said geographic terrain characteristic themes for application to said theme cells; and
- means for applying at least part of at least one of said terrain treatment arrays to texture said theme cells whereby a single terrain treatment array is applied when said index identifiers for a theme cell represent similar geographic terrain characteristic themes, and a plurality of terrain treatment arrays are applied when said index identifiers for said theme cell represent different geographic terrain characteristic themes, said plurality of terrain treatment arrays applied in accordance with a sinuous merging rule for natural terrains and an inorganic merging rule for unnatural terrains, such that boundaries terminate at an edge of said theme cell substantially on a midpoint between corners.

5,748,868

TWO-DIMENSIONAL MANAGEMENT PATTERN, INFORMATION DISPLAY TAG, AND IMAGE PROCESSING METHOD AND DEVICE

Tomio Echigo, Yokohama, and Shunichi Asaka, Sagamihara, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

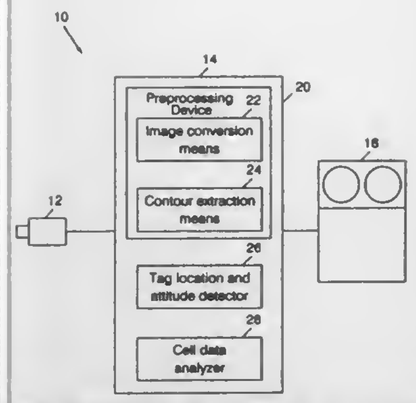
Filed Jun. 20, 1995, Ser. No. 492,501

Claims priority, application Japan, Jun. 20, 1994, 6-137399

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—133 **18 Claims**

1. A two-dimensional management pattern for reading the image of at least part of an object to detect information about the object based on the read image, comprising:



- a first region located near the center of said two-dimensional management pattern and having a locational reference pattern for identifying the location of said two-dimensional management pattern;
- a second region with unit patterns of at least one of multiple types arranged in a specified direction from said first region to the outer circumference of said two-dimensional management pattern; and
- a third region other than said first and second regions with said multiple types of unit pattern arranged to represent said information about the object.

5,748,869

COORDINATE TRANSFORMATION APPARATUS AND METHOD

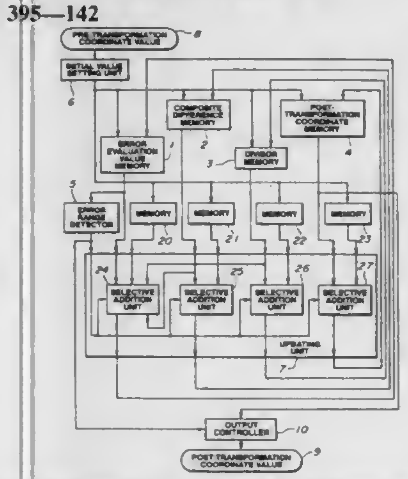
Hiroyuki Shioya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 347,281

Claims priority, application Japan, Dec. 3, 1993, 5-304364

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—142 **16 Claims**


PRE-TRANSFORMATION COORDINATE VALUE
8
INITIAL VALUE SETTING UNIT
6
COMPOSITE DIFFERENCE MEMORY
POST-TRANSFORMATION COORDINATE MEMORY
ERROR EVALUATION VALUE MEMORY
DIVISOR MEMORY
ERROR RANGE DETECTOR
MEMORY
SELECTIVE ADDITION UNIT
UPDATING UNIT
7
OUTPUT CONTROLLER
10
POST-TRANSFORMATION COORDINATE VALUE
9

1. A texture mapping coordinate transformation apparatus for producing post-transformation coordinates by a ratio of plural polynomials having pre-transformation coordinates as variables in order to map a texture picture on a polygon defined by perspective coordinates on a display screen to thereby generate an output display picture on the display screen, comprising:

- post-transformation coordinate storage means for storing the post-transformation coordinates,
- error evaluation value storage means for storing error evaluation values of said post-transformation coordinates,
- error judgment means for judging that the error evaluation value is within a tolerable range,
- initial value setting means for setting respective initial values of the post-transformation coordinate storage means and said error evaluation value storage means based upon said pre-transformation coordinates, and
- updating means for updating the contents of the post-transformation coordinate storage means and the error evaluation value storage means responsive to an output of said error judgment means, and
- means for sequentially finding said post-transformation coordinates from said pre-transformation coordinates.

5,748,870

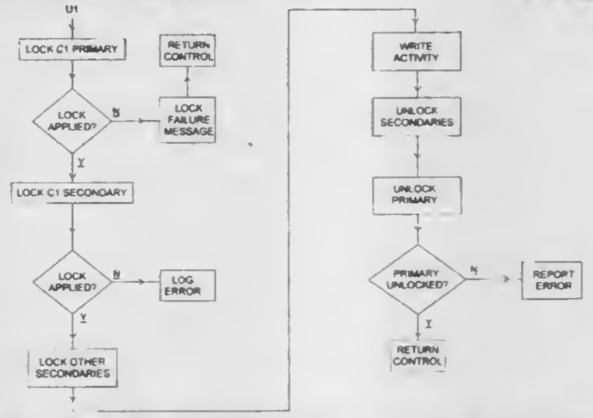
FAULT-TOLERANT NETWORKABLE COMPUTER SOFTWARE WITH ACCESS LOCKING

Fred William Tims, Springfield Center; Richard F. Clowes, New York; Kevin C. Yager, Oneida, and David J. Schroeder, New Hartford, all of N.Y., assignors to Non-Stop Networks Limited, New York, N.Y.

Continuation-in-part of Ser. No. 610,181, Nov. 7, 1990. This application Apr. 7, 1993, Ser. No. 44,323

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.02 **6 Claims**



1. On-line, data-replication software operative on a computer network having multiple, intelligent processor-equipped workstations, said software being loadable to RAM at said workstations and replicating data-changing activity originating from said workstation to both a primary storage device supported by a primary file server and to a secondary storage device, said primary file server providing multi-user access to said primary storage device and supporting data-access locking with data-access lock and unlock capabilities for regulating multi-user access to data on the primary logical drive said data-replication software having an access-lock-sequencing protocol comprising:

- a) an access lock sequencer operative to apply access locks sequentially, firstly to data on said primary storage device and subsequently to replicated data, on said secondary storage device; and
- b) an access-unlock sequencer operative to remove access locks sequentially, firstly, from access-locked data on said secondary storage device and subsequently from access-locked data on said primary storage device.

5,748,871

DUAL BUS ARCHITECTURE FOR A STORAGE DEVICE

Keith B. DuLac, Derby, and Grover G. Phillips, Andover, both of Kans., assignors to Symbios Logic Inc., Fort Collins, Colo.

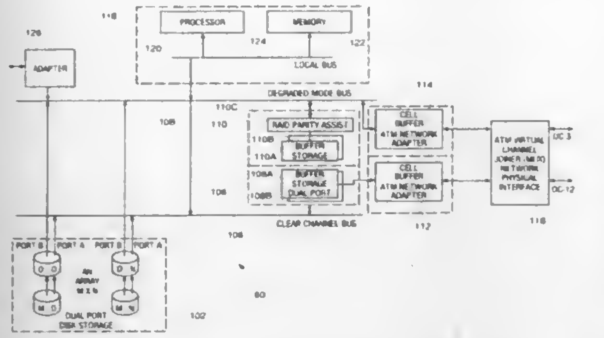
Filed Aug. 11, 1995, Ser. No. 514,479

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.03 **26 Claims**

1. An apparatus comprising:

- a first bus;
- a second bus;
- a storage module, the storage module having a first output and a second output, the first output being connected to the first bus and the second output being connected to the second bus, wherein data is stored in the storage device;
- a first buffer storage connected to the first bus;
- a second buffer storage including an error correction module, the second buffer storage being connected to the second bus;
- a first network adapter connected to an output of the first buffer;



a second network adapter connected to the second bus; and

a processor including a first processor means for transferring the data using a first path from the first output to the first buffer storage and from the first buffer storage to the first network adapter and second processor means for transferring the data using a second path from the second output to the second buffer storage and from the second buffer storage to the second network adapter, wherein the second processor means is responsive to an error in the storage module and wherein errors in data are detected and corrected by the error correction module.

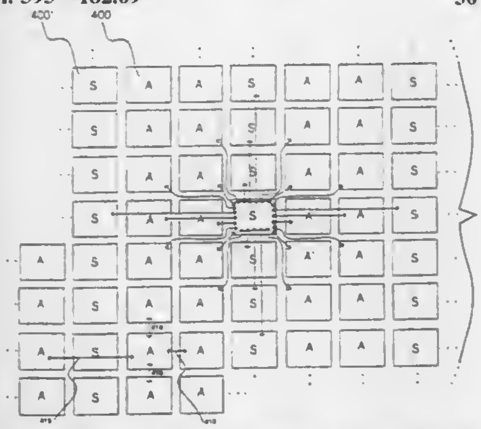
5,748,872
DIRECT REPLACEMENT CELL FAULT TOLERANT ARCHITECTURE

Richard S. Norman, 1877 Poissant Road., Sutton, Quebec, Canada, J0E 2K0

Continuation of Ser. No. 216,262, Mar. 22, 1994, abandoned. This application Mar. 19, 1996, Ser. No. 618,397

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 395—182.09 **30 Claims**



1. A data processing system containing a monolithic network of cells with sufficient redundancy to allow an array of cells to be organized where said array would, if made with the same processes but without spare cells, contain on the average a plurality of defective cells, with a yield in excess of 50% of arrays where all defective array cells are logically replaced by correctly functioning spare cells, where said sufficient redundancy includes a spare cell arrangement that provides a specified number of spare cells that are potential replacements for any array cell, with fewer than that specified number of times as many spare cells as array cells in the network as a whole; where each spare cell that replaces an array cell duplicates or utilizes every internal function and every external connection of said array cell so that said spare cell interacts with the rest of said data processing system in a manner logically identical to the way said array cell would have had it not been defective; and where said array cells also have at least one of the following properties:

(a) any array cell is directly addressable through a single off/on addressing signal for each physical array dimension, said addressing signal for a physical dimension traveling through a carrier that propagates said addressing signal directly to each array cell at the same index as said array cell in said physical dimension, said array cell receiving said addressing signal through a connection dedicated to said array cell;

(b) each array cell has input means for receiving a signal directly from at least one neighboring array cell and output means for sending a signal directly to at least one other neighboring array cell in each of at least three total dimensions, at least two of which are physical dimensions, with said signals between a pair of neighboring array cells being sent through a dedicated carrier connecting solely said pair of array cells or said pair of array cells and their potential replacements;

(c) each array cell has direct optical output means for sending an optical output signal directly external to said data processing system, where said direct optical output means are dedicated solely to said array cell or said array cell and its potential replacements, where the carrier or carriers through which the controlling signals for said direct optical output means are sent to said direct optical output means are dedicated solely to said array cell or said array cell and its potential replacements; and where the replacement of an array cell by one of said potential replacements does not change the position of the optical output that would have come from said replaced array cell by more than 50 microns.

5,748,873
FAULT RECOVERING SYSTEM PROVIDED IN HIGHLY RELIABLE COMPUTER SYSTEM HAVING DUPLICATED PROCESSORS

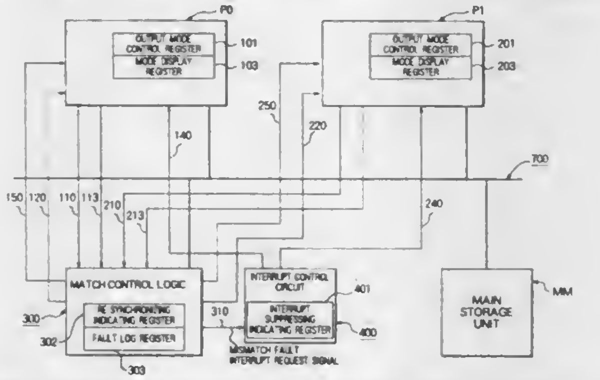
Hiroshi Ohguro, Hadano; Koichi Ikeda, Machida; Takaaki Nishiyama; Hiroshi Iwamoto, both of Hadano; Kenichi Kurosawa, Hitachi; Tetsuaki Nakamikawa, Hitachi, and Michio Morioka, Hitachi, all of Japan, assignors to Hitachi,Ltd., Tokyo, Japan

Continuation of Ser. No. 630,023, Apr. 9, 1996, abandoned, which is a continuation of Ser. No. 123,857, Sep. 17, 1993, abandoned. This application Jul. 26, 1996, Ser. No. 686,486

Claims priority, application Japan, Sep. 17, 1992, 4-248133; Mar. 17, 1993, 5-056777

Int. Cl.⁶ G06F *11/34*

U.S. Cl. 395—182.09 **26 Claims**


P0
P1
OUTPUT MODE CONTROL REGISTER
MODE DISPLAY REGISTER
101
103
201
203
250
220
140
700
150
120
110
113
210
213
240
MATCH CONTROL LOGIC
RE SYNCHRONIZING INDICATING REGISTER
FAULT LOG REGISTER
300
302
303
310
INTERRUPT CONTROL CIRCUIT
INTERRUPT SUPPRESSING INDICATING REGISTER
401
400
MISMATCH FAULT INTERRUPT REQUEST SIGNAL
MAIN STORAGE UNIT
MM

24. A processor in a highly reliable computer system comprising a main memory for storing data processed by said computer system and a plurality of said processors connected to said main memory via a bus for executing a process in a duplex mode said processor comprising:

means for comparing outputs of said processor with an output of another processor of said plurality of processors to detect a mismatch between said outputs;

means for detecting an internal fault occurring in said processor;

means for outputting fault information when an internal fault is detected by said detecting means; and

means for recognizing that an internal fault has occurred on said another processor of said plurality of processors based on said fault information of said internal fault output by said another processor of said plurality of processors, when a mismatch is detected by said comparing means.

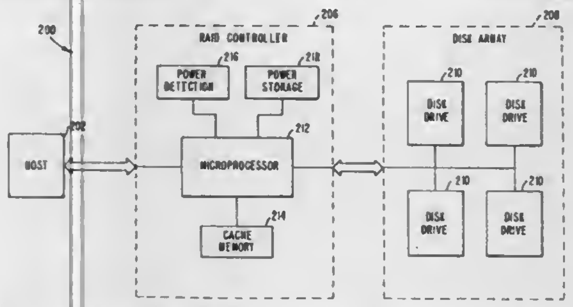
5,748,874
RESERVED CYLINDER FOR SCSI DEVICE WRITE BACK CACHE

Richard L. Hicksted, Incline Village, Nev., and Michael Glaser, Plettenberg, Germany, assignors to MTI Technology Corporation, Anaheim, Calif.

Filed Jun. 5, 1995, Ser. No. 464,101

Int. Cl.⁶ G06F *1/30*

U.S. Cl. 395—182.22 **14 Claims**



1. In a storage subsystem comprising a microprossor, a cache memory, and a disk drive, a method for storing contents of the cache memory after an interruption of power to the computer system, the method comprising the steps of:

reserving a location in the disk drive of sufficient size to hold a copy of the contents of the cache memory;

detecting the interruption of power to the computer system;

supplying temporary power to the microprocessor and the disk drive after the interruption of power to the computer system;

seeking to the reserved location in the disk drive under temporary power;

storing the copy of the contents of the cache memory in the reserved location in the disk drive under temporary power; and

restoring the copy of the contents of the cache memory stored in reserved location in the disk drive back to the cache memory after a restoration of power to the computer system.

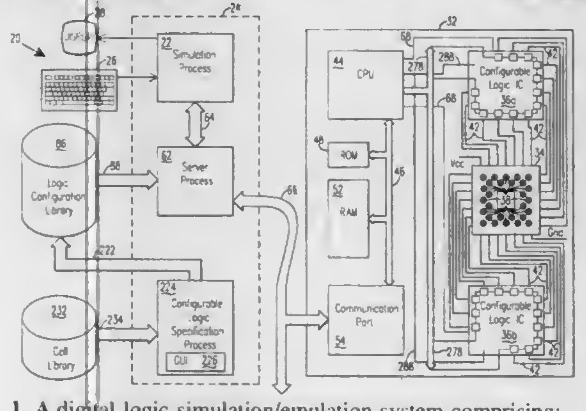
5,748,875
DIGITAL LOGIC SIMULATION/EMULATION SYSTEM

Yifatch Tzori, Sunnyvale, Calif., assignor to Simpod, Inc., Santa Clara, Calif.

Filed Jun. 12, 1996, Ser. No. 661,991

Int. Cl.⁶ G01R *31/28*

U.S. Cl. 395—183.05 **40 Claims**



1. A digital logic simulation/emulation system comprising:

a computer program digital-logic simulation process executed by a digital computer for modeling a digital logic system;

a hardware pod that:

is adapted for being coupled to a digital logic circuit;

includes a configurable-logic integrated circuit ("IC") which is arranged to include a plurality of stimulus/response cells for providing stimulus signals to the digital logic circuit during a stimulation-response cycle, and for receiving responses from the digital logic circuit during the stimulation-response cycle; and

further includes a communication port for receiving stimulation-control data to be transmitted to the configurable-logic IC for controlling stimulation of the digital logic circuit by the configurable-logic IC during the stimulation-response cycle, and for receiving for transmission from said hardware pod response data which the configurable-logic IC receives from the digital logic circuit in response to stimulation thereof during the stimulation-response cycle; and

a server process, coupled both to said digital-logic simulation process and to said hardware pod, for exchanging stimulation-control data and response data between said digital-logic simulation process and said hardware pod, whereby said digital-logic simulation process may transmit stimulation-control data through said server process to said hardware pod for controlling stimulation of the digital logic circuit by the stimulus/response cells during the stimulation-response cycle, and whereby said digital-logic simulation process may receive from said hardware pod through said server process response data from stimulus/response cells of the configurable-logic IC that reports the response of the digital logic circuit to stimulation during the stimulation-response cycle.

21. A method for swiftly determining configuration data to be used for configuring a configurable-logic IC for performing specified digital logic functions, the configurable-logic IC including an array of configurable-logic cells that may be logically interconnected by the configuration data to perform specific digital logic functions, the method comprising the steps of:

determining, for a plurality of logic-function cells to be established within the configurable-logic IC, a digital logic function to be performed by each such logic-function cell;

retrieving from a configurable-logic cell-library, which stores configuration data that specifies various different types of individual logic-function cells, configuration data for each logic-function cell in the plurality of logic-function cells, the configuration data retrieved for each logic-function cell specifying a pre-established interconnection of several configurable-logic cells included in the configurable-logic IC which, upon loading of such configuration data into a configurable-logic IC, establishes by interconnecting several configurable-logic cells a digital logic circuit within the configurable-logic IC that performs the digital logic functions specified for that logic-function cell; and

determining the configuration data to be used for configuring a configurable-logic IC merely by assigning to specific locations throughout the configurable-logic IC the configuration data retrieved from the configurable-logic cell-library for each of the logic-function cells.

27. A faster-performance digital logic simulation/emulation system comprising:

stimulation-control data that specifies stimulation-response-cycle data to be to be applied to a digital logic circuit during stimulation-response cycles;

a hardware pod that:

is adapted for receiving the stimulation-response-cycle data, and for being coupled to the digital logic circuit;

includes a configurable-logic IC which is arranged to include a plurality of stimulus/response cells for providing stimulus signals to the digital logic circuit during the stimulation-response cycles, and for receiving responses from the digital logic circuit during the stimulation-response cycles; and

further includes a communication port for receiving stimulation-response-cycle data to be transmitted to the configurable-logic IC for controlling stimulation of the digital logic circuit by the configurable-logic IC during the stimulation-response cycles; and

a server process, coupled to said hardware pod for supplying stimulation-response-cycle data to said hardware pod, whereby stimulation-response-cycle data supplied by said server process to said hardware pod controls stimulation of the digital logic circuit by the stimulus/response cells during the stimulation-response cycles.

OL
2 10
SS
1
MY
5
998
MI

5,748,876

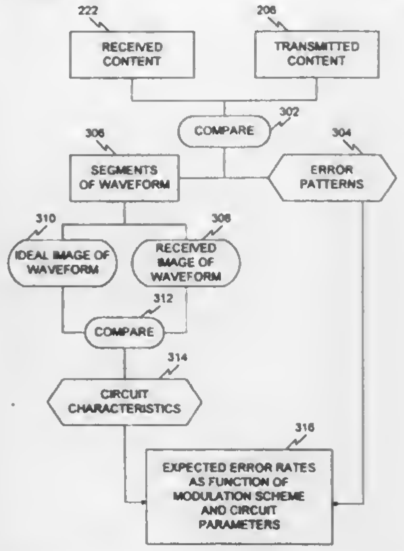
SYSTEM AND METHOD FOR TESTING ACOUSTIC MODEMS WITH SEMANTICALLY ENCODED WAVEFORMS

William Christopher Hardy, Dallas, Tex., assignor to MCI Communications Corporation, Washington, D.C.

Filed Dec. 29, 1995, Ser. No. 580,743

Int. Cl.^{6} H04M *1/64*

U.S. Cl. 395—183.01 **10 Claims**



1. A method for testing acoustic modem signals, comprising the steps of:

(1) producing an acoustic waveform representing a semantically encoded Modem waveform;
(2) transmitting said acoustic waveform over an operational telephone line to a destination location;
(3) recording said transmitted acoustic waveform at said destination location;
(4) accessing an ideal acoustic waveform; and
(5) comparing said recorded acoustic waveform with said ideal acoustic waveform to determine whether a transmission error has occurred, wherein said transmission error is associated with at least one circuit component of the operational telephone line.

5,748,877

METHOD FOR EXECUTING EMBEDDED DIAGNOSTICS FROM OPERATING SYSTEM-BASED APPLICATIONS

Bill Dollahite, and Rick Finch, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

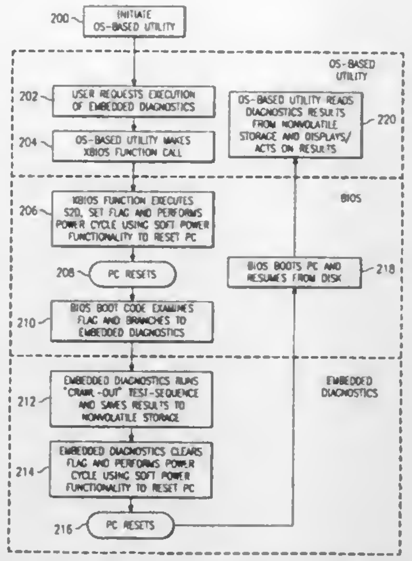
Filed Mar. 8, 1995, Ser. No. 401,047

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.12 **30 Claims**

1. In a computer comprising a hard disk and a memory device for storing BIOS code, a method for executing hardware diagnostics code embedded in said memory device, the method comprising,

saving a state of said computer to said hard disk responsive to a request for execution of said embedded diagnostics code;
automatically resetting said computer without additional user input;
responsive to said resetting, executing said embedded diagnostics code;
storing results of said executing to a nonvolatile storage device of said computer;
automatically resetting said computer a second time without additional user input after said storing; and
responsive to said second resetting, restoring said computer to said saved state.


200
INITIATE OS-BASED UTILITY
OS-BASED UTILITY
202
USER REQUESTS EXECUTION OF EMBEDDED DIAGNOSTICS
204
OS-BASED UTILITY MAKES XBIOS FUNCTION CALL
OS-BASED UTILITY READS DIAGNOSTICS RESULTS FROM NONVOLATILE STORAGE AND DISPLAYS/ ACTS ON RESULTS
220
BIOS
206
XBIOS FUNCTION EXECUTES S2D, SET FLAG AND PERFORMS POWER CYCLE USING SOFT POWER FUNCTIONALITY TO RESET PC
208
PC RESETS
BIOS BOOTS PC AND RESUMES FROM DISK
218
210
BIOS BOOT CODE EXAMINES FLAG AND BRANCHES TO EMBEDDED DIAGNOSTICS
EMBEDDED DIAGNOSTICS
212
EMBEDDED DIAGNOSTICS RUNS "CRAWL-OUT" TEST-SEQUENCE AND SAVES RESULTS TO NONVOLATILE STORAGE
214
EMBEDDED DIAGNOSTICS CLEARS FLAG AND PERFORMS POWER CYCLE USING SOFT POWER FUNCTIONALITY TO RESET PC
216
PC RESETS

5,748,878

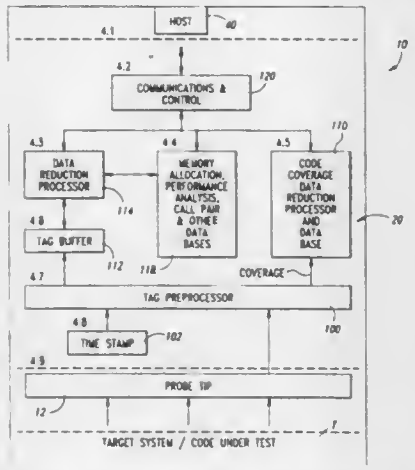
METHOD AND APPARATUS FOR ANALYZING SOFTWARE EXECUTED IN EMBEDDED SYSTEMS

Andrew John Rees, Seattle; Stephen Caine O'Brien, Redmond, and Peter D. Krystad, Seattle, all of Wash., assignors to Applied Microsystems, Inc., Redmond, Wash.

Filed Sep. 11, 1995, Ser. No. 526,709

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.14 **46 Claims**



1. A system for analyzing software being executed in a target system having a data bus and an address bus, said software containing a plurality of executable tag statements which, when executed, cause said target system to write at least one tag to respective predetermined locations in the address space of said target system, said tags containing respective tag values corresponding to the locations in said software of tag statements generating said tags, said system comprising:

a probe connected to the address and data buses of said target system while said target system is executing said software, said probe detecting when said predetermined location in the address space of said target system is being addressed, said probe capturing a tag on the data bus of said target system when said probe detects that said predetermined location has been addressed; and
a processor connected to said probe, said processor processing said tags at a rate sufficient to sustain processing said tags as they are captured while said software is being executed, said processor determining and displaying information about the execution of said software based on said tag values while said software is being executed.

5,748,879

CACHE MEMORY TESTING METHOD

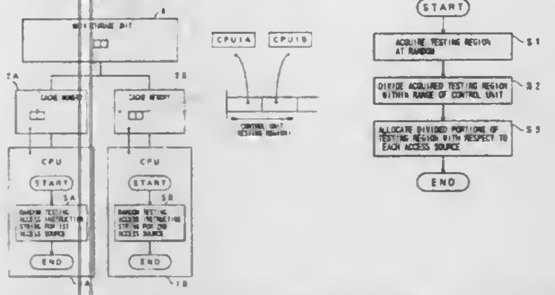
Yukio Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1996, Ser. No. 635,399

Claims priority, application Japan, Jul. 4, 1995, 7-169049

Int. Cl.^{6} G06F *11/00;12/08*

U.S. Cl. 395—183.18 **11 Claims**


2A
2B
CPU
START
SA
SB
END
CPU1A
CPU1B
START
ACQUIRE TESTING REGION AT RANDOM
S1
DIVIDE ACQUIRED TESTING REGION WITHIN RANGE OF CONTROL UNIT
S2
ALLOCATE DIVIDED PORTIONS OF TESTING REGION WITH RESPECT TO EACH ACCESS SOURCE
S3
END

1. A cache memory testing method for testing a cache memory control mechanism which controls data coherency between cache memories or between a main storage unit and a cache memory in a system including N processors each having a cache memory and coupled to the main storage unit, where said processors are access sources and N is an integer greater than one, said cache memory testing method comprising the steps of:

(a) dividing a control unit depending on N, and allocating access regions within the cache memories at positions which are mutually different and are peculiar to each of the N processors in the divided portions of the control unit, said control unit being a mechanical minimum unit of the data coherency control; and
(b) testing the cache memory control mechanism based on read data by writing data to and reading data from only the peculiar access regions within the same control unit by each of the N processors.

5,748,880

COMPUTER-SUPERVISING SYSTEM

Yutaka Ito, Nagoya; Naoko Egawa, Inazawa; Shogo Unai, and Tadashi Murase, both of Nagoya, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

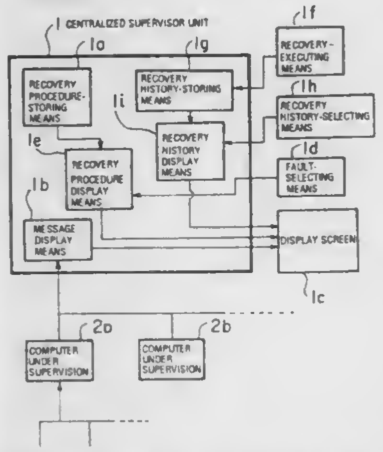
Continuation of Ser. No. 370,852, Jan. 10, 1995, abandoned.

This application Sep. 3, 1996, Ser. No. 718,017

Claims priority, application Japan, Mar. 15, 1994, 6-043727

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.22 **4 Claims**


1 CENTRALIZED SUPERVISOR UNIT
1a
1g
1f
RECOVERY PROCEDURE-STORING MEANS
RECOVERY HISTORY-STORING MEANS
RECOVERY-EXECUTING MEANS
1i
1h
RECOVERY HISTORY-SELECTING MEANS
1e
RECOVERY HISTORY DISPLAY MEANS
RECOVERY PROCEDURE DISPLAY MEANS
1d
FAULT-SELECTING MEANS
1b
MESSAGE DISPLAY MEANS
DISPLAY SCREEN
1c
2a
2b
COMPUTER UNDER SUPERVISION
COMPUTER UNDER SUPERVISION

1. A computer-supervising system including a centralized supervisor unit for supervising a large number of computers under supervision connected to each other via a network, said computer-supervising system comprising:

recovery procedure-storing means for storing a plurality of recovery procedures corresponding to a plurality of faults of said computers under supervision, respectively; message display means for displaying a plurality of error messages corresponding to said plurality of faults, respectively, on a display screen, together with a plurality of classification data added thereto by said computers under supervision;
fault-selecting means for selecting one of said plurality of error messages displayed on said display screen, according to an operation of an operator;
recovery procedure display means for reading one of said plurality of recovery procedures stored in said recovery procedure-storing means based on said selected one error message which corresponds to one of said plurality of faults, and for displaying said read one recovery procedure on said display screen;
recovery-executing means for executing said read and displayed one recovery procedure when instructed by an operator, to thereby recover from said one fault which corresponds to said selected one error message;
recovery history-storing means for storing said one recovery procedure actually executed by said recovery-executing means and for storing a plurality of executed recovery procedures executed by said recovery-executing means over time;
recovery history-selecting means for selecting one of said plurality of executed recovery procedures stored in said recovery history-storing means, according to an operation of said operator; and
recovery history display means for displaying the selected one recovery procedure on said display screen.

5,748,881

METHOD AND APPARATUS FOR A REAL-TIME DATA COLLECTION AND DISPLAY SYSTEM

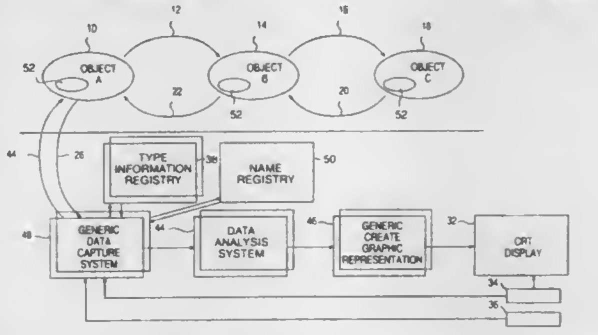
Brian T. Lewis, and Graham Hamilton, both of Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 958,624, Oct. 9, 1992, abandoned.

This application Nov. 3, 1995, Ser. No. 552,971

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—184.01 **18 Claims**



1. A process for monitoring a target program in a computer system while running programs, the process comprising the steps, performed by the computer system while executing the programs, of:

a. acquiring data from the target program without using any prior knowledge of said data, said data including a display hint suggesting an appropriate way to display said data;
b. determining from said display hint, an appropriate display of the acquired data;
c. generating a graphic representation of the acquired data based upon said appropriate display; and
d. displaying the graphic representation.

/OL
2 10
ISS
1
MY
5
998
JMI

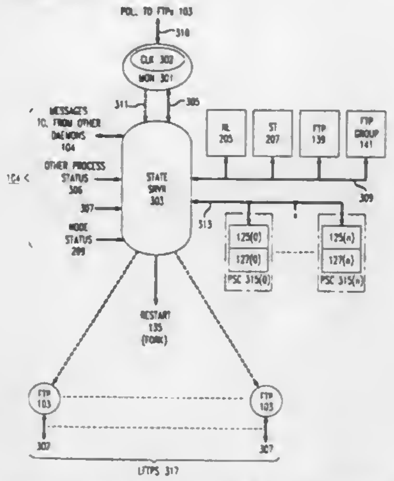
5,748,882
APPARATUS AND METHOD FOR FAULT-TOLERANT COMPUTING

Yennun Huang, Bridgewater, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 301,362, Sep. 6, 1994, abandoned, which is a continuation of Ser. No. 954,549, Sep. 30, 1992, abandoned. This application May 8, 1996, Ser. No. 643,274

Int. Cl.^{6} G06F *11/00;11/08*

U.S. Cl. 395—184.01 **29 Claims**



17. A computer system for fault tolerant computing comprising:

a plurality of nodes, each of said nodes comprising at least one processor for executing user level processes;

a first user level process executing in a first one of said nodes;

a first user level daemon process executing in a second one of said nodes for actively polling said first one of said nodes for determining whether said first one of said nodes is inoperable, and for restarting said first user level process on said second one of said nodes when said first user level daemon process determines that said first one of said nodes is inoperable;

a second user process executing in said second one of said nodes, wherein said first user level daemon further observes whether said second user process is unable to continue execution and restarts said second user level process on said second one of said nodes when said second user level process is observed to be unable to continue;

a second one of said user level daemon processes executing on said first one of said nodes, said second one of said user level daemon processes copies state information from said first user level process to said first user level daemon process, and said first user level daemon process employs said state information in restarting execution of said first user level process; and

computer program code executed by said first user level process, said computer program code comprising a first fault tolerant library routine which, when executed, saves said state information.

5,748,883
DISTRIBUTED DEVICE STATUS IN A CLUSTERED SYSTEM ENVIRONMENT

Brent Allen Carlson; Frederic Lawrence Huss; Nancy Marie Schmucki, and Richard Elmer Zelenski, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

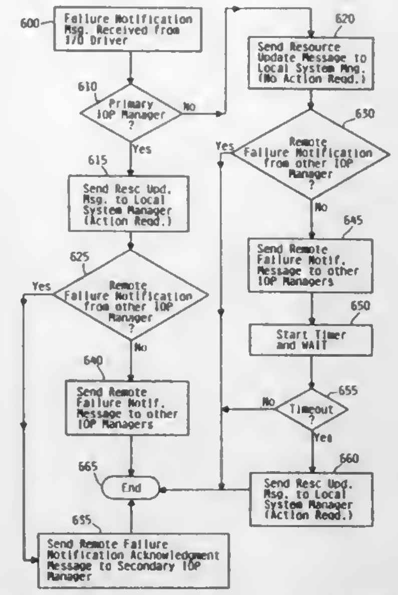
Division of Ser. No. 492,676, Jun. 20, 1995, Pat. No. 5,600,791, which is a continuation of Ser. No. 954,203, Sep. 30, 1992, abandoned. This application Aug. 1, 1996, Ser. No. 691,054

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—184.01 **2 Claims**

1. A apparatus, said apparatus comprising:

A clustered computer system, said clustered computer system comprising,


600
Failure Notification Msg. Received from I/O Driver
610
Primary IOP Manager?
No
Yes
615
Send Resc Upd. Msg. to Local System Manager (Action Reqd.)
620
Send Resource Update Message to Local System Mng. (No Action Reqd.)
630
Remote Failure Notification from other IOP Manager
Yes
No
625
Remote Failure Notification from other IOP Manager
Yes
No
645
Send Remote Failure Notif. Message to other IOP Managers
650
Start Timer and WAIT
640
Send Remote Failure Notif. Message to other IOP Managers
655
Timeout?
No
Yes
660
Send Resc Upd. Msg. to Local System Manager (Action Reqd.)
665
End
635
Send Remote Failure Notification Acknowledgment Message to Secondary IOP Manager

an input/output processor (IOP), said IOP being bus connected to a first computer system and to a second computer system such that said IOP is shared by said first computer system and said second computer system;

a first system manager that executes on said first computer system;

a secondary IOP manager that executes on said second computer system; and

a primary IOP manager that executes on said first computer, said primary IOP manager being responsible for forwarding error information received from said IOP to said first system manager for handling by said first system manager, said primary IOP manager also being responsible for forwarding status information received from said IOP to said secondary IOP manager, said status information not including said error information.

5,748,884
AUTONOTIFICATION SYSTEM FOR NOTIFYING RECIPIENTS OF DETECTED EVENTS IN A NETWORK ENVIRONMENT

Kevin M. Royce; Stanley D. Berry, both of Colorado Springs; Brian W. Erdmann, Monument; Jeffrey P. Scheetz, Colorado Springs; John D. Cole, Colorado Springs, and Hayes J. Landry, Jr., Colorado Springs, all of Colo., assignors to MCI Corporation, Washington, D.C.

Filed Jun. 13, 1996, Ser. No. 663,401

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.1 **37 Claims**

1. An autonotification system for use in a network environment, wherein said network processes a job, the system comprising:

a pre-determined notification procedure having an instruction indicating a first recipient to notify when a triggering event occurs while the job is being processed;

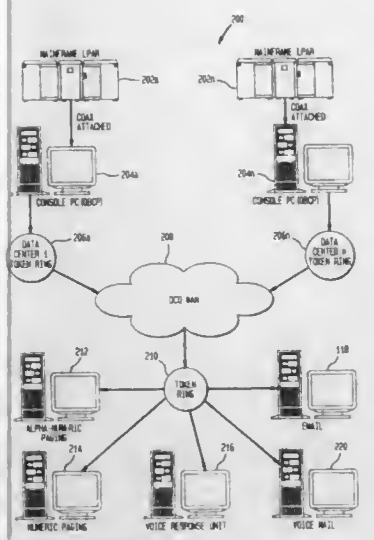
an auxiliary procedure for entering a plurality of global variables into the system; including a global variable to notify a default recipient different from said first recipient;

means for confirming receipt of a notification;

means for escalating said notification to said default recipient, if said first recipient does not accept and, said escalating means also escalating said notification when said first recipient does not confirm within a predetermined time period;

means for detecting one of a plurality of traps occurring from the processing of said job and generating a detection message corresponding to said trap;

means for analyzing said detection message to determine whether said trap is eligible for one of a plurality of notification services and generating an analysis message, wherein said means for analyzing comprises



an applications (APPS) process;

a user-invoked process;

a non-notification process;

a systems software process; and

a default process; and

autonotification means for automatically notifying said first recipient according to an autonotification message.

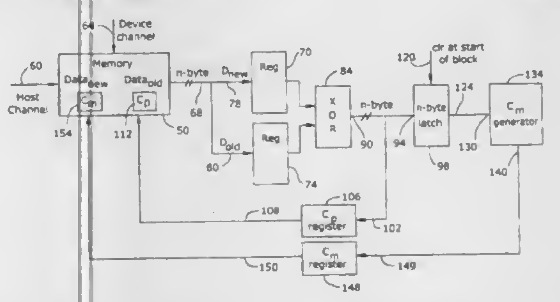
5,748,885
METHOD AND APPARATUS FOR REDUCTION OF I/O OPERATIONS IN PERSISTENT STORAGE SYSTEM

Brian Gallagher, Marlboro, Mass., assignor to EMC Corporation, Hopkinton, Mass.

Continuation of Ser. No. 363,719, Dec. 23, 1994, abandoned. This application Jul. 15, 1996, Ser. No. 679,740

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—185.01 **16 Claims**



10. An apparatus for writing a new block of data to a predetermined storage location on a data disk drive having a plurality of storage locations in response to a write request from a host computer, wherein said write request comprises an indication of said predetermined storage location and said new block of data. said apparatus comprising:

a first register having an input and an output, said input of said first register receiving said new block of data to be written to said data disk drive;

a second register having an input and an output, said input of said second register receiving a block of data stored in said predetermined location on said data disk drive;

XOR logic having a first input, a second input and an output, said first input of said XOR logic coupled to said output of said first register and said second input of said XOR logic coupled to said output of said second register, wherein a difference pattern is generated at said output of said XOR logic in response to said new block of data and said stored block of data; and

said apparatus being operative to discontinue storing of said new block of data to said predetermined location on said data disk drive if said difference pattern is equal to a predetermined value.

5,748,886
DATA CHECK METHOD FOR AN EXTERNAL MEMORY AND CHECK SYSTEM FOR AN EXTERNAL ROM DATA

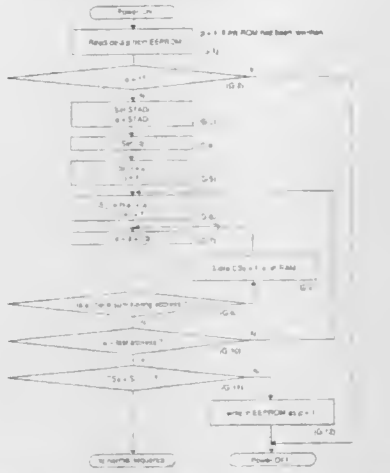
Kazuyoshi Hijii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 1, 1996, Ser. No. 641,532

Claims priority, application Japan, May 1, 1995, 7-107462

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.02 **21 Claims**



1. A method for checking data of an external memory comprising:

a first storing step of storing in advance a check start address for an external memory, a skip value and a storing address for said external memory in an internal memory of a Central Processing Unit (referred to as CPU, hereinafter);

a second storing step of conducting in advance a predetermined calculation to data in retrieval addresses of said external memory that are calculation results of sequentially adding said skip value to said check start address, and storing a result of said predetermined calculation in said storing address of said external memory;

a comparison step of reading data stored in said retrieval addresses of said external memory at checking said external memory, conducting said predetermined calculation to said read data and comparing this calculation result with said calculation result stored in said storing address of said external memory; and

a decision step of deciding that said external memory is normal when said calculation result based on said read data coincides with said calculation result stored in said storing address.

5,748,887
INTER-PROCESSOR ASYNCHRONOUS SERIAL COMMUNICATION TRANSMISSION/RECEPTION APPARATUS USING EACH OTHER'S MEMORIES

Young Goo Kim, Kyoungki-do, and Jae Kon Kim, Seoul, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, China

Filed Apr. 17, 1996, Ser. No. 634,020

Claims priority, application Rep. of Korea, Apr. 18, 1995, 95-9100

Int. Cl.^{6} G06F *11/34*

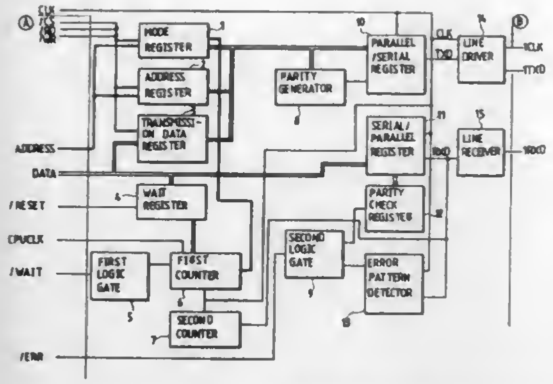
U.S. Cl. 395—185.05 **14 Claims**

1. An inter-processor asynchronous serial communication transmission/reception apparatus using each other's memories, comprising:

mode, address and transmission data registers for selectively receiving a chip selection signal, a read signal and a write signal from a first processor;

a parallel/serial register for converting parallel data from said mode register, address register and transmission data register into serial data in response to an external clock signal;

VOL
1210
ISS
1
MY
5
1998
UMI



- a line driver for receiving the serial data from said parallel/serial register and transmitting the received serial data to a second processor in response to the external clock signal;
- a parity generator for generating a parity bit in response to the parallel data from said mode register, address register and transmission data register and supplying the generated parity bit to said parallel/serial register;
- a line receiver for receiving serial data from said second processor and transmitting the received serial data to said first processor;
- a serial/parallel register for converting the serial data from said line receiver into parallel data in response to the external clock signal;
- a wait register for generating a time delay signal and a reset signal in response to a data signal from said first processor and the parallel data from said serial/parallel register and supplying the generated reset signal to said first processor;
- a first counter for performing a counting operation in response to an output signal from said wait register, an output signal from said rode register, the external clock signal and a central processing unit clock signal from said first processor;
- a parity check register for checking a parity bit of the parallel data from said serial/parallel register;
- an error pattern detector for detecting an error pattern of the serial data from said line receiver in response to the external clock signal;
- a second counter for performing a counting operation in response to an output signal from said line receiver and the external clock signal;
- a first logic gate for generating a wait signal in response to output signals from said first and second counters and supplying the generated wait signal to said first processor; and
- a second logic gate for generating an error signal in response to an output signal from said parity check register and an output signal from said error pattern detector and supplying the generated error signal to said first processor.

5,748,888

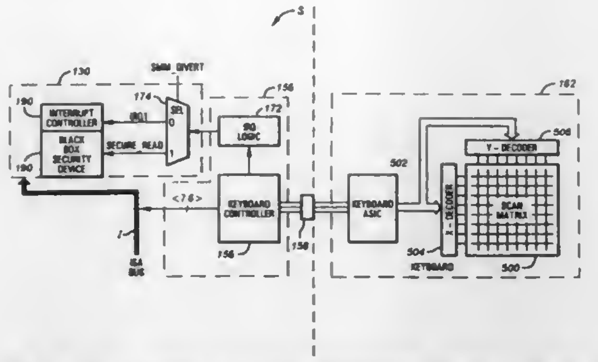
METHOD AND APPARATUS FOR PROVIDING SECURE AND PRIVATE KEYBOARD COMMUNICATIONS IN COMPUTER SYSTEMS

Michael F. Angelo, Houston, and Jeff W. Wolford, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed May 29, 1996, Ser. No. 657,982
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—186 **12 Claims**

1. A method for securely communicating data from a keyboard to a non-readable security device in a computer system having a processor incorporating system management mode or similar capabilities, the keyboard and computer system being coupled via a keyboard interface, the method comprising the steps of:



- generating a system management interrupt in response to a request for secure communications;
- placing the processor in system management mode to execute a system management interrupt handler as a result of said step of generating a system management interrupt;
- entering keystroke data via a keyboard, wherein a keyboard interrupt is also generated;
- setting a secured keyboard bit or otherwise communicating a command that causes specialized circuitry in the keyboard interface to intercept the keyboard interrupt;
- rerouting the keyboard interrupt or a signal generated therefrom to the non-readable security device to indicate the presence of keyboard data; and
- diverting the keystroke data to the non-readable security device in response to the step of generating a system management interrupt in response to a request for secure communications.

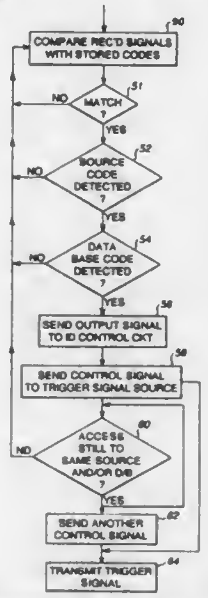
5,748,889

MONITORING IDENTITY OF COMPUTER USERS ACCESSING DATA BASES, AND STORING INFORMATION ABOUT THE USERS AND THE ACCESSED DATA BASE

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666, and Thomas Langer, Teaneck, N.J., assignors to Lee S. Weinblatt, Teaneck, N.J.

Continuation of Ser. No. 503,814, Jul. 18, 1995, abandoned.
This application Nov. 5, 1996, Ser. No. 730,120
Int. Cl.^{6} G06F *13/00;* **G11B** *23/28;* **H04L** *9/00;* **H04K** *1/00*

U.S. Cl. 395—187.01 **9 Claims**


COMPARE REC'D SIGNALS WITH STORED CODES
50
MATCH ?
51
NO
YES
SOURCE CODE DETECTED ?
52
DATA BASE CODE DETECTED ?
54
SEND OUTPUT SIGNAL TO ID CONTROL CKT
56
SEND CONTROL SIGNAL TO TRIGGER SIGNAL SOURCE
58
ACCESS STILL TO SAME SOURCE AND/OR D/B ?
60
SEND ANOTHER CONTROL SIGNAL
62
TRANSMIT TRIGGER SIGNAL
64

1. Apparatus for monitoring access by computer users to data bases available on information sources, the apparatus including a stationary monitoring portion and a plurality of portable transmitter devices respectively associated with such users,

wherein the stationary monitoring portion comprises:

- a signal detector responsive to code signals respectively stored in association with the data bases and information sources and respectively unique thereto,
- a comparator responsive to said signal detector for producing an output signal when a match exists between a code signal detected by said signal detector and a stored code which corresponds to one of the data bases and information sources that is being monitored,
- a trigger signal source responsive to the output signal of said comparator for emitting a trigger signal adapted to trigger emission of ID signals by the portable transmitter devices,
- an ID signal processing circuit responsive to the emitted ID signal to compare the emitted ID signal with stored ID codes and, if a match with a particular ID code is found, to output the particular ID code, and
- a memory coupled to the output of said ID signal processing circuit to store said particular ID code; and

wherein each of said portable transmitter devices comprises transmitter means for emitting the ID signals which are respectively unique to the associated users, and means responsive to said trigger signal to actuate said transmitter means.

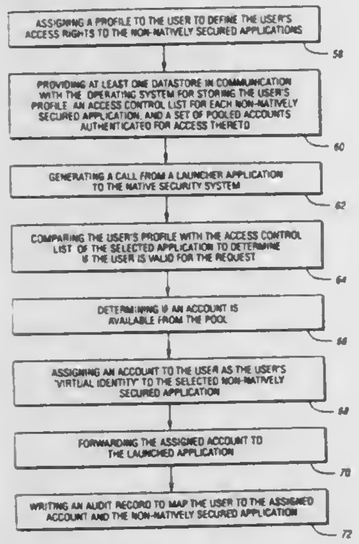
5,748,890

METHOD AND SYSTEM FOR AUTHENTICATING AND AUDITING ACCESS BY A USER TO NON-NATIVELY SECURED APPLICATIONS

Max Motti Goldberg; Melodi Mosley Gates, both of Denver; Susan Barbara Ericksen, Englewood, and William O. White, Boulder, all of Colo., assignors to U S West, Inc., Englewood, Colo.

Filed Dec. 23, 1996, Ser. No. 772,675
Int. Cl.^{6} G06F *12/14;* **H04L** *9/32*

U.S. Cl. 395—188.01 **20 Claims**


ASSIGNING A PROFILE TO THE USER TO DEFINE THE USER'S ACCESS RIGHTS TO THE NON-NATIVELY SECURED APPLICATIONS
58
PROVIDING AT LEAST ONE DATASTORE IN COMMUNICATION WITH THE OPERATING SYSTEM FOR STORING THE USER'S PROFILE AN ACCESS CONTROL LIST FOR EACH NON-NATIVELY SECURED APPLICATION, AND A SET OF POOLED ACCOUNTS AUTHENTICATED FOR ACCESS THERETO
60
GENERATING A CALL FROM A LAUNCHER APPLICATION TO THE NATIVE SECURITY SYSTEM
62
COMPARING THE USER'S PROFILE WITH THE ACCESS CONTROL LIST OF THE SELECTED APPLICATION TO DETERMINE IF THE USER IS VALID FOR THE REQUEST
64
DETERMINING IF AN ACCOUNT IS AVAILABLE FROM THE POOL
66
ASSIGNING AN ACCOUNT TO THE USER AS THE USER'S "VIRTUAL IDENTITY" TO THE SELECTED NON-NATIVELY SECURED APPLICATION
68
FORWARDING THE ASSIGNED ACCOUNT TO THE LAUNCHED APPLICATION
70
WRITING AN AUDIT RECORD TO MAP THE USER TO THE ASSIGNED ACCOUNT AND THE NON-NATIVELY SECURED APPLICATION
72

1. For use in cooperation with an operating system having a native security system, a method for authenticating and auditing access by a user to non-natively secured applications, comprising:

- assigning a profile to the user to define the access rights to the non-natively secured applications;
- providing at least one datastore in communication with the operating system for storing the user's profile and account data relating to each of the non-natively secured applications, including an access control list defining authorized users and a set of pooled accounts authenticated for access to the respective non-natively secured application;
- generating a call from a launcher application to the native security system or an extension thereof in response to a request by the user to access a selected non-natively secured application;
- determining if the user is permitted access to the selected non-natively secured application;
- requesting an account from the set of pooled accounts in response to a determination that the user is permitted access to the selected non-natively secured application;
- determining if an account is available from the set of pooled accounts;
- assigning an account to the user in response to a determination that an account is available from the set of pooled accounts, the assigned account operative as the user's virtual identity to the selected non-natively secured application;
- forwarding account data to the launcher application; and
- generating an audit record to map the user to the assigned account.

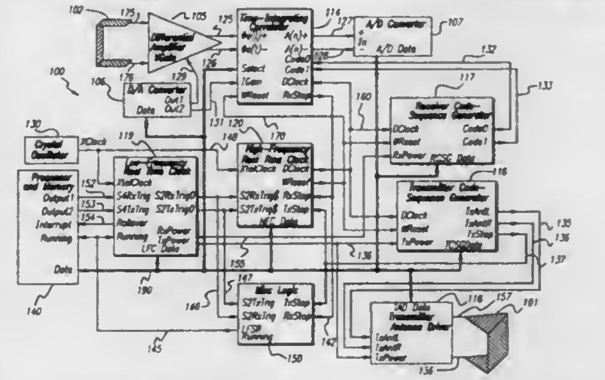
5,748,891

SPREAD SPECTRUM LOCALIZERS

Robert Alan Fleming, and Cherie Elaine Kushner, both of Nicasio, Calif., assignors to Aether Wire & Location, Nicasio, Calif.

Filed Jul. 22, 1994, Ser. No. 279,329
Int. Cl.^{6} H04B *15/00*

U.S. Cl. 375—200 **16 Claims**



1. A receiver for reception of nonsinusoidal spread spectrum radio communications from a nonsinusoidal spread spectrum radio transmitter comprising:

- a spread spectrum radio antenna having an ultra-wide bandwidth for receiving a nonsinusoidal communication signal impingent thereon during a reception time window;
- a code-sequence generator to generate a digital pseudorandom sequence resembling a portion of said nonsinusoidal communication signal;
- a time-integrating correlator to calculate values of integrals of a product of said communication signal and delayed versions of said digital pseudorandom sequences, said communication signal being an analog waveform derived from a digital signal generated at said nonsinusoidal spread spectrum radio transmitter; and
- a processor for determining an arrival time of said communication signal from said values of said integrals.

5,748,892

METHOD AND APPARATUS FOR CLIENT MANAGED FLOW CONTROL ON A LIMITED MEMORY COMPUTER SYSTEM

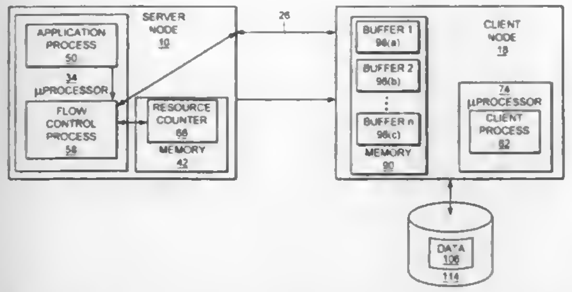
John Richardson, Boca Raton, Fla., assignor to Citrix Systems, Inc., Ft. Lauderdale, Fla.

Filed Mar. 25, 1996, Ser. No. 621,848
Int. Cl.^{6} G06F *9/44;9/00;13/00*

U.S. Cl. 395—200.3 **7 Claims**

1. A method for flow control on a network having a server and a non-blocking client node which may not drop requests, the method comprising the steps of:

- allocating resources on said non-blocking client node by said non-blocking node;
- notifying said server of said allocated resources by said non-blocking client node;
- determining by said server the resources on said non-blocking client node required to fulfill a request made by an application executing on said server;



determining by said server whether sufficient resources are available on said non-blocking client node to fulfill said request of said application; and

sending said request of said application by said server to said non-blocking client node if sufficient resources are available on said non-blocking client node to fulfill said request.

5,748,893
NETWORK INTERFACE APPARATUS

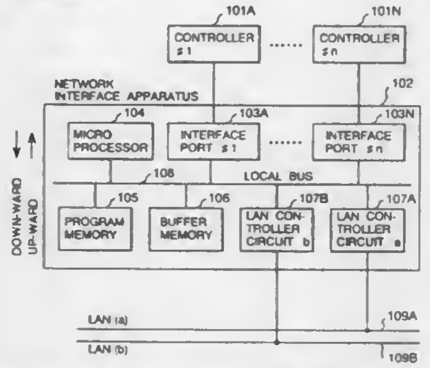
Tetsuhiko Hirata; Minoru Koizumi; Masayo Nagano, all of Yokohama; Yoshiaki Adachi, Hatachiota; Hiroshi Wataya, Hitachinaka, and Ken Onuki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1996, Ser. No. 739,436

Claims priority, application Japan, Nov. 1, 1995, 7-284956

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.3 **16 Claims**



1. A network interface apparatus for connecting a network terminal and a duplicated LAN, comprising:

means for controlling an interface with said network terminal;

means for controlling an interface with each LAN transmission line of said duplicated LAN;

means for buffering data from said network terminal;

means for sending said data to each LAN transmission line from said buffering means; and

means for sending said data received from each LAN transmission line to said network terminal,

wherein said data from said network terminal is buffered in said means for buffering data, and when said buffered data reaches a fixed amount, said data is sent to both LANs of said duplicated LAN, and said data received from each LAN transmission line of said duplicated LAN is compared in the competition relation thereof, and only said data which is judged as earlier arrival data is sent to said network terminal, and said interface duplicated so as to connect to said duplicated LAN is controlled.

5,748,894
COOPERATIVE INFORMATION PROCESSING METHOD AND APPARATUS UTILIZING LOCAL PROGRAM

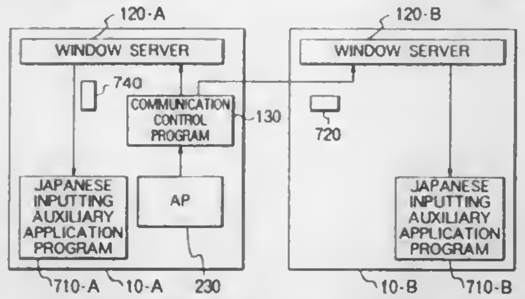
Takeshi Ishizaki; Kenjiro Mori, both of Sagamihara; Yoshiyuki Nakayama; Chiho Kitahara, both of Kawasaki; Masami Kameda, Yokohama, and Tomomi Suzuki, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 795,828, Nov. 21, 1991, Pat. No. 5,379,374, and a continuation-in-part of Ser. No. 968,046, Oct. 28, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 231,517

Claims priority, application Japan, Apr. 23, 1993, 5-097868

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 395—200.04 **11 Claims**


120-A
120-B
WINDOW SERVER
WINDOW SERVER
740
COMMUNICATION CONTROL PROGRAM
130
720
JAPANESE INPUTTING AUXILIARY APPLICATION PROGRAM
AP
JAPANESE INPUTTING AUXILIARY APPLICATION PROGRAM
710-A
10-A
230
10-B
710-B

1. A cooperative information processing method wherein an inter-application program message issued by an application program operating on a computer is transmitted to a window server operating on others of a plurality of computers, to cooperatively display a screen display of said application program on said plurality of computers, and a communication message generated as a result of an input to said application program issued by one of said plurality of computers is received and multiplexed and a multiplexed result is transmitted to said application program, to cooperatively execute said application program on said plurality of computers, said method comprising the steps of:

receiving said communication message generated as a result of the input to said application program by utilizing an auxiliary program which is a program executed locally in one of said plurality of computers for directly communicating with said window server without going through any other program;

based on predetermined server-dependent information on a format of a communication message of said inter-application program, interpreting a format of said communication message and converting said communication message to a communication message format for a server on a destination computer; and

transmitting said converted communication message to said window server, to cooperatively execute said application program on said plurality of computers.

5,748,895
SYSTEM FOR REMOTELY PROGRAMMING A PORTABLE INFORMATION DEVICE USING VISIBLE OPTICAL PATTERN TRANSMITTED FROM A DISPLAY DEVICE WHILE CONCURRENTLY DISPLAYING HUMAN-READABLE EXPLANATION OF THE PATTERN

Victor Shiff, Wolcott, Conn.; Neil S. Fishman, Bothell, Wash., and Philip Brzezinski, Middlebury, Conn., assignors to Microsoft Corporation, Redmond, Wash.

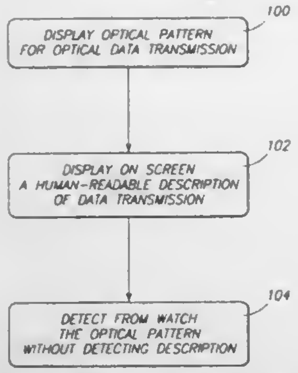
Continuation of Ser. No. 428,917, Apr. 25, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 786,192

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 395—200.09 **12 Claims**

1. A method for remotely programming a programmable portable information device using optical data transmission from a visual display device, the portable information device having an optical sensor, the method comprising the following steps:

displaying, on the visual display device, a sequence of changing optical patterns in a first color that is detectable by the optical


DISPLAY OPTICAL PATTERN FOR OPTICAL DATA TRANSMISSION
100
DISPLAY ON SCREEN A HUMAN-READABLE DESCRIPTION OF DATA TRANSMISSION
102
DETECT FROM WATCH THE OPTICAL PATTERN WITHOUT DETECTING DESCRIPTION
104

sensor of the portable information device to optically transmit a serial stream of data; and

displaying, on the visual display device concurrently with the sequence of optical patterns, a human-readable image in a second color different from the first color that cannot be detected by the optical sensor to explain to a user the data being optically transmitted through use of the optical patterns, wherein the optical patterns in the first color and the human-readable image in the second color are visible to a human eye.

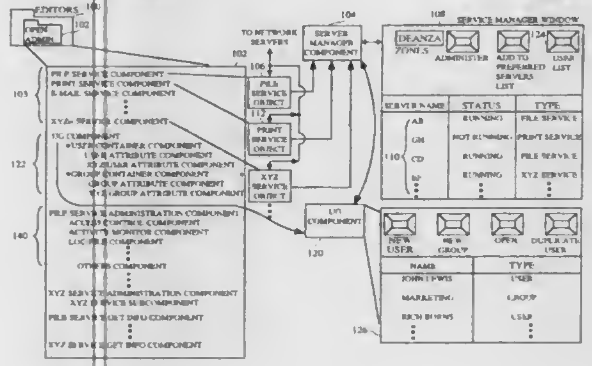
5,748,896
REMOTE NETWORK ADMINISTRATION METHODS AND APPARATUS

Una T. Daly, Saratoga; Ying-Kuei Ann Huang, Cupertino; Robert D. Parker, San Jose, and Mary E. Firenze, Los Altos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 27, 1995, Ser. No. 605,325

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—200.53 **20 Claims**



1. A remote network administration apparatus for managing network services on a plurality of network servers in a computer network, comprising:

a component repository, said component repository containing service components, each of said service components corresponds to one of said network services;

a service object, said service object being associated with a first one of said service components, said service object, when executed, communicates with said plurality of network servers to obtain network service instantiation data relating to instantiations of a first one of said network services on said plurality of network servers, said first one of said network services being a network service that corresponds to said first one of said service components;

a server manager component for receiving said network service instantiation data from said service object;

a server manager window representing the user interface component for said server manager component, said server manager window displaying a status of said instantiations responsive to said network service instantiation data.

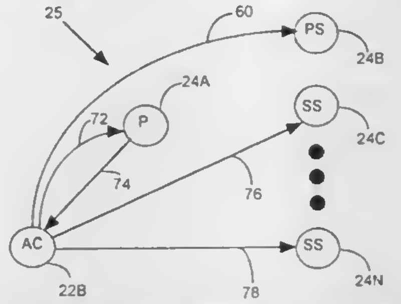
5,748,897
APPARATUS AND METHOD FOR OPERATING AN AGGREGATION OF SERVER COMPUTERS USING A DUAL-ROLE PROXY SERVER COMPUTER

Dinesh Katiyar, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 2, 1996, Ser. No. 674,402

Int. Cl.^{6} H04L *12/00*

U.S. Cl. 395—200.49 **18 Claims**



11. A method for processing remote procedure calls to objects stored on an aggregation of server computers, said method comprising the steps of:

directing non-client remote procedure calls to a dual-role proxy server computer of said aggregation of server computers;

routing client remote procedure calls to non-proxy server computers of said aggregation of server computers; and

re-routing said client remote procedure calls to said dual-role proxy server computer only when said nonproxy server computers cannot process said client remote procedure calls.

5,748,898
IMAGE DATA COMMUNICATION SYSTEM

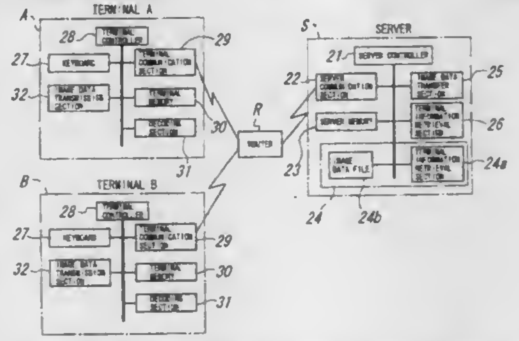
Hiroaki Ueda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 12, 1996, Ser. No. 695,415

Claims priority, application Japan, Aug. 10, 1995, 7-224570

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 395—200.49 **4 Claims**



1. An image data communication system which includes a server and a plurality of terminals and wherein image data are communicated between said server and said terminals, comprising:

transmission discrimination means provided in said server for discriminating whether or not image data requested from a first one of said terminals have already been transmitted to a second one of said terminals;

image data transfer means provided in said server for requesting, when a result of the discrimination of said transmission discrimination means is that the data have been transmitted already, the second terminal for transmission of the image data and transferring the image data received from the second terminal to the first terminal;

terminal side storage means provided in each of said terminals for storing image data; and

image data transmission means provided in each of said terminals for reading out image data requested from said server from each of said terminal side storage means and transmitting the read out image data to said server.

OL
2 10
ISS
1
MY
5
998
MI

5,748,899

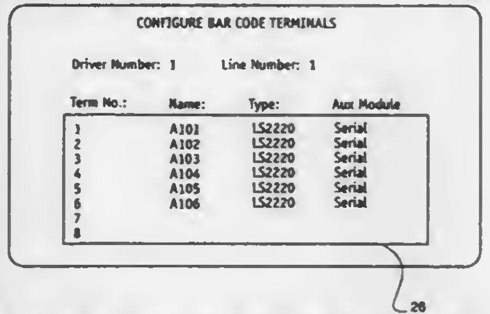
METHOD AND SYSTEM FOR COLLECTING AND PROCESSING BAR CODE DATA

Rodney D. Aldrich, Brighton, Mich., assignor to Lowry Computer Products, Inc., Brighton, Mich.

Continuation of Ser. No. 448,893, May 24, 1995, abandoned, which is a continuation of Ser. No. 692,730, Apr. 29, 1991, abandoned, which is a continuation of Ser. No. 579,931, Sep. 7, 1990, abandoned. This application Feb. 24, 1997, Ser. No. 805,061

Int. Cl.^{6} G06F *15/177*

U.S. Cl. 395—200.52 **8 Claims**



CONFIGURE BAR CODE TERMINALS

Driver Number: 1 Line Number: 1

Term No.:	Name:	Type:	Aux Module
1	A101	LS2220	Serial
2	A102	LS2220	Serial
3	A103	LS2220	Serial
4	A104	LS2220	Serial
5	A105	LS2220	Serial
6	A106	LS2220	Serial
7			
8			

1. A method for setting up a bar code network from a central location according to the requirements of a user for use with a host computer operable through a host computer terminal having at least one host screen with host data fields at predetermined row and column locations having at least one database, the bar code network including a plurality of data collection terminals, a plurality of workstations and a controller for transmitting and receiving bar code data made up of bar code transactions containing a plurality of bar code data fields to and from the terminals over a communications line, the method comprising the steps of:

selecting at least one database;
configuring the terminals;
testing the terminals;
each of the steps of selecting, configuring and testing is performed from the central location;
selecting any one of said workstations as the central location;
wherein said configuring step includes emulating said host computer terminal by associating individual bar code data fields contained in said bar code transactions with the row and column locations of host data fields on said host screen to thereby configure said bar code network to supply bar code transactions to said host computer as if entered through said host computer terminal;
wherein said testing step includes the steps of choosing a number of terminals in the network to be tested, selecting a duration of a test to be conducted and reporting test results based upon the test; and
wherein said database selecting step includes the steps of identifying a storage location for the collected bar code data, and identifying a storage location for validation data and processing programs.

5,748,900

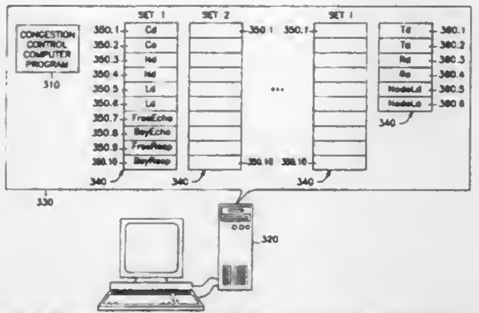
ADAPTIVE CONGESTION CONTROL MECHANISM FOR MODULAR COMPUTER NETWORKS

Steven L. Scott, Eau Claire; Richard D. Pribnow, Chippewa Falls; Peter G. Logghe, Chippewa Falls; Daniel L. Kunkel, Chippewa Falls, and Gerald A. Schwoerer, Chippewa Falls, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed Mar. 13, 1996, Ser. No. 615,700

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—200.65 **22 Claims**



1. A method for controlling data congestion on a computer system having a plurality of client computers, including a first and second client computer, connected across a network, comprising the steps of:

defining a threshold number of requests allowed at one time by said first client computer;
defining a threshold number of busy echoes allowed;
defining a threshold number of non-busy echoes allowed;
defining a number of active requests;
receiving a request from the first client computer;
if the number of active requests is less than the threshold number of requests allowed, dispatching the request, wherein the step of dispatching comprises the steps of:
  sending the request on the computer network to said second client computer; and
  incrementing the number of active requests;
  receiving a signal from the network when the request is successfully received by the second client, indicating whether the request was busied prior to delivery;
if the signal indicates that the request was busied, adjusting the threshold number of requests allowed if the threshold number of busy echoes has been reached; and
if the signal indicates that the request was not busied, adjusting the threshold number of requests allowed if the threshold number of non-busy echoes has been reached.

5,748,901

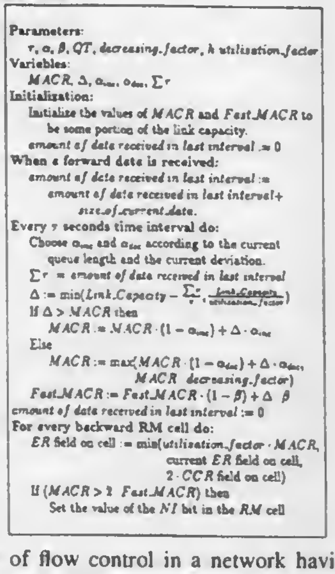
FLOW CONTROL ALGORITHM FOR HIGH SPEED NETWORKS

Yehuda Afek, Hod Hasharon; Yishay Mansour, Tel Aviv, and Zvi Ostfeld, Ramat Gan, all of Israel, assignors to Ramot University Authority Ltd., Tel Aviv, Israel

Filed May 21, 1996, Ser. No. 651,176

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 395—200.68 **37 Claims**



```
Parameters:
    $\tau, \alpha, \beta, QT$, decreasing_factor, h utilisation_factor
Variables:
    $MACR, \Delta, \alpha_{inc}, \alpha_{dec}, \sum r$
Initialization:
    Initialize the values of MACR and Fast_MACR to
        be some portion of the link capacity.
    amount of data received in last interval := 0
When a forward data is received:
    amount of data received in last interval :=
        amount of data received in last interval+
            size_of_current_data.
Every $\tau$ seconds time interval do:
    Choose $\alpha_{inc}$ and $\alpha_{dec}$ according to the current
        queue length and the current deviation.
    $\sum r$ = amount of data received in last interval
    $\Delta := \min(Link\_Capacity - \frac{\sum r}{\tau}, \frac{Link\_Capacity}{utilisation\_factor})$
    If $\Delta > MACR$ then
        $MACR := MACR \cdot (1 - \alpha_{inc}) + \Delta \cdot \alpha_{inc}$
    Else
        $MACR := \max(MACR \cdot (1 - \alpha_{dec}) + \Delta \cdot \alpha_{dec},$
                    $MACR \cdot decreasing\_factor)$
    $Fast\_MACR := Fast\_MACR \cdot (1 - \beta) + \Delta \cdot \beta$
amount of data received in last interval := 0
For every backward RM cell do:
    ER field on cell := min(utilisation_factor · MACR,
                            current ER field on cell,
                            2 · CCR field on cell)
    If ($MACR > 2 \cdot Fast\_MACR$) then
        Set the value of the NI bit in the RM cell
```

1. A method of flow control in a network having at least one switch, the at least one switch receiving at least one forward cell from at least one source via one of at least one first link and transmitting the at least one forward cell to at least one destination via one of at least one second link, the at least one switch receiving at least one backward cell from the at least one destination via one of the at least one second link and transmitting the at least one backward cell to the at least one source via one of the at least one first link, each of the first and second links having a link capacity, L, the method comprising the steps of:

for at least one link, selected from the group consisting of the at least one first link and the at least one second link of at least one of the at least one switch:
(a) determining an unused bandwidth, Δ; and
(b) setting a maximum allowed cell rate, MACR, equal to a weighted average of said Δ and a prior value of said MACR, prior_MACR.

5,748,902

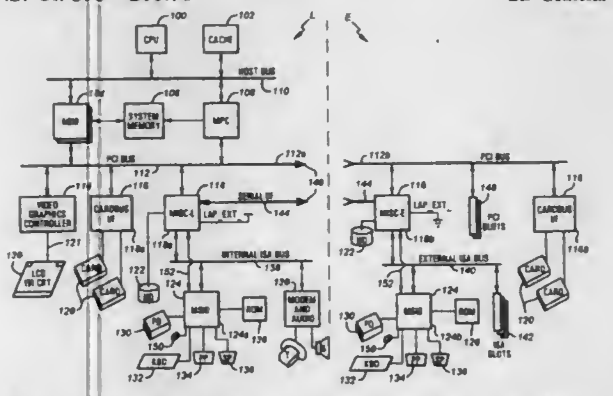
POLARITY SWITCHED DATA BUS FOR REDUCED ELECTROMAGNETIC INTERFERENCE

Scott W. Dalton, Tomball, and Todd D. Podhaisky, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 19, 1996, Ser. No. 684,536

Int. Cl.^{6} H04L *25/34;25/49*

U.S. Cl. 395—200.76 **22 Claims**



8. A computer system for providing video data with reduced EMI, the system comprising:

a processor for executing instructions and writing data to be displayed;
a memory for storing to be displayed;
a video controller coupled to said memory and said processor, said video controller providing m bit video data items corresponding to the data to be displayed;
a data bus with a data polarity line that carries a data polarity signal and with m data lines that carry polarity adjusted data items;
a data transmission circuit coupled to the data bus and receiving the m bit video data items, the data transmission circuit including:
  storage that holds a first video data item of the received video data items;
  a bit level comparison circuit coupled to the storage and receiving a second video data item of the received video data items, the bit level comparison circuit providing an indication of whether over m/2 of the bits in the first and second video data items are different; and
  a polarity adjusted output circuit receiving the first and second video data items, having a polarity output and polarity adjusted data outputs, and responsive to the indication of whether over m/2 of the bits in the first and second video data items are different, said polarity adjusted output circuit adapted to provide a first polarity signal on its polarity output and a first polarity adjusted video data item on its polarity adjusted data outputs at a first polarity corresponding to the first polarity signal, and to provide a second polarity signal on its polarity output and a second polarity adjusted video data item on its polarity adjusted data outputs at a second polarity corresponding to the second polarity signal, wherein the polarity adjusted output circuit provides the second polarity signal to indicate the opposite polarity as the first polarity signal in response to the indication indicating that over m/2 bits are different;
a decoding receive circuit coupled to the bus and providing decoded received video data outputs, the decoding receive circuit providing as the decoded received video data the data on the m data lines when a corresponding data polarity signal on the data polarity line is at a first state, and providing as the decoded received data the inverse of the data on the m data lines when the corresponding data polarity signal on the data polarity line is at a second state; and a display that receives and displays the decoded received video data.

5,748,903

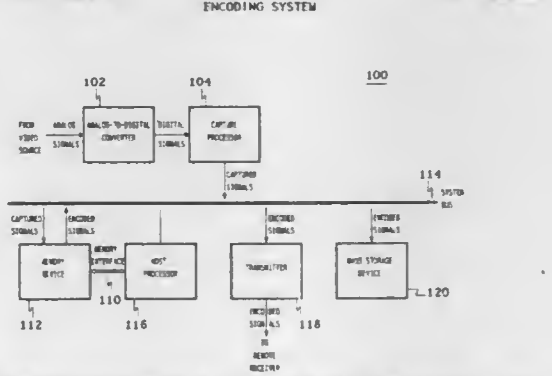
ENCODING IMAGES USING DECODE RATE CONTROL

Rohit Agarwal, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1995, Ser. No. 537,249

Int. Cl.^{6} H04N *1/417*

U.S. Cl. 395—200.77 **39 Claims**



1. A computer-implemented process for encoding images, comprising the steps of:

(a) receiving a selection of an encoding mode selected from a plurality of encoding modes supported by an encoder based on a targeted decode rate, wherein each of the encoding modes corresponds to a different decode rate; and
(b) encoding one or more images using the selected encoding mode.

5,748,904

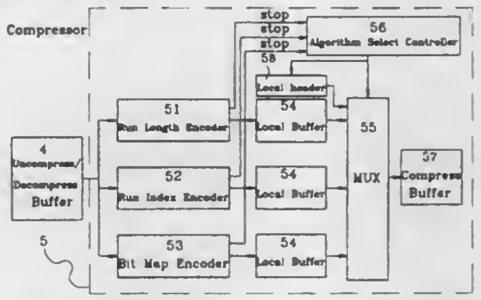
METHOD AND SYSTEM FOR SEGMENT ENCODED GRAPHIC DATA COMPRESSION

Hung-Ju Huang; Jo-Tan Yao, both of Taipei, and Chung-Heng Chen, Chia-Yi, all of Taiwan, assignors to Silicon Integrated Systems Corp., Hsinchu, Taiwan

Filed Sep. 13, 1996, Ser. No. 713,598

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.77 **4 Claims**



1. A method of compressing graphic data in a graphic system having a frame buffer partitioned into an uncompressed frame buffer and a compressed frame buffer, comprising the steps of:

a. dividing said graphic data stored in said uncompressed frame buffer into a plurality of uncompressed segments each having a plurality of pixels;
b. preparing a compression status flag buffer having a plurality of status flags being set to zero, each of said status flags indicating the compression status of one of said uncompressed segments;

OL
2 10
ISS
1
MY
5
998
MI

c. reading and compressing the plurality of pixels of an uncompressed segment pixel by pixel using a plurality of compression methods for forming a compressed segment including a header and a plurality of code-words for said uncompressed segment, said compressed segment being generated by the steps of:
  d. formatting said header for the storage of a length code and a plurality of method codes;
  e. reading pixels from said uncompressed segment and determining the number of pixels that can be encoded in a code-word for each of said compression methods;
  f. selecting and saving the code-word of the compression method that encodes the largest number of pixels into said code-word;
  g. identifying the selected compression method with a method code and recording said method code in said header orderly;
  h. repeating steps d., e., f. and g. until all pixels of said uncompressed segment have been encoded;
  i. and forming said compressed segment by counting the total number of all saved code-words, recording said total number in said length code and appending all saved code-words orderly to said header;
j. determining the total number of bytes in said compressed segment and comparing the total number of bytes with a pre-defined limit;
k. writing said compressed segment to said compressed frame buffer and setting the corresponding status flag to 1 if the total number in step j. is smaller than said limit;
l. and repeating steps c., j. and k. until all uncompressed segments have been processed;

wherein when said graphic data after compression are sent for display, the compression status of each segment is determined by its corresponding status flag, the compressed segment are decompressed if the corresponding status flag is set, and each code-word is decompressed by a decompression method corresponding to the compression method code stored in the header of the compressed segment.

5,748,905

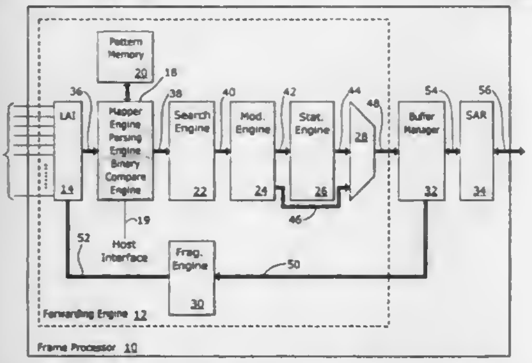
FRAME CLASSIFICATION USING CLASSIFICATION KEYS

Stephen A. Hauser, Burlington, and Jeffrey L. Williams, Hopkinton, both of Mass., assignors to Fujitsu Network Communications, Inc., Richardson, Tex., and Fujitsu Limited, Kawasaki, Japan

Filed Aug. 30, 1996, Ser. No. 701,335

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.79 **50 Claims**



1. A method for classifying received data having at least one predetermined format and containing a plurality of data values within said received data comprising the steps of:

in a first parsing step, parsing said received data to retrieve at least first and second data values of said plurality of data values;

in a first searching step, searching a first field of a first lookup table having said first field and a second associated field to locate an entry having a value associated with said first data value, and identifying a first classification value in the respective second associated field of said first lookup table;

in a second searching step, searching a first field of a second lookup table having said first field and a second associated field to locate an entry having a value associated with said second data value, and identifying a second classification value in the respective second associated field of said second lookup table;

concatenating said first and second classification values to generate a third data value;

in a third searching step, searching a first field of a third lookup table to locate an entry having a value associated with said third data value, and identifying a third classification value in the respective second associated field of said third lookup table; and

selecting at least one processing step to be performed upon said received data based upon the value of said third classification value.

5,748,906

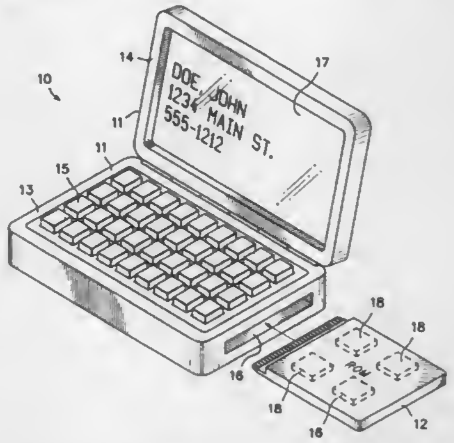
ELECTRONIC TELEPHONE DIRECTORY WITH INTERCHANGEABLE LISTINGS

Bruce Sandig, Phoenix, Ariz., assignor to Infopak, Inc., Phoenix, Ariz.

Continuation of Ser. No. 696,948, May 8, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 229,147

Int. Cl.^{6} G06F *15/08*

U.S. Cl. 395—251 **19 Claims**



1. A method for accessing telephone numbers corresponding to a telephone book, the methods comprising the steps of:

receiving at least one plug in memory card that stores the telephone numbers corresponding to at least one telephone book;

coupling said at least one plug in memory card to a portable electronic telephone directory wherein said at least one plug in memory card includes only data corresponding to a telephone book;

entering a name to said portable electronic telephone directory; and

using electronics within the portable electronic telephone directory to search said at least one plug in memory card for said name wherein a telephone number corresponding to said name is provided when said name is found.

5,748,907

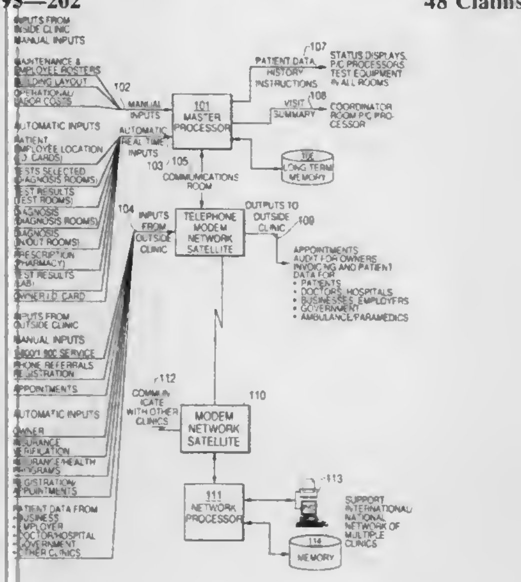
MEDICAL FACILITY AND BUSINESS: AUTOMATIC INTERACTIVE DYNAMIC REAL-TIME MANAGEMENT

Harold E. Crane, P.O. Box 6169, Kingwood, Tex. 77325-6169

Continuation of Ser. No. 140,550, Oct. 25, 1993, abandoned. This application Oct. 30, 1996, Ser. No. 739,813

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 395—202 **48 Claims**


INPUTS FROM INSIDE CLINIC
MANUAL INPUTS
MAINTENANCE & EMPLOYEE ROSTERS
BUILDING LAYOUT
OPERATIONAL/LABOR COSTS
102
MANUAL INPUTS
101 MASTER PROCESSOR
107
PATIENT DATA HISTORY INSTRUCTIONS
STATUS DISPLAYS, P/C PROCESSORS TEST EQUIPMENT IN ALL ROOMS
108
VISIT SUMMARY
COORDINATOR ROOM P/C PROCESSOR
AUTOMATIC INPUTS
PATIENT EMPLOYEE LOCATION (I.D. CARDS)
AUTOMATIC REAL TIME INPUTS
103
105
COMMUNICATIONS ROOM
106 LONG TERM MEMORY
TESTS SELECTED (DIAGNOSIS ROOMS)
TEST RESULTS (TEST ROOMS)
DIAGNOSIS (DIAGNOSIS ROOMS)
DIAGNOSIS (IN/OUT ROOMS)
PRESCRIPTION (PHARMACY)
TEST RESULTS (LAB)
OWNER I.D. CARD
104
INPUTS FROM OUTSIDE CLINIC
TELEPHONE MODEM NETWORK SATELLITE
OUTPUTS TO OUTSIDE CLINIC
109
APPOINTMENTS
AUDIT FOR OWNERS
INVOICING AND PATIENT DATA FOR
• PATIENTS
• DOCTORS, HOSPITALS
• BUSINESSES, EMPLOYERS
• GOVERNMENT
• AMBULANCE/PARAMEDICS
INPUTS FROM OUTSIDE CLINIC
MANUAL INPUTS
800/1 900 SERVICE
PHONE REFERRALS REGISTRATION
APPOINTMENTS
112
COMMUNICATE WITH OTHER CLINICS
110
MODEM NETWORK SATELLITE
AUTOMATIC INPUTS
OWNER
INSURANCE VERIFICATION
INSURANCE/HEALTH PROGRAMS
REGISTRATION/APPOINTMENTS
PATIENT DATA FROM
- BUSINESS
- EMPLOYER
- DOCTOR/HOSPITAL
- GOVERNMENT
- OTHER CLINICS
111 NETWORK PROCESSOR
113
SUPPORT INTERNATIONAL/NATIONAL NETWORK OF MULTIPLE CLINICS
114 MEMORY

1. A dynamic real-time interactive management system for use in management and operation of a facility and management of a plurality of persons relative to said facility, said plurality of persons including a first plurality of persons who are employees of said facility and a second plurality of persons who are customers utilizing said facility, comprising:

(a) a master processor for continuously and automatically receiving a plurality of sensed real-time inputs related to said facility and a plurality of persons relative to said facility, said master processor also receiving a plurality of operator-entered inputs related to said facility and locations of said plurality of persons inside said facility;

(b) a memory linked to said master processor, for storing sensed values of said sensed real-time inputs and for storing a plurality of programs for defining relationships between certain ones of said sensed real-time inputs; and

(c) a display connected to said master processor, said display for producing a humanly perceivable signal; wherein

(d) said master processor includes means for continuously and automatically determining in real-time interactions and relationships between said sensed real-time inputs using said plurality of stored programs, means for continuously and automatically producing an interaction indication result for identifying a first set of desired locations for said second plurality of persons inside said facility to provide assistance to said first plurality of persons based on said sensed real-time inputs, means for continuously and automatically producing a condition output which is indicative of a relationship between said sensed values and said interaction indication result, and means for automatically transmitting said condition output to said display, said condition output identifying a second set of desired locations to which said first plurality of persons are to go to inside said facility.

5,748,908

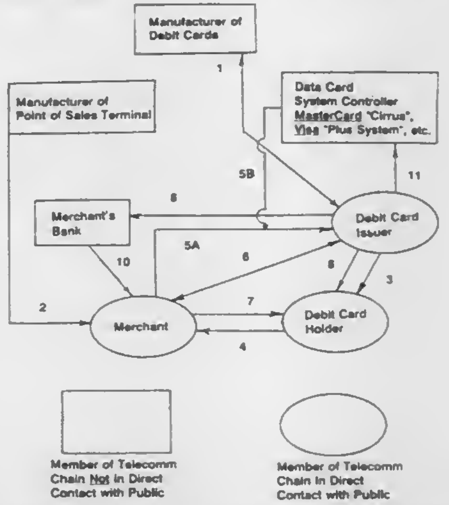
AUTOMATED, CLASSIFIED EXPENDITURE DATA CARD RECORDING SYSTEM

Mason K. Yu, 550 W. Brown Suite#3, Birmingham, Mich. 48009

Filed Jun. 7, 1995, Ser. No. 476,894

Int. Cl.^{6} G06F *15/00;15/20;* G06K *5/00;* B42D *15/00*

U.S. Cl. 395—244 **3 Claims**


Manufacturer of Debit Cards
1
Manufacturer of Point of Sales Terminal
Data Card System Controller MasterCard "Cirrus", Visa "Plus System", etc.
5B
11
8
Merchant's Bank
Debit Card Issuer
5A
6
10
8
3
2
7
Merchant
Debit Card Holder
4
Member of Telecomm Chain Not in Direct Contact with Public
Member of Telecomm Chain In Direct Contact with Public

1. A method of generating a summary record of expenditures in each of expenditure a plurality of categories incurred over a selected period by use of an authorization card issued by a financial institution;

a card used in conjunction with each card reader terminal to authorize a charge against a user's account with said financial institution, said terminal electronically communicating transaction data to said financial institution, said method comprising the steps of:

pre-programming said card reader terminal to generate a selected one of a series of code signals corresponding to each of said plurality of expenditure categories, said selected one of said code signals programmed to be generated by said terminal categorizing transactions at said terminal;

transmitting said selected one code signal to said financial institution in conjunction with communication of transaction data to said financial institution; and,

preparing summary reports for said time period showing total transactions by date, vendor, and amount according to each expenditure category as identified by said code signals from each terminal, said summary reports presented to said card user.

5,748,909

INTERFACE BOARD AND INSTRUCTION PROCESSING DEVICE WITHOUT A LOCAL CPU

Takeo Nakabayashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1995, Ser. No. 504,830

Claims priority, application Japan, Oct. 17, 1994, 6-250717

Int. Cl.^{6} G06F *13/10*

U.S. Cl. 395—280 **16 Claims**

1. An interface board, comprising:

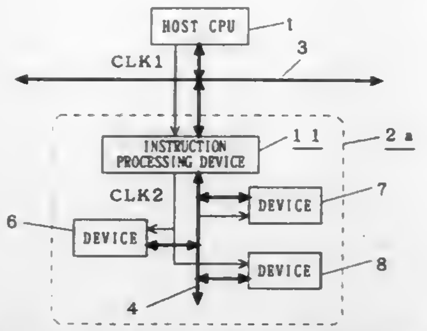
(a) an instruction processing device connected to an extension bus and including

(a-1) an input portion for inputting an instruction which is provided from said extension bus and corresponds to an address space including first and second portions,

(a-2) an operation determination portion for determining to which of said first and second portions said instruction corresponds, and

(a-3) an operation selection portion for processing said instruction when said instruction corresponds to said first portion and outputting said instruction when said instruction corresponds to said second portion;

VOL
210
ISS
1
MY
5
1998
UMI



(b) at least one controlled element including a storage element to which said second portion is assigned, said at least one controlled element controlled based on said instruction corresponding to said second portion, and

(c) a board bus which connects said at least one controlled element and said instruction processing device, wherein said instruction processing device functions as a master for said board bus.

5,748,910

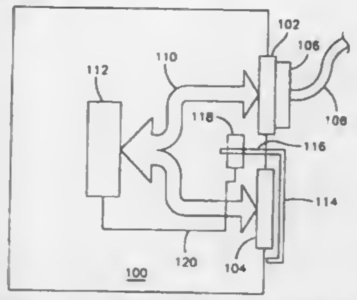
AUTOMATIC ENABLING/DISABLING OF TERMINATION IMPEDANCE FOR A COMPUTER BUS

Oscar R. Herrera E., Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1996, Ser. No. 594,190

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—281 **8 Claims**



1. An apparatus for controlling a termination impedance circuit in a device on a computer bus, the apparatus comprising:

a connector cover;

a sensor in the device detecting the presence of the connector cover; and

the sensor having a signal controlling enabling and disabling of the termination impedance circuit, the signal causing the termination impedance circuit to be enabled when the sensor detects the presence of the connector cover.

5,748,911

SERIAL BUS SYSTEM FOR SHADOWING REGISTERS

David J. Maguire, Spring, and Hung Q. Le, Katy, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 19, 1996, Ser. No. 684,710

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—281 **30 Claims**

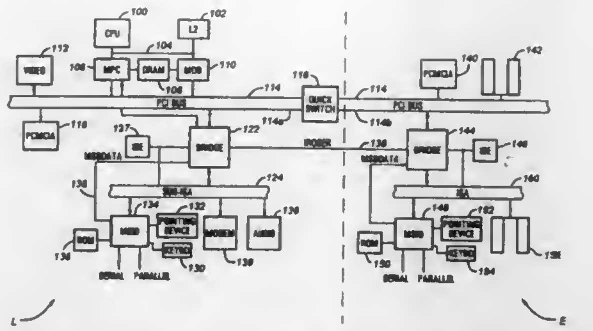
1. For use in a computer system having a first register with associated first data and a second register, a serial bus system for shadowing the first data of the first register in the second register, the serial bus system comprising:

a serial bus;

a change indicator coupled to the first register for providing a change signal for indicating a change in the first data;

a serial transmitter coupled to said serial bus and to the first register for receiving the change signal and for serially transmitting serialized first data to said serial bus indicative of the first data when the change signal indicates a change in the first data; and

a serial receiver coupled to said serial bus and to the second register for serially receiving the serialized first data from said serial bus and for providing the received serialized first data to the second register.



5,748,912

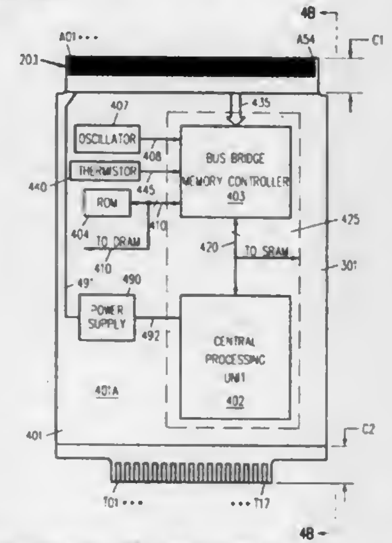
USER-REMOVABLE CENTRAL PROCESSING UNIT CARD FOR AN ELECTRICAL DEVICE

Sherman Lee, Rancho Palos Verdes, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 13, 1995, Ser. No. 489,864

Int. Cl.^{6} H01J *13/00*

U.S. Cl. 395—282 **15 Claims**



1. A user-removable CPU card comprising:

a substrate having a width approximately the width of a credit card;

a bus bridge memory controller supported by said substrate, said bus bridge memory controller comprising a bus interface unit;

a central processing unit supported by said substrate, said central processing unit being electrically coupled to said bus bridge memory controller;

read-only-memory supported by said substrate, said read-only-memory being electrically coupled by said bus bridge memory controller to said central processing unit;

a first connector supported by said substrate, said first connector being coupled by said bus bridge memory controller to said central processing unit;

dynamic random-access-memory said dynamic random-access-memory being supported by said substrate, said bus bridge memory controller further comprising a memory control unit, said memory control unit coupling said dynamic random-access-memory and said read-only-memory to said central processing unit; and

a plurality of chip select lines coupled to said memory control unit, wherein said memory control unit distinguishes between said read-only-memory and said dynamic random-access-memory by driving a plurality of signals on said plurality of chip select lines;

wherein on insertion of said CPU card through an opening in a housing of an electrical device, said first connector is detachably and electrically coupled with a second connector of a system board enclosed by said housing;

wherein said system board supplies power to said CPU card through said second connector and said first connector on said insertion; and

wherein said bus bridge memory controller passes a first address signal to said first connector on receipt of said first address signal from said central processing unit.

5,748,913

COMPUTER SYSTEM CAPABLE OF TRANSFERRING VIDEO DATA BETWEEN CARD DEVICES

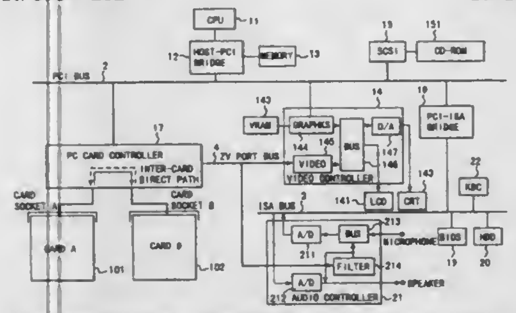
Akihiko Shibahara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1996, Ser. No. 712,326

Claims priority, application Japan, Feb. 29, 1996, 8-042918

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—282 **18 Claims**



1. A computer system having first and second card sockets respectively capable of receiving card devices, comprising:

a system bus; and

a card device controller connected to said system bus to control said card devices respectively inserted in said first and second card sockets,

said card device controller including switch means capable of electrically connecting said first card socket to said second card socket.

5,748,914

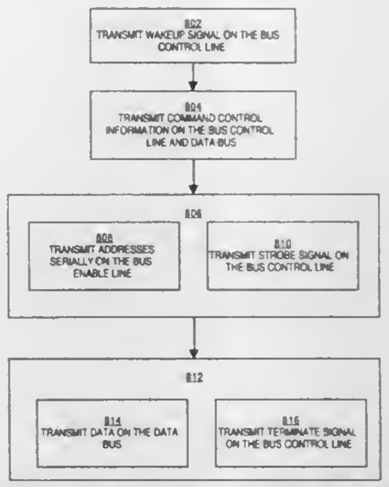
PROTOCOL FOR COMMUNICATION WITH DYNAMIC MEMORY

Richard Maurice Barth, Palo Alto; Frederick Abbot Ware, Los Altos Hills; John Bradly Dillon, Palo Alto; Donald Charles Stark, Woodside; Craig Edward Hampel, San Jose, and Matthew Murdy Griffin, Mountain View, all of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Filed Oct. 19, 1995, Ser. No. 545,292

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 395—285 **19 Claims**


802
TRANSMIT WAKEUP SIGNAL ON THE BUS CONTROL LINE
804
TRANSMIT COMMAND CONTROL INFORMATION ON THE BUS CONTROL LINE AND DATA BUS
806
808
TRANSMIT ADDRESSES SERIALLY ON THE BUS ENABLE LINE
810
TRANSMIT STROBE SIGNAL ON THE BUS CONTROL LINE
812
814
TRANSMIT DATA ON THE DATA BUS
816
TRANSMIT TERMINATE SIGNAL ON THE BUS CONTROL LINE

1. A method for performing data transfers within a computer system, the method comprising the steps of:

causing a controller to perform the steps of

transmitting control information on a bus, the control information specifying a data transfer operation and a first location of data to be transferred;

after transmitting the control information on the bus, performing the steps of

determining a desired amount of data to be transferred in the data transfer operation;

transmitting over the bus additional locations of data if the desired amount of data is greater than a predetermined amount of data;

transmitting over the bus a terminate indication at a time that is based on the desired amount of data to be transferred;

causing a memory device to perform the steps of

reading the control information on the bus;

performing the specified data transfer operation on data stored at the first location;

performing the specified data transfer operation on data stored at the additional locations when the desired amount of data is greater than the amount of data associated with the first location;

continuing to perform the specified data transfer operation until detecting the terminate indication on the bus;

ceasing to perform the data transfer operation at a time that is based on the time at which the terminate indication is detected.

5,748,915

TRANSMISSION METHOD OF CHANGING PROTOCOL AND DATA PROCESSING APPARATUS USING THIS METHOD

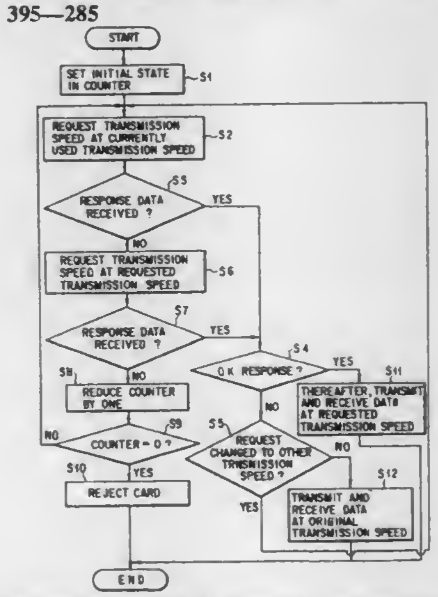
Yasuo Iijima, Yokoaham, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1996, Ser. No. 619,322

Claims priority, application Japan, Mar. 22, 1995, 7-063100

Int. Cl.^{6} G06F *13/42*

U.S. Cl. 395—285 **17 Claims**


START
SET INITIAL STATE IN COUNTER
S1
REQUEST TRANSMISSION SPEED AT CURRENTLY USED TRANSMISSION SPEED
S2
S3
RESPONSE DATA RECEIVED ?
YES
NO
REQUEST TRANSMISSION SPEED AT REQUESTED TRANSMISSION SPEED
S6
S7
RESPONSE DATA RECEIVED ?
YES
NO
S8
REDUCE COUNTER BY ONE
COUNTER = 0 ?
S9
NO
S10
YES
REJECT CARD
S4
O K RESPONSE ?
YES
NO
S11
THEREAFTER, TRANSMIT AND RECEIVE DATA AT REQUESTED TRANSMISSION SPEED
S5
REQUEST CHANGED TO OTHER TRANSMISSION SPEED ?
NO
YES
S12
TRANSMIT AND RECEIVE DATA AT ORIGINAL TRANSMISSION SPEED
END

1. A transmission method of changing communication protocol between a first data processing apparatus and a second data processing apparatus connected to the first data processing apparatus, comprising:

VOL 210 ISS 1 MY 5 1998 UMI

first step for transmitting a first request signal from the first data processing apparatus to the second data processing apparatus on the basis of a first protocol, for requesting a change from the first protocol to a second protocol different from the first protocol;

second step, in the first data processing apparatus, for confirming a first response signal to the first request signal from the second data processing apparatus;

third step for transmitting, when a first response signal to the first request signal is not confirmed at the second step, a second request signal from the first data processing apparatus to the second data processing apparatus on the basis of the second protocol, for requesting a change from the first protocol to the second protocol;

fourth step, in the first data processing apparatus, for confirming a second response signal to the second request signal from the second data processing apparatus; and

fifth step for determining, in accordance with one of the confirming of the first response signal at the second step and the confirming of the second response signal at the fourth step, whether the first data processing apparatus should execute data transfer with the second data processing apparatus on the basis of the second protocol.

5,748,916

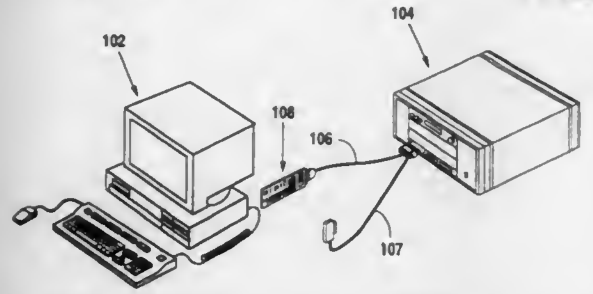
VXIBUS DEVICE WHICH INTELLIGENTLY MONITORS BUS CONDITIONS AND BEGINS EARLY CYCLES FOR IMPROVED PERFORMANCE

Craig M. Conway, Round Rock, and Brian Keith Odom, Pflugerville, both of Tex., assignors to National Instruments Corporation, Austin, Tex.

Filed Sep. 18, 1995, Ser. No. 529,692

Int. Cl.⁶ G06F *13/14*

U.S. Cl. 395—287 **11 Claims**



1. A device adapted for coupling to a VME-based bus which begins early cycles on the VME-based bus for increased system performance, comprising:

a bus master adapted for coupling to said VME-based bus which asserts a signal to request control of the VME-based bus;

a VME requester coupled to the bus master and adapted for coupling to the VME-based bus which receives said signal from the bus master requesting control of the VME-based bus and gains control of the VME-based bus for the bus master in response to said signal requesting control of the VME-based bus, wherein said VME requester includes:

means for monitoring the bus to determine if said bus master is about to lose control of the bus;

means, coupled to said means for monitoring, for generating an early indication signal to said bus master to indicate whether said bus master is about to lose control of the VME-based bus; and

wherein said bus master includes means for determining if said early indication signal has been generated;

wherein said bus master begins a cycle on a first clock cycle if said early indication signal indicates that said bus master is not about to lose control of the bus, wherein said bus master begins a cycle on a later clock cycle than said first clock cycle if said early indication signal indicates that said bus master is about to lose control of the bus.

5,748,917

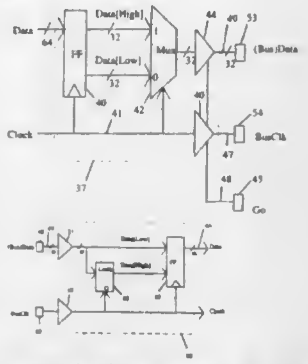
LINE DATA ARCHITECTURE AND BUS INTERFACE CIRCUITS AND METHODS FOR DUAL-EDGE CLOCKING OF DATA TO BUS-LINKED LIMITED CAPACITY DEVICES

William Todd Krein, San Jose; Charles M. Flaig, Cupertino, and James D. Kelly, Aptos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 215,281, Mar. 18, 1994, abandoned. This application Dec. 28, 1995, Ser. No. 579,884

Int. Cl.⁶ G06F *13/38*

U.S. Cl. 395—306 **3 Claims**



1. In a bus communications system, for transmission of an information packet having a first predetermined bit width, the bus communication system including a sending circuit and a receiving circuit connected by a data bus having a second predetermined bit width, the second predetermined bit width less than the first predetermined bit width, a method of communication comprising the steps of:

ordering plurality of bits of the information packet to place information of greater significance in a second portion and to place information of lesser significance in a first portion;

producing sequential clock signals for the sending circuit, each clock signal having a rising edge and a falling edge;

receiving the information packet at the sending circuit;

breaking the information packet into the first portion, having a first portion bit width and the second portion, having a second portion bit width, the first portion bit width substantially equivalent to the second portion bit width;

transmitting across the data bus the first portion on the rising edge of the clock signal and the second portion on the falling edge of the clock signal;

receiving at the receiving circuit the first portion and the second portion from the data bus; and

concatenating the first portion and the second portion to produce the information packet at the data line.

5,748,918

METHOD AND APPARATUS FOR SUPPORTING TWO SUBTRACTIVE DECODE AGENTS ON THE SAME BUS IN A COMPUTER SYSTEM

Sung-Soo Cho, Sunnyvale; Chao-Hsin Chi, San Jose, and David Chang, Daly City, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1996, Ser. No. 673,450

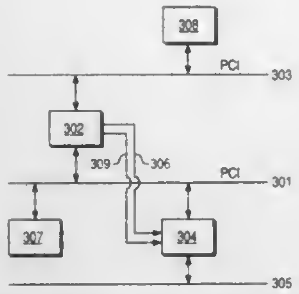
Int. Cl.⁶ G06F *12/02;13/38*

U.S. Cl. 395—306 **25 Claims**

1. A computer system comprising:

a first bus;

a first agent coupled to the first bus that claims to be a target of a transaction on the first bus without decoding an address associated with the transaction;



a second agent coupled to the first bus, the second agent responding to the transaction as the target if the first agent indicates the second agent is to respond.

5,748,919

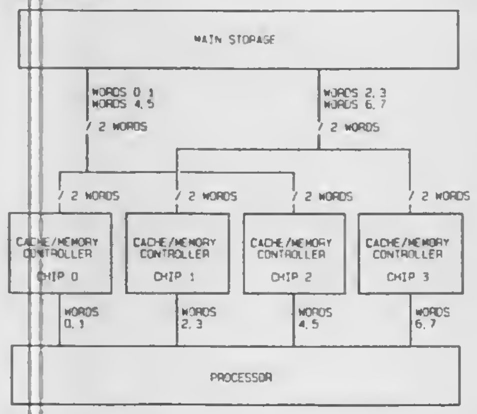
SHARED BUS NON-SEQUENTIAL DATA ORDERING METHOD AND APPARATUS

Herman Lee Blackmon, Rochester; Robert Allen Drehmel, Goodhue; Lyle Edwin Grosbach, Rochester; Kent Harold Haselhorst, Byron; David John Krolak, Dodge Center; James Anthony Marcella, and Peder James Paulson, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 222,147, Apr. 1, 1994, abandoned. This application Jul. 10, 1996, Ser. No. 677,775

Int. Cl.⁶ G06F *12/00;13/00*

U.S. Cl. 395—306 **3 Claims**



1. A data ordering method for transferring data on a shared bi-directional bus having a maximum bus width value and a minimum transfer value for a data processing system, where said maximum bus width is less than said minimum transfer value, said data ordering method comprising the steps of:

calculating a minimum number of sub-transfers utilizing said maximum bus width value and said minimum transfer value for the data processing system;

identifying a bus unit having a plurality of chips, each of said plurality of chips to receive and/or send data for the data processing system; each of said chips having a word sub-transfer size; and

during each data sub-transfer, ordering non-sequential words utilizing said calculated minimum number of sub-transfers and transferring a predefined group of said ordered non-sequential words, one word to each chip of said bus unit; said predefined group of said ordered non-sequential words for each data sub-transfer including either even numbered words or odd numbered words.

5,748,920

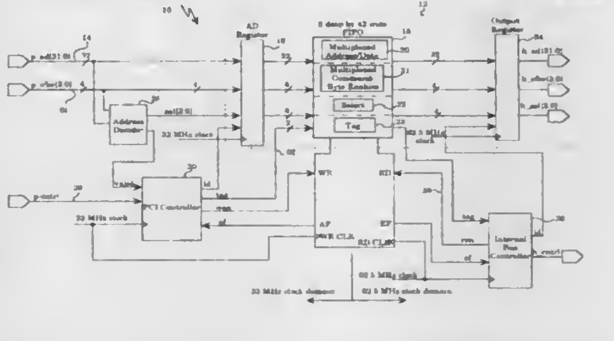
TRANSACTION QUEUE IN A GRAPHICS CONTROLLER CHIP

Karl Scott Mills, Lynnwood; Lauren Emory Linstad, Renton, both of Wash.; Sherwood Brannon, Fremont, Calif.; Mark Emil Bonnelycke, and Richard Charles Andrew Owen, both of Seattle, Wash., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 29, 1995, Ser. No. 536,689

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—308 **20 Claims**



1. A circuit for transferring data between a host bus and an internal system bus, comprising:

a FIFO buffer coupled to receive a data entry including a tag value which indicates a data entry type, the FIFO buffer being responsive to a first clock signal for receiving the data entry;

an output register coupled to the FIFO buffer for receiving the data entry from the FIFO buffer; and

a bus controller for receiving the tag value from the FIFO buffer, the FIFO buffer providing the tag value to the bus controller in response to a second clock signal, wherein the bus controller causes the data entry to be written to the output register during a next cycle of the second clock signal, and wherein the output register dispatches the data entry in response to the bus controller.

5,748,921

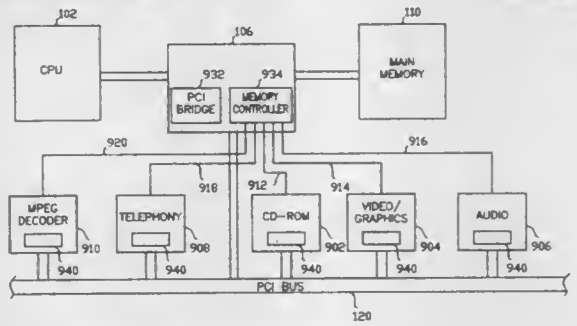
COMPUTER SYSTEM INCLUDING A PLURALITY OF MULTIMEDIA DEVICES EACH HAVING A HIGH-SPEED MEMORY DATA CHANNEL FOR ACCESSING SYSTEM MEMORY

Andy Lambrecht, Austin; Steve L. Belt, Pflugerville, and Drew Dutton, Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 11, 1995, Ser. No. 570,591

Int. Cl.⁶ G06F *13/14*

U.S. Cl. 395—308 **18 Claims**



1. A computer system, comprising:

a CPU;

main memory coupled to the CPU which stores data accessible by the CPU;

OL
2 10
SS
1
MY
5
998
MI

bridge logic coupled to the CPU and to the main memory, wherein the bridge logic includes a memory controller coupled to the main memory and also includes expansion bus interface logic;

an expansion bus coupled to the bridge logic, wherein said expansion bus includes a plurality of data lines and control lines;

a plurality of multimedia devices coupled to said expansion bus, wherein each of said multimedia devices performs operations on said expansion bus, wherein each of said multimedia devices includes expansion bus interface logic for performing data, addressing and control operations on said expansion bus, wherein each of said plurality of multimedia devices includes a respective memory data channel separate from said expansion bus coupled to said memory controller, wherein each of said plurality of multimedia devices are operable to individually and independently access said main memory using said respective separate memory data channel.

5,748,922

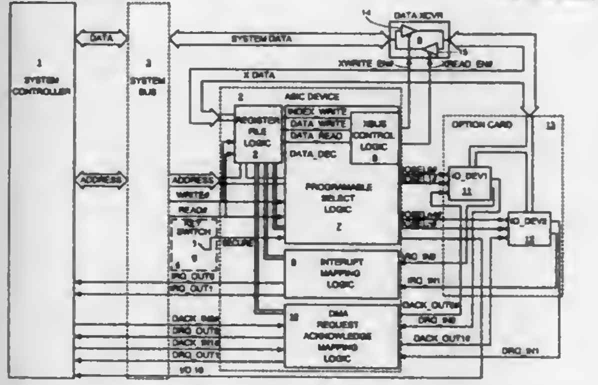
METHOD AND APPARATUS FOR READING DATA FROM A WRITE ONLY PORT

Jimmy Dean Smith; Mark D. Nicol, both of Stevensville, and Terence Paul O'Brien, Saint Joseph, all of Mich., assignors to Packard Bell NEC, Sacramento, Calif.

Continuation of Ser. No. 43,169, Apr. 5, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,370

Int. Cl.^{6} G06F *12/00;12/14*

U.S. Cl. 395—309 **26 Claims**



1. In a computer system having a central processing unit (CPU), a memory comprising one or more memory units wherein at least one of the memory units has a portion configured as a a write only port having a predetermined address and a predetermined bus coupled between said CPU and said memory, a system for reading data written to a write only port comprising:

a read/write register coupled to said predetermined bus, said read/write register resident in said memory;

means including an address decoder coupled to said predetermined bus, said means responsive to a write signal and the address of said write only port for enabling data to be written to said write only port and for automatically writing said data to said read/write register; and

means responsive to a read signal, the address of the write only port and a predetermined signal for reading said data from said read/write register to enable data to be supplied to said bus from said read/write register which is accessed using the same address at which said write only port is accessed.

5,748,923

METHOD FOR THE CYCLIC TRANSMISSION OF DATA BETWEEN AT LEAST TWO CONTROL DEVICES WITH DISTRIBUTED OPERATION

Frank-Thomas Eitrich, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

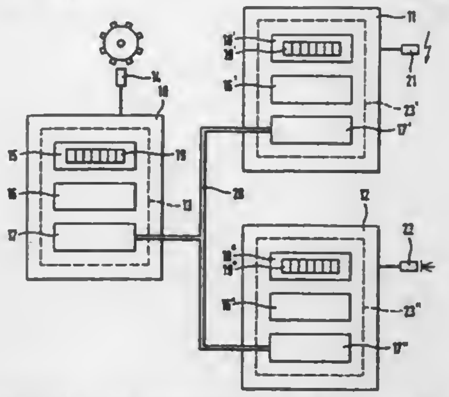
PCT No. PCT/DE95/00256, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO95/25024, PCT Pub. Date Sep. 21, 1995

PCT Filed Feb. 28, 1995, Ser. No. 530,203

Claims priority, application Germany, Mar. 14, 1994, 44 08 488.9

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—309 **26 Claims**



1. A method for cyclic transmission of data between at least two control devices (**10**,**11**,**12**) with distributed operation, wherein the at least two control devices (**10**,**11**,**12**) are interconnected via a serial bus (**20**) and each include at least one serial interface and an arithmetic/control unit, and said data is provided cyclically by said arithmetic/control unit of one of the at least two control devices (**10**,**11**,**12**), said method including the steps of:

a) providing means for handling a transmission job for transmitting a message including said data in said serial interface of said one (**10**) of said at least two control devices (**10**,**11**,**12**) transmitting said data;

b) feeding the transmission job to said serial interface of said one (**10**) of said at least two control devices (**10**,**11**,**12**) transmitting said message at a predetermined instant by means of the arithmetic/control unit of said one of said at least two control devices transmitting the message;

c) after the feeding of step b), cyclically passing updated data to said one (**10**) of said at least two control devices (**10**,**11**,**12**) transmitting said message and replacing said data in said message with said updated data prior to transmission of said message via said serial bus; and

d) transmitting said message over said serial bus to another of said at least two control devices (**10**,**11**,**12**) by means of said serial interface of said one (**10**) of said at least two control devices (**10**,**11**,**12**) transmitting said message after step c).

5,748,924

METHOD AND APPARATUS FOR TRANSFERRING DATA FROM SCSI BUS TO SERIAL DEVICE AND FROM SERIAL DEVICE TO SCSI BUS

Joseph R. Llorens, Winfield, and Huili Wang, Round Lake Beach, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

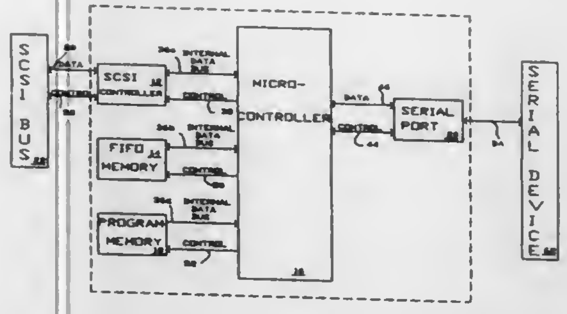
Filed Oct. 17, 1995, Ser. No. 544,275

Int. Cl.^{6} G06F *11/00;13/00*

U.S. Cl. 395—309 **16 Claims**

1. An adapter for performing bi-directional data transfers between a SCSI bus, and a serial transfer medium, said adapter comprising:

a) a SCSI controller providing bi-directional parallel SCSI data transfers between said SCSI bus and said adapter according to standard SCSI protocol;



b) a serial port providing bi-directional serial format data transfers between said adapter and said serial transfer medium;

c) a micro-controller for converting SCSI data received by said SCSI controller to serial format data to be transferred to said serial transfer medium through said serial port, and for converting serial data received by said serial port to parallel SCSI data to be transferred to said SCSI bus through said SCSI controller; and

d) a memory device for temporarily storing SCSI data received by said SCSI controller to be converted to serial data, and SCSI data having been converted from serial data received by said serial port to be transferred to said SCSI bus.

5,748,925

DYNAMIC REALTIME ROUTING IN A DATA COMMUNICATIONS NETWORK

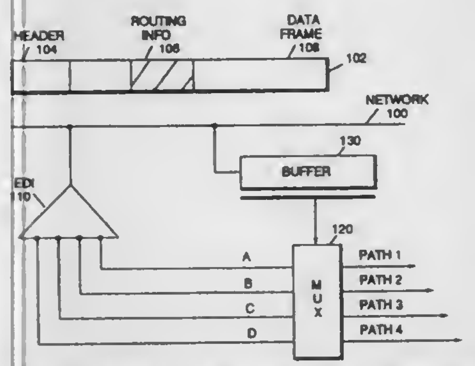
John G. Waclawsky, Frederick, Md.; Paul C. Hershey, Manassas, Va., and Raymond F. Daugherty, Mt. Airy, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 187,949, Jan. 26, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 573,586

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—311 **11 Claims**

EDI COUPLED TO A MULTIPLEXER



1. A system for monitoring and controlling a data communications network which communicates a serial stream of binary bits having a characteristic pattern for data frames which include routing information, a dynamic, real-time, routing means, comprising:

a programmable digital filter having an input coupled to said data communications network and a plurality of output lines, the filter receiving the serial stream and programmed to identify routing bit patterns in said routing information of said data frames, for generating within the filter an enabling signal on a discrete output line in response to identifying said routing bit patterns within the serial stream;

a data routing multiplexer having a plurality of control inputs solely and directly coupled to said discrete outputs of said filter, said multiplexer having a plurality of output paths, for outputting said serial bit stream over one of said plurality of output paths in response to said enabling signal received from said filter; and

a data frame buffer having an input coupled to said data communications network and an output coupled to said data input of said multiplexer, for buffering said data frame, the buffer storing the serial stream in the buffer until the filter provides the enable signal to the multiplexor whereupon the contents of the buffer are directed to an output path from the multiplexer solely according to the enable signal present on the discrete output line from the filter.

5,748,926

DATA PROCESSING METHOD AND APPARATUS

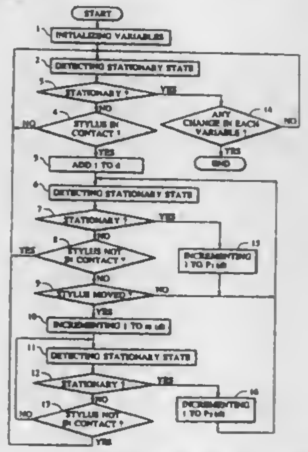
Ryoji Fukuda, Kawasaki, and Takashi Harada, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,426

Claims priority, application Japan, Apr. 18, 1995, 7-116416

Int. Cl.^{6} G06F *15/00;* **G09G** *5/00*

U.S. Cl. 395—326 **8 Claims**



1. A data processing apparatus having a stylus and means for detecting a position at which said stylus touches, to which commands for operation are capable of being inputted by using gestures, said data processing apparatus comprising:

halt detection means for detecting halts of said stylus;

touch counter means for counting the number of touches of said stylus;

first halt counter means for counting the number of halts after touch of said stylus;

second halt counter means for counting the number of halts after moving of said stylus;

move counter means for counting the number of moving said stylus; and

gesture recognition means for recognizing said gestures, based on said counted number of touches of said stylus, said counted number of halts of said stylus, said counted number of halts after moving of said stylus, and said counted number of moving said stylus.

5,748,927

GRAPHICAL USER INTERFACE WITH ICONS HAVING EXPANDABLE DESCRIPTORS

Michael Victor Stein, San Jose, and Paul Richard Wenker, Milpitas, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 10, 1996, Ser. No. 644,370

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—333 **18 Claims**

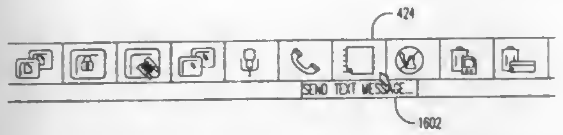
11. A graphical user interface comprising:

an arrangement of a plurality of icons; and

a plurality of corresponding icon descriptors each of which is arranged adjacent an associated icon;

wherein said icon descriptors appear in a truncated form so as to reside within a width of an associated icon, and wherein an

OL
210
SS
1
MY
5
998
MI



icon descriptor expands to a full length text description of a function of an associated icon when the associated icon is designated.

5,748,928

Patent Not Issued For This Number

5,748,929

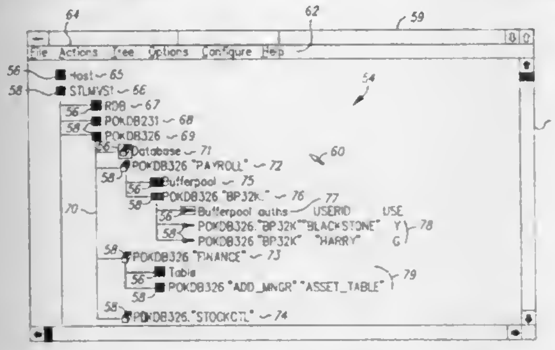
PROGRAM STORAGE DEVICE AND COMPUTER PROGRAM PRODUCT FOR INTERACTIVELY MANAGING A DISTRIBUTED DATABASE SYSTEM

Thomas E. Conrad, Morgan Hill, and Garry L. Haas, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 956,942, Oct. 5, 1992, Pat. No. 5,539,870. This application Jun. 5, 1995, Ser. No. 462,685

Int. Cl.⁶ G06F *17/30*

U.S. Cl. 395—352 **13 Claims**



1. A program storage device, readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for managing a distributed data processing system, wherein the machine having a display device and user interaction device, said method steps comprising:

(1) displaying on the display device an object listing of related data processing system object types and displaying object occurrences corresponding to each of the displayed object types;

(2) interactively modifying said object listing using input from the user interaction device and control information accessible from a set of at least one table stored in the distributed system;

(3) interactively selecting an action to be performed on a user selected list of at least one object occurrence from said object listing using input from the user interaction device and control information from a set of at least one table stored in the distributed system; and

(4) performing the selected action on the selected object occurrence list, by means of the machine executing a list of at least one program stored in the distributed system, wherein the program list is identified using a set of at least one table stored in the distributed system.

5,748,930

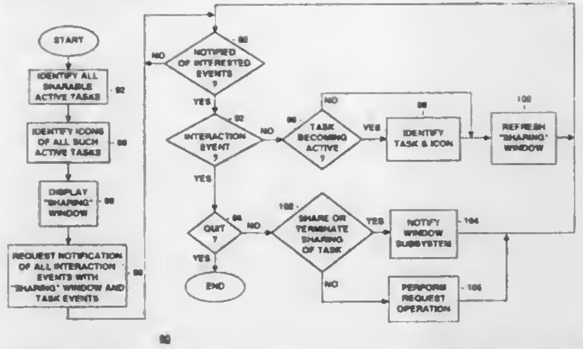
METHOD AND APPARATUS FOR INTERFACING WITH A HOST COMPUTER SYSTEM SHARING TASKS WITH ANOTHER USER ON A CLIENT COMPUTER SYSTEM

Alok Prakash, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 311,876, Sep. 26, 1994, abandoned. This application May 1, 1996, Ser. No. 641,432

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—352 **10 Claims**


START
IDENTIFY ALL SHARABLE ACTIVE TASKS
IDENTIFY ICONS OF ALL SUCH ACTIVE TASKS
DISPLAY "SHARING" WINDOW
REQUEST NOTIFICATION OF ALL INTERACTION EVENTS WITH "SHARING" WINDOW AND TASK EVENTS
NOTIFIED OF INTERESTED EVENTS ?
NO
YES
INTERACTION EVENT ?
TASK BECOMING ACTIVE ?
IDENTIFY TASK & ICON
REFRESH "SHARING" WINDOW
QUIT ?
END
SHARE OR TERMINATE SHARING OF TASK
NOTIFY WINDOW SUBSYSTEM
PERFORM REQUEST OPERATION
100
102
104
106

1. In a computer system comprising a plurality of active tasks sharable with a compatibly equipped client computer system coupled to the computer system, a method for interacting with a first user of the computer system to selectively initiate sharing of the active tasks, or to selectively terminate sharing of the sharable active tasks currently being shared, said method comprising the steps of:

a) gathering up control information about the active tasks currently being executed on the computer system that are sharable, and identifying the sharable active tasks in a consolidated manner to the first user, by a task sharing manager, using support from a local operating system only;

b) enabling the first user to interact with the consolidated sharable active task identifications to initiate sharing of the identified sharable active tasks, or to terminate sharing of the sharable active tasks currently being shared, without requiring the first user to bring into view end user interface windows of the affected active tasks, by the task sharing manager;

c) causing the sharing initiated sharable active tasks to be shared, and causing sharing of the sharable active tasks that are currently shared to be terminated as instructed by the first user, by the task sharing manager, using application sharing service of the local operating system, wherein the application sharing service is equipped to cooperate with a complementary counterpart on the client computer system to enable a second user on the client computer system to interact with the shared active tasks, with the shared active tasks executing on the computer system only; and

d) requesting the local operating system by the task sharing manager that the task sharing manger be notified of all task activation and termination events, and upon receipt of notification of such an event, the task sharing manager updating the gathered control information for the sharable active tasks, and refreshing the sharable active tasks identified for the first user.

5,748,931

INFORMATION DISPLAY SYSTEM FOR SIMULTANEOUSLY DISPLAYING GRAPHICAL IMAGES AND TEXT OF A PUBLICATION

Michael William Dudleston Jones, North Ferriby; Nicholas Geen, Hunmanby; Anthony Warner, Driffield, and Mischka Hughes, Pocklington, all of United Kingdom, assignors to Infosis Group Ltd., Yorkshire, England

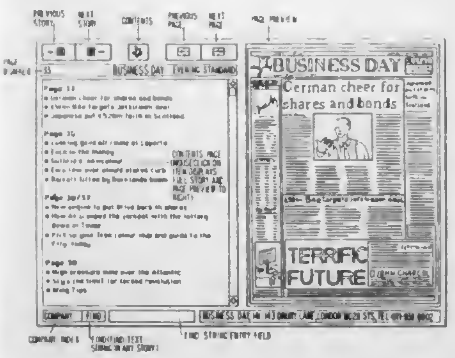
Filed Oct. 24, 1994, Ser. No. 329,948

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—356 **27 Claims**

1. An information display system comprising:

data access means to access page image data comprising graphical images of pages of a publication and text data, said page image data comprising graphical images of both text and non-text matter, said text matter including a plurality of predefined passages of text which are arranged on the page in an ordering indicating their relative importance in relation to other text passages on the page, and said text data comprising a plurality of predefined passages of text corresponding to text passages appearing in the graphical images of the pages of the publication;



display means to display a graphical image of a page of the publication simultaneously with display of text data corresponding to a text passage appearing in the graphical image of the displayed page; and

selection means operable by a user to select a text passage appearing in the graphical image of the page displayed by said display means;

said display means being responsive to said selection means and said data access means to simultaneously display the graphical image of the page of the publication accessed from said page image data alongside the selected passage of text accessed from said text data such that the user can view the text passage in detail as text data while being apprised of its relative importance in relation to the other text passages through viewing the simultaneous display of the graphical image of the page.

5,748,932

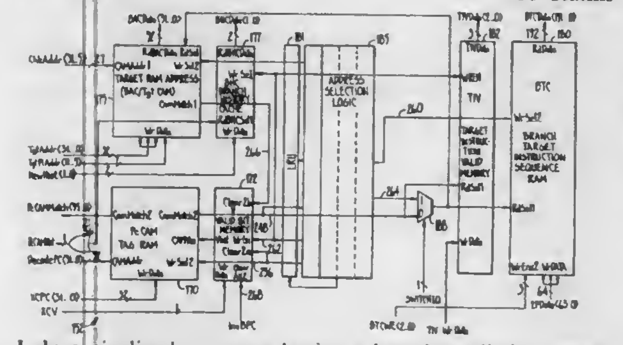
CACHE MEMORY SYSTEM FOR DYNAMICALLY ALTERING SINGLE CACHE MEMORY LINE AS EITHER BRANCH TARGET ENTRY OR PREFETCH INSTRUCTION QUEUE BASED UPON INSTRUCTION SEQUENCE

Korbin S. Van Dyke, Fremont; David R. Stiles, Sunnyvale, and John G. Favor, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 68,364, May 27, 1993, abandoned, which is a continuation of Ser. No. 485,304, Feb. 26, 1990, Pat. No. 5,230,068. This application Jan. 25, 1995, Ser. No. 378,054

Int. Cl.⁶ G06F *12/08;9/30*

U.S. Cl. 395—375 **10 Claims**



1. In a pipelined processor having a branch prediction system fabricated on an integrated circuit chip, a method, performed with said integrated circuit chip, of providing instruction bytes to the instruction pipeline, the method comprising the steps of:

storing at least portions of branch-related addresses for select branch instructions in a branch address array;

storing at least portions of branch-related target addresses for said select branch instructions in a target address array;

storing branch-related history bits for said branch instructions in a branch history array;

fetching a first sequence of instruction bytes using a first prefetch instruction storage circuit until a branch is predicted to be taken;

detecting a match between the address of a branch-related instruction in the instruction pipeline and one of said branch-related addresses in said branch address array;

predicting the current direction to be taken by the branch instruction corresponding to said match using said history bits;

fetching a second sequence of instruction bytes using a second prefetch instruction storage circuit if said branch instruction is predicted to be taken, said second sequence of instruction bytes including instruction bytes corresponding to one of said target addresses in said target address array;

if said branch instruction is predicted to be taken, suspending further fetching using said first prefetch instruction storage circuit;

comparing an actual direction taken by the branch instruction with the predicted direction; and

flushing the pipeline of said processor, suspending fetching using said second prefetch instruction storage circuit, and resuming fetching said first sequence of instruction bytes using said first prefetch instruction storage circuit if said actual direction was mispredicted.

5,748,933

DATA DRIVEN TYPE INFORMATION PROCESSOR SUITABLE FOR IMAGE PROCESSING THAT UTILIZES A CONFIGURATION CONDITION

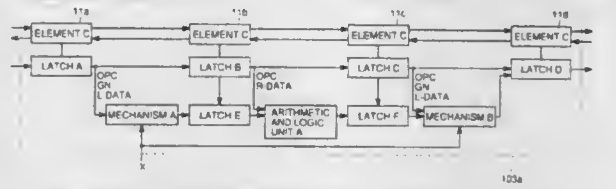
Takayuki Amagai, Yamatokouriyama, and Tsuyoshi Muramatsu, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1995, Ser. No. 463,767

Claims priority, application Japan, Aug. 31, 1994, 6-206402

Int. Cl.⁶ G06F *12/04*

U.S. Cl. 395—377 **22 Claims**



1. A data drive type information processor for operating upon received data having a plural-field generation number representing image coordinate information , upon an instruction code, and upon a configuration condition which determines a relative field-size configuration of said generation number, comprising:

taking means for taking data from a first field of said generation number, said first field being designated according to said instruction code and said configuration condition;

operating means for carrying out an operation between said taken data from the first field and operand data; and

storing means for storing an operation result by said operating means into the first field of the generation number, whereby the data from said designated first field of said generation number is replaced by said operation result.

VOL
1210
ISS
1
MY
5
1998
UMI

5,748,934

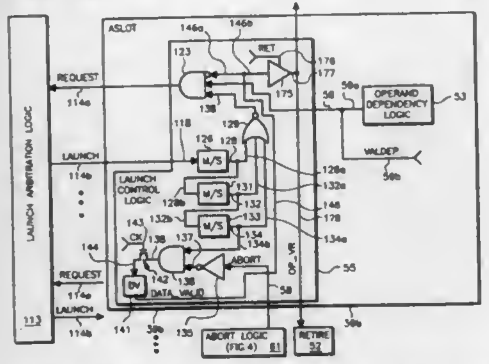
OPERAND DEPENDENCY TRACKING SYSTEM AND METHOD FOR A PROCESSOR THAT EXECUTES INSTRUCTIONS OUT OF ORDER AND THAT PERMITS MULTIPLE PRECISION DATA WORDS

Gregg Lesartre; Doug Quarnstrom, and Jonathan P. Lotz, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 31, 1996, Ser. No. 658,922

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—392 **8 Claims**



1. A system for tracking data dependencies in a processor that permits execution of instructions out of order and processing of multiple precision data words, comprising:

a reordering mechanism configured to receive instructions and permit execution of said instructions in an out of order sequence;

operand dependency logic associated with said reordering mechanism, said operand dependency logic configured to detect a dependent instruction that depends upon at least one data portion to be produced by a producer instruction;

a result register configured to store a plurality of valid bits and a result of execution of said producer instruction, each of said valid bits corresponding with a respective data portion of said result and indicative of whether each said respective data portion is valid; and

abort logic configured to determine if said at least one data portion is valid based upon at least one of said valid bits when executing said dependent instruction, to abort execution of said dependent instruction when said at least one data portion is invalid and iteratively recommence execution and said validity determination until said at least one data portion is valid, and to permit execution of said dependent instruction when said at least one data portion is valid.

5,748,935

RECONSTRUCTION OF YOUNG BITS IN ANNEX AFTER MISPREDICTED EXECUTION BRANCH IN PIPELINED PROCESSOR

Marc Tremblay, Palo Alto, and Krishna C. Yarlagadda, San Mateo, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Continuation of Ser. No. 378,659, Jan. 26, 1995, abandoned. This application Nov. 20, 1996, Ser. No. 752,950

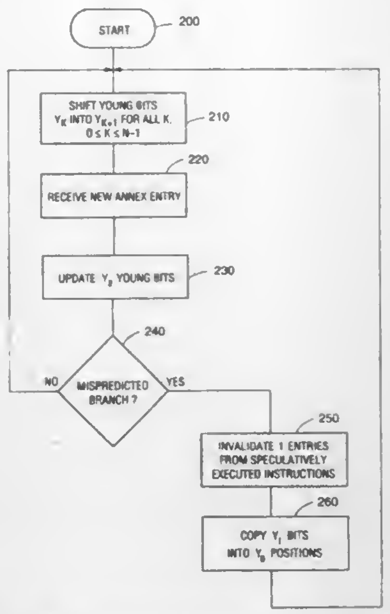
Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—392 **20 Claims**

1. A method of reconstructing young bit values after speculatively executing instructions following a mispredicted branch in a post-functional unit annex having a plurality of entries, wherein each entry includes address, data, and young bit information, comprising steps of:

(a) invalidating the instruction results in a post-functional unit annex after the mispredicted branch;

(b) broadcasting to every other valid annex entry for comparison a destination address of an oldest valid annex entry which has not previously been broadcast;


START
200
SHIFT YOUNG BITS Y_K INTO Y_{K+1} FOR ALL K, $0 \le K \le N-1$
210
RECEIVE NEW ANNEX ENTRY
220
UPDATE Y_0 YOUNG BITS
230
240
MISPREDICTED BRANCH ?
NO
YES
INVALIDATE 1 ENTRIES FROM SPECULATIVELY EXECUTED INSTRUCTIONS
250
COPY Y_1 BITS INTO Y_0 POSITIONS
260

(c) comparing the destination address of the oldest valid annex entry which has not previously been broadcast to every other destination address of every other valid annex entry;

(d) resetting the young bit in each valid annex entry in which the destination address of the oldest valid annex entry which has not previously been broadcast equals the destination address in that valid annex entry;

(e) setting the young bit in the oldest valid annex entry whose destination address has not previously been broadcast; and

(f) repeating steps b through e once for each valid annex entry ending with the youngest valid annex entry.

5,748,936

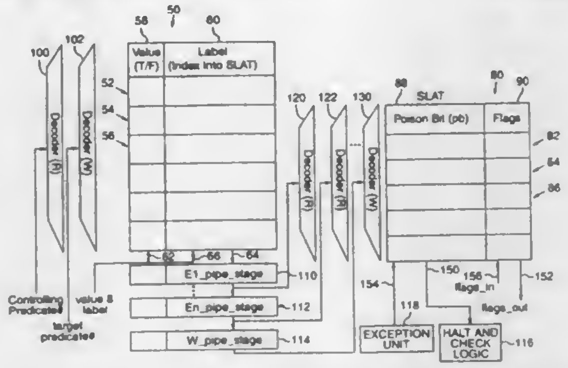
METHOD AND SYSTEM FOR SUPPORTING SPECULATIVE EXECUTION USING A SPECULATIVE LOOK-ASIDE TABLE

Alan H. Karp, Palo Alto, and Rajendra Kumar, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 30, 1996, Ser. No. 655,655

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—394 **20 Claims**



1. In a processor, logic for supporting speculative execution comprising:

a speculative look aside table including a plurality of entries for storing data indicating whether an exception is being deferred;

a predicate register file including a plurality of entries operable to store a predicate for controlling execution of one or more operations and a label representing an index into the speculative look aside table;

a predicate decoder operable to read a predicate and to locate a corresponding entry in the predicate register file;

control logic operable to read a predicate value and a label from the corresponding entry in the predicate register file; and

a label decoder communicative with the control logic, the label decoder operable to receive the label from the control logic and operable to locate a corresponding entry in the speculative look aside table.

5,748,937

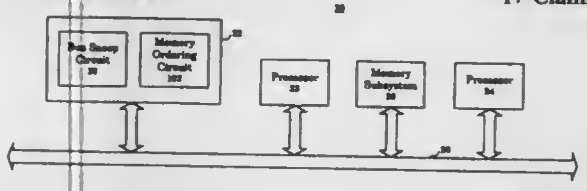
COMPUTER SYSTEM THAT MAINTAINS PROCESSOR ORDERING CONSISTENCY BY SNOOPING AN EXTERNAL BUS FOR CONFLICTS DURING OUT OF ORDER EXECUTION OF MEMORY ACCESS INSTRUCTIONS

Jeffrey M. Abramson, Aloha; Haitham Akkary, Portland; Andrew F. Glew, Hillsboro; Glenn J. Hinton; Kris G. Konigsfeld, both of Portland, and Paul D. Madland, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 388,150, Feb. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 112,668, Aug. 26, 1993, abandoned. This application Mar. 28, 1997, Ser. No. 825,417

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—394 **17 Claims**



1. A computer system that executes a load memory instruction out-of-order in relation to a program order and that promotes a result of the load memory instruction to a committed state according to the program order, the computer system comprising:

a memory subsystem including a cache memory device coupled to a bus;

a load buffer for saving at least a partial copy of a source address of the load memory instruction, and

a snoop circuit coupled to the bus and the load buffer for detecting a transaction on the bus that conflicts with the load memory instruction using the saved at least partial copy of the source address as long as the result of the load memory instruction has not been promoted to the committed state.

5,748,938

SYSTEM AND METHOD FOR MAINTAINING COHERENCY OF INFORMATION TRANSFERRED BETWEEN MULTIPLE DEVICES

James Allan Kahle, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 61,785, May 14, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 350,399

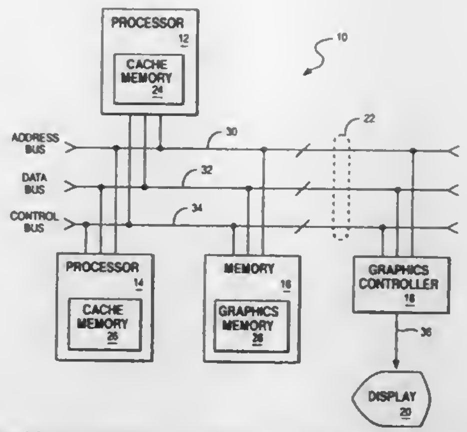
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—465 **17 Claims**

12. A method, comprising the steps of:

storing information at a first device;

outputting an indication from a second device of whether at least one portion of said information is to be cached by said second device; and



using said second device, inputting said at least one portion from said first device.

5,748,939

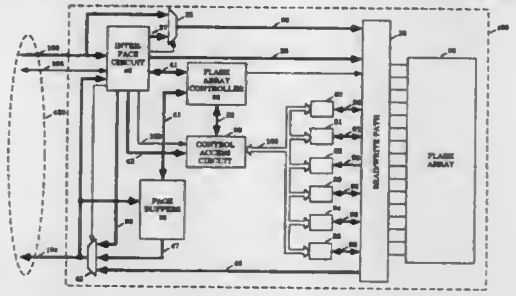
MEMORY DEVICE WITH A CENTRAL CONTROL BUS AND A CONTROL ACCESS REGISTER FOR TRANSLATING AN ACCESS REQUEST INTO AN ACCESS CYCLE ON THE CENTRAL CONTROL BUS

Rodney R. Rozman, Placerville; Richard J. Durante, Citrus Heights; Mickey L. Fandrich, Placerville, and Ranjeet Alexis, Citrus Heights, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 85,636, Jun. 30, 1993, abandoned. This application Feb. 14, 1996, Ser. No. 601,652

Int. Cl.^{6} G06F *13/16;12/00*

U.S. Cl. 395—430 **28 Claims**



1. A memory device, comprising:

a cell array comprising a plurality of memory cells;

a read/write circuit coupled to the cell array and comprising circuitry that performs select, write, read, verify, and repair operations on the memory cells according to a plurality of control signals;

a plurality of control register circuits coupled to the read/write circuit and comprising a plurality of control registers that generate the control signals to the read/write circuit, the plurality of control registers programmed over a central control bus;

a control access circuit coupled to the plurality of control register circuits via the central control bus, the control access circuit translating an access request into an access cycle on the central control bus, the access cycle loading the plurality of control registers by transferring write control signals, read control signals, register addresses, data, and strobe signals.

VOL
210
ISS
1
MY
5
1998
UMI

5,748,940

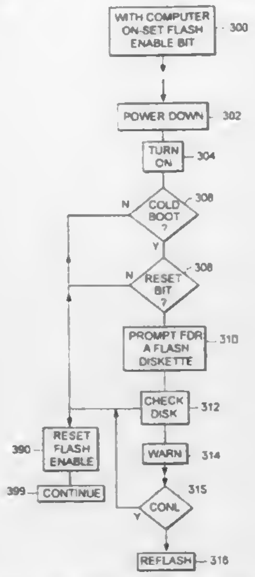
SECURE UPDATING OF NON-VOLATILE MEMORY

Michael F. Angelo, Houston; Craig A. Miller, Tomball, and David R. Wooten, Spring, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Aug. 17, 1995, Ser. No. 516.276

Int. Cl.^{6} G06F *12/16*

U.S. Cl. 395—490 **74 Claims**



1. A flash-protected computer system, comprising:

a processor;

a non-volatile memory storing predetermined instructions to be executed by said processor on initial start-up; and

an element that provides instructions to update contents in said non-volatile memory, said element being arranged to effect at least two predetermined security features, and to allow new data to be written into the non-volatile memory only when both of said at least two predetermined security features have specified states indicating that updating the contents of said non-volatile memory is likely to be secure,

wherein said predetermined security features include a predetermined flash enable value in said non-volatile memory being in a predetermined state, and

a determination that said system is being reset from a power off state.

5,748,941

SYSTEM AND METHOD FOR SYNCHRONIZING CONTROL CLOCKS FOR A MODULAR PRINTING SYSTEM

Douglas T. Rabjohns, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 9, 1995, Ser. No. 556,153

Int. Cl.^{6} G06F *1/12*

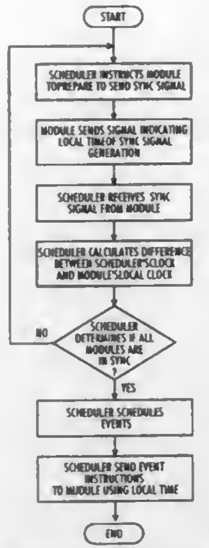
U.S. Cl. 395—551 **15 Claims**

1. A modular feeder finisher system, comprising:

a first module having a local clock; and

master scheduler means for determining a time of said local clock of said first module and for determining a difference between said time of said local clock of said first module and a time of a local clock of said master scheduler means;

said master scheduler means generating an event instruction and a timing instruction in terms of said time of said local clock of said first module and sending the event instruction and timing instruction thereto.


START
SCHEDULER INSTRUCTS MODULE TO PREPARE TO SEND SYNC SIGNAL
MODULE SENDS SIGNAL INDICATING LOCAL TIME OF SYNC SIGNAL GENERATION
SCHEDULER RECEIVES SYNC SIGNAL FROM MODULE
SCHEDULER CALCULATES DIFFERENCE BETWEEN SCHEDULER'S CLOCK AND MODULE'S LOCAL CLOCK
80
SCHEDULER DETERMINES IF ALL MODULES ARE IN SYNC ?
YES
SCHEDULER SCHEDULES EVENTS
SCHEDULER SENDS EVENT INSTRUCTIONS TO MODULE USING LOCAL TIME
END

5,748,942

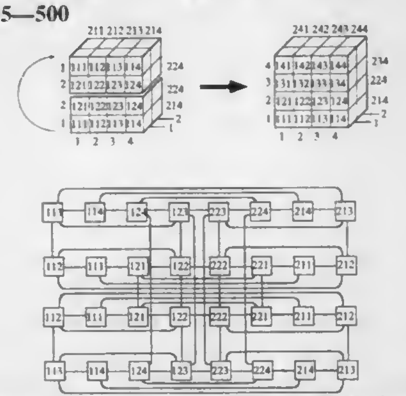
EFFICIENT THREE-DIMENSIONAL LAYOUT METHOD FOR LOGIC CELL ARRAYS

Robert G. Duncan, Castroville, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Jun. 7, 1995, Ser. No. 482,139

Int. Cl.^{6} G06F *3/00;15/14*

U.S. Cl. 395—500 **3 Claims**



1. A method of interconnecting a three-dimensional array of logic elements to form a two-dimensional array while minimizing interconnect line crossovers, comprising the steps of:

creating a three-dimensional model including said logic elements;

noting by adjacency which of said logic elements are connected to other of said logic elements in said three-dimensional array;

laying out said two-dimensional array of logic elements;

interconnecting said logic elements of said two-dimensional array in accordance with the result of said noting step.

5,748,943

INTELLIGENT CAD PROCESS

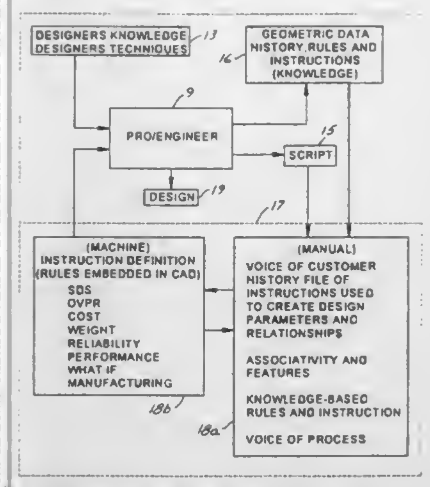
Gregory A. Kaepp, Dearborn, and Beverly J. Becker, Harper Woods, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Oct. 4, 1995, Ser. No. 538,925

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 395—500 **9 Claims**

1. A method of evolving and dynamically adapting a computer aided part design having unknown initial form, comprising: (a) gathering data related to said part consisting of (i) human generated information techniques, and (ii) machine generated information or rules; (b) processing the gathered data by instructions to produce processed knowledge containing script without a part design; (c) iteratively and recursively editing the processed knowledge to continuously adapt and improve the script to form one or more initial executable part designs by inputting into the editing process at least associative techniques, relations and features, and knowledge-based rules or instructions; and (d) inputting the editing history of step (c) into processed knowledge, such inputting creating captured improvement criteria that is iteratively and recursively fed back into either the recursive editing process or into the processing of step (b) to effect evolvement of a different executable design form.


DESIGNERS KNOWLEDGE DESIGNERS TECHNIQUES
13
GEOMETRIC DATA HISTORY, RULES AND INSTRUCTIONS (KNOWLEDGE)
16
9
PRO/ENGINEER
15
SCRIPT
DESIGN
19
17
(MACHINE) INSTRUCTION DEFINITION (RULES EMBEDDED IN CAD)
SDS
OVPR
COST
WEIGHT
RELIABILITY
PERFORMANCE
WHAT IF
MANUFACTURING
18b
(MANUAL)
VOICE OF CUSTOMER
HISTORY FILE OF INSTRUCTIONS USED TO CREATE DESIGN PARAMETERS AND RELATIONSHIPS
ASSOCIATIVITY AND FEATURES
KNOWLEDGE-BASED RULES AND INSTRUCTION
VOICE OF PROCESS
18a

5,748,944

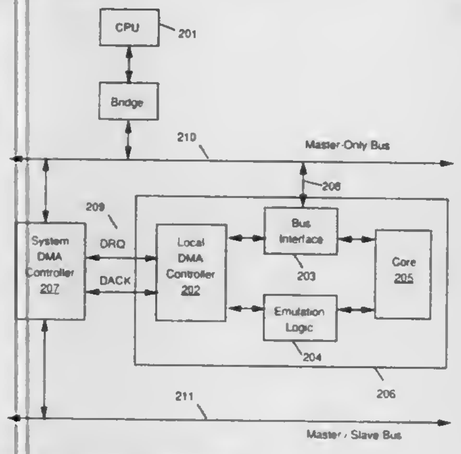
APPARATUS FOR SLAVE DMA EMULATION ON A COMPUTER SYSTEM BUS

Timothy C. Ng, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1996, Ser. No. 656,657

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—500 **14 Claims**



1. A microprocessor comprising:

core logic;

a local direct memory access (DMA) controller, the local DMA controller capable of full DMA emulation so that slave DMA function is provided when the microprocessor is connected to a master-only computer system bus, the local DMA controller having connections for a system DMA controller connected to a master/slave computer system bus;

master-only bus interface logic disposed between the local DMA controller and the core logic, the master-only bus interface logic having a master-only bus interface; and

emulation logic disposed between the local DMA controller and the core logic.

5,748,945

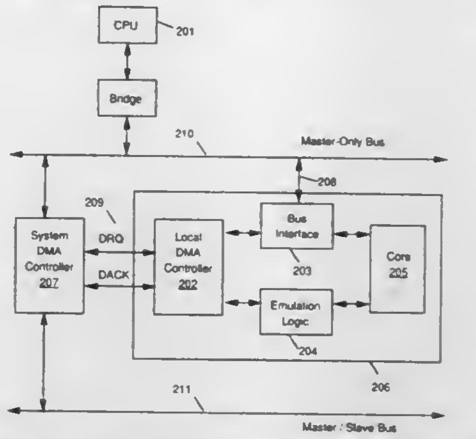
METHOD FOR SLAVE DMA EMULATION ON A COMPUTER SYSTEM BUS

Timothy C. Ng, Cary, N.C., assignor to International Business Machiens Corporation, Armonk, N.Y.

Filed May 31, 1996, Ser. No. 657,845

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—500 **5 Claims**



2. A method of performing a DMA write by a local direct memory access (DMA) controller in slave DMA emulation mode, the local DMA controller being on an adapter card having emulation logic, the local DMA controller capable of full DMA emulation so that slave DMA function is provided when the adapter card is connected to a master-only computer system bus, the local DMA controller having connections for a system DMA controller connected to a master/slave computer system bus, the method comprising the steps of:

monitoring the master-only computer system bus for DMA activity;

latching DMA control information for a DMA transfer request;

performing a DMA transfer of data from the emulation logic to the local DMA controller;

writing a dummy address to the system DMA controller if the DMA transfer will not be directly monitored;

requesting the system DMA controller to perform the DMA transfer on the master/slave computer system bus and receiving an acknowledgment from the system DMA controller;

determining if the DMA transfer is compete on the master/slave computer system bus;

performing the DMA transfer on the master-only bus;

notifying the emulation logic that the DMA transfer is complete; and

performing an additional DMA transfer if the full depth of the DMA transfer request has not been completed.

5,748,946

METHOD AND APPARATUS FOR IMPROVED GRAPHICS PICKING USING AUXILIARY BUFFER INFORMATION

Bengt-Olaf Schneider, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,324

Int. Cl.^{6} G06F *15/00*

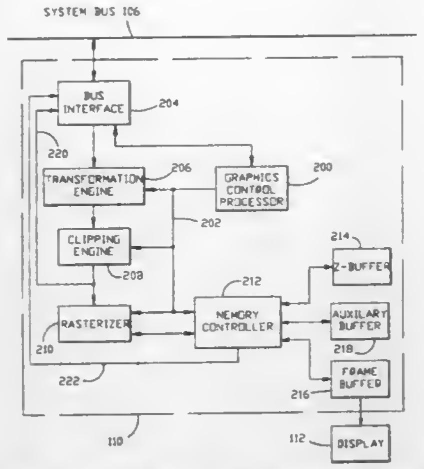
U.S. Cl. 395—501 **11 Claims**

1. In a graphics system wherein objects defining a three dimensional scene are rendered for display as an array of pixels in a display area of a display device, an apparatus for identifying one or more objects that are visible within a picking aperture within said display area comprising:

a system control processor, under control of an application program, that in normal operation mode assigns each of said objects defining said scene with an identifier;

a rasterizer, coupled to said system control processor via a system bus, that in normal operation mode determines which particular object of said objects defining said scene is visible

VOL
210
SS
1
MY
5
998
MI



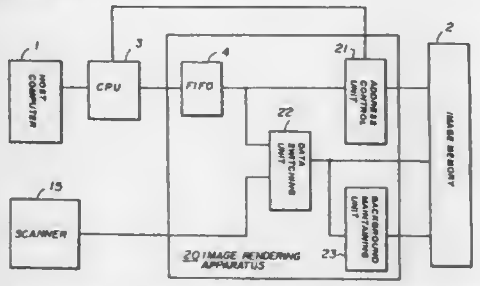
for a given pixel of said display device, and a memory controller, coupled to said rasterizer, that in normal operation mode stores the identifier assigned to the particular object in an auxiliary buffer at an address corresponding to the given pixel;

wherein said system control processor, under control of said application program, enters a picking mode whereby said picking aperture within said display area is defined according to user input; and

wherein said memory controller, under control of said system control processor, enters said picking mode whereby, for each pixel associated with said picking aperture, the identifier stored in said auxiliary buffer at an address corresponding to the pixel is retrieved and transferred to said system control processor to thereby identify one or more objects visible in said picking aperture as a picked object.

5,748,947
INFORMATION PROCESSING SYSTEM FOR SWITCHABLY PROCESSING DATA ASSOCIATED WITH STRAIGHT LINE VECTORS

Tokutaro Fukushima, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 580,773, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 200,424, Feb. 23, 1994, abandoned. This application Dec. 18, 1996, Ser. No. 768,538
Claims priority, application Japan, Feb. 25, 1993, 5-036917
Int. Cl.^{6} G06F *15/00*
U.S. Cl. 395—501 **24 Claims**



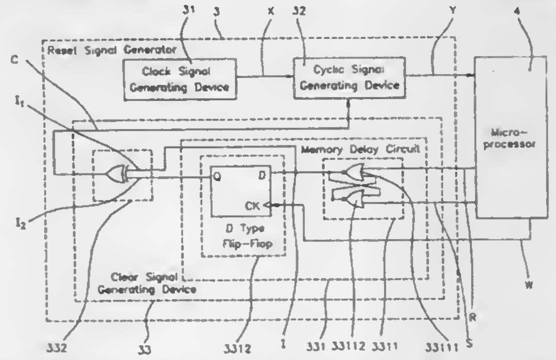
1. An information processing system for processing image data input through an image scanner, comprising:

an image memory for storing image data in a form for realizing the corresponding image on a recording medium and in a number of tone levels associated with said image memory, wherein said number of tone levels associated with said image memory is smaller than a number of tone levels associated with said image data input through said image scanner; and

a central processing unit controlling scanner modes of the information processing system and registering scanner mode specification information corresponding to said scanner modes, wherein at least a first one of said scanner modes reduces the number of tone levels of the image data input through the image scanner and an alternative second one of said scanner modes reduces the size of a read-in area of the image scanned by the image scanner and wherein it possible to selectively change from said first tone-level reduction mode and said second read-in area reduction mode.

5,748,948
RESET SIGNAL GENERATOR

Kuo-Cheng Yu; Bao-Shiang Suo, and Ching-Yi Lin, all of Hsinchu, Taiwan, assignors to Holtek Microelectronics Inc., Hsinchu, Taiwan
Filed Sep. 11, 1995, Ser. No. 526,850
Int. Cl.^{6} G06F *1/04;1/24*
U.S. Cl. 395—555 **23 Claims**



16. A reset signal generator adapted to be used with a microprocessor for generating a reset signal to initialize said microprocessor, comprising:

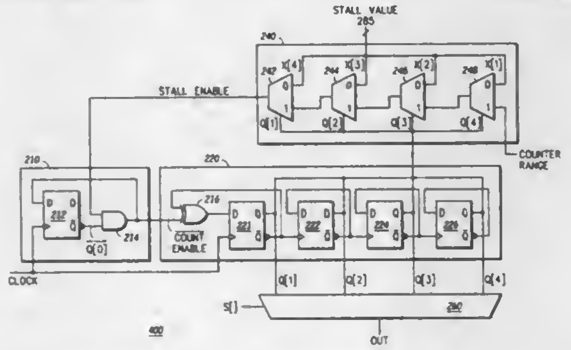
a clock signal generating device generating a fixed clock signal;

a cyclic signal generating device electrically connected to said clock signal generating device for generating a cyclic signal in response to said clock signal, and outputting said reset signal at an end of a period of said cyclic signal;

a clear signal generating device electrically connected to said cyclic signal generating device for generating a clear signal for said cyclic signal generating device in response to said output signal, wherein said clear signal generating device includes a memory delay device having a latch circuit for storing said output signal.

5,748,949
COUNTER HAVING PROGRAMMABLE PERIODS AND METHOD THEREFOR

Thomas K. Johnston, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.
Filed Jul. 2, 1996, Ser. No. 674,381
Int. Cl.^{6} G06K *1/025;* H03K *23/00*
U.S. Cl. 395—557 **13 Claims**



1. A programmable counter comprising:

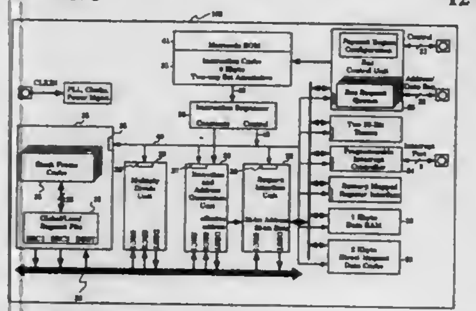
a counter stage for receiving a clock signal, and a count enable signal, and producing a count value, wherein the counter stage increments the count value on an active clock edge when the count enable signal is active;

a stall stage for receiving a stall enable signal, the clock signal, and coupled to the counter stage to provide the count enable signal, wherein the stall stage disables the count enable signal based on the stall enable signal; and

a stall programmer stage for receiving a stall value, coupled to the counter stage for receiving the count value, and coupled to the stall stage for providing the stall enable signal, wherein the stall enable signal is asserted based on the stall value.

5,748,950
METHOD AND APPARATUS FOR PROVIDING AN OPTIMIZED COMPARE-AND-BRANCH INSTRUCTION

James E. White, and Kenneth P. Griesser, both of Gilbert, Ariz., assignors to Intel Corporation, Santa Clara, Calif.
Continuation of Ser. No. 309,073, Sep. 20, 1994, abandoned. This application Mar. 20, 1997, Ser. No. 821,029
Int. Cl.^{6} G06F *9/00*
U.S. Cl. 395—595 **12 Claims**



7. A computer system comprising:

an input/output (I/O) means for providing a communication interface;

a memory means coupled to the I/O means for storing instructions and computer data;

data input means coupled to the I/O means for providing data input and data output to interface the computer system with a computer user; and

microprocessor means coupled to the I/O means for executing a composite instruction wherein said composite instruction includes a first opcode portion corresponding to a first instruction, said microprocessor means comprising:

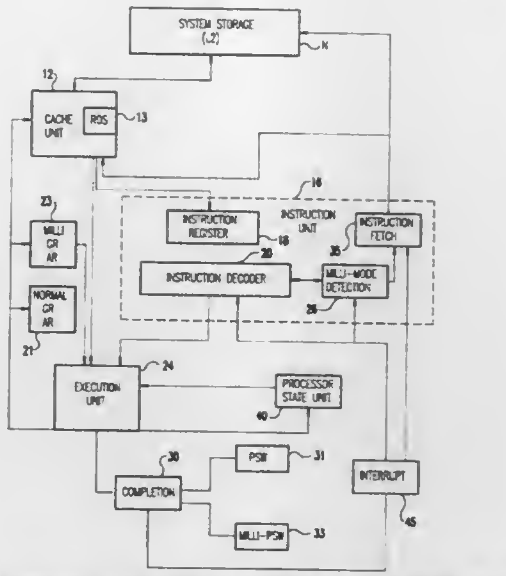
- an instruction memory for storing said composite instruction;
- an instruction bus coupled to said instruction memory for conveying said composite instruction;
- an instruction sequencer coupled to said instruction bus for receiving said composite instruction from said instruction memory; and
- a plurality of execution units coupled to said instruction sequencer for executing instructions,

said instruction sequencer in response to receiving said composite instruction, translating the first opcode portion into a second opcode portion corresponding to a second instruction.

5,748,951
SPECIALIZED MILLICODE INSTRUCTIONS WHICH REDUCE CYCLE TIME AND NUMBER OF INSTRUCTIONS NECESSARY TO PERFORM COMPLEX OPERATIONS

Charles Franklin Webb, Poughkeepsie; Mark Steven Farrell, Pleasant Valley; Mark Anthony Check, Hopewell Junction, and John Stephen Liptay, Rhinebeck, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 414,154, Mar. 31, 1995, Pat. No. 5,694,587. This application Mar. 31, 1997, Ser. No. 829,267
Int. Cl.^{6} G06F *9/22;9/305*
U.S. Cl. 395—595 **1 Claim**

1. In a pipelined computer processor, which executes a relatively simple instruction set in a hardware controlled execution unit and executes a relatively complex instruction set in a milli-mode architected state with a millicode sequence of simple instructions in said hardware controlled execution unit, a method of operation including the steps of:



storing a millicode instruction that includes a field specifying a processor state unit register in which said program status word is stored and a field specifying a millicode general register in which a mask is stored indicating those bits in the program status word which are to be zeros if the program status word is valid;

fetching said millicode instruction from storage;

performing a logical AND operation between correspondingly positioned bits in said program status word and bits in said mask;

storing a millicode load and test access instruction that includes a field specifying a millicode register address and a field specifying a storage address for an access exception to a second operand fetch access exception;

fetching said millicode load and test access instruction;

executing said millicode load and test access instruction including testing a load operand operation, setting one condition code when no access exception is found, and blocking an interrupt when an access exception is found and setting another condition code;

storing a millicode instruction to facilitate translation of string bytes which includes a field that specifies a first millicode general register, a field that specifies a second millicode general register, a field that selects one byte from the first register to be added to the content of the second millicode general register to form an operand address of a byte to be fetched from storage, and a field that specifies a register pair into which said byte to be fetched from storage is to be stored; and

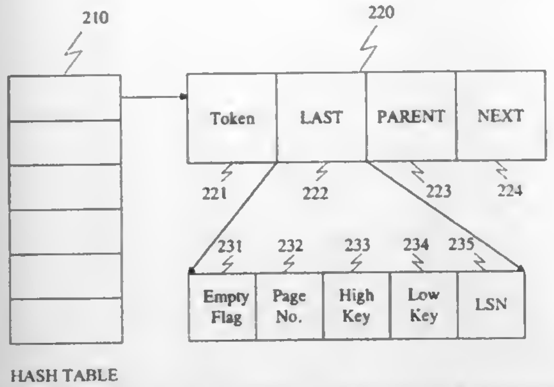
fetching said millicode instruction to facilitate translation of string bytes, and executing said millicode instruction to facilitate translation of string bytes.

5,748,952
SYSTEM AND METHOD FOR AVOIDING COMPLETE INDEX TREE TRAVERSALS IN SEQUENTIAL AND ALMOST SEQUENTIAL INDEX PROBES

Atul Chadha, Milpitas; Donald J. Haderle, Los Gatos; Akira Shibamiya, Los Altos; Robert W. Lyle, and Steven J. Watts, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 10, 1995, Ser. No. 438,558
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—602 **25 Claims**

23. A system for avoiding root-to-leaf traversal of an index tree having leaf and parent pages, the system comprising:

VOL
210
SS
1
MY
5
998
UMI



means for storing page descriptive information in a LAST information field, a PARENT information field and a NEXT information field in an index lookaside buffer, said LAST information field identifying the most recent leaf page accessed during an index probe in a read-key or an insert-key operation, said PARENT information field identifying the parent page of the leaf page described in said LAST information field and said NEXT information field identifying the most recent leaf page accessed during an index probe in a fetch-next-key or delete-key operation;

means for determining if a search key is located within one of the leaf pages described by said LAST information field and said NEXT information field or is located within one of the leaf pages pointed to by the parent page described in said PARENT information field.

5,748,953

DOCUMENT SEARCH METHOD WHEREIN STORED DOCUMENTS AND SEARCH QUERIES COMPRISE SEGMENTED TEXT DATA OF SPACED, NONCONSECUTIVE TEXT ELEMENTS AND WORDS SEGMENTED BY PREDETERMINED SYMBOLS

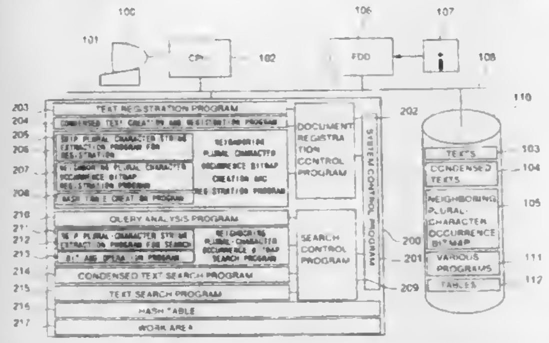
Natsuko Mizutani; Atsushi Hatakeyama, both of Kawasaki; Hisamitsu Kawaguchi, Sagamihara; Katsumi Tada; Kanji Kato, both of Yokohama, and Satoshi Asakawa, Hirakata, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 120,285, Sep. 13, 1993, abandoned, aod Ser. No. 31,625, Mar. 15, 1993, Pat. No. 5,471,610, each which is a continuation-in-part of Ser. No. 985,795, Nov. 30, 1992, Pat. No. 5,519,857, which is a continuation of Ser. No. 555,483, Aug. 9, 1990, Pat. No. 5,168,533. This application May 18, 1995, Ser. No. 444,842

Claims priority, application Japan, Jun. 14, 1989, 1-149630; Jul. 24, 1989, 1-188772; Jul. 24, 1989, 1-188773; Sep. 8, 1989, 1-231567; Mar. 19, 1992, 4-063067; Sep. 18, 1992, 4-249191; Sep. 18, 1992, 4-275186; Nov. 17, 1992, 4-306748; May 24, 1994, 6-133810

Int. Cl.⁶ G06F ***17/30***

U.S. Cl. 395—606 **18 Claims**



1. A document search method in a data base of stored documents comprising the steps of:

extracting a partial character string in a predetermined form from each of the stored documents;

qcreating a neighboring plural-character occurrence bitmap for indicating whether each of said documents contains any of said partial character strings;

extracting a search term partial character string in a predetermined form from a search term inputted for searching for a desired document from said stored documents; and

referring to said neighboring plural-character occurrence bitmap for said extracted search term partial string to search if any of said stored documents contains said search term partial character string, and to discard any of said stored documents not containing said search term partial character string,

wherein:

said partial character string and said search term partial character string comprise predetermined n-character strings selected from predetermined (m+1)-th character positions from each of said stored documents and exclude intermediate elements between said predetermined (m+1)-th character positions where n is an integer of 2 or larger and m is an integer of 1 or larger.

5,748,954

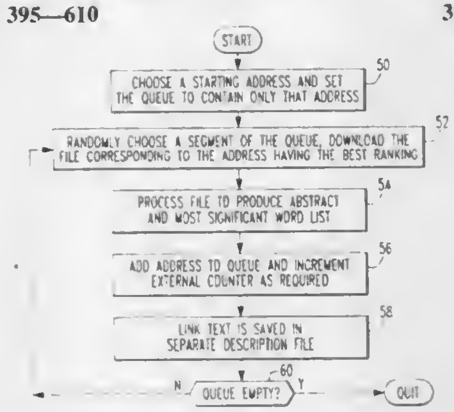
METHOD FOR SEARCHING A QUEUED AND RANKED CONSTRUCTED CATALOG OF FILES STORED ON A NETWORK

Michael L. Mauldin, Penn Hills, Pa., assignor to Carnegie Mellon University, Pittsburgh, Pa.

Filed Jun. 5, 1995, Ser. No. 462,520

Int. Cl.⁶ G06F ***17/30***

U.S. Cl. 395—610 **38 Claims**


START
CHOOSE A STARTING ADDRESS AND SET THE QUEUE TO CONTAIN ONLY THAT ADDRESS
50
RANDOMLY CHOOSE A SEGMENT OF THE QUEUE, DOWNLOAD THE FILE CORRESPONDING TO THE ADDRESS HAVING THE BEST RANKING
52
PROCESS FILE TO PRODUCE ABSTRACT AND MOST SIGNIFICANT WORD LIST
54
ADD ADDRESS TO QUEUE AND INCREMENT EXTERNAL COUNTER AS REQUIRED
56
LINK TEXT IS SAVED IN SEPARATE DESCRIPTION FILE
58
60
N
QUEUE EMPTY?
Y
QUIT

1. A method of constructing a catalog of the files stored on a network comprised of a plurality of interconnected computers each having a plurality of files stored thereon, said method comprising the steps of:

(a) establishing a queue containing at least one address representative of a file stored on one of said interconnected computers;

(b) ranking each address in said queue according to a heuristic;

(c) downloading the file corresponding to the address in said queue having the highest ranking;

(d) processing said downloaded file to generate certain information about said downloaded file for the catalog;

(e) adding to said queue any addresses found in said downloaded file;

(f) repeating steps (b) through (f).

5,748,955

STREAM DATA COMPRESSION SYSTEM USING DYNAMIC CONNECTION GROUPS

Rodney J. Smith, 21 Baroda St., Khandallah, Wellington, New Zealand

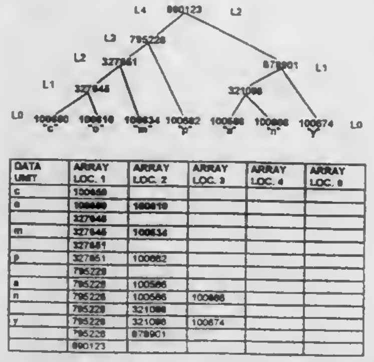
PCT No. PCT/NZ94/00146, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO95/17783, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 20, 1994, Ser. No. 666,332

Claims priority, application New Zealand, Dec. 20, 1993, 250522

Int. Cl.⁶ G06F ***17/30;15/16***

U.S. Cl. 395—612 **19 Claims**



1. A method of compressing data by computer, in which connection groups of two or more consecutive data units are identified and recorded as compression proceeds, comprising:

receiving a stream of data units to be compressed, with no predetermined variety of data unit having significance as a delimiter of other data units,

storing a record of each received data unit in a processing block of computer memory,

determining whether each received data unit forms an already identified connection group existing in an index block of computer memory, when considered in relation to any immediately preceding data unit or connection group recorded in said processing block,

storing in said processing block a fresh record of any such already identified connection group formed by said received data unit, in place of said received data unit and said immediately preceding data unit or connection group recorded in said processing block,

determining whether each connection group freshly recorded in said processing block forms a larger already identified connection group existing in said index block, when considered in relation to any respective immediately preceding data unit or connection group recorded in said processing block,

storing a further fresh record of any such larger already identified connection group, in place of said connection group freshly recorded in said processing block and said respective immediately preceding data unit or connection group recorded in said processing block,

delivering the records stored in said processing block for further storage or for transmission as required, once said stream of data units has been received and compressed.

5,748,956

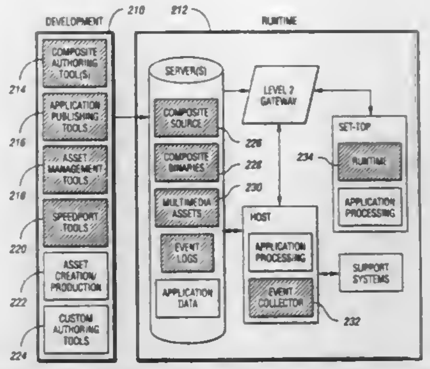
METHOD AND SYSTEM FOR MANAGING MULTIMEDIA ASSETS FOR PROPER DEPLOYMENT ON INTERACTIVE NETWORKS

John P. Lafer, Louisville; John E. Faust, and Michael D. Williams, both of Boulder, all of Colo., assignors to U.S. West Technologies, Inc., Boulder, Colo.

Filed Jan. 13, 1995, Ser. No. 372,157

Int. Cl.⁶ G06F ***17/00***

U.S. Cl. 395—615 **8 Claims**



1. In an application development computer system, a method for automatically managing multimedia assets for use in a multimedia application requiring compatible versions of the multimedia assets for proper deployment on different installation platforms, the method comprising:

storing a plurality of multimedia asset data files, wherein the plurality of multimedia asset data files include asset concepts, asset comparables, and asset instances;

automatically categorizing each one of the plurality of multimedia asset data files as an asset concept, an asset comparable, or an asset instance;

assigning an asset concept identifier which includes a unique identifier and a concept description to each asset concept;

assigning an asset comparable identifier which includes a unique identifier and a concept variation description to each asset comparable;

assigning an asset instance identifier which includes a unique identifier, the associated asset concept identifier, and the associated asset comparable identifier to each asset instance;

storing identifying information including the asset concept identifiers, the asset comparable identifiers, and the asset instance identifiers associated with each one of the plurality of multimedia asset data files; and

generating from the plurality of multimedia asset data files a set of multimedia application asset files compatible for proper use in a multimedia application deployed on an installation platform based on the identifying information.

5,748,957

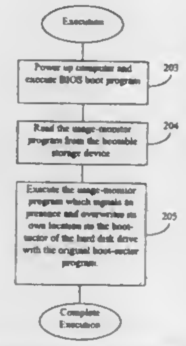
COMPUTER SYSTEM USAGE DETERMINATION BASED ON HARD DISK DRIVE ACTIVITY

Dean A. Klein, 36400 Golfview Ridge, Lake City, Minn. 55041

Filed Feb. 16, 1996, Ser. No. 602,337

Int. Cl.⁶ G06F ***9/06***

U.S. Cl. 395—652 **22 Claims**


Execution
Power up computer and execute BIOS boot program
203
Read the usage-monitor program from the bootable storage device
204
Execute the usage-monitor program which signals its presence and overwrites its own location on the boot-sector of the hard disk drive with the original boot-sector program.
205
Complete Execution

1. A method, performed by a computer having (1) a bootable writable storage medium and (2) executing a usage-monitor program stored in a boot-sector of the storage medium, comprising:

(a) signaling the presence of the usage-monitor program; and

(b) overwriting the usage-monitor program.

VOL
2 10
SS
1
MY
5
998
MI

5,748,958

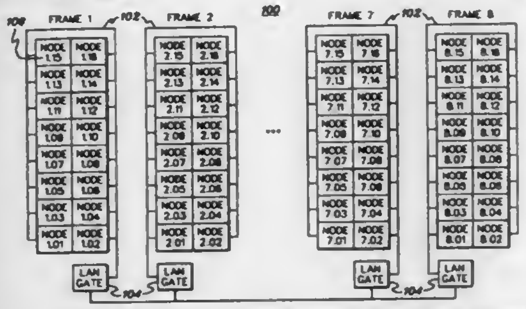
SYSTEM FOR UTILIZING BATCH REQUESTS TO PRESENT MEMBERSHIP CHANGES TO PROCESS GROUPS

Peter Richard Badovinatz, Kingston, N.Y.; Larry Bert Brenner, Austin, Tex.; Tushar Deepak Chandra, Elmsford, N.Y.; Orvalle Theodore Kirby, Pleasant Valley, N.Y., and John Arthur Pershing, Jr., Buchanan, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1996, Ser. No. 640,382

Int. Cl.^{6} G06F *15/163*

U.S. Cl. 395—670 **5 Claims**



1. A system for managing membership of process groups of a distributed computing environment, said system comprising:

means for receiving a first plurality of requests to alter a membership of a first process group and a second plurality of requests to alter a membership of a second process group; and

means for presenting said first plurality of requests to said first process group as a batch request and said second plurality of requests to said second process group as a plurality of serial requests.

5,748,959

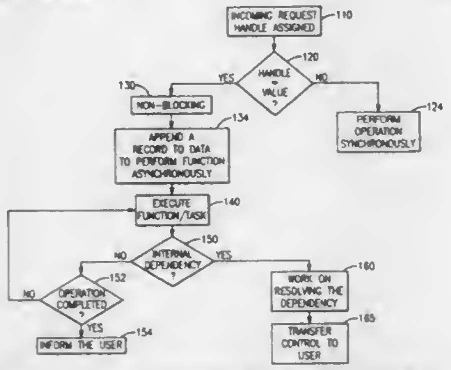
METHOD OF CONDUCTING ASYNCHRONOUS DISTRIBUTED COLLECTIVE OPERATIONS

David Corder Reynolds, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1996, Ser. No. 653,559

Int. Cl.^{6} G06F *9/40*

U.S. Cl. 395—676 **13 Claims**



1. In a multiprocessor system having multiple nodes, a method of distributing data from a first node to at least a second node using request commands, each node having a user application for issuing said request command, said method comprising the steps of:

assigning a handle for identifying a command, said handle being set to a value for non-blocking mode and to null for blocking mode;

processing a requested non-blocking command when said handle is assigned a value in said assigning step;

building a report for recording a sequence of functions to be executed asynchronously given said non-blocking command;

executing in order, the sequence of functions recorded in said report;

when reaching a function that cannot be executed due to an internal dependency which requires some other operation to be completed before execution, returning control to said user application whereby said user application may perform other, unrelated operations; and

providing a handler routine to notify said user application when said internal dependency is resolved and removing said control away from said user application to continue with executing said requested non-blocking command.

5,748,960

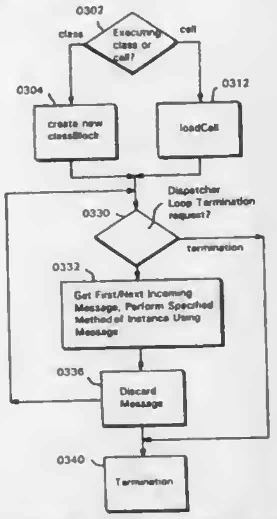
METHOD AND APPARATUS FOR VALIDATING TRAVELLING OBJECT-ORIENTED PROGRAMS WITH DIGITAL SIGNATURES

Addison M. Fischer, 4073 Merchantile Ave., Naples, Fla. 33942

Continuation of Ser. No. 103,778, Aug. 10, 1993, abandoned. This application Dec. 18, 1996, Ser. No. 769,118

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—683 **95 Claims**



1. In a communications system having a plurality of digital computers coupled to a channel over which computers exchange digital messages, a method for processing information among said computers comprising the steps of:

executing on a first computer a travelling program comprising a sequence of digital program instructions including instructions which determine at least one next destination that receives the sequence of instructions, said sequence of instructions defining a plurality of related object instances which are bound together; and

transmitting to said next destination digital information comprising at least said plurality of object instances together with accompanying digital data associated with said sequence of instructions.

5,748,961

EFFICIENT METHOD AND APPARATUS FOR COMPILING AND LINKING MODULES OF COMPUTER CODE IN A LARGE SOFTWARE SYSTEM

Christine Beth Hanna, Woodside, and Roy Levin, Palo Alto, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 91,093, Jul. 12, 1993, abandoned. This application Aug. 30, 1996, Ser. No. 706,382

Int. Cl.^{6} G06F *17/30*

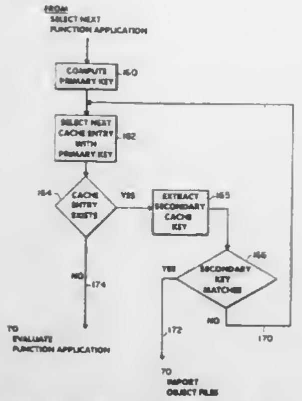
U.S. Cl. 395—701 **7 Claims**

1. A method for building a software system having a plurality of code modules comprising the steps of:

providing a computer system, said computer system having a memory, said memory storing the plurality of code modules;

assigning a unique code identifier for each one of said code modules in said memory;

assigning a unique operations identifier for operations performed on each selected one of the plurality of code modules;


FROM SELECT NEXT FUNCTION APPLICATION
COMPUTE PRIMARY KEY
160
SELECT NEXT CACHE ENTRY WITH PRIMARY KEY
162
164
CACHE ENTRY EXISTS
YES
EXTRACT SECONDARY CACHE KEY
165
166
SECONDARY KEY MATCHES
YES
NO
NO
174
172
170
TO EVALUATE FUNCTION APPLICATION
TO REPORT OBJECT FILE

assigning a pointer to a file containing a processed result of at least one of said each selected code module;

providing a plurality of cache entries, each said cache entry created in response to said unique code identifier for each code module, to said unique operation identifier for operations performed on each selected code module, and to said pointer to said file;

examining a selected subset of said plurality of cache entries to select those code modules which require operations to be performed; and

performing said required operations.

5,748,962

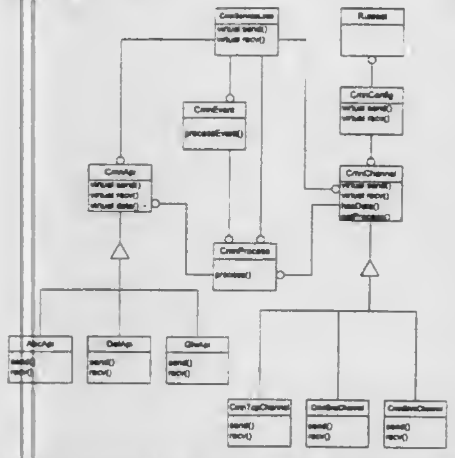
COMMON CHANNELS FOR INTER-APPLICATION COMMUNICATIONS

James P. Brechtel, and Greg La Buhn, both of Colorado Springs, Colo., assignors to MCI Communications Corporation, Washington, D.C.

Filed Sep. 30, 1996, Ser. No. 720,479

Int. Cl.^{6} G06F *15/173*

U.S. Cl. 395—701 **2 Claims**



1. A method for using a set of common utilities implemented as object classes, to provide common channels of communications among applications that run on a distributed platform, comprising the steps:

invoking a common process class (CmnProcess) representing an application code for a particular application (Application X) wherein the code relates to how particular Application Programming Interfaces messages (API) will be processed, and whether responses will be sent;

calling an API processing function (processApi) from CmnProcess, for processing API messages that are sent to and received by the Application X;

invoking a common API class (CmnApi) to create polymorphic API objects that respond to a common verb set, the API objects containing the data that is being sent from Application X to another application;

CmnApi calling generalized virtual send, virtual receive, and virtual data functions for defining the general API functions needed to send and receive data;

at a data sending end, Application X instructing the API object to send itself using the virtual send function and at the receiving end the API object rebuilding itself using the virtual receive function;

CmnApi deriving subclasses with specific functions defined by Application X;

invoking a Common Channel class (CmnChannel) to reference a communications channel to be used to send/receive the API object, the API object using this reference to send or receive itself;

invoking a common service loop class (CmnServiceLoop) operating as a process manager performing a plurality of predefined functions during its servicing loop;

CmnServiceLoop objects processing the input and output from the common channels to extract the API object;

CmnServiceLoop containing its own virtual send and receive functions;

invoking a common event (CmnEvent) class for deriving application-specific classes and instructing the CmnServiceLoop to perform events based on generalized methods as to how and when the events are to be performed;

the derived application-specific classes also specifying which application-specific CmnProcess class to perform the event on;

the CmnServiceLoop, during its execution, determining which events are to be performed and invoking appropriate CmnEvent objects according to event type by calling on the CmnEvent "processEvent" method, the "processEvent" method invoking a CmnProcess "process" method to perform the event;

invoking CmnChannel for representing the actual communications channels that are used for application interfaces;

deriving subclasses specific to a particular communications protocol from CmnChannel;

calling upon functions of the derived subclasses relating to respective communications protocols they support;

encapsulating all data needed to use a protocol communications channel in a CmnChannel object, an application using this communications channel to send or receive data, the application itself not needing to contain any of this data and only needing to reference the name of the channel;

CmnChannel having a function (hasData) to which CmnServiceLoop responds as a reference for indicating that a particular CmnChannel object has data to be received;

a common configuration class (CmnConfig) invoked by CmnChannel to setup the configuration of each channel;

a rules set class (RuleSet) containing rules files for configuring communications channels being invoked by CmnConfig, RuleSet further specifying the types of channels to instantiate from CmnChannel subclasses, channel information made by channel name, and passed on to CmnConfig.

5,748,963

ADAPTIVE BINDING

Michael B. Orr, Bainbridge Island, Wash., assignor to Design Intelligence, Inc., Seattle, Wash.

Filed May 12, 1995, Ser. No. 437,417

Int. Cl.^{6} G06F *9/30*

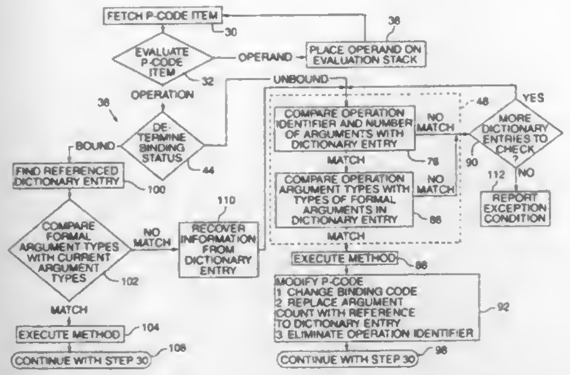
U.S. Cl. 395—704 **16 Claims**

8. A method of binding an entity to an identifier, the entity being selected in accordance with selection criteria from a dictionary including more than one entity, the selection criteria and the entity bound to the identifier capable of changing during program execution, the method comprising:

searching the dictionary for an entity meeting a selection criterion corresponding to a first occurrence of the identifier;

binding a first entity to the identifier for the first occurrence of the identifier;

OL
2 10
ISS
1
MY
5
998
MI


FETCH P-CODE ITEM
30
38
EVALUATE P-CODE ITEM
OPERAND
PLACE OPERAND ON EVALUATION STACK
32
UNBOUND
OPERATION
36
DE-TERMINE BINDING STATUS
44
BOUND
FIND REFERENCED DICTIONARY ENTRY
100
COMPARE OPERATION IDENTIFIER AND NUMBER OF ARGUMENTS WITH DICTIONARY ENTRY
NO MATCH
48
YES
MORE DICTIONARY ENTRIES TO CHECK ?
78
MATCH
90
112
NO
COMPARE OPERATION ARGUMENT TYPES WITH TYPES OF FORMAL ARGUMENTS IN DICTIONARY ENTRY
NO MATCH
REPORT EXCEPTION CONDITION
86
110
COMPARE FORMAL ARGUMENT TYPES WITH CURRENT ARGUMENT TYPES
NO MATCH
RECOVER INFORMATION FROM DICTIONARY ENTRY
MATCH
EXECUTE METHOD
88
102
MODIFY P-CODE
1 CHANGE BINDING CODE
2 REPLACE ARGUMENT COUNT WITH REFERENCE TO DICTIONARY ENTRY
3 ELIMINATE OPERATION IDENTIFIER
92
MATCH
EXECUTE METHOD
104
CONTINUE WITH STEP 30
106
CONTINUE WITH STEP 30
98

determining during a second occurrence of the identifier whether the first entity meets a second selection criterion corresponding to the second occurrence;
if the first entity meets the second selection criterion, binding the first entity to the identifier for the second occurrence of the identifier; and
if the first entity fails to meet the second selection criterion,
  searching the dictionary for a second entity meeting the second selection criterion, and
  binding the second entity to the identifier for the second occurrence of the identifier.

5,748,964

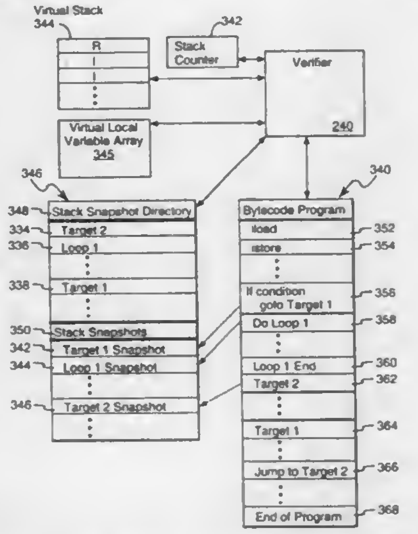
BYTECODE PROGRAM INTERPRETER APPARATUS AND METHOD WITH PRE-VERIFICATION OF DATA TYPE RESTRICTIONS

James A. Gosling, Woodside, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Dec. 20, 1994, Ser. No. 360,202

Int. Cl.^{6} G06F *9/45*

U.S. Cl. 395—705 **14 Claims**



1. A method of operating a computer system, the steps of the method comprising:

(A) storing a program in a memory, the program including a sequence of bytecodes, where each of a multiplicity of said bytecodes each represents an operation on data of a specific data type; said each bytecode having associated data type restrictions on the data type of data to be manipulated by said each bytecode;
(B) prior to execution of said program, preprocessing said program by determining whether execution of any bytecode in said program would violate said data type restrictions for that bytecode and generating a program fault signal when execution of any bytecode in said program would violate the data type restrictions for that bytecode;
(C) when said preprocessing of said program results in the generation of no program fault signals, enabling execution of said program;
(D) when said preprocessing of said program results in the generation of a program fault, preventing execution of said program; and
(E) when execution of said bytecode program has been enabled, executing said bytecode program without performing data type checks on operands stored in said operand stack during execution of said bytecode program;

said bytecode program including at least one execution loop;
said step (B) including
  determining the state of a virtual stack associated with said program before and after execution of each said bytecode in the program, said virtual stack state storing data type values for operands that would be stored in an operand stack during execution of said program; and
  determining whether execution of any loop in said program would result in a net addition or deletion of operands to said operand stack, and for generating a program fault signal when execution of any loop in said program would produce a net addition or deletion of operands to said operand stack; and
said executing step including executing said bytecode program without performing operand stack underflow and overflow checks during execution of said bytecode program.

5,748,965

LANGUAGE PROCESSING METHOD FOR CALCULATING OPTIMUM ADDRESS OF ARRAY

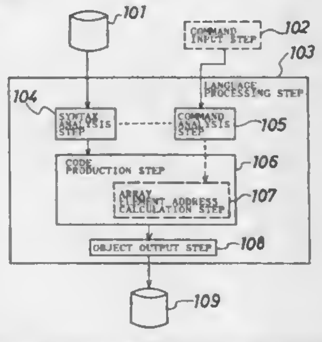
Hiroko Isozaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 266,573, Jun. 28, 1994, abandnned. This application Mar. 24, 1997, Ser. No. 822,471

Claims priority, application Japan, Jul. 1, 1993, 5-163384

Int. Cl.^{6} G06F *9/45*

U.S. Cl. 395—705 **17 Claims**



1. A language processing method, comprising steps of:
inputting source program information;
analyzing the thus inputted source program information to produce object information;
calculating an address of an array element to be processed upon production of the object information; and
outputting the object information thus produced,
the step of calculating an address of an array element including steps of:
  (1) inputting a command which designates a maximum size of the array and analyzing whether the designated size is equal to or smaller than a fixed size;
  (2) taking out a subscript of the array when a result of the analysis is equal to or smaller than the fixed size;
  (3) calculating an offset from contents of the subscript thus taken out and a data width of the array element; and
  (4) calculating an address of the array element from the offset thus calculated and a top address of the array,
said method further comprising a step of selecting based on a result of an analysis in said step (1), one of performing address calculation processing for an optimum array address in accordance with said steps (2) to (4), and performing an ordinary address calculation processing including a step of expanding an array index including said contents of the subscript thus taken out to a width for preventing a dropping of a digit in address calculation.

5,748,966

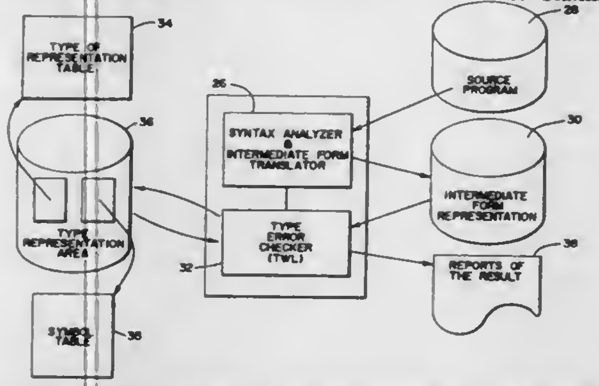
TYPE ERROR CHECKER FOR TYPE-FREE OR POLYMORPHIC COMPUTER LANGUAGE

Yoshikazu Sato, Urawa, Japan, assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Dec. 30, 1994, Ser. No. 366,894

Int. Cl.^{6} G06F *9/445;9/45*

U.S. Cl. 395—708 **65 Claims**



33. A method of detecting a run-time type error in a program prior to running the program whose source code being written in a programming language with imperative constructs and parametric polymorphic procedures, comprising the steps of:

a. providing type representations hating predetermined types including a locking type constructor and an unlocking type constructor, said locking type constructors locking said predetermined types for preventing run-time type error associated with mutuality in relation to said imperative constructs, said unlocking type constructors unlocking said predetermined locked types;
b. translating said source code including imperative constructs and the parametric polymorphic procedures into intermediate form representations; and
c. determining in response to said intermediate form representations and said type representations whether said predetermined locked types are free of substitution with an exact type so that said program will be free of said run-time type error.

5,748,967

PROGRAM REWRITING METHOD AND APPARATUS FOR MULTIPROCESSOR SYSTEM

Takahiro Nakamura, and Takafumi Oka, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

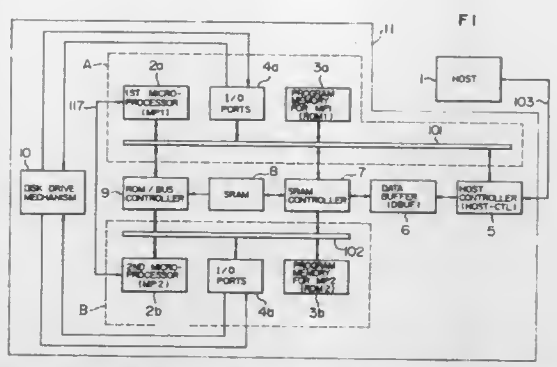
Filed Jan. 10, 1994, Ser. No. 179,200

Claims priority, application Japan, Jan. 11, 1993, 5-002622

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—712 **16 Claims**

1. A method of rewriting, by a first microprocessor in a first microprocessor system, contents of a program memory for a second microprocessor in a second microprocessor system and vice versa, said first microprocessor system including said first microprocessor, a first rewritable program memory for storing therein an executable program for said first microprocessor, and a first system bus connected to said first microprocessor and said first rewritable program memory, and said second microprocessor system including said second microprocessor, a second rewritable program memory for storing therein an executable program for said second microprocessor, and a second system bus connected to said second microprocessor and said second rewritable program memory, said second system bus being separate from said first system bus, said method comprising the steps of:



releasing said second system bus by said second microprocessor, in response to a request from said first microprocessor;
supplying from said first system bus an address on said second system bus thus released under control of said first microprocessor;
reading data of a new program from a common memory connected to said first and second system buses and commonly accessible by said first and second microprocessors under control of said first and second microprocessors;
supplying from said first system bus the data thus read on said second system bus thus released under control of said first microprocessor; and
rewriting the data thus supplied on said second system bus in said second program memory by performing data write operation of said second program memory under control of said first microprocessor.

5,748,968

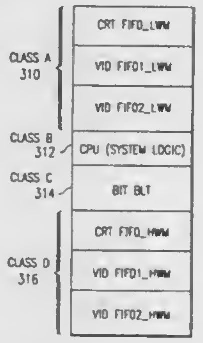
REQUESTING DEVICE CAPABLE OF CANCELING ITS MEMORY ACCESS REQUESTS UPON DETECTING OTHER SPECIFIC REQUESTING DEVICES SIMULTANEOUSLY ASSERTING ACCESS REQUESTS

Robert Marshall Nally; Pete Edward Nelsen, both of Plano; Douglas Hamilton, Allen, and Douglas Michael Berk, Plano, all of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jan. 5, 1996, Ser. No. 583,390

Int. Cl.^{6} G06F *13/36*

U.S. Cl. 395—728 **30 Claims**



1. A requesting device for monitoring an arbitration controller that arbitrates access to a resource in a computer system having the requesting device and a plurality of other requesting devices, comprising:

circuitry for detecting when the requesting device and particular ones of the other requesting devices are asserting access requests;
circuitry for canceling the access requests of the requesting device when the circuitry for detecting detects that the requesting device and the particular ones of the other requesting devices are asserting access requests; and
circuitry for regenerating the access requests from the requesting device when a signal goes active.

VOL 210
ISS 1
MY 5
1998
UMI

5,748,969

ARBITRATION APPARATUS USING LEAST RECENTLY USED ALGORITHM

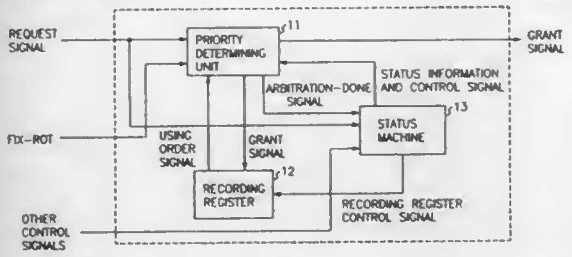
Suk Joong Lee, and Jin Kook Choi, both of Bubaleub, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed May 14, 1996, Ser. No. 649,134

Claims priority, application Rep. of Korea, May 15, 1995, 1995-11924

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—732 **6 Claims**



1. An arbitration apparatus using a least recently used algorithm, comprising:

a priority determining unit for receiving shared-resource request signals from a plurality of request devices having priorities and a shared resource using order signals respectively associated with the request devices, thereby outputting a grant signal for the request device with the highest priority along with an arbitration-done signal;

a recording register for receiving the grant signal, associated with the shared resource, from the priority determining unit, wherein the recording register includes N(N-1)/2 flip-flops adapted to indicate a relative shared-resource using order among N request devices, said N being a natural number no less than 2, the recording register storing the resource using order based on the grant signal and outputting the stored resource to the priority determining unit; and

a status machine for receiving the arbitration-done signal from the priority determining unit along with the request signals from the request devices and other control signals, thereby outputting a status information and control signal to the priority determining unit and a recording register control signal to the recording register.

5,748,970

INTERRUPT CONTROL DEVICE FOR PROCESSING INTERRUPT REQUEST SIGNALS THAT ARE GREATER THAN INTERRUPT LEVEL SIGNALS

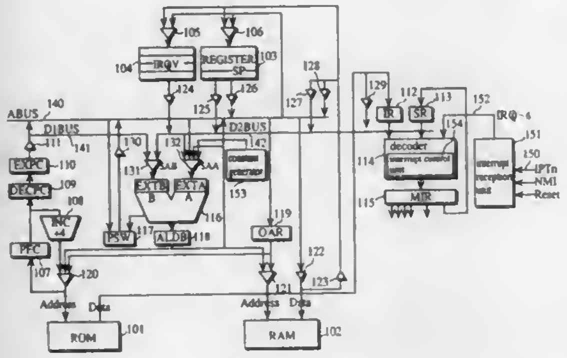
Shinya Miyaji, Nara, and Nobuo Higaki, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 30, 1996, Ser. No. 640,082

Claims priority, application Japan, May 11, 1995, 7-113130

Int. Cl.^{6} G06F *9/46;13/24*

U.S. Cl. 395—733 **12 Claims**



1. An interrupt control device for an embedded microcomputer including I/O devices and a processor core comprising:

program storage means for storing interrupt processing programs, each corresponding to an interrupt level signal, in sequential areas;

start address hold means for holding start addresses, which are updatable, of the interrupt processing programs;

level hold means for holding an interrupt level, which are updatable, of each interrupt signal;

interrupt reception means for, when at least one out of a plurality of interrupt signals inputted from the I/O devices becomes effective, receiving an interrupt signal of a highest interrupt level out of the inputted interrupt signals and outputting an interrupt level signal of the same interrupt level; and

control means for controlling a branch, when the interrupt level signal is outputted, by fetching one of the start addresses which corresponds to the interrupt level of the interrupt request signal from the start address hold means and setting the start address in a program counter.

5,748,971

OPTION CARD HIBERNATION SYSTEM

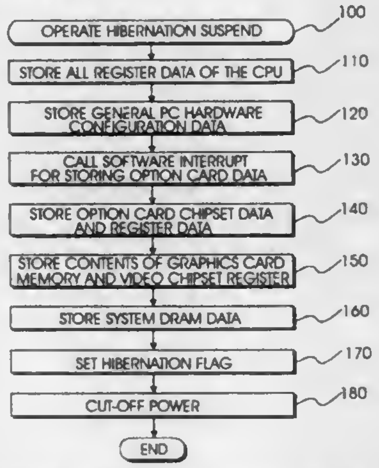
Seung-Beom Choi, Seoul; Shung-Hyun Cho, Kyonggi-do, and Noh-Byung Park, Seoul, all of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 5, 1996, Ser. No. 583,593

Claims priority, application Rep. of Korea, Jan. 6, 1995, 1995/187

Int. Cl.^{6} G06F *1/00;1/18*

U.S. Cl. 395—750.03 **13 Claims**


OPERATE HIBERNATION SUSPEND
100
STORE ALL REGISTER DATA OF THE CPU
110
STORE GENERAL PC HARDWARE CONFIGURATION DATA
120
CALL SOFTWARE INTERRUPT FOR STORING OPTION CARD DATA
130
STORE OPTION CARD CHIPSET DATA AND REGISTER DATA
140
STORE CONTENTS OF GRAPHICS CARD MEMORY AND VIDEO CHIPSET REGISTER
150
STORE SYSTEM DRAM DATA
160
SET HIBERNATION FLAG
170
CUT-OFF POWER
180
END

1. A hibernation system for a computer having a hibernation state and an operating state and employing option cards, comprising:

a power management system for outputting a hibernation interrupt signal in case of power failure or a period of non-use;

an operation controlling means for performing a hibernation function comprising backing up a current operating state upon receiving an output hibernation interrupt signal from the power management system, and outputting a power supply cut-off signal and for performing a restoring function for restoring the computer into said current operating state just prior to the performing of the hibernation function when a particular event occurs;

a basic input/output system means for causing a generation of a software interrupt for storing option card data once the hibernation function is to be performed by the operation controlling means and a software interrupt for restoring option card data when the restoring function is to be performed by the operation controlling means; and

a plurality of option cards mounted on extension slots, each option card, in response to said software interrupt for storing option card data of the basic input/output system means, causes the generation of a software interrupt for storing data by generating an interrupt routine for storing chipset data and register data for initializing, and in response to said software interrupt for restoring option card data of the basic input/output system means, causes the generation of a software interrupt for restoring the option data by generating an interrupt routine for performing initialization according to the previously stored chipset data and register data.

5,748,972

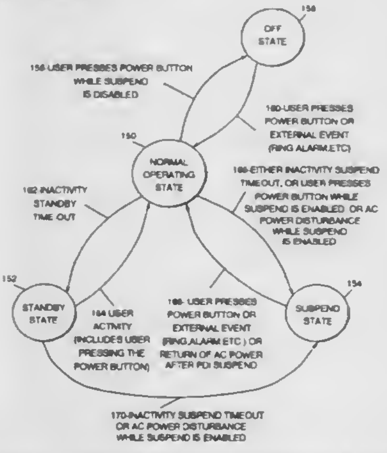
COMPUTER SYSTEM WHICH IS OPERATIVE TO CHANGE FROM A NORMAL OPERATING STATE TO A SUSPEND STATE WHEN A POWER SUPPLY THEREOF DETECTS THAT AN EXTERNAL SOURCE IS NO LONGER PROVIDING POWER TO SAID POWER SUPPLY AT A PREDETERMINED LEVEL

Michael William Clark, Hillsborough; James Alfred Hearney, Durham; Duane Edward Norris, and Paul Harrison Benson, IV, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1996, Ser. No. 639,639

Int. Cl.^{6} G06F *1/30;1/32*

U.S. Cl. 395—750.05 **26 Claims**


158
OFF STATE
156-USER PRESSES POWER BUTTON WHILE SUSPEND IS DISABLED
160-USER PRESSES POWER BUTTON OR EXTERNAL EVENT (RING ALARM,ETC)
150
NORMAL OPERATING STATE
162-INACTIVITY STANDBY TIME OUT
166-EITHER INACTIVITY SUSPEND TIMEOUT, OR USER PRESSES POWER BUTTON WHILE SUSPEND IS ENABLED OR AC POWER DISTURBANCE WHILE SUSPEND IS ENABLED
152
STANDBY STATE
164 USER ACTIVITY (INCLUDES USER PRESSING THE POWER BUTTON)
168- USER PRESSES POWER BUTTON OR EXTERNAL EVENT (RING ALARM ETC.) OR RETURN OF AC POWER AFTER PDI SUSPEND
154
SUSPEND STATE
170-INACTIVITY SUSPEND TIMEOUT OR AC POWER DISTURBANCE WHILE SUSPEND IS ENABLED

1. A computer system capable of operating in at least two states of power management, namely a normal operating state in which code is executed by said computer system and a suspend state, the system comprising:

(a) a CPU capable of executing said code;

(b) power management circuitry in circuit communication with said CPU for selectively changing the state of said computer system between said normal operating state and said suspend state responsive to a first control signal;

(c) a switch in circuit communication with said power management circuitry,

(d) a power supply in circuit communication with said CPU, said power management circuitry and said switch, said power supply comprising circuitry for selectively providing system power from an external source to said computer system responsive to said power management circuitry, characterized by having a first power supply state, a second power supply state and a third power supply state and further characterized by having circuitry for providing auxiliary power to said power management circuitry, said power supply further comprising circuitry for providing system power to said computer system and auxiliary power to said power management circuitry from an internal source, said power supply being operative to generate a second control signal to said switch when said system in said normal operating state and said external source stops providing power at a predetermined level to said power supply,

wherein said first power supply state is characterized by said power supply providing system power to said computer system from said external source and auxiliary power to said power management circuitry from said external source,

wherein said second power supply state is characterized by said power supply not providing system power to said computer system from said external source and said power supply providing auxiliary power to said power management circuitry from said external source,

wherein said third power supply state is characterized by said power supply providing system power to said computer system and auxiliary power to said power management processor from said internal source,

wherein said normal operating state is characterized in that said power supply is in said first power supply state; and

wherein said suspend state is characterized by the code executing on the CPU being reversibly interrupted such that the execution of the code on the CPU is capable of being resumed after the power supply changes to said first power supply state, and

wherein responsive to said power supply activating said second control signal while said system is in said normal operating state, said switch generates a closure event which activates said first control signal, said power management circuitry being characterized in that in response to activation of said first control signal said power management circuitry causes said computer system to change to said suspend state.

5,748,973

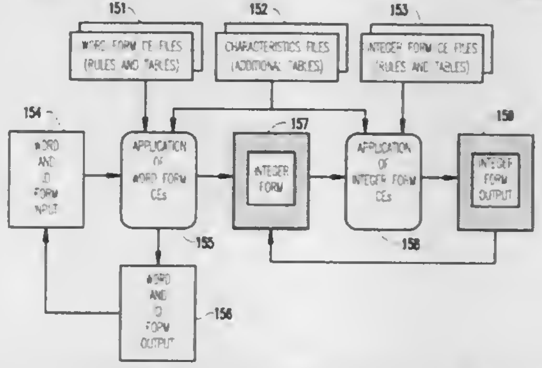
ADVANCED INTEGRATED REQUIREMENTS ENGINEERING SYSTEM FOR CE-BASED REQUIREMENTS ASSESSMENT

James D. Palmer, and Richard P. Evans, both of Fairfax County, Va., assignors to George Mason University, Fairfax, Va.

Filed Jul. 15, 1994, Ser. No. 275,422

Int. Cl.^{6} G06F *17/27*

U.S. Cl. 395—759 **5 Claims**


151
WORD FORM CE FILES (RULES AND TABLES)
152
CHARACTERISTICS FILES (ADDITIONAL TABLES)
153
INTEGER FORM CE FILES (RULES AND TABLES)
154
WORD AND ID FORM INPUT
APPLICATION OF WORD FORM CEs
157
INTEGER FORM
APPLICATION OF INTEGER FORM CEs
159
INTEGER FORM OUTPUT
155
158
WORD AND ID FORM OUTPUT
156

1. A user-interactive computer-aided English text categorization method that supports the use of quantified conditions and implemented on a computer having a computer user interface for prompting and receiving user selections and inputs, said method comprising the steps of:

accepting input as English language text, formatting the text for subsequent processing, and assigning identifications (IDs) to sets of the input English language text;

establishing the characteristics of a complete set of text as the basis for the quantifiable conditions, the characteristics including co-occurring terms, pair-wise syntactic similarity coefficients (SCs), combinations of parts of speech;

constructing interactively with prompted operator input classification ectypes (CEs) as text-edited rules and tables to specify the quantified conditions for representation of a category within a classification structure, said CEs being of two forms, word form and integer form CEs, said word form CEs being based on a list of designated words from the input English language text, said integer form CEs being of two types, ID-based and SC-based, ID-based CEs supporting logical operations as a basis for categorizing statements and SC-based CEs using the pair-wise SCs between statements; and

applying constructed CEs to prepare lists of candidates for each category.

/OL
2 10
ISS
1
MY
5
998
JMI

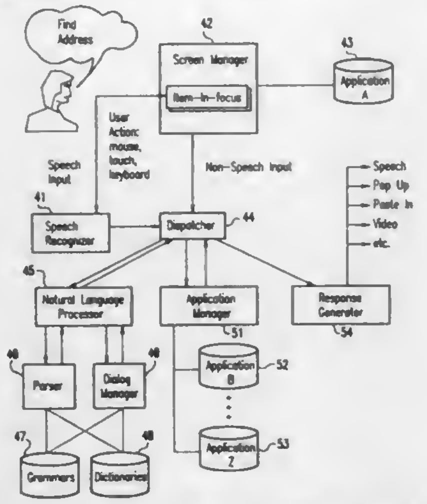
5,748,974
MULTIMODAL NATURAL LANGUAGE INTERFACE FOR CROSS-APPLICATION TASKS

David Edward Johnson, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1994, Ser. No. 354,987

Int. Cl.^{6} G06F *9/45*

U.S. Cl. 395—759 **8 Claims**



1. A multimodal natural language interface for a computer system which interprets user requests combining natural language input from the user with information selected from a current application running on the computer system and sends the request in proper form to an appropriate auxiliary application for processing, the multimodal natural language interface comprising:

- a dispatcher receiving a natural language input from the user and combining the natural language input with input information selected from a current application to form a combined multimodal request;
- a parser receiving the combined multimodal request for parsing the combined multimodal request;
- a natural language processor performing semantic interpretation of the parsed combined multimodal request and generating a semantic representation of the combined multimodal request;
- an application manager receiving the semantic representation from the natural language processor for determining which auxiliary application should process the request, said application manager invoking the auxiliary application and generating application program interface (API) code to access requested information via the auxiliary application, the accessed requested information being supplied to said dispatcher; and
- a response generator receiving the accessed requested information from the dispatcher for generating a response as may be applicable to the user's request.

5,748,975
SYSTEM AND METHOD FOR TEXTUAL EDITING OF STRUCTURALLY-REPRESENTED COMPUTER PROGRAMS WITH ON-THE-FLY TYPOGRAPHICAL DISPLAY

Michael L. Van De Vanter, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

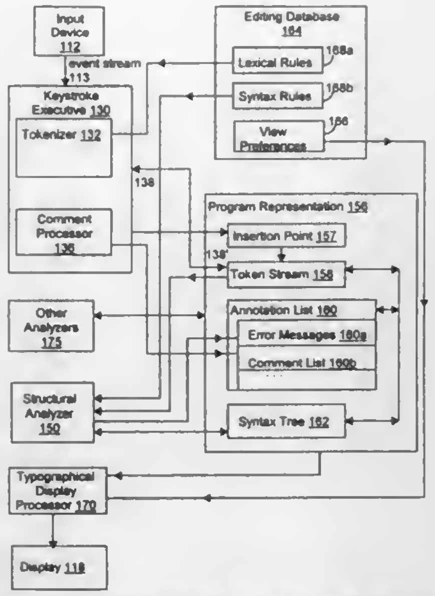
Filed Jul. 6, 1995, Ser. No. 499,084

Int. Cl.^{6} G06F *17/21*

U.S. Cl. 395—793 **33 Claims**

1. A process for editing structurally represented computer programs with on-the-fly prettyprinting comprising the steps of:

- maintaining a token stream representation of a computer program after each input event that occurs as said program is entered, wherein said token stream representation comprises a sequence of tokens, each of said tokens characterized according to a set of extended lexical properties relative to the language of said computer program, said maintaining step requiring no maintenance of a text stream representation of said program; and
- typographically displaying said program as said program is entered based on said token stream representation of said program, wherein said extended lexical properties of said tokens influence said typographical display of said tokens.



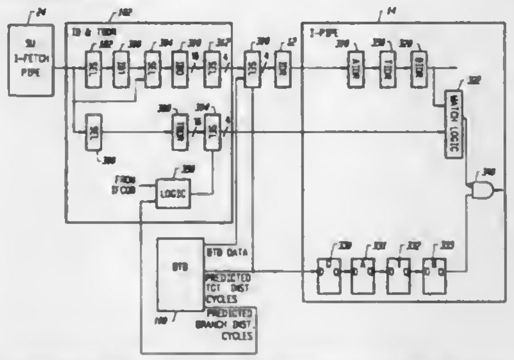
5,748,976
MECHANISM FOR MAINTAINING DATA COHERENCY IN A BRANCH HISTORY INSTRUCTION CACHE

Michael Demar Taylor, San Jose, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 18, 1993, Ser. No. 138,341

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—800 **1 Claim**



1. System for maintaining data integrity in a pipeline processor, the system comprising:

- an instruction pipeline comprising a plurality of segments for processing instructions;
- a branch target buffer coupled to the instruction pipeline, the branch target buffer supplying a first stream of instructions to be processed to the instruction pipeline following a particular branch instruction, the first stream of instructions beginning with a predicted target of the particular branch instruction, said first stream of instructions having been stored in the branch target buffer after a previous processing of the particular branch instruction;
- a prefetch pipeline comprising a plurality of segments for prefetching instructions from a cache memory, the prefetch pipeline fetching and supplying a second stream of instructions beginning with a target of the particular branch instruction, and fetching and supplying a third stream of instructions as determined from signals received from the system after processing of instructions in the instruction pipeline;

- a target register coupled to the prefetch pipeline and the instruction pipeline, the target register receiving the second stream of instructions and supplying the second stream of instructions to a given one of the segments in correspondence with receipt by the given segment of first instructions supplied from the branch target buffer;
- a match means coupled to the instruction pipeline and the target register, the match means comparing each first instruction in the given segment with a corresponding instruction from the target register and indicating if a mismatch occurs;
- a fetch data register coupled to the prefetch pipeline, the fetch data register storing the second stream of instructions as received from the prefetch pipeline; and
- an instruction buffer coupled to the fetch data register, the prefetch pipeline and the instruction pipeline, the instruction buffer receiving the second stream of instructions from the fetch data register and providing the second stream of instructions to the instruction pipeline when the match means indicates a mismatch, and receiving the third stream of instructions from the prefetch pipeline and providing the third stream of instructions to the instruction pipeline after the first stream of instructions are supplied by the branch target buffer when the match means indicates a match.

5,748,977
MULTIPLY CONNECTABLE MICROPROCESSOR AND MICROPROCESSOR SYSTEM

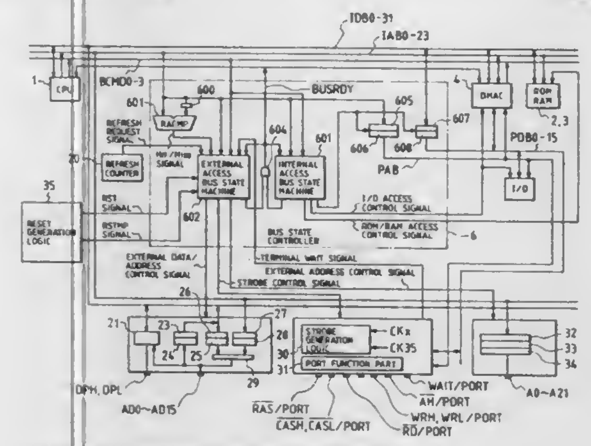
Shumpei Kawasaki, Kodaira; Kaoru Fukada, Koganei; Mitsuru Watabe, Uridura; Kouki Noguchi, Kokubunji; Kiyoshi Matsubara, Higashimurayama; Isamu Mochizuki, Tachikawa; Kazufumi Suzukawa, Ichikawa; Shigeki Masumura, Kodaira; Yasushi Akao, Kokubunji, and Eiji Sakakibara, Kodaira, all of Japan, assignors to Hitachi, Ltd.; Hitachi Microcomputer System Ltd., and Hitachi ULSI Engineering Corp., all of Tokyo, Japan

Continuation of Ser. No. 517,151, Aug. 21, 1995, Pat. No. 5,530,965. This application Apr. 4, 1996, Ser. No. 628,241

Claims priority, application Japan, Nov. 6, 1992, 4-322598

Int. Cl.^{6} G06F *12/00;13/00*

U.S. Cl. 395—800 **1 Claim**



1. A microcomputer system comprising:

- an address non-multiplexed type memory having address input terminals, data terminals and a chip select signal input terminal;
- a device having address and data multiplexed terminals and a chip select signal input terminal; and
- a single-chip microcomputer having address output terminals coupled to the address input terminals of the address non-multiplexed type memory, external terminals coupled to the data terminals of the address non-multiplexed type memory and coupled to the address and data multiplexed terminals of the device, a first chip select signal output terminal coupled to the chip select signal input terminal of the address non-multiplexed type memory, and a second chip select output terminal coupled to the chip select input terminal of the device, wherein the single-chip microcomputer further comprises:
- a central processing unit;
- an internal bus coupled to the central processing unit, and including an address bus and a data bus;
- a first address output circuit, coupled to the address bus, selectively providing an address signal on the internal bus to the address output terminals in response to an access to the address non-multiplexed type memory, wherein the first address output circuit selectively providing multiplexed address signals as row and column address signals, which are multiplexed and which are for an address multiplexed type memory, to ones of the address terminals in response to a control signal indicating an access to the address multiplexed type memory;
- an interface circuit including
  - a data input circuit having inputs coupled to the external terminals and outputs coupled to the data bus, and including a first data aligner for performing data alignment when reading data into the single-chip microcomputer having a bit length smaller than a bit length of the data bus;
  - a multiplexer having outputs coupled to the external terminals and first and second inputs;
  - a second address output circuit coupled between the address bus and the first inputs of the multiplexer; and
  - a data output circuit coupled between the data bus and the second inputs of the multiplexer, and including a second data aligner for performing data alignment when outputting data having a bit length smaller than a bit length of the data bus out from the single-chip microcomputer;
  - wherein the first and second data aligners in the interface circuit enable the single-chip microcomputer to communicate between a device having a different data bit length than the bit length of the data bus of the single-chip microcomputer;
- a strobe signal generation circuit selectively providing a first chip select signal to the first chip select signal output terminal in response to the access to the address non-multiplexed type memory and selectively providing a second chip select signal to the second chip select signal output terminal in response to the access to the device; and,
- a controller coupled to the internal bus and selectively controlling the multiplexer in the interface circuit and the strobe signal generation circuit in response to the access to the device so that the multiplexer outputs an address of the device and data for the device in sequence, the controller further including a control bit having a predetermined state indicating that the first address output circuit does not provide the multiplexed address signal to the address output terminals.

5,748,978
BYTE QUEUE DIVIDED INTO MULTIPLE SUBQUEUES FOR OPTIMIZING INSTRUCTION SELECTION LOGIC

Rammohan Narayan, and Thang M. Tran, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 17, 1996, Ser. No. 650,940

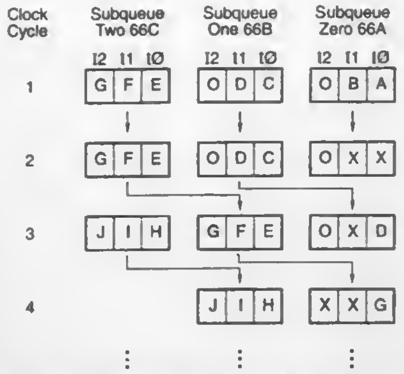
Int. Cl.^{6} G06F *15/78;15/82*

U.S. Cl. 395—800.23 **20 Claims**

1. An apparatus for aligning instructions to a plurality of issue positions, comprising:

- a queue for storing instructions, said queue including:
  - a first portion configured to store a first block of instructions, wherein said first portion is further configured to store a first valid indication indicative of validity of a first instruction within said first block of instructions and a second valid indication indicative of validity of a second instruction within said first block of instructions, and wherein said second instruction is subsequent to said first instruction in program order;

VOL
210
ISS
1
MY
5
1998
UMI



- a second portion configured to store a second block of instructions, wherein said second portion is further configured to store a third valid indication indicative of validity of a third instruction within said second block of instructions and a fourth valid indication indicative of validity of a fourth instruction within said second block of instructions, and wherein said fourth instruction is subsequent to said third instruction in program order;

a selection control unit coupled to said queue, wherein said selection control unit is configured to select a first dispatched instruction from said first instruction and said third instruction, and wherein said first dispatched instruction is dispatched to a first one of said plurality of issue positions, and wherein said first instruction is selected if said first valid indication indicates validity, and wherein said third instruction is selected if said first valid indication indicates invalidity and said third valid indication indicates validity; and

a control unit coupled to said queue and to said selection control unit, wherein said control unit is configured to shift said second valid indication into said first valid indication if said first instruction is selected by said selection control unit, and wherein said control unit is configured to shift said second portion of said queue into said first portion of said queue if instructions within said first portion of said queue have been dispatched.

5,748,979

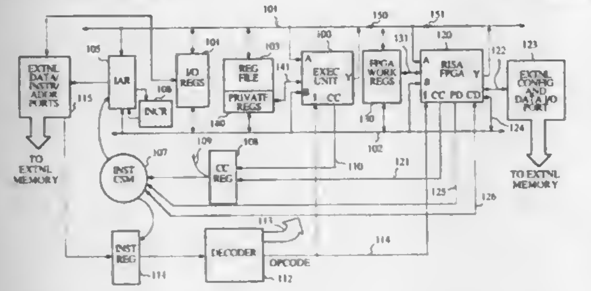
REPROGRAMMABLE INSTRUCTION SET ACCELERATOR USING A PLURALITY OF PROGRAMMABLE EXECUTION UNITS AND AN INSTRUCTION PAGE TABLE

Stephen M. Trimberger, 1261 Chateau Dr., San Jose, Calif. 95120

Continuation-in-part of Ser. No. 417,337, Apr. 5, 1995. This application Jun. 7, 1995, Ser. No. 483,240

Int. Cl.^{6} G06F *15/76;9/30*

U.S. Cl. 395—800.37 **29 Claims**



1. A data processor comprising:

internal buses for operand and result data;

a defined execution unit coupled to the internal buses for execution of defined instructions;

a plurality of separately configurable execution units coupled to the internal buses for execution of respective sets of programmed instructions; and

a condition code register connected to at least one of the configurable execution units to receive condition codes from said at least one of the configurable execution units.

5,748,980

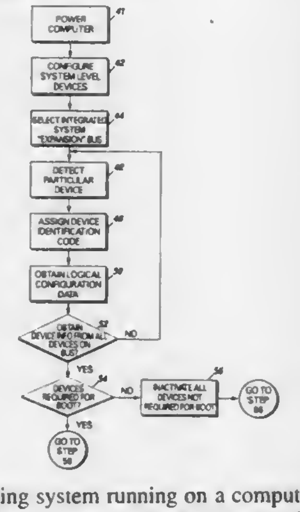
SYSTEM FOR CONFIGURING A COMPUTER SYSTEM

Ralph A. Lipe, Woodinville, and Pierre-Yves Santerre, Bellevue, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 250,698, May 27, 1994. This application Dec. 13, 1994, Ser. No. 356,058

Int. Cl.^{6} G06F *15/177;11/267*

U.S. Cl. 395—828 **19 Claims**


POWER COMPUTER
CONFIGURE SYSTEM LEVEL DEVICES
SELECT INTEGRATED SYSTEM "EXPANSION" BUS
DETECT PARTICULAR DEVICE
ASSIGN DEVICE IDENTIFICATION CODE
OBTAIN LOGICAL CONFIGURATION DATA
OBTAIN DEVICE INFO FROM ALL DEVICES ON BUS?
NO
YES
DEVICES REQUIRED FOR BOOT?
NO
INACTIVATE ALL DEVICES NOT REQUIRED FOR BOOT
GO TO STEP
YES
GO TO STEP

1. In an operating system running on a computer having at least one system bus, said operating system characterized by enumerators and a configuration manager, each enumerator assigned to a particular system bus and operative for enumerating each device connected to said particular bus, said configuration manager operative for managing the configuration of said devices by maintaining a hardware tree containing device nodes representing enumerated devices, a method for causing a selected enumerator to enumerate one of the devices on said particular system bus in response to detecting the addition of another device to said particular system bus, comprising the steps of:

issuing, by said selected enumerator, an application program interface (API) call to said configuration manager to cause the generation of a message to enumerate one of the devices on said particular system bus assigned to said selected enumerator, said API call including a parameter defining one of said device nodes representing the device to be enumerated by said selected enumerator; and

receiving, by said selected enumerator, said message from said configuration manager to enumerate said device represented by said device node defined by said parameter.

5,748,981

MICROCONTROLLER WITH IN-CIRCUIT USER PROGRAMMABLE MICROCODE

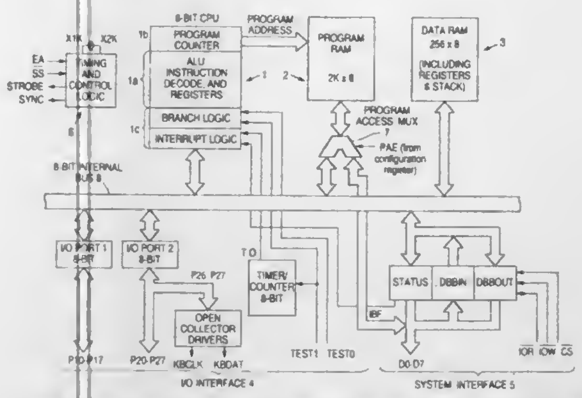
Paul J. Patchen; Hon C. Fung, both of Arlington, Tex.; Fred Leung, Cupertino, and Steven McGinness, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 454,427, May 30, 1995, abandoned, which is a continuation of Ser. No. 963,782, Oct. 20, 1992, abandoned. This application Nov. 13, 1996, Ser. No. 748,970

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—828 **10 Claims**

1. A keyboard controller for use in a computer system to control and manipulate data passing between a keyboard and a computer system, the keyboard controller comprising:



a central processing unit for controlling and manipulating data passing between the keyboard and the computer system in accordance with a control program;

a program random access memory (program RAM) for receiving and storing the control program;

a bus for transferring data, with the bus being coupled to the keyboard, the central processing unit, and the computer system; and

a program access enable unit coupled to the bus, the computer system and the program RAM, with the program access enable unit being selectively set in a first state or a second state so that when the program access enable unit is in the first state the control program is transferred directly from the computer system to the program RAM, without being transferred over the bus, via the program access enable unit, and when the program access enable unit is in the second state data is transferred between the bus and the program RAM via the program access enable unit.

5,748,982

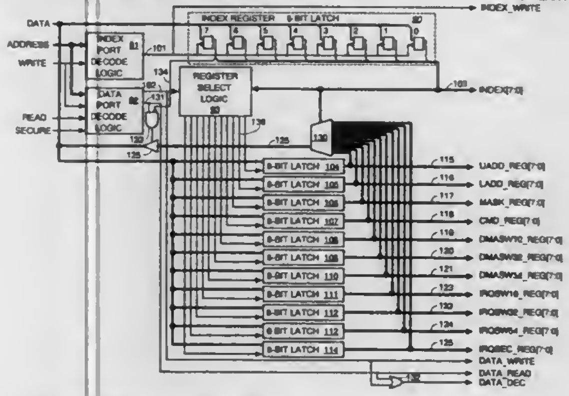
APPARATUS FOR SELECTING A USER PROGRAMMABLE ADDRESS FOR AN I/O DEVICE

Jimmy Dean Smith; Mark D. Nicol, both of Stevensville, Mich.; Brian K. Straup, South Bend, Ind.; Terence Paul O'Brien, Saint Joseph, Mich.; Mark Layne Herman, Saint Joseph, Mich., and Terrence A. Hussey, Saint Joseph, Mich., assignors to Packard Bell NEC, Sacramento, Calif.

Continuation of Ser. No. 43,191, Apr. 5, 1993, abandoned. This application Mar. 15, 1996, Ser. No. 616,430

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—829 **4 Claims**



1. An apparatus comprising:

a memory device for storing one or more user programmable address signals for addressing a predetermined input/output (I/O) device, said one or more user programmable address signals being software programmable;

a decoder for decoding said one or more user programmable address signals and generating a select signal;

means for enabling said predetermined I/O device to be selected by said select signal at any of said one or more user programmable addresses;

means for receiving an external write signal and generating a control signal to enable data to be written to said I/O device once it has been selected; and

means for receiving an external read signal and generating a control signal to enable data to be read from said I/O device once it has been selected.

5,748,983

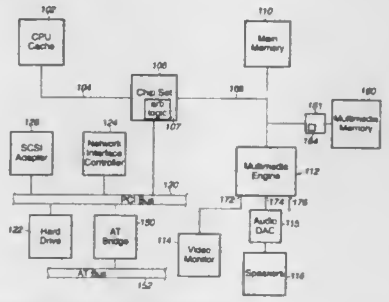
COMPUTER SYSTEM HAVING A DEDICATED MULTIMEDIA ENGINE AND MULTIMEDIA MEMORY HAVING ARBITRATION LOGIC WHICH GRANTS MAIN MEMORY ACCESS TO EITHER THE CPU OR MULTIMEDIA ENGINE

Dale E. Gulick; Andy Lambrecht; Mike Webb; Larry Hewitt, all of Austin, and Brian Barnes, Round Rock, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 474,554

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—842 **15 Claims**



1. A computer system, comprising:

a CPU;

chip set logic coupled to the CPU, wherein the chip set logic includes arbitration logic for coupling to a memory bus, and wherein the chip set logic includes expansion bus bridge logic for coupling to an expansion bus;

an expansion bus coupled to the chip set logic;

one or more peripheral devices coupled to the expansion bus;

a memory bus coupled to the chip set logic;

main memory coupled to the memory bus which stores data accessible by the CPU;

multimedia memory coupled to the memory bus for storing multimedia data;

a direct memory access engine coupled to said memory bus, wherein said direct memory access engine retrieves data from said main memory and stores said data in said multimedia memory;

a multimedia engine coupled to the memory bus, wherein said multimedia engine comprises:

- one or more DSP engines coupled to said memory bus, wherein said one or more DSP engines process said multimedia data stored in said multimedia memory;
- one or more input/output channels coupled to said one or more DSP engines for transmitting data;
- a video port coupled to at least one of said one or more input/output channels, wherein said video port is adapted for coupling to a video monitor;
- an audio port coupled to at least one of said one or more input/output channels, wherein said audio port is adapted for transferring audio data;

arbitration logic coupled between said memory bus and said multimedia memory, wherein said arbitration logic receives multimedia memory access requests from each of said CPU and said multimedia engine and grants multimedia memory access to either of said CPU or said multimedia engine; and

second arbitration logic coupled to said CPU and said memory bus, wherein said second arbitration logic receives main memory access requests from each of said CPU and said direct memory access engine and grants main memory access to either of said CPU or said direct memory access engine.

/OL
2 10
ISS
1
MY
5
998
JMI

5,748,984

AD CONVERTING APPARATUS INCLUDING HOLDING MEANS INDICATING WHETHER OR NOT DATA AFTER AD CONVERSION HAS BEEN PREVIOUSLY USED

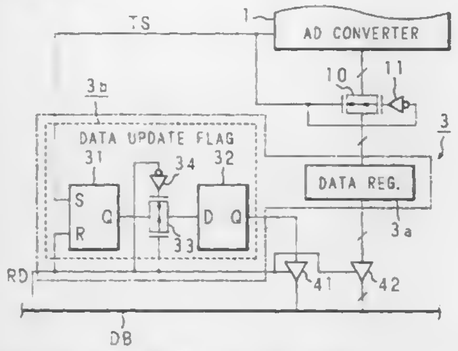
Mitsuru Sugita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, both of Japan

Filed May 23, 1995, Ser. No. 447,588

Claims priority, application Japan, Sep. 5, 1994, 6-221250

Int. Cl.^{6} G06F *11/00;* H03M *1/38*

U.S. Cl. 395—889 **19 Claims**



1. An AD converting apparatus, comprising:

an AD converter for converting an analog signal to digital data; and

data storing means for storing the digital data obtained by said AD converter; and

further comprising holding means for holding a first value when an analog signal is newly converted by said AD converter to digital data and is stored into said data storing means, and for holding a second value when the contents of said data storing means are read out externally in a state under which said first value has been stored therein.

5,748,985

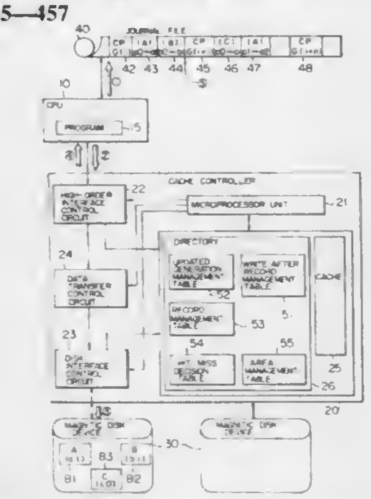
CACHE CONTROL METHOD AND CACHE CONTROLLER

Sadasaburo Kanai, Kawasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1993, Ser. No. 76,856

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—457 **16 Claims**



1. A method of controlling a cache in a computer system which includes a central processing unit (CPU), a direct access storage device, a cache disposed between the CPU and the storage device for temporarily storing therein a record transferred between the CPU and the storage device, a cache controller for controlling the cache, and a program executed by the CPU and issuing record update requests for the storage device, comprising the steps of:

issuing from the CPU executing the program a checkpoint request with a checkpoint identifier to the cache controller;

generating by the cache controller, in response to the checkpoint request issued by the CPU, an update generation identifier corresponding to the checkpoint identifier of the checkpoint request and indicating when an update record in the cache to be written into the storage device is first written into the cache in response to an update request issued by the CPU;

writing by the cache controller an update record into the cache in response to the update request issued by the CPU;

notifying by the cache controller completion of the write operation to the CPU when the update record is written into the cache; and

writing by the cache controller the update record in the cache into the storage device,

wherein the step of writing the update record into the cache includes the step of recording the update generation identifier generated at the last checkpoint with the update record as the update generation identifier of the update record if the update generation identifier of the undated record is not recorded, and

the step of writing the update record in the cache into the storage device includes the step of deciding an order of writing the update record into the storage device based on the update generation identifier of the update record.

5,748,986

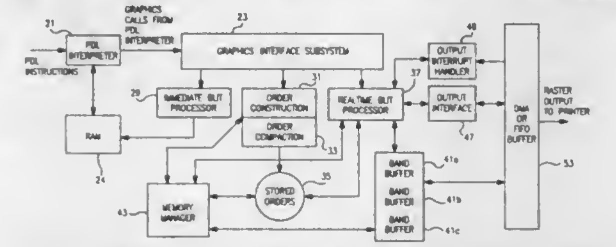
METHOD AND APPARATUS FOR DISPLAYING A PAGE WITH GRAPHICS INFORMATION ON A CONTINUOUS SYNCHRONOUS RASTER OUTPUT DEVICE

Stephen R. Butterfield, Manhattan Beach; Donald E. Phillips, Garden Grove; Barbara B. Renshaw, Manhattan Beach; Steven K. Nelson, Harbor City, and Robert F. Hossley, El Segundo, all of Calif., assignors to Peerless Systems Corporation, El Segundo, Calif.

Continuation of Ser. No. 277,788, Jul. 20, 1994, Pat. No. 5,502,804, which is a continuation of Ser. No. 74,016, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 564,417, Aug. 8, 1990, abandoned. This application Mar. 25, 1996, Ser. No. 621,396

Int. Cl.^{6} G06T *11/00;11/60*

U.S. Cl. 395—763 **4 Claims**



1. An apparatus for creating a page image which includes graphics information for display on a continuous synchronous raster output device, said apparatus comprising:

a) means for receiving commands which define the page image to be output;

b) means for generating a set of graphics orders which represent the page image being created from the received commands, wherein a graphics order is a graphics function represented as a low level primitive, such that:

   i) said graphics orders are processed into bands of bitmap images for delivery to the output device at a speed required by the output device so that the generated bands of graphics information needed to produce a complete page image use an amount of memory which is less than the amount of memory which would be needed to store the complete page image; and

   ii) while the graphics information in a first one of said bands is being output by said output device, the bitmap images for a second one of said bands are being generated;

c) means for generating said bands of bitmap images from said graphics orders;

d) means for outputting said generated bands of bitmap images to said output device

wherein said graphics orders generation means comprises:

i) graphics interface subsystem means for receiving said commands and passing said received commands to at least one of a memory manager means, a bit block transfer processor means and an order construction means coupled to a memory;

ii) said memory manager means for allocating and deallocating block of said memory in response to requests issued by said graphics interface subsystem means and said order construction means;

iii) said bit block transfer processor means for drawing pixels in a user memory based upon a pixel drawing command passed by said graphics interface subsystem means;

iv) said order construction means for building graphics orders based upon bit block transfer arguments passed by said graphics interface subsystem means, which built graphics orders operate on a plurality of destination pixel groups.

5,748,987

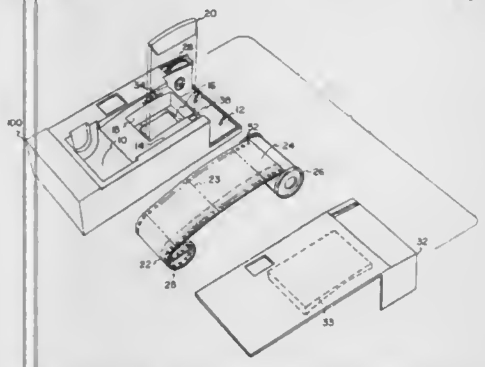
PRODUCING SMOOTHLY BLENDED DOUBLE EXPOSURE COMPOSITE IMAGES

Robert Lee Craig, Pfafftown, N.C., assignor to Photo Dimensions, Winston-Salem, N.C.

Continuation of Ser. No. 670,352, Jun. 25, 1996, Pat. No. 5,615,396. This application Feb. 26, 1997, Ser. No. 806,190

Int. Cl.^{6} G03B *1/00;11/00;17/02;17/24*

U.S. Cl. 396—6 **43 Claims**



1. A length of film for photographic exposure in a camera comprising a first exposed area, and an unexposed area for exposure to a target image, the unexposed area being the portion of the film not containing the first exposed area; the first exposed area on the film having been partially pre-exposed, thereby being conditioned for re-exposure under a partially reduced exposure intensity with respect to the target image when the target image is exposed to the unexposed portion of the film, and thereby permitting the production of film having both a re-exposed area and the target image.

5,748,988

QUIETLY OPERATING ANTI-BACKUP PAWL FOR MANUAL FILM ADVANCE THUMBWHEELIN CAMERA

John H. Alligood, Penfield; Mark A. Lamphron, Rochester, and David Cipolla, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

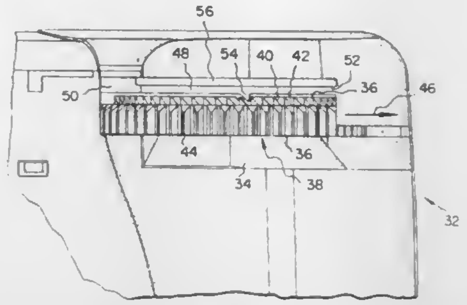
Filed Mar. 13, 1997, Ser. No. 816,282

Int. Cl.^{6} G03B *17/02;1/00*

U.S. Cl. 396—6 **7 Claims**

1. A camera comprising a rotatable part to be rotated in a predetermined direction and having a continuous alternating series of teeth and spaces, and a flexible beam having an anti-backup pawl to be received in anyone of said spaces to prevent reverse rotation of said rotatable part but being pushed out of anyone of the spaces to make said beam flex away from said rotatable part when the rotatable part is rotated in the predetermined direction, is characterized in that:

said beam has a pair of opposite ends fixed to be continuously held in place and said pawl is located between said fixed opposite ends, to make said beam be flexed only intermediate the fixed opposite ends when said pawl is pushed out of anyone of said spaces because of rotation of said rotatable part in the predetermined direction, whereby the natural frequency of vibration of said beam can be raised to make the noise of said pawl contacting successive ones of said teeth when said rotatable part is rotated in the predetermined direction less noticeable.



5,748,989

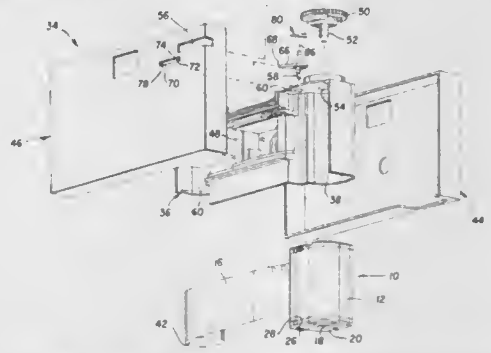
ONE-TIME-USE CAMERA WITH MANUAL CONTROL LEVER AND BI-DIRECTIONAL OVERCENTER SPRING FOR CLOSING MOVABLE LIGHT SHIELD OF FILM CASSETTE

Jude A. Sangregory, Spencerport, and Douglas H. Pearson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 8, 1997, Ser. No. 841,952

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **6 Claims**



1. A camera comprising a housing, a chamber within said housing for a film cassette which includes a light shield that is opened to allow movement of a filmstrip through a film passageway to the cassette interior and is closed to prevent ambient light from entering the cassette interior through the film passageway, and a driver rotatable within said housing in opening and closing directions in engagement with the light shield to open and close the light shield, is characterized in that:

a control lever connected to said driver can be rotationally positioned to protrude out of said housing from a slot in the housing, when the light shield is open, to permit said control lever to be grasped to be manually rotated in the closing direction to close the light shield, and can be positioned not to protrude out of the housing from said slot, when the light shield is closed, to substantially prevent the control lever from being grasped to be manually rotated in the opening direction to open the light shield.

5,748,990

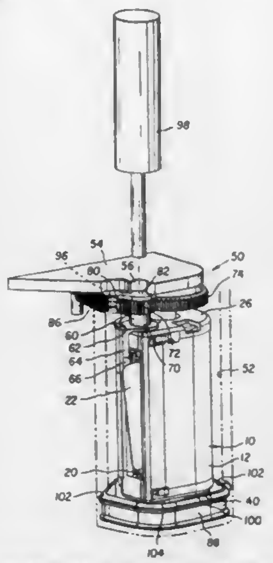
ONE-TIME-USE CAMERA WITH LID FLEXED TO UNCOVER CHAMBER WHEN CASSETTE FORCIBLY EJECTED FROM CHAMBER

David Clinton Smart, and Ralph Merwin Lyon, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 590,719, Jan. 24, 1996, abandoned. This application May 5, 1997, Ser. No. 851,555

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—6 **9 Claims**



1. A camera comprising a chamber for holding a film cassette and a lid for closing said chamber which is movable relative to said chamber to open the chamber, is characterized in that:

- an ingress opening to said chamber is located to admit an insertion tool into said chamber to push the cassette in the chamber against said lid to move the lid to open the chamber, to permit the cassette to be pushed out of the chamber;
- said chamber and said lid have respective peripheries with mutually engaging light-trapping portions which engage to secure the lid to light-tightly close the chamber, but which are separated when the lid is moved relative to the chamber to open the chamber; and
- said lid is flexible and has a fixed rigid non-resilient projection which protrudes into said chamber and is located to be pushed by the cassette in the chamber to flex the lid partially out of the chamber to move the lid relative to the chamber and make said engaging portion of the lid separate from said engaging portion of the chamber.

5,748,991

Patent Not Issued For This Number

5,748,992

CAMERA CONTROL DEVICE

Daiki Tsukahara, Hiratsuka, and Hideya Inoue, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

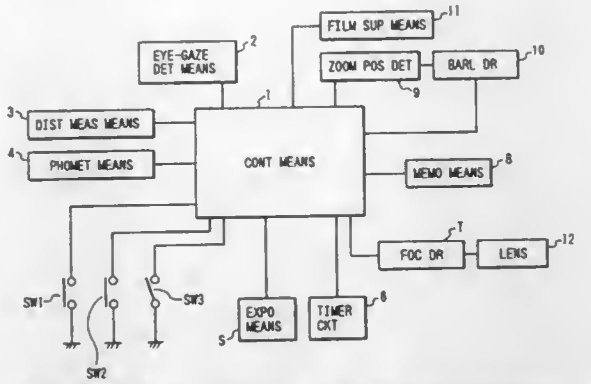
Continuation of Ser. No. 605,363, Feb. 22, 1996, abandoned, which is a continuation of Ser. No. 386,215, Feb. 9, 1995, Pat. No. 5,515,130, which is a continuation of Ser. No. 233,082, Apr. 25, 1994, abandoned, which is a continuation of Ser. No. 801,042, Dec. 3, 1991, abandoned. This application Dec. 27, 1996, Ser. No. 774,895

Claims priority, application Japan, Dec. 10, 1990, 2-409798; Dec. 11, 1990, 2-409981

Int. Cl.^{6} G03B *13/02*

U.S. Cl. 396—51 **30 Claims**

1. A control device comprising:



- an operating device capable of automatically performing an operation in relation to plural areas of a viewing field;
- an eye-gaze direction detector to detect an eye-gaze position of a user, corresponding to one of the areas of said viewing field, thereby specifying an area desired by the user; and
- a controller which, in case no area is specified by said eye-gaze direction detector, selects a predetermined area of said viewing field that is independent of eye-gaze direction detection, thereby causing said operating device to perform said operation with respect to said predetermined area.

5,748,993

IMAGE STABILIZING DEVICE

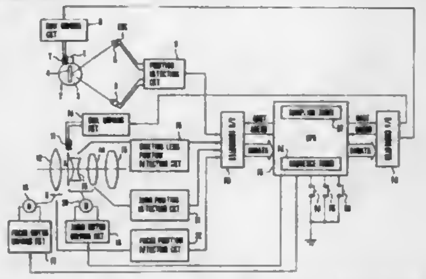
Yasuhiko Shiomi, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 40,279, Mar. 30, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,745

Claims priority, application Japan, Apr. 6, 1992, 4-112441

Int. Cl.^{6} B03B *17/00*

U.S. Cl. 396—52 **17 Claims**



1. An apparatus for use in an image shake preventing device for preventing image shake, the image shake preventing device including an operation unit and an initializing unit for initializing the operation unit, said apparatus comprising:

- an input device which inputs a predetermined signal; and
- a setting device which sets a parameter of an initializing operation by the initializing unit in accordance with the signal inputted by said input device.

5,748,994

OPTICAL DEVICE WITH AN IMAGE BLUR SUPPRESSION FUNCTION

Tadao Kai, Kawasaki; Nobuhiko Terui, Ichikawa, and Shinichi Tsukada, Toride, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 29, 1996, Ser. No. 638,752

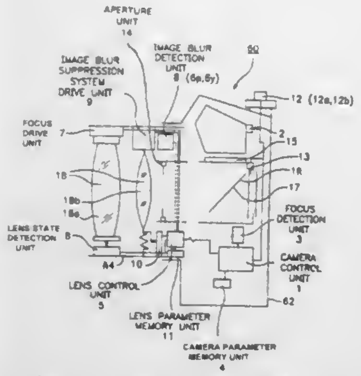
Claims priority, application Japan, Apr. 28, 1995, 7-106106; Apr. 19, 1996, 8-098317

Int. Cl.^{6} G03B *17/00;3/00*

U.S. Cl. 396—55 **24 Claims**

1. An optical device, comprising:

- a photographic optical system to produce a photographic image and including a suppression optical system to suppress image blur of the photographic image;


APERTURE UNIT
14
IMAGE BLUR SUPPRESSION SYSTEM DRIVE UNIT
9
IMAGE BLUR DETECTION UNIT
8
FOCUS DRIVE UNIT
7
LENS STATE DETECTION UNIT
6
FOCUS DETECTION UNIT
3
CAMERA CONTROL UNIT
1
LENS CONTROL UNIT
5
LENS PARAMETER MEMORY UNIT
11
CAMERA PARAMETER MEMORY UNIT
4
62
12
13
15
17

- a suppression detection unit to detect changes in said suppression optical system during the suppression of the image blur; and
- a constant generation unit to generate constants representative of changes to optical conditions for producing the photographic image resulting from the changes detected by said suppression detection unit,
  - wherein said optical device uses the constants to alter image taking conditions related to taking of a picture of the photographic image.

5,748,995

VIBRATION REDUCING APPARATUS AND VIBRATION REDUCING CAMERA

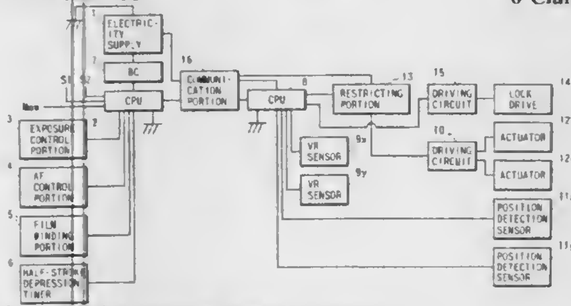
Yoshihisa Kitagawa, Kasukabe, and Shinichi Hirano, Utsunomiya, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 12, 1996, Ser. No. 713,251

Claims priority, application Japan, Sep. 14, 1995, 7-236823

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—55 **6 Claims**



4. A vibration reducing camera comprising:

- a vibration reducing apparatus comprising:
- a holding unit to hold a vibration reducing optical system:
- a vibration reducing drive unit to reduce vibrations of an object image by moving said holding unit:
- a lock unit to lock said holding unit in a predetermined position:
- a control unit to control said vibration reducing drive unit and said locking unit; and
- a determining unit to determine whether said holding unit should be locked in the predetermined position.
- wherein said determining unit outputs a lock signal to said control unit in response to an electricity supply to said vibration reducing apparatus so as to lock said holding unit in the predetermined position at least once before operating said vibration reducing drive unit,
- and said control unit, upon receiving the lock signal from the determining unit, controls said lock unit to lock said holding unit in the predetermined position;
- a signal generating unit to generate a get-ready-for photography signal; and
- a timer to count a predetermined time.
- wherein said determining unit causes the timer to start counting the predetermined time when the get-ready-for photography signal disappears, and said determining unit outputs the lock signal to said control unit when the get-ready-for photography signal is not again generated before the predetermined time elapses.

5,748,996

DEVICE AND METHOD FOR SENSING BRIGHTNESS

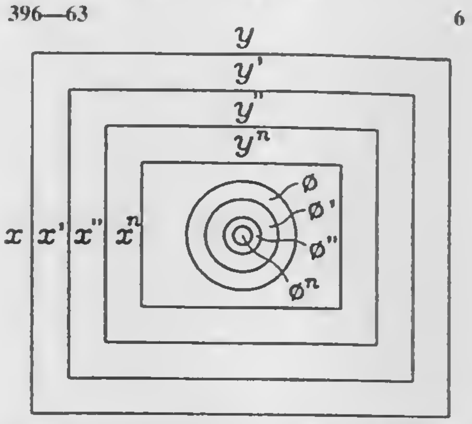
Ki-yul Lee, Buk-ku, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyungsangnam-do, Rep. of Korea

Filed Sep. 27, 1996, Ser. No. 720,006

Claims priority, application Rep. of Korea, Sep. 29, 1995, 95-33027

Int. Cl.^{6} G03B *7/00*

U.S. Cl. 396—63 **6 Claims**



1. A brightness sensing device, by which a brightness sensing area of a camera is varied, comprising:

- a zoom position sensing unit which senses the position of a lens displaced according to a zooming operation and outputs an electrical signal corresponding to the sensed position;
- a brightness sensing unit which is divided into a plurality of concentric rectangular cells, and wherein the brightness measuring unit measures the brightness applied to a cell and outputs an electrical signal corresponding to the measured brightness, the brightness sensing unit further including:
  - a central part which is divided into a plurality of concentric circular sensors for performing the functions of back light compensation and automatic flash exposure control under back light conditions, and wherein the circular sensor with the largest area is smaller than the rectangular cell with the smallest area; and
  - a control unit which detects the position of the lens by the signal outputted from the zoom position sensing unit, and wherein the control unit:
    - selects one cell of the plurality of rectangular cells of the brightness sensing unit, the selected rectangular cell corresponding to the sensed position, to set the exposure value according to the sensed position of the lens; and
    - outputs a driving signal to drive the selected cell.

5,748,997

CONTROL METHOD OF A ZOOM LENS CAMERA

Yasushi Tabata; Norio Numako; Yoshinari Tanimura; Takuma Sato; Masaaki Kishimoto; Hiroshi Nomura; Kazuyoshi Azegami, and Takamitsu Sasaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1997, Ser. No. 781,603

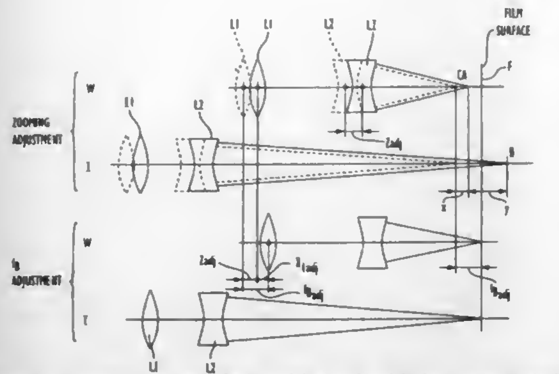
Claims priority, application Japan, Jan. 26, 1996, 8-012317; Feb. 21, 1996, 8-034121

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—87 **4 Claims**

1. A control method of a zoom lens camera comprising a lens system having a movable front lens group and a movable rear lens group, a first motor for moving said front lens group, a second motor for moving said rear lens group, a first pulse encoder

/OL
210
ISS
1
MY
5
998
JMI



adapted to control an angular position of said first motor and a second pulse encoder adapted to control an angular position of said second motor,

wherein said method comprises:

measuring positions of an image plane at a wide-angle position and a telephoto position to determine a difference between image plane positions in an optical axis direction;

obtaining a displacement of said front lens group in order to make said positions of said image plane at said wide-angle position and at said telephoto position identical without moving said rear lens group and determining a number of drive pulses of said first motor to move said front lens group by said obtained displacement;

deriving displacements of said front lens group and said rear lens group in order to make a position of said image plane, when said movement of said front lens group by said obtained displacement takes place, coincident with said focal plane of said camera to determine a number of drive pulses of said first and second motors necessary to move said front lens group and said rear lens group through said respective obtained displacements; and

controlling said first and second motors upon focusing, through said first pulse encoder and said second pulse encoder, respectively, in accordance with said number of drive pulses obtained during said obtaining step, a number of drive pulses obtained during said deriving step, a number of drive pulses based on focal length information, and a number of drive pulses based on object distance information.

5,748,998

CAMERA

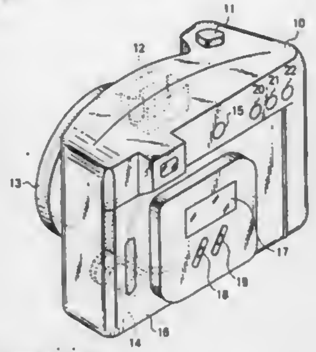
Minoru Ishiguro, and Jun'ichi Iwamoto, both of Saitama-ken, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitana-ken, Japan

Division of Ser. No. 536,943, Sep. 29, 1995, Pat. No. 5,701,520. This application May 30, 1997, Ser. No. 865,345

Claims priority, application Japan, Oct. 13, 1994, 6-247866; Oct. 13, 1994, 6-247877

Int. Cl.⁶ G03B *5/00;17/18*

U.S. Cl. 396—88 **9 Claims**



1. A camera comprising:

focal length designating means switchable between an off state and an on state, said focal length designating means accepting designation of a focal length in the on state and outputting data concerning the focal length;

a clock circuit for outputting data concerning time;

a display for displaying the data concerning the focal length and the data concerning the time;

focusing means for focusing in synchronization with a shutter release button; and

display controlling means for displaying the data concerning the focal length on said display when said focal length designating means is in the on state and displaying the data concerning the time on said display when said focal length designating means is in the off state.

5,748,999

LENS-EXCHANGEABLE CAMERA

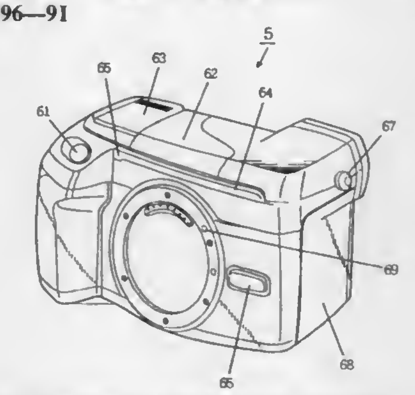
Hiroshi Ueda, Habikino, and Masayuki Miyazawa, Kawachinagano, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jan. 30, 1997, Ser. No. 791,697

Claims priority, application Japan, Jan. 31, 1996, 8-015490

Int. Cl.⁶ G03B *13/36*

U.S. Cl. 396—91 **6 Claims**



1. A lens-exchangeable camera system comprising:

a lens including

a focus lens moving for focus adjustment,

a detect circuit for detecting an amount of movement of said focus lens from a reference position, and

transmitting means transmitting to a camera body the amount of the movement obtained at said detect circuit and a signal indicating whether the reference position is optical infinity; and

a camera body mounted with a lens, including a control circuit for controlling said camera system according to a signal transmitted from said transmitting means.

5,749,000

CAMERA HAVING VOICE-INPUT DEVICE FOR CHANGING FOCUS DETECTION

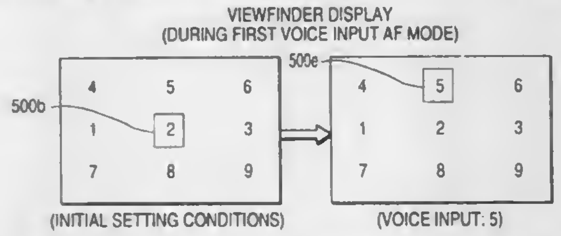
Tsutomu Narisawa, Saitama-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 230,725, Apr. 21, 1994, abandoned. This application May 24, 1996, Ser. No. 653,118

Claims priority, application Japan, Apr. 28, 1993, 5-102608

Int. Cl.⁶ G03B *3/10;13/02;13/30*

U.S. Cl. 396—121 **9 Claims**


VIEWFINDER DISPLAY
(DURING FIRST VOICE INPUT AF MODE)
500b
500e
4
5
6
1
2
3
7
8
9
4
5
6
1
2
3
7
8
9
(INITIAL SETTING CONDITIONS)
(VOICE INPUT: 5)

1. A camera which can detect multiple focus conditions corresponding, respectively, to multiple focus detection areas, the camera comprising:

a calibration mechanism which creates a database of frequencies corresponding to the voice of a respective photographer;

a voice recognition mechanism which uses the database of frequencies created by the calibration mechanism to recognize the voice of the respective photographer from other voices;

a selection mechanism which selects, when the voice recognition mechanism recognizes the voice, at least one focus detection area from the multiple focus detection areas, the selection being made in correspondence to the voice;

a focus mechanism which detects and adjusts respective focus conditions corresponding to the at least one focus detection area selected by the selection mechanism; and

a display device which includes a viewfinder display with area display portions corresponding, respectively, to the multiple focus detection areas, the display device displaying the respective at least one focus detection areas selected by the selection mechanism on the corresponding area display portions,

wherein, when creating the database of frequencies, the calibration mechanism sequentially determines each focus detection area which can be selected by the selection mechanism and the display device displays each sequentially determined focus detection area after the respective focus detection area is determined and before the next sequential focus detection area is determined.

5,749,001

CAMERA PHOTOMETRY DEVICE

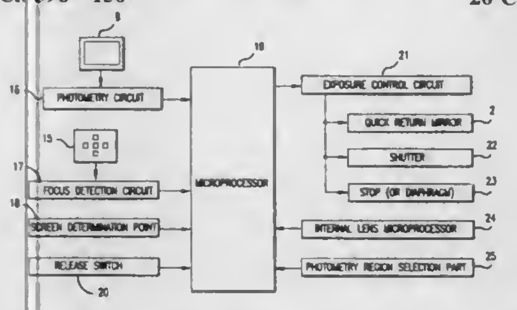
Hiroyuki Iwasaki, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 755,012

Claims priority, application Japan, Feb. 15, 1996, 8-027485

Int. Cl.⁶ G03B *7/08*

U.S. Cl. 396—150 **26 Claims**



1. A camera photometry device equipped with an optical system in which the luminous flux from the object field is formed on a screen through a photographic lens, the optical system being capable of observing the object field, and a plurality of photometry regions for performing the photometry in the object field, the camera photometry device comprising:

a first photometry part for photometry of the image of the object field formed on said screen through photometry regions positionally arranged at least at the screen center as well as outside the screen center, said photometry regions being of a size equal to or smaller than a focusing visual observation part of that screen;

a second photometry part for photometry of the object field using the luminous flux that does not pass through said screen;

a region selection part capable of selecting said photometry regions in at least the screen center and outside of the screen center; and

an output selection part for selecting the output of said second photometry part in a case where the photometry region selected through said region selection part is in the screen center, and for selecting the output of said first photometry part in other cases where the photometry region is outside of the screen center.

5,749,002

CHROMATIC BALANCER FOR FLASH CAMERAS

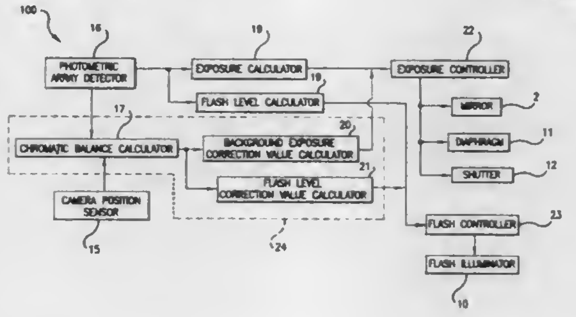
Hiroyuki Iwasaki, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 28, 1997, Ser. No. 807,272

Claims priority, application Japan, Mar. 1, 1996, 8-044845

Int. Cl.⁶ G03B *7/00;15/05*

U.S. Cl. 396—161 **27 Claims**



1. A chromatic balancer, comprising:

a photometric detector which measures light from at least one of a plurality of regions of a photograph scene and which generates corresponding photometric data;

a chromatic balance calculator which determines a first chromatic balance and a second chromatic balance of the photograph scene based on the photometric data from the photometric detector;

a background exposure correction value calculator which determines a background light exposure correction value based on the first chromatic balance determined by the chromatic balance calculator; and

a flash level correction value calculator which generates a flash level correction value based on the second chromatic balance determined by the chromatic balance calculator.

5,749,003

CAMERA HAVING FLASH DEVICE

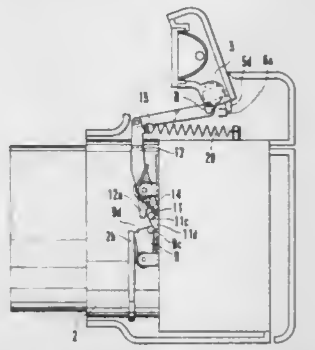
Minoru Tanabe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1996, Ser. No. 692,052

Claims priority, application Japan, Aug. 8, 1995, 7-202395; Oct. 12, 1995, 7-264408

Int. Cl.⁶ G03B *15/05;17/04*

U.S. Cl. 396—177 **12 Claims**



1. A camera having a flash device and a film accommodating chamber, comprising:

a) a flash emitting unit arranged to be movable between a use position and a stowage position;

b) driving means for driving a lens sleeve so as to move an optical element disposed within said lens sleeve;

c) a first member arranged to move in association with a movement of said lens sleeve;

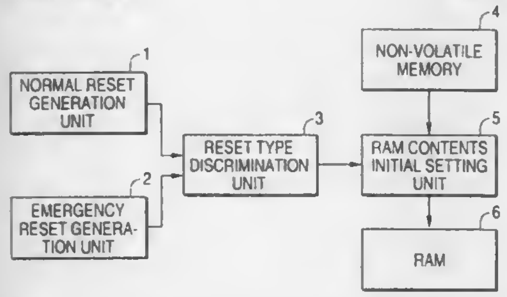
d) a second member arranged to drive said flash emitting unit; and

OL
2 10
ISS
1
MY
5
998
MI

e) a spring member arranged to interconnect said first member and said second member to transmit a movement of said first member to said second member, wherein said spring member is located between said lens sleeve and said film accommodating chamber.

5,749,004
OPTION SETTING DEVICE AND METHOD OF OPERATING SAME FOR USE WITH A CAMERA

Seiichi Yasukawa, Yotsukaido, Japan, assignor to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 524,572, Sep. 7, 1995, abandoned.
This application Mar. 4, 1997, Ser. No. 810,592
Claims priority, application Japan, Oct. 31, 1994, 6-266833
Int. Cl.^{6} G03B *7/26*
U.S. Cl. 396—280 **15 Claims**

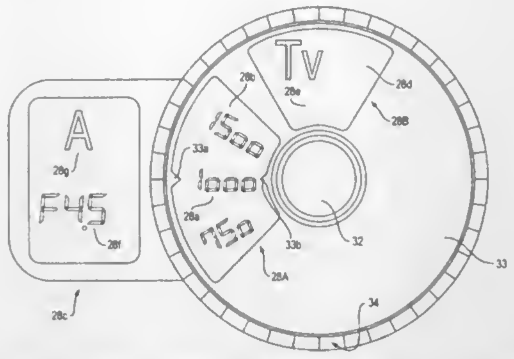

1
NORMAL RESET GENERATION UNIT
2
EMERGENCY RESET GENERATION UNIT
3
RESET TYPE DISCRIMINATION UNIT
4
NON-VOLATILE MEMORY
5
RAM CONTENTS INITIAL SETTING UNIT
6
RAM

1. An option setting device for use with a camera comprising:
- a power supply unit supplying power to the option setting device;
- a microcomputer controlling the operations of the camera;
- a random access memory (RAM) unit storing option settings set by the microcomputer;
- a non-volatile memory unit storing the option settings set by the microcomputer;
- a normal reset generation unit generating a normal reset signal to reset the microcomputer after the introduction of power by the power supply unit;
- an emergency reset generation unit generating an emergency reset signal to reset the microcomputer after an interruption of power from the power supply unit; and
- a reset type discrimination unit determining after a reset has occurred whether the reset was caused by the normal reset generation unit or the emergency reset generation unit and only in the case that the reset type discrimination unit determines that the reset was caused by the normal reset generation unit the contents of the non-volatile memory unit are transmitted to the random access memory unit, and in the case that the reset generation type discrimination unit determines that the reset was by the emergency reset generation unit the microcomputer preserves the contents of the random access memory unit without ever transmitting the contents of the non-volatile memory unit to the random access memory unit.

5,749,005
INFORMATION SETTING AND DISPLAYING DEVICE FOR A CAMERA

Masaaki Haga; Katsuki Machida, and Hideaki Tsuji, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 7, 1995, Ser. No. 480,329
Claims priority, application Japan, Jun. 9, 1994, 6-151489
Int. Cl.^{6} G03B *17/18*
U.S. Cl. 396—287 **29 Claims**

1. An information setting and displaying device for a camera, comprising:
- a rotary dial rotatably mounted in an adjustable manner on a camera body;

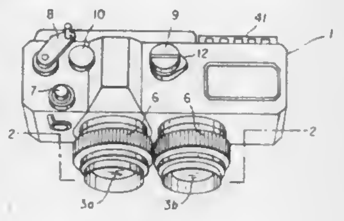


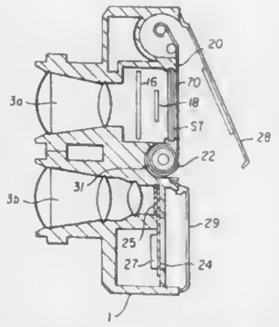
- a display member including at least first and second display sub-areas arranged successively inside and along in an inner periphery of said rotary dial;
- information setting means for changing information in a predetermined order by operating said rotary dial;
- display control means for electronically displaying a currently set information in said first display sub-area, and for electronically displaying proposed information, to be set as said rotary dial rotates in a direction from said first display sub-area towards said second display sub-area by at least one rotation step, in said second display sub-area; and
- memory means for storing digital information, in the form of digital values tables, said digital information being changeable by operation of said rotary dial, each of said tables containing a plurality of digital values arranged in a predetermined order,

wherein said information setting means reads proposed information from said memory means, and said display member displays said proposed information.

5,749,006
CAMERA FOR RECORDING IMAGES ON A PHOTOGRAPHIC FILM OR ON A MAGNETIC TAPE

Dale F. McIntyre, Honeoye Falls, and Loretta E. Allen, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 672,390, May 29, 1996, abandoned.
This application Jul. 18, 1997, Ser. No. 896,714
Int. Cl.^{6} G03B *17/24;17/48;19/06;29/00*
U.S. Cl. 396—310 **14 Claims**





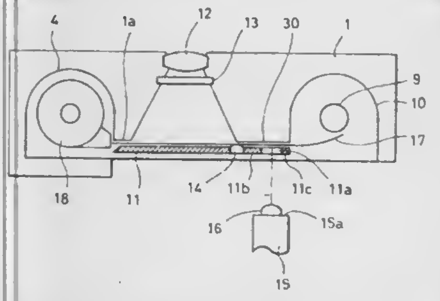
1. A camera for recording photographic images on a photographic film contained in a photographic film cartridge and for recording electronic images on a magnetic tape contained in a magnetic tape cartridge, said camera comprising:
- a) cartridge receiving means for receiving either one of said photographic film cartridge and said magnetic tape cartridge;

- b) optical recording means for recording a photographic image of a subject on the photographic film when the photographic film cartridge is disposed in the cartridge receiving means;
- c) electronic image storage means for generating an electronic image of the subject and storing the electronic image as a plurality of electrical signals; and
- d) recording means, responsive to the magnetic tape cartridge containing the magnetic tape being disposed in the cartridge receiving means, for selectively recording the electronic image stored in the electronic image storage means onto the magnetic tape

wherein the magnetic tape does not include a photographic emulsion layer.

5,749,007
CAMERA USING FILM HAVING A MAGNETIC MEMORY PORTION

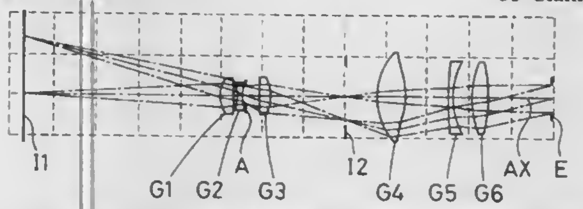
Hiroshi Sakurai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 457,128, Jun. 1, 1995, abandoned.
This application Jul. 25, 1997, Ser. No. 900,130
Int. Cl.^{6} G03B *17/24*
U.S. Cl. 396—319 **38 Claims**



1. An apparatus adapted for a film with a magnetic memory portion, comprising:
- a magnetic head for at least one of writing information to the magnetic memory portion of the film and reading information from the magnetic memory portion; and
- a tool application portion for receiving an external tool applied thereto for checking a performance of said magnetic head by evaluating information processed through said magnetic head.

5,749,008
EYEPIECE

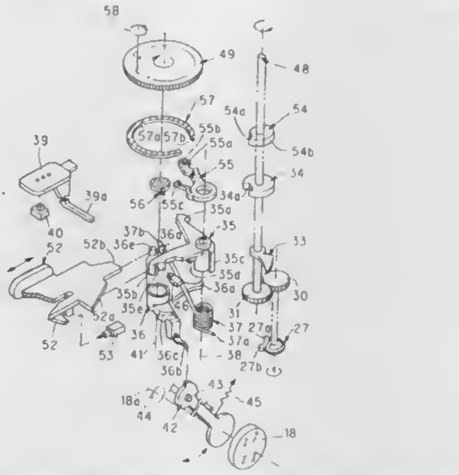
Jun Ishihara, Kobe, and Kyoko Yamaguchi, Sakai, both of Japan, assignors to Minolta, Osaka, Japan
Filed Jan. 16, 1997, Ser. No. 784,426
Claims priority, application Japan, Jan. 18, 1996, 8-006731; Jan. 18, 1996, 8-006734
U.S. Cl. 396—373 **35 Claims**



1. An eyepiece for use in a viewfinder optical system provided with a relay lens system, comprising, from a side of an image plane formed by the relay lens system:
- a first lens unit having a positive refractive power and moved in an optical axis direction for dioptric power adjustment; and other lens units.

5,749,009
PHOTOGRAPHIC CAMERA HAVING FILM WINDING MECHANISM

Yoji Naka; Masashi Takamura; Hiroshi Sohma, all of Asaka, and Kazuhiko Onda, Omiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, and Fuji Photo Optical Co., Ltd., Saitama, both of Japan
Filed Oct. 9, 1996, Ser. No. 728,073
Claims priority, application Japan, Oct. 9, 1995, 7-261775; Feb. 20, 1996, 8-031756
Int. Cl.^{6} G03B *1/18;1/62;1/66*
U.S. Cl. 396—395 **5 Claims**



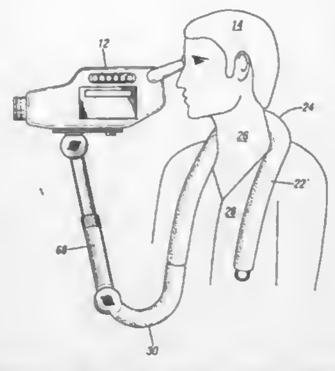
1. A camera for use with a filmstrip having a row of perforations separated at alternate short and long intervals in a side margin of said filmstrip such that a picture frame is defined between adjacent two of said perforations at said long interval and an interval between adjacent two picture frames is defined between adjacent two of said perforations at said short interval, said camera comprising:
- a sprocket having at least a pair of cogs formed on a periphery and engageable with said perforations, said periphery being divided by said cogs into a frictional engaging section which provides frictional engagement of said periphery with said filmstrip by means of which said sprocket rotates following movement of said filmstrip and a mechanically engaging section which provides mechanical engagement of said cogs with said perforations by means of which said sprocket rotates following movement of said filmstrip;
- a counter mechanism including an exposure counter disk for indicating a number of exposures, said exposure counter disk stepping from a start position following rotation of said sprocket for advancing movement of one picture frame and stepping back to said start position following reverse rotation of said sprocket for rewinding movement of said filmstrip; and
- a locking mechanism for locking said sprocket in a specified position when said exposure counter disk returns to said starting position.

5,749,010
CAMERA SUPPORT

Michael T. McCumber, League City, Tex., assignor to McCumber Enterprises, Inc., League City, Tex.
Filed Apr. 18, 1997, Ser. No. 837,502
Int. Cl.^{6} G03B *29/00*
U.S. Cl. 396—420 **15 Claims**

1. A camera support means for holding a camera in front of a user comprising:
- a first U-shaped section having a first end and a second end and formed from a pair of generally straight leg portions and a generally arcuate connecting portion, said first U-shaped section being adapted to fit around said user's neck so that the legs rest on said user's chest;

VOL
210
ISS
1
MY
5
998
MI



a second U-shaped section having a first end and a second end with the first end being rotatably connected to the second end of the first U-shaped section;

an arm section having a first end and a second end, where the first end is pivotally connected to the second end of said second U-shaped section by a first pivot means,

a camera mounting means pivotally connected to the second end of the arm section by a second pivot means;

said first pivot means including a locking means for locking the arm section in a pre-determined relationship with the second U-shaped section; and

said second pivot means including a locking means for locking the camera mounting means in a pre-determined relationship with the arm section.

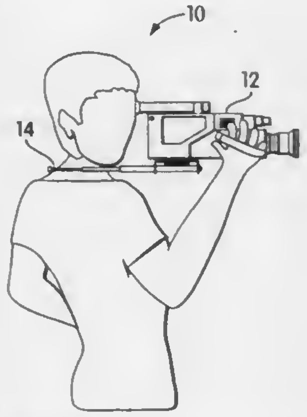
5,749,011
CAMERA STABILIZING MECHANISM

John F. Nicolaci, 36 Indian Cove Rd., Marion, Mass. 02738

Continuation of Ser. No. 345,609, Nov. 28, 1994, abandoned, which is a continuation of Ser. No. 71,198, Jun. 2, 1993, Pat. No. 5,373,334. This application Dec. 9, 1996, Ser. No. 762,603

Int. Cl.^{6} G03B *29/00*

U.S. Cl. 396—421 **2 Claims**



1. A stabilizing apparatus for a handheld optical system through which a user has a line of sight to objects in front of the system, the apparatus comprising:

A. a single telescoping rod having a first end and a second end and being oriented such that when a user looks through the system the second end of the rod extends toward the user at an angle to the line-of-sight, the rod being the only element of the apparatus that rests against the user; and

B. means for mounting the first end of the rod on the optical system, the means for mounting including:

  a. an inverted U-shaped bracket including a body having a hole through which a first screw extends, a first flared side having a hole through which a second screw extends and a second flared side having a hole through which the second end of the rod extends;

  b. the first screw that extends through the hole in the body of the bracket and screws into a threaded aperture in the optical system; and

  c. the second screw that extends through the hole in the first flared leg of the U-shaped member and screws into the first end of the rod; and

C. a threaded aperture at the first end of the rod to receive the second screw.

5,749,012
CAMERA

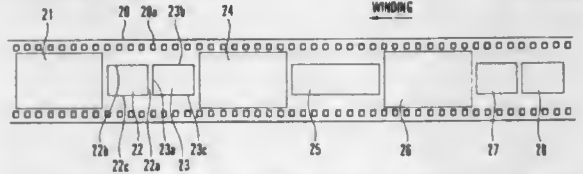
Takanori Kodaira, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 248,512, May 24, 1994, abandoned. This application Dec. 12, 1996, Ser. No. 762,692

Claims priority, application Japan, May 31, 1993, 5-149811

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—435 **14 Claims**



2. A photographic image plane setting apparatus for a camera, comprising:

a first light blocking member that defines a length in a first direction of a photographic image plane, said first light blocking member changing the length in the first direction of the photographic image plane by selective movement between a first position that light-blocks at least part of the photographic image plane and a second position withdrawn from the first position;

a second light blocking member that defines a length in a second direction, different from the first direction, of the photographic image plane, said second light blocking member changing the length in the second direction by selective movement between a third position that light-blocks at least part of the photographic image plane and a fourth position withdrawn from the third position, and

a setting device that permits the second light blocking member to be selectively set in the third position or in the fourth position when the first light blocking member is set in the first position, that permits the second light blocking member to be set in the fourth position when the first light blocking member is set in the second position, and prevents the second light blocking member from being set in the third position when the first light blocking member is set in the second position.

5,749,013

Patent Not Issued For This Number

5,749,014
SHUTTER DEVICE

Fumio Shimada, Saitama-ken, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama-ken, Japan

Continuation of Ser. No. 582,189, Jan. 2, 1996, abandoned. This application Dec. 17, 1996, Ser. No. 768,337

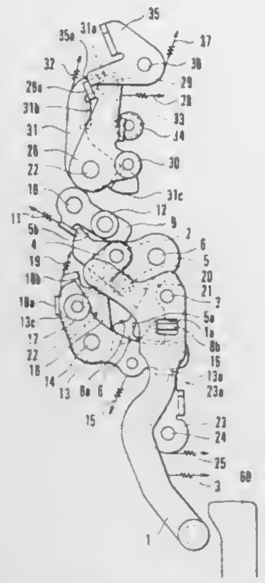
Claims priority, application Japan, Jan. 10, 1995, 7-001983; Jan. 10, 1995, 7-001984; Jan. 10, 1995, 7-002002

Int. Cl.^{6} G03B *9/40*

U.S. Cl. 396—489 **29 Claims**

1. A shutter device comprising:

a) a shutter blade which operates according to an exposure operation;



b) a first blade driving spring for giving an urging force working in a predetermined direction to said shutter blade in operating range of said shutter blade;

c) a second blade driving spring for giving said shutter blade an urging force working in the same direction as said first blade driving spring; and

d) a charging mechanism for charging said first blade driving spring and said second blade driving spring,

wherein said charging mechanism includes a first charging member which travels to charge said first blade driving spring and a second charging member which travels to charge said second blade driving spring.

5,749,015
LIGHT-QUANTITY CONTROL DEVICE WITH SPRING CONTROL OF LIGHT CONTROL MEMBER

Osamu Sato, and Koichi Shimada, both of Saitama-ken, Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama-ken, Japan

Division of Ser. No. 409,541, Mar. 24, 1995, which is a continuation of Ser. No. 238,579, May 5, 1994, abandoned, which is a continuation of Ser. No. 811,794, Dec. 20, 1991, abandoned. This application Apr. 6, 1995, Ser. No. 417,829

Claims priority, application Japan, Dec. 25, 1990, 2-419082; May 27, 1991, 3-121323; May 27, 1991, 3-121324; May 27, 1991, 3-121325

Int. Cl.^{6} G03B *9/06*

U.S. Cl. 396—508 **3 Claims**

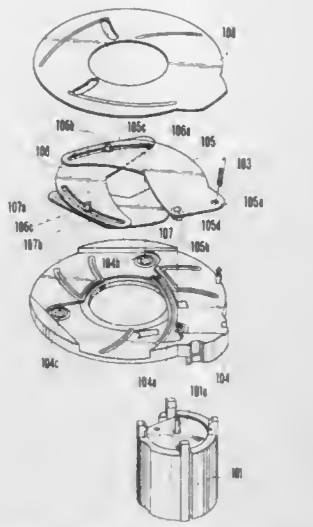
1. A light-quantity control device, comprising:

a) a light-quantity control member which moves to change an aperture opening amount;

b) a drive source which swing said light-quantity control member in one direction;

c) a spring having a coil part, said spring being arranged to return said light-quantity control member to an original position when said light-quantity control member is not swung by said drive source; and

d) a base member having an aperture, which fixedly supports said drive source and swingably support said light-quantity control member and has a shaft for carrying said coil part, wherein said shaft is formed at a position outside the supporting position of said drive source on said base member relative to the center of said aperture.



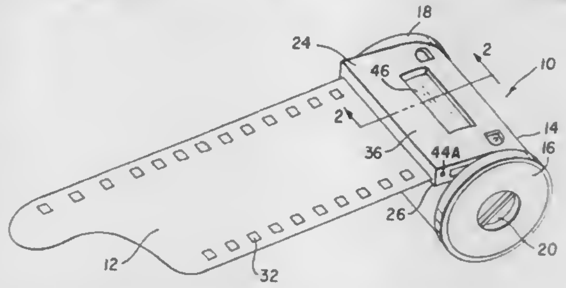
5,749,016
PHOTOGRAPHIC FILM CARTRIDGE WITH DRIVE WHEEL ACTIVATED STATUS INDICATOR

P. W. Thomas Moran, Fairport, N.Y., and Joseph J. Rice, West Bridgford, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1997, Ser. No. 800,306

Int. Cl.^{6} G03B *19/02;17/26*

U.S. Cl. 396—515 **6 Claims**



1. A film cartridge with status indicator, comprising:

a hollow cartridge body having an exit slit;

a film strip enclosed in said cartridge body to be withdrawn from or inserted into said cartridge body via said extra slit, said film strip having longitudinal edges with a series of edge perforations;

a housing member supported by said cartridge body adjacent said exit slit;

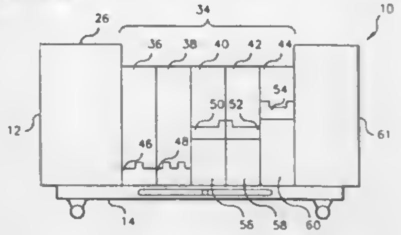
at least one star wheel rotatably supported by said housing member in a position to engage said edge perforations, whereby movement of said film strip through said slit will rotate said star wheel;

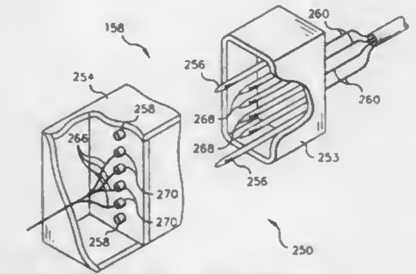
an endless belt movably supported by said housing member, said belt further having perforations for engaging with said star wheel; and

visible indicia of the status of the film strip affixed to said endless belt, whereby rotation of the star wheel will move the belt to indicate changes in the status of the film strip.

5,749,017
PHOTOGRAPHIC PROCESSOR AND METHOD OF OPERATION

David George Foster, West Henrietta; Edgar Preston Gates, Honeoye, and John Howard Rosenburg, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 30, 1996, Ser. No. 720,400
Int. Cl.^{6} G03D *13/00;13/04*
U.S. Cl. 396—578 **28 Claims**

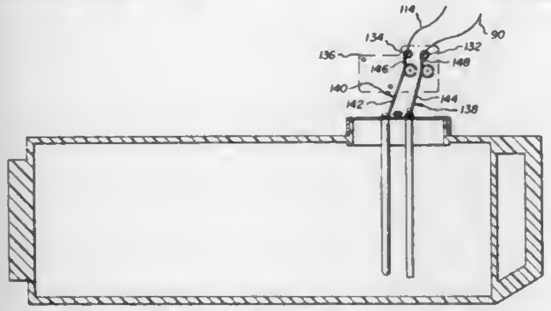




1. A photographic processor comprising:
a processing section containing at least one removable processing tank for containing a processing solution therein, said at least one removable processing tank having an access opening, an outlet port and an inlet port;
a recirculation system connected to said inlet port and said outlet port of said at least one removable processing tank for recirculating said processing solution through said at least one removable processing tank; and
identification means provided on said at least one removable processing tank for identifying a particular photographic chemical contained therein or a particular type of removable processing tank.

5,749,018
PHOTOGRAPHIC PROCESS WITH IMPROVED REPLENISHMENT MONITORING SYSTEM

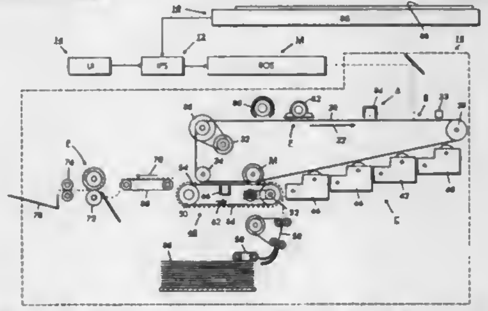
Raymond E. Wess, Holley; Ralph L. Piccinino, Jr., Rush, and John H. Rosenburgh, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 655,106, May 29, 1996, Pat. No. 5,689,748. This application Jan. 21, 1997, Ser. No. 785,116
Int. Cl.^{6} G03D *3/02*
U.S. Cl. 396—578 **18 Claims**



1. A processor for processing a photosensitive material, comprising:
at least one processing tank for holding a processing solution;
a processing solution level monitoring and replenishment system for monitoring the level of the processing solution within said processing tank and for delivering replenishment solution to said processing tank, said replenishment system including a single means for supplying replenishment solution to said processing tank and for monitoring the level of the replenishment in said processing tank;
wherein said single means comprises a first electrically conductive rod of a first predetermined length and a tube of a second predetermined length, said rod and tube extending into a container which contains the replenishment solution and being positioned for detection when the replenishment solution falls to a predetermined level, said tube being capable of supplying replenishment solution to said processing tank.

5,749,019
LOOK UP TABLE TO CONTROL NON-LINEAR XEROGRAPHIC PROCESS

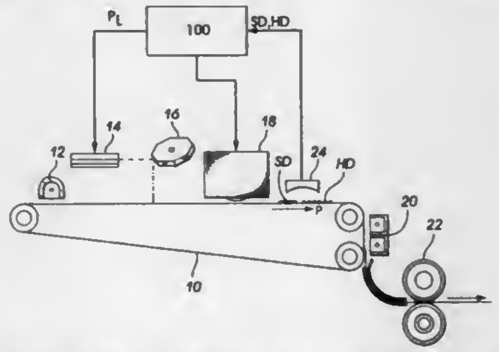
Lingappa K. Mestha, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 9, 1996, Ser. No. 709,699
Int. Cl.^{6} G03G *15/06;13/06;15/02;13/02*
U.S. Cl. 399—46 **25 Claims**



13. In an electrostatographic printing machine having an imaging member with a surface voltage potential on a portion thereof, the electrostatographic printing machine including a control system having a sensor and a compensator, a method of linearly adjusting the surface voltage potential comprising the steps of:
storing a reference signal,
sensing the surface voltage potential,
responding by the compensator to the reference signal and the surface voltage potential to provide an adjustment signal,
a look up table responding to the adjustment signal to linearize the adjustment signal for adjusting the surface voltage potential.

5,749,020
COORDINITIZATION OF TONE REPRODUCTION CURVE IN TERMS OF BASIS FUNCTIONS

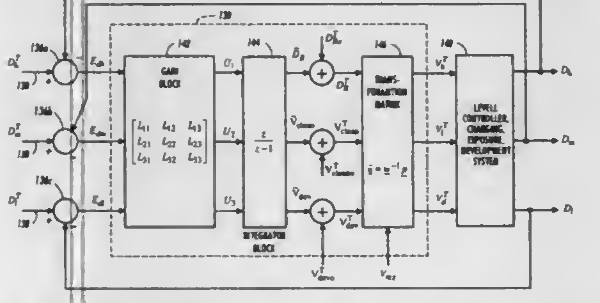
Lingappa K. Mestha, Fairport; Yao Rong Wang, Webster; Sohail A. Dianat, Pittsford, all of N.Y.; Pramod P. Khargonekar; Daniel E. Koditschek, both of Ann Arbor, Mich.; Eric Jackson, Rochester, and Tracy E. Thieret, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 21, 1996, Ser. No. 754,571
Int. Cl.^{6} G02G *15/00*
U.S. Cl. 399—49 **24 Claims**



10. In an imaging system for projecting an image onto an imaging surface, the imaging system having a control including actuators and a model of tone reproduction curve response, a method of reconstructing a tone reproduction curve for use in controlling the imaging system operation comprising the steps of:
predicting a tone reproduction curve for a given set of actuator conditions,
sensing a discrete number of tone reproduction samples, and
merging the discrete number of tone reproduction samples with the tone reproduction curve to provide a reconstructed tone reproduction curve.

5,749,021
DEVELOPED MASS PER UNIT AREA (DMA) CONTROLLER TO CORRECT FOR DEVELOPMENT ERRORS

Lingappa K. Mestha, Fairport, N.Y., and Prasad P. Padmanabhan, San Francisco, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 4, 1996, Ser. No. 760,616
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 399—49 **20 Claims**

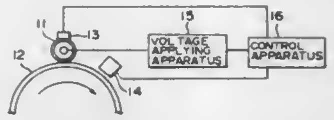


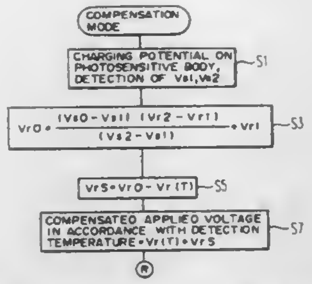
1. In an imaging machine having an imaging member and electrostatic and development subsystems, a multi-level control comprising:
a first control loop responsive to imaging member voltage potential and first target values to adjust the electrostatic subsystem,
a second control loop responsive to developed mass per unit area on the imaging member to adjust the development subsystem, the second control loop including a control device for providing the first target values to the first control loop, the control device including a transformation matrix responding to internal process parameters to compute the first target values for the first control loop.

5,749,022
CHARGING APPARATUS AND METHOD FOR USE IN IMAGE FORMING DEVICE

Shinsuke Kikui, Yokohama; Wataru Yasuda, Tokyo; Ichiro Shimeki, and Naomi Sugimoto, both of Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 7, 1996, Ser. No. 729,756
Claims priority, application Japan, Oct. 5, 1995, 7-286503; Dec. 4, 1995, 7-315186
Int. Cl.^{6} G03G *15/02*
U.S. Cl. 399—50 **28 Claims**

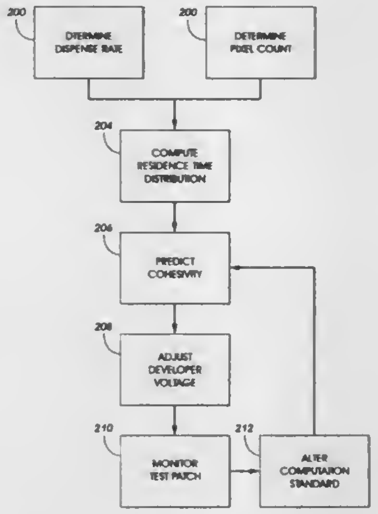
19. A method for charging a photosensitive body comprising the steps of:
applying an applied voltage to a charging member;
applying a charging potential to a photosensitive body from said charging member;
measuring the charging potential, and providing a corresponding measured charging potential signal;
sensing at least one environmental condition proximate said photosensitive body, and outputting a corresponding environmental condition signal;
controlling an amount of said applied voltage applied to said charging member in accordance with said charging potential signal and said environmental condition signal, said controlling step comprising the steps of,
detecting a charging potential on said photosensitive body in response to the applied voltage applied to said charging member,
producing an uncompensated target applied voltage that corresponds with a target charging potential on said photosensitive body,
adjusting said uncompensated target applied voltage with said environmental condition signal to provide a compensated target applied voltage that more closely corresponds with said target charging potential, and
applying said compensated applied voltage in place of said applied voltage.




COMPENSATION MODE
CHARGING POTENTIAL ON PHOTOSENSITIVE BODY, DETECTION OF Vs1,Vs2
S1
Vr0 = (Vs0 - Vs1) (Vr2 - Vr1) / (Vs2 - Vs1) + Vr1
S3
Vr5 = Vr0 - Vr(T)
S5
COMPENSATED APPLIED VOLTAGE IN ACCORDANCE WITH DETECTION TEMPERATURE = Vr(T) + Vr5
S7
R

5,749,023
ADAPTIVE FEED FORWARD COMPENSATION FOR TIME VARYING TONER COHESIVITY

Robert E. Grace; Guru B. Raj, both of Fairport, and James M. Pacer, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 4, 1997, Ser. No. 832,927
Int. Cl.^{6} G03G *15/10*
U.S. Cl. 399—58 **9 Claims**



1. In a machine having a moving imaging surface, a projecting system projecting an image onto the imaging surface, a developer for application of toner to the image projected onto the imaging surface for transfer of the image to a medium, the developer being responsive to a development voltage and including a repository of toner to be applied to the image, a method of compensating for toner cohesivity within the repository comprising the steps of:
recording toner consumption rate and toner dispense rate over a given time period,

OL
2 10
SS
1
MY
5
998
MI

responsive to the toner consumption rate and toner dispense rate over the given time period, computing toner residence time in the repository,

based upon average toner residence time in the repository, estimating a degree of toner cohesiveness, and

responsive to estimating the degree of toner cohesiveness, projecting an adjustment to the development voltage to suppress the effects of toner cohesivity.

5,749,024

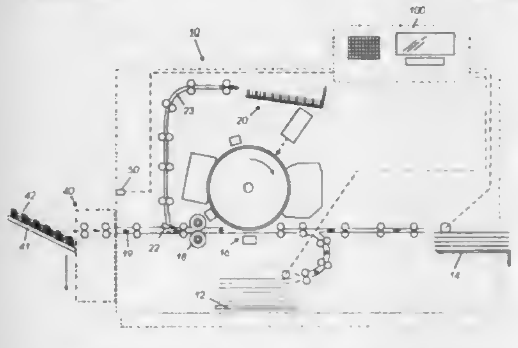
PRINTING SYSTEM FOR AUTOMATICALLY DELIVERING TRANSPARENCIES AND REGULAR SHEETS IN PROPER ORDER WITH DIFFERENT OUTPUT MODULES

David K. Young, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1997, Ser. No. 846,191

Int. Cl.^{6} G03G *21/14*

U.S. Cl. 399—85 **4 Claims**



1. In a reproduction system providing in at least one mode of operation an ordered output from a printing apparatus fed to a sheet output stacker of printed transparency sheets interleaved with corresponding paper sheets. wherein said reproduction system provides a choice of different sheet output stackers which may be operatively connected to said printing apparatus, wherein at least one of said sheet output stackers provides face down stacking. and wherein at least one other of said sheet output stackers provides face up stacking: wherein an automatic electronic printing order control system is provided which is automatically electronically activated by said connection of said at least one of said sheet output stackers to said printing apparatus to change said ordered output of printed transparency sheets and paper sheets to automatically select between said output of paper sheets first or said output of transparency sheets first such that said transparency sheets are before their corresponding paper copy sheets for either said output stacker with face down stacking or said output stacker with face up stacking.

5,749,025

DOCUMENT-EXPOSING AND -SCANNING APPARATUS

Ayumu Oda, Yamatokoriyama, and Toshihiro Horiuchi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 1, 1996, Ser. No. 690,974

Claims priority, application Japan, Aug. 1, 1995, 7-196598

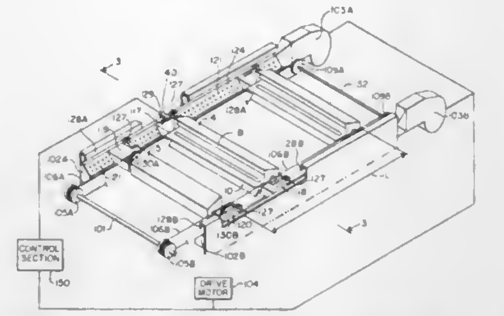
Int. Cl.^{6} G03G *21/20;15/04*

U.S. Cl. 399—92 **8 Claims**

1. A document-exposing and -scanning apparatus comprising:

a document-laying table for mounting a document thereon; an optical scanning section comprising exposing and scanning means which exposes and scans the document on the document-laying table and is provided with air-receiving surfaces, and drive means for reciprocating the exposing and scanning means in the direction of scanning; and air duct means placed facing the air-receiving surfaces of the exposing and scanning means so as to subject the surfaces to the action of air, extending along the direction of scanning,

wherein air is blown through the air duct means to levitate the exposing and scanning means while being directed to the optical scanning section as well.



5,749,026

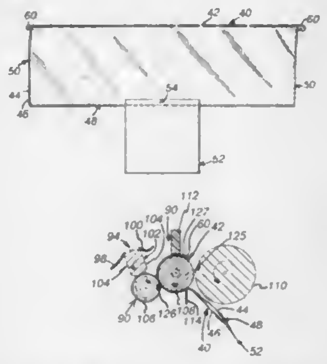
REMOVABLE SHIPPING SEAL FOR A TONER CARTRIDGE AND METHOD OF USING THE SAME

Glenn C. Goldie, Tariffville, Conn., assignor to RTI International Corporation, Springfield, Mass.

Filed Feb. 13, 1996, Ser. No. 601,952

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—103 **25 Claims**



1. A toner cartridge seal for a toner cartridge having a rotating toner developer roller, the developer roller having a predetermined width aligned with an axis of rotation thereof and the toner cartridge further having closely spaced surfaces adjacent the developer roller. the seal comprising:

a thin sheet material sized and arranged to wrap around the developer roller with opposing side edges that, along at least a portion thereof, are spaced apart a distance approximately equal to the predetermined width of the developer roller and the thin sheet material having a thickness that, when wrapped around the developer roller in a predetermined orientation, spans a gap formed between a surface of the developer roller and each of the closely spaced surfaces to seal each gap respectively against passage of toner therethrough and

a pair of soft pliable projections that extend outwardly in a direction aligned with the predetermined width beyond the side edges to seal against respective adjacent walls of the toner cartridge.

5,749,027

PROCESS CARTRIDGE, PROCESS CARTRIDGE ASSEMBLY METHOD, AND IMAGE FORMING APPARATUS

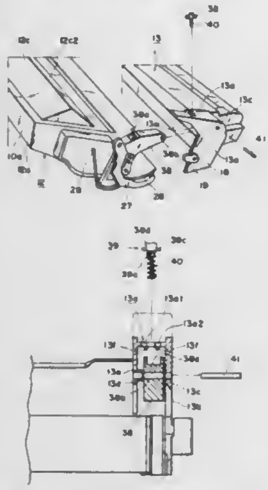
Isao Ikemoto, Kawasaki; Yoshikazu Sasago, Tokyo; Haruhisa Oshida, Hatogaya; Toshiyuki Karakama, Tokyo, and Shinya Noda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1996, Ser. No. 637,266

Claims priority, application Japan, Apr. 28, 1995, 7-105001

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—113 **45 Claims**



1. An assembling method of a process cartridge detachably mountable to a main assembly of an image forming apparatus, comprising the steps of:

a. preparing a drum frame to which an electrophotographic photosensitive drum is mounted;

b. preparing a developing frame having a toner accommodating portion for accommodating toner for developing a latent image formed on said electrophotographic photosensitive drum and also having developing means, mounted thereto, for developing the latent image formed on said electrophotographic photosensitive drum, using toner accommodated in said toner accommodating portion;

c. engaging a portion of said drum frame and a portion of said developing frame;

d. coupling a coupling member with a portion where said drum frame and said developing frame are engaged to couple said drum frame and developing frame, wherein said drum frame and said developing frame are rotatable relative to each other about said coupling member; and

e. spring mounting a compression spring by locking a base member by rotating said base member having said compression spring mounted thereto.

5,749,028

MULTI-SIZE PHOTORECEPTOR FLANGE BEARING

Dhirendra C. Damji, and Richard W. Herzog, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1996, Ser. No. 672,344

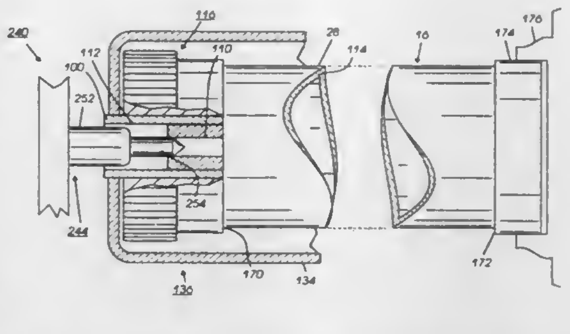
Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—117 **27 Claims**

10. A customer replaceable unit including a processing station for use in a printing machine, said customer replacement unit including a bearing for supporting a moving member on a support structure and for alternatively receiving at least a first shaft and a second shaft, the bearing comprising:

a body operably associated with the member; and

a sleeve matingly fitted at least Partially within said body, said sleeve including a first feature operably associated with said sleeve for supporting the first shaft and a second feature operably associated with said sleeve for supporting the second shaft, whereby the bearing may accommodate both of the two shafts.



5,749,029

ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS THEREFOR

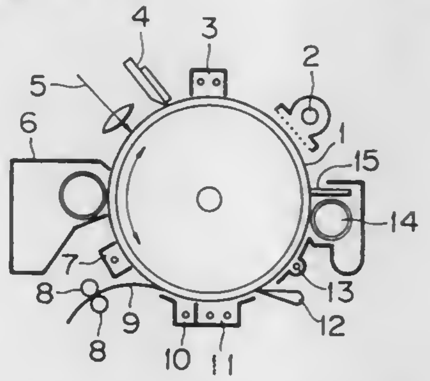
Minoru Umeda, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 6, 1996, Ser. No. 744,834

Claims priority, application Japan, Nov. 6, 1995, 7-309752; Oct. 24, 1996, 8-299243

Int. Cl.^{6} G03G *15/04;21/00*

U.S. Cl. 399—128 **30 Claims**



1. An electrophotographic process using an electrophotographic photoconductor comprising a photoconductive layer which comprises a charge generation material and a charge transport material, said charge transport material being convertible from a neutral state into a charged state during the photoconduction in said photoconductive layer, comprising the steps of:

charging said photoconductive layer so as to have a predetermined surface potential in the dark;

exposing said photoconductive layer with said predetermined surface potential to light images to form latent electrostatic images on said photoconductive layer;

developing said latent electrostatic images with a toner to visible toner images;

transferring said visible toner images to an image transfer sheet;

cleaning said photoconductive layer to remove residual toner particles from the surface of said photoconductive layer; and

quenching residual charges from the surface of said photoconductive layer,

wherein when light is applied to said photoconductive layer in the course of said electrophotographic process, at least one type of rays of light selected from type 1, type 2 and type 3 is employed:

type 1: rays of light having a light emission peak, with a half-width wavelength range thereof being free from the overlapping of a peak wavelength of an absorption light of said charge transport material in said charged state;

type 2: rays of light with a continuous spectrum having a threshold wavelength value, with the light emission compo-

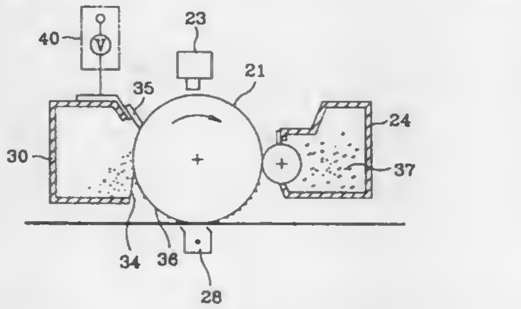
/OL
2 10
SS
1
MY
5
998
JMI

nents thereof being present on a longer wavelength side than said threshold wavelength value, and on a scale with the wavelength increasing in the right direction, a half value of said threshold wavelength value being on a longer wavelength side beyond the wavelength of a rightmost absorption peak of an absorption light of said charge transport material in said charged state; and

type 3: rays of light with a continuous spectrum having a threshold wavelength value, with the light emission components thereof being present on a shorter wavelength side than said threshold wavelength value, and on a scale with the wavelength decreasing in the left direction, a half value of said threshold wavelength value being on a shorter wavelength side beyond the wavelength of a leftmost absorption peak of an absorption light of said charge transport material in said charged state, in a wavelength range free from the overlapping of the light absorption of said charge transport material in said neutral state and the light absorption of said charge transport material in said charged state.

5,749,030
CLEANING DEVICE FOR ELECTROPHOTOGRAPHIC PROCESSOR

Hyoung-Koo Park, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Oct. 16, 1996, Ser. No. 732,182
Claims priority, application Rep. of Korea, Oct. 16, 1995, 1995-35654
Int. Cl.⁶ G03G *15/02;21/00*
U.S. Cl. 399—148 **13 Claims**



1. A cleaning device of an electrophotographic processor, comprising:

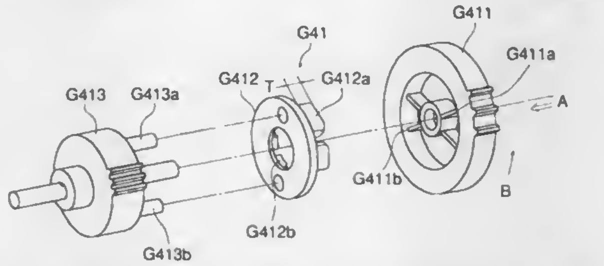
a cleaning housing having an opening;

a conductive cleaning blade installed on said cleaning housing to cover part of the opening, for removing a residual toner remaining on a surface of a photosensitive drum during a cleaning operation; and

a single power source electrically connected to said conductive cleaning blade for applying a first voltage exhibiting a first polarity to said conductive cleaning blade to charge the surface of the photosensitive drum during a charging operation to form a latent image on the photosensitive drum, and for applying a second voltage exhibiting a second polarity opposite of said first polarity to said conductive cleaning blade to charge the surface of the photosensitive drum during said cleaning operation while said conductive cleaning blade removes the residual toner remaining on the surface of the photosensitive drum after said charging operation.

5,749,031
DEVELOPING APPARATUS IN USE WITH AN IMAGE FORMING APPARATUS

Tadashi Miwa; Hidehiro Kanda; Isao Matsuoka; Toru Makino; Wang Zhoa Yan; Ryoko Yoshikawa; Akira Tai; Naoto Tokutake, and Masahiro Shigetomi, all of Hachioji, Japan, assignors to Konica Corporation, Japan
Filed Jun. 25, 1996, Ser. No. 670,394
Claims priority, application Japan, Jun. 29, 1995, 7-163808
Int. Cl.⁶ G03G *15/06*
U.S. Cl. 399—228 **7 Claims**



1. A developing apparatus for use with an image forming apparatus comprising:

a developing sleeve for rotating and holding toner thereon so as to develop a latent image on an image carrier of said image forming apparatus with said toner;

a driver for generating a rotational driving force;

a drive transmission for transmitting said rotational driving force to said developing sleeve, wherein said drive transmission has a transmitting state and an untransmitting state;

a shock easing device for easing a shock of transmission of said rotational driving force to said developing sleeve in said transmitting state, wherein said shock easing device is provided in at least one of said driver and said drive transmission;

a developing cartridge detachable from said image forming apparatus, wherein said developing sleeve is provided in said developing cartridge;

said shock easing device being provided in said drive transmission, said shock easing device is a shock easing member disposed in said developing cartridge;

said shock easing device being an elastic member,

said drive transmission including a pair of coupling gears for transmitting said rotational driving force at a boundary area between said transmission and said developing cartridge, said shock easing member disposed to one of said pair of coupling gears.

5,749,032
COLOR IMAGING SYSTEM

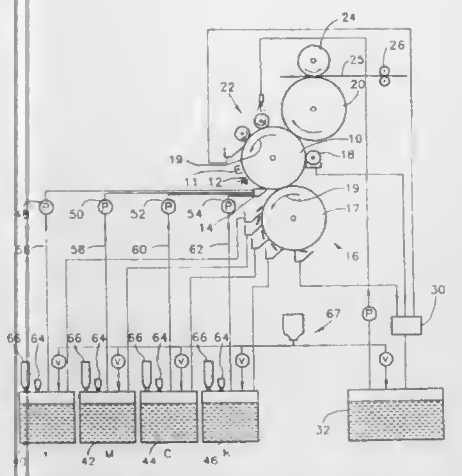
Benzion Landa, Edmonton, Canada; Ishaiau Lior, Nes Ziona, Israel; Dan Barnea, Neve Monosson, Israel; Paul Fenster, Petach Tikva, Israel, and Uri Levy, Rehovot, Israel, assignors to Indigo N.V., SM Veldhoven, Netherlands
Continuation of Ser. No. 351,546, May 15, 1989, Pat. No. 5,557,376. This application Aug. 19, 1996, Ser. No. 699,456
Int. Cl.⁶ G03G *15/01;15/10*
U.S. Cl. 399—233 **13 Claims**

1. An electrostatic imaging system comprising:

an imaging surface having an electrostatic image formed thereon;

at least one source of liquid toner;

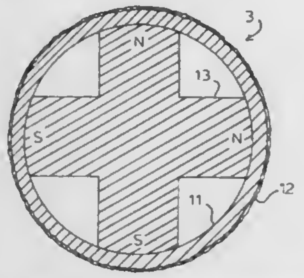
at least one stationary toner outlet, said outlet receiving liquid toner from said source and supplying it directly to said imaging surface in the form of a stream of liquid toner whose cross sectional extent upon impingement with the imaging surface does not significantly exceed the cross sectional extent thereof upon leaving the outlet; and



a developer system which develops said electrostatic image using said liquid toner to form a developed image.

5,749,033
DURABLE COATED MAGNETIC DEVELOPMENT ROLLER

Edwin Swartz, 2300 Lakeland Dr., and Gene Thomas, 2506 Chadwick Cir., both of Sanford, N.C. 27331
Filed Dec. 29, 1995, Ser. No. 580,639
Int. Cl.⁶ G03G *15/09*
U.S. Cl. 399—267 **9 Claims**



1. A magnetic roller for use in a printing or copying apparatus comprising:

a) A cylindrical sleeve made of a non-magnetic electrically conducted material with a textured exterior surface;

b) A wear resistant lubricious electrically conducted surface coating adhered to the textured exterior surface of the cylindrical sleeve, said surface coating being formed from an alloy of nickel, phosphorus and molybdenum;

c) Means for generating a magnetic field sufficient to attract toner to the surface coating, said means for generating a magnetic field disposed within the cylindrical sleeve.

5,749,034
TRANSFER, CLEANING AND IMAGING STATIONS SPACED WITHIN AN INTERDOCUMENT ZONE

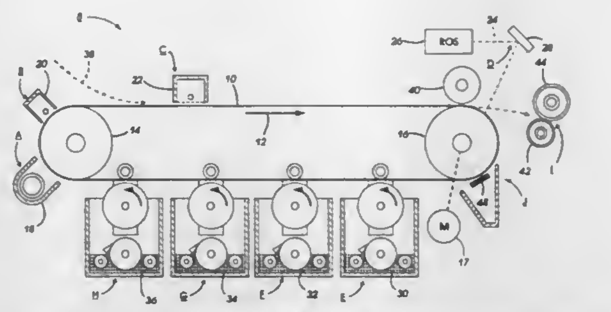
Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 21, 1997, Ser. No. 775,339
Int. Cl.⁶ G03G *15/16*
U.S. Cl. 399—303 **8 Claims**

1. An electrophotographic printing machine, comprising:

a rotating photoreceptor having an image area for receiving toner and an interdocument zone of a length L;

a charging station for charging said image area to a predetermined potential;

an exposure station for exposing said image area with image data;



a plurality of N developers that are capable of producing N toner images on said image area in N cycles of said image area;

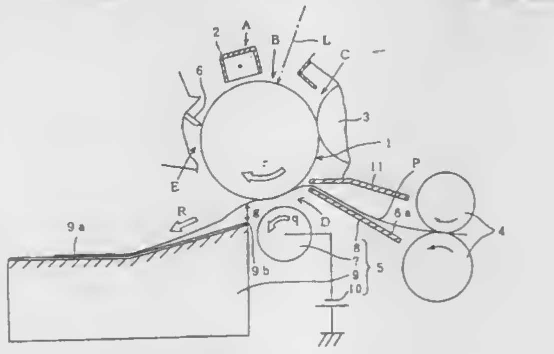
a transfer station for transferring toner images on said image area to a substrate during an N+1 cycle; and

a cleaning station for cleaning said image area after said toner images are transferred to a substrate;

wherein physical contact between both said transfer station and said cleaning station with said photoreceptor occur within the distance L, and wherein said exposure station exposes said photoreceptor when said transfer station and said cleaning station are not both adjacent said interdocument zone.

5,749,035
IMAGE TRANSFERRED SHEET CONVEYING GUIDE FOR USE IN AN IMAGE FORMING APPARATUS

Keiji Ban; Tetsuro Tomoe; Masami Fuchi; Hiroaki Tsuchiya; Osamu Yoshimura, and Shinichi Tanaka, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 276,784, Jul. 18, 1994, Pat. No. 5,617,193. This application Oct. 10, 1996, Ser. No. 728,783
Claims priority, application Japan, Jul. 29, 1993, 5-187729
Int. Cl.⁶ G03G *15/16*
U.S. Cl. 399—316 **20 Claims**



1. An image forming apparatus comprising:

an image carrier which carries on its moving surface an image formed by charged toner;

transferring means for transferring a toner image on the image carrier onto a transfer sheet adhering to the surface of the image carrier, said transferring means being arranged below the image carrier; and

a sheet conveying guide for conveying a transfer sheet onto which an image has been transferred by the transferring means, said sheet conveying guide having an electric resistance higher than an electric resistance of the transfer sheet, wherein on an upper surface of the sheet conveying guide serving as a conveying path for the transfer sheet, a plurality of guide ribs are formed in a direction in which the transfer sheet is conveyed.

VOL
2 10
ISS
1
MY
5
998
JMI

5,749,036

IMAGE FORMING APPARATUS WITH OIL SUPPLY CONSUMPTION PREDICTION

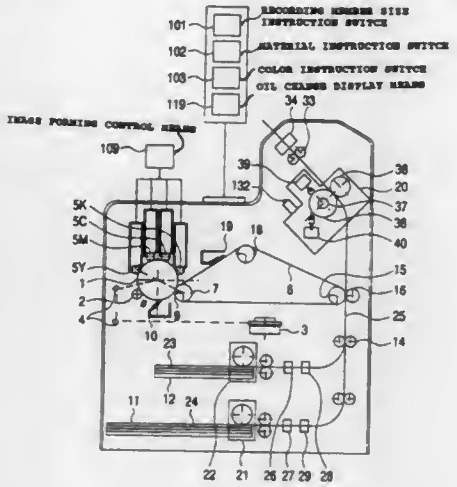
Kaneo Yoda, and Hiroshi Tanaka, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 12, 1996, Ser. No. 766,465

Claims priority, application Japan, Dec. 20, 1995, 7-332220

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—325 **15 Claims**



1. An image forming apparatus, comprising:

image forming means for forming a toner image on an electrostatic latent image holding member,

transfer means for transferring said toner image onto a current one of a plurality of recording members,

fixing means for fixing said toner image to said current one of said plurality of recording members with a heated rotational member,

paper feeding means for feeding said plurality of recording members,

a recording member conveyance passage for conveying said plurality of recording members to said transfer means and to said fixing means,

oil supply means for supplying oil to said heated rotational member,

calculating means for calculating, with respect said current one of said plurality of recording members, a current recording member oil consumption prediction,

integrated value storage means for storing an integrated value of said current recording member oil consumption prediction for each of said plurality of recording members,

comparison means for comparing said integrated value with a predetermined value, and

output means for transmitting a change signal to change the oil supply means when said integrated value exceeds said predetermined value;

wherein said current recording member oil consumption prediction is calculated based on consumption information that comprises at least one of:

size information pertaining to said current one of said plurality of recording members,

material information pertaining to said current one of said plurality of recording members,

printing mode information that indicates one of single sheet printing and continuous printing, and

color mode information that indicates one of single and plural color mode.

5,749,037

FIXING DEVICE WITH CLEANING DEVICE FOR CLEANING FIXING ROLLER

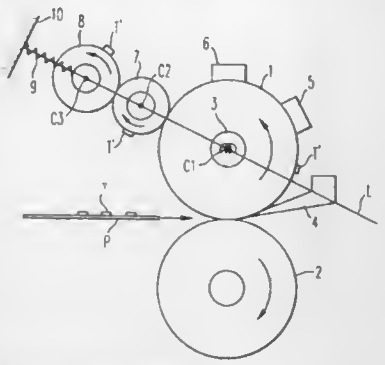
Seki Takayuki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 615,438

Claims priority, application Japan, Mar. 14, 1995, 7-054730

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—327 **4 Claims**



1. A fixing device comprising:

a fixing roller;

a first cleaning roller extending parallel to said fixing roller and positioned such that a circumferential periphery of said first cleaning roller engages a circumferential periphery of said fixing roller; and

a second cleaning roller extending parallel to said first cleaning roller and positioned such that a circumferential periphery thereof is in contact with said first cleaning roller,

wherein rotational centers of said first cleaning roller and second cleaning roller are on a single straight line and said first cleaning roller and said second cleaning roller are movable along said straight line, wherein a rotational center of said fixing roller is on said line.

5,749,038

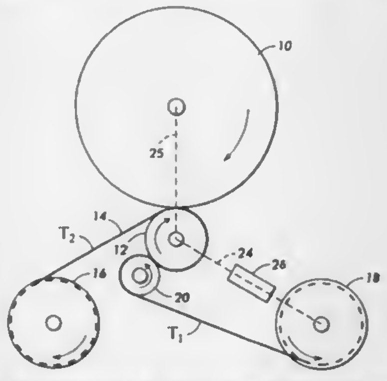
TENSION CONTROL FOR A CLEANING WEB IN A FUSER SUBSYSTEM IN AN ELECTROPHOTOGRAPHIC PRINTER

Paul M. Fromm, Rochester, and Edward C. Hanzlik, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1997, Ser. No. 837,935

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—327 **9 Claims**



6. A fusing apparatus for an electrostatographic printer, comprising:

a rotatable fuser roll;

a nip roll, a length of the nip roll being adjacent to a length of the fuser roll;

the nip roll being mounted on a mounting structure, the mounting structure being associated with a fulcrum and having a spring associated therewith, so that the spring causes the nip roll to exert a constant torque force against the fuser roll.

5,749,039

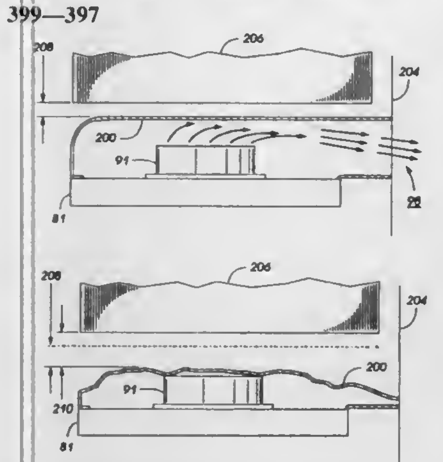
COLLAPSIBLE AIR PLENUM

Dean Thomas, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1996, Ser. No. 751,346

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—397 **5 Claims**



1. A substrate transport assembly, comprising:

an air housing having an air outlet port;

an air mover for selectively moving air through said air outlet port;

a drive assembly for receiving and moving a substrate, said drive member positioned such that when said air mover moves air that a substrate received by said drive member is biased against said drive member; and

an air plenum comprised of a flexible material, said air plenum for receiving air from said air outlet port and for directing that air along a first path,

wherein said air plenum expands when air is moved by said air mover, and wherein said air plenum collapses when air is not moved by said air mover.

5,749,040

IMAGE FORMING APPARATUS CAPABLE OF CORRECTING CURL OF SHEET

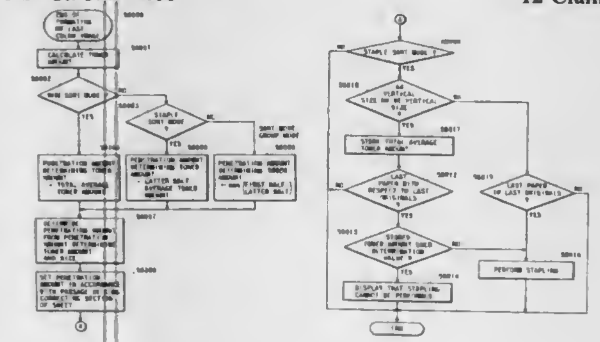
Masanori Muramatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1996, Ser. No. 680,696

Claims priority, application Japan, Jul. 20, 1995, 7-184295; Aug. 4, 1995, 7-199798

Int. Cl.^{6} G03G *15/00;* **B41J** *2/00*

U.S. Cl. 399—406 **12 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image on a sheet;

detecting means for detecting a processing amount of said image forming means which becomes a factor of an occurrence of the curl of said sheet;

a tray for receiving the sheet;

registration means for registering a direction perpendicular to the sheet conveying direction of the sheet on said tray;

binding means for binding the sheet on said tray; and

inhibiting means for inhibiting a binding operation of said binding means in accordance with the detection result of said detecting means.

5,749,041

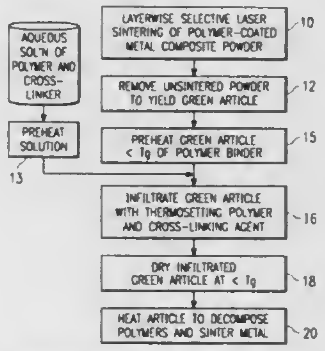
METHOD OF FORMING THREE-DIMENSIONAL ARTICLES USING THERMOSETTING MATERIALS

Udaykumar Lakshminarayan; Kevin P. McAlea, both of Austin, and Richard B. Booth, Pflugerville, all of Tex., assignors to DTM Corporation, Austin, Tex.

Filed Oct. 13, 1995, Ser. No. 542,977

Int. Cl.^{6} B22F *1/02;3/26*

U.S. Cl. 419—2 **17 Claims**


AQUEOUS SOL'N OF POLYMER AND CROSS-LINKER
PREHEAT SOLUTION
13
LAYERWISE SELECTIVE LASER SINTERING OF POLYMER-COATED METAL COMPOSITE POWDER
10
REMOVE UNSINTERED POWDER TO YIELD GREEN ARTICLE
12
PREHEAT GREEN ARTICLE < Tg OF POLYMER BINDER
15
INFILTRATE GREEN ARTICLE WITH THERMOSETTING POLYMER AND CROSS-LINKING AGENT
16
DRY INFILTRATED GREEN ARTICLE AT < Tg
18
HEAT ARTICLE TO DECOMPOSE POLYMERS AND SINTER METAL
20

1. A method of fabricating an article, comprising the steps of:

forming a green article by the selective sintering of a composite metal powder having a thermoplastic polymer binder;

infiltrating the green article with an aqueous emulsion of a thermosetting polymer material; and

drying the infiltrated green article.

5,749,042

BISMUTH GENERATOR METHOD

Lane Allan Bray, Richland, and Jaquetta R. DesChane, Pasco, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jan. 28, 1997, Ser. No. 789,973

Int. Cl.^{6} C01G *30/00*

U.S. Cl. 423—2 **7 Claims**

1. A method for separating ^{213}Bi from a solution of radionuclides comprising the following steps:

(a) ensuring the solution of radionuclides containing ^{213}Bi further contains HCl at a concentration which allows the formation of a chloride complex,

(b) exposing the solution to an anionic exchange resin, thereby absorbing the ^{213}Bi from the solution as an anionic complex and adhering the ^{213}Bi in the anionic complex to the resin,

(c) separating the resin with the adhered ^{213}Bi in the anionic complex from the solution, and

(d) exposing the resin and the adhered ^{213}Bi in the anionic complex to a stripping solution thereby removing the ^{213}Bi from the resin and transferring the ^{213}Bi into said stripping solution.

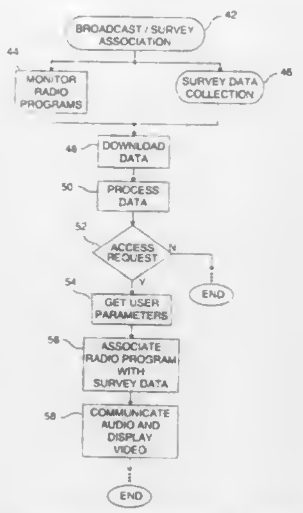
/OL
2 10
SS
1
MY
5
998
JMI

5,749,043

SYSTEM AND METHOD FOR ESTIMATING CHARACTERISTICS OF BROADCAST RADIO AUDIENCES

David G. Worthy, 819 East Vaughn, Gilbert, Ariz. 85234
Filed Sep. 27, 1995, Ser. No. 534,508
Int. Cl.⁶ H04N *7/16*

U.S. Cl. 455—2 **18 Claims**



1. A method for estimating listening audience preferences in response to radio broadcast programming, said method comprising the steps of:

monitoring a radio program broadcast by a radio station during a time period;

collecting survey data describing radio stations to which tuners are tuned during said time period;

associating said radio program with said survey data in a substantially synchronous format;

communicating an audio representation of said radio program to a remote access site; and

displaying a visual representation of said survey data at said remote access site; wherein

the temporal relationship between said audio representation and said visual representation is substantially equivalent to the temporal relationship between said radio program and said survey data.

5,749,044

CENTRALIZED DYNAMIC CHANNEL ASSIGNMENT CONTROLLER AND METHODS

Kadathur S. Natarajan, Mesa; Yih G. Jan, and Kenneth M. Peterson, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 14, 1995, Ser. No. 502,793
Int. Cl.⁶ H04R *7/185;7/19;7/195*

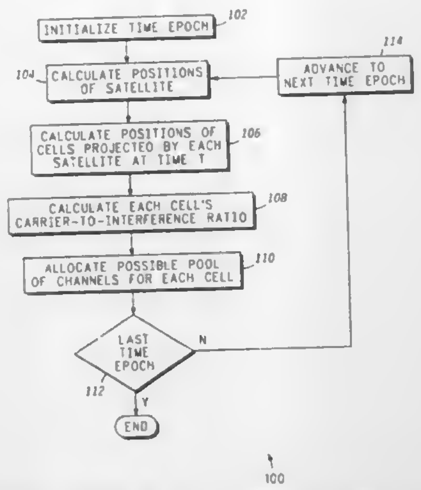
U.S. Cl. 455—13.1 **20 Claims**

1. A method for allocating channels and cells of a plurality of satellites at each of a plurality of time epochs, the method comprising the steps of:

a) calculating positions of each of the satellites at a time epoch;

b) calculating positions of each of the cells for each satellite based on the positions of the satellites at the time epoch;

c) calculating a carrier-to-interference value for each of the cells at the time epoch based on a transmitting power of a cell and interfering cells, antenna gain distribution of the cell and the interfering cells, receiving antenna gain distribution of a subscriber unit and receiver filter characteristics of the subscriber unit:


INITIALIZE TIME EPOCH
102
104
CALCULATE POSITIONS OF SATELLITE
ADVANCE TO NEXT TIME EPOCH
114
CALCULATE POSITIONS OF CELLS PROJECTED BY EACH SATELLITE AT TIME T
106
CALCULATE EACH CELL'S CARRIER-TO-INTERFERENCE RATIO
108
ALLOCATE POSSIBLE POOL OF CHANNELS FOR EACH CELL
110
LAST TIME EPOCH
N
112
Y
END
100

d) allocating channels to each of the cells based on the carrier-to-interference value at the time epoch: and

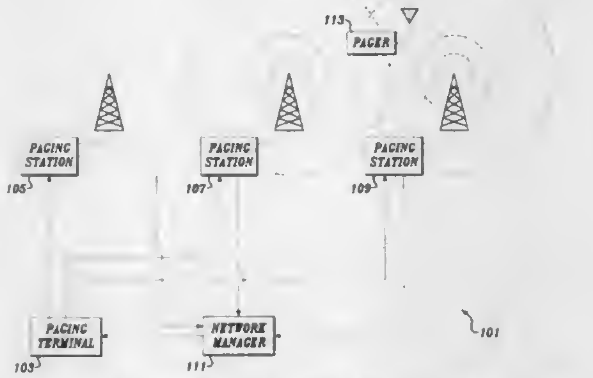
e) repeating steps (a)–(d) for each of the time epochs.

5,749,045

METHOD FOR HANDLING ALARM CONDITIONS IN A PAGING SYSTEM

Roger E. Benz; Warren L. Schroeder; Kenneth T. Smelcer; Kevin W. Dahl, and James A. Rodts, all of Quincy, Ill., assignors to Glenayre Electronics, Inc., Charlotte, N.C.
Filed Jun. 29, 1995, Ser. No. 496,829
Int. Cl.⁶ H04Q *7/00*

U.S. Cl. 455—31.2 **12 Claims**



1. A method of processing a current alarm in a paging system said paging system including a plurality of paging stations and a network manager said current alarm originating from a one of said paging stations to indicate an alarm condition at said one of said paging stations, the method including the steps of:

maintaining an alarm record said alarm record including a record of previous alarms received from each said one of said paging stations;

comparing said current alarm with a predetermined set of said previous alarms in said alarm record to determine if said current alarm is a duplicate of any of said predetermined set of said previous alarms;

alerting a technician of said current alarm if said current alarm is not a duplicate of any of said predetermined set of said previous alarms; and

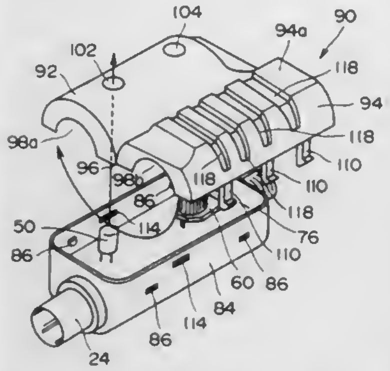
determining whether an ALERT_ENABLE flag is high, and if so, even if said current alarm is a duplicate of any of said predetermined set of said previous alarms, alerting the technician.

5,749,046

SIGNAL LEVEL MEASURING APPARATUS FOR DIRECTING AN ANTENNA TOWARD A SATELLITE

Minoru Ohta, and Akibiro Fujimoto, both of akashi, Japan, assignors to DX Antenna Company, Llmited, Kobe, Japan
Filed Jun. 7, 1995, Ser. No. 485,687
Claims priority, application Japan, Jul. 5, 1994, 6-177649
Int. Cl.⁶ H01Q *3/00*

U.S. Cl. 455—67.1 **4 Claims**



1. A signal level measuring apparatus for use in directing a receiving antenna to a geostationary satellite, said signal level measuring apparatus being adapted to be disposed between a converter associated with said receiving antenna to convert a satellite signal from said geostationary satellite as received by said receiving antenna into an intermediate frequency (IF) signal, and a tuner for demodulating said IF signal, said signal level measuring apparatus comprising:

an input terminal adapted to receive said IF signal;

level measuring means for measuring the level of said IF signal from said input terminal;

indicating means for indicating the measurement in said level measuring means;

an output terminal for coupling said IF signal to said tuner; and

a housing for housing said input terminal, said level measuring means, said indicating means, and said output terminal;

wherein said housing includes a first section having a semi-circular cross-section and a second section coupled to said first section having a modified semi-circular cross-section having a flat surface extending along the length thereof, and a plurality of ridges or grooves formed in said flat surface of said second section to extend transversely across said flat surface are arranged along the length of said housing.

5,749,047

METHOD AND APPARATUS FOR RECOGNIZING A TEST SIGNAL AND DETERMINING SIGNAL TRANSFER CHARACTERISTICS THEREFROM

Richard C. Cabot, Lake Oswego, Oreg., assignor to Audio Precision, Portland, Oreg.
Continuation of Ser. No. 86,694, Jul. 1, 1993, abandoned, which is a continuation of Ser. No. 764,142, Sep. 20, 1991, abandoned. This application Apr. 5, 1995, Ser. No. 417,466
Int. Cl.⁶ G01R *23/16*

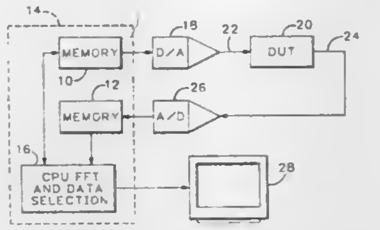
U.S. Cl. 455—67.4 **20 Claims**

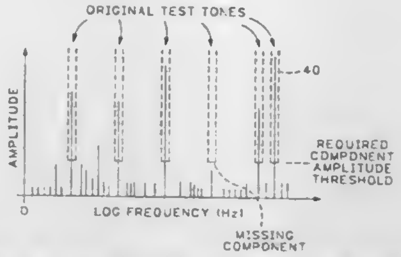
1. A method for recognizing, in an electrical signal on an electrical signal transfer channel having an electrical signal input and an electrical signal output, a test signal comprising at least several distinct, substantially sinusoidal frequency components and using said test signal to determine the electrical signal transfer characteristic of said electrical signal transfer channel, comprising:

(a) inserting said test signal at said electrical signal input for a selected period of time;

(b) receiving at said electrical signal output the electrical signal,

(c) performing a time-to-frequency transformation of said electrical signal to determine its spectral characteristics;





(d) comparing said spectral characteristics of said electrical signal to spectral characteristics of said test signal to determine, without foreknowledge, whether said test signal has been inserted; and

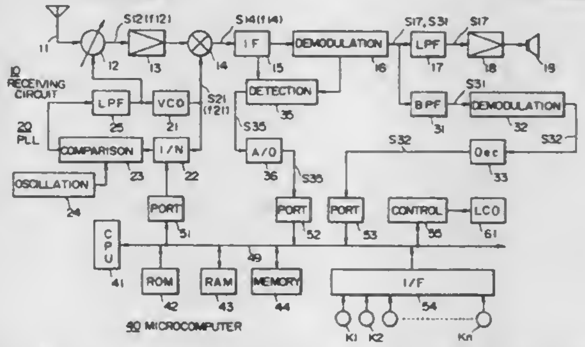
(e) where it is determined that said test signal has been inserted, thereafter analyzing said test signal to determine an electrical signal transfer characteristic of said electrical signal transfer channel.

5,749,048

RECEIVER

Hiroshi Masuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 681,366, Jul. 23, 1996. This application Jul. 2, 1997, Ser. No. 886,665
Claims priority, application Japan, Aug. 8, 1995, 7-222618
Int. Cl.⁶ H04B *1/18*

U.S. Cl. 455—186.1 **2 Claims**



1. A receiver for receiving a broadcast signal in which data indicating a broadcast station name associated with the broadcast signal has been multiplexed, comprising:

a receiving circuit for receiving the broadcast signal and operating in a frequency synthesizer mode;

a memory for registering a group of frequency data and associated broadcast station name data arranged in an alphabetical ranking according to said broadcast station name for selecting said broadcast signal in said receiving circuit;

a circuit for demultiplexing said associated broadcast station name data from the broadcast signal received by said receiving circuit and storing a frequency of said signal and said associated broadcast station name data in said memory;

rank determining means for determining an alphabetical rank of said associated broadcast station name of said received broadcast signal;

means for causing said receiving circuit to scan a broadcasting zone for said broadcast signal; and

detection means for detecting said received broadcast signal at the time of said scanning, wherein

/OL
2 10
SS
1
MY
5
998
MI

when said detection means has detected said received broadcast signal during said scanning, a segment of said group of frequency data and associated broadcast station name data which has been registered before the start of said scanning including only broadcast station names with alphabetical ranks that are lower than the rank of said received broadcast signal detected by said rank detecting means are shifted to a second data area from a first data area in said memory, and

said demultiplexing and storage circuit stores said frequency of said received broadcast signal thus detected and said data indicating said broadcast station name in said first data area in said memory following the shift.

5,749,049

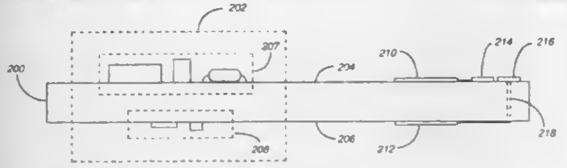
METHOD AND APPARATUS FOR MEASURING THE INHERENT CAPACITANCE OF A CIRCUIT SUPPORTING SUBSTRATE

Nicholas Jacob Worp, 6776 Paul Mar Dr., Lantana, Fla. 33462

Division of Ser. No. 786,675, Nov. 1, 1991, abandoned. This application Feb. 16, 1993, Ser. No. 18,132

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—226.1 **11 Claims**



1. An electronic device comprising:

a substrate for supporting electrical circuits, the substrate comprising first and second opposing surface areas;

at least first and second electrical contacts disposed on the substrate; and

at least first and second conductive plates disposed on the first and second surface areas, respectively, and also electrically coupled to the at least first and second electrical contacts, respectively, the first and second conductive plates forming a capacitive element therebetween for determining excessive variability in composition of the substrate as indicated by a measured inherent capacitance of the substrate at the capacitive element that is outside a specified tolerance thereof.

5,749,050

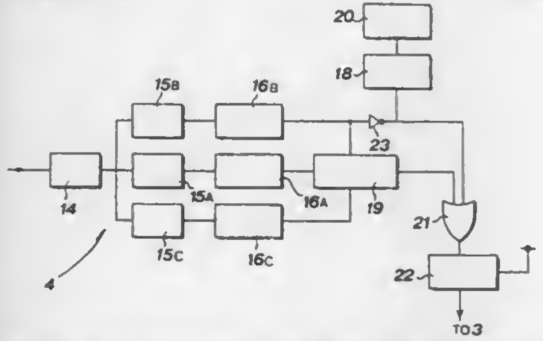
AUTOMATIC EMERGENCY ALARM RECEPTION APPARATUS USING SPECIFIC FREQUENCY

Jae Sung Kim, Rm. 505, Chugong Apt. No. 405, Chungkae 4-dong, Nowon-Ku, Seoul, Rep. of Korea

Filed Oct. 7, 1996, Ser. No. 726,899

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—228 **2 Claims**



1. In a broadcasting receiver which has a radio frequency par; and a low frequency part, an automatic emergency alarm receptioo apparatus comprising:

an ON/OFF switch connected between said radio frequency part and said low frequency part, for turning on said broadcasting receiver when a specific frequency signal indicative of a state of emergency is received at an antenna of said broadcasting receiver; and

emergency alarm signal detection means for detecting the specific frequency signal from said radio frequency part to control said ON/OFF switch, said emergency alarm signal detection means including an amplifier for amplifying the specific frequency signal from said radio frequency part, first to third band pass filters for band pass filtering an output signal from said amplifier at first to third bands, respectively, first to third level comparators for wave-shaping output signals from said first to third band pass filters, respectively, an inverter for inverting an output signal from said second level comparator, a counter for counting an output signal from said inverter to detect an air defense alarm signal therefrom, a pulse generator for generating a pulse in the unit of seconds and outputting the generated pulse to said counter, a sequential detector for detecting an air-raid alarm signal from output signals from said first and third level comparators and the output signal from said second level comparator, an OR gate for performing an OR operation with respect to an output signal from said counter and an output signal from said sequential detector, and an R-S flip-flop for generating a control signal in response to an output signal from said OR gate and outputting the generated control signal to said ON/OFF switch.

5,749,051

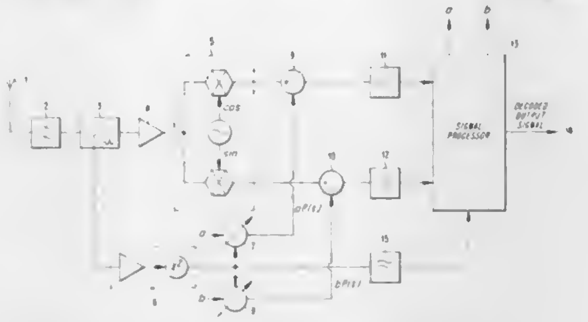
COMPENSATION FOR SECOND ORDER INTERMODULATION IN A HOMODYNE RECEIVER

Paul W. Dent, Pittsboro, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jul. 18, 1996, Ser. No. 683,384

Int. Cl.^{6} H04B *1/26*

U.S. Cl. 455—324 **32 Claims**



1. A homodyne radio receiving apparatus comprising:

an antenna for receiving an incoming signal;

a bandpass filter connected to said antenna for limiting the bandwidth of said incoming signal to produce a filtered signal;

an amplifier connected to said filter for amplifying said filtered signal to produce an amplified signal;

a down converter connected to said amplifier for converting said amplified signal to complex baseband signals I and Q;

a power detector connected to said amplifier for producing a power signal related to total received signal power amplified by said amplifier, and

a signal processor connected to said down converter and to said power detector for processing said I,Q signals and said power signal to produce a desired output signal in which corruption due to second order intermodulation in said amplifier and said down converter has been compensated.

5,749,052

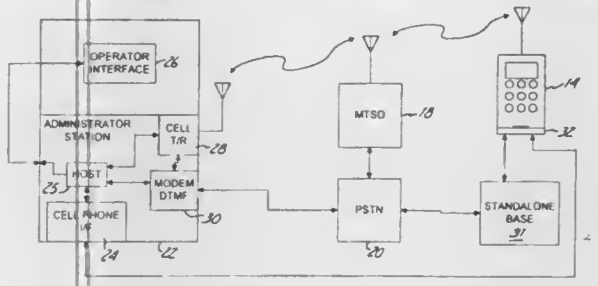
CELLULAR TELEPHONE MANAGEMENT SYSTEM

Stephen E. Hidem; Joseph P. Tretter, III, both of Minneapolis, Minn.; John Schuholz, Cincinnati, Ohio; Robert P. Engfer, Minnetonka, Minn.; Charles H. Smoot, III, Orono, Minn., and Hans Anderson, Bloomington, Minn., assignors to Tele Digital Development, Inc., St. Paul, Minn.

Filed May 24, 1995, Ser. No. 449,849

Int. Cl.^{6} H04M *11/00;* H04Q *7/00*

U.S. Cl. 455—406 **7 Claims**



1. A cellular telephone system, comprising: a cellular telephone including:

a receiver for receiving cellular communications;

a transmitter for transmitting cellular communications;

an operator interface for receiving input commands from an operator and for providing command signals based on the input commands; and

a controller, coupled to the receiver, the transmitter and the operator interface, for controlling the receiver and the transmitter based on the command signals, the controller including:

a memory for storing predetermined dialing directory data indicative of allowed telephone numbers useable by the operator;

restriction means for restricting communications with unauthorized telephonic communicators corresponding to telephone numbers other than the allowed telephone numbers; and

an administrator station having a second controller for communicating with the controller in the cellular telephone, wherein the controller in the cellular telephone includes an input, coupled to the receiver, for receiving the dialing directory data remotely from the administrator station.

5,749,053

MOBILE COMMUNICATION NETWORK AND CONTROL METHOD THEREOF

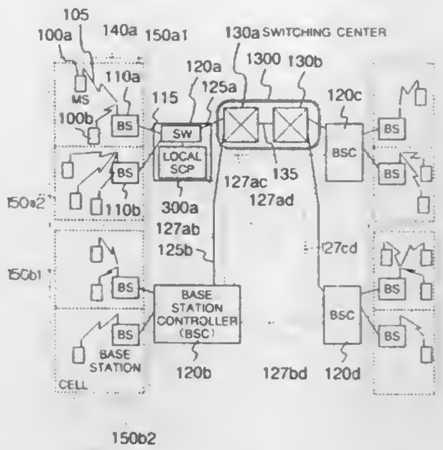
Tsutomu Kusaki, Yokohama; Toshiya Ouchi, Tokyo; Shiro Tanabe, Hidaka; Ken Nanjo, and Takeshi Maki, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,394

Claims priority, application Japan, Aug. 24, 1994, 6-199232

Int. Cl.^{6} H04B *7/00;* H04Q *7/20*

U.S. Cl. 455—524 **20 Claims**



1. A mobile communication network comprising:

a plurality of base stations each of which communicates with a plurality of mobile stations through wireless channels;

a plurality of control stations, each of said control stations having a data base for storing terminal information including location data of each mobile station in a group of mobile stations and serving as a home control station for said group of mobile stations; and

an exclusive network for interconnecting said plurality of control stations with each other, wherein each of said control stations includes:

means for making, when terminal information for one mobile station is required, the judgement of whether or not the required terminal information is stored in said data base and for broadcasting, in the case where the required terminal information is not stored in said data base, a request message for the required terminal information to a plurality of other control stations through said exclusive network,

means for receiving through said exclusive network a response message which one of the other control stations serving as a home control station of said one mobile station transmits in response to said request message,

means for transmitting, when a request message for terminal information concerning one mobile station is received from any one of other control stations through said exclusive network, a response message inclusive of the requested terminal information to the requesting control station through said exclusive network if the requested terminal information is stored in said data base, and

a content-addressable memory for storing identification numbers of said group of mobile stations and memory addresses of terminal information thereof in said data base in association with each other and wherein each of said control stations makes, when terminal information for one mobile station is required, the reference to said content-addressable memory to judge whether or not the required terminal information is stored in said data base.

5,749,054

Patent Not Issued For This Number

5,749,055

ANALOG RETRY

Steinar Dahlin, Jarfalla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 980,715, Nov. 24, 1992, abandoned. This application Jul. 24, 1996, Ser. No. 685,802

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 455—553 **3 Claims**

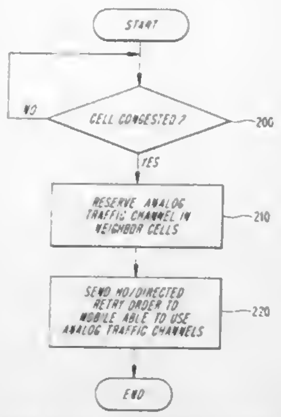
1. In a cellular mobile system having both analog and digital traffic channels and including a land system serving a plurality of cells, a plurality of mobile stations of a first kind using said analog channels only and a plurality of mobile stations of a second kind using both said analog and digital traffic channels, a method of reducing disturbance of communications within the system when a mobile station of said second kind leaves a first cell for a second cell, said second cell having a heavy traffic load, comprising the steps:

in the land system:

sending a directed retry order to a mobile station of said second kind identifying at least one target cell adjacent to said second cell and having at least one analog traffic channel available;

in the mobile station:

/OL
2 10
ISS
1
MY
5
998
JMI


START
NO
CELL CONGESTED?
200
YES
RESERVE ANALOG TRAFFIC CHANNEL IN NEIGHBOR CELLS
210
SEND HO/DIRECTED RETRY ORDER TO MOBILE ABLE TO USE ANALOG TRAFFIC CHANNELS
220
END

accessing said target cell identified in the received directed retry order; and

in the accessed target cell:

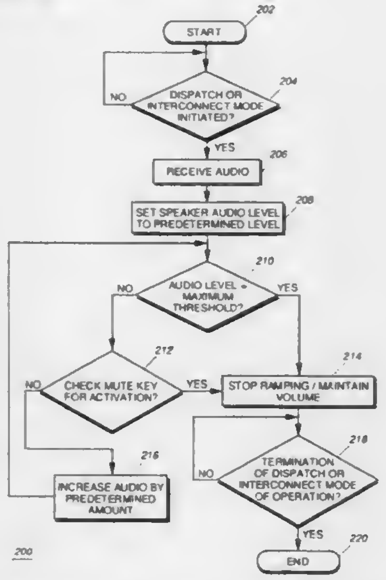
assigning to the accessing mobile station of said second kind an analog traffic channel in preference over a digital traffic channel based on said directed retry order.

5,749,056
AUDIO RAMPING TECHNIQUE FOR A RADIO
Audley F. Patterson, Miramar; Hector E. Suarez, Miami, and Craig P. Wadin, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1995, Ser. No. 522,200

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—569 **15 Claims**


START
202
NO
DISPATCH OR INTERCONNECT MODE INITIATED?
204
YES
RECEIVE AUDIO
206
SET SPEAKER AUDIO LEVEL TO PREDETERMINED LEVEL
208
210
NO
AUDIO LEVEL = MAXIMUM THRESHOLD?
YES
212
214
NO
CHECK MUTE KEY FOR ACTIVATION?
YES
STOP RAMPING / MAINTAIN VOLUME
216
218
INCREASE AUDIO BY PREDETERMINED AMOUNT
NO
TERMINATION OF DISPATCH OR INTERCONNECT MODE OF OPERATION?
YES
220
200
END

1. A radio providing first and second operating modes each having different nominal audio speaker levels, including:

a controller for enabling either the first or second operating modes, said controller increasing the audio speaker level of each of the first and second operating modes from a similar predetermined level at a similar predetermined rate;

a speaker operatively coupled to the controller for generating the audio speaker level; and

a keypad coupled to the controller for providing a user initiated control signal to the controller, said controller ceasing to increase the audio speaker level in response to the user initiated control signal, and the controller maintaining the audio speaker level in response to the user initiated control.

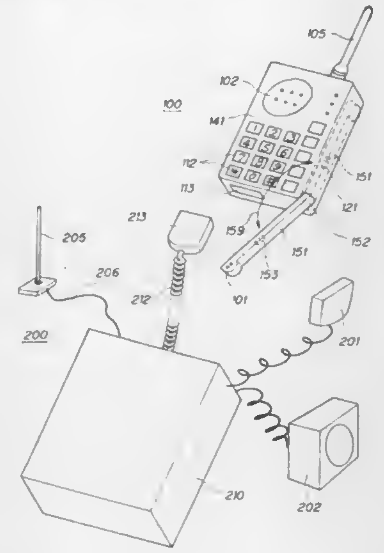
5,749,057
TELEPHONE HANDSET FOR HANDS-FREE USE IN AN AUTO MOBILE
Kotaro Takagi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 552,864

Claims priority, application Japan, Nov. 8, 1994, 6-298914

Int. Cl.^{6} H04M *11/00;* **H04Q** *7/00*

U.S. Cl. 455—569 **3 Claims**



1. A telephone handset for hands-free use in an automobile comprising:

a handset including

a microphone activated in a first mode;

a speaker activated in said first mode;

an arm having said microphone mounted thereon and being changeable from a first position to a second position;

position detection means for detecting a position of said arm;

switch means for switching between a use status or a non-use status of said microphone and speaker according to said first mode; and

control means for determining whether a status of the telephone apparatus is said first mode;

an accessory apparatus for connection to said handset via a detachable connector, wherein said accessory apparatus includes a radio frequency antenna for communicating a transmitted signal from said handset;

accessory connecting detecting means for detecting whether said accessory apparatus is connected to said handset wherein said control means determines whether the telephone is in said first mode depending on the output of the accessory connecting detecting means and the position detecting means; and

a magnet located at a predetermined position on said arm, and wherein

said position detection means includes magnetic field detection means located at a position corresponding to a position of said magnet when said arm is in said first position.

5,749,058
ROBOT SAFETY SYSTEM FOR CONNECTING PERIPHERAL DEVICE TO A ROBOT CONTROLLER
Yoshiki Hashimoto, Hadano, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

Filed Jun. 6, 1995, Ser. No. 469,827

Claims priority, application Japan, Jun. 29, 1994, 6-147288

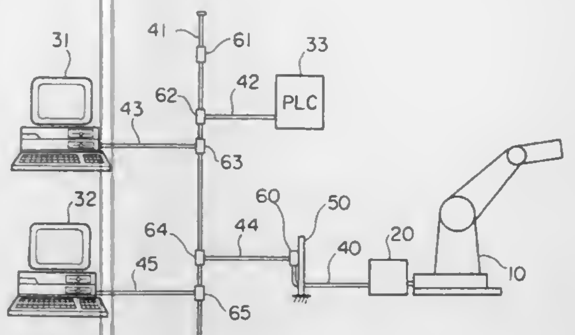
Int. Cl.^{6} G06F *7/70;* **G05B** *19/04*

U.S. Cl. 701—23 **7 Claims**

1. A robot system comprising:

a movable robot assembly movable within an operation range;

a robot controller integrally connected to said movable robot assembly;



a peripheral device disposed outside of said operation range;

a data communication cable connected to said peripheral device for data communications with said robot controller;

a connector cable connected to said robot controller for data communications with said peripheral device; and

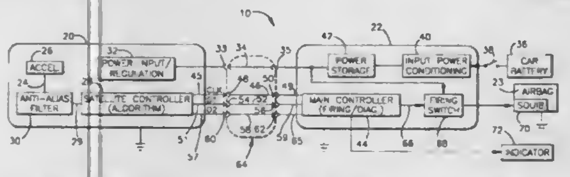
a relay disposed outside of said operation range and having a connector for interconnecting said data communication cable and said connector cable.

5,749,059
APPARATUS AND METHOD FOR CONTROLLING AN ACTUATABLE RESTRAINT DEVICE
Karl D. Walton, Rowland Heights, Calif., assignor to TRW Technar Inc., Irwindale, Calif.

Filed Sep. 14, 1995, Ser. No. 528,427

Int. Cl.^{6} B60R *21/32*

U.S. Cl. 701—45 **18 Claims**



1. An apparatus for controlling an actuatable restraining device, said apparatus comprising:

satellite crash sensing means including acceleration sensing means for providing a crash acceleration signal having a characteristic indicative of crash acceleration of the vehicle, said satellite crash sensing means further including determining means for determining, in response to said crash acceleration signal, whether a deployment crash condition is occurring, said satellite crash sensing means including means for providing a coded signal in response to a determined deployment crash condition; and

main control means remotely located from and operatively connected to said satellite crash sensing means and to said restraining device, said main control means actuating said actuatable restraining device in response to said coded signal from said satellite crash sensing means.

5,749,060
AUTOMATIC TRANSMISSION CONTROL FOR A MOTOR VEHICLE
Friedrich Graf, Regensburg; Kai Storjohann, Regensburg Grass; Michael Ulm, Alteglofsheim; Ralf-Johannes Lenninger, Regensburg, and August Kammerl, Brunn, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

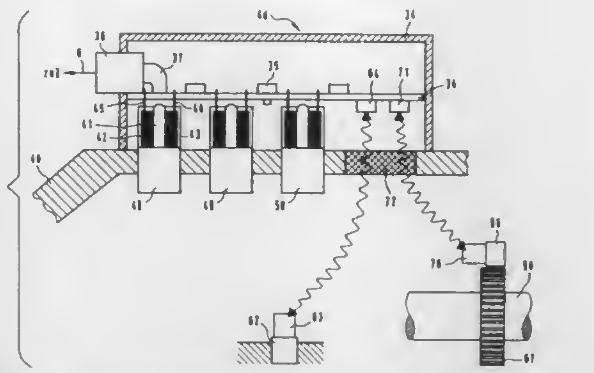
Filed Apr. 11, 1996, Ser. No. 631,805

Claims priority, application Germany, Oct. 11, 1993, 43 34 595.6

Int. Cl.^{6} G06G *7/10*

U.S. Cl. 701—51 **5 Claims**

1. In a motor vehicle with an automatic transmission being accommodated in a housing and having friction elements, a control configuration for the motor vehicle, comprising:



sensors transmitting sensor signals wirelessly;

a transmission control device mounted at the transmission housing for receiving and evaluating the sensor signals transmitted by said sensors;

an engine control device;

a communication channel interconnecting said transmission control device and said engine control device; and

electrohydraulic pressure control valves having coils integrated into said transmission control device, said control valves shifting the transmission and actuating the friction elements in the transmission, wherein said sensors transmitting sensor signals wirelessly include a temperature sensor disposed inside the transmission housing, and including a transponder connected to said temperature sensor, and a receiver in said transmission control device for receiving temperature measurement values from said transponder wirelessly on request.

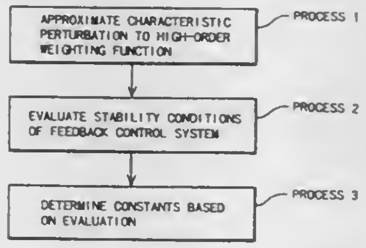
5,749,061
CLUTCH SLIP CONTROL DEVICE AND METHOD OF MANUFACTURING THE SAME, CLUTCH SLIP CONTROL METHOD, AND VEHICLE CONTROL DEVICE
Katsumi Kono; Hiroshi Ito; Kagenori Fukumura, all of Toyota; Shinya Nakamura, Owari-Asahi; Masataka Osawa, Nagoya; Ryoichi Hibino, Aichi-ken, and Masatoshi Yamada, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, both of Japan

Division of Ser. No. 365,797, Dec. 29, 1994, Pat. No. 5,627,750. This application Jan. 3, 1997, Ser. No. 778,506

Claims priority, application Japan, Dec. 29, 1993, 5-354656; Jul. 22, 1994, 6-191988

Int. Cl.^{6} F16H *61/00;* **B60K** *41/02*

U.S. Cl. 701—68 **9 Claims**


APPROXIMATE CHARACTERISTIC PERTURBATION TO HIGH-ORDER WEIGHTING FUNCTION
PROCESS 1
EVALUATE STABILITY CONDITIONS OF FEEDBACK CONTROL SYSTEM
PROCESS 2
DETERMINE CONSTANTS BASED ON EVALUATION
PROCESS 3

1. A method of manufacturing a slip control device which outputs a plant input for actuating a clutch so as to make an actual slip revolution speed coincident with a target slip revolution speed and adjusts slip conditions of said clutch based on said plant input, said method comprising the steps of:

(a) measuring characteristic perturbations of a slip-conditions feedback control system on a plurality of factors causing said characteristic perturbations, and approximating a total of said characteristic perturbations due to said plurality of factors as a first high-order weighting function;

/OL
2 10
ISS
1
MY
5
998
JMI

(b) evaluating a first value and a second value as conditions for making said feedback control system stable over said characteristic perturbations,

said first value being determined by taking account of said first high-order weighting function and a transfer function from said target slip revolution speed to said actual slip revolution speed, and

said second value being determined by taking account of a transfer function from said target slip revolution speed to a control deviation and a second weighting function set for guaranteeing response of said feedback control system; and

(c) determining constants for calculating a control amount of said feedback control system based on the result of said evaluation in said step (b).

5,749,062
REFERENCE VALUE CORRECTING DEVICE IN DRIVEN WHEEL SLIP CONTROL SYSTEM

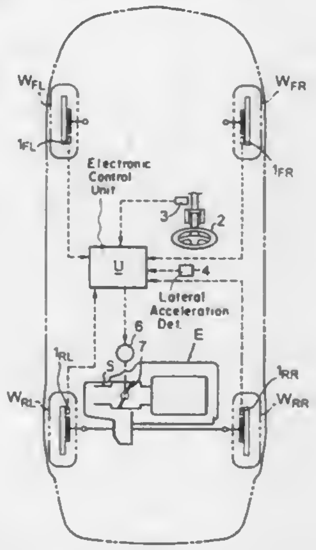
Osamu Yamamoto; Shuji Shiraishi, both of Wako, and Osamu Yano, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 571,799

Claims priority, application Japan, Dec. 20, 1994, 6-316477

Int. Cl.⁶ B60K *28/16*

U.S. Cl. 701—72 **4 Claims**



1. A reference value correcting device in a driven wheel slip control system for estimating a slip state of a driven wheel to control a driving torque by calculating a slip rate of the driven wheel, based on a driven wheel speed and a vehicle speed, and by comparing said slip rate with a slip-controlling reference value, said reference value correcting device comprising:

a reference value calculating means for calculating the slip-controlling reference value based on said vehicle speed; a turning-state detecting means for detecting that the vehicle is in a predetermined turning state;

a correction value calculating means for calculating a correction value which corrects the slip-controlling reference value based on the vehicle speed and a steered state, when the vehicle is in the predetermined turning state; and

a reference value correcting means for correcting said slip-controlling reference value by said correction value.

5,749,063
AUTOMATIC VEHICLE SPEED CONTROLLING APPARATUS

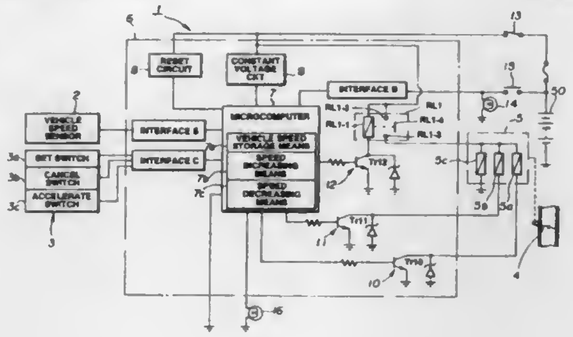
Kazutaka Sakonjyu, and Eisaku Hori, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed Nov. 10, 1993, Ser. No. 149,741

Claims priority, application Japan, Nov. 11, 1992, 4-301195

Int. Cl.⁶ G06G *7/70*

U.S. Cl. 701—93 **3 Claims**



1. An automatic vehicle speed controlling apparatus for a vehicle comprising:

a vehicle speed sensor for sensing actual speed of the vehicle, and for generating actual speed data which is proportional to the actual speed of the vehicle;

command switch means operable for generating a cruise command signal;

activator means for driving a throttle valve of the vehicle;

control means responsive to the actual speed data from said vehicle speed sensor and the cruise command signal from said command switch means, and including storage means for storing a desired speed datum in response to the cruise command signal from said command switch means, and means for selectively generating a speed increasing signal and a speed decreasing signal in response to a difference between the actual speed data from said vehicle speed sensor and the desired speed datum stored in said storage means and for supplying the speed increasing signal and the speed decreasing signal to said activator means;

wherein said means for selectively generating the speed increasing and the speed decreasing signals discontinues generating of the speed increasing signal and successively generates the speed decreasing signal when the difference between the actual speed data from said vehicle speed sensor and the desired speed datum stored in said storage means reaches a first predetermined value while the vehicle is accelerated with the speed increasing signal; and

wherein said control means further includes means for detecting the acceleration value of the vehicle derived from change rate of the actual speed data supplied from said vehicle speed sensor;

the improvement comprising said control means generates the speed decreasing signal when the difference between the actual speed data supplied from said vehicle speed sensor and the desired speed datum stored in said storage means reaches a second predetermined value greater than the first predetermined value after the acceleration of the vehicle detected with said detecting means exceeds a predetermined acceleration value.

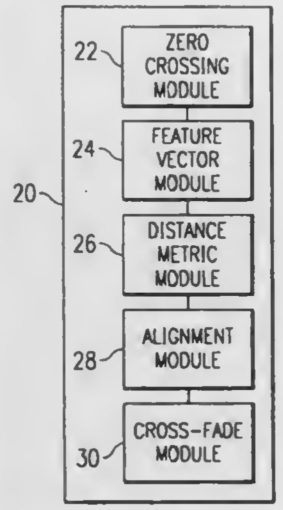
5,749,064
METHOD AND SYSTEM FOR TIME SCALE MODIFICATION UTILIZING FEATURE VECTORS ABOUT ZERO CROSSING POINTS

Basavaraj I. Pawate, Ibaraki, Japan, and Susan Yim, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 1, 1996, Ser. No. 609,335

Int. Cl.⁶ G10L *3/02;9/12*

U.S. Cl. 704—213 **8 Claims**



1. A method of generating a time scale modification of a signal comprising the steps of:

determining zero crossing points in the signal using a zero crossing module;

determining feature vectors in neighborhood of said zero crossing points based on absolute magnitude and slope of sample points before and after zero crossing points using a feature vector module wherein each feature vector has j dimensions;

determining distance metrics associated with said zero crossing points using said feature vectors bases on accumulation of differences for each of the j dimensions, each of said distance metrics to measure closeness of local characteristics between two of said zero crossing points, using a distance metric module; finding minimum measure of said accumulation of differences for each of the dimensions; and

aligning the signal along similar segments using said feature vectors and said distance metrics based on said minimum measure of said accumulation of differences for each of the j dimensions to achieve the time scale modification of the signal using said alignment module.

5,749,065
SPEECH ENCODING METHOD, SPEECH DECODING METHOD AND SPEECH ENCODING/DECODING METHOD

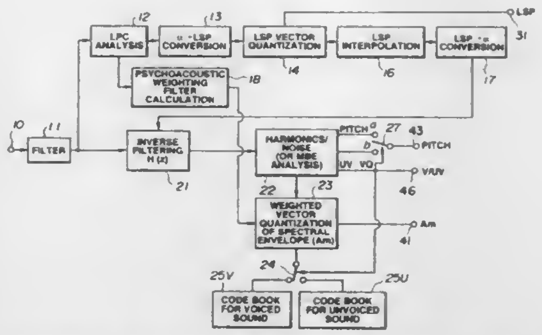
Masayuki Nishiguchi, and Jun Matsumoto, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1995, Ser. No. 518,298

Claims priority, application Japan, Aug. 30, 1994, 6-205284

Int. Cl.⁶ G10L *3/02;9/00*

U.S. Cl. 704—219 **39 Claims**


12
LPC ANALYSIS
13
α→LSP CONVERSION
LSP VECTOR QUANTIZATION
14
LSP INTERPOLATION
16
LSP→α CONVERSION
17
LSP
31
PSYCHOACOUSTIC WEIGHTING FILTER CALCULATION
18
10
11
FILTER
INVERSE FILTERING H(z)
21
HARMONICS/NOISE (OR MBE ANALYSIS)
PITCH
a
b
27
43
PITCH
UV
VO
V/UV
46
22
23
WEIGHTED VECTOR QUANTIZATION OF SPECTRAL ENVELOPE (Am)
Am
41
24
25V
25U
CODE BOOK FOR VOICED SOUND
CODE BOOK FOR UNVOICED SOUND

1. A speech encoding method which divides an input speech signal into blocks on a time axis and encodes the input speech signal on a block basis, the speech encoding method comprising the steps of:

finding a short-term prediction residue of the input speech signal;

representing the short-term prediction residue by at least a sum of sine waves; and

encoding information of a frequency spectrum of the sum of the sine waves, wherein the frequency spectrum is processed by matrix quantization or vector quantization with weighting that takes into account factors relating to human hearing sense.

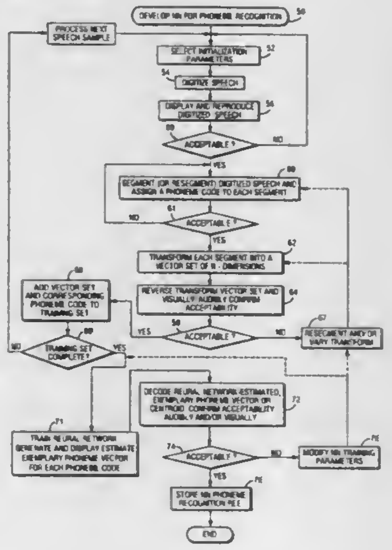
5,749,066
METHOD AND APPARATUS FOR DEVELOPING A NEURAL NETWORK FOR PHONEME RECOGNITION

Paul A. Nussbaum, Long Beach, N.Y., assignor to Ericsson Messaging Systems Inc., Woodbury, N.Y.

Filed Apr. 24, 1995, Ser. No. 427,667

Int. Cl.⁶ G10L *5/06;9/00*

U.S. Cl. 704—232 **37 Claims**


DEVELOP NN FOR PHONEME RECOGNITION
50
PROCESS NEXT SPEECH SAMPLE
SELECT INITIALIZATION PARAMETERS
52
54
DIGITIZE SPEECH
DISPLAY AND REPRODUCE DIGITIZED SPEECH
56
ACCEPTABLE ?
NO
YES
SEGMENT (OR RESEGMENT) DIGITIZED SPEECH AND ASSIGN A PHONEME CODE TO EACH SEGMENT
61
ACCEPTABLE ?
TRANSFORM EACH SEGMENT INTO A VECTOR SET OF N - DIMENSIONS
62
REVERSE TRANSFORM VECTOR SET AND VISUALLY/AUDIBLY CONFIRM ACCEPTABILITY
64
ADD VECTOR SET AND CORRESPONDING PHONEME CODE TO TRAINING SET
ACCEPTABLE ?
RESEGMENT AND/OR VARY TRANSFORM
TRAINING SET COMPLETE?
DECODE NEURAL NETWORK ESTIMATED, EXEMPLARY PHONEME VECTOR OR CENTROID. CONFIRM ACCEPTABILITY AUDIBLY AND/OR VISUALLY
72
TRAIN NEURAL NETWORK GENERATE AND DISPLAY ESTIMATE EXEMPLARY PHONEME VECTOR FOR EACH PHONEME CODE
71
74
ACCEPTABLE ?
MODIFY NN TRAINING PARAMETERS
STORE NN PHONEME RECOGNITION FILE
END

1. A method for developing a neural network to recognize phonemes in speech comprising the steps of:

generating a training set of phonemes for later training the neural network to recognize phonemes in speech:

an operator visibly or audibly determining at selected stages of generating the training set the quality of a training set of phonemes used to train the neural network to later recognize phonemes in speech; and

varying one or more parameters used to generate the training set of phonemes to affect how the training set is generated until the operator determines that the generated training set is acceptable.

5,749,067
VOICE ACTIVITY DETECTOR

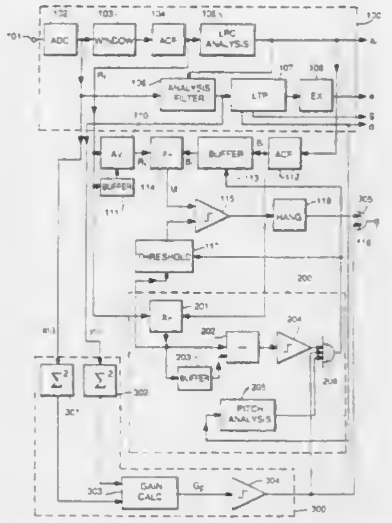
Paul Alexander Barrett, Ipswich, United Kingdom, assignor to British Telecommunications public limited company, London, England

Continuation-in-part of Ser. No. 155,852, Nov. 23, 1993, abandoned. This application Mar. 8, 1996, Ser. No. 596,357

Claims priority, application European Pat. Off., Dec. 6, 1993, 9324967; United Kingdom, Jun. 21, 1994, 9412451; Sep. 14, 1994, 93307211

Int. Cl.^{6} G10L *3/02;9/00*

U.S. Cl. 704—233 **18 Claims**



1. A voice activity detector for detecting the presence of speech in an input signal which comprises a noise component, said detector comprising:

- (a) means for storing an estimate of the noise component of an input signal;
- (b) means for recognizing a spectral similarity of the input signal and the stored estimate to produce an output decision signal;
- (c) means for updating the stored estimate;
- (d) an auxiliary detector arranged to indicate the absence of speech from the input signal and control the means for updating so that updating occurs only when speech is indicated by the auxiliary detector to be absent from the input signal;
- (e) means operable to calculate a prediction gain for the input signal; and
- (f) modifying means arranged to suppress said updating of the stored estimate in the event that the prediction gain exceeds a threshold value.

5,749,068
SPEECH RECOGNITION APPARATUS AND METHOD IN NOISY CIRCUMSTANCES

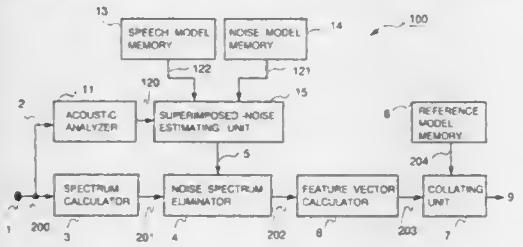
Tadashi Suzuki, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1996, Ser. No. 732,891

Claims priority, application Japan, Mar. 25, 1996, 8-068210

Int. Cl.^{6} G10L *3/02;9/00*

U.S. Cl. 704—233 **13 Claims**



1. A speech recognition apparatus for recognizing an input speech under noisy circumstances comprising:

- a noise model memory for storing a noise model;
- a speech model memory for storing a noise-free speech model;
- a reference model memory for storing a plurality of speech models for collation;
- an acoustic analyzer for receiving the input speech, acoustically analyzing a noise-superimposed speech signal of the input speech, and outputting a time-series feature vector of noise-superimposed speech;
- a superimposed-noise estimating unit for estimating a superimposed noise based on the time-series feature vector of noise-superimposed speech by using the noise model stored in the noise model memory and the noise-free speech model stored in the speech model memory, and outputting an estimated superimposed-noise spectrum;
- a spectrum calculator for receiving the input speech, analyzing a spectrum of the noise-superimposed speech signal of the input speech, and outputting a time-series noise-superimposed speech spectrum;
- a noise spectrum eliminator for eliminating a spectrum component of a noise speech in the noise-superimposed speech signal for the time-series noise-superimposed speech spectrum output from the spectrum calculator by using the estimated superimposed-noise spectrum output from the superimposed-noise estimating unit, and outputting a time-series noise-eliminated speech spectrum;
- a feature vector calculator for calculating a first feature vector from the time-series noise-eliminated speech spectrum and outputting a time-series feature vector of noise-eliminated speech; and
- a collating unit for collating the time-series feature vector of noise-eliminated speech with the plurality of speech models for collation stored in the reference model memory, selecting a speech model out of the plurality of speech models for collation, whose likelihood is highest, and outputting the speech model as a recognition result.

5,749,069
PATTERN AND SPEECH RECOGNITION USING ACCUMULATED PARTIAL SCORES FROM A POSTERIORI ODDS, WITH PRUNING BASED ON CALCULATION AMOUNT

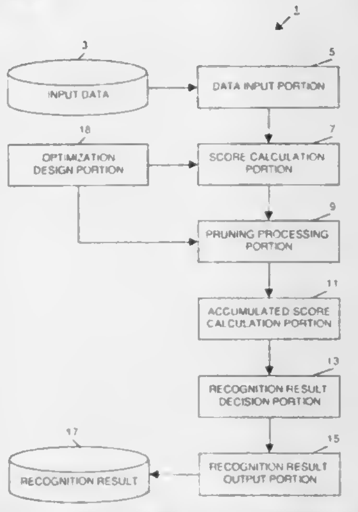
Takashi Komori, and Shigeru Katagiri, both of Kyoto, Japan, assignors to ATR Human Information Processing Research Laboratories, Kyoto, Japan

Filed Mar. 17, 1995, Ser. No. 405,674

Claims priority, application Japan, Mar. 18, 1994, 6-48694

Int. Cl.^{6} G10L *5/06*

U.S. Cl. 704—240 **30 Claims**


1
3
5
INPUT DATA
DATA INPUT PORTION
10
7
OPTIMIZATION DESIGN PORTION
SCORE CALCULATION PORTION
9
PRUNING PROCESSING PORTION
11
ACCUMULATED SCORE CALCULATION PORTION
13
RECOGNITION RESULT DECISION PORTION
17
15
RECOGNITION RESULT
RECOGNITION RESULT OUTPUT PORTION

1. A pattern recognition method for classifying a continuous pattern representative of a physical activity or phenomenon to one or predetermined classes each indicating a combination of one or more predetermined subclasses, comprising:

- a first step of determining a plurality of partial scores each indicating an estimate of logarithm of a posteriori odds that one of partial patterns of said continuous pattern is classified to one of said subclasses;
- a second step of determining accumulated scores each indicating summation of one or more of said partial scores; and
- a third step of classifying said continuous pattern into one of said predetermined classes based on said determined accumulated scores, wherein

scores of any possible partial patterns are used, and

the partial patterns are not first isolated.

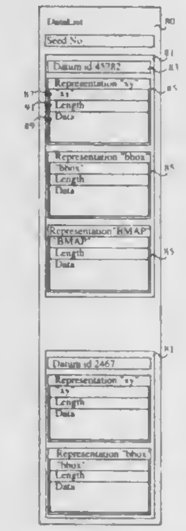
5,749,070
MULTI-REPRESENTATIONAL DATA STRUCTURE FOR RECOGNITION IN COMPUTER SYSTEMS

Arnaud P. J. Gourdol, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 120,151, Sep. 9, 1993, abandoned. This application Apr. 4, 1997, Ser. No. 833,309

Int. Cl.^{6} G10L *5/00*

U.S. Cl. 704—242 **22 Claims**



20. A computer-readable media having a recognition data structure suitable for use in a computer system that is arranged to pass recognition information back and forth between an application program, an operating system and a recognition engine, the data structure comprising:

- a multi-representational data list section arranged within said computer-readable media to store a multiplicity of datum, wherein each datum includes a datum reference number that uniquely identifies that datum, and is arranged to contain a plurality of representation zones, each representation zone being arranged to hold data indicative of a particular representation of the data stored in the datum, an indicia identifying the format of the data stored in its associated zone and an indicia indicative of the amount of memory used to store the associated representation, wherein said multiplicity of datum represents information relating to speech or stroke inputs that are available for use by said recognition engine; and
- a trellis based recognition results section arranged within said computer-readable media to contain a plurality of arrays, each array corresponding to a different trellis level and including a representation of each link or node of its associated trellis level, a label applied to the represented link or node, and an indication of the probability that the represented link or node is correct, said plurality of arrays being generated by said recognition engine following recognition of said multiplicity of datum.

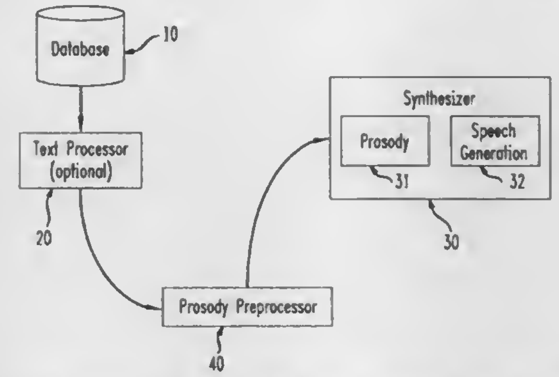
5,749,071
ADAPTIVE METHODS FOR CONTROLLING THE ANNUNCIATION RATE OF SYNTHESIZED SPEECH

Kim Ernest Alexander Silverman, 56 Mill Plain Rd. #10-3, Danbury, Conn. 06811

Continuation of Ser. No. 641,480, Mar. 1, 1996, Pat. No. 5,652,828, which is a continuation of Ser. No. 460,030, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 33,528, Mar. 19, 1993, abandoned. This application Jan. 29, 1997, Ser. No. 790,580

Int. Cl.^{6} G10L *5/02*

U.S. Cl. 704—260 **26 Claims**



1. A method of synthesizing human audible speech from a plurality of text segments represented in electronic form, the method comprising the steps of:

- generating audible speech from a first text segment using an initial annunciation rate;
- in response to a first number of requests from a first listener to repeat the audible speech generated from the first text segment,
  - adjusting the initial annunciation rate to produce a repeat annunciation rate; and
  - generating audible speech from the first text segment using the repeat annunciation rate.

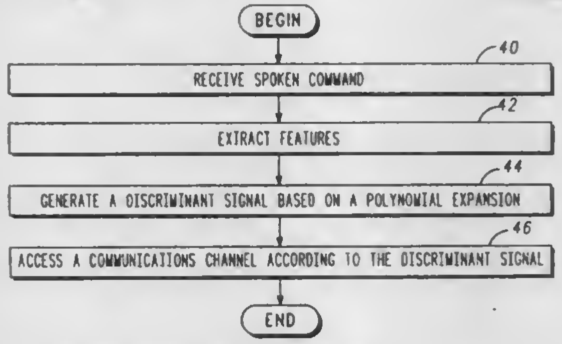
5,749,072
COMMUNICATIONS DEVICE RESPONSIVE TO SPOKEN COMMANDS AND METHODS OF USING SAME

Theodore Mazurkiewicz, Lake Zurich; Gil E. Levendel, Schaumburg, and Shay-Ping Thomas Wang, Long Grove, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 253,893, Jun. 3, 1994, Pat. No. 5,509,103. This application Dec. 28, 1995, Ser. No. 579,714

Int. Cl.^{6} G10L *7/08*

U.S. Cl. 704—275 **24 Claims**


BEGIN
40
RECEIVE SPOKEN COMMAND
42
EXTRACT FEATURES
44
GENERATE A DISCRIMINANT SIGNAL BASED ON A POLYNOMIAL EXPANSION
46
ACCESS A COMMUNICATIONS CHANNEL ACCORDING TO THE DISCRIMINANT SIGNAL
END

7. A communications device, comprising:

- a pre-processor for transforming an audio signal into a sequence of data vectors;
- extraction means for extracting a plurality of feature frames from the sequence of data vectors;
- a plurality of classifiers for generating a plurality of discriminant signals, each of the plurality of classifiers designating a different spoken command and generating a discriminant signal

/OL
2 10
ISS
1
MY
5
998
JMI

according to a polynomial expansion having a form

$$y = \sum_{i=0}^{m} w_i \left[\prod_{j=0}^{n} x_j g_{ji} \right];$$

wherein x_j represents a feature frame, y represents the discriminant signal, w_i represents a coefficient, g_{ji} represents an exponent, and i, j, m and n are integers;

an accumulator for generating a plurality of accumulated discriminant signals, the accumulator generating each of the plurality of accumulated discriminant signals by summing ones of the plurality of discriminant signals produced by a respective one of the plurality of classifiers;

a selector for selecting a largest accumulated discriminant signal from the plurality of accumulated discriminant signals; and

a two-way audio interface for transmitting and receiving data across a communications channel according a control signal, the control signal being a function of the largest accumulated discriminant signal.

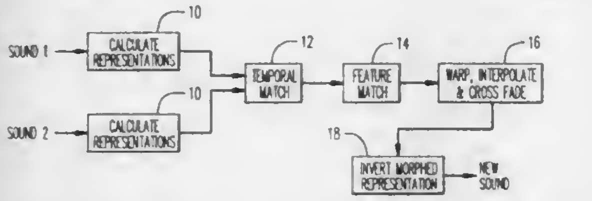
5,749,073
SYSTEM FOR AUTOMATICALLY MORPHING AUDIO INFORMATION

Malcolm Slaney, Los Altos Hills, Calif., assignor to Interval Research Corporation, Palo Alto, Calif.

Filed Mar. 15, 1996, Ser. No. 616,290

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 704—278 **47 Claims**


SOUND 1
CALCULATE REPRESENTATIONS
10
SOUND 2
CALCULATE REPRESENTATIONS
10
TEMPORAL MATCH
12
FEATURE MATCH
14
WARP, INTERPOLATE & CROSS FADE
16
18
INVERT MORPHED REPRESENTATION
NEW SOUND

1. A method for morphing from a first sound to a second sound, comprising the steps of:

analyzing each of said first and second sounds to obtain a dense representation for each sound;

determining correspondence between the respective representations of said sounds;

modifying the representations of said sounds, based on said correspondence, to form a new representation; and

inverting the new representation and generating a morphed sound from the inverted representation.

5,749,074
METHOD AND APPARATUS FOR REPRESENTING RECURRING EVENTS

Chris S. Kasso, Sunnyvale; Martin Arthur Knutson, Cupertino; Yvonne Yuen-Yee Tso, Milpitas, all of Calif., and Frank R. Dawson, Keller, Tex., assignors to Sun Microsystems, Inc., Mountainview, Calif., and International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1995, Ser. No. 395,458

Int. Cl.^{6} G06F *17/60;* G06G *7/52*

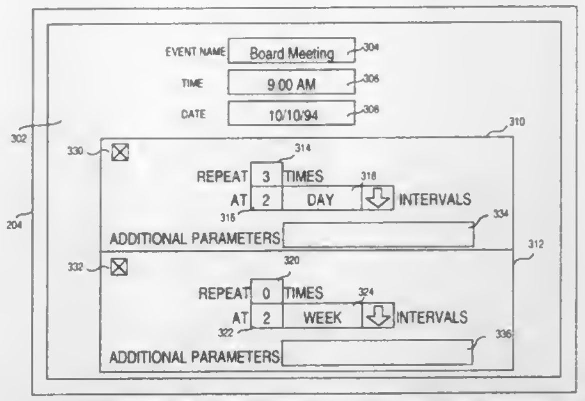
U.S. Cl. 705—8 **23 Claims**

1. A method for representing a schedule of a recurring event in an electronic device, wherein the schedule includes one or more cycles, wherein each of said one or more cycles has a length, the method comprising causing the electronic device to perform the steps of:

a) for each cycle in said schedule, performing the steps of

a1) receiving a first input that specifies a unit of time used to measure the length of said cycle;

a2) receiving a second input that specifies a number of time units;



a3) generating a time-interval indicator representing the length of said cycle;

wherein said step of generating said time-interval indicator includes the steps of

generating a unit-type indicator corresponding to said unit of time;

generating a unit-frequency indicator corresponding to said number of time units;

a4) generating a repeat-quantity indicator representing how many times said cycle is repeated in said schedule;

a5) generating a recurrence command to represent said cycle, said recurrence command including said time-interval indicator and said repeat-quantity indicator; and

b) constructing a recurrence rule to represent said schedule, wherein said recurrence rule includes the recurrence command generated for each cycle of said one or more cycles.

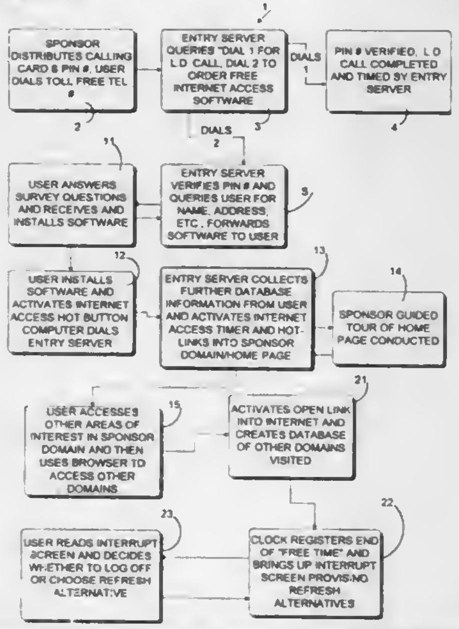
5,749,075
METHOD FOR PROVIDING PREPAID INTERNET ACCESS AND/OR LONG DISTANCE CALLING INCLUDING THE DISTRIBUTION OF SPECIALIZED CALLING CARDS

Adrian Toader, Overland Park, and Jose Valdez, Olathe, both of Kans., assignors to Interactive Media Works, L.L.C., Overland Park, Kans.

Continuation-in-part of Ser. No. 471,337, Jun. 6, 1995. This application Dec. 28, 1995, Ser. No. 579,881

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—14 **21 Claims**


1
SPONSOR DISTRIBUTES CALLING CARD & PIN #, USER DIALS TOLL FREE TEL #
2
ENTRY SERVER QUERIES "DIAL 1 FOR L.D. CALL, DIAL 2 TO ORDER FREE INTERNET ACCESS SOFTWARE
3
DIALS 1
PIN # VERIFIED, L.D. CALL COMPLETED AND TIMED BY ENTRY SERVER
4
DIALS 2
11
USER ANSWERS SURVEY QUESTIONS AND RECEIVES AND INSTALLS SOFTWARE
ENTRY SERVER VERIFIES PIN # AND QUERIES USER FOR NAME, ADDRESS, ETC., FORWARDS SOFTWARE TO USER
5
12
USER INSTALLS SOFTWARE AND ACTIVATES INTERNET ACCESS HOT BUTTON COMPUTER DIALS ENTRY SERVER
13
ENTRY SERVER COLLECTS FURTHER DATABASE INFORMATION FROM USER AND ACTIVATES INTERNET ACCESS TIMER AND HOT-LINKS INTO SPONSOR DOMAIN/HOME PAGE
14
SPONSOR GUIDED TOUR OF HOME PAGE CONDUCTED
15
USER ACCESSES OTHER AREAS OF INTEREST IN SPONSOR DOMAIN AND THEN USES BROWSER TO ACCESS OTHER DOMAINS
21
ACTIVATES OPEN LINK INTO INTERNET AND CREATES DATABASE OF OTHER DOMAINS VISITED
23
USER READS INTERRUPT SCREEN AND DECIDES WHETHER TO LOG OFF OR CHOOSE REFRESH ALTERNATIVE
22
CLOCK REGISTERS END OF "FREE TIME" AND BRINGS UP INTERRUPT SCREEN PROVISING REFRESH ALTERNATIVES

1. A method of providing an enhanced value specialized prepaid calling card to a user comprising the steps of:

a. distributing the prepaid telephone calling card with associated PIN number to the user which prepaid telephone calling card and PIN number entitles the user to log onto an Enhanced Entry Server and to access any combination of either:

i. Internet access for a limited time; and/or

ii. ordinary long distance calling for a limited time;

b. prompting the user to either complete the long distance call or, alternatively, to order Internet access software which allows the user to connect a personal computer (PC) to the Enhanced Entry Server to access the Internet and gives the user a predetermined amount of pre-paid Internet access time.

5,749,076

Patent Not Issued For This Number

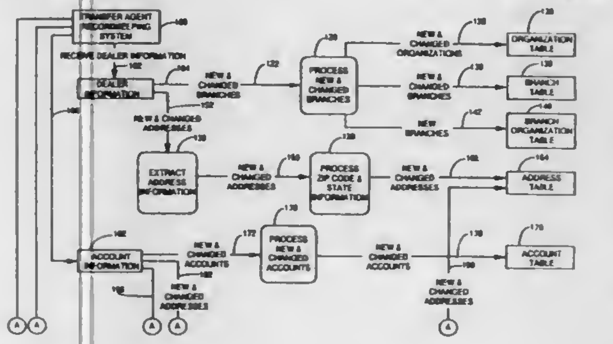
5,749,077
METHOD AND APPARATUS FOR UPDATING AND SELECTIVELY ACCESSING FINANCIAL RECORDS RELATED TO INVESTMENTS

David Campbell, Pittsburgh, Pa., assignor to FS Holdings, Inc., Wilmington, Del.

Division of Ser. No. 345,881, Nov. 28, 1994. This application Jan. 23, 1997, Ser. No. 787,679

Int. Cl.^{6} G06F *15/21*

U.S. Cl. 705—36 **88 Claims**



1. A data processing system for maintaining, updating and accessing investment information comprising

computer means for receiving and processing said data,

said computer means having data storage means,

said data storage means having means for storing data including the following categories of data: dealer information, dates, transactions, identity of the investment, asset information and sales information,

first data including data in at least one of said categories stored in said means for storing,

said computer means having means for receiving and processing second data relating to said at least one of said categories,

said computer means having means for comparing said second data with said first data and modifying existing first data to create third data which is stored in said data storage means,

said computer means having user interface means for selecting and retrieving data in at least one said category from said third data, and

said user interface means permitting information requests with respect to said categories in the form of a first option for specific information or a second option for all information or a third option for less information than said first option and said second option.

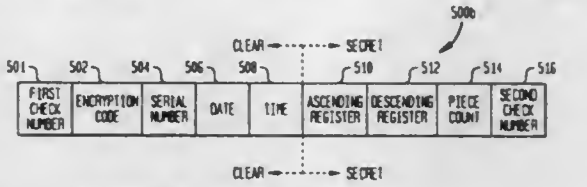
5,749,078
METHOD AND APPARATUS FOR STORAGE OF ACCOUNTING INFORMATION IN A VALUE DISPENSING SYSTEM

Joseph L. Gargiulo, Trumbull; Walter J. Baker, Stratford, and Richard W. Heiden, Shelton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 23, 1996, Ser. No. 709,190

Int. Cl.^{6} G07B *17/00*

U.S. Cl. 705—404 **13 Claims**



1. A value dispensing system, comprising:

a portable data carrier including a memory having stored therein accounting information indicative of an amount of value available for dispensing; and

a terminal including a memory and means for dispensing value, the terminal adapted to receive the portable data carrier and process a transaction which dispenses a given value in response to a digital token generated by the portable data carrier using a first cryptographic key; and

wherein, for the value dispensed, a transaction record is created having a secret portion which is indicative of the amount of value available for dispensing on the portable data carrier, the secret portion of the transaction record is encrypted using a second cryptographic key derived from the first cryptographic key, and the transaction record is stored in the terminal memory.

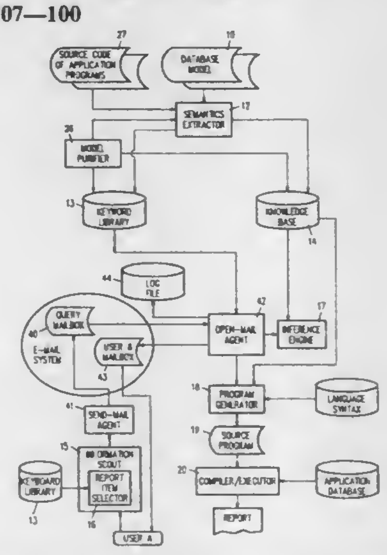
5,749,079
END USER QUERY FACILITY INCLUDING A QUERY CONNECTIVITY DRIVER

Dennis Yong; Viktor Choong-Hung Cheng; Christopher Leng-Hong Yo, and Liat Lim, all of Singapore, Singapore, assignors to Singapore Computer Systems Limited, Singapore

Continuation-in-part of Ser. No. 346,507, Nov. 29, 1994, Pat. No. 5,701,466, which is a continuation-in-part of Ser. No. 154,343, Nov. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 846,522, Mar. 4, 1992, Pat. No. 5,325,465. This application Jan. 26, 1995, Ser. No. 378,744

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—100 **82 Claims**



10. An end user query facility for accessing a database having a plurality of database files formed using a database model, comprising:

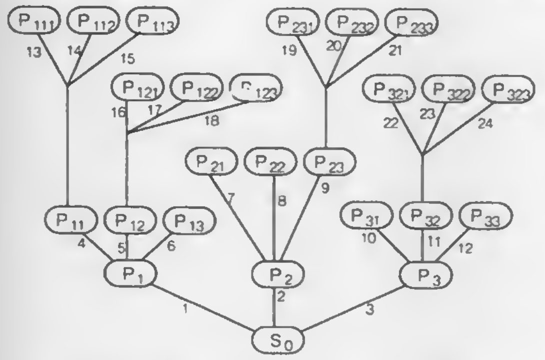
a knowledge base which stores a set of linkages of the database model, each said linkage representing a relation between two

VOL
210
ISS
1
MY
5
1998
UMI

of said database files in which a first file has a key that references an equivalent key of a second file;
a semantics extractor for reading said database model and extracting the semantics of said database model, and which stores in said knowledge base said set of linkages;
a keyword library which stores a set of keywords of said database model;
an application, which supports end-user query, to obtain from a user a designation of the information to be extracted from said database using said keyword library;
a first connectivity driver for connecting said application to said keyword library;
an inference engine which, based upon said designation of information to be extracted from said database, identifies one or more of said database files which contain the desired information and searches said knowledge base to determine the linkage(s) connecting said one or more identified files;
a first e-mail agent for said first connectivity driver to interface with an e-mail system, said first e-mail agent being used to post said designation of information to be extracted from said database to the mailbox of said inference engine;
a second e-mail agent for the said inference engine to interface with said e-mail system, the said second e-mail agent being used to access said mailbox of said inference engine to obtain said designation of information to be extracted from said database;
a program generator which accesses the linkages obtained by said inference engine and generates a program to extract said desired information from said database.

5,749,080
DATA RETRIEVAL METHOD AND LINK-INFORMATION ADDING METHOD

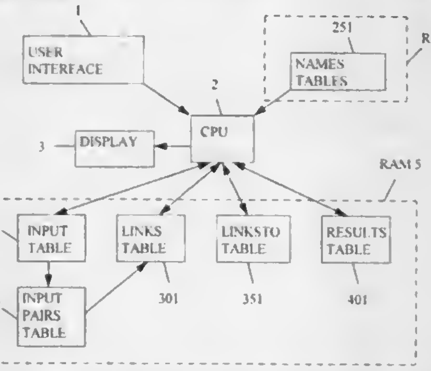
Shigeru Matsumoto, 420, Toyazuka-cho, Isesaki-shi, Gunma 372, and Takahisa Yamamoto, Yokohama, both of Japan, assignors to Shigeru Matsumoto, Gunma, Japan
Filed Jun. 5, 1996, Ser. No. 659,163
Claims priority, application Japan, Jun. 5, 1995, 7-161400
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 707—100 **6 Claims**



1. A link-information adding method of adding new link-information data to a data string in a data-string set consisting of a plurality of data strings,
each data string DS_1 having
(1) a data identification name storage area storing a data identification name,
(2) a data level storage area storing a data level value, and
(3) a parent data storage area storing link-information data about a data string DS_2 storing the data identification name which indicates a set including the data identification name stored in the data string DS_1,
wherein:
(A) the data string DS_2 has a greater data level value than the data string DS_1 has,
(B) the parent data storage area of the data string DS_1 does not contain link-information data about the data string DS_1 itself, and the link-information data stored in the parent data storage area of the data string DS_1 differ from one another, and
(C) when data strings are consecutively traced on the basis of link-information data stored in parent data storage areas of data strings, with arbitrary link-information data stored in the parent data storage area of the data string DS_1 as a starting point, until the parent data storage area of the traced data string is empty, the link-information data about the data string DS_1 is included in none of the parent data storage areas of the traced data strings.
the method comprising the steps of
(a) inputting a data identification name and a parent concept name which indicates a set including the data identification name,
(b) adding no link-information data when the inputted data identification name and the inputted parent concept name are in agreement with each other,
(c) extracting a data string DS_1 storing the inputted data identification name when the inputted data identification name and the inputted parent concept name are not in agreement with each other,
(d) extracting a data string DS_P storing the data identification name which is in agreement with the inputted parent concept name,
(e) adding no link-information data when the parent data storage area of the data string DS_1 extracted in the step (c) has link-information data about the data string DS_P extracted in the step (d),
(f) extracting a data string on the basis of link-information data stored in the parent data storage area of the data string DS_P extracted in the step (d) when the parent data storage area of the data string DS_1 extracted in the step (c) has no link-information data about the data string DS_P extracted in the step (d), and further extracting a data string on the basis of the link-information data stored in the parent data storage area of the extracted data string until the parent data storage area of the extracted data string is empty,
(g) adding no link-information data when any one of the data strings extracted in the step (f) is in agreement with the data string DS_1 extracted in the step (c),
(h) storing link-information data about the data string DS_P extracted in the step (d) to the parent data storage area of the data string DS_1 extracted in the step (c) when none of the data strings extracted in the step (f) is in agreement with the data string DS_1 extracted in the step (c), and
(i) storing a value obtained by adding 1 to the data level value of the data string DS_1 extracted in the step (c) in the data level storage area of the data string DS_P extracted in the step (d) when the data string DS_P extracted in the step (d) has a data level value equal to, or smaller than, the data level value of the data string DS_1 extracted in the step (c).

5,749,081
SYSTEM AND METHOD FOR RECOMMENDING ITEMS TO A USER

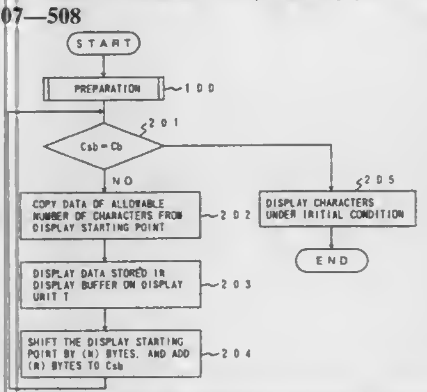
David E. Whiteis, Germantown, Md., assignor to Firefly Network, Inc., Cambridge, Mass.
Filed Apr. 6, 1995, Ser. No. 417,961
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 707—102 **14 Claims**



9. A computer system for recommending items, comprising:
item storage means for storing an input plurality of items;
combination generation means for generating all combinations of pairs of items in the input plurality of items;
link storage means for storing links representing the generated combinations, each link relating each one of the input plurality of items to another of the input plurality of items;
means for inputting at least one specified input item;
a processor for determining, for the specified input items, another one or more of the input plurality of items linked to the specified item; and
means for recommending the determined one or more linked items.

5,749,082
DISPLAY SYSTEM INCLUDING DATA DISPLAY FIELDS IN WHICH CHARACTERS ARE SCROLLED

Kenji Sasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 177,229, Jan. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 712,090, Jun. 7, 1991, abandoned. This application May 17, 1996, Ser. No. 664,255
Claims priority, application Japan, Jun. 11, 1990, 2-61461
Int. Cl.^{6} G06F *15/00;* **G09G** *5/34*
U.S. Cl. 707—508 **8 Claims**

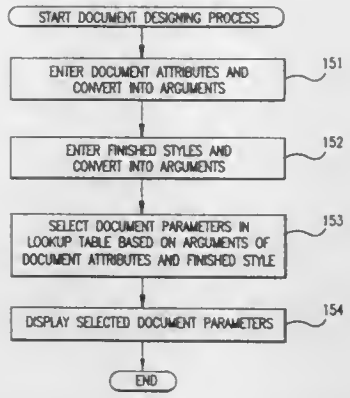

START
PREPARATION
100
201
Csb = Cb
NO
COPY DATA OF ALLOWABLE NUMBER OF CHARACTERS FROM DISPLAY STARTING POINT
202
DISPLAY DATA STORED IN DISPLAY BUFFER ON DISPLAY UNIT T
203
SHIFT THE DISPLAY STARTING POINT BY (N) BYTES, AND ADD (N) BYTES TO Csb
204
205
DISPLAY CHARACTERS UNDER INITIAL CONDITION
END

1. A data display system for displaying data blocks in a plurality of display fields arranged in a screen, said data display system comprising:
selecting means for selecting at least one display field from among said plurality of display fields;
processing means for retrieving from a data base a data block associated with said at least one display field and for processing said data block for subsequent display;
display control means for limiting the display in said at least one display field to a predetermined allowable number of characters when the number of characters in said data block associated with said at least one display field is greater than the predetermined allowable number; and
scrolling means for automatically continually scrolling the characters displayed by said processing means in the display field selected by said selecting means, without further user input after said display field selection until all of the characters in the data block have been displayed, when the number of characters in said data block is greater than the predetermined allowable number.

5,749,083
DOCUMENT PROCESSING SYSTEM

Yasunori Koda, and Tsuyoshi Tanaka, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Aug. 30, 1995, Ser. No. 521,451
Claims priority, application Japan, Sep. 9, 1994, 6-240896
Int. Cl.^{6} G06F *17/24;17/21*
U.S. Cl. 707—530 **16 Claims**

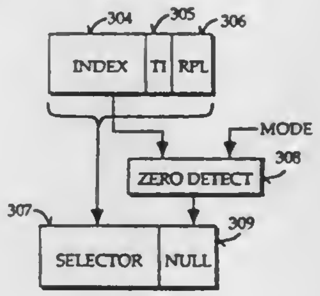
1. A document processing system comprising:
storage means for storing document forms which can be selected based on document attributes;
input means for entering attributes of a document;


START DOCUMENT DESIGNING PROCESS
ENTER DOCUMENT ATTRIBUTES AND CONVERT INTO ARGUMENTS
151
ENTER FINISHED STYLES AND CONVERT INTO ARGUMENTS
152
SELECT DOCUMENT PARAMETERS IN LOOKUP TABLE BASED ON ARGUMENTS OF DOCUMENT ATTRIBUTES AND FINISHED STYLE
153
DISPLAY SELECTED DOCUMENT PARAMETERS
154
END

display means for displaying a document form which is read out of said storage means in accordance with document attributes entered by said input means; and
lookup table means for storing document forms that are slightly different than the document form displayed by the display means.

5,749,084
ADDRESS GENERATION UNIT WITH SEGMENTED ADDRESSES IN A MICROPROCESSOR

Kamla P. Huck, Portland; Scott D. Rodgers, and Andrew F. Glew, both of Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Continuation of Ser. No. 176,066, Jan. 4, 1994, Pat. No. 5,590,297. This application Apr. 17, 1996, Ser. No. 634,092
Int. Cl.^{6} G06F *12/02;12/06;12/10*
U.S. Cl. 711—1 **25 Claims**



1. A processor comprising:
a bus;
a memory;
an execution unit coupled to said bus for performing arithmetic functions;
a fetch unit coupled to said bus for determining an entry is to be accessed;
an issue unit coupled to said bus for accessing said entry from storage in said memory; and
an address generation unit (AGU) coupled to said bus for generating an address corresponding to said entry, said AGU including a segment register file for storing address segments, a circuit for rearranging noncontiguous base and limit bit positions of a first address segment in order to generate a second address segment having all base and limit bits in a contiguous order, and a circuit for executing a single microinstruction to perform read and write operations on a selected field of said second address segments stored in said segment register file.

VOL
210
ISS
1
MY
5
1998
UMI

5,749,085

ELECTRONIC MEMORY ADDRESSING DEVICE ESPECIALLY FOR A MEMORY ORGANIZED INTO BANKS

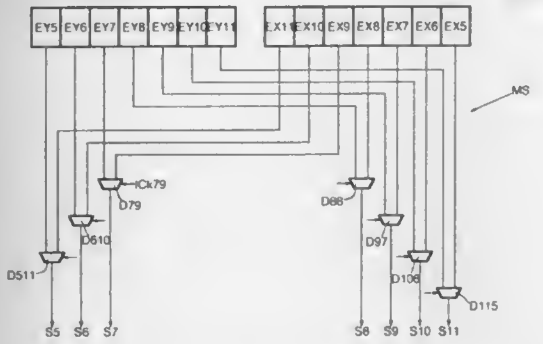
Claude Quillevere, Plougastel-Daoulas, and Frédéric Dufal, Grenoble, both of France, assignors to France Telecom, France

Filed Jun. 20, 1995, Ser. No. 492,591

Claims priority, application France, Jun. 21, 1994, 94 07579

Int. Cl.^{6} G06F *12/10;12/02*

U.S. Cl. 711—5 **16 Claims**



1. Electronic memory addressing device, for a memory containing a useful memory space of M bits which can be configured as 2^n memory cells of D bits, each memory cell being addressable by a cell address word of n bits, comprising:

input means including a first input port and a second input port, the sum of whose inputs is greater than n, for receiving pairs of first words of k bits and of second words of n−k bits, each set of n bits representing an address item for a point of a two-dimensional space of points associated with data coded on D bits, the respective bits of the first and second words representing two coordinates (X, Y) of the point in the said space,

a configuration input for receiving a value of k, chosen to be positive or zero and less than or equal to n, and representative of a geometrical configuration chosen for the two-dimensional space,

addressing means which can be controlled through the value of k, including selection means for selecting the inputs of the first port receiving the k bits of each first word and the inputs of the second port receiving the n−k bits of each second word, and address generation means for forming, from the selected bits, a cell address word of n bits making it possible to address the memory cell in which the datum associated with the said point will be stored in such a way as to be able to address the same useful memory space on the basis of a dimensional space of different geometrical configurations, in particular a video image,

wherein the memory is organized into banks,

useful memory space includes at least 2^b banks of M bits with $b \geqq 1$,

the sum of the inputs of the two ports is greater than the sum s equal to n+b while k is chosen to be greater than or equal to b and less than or equal to s−b, and

the addressing means are able to convert, according to a predetermined infective conversion law, each address item of a point into a memory address word including a cell address word and a bank address word representing, in the memory space, the address of the bank containing the said cell, and comprising selection means capable, in the presence of address item words of s_1 bits, with s_1=s, of selecting the inputs of the first port receiving the k bits of each first word and the s_1−k bits of each second word in order to form an intermediate word of s_1 bits, and generation means capable of forming from the s_1 bits of the intermediate word, the cell address word of n_1 bits with n_1=n and the bank address word of at least b bits.

5,749,086

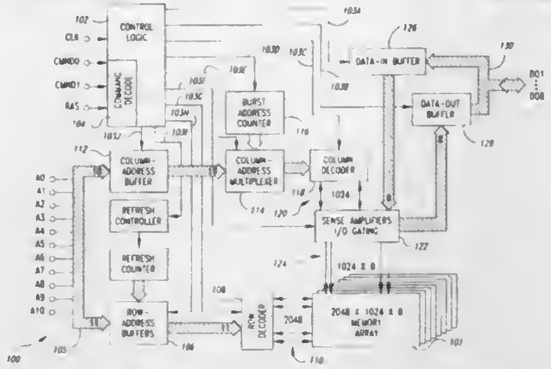
SIMPLIFIED CLOCKED DRAM WITH A FAST COMMAND INPUT

Kevin J. Ryan, Meridian, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Feb. 29, 1996, Ser. No. 608,661

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 711—105 **40 Claims**



1. A method of transferring data between a processor and a memory device having an array of memory cells arranged in rows and columns, comprising the steps of:

applying a system clock signal to the memory device and to the processor;

applying a row activation signal to the memory device, said row activation signal having two logical values;

applying first and second command signals to the memory device, each of said first and second command signals having two logical values;

sampling said row activation signal at regular time intervals determined by said system clock signal;

initiating activation of a row of memory cells identified by a row address in the array in response to sampling a first logical value of said row activation signal;

sampling said first and second command signals;

initiating one of a plurality of selected memory device operating modes in response to sampling a corresponding one of a plurality of logical value combinations of said first and second comınand signals; and

after initiating the selected operating(mode, initiating one of a plurality of selected memory device commands in response to sampling a corresponding one of the plurality of logical value combinations of said first and second command signals.

5,749,087

METHOD AND APPARATUS FOR MAINTAINING N-WAY ASSOCIATIVE DIRECTORIES UTILIZING A CONTENT ADDRESSABLE MEMORY

Russell D. Hoover, Rochester; George W. Nation, Eyota, and Kenneth M. Valk, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1996, Ser. No. 688,313

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 711—108 **16 Claims**

1. A method for maintaining a N-way associative directory utilizing a content addressable memory (CAM) comprising the steps of:

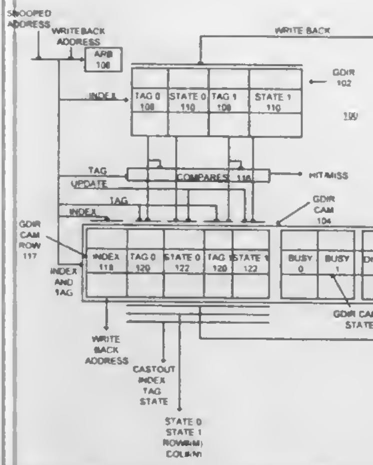
identifying a data operation to process;

identifying a congruence class from the N-way associative directory including a directory entry for said data operation; said congruence class directory entry including multiple (N) directory entries for each associativity class;

reading said congruence class from the N-way associative directory and writing said read congruence class into the CAM;

locking said directory entry for said data operation in CAM while said data operation is pending;

checking for a state change when said data operation is completed; and



updating said directory entry for said data operation in CAM responsive to said identified state change.

5,749,088

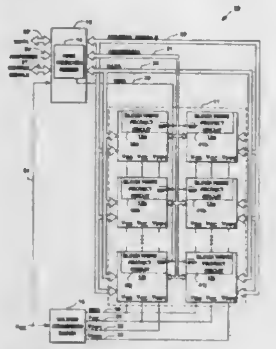
MEMORY CARD WITH ERASURE BLOCKS AND CIRCUITRY FOR SELECTIVELY PROTECTING THE BLOCKS FROM MEMORY OPERATIONS

David M. Brown, Fair Oaks; Russell D. Eslick, Placerville, and Kurt B. Robinson, Newcastle, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 587,337, Jan. 16, 1996, abandoned, which is a continuation of Ser. No. 307,317, Sep. 15, 1994, abandoned. This application Apr. 22, 1997, Ser. No. 844,851

Int. Cl.^{6} G06F *12/00;* **G11C** *7/00;11/34*

U.S. Cl. 711—115 **7 Claims**



4. A computer system, comprising:

(A) a central processing unit (CPU);

(B) a memory card coupled to the CPU, wherein the memory card further comprises

  (I) a plurality of nonvolatile memories, each comprising

    (a) a first and a second individually erasable and programmable memory block;

    (b) a first and a second nonvolatile memory cell, each storing one of a first and a second datum indicating whether the respective one of the first and second blocks is locked;

    (c) a first and a second volatile register, each receiving and storing the respective one of the first and second datum when a read operation is performed on the respective one of the first and second memory cells;

    (d) a block lock circuit that, when enabled, provides a block lock signal in accordance with the first datum in the first register in response to the first block being addressed or the second datum in the second register in response to the second block being addressed to prevent the addressed one of the first and second blocks from being programmed and erased;

    (e) a control input that applies a control signal to enable the block lock circuit;

  (II) a register circuit that stores a control datum to generate the control signal to the control input of each of the memories, wherein when the register circuit does not store the control datum, the block lock circuit of each of the memories is disabled from providing the block lock signal;

(C) a card control logic for interfacing the plurality of nonvolatile memories with external circuitry, wherein the register circuit is located in the card control logic and is allowed to be updated by the external circuitry with respect to the control datum, and

wherein the first memory cell is locked when the first block is locked and the second memory cell is locked when the second block is locked, wherein when the block lock circuit does not receive the control signal, each of the first and second datum stored in each of the first and second memory cells is allowed to be changed.

5,749,089

CACHE-MEMORY SYSTEM HAVING MULTIDIMENSIONAL SPREAD CACHE

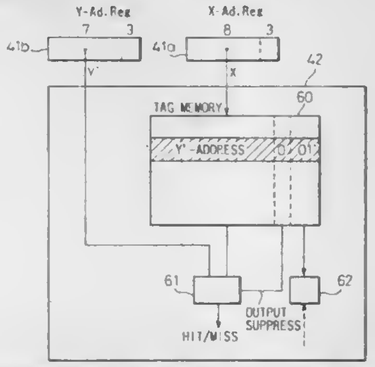
Hideki Yoshizawa, and Tatsushi Otsuka, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 381,157, Jan. 31, 1995, abandoned. This application Nov. 26, 1996, Ser. No. 757,081

Claims priority, application Japan, Jan. 31, 1994, 6-009756

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 711—127 **11 Claims**



1. A cache-memory system for processing multi-dimensional data stored in a main memory having a location specified by a combination of a plurality of data addresses, the cache-memory system comprising:

a cache memory having a plurality of memory areas for storing copies of data blocks in a multi-dimensional spread in the main memory, each data block being specified by a block address comprising a combination of high-order bits of the plurality of data addresses, each data block having data specified by an intra-block address comprising a combination of low-order bits of the plurality of data addresses;

a cache comparator for determining whether a copy of the data specified by a combination of a plurality of specified data addresses is stored in said cache memory; and

a control block for controlling said main memory and said cache memory in accordance with the determination made by said cache comparator.

5,749,090

CACHE TAG RAM HAVING SEPARATE VALID BIT ARRAY WITH MULTIPLE STEP INVALIDATION AND METHOD THEREFOR

Taisheng Feng, and Donovan Raatz, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1994, Ser. No. 293,625

Int, Cl.^{6} G06F *12/12*

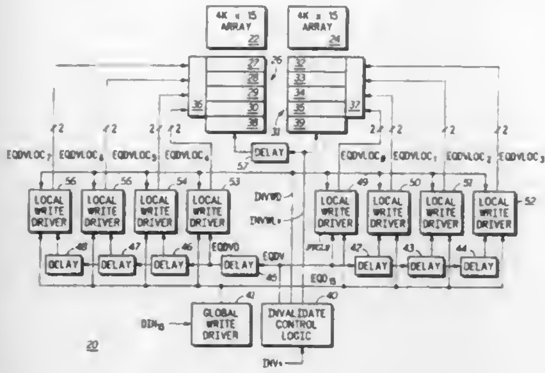
U.S. Cl. 711—135 **4 Claims**

1. A cache TAG random access memory, comprising:

a TAG array for storing a plurality of TAG addresses;

a valid bit array having a plurality of memory cells coupled to intersecting word lines and bit line pairs, a memory cell of the plurality of memory cells for storing a valid bit corresponding to one of a plurality of TAG addresses, the valid bit array

/OL
2 10
ISS
1
MY
5
998
JMI



located separate from the TAG array, the valid bit for qualifying a valid hit of the plurality of TAG addresses during a compare cycle of the cache TAG random access memory;

a plurality of word line driver circuits, coupled to the word lines of the valid bit array, the plurality of word line driver circuits for selecting all of the word lines during an invalidation cycle of the valid bit array;

a plurality of write driver circuits, each of the plurality of write driver circuits coupled to a predetermined number of the bit line pairs, the plurality of write driver circuits for sequentially invalidating the valid bit array during the invalidation cycle and for writing to a selected memory cell during a normal write cycle; and

an invalidate control circuit, coupled to the valid bit array and to the plurality of local write driver circuits, for selecting the plurality of word lines in the valid bit array and in a predetermined sequence, causing a voltage on each of the bit line pairs to be equalized at about ground potential, and then writing a same predetermined logic state into every memory cell of the valid bit array in response to receiving an invalidate control signal.

5,749,091
CACHE CONTROLLER WITH INDEX STACK FOR COHERENCY FAULT TOLERANCE

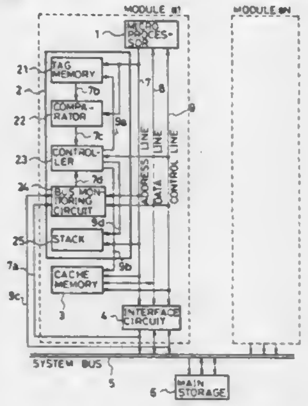
Hitoshi Ishida; Minoru Shiga; Toyohito Hatashita; Yuichl Tokunaga; Hiroyuki Fukuda, and Shunyo Minesaki, all of Kanagawa-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 787,246, Nov. 4, 1991, abandoned. This application Dec. 13, 1994, Ser. No. 355,093

Claims priority, application Japan, Nov. 5, 1990, 2-299487; Sep. 27, 1991, 3-276804

Int. Cl.^{6} G06F *12/12*

U.S. Cl. 711—135 **4 Claims**



1. A fault tolerant computer comprising:

a plurality of processor modules; and

a system bus connecting said processor modules;

wherein each processor module includes a write-back cache memory, and a cache controller for controlling said cache memory, said cache controller including a stack for storing entry addresses in a series of locations having contiguous physical addresses, an entry address stored therein pointing to the updated cache block in cache memory, and control means for registering the entry address of the updated cache block in said stack and for performing a cache flush transfer using the registered entry address to locate the updated cache block.

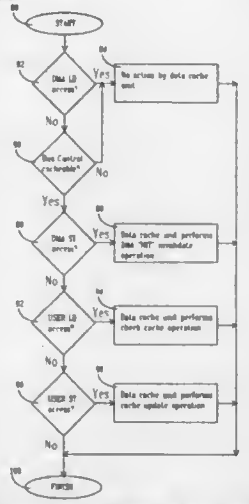
5,749,092
METHOD AND APPARATUS FOR USING A DIRECT MEMORY ACCESS UNIT AND A DATA CACHE UNIT IN A MICROPROCESSOR

Jay Ileeb, Gilbert, Ariz.; Sunil Shenoy, and Jimmy Wong, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 619,959, Mar. 20, 1996, abandoned, which is a continuation of Ser. No. 32,968, Mar. 18, 1993, abandoned. This application Jan. 27, 1997, Ser. No. 789,455

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 711—138 **17 Claims**



16. A method for using a data cache unit and a direct memory access unit in a microprocessor, comprising the steps of:

accessing an external memory location containing original data, the external memory location being external to the microprocessor;

preventing action by the data cache unit if said accessing is a load by the direct memory access unit; and

updating a copy data in the data cache if said accessing is a store by the direct memory access unit and the copy data corresponds to the original data in the external memory location.

5,749,093
ENHANCED INFORMATION PROCESSING SYSTEM USING CACHE MEMORY INDICATION DURING DMA ACCESSING

Kazushi Kobayashi, Ebina; Takeshi Aoki, Hadano; Koichi Okazawa, Tokyo, and Ichiharu Aburano, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Computer Electronics Co., Ltd., Hadano, both of Japan

Continuation of Ser. No. 728,589, Jul. 11, 1991, abandoned. This application Feb. 14, 1995, Ser. No. 389,080

Claims priority, application Japan, Jul. 16, 1990, 2-187442

Int. Cl.^{6} G06F *12/08;13/28*

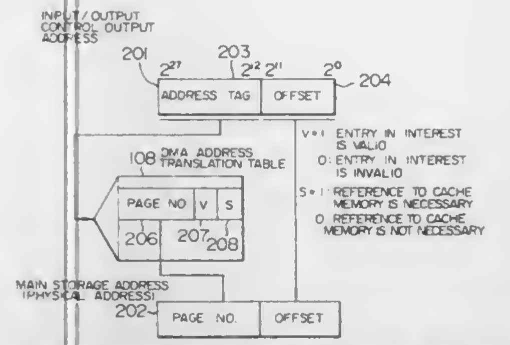
U.S. Cl. 711—139 **13 Claims**

1. An information processing system comprising:

a main storage;

a cache memory storing a subset of data stored in said main storage;

a main storage controller performing access to said main storage;


INPUT/OUTPUT CONTROL OUTPUT ADDRESS
201
203
ADDRESS TAG
OFFSET
204
108
DMA ADDRESS TRANSLATION TABLE
PAGE NO
V
S
206
207
208
V=1 ENTRY IN INTEREST IS VALID
0: ENTRY IN INTEREST IS INVALID
S=1 REFERENCE TO CACHE MEMORY IS NECESSARY
0 REFERENCE TO CACHE MEMORY IS NOT NECESSARY
MAIN STORAGE ADDRESS (PHYSICAL ADDRESS)
202
PAGE NO.
OFFSET

a central processing unit capable of accessing the main storage through said main storage controller and capable of accessing said cache memory;

at least one DMA controller capable of accessing the main storage and said cache memory through said main storage controller; and

a DMA address translator translating a logical address outputted from the DMA controller into a physical address for accessing said main storage and said cache memory;

wherein said DMA address translator has an associated flag representative of whether or not said main storage controller accesses said cache memory for a DMA access at which a DMA controller accesses said main storage through said main storage controller;

wherein said central processing unit divides said main storage into a buffer area for data to be transferred by DMA and other areas, sets an associated flag corresponding to said buffer area for data to be transferred by DMA to have a value indicative of not accessing said cache memory, and sets an associated flag corresponding to said other areas to have a value indicative of accessing said cache memory; and

wherein said main storage controller receives said translated physical address together with said associated flag from said DMA address translator and accesses on the basis of said associated flag either said main storage without accessing said cache memory or said cache memory during said DMA access to said main storage.

5,749,094
INVALID WRITE RECOVERY APPARATUS AND METHOD WITHIN CACHE MEMORY

David Vivian Jaggar, Cherry Hinton, United Kingdom, assignor to Advanced Risc Machines Limited, Cambridge, United Kingdom

Continuation of Ser. No. 301,482, Sep. 7, 1994, abandoned. This application Nov. 12, 1996, Ser. No. 747,196

Claims priority, application United Kingdom, Sep. 29, 1993, 9320143

Int. Cl.^{6} G06F *12/12*

U.S. Cl. 711—139 **8 Claims**

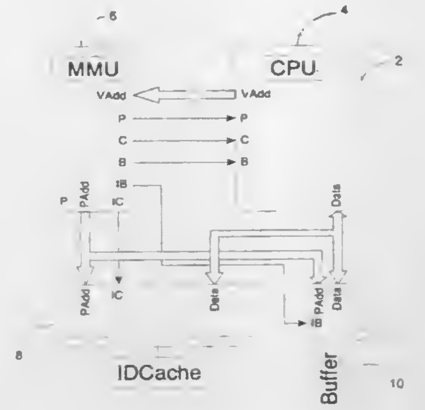
1. Apparatus for data processing, said apparatus having the form of a single integrated circuit and comprising:

(i) a central processing unit driven by a clock signal for generating, during a processing clock period with a duration of one cycle of said clock signal, an output data word for storage;

(ii) a cache memory for storing said output data word during said processing clock period to provide single cycle storage operation, said cache memory having a plurality of cache banks, each having a plurality of cache storage lines, each cache storage line having an associated invalid-line flag and being operable to store a plurality of such output data words;

(iii) memory management means distinct from said central processing unit and said cache memory for generating, during a following clock period subsequent to said processing clock period and during which said central processing unit continues operation independently of storage of said output data word, an invalid-storage signal, independent of whether a cache hit occurred, indicative of whether storage of said output data word in said cache memory during said processing clock period was an invalid storage operation; and

(iv) flag setting means responsive to said invalid-storage signal for setting the invalid-line flags associated with the cache storage line within which said invalid storage operation has been made and the corresponding cache storage lines in the other cache banks.



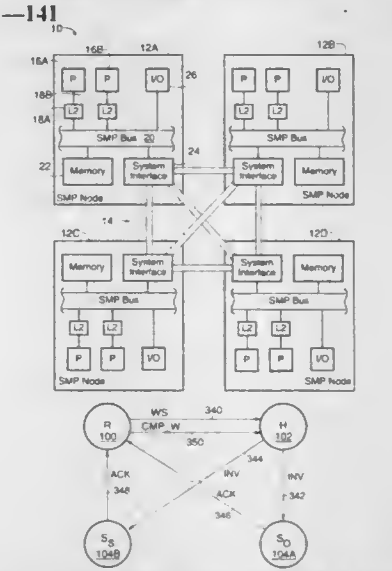
5,749,095
MULTIPROCESSING SYSTEM CONFIGURED TO PERFORM EFFICIENT WRITE OPERATIONS

Erik E. Hagersten, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jul. 1, 1996, Ser. No. 675,634

Int. Cl.^{6} G06F *12/08;13/00*

U.S. Cl. 711—141 **20 Claims**



1. A method for performing write operations in a multiprocessing computer system, comprising:

initiating a write operation by a processor within a local processing node of said multiprocessing computer system;

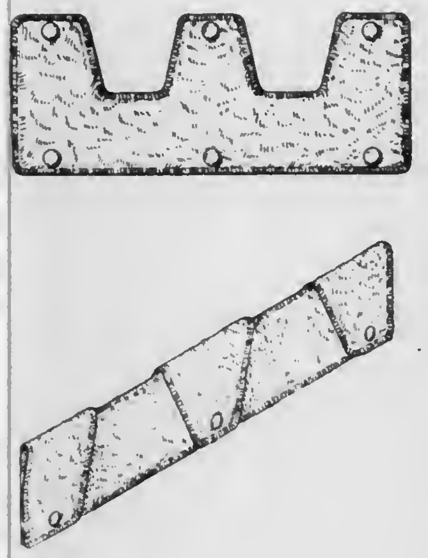
performing a coherency operation to at least one remote processing node in response to said write operation;

completing said write operation within said local processing node prior to completion of said coherency operation if said write operation includes a specific predefined encoding; and

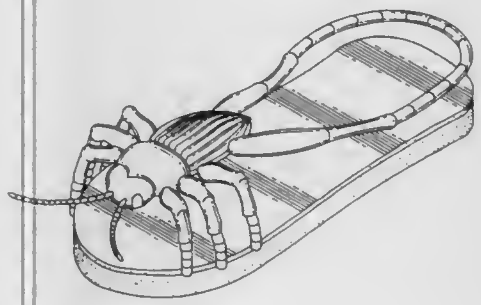
completing said write operation within said local processing node subsequent to completion of said coherency operation if said write operation includes an encoding different than said specific predefined encoding.

OL
2 10
ISS
1
MY
5
998
MI

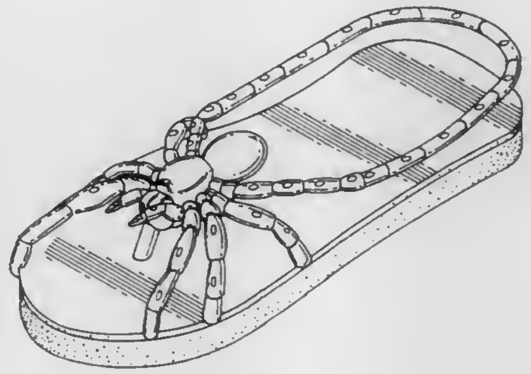
393,935
COMFORT HEADBAND FOR HEADGEAR
Peyton H. Hines, P.O. Box 382, Belle Chase, La. 70037
Filed Mar. 25, 1996, Ser. No. 52,109
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—891



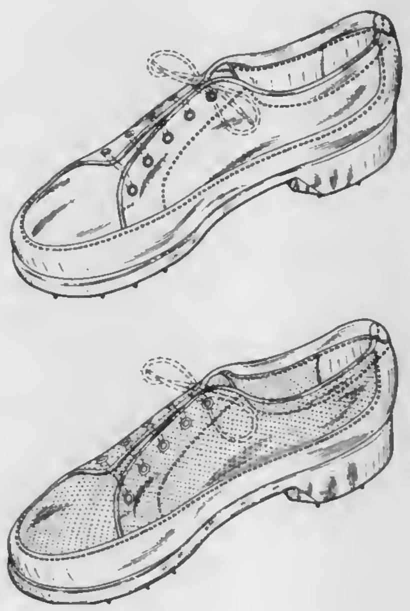
393,936
BEETLE SANDAL
Celia Jane Henson, 6912 77th St. NW., Gig Harbor, Wash. 98335
Continuation-in-part of Ser. No. 57,967, Aug. 5, 1996. This application Jul. 2, 1997, Ser. No. 73,091
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—899



393,937
SPIDER SANDAL
Celia Jane Henson, 6912 77th St. NW., Gig Haror, Wash. 98335
Continuation-in-part of Ser. No. 57,967, Aug. 5, 1996. This application Jul. 2, 1997, Ser. No. 73,092
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—899



393,938
GOLF SHOE
Alessandro Genuin, Munich, Germany, assignor to Genuin Golf & Dress of America, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 50,568, Jan. 25, 1996, Pat. No. Des. 382,388. This application Sep. 6, 1996, Ser. No. 59,254
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—906

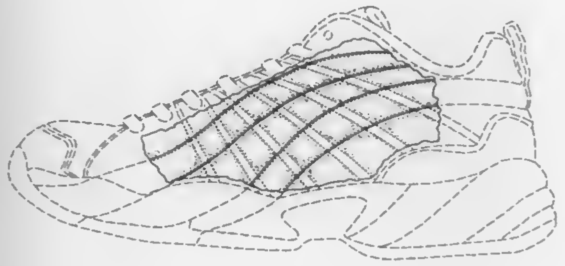


VOL
210
ISS
1
MY
5
998
UMI

393,939

SIDE ELEMENT OF A SHOE UPPER

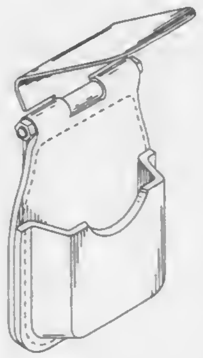
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 30, 1997, Ser. No. 71,504
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



393,940

PORTABLE CASE

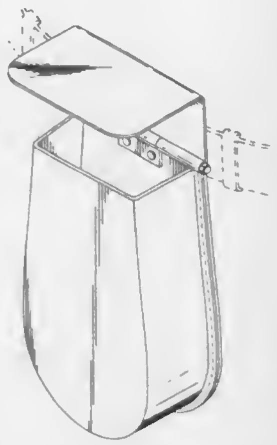
Akira Akutsu, Itabashi 1-36-4, Itabashi-ku, Tokyo 173, Japan
Filed Mar. 24, 1997, Ser. No. 68,571
Claims priority, application Japan, Sep. 3, 1996, 8-28898
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—226



393,941

PORTABLE CASE

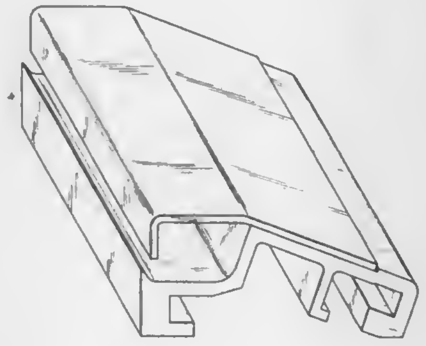
Akira Akutsu, Itabashi 1-36-4, 173 Itabashi-ku, Japan
Filed Mar. 24, 1997, Ser. No. 68,572
Claims priority, application Japan, Nov. 26, 1996, 8-35635
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—226



393,942

TRACK FOR STORING FISH HOOKS

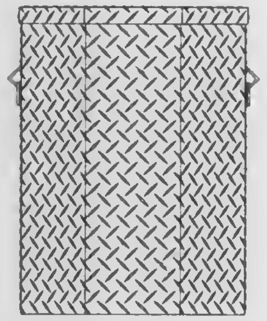
Geir Jørn Liaklev, Gjøvik, Norway, assignor to O. Mustad & Son, Gjovik, Norway
Filed Dec. 20, 1996, Ser. No. 64,038
Claims priority, application Norway, Jun. 24, 1996, 960449
Term of patent 14 years
LOC (6) Cl. 03 - *99*
U.S. Cl. D3—260



393,943

TOOL TOTE BUCKET

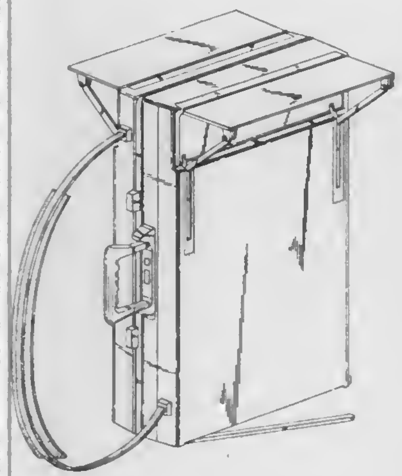
Ronnie P. Franklin, Rte. 4 Box 1674., Bainbridge, and Hugh D. Bailey, Colquitt Highway Box 2465, Colquitt, both of Ga. 31717
Continuation-in-part of Ser. No. 63,013, Nov. 21, 1996. This application Feb. 19, 1997, Ser. No. 66,681
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—273



393,944

COMBINED CARRYING CASE AND DISPLAY STAND

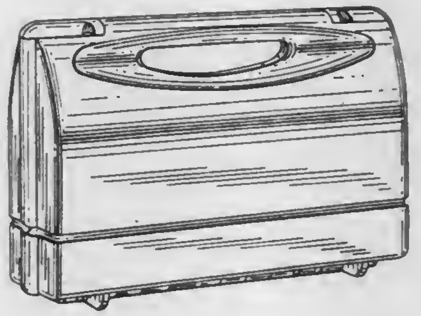
William V. Stowell, 1294 Polk 47, Mena, Ark. 71953
Filed Mar. 16, 1995, Ser. No. 36,233
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—276



393,945

CARRYING CASE

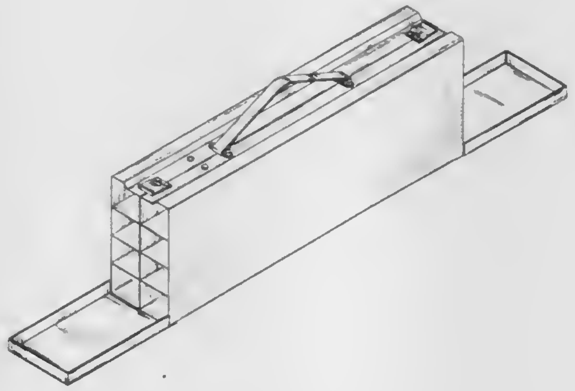
Jean-Jacques Urvoy, Paris, France, assignor to Meccano, S.A., Calais, France
Filed Feb. 5, 1997, Ser. No. 66,036
Claims priority, application WIPO, Sep. 23, 1996, D12792
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—282



393,946

TOOL CASE

Lars Borgström, Malmö, Sweden, assignor to Bernt Borgstrom Mekanisk Verkstad AB, Malmo, Sweden
Filed May 30, 1996, Ser. No. 55,128
Claims priority, application Sweden, Dec. 1, 1995, 95-2264
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—295



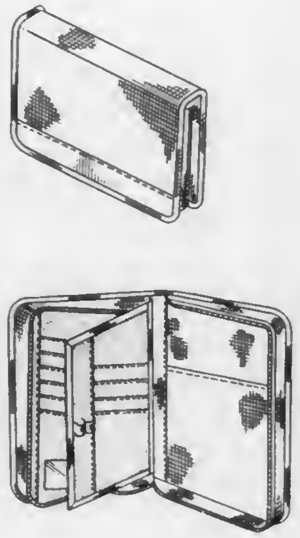
VOL
210
ISS
1
MY
5
1998
UMI

393,947
MULTI-MEDIA ORGANIZER CASE

Kasidy W. Alves, Oxnard, and Roy Nimpoeno, Agoura Hills, both of Calif., assignors to Scosche Industries, Inc., Moorpark, Calif.

Filed Jun. 9, 1997, Ser. No. 71,933
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—303

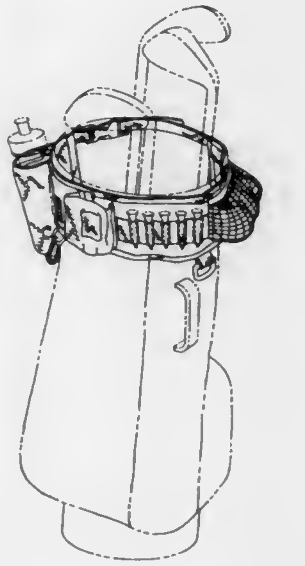


393,948
GOLF BAG ACCESSORY BELT

Nicholas J. Cowlen, 7582 Blackberry Ave., St. Louis, Mo. 63130

Filed Oct. 15, 1996, Ser. No. 60,971
Term of patent 14 years
LOC (6) Cl. 03 - *99*

U.S. Cl. D3—320



393,949
PATTERN FOR AN EMBOSSED PAPER PRODUCT

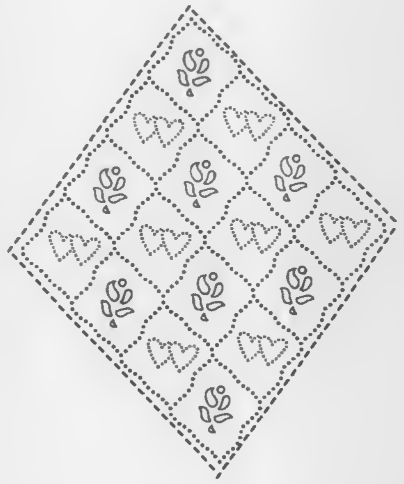
Galyn A. Schulz, Greenville; Pamela J. Wiese, Sheen Bay, and John H. Dwiggins, Neenah, all of Wis., assignors to Fort James Corporation, Richmond, Va.

Filed Jun. 5, 1996, Ser. No. 55,422

The portion of the term of this patent subsequent to Jun. 5, 2010, has been disclaimed.

Term of patent 14 years
LOC (6) Cl. 05 - *06*

U.S. Cl. D5—53

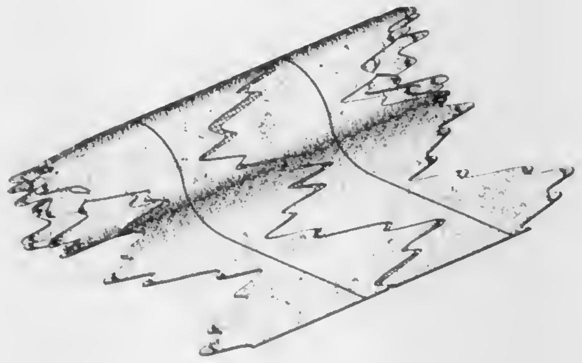


393,950
CONCEALMENT TAPE

Larry Lockhart, Stearns, Ky., assignor to Shelter Pro, LLC, Whitley City, Ky.

Filed Mar. 10, 1997, Ser. No. 67,712
Term of patent 14 years
LOC (6) Cl. 05 - *06*

U.S. Cl. D5—64

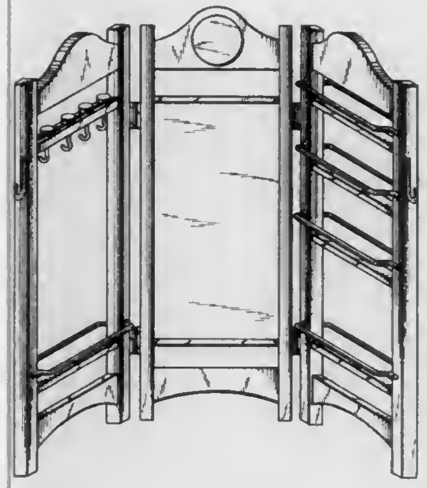


393,951
HOUSEHOLD SCREEN

Samantha A. Ravenscroft, 160 E. Elm St., Apt. 1C, Greenwich, Conn. 06830

Filed May 7, 1996, Ser. No. 54,113
Term of patent 14 years
LOC (6) Cl. 06 - *01*

U.S. Cl. D6—332

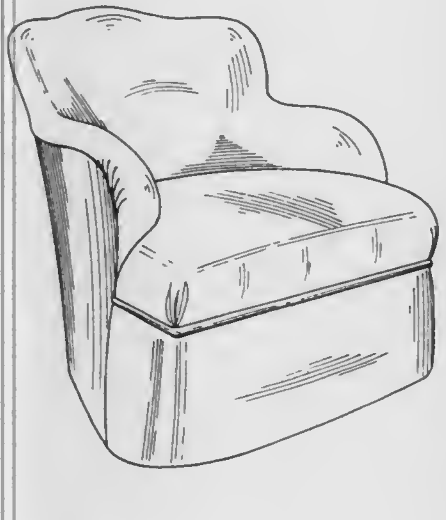


393,952
SEAT

Sally Sirkin Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210

Filed Sep. 20, 1996, Ser. No. 60,288
Term of patent 14 years
LOC (6) Cl. 06 - *01*

U.S. Cl. D6—334

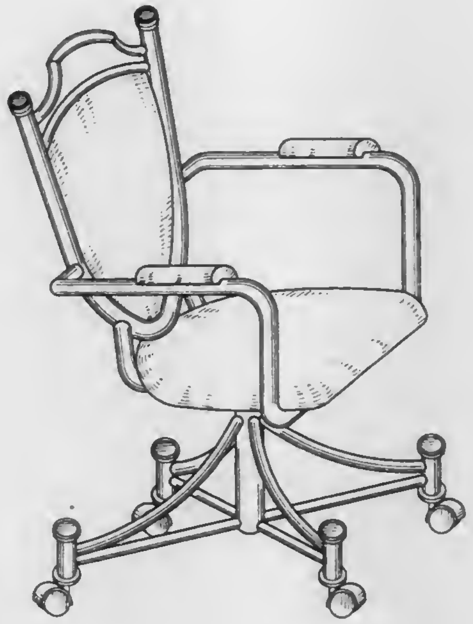


393,953
SWIVEL CHAIR

Arsho Diramarian, Pasadena, Calif., assignor to Aleco Furniture Mfg. Inc., Vernon, Calif.

Filed May 5, 1997, Ser. No. 70,278
Term of patent 14 years
LOC (6) Cl. 06 - *01*

U.S. Cl. D6—366

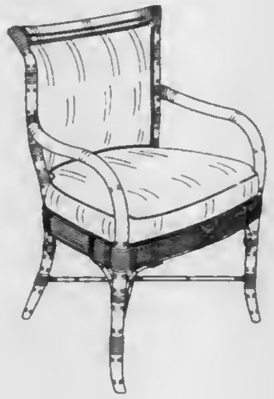


393,954
SEAT

Darrell C. Ferguson, Charleston, S.C., assignor to Ferguson Copeland, LLC, Valdese, N.C.

Filed Apr. 10, 1997, Ser. No. 69,389
Term of patent 14 years
LOC (6) Cl. 06 - *01*

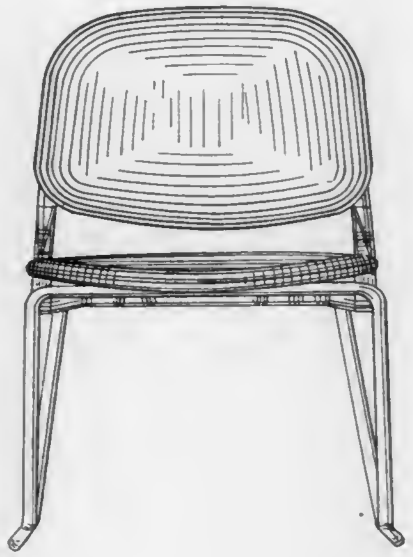
U.S. Cl. D6—369



/OL
2 10
ISS
1
MY
5
998
JMI

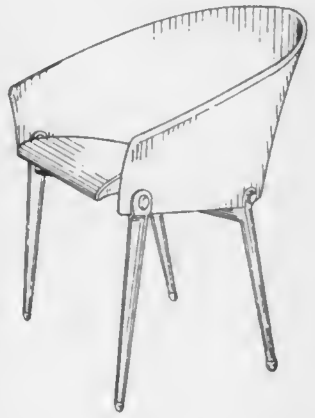
393,955
CHAIR

Giancarlo Piretti, Bologna, Italy, assignor to Pro-Cord S.r.l., Bologna, Italy
Filed Jun. 7, 1996, Ser. No. 55,604
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—373



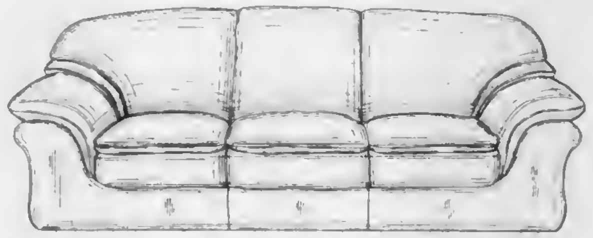
393,956
CHAIR

Brian Kane, San Francisco, Calif., assignor to Carnegie Fabrics, Inc., Rockville Centre, N.Y.
Filed Jun. 7, 1996, Ser. No. 55,550
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—334



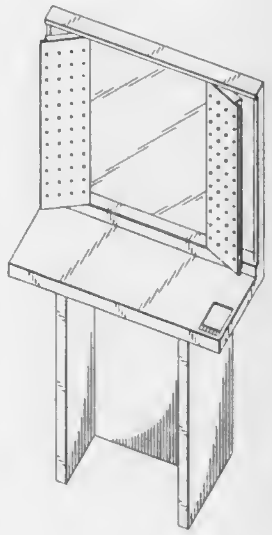
393,957
SEAT

Pasquale Natuzzi, Santeramo In Colle, and Arcangelo Scarati, Talsano, both of Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy
Filed Mar. 26, 1996, Ser. No. 52,239
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



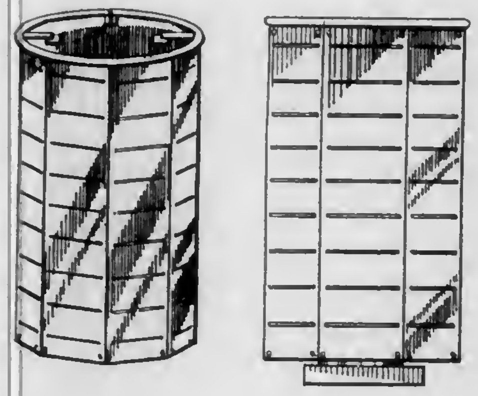
393,958
COMBINED LIGHTED BOOTH AND MIRROR

Dominique Moncourtois, Paris, and Francis Vandenbussche, Vaucresson, both of France, assignors to Chanel, S.A., Neuilly-sur-Seine, France
Filed Jun. 21, 1996, Ser. No. 56,069
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—444



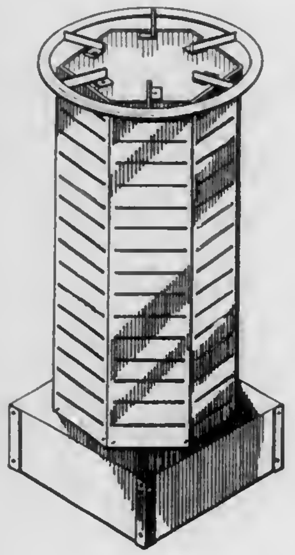
393,959
COUNTER TOP RETAIL DISPLAY UNIT

James Geier, and Jim Jobes, both of Chicago, Ill., assignors to 555 Design Fabrication Management, Inc., Chicago, Ill.
Filed Jul. 31, 1997, Ser. No. 74,473
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—457



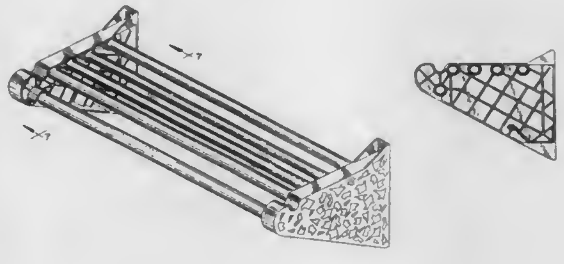
393,960
HEXAGONAL RETAIL DISPLAY UNIT

James Geier, and Jim Jobes, both of 1238 S. Ashland Ave., Chicago, Ill. 60608
Filed Jul. 31, 1997, Ser. No. 74,480
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—457



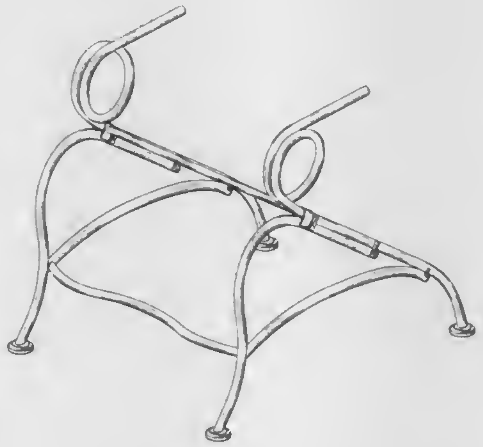
393,961
MINI BALL RACK WITH FIVE POLES

Stephen P. Whitehead, Elgin; Torrence Anderson, and Michael G. Uffner, both of Naperville, all of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Mar. 5, 1996, Ser. No. 51,180
The portion of the term of this patent subsequent to Mar. 5, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D6—464



393,962
CHAIR BASE

Ashley Wiltshire Spotswood, Birmingham, Ala., assignor to Village Smith, L.P., Chattanooga, Tenn.
Filed Dec. 16, 1996, Ser. No. 63,751
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—499



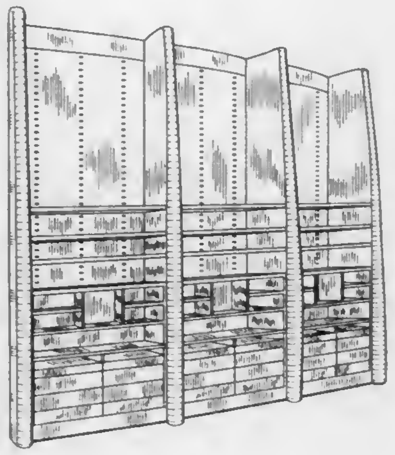
VOL
2 10
SS
1
MY
5
998
UMI

393,963

VIDEO DISPLAY CART

James Mansour, NY, N.Y., assignor to Sony Corporation, Tokyo, Japan, and Sony Corp. of America, New York, N.Y.
Filed Nov. 8, 1995, Ser. No. 46,191
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—478

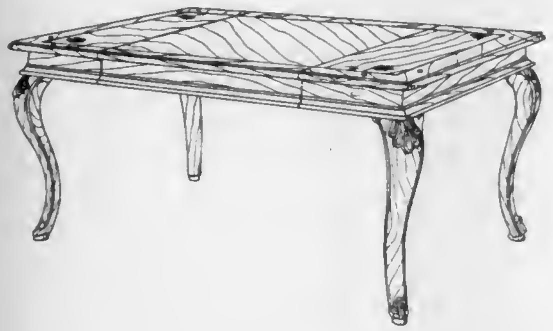


393,964

TABLE

Christopher S. Bergelin, Morganton, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Apr. 9, 1997, Ser. No. 68,895
Term of patent 14 years
LOC (6) Cl. 06 - *03*

U.S. Cl. D6—480

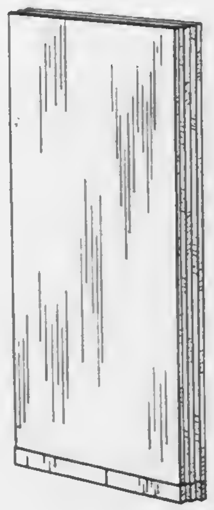


393,965

END PANEL FOR SHELVING, TABLES, AND FURNITURE

Hal Sandy, 4937 Glendale Rd., Shawnee-Mission, Kans. 66205
Filed Feb. 10, 1997, Ser. No. 66,313
Term of patent 14 years
LOC (6) Cl. 06 - *06*

U.S. Cl. D6—492

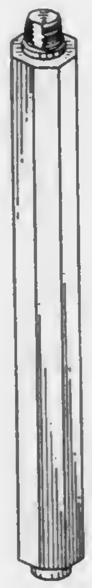


393,966

SHELVING SUPPORT SPINDLE

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France
Filed Aug. 6, 1997, Ser. No. 74,500
Claims priority, application Hague Agreement, Feb. 10, 1997, DMA/003587
Term of patent 14 years
LOC (6) Cl. 06 - *06*

U.S. Cl. D6—495

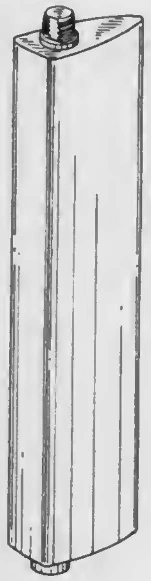


393,967

SHELVING SUPPORT SPINDLE

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France
Filed Aug. 6, 1997, Ser. No. 74,504
Claims priority, application Hague Agreement, Feb. 10, 1997, DMA/003587
Term of patent 14 years
LOC (6) Cl. 06 - *06*

U.S. Cl. D6—495

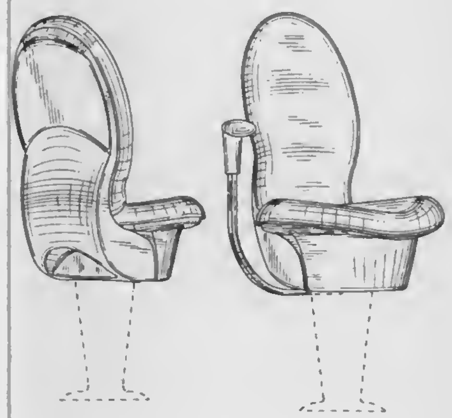


393,968

CHAIR

Kenneth James Penning, Grand Rapids, Mich.; Robert Peter Arko, Palo Alto, Calif.; Eric Thomas McClure, Grand Rapids, Mich.; James P. Steffens, Hopkins, Mich., and Mark Scott Drelles, Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Feb. 26, 1997, Ser. No. 66,890
Term of patent 14 years
LOC (6) Cl. 06 - *06*

U.S. Cl. D6—500

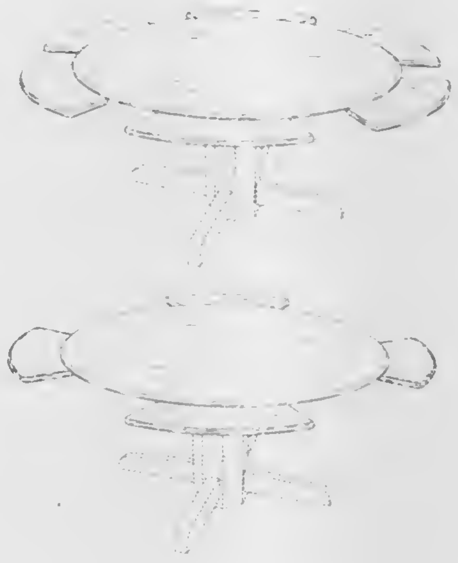


393,969

RETRACTABLE ROUND CARD TABLE TOP

Larry G. Jenkins, 340 Johnston Rd., Searcy, Ark. 72143, and Gary L. Dukes, #8 Appletree Cir., Little Rock, Ark. 72209
Filed Feb. 28, 1997, Ser. No. 67,400
Term of patent 14 years
LOC (6) Cl. 06 - *03*

U.S. Cl. D6—511

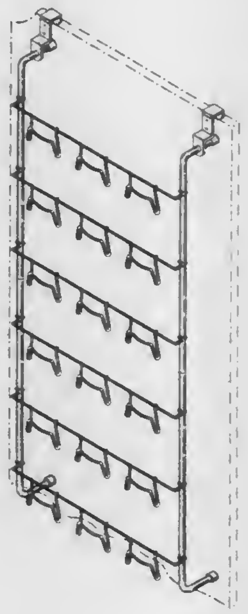


393,970

DOOR-MOUNTED CAP RACK

James Lee, Old Tappan, N.J., assignor to Organize It All, Moonachie, N.J.
Filed Mar. 12, 1997, Ser. No. 67,835
Term of patent 14 years
LOC (6) Cl. 08 - *08*

U.S. Cl. D6—514



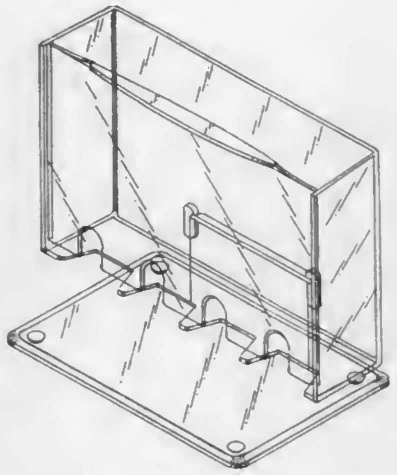
/OL
2 10
SS
1
MY
5
998
JMI

393,971

FOUR COLUMN PACKET DISPENSER

John C. Curry, P.O. Box 427, Port Richey, Fla. 34673-0427
Filed Jun. 23, 1997, Ser. No. 72,667
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—515

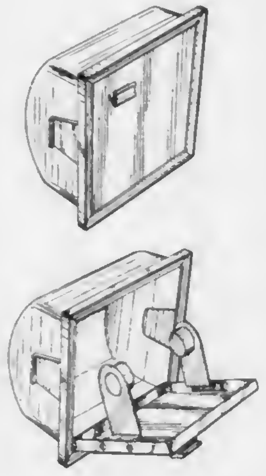


393,972

TOILET PAPER HOLDER

Taro Kato, Sao Paulo, Brazil, assignor to Cris-Metal Móveis Para Banheiro Ltda., São Paulo, Brazil
Filed Jun. 19, 1997, Ser. No. 72,561
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—523

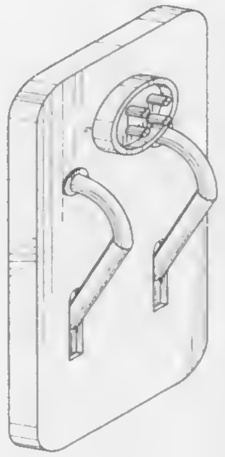


393,973

LOCKABLE RAZOR HOLDER

Oren Herring, 1071 Cottingham Dr., Mount Pleasant, S.C. 29464
Filed Apr. 12, 1996, Ser. No. 52,993
Term of patent 14 years
LOC (6) Cl. 06 - *02*

U.S. Cl. D6—526

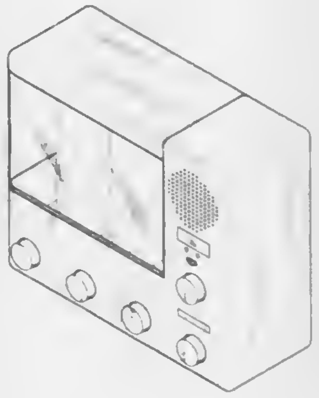


393,974

SHOWER DISPENSER RADIO

Omar Davis, Clifton, N.J., assignor to Salton-Maxim Housewares, Inc., Mt. Prospect, Ill.
Filed Jun. 23, 1997, Ser. No. 72,668
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—544

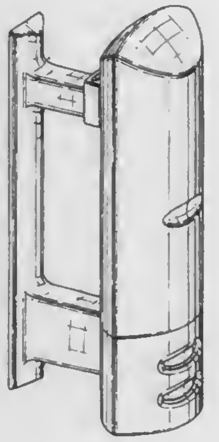


393,975

SOAP DISPENSER

Gerrit K. Bunschoten, Oud Zuilen, Netherlands, and Patrick Van Gendt, Brussels, Belgium, assignors to Diversey Lever, Inc., Plymouth, Mich.
Filed Apr. 11, 1997, Ser. No. 69,137
Claims priority, application United Kingdom, Oct. 15, 1996, 2060046
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—545

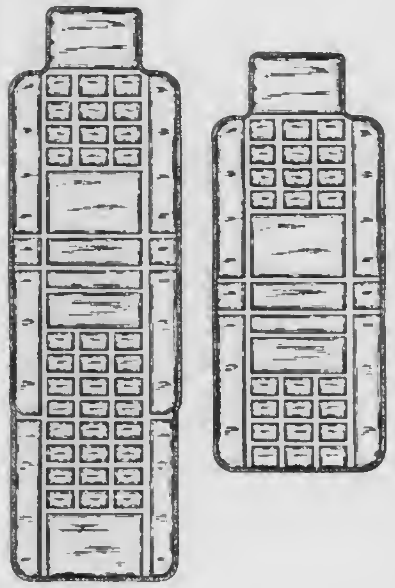


393,976

MASSAGING SYSTEM SEAT CUSHION

Craig M. Loud, Whittier, Calif., assignor to JB Research, Inc., Bellflower, Calif.
Filed Mar. 13, 1996, Ser. No. 51,548
Term of patent 14 years
LOC (6) Cl. 06 - *09*

U.S. Cl. D6—601

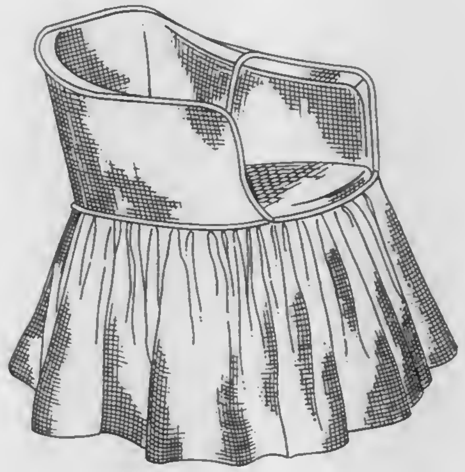


393,977

CHAIR COVER

Sharon A. Springer, 1145 E. Tujunga Ave., Burbank, Calif. 91501
Filed Apr. 23, 1996, Ser. No. 53,435
Term of patent 14 years
LOC (6) Cl. 06 - *13*

U.S. Cl. D6—610

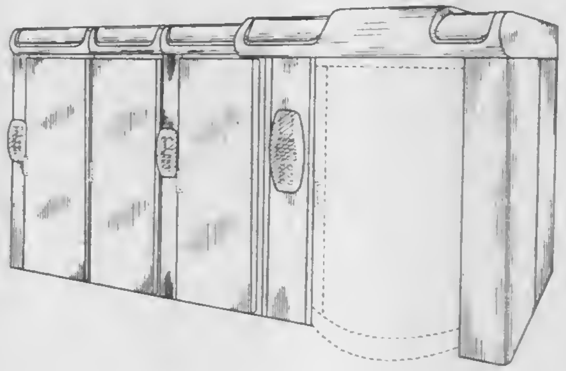


393,978

COMMERCIAL BAKING OVEN

Kenneth T. Graat, Woodinville, Wash., and Donald H. Jones, Roebling, N.J., assignors to The Lucks Company, Kent, Wash.
Filed May 19, 1997, Ser. No. 69,885
Term of patent 14 years
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—348

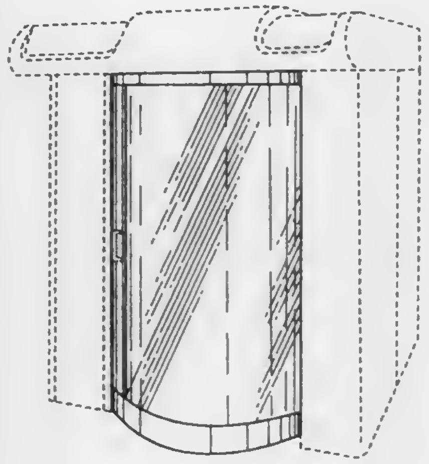


/OL
2 10
ISS
1
MY
5
998
MI

393,979
COMMERCIAL BAKING OVEN DOOR

Kenneth T. Graat, Woodinville, Wash., assignor to The Lucks Company, Kent, Wash.
Filed May 16, 1997, Ser. No. 70,837
Term of patent 14 years
LOC (6) Cl. 07 - *02*

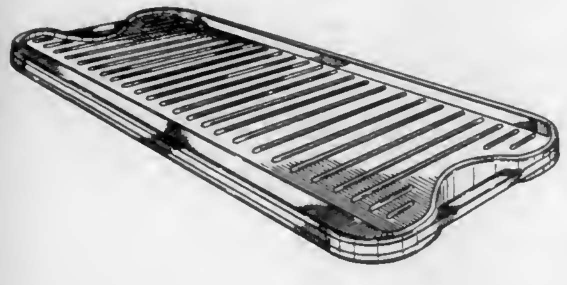
U.S. Cl. D7—405



393,980
PRO GRID/IRON GRIDDLE

Robert F. Kellermann, P.O. Box 380 6th St. at Railroad Ave., South Pittsburg, Tenn. 37380
Filed May 1, 1997, Ser. No. 70,148
Term of patent 14 years
LOC (6) Cl. 07 - *02*

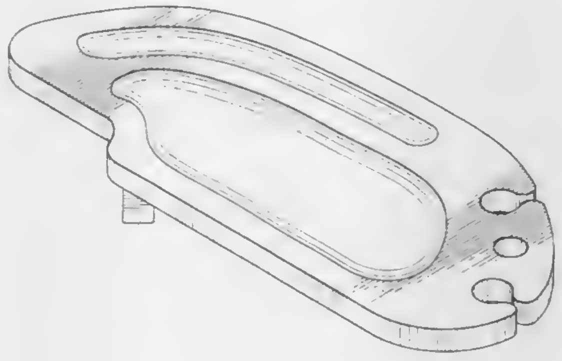
U.S. Cl. D7—409



393,981
PARTY TRAY

John M. Lipkowitz, Las Vegas, Nev., assignor to Rio Properties, Inc., Las Vegas, Nev.
Filed Mar. 17, 1997, Ser. No. 68,188
Term of patent 14 years
LOC (6) Cl. 07 - *01*

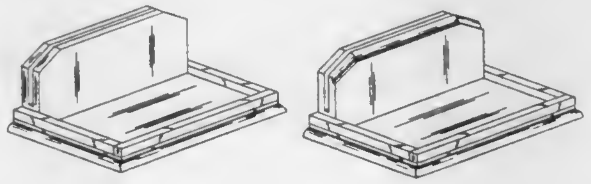
U.S. Cl. D7—553



393,982
TABLE TOP ORGANIZER FOR CONDIMENT CONTAINERS, MENUS AND NAPKINS

Frank Pulitano, 163 Summer St., Stratford, Conn. 06497
Filed Jun. 19, 1997, Ser. No. 72,500
Term of patent 14 years
LOC (6) Cl. 07 - *06*

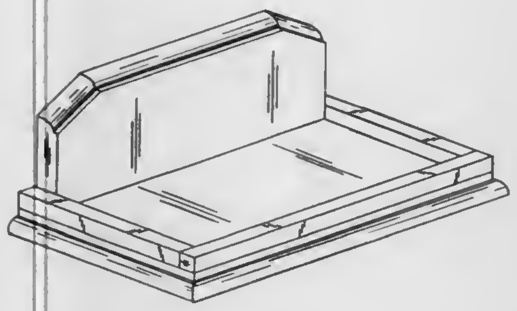
U.S. Cl. D7—590



393,983
TABLE TOP ORGANIZER FOR CONDIMENT CONTAINERS AND NAPKINS

Frank Pulitano, 163 Summer St., Stratford, Conn. 06497
Filed Jun. 19, 1997, Ser. No. 72,521
Term of patent 14 years
LOC (6) Cl. 07 - *06*

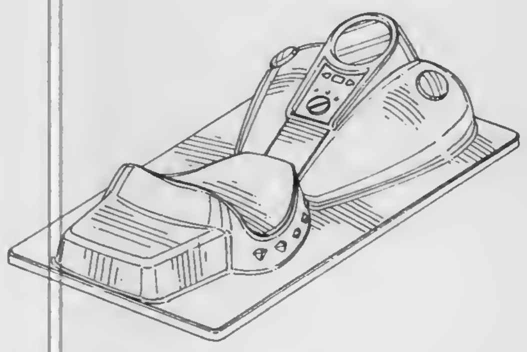
U.S. Cl. D7—590



393,984
LID FOR A COOLER

David A. Arnfelt, 816 10th Ave. NW., Waseca, Minn. 56093
Filed Apr. 2, 1997, Ser. No. 68,858
Term of patent 14 years
LOC (6) Cl. 07 - *01*

U.S. Cl. D7—606



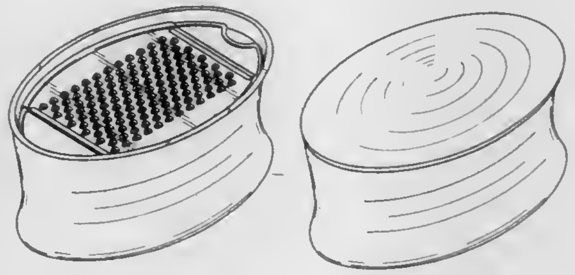
393,985

Patent Not Issued For This Number

393,986
CHEESE GRATER

Carsten Joergensen, Kriens, Switzerland, assignor to PI-Design AG, Triengen, Switzerland
Filed Nov. 14, 1996, Ser. No. 62,396
Claims priority, application Denmark, May 17, 1996, 500/96
Term of patent 14 years
LOC (6) Cl. 07 - *04*

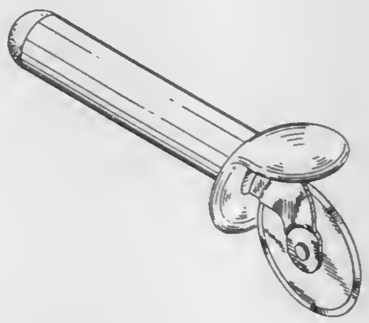
U.S. Cl. D7—678



393,987
PIZZA CUTTER

Nicholas J. Molo, Aldinga Beach, Australia, assignor to Dart Industries Inc., Orlando, Fla.
Filed Jul. 14, 1997, Ser. No. 73,527
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—694



VOL 210 ISS 1 MY 5 1998 UMI

393,988

PLATE HOLDER

Ian Derrick Rogers, 13 Grosskopf Street, Helderkruin, Roodepoort, South Africa

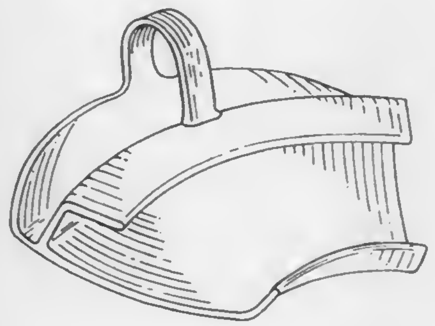
Filed Dec. 12, 1996, Ser. No. 64,087

Claims priority, application South Africa, Jun. 14, 1996, F96/0533; Jun. 14, 1996, F96/0534

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—701



393,989

VEGETATION BARRIER

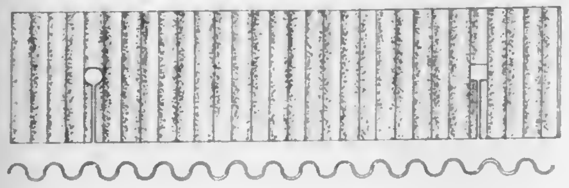
George D. Groves, 2305 Weedel, Arnold, Mo. 63010

Division of Ser. No. 15,522, Nov. 19, 1993, which is a division of Ser. No. 767,195, Sep. 30, 1991, Pat. No. Des. 342,874. This application Mar. 8, 1996, Ser. No. 51,276

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1



393,990

TELESCOPING SNOW SHOVEL FOR VEHICLES

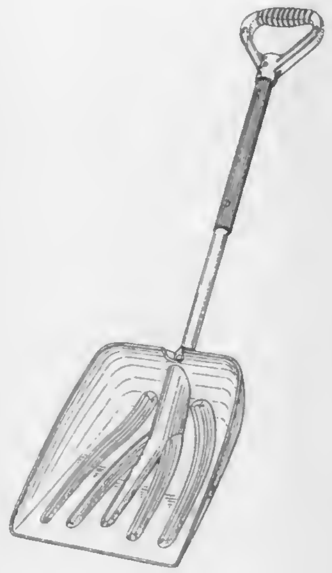
Stephen P. Whitehead, Elgin; Michael R. Vogler, and Torrence C. Anderson, both of Aurora, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Oct. 6, 1997, Ser. No. 77,634

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—10



393,991

SNOW SCOOP

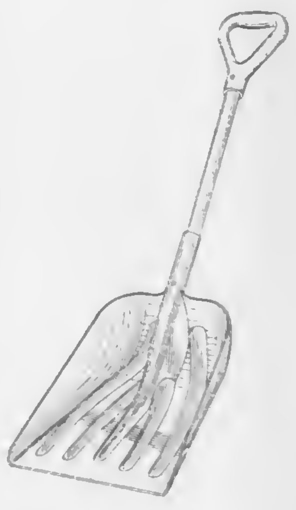
Thomas A. Tisbo, Barrington Hills, and Stephen P. Whitehead, Elgin, both of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Aug. 28, 1997, Ser. No. 76,261

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—10



393,992

AUTOMOTIVE SPLINED CLUTCH ALIGNMENT TOOL

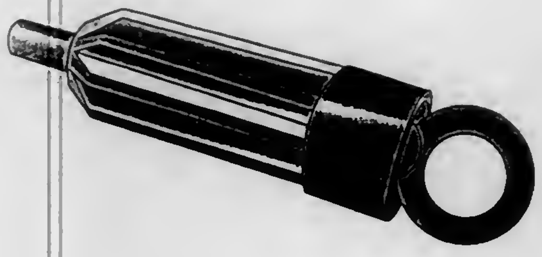
Donavan J. West, 9314 SE. Evergreen Hwy., Vancouver, Wash. 98664

Filed Dec. 9, 1996, Ser. No. 62,892

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—14



393,993

CORKSCREW

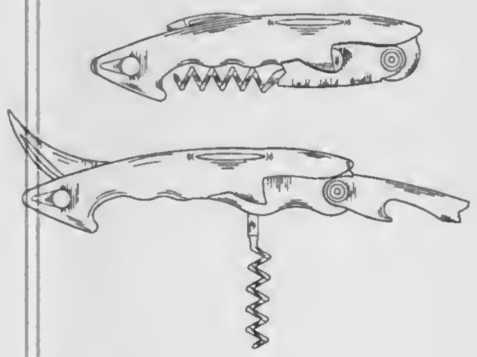
Stephane De Bergen, Villecerf, France, assignor to Le Creuset S.A., Fresnoy-Le Grand, France

Filed Jun. 11, 1997, Ser. No. 72,314

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D8—43



393,994

HANDLE FOR DOORS

Willi Hankel, Waldeck, and Winfried Scholl, Düsseldorf, both of Germany, assignors to HEWI Heinrich Wilke GmbH, Arolsen, Germany

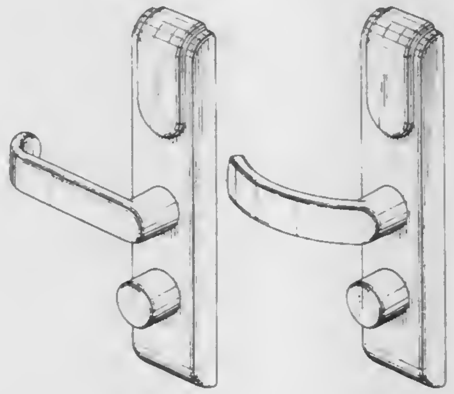
Filed Jul. 29, 1996, Ser. No. 57,639

Claims priority, application Germany, Jan. 29, 1996, M 96 00 781.8

Term of patent 14 years

LOC (6) Cl. 08 - *06*

U.S. Cl. D8—302



393,995

DISPLAY CASE LOCK

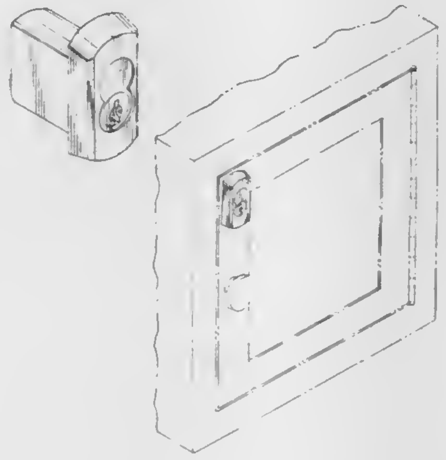
Robert L. Thompson, White Plains, N.Y., assignor to Thompson Lock & Supply Corporation, Mamaroneck, N.Y.

Filed Aug. 15, 1997, Ser. No. 75,487

Term of patent 14 years

LOC (6) Cl. 08 - *07*

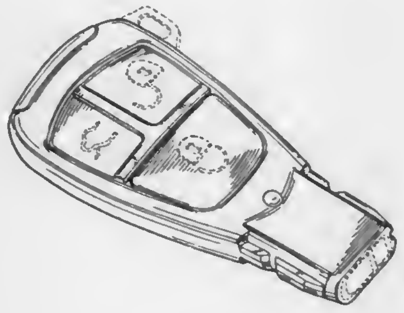
U.S. Cl. D8—331



VOL
210
ISS
1
MY
5
1998
UMI

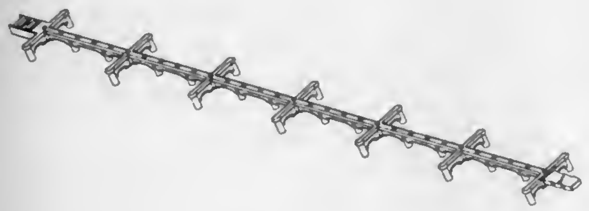
393,996
KEY
Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany
Filed Aug. 28, 1997, Ser. No. 75,300
Claims priority, application Germany, Feb. 28, 1997, M 97 01 993.3
Term of patent 14 years
LOC (6) Cl. 08 - *07*

U.S. Cl. D8—347



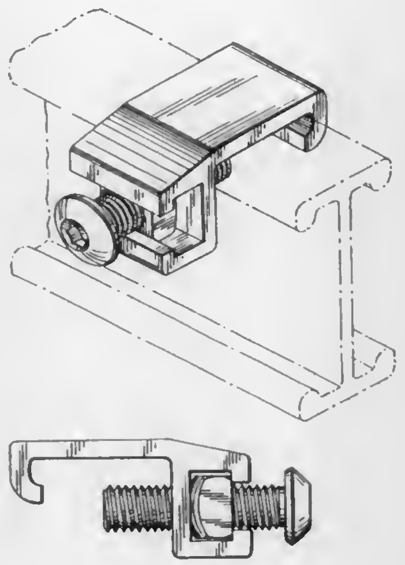
393,997
BOLSTER BAR
G. Douglas Hartzheim, 12390 Cambria Dr., Yucaipa, Calif. 92399
Filed May 7, 1996, Ser. No. 54,169
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—354



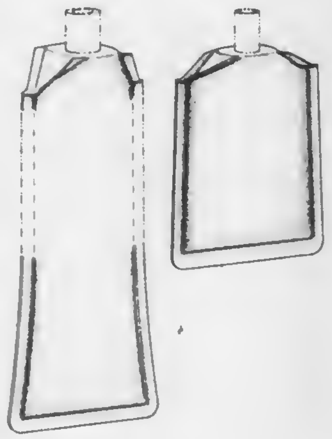
393,998
CLAMP
Carl Anderson, 1011 Capouse Ave., Scranton, Pa. 18509
Filed Dec. 12, 1996, Ser. No. 65,443
Term of patent 14 years
LOC (6) Cl. 08 - *08*

U.S. Cl. D8—394



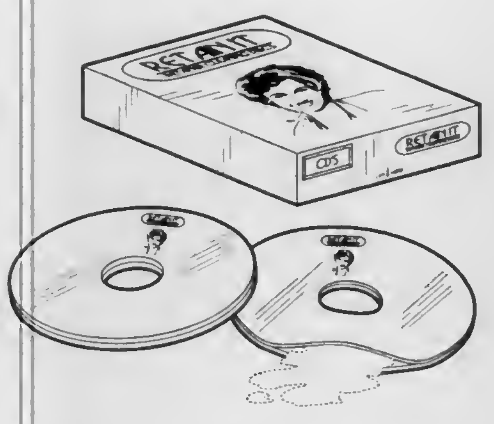
393,999
FLEXIBLE GUSSETED PACKAGE
Dana P. Gruenbacher, Fairfield, Ohio, and Jerald R. Wiles, Sarasota, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 644,673, May 7, 1996, abandoned, which is a continuation of Ser. No. 359,155, Dec. 19, 1994, Pat. No. 5,540,358. This application May 31, 1996, Ser. No. 55,223
Term of patent 14 years
LOC (6) Cl. 09 - *01*

U.S. Cl. D9—302



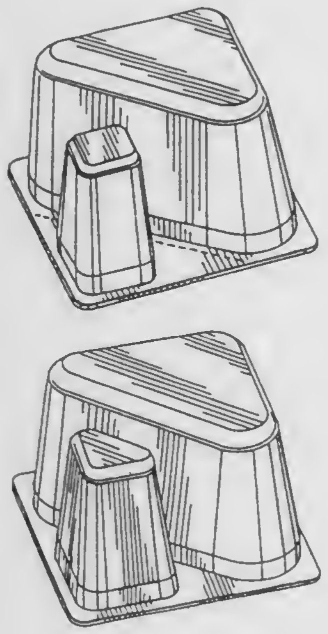
394,000
DISPENSING CONTAINER FOR DENTURE CLEANER
Jacqueline A. Rowe, and Gretchen A. Rowe, both of 470 Conch Ave., Rte. 1 Box 470, Marathon, Fla. 33050
Filed Nov. 20, 1995, Ser. No. 46,907
Term of patent 14 years
LOC (6) Cl. 09 - *07*

U.S. Cl. D9—337



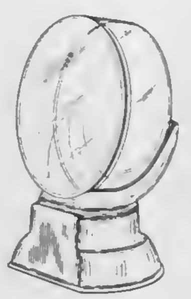
394,001
FOOD CONTAINER
Sophie Vilos, London, Canada, assignor to Landlove Industries, Ltd., London, Canada
Filed Jun. 10, 1996, Ser. No. 55,623
Claims priority, application Canada, Dec. 8, 1995, 1995-2802
Term of patent 14 years
LOC (6) Cl. 09 - *03*

U.S. Cl. D9—347



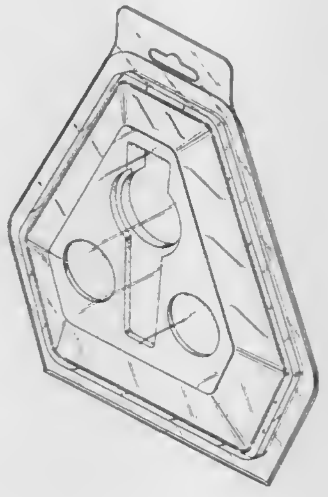
394,002
DISPLAY BOX
Michel Morelli, Quebec, Canada, assignor to Corporation in Glass Co Ltd., Sherbrooke, Canada
Filed Aug. 8, 1997, Ser. No. 74,656
Term of patent 14 years
LOC (6) Cl. 09 - *07*

U.S. Cl. D9—415



394,003
GOLF REPAIR TOOL AND BALL MARKER PRESENTATION CASE
John Tate, 11621 Markon Dr., Garden Grove, Calif. 92841
Filed Aug. 7, 1997, Ser. No. 74,668
Term of patent 14 years
LOC (6) Cl. 09 - *07*

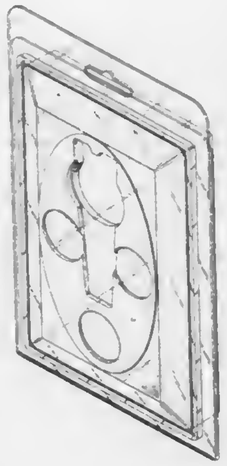
U.S. Cl. D9—415



VOL
2 10
ISS
1
MY
5
998
JMI

394,004
GOLF REPAIR TOOL AND BALL MARKER PRESENTATION CASE

John Tate, 11621 Markon Dr., Garden Grove, Calif. 92841
Filed Aug. 7, 1997, Ser. No. 74,669
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—415

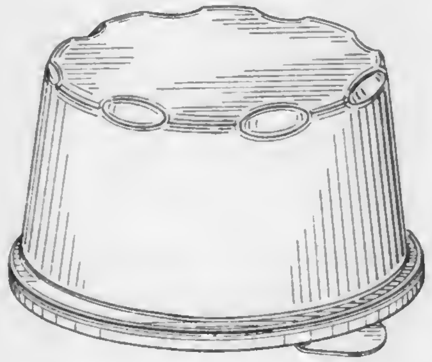


394,005
CONTAINER

Koert Marijnissen, GM Sassenheim, Netherlands, assignor to Lawson Mardon Picopac B.V., Netherlands
Filed Jul. 15, 1997, Ser. No. 73,488

Claims priority, application Hague Agreement, Mar. 18, 1997, DM/039556

Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—416

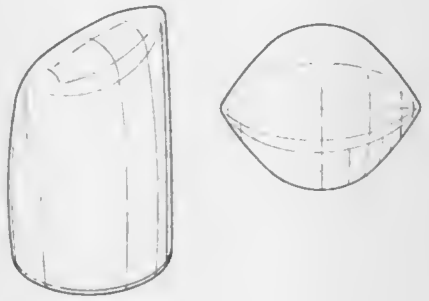


394,006
BOTTLE CAP

James Robert Toleman, San Francisco, Calif., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 6, 1997, Ser. No. 67,393

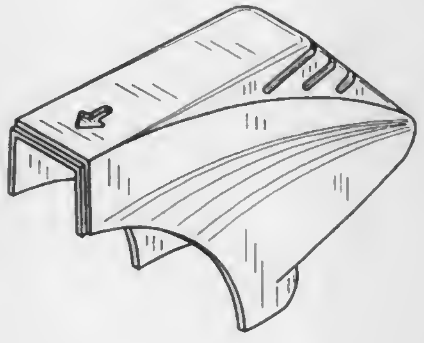
The portion of the term of this patent subsequent to Mar. 6, 2011, has been disclaimed.

Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—435



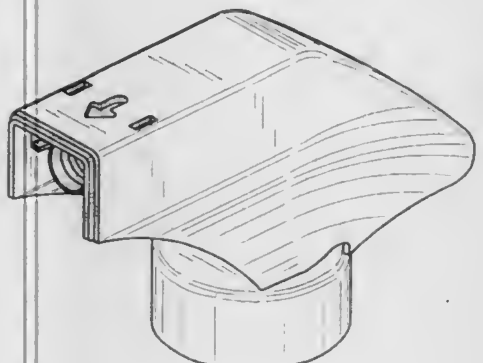
394,007
TRIGGER SPRAYER HOUSING HAVING HORIZONTAL RIBS

Donald D. Foster, St. Charles, and John Finch, St. Peters, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Apr. 22, 1997, Ser. No. 69,506
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



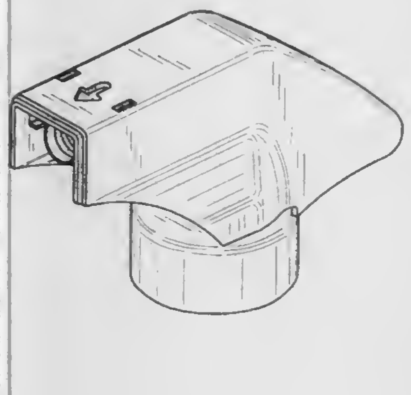
394,008
TRIGGER SPRAYER HOUSING

Donald D. Foster, St. Charles; Philip L. Nelson, Ellisville, and Mark Ochs, High Ridge, all of Mo., assignors to Contico International Inc., St. Louis, Mo.
Filed May 29, 1997, Ser. No. 71,450
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



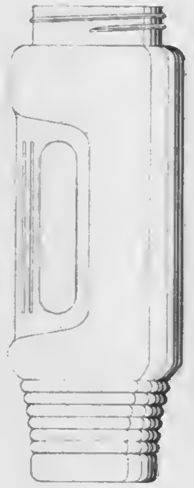
394,009
TRIGGER SPRAYER HOUSING

Donald D. Foster, St. Charles; Philip L. Nelson, Ellisville, and Mark Ochs, High Ridge, all of Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Jun. 17, 1997, Ser. No. 72,493
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



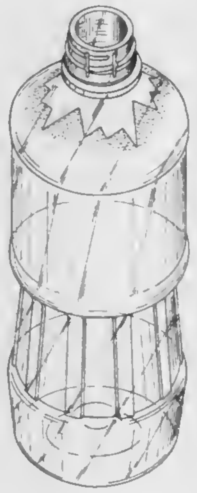
394,010
SQUEEZE BOTTLE

L. Grant Lynd, Canal Winchester, Ohio, assignor to National Packaging Corporation, Columbus, Ohio
Filed Jun. 13, 1997, Ser. No. 72,038
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—531



394,011
BOTTLE

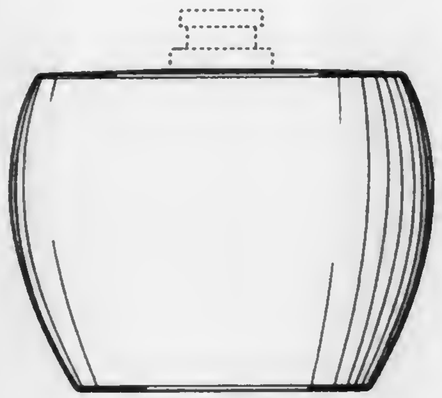
Michael J. Finch, Grand Rapids, Mich., assignor to Northern Falls Water Company, L.L.C., Kentwood, Mich.
Filed May 21, 1997, Ser. No. 71,145
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—538



/OL
2 10
SS
1
MY
5
998
JMI

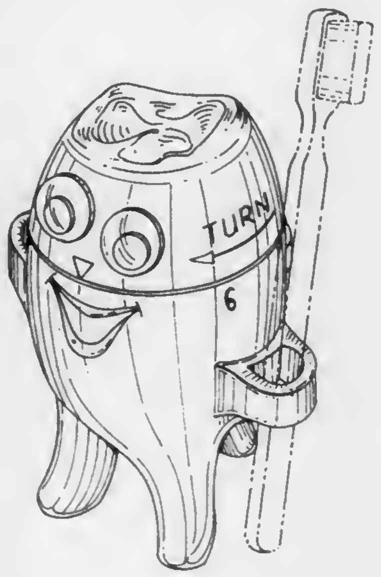
394,012
BOTTLE

Dieter Bakic, Milan, Italy, assignor to Dieter Bakic S.r.l., Milan, Italy
Filed Jul. 8, 1997, Ser. No. 73,404
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—545



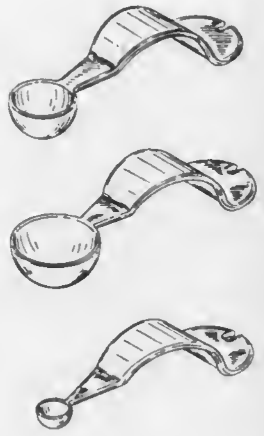
394,013
TOOTH BRUSHING TIMER

Joseph L. Morelli, and Helen M. Mendes, both of Hartford, Conn., assignors to M. H. Rhodes, Inc., Avon, Conn.
Filed May 5, 1997, Ser. No. 70,311
Term of patent 14 years
LOC (6) Cl. 10 - *03*
U.S. Cl. D10—40



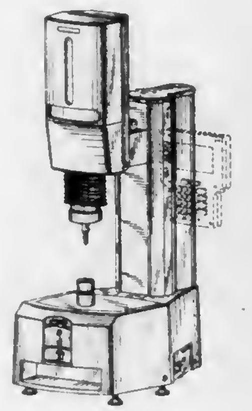
394,014
MEASURING SPOON

Douglas M. Laib, Orlando, Fla., assignor to Dart Industries Inc., Orlando, Fla.
Filed Jun. 18, 1997, Ser. No. 72,081
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—46.2



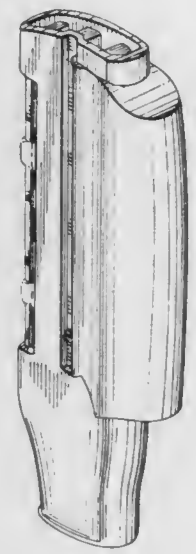
394,015
HARDNESS TESTER

Charles W. Kellstedt, Jr., and Joel M. Lieblein, both of Sudbury, Mass., assignors to Instron Corporation, Canton, Mass.
Continuation-in-part of Ser. No. 55,015, May 28, 1996, abandoned. This application Mar. 21, 1997, Ser. No. 68,523
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—83



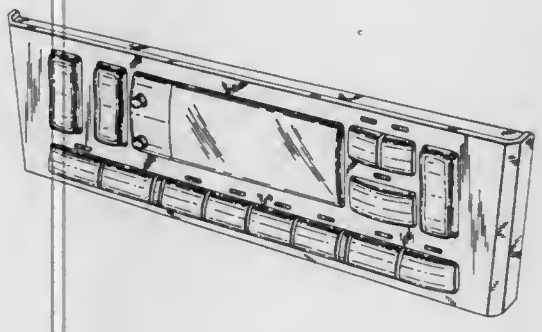
394,016
PORTABLE PEAK FLOW METER

Steven Bellofatto, Closter, and Scott Salmon, Jersey City, both of N.J., assignors to Healthscan Products, Inc., Cedar Grove, N.J.
Filed Jan. 24, 1997, Ser. No. 65,396
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—96



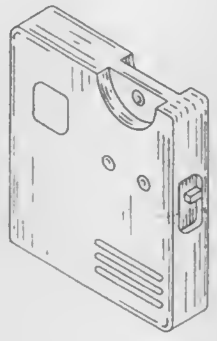
394,017
FRONT PANEL FOR AN AUTOMOTIVE CLIMATE CONTROL

Shangshyan S. Liao, Ann Arbor, and Nevenka Schumaker, West Bloomfield, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Jul. 23, 1997, Ser. No. 74,366
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—103



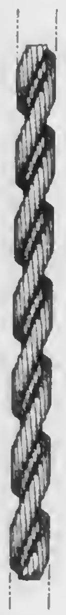
394,018
TRANSMITTER FOR LOCATING KEYS

Marcos Garcia, 516 N. Moore Ave. #B, Monterey Park, Calif. 91754
Filed Aug. 20, 1997, Ser. No. 75,332
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—104



394,019
ORNAMENTAL CHAIN

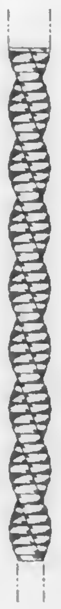
Silverio Cerato, Mussolente, Italy, assignor to Silmar S.P.A., Vicenza, Italy
Filed Jun. 19, 1997, Ser. No. 72,520
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—13



/OL
2 10
ISS
1
MY
5
998
JMI

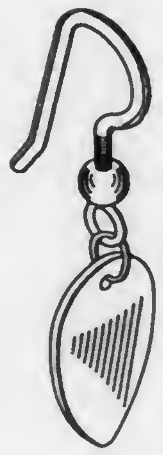
394,020
ORNAMENTAL CHAIN

Silverio Cerato, Mussolente, Italy, assignor to Silmar S.p.A., Vicenza, Italy
Filed Jun. 23, 1997, Ser. No. 72,682
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—13



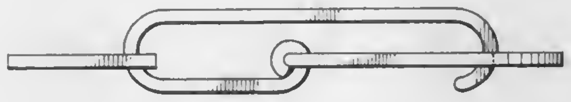
394,021
EARRING

Randy P. Matye, 6102 Ridge Vale, San Antonio, Tex. 78250
Division of Ser. No. 32,655, Dec. 22, 1994. This application Sep. 19, 1995, Ser. No. 44,177
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—44



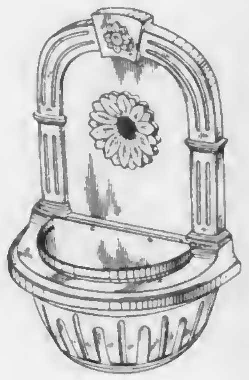
394,022
JEWELRY CLASP

Brian S. Tanner, P.O. Box 1504, Lunenburg, Canada, B0J 2C0
Filed Aug. 16, 1996, Ser. No. 58,542
Claims priority, application Canada, Feb. 19, 1996, 19960376
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—87



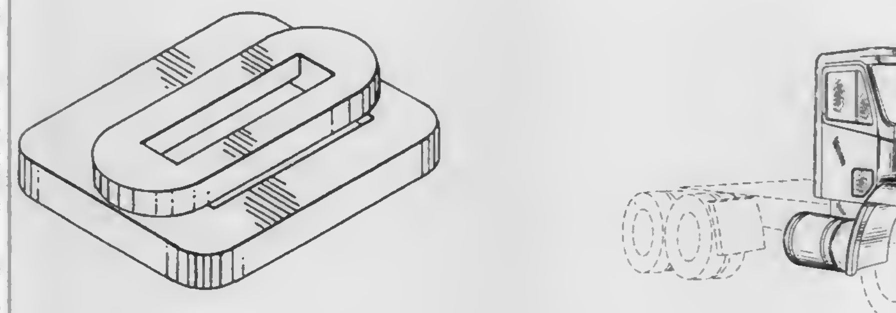
394,023
WALL MOUNTED PLANTER

Donald Shaw, 170 Commander Blvd., Agincourt, Ontario, Canada, M1S 3C8
Filed Jul. 18, 1997, Ser. No. 73,886
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—151



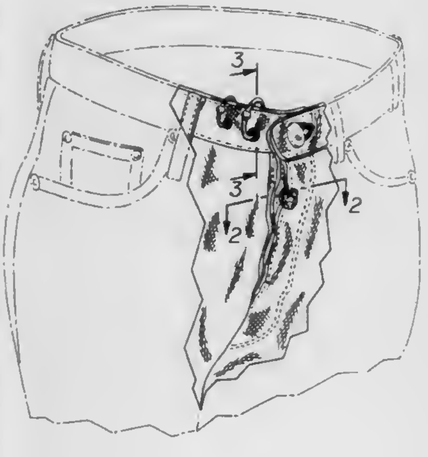
394,024
SELF LOCKING STRAP BUCKLE

Walter M. Johnson, III, Tarpon Springs, Fla., assignor to Net/Werk/USA, Inc., New York, N.Y.
Filed Jul. 14, 1997, Ser. No. 73,529
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—218



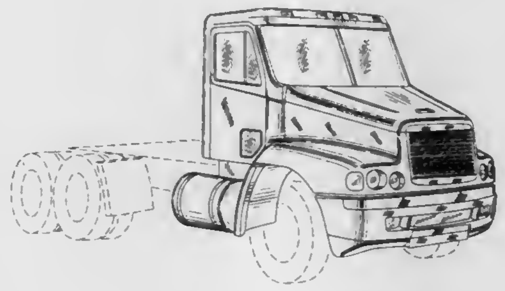
394,025
COMBINED JEANS FLY AND WAIST BAND PORTIONS, AND JEWELRY THEREFOR

Mel B. Geliebter, City of Commerce, Calif., assignor to R.S.V. Sport, Inc., City of Commerce, Calif.
Filed Oct. 16, 1995, Ser. No. 45,275
The portion of the term of this patent subsequent to Jul. 22, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—226



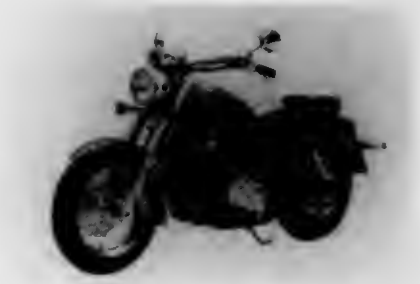
394,026
DAY CAB TRUCK EXTERIOR SURFACE

Ferdinand F. Hellhake, Beaverton; Mark S. Hurayt, Aloha, and Sigmun D. Runyon, Sandy, all of Oreg., assignors to Freightliner Corporation, Portland, Oreg.
Filed Feb. 16, 1996, Ser. No. 50,616
Term of patent 14 years
LOC (6) Cl. 12 - *08*
U.S. Cl. D12—96



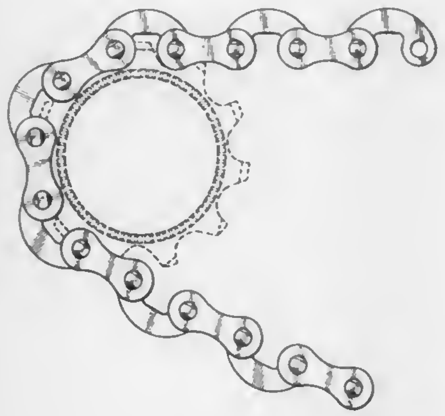
394,027
MOTORCYCLE

Tetsuo Ban, and Daisuke Takahashi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 21, 1997, Ser. No. 72,215
Claims priority, application Japan, Oct. 21, 1996, 8-031460
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—110

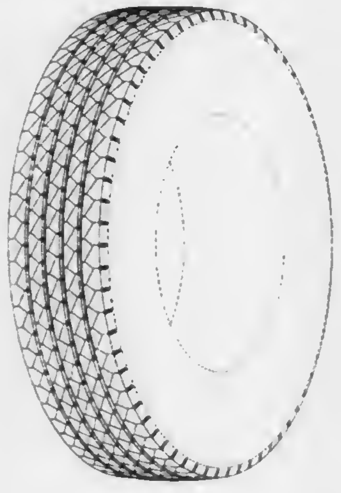


VOL 210 ISS 1 MY 5 1998 UMI

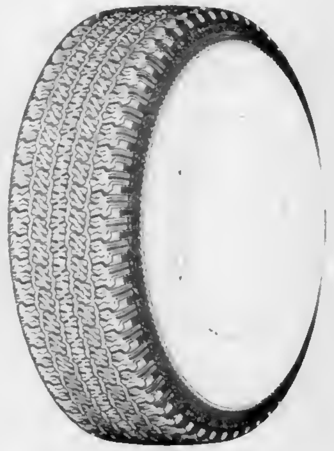
394,028
BICYCLE CHAIN
Yasushi Nakamura, Itami, Japan, assignor to Shimano Inc., Osaka, Japan
Continuation of Ser. No. 755,487, Nov. 21, 1996. This application Jun. 20, 1997, Ser. No. 72,633
Claims priority, application Japan, Jan. 16, 1997, 9-1061
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—124



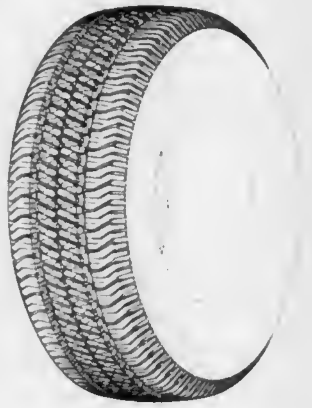
394,029
TIRE TREAD
Jean-Michel Gillard, Mersch, and Georges Gaston Feider, Bettborn, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 29, 1997, Ser. No. 70,361
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—141



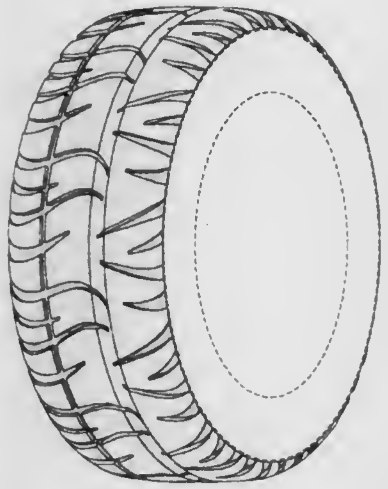
394,030
TIRE TREAD
Timothy J. Lassan, Kent; Bill J. Wallet, Marshallville, and Joseph F. Molnar, Wadsworth, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed May 31, 1996, Ser. No. 55,225
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



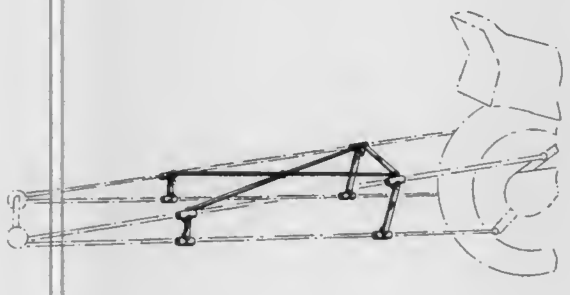
394,031
TIRE TREAD
Richard Louis Galante, Akron; Terrell Dean Windham, Hartville; Colleen Anne Nowacki, and Jay Kevin Lawrence, both of Uniontown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 50,362, Feb. 15, 1996, abandoned. This application Oct. 21, 1996, Ser. No. 61,308
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



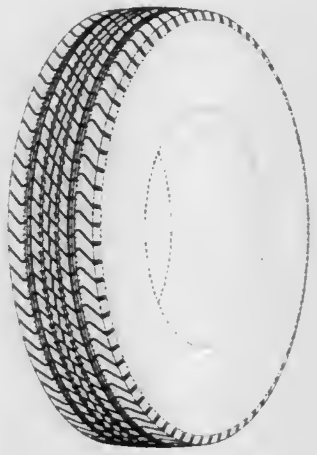
394,032
TIRE TREAD
Paul Bryan Maxwell, Munroe Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 11, 1997, Ser. No. 69,140
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



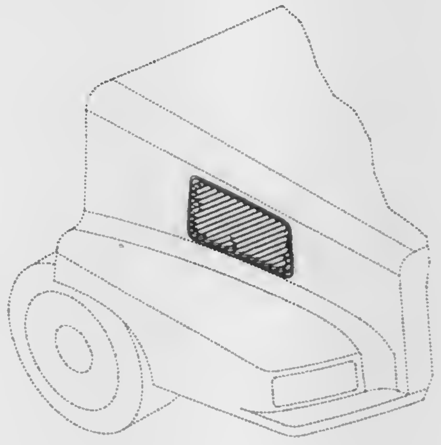
394,033
BRACE FOR WHEELIE BAR
Wayne Pingel, and Donna Pingel, both of Adams, Wis., assignors to Pingel Enterprise, Inc., Adams, Wis.
Filed Aug. 1, 1996, Ser. No. 57,836
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—114



394,034
TIRE TREAD
Georges Gaston Feider, Bettborn; Jean-Michel Gillard, Mersch, and Susan Marie Spaeth, Strassen, all of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 29, 1997, Ser. No. 70,364
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



394,035
VEHICLE AIR INTAKE GRILLE
Dennis E. Stosel, Kernersville, and Thomas J. Palenchar, Greensboro, both of N.C., assignors to Volvo GM Heavy Truck Corporation, Greensboro, N.C.
Filed Aug. 16, 1996, Ser. No. 59,127
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—163



OL
2 10
ISS
1
MY
5
998
MI

394,036

CAR MAT

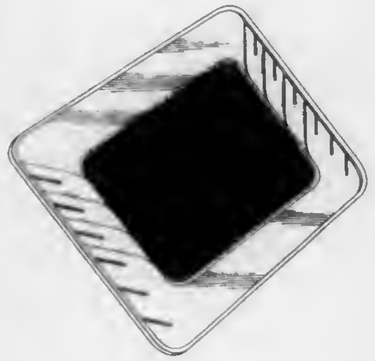
Claude Mauffette, Montreal, Canada, assignor to Atlantech Inc., Montréal, Canada

Filed May 28, 1997, Ser. No. 71,343

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—203



394,037

CAR MAT

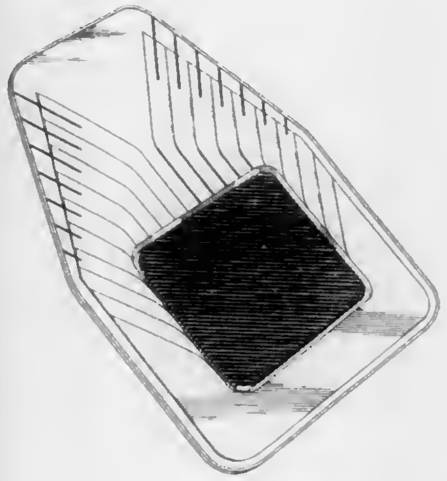
Claude Mauffette, Montreal, Canada, assignor to Atlantech Inc., Québec, Canada

Filed May 28, 1997, Ser. No. 71,344

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—203



394,038

FRONT FACE OF A VEHICLE WHEEL

Rainer Braun, Freiberg/N., Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

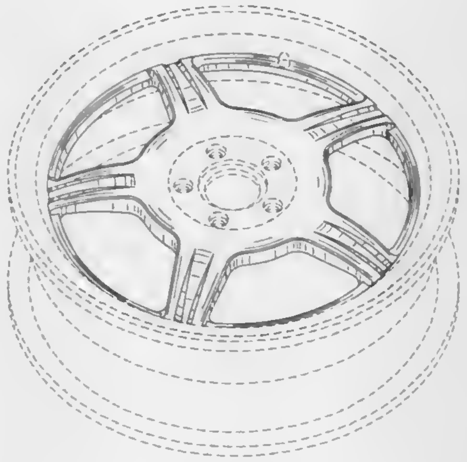
Filed Jun. 11, 1997, Ser. No. 73,754

Claims priority, application Germany, Dec. 11, 1996, M 96 10 585.2

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—211



394,039

AIRPLANE

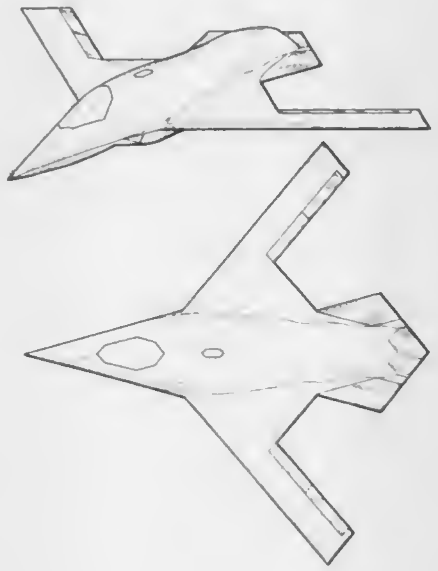
Darold B. Cummings, Hawthorne, Calif., assignor to Boeing North American, Inc., Seal Beach, Calif.

Filed Jun. 23, 1997, Ser. No. 72,587

Term of patent 14 years

LOC (6) Cl. 12 - *07*

U.S. Cl. D12—333



394,040

MARS AEROSHELL

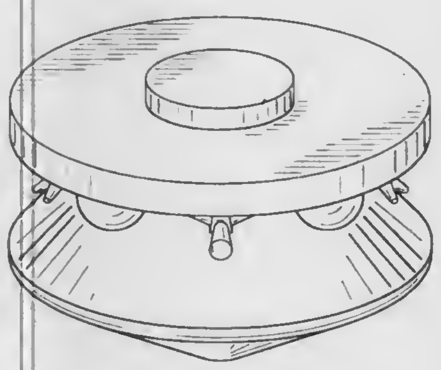
Michael O'Neal, Pasadena; Dara Sabahi, Marina Del Rey, and Michael Tauber, Cupertino, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 21, 1996, Ser. No. 56,094

Term of patent 14 years

LOC (6) Cl. 12 - *07*

U.S. Cl. D12—325



394,041

CABLE RADIO FREQUENCY SIGNAL SPLITTER

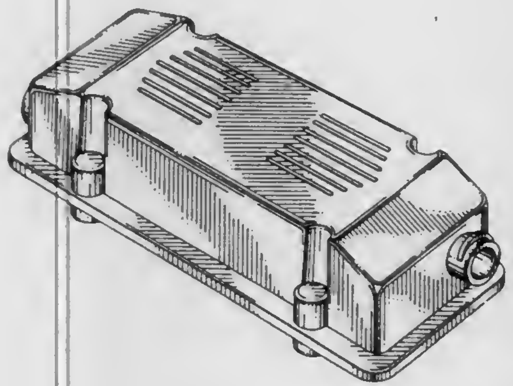
Bart Spriester, Duluth, Ga., and Huang Chi-Jui, Taipei Hsien, Taiwan, assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Nov. 28, 1995, Ser. No. 47,181

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—123



394,042

SWITCH

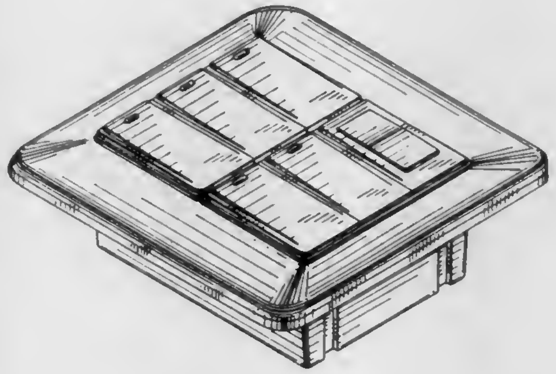
In Gil Hwang, Seoul, Rep. of Korea, assignor to Anam Industrial Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 6, 1996, Ser. No. 57,997

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—171



394,043

CLAMPING HEAT SINK

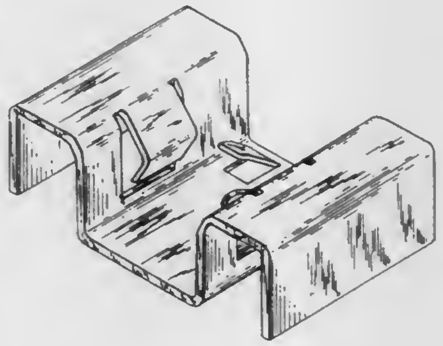
Vincent Campanella, Wakefield, and Osvaldo M. Vasconcelos, Milton, both of Mass., assignors to Wakefield Engineering, Inc., Wakefield, Mass.

Filed Feb. 23, 1996, Ser. No. 50,717

Term of patent 14 years

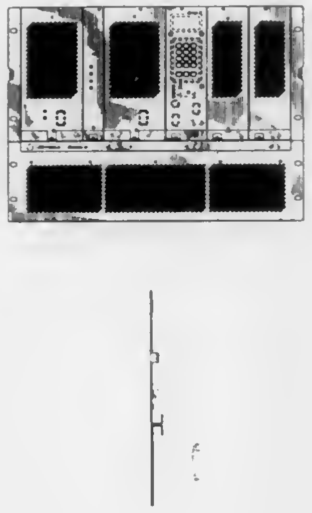
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—179

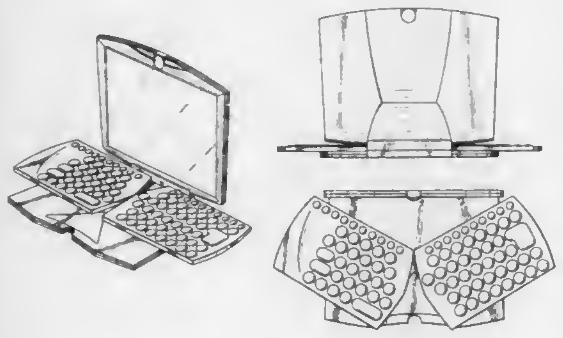


VOL
2 10
SS
1
MY
5
998
MI

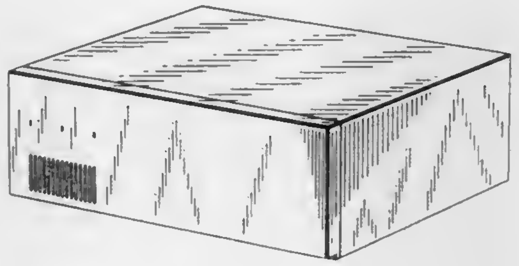
394,044
FRONT PANEL FOR INFRASTRUCTURE EQUIPMENT
Douglas D. Peebles, Keller; David J. Kornely, Colleyville; Kenneth M. Wasko, Southlake, and Shelly Haffly, Arlington, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 29, 1996, Ser. No. 57,637
Term of patent 14 years
LOC (6) Cl. 13 - *99*
U.S. Cl. D13—184



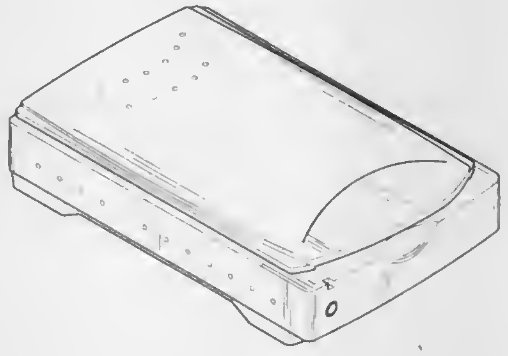
394,045
ELECTRONIC COMPUTER
Masaaki Iino, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 17, 1997, Ser. No. 72,433
Claims priority, application Japan, Feb. 18, 1997, 9-4320
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—106



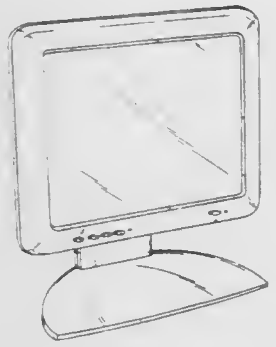
394,046
DATA TRANSFER MACHINE FOR A COMPUTER
Mayumi Kurokawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 10, 1997, Ser. No. 71,991
Claims priority, application Japan, Jan. 27, 1997, 9-1889
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



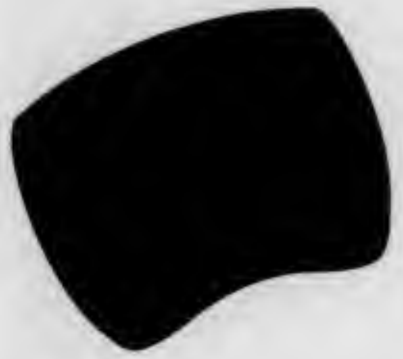
394,047
SCANNER
Jack Chang, Taoyuang, and Tony Chen, Taipei, both of Taiwan, assignors to UMAX Data Systems Inc., Hsin-Chu, Taiwan
Filed Jul. 1, 1997, Ser. No. 73,134
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



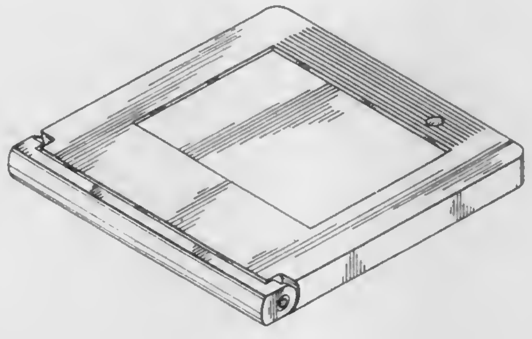
394,048
LIQUID CRYSTAL DISPLAY
Myunghoon Lee, Kyunggi-Do, Rep. of Korea, assignor to Comtec Systems Co. Ltd., Youngdungpo-ku, Rep. of Korea
Filed Jul. 11, 1997, Ser. No. 73,465
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



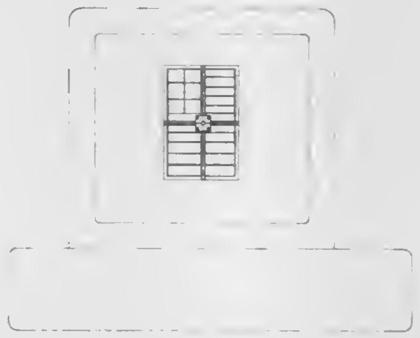
394,049
MOUSE PAD
David W. Barrette, Eagan, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 23, 1996, Ser. No. 49,325
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



394,050
MAGNETIC DISC FOR COMPUTER
Takatsugu Funawatari, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 26, 1996, Ser. No. 53,694
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114

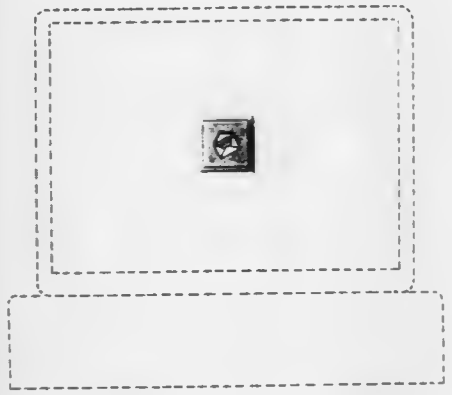


394,051
USER INTERFACE ICON FOR A DISPLAY SCREEN
Kim C. Smith, Colleyville, Tex., assignor to AST Research, Inc., Irvine, Calif.
Filed Jun. 12, 1995, Ser. No. 40,173
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.3

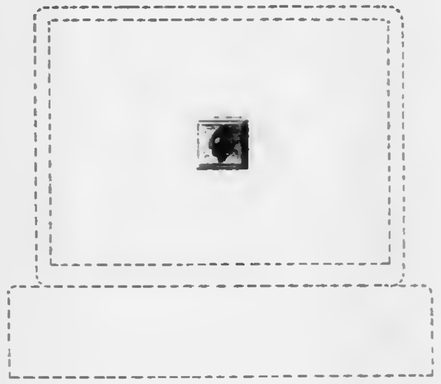


VOL
2 10
ISS
1
MY
5
998
MI

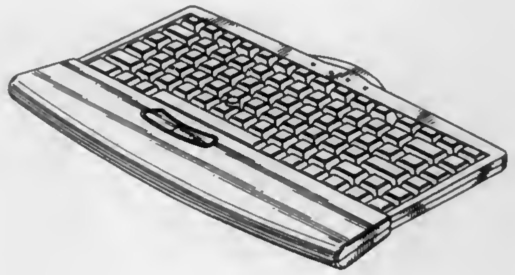
394,052
ICON FOR A COMPUTER DISPLAY
John Meade, Marblehead, Mass., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 33,232, Jan. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,329
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.5



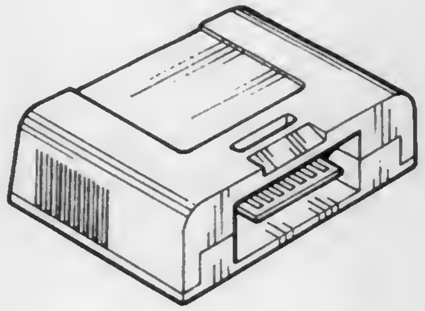
394,053
ICON FOR A COMPUTER DISPLAY
John Meade, Marblehead, Mass., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 33,232, Jan. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,331
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.5



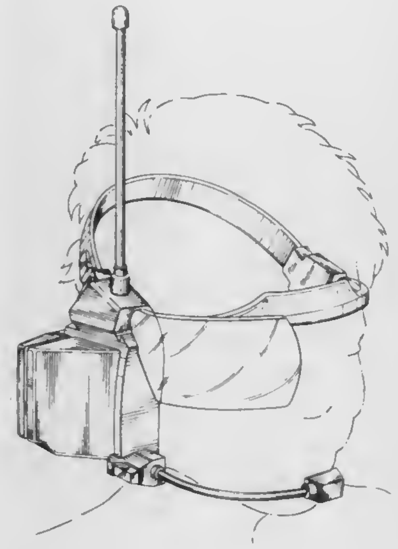
394,054
KEYBOARD FOR ELECTRONIC COMPUTERS
Ushio Inami, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 20, 1997, Ser. No. 72,636
Claims priority, application Japan, Dec. 20, 1996, 8-38453
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—115



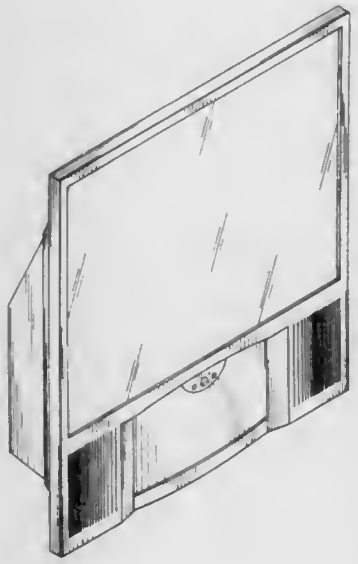
394,055
MEMORY PACK FOR VIDEO GAMES
Kelly D. Tyler, Box 841, Jamul, Calif. 91935
Filed Dec. 2, 1996, Ser. No. 63,229
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—121



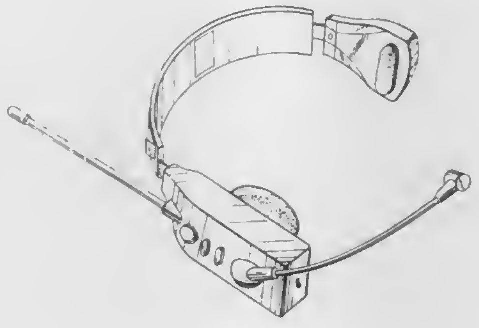
394,056
VIRTUAL REALITY WALKIE TALKIE
Isaac Larian, Los Angeles, Calif., assignor to ABC International Traders, Inc., North Hills, Calif.
Filed Sep. 5, 1997, Ser. No. 76,275
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D14—124



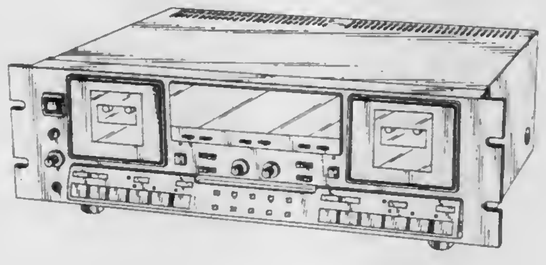
394,057
PROJECTION TELEVISION
Richard A. Bourgerie, Noblesville, Ind., assignor to Thomson Consumer Electronics, Indianapolis, Ind.
Filed Aug. 25, 1997, Ser. No. 76,132
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—128



394,058
CORDLESS TELEPHONE HEADSET
Robert M. Fitzgerald, 233 Milwaukee, Denver, Colo. 80206
Filed Jun. 17, 1997, Ser. No. 72,426
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—142



394,059
DIGITAL AUDIO TAPE RECORDER
Masafumi Ito; Haruki Takita, and Katsuhiro Takashima, all of Musashino, Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Jul. 11, 1997, Ser. No. 73,385
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—164



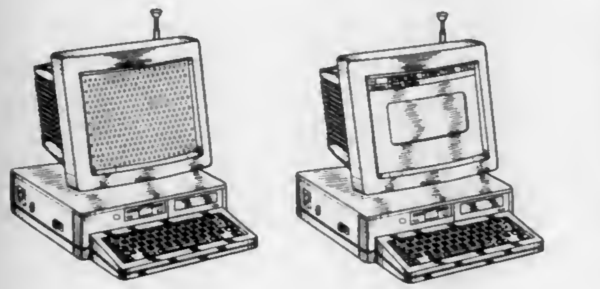
OL
2 10
ISS
1
MY
5
998
MI

394,060
CLOCK COMBINED WITH RADIO

Tjeerd Dijkstra, Leiderdorp, Netherlands, assignor to Pollyflame International B.V., Roelofarendsveen, Netherlands
Filed Jul. 5, 1996, Ser. No. 56,656
Claims priority, application WIPO, Jan. 5, 1996, DM/35142
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—170

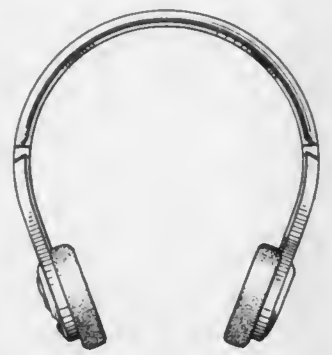
394,061
COMBINED COMPUTER-STYLE RADIO AND ALARM CLOCK

David Fink, Dix Hills, N.Y., assignor to Windsor Industries, Inc., Farmingdale, N.Y.
Filed Jul. 1, 1997, Ser. No. 73,141
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—170



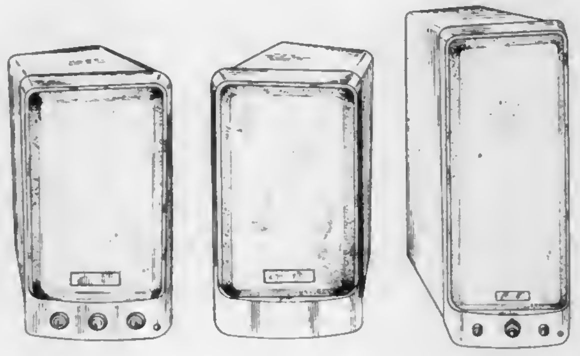
394,062
HEAD MOUNTED RADIO

Lee Cheuk Chun, Queen's Road West, Hong Kong, assignor to Aspen Marketing, Inc., Evergreen, Colo.
Filed Oct. 6, 1997, Ser. No. 77,559
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—192



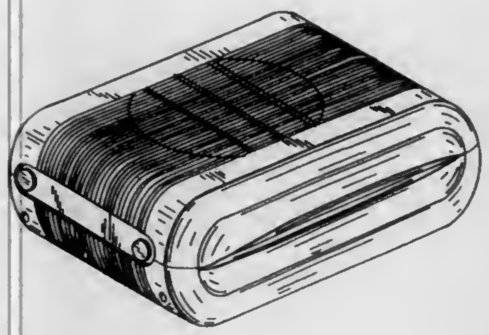
394,063
PAIR OF SPEAKER ENCLOSURES

Patrick Hart, Torrance, Calif., assignor to Aura Systems, Inc., El Segundo, Calif.
Filed Nov. 9, 1995, Ser. No. 46,225
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



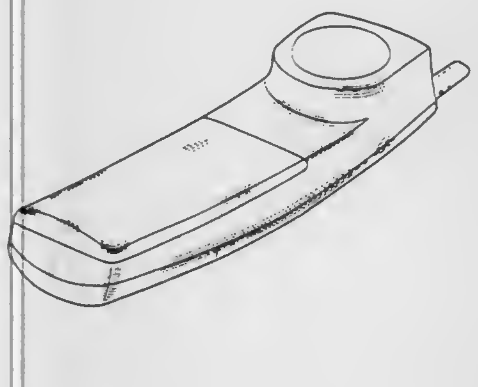
394,064
SUB WOOFER

Tommyea Freadman, 16 Glen Dr., Goshen, N.Y. 10924
Filed Dec. 31, 1996, Ser. No. 64,418
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



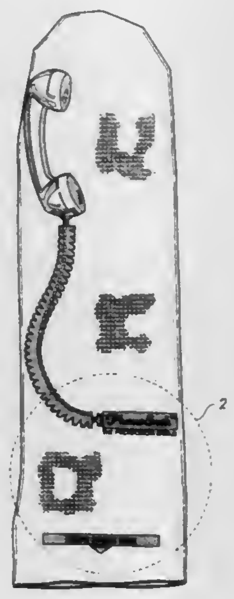
394,065
PORTABLE TELEPHONE HANDSET

Michael John Nuttall, Portola Valley; Christopher A. Robinette, Woodside, both of Calif., and John Henry Schaffeld, New Vernon, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Dec. 30, 1994, Ser. No. 32,957
The portion of the term of this patent subsequent to Jun. 4, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—248



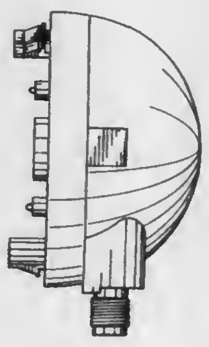
394,066
TELEPHONE HANDSET SANITARY GUARD

Joseph G. Julian, 8002 Bayard Ct., Pittsburgh, Pa. 15237
Filed Dec. 10, 1996, Ser. No. 63,558
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—250



394,067
PUMP FOR MOVING LIQUID THROUGH A TUBE

Yukio Kon, 2995-4, Oaza-Hino, Hino-shi, Tokyo, Japan
Filed Apr. 1, 1997, Ser. No. 69,679
Term of patent 14 years
LOC (6) Cl. 15 - *02*
U.S. Cl. D15—7



/OL
2 10
ISS
1
MY
5
998
JMI

394,068
COMPRESSOR

Volker Pollrich, Schkeuditz, and Helmut Barowsky, Bergfelde, both of Germany, assignors to Bitzer Kuehlmaschinenbau GmbH & Co. KG, Sindelfingen, Germany

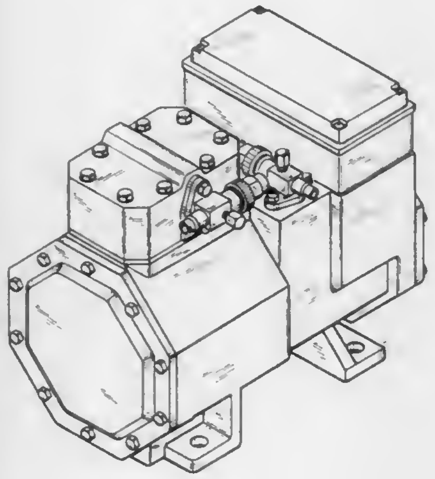
Filed Jul. 23, 1997, Ser. No. 74,050

Claims priority, application Germany, Jan. 31, 1997, 97 01 084.7

Term of patent 14 years

LOC (6) Cl. 15 - *02*

U.S. Cl. D15—9



394,069
CABIN FOR A DRILLING MACHINE

Martti Muranen, Kangasala, Finland, assignor to Tamrock OY, Tampere, Finland

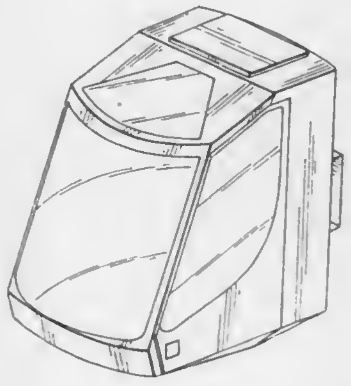
Filed Dec. 30, 1996, Ser. No. 64,395

Claims priority, application Finland, Jul. 5, 1996, 44796; Jul. 5, 1996, 44896

Term of patent 14 years

LOC (6) Cl. 15 - *04*

U.S. Cl. D15—30



394,070
PLANER APPARATUS

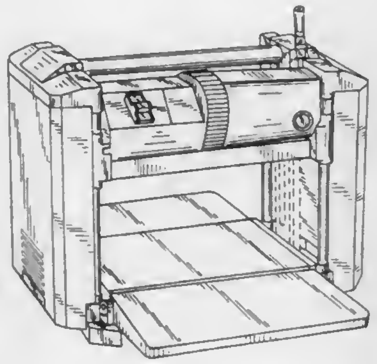
Jaime E. Garcia, Wexford, and David N. Hollinger, Glenshaw, both of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Aug. 9, 1996, Ser. No. 58,266

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—124



394,071
TABLE SAW WITH TELESCOPING FENCE ASSEMBLY

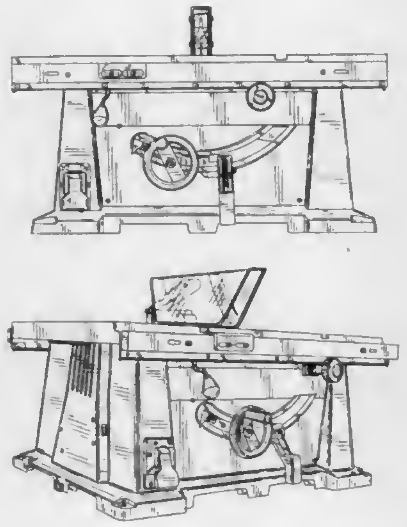
Warren A. Ceroll, Owings Mills; Robert S. Gehret, Hampstead; Daniel Puzio, Baltimore; Frederick R. Bean, Finksburg; Michael L. O'Banion, Westminster, all of Md.; David A. Porter, Hanover, Pa., and Daniel A. Ferrara, Jr., Bantam, Conn., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 51,851, Mar. 1, 1996, abandoned. This application Aug. 1, 1996, Ser. No. 57,853

Term of patent 14 years

LOC (6) Cl. 15 - *07*

U.S. Cl. D15—133



394,072
DRIVE FOR AN INDUSTRIAL MIXER

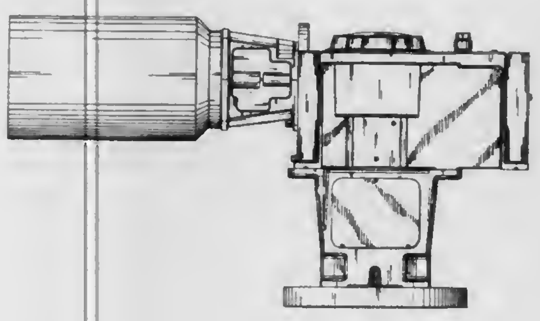
Thomas A. McAvinney; Gregory P. Hancock, both of Rochester; Frederick W. Kehr, Webster, and Jeffrey A. Townsend, Victor, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Feb. 26, 1997, Ser. No. 67,038

Term of patent 14 years

LOC (6) Cl. 15 - *99*

U.S. Cl. D15—148



394,073
MAGNIFIER WITH GRIPPER HANDLE

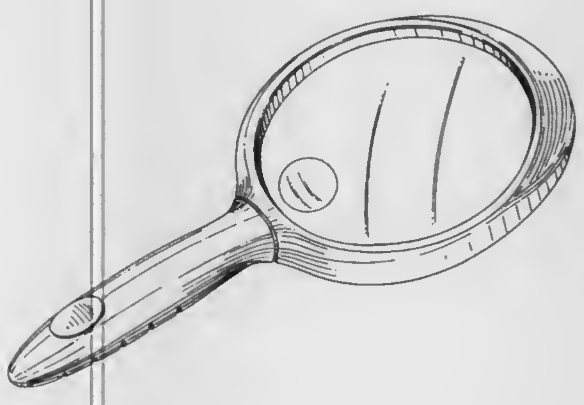
John P. Hennessy, Pittsford; Howard Scott Ryan, Skaneateles, and James A. Goff, Webster, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 4, 1997, Ser. No. 66,057

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—135



394,074
ELECTRONIC STILL CAMERA

Toshiyuki Yamanouchi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

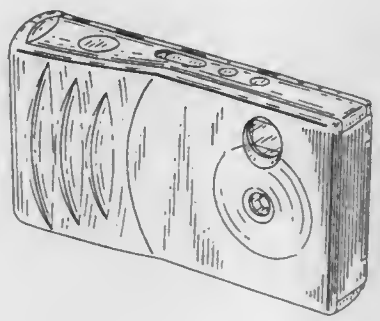
Filed Jun. 25, 1997, Ser. No. 72,302

Claims priority, application Japan, Jan. 7, 1997, 9-21

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—202



394,075
VIDEO CAMERA WITH VIDEO TAPE RECORDER

Shigetada Ninomiya; Masaaki Goto, and Akira Onoda, all of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

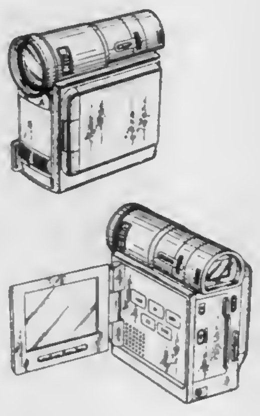
Filed Jul. 22, 1997, Ser. No. 73,998

Claims priority, application Japan, Feb. 13, 1997, 9-4247

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—202



/OL
2 10
SS
1
MY
5
998
JMI

394,076

CAMERA

Yoshiyuki Matsumura, Yokosuka, Japan, and Chien Chun Chih, Tair Wan Sheng, Taiwan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

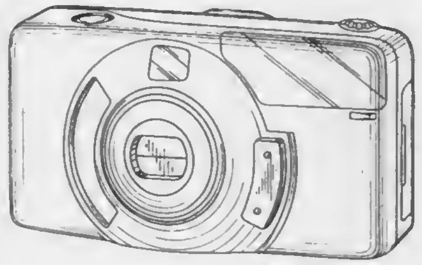
Filed Aug. 4, 1997, Ser. No. 74,523

Claims priority, application Japan, Feb. 7, 1997, 9-3624

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—209



394,077

EYEGLASSES

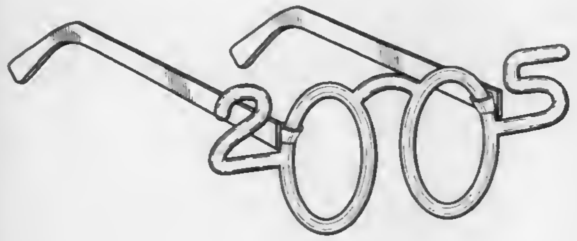
Peter A. Suorsa, 48 Monroe St., Amesbury, Mass. 01913

Filed Mar. 15, 1996, Ser. No. 51,713

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—306



394,078

DRUM PERCUSSION DEVICE

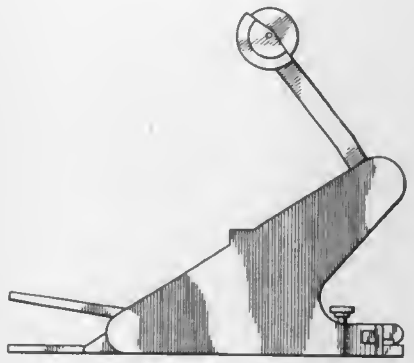
Maurice H. Labute, 268 Frank Avenue, Windsor, Ontario, Canada, N85 3W8

Filed Sep. 16, 1996, Ser. No. 59,786

Term of patent 14 years

LOC (6) Cl. 17 - *04*

U.S. Cl. D17—22



394,079

CALCULATOR WITH CONTAINER FOR STATIONERY KIT

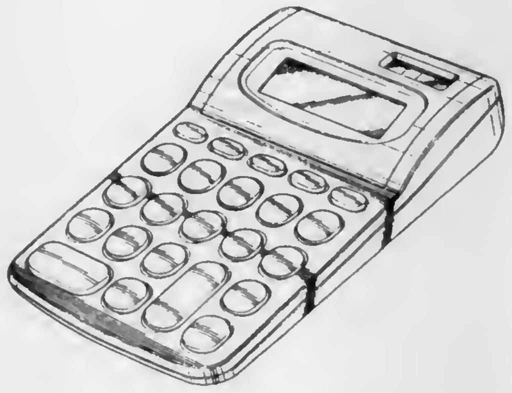
Szu Pui Leung, Hong Kong, Hong Kong, assignor to Stelex Electronics Company Limited, Kowloon, Hong Kong

Filed Jul. 9, 1997, Ser. No. 73,466

Term of patent 14 years

LOC (6) Cl. 18 - *01*

U.S. Cl. D18—7



394,080

EMBOSSING DEVICE

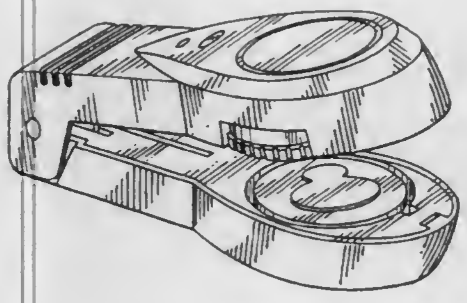
Yip Kwong Chan, Hong Kong, Hong Kong, assignor to Y & H Industrial Limited, New Territories, Hong Kong

Filed Jun. 9, 1997, Ser. No. 72,132

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D18—19



394,081

Patent Not Issued For This Number

394,082

IMAGE FORMING APPARATUS

Naoki Tashiro, and Toshimi Chiba, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

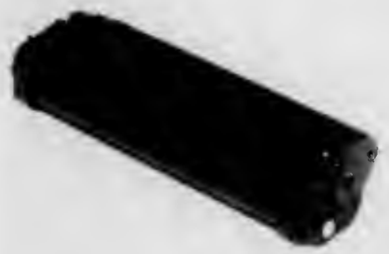
Filed Dec. 28, 1995, Ser. No. 48,407

Claims priority, application Japan, Jun. 28, 1995, 7-18661

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—43



394,083

TONER CARTRIDGE

Kazuo Jyoroku, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

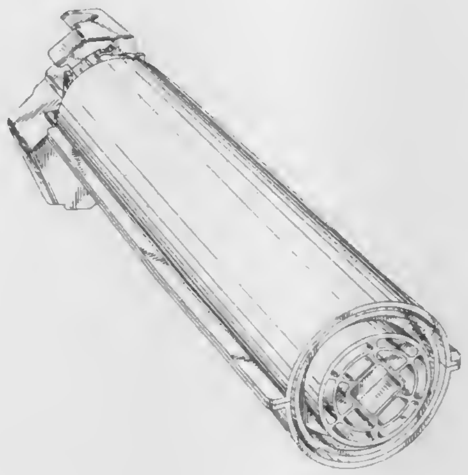
Filed May 3, 1996, Ser. No. 53,985

Claims priority, application Japan, Nov. 7, 1995, 7-33598

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—43



394,084

SORTER FOR COPYING MACHINE

Kazuteru Nagata, and Hiroo Seki, both of Yokohama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

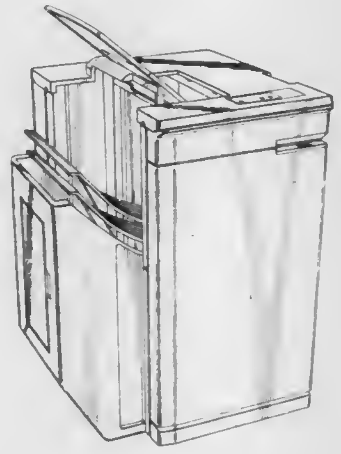
Filed Feb. 1, 1996, Ser. No. 49,860

Claims priority, application Japan, Aug. 9, 1995, 7-23167

Term of patent 14 years

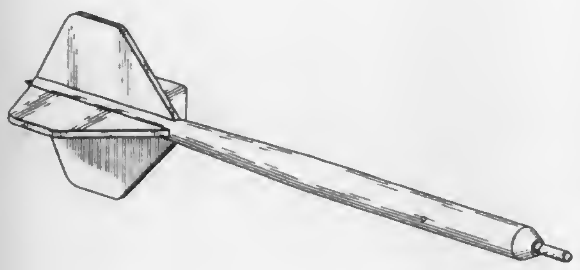
LOC (6) Cl. 18 - *99*

U.S. Cl. D18—47

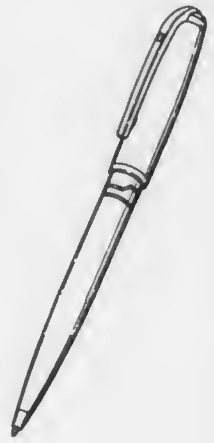


VOL
210
ISS
1
MY
5
1998
UMI

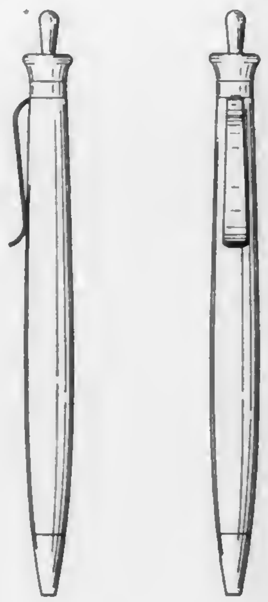
394,085
DART PEN
Curtis B. Leedy, 8567 Erin Brook Way, Sacramento, Calif. 95826
Filed Oct. 16, 1996, Ser. No. 61,082
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—42



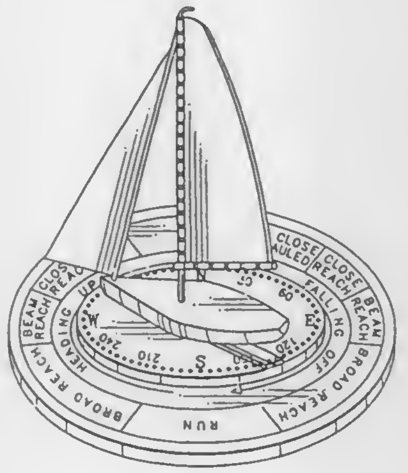
394,086
BALL-POINT PEN
Philippe Compte, Paris, France, assignor to S. T. Dupont S.A., France
Filed Jan. 30, 1997, Ser. No. 65,601
Claims priority, application France, Aug. 22, 1996, 96 4812
The portion of the term of this patent subsequent to Jan. 30, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—51



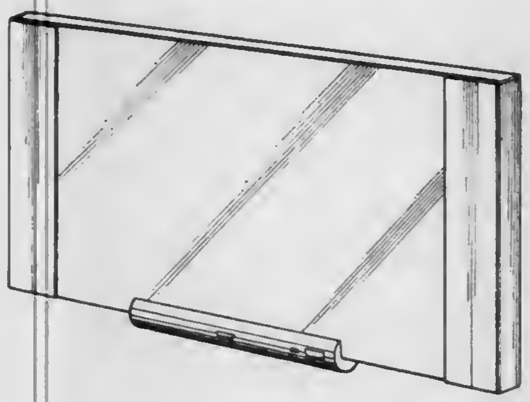
394,087
BALLPOINT PEN
Maria Boix Gacia, Ganduxer, 43, Barcelona, Spain
Filed Aug. 11, 1997, Ser. No. 74,774
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—51



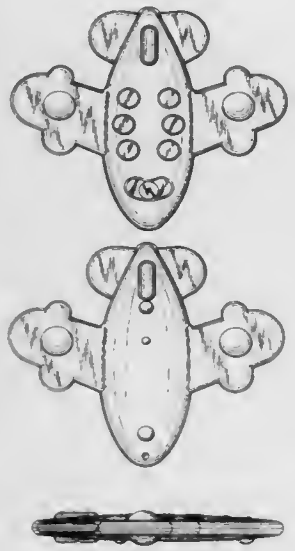
394,088
SAILING TRAINING AIDE
Robert T. Ellis, 728 Oak Leaf Ct., Apopka, Fla. 32712
Filed Feb. 24, 1997, Ser. No. 66,908
Term of patent 14 years
LOC (6) Cl. 19 - *07*
U.S. Cl. D19—62



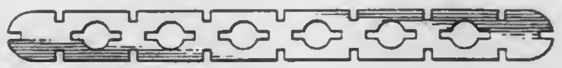
394,089
DISPLAY DEVICE
Kazuo Kawasaki, Nagoya; Akira Hashimoto, Machida; Katsuhiko Hayashi, Sagamihara; Akihiko Ishizuka, Narashino; Hidefumi Yamaguchi, Kawasaki, and Takashi Ifuji, Tokyo, all of Japan, assignors to Fujitsu General Limited, and Fujitsu Limited, both of Japan
Filed Aug. 16, 1996, Ser. No. 58,528
Claims priority, application Japan, Feb. 19, 1996, 8-4109
Term of patent 14 years
LOC (6) Cl. 20 - *03*
U.S. Cl. D20—10



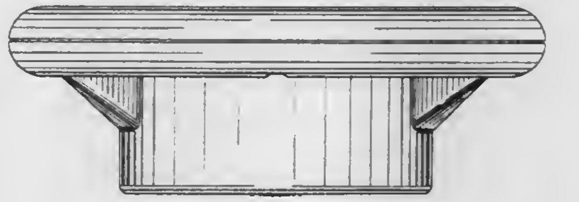
394,090
TOY PLANE
Yuji Kato, Tokyo, Japan, assignor to Tomy Company, Ltd., Japan
Filed Apr. 5, 1996, Ser. No. 52,732
Claims priority, application Japan, Oct. 5, 1995, 7-29891
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—87



394,091
TOY CONSTRUCTION PIECE
Stuart Parry, 1/30 Wangaratta Street, Richmond, Victoria 3121, Australia
Filed Jul. 1, 1997, Ser. No. 73,131
Claims priority, application Australia, Jan. 7, 1997, 20/97
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—108



394,092
TOY CAR REMOTE CONTROL DEVICE
Yuji Kato, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Apr. 10, 1996, Ser. No. 52,861
Claims priority, application Japan, Oct. 11, 1995, 7-30421
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D12—141.1

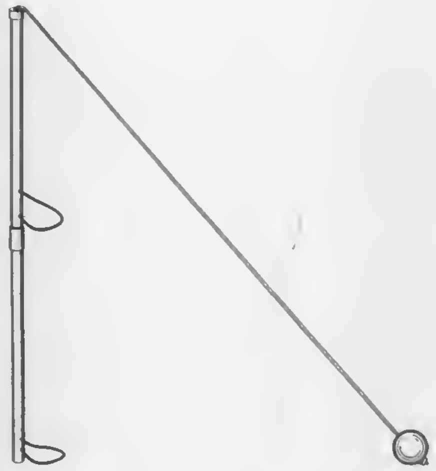


/OL
2 10
ISS
1
MY
5
998
JMI

394,093

RETRACTABLE TETHERED BALL BASEBALL PRACTICE DEVICE

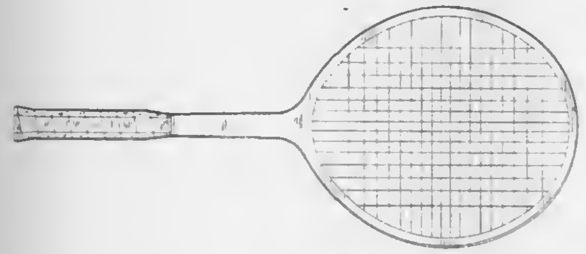
Jack A. Burns, 485 SE. 26th Ave., Hillsboro, Oreg. 97123
Filed Aug. 22, 1996, Ser. No. 58,752
Term of patent 14 years
LOC (6) Cl. 21 - *99*
U.S. Cl. D21—199



394,094

TENNIS RACQUET

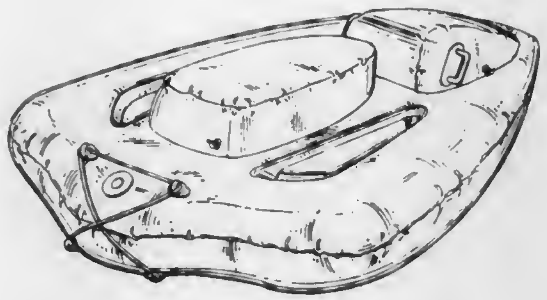
Stephen J. Davis, Washington Crossing, and André Terzaghi, Havertown, both of Pa., assignors to Prince Manufacturing, Inc., Bordentown, N.J.
Division of Ser. No. 988,579, Dec. 10, 1992, Pat. No. 5,417,418. This application May 6, 1993, Ser. No. 8,022
Term of patent 14 years
LOC (6) Cl. 21 - *99*
U.S. Cl. D21—212



394,095

FLOAT

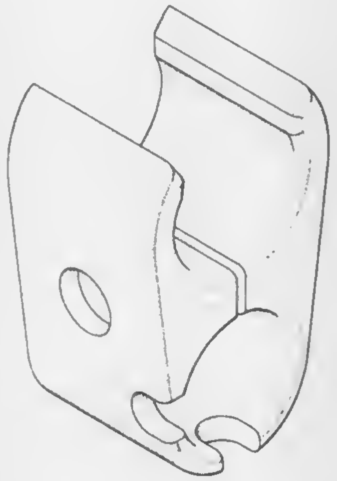
Frank C. Kuan, P.O. Box 24-108, Taipei, Taiwan
Filed Sep. 5, 1997, Ser. No. 76,121
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237



394,096

MOUNT FOR SECURING A SIGHTING LIGHT TO A FIREARM

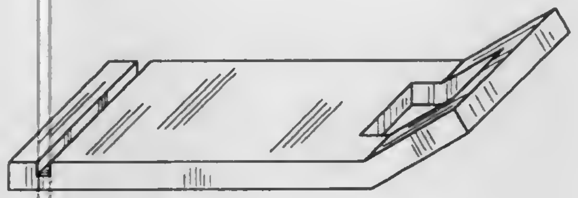
Mark S. Edgar, P.O. Box 261, Clarkston, Wash. 99403
Filed Oct. 4, 1996, Ser. No. 60,744
Term of patent 14 years
LOC (6) Cl. 22 - *01*
U.S. Cl. D22—110



394,097

TOILET SEAT LIFTER

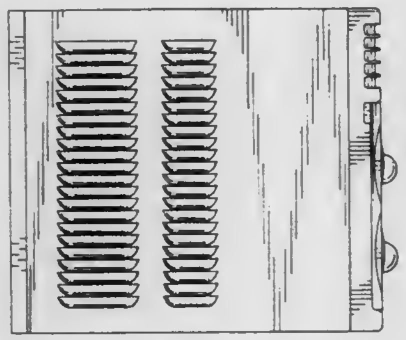
John D. Nivin, and Donna Nivin, both of R.R. 3, Box 425A, Arlington, Vt. 05250
Filed Apr. 1, 1996, Ser. No. 52,476
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—309



394,098

WINDOW ADHESIVE-TYPE AIR CONDITIONER

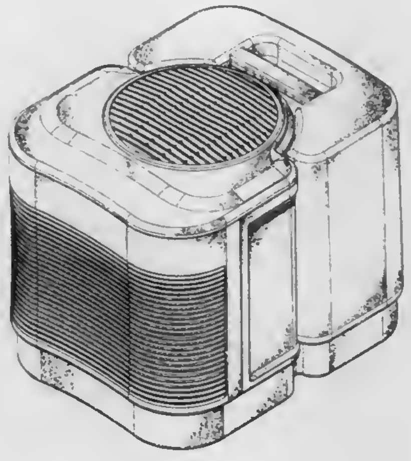
Yoon-Young Cho, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea
Filed Feb. 27, 1997, Ser. No. 67,415
Claims priority, application Rep. of Korea, Aug. 30, 1996, 1996-18423
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—353



394,099

HUMIDIFIER

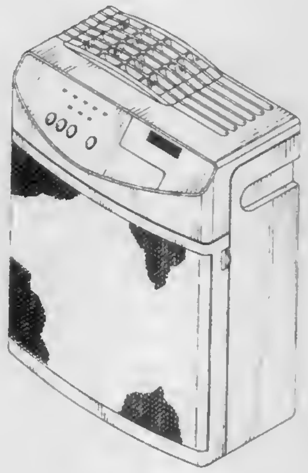
Masao Tsuji, Germantown, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.
Filed Jan. 8, 1997, Ser. No. 64,680
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—356



394,100

AIR CLEANER

Watcharin Promseeda, Bangkok THX, assignor to Wanavit Group, Bangkok THX
Filed Jul. 29, 1997, Ser. No. 74,229
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—364



VOL
2 10
SS
1
MY
5
998
MI

394,101
VENTILATING FAN

Kyo Hayashi, and Hitoshi Miura, both of Aichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., and Matsushita Seiko Co., Ltd., both of Japan

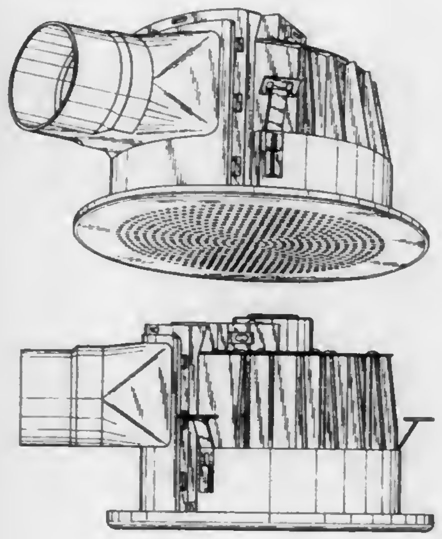
Filed Jul. 29, 1997, Ser. No. 74,238

Claims priority, application Japan, May 3, 1997, 9-6531

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—370



394,102
COMBINED CEILING FAN MOTOR HOUSING, SWITCH HOUSING, AND BLADE IRONS UNIT

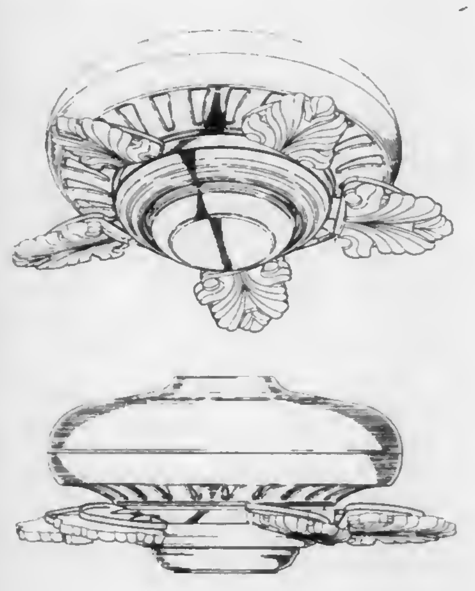
Jack W. Gee, II, Memphis, and Masao Tsuji, Germantown, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Filed Aug. 9, 1996, Ser. No. 58,258

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,103
COMBINED CEILING FAN MOTOR HOUSING AND LIGHT

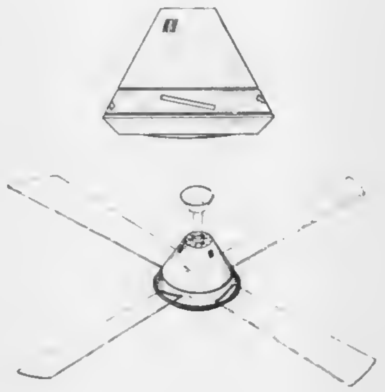
Ching-Tan Lee, No. 52, Lane 480, Sec. 2, Fengshi Rd., Fengyuan, Taichung Hsien, Taiwan

Filed Aug. 20, 1997, Ser. No. 75,173

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,104
COMBINED CEILING FAN MOTOR HOUSING, SWITCH HOUSING, AND BLADE IRONS UNIT

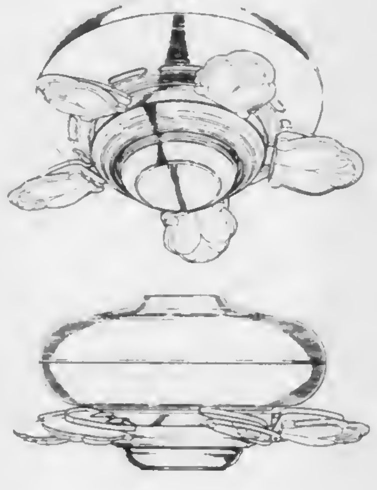
Jack W. Gee, II, Memphis, and Masao Tsuji, Germantown, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Filed Aug. 9, 1996, Ser. No. 58,277

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,105
CEILING FAN HOUSING

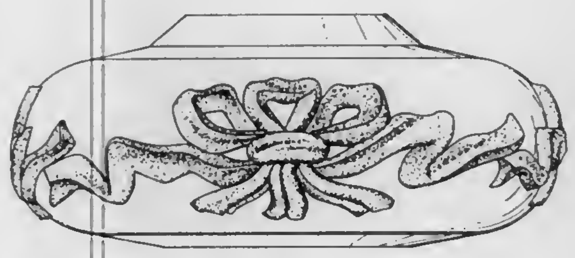
William S. Davis, Jr., Fort Worth, Tex., assignor to Quorum International, Fort Worth, Tex.

Filed Jan. 7, 1997, Ser. No. 64,607

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,106
MEDALLION FOR USE ON A CEILING FAN

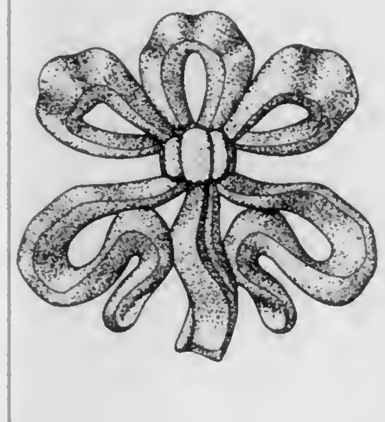
Jill Webb, Austin, Tex., assignor to Quorum International, Fort Worth, Tex.

Filed Jan. 7, 1997, Ser. No. 64,615

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,107
CENTER BAND FOR A CEILING FAN

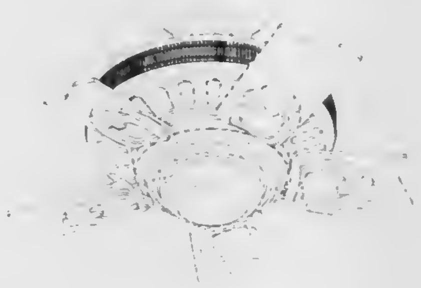
Masao Tsuji, Germantown, Tenn., and Jack W. Gee, II, Huntsville, Ala., assignors to Hunter Fan Company, Memphis, Tenn.

Division of Ser. No. 58,261, Aug. 9, 1997. This application Aug. 5, 1997, Ser. No. 74,543

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



394,108
LOTION APPLICATOR

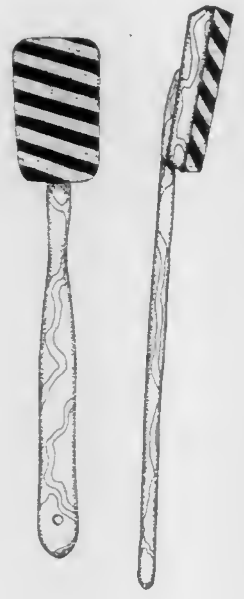
Patricia Lynn Ebert, 4763 Hwy. B, Oregon, Wis. 53575

Filed Jul. 29, 1994, Ser. No. 26,487

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—119



394,109

BI-LEAF SURGICAL INSTRUMENT HANDLE

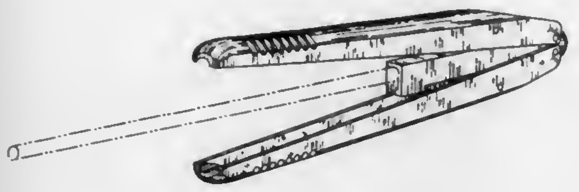
Scott H. Miller, Sunnyvale, and Alex T. Roth, Redwood City, both of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Filed Nov. 4, 1996, Ser. No. 62,408

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—133



394,110

ANKLE BRACE

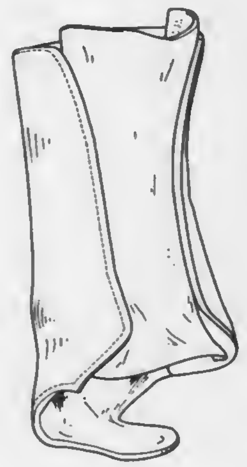
Jeffrey E. Duback, Davidson, and Mark G. Friday, Dallas, both of N.C., assignors to Parker Medical Associates Limited Partnership, Charlotte, N.C.

Filed May 14, 1997, Ser. No. 70,705

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—192



394,111

ANKLE BRACE

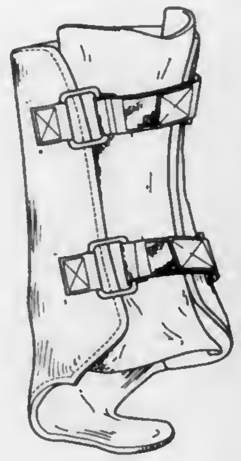
Jeffrey E. Duback, Davidson, and Mark G. Friday, Dallas, both of N.C., assignors to Parker Medical Associates Limited Partnership, Charlotte, N.C.

Filed May 14, 1997, Ser. No. 70,706

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—192



394,112

ANKLE BRACE

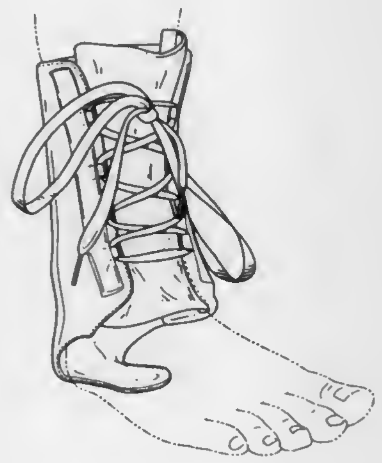
Jeffrey E. Duback, Davidson, and Mark G. Friday, Dallas, both of N.C., assignors to Parker Medical Associates, Charlotte, N.C.

Filed May 14, 1997, Ser. No. 70,708

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—192



394,113

BABY BOTTLE

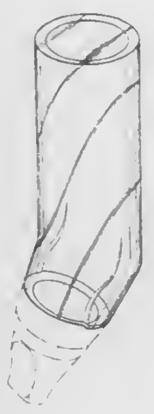
Stacy Walsh, and Davin Stowell, both of New York, N.Y., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Continuation of Ser. No. 16,101, Dec. 7, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 420,395

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D24—197



394,114

BIOENTRAINMENT MODULE

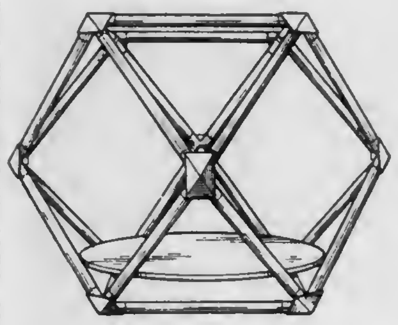
Michael H. Bradford, 6893 S. Section Line Rd., Delaware, Ohio 43015

Filed Jan. 2, 1996, Ser. No. 49,009

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—200



394,115

DOUBLE HUNG WINDOW

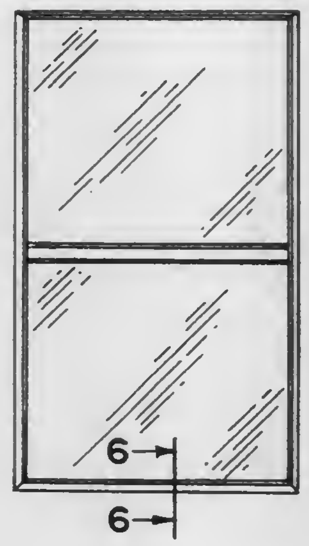
Todd W. Bruchu, Lake Elmo, Minn., and David D. Plummer, Hudson, Wis., assignors to Andersen Corporation, Bayport, Minn.

Filed Mar. 27, 1996, Ser. No. 52,289

Term of patent 14 years

LOC (6) Cl. 25 - *02*

U.S. Cl. D25—52



394,116

PICTURE WINDOW

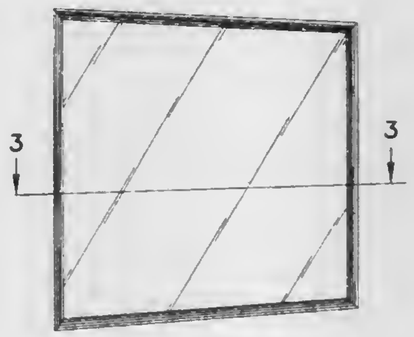
David D. Plummer, Hudson, Wis., assignor to Andersen Corporation, Bayport, Minn.

Filed Mar. 27, 1996, Ser. No. 52,292

Term of patent 14 years

LOC (6) Cl. 25 - *02*

U.S. Cl. D25—52



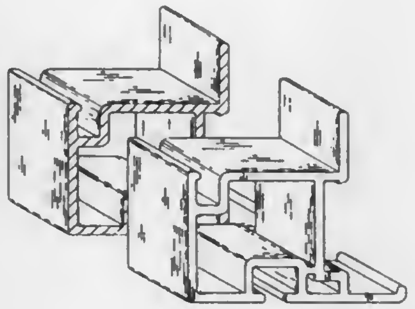
/OL
2 10
ISS
1
MY
5
998
JMI

394,117
WINDOW COMPONENT EXTRUSION

Lorane Goss, Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Mar. 20, 1997, Ser. No. 69,253
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124



394,118

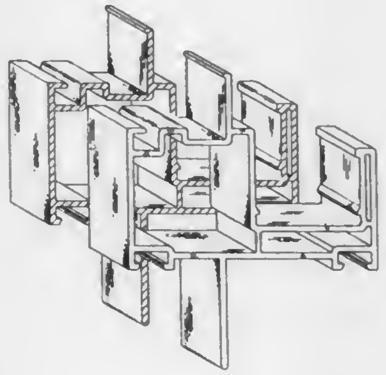
Patent Not Issued For This Number

394,119
WINDOW COMPONENT EXTRUSION

Robert B. Jarrell, Seattle, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Feb. 6, 1996, Ser. No. 50,026
The portion of the term of this patent subsequent to May 13, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124

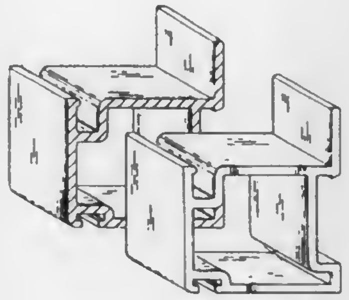


394,120
WINDOW COMPONENT EXTRUSION

Lorane Goss, Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Mar. 20, 1997, Ser. No. 69,260
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124

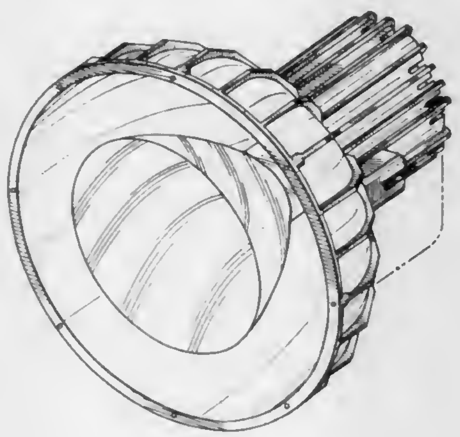


394,121
DOCK LIGHT

Barre Seid, Chicago, Ill., assignor to Tri-Lite, Inc., Chicago, Ill.

Filed May 7, 1997, Ser. No. 70,427
Term of patent 14 years
LOC (6) Cl. 26 - *06*

U.S. Cl. D26—28

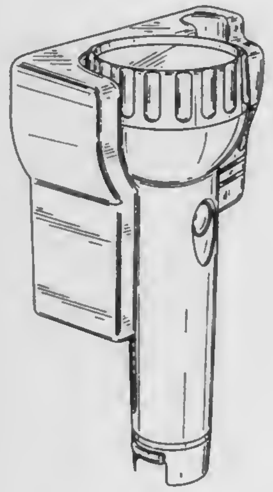


394,122
COMBINED RECHARGEABLE FLASHLIGHT AND BASE THEREFOR

Gabriel E. Concari, Eldersburg, and Gregory Scott Snider, Bel Air, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jul. 29, 1997, Ser. No. 74,154
Term of patent 14 years
LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38



394,123
TWINS SPOTLIGHT

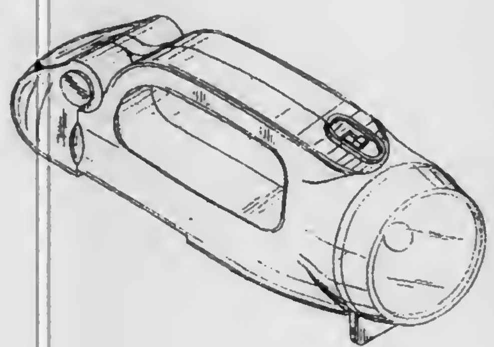
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Apr. 18, 1997, Ser. No. 69,950

Claims priority, application United Kingdom, Dec. 2, 1996, 2061413

Term of patent 14 years
LOC (6) Cl. 26 - *02*

U.S. Cl. D26—44

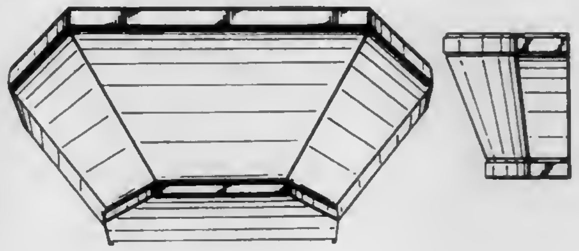


394,124
DECORATIVE HOUSING

Ross Austin Mackert, St. Louis Park, and Neil Thomas Amundson, Eden Prairie, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Aug. 23, 1996, Ser. No. 59,131
Term of patent 14 years
LOC (6) Cl. 26 - *05*

U.S. Cl. D26—85

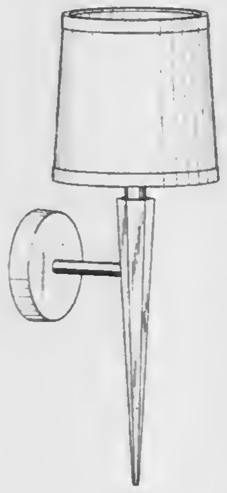


394,125
LAMP WITH TAPERED HEXAGONAL STEM

Barbara Barry, Los Angeles, Calif., assignor to Boyd Lighting Company, San Francisco, Calif.

Division of Ser. No. 54,574, May 15, 1996. This application Jul. 17, 1997, Ser. No. 73,781
Term of patent 14 years
LOC (6) Cl. 26 - *05*

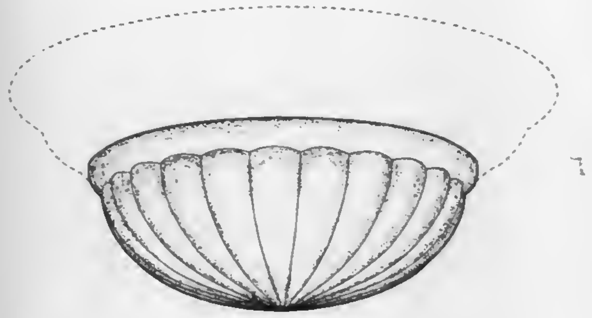
U.S. Cl. D26—87



OL
2 10
SS
1
MY
5
998
MI

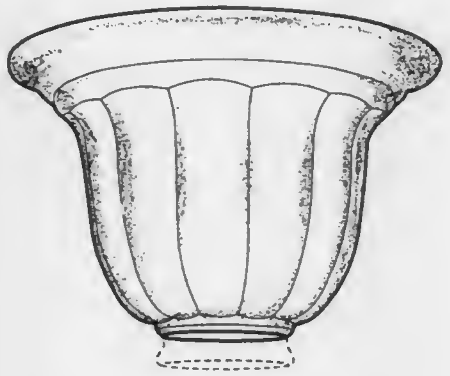
394,126
LAMP GLASS SHADE

Patrick S. Dolan, 1901 NW. Upshur, Portland, Oreg. 97209
Filed Jun. 24, 1997, Ser. No. 72,549
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—134



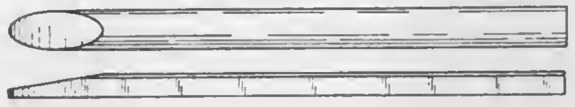
394,127
LAMP GLASS SHADE

Patrick S. Dolan, 1901 NW. Upshur, Portland, Oreg. 97209
Filed Jun. 24, 1997, Ser. No. 72,550
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—134



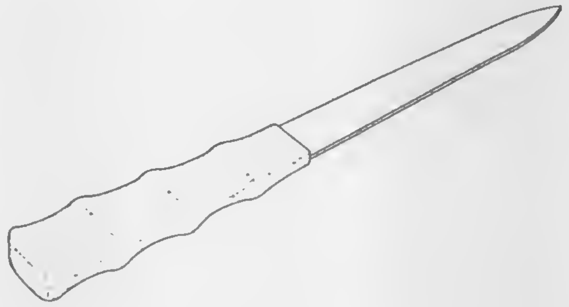
394,128
CUTICLE SHAPER/NAIL FILE

Charles W. Atkinson, 514 N. Elmwood, Traverse City, Mich. 49684
Filed Jun. 21, 1996, Ser. No. 56,074
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—57



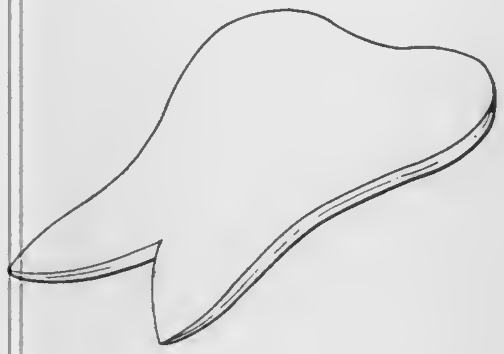
394,129
NAIL FILE

Garfield Litton, Glenrock, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Aug. 28, 1996, Ser. No. 59,714
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—59



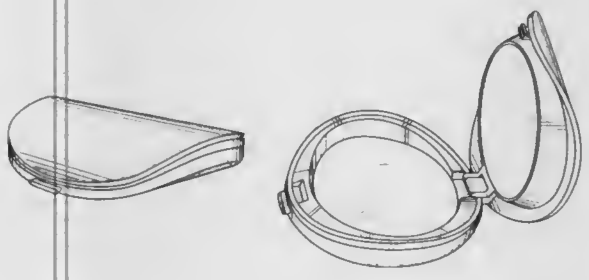
394,130
TOOTHPICK

Spencer Iverson, 2275 Gray Hwy., Apt. S-10, Macon, Ga. 31211
Filed Oct. 25, 1994, Ser. No. 30,254
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—64



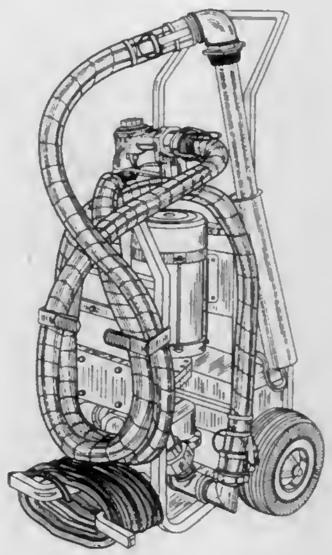
394,131
COMPACT CASE

Garfield Litton, Glenrock, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Apr. 29, 1996, Ser. No. 53,714
The portion of the term of this patent subsequent to Apr. 29, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—82



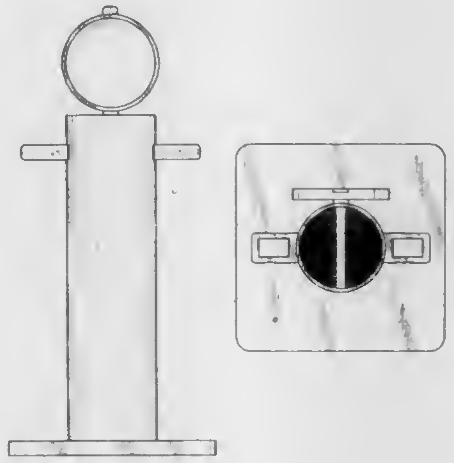
394,132
MOBILE SELF-CONTAINED PUMPING UNIT

Randy J. Dixon, Billings, Mont., assignor to Commercial Trade Corp., Billings, Mont.
Filed Apr. 25, 1996, Ser. No. 53,309
Term of patent 14 years
LOC (6) Cl. 15 - *05*
U.S. Cl. D32—21

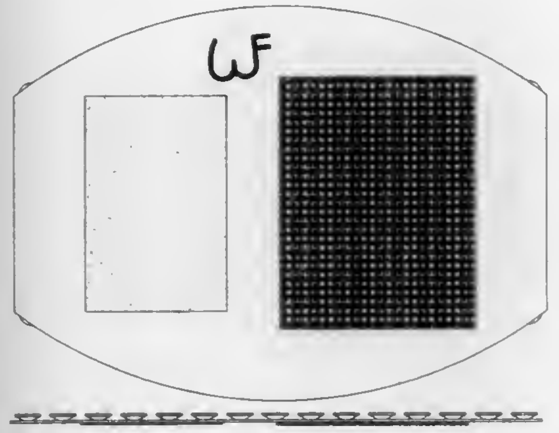


394,133
COMBINED TOOTHBRUSH CLEANER AND HOLDER

Mike L Mead, 831 Mazurka Dr., Chuluota, Fla. 32766
Filed Jul. 10, 1997, Ser. No. 73,442
Term of patent 14 years
LOC (6) Cl. 08 - *99*
U.S. Cl. D32—35



394,134
FOOT SCRUBBING DEVICE
Rosemary Ambrose, 3375 N. Fairfax St. #41, Kingman, Ariz. 86401-090
Filed Apr. 24, 1997, Ser. No. 69,792
Term of patent 14 years
LOC (6) Cl. 08 - 99
U.S. Cl. D32—47



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5th DAY OF MAY, 1998

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Menarini Industrie Farmaceutiche Riunite: *See—*
  - Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.
- A. Relin: *See—*
  - Gelfgat, David Mendeloevich; Skipidarov, Sergei Yakovlevich; Yakhats, Michael; and Kamensky, Vyacheslav Tikhonovich, 5,746,702, Cl. 601-15.000.
- A.W. Faber-Castell Unternehmensverwaltung GmbH & Co.: *See—*
  - Jankewitz, Axel; and Lugert, Gerhard, 5,746,778, Cl. 8-402.000.
- A/S Dampskibsselskabet Svendborg: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Aaronson, Stuart A.: *See—*
  - King, C. Richter; Kraus, Matthias H.; and Aaronson, Stuart A., 5,747,261, Cl. 435-7.100.
- AB Volvo: *See—*
  - Palmqvist, Peter, 5,746,086, Cl. 72-450.000.
- Abatzoglou, Theagenis J.; Lam, Lawrence K.; Malek, Homayoun; and Reagan, John T., to Lockheed Martin Corporation. Real-time superresolution signal processing. 5,748,507, Cl. 364-572.000.
- ABB Power T&D Company Inc.: *See—*
  - Brubaker, Michael A.; and Frimpong, George K., 5,747,992, Cl. 324-663.000.
- Abbate, Agostino; Frankel, Julius; and Doxbeck, Mark, to United States of America, Army. System for taking transverse measurements. 5,747,693, Cl. 73-622.000.
- Abbott Laboratories: *See—*
  - Elliott, Richard L.; Or, Yat Sun; Pireh, Daisy; and Chu, Daniel T., 5,747,466, Cl. 514-29.000.
  - Lindberg, John M.; and Heinz, Robert Eric, 5,748,308, Cl. 356-310.000.
  - Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
- Abboud, Robert G., to Commonwealth Research Corporation. High performance magnetic bearing systems using high temperature superconductors. 5,747,426, Cl. 505-166.000.
- ABC Rail Products Corporation: *See—*
  - Remington, James A.; Schultz, Kenneth L.; and Hein, Russell R., 5,746,400, Cl. 246-465.000.
- Abe, Akira: *See—*
  - Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.
- Abe, Hiroshi; and Matsuno, Osamu, to Nissan Motor Co., Ltd. Diagnostic system for pressure switch. 5,746,174, Cl. 123-306.000.
- Abe, Noriyuki: *See—*
  - Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
- Abe, Susumu: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Abe, Tomoaki: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
- Abe, Tomoyuki, to Fujitsu Limited. Method of manufacturing multilayer circuit substrate. 5,746,868, Cl. 156-247.000.
- Abe, Yoshinori: *See—*
  - Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.
- Abe, Yuko: *See—*
  - Shinagawa, Akio; Ohno, Hitoshi; and Abe, Yuko, 5,748,122, Cl. 341-67.000.
- Abele, John E.; and Sahatjian, Ronald A., to Boston Scientific Corporation. Balloon catheter. 5,746,745, Cl. 606-108.000.
- Aboaf, Joseph Adam; Denison, Edward Virgil; and Kahwaty, Vincent Noel, to International Business Machines Corporation. Method of making magnetoresistive sensor with improved microtrack profile for improved servo-positioning precision. 5,745,978, Cl. 29-603.080.
- Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., to Intel Corporation. Computer system that maintains processor ordering consistency by snooping an external bus for conflicts during out of order execution of memory access instructions. 5,748,937, Cl. 395-394.000.
- Aburano, Ichiharu: *See—*
  - Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, 5,749,093, Cl. 711-139.000.
- Acer Peripherals, Inc.: *See—*
  - Lin, San-Feng, 5,746,308, Cl. 200-344.000.
- Acheson Industries, Inc.: *See—*
  - Lewandowski, Mark A.; and Chasser, Anthony M., 5,747,551, Cl. 522-95.000.
- Acker, Elizabeth A.: *See—*
  - Ruch, Frank E.; and Acker, Elizabeth A., 5,747,031, Cl. 424-130.100.
- Action Equipment Co., Inc.: *See—*
  - LaVeine, Andrew T.; and Humiston, Stanley L., 5,746,322, Cl. 209-393.000.
- Adachi, Fumiyuki: *See—*
  - Sawahashi, Mamoru; and Adachi, Fumiyuki, 5,748,623, Cl. 370-342.000.
- Adachi, Masahiro: *See—*
  - Hata, Akihiro; Funai, Takashi; and Adachi, Masahiro, 5,747,828, Cl. 257-66.000.
- Adachi, Rensuke: *See—*
  - Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.
- Adachi, Shuhei; and Inami, Junichi, to Yamaha Hatsudoki Kabushiki Kaisha. Valve seat. 5,745,993, Cl. 29-888.440.
- Adachi, Takahiro; and Takata, Toshiaki, to Mitsubishi Gas Chemical Company, Inc. Polycarbonate resin with high flowability and process for producing the same. 5,747,632, Cl. 528-196.000.
- Adachi, Yoshiaki: *See—*
  - Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.
- Adams, Curtis E.: *See—*
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,747,562, Cl. 523-215.000.
- Adams, Phyllis: *See—*
  - Steinberg, Frederic; Adams, Phyllis; and Arnoth, Frank W., 5,746,748, Cl. 606-118.000.
- Adams, Robert: *See—*
  - Nordquist, Robert E.; Chen, Wei R.; Carubelli, Raoul; and Adams, Robert, 5,747,475, Cl. 514-55.000.
- Adamson, Brent R.: *See—*
  - Christiansen, Lars K.; Roberts, Mark H.; Griffiths, David J.; and Adamson, Brent R., 5,748,485, Cl. 364-479.040.
- Adaptec, Inc.: *See—*
  - Gates, Stillman F., 5,748,806, Cl. 395-306.000.
- Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, to International Business Machines Corporation. Coin roll opening device. 5,746,103, Cl. 83-440.000.
- Addy, Kenneth L., to Pittway Corporation. Alarm communications system with independent supervision signal analysis. 5,748,079, Cl. 340-539.000.
- Adey, Nils B.: *See—*
  - Kay, Brian K; Fowlkes, Dana M.; Adey, Nils B.; and Sparks, Andrew B., 5,747,334, Cl. 435-320.100.
- Adovasio, Mauro: *See—*
  - Broussard, Fabio; Adovasio, Mauro; and Roncalli, José, 5,747,601, Cl. 525-375.000.
- Adriance, Kyle: *See—*
  - Aylsworth, Alonzo C.; Adriance, Kyle; and Miller, Gregory R., 5,746,806, Cl. 95-8.000.
- Adtech Holding: *See—*
  - Sodervall, Billy Valter; and Lundeberg, Thomas, 5,747,178, Cl. 428-624.000.
- Advanced Cardiovascular Systems, Inc.: *See—*
  - Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,747,591, Cl. 525-176.000.
- Advanced Ceramics Corporation: *See—*
  - Honma, Junich; Mino, Kotaro; Miyata, Hisayuki; and Inoue, Haruhide, 5,748,436, Cl. 361-234.000.
- Advanced Chemill Systems: *See—*
  - Jones, Jeffrey D., 5,746,234, Cl. 134-64.00R.
- Advanced ChemTech, Inc.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

  - Saneii, Hossain; Boroomand, Mohammad R.; and Ferriell, Michael R., 5,746,982, Cl. 422-134.000.
- Advanced Cytometrix, Inc.: *See—*
  - Powles, Trevor J.; Imran, Mir A.; Syed, Baber; and Gandhi, Deepak R., 5,746,724, Cl. 604-240.000.
- Advanced Energy Industries, Inc.: *See—*
  - Porter, Robert M.; and Mueller, Michael L., 5,747,935, Cl. 315-111.510.
- Advanced Fiber Optechs, Inc.: *See—*
  - Sundburg, William J.; and Shi, Weiman, 5,747,793, Cl. 250-227.140.
- Advanced Micro Devices: *See—*
  - Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby I., Jr., 5,748,640, Cl. 371-21.300.
  - Levinson, Harry J., 5,748,323, Cl. 356-399.000.
- Advanced Micro Devices, Inc.: *See—*
  - Chang, Kuang-Yeh; Gardner, Mark I.; and Hause, Fred, 5,747,852, Cl. 257-336.000.
  - Goddard, Michael D.; and Goveas, Kelvin D., 5,748,516, Cl. 364-748.030.
  - Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, 5,748,983, Cl. 395-842.000.
  - Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.
  - Kadosh, Daniel; and Gardner, Mark I., 5,747,367, Cl. 438-152.000.
  - Lambrecht, Andy; Belt, Steve L.; and Dutton, Drew, 5,748,921, Cl. 395-308.000.
  - Lee, Sherman, 5,748,912, Cl. 395-282.000.
  - Mullee, William H., 5,746,993, Cl. 423-352.000.
  - Narayan, Rammohan; and Tran, Thang M., 5,748,978, Cl. 395-800.230.
  - Van Dyke, Korbin S.; Stiles, David R.; and Favor, John G., 5,748,932, Cl. 395-375.000.
  - Wang, Hsingya Arthur; Ramsbey, Mark T.; and Sun, Yu, 5,747,882, Cl. 257-768.000.
  - Wong, Jack T.; Fontana, Fabiano; and Nguyen, Susan, 5,748,525, Cl. 365-185.050.
- Advanced Mobile Telecommunication Technology Inc.: *See—*
  - Torii, Akito; and Kohara, Kimio, 5,746,269, Cl. 165-10.000.
- Advanced Pathology Systems, Inc.: *See—*
  - Bolles, Michael, 5,746,855, Cl. 156-64.000.
- Advanced RISC Machines Limited: *See—*
  - Glass, Simon James; and Jaggar, David Vivian, 5,748,515, Cl. 364-736.500.
  - Jaggar, David Vivian, 5,748,518, Cl. 364-764.000.
  - Jaggar, David Vivian, 5,749,094, Cl. 711-139.000.
- Advanced Therapeutic Products, Inc.: *See—*
  - Rose, Jed E.; Behm, Frederique; and Turner, James, 5,746,227, Cl. 131-270.000.
- Advancement of Military Medicine, Henry M. Jackson Foundation for the: *See—*
  - O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, 5,747,272, Cl. 435-7.370.
- Advantest Corporation: *See—*
  - Kitayoshi, Hitoshi, 5,748,314, Cl. 356-346.000.
  - Suga, Kazunari, 5,747,994, Cl. 324-158.100.
- Aeby, François: *See—*
  - Maillefer, Pierre-Luc; and Aeby, François, 5,746,597, Cl. 433-102.000.
- Aeroquip Corporation: *See—*
  - Sterett, Robert A.; and Sudhalkar, Atul M., 5,746,844, Cl. 148-522.000.
- Aerospace Corporation, The: *See—*
  - Jaduszliwer, Bernardo; Klimcak, Charles M.; and Loper, Gary L., 5,747,348, Cl. 436-106.000.
- Aether Wire & Location: *See—*
  - Fleming, Robert Alan; and Kushner, Cherie Elaine, 5,748,891, Cl. 375-200.000.
- Afek, Yachin: *See—*
  - Koifman, Vladimir; Afek; Yachin; and Kashat, Israel, 5,748,030, Cl. 327-513.000.
- Afek, Yehuda; Mansour, Yishay; and Ostfeld, Zvi, to Ramot University Authority Ltd. Flow control algorithm for high speed networks. 5,748,901, Cl. 395-200.680.
- Afilani, Thomas L. Device and method using dielectrokinesis to locate entities. 5,748,088, Cl. 340-573.000.
- Africano, Renato: *See—*
  - Pinoca, Leonardo; Africano, Renato; and Braca, Giancarlo, 5,747,160, Cl. 428-364.000.
- Agapiou, Agapios Kyriacos; Muhle, Michael Elroy; and Renola, Gary Thomas, to Exxon Chemical Patents Inc. Process for transitioning between incompatible polymerization catalysts. 5,747,612, Cl. 526-82.000.
- Agard, James: *See—*
  - McKenzie, Therman; and Agard, James, 5,747,021, Cl. 424-73.000.
- Agarwal, Rohit, to Intel Corporation. Encoding images using decode rate control. 5,748,903, Cl. 395-200.770.
- Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor. 5,747,206, Cl. 430-64.000.
- Agfa Division, Bayer Corporation: *See—*
  - Ziph-Schatzberg, Leah, 5,748,225, Cl. 347-262.000.
- AGFA-Gervaert N.V.: *See—*
  - Leenders, Luc; Defieuw, Geert; Horsten, Bart; and Strijckers, Hans, 5,747,412, Cl. 503-201.000.
- Agfa-Gevaert Aktiengesellschaft: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Agouridas, Constantin; Bretin, François; and Chantot, Jean-François, to Roussel Uclaf. Erythromycins. 5,747,467, Cl. 514-29.000.
- AgriBioTech, Inc.: *See—*
  - Stedman, David, 5,746,241, Cl. 137-101.210.
- Agricultural & Mechanical College: *See—*
  - Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., 5,747,659, Cl. 536-23.400.
- Agricultural Genetics Co., Ltd.: *See—*
  - Meadows, Martin Paul; Ellis, Deborah June; and Jarrett, Paul, 5,747,025, Cl. 424-93.461.
- Agritech Technologies, Ltd.: *See—*
  - Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., 5,747,659, Cl. 536-23.400.
- Agusa, Kiyoshi: *See—*
  - Taguchi, Toshio; Agusa, Kiyoshi; Yamamoto, Shin-ichiro; and Nakamura, Hiroki, 5,748,808, Cl. 382-312.000.
- Ahghar, Massoud: *See—*
  - Rendall, John S.; and Ahghar, Massoud, 5,746,932, Cl. 252-62.000.
- Ahlskog, Torbjörn: *See—*
  - Harju-Jeanty, Pontus; and Ahlskog, Torbjörn, 5,747,417, Cl. 504-116.000.
- Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, to General Electric Company. Self-steering railway truck. 5,746,135, Cl. 105-196.000.
- Ahn, Byung-seol: *See—*
  - Chae, Seung-ki; Ahn, Byung-seol; Hahm, Sang-kyu; and Kim, Jong-soo, 5,746,832, Cl. 118-665.000.
- Aiba, Kazukiyo: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Aigner, Karl R. Balloon catheter and device for perfusion with the balloon catheter. 5,746,717, Cl. 604-102.000.
- Aihara, Takaaki: *See—*
  - Sunagawa, Hiroshi; Uejima, Atsushi; Iwasaki, Osamu; and Aihara, Takaaki, 5,748,283, Cl. 355-35.000.
- Aikawa, Yukihiro: *See—*
  - Hirobe, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, 5,746,505, Cl. 362-260.000.
- Aikman, Robert E., Jr., to Dow Chemical Company, The. Processes for forming thin, durable coatings of perfluorocarbon ionomers on various substrate materials. 5,746,954, Cl. 264-87.000.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Masuda, Soichiro, 5,747,761, Cl. 200-61.45R.
  - Naito, Takeshi; and Nishio, Akitaka, 5,746,487, Cl. 303-158.000.
  - Niimi, Shigeki, 5,746,412, Cl. 251-129.150.
  - Sakuma, Masafumi; Ookawa, Akemi; and Myouga, Takahiro, 5,747,912, Cl. 310-261.000.
- AIWA Research and Development, Inc.: *See—*
  - Malhotra, Arun; Ang, Jane; Gray, G. Robert; and Watterston, James, 5,748,417, Cl. 360-126.000.
- Aizawa, Iwao: *See—*
  - Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.
- Aizawa, Yoshihisa: *See—*
  - Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, 5,746,320, Cl. 209-127.300.
- Ajioka, Masanobu: *See—*
  - Shinoda, Hosei; Ajioka, Masanobu; and Chida, Kimitaka, 5,747,637, Cl. 528-354.000.
- Ajmera, Atul: *See—*
  - Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.
- Akahane, Fujio: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
  - Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.
- Akaike, Takaaki: *See—*
  - Maeda, Hiroshi; Akaike, Takaaki; Miyamoto, Yoichi; and Yoshida, Masaki, 5,747,495, Cl. 514-258.000.
- Akao, Yasushi: *See—*
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
- Akashi, Takamitsu: *See—*
  - Tajima, Yoshitaka; and Akashi, Takamitsu, 5,746,674, Cl. 474-253.000.
- Akashige, Etsushi: *See—*

  - Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, 5,747,576, Cl. 524-451.000.
- Akebi, Yasunobu: *See—*
  - Shimada, Takayuki; Akebi, Yasunobu; and Takafuji, Yutaka, 5,748,175, Cl. 345-127.000.
- Akebono Brake Industry Co., Ltd.: *See—*
  - Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.
- Aked, Peter Armstrong: *See—*
  - Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.
- Akira, Toshiro, to Noritsu Koki Co., Ltd. Photographic printing apparatus and method for accurately printing frame numbers on print paper. 5,748,285, Cl. 355-39.000.
- Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, to Komatsu Electronic Metals Co., Ltd. Method of making semiconductor wafers and semiconductor wafers made thereby. 5,747,364, Cl. 438-14.000.
- Akkary, Haitham: *See—*
  - Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.
- Alamgir, Mohammed; Kejha, Joseph B.; and Shiao, Hung Chieh. Current collectors for high energy density cells. 5,747,195, Cl. 429-235.000.
- Alaze, Norbert: *See—*
  - Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, 5,746,111, Cl. 92-168.000.
- Alba, Tony J.: *See—*
  - Tsui, Gary; Tran, James B.; and Alba, Tony J., 5,746,552, Cl. 408-72.00B.
- Albaugh, David A.: *See—*
  - Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Albaugh, David A., 5,747,304, Cl. 435-121.000.
- Albert Einstein College of Medicine of Yeshiva University: *See—*
  - Angeletti, Ruth Hogue; and Russell, John, 5,747,454, Cl. 514-12.000.
- Alberta Research Council: *See—*
  - Heerze, Louis D.; Armstrong, Glen D.; and Smith, Richard, 5,747,040, Cl. 424-190.100.
- Albright, Jay Donald; and Reich, Marvin Fred, to American Cyanamid Company. Tricyclic benzazepine vasopressin antagonists. 5,747,487, Cl. 514-215.000.
- Albus, Udo: *See—*
  - Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.
- Alcan International Limited: *See—*
  - Parent, Luc; Peloquin, Guy; Tremblay, Gilles; and Vaillancourt, Andre, 5,747,672, Cl. 73-61.790.
- Alcatel Alsthom Compagnie Generale D'Electricite: *See—*
  - Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, 5,747,366, Cl. 438-44.000.
- Alcatel N.V.: *See—*
  - Heidemann, Rolf; Veith, Gustav; and Otterbach, Jurgen, 5,748,348, Cl. 359-125.000.
  - Lautenschlager, Wolfgang, 5,748,710, Cl. 379-88.000.
- Alcatel NV: *See—*
  - Garcia Vacas, Maria Teresa, 5,748,622, Cl. 370-337.000.
- Alcon Laboratories, Inc.: *See—*
  - Jung, Christopher C.; and Nazarifar, Nader, 5,747,824, Cl. 250-577.000.
- Aldcroft, Gary T.: *See—*
  - Hoyt, David; and Aldcroft, Gary T., 5,746,265, Cl. 150-160.000.
- Alderfer, David W.: *See—*
  - Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., 5,748,090, Cl. 340-578.000.
- Aldrich, Rodney D., to Lowry Computer Products, Inc. Method and system for collecting and processing bar code data. 5,748,899, Cl. 395-200.520.
- Aldrich, Thomas H.: *See—*
  - Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.
- Alexeff, Kevin A.: *See—*
  - Cadou, Peter B.; Homer, John C., III; and Alexeff, Kevin A., 5,747,747, Cl. 177-145.000.
- Alexis, Ranjeet: *See—*
  - Rozman, Rodney R.; Durante, Richard J.; Fandrich, Mickey L.; and Alexis, Ranjeet, 5,748,939, Cl. 395-430.000.
- Alfa Leisure, Inc.: *See—*
  - Crean, Johnnie Robert, 5,746,473, Cl. 296-181.000.
- Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, to Hoffman-La Roche Inc. Amino acid derivatives. 5,747,522, Cl. 514-423.000.
- Alizon, Marc; Sonigo, Pierre; Wain-Hobson, Simon; and Montagnier, Luc, to Institut Pasteur. Diagnostic kits and methods for detecting antibodies to LAV viruses. 5,747,242, Cl. 435-5.000.
- Allan, Brenda J.; and Potter, Andrew A., to University of Saskatchewan. Bacterial vaccines using vaccine strains of pathogenic bacteria. 5,747,309, Cl. 435-172.300.
- Allard, Randall N.: *See—*
  - Runciman, Robert John; and Allard, Randall N., 5,746,742, Cl. 606-69.000.
- Allcock, Harry R.; Visscher, Karyn; and Kim, Young Baek, to Penn State Research Foundation, The. Polyphosphazenes with unsaturated side groups useful as reaction intermediates, cross-linkable polymers, and as components of interpenetrating polymer networks. 5,747,604, Cl. 525-417.000.
- Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., to Ransburg Corporation. Voltage block. 5,746,831, Cl. 118-621.000.
- Allen, James D.: *See—*
  - Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, 5,748,786, Cl. 382-240.000.
- Allen, John David; Chow, Ching-Hua; and Shah, Jasvantrai C., to MCI Corporation. System and method for restoring a telecommunications network using conservative bandwidth reservation and selective message rebroadcast. 5,748,611, Cl. 370-224.000.
- Allen, Loretta E.: *See—*
  - McIntyre, Dale F.; and Allen, Loretta E., 5,749,006, Cl. 396-310.000.
- Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, to International Business Machines Corporation. Composition for photoimaging. 5,747,223, Cl. 430-325.000.
- Allergan: *See—*
  - Huth, Stanley W., 5,746,838, Cl. 134-27.000.
  - Park, John Y.; Thomas, Larry K.; Peng, Lin; and Cafaro, Daniel P., 5,746,972, Cl. 422-30.000.
  - Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.
- Alliance Semiconductor Corporation: *See—*
  - Reddy, Chitranjan N.; and Medhekar, Ajit K., 5,747,868, Cl. 257-529.000.
- Allied Colloids Limited: *See—*
  - Stockwell, John Oliver; Bingham, Timothy Guy; and Dungworth, Howard Roger, 5,746,885, Cl. 162-5.000.
- AlliedSignal Inc.: *See—*
  - Christiani, Brian R.; and Maxfield, MacRae, 5,747,560, Cl. 523-209.000.
  - Fanelli, Anthony; Behi, Mohammad; Ballard, Clifford Palmer, Jr.; and Burlew, Joan V., 5,746,957, Cl. 264-109.000.
  - Golecki, Ilan; and Narasimham, Dave, 5,747,096, Cl. 427-8.000.
  - Steiner, Ivan B.; Zimmerman, Scott M.; and Beeson, Karl W., 5,748,828, Cl. 385-146.000.
- Alligood, John H.; Lamphron, Mark A.; and Cipolla, David, to Eastman Kodak Company. Quietly operating anti-backup pawl for manual film advance thumbwheelin camera. 5,748,988, Cl. 396-6.000.
- Allison, Daniel B.; and Bowlby, James O., Jr., to Perkin-Elmer Corporation, The. Deconvolution method for the analysis of data resulting from analytical separation processes. 5,748,491, Cl. 364-497.000.
- Allison, Michael T.: *See—*
  - Talbot, Nicholas C.; Allison, Michael T.; and Griffioen, Peter, 5,748,145, Cl. 342-357.000.
- Almansa, Carmen: *See—*
  - Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.
- Almers, Wolfhard: *See—*
  - Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, 5,747,267, Cl. 435-7.210.
- Alper, Hal, to Mansfield & Alper, Inc. Composition for coagulating oil. 5,746,925, Cl. 210-728.000.
- Alps Electric Co., Ltd.: *See—*
  - Sawada, Toru, 5,748,404, Cl. 360-99.010.
- Alsch, Ing. Gottfried, to Naimer, Hubert Laurenz. Screw terminal for an electrical connection of cables or wires. 5,747,741, Cl. 174-84.00C.
- Alt, Yehuda, to Thermopol, Inc. Electrothermal recorder. 5,748,219, Cl. 347-171.000.
- Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, to A. Menarini Industrie Farmaceutiche Riunite; and Istituto Lusofarmaco D'Italia. Penem derivatives, their preparation and pharmaceutical compositions containing them. 5,747,483, Cl. 514-195.000.
- Altmeier, Patrick. Strongly alkaline anion exchange membranes and process for producing the same. 5,746,917, Cl. 210-500.370.
- Alumax Inc.: *See—*
  - L'Espérance, André; Bouchard, Martin; Paillard, Bruno; and Guigou, Catherine, 5,748,750, Cl. 381-71.500.
- Aluminum Company of America: *See—*
  - Chakrabarti, Dhruba J.; Hoffman, Richard A.; and Jensen, Craig L., 5,747,135, Cl. 428-64.100.
  - Novak, Miloslav; Trageser, Andrew B.; Summe, Isabel M.; and Kane, Susan L., 5,746,476, Cl. 297-216.130.
  - Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.
- ALZA Corporation: *See—*
  - Holladay, Leslie A.; and Oldenburg, Kevin R., 5,747,453, Cl. 514-12.000.
- Amagai, Takayuki; and Muramatsu, Tsuyoshi, to Sharp Kabushiki Kaisha. Data driven type information processor suitable for image processing that utilizes a configuration condition. 5,748,933, Cl. 395-377.000.
- Amano, Itaru: *See—*

VOL
2 10
ISS
1
MY
5
998
MI

  - Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.
- Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, to Ricoh Company, Ltd. Reversible thermosensitive recording material and method of forming and erasing images. 5,747,413, Cl. 503-201.000.
- Amazutsumi, Toru: *See—*
  - Narukawa, Satoshi; Amazutsumi, Toru; Fukuda, Hideki; and Tamaki, Hiyoshi, 5,746,780, Cl. 29-623.100.
- Ambrogio, Morettin, to Avir Finanziaria S.p.A. Glass making apparatus having automatic blank-mold sooting device. 5,746,800, Cl. 65-169.000.
- Ambrose, Frederic C.; and Hawley, David. Sliding pointing device tray. 5,746,402, Cl. 248-118.000.
- Ambrose, Frederic C.; and Hawley, David. Sliding pointing device tray. 5,746,403, Cl. 248-118.000.
- Ambs, Richard W.; Reiner, Mary C.; Stugard, Howard E.; and Pfeiffer, John W., to Young Industries, Inc., The. Air filtration apparatus and filter cartridge retaining means therefor. 5,746,796, Cl. 55-493.000.
- Amdahl Corporation: *See—*
  - Taylor, Michael Demar, 5,748,976, Cl. 395-800.000.
- Amerasekera, Ajith: *See—*
  - Chen, Julian Zhiliang; Amerasekera, Ajith; and Vrotsos, Thomas A., 5,747,834, Cl. 257-111.000.
- American Cyanamid Company: *See—*
  - Albright, Jay Donald; and Reich, Marvin Fred, 5,747,487, Cl. 514-215.000.
  - Scheiblich, Stefan; Maier, Thomas; Baltruschat, Helmut Siegfried; and Pont, Joseph Luke, 5,747,423, Cl. 504-251.000.
  - Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Albaugh, David A., 5,747,304, Cl. 435-121.000.
- American Dental Technologies: *See—*
  - Yessik, Michael J.; and Thompson, Richard G., 5,748,655, Cl. 372-22.000.
- American Dental Technologies, Inc.: *See—*
  - Gallant, Ben J.; Gleeman, Alan N.; and Parker, William S., 5,746,596, Cl. 433-88.000.
- American Excelsior Company: *See—*
  - Spence, Orville, 5,746,372, Cl. 229-403.000.
- American Home Products Corporation: *See—*
  - Gast, Michael J., 5,747,480, Cl. 514-179.000.
- Amersfoort, Martin Ronald; and Soole, Julian Bernard Donald, to Bell Communications Research, Inc. Optical switch. 5,748,811, Cl. 385-15.000.
- Amft, Dietrich; Branston, David-Walter; Kieser, Jörg; and Maier, Reinhard, to Siemens Aktiengesellschaft. Switching component for detecting contact erosion. 5,747,984, Cl. 324-71.200.
- Amgen Boulder Inc.: *See—*
  - Seely, James Ervin, 5,747,639, Cl. 528-421.000.
- Amirsakis, Charles J., to Morton International, Inc. Polyurethane binder for a magnetic recording medium. 5,747,630, Cl. 528-71.000.
- Amlee, Dale Alan; Matouka, Michael Frank; Rausch, Richard Allen; and Otipoby, Keith, to General Motors Corporation. Rotor for hybrid generator having improved magnet retention. 5,747,913, Cl. 310-263.000.
- Amos, Dennis Ray; Bachman, Sallie Ann; and Chen, Jianqiang, to Westinghouse Electric Corporation. Stress corrosion resistant rims and discs for steam turbine rotors device and method. 5,746,579, Cl. 416-204.00A.
- Ampex Corporation: *See—*
  - Lindholm, Dennis Allen, 5,748,192, Cl. 345-425.000.
- Amplas, Inc.: *See—*
  - Smith, Michael J.; and Blaser, Giles R., 5,746,569, Cl. 414-790.400.
- Amrad Corporation Limited: *See—*
  - Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, 5,747,032, Cl. 424-133.100.
- AMSC Subsidiary Corporation: *See—*
  - Tisdale, William R.; and Sigler, Charles E., 5,748,742, Cl. 380-49.000.
- Amselem, Shimon; and Friedman, Doron, to Pharmos Corporation. Suspension of loteprednol etabonate for ear, eye, or nose treatment. 5,747,061, Cl. 424-427.000.
- Amsted Industries Incorporated: *See—*
  - Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,136, Cl. 105-199.300.
  - Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,137, Cl. 105-219.000.
- AMTX, Inc.: *See—*
  - Fischbeck, Karl W.; and Marks, Gary T., 5,746,127, Cl. 101-123.000.
- Amway Corporation: *See—*
  - Dornoff, Jeffrey M.; O'Toole, Deborah A.; and Davies, Michael B., 5,747,006, Cl. 424-62.000.
- An, Yo-Han: *See—*
  - Lee, Joung-Sun; Kim, Dae-Yul; An, Yo-Han; and Jun, Jae-Kang, 5,746,652, Cl. 454-187.000.
- Anadigics, Inc.: *See—*
  - Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., 5,748,049, Cl. 331-49.000.
- Analog Devices, Inc.: *See—*
  - Kelly, Thomas W.; and Memishian, John, 5,748,004, Cl. 324-661.000.
- Anand, Tejwansh S.: *See—*
  - Hu, Yih-Shiuan; and Anand, Tejwansh S., 5,748,188, Cl. 345-326.000.
- Andelman, Marc D. Fluid separation system with flow-through capacitor. 5,748,437, Cl. 361-302.000.
- Andersen, Henrik Sune: *See—*
  - Jorgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.
- Andersen, Knud Erik: *See—*
  - Jorgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.
- Anderson, Anthony J.: *See—*
  - Schoen, Robert M.; and Anderson, Anthony J., 5,746,468, Cl. 296-76.000.
- Anderson, Charles C.; and DeLaura, Mario D., to Eastman Kodak Company. Motion imaging film comprising a carbon black-containing backing and a process surviving conductive subbing layer. 5,747,232, Cl. 430-514.000.
- Anderson, Hans: *See—*
  - Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.
- Anderson, Harold: *See—*
  - Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, 5,748,221, Cl. 347-232.000.
- Anderson, John McCune: *See—*
  - McLaughlin, James Andrew; Anderson, John McCune; and McAdams, Eric Thomas, 5,746,207, Cl. 128-639.000.
- Anderson, Mary E.: *See—*
  - Meister, Alton; Huang, Chin-Shiou; and Anderson, Mary E., 5,747,329, Cl. 435-252.330.
- Anderson, Michael B., to Symbios Logic Inc. Linearization method and apparatus for voltage controlled oscillator. 5,748,050, Cl. 331-57.000.
- Anderson, Tracy Lynn: *See—*
  - McKinzie, William Edward, III; and Anderson, Tracy Lynn, 5,748,153, Cl. 343-767.000.
- Andersson, Karl-Hugo; Stenkvist, Sven-Einar; and Wikström, Göran, to Asea Brown Boveri AG. Method and furnace for treatment of ash. 5,748,666, Cl. 373-9.000.
- Andl, Günter; and Kembach, Rolf, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for washing the outer cylindrical surface of a cylinder of a rotary printing press. 5,746,130, Cl. 101-424.000.
- Ando Electric Co., Ltd.: *See—*
  - Fujiyoshi, Kenichi, 5,748,310, Cl. 356-334.000.
  - Unno, Yasushi, 5,748,302, Cl. 356-224.000.
- Ando, Yoshio: *See—*
  - Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, 5,746,581, Cl. 417-2.000.
- Andreas, Bernard H.: *See—*
  - Wood, Timothy J.; and Andreas, Bernard H., 5,746,755, Cl. 606-148.000.
- Andreas Stihl: *See—*
  - Stark, Thomas; Zimmermann, Helmut; and Uhl, Klaus-Martin, 5,746,160, Cl. 123-41.700.
- Andrews, Gary W.: *See—*
  - Turner, Terry R.; Belcher, James F.; and Andrews, Gary W., 5,746,835, Cl. 118-723.0MW.
- Andrews, Howard W.: *See—*
  - Simonetti, Sergio G.; and Andrews, Howard W., 5,746,374, Cl. 239-240.000.
- Ang, Jane: *See—*
  - Malhotra, Arun; Ang, Jane; Gray, G. Robert; and Watterston, James, 5,748,417, Cl. 360-126.000.
- Angelette, A. M. Railroad crossing signal foundation and spider and method of producing the same. 5,746,036, Cl. 52-295.000.
- Angeletti, Ruth Hogue; and Russell, John, to Albert Einstein College of Medicine of Yeshiva University. Chromogranin peptides. 5,747,454, Cl. 514-12.000.
- Angelo, Michael F.; and Wolford, Jeff W., to Compaq Computer Corporation. Method and apparatus for providing secure and private keyboard communications in computer systems. 5,748,888, Cl. 395-186.000.
- Angelo, Michael F.; Miller, Craig A.; and Wooten, David R., to Compaq Computer Corporation. Secure updating of non-volatile memory. 5,748,940, Cl. 395-490.000.
- Angermaier, Anton, to Siemens Aktiengesellschaft. Method for detecting crankshaft oscillations. 5,747,678, Cl. 73-116.000.
- Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, to Thetford Corporation. Flush service door for RV. 5,746,466, Cl. 296-37.100.
- Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, to Ricoh Company, Ltd.; and Hodogaya Chemical Co., Ltd. Electrophotographic photoconductor and aromatic polycarbonate resin for use in the same. 5,747,204, Cl. 430-59.000.
- Aoki, Hiroyuki: *See—*
  - Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.
- Aoki, Jun: *See—*
  - Masuda, Katsuhiko; Aoki, Jun; and Hashizume, Isamu, 5,748,474, Cl. 364-426.036.

- Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, to Kabushiki Kaisha Toshiba. Dynamic semiconductor memory device with higher density bit line/word line layout. 5,747,844, Cl. 257-296.000.
- Aoki, Takeshi: *See—*
  - Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, 5,749,093, Cl. 711-139.000.
- Aoki, Tomoaki: *See—*
  - Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
- Aoyagi, Shoji: *See—*
  - Hashiba, Hidetoshi; Aoyagi, Shoji; Fujii, Hitoshi; and Kojo, Kiyoshi, 5,747,156, Cl. 428-328.000.
- Aparicio, Jean-Pierre; and Douchin, Christian, to Thomson-CSF. Device to join up cable sheathings. 5,746,625, Cl. 439-610.000.
- Apfel, Leonie. Seat belt holder. 5,746,448, Cl. 280-801.100.
- Aplus Integrated Circuits, Inc.: *See—*
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,538, Cl. 365-185.060.
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,545, Cl. 365-201.000.
- Apple Computer, Inc.: *See—*
  - Daly, Una T.; Huang, Ying-Kuei Ann; Parker, Robert D.; and Firenze, Mary E., 5,748,896, Cl. 395-200.530.
  - Gourdol, Arnaud P. J., 5,749,070, Cl. 704-242.000.
  - Krein, William Todd; Flaig, Charles M.; and Kelly, James D., 5,748,917, Cl. 395-306.000.
  - Stein, Michael Victor; and Wenker, Paul Richard, 5,748,927, Cl. 395-333.000.
- Applied Food Biotechnology, Inc.: *See—*
  - Garnett, Kevin M.; Gierhart, Dennis L.; and Guerra-Santos, Luis H., 5,747,544, Cl. 514-729.000.
- Applied Magnetics Corporation: *See—*
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Applied Materials, Inc.: *See—*
  - Harrison, Bernard; and Plumb, Frederick G., 5,747,936, Cl. 315-111.810.
  - Herchen, Harald, 5,747,917, Cl. 313-231.310.
  - Marohl, Dan A.; and Ngan, Kenny King-Tai, 5,746,460, Cl. 294-1.100.
  - Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.
  - Nulman, Jaim, 5,747,360, Cl. 437-189.000.
  - Parkhe, Vijay, 5,748,435, Cl. 361-234.000.
  - Rossman, Kent; Lue, Brian; and Redeker, Fred C., 5,748,434, Cl. 361-234.000.
- Applied Microsystems, Inc.: *See—*
  - Rees, Andrew John; O'Brien, Stephen Caine; and Krystad, Peter D., 5,748,878, Cl. 395-183.140.
- APW/Wyott Foodservice Equipment Company: *See—*
  - Smith, Mark J., 5,746,116, Cl. 99-386.000.
- Aragaki, Taul: *See—*
  - Bickley, Robert Henry; Aragaki, Taul; Moy, Leland Lem; and Waddoups, Ray Owen, 5,748,147, Cl. 342-457.000.
- Arai, Atsushi: *See—*
  - Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
- Arai, Mikirou: *See—*
  - Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, 5,747,429, Cl. 508-208.000.
- Arai, Takeshi: *See—*
  - Hagi, Masayuki; Tamaoki, Junichi; Arai, Takeshi; and Fukuda, Hiroyuki, 5,747,211, Cl. 430-110.000.
- Arai, Tsugio: *See—*
  - Nishigami, Akira; and Arai, Tsugio, 5,746,350, Cl. 222-95.000.
- Arajs, Guntis; and Patel, Dennis, to Collins & Aikman Plastics, Inc. Eyeball outlet assembly. 5,746,651, Cl. 454-154.000.
- Arakawa, Kaneyasu: *See—*
  - Kimura, Takashi; and Arakawa, Kaneyasu, 5,747,989, Cl. 324-235.000.
- Arbuckle, Donald P. Dual seal barrier fluid leakage control method. 5,746,435, Cl. 277-1.000.
- Arcamone, Federico Maria: *See—*
  - Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.
- Arft, Dennis E., to L&P Property Management Co. Sinuous wire seat section sofa sleeper. 5,745,935, Cl. 5-13.000.
- Argyroudis, Panayotis; Bayley, Gwain; Grob, Matthew S.; Phillips, Marc; and Soliman, Samir S., to Qualcomm Incorporated. Wireless remote telemetry system. 5,748,104, Cl. 340-870.110.
- Ariki, Yoshiyuki: *See—*
  - Iwasa, Toru; Ito, Akio; and Ariki, Yoshiyuki, 5,747,897, Cl. 310-49.00R.
- Arimoto, Shinobu: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshimori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Aristech Chemical Corporation: *See—*
  - Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., 5,747,154, Cl. 428-327.000.
- Arita, Setsuo; Ito, Tetsuo; Ohga; Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, to Hitachi, Ltd. Plant operating and monitoring apparatus. 5,748,495, Cl. 364-550.000.
- Arithmos, Inc.: *See—*
  - Neugebauer, Charles F., 5,748,035, Cl. 327-562.000.
- Ariyama, Nakazo: *See—*
  - Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, 5,746,515, Cl. 384-115.000.
- Ariyoshi, Yasumi: *See—*
  - Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.
- Armanno, Frank, Sr. Toilet bowl dispensing system. 5,745,928, Cl. 4-225.100.
- Armstrong, Gary A.: *See—*
  - Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.
- Armstrong, Glen D.: *See—*
  - Heerze, Louis D.; Armstrong, Glen D.; and Smith, Richard, 5,747,040, Cl. 424-190.100.
- Armstrong World Industries, Inc.: *See—*
  - Reichwein, David P., 5,746,128, Cl. 101-416.100.
- Arnaud, Jean-Fabrice: *See—*
  - Ungerer, Philippe; and Arnaud, Jean-Fabrice, 5,747,673, Cl. 73-61.410.
- Arnic, Garlon A. Portable garage. 5,746,237, Cl. 135-88.060.
- Arnold, Lee D.: *See—*
  - Schnur, Rodney C.; and Arnold, Lee D., 5,747,498, Cl. 514-259.000.
- Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, to Siemens Aktiengesellschaft; and International Business Machines Corporation. Automated non-visual method of locating periodically arranged sub-micron objects. 5,747,802, Cl. 250-307.000.
- Arnoth, Frank W.: *See—*
  - Steinberg, Frederic; Adams, Phyllis; and Arnoth, Frank W., 5,746,748, Cl. 606-118.000.
- Arov, Gennady, to Arov, Gennady; and Zaske, James L. Precision machine tool vise with self adjusting clamp. 5,746,423, Cl. 269-266.000.
- Arsenault, Marc J.; and DerMarderosian, Aaron C., Sr. Ceiling tile moisture detection system. 5,748,092, Cl. 340-604.000.
- Arterbery, Cynthia W.; Callaham, W. Timothy; Keritsis, Gus D.; and White, Morris F., Jr., to Philip Morris Incorporated. Concentric smoking filter discrete tow and web filter media. 5,746,230, Cl. 131-331.000.
- Arthrex, Inc.: *See—*
  - Burkhart, Stephen S., 5,746,752, Cl. 606-139.000.
- Arthur D. Little, Inc.: *See—*
  - Farra, Robert; and Forni, Ronald J., 5,746,719, Cl. 604-151.000.
- Aruffo, Alejandro: *See—*
  - Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., 5,747,037, Cl. 424-154.100.
- Asada, Satoshi: *See—*
  - Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, 5,748,276, Cl. 349-144.000.
- Asahi Glass Company Ltd.: *See—*
  - Matsumura, Yasushi; Nakano, Takashi; Makino, Mayumi; and Morizawa, Yoshitomi, 5,747,531, Cl. 514-469.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
  - Ikegaki, Ichiro; and Asano, Toshio, 5,747,507, Cl. 514-312.000.
  - Komiya, Kyosuke; and Fukuoka, Shinsuke, 5,747,609, Cl. 526-68.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  - Haga, Masaaki; Machida, Katsuki; and Tsuji, Hideaki, 5,749,005, Cl. 396-287.000.
  - Iizuka, Takashi, 5,748,354, Cl. 359-205.000.
  - Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.
  - Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,388, Cl. 359-700.000.
  - Sato, Koichi, 5,748,833, Cl. 386-95.000.
  - Sensui, Takayuki, 5,748,384, Cl. 359-686.000.
  - Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.
  - Yamamoto, Yasuhiro; and Sato, Koichi, 5,748,829, Cl. 386-46.000.
  - Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, 5,746,695, Cl. 600-127.000.
- Asahi/America, Inc.: *See—*
  - Marsh, David Winsor; Rosaen, Lars Oscar; and Rosaen, Eric J., 5,747,701, Cl. 73-861.230.
- Asai, Katsumi: *See—*
  - Murakami, Hiroshi; Tsutsui, Masanori; Asai, Katsumi; and Sasaki, Takayoshi, 5,746,002, Cl. 33-517.000.
- Asaka, Hideo; and Yamauchi, Hiroyuki, to Matsushita Electric Industrial Co.Ltd. Semiconductor memory device having minimal leakage current. 5,748,520, Cl. 365-149.000.
- Asaka, Shunichi: *See—*
  - Echigo, Tomio; and Asaka, Shunichi, 5,748,868, Cl. 395-133.000.
- Asakawa, Satoshi: *See—*
  - Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.

OL
2 10
SS
1
MY
5
998
MI

Asakawa, Toshifumi: *See—*

Gotou, Hiroshi; and Asakawa, Toshifumi, 5,748,530, Cl. 365-185.180.

Asakura, Mikio: *See—*

Kometani, Osamu; Wakano, Shoichi; and Asakura, Mikio, 5,748,549, Cl. 365-226.000.

Asakura, Sotou; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, to Fujisawa Pharmaceutical Co., Ltd. Percutaneously absorbable preparation. 5,747,069, Cl. 424-484.000.

Asanasavest, Chainarong, to National Semiconductor Corporation. Method of fusing and programming fuse frame. 5,747,779, Cl. 219-603.000.

Asano, Osamu: *See—*

Fukuda, Kenji; and Asano, Osamu, 5,747,762, Cl. 200-61.45R.

Asano, Shouji: *See—*

Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Asano, Toshio: *See—*

Ikegaki, Ichiro; and Asano, Toshio, 5,747,507, Cl. 514-312.000.

Asano, Yasuhiro: *See—*

Torimoto, Tadashi; Asano, Yasuhiro; Kohara, Tsunehiro; and Nishimura, Tetsuya, 5,747,177, Cl. 428-537.100.

Asashi Kogaku Kogyo Kabushiki Kaisha: *See—*

Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, 5,747,787, Cl. 235-472.000.

ASC Audio Video Corporation: *See—*

Chatinsky, Mark; and Kuchta, Bruce, 5,748,253, Cl. 348-552.000.

ASC Incorprated: *See—*

Caye, Mark A.; and Boutin, Robert J., 5,746,475, Cl. 296-223.000.

Aschberger, Anton A.: *See—*

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Ascom Hasler Mailing Systems AG: *See—*

Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, 5,746,133, Cl. 101-484.000.

Ascom Nexion Inc.: *See—*

Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., 5,748,629, Cl. 370-389.000.

Asea Brown Boveri AG: *See—*

Andersson, Karl-Hugo; Stenkvist, Sven-Einar; and Wikström, Göran, 5,748,666, Cl. 373-9.000.

Bayerer, Reinhold, 5,748,456, Cl. 261-820.000.

Ashar, Pranav; and Cheong, Chao, to NEC USA, Inc. Breadth-first manipulation of binary decision diagrams. 5,748,486, Cl. 364-488.000.

Ashida, Takahiro: *See—*

Shimamune, Takayuki; Nakajima, Yasuo; Nishiki, Yoshinori; and Ashida, Takahiro, 5,746,896, Cl. 204-284.000.

Ashland Inc.: *See—*

Hettinger, William P., Jr.; Moore, Howard F.; Goolsby, Terry L.; and Peppard, A. V., 5,746,321, Cl. 209-233.000.

Asia Umbrella Industries Co., Ltd.: *See—*

Lin, Yao-Chin, 5,746,235, Cl. 135-29.000.

ASMO Co., Ltd.: *See—*

Hara, Masami, 5,746,534, Cl. 403-133.000.

Harada, Yoshihiko; Nakata, Masashi; Oshiro, Akio; and Murakami, Seiichi, 5,747,901, Cl. 310-71.000.

Associates of Cape Cod, Inc.: *See—*

Wainwright, Norman R.; and Novitsky, Thomas J., 5,747,455, Cl. 514-12.000.

Asta Medica AG: *See—*

Günther, Eckhard; Wulf, Jens-Peter; Engel, Jürgen; and Kutscher, Bernhard, 5,747,534, Cl. 514-492.000.

Asten, Inc.: *See—*

Fry, Ted J., 5,746,257, Cl. 139-383.0AA.

Astra Aktiebolag: *See—*

Bäckström, Kjell Göran Erik; Dahlbäck, Carl Magnus Olof; Edman, Peter; and Johansson, Ann Charlotte Birgit, 5,747,445, Cl. 514-4.000.

Boar, Robin Bernad; Cross, Alan John; Gray, Duncan Alastair; and Green, Richard Alfred, 5,747,515, Cl. 514-359.000.

Bylund, Ruth Elvy; and Teger-Nilsson, Ann-Catrine Elisabet, 5,747,460, Cl. 514-19.000.

Astra Pharmaceuticals Limited: *See—*

Cox, David; Ingall, Anthony; and Willis, Paul, 5,747,496, Cl. 514-258.000.

AT&T Corp: *See—*

Escolar, Carlos, 5,748,078, Cl. 340-506.000.

Kovacs, Frank, Jr., 5,748,713, Cl. 379-95.000.

ATEA Société Atlantique de Techniques Avancées: *See—*

Malmasson, Jacques, 5,748,689, Cl. 376-204.000.

Atkinson, George H.; and Mehdizadeh, Esmail, to Innovative Lasers Coropration. Diode laser-pumped laser system for ultra-sensitive gas detection via intracavity laser spectroscopy (ILS). 5,747,807, Cl. 250-339.130.

Atlantic Research Corporation: *See—*

Scheffee, Robert S.; Thibodeau, Robert Lee; and Wheatley, Brian K., 5,747,730, Cl. 149-47.000.

Atlantic Richfield Company: *See—*

Lara, Pedro F.; and Mateer, Mark W., 5,747,983, Cl. 324-71.100.

Patterson, John C., 5,746,582, Cl. 417-53.000.

Atlantic Scientific Corporation: *See—*

Bird, Anthony Owen, 5,748,430, Cl. 361-119.000.

Atlas Pacific Engineering Company: *See—*

Howarth, M. Scott; Tillett, Robin D.; and Bull, Christine R., 5,748,324, Cl. 356-425.000.

Atochem: *See—*

Menassa, Aine; and Caupin, Henri, 5,747,090, Cl. 426-532.000.

Atohaas Holding C.V.: *See—*

Renard, Lucien; Delprat, Patrick; and Heim, Philippe, 5,747,569, Cl. 524-140.000.

ATR Human Information Processing Research Laboratories: *See—*

Komori, Takashi; and Katagiri, Shigeru, 5,749,069, Cl. 704-240.000.

Atrion Medical Products, Inc.: *See—*

Green, Nicholas A.; and Williams, Fred E., Jr., 5,746,764, Cl. 606-194.000.

Attali, Jean-Claude; and Vuagnoux, Jean-Claude. Insecticidal and pesticidal complex, and method for destroying insects and ectoparasites. 5,747,055, Cl. 424-409.000.

Atwood, Gregory: *See—*

Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.

Audio Navigation Systems, Inc.: *See—*

La Rue, Charles, 5,748,840, Cl. 395-2.630.

Audio Precision: *See—*

Cabot, Richard C., 5,749,047, Cl. 455-67.400.

Audio Precision, Inc.: *See—*

Cabot, Richard C., 5,748,001, Cl. 324-624.000.

Audren, Jean Thierry, to SFIM Industries. Vibration motor with a rotor/stator interface made of shape memory alloy. 5,747,951, Cl. 318-114.000.

Augat Inc.: *See—*

Gauker, Bradford K., 5,746,618, Cl. 439-352.000.

Auger, Raymond N.: *See—*

Colson, Wendell B.; and Auger, Raymond N., 5,746,266, Cl. 160-84.050.

Auguello, Michael; Ruszkay, Thomas A.; and Reier, George E., to FMC Corporation. Co-processed products. 5,747,067, Cl. 424-464.000.

Aulbaugh, Randy; and Hawk, Gregory G., to Thermall Corp. Apparatus for physical amd chemical separation and reaction. 5,746,987, Cl. 422-190.000.

Auld, David: *See—*

Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.

Austin, Glenn D.: *See—*

Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, 5,746,714, Cl. 604-68.000.

Automatic Switch Company: *See—*

Przywozny, Walter; and Scheffer, Daniel, 5,748,432, Cl. 361-159.000.

Automotive Fluid Systems, Inc.: *See—*

Patel, Chhotu; Lafer, Larry M.; and Tossey, Steven M., 5,746,065, Cl. 62-503.000.

Automotive Technologies International, Inc.: *See—*

Breed, David S.; and Sanders, William Thomas, 5,746,446, Cl. 280-743.100.

Breed, David S.; and DuVall, Wilbur E., 5,748,473, Cl. 364-424.055.

Au-Young, Janice; Hawkins, Phillip R.; and Hillman, Jennifer L., to Incyte Pharmaceuticals, Inc. Human mRNA editing enzyme. 5,747,319, Cl. 435-199.000.

Avant Incorporated: *See—*

Kuhns, Roger J.; and Chandler, Scott, 5,746,878, Cl. 156-364.000.

Averett, Devron Randolph: *See—*

Krenitsky, Thomas Anthony; Averett, Devron Randolph; Koszalka, George Walter; and Wolberg, Gerald, 5,747,472, Cl. 514-45.000.

Avery Dennison Corporation: *See—*

Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., 5,747,192, Cl. 429-163.000.

Avir Finanziaria S.p.A.: *See—*

Ambrogio, Morettin, 5,746,800, Cl. 65-169.000.

Avramovich, Rudy: *See—*

Orrico, Mario; Farhadieh, Rou; Avramovich, Rudy; and Koford, Stuart, 5,747,782, Cl. 219-689.000.

Ayame, Shogo: *See—*

Hanai, Katsuyuki; and Ayame, Shogo, 5,748,723, Cl. 379-198.000.

Aylsworth, Alonzo C.; Adriance, Kyle; and Miller, Gregory R., to Nellcor Puritan Bennett Incorporated. Apparatus and method for controlling output of an oxygen concentrator. 5,746,806, Cl. 95-8.000.

Ayotte, Leo; and Obie, Paul. Freeze protection system for car washer units. 5,746,240, Cl. 137-59.000.

Azegami, Kazuyoshi: *See—*

Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,388, Cl. 359-700.000.

Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.

Azionaria Costruzioni Macchine Automatiche ACMA, SpA: *See—*

Spatafora, Mario; and Berti, Andrea, 5,746,872, Cl. 156-274.200.

Azuma, Akihiro: *See—*

Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.

Baagø Jepsen, Aksel: *See—*

Friedrichsen, Welm; and Baagø Jepsen, Aksel, 5,747,950, Cl. 318-5.000.

Baba, Atsuo: *See—*

Sohda, Takashi; Makino, Haruhiko; and Baba, Atsuo, 5,747,486, Cl. 514-211.000.

Baba, Hisatoshi, to Canon Kabushiki Kaisha. Information recording/reproducing apparatus with counter means accessible by system and servo processing units. 5,748,583, Cl. 369-44.280.

Baba, Hironobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, to Nippondenso Co., Ltd. Pressure sensor with barrier in a pressure chamber. 5,747,694, Cl. 73-723.000.

Baba, Koji, to Seiko Clock Inc. Viscous coupling gear device. 5,746,092, Cl. 74-421.00R.

Baccou, Jean-Claude: *See—*

Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lacan, Dominique, 5,747,043, Cl. 424-195.100.

Baccus, John C.: *See—*

Meade, John C.; and Baccus, John C., 5,746,759, Cl. 606-170.000.

Bachman, Sallie Ann: *See—*

Amos, Dennis Ray; Bachman, Sallie Ann; and Chen, Jianqiang, 5,746,579, Cl. 416-204.00A.

Bachmann, Hubert: *See—*

Boss, Christoph; and Bachmann, Hubert, 5,746,090, Cl. 74-89.170.

Bacic, Antony: *See—*

Clarke, Adrienne Elizabeth; Bacic, Antony; and Lane, Alan Gordon, 5,747,297, Cl. 435-72.000.

Bacich, Steven R.; Nguyen, Tuoc Tan; and Greelis, John Patrick, to Imagen Medical, Inc. Catheter and endoscope system with distal protruding ball tip and method. 5,746,692, Cl. 600-104.000.

Bacina, Paul Raymond; and Fusco, John Jude, to Ford Global Technologies, Inc. Body panel reinforcement. 5,746,474, Cl. 296-191.000.

Backlund, Åke; and Stigsson, Lars, to Kvaerner Pulping AB. Method for the recovery of energy and chemicals from cellulose spent liquor containing potassium using a gasifier. 5,746,886, Cl. 162-30.100.

Bäckström, Kjell Göran Erik; Dahlbäck, Carl Magnus Olof; Edman, Peter; and Johansson, Ann Charlotte Birgit, to Astra Aktiebolag. Therapeutic preparation for inhalation. 5,747,445, Cl. 514-4.000.

Badesha, Santokh S.: *See—*

Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.

Badger, David Mark, to Thomson Consumer Electronics, Inc. Phase locked loop with controllable response time. 5,748,046, Cl. 331-17.000.

Badger Meter, Inc.: *See—*

Vander Heyden, William H.; and Berg, Ronald Arthur, 5,748,492, Cl. 364-499.000.

Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., to International Business Machines Corporation. System for utilizing batch requests to present membership changes to process groups. 5,748,958, Cl. 395-670.000.

Bae, Byung-Il: *See—*

Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.

Bae, Seong Ok: *See—*

Kim, Su Hwan; and Bae, Seong Ok, 5,748,688, Cl. 375-368.000.

Baebel, Ronald G. Method to control fugitive dust and sodium hydroxide in bauxite tailings disposal pits. 5,747,104, Cl. 427-136.000.

Baek, Jong-Hyeob; Lee, Bun; Choi, Sung-Woo; and Lee, Jin-Hong, to Electronics and Telecommunications Research Institute. Method for sensing complete removal of oxide layer from substrate by thermal etching with real time. 5,748,319, Cl. 356-382.000.

Baek, Joon-Hyun, to LG Semicon Co., Ltd. Charge pumping circuit for generating a high output voltage. 5,748,032, Cl. 327-536.000.

Baer, Mark E.: *See—*

Robitaille, James M.; Crevling, Robert L., Jr.; and Baer, Mark E., 5,747,973, Cl. 323-239.000.

Baghoomian, Hovik, to Hovik Baghoomian; and Technology Licensing Co. LLC. Process and structure for reducing roadway construction period. 5,746,544, Cl. 405-229.000.

Bagley, Steven C.: *See—*

Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.

Bagley, Wendell W. Cable stripping and bending device. 5,745,943, Cl. 7-107.000.

Bahl, Inder J., to ITT Industries, Inc. Compact 90° monolithic GaAs coupler for wireless applications. 5,748,056, Cl. 333-112.000.

Bailey, Clyde Arthur: *See—*

Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.

Bailey, Jack W.; and Howard, Joseph E., to White Consolidated Industries, Inc. Plastic and stainless steel horizontal axis spin tub. 5,746,070, Cl. 68-24.000.

Bailey, Jeffrey R.; and Ringo, Marion M., to Exxon Production Research Company. Single well system for mapping sources of acoustic energy. 5,747,750, Cl. 181-112.000.

Bailey, Mark A.: *See—*

Khokhar, Wasim; and Bailey, Mark A., 5,745,957, Cl. 24-16.0PB.

Bain, Steven: *See—*

Korsgaard, Niels; Piggott, James Robertson; Labroo, Virender Mohan: and Bain, Steven, 5,747,059, Cl. 424-451.000.

Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., to Semantic Compaction Systems. Dynamic keyboard and method for dynamically redefining keys on a keyboard. 5,748,177, Cl. 345-133.000.

Baker Hughes Incorporated: *See—*

Scott, Danny E.; Pessier, Rudolf Carl Otto; and Boylan, Turlach Paul, 5,746,280, Cl. 175-374.000.

Voll, Benn Arild; Kebodeaux, Matthew S.; Stringfellow, Steve; and Bayne, Christian F., 5,746,274, Cl. 166-278.000.

Baker, Walter J.: *See—*

Gargiulo, Joseph L.; Baker, Walter J.; and Heiden, Richard W., 5,749,078, Cl. 705-404.000.

Balch, Joseph W.; Carrano, Anthony V.; Davidson, James C.; and Koo, Jackson C., to Regents Of The University Of California. Hybrid slab-microchannel gel electrophoresis system. 5,746,901, Cl. 204-606.000.

Bald, Wilfried: *See—*

Klamma, Klaus; and Bald, Wilfried, 5,746,081, Cl. 72-229.000.

Baldes, Gary: *See—*

Coelho, Rohan G. F.; Packer, Alan; and Baldes, Gary, 5,748,196, Cl. 345-433.000.

Baldwin, Timothy J.: *See—*

Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby I., Jr., 5,748,640, Cl. 371-21.300.

Baleanu, Michael-Alin. Method and device for signal analysis, process identification and monitoring of a technical process. 5,748,508, Cl. 364-578.000.

Ball, Bradley E. System for automatically producing infrared control signals. 5,748,263, Cl. 348-734.000.

Ball, William T., to WCM Industries, Inc. Method and means for covering the flange of a waste water strainer. 5,745,931, Cl. 4-286.000.

Ballard, Clifford Palmer, Jr.: *See—*

Fanelli, Anthony; Behi, Mohammad; Ballard, Clifford Palmer, Jr.; and Burlew, Joan V., 5,746,957, Cl. 264-109.000.

Balooch, Mehdi: *See—*

McLean, William, II; Balooch, Mehdi; and Siekhaus, Wigbert J., 5,747,120, Cl. 427-596.000.

Balsa, Dolors: *See—*

Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Baltab Holdings, Ltd.: *See—*

Thorton-Trump, Walter E., 5,746,396, Cl. 244-134.00R.

Baltruschat, Helmut Siegfried: *See—*

Scheiblich, Stefan; Maier, Thomas; Baltruschat, Helmut Siegfried; and Pont, Joseph Luke, 5,747,423, Cl. 504-251.000.

Balzer, Thomas: *See—*

Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.

Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, to Mita Industrial Co., Ltd. Image transferred sheet conveying guide for use in an image forming apparatus. 5,749,035, Cl. 399-316.000.

Bando Chemical Industries, Ltd.: *See—*

Tajima, Yoshitaka; and Akashi, Takamitsu, 5,746,674, Cl. 474-253.000.

Bandyopadhyay, Supriyo: *See—*

Miller, Albert E.; and Bandyopadhyay, Supriyo, 5,747,180, Cl. 428-601.000.

Bänziger, Heinz: *See—*

Gietz, Hanspeter; Rösli, Manfred; and Bänziger, Heinz, 5,746,122, Cl. 100-43.000.

Baragar, Marc Christopher; and Roman, Michael John, to Xenophon Design Inc. Constrained hermaphroditic ball and socket hinge joint. 5,745,952, Cl. 16-228.000.

Barath, Peter: *See—*

Vigil, Dennis M.; and Barath, Peter, 5,746,716, Cl. 604-97.000.

Barber, David Charles: *See—*

Brown, Brian Hilton; and Barber, David Charles, 5,746,214, Cl. 128-693.000.

Barber, Robert D.: *See—*

Donohue, Timothy J.; Barber, Robert D.; and Witthuhn, Vern, 5,747,328, Cl. 435-252.300.

Barels, Ronald R.; and Cohler, Charles M. Oil-based, anti-plaque dentifrice composition. 5,747,005, Cl. 424-50.000.

Baretich, David F.; and Wiegand, Gregory P., to MicroPlanet Ltd. Method and apparatus for electronic power control. 5,747,972, Cl. 323-223.000.

Barnea, Dan: *See—*

Landa, Benzion; Lior, Ishaiau; Barnea, Dan; Fenster, Paul; and Levy, Uri, 5,749,032, Cl. 399-233.000.

Barnes, Brian: *See—*

Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, 5,748,983, Cl. 395-842.000.

Barovetto, David L. Hot tub cover and enclosure. 5,745,932, Cl. 4-498.000.

Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased (by Joan Seidensticker, heir); and Hopkins, Richard H., to Northrop Grumman Corporation. Method of producing large diameter silicon carbide crystals. 5,746,827, Cl. 117-100.000.

Barrett, Paul Alexander, to British Telecommunications public limited company. Voice activity detector. 5,749,067, Cl. 704-233.000.

/OL
210
ISS
1
MY
5
998
JMI

- Barrois, Gérard; Dominiak, Marcel; Fedeli, Jean-Marc; and Pisella, Christian, to Commissariat a l'Energie Atomique. Flight slider for magnetic recording. 5,748,408, Cl. 360-103.000.
- Barron, Thomas D., to United States of America, Navy. Apparatus for interconnecting an underwater vehicle and a free floating communications pod. 5,748,102, Cl. 340-850.000.
- Barron, William N. G., III: *See—*
  - Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.
- Barsoum, James G.: *See—*
  - Frankel, Alan; Pabo, Carl; Barsoum, James G.; Fawell, Stephen E.; and Pepinsky, R. Blake, 5,747,641, Cl. 530-300.000.
- Barta, Gabor: *See—*
  - Gerum, Eduard; Laszlo, Palkovics; Semsey, Akos; and Barta, Gabor, 5,747,683, Cl. 73-118.100.
- Barth, Gerald D.; and Bechtel, Frank W., to Illinois Tool Works Inc. Fastener having torque-absorbing ribs. 5,746,560, Cl. 411-188.000.
- Barth, Richard M.; Stark, Donald C.; Lai, Lawrence; and Richardson, Wayne S., to Rambus, Inc. Memory and method for sensing sub-groups of memory elements. 5,748,554, Cl. 365-230.030.
- Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, to Rambus, Inc. Protocol for communication with dynamic memory. 5,748,914, Cl. 395-285.000.
- Barthold, Stephen W.: *See—*
  - Flavell, Richard A.; Kantor, Fred S.; Barthold, Stephen W.; and Fikrig, Erol, 5,747,294, Cl. 435-70.210.
- Bartlett, Robert Ryder: *See—*
  - Schleyerbach, Rudolf; Bartlett, Robert Ryder; Kuo, Elizabeth Anne; and Little, Edward James, 5,747,664, Cl. 558-392.000.
- Bartlett, Stephen L.: *See—*
  - Logan, Walter T.; and Bartlett, Stephen L., 5,746,155, Cl. 119-230.000.
- Bartley, Charles Allen; and Scruggs, Robert Burks, II, to Westvaco Corporation. Rescue board. 5,745,938, Cl. 5-625.000.
- Bartley, Paul L.; and Fisher, Deborah A., to Lucent Technologies Inc. Method for bonding circuit boards to pallets. 5,745,987, Cl. 29-840.000.
- Bartroli, Javier: *See—*
  - Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.
- Baruchello, Roberto, to Marposs Societa Per Azioni. Gauges for checking linear dimensions. 5,746,003, Cl. 33-542.000.
- BASF Aktiengesellschaft: *See—*
  - Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.
  - Fischer, Wolfgang; and Güntherberg, Norbert, 5,747,568, Cl. 524-110.000.
  - Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.
  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
  - Müller, Michael Wolfgang; Klingelhöfer, Paul; and Weiss, Stefan, 5,746,812, Cl. 106-10.000.
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
  - Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.
- BASF Corporation: *See—*
  - Schwarte, Stephan; and Grosch, Horst, 5,747,166, Cl. 428-423.100.
- Bashir, Rashid; and Kabir, Abul E., to National Semiconductor Corporation. Method of making surface micro-machined accelerometer using silicon-on-insulator technology. 5,747,353, Cl. 437-21.000.
- Bass, Lawrence S. Device and method for surgical flap dissection. 5,746,762, Cl. 606-192.000.
- Bass, Steven L.: *See—*
  - Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, 5,748,856, Cl. 395-102.000.
- Bassett, Duane Edward: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Bassi, Sukh; Maningat, Clodualdo C.; Chinnaswamy, Rangaswamy; and Nie, Li, to Midwest Grain Products. Modified wheat glutens and use thereof in fabrication of films. 5,747,648, Cl. 530-374.000.
- Bastani, Babak: *See—*
  - Boscovic, Dragan; Valentine, Stephen; Bastani, Babak; and Wray, Anthony, 5,748,038, Cl. 330-2.000.
- Batchelor, Sally Fiona. Reuseable facial tissue dispensing system. 5,746,318, Cl. 206-494.000.
- Bates, Kent C., to Caterpillar Inc. Apparatus for monitoring the speed and axial position of a rotating member. 5,748,111, Cl. 341-11.000.
- Battelle Memorial Institute: *See—*
  - Bray, Lane Allan; and DesChane, Jaquetta R., 5,749,042, Cl. 423-2.000.
- Bauer, Hans: *See—*
  - Platzek, Johannes; Radüchel, Bernd, Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.
- Bauer, Klaus: *See—*
  - Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, 5,747,421, Cl. 504-214.000.
- Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, to Intel Corporation. Sensing scheme for flash memory with multilevel cells. 5,748,546, Cl. 365-210.000.
- Bauer, Michael: *See—*
  - Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
- Bauer, Peter: *See—*
  - Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
- Bauer, William, Jr.; Hale, Timothy Allen; Mason, Robert Michael; and Upmacis, Rita Karina, to Rohm and Haas Company. Process for pure grade acrylic acid. 5,746,892, Cl. 203-38.000.
- Baum, Stephen L.: *See—*
  - Bennett, Arthur T.; Baum, Stephen L.; Rubenstein, Scott K.; and Randall, Gary A., 5,747,893, Cl. 307-100.000.
- Baum, Sylvia: *See—*
  - Fischer, Wolfgang; Baum, Sylvia; Hartig, Thorsten; and Schleehahn, Michael, 5,747,656, Cl. 534-683.000.
- Baumgarth, Manfred: *See—*
  - Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, 5,747,539, Cl. 514-618.000.
- Baumgartner, Hans, to Doll Fahrzeugbau GmbH. Branch remover. 5,746,262, Cl. 144-24.130.
- Baumgartner, H. Robert: *See—*
  - Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.
- Baur, Richard: *See—*
  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
- Baur, Siegfried; Horn, Heinz; and Dexling, Hartmut, to Schuler Pressen GmbH & Co. Drawing mechanism for a press. 5,746,084, Cl. 72-351.000.
- Bavetsias, Vassilios; Boyle, Francis Thomas; Hennequin, Laurent Francois Andre; and Marriott, Jonathan Hugh, to British Technology Group Limited. Anti-cancer compounds. 5,747,499, Cl. 514-267.000.
- Baxter International Inc.: *See—*
  - Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., 5,746,708, Cl. 604-4.000.
  - Westphal, Dieter; Reul, Helmut; and Rau, Guenter, 5,746,575, Cl. 415-206.000.
- Bay Glass Research: *See—*
  - McPherson, Donald M.; and Murray, Steven C., 5,747,397, Cl. 501-51.000.
- Bayer AG: *See—*
  - Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, 5,747,589, Cl. 525-146.000.
  - Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.
  - Schönfelder, Lothar; Leimer, Gerhard; and Roth, Stefan, 5,746,969, Cl. 264-645.000.
- Bayer Aktiengesellschaft: *See—*
  - Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.
  - Neubach, Werner, 5,747,391, Cl. 442-70.000.
  - Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, 5,747,582, Cl. 524-591.000.
  - Schmalstieg, Lutz; Gruber, Hermann; Riberi, Bernd; and Nachtkamp, Klaus, 5,747,628, Cl. 528-60.000.
- Bayer Corporation: *See—*
  - Yeske, Philip E.; Slack, William E.; and Squiller, Edward P., 5,747,629, Cl. 528-70.000.
- Bayer, Erich, to Texas Instruments Deutschland GmbH. Edge detector. 5,748,014, Cl. 327-72.000.
- Bayer, Glen H., Jr.; and O'Leary, Timothy J., to Minnesota Mining and Manufacturing Company. Method of applying a hot melt coating. 5,747,107, Cl. 427-208.400.
- Bayerer, Reinhold, to Asea Brown Boveri AG. Power semiconductor module system. 5,748,456, Cl. 261-820.000.
- Bayerische Motoren Werke Aktiengesellschaft: *See—*
  - Glonner, Hans, 5,748,112, Cl. 341-17.000.
- Bayley, Gwain: *See—*
  - Argyroudis, Panayotis; Bayley, Gwain; Grob, Matthew S.; Phillips, Marc; and Soliman, Samir S., 5,748,104, Cl. 340-870.110.

- Bayly, Elliott, to World Power Technologies, Inc. Wind energy conversion device with angled governing mechanism. 5,746,576, Cl. 416-16.000.
- Bayne, Christian F.: *See—*
  - Voll, Benn Arild; Kebodeaux, Matthew S.; Stringfellow, Steve; and Bayne, Christian F., 5,746,274, Cl. 166-278.000.
- Bayron, Harry; and Winthrop, Neil. Respiratory valve. 5,746,199, Cl. 128-205.240.
- Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., to Anadigics, Inc. Multi-frequency local oscillators. 5,748,049, Cl. 331-49.000.
- Bayruns, Robert J.: *See—*
  - Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., 5,748,049, Cl. 331-49.000.
- Beach, Peter G. Assay and method for determining newborn risk for sudden infant death syndrome. 5,747,266, Cl. 435-7.900.
- Beadle, Charles Donald; and Green, Murray Frank, to Marathon Equipment Company. Volume reduction machine. 5,746,378, Cl. 241-99.000.
- Beadman, Michael Andrew: *See—*
  - Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.
- Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, to International Business Machines Corporation. Methodology to test pulsed logic circuits in pseudo-static mode. 5,748,012, Cl. 326-93.000.
- Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, to Gersan Establishment. Working a natural or synthetic hard stone such as a gemstone. 5,746,645, Cl. 451-11.000.
- Beard, McDaniel L.: *See—*
  - McCartney, Phillip D.; Beard, McDaniel L.; and Inman, Elaine V., 5,746,046, Cl. 57-350.000.
- Beard, Paul, to Norand Corporation. Automatic control electroluminescent backlight panel. 5,747,938, Cl. 315-169.300.
- Beard, Richard L.: *See—*
  - Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.
- Beatty, Harry John; Elmendorf, Peter Claude; Gillis, Roland Roberto; and Pramanick, Ira, to International Business Machines Corporation. Parallel execution of a complex task partitioned into a plurality of entities. 5,748,489, Cl. 364-489.000.
- Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, to Thomson-CSF. Combined magnetic core. 5,748,013, Cl. 336-233.000.
- Beaulac, Daniel E.; Hewison, Trevor S.; and Washington, Wayne. Boat for use with a personal watercraft. 5,746,150, Cl. 114-248.000.
- Beaver, George M. Grooved smoking pipes and method of filling. 5,746,226, Cl. 131-226.000.
- Beaverson, Gregory K.; Schnetzka, Harold R.; and Frank, Timothy M., to York International Corporation. Methods and apparatuses for detecting surge in centrifugal compressors. 5,746,062, Cl. 62-228.300.
- Bebbington, Christopher Robert; and Yarranton, Geoffrey Thomas, to Celltech Therapeutics Limited. Recombinant DNA method. 5,747,308, Cl. 435-172.300.
- Becherer, Kathleen; Dattagupta, Nanibhushan; and Naidu, Yathi M., to Gen-Probe Incorporated. Method for inhibiting cellular proliferation using antisense oligonucleotides to gp130 mRNA. 5,747,470, Cl. 514-44.000.
- Bechtel, Frank W.: *See—*
  - Barth, Gerald D.; and Bechtel, Frank W., 5,746,560, Cl. 411-188.000.
- Beck, Leslie M.; and Raney, David A., to PPG Industries, Inc. Process for treating an aluminum can using a mobility enhancer. 5,746,837, Cl. 134-2.000.
- Becker, Beverly J.: *See—*
  - Kaepp, Gregory A.; and Becker, Beverly J., 5,748,943, Cl. 395-500.000.
- Becker, Rainer: *See—*
  - Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.
- Beckett, Raymond Paul; Whittaker, Mark; Miller, Andrew; and Martin, Fionna Mitchell, to British Biotech Pharmaceuticals Limited. Metalloproteinase inhibitors. 5,747,514, Cl. 514-352.000.
- Beckman Instruments, Inc.: *See—*
  - Yan, Cheng F.; and Yein, Fredrick S., 5,747,256, Cl. 435-6.000.
  - Yan, Cheng F.; Oh, Chan S.; and Cheng, Anthony K., 5,747,352, Cl. 436-533.000.
- Becton, Dickinson and Company: *See—*
  - Capaccio, Paul R.; Cohen, Gary; Olsen, Alvin T.; and Yale, Mark C., 5,746,733, Cl. 604-411.000.
  - Graves, Arlinda; and Szabo, Sandor, 5,746,727, Cl. 604-283.000.
  - Sweeney, Niall; Morigi, Adriano; and Gyure, Sandor, 5,746,726, Cl. 604-263.000.
  - You, Qimin, 5,747,259, Cl. 435-6.000.
- Bedarida, Lorenzo: *See—*
  - Campardo, Giovanni; Bedarida, Lorenzo; Fusillo, Giuseppe; and Silvagni, Andrea, 5,748,528, Cl. 365-185.130.
- Bedingfield, John; and Hicks, Michael A., to Paradyne Corporation. Method for interfacing to a powered bus. 5,748,426, Cl. 361-58.000.
- Bedini Electronics, Inc.: *See—*
  - Bedini, John C., 5,748,745, Cl. 381-1.000.
- Bedini, John C., to Bedini Electronics, Inc. Analog vector processor and method for producing a binaural signal. 5,748,745, Cl. 381-1.000.
- Bednarczyk, Adam; Maute, Robert E.; and Thompson, Laird B., to Mobil Oil Corporation. Acoustic logging to identify oil flow rate. 5,747,749, Cl. 181-102.000.
- Bedner, Edward John: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Bee, Gary: *See—*
  - Yang, Yeasing; Bee, Gary; and McDonough, Sherrol, 5,747,252, Cl. 435-6.000.
- Bee, John Arthur; Kempster, John Kenneth Charles; and Evans, Gareth, to Eastman Kodak Company. Photographic silver halide colour material having improved granularity and dye hue. 5,747,230, Cl. 430-503.000.
- Beeler, Mark T.; and Welker, Brian H., to Decision Point Marketing, Inc. Pegboard-mountable adjustable merchandising rack. 5,746,328, Cl. 211-59.300.
- Beer, Richard D.: *See—*
  - Boyd, Trace L.; Beer, Richard D.; Terbeek, Eric A.; and Wong, Vernon W. II., 5,746,434, Cl. 277-1.000.
- Beeson, Karl W.: *See—*
  - Steiner, Ivan B.; Zimmerman, Scott M.; and Beeson, Karl W., 5,748,828, Cl. 385-146.000.
- Beeteson, John; and Knox, Andrew, to International Business Machines Corporation. Magnetic matrix display device and computer system for displaying data thereon. 5,747,923, Cl. 313-431.000.
- Beeteson, John; and Knox, Andrew, to International Business Machines Corp. Moire interference detection for raster-scanned cathode ray tube displays. 5,747,933, Cl. 315-1.000.
- Behi, Mohammad: *See—*
  - Fanelli, Anthony; Behi, Mohammad; Ballard, Clifford Palmer, Jr.; and Burlew, Joan V., 5,746,957, Cl. 264-109.000.
- Behm, Frederique: *See—*
  - Rose, Jed E.; Behm, Frederique; and Turner, James, 5,746,227, Cl. 131-270.000.
- Behr GmbH & Co.: *See—*
  - Lochmahr, Karl; and Rauland, Werner, 5,747,759, Cl. 200-5.00R.
- Beier, Norbert: *See—*
  - Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, 5,747,539, Cl. 514-618.000.
- Beige, Marc P.; and Kearns, John G., to Rubie's Costume Co., Inc. Costumes with semi-rigid fabric components and method of manufacture of same. 5,747,144, Cl. 428-187.000.
- Beilin, Solomon I.; Chou, William T.; Lee, Michael G.; and Wang, Wen-chou Vincent, to Fujitsu Limited. Wet chemical processing techniques for plating high aspect ratio features. 5,746,903, Cl. 205-118.000.
- Belcher, James F.; Beratan, Howard R.; and Summerfelt, Scott R., to Texas Instruments Incorporated. Method and structure for forming an array of thermal sensors. 5,746,930, Cl. 216-87.000.
- Belcher, James F.: *See—*
  - Turner, Terry R.; Belcher, James F.; and Andrews, Gary W., 5,746,835, Cl. 118-723.0MW.
- Bell Atlantic Network Services, Inc.: *See—*
  - Ganesan, Ravi, 5,748,735, Cl. 380-21.000.
  - Lightfoot, Regina; and Goodman, William, 5,748,493, Cl. 364-514.00C.
- Bell Communications Research, Inc.: *See—*
  - Amersfoort, Martin Ronald; and Soole, Julian Bernard Donald, 5,748,811, Cl. 385-15.000.
  - Gerand, Bernard; Larcher, Dominique; and Tarascon, Jean-Marie, 5,747,193, Cl. 429-224.000.
  - Leigh, John Scott; and Schotland, John Carl, 5,746,211, Cl. 128-665.000.
- Bell, Lem; Pearson, Tim; and Haberstroh, James, to Illinois Tool Works Inc. Strap path access apparatus and method for strapping machine. 5,746,882, Cl. 156-580.000.
- Bellera, Jacques Serge Louis: *See—*
  - Rollet, Philippe Alain Jean; and Bellera, Jacques Serge Louis, 5,746,398, Cl. 244-223.000.
- Belloni, Paula Nanette: *See—*
  - Harats, Dror; Kurihara, Hiroki; Belloni, Paula Nanette; and Sigal, Charles Elliott, 5,747,340, Cl. 435-375.000.
- BellSouth Corporation: *See—*
  - Chan, Jim H.; and Desai, Nailesh B., 5,748,717, Cl. 379-120.000.
- Belmont, James A.: *See—*
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,747,562, Cl. 523-215.000.
- Belon, Juan B.: *See—*
  - Mayer, Jeremy; Belon, Juan B.; and Kennedy, A. Terence, 5,746,528, Cl. 400-625.000.
- Belt, James S.: *See—*
  - Burton, Charles A.; Boyd, Douglas E.; Haubert, Thomas D.; and Belt, James S., 5,746,830, Cl. 118-308.000.
- Belt, Steve L.: *See—*
  - Lambrecht, Andy; Belt, Steve L.; and Dutton, Drew, 5,748,921, Cl. 395-308.000.

VOL 210 ISS 1 MY 5 1998 UMI

Benaron, David A.; and Rubinsky, Boris, to Benaron, David A. Device and method for detection, localization, and characterization of inhomogeneities in turbid media. 5,746,210, Cl. 128-665.000.

Benati, Paul J.; Gray, Robert T.; and Cosgrove, Patrick A., to Eastman Kodak Company. Automated detection and correction of eye color defects due to flash illumination. 5,748,764, Cl. 382-117.000.

Benavides, Gilbert L., to Sandia Corporation. Bent shaft motor. 5,747,915, Cl. 310-331.000.

Ben-Ayun, Moshe: *See—*

Rozental, Mark; Horowitz, Ilan Yehezkel; and Ben-Ayun, Moshe, 5,748,037, Cl. 330-2.000.

Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., to Boston Scientific Technology, Inc. Device for supporting and positioning medical equipment. 5,746,763, Cl. 606-193.000.

Ben-Haim, Amit. Cutting brick folding carton and blank. 5,746,371, Cl. 229-222.000.

Benker, Gerhard: *See—*

Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.

Bennett, Arthur T.; Baum, Stephen L.; Rubenstein, Scott K.; and Randall, Gary A., to Compaq Computer Corporation. Termination scheme for twisted-wire pairs. 5,747,893, Cl. 307-100.000.

Bennett, Mark A.: *See—*

Beveridge, Keith A.; Bennett, Mark A.; Waeber, Kenneth R.; and Haynes, Clinton A., 5,746,357, Cl. 222-386.000.

Bennett, Michael T.: *See—*

Calapp, David E.; and Bennett, Michael T., 5,746,955, Cl 264-103.000.

Bennin, Jeffry S.: *See—*

Girard, Mark T.; Bennin, Jeffry S.; and Ziegler, David A., 5,748,409, Cl. 360-104.000.

Benson, Paul Harrison, IV: *See—*

Clark, Michael William; Hearney, James Alfred; Norris, Duane Edward; and Benson, Paul Harrison, IV, 5,748,972, Cl. 395-750.050.

Bentley, Ralph Talmadge, II: *See—*

Brown, Michael Dale; Duncan, Frank Louis; and Bentley, Ralph Talmadge, II, 5,746,611, Cl. 439-135.000.

Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., to Glenayre Electronics, Inc. Method for handling alarm conditions in a paging system. 5,749,045, Cl. 455-31.200.

Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, to Goodyear Tire & Rubber Company, The. Method for cutting a cord reinforced elastomeric laminate. 5,746,101, Cl. 83-34.000.

Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, to Goodyear Tire & Rubber Company, The. Method for cutting a cord reinforced elastomeric laminate. 5,746,102, Cl. 83-34.000.

Bera, John; and Kohaut, John E., to Raceway Components, Inc. Fire-rated furniture feed poke-through fitting. 5,747,732, Cl. 174-48.000.

Beratan, Howard R.: *See—*

Belcher, James F.; Beratan, Howard R.; and Summerfelt, Scott R., 5,746,930, Cl. 216-87.000.

Bereznak, James Francis; Chang, Zen-Yu; Selby, Thomas Paul; and Sternberg, Charlene Gross, to Du Pont de Nemours, E. I., and Company. Fungicidal fused bicyclic pyrimidinones. 5,747,497, Cl. 514-259.000.

Berg, Gordon O.: *See—*

Gering, Marcus J.; Berg, Gordon O.; Lehnen, David C.; and Frisbie, Joseph W., 5,748,389, Cl. 359-811.000.

Berg, Howard G.; and Rivera, Benjamin C., to Leatherman Tool Group, Inc. Multi-purpose tool including folding scissors. 5,745,997, Cl. 30-155.000.

Berg, Jacqueline G.: *See—*

Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., 5,748,654, Cl. 372-19.000.

Berg, Joel S.: *See—*

Hutchings, William F.; Schutte, Marlin D.; Markle, Stephen L.; Berg, Joel S.; and Engel, David J., 5,746,536, Cl. 403-370.000.

Berg, Ronald Arthur: *See—*

Vander Heyden, William H.; and Berg, Ronald Arthur, 5,748,492, Cl. 364-499.000.

Berg Technology, Inc.: *See—*

Clark, Stephen L., 5,746,620, Cl. 439-404.000.

Bergan, Terry; and Friesen, Dwaine, to International Road Dynamics, Inc. Restraint system for weight scales. 5,747,746, Cl. 177-134.000.

Bergantino, Paul V.; and Lussier, Daniel J., to Maker Communications, Inc. Asynchronous transfer mode cell processing system with load multiple instruction and memory write-back. 5,748,630, Cl. 370-395.000.

Bergantino, Paul V.; and Lussier, Daniel J., to Maker Communications, Inc. Asynchronous transfer mode cell processing system with multiple cell source multiplexing. 5,748,631, Cl. 370-398.000.

Bergemann, Eugene P.: *See—*

Smith, Paul K.; and Bergemann, Eugene P., 5,746,922, Cl. 210-670.000.

Berger, Albin: *See—*

Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.

Berger, Noah: *See—*

Stein, Jay A.; and Berger, Noah, 5,748,705, Cl. 378-196.000.

Bergman, Dan; and Inomoto, Takeo, to Mefos, Stiftelsen För Metallurgisk Forskning. Nozzle and method of blowing hot metal. 5,746,970, Cl. 266-225.000.

Bergmann, Wolfgang; Dreyer, Hans; and Pohl, Wolfgang, to Jost—Werke AG. Fifth wheel. 5,746,438, Cl. 280-433.000.

Berk, Douglas Michael: *See—*

Nally, Robert Marshall; Nelsen, Pete Edward; Hamilton, Douglas; and Berk, Douglas Michael, 5,748,968, Cl. 395-728.000.

Berkers, Jacobus Arnoldus Peter: *See—*

Rutten, Hendrik Gerard Jozef; Berkers, Jacobus Arnoldus Peter; and Vegter, Gert, 5,746,424, Cl. 270-37.000.

Berlam, Gary R.: *See—*

Kirschner, Ivan N.; and Berlam, Gary R., 5,746,018, Cl. 42-1.140.

Berlo, Marcelyn A.: *See—*

Dormandy, Ray H., Jr.; Berlo, Marcelyn A.; and Paul, David J., 5,746,734, Cl. 606-1.000.

Berman, Paul; and Kraushaar, Jim. Exercise apparatus. 5,746,686, Cl. 482-125.000.

Bernard, Bruno: *See—*

Charpentier, Bruno; and Bernard, Bruno, 5,747,530, Cl. 514-468.000.

Bernhard Forster GmbH: *See—*

Forster, Rolf, 5,746,593, Cl. 433-8.000.

Bernstein, Lawrence R. Methods and compositions to inhibit keratinocyte proliferation. 5,747,482, Cl. 514-184.000.

Bernstein, Michael J.: *See—*

Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Noothaar, Michael W., 5,746,697, Cl. 600-323.000.

Berry, James P.: *See—*

Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., 5,746,391, Cl. 244-54.000.

Berry, Stanley D.: *See—*

Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.

Berti, Andrea: *See—*

Spatafora, Mario; and Berti, Andrea, 5,746,872, Cl. 156-274.200.

Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, to International Business Machines Corporation. Programmable logic cell. 5,748,009, Cl. 326-39.000.

Best, Scott C., to Cypress Semiconductor, Corporation. Electrical laser fuse hybrid cell. 5,748,031, Cl. 327-525.000.

Bestel, E. Fred; and Stoving, Paul Newcomb, to Cooper Industries, Inc. Vertical antitracking skirts. 5,747,765, Cl. 218-155.000.

Beth Israel Deaconess Medical Center: *See—*

Chorev, Michael; and Rosenblatt, Michael, 5,747,456, Cl. 514-12.000.

Sytkowski, Arthur J., 5,747,446, Cl. 514-8.000.

Bettine, Dale R.; and Frederick, Thomas J., to Sensormatic Electronics Corporation. Electronic article surveillance system with comb filtering and false alarm suppression. 5,748,086, Cl. 340-572.000.

BetzDearborn Inc.: *See—*

Nguyen, Duy T.; and Ling, Tien-Feng, 5,746,888, Cl. 162-199.000.

Beuck, Martin: *See—*

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.

Beveridge, Keith A.; Bennett, Mark A.; Waeber, Kenneth R.; and Haynes, Clinton A., to Essex Specialty Products, Inc. Plunger and apparatus useful in extruding or dispensing viscous materials. 5,746,357, Cl. 222-386.000.

Bezdon, Ronald J.: *See—*

Shackle, Peter W.; Russell, Randy G.; Crouse, Kent E.; and Bezdon, Ronald J., 5,747,941, Cl. 315-224.000.

Bezick, William; Fiedler, Allen E.; Kerlee, Jody; and Hemphill, Shan. Video game competition method and apparatus. 5,746,656, Cl. 463-42.000.

Bezzant, Daniel G.: *See—*

Ketineni, Venkateswarrao; and Bezzant, Daniel G., 5,748,034, Cl. 327-551.000.

BHA Group Holdings, Inc.: *See—*

Clements, Jack T.; Thill, Anthony J.; and Mahoney, Ronald L., 5,746,792, Cl. 55-341.100.

Bhattacharya, Subhrajit; and Dey, Sujit, to NEC USA, Inc. Low cost testing method for register transfer level circuits. 5,748,647, Cl. 371-22.310.

Bickley, Robert Henry; Aragaki, Taul; Moy, Leland Lem; and Waddoups, Ray Owen. Position locating rescue transceiver. 5,748,147, Cl. 342-457.000.

Biebel, Willi: *See—*

Weber, Gerd; and Biebel, Willi, 5,748,479, Cl. 364-470.010.

Bielik, Robert S.: *See—*

Van Zeeland, Anthony J.; and Bielik, Robert S., 5,747,757, Cl. 200-5.00A.

Bienhaus, Gerhard; and Lange, Hans, to Boehringer Mannheim GmbH. Device for treating nucleic acids from a sample. 5,746,978, Cl. 422-68.100.

Bieringer, Hermann: *See—*

Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, 5,747,421, Cl. 504-214.000.

Bietti, Ivan: *See—*

Tomasini, Luciano; Castello, Rinaldo; Clerici, Giancarlo; and Bietti, Ivan, 5,748,029, Cl. 327-389.000.

Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., to Blount, Inc. Apparatus and method for loading items into component holder. 5,747,718, Cl. 86-23.000.

Billardon, Martine: *See—*

Medjad, Nadia; and Billardon, Martine, 5,747,494, Cl. 514-255.000.

Bindra, Amrit, to Engelhard Corporation. Heat stable monoazo red pigment compositions. 5,747,571, Cl. 524-190.000.

Bingham, Timothy Guy: *See—*

Stockwell, John Oliver; Bingham, Timothy Guy; and Dungworth, Howard Roger, 5,746,885, Cl. 162-5.000.

Binzer, Dan. Dual inlet gas burner. 5,746,588, Cl. 431-354.000.

Bio-Melktechnik Hoefelmayer & Co.: *See—*

Hoefelmayr, Tilman, 5,746,153, Cl. 119-14.010.

Bio-Obtention SC: *See—*

Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lucan, Dominique, 5,747,043, Cl. 424-195.100.

Bio Polymers Pty. Ltd.: *See—*

Clarke, Adrienne Elizabeth; Bacic, Antony; and Lane, Alan Gordon, 5,747,297, Cl. 435-72.000.

Bio-Sphere Technology, Inc.: *See—*

See, Jackie Ray, 5,747,464, Cl. 514-26.000.

Biomechanics, Inc.: *See—*

Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, 5,746,699, Cl. 600-529.000.

Biomembrane Institute, The: *See—*

Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.

bioMérieux Vitek, Inc.: *See—*

O'Bear, Raymond E.; Colin, Bruno; Tegeler, G. R.; and Staples, John L., 5,746,980, Cl. 422-102.000.

Biomet, Inc.: *See—*

Lewis, Ralph; and Hershberger, Troy, 5,746,768, Cl. 606-205.000.

BioTime, Inc.: *See—*

Segall, Paul E.; Waitz, Harold D.; Sternberg, Hal; and Segall, Judith M., 5,747,071, Cl. 424-663.000.

Bird, Anthony Owen, to Atlantic Scientific Corporation. Integrated hybrid surge protector architecture configured to accomodate multiple replaceable communication signal surge protection modules in common housing with AC voltage receptacle terminal strip. 5,748,430, Cl. 361-119.000.

Birkhan, Joao Augusto: *See—*

Jennebach, Markus; and Birkhan, Joao Augusto, 5,746,142, Cl. 110-248.000.

Birukawa, Masahiro: *See—*

Hino, Yasumori; Miyatake, Norio; Birukawa, Masahiro; and Nakamura, Tadashi, 5,748,592, Cl. 369-59.000.

Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., to Document Authentication Systems, Inc. System and method for electronic transmission, storage and retrieval of authenticated documents. 5,748,738, Cl. 380-25.000.

Bischel, Brian John; and Rankin, James Richard, to Vermeer Manufacturing Company. Apparatus and method for controlling an underground boring machine. 5,746,278, Cl. 175-24.000.

Bischoff, Hilmar: *See—*

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.

Bittorf, Hannjoerg: *See—*

Mika, Norbert; and Bittorf, Hannjoerg, 5,748,701, Cl. 378-109.000.

Bixel, Charles Gilbert, Jr. Surface effect planing pontoon seaplane (SEPPS). 5,746,146, Cl. 114-67.00A.

Bizerba GmbH & Co. KG: *See—*

Kraft, Horst; Purr, Horst; and Engelhardt, Edgar, 5,747,744, Cl. 177-25.150.

Blackburn, Gary F.: *See—*

Massey, Richard J.; Blackburn, Gary F.; Wilkins, Elizabeth W.; and Leland, Jonathan K., 5,746,974, Cl. 422-52.000.

Blackham, David Vernon, to Hewlett-Packard Company. Error correction method for transmission measurements in vector network analyzers. 5,748,000, Cl. 324-601.000.

Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, to International Business Machines Corporation. Shared bus non-sequential data ordering method and apparatus. 5,748,919, Cl. 395-306.000.

Blaha, John M.: *See—*

Jones, Carl H.; Blaha, John M.; and Townsend, Gail J., 5,746,221, Cl. 128-859.000.

Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., to North American Vaccine, Inc.; and Rockefeller University, The. Method for the high level expression, purification and refolding of the outer membrane group B porin proteins from *Neisseria meningitidis*. 5,747,287, Cl. 435-69.100.

Blakeman, Peter John; and Johnson, Terence Richard, to W.R. Grace & Co.-Conn. Container sealing compositions using latent cross-linking agent. 5,747,579, Cl. 524-562.000.

Blaker, David Mark; Ellard, Gregory Stephen; and Mohin, Muhammad Shafiul, to Lucent Technologies, Inc. Digital processor with viterbi process. 5,748,650, Cl. 371-43.100.

Blanc, Régis: *See—*

Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.

Blanchard, Robert R.: *See—*

McKay, Kevin W.; Blanchard, Robert R.; Feig, Edwin R.; and Kummer, Kyle G., 5,747,580, Cl. 524-576.000.

Bland, Michael James: *See—*

McFadden, James Robert; Greene, Joseph Paul; and Bland, Michael James, 5,746,419, Cl. 267-140.000.

Blank, Werner Joseph: *See—*

He, Zhigiang Alex; and Blank, Werner Joseph, 5,746,946, Cl. 252-392.000.

Blaser, Giles R.: *See—*

Smith, Michael J.; and Blaser, Giles R., 5,746,569, Cl. 414-790.400.

Blaugher, Richard D., to Midwest Research Institute. Two chamber reaction furnace. 5,747,099, Cl. 427-62.000.

Bleasdale, Desmond Harold, to Form-Rite Plastics Development Pty., Ltd. Former for core sandwich in composite reinforced plastics. 5,747,142, Cl. 428-167.000.

Blindt, Renoo Avinash: *See—*

Bows, John Richard; Blindt, Renoo Avinash; Hurling, Robert; and Mullin, James Thomas, 5,747,086, Cl. 426-234.000.

Bliss, Arthur E., to Phoenix Precision Graphics, Inc. Charge compensation circuit for an electrostatic writing head. 5,748,217, Cl. 347-141.000.

Blodgett, Fred B.: *See—*

Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.

Blomenkamp, Horst: *See—*

Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, 5,746,619, Cl. 439-352.000.

Blondeel, Eric Jozef Gentil: *See—*

Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.

Bloom, Debra; Fathman, C. Garrison; and Slaymaker, Sarah, to Leland Stanford Junior University, The Board of Trustees of the. Anergy genes. 5,747,299, Cl. 435-91.200.

Bloom, Robert. Hair treatment timer receptacle with detachable timer. 5,746,348, Cl. 222-39.000.

Bloom, Stuart J.; and Nichols, Lorna, to Pockets of Learning, Ltd. Flat stuffed doll and clothing combination. 5,746,639, Cl. 446-98.000.

Blough, Bruce: *See—*

Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., 5,747,503, Cl. 514-294.000.

Blount, Inc.: *See—*

Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.

Blum, Joachim: *See—*

Stegen, Helga; Blum, Joachim; and Kerlin, Klaus-Günter, 5,747,114, Cl. 427-380.000.

Boar, Robin Bernad; Cross, Alan John; Gray, Duncan Alastair; and Green, Richard Alfred, to Astra Aktiebolag. Heterocyclic compounds and compositions having nevropharmacological potential. 5,747,515, Cl. 514-359.000.

Board of Regents, The University of Texas System: *See—*

Newgard, Christopher B., 5,747,325, Cl. 435-240.200.

Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.

Board of Supervisors of Louisana State Univ.: *See—*

Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., 5,747,659, Cl. 536-23.400.

Board of Trustees of Leland Stanford Jr. University, The: *See—*

Pontius, Brian Wylie, 5,747,254, Cl. 435-6.000.

Board of Trustees operating Michigan State University: *See—*

Boyd, Stephen A.; and Kukkadapu, Ravi, 5,747,403, Cl. 502-62.000.

Boatwright, Darrell L.: *See—*

Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.

Miller, Phillip; Walter, Jerry L.; Boatwright, Darrell L.; and Schultz, Darald R., 5,747,785, Cl. 235-472.000.

Bobst SA: *See—*

Monney, Patrick, 5,747,795, Cl. 250-227.240.

BOC Group, Inc., The: *See—*

Lehan, John; Byorum, Henry; Hill, Russell J.; and Rough, J. Kirkwood, 5,746,894, Cl. 204-192.120.

BOC Group PLC, The: *See—*

O'Neill, William, 5,747,771, Cl. 219-121.840.

Bock, Mark G.; Lumma, William C.; and Patane, Michael A., to Merck & Co., Inc. Alpha 1b adrenergic receptor antagonists. 5,747,490, Cl. 514-233.800.

Bockelman, David E., to Motorola, Inc. Calibration technique for a network analyzer. 5,748,506, Cl. 364-571.020.

Bodin, Alvin L.: *See—*

Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.

Bodnar, David A., to Steelcase Inc. Armrest attachment for chair. 5,746,479, Cl. 297-411.260.

- Boebel, Manfred: *See—*
  - Prestel, Stephan; Boebel, Manfred; Reich, Harry; and Messroghli, Hossein, 5,746,750, Cl. 606-119.000.
- Boeckh, Dieter: *See—*
  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
- Boecking, Friedrich; and Haug, Stefan, to Robert Bosch GmbH. Fuel injection valve for internal combustion engines. 5,746,181, Cl. 123-470.000.
- Boedecker, Todd Jay, to GM Nameplate, Inc. Electroluminescent backlit keypad. 5,747,756, Cl. 200-5.00A.
- Boehm, Alfred; Lehner, Edwin; and Messerschmidt, Werner, to Marker Deutschland GmbH. Spacer-plate arrangement for ski bindings. 5,746,439, Cl. 280-602.000.
- Boehringer Ingelheim Pharmaceuticals, Inc.: *See—*
  - Hargrave, Karl D.; and Proudfoot, John R., 5,747,488, Cl. 514-219.000.
- Boehringer Mannheim GmbH: *See—*
  - Bienhaus, Gerhard; and Lange, Hans, 5,746,978, Cl. 422-68.100.
  - Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, 5,747,326, Cl. 435-240.200.
  - Kohnert, Ulrich; Fischer, Stephan; Markl, Hans-Jörg; and Woog, Heinrich, 5,747,030, Cl. 424-94.640.
  - Sattler, Stephan, 5,747,350, Cl. 436-180.000.
- Boeing Company, The: *See—*
  - Engwall, Dwight L., 5,746,553, Cl. 409-132.000.
  - Gast, Mark E., 5,746,392, Cl. 244-76.00B.
  - Gunnoe, Lowell G.; Kawada, Hideo; and Nutting, Philip C., 5,746,394, Cl. 244-111.000.
  - Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,747,179, Cl. 428-586.000.
- Boergardts, Peter; Krischke, Wolfgang; and Troesch, Walter, to Fraunhofer-Gesellschaft zur Foerder der Angewandten Forschung e.V. Process for purifying dairy wastewater. 5,746,920, Cl. 210-611.000.
- Boettger, Eckart: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
- Boeyen, Johannes Wilhelmus; and Meerdink, Jan Johannes, to Stork Protecon-Langen B.V. Apparatus and method for making a cut in and particularly removing the spine from a half. 5,746,648, Cl. 452-156.000.
- Bogart, Michael W., to United States Surgical Corporation. Method of energy beam forming surgical incision members. 5,747,770, Cl. 219-121.720.
- Boggs, David L., to Ford Motor Company. Engine cylinder block cooling passage. 5,746,161, Cl. 123-41.720.
- Bohan, Anne E.; Buchanan, John M.; and Szajewski, Richard P., to Eastman Kodak Company. Method for providing a color display image using duplitized color silver halide photographic elements. 5,747,228, Cl. 430-380.000.
- Böhnke, Bernd, to H.Krantz Textiltechnik GmbH. System for conveying and treating an endless textile loop. 5,746,072, Cl. 68-178.000.
- Boie, Werner, to Thomson Multimedia S.A. Method of digitization of intermediate frequency signals in particular television signals, and device for implementation of the method. 5,748,262, Cl. 348-726.000.
- Bokamper, Ralf: *See—*
  - Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, 5,746,619, Cl. 439-352.000.
- Boliden Mineral AB: *See—*
  - Lindgren, Per-Olov; Johansson, Karl-Erik; Johansson, Kjell-Åke; and Paulsson, Karin, 5,747,724, Cl. 102-459.000.
- Boliek, Martin: *See—*
  - Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, 5,748,786, Cl. 382-240.000.
- Bolles, Michael, to Advanced Pathology Systems, Inc. Method and apparatus for automatic archival storage of tissue sample sections cut from a sample block. 5,746,855, Cl. 156-64.000.
- Bomatic, Inc.: *See—*
  - Hestehave, Borge; and Hestehave, Kjeld, 5,746,151, Cl. 114-343.000.
- Bombardier, Inc.: *See—*
  - Matte, Sylvain, 5,746,054, Cl. 60-310.000.
- Bonerb, Timothy C. Device and method for removing ice and snow from roofs and overhangs. 5,746,027, Cl. 52-1.000.
- Bonnelycke, Mark Emil: *See—*
  - Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, 5,748,920, Cl. 395-308.000.
- Bonner, Tom I.; Brann, Mark Robert; and Buckley, Noel J., to United States of America, Health and Human Services. Cloned human genes for muscarinic acetylcholine receptors and cells lines expressing same. 5,747,336, Cl. 435-325.000.
- Bonte, Frédéric: *See—*
  - Meybeck, Alain; Bonte, Frédéric; Dumas, Marc; and Chaudagne, Catherine, 5,747,538, Cl. 514-570.000.
- Bonutti, Peter M. Armrest assembly. 5,746,480, Cl. 297-411.350.
- Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, to Ludwig Institute For Cancer Research. Method for identifying individuals suffering from a cellular abnormality some of whose abnormal cells present complexes of HLA-A2/tyrosinase derived peptides, and methods for treating said individuals. 5,747,271, Cl. 435-7.240.
- Boos, Alfred: *See—*
  - Loose, Werner; Korec, Jacek; Niemann, Ekkehard; and Boos, Alfred, 5,747,831, Cl. 257-77.000.
- Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., to International Business Machines Corporation. Direct chip attachment (DCA) with electrically conductive adhesives. 5,747,101, Cl. 427-96.000.
- Booth, Richard B.: *See—*
  - Lakshminarayan, Udaykumar; McAlea, Kevin P.; and Booth, Richard B., 5,749,041, Cl. 419-2.000.
- Borg, Jens: *See—*
  - Mazess, Richard B.; Borg, Jens; and Ergun, David L., 5,748,704, Cl. 378-54.000.
- Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., to United States of America, National Aeronautics and Space Administration. Optical flameout detector. 5,748,090, Cl. 340-578.000.
- Bormann, James Edward: *See—*
  - Foo, Chek-Peng; and Bormann, James Edward, 5,746,444, Cl. 280-735.000.
- Boroomand, Mohammad R.: *See—*
  - Saneii, Hossain; Boroomand, Mohammad R.; and Ferriell, Michael R., 5,746,982, Cl. 422-134.000.
- Borshchevsky, Alexander: *See—*
  - Fleurial, Jean-Pierre; Caillat, Thierry F.; and Borshchevsky, Alexander, 5,747,728, Cl. 136-203.000.
- Borst, Inc.: *See—*
  - Tsenter, Boris, 5,746,064, Cl. 62-480.000.
- Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, to Lever Brothers Company, Division of Conopco, Inc. Stick pretreater compositions containing hydrophobically modified polar polymers. 5,747,442, Cl. 510-475.000.
- Bos, Philip J.: *See—*
  - Huang, Xiao-Yang; Bos, Philip J.; and Yang, Deng-Ke, 5,748,277, Cl. 349-169.000.
- Bos, Willem Jan Wubbo; and Wesseling, Karel Hendrik, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO. Method and device for determining brachial arterial pressure wave on the basis of nonivasively measured finger blood pressure wave. 5,746,698, Cl. 600-493.000.
- Bosch Systems De Freinage: *See—*
  - Gautier, Jean Pierre; and Verbo, Ulysse, 5,746,107, Cl. 91-376.00R.
- Boscovic, Dragan; Valentine, Stephen; Bastani, Babak; and Wray, Anthony, to Motorola, Inc. Method for amplifier training in a linear power amplifier. 5,748,038, Cl. 330-2.000.
- Boss, Christoph; and Bachmann, Hubert, to Meritor Automotive GmbH. Drive apparatus for sliding roofs for automobiles. 5,746,090, Cl. 74-89.170.
- Bossert, Marie-Claude: *See—*
  - Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, 5,746,529, Cl. 401-18.000.
- Boston Scientific Corporation: *See—*
  - Abele, John E.; and Sahatjian, Ronald A., 5,746,745, Cl. 606-108.000.
  - Sullivan, Roy H.; and Gellman, Barry N., 5,746,753, Cl. 606-147.000.
- Boston Scientific Technology, Inc.: *See—*
  - Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., 5,746,763, Cl. 606-193.000.
- Bothast, Rodney J.: *See—*
  - Saha, Badal C.; and Bothast, Rodney J., 5,747,320, Cl. 435-209.000.
- Bottesch, H. Werner. Armed terrorist immobilization (ATI) system. 5,747,719, Cl. 89-1.100.
- Bouc, Gary L.: *See—*
  - Waltke, David L.; and Bouc, Gary L., 5,746,343, Cl. 220-9.200.
- Bouchard, Martin: *See—*
  - L'Espérance, André; Bouchard, Martin; Paillard, Bruno; and Guigou, Catherine, 5,748,750, Cl. 381-71.500.
- Boucherie, Leonel Polydore, to G.B. Boucherie N.V. Brush body feeding device. 5,746,482, Cl. 300-11.000.
- Bouilloux, Alain: *See—*
  - Breant, Patrice; and Bouilloux, Alain, 5,747,605, Cl. 525-437.000.
- Boulaev, Anatoli S., to General Signal Corporation. Temperature control system for growing high-purity monocrystals. 5,746,828, Cl. 117-201.000.
- Bourdon, Karl-Heinz: *See—*
  - Jaroschek, Christoph; and Bourdon, Karl-Heinz, 5,747,076, Cl. 425-145.000.
- Bourns, Inc.: *See—*
  - Kwiat, Karol; Sheehan, John; Brown, Ricky; and Doyle, Pat, 5,746,626, Cl. 439-630.000.
- Boutin, Robert J.: *See—*
  - Caye, Mark A.; and Boutin, Robert J., 5,746,475, Cl. 296-223.000.
- Bovenberg, Roelof Ary Lans; Vollebregt, Adrianus Wilhelmus Hermanus; and Van Solingen, Pieter, to Gist-Brocades, NV. DNA comprising regulatory regions from gene y of *penicillium chrysogenum* . 5,747,285, Cl. 435-69.700.
- Bowater Packaging Limited: *See—*
  - Tallentire, Alan; and Sinclair, Colin Samuel, 5,747,110, Cl. 427-244.000.
- Bowerman, Dean E. Board holding device. 5,746,421, Cl. 269-41.000.
- Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, to Duriron Company, Inc., The. Adjustable ball valve. 5,746,417, Cl. 251-315.120.
- Bowlby, James O., Jr.: *See—*

  - Allison, Daniel B.; and Bowlby, James O., Jr., 5,748,491, Cl. 364-497.000.
- Bowling, John M. Remotely controlled stump cutter or similar apparatus. 5,746,261, Cl. 144-24.120.
- Bowman, John H. Apparatus for cleaning conveyors. 5,746,302, Cl. 198-496.000.
- Bowman, Steven R.; Feldman, Barry J.; and Shaw, Leslie B., to United States of America, Navy. Erbium-doped low phonon hosts as sources of fluorescent emission. 5,746,942, Cl. 252-301.40H.
- Bows, John Richard; Blindt, Renoo Avinash; Hurling, Robert; and Mullin, James Thomas, to Unilever Patent Holdings B.V. Method of cooking a food product using a mode filtering structure. 5,747,086, Cl. 426-234.000.
- Boyce, Walter A.: *See—*
  - Gandhi, Harish F.; Boyce, Walter A.; and Woodward, David R., 5,747,919, Cl. 313-318.010.
- Boyd, Andrew Wallace: *See—*
  - Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, 5,747,032, Cl. 424-133.100.
- Boyd, Douglas E.: *See—*
  - Burton, Charles A.; Boyd, Douglas E.; Haubert, Thomas D.; and Belt, James S., 5,746,830, Cl. 118-308.000.
- Boyd, Stephen A.; and Kukkadapu, Ravi, to Board of Trustees operating Michigan State University. Organophilic, quaternary phosphonium ion-exchanged smectite clays. 5,747,403, Cl. 502-62.000.
- Boyd, Trace L.; Beer, Richard D.; Terbeek, Eric A.; and Wong, Vernon W. H., to Lam Research Corporation. Chamber interfacing O-rings and method for implementing same. 5,746,434, Cl. 277-1.000.
- Boydstun Metal Works Inc.: *See—*
  - Boydstun, Robert D., IV; and Huey, John T., 5,746,554, Cl. 410-12.000.
- Boydstun, Robert D., IV; and Huey, John T., to Boydstun Metal Works Inc. Tie-down method for vehicle transporter. 5,746,554, Cl. 410-12.000.
- Boylan, Turlach Paul: *See—*
  - Scott, Danny E.; Pessier, Rudolf Carl Otto; and Boylan, Turlach Paul, 5,746,280, Cl. 175-374.000.
- Boyle, Francis Thomas: *See—*
  - Bavetsias Vassilios; Boyle, Francis Thomas; Hennequin, Laurent Francois Andre; and Marriott, Jonathan Hugh, 5,747,499, Cl. 514-267.000.
- BP Chemicals Limited: *See—*
  - Little, Ian Raymond; and McNally, John Paul, 5,747,405, Cl. 502-113.000.
- Braca, Giancarlo: *See—*
  - Pinoca, Leonardo; Africano, Renato; and Braca, Giancarlo, 5,747,160, Cl. 428-364.000.
- Braconnier, Jean-Jacques, to Rhone-Poulenc Chimie. Granular lanthanum/cerium/terbium/mixer phoshates having characteristic morphology and green luminophors comprised thereof. 5,746,944, Cl. 252-301.40P.
- Bradley, Donal Donat Conor: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Bradt, Rexford H., to Materials Research Innovations Corporation. Compartmented thermoplastic pellets. 5,747,548, Cl. 521-57.000.
- Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, to Ecolab, Inc. Liquid chemical dilution and dosing system. 5,746,238, Cl. 137-3.000.
- Brady, Steven Garvin. Batting swing training device. 5,746,670, Cl. 473-451.000.
- Braggins, Timothy T.: *See—*
  - Young, Robert M.; Freidhoff, Carl B.; Braggins, Timothy T.; and Congedo, Thomas V., 5,747,815, Cl. 250-423.00R.
- Brand, Gerd T.: *See—*
  - Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.
- Brand, Jerry D.: *See—*
  - Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.
- Brandenberg, Carl Brock. Apparatus for supporting modular and cooperating components. 5,746,334, Cl. 211-205.000.
- Brandes, Lorne J. Treatment method for cancer. 5,747,543, Cl. 514-651.000.
- Brandon, Malcolm Roy: *See—*
  - Emtage, John Spencer; and Brandon, Malcolm Roy, 5,747,290, Cl. 435-69.400.
- Brandt, Calvin, to McNeilus Truck and Manufacturing, Inc. Hydraulic leak detection system. 5,748,077, Cl. 340-450.000.
- Brann, Mark Robert: *See—*
  - Bonner, Tom I.; Brann, Mark Robert; and Buckley, Noel J., 5,747,336, Cl. 435-325.000.
- Brannon, Sherwood: *See—*
  - Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, 5,748,920, Cl. 395-308.000.
- Branson, Gregory W.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Branston, David-Walter: *See—*
  - Amft, Dietrich; Branston, David-Walter; Kieser, Jörg; and Maier, Reinhard, 5,747,984, Cl. 324-71.200.
- Brassfield, Steven R.; and Webb, Alan L., to General Electric Company. Retention system for bar-type damper of rotor. 5,746,578, Cl. 416-190.000.
- Bratten, Scott J. Electrical connection bar assembly and housing. 5,746,627, Cl. 439-721.000.
- Braun, David B.: *See—*
  - Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, 5,748,271, Cl. 349-69.000.
- Braun, John A.: *See—*
  - Krivec, Bert; Petruzzi, Thomas B.; and Braun, John A., 5,746,298, Cl. 192-48.300.
- Braunschweigische Maschinenbauanstalt AG: *See—*
  - Ebeling, Ralf-Martin, 5,746,915, Cl. 210-363.000.
- Bray, Lane Allan; and DesChane, Jaquetta R., to Battelle Memorial Institute. Bismuth generator method. 5,749,042, Cl. 423-2.000.
- Breant, Patrice; and Bouilloux, Alain, to Elf Atochem S.A. Mixtures of polymers including a halogen-containing polymer and compatibilized with a grafted aliphatic polyester. 5,747,605, Cl. 525-437.000.
- Breaux, Terry: *See—*
  - Dishner, Teddy L.; and Breaux, Terry, 5,745,960, Cl. 24-381.000.
- Brechtel, James P.; and La Buhn, Greg, to MCI Communications Corporation. Common channels for inter-application communications. 5,748,962, Cl. 395-701.000.
- Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, to Dynamit Nobel Aktiengesellschaft. Method for unlocking a window pane of a railroad car with an inflatable pressure tube. 5,746,026, Cl. 49-506.000.
- Breed, David S.; and Sanders, William Thomas, to Automotive Technologies International, Inc. Plastic film airbag. 5,746,446, Cl. 280-743.100.
- Breed, David S.; and DuVall, Wilbur E., to Automotive Technologies International, Inc. Automatic vehicle seat adjuster. 5,748,473, Cl. 364-424.055.
- Breeds, Christopher D.: *See—*
  - Hindle, David J.; Breeds, Christopher D.; Conway, Jeremy J.; Morris, Ian W.; and Ledgerwood, Eric, 5,746,540, Cl. 405-131.000.
- Breen, Bernard P.; Gabrielson, James E.; and Cavello, Joseph, to Duquesne Light Company. Method and apparatus for nox reduction by upper furnace injection of coal water slurry. 5,746,144, Cl. 110-345.000.
- Brendel, Joachim: *See—*
  - Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.
- Brenner, Larry Bert: *See—*
  - Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., 5,748,958, Cl. 395-670.000.
- Brenner, Michael; and Der Simonian, Harout, to Brigham & Women's Hospital and Dana Farber Cancer Institute. Methods and compositions for detecting and treating a subset of human patients having an autoimmune disease. 5,747,036, Cl. 424-144.100.
- Brenner, Sydney, to Lynx Therapeutics, Inc. Polynucleotide detection by isothermal amplification using cleavable oligonucleotides. 5,747,255, Cl. 435-6.000.
- Bretfeld, Anton: *See—*
  - Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.
- Bretin, François: *See—*
  - Agouridas, Constantin; Bretin, François; and Chantot, Jean-François, 5,747,467, Cl. 514-29.000.
- Breton, Marcel P.: *See—*
  - Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., 5,747,554, Cl. 523-161.000.
- Bricaud, Herve Guy; and Valcher, Fabrice, to ITT Composants et Instruments. Smart card electrical connector. 5,746,607, Cl. 439-66.000.
- Brichard, Vincent: *See—*
  - Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.
- Bridgestone Corporation: *See—*
  - Moriyama, Sadao, 5,746,860, Cl. 156-111.000.
- Briggs, John C.; Patterson, Robert S.; and Dewey, Jason, to Iomega Corporation. Slotted flex circuit for a disk drive actuator. 5,748,410, Cl. 360-106.000.
- Brigham & Women's Hospital and Dana Farber Cancer Institute: *See—*
  - Brenner, Michael; and Der Simonian, Harout, 5,747,036, Cl. 424-144.100.
- Brighton, Everett W. Electric propulsion system for a vehicle. 5,746,283, Cl. 180-65.300.
- Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, to Alcatel Alsthom Compagnie Generale D'Electricite. Method of fabricating a surface emitting semiconductor laser. 5,747,366, Cl. 438-44.000.
- Brink, Kevin B.: *See—*
  - Rice, Robert M.; Brink, Kevin B.; and Hansen, David J., 5,746,024, Cl. 47-58.000.
- Brinkmann, Ulrich: *See—*
  - Pastan, Ira H.; Lee, Byungkook; Jung, Sun-Hee; and Brinkmann, Ulrich, 5,747,654, Cl. 530-391.700.
- Bristol-Myers Squibb Company: *See—*

/OL
2 10
SS
1
MY
5
998
MI

  - Brown, Keith, 5,746,779, Cl. 8-426.000.
  - Marinier, Anne; and Martel, Alain, 5,747,463, Cl. 514-25.000.
  - Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., 5,747,037, Cl. 424-154.100.
  - Runciman, Robert John; and Allard, Randall N., 5,746,742, Cl. 606-69.000.
- Britax Child-Care Products Pty Ltd: *See—*
  - Lumley, Micheal Andrew; and Maciejczyk, Wieslaw Peter, 5,746,478, Cl. 297-256.130.
- British Biotech Pharmaceuticals Limited: *See—*
  - Beckett, Raymond Paul; Whittaker, Mark; Miller, Andrew; and Martin, Fionna Mitchell, 5,747,514, Cl. 514-352.000.
- British Technology Group Limited: *See—*
  - Bavetsias, Vassilios; Boyle, Francis Thomas; Hennequin, Laurent Francois Andre; and Marriott, Jonathan Hugh, 5,747,499, Cl. 514-267.000.
  - Brown, Brian Hilton; and Barber, David Charles, 5,746,214, Cl. 128-693.000.
- British Telecommunications pubic limited company: *See—*
  - Cassidy, Stephen Anthony; Smyth, Peter Paul; Williams, Douglas Lawrence; and White, Trevor Keith, 5,748,813, Cl. 385-24.000.
- British Telecommunications public limited company: *See—*
  - Barrett, Paul Alexander, 5,749,067, Cl. 704-233.000.
  - Grace, Andrew, 5,748,098, Cl. 340-825.160.
  - Parke, Ian, 5,748,248, Cl. 348-416.000.
- Brittle, Allan C., Jr.: *See—*
  - Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.
- Brizzi, Marco; Fantini, Andrea; and Gamberini, Antonio, to G.D Societa' Per Azioni. Storage unit for elongated elements particularly cigarettes. 5,746,300, Cl. 198-347.300.
- Broberg, James. Bird feeder hanging device system. 5,746,461, Cl. 294-19.100.
- Bromfield, George; and Vaitekunas, Jeffrey J., to Ethicon Endo-Surgery, Inc. Internal ultrasonic tip amplifier. 5,746,756, Cl. 606-169.000.
- Brooke, Jason C.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M C., 5,745,937, Cl. 5-624.000.
- Brooks, David P., II: *See—*
  - Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.
- Brophy, Robert C.; Wooters, Eldon W.; and Capps, R. Scott, to Tuefco Manufacturing, Incorporated. Electronic dog fence installer. 5,746,541, Cl. 405-174.000.
- Brother Kogyo Kabushiki Kaisha: *See—*
  - Hattori, Yutaka, 5,748,352, Cl. 359-196.000.
  - Inukai, Atsuomi, 5,748,180, Cl. 345-161.000.
  - Minamizawa, Fumihiro, 5,748,337, Cl. 358-468.000.
  - Mizuno, Masahiro, 5,748,480, Cl. 364-470.090.
  - Nonomura, Yutaka, 5,748,712, Cl. 379-93.000.
  - Takagi, Osamu, 5,748,212, Cl. 347-55.000.
  - Takayanagi, Toshihiro; Yanase, Kenji; and Muramatsu, Kiyoji, 5,748,859, Cl. 395-109.000.
  - Taki, Kazunari; and Matsuda, Riki, 5,748,421, Cl. 360-135.000.
  - Yamane, Toshiyuki, 5,748,206, Cl. 347-37.000.
- Brothers, Ann Janice, to Pacific Biomedical Research, Inc. Culture media having low osmolarity for establishing and maintaining hormone-secreting cells in long-term culture. 5,747,341, Cl. 435-404.000.
- Brotz, Gregory R. Pallette dispenser. 5,746,351, Cl. 222-106.000.
- Brough, Steve A.; and Deppen, John F., to Keystone Industries, Inc. Double acting center-of-car cushioning device. 5,746,335, Cl. 213-43.000.
- Broussalian, Chris: *See—*
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Broussard, Fabio; Adovasio, Mauro; and Roncalli, José, to Great Lakes Chemical Italia S.r.l. Dihydropyridines as vulcanization accelerators for natural or synthetic rubbers. 5,747,601, Cl. 525-375.000.
- Browder, George A., Jr.: *See—*
  - Popa, Catrinel I.; Browder, George A., Jr.; and Segraves, Archie Dale, 5,746,068, Cl. 66-176.000.
- Brown, Adam Richard: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Brown, Brian Hilton; and Barber, David Charles, to British Technology Group Limited. Investigation of a body. 5,746,214, Cl. 128-693.000.
- Brown, David L.; Stellon, Andrew P.; and Gemma, Edward A., Jr., to United States Surgical Corporation. Suture retainer and method. 5,746,311, Cl. 206-63.300.
- Brown, David M.; Eslick, Russell D.; and Robinson, Kurt B., to Intel Corporation. Memory card with erasure blocks and circuitry for selectively protecting the blocks from memory operations. 5,749,088, Cl. 711-115.000.
- Brown, Harold: *See—*
  - Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, 5,748,221, Cl. 347-232.000.
- Brown, John Seely: *See—*
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Brown, Keith, to Bristol-Myers Squibb Company. Quaternized blue anthraqinone hair dyes in an isatin/amine dye system. 5,746,779, Cl. 8-426.000.
- Brown, Michael Dale; Duncan, Frank Louis; and Bentley, Ralph Talmadge, II, to Whitaker Corporation, The. Electrical connector seal cap assembly. 5,746,611, Cl. 439-135.000.
- Brown, Neil Leonard: *See—*
  - Parker, Barry John; Krinickas, Alexander; Stilwell, John Douglas; and Brown, Neil Leonard, 5,746,580, Cl. 416-245.00R.
- Brown, Richard James; Sun, King-Mo; and Frasier, Deborah Ann, to Du Pont de Nemours, E. I., and Company. Dihydroazole compounds and their use for controlling fungal plant diseases. 5,747,516, Cl. 514-359.000.
- Brown, Ricky: *See—*
  - Kwiat, Karol; Sheehan, John; Brown, Ricky; and Doyle, Pat, 5,746,626, Cl. 439-630.000.
- Brown, Robert Joseph: *See—*
  - Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, 5,746,417, Cl. 251-315.120.
- Brown, Steven E.; and Suddeth, Bruce H., to Milliken Research Corporation. Coated seed having improved colorant. 5,746,022, Cl. 47-57.600.
- Brown, Thomas C.: *See—*
  - Cosman, Michael; and Brown, Thomas C., 5,748,867, Cl. 395-130.000.
- Brown University Research Foundation: *See—*
  - Maris, Humphrey J; and Stoner, Robert J, 5,748,317, Cl. 356-357.000.
  - Maris, Humphrey J.; and Stoner, Robert J., 5,748,318, Cl. 356-381.000.
- Bruas, Michel: *See—*
  - Bruas, Michel Y.; and Cainaud, Henri J., 5,746,411, Cl. 248-635.000.
- Bruas, Michel Y.; and Cainaud, Henri J., to Bruas, Michel. Suspension pad designed to be interposed between two structural elements, in particular between a frame and a container tank. 5,746,411, Cl. 248-635.000.
- Brubaker, Michael A.; and Frimpong, George K., to ABB Power T&D Company Inc. Materials characterization cell for polarization spectrum and streaming electrification measurements. 5,747,992, Cl. 324-663.000.
- Bruccoleri, Melchiorre; Demicheli, Marco; Patti, Giuseppe; and Pisati, Valerio, to SGS-Thomson Microelectronics, S.r.l. Reduced current quadratic digital/analog converter with improved settling-time. 5,748,128, Cl. 341-144.000.
- Bruderer AG: *See—*
  - Eigenmann, Oskar, 5,746,123, Cl. 100-208.000.
- Brugger, Hubert, to Voith Sulzer Papiermaschinen GmbH. Temperature control in a paper machine dryer. 5,746,009, Cl. 34-446.000.
- Bruker-Franzen Analytik GmbH: *See—*
  - Franzen, Jochen, 5,747,799, Cl. 250-288.000.
- Brunner, Dieter; Damrath, Joachim; and Kornberger, Martin, to Gaggenau Hausgerate GmbH. Holding device for a cooking product carrier. 5,746,118, Cl. 99-427.000.
- Brunswick Corporation: *See—*
  - Schroeder, Bruce A.; and Horak, James Michael, 5,746,270, Cl. 165-41.000.
  - Staerzl, Richard E., 5,747,892, Cl. 307-95.000.
- Brust, David P.: *See—*
  - Reiter, Thomas Carl; Soscia, Peter P.; and Brust, David P., 5,746,864, Cl. 156-220.000.
- Bryce, Graeme Findlay; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Vitamin D3 analogs useful for reversing the photodamage in sun-exposed skin. 5,747,479, Cl. 514-167.000.
- Bryfogle, Robert D.: *See—*
  - Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby I., Jr., 5,748,640, Cl. 371-21.300.
- Brzezinski, Philip: *See—*
  - Shiff, Victor; Fishman, Neil S.; and Brzezinski, Philip, 5,748,895, Cl. 395-200.090.
- Buchanan, Jeffrey James: *See—*
  - Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, 5,746,306, Cl. 200-283.000.
- Buchanan, John M.: *See—*
  - Bohan, Anne E.; Buchanan, John M.; and Szajewski, Richard P., 5,747,228, Cl. 430-380.000.
- Buchin, Michael P. High-speed optical switch. 5,748,812, Cl. 385-18.000.
- Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, to United States of America, Army. Modular artillery charge system. 5,747,723, Cl. 102-282.000.
- Buckley, Noel J.: *See—*
  - Bonner, Tom I.; Brann, Mark Robert; and Buckley, Noel J., 5,747,336, Cl. 435-325.000.
- Buckley, Paul: *See—*
  - Jefferson, John Roderick; Collingborn, Peter Alban George; Cooke, Michael Peter; and Buckley, Paul, 5,746,180, Cl. 123-447.000.
- Buechner, Karl-Heinz: *See—*
  - Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.

  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
- Buer, Myron: *See—*
  - Priebe, Gordon W.; and Buer, Myron, 5,748,070, Cl. 340-146.200.
- Bugten, Bjarne: *See—*
  - Svenning, Bjørnar; Hals, Tormod; and Bugten, Bjarne, 5,747,754, Cl. 181-401.000.
- Bühler AG: *See—*
  - Greminger, Hansueli; and Schoenenberger, Niklaus, 5,747,675, Cl. 73-104.000.
- Bull, Christine R.: *See—*
  - Howarth, M. Scott; Tillett, Robin D.; and Bull, Christine R., 5,748,324, Cl. 356-425.000.
- Bull, John W. Walking exercise machine. 5,746,681, Cl. 482-53.000.
- Bullard, Horace. Multi-port fluid valve. 5,746,251, Cl. 137-625.120.
- Bulot, Jean-Paul: *See—*
  - Roberts, David Alan; Cramp, Susan Mary; Wallis, Derek Ian; and Bulot, Jean-Paul, 5,747,424, Cl. 504-271.000.
- Bulpitt, Malcolm Robert: *See—*
  - Finbow, John Robert; and Bulpitt, Malcolm Robert, 5,746,899, Cl. 204-415.000.
- Bunnell, Dale Leon: *See—*
  - Parks, Thomas Dewayne; Turner, Michael Rolland; Bunnell, Dale Leon; and Teeter, Gary Wilson, 5,746,132, Cl. 101-483.000.
- Bunshah, Rointan F.; Doerr, Hans J.; and Jou, Shyankay, to University of California, The Regents of the. Plasma enhanced chemical transport process for forming diamond films. 5,747,118, Cl. 427-577.000.
- Burazin, Mark Alan: *See—*
  - Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, 5,746,887, Cl. 162-109.000.
- Burdoin, Robert B.: *See—*
  - Kingston, Samuel C.; Burdoin, Robert B.; and Lamensdorf, David, 5,748,151, Cl. 343-753.000.
- Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., to Chiron Corporation. Recombinant herpes simplex gB-gD vaccine. 5,747,039, Cl. 424-186.100.
- Burkert Werke GmbH & Co.: *See—*
  - Hettinger, Gerhard; and Rutsch, Walter, 5,746,079, Cl. 72-57.000.
- Burkhart, Stephen S., to Arthrex, Inc. Double-diameter knot pusher. 5,746,752, Cl. 606-139.000.
- Burkoth, Terry L.: *See—*
  - Lee, Eun Soo; Watanabe, Tyler; Gale, Robert M.; and Burkoth, Terry L., 5,747,065, Cl. 424-448.000.
- Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., to United States of America, Energy. Position and orientation tracking system. 5,748,321, Cl. 356-386.000.
- Burlacot, Laurence, to Compagnie Générale des Etablissements Michelin - Michelin Cie. Radial heavy-duty truck tire with crown reinforcement having a multipartite ply. 5,746,853, Cl. 152-531.000.
- Burlew, Joan V.: *See—*
  - Fanelli, Anthony; Behi, Mohammad; Ballard, Clifford Palmer, Jr.; and Burlew, Joan V., 5,746,957, Cl. 264-109.000.
- Burmeister, Kevin L.: *See—*
  - Hanna, Scott C.; and Burmeister, Kevin L., 5,746,914, Cl. 210-266.000.
- Burn, Paul Leslie: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Burnett, Debbie L.; Dubash, Darius D.; Ladas, Athanasios S.; and Wong, Victor M., to Pfizer Inc. Psoriasis treatment. 5,747,064, Cl. 424-443.000.
- Burns, David W.: *See—*
  - Herb, William R.; and Burns, David W., 5,747,705, Cl. 73-862.590.
- Burns, James M. Wild fire suppressor for utility poles. 5,746,031, Cl. 52-170.000.
- Burns, Ronnie R.; and Nagarajan, Ram, to HE Holdings, Inc. Residual coding of model failure regions in compressed video sequences. 5,748,241, Cl. 348-390.000.
- Burns, Stanley G.: *See—*
  - Shanks, Howard R.; Burns, Stanley G.; and Jeffrey, Frank R., III, 5,747,928, Cl. 313-498.000.
- Burroughes, Jeremy Henley: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Burton, Charles A.; Boyd, Douglas E.; Haubert, Thomas D.; and Belt, James S., to Owens-Corning Fiberglas Technology, Inc. Pneumatic granule blender for asphalt shingles. 5,746,830, Cl. 118-308.000.
- Burton Corporation, The: *See—*
  - Dodge, David J., 5,745,959, Cl. 24-68.0SK.
- Burton, Harold M., to Scientech Inc. Rack loader and method for transuranic transfers into and out of storage. 5,748,692, Cl. 376-272.000.
- Bush, James W.: *See—*
  - Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 5,745,992, Cl. 29-888.022.
- Busman, Stanley C.: *See—*
  - Zaklika, Krzysztof A.; Busman, Stanley C.; and Cuny, Gregory D., 5,747,217, Cl. 430-158.000.
- Buss, Heiko: *See—*
  - Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.
- Bustamante, Herman A.; and Chen, Horen, to Stanford Telecommunications, Inc. Multi-application wireless direct sequence spread spectrum digital cellular telephone system. 5,748,610, Cl. 370-208.000.
- Butterbrodt, Jay T.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., to Peerless Systems Corporation. Method and apparatus for displaying a page with graphics information on a continuous synchronous raster output device. 5,748,986, Cl. 395-763.000.
- Butterton, Joan R.: *See—*
  - Calderwood, Stephen B.; Butterton, Joan R.; and Mekalanos, John J., 5,747,028, Cl. 424-93.200.
- Button, Douglas J., to Harman International Industries, Inc. Dual coil drive with multipurpose housing. 5,748,760, Cl. 381-199.000.
- Bylund, Ruth Elvy; and Teger-Nilsson, Ann-Catrine Elisabet, to Astra Aktiebolag. Method of treatment and prophylaxis of venous thrombosis. 5,747,460, Cl. 514-19.000.
- Byon, Sung Kwang, to Daewoo Electronics Co., Ltd. Lithium battery having an over-loading preventing device. 5,747,187, Cl. 429-58.000.
- Byorum, Henry: *See—*
  - Lehan, John; Byorum, Henry; Hill, Russell J.; and Rough, J. Kirkwood, 5,746,894, Cl. 204-192.120.
- Byrne, James M.: *See—*
  - Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.
- Byrnes, Gale A.: *See—*
  - Dunn, Steven; and Byrnes, Gale A., 5,747,439, Cl. 510-255.000.
- C.R. Bard, Inc.: *See—*
  - Pasch, Kenneth A.; and Zeigler, Andrew, 5,746,721, Cl. 604-153.000.
- Cabletron Systems, Inc.: *See—*
  - Datta, Utpal; and Carlson, David G., 5,748,781, Cl. 382-232.000.
- Cabot Corporation: *See—*
  - Flenniken, Cindy L.; Menashi, Jameel; and Whitehouse, Robert S., 5,747,563, Cl. 523-215.000.
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,747,562, Cl. 523-215.000.
  - Whitehouse, Robert S.; and Reed, Thomas F., 5,747,559, Cl. 523-205.000.
- Cabot, Richard C., to Audio Precision, Inc. Method and apparatus for fast response and distortion measurement. 5,748,001, Cl. 324-624.000.
- Cabot, Richard C., to Audio Precision. Method and apparatus for recognizing a test signal and determining signal transfer characteristics therefrom. 5,749,047, Cl. 455-67.400.
- Cadou, Peter B.; Homer, John C., III; and Alexeff, Kevin A., to General Signal Corporation. Continuing belt-type conveyor and means for weighing contents transported thereon. 5,747,747, Cl. 177-145.000.
- Cafaro, Daniel P.: *See—*
  - Park, John Y.; Thomas, Larry K.; Peng, Lin; and Cafaro, Daniel P., 5,746,972, Cl. 422-30.000.
- Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., to Copeland Corporation. Method of making a scroll-type machine. 5,745,992, Cl. 29-888.022.
- Caillat, Thierry F.: *See—*
  - Fleurial, Jean-Pierre; Caillat, Thierry F.; and Borshchevsky, Alexander, 5,747,728, Cl. 136-203.000.
- Cailleteau, Benoit. Safety bag, in particular for hygienic purposes. 5,745,926, Cl. 4-144.100.
- Cainaud, Henri J.: *See—*
  - Bruas, Michel Y.; and Cainaud, Henri J., 5,746,411, Cl. 248-635.000.
- Calace, Michael A. Golfing and batting aid. 5,746,663, Cl. 473-211.000.
- Calapp, David E.; and Bennett, Michael T., to Christian Brothers, Inc. Process for making a composite hockey stick shaft. 5,746,955, Cl. 264-103.000.
- Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., to Ascom Nexion Inc. Allocated and dynamic bandwidth management. 5,748,629, Cl. 370-389.000.
- Calderwood, Stephen B.; Butterton, Joan R.; and Mekalanos, John J., to President and Fellows of Harvard College, The. Immunizing compositions comprising *Vibrio cholerae* expressing heterologous antigens. 5,747,028, Cl. 424-93.200.
- Caletti, Diego; and Ferrarese, Antonio. Waterproof shoe. 5,746,012, Cl. 36-3.00B.
- Calgon Corporation: *See—*
  - Vanderpool, Daniel P.; and Cha, Charles Y., 5,746,947, Cl. 252-394.000.
  - Zupanovich, John D., 5,747,342, Cl. 436-55.000.
- California Institute of Technology: *See—*
  - Fleurial, Jean-Pierre; Caillat, Thierry F.; and Borshchevsky, Alexander, 5,747,728, Cl. 136-203.000.
  - Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, 5,747,278, Cl. 435-69.100.
  - Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., 5,747,249, Cl. 435-6.000.

VOL
2 10
SS
1
MY
5
998
MI

- California Pacific Medical Center, Research Institute: *See—*
  - Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.
- Callaham, W. Timothy: *See—*
  - Arterbery, Cynthia W.; Callaham, W. Timothy; Keritsis, Gus D.; and White, Morris F., Jr., 5,746,230, Cl. 131-331.000.
- Callanan, Robert J., to Ford Motor Company. Inductor for an electrical system. 5,747,981, Cl. 323-362.000.
- Calsonic Corporation: *See—*
  - Sunaga, Hideki; and Suto, Masatoshi, 5,746,060, Cl. 62-126.000.
- Calta, Jeffrey S. Process for extracting tar from tarsand. 5,746,909, Cl. 208-390.000.
- Cambridge Display Technology Limited: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Cameron, David B.: *See—*
  - Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.
- Cameron, Fiona Helen: *See—*
  - Haseloff, James Phillip; Gerlach, Wayne Lyle; Jennings, Philip Anthony; and Cameron, Fiona Helen, 5,747,335, Cl. 435-325.000.
- Cameron, Robert Joseph, to Eastman Kodak Company. Film loading device. 5,748,291, Cl. 355-75.000.
- Campardo, Giovanni; Bedarida, Lorenzo; Fusillo, Giuseppe; and Silvagni, Andrea, to SGS-Thomson Microelectronics S.r.l. EEPROM memory device with simultaneous read and write sector capabilities. 5,748,528, Cl. 365-185.130.
- Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., to Eastman Kodak Company; and Mobil Oil Corporation. Subbing layer for antistatic layer on dye-receiving element used in thermal dye transfer. 5,747,415, Cl. 503-227.000.
- Campbell, Carey V.; Chastain, James H.; Laguna, Alvaro J.; and Pond, Daniel B., to W. L. Gore & Associates, Inc. Radially supported polytetrafluoroethylene vascular graft. 5,747,128, Cl. 428-35.700.
- Campbell, David, to FS Holdings, Inc. Method and apparatus for updating and selectively accessing financial records related to investments. 5,749,077, Cl. 705-36.000.
- Camposeo, Paul V.: *See—*
  - Humbarger, Robert Allen; Camposeo, Paul V.; and Hurtig, Terry William, 5,746,690, Cl. 493-405.000.
- Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources: *See—*
  - Negeri, Tesfaye, 5,746,910, Cl. 209-168.000.
- Cancro, Lewis Patrick: *See—*
  - Giani, Paola; L'Abbate, Massimo; and Cancro, Lewis Patrick, 5,747,004, Cl. 424-49.000.
- Candescent Technologies Corporation: *See—*
  - Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., 5,746,635, Cl. 445-24.000.
- Cane, Michael Roger: *See—*
  - Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.
- Cannon Kabushiki Kaisha: *See—*
  - Moro, Takahiro, 5,748,788, Cl. 382-243.000.
- Cannon, Thomas G.; and DeHart, Daniel L., to Onkor, Ltd. System for printing social expression cards in response to electronically transmitted orders. 5,748,484, Cl. 364-479.030.
- Canon Denshi Kabushiki Kaisha: *See—*
  - Sato, Osamu; and Shimada, Koichi, 5,749,015, Cl. 396-508.000.
  - Shimada, Fumio, 5,749,014, Cl. 396-489.000.
- Canon Kabushiki Kaisha: *See—*
  - Baba, Hisatoshi, 5,748,583, Cl. 369-44.280.
  - Fujita, Muneo, 5,747,797, Cl. 250-231.140.
  - Fukuda, Ryoji; and Harada, Takashi, 5,748,926, Cl. 395-326.000.
  - Harada, Yoshihito, 5,747,944, Cl. 315-241.00P.
  - Hasegawa, Takayuki; Tanaka, Yutaka; and Fujioka, Hidehiko, 5,746,562, Cl. 414-217.000.
  - Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.
  - Ikeda, Jun, 5,748,343, Cl. 358-501.000.
  - Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, 5,749,027, Cl. 399-113.000.
  - Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
  - Ishikawa, Tadashi, 5,748,460, Cl. 363-21.000.
  - Ishizaki, Akira; and Ogawa, Katsuhisa, 5,748,171, Cl. 345-101.000.
  - Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.
  - Kashiwazaki, Akio; Katayama, Masato; and Moriya, Kenichi, 5,747,146, Cl. 428-206.000.
  - Kashiwazaki, Masami; Kanakubo, Yukio; and Takahashi, Hiroharu, 5,748,861, Cl. 395-110.000.
  - Katayama, Akihiro; Ishida, Yoshihiro; and Yamakawa, Junichi, 5,748,777, Cl. 382-199.000.
  - Kodaira, Takanori, 5,749,012, Cl. 396-435.000.
  - Kubo, Ryoji, 5,748,831, Cl. 386-46.000.
  - Mashimo, Seiji, 5,747,207, Cl. 430-66.000.
  - Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, 5,748,772, Cl. 382-167.000.
  - Muramatsu, Masanori, 5,749,040, Cl. 399-406.000.
  - Murata, Yukio, 5,748,774, Cl. 382-181.000.
  - Ohashi, Masashi; and Taniishi, Shinnosuke, 5,748,182, Cl. 345-173.000.
  - Ohnishi, Shinji; and Fujii, Akio, 5,748,795, Cl. 382-251.000.
  - Ohno, Takashi; and Ooki, Jouji, 5,748,862, Cl. 395-115.000.
  - Okado, Kenji; Maeyama, Ryuichiro; and Inaba, Kouji, 5,747,213, Cl. 430-124.000.
  - Okita, Akira, 5,747,830, Cl. 257-72.000.
  - Ozaki, Hidenori; and Shimizu, Hideaki, 5,748,345, Cl. 358-537.000.
  - Sakaguchi, Katsuhiko, 5,748,779, Cl. 382-203.000.
  - Sakai, Masanori; and Shimizu, Hideaki, 5,748,797, Cl. 382-256.000.
  - Sakurai, Hiroshi, 5,749,007, Cl. 396-319.000.
  - Shimizu, Tetsuya; and Takeuchi, Yoshitaka, 5,748,245, Cl. 348-405.000.
  - Shiomi, Yasuhiko, 5,748,993, Cl. 396-52.000.
  - Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.
  - Suzuki, Masao; Matoba, Kazuyuki; and Nanba, Norihiro, 5,748,339, Cl. 358-473.000.
  - Takahashi, Koji, 5,748,832, Cl. 386-68.000.
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
  - Tanabe, Minoru, 5,749,003, Cl. 396-177.000.
  - Tanaka, Hiroshi, 5,747,202, Cl. 430-30.000.
  - Taniguchi, Osamu; Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 5,746,939, Cl. 252-299.010.
  - Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,748,274, Cl. 349-133.000.
  - Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.
  - Toyoda, Hisashi; Kenmochi, Toshio; Ezumi, Yosuke; and Tsukamoto, Takeshi, 5,748,327, Cl. 358-296.000.
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
  - Usami, Akihiro, 5,748,342, Cl. 358-500.000.
  - Watanabe, Gaku; and Yamazaki, Yasuyuki, 5,748,167, Cl. 345-98.000.
  - Yamamoto, Hiroyuki; Ohshima, Toshikazu; and Uchiyama, Shinji, 5,748,865, Cl. 395-123.000.
  - Yokota, Hideo, 5,748,369, Cl. 359-487.000.
  - Yoshida, Takehiro, 5,748,333, Cl. 358-445.000.
  - Yoshida, Takehiro, 5,748,334, Cl. 358-435.000.
  - Yoshida, Takehiro, 5,748,714, Cl. 379-100.060.
  - Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.
- Canstar Italia S.p.A.: *See—*
  - Graziano, Nicoletti, 5,745,963, Cl. 24-685.00K.
- Canteloup, Jean, to Sofie Instruments. Method and device for in situ quantification, by reflectometry, of the morphology of a localized region during etching of the surface layer of a thin-film structure. 5,748,296, Cl. 356-72.000.
- Cantrell, John H.: *See—*
  - Yost, William T.; Cantrell, John H.; and Taler, George A., 5,746,209, Cl. 128-661.030.
- Cao, Simon X. F.: *See—*
  - Pan, Jing-Jong; Cao, Simon X. F.; Shi, Yuan; and Yu, Donna S., 5,748,350, Cl. 359-130.000.
- Cao, Zhaodan, to Tularik Inc. Human telomerase gene. 5,747,317, Cl. 435-194.000.
- Capaccio, Paul R.; Cohen, Gary; Olsen, Alvin T.; and Yale, Mark C., to Becton, Dickinson and Company. Syringe filling and delivery device. 5,746,733, Cl. 604-411.000.
- Capps, R. Scott: *See—*
  - Brophy, Robert C.; Wooters, Eldon W.; and Capps, R. Scott, 5,746,541, Cl. 405-174.000.
- Capurka, Tomas, to Motorola, Inc. Method for providing communications to a communication device in a radio communication system. 5,748,620, Cl. 370-328.000.
- Caputo, Peter A., to Morton International, Inc. Stable oil-in-water ink emulsions based upon water-reducible nigrosine dyes for ink-jet printers and felt-tip and roller-ball pens. 5,746,815, Cl. 106-31.250.
- Carabetta, Francesco: *See—*
  - Schempp, Otto; and Carabetta, Francesco, 5,748,821, Cl. 385-76.000.
- Carbon Based Corporation: *See—*
  - Schauss, Mark A., 5,746,204, Cl. 128-630.000.
- Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, to J. Uriach & Cia S.A. Azo derivatives of 5-aminosalicylic acid. 5,747,477, Cl. 514-150.000.

- Carden, Huey D.: *See—*
  - Kellas, Sotiris; and Carden, Huey D., 5,746,537, Cl. 404-6.000.
- Cardin, Roberto: *See—*
  - Mansutti, Silvano; and Cardin, Roberto, 5,748,511, Cl. 364-708.100.
- Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., to Nabisco Technology Company. Production of crispy wheat-based snacks having surface bubbles. 5,747,092, Cl. 426-560.000.
- Cargill, Incorporated: *See—*
  - Wold, Kermit A., 5,746,355, Cl. 222-189.020.
- Cargill, Robert S., to Maxim Integrated Products, Inc. Low power, high linearity log-linear control method and apparatus. 5,748,027, Cl. 327-350.000.
- Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., to Norand Corporation. Communication module for a data capture system. 5,747,786, Cl. 235-472.000.
- Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, to Hewlett-Packard Company. Method for reducing pixel density along a plurality of axes of a multiple dimension image representation. 5,748,856, Cl. 395-102.000.
- Carl-Zeiss-Stiftung: *See—*
  - Lücke, Christian; Sümmerer, Gunther; and Gärtner, Hartmut, 5,748,367, Cl. 359-385.000.
  - Poglitsch, Christof, 5,746,093, Cl. 74-490.050.
- Carlson, Brent Allen; Huss, Frederic Lawrence; Schmucki, Nancy Marie; and Zelenski, Richard Elmer, to International Business Machines Corporation. Distributed device status in a clustered system environment. 5,748,883, Cl. 395-184.010.
- Carlson, David G.: *See—*
  - Datta, Utpal; and Carlson, David G., 5,748,781, Cl. 382-232.000.
- Carmichael, Edward. Pulse sensor clip. 5,747,710, Cl. 73-866.500.
- Carmichael, Robert M. Drop weight dive belt. 5,746,542, Cl. 405-186.000.
- Carnegie Mellon University: *See—*
  - Mauldin, Michael L., 5,748,954, Cl. 395-610.000.
- Carnevali, Jeffrey D. Trim device for a boat rudder. 5,746,147, Cl. 114-162.000.
- Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., to Sun Microsystems, Inc. PCI expansion card slide-type retainer. 5,748,453, Cl. 361-801.000.
- Carr, Jeffery Dean; and Sutton, John Michael, to International Business Machines Corporation. Optimal array addressing control structure comprising an I-frame only video encoder and a frame difference unit which includes an address counter for addressing memory addresses. 5,748,240, Cl. 348-384.000.
- Carrano, Anthony V.: *See—*
  - Balch, Joseph W.; Carrano, Anthony V.; Davidson, James C.; and Koo, Jackson C., 5,746,901, Cl. 204-606.000.
- Carrier Corporation: *See—*
  - Legutko, Thomas J., 5,746,194, Cl. 126-91.00A.
- Carroll, Frank I.: *See—*
  - Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., 5,747,503, Cl. 514-294.000.
- Carroll, Steven S.: *See—*
  - Fowler, J. Thomas; and Carroll, Steven S., 5,747,998, Cl. 324-263.000.
- Carson, Dennis A.; and Kohsaka, Hitoshi, to University of California, The Regents of the. Polymerase chain reaction assays to determine the presence and concentration of a target nucleic acid in a sample. 5,747,251, Cl. 435-6.000.
- Carson, Douglass L.: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Carubelli, Raoul: *See—*
  - Nordquist, Robert E.; Chen, Wei R.; Carubelli, Raoul; and Adams, Robert, 5,747,475, Cl. 514-55.000.
- Carver Corporation: *See—*
  - Croft, James Joseph; and Williamson, Robert C., 5,748,759, Cl. 381-193.000.
- Carver, Robert W. High power audio subwoofer. 5,748,753, Cl. 381-96.000.
- Casareto, Enrico; Leoni, Massimo; Ronzio, Enrico; and Magni, Ambrogio, to Poli Industria Chimica. Antibiotic producing microbe. 5,747,330, Cl. 435-254.100.
- Cascio, Giuseppe: *See—*
  - Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.
- Case Corporation: *See—*
  - Collins, David L., 5,748,097, Cl. 340-686.000.
- Cass, Todd A.: *See—*
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Cassidy, Stephen Anthony; Smyth, Peter Paul; Williams, Douglas Lawrence; and White, Trevor Keith, to British Telecommunications pubic limited company. Free space optical communication system. 5,748,813, Cl. 385-24.000.
- Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, to Square D Company. Switch having stackable fuses. 5,746,306, Cl. 200-283.000.
- Castañeda, Julio C.: *See—*
  - Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.
- Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, to Xerox Corporation. Apparatus for colorimetry gloss and registration feedback in a color printing machine. 5,748,221, Cl. 347-232.000.
- Castello, Rinaldo: *See—*
  - Tomasini, Luciano; Castello, Rinaldo; Clerici, Giancarlo; and Bietti, Ivan, 5,748,029, Cl. 327-389.000.
- Castro, Maria Angeles: *See—*
  - Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.
- Castro, Peter S.: *See—*
  - Gilblom, David L.; and Castro, Peter S., 5,747,825, Cl. 250-586.000.
- Caterpillar Inc.: *See—*
  - Bates, Kent C., 5,748,111, Cl. 341-11.000.
  - Goloff, Charles N., 5,746,413, Cl. 251-129.150.
  - Mandon, Stephane L., 5,746,861, Cl. 156-182.000.
  - Smith, David P., 5,746,056, Cl. 60-447.000.
- Cathey, Wade Thomas, Jr.; and Dowski, Edward Raymond, Jr., to University of Colorado, The Regents of the. Extended depth of field optical systems. 5,748,371, Cl. 359-558.000.
- Caupin, Henri: *See—*
  - Menassa, Aime; and Caupin, Henri, 5,747,090, Cl. 426-532.000.
- Cauwet, Daniele; and Dubief, Claude, to L'Oreal. Cosmetics compositions containing at least one anionic suracant of alkylgalactoside uronate type and at least one amphoteric polymer. 5,747,014, Cl. 424-70.110.
- Cavagnaro, Richard F.: *See—*
  - Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.
- Cavalleri, Paolo: *See—*
  - Montanari, Stefania; Cavalleri, Paolo; and Santangelo, Francesco, 5,747,513, Cl. 514-351.000.
- Cavanaugh, Scott R.: *See—*
  - Veltman, Joost; Prins, Andrew Carl; and Cavanaugh, Scott R., 5,747,085, Cl. 426-233.000.
- Cavaness, Deanne E.: *See—*
  - Cavaness, Jack D.; and Cavaness, Deanne E., 5,747,711, Cl. 84-291.000.
- Cavaness, Jack D.; and Cavaness, Deanne E. Body for stringed musical instrument. 5,747,711, Cl. 84-291.000.
- Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Pharmaceutical composition comprising L-carnitine or derivative thereof and trihydroxy or tetrahydroxystilbene. 5,747,536, Cl. 514-556.000.
- Cavello, Joseph: *See—*
  - Breen, Bernard P.; Gabrielson, James E.; and Cavello, Joseph, 5,746,144, Cl. 110-345.000.
- Caye, Mark A.; and Boutin, Robert J., to ASC Incorprated. Drive mechanism for an automotive vehicle sunroof assembly. 5,746,475, Cl. 296-223.000.
- Ceccon, Harry L.: *See—*
  - Furumoto, Horace W.; and Ceccon, Harry L., 5,746,735, Cl. 606-9.000.
- Cecere, Michael A., to Schlumberger Technologies Inc. Thermoelectric cooling in gas-assisted FIB system. 5,747,818, Cl. 250-492.210.
- Cederbaum, Carl; Girard, Philippe; and Mone, Patrick, to International Business Machines Corporation. Digital delay interpolator circuit. 5,748,125, Cl. 341-136.000.
- Celltech Therapeutics Limited: *See—*
  - Bebbington, Christopher Robert; and Yarranton, Geoffrey Thomas, 5,747,308, Cl. 435-172.300.
- Cellular Designs Unlimited, Inc.: *See—*
  - Fritzman, Ralph, 5,747,123, Cl. 428-12.000.
- CenRad, Inc.: *See—*
  - Smith, Marc L.; and Daou, Fadi H., 5,748,672, Cl. 375-226.000.
- Centek Industries, Inc.: *See—*
  - Ford, John R.; and Shelton, Sam V., 5,746,630, Cl. 440-89.000.
- Central Glass Company, Limited: *See—*
  - Kubota, Yoshinori, 5,746,991, Cl. 423-263.000.
- Centre International de Recherches Dermatologiques Galderma: *See—*
  - Charpentier, Bruno; and Bernard, Bruno, 5,747,530, Cl. 514-468.000.
- Centre Suisse D'Electronique et de Microtechnique SA: *See—*
  - Piguet, Christian; and Masgonty, Jean-Marc, 5,748,522, Cl. 365-154.000.
- Centro Nacional De Biopreparados: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
- Ceridan Corporation: *See—*
  - Pai, Deepak Keshav; and Lund, Lowell Dennis, 5,746,367, Cl 228-19.000.
- Cerier, Jeffrey C.: *See—*

VOL 210 ISS 1 MY 5 1998 UMI

- Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., 5,746,222, Cl. 128-885.000.
- Cernansky, Joseph; Foster, George T.; and Rudell, Elliot, to Rudell, Elliot A. Bubble and sound generating toy. 5,746,636, Cl. 446-16.000.
- Cha, Charles Y.: *See—*
  - Vanderpool, Daniel P.; and Cha, Charles Y., 5,746,947, Cl. 252-394.000.
- Cha, Gi-ho; Kang, Chi-jung; Lee, Byung-hun; and Lee, Kyung-wook, to Samsung Electronics Co., Ltd. Apparatus for bonding semiconductor wafers. 5,746,883, Cl. 156-580.000.
- Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., to International Business Machines Corporation. System and method for avoiding complete index tree traversals in sequential and almost sequential index probes. 5,748,952, Cl. 395-602.000.
- Chae, Seung-ki; Ahn, Byung-seol; Hahm, Sang-kyu; and Kim, Jong-soo, to Samsung Electronics Co., Ltd. Apparatus for depositing particles onto a wafer. 5,746,832, Cl. 118-665.000.
- Chae, Yung-Bok: *See—*
  - Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.
- Chaen, Hiroto: *See—*
  - Nishimoto, Tomoyuki; Chaen, Hiroto; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,747,300, Cl. 435-101.000.
- Chaffin, Royce: *See—*
  - Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, 5,746,417, Cl. 251-315.120.
- Chakrabarti, Dhruba J.; Hoffman, Richard A.; and Jensen, Craig L., to Aluminum Company of America. Thin film pretreatment for memory disks and associated methods. 5,747,135, Cl. 428-64.100.
- Chan, Becky Laiping: *See—*
  - Johnson, Harold Joseph; Gu, Yuan Xiang; Chan, Becky Laiping; and Chow, Stanley Taihai, 5,748,741, Cl. 380-28.000.
- Chan, Jim H.; and Desai, Nailesh B., to BellSouth Corporation. Method and system for assigning a communication to a preferred carrier for accounting and/or communication routing purposes. 5,748,717, Cl. 379-120.000.
- Chan, Kwan-Ho. Method of using a surgical repair kit. 5,746,754, Cl. 606-148.000.
- Chan, Randolph W.: *See—*
  - Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., 5,747,192, Cl. 429-163.000.
- Chandler, Scott: *See—*
  - Kuhns, Roger J.; and Chandler, Scott, 5,746,878, Cl. 156-364.000.
- Chandonnet, Alain: *See—*
  - Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, 5,748,814, Cl. 385-37.000.
- Chandra, Tushar Deepak: *See—*
  - Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., 5,748,958, Cl. 395-670.000.
- Chandraratna, Roshantha A.: *See—*
  - Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.
- Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, to Industrial Technology Research Institute. Medicinal thiophene compounds. 5,747,525, Cl. 514-444.000.
- Chang, Chin-lu. Color reference chips system for plastics. 5,746,600, Cl. 434-98.000.
- Chang, Chong-Min: *See—*
  - Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, 5,748,376, Cl. 359-629.000.
- Chang, Chu-An: *See—*
  - Sheridan, Patrick; Chang, Chu-An; Running, Joyce; and Urdea, Michael S., 5,747,244, Cl. 435-6.000.
- Chang, David: *See—*
  - Cho, Sung-Soo; Chi, Chao-Hsin; and Chang, David, 5,748,918, Cl. 395-306.000.
- Chang, Gao-Wei, to Industrial Technology Research Institute. Method and apparatus for adaptive color scanning/printing data correction employing neural networks. 5,748,329, Cl. 358-298.000.
- Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, to Daewoo Electronics Co., Ltd. Method for segmenting and estimating a moving object motion. 5,748,761, Cl. 382-107.000.
- Chang, Henry: *See—*
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,275, Cl. 435-15.000.
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,288, Cl. 435-69.100.
- Chang, Herman, to Holtek Microelectronics, Inc. Voice-generating telephone set without external power supply. 5,748,708, Cl. 379-67.000.
- Chang, Hsiu-Chuan; and Lin, Mao-Sheng. Continuous sand filter. 5,746,913, Cl. 210-189.000.
- Chang, Jiin-Chyuan: *See—*
  - Chuang, Tung-Han; Lin, Ching-Bin; Tsai, Teng-Chun; and Chang, Jiin-Chyuan, 5,746,956, Cl. 264-104.000.
- Chang, Kuang-Hui: *See—*
  - Yen, Shih Kuei; Chu, Po-Tao; and Chang, Kuang-Hui, 5,746,928, Cl. 216-37.000.
- Chang, Kuang-Yeh; Gardner, Mark I.; and Hause, Fred, to Advanced Micro Devices, Inc. LDD MOS transistor with improved uniformity and controllability of alignment. 5,747,852, Cl. 257-336.000.
- Chang, Kuan-Hui: *See—*
  - Huang, Yuan-Chang; and Chang, Kuan-Hui, 5,747,379, Cl. 438-586.000.
- Chang, Li-Chen, to Lyu Jan Co., Ltd. Deep fryer. 5,746,117, Cl. 99-407.000.
- Chang, Li-Hsin: *See—*
  - Robb, Francine Y.; Robb, Stephen P.; Reynes, Jean-Michel; and Chang, Li-Hsin, 5,747,371, Cl. 438-273.000.
- Chang, Lydia: *See—*
  - Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.
- Chang, Wei-Sun; and Chen, Liu-Yuan, to Molex Incorporated. Grounding clip for IC cards. 5,747,735, Cl. 174-51.000.
- Chang, Zen-Yu: *See—*
  - Bereznak, James Francis; Chang, Zen-Yu; Selby, Thomas Paul; and Sternberg, Charlene Gross, 5,747,497, Cl. 514-259.000.
- Chantot, Jean-François: *See—*
  - Agouridas, Constantin; Bretin, François; and Chantot, Jean-François, 5,747,467, Cl. 514-29.000.
- Chao, Fang-Ching; and Li, Tien-Chiieh, to United Microelectronics Corporation. Method of fabricating a phase-shift photomask. 5,747,196, Cl. 430-5.000.
- Chao, Kam-chi: *See—*
  - Wong, Wai-sing; Chao, Kam-chi; and Fong, Chi-ming, 5,748,174, Cl. 345-118.000.
- Chao, Zu-Wen, to Industrial Technology Research Institute. Double focal-point magneto-optic pick-up head. 5,748,574, Cl. 369-13.000.
- Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, to Industrial Technology Research Institute. Single-lens optical pick-up head for accessing a DVD disc and a CD disc by switching between two optical states. 5,748,602, Cl. 369-112.000.
- Chaparral Communications: *See—*
  - Weber, John G., 5,748,156, Cl. 343-762.000.
- Chapman, Terri I.; Tran, Hai Q.; and Keefe, Brian J., to Hewlett-Packard Company. Thermal ink jet tab circuit having a plurality of trace groups wherein adjacent traces in each group are staggered. 5,748,209, Cl. 347-50.000.
- Chappell, Barbara Alane: *See—*
  - Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.
- Chappell, Terry Ivan: *See—*
  - Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.
- Charles Stark Draper Laboratory, Inc., The: *See—*
  - Ward, Paul A.; and Kourepenis, Anthony S., 5,747,961, Cl. 318-646.000.
- Charles, Stephen Alexander: *See—*
  - Hawke, David Harry; Parekh, Rajesh Bhikhu; Goulding, Paul; and Charles, Stephen Alexander, 5,747,347, Cl. 436-94.000.
- Charpentier, Bruno; and Bernard, Bruno, to Centre International de Recherches Dermatologiques Galderma. Aromatic dibenzofuran compounds and pharmaceutical/cosmetic compositions comprised thereof. 5,747,530, Cl. 514-468.000.
- Chartered Semiconductor Manufacturing Ltd.: *See—*
  - Kantimahanti, Arjun Kumar; Subrahmanyam, Chivukula; and Zhou, Mei Sheng, 5,747,369, Cl. 438-241.000.
- Chasin, Mark: *See—*
  - Sackler, Richard; Goldenheim, Paul; and Chasin, Mark, 5,747,060, Cl. 424-426.000.
- Chassaing, Alain; and Finck, Bernard, to Societe Nationale Des Poudres Et Explosifs. Propellants with a high specific impulse, comprising furazane derivatives. 5,747,729, Cl. 149-19.100.
- Chasser, Anthony M.: *See—*
  - Lewandowski, Mark A.; and Chasser, Anthony M., 5,747,551, Cl. 522-95.000.
- Chastain, James H.: *See—*
  - Campbell, Carey V.; Chastain, James H.; Laguna, Alvaro J.; and Pond, Daniel B., 5,747,128, Cl. 428-35.700.
- Chateau, Sophie, to SCIBIEX (SARL). Apparatus for immunological analysis. 5,746,975, Cl. 422-61.000.
- Chatinsky, Mark; and Kuchta, Bruce, to ASC Audio Video Corporation. Direct keyboard access to video editing source material. 5,748,253, Cl. 348-552.000.
- Chaudagne, Catherine: *See—*
  - Meybeck, Alain; Bonte, Frédéric; Dumas, Marc; and Chaudagne, Catherine, 5,747,538, Cl. 514-570.000.
- Check, Mark Anthony: *See—*
  - Webb, Charles Franklin; Farrell, Mark Steven; Check, Mark Anthony; and Liptay, John Stephen, 5,748,951, Cl. 395-595.000.
- Check Technology Corporation: *See—*
  - Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.
- Cheetham, Charles J., to Royal Master Grinders, Inc. Centerless grinder assembly and method of operating the same. 5,746,644, Cl. 451-6.000.
- Cheil Foods & Chemicals, Inc.: *See—*
  - Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, 5,747,081, Cl. 426-72.000.
- Cheil Industries, Inc.: *See—*
  - Kim, Sung-kook; and Choi, Jin-whan, 5,747,587, Cl. 525-87.000.

- Chemische Betriebe Pluto GmbH: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Chen, Chao C.: *See—*
  - Cooper, Kevin; Chen, Chao C.; and Scopelianos, Angelo, 5,747,390, Cl. 442-59.000.
- Chen, Chin H.: *See—*
  - Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.
  - Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.
- Chen, Chin-Lai. Coat hanger bag. 5,746,360, Cl. 223-85.000.
- Chen, Chris C.: *See—*
  - North, Michael John; Hall, Christopher; Cyster, Thomas Mark; and Chen, Chris C., 5,748,445, Cl. 361-697.000.
- Chen, Chung-Heng: *See—*
  - Huang, Hung-Ju; Yao, Jo-Tan; and Chen, Chung-Heng, 5,748,904, Cl. 395-200.770.
- Chen, Chungte W., to Hughes Electronics. Catadioptric one-to-one telecentric image combining system. 5,748,365, Cl. 359-366.000.
- Chen, Eugene; Tehrani, Saied N.; Legge, Ronald N.; and Zhu, Xiaodong T., to Motorola, Inc. MRAM with pinned ends. 5,748,524, Cl. 365-173.000.
- Chen, Guan-Zhon. Luggage carrier. 5,746,440, Cl. 280-652.000.
- Chen, Horen: *See—*
  - Bustamante, Herman A.; and Chen, Horen, 5,748,610, Cl. 370-208.000.
- Chen, Hsien Heng: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Chen, Iue-Shuenn: *See—*
  - Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, 5,748,856, Cl. 395-102.000.
- Chen, Jianqiang: *See—*
  - Amos, Dennis Ray; Bachman, Sallie Ann; and Chen, Jianqiang, 5,746,579, Cl. 416-204.00A.
- Chen, Julian Zhiliang; Amerasekera, Ajith; and Vrotsos, Thomas A. Adjustable Bipolar SCR holding voltage for ESD protection circuits in high speed Bipolar/BiCMOS circuits. 5,747,834, Cl. 257-111.000.
- Chen, Kuang-Vu: *See—*
  - Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, 5,748,376, Cl. 359-629.000.
- Chen, Kuo-Mou: *See—*
  - Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, 5,747,525, Cl. 514-444.000.
- Chen, Kwang-Cheng: *See—*
  - Lee, Tsai-Pao; Chen, Kwang-Cheng; and Yang, Chin-Lin, 5,748,036, Cl. 329-300.000.
- Chen, Li-Chun; and Shen, Chih-Heng, to Taiwan Semiconductor Manufacturing Company Ltd. Method for forming conductive lines and stacked vias. 5,747,383, Cl. 438-648.000.
- Chen, Ling; Hsu, Sung-Mu; and Fang, Weng Liang, to Taiwan Semiconductor Manufacturing Company Ltd. Vertical channel masked ROM memory cell with epitaxy. 5,747,856, Cl. 257-390.000.
- Chen, Liu-Yuan: *See—*
  - Chang, Wei-Sun; and Chen, Liu-Yuan, 5,747,735, Cl. 174-51.000.
- Chen, San-Ming: *See—*
  - Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, 5,748,376, Cl. 359-629.000.
- Chen, Shenchang Eric, to Live Picture, Inc. Rendering perspective views of a scene using a scanline-coherent look-up table. 5,748,194, Cl. 345-427.000.
- Chen, Shun-Long; and Hsu, Kuo-Yue, to Taiwan Semiconductor Manufacturing Company, Ltd. Safety sampler for hot acid in semiconductor manufacturing fab. 5,746,876, Cl. 156-345.000.
- Chen, Tienteh: *See—*
  - Mitacek, Paul; Ghyzel, Peter John; and Chen, Tienteh, 5,747,585, Cl. 524-845.000.
- Chen, Wei R.: *See—*
  - Nordquist, Robert E.; Chen, Wei R.; Carubelli, Raoul; and Adams, Robert, 5,747,475, Cl. 514-55.000.
- Chen, Wei-ge: *See—*
  - Lee, Ming-Chieh; and Chen, Wei-ge, 5,748,789, Cl. 382-243.000.
- Chen, Y. H.: *See—*
  - Lee, C. H.; and Chen, Y. H., 5,746,462, Cl. 294-64.100.
- Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, to Advanced Cardiovascular Systems, Inc. Polymer blends for use in making medical devices including catheters and balloons for dilation catheters. 5,747,591, Cl. 525-176.000.
- Chenausky, Peter, to QSource, Inc. Retangular discharge gas laser. 5,748,663, Cl. 372-64.000.
- Cheng, Anthony K.: *See—*
  - Yan, Cheng F.; Oh, Chan S.; and Cheng, Anthony K., 5,747,352, Cl. 436-533.000.
- Cheng, Lee-Ming; and Choy, Edmond, to Hon Hai Precision Ind. Co., Ltd. Card edge connector with ejector. 5,746,613, Cl. 439-157.000.
- Cheng, Lee-Ming; Choy, Edmond; and Tseng, Gwou-Jong, to Hon Hai Precision Ind. Co., Ltd. Card edge connector with ejector. 5,746,614, Cl. 439-157.000.
- Cheng, Seng H.: *See—*
  - Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.
- Cheng, Tai: *See—*
  - Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,747,591, Cl. 525-176.000.
- Cheng, Viktor Choong-Hung: *See—*
  - Yong, Dennis; Cheng, Viktor Choong-Hung; Yo, Christopher Leng-Hong; and Lim, Liat, 5,749,079, Cl. 707-100.000.
- Cheok, Calvin Kok-Hwa; and Saggi, Rajesh Jaigopai. Portable laundry detergent dispensing system. 5,746,353, Cl. 222-132.000.
- Cheong, Chao: *See—*
  - Ashar, Pranav; and Cheong, Chao, 5,748,486, Cl. 364-488.000.
- Cherbettchian, Agop H.; and Debley, William P., to Litton Systems, Inc. Flexible interlink for hydrophone array. 5,748,565, Cl. 367-154.000.
- Cherek, Bogdan; and Pawliw, Jean-Pierre, to Milltronics Ltd. Level detector for solids. 5,748,562, Cl. 367-124.000.
- Cherukuri, Satyam Choudary: *See—*
  - Fan, Zhong Hui-Hugh; Levine, Aaron William; Cherukuri, Satyam Choudary; and Lipp, Steven A., 5,747,169, Cl. 428-426.000.
- Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See—*
  - Giani, Paola; L'Abbate, Massimo; and Cancro, Lewis Patrick, 5,747,004, Cl. 424-49.000.
  - Slavtcheff, Craig Steven, 5,747,022, Cl. 424-78.030.
- Chesnutt, Robert: *See—*
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Chester, Mark S. Magnetic tangram puzzle game assembly. 5,746,430, Cl. 273-157.00R.
- Chi, Chao-Hsin: *See—*
  - Cho, Sung-Soo; Chi, Chao-Hsin; and Chang, David, 5,748,918, Cl. 395-306.000.
- Chia, Chok J.: *See—*
  - Variot, Patrick; Chia, Chok J.; and Trabucco, Robert T., 5,745,986, Cl. 29-840.000.
- Chiang, Paul M-Bhor: *See—*
  - Fung, Michael G.; and Chiang, Paul M-Bhor, 5,748,552, Cl. 365-230.030.
- Chiappetta, Frank Richard, to Fran Rich Chi Associates, Inc. Air-land vehicle with ducted fan vanes providing improved performance. 5,746,390, Cl. 244-12.300.
- Chiba, Mikio: *See—*
  - Potter, John W.; and Chiba, Mikio, 5,747,056, Cl. 424-410.000.
- Chida, Kimitaka: *See—*
  - Shinoda, Hosei; Ajioka, Masanobu; and Chida, Kimitaka, 5,747,637, Cl. 528-354.000.
- Chien, Henry: *See—*
  - Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,747,359, Cl. 437-186.000.
- Chien, Tseng Lu. Portable object having a fastening band illuminated by a super thin lighting element. 5,746,501, Cl. 362-103.000.
- Chien, Tseng-Lu. Illuminated laces for footwear. 5,746,500, Cl. 362-103.000.
- Chien-Yuan, Wang. Adapter junction box. 5,746,612, Cl. 439-139.000.
- Chihara, Kohji Y.; Roth, James A.; and Krotke, Gary A., to GenCorp Inc. Process for film transfer rubber molding of glass run channel composites and the product formed thereby. 5,746,867, Cl. 156-242.000.
- Chikyou, Toyohiro; and Koguchi, Nobuyuki, to National Research Institute for Metals. Decelerating and focusing ion beam device. 5,748,360, Cl. 359-298.000.
- Children's Medical Center Corporation, The: *See—*
  - Lipton, Stuart A., 5,747,545, Cl. 514-742.000.
- Chin, Paul W., Jr., to Lite Corporation. Corner structure for securing lighting fixture panels. 5,746,508, Cl. 362-367.000.
- Chin, Yuen-Kwok: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- China Grinding Wheel Corporation: *See—*
  - Huang, Shih-chung, 5,746,647, Cl. 451-343.000.
- Chinn, Stephen R.: *See—*
  - Swanson, Eric A.; and Chinn, Stephen R., 5,748,598, Cl. 369-94.000.
- Chinnaswamy, Rangaswamy: *See—*
  - Bassi, Sukh; Maningat, Clodualdo C.; Chinnaswamy, Rangaswamy; and Nie, Li, 5,747,648, Cl. 530-374.000.
- Chinon Kabushiki Kaisha: *See—*
  - Nakamura, Hideo; and Furuta, Haruki, 5,748,307, Cl. 358-296.000.
- Chiodo, Christopher E.: *See—*
  - Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., 5,748,453, Cl. 361-801.000.
- Chiron Corporation: *See—*
  - Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,747,039, Cl. 424-186.100.
  - Collins, Mark L., 5,747,248, Cl. 435-6.000.
  - Giese, Klaus; and Escobedo, Jaime, 5,747,338, Cl. 435-348.000.

/OL
2 10
ISS
1
MY
5
998
MI

- Haskill, John Stephen; and Ralph, Peter, 5,747,444, Cl. 514-2.000.
- Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,747,044, Cl. 424-202.100.
- Rosenberg, Steve; Spear, Kerry L.; and Martin, Eric J., 5,747,458, Cl. 514-18.000.
- Sheridan, Patrick; Chang, Chu-An; Running, Joyce; and Urdea, Michael S., 5,747,244, Cl. 435-6.000.
- de Boer, Mark; and Conroy, Leah B., 5,747,034, Cl. 424-137.100.

Chiu, Kai F.: *See—*
- Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, 5,746,887, Cl. 162-109.000.

Chiyonobu, Tatuo: *See—*
- Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.

Cho, Chih-Chen: *See—*
- Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,747,880, Cl. 257-759.000.

Cho, Eui Hwan; Chung, Sun Gan; Lee, Kyou Heung; and Park, Si Kyung, to Samjin Pharm. Co., Ltd. N-cinnamoyl-2-methyl-5-methoxy-3-indoleacetic acid ester, and pharmaceutical preparation containing the same. 5,747,521, Cl. 514-420.000.

Cho, Han-ki: *See—*
- Song, Ci-moo; Lee, Chul-woo; and Cho, Han-ki, 5,748,172, Cl. 345-111.000.

Cho, Hong-Keun: *See—*
- Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, 5,747,985, Cl. 324-103.00R.

Cho, Shung-Hyun: *See—*
- Choi, Seung-Beom; Cho, Shung-Hyun; and Park, Noh-Byung, 5,748,971, Cl. 395-750.030.

Cho, Soo-In: *See—*
- Lee, Sang-Bo; and Cho, Soo-In, 5,748,543, Cl. 365-200.000.

Cho, Sung-Been: *See—*
- Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.

Cho, Sung-Soo; Chi, Chao-Hsin; and Chang, David, to Intel Corporation. Method and apparatus for supporting two subtractive decode agents on the same bus in a computer system. 5,748,918, Cl. 395-306.000.

Cho, Young-ho: *See—*
- Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, 5,747,690, Cl. 73-504.120.

Choi, Byeng-Sun, to Samsung Electronics Co., Ltd. Common source line control circuit for preventing snap back breakdown. 5,748,531, Cl. 365-185.180.

Choi, Byung-Nam: *See—*
- Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, 5,747,781, Cl. 219-685.000.

Choi, Chi Chung: *See—*
- Roovers, Wilhelmus Cornelus Waltherus Maria; and Choi, Chi Chung, 5,746,678, Cl. 477-45.000.

Choi, Jae-Gark: *See—*
- Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, 5,748,761, Cl. 382-107.000.

Choi, Jin Kook: *See—*
- Lee, Suk Joong; and Choi, Jin Kook, 5,748,969, Cl. 395-732.000.

Choi, Jin-whan: *See—*
- Kim, Sung-kook; and Choi, Jin-whan, 5,747,587, Cl. 525-87.000.

Choi, Joong-Kwon: *See—*
- Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.

Choi, Myoung-soo, to Samsung Electronics Co., Ltd. Pinch roller driving apparatus. 5,748,402, Cl. 360-85.000.

Choi, Myung-chan; and Park, Churoo, to Samsung Electronics Co., Ltd. Multi-bit test circuits for integrated circuit memory devices and related methods. 5,748,639, Cl. 371-212.000.

Choi, Seung-Beom; Cho, Shung-Hyun; and Park, Noh-Byung, to SamSung Electronics Co., Ltd. Option card hibernation system. 5,748,971, Cl. 395-750.030.

Choi, Sung-Woo: *See—*
- Baek, Jong-Hyeob; Lee, Bun; Choi, Sung-Woo; and Lee, Jin-Hong, 5,748,319, Cl. 356-382.000.

Chollet, Philippe: *See—*
- Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, 5,746,133, Cl. 101-484.000.

Chomet, Marc, to Fred M. Schildwachter & Sons, Inc. Electronic door chime. 5,748,074, Cl. 340-328.000.

Choo, Qui-Lim: *See—*
- Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,747,044, Cl. 424-202.100.

Chopra, Suman K.: *See—*
- Patel, Amrit M.; and Chopra, Suman K., 5,747,436, Cl. 510-124.000.

Choquet, Claude. Method for producing carbon dioxide, fungicidal compounds and thermal energy. 5,747,042, Cl. 424-195.100.

Chorev, Michael; and Rosenblatt, Michael, to Beth Israel Deaconess Medical Center. Continuous low-dose administration of parathyroid hormone or its agonist. 5,747,456, Cl. 514-12.000.

Chou, William T.: *See—*
- Beilin, Solomon I.; Chou, William T.; Lee, Michael G.; and Wang, Wen-chou Vincent, 5,746,903, Cl. 205-118.000.

Choukh, A. M.: *See—*
- Kim, In Eung; and Choukh, A. M., 5,748,414, Cl. 360-113.000.

Chow, Che C.: *See—*
- Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.

Chow, Ching-Hua: *See—*
- Allen, John David; Chow, Ching-Hua; and Shah, Jasvantrai C., 5,748,611, Cl. 370-224.000.

Chow, Stanley Taihai: *See—*
- Johnson, Harold Joseph; Gu, Yuan Xiang; Chan, Becky Laiping; and Chow, Stanley Taihai, 5,748,741, Cl. 380-28.000.

Chow, Wendy: *See—*
- Von Sacken, Ulrich; Chow, Wendy; and Shkuratoff, Allen, 5,747,188, Cl. 429-61.000.

Choy, Edmond: *See—*
- Cheng, Lee-Ming; and Choy, Edmond, 5,746,613, Cl. 439-157.000.
- Cheng, Lee-Ming; Choy, Edmond; and Tseng, Gwou-Jong, 5,746,614, Cl. 439-157.000.

Christensen, Mark; and Fischer, Alfred L. Concealed access entry system for a vehicle. 5,748,101, Cl. 340-825.310.

Christian Brothers, Inc.: *See—*
- Calapp, David E.; and Bennett, Michael T., 5,746,955, Cl. 264-103.000.

Christian, Peter Rahlff: *See—*
- Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, 5,748,664, Cl. 372-75.000.

Christiani, Brian R.; and Maxfield, MacRae, to AlliedSignal Inc. Melt process formation of polymer nanocomposite of exfoliated layered material. 5,747,560, Cl. 523-209.000.

Christiansen, Lars K.; Roberts, Mark H.; Griffiths, David J.; and Adamson, Brent R., to LaserVend, Inc. Software vending machine having CD-ROM storage. 5,748,485, Cl. 364-479.040.

Christner, Jodie Ann; and Cunningham, Earl Albert, to International Business Machines Corporation. Magnetoresistive head with a magnetoresistive film shaped to provide an improved read sensitivity profile. 5,748,415, Cl. 360-113.000.

Chrysler Corporation: *See—*
- Hormel, Ronald F.; and Miesterfeld, Frederick O., 5,748,675, Cl. 375-257.000.
- Schoen, Robert M.; and Anderson, Anthony J., 5,746,468, Cl. 296-76.000.

Chu, Daniel T.: *See—*
- Elliott, Richard L.; Or, Yat Sun; Pireh, Daisy; and Chu, Daniel T., 5,747,466, Cl. 514-29.000.

Chu, George E.: *See—*
- Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.

Chu, John K., to Intel Corporation. Crack resistant passivation layer. 5,747,389, Cl. 438-783.000.

Chu, Po-Tao: *See—*
- Yen, Shih Kuei; Chu, Po-Tao; and Chang, Kuang-Hui, 5,746,928, Cl. 216-37.000.

Chuang, Shouping: *See—*
- Hager, Arthur L., III; Marchant, Brian E.; Chuang, Shouping; and Kim, Ki Duk, 5,748,470, Cl. 364-187.000.

Chuang, Tung-Han; Lin, Ching-Bin; Tsai, Teng-Chun; and Chang, Jiin-Chyuan, to National Science Council. Process and apparatus for manufacturing aluminum laminally filled plastic pellets for shielding electromagnetic interference. 5,746,956, Cl. 264-104.000.

Chuang, Yung-Chuan. Method for constructing one-step group fixed window frames in a concrete-structured building. 5,746,033, Cl 52-213.000.

Chui, Charles K.; and Yi, Rongxiang, to Teralogic, Incorporated. System and method for nested split coding of sparse data sets. 5,748,116, Cl. 341-50.000.

Chun, Kuk Jin: *See—*
- Lee, Jong Duk; Chun, Kuk Jin; Park, Byung Gook; and Lyu, Jeong Ho, 5,747,356, Cl. 437-44.000.

Chung, Mong-Suk, to Hyundai Welding & Metal Col, Ltd. Device for preventing welding wire in a welding wire pail from tangling. 5,746,380, Cl. 242-171.000.

Chung, Sun Gan: *See—*
- Cho, Eui Hwan; Chung, Sun Gan; Lee, Kyou Heung; and Park, Si Kyung, 5,747,521, Cl. 514-420.000.

Chung, Wen-Jyc, to Taiwan Semiconductor Manufacturing Company, Ltd. One-step method for on-line lithographic pattern inspection. 5,747,817, Cl. 250-492.200.

Chung, Young Sir: *See—*
- Hammond, Jonathan H.; and Chung, Young Sir, 5,747,839, Cl. 257-253.000.

Church & Dwight Co, Inc.: *See—*
- Dunn, Steven; and Byrnes, Gale A., 5,747,439, Cl. 510-255.000.

Church, Joseph T.: *See—*
- Romes, Gary E.; Church, Joseph T.; Sanford, Steven; and Syme, Robert W., 5,746,854, Cl. 156-62.200.

Cianciara, Wojciech, to Siemens Aktiengesellschaft. Diagnostic process for an exhaust gas sensor. 5,747,668, Cl. 73-1.060.

Ciba Specialty Chemicals Corporation: *See—*
- Pfaendner, Rudolf; Hoffmann, Kurt; and Herbst, Heinz, 5,747,606, Cl. 525-438.000.

Cicero, Samuel J.: *See—*

- Smeenge, Robert E.; Pierce, George F.; and Cicero, Samuel J., 5,748,064, Cl. 336-83.000.

Ciena Corp.: *See—*
- Mizrahi, Victor, 5,748,349, Cl. 359-130.000.

Ciganko, David J.: *See—*
- Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.

Cipolla, David: *See—*
- Alligood, John H.; Lamphron, Mark A.; and Cipolla, David, 5,748,988, Cl. 396-6.000.

Cipriano, Robert A.: *See—*
- Sorenson, Marius W.; Cipriano, Robert A.; Longoria, Jose J.; and Weaver, John D., 5,747,546, Cl. 521-32.000.

Cirincione, Richard: *See—*
- Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garuti, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.

Cirrus Logic, Inc.: *See—*
- Han, Robin S., 5,748,163, Cl. 345-88.000.
- Ketineni, Venkateswarrao; and Bezzant, Daniel G., 5,748,034, Cl. 327-551.000.
- Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, 5,748,920, Cl. 395-308.000.
- Nally, Robert Marshall; Nelsen, Pete Edward; Hamilton, Douglas; and Berk, Douglas Michael, 5,748,968, Cl. 395-728.000.
- Prakash, Jaideep; Norsworthy, John Paul; and Doyle, Bruce Andrew, 5,748,127, Cl. 341-144.000.

Citizen Watch Co., Ltd.: *See—*
- Kasai, Takao; Yoshikawa, Kenichi; Saito, Shigeru; and Hoshi, Masami, 5,746,960, Cl. 264-234.000.

Citrix Systems, Inc.: *See—*
- Richardson, John, 5,748,892, Cl. 395-200.300.

City Technology Limited: *See—*
- Finbow, John Robert; and Bulpitt, Malcolm Robert, 5,746,899, Cl. 204-415.000.

Claisse, Paul: *See—*
- Kiely, Philip; Claisse, Paul; and Gable, Benjamin W., 5,748,661, Cl. 372-50.000.

Clapp, Timothy G.: *See—*
- Cox, Robert N.; Clapp, Timothy G.; and Titus, Kimberly J., 5,746,145, Cl. 112-278.000.

Clariant Finance (BVI) Limited: *See—*
- Lehr, Friedrich, 5,747,657, Cl. 534-635.000.

Clariant GmbH: *See—*
- Schmitz, Ludwig; Hess, Stefan; and Gerharz, Bettina, 5,747,578, Cl. 524-502.000.

Clark, Andrew Reginald; Hsu, Chung C.; and Walsh, Andrew J., to Genentech, Inc. Preparation of sodium chloride aerosol formulations. 5,747,002, Cl. 424-45.000.

Clark, Lawrence T.: *See—*
- Korta, Jean-Charles; Davis, Derek L.; Spaw, William J.; and Clark, Lawrence T., 5,748,303, Cl. 356-229.000.

Clark, Michael William; Hearney, James Alfred; Norris, Duane Edward; and Benson, Paul Harrison, IV, to International Business Machines Corporation. Computer system which is operative to change from a normal operating state to a suspend state when a power supply thereof detects that an external source is no longer providing power to said power supply at a predetermined level. 5,748,972, Cl. 395-750.050.

Clark, Stephen L., to Berg Technology, Inc. Electrical connector including means for terminating wires. 5,746,620, Cl. 439-404.000.

Clarke, Adrienne Elizabeth; Bacic, Antony; and Lane, Alan Gordon, to Bio Polymers Pty. Ltd.; and Commonwealth Scientific and Industrial Research Organisation. Industrial pharmaceutical and cosmetics applications for cultured plant cell gums. 5,747,297, Cl. 435-72.000.

Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, to Medivir AB. L-nucleoside analogues and pharmaceutical compositions. 5,747,473, Cl. 514-45.000.

Clausen, Henrik: *See—*
- Kjeldsen, Thomas J., Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.

Claussen, Hinrich: *See—*
- Kersken, Ulrich; and Claussen, Hinrich, 5,748,107, Cl. 340-905.000.

Clay, Charles Matthew. Overboard safety device. 5,748,080, Cl. 340-539.000.

Claytor, Robinson Camden Perkins, to Westvaco Copration. Paperboard packaging with an improved sizing layer including a styrene maleic anhydride binder for reducing edgewicking. 5,747,141, Cl. 428-143.000.

Clean Cam Technology Systems: *See—*
- Green, Edward, 5,746,163, Cl. 123-65.0VC.

Cleary & Oxford Associates: *See—*
- Cleary, David J.; and Ryu, Hyung S., 5,746,738, Cl. 606-15.000.

Cleary, David J.; and Ryu, Hyung S., to Cleary & Oxford Associates. Laser surgical device. 5,746,738, Cl. 606-15.000.

Cleator, Iain G.M. Device and method for screening fecal occult blood specimens. 5,747,344, Cl. 436-66.000.

Clement, Andrew. Tremolo. 5,747,713, Cl. 84-313.000.

Clement, Jean-Pierre; and Dalvy, Olivier, to Salomon S.A. Comfort liner for ski boot. 5,746,015, Cl. 36-93.000.

Clement, Lemuel Vance, Jr.; Clift, Joseph S., Jr.; and Houfburg, Rodney L., to Wright Medical Technology, Inc. Calcar collar instrumentation. 5,746,771, Cl. 623-16.000.

Clements, Jack T.; Thill, Anthony J.; and Mahoney, Ronald L., to BHA Group Holdings, Inc. Dust collector filter element and supporting structure. 5,746,792, Cl. 55-341.100.

Clemson University: *See—*
- Peck, John C.; Rowland, Randy; and Wu, Duanpei, 5,748,843, Cl. 395-2.840.

Clendening, Charles W., Jr.: *See—*
- Schnurr, Alvin D.; Clendening, Charles W., Jr.; Shwartz, Josef; and Moyer, Richard H., 5,747,720, Cl. 89-1.110.

Clerici, Giancarlo: *See—*
- Tomasini, Luciano; Castello, Rinaldo; Clerici, Giancarlo; and Bietti, Ivan, 5,748,029, Cl. 327-389.000.

Clift, Joseph S., Jr.: *See—*
- Clement, Lemuel Vance, Jr.; Clift, Joseph S., Jr.; and Houfburg, Rodney L., 5,746,771, Cl. 623-16.000.

Clinton, Kim P. N.: *See—*
- Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.

Clowes, Richard F.: *See—*
- Tims, Fred William; Clowes, Richard F.; Yager, Kevin C.; and Schroeder, David J., 5,748,870, Cl. 395-182.020.

Coach Master International Corporation: *See—*
- Harrison, Robert G.; and Lamson, Robert D., 5,748,254, Cl. 348-552.000.

Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Electrooptical liquid crystal system. 5,746,938, Cl. 252-299.010.

Coates, David; and May, Alison Linda, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline material comprising terpenoids. 5,746,940, Cl. 252-299.010.

Coates, David: *See—*
- Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, 5,746,941, Cl. 252-299.630.

Coats, David E.: *See—*
- Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., 5,746,222, Cl. 128-885.000.

Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, to Merck & Co., Inc. HIV protease inhibitors useful for the treatment of AIDS. 5,747,540, Cl. 514-622.000.

Coburn Optical Industries, Inc.: *See—*
- Kulan, Stephen; and Smith, Kenneth L., 5,746,436, Cl. 279-4.040.

Cochet, Madeleine: *See—*
- Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, 5,747,246, Cl. 435-6.000.

Cochran, Stuart A.; Goll, Steven J.; Lippincott, Howard C.; and Winkler, Gary A., to Kraft Foods, Inc. Ready-to-assemble, ready-to-eat packaged pizza. 5,747,084, Cl. 426-120.000.

Codazzi, Luca; and Moro, Mauro, to Electrolux Zanussi Grandi Impianti S.P.A. Flow turbulence creating arrangement of a gas-fired deep fat fryer. 5,746,195, Cl. 126-391.000.

Coelho, Rohan G. F.; Packer, Alan; and Baldes, Gary, to Intel Corporation. Implementing branching operations at processing intersections in interactive applications. 5,748,196, Cl. 345-433.000.

Coen, Edward C.: *See—*
- Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.

Coetsier, Paul: *See—*
- Muller, Patrice; Coetsier, Paul; and Douine, Denis, 5,748,301, Cl. 356-155.000.

Coha, Timothy Francis: *See—*
- Sawert, Ulf; Ireland, Hugh Wesley; and Coha, Timothy Francis, 5,746,088, Cl. 73-317.000.

Cohen, Gary: *See—*
- Capaccio, Paul R.; Cohen, Gary; Olsen, Alvin T.; and Yale, Mark C., 5,746,733, Cl. 604-411.000.

Cohen, Justin R. Method of simulating activities for infants and very young children. 5,746,604, Cl. 434-307.00R.

Cohen, Uri. Method of fabricating magnetic recording thin film head having pinched-gap. 5,745,980, Cl. 29-603.140.

Cohler, Charles M.: *See—*
- Barels, Ronald R.; and Cohler, Charles M., 5,747,005, Cl. 424-50.000.

Coinstar, Inc.: *See—*
- Molbak, Jens H.; Gerrity, Dan; Scherer, Scott; and Finch, Aaron R., 5,746,299, Cl. 194-200.000.

Colandrea, Francesco; and Poletto, Vanni, to SGS-Thomson Microelectronics S.r.l. Overload protection circuit for MOS power drivers. 5,747,975, Cl. 323-276.000.

Colhern, Gail T.: *See—*
- Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colhern, Gail T., 5,747,027, Cl. 424-94.620.

Colby, Mark J.: *See—*
- Dunlap, Thomas G.; Elkins, Robert B.; and Colby, Mark J., 5,748,695, Cl. 376-446.000.

OL
2 10
SS
1
MY
5
998
MI

Cole, Curtis A.: *See—*

Geesin, Jeffrey C.; Cole, Curtis A.; and Wisniewski, Stephen J., 5,747,010, Cl. 424-59.000.

Cole, Dee Raymond: *See—*

Speakes, Dale M.; and Cole, Dee Raymond, 5,747,721, Cl. 89-36.110.

Cole, Herbert Stanley, Jr.; and Sitzik-Nieters, Theresa Ann, to Martin Marietta Corporation. Method for making an electronic module. 5,745,984, Cl. 29-834.000.

Cole, John D.: *See—*

Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.

Colgate-Palmolive Co.: *See—*

Farooq, Amjad; and Mastrull, Jeffrey Joseph, 5,747,108, Cl. 427-242.000.

Farooq, Amjad; and Mastrull, Jeffrey Joseph, 5,747,109, Cl. 427-242.000.

Mercado, Hedeliza Malonzo, 5,746,936, Cl. 252-187.250.

Patel, Amrit M., 5,747,435, Cl. 510-119.000.

Patel, Amrit M.; and Chopra, Suman K., 5,747,436, Cl. 510-124.000.

Vesborg, Steen, 5,746,260, Cl. 141-319.000.

Colin, Bruno: *See—*

O'Bear, Raymond E.; Colin, Bruno; Tegeler, G. R.; and Staples, John L., 5,746,980, Cl. 422-102.000.

Collingborn, Peter Alban George: *See—*

Jefferson, John Roderick; Collingborn, Peter Alban George; Cooke, Michael Peter; and Buckley, Paul, 5,746,180, Cl. 123-447.000.

Collins & Aikman Plastics, Inc.: *See—*

Arajs, Guntis; and Patel, Dennis, 5,746,651, Cl. 454-154.000.

Collins, David L., to Case Corporation. Method and apparatus for storing the boom of a work vehicle. 5,748,097, Cl. 340-686.000.

Collins, Mark L., to Chiron Corporation. Discontinuous probe design using hybritope mapping. 5,747,248, Cl. 435-6.000.

Collins, William V. F. Locking mechanism for lawn mowers. 5,746,074, Cl. 70-18.000.

Colorado State University Research Foundation: *See—*

Zoughi, Reza; Yeh, Chin-Yung; Ganchev, Stoyan I.; and Huber, Christian, 5,748,003, Cl. 324-644.000.

Colortronic GmbH: *See—*

Gehrig, Johann, 5,746,377, Cl. 241-73.000.

Colpan, Metin; Moritz, Peter; and Schorr, Joachim, to Qiagen GmbH. Process for the depletion or removal of endotoxins. 5,747,663, Cl. 536-25.400.

Colsman, Matthias L.: *See—*

Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., 5,748,629, Cl. 370-389.000.

Colson, Wendell B.; and Auger, Raymond N., to Hunter Douglas Inc. Roll up roman shade. 5,746,266, Cl. 160-84.050.

Combs, Robert Franklin: *See—*

Hammer, Michael Frederick; and Combs, Robert Franklin, 5,747,883, Cl. 290-1.00B.

Combustion Engineering, Inc.: *See—*

Holden, W. Wayne; and Holden, Michael C., 5,745,950, Cl. 15-316.100.

Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, to Lucent Technologies Inc. Offset correction for a homodyne radio. 5,748,681, Cl. 375-319.000.

Commereuc, Dominique, to Institut Francais Du Petrole. Supported catalysts containing rhenium and aluminium, preparation thereof and use thereof for the metathesis of olefins. 5,747,408, Cl. 502-171.000.

Commereuc, Dominique, to Institut Francais Du Petrole. Catalytic compositions based on compounds of rhenium and aluminium, preparation thereof and use thereof for the metathesis of olefins. 5,747,409, Cl. 502-171.000.

Commissariat a l'Energie Atomique: *See—*

Barrois, Gérard; Dominiak, Marcel; Fedeli, Jean-Marc; and Pisella, Christian, 5,748,408, Cl. 360-103.000.

Commonwealth Research Corporation: *See—*

Abboud, Robert G., 5,747,426, Cl. 505-166.000.

Commonwealth Scientific and Industrial Research Organisation: *See—*

Clarke, Adrienne Elizabeth; Bacic, Antony; and Lane, Alan Gordon, 5,747,297, Cl. 435-72.000.

Compagnie Generale d'Automatisme CGA-HBS: *See—*

Michel, Jacques; and Trouche, Dominique, 5,748,649, Cl. 371-40.160.

Compagnie Générale des Etablissements Michelin - Michelin Cie: *See—*

Burlacot, Laurence, 5,746,853, Cl. 152-531.000.

Compal Electronics, Inc.: *See—*

Kung, Shao-Tsu, 5,748,498, Cl. 364-551.010.

Compaq Computer Corporation: *See—*

Angelo, Michael F.; and Wolford, Jeff W., 5,748,888, Cl. 395-186.000.

Angelo, Michael F.; Miller, Craig A.; and Wooten, David R., 5,748,940, Cl. 395-490.000.

Bennett, Arthur T.; Baum, Stephen L.; Rubenstein, Scott K.; and Randall, Gary A., 5,747,893, Cl. 307-100.000.

Dalton, Scott W.; and Podhaisky, Todd D., 5,748,902, Cl. 395-200.760.

Maguire, David J.; and Le, Hung Q., 5,748,911, Cl. 395-281.000.

Watts, Robert F.; Skinker, Benjamin H.; and Wang, Kai, 5,748,719, Cl. 379-142.000.

Compere, Alicia L.; Griffith, William L.; Dorsey, George F.; and West, Brian H., to Martin Marietta Energy Systems, Inc. Low emissions diesel fuel. 5,746,783, Cl. 44-301.000.

Conceptus, Inc.: *See—*

Ton, Dai T.; and Nikolchev, Julian N., 5,746,769, Cl. 606-206.000.

Condon, Duane R. Universal pipe hanger with strap tightened by belt buckle ratchet. 5,746,401, Cl. 248-62.000.

Congedo, Thomas V.: *See—*

Young, Robert M.; Freidhoff, Carl B.; Braggins, Timothy T.; and Congedo, Thomas V., 5,747,815, Cl. 250-423.00R.

Connell, Charles R.: *See—*

Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., 5,747,249, Cl. 435-6.000.

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, to Bayer Aktiengesellschaft. Heterocyclic aryl-, alkyl- and cycloalkylacetamides. 5,747,505, Cl. 514-307.000.

Conrad, Thomas E.; and Haas, Garry L., to International Business Machines Corporation. Program storage device and computer program product for interactively managing a distributed database system. 5,748,929, Cl. 395-352.000.

Conrex Automation Oy: *See—*

Heinonen, Aimo, 5,748,304, Cl. 356-236.000.

Conroy, Leah B.: *See—*

de Boer, Mark; and Conroy, Leah B., 5,747,034, Cl. 424-137.100.

Consoli, John Joseph; and Sipe, Lynn Robert, to Whitaker Corporation, The. Board-mountable electrical connector. 5,746,622, Cl. 439-521.000.

Consorzio Obbligatorio Nazionale Per Il Riciclaggio Dei Contenitori in Plastica Per Liquidi: *See—*

Lacquaniti, Luigi; Liuzzo, Giuseppe; Palitto, Marcello; and Verdone, Nicola, 5,746,141, Cl. 110-203.000.

Consorzio per la Ricerca sulla Microelecttronica nel Mezzogiorno: *See—*

Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.

Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno: *See—*

Gariboldi, Roberto; and Pulvirenti, Francesco, 5,747,978, Cl. 323-313.000.

Conti, Robert V.: *See—*

Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl. 345-133.000.

Continental Aktiengesellschaft: *See—*

Schulze, Thomas; Roik, Geert; Hahn, Michael; and Kleinhoff, Klaus, 5,746,848, Cl. 152-209.00R.

Contract Industrial Tooling, Inc.: *See—*

Wuertemberger, Kim, 5,746,333, Cl. 211-189.000.

Conway, Craig M.; and Odom, Brian Keith, to National Instruments Corporation. VXIbus device which intelligently monitors bus conditions and begins early cycles for improved performance. 5,748,916, Cl. 395-287.000.

Conway, Jeremy J.: *See—*

Hindle, David J.; Breeds, Christopher D.; Conway, Jeremy J.; Morris, Ian W.; and Ledgerwood, Eric, 5,746,540, Cl. 405-131.000.

Cooke, Michael Peter: *See—*

Jefferson, John Roderick; Collingborn, Peter Alban George; Cooke, Michael Peter; and Buckley, Paul, 5,746,180, Cl. 123-447.000.

Cooke, Syd L. Apparatus for supplying fuel to an internal combustion engine. 5,746,188, Cl. 123-549.000.

Cookson Matthey Ceramics & Materials Limited: *See—*

Smith, Peter John; and Mangat, Harbans Kaur, 5,747,395, Cl. 501-5.000.

Coolbaugh, Thomas S.; Loveless, Frederick Charles; and Matthews, Demetreos N., to Mobil Oil Corporation. Epoxidized solid elastomeric copolymers. 5,747,598, Cl. 525-314.000.

Cooper, Fredrick L.; Kibala, Piotr A.; and Weismiller, Michael C., to Nalco/Exxon Energy Chemicals, L.P. Antifoulant for acrylonitrile purification. 5,746,924, Cl. 210-698.000.

Cooper Industries, Inc.: *See—*

Bestel, E. Fred; and Stoving, Paul Newcomb, 5,747,765, Cl. 218-155.000.

Waino, Ronald Arvid; and Schreiber, Daniel James, 5,747,766, Cl. 218-140.000.

Cooper, Kevin; Chen, Chao C.; and Scopelianos, Angelo, to Ethicon, Inc. Hard tissue bone cements and substitutes. 5,747,390, Cl. 442-59.000.

Copal Electronics Co., Ltd.: *See—*

Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, 5,746,515, Cl. 384-115.000.

Copeland Corporation: *See—*

Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 5,745,992, Cl. 29-888.022.

Copmans, Alex Herman: *See—*

Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.

COR Therapeutics: *See—*

Swift, Robert L.; Du Mee, Charles P.; and Randolph, Anne, 5,747,447, Cl. 514-9.000.

Corace, Russell A.: *See—*

Rom, Paul F.; and Corace, Russell A., 5,746,709, Cl. 604-8.000.

Corcoran, Patrick Henry; Hazan, Isidor; and Quashie, Sapé Kwesi, to Du Pont de Nemours, E. I., and Company. Acrylic-melamine-functionalized oligomer coating composition. 5,747,590, Cl. 525-155.000.

Cordis Corporation: *See—*

Green, Nicholas A.; and Williams, Fred E., Jr., 5,746,764, Cl. 606-194.000.

Corella, Arthur P. Metered flexible dispensing package. 5,746,352, Cl. 222-107.000.

Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, to Shell Oil Company. Epoxy resin system. 5,746,935, Cl. 252-182.230.

Cornelius, Steve: *See—*

Levy, Paul S.; and Cornelius, Steve, 5,748,744, Cl. 380-52.000.

Cornell Research Foundation, Inc.: *See—*

Meister, Alton; Huang, Chin-Shiou; and Anderson, Mary E., 5,747,329, Cl. 435-252.330.

Shuler, Michael L.; and Wilson, David B., 5,747,281, Cl. 435-69.100.

Corning Incorporated: *See—*

Smith, David K., 5,748,824, Cl. 385-124.000.

Coroy, Trenton G. Method and devices for wavelength and power demodulation based on the use of a quantum well electroabsorption filtering detector. 5,747,791, Cl. 250-214.00R.

Corvas International, Inc.: *See—*

Lasters, Ignace; De Maeyer, Marc; and Ripka, William Charles, 5,747,449, Cl. 514-12.000.

Moyle, Matthew; Foster, David L.; and Vlasuk, George P., 5,747,296, Cl. 435-72.000.

Cosgrove, Patrick A.: *See—*

Benati, Paul J.; Gray, Robert T.; and Cosgrove, Patrick A., 5,748,764, Cl. 382-117.000.

Cosman, Eric R. Dynamic collimator for a linear accelerator. 5,748,703, Cl. 378-152.000.

Cosman, Michael; and Brown, Thomas C., to Evans & Sutherland Computer Corp. Image texturing system having theme cells. 5,748,867, Cl. 395-130.000.

Cossandi, Antonio: *See—*

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,955, Cl. 19-102.000.

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,956, Cl. 19-106.00R.

Coste, Steven D.; and Izard, Jeff, to Otis Elevator Company. Elevator position compensation system. 5,747,755, Cl. 187-394.000.

Cottam, Howard B.: *See—*

Ojo-Amaize, Emmanuel A.; Cottam, Howard B.; and Kini, Ganesh D., 5,747,474, Cl. 514-46.000.

Cotton, Bryan E.: *See—*

Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.

Coulie, Pierre: *See—*

Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.

Coulter, Christopher C.: *See—*

Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., 5,746,222, Cl. 128-885.000.

Courtaulds Fibres (Holdings) Limited: *See—*

Cox, Roland; Taylor, Jonathan Michael; and Thomson, Julie Ann, 5,746,959, Cl. 264-182.000.

Courtaulds Packaging Inc.: *See—*

Kieras, Ronald E., 5,746,356, Cl. 222-212.000.

Coushaine, Charles M.: *See—*

Devir, Daniel D.; and Coushaine, Charles M., 5,747,920, Cl. 313-318.090.

Cox, David; Ingall, Anthony; and Willis, Paul, to Astra Pharmaceuticals Limited. Inhibitors of platelet aggregation. 5,747,496, Cl. 514-258.000.

Cox, Robert N.; Clapp, Timothy G.; and Titus, Kimberly J., to North Carulina State University. Stitch quality monitoring system for sewing machines. 5,746,145, Cl. 112-278.000.

Cox, Roland; Taylor, Jonathan Michael; and Thomson, Julie Ann, to Courtaulds Fibres (Holdings) Limited. Manufacture of acrylic fiber. 5,746,959, Cl. 264-182.000.

Craig, Robert Lee, to Photo Dimensions. Producing smoothly blended double exposure composite images. 5,748,987, Cl. 396-6.000.

Craik, Charles S.; and Tsu, Christopher A., to University of California, The Regents of the. Recombinant crab collagenase. 5,747,322, Cl. 435-226.000.

Cramp, Susan Mary: *See—*

Roberts, David Alan; Cramp, Susan Mary; Wallis, Derek Ian; and Bulot, Jean-Paul, 5,747,424, Cl. 504-271.000.

Crandall, Robert M., to Harman Automotive, Inc. Core lock pivot system. 5,746,548, Cl. 403-316.000.

Crane, Harold E. Medical facility and business: automatic interactive dynamic real-time management. 5,748,907, Cl. 395-202.000.

Crapo, James D.; and Freeman, Bruce A., to University of Alabama at Birmingham Research Foundation; and Duke University. Antioxidants. 5,747,026, Cl. 424-94.300.

Crawford, James D. Electronic goal detector. 5,748,073, Cl. 340-323.00R.

Crawford, Jamie; Powell, Steven; and Walker, John Michael, to Xerox Corporation. Adjustable document handler for reproduction apparatus. 5,748,293, Cl. 355-75.000.

Cray Research, Inc.: *See—*

Scott, Steven L.; Prihnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., 5,748,900, Cl. 395-200.650.

Crean, Johnnie Robert, to Alfa Leisure, Inc. Travel trailer chassis. 5,746,473, Cl. 296-181.000.

Creare, Inc.: *See—*

McCormick, John A.; and Sixsmith, Herbert, 5,748,005, Cl. 324-662.000.

Creative Aeronautical Accessories, Inc.: *See—*

Speakes, Dale M.; and Cole, Dee Raymond, 5,747,721, Cl. 89-36.110.

Creative Products Resource, Inc.: *See—*

Smith, James A.; and Kellett, George W., 5,746,776, Cl. 8-142.000.

Creative Technology, LTD: *See—*

Massie, Dana C., 5,748,747, Cl. 381-61.000.

Creatura, John A.: *See—*

Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., 5,747,577, Cl. 524-458.000.

Credence Systems Corporation: *See—*

Lesmeister, Gary J., 5,748,642, Cl. 371-22.100.

Crest Ultrasonic Corporation: *See—*

Goodson, J. Michael, 5,748,566, Cl. 367-158.000.

Crevling, Robert L., Jr.: *See—*

Robitaille, James M.; Crevling, Robert L., Jr.; and Baer, Mark E., 5,747,973, Cl. 323-239.000.

Crilly, Thomas G. Paint carrier. 5,746,346, Cl. 220-736.000.

Criss, James L.; and Fry, Lindā J., to Ford Motor Company. T-slot throttle body shaft. 5,746,177, Cl. 123-337.000.

Crivello, James V., to General Electric Company. Ultraviolet and electron beam curable propenyl-ether silicone release compositions. 5,747,172, Cl. 428-447.000.

Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., to Litton Systems Inc. Method of manufacturing an electrical slip ring base. 5,745,976, Cl. 29-597.000.

Croft, James Joseph; and Williamson, Robert C., to Carver Corporation. Loud speaker structure. 5,748,759, Cl. 381-193.000.

Cronin, David V., to Polaroid Corporation. Electrostatic discharge protection device. 5,746,621, Cl. 439-507.000.

Croshy, Donald. Vented pouring spout. 5,746,358, Cl. 222-479.000.

Cross, Alan John: *See—*

Boar, Robin Bernad; Cross, Alan John; Gray, Duncan Alastair; and Green, Richard Alfred, 5,747,515, Cl. 514-359.000.

Cross, Gary; and Sloan, Ken, to Cycle Country Accessories Corp. Three-point hitch for an all terrain vehicle. 5,746,275, Cl. 172-440.000.

Cross Tread Industries, Inc.: *See—*

Hickey, David R., 5,746,362, Cl. 224-331.000.

Crouch, Harry Steven: *See—*

Wright, Steve Robin; and Crouch, Harry Steven, 5,746,789, Cl. 55-306.000.

Croucher, Ewan Howden: *See—*

Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.

Crouse, Kent E.: *See—*

Shackle, Peter W.; Russell, Randy G.; Crouse, Kent E.; and Bezdon, Ronald J., 5,747,941, Cl. 315-224.000.

Crow, James T., to Sandia Corporation. Generating highly uniform electromagnetic field characteristics. 5,748,063, Cl. 335-299.000.

Crow, John M.: *See—*

Rockstroh, Todd J.; Crow, John M.; Lee, Ching-Pang; and Risbeck, James D., 5,747,769, Cl. 219-121.710.

Crown Cork & Seal Company, Inc.: *See—*

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Crystal Semiconductor Corporation: *See—*

Leung, Ka Yin, 5,748,040, Cl. 330-253.000.

Crystal Semiconductor, Inc.: *See—*

Sanchez, Clifton W., 5,748,684, Cl. 375-357.000.

Cuif, Jean Pierre, to Rhone-Poulenc Inc. Cerium and zirconium oxides, mixed oxides and solid solutions having improved thermal stability. 5,747,401, Cl. 501-103.000.

Cullen, Michael John; Dinsdale, Steven; and Davey, Christopher K., to Ford Global Technologies, Inc. Method and apparatus for estimating and controlling no x trap temperature. 5,746,049, Cl. 60-274.000.

Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., to Eli Lilly and Company. Cannabinoid receptor antagonists. 5,747,524, Cl. 514-443.000.

Cummings, James A.: *See—*

Marschke, Carl R.; Welch, Harold D.; and Cummings, James A., 5,746,010, Cl. 34-631.000.

Cunningham, Earl Albert: *See—*

Christner, Jodie Ann; and Cunningham, Earl Albert, 5,748,415, Cl. 360-113.000.

Cunningham, Michael F.: *See—*

Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., 5,747,577, Cl. 524-458.000.

Cuny, Gregory D.: *See—*

Zaklika, Krzysztof A.; Busman, Stanley C.; and Cuny, Gregory D., 5,747,217, Cl. 430-158.000.

Curry, Stephen M.; Loomis, Donald W.; and Fox, Christopher W., to Dallas Semiconductor. Method, apparatus, system and firmware for secure transactions. 5,748,740, Cl. 380-25.000.

Cutolo, Domingo; and Zoppi, Erminio, to Eniricerche S.p.A.; and Enichem S.p.A. Flexible, composite thermoplastic filament which contains endless fibres and process for preparing it. 5,747,137, Cl. 428-74.000.

CVC Products, Inc.: *See—*

VOL 210 ISS 1 MY 5 998 UMI

- Heimanson, Dorian; Moslehi, Mehrdad M.; Spronz, Paul E.; and Omstead, Thomas R., 5,746,897, Cl. 204-298.200.
- Cycle Country Accessories Corp.: *See—*
  - Cross, Gary; and Sloan, Ken, 5,746,275, Cl. 172-440.000.
- Cymer, Inc.: *See—*
  - Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.
- Cynosure, Inc.: *See—*
  - Furumoto, Horace W.; and Ceccon, Harry L., 5,746,735, Cl. 606-9.000.
- Cypress Semiconductor, Corporation: *See—*
  - Best, Scott C., 5,748,031, Cl. 327-525.000.
  - Hunt, Jeffery Scott; and Saripella, Satish C., 5,748,021, Cl. 327-312.000.
  - Moyal, Nathan Y., 5,748,048, Cl. 331-34.000.
  - Raza, S. Babar; and MacArthur, James B., 5,748,559, Cl. 365-233.000.
- Cyster, Thomas Mark: *See—*
  - North, Michael John; Hall, Christopher; Cyster, Thomas Mark; and Chen, Chris C., 5,748,445, Cl. 361-697.000.
- Cytec Technology Corp.: *See—*
  - Repecka, Linas Norman, 5,747,615, Cl. 526-262.000.
- Czachor, Robert P.; and Jones, Robert E., to General Electric Company. Low profile fluid joint. 5,746,574, Cl. 415-115.000.
- Czech, Günther: *See—*
  - Küsters, Karl-Heinz; Küpper, Paul; Czech, Günther; and Joswig, Hellmut, 5,747,388, Cl. 438-723.000.
- Daab-Krzykowski, Andre: *See—*
  - Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
- Dade International Inc.: *See—*
  - Herring, Kathryn; and Sandberg, Denise, 5,747,268, Cl. 435-7.230.
- Daewoo Electronics Co., Ltd.: *See—*
  - Byon, Sung Kwang, 5,747,187, Cl. 429-58.000.
  - Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, 5,748,761, Cl. 382-107.000.
  - Hwang, Sung-Soo, 5,748,411, Cl. 360-107.000.
  - Jung, Hae-Mook, 5,748,244, Cl. 348-403.000.
  - Kang, Kwon-Hag, 5,748,259, Cl. 348-634.000.
  - Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, 5,747,781, Cl. 219-685.000.
  - Son, Chang-Woo; and Kim, Yang-Rae, 5,747,764, Cl. 200-61.860.
  - Youn, Gab-Jin, 5,746,071, Cl. 68-53.000.
- Daewoo Telecom Ltd.: *See—*
  - Hong, Kee-Chul, 5,746,326, Cl. 211-41.170.
- Daggar, Robert N. Multimedia electronic wallet with generic card. 5,748,737, Cl. 380-24.000.
- Dague, Richard R.; Harris, William L.; and Kaiser, Sandra K., to Iowa State University Research Foundation, Inc. Temperature-phased anaerobic waste treatment process. 5,746,919, Cl. 210-603.000.
- Dahl, Kevin W.: *See—*
  - Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., 5,749,045, Cl. 455-31.200.
- Dahlbäck, Carl Magnus Olof: *See—*
  - Bäckström, Kjell Göran Erik; Dahlbäck, Carl Magnus Olof; Edman, Peter; and Johansson, Ann Charlotte Birgit, 5,747,445, Cl. 514-4.000.
- Dahlberg, E. Dan; and Moran, Timothy J., to University of Minnesota, Regents of the. Spin-valve magnetoresistance sensor having minimal hysteresis problems. 5,747,997, Cl. 324-252.000.
- Dahlin, Steinar, to Telefonaktiebolaget LM Ericsson. Analog retry. 5,749,055, Cl. 455-553.000.
- Dahms, Gerd Herbert, to Tioxide Specialties Limited. Compositions containing sunscreens. 5,747,012, Cl. 424-60.000.
- Dai Nippon Printing Co., Ltd.: *See—*
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
  - Okabe, Masato, 5,748,273, Cl. 349-86.000.
- Daido Tokushuko Kabushiki Kaisha: *See—*
  - Kishino, Katsumi; and Kato, Toshihiro, 5,747,862, Cl. 257-436.000.
  - Yoshida, Hiroaki; and Isogawa, Sachihiro, 5,746,845, Cl. 148-587.000.
- Daikin Industries: *See—*
  - Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
- Daimler-Benz Aktiengesellschaft: *See—*
  - Loose, Werner; Korec, Jacek; Niemann, Ekkehard; and Boos, Alfred, 5,747,831, Cl. 257-77.000.
- Dainippon Ink and Chemicals, Inc.: *See—*
  - Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
- Dairygold Technologies Limited: *See—*
  - Stack, Francis Martin; Hennessy, Mark; Mulvihill, Daniel; and O'Kennedy, Brendan Thomas, 5,747,647, Cl. 530-365.000.
- Daisey Kikai Co., Ltd.: *See—*
  - Suzuki, Tomosaburo; and Kawakami, Sanji, 5,746,105, Cl. 83-804.000.
- Daiwa Seiko, Inc.: *See—*
  - Miyazaki, Takeo, 5,746,381, Cl. 242-261.000.
  - Tsutsumi, Wataru, 5,746,382, Cl. 242-322.000.
- Dallas Semiconductor: *See—*
  - Curry, Stephen M., Loomis, Donald W.; and Fox, Christopher W., 5,748,740, Cl. 380-25.000.
- Dalton, Scott W.; and Podhaisky, Todd D., to Compaq Computer Corporation. Polarity switched data bus for reduced electromagnetic interference. 5,748,902, Cl. 395-200.760.
- Dalvy, Olivier: *See—*
  - Clement, Jean-Pierre; and Dalvy, Olivier, 5,746,015, Cl. 36-93.000.
- Daly, Una T.; Huang, Ying-Kuei Ann; Parker, Robert D.; and Firenze, Mary E., to Apple Computer, Inc. Remote network administration methods and apparatus. 5,748,896, Cl. 395-200.530.
- Damji, Dhirendra C.; and Herzog, Richard W., to Xerox Corporation. Multi-size photoreceptor flange bearing. 5,749,028, Cl. 399-117.000.
- Damm, Hartmut: *See—*
  - Jaksic, Zeljko; Damm, Hartmut; and Meyer, Christof, 5,748,816, Cl. 385-39.000.
- Dampskibsselskabet AF 1912 A/S: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Damrath, Joachim: *See—*
  - Brunner, Dieter; Damrath, Joachim; and Kornberger, Martin, 5,746,118, Cl. 99-427.000.
- Damson, Eckart; Klenk, Martin; and Miller, Stefan, to Robert Bosch GmbH. Method and arrangement for controlling an internal combustion engine. 5,746,176, Cl. 123-336.000.
- Dana Corporation: *See—*
  - Duggan, James A.; and Gall, Ray A., 5,746,658, Cl. 464-130.000.
- Danfoss A/S: *See—*
  - Friedrichsen, Welm; and Baagø Jepsen, Aksel, 5,747,950, Cl. 318-5.000.
- Danisco Sugar AB: *See—*
  - Ljusberg, Helena; and Pehrson, Kerstin, 5,747,089, Cl. 426-478.000.
- Dannenberg, Rand, to Servo Corporation of America. Method of applying a film to a substrate. 5,747,117, Cl. 427-535.000.
- Daou, Fadi H.: *See—*
  - Smith, Marc L.; and Daou, Fadi H., 5,748,672, Cl. 375-226.000.
- Darche, Sylvie: *See—*
  - Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, 5,747,246, Cl. 435-6.000.
- Darlix, Jean-Luc; and Torrent, Christophe, to Institut National de la Sante et de la Recherche Medicale (INSERM). Retroviral vectors comprising a VL30-derived psi region. 5,747,323, Cl. 435-235.100.
- Darzynkiewicz, Zbigniew D.; Li, Xun; Traganos, Frank N.; and Melamed, Myron R., to New York Medical College. Detection of halogenated precursors incorporated into DNA. 5,747,258, Cl. 435-6.000.
- Das, Palash P.: *See—*
  - Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.
- Dascal, Nathan: *See—*
  - Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, 5,747,278, Cl. 435-69.100.
- Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, to Sanyo Chemical Industries, Ltd. Water-absorbing resin composition. 5,747,570, Cl. 524-161.000.
- Datta, Utpal; and Carlson, David G., to Cabletron Systems, Inc. Method and apparatus for digital data compression. 5,748,781, Cl. 382-232.000.
- Dattagupta, Nanibhushan: *See—*
  - Becherer, Kathleen; Dattagupta, Nanibhushan; and Naidu, Yathi M., 5,747,470, Cl. 514-44.000.
- Daugherty, Raymond F.: *See—*
  - Waclawsky, John G.; Hershey, Paul C.; and Daugherty, Raymond F., 5,748,925, Cl. 395-311.000.
- Daum, Wolfgang: *See—*
  - Roshen, Waseem Ahmed; Korman, Charles Steven; and Daum, Wolfgang, 5,745,981, Cl. 29-607.000.
- Davey, Christopher K.: *See—*
  - Cullen, Michael John; Dinsdale, Steven; and Davey, Christopher K., 5,746,049, Cl. 60-274.000.
- David, Jean-François; and Gerbe, Jean-Pierre, to Sextant Avionique. Device for stowing away a holographic mirror, notably for aircraft. 5,748,346, Cl. 359-15.000.
- David Sarnoff Research Center, Inc.: *See—*
  - Fan, Zhong Hui-Hugh; Levine, Aaron William; Cherukuri, Satyam Choudary; and Lipp, Steven A., 5,747,169, Cl. 428-426.000.
  - Riddle, George Herbert Needham; Prabhu, Ashok Naryan; Matthies, Dennis Lee; and Sreeram, Attiganal Narayanaswamy, 5,747,931, Cl. 313-581.000.
- Davidson, Beverly L.; and Roessler, Blake J., to University of Michigan. Adenoviral-mediated gene transfer to synovial cells in vivo. 5,747,072, Cl. 424-93.200.
- Davidson, Isobel J.; McMillan, Roderick S.; and Murray, John J., to National Research Council of Canada. Use of a stable form of $LiMnO_2$ as cathode in lithium cell. 5,747,194, Cl. 429-224.000.
- Davidson, James C.: *See—*
  - Balch, Joseph W.; Carrano, Anthony V.; Davidson, James C.; and Koo, Jackson C., 5,746,901, Cl. 204-606.000.
- Davidson, Norman: *See—*
  - Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, 5,747,278, Cl. 435-69.100.
- Davies, Michael B.: *See—*

  - Dornoff, Jeffrey M.; O'Toole, Deborah A.; and Davies, Michael B., 5,747,006, Cl. 424-62.000.
- Davis, Dennis W.; and Lucio, John. Electronic article surveillance event monitoring system. 5,748,085, Cl. 340-572.000.
- Davis, Derek L.: *See—*
  - Korta, Jean-Charles; Davis, Derek L.; Spaw, William J.; and Clark, Lawrence T., 5,748,303, Cl. 356-229.000.
- Davis, Harry L.: *See—*
  - Parr, William; and Davis, Harry L., 5,747,886, Cl. 307-10.200.
- Davis, James L.; Williams, Melanie; and Pennisi, Robert W., to Motorola, Inc. Electrical energy storage device having a porous organic electrode. 5,748,438, Cl. 361-504.000.
- Davis, Michael A.: *See—*
  - Kersey, Alan D.; and Davis, Michael A., 5,748,312, Cl. 356-345.000.
- Davis, Pete: *See—*
  - Ecker, David J.; Vickers, Tim; and Davis, Pete, 5,747,253, Cl. 435-6.000.
- Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., to Regeneron Pharmaceuticals, Inc. Method of enhancing the biological activity of Eph family ligands. 5,747,033, Cl. 424-134.100.
- Dawley, Mark: *See—*
  - Shogan, Gregory P.; Stroud, David J.; and Dawley, Mark, 5,745,954, Cl. 16-343.000.
- Dawson, Frank R.: *See—*
  - Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., 5,749,074, Cl. 705-8.000.
- Day, Michael J.: *See—*
  - Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.
- Day, Richard Allen: *See—*
  - Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.
- De La Rue Cartes Et Systems SAS: *See—*
  - Ferreira, Ronald; and Hoppe, Joseph, 5,748,782, Cl. 382-232.000.
- Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, to Rhone-Poulenc Rorer S.A. Intermediates of peptide antagonists of neurotensin. 5,747,303, Cl. 435-119.000.
- Debley, William P.: *See—*
  - Cherbettchian, Agop H.; and Debley, William P., 5,748,565, Cl. 367-154.000.
- de Boer, Mark; and Conroy, Leah B., to Chiron Corporation. Methods and materials for the induction of T cell anergy. 5,747,034, Cl. 424-137.100.
- DeCastro, Lan: *See—*
  - Wiedmann, Timothy S.; Wood, Ray W.; and DeCastro, Lan, 5,747,001, Cl. 424-45.000.
- Decision Point Marketing, Inc.: *See—*
  - Beeler, Mark T.; and Welker, Brian H., 5,746,328, Cl. 211-59.300.
- Decker, Detlef: *See—*
  - Weigelt, Beate; Mügge, Martin; and Decker, Detlef, 5,746,496, Cl. 362-61.000.
- Decory, John Francis: *See—*
  - Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., 5,747,234, Cl. 430-523.000.
- DeCosta, Daniel J. Climate controlled doghouse. 5,746,271, Cl. 165-53.000.
- Deere & Company: *See—*
  - Goodnight, Trent Lynn; and Dharia, Vijay Manilal, 5,748,431, Cl. 361-154.000.
- De Felippis, Michael R., to Eli Lilly and Company. Monomeric insulin analog formulations. 5,747,642, Cl. 530-304.000.
- DeField, Brent: *See—*
  - DeField, Topper; and DeField, Brent, 5,746,397, Cl. 244-135.00R.
- DeField, Topper; and DeField, Brent. Aircraft defueling system. 5,746,397, Cl. 244-135.00R.
- Defieuw, Geert: *See—*
  - Leenders, Luc; Defieuw, Geert; Horsten, Bart; and Strijckers, Hans, 5,747,412, Cl. 503-201.000.
- deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., to Dow Chemical Company, The. Polyolefin compositions exhibiting heat resistivity, low hexane-extractives and controlled modulus. 5,747,594, Cl. 525-240.000.
- Degussa Aktiengesellschaft: *See—*
  - Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.
- De Haan, Ben Rudolf: *See—*
  - De Jong, Sylvia Josefine; De Haan, Ben Rudolf; and Tan, Hong Sheng, 5,747,078, Cl. 426-9.000.
- DeHart, Daniel L.: *See—*
  - Cannon, Thomas G.; and DeHart, Daniel L., 5,748,484, Cl. 364-479.030.
- de Hemptinne, Jean-Charles: *See—*
  - Moracchini, Gérard; Sanchez, José; de Hemptinne, Jean-Charles; and Ungerer, Philippe, 5,747,674, Cl. 73-61.440.
- Deimen, James M.: *See—*
  - Finkbeiner, Bradley M., 5,746,858, Cl. 156-108.000.
- De Jong, Sylvia Josefine; De Haan, Ben Rudolf; and Tan, Hong Sheng, to Gist-brocades, N.V. Longterm antimicrobial activity obtained by sustained release of hydrogen peroxide. 5,747,078, Cl. 426-9.000.
- De Knaep, Alfons Gaston Maria: *See—*
  - Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.
- de la Caridad Puentes Rizo, Gisela: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
- Delacourt, Dominique; Truffer, Jean-Patrick; Papillon, Dominique; and Papuchon, Michel, to Thomson-CSF. Frequency converter, with very high efficiency, in guided optics. 5,748,362, Cl. 359-332.000.
- Delago, Pierre C. Radial support assembly for an apparatus for positioning a vessel. 5,746,148, Cl. 114-230.000.
- DeLaura, Mario D.: *See—*
  - Anderson, Charles C.; and DeLaura, Mario D., 5,747,232, Cl. 430-514.000.
- Delco Electronics Corporation: *See—*
  - Draves, Kenneth George, 5,748,252, Cl. 348-516.000.
  - Schoenian, Richard J.; and Strader, Alan Lee, 5,748,106, Cl. 340-928.000.
- del Corral, Jose Maria Migel: *See—*
  - Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.
- Dell USA, L.P.: *See—*
  - Dollahite, Bill; and Finch, Rick, 5,748,877, Cl. 395-183.120.
- Delorme, Franck; and Ougier, Christophe, to France Telecom. Sample grating distributed bragg reflector laser, very widely matchable by phase variation and process for using this laser. 5,748,660, Cl. 372-50.000.
- De Los Santos, Hector J., to Hughes Electronics. Photonic bandgap crystal frequency multiplexers and a pulse blanking filter for use therewith. 5,748,057, Cl. 333-134.000.
- Delprat, Patrick: *See—*
  - Renard, Lucien; Delprat, Patrick; and Heim, Philippe, 5,747,569, Cl. 524-140.000.
- Delta Agro Industries: *See—*
  - Menassa, Aime; and Caupin, Henri, 5,747,090, Cl. 426-532.000.
- Delta America Ltd.: *See—*
  - Salsman, Kenneth E.; Malik, Amjad I.; and Kingsley, Gary B., 5,748,379, Cl. 359-634.000.
- Delvinquier, Jean-Pierre: *See—*
  - Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, 5,748,013, Cl. 336-233.000.
- De Maeyer, Marc: *See—*
  - Lasters, Ignace; De Maeyer, Marc; and Ripka, William Charles, 5,747,449, Cl. 514-12.000.
- Demicheli, Marco: *See—*
  - Bruccoleri, Melchiorre; Demicheli, Marco; Patti, Giuseppe; and Pisati, Valerio, 5,748,128, Cl. 341-144.000.
- Den Norske Stats Oljeselskap A.S: *See—*
  - Svenning, Bjørnar; Hals, Tormod; and Bugten, Bjarne, 5,747,754, Cl. 181-401.000.
- Denaro, Maurizio: *See—*
  - Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, 5,747,295, Cl. 435-71.300.
- DenBaars, Steven P.: *See—*
  - Mishra, Umesh Kumar; and DenBaars, Steven P., 5,747,838, Cl. 257-192.000.
- Deng, Tiliang; and Karin, Michael, to University of California, The Regents of the. Mitogen activated c-Fos regulating kinase, FRK. 5,747,318, Cl. 435-194.000.
- Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, to Tate & Lyle Public Limited Company. Sweetened extruded food products. 5,747,091, Cl. 426-548.000.
- DeNigris, Thomas D.: *See—*
  - Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., 5,748,049, Cl. 331-49.000.
- Denison, Edward Virgil: *See—*
  - Aboaf, Joseph Adam; Denison, Edward Virgil; and Kahwaty, Vincent Noel, 5,745,978, Cl. 29-603.080.
- Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Miyakawa, Takeshi; Shimizu, Mikio; and Nabeta, Takeshi, 5,747,164, Cl. 428-411.100.
- Denninger, Erich W. E.: *See—*
  - Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.
- Dennis, Scott Michael: *See—*
  - Rutherford William Michael; Hinds, Mark Alan; and Dennis, Scott Michael, 5,747,020, Cl. 424-93.450.
- Dennison, Charles H.; and Helm, Mark, to Micron Technology, Inc. CMOS integrated circuitry with HALO and LDD regions. 5,747,855, Cl. 257-369.000.
- Denso Corporation: *See—*
  - Honda, Akihiro, 5,746,190, Cl. 123-568.000.

Ito, Koji; Kameoka, Teruhiko; Matsunaga, Kouji; and Kuwayama, Kazutoshi, 5,746,577, Cl. 416-178.000.

Tsutsui, Toshio; Sato, Hirohide; and Maruyama, Toshinori, 5,748,463, Cl. 363-127.000.

Dent, Paul W., to Ericsson Inc. Compensation for second order intermodulation in a homodyne receiver. 5,749,051, Cl. 455-324.000.

Dent, Paul Wilkinson, to Ericsson Inc. Method and apparatus for converting an analog signal into digital format. 5,748,134, Cl. 341-172.000.

Dentai, Andrew Gomperz, to Lucent Technologies Inc. Wavelength discriminating photodiode for 1.3/1.55 µm lightwave systems. 5,747,861, Cl. 257-435.000.

Denzer, Dirk: *See—*

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.

Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, to BASF Aktiengesellschaft. Water-soluble, carboxyl-containing copolymers, the preparation thereof and the use thereof as scale inhibitor. 5,747,619, Cl. 526-318.500.

DePalma, Vito A.: *See—*

Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., 5,747,234, Cl. 430-523.000.

DePiero, Fred W.: *See—*

Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.

De Plaen, Etienne: *See—*

Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.

Deppen, John F.: *See—*

Brough, Steve A.; and Deppen, John F., 5,746,335, Cl. 213-43.000.

Derby, Norwin C., to Super Sack Mfg. Corp. Method of making a liner for roll-off waste containers. 5,746,862, Cl. 156-198.000.

DerMarderosian, Aaron C., Sr.: *See—*

Arsenault, Marc J.; and DerMarderosian, Aaron C., Sr., 5,748,092, Cl. 340-604.000.

Der Simonian, Harout: *See—*

Brenner, Michael; and Der Simonian, Harout, 5,747,036, Cl. 424-144.100.

de Ruijter, Hendrik: *See—*

Domburg, Bastiaan; Gupta, Anshu M.; de Ruijter, Hendrik; and Strijbosch, Antonius Henricus J., 5,747,441, Cl. 510-375.000.

de Ruyter, Anthony J.: *See—*

Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.

Desai, Nailesh B.: *See—*

Chan, Jim H.; and Desai, Nailesh B., 5,748,717, Cl. 379-120.000.

DesChane, Jaquetta R.: *See—*

Bray, Lane Allan; and DesChane, Jaquetta R., 5,749,042, Cl. 423-2.000.

Deschenes, Laurent, to Moulinex S.A. Vacuum cleaner with fuzzy logic control unit. 5,748,853, Cl. 395-61.000.

Design Intelligence, Inc.: *See—*

Orr, Michael B., 5,748,963, Cl. 395-704.000.

Design Systems, Inc.: *See—*

Pfarr, Craig E.; and Rudy, Norman A., 5,746,566, Cl. 414-751.000.

Desilets, Dave: *See—*

Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., 5,748,453, Cl. 361-801.000.

Desmettre, Philippe: *See—*

Languet, Bernard; and Desmettre, Philippe, 5,747,063, Cl. 424-442.000.

Deutsch, Rainer: *See—*

Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.

Deutsche Forschungsanstalt Fuer Luft-und Raumfahrt E.V.: *See—*

Peschka, Walter; and Schneider, Gottfried, 5,746,172, Cl. 123-292.000.

Deutsche Rockwool Mineralwall-GmbH: *See—*

Weber, Gerd; and Biebel, Willi, 5,748,479, Cl. 364-470.010.

De Vaan, Adrianus J. S. M.: *See—*

Neijzen, Jacobus H. M.; De Vaan, Adrianus J. S. M.; and Stroomer, Martinus V. C., 5,748,374, Cl. 359-621.000.

Devir, Daniel D.; and Coushaine, Charles M., to Osram Sylvania Inc. Lamp capsule with rotary swaged lug connectors. 5,747,920, Cl. 313-318.090.

Dewey, Jason: *See—*

Briggs, John C.; Patterson, Robert S.; and Dewey, Jason, 5,748,410, Cl. 360-106.000.

De Wit, Dirk: *See—*

Veelaert, Sarah; De Wit, Dirk; and Tournois, Huibert, 5,747,658, Cl. 536-18.500.

De Woskin, Richard E.: *See—*

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.

Dexling, Hartmut: *See—*

Baur, Siegfried; Horn, Heinz; and Dexling, Hartmut, 5,746,084, Cl. 72-351.000.

Dey, Sujit: *See—*

Bhattacharya, Subhrajit; and Dey, Sujit, 5,748,647, Cl. 371-22.310.

Dharia, Vijay Manilal: *See—*

Goodnight, Trent Lynn; and Dharia, Vijay Manilal, 5,748,431, Cl. 361-154.000.

Dhein, Rolf: *See—*

Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.

d'Hont, Loek, to Texas Instruments Incorporated. Wireless flywheel synchronization method. 5,748,137, Cl. 342-42.000.

Diado Metal Company Ltd.: *See—*

Murakami, Hiroshi; Tsutsui, Masanori; Asai, Katsumi; and Sasaki, Takayoshi, 5,746,002, Cl. 33-517.000.

Diagnostic Systems Laboratories, Inc.: *See—*

Khosravi, M. Javad; Mistry, Jehangir; and Diamandi, Anastasia, 5,747,273, Cl. 435-7.940.

Diamandi, Anastasia: *See—*

Khosravi, M. Javad; Mistry, Jehangir; and Diamandi, Anastasia, 5,747,273, Cl. 435-7.940.

Dianat, Sohail A.: *See—*

Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.

DiBenedetto, John. Moveable grass field. 5,746,028, Cl. 52-6.000.

DiBetta, Geno. Tool rack. 5,746,330, Cl. 211-70.600.

Dicke, Grant D.; and Williams, Jeffrey A., to Dicke Tool Company. Tripod stand. 5,746,406, Cl. 248-166.000.

Dicke Tool Company: *See—*

Dicke, Grant D.; and Williams, Jeffrey A., 5,746,406, Cl. 248-166.000.

Dicker, Timothy P.; and Wilkinson, William T. Energy expenditure garment. 5,745,917, Cl. 2-69.000.

Dickson, Gary: *See—*

Millet, Cedar; and Dickson, Gary, 5,746,154, Cl. 119-57.800.

DiCosmo, Bob S.; and Tyszkiewicz, Gary R. Handicap telephone with associated booth. 5,748,721, Cl. 379-155.000.

Diefenbach, Beate: *See—*

Jonczyk, Alfred; Felding-Habermann, Brunhilde; Diefenbach, Beate; and Rippmann, Friedrich, 5,747,457, Cl. 514-13.000.

Diesel Engine Retarders, Inc.: *See—*

Hu, Haoran, 5,746,175, Cl. 123-322.000.

Dietschi, Roland; and Levy, Gideon, to Elpatronic AG. Process for the initial operation or changeover of a sheet metal processing machine and a modular magazine for carrying out the process. 5,746,571, Cl. 414-795.700.

Dietz, Erwin; and Schönfeld, Axel. LCP blends. 5,747,175, Cl. 428-480.000.

Dietz, Hartmut; Ries-Müller, Klaus; and Förster, Jürgen, to Robert Bosch GmbH. Method for detecting combustion misfires. 5,747,679, Cl. 73-116.000.

DiFilippo, Frank P., to Picker International, Inc. Scatter filter for emission tomography. 5,747,812, Cl. 250-363.100.

Digimarc Corporation: *See—*

Rhoads, Geoffrey B., 5,748,763, Cl. 382-115.000.

Rhoads, Geoffrey B., 5,748,783, Cl. 382-232.000.

Digital Equipment Corporation: *See—*

Hanna, Christine Beth; and Levin, Roy, 5,748,961, Cl. 395-701.000.

Raman, T. V., 5,748,186, Cl. 345-302.000.

Dillon, John Bradly: *See—*

Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.

Dimiduk, Dennis M.: *See—*

Kim, Young-Won; and Dimiduk, Dennis M., 5,746,846, Cl. 148-671.000.

Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, to U.S. Philips Corporation. Resistive film. 5,748,069, Cl. 338-308.000.

Dinsdale, Steven: *See—*

Cullen, Michael John; Dinsdale, Steven; and Davey, Christopher K., 5,746,049, Cl. 60-274.000.

Dinwoodie, Thomas L., to PowerLight Corporation. Lightweight, self-ballasting photovoltaic roofing assembly. 5,746,839, Cl. 136-251.000.

DiPiazza, Frank Burke: *See—*

Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, 5,746,368, Cl. 228-33.000.

Dipl.-Ing H. Horstmann GmbH: *See—*

Horstmann, Hendrik, 5,748,095, Cl. 340-664.000.

Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, to Siemens Aktiengesellschaft. Control unit with an air pressure detector for a vehicle passenger protection system. 5,748,075, Cl. 340-436.000.

Discovision Associates: *See—*

Schell, David L., 5,748,578, Cl. 369-44.140.

Dishart, Peter T.: *See—*

Kadunce, Randy R.; Shumaker, Robert T., Jr.; and Dishart, Peter T., 5,748,155, Cl. 343-713.000.

Dishner, Teddy L.; and Breaux, Terry, to Walrus, Inc. Zipper apparatus and method facilitating maintenance and repair. 5,745,960, Cl. 24-381.000.

Displaytech, Inc.: *See—*

Handschy, Mark A.; and Meadows, Michael R., 5,748,164, Cl. 345-89.000.

Disser, Robert John: *See—*

Heaston, Bruce Allen; and Disser, Robert John, 5,748,422, Cl. 361-18.000.

Distinti, Robert J., to Intellectual Property Development Associates of Connecticut, Incorporated. Analog to digital converter. 5,748,133, Cl. 341-161.000.

Ditze, Alexander: *See—*

Fleckenstein, Theo; Ditze, Alexander; and Hahn, Thomas, 5,746,777, Cl. 8-142.000.

Diversey Lever Inc.: *See—*

Taylour, James; and Glozbach, Eberhard, 5,747,431, Cl. 508-283.000.

Dobratz, Jeffrey Alan: *See—*

Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, 5,748,269, Cl. 349-58.000.

Dobuzinsky, David M.: *See—*

Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.

Dochi, Tohru: *See—*

Kawakami, Youichi; and Dochi, Tohru, 5,748,139, Cl. 342-51.000.

Dochtermann, Ulrich; Fein, Peter; Klinar, Robert; and Philipps, Werner, to ITT Automotive Europe GmbH. Central locking system for motor vehicles. 5,747,885, Cl. 307-10.200.

Document Authentication Systems, Inc.: *See—*

Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., 5,748,738, Cl. 380-25.000.

Dodge, David J., to Burton Corporation, The. Ratchet-type buckle. 5,745,959, Cl. 24-68.0SK.

Dodson, Esther L. Christmas tree light ring. 5,746,504, Cl. 362-252.000.

Doering, Jeffrey Allen: *See—*

Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, 5,746,183, Cl. 123-492.000.

Doerr, Hans J.: *See—*

Bunshah, Rointan F.; Doerr, Hans J.; and Jou, Shyankay, 5,747,118, Cl. 427-577.000.

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, to Merck & Co., Inc. Substituted azetidiones as anti-inflammatory and antidegenerative agents. 5,747,485, Cl. 514-210.000.

Doi, Seizou: *See—*

Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.

Doi, Takefumi: *See—*

Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, 5,747,451, Cl. 514-12.000.

Doll Fahrzeugbau GmbH: *See—*

Baumgartner, Hans, 5,746,262, Cl. 144-24.130.

Dollahite, Bill; and Finch, Rick, to Dell USA, L.P. Method for executing embedded diagnostics from operating system-based applications. 5,748,877, Cl. 395-183.120.

Domburg, Bastiaan; Gupta, Anshu M.; de Ruijter, Hendrik; and Strijbosch, Antonius Henricus J., to Lever Brothers Company, Division of Conopco, Inc. Encapsulated bleach particles. 5,747,441, Cl. 510-375.000.

Domenig, Georg, to Grass America, Inc. Drawer guide support bracket. 5,746,490, Cl. 312-334.500.

Dominguez, Manuel Alfredo Galguera: *See—*

Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.

Dominiak, Marcel: *See—*

Barrois, Gérard; Dominiak, Marcel; Fedeli, Jean-Marc; and Pisella, Christian, 5,748,408, Cl. 360-103.000.

Dominico, James W.: *See—*

Gujda, Mieczyslaw; van der Griendt, Pieter S.; and Dominico, James W., 5,746,570, Cl. 414-795.600.

Dönges, Reinhard; and Ehrler, Rudolf, to Hoechst Aktiengesellschaft. Cationic unsaturated saccharides and polymers prepared therefrom, and their use. 5,747,468, Cl. 514-42.000.

Dongyang Mechatronics Corp.: *See—*

Kim, Manyeob, 5,746,457, Cl. 292-216.000.

Donohue, Timothy J.; Barber, Robert D.; and Witthuhn, Vern, to Wisconsin Alumni Research Foundation. Microbial system for formaldehyde sensing and remediation. 5,747,328, Cl. 435-252.300.

Doong, Yih-Yuh, to United Microelectronics Corporation. Method for preventing charging effect and thermal damage in charged-particle microscopy. 5,747,803, Cl. 250-307 000.

Doran, Thomas I.; and McLane, John Arthur, to Hoffman-La Roche Inc. Vitamin D3 analogs for the treatment of psoriasis and sebaceous gland diseases. 5,747,478, Cl. 514-167.000.

Dormandy, Ray H., Jr.; Berlo, Marcelyn A.; and Paul, David J., to International Therapeutics Corporation. Introducer cartridge for delivering an embolization device. 5,746,734, Cl. 606-1.000.

Dorn, Conrad: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Dornier GmbH: *See—*

Kurbjuhn, Manfred; Stolten, Detlef; and Wagner, Wolfgang, 5,747,184, Cl. 429-31.000.

Dornoff, Jeffrey M.; O'Toole, Deborah A.; and Davies, Michael B., to Amway Corporation. Skin whitener composition containing acerola cherry fermentate. 5,747,006, Cl. 424-62.000.

Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Fluorine-containing benzoylguanidines. 5,747,539, Cl. 514-618.000.

Dorsey, George F.: *See—*

Compere, Alicia L.; Griffith, William L.; Dorsey, George F.; and West, Brian H., 5,746,783, Cl. 44-301.000.

Douchin, Christian: *See—*

Aparicio, Jean-Pierre; and Douchin, Christian, 5,746,625, Cl. 439-610.000.

Dougan, Gordon; and Frankel, Gad, to Imperial College of Science, Technology & Medicine. Intimin-like proteins of *E. coli* . 5,747,293, Cl. 530-402.000.

Douglas, Richard M. Powder for use in thermal spraying. 5,747,163, Cl. 428-404.000.

Douine, Denis: *See—*

Muller, Patrice; Coetsier, Paul; and Douine, Denis, 5,748,301, Cl. 356-155.000.

Dow Chemical Company, The: *See—*

Aikman, Robert E., Jr., 5,746,954, Cl. 264-87.000.

Dunmead, Stephen D.; and Romanowski, Michael J., 5,746,803, Cl. 75-351.000.

McKay, Kevin W.; Blanchard, Robert R.; Feig, Edwin R.; and Kummer, Kyle G., 5,747,580, Cl. 524-576.000.

Sorenson, Marius W.; Cipriano, Robert A.; Longoria, Jose J.; and Weaver, John D., 5,747,546, Cl. 521-32.000.

deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.

Dow Corning Corporation. *See—*

Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.

Downing, Daniel Ray: *See—*

Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,101, Cl. 83-34.000.

Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,102, Cl. 83-34.000.

Dowski, Edward Raymond, Jr.: *See—*

Cathey, Wade Thomas, Jr.; and Dowski, Edward Raymond, Jr., 5,748,371, Cl. 359-558.000.

Doxbeck, Mark: *See—*

Abbate, Agostino; Frankel, Julius; and Doxbeck, Mark, 5,747,693, Cl. 73-622.000.

Doyle, Bruce Andrew: *See—*

Prakash, Jaideep; Norsworthy, John Paul; and Doyle, Bruce Andrew, 5,748,127, Cl. 341-144.000.

Doyle, Pat: *See—*

Kwiat, Karol; Sheehan, John; Brown, Ricky; and Doyle, Pat, 5,746,626, Cl. 439-630.000.

Dr. Ing. h.c.F. Porsche AG: *See—*

Knauss, Hans-Peter; Mayer, Hartmut; and Goetz, Bernhard, 5,746,291, Cl. 187-223.000.

Dr. Johannes Heidenhain GmbH: *See—*

Spies, Alfons, 5,747,995, Cl. 324-207.200.

Draenert, Klaus. Trabecula nasal filter having both macropores and micropores. 5,746,200, Cl. 128-206.110.

Draghetti, Fiorenzo, to G.D Societa Per Azioni. Product wrapping method. 5,746,044, Cl. 53-461.000.

Draghetti, Fiorenzo; and Polloni, Roberto, to G.D Societa' Per Azioni. Perforating unit for producing ventilated cigarettes. 5,746,229, Cl. 131-281.000.

Dragotta, Peter J., to M.W. Technologies, Inc. Apparatus for high speed inspection of objects. 5,746,323, Cl. 209-539.000.

Drake, Gerald E.: *See—*

Theirl, Scott G.; and Drake, Gerald E., 5,746,408, Cl. 248-295.110.

Draper, Michael W., to Eli Lilly and Company. Pharmaceutical unit dosage formulations. 5,747,510, Cl. 514-333.000.

Drappel, Stephan V.: *See—*

Ong, Beng S.; Mychajlowskijj, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.

Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., 5,747,554, Cl. 523-161.000.

Draudt, Gregg R.: *See—*

Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.

Draudt, Gregg Robert: *See—*

Luchetti, Robert J.; Draudt, Gregg Robert; Eldon, James Bender, III; and McClanahan, David Dean, 5,746,034, Cl. 52-220.700.

OL
2 10
ISS
1
MY
5
998
MI

Draves, Kenneth George, to Delco Electronics Corporation. Method and apparatus for synchronizing internal and external video signals. 5,748,252, Cl. 348-516.000.
Drawert, Bruce M.: *See—*
Sivers, Erlvada A.; Silver, Michael D.; and Drawert, Bruce M., 5,748,768, Cl. 382-130.000.
Drehmel, Robert Allen: *See—*
Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.
Drenner, George L., Jr.: *See—*
Jones, David L.; and Drenner, George L., Jr., 5,746,465, Cl. 296-65.100.
Drent, Eit; Van Der Veer, Frits; and Wijngaarden, Rudolf Jacobus, to Shell Oil Company. Process for the preparation of a copolymer of carbon monoxide. 5,747,638, Cl. 528-392.000.
Drewry, Raymond, to Sybase, Inc. Digital video system and methods for efficient rendering of superimposed vector graphics. 5,748,178, Cl. 345-138.000.
Dreyer, Alain: *See—*
Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lacan, Dominique, 5,747,043, Cl. 424-195.100.
Dreyer, Hans: *See—*
Bergmann, Wolfgang; Dreyer, Hans; and Pohl, Wolfgang, 5,746,438, Cl. 280-433.000.
Dreyfuss, David: *See—*
Wilder, Joseph; and Dreyfuss, David, 5,748,300, Cl. 356-124.000.
Driscoll, Timothy D.: *See—*
Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.
Drobnich, Vaughn J.: *See—*
Teller, Bill; McCulloch, Pete; Drobnich, Vaughn J.; and Goins, Jeffrey Lee, 5,746,363, Cl. 224-547.000.
Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, to Lucent Technologies Inc. Multi-chip modules with isolated coupling between modules. 5,747,982, Cl. 323-902.000.
Drug Delivery Systems, Inc.: *See—*
Sibalis, Dan; and Rosen, Sanford, 5,746,711, Cl. 604-20.000.
DSC Telecom L.P.: *See—*
Teodorescu, Ioan V.; and Mazzurco, Anthony, 5,748,569, Cl. 368-118.000.
DTM Corporation: *See—*
Lakshminarayan, Udaykumar; McAlea, Kevin P.; and Booth, Richard B., 5,749,041, Cl. 419-2.000.
Du Pont de Nemours, E. I., and Company: *See—*
Bereznak, James Francis; Chang, Zen-Yu; Selby, Thomas Paul; and Sternberg, Charlene Gross, 5,747,497, Cl. 514-259.000.
Brown, Richard James; Sun, King-Mo; and Frasier, Deborah Ann, 5,747,516, Cl. 514-359.000.
Corcoran, Patrick Henry; Hazan, Isidor; and Quashie, Sapé Kwesi, 5,747,590, Cl. 525-155.000.
Hanafey, Michael K.; Sebastian, Scott Anthony; and Tingey, Scott Valray, 5,746,023, Cl. 47-58.000.
Jensen, Mark Anton, 5,747,257, Cl. 435-6.000.
Vinod, Yashavant Vinayak; and Whelchel, Wayne Curtis, 5,747,133, Cl. 428-46.000.
Dubash, Darius D.: *See—*
Burnett, Debbie L.; Dubash, Darius D.; Ladas, Athanasios S.; and Wong, Victor M., 5,747,064, Cl. 424-443.000.
Dubertret, Catherine: *See—*
Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, 5,747,303, Cl. 435-119.000.
Dubief, Claude: *See—*
Cauwet, Daniele; and Dubief, Claude, 5,747,014, Cl. 424-70.110.
Duchek, John W.: *See—*
Stewart, W. Brian; Osment, Donald R.; and Duchek, John W., 5,747,725, Cl. 102-521.000.
Duck, Gary Stephan; and Ip, Joseph, to Fitel Inc. Wavelength dependent crossover system for bi-directional transmission. 5,748,363, Cl. 359-341.000.
Duel, Susan Beth: *See—*
Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
Dufal, Frédéric: *See—*
Quillevere, Claude; and Dufal, Frédéric, 5,749,085, Cl. 711-5.000.
Dufrane, Ronald M.: *See—*
Gladden, Ernest L.; and Dufrane, Ronald M., 5,747,722, Cl. 102-275.110.
Duggan, Geoffrey; Teraguchi, Nobuaki; Rorison, Judy Megan; and Tomomura, Yoshitaka, to Sharp Kabushiki Kaisha. Optoelectronic semiconductor device having a miniband. 5,747,827, Cl. 257-15.000.
Duggan, James A.; and Gall, Ray A., to Dana Corporation. Anti-rotation retainer for universal joint. 5,746,658, Cl. 464-130.000.
Duke University: *See—*
Crapo, James D.; and Freeman, Bruce A., 5,747,026, Cl. 424-94.300.
Rose, Jed E.; Behm, Frederique; and Turner, James, 5,746,227, Cl. 131-270.000.
DuLac, Keith B.; and Phillips, Grover G., to Symbios Logic Inc. Dual bus architecture for a storage device. 5,748,871, Cl. 395-182.030.
Dumas, Marc: *See—*
Meybeck, Alain; Bonte, Frédéric; Dumas, Marc; and Chaudagne, Catherine, 5,747,538, Cl. 514-570.000.
Du Mee, Charles P.: *See—*
Swift, Robert L.; Du Mee, Charles P.; and Randolph, Anne, 5,747,447, Cl. 514-9.000.
Dunbar, Belinda W. Removable lampshade cover and method therefor. 5,746,506, Cl. 362-351.000.
Duncan, Darlene S.: *See—*
Foster, Kenneth C.; and Duncan, Darlene S., 5,746,603, Cl. 434-219.000.
Duncan, Frank Louis: *See—*
Brown, Michael Dale; Duncan, Frank Louis; and Bentley, Ralph Talmadge, II, 5,746,611, Cl. 439-135.000.
Duncan, Robert G., to Xilinx, Inc. Efficient three-dimensional layout method for logic cell arrays. 5,748,942, Cl. 395-500.000.
Dungworth, Howard Roger: *See—*
Stockwell, John Oliver; Bingham, Timothy Guy; and Dungworth, Howard Roger, 5,746,885, Cl. 162-5.000.
Dunlap, Frank M; So, Hock C.; and Wong, Sau C., to inVoice Technology, Inc. Read circuit which uses a coarse-to-fine search when reading the threshold voltage of a memory cell. 5,748,533, Cl. 365-185.190.
Dunlap, Frank M.; So, Hock C.; and Wong, Sau C., to Invox Technology. Feedback loop for reading threshold voltage. 5,748,534, Cl. 365-185.210.
Dunlap, Thomas G.; Elkins, Robert B.; and Colby, Mark J., to General Electric Company. Fuel assembly structure selectively using channel and coolant rod for load support and method. 5,748,695, Cl. 376-446.000.
Dunmead, Stephen D.; and Romanowski, Michael J., to Dow Chemical Company, The. Metallic-carbide group VIII metal powder and preparation methods thereof. 5,746,803, Cl. 75-351.000.
Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Solid state laser with positive thermal lens. 5,748,664, Cl. 372-75.000.
Dunn, Steven; and Byrnes, Gale A., to Church & Dwight Co. Inc. Aqueous sodium salt metal cleaner. 5,747,439, Cl. 510-255.000.
Duperrier, Marc, to OCD S.A. Inkjet printer. 5,748,205, Cl. 347-29.000.
Duquesne Light Company: *See—*
Breen, Bernard P.; Gabrielson, James E.; and Cavello, Joseph, 5,746,144, Cl. 110-345.000.
Durante, Richard J.: *See—*
Rozman, Rodney R.; Durante, Richard J.; Fandrich, Mickey L.; and Alexis, Ranjeet, 5,748,939, Cl. 395-430.000.
Durbin, Dennis A.: *See—*
Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.
Dürckheimer, Walter: *See—*
Lattrell, Rudolf; Dürckheimer, Walter; and Schmid, Peter, 5,747,484, Cl. 514-202.000.
Durette, Philippe: *See—*
Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.
Durham, Darrell Lee; Johnson, Mark Anthony; and O'Reilly, David Wayne, to Eskridge, Inc. Retaining assembly for roller bearings. 5,746,517, Cl. 384-538.000.
Durham, Stevenson, Jr. Ham ladder. 5,746,287, Cl. 182-70.000.
Duriron Company, Inc., The: *See—*
Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, 5,746,417, Cl. 251-315.120.
Dusek, John E., Jr.: *See—*
Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.
Duske Engineering Co., Inc.: *See—*
Duske, Wilfried P.; Hogue, Robert T.; and Koeslin, Kenneth J., 5,746,006, Cl. 34-136.000.
Duske, Wilfried P.; Hogue, Robert T.; and Koeslin, Kenneth J., to Duske Engineering Co., Inc. Single pass rotary dryer. 5,746,006, Cl. 34-136.000.
Dust, Herbert; Lohmeier, Gerhard; and Viebranz, Manfred G., to Minnesota Mining and Manufacturing Company. Crushable core and cover assembly having an expanded tubing and a crushable core. 5,746,253, Cl. 138-178.000.
Dutta, Mitra: *See—*
Shen, Paul H.; Dutta, Mitra; Wraback, Michael; and Pamulapati, Jagadeesh, 5,748,359, Cl. 359-248.000.
Dutton, Drew: *See—*
Lambrecht, Andy; Belt, Steve L.; and Dutton, Drew, 5,748,921, Cl. 395-308.000.
DuVall, Wilbur E.: *See—*
Breed, David S.; and DuVall, Wilbur E., 5,748,473, Cl. 364-424.055.
Dvorak, John Thomas; and Erasmy, Joseph J. Water heater seismic support system. 5,746,405, Cl. 248-146.000.
DX Antenna Company, Limited: *See—*
Ohta, Minoru; and Fujimoto, Akihiro, 5,749,046, Cl. 455-67.100.

Dyadic Systems Co., Ltd.: *See—*
Kojima, Masakazu, 5,745,967, Cl. 29-40.000.
Dyckerhoff & Widmann AG of Munich: *See—*
Kenny, Daniel P.; Singer, Donald J.; and Kast, Gerhard G., 5,745,996, Cl. 30-90.100.
Dyckman, Howard L. Spread spectrum modulation using time varying linear filtering. 5,748,667, Cl. 375-200.000.
Dyconex Patente AG: *See—*
Schmidt, Walter; and Schmid, Hermann, 5,746,929, Cl. 216-59.000.
Dye, Pamela G.: *See—*
Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.
Dyer, David J.; Geisler, Claus J.; and Woerner, Ulrich, to Morton International, Inc. Airbag module. 5,746,447, Cl. 280-743.200.
Dynamics Imaging, Inc.: *See—*
Godik, Eduard E., 5,747,789, Cl. 250-208.100.
Dynamit Nobel Aktiengesellschaft: *See—*
Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.
Dzurenko, Theresa E.: *See—*
Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen I., 5,747,092, Cl. 426-560.000.
E-Systems, Inc.: *See—*
Skaggs, John M., 5,746,551, Cl. 408-1.00R.
Willmann, Donald F., 5,746,389, Cl. 242-615.100.
E-Tek Dynamics, Inc.: *See—*
Pan, Jing-Jong; Cao, Simon X. F.; Shi, Yuan; and Yu, Donna S., 5,748,350, Cl. 359-130.000.
Ear Craft Technologies: *See—*
Weeks, Eric L., 5,748,743, Cl. 381-68.600.
Eason, Richard O. Display apparatus utilizing persistence of vision. 5,748,157, Cl. 345-31.000.
Eastman Kodak Company: *See—*
Alligood, John H.; Lamphron, Mark A.; and Cipolla, David, 5,748,988, Cl. 396-6.000.
Anderson, Charles C.; and DeLaura, Mario D., 5,747,232, Cl. 430-514.000.
Bee, John Arthur; Kempster, John Kenneth Charles; and Evans, Gareth, 5,747,230, Cl. 430-503.000.
Benati, Paul J.; Gray, Robert T.; and Cosgrove, Patrick A., 5,748,764, Cl. 382-117.000.
Bohan, Anne E.; Buchanan, John M.; and Szajewski, Richard P., 5,747,228, Cl. 430-380.000.
Cameron, Robert Joseph, 5,748,291, Cl. 355-75.000.
Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.
Foster, David George; Gates, Edgar Preston; and Rosenburg, John Howard, 5,749,017, Cl. 396-578.000.
Gupta, Mool C.; Nutt, Alan C. G.; and Gopalan, Venkatraman, 5,748,361, Cl. 359-332.000.
Harrison, Daniel J., 5,748,204, Cl. 347-2.000.
Klees, Kevin John, 5,748,239, Cl. 348-373.000.
Manico, Joseph Anthony; and Reem, Richard Carroll, 5,747,225, Cl. 430-345.000.
Manico, Joseph Anthony; Roule, Thomas Richard; Loveland, William Davis; and Pricola, Barton Anthony, 5,748,284, Cl. 355-39.000.
Manico, Joseph Anthony; Patton, David Lynn; and Forest, Paul Henry, 5,748,289, Cl. 355-74.000.
McIntyre, Dale F.; and Allen, Loretta E., 5,749,006, Cl. 396-310.000.
Mitacek, Paul; Ghyzel, Peter John; and Chen, Tienteh, 5,747,585, Cl. 524-845.000.
Moran, P. W. Thomas; and Rice, Joseph J., 5,749,016, Cl. 396-515.000.
Naujokas, Andrius Algimantas; and Gamble, William James, 5,747,547, Cl. 521-48.500.
Raimondi, Russell J., Jr., 5,746,388, Cl. 242-595.000.
Reiter, Thomas Carl; Soscia, Peter P.; and Brust, David P., 5,746,864, Cl. 156-220.000.
Roberts, Luther C.; and Losee, David L., 5,747,199, Cl. 430-7.000.
Sangregory, Jude A.; and Pearson, Douglas H., 5,748,989, Cl. 396-6.000.
Smart, David Clinton; and Lyon, Ralph Merwin, 5,748,990, Cl. 396-6.000.
Sorriero, Louis Joseph; and Fitzgerald, John J., 5,747,145, Cl. 428-195.000.
Stelter, Eric C.; Guth, Joseph E.; and Kasiske, W. Charles, 5,748,218, Cl. 347-158.000.
Wess, Raymond E.; Piccinino, Ralph L., Jr.; and Rosenburgh, John H., 5,749,018, Cl. 396-578.000.
Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., 5,747,234, Cl. 430-523.000.
Eastman, Simon J.: *See—*
Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.
Ebara Corporation: *See—*
Niimura, Yasuhiro; Ikegami, Tetsuma; Hanafusa, Naoya; and Nakaniwa, Masaru, 5,746,790, Cl. 55-317.000.
Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, 5,746,581, Cl. 417-2.000.
Ebbinghaus, Rainer: *See—*
Osthoff, Walter; and Ebbinghaus, Rainer, 5,745,966, Cl. 26-3.000.
Ebeling, Ralf-Martin, to Braunschweigische Maschinenbauanstalt AG. Centrifuge with a drive unit and an endless drive means. 5,746,915, Cl. 210-363.000.
Ebert, Wolfgang: *See—*
Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, 5,747,589, Cl. 525-146.000.
Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.
Ehi, Günter. Method of measuring torsional stresses and/or axial stresses on a rotating shaft or on a comparable workpiece. 5,747,699, Cl. 73-800.000.
Ehisawa, Isao: *See—*
Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwahara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
Echelon Corporation: *See—*
Sutterlin, Philip H.; and Stewart, J. Marcus, 5,748,671, Cl. 375-206.000.
Echigo, Tomio; and Asaka, Shunichi, to International Business Machines Corporation. Two-dimensional management pattern, information display tag, and image processing method and device. 5,748,868, Cl. 395-133.000.
Eck, Donald R. Carpel tunnel syndrome external brace. 5,746,707, Cl. 602-21.000.
Eckel Manufacturing Company, Inc.: *See—*
Stuart, Randolph L., 5,746,276, Cl. 173-1.000.
Eckel, Petra; Pelz, Edgar; and Potzler, Bernd, to Lohmann GmbH & Co. KG. Textile fabric for seat covers or cushions, in particular for seats in motor vehicles. 5,747,393, Cl. 442-272.000.
Ecker, David J.; Vickers, Tim; and Davis, Pete, to Isis Pharmaceuticals, Inc. Combinatorial oligomer immunoabsorbant screening assay for transcription factors and other biomolecule binding. 5,747,253, Cl. 435-6.000.
Eckhardt, Matthias: *See—*
Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, 5,747,326, Cl. 435-240.200.
Eckstrom, Donald J., to SRI International. NDIR apparatus and method for measuring isotopic ratios in gaseous samples. 5,747,809, Cl. 250-345.000.
Ecoair Corp.: *See—*
Syverson, Charles D.; and Francis, Willard P., 5,747,909, Cl. 310-156.000.
Ecolab, Inc.: *See—*
Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.
Eda, Kazuo; Taguchi, Yutaka; Kanaboshi, Akihiro; and Ogura, Tetsuyoshi, to Matsushita Electric Industrial Co., Ltd. Electronic components having high-frequency elements and methods of manufacture therefor. 5,747,857, Cl. 257-416.000.
Eda, Takeshi: *See—*
Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwahara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.
Eddy, Clifford O.: *See—*
Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.
Eder, Erich, to Motorenfabrik Hatz GmbH & Co. Muffler for an internal combustion engine, particularly a single-cylinder diesel engine. 5,747,753, Cl. 181-282.000.
Eder, Roman: *See—*
Schmid, Eduard; and Eder, Roman, 5,747,634, Cl. 528-315.000.
Edgar, Albert Durr, to International Business Machines Corporation. Virtual display adapters using a digital signal processing to reformat different virtual displays into a common format and display. 5,748,866, Cl. 395-128.000.
Edge, David A. Therapeutic pillow. 5,746,218, Cl. 128-845.000.
Edman, Peter: *See—*
Bäckström, Kjell Göran Erik; Dahlbäck, Carl Magnus Olof; Edman, Peter; and Johansson, Ann Charlotte Birgit, 5,747,445, Cl. 514-4.000.
Edoga, John K. Surgical stent. 5,746,766, Cl. 606-198.000.
Edwards, Daniel J.; and Edwards, Mark J., to Mid-States Plastics, Inc. In-ground receptacle for fluid meter and valves. 5,747,687, Cl. 73-277.000.
Edwards, Hywel, to Pilkington P.E. Limited. Mounting arrangement. 5,748,393, Cl. 359-822.000.
Edwards, Lawrence D., to Kadee Quality Products Co. Coupler adaptor for model railroad rolling stock. 5,746,336, Cl. 213-75.0TC.
Edwards, Mark J.: *See—*
Edwards, Daniel J.; and Edwards, Mark J., 5,747,687, Cl. 73-277.000.
Edwards, Stuart D., to Somnus Medical Technologies, Inc. Method for ablating turbinates. 5,746,224, Cl. 128-898.000.
Egawa, Naoko: *See—*
Ito, Yutaka; Egawa, Naoko; Unai, Shogo; and Murase, Tadashi, 5,748,880, Cl. 395-183.220.

VOL
210
ISS
1
MY
5
998
MI

Egberg, Nils; Larsson-Backström, Carin; Jakobsson, Jan; and Lundh, Rolf, to Pharmacia & Upjohn Aktiebolag. Use of ω-3-fatty acids. 5,747,533, Cl. 514-549.000.

Egger, F. Robert, to Specialized Bicycle Components, Inc. Bicycle helmet. 5,745,924, Cl. 2-425.000.

Eggins, Douglas W.: *See—*

Walsh, Roger C.; and Eggins, Douglas W., 5,746,255, Cl. 138-115.000.

Eggleston, Angela K.: *See—*

Kowalczykowski, Stephen C.; and Eggleston, Angela K., 5,747,247, Cl. 435-6.000.

Eguchi, Shin: *See—*

Matsumoto, Tsuyoshi; Mizuno, Yoshihiro; Omata, Keiichi; and Eguchi, Shin, 5,748,377, Cl. 359-633.000.

Eguchi, Toyoaki; and Majima, Hiroshi, to Toa Steel Co., Ltd. Steel gear. 5,746,842, Cl. 148-319.000.

Ehman, Michael F.: *See—*

Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.

Ehrler, Rudolf: *See—*

Dönges, Reinhard; and Ehrler, Rudolf, 5,747,468, Cl. 514-42.000.

Ehrlich, Kenneth P.; Kutz, David; and Nowakowski, Edmund C., to Union Switch & Signal Inc. Car space measurement apparatus. 5,746,399, Cl. 246-122.00R.

Eigenmann, Oskar, to Bruderer AG. Punch press having an elongate space for mounting its tools. 5,746,123, Cl. 100-208.000.

Eitel, John E.: *See—*

Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., 5,747,154, Cl. 428-327.000.

Eitrich, Frank-Thomas, to Robert Bosch GmbH. Method for the cyclic transmission of data between at least two control devices with distributed operation. 5,748,923, Cl. 395-309.000.

Eka Chemicals AB: *See—*

Tokarz, Marek; Persson, Michael; and Kozlowski, Roman, 5,747,171, Cl. 428-446.000.

Ekimoto, Hisao: *See—*

Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Ekstam, Charles L., to Ekstam Patent, L.L.C. Fuel delivery system for diesel engines. 5,746,184, Cl. 123-510.000.

Ekstam Patent, L.L.C.: *See—*

Ekstam, Charles L., 5,746,184, Cl. 123-510.000.

Eldon, James B., III: *See—*

Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.

Eldon, James Bender, III: *See—*

Luchetti, Robert J.; Draudt, Gregg Robert; Eldon, James Bender, III; and McClanahan, David Dean, 5,746,034, Cl. 52-220.700.

Eldridge, Richard A.: *See—*

Griffin, David C.; Wiersema, Dale T.; Eldridge, Richard A.; and Klingbeil, William R., 5,747,773, Cl. 219-130.100.

Electric Power Research Institute, Inc.: *See—*

Millett, Peter J.; and Miller, Alan D., 5,746,971, Cl. 422-16.000.

Quentin, George Heinz; and Yannone, Robert Alfred, 5,748,500, Cl. 364-551.010.

Electrolux Zanussi Grandi Impianti S.P.A.: *See—*

Codazzi, Luca; and Moro, Mauro, 5,746,195, Cl. 126-391.000.

Electronics and Telecommunications Research Institute: *See—*

Baek, Jong-Hyeob; Lee, Bun; Choi, Sung-Woo; and Lee, Jin-Hong, 5,748,319, Cl. 356-382.000.

Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.

Lee, Kyu-Hong; Lee, Jin-Hyo; and Lyu, Jong-Sun, 5,747,871, Cl. 257-586.000.

Elf Aquitaine Production: *See—*

Ungerer, Philippe; and Arnaud, Jean-Fabrice, 5,747,673, Cl. 73-61.410.

Elf Atochem S.A.: *See—*

Breant, Patrice; and Bouilloux, Alain, 5,747,605, Cl. 525-437.000.

Michaud, Pascal, 5,747,437, Cl. 510-177.000.

El-Genk, Mohamed S.: *See—*

Metzger, John D.; and El-Genk, Mohamed S., 5,747,418, Cl. 505-160.000.

Eli Lilly and Company: *See—*

Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., 5,747,524, Cl. 514-443.000.

De Felippis, Michael R., 5,747,642, Cl. 530-304.000.

Draper, Michael W., 5,747,510, Cl. 514-333.000.

Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.

El-Ibiary, Yehia; Nisley, Donald L.; and Stroobandt, Jack D., to Reliance Electric Industrial Company. Bearing assembly having integrated speed sensor. 5,746,452, Cl. 384-446.000.

Elizabeth Arden Co., Division of Conopco, Inc.: *See—*

Granger, Stewart Paton; Rawlings, Anthony Vincent; and Scott, Ian Richard, 5,747,051, Cl. 424-401.000.

El-Khateeb, Hesham: *See—*

Fiore, Joseph F., Jr.; Gehret, Michael J.; Roulston, Gary; and El-Khateeb, Hesham, 5,746,020, Cl. 43-85.000.

Elkins, Robert B.: *See—*

Dunlap, Thomas G.; Elkins, Robert B.; and Colby, Mark J., 5,748,695, Cl. 376-446.000.

Ellard, Gregory Stephen: *See—*

Blaker, David Mark; Ellard, Gregory Stephen; and Mohin, Muhammad Shafiul, 5,748,650, Cl. 371-43.100.

Elliott, Richard L.; Or, Yat Sun; Pireh, Daisy; and Chu, Daniel T., to Abbott Laboratories. 3-deoxy-3-descladinose derivatives of erythromycins A and B. 5,747,466, Cl. 514-29.000.

Ellis, Deborah June: *See—*

Meadows, Martin Paul; Ellis, Deborah June; and Jarrett, Paul, 5,747,025, Cl. 424-93.461.

Ellman, Alan G.: *See—*

Garito, Jon C.; and Ellman, Alan G., 5,746,746, Cl. 606-41.000.

Elmendorf, Peter Claude: *See—*

Beatty, Harry John; Elmendorf, Peter Claude; Gillis, Roland Roberto; and Pramanick, Ira, 5,748,489, Cl. 364-489.000.

Elpatronic AG: *See—*

Dietschi, Roland; and Levy, Gideon, 5,746,571, Cl. 414-795.700.

Elsner, Martin: *See—*

Richter, Peter; Elsner, Martin; and Vogt, Barbara, 5,747,508, Cl. 514-320.000.

EMC Corporation: *See—*

Gallagher, Brian, 5,748,885, Cl. 395-185.010.

Emerson Electric Co.: *See—*

Stanek, Terrence L.; and Tomasiak, Mark J., 5,746,359, Cl. 222-542.000.

Emert, Jacob; Lundberg, Robert Dean; and Lohse, David John, to Exxon Chemical Patents Inc. Gel-free alpha-olefin dispersant additives useful in oleaginous compositions. 5,747,596, Cl. 525-298.000.

Emhart Inc.: *See—*

Woolley, Curtis Scott, Sr.; and Inocelda, Arthur Corpuz, 5,746,244, Cl. 137-359.000.

Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, to Ricoh Company, Ltd. Electrostatic image developing toner and method for producing the toner. 5,747,210, Cl. 430-109.000.

EMS-Inventa AG: *See—*

Schmid, Eduard; and Eder, Roman, 5,747,634, Cl. 528-315.000.

Emtage, John Spencer; and Brandon, Malcolm Roy, to Southern Cross Biotech Party, Ltd. Process for the production of recombinant polypeptides. 5,747,290, Cl. 435-69.400.

Emura, Shinichi: *See—*

Fujisaki, Yoshihiro; Emura, Shinichi; and Takada, Kazuyuki, 5,747,833, Cl. 318-808.000.

Emura, Tetsuji: *See—*

Shimazaki, Yoshio; and Emura, Tetsuji, 5,748,394, Cl. 359-823.000.

Endo, Kazuhito: *See—*

Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, 5,748,585, Cl. 369-47.000.

Endo, Takahiro: *See—*

Masuda, Atsushi; and Endo, Takahiro, 5,748,621, Cl. 370-337.000.

Energy Savings, Inc.: *See—*

Shackle, Peter W.; Russell, Randy G.; Crouse, Kent E.; and Bezdon, Ronald J., 5,747,941, Cl. 315-224.000.

Enersol Systems, Inc.: *See—*

Ranganath, Krishnappa, 5,747,942, Cl. 315-224.000.

Engel, David J.: *See—*

Hutchings, William F.; Schutte, Marlin D.; Markle, Stephen L.; Berg, Joel S.; and Engel, David J., 5,746,536, Cl. 403-370.000.

Engel, Jürgen: *See—*

Günther, Eckhard; Wulf, Jens-Peter; Engel, Jürgen; and Kutscher, Bernhard, 5,747,534, Cl. 514-492.000.

Engelhard Corporation: *See—*

Bindra, Amrit, 5,747,571, Cl. 524-190.000.

Hays, Byron G., 5,746,821, Cl. 106-496.000.

Engelhard Process Chemicals GmbH: *See—*

Schmidt, Torsten; and Hoffmeister, Michael, 5,746,788, Cl. 48-198.200.

Engelhard Sensor Technologies: *See—*

Wong, Jacob Y., 5,747,808, Cl. 250-343.000.

Engelhardt, Edgar: *See—*

Kraft, Horst; Purr, Horst; and Engelhardt, Edgar, 5,747,744, Cl. 177-25.150.

Engfer, Robert P.: *See—*

Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.

Engle, Thomas H., to Westinghouse Air Brake Company. Pneumatic pressure to hydraulic pressure intensifier mechanism. 5,746,293, Cl. 188-151.00R.

Englund, Paul T.: *See—*

Gordon, Jeffrey I.; Gokel, George W.; and Englund, Paul T., 5,747,537, Cl. 514-558.000.

Engwall, Dwight L., to Boeing Company, The. Dual purpose lay-up tool. 5,746,553, Cl. 409-132.000.

Enichem S.p.A.: *See—*

Cutolo, Domingo; and Zoppi, Erminio, 5,747,137, Cl. 428-74.000.

Eniricerche S.p.A.: *See—*

Cutolo, Domingo; and Zoppi, Erminio, 5,747,137, Cl. 428-74.000.

Enright, Thomas E.: *See—*

Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., 5,747,577, Cl. 524-458.000.

Ensign-Bickford Company, The: *See—*

Gladden, Ernest L.; and Dufrane, Ronald M., 5,747,722, Cl. 102-275.110.

Environ Products, Inc.: *See—*

Webb, Michael C., 5,746,454, Cl. 285-92.000.

Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, to Lucent Technologies Inc. Display apparatus comprising diamond field emitters. 5,747,918, Cl. 313-309.000.

Epoch Pharmaceuticals, Inc.: *See—*

Reed, Michael W., 5,746,997, Cl. 424-1.730.

Equipment Development Company, Inc.: *See—*

Swan, Leo, 5,746,193, Cl. 125-13.030.

Erasmy, Joseph J.: *See—*

Dvorak, John Thomas; and Erasmy, Joseph J., 5,746,405, Cl. 248-146.000.

ERC Industries, Inc.: *See—*

Roberts, Allen L., 5,746,453, Cl. 285-47.000.

Erdmann, Brian W.: *See—*

Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.

Ergun, David L.: *See—*

Mazess, Richard B.; Borg, Jens; and Ergun, David L., 5,748,704, Cl. 378-54.000.

Ericksen, Susan Barbara: *See—*

Goldberg, Max Motti; Gates, Melodi Mosley; Ericksen, Susan Barbara; and White, William O., 5,748,890, Cl. 395-188.010.

Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., to Integ Incorporated. Interstitial fluid collection and constituent measurement. 5,746,217, Cl. 128-760.000.

Erickson, Ronald R., to Hologram Technology International, Inc. Image recording medium and method of making same. 5,748,347, Cl. 359-23.000.

Ericson, Philip G.; and Ransom, Ray M., to Interack Communications, Inc. ISDN D-channel signaling discriminator. 5,748,628, Cl. 370-384.000.

Ericsson Inc.: *See—*

Dent, Paul W., 5,749,051, Cl. 455-324.000.

Dent, Paul Wilkinson, 5,748,134, Cl. 341-172.000.

Jönsson, Anders; and Wictor, Mats, 5,746,493, Cl. 362-31.000.

Phillips, John C.; and Phelps, Craig A., 5,748,455, Cl. 361-818.000.

Rudisill, Charles Albert, 5,748,150, Cl. 343-702.000.

Smith, Dwight D., 5,748,270, Cl. 349-69.000.

Ericsson Messaging Systems Inc.: *See—*

Nussbaum, Paul A., 5,749,066, Cl. 704-232.000.

Ernst, Andreas: *See—*

Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.

Eryurek, Evren; and Lenz, Gary, to Rosemount Inc. Temperature transmitter with on-line calibration using johnson noise. 5,746,511, Cl. 374-2.000.

ESAB Group, Inc., The: *See—*

Griffin, David C.; Wiersema, Dale T.; Eldridge, Richard A.; and Klingbeil, William R., 5,747,773, Cl. 219-130.100.

Severance, Wayne Stanley; and Winterfeldt, Duane Norman, 5,747,767, Cl. 219-121.500.

Esaki, Hiroshi; Saito, Takeshi; and Matsuzawa, Shigeo, to Kabushiki Kaisha Toshiba. ATM communication system with high speed connection-less service function. 5,748,626, Cl. 370-355.000.

Eschbach, Reiner: *See—*

Mantell, David A.; and Eschbach, Reiner, 5,748,785, Cl. 382-237.000.

Escher, Manfred: *See—*

Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, 5,748,472, Cl. 364-424.080.

Escobedo, Jaime: *See—*

Giese, Klaus; and Escobedo, Jaime, 5,747,338, Cl. 435-348.000.

Escolar, Carlos, to AT&T Corp. Alarm alerting method and apparatus. 5,748,078, Cl. 340-506.000.

Eskridge, Inc.: *See—*

Durham, Darrell Lee; Johnson, Mark Anthony; and O'Reilly, David Wayne, 5,746,517, Cl. 384-538.000.

Eslick, Russell D.: *See—*

Brown, David M.; Eslick, Russell D.; and Robinson, Kurt B., 5,749,088, Cl. 711-115.000.

Esmaeili, Sasan, to Telefonaktiebolaget LM Ericsson. Method and system for detecting dirt on optical fibres. 5,748,299, Cl. 356-73.100.

Espinoza, Therese A.; Miller, Charles J.; and Stevens, Richard B., to United States Gypsum Company. Ready-mixed setting type joint compound. 5,746,822, Cl. 106-785.000.

Essex Specialty Products, Inc.: *See—*

Beveridge, Keith A.; Bennett, Mark A.; Waeber, Kenneth R.; and Haynes, Clinton A., 5,746,357, Cl. 222-386.000.

Ethicon Endo-Surgery, Inc.: *See—*

Bromfield, George; and Vaitekunas, Jeffrey J., 5,746,756, Cl. 606-169.000.

Ethicon, Inc.: *See—*

Cooper, Kevin; Chen, Chao C.; and Scopelianos, Angelo, 5,747,390, Cl. 442-59.000.

Euro-Celtique, S.A.: *See—*

Sackler, Richard; Goldenheim, Paul; and Chasin, Mark, 5,747,060, Cl. 424-426.000.

Eurocopter France: *See—*

Rollet, Philippe Alain Jean; and Bellera, Jacques Serge Louis, 5,746,398, Cl. 244-223.000.

Evans & Sutherland Computer Corp.: *See—*

Cosman, Michael; and Brown, Thomas C., 5,748,867, Cl. 395-130.000.

Evans, Gareth: *See—*

Bee, John Arthur; Kempster, John Kenneth Charles; and Evans, Gareth, 5,747,230, Cl. 430-503.000.

Evans, Joseph L.: *See—*

Inman, Wayne D.; King, Steven Row; Evans, Joseph L.; and Luo, Jian, 5,747,527, Cl. 514-453.000.

Evans, Richard P.: *See—*

Palmer, James D.; and Evans, Richard P., 5,748,973, Cl. 395-759.000.

Evans, Ronald M.; Mangelsdorf, David J.; and Willy, Patricia J., to Howard Hughes Medical Institute. Retinoid-inducible response elements. 5,747,661, Cl. 536-24.100.

Evi Corporation: *See—*

Nordgren, Gregory N.; and Kelly, Thomas L., 5,746,758, Cl. 606-159.000.

Excel Modular Scaffold and Leasing Corporation: *See—*

Williams, Joe W., 5,746,289, Cl. 182-129.000.

Excellence Manufacturing, Inc.: *See—*

Rees, Richard W.A., 5,746,409, Cl. 248-422.000.

Exotic Materials, Inc.: *See—*

Fisher, Donald; and Warner, Charles, 5,745,989, Cl. 29-846.000.

Exxon Chemical Patents Inc.: *See—*

Agapiou, Agapios Kyriacos; Muhle, Michael Elroy; and Renola, Gary Thomas, 5,747,612, Cl. 526-82.000.

Emert, Jacob; Lundberg, Robert Dean; and Lohse, David John, 5,747,596, Cl. 525-298.000.

Huff, Terrence; and McAlpin, James John, 5,747,592, Cl. 525-191.000.

Exxon Production Research Company: *See—*

Bailey, Jeffrey R.; and Ringo, Marion M., 5,747,750, Cl. 181-112.000.

Exxon Research and Engineering Company: *See—*

Matsushita, Shozo; and Suzuki, Naomi, 5,747,430, Cl. 508-209.000.

Eyes For You Inc.: *See—*

Herman, Pat, 5,748,280, Cl. 351-110.000.

Ezawa, Akira, to Nikon Corporation. Film forwarding device. 5,746,383, Cl. 242-332.700.

Ezumi, Yosuke: *See—*

Toyoda, Hisashi; Kenmochi, Toshio; Ezumi, Yosuke; and Tsukamoto, Takeshi, 5,748,327, Cl. 358-296.000.

F.LLi Marzoli & C. S.p.A.: *See—*

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,955, Cl. 19-102.000.

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,956, Cl. 19-106.00R.

F. R. Squibb & Sons, Inc.: *See—*

Holm, Niels Erik, 5,746,979, Cl. 422-72.000.

Faber, Robin L. Ratcheting hub wheelchair attachment. 5,746,437, Cl. 280-304.100.

Faber, Rolf E.: *See—*

Syler, Rodney R.; Faber, Rolf E.; and Lindahl, D. Kent, 5,746,344, Cl. 220-465.000.

Fahey, Kennan J.: *See—*

Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., 5,747,524, Cl. 514-443.000.

Fahlen, Theodore S.: *See—*

Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., 5,746,635, Cl. 445-24.000.

Falk, Kirsten: *See—*

Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović, Stefan; and Jung, Günther, 5,747,269, Cl. 435-7.240.

Fallen, Christopher L. Toilet seat lifting device. 5,745,930, Cl. 4-246.100.

Fan, Der-Tsyr; Jou, Chon-Shin; and Wang, Ting-S., to Mosel Vitelic Inc. Method of damage free doping for forming a dram memory cell. 5,747,378, Cl. 438-563.000.

Fan, Zhong Hui-Hugh; Levine, Aaron William; Cherukuri, Satyam Choudary; and Lipp, Steven A., to David Sarnoff Research Center, Inc. Field-assisted sealing. 5,747,169, Cl. 428-426.000.

Fandeux, Isabelle: *See—*

Petre, Jean-Marie; and Fandeux, Isabelle, 5,746,339, Cl. 215-383.000.

Fandrich, Mickey L.: *See—*

Rozman, Rodney R.; Durante, Richard J.; Fandrich, Mickey L.; and Alexis, Ranjeet, 5,748,939, Cl. 395-430.000.

Fanelli, Anthony; Behi, Mohammad; Ballard, Clifford Palmer, Jr.; and Burlew, Joan V., to AlliedSignal Inc. Gel strength enhancing additives for agaroid-based injection molding compositions. 5,746,957, Cl. 264-109.000.

Fang, Ta-Yun. Reconstitutable polyacrylamide materials and methods for producing same. 5,747,600, Cl. 525-329.400.

Fang, Weng Liang: *See—*

Chen, Ling; Hsu, Sung-Mu; and Fang, Weng Liang, 5,747,856, Cl. 257-390.000.

Fantini, Andrea: *See—*

Brizzi, Marco; Fantini, Andrea; and Gamberini, Antonio, 5,746,300, Cl. 198-347.300.

Fanuc Ltd.: *See—*

VOL 210 ISS 1 MY 5 1998 UMI

Hashimoto, Yoshiki, 5,749,058, Cl. 701-23.000.
Nakamura, Kosei; Katsuzawa, Yukio; and Nagai, Junichi, 5,747,900, Cl. 310-58.000.
Watanabe, Atsushi; Terada, Tomoyuki; and Sakamoto, Shinsuke, 5,748,854, Cl. 395-93.000.

Färgklämman AB: *See—*
Stoltz, Klas; and Gustavsson, Bo, 5,745,965, Cl. 24-704.100.

Farhadieh, Rou: *See—*
Orrico, Mario; Farhadieh, Rou; Avramovich, Rudy; and Koford, Stuart, 5,747,782, Cl. 219-689.000.

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., to Eastman Kodak Company. Silver halide light sensitive emulsion layer having enhanced photographic sensitivity. 5,747,235, Cl. 430-583.000.

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., to Eastman Kodak Company. Silver halide light sensitive emulsion layer having enhanced photographic sensitivity. 5,747,236, Cl. 430-583.000.

Farmer, Brian W., to University of Georgia Research Foundation. Method and apparatus for determining the range, direction and velocity of an object. 5,748,295, Cl. 356-5.090.

Faro Technology, Inc.: *See—*
Raab, Simon, 5,748,767, Cl. 382-128.000.

Farooq, Amjad; and Mastrull, Jeffrey Joseph, to Colgate-Palmolive Co. Super-concentrated liquid rinse cycle fabric softening composition. 5,747,108, Cl. 427-242.000.

Farooq, Amjad; and Mastrull, Jeffrey Joseph, to Colgate-Palmolive Co. Method of preparing super-concentrated liquid rinse cycle fabric softening composition. 5,747,109, Cl. 427-242.000.

Farra, Robert; and Forni, Ronald J., to Arthur D. Little, Inc. Fluid flow control system incorporating a disposable pump cartridge. 5,746,719, Cl. 604-151.000.

Farrar, Peter G. G.: *See—*
Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., 5,746,391, Cl. 244-54.000.

Farrell, Mark Steven: *See—*
Webb, Charles Franklin; Farrell, Mark Steven; Check, Mark Anthony; and Liptay, John Stephen, 5,748,951, Cl. 395-595.000.

Farrington, Theodore Edwin, Jr.: *See—*
Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, 5,746,887, Cl. 162-109.000.

Fathman, C. Garrison: *See—*
Bloom, Debra; Fathman, C. Garrison; and Slaymaker, Sarah, 5,747,299, Cl. 435-91.200.

Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, to Mercedes-Benz AG. Method and device for determining the surface contour in an elastic seat cushion deformable for under load. 5,747,676, Cl. 73-105.000.

Faust, John E.: *See—*
Lafer, John P.; Faust, John E.; and Williams, Michael D., 5,748,956, Cl. 395-615.000.

Fauteux, Denis G.: *See—*
Massucco, Arthur A.; Fauteux, Denis G.; and Van Buren, Martin, 5,746,782, Cl. 29-730.000.

Favor, John G.: *See—*
Van Dyke, Korbin S.; Stiles, David R.; and Favor, John G., 5,748,932, Cl. 395-375.000.

Fawell, Stephen E.: *See—*
Frankel, Alan; Pabo, Carl; Barsoum, James G.; Fawell, Stephen E.; and Pepinsky, R. Blake, 5,747,641, Cl. 530-300.000.

Fay, William L., Sr., to Faytex Corp. Shoe having an air-cooled breathable shoe liner. 5,746,013, Cl. 36-3.00R.

Faytex Corp.: *See—*
Fay, William L., Sr., 5,746,013, Cl. 36-3.00R.

Fazio, Albert: *See—*
Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.

Fear, Robert H.: *See—*
Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.

Febonio, Robert L.; and Foley, James A., to Polaroid Corporation. Image-receiving elements. 5,747,219, Cl. 430-215.000.

Fedeli, Jean-Marc: *See—*
Barrois, Gérard; Dominiak, Marcel; Fedeli, Jean-Marc; and Pisella, Christian, 5,748,408, Cl. 360-103.000.

Fei, Xin: *See—*
Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, 5,747,425, Cl. 505-150.000.

Feig, Edwin R.: *See—*
McKay, Kevin W.; Blanchard, Robert R.; Feig, Edwin R.; and Kummer, Kyle G., 5,747,580, Cl. 524-576.000.

Feightner, Rick; and Nguyen, My-Hanh, to Intel Corporation. Heat sink support. 5,748,446, Cl. 361-709.000.

Fein, Peter: *See—*
Dochtermann, Ulrich; Fein, Peter; Klinar, Robert; and Philipps, Werner, 5,747,885, Cl. 307-10.200.

Feldhaus, Reinhard: *See—*
Fischer, Matthias; Feldhaus, Reinhard; and Orlamünder, Andreas, 5,748,748, Cl. 381-71.400.

Felding-Habermann, Brunhilde: *See—*
Jonczyk, Alfred; Felding-Habermann, Brunhilde; Diefenbach, Beate; and Rippmann, Friedrich, 5,747,457, Cl. 514-13.000.

Feldman, Barry J.: *See—*
Bowman, Steven R.; Feldman, Barry J.; and Shaw, Leslie B., 5,746,942, Cl. 252-301.40H.

Feldman, Edward T.: *See—*
Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.

Feng, Taisheng; and Raatz, Donovan, to Motorola, Inc. Cache tag RAM having separate valid bit array with multiple step invalidation and method therefor. 5,749,090, Cl. 711-135.000.

Fenger, Clara K.: *See—*
Russell, Meri Charm; and Fenger, Clara K., 5,747,476, Cl. 514-275.000.

Fenster, Paul: *See—*
Landa, Benzion; Lior, Ishaiau, Barnea, Dan; Fenster, Paul; and Levy, Uri, 5,749,032, Cl. 399-233.000.

Feola, John. Method of playing a game using plurality of random value selectors. 5,746,432, Cl. 273-274.000.

Ferbus, Jean-Francois: *See—*
Violi, Raymond; and Ferhus, Jean-Francois, 5,746,456, Cl. 292-146.000.

Ferrando, Rosa: *See—*
Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Ferrarese, Antonio: *See—*
Caletti, Diego; and Ferrarese, Antonio, 5,746,012, Cl. 36-3.00B.

Ferrari, Pietro: *See—*
Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, 5,747,295, Cl. 435-71.300.

Ferreira, Ronald; and Hoppe, Joseph, to De La Rue Cartes Et Systems SAS. Device for implementing a message signature system and chip card comprising such a device. 5,748,782, Cl. 382-232.000.

Ferriell, Michael R.: *See—*
Saneii, Hossain; Boroomand, Mohammad R.; and Ferriell, Michael R., 5,746,982, Cl. 422-134.000.

Ferromatik Milacron Maschinenbau GmbH: *See—*
Jaroschek, Christoph; and Bourdon, Karl-Heinz, 5,747,076, Cl. 425-145.000.

Festo KG: *See—*
Stoll, Kurt, 5,746,110, Cl. 92-13.600.

FEV Motorentechnik GmbH & Co. KG: *See—*
Schrey, Ekkehard; and Schmitz, Guenter, 5,746,164, Cl. 123-90.110.
Schrey, Ekkehard; Kather, Lutz; and Van Der Staay, Frank, 5,748,433, Cl. 361-210.000.

Fewster, Paul F., to U.S. Philips Corporation. Analysing a material sample. 5,748,509, Cl. 364-578.000.

Feygenson, Anatoly: *See—*
Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, 5,747,982, Cl. 323-902.000.

Fibranz, Joachim: *See—*
Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.

Fibre Glass-Evercoat Company, Inc.: *See—*
Liddell, Kimm A., 5,747,094, Cl. 427-8.000.

Fichtel & Sachs AG: *See—*
Fischer, Matthias; Feldhaus, Reinhard; and Orlamünder, Andreas, 5,748,748, Cl. 381-71.400.

Fiedler, Alan: *See—*
Mactaggart, Iain Ross; Welch, James R.; and Fiedler, Alan, 5,748,020, Cl. 327-218.000.

Fiedler, Allen E.: *See—*
Bezick, William; Fiedler, Allen E.; Kerlee, Jody; and Hemphill, Shan, 5,746,656, Cl. 463-42.000.

Fiedler, Lee B.: *See—*
Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.

Fifolt, Douglas A.: *See—*
Mastrorio, Brooke W.; and Fifolt, Douglas A., 5,746,272, Cl. 164-516.000.

Fikrig, Erol: *See—*
Flavell, Richard A.; Kantor, Fred S.; Barthold, Stephen W.; and Fikrig, Erol, 5,747,294, Cl. 435-70.210.

Filipiak, Michael A.: *See—*
Herbermann, Alfred F.; Van't Land, Jacob J.; and Filipiak, Michael A., 5,746,567, Cl. 414-752.000.

Filterwerk Mann & Hummel GmbH: *See—*
Hamm, Hans-Peter; and Moessinger, Klaus, 5,746,794, Cl. 55-385.300.

Finbow, John Robert; and Bulpitt, Malcolm Robert, to City Technology Limited. Electrochemical gas sensor. 5,746,899, Cl. 204-415.000.

Finch, Aaron R.: *See—*
Molbak, Jens H.; Gerrity, Dan; Scherer, Scott; and Finch, Aaron R., 5,746,299, Cl. 194-200.000.

Finch, Rick: *See—*
Dollahite, Bill; and Finch, Rick, 5,748,877, Cl. 395-183.120.

Finch, Steven J.: *See—*
Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.

Finck, Bernard: *See—*
Chassaing, Alain; and Finck, Bernard, 5,747,729, Cl. 149-19.100.

Finkbeiner, Bradley M., to Deimen, James M. Method of affixing trim strip for windshield installation. 5,746,858, Cl. 156-108.000.

Finke, Paul: *See—*
Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Finkenbeiner, Pascal G.; and Kolze, Thomas J., to TRW Inc. Modulated clock MSK modulator for high data rate applications. 5,748,679, Cl. 375-305.000.

Fiore, Joseph F., Jr.; Gehret, Michael J.; Roulston, Gary; and El-Khateeb, Hesham, to Woodstream Corporation. Rubber band and spring powered mousetraps. 5,746,020, Cl. 43-85.000.

Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., to Agritech Technologies, Ltd.; Board of Supervisors of Louisana State Univ.; and Agricultural & Mechanical College. Fusion gene products encoding avian alpha subunit inhibin protein, or an immunogenic fragment thereof, and a carrier protein. 5,747,659, Cl. 536-23.400.

Firefly Network, Inc.: *See—*
Whiteis, David E., 5,749,081, Cl. 707-102.000.

Firenze, Mary E.: *See—*
Daly, Una T.; Huang, Ying-Kuei Ann; Parker, Robert D.; and Firenze, Mary E., 5,748,896, Cl. 395-200.530.

First Lady Coiffures, Ltd.: *See—*
Martin, Randy; and Martin, Les, 5,746,232, Cl. 132-54.000.

Firth, Michael Andrew: *See—*
Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, 5,748,664, Cl. 372-75.000.

Fischbeck, Karl W.; and Marks, Gary T., to AMTX, Inc. Electroformed squeegee blade for surface mount screen printing. 5,746,127, Cl. 101-123.000.

Fischer, Addison M. Method and apparatus for validating travelling object-oriented programs with digital signatures. 5,748,960, Cl. 395-683.000.

Fischer, Alfred L.: *See—*
Christensen, Mark; and Fischer, Alfred L., 5,748,101, Cl. 340-825.310.

Fischer, Dan E., to Ultradent Products, Inc. Dental bleaching compositions including a sticky matrix material. 5,746,598, Cl. 433-216.000.

Fischer, Gregory M., to Rockwell International Corporation. Electronic landmark enhancement to GPS based navigation systems. 5,748,136, Cl. 342-33.000.

Fischer, Matthias; Feldhaus, Reinhard; and Orlamünder, Andreas, to Fichtel & Sachs AG. Apparatus and method for influencing oscillations in the passenger compartment of a motor vehicle and apparatus and method for detecting defects in a motor vehicle. 5,748,748, Cl. 381-71.400.

Fischer, Paul J.: *See—*
Gorrell, Robin E.; and Fischer, Paul J., 5,747,358, Cl. 437-183.000.

Fischer, Stephan: *See—*
Kohnert, Ulrich; Fischer, Stephan; Markl, Hans-Jörg; and Woog, Heinrich, 5,747,030, Cl. 424-94.640.

Fischer, Wolfgang; and Güntherberg, Norbert, to BASF Aktiengesellschaft. Thermoplastic molding material. 5,747,568, Cl. 524-110.000.

Fischer, Wolfgang; Baum, Sylvia; Hartig, Thorsten; and Schleehahn, Michael, to Merck Patent Gesellschaft Mit Beshrankter Haftung. Indicators for determining the proton concentration of strongly alkaline aqueous solutions. 5,747,656, Cl. 534-683.000.

Fisher, Deborah A.: *See—*
Bartley, Paul L.; and Fisher, Deborah A., 5,745,987, Cl. 29-840.000.

Fisher, Delores. Teaching ruler. 5,746,001, Cl. 33-484.000.

Fisher, Donald; and Warner, Charles, to Exotic Materials, Inc. Method of preparation of an optically transparent article with an embedded mesh. 5,745,989, Cl. 29-846.000.

Fisher, Jeffrey J., to Synergy Technologies, Inc. Hunters scent system. 5,746,019, Cl. 43-1.000.

Fisher-Price Inc.: *See—*
Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.

Fisher-Rosemount Systems, Inc.: *See—*
Qin, S. Joe; Ott, Michael G.; and Wojsznis, Wilhelm K., 5,748,467, Cl. 364-148.000.

Fisher, Roy E., to Ralph's Welding Inc. Easily installable delayed egress lock system. 5,746,458, Cl. 292-252.000.

Fishman, Neil S.: *See—*
Shiff, Victor; Fishman, Neil S.; and Brzezinski, Philip, 5,748,895, Cl. 395-200.090.

Fitel Inc.: *See—*
Duck, Gary Stephan; and Ip, Joseph, 5,748,363, Cl. 359-341.000.

Fitzgerald, John J.: *See—*
Sorriero, Louis Joseph; and Fitzgerald, John J., 5,747,145, Cl. 428-195.000.

Flach, Terry E.; and Stoop, Michael D., to Vitalcom, Inc. Two-way TDMA telemetry system with power conservation features. 5,748,103, Cl. 340-870.070.

Flaig, Charles M.: *See—*
Krein, William Todd; Flaig, Charles M.; and Kelly, James D., 5,748,917, Cl. 395-306.000.

Flake, Lance Leslie; and Shonle, Gregory Black, to Optics Research, Inc. Method of compensating for the misregistration of the radial track positions of a floppy diskette in a disk drive. 5,748,400, Cl. 360-77.020.

Flannery, James W., Jr., to Time Inc. Gripper-accumulator. 5,746,425, Cl. 270-52.140.

Flavell, Richard A.; Kantor, Fred S.; Barthold, Stephen W.; and Fikrig, Erol, to Yale University. Compositions and methods for the prevention and diagnosis of lyme disease. 5,747,294, Cl. 435-70.210.

Fleckenstein, Theo; Ditze, Alexander; and Hahn, Thomas, to Henkel Kommanditgesellschaft auf Aktien. Scatterable carpet cleaning formulations. 5,746,777, Cl. 8-142.000.

Fleischer, Bruce Martin: *See—*
Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.

Fleishman, Roc V.: *See—*
Hansen, Borg; Gonzalez, Rafael; and Fleishman, Roc V., 5,745,934, Cl. 4-541.300.

Fleming, Robert Alan; and Kushner, Cherie Elaine, to Aether Wire & Location. Spread spectrum localizers. 5,748,891, Cl. 375-200.000.

Flender, Gregg, to U.S. Philips Corporation. Changer for information carriers, holder suitable for use in said changer, and scanning system comprising said holder. 5,748,604, Cl. 369-192.000.

Flenniken, Cindy L.; Menashi, Jameel; and Whitehouse, Robert S., to Cabot Corporation. Polyethylene glycol treated carbon black and compounds thereof. 5,747,563, Cl. 523-215.000.

Fletcher, LeRoy W. Method of producing fruit juices and an edible infused solid fruit product. 5,747,088, Cl. 426-425.000.

Fletcher-Haynes, Peter, to Welch Allyn, Inc. Calibration method for use with ultrasonic flowmeters. 5,748,504, Cl. 364-571.010.

Fleurial, Jean-Pierre; Caillat, Thierry F.; and Borshchevsky, Alexander, to California Institute of Technology. Advanced thermoelectric materials with enhanced crystal lattice structure and methods of preparation. 5,747,728, Cl. 136-203.000.

Flick, Roland E.; and Whitney, John K., to Gaymar Industries, Inc. Leg rest. 5,745,939, Cl. 5-648.000.

Flint, Ephraim Bemis; Karidis, John Peter; McVicker, Gerard; and Pence, William Edward, to International Business Machines Corporation. Mating adapter between a module and chassis of a computer processing system. 5,748,443, Cl. 361-686.000.

Flood, Dennis, to NCR Corporation. Security container. 5,746,140, Cl. 109-50.000.

Flores, Mario: *See—*
Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

Flores, Robert: *See—*
Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.

Floyd, Stan Louis; Muise, Herbert Donald; and Stanish, Mark A. Package for perishable food and horticultural products. 5,747,082, Cl. 426-109.000.

Flückiger, Daniel: *See—*
Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, 5,746,133, Cl. 101-484.000.

Flugstad, Philip O.: *See—*
McLean, Christopher H.; Lichon, Paul G.; Morris, Joseph P.; and Flugstad, Philip O., 5,746,050, Cl. 60-200.100.

Flynn, Tracy L.: *See—*
Walter, Joanne S.; and Flynn, Tracy L., 5,747,784, Cl. 235-383.000.

FMC Corporation: *See—*
Auguello, Michael; Ruszkay, Thomas A.; and Reier, George E., 5,747,067, Cl. 424-464.000.
Veltman, Joost; Prins, Andrew Carl; and Cavanaugh, Scott R., 5,747,085, Cl. 426-233.000.

Foamex L.P.: *See—*
Miller, Craig S., Sr., 5,745,941, Cl. 5-710.000.

Foley, Diane M.: *See—*
Malhotra, Shadi L.; and Foley, Diane M., 5,746,814, Cl. 106-18.000.

Foley, James A.: *See—*
Febonio, Robert L.; and Foley, James A., 5,747,219, Cl. 430-215.000.

Folkins, Jeffrey J., to Xerox Corporation. Transfer, cleaning and imaging stations spaced within an interdocument zone. 5,749,034, Cl. 399-303.000.

Fomenkov, Igor V.: *See—*
Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.

Fong, Chi-ming: *See—*
Wong, Wai-sing; Chao, Kam-chi; and Fong, Chi-ming, 5,748,174, Cl. 345-118.000.

Fong, Jon: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.

Fontana, Fabiano: *See—*
Wong, Jack T.; Fontana, Fabiano; and Nguyen, Susan, 5,748,525, Cl. 365-185.050.

/OL
2 10
ISS
1
MY
5
998
JMI

- Fontana, Robert Edward, Jr.; Lane, Linda Hope; Williams, Mason Lamar, III; and Yeack-Scranton, Celia Elizabeth, to International Business Machines Corporation. Magnetic head for recording with ultra low force. 5,745,979, Cl. 29-603.120.
- Foo, Chek-Peng; and Bormann, James Edward, to TRW Inc. Method and apparatus for single point sensing of front and side impact crash conditions. 5,746,444, Cl. 280-735.000.
- Ford, Frank E. Toothbrush. 5,746,595, Cl. 433-80.000.
- Ford Global Technologies, Inc.: *See—*
  - Bacina, Paul Raymond; and Fusco, John Jude, 5,746,474, Cl. 296-191.000.
  - Cullen, Michael John; Dinsdale, Steven; and Davey, Christopher K., 5,746,049, Cl. 60-274.000.
  - Hampo, Richard Joseph; Momcilovich, Paul Theodore; and Stuntz, Ross Maxwell, 5,747,689, Cl. 73-304.00C.
  - Kaepp, Gregory A.; and Becker, Beverly J., 5,748,943, Cl. 395-500.000.
  - Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, 5,746,183, Cl. 123-492.000.
  - Rendi, Anthony J., Jr., 5,748,395, Cl. 359-841.000.
  - Wirtz, Hans-Peter, 5,746,296, Cl. 192-3.290.
- Ford, John R.; and Shelton, Sam V., to Centek Industries, Inc. Combination wet marine exhaust muffler and water separator. 5,746,630, Cl. 440-89.000.
- Ford Motor Company: *See—*
  - Boggs, David L., 5,746,161, Cl. 123-41.720.
  - Callanan, Robert J., 5,747,981, Cl. 323-362.000.
  - Criss, James L.; and Fry, Linda J., 5,746,177, Cl. 123-337.000.
  - Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, 5,746,368, Cl. 228-33.000.
- Forest, Paul Henry: *See—*
  - Manico, Joseph Anthony; Patton, David Lynn; and Forest, Paul Henry, 5,748,289, Cl. 355-74.000.
- Form-Rite Plastics Development Pty., Ltd.: *See—*
  - Bleasdale, Desmond Harold, 5,747,142, Cl. 428-167.000.
- Formby, Bent: *See—*
  - Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.
- Forn, Javier: *See—*
  - Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.
- Forni, Ronald J.: *See—*
  - Farra, Robert; and Forni, Ronald J., 5,746,719, Cl. 604-151.000.
- Forslund, Kjell, to Sunds Defibrator Industries AB. Device for admixing a processing agent into a pulp suspension. 5,746,890, Cl. 162-243.000.
- Förster, Jürgen: *See—*
  - Dietz, Hartmut; Ries-Müller, Klaus; and Förster, Jürgen, 5,747,679, Cl. 73-116.000.
- Forster, Rolf, to Bernhard Forster GmbH. Orthodontic device made of metal. 5,746,593, Cl. 433-8.000.
- Forward, Peter, to Minister For Infrastructure. Control of iron deposition in borehole pumps. 5,746,923, Cl. 210-696.000.
- Fosbøl, Peder; Korremann, Birgitte; and Ullum, Henrik, to Snacko A/S. Method for the production of vegetable snacks. 5,747,087, Cl. 426-242.000.
- Foschini, Gerard Joseph: *See—*
  - Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.
- Fossum, Gordon C., to International Business Machines Corporation. Method and system for fast interpolation of depth buffer values in a computer graphics display system. 5,748,863, Cl. 395-122.000.
- Foster, David George; Gates, Edgar Preston; and Rosenburg, John Howard, to Eastman Kodak Company. Photographic processor and method of operation. 5,749,017, Cl. 396-578.000.
- Foster, David L.: *See—*
  - Moyle, Matthew; Foster, David L.; and Vlasuk, George P., 5,747,296, Cl. 435-72.000.
- Foster, George T.: *See—*
  - Cernansky, Joseph; Foster, George T.; and Rudell, Elliot, 5,746,636, Cl. 446-16.000.
- Foster, John K.: *See—*
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,747,562, Cl. 523-215.000.
- Foster, Kenneth C.; and Duncan, Darlene S. Narcotics flash cards. 5,746,603, Cl. 434-219.000.
- Foster, Stephen Leslie, to Siemens Measurements Limited. Meters. 5,746,245, Cl. 137-505.350.
- Foucher, Daniel A.: *See—*
  - Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., 5,747,554, Cl. 523-161.000.
- Foveonics, Inc.: *See—*
  - Merrill, Richard Billings, 5,747,840, Cl. 257-233.000.
- Fowler, J. Thomas; and Carroll, Steven S., to Gas Research Institute. Apparatus for detecting anomalies in pipes. 5,747,998, Cl. 324-263.000.
- Fowlkes, Dana M.: *See—*
  - Kay, Brian K; Fowlkes, Dana M.; Adey, Nils B.; and Sparks, Andrew B., 5,747,334, Cl. 435-320.100.
- Fox, Christopher W.: *See—*
  - Curry, Stephen M.; Loomis, Donald W.; and Fox, Christopher W., 5,748,740, Cl. 380-25.000.
- Fox Lite, Inc.: *See—*
  - Hoy, Walter S.; and Hoy, W. Douglas, 5,746,967, Cl. 264-406.000.
- Foy, Teresa M.: *See—*
  - Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., 5,747,037, Cl. 424-154.100.
- Framatome: *See—*
  - Malmasson, Jacques, 5,748,689, Cl. 376-204.000.
- Fran Rich Chi Associates, Inc.: *See—*
  - Chiappetta, Frank Richard, 5,746,390, Cl. 244-12.300.
- France Telecom: *See—*
  - Delorme, Franck; and Ougier, Christophe, 5,748,660, Cl. 372-50.000.
  - Hamel, André; and Laville, Daniel, 5,748,815, Cl. 385-37.000.
  - Le Marer, René; and Perrin, Gabrielle, 5,748,820, Cl. 385-76.000.
  - Quillevere, Claude; and Dufal, Frédéric, 5,749,085, Cl. 711-5.000.
- Francis, Willard P.: *See—*
  - Syverson, Charles D.; and Francis, Willard P., 5,747,909, Cl. 310-156.000.
- Francotyp-Postalia Aktiengesellschaft & Co.: *See—*
  - Gunther, Stephan; and Kunde, Christoph, 5,748,638, Cl. 371-21.200.
- Frank, Timothy M.: *See—*
  - Beaverson, Gregory K.; Schnetzka, Harold R.; and Frank, Timothy M., 5,746,062, Cl. 62-228.300.
- Franke, Robert E. Valved inflation adapter. 5,746,243, Cl. 137-231.000.
- Frankel, Alan; Pabo, Carl; Barsoum, James G.; Fawell, Stephen E.; and Pepinsky, R. Blake. Tat-derived transport polypeptide conjugates. 5,747,641, Cl. 530-300.000.
- Frankel, Gad: *See—*
  - Dougan, Gordon; and Frankel, Gad, 5,747,293, Cl. 530-402.000.
- Frankel, Julius: *See—*
  - Abbate, Agostino; Frankel, Julius; and Doxbeck, Mark, 5,747,693, Cl. 73-622.000.
- Franks, George J., Jr. Clamping bracket for a grounding system. 5,746,609, Cl. 439-92.000.
- Frantzen, John J., to Global Therapeutics, Inc. Method for polishing surgical stents. 5,746,691, Cl. 600-36.000.
- Franz, Lothar: *See—*
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Franzen, Jochen, to Bruker-Franzen Analytik GmbH. Method and device for the introduction of ions into the gas stream of an aperture to a mass spectrometer. 5,747,799, Cl. 250-288.000.
- Frary, Kevin W.: *See—*
  - Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.
- Fraser, Paul M.; and Proctor, Stanley Dwayne. Suspension type golf tee. 5,746,667, Cl. 473-393.000.
- Frasier, Deborah Ann: *See—*
  - Brown, Richard James; Sun, King-Mo; and Frasier, Deborah Ann, 5,747,516, Cl. 514-359.000.
- Fraunhofer-Gesellschaft zur Foerder der Angewandten Forschung e.V.: *See—*
  - Boergardts, Peter; Krischke, Wolfgang; and Troesch, Walter, 5,746,920, Cl. 210-611.000.
- Fred Hutchinson Cancer Research Center: *See—*
  - Greenberg, Philip D.; and Nelson, Brad H., 5,747,292, Cl. 435-69.700.
- Fred M. Schildwachter & Sons, Inc.: *See—*
  - Chomet, Marc, 5,748,074, Cl. 340-328.000.
- Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, to Hood Laboratories; and Biomechanics, Inc. Acoustic imaging. 5,746,699, Cl. 600-529.000.
- Fredenburg, Edward A. Dice marked to permit fair and mathematically simple betting odds in craps. 5,746,428, Cl. 273-146.000.
- Frederic, Alain: *See—*
  - Garcia, Salvador; Vegeais, Patrick; and Frederic, Alain, 5,748,220, Cl. 347-181.000.
- Frederick, Michael J. Gas relief valve protector. 5,746,242, Cl. 137-177.000.
- Frederick, Thomas J.: *See—*
  - Bettine, Dale R.; and Frederick, Thomas J., 5,748,086, Cl. 340-572.000.
- Freeman, Bruce A.: *See—*
  - Crapo, James D.; and Freeman, Bruce A., 5,747,026, Cl. 424-94.300.
- Freeman, Jack B.; and Gomez, Edward R. Catheter fluid absorption device and method of use. 5,746,723, Cl. 604-178.000.
- Freeman, Michael H., to Pilkington Barnes Hind, Inc. Multifocal contact lens. 5,748,282, Cl. 351-161.000.
- Freidhoff, Carl B.: *See—*
  - Young, Robert M.; Freidhoff, Carl B.; Braggins, Timothy T.; and Congedo, Thomas V., 5,747,815, Cl. 250-423.00R.
- Freisinger, Henry; and Wittmann, Heinz, to HTM Sport- und Freizeitgeraete Aktiengesellschaft. Ski boot having walking and skiing positions. 5,746,016, Cl. 36-117.100.
- Fresvig, Jan: *See—*
  - Knutsen, Stian V.; and Fresvig, Jan, 5,746,314, Cl. 206-308.100.
- Frey, Lyndsy J. Large key calculator and mount. 5,748,440, Cl. 361-683.000.
- Friedhelm Schneider: *See—*
  - Mark, Fritz; and Noser, Martin, 5,746,510, Cl. 366-217.000.
- Friedlaender, Uri: *See—*

  - Jungmann-Campello, Diana DeMello; and Friedlaender, Uri, 5,747,333, Cl. 435-283.100.
- Friedman, Doron: *See—*
  - Amselem, Shimon; and Friedman, Doron, 5,747,061, Cl. 424-427.000.
- Friedrichsen, Welm; and Baago Jepsen, Aksel, to Danfoss A/S. Steering system for vehicles or ships. 5,747,950, Cl. 318-5.000.
- Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, to Cambridge Display Technology Limited. Manufacture of electroluminescent devices. 5,747,182, Cl. 428-690.000.
- Friesen, Dwaine: *See—*
  - Bergan, Terry; and Friesen, Dwaine, 5,747,746, Cl. 177-134.000.
- Frimberger, Manfred: *See—*
  - Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
- Frimpong, George K.: *See—*
  - Brubaker, Michael A.; and Frimpong, George K., 5,747,992, Cl. 324-663.000.
- Frisbie, Joseph W.: *See—*
  - Gering, Marcus J.; Berg, Gordon O.; Lehnen, David C.; and Frisbie, Joseph W., 5,748,389, Cl. 359-811.000.
- Frisch, Kurt C.: *See—*
  - Xiao, Han Xiong; Geng, Peng; and Frisch, Kurt C., 5,747,392, Cl. 442-82.000.
- Fritzman, Ralph, to Cellular Designs Unlimited, Inc. Expandable-collapsible article having a contoured surface. 5,747,123, Cl. 428-12.000.
- Fromm, Paul M.; and Hanzlik, Edward C., to Xerox Corporation. Tension control for a cleaning web in a fuser subsystem in an electrophotographic printer. 5,749,038, Cl. 399-327.000.
- Frost, Gregory I.: *See—*
  - Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.
- Fry, Linda J.: *See—*
  - Criss, James L.; and Fry, Linda J., 5,746,177, Cl. 123-337.000.
- Fry, Ted J., to Asten, Inc. Corrugator belt seam. 5,746,257, Cl. 139-383.0AA.
- Frye, Robert Charles: *See—*
  - Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, 5,747,982, Cl. 323-902.000.
- FS Holdings, Inc.: *See—*
  - Campbell, David, 5,749,077, Cl. 705-36.000.
- Fu, Alex; Wang, David; and Wu, Chris, to Primax Electronics Ltd. Cursor controlling apparatus and its direction detection method. 5,748,181, Cl. 345-165.000.
- Fuchi, Masami: *See—*
  - Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.
- Fuchs, Josef; and Schneider, Mario, to Huber & Suhner AG. Axially adjustable coaxial electrical connecting line with constant impedance. 5,746,623, Cl. 439-578.000.
- Fuchs, Manfred H., to U.S. Philips Corporation. Device for determining the spatial position of a sensor element which is displacement relative to a reference element. 5,747,996, Cl. 324-207.170.
- Fuentes, Victoria M., to Laboratorio CHile S.A. Pharmaceutically active compounds and their use. 5,747,462, Cl. 514-23.000.
- Fugardi, Stephen: *See—*
  - Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.
- Fuji Electric Co., Ltd.: *See—*
  - Iijima, Katsuhiko; and Kinoshita, Shigenori, 5,747,959, Cl. 318-762.000.
  - Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000.
- Fuji Photo Film Co, Ltd.: *See—*
  - Watanabe, Takuo; Naruse, Yasuhito; and Yamasue, Kotaro, 5,747,216, Cl. 430-156.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Fukui, Shinichiro; and Kuno, Koichi, 5,747,237, Cl. 430-596.000.
  - Funahashi, Takeshi, 5,748,200, Cl. 345-507.000.
  - Hashimoto, Hiroshi; Murayama, Yuichiro; Satake, Masaki; and Okita, Tsutomu, 5,747,157, Cl. 428-332.000.
  - Kato, Eiichi; Nakazawa, Yusuke; and Osawa, Sadao, 5,747,214, Cl. 430-126.000.
  - Kawai, Kiyoshi, 5,747,227, Cl. 430-363.000.
  - Momota, Makoto; Sato, Kenichiro; and Sakaguchi, Shinji, 5,747,218, Cl. 430-192.000.
  - Morikawa, Seiichiro, 5,748,341, Cl. 358-488.000.
  - Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, 5,749,009, Cl. 396-395.000.
  - Nakamura, Yoshisada; Ishikawa, Shun-ichi; and Matsumoto, Kazuhiko, 5,747,226, Cl. 430-348.000.
  - Ohtsuka, Shuichi; Yoda, Akira; and Usami, Yoshinori, 5,748,858, Cl. 395-109.000.
  - Okazaki, Masaki; Yokoyama, Shigeki; and Negoro, Masayuki, 5,747,121, Cl. 428-1.000.
  - Sanada, Kazuo, 5,746,373, Cl. 239-102.200.
  - Sato, Takehiko; Takizawa, Hiroo; and Takahashi, Osamu, 5,747,231, Cl. 430-514.000.
  - Shimura, Kazuo, 5,748,799, Cl. 382-260.000.
  - Sunagawa, Hiroshi; Uejima, Atsushi; Iwasaki, Osamu; and Aihara, Takaaki, 5,748,283, Cl. 355-35.000.
  - Tanaka, Toshiharu; and Yamamoto, Mitsuru, 5,746,866, Cl. 156-234.000.
  - Tsuzaki, Hiroshi; Kanaoka, Takeshi; and Tsuchiya, Junichi, 5,746,100, Cl. 83-13.000.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Ishiguro, Minoru; and Iwamoto, Jun'ichi, 5,748,998, Cl. 396-88.000.
  - Kondo, Mituo, 5,746,696, Cl. 600-139.000.
  - Miyano, Hitoshi, 5,748,385, Cl. 359-691.000.
  - Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, 5,749,009, Cl. 396-395.000.
- Fuji Xerox Co., Ltd.: *See—*
  - Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, 5,747,206, Cl. 430-64.000.
  - Ito, Masao, 5,748,223, Cl. 347-241.000.
  - Kobayashi, Kenichi; Makida, Seigo; Nishihara, Yoshio; and Hiji, Naoki, 5,748,228, Cl. 348-63.000.
  - Koda, Yasunori; and Tanaka, Tsuyoshi, 5,749,083, Cl. 707-530.000.
  - Shimizu, Mitsuo, 5,748,340, Cl. 358-482.000.
- Fujii, Akio: *See—*
  - Ohnishi, Shinji; and Fujii, Akio, 5,748,795, Cl. 382-251.000.
- Fujii, Hitoshi: *See—*
  - Hashiba, Hidetoshi; Aoyagi, Shoji; Fujii, Hitoshi; and Kojo, Kiyoshi, 5,747,156, Cl. 428-328.000.
- Fujii, Tetsuo: *See—*
  - Iida, Makio; Fujii, Tetsuo; and Isobe, Yoshihiko, 5,747,846, Cl. 257-314.000.
- Fujii, Tsuyoshi: *See—*
  - Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, 5,747,432, Cl. 508-462.000.
- Fujii, Yasutoshi: *See—*
  - Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.
- Fujikawa, Keiji: *See—*
  - Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.
- Fujikawa, Takayuki: *See—*
  - Yamamoto, Norio; Fujikawa, Takayuki; Koide, Shunichi; and Suzuki, Yoshiichi, 5,747,122, Cl. 428-1.000.
- Fujimak Corporation: *See—*
  - Tsukamoto, Hideki; Ueoka, Akio; and Matsuo, Hiroshi, 5,747,775, Cl. 219-400.000.
- Fujimori, Haruo: *See—*
  - Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.
- Fujimoto, Akihiro: *See—*
  - Ohta, Minoru; and Fujimoto, Akihiro, 5,749,046, Cl. 455-67.100.
- Fujimoto, Harry H.: *See—*
  - Rastogi, Rajiv; Underwood, Sandra J.; and Fujimoto, Harry H., 5,747,879, Cl. 257-751.000.
- Fujimoto, Hideki: *See—*
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Fujimoto, Manabu: *See—*
  - Heard, David; Ohtani, Noboru; Unuma, Yutaka; and Fujimoto, Manabu, 5,747,796, Cl. 250-227.260.
- Fujimoto, Yasunari: *See—*
  - Iokibe, Tadashi; Tanimura, Takayoshi; and Fujimoto, Yasunari, 5,748,851, Cl. 395-51.000.
- Fujioka, Hidehiko: *See—*
  - Hasegawa, Takayuki; Tanaka, Yutaka; and Fujioka, Hidehiko, 5,746,562, Cl. 414-217.000.
- Fujioka, Satoshi: *See—*
  - Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.
- Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, to Nippon Steel Corporation. Continuous casting method and apparatus. 5,746,268, Cl. 164-468.000.
- Fujisaki, Yoshihiro; Emura, Shinichi; and Takada, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Apparatus for driving induction motor. 5,747,833, Cl. 318-808.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Asakura, Sotoo; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, 5,747,069, Cl. 424-484.000.
- Fujishiro, Felix H.: *See—*
  - Lee, Chang-Ou; Vines, Landon B.; Fujishiro, Felix H.; and Koenigseder, Sigmund, 5,745,990, Cl. 29-852.000.
- Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, to Kabushiki Kaisha Toshiba. Radiation computed tomography apparatus. 5,748,696, Cl. 378-4.000.

Fujita, Kazuhisa: *See—*

Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.

Fujita, Keiji: *See—*

Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, 5,748,288, Cl. 355-53.000.

Fujita, Masanari: *See—*

Nozawa, Masayuki; Shichijo, Yasuji; and Fujita, Masanari, 5,747,593, Cl. 525-193.000.

Fujita, Muneo, to Canon Kabushiki Kaisha. Rotation information detecting apparatus and scale for use in the same. 5,747,797, Cl. 250-231.140.

Fujita, Ryoichi: *See—*

Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.

Fujita, Tatsuya: *See—*

Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.

Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, to Tooyota Tsusho Corporation; Senko Kogyo Co., Ltd.; and Toyota Metal Co., Ltd. Friction electrifying-type electrostatic sorting apparatus. 5,746,320, Cl. 209-127.300.

Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, to Dainippon Ink and Chemicals, Inc. Curable resin composition and coating material composition. 5,747,597, Cl. 525-312.000.

Fujitsu Automation Limited: *See—*

Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.

Fujitsu Limited: *See—*

Abe, Tomoyuki, 5,746,868, Cl. 156-247.000.

Beilin, Solomon I.; Chou, William T.; Lee, Michael G.; and Wang, Wen-chou Vincent, 5,746,903, Cl. 205-118.000.

Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.

Hauser, Stephen A.; and Williams, Jeffrey L., 5,748,905, Cl. 395-200.790.

Ito, Yutaka; Egawa, Naoko; Unai, Shogo; and Murase, Tadashi, 5,748,880, Cl. 395-183.220.

Iwase, Akihiro; Nakano, Tomio; and Seki, Teruo, 5,747,837, Cl. 257-173.000.

Kobayashi, Yukio, 5,748,879, Cl. 395-183.180.

Matsumoto, Tsuyoshi; Mizuno, Yoshihiro; Omata, Keiichi; and Eguchi, Shin, 5,748,377, Cl. 359-633.000.

Minamoto, Yoshiji, 5,747,966, Cl. 320-6.000.

Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, 5,748,822, Cl. 385-90.000.

Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.

Shinagawa, Akio; Ohno, Hitoshi; and Abe, Yuko, 5,748,122, Cl. 341-67.000.

Shono, Keiji; Hashimoto, Yasunobu; Kuroda, Sumio; and Tamanoi, Ken, 5,747,136, Cl. 428-64.300.

Suzuki, Hiroaki, 5,747,669, Cl. 73-23.210.

Takahashi, Yutaka; Niiyama, Manabu; and Goto, Yoshiki, 5,748,024, Cl. 327-333.000.

Yokota, Yasuhiro, 5,748,154, Cl. 343-702.000.

Yoshizawa, Hideki; and Otsuka, Tatsushi, 5,749,089, Cl. 711-127.000.

Fujitsu Network Communications, Inc.: *See—*

Hauser, Stephen A.; and Williams, Jeffrey L., 5,748,905, Cl. 395-200.790.

Fujiwara, Hiroshi: *See—*

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Fujiwara, Mitsuaki, to Victor Company of Japan, Ltd. Variable transfer rate control coding apparatus. 5,748,249, Cl. 348-419.000.

Fujiwara, Shigeki; Yamashita, Hideki; and Maeda, Hiroshi, to Matsushita Electric Works, Ltd. Power-assisted cart. 5,746,282, Cl. 180-6.200.

Fujiwara, Shirou, to NEC Corporation. Look-up table forming method and device. 5,748,771, Cl. 382-168.000.

Fujiwara, Tatsunori: *See—*

Morimoto, Takao; and Fujiwara, Tatsunori, 5,748,406, Cl. 360-99.120.

Fujiwara, Toshiyoshi: *See—*

Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.

Fujiwara, Tsutomu: *See—*

Sanda, Tsuyoshi; and Fujiwara, Tsutomu, 5,746,525, Cl. 400-605.000.

Fujiwara, Yooichi: *See—*

Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.

Fujiyama, Takeshi: *See—*

Furukawa, Nobuyuki; Fujiyama, Takeshi; and Yuasa, Masatoshi, 5,747,625, Cl. 528-26.000.

Fujiyoshi, Kenichi, to Ando Electric Co., Ltd. Optical spectrum separation apparatus. 5,748,310, Cl. 356-334.000.

Fukada, Kaoru: *See—*

Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.

Fukai, Hisayo, to Oyentos Corporation. Method for removing a photosensitive layer from a photosensitive drum. 5,746,836, Cl. 134-1.000.

Fukakusa, Kumiko: *See—*

Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.

Fukaya, Takashi: *See—*

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Fuke, Isao: *See—*

Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, 5,747,339, Cl. 435-350.000.

Fukuda, Chie; Onishi, Masashi; and Kanamori, Hiroo, to Sumitomo Electric Industries, Ltd. Process of producing fluoride glass. 5,746,801, Cl. 65-379.000.

Fukuda, Hideki: *See—*

Narukawa, Satoshi; Amazutsumi, Toru; Fukuda, Hideki; and Tamaki, Hiyoshi, 5,746,780, Cl. 29-623.100.

Fukuda, Hiroyuki: *See—*

Hagi, Masayuki; Tamaoki, Junichi; Arai, Takeshi; and Fukuda, Hiroyuki, 5,747,211, Cl. 430-110.000.

Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.

Fukuda, Kenji; and Asano, Osamu, to Nitto Kohki Co., Ltd. Oscillation switch and a portable electrically driving machine with the oscillation switch. 5,747,762, Cl. 200-61.45R.

Fukuda, Minoru: *See—*

Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, 5,747,326, Cl. 435-240.200.

Fukuda, Ryoji; and Harada, Takashi, to Canon Kabushiki Kaisha. Data processing method and apparatus. 5,748,926, Cl. 395-326.000.

Fukuhara, Hiroyuki; Yamada, Sadayuki; and Muramatsu, Shigeru, to Matsushita Electric Industrial Co., Ltd. Scroll compressor having positioning means for axially movable non-orbiting scroll. 5,746,586, Cl. 418-55.200.

Fukui, Hiroaki: *See—*

Suzuki, Migaku; and Fukui, Hiroaki, 5,746,730, Cl. 604-385.200.

Fukui, Shinichiro; and Kuno, Koichi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,747,237, Cl. 430-596.000.

Fukui, Wataru: *See—*

Takahashi, Yasuhiro; and Fukui, Wataru, 5,747,670, Cl. 73-35.080.

Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, to Nisshin Steel Co., Ltd. Steel sheet coated with Zn-Mg binary coating layer excellent in corrosion resistance and manufacturing method thereof. 5,747,111, Cl. 427-250.000.

Fukumura, Kagenori: *See—*

Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.

Fukuoka, Shinsuke: *See—*

Komiya, Kyosuke; and Fukuoka, Shinsuke, 5,747,609, Cl. 526-68.000.

Fukuoka, Yoouichi: *See—*

Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.

Fukushima, Shinichi: *See—*

Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.

Fukushima, Tokutaro, to Ricoh Company, Ltd. Information processing system for switchably processing data associated with straight line vectors. 5,748,947, Cl. 395-501.000.

Fukuzaki, Takaharu: *See—*

Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.

Fulcher, Carol A.: *See—*

Zimmerman, Theodore S.; and Fulcher, Carol A., 5,747,337, Cl. 435-337.000.

Fuller, Christine Marie: *See—*

Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.

Fulton, Norman Neilson, to Switched Reluctance Drives Limited. Method and apparatus for increasing the starting torque of a two-phase switched reluctance motor. 5,747,962, Cl. 318-701.000.

Fumakilla Ltd.: *See—*

Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,747,047, Cl. 424-275.100.

Funahashi, Takahiko: *See—*

Sekizawa, Yasushi; and Funahashi, Takahiko, 5,748,110, Cl. 341-5.000.

Funahashi, Takeshi, to Fuji Photo Film Co., Ltd. Image displaying apparatus. 5,748,200, Cl. 345-507.000.

Funai Electric Co., Ltd.: *See—*

Nishimura, Shouichirou, 5,748,251, Cl. 348-468.000.

Funai, Takashi: *See—*

Hata, Akihiro; Funai, Takashi; and Adachi, Masahiro, 5,747,828, Cl. 257-66.000.

Fung, Hon C.: *See—*

Patchen, Paul J.; Fung, Hon C.; Leung, Fred; and McGinness, Steven, 5,748,981, Cl. 395-828.000.

Fung, Michael G.; and Chiang, Paul M-Bhor, to Silicon Magic Corporation. DRAM implementation for more efficient use of silicon area. 5,748,552, Cl. 365-230.030.

Funhoff, Angelika: *See—*

Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.

Fursich, Manfred: *See—*

Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.

Furukawa Electric Co. Ltd., The: *See—*

Morimoto, Masahito, 5,748,351, Cl. 359-193.000.

Furukawa, Nobuyuki; Fujiyama, Takeshi; and Yuasa, Masatoshi, to Nippon Steel Chemical Co., Ltd. Silicate group-containing polyimide. 5,747,625, Cl. 528-26.000.

Furumoto, Horace W.; and Ceccon, Harry L., to Cynosure, Inc. Ultra long pulsed dye laser device for treatment of ectatic vessels and method therefor. 5,746,735, Cl. 606-9.000.

Furuta, Haruki: *See—*

Nakamura, Hideo; and Furuta, Haruki, 5,748,307, Cl. 358-296.000.

Furutani, Koji: *See—*

Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.

Furuune, Makoto: *See—*

Nozomi, Mamoru; Murakami, Osamu; Fuse, Masahiro; and Furuune, Makoto, 5,747,203, Cl. 430-58.000.

Furuya, Yukitsuna: *See—*

Tomita, Hideho; Ooki, Masahiro; and Furuya, Yukitsuna, 5,748,668, Cl. 375-200.000.

Fusco, John Jude: *See—*

Bacina, Paul Raymond; and Fusco, John Jude, 5,746,474, Cl. 296-191.000.

Fuse, Masahiro: *See—*

Nozomi, Mamoru; Murakami, Osamu; Fuse, Masahiro; and Furuune, Makoto, 5,747,203, Cl. 430-58.000.

Fusillo, Giuseppe: *See—*

Campardo, Giovanni; Bedarida, Lorenzo; Fusillo, Giuseppe; and Silvagni, Andrea, 5,748,528, Cl. 365-185.130.

Futaba Denshi Kogyo K.K.: *See—*

Namikawa, Mamoru; Yoshimura, Satoshi; and Honda, Kenichi, 5,747,927, Cl. 313-495.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See—*

Itoh, Shigeo; Yonezawa, Yoshihisa; Toki, Hitoshi; and Satoh, Yoshitaka, 5,746,589, Cl. 432-77.000.

Futagi, Sadaki; and Uesugi, Mitsuru, to Matsushita Electric Industrial Co., Ltd. Data receiving apparatus. 5,748,673, Cl. 375-232.000.

Futreal, P. Andrew: *See—*

Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.

G & H Technology, Inc.: *See—*

Holt, Andrew J., 5,748,066, Cl. 337-1.000.

G.B. Boucherie N.V.: *See—*

Boucherie, Leonel Polydore, 5,746,482, Cl. 300-11.000.

G.D Societa Per Azioni: *See—*

Draghetti, Fiorenzo, 5,746,044, Cl. 53-461.000.

G.D Societa' Per Azioni: *See—*

Brizzi, Marco; Fantini, Andrea; and Gamberini, Antonio, 5,746,300, Cl. 198-347.300.

Draghetti, Fiorenzo; and Polloni, Roberto, 5,746,229, Cl. 131-281.000.

G.E.W. Corporation Limited: *See—*

Yip, Kit Chuen, 5,746,115, Cl. 99-339.000.

Gable, Benjamin W.: *See—*

Kiely, Philip; Claisse, Paul; and Gable, Benjamin W., 5,748,661, Cl. 372-50.000.

Gabrielson, James E.: *See—*

Breen, Bernard P.; Gabrielson, James E.; and Cavello, Joseph, 5,746,144, Cl. 110-345.000.

Gaddis, Mark W., to United States of America, Air Force. High efficiency constant current laser driver. 5,748,657, Cl. 372-38.000.

Gaggenau Hausgerate GmbH: *See—*

Brunner, Dieter; Damrath, Joachim; and Kornberger, Martin, 5,746,118, Cl. 99-427.000.

Gagnier, Jerome V.: *See—*

Langseth, Lee M.; Wulfing, James J.; Hubbling, David L.; and Gagnier, Jerome V., 5,748,419, Cl. 360-133.000.

Galarneau, Pierre: *See—*

Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, 5,748,814, Cl. 385-37.000.

Gale, Nicholas W.: *See—*

Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.

Gale, Robert M.: *See—*

Lee, Eun Soo; Watanabe, Tyler; Gale, Robert M.; and Burkoth, Terry L., 5,747,065, Cl. 424-448.000.

Gall, Ray A.: *See—*

Duggan, James A.; and Gall, Ray A., 5,746,658, Cl. 464-130.000.

Gallagher, Brian, to EMC Corporation. Method and apparatus for reduction of I/O operations in persistent storage system. 5,748,885, Cl. 395-185.010.

Gallant, Ben J.; Gleeman, Alan N.; and Parker, William S., to American Dental Technologies, Inc. Dental treatment method. 5,746,596, Cl. 433-88.000.

Gamberini, Antonio: *See—*

Brizzi, Marco; Fantini, Andrea; and Gamberini, Antonio, 5,746,300, Cl. 198-347.300.

Gamble, William James: *See—*

Naujokas, Andrius Algimantas; and Gamble, William James, 5,747,547, Cl. 521-48.500.

Ganchev, Stoyan I.: *See—*

Zoughi, Reza; Yeh, Chin-Yung; Ganchev, Stoyan I.; and Huber, Christian, 5,748,003, Cl. 324-644.000.

Gandhi, Deepak R.: *See—*

Powles, Trevor J.; Imran, Mir A.; Syed, Baber; and Gandhi, Deepak R., 5,746,724, Cl. 604-240.000.

Gandhi, Harish F.; Boyce, Walter A.; and Woodward, David R., to Philips Electronics North America Corporation. Electric lamp having a hybrid skirted lamp base. 5,747,919, Cl. 313-318.010.

Ganesan, Ravi, to Bell Atlantic Network Services, Inc. Securing E-mail communications and encrypted file storage using yaksha split private key asymmetric cryptography. 5,748,735, Cl. 380-21.000.

Gao, Ning: *See—*

York, Brian R.; Xiao, Oi-fan; and Gao, Ning, 5,747,821, Cl. 250-505.100.

Garbe, Gary S.: *See—*

Guthrie, Warren E.; and Garbe, Gary S., 5,748,047, Cl. 331-19.000.

Garbers, Jeffrey Paul; and Moseley, Dennis Drew. Method and apparatus for storing items in flash memory. 5,748,537, Cl. 365-185.330.

Garcia, Jorge L.: *See—*

Nichols, Jerry R.; Siddoway, Craig F; Habbaba, Faris S.; and Garcia, Jorge L., 5,748,454, Cl. 361-814.000.

Garcia, Salvador; Vegeais, Patrick; and Frederic, Alain, to Societe d'Applications Generales d'Electricite. Thermal line-printer head. 5,748,220, Cl. 347-181.000.

Garcia-Rafanell, Julian: *See—*

Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Garcia Vacas, Maria Teresa, to Alcatel NV. Burst alignment procedure. 5,748,622, Cl. 370-337.000.

Gardner, Mark I.: *See—*

Chang, Kuang-Yeh; Gardner, Mark I.; and Hause, Fred, 5,747,852, Cl. 257-336.000.

Kadosh, Daniel; and Gardner, Mark I., 5,747,367, Cl. 438-152.000.

Gargas, Joseph E.; and Hyde, Robert H., to Hartz Mountain Corporation, The. Fluidized bed aquarium filtration method. 5,746,921, Cl. 210-617.000.

Gargiulo, Joseph L.; Baker, Walter J.; and Heiden, Richard W., to Pitney Bowes Inc. Method and apparatus for storage of accounting information in a value dispensing system. 5,749,078, Cl. 705-404.000.

Gariboldi, Roberto; and Pulvirenti, Francesco, to SGS-Thomson Microelectronics S.r.l.; and Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno. Circuit for generating a reference voltage and detecting an under voltage of a supply and corresponding method. 5,747,978, Cl. 323-313.000.

Garito, Jon C.; and Ellman, Alan G. Electrosurgical electrode and method for skin resurfacing. 5,746,746, Cl. 606-41.000.

Garnett, Kevin M.; Gierhart, Dennis L.; and Guerra-Santos, Luis H., to Applied Food Biotechnology, Inc. Method of using pure 3R-3'R stereoisomer of zeaxanthin to treat or prevent retinal degeneration in humans. 5,747,544, Cl. 514-729.000.

Gärtner, Hartmut: *See—*

Lücke, Christian; Sümmerer, Gunther; and Gärtner, Hartmut, 5,748,367, Cl. 359-385.000.

Garufi, Robert: *See—*

Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.

Gas Research Institute: *See—*

Fowler, J. Thomas; and Carroll, Steven S., 5,747,998, Cl. 324-263.000.

Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

VOL
210
SS
1
MY
5
998
UMI

- Kormanyos, Kenneth R., 5,746,799, Cl. 65-111.000.
- Gaschke, Paul Mathew, to International Business Machines Corporation. Universal test and burn-in socket adaptable to varying IC module thickness. 5,748,007, Cl. 324-755.000.
- Gast, Mark E., to Boeing Company, The. Autopilot/flight director underspeed protection system. 5,746,392, Cl. 244-76.00B.
- Gast, Michael J., to American Home Products Corporation. Oral contraceptive. 5,747,480, Cl. 514-179.000.
- Gates, Edgar Preston: *See—*
  - Foster, David George; Gates, Edgar Preston; and Rosenburg, John Howard, 5,749,017, Cl. 396-578.000.
- Gates, Melodi Mosley: *See—*
  - Goldberg, Max Motti; Gates, Melodi Mosley; Ericksen, Susan Barbara; and White, William O., 5,748,890, Cl. 395-188.010.
- Gates, Stillman F., to Adaptec, Inc. Deskew circuit in a host interface circuit. 5,748,806, Cl. 395-306.000.
- Gauchel, James V.; and Lehman, Richard N., to Owens-Corning Fiberglas Technology Inc. Apparatus for resin ipregnated pultrusion. 5,747,075, Cl. 425-114.000.
- Gaughan, Edward W.; and Troiani, Vincent F., to Westinghouse Air Brake Company. E/P interface with pneumatic control valve for back-up brake arrangement. 5,746,484, Cl. 303-3.000.
- Gauker, Bradford K., to Augat Inc. Squib connector for automotive air bag assembly. 5,746,618, Cl. 439-352.000.
- Gautier, Jean Pierre; and Verbo, Ulysse, to Bosch Systems De Freinage. Pneumatic booster with reduced load and reduced hysteresis. 5,746,107, Cl. 91-376.00R.
- Gaworowski, Andrew J.: *See—*
  - Genest, John H.; Gaworowski, Andrew J.; and Sheron, Herman D., 5,745,968, Cl. 29-270.000.
- Gaymar Industries, Inc.: *See—*
  - Flick, Roland E.; and Whitney, John K., 5,745,939, Cl. 5-648.000.
- Gaynes, Michael A.: *See—*
  - Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.
- Gazelle, G. Scott: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,746,998, Cl. 424-9.400.
- GB Electrical, Inc.: *See—*
  - Sorensen, Soren Christian; and Sorensen, Jens Ole, 5,746,965, Cl. 264-318.000.
- Geary, Jeffrey A.: *See—*
  - Sampey, Harry R.; Geary, Jeffrey A.; and Schimpf, James H., 5,748,108, Cl. 340-933.000.
- Gebhard, Wolfgang; and Mann, Egon, to ZF Friedrichshafen AG. Hydrostatic-mechanical gear for driving a mixing drum. 5,746,509, Cl. 366-61.000.
- Gebruder Obermaier oHG: *See—*
  - Obermaier, Anton, 5,746,481, Cl. 297-452.410.
- Geckle, Ronita Kay: *See—*
  - Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
- Gee, Timothy F.: *See—*
  - Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.
- Geen, Nicholas: *See—*
  - Jones, Michael William Dudleston; Geen, Nicholas; Warner, Anthony; and Hughes, Mischka, 5,748,931, Cl. 395-356.000.
- Geesin, Jeffrey C.; Cole, Curtis A.; and Wisniewski, Stephen J., to Johnson & Johnson Consumer Products, Inc. Photoprotective lipophilic antioxidant compounds and their use to prevent UVA-mediated lipid peroxidation. 5,747,010, Cl. 424-59.000.
- Gehling, Steven Craig: *See—*
  - Rajala, Gregory John; Gehling, Steven Craig; and Suke, Paul Daniel, 5,745,922, Cl. 2-243.100.
- Gehret, Michael J.: *See—*
  - Fiore, Joseph F., Jr.; Gehret, Michael J.; Roulston, Gary; and El-Khateeb, Hesham, 5,746,020, Cl. 43-85.000.
- Gehrett, Larry James: *See—*
  - Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,101, Cl. 83-34.000.
  - Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,102, Cl. 83-34.000.
- Gehrig, Johann, to Colortronic GmbH. Apparatus for comminuting waste materials. 5,746,377, Cl. 241-73.000.
- Geiger, Rolf: *See—*
  - Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, 5,747,504, Cl. 514-307.000.
- Geisler, Claus J.: *See—*
  - Dyer, David J.; Geisler, Claus J.; and Woerner, Ulrich, 5,746,447, Cl. 280-743.200.
- Gelfgat, David Mendeloevich; Skipidarov, Sergei Yakovlevich; Yakhats, Michael; and Kamensky, Vyacheslav Tikhonovich, to A. Relin. Method of and device for local skin massaging. 5,746,702, Cl. 601-15.000.
- Gellman, Barry N.: *See—*
  - Sullivan, Roy H.; and Gellman, Barry N., 5,746,753, Cl. 606-147.000.
- Gemma, Edward A., Jr.: *See—*
  - Brown, David L.; Stellon, Andrew P.; and Gemma, Edward A., Jr., 5,746,311, Cl. 206-63.300.
- Gen-Probe Incorporated: *See—*
  - Becherer, Kathleen; Dattagupta, Nanibhushan; and Naidu, Yathi M., 5,747,470, Cl. 514-44.000.
  - Yang, Yeasing; Bee, Gary; and McDonough, Sherrol, 5,747,252, Cl. 435-6.000.
- GenCorp Inc.: *See—*
  - Chihara, Kohji Y.; Roth, James A.; and Krotke, Gary A., 5,746,867, Cl. 156-242.000.
- Gene Shears Pty. Limited: *See—*
  - Haseloff, James Phillip; Gerlach, Wayne Lyle; Jennings, Philip Anthony; and Cameron, Fiona Helen, 5,747,335, Cl. 435-325.000.
- Genentech, Inc.: *See—*
  - Clark, Andrew Reginald; Hsu, Chung C.; and Walsh, Andrew J., 5,747,002, Cl. 424-45.000.
  - Goeddel, David V.; and Wong, Grace H. W., 5,747,023, Cl. 424-85.100.
  - Presta, Leonard G.; and Snedecor, Bradley R., 5,747,035, Cl. 424-144.100.
  - Simmons, Laura C.; and Yansura, Daniel G., 5,747,662, Cl. 536-24.100.
- General Elecric Company: *See—*
  - Traver, Frank John; and Merrill, Duane Franklin, 5,747,567, Cl. 524-110.000.
- General Electric Company: *See—*
  - Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.
  - Brassfield, Steven R.; and Webb, Alan L., 5,746,578, Cl. 416-190.000.
  - Crivello, James V., 5,747,172, Cl. 428-447.000.
  - Czachor, Robert P.; and Jones, Robert E., 5,746,574, Cl. 415-115.000.
  - Dunlap, Thomas G.; Elkins, Robert B.; and Colby, Mark J., 5,748,695, Cl. 376-446.000.
  - Harmon, John L.; Peters, William C.; Haughton, Robert A.; and Lingenfelter, Andrew A., 5,748,691, Cl. 376-261.000.
  - King, Harold B., 5,748,694, Cl. 376-313.000.
  - Pattanayak, Deva Narayan, 5,748,564, Cl. 367-149.000.
  - Raber, Thomas Robert, 5,747,181, Cl. 428-614.000.
  - Rockstroh, Todd J.; Crow, John M.; Lee, Ching-Pang; and Risbeck, James D., 5,747,769, Cl. 219-121.710.
  - Roshen, Waseem Ahmed; Korman, Charles Steven; and Daum, Wolfgang, 5,745,981, Cl. 29-607.000.
  - Rubinsztajn, Slawomir; and Gross, David C., 5,747,624, Cl. 528-21.000.
- General Hospital Corporation, The: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,746,998, Cl. 424-9.400.
- General Motors Corporation: *See—*
  - Amlee, Dale Alan; Matouka, Michael Frank; Rausch, Richard Allen; and Otipoby, Keith, 5,747,913, Cl. 310-263.000.
  - Hammer, Michael Frederick; and Combs, Robert Franklin, 5,747,883, Cl. 290-1.00B.
  - Heaston, Bruce Allen; and Disser, Robert John, 5,748,422, Cl. 361-18.000.
  - McFadden, James Robert; Greene, Joseph Paul; and Bland, Michael James, 5,746,419, Cl. 267-140.000.
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
  - Sawert, Ulf; Ireland, Hugh Wesley; and Coha, Timothy Francis, 5,746,088, Cl. 73-317.000.
- General Resources Corporation: *See—*
  - North, Michael John; Hall, Christopher; Cyster, Thomas Mark; and Chen, Chris C., 5,748,445, Cl. 361-697.000.
- General Signal Corporation: *See—*
  - Boulaev, Anatoli S., 5,746,828, Cl. 117-201.000.
  - Cadou, Peter B.; Homer, John C., III; and Alexeff, Kevin A., 5,747,747, Cl. 177-145.000.
- Genest, John H.; Gaworowski, Andrew J.; and Sheron, Herman D., to Reeves Brothers, Inc. Sound dampening tool for cylindrical printing blankets. 5,745,968, Cl. 29-270.000.
- Geneva Group of Companies, Inc.: *See—*
  - Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., 5,748,418, Cl. 360-128.000.
- Geng, Peng: *See—*
  - Xiao, Han Xiong; Geng, Peng; and Frisch, Kurt C., 5,747,392, Cl. 442-82.000.
- Gennaro, Rosemarie A. Aircraft wheel rotating apparatus. 5,746,393, Cl. 244-103.00S.
- Genzyme Corporation: *See—*
  - Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.
- Geomarine Systems, Inc.: *See—*
  - Wilkerson, Jack, 5,745,942, Cl. 5-715.000.
- Geon Company, The: *See—*
  - Schwaegerle, Paul Robert, 5,747,556, Cl. 523-171.000.
- George, John Barrett, to Thomson Consumer Electronics, Inc. Convergence correction. 5,747,948, Cl. 315-368.180.

- George Mason University: *See—*
  - Palmer, James D.; and Evans, Richard P., 5,748,973, Cl. 395-759.000.
- Georgia Tech Research Corporation: *See—*
  - Sinclair, Michael J.; and Vitz, Frank E., 5,747,822, Cl. 250-559.190.
- Gerand, Bernard; Larcher, Dominique; and Tarascon, Jean-Marie, to Bell Communications Research, Inc. Process for synthesizing lixmny04 intercalation compounds. 5,747,193, Cl. 429-224.000.
- Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, to La Jolla Cancer Research Foundation; and Boehringer Mannheim GmbH. Isolated nucleic acid molecules which encode mammalian α2,8 polysialyl transferases. 5,747,326, Cl. 435-240.200.
- Gerbe, Jean-Pierre: *See—*
  - David, Jean-François; and Gerbe, Jean-Pierre, 5,748,346, Cl. 359-15.000.
- Gereral Electric Company: *See—*
  - Steyer, William; and Higgins, Timothy Joseph, 5,746,047, Cl. 60-39.500.
- Gerhardt, Norbert, to TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH. Apparatus for continuously applying a coating to a sheet of indeterminate length. 5,746,833, Cl. 118-665.000.
- Gerharz, Bettina: *See—*
  - Schmitz, Ludwig; Hess, Stefan; and Gerharz, Bettina, 5,747,578, Cl. 524-502.000.
- Gericke, Rolf: *See—*
  - Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, 5,747,539, Cl. 514-618.000.
- Gering, Marcus J.; Berg, Gordon O.; Lehnen, David C.; and Frisbie, Joseph W., to Motorola, Inc. Optical pedestal and method for using the same. 5,748,389, Cl. 359-811.000.
- Gerlach, Wayne Lyle: *See—*
  - Haseloff, James Phillip; Gerlach, Wayne Lyle; Jennings, Philip Anthony; and Cameron, Fiona Helen, 5,747,335, Cl. 435-325.000.
- Gerrity, Dan: *See—*
  - Molbak, Jens H.; Gerrity, Dan; Scherer, Scott; and Finch, Aaron R., 5,746,299, Cl. 194-200.000.
- Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., to Xerox Corporation. Conductive particles containing carbon black and processes for the preparation thereof. 5,747,577, Cl. 524-458.000.
- Gersan Establishment: *See—*
  - Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.
- Gershen, Bernard, to Leviton Manufacturing Co., Inc. Differential transformer correction by compensation. 5,747,980, Cl. 323-356.000.
- Gersz, Tadeusz: *See—*
  - Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.
- Gerum, Eduard; Laszlo, Palkovics; Semsey, Akos; and Barta, Gabor, to Knorr-Bremse Systeme Fur Nutzfahrzeuge GmbH. Method for drive stability enhancement of multi-unit vehicles. 5,747,683, Cl. 73-118.100.
- Gestion De Brevets Fraco LTÉE: *See—*
  - St-Germain, André; and Tessier, Luc, 5,746,290, Cl. 182-146.000.
- Ghilardi, Alfred; and Paradis, Sean. Lead-containing garment. 5,745,925, Cl. 2-457.000.
- Ghoneim, Youssef Ahmed: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Ghosh, Kalyan: *See—*
  - Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
- Ghosh, Prosenjit; and Thomas, Sunil, to Texas Instruments Incorporated. Method of attaching a semiconductor microchip to a circuit board. 5,745,985, Cl. 29-834.000.
- Ghyzel, Peter John: *See—*
  - Mitacek, Paul; Ghyzel, Peter John; and Chen, Tienteh, 5,747,585, Cl. 524-845.000.
- Giani, Paola; L'Abbate, Massimo; and Cancro, Lewis Patrick, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Self-heating dentifrice. 5,747,004, Cl. 424-49.000.
- Gibbs, William T.: *See—*
  - Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.
- Gibson, Mark T.: *See—*
  - Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
- Gierhart, Dennis L.: *See—*
  - Garnett, Kevin M.; Gierhart, Dennis L.; and Guerra-Santos, Luis H., 5,747,544, Cl. 514-729.000.
- Giese, Klaus; and Escobedo, Jaime, to Chiron Corporation. Method and construct for screening for inhibitors of transcriptional activation. 5,747,338, Cl. 435-348.000.
- Giesecke & Devrient GmbH: *See—*
  - Hohmann, Arno; Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 5,745,988, Cl. 29-841.000.
- Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., to Baxter International Inc. Peristaltic pump tube holder with pump tube shield and cover. 5,746,708, Cl. 604-4.000.
- Gietz, Hanspeter; Rösli, Manfred; and Bänziger, Heinz, to Maschinenfabrik Gietz AG. Embossing machine. 5,746,122, Cl. 100-43.000.
- Gifford, Mark: *See—*
  - Mitchell, Albert W.; and Gifford, Mark, 5,745,921, Cl. 2-181.000.
- Gilblom, David L.; and Castro, Peter S., to Picker International, Inc. Shadowgraphic x-ray imager with TDI camera and photo stimulable phosphor plate. 5,747,825, Cl. 250-586.000.
- Gill, Hardayal Singh, to International Business Machines Corporation. Resettable symmetric spin valve. 5,748,399, Cl. 360-66.000.
- Gillis, Roland Roberto: *See—*
  - Beatty, Harry John; Elmendorf, Peter Claude; Gillis, Roland Roberto; and Pramanick, Ira, 5,748,489, Cl. 364-489.000.
- Gilot, Monefax Joseph: *See—*
  - Johnson, Robert Michael, Jr.; and Gilot, Monefax Joseph, 5,747,970, Cl. 320-151.000.
- Ginko Bussan Co., Ltd.: *See—*
  - Moriya, Yukio, 5,746,170, Cl. 123-196.0AB.
- Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lacan, Dominique, to Bio-Obtention SC. *Cucumis melo* protein extract with antioxidant activity and process for preparing it, cosmetic composition or food composition containing such an extract. 5,747,043, Cl. 424-195.100.
- Ginsberg, Frances R.: *See—*
  - Ginsberg, Robert L.; and Ginsberg, Frances R., 5,748,728, Cl. 379-447.000.
- Ginsberg, Robert L.; and Ginsberg, Frances R., to Phran-Tek Ltd. Shield for concealing operation of a keypad. 5,748,728, Cl. 379-447.000.
- Gioutsos, Tony: *See—*
  - Kwun, Hegeon; Piskie, Michael Allen; and Gioutsos, Tony, 5,747,696, Cl. 73-728.000.
- Giral, Marta: *See—*
  - Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.
- Girard, Mark T.; Bennin, Jeffry S.; and Ziegler, David A., to Hutchinson Technology Incorporated. Welding stress isolation structure for head suspension assemblies. 5,748,409, Cl. 360-104.000.
- Girard, Philippe: *See—*
  - Cederbaum, Carl; Girard, Philippe; and Mone, Patrick, 5,748,125, Cl. 341-136.000.
- Giroux, William H., Jr.; and Johnson, Charles E., to Independent Mobility Systems, Inc. Power door latch method and apparatus. 5,746,459, Cl. 292-341.160.
- Gissel, Edward B. Automatic bow retention device. 5,746,192, Cl. 124-1.000.
- Gist-brocades, N.V.: *See—*
  - De Jong, Sylvia Josefine; De Haan, Ben Rudolf; and Tan, Hong Sheng, 5,747,078, Cl. 426-9.000.
- Gist-Brocades, NV.: *See—*
  - Bovenberg, Roelof Ary Lans; Vollebregt, Adrianus Wilhelmus Hermanus; and Van Solingen, Pieter, 5,747,285, Cl. 435-69.700.
- Gits Manufacturing Company: *See—*
  - Vertanen, Mark W., 5,746,058, Cl. 60-602.000.
- Glabe, John R.; and Pelton, Edward L., to McDonnell Douglas Corporation. Broad band parallel plate antenna. 5,748,152, Cl. 343-767.000.
- Gladden, Ernest L.; and Dufrane, Ronald M., to Ensign-Bickford Company, The. Detonators having multiple-line input leads. 5,747,722, Cl. 102-275.110.
- Glanzbergh, Mitchel. Kit for momentary correction of vision to aid in the selection of eyeglass frames. 5,748,279, Cl. 351-45.000.
- Glaser, Mark Leonard. Wrist memory strap to assist powerlifting. 5,746,685, Cl. 482-93.000.
- Glaser, Michael: *See—*
  - Hicksted, Richard L.; and Glaser, Michael, 5,748,874, Cl. 395-182.220.
- Glass, Gary: *See—*
  - Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, 5,746,699, Cl. 600-529.000.
- Glass, Simon James; and Jaggar, David Vivian, to Advanced RISC Machines Limited. Data processing condition code flags. 5,748,515, Cl. 364-736.500.
- Glassberg, Paul R.: *See—*
  - Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R., 5,747,129, Cl. 428-36.400.
- Glatzel, Donald Herman: *See—*
  - Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.
- Glaxo Wellcome Inc.: *See—*
  - Krenitsky, Thomas Anthony; Averett, Devron Randolph; Koszalka, George Walter; and Wolberg, Gerald, 5,747,472, Cl. 514-45.000.
- Gleeman, Alan N.: *See—*
  - Gallant, Ben J.; Gleeman, Alan N.; and Parker, William S., 5,746,596, Cl. 433-88.000.
- Gleich, Gerald J.: *See—*
  - Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,747,283, Cl. 435-69.100.
- Glenayre Electronics, Inc.: *See—*

/OL
2 10
ISS
1
MY
5
998
JMI

Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., 5,749,045, Cl. 455-31.200.

Glew, Andrew F.: *See—*

Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.

Huck, Kamla P.; Rodgers, Scott D.; and Glew, Andrew F., 5,749,084, Cl. 711-1.000.

Global Therapeutics, Inc.: *See—*

Frantzen, John J., 5,746,691, Cl. 600-36.000.

Globespan Technologies, Inc.: *See—*

Langberg, Ehud; and Wang, Jin-Der, 5,748,686, Cl. 345-367.000.

Glonner, Hans, to Bayerische Motoren Werke Aktiengesellschaft. Position recognition arrangement for a selector lever in motor vehicles. 5,748,112, Cl. 341-17.000.

Glozbach, Eberhard: *See—*

Taylour, James; and Glozbach, Eberhard, 5,747,431, Cl. 508-283.000.

GM Nameplate, Inc.: *See—*

Boedecker, Todd Jay, 5,747,756, Cl. 200-5.00A.

Gnade, Bruce E.: *See—*

Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,747,880, Cl. 257-759.000.

Gobert, Jean, to U.S. Philips Corporation. Neural processor comprising distributed synaptic cells. 5,748,849, Cl. 395-27.000.

Goddard, Michael D.; and Goveas, Kelvin D., to Advanced Micro Devices, Inc. Floating point processing unit with forced arithmetic results. 5,748,516, Cl. 364-748.030.

Godik, Eduard E., to Dynamics Imaging, Inc. Method for investigation of distribution of physiological components in human body tissues and apparatus for its realization. 5,747,789, Cl. 250-208.100.

Godleski, Stephen A.: *See—*

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.

Goeddel, David V.; and Wong, Grace H. W., to Genentech, Inc. Cancer therapy using lymphotoxin. 5,747,023, Cl. 424-85.100.

Goenka, Lakhi Nandial: *See—*

Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, 5,746,368, Cl. 228-33.000.

Goetz, Bernhard: *See—*

Knauss, Hans-Peter; Mayer, Hartmut; and Goetz, Bernhard, 5,746,291, Cl. 187-223.000.

Gogola, Michael R.: *See—*

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Gogolin, E. Lawrence: *See—*

Velasquez, David A.; Holmes, Douglas B.; and Gogolin, E. Lawrence, 5,746,781, Cl. 29-730.000.

Goins, Jeffrey Lee: *See—*

Teller, Bill; McCulloch, Pete; Drobnich, Vaughn J.; and Goins, Jeffrey Lee, 5,746,363, Cl. 224-547.000.

Gokel, George W.: *See—*

Gordon, Jeffrey I.; Gokel, George W.; and Englund, Paul T., 5,747,537, Cl. 514-558.000.

Gold, Peter. Stationary motor vehicle window. 5,746,859, Cl. 156-108.000.

Goldberg, Max Motti; Gates, Melodi Mosley; Ericksen, Susan Barbara; and White, William O., to U S West, Inc. Method and system for authenticating and auditing access by a user to non-natively secured applications. 5,748,890, Cl. 395-188.010.

Goldco Industries, Inc.: *See—*

Winski, Ernest P., 5,746,572, Cl. 414-796.300.

Golden, Michael D., to Western Design Corporation. Hinge assembly, platform and method of making same. 5,745,953, Cl. 16-260.000.

Goldenheim, Paul: *See—*

Sackler, Richard; Goldenheim, Paul; and Chasin, Mark, 5,747,060, Cl. 424-426.000.

Goldfarb, Mitchell: *See—*

Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.

Goldgar, David E.: *See—*

Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.

Goldie, Glenn C., to RTI International Corporation. Removable shipping seal for a toner cartridge and method of using the same. 5,749,026, Cl. 399-103.000.

Goldmann, Siegfried: *See—*

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.

Goldstar Co., Ltd.: *See—*

Kim, Yeoung Ku, 5,747,921, Cl. 313-346.00R.

Goldstein, Léon: *See—*

Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, 5,747,366, Cl. 438-44.000.

Golecki, Ilan; and Narasimham, Dave, to AlliedSignal Inc. Method for measuring the depositions, densification of etching rate of an electrically conductive body. 5,747,096, Cl. 427-8.000.

Golin, Stuart J., to Intel Corporation. Table-driven statistical decoder. 5,748,790, Cl. 382-246.000.

Golipad, Pyotr Nikolaevich: *See—*

Smirnov, Aleksandr Vitalievich; Orlov, Oleg Georgievich; Golipad, Pyotr Nikolaevich; Koriakin, Yurii Nikolaevich; and Yegorov, Boris Mikhailovich, 5,747,561, Cl. 523-212.000.

Goll, Steven J.: *See—*

Cochran, Stuart A.; Goll, Steven J.; Lippincott, Howard C.; and Winkler, Gary A., 5,747,084, Cl. 426-120.000.

Golla, Carla: *See—*

Padoan, Silvia; Olivo, Marco; and Golla, Carla, 5,748,548, Cl. 365-226.000.

Goloff, Charles N., to Caterpillar Inc. Fluid metering valve. 5,746,413, Cl. 251-129.150.

Gomez, Edward R.: *See—*

Freeman, Jack B.; and Gomez, Edward R., 5,746,723, Cl. 604-178.000.

Gondek, Jay S., to Hewlett-Packard Company. Multi-variable colorimetric data access by iterative interpolation and subdivision. 5,748,176, Cl. 345-131.000.

Gong, Woon Young: *See—*

Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, 5,747,081, Cl. 426-72.000.

Gonzalez, Fernando: *See—*

Lee, Roger R.; and Gonzalez, Fernando, 5,748,527, Cl. 365-185.090.

Gonzalez, Hector F.: *See—*

Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., 5,748,418, Cl. 360-128.000.

Gonzalez, Rafael: *See—*

Hansen, Borg; Gonzalez, Rafael; and Fleishman, Roc V., 5,745,934, Cl. 4-541.300.

Gonzalez, Victoriano Gustavo Sierra: *See—*

Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.

Good, David M.: *See—*

Mitchell, Chauncey T., Jr.; Good, David M.; Shadle, Mark A.; and Verschuur, Gerrit L., 5,747,103, Cl. 427-123.000.

Goodman, David: *See—*

Wei, George; Hecker, Arlene; and Goodman, David, 5,747,402, Cl. 501-152.000.

Goodman, William: *See—*

Lightfoot, Regina; and Goodman, William, 5,748,493, Cl. 364-514.00C.

Goodnight, Trent Lynn; and Dharia, Vijay Manilal, to Deere & Company. Solenoid driver circuit. 5,748,431, Cl. 361-154.000.

Goodson, J. Michael, to Crest Ultrasonic Corporation. Ultrasonic transducer. 5,748,566, Cl. 367-158.000.

Goodyear Tire & Rubber Company, The: *See—*

Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,101, Cl. 83-34.000.

Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,102, Cl. 83-34.000.

Hutson, David Dean; Johenning, Christopher Paul; Taube, John Janis; and Waibel, Terry John, 5,746,849, Cl. 152-209.00R.

Goolsby, Terry L.: *See—*

Hettinger, William P., Jr.; Moore, Howard F.; Goolsby, Terry L.; and Peppard, A. V., 5,746,321, Cl. 209-233.000.

Gopalan, Venkatraman: *See—*

Gupta, Mool C.; Nutt, Alan C. G.; and Gopalan, Venkatraman, 5,748,361, Cl. 359-332.000.

Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., to Universidad de Salamanca. Antineoplastic cyclolignan derivatives. 5,747,529, Cl. 514-463.000.

Gordon, Jeffrey I.; Gokel, George W.; and Englund, Paul T., to Washington University; and Johns Hopkins University. Method of inhibiting parasitic activity. 5,747,537, Cl. 514-558.000.

Gordon, Michael Stuart; and Petric, Paul F., to International Business Machines Corporation. Method for centering a lens in a charged-particle system. 5,747,814, Cl. 250-398.000.

Gordon, William H. Helical surface-mounted test point. 5,747,740, Cl. 174-68.100.

Gorham, Kent: *See—*

Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.

Goromaru, Masaomi: *See—*

Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.

Goronkin, Herbert: *See—*

Tehrani, Saied N.; and Goronkin, Herbert, 5,748,519, Cl. 365-98.000.

Gorrell, Robin E.; and Fischer, Paul J., to W. L. Gore & Associates, Inc. Method of forming raised metallic contacts on electrical circuits. 5,747,358, Cl. 437-183.000.

Gosling, James A., to Sun Microsystems, Inc. Bytecode program interpreter apparatus and method with pre-verification of data type restrictions. 5,748,964, Cl. 395-705.000.

Gosselink, Eugene Paul: *See—*

Kellett, Patti Jean; Gosselink, Eugene Paul; and Perkins, Christopher Mark, 5,747,440, Cl. 510-276.000.

Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, 5,747,443, Cl. 510-515.000.

Goto, Akihiro: *See—*

Nebashi, Mitsuhiko; Murakoshi, Keiji; Iwaya, Satoshi; and Goto, Akihiro, 5,746,527, Cl. 400-621.000.

Goto, Akira: *See—*

Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Goto, Hisashi: *See—*

Koiwai, Tamotsu; Kawai, Sumio; Kitazawa, Tatsuo; and Goto, Hisashi, 5,748,390, Cl. 359-811.000.

Goto, Takao, to Gotoh Gut Yugen Kaisha. Peg for a stringed instrument. 5,747,712, Cl. 84-306.000.

Goto, Tetsuro, to Nikon Corporation. Display driving apparatus with automatic drive voltage optimization. 5,748,170, Cl. 345-101.000.

Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, to Nihon Bayer Agrochem K.K. Tetrazolinones. 5,747,420, Cl. 504-209.000.

Goto, Yoshihiro, to Hitachi Medical Corporation. Method of setting threshold values for extracting image data. 5,748,801, Cl. 382-270.000.

Goto, Yoshiki: *See—*

Takahashi, Yutaka; Niiyama, Manabu; and Goto, Yoshiki, 5,748,024, Cl. 327-333.000.

Gotoh Gut Yugen Kaisha: *See—*

Goto, Takao, 5,747,712, Cl. 84-306.000.

Gotou, Hiroshi, to NKK Corporation. Semiconductor device and manufacturing method thereof. 5,747,854, Cl. 257-368.000.

Gotou, Hiroshi; and Asakawa, Toshifumi, to NKK Corporation. Non-voltile memory device, non-volatile memory cell and method of adjusting the threshold value of the non-volatile memory cell and each of plural transistors. 5,748,530, Cl. 365-185.180.

Gottlieb, Saul: *See—*

Turturro, Vincent; Palmer, Matthew A.; Slater, Charles R.; and Gottlieb, Saul, 5,746,216, Cl. 128-751.000.

Gould, Ian R.: *See—*

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.

Gould, Scott Whitney: *See—*

Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.

Gould, Steven A.: *See—*

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.

Goulding, Mark John: *See—*

Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.

Goulding, Paul: *See—*

Hawke, David Harry; Parekh, Rajesh Bhikhu; Goulding, Paul; and Charles, Stephen Alexander, 5,747,347, Cl. 436-94.000.

Gourdol, Arnaud P. J., to Apple Computer, Inc. Multi-representational data structure for recognition in computer systems. 5,749,070, Cl. 704-242.000.

Gove, Robert J.: *See—*

Markandey, Vishal; and Gove, Robert J., 5,748,250, Cl. 348-451.000.

Goveas, Kelvin D.: *See—*

Goddard, Michael D.; and Goveas, Kelvin D., 5,748,516, Cl. 364-748.030.

Govindan, Serengulam V.; Griffiths, Gary L.; and Hansen, Hans L., to Immunomedics, Inc. Thiolation of peptides for radionuclide-based radiodetection and radiotherapy. 5,746,996, Cl. 424-1.690.

Grabstein, Kenneth H.; and Widmer, Michael B., to Immunex Corporation. Vaccine adjuvant comprising interleukin-15. 5,747,024, Cl. 424-85.200.

Grace, Andrew, to British Telecommunications public limited company. Event correlation. 5,748,098, Cl. 340-825.160.

Grace, Robert E.; Raj, Guru B.; and Pacer, James M., to Xerox Corporation. Adaptive feed forward compensation for time varying toner cohesivity. 5,749,023, Cl. 399-58.000.

Gradischnig, Klaus, to Siemens Aktiengesellschaft. Method for transmitting signaling information within a broadband ISDN communication network. 5,748,636, Cl. 370-469.000.

Graebner, John Edwin; Jin, Sungho; and Zhu, Wei, to Lucent Technologies Inc. Method and apparatus for chemical-mechanical polishing of diamond. 5,746,931, Cl. 216-88.000.

Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, to Siemens Aktiengesellschaft. Automatic transmission control for a motor vehicle. 5,749,060, Cl. 701-51.000.

Graf, Josef. Process for producing an air mattress with a pump part and a part to be inflated. 5,746,873, Cl. 156-274.400.

Graham, David Ian: *See—*

Roberts, Gareth Wyn; Graham, David Ian; and Nicoll, James Alan Ramsey, 5,747,260, Cl. 435-6.000.

Graham-Field, Inc.: *See—*

Selinger, Irwin, 5,747,752, Cl. 181-131.000.

Graham, Steven: *See—*

McGivern, Patrick T.; King, Bradley S.; and Graham, Steven, 5,748,466, Cl. 364-146.000.

Graham, Warren: *See—*

Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.

Grande, René Shoan, to Otatco, Inc. Well collar identification method. 5,748,471, Cl. 364-422.000.

Granger, Stewart Paton; Rawlings, Anthony Vincent; and Scott, Ian Richard, to Elizabeth Arden Co., Division of Conopco, Inc. Skin care compositions containing an amide of a hydroxy fatty acid and a retinoid. 5,747,051, Cl. 424-401.000.

Grapha-Holding AG: *See—*

Maier, Willi, 5,746,301, Cl. 198-370.040.

Graphic Packaging Corporation: *See—*

Walsh, Joseph Christopher, 5,746,871, Cl. 156-268.000.

Graphite Sales, Inc.: *See—*

Hanna, Scott C.; and Burmeister, Kevin L., 5,746,914, Cl. 210-266.000.

Grapp, Raymond. Rear telemetry light for model trains. 5,746,642, Cl. 446-438.000.

Grass America, Inc.: *See—*

Domenig, Georg, 5,746,490, Cl. 312-334.500.

Gravalos, Dolores G.: *See—*

Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.

Graves, Arlinda; and Szabo, Sandor, to Becton, Dickinson and Company. Safety needle assembly having telescoping shield. 5,746,727, Cl. 604-283.000.

Gray, Duncan Alastair: *See—*

Boar, Robin Bernad; Cross, Alan John; Gray, Duncan Alastair; and Green, Richard Alfred, 5,747,515, Cl. 514-359.000.

Gray, G. Robert: *See—*

Malhotra, Arun; Ang, Jane; Gray, G. Robert; and Watterston, James, 5,748,417, Cl. 360-126.000.

Gray, Laurence William: *See—*

Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.

Gray, Robert T.: *See—*

Benati, Paul J.; Gray, Robert T.; and Cosgrove, Patrick A., 5,748,764, Cl. 382-117.000.

Graziano, Nicoletti, to Canstar Italia S.p.A. Adjustable fastening device for sports footwear. 5,745,963, Cl. 24-685.00K.

Greason, Jeff: *See—*

Ng, Yong-Gee; and Greason, Jeff, 5,748,025, Cl. 327-333.000.

Great Lakes Chemical Italia S.r.l.: *See—*

Broussard, Fabio; Adovasio, Mauro; and Roncalli, José, 5,747,601, Cl. 525-375.000.

Greelis, John Patrick: *See—*

Bacich, Steven R.; Nguyen, Tuoc Tan; and Greelis, John Patrick, 5,746,692, Cl. 600-104.000.

Green, Edward, to Clean Cam Technology Systems. Low emission power plant and method of making same. 5,746,163, Cl. 123-65.0VC.

Green, Murray Frank: *See—*

Beadle, Charles Donald; and Green, Murray Frank, 5,746,378, Cl. 241-99.000.

Green, Nicholas A.; and Williams, Fred E., Jr., to Atrion Medical Products, Inc.; and Cordis Corporation. Stent compression instrument. 5,746,764, Cl. 606-194.000.

Green, Richard Alfred: *See—*

Boar, Robin Bernad; Cross, Alan John; Gray, Duncan Alastair; and Green, Richard Alfred, 5,747,515, Cl. 514-359.000.

Green Tokai Co., Ltd.: *See—*

Yamamoto, Hiroaki, 5,746,962, Cl. 264-266.000.

Green, William Farley. Fire ant bait station. 5,746,021, Cl. 43-131.000.

Greenberg, Alex M., to Greenberg Surgical Technologies, LLC. Single-handed surgical drill depth guide with mandibular retractor. 5,746,743, Cl. 606-96.000.

Greenberg, Philip D.; and Nelson, Brad H., to Fred Hutchinson Cancer Research Center. Chimeric cytokine receptors in lymphocytes. 5,747,292, Cl. 435-69.700.

Greenberg Surgical Technologies, LLC: *See—*

Greenberg, Alex M., 5,746,743, Cl. 606-96.000.

Greene, Joseph Paul: *See—*

McFadden, James Robert; Greene, Joseph Paul; and Bland, Michael James, 5,746,419, Cl. 267-140.000.

Greene, Steven R. Process for making molded polyurethane laminate articles. 5,747,167, Cl. 428-423.100.

Greenfield, Simon: *See—*

Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.

Greenham, Neil Clement: *See—*

Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.

Greer, Dale R., to Perceptron, Inc. Method and apparatus for calibrating a noncontact gauging sensor with respect to an external coordinate system. 5,748,505, Cl. 364-571.020.

Greer, David Emerson: *See—*

Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, 5,746,306, Cl. 200-283.000.

Gregg, Paul S.: *See—*

Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,747,179, Cl. 428-586.000.

Gregory, Brent L.; and Segal, Russell B., to Synopsys, Inc. Method for generating a logic circuit from a hardware independent user description using assignment conditions. 5,748,488, Cl. 364-490.000.

Greminger, Hansueli; and Schoenenberger, Niklaus, to Bühler AG. Method for measuring the thickness of a layer and apparatus for carrying out the method. 5,747,675, Cl. 73-104.000.

Grewe, David Douglas: *See—*

Zeitels, Jerrold Roy; and Grewe, David Douglas, 5,746,770, Cl. 606-207.000.

Gries, Heinz; Mützel, Wolfgang; Zurth, Christian; and Weinmann, Hanns-Joachim, to Schering Aktiengesellschaft. Magnetic particles for diagnostic purposes. 5,746,999, Cl. 424-9.322.

Griesser, Kenneth P.: *See—*

White, James E.; and Griesser, Kenneth P., 5,748,950, Cl. 395-595.000.

Griffin, David C.; Wiersema, Dale T.; Eldridge, Richard A.; and Klingbeil, William R., to ESAB Group, Inc., The. Arc welder power source. 5,747,773, Cl. 219-130.100.

Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., to Geneva Group of Companies, Inc. Magnetic tape recording head cleaning apparatus. 5,748,418, Cl. 360-128.000.

Griffin, Matthew Murdy: *See—*

Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.

Griffioen, Peter: *See—*

Talbot, Nicholas C.; Allison, Michael T.; and Griffioen, Peter, 5,748,145, Cl. 342-357.000.

Griffith, William L.: *See—*

Compere, Alicia L.; Griffith, William L.; Dorsey, George F.; and West, Brian H., 5,746,783, Cl. 44-301.000.

Griffiths, David J.: *See—*

Christiansen, Lars K.; Roberts, Mark H.; Griffiths, David J.; and Adamson, Brent R., 5,748,485, Cl. 364-479.040.

Griffiths, Gary L.: *See—*

Govindan, Serengulam V.; Griffiths, Gary L.; and Hansen, Hans L., 5,746,996, Cl. 424-1.690.

Grimm, Elizabeth A.: *See—*

Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.

Gritz, Linda R.: *See—*

Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.

Grob, Matthew S.: *See—*

Argyroudis, Panayotis; Bayley, Gwain; Grob, Matthew S.; Phillips, Marc; and Soliman, Samir S., 5,748,104, Cl. 340-870.110.

Grosbach, Lyle Edwin: *See—*

Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.

Grosch, Horst: *See—*

Schwarte, Stephan; and Grosch, Horst, 5,747,166, Cl. 428-423.100.

Gross, David C.: *See—*

Rubinsztajn, Slawomir; and Gross, David C., 5,747,624, Cl. 528-21.000.

Grosse, Andrea: *See—*

Hochgesang, Gerhard; and Grosse, Andrea, 5,747,758, Cl. 200-5.00A.

Grove, Carl E.; and Thielking Slaski, Lisa K., to United States of America, Air Force. Parallax induced polarization loss to reduce sidelobe levels. 5,748,146, Cl. 342-372.000.

Grover, Douglas B., to T & R Assembly, Inc. Game table tilt and roll support. 5,746,660, Cl. 473-15.000.

Gruber, Harry E.; Jolly, Douglas J.; and Kwang, Hwei-Sing, to University of California. Retrovirus detection method. 5,747,243, Cl. 435-5.000.

Gruber, Hermann: *See—*

Schmalstieg, Lutz; Gruber, Hermann; Riberi, Bernd; and Nachtkamp, Klaus, 5,747,628, Cl. 528-60.000.

Gruber, Robert: *See—*

Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.

Gruenenthal GmbH: *See—*

Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, 5,747,291, Cl. 435-69.600.

Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, to ZF Friedrichshafen AG. Process for controlling an automatic gearbox. 5,748,472, Cl. 364-424.080.

Gruntec LTDA: *See—*

Jennebach, Markus; and Birkhan, Joao Augusto, 5,746,142, Cl. 110-248.000.

Gruppo Lepetit S.p.A.: *See—*

Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, 5,747,295, Cl. 435-71.300.

Gruss, Peter; and Maulbecker, Catharina, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Probe for tumour diagnostics or tumour therapy. 5,747,250, Cl. 435-6.000.

Grützmann, Rudi: *See—*

Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.

Gu, Yuan Xiang: *See—*

Johnson, Harold Joseph; Gu, Yuan Xiang; Chan, Becky Laiping; and Chow, Stanley Taihai, 5,748,741, Cl. 380-28.000.

Guardian Fiberglass, Inc.: *See—*

Romes, Gary E.; Church, Joseph T.; Sanford, Steven; and Syme, Robert W., 5,746,854, Cl. 156-62.200.

Gubbin, Douglas H.: *See—*

Pohndorf, Peter J.; and Gubbin, Douglas H., 5,746,722, Cl. 604-175.000.

Guenther, Wolfgang: *See—*

Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.

Guerra-Santos, Luis H.: *See—*

Garnett, Kevin M.; Gierhart, Dennis L.; and Guerra-Santos, Luis H., 5,747,544, Cl. 514-729.000.

Guez, Allon. Hierarchical multi-resolution, multi-agent parts nesting process. 5,748,762, Cl. 382-111.000.

Guibas, Leonidas John; and Marimont, David H., to Xerox Corporation. Dynamic computation of a line segment arrangement using finite precision arithmetic for use in a processor controlled system. 5,748,197, Cl. 345-438.000.

Guigou, Catherine: *See—*

L'Espérance, André; Bouchard, Martin; Paillard, Bruno; and Guigou, Catherine, 5,748,750, Cl. 381-71.500.

Guilford Mills, Inc.: *See—*

McCartney, Phillip D.; Beard, McDaniel L.; and Inman, Elaine V., 5,746,046, Cl. 57-350.000.

Guilford Pharmaceuticals Inc.: *See—*

Jackson, Paul F., 5,747,523, Cl. 514-427.000.

Gujda, Mieczyslaw; van der Griendt, Pieter S.; and Dominico, James W., to Polytype America Corporation. Apparatus for positioning a handle of a pail for a printing operation on the pail. 5,746,570, Cl. 414-795.600.

Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, to Advanced Micro Devices, Inc. Computer system having a dedicated multimedia engine and multimedia memory having arbitration logic which grants main memory access to either the CPU or multimedia engine. 5,748,983, Cl. 395-842.000.

Gunness, Clark Robert. Concrete barrier having a plastic cladding. 5,746,538, Cl. 404-6.000.

Gunnoe, Lowell G.; Kawada, Hideo; and Nutting, Philip C., to Boeing Company, The. Method and apparatus for damping high frequency vibrations generated by landing gear brake applications. 5,746,394, Cl. 244-111.000.

Günther, Eckhard; Wulf, Jens-Peter; Engel, Jürgen; and Kutscher, Bernhard, to Asta Medica AG. Lobaplatin trihydrate. 5,747,534, Cl. 514-492.000.

Gunther, Stephan; and Kunde, Christoph, to Francotyp-Postalia Aktiengesellschaft & Co. Method for storing security relevant data. 5,748,638, Cl. 371-21.200.

Güntherberg, Norbert: *See—*

Fischer, Wolfgang; and Güntherberg, Norbert, 5,747,568, Cl. 524-110.000.

Guo, Wen-Li. Sprayer device. 5,746,375, Cl. 239-245.000.

Gupta, Anshu M.: *See—*

Domburg, Bastiaan; Gupta, Anshu M.; de Ruijter, Hendrik; and Strijbosch, Antonius Henricus J., 5,747,441, Cl. 510-375.000.

Gupta, Mool C.; Nutt, Alan C. G.; and Gopalan, Venkatraman, to Eastman Kodak Company. Ferroelectric crystal having inverted domain structure. 5,748,361, Cl. 359-332.000.

Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., to Advanced Micro Devices, Inc. Fluted via formation for superior metal step coverage. 5,746,884, Cl. 156-643.100.

Gur, David, to University of Pittsburgh. Hybrid display for simultaneous side-by-side review of radiographs. 5,748,173, Cl. 345-115.000.

Gust, Jay I.: *See—*

Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.

Gustafsson, Kjell-Ake; Muller, John J.; and Wittenberg, Roger A., to Trex Company, L.L.C. Method of producing a wood-thermoplastic composite material. 5,746,958, Cl. 264-115.000.

Gustavsson, Bo: *See—*

Stoltz, Klas; and Gustavsson, Bo, 5,745,965, Cl. 24-704.100.

Guth, Joseph E.: *See—*

Stelter, Eric C.; Guth, Joseph E.; and Kasiske, W. Charles, 5,748,218, Cl. 347-158.000.

Guthrie, Warren E.; and Garbe, Gary S., to Northrop Grumman Corporation. Microwave frequency generator and method of generating a desired microwave frequency signal. 5,748,047, Cl. 331-19.000.

Gutman, Jose; and Wright, James A., to Motorola, Inc. Reliable wireless message distribution system. 5,748,100, Cl. 340-825.440.

Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, to Temic Telefunken microelectronic GmbH. Electrostatic discharge circuit layout. 5,748,425, Cl. 361-56.000.

Guzauskas, Robert, to Reinforced Polymer Inc. Low pressure acrylic molding composition with fiber reinforcement. 5,747,553, Cl. 523-115.000.

Gyoten, Takaaki; and Kawashima, Masahiro, to Matsushita Electric Industrial Co., Ltd. CRT focusing circuit with individually controlled switches developing an approximate parabolic waveform. 5,747,949, Cl. 315-382.100.

Gyure, Sandor: *See—*

Sweeney, Niall; Morigi, Adriano; and Gyure, Sandor, 5,746,726, Cl. 604-263.000.

H. B. Fuller Licensing & Financing, Inc.: *See—*

Ryan, Lisa L., 5,747,573, Cl. 524-270.000.

H.Krantz Textiltechnik GmbH: *See—*

Böhnke, Bernd, 5,746,072, Cl. 68-178.000.

H.M.W. Consulting, Inc.: *See—*

Heiser, Stephen J.; Malvino, Joanna Mary; Wohl, Charles M.; and Poza, Fausto, 5,748,148, Cl. 342-457.000.

H.V. Setty Enterprises, Inc.: *See—*

Venkatasetty, H. V., 5,746,900, Cl. 204-415.000.

Haarer, Werner: *See—*

Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.

Haas, Garry L.: *See—*

Conrad, Thomas E.; and Haas, Garry L., 5,748,929, Cl. 395-352.000.

Habbab, Isam M.: *See—*

Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.

Habbaba, Faris S.: *See—*

Nichols, Jerry R.; Siddoway, Craig F; Habbaba, Faris S.; and Garcia, Jorge L., 5,748,454, Cl. 361-814.000.

Häberle, Friedrich: *See—*

Kress, Dieter; and Häberle, Friedrich, 5,746,549, Cl. 407-102.000.

Haberstroh, James: *See—*

Bell, Lem; Pearson, Tim; and Haberstroh, James, 5,746,882, Cl. 156-580.000.

Hach Company: *See—*

Sadar, Michael J., 5,747,667, Cl. 73-1.020.

Hadano, Hiroshi: *See—*

Nakabayashi, Yoshikazu; Hadano, Hiroshi; Okabe, Norikazu; and Sendou, Hideki, 5,746,426, Cl. 271-119.000.

Haden, Inc.: *See—*

Johnson, Jeffrey; and St. Louis, Daniel M., 5,746,650, Cl. 454-52.000.

Haderle, Donald J.: *See—*

Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., 5,748,952, Cl. 395-602.000.

Hadvary, Paul: *See—*

Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.

Häfner, Horst: *See—*

Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, 5,748,425, Cl. 361-56.000.

Haga, Masaaki; Machida, Katsuki; and Tsuji, Hideaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Information setting and displaying device for a camera. 5,749,005, Cl. 396-287.000.

Hagander, Bertil. Method and device for composting organic matter. 5,746,802, Cl. 71-9.000.

Hagen, Frederick Stamner: *See—*

Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, 5,747,267, Cl. 435-7.210.

Hager, Arthur L., III; Marchant, Brian E.; Chuang, Shouping; and Kim, Ki Duk, to NEC Electronics, Inc. Semiconductor processing backup system. 5,748,470, Cl. 364-187.000.

Hager, William G.; Wilson, Edward L.; and Krumlauf, Paul R., to Owens-Corning Fiberglas Technology, Inc. Sheet molding composition having controllable thickening. 5,747,607, Cl. 525-445.000.

Hagersten, Erik E., to Sun Microsystems, Inc. Multiprocessing system configured to perform efficient write operations. 5,749,095, Cl. 711-141.000.

Haghiri-Tehrani, Yahya: *See—*

Hohmann, Arno; Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 5,745,988, Cl. 29-841.000.

Hagi, Masayuki; Tamaoki, Junichi; Arai, Takeshi; and Fukuda, Hiroyuki, to Minolta Co., Ltd. Toner for developing electrostatic latent images. 5,747,211, Cl. 430-110.000.

Hagmann, William: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Hahm, Sang-kyu: *See—*

Chae, Seung-ki; Ahn, Byung-seol; Hahm, Sang-kyu; and Kim, Jong-soo, 5,746,832, Cl. 118-665.000.

Hahn, Michael: *See—*

Schulze, Thomas; Roik, Geert; Hahn, Michael; and Kleinhoff, Klaus, 5,746,848, Cl. 152-209.00R.

Hahn, Thomas: *See—*

Fleckenstein, Theo; Ditze, Alexander; and Hahn, Thomas, 5,746,777, Cl. 8-142.000.

Hai, Lim Cheang: *See—*

Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.

Hains, Charles M.: *See—*

Wang, Shen-ge; and Hains, Charles M., 5,748,330, Cl. 358-298.000.

Haist, Henri, to HVB Innova AG. Container, in particular a bottle for liquids which may be under pressure. 5,746,337, Cl. 215-44.000.

Haji, Katsuhiko: *See—*

Sasaki, Makoto; Ishii, Takafumi; and Haji, Katsuhiko, 5,746,934, Cl. 252-77.000.

Hajime, Hirofumi: *See—*

Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, 5,747,364, Cl. 438-14.000.

Hajjahmad, Ibrahim; Reisch, Michael L.; Soini, F. Richard; and Wober, Munib A., to Polaroid Corporation. System and method for color recovery using discrete cosine transforms. 5,748,770, Cl. 382-167.000.

Hak, Moon Seong, to LG Electronics Inc. Gain controlled control signal based on sensed lamp current. 5,747,947, Cl. 315-308.000.

Hakimi, John; Kilian, Patricia; and Rosen, Perry, to Hoffmann-La Roche Inc. Polyethylene-protein conjugates. 5,747,646, Cl. 530-351.000.

Hakomori, Sen-itiroh: *See—*

Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.

Halahmi, Dror: *See—*

Orbach, Yair; Zmora, Eitan; and Halahmi, Dror, 5,748,071, Cl. 340-146.200.

Hale, Jeffrey: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Hale, Timothy Allen: *See—*

Bauer, William, Jr.; Hale, Timothy Allen; Mason, Robert Michael; and Upmacis, Rita Karina, 5,746,892, Cl. 203-38.000.

Haleen, Len W. Aggressive convective drying in an agitated pan type dryer. 5,746,007, Cl. 34-187.000.

Hall, Christopher: *See—*

North, Michael John; Hall, Christopher; Cyster, Thomas Mark; and Chen, Chris C., 5,748,445, Cl. 361-697.000.

Hall, Darlene: *See—*

Hall, John L., 5,746,988, Cl. 422-292.000.

Hall, Donald M.: *See—*

Hall, Renee M.; and Hall, Donald M., 5,746,063, Cl. 62-331.000.

Hall, Douglas Oliver. Wear plate positioned guide shoe. 5,746,366, Cl. 226-189.000.

Hall, Jackson: *See—*

Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.

Hall, John L., to Hall, Darlene; Hall, Wilburn E., and Hall, Vern W. Apparatus for processing bio-harzardous waste. 5,746,988, Cl. 422-292.000.

Hall, Milo. Door mounted shoe tree and last. 5,745,944, Cl. 12-117.400.

Hall, Renee M.; and Hall, Donald M. Method and apparatus to cool food contact machines and surface. 5,746,063, Cl. 62-331.000.

Hall, Vern W.: *See—*

Hall, John L., 5,746,988, Cl. 422-292.000.

Hall, Wilburn E.: *See—*

Hall, John L., 5,746,988, Cl. 422-292.000.

Hals, Tormod: *See—*

Svenning, Bjørnar; Hals, Tormod; and Bugten, Bjarne, 5,747,754, Cl. 181-401.000.

Halvorsen, Per-Kristian: *See—*

Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.

Hamada, Hidenobu, to Matsushita Electric Industrial Co., Ltd. Optical voltage sensor, group of optical parts and method of manufacturing same. 5,748,392, Cl. 359-819.000.

Hamada, Masami: *See—*

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Hamada, Shinji: *See—*

OL 2 10 SS 1 MY 5 998 MI

Morishita, Nobuyasu; Hamada, Shinji; Matsuda, Hiromu; and Ikoma, Munehisa, 5,747,186, Cl. 429-53.000.

Hamamatsu Photonics K.K.: *See—*

Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,747,826, Cl. 257-10.000.

Hamann, Oliver; and Ulrich, Reinhard. Apparatus and method of particle geometry measurement by speckle pattern analysis. 5,748,311, Cl. 356-336.000.

Hamaura, Masahide: *See—*

Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, 5,747,576, Cl. 524-451.000.

Hamel, André; and Laville, Daniel, to France Telecom. Optical component adapted to monitor a multiwavelength link and add-drop multiplexer using this component, application to optical networks. 5,748,815, Cl. 385-37.000.

Hamid, Hadi Muzaffar Nayyer, to Jet Sew Technologies, Inc. Roller type stacker and method for stacking pieces of limp material. 5,746,427, Cl. 271-176.000.

Hamilton, Douglas: *See—*

Nally, Robert Marshall; Nelsen, Pete Edward; Hamilton, Douglas; and Berk, Douglas Michael, 5,748,968, Cl. 395-728.000.

Hamilton, Graham: *See—*

Lewis, Brian T.; and Hamilton, Graham, 5,748,881, Cl. 395-184.010.

Hamilton, R. Scott: *See—*

Hinshaw, Jerald C.; and Hamilton, R. Scott, 5,747,603, Cl. 525-403.000.

Hamilton, Tyler W.: *See—*

Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.

Hamm, Hans-Peter; and Moessinger, Klaus, to Filterwerk Mann & Hummel GmbH. Filter for the air in the passenger compartment of a motor vehicle. 5,746,794, Cl. 55-385.300.

Hammel, Hermann: *See—*

Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, 5,748,425, Cl. 361-56.000.

Hammer, Michael Frederick; and Combs, Robert Franklin, to General Motors Corporation. Fan and generator variable speed drive mechanism. 5,747,883, Cl. 290-1.00B.

Hammerl, Erwin: *See—*

Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.

Hammock, Donnie Ray: *See—*

Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, 5,746,417, Cl. 251-315.120.

Hammond, Jonathan H.; and Chung, Young Sir, to Motorola, Inc. Chemical sensing trench field effect transistor. 5,747,839, Cl. 257-253.000.

Hampel, Craig Edward: *See—*

Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.

Hampo, Richard Joseph; Momcilovich, Paul Theodore; and Stuntz, Ross Maxwell, to Ford Global Technologies, Inc. Fluid level sensing system. 5,747,689, Cl. 73-304.00C.

Hamprecht, Gerhard: *See—*

Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.

Hampshire Holographic Manufacturing Corp.: *See—*

Stepanek, Stephen B., 5,746,865, Cl. 156-233.000.

Han, Jeong-Sik: *See—*

Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.

Han, Robin S., to Cirrus Logic, Inc. Dithering process for producing shaded images on display screens. 5,748,163, Cl. 345-88.000.

Hanafey, Michael K.; Sebastian, Scott Anthony; and Tingey, Scott Valray, to Du Pont de Nemours, E. I., and Company. Method to identify genetic markers that are linked to agronomically important genes. 5,746,023, Cl. 47-58.000.

Hanafusa, Naoya: *See—*

Niimura, Yasuhiro; Ikegami, Tetsuma; Hanafusa, Naoya; and Nakaniwa, Masaru, 5,746,790, Cl. 55-317.000.

Hanai, Katsuyuki; and Ayame, Shogo, to Toshiba Corporation. Telephone system. 5,748,723, Cl. 379-198.000.

Hanami, Takayoshi, to Seiko Instruments Inc. Low voltage liquid crystal display device. 5,748,162, Cl. 345-87.000.

Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, to Nippon Kayaku Kabushiki Kaisha. Process for preparing benzo[c]phenanthridinium derivatives, novel compounds prepared by said process, and antitumor agents. 5,747,502, Cl. 514-280.000.

Handschy, Mark A.; and Meadows, Michael R., to Displaytech, Inc. Active matrix liquid crystal image generator. 5,748,164, Cl. 345-89.000.

Handy, Gwendolyn C.: *See—*

Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.

Hane, Kazuhiro; and Ieki, Atsushi, to Okuma Corporation. Scale and encoder including differently spaced pattern lines. 5,748,373, Cl. 359-575.000.

Haner, Lambert. Brushless motor. 5,747,910, Cl. 310-180.000.

Haney, James. Lawn mower with improved clipping dispersal. 5,746,045, Cl. 56-13.300.

Hanley, Thomas Martin, to MEMC Electronics Materials, Inc. Method and apparatus for purging barrel reactors. 5,746,834, Cl. 118-715.000.

Hanna, Christine Beth; and Levin, Roy, to Digital Equipment Corporation. Efficient method and apparatus for compiling and linking modules of computer code in a large software system. 5,748,961, Cl. 395-701.000.

Hanna, Scott C.; and Burmeister, Kevin L., to Graphite Sales, Inc. Honey comb filter assembly and method of making the same. 5,746,914, Cl. 210-266.000.

Hansen, Borg; Gonzalez, Rafael; and Fleishman, Roc V., to Softub, Inc. Spa apparatus with hanging structural liner. 5,745,934, Cl. 4-541.300.

Hansen, David J.: *See—*

Rice, Robert M.; Brink, Kevin B.; and Hansen, David J., 5,746,024, Cl. 47-58.000.

Hansen, Hans L.: *See—*

Govindan, Serengulam V.; Griffiths, Gary L.; and Hansen, Hans L., 5,746,996, Cl. 424-1.690.

Hansen, James D.: *See—*

Jordan, Russell A.; and Hansen, James D., 5,746,594, Cl. 433-9.000.

Hansenne, Isabelle, to L'Oreal. Dihydroxyacetone-based emulsion and its use in cosmetics. 5,747,009, Cl. 424-59.000.

Hanson, Michael J.: *See—*

Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., 5,747,971, Cl. 322-10.000.

Hanyu, Koshi; and Yoshizumi, Akira, to Kabushiki Kaisha Toshiba. Method of manufacturing a castable epoxy resin composition comprising acrylic rubber particles predispersed in an anhydride hardener. 5,747,557, Cl. 523-201.000.

Hanzlik, Edward C.: *See—*

Fromm, Paul M.; and Hanzlik, Edward C., 5,749,038, Cl. 399-327.000.

Haque, Yusuf A., to Maxim Integrated Products. Logic signal level translation apparatus having very low dropout with respect to the powering rails. 5,748,010, Cl. 326-80.000.

Hara, Kazuhiko: *See—*

Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Hara, Masami, to ASMO Co., Ltd. Clip for windshield wiper blade. 5,746,534, Cl. 403-133.000.

Hara, Yukihiko: *See—*

Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, 5,747,053, Cl. 424-405.000.

Harada, Kazunori: *See—*

Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.

Harada, Koichi; Torihata, Minoru; and Iiyama, Takayuki, to Kabushiki Kaisha Shinkawa. Clamping device. 5,746,422, Cl. 269-172.000.

Harada, Koji; and Kanamaru, Hisanobu, to Hitachi, Ltd. Gear forming method. 5,746,085, Cl. 72-355.600.

Harada, Shizuko: *See—*

Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,747,241, Cl. 435-5.000.

Harada, Takashi: *See—*

Fukuda, Ryoji; and Harada, Takashi, 5,748,926, Cl. 395-326.000.

Harada, Yoshihiko; Nakata, Masashi; Oshiro, Akio; and Murakami, Seiichi, to ASMO Co., Ltd. Electric motor and method of making the same. 5,747,901, Cl. 310-71.000.

Harada, Yoshihito, to Canon Kabushiki Kaisha. Flash device having plural emission modes in one of which a flash inductor is selectively short-circuited. 5,747,944, Cl. 315-241.00P.

Harakawa, Hiromi: *See—*

Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.

Harari, Eliyahou: *See—*

Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,747,359, Cl. 437-186.000.

Harats, Dror; Kurihara, Hiroki; Belloni, Paula Nanette; and Sigal, Charles Elliott, to Syntex (U.S.A.) Inc. Targeted gene expression using preproendothelin-1 promoters. 5,747,340, Cl. 435-375.000.

Hardy, William Christopher, to MCI Communications Corporation. System and method for testing acoustic modems with semantically encoded waveforms. 5,748,876, Cl. 395-183.010.

Hare, Daniel J.: *See—*

Johnson, William T.; and Hare, Daniel J., 5,747,697, Cl. 73-760.000.

Hargrave, Karl D.; and Proudfoot, John R., to Boehringer Ingelheim Pharmaceuticals, Inc. 2-aryl-5,11-dihydro-6H-dipyrido[3,2-B:2',3'-E][1,4]diazepines and their use in the treatment of HIV infection. 5,747,488, Cl. 514-219.000.

Haring, Rudolf Adriaan: *See—*

Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.

Harju-Jeanty, Pontus; and Ahlskog, Torbjörn, to Hoechst Schering AgrEvo GmbH. Method for producing pesticide composition. 5,747,417, Cl. 504-116.000.

Harman Automotive, Inc.: *See—*

Crandall, Robert M., 5,746,548, Cl. 403-316.000.

Harman International Industries, Inc.: *See—*

Button, Douglas J., 5,748,760, Cl. 381-199.000.

Harmon, John L.; Peters, William C.; Haughton, Robert A.; and Lingenfelter, Andrew A., to General Electric Company. Apparatus and methods for sealing end plugs for nuclear fuel rods. 5,748,691, Cl. 376-261.000.

Harper, Samuel E., Jr.: *See—*

Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., 5,748,090, Cl. 340-578.000.

Harris, Bradley D.: *See—*

Johnson, Darrin L.; and Harris, Bradley D., 5,746,445, Cl. 280-741.000.

Harris Corporation: *See—*

Weir, Steven P., 5,748,627, Cl. 370-384.000.

Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, to Westinghouse Air Brake Company. Environmentally-sealed, convectively-cooled active matrix liquid crystal display (LCD). 5,748,269, Cl. 349-58.000.

Harris, David J.: *See—*

Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.

Harris, David P. Intelligent cooking system with wireless control. 5,746,114, Cl. 99-331.000.

Harris, Glen M.: *See—*

Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.

Harris, William L.: *See—*

Dague, Richard R.; Harris, William L.; and Kaiser, Sandra K., 5,746,919, Cl. 210-603.000.

Harrison, Bernard; and Plumb, Frederick G., to Applied Materials, Inc. Ion implantation apparatus with improved post mass selection deceleration. 5,747,936, Cl. 315-111.810.

Harrison, Daniel J., to Eastman Kodak Company. Hybrid imaging system capable of using ink jet and thermal dye transfer imaging technologies on a single image receiver. 5,748,204, Cl. 347-2.000.

Harrison, Hal M. Timepiece display which superimposes digits and graphics. 5,748,568, Cl. 368-82.000.

Harrison, Ian Austin. Adjustable spanners. 5,746,098, Cl. 81-143.000.

Harrison, Robert G.; and Lamson, Robert D., to Coach Master International Corporation. Systems with a remote control in which information can be retrieved from an encoded, laser readable disc. 5,748,254, Cl. 348-552.000.

Harrison, Robert Mark: *See—*

Smith, Paul Fielding; and Harrison, Robert Mark, 5,748,683, Cl. 375-347.000.

Harshman, Keith D.: *See—*

Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.

Hartig, Thorsten: *See—*

Fischer, Wolfgang; Baum, Sylvia; Hartig, Thorsten; and Schleehahn, Michael, 5,747,656, Cl. 534-683.000.

Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, to Vapo Oy. Process and apparatus for the purification of gases. 5,747,331, Cl. 435-266.000.

Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, to Harting KGAA. Coaxial plug-and-socket connector. 5,746,619, Cl. 439-352.000.

Harting KGAA. *See—*

Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, 5,746,619, Cl. 439-352.000.

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., to Crown Cork & Seal Company, Inc. Systems and methods for making decorative shaped metal cans. 5,746,080, Cl. 72-61.000.

Hartman, Steven Paul: *See—*

Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.

Hartmann, Heinrich: *See—*

Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.

Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.

Hartmann, Heinz-Werner, to Siemens Aktiengesellschaft. Safety feed fo. borating system for a pressurized water reactor and process for operating such a system. 5,748,693, Cl. 376-282.000.

Hartmann, Klaus-P.: *See—*

Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.

Hartz Mountain Corporation, The: *See—*

Gargas, Joseph E.; and Hyde, Robert H., 5,746,921, Cl. 210-617.000.

Hasegawa, Etsuo: *See—*

Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; and Hasegawa, Etsuo, 5,747,622, Cl. 528-12.000.

Hasegawa, Hideo: *See—*

Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.

Hasegawa, Hiroaki: *See—*

Miyakoshi, Toshinobu; and Hasegawa, Hiroaki, 5,747,396, Cl. 501-32.000.

Hasegawa, Kumi: *See—*

Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, 5,747,210, Cl. 430-109.000.

Hasegawa, Naoko: *See—*

Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.

Hasegawa, Shizuo: *See—*

Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.

Hasegawa, Takashi, to Murata Manufacturing Co., Ltd. Nonreciprocal circuit element. 5,748,052, Cl. 333-1.100.

Hasegawa, Takayuki; Tanaka, Yutaka; and Fujioka, Hidehiko, to Canon Kabushiki Kaisha. Processing system and device manufacturing method using the same. 5,746,562, Cl. 414-217.000.

Hasegawa, Takuji, to Konica Corporation. Solid developing composition for processing silver halide photographic light-sensitive material and processing method employing the same. 5,747,229, Cl. 430-465.000.

Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, to Hitachi, Ltd. Method and apparatus for forming microstructure body. 5,746,826, Cl. 117-90.000.

Haselhorst, Kent Harold: *See—*

Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.

Haseloff, James Phillip; Gerlach, Wayne Lyle; Jennings, Philip Anthony; and Cameron, Fiona Helen, to Gene Shears Pty. Limited. Ribozymes. 5,747,335, Cl. 435-325.000.

Hashiba, Hidetoshi; Aoyagi, Shoji; Fujii, Hitoshi; and Kojo, Kiyoshi, to New Oji Paper Co., Ltd. Thermosensitive magnetic recording medium. 5,747,156, Cl. 428-328.000.

Hashimoto, Akira, to NEC Corporation. Inter-LAN connection method using ISDN. 5,748,625, Cl. 370-353.000.

Hashimoto, Haruo: *See—*

Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.

Hashimoto, Hiroshi; Murayama, Yuichiro; Satake, Masaki; and Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,747,157, Cl. 428-332.000.

Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, to Fujitsu Limited. Electrical connecting device and method for making same. 5,746,927, Cl. 216-18.000.

Hashimoto, Koichi: *See—*

Kosokabe, Hiroyuki; and Hashimoto, Koichi, 5,747,399, Cl. 501-67.000.

Hashimoto, Masashi, to Texas Instruments Incorporated. Apparatus and method for reducing test time of the data retention parameter in a dynamic random access memory. 5,748,544, Cl. 365-201.000.

Hashimoto, Shunji; Taoka, Mikio; and Nakano, Hideo, to Matsushita Electric Industrial Co., Ltd. Chip inductor. 5,748,065, Cl. 336-96.000.

Hashimoto, Yasunobu: *See—*

Shono, Keiji; Hashimoto, Yasunobu; Kuroda, Sumio; and Tamanoi, Ken, 5,747,136, Cl. 428-64.300.

Hashimoto, Yoshiki, to Fanuc Ltd. Robot safety system for connecting peripheral device to a robot controller. 5,749,058, Cl. 701-23.000.

Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, to Tsubakimoto Chain Co. Speed increasing and accumulating conveyor chain. 5,746,304, Cl. 198-781.020.

Hashizume, Isamu: *See—*

Masuda, Katsuhiko; Aoki, Jun; and Hashizume, Isamu, 5,748,474, Cl. 364-426.036.

Haskill, John Stephen; and Ralph, Peter, to Chiron Corporation. Method of treating graft-versus-host disease. 5,747,444, Cl. 514-2.000.

Hass, Lester A.: *See—*

Rotunda, John T.; Hass, Lester A.; and Pipinich, Victor, 5,747,955, Cl. 318-434.000.

Hassenboehler, Charles B., Jr.; and Wadsworth, Larry C., to University of Tennessee Research Corporation, The. Post-treatment of laminated nonwoven cellulosic fiber webs. 5,747,394, Cl. 442-328.000.

Hassner, Martin; Koyama, Seiji; Nozawa, Tohru; Terukina, Asao; and Tetsuya, Tamura. Integrator with output-compensating capability. 5,748,023, Cl. 327-336.000.

- Hastings, Gregg A.; and Rosen, Craig A., to Human Genome Sciences, Inc. Human vascular IBP-like growth factor. 5,747,280, Cl. 435-69.100.
- Hata, Akihiro; Funai, Takashi; and Adachi, Masahiro, to Sharp Kabushiki Kaisha. Semiconductor device with increased distance between channel edges and a gate electrode. 5,747,828, Cl. 257-66.000.
- Hata, Takehisa: *See—*
  - Asakura, Sotoo; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, 5,747,069, Cl. 424-484.000.
- Hatakeyama, Atsushi: *See—*
  - Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.
- Hatano, Takahisa, to Matsushita Electric Industrial Co., Ltd. Luminance and chrominance signal separating apparatus. 5,748,260, Cl. 348-663.000.
- Hatashita, Toyohito: *See—*
  - Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.
- Hataura, Kiyoshi: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Hatoh, Hitoshi: *See—*
  - Sato, Makiko; Hisatake, Yuzo; Watanabe, Ryoichi; and Hatoh, Hitoshi, 5,748,275, Cl. 349-144.000.
- Hatsukami, Dorothy K.: *See—*
  - Keenan, Robert M.; and Hatsukami, Dorothy K., 5,747,512, Cl. 514-343.000.
- Hattori, Naoshi: *See—*
  - Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, 5,746,676, Cl. 476-50.000.
- Hattori, Tadashi: *See—*
  - Kato, Akira; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,747,929, Cl. 313-503.000.
- Hattori, Toshio: *See—*
  - Ishimoto, Shoichi; and Hattori, Toshio, 5,747,419, Cl. 504-187.000.
- Hattori, Yoshio: *See—*
  - Uchiyama, Norio; and Hattori, Yoshio, 5,747,763, Cl. 200-61.540.
- Hattori, Yutaka, to Brother Kogyo Kabushiki Kaisha. Optical scanning device. 5,748,352, Cl. 359-196.000.
- Haubert, Thomas D., to Owens Corning Fiberglas Technology Inc. Traversing nozzle for applying granules to an asphalt coated sheet. 5,747,105, Cl. 427-186.000.
- Haubert, Thomas D.: *See—*
  - Burton, Charles A.; Boyd, Douglas E.; Haubert, Thomas D.; and Belt, James S., 5,746,830, Cl. 118-308.000.
- Haug, Stefan: *See—*
  - Boecking, Friedrich; and Haug, Stefan, 5,746,181, Cl. 123-470.000.
- Haughton, Robert A.: *See—*
  - Harmon, John L.; Peters, William C.; Haughton, Robert A.; and Lingenfelter, Andrew A., 5,748,691, Cl. 376-261.000.
- Hause, Fred: *See—*
  - Chang, Kuang-Yeh; Gardner, Mark I.; and Hause, Fred, 5,747,852, Cl. 257-336.000.
- Hauser, Stephen A.; and Williams, Jeffrey L., to Fujitsu Network Communications, Inc.; and Fujitsu Limited. Frame classification using classification keys. 5,748,905, Cl. 395-200.790.
- Hauser, Stephen A.: *See—*
  - Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., 5,748,629, Cl. 370-389.000.
- Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, to Texas Instruments Incorporated. Interconnect structure with an integrated low density dielectric. 5,747,880, Cl. 257-759.000.
- Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, to Gas Research Institute. Method and apparatus for changing bits while drilling with a flexible shaft. 5,746,279, Cl. 175-52.000.
- Hawk, Gregory G.: *See—*
  - Aulbaugh, Randy; and Hawk, Gregory G., 5,746,987, Cl. 422-190.000.
- Hawke, David Harry; Parekh, Rajesh Bhikhu; Goulding, Paul; and Charles, Stephen Alexander, to Oxford Glycosystems Ltd. Labelled carbohydrates and their use in assays. 5,747,347, Cl. 436-94.000.
- Hawkins, George W., to Motorola, Inc. Electronic component having an interconnect substrate adjacent to a side surface of a device substrate. 5,747,858, Cl. 257-417.000.
- Hawkins, Phillip R.: *See—*
  - Au-Young, Janice; Hawkins, Phillip R.; and Hillman, Jennifer L., 5,747,319, Cl. 435-199.000.
- Hawley, David: *See—*
  - Ambrose, Frederic C.; and Hawley, David, 5,746,402, Cl. 248-118.000.
  - Ambrose, Frederic C.; and Hawley, David, 5,746,403, Cl. 248-118.000.
- Haworth, Karen Elizabeth; Seward, Eileen Mary; Swain, Christopher John; and Teall, Martin Richard, to Merck Sharp & Dohme Ltd. Morpholine derivatives and their use as antagonists of tachikinins. 5,747,491, Cl. 514-236.200.
- Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., to Amsted Industries Incorporated. Dynamically stable, lightweight railcar support system. 5,746,136, Cl. 105-199.300.
- Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., to Amsted Industries Incorporated. Railcar truck bearing adapter construction. 5,746,137, Cl. 105-219.000.
- Hayashi, Hiroko: *See—*
  - Uchiyama, Yaeko, deceased; Itano, Masaaki; and Hayashi, Hiroko, 5,748,208, Cl. 347-43.000.
- Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, to Matsushita Electronics Corporation. Press molding oil and method of manufacturing press-molded products by using the same. 5,747,432, Cl. 508-462.000.
- Hayashi, Masatake; and Miyazaki, Shigeki, to Sony Corporation. Plasma display device with cathode insulating layer. 5,747,932, Cl. 313-582.000.
- Hayashi, Mitsuhiro: *See—*
  - Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
- Hayashi, Sachio: *See—*
  - Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.
- Hayashi, Shuji: *See—*
  - Nakamura, Koji; Yamamoto, Haruo; and Hayashi, Shuji, 5,748,857, Cl. 395-109.000.
- Hayashi, Takashi: *See—*
  - Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, 5,747,432, Cl. 508-462.000.
- Hayashi, Yuji: *See—*
  - Maekawa, Toshikazu; and Hayashi, Yuji, 5,748,026, Cl. 327-333.000.
- Hayashida, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Method of controlling vectors in motor and vector-controlling inverter device. 5,747,957, Cl. 319-799.000.
- Hayden, Michael Patrick; and Stuermer, Karl Heinz, to Procter & Gamble Company, The. Apparatus and process for cyclically accelerating and decelerating a strip of material. 5,746,869, Cl. 156-265.000.
- Hayes, Jeffrey P.: *See—*
  - Jankowski, Alan F.; and Hayes, Jeffrey P., 5,746,634, Cl. 445-14.000.
- Haynes, Clinton A.: *See—*
  - Beveridge, Keith A.; Bennett, Mark A.; Waeber, Kenneth R.; and Haynes, Clinton A., 5,746,357, Cl. 222-386.000.
- Hays, Byron G., to Engelhard Corporation. Pigment compositions. 5,746,821, Cl. 106-496.000.
- Hazan, Isidor: *See—*
  - Corcoran, Patrick Henry; Hazan, Isidor; and Quashie, Sapé Kwesi, 5,747,590, Cl. 525-155.000.
- Hazlitt, Lonnie G.: *See—*
  - deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
- Hazzard, Edwin W.: *See—*
  - Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., 5,748,418, Cl. 360-128.000.
- HE Holdings, Inc.: *See—*
  - Burns, Ronnie R.; and Nagarajan, Ram, 5,748,241, Cl. 348-390.000.
- He, Wangsong: *See—*
  - Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, 5,747,425, Cl. 505-150.000.
- He, Zhigiang Alex; and Blank, Werner Joseph, to King Idustries, Inc. Imidazolidinone derivatives as corrosion inhibitors. 5,746,946, Cl. 252-392.000.
- Head, William James: *See—*
  - Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,101, Cl. 83-34.000.
  - Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,102, Cl. 83-34.000.
- Health Research, Inc.: *See—*
  - Kulesz-Martin, Molly F., 5,747,650, Cl. 530-387.700.
- Heard, David; Ohtani, Noboru; Unuma, Yutaka; and Fujimoto, Manabu, to Sharp Kabushiki Kaisha. Waveguide type compact optical scanner and manufacturing method thereof. 5,747,796, Cl. 250-227.260.
- Hearne, John S.: *See—*
  - Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.
- Hearney, James Alfred: *See—*
  - Clark, Michael William; Hearney, James Alfred; Norris, Duane Edward; and Benson, Paul Harrison, IV, 5,748,972, Cl. 395-750.050.
- Heaston, Bruce Allen; and Disser, Robert John, to General Motors Corporation. Power latch circuit with overvoltage protection. 5,748,422, Cl. 361-18.000.
- Heath, Christopher Robin: *See—*
  - Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.
- Heath Company, Inc.: *See—*
  - Wiesemann, David L.; Schaaf, Daniel E.; and Ko, Wai-Shing P., 5,747,937, Cl. 315-159.000.
- Heaton, David Alan: *See—*
  - Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, 5,746,887, Cl. 162-109.000.

- Hecker, Arlene: *See—*
  - Wei, George; Hecker, Arlene; and Goodman, David, 5,747,402, Cl. 501-152.000.
- Hedström, Peter J., to Ortolab AB. Orthopedic insole and method of its manufacture. 5,746,011, Cl. 36-44.000.
- Heeb, Jay; Shenoy, Sunil; and Wong, Jimmy, to Intel Corporation. Method and apparatus for using a direct memory access unit and a data cache unit in a microprocessor. 5,749,092, Cl. 711-138.000.
- Heeks, George J.: *See—*
  - Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.
- Heerklotz, Siegfried. Flat upholstered body. 5,747,140, Cl. 428-131.000.
- Heerze, Louis D.; Armstrong, Glen D.; and Smith, Richard, to Alberta Research Council. Anti-inflammatory, tolerogenic and immunoinhibiting properties of carbohydrate binding-peptides. 5,747,040, Cl. 424-190.100.
- Hegg, Ronald G., to Hughes Electronics. Distortion Corrected display. 5,748,264, Cl. 348-746.000.
- Hehle, Josef: *See—*
  - Wahhoud, Adnan; and Hehle, Josef, 5,746,256, Cl. 139-116.200.
- Hehr International Inc.: *See—*
  - Smith, Stuart B., 5,747,552, Cl. 522-96.000.
- Heidelberger Druckmaschinen AG: *See—*
  - Henn, Manfred; and Vettermann, Maritta, 5,746,131, Cl. 101-424.200.
- Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
  - Andl, Günter; and Kernbach, Rolf, 5,746,130, Cl. 101-424.000.
- Heidemann, Rolf; Veith, Gustav; and Otterbach, Jurgen, to Alcatel N.V. Optical communication system for cable-television signals and for subscriber-assigned signals. 5,748,348, Cl. 359-125.000.
- Heiden, Richard W.: *See—*
  - Gargiulo, Joseph L.; Baker, Walter J.; and Heiden, Richard W., 5,749,078, Cl. 705-404.000.
- Heider, Marc: *See—*
  - Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
- Heilmann, Steven M.: *See—*
  - Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
- Heim, Philippe: *See—*
  - Renard, Lucien; Delprat, Patrick; and Heim, Philippe, 5,747,569, Cl. 524-140.000.
- Heimanson, Dorian; Moslehi, Mehrdad M.; Spronz, Paul E.; and Omstead, Thomas R., to CVC Products, Inc. High magnetic flux permanent magnet array apparatus and method for high productivity physical vapor deposition. 5,746,897, Cl. 204-298.200.
- Hein, Russell R.: *See—*
  - Remington, James A.; Schultz, Kenneth L.; and Hein, Russell R., 5,746,400, Cl. 246-465.000.
- Heinonen, Aimo, to Conrex Automation Oy. Measuring instrument for reflectometric measurements. 5,748,304, Cl. 356-236.000.
- Heinz, Robert Eric: *See—*
  - Lindberg, John M.; and Heinz, Robert Eric, 5,748,308, Cl. 356-310.000.
- Heinzel-Wieland, Regina: *See—*
  - Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, 5,747,291, Cl. 435-69.600.
- Heiser, Stephen J.; Malvino, Joanna Mary; Wohl, Charles M.; and Poza, Fausto, to H.M.W. Consulting, Inc. Positional information storage and retrieval system and method. 5,748,148, Cl. 342-457.000.
- Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, to Molex Incorporated. Wire harness termination apparatus for programmable connectors. 5,745,975, Cl. 29-564,600.
- Heiss, Herbert: *See—*
  - Riedel, Michael; and Heiss, Herbert, 5,748,615, Cl. 370-238.000.
- Heistracher, Elisabeth: *See—*
  - Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.
- Heitke, John C.: *See—*
  - Murdock, Edward S.; Heitke, John C.; and Schulz, Kevin J., 5,748,412, Cl. 360-113.000.
- Hella KG Hueck & Co.: *See—*
  - Rogge, Ingo, 5,746,498, Cl. 362-80.100.
  - Weigelt, Beate; Mügge, Martin; and Decker, Detlef, 5,746,496, Cl. 362-61.000.
- Hellenschmidt, Stephen P., to Tetra Laval Holdings & Finance SA. Thermal processing and packaging system employing an intermediate degassing tank. 5,746,808, Cl. 96-205.000.
- Helm, Mark: *See—*
  - Dennison, Charles H.; and Helm, Mark, 5,747,855, Cl. 257-369.000.
- Helopharm G. Petrik GmbH: *See—*
  - Richter, Peter; Elsner, Martin; and Vogt, Barbara, 5,747,508, Cl. 514-320.000.
- Helsinki University Licensing, Ltd.: *See—*
  - Virsu, Veijo; and Salminen, Seppo, 5,746,205, Cl. 128-630.000.
- Helynck, Gérard: *See—*
  - Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, 5,747,303, Cl. 435-119.000.
- Hemmati, Goodarz Sahneh, to SmithKline Diagnostics, Inc. Immunochemical-based test device with lift and twist specimen full tab. 5,747,351, Cl. 436-514.000.
- Hemphill, Shan: *See—*
  - Bezick, William; Fiedler, Allen E.; Kerlee, Jody; and Hemphill, Shan, 5,746,656, Cl. 463-42.000.
- Hendershot, William J.; McDonald, Michael L.; and Timian, Vivian J., to W. L. Gore & Associates, Inc. Method of ultrasonically welding articles of porous polytetrafluoroethylene. 5,746,856, Cl. 156-73.400.
- Hendrickson, Tracy A.: *See—*
  - Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.
- Henkel Kommanditgesellschaft auf Aktien: *See—*
  - Fleckenstein, Theo; Ditze, Alexander; and Hahn, Thomas, 5,746,777, Cl. 8-142.000.
  - Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, 5,746,529, Cl. 401-18.000.
- Henn, Manfred; and Vettermann, Maritta, to Heidelberger Druckmaschinen AG. Powder sprayer. 5,746,131, Cl. 101-424.200.
- Hennchen, Norbert, to Wind Strom Frisia GmbH. System for limiting short circuit current in 3-phase electric power networks. 5,748,423, Cl. 361-31.000.
- Hennequin, Laurent Francois Andre: *See—*
  - Bavetsias, Vassilios; Boyle, Francis Thomas; Hennequin, Laurent Francois Andre; and Marriott, Jonathan Hugh, 5,747,499, Cl. 514-267.000.
- Hennessy, Mark: *See—*
  - Stack, Francis Martin; Hennessy, Mark; Mulvihill, Daniel; and O'Kennedy, Brendan Thomas, 5,747,647, Cl. 530-365.000.
- Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, to Hoechst Aktiengesellschaft. Method of treating cardiac insufficiency using angiotensin-converting enzyme inhibitors. 5,747,504, Cl. 514-307.000.
- Henry, Arnold W.: *See—*
  - Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.
- Henry, Philippe: *See—*
  - Peru, Gilles; and Henry, Philippe, 5,747,768, Cl. 219-121.630.
- Henson, Dale. Three-way hot air divert valve. 5,746,252, Cl. 137-625.470.
- Her Majesty in right of Canada as represented by the Minister of Agriculture and Agri-Food: *See—*
  - Potter, John W.; and Chiba, Mikio, 5,747,056, Cl. 424-410.000.
- Herb, William R.; and Burns, David W., to Honeywell Inc. Method for making a thin film resonant microbeam absolute. 5,747,705, Cl. 73-862.590.
- Herbermann, Alfred F.; Van't Land, Jacob J.; and Filipiak, Michael A., to Syron Engineering & Manufacturing Corporation. Tool mount for moving elements. 5,746,567, Cl. 414-752.000.
- Herberts Gesellschaft mit beschrankter Haftung: *See—*
  - Stegen, Helga; Blum, Joachim; and Kerlin, Kiaus-Günter, 5,747,114, Cl. 427-380.000.
- Herbst, Heinz: *See—*
  - Pfaendner, Rudolf; Hoffmann, Kurt; and Herbst, Heinz, 5,747,606, Cl. 525-438.000.
- Herchen, Harald, to Applied Materials, Inc. Double-walled mircrowave plasma based applicator. 5,747,917, Cl. 313-231.310.
- Herm, Hartmut: *See—*
  - May, Karl; Herm, Hartmut; and Unverzagt, Karlheinz, 5,746,590, Cl. 432-114.000.
- Herman, Mark Layne: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
- Herman, Pat, to Eyes For You Inc. Rimless eyeglasses having a single wire bridge and removable lenses. 5,748,280, Cl. 351-110.000.
- Heron Sondermaschinen und Steuerungen Ges.m.b.H: *See—*
  - Kohler, Dietmar, 5,746,535, Cl. 403-258.000.
- Herrera, Maria del Carmen Sampedro: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
- Herrera E., Oscar R., to Hewlett-Packard Company. Automatic enabling/disabling of termination impedance for a computer bus. 5,748,910, Cl. 395-281.000.
- Herring, Kathryn; and Sandberg, Denise, to Dade International Inc. Tumor marker control. 5,747,268, Cl. 435-7.230.
- Hershberger, David: *See—*
  - Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl, 345-133.000.
- Hershberger, Troy: *See—*
  - Lewis, Ralph; and Hershberger, Troy, 5,746,768, Cl. 606-205.000.
- Hershey, Paul C.: *See—*

/OL
2 10
ISS
1
MY
5
998
JMI

- Waclawsky, John G.; Hershey, Paul C.; and Daugherty, Raymond F., 5,748,925, Cl. 395-311.000.
- Herzog, Richard W.: *See—*
  - Damji, Dhirendra C.; and Herzog, Richard W., 5,749,028, Cl. 399-117.000.
- Hess, Stefan: *See—*
  - Schmitz, Ludwig; Hess, Stefan; and Gerharz, Bettina, 5,747,578, Cl. 524-502.000.
- Hesser, Frederick W.: *See—*
  - Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
- Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Multi-functional carrier for sailboats. 5,746,151, Cl. 114-343.000.
- Hestehave, Kjeld: *See—*
  - Hestehave, Borge; and Hestehave, Kjeld, 5,746,151, Cl. 114-343.000.
- Hettinger, Gerhard; and Rutsch, Walter, to Burkert Werke GmbH & Co. Method for the production of a valve housing. 5,746,079, Cl. 72-57.000.
- Hettinger, William P., Jr.; Moore, Howard F.; Goolsby, Terry L.; and Peppard, A. V., to Ashland Inc. Combination magnetic separation, classification and attrition process for renewing and recovering particulates. 5,746,321, Cl. 209-233.000.
- Hewison, Trevor S.: *See—*
  - Beaulac, Daniel E.; Hewison, Trevor S.; and Washington, Wayne, 5,746,150, Cl. 114-248.000.
- Hewitt, Larry: *See—*
  - Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, 5,748,983, Cl. 395-842.000.
- Hewlett-Packard Company: *See—*
  - Blackham, David Vernon, 5,748,000, Cl. 324-601.000.
  - Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, 5,748,856, Cl. 395-102.000.
  - Chapman, Terri I.; Tran, Hai Q.; and Keefe, Brian J., 5,748,209, Cl. 347-50.000.
  - Gondek, Jay S., 5,748,176, Cl. 345-131.000.
  - Herrera E., Oscar R., 5,748,910, Cl. 395-281.000.
  - Karp, Alan H.; and Kumar, Rajendra, 5,748,936, Cl. 395-394.000.
  - Kelly, Christopher P. J., 5,748,105, Cl. 340-870.210.
  - Kilk, Erik; Van der Veer, Karen; and MacMillan, Leann M., 5,748,613, Cl. 370-231.000.
  - Lesartre, Gregg; Quarnstrom, Doug; and Lotz, Jonathan P., 5,748,934, Cl. 395-392.000.
  - Mayer, Jeremy; Belon, Juan B.; and Kennedy, A. Terence, 5,746,528, Cl. 400-625.000.
  - Paul, D. Scott, 5,746,464, Cl. 294-116.000.
  - Raynham, Michael B.; and Tuttle, Myron R., 5,747,889, Cl. 307-80.000.
  - Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
  - Swanson, David W.; Kaplinsky, George T.; Salter, James G.; and Rhoads, W. Wistar, 5,748,215, Cl. 347-87.000.
  - Zorabedian, Paul, 5,748,313, Cl. 356-345.000.
- Hi-Tex, Inc.: *See—*
  - Xiao, Han Xiong; Geng, Peng; and Frisch, Kurt C., 5,747,392, Cl. 442-82.000.
- Hibberd, Christopher V.: *See—*
  - Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., 5,746,881, Cl. 156-578.000.
- Hibino, Masahiko, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling power supplied to an electrically heated catalyst attached to an exhaust gas passage of an internal combustion engine. 5,746,053, Cl. 60-277.000.
- Hibino, Ryoichi: *See—*
  - Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.
- Hickey, David R., to Cross Tread Industries, Inc. Heavy duty vehicle rack. 5,746,362, Cl. 224-331.000.
- Hicks, Michael A.: *See—*
  - Bedingfield, John; and Hicks, Michael A., 5,748,426, Cl. 361-58.000.
- Hicksted, Richard L.; and Glaser, Michael, to MTI Technology Corporation. Reserved cylinder for SCSI device write back cache. 5,748,874, Cl. 395-182.220.
- Hidaka, Katsuhiko; Kawabata, Katsuhiro; and Tamukai, Keiko, to Mitsubishi Chemical Corporation. Light sensitive planographic printing plate having particular deposited particles and process for producing the same. 5,747,220, Cl. 430-273.100.
- Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, to Tele Digital Development, Inc. Cellular telephone management system. 5,749,052, Cl. 455-406.000.
- Hieda, Katsuhiko: *See—*
  - Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.
- Higaki, Nobuo: *See—*
  - Miyaji, Shinya; and Higaki, Nobuo, 5,748,970, Cl. 395-733.000.
- Higashi, Noboru; and Sano, Koichi, to Hitachi, Ltd. Flat pattern image generation of internal structure data. 5,748,193, Cl. 345-427.000.
- Higashikawa, Yuichi: *See—*
  - Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.
- Higashisaka, Shingo: *See—*
  - Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, 5,747,945, Cl. 315-248.000.
- Higby, Paige L.; Vernacotola, Dean E.; and Penrod, Bret E., to Libbey-Owens-Ford Co. Neutral colored glass compositions. 5,747,398, Cl. 501-66.000.
- Higgins, Timothy Joseph: *See—*
  - Steyer, William; and Higgins, Timothy Joseph, 5,746,047, Cl. 60-39.500.
- Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, to Daikin Industries. Continunous process for preparing polytetrafluoroethlene wet powder. 5,747,640, Cl. 528-502.00F.
- Hihaisuto Seiko Co., Ltd.: *See—*
  - Hirose, Kazuya, 5,746,138, Cl. 108-145.000.
- Hiji, Naoki: *See—*
  - Kobayashi, Kenichi; Makida, Seigo; Nishihara, Yoshio; and Hiji, Naoki, 5,748,228, Cl. 348-63.000.
- Hijii, Kazuyoshi, to NEC Corporation. Data check method for an external memory and check system for an external ROM data. 5,748,886, Cl. 395-185.020.
- Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, to U.S. Philips Corporation. Electroluminescent device having electruluminescent compound and liquid crystalline compound. 5,748,271, Cl. 349-69.000.
- Hilgers, Michael E.: *See—*
  - Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.
- Hill-Rom, Inc.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Hill, Russell J.: *See—*
  - Lehan, John; Byorum, Henry; Hill, Russell J.; and Rough, J. Kirkwood, 5,746,894, Cl. 204-192.120.
- Hillenmayer, Stefan: *See—*
  - Loritz, Axel; and Hillenmayer, Stefan, 5,748,441, Cl. 361-683.000.
- Hillman, Jennifer L.: *See—*
  - Au-Young, Janice; Hawkins, Phillip R.; and Hillman, Jennifer L., 5,747,319, Cl. 435-199.000.
- Hillstrom, Brian J.: *See—*
  - Hillstrom, David U.; and Hillstrom, Brian J., 5,746,503, Cl. 362-248.000.
- Hillstrom, David U.; and Hillstrom, Brian J., to Marketing Displays Inc. Illuminated canopy system. 5,746,503, Cl. 362-248.000.
- Hilti Aktiengesellschaft: *See—*
  - Kaibach, Werner, 5,746,557, Cl. 411-60.000.
  - Söhnlein, Dieter, 5,746,095, Cl. 76-108.600.
- Himmelwright, Richard S.: *See—*
  - Katsen, Boris Joseph; Himmelwright, Richard S.; Stewart, Barbara Jones; and Schwartz, Nate R., 5,746,817, Cl. 106-31.650.
- Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, to University of California, The Regents of the. Neurological drug screens. 5,747,262, Cl. 435-7.100.
- Hindle, David J.; Breeds, Christopher D.; Conway, Jeremy J.; Morris, Ian W.; and Ledgerwood, Eric. Method of isolating a nuclear reactor or other large structures. 5,746,540, Cl. 405-131.000.
- Hinds, Mark Alan: *See—*
  - Rutherford, William Michael; Hinds, Mark Alan; and Dennis, Scott Michael, 5,747,020, Cl. 424-93.450.
- Hino Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Tanaka, Shinichi; and Tanaka, Shigeru, 5,746,292, Cl. 188-73.370.
- Hino, Yasumori; Miyatake, Norio; Birukawa, Masahiro; and Nakamura, Tadashi, to Matsushita Electric Industrial Co., Ltd. Disk drive apparatus and disk storage medium for high density recording. 5,748,592, Cl. 369-59.000.
- Hinsberg, William Dinan: *See—*
  - Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.
- Hinshaw, Jerald C.; and Hamilton, R. Scott, to Thiokol Corporation. Polymers used in elastomeric binders for high-energy compositions. 5,747,603, Cl. 525-403.000.
- Hinton, Glenn J.: *See—*
  - Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.
- Hinton, Mark L.: *See—*
  - Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.
- Hiraga, Yoshiji: *See—*
  - Hirai, Junji; Hiraga, Yoshiji; and Nomura, Kenji, 5,747,894, Cl. 307-104.000.
- Hirai, Junji; Hiraga, Yoshiji; and Nomura, Kenji, to Kabushiki Kaisha Yaskawa Denki. Factory automation connector and work pallet. 5,747,894, Cl. 307-104.000.
- Hirai, Nobuaki: *See—*

  - Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, 5,748,585, Cl. 369-47.000.
- Hirakawa Guidom Corporation: *See—*
  - Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,746,159, Cl. 122-367.100.
- Hiramatsu, Takeshi: *See—*
  - Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, 5,747,576, Cl. 524-451.000.
- Hirano, Hideki: *See—*
  - Shinozaki, Kenji; and Hirano, Hideki, 5,748,211, Cl. 347-51.000.
- Hirano, Masao: *See—*
  - Koike, Sou; Hirano, Masao; and Okubo, Takayuki, 5,746,032, Cl. 52-204.100.
- Hirano, Masashi: *See—*
  - Ohta, Shinichi; and Hirano, Masashi, 5,747,715, Cl. 84-609.000.
- Hirano, Shinichi: *See—*
  - Kitagawa, Yoshihisa; and Hirano, Shinichi, 5,748,995, Cl. 396-55.000.
- Hirano, Yutaka, to Toyota Jidosha Kabushiki Kaisha. Apparatus for determining an estimated quantity of a state of motion of a vehicle. 5,747,682, Cl. 73-118.100.
- Hiraoka, Manabu: *See—*
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Hirata, Noriyuki, to Kabushiki Kaisha Toshiba. Vapor deposition method and apparatus. 5,747,119, Cl. 427-585.000.
- Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, to Hitachi, Ltd. Network interface apparatus. 5,748,893, Cl. 395-200.300.
- Hirube, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, to Mita Industrial Co., Ltd. Electrical conductor for an optical system. 5,746,505, Cl. 362-260.000.
- Hirohata, Toru: *See—*
  - Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,747,826, Cl. 257-10.000.
- Hirose, Kazuya, to Hihaisuto Seiko Co., Ltd. Multi-degree-of-freedom positioning mechanism. 5,746,138, Cl. 108-145.000.
- Hirose, Takashi, to NEC Corporation. Printer apparatus for printing on both surfaces of paper or the like. 5,746,526, Cl. 400-619.000.
- Hiroshige, Atsushi, to Toyota Jidosha Kabushiki Kaisha. Shock absorbing cover for seat belt anchor. 5,746,449, Cl. 280-808.000.
- Hiroshima University: *See—*
  - Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,747,047, Cl. 424-275.100.
- Hirota, Toshiaki: *See—*
  - Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.
- Hirota, Toshikazu; Shibata, Kazuyoshi; and Takeuchi, Yukihisa, to NGK Insulators, Ltd. Axial flow particle sensor. 5,747,671, Cl. 73-61.750.
- Hirsch, Danielle: *See—*
  - Levy, Robert J.; and Hirsch, Danielle, 5,746,775, Cl. 8-94.110.
- Hirsch, David Edward, to Xerox Corporation. Active area identification on a machine readable form using form landmarks. 5,748,809, Cl. 382-317.000.
- Hirsch, Martin: *See—*
  - Queneau, Paul E.; and Hirsch, Martin, 5,746,805, Cl. 75-446.000.
- Hisada, Kenichi, to Uni-Charm Corporation. Disposable undergarment. 5,746,731, Cl. 604-385.200.
- Hisatake, Yuzo: *See—*
  - Sato, Makiko; Hisatake, Yuzo; Watanabe, Ryoichi; and Hatoh, Hitoshi, 5,748,275, Cl. 349-144.000.
- Hitachi Car Engineering Co., Ltd.: *See—*
  - Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, 5,746,178, Cl. 123-399.000.
- Hitachi Computer Electronics Co., Ltd.: *See—*
  - Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, 5,749,093, Cl. 711-139.000.
- Hitachi Computer Engineering Co., Ltd.: *See—*
  - Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.
- Hitachi Engineering Co., Ltd.: *See—*
  - Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
- Hitachi Koki Co., Ltd.: *See—*
  - Nishimura, Takashi, 5,748,482, Cl. 364-474.060.
- Hitachi, Ltd.: *See—*
  - Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.
  - Harada, Koji; and Kanamaru, Hisanobu, 5,746,085, Cl. 72-355.600.
  - Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.
  - Higashi, Noboru; and Sano, Koichi, 5,748,193, Cl. 345-427.000.
  - Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.
  - Imai, Kyuko; Imai, Kazumichi; and Nomura, Yasushi, 5,746,977, Cl. 422-62.000.
  - Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, 5,747,823, Cl. 250-559.440.
  - Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.
  - Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.
  - Kanai, Sadasaburo, 5,748,985, Cl. 395-457.000.
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
  - Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, 5,747,864, Cl. 257-458.000.
  - Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, 5,749,093, Cl. 711-139.000.
  - Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.
  - Kuroda, Kenichi; Shiba, Kazuyoshi; and Matsuo, Akinori, 5,747,849, Cl. 257-321.000.
  - Kurosaki, Toshiei, 5,747,816, Cl. 250-491.100.
  - Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, 5,749,053, Cl. 455-524.000.
  - Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
  - Minowa, Toshimichi; and Ohyama, Yoshishige, 5,746,679, Cl. 477-92.000.
  - Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.
  - Nakamura, Takahiro; and Oka, Takafumi, 5,748,967, Cl. 395-712.000.
  - Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
  - Nakayama, Yasuhiko; Shiba, Masataka; and Komoriya, Susumu, 5,747,201, Cl. 430-30.000.
  - Natori, Masataka; Kumaoka, Shunichi; and Ueda, Shiro, 5,748,267, Cl. 349-40.000.
  - Nishimura, Takashi, 5,748,482, Cl. 364-474.060.
  - Sakurai, Akito, 5,748,850, Cl. 395-50.000.
  - Sakurai, Naoki; and Sugawara, Yoshitaka, 5,747,829, Cl. 257-66.000.
  - Seo, Yosuke, 5,748,398, Cl. 360-51.000.
  - Shimizu, Kikuo, 5,748,589, Cl. 369-54.000.
  - Shinagawa, Tetsuo; Watanabe, Yumiko; Shinagawa, Akio; and Ito, Fumitaka, 5,748,715, Cl. 379-100.130.
  - Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, 5,746,178, Cl. 123-399.000.
  - Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
  - Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.
  - Yano, Masayoshi; and Mochizuki, Kohei, 5,747,800, Cl. 250-292.000.
  - Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.
- Hitachi,Ltd.: *See—*
  - Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.
- Hitachi Maxell, Ltd.: *See—*
  - Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, 5,747,823, Cl. 250-559.440.
- Hitachi Medical Corporation: *See—*
  - Goto, Yoshihiro, 5,748,801, Cl. 382-270.000.
- Hitachi Metals Ltd.: *See—*
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Hitachi Microcomputer System Ltd.: *See—*
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
  - Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.
- Hitachi Plant Engineering & Construction Co., Ltd.: *See—*
  - Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
- Hitachi Powdered Metals Co., Ltd.: *See—*

OL 210 ISS 1 MY 5 998 MI

Miyasaka, Motohiro; Kondo, Makoto; and Otsuka, Shigeru, 5,746,516, Cl. 384-291.000.

Hitachi ULSI Engineering Corp.: *See—*

Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.

Kuroda, Kenichi; Shiba, Kazuyoshi; and Matsuo, Akinori, 5,747,849, Cl. 257-321.000.

Hittich, Reinhard: *See—*

Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, 5,746,941, Cl. 252-299.630.

HK Systems, Inc.: *See—*

Wilkins, John J.; and Steffens, Walter L., 5,746,305, Cl. 198-890.100.

Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., to Siemens Aktiengesellschaft. Application of thin crystalline Si_3N_4 liners in shallow trench isolation (STI) structures. 5,747,866, Cl. 257-506.000.

Hoard, John W., to Low Emissions Technologies Research and Development Partnership. Exhaust system with emissions storage device and plasma reactor. 5,746,984, Cl. 422-169.000.

Hoareau, Desire Dominique. Apparatus for lavatory bowl ventilation. 5,745,927, Cl. 4-213.000.

Hobson, Phillip M.: *See—*

Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.

Hoch, James A.; and Huang, Shaoming, to Scripps Research Institute, The. Screening methods for the identification of novel antibiotics. 5,747,276, Cl. 435-32.000.

Hochgesang, Gerhard; and Grosse, Andrea, to Preh-Werke GmbH & Co. KG. Keyboard arrangement. 5,747,758, Cl. 200-5.00A.

Hodges, Ralph S. High volume meat product incisor. 5,746,106, Cl. 83-884.000.

Hodogaya Chemical Co., Ltd.: *See—*

Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.

Hoechst Aktiengesellschaft: *See—*

Dönges, Reinhard; and Ehrler, Rudolf, 5,747,468, Cl. 514-42.000.

Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, 5,747,504, Cl. 514-307.000.

Lattrell, Rudolf; Dürckheimer, Walter; and Schmid, Peter, 5,747,484, Cl. 514-202.000.

Schleyerbach, Rudolf; Bartlett, Robert Ryder; Kuo, Elizabeth Anne; and Little, Edward James, 5,747,664, Cl. 558-392.000.

Urban, Manfred; and Schnaitmann, Dieter, 5,746,820, Cl. 106-471.000.

Weber, Joachim, 5,747,566, Cl. 524-93.000.

Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.

Hoechst Celanese Corp.: *See—*

Shen, Sunny S.; Polis, David W.; Yoon, Hyun N.; and Tien, Tze-Pei, 5,746,949, Cl. 252-585.000.

Hoechst Marion Roussel, Inc.: *See—*

Weiberth, Franz Josef, 5,747,708, Cl. 73-863.810.

Hoechst Schering AgrEvo GmbH: *See—*

Harju-Jeanty, Pontus; and Ahlskog, Torbjörn, 5,747,417, Cl. 504-116.000.

Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, 5,747,421, Cl. 504-214.000.

Hoefelmayr, Tilman, to Bio-Melktechnik Hoefelmayer & Co. Device for extracting from a milking flow an analysis sample having a proportional amount. 5,746,153, Cl. 119-14.010.

Hoess, Alfred, to Siemens Aktiengesellschaft. Radar device with reduced power emission. 5,748,141, Cl. 342-109.000.

Hoffman, Howard L. Oxygenated beverage. 5,747,079, Cl. 426-67.000.

Hoffman-La Roche Inc.: *See—*

Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.

Doran, Thomas I.; and McLane, John Arthur, 5,747,478, Cl. 514-167.000.

Hoffman, Richard A.: *See—*

Chakrabarti, Dhruba J.; Hoffman, Richard A.; and Jensen, Craig L., 5,747,135, Cl. 428-64.100.

Hoffmann, Kurt: *See—*

Pfaendner, Rudolf; Hoffmann, Kurt; and Herbst, Heinz, 5,747,606, Cl. 525-438.000.

Hoffmann-La Roche Inc.: *See—*

Bryce, Graeme Findlay; and Uskokovic, Milan Radoje, 5,747,479, Cl. 514-167.000.

Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,747,646, Cl. 530-351.000.

Pittrof, Folker; and Steffen, Hans, 5,747,066, Cl. 424-450.000.

Hoffmeister, Michael: *See—*

Schmidt, Torsten; and Hoffmeister, Michael, 5,746,788, Cl. 48-198.200.

Hofmann, Jurgen, to TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH. Energy converter for generating high power pulses. 5,748,563, Cl. 367-147.000.

Hogan, Patrick T.: *See—*

Smith, James C.; Hogan, Patrick T.; and Saidman, Laurence B., 5,747,102, Cl. 427-96.000.

Hogg, John Moss. Cold flow control. 5,746,963, Cl. 264-271.100.

Hogue, Robert T.: *See—*

Duske, Wilfried P.; Hogue, Robert T.; and Koeslin, Kenneth J., 5,746,006, Cl. 34-136.000.

Hohlweg, Rolf: *See—*

Jørgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.

Hohmann, Arno; Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to Giesecke & Devrient GmbH. Method for producing data carriers. 5,745,988, Cl. 29-841.000.

Hokari, Yasuaki, to NEC Corporation. Solid-state image sensor assembly with image sensor element chip mounted in package. 5,748,448, Cl. 361-749.000.

Hokkaido Electric Power Co., Inc.: *See—*

Homma, Norio; and Morishita, Tadataka, 5,747,427, Cl. 505-476.000.

Hokoi, Hayato: *See—*

Ueta, Souichi; and Hokoi, Hayato, 5,748,800, Cl. 382-266.000.

Holden, Michael C.: *See—*

Holden, W. Wayne; and Holden, Michael C., 5,745,950, Cl. 15-316.100.

Holden, W. Wayne; and Holden, Michael C., to Combustion Engineering, Inc. Hub and drive assembly for full coverage sootblower. 5,745,950, Cl. 15-316.100.

Holl, Mark R.; and Sabeti, Roya R., to University of Washington. Two-stage kinematic mount. 5,748,827, Cl. 385-134.000.

Holl, Richard J.: *See—*

Tipton, Arthur J.; and Holl, Richard J., 5,747,058, Cl. 424-423.000.

Holladay, Leslie A.; and Oldenburg, Kevin R., to ALZA Corporation. Method for increasing the electrotransport flux of polypeptides. 5,747,453, Cl. 514-12.000.

Hollandsworth, Roger Paul: *See—*

Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., 5,747,968, Cl. 320-119.000.

Holleman, Gerald W.: *See—*

Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., 5,748,654, Cl. 372-19.000.

Holley, Charles Carl: *See—*

Liu, Kaibai; Holley, Charles Carl; and Petersen, Walter John, 5,745,947, Cl. 15-84.000.

Hollinshead, Ariel C. Anti-HIV /Aids Chemo(C)-, immuno(I)-, or ci-therapy using tur (or related compounds) and/or NVA (or EPV). 5,747,526, Cl. 514-448.000.

Hollowood, Inc.: *See—*

Jarrett, Mark G., 5,746,863, Cl. 156-218.000.

Holm, Niels Erik, to F. R, Squibb & Sons, Inc. Method for receiving and separating a fluid into its ingredients. 5,746,979, Cl. 422-72.000.

Holmes, Andrew Bruce: *See—*

Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.

Holmes, Daniel J.; Molnar, John W.; and Tarr, Morton H., to Media 100 Inc. Synchronizing digital audio to digital video. 5,748,842, Cl. 395-2.790.

Holmes, Douglas B.: *See—*

Velasquez, David A.; Holmes, Douglas B.; and Gogolin, E. Lawrence, 5,746,781, Cl. 29-730.000.

Holmes, Patrick W.: *See—*

Pettersson, Bjorn Ola Alfons; and Holmes, Patrick W., 5,747,073, Cl. 425-78.000.

Holmes, Terry L.: *See—*

Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.

Hologic Inc.: *See—*

Stein, Jay A.; and Berger, Noah, 5,748,705, Cl. 378-196.000.

Hologram Technology International, Inc.: *See—*

Erickson, Ronald R., 5,748,347, Cl. 359-23.000.

Holt, Andrew J., to G & H Technology, Inc. Cartridge motion initiator with replaceable link wire controller. 5,748,066, Cl. 337-1.000.

Holtek Microelectronics, Inc.: *See—*

Chang, Herman, 5,748,708, Cl. 379-67.000.

Yu, Kuo-Cheng; Sun, Bao-Shiang; and Lin, Ching-Yi, 5,748,948, Cl. 395-555.000.

Homer, David Antony: *See—*

Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.

Homer, John C., III: *See—*

Cadou, Peter B.; Homer, John C., III; and Alexeff, Kevin A., 5,747,747, Cl. 177-145.000.

Homma, Norio; and Morishita, Tadataka, to Hokkaido Electric Power Co., Inc.; and International Superconductivity Technology Center. Process for forming a semiconductive thin film containing a junction. 5,747,427, Cl. 505-476.000.

Hon Hai Precision Ind. Co., Ltd.: *See—*

Cheng, Lee-Ming; and Choy, Edmond, 5,746,613, Cl. 439-157.000.

Cheng, Lee-Ming; Choy, Edmond; and Tseng, Gwou-Jong, 5,746,614, Cl. 439-157.000.

Honda, Akihiro, to Denso Corporation. EGR system using perpendicularly arranged control valve. 5,746,190, Cl. 123-568.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*

Isobe, Takashi; and Toda, Takushi, 5,746,191, Cl. 123-686.000.

Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.

Kuroda, Shigetaka; and Shimasaki, Yuichi, 5,747,681, Cl. 73-117.300.

Masuda, Katsuhiko; Aoki, Jun; and Hashizume, Isamu, 5,748,474, Cl. 364-426.036.

Nishihara, Takashi; Shiraishi, Shuji; Yamamoto, Osamu; and Yano, Osamu, 5,747,686, Cl. 73-146.200.

Sekine, Hiroshi; and Tamura, Kazuya, 5,748,476, Cl. 364-449.000.

Yamamoto, Osamu; Shiraishi, Shuji; and Yano, Osamu, 5,749,062, Cl. 701-72.000.

Honda, Kenichi: *See—*

Namikawa, Mamoru; Yoshimura, Satoshi; and Honda, Kenichi, 5,747,927, Cl. 313-495.000.

Honda, Masahiko; and Miyao, Yasuhiro, to NEC Corporation. ATM switching apparatus. 5,748,632, Cl. 370-399.000.

Honda, Masami; and Shibasaki, Kazuya, to Kabushiki Kaisha Toshiba Portable electronic apparatus having frame with cooling air flowing passage. 5,748,444, Cl. 361-687.000.

Honda, Norio: *See—*

Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, 5,747,400, Cl. 501-94.000.

Honda, Yoshikazu: *See—*

Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,747,241, Cl. 435-5.000.

Honda, Yuichi: *See—*

Nakayama, Haruki; Honda, Yuichi; and Imaizumi, Toshio, 5,748,386, Cl. 359-694.000.

Honeywell Inc.: *See—*

Herb, William R.; and Burns, David W., 5,747,705, Cl. 73-862.590.

Peterson, Scott M., 5,748,429, Cl. 361-106.000.

Smith, Paul E., 5,747,987, Cl. 324-207.130.

Hong, Guo Fan; Zhai, Feng, deceased (by Fudi Ni, executor), to Shanghai Institute for Biochemistry, Chinese Academy of Sciences. DNA polymerase with proof-reading 3'-5' exonuclease activity *Bacillus stearothermophilus*. 5,747,298, Cl. 435-91.100.

Hong, Kee-Chul, to Daewoo Telecom Ltd. Shelf unit with a spring for use in a rack for storing a communication system. 5,746,326, Cl. 211-41.170.

Hong, Meru Y., to Motorola, Inc. Apparatus and method of orienting asymmetrical semiconductor devices in a circuit. 5,748,475, Cl. 364-491.000.

Hong, Seong Won: *See—*

Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.

Hong, Song-Cheol: *See—*

Kim, Dong-Wook; Son, Jeong-Hwan; Hong, Song-Cheol; and Kwon, Yeong-Se, 5,747,865, Cl. 257-480.000.

Honma, Junich; Mino, Kotaro; Miyata, Hisayuki; and Inoue, Haruhide, to Advanced Ceramics Corporation. Ceramic electrostatic chuck and method, 5,748,436, Cl. 361-234.000.

Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, to Canon Kabushiki Kaisha. Image reading apparatus with A/D conversion and adjustment thereof. 5,748,335, Cl. 358-445.000.

Honnorat, Yves Christian Louis, to Societe Nationale d' Etude et de Construction de Moteurs d'Aviation "Snecma". Process for making a composite rotor with metallic matrix. 5,745,994, Cl. 29-889.200.

Hood Laboratories: *See—*

Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, 5,746,699, Cl. 600-529.000.

Hood, Larry; and Lemus, Tony V. Phacoemulsification needle. 5,746,713, Cl. 604-22.000.

Hood, Leroy E.: *See—*

Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., 5,747,249, Cl. 435-6.000.

Hood, Rush W., Jr., to Johnson & Johnson Medical, Inc. Failsafe supervisor system for a patient monitor. 5,746,203, Cl. 128-630.000.

Hoover Group, Inc.: *See—*

Waltke, David L.; and Bouc, Gary L., 5,746,343, Cl. 220-9.200.

Hoover, Russell D.; Nation, George W.; and Valk, Kenneth M., to International Business Machines Corporation. Method and apparatus for maintaining n-way associative directories utilizing a content addressable memory. 5,749,087, Cl. 711-108.000.

Hopkins, Richard H.: *See—*

Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased; and Hopkins, Richard H., 5,746,827, Cl. 117-100.000.

Hoppe, Joachim: *See—*

Hohmann, Arno; Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 5,745,988, Cl. 29-841.000.

Hoppe, Joseph: *See—*

Ferreira, Ronald; and Hoppe, Joseph, 5,748,782, Cl. 382-232.000.

Horak, James Michael: *See—*

Schroeder, Bruce A.; and Horak, James Michael, 5,746,270, Cl. 165-41.000.

Hori, Eisaku: *See—*

Sakonjyu, Kazutaka; and Hori, Eisaku, 5,749,063, Cl. 701-93.000.

Hori, Hidetaka: *See—*

Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Hori, Hiroshi: *See—*

Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.

Hori, Masako: *See—*,

Shioyama, Yoshiyuki; Hori, Masako; and Kimura, Koji, 5,747,780, Cl. 219-648.000.

Horiba Ltd.: *See—*

Yamada, Shinsaku; Ohashi, Hideki; Shimizu, Sumio; and Imaki, Takao, 5,746,976, Cl. 422-62.000.

Horie, Hiroto, to Sumitomo Rubber Industries, Ltd.; and Sumitomo Electric Industries, Ltd. Apparatus for alarming of an abnormality of tire air pressure. 5,748,076, Cl. 340-442.000.

Horikawa, Junichi: *See—*

Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.

Horinouchi, Shunji: *See—*

Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Horiuchi, Toshihiro: *See—*

Oda, Ayumu; and Horiuchi, Toshihiro, 5,749,025, Cl. 399-92.000.

Hormel, Ronald F.; and Miesterfeld, Frederick O., to Chrysler Corporation. Vehicle communications network with improved current sourcing. 5,748,675, Cl. 375-257.000.

Horn, Heinz: *See—*

Baur, Siegfried; Horn, Heinz; and Dexling, Hartmut, 5,746,084, Cl. 72-351.000.

Horn, Klaus: *See—*

Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, 5,747,589, Cl. 525-146.000.

Horng, Shean-Ren: *See—*

Wang, Wonder D.; Horng, Shean-Ren; and Huang, Fei-Chi, 5,747,365, Cl. 438-17.000.

Horowitz, Ilan Yehezkel: *See—*

Rozental, Mark; Horowitz, Ilan Yehezkel; and Ben-Ayun, Moshe, 5,748,037, Cl. 330-2.000.

Horsten, Bart: *See—*

Leenders, Luc; Defieuw, Geert; Horsten, Bart; and Strijckers, Hans, 5,747,412, Cl. 503-201.000.

Horstmann, Hendrik, to Dipl.-Ing H. Horstmann GmbH. Mini faulted circuit indicator unit. 5,748,095, Cl. 340-664.000.

Hosein, Barbara: *See—*

Wang, Chang Yi; and Hosein, Barbara, 5,747,239, Cl. 435-5.000.

Hoshi, Masami: *See—*

Kasai, Takao; Yoshikawa, Kenichi; Saito, Shigeru; and Hoshi, Masami, 5,746,960, Cl. 264-234.000.

Hoshino, Ayami: *See—*

Machida, Shuji; Shikuma, Häriio; Hoshino, Ayami; and Takakura, Yutaka, 5,747,620, Cl. 526-348.300.

Hoshino, Tatsuo; Ojima, Setsuko; and Sugisawa, Teruhide, to Roche Vitamins Inc. D-sorbitol dehydrogenase. 5,747,301, Cl. 435-105.000.

Hosoda, Hiroyuki: *See—*

Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, 5,747,627, Cl. 528-59.000.

Hosoi, Masatoshi; Sugiyama, Yoshihide; Ichikawa, Mitsuru; and Masamura, Norihisa, to Ricoh Company, Ltd. Sheet processing apparatus and sheet processing method. 5,746,162, Cl. 123-58.090.

Hosokai, Tetsushi: *See—*

Ninomiya, Hiroshi; and Hosokai, Tetsushi, 5,746,187, Cl. 123-520.000.

Hosokawa, Toshinori, to Matsushita Electric Industrial Co., Ltd. Design-for-testability method for path delay faults and test pattern generation method for path delay faults. 5,748,646, Cl. 371-22.310.

Hosoki, Shigeyuki: *See—*

Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.

Hosomi, Eiichi; Tazawa, Hiroshi; Takubo, Chiaki; and Shibasaki, Koji, to Kabushiki Kaisha Toshiba. Semiconductor device, method of fabricating the same and copper leads. 5,747,881, Cl. 257-762.000.

Hossley, Robert F.: *See—*

Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., 5,748,986, Cl. 395-763.000.

Hotta, Yasuhiro, to Sharp Kabushiki Kaisha. Semiconductor memory device with fast successive read operation. 5,748,561, Cl. 365-238.500.

Hotta, Yoshihiko: *See—*

Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, 5,747,413, Cl. 503-201.000.

Houamed, Khaled M.: *See—*

Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, 5,747,267, Cl. 435-7.210.

- Houfburg, Rodney L.: *See—*
  - Clement, Lemuel Vance, Jr.; Clift, Joseph S., Jr.; and Houfburg, Rodney L., 5,746,771, Cl. 623-16.000.
- Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, to Chiron Corporation. Hepatitis delta diagnostics and vaccines. 5,747,044, Cl. 424-202.100.
- Houk, Edward E. Construction components and assembly system. 5,746,038, Cl. 52-590.100.
- Houk, Talbott M.; and Wood, Peter N., to International Rectifier Corporation. MOS gate driver integrated circuit for ballast circuits. 5,747,943, Cl. 315-225.000.
- Hovik Baghoomian: *See—*
  - Baghoomian, Hovik, 5,746,544, Cl. 405-229.000.
- Howard Hughes Medical Institute: *See—*
  - Evans, Ronald M.; Mangelsdorf, David J.; and Willy, Patricia J., 5,747,661, Cl. 536-24.100.
- Howard, Joseph E.: *See—*
  - Bailey, Jack W.; and Howard, Joseph E., 5,746,070, Cl. 68-24.000.
- Howarth, M. Scott; Tillett, Robin D.; and Bull, Christine R., to Atlas Pacific Engineering Company. Bichromatic method and apparatus for detecting peach pit fragments. 5,748,324, Cl. 356-425.000.
- Howe, Varce E.: *See—*
  - Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.
- Howell, Barbara F.; and Poole, Karen M., to United States of America, Navy. UV-curable and non-volatile pigmented coatings. 5,747,115, Cl. 427-514.000.
- Howell, Richard L., Jr. Drilling apparatus. 5,746,277, Cl. 173-184.000.
- Hoy, Walter S.; and Hoy, W. Douglas, to Fox Lite, Inc. Method of curing thermoset resin with visible light. 5,746,967, Cl. 264-406.000.
- Hoy, W. Douglas: *See—*
  - Hoy, Walter S.; and Hoy, W. Douglas, 5,746,967, Cl. 264-406.000.
- Hoya Corporation: *See—*
  - Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.
- Hoyaukin, Peter. Safety apparel. 5,746,442, Cl. 280-730.100.
- Hoyt, David; and Aldcroft, Gary T., to Principle Plastics, Inc. Lanyard for golf club head covers. 5,746,265, Cl. 150-160.000.
- Hristoforou, Evangelos. Array sensors based on the magnetrostrictive delay line technique. 5,747,986, Cl. 324-207.130.
- Hronowski, Lucjan J. J.: *See—*
  - Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.
- Hshieh, Fwu-Iuan: *See—*
  - So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, 5,747,853, Cl. 257-355.000.
- Hsiao, Ray-Ling. Skin allergic test assembly. 5,746,700, Cl. 600-556.000.
- Hsu, Chung C.: *See—*
  - Clark, Andrew Reginald; Hsu, Chung C.; and Walsh, Andrew J., 5,747,002, Cl. 424-45.000.
- Hsu, Fu-Chang: *See—*
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,538, Cl. 365-185.060.
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,545, Cl. 365-201.000.
- Hsu, Kuo-Yue: *See—*
  - Chen, Shun-Long; and Hsu, Kuo-Yue, 5,746,876, Cl. 156-345.000.
- Hsu, Michael S., to Ztek Corporation. High temperature electrochemical converter for hydrocarbon fuels. 5,747,185, Cl. 429-44.000.
- Hsu, Sung-Mu: *See—*
  - Chen, Ling; Hsu, Sung-Mu; and Fang, Weng Liang, 5,747,856, Cl. 257-390.000.
- Hsu, Wei-Chan: *See—*
  - Ma, Chingwo; Yang, Inging; and Hsu, Wei-Chan, 5,748,126, Cl. 341-143.000.
- HTM Sport- und Freizeitgeraete Aktiengesellschaft: *See—*
  - Freisinger, Henry; and Wittmann, Heinz, 5,746,016, Cl. 36-117.100.
- Hu, Haoran, to Diesel Engine Retarders, Inc. Four-cycle internal combustion engines with two-cycle compression release braking. 5,746,175, Cl. 123-322.000.
- Hu, Nan-Xing; Liu, Ping; and Ong, Beng S., to Xerox Corporation. Photoconductive imaging members. 5,747,205, Cl. 430-59.000.
- Hu, Shane Ching-Feng, to Tektronix, Inc. Refinement of block motion vectors to achieve a dense motion field. 5,748,247, Cl. 348-413.000.
- Hu, Yih-Shiuan; and Anand, Tejwansh S., to NCR Corporation. Hypertext markup language (HTML) extensions for graphical reporting over an internet. 5,748,188, Cl. 345-326.000.
- Huang, Chai-Yee. Rubbish compressing apparatus. 5,746,126, Cl. 100-125.000.
- Huang, Chin-Shiou: *See—*
  - Meister, Alton; Huang, Chin-Shiou; and Anderson, Mary E., 5,747,329, Cl. 435-252.330.
- Huang, Fei-Chi: *See—*
  - Wang, Wonder D.; Horng, Shean-Ren; and Huang, Fei-Chi, 5,747,365, Cl. 438-17.000.
- Huang, Hung-Ju; Yao, Jo-Tan; and Chen, Chung-Heng, to Silicon Integrated Systems Corp. Method and system for segment encoded graphic data compression. 5,748,904, Cl. 395-200.770.
- Huang, Ji-Chung: *See—*
  - Huang, Yung-Sheng; Yeou, Long-Sheng; Huang, Ji-Chung; and Lin, Chang-Song, 5,747,382, Cl. 438-624.000.
- Huang, Jin; Midya, Pallab; and Mancini, Brian M., to Motorola Inc. Driving circuit for multisectional piezoelectric transformers using pulse-position-modulation/phase modulation. 5,747,914, Cl. 310-318.000.
- Huang, Shaoming: *See—*
  - Hoch, James A.; and Huang, Shaoming, 5,747,276, Cl. 435-32.000.
- Huang, Shih-chung, to China Grinding Wheel Corporation. Sleeve flange type mounting device for mounting a grinding wheel on a spindle of a grinding machine. 5,746,647, Cl. 451-343.000.
- Huang, Tseng-Tsai. Receptacle structure for fluorescent lamp. 5,746,502, Cl. 362-223.000.
- Huang, Xiao-Yang; Bos, Philip J.; and Yang, Deng-Ke, to Kent State University. Dynamic drive method and apparatus for a bistable liquid crystal display. 5,748,277, Cl. 349-169.000.
- Huang, Yennun, to Lucent Technologies Inc. Apparatus and method for fault-tolerant computing. 5,748,882, Cl. 395-184.010.
- Huang, Ying-Kuei Ann: *See—*
  - Daly, Una T.; Huang, Ying-Kuei Ann; Parker, Robert D.; and Firenze, Mary E., 5,748,896, Cl. 395-200.530.
- Huang, Yuan-Chang; and Chang, Kuan-Hui, to Taiwan Semiconductor Manufacturing Company, Ltd. Method of fabricating seamless tungsten plug employing tungsten redeposition and etch back. 5,747,379, Cl. 438-586.000.
- Huang, Yung-Sheng; Yeou, Long-Sheng; Huang, Ji-Chung; and Lin, Chang-Song, to Taiwan Semiconductor Manufacturing Company, Ltd. Two-step planarization process using chemical-mechanical polishing and reactive-ion-etching. 5,747,382, Cl. 438-624.000.
- Hubbard, Shirley C.: *See—*
  - Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.
- Hubbling, David L.: *See—*
  - Langseth, Lee M.; Wulfing, James J.; Hubbling, David L.; and Gagnier, Jerome V., 5,748,419, Cl. 360-133.000.
- Hubbs, James J., Jr.: *See—*
  - Hubbs, Jonathan W.; and Hubbs, James J., Jr., 5,746,546, Cl. 405-263.000.
- Hubbs, Jonathan W.; and Hubbs, James J., Jr., to Stabilizer, Inc. Soil stabilization composition and method. 5,746,546, Cl. 405-263.000.
- Huber & Suhner AG: *See—*
  - Fuchs, Josef; and Schneider, Mario, 5,746,623, Cl. 439-578.000.
- Huber, Christian: *See—*
  - Zoughi, Reza; Yeh, Chin-Yung; Ganchev, Stoyan I.; and Huber, Christian, 5,748,003, Cl. 324-644.000.
- Huber, Leonhard: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Hübsch, Hubertus: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
- Huck, Hans J., to Waeschle Inc. Apparatus for filling a container with free-flowing bulk material. 5,746,258, Cl. 141-67.000.
- Huck, Kamla P.; Rodgers, Scott D.; and Glew, Andrew F., to Intel Corporation. Address generation unit with segmented addresses in a microprocessor. 5,749,084, Cl. 711-1.000.
- Huebner, Fritz; and Schoeb, Gerard J., to Plascore, Inc. Apparatus for making honeycomb from substrates and node strips. 5,746,879, Cl. 156-516.000.
- Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, to Centro Nacional De Biopreparados. Method of producing of an antimeningococcic hyperimmune gamma globulin and gamma globulin produced by method. 5,747,653, Cl. 530-389.500.
- Huey, John T.: *See—*
  - Boydstun, Robert D., IV; and Huey, John T., 5,746,554, Cl. 410-12.000.
- Huff, Terrence; and McAlpin, James John, to Exxon Chemical Patents, Inc. Thermoplastic polymer compositions and their production and use. 5,747,592, Cl. 525-191.000.
- Hufford, George, III: *See—*
  - Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, 5,746,103, Cl. 83-440.000.
- Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., to Avery Dennison Corporation. Single ply PSA labels for battery applications. 5,747,192, Cl. 429-163.000.
- Hughes Electronics: *See—*
  - Chen, Chungte W., 5,748,365, Cl. 359-366.000.
  - De Los Santos, Hector J., 5,748,057, Cl. 333-134.000.
  - Hegg, Ronald G., 5,748,264, Cl. 348-746.000.
  - Schober, Michael B., 5,748,140, Cl. 342-90.000.
  - Sobhani, Mohi, 5,746,606, Cl. 439-21.000.
- Hughes, Jonathan Rennie; and Towler, Michael John, to Secretary of State for Defense, The. Addressing ferroelectric liquid crystal displays. 5,748,166, Cl. 345-97.000.
- Hughes, Mischka: *See—*

  - Jones, Michael William Dudleston; Geen, Nicholas; Warner, Anthony; and Hughes, Mischka, 5,748,931, Cl. 395-356.000.
- Hughey & Phillips, Inc.: *See—*
  - Smith, Howard T., 5,747,798, Cl. 250-239.000.
- Hui, Philip: *See—*
  - Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.
- Hulkkonen, Teijo, to Oy Robit Rocktools Ltd. Method for mounting hard metal buttons in a drill bit. 5,746,281, Cl. 175-420.100.
- Hüllmann, Michael: *See—*
  - Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.
- Human Genome Sciences, Inc.: *See—*
  - Hastings, Gregg A.; and Rosen, Craig A., 5,747,280, Cl. 435-69.100.
  - Wei, Ying-Fei; and Sutton, Granger G., III, 5,747,312, Cl. 435-183.000.
- Humbarger, Robert Allen; Camposeo, Paul V.; and Hurtig, Terry William, to Omega Automation, Inc. Method and apparatus for folding an inflatable cushion. 5,746,690, Cl. 493-405.000.
- Humiston, Stanley L.: *See—*
  - LaVeine, Andrew T.; and Humiston, Stanley L., 5,746,322, Cl. 209-393.000.
- Hummler, Klaus: *See—*
  - Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, 5,747,802, Cl. 250-307.000.
- Humphrey, Louis E., Jr., to Laserscope. Semi-automatic tissue morcellation device. 5,746,760, Cl. 606-171.000.
- Hung, Chun-Hsiung: *See—*
  - Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.
- Hung, Jerry, to Primax Electronics Ltd. Electrical plug receptacle. 5,748,424, Cl. 361-56.000.
- Hung, Michael. Folding device for treadmill. 5,746,682, Cl. 482-54.000.
- Hung, Teng-Shun. Document holding panel with a depression bar for incrementally adjusting an indexing ruler. 5,746,410, Cl. 248-441.100.
- Hungate, Randall W.: *See—*
  - Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, 5,747,540, Cl. 514-622.000.
- Hunkapiller, Michael W.: *See—*
  - Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., 5,747,249, Cl. 435-6.000.
- Hunkapiller, Tim J.: *See—*
  - Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., 5,747,249, Cl. 435-6.000.
- Hunt, David S.: *See—*
  - Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
- Hunt Group, The: *See—*
  - Hunt, Waldo Henley, 5,746,637, Cl. 446-72.000.
- Hunt, Jeffery Scott; and Saripella, Satish C., to Cypress Semiconductor Corporation. Improved sense amplifier design with dynamic recovery. 5,748,021, Cl. 327-312.000.
- Hunt, Waldo Henley, to Hunt Group, The. Children's book construction. 5,746,637, Cl. 446-72.000.
- Hunt, Warren H.: *See—*
  - Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H: Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.
- Hunt-Wesson, Inc.: *See—*
  - Ondrus, Mark, 5,746,239, Cl. 137-15.000.
- Hunter, Craig C.; and Reininger, Russell A., to Motorola, Inc. Clock scan design from sizzle global clock and method therefor. 5,748,645, Cl. 371-22.310.
- Hunter Douglas Inc.: *See—*
  - Colson, Wendell B.; and Auger, Raymond N., 5,746,266, Cl. 160-84.050.
- Hunter, Eric: *See—*
  - Lever, Andrew Michael Lindsay; and Hunter, Eric, 5,747,307, Cl. 435-172.300.
- Hunter, Joseph Michael: *See—*
  - Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
- Huot Manufacturing Company: *See—*
  - La Barre, Charles, 5,746,316, Cl. 206-379.000.
- Huovila, Jyrki; and Linsuri, Ari, to Valmet Corporation. Stock feed system for a multi-layer headbox and method in the operation of a multi-layer headbox. 5,746,889, Cl. 162-216.000.
- Hurling, Robert: *See—*
  - Bows, John Richard; Blindt, Renoo Avinash; Hurling, Robert; and Mullin, James Thomas, 5,747,086, Cl. 426-234.000.
- Hurr, Hellmut: *See—*
  - Schlecht, Karl; and Hurr, Hellmut, 5,746,247, Cl. 137-625.450.
- Hurtig, Terry William: *See—*
  - Humbarger, Robert Allen; Camposeo, Paul V.; and Hurtig, Terry William, 5,746,690, Cl. 493-405.000.
- Hürzeler, Marianne: *See—*
  - Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.
- Huse, O. C., to Moeller Marine Products. Telescoping seat pedestal. 5,746,152, Cl. 114-363.000.
- Huss, Frederic Lawrence: *See—*
  - Carlson, Brent Allen; Huss, Frederic Lawrence; Schmucki, Nancy Marie; and Zelenski, Richard Elmer, 5,748,883, Cl. 395-184.010.
- Hussey, Terrence A.: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
- Hutchings, William F.; Schutte, Marlin D.; Markle, Stephen L.; Berg, Joel S.; and Engel, David J. Double taper lock system for a locking a mixer shaft in a quill. 5,746,536, Cl. 403-370.000.
- Hutchinson Technology Incorporated: *See—*
  - Girard, Mark T.; Bennin, Jeffry S.; and Ziegler, David A., 5,748,409, Cl. 360-104.000.
- Huth, Stanley W., to Allergan. Enzyme compositions and methods for contact lens cleaning. 5,746,838, Cl. 134-27.000.
- Hutson, David Dean; Johenning, Christopher Paul; Taube, John Janis; and Waibel, Terry John, to Goodyear Tire & Rubber Company, The. Tire tread including tie bar. 5,746,849, Cl. 152-209.00R.
- Huttenlocher, Daniel P.: *See—*
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Huynh-Ba, Tuong; Jaeger, Daniel; and Matthey-Doret, Walter, to Nestec S.A. Preparation of thiols with food-acceptable micro-organisms. 5,747,302, Cl. 435-117.000.
- HVB Innova AG: *See—*
  - Haist, Henri, 5,746,337, Cl. 215-44.000.
- Hwang, Jeffrey H., to Micro Linear Corporation. Switching regulator having low power mode responsive to load power consumption. 5,747,977, Cl. 323-284.000.
- Hwang, Sang Yeul: *See—*
  - Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
- Hwang, Seong Ryul: *See—*
  - Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
- Hwang, Sung-Soo, to Daewoo Electronics Co., Ltd. Head drum assembly of a video cassette recorder with audio and control heads mounted on upper and lower stationary drums of head drum. 5,748,411, Cl. 360-107.000.
- Hyde, Robert H.: *See—*
  - Gargas, Joseph E.; and Hyde, Robert H., 5,746,921, Cl. 210-617.000.
- Hydra Fold Auger, Inc.: *See—*
  - Niewold, D. Wayne, 5,746,303, Cl. 198-660.000.
- Hyodo, Yoshihiko: *See—*
  - Kidokoro, Toru; Ito, Takaaki; and Hyodo, Yoshihiko, 5,746,185, Cl. 123-516.000.
- Hyundai Electronics Ind. Co., Ltd.: *See—*
  - Kim, Jin-Tae, 5,748,652, Cl. 371-53.000.
- Hyundai Electronics Industries Co., Ltd.: *See—*
  - Kim, Chong-hoe; Kil, Myŏng-gun; Kwŏn, Won-t'aek; and Kim, Kwang-chŏl, 5,747,221, Cl. 430-311.000.
  - Kim, Young Goo; and Kim, Jae Kon, 5,748,887, Cl. 395-185.050.
  - Lee, Jong Oh, 5,748,526, Cl. 365-185.090.
  - Lee, Suk Joong; and Choi, Jin Kook, 5,748,969, Cl. 395-732.000.
- Hyundai Motor Company: *See—*
  - Kim, Do Chul, 5,746,108, Cl. 91-444.000.
- Hyundai Welding & Metal Col, Ltd.: *See—*
  - Chung, Mong-Suk, 5,746,380, Cl. 242-171.000.
- Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., to Westinghouse Electric Corporation. Coupling reaming apparatus and method. 5,746,550, Cl. 408-1.00R.
- Iadanza, Joseph Andrew: *See—*
  - Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
- Ibiden Co., Ltd.: *See—*
  - Torimoto, Tadashi; Asano, Yasuhiro; Kohara, Tsunehiro; and Nishimura, Tetsuya, 5,747,177, Cl. 428-537.100.
- Ichiba, Shigeru: *See—*
  - Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
- Ichikawa, Hideki; and Saji, Ryohei, to Nippondenso Co., Ltd. Method of manufacturing rotary electric machine. 5,745,977, Cl. 29-598.000.
- Ichikawa, Hiroyuki: *See—*
  - Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.
- Ichikawa, Katsumi: *See—*
  - Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.

OL
210
ISS
1
MY
5
998
MI

- Ichikawa, Masaaki; Ono, Tomoyuki; Nishihama, Nobumichi; and Isoda, Masaaki, to Matsushita Electric Works, Ltd. Lighting device. 5,746,615, Cl. 439-227.000.
- Ichikawa, Masakazu: *See—*
  - Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.
- Ichikawa, Mitsuru: *See—*
  - Hosoi, Masatoshi; Sugiyama, Yoshihide; Ichikawa, Mitsuru; and Masamura, Norihisa, 5,746,162, Cl. 123-58.090.
- Ida, Tetsuya: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Idemitsu Kosan Co., Ltd.: *See—*
  - Machida, Shuji; Shikuma, Häruo; Hoshino, Ayami; and Takakura, Yutaka, 5,747,620, Cl. 526-348.300.
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,613, Cl. 526-134.000.
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,614, Cl. 526-160.000.
- Identix Incorporated: *See—*
  - Maase, Daniel Frederick; and Sartor, Thomas Frank, 5,748,766, Cl. 382-124.000.
- Idol, Ronald C.: *See—*
  - McKedy, George E.; Idol, Ronald C.; and Powers, Thomas H., 5,746,937, Cl. 252-188.280.
- Ieki, Atsushi: *See—*
  - Hane, Kazuhiro; and Ieki, Atsushi, 5,748,373, Cl. 359-575.000.
- Igarashi, Hisashi: *See—*
  - Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.
- Igarashi, Kouhei: *See—*
  - Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, 5,746,052, Cl. 60-274.000.
- Igarashi, Masaaki: *See—*
  - Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.
- IGEN International, Inc.: *See—*
  - Massey, Richard J.; Blackburn, Gary F.; Wilkins, Elizabeth W.; and Leland, Jonathan K., 5,746,974, Cl. 422-52.000.
- Ihara, Tomohiko: *See—*
  - Tsubouchi, Toshiyasu; Okamoto, Satoru; and Ihara, Tomohiko, 5,747,112, Cl. 427-253.000.
- Ihara, Tuneo: *See—*
  - Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,747,826, Cl. 257-10.000.
- Iida, Makio; Fujii, Tetsuo; and Isobe, Yoshihiko, to Nippondenso Co., Ltd. Programmable non-volatile memory cell. 5,747,846, Cl. 257-314.000.
- Iida, Masahiko: *See—*
  - Nakamura, Daisuke; and Iida, Masahiko, 5,746,055, Cl. 60-454.000.
- Iida, Shunichi: *See—*
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Iida, Wakashi: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Iijima, Katsuhiko; and Kinoshita, Shigenori, to Fuji Electric Co., Ltd.; and Mitsubishi Heavy Industries, Ltd. Method of controlling electric vehicle driven by an internal combustion engine. 5,747,959, Cl. 318-762.000.
- Iijima, Sumio, to NEC Corporation. Graphite filaments having tubular structure and method of forming the same. 5,747,161, Cl. 428-367.000.
- Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Transmission method of changing protocol and data processing apparatus using this method. 5,748,915, Cl. 395-285.000.
- IInternational Business Machines Corporation: *See—*
  - Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,748,855, Cl. 395-800.230.
- Iinuma, Katsuharu: *See—*
  - Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
- Iiyama, Takayuki: *See—*
  - Harada, Koichi; Torihata, Minoru; and Iiyama, Takayuki, 5,746,422, Cl. 269-172.000.
- Iizuka, Takashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflection-type scanning optical system. 5,748,354, Cl. 359-205.000.
- Ikeda, Jun, to Canon Kabushiki Kaisha. Image processing apparatus and method. 5,748,343, Cl. 358-501.000.
- Ikeda, Koichi: *See—*
  - Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.
- Ikeda, Kunitoshi: *See—*
  - Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.
- Ikeda, Mami: *See—*
  - Tsuchiya, Katsuhiro; Nagai, Yutaka; and Ikeda, Mami, 5,747,343, Cl. 436-63.000.
- Ikeda, Yoshiko: *See—*
  - Kameyama, Atsushi; Kawakyu, Katsue; and Ikeda, Yoshiko, 5,748,053, Cl. 333-103.000.
- Ikeda, Yoshinori: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Ikegaki, Ichiro; and Asano, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Cardio-protective agent. 5,747,507, Cl. 514-312.000.
- Ikegami, Tetsuma: *See—*
  - Niimura, Yasuhiro; Ikegami, Tetsuma; Hanafusa, Naoya; and Nakaniwa, Masaru, 5,746,790, Cl. 55-317.000.
- Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, to Canon Kabushiki Kaisha. Process cartridge, process cartridge assembly method, and image forming apparatus. 5,749,027, Cl. 399-113.000.
- Iketani, Masaru: *See—*
  - Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.
- Ikoma, Munehisa: *See—*
  - Morishita, Nobuyasu; Hamada, Shinji; Matsuda, Hiromu; and Ikoma, Munehisa, 5,747,186, Cl. 429-53.000.
- Illinois Tool Works Inc.: *See—*
  - Barth, Gerald D.; and Bechtel, Frank W., 5,746,560, Cl. 411-188.000.
  - Bell, Lem; Pearson, Tim; and Haberstroh, James, 5,746,882, Cl. 156-580.000.
  - Slomski, Edward J., 5,746,310, Cl. 206-150.000.
  - Van Erden, Donald; and Malin, Art, 5,747,126, Cl. 428-35.200.
- Imagen Medical, Inc.: *See—*
  - Bacich, Steven R.; Nguyen, Tuoc Tan; and Greelis, John Patrick, 5,746,692, Cl. 600-104.000.
- Imahori, Yoshio: *See—*
  - Tajima, Kazushige; and Imahori, Yoshio, 5,747,906, Cl. 310-89.000.
- Imai, Akihiro: *See—*
  - Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.
- Imai, Akira: *See—*
  - Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, 5,747,206, Cl. 430-64.000.
- Imai, Kazumichi: *See—*
  - Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, 5,746,977, Cl. 422-62.000.
- Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, to Hitachi, Ltd. Automatic analyzer. 5,746,977, Cl. 422-62.000.
- Imai, Masahito: *See—*
  - Baba, Horonobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.
- Imaizumi, Toshio: *See—*
  - Nakayama, Haruki; Honda, Yuichi; and Imaizumi, Toshio, 5,748,386, Cl. 359-694.000.
- Imaki, Takao: *See—*
  - Yamada, Shinsaku; Ohashi, Hideki; Shimizu, Sumio; and Imaki, Takao, 5,746,976, Cl. 422-62.000.
- Imamura, Seiji: *See—*
  - Tsutsui, Kazuhiro; and Imamura, Seiji, 5,748,061, Cl. 335-83.000.
- Imanishi, Kunihiko: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Imanishi, Takeshi: *See—*
  - Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, 5,747,451, Cl. 514-12.000.
- Imation Corp.: *See—*
  - Langseth, Lee M.; Wulfing, James J.; Hubbling, David L.; and Gagnier, Jerome V., 5,748,419, Cl. 360-133.000.
- IMEC: *See—*
  - Sawasaki, Milton Hiroki; Ykman-Couvreur, Chantal; Lin, Bill; and Man, Hugo De, 5,748,487, Cl. 364-489.000.
- Imia, Luis Guillermo Garcia: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
- ImmuCell Corporation: *See—*
  - Ruch, Frank E.; and Acker, Elizabeth A., 5,747,031, Cl. 424-130.100.
- Immune Modulation, Inc.: *See—*
  - Ojo-Amaize, Emmanuel A.; Cottam, Howard B.; and Kini, Ganesh D., 5,747,474, Cl. 514-46.000.
- Immunex Corporation: *See—*
  - Grabstein, Kenneth H.; and Widmer, Michael B., 5,747,024, Cl. 424-85.200.
- Immunomedics, Inc.: *See—*

  - Govindan, Serengulam V.; Griffiths, Gary L.; and Hansen, Hans L., 5,746,996, Cl. 424-1.690.
- Imperial College of Science, Technology & Medicine: *See—*
  - Dougan, Gordon; and Frankel, Gad, 5,747,293, Cl. 530-402.000.
- Imran, Mir A.: *See—*
  - Powles, Trevor J.; Imran, Mir A.; Syed, Baber; and Gandhi, Deepak R., 5,746,724, Cl. 604-240.000.
- Ina Waelzlager Schaeffler OHG: *See—*
  - Polster, Rudolf; and Schmidt, Werner, 5,746,673, Cl. 474-101.000.
- Ina Walzlager Schaeffler KG: *See—*
  - Speil, Walter; and Maas, Gerhard, 5,746,165, Cl. 123-90.160.
- Inaba, Kohji: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Inaba, Kouji: *See—*
  - Okado, Kenji; Maeyama, Ryuichiro; and Inaba, Kouji, 5,747,213, Cl. 430-124.000.
- Inaba, Yutaka: *See—*
  - Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,748,274, Cl. 349-133.000.
- Inadome, Kiyotaka, to Nikon Corporation. Zoom lens system. 5,748,387, Cl. 359-699.000.
- Inami, Junichi: *See—*
  - Adachi, Shuhei; and Inami, Junichi, 5,745,993, Cl. 29-888.440.
- Inami, Shunichi: *See—*
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Inazawa, Shinji: *See—*
  - Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,747,727, Cl. 136-201.000.
- Inazu, Masato: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Incyte Pharmaceuticals, Inc.: *See—*
  - Au-Young, Janice; Hawkins, Phillip R.; and Hillman, Jennifer L., 5,747,319, Cl. 435-199.000.
- Incyte Pharmaceuticals, Inc.: *See—*
  - Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,747,283, Cl. 435-69.100.
- Independent Mobility Systems, Inc.: *See—*
  - Giroux, William H., Jr.; and Johnson, Charles E., 5,746,459, Cl. 292-341.160.
- Indigo N.V.: *See—*
  - Landa, Benzion; Lior, Ishaiau; Barnea, Dan; Fenster, Paul; and Levy, Uri, 5,749,032, Cl. 399-233.000.
- Indoe, Terry E. Method of applying wall covering to a plate cover. 5,747,738, Cl. 174-66.000.
- Industrial Technology Research Institute: *See—*
  - Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, 5,747,525, Cl. 514-444.000.
  - Chang, Gao-Wei, 5,748,329, Cl. 358-298.000.
  - Chao, Zu-Wen, 5,748,574, Cl. 369-13.000.
  - Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, 5,748,602, Cl. 369-112.000.
  - Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, 5,748,376, Cl. 359-629.000.
- Infopak, Inc.: *See—*
  - Sandig, Bruce, 5,748,906, Cl. 395-251.000.
- Infosis Group Ltd.: *See—*
  - Jones, Michael William Dudleston; Geen, Nicholas; Warner, Anthony; and Hughes, Mischka, 5,748,931, Cl. 395-356.000.
- Ingall, Anthony: *See—*
  - Cox, David; Ingall, Anthony; and Willis, Paul, 5,747,496, Cl. 514-258.000.
- Ingargiola, Thomas R.; and Milidantri, William. Remote personal security alarm system. 5,748,087, Cl. 340-573.000.
- Ingwersen, Peter: *See—*
  - Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
- Injeyan, Hagop: *See—*
  - Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., 5,748,654, Cl. 372-19.000.
- Inman, Elaine V.: *See—*
  - McCartney, Phillip D.; Beard, McDaniel L.; and Inman, Elaine V., 5,746,046, Cl. 57-350.000.
- Inman, Wayne D.; King, Steven Row; Evans, Joseph L.; and Luo, Jian, to Shaman Pharmaceuticals, Inc. Furanoeremophilane and eremophilanolide sesquiterpenes for treatment of diabetes. 5,747,527, Cl. 514-453.000.
- Innovatech, Inc.: *See—*
  - Wright, Steve Robin; and Crouch, Harry Steven, 5,746,789, Cl. 55-306.000.
- Innovative Lasers Coropration: *See—*
  - Atkinson, George H.; and Mehdizadeh, Esmail, 5,747,807, Cl. 250-339.130.
- Inocelda, Arthur Corpuz: *See—*
  - Woolley, Curtis Scott, Sr.; and Inocelda, Arthur Corpuz, 5,746,244, Cl. 137-359.000.
- Inomata, Koichiro: *See—*
  - Mizushima, Koichi; Kinno, Teruyuki; Yamauchi, Takashi; and Inomata, Koichiro, 5,747,859, Cl. 257-421.000.
- Inomata, Shigemitsu: *See—*
  - Okumoto, Yutaka; and Inomata, Shigemitsu, 5,746,225, Cl. 131-84.100.
- Inomoto, Takeo: *See—*
  - Bergman, Dan; and Inomoto, Takeo, 5,746,970, Cl. 266-225.000.
- Inoue, Goichi: *See—*
  - Koike, Kunihiko; and Inoue, Goichi, 5,746,841, Cl. 148-280.000.
- Inoue, Haruhide: *See—*
  - Honma, Junich; Mino, Kotaro; Miyata, Hisayuki; and Inoue, Haruhide, 5,748,436, Cl. 361-234.000.
- Inoue, Hideya: *See—*
  - Tsukahara, Daiki; and Inoue, Hideya, 5,748,992, Cl. 396-51.000.
- Inoue, Hiroo: *See—*
  - Yokayama, Tetsuhiru; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.
- Inoue, Hiroshi: *See—*
  - Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.
- Inoue, Jiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Door lock actuator unit. 5,746,076, Cl. 70-277.000.
- Inoue, Shinya: *See—*
  - Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, 5,747,843, Cl. 257-296.000.
- Inoue, Takashi: *See—*
  - Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, 5,748,288, Cl. 355-53.000.
- Institut Francais Du Petrole: *See—*
  - Commereuc, Dominique, 5,747,408, Cl. 502-171.000.
  - Commereuc, Dominique, 5,747,409, Cl. 502-171.000.
  - Moracchini, Gérard; Sanchez, José; de Hemptinne, Jean-Charles; and Ungerer, Philippe, 5,747,674, Cl. 73-61.440.
  - Ungerer, Philippe; and Arnaud, Jean-Fabrice, 5,747,673, Cl. 73-61.410.
- Institut National de la Sante et de la Recherche Medicale (INSERM): *See—*
  - Darlix, Jean-Luc; and Torrent, Christophe, 5,747,323, Cl. 435-235.100.
- Institut National D'Optique: *See—*
  - Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, 5,748,814, Cl. 385-37.000.
- Institut Pasteur: *See—*
  - Alizon, Marc; Sonigo, Pierre; Wain-Hobson, Simon; and Montagnier, Luc, 5,747,242, Cl. 435-5.000.
  - Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, 5,747,246, Cl. 435-6.000.
- Institute National de la Sante et de la Recherche Medicale (INSERM): *See—*
  - Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, 5,747,246, Cl. 435-6.000.
- Instituto Farmacoterapico Italiano S.p.A.: *See—*
  - Tarro, Giulio, 5,747,643, Cl. 530-329.000.
- Instituut Voor Agrotechnologisch Onderzoek (ATO-DLO): *See—*
  - Veelaert, Sarah; De Wit, Dirk; and Tournois, Huibert, 5,747,658, Cl. 536-18.500.
- InstrumenTarium Corp.: *See—*
  - Karlsson, Kai; Meriläinen, Timo; Weckström, Kurt; and Poikolainen, Seppo, 5,747,820, Cl. 250-504.00R.
- Instrumentation Metrics, Inc: *See—*
  - Khalil, Gamal; and Malin, Stephen F., 5,747,806, Cl. 250-339.120.
- Integ Incorporated: *See—*
  - Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.
- Integrated Network Corporation: *See—*
  - Joffe, Daniel M.; and Panek, Donald C., Jr., 5,748,637, Cl. 370-516.000.
- Integrated Solutions, Inc.: *See—*
  - Tepolt, Gary B., 5,746,565, Cl. 414-744.500.
- Intel Corporation: *See—*
  - Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.
  - Agarwal, Rohit, 5,748,903, Cl. 395-200.770.
  - Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.
  - Brown, David M.; Eslick, Russell D.; and Robinson, Kurt B., 5,749,088, Cl. 711-115.000.
  - Cho, Sung-Soo; Chi, Chao-Hsin; and Chang, David, 5,748,918, Cl. 395-306.000.
  - Chu, John K., 5,747,389, Cl. 438-783.000.
  - Coelho, Rohan G. F.; Packer, Alan; and Baldes, Gary, 5,748,196, Cl. 345-433.000.
  - Feightner, Rick; and Nguyen, My-Hanh, 5,748,446, Cl. 361-709.000.
  - Golin, Stuart J., 5,748,790, Cl. 382-246.000.
  - Heeb, Jay; Shenoy, Sunil; and Wong, Jimmy, 5,749,092, Cl. 711-138.000.
  - Huck, Kamla P.; Rodgers, Scott D.; and Glew, Andrew F., 5,749,084, Cl. 711-1.000.
  - Kaveh, Golnaz; Taylor, Gregory F.; and Smith, Jeffrey E., 5,748,033, Cl. 327-545.000.

OL
2 10
ISS
1
MY
5
998
MI

Korta, Jean-Charles; Davis, Derek L.; Spaw, William J.; and Clark, Lawrence T., 5,748,303, Cl. 356-229.000.
Lippincott, Louis A., 5,748,234, Cl. 348-222.000.
Ng, Yong-Gee; and Greason, Jeff, 5,748,025, Cl. 327-333.000.
Prakash, Alok, 5,748,930, Cl. 395-352.000.
Rastogi, Rajiv; Underwood, Sandra J.; and Fujimoto, Harry H., 5,747,879, Cl. 257-751.000.
Romriell, Joseph N., 5,748,121, Cl. 341-65.000.
Rothrock, Lewis V., 5,748,618, Cl. 370-260.000.
Rozman, Rodney R.; Durante, Richard J.; Fandrich, Mickey L.; and Alexis, Ranjeet, 5,748,939, Cl. 395-430.000.
White, James E.; and Griesser, Kenneth P., 5,748,950, Cl. 395-595.000.

Intellectual Property Development Associates of Connecticut, Incorporated: *See—*
Distinti, Robert J., 5,748,133, Cl. 341-161.000.

Intellectual Science and Technology, Inc.: *See—*
Lee, Howard Hong-Dough, 5,748,575, Cl. 369-30.000.

Interack Communications, Inc.: *See—*
Ericson, Philip G.; and Ransom, Ray M., 5,748,628, Cl. 370-384.000.

Interactive Media Works, L.L.C.: *See—*
Toader, Adrian; and Valdez, Jose, 5,749,075, Cl. 705-14.000.

InterDigital Technology Corp.: *See—*
Ozluturk, Fatih, 5,748,687, Cl. 375-367.000.

Intermec Corporation: *See—*
Schoen, Joel A.; and Miazga, Jay M., 5,746,521, Cl. 400-120.160.
Zigler, Robert A., 5,747,748, Cl. 178-18.000.

International Business Machiens Corporation: *See—*
Ng, Timothy C., 5,748,945, Cl. 395-500.000.

International Business Machines Corporation: *See—*
Aboaf, Joseph Adam; Denison, Edward Virgil; and Kahwaty, Vincent Noel, 5,745,978, Cl. 29-603.080.
Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, 5,746,103, Cl. 83-440.000.
Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.
Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, 5,747,802, Cl. 250-307.000.
Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., 5,748,958, Cl. 395-670.000.
Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.
Beatty, Harry John; Elmendorf, Peter Claude; Gillis, Roland Roberto; and Pramanick, Ira, 5,748,489, Cl. 364-489.000.
Beeteson, John; and Knox, Andrew, 5,747,923, Cl. 313-431.000.
Beeteson, John; and Knox, Andrew, 5,747,933, Cl. 315-1.000.
Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.
Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.
Carlson, Brent Allen; Huss, Frederic Lawrence; Schmucki, Nancy Marie; and Zelenski, Richard Elmer, 5,748,883, Cl. 395-184.010.
Carr, Jeffery Dean; and Sutton, John Michael, 5,748,240, Cl. 348-384.000.
Cederbaum, Carl; Girard, Philippe; and Mone, Patrick, 5,748,125, Cl. 341-136.000.
Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., 5,748,952, Cl. 395-602.000.
Christner, Jodie Ann; and Cunningham, Earl Albert, 5,748,415, Cl. 360-113.000.
Clark, Michael William; Hearney, James Alfred; Norris, Duane Edward; and Benson, Paul Harrison, IV, 5,748,972, Cl. 395-750.050.
Conrad, Thomas E.; and Haas, Garry L., 5,748,929, Cl. 395-352.000.
Echigo, Tomio; and Asaka, Shunichi, 5,748,868, Cl. 395-133.000.
Edgar, Albert Durr, 5,748,866, Cl. 395-128.000.
Flint, Ephraim Bemis; Karidis, John Peter; McVicker, Gerard; and Pence, William Edward, 5,748,443, Cl. 361-686.000.
Fontana, Robert Edward, Jr.; Lane, Linda Hope; Williams, Mason Lamar, III; and Yeack-Scranton, Celia Elizabeth, 5,745,979, Cl. 29-603.120.
Fossum, Gordon C., 5,748,863, Cl. 395-122.000.
Gaschke, Paul Mathew, 5,748,007, Cl. 324-755.000.
Gill, Hardayal Singh, 5,748,399, Cl. 360-66.000.
Gordon, Michael Stuart; and Petric, Paul F., 5,747,814, Cl. 250-398.000.
Hoover, Russell D.; Nation, George W.; and Valk, Kenneth M., 5,749,087, Cl. 711-108.000.
Johnson, David Edward, 5,748,974, Cl. 395-759.000.
Kahle, James Allan, 5,748,938, Cl. 395-465.000.
Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., 5,749,074, Cl. 705-8.000.
Kodate, Manabu, 5,748,266, Cl. 349-39.000.
Londa, Joseph Michael, 5,748,452, Cl. 361-790.000.
Manfredi, Paul A.; and Morris, Raymond G., 5,745,945, Cl. 15-77.000.
Martin, Douglas Ele, 5,748,028, Cl. 327-374.000.
McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
Natarajan, Govindarajan; and Pasco, Robert William, 5,746,874, Cl. 156-285.000.
Ng, Timothy C., 5,748,944, Cl. 395-500.000.
Nin, Sigfredo Isamael, 5,748,195, Cl. 345-431.000.
Pelella, Antnnio Raffaele; Liu, Peter Tsung-shih; and Scharff, Gerard Joseph, 5,748,643, Cl. 371-22.300.
Reynolds, David Corder, 5,748,959, Cl. 395-676.000.
Schneider, Bengt-Olaf, 5,748,946, Cl. 395-501.000.
Shieh, Johnny Meng-Han, 5,748,184, Cl. 345-173.000.
Thompson, Gary Allen; and Zenz, Charles Vernon, Sr., 5,748,451, Cl. 361-788.000.
Waclawsky, John G.; Hershey, Paul C.; and Daugherty, Raymond F., 5,748,925, Cl. 395-311.000.
Webb, Charles Franklin; Farrell, Mark Steven; Check, Mark Anthony; and Liptay, John Stephen, 5,748,951, Cl. 395-595.000.
Wilson, James Warren, 5,747,877, Cl. 257-703.000.

International Computers Limited: *See—*
Press, James, 5,748,739, Cl. 380-25.000.

International Rectifier Corporation: *See—*
Houk, Talbott M.; and Wood, Peter N., 5,747,943, Cl. 315-225.000.

International Road Dynamics, Inc.: *See—*
Bergan, Terry; and Friesen, Dwaine, 5,747,746, Cl. 177-134.000.

International Superconductivity Technology Center: *See—*
Homma, Norio; and Morishita, Tadataka, 5,747,427, Cl. 505-476.000.

International Therapeutics Corporation: *See—*
Dormandy, Ray H., Jr.; Berlo, Marcelyn A.; and Paul, David J., 5,746,734, Cl. 606-1.000.

Interstore Transfer Systems, Ltd.: *See—*
Waner, John, 5,745,951, Cl. 16-31.00R.

Interval Research Corporation: *See—*
Slaney, Malcolm, 5,749,073, Cl. 704-278.000.

Interventional Technologies, Inc.: *See—*
Radisch, Herbert R., Jr., 5,746,968, Cl. 264-529.000.
Vigil, Dennis M.; and Barath, Peter, 5,746,716, Cl. 604-97.000.

Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, to Canon Kabushiki Kaisha. Ink jet recording system for preventing blurring at color boundary portion. 5,748,207, Cl. 347-43.000.

Inukai, Atsuomi, to Brother Kogyo Kabushiki Kaisha. Pointing device for controlling cursor movement on display. 5,748,180, Cl. 345-161.000.

inVoice Technology, Inc.: *See—*
Dunlap, Frank M; So, Hock C.; and Wong, Sau C., 5,748,533, Cl. 365-185.190.

Invox Technology: *See—*
Dunlap, Frank M.; So, Hock C.; and Wong, Sau C., 5,748,534, Cl. 365-185.210.

Iokibe, Tadashi; Tanimura, Takayoshi; and Fujimoto, Yasunari, to Kabushiki Kaisha Meidensha. Method and apparatus for executing short-term prediction of timeseries data. 5,748,851, Cl. 395-51.000.

Iomega Corporation: *See—*
Briggs, John C.; Patterson, Robert S.; and Dewey, Jason, 5,748,410, Cl. 360-106.000.

Iowa State University Research Foundation, Inc.: *See—*
Dague, Richard R.; Harris, William L.; and Kaiser, Sandra K., 5,746,919, Cl. 210-603.000.
Shanks, Howard R.; Burns, Stanley G.; and Jeffrey, Frank R., III, 5,747,928, Cl. 313-498.000.

Ip, Hiu F.; and Ma, Ellick L., to Micrel, Incorporated. Mask structure having offset patterns for alignment. 5,747,200, Cl. 430-22.000.

Ip, Joseph: *See—*
Duck, Gary Stephan; and Ip, Joseph, 5,748,363, Cl. 359-341.000.

IPL, Inc.: *See—*
Jacques, Michel; and Nolet, Roch, 5,746,342, Cl. 220-6.000.
LaCasse, Gaston, 5,747,731, Cl. 174-40.0CC.

Ireland, Hugh Wesley: *See—*
Sawert, Ulf; Ireland, Hugh Wesley; and Coha, Timothy Francis, 5,746,088, Cl. 73-317.000.

Irie, Yukio: *See—*
Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Irite, Naoko: *See—*
Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.

Irvine, William O.: *See—*
Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Isaac, Arwen G.: *See—*
Nygren, William D., Jr.; and Isaac, Arwen G., 5,746,561, Cl. 411-368.000.

Isaacs, Richard C. A.: *See—*
Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, 5,747,540, Cl. 514-622.000.

Isaar, Arwen G.: *See—*
Nygren, William D., Jr.; and Isaar, Arwen G., 5,746,558, Cl. 411-110.000.

Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, to Mitsubishi Denki Kabushiki Kaisha. Cache controller with index stack for coherency fault tolerance. 5,749,091, Cl. 711-135.000.

Ishida, Masaharu: *See—*
Yoshida, Minoru; Mizuguchi, Hideki; Kobayashi, Nobuhisa; and Ishida, Masaharu, 5,747,077, Cl. 425-183.000.

Ishida, Masayuki: *See—*
Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, 5,748,585, Cl. 369-47.000.

Ishida, Noboru; Sasaki, Umekichi; Takigawa, Katsuya; and Suda, Satoshi, to Nippon Oil Co., Ltd. Lubricating oil and composition for refrigerating machine and refrigerating machine. 5,746,933, Cl. 252-68.000.

Ishida, Yoshihiro: *See—*
Katayama, Akihiro; Ishida, Yoshihiro; and Yamakawa, Junichi, 5,748,777, Cl. 382-199.000.

Ishida, Yoshinobu: *See—*
Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, 5,748,585, Cl. 369-47.000.

Ishido, Kiminori; and Yamaguchi, Masahiro, to NEC Corporation. Surface protection material for printed circuit board and process of forming surface protection films. 5,746,813, Cl. 106-14.160.

Ishiguro, Minoru; and Iwamoto, Jun'ichi, to Fuji Photo Optical Co., Ltd. Camera. 5,748,998, Cl. 396-88.000.

Ishihara, Jun; and Yamaguchi, Kyoko, to Minolta. Eyepiece. 5,749,008, Cl. 396-373.000.

Ishii, Kenichiro: *See—*
Tsuchikawa, Megumu; Sato, Atsushi; Tomono, Akira; and Ishii, Kenichiro, 5,748,775, Cl. 382-190.000.

Ishii, Takafumi: *See—*
Sasaki, Makoto; Ishii, Takafumi; and Haji, Katsuhiko, 5,746,934, Cl. 252-77.000.

Ishii, Takashi; and Matsuoka, Naoki, to Yazaki Corporation. Fuse with low-melting point metal and structure for holding the fuse. 5,748,067, Cl. 337-160.000.

Ishikawa, Kazunori: *See—*
Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, 5,747,627, Cl. 528-59.000.

Ishikawa, Keizou: *See—*
Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Ishikawa, Shun-ichi: *See—*
Nakamura, Yoshisada; Ishikawa, Shun-ichi; and Matsumoto, Kazuhiko, 5,747,226, Cl. 430-348.000.

Ishikawa, Tadashi, to Canon Kabushiki Kaisha. Power supply apparatus. 5,748,460, Cl. 363-21.000.

Ishikawa, Tomonori: *See—*
Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Ishikawa, Toru, to NEC Corporation. Data transfer system for an integrated circuit, capable of shortening a data transfer cycle. 5,748,018, Cl. 327-154.000.

Ishimatsu, Shin: *See—*
Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Ishimatsu, Takeshi: *See—*
Saito, Kazuo; and Ishimatsu, Takeshi, 5,746,951, Cl. 264-29.100.

Ishimoto Agri-Tech Research Corp.: *See—*
Ishimoto, Shoichi; and Hattori, Toshio, 5,747,419, Cl. 504-187.000.

Ishimoto, Shoichi; and Hattori, Toshio, to Ishimoto Agri-Tech Research Corp. Plant growing agent comprising iron ferrocyanide complexes and plant growing method. 5,747,419, Cl. 504-187.000.

Ishitoya, Koichi: *See—*
Miyazaki, Haruhito; and Ishitoya, Koichi, 5,748,834, Cl. 386-96.000.

Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Two-dimensional code mark detecting method and apparatus therefor. 5,747,823, Cl. 250-559.440.

Ishizaki, Akira; and Ogawa, Katsuhisa, to Canon Kabushiki Kaisha. Liquid crystal display. 5,748,171, Cl. 345-101.000.

Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, to Hitachi, Ltd. Cooperative information processing method and apparatus utilizing local program. 5,748,894, Cl. 395-200.040.

Ishizuka, Kachu: *See—*
Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, 5,746,515, Cl. 384-115.000.

Ishizuka, Yukihiro: *See—*
Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, 5,747,787, Cl. 235-472.000.

Isikoff, Jeremy M. Device security system. 5,748,084, Cl. 340-568.000.

Isis Pharmaceuticals, Inc.: *See—*
Ecker, David J.; Vickers, Tim; and Davis, Pete, 5,747,253, Cl. 435-6.000.

Isobe, Takashi; and Toda, Takushi, to Honda Giken Kogyo Kabushiki Kaisha. Evaporative fuel-processing system for internal combustion engines. 5,746,191, Cl. 123-686.000.

Isobe, Yoshihiko: *See—*
Iida, Makio; Fujii, Tetsuo; and Isobe, Yoshihiko, 5,747,846, Cl. 257-314.000.

Isoda, Masaaki: *See—*
Ichikawa, Masaaki; Ono, Tomoyuki; Nishihama, Nobumichi; and Isoda, Masaaki, 5,746,615, Cl. 439-227.000.

Isogawa, Sachihiro: *See—*
Yoshida, Hiroaki; and Isogawa, Sachihiro, 5,746,845, Cl. 148-587.000.

Isoguchi, Seiichi: *See—*
Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.

Isozaki, Hiroko, to NEC Corporation. Language processing method for calculating optimum address of array. 5,748,965, Cl. 395-705.000.

Issler, Wolfgang; and Kollotzek, Helmut, to Mahle GmbH. Light-metal piston for highly stressed internal combustion engines. 5,746,169, Cl. 123-193.600.

Istituto Lusofarmaco D'Italia: *See—*
Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.

Itagaki, Hiroshi: *See—*
Honma, Toshin; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.

Itano, Masaaki: *See—*
Uchiyama, Yaeko, deceased; Itano, Masaaki; and Hayashi, Hiroko, 5,748,208, Cl. 347-43.000.

Ito, Akio: *See—*
Iwasa, Toru; Ito, Akio; and Ariki, Yoshiyuki, 5,747,897, Cl. 310-49.00R.

Ito, Fumitaka: *See—*
Shinagawa, Tetsuo; Watanabe, Yumiko; Shinagawa, Akio; and Ito, Fumitaka, 5,748,715, Cl. 379-100.130.

Ito, Hidekuni: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, to Hitachi, Ltd. LCD device having driving circuits with multilayer external terminals. 5,748,179, Cl. 349-152.000.

Ito, Hiroshi: *See—*
Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.

Ito, Keiji: *See—*
Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, 5,746,695, Cl. 600-127.000.

Ito, Koji; Kameoka, Teruhiko; Matsunaga, Kouji; and Kuwayama, Kazutoshi, to Denso Corporation. Centrifugal-type blower. 5,746,577, Cl. 416-178.000.

Ito, Masami: *See—*
Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, 5,748,305, Cl. 356-237.000.

Ito, Masao, to Fuji Xerox Co., Ltd. Image writing apparatus having a multi-beam scanning optical system for improving the quality of reproduced images. 5,748,223, Cl. 347-241.000.

Ito, Natsuko; and Okada, Hiroyuki, to NEC Corporation. Capacitance type acceleration sensor. 5,747,991, Cl. 324-661.000.

Ito, Nobuei; *See—*
Kato, Akira; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,747,929, Cl. 313-503.000.

Ito, Seishi: *See—*
Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.

Ito, Takaaki: *See—*
Kidokoro, Toru; Ito, Takaaki; and Hyodo, Yoshihiko, 5,746,185, Cl. 123-516.000.

Ito, Takurou; and Maruhashi, Yoshitsugu, to Toyo Seikan Kaisha, Ltd. Resin composition having improved mechanical properties and bio-disintegrating property and containers comprising thereof. 5,747,633, Cl. 528-272.000.

Ito, Tetsuo: *See—*
Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.

Ito, Yoshiyuki: *See—*
Sasaki, Takashi; Sasaki, Yasuko; Ito, Yoshiyuki; and Otsu, Kumi, 5,747,310, Cl. 435-172.300.

Ito, Yutaka; Egawa, Naoko; Unai, Shogo; and Murase, Tadashi, to Fujitsu Limited. Computer-supervising system. 5,748,880, Cl. 395-183.220.

Itoh, Akio: *See—*
Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.

Itoh, Goh: *See—*
Okumura, Haruhiko; and Itoh, Goh, 5,748,169, Cl. 345-100.000.

Itoh, Haruo: *See—*
Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.

Itoh, Hiroshi: *See—*
Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.

Itoh, Katsuhiko: *See—*
Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.

Itoh, Shigeo; Yonezawa, Yoshihisa; Toki, Hitoshi; and Satoh, Yoshitaka, to Futaba Denshi Kogyo Kabushiki Kaisha. Phosphor heat-transfer method and apparatus therefor. 5,746,589, Cl. 432-77.000.

Itoh, Shigeyuki: *See—*
Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Itoh, Tatsuya: *See—*
Maeda, Hiroshi; Itoh, Tatsuya; and Nakamura, Masatsugu, 5,748,794, Cl. 382-251.000.

Itou, Akira: *See—*
Teramoto, Mitsunobu; and Itou, Akira, 5,746,471, Cl. 296-146.100.

Itou, Takaaki: *See—*
Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, 5,746,052, Cl. 60-274.000.

Itou, Takashi: *See—*
Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.

ITT Automotive Electrical Systems, Inc.: *See—*
Kikly, Ned L., 5,747,911, Cl. 310-239.000.

ITT Automotive Europe GmbH: *See—*
Dochtermann, Ulrich; Fein, Peter; Klinar, Robert; and Philipps, Werner, 5,747,885, Cl. 307-10.200.

ITT Composants et Instruments: *See—*
Bricaud, Herve Guy; and Valcher, Fabrice, 5,746,607, Cl. 439-66.000.

ITT Industries, Inc.: *See—*
Bahl, Inder J., 5,748,056, Cl. 333-112.000.

Iwagami, Tooru: *See—*
Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.

Iwahana, Hidenori: *See—*
Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Iwamoto, Hiroshi: *See—*
Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.

Iwamoto, Jun'ichi: *See—*
Ishiguro, Minoru; and Iwamoto, Jun'ichi, 5,748,998, Cl. 396-88.000.

Iwasa, Naruhito: *See—*
Nakamura, Shuji; Mukai, Takashi; and Iwasa, Naruhito, 5,747,832, Cl. 257-103.000.

Iwasa, Shigeyuki: *See—*
Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; and Hasegawa, Etsuo, 5,747,622, Cl. 528-12.000.

Iwasa, Shoichi, to Nippon Steel Corporation. Semiconductor memory device with memory cells each having transistor and capacitor and method of making the same. 5,747,845, Cl. 257-306.000.

Iwasa, Toru; Ito, Akio; and Ariki, Yoshiyuki, to Jeco Co., Ltd. Stepping motor having improved construction to reduce parts and facilitate manufacture. 5,747,897, Cl. 310-49.00R.

Iwasaki, Hiroyuki, to Nikon Corporation. Camera photometry device. 5,749,001, Cl. 396-150.000.

Iwasaki, Hiroyuki, to Nikon Corporation. Chromatic balancer for flash cameras. 5,749,002, Cl. 396-161.000.

Iwasaki, Masayasu: *See—*
Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.

Iwasaki, Osamu: *See—*
Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
Sunagawa, Hiroshi; Uejima, Atsushi; Iwasaki, Osamu; and Aihara, Takaaki, 5,748,283, Cl. 355-35.000.

Iwasaki, Yasuo; Ozaki, Toshiaki; and Miyawaki, Hiroyuki, to Sony Corporation. Apparatus for inspecting disc recording medium. 5,748,590, Cl. 369-58.000.

Iwase, Akihiro; Nakano, Tomio; and Seki, Teruo, to Fujitsu Limited. Semiconductor device having input protective function. 5,747,837, Cl. 257-173.000.

Iwata, Hiroshi: *See—*
Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, 5,746,695, Cl. 600-127.000.

Iwatani Sangyo Kabushiki Kaisha Iwatani International Corporation: *See—*
Koike, Kunihiko; and Inoue, Goichi, 5,746,841, Cl. 148-280.000.

Iwaya, Satoshi: *See—*
Nebashi, Mitsuhiko; Murakoshi, Keiji; Iwaya, Satoshi; and Goto, Akihiro, 5,746,527, Cl. 400-621.000.

Iyengar, Narasimhan, to SGS-Thomson Microelectronics, Inc. Tristatable driver for internal data bus lines. 5,748,556, Cl. 365-230.060.

Izard, Jeff: *See—*
Coste, Steven D.; and Izard, Jeff, 5,747,755, Cl. 187-394.000.

Izawa, Makoto; and Nanba, Katsuhiro, to Minolta Co., Ltd. Linear motor, apparatus, armature coil current supply circuit for linear motor, and method of supplying current to armature coil of linear motor. 5,747,952, Cl. 318-135.000.

Izhak, Allan. Hairbush and container with dispenser. 5,746,531, Cl. 401-139.000.

J.M. Huber Corporation: *See—*
Wason, Satish K.; and Sumpter, James E., 5,747,008, Cl. 424-52.000.

J. M. Voith GmbH: *See—*
Lindenthal, Hans, 5,746,659, Cl. 464-135.000.

J. Uriach & Cia S.A.: *See—*
Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Ja-Bar Silicone Corp.: *See—*
Jacobs, Gilbert R., 5,746,772, Cl. 623-35.000.

Jaber, Talal Kamel: *See—*
Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.

Jackl, Werner, to Textron Inc. Plastic top shell. 5,748,571, Cl. 368-282.000.

Jackowski, George, to Spectral Diagnostics Inc. Method and device for diagnosing and distinguishing chest pain in early onset thereof. 5,747,274, Cl. 435-7.940.

Jackson, Eric: *See—*
Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.

Jackson, Michael: *See—*
Watkins, David Robert; Nock, Nigel Gerard; and Jackson, Michael, 5,746,852, Cl. 152-454.000.

Jackson, Michael A., to United States of America, Agriculture. Monoglyceride production via enzymatic glycerolysis of oils in supercritical CO_2. 5,747,305, Cl. 435-134.000.

Jackson, Paul F., to Guilford Pharmaceuticals Inc. Substituted ethyl α,α-diarylmethyl ether derivatives. 5,747,523, Cl. 514-427.000.

Jacobs, Gilbert R., to Ja-Bar Silicone Corp.; and Ortho Europe Ltd. Prosthetic socket. 5,746,772, Cl. 623-35.000.

Jacobsen, Stephen C.; and Wells, David L., to Sarcos Group. Sensor system for determining acceleration. 5,747,692, Cl. 73-514.250.

Jacobsen, Stephen C.; and Wells, David L., to Sarcos Group. Movement actuator/sensor systems. 5,747,993, Cl. 324-109.000.

Jacques, Michel; and Nolet, Roch, to IPL, Inc. Five-piece container with hingeable sides. 5,746,342, Cl. 220-6.000.

Jacquet, Joël: *See—*
Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, 5,747,366, Cl. 438-44.000.

Jaduszliwer, Bernardo; Klimcak, Charles M.; and Loper, Gary L., to Aerospace Corporation, The. Diode laser interrogated fiber optic hydrazine-fuel sensor. 5,747,348, Cl. 436-106.000.

Jaeger, Daniel: *See—*
Huynh-Ba, Tuong; Jaeger, Daniel; and Matthey-Doret, Walter, 5,747,302, Cl. 435-117.000.

Jaggar, David Vivian, to Advanced Risc Machines Limited. Data processing divider. 5,748,518, Cl. 364-764.000.

Jaggar, David Vivian, to Advanced Risc Machines Limited. Invalid write recovery apparatus and method within cache memory. 5,749,094, Cl. 711-139.000.

Jaggar, David Vivian: *See—*
Glass, Simon James; and Jaggar, David Vivian, 5,748,515, Cl. 364-736.500.

Jain, Pradeep: *See—*
deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.

Jairazbhoy, Vivek Amir: *See—*
Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, 5,746,368, Cl. 228-33.000.

Jakobsson, Jan: *See—*
Egberg, Nils; Larsson-Backström, Carin; Jakobsson, Jan; and Lundh, Rolf, 5,747,533, Cl. 514-549.000.

Jaksic, Zeljko; Damm, Hartmut; and Meyer, Christof, to Sick AG. Optical cavity for exclusively receiving light parallel to an optical axis. 5,748,816, Cl. 385-39.000.

James, Robert Owen: *See—*
Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., 5,747,234, Cl. 430-523.000.

Jamieson, Paul E., to Westinghouse Air Brake Company. Penalty brake circuit for straight air pipe brake control equipment. 5,746,485, Cl. 303-19.000.

Jan, Yih G.: *See—*
Natarajan, Kadathur S.; Jan, Yih G.; and Peterson, Kenneth M., 5,749,044, Cl. 455-13.100.

Janesky, Lawrence. Water-escape device for freeze-prone water conduit. 5,746,254, Cl. 138-32.000.

Janet, Philippe: *See—*
Plisson, François; Janet, Philippe; and Puybaret, Frédéric, 5,747,703, Cl. 73-861.770.

Jang, Soon-mo, to Samsung Electronics Co., Ltd. Color signal processor for removing leakage components. 5,748,830, Cl. 386-22.000.

Jang, Syun-Ming: *See—*
Yu, Chen-Hua; and Jang, Syun-Ming, 5,747,380, Cl. 438-599.000.

Jankewitz, Axel; and Lugert, Gerhard, to A.W. Faber-Castell Unternehmensverwaltung GmbH & Co. Wood stain containing a stabilizing agent. 5,746,778, Cl. 8-402.000.

Jankowski, Alan F.; and Hayes, Jeffrey P., to University of California, The Regents of the. Process system and method for fabricating submicron field emission cathodes. 5,746,634, Cl. 445-14.000.

Janocko, Michael A.: *See—*
Talisa, Salvador H.; Janocko, Michael A.; Partlow, Deborah P.; and Piloto, Andrew J., 5,747,873, Cl. 257-661.000.

Janse, Cornelis P.; and Timmermans, Patrick A. A., to U.S. Philips Corporation. Signal amplifier system with improved echo cancellation. 5,748,751, Cl. 381-93.000.

Jansen, Arie. Retardation system for reducing the speed of a moving object. 5,746,418, Cl. 267-136.000.

Jansen, John F.: *See—*
Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.

Janson, Paul. Adjustable open-wrench with a sliding side jaw having a releasable adjustment mechanism to allow ratcheting operation. 5,746,099, Cl. 81-165.000.

Janssen Pharmaceutica, N.V.: *See—*
Putteman, Peter; and Wouters, Alfons Jeanne, 5,746,349, Cl. 222-49.000.
Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.

Japan as represented by Director General of Agency of National Institute of Health: *See—*
Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,747,241, Cl. 435-5.000.

Japan Metals & Chemicals Co., Ltd.: *See—*
Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.

Japan Steel Works, Ltd., The: *See—*
Yoshida, Minoru; Mizuguchi, Hideki; Kobayashi, Nobuhisa; and Ishida, Masaharu, 5,747,077, Cl. 425-183.000.

Japan Tobacco Inc.: *See—*
Okumoto, Yutaka; and Inomata, Shigemitsu, 5,746,225, Cl. 131-84.100.
Ueki, Jun; and Morioka, Shinji, 5,747,327, Cl. 435-252.300.

Jaramillo, Jennifer Lynn: *See—*
Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.

Jaroschek, Christoph; and Bourdon, Karl-Heinz, to Ferromatik Milacron Maschinenbau GmbH. Electric drive with hydraulic assist in an injection molding machine. 5,747,076, Cl. 425-145.000.

Jaroska, Miles: *See—*
Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

Jarrett, Mark G., to Hollowood, Inc. Method of making wood tubing. 5,746,863, Cl. 156-218.000.

Jarrett, Paul: *See—*
Meadows, Martin Paul; Ellis, Deborah June; and Jarrett, Paul, 5,747,025, Cl. 424-93.461.

Jasper Consulting, Inc.: *See—*
Takhar, Harinder S., 5,748,765, Cl. 382-124.000.

Jatco Corporation: *See—*
Sugiyama, Shinichi, 5,746,675, Cl. 475-278.000.

Jauch, Friedemann: *See—*
Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, 5,748,472, Cl. 364-424.080.

Javanifard, Johnny: *See—*
Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.

Jayaweera, Indira: *See—*
Ross, David S.; Jayaweera, Indira; and Leif, Roald N., 5,746,926, Cl. 210-761.000.

Jeco Co., Ltd.: *See—*
Iwasa, Toru; Ito, Akio; and Ariki, Yoshiyuki, 5,747,897, Cl. 310-49.00R.

Jefferson, John Roderick; Collingborn, Peter Alban George; Cooke, Michael Peter; and Buckley, Paul, to Lucas Industries Public Limited Company. Fuel supply apparatus. 5,746,180, Cl. 123-447.000.

Jeffrey, Frank R., III: *See—*
Shanks, Howard R.; Burns, Stanley G.; and Jeffrey, Frank R., III, 5,747,928, Cl. 313-498.000.

Jeffrey, Lawrence W. Personal flotation device. 5,746,633, Cl. 441-123.000.

Jemelka, Jorg: *See—*
Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.

Jencons (Scientific) Limited: *See—*
Jungmann-Campello, Diana DeMello; and Friedlaender, Uri, 5,747,333, Cl. 435-283.100.

Jeng, Shin-Puu: *See—*
Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,747,880, Cl. 257-759.000.

Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., to Pitney Bowes Inc. Moistener for a postage meter. 5,746,881, Cl. 156-578.000.

Jennebach, Markus; and Birkhan, Joao Augusto, to Leslie Technologies, Inc.; and Gruntec LTDA. Horizontally pivoted system grate for a furnace. 5,746,142, Cl. 110-248.000.

Jennings, Philip Anthony: *See—*
Haseloff, James Phillip; Gerlach, Wayne Lyle; Jennings, Philip Anthony; and Cameron, Fiona Helen, 5,747,335, Cl. 435-325.000.

Jensen, Craig L.: *See—*
Chakrabarti, Dhruba J.; Hoffman, Richard A.; and Jensen, Craig L., 5,747,135, Cl. 428-64.100.

Jensen, Mark Anton, to Du Pont de Nemours, E. I., and Company. Genetic markers and methods for the detection of *escherichia coli* serotype-0157:H7. 5,747,257, Cl. 435-6.000.

Jensen, Tyler D.: *See—*
Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.

Jeon, Hee-Seog, to Samsung Electronics Co., Ltd. Methods of fabricating bipolar transistors having separately formed intrinsic base and link-up regions. 5,747,374, Cl. 438-309.000.

Jeon, Jun-Young, to Samsung Electronics Co., Ltd. Internal supply voltage generating circuit for semiconductor memory device. 5,747,974, Cl. 323-269.000.

Jeon, Jun-Young; and Park, Pil-Soon, to Samsung Electronics Co., Ltd. Multiple power line arrangement for a semiconductor memory device. 5,748,550, Cl. 365-226.000.

Jeong, Dong-cheol: *See—*
Kim, Dae-il; Kim, Nae-koo; Kim, Kyung-min; and Jeong, Dong-cheol, 5,747,939, Cl. 315-169.400.

Jeong, Seong Yun: *See—*
Kim, Jin Yong; and Jeong, Seong Yun, 5,748,603, Cl. 369-112.000.

Jeong, Yi Na: *See—*
Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.

Jesadanont, Mongkol. Automatic safety car seat using tension springs. 5,746,467, Cl. 296-68.100.

Jesel, Daniel H. Valve lifter. 5,746,167, Cl. 123-90.350.

Jet Sew Technologies, Inc.: *See—*
Hamid, Hadi Muzaffar Nayyer, 5,746,427, Cl. 271-176.000.

Jewell, William J., to Microgen Corporation. Process for chemical modification of reactants by microbes. 5,747,311, Cl. 435-176.000.

Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby I., Jr., to Advanced Micro Devices. Technique for incorporating a built-in self-test (BIST) of a DRAM block with existing functional test vectors for a microprocessor. 5,748,640, Cl. 371-21.300.

Jiang, Wenbin; and Lebby, Michael S., to Motorola, Inc. Visible VCSEL with hybrid mirrors. 5,748,665, Cl. 372-96.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See—*
Sakonjyu, Kazutaka; and Hori, Eisaku, 5,749,063, Cl. 701-93.000.

Jimenez, Pere J.: *See—*
Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Jin, Byeong-Won: *See—*
Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.

Jin, Sungho: *See—*
Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, 5,747,918, Cl. 313-309.000.
Graebner, John Edwin; Jin, Sungho; and Zhu, Wei, 5,746,931, Cl. 216-88.000.

Joalto Design, Inc.: *See—*
Townsend, John A., 5,746,443, Cl. 280-730.200.

Joffe, Daniel M.; and Panek, Donald C., Jr., to Integrated Network Corporation. DTMF signaling on four-wire switched 56 KBPS lines. 5,748,637, Cl. 370-516.000.

Johansson, Ann Charlotte Birgit: *See—*
Bäckström, Kjell Göran Erik; Dahlbäck, Carl Magnus Olof; Edman, Peter; and Johansson, Ann Charlotte Birgit, 5,747,445, Cl. 514-4.000.

Johansson, Karl-Erik: *See—*
Lindgren, Per-Olov; Johansson, Karl-Erik; Johansson, Kjell Åke; and Paulsson, Karin, 5,747,724, Cl. 102-459.000.

Johansson, Kjell-Åke: *See—*
Lindgren, Per-Olov; Johansson, Karl-Erik; Johansson, Kjell Åke; and Paulsson, Karin, 5,747,724, Cl. 102-459.000.

Johansson, Ola; and Kjellqvist, Olof, to Sunds Defibrator Industries AB. Measuring device for refiners. 5,747,707, Cl. 73-862.623.

Johenning, Christopher Paul: *See—*

Hutson, David Dean; Johenning, Christopher Paul; Taube, John Janis; and Waibel, Terry John, 5,746,849, Cl. 152-209.00R.

Johns Hopkins University: *See—*

Gordon, Jeffrey I.; Gokel, George W.; and Englund, Paul T., 5,747,537, Cl. 514-558.000.

Johns, Margaret A.: *See—*

Parsons, George H.; Johns, Margaret A.; and Rugg, Arthur E., 5,747,265, Cl. 435-7.200.

Johnson, Alan T.: *See—*

Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.

Johnson & Johnson Clinical Diagnostics, Inc.: *See—*

Weber, Wayne Woodrow, II; Messing, Calvin Roman; and Logan, Margaret Elizabeth, 5,747,345, Cl. 436-74.000.

Johnson & Johnson Consumer Products, Inc.: *See—*

Geesin, Jeffrey C.; Cole, Curtis A.; and Wisniewski, Stephen J., 5,747,010, Cl. 424-59.000.

Johnson & Johnson Medical, Inc.: *See—*

Hood, Rush W., Jr., 5,746,203, Cl. 128-630.000.

Johnson & Johnson Professional, Inc.: *See—*

Mastrorio, Brooke W.; and Fifolt, Douglas A., 5,746,272, Cl. 164-516.000.

Johnson & Johnson Vision Products, Inc.: *See—*

Wilder, Joseph; and Dreyfuss, David, 5,748,300, Cl. 356-124.000.

Johnson, Charles E.: *See—*

Giroux, William H., Jr.; and Johnson, Charles E., 5,746,459, Cl. 292-341.160.

Johnson, Darrin L.; and Harris, Bradley D. Injection termination feature. 5,746,445, Cl. 280-741.000.

Johnson, David. Vehicle back-up safety device. 5,746,284, Cl. 180-167.000.

Johnson, David Edward, to International Business Machines Corporation. Multimodal natural language interface for cross-application tasks. 5,748,974, Cl. 395-759.000.

Johnson, Eugene M., Jr.; Milbrandt, Jeffrey D.; Kotzbauer, Paul T.; and Lampe, Patricia A., to Washington University. Neurturin and related growth factors. 5,747,655, Cl. 530-399.000.

Johnson, Harold Joseph; Gu, Yuan Xiang; Chan, Becky Laiping; and Chow, Stanley Taihai, to Northern Telecom Limited. Encoding technique for software and hardware. 5,748,741, Cl. 380-28.000.

Johnson, Jeffrey; and St. Louis, Daniel M., to Haden, Inc. Integrated paint spray booth and air conditioning system and process. 5,746,650, Cl. 454-52.000.

Johnson, Jimmie L. Method and apparatus for supplying two-part systems. 5,746,312, Cl. 206-217.000.

Johnson, Larry D.; Memory, Joseph W., Jr.; and Prudic, Anthony F., to Philips Electronics North America Corporation. Interface system for a television receiver. 5,748,255, Cl. 348-553.000.

Johnson, Mark Anthony: *See—*

Durham, Darrell Lee; Johnson, Mark Anthony; and O'Reilly, David Wayne, 5,746,517, Cl. 384-538.000.

Johnson, Michael D., to New Mexico State University Technology Transfer Corporation. Method for synthesizing ferrate and ferrate produced thereby. 5,746,994, Cl. 423-594.000.

Johnson, Randall LeRoy. Carrier for transporting elongate recreational equipment. 5,746,361, Cl. 224-258.000.

Johnson, Robert Michael, Jr.; and Gilot, Monefax Joseph, to Motorola, Inc. Battery charger charging time control. 5,747,970, Cl. 320-151.000.

Johnson, Terence Richard: *See—*

Blakeman, Peter John; and Johnson, Terence Richard, 5,747,579, Cl. 524-562.000.

Johnson, Thomas W.; and Muerle, John L., to Moore Business Forms, Inc. Picture checks. 5,748,755, Cl. 382-115.000.

Johnson, William T.; and Hare, Daniel J., to Niagara Mohawk Power Corporation. Valve stem thrust measuring device. 5,747,697, Cl. 73-760.000.

Johnston, Thomas K., to Motorola Inc. Counter having programmable periods and method therefor. 5,748,949, Cl. 395-557.000.

Jolly, Douglas J.: *See—*

Gruber, Harry E.; Jolly, Douglas J.; and Kwang, Hwei-Sing, 5,747,243, Cl. 435-5.000.

Jonas, Rochus; Wolf, Michael; and Klockow, Michael, to Merck Patent Gesellschaft mit Beschrankter Haftung. Arylalkyl-thiadiazinones. 5,747,489, Cl. 514-222.500.

Jonczyk, Alfred; Felding-Habermann, Brunhilde; Diefenbach, Beate; and Rippmann, Friedrich, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Linear adhesion inhibitors. 5,747,457, Cl. 514-13.000.

Jones, Allen J.: *See—*

Morgan, Samuel D.; and Jones, Allen J., 5,748,706, Cl. 379-37.000.

Jones, Carl H.; Blaha, John M.; and Townsend, Gail J., to W. L. Gore & Associates, Inc. Cold formable mouthguards. 5,746,221, Cl. 128-859.000.

Jones, David L.; and Drenner, George L., Jr., to Mobility Plus, Inc. Method and apparatus for moving a physically disabled person to and from a driving position within a vehicle. 5,746,465, Cl. 296-65.100.

Jones, E. B. Gareth: *See—*

Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Albaugh, David A., 5,747,304, Cl. 435-121.000.

Jones, Jeffrey D., to Advanced Chemill Systems. Method and apparatus for cleaning thin substrates. 5,746,234, Cl. 134-64.00R.

Jones, Laurence E.: *See—*

Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.

Jones, Michael William Dudleston; Geen, Nicholas; Warner, Anthony; and Hughes, Mischka, to Infosis Group Ltd. Information display system for simultaneously displaying graphical images and text of a publication. 5,748,931, Cl. 395-356.000.

Jones, Richard S.; and Williamson, N. Rodgers, Jr., to Union Switch & Signal Inc. Highway crossing guard mechanism controller. 5,747,954, Cl. 318-266.000.

Jones, Robert E.: *See—*

Czachor, Robert P.; and Jones, Robert E., 5,746,574, Cl. 415-115.000.

Jonsson, Age, to Sunds Defibrator Industries AB. Tying device in which the drive means are electric servomotors. 5,746,120, Cl. 100-4.000.

Jönsson, Anders; and Wictor, Mats, to Ericsson Inc. Light guide for a display or keyboard. 5,746,493, Cl. 362-31.000.

Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, to Pohang Iron & Steel Co., Ltd.; Research Institute of Industrial Science & Technology; and Voest-Alpine Industrieanlagenbau GmbH. Apparatus for melting fine particles containing carbon and method for melting such fine particles using the apparatus. 5,746,804, Cl. 75-387.000.

Jordan, James L. Foundation stand and method of use. 5,746,684, Cl. 482-62.000.

Jordan, Russell A.; and Hansen, James D., to Minnesota Mining & Manufacturing Co. Orthodontic appliance with asymmetric bonding structure. 5,746,594, Cl. 433-9.000.

Jorgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, to Novo Nordisk A/J. Heterocyclic compounds. 5,747,481, Cl. 514-183.000.

Jorrin, Gonzalo Bisset: *See—*

Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.

Joseph, Robert Louis: *See—*

Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.

Joslyn Electronic Systems Corporation: *See—*

Swanson, S. Keith; and Miller, Tom, 5,748,093, Cl. 340-659.000.

Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., to Motorola, Inc. Switch assembly for a portable radio. 5,746,307, Cl. 200-303.000.

Jost—Werke AG: *See—*

Bergmann, Wolfgang; Dreyer, Hans; and Pohl, Wolfgang, 5,746,438, Cl. 280-433.000.

Joswig, Hellmut: *See—*

Küsters, Karl-Heinz; Küpper, Paul; Czech, Günther; and Joswig, Hellmut, 5,747,388, Cl. 438-723.000.

Jou, Chon-Shin: *See—*

Fan, Der-Tsyr; Jou, Chon-Shin; and Wang, Ting-S., 5,747,378, Cl. 438-563.000.

Jou, Shyankay: *See—*

Bunshah, Rointan F.; Doerr, Hans J.; and Jou, Shyankay, 5,747,118, Cl. 427-577.000.

JSP Corporation: *See—*

Tsurugai, Kazuo; Tokoro, Hisao; and Oikawa, Masaharu, 5,747,549, Cl. 521-60.000.

Ju, Jau-Jiu: *See—*

Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, 5,748,602, Cl. 369-112.000.

Judenhahn, Wolfram: *See—*

Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, 5,747,676, Cl. 73-105.000.

Juki Corporation: *See—*

Ogawa, Hiroshi; Sugita, Seiichi; and Sato, Toshio, 5,746,568, Cl. 414-789.600.

Jun, Jae-Kang: *See—*

Lee, Joung-Sun; Kim, Dae-Yul; An, Yo-Han; and Jun, Jae-Kang, 5,746,652, Cl. 454-187.000.

Jung, Christopher C.; and Nazarifar, Nader, to Alcon Laboratories, Inc. Apparatus and method for sensing fluid level. 5,747,824, Cl. 250-577.000.

Jung, Günther: *See—*

Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović, Stefan; and Jung, Günther, 5,747,269, Cl. 435-7.240.

Jung, Hae-Mook, to Daewoo Electronics Co., Ltd. Adaptive runlength coding based on zero and non-zero subblocks. 5,748,244, Cl. 348-403.000.

Jung, Hae-Mook: *See—*

Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, 5,748,761, Cl. 382-107.000.

Jung, Sun-Hee: *See—*

Pastan, Ira H.; Lee, Byungkook; Jung, Sun-Hee; and Brinkmann, Ulrich, 5,747,654, Cl. 530-391.700.

Junginger, George J.: *See—*

Yang, Kim W.; Junginger, George J.; Mockridge, Raymond G.; and Pearce, Robert C., III, 5,747,054, Cl. 424-409.000.

Jungmann-Campello, Diana DeMello; and Friedlaender, Uri, to Jencons (Scientific) Limited. Culture of micro-organisms. 5,747,333, Cl. 435-283.100.

Junino, Alex: *See—*

Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, 5,747,013, Cl. 424-707.000.

Junkin, John Edward; and Robinson, George Joseph, to Westinghouse Electric Corporation. Vane segment compliant seal assembly. 5,746,573, Cl. 415-115.000.

Junqua, Jean-claude: *See—*

Morin, Philippe; and Junqua, Jean-claude, 5,748,841, Cl. 395-2.660.

Kabir, Abul E.: *See—*

Bashir, Rashid; and Kabir, Abul E., 5,747,353, Cl. 437-21.000.

Kabushiki Kaisha Hayashibara Seibutsu Kaguku Kenkyujo: *See—*

Nishimoto, Tomoyuki; Chaen, Hiroto; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,747,300, Cl. 435-101.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*

Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.

Kabushiki Kaisha Meidensha: *See—*

Iokibe, Tadashi; Tanimura, Takayoshi; and Fujimoto, Yasunari, 5,748,851, Cl. 395-51.000.

Kabushiki Kaisha Riken: *See—*

Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.

Kabushiki Kaisha Shinkawa: *See—*

Harada, Koichi; Torihata, Minoru; and Iiyama, Takayuki, 5,746,422, Cl. 269-172.000.

Kabushiki Kaisha TEC: *See—*

Sanda, Tsuyoshi; and Fujiwara, Tsutomu, 5,746,525, Cl. 400-605.000.

Kabushiki Kaisha Toshiba: *See—*

Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.

Esaki, Hiroshi; Saito, Takeshi; and Matsuzawa, Shigeo, 5,748,626, Cl. 370-355.000.

Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.

Hanyu, Koshi; and Yoshizumi, Akira, 5,747,557, Cl. 523-201.000.

Hirata, Noriyuki, 5,747,119, Cl. 427-585.000.

Honda, Masami; and Shibasaki, Kazuya, 5,748,444, Cl. 361-687.000.

Hosomi, Eiichi; Tazawa, Hiroshi; Takubo, Chiaki; and Shibasaki, Koji, 5,747,881, Cl. 257-762.000.

Iijima, Yasuo, 5,748,915, Cl. 395-285.000.

Kameyama, Atsushi; Kawakyu, Katsue; and Ikeda, Yoshiko, 5,748,053, Cl. 333-103.000.

Kawai, Yasumasa, 5,748,401, Cl. 360-78.140.

Masuda, Atsushi; and Endo, Takahiro, 5,748,621, Cl. 370-337.000.

Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.

Mizushima, Koichi; Kinno, Teruyuki; Yamauchi, Takashi; and Inomata, Koichiro, 5,747,859, Cl. 257-421.000.

Nagasaka, Shigeki, 5,748,201, Cl. 345-509.000.

Nakamoto, Masayuki; and Ohashi, Hiromichi, 5,747,926, Cl. 313-495.000.

Nishimura, Kazuo; and Natori, Naotake, 5,748,769, Cl. 382-159.000.

Ochiai, Masashi, 5,748,458, Cl. 363-17.000.

Ohsawa, Takahashi, 5,748,641, Cl. 371-21.300.

Okumura, Haruhiko; and Itoh, Goh, 5,748,169, Cl. 345-100.000.

Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, 5,746,581, Cl. 417-2.000.

Onoguchi, Kazunori, 5,748,778, Cl. 382-199.000.

Sato, Makiko; Hisatake, Yuzo; Watanabe, Ryoichi; and Hatoh, Hitoshi, 5,748,275, Cl. 349-144.000.

Shibahara, Akihiko, 5,748,913, Cl. 395-282.000.

Shioyama, Yoshiyuki; Hori, Masako; and Kimura, Koji, 5,747,780, Cl. 219-648.000.

Shiraishi, Takashi; and Yamaguchi, Masao, 5,748,355, Cl. 359-206.000.

Sivers, Erlvada A.; Silver, Michael D.; and Drawert, Bruce M., 5,748,768, Cl. 382-130.000.

Suzuki, Azuma, 5,748,558, Cl. 365-233.000.

Takahashi, Makoto; and Nogami, Kazutaka, 5,748,011, Cl. 326-83.000.

Tanaka, Satoshi, 5,748,609, Cl. 369-291.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*

Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.

Kabushiki Kaisha Yaskawa Denki: *See—*

Hirai, Junji; Hiraga, Yoshiji; and Nomura, Kenji, 5,747,894, Cl. 307-104.000.

Kabushiki Kaisha Yokota Seisakusho: *See—*

Yokota, Hiroshi; and Yokota, Shingo, 5,746,246, Cl. 137-514.000.

Kabushiki Kaisha Youma Kohboh: *See—*

Sato, Yoshinori, 5,746,556, Cl. 411-42.000.

Kaczmarczyk, Sabina W. Sucrose-free dietary fiber composition. 5,747,093, Cl. 426-617.000.

Kadee Quality Products Co.: *See—*

Edwards, Lawrence D., 5,746,336, Cl. 213-75.0TC.

Kadlicko, George D., to Microhydraulics, Inc. Diagnostic device for hydraulic circuit. 5,747,702, Cl. 73-861.530.

Kado, Kazutake: *See—*

Asakura, Sotoo; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, 5,747,069, Cl. 424-484.000.

Kadonaga, Anne P.: *See—*

Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, 5,748,856, Cl. 395-102.000.

Kadosh, Daniel; and Gardner, Mark I., to Advanced Micro Devices, Inc. Multi-level transistor fabrication method with high performance source/drain connection. 5,747,367, Cl. 438-152.000.

Kadunce, Randy R.; Shumaker, Robert T., Jr.; and Dishart, Peter T., to PPG Industries, Inc. On-glass antenna and connector arrangement. 5,748,155, Cl. 343-713.000.

Kaepp, Gregory A.; and Becker, Beverly J., to Ford Global Technologies, Inc. Intelligent CAD process. 5,748,943, Cl. 395-500.000.

Kaganas, Israel: *See—*

Leal, Horacio; and Kaganas, Israel, 5,748,756, Cl. 381-118.000.

Kageyama, Atsuhisa: *See—*

Kawabata, Minoru; and Kageyama, Atsuhisa, 5,748,257, Cl. 348-615.000.

Kahle, James Allan, to International Business Machines Corporation. System and method for maintaining coherency of information transferred between multiple devices. 5,748,938, Cl. 395-465.000.

Kahwaty, Vincent Noel: *See—*

Aboaf, Joseph Adam; Denison, Edward Virgil; and Kahwaty, Vincent Noel, 5,745,978, Cl. 29-603.080.

Kai, Fumitaka: *See—*

Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, 5,747,364, Cl. 438-14.000.

Kai, James K.: *See—*

Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.

Kai, Tadao; Terui, Nobuhiko; and Tsukada, Shinichi, to Nikon Corporation. Optical device with an image blur suppression function. 5,748,994, Cl. 396-55.000.

Kaibach, Werner, to Hilti Aktiengesellschaft. Expansion dowel. 5,746,557, Cl. 411-60.000.

Kaiser Aerospace & Electronics Co.: *See—*

Kalmanash, Michael H., 5,748,268, Cl. 349-47.000.

Kaiser, Sandra K.: *See—*

Dague, Richard R.; Harris, William L.; and Kaiser, Sandra K., 5,746,919, Cl. 210-603.000.

Kakutani, Toshiaki, to Seiko Epson Corporation. Image processing method and image processing apparatus. 5,748,336, Cl. 358-458.000.

Kaldor, Alan. Cable-bundling band. 5,745,958, Cl. 24-16.00R.

Kallio, Donald M., Jr.: *See—*

Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.

Källström, Markku Tapio: *See—*

Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.

Kalmanash, Michael H., to Kaiser Aerospace & Electronics Co. Quasi-tiled active matrix display. 5,748,268, Cl. 349-47.000.

Kamb, Alexander: *See—*

Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.

Kameda, Masami: *See—*

Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.

Kamegawa, Keizi: *See—*

Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Kamensky, Vyacheslav Tikhonovich: *See—*

Gelfgat, David Mendeloevich; Skipidarov, Sergei Yakovlevich; Yakhats, Michael; and Kamensky, Vyacheslav Tikhonovich, 5,746,702, Cl. 601-15.000.

Kameoka, Teruhiko: *See—*

Ito, Koji; Kameoka, Teruhiko; Matsunaga, Kouji; and Kuwayama, Kazotoshi, 5,746,577, Cl. 416-178.000.

Kameyama, Atsushi; Kawakyu, Katsue; and Ikeda, Yoshiko, to Kabushiki Kaisha Toshiba. Switching circuit. 5,748,053, Cl. 333-103.000.

Kamijima, Akifumi, to TDK Corporation. Resist pattern of T-shaped cross section. 5,747,198, Cl. 430-11.000.

Kaminashi, Atsumi: *See—*

Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,746,159, Cl. 122-367.100.

VOL 210
ISS 1
MY 5
1998
UMI

- Kammerl, August: *See—*
  - Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, 5,749,060, Cl. 701-51.000.
- Kamo, Jun; Koyanagi, Seiya; and Kawai, Miho, to Mitsubishi Rayon Co., Ltd. Microporous membrane made of non-crystalline polymers and method of producing the same. 5,746,916, Cl. 210-500.230.
- Kanaboshi, Akihiro: *See—*
  - Eda, Kazuo; Taguchi, Yutaka; Kanaboshi, Akihiro; and Ogura, Tetsuyoshi, 5,747,857, Cl. 257-416.000.
- Kanai, Sadasaburo, to Hitachi, Ltd. Cache control method and cache controller. 5,748,985, Cl. 395-457.000.
- Kanakubo, Yukio: *See—*
  - Kashiwazaki, Masami; Kanakubo, Yukio; and Takahashi, Hiroharu, 5,748,861, Cl. 395-110.000.
- Kanamaru, Hisanobu: *See—*
  - Harada, Koji; and Kanamaru, Hisanobu, 5,746,085, Cl. 72-355.600.
- Kanamori, Hiroo: *See—*
  - Fukuda, Chie; Onishi, Masashi; and Kanamori, Hiroo, 5,746,801, Cl. 65-379.000.
- Kanamori, Yasuo, to Yazaki Corporation. Flame-retarded resin composition and insulated wire. 5,747,574, Cl. 524-436.000.
- Kanaoka, Takeshi: *See—*
  - Tsuzaki, Hiroshi; Kanaoka, Takeshi; and Tsuchiya, Junichi, 5,746,100, Cl. 83-13.000.
- Kanbayashi, Makoto: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Kanbe, Junichiro: *See—*
  - Taniguchi, Osamu; Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 5,746,939, Cl. 252-299.010.
- Kanda, Hidehiro: *See—*
  - Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
- Kane, Susan L.: *See—*
  - Novak, Miloslav; Trageser, Andrew B.; Summe, Isabel M.; and Kane, Susan L., 5,746,476, Cl. 297-216.130.
- Kaneda, Masanori: *See—*
  - Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.
- Kaneda, Masataka: *See—*
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Kaneko, Kunikiyo: *See—*
  - Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.
- Kaneko, Satoru; and Ohkoda, Toshiyuki, to Sanyo Electric Co., Ltd. Method of manufacturing a semiconductor integrated circuit device. 5,747,375, Cl. 438-396.000.
- Kaneko, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Method of processing data in numerically controlled drive unit. 5,748,465, Cl. 364-132.000.
- Kanematsu, Daigoro: *See—*
  - Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
- Kang, Bok-Moon, to Samsung Electronics Co., Ltd. Address buffer for high-speed address inputting. 5,748,557, Cl. 365-230.080.
- Kang, Chi-jung: *See—*
  - Cha, Gi-ho; Kang, Chi-jung; Lee, Byung-hun; and Lee, Kyung-wook, 5,746,883, Cl. 156-580.000.
- Kang, Dong Hoon: *See—*
  - Park, Chang Jin; Kang, Dong Hoon; and Lee, Chul Woo, 5,748,356, Cl. 359-207.000.
- Kang, Kwon-Hag, to Daewoo Electronics Co., Ltd. Screen size control circuit according to a power on or off condition of a television. 5,748,259, Cl. 348-634.000.
- Kanno, Itaru: *See—*
  - Kuroda, Takeshi; and Kanno, Itaru, 5,746,233, Cl. 134-57.00R.
- Kano, Mitsunari: *See—*
  - Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, 5,747,823, Cl. 250-559.440.
- Kanoh, Osamu; Yoshida, Yasushi; Senda, Atsuo, deceased (by Eiko Senda, Yoshio Senda, Hiroko Senda, Masako Senda, legal representatives), to Murata Manufacturing Co., Ltd. Activating catalytic solution for electroless plating. 5,746,809, Cl. 106-1.110.
- Kansai Netukagaku Kabushiki Kaisha: *See—*
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Kansai Paint Co., Ltd.: *See—*
  - Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.
  - Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwahara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.
  - Ohnishi, Kazuhiko, 5,747,599, Cl. 525-327.300.
- Kantimahanti, Arjun Kumar; Subrahmanyam, Chivukula; and Zhou, Mei Sheng, to Chartered Semiconductor Manufacturing Ltd. Formation of a capacitor using a sacrificial etch stop. 5,747,369, Cl. 438-241.000.
- Kantor, Fred S.: *See—*
  - Flavell, Richard A.; Kantor, Fred S.; Barthold, Stephen W.; and Fikrig, Erol, 5,747,294, Cl. 435-70.210.
- Kao Corporation: *See—*
  - Oshika, Masato; and Naito, Sachio, 5,747,015, Cl. 424-70.140.
  - Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.
- Kao, Yi-Han: *See—*
  - Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, 5,747,425, Cl. 505-150.000.
- Kaplan, Ronald M.: *See—*
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A. Fusing system with amino functional groups in siloxane release agent for use with toners and fusing members reactive with amine groups. 5,747,212, Cl. 430-124.000.
- Kaplinsky, George T.: *See—*
  - Swanson, David W.; Kaplinsky, George T.; Salter, James G.; and Rhoads, W. Wistar, 5,748,215, Cl. 347-87.000.
- Karakama, Toshiyuki: *See—*
  - Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, 5,749,027, Cl. 399-113.000.
- Karande, Seema V.: *See—*
  - deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
- Karidis, John Peter: *See—*
  - Flint, Ephraim Bemis; Karidis, John Peter; McVicker, Gerard; and Pence, William Edward, 5,748,443, Cl. 361-686.000.
- Karim, Felix: *See—*
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,275, Cl. 435-15.000.
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,288, Cl. 435-69.100.
- Karin, Michael: *See—*
  - Deng, Tiliang; and Karin, Michael, 5,747,318, Cl. 435-194.000.
- Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, to Canon Kabushiki Kaisha. Ink jet head having plural elemental substrates, apparatus having the ink jet head, and method for manufacturing the ink jet head. 5,748,213, Cl. 347-63.000.
- Karlsson, Kai; Meriläinen, Timo; Weckström, Kurt; and Poikolainen, Seppo, to InstrumenTarium Corp. Infrared radiation source for a gas analyzer and method for generating infrared radiation. 5,747,820, Cl. 250-504.00R.
- Karol, Frederick John: *See—*
  - Reichle, Walter Thomas; Yang, Xinmin; and Karol, Frederick John, 5,747,406, Cl. 502-117.000.
- Karp, Alan H.; and Kumar, Rajendra, to Hewlett-Packard Company. Method and system for supporting speculative execution using a speculative look-aside table. 5,748,936, Cl. 395-394.000.
- Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, to BASF Aktiengesellschaft. Supported catalysts which are suitable for ammonoxidation. 5,747,411, Cl. 502-353.000.
- Kasai, Junichi: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Kasai, Takao; Yoshikawa, Kenichi; Saito, Shigeru; and Hoshi, Masami, to Citizen Watch Co., Ltd. Method of manufacturing powder injection molded part. 5,746,960, Cl. 264-234.000.
- Kashat, Israel: *See—*
  - Koifman, Vladimir; Afek, Yachin; and Kashat, Israel, 5,748,030, Cl. 327-513.000.
- Kashikawa, Masakazu: *See—*
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Kashino, Toshio: *See—*
  - Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.
- Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, to Kansai Paint Co., Ltd. Releasable aqueous coating composition and method of temporarily protecting finished coating film on automobile body by use of the same. 5,747,572, Cl. 524-265.000.
- Kashiwagi, Toshiyuki: *See—*
  - Kobayashi, Seiji; Okamura, Hiroshige; Yamatsu, Hisayuki; and Kashiwagi, Toshiyuki, 5,748,582, Cl. 369-44.260.

- Kashiwakura, Naotake: *See—*
  - Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, 5,747,174, Cl. 428-480.000.
- Kashiwazaki, Akio; Katayama, Masato; and Moriya, Kenichi, to Canon Kabushiki Kaisha. Printing medium and ink jet print. 5,747,146, Cl. 428-206.000.
- Kashiwazaki, Masami; Kanakubo, Yukio; and Takahashi, Hiroharu, to Canon Kabushiki Kaisha. Image processing apparatus and method therefor. 5,748,861, Cl. 395-110.000.
- Kasiske, W. Charles: *See—*
  - Stelter, Eric C.; Guth, Joseph E.; and Kasiske, W. Charles, 5,748,218, Cl. 347-158.000.
- Kassing, Lothar: *See—*
  - Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, 5,747,676, Cl. 73-105.000.
- Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., to Sun Microsystems, Inc.; and International Business Machines Corporation. Method and apparatus for representing recurring events. 5,749,074, Cl. 705-8.000.
- Kast, Gerhard G.: *See—*
  - Kenny, Daniel P.; Singer, Donald J.; and Kast, Gerhard G., 5,745,996, Cl. 30-90.100.
- Kasturia, Sanjay: *See—*
  - Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.
- Katagiri, Hiroomi: *See—*
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
- Katagiri, Kazuharu: *See—*
  - Taniguchi, Osamu; Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 5,746,939, Cl. 252-299.010.
- Katagiri, Masayuki: *See—*
  - Sakashita, Hiroshi; and Katagiri, Masayuki, 5,745,970, Cl. 29-407.050.
- Katagiri, Shigeru: *See—*
  - Komori, Takashi; and Katagiri, Shigeru, 5,749,069, Cl. 704-240.000.
- Katagiri, Tatsuo: *See—*
  - Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, 5,745,971, Cl. 29-421.100.
- Katakura, Takahiro: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
- Kataoka, Mitsuhiro: *See—*
  - Tomatsu, Yutaka; and Kataoka, Mitsuhiro, 5,747,851, Cl. 257-330.000.
- Katayama, Akihiro; Ishida, Yoshihiro; and Yamakawa, Junichi, to Canon Kabushiki Kaisha. Apparatus and method for extracting outline data and encoding image data using the outline data. 5,748,777, Cl. 382-199.000.
- Katayama, Akira: *See—*
  - Tanaka, Etsuo; Okano, Hiroshi; and Katayama, Akira, 5,748,391, Cl. 359-813.000.
- Katayama, Koji, to Mitsubishi Denki Kabushiki Kaisha. Optical-axis adjusting device for a vehicle light radar service. 5,748,294, Cl. 356-4.010.
- Katayama, Masato: *See—*
  - Kashiwazaki, Akio; Katayama, Masato; and Moriya, Kenichi, 5,747,146, Cl. 428-206.000.
- Katayama, Masayuki: *See—*
  - Kato, Akira; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,747,929, Cl. 313-503.000.
- Kather, Lutz: *See—*
  - Schrey, Ekkehard; Kather, Lutz; and Van Der Staay, Frank, 5,748,433, Cl. 361-210.000.
- Katiyar, Dinesh, to Sun Microsystems, Inc. Apparatus and method for operating an aggregation of server computers using a dual-role proxy server computer. 5,748,897, Cl. 395-200.490.
- Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, to Honda Giken Kogyo Kabushiki Kaisha. Control system for automatic transmissions. 5,746,680, Cl. 477-95.000.
- Kato, Akira; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, to Nippondenso Co., Ltd. Electroluminescence element and method for fabricating same. 5,747,929, Cl. 313-503.000.
- Kato, Eiichi; Nakazawa, Yusuke; and Osawa, Sadao, to Fuji Photo Film Co., Ltd. Method of forming an electrophotographic color transfer image and apparatus used therefor. 5,747,214, Cl. 430-126.000.
- Kato, Hirohisa: *See—*
  - Nagai, Ryozo; Kuroo, Makoto; and Kato, Hirohisa, 5,747,652, Cl. 530-387.900.
- Kato, Kanji: *See—*
  - Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.
- Kato, Katsuhito: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Kato, Kazunori: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Kato, Kenzi: *See—*
  - Yoshino, Yoshimi; and Kato, Kenzi, 5,747,691, Cl. 73-504.160.
- Kato, Kinya: *See—*
  - Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,748,272, Cl. 349-86.000.
- Kato, Komei: *See—*
  - Takeda, Masaki; and Kato, Komei, 5,748,198, Cl. 345-441.000.
- Kato, Masataka: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
- Kato, Miki; Tamano, Yukinori; Kobayashi, Katsumi; and Noba, Michiyuki, to Nippondenso Co., Ltd. Coil-shaped flexible printed circuit board. 5,747,743, Cl. 174-254.000.
- Kato, Mikio: *See—*
  - Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000.
- Kato, Mitsuhide: *See—*
  - Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.
- Kato, Toshihiro: *See—*
  - Kishino, Katsumi; and Kato, Toshihiro, 5,747,862, Cl. 257-436.000.
- Katoh, Kenichi: *See—*
  - Kubota, Yasushi; Yoneda, Hiroshi; and Katoh, Kenichi, 5,748,165, Cl. 345-96.000.
- Katoh, Kouki: *See—*
  - Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, 5,747,210, Cl. 430-109.000.
- Katoh, Shigeru, to Takata Corporation. Vehicle collision control system. 5,748,477, Cl. 364-461.000.
- Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, to Tonen Corporation. Fluid composition for use in fluid couplings containing at least one ferrocene derivative. 5,747,429, Cl. 508-208.000.
- Katoot, Mohammad W., to KTH, LLC. Polymer optical fibers and process for manufacture thereof. 5,747,610, Cl. 526-73.000.
- Katsen, Boris Joseph; Himmelwright, Richard S.; Stewart, Barbara Jones; and Schwartz, Nate R., to Rexam Graphics Inc. Ink jet ink composition. 5,746,817, Cl. 106-31.650.
- Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, to Dow Corning Corporation; and Massachusetts Inst. Tech. Rubber-modified rigid silicone resins and composites produced therefrom. 5,747,608, Cl. 525-477.000.
- Katsura, Koyo: *See—*
  - Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
- Katsurada, Hiroyuki: *See—*
  - Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, 5,746,695, Cl. 600-127.000.
- Katsuta, Hiroyuki: *See—*
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Katsuzawa, Yukio: *See—*
  - Nakamura, Kosei; Katsuzawa, Yukio; and Nagai, Junichi, 5,747,900, Cl. 310-58.000.
- Katz, Jeffrey P. Impact absorbing protective apparatus for the frontal temporal and occipital basilar skull. 5,745,923, Cl. 2-411.000.
- Kaufer, Laurel G. Toilet bowl illumination device including audible annunciator for reminding user to move toilet seat from upper retracted position to lower seating position after use. 5,748,096, Cl. 340-686.000.
- Kauser, Katalin; and Rubanyi, Gabor M., to Schering Aktiengesellschaft. Method for lowering plasma levels of lipoprotein(a). 5,747,509, Cl. 514-324.000.
- Kaveh, Golnaz; Taylor, Gregory F.; and Smith, Jeffrey E., to Intel Corporation. Differential power bus comparator. 5,748,033, Cl. 327-545.000.
- Kawabata, Katsuhiro: *See—*
  - Hidaka, Katsuhiko; Kawabata, Katsuhiro; and Tamukai, Keiko, 5,747,220, Cl. 430-273.100.
- Kawabata, Minoru; and Kageyama, Atsuhisa, to Matsushita Electric Industrial Co., Ltd. Picture information detecting apparatus for a video signal. 5,748,257, Cl. 348-615.000.
- Kawada, Hideo: *See—*
  - Gunnoe, Lowell G.; Kawada, Hideo; and Nutting, Philip C., 5,746,394, Cl. 244-111.000.
- Kawafuji, Hisashi: *See—*
  - Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.
- Kawaguchi, Hisamitsu: *See—*
  - Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.
- Kawaguchi, Hitoshi: *See—*
  - Yamada, Michio; and Kawaguchi, Hitoshi, 5,748,459, Cl. 363-21.000.
- Kawaguchi, Kunjo: *See—*

/OL
2 10
SS
1
MY
5
998
JMI

- Kondo, Tetsujiro; and Kawaguchi, Kunjo, 5,748,235, Cl. 348-222.000.
- Kawaguchi, Makoto: *See*—
  - Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, 5,747,413, Cl. 503-201.000.
- Kawahata, Kazunari, to Murata Manufacturing Co., Ltd. Surface mounting antenna and antenna apparatus. 5,748,149, Cl. 343-700.0MS.
- Kawai, Hisao: *See*—
  - Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.
- Kawai, Hitohsi; Kawakami, Jun; and Tsukihara, Kouichi, to Nikon Corporation. Optical interference measuring apparatus and method for measuring displacement of an object having an optical path separating system. 5,748,315, Cl. 356-349.000.
- Kawai, Kazuhiko: *See*—
  - Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.
- Kawai, Kiyoshi, to Fuji Photo Film Co., Ltd. Method of forming colored images. 5,747,227, Cl. 430-363.000.
- Kawai, Miho: *See*—
  - Kamo, Jun; Koyanagi, Seiya; and Kawai, Miho, 5,746,916, Cl. 210-500.230.
- Kawai, Sumio: *See*—
  - Koiwai, Tamotsu; Kawai, Sumio; Kitazawa, Tatsuo; and Goto, Hisashi, 5,748,390, Cl. 359-811.000.
- Kawai, Tetsurou: *See*—
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Kawai, Yasumasa, to Kabushiki Kaisha Toshiba. Sector servo system data recording/reproducing apparatus without ID portion. 5,748,401, Cl. 360-78.140.
- Kawakami, Jun: *See*—
  - Kawai, Hitohsi; Kawakami, Jun; and Tsukihara, Kouichi, 5,748,315, Cl. 356-349.000.
- Kawakami, Sanji: *See*—
  - Suzuki, Tomosaburo; and Kawakami, Sanji, 5,746,105, Cl. 83-804.000.
- Kawakami, Youichi; and Dochi, Tohru, to Mitsubishi Denki Kabushiki Kaisha. Radar transponder. 5,748,139, Cl. 342-51.000.
- Kawakatsu, Nobuyuki: *See*—
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Kawakyu, Katsue: *See*—
  - Kameyama, Atsushi; Kawakyu, Katsue; and Ikeda, Yoshiko, 5,748,053, Cl. 333-103.000.
- Kawamoto, Tadasu: *See*—
  - Nagai, Shigekazu; and Kawamoto, Tadasu, 5,747,896, Cl. 310-20.000.
- Kawanishi, Masaki: *See*—
  - Saeki, Minoru; Kawanishi, Masaki; Tsuchiya, Yoshiaki; and Suzuki, Tomokiyo, 5,748,503, Cl. 364-565.000.
- Kawano, Hitoshi: *See*—
  - Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
- Kawano, Kyoichiro: *See*—
  - Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.
- Kawasaki, Kotaro; and Noda, Kazumi, to Mita Industrial Co., Ltd. Coupling mechanism for use in a semi-openable document presser of an image forming apparatus. 5,748,292, Cl. 355-75.000.
- Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, to Hitachi, Ltd.; Hitachi Microcomputer System Ltd.; and Hitachi ULSI Engineering Corp. Multiply connectable microprocessor and microprocessor system. 5,748,977, Cl. 395-800.000.
- Kawasaki Steel Corporation: *See*—
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Kawasaki, Yoko: *See*—
  - Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
- Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, to NTN Corporation. Friction type continuously variable transmission. 5,746,676, Cl. 476-50.000.
- Kawashima, Hideo: *See*—
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; aod Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Kawashima, Masahiro: *See*—
  - Gyoten, Takaaki; and Kawashima, Masahiro, 5,747,949, Cl. 315-382.100.
- Kawasugi, Tadaaki: *See*—
  - Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.
- Kawata, Satoshi: *See*—
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Kawazu, Keiichi: *See*—
  - Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.
- Kay, Brian K; Fowlkes, Dana M.; Adey, Nils B.; and Sparks, Andrew B., to University of North Carolina at Chapel Hill, The. Random peptide library. 5,747,334, Cl. 435-320.100.
- Kay, Martin: *See*—
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Kayser, Franz, to Voith Sulzer Finishing GmbH. Calender for treating a web of paper. 5,746,124, Cl. 100-331.000.
- Kazkaz, Ghaffar: *See*—
  - Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.
- Kearfott, Robert T.; and Raines, Garry F., to Line Power Manufacturing Corporation. Vented lid for electric enclosures. 5,746,340, Cl. 220-3.800.
- Kearns, John G.: *See*—
  - Beige, Marc P.; and Kearns, John G., 5,747,144, Cl. 428-187.000.
- Kebodeaux, Matthew S.: *See*—
  - Voll, Benn Arild; Kebodeaux, Matthew S.; Stringfellow, Steve; and Bayne, Christian F., 5,746,274, Cl. 166-278.000.
- Keefe, Brian J.: *See*—
  - Chapman, Terri I.; Tran, Hai Q.; and Keefe, Brian J., 5,748,209, Cl. 347-50.000.
- Keenan, Robert M.; and Hatsukami, Dorothy K., to Pharmaco Behavioral Associates, Inc. Use of cotinine to alleviate tobacco withdrawal syndrome. 5,747,512, Cl. 514-343.000.
- Keil, John, Jr.: *See*—
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Keilmann, Fritz: *See*—
  - van der Weide, D. W.; and Keilmann, Fritz, 5,748,309, Cl. 356-326.000.
- Kejha, Joseph B.: *See*—
  - Alamgir, Mohammed; Kejha, Joseph B.; and Shiao, Hung Chieh, 5,747,195, Cl. 429-235.000.
- Kelders, Johannes Hubertus Jozef Maria: *See*—
  - Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, 5,746,529, Cl. 401-18.000.
- Kellas, Sotiris; and Carden, Huey D., to United States of America, National Aeronautics and Space Administration. Crash-energy absorbing composite structure and method of fabrication. 5,746,537, Cl. 404-6.000.
- Kellett, George W.: *See*—
  - Smith, James A.; and Kellett, George W., 5,746,776, Cl. 8-142.000.
- Kellett, Patti Jean; Gosselink, Eugene Paul; and Perkins, Christopher Mark, to Procter & Gamble Company. Laundry detergents comprising heavy metal ion chelants. 5,747,440, Cl. 510-276.000.
- Kelley, Jeffrey T.; and Wrenbeck, Bruce, to United Technologies Automotive, Inc. Pulse width modulation and protection circuit. 5,748,428, Cl. 361-94.000.
- Kelly, Christopher P. J., to Hewlett-Packard Co. Fast technique for converting sampled analog measurements of a physical quanity to values expressed in engineering unit format. 5,748,105, Cl. 340-870.210.
- Kelly, James D.: *See*—
  - Krein, William Todd; Flaig, Charles M.; and Kelly, James D., 5,748,917, Cl. 395-306.000.
- Kelly, Stephen J.: *See*—
  - Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.
- Kelly, Thomas L.: *See*—
  - Nordgren, Gregory N.; and Kelly, Thomas L., 5,746,758, Cl. 606-159.000.
- Kelly, Thomas W.; and Memishian, John, to Analog Devices, Inc. Reset switch for a micromachined device. 5,748,004, Cl. 324-661.000.
- Kemmochi, Kazuhisa: *See*—
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Kempster, John Kenneth Charles: *See*—
  - Bee, John Arthur; Kempster, John Kenneth Charles; and Evans, Gareth, 5,747,230, Cl. 430-503.000.
- Kenmochi, Toshio: *See*—
  - Toyoda, Hisashi; Kenmochi, Toshio; Ezumi, Yosuke; and Tsukamoto, Takeshi, 5,748,327, Cl. 358-296.000.
- Kennedy, A. Terence: *See*—
  - Mayer, Jeremy; Belon, Juan B.; and Kennedy, A. Terence, 5,746,528, Cl. 400-625.000.

- Kennedy, Stephen E., to Red Ant, Inc. Method and system for music training. 5,746,605, Cl. 434-307.00R.
- Kennedy, Steven C.: *See*—
  - Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., 5,747,192, Cl. 429-163.000.
- Kenny, Daniel P.; Singer, Donald J.; and Kast, Gerhard G., to Dyckerhoff & Widmann AG of Munich. Sheathing cutting device. 5,745,996, Cl. 30-90.100.
- Kent State University: *See*—
  - Huang, Xiao-Yang; Bos, Philip J.; and Yang, Deng-Ke, 5,748,277, Cl. 349-169.000.
- Keritsis, Gus D.: *See*—
  - Arterbery, Cynthia W.; Callaham, W. Timothy; Keritsis, Gus D.; and White, Morris F., Jr., 5,746,230, Cl. 131-331.000.
- Kerlee, Jody: *See*—
  - Bezick, William; Fiedler, Allen E.; Kerlee, Jody; and Hemphill, Shan, 5,746,656, Cl. 463-42.000.
- Kerlin, Klaus-Günter: *See*—
  - Stegen, Helga; Blum, Joachim; and Kerlin, Klaus-Günter, 5,747,114, Cl. 427-380.000.
- Kernbach, Rolf: *See*—
  - Andl, Günter; and Kernbach, Rolf, 5,746,130, Cl. 101-424.000.
- Kerrigan, James J.: *See*—
  - Porter, Frank Kendall, Jr.; and Kerrigan, James J., 5,746,617, Cl. 439-248.000.
- Kersey, Alan D.; and Davis, Michael A., to United States of America, Navy. Sensing apparatus and method for detecting strain between fiber bragg grating sensors inscribed into an optical fiber. 5,748,312, Cl. 356-345.000.
- Kersken, Ulrich; and Claussen, Hinrich, to Robert Bosch GmbH. Method and apparatus for locating an available parking facility. 5,748,107, Cl. 340-905.000.
- Keryk, John Robert: *See*—
  - Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.
- Ketchum, Kevin D.: *See*—
  - Sokol, Michael A.; and Ketchum, Kevin D., 5,748,634, Cl. 370-402.000.
- Ketelsen, Sandra Mills: *See*—
  - Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.
- Ketineni, Venkateswarrao; and Bezzant, Daniel G., to Cirrus Logic, Inc. Combinational logic circuit, system and method for eliminating both positive and negative glitches. 5,748,034, Cl. 327-551.000.
- Kevill, John F.: *See*—
  - Ko, Lawrence K. C.; and Kevill, John F., 5,748,420, Cl. 360-133.000.
- Keyser, Frank Ray: *See*—
  - Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
- Keystone Industries, Inc.: *See*—
  - Brough, Steve A.; and Deppen, John F., 5,746,335, Cl. 213-43.000.
- KFx Inc.: *See*—
  - Koppelman, Edward, 5,746,787, Cl. 44-621.000.
- Khalil, Gamal; and Malin, Stephen F., to Instrumentation Metrics, Inc. Method and apparatus for multi-spectral analysis in noninvasive nir spectroscopy. 5,747,806, Cl. 250-339.120.
- Khargonekar, Pramod P.: *See*—
  - Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.
- Khattah, Ghazi M. A.: *See*—
  - Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.
- Khokhar, Wasim; and Bailey, Mark A., to Thomas & Betts Corporation. In-line cable tie. 5,745,957, Cl. 24-16.0PB.
- Khorramian, Behrooz A. Solid lubricant for low and high temperature applications. 5,747,428, Cl. 508-151.000.
- Khosravi, M. Javad; Mistry, Jehangir; and Diamandi, Anastasia, to Diagnostic Systems Laboratories, Inc. Immunoassay of total insulin-like growth factor binding protein-1. 5,747,273, Cl. 435-7.940.
- Kia Motors Corporation: *See*—
  - Lee, Jae-Woong, 5,746,294, Cl. 188-163.000.
- Kibala, Piotr A.: *See*—
  - Cooper, Fredrick L.; Kibala, Piotr A.; and Weismiller, Michael C., 5,746,924, Cl. 210-698.000.
- Kidd, Lisa A., to Nellcor Puritan-Bennett. CPAP nose mask. 5,746,201, Cl. 128-206.240.
- Kidokoro, Toru; Ito, Takaaki; and Hyodo, Yoshihiko, to Toyota Jidosha Kabushiki Kaisha. Fuel storing device for an automobile. 5,746,185, Cl. 123-516.000.
- Kidokoro, Toru, to Toyota Jidosha Kabushiki Kaisha. Fuel storing device for an automobile. 5,746,186, Cl. 123-516.000.
- Kiely, Joseph A.: *See*—
  - Zaccagni, Gregory R.; and Kiely, Joseph A., 5,746,077, Cl. 72-183.000.
- Kiely, Philip; Claisse, Paul; and Gable, Benjamin W., to Motorola, Inc. Integrated lateral detector and laser device and method of fabrication. 5,748,661, Cl. 372-50.000.
- Kieras, Ronald E., to Courtaulds Packaging Inc. Rotatable spout dispensing tube. 5,746,356, Cl. 222-212.000.
- Kiernan, Mark. Protection device for key lock openings. 5,746,078, Cl. 70-424.000.
- Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert; and Römheld, Michael, to Siemens Aktiengesellschaft. Device for detoxifying exhaust fumes from mobile equipment. 5,746,051, Cl. 60-275.000.
- Kieser, Jörg: *See*—
  - Amft, Dietrich; Branston, David-Walter; Kieser, Jörg; and Maier, Reinhard, 5,747,984, Cl. 324-71.200.
- Kikinis, Dan. PC peripheral interactive doll. 5,746,602, Cl. 434-169.000.
- Kikly, Ned L., to ITT Automotive Electrical Systems, Inc. Brush holder. 5,747,911, Cl. 310-239.000.
- Kikui, Shinsuke; Yasuda, Wataru; Shimeki, Ichiro; and Sugimoto, Naomi, to Ricoh Company, Ltd. Charging apparatus and method for use in image forming device. 5,749,022, Cl. 399-50.000.
- Kil, Myŏng-gun: *See*—
  - Kim, Chong-hoe; Kil, Myŏng-gun; Kwôn, Won-t'aek; and Kim, Kwang-chŏl, 5,747,221, Cl. 430-311.000.
- Kilian, Patricia: *See*—
  - Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,747,646, Cl. 530-351.000.
- Kilk, Erik; Van der Veer, Karen; and MacMillan, Leann M., to Hewlett-Packard Company. Communication pacing method. 5,748,613, Cl. 370-231.000.
- Killer Loop S.p.A.: *See*—
  - Simioni, Luciano; and Menegon, Sergio, 5,748,281, Cl. 351-121.000.
- Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, to Daewoo Electronics Co., Ltd. Microwave oven with turntable and swingable electrical heater. 5,747,781, Cl. 219-685.000.
- Kim, Chang-Sik: *See*—
  - Suk, Jong-Wook; Park, Jin-Ho; Park, Shin-Hyun; and Kim, Chang-Sik, 5,748,297, Cl. 356-72.000.
- Kim, Chong-hoe; Kil, Myŏng-gun; Kwôn, Won-t'aek; and Kim, Kwang-chŏl, to Hyundai Electronics Industries Co., Ltd. Photolithography method and photolithography system for performing the method. 5,747,221, Cl. 430-311.000.
- Kim, Dae-il; Kim, Nae-koo; Kim, Kyung-min; and Jeong, Dong-cheol, to Samsung Display Devices Co., Ltd. Plasma display panel with control resistance values for restricting current flow into the cathodes. 5,747,939, Cl. 315-169.400.
- Kim, Dae-Yul: *See*—
  - Lee, Joung-Sun; Kim, Dae-Yul; An, Yo-Han; and Jun, Jae-Kang, 5,746,652, Cl. 454-187.000.
- Kim, Do Chul, to Hyundai Motor Company. Hydraulic control system of transfer system for machine tools. 5,746,108, Cl. 91-444.000.
- Kim, Do Weon, to Samsung Electronics Co., Ltd. Clothes washing machine having upper and lower dynamic balancers. 5,746,069, Cl. 68-23.200.
- Kim, Dong-Wook; Son, Jeong-Hwan; Hong, Song-Cheol; and Kwon, Yeong-Se, to Korea Advanced Institute of Science and Technology. Varactor diode controllable by surface layout design. 5,747,865, Cl. 257-480.000.
- Kim, Dong-Wook: *See*—
  - Park, Yong-Chul; Paik, Joon-Ki; and Kim, Dong-Wook, 5,748,231, Cl. 348-208.000.
- Kim, Dong-You: *See*—
  - Kim, Young-Gon; and Kim, Dong-You, 5,748,450, Cl. 361-777.000.
- Kim, Ho: *See*—
  - Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, 5,747,081, Cl. 426-72.000.
- Kim, Hyeong-dong, to Samsung Display Devices Co., Ltd. Electron gun for cathode ray tube. 5,747,925, Cl. 313-446.000.
- Kim, In Eung; and Choukh, A. M., to Samsung Electro-Mechanics Co., Ltd. Magnetoresistive element assembly with longitudinal bias. 5,748,414, Cl. 360-113.000.
- Kim, Jae Kon: *See*—
  - Kim, Young Goo; and Kim, Jae Kon, 5,748,887, Cl. 395-185.050.
- Kim, Jae Sung. Automatic emergency alarm reception apparatus using specific frequency. 5,749,050, Cl. 455-228.000.
- Kim, Jae-Soo: *See*—
  - Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, 5,747,781, Cl. 219-685.000.
- Kim, Jeong Whan: *See*—
  - Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, 5,747,081, Cl. 426-72.000.
- Kim, Jim-Ki: *See*—
  - Kwon, Suk-Chun; and Kim, Jim-Ki, 5,748,536, Cl. 365-185.250.
- Kim, Jin Tae. Optical head of an optical disc recording/reproducing apparatus having a polygonal prism. 5,748,581, Cl. 369-44.230.
- Kim, Jin Yong; and Jeong, Seong Yun, to LG Electronics, Inc. Optical pickup apparatus for different discs. 5,748,603, Cl. 369-112.000.
- Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, to Electronics and Telecommunications Research Institute; and Korea Telecommunication Authority. Synchronization control of multimedia objects in an MHEG engine. 5,748,187, Cl. 345-302.000.
- Kim, Jin-Tae, to Hyundai Electronics Ind. Co., Ltd. Apparatus for detecting and correcting cyclic redundancy check errors. 5,748,652, Cl. 371-53.000.
- Kim, John Jungwoo, to McDonnell Douglas Corporation. Fiber optic ice detector. 5,748,091, Cl. 340-583.000.
- Kim, Jong-soo: *See*—
  - Chae, Seung-ki; Ahn, Byung-seol; Hahm, Sang-kyu; and Kim, Jong-soo, 5,746,832, Cl. 118-665.000.

OL
210
SS
1
MY
5
998
MI

- Kim, Keon-soo: *See—*
  - Yoo, Jong-weon; and Kim, Keon-soo, 5,747,848, Cl. 257-316.000.
- Kim, Ki Duk: *See—*
  - Hager, Arthur L., III; Marchant, Brian E.; Chuang, Shouping; and Kim, Ki Duk, 5,748,470, Cl. 364-187.000.
- Kim, Kwang-chŏl: *See—*
  - Kim, Chong-hoe; Kil, Myŏng-gun; Kwŏn, Won-t'aek; and Kim, Kwang-chŏl, 5,747,221, Cl. 430-311.000.
- Kim, Kyung-min: *See—*
  - Kim, Dae-il; Kim, Nac-koo; Kim, Kyung-min; and Jeong, Dong-cheol, 5,747,939, Cl. 315-169.400.
- Kim, Manyeob, to Dongyang Mechatronics Corp. Locking device. 5,746,457, Cl. 292-216.000.
- Kim, Nac-koo: *See—*
  - Kim, Dae-il; Kim, Nac-koo; Kim, Kyung-min; and Jeong, Dong-cheol, 5,747,939, Cl. 315-169.400.
- Kim, Nak-Seok, to Samsung Electronics Co., Ltd. Multi-layered disk focusing method and apparatus. 5,748,597, Cl. 369-94.000.
- Kim, Sang Soo: *See—*
  - Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
- Kim, Sang-Jin: *See—*
  - Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, 5,747,783, Cl. 219-758.000.
- Kim, Seong-Dae: *See—*
  - Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, 5,748,761, Cl. 382-107.000.
- Kim, Su Hwan; and Bae, Seong Ok, to LG Semicon Co., Ltd. Bit-pattern detector. 5,748,688, Cl. 375-368.000.
- Kim, Sung-kook; and Choi, Jin-whan, to Cheil Industries, Inc. HCFC resistant resin composition. 5,747,587, Cl. 525-87.000.
- Kim, Sung-Soo, to SamSung Electronics Co., Ltd. Apparatus and method for displaying operating states and characteristics of a computer system via icons and alphanumeric representations. 5,748,158, Cl. 345-33.000.
- Kim, Yang-Rae: *See—*
  - Son, Chang-Woo; and Kim, Yang-Rae, 5,747,764, Cl. 200-61.860. ,
- Kim, Yeoung Ku, to Goldstar Co., Ltd. Impregnation type cathode for a cathode for a cathodic ray tube. 5,747,921, Cl. 313-346.00R.
- Kim, Yo-Hee: *See—*
  - Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, 5,747,985, Cl. 324-103.00R.
- Kim, Young Baek: *See—*
  - Allcock, Harry R.; Visscher, Karyn; and Kim, Young Baek, 5,747,604, Cl. 525-417.000.
- Kim, Young Goo; and Kim, Jae Kon, to Hyundai Electronics Industries Co., Ltd. Inter-processor asynchronous serial communication transmission/reception apparatus using each other's memories. 5,748,887, Cl. 395-185.050.
- Kim, Young-Gon; and Kim, Dong-You, to LG Semicon Co., Ltd. BGA package using a dummy ball and a repairing method thereof. 5,748,450, Cl. 361-777.000.
- Kim, Young-Soo: *See—*
  - Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, 5,747,985, Cl. 324-103.00R.
- Kim, Young-Won; and Dimiduk, Dennis M., to United States of America, Air Force. Method to produce gamma titanium aluminide articles having improved properties. 5,746,846, Cl. 148-671.000.
- Kimberly Clark Corporation: *See—*
  - Rajala, Gregory John; Gehling, Steven Craig; and Suke, Paul Daniel, 5,745,922, Cl. 2-243.100.
- Kimberly-Clark Worldwide, Inc.: *See—*
  - Nielsen, Steven James; Rentmeester, Tammy Jo; Krueger, Allan James; and Weyenberg, Jeffrey Michael, 5,746,710, Cl. 609-14.000.
  - Nohr, Ronald Sinclair; and MacDonald, John Gavin, 5,747,550, Cl. 522-34.000.
  - Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, 5,746,887, Cl. 162-109.000.
- Kimmet, James S.: *See—*
  - Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.
- Kimmich, John R.: *See—*
  - Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., 5,746,550, Cl. 408-1.00R.
- Kimura, Isao: *See—*
  - Tanaka, Shinichi; and Kimura, Isao, 5,748,593, Cl. 369-59.000.
- Kimura, Katsuji, to NEC Corporation. AGC amplifier circuit using triple-tail cell. 5,748,041, Cl. 330-254.000.
- Kimura, Katsutaka: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
- Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, to Yokohama Rubber Co., Ltd., The. Room temperature curing polyurethane compositions. 5,747,627, Cl. 528-59.000.
- Kimura, Koji: *See—*
  - Shioyama, Yoshiyuki; Hori, Masako; and Kimura, Koji, 5,747,780, Cl. 219-648.000.
- Kimura, Makoto: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, to Toray Industries, Inc. Biaxially oriented, laminated polyester film. 5,747,174, Cl. 428-480.000.
- Kimura, Sumihisa: *See—*
  - Asakura, Sotoo; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, 5,747,069, Cl. 424-484.000.
- Kimura, Takashi; and Arakawa, Kaneyasu, to Kyokutoh Co., Ltd. Apparatus for non-destructively detecting a nugget for spot welding. 5,747,989, Cl. 324-235.000.
- Kimura, Tatsuya; and Takemi, Masayoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 5,748,659, Cl. 372-46.000.
- Kincaid, Derek Scott: *See—*
  - Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
- King, Bradley S.: *See—*
  - McGivern, Patrick T.; King, Bradley S.; and Graham, Steven, 5,748,466, Cl. 364-146.000.
- King, C. Richter; Kraus, Matthias H.; and Aaronson, Stuart A., to United States of America, Health and Human Services. Protein related to but distinct from EGF receptor and antibodies reactive therewith. 5,747,261, Cl. 435-7.100.
- King, Harold B., to General Electric Company. Fuel bundle filter for a nuclear reactor fuel bundle assembly. 5,748,694, Cl. 376-313.000.
- King Idustries, Inc.: *See—*
  - He, Zhigiang Alex; and Blank, Werner Joseph, 5,746,946, Cl. 252-392.000.
- King, Ronald Stewart: *See—*
  - Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
- King, Steven Row: *See—*
  - Inman, Wayne D.; King, Steven Row; Evans, Joseph L.; and Luo, Jian, 5,747,527, Cl. 514-453.000.
- Kingsley, Gary B.: *See—*
  - Salsman, Kenneth E.; Malik, Amjad I.; and Kingsley, Gary B., 5,748,379, Cl. 359-634.000.
- Kingston, Samuel C.; Burdoin, Robert B.; and Lamensdorf, David, to Lockheed Martin Corporation. Low radar cross section (RCS) high gain lens antenna. 5,748,151, Cl. 343-753.000.
- Kini, Ganesh D.: *See—*
  - Ojo-Amaize, Emmanuel A.; Cottam, Howard B.; and Kini, Ganesh D., 5,747,474, Cl. 514-46.000.
- Kink, John A.; Ryan, Terence E.; Todd, John A.; and Saeed, Badr. Epitope mapping of the c33 region of HCV. 5,747,240, Cl. 435-5.000.
- Kinne, Marianne: *See—*
  - Lutz, Josef; Kinne, Marianne; and Mueller, Heinz-Juergen, 5,747,872, Cl. 257-611.000.
- Kinno, Teruyuki: *See—*
  - Mizushima, Koichi; Kinno, Teruyuki; Yamauchi, Takashi; and Inomata, Koichiro, 5,747,859, Cl. 257-421.000.
- Kinoshita, Masanari: *See—*
  - Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,746,159, Cl. 122-367.100.
- Kinoshita, Masataka: *See—*
  - Wada, Ichiro; Kondo, Hideki; and Kinoshita, Masataka, 5,746,729, Cl. 604-378.000.
- Kinoshita, Shigenori: *See—*
  - Iijima, Katsuhiko; and Kinoshita, Shigenori, 5,747,959, Cl. 318-762.000.
- Kintz, Kevin G.; and Rogers, Mark D., to McDonnell Douglas Corporation. Circuit and method for preventing laser jamming of night vision goggles. 5,747,792, Cl. 250-214.0VT.
- Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas purification device for an engine. 5,746,052, Cl. 60-274.000.
- Kinukawa, Masahiko: *See—*
  - Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.
- Kirby, Orvalle Theodore: *See—*
  - Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., 5,748,958, Cl. 395-670.000.
- Kirchner, Katherene J.: *See—*
  - Petrides, George H.; and Kirchner, Katherene J., 5,746,156, Cl. 119-428.000.
- Kirkland, Larry V.; and Wiederholt, Jere D., to United States of America, Air Force. Neural engineering utility with adaptive algorithms. 5,748,846, Cl. 395-20.000.
- Kirkpatrick, Jay Albert. Fabricated electric lifting magnet. 5,748,062, Cl. 335-294.000.
- Kirschner, Ivan N.; and Berlam, Gary R., to United States of America, Navy. Muzzle brake for an underwater gun. 5,746,018, Cl. 42-1.140.
- Kishi, Junro: *See—*

  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Kishi, Norimasa: *See—*
  - Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
- Kishida, Yasushi: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
- Kishii, Kenichi: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Kishikawa, Tsutomu: *See—*
  - Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.
- Kishimoto, Masaaki: *See—*
  - Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.
- Kishino, Katsumi; and Kato, Toshihiro, to Kishino, Katsumi; and Daido Tokushuko Kabushiki Kaisha. Spin-polarized electron emitter having semiconductor opto-electronic layer with split valence band and reflecting mirror. 5,747,862, Cl. 257-436.000.
- Kiss, Bill: *See—*
  - Neathway, Graham; and Kiss, Bill, 5,748,094, Cl. 340-660.000.
- Kitagawa, Junichi, to Olympus Optical Company Limited. High numerical aperture and long working distance objective system using diffraction-type optical elements. 5,748,372, Cl. 359-565.000.
- Kitagawa, Katsuji: *See—*
  - Ono, Kazuya; Yasuda, Akira; and Kitagawa, Katsuji, 5,747,565, Cl. 523-413.000.
- Kitagawa, Yoshihisa; and Hirano, Shinichi, to Nikon Corporation. Vibration reducing apparatus and vibration reducing camera. 5,748,995, Cl. 396-55.000.
- Kitahara, Chiho: *See—*
  - Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.
- Kitajima, Tatsutoshi; and Yamamoto, Yasushi, to Ricoh Company, Ltd. Image signal coding device of electronic still camera. 5,748,233, Cl. 348-220.000.
- Kitamura, Mamoru, to NEC Corporation. Semiconductor memory device having extended margin in latching input signal. 5,748,553, Cl. 365-230.030.
- Kitamura, Toru: *See—*
  - Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.
- Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, to Hitachi, Ltd. Light receiving element and a method of fabricating the same. 5,747,864, Cl. 257-458.000.
- Kitayoshi, Hitoshi, to Advantest Corporation. Correlation function measurement method and apparatus, and wave source image visualization method and apparatus based on correlation function measurement. 5,748,314, Cl. 356-346.000.
- Kitazawa, Tatsuo: *See—*
  - Koiwai, Tamotsu; Kawai, Sumio; Kitazawa, Tatsuo; and Goto, Hisashi, 5,748,390, Cl. 359-811.000.
- Kiyota, Hirotaka, to Yazaki Corporation. Fuse box. 5,748,068, Cl. 337-208.000.
- Kizaki, Masami: *See—*
  - Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.
- Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, to Biomembrane Institute, The. Monoclonal antibodies and vaccine development directed to human cancer-associated antigens by immunization with animal and human mucin and with synthetic carbohydrate-carrier conjugates. 5,747,048, Cl. 424-277.100.
- Kjellqvist, Olof: *See—*
  - Johansson, Ola; and Kjellqvist, Olof, 5,747,707, Cl. 73-862.623.
- Kjorsvik, Reidar, to WiseVision AS. Presentation system for individual personal computers in a personal computer network. 5,748,190, Cl. 345-329.000.
- KLA-Tencor. Corporation: *See—*
  - Norton, Adam E.; Mallory, Chester L.; Pham, Hung V.; and Rasmussen, Paul, 5,747,813, Cl. 250-372.000.
- Klages, Claus-Peter: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
- Klamm, Thomas L. Portable work light with optical fiber adapter. 5,746,495, Cl. 362-32.000.
- Klamma, Klaus; and Bald, Wilfried, to SMS Schloemann-Siegmag Aktiengesellschaft. Reversing compact installation for cold rolling strip-shaped rolling material. 5,746,081, Cl. 72-229.000.
- Klassen, Dwayne: *See—*
  - Klassen, Karen; and Klassen, Dwayne, 5,746,433, Cl. 273-302.000.
- Klassen, Karen; and Klassen, Dwayne. Method of playing a cards and dice game to develop public speaking ability. 5,746,433, Cl. 273-302.000.
- Kleemann, Heinz-Werner: *See—*
  - Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.
- Klees, Kevin John, to Eastman Kodak Company. Method and apparatus for capturing a stored preexisting image on a user's image recording medium. 5,748,239, Cl. 348-373.000.
- Klein, Dean A. Computer system usage determination based on hard disk drive activity. 5,748,957, Cl. 395-652.000.
- Klein, Markus: *See—*
  - Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert; and Römheld, Michael, 5,746,051, Cl. 60-275.000.
- Kleinhoff, Klaus: *See—*
  - Schulze, Thomas; Roik, Geert; Hahn, Michael; and Kleinhoff, Klaus, 5,746,848, Cl. 152-209.00R.
- Kleinschmidt, Roger E. Transparent shelf for display assembly. 5,746,332, Cl. 211-153.000.
- Klenk, Martin: *See—*
  - Damson, Eckart; Klenk, Martin; and Miller, Stefan, 5,746,176, Cl. 123-336.000.
- Kleshinski, Stephen J.; Simon, Morris A.; and Rabkin, Dmitry, to Nitinol Medical Technologies, Inc. Stent and method and apparatus for forming and delivering the same. 5,746,765, Cl. 606-198.000.
- Klimcak, Charles M.: *See—*
  - Jaduszliwer, Bernardo; Klimcak, Charles M.; and Loper, Gary L., 5,747,348, Cl. 436-106.000.
- Klimesch, Roger: *See—*
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Klinar, Robert: *See—*
  - Dochtermann, Ulrich; Fein, Peter; Klinar, Robert; and Philipps, Werner, 5,747,885, Cl. 307-10.200.
- Klinedinst, Steven Zane, to Whitaker Corporation, The. Lifting device for a crimped wire assembly. 5,745,982, Cl. 29-753.000.
- Klingbeil, William R.: *See—*
  - Griffin, David C.; Wiersema, Dale T.; Eldridge, Richard A.; and Klingbeil, William R., 5,747,773, Cl. 219-130.100.
- Klingelhöfer, Paul: *See—*
  - Müller, Michael Wolfgang; Klingelhöfer, Paul; and Weiss, Stefan, 5,746,812, Cl. 106-10.000.
- Klingler, Peter, to Siemens Aktiengesellschaft. Motor-gear drive unit, particularly for an automobile window lifter drive or the like, in which a motor-gear shaft is mounted. 5,747,903, Cl. 310-75.00R.
- Klintz, Ralf: *See—*
  - Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.
- Klockow, Michael: *See—*
  - Jonas, Rochus; Wolf, Michael; and Klockow, Michael, 5,747,489, Cl. 514-222.500.
- Kmiecik-Lawrynowicz, Grazyna E.: *See—*
  - Ong, Beng S.; Mychajlowskijj, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.
- Knauss, Hans-Peter; Mayer, Hartmut; and Goetz, Bernhard, to Dr. Ing. h.c.F. Porsche AG. Floor conveyor vehicle. 5,746,291, Cl. 187-223.000.
- Kneuper, Heinz-Josef: *See—*
  - Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.
- Kniest, James; and Petersen, Jay Dee, to Kniest, James N. Digital tone synthesis modeling for complex instruments. 5,747,714, Cl. 84-604.000.
- Kniest, James N.: *See—*
  - Kniest, James; and Petersen, Jay Dee, 5,747,714, Cl. 84-604.000.
- Knitza, Reinhold: *See—*
  - Rall, Gerhard; and Knitza, Reinhold, 5,746,212, Cl. 128-672.000.
- Knorr-Bremse Systeme Fur Nutzfahrzeuge GmbH: *See—*
  - Gerum, Eduard; Laszlo, Palkovics; Semsey, Akos; and Barta, Gabor, 5,747,683, Cl. 73-118.100.
- Knox, Andrew: *See—*
  - Beeteson, John; and Knox, Andrew, 5,747,923, Cl. 313-431.000.
  - Beeteson, John; and Knox, Andrew, 5,747,933, Cl. 315-1.000.
- Knudson, Mark B.: *See—*
  - Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.

Knutsen, Stian V.; and Fresvig, Jan. Disc case. 5,746,314, Cl. 206-308.100.

Knutson, Martin Arthur: *See—*

Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., 5,749,074, Cl. 705-8.000.

Ko, Jung-wan, to Samsung Electronics Co., Ltd. Devices and methods for channel-encoding and channel-decoding of digital data. 5,748,119, Cl. 341-59.000.

Ko, Lawrence K. C.; and Kevill, John F., to Swan Instruments, Inc. Ultra-high capacity removable media cartridge configured to prevent insertion in a conventional floppy disk drive. 5,748,420, Cl. 360-133.000.

Ko, Lily. Infusion vessel. 5,746,113, Cl. 99-323.000.

Ko, Wai-Shing P.: *See—*

Wiesemann, David L.; Schaaf, Daniel E.; and Ko, Wai-Shing P., 5,747,937, Cl. 315-159.000.

Ko, Wen-San. Method and arrangement for resolution enhancement. 5,748,494, Cl. 364-525.000.

Kobayashi, Fumiko: *See—*

Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, to Hirakawa Guidom Corporation. Combustion device in tube nested boiler and its method of combustion. 5,746,159, Cl. 122-367.100.

Kobayashi, Hiroya: *See—*

Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.

Kobayashi, Katsumi: *See—*

Kato, Miki; Tamano, Yukinori; Kobayashi, Katsumi; and Noba, Michiyuki, 5,747,743, Cl. 174-254.000.

Kobayashi, Katsuyuki: *See—*

Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.

Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, to Hitachi, Ltd.; and Hitachi Computer Electronics Co., Ltd. Enhanced information processing system using cache memory indication during DMA accessing. 5,749,093, Cl. 711-139.000.

Kobayashi, Kenichi; Makida, Seigo; Nishihara, Yoshio; and Hiji, Naoki, to Fuji Xerox Co., Ltd. Image information enlarging reading device. 5,748,228, Cl. 348-63.000.

Kobayashi, Kenji: *See—*

Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Kobayashi, Masakazu: *See—*

Sato, Mitsuru; Kobayashi, Masakazu; and Nakayama, Toshimasa, 5,747,224, Cl. 430-331.000.

Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, to Hoya Corporation. Method of manufacturing magnetic recording medium. 5,746,893, Cl. 204-192.200.

Kobayashi, Nobuhisa: *See—*

Yoshida, Minoru; Mizuguchi, Hideki; Kobayashi, Nobuhisa; and Ishida, Masaharu, 5,747,077, Cl. 425-183.000.

Kobayashi, Seiji; Okamura, Hiroshige; Yamatsu, Hisayuki; and Kashiwagi, Toshiyuki, to Sony Corporation. Information recording medium wherein digital symbols are represented by discrete shift amounts of a pit edge and tracking wobbling pits are shared between adjacent tracks and information recording and reproducing apparatus therefor. 5,748,582, Cl. 369-44.260.

Kobayashi, Seiji; and Kock, Joost De, to Sony Corporation. Data recording method and apparatus for minimizing the influence of inter symbol interface. 5,748,586, Cl. 369-48.000.

Kobayashi, Yukio, to Fujitsu Limited. Cache memory testing method. 5,748,879, Cl. 395-183.180.

Kobayashi, Yukio: *See—*

Wakabayashi, Osamu; and Kobayashi, Yukio, 5,748,316, Cl. 356-352.000.

Koch, Carol A.: *See—*

Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., 5,747,192, Cl. 429-163.000.

Koch, John: *See—*

Song, Jin; Koch, John; and Squier, Marilyn, 5,747,007, Cl. 424-69.000.

Koch, Kevin, to Pfizer Inc. Sugar derivatives of macrolides. 5,747,465, Cl. 514-28.000.

Koch, Steven J.: *See—*

Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.

Kochanski, Gregory Peter: *See—*

Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, 5,747,918, Cl. 313-309.000.

Kock, Joost De: *See—*

Kobayashi, Seiji; and Kock, Joost De, 5,748,586, Cl. 369-48.000.

Koda, Yasunori; and Tanaka, Tsuyoshi, to Fuji Xerox Co., Ltd. Document processing system. 5,749,083, Cl. 707-530.000.

Kodaira, Jun-ichi: *See—*

Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,748,353, Cl. 359-197.000.

Kodaira, Takanori, to Canon Kabushiki Kaisha. Camera. 5,749,012, Cl. 396-435.000.

Kodama, Hiroshi; Wada, Yasuhiro; and Yamaguchi, Rikio, to Rhone-Poulenc Agrochimie. Synergistic termiticidal composition of pyrethroid and N-phenyl-pyrazole. 5,747,519, Cl. 514-407.000.

Kodama, Tatsuhiko: *See—*

Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, 5,747,451, Cl. 514-12.000.

Kodate, Manabu, to International Business Machines Corporation. Color filter, liquid crystal display panel, liquid crystal display, and liquid crystal display panel manufacturing method. 5,748,266, Cl. 349-39.000.

Koditschek, Daniel E.: *See—*

Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.

Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Illuminating apparatus of endoscope. 5,746,494, Cl. 362-32.000.

Koehn, Matthias-Reinhard. Flat input keyboard for data processing machines or the like and process for producing the same. 5,748,114, Cl. 341-22.000.

Koenig & Bauer-Albert Aktiengesellschaft: *See—*

Schaede, Johannes Georg, 5,746,091, Cl. 74-409.000.

Koenigseder, Sigmund: *See—*

Lee, Chang-Ou; Vines, Landon B.; Fujishiro, Felix H.; and Koenigseder, Sigmund, 5,745,990, Cl. 29-852.000.

Koeslin, Kenneth J.: *See—*

Duske, Wilfried P.; Hogue, Robert T.; and Koeslin, Kenneth J., 5,746,006, Cl. 34-136.000.

Koford, Stuart: *See—*

Orrico, Mario; Farhadieh, Rou; Avramovich, Rudy; and Koford, Stuart, 5,747,782, Cl. 219-689.000.

Kogawa, Osamu: *See—*

Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Koguchi, Nobuyuki: *See—*

Chikyou, Toyohiro; and Koguchi, Nobuyuki, 5,748,360, Cl. 359-298.000.

Kogyo Kabushiki Kaisha: *See—*

Tanabe, Satoshi, 5,747,611, Cl. 526-73.000.

Kohara, Kimio: *See—*

Torii, Akito; and Kohara, Kimio, 5,746,269, Cl. 165-10.000.

Kohara, Tsunehiro: *See—*

Torimoto, Tadashi; Asano, Yasuhiro; Kohara, Tsunehiro; and Nishimura, Tetsuya, 5,747,177, Cl. 428-537.100.

Kohaut, John E.: *See—*

Bera, John; and Kohaut, John E., 5,747,732, Cl. 174-48.000.

Kohira, Hiroyuki, to Seiko Instruments Inc. Printer with printhead and pressing body in point contact. 5,746,520, Cl. 400-120.010.

Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, to Bayer AG. High-impact molding compounds based on polyisobutylene-containing polycarbonate. 5,747,586, Cl. 525-67.000.

Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, to Bayer AG. Process for the production of polycarbonate-polyisobutylene block cocondensates. 5,747,589, Cl. 525-146.000.

Kohler, Dietmar, to Heron Sondermaschinen und Steuerungen Ges.m.b.H. Plate fastener. 5,746,535, Cl. 403-258.000.

Köhler, Thomas, to Linotype-Hell AG. Process control strip and method for recording. 5,748,331, Cl. 358-302.000.

Köhler, Ulrich: *See—*

Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.

Kohlert, Rudolf. Clamping device for securing a first component, such as a tool, to a second component. 5,746,420, Cl. 269-32.000.

Kohlhaas, Frank Anthony. Pallet assembly. 5,745,973, Cl. 29-432.000.

Kohnert, Ulrich; Fischer, Stephan; Markl, Hans-Jörg; and Woog, Heinrich, to Boehringer Mannheim GmbH. Pharmaceutical preparation containing plasminogen activators. 5,747,030, Cl. 424-94.640.

Kohno, Makiko: *See—*

Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.

Kohno, Takanobu: *See—*

Yoshizawa, Masaki; Kohno, Takanobu; and Ota, Satoshi, 5,746,384, Cl. 242-334.400.

Kohsaka, Hitoshi: *See—*

Carson, Dennis A.; and Kohsaka, Hitoshi, 5,747,251, Cl. 435-6.000.

Kohut, Michael J.: *See—*

Ozaki, Yoshio; and Kohut, Michael J., 5,748,746, Cl. 381-18.000.

Koide, Shunichi: *See—*

Yamamoto, Norio; Fujikawa, Takayuki; Koide, Shunichi; and Suzuki, Yoshiichi, 5,747,122, Cl. 428-1.000.

Koifman, Vladimir; Afek, Yachin; and Kashat, Israel, to Motorola, Inc. Bias generator providing process and temperature invariant MOSFET transconductance. 5,748,030, Cl. 327-513.000.

Koike, Kunihiko; and Inoue, Goichi, to Iwatani Sangyo Kabushiki Kaisha Iwatani International Corporation. Process for passivating treatment of piping system for high-purity gas. 5,746,841, Cl. 148-280.000.

Koike, Masahiro: *See—*

Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.

Koike, Sou; Hirano, Masao; and Okubo, Takayuki, to YKK Architectural Products Inc. Structure for attaching a lower transverse frame member of a sash to a lower edge of a building opening. 5,746,032, Cl. 52-204.100.

Koito Manufacturing Co., Ltd.: *See—*

Machida, Tsutomu, 5,746,497, Cl. 362-80.000.

Shirai, Katutada, 5,746,559, Cl. 411-182.000.

Tatsukawa, Masashi, 5,746,491, Cl. 362-61.000.

Koiwai, Tamotsu; Kawai, Sumio; Kitazawa, Tatsuo; and Goto, Hisashi, to Olympus Optical Co., Ltd. Imaging lens system. 5,748,390, Cl. 359-811.000.

Koizumi, Hirotaka, to NEC Corporation. Printing control apparatus for spacing 1-byte and 2-byte characters. 5,746,524, Cl. 400-306.000.

Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, to Hitachi, Ltd.; and Hitachi Microcomputer System Ltd. Removal method of organic matter and system for the same. 5,747,387, Cl. 438-708.000.

Koizumi, Minoru: *See—*

Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.

Koizumi, Yutaka: *See—*

Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Kojima, Koichi: *See—*

Murachi, Mikio; Okawara, Seiji; Kojima, Koichi; and Kondo, Takuya, 5,746,989, Cl. 423-212.00R.

Kojima, Masakazu, to Dyadic Systems Co., Ltd. Turret head device for machine tool. 5,745,967, Cl. 29-40.000.

Kojo, Kiyoshi: *See—*

Hashiba, Hidetoshi; Aoyagi, Shoji; Fujii, Hitoshi; and Kojo, Kiyoshi, 5,747,156, Cl. 428-328.000.

Kokubo, Masahiro: *See—*

Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.

Kollotzek, Helmut: *See—*

Issler, Wolfgang; and Kollotzek, Helmut, 5,746,169, Cl. 123-193.600.

Kolze, Thomas J.: *See—*

Finkenbeiner, Pascal G.; and Kolze, Thomas J., 5,748,679, Cl. 375-305.000.

Komai, Nobuyoshi: *See—*

Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.

Komatsu Electronic Metals Co., Ltd.: *See—*

Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, 5,747,364, Cl. 438-14.000.

Komatsu Ltd.: *See—*

Matsumura, Yukinori; and Tanaka, Hirokazu, 5,747,772, Cl. 219-121.850.

Wakabayashi, Osamu; and Kobayashi, Yukio, 5,748,316, Cl. 356-352.000.

Kometani, Osamu; Wakano, Shoichi; and Asakura, Mikio, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Co., Ltd. Semiconductor memory device. 5,748,549, Cl. 365-226.000.

Komiya, Kyosuke; and Fukuoka, Shinsuke, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing an aromatic polycarbonate having improved melt stability. 5,747,609, Cl. 526-68.000.

Komma, Yoshiaki: *See—*

Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, 5,748,599, Cl. 369-103.000.

Komoda, Motoyoshi, to NEC Corporation. Time correction of an electronic clock. 5,748,570, Cl. 368-202.000.

Komori, Akira: *See—*

Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.

Komori, Takashi; and Katagiri, Shigeru, to ATR Human Information Processing Research Laboratories. Pattern and speech recognition using accumulated partial scores from a posteriori odds, with pruning based on calculation amount. 5,749,069, Cl. 704-240.000.

Komori, Tomoyasu: *See—*

Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.

Komoriya, Susumu: *See—*

Nakayama, Yasuhiko; Shiba, Masataka; and Komoriya, Susumu, 5,747,201, Cl. 430-30.000.

Konath, Kannan: *See—*

Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, 5,748,124, Cl. 341-120.000.

Konder, Wolfgang; and Wollscheid, Heinz-Peter, to Laeis + Bucher GmbH. Method and apparatus for quality inspection or molded of formed articles. 5,748,322, Cl. 356-394.000.

Kondo, Hideki: *See—*

Wada, Ichiro; Kondo, Hideki; and Kinoshita, Masataka, 5,746,729, Cl. 604-378.000.

Kondo, Makoto: *See—*

Miyasaka, Motohiro; Kondo, Makoto; and Otsuka, Shigeru, 5,746,516, Cl. 384-291.000.

Kondo, Mituo, to Fuji Photo Optical Co., Ltd. Flexible sheathing tube construction. 5,746,696, Cl. 600-139.000.

Kondo, Takayuki, to NEC Corporation. Method of time-slot allocation in a TDMA communication system. 5,748,624, Cl. 370-347.000.

Kondo, Takuya: *See—*

Murachi, Mikio; Okawara, Seiji; Kojima, Koichi; and Kondo, Takuya, 5,746,989, Cl. 423-212.00R.

Kondo, Tetsujiro; and Kawaguchi, Kunjo, to Sony Corporation. Imaging apparatus including means for converting red, green, and blue signal components of standard resolution to respective high resolution signal components. 5,748,235, Cl. 348-222.000.

Kondo, Toshio: *See—*

Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Kondo, Tsuyoshi; and Mukawa, Hiroshi, to Sony Corporation. Apparatus for recording and/or reproducing a recording medium having data control function. 5,748,576, Cl. 369-32.000.

Kondo, Yosuke, to Shinto Paint Co., Ltd. Water-dilutive and conductive coating composition capable of affording desired color tone. 5,746,948, Cl. 252-519.330.

Kondo, Yuji: *See—*

Sugimoto, Mitsuhiro; Kondo, Yuji; Zama, Koichi; and Sato, Yuko, 5,747,916, Cl. 310-348.000.

Konica Corporation: *See—*

Hasegawa, Takuji, 5,747,229, Cl. 430-465.000.

Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.

Nakayama, Haruki; Honda, Yuichi; and Imaizumi, Toshio, 5,748,386, Cl. 359-694.000.

Shimazaki, Yoshio; and Emura, Tetsuji, 5,748,394, Cl. 359-823.000.

Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.

König, Hartmann: *See—*

Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.

Konigsfeld, Kris G.: *See—*

Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.

Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Clutch slip control device and method of manufacturing the same, clutch slip control method, and vehicle control device. 5,749,061, Cl. 701-68.000.

Konuma, Kazuo, to NEC Corporation. Image sensor and driving method for the same. 5,748,232, Cl. 348-219.000.

Konuma, Toshimitsu; Sugawara, Akira; and Tsuji, Takahiro, to Semiconductor Energy Laboratory Co., Ltd. Method for producing a transistor using anodic oxidation. 5,747,355, Cl. 437-41.000.

Koo, Jackson C.: *See—*

Balch, Joseph W.; Carrano, Anthony V.; Davidson, James C.; and Koo, Jackson C., 5,746,901, Cl. 204-606.000.

Kopp, Joseph J., Jr.: *See—*

Moore, Devin Lee; McMillan, John A.; and Kopp, Joseph J., Jr., 5,748,836, Cl. 392-337.000.

Koppel, Gary A.: *See—*

Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., 5,747,524, Cl. 514-443.000.

Koppelman, Edward, to KFx Inc. Process for treating carbonaceous materials. 5,746,787, Cl. 44-621.000.

Koppers Industries, Inc.: *See—*

McHenry, E. Ronald; and Saver, William E., 5,746,906, Cl. 208-22.000.

Kordel, Gerhard: *See—*

Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.

Korea Advanced Institute of Science and Technology: *See—*

Kim, Dong-Wook; Son, Jeong-Hwan; Hong, Song-Cheol; and Kwon, Yeong-Se, 5,747,865, Cl. 257-480.000.

Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, 5,747,690, Cl. 73-504.120.

Korea Electric Power Corporation: *See—*

Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, 5,747,985, Cl. 324-103.00R.

Korea Information & Communication Co., Ltd.: *See—*

Lee, Jong Duk; Chun, Kuk Jin; Park, Byung Gook; and Lyu, Jeong Ho, 5,747,356, Cl. 437-44.000.

Korea Research Institute of Chemical Technology: *See—*

Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.

VOL 210 ISS 1 MY 5 1998 UMI

- Korea Telecommunication Authority: *See—*
  - Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.
- Korec, Jacek: *See—*
  - Loose, Werner; Korec, Jacek; Niemann, Ekkehard; and Boos, Alfred. 5,747,831, Cl. 257-77.000.
- Koriakin, Yurii Nikolaevich: *See—*
  - Smirnov, Aleksandr Vitalievich; Orlov, Oleg Georgievich; Golipad, Pyotr Nikolaevich; Koriakin, Yurii Nikolaevich; and Yegorov, Boris Mikhailovich, 5,747,561, Cl. 523-212.000.
- Korman, Charles Steven: *See—*
  - Roshen, Waseem Ahmed; Korman, Charles Steven; and Daum, Wolfgang, 5,745,981, Cl. 29-607.000.
- Kormanyos, Kenneth R., to Gas Research Institute. Process for heating glass sheets within a forced convection heating apparatus by mixing and distributing spent working fluid and combustion gases. 5,746,799, Cl. 65-111.000.
- Kornberger, Martin: *See—*
  - Brunner, Dieter; Damrath, Joachim; and Kornberger, Martin, 5,746,118, Cl. 99-427.000.
- Korremann, Birgitte: *See—*
  - Fosbøl, Peder; Korremann, Birgitte; and Ullum, Henrik, 5,747,087, Cl. 426-242.000.
- Korsgaard, Niels; Piggott, James Robertson; Labroo, Virender Mohan; and Bain, Steven, to Novo Nordisk A/S. Atrophy of skin/mucous membrane. 5,747,059, Cl. 424-451.000.
- Korta, Jean-Charles; Davis, Derek L.; Spaw, William J.; and Clark, Lawrence T., to Intel Corporation. Light sensing device. 5,748,303, Cl. 356-229.000.
- Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, to Nissan Motor Co., Ltd. Apparatus and method for navigating vehicle to destination using display unit. 5,748,109, Cl. 340-995.000.
- Kosaka, Yoshiomi: *See—*
  - Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, 5,747,053, Cl. 424-405.000.
- Koshio, Chiharu: *See—*
  - Nishio, Takashi; Koshio, Chiharu; Tsuchiya, Kunimoto; and Matsumoto, Tetsuya, 5,748,159, Cl. 345-76.000.
- Koslov, Vitali Ivanovich. Digital PLL frequency synthesizer. 5,748,043, Cl. 331-1.00A.
- Kosokabe, Hiroyuki; and Hashimoto, Koichi, to Nippon Electric Glass Co., Ltd. Glass for a fluorescent lamp. 5,747,399, Cl. 501-67.000.
- Kostelnik, Robert J.; and Wen, Fu-Chu, to SCM Chemicals, Inc. High solids anatase TiO_2 slurries. 5,746,819, Cl. 106-447.000.
- Koszalka, George Walter: *See—*
  - Krenitsky, Thomas Anthony; Averett, Devron Randolph; Koszalka, George Walter; and Wolberg, Gerald, 5,747,472, Cl. 514-45.000.
- Kotani, Miki: *See—*
  - Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, 5,747,945, Cl. 315-248.000.
- Kotzbauer, Paul T.: *See—*
  - Johnson, Eugene M., Jr.; Milbrandt, Jeffrey D.; Kotzbauer, Paul T.; and Lampe, Patricia A., 5,747,655, Cl. 530-399.000.
- Kouken Company, Limited: *See—*
  - Matsumoto, Kesafumi, 5,746,119, Cl. 99-451.000.
- Kourepenis, Anthony S.: *See—*
  - Ward, Paul A.; and Kourepenis, Anthony S., 5,747,961, Cl. 318-646.000.
- Kourilsky, Philippe: *See—*
  - Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, 5,747,246, Cl. 435-6.000.
- Kousoulas, Konstantin: *See—*
  - Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., 5,747,659, Cl. 536-23.400.
- Kovacs, Frank, Jr., to AT&T Corp. Method for automatically initiating a calling card telephone call. 5,748,713, Cl. 379-95.000.
- Kovarovic, Josef; and Kowalewsky, John Ralph, to Western Atlas U.K. Limited. Hemming machine. 5,746,083, Cl. 72-315.000.
- Koverola, Matti, to Suomen Yrittäjäin Tuki R.Y. Method of producing a wooden package or container and a wooden package or container. 5,746,263, Cl. 144-355.000.
- Kowalczykowski, Stephen C.; and Eggleston, Angela K., to University of California, The Regents of The. Spectroscopic helicase assay. 5,747,247, Cl. 435-6.000.
- Kowalewsky, John Ralph: *See—*
  - Kovarovic, Josef; and Kowalewsky, John Ralph, 5,746,083, Cl. 72-315.000.
- Koyama, Masao: *See—*
  - Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
- Koyama, Seiji: *See—*
  - Hassner, Martin; Koyama, Seiji; Nozawa, Tohru; Terukina, Asao; and Tetsuya, Tamura, 5,748,023, Cl. 327-336.000.
- Koyama, Toshio: *See—*
  - Ueda, Toshiaki; Ueno, Katsuhiko; Ono, Yoshihiro; and Koyama, Toshio, 5,748,237, Cl. 348-333.000.
- Koyanagi, Seiya: *See—*
  - Kamo, Jun; Koyanagi, Seiya; and Kawai, Miho, 5,746,916, Cl. 210-500.230.
- Koyo Seiko Co., Ltd.: *See—*
  - Yonezawa, Masami, 5,746,285, Cl. 180-428.000.
- Kozlowski, Mark L.; and Whiteaker, Ross, to Siemens Stromberg-Carlson. Universal modular housing system. 5,747,734, Cl. 174-50.000.
- Kozlowski, Roman: *See—*
  - Tokarz, Marek; Persson, Michael; and Kozlowski, Roman, 5,747,171, Cl. 428-446.000.
- Kozuka, Shoji: *See—*
  - Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.
- Kraatz, Gerald A., to Whizard Protective Wear Corp. Cut-resistant protective glove with leather sheath. 5,745,919, Cl. 2-161.600.
- Kraft, Arno: *See—*
  - Friend, Richard Henry; Holmes, Andrew Bruce; Bradley, Donal Donat Conor; Burn, Paul Leslie; Kraft, Arno; Brown, Adam Richard; Burroughes, Jeremy Henley; and Greenham, Neil Clement, 5,747,182, Cl. 428-690.000.
- Kraft Foods, Inc.: *See—*
  - Cochran, Stuart A.; Goll, Steven J.; Lippincott, Howard C.; and Winkler, Gary A., 5,747,084, Cl. 426-120.000.
  - Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.
- Kraft, Horst; Purr, Horst; and Engelhardt, Edgar, to Bizerba GmbH & Co. KG. Weighing device for the point-of-sale of a retail outlet. 5,747,744, Cl. 177-25.150.
- Kraft, Josef: *See—*
  - Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.
- Kramer, Daniel E. Physchrometric measurement of air flow through airconditioning evaporator. 5,746,061, Cl. 62-127.000.
- Kramer, Kenneth L.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Kramer, Steven; Srinivasan, Sujatha; and Swanson, Verner, to University of Toledo, The. Knee joint mechanism for knee disarticulation prosthesis. 5,746,774, Cl. 623-39.000.
- Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, to Tufts University; and Worcester Polytechnic Institute. External fixator system. 5,746,741, Cl. 606-54.000.
- Kraus, Matthias H.: *See—*
  - King, C. Richter; Kraus, Matthias H.; and Aaronson, Stuart A., 5,747,261, Cl. 435-7.100.
- Krause, Werner: *See—*
  - Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
- Kraushaar, Jim: *See—*
  - Berman, Paul; and Kraushaar, Jim, 5,746,686, Cl. 482-125.000.
- Kreckel, Karl W., to Minnesota Mining and Manufacturing Company. Process for bundling and/or fixing articles by use of an extensible plastic tape. 5,747,131, Cl. 428-40.100.
- Krein, William Todd; Flaig, Charles M.; and Kelly, James D., to Apple Computer, Inc. Line data architecture and bus interface circuits and methods for dual-edge clocking of data to bus-linked limited capacity devices. 5,748,917, Cl. 395-306.000.
- Krementsov, Yuriy. Dynamometer for determining human force. 5,747,688, Cl. 73-379.010.
- Krenitsky, Thomas Anthony; Averett, Devron Randolph; Koszalka, George Walter; and Wolberg, Gerald, to Glaxo Wellcome Inc. Therapeutic methods for using ARA-G derivatives. 5,747,472, Cl. 514-45.000.
- Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, to Minnesota Mining and Manufacturing Company. Silyl terminated sulfopoly(ester-urethane pavement marking compositions. 5,747,626, Cl. 528-28.000.
- Kress, Dieter; and Häberle, Friedrich, to Mapal Fabrik für Präzisionswerkzeuge Dr. Kress KG. Metal cutting tool. 5,746,549, Cl. 407-102.000.
- Krevald, Walter Richard: *See—*
  - Schenck, Robert R.; and Krevald, Walter Richard, 5,746,704, Cl. 601-40.000.
- Kriegsman, Daniel S.: *See—*
  - Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S., 5,748,135, Cl. 341-176.000.
- Kriegsman, Edward M.: *See—*
  - Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S., 5,748,135, Cl. 341-176.000.
- Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S. Wireless remote control transmitter for use with consumer entertainment electronics appliance. 5,748,135, Cl. 341-176.000.
- Krinickas, Alexander: *See—*
  - Parker, Barry John; Krinickas, Alexander; Stilwell, John Douglas; and Brown, Neil Leonard, 5,746,580, Cl. 416-245.00R.
- Krischke, Wolfgang: *See—*
  - Boergardts, Peter; Krischke, Wolfgang; and Troesch, Walter, 5,746,920, Cl. 210-611.000.
- Krivak, Thomas G.: *See—*

  - Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.
- Krivec, Ben; Petruzzi, Thomas B.; and Braun, John A., to Snap-on Technologies, Inc. Adjustable torque-limiting mini screwdriver. 5,746,298, Cl. 192-48.300.
- Krohne Messtechnik GmbH & Co., KG: *See—*
  - van der Pol, Ronald, 5,747,704, Cl. 73-861.357.
- Krolak, David John: *See—*
  - Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.
- Kronberger, Maximilian: *See—*
  - Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.
- Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, to BASF Aktiengesellschaft. Modified polyaspartic acids, preparation thereof and use thereof. 5,747,635, Cl. 528-328.000.
- Krotke, Gary A.: *See—*
  - Chihara, Kohji Y.; Roth, James A.; and Krotke, Gary A., 5,746,867, Cl. 156-242.000.
- Krueger, Allan James: *See—*
  - Nielsen, Steven James; Rentmeester, Tammy Jo; Krueger, Allan James; and Weyenberg, Jeffrey Michael, 5,746,710, Cl. 609-14.000.
- Kruka, Vitold Raimond: *See—*
  - Wielers, Antonius Franziskus Heinrich; and Kruka, Vitold Raimond, 5,746,907, Cl. 208-251.00H.
- Krumlauf, Paul R.: *See—*
  - Hager, William G.; Wilson, Edward L.; and Krumlauf, Paul R., 5,747,607, Cl. 525-445.000.
- Krussell, Wilbur C.: *See—*
  - Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.
- Krystad, Peter D.: *See—*
  - Rees, Andrew John; O'Brien, Stephen Caine; and Krystad, Peter D., 5,748,878, Cl. 395-183.140.
- KTH, LLC: *See—*
  - Katoot, Mohammad W., 5,747,610, Cl. 526-73.000.
- Kubli, Robert Alfred; and West, James Edward, to Lucent Technologies Inc. Collapsible image derived differential microphone. 5,748,757, Cl. 381-168.000.
- Kubo, Akio; and Nemoto, Hiroshi, to Ushikata Mfg. Co., Ltd. Apparatus for measuring a figure having a calibration mode and method for calibrating a measuring apparatus. 5,748,502, Cl. 364-560.000.
- Kubo, Kenichi: *See—*
  - Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
- Kubo, Masato, to NEC Corporation. Telephone set with background noise suppression function. 5,748,725, Cl. 379-387.000.
- Kubo, Ryoji, to Canon Kabushiki Kaisha. Image reproducing apparatus. 5,748,831, Cl. 386-46.000.
- Kubo, Takehiko: *See—*
  - Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.
- Kubota Corporation: *See—*
  - Matsuda, Kenji, 5,746,109, Cl. 91-448.000.
  - Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Kubota, Yasushi; Yoneda, Hiroshi; and Katoh, Kenichi, to Sharp Kabushiki Kaisha. Image display device with plural data driving circuits for driving the display at different voltage magnitudes and polarity. 5,748,165, Cl. 345-96.000.
- Kubota, Yoshinori, to Central Glass Company, Limited. Composition for growing laser crystals. 5,746,991, Cl. 423-263.000.
- Kuchel, Bernhard W.: *See—*
  - Notheis, Michael S.; and Kuchel, Bernhard W., 5,746,877, Cl. 156-356.000.
- Kuchta, Bruce: *See—*
  - Chatinsky, Mark; and Kuchta, Bruce, 5,748,253, Cl. 348-552.000.
- Kud, Alexander: *See—*
  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
- Kudo, Kiyomitsu: *See—*
  - Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.
- Kudo, Mitsuru: *See—*
  - Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.
- Kuhns, Roger J.; and Chandler, Scott, to Avant Incorporated. Variable effective temperature laminator thermalbinder. 5,746,878, Cl. 156-364.000.
- Kukkadapu, Ravi: *See—*
  - Boyd, Stephen A.; and Kukkadapu, Ravi, 5,747,403, Cl. 502-62.000.
- Kukla, Ryszard: *See—*
  - Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.
- Kulan, Stephen; and Smith, Kenneth L., to Coburn Optical Industries, Inc. Air pressurized chuck. 5,746,436, Cl. 279-4.040.
- Kulesz-Martin, Molly F., to Health Research, Inc. P53AS protein and antibody therefor. 5,747,650, Cl. 530-387.700.
- Kull, Robert Charles: *See—*
  - Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, 5,748,269, Cl. 349-58.000.
- Kulpa, Walter J.: *See—*
  - Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., 5,746,881, Cl. 156-578.000.
- Kumagai, Masakatsu: *See—*
  - Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, 5,746,320, Cl. 209-127.300.
- Kumagawa, Katsuhiko: *See—*
  - Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, 5,748,276, Cl. 349-144.000.
- Kumaoka, Shunichi: *See—*
  - Natori, Masataka; Kumaoka, Shunichi; and Ueda, Shiro, 5,748,267, Cl. 349-40.000.
- Kumar, Derek D. Reference signal communication method and system. 5,748,677, Cl. 375-285.000.
- Kumar, Rajendra: *See—*
  - Karp, Alan H.; and Kumar, Rajendra, 5,748,936, Cl. 395-394.000.
- Kummer, Kyle G.: *See—*
  - McKay, Kevin W.; Blanchard, Robert R.; Feig, Edwin R.; and Kummer, Kyle G., 5,747,580, Cl. 524-576.000.
- Kunde, Christoph: *See—*
  - Gunther, Stephan; and Kunde, Christoph, 5,748,638, Cl. 371-21.200.
- Kundenko Co., Ltd.: *See—*
  - Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000.
- Kung, Shao-Tsu, to Compal Electronics, Inc. Method and a device for detecting execution efficiency of a CPU in computer system. 5,748,498, Cl. 364-551.010.
- Kunkel, Daniel L.: *See—*
  - Scott, Steven L.; Pribnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., 5,748,900, Cl. 395-200.650.
- Kuno, Koichi: *See—*
  - Fukui, Shinichiro; and Kuno, Koichi, 5,747,237, Cl. 430-596.000.
- Kuo, Elizabeth Anne: *See—*
  - Schleyerbach, Rudolf; Bartlett, Robert Ryder; Kuo, Elizabeth Anne; and Little, Edward James, 5,747,664, Cl. 558-392.000.
- Küpper, Paul: *See—*
  - Küsters, Karl-Heinz; Küpper, Paul; Czech, Günther; and Joswig, Hellmut, 5,747,388, Cl. 438-723.000.
- Kurasawa, Yoshihiro: *See—*
  - Nishida, Koji; Kurasawa, Yoshihiro; Takagi, Kiyoji; and Sano, Hironari, 5,747,575, Cl. 524-443.000.
- Kurbjuhn, Manfred; Stolten, Detlef; and Wagner, Wolfgang, to Dornier GmbH. Joining element on a lanthanum chromite base for high-temperature fuel cells and high-temperature electrolysis cells. 5,747,184, Cl. 429-31.000.
- Kure, Naohisa: *See—*
  - Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.
- Kuribayashi, Toshiaki: *See—*
  - Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, 5,747,429, Cl. 508-208.000.
- Kurihara, Hiroki: *See—*
  - Harats, Dror; Kurihara, Hiroki; Belloni, Paula Nanette; and Sigal, Charles Elliott, 5,747,340, Cl. 435-375.000.
- Kuriyama, Toshiaki: *See—*
  - Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.
- Kurmeier, Hans Adolf: *See—*
  - Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, 5,746,941, Cl. 252-299.630.
- Kuroda, Kenichi; Shiba, Kazuyoshi; and Matsuo, Akinori, to Hitachi, Ltd.; and Hitachi ULSI Engineering Corp. Nonvolatile memory device having buried data lines and floating gate electrode on buried data lines. 5,747,849, Cl. 257-321.000.
- Kuroda, Shigetaka; and Shimasaki, Yuichi, to Honda Giken Kogyo Kabushiki Kaisha. Combustion state-detecting system for internal combustion engines. 5,747,681, Cl. 73-117.300.
- Kuroda, Sumio: *See—*
  - Shono, Keiji; Hashimoto, Yasunobu; Kuroda, Sumio; and Tamanoi, Ken, 5,747,136, Cl. 428-64.300.

OL
2 10
SS
1
MY
5
998
MI

Kuroda, Takeshi; and Kanno, Itaru, to Mitsubishi Denki Kabushiki Kaisha; and Ryoden Semiconductor System Engineering Corporation. Washing apparatus and method therefor. 5,746,233, Cl. 134-57.00R.

Kuroki, Kazuo: *See—*

Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000

Kurome, Hirokazu: *See—*

Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, 5,747,174, Cl. 428-480.000.

Kuroo, Makoto: *See—*

Nagai, Ryozo; Kuroo, Makoto; and Kato, Hirohisa, 5,747,652, Cl. 530-387.900.

Kurosaki, Toshiei, to Hitachi, Ltd. Charged particle beam apparatus. 5,747,816, Cl. 250-491.100.

Kurosawa, Kenichi: *See—*

Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.

Kurosawa, Susumu, to NEC Corporation. Driver circuit. 5,748,016, Cl. 327-108.000.

Kurtis, Rachel M. Collapsible stand for school locker. 5,746,331, Cl. 211-149.000.

Kurtzhals, William Anthony: *See—*

Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.

Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, to Hitachi, Ltd. Mobile communication network and control method thereof. 5,749,053, Cl. 455-524.000.

Kushner, Cherie Elaine: *See—*

Fleming, Robert Alan; and Kushner, Cherie Elaine, 5,748,891, Cl. 375-200.000.

Kuster & Co., GmbH: *See—*

Medebach, Thomas; and Marscholl, Klaus, 5,746,094, Cl. 74-502.400.

Küsters, Karl-Heinz; Küpper, Paul; Czech, Günther; and Joswig, Hellmut, to Siemens Aktiengesellschaft. Antireflection layer and process for lithographically structuring a layer. 5,747,388, Cl. 438-723.000.

Kusuzawa, Hideo, to Toa Medical Electronics Co., Ltd. Light receiving optical system having a light selector integral with a lens and particle analyzer including the same. 5,748,298, Cl. 356-73.000.

Kutscher, Bernhard: *See—*

Günther, Eckhard; Wulf, Jens-Peter; Engel, Jürgen; and Kutscher, Bernhard, 5,747,534, Cl. 514-492.000.

Kutsuwada, Satoru: *See—*

Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.

Kutz, David: *See—*

Ehrlich, Kenneth P.; Kutz, David; and Nowakowski, Edmund C., 5,746,399, Cl. 246-122.00R.

Kuwabara, Nobuyuki: *See—*

Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.

Kuwabara, Yutaka: *See—*

Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.

Kuwayama, Kazutoshi: *See—*

Ito, Koji; Kameoka, Teruhiko; Matsunaga, Kouji; and Kuwayama, Kazutoshi, 5,746,577, Cl. 416-178.000.

Kuyama, Koji: *See—*

Saneshige, Ryoji; and Kuyama, Koji, 5,747,908, Cl. 310-91.000.

Kuzuya, Yoshihumi; Saito, Kimitaka; and Shibata, Hitoshi, to Nippon Soken, Inc. EGR gas assist injection system for internal combustion engine. 5,746,189, Cl. 123-568.000.

Kvaerner Pulping AB: *See—*

Backlund, Åke; and Stigsson, Lars, 5,746,886, Cl. 162-30.100.

Kvarnström, Ingemar Sven-Anders: *See—*

Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, 5,747,473, Cl. 514-45.000.

Kwang, Hwei-Sing: *See—*

Gruber, Harry E.; Jolly, Douglas J.; and Kwang, Hwei-Sing, 5,747,243, Cl. 435-5.000.

Kwiat, Karol; Sheehan, John; Brown, Ricky; and Doyle, Pat, to Bourns, Inc. Electrical connector assembly. 5,746,626, Cl. 439-630.000.

Kwon, Suk-Chun; and Kim, Jim-Ki, to Samsung Electronics Co., Ltd. Data read circuit for a nonvolatile semiconductor memory. 5,748,536, Cl. 365-185.250.

Kwôn, Won-t'aek: *See—*

Kim, Chong-hoe; Kil, Myŏng-gun; Kwôn, Won-t'aek; and Kim, Kwang-chŏl, 5,747,221, Cl. 430-311.000.

Kwon, Yeong-Se: *See—*

Kim, Dong-Wook; Son, Jeong-Hwan; Hong, Song-Cheol; and Kwon, Yeong-Se, 5,747,865, Cl. 257-480.000.

Kwun, Hegeon; Piskie, Michael Allen; and Gioutsos, Tony, to Temic Bayern-Chemie Airbag GmbH. Method of non-invasively monitoring pressure of a compressed gas in a closed container. 5,747,696, Cl. 73-728.000.

Kyokutoh Co., Ltd.: *See—*

Kimura, Takashi; and Arakawa, Kaneyasu, 5,747,989, Cl. 324-235.000.

Kyushu Hitachi Maxell, Ltd.: *See—*

Yamashita, Yasuo; and Takami, Satoshi, 5,745,995, Cl. 30-43.600.

L.A. Gear, Inc.: *See—*

Ratcliffe, William R.; and Lawrence, Don C., 5,746,499, Cl. 362-103.000.

L&P Property Management Co.: *See—*

Arft, Dennis E., 5,745,935, Cl. 5-13.000.

L.V.M.H. Recherche: *See—*

Meybeck, Alain; Bonte, Frédéric; Dumas, Marc; and Chaudagne, Catherine, 5,747,538, Cl. 514-570.000.

La Jolla Cancer Research Foundation: *See—*

Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, 5,747,326, Cl. 435-240.200.

Reed, John C.; and Sato, Takaaki, 5,747,245, Cl. 435-6.000.

Ruoslahti, Erkki I.; and Morla, Alex, 5,747,452, Cl. 514-12.000.

La-Z-Boy Incorporated: *See—*

LaPointe, Larry P.; and Saul, Jonathan R., 5,747,965, Cl. 320-5.000.

La Barre, Charles, to Huot Manufacturing Company. Tray connecting members for a drill bit case. 5,746,316, Cl. 206-379.000.

L'Abbate, Massimo: *See—*

Giani, Paola; L'Abbate, Massimo; and Cancro, Lewis Patrick, 5,747,004, Cl. 424-49.000.

Labock, Joseph, to M.R.M. International, Inc. Bullet-resistant transparent panel, and method and press for making same. 5,747,159, Cl. 428-335.000.

Laboratorio CHile S.A.: *See—*

Fuentes, Victoria M., 5,747,462, Cl. 514-23.000.

Labroo, Virender Mohan: *See—*

Korsgaard, Niels; Piggott, James Robertson; Labroo, Virender Mohan; and Bain, Steven, 5,747,059, Cl. 424-451.000.

La Buhn, Greg: *See—*

Brechtel, James P.; and La Buhn, Greg, 5,748,962, Cl. 395-701.000.

Labun, Nicholas M.; McClaughry, Thomas J.; and Wang, Shay-Ping T., to Motorola, Inc. FES method and system for controlling the movement of a limb. 5,748,845, Cl. 395-20.000.

Lacan, Dominique: *See—*

Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lacan, Dominique, 5,747,043, Cl. 424-195.100.

LaCasse, Gaston, to IPL, Inc. Spacing device for utility wire. 5,747,731, Cl. 174-40.0CC.

LaCour,Inc.: *See—*

LaCour, Paul M., 5,746,488, Cl. 312-196.000.

LaCour, Paul M., to LaCour,Inc. Stressed modular desk system. 5,746,488, Cl. 312-196.000.

Lacquaniti, Luigi; Liuzzo, Giuseppe; Palitto, Marcello; and Verdone, Nicola, to Consorzio Obbligatorio Nazionale Per Il Riciclaggio Dei Contenitori in Plastica Per Liquidi. High temperature acid gases and particulate removal in waste incineration process. 5,746,141, Cl. 110-203.000.

Lada, Christopher O.: *See—*

Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.

Ladas, Athanasios S.: *See—*

Burnett, Debbie L.; Dubash, Darius D.; Ladas, Athanasios S.; and Wong, Victor M., 5,747,064, Cl. 424-443.000.

LaDue, Duane: *See—*

Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

Laeis + Bucher GmbH: *See—*

Konder, Wolfgang; and Wollscheid, Heinz-Peter, 5,748,322, Cl. 356-394.000.

Lafer, John P.; Faust, John E.; and Williams, Michael D., to U.S. West Technologies, Inc. Method and system for managing multimedia assets for proper deployment on interactive networks. 5,748,956, Cl. 395-615.000.

Lafer, Larry M.: *See—*

Patel, Chhotu; Lafer, Larry M.; and Tossey, Steven M., 5,746,065, Cl. 62-503.000.

Laguna, Alvaro J.: *See—*

Campbell, Carey V.; Chastain, James H.; Laguna, Alvaro J.; and Pond, Daniel B., 5,747,128, Cl. 428-35.700.

Lahlouh, John G.: *See—*

Wartenberg, Mark F.; Lahlouh, John G.; and Toth, James, 5,747,147, Cl. 428-209.000.

Lai, Ching-San, to Medinox, Inc. Combinational therapeutic methods employing nitric oxide scavengers and compositions useful therefor. 5,747,532, Cl. 514-491.000.

Lai, Lawrence: *See—*

Barth, Richard M.; Stark, Donald C.; Lai, Lawrence; and Richardson, Wayne S., 5,748,554, Cl. 365-230.030.

Lake, Rickie C., to Micron Communications, Inc. Multilayered battery having a cured conductive ink layer. 5,747,190, Cl. 429-124.000.

Lake, Rickie C., to Micron Communications, Inc. Multilayered battery having a cured conductive ink layer. 5,747,191, Cl. 429-124.000.

Lakshminarayan, Udaykumar; McAlea, Kevin P.; and Booth, Richard B., to DTM Corporation. Method of forming three-dimensional articles using thermosetting materials. 5,749,041, Cl. 419-2.000.

Lam, Lawrence K.: *See—*

Abatzoglou, Theagenis J.; Lam, Lawrence K.; Malek, Homayoun; and Reagan, John T., 5,748,507, Cl. 364-572.000.

Lam Research Corporation: *See—*

Boyd, Trace L.; Beer, Richard D.; Terbeek, Eric A.; and Wong, Vernon W. II, 5,746,434, Cl. 277-1.000.

Lambrecht, Andy; Belt, Steve L.; and Dutton, Drew, to Advanced Micro Devices, Inc. Computer system including a plurality of multimedia devices each having a high-speed memory data channel for accessing system memory. 5,748,921, Cl. 395-308.000.

Lambrecht, Andy: *See—*

Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, 5,748,983, Cl. 395-842.000.

Lamensdorf, David: *See—*

Kingston, Samuel C.; Burdoin, Robert B.; and Lamensdorf, David, 5,748,151, Cl. 343-753.000.

Lamm, Hubert, to Robert Bosch GmbH. Method of controlling the rpm of a motor. 5,747,956, Cl. 318-599.000.

Lamoureux, James G.: *See—*

Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.

Lampe, Patricia A.: *See—*

Johnson, Eugene M., Jr.; Milbrandt, Jeffrey D.; Kotzbauer, Paul T.; and Lampe, Patricia A., 5,747,655, Cl. 530-399.000.

Lamphron, Mark A.: *See—*

Alligood, John H.; Lamphron, Mark A.; and Cipolla, David, 5,748,988, Cl. 396-6.000.

Lämsä, Merja; Linko, Yu-Yen; Linko, Pekka; and Uosukainen, Esa, to Raisio Yhtyma Oyj. Enzymatic process for preparing a synthetic ester from a vegetable oil. 5,747,434, Cl. 508-485.000.

Lamson, Robert D.: *See—*

Harrison, Robert G.; and Lamson, Robert D., 5,748,254, Cl. 348-552.000.

Landa, Benzion; Lior, Ishaiau; Barnea, Dan; Fenster, Paul; and Levy, Uri, to Indigo N.V. Color imaging system. 5,749,032, Cl. 399-233.000.

Landau, Sergio: *See—*

Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, 5,746,714, Cl. 604-68.000.

Landherr, Nicholas N. Hunting dog signal device. 5,746,158, Cl. 119-858.000.

Landreth, Keith W. Electrical integrity test system for boats. 5,748,008, Cl. 324-763.000.

Landry, Hayes J., Jr.: *See—*

Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.

Lane, Alan Gordon: *See—*

Clarke, Adrienne Elizabeth; Bacic, Antony; and Lane, Alan Gordon, 5,747,297, Cl. 435-72.000.

Lane, Linda Hope: *See—*

Fontana, Robert Edward, Jr.; Lane, Linda Hope; Williams, Mason Lamar, III; and Yeack-Scranton, Celia Elizabeth, 5,745,979, Cl. 29-603.120.

Lane, Mathieu B.: *See—*

Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.

Lang, Hans Jochen: *See—*

Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.

Langberg, Ehud; and Wang, Jin-Der, to Globespan Technologies, Inc. System and method producing improved frame synchronization in a digital communication system. 5,748,686, Cl. 345-367.000.

Lange, Hans: *See—*

Bienhaus, Gerhard; and Lange, Hans, 5,746,978, Cl. 422-68.100.

Lange, Richard M.: *See—*

Luciani, Carmen V.; Lange, Richard M.; and Seebauer, Joseph G., 5,747,433, Cl. 508-479.000.

Langer, Thomas: *See—*

Weinblatt, Lee S.; and Langer, Thomas, 5,748,889, Cl. 395-187.010.

Langlois, Pierre: *See—*

Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, 5,748,814, Cl. 385-37.000.

Langseth, Lee M.; Wulfing, James J.; Hubbling, David L.; and Gagnier, Jerome V., to Imation Corp. Write protect mechanism with spring element for data storage diskette and fabrication method. 5,748,419, Cl. 360-133.000.

Languet, Bernard; and Desmettre, Philippe, to Rhone Merieux. Therapeutic elements for the oral administration of medication to animals and process for making same. 5,747,063, Cl. 424-442.000.

Lanoir, Gian: *See—*

Racine, Roland, deceased; Racine, by Francine, legal representative; and Lanoir, Gian, 5,746,587, Cl. 431-253.000.

Lanza, Thomas: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

LaPointe, Larry P.; and Saul, Jonathan R., to La-Z-Boy Incorporated. Battery pack for powered motion furniture. 5,747,965, Cl. 320-5.000.

LaPorte, Brent N.: *See—*

Stephan, Allan H.; LaPorte, Brent N.; Powers, Stephen B.; and McNeely, Mark, 5,748,185, Cl. 345-173.000.

Lara, Pedro F.; and Mateer, Mark W., to Atlantic Richfield Company. Apparatus and method for measuring potentials through pavements for buried pipeline cathodic protection systems. 5,747,983, Cl. 324-71.100.

Larcher, Dominique: *See—*

Gerand, Bernard; Larcher, Dominique; and Tarascon, Jean-Marie, 5,747,193, Cl. 429-224.000.

Larsen, Charles E.: *See—*

Weldon, Thomas D.; Larsen, Charles E., and Rosen, Jonathan J., 5,746,414, Cl. 251-149.600.

Larson, Donald G.: *See—*

Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.

Larson, Gary B., to MacDermid, Incorporated. Process for the manufacture of printed circuit boards. 5,747,098, Cl. 427-58.000.

Larson, Wayne K.: *See—*

Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.

Larsson-Backström, Carin: *See—*

Egberg, Nils; Larsson-Backström, Carin; Jakobsson, Jan; and Lundh, Rolf, 5,747,533, Cl. 514-549.000.

La Rue, Charles, to Audio Navigation Systems, Inc. Methods and apparatus for improving the reliability of recognizing words in a large database when the words are spelled or spoken. 5,748,840, Cl. 395-2.630.

Laserscope: *See—*

Humphrey, Louis E., Jr., 5,746,760, Cl. 606-171.000.

LaserVend, Inc.: *See—*

Christiansen, Lars K.; Roberts, Mark H.; Griffiths, David J.; and Adamson, Brent R., 5,748,485, Cl. 364-479.040.

Lasters, Ignace; De Maeyer, Marc; and Ripka, William Charles, to Corvas International, Inc. Bovine pancreatic trypsin inhibitor derived inhibitors of factor XA. 5,747,449, Cl. 514-12.000.

Laszlo, Palkovics: *See—*

Gerum, Eduard; Laszlo, Palkovics; Semsey, Akos; and Barta, Gabor, 5,747,683, Cl. 73-118.100.

Latimer, Kenneth S.: *See—*

Ritchie, Branson W.; Niagro, Frank D.; and Latimer, Kenneth S., 5,747,045, Cl. 424-204.100.

Lattrell, Rudolf; Dürckheimer, Walter; and Schmid, Peter, to Hoechst Aktiengesellschaft. Crystalline cepham acid addition salts and processes for their preparation. 5,747,484, Cl. 514-202.000.

Lautenschlager, Wolfgang, to Alcatel N.V. Method, network, system and devices for central management of spoken announcements for download on demand. 5,748,710, Cl. 379-88.000.

Lauzon, Jocelyn: *See—*

Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, 5,748,814, Cl. 385-37.000.

LaVeine, Andrew T.; and Humiston, Stanley L., to Action Equipment Co., Inc Vibratory finger screen with lateral wedge members. 5,746,322, Cl. 209-393.000.

Lavigne, Marc Tessier: *See—*

Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, 5,747,262, Cl. 435-7.100.

Laville, Daniel: *See—*

Hamel, André; and Laville, Daniel, 5,748,815, Cl. 385-37.000.

Lavorata, John M.: *See—*

Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.

Lawler, Christopher P.; and Ready, David C., to 3Com Corporation. Method and apparatus for the concurrent reception and transmission of packets in a communications internetworking device. 5,748,633, Cl. 370-401.000.

Lawlor, Elizabeth Jane, to SmithKline Beecham Corp.; and SmithKline Beecham p.l.c. DNA encoding histidyl tRNA synthetase from *Streptococcus pneumoniae*. 5,747,313, Cl. 435-183.000.

Lawlor, Elizabeth Jane, to SmithKline Beecham Corporation; and SmithKline Beecham p.l.c. Valyl tRNA Synthetase polynucleotides of Streptococcus. 5,747,314, Cl. 435-183.000.

Lawlor, Elizabeth Jane, to SmithKline Beecham Corp.; and SmithKline Beecham p.l.c. DNA encoding aspartyl tRNA synthetase from *Streptococcus pneumoniae*. 5,747,315, Cl. 435-183.000.

Lawrence, Don C.: *See—*

Ratcliffe, William R.; and Lawrence, Don C., 5,746,499, Cl. 362-103.000.

Lawrence, Robert M.: *See—*

Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., 5,748,090, Cl. 340-578.000.

Lawson, Glenn E.: *See—*

Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.

Layton, Judith Eleanor: *See—*

Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, 5,747,032, Cl. 424-133.100.

Le, Hung Q.: *See—*

Maguire, David J.; and Le, Hung Q., 5,748,911, Cl. 395-281.000.

/OL
2 10
ISS
1
MY
5
998
JMI

Le, Thong Huu; and Le, Timothy Van. Pruning implement. 5,745,998, Cl. 30-249.000.

Le, Timothy Van: *See*—

Le, Thong Huu; and Le, Timothy Van, 5,745,998, Cl. 30-249.000.

Leach & Garner Company: *See*—

Leach, Edwin F., II; Markic, Marinko; and Precourt, Ronald E., Jr., 5,746,067, Cl. 63-7.000.

Leach, Edwin F., II; Markic, Marinko; and Precourt, Ronald E., Jr., to Leach & Garner Company. Round bangle. 5,746,067, Cl. 63-7.000.

Leal, Horacio; and Kaganas, Israel, to TLC Industries Inc. Entertainment system with sound storage cartridge and playback device. 5,748,756, Cl. 381-118.000.

Lear Corporation: *See*—

Teller, Bill; McCulloch, Pete; Drobnich, Vaughn J.; and Goins, Jeffrey Lee, 5,746,363, Cl. 224-547.000.

Leatherman Tool Group, Inc.: *See*—

Berg, Howard G.; and Rivera, Benjamin C., 5,745,997, Cl. 30-155.000.

Lebby, Michael S.; and Nelson, Ronald J., to Motorola, Inc. Integrated electro-optical package with independent menu bar. 5,748;161, Cl. 345-84.000.

Lebby, Michael S.: *See*—

Jiang, Wenbin; and Lebby, Michael S., 5,748,665, Cl. 372-96.000.

Le Berre, Jacques; and Persson, Bjorn, to U.S. Philips Corporation. Pay TV method and device which comprise master and slave decoders. 5,748,732, Cl. 380-10.000.

Leboul, Jean: *See*—

Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, 5,747,303, Cl. 435-119.000.

Lebourgeois, Richard: *See*—

Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, 5,748,013, Cl. 336-233.000.

Lechner, Robert J., to McDonnell Douglas Corporation. Modular video display system. 5,746,599, Cl. 434-44.000.

Ledbetter, Jeffrey A.: *See*—

Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., 5,747,037, Cl. 424-154.100.

Ledbetter, Steve Miles: *See*—

Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, 5,746,306, Cl. 200-283.000.

Lederman, Marcos M.; and Yuan, Samuel W., to Read-Rite Corporation. Magnetoresistive reas transducer with exchange biasing of magnetoresistive sensor and soft adjacent layer. 5,748,413, Cl. 360-113.000.

Ledgerwood, Eric: *See*—

Hindle, David J.; Breeds, Christopher D.; Conway, Jeremy J.; Morris, Ian W.; and Ledgerwood, Eric, 5,746,540, Cl. 405-131.000.

Lee, Alan James: *See*—

Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.

Lee, Bun: *See*—

Baek, Jong-Hyeob; Lee, Bun; Choi, Sung-Woo; and Lee, Jin-Hong, 5,748,319, Cl. 356-382.000.

Lee, Byung-hun: *See*—

Cha, Gi-ho; Kang, Chi-jung; Lee, Byung-hun; and Lee, Kyung-wook, 5,746,883, Cl. 156-580.000.

Lee, Byung-Il, to LG Semicon Co., Ltd. Method of manufacturing a nonvolatile semiconductor device. 5,747,370, Cl. 438-267.000.

Lee, Byungkook: *See*—

Pastan, Ira H.; Lee, Byungkook; Jung, Sun-Hee; and Brinkmann, Ulrich, 5,747,654, Cl. 530-391.700.

Lee, C. H.; and Chen, Y. H., to Taiwan Semiconductor Manufacturing Company,Ltd. Flexible vacuum pick-up device. 5,746,462, Cl. 294-64.100.

Lee, Chang-Ou; Vines, Landon B.; Fujishiro, Felix H.; and Koenigseder, Sigmund, to VLSI Technology, Inc. Titanium boride and titanium silicide contact barrier formation for integrated circuits. 5,745,990, Cl. 29-852.000.

Lee, Charles C.: *See*—

Warner, David; Lee, Charles C.; and Li, Wu-Shyong, 5,747,148, Cl. 428-212.000.

Lee, Ching-Pang: *See*—

Rockstroh, Todd J.; Crow, John M.; Lee, Ching-Pang; and Risbeck, James D., 5,747,769, Cl. 219-121.710.

Lee, Chong-won: *See*—

Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, 5,747,690, Cl. 73-504.120.

Lee, Chul Woo: *See*—

Park, Chang Jin; Kang, Dong Hoon; and Lee, Chul Woo, 5,748,356, Cl. 359-207.000.

Lee, Chul-woo: *See*—

Song, Ci-moo; Lee, Chul-woo; and Cho, Han-ki, 5,748,172, Cl. 345-111.000.

Lee, Chya-Hyung: *See*—

Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, 5,747,783, Cl. 219-758.000.

Lee, Donald: *See*—

Wong, Belle; Lee, Donald; and Mattos, Derwin, 5,748,019, Cl. 327-170.000.

Lee, Edward R.: *See*—

Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.

Lee, Eun Soo; Watanabe, Tyler; Gale, Robert M.; and Burkoth, Terry L. Monoglyceride/lactate ester permeation enhancer for oxybutynin. 5,747,065, Cl. 424-448.000.

Lee, Gab-Youl, to Samsung Electronics Co., Ltd. Method and apparatus for opening and closing an air outlet of an air conditioner. 5,746,655, Cl. 454-233.000.

Lee, Hae-Won: *See*—

Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.

Lee, H. C.: *See*—

Shi, Song; So, Franky; and Lee, H. C., 5,747,183, Cl. 428-690.000.

Lee, Hee-Soo, to Samsung Electronics Co., Ltd. Audio signal decoding apparatus and method for a disc driving system. 5,748,835, Cl. 386-104.000.

Lee, Howard Hong-Dough, to Intellectual Science and Technology, Inc. Information processing apparatus having a multitasking function with one or more optical discs. 5,748,575, Cl. 369-30.000.

Lee, Hsing-Chung: *See*—

Shieh, Chan-Long; Lee, Hsing-Chung; and So, Franky, 5,748,160, Cl. 345-82.000.

Wei, Chengping; Shi, Song Q.; and Lee, Hsing-Chung, 5,747,363, Cl. 438-5.000.

Lee, Hyong-Gon, to Samsung Electronics Co., Ltd. Integrated circuit memory devices having direct read capability. 5,748,529, Cl. 365-185.170.

Lee, Ill-Young: *See*—

Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, 5,747,500, Cl. 514-274.000.

Lee, Jae-soo, to Samsung Electronics Co., Ltd. Magnetic recording and reproducing apparatus having a cassette holder with guide pins. 5,748,403, Cl. 360-96.500.

Lee, Jae-Woong, to Kia Motors Corporation. Magnetic brake system for a vehicle. 5,746,294, Cl. 188-163.000.

Lee, Jin-Hong: *See*—

Baek, Jong-Hyeob; Lee, Bun; Choi, Sung-Woo; and Lee, Jin-Hong, 5,748,319, Cl. 356-382.000.

Lee, Jin-Hyo: *See*—

Lee, Kyu-Hong; Lee, Jin-Hyo; and Lyu, Jong-Sun, 5,747,871, Cl. 257-586.000.

Lee, Jin-Yuan: *See*—

Wu, Lin-June; Yu, Chen-Hua Douglas; and Lee, Jin-Yuan, 5,747,381, Cl. 438-624.000.

Lee, Jong Duk; Chun, Kuk Jin; Park, Byung Gook; and Lyu, Jeong Ho, to Korea Information & Communication Co., Ltd.; and Lee, Jong Duk. Method for manufacturing ISRC MOSFET. 5,747,356, Cl. 437-44.000.

Lee, Jong Oh, to Hyundai Electronics Industries Co., Ltd. Circuit for repair of flash memory cells and a method of repair. 5,748,526, Cl. 365-185.090.

Lee, Jong-wan, to Samsung Electronics Co., Ltd. Rotary arm-type optical pick-up driving device. 5,748,605, Cl. 369-222.000.

Lee, Jong-young, to Samsung Electronics Co., Ltd. Collective-house control system employing an interface circuit for alternative mark inversion control communication. 5,748,722, Cl. 379-160.000.

Lee, Joung-Sun; Kim, Dae-Yul; An, Yo-Han; and Jun, Jae-Kang, to Samsung Electronics Co., Ltd. Activated air showering system for clean room and method for controlling the same. 5,746,652, Cl. 454-187.000.

Lee, Kiem T., to Thomas Industries, Inc. Recessed lighting fixture for two light sizes. 5,746,507, Cl. 362-365.000.

Lee, Ki-yul, to Samsung Aerospace Industries, Ltd. Device and method for sensing brightness. 5,748,996, Cl. 396-63.000.

Lee, Koo: *See*—

Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.

Lee, Kuo-Lung. Folding collapsible step exercising machine. 5,746,683, Cl. 482-57.000.

Lee, Kyou Heung: *See*—

Cho, Eui Hwan; Chung, Sun Gan; Lee, Kyou Heung; and Park, Si Kyung, 5,747,521, Cl. 514-420.000.

Lee, Kyu-Hong; Lee, Jin-Hyo; and Lyu, Jong-Sun, to Electronics and Telecommunications Research Institute. Bipolar transistor having a self-aligned base electrode and method for manufacturing the same. 5,747,871, Cl. 257-586.000.

Lee, Kyung-wook: *See*—

Cha, Gi-ho; Kang, Chi-jung; Lee, Byung-hun; and Lee, Kyung-wook, 5,746,883, Cl. 156-580.000.

Lee, Kyu-pil, to Samsung Electronics Co., Ltd. Metal plug capacitor structures for integrated circuit devices and related methods. 5,748,521, Cl. 365-149.000.

Lee, Michael G.: *See*—

Beilin, Solomon I.; Chou, William T.; Lee, Michael G.; and Wang, Wen-chou Vincent, 5,746,903, Cl. 205-118.000.

Lee, Ming Shing. Method, apparatus and system for continuously treating water body. 5,746,904, Cl. 205-757.000.

Lee, Ming-Chieh; and Chen, Wei-ge, to Microsoft Corporation. Transparent block skipping in object-based video coding systems. 5,748,789, Cl. 382-243.000.

Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, to Aplus Integrated Circuits, Inc. OR-plane memory cell array for flash memory with bit-based write capability, and methods for programming and erasing the memory cell array. 5,748,538, Cl. 365-185.060.

Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, to Aplus Integrated Circuits, Inc. Memory device with on-chip manufacturing and memory cell defect detection capability. 5,748,545, Cl. 365-201.000.

Lee, Roger R.; and Gonzalez, Fernando, to Micron Technology, Inc. Nonvolatile memory having transistor redundancy. 5,748,527, Cl. 365-185.090.

Lee, Sang-Bo; and Cho, Soo-In, to Samsung Electronics Co., Ltd. Self repairing integrated circuit memory devices and methods. 5,748,543, Cl. 365-200.000.

Lee, Sang-Don, to LG Semicon Co., Ltd. Method for fabricating isolation layer of semiconductor device. 5,747,376, Cl. 438-443.000.

Lee, Sherman, to Advanced Micro Devices, Inc. User-removable central processing unit card for an electrical device. 5,748,912, Cl. 395-282.000.

Lee, Si-Woong: *See*—

Chang, Gyu-Hwan; Jung, Hae-Mook; Kim, Seong-Dae; Choi, Jae-Gark; and Lee, Si-Woong, 5,748,761, Cl. 382-107.000.

Lee, Suk Joong; and Choi, Jin Kook, to Hyundai Electronics Industries Co., Ltd. Arbitration apparatus using least recently used algorithm. 5,748,969, Cl. 395-732.000.

Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, to Cheil Foods & Chemicals, Inc. Process for producing a beverage composition containing pine sprout extract. 5,747,081, Cl. 426-72.000.

Lee, Tangkoo, to SMK Corporation. Manual scanning type image scanner. 5,748,338, Cl. 358-473.000.

Lee, Tsai-Pao; Chen, Kwang-Cheng; and Yang, Chin-Lin, to United Microelectronics Corporation. Non-coherent digital FSK demodulator. 5,748,036, Cl. 329-300.000.

Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, to Korea Electric Power Corporation. Optical-electronic demand meter using optical metering outfit. 5,747,985, Cl. 324-103.00R.

Lee, Wonno, to LG Semicon Co., Ltd. Decoding apparatus for Manchester code. 5,748,123, Cl. 341-70.000.

Lee, Yong Hee: *See*—

Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.

Lee, Yong-soo, to Samsung Electronics Co., Ltd. Video repeat reproduction method and apparatus. 5,748,332, Cl. 358-335.000.

Lee, Yu-jong. Knockdown CD/audio tape storage rack. 5,746,325, Cl. 211-40.000.

Leenders, Luc; Defieuw, Geert; Horsten, Bart; and Strijckers, Hans, to AGFA-Gervaert N.V. Thermographic material with outmost antistatic layer. 5,747,412, Cl. 503-201.000.

Leermakers, Johannes M.H.P.L.; Van Os, Albertus M.B.M.; and Slaats, Cornelis H.J., to OCE-Nederland, B.V. Receiving material holder. 5,746,327, Cl. 211-50.000.

Leger, Gregory S.; Patterson, Scott R.; and Porter, Ryan S., to Philips Electronics North America Corporation. Tape library cartridge storage and control system. 5,746,385, Cl. 242-337.000.

Legge, Ronald N.: *See*—

Chen, Eugene; Tehrani, Saied N.; Legge, Ronald N.; and Zhu, Xiaodong T., 5,748,524, Cl. 365-173.000.

Legome, Mark J.: *See*—

Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., 5,746,763, Cl. 606-193.000.

Legutko, Thomas J., to Carrier Corporation. Catalytic insert for NO_x reduction. 5,746,194, Cl. 126-91.00A.

Lehan, John; Byorum, Henry; Hill, Russell J.; and Rough, J. Kirkwood, to BOC Group, Inc., The. Sputtering system using cylindrical rotating magnetron electrically powered using alternating current. 5,746,894, Cl. 204-192.120.

Lehman, Richard N.: *See*—

Gauchel, James V.; and Lehman, Richard N., 5,747,075, Cl. 425-114.000.

Lehmann, Lutz Uwe: *See*—

Lonsky, Ralph; and Lehmann, Lutz Uwe, 5,747,233, Cl. 430-522.000.

Lehnen, David C.: *See*—

Gering, Marcus J.; Berg, Gordon O.; Lehnen, David C.; and Frisbie, Joseph W., 5,748,389, Cl. 359-811.000.

Lehner, Edwin: *See*—

Boehm, Alfred; Lehner, Edwin; and Messerschmidt, Werner, 5,746,439, Cl. 280-602.000.

Lehniger, Peter: *See*—

Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.

Lehr, Friedrich, to Clariant Finance (BVI) Limited. Reactive monoazo dyestuffs and the processes in which they are produced. 5,747,657, Cl. 534-635.000.

Lehr, John: *See*—

Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, 5,746,699, Cl. 600-529.000.

Leif, Roald N.: *See*—

Ross, David S.; Jayaweera, Indira; and Leif, Roald N., 5,746,926, Cl. 210-761.000.

Leigh, John Scott, and Schotland, John Carl, to Bell Communications Research, Inc. Absorption imaging system and method using direct reconstruction of scattered radiation. 5,746,211, Cl. 128-665.000.

Leimer, Gerhard: *See*—

Schönfelder, Lothar; Leimer, Gerhard; and Roth, Stefan, 5,746,969, Cl. 264-645.000.

Leland, Jonathan K.: *See*—

Massey, Richard J.; Blackburn, Gary F.; Wilkins, Elizabeth W.; and Leland, Jonathan K., 5,746,974, Cl. 422-52.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—

Bloom, Debra; Fathman, C. Garrison; and Slaymaker, Sarah, 5,747,299, Cl. 435-91.200.

Le Marer, René; and Perrin, Gabrielle, to France Telecom. Component for connection to a multi-core fiber, and a method of manufacture. 5,748,820, Cl. 385-76.000.

Lemischka, Ihor R., to Trustees of Princeton University, The. Antibodies against tyrosine kinase receptor flk-1. 5,747,651, Cl. 530-387.900.

Lemke, Stefan; and Sagredos, Angelos. Method for the preparation of popped cereal products enriched with vitamins, mineral nutrients and/or trace elements. 5,747,080, Cl. 426-72.000.

Lemus, Tony V.: *See*—

Hood, Larry; and Lemus, Tony V., 5,746,713, Cl. 604-22.000.

Lenhard, Jerome R.: *See*—

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.

Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.

Lenninger, Ralf-Johannes: *See*—

Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, 5,749,060, Cl. 701-51.000.

Lennon, T. Patrick: *See*—

Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, 5,746,714, Cl. 604-68.000.

Lenz, Gary: *See*—

Eryurek, Evren; and Lenz, Gary, 5,746,511, Cl. 374-2.000.

Leonard, Kenneth J. Volume control module for use in diving. 5,746,543, Cl. 405-186.000.

Leonard, Ronald J., to Minnesota Mining and Manufacturing Company. Multilayer hollow-fiber body and method of making. 5,747,138, Cl. 428-113.000.

Leonardo, David: *See*—

Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, 5,747,262, Cl. 435-7.100.

Leoni, Massimo: *See*—

Casareto, Enrico; Leoni, Massimo; Ronzio, Enrico; and Magni, Ambrogio, 5,747,330, Cl. 435-254.100.

Lesartre, Gregg; Quarnstrom, Doug; and Lotz, Jonathan P., to Hewlett-Packard Company. Operand dependency tracking system and method for a processor that executes instructions out of order and that permits multiple precision data words. 5,748,934, Cl 395-392.000.

Leslie Technologies, Inc.: *See*—

Jennebach, Markus; and Birkhan, Joao Augusto, 5,746,142, Cl. 110-248.000.

Lesmeister, Gary J., to Credence Systems Corporation. Parallel processing integrated circuit tester. 5,748,642, Cl. 371-22.100.

L'Espérance, André; Bouchard, Martin; Paillard, Bruno; and Guigou, Catherine, to Alumax Inc. Method and apparatus for active noise control of high order modes in ducts. 5,748,750, Cl. 381-71.500.

Lesser, Craig; and Von Borstel, Reid W., to Lesser, Craig. Tobacco smoke filter for removing toxic compounds. 5,746,231, Cl. 131-334.000.

Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, to California Institute of Technology. DNA encoding inward rectifier, G-protein activated, mammalian, potassium KGA channel and uses thereof. 5,747,278, Cl. 435-69.100.

Letendre, Guy R.: *See*—

Rink, Linda M.; Letendre, Guy R.; Teverovsky, Alexander; and Marjanski, George C., 5,746,793, Cl. 55-385.300.

Letton, James Carey: *See*—

Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, 5,747,443, Cl. 510-515.000.

Leung, Fred: *See*—

Patchen, Paul J.; Fung, Hon C.; Leung, Fred; and McGinness, Steven, 5,748,981, Cl. 395-828.000.

Leung, Ka Yin, to Crystal Semiconductor Corporation. Fully differential high gain cascode amplifier. 5,748,040, Cl. 330-253.000.

Levatino, Samuel R. Temporomandibular rehabilitator. 5,746,703, Cl. 601-38.000.

Level One Communications, Inc.: *See*—

Sokol, Michael A.; and Ketchum, Kevin D., 5,748,634, Cl. 370-402.000.

Levendel, Gil E.: *See*—

Mazurkiewicz, Theodore; Levendel, Gil E., and Wang, Shay-Ping Thomas, 5,749,072, Cl. 704-275.000.

Lever, Andrew Michael Lindsay; and Hunter, Eric, to Syngenix Limited. Mason-Pfizer Monkey Retroviral packaging defective vectors. 5,747,307, Cl. 435-172.300.

Lever Brothers Company, Division of Conopco, Inc.: *See*—

Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, 5,747,442, Cl. 510-475.000.

Domburg, Bastiaan; Gupta, Anshu M.; de Ruijter, Hendrik; and Strijbosch, Antonius Henricus J., 5,747,441, Cl. 510-375.000.

Levin, Roy: *See*—

VOL
210
ISS
1
MY
5
1998
UMI

  - Hanna, Christine Beth; and Levin, Roy, 5,748,961, Cl. 395-701.000.
- Levine, Aaron William: *See—*
  - Fan, Zhong Hui-Hugh; Levine, Aaron William; Cherukuri, Satyam Choudary; and Lipp, Steven A., 5,747,169, Cl. 428-426.000.
- Levine, Ernest: *See—*
  - Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, 5,747,802, Cl. 250-307.000.
- Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, to IInternational Business Machines Corporation. Method and system for performance monitoring of misaligned memory accesses in a processing system. 5,748,855, Cl. 395-800.230.
- Levine, Harry: *See—*
  - Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
- Levine, Michael R., to Smart VCR Limited Partnership. Telephonically programmable apparatus. 5,748,716, Cl. 379-102.030.
- Levinson, Harry J., to Advanced Micro Devices. Method and apparatus for wafer-focusing. 5,748,323, Cl. 356-399.000.
- Leviton Manufacturing Co., Inc.: *See—*
  - Gershen, Bernard, 5,747,980, Cl. 323-356.000.
- Levy, Gideon: *See—*
  - Dietschi, Roland; and Levy, Gideon, 5,746,571, Cl. 414-795.700.
- Levy, Paul S.; and Cornelius, Steve, to VLSI Technology, Inc. Secure mass storage system for computers. 5,748,744, Cl. 380-52.000.
- Levy, Robert J.; and Hirsch, Danielle, to University of Michigan, The Board of Regent6s of the. Method of making calcification-resistant bioprosthetic tissue. 5,746,775, Cl. 8-94.110.
- Levy, Uri: *See—*
  - Landa, Benzion; Lior, Ishaiau; Barnea, Dan; Fenster, Paul; and Levy, Uri, 5,749,032, Cl. 399-233.000.
- Lewandowski, Mark A.; and Chasser, Anthony M., to Acheson Industries, Inc. UV curable pressure sensitive adhesive composition. 5,747,551, Cl. 522-95.000.
- Lewis, Brian T.; and Hamilton, Graham, to Sun Microsystems, Inc. Method and apparatus for a real-time data collection and display system. 5,748,881, Cl. 395-184.010.
- Lewis, Charles, to Z-Communications, Inc. Low phase noise UHF and microwave oscillator. 5,748,051, Cl. 331-117.00R.
- Lewis, Ralph; and Hershberger, Troy, to Biomet, Inc. Scissor action low profile surgical hand instrument. 5,746,768, Cl. 606-205.000.
- Leyderman, Alexander, to University of Puerto Rico. Organic crystalline films for optical applications and related methods of fabrication. 5,746,823, Cl. 117-5.000.
- LG Chemical Ltd.: *See—*
  - Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
- LG Electronics Inc.: *See—*
  - Hak, Moon Seong, 5,747,947, Cl. 315-308.000.
  - Kim, Jin Yong; and Jeong, Seong Yun, 5,748,603, Cl. 369-112.000.
  - Park, Yong Cheol, 5,748,791, Cl. 382-250.000.
- LG Semicon Co., Ltd.: *See—*
  - Baek, Joon-Hyun, 5,748,032, Cl. 327-536.000.
  - Kim, Su Hwan; and Bae, Seong Ok, 5,748,688, Cl. 375-368.000.
  - Kim, Young-Gon; and Kim, Dong-You, 5,748,450, Cl. 361-777.000.
  - Lee, Byung-Il, 5,747,370, Cl. 438-267.000.
  - Lee, Sang-Don, 5,747,376, Cl. 438-443.000.
  - Lee, Wonro, 5,748,123, Cl. 341-70.000.
  - Lim, Geun, 5,747,372, Cl. 438-298.000.
  - Lim, Il-Taek, 5,748,674, Cl. 375-233.000.
  - Park, Soung Hwi, 5,748,555, Cl. 365-230.040.
- Li, Tien-Chiieh: *See—*
  - Chao, Fang-Ching; and Li, Tien-Chiieh, 5,747,196, Cl. 430-5.000.
- Li, Wu-Shyong: *See—*
  - Warner, David; Lee, Charles C.; and Li, Wu-Shyong, 5,747,148, Cl. 428-212.000.
- Li, Xun: *See—*
  - Darzynkiewicz, Zbigniew D.; Li, Xun; Traganos, Frank N.; and Melamed, Myron R., 5,747,258, Cl. 435-6.000.
- Liang, Shu-Mei: *See—*
  - Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.
- Liao, Simon: *See—*
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Libbey-Owens-Ford Co.: *See—*
  - Higby, Paige L.; Vernacotola, Dean E.; and Penrod, Bret E., 5,747,398, Cl. 501-66.000.
  - Parker, Anthony A.; Strickler, David A.; and Park, Hung S., 5,747,617, Cl. 526-273.000.
- Lichon, Paul G.: *See—*
  - McLean, Christopher H.; Lichon, Paul G.; Morris, Joseph P.; and Flugstad, Philip O., 5,746,050, Cl. 60-200.100.
- Liddell, Kimm A., to Fibre Glass-Evercoat Company, Inc. Method for checking paint applied to a surface. 5,747,094, Cl. 427-8.000.
- Lightfoot, Regina; and Goodman, William, to Bell Atlantic Network Services, Inc. Level 1 Gateway for video dial tone networks. 5,748,493, Cl. 364-514.00C.
- Lilly S. A.: *See—*
  - Mendizabal, Flavia Arce, 5,747,068, Cl. 424-465.000.
- Lim, Geun, to LG Semicon Co., Ltd. Semiconductor device and method for fabricating same. 5,747,372, Cl. 438-298.000.
- Lim, Il-Taek, to LG Semicon Co., Ltd. Decision-feedback equalizer for digital communication system. 5,748,674, Cl. 375-233.000.
- Lim, Liat: *See—*
  - Yong, Dennis; Cheng, Viktor Choong-Hung; Yo, Christopher Leng-Hong; and Lim, Liat, 5,749,079, Cl. 707-100.000.
- Lim, Nancy F.: *See—*
  - Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, 5,747,278, Cl. 435-69.100.
- Limberg, Allen LeRoy, to Samsung Electronics Co., Ltd. Digital television receiver with adaptive filter circuitry for suppressing NTSC co-channel interference. 5,748,226, Cl. 348-21.000.
- Limper-Brenner, Linda: *See—*
  - McDunn, Kevin J.; Limper-Brenner, Linda; and Press, Minoo D., 5,746,585, Cl. 417-477.110.
- Lin, Bill: *See—*
  - Sawasaki, Milton Hiroki; Ykman-Couvreur, Chantal; Lin, Bill; and Man, Hugo De, 5,748,487, Cl. 364-489.000.
- Lin, Chang-Song: *See—*
  - Huang, Yung-Sheng; Yeou, Long-Sheng; Huang, Ji-Chung; and Lin, Chang-Song, 5,747,382, Cl. 438-624.000.
- Lin, Ching-Bin: *See—*
  - Chuang, Tung-Han; Lin, Ching-Bin; Tsai, Teng-Chun; and Chang, Jiin-Chyuan, 5,746,956, Cl. 264-104.000.
- Lin, Ching-Yi: *See—*
  - Yu, Kuo-Cheng; Sun, Bao-Shiang; and Lin, Ching-Yi, 5,748,948, Cl. 395-555.000.
- Lin, Deng-Nan. Picture tube fixing device. 5,748,265, Cl. 348-825.000.
- Lin, Edward. Multi-functional anti-theft supervising assembly. 5,748,081, Cl. 340-555.000.
- Lin, Fen-Lan: *See—*
  - Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, 5,747,525, Cl. 514-444.000.
- Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, to Industrial Technology Research Institute. High optical throughput liquid-crystal projection display system. 5,748,376, Cl. 359-629.000.
- Lin, Mao-Sheng: *See—*
  - Chang, Hsiu-Chuan; and Lin, Mao-Sheng, 5,746,913, Cl. 210-189.000.
- Lin, San-Feng, to Acer Peripherals, Inc. Push button switch having scissors-type arm members. 5,746,308, Cl. 200-344.000.
- Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, to Macronix International Co., Ltd. Advanced program verify for page mode flash memory. 5,748,535, Cl. 365-185.220.
- Lin, William Chin-Woei: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Lin, Yao-Chin, to Asia Umbrella Industries Co., Ltd. Linkage device for an umbrella. 5,746,235, Cl. 135-29.000.
- Lindahl, D. Kent: *See—*
  - Syler, Rodney R.; Faber, Rolf E.; and Lindahl, D. Kent, 5,746,344, Cl. 220-465.000.
- Lindauer Dornier Gesellschaft mbH: *See—*
  - Wahhoud, Adnan; and Hehle, Josef, 5,746,256, Cl. 139-116.200.
- Lindberg, John M.; and Heinz, Robert Eric, to Abbott Laboratories. Programmable standard for use in an apparatus and process for the noninvasive measurement of optically absorbing compounds. 5,748,308, Cl. 356-310.000.
- Lindenthal, Hans, to J. M. Voith GmbH. Flange driver for a cardan shaft. 5,746,659, Cl. 464-135.000.
- Lindgren, Per-Olov; Johansson, Karl-Erik; Johansson, Kjell-Åke; and Paulsson, Karin, to Boliden Mineral AB. Shot pellets for game hunting on wet marshlands and method of manufacturing such shot. 5,747,724, Cl. 102-459.000.
- Lindgren, Susanne Ward: *See—*
  - O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, 5,747,272, Cl. 435-7.370.
- Lindholm, Dennis Allen, to Ampex Corporation. Video special effects system with graphical operator interface. 5,748,192, Cl. 345-425.000.
- Line Power Manufacturing Corporation: *See—*
  - Kearfott, Robert T.; and Raines, Garry F., 5,746,340, Cl. 220-3.800.
- Line, True-Lon: *See—*
  - So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, 5,747,853, Cl. 257-355.000.
- Ling, Tien-Feng: *See—*
  - Nguyen, Duy T.; and Ling, Tien-Feng, 5,746,888, Cl. 162-199.000.
- Lingenfelter, Andrew A.: *See—*
  - Harmon, John L.; Peters, William C.; Haughton, Robert A.; and Lingenfelter, Andrew A., 5,748,691, Cl. 376-261.000.
- Linko, Pekka: *See—*
  - Lämsä, Merja; Linko, Yu-Yen; Linko, Pekka; and Uosukainen, Esa, 5,747,434, Cl. 508-485.000.
- Linko, Yu-Yen: *See—*

  - Lämsä, Merja; Linko, Yu-Yen; Linko, Pekka; and Uosukainen, Esa, 5,747,434, Cl. 508-485.000.
- Linner, Hans. Protective glove for ice-hockey and similar sports. 5,745,916, Cl. 2-16.000.
- Linotype-Hell AG: *See—*
  - Köhler, Thomas, 5,748,331, Cl. 358-302.000.
  - Schielke, Rainer, 5,748,803, Cl. 382-275.000.
  - Winkelman, Kurt-Helfried, 5,748,802, Cl. 382-271.000.
- Lins, Günter: *See—*
  - Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert; and Römheld, Michael, 5,746,051, Cl. 60-275.000.
- Linstad, Lauren Emory: *See—*
  - Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, 5,748,920, Cl. 395-308.000.
- Linsuri, Ari: *See—*
  - Huovila, Jyrki; and Linsuri, Ari, 5,746,889, Cl. 162-216.000.
- Lior, Ishaiau: *See—*
  - Landa, Benzion; Lior, Ishaiau; Barnea, Dan; Fenster, Paul; and Levy, Uri, 5,749,032, Cl. 399-233.000.
- Liou, Kong-Mou: *See—*
  - Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.
- Lip-Ink International: *See—*
  - Nichols, Rosemarie; and Weisman, Martin J., 5,747,017, Cl. 424-61.000.
- Lipe, Ralph A.; and Santerre, Pierre-Yves, to Microsoft Corporation. System for configuring a computer system. 5,748,980, Cl. 395-828.000.
- Lipp, Steven A.: *See—*
  - Fan, Zhong Hui-Hugh; Levine, Aaron William; Cherukuri, Satyam Choudary; and Lipp, Steven A., 5,747,169, Cl. 428-426.000.
- Lippincott, Howard C.: *See—*
  - Cochran, Stuart A.; Goll, Steven J.; Lippincott, Howard C.; and Winkler, Gary A., 5,747,084, Cl. 426-120.000.
- Lippincott, Louis A., to Intel Corporation. Video processing system and method. 5,748,234, Cl. 348-222.000.
- Liptay, John Stephen: *See—*
  - Webb, Charles Franklin; Farrell, Mark Steven; Check, Mark Anthony; and Liptay, John Stephen, 5,748,951, Cl. 395-595.000.
- Lipton, Stuart A., to Children's Medical Center Corporation, The. Method of preventing NMDA receptor complex-mediated Neuronal damage. 5,747,545, Cl. 514-742.000.
- Lisco, Inc.: *See—*
  - Shogan, Gregory P.; Stroud, David J.; and Dawley, Mark, 5,745,954, Cl. 16-343.000.
- Listigovers, Nancy Ann: *See—*
  - Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., 5,747,577, Cl. 524-458.000.
- Lite Corporation: *See—*
  - Chin, Paul W., Jr., 5,746,508, Cl. 362-367.000.
- Littig, David H., to United States Manufacturing Company. C-shaped spring member for prosthetic limbs. 5,746,773, Cl. 623-35.000.
- Little, Arthur J., to Nason Company, The. Throttle control device. 5,746,179, Cl. 123-401.000.
- Little, Edward James: *See—*
  - Schleyerbach, Rudolf; Bartlett, Robert Ryder; Kuo, Elizabeth Anne; and Little, Edward James, 5,747,664, Cl. 558-392.000.
- Little, Ian Raymond; and McNally, John Paul, to BP Chemicals Limited. Catalyst compositions and process for preparing polyolefins. 5,747,405, Cl. 502-113.000.
- Littmann, Dieter: *See—*
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
- Litton Systems, Inc.: *See—*
  - Cherbettchian, Agop H.; and Debley, William P., 5,748,565, Cl. 367-154.000.
  - Crockett, Russell L.; Day, Michael J.; Hamilton, Tyler W.; Handy, Gwendolyn C.; Harris, Glen M.; and Lawson, Glenn E., 5,745,976, Cl. 29-597.000.
- Liu, Jung-Yang. Hot melting iron having a safety control circuit board. 5,747,778, Cl. 219-506.000.
- Liu, Kaibai; Holley, Charles Carl; and Petersen, Walter John, to Toro Company, The. Automatic debris retrieval system. 5,745,947, Cl. 15-84.000.
- Liu, Pei-Yih: *See—*
  - Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, 5,748,602, Cl. 369-112.000.
- Liu, Peter Tsung-shih: *See—*
  - Pelella, Antonio Raffaele; Liu, Peter Tsung-shih; and Scharff, Gerard Joseph, 5,748,643, Cl. 371-22.300.
- Liu, Ping: *See—*
  - Hu, Nan-Xing; Liu, Ping; and Ong, Beng S., 5,747,205, Cl. 430-59.000.
- Liu, Wann-Huang: *See—*
  - Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, 5,747,525, Cl. 514-444.000.
- Liuzzo, Giuseppe: *See—*
  - Lacquaniti, Luigi; Liuzzo, Giuseppe; Palitto, Marcello; and Verdone, Nicola, 5,746,141, Cl. 110-203.000.
- Live Picture, Inc.: *See—*
  - Chen, Shenchang Eric, 5,748,194, Cl. 345-427.000.
- Ljusberg, Helena; and Pehrson, Kerstin, to Danisco Sugar AB. Method of making molasses product having low hygroscopicity and sufficient non-caking properties. 5,747,089, Cl. 426-478.000.
- Llorens, Joseph R.; and Wang, Huili, to Methode Electronics, Inc. Method and apparatus for transferring data from SCSI bus to serial device and from serial device to SCSI bus. 5,748,924, Cl. 395-309.000.
- Lloyd, Samuel J.; and Martin, Steven R. Conduit cleaner. 5,745,948, Cl. 15-104.120.
- LME Inc.: *See—*
  - Peck, Walter Richard; and Oates, Ronald Wayne, 5,746,395, Cl. 244-121.000.
- Lo, James Ting-Ho, to Maryland Technology Corporation. Nonadaptively trained adaptive neural systems. 5,748,847, Cl. 395-23.000.
- Lobo, Lloyd A.: *See—*
  - Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., 5,747,234, Cl. 430-523.000.
- Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, to Robert Bosch GmbH. Cylinder head cover of an internal combustion engine. 5,746,168, Cl. 123-90.380.
- Lochmahr, Karl; and Rauland, Werner, to Behr GmbH & Co. Control unit for vehicle climate control. 5,747,759, Cl. 200-5.00R.
- Lockheed Martin Corporation: *See—*
  - Abatzoglou, Theagenis J.; Lam, Lawrence K.; Malek, Homayoun; and Reagan, John T., 5,748,507, Cl. 364-572.000.
  - Kingston, Samuel C.; Burdoin, Robert B.; and Lamensdorf, David, 5,748,151, Cl. 343-753.000.
  - Mahler, Ronald P. S., 5,748,852, Cl. 395-61.000.
  - Nygren, William D., Jr.; and Isaar, Arwen G., 5,746,558, Cl. 411-110.000.
  - Nygren, William D., Jr.; and Isaac, Arwen G., 5,746,561, Cl. 411-368.000.
- Lockheed Martin Corp. Missiles & Space: *See—*
  - Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., 5,747,968, Cl. 320-119.000.
- Loder, John Andrew, to Nokia Telecommunications Oy. Removable subscriber identification module for a mobile radio terminal. 5,748,720, Cl. 379-144.000.
- Logan, Margaret Elizabeth: *See—*
  - Weber, Wayne Woodrow, II; Messing, Calvin Roman; and Logan, Margaret Elizabeth, 5,747,345, Cl. 436-74.000.
- Logan, Walter T.; and Bartlett, Stephen L. Water treatment with large numbers of non-pathogenic bacteria to improve yield of aquatic animals. 5,746,155, Cl. 119-230.000.
- Logghe, Peter G.: *See—*
  - Scott, Steven L.; Pribnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., 5,748,900, Cl. 395-200.650.
- Lohmann, Gabriele: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Lohmann GmbH & Co. KG: *See—*
  - Eckel, Petra; Pelz, Edgar; and Potzler, Bernd, 5,747,393, Cl. 442-272.000.
- Lohmeier, Gerhard: *See—*
  - Dust, Herbert; Lohmeier, Gerhard; and Viebranz, Manfred G., 5,746,253, Cl. 138-178.000.
- Lohse, David John: *See—*
  - Emert, Jacob; Lundberg, Robert Dean; and Lohse, David John, 5,747,596, Cl. 525-298.000.
- Lokar, Richard A.; and Rezabek, Dennis J., to Process Technology Inc. High temperature lamp heater assembly with cooling of lamp base portions. 5,748,837, Cl. 392-411.000.
- Lombardi, Raymond A., to Scientific Resources, Inc. Vial capping device. 5,746,042, Cl. 53-305.000.
- Londa, Joseph Michael, to International Business Machines Corporation. Multi-electronic device package. 5,748,452, Cl. 361-790.000.
- Longoria, Jose J.: *See—*
  - Sorenson, Marius W.; Cipriano, Robert A.; Longoria, Jose J.; and Weaver, John D., 5,747,546, Cl. 521-32.000.
- Lonsky, Ralph; and Lehmann, Lutz Uwe, to Riedel-De Haen Aktiengesellschaft. Use of indoleine-cyaninedisulphonic acid derivatives. 5,747,233, Cl. 430-522.000.
- Loomis, Donald W.: *See—*
  - Curry, Stephen M.; Loomis, Donald W.; and Fox, Christopher W., 5,748,740, Cl. 380-25.000.
- Loose, Werner; Korec, Jacek; Niemann, Ekkehard; and Boos, Alfred, to Daimler-Benz Aktiengesellschaft. SIC field-effect transistor array with ring type trenches and method of producing them. 5,747,831, Cl. 257-77.000.
- Loper, Gary L.: *See—*
  - Jaduszliwer, Bernardo; Klimcak, Charles M.; and Loper, Gary L., 5,747,348, Cl. 436-106.000.
- Lopez, Marco A.: *See—*
  - Orlando, Harold J.; Pappas, Michael L.; and Lopez, Marco A., 5,748,230, Cl. 348-187.000.
- Lopez, Maria Luisa: *See—*
  - Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.

OL
2 10
ISS
1
MY
5
998
MI

- Lopresti, Daniel P.; and Sandberg, Jonathan S., to Panasonic Technologies, Inc. Method and means for enhancing optical character recognition of printed documents. 5,748,807, Cl. 382-310.000.
- L'Oreal: *See—*
  - Cauwet, Daniele; and Dubief, Claude, 5,747,014, Cl. 424-70.110.
  - Hansenne, Isabelle, 5,747,009, Cl. 424-59.000.
  - Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, 5,747,013, Cl. 424-707.000.
- Loritz, Axel; and Hillenmayer, Stefan, to Siemens Aktiengesellschaft. Notepad computer having an integrated video camera. 5,748,441, Cl. 361-683.000.
- Losee, David L.: *See—*
  - Roberts, Luther C.; and Losee, David L., 5,747,199, Cl. 430-7.000.
- Lotfi, Ashraf Wagih: *See—*
  - Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, 5,747,982, Cl. 323-902.000.
- Lotz, Jonathan P.: *See—*
  - Lesartre, Gregg; Quarnstrom, Doug; and Lotz, Jonathan P., 5,748,934, Cl. 395-392.000.
- Loughrin, Thomas Daniel: *See—*
  - Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
- Louis, Bruno: *See—*
  - Fredberg, Jeffrey; Glass, Gary; Lehr, John; and Louis, Bruno, 5,746,699, Cl. 600-529.000.
- Louis, Daniel P. Visual alignment instrument. 5,748,306, Cl. 356-247.000.
- Love It Golf Company: *See—*
  - Lovett, William E., 5,746,666, Cl. 473-328.000.
- Love, Stephen John: *See—*
  - Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.
- Lovelace, Susan L.: *See—*
  - Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., 5,746,708, Cl. 604-4.000.
- Loveland, William Davis: *See—*
  - Manico, Joseph Anthony; Roule, Thomas Richard; Loveland, William Davis; and Pricola, Barton Anthony, 5,748,284, Cl. 355-39.000.
- Loveless, Frederick Charles: *See—*
  - Coolbaugh, Thomas S.; Loveless, Frederick Charles; and Matthews, Demetreos N., 5,747,598, Cl. 525-314.000.
- Lovett, William E., to Love It Golf Company. Golf club and club head. 5,746,666, Cl. 473-328.000.
- Lovgren, Jack G.: *See—*
  - Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., 5,747,968, Cl. 320-119.000.
- Lovoi, Paul A.: *See—*
  - Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., 5,746,635, Cl. 445-24.000.
- Low Emissions Technologies Research and Development Partnership: *See—*
  - Hoard, John W., 5,746,984, Cl. 422-169.000.
- Lowry Computer Products, Inc.: *See—*
  - Aldrich, Rodney D., 5,748,899, Cl. 395-200.520.
- LSI Logic Corporation: *See—*
  - Mactaggart, Iain Ross; Welch, James R.; and Fiedler, Alan, 5,748,020, Cl. 327-218.000.
  - Priebe, Gordon W.; and Buer, Myron, 5,748,070, Cl. 340-146.200.
  - Variot, Patrick; Chia, Chok J.; and Trabucco, Robert T., 5,745,986, Cl. 29-840.000.
- Lub, Johan: *See—*
  - Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, 5,748,271, Cl. 349-69.000.
- Lubrizol Corporation, The: *See—*
  - Luciani, Carmen V.; Lange, Richard M.; and Seebauer, Joseph G., 5,747,433, Cl. 508-479.000.
- Lucas Industries Public Limited Company: *See—*
  - Jefferson, John Roderick; Collingborn, Peter Alban George; Cooke, Michael Peter; and Buckley, Paul, 5,746,180, Cl. 123-447.000.
- Lucas, Michael S. P.: *See—*
  - Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, 5,747,425, Cl. 505-150.000.
- Lucent Technologies Inc: *See—*
  - Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.
- Lucent Technologies Inc.: *See—*
  - Bartley, Paul L.; and Fisher, Deborah A., 5,745,987, Cl. 29-840.000.
  - Blaker, David Mark; Ellard, Gregory Stephen; and Mobin, Muhammad Shafiul, 5,748,650, Cl. 371-43.100.
  - Dentai, Andrew Gomperz, 5,747,861, Cl. 257-435.000.
  - Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, 5,747,982, Cl. 323-902.000.
  - Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, 5,747,918, Cl. 313-309.000.
  - Graebner, John Edwin; Jin, Sungho; and Zhu, Wei, 5,746,931, Cl. 216-88.000.
  - Huang, Yennun, 5,748,882, Cl. 395-184.010.
  - Kubli, Robert Alfred; and West, James Edward, 5,748,757, Cl. 381-168.000.
  - Mizikovsky, Semyon, 5,748,734, Cl. 380-21.000.
  - Mobin, Mohammad Shafiul, 5,748,680, Cl. 375-317.000.
  - Mobin, Mohammad Shafiul, 5,748,682, Cl. 375-344.000.
  - Nelson, Edward Dennis, 5,747,742, Cl. 174-84.00R.
  - Podilchuk, Christine Irene, 5,748,242, Cl. 348-391.000.
- Luchetti, Robert J.; Draudt, Gregg Robert; Eldon, James Bender, III; and McClanahan, David Dean, to Steelcase Inc. Partition system. 5,746,034, Cl. 52-220.700.
- Luchetti, Robert J.: *See—*
  - Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
- Luciani, Carmen V.; Lange, Richard M.; and Seebauer, Joseph G., to Lubrizol Corporation, The. Oil concentrates of polymers with improved viscosity. 5,747,433, Cl. 508-479.000.
- Lucio, John: *See—*
  - Davis, Dennis W.; and Lucio, John, 5,748,085, Cl. 340-572.000.
- Lücke, Christian; Sümmerer, Gunther; and Gärtner, Hartmut, to Carl-Zeiss-Stiftung. Illuminating device for a stereo microscope. 5,748,367, Cl. 359-385.000.
- Lucke, Donald E.: *See—*
  - Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.
- Luckett, Lawane: *See—*
  - Storey, Michael C.; and Luckett, Lawane, 5,748,017, Cl. 327-131.000.
- Luckow, Hans-Jürgen. Holding device for compact discs. 5,746,315, Cl. 206-310.000.
- Ludikhuize, Adrianus W., to U.S. Philips Corporation. Circuit arrangement, and junction field effect transistor suitable for use in such a circuit arrangement. 5,747,841, Cl. 257-266.000.
- Ludwig, Howard Hans: *See—*
  - Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.
- Ludwig Institute For Cancer Research: *See—*
  - Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.
- Lue, Brian: *See—*
  - Rossman, Kent; Lue, Brian; and Redeker, Fred C., 5,748,434, Cl. 361-234.000.
- Luecke, James E.: *See—*
  - Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Nootbaar, Michael W., 5,746,697, Cl. 600-323.000.
- Lüer, Harald; Scheffels, Volker; and Pferdehirt, Thomas, to YKK Corporation. Push-button closure part. 5,745,964, Cl. 24-687.000.
- Lugert, Gerhard: *See—*
  - Jankewitz, Axel; and Lugert, Gerhard, 5,746,778, Cl. 8-402.000.
- Lukes, Richard, to Textron Inc. Break-off drillpoint screw. 5,746,096, Cl. 81-54.000.
- Lumedics, Ltd.: *See—*
  - Tankovich, Nikolai, 5,746,736, Cl. 606-9.000.
- Lumley, Micheal Andrew; and Maciejczyk, Wieslaw Peter, to Britax Child-Care Products Pty Ltd. Reclining mechanism and latch for child safety seat. 5,746,478, Cl. 297-256.130.
- Lumma, William C.: *See—*
  - Bock, Mark G.; Lumma, William C.; and Patane, Michael A., 5,747,490, Cl. 514-233.800.
- Lunar Corporation: *See—*
  - Mazess, Richard B.; Borg, Jens; and Ergun, David L., 5,748,704, Cl. 378-54.000.
- Lund, Lowell Dennis: *See—*
  - Pai, Deepak Keshav; and Lund, Lowell Dennis, 5,746,367, Cl. 228-19.000.
- Lundberg, Robert Dean: *See—*
  - Emert, Jacob; Lundberg, Robert Dean; and Lohse, David John, 5,747,596, Cl. 525-298.000.
- Lundeberg, Thomas: *See—*
  - Sodervall, Billy Valter; and Lundeberg, Thomas, 5,747,178, Cl. 428-624.000.
- Lundell, Louis J.; Oh, Sang Y.; and Newman, Terron C., to Motorola, Inc. Cordless telephone apparatus switchable between desktop and wall mount. 5,748,727, Cl. 379-446.000.
- Lundh, Rolf: *See—*
  - Egberg, Nils; Larsson-Backström, Carin; Jakobsson, Jan; and Lundh, Rolf, 5,747,533, Cl. 514-549.000.
- Lunsmann, Walter Joseph: *See—*
  - Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, 5,747,442, Cl. 510-475.000.
- Luo, Jian: *See—*
  - Inman, Wayne D.; King, Steven Row; Evans, Joseph L.; and Luo, Jian, 5,747,527, Cl. 514-453.000.
- Luongo, Danielle L.: *See—*

  - Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.
- Luscher, Marcus P.; and Ridley, Stephen F. Double inner tube and valve system. 5,746,850, Cl. 152-339.100.
- Lussier, Daniel J.: *See—*
  - Bergantino, Paul V.; and Lussier, Daniel J., 5,748,630, Cl. 370-395.000.
  - Bergantino, Paul V.; and Lussier, Daniel J., 5,748,631, Cl. 370-398.000.
- Lutz, Josef; Kinne, Marianne; and Mueller, Heinz-Juergen, to Semikron Elektronik GmbH. Fast power diode. 5,747,872, Cl. 257-611.000.
- Lützen, Christian: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Lyle, Robert W.: *See—*
  - Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., 5,748,952, Cl. 395-602.000.
- Lynch, Gary S.; and Rogers, Gary A., to University of California, The Regents of the. Heteroatom substituted benzoyl derivatives that enhance synaptic responses mediated by ampa receptors. 5,747,492, Cl. 514-249.000.
- Lynx Therapeutics, Inc.: *See—*
  - Brenner, Sydney, 5,747,255, Cl. 435-6.000.
- Lyon, Ralph Merwin: *See—*
  - Smart, David Clinton: and Lyon, Ralph Merwin, 5,748,990, Cl. 396-6.000.
- Lyondell Petrochemical Company: *See—*
  - Nagy, Sandor; and Tyrell, John A., 5,747,404, Cl. 502-104.000.
- Lyu Jan Co., Ltd.: *See—*
  - Chang, Li-Chen, 5,746,117, Cl. 99-407.000.
- Lyu, Jeong Ho: *See—*
  - Lee, Jong Duk; Chun, Kuk Jin; Park, Byung Gook; and Lyu, Jeong Ho, 5,747,356, Cl. 437-44.000.
- Lyu, Jong-Sun: *See—*
  - Lee, Kyu-Hong; Lee, Jin-Hyo; and Lyu, Jong-Sun, 5,747,871, Cl. 257-586.000.
- M.R.M. International, Inc.: *See—*
  - Labock, Joseph, 5,747,159, Cl. 428-335.000.
- M.W. Technologies, Inc.: *See—*
  - Dragotta, Peter J., 5,746,323, Cl. 209-539.000.
- Ma, Chingwo; Yang, Inging; and Hsu, Wei-Chan, to S3 Incorporated. Sigma-delta digital-to-analog conversion system and process through reconstruction and resampling. 5,748,126, Cl. 341-143.000.
- Ma, Ellick L.: *See—*
  - Ip, Hiu F.; and Ma, Ellick L., 5,747,200, Cl. 430-22.000.
- Maag, Clifford; and Parker, Lance, to Night Technologies International. Sound system gain and equalization circuit. 5,748,754, Cl. 381-104.000.
- Maas, Cyde D.: *See—*
  - Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.
- Maas, Gerhard: *See—*
  - Speil, Walter; and Maas, Gerhard, 5,746,165, Cl. 123-90.160.
- Maase, Daniel Frederick; and Sartor, Thomas Frank, to Identix Incorporated. Method and device for reducing smear in a rolled fingerprint image. 5,748,766, Cl. 382-124.000.
- MacArthur, James B.: *See—*
  - Raza, S. Babar; and MacArthur, James B., 5,748,559, Cl. 365-233.000.
- MaCaudiere, Pierre; and Pescher, Yvette, to Rhone-Poulenc Chimie. Process for the preparation of rare-earth sulphides from halides. 5,746,990, Cl. 423-263.000.
- MacBeath, Fiona Susan, to Procter & Gamble Company, The. Machine dishwashing detergent containing coated percarbonate and an acidification agent to provide delayed lowered pH. 5,747,438, Cl. 510-224.000.
- Maccoss, Malcolm: *See—*
  - Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.
- MacDermid, Incorporated: *See—*
  - Larson, Gary B., 5,747,098, Cl. 427-58.000.
- MacDonald, John Gavin: *See—*
  - Nohr, Ronald Sinclair; and MacDonald, John Gavin, 5,747,550, Cl. 522-34.000.
- MacDonald, Timothy Lee: *See—*
  - Pommier, Yves; MacDonald, Timothy Lee; and Madalengoitia, Jose S., 5,747,520, Cl. 514-412.000.
- MacDougall, Thomas D.: *See—*
  - Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.
- MacFarlane, Douglas Robert; and Voelkel, Alice, to Telectronics Pacing Systems, Inc. Capacitors having high strength electrolytic capacitor separators. 5,748,439, Cl. 361-525.000.
- Machida, Hajime: *See—*
  - Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
- Machida, Katsuki: *See—*
  - Haga, Masaaki; Machida, Katsuki; and Tsuji, Hideaki, 5,749,005, Cl. 396-287.000.
- Machida, Shuji; Shikuma, Härüo; Hoshino, Ayami; and Takakura, Yutaka, to Idemitsu Kosan Co., Ltd. Ethylene copolymer, thermoplastic resin composition containing same, and process for preparing ethylene copolymer. 5,747,620, Cl. 526-348.300.
- Machida, Tsutomu, to Koito Manufacturing Co., Ltd. Automotive signal lamps. 5,746,497, Cl. 362-80.000.
- Maciejczyk, Wieslaw Peter: *See—*
  - Lumley, Micheal Andrew; and Maciejczyk, Wieslaw Peter, 5,746,478, Cl. 297-256.130.
- Mack, Peter. Process and mixture for applying a coating made of the precious stone lapis lazuli on a substrate and substrate thus produced. 5,747,168, Cl. 428-425.800.
- MacMillan, Leann M.: *See—*
  - Kilk, Erik; Van der Veer, Karen; and MacMillan, Leann M., 5,748,613, Cl. 370-231.000.
- Macor, John Eugene; and Wythes, Martin James, to Pfizer, Inc. Indole derivatives. 5,747,501, Cl. 514-376.000.
- Macronix International Co., Ltd.: *See—*
  - Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.
- Macrovision Corporation: *See—*
  - Quan, Ronald, 5,748,733, Cl. 380-15.000.
- Mactaggart, Iain Ross; Welch, James R.; and Fiedler, Alan, to LSI Logic Corporation. High speed capture latch. 5,748,020, Cl. 327-218.000.
- Madalengoitia, Jose S.: *See—*
  - Pommier, Yves; MacDonald, Timothy Lee; and Madalengoitia, Jose S., 5,747,520, Cl. 514-412.000.
- Mader, Gerhard: *See—*
  - Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
- Madland, Paul D.: *See—*
  - Abramson, Jeffrey M.; Akkary, Haitham; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,748,937, Cl. 395-394.000.
- Madsen, David C.: *See—*
  - Rowe, W. Bruce; Mark, David A.; and Madsen, David C., 5,747,459, Cl. 514-18.000.
- Madsen, Peter: *See—*
  - Jørgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.
- Maeda, Hiroshi; Akaike, Takaaki; Miyamoto, Yoichi; and Yoshida, Masaki, to Maeda, Hiroshi. Method for treating hypertension using pyrazolopyrimidine derivatives. 5,747,495, Cl. 514-258.000.
- Maeda, Hiroshi; Itoh, Tatsuya; and Nakamura, Masatsugu, to Sharp Kabushiki Kaisha. Image processing device. 5,748,794, Cl. 382-251.000.
- Maeda, Hiroshi: *See—*
  - Fujiwara, Shigeki; Yamashita, Hideki; and Maeda, Hiroshi, 5,746,282, Cl. 180-6.200.
- Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; and Hasegawa, Etsuo, to NEC Corporation. Polymer having silicon atoms and sulfonium salt units and photoresist compositions containing the same. 5,747,622, Cl. 528-12.000.
- Maeda, Masahiko: *See—*
  - Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, 5,747,364, Cl. 438-14.000.
- Maeda, Yasuaki; and Nakamura, Kosuke, to Sony Corporation. Memory controller and recording apparatus which adds dummy data to complete a sector of data when writing to memory. 5,748,588, Cl. 369-54.000.
- Maekawa, Toshikazu; and Hayashi, Yuji, to Sony Corporation. Circuit for converting level of low-amplitude input. 5,748,026, Cl. 327-333.000.
- Maekawa, Youichi: *See—*
  - Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, 5,747,210, Cl. 430-109.000.
- Maeyama, Ryuichiro: *See—*
  - Okado, Kenji; Maeyama, Ryuichiro; and Inaba, Kouji, 5,747,213, Cl. 430-124.000.
- Maezawa, Etsuo, to NEC Corporation. Optical disk device having a focus offset controller. 5,748,584, Cl. 369-44.290.
- Magni, Ambrogio: *See—*
  - Casareto, Enrico; Leoni, Massimo; Ronzio, Enrico; and Magni, Ambrogio, 5,747,330, Cl. 435-254.100.
- Maguire, David J.; and Le, Hung Q., to Compaq Computer Corporation. Serial bus system for shadowing registers. 5,748,911, Cl. 395-281.000.
- Maguire, Francis J., Jr. System for stretching a solid flexible lens. 5,748,382, Cl. 359-676.000.
- Mahany, Ronald L., to Norand Corporation. Network utilizing modified preambles that support antenna diversity. 5,748,676, Cl. 375-260.000.
- Mahany, Ronald L.: *See—*
  - Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.
- Mahle GmbH: *See—*
  - Issler, Wolfgang; and Kollotzek, Helmut, 5,746,169, Cl. 123-193.600.
- Mahler, Ronald P. S., to Lockheed Martin Corporation. Fuzzy-logic classification system. 5,748,852, Cl. 395-61.000.
- Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., to Cabot Corporation. Ink and coating compositions containing silicon-treated carbon black. 5,747,562, Cl. 523-215.000.
- Mahoney, Ronald L.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

  - Clements, Jack T.; Thill, Anthony J.; and Mahoney, Ronald L., 5,746,792, Cl. 55-341.100.
- Mahr, Anna: *See—*
  - Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.
- Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, to Schering Aktiengesellschaft. DTPA derivatives substituted in a novel way, their metal complexes, and their use in diagnosis and therapy. 5,746,995, Cl. 424-1.650.
- Maier, Reinhard: *See—*
  - Amft, Dietrich; Branston, David-Walter; Kieser, Jörg; and Maier, Reinhard, 5,747,984, Cl. 324-71.200.
- Maier, Thomas: *See—*
  - Scheiblich, Stefan; Maier, Thomas; Baltruschat, Helmut Siegfried; and Pont, Joseph Luke, 5,747,423, Cl. 504-251.000.
- Maier, Willi, to Grapha-Holding AG. Sorting conveyor for packets. 5,746,301, Cl. 198-370.040.
- Maillefer Instruments S.A.: *See—*
  - Maillefer, Pierre-Luc; and Aeby, François, 5,746,597, Cl. 433-102.000.
- Maillefer, Pierre-Luc; and Aeby, François, to Maillefer Instruments S.A. Instrument for boring dental radicular canals. 5,746,597, Cl. 433-102.000.
- Maisonpierre, Peter C.: *See—*
  - Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.
- Majeti, Satyanarayana, to Procter & Gamble Company, The. Methods for the treatment of herpes virus infections. 5,747,070, Cl. 424-650.000.
- Majima, Hiroshi: *See—*
  - Eguchi, Toyoaki; and Majima, Hiroshi, 5,746,842, Cl. 148-319.000.
- Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and semiconductor module. 5,747,876, Cl. 257-687.000.
- Mak, Steve S. Y.: *See—*
  - Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.
- Maker Communications, Inc.: *See—*
  - Bergantino, Paul V.; and Lussier, Daniel J., 5,748,630, Cl. 370-395.000.
  - Bergantino, Paul V.; and Lussier, Daniel J., 5,748,631, Cl. 370-398.000.
- Maki, Takeshi: *See—*
  - Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, 5,749,053, Cl. 455-524.000.
- Makida, Seigo: *See—*
  - Kobayashi, Kenichi; Makida, Seigo; Nishihara, Yoshio; and Hiji, Naoki, 5,748,228, Cl. 348-63.000.
- Makie, Ikuo: *See—*
  - Hirobe, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, 5,746,505, Cl. 362-260.000.
- Makimoto, Mitsuo: *See—*
  - Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,748,059, Cl. 333-204.000.
- Makino, Haruhiko: *See—*
  - Sohda, Takashi; Makino, Haruhiko; and Baba, Atsuo, 5,747,486, Cl. 514-211.000.
- Makino, Mayumi: *See—*
  - Matsumura, Yasushi; Nakano, Takashi; Makino, Mayumi; and Morizawa, Yoshitomi, 5,747,531, Cl. 514-469.000.
- Makino, Tomoaki: *See—*
  - Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, 5,746,676, Cl. 476-50.000.
- Makino, Toru: *See—*
  - Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
- Makita, Tatsuo: *See—*
  - Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
- Malavalli, Kumar: *See—*
  - Stoevhase, Bent; and Malavalli, Kumar, 5,748,612, Cl. 370-230.000.
- Malchesky, Paul S., to Steris Corporation. Scanning device for evaluating cleanliness and integrity of medical and dental instruments. 5,747,794, Cl. 250-227.230.
- Malek, Homayoun: *See—*
  - Abatzoglou, Theagenis J.; Lam, Lawrence K.; Malek, Homayoun; and Reagan, John T., 5,748,507, Cl. 364-572.000.
- Malhotra, Arun; Ang, Jane; Gray, G. Robert; and Watterston, James, to AIWA Research and Development, Inc. Thin film magnetic head including layered magnetic side poles. 5,748,417, Cl. 360-126.000.
- Malhotra, Shadi L.; and Foley, Diane M., to Xerox Corporation. Decurling compositions. 5,746,814, Cl. 106-18.000.
- Malik, Amjad I.: *See—*
  - Salsman, Kenneth E.; Malik, Amjad I.; and Kingsley, Gary B., 5,748,379, Cl. 359-634.000.
- Malin, Art: *See—*
  - Van Erden, Donald; and Malin, Art, 5,747,126, Cl. 428-35.200.
- Malin, Stephen F.: *See—*
  - Khalil, Gamal, and Malin, Stephen F., 5,747,806, Cl. 250-339.120.
- Mallory, Chester L.: *See—*
  - Norton, Adam E.; Mallory, Chester L.; Pham, Hung V.; and Rasmussen, Paul, 5,747,813, Cl. 250-372.000.
- Malmasson, Jacques, to Framatome; and ATEA Société Atlantique de Techniques Avancées. Sealing device for an instrumentation column penetrating the head of the vessel of a nuclear reactor inside an adapter. 5,748,689, Cl. 376-204.000.
- Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R., to Piccolino, LLC. Child and infant enclosure structure. 5,747,129, Cl. 428-36.400.
- Malofsky, Bernard M.: *See—*
  - Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R., 5,747,129, Cl. 428-36.400.
- Malvino, Joanna Mary: *See—*
  - Heiser, Stephen J.; Malvino, Joanna Mary; Wohl, Charles M.; and Poza, Fausto, 5,748,148, Cl. 342-457.000.
- Man, Hugo De: *See—*
  - Sawasaki, Milton Hiroki; Ykman-Couvreur, Chantal; Lin, Bill; and Man, Hugo De, 5,748,487, Cl. 364-489.000.
- Mancini, Brian M.: *See—*
  - Huang, Jin; Midya, Pallab; and Mancini, Brian M., 5,747,914, Cl. 310-318.000.
- Mancuso, Massimo: *See—*
  - Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.
- Mando Machinery Corporation: *See—*
  - Shim, Tae-Young, 5,746,057, Cl. 60-545.000.
- Mandon, Stephane L., to Caterpillar Inc. Method of manufacturing a structural portion of a construction machine. 5,746,861, Cl. 156-182.000.
- Manfredi, Paul A.; and Morris, Raymond G., to International Business Machines Corporation. Brush conditioner for a semiconductor cleaning brush. 5,745,945, Cl. 15-77.000.
- Mangat, Harbans Kaur: *See—*
  - Smith, Peter John; and Mangat, Harbans Kaur, 5,747,395, Cl. 501-5.000.
- Mangelsdorf, David J.: *See—*
  - Evans, Ronald M.; Mangelsdorf, David J.; and Willy, Patricia J., 5,747,661, Cl. 536-24.100.
- Mangrum, Ronald W.: *See—*
  - Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., 5,746,073, Cl. 68-198.000.
- Manico, Joseph Anthony; and Reem, Richard Carroll, to Eastman Kodak Company. Light sensitive device. 5,747,225, Cl. 430-345.000.
- Manico, Joseph Anthony; Roule, Thomas Richard; Loveland, William Davis; and Pricola, Barton Anthony, to Eastman Kodak Company. Index print. 5,748,284, Cl. 355-39.000.
- Manico, Joseph Anthony; Patton, David Lynn; and Forest, Paul Henry, to Eastman Kodak Company. Apparatus and method for producing photographic prints with write-on borders. 5,748,289, Cl. 355-74.000.
- Manicone, Paul. Telephone monitoring system to reduce consumer payments of telephone bill. 5,748,718, Cl. 379-131.000.
- Maningat, Clodualdo C.: *See—*
  - Bassi, Sukh; Maningat, Clodualdo C.; Chinnaswamy, Rangaswamy; and Nie, Li, 5,747,648, Cl. 530-374.000.
- Manjarrez, Carlos H., to U.S. Medical Instruments, Inc. IV infusion or collection device with extendable and retractable needle. 5,746,215, Cl. 128-763.000.
- Manley, David B. Pre-fractionation of cracked gas or olefins fractionation by one or two mixed refrigerant loops and cooling water. 5,746,066, Cl. 62-612.000.
- Mann, Egon: *See—*
  - Gebhard, Wolfgang; and Mann, Egon, 5,746,509, Cl. 366-61.000.
- Mann, William H., to REFAC International, Ltd. Thermoplastic urethane elastometric alloys. 5,747,588, Cl. 525-129.000.
- Mannheimer, Paul D., to Nellcor Incorporated. Isolated layer pulse oximetry. 5,746,206, Cl. 125-633.000.
- Manning, Thomas A.: *See—*
  - Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., 5,748,629, Cl. 370-389.000.
- Mansfield & Alper, Inc.: *See—*
  - Alper, Hal, 5,746,925, Cl. 210-728.000.
- Mansour, Yishay: *See—*
  - Afek, Yehuda; Mansour, Yishay; and Ostfeld, Zvi, 5,748,901, Cl. 395-200.680.
- Mansutti, Silvano; and Cardin, Roberto, to 4P S.r.l. Multipurpose handheld electronic computer. 5,748,511, Cl. 364-708.100.
- Mantell, David A.; and Eschbach, Reiner, to Xerox Corporation. Interseparation color image processing using error diffusion. 5,748,785, Cl. 382 237.000.
- Mapal Fabrik für Präzisionswerkzeuge Dr. Kress KG: *See—*
  - Kress, Dieter; and Häberle, Friedrich, 5,746,549, Cl. 407-102.000.
- Mar, Craig E., to Pacesetter, Inc. Defibrillation electrode connection. 5,746,616, Cl. 439-245.000.
- Mara, Leo M., to Sandia National Laboratories. Rapid road repair vehicle. 5,746,539, Cl. 404-84.050.
- Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., to TRW Inc. Diode array providing either a pulsed or a CW mode of operation of a diode pumped solid state laser. 5,748,654, Cl. 372-19.000.
- Marathon Equipment Company: *See—*
  - Beadle, Charles Donald; and Green, Murray Frank, 5,746,378, Cl. 241-99.000.

- Marcella, James Anthony: *See—*
  - Blacknon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.
- Marchant, Brian E.: *See—*
  - Hager, Arthur L., III; Marchant, Brian E.; Chuang, Shouping; and Kim, Ki Duk, 5,748,470, Cl. 364-187.000.
- Marczinke, Bernd Lothar: *See—*
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Marimont, David H.: *See—*
  - Guibas, Leonidas John; and Marimont, David H., 5,748,197, Cl. 345-438.000.
- Marin, Giancarlo, to Svecom Pe SRL. Expanding shaft. 5,746,386, Cl. 242-571.200.
- Marinier, Anne; and Martel, Alain, to Bristol-Myers Squibb Company. Malonate derivatives of glycolipids as cell adhesion inhibitors. 5,747,463, Cl. 514-25.000.
- Maris, Humphrey J; and Stoner, Robert J, to Brown University Research Foundation. Apparatus and method for characterizing thin film and interfaces using an optical heat generator and detector. 5,748,317, Cl. 356-357.000.
- Maris, Humphrey J.; and Stoner, Robert J., to Brown University Research Foundation. Optical stress generator and detector. 5,748,318, Cl. 356-381.000.
- Mariyama, Mitsuru, to Sharp Kabushiki Kaisha. Semiconductor integrated circuit provided with thyristor. 5,747,836, Cl. 257-119.000.
- Marjanski, George C.: *See—*
  - Rink, Linda M.; Letendre, Guy R.; Teverovsky, Alexander; and Marjanski, George C., 5,746,793, Cl. 55-385.300.
- Mark Andy, Inc.: *See—*
  - Parks, Thomas Dewayne; Turner, Michael Rolland; Bunnell, Dale Leon; and Teeter, Gary Wilson, 5,746,132, Cl. 101-483.000.
- Mark, David A.: *See—*
  - Rowe, W. Bruce; Mark, David A.; and Madsen, David C., 5,747,459, Cl. 514-18.000.
- Mark, Fritz; and Noser, Martin, to Friedhelm Schneider. Mixing device including counterweight. 5,746,510, Cl. 366-217.000.
- Markandey, Vishal; and Gove, Robert J., to Texas Instruments Incorporated. Video display system with digital de-interlacing. 5,748,250, Cl. 348-451.000.
- Markem Corporation: *See—*
  - Murray, Michael P., 5,746,129, Cl. 101-483.000.
- Marker Deutschland GmbH: *See—*
  - Boehm, Alfred; Lehner, Edwin; and Messerschmidt, Werner, 5,746,439, Cl. 280-602.000.
- Marketing Displays Inc.: *See—*
  - Hillstrom, David U.; and Hillstrom, Brian J., 5,746,503, Cl. 362-248.000.
- Markic, Marinko: *See—*
  - Leach, Edwin F., II; Markic, Marinko; and Precourt, Ronald E., Jr., 5,746,067, Cl. 63-7.000.
- Markl, Hans-Jörg: *See—*
  - Kohnert, Ulrich; Fischer, Stephan; Markl, Hans-Jörg; and Woog, Heinrich, 5,747,030, Cl. 424-94.640.
- Markle, Stephen L.: *See—*
  - Hutchings, William F.; Schutte, Marlin D.; Markle, Stephen L.; Berg, Joel S.; and Engel, David J., 5,746,536, Cl. 403-370.000.
- Markov, Angel K. Synergistic administration of cyclosporine and fructose diphosphate. 5,747,461, Cl. 514-23.000.
- Marks, Gary T.: *See—*
  - Fischbeck, Karl W.; and Marks, Gary T., 5,746,127, Cl. 101-123.000.
- Marks, Joseph W., to Mitsubishi Electric Information Technology Center America, Inc. Graph partitioning system. 5,748,844, Cl. 395-10.000.
- Marks, Lloyd A. Adjustable blood pressure cuff and method of using same. 5,746,213, Cl. 128-686.000.
- Markulin, John, to Viskase Corporation. Fibrous composite cellulosic film and method. 5,747,125, Cl. 428-34.800.
- Markunas, Albert L.: *See—*
  - Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., 5,747,971, Cl. 322-10.000.
- Marohl, Dan A.; and Ngan, Kenny King-Tai, to Applied Materials, Inc. End effector for semiconductor wafer transfer device and method of moving a wafer with an end effector. 5,746,460, Cl. 294-1.100.
- Marposs Societa Per Azioni: *See—*
  - Baruchello, Roberto, 5,746,003, Cl. 33-542.000.
- Marquip, Inc.: *See—*
  - Marschke, Carl R.; Welch, Harold D.; and Cummings, James A., 5,746,010, Cl. 34-631.000.
- Marriott, Jonathan Hugh: *See—*
  - Bavetsias, Vassilios; Boyle, Francis Thomas; Hennequin, Laurent Francois Andre; and Marriott, Jonathan Hugh, 5,747,499, Cl. 514-267.000.
- Marschewski, Armin: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Armin; Nielseń, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Marschke, Carl R.; Welch, Harold D.; and Cummings, James A., to Marquip, Inc. Web holddown and drive for corrugator double backer. 5,746,010, Cl. 34-631.000.
- Marscholl, Klaus: *See—*
  - Medebach, Thomas; and Marscholl, Klaus, 5,746,094, Cl. 74-502.400.
- Marsh, David Winsor; Rosaen, Lars Oscar; and Rosaen, Eric J., to Asahi/America, Inc. Ultrasonic vortex flowmeter having remote signal processing. 5,747,701, Cl. 73-861.230.
- Marshall, John: *See—*
  - Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.
- Marshall, Scott, to Professional Footcare International, Inc. Method of making injection molded orthotics. 5,746,952, Cl. 264-40.100.
- Martel, Alain: *See—*
  - Marinier, Anne; and Martel, Alain, 5,747,463, Cl. 514-25.000.
- Martens, Charles S.: *See—*
  - Weisman, Martin J., 5,747,019, Cl. 424-61.000.
- Martikainen, Pertti Juhani: *See—*
  - Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.
- Martin, Douglas Ele, to International Business Machines Corporation. Method and apparatus for multi-level input voltage receiver circuit. 5,748,028, Cl. 327-374.000.
- Martin, Eric J.: *See—*
  - Rosenberg, Steve; Spear, Kerry L.; and Martin, Eric J., 5,747,458, Cl. 514-18.000.
- Martin, Fionna Mitchell: *See—*
  - Beckett, Raymond Paul; Whittaker, Mark; Miller, Andrew; and Martin, Fionna Mitchell, 5,747,514, Cl. 514-352.000.
- Martin, Jean-Paul: *See—*
  - Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, 5,747,303, Cl. 435-119.000.
- Martin, Joel L., to Phillips Petroleum Company. Method of making a Ziegler-Natta olefin polymerization catalyst. 5,747,407, Cl. 502-26.000.
- Martin, Kevin, to Network Computing Devices. Video buffer recycling method and apparatus. 5,748,864, Cl. 395-122.000.
- Martin, Les: *See—*
  - Martin, Randy; and Martin, Les, 5,746,232, Cl. 132-54.000.
- Martin Marietta Corporation: *See—*
  - Cole, Herbert Stanley, Jr.; and Sitnik-Nieters, Theresa Ann, 5,745,984, Cl. 29-834.000.
- Martin Marietta Energy Systems, Inc.: *See—*
  - Compere, Alicia L.; Griffith, William L.; Dorsey, George F.; and West, Brian H., 5,746,783, Cl. 44-301.000.
- Martin, Randy; and Martin, Les, to First Lady Coiffures, Ltd. Hairpiece with reinforced mesh base. 5,746,232, Cl. 132-54.000.
- Martin, Steven R.: *See—*
  - Lloyd, Samuel J.; and Martin, Steven R., 5,745,948, Cl. 15-104.120.
- Martin, Thomas William: *See—*
  - Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
- Martinson, Howard: *See—*
  - Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,747,179, Cl. 428-586.000.
- Maruhashi, Yoshitsugu: *See—*
  - Ito, Takurou; and Maruhashi, Yoshitsugu, 5,747,633, Cl. 528-272.000.
- Maruyama, Takesuke: *See—*
  - Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.
- Maruyama, Toshinori: *See—*
  - Tsutsui, Toshio; Sato, Hirohide; and Maruyama, Toshinori, 5,748,463, Cl. 363-127.000.
- Maruyama, Yasuo: *See—*
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Marvet, Laurence E.: *See—*
  - Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.
- Marvik, Jostein, to Scana Staal AS. Ploughshare. 5,746,017, Cl. 37-446.000.
- Maryland Technology Corporation: *See—*
  - Lo, James Ting-Ho, 5,748,847, Cl. 395-23.000.
- Marzonie, Robert Matthew: *See—*
  - Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, 5,746,183, Cl. 123-492.000.
- Masaki, Katsumi: *See—*
  - Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, 5,748,772, Cl. 382-167.000.
- Masamura, Norihisa: *See—*
  - Hosoi, Masatoshi; Sugiyama, Yoshihide; Ichikawa, Mitsuru; and Masamura, Norihisa, 5,746,162, Cl. 123-58.090.
- Mascarella, Samuel W.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., 5,747,503, Cl. 514-294.000.
Maschinenfabrik Gietz AG: *See—*
Gietz, Hanspeter; Rösli, Manfred; and Bänziger, Heinz, 5,746,122, Cl. 100-43.000.
Masgonty, Jean-Marc: *See—*
Piguet, Christian; and Masgonty, Jean-Marc, 5,748,522, Cl. 365-154.000.
Mashiko, Koichiro: *See—*
Morinaka, Hiroyuki; Ueda, Kimio; and Mashiko, Koichiro, 5,747,847, Cl. 257-315.000.
Mashimo, Seiji, to Canon Kabushiki Kaisha. Electrophotographic apparatus with charge injection layer on photosensitive member. 5,747,207, Cl. 430-66.000.
Mason, Robert Michael: *See—*
Bauer, William, Jr.; Hale, Timothy Allen; Mason, Robert Michael; and Upmacis, Rita Karina, 5,746,892, Cl. 203-38.000.
Massachusetts Inst. Tech.: *See—*
Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.
Massachusetts Institute of Technology: *See—*
Swanson, Eric A.; and Chinn, Stephen R., 5,748,598, Cl. 369-94.000.
Massey, Richard J.; Blackburn, Gary F.; Wilkins, Elizabeth W.; and Leland, Jonathan K., to IGEN International, Inc. Apparatus for improved luminescence assays using particle concentration, electrochemical generation of chemiluminescence and chemiluminescence detection. 5,746,974, Cl. 422-52.000.
Massie, Dana C., to Creative Technology, LTD. Digital signal processor for adding harmonic content to digital audio signal. 5,748,747, Cl. 381-61.000.
Massucco, Arthur A.; Fauteux, Denis G.; and Van Buren, Martin, to Mitsubishi Chemical Corporation. Electrode paste applicator apparatus. 5,746,782, Cl. 29-730.000.
Mastrorio, Brooke W.; and Fifolt, Douglas A., to Johnson & Johnson Professional, Inc. Investment casting. 5,746,272, Cl. 164-516.000.
Mastrull, Jeffrey Joseph: *See—*
Farooq, Amjad; and Mastrull, Jeffrey Joseph, 5,747,108, Cl. 427-242.000.
Farooq, Amjad; and Mastrull, Jeffrey Joseph, 5,747,109, Cl. 427-242.000.
Masu, Kasuko: *See—*
Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, 5,747,262, Cl. 435-7.100.
Masu, Masayuki: *See—*
Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, 5,747,262, Cl. 435-7.100.
Masubuchi, Fumihito: *See—*
Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, 5,747,413, Cl. 503-201.000.
Masuda, Atsushi; and Endo, Takahiro, to Kabushiki Kaisha Toshiba. Digital mobile communication system. 5,748,621, Cl. 370-337.000.
Masuda, Hiroshi, to Sony Corporation. Receiver. 5,749,048, Cl. 455-186.100.
Masuda, Katsuhiko; Aoki, Jun; and Hashizume, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Driving-force control system for a vehicle. 5,748,474, Cl. 364-426.036.
Masuda, Soichiro, to Aisin Seiki Kabushiki Kaisha. Manually resettable shock sensor switch. 5,747,761, Cl. 200-61.45R.
Masumura, Shigeki: *See—*
Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
Masunaga, Yoshifumi: *See—*
Miyagi, Takahiro; Takaya, Shigeru; and Masunaga, Yoshifumi, 5,748,579, Cl. 369-44.140.
Masuyama, Fujimitsu: *See—*
Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.
Mat-3, Inc.: *See—*
Mlaker, John J., 5,746,286, Cl. 182-2.900.
Mateer, Mark W.: *See—*
Lara, Pedro F.; and Mateer, Mark W., 5,747,983, Cl. 324-71.100.
Materials Research Innovations Corporation: *See—*
Bradt, Rexford H., 5,747,548, Cl. 521-57.000.
Mathieu, Barry Morris: *See—*
Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, 5,748,269, Cl. 349-58.000.
Matoba, Kazuyuki: *See—*
Suzuki, Masao; Matoba, Kazuyuki; and Nanba, Norihiro, 5,748,339, Cl. 358-473.000.
Matouka, Michael Frank: *See—*
Amlee, Dale Alan; Matouka, Michael Frank; Rausch, Richard Allen; and Otipoby, Keith, 5,747,913, Cl. 310-263.000.
Matrixx Marketing Inc.: *See—*
Scherer, Gordon F., 5,748,711, Cl. 379-91.020.
Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, to Boeing Company, The. Pack for inductively consolidating an organic matrix composite. 5,747,179, Cl. 428-586.000.
Matsubara, Jun: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
Matsubara, Kiyoshi: *See—*
Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
Matsuda, Hiromu: *See—*
Morishita, Nobuyasu; Hamada, Shinji; Matsuda, Hiromu; and Ikoma, Munehisa, 5,747,186, Cl. 429-53.000.
Matsuda, Hiroyuki: *See—*
Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
Matsuda, Keiji: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
Matsuda, Kenji, to Kubota Corporation. Hydraulic system for controlling a mower unit through a raising and lowering mechanism. 5,746,109, Cl. 91-448.000.
Matsuda, Riki: *See—*
Taki, Kazunari; and Matsuda, Riki, 5,748,421, Cl. 360-135.000.
Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, to Kansai Paint Co., Ltd.; and Nitto Denko Corporation. Automobile paint film-protective sheet. 5,747,132, Cl. 428-41.700.
Matsui, Mika: *See—*
Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, 5,748,798, Cl. 382-258.000.
Matsui, Tsutomu, to NEC Corporation. Objective lens actuator for optical head. 5,748,580, Cl. 369-44.160.
Matsumoto, Jun: *See—*
Nishiguchi, Masayuki; and Matsumoto, Jun, 5,749,065, Cl. 704-219.000.
Matsumoto, Kazuhiko: *See—*
Nakamura, Yoshisada; Ishikawa, Shun-ichi; and Matsumoto, Kazuhiko, 5,747,226, Cl. 430-348.000.
Matsumoto, Kenji: *See—*
Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.
Matsumoto, Kesafumi, to Kouken Company, Limited. Method and utensil for cooking food with heat. 5,746,119, Cl. 99-451.000.
Matsumoto, Shigeru; and Yamamoto, Takahisa, to Matsumoto, Shigeru. Data retrieval method and link-information adding method. 5,749,080, Cl. 707-100.000.
Matsumoto, Shuichi, to Yamaha Corporation. Medley playback apparatus with adaptive editing of bridge part. 5,747,716, Cl. 84-609.000.
Matsumoto, Shuichi: *See—*
Tamada, Hitoshi; Matsumoto, Shuichi; Nishi, Noriaki; and Saito, Kimihiro, 5,748,368, Cl. 359-486.000.
Matsumoto, Tetsuya: *See—*
Nishio, Takashi; Koshio, Chiharu; Tsuchiya, Kunimoto; and Matsumoto, Tetsuya, 5,748,159, Cl. 345-76.000.
Matsumoto, Tsuyoshi; Mizuno, Yoshihiro; Omata, Keiichi; and Eguchi, Shin, to Fujitsu Limited. Headup display. 5,748,377, Cl. 359-633.000.
Matsumura, Mika: *See—*
Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
Matsumura, Yasushi; Nakano, Takashi; Makino, Mayumi; and Morizawa, Yoshitomi, to Asahi Glass Company Ltd. Difluoroprostacyclins. 5,747,531, Cl. 514-469.000.
Matsumura, Yukinori; and Tanaka, Hirokazu, to Komatsu Ltd. Laser marking method including raster scanning of rapidly rewritten liquid crystal mask. 5,747,772, Cl. 219-121.850.
Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, to Kabushiki Kaisha Toshiba. Impurity concentrator and analyzer. 5,746,829, Cl. 117-203.000.
Matsunaga, Kouji: *See—*
Ito, Koji; Kameoka, Teruhiko; Matsunaga, Kouji; and Kuwayama, Kazutoshi, 5,746,577, Cl. 416-178.000.
Matsunaga, Kuniaki: *See—*
Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, 5,747,432, Cl. 508-462.000.
Matsunaga, Kuniyuki: *See—*
Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.
Matsunaga, Masafumi, to Nordson Corporation. Two stage powder application method. 5,747,106, Cl. 427-201.000.
Matsunaga, Tadao: *See—*
Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.
Matsuno, Masanori: *See—*

Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.
Matsuno, Osamu: *See—*
Abe, Hiroshi; and Matsuno, Osamu, 5,746,174, Cl. 123-306.000.
Matsuno, Tsutomu: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
Matsuo, Akinori: *See—*
Kuroda, Kenichi; Shiba, Kazuyoshi; and Matsuo, Akinori, 5,747,849, Cl. 257-321.000.
Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, to Tonen Corporation. Method and composition for forming ceramics and article coated with the ceramics. 5,747,623, Cl. 528-14.000.
Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, to Mitsubishi Denki Kabushiki Kaisha; and Ryoden Semiconductor System Engineering Corporation. Semiconductor memory device. 5,747,843, Cl. 257-296.000.
Matsuo, Hiroshi: *See—*
Tsukamoto, Hideki; Ueoka, Akio; and Matsuo, Hiroshi, 5,747,775, Cl. 219-400.000.
Matsuo, Michiaki: *See—*
Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,748,059, Cl. 333-204.000.
Matsuo, Shigeru: *See—*
Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa; Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
Matsuoka, Isao: *See—*
Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
Matsuoka, Mitsuo, to Umix Co., Ltd. Thin sheet forming die assembly including lower die cylindrical member having varied diameters. 5,746,082, Cl. 72-313.000.
Matsuoka, Naoki: *See—*
Ishii, Takashi; and Matsuoka, Naoki, 5,748,067, Cl. 337-160.000.
Matsuoka, Nobuo: *See—*
Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.
Matsuoka, Teruhiko, to Sharp Kabushiki Kaisha. Heater control device. 5,747,777, Cl. 219-497.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Eda, Kazuo; Taguchi, Yutaka; Kanaboshi, Akihiro; and Ogura, Tetsuyoshi, 5,747,857, Cl. 257-416.000.
Fujisaki, Yoshihiro; Emura, Shinichi; and Takada, Kazuyuki, 5,747,833, Cl. 318-808.000.
Fukuhara, Hiroyuki; Yamada, Sadayuki; and Muramatsu, Shigeru, 5,746,586, Cl. 418-55.200.
Futagi, Sadaki; and Uesugi, Mitsuru, 5,748,673, Cl. 375-232.000.
Gyoten, Takaaki; and Kawashima, Masahiro, 5,747,949, Cl. 315-382.100.
Hamada, Hidenobu, 5,748,392, Cl. 359-819.000.
Hashimoto, Shunji; Taoka, Mikio; and Nakano, Hideo, 5,748,065, Cl. 336-96.000.
Hatano, Takahisa, 5,748,260, Cl. 348-663.000.
Hino, Yasumori; Miyatake, Norio; Birukawa, Masahiro; and Nakamura, Tadashi, 5,748,592, Cl. 369-59.000.
Hosokawa, Toshinori, 5,748,646, Cl. 371-22.310.
Kawahata, Minoru; and Kageyama, Atsuhisa, 5,748,257, Cl. 348-615.000.
Matsuzawa, Akira, 5,748,132, Cl. 341-156.000.
Mino, Norihisa; and Ogawa, Kazufumi, 5,747,158, Cl. 428-333.000.
Miyaji, Shinya; and Higaki, Nobuo, 5,748,970, Cl. 395-733.000.
Miyasaka, Motohiro; Kondo, Makoto; and Otsuka, Shigeru, 5,746,516, Cl. 384-291.000.
Morishita, Nobuyasu; Hamada, Shinji; Matsuda, Hiromu; and Ikoma, Munehisa, 5,747,186, Cl. 429-53.000.
Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, 5,748,288, Cl. 355-53.000.
Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
Nakanishi, Hideyuki; Ueno, Akira; Nagai, Hideo; and Yoshikawa, Akio, 5,748,658, Cl. 372-43.000.
Saneshige, Ryoji; and Kuyama, Koji, 5,747,908, Cl. 310-91.000.
Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, 5,748,305, Cl. 356-237.000.
Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, 5,748,276, Cl. 349-144.000.
Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,748,059, Cl. 333-204.000.
Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, 5,748,599, Cl. 369-103.000.
Matsushita Electric Industrial Co.Ltd.: *See—*
Asaka, Hideo; and Yamauchi, Hiroyuki, 5,748,520, Cl. 365-149.000.
Matsushita Electric Works, Ltd.: *See—*
Fujiwara, Shigeki; Yamashita, Hideki; and Maeda, Hiroshi, 5,746,282, Cl. 180-6.200.
Ichikawa, Masaaki; Ono, Tomoyuki; Nishihama, Nobumichi; and Isoda, Masaaki, 5,745,615, Cl. 439-227.000.
Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, 5,747,945, Cl. 315-248.000.
Matsushita Electronics Corporation: *See—*
Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, 5,747,432, Cl. 508-462.000.
Shimomura, Koji; and Sano, Yoshikazu, 5,747,790, Cl. 250-208.100.
Sukeno, Masahiko; and Ueda, Yasuyuki, 5,747,922, Cl. 313-412.000.
Matsushita, Hiroki: *See—*
Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, 5,746,515, Cl. 384-115.000.
Matsushita Seiko Co., Ltd.: *See—*
Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, 5,747,053, Cl. 424-405.000.
Matsushita, Shozo; and Suzuki, Naomi, to Exxon Research and Engineering Company. Lubricant composition. 5,747,430, Cl. 508-209.000.
Matsushita Wlectric Ind.: *See—*
Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, 5,748,798, Cl. 382-258.000.
Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, to Hitachi, Ltd.; and Hitachi Plant Engineering & Construction Co., Ltd. Construction method of nuclear reactor reinforced concrete containment vessel and diaphragm floor structure of nuclear reactor reinforced concrete containment vessel. 5,748,690, Cl. 376-260.000.
Matsuya, Hidefumi: *See—*
Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
Matsuzawa, Akira, to Matsushita Electric Industrial Co., Ltd. Interpolation type A/D converter. 5,748,132, Cl. 341-156.000.
Matsuzawa, Shigeo: *See—*
Esaki, Hiroshi; Saito, Takeshi; and Matsuzawa, Shigeo, 5,748,626, Cl. 370-355.000.
Matte, Sylvain, to Bombardier, Inc. Method and apparatus for tuned pipe water injection. 5,746,054, Cl. 60-310.000.
Matthews, Demetreos N.: *See—*
Coolbaugh, Thomas S.; Loveless, Frederick Charles; and Matthews, Demetreos N., 5,747,598, Cl. 525-314.000.
Matthey-Doret, Walter: *See—*
Huynh-Ba, Tuong; Jaeger, Daniel; and Matthey-Doret, Walter, 5,747,302, Cl. 435-117.000.
Matthies, Dennis Lee: *See—*
Riddle, George Herbert Needham; Prabhu, Ashok Naryan; Matthies, Dennis Lee; and Sreeram, Attiganal Narayanaswamy, 5,747,931, Cl. 313-581.000.
Mattia, Paul J.: *See—*
Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.
Mattos, Derwin: *See—*
Wong, Belle; Lee, Donald; and Mattos, Derwin, 5,748,019, Cl. 327-170.000.
Maulbecker, Catharina: *See—*
Gruss, Peter; and Maulbecker, Catharina, 5,747,250, Cl. 435-6.000.
Mauldin, Michael L., to Carnegie Mellon University. Method for searching a queued and ranked constructed catalog of files stored on a network. 5,748,954, Cl. 395-610.000.
Maute, Robert E.: *See—*
Bednarczyk, Adam; Maute, Robert E.; and Thompson, Laird B., 5,747,749, Cl. 181-102.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften: *See—*
van der Weide, D. W.; and Keilmann, Fritz, 5,748,309, Cl. 356-326.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Gruss, Peter; and Maulbecker, Catharina, 5,747,250, Cl. 435-6.000.
Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović, Stefan; and Jung, Günther, 5,747,269, Cl. 435-7.240.
Maxfield, MacRae: *See—*
Christiani, Brian R.; and Maxfield, MacRae, 5,747,560, Cl. 523-209.000.
Maxim Integrated Products: *See—*
Haque, Yusuf A., 5,748,010, Cl. 326-80.000.
Maxim Integrated Products, Inc.: *See—*
Cargill, Robert S., 5,748,027, Cl. 327-350.000.
May, Alison Linda: *See—*
Coates, David; and May, Alison Linda, 5,746,940, Cl. 252-299.010.
May, Karl; Herm, Hartmut; and Unverzagt, Karlheinz, to Siemens Aktiengesellschaft. Heating chamber with inner heating tubes and method of replacing the heating tubes. 5,746,590, Cl. 432-114.000.
Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, to Applied Materials, Inc. Gas injection slit nozzle for a plasma process reactor. 5,746,875, Cl. 156-345.000.
Mayer, Hartmut: *See—*
Knauss, Hans-Peter; Mayer, Hartmut; and Goetz, Bernhard, 5,746,291, Cl. 187-223.000.

/OL
2 10
ISS
1
MY
5
998
JMI

- Mayer, Jeremy; Belon, Juan B.; and Kennedy, A. Terence, to Hewlett-Packard Company. Hard copy apparatus with a print media telescoping tray system. 5,746,528, Cl. 400-625.000.
- Mayhood, Keith L.: *See—*
  - Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., 5,746,550, Cl. 408-1.00R.
- Maynard, Raymond W.: *See—*
  - Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., 5,746,073, Cl. 68-198.000.
- Mayo Foundation for Medical Education and Research: *See—*
  - Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,747,283, Cl. 435-69.100.
- Mazda Motor Corporation: *See—*
  - Ninomiya, Hiroshi; and Hosokai, Tetsushi, 5,746,187, Cl. 123-520.000.
- Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, to Abbott Laboratories. Method of adding marker dye to nutritional product during enternal tube feeding. 5,746,715, Cl. 604-83.000.
- Mazess, Richard B.; Borg, Jens; and Ergun, David L., to Lunar Corporation. Peripheral bone densitometer. 5,748,704, Cl. 378-54.000.
- Mazurkiewicz, Theodore; Levendel, Gil E.; and Wang, Shay-Ping Thomas, to Motorola Inc. Communications device responsive to spoken commands and methods of using same. 5,749,072, Cl. 704-275.000.
- Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, to Therion Biologics Corporation. Self-assembled, defective, non-self-propagating lentivirus particles. 5,747,324, Cl. 435-236.000.
- Mazzurco, Anthony: *See—*
  - Teodorescu, Ioan V.; and Mazzurco, Anthony, 5,748,569, Cl. 368-118.000.
- McAdams, Eric Thomas: *See—*
  - McLaughlin, James Andrew; Anderson, John McCune; and McAdams, Eric Thomas, 5,746,207, Cl. 128-639.000.
- McAlea, Kevin P.: *See—*
  - Lakshminarayan, Udaykumar; McAlea, Kevin P.; and Booth, Richard B., 5,749,041, Cl. 419-2.000.
- McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, to International Business Machines Corporation. Method for repairing defective electrical connections on multi-layer thin film (MLTF) electronic packages. 5,747,095, Cl. 427-8.000.
- McAlpin, James John: *See—*
  - Huff, Terrence; and McAlpin, James John, 5,747,592, Cl. 525-191.000.
- McArdle, Blaise. Herbicidal and insecticidal protein-polysaccharide delivery compositions and methods for controlling plant and insect populations. 5,747,416, Cl. 504-115.000.
- McArthur, Malcolm J., to Sundstrand Corporation. Multiple parameter sensor and method of operation thereof. 5,747,680, Cl. 73-117.300.
- McCall, John E., Jr.: *See—*
  - Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.
- McCann, Frank. Wrench having a spring biased jaw. 5,746,097, Cl. 81-99.000.
- McCarthy, Peter T. High efficiency hydrofoil and swim fin designs. 5,746,631, Cl. 441-64.000.
- McCartney, Clifford A.: *See—*
  - Reinmann, John Joseph; and McCartney, Clifford A., 5,746,547, Cl. 405-288.000.
- McCartney, Phillip D.; Beard, McDaniel L.; and Inman, Elaine V., to Guilford Mills, Inc. Method for forming comingled composite yarn. 5,746,046, Cl. 57-350.000.
- McClanahan, David D.: *See—*
  - Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
- McClanahan, David Dean: *See—*
  - Luchetti, Robert J.; Draudt, Gregg Robert; Eldon, James Bender, III; and McClanahan, David Dean, 5,746,034, Cl. 52-220.700.
- McClaughry, Thomas J.: *See—*
  - Labun, Nicholas M.; McClaughry, Thomas J.; and Wang, Shay-Ping T., 5,748,845, Cl. 395-20.000.
- McClure, Robert B.: *See—*
  - Caldara, Stephen A.; Hauser, Stephen A.; Manning, Thomas A.; McClure, Robert B.; and Colsman, Matthias L., 5,748,629, Cl. 370-389.000.
- McConnell, Thomas E. Infant sleep positioning device. 5,746,219, Cl. 128-845.000.
- McCormack, Mark Thomas: *See—*
  - Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, 5,747,918, Cl. 313-309.000.
- McCormick, John A.; and Sixsmith, Herbert, to Creare, Inc. Radial displacement sensor for non-contact bearings. 5,748,005, Cl. 324-662.000.
- McCray, Charles Martin: *See—*
  - Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, 5,746,103, Cl. 83-440.000.
- McCreight, Marion E.: *See—*
  - Talvalkar, Shashi G.; and McCreight, Marion E., 5,747,176, Cl. 428-484.000.
- McCulloch, Pete: *See—*
  - Teller, Bill; McCulloch, Pete; Drobnich, Vaughn J.; and Goins, Jeffrey Lee, 5,746,363, Cl. 224-547.000.
- McCumber Enterprises, Inc.: *See—*
  - McCumber, Michael T., 5,749,010, Cl. 396-420.000.
- McCumber, Michael T., to McCumber Enterprises, Inc. Camera support. 5,749,010, Cl. 396-420.000.
- McDaniel, Harry C. Glass and ceramic objects having durable lustrous coatings and methods of producing. 5,747,153, Cl. 428-324.000.
- McDATA Corporation: *See—*
  - Stoevhase, Bent; and Malavalli, Kumar, 5,748,612, Cl. 370-230.000.
- McDermott, Gerald Patrick: *See—*
  - Bowers, David Lamar; Brown, Robert Joseph; Chaffin, Royce; Hammock, Donnie Ray; and McDermott, Gerald Patrick, 5,746,417, Cl. 251-315.120.
- McDermott, Virginia B. Packaging carton with perforations for dispensing mouth. 5,746,369, Cl. 229-120.030.
- McDonald, James: *See—*
  - McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
- McDonald, Michael L.: *See—*
  - Hendershot, William J.; McDonald, Michael L.; and Timian, Vivian J., 5,746,856, Cl. 156-73.400.
- McDonald, Robert R., to Metallamics, Inc. Molds, dies or forming tools having a cavity formed by thermal spraying and methods of use. 5,746,966, Cl. 264-338.000.
- McDonnell Douglas Corporation: *See,—*
  - Glabe, John R.; and Pelton, Edward L., 5,748,152, Cl. 343-767.000.
  - Kim, John Jungwoo, 5,748,091, Cl. 340-583.000.
  - Kintz, Kevin G.; and Rogers, Mark D., 5,747,792, Cl. 250-214.0VT.
  - Lechner, Robert J., 5,746,599, Cl. 434-44.000.
- McDonough, Sherrol: *See—*
  - Yang, Yeasing; Bee, Gary; and McDonough, Sherrol, 5,747,252, Cl. 435-6.000.
- McDunn, Kevin J.; Limper-Brenner, Linda; and Press, Minoo D., to Motorola, Inc. Peristaltic pump and method in a peristaltic pump for advancing a tube from a first position to a second position. 5,746,585, Cl. 417-477.110.
- McEvoy, William Richard. Connector with engagement indicator. 5,746,555, Cl. 411-14.000.
- McFadden, James Robert; Greene, Joseph Paul; and Bland, Michael James, to General Motors Corporation. Energy absorbing device. 5,746,419, Cl. 267-140.000.
- McGarry, Frederick Jerome: *See—*
  - Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.
- McGettigan, John J.: *See—*
  - Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., 5,746,550, Cl. 408-1.00R.
- McGinness, Steven: *See—*
  - Patchen, Paul J.; Fung, Hon C.; Leung, Fred; and McGinness, Steven, 5,748,981, Cl. 395-828.000.
- McGivern, Patrick T.; King, Bradley S.; and Graham, Steven, to Nelson, L. R. Adaptable control system for a variable number of switches. 5,748,466, Cl. 364-146.000.
- McGrew, Dean Zeal: *See—*
  - Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.
- McGuire, David A. Suturing jig and method for using same. 5,746,757, Cl. 606-148.000.
- McHenry, E. Ronald; and Saver, William E., to Koppers Industries, Inc. Coal tar pitch blend having low polycyclic aromatic hydrocarbon content and method of making thereof. 5,746,906, Cl. 208-22.000.
- McHugh, Kevin: *See—*
  - Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
- MCI Communications Corporation: *See—*
  - Brechtel, James P.; and La Buhn, Greg, 5,748,962, Cl. 395-701.000.
  - Hardy, William Christopher, 5,748,876, Cl. 395-183.010.
- MCI Corporation: *See—*
  - Allen, John David; Chow, Ching-Hua; and Shah, Jasvantrai C., 5,748,611, Cl. 370-224.000.
  - McLain, John V., Jr., 5,748,617, Cl. 370-244.000.
  - Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.
  - Stoker, Edward J., 5,748,229, Cl. 348-180.000.
- McIntyre, Dale F.; and Allen, Loretta E., to Eastman Kodak Company. Camera for recording images on a photographic film or on a magnetic tape. 5,749,006, Cl. 396-310.000.
- McIntyre, Martin D.; and McLendon, Jerry L. Question and answer football game. 5,746,431, Cl. 273-247.000.

- McKay, Kevin W.; Blanchard, Robert R.; Feig, Edwin R.; and Kummer, Kyle G., to Dow Chemical Company, The. Formulated ethylene/α-olefin elastomeric compounds. 5,747,580, Cl. 524-576.000.
- McKeating, John A. Polypectomy instrument. 5,746,747, Cl. 606-114.000.
- McKedy, George E.; Idol, Ronald C.; and Powers, Thomas H., to Multiform Desiccants, Inc. Oxygen absorbing composition. 5,746,937, Cl. 252-188.280.
- McKenzie, Therman; and Agard, James. After shave treatment composition. 5,747,021, Cl. 424-73.000.
- McKinzie, William Edward, III; and Anderson, Tracy Lynn, to Northrop Grumman Corporation. Flared conductor-backed coplanar waveguide traveling wave antenna. 5,748,153, Cl. 343-767.000.
- McLain, John V., Jr., to MCI Corporation. Method and apparatus for emulating a digital cross-connect switch network. 5,748,617, Cl. 370-244.000.
- McLane, John Arthur: *See—*
  - Doran, Thomas I.; and McLane, John Arthur, 5,747,478, Cl. 514-167.000.
- McLaughlin, James Andrew; Anderson, John McCune; and McAdams, Eric Thomas. Profiled biosignal electrode device. 5,746,207, Cl. 128-639.000.
- McLaughlin, Steven W., to Optex Corporation. M=8 (1,3) runlength limited code for multi-level data. 5,748,117, Cl. 341-59.000.
- McLaughlin, Steven W., to Optex Corporation. M=7 (3,8) runlength limited code for multi-level data. 5,748,118, Cl. 341-59.000.
- McLean, Christopher H.; Lichon, Paul G.; Morris, Joseph P.; and Flugstad, Philip O., to Primex Technologies, Inc. Gaseous product delivery system. 5,746,050, Cl. 60-200.100.
- McLean, William, II; Balooch, Mehdi; and Siekhaus, Wigbert J., to Regents Of The University Of California. Laser ablated hard coating for microtools. 5,747,120, Cl. 427-596.000.
- McLendon, Jerry L.: *See—*
  - McIntyre, Martin D.; and McLendon, Jerry L., 5,746,431, Cl. 273-247.000.
- McMillan, John A.: *See—*
  - Moore, Devin Lee; McMillan, John A.; and Kopp, Joseph J., Jr., 5,748,836, Cl. 392-337.000.
- McMillan, Roderick S.: *See—*
  - Davidson, Isobel J.; McMillan, Roderick S.; and Murray, John J., 5,747,194, Cl. 429-224.000.
- McNally, John Paul: *See—*
  - Little, Ian Raymond; and McNally, John Paul, 5,747,405, Cl. 502-113.000.
- McNeely, Mark: *See—*
  - Stephan, Allan H.; LaPorte, Brent N.; Powers, Stephen B.; and McNeely, Mark, 5,748,185, Cl. 345-173.000.
- McNeilus Truck and Manufacturing, Inc.: *See—*
  - Brandt, Calvin, 5,748,077, Cl. 340-450.000.
- McPherson, Donald M.; and Murray, Steven C., to Bay Glass Research. Optical glass. 5,747,397, Cl. 501-51.000.
- McPherson, Jerry L., Jr.: *See—*
  - Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.
- McPherson, Raymond Willard. Lift truck side loading attachment. 5,746,564, Cl. 414-607.000.
- McVicker, Gerard: *See—*
  - Flint, Ephraim Bemis; Karidis, John Peter; McVicker, Gerard; and Pence, William Edward, 5,748,443, Cl. 361-686.000.
- Meade, John C.; and Baccus, John C., to MicroSurge, Inc. Reusable endoscopic surgical instrument. 5,746,759, Cl. 606-170.000.
- Meadows, Martin Paul; Ellis, Deborah June; and Jarrett, Paul, to Agricultural Genetics Co., Ltd. Biological control of pests. 5,747,025, Cl. 424-93.461.
- Meadows, Michael R. Motion-activated musical device. 5,746,640, Cl. 446-213.000.
- Meadows, Michael R.: *See—*
  - Handschy, Mark A.; and Meadows, Michael R., 5,748,164, Cl. 345-89.000.
- Medebach, Thomas; and Marscholl, Klaus, to Kuster & Co., GmbH. Automatic length-correcting device for flexible cable drives in particular a cable-adjusting device. 5,746,094, Cl. 74-502.400.
- Medhekar, Ajit K.: *See—*
  - Reddy, Chitranjan N.; and Medhekar, Ajit K., 5,747,868, Cl. 257-529.000.
- Media 100 Inc.: *See—*
  - Holmes, Daniel J.; Molnar, John W.; and Tarr, Morton H., 5,748,842, Cl. 395-2.790.
- Medinox, Inc.: *See—*
  - Lai, Ching-San, 5,747,532, Cl. 514-491.000.
- Medivir AB: *See—*
  - Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, 5,747,473, Cl. 514-45.000.
- Medjad, Nadia; and Billardon, Martine, to U C B S.A. Pharmaceutical compositions for the treatment of depressive disorders. 5,747,494, Cl. 514-255.000.
- Medtronic, Inc.: *See—*
  - Noone, Michael S., 5,746,701, Cl. 600-585.000.
  - Pohndorf, Peter J.; and Gubbin, Douglas H., 5,746,722, Cl. 604-175.000.
  - Rom, Paul F.; and Corace, Russell A., 5,746,709, Cl. 604-8.000.
- Meerdink, Jan Johannes: *See—*
  - Boeyen, Johannes Wilhelmus; and Meerdink, Jan Johannes, 5,746,648, Cl. 452-156.000.
- Mefos, Stiftelsen För Metallurgisk Forskning: *See—*
  - Bergman, Dan; and Inomoto, Takeo, 5,746,970, Cl. 266-225.000.
- MegaMos Corporation: *See—*
  - So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, 5,747,853, Cl. 257-355.000.
- Megill, John T.: *See—*
  - Megill, Joseph M.; and Megill, John T., 5,746,532, Cl. 401-175.000.
- Megill, Joseph M.; and Megill, John T. Toothbrush assembly. 5,746,532, Cl. 401-175.000.
- Mehdizadeh, Esmail: *See—*
  - Atkinson, George H.; and Mehdizadeh, Esmail, 5,747,807, Cl. 250-339.130.
- Mei, Chia-Cu Peter, to Texas Instruments Incorporated. Extended drain resurf lateral DMOS devices. 5,747,850, Cl. 257-328.000.
- Meier, Robert C. Communication network providing wireless and hard-wired dynamic routing. 5,748,619, Cl. 370-278.000.
- Meiji Milk Products Co., Ltd.: *See—*
  - Sasaki, Takashi; Sasaki, Yasuko; Ito, Yoshiyuki; and Otsu, Kumi, 5,747,310, Cl. 435-172.300.
- Meiji Seika Kaisha, Ltd.: *See—*
  - Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
- Meilus, Leo: *See—*
  - Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
- Meister, Alton; Huang, Chin-Shiou; and Anderson, Mary E., to Cornell Research Foundation, Inc. Glutamylcysteine synthetase light subunit. 5,747,329, Cl. 435-252.330.
- Mejia, Benjamin A.: *See—*
  - Notenboom, Leo A.; Mejia, Benjamin A.; and Smith, Curtis D., 5,748,468, Cl. 364-132.000.
- Mekalanos, John J.: *See—*
  - Calderwood, Stephen B.; Butterton, Joan R.; and Mekalanos, John J., 5,747,028, Cl. 424-93.200.
- Melamed, Myron R.: *See—*
  - Darzynkiewicz, Zbigniew D.; Li, Xun; Traganos, Frank N.; and Melamed, Myron R., 5,747,258, Cl. 435-6.000.
- Melega, Valerie: *See—*
  - Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.
- Meli, Fausto; and Roba, Giacomo Stefano, to Pirelli Cavi S.p.A. Amplified telecommunication system for wavelength-division multiplexing transmissions. 5,748,364, Cl. 359-341.000.
- Melnor Inc.: *See—*
  - Simonetti, Sergio G.; and Andrews, Howard W., 5,746,374, Cl. 239-240.000.
- Melton-Celsa, Angela Ruth: *See—*
  - O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, 5,747,272, Cl. 435-7.370.
- Melvin, William L., Jr.; and Wicks, Michael C., to United States of America, Air Force. Adaptive post-doppler sequential beam processor. 5,748,143, Cl. 342-162.000.
- MEMC Electronics Materials, Inc.: *See—*
  - Hanley, Thomas Martin, 5,746,834, Cl. 118-715.000.
- Memishian, John: *See—*
  - Kelly, Thomas W.; and Memishian, John, 5,748,004, Cl. 324-661.000.
- Memory, Joseph W., Jr.: *See—*
  - Johnson, Larry D.; Memory, Joseph W., Jr.; and Prudic, Anthony F., 5,748,255, Cl. 348-553.000.
- Menasco, Jeffrey W.: *See—*
  - Menasco, Lawrence C., Jr.; and Menasco, Jeffrey W., 5,748,758, Cl. 381-176.000.
- Menasco, Lawrence C., Jr.; and Menasco, Jeffrey W. Acoustic audio transducer with aerogel diaphragm. 5,748,758, Cl. 381-176.000.
- Menashi, Jameel: *See—*
  - Flenniken, Cindy L.; Menashi, Jameel; and Whitehouse, Robert S., 5,747,563, Cl. 523-215.000.
- Menassa, Aime; and Caupin, Henri, to Delta Agro Industries; and Atochem. Undecylenate deodorants for animal feeds. 5,747,090, Cl. 426-532.000.
- Mendizabal, Flavia Arce, to Lilly S. A. Flouxetine pharmaceutical formulations. 5,747,068, Cl. 424-465.000.
- Menegon, Sergio: *See—*
  - Simioni, Luciano; and Menegon, Sergio, 5,748,281, Cl. 351-121.000.
- Menzie, Andrew B., to Owens-Brockway Glass Container Inc. Control of glass gob delivery for simultaneous arrival at blank molds. 5,746,798, Cl. 65-29.120.
- Mercado, Hedeliza Malonzo, to Colgate-Palmolive Co. Hypochlorite bleaching composition having enhanced fabric whitening and/or safety benefits. 5,746,936, Cl. 252-187.250.
- Mercedes-Benz AG: *See—*
  - Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, 5,747,676, Cl. 73-105.000.
  - Seel, Holger; Schaible, Kurt; and Schenk, Bernhard, 5,746,470, Cl. 296-108.000.
- Merck & Co., Inc.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

Bock, Mark G.; Lumma, William C.; and Patane, Michael A., 5,747,490, Cl. 514-233.800.
Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, 5,747,540, Cl. 514-622.000.
Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See—*
Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.
Coates, David; and May, Alison Linda, 5,746,940, Cl. 252-299.010.
Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, 5,747,539, Cl. 514-618.000.
Jonas, Rochus; Wolf, Michael; and Klockow, Michael, 5,747,489, Cl. 514-222.500.
Jonczyk, Alfred; Felding-Habermann, Brunhilde; Diefenbach, Beate; and Rippmann, Friedrich, 5,747,457, Cl. 514-13.000.
Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, 5,746,941, Cl. 252-299.630.
Merck Patent Gesellschaft Mit Beshrankter Haftung: *See—*
Fischer, Wolfgang; Baum, Sylvia; Hartig, Thorsten; and Schleehahn, Michael, 5,747,656, Cl. 534-683.000.
Merck Sharp & Dohme Ltd.: *See—*
Haworth, Karen Elizabeth; Seward, Eileen Mary; Swain, Christopher John; and Teall, Martin Richard, 5,747,491, Cl. 514-236.200.
Mergenhagen, Laura K.: *See—*
deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
Meriläinen, Timo: *See—*
Karlsson, Kai; Meriläinen, Timo; Weckström, Kurt; and Poikolainen, Seppo, 5,747,820, Cl. 250-504.00R.
Meritor Automotive GmbH: *See—*
Boss, Christoph; and Bachmann, Hubert, 5,746,090, Cl. 74-89.170.
Merko, Andrew V. Apparatus for counterbalancing equipment. 5,746,404, Cl. 248-123.110.
Merlos, Manel: *See—*
Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.
Merrill, Duane Franklin: *See—*
Traver, Frank John; and Merrill, Duane Franklin, 5,747,567, Cl. 524-110.000.
Merrill, Richard Billings, to Foveonics, Inc. Photodiode with improved photoresponse behavior. 5,747,840, Cl. 257-233.000.
Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., to Lockheed Martin Corp. Missiles & Space. Lithium polymer battery charger apparatus. 5,747,968, Cl. 320-119.000.
Mertz, John Richard: *See—*
Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.
Messerschmidt, Werner: *See—*
Boehm, Alfred; Lehner, Edwin; and Messerschmidt, Werner, 5,746,439, Cl. 280-602.000.
Messing, Calvin Roman: *See—*
Weber, Wayne Woodrow, II; Messing, Calvin Roman; and Logan, Margaret Elizabeth, 5,747,345, Cl. 436-74.000.
Messroghli, Hossein: *See—*
Prestel, Stephan; Boebel, Manfred; Reich, Harry; and Messroghli, Hossein, 5,746,750, Cl. 606-119.000.
Mestha, Lingappa K., to Xerox Corporation. Look up table to control non-linear xerographic process. 5,749,019, Cl. 399-46.000.
Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., to Xerox Corporation. Coordinitization of tone reproduction curve in terms of basis functions. 5,749,020, Cl. 399-49.000.
Mestha, Lingappa K.; and Padmanabhan, Prasad P., to Xerox Corporation. Developed mass per unit area (DMA) controller to correct for development errors. 5,749,021, Cl. 399-49.000.
Metallamics, Inc.: *See—*
McDonald, Robert R., 5,746,966, Cl. 264-338.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Queneau, Paul E.; and Hirsch, Martin, 5,746,805, Cl. 75-446.000.
Metaltite Corporation: *See—*
Nystrom, Robert G., 5,746,039, Cl. 52-639.000.
Metaphase Technology Access, Ltd.: *See—*
Shalon, Tadmor; and Shea, John J., Jr., 5,746,725, Cl. 604-246.000.
Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, to Amrad Corporation Limited. Monoclonal antibody to human granulocyte macrophage colony stimulating factor. 5,747,032, Cl. 424-133.100.
Methode Electronics, Inc.: *See—*
Llorens, Joseph R.; and Wang, Huili, 5,748,924, Cl. 395-309.000.
Metzger, John D.; and El-Genk, Mohamed S., to United States of America, Energy. Superconducting thermoelectric generator. 5,747,418, Cl. 505-160.000.
Meybeck, Alain; Bonte, Frédéric; Dumas, Marc; and Chaudagne, Catherine, to L.V.M.H. Recherche. Use of ginsenoside R_0 or a plant extract containing same to promote collagen synthesis. 5,747,538, Cl. 514-570.000.
Meyer, Christof: *See—*
Jaksic, Zeljko; Damm, Hartmut; and Meyer, Christof, 5,748,816, Cl. 385-39.000.
Meyer, Eric R.: *See—*
Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
Miazga, Jay M.: *See—*
Schoen, Joel A.; and Miazga, Jay M., 5,746,521, Cl. 400-120.160.
Michael, Guenther: *See—*
Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.
Michalak, Richard J.: *See—*
Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.
Michaud, Pascal, to Elf Atochem S.A. Cleaning compositions based on 1,1,1,2,2,4,4-heptafluorobutane and C_1-C_3 alcohols. 5,747,437, Cl. 510-177.000.
Michel, Jacques; and Trouche, Dominique, to Compagnie Generale d'Automatisme CGA-HBS. System enabling a magnetic code recorded on a magnetic track to be properly decoded in the form of a binary message. 5,748,649, Cl. 371-40.160.
Mickus, Daniel E.: *See—*
Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
Micrel, Incorporated: *See—*
Ip, Hiu F.; and Ma, Ellick L., 5,747,200, Cl. 430-22.000.
Micro Linear Corporation: *See—*
Hwang, Jeffrey H., 5,747,977, Cl. 323-284.000.
Microgen Corporation: *See—*
Jewell, William J., 5,747,311, Cl. 435-176.000.
Microhydraulics, Inc.: *See—*
Kadlicko, George D., 5,747,702, Cl. 73-861.530.
Micron Communications, Inc.: *See—*
Lake, Rickie C., 5,747,190, Cl. 429-124.000.
Lake, Rickie C., 5,747,191, Cl. 429-124.000.
Micron Technology, Inc.: *See—*
Dennison, Charles H.; and Helm, Mark, 5,747,855, Cl. 257-369.000.
Lee, Roger R.; and Gonzalez, Fernando, 5,748,527, Cl. 365-185.090.
Moore, Scott E., 5,747,386, Cl. 438-692.000.
Prall, Kirk; Stone, Tod S.; and Zagar, Paul S., 5,747,869, Cl. 257-529.000.
Ryan, Kevin J.; and Wright, Jeffrey P., 5,748,551, Cl. 365-230.030.
Ryan, Kevin J., 5,749,086, Cl. 711-105.000.
Sharan, Sujit; and Sandhu, Gurtej S., 5,747,116, Cl. 427-534.000.
Thomann, Mark; and Vo, Huy Thanh, 5,748,635, Cl. 370-465.000.
Zheng, Hua; and Wright, Jeffrey P., 5,748,542, Cl. 365-194.000.
MicroPlanet Ltd.: *See—*
Baretich, David F.; and Wiegand, Gregory P., 5,747,972, Cl. 323-223.000.
Microsoft Corporation: *See—*
Lee, Ming-Chieh; and Chen, Wei-ge, 5,748,789, Cl. 382-243.000.
Lipe, Ralph A.; and Santerre, Pierre-Yves, 5,748,980, Cl. 395-828.000.
Notenboom, Leo A.; Mejia, Benjamin A.; and Smith, Curtis D., 5,748,468, Cl. 364-132.000.
Rozak, Michael J.; and Spoltman, James H., 5,748,191, Cl. 395-333.000.
Shiff, Victor; Fishman, Neil S.; and Brzezinski, Philip, 5,748,895, Cl. 395-200.090.
Vargas, Garrett R., 5,748,512, Cl. 364-709.120.
MicroSurge, Inc.: *See—*
Meade, John C.; and Baccus, John C., 5,746,759, Cl. 606-170.000.
Mid-States Plastics, Inc.: *See—*
Edwards, Daniel J.; and Edwards, Mark J., 5,747,687, Cl. 73-277.000.
Midorikawa, Yoshimi: *See—*
Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, 5,747,414, Cl. 503-207.000.
Midwest Grain Products: *See—*
Bassi, Sukh; Maningat, Clodualdo C.; Chinnaswamy, Rangaswamy; and Nie, Li, 5,747,648, Cl. 530-374.000.
Midwest Research Institute: *See—*
Blaugher, Richard D., 5,747,099, Cl. 427-62.000.
Muljadi, Eduard; and Taylor, Roger W., 5,747,967, Cl. 320-39.000.
Midwest Superconductivity Inc.: *See—*
Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, 5,747,425, Cl. 505-150.000.
Midya, Pallab: *See—*
Huang, Jin; Midya, Pallab; and Mancini, Brian M., 5,747,914, Cl. 310-318.000.
Miesterfeld, Frederick O.: *See—*
Hormel, Ronald F.; and Miesterfeld, Frederick O., 5,748,675, Cl. 375-257.000.
Mika, Norbert; and Bittorf, Hannjoerg, to Siemens Aktiengesellschaft. Cathode system for an X-ray tube. 5,748,701, Cl. 378-109.000.
Mikata, Yuuichi: *See—*

Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, 5,746,581, Cl. 417-2.000.
Miki, Yoshio: *See—*
Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
Milbrandt, Jeffrey D.: *See—*
Johnson, Eugene M., Jr.; Milbrandt, Jeffrey D.; Kotzbauer, Paul T.; and Lampe, Patricia A., 5,747,655, Cl. 530-399.000.
Miles, Myra P.: *See—*
Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., 5,746,708, Cl. 604-4.000.
Milidantri, William: *See—*
Ingargiola, Thomas R.; and Milidantri, William, 5,748,087, Cl. 340-573.000.
Miller, Alan D.: *See—*
Millett, Peter J.; and Miller, Alan D., 5,746,971, Cl. 422-16.000.
Miller, Albert E.; and Bandyopadhyay, Supriyo, to University of Notre Dame Du Lac. Electrochemical synthesis of quasi-periodic quantum dot and nanostructure arrays. 5,747,180, Cl. 428-601.000.
Miller, Andrew: *See—*
Beckett, Raymond Paul; Whittaker, Mark; Miller, Andrew; and Martin, Fionna Mitchell, 5,747,514, Cl. 514-352.000.
Miller, Charles J.: *See—*
Espinoza, Therese A.; Miller, Charles J.; and Stevens, Richard B., 5,746,822, Cl. 106-785.000.
Miller, Craig A.: *See—*
Angelo, Michael F.; Miller, Craig A.; and Wooten, David R., 5,748,940, Cl. 395-490.000.
Miller, Craig S., Sr., to Foamex L.P. Air support mattress overlay with fitted sheet mounting. 5,745,941, Cl. 5-710.000.
Miller, Gary Allen: *See—*
Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.
Miller, Gregory R.: *See—*
Aylsworth, Alonzo C.; Adriance, Kyle; and Miller, Gregory R., 5,746,806, Cl. 95-8.000.
Miller, Phillip; Walter, Jerry L.; Boatwright, Darrell L.; and Schultz, Darald R. Integrated hand-held bar code processing device capable of automatic scan and data display. 5,747,785, Cl. 235-472.000.
Miller, Robin M., to United Technologies Automotive, Inc. Backup bearings for positive re-centering of magnetic bearings. 5,747,907, Cl. 310-90.000.
Miller, Scott; and Shipps, J. Clay, to Noise Cancellation Technologies, Inc. Active noise cancelling muffler. 5,748,749, Cl. 381-71.500.
Miller, Stefan: *See—*
Danison, Eckart; Klenk, Martin; and Miller, Stefan, 5,746,176, Cl. 123-336.000.
Miller, Thomas A., to Virbac, Inc. Sustained release pyriproxifen compositions for parasite control. 5,747,057, Cl. 424-411.000.
Miller, Thomas C., Jr.; and Obringer, Thomas J., to NCR Corporation. Smear and scratch resistant thermally transferable printing ribbons and methods of making the same. 5,747,155, Cl. 428-327.000.
Miller, Tom: *See—*
Swanson, S. Keith; and Miller, Tom, 5,748,093, Cl. 340-659.000.
Millet, Cedar; and Dickson, Gary. Hand-held bird feeder. 5,746,154, Cl. 119-57.800.
Millett, Peter J.; and Miller, Alan D., to Electric Power Research Institute, Inc. Method of producing low volatility amines for power plant pH control by in situ hydrolytic decomposition of a more volatile amine with a ring structure. 5,746,971, Cl. 422-16.000.
Millham, Eric Ernest: *See—*
Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
Milliken Research Corporation: *See—*
Brown, Steven E.; and Suddeth, Bruce H., 5,746,022, Cl. 47-57.600.
Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, to Cirrus Logic, Inc. Transaction queue in a graphics controller chip. 5,748,920, Cl. 395-308.000.
Mills, Sander: *See—*
Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.
Milltronics Ltd.: *See—*
Cherek, Bogdan; and Pawliw, Jean-Pierre, 5,748,562, Cl. 367-124.000.
Milne, Lisa: *See—*
Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Albaugh, David A., 5,747,304, Cl. 435-121.000.
Milo, Richard K., to Seagate Technology, Inc. Arrangement and method for optimizing the recorded signal to noise ratio in contact recording systems. 5,748,396, Cl. 360-31.000.
Mimikos, Andrew N.; and Rizzo, Sam, to Rizzo, Anthony. Aqueous composition to neutralize the irritating effect of capsaicin on eyes, skin and mucous membranes. 5,747,052, Cl. 424-402.000.
Min, Dong Joon: *See—*
Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, 5,746,804, Cl. 75-387.000.
Min, Sang-Kee: *See—*
Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, 5,747,781, Cl. 219-685.000.
Minami, Go: *See—*
Hayashi, Masao; Minami, Go; Matsunaga, Kuniaki; Fujii, Tsuyoshi; and Hayashi, Takashi, 5,747,432, Cl. 508-462.000.
Minami, Kenji: *See—*
Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.
Minamizawa, Fumihiro, to Brother Kogyo Kabushiki Kaisha. Facsimile device having a printing function. 5,748,337, Cl. 358-468.000.
Minamoto, Yoshiji, to Fujitsu Limited. Battery charging/discharging apparatus with serial battery connection. 5,747,966, Cl. 320-6.000.
Minassian, Aram, to United Electric Controls Company. System for temporarily preserving signal-flow around a signal switch. 5,747,895, Cl. 307-118.000.
Minck, Klaus-Otto: *See—*
Dorsch, Dieter; Baumgarth, Manfred; Gericke, Rolf; Minck, Klaus-Otto; and Beier, Norbert, 5,747,539, Cl. 514-618.000.
Minebea Co., Ltd.: *See—*
Yoshimura, Noriyuki; and Yoshida, Kenji, 5,747,898, Cl. 310-49.00R.
Minemura, Junko: *See—*
Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, 5,747,864, Cl. 257-458.000.
Minesaki, Shunyo: *See—*
Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.
Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., to Aristech Chemical Corporation. Acrylic sheet having uniform distribution of coloring and mineral filler before and after thermoforming. 5,747,154, Cl. 428-327.000.
Mingo, Paul Charles: *See—*
Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, 5,746,183, Cl. 123-492.000.
Minister For Infrastructure: *See—*
Forward, Peter, 5,746,923, Cl. 210-696.000.
Minnesota Mining and Manufacturing Company: *See—*
Bayer, Glen H., Jr.; and O'Leary, Timothy J., 5,747,107, Cl. 427-208.400.
Dust, Herbert; Lohmeier, Gerhard; and Viebranz, Manfred G., 5,746,253, Cl. 138-178.000.
Jordan, Russell A.; and Hansen, James D., 5,746,594, Cl. 433-9.000.
Kreckel, Karl W., 5,747,131, Cl. 428-40.100.
Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
Leonard, Ronald J., 5,747,138, Cl. 428-113.000.
Schenz, James L., 5,747,139, Cl. 428-120.000.
Theirl, Scott G.; and Drake, Gerald E., 5,746,408, Cl. 248-295.110.
Warner, David; Lee, Charles C.; and Li, Wu-Shyong, 5,747,148, Cl. 428-212.000.
Zaklika, Krzysztof A.; Busman, Stanley C.; and Cuny, Gregory D., 5,747,217, Cl. 430-158.000.
Mino, Kotaro: *See—*
Honma, Junich; Mino, Kotaro; Miyata, Hisayuki; and Inoue, Haruhide, 5,748,436, Cl. 361-234.000.
Mino, Norihisa; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Chemically adsorbed multilayer film. 5,747,158, Cl. 428-333.000.
Minolta: *See—*
Ishihara, Jun; and Yamaguchi, Kyoko, 5,749,008, Cl. 396-373.000.
Minolta Co., Ltd.: *See—*
Hagi, Masayuki; Tamaoki, Junichi; Arai, Takeshi; and Fukuda, Hiroyuki, 5,747,211, Cl. 430-110.000.
Izawa, Makoto; and Nanba, Katsuhiro, 5,747,952, Cl. 318-135.000.
Nakabayashi, Yoshikazu; Hadano, Hiroshi; Okabe, Norikazu; and Sendou, Hideki, 5,746,426, Cl. 271-119.000.
Ueda, Hideaki, 5,747,208, Cl. 430-97.000.
Ueda, Hiroshi; and Miyazawa, Masayuki, 5,748,999, Cl. 396-91.000.
Minowa, Toshimichi; and Ohyama, Yoshishige, to Hitachi, Ltd. Method and apparatus for controlling driving power of motor vehicle. 5,746,679, Cl. 477-92.000.
Miono, Tadaaki: *See—*
Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.
Mishra, Umesh Kumar; and DenBaars, Steven P., to University of California, The Regents of the. Ultra-low phase noise GaAs MOSFETs. 5,747,838, Cl. 257-192.000.
Misslitz, Ulf: *See—*
Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.
Mistry, Jehangir: *See—*
Khosravi, M. Javad; Mistry, Jehangir; and Diamandi, Anastasia, 5,747,273, Cl. 435-7.940.
Mita Industrial Co., Ltd.: *See—*

OL
2 10
SS
1
MY
5
998
MI

  - Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.
  - Hirobe, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, 5,746,505, Cl. 362-260.000.
  - Kawasaki, Kotaro; and Noda, Kazumi, 5,748,292, Cl. 355-75.000.
  - Nakamura, Koji; Yamamoto, Haruo; and Hayashi, Shuji, 5,748,857, Cl. 395-109.000.
- Mitacek, Paul; Ghyzel, Peter John; and Chen, Tienteh, to Eastman Kodak Company. Process for synthesizing latex polymers from solid monomer particles. 5,747,585, Cl. 524-845.000.
- Mitani, Masaki: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Mitani, Tomomasa: *See—*
  - Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
- Mitchell, Albert W.; and Gifford, Mark. Moisture-transferring sweat band. 5,745,921, Cl. 2-181.000.
- Mitchell, Chauncey T., Jr.; Good, David M.; Shadle, Mark A.; and Verschuur, Gerrit L., to Voxcom, Inc. Method and apparatus for printign lithium patterns on a press. 5,747,103, Cl. 427-123.000.
- Mitchell, Kent E., to Phillips Petroleum Company. Crude oil desalting process. 5,746,908, Cl. 208-251.00R.
- Mitel Corporation: *See—*
  - Ouellet, Luc, 5,747,361, Cl. 437-190.000.
- Mitobe, Kazuhiko: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Mitsubishi Chemical Corporation: *See—*
  - Hidaka, Katsuhiko; Kawabata, Katsuhiro; and Tamukai, Keiko, 5,747,220, Cl. 430-273.100.
  - Massucco, Arthur A.; Fauteux, Denis G.; and Van Buren, Martin, 5,746,782, Cl. 29-730.000.
  - Nishida, Koji; Kurasawa, Yoshihiro; Takagi, Kiyoji; and Sano, Hironari, 5,747,575, Cl. 524-443.000.
  - Nozomi, Mamoru; Murakami, Osamu; Fuse, Masahiro; and Furuune, Makoto, 5,747,203, Cl. 430-58.000.
  - Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, 5,747,576, Cl. 524-451.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Hayashida, Takahiro, 5,747,957, Cl. 319-799.000.
  - Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.
  - Kaneko, Yasushi, 5,748,465, Cl. 364-132.000.
  - Katayama, Koji, 5,748,294, Cl. 356-4.010.
  - Kawakami, Youichi; and Dochi, Tohru, 5,748,139, Cl. 342-51.000.
  - Kimura, Tatsuya; and Takemi, Masayoshi, 5,748,659, Cl. 372-46.000.
  - Kometani, Osamu; Wakano, Shoichi; and Asakura, Mikio, 5,748,549, Cl. 365-226.000.
  - Kuroda, Takeshi; and Kanno, Itaru, 5,746,233, Cl. 134-57.00R.
  - Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.
  - Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, 5,747,843, Cl. 257-296.000.
  - Miyoshi, Nobuhiro; and Yamanaka, Kazuya, 5,748,517, Cl. 364-760.010.
  - Morimoto, Takao; and Fujiwara, Tatsunori, 5,748,406, Cl. 360-99.120.
  - Morimoto, Yoshihiro, 5,746,089, Cl. 74-7.00E.
  - Morinaka, Hiroyuki; Ueda, Kimio; and Mashiko, Koichiro, 5,747,847, Cl. 257-315.000.
  - Nakabayashi, Takeo, 5,748,909, Cl. 395-280.000.
  - Nii, Koji, 5,748,541, Cl. 365-189.050.
  - Nishida, Satoshi; and Otani, Akihiro, 5,748,662, Cl. 372-55.000.
  - Oshima, Seiichi, 5,747,875, Cl. 257-687.000.
  - Sawada, Seiji, 5,748,560, Cl. 365-233.000.
  - Sugita, Mitsuru, 5,748,984, Cl. 395-889.000.
  - Suzuki, Tadashi, 5,749,068, Cl. 704-233.000.
  - Takahashi, Yasuhiro; and Fukui, Wataru, 5,747,670, Cl. 73-35.080.
  - Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, 5,748,585, Cl. 369-47.000.
  - Yamada, Michio; and Kawaguchi, Hitoshi, 5,748,459, Cl. 363-21.000.
- Mitsubishi Electric Engineering Co., Ltd.: *See—*
  - Kometani, Osamu; Wakano, Shoichi; and Asakura, Mikio, 5,748,549, Cl. 365-226.000.
  - Miyoshi, Nobuhiro; and Yamanaka, Kazuya, 5,748,517, Cl. 364-760.010.
- Mitsubishi Electric Information Technology Center America, Inc.: *See—*
  - Marks, Joseph W., 5,748,844, Cl. 395-10.000.
- Mitsubishi Electric Semiconductor Software Co., Ltd.: *See—*
  - Sugita, Mitsuru, 5,748,984, Cl. 395-889.000.
- Mitsubishi Gas Chemical Company, Inc.: *See—*
  - Adachi, Takahiro; and Takata, Toshiaki, 5,747,632, Cl. 528-196.000.
- Mitsubishi Heavy Industries, Ltd.: *See—*
  - Iijima, Katsuhiko; and Kinoshita, Shigenori, 5,747,959, Cl. 318-762.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.
- Mitsubishi Rayon Co., Ltd.: *See—*
  - Kamo, Jun; Koyanagi, Seiya; and Kawai, Miho, 5,746,916, Cl. 210-500.230.
- Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See—*
  - Inoue, Jiro, 5,746,076, Cl. 70-277.000.
- Mitsui Mining & Smelting Co. Ltd.: *See—*
  - Moriya, Kazuo, 5,748,320, Cl. 356-385.000.
- Mitsui Norin Co., Ltd.: *See—*
  - Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, 5,747,053, Cl. 424-405.000
- Mitsui Toatsu Chemicals, Inc.: *See—*
  - Shinoda, Hosei; Ajioka, Masanobu; and Chida, Kimitaka, 5,747,637, Cl. 528-354.000.
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Mitsumata, Chiharu: *See—*
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Mittra, Suvo. System and method for secure group communications via multicast or broadcast. 5,748,736, Cl. 380-21.000.
- Miura, Hisayuki: *See—*
  - Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, 5,748,416, Cl. 360-113.000.
- Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, to Fujitsu Limited. Optical module for connecting optical element and optical fiber. 5,748,822, Cl. 385-90.000.
- Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, to Konica Corporation. Developing apparatus in use with an image forming apparatus. 5,749,031, Cl. 399-228.000.
- Miyabe, Yoshiyuki: *See—*
  - Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, 5,748,798, Cl. 382-258.000.
- Miyachi Technos Corporation: *See—*
  - Moro, Kyoji; and Shimada, Hiroshi, 5,748,462, Cl. 363-97.000.
- Miyagi, Takahiro; Takaya, Shigeru; and Masunaga, Yoshifumi, to Pioneer Electronic Corporation. Optical pickup for magneto optical recording apparatus. 5,748,579, Cl. 369-44.140.
- Miyaji, Shinya; and Higaki, Nobuo, to Matsushita Electric Industrial Co., Ltd. Interrupt control device for processing interrupt request signals that are greater than interrupt level signals. 5,748,970, Cl. 395-733.000.
- Miyakawa, Takeshi; Shimizu, Mikio; and Nabeta, Takeshi, to Denki Kagaku Kogyo Kabushiki Kaisha. Conductive composite plastic sheet and container. 5,747,164, Cl. 428-411.100.
- Miyake, Toshio: *See—*
  - Nishimoto, Tomoyuki; Chaen, Hiroto; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,747,300, Cl. 435-101.000.
- Miyakoshi, Toshinobu; and Hasegawa, Hiroaki, to TDK Corporation. Glass and ceramic substrate using the same. 5,747,396, Cl. 501-32.000.
- Miyama, Yasuyuki: *See—*
  - Sugamata, Tohru; Miyama, Yasuyuki; and Shinriki, Takashi, 5,748,358, Cl. 359-245.000.
- Miyamoto, Takaaki, to Sony Corporation. Process of forming a refractory metal thin film. 5,747,384, Cl. 438-685.000.
- Miyamoto, Yoichi: *See—*
  - Maeda, Hiroshi; Akaike, Takaaki; Miyamoto, Yoichi; and Yoshida, Masaki, 5,747,495, Cl. 514-258.000.
- Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, to Japan as represented by Director General of Agency of National Institute of Health. Diagnostic reagent for hepatitis c. 5,747,241, Cl. 435-5.000.
- Miyano, Hitoshi, to Fuji Photo Optical Co., Ltd. Objective lens for variable field angle endoscope. 5,748,385, Cl. 359-691.000.
- Miyao, Yasuhiro: *See—*
  - Honda, Masahiko; and Miyao, Yasuhiro, 5,748,632, Cl. 370-399.000.
- Miyasaka, Motohiro; Kondo, Makoto; and Otsuka, Shigeru, to Hitachi Powdered Metals Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Porous bearing system having internal grooves and electric motor provided with the same. 5,746,516, Cl. 384-291.000.
- Miyata, Hisayuki: *See—*
  - Honma, Junich; Mino, Kotaro; Miyata, Hisayuki; and Inoue, Haruhide, 5,748,436, Cl. 361-234.000.
- Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, to Sumitomo Metal Industries, Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Low Mn-low Cr ferritic heat resistant steel excellent in strength at elevated temperatures. 5,746,843, Cl. 148-335.000.
- Miyatake, Norio: *See—*
  - Hino, Yasumori; Miyatake, Norio; Birukawa, Masahiro; and Nakamura, Tadashi, 5,748,592, Cl. 369-59.000.
- Miyawaki, Hiroyuki: *See—*
  - Iwasaki, Yasuo; Ozaki, Toshiaki; and Miyawaki, Hiroyuki, 5,748,590, Cl. 369-58.000.

- Miyazaki, Haruhito; and Ishitoya, Koichi, to Pioneer Electronic Corporation. Recording/reproducing system wherein an analog stereo audio format is maintained and half the analog stereo signal is replaced by a digital stereo audio signal. 5,748,834, Cl. 386-96.000.
- Miyazaki, Hideya: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Miyazaki, Manabu: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Miyazaki, Shigeki: *See—*
  - Hayashi, Masatake; and Miyazaki, Shigeki, 5,747,932, Cl. 313-582.000.
- Miyazaki, Takeo, to Daiwa Seiko, Inc. Fishing reel with clutch mechanism utilizing an engaging protrusion and engaging recesses. 5,746,381, Cl. 242-261.000.
- Miyazawa, Kazuyuki: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
- Miyazawa, Masayuki: *See—*
  - Ueda, Hiroshi; and Miyazawa, Masayuki, 5,748,999, Cl. 396-91.000.
- Miyazawa, Yoshio: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
- Miyoshi, Nobuhiro; and Yamanaka, Kazuya, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Co., Ltd. Multiplier circuit. 5,748,517, Cl. 364-760.010.
- Mizikovsky, Semyon, to Lucent Technologies Inc. Circuit and method for generating cryptographic keys. 5,748,734, Cl. 380-21.000.
- Mizokawa, Takumi: *See—*
  - Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.
- Mizrahi, Victor, to Ciena Corp. Gratings-based optical add-drop multiplexers for WDM optical communication system. 5,748,349, Cl. 359-130.000.
- Mizuguchi, Hideki: *See—*
  - Yoshida, Minoru; Mizuguchi, Hideki; Kobayashi, Nobuhisa; and Ishida, Masaharu, 5,747,077, Cl. 425-183.000.
- Mizuno, Masahiro, to Brother Kogyo Kabushiki Kaisha. Embroidery data processing apparatus. 5,748,480, Cl. 364-470.090.
- Mizuno, Tiaki: *See—*
  - Baba, Horonobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.
- Mizuno, Yoshihiro: *See—*
  - Matsumoto, Tsuyoshi; Mizuno, Yoshihiro; Omata, Keiichi; and Eguchi, Shin, 5,748,377, Cl. 359-633.000.
- Mizushima, Koichi; Kinno, Teruyuki; Yamauchi, Takashi; and Inomata, Koichiro, to Kabushiki Kaisha Toshiba. Magnetic device and magnetic sensor using the same. 5,747,859, Cl. 257-421.000.
- Mizutani, Hiroyuki: *See—*
  - Tanaka, Hiroki; Mizutani, Hiroyuki; Narita, Midori; and Takada, Koichi, 5,746,847, Cl. 148-692.000.
- Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, to Hitachi, Ltd. Document search method wherein stored documents and search queries comprise segmented text data of spaced, nonconsecutive text elements and words segmented by predetermined symbols. 5,748,953, Cl. 395-606.000.
- MKE-Quantum Components Colorado LLC: *See—*
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Mlaker, John J., to Mat-3, Inc. Hydraulic boom platform leveling system. 5,746,286, Cl. 182-2.900.
- Mobil Oil Corporation: *See—*
  - Bednarczyk, Adam; Maute, Robert E.; and Thompson, Laird B., 5,747,749, Cl. 181-102.000.
  - Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
  - Coolbaugh, Thomas S.; Loveless, Frederick Charles; and Matthews, Demetreos N., 5,747,598, Cl. 525-314.000.
- Mobility Plus, Inc.: *See—*
  - Jones, David L.; and Drenner, George L., Jr., 5,746,465, Cl. 296-65.100.
- Mobin, Mohammad Shafiul, to Lucent Technologies Inc. Coarse frequency burst detector for a wireline communications system. 5,748,680, Cl. 375-317.000.
- Mobin, Mohammad Shafiul, to Lucent Technologies Inc. Oscillator frequency offset error estimator for communications systems. 5,748,682, Cl. 375-344.000.
- Mobin, Muhammad Shafiul: *See—*
  - Blaker, David Mark; Ellard, Gregory Stephen; and Mobin, Muhammad Shafiul, 5,748,650, Cl. 371-43.100.
- Mochida, Shoji: *See—*
  - Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.
- Mochida, Yoshinori: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Mochizuki, Isamu: *See—*
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
- Mochizuki, Kohei: *See—*
  - Yano, Masayoshi; and Mochizuki, Kohei, 5,747,800, Cl. 250-292.000.
- Mockridge, Raymond G.: *See—*
  - Yang, Kim W.; Junginger, George J.; Mockridge, Raymond G.; and Pearce, Robert C., III, 5,747,054, Cl. 424-409.000.
- Moeller, Larry. Electrical outlet box. 5,747,739, Cl. 174-67.000.
- Moeller Marine Products: *See—*
  - Huse, O. C., 5,746,152, Cl. 114-363.000.
- Moessinger, Klaus: *See—*
  - Hamm, Hans-Peter; and Moessinger, Klaus, 5,746,794, Cl. 55-385.300.
- Mohammed, Abdeally; and Wynne, Lyndell Kyle, to Reef Industries, Inc. Continuous polymer and fabric composite. 5,747,134, Cl. 428-57.000.
- Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., to PPG Industries, Inc. Amorphous precipitated silica abrasive. 5,747,003, Cl. 424-49.000.
- Mohr, Juergen: *See—*
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Moisey, Mark J.: *See—*
  - Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
- Molbak, Jens H.; Gerrity, Dan; Scherer, Scott; and Finch, Aaron R., to Coinstar, Inc. Coin counter dejamming method and apparatus. 5,746,299, Cl. 194-200.000.
- Moldovan, Dan G.: *See—*
  - deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
- Molex Incorporated: *See—*
  - Chang, Wei-Sun; and Chen, Liu-Yuan, 5,747,735, Cl. 174-51.000.
  - Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
  - Schempp, Otto; and Carabetta, Francesco, 5,748,821, Cl. 385-76.000.
- Moli Energy (1990) Limited: *See—*
  - Von Sacken, Ulrich; Chow, Wendy; and Shkuratoff, Allen, 5,747,188, Cl. 429-61.000.
- Molnar, John W.: *See—*
  - Holmes, Daniel J.; Molnar, John W.; and Tarr, Morton H., 5,748,842, Cl. 395-2.790.
- Molnlycke AB: *See—*
  - Olsson, Stefan; Widlund, Urban; and Söderbergh, Anders, 5,746,732, Cl. 604-385.200.
- Moltech Invent S.A.: *See—*
  - Sekhar, Jainagesh A., 5,746,895, Cl. 204-279.000.
- Molz, Herbert F. Docking apparatus. 5,746,149, Cl. 114-230.000.
- Momcilovich, Paul Theodore: *See—*
  - Hampo, Richard Joseph; Momcilovich, Paul Theodore; and Stuntz, Ross Maxwell, 5,747,689, Cl. 73-304.00C.
- Momota, Makoto; Sato, Kenichiro; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Positive photoresist composition. 5,747,218, Cl. 430-192.000.
- Mondet, Jean: *See—*
  - Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, 5,747,013, Cl. 424-707.000.
- Mone, Patrick: *See—*
  - Cederbaum, Carl; Girard, Philippe; and Mone, Patrick, 5,748,125, Cl. 341-136.000.
- Monney, Patrick, to Bobst SA. Photoelectric detector for a register control device within a rotary printing machine. 5,747,795, Cl. 250-227.240.
- Monopanel Technologies, Inc.: *See—*
  - Van Zeeland, Anthony J.; and Bielik, Robert S., 5,747,757, Cl. 200-5.00A.
- Montagnier, Luc: *See—*
  - Alizon, Marc; Sonigo, Pierre; Wain-Hobson, Simon; and Montagnier, Luc, 5,747,242, Cl. 435-5.000.
- Montanari, Stefania; Cavalleri, Paolo; and Santangelo, Francesco, to Zambon Group, S.P.A. Derivatives of 2-amino-1,2,3,4-tetrahydronaphthalene active on the cardiovascular system. 5,747,513, Cl. 514-351.000.
- Monteith, Joseph Gordon, to Stormceptor Canada Inc. Multicell separator. 5,746,912, Cl. 210-170.000.
- Montell North America Inc.: *See—*
  - Pinoca, Leonardo; Africano, Renato; and Braca, Giancarlo, 5,747,160, Cl. 428-364.000.
- Montell Technology Company BV: *See—*
  - Resconi, Luigi; Piemontesi, Fabrizio; and Yu, Lin-Chen, 5,747,621, Cl. 526-351.000.
- Moon, Jae-Nyun. Desk for computer system. 5,746,489, Cl. 312-223.300.
- Moore Business Forms, Inc.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

Johnson, Thomas W.; and Muerle, John L., 5,748,755, Cl. 382-115.000.
Moore, Devin Lee; McMillan, John A.; and Kopp, Joseph J., Jr., to Sunbeam Products, Inc. Locking mechanism for vaporizer electrode housing utilizing electrical plug prong as key. 5,748,836, Cl. 392-337.000.
Moore, Howard F.: *See—*
Hettinger, William P., Jr.; Moore, Howard F.; Goolsby, Terry L.; and Peppard, A. V., 5,746,321, Cl. 209-233.000.
Moore, Scott E., to Micron Technology, Inc. Improved rotary coupling. 5,747,386, Cl. 438-692.000.
Moracchini, Gérard; Sanchez, José; de Hemptinne, Jean-Charles; and Ungerer, Philippe, to Institut Francais du Petrole. Device for performing thermodynamic measurements on multiphase fluids at very high pressures and temperatures. 5,747,674, Cl. 73-61.440.
Morales, Eloisa Xochitl Le Riverend: *See—*
Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
Moran, P. W. Thomas; and Rice, Joseph J., to Eastman Kodak Company. Photographic film cartridge with drive wheel activated status indicator. 5,749,016, Cl. 396-515.000.
Moran, Timothy J.: *See—*
Dahlberg, E. Dan; and Moran, Timothy J., 5,747,997, Cl. 324-252.000.
Morefield, Elaine M.: *See—*
Ross, Jamie S.; and Morefield, Elaine M., 5,747,011, Cl. 424-59.000.
Moreland, Richard B., to NCR Corporation. Liquid tank re-inker using ball transfer mechanism. 5,746,522, Cl. 400-197.000.
Morgan, Michael V.: *See—*
Taba, Serge; and Morgan, Michael V., 5,746,198, Cl. 128-204.260.
Morgan, Samuel D.; and Jones, Allen J. Emergency signal display activation system. 5,748,706, Cl. 379-37.000.
Mori, Chisato: *See—*
Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, 5,747,339, Cl. 435-350.000.
Mori, Kenichi: *See—*
Tomisawa, Naoki; and Mori, Kenichi, 5,747,677, Cl. 73-115.000.
Mori, Kenjiro: *See—*
Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.
Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, to Akebono Brake Industry Co., Ltd.; and Nihon Inter Electronics Corporation. Acceleration sensor. 5,748,567, Cl. 367-178.000.
Mori, Satoshi: *See—*
Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.
Morigi, Adriano: *See—*
Sweeney, Niall; Morigi, Adriano; and Gyure, Sandor, 5,746,726, Cl. 604-263.000.
Morikawa, Seiichiro, to Fuji Photo Film Co., Ltd. Method of and apparatus for determining whether an original is present in a readout region. 5,748,341, Cl. 358-488.000.
Morimoto, Hideaki: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
Morimoto, Masahito, to Furukawa Electric Co. Ltd., The. Optical power detector, and multi-level digital transmission system incorporating the same. 5,748,351, Cl. 359-193.000.
Morimoto, Takao; and Fujiwara, Tatsunori, to Mitsubishi Denki Kabushiki Kaisha. Rotational driving apparatus for disks having a magnet disposed on a motor mounting base surface to absorb radial deflections. 5,748,406, Cl. 360-99.120.
Morimoto, Toshihiro: *See—*
Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
Morimoto, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Planetary gear-type starter. 5,746,089, Cl. 74-7.00E.
Morin, Philippe; and Junqua, Jean-claude. Supervised contextual language acquisition system. 5,748,841, Cl. 395-2.660.
Morinaka, Hiroyuki; Ueda, Kimio; and Mashiko, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device, method for manufacturing the same, and logical circuit. 5,747,847, Cl. 257-315.000.
Morioka, Michio: *See—*
Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.
Morioka, Shinji: *See—*
Ueki, Jun; and Morioka, Shinji, 5,747,327, Cl. 435-252.300.
Morishita, Nobuyasu; Hamada, Shinji; Matsuda, Hiromu; and Ikoma, Munehisa, to Matsushita Electric Industrial Co., Ltd. Cell and module battery of sealed nickel-metal hydride storage. 5,747,186, Cl. 429-53.000.
Morishita, Tadataka: *See—*
Homma, Norio; and Morishita, Tadataka, 5,747,427, Cl. 505-476.000.
Morita, Katsuyuki: *See—*
Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, 5,748,798, Cl. 382-258.000.
Morita, Mikio: *See—*
Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
Morita, Teruya: *See—*
Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
Moritani, Ryuzo: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
Moritz, Peter: *See—*
Colpan, Metin; Moritz, Peter; and Schorr, Joachim, 5,747,663, Cl. 536-25.400.
Moriya, Kazuo, to Mitsui Mining & Smelting Co. Ltd. Wiring pattern line width measuring apparatus. 5,748,320, Cl. 356-385.000.
Moriya, Kenichi: *See—*
Kashiwazaki, Akio; Katayama, Masato; and Moriya, Kenichi, 5,747,146, Cl. 428-206.000.
Moriya, Yukio, to Ginko Bussan Co., Ltd. Engine oil block for use in routing to an oil cooler. 5,746,170, Cl. 123-196.0AB.
Moriyama, Jiro: *See—*
Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
Moriyama, Sadao, to Bridgestone Corporation. Method of building green tires for low-section profile pneumatic radial tires. 5,746,860, Cl. 156-111.000.
Moriyama, Yasuyuki: *See—*
Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
Morizawa, Yoshitomi: *See—*
Matsumura, Yasushi; Nakano, Takashi; Makino, Mayumi; and Morizawa, Yoshitomi, 5,747,531, Cl. 514-469.000.
Morla, Alex: *See—*
Ruoslahti, Erkki I.; and Morla, Alex, 5,747,452, Cl. 514-12.000.
Moro, Kyoji; and Shimada, Hiroshi, to Miyachi Technos Corporation. Apparatus for controlling inverter resistance welding. 5,748,462, Cl. 363-97.000.
Moro, Mauro: *See—*
Codazzi, Luca; and Moro, Mauro, 5,746,195, Cl. 126-391.000.
Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, to Canon Kabushiki Kaisha. Image processing method and apparatus including an error calculation for calculating a difference between the values of error correction data and stored representative values. 5,748,772, Cl. 382-167.000.
Moro, Takahiro, to Cannon Kabushiki Kaisha. Image processing method and apparatus. 5,748,788, Cl. 382-243.000.
Moroishi, Keiji: *See—*
Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.
Mororola, Inc.: *See—*
Shieh, Chan-Long; Lee, Hsing-Chung; and So, Franky, 5,748,160, Cl. 345-82.000.
Morris, David L.: *See—*
Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., 5,746,635, Cl. 445-24.000.
Morris, Ian W.: *See—*
Hindle, David J.; Breeds, Christopher D.; Conway, Jeremy J.; Morris, Ian W.; and Ledgerwood, Eric, 5,746,540, Cl. 405-131.000.
Morris, Joseph P.: *See—*
McLean, Christopher H.; Lichon, Paul G.; Morris, Joseph P.; and Flugstad, Philip O., 5,746,050, Cl. 60-200.100.
Morris, Raymond G.: *See—*
Manfredi, Paul A.; and Morris, Raymond G., 5,745,945, Cl. 15-77.000.
Morris, William N., Jr.: *See—*
Russell, Howard L.; and Morris, William N., Jr., 5,746,104, Cl. 83-698.710.
Mortar & Pestle Veterinary Pharmacy, Inc.: *See—*
Russell, Meri Charm; and Fenger, Clara K., 5,747,476, Cl. 514-275.000.
Morton International, Inc.: *See—*
Amirsakis, Charles J., 5,747,630, Cl. 528-71.000.
Caputo, Peter A., 5,746,815, Cl. 106-31.250.
Dyer, David J.; Geisler, Claus J.; and Woerner, Ulrich, 5,746,447, Cl. 280-743.200.
Rink, Linda M.; Letendre, Guy R.; Teverovsky, Alexander; and Marjanski, George C., 5,746,793, Cl. 55-385.300.
Mosel Vitelic Inc.: *See—*
Fan, Der-Tsyr; Jou, Chon-Shin; and Wang, Ting-S., 5,747,378, Cl. 438-563.000.

Su, Wen-Doe, 5,747,357, Cl. 437-69.000.
Yang, Ching-Nan; and Peng, Li-Chun, 5,747,368, Cl. 438-217.000.
Moseley, Dennis Drew: *See—*
Garbers, Jeffrey Paul; and Moseley, Dennis Drew, 5,748,537, Cl. 365-185.330.
Moseley, Pope L.: *See—*
Wallen, Erik S.; Roigas, Jan; and Moseley, Pope L., 5,747,332, Cl. 435-272.000.
Moseman, James F.: *See—*
Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.
Moskowitz, Jack J.: *See—*
Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., 5,748,738, Cl. 380-25.000.
Moslehi, Mehrdad M.: *See—*
Heimanson, Dorian; Moslehi, Mehrdad M.; Spronz, Paul E.; and Omstead, Thomas R., 5,746,897, Cl. 204-298.200.
Moss, Gerald S.: *See—*
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.
Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, to Sharp Kabushiki Kaisha; and Yozan, Inc. A/D converting circuit. 5,748,131, Cl. 341-155.000.
Motohashi, Kazunori: *See—*
Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, 5,748,510, Cl. 364-606.000.
Motorenfabrik Hatz GmbH & Co.: *See—*
Eder, Erich, 5,747,753, Cl. 181-282.000.
Motorola, Inc.: *See—*
Bockelman, David E., 5,748,506, Cl. 364-571.020.
Boscovic, Dragan; Valentine, Stephen; Bastani, Babak; and Wray, Anthony, 5,748,038, Cl. 330-2.000.
Capurka, Tomas, 5,748,620, Cl. 370-328.000.
Chen, Eugene; Tehrani, Saied N.; Legge, Ronald N.; and Zhu, Xiaodong T., 5,748,524, Cl. 365-173.000.
Davis, James L.; Williams, Melanie; and Pennisi, Robert W., 5,748,438, Cl. 361-504.000.
Feng, Taisheng; and Raatz, Donovan, 5,749,090, Cl. 711-135.000.
Gering, Marcus J.; Berg, Gordon O.; Lehnen, David C.; and Frisbie, Joseph W., 5,748,389, Cl. 359-811.000.
Gutman, Jose; and Wright, James A., 5,748,100, Cl. 340-825.440.
Hammond, Jonathan H.; and Chung, Young Sir, 5,747,839, Cl. 257-253.000.
Hawkins, George W., 5,747,858, Cl. 257-417.000.
Hong, Merit Y., 5,748,475, Cl. 364-491.000.
Huang, Jin; Midya, Pallab; and Mancini, Brian M., 5,747,914, Cl. 310-318.000.
Hunter, Craig C.; and Reininger, Russell A., 5,748,645, Cl. 371-22.310.
Jiang, Wenbin; and Lebby, Michael S., 5,748,665, Cl. 372-96.000.
Johnson, Robert Michael, Jr.; and Gilot, Monefax Joseph, 5,747,970, Cl. 320-151.000.
Johnston, Thomas K., 5,748,949, Cl. 395-557.000.
Joss, Steve M.; Jensen, Tyler D.; Marvet, Laurence E.; Castañeda, Julio C.; Auld, David; and Finch, Steven J., 5,746,307, Cl. 200-303.000.
Kiely, Philip; Claisse, Paul; and Gable, Benjamin W., 5,748,661, Cl. 372-50.000.
Koifman, Vladimir; Afek, Yachin; and Kashat, Israel, 5,748,030, Cl. 327-513.000.
Labun, Nicholas M.; McClaughry, Thomas J.; and Wang, Shay-Ping T., 5,748,845, Cl. 395-20.000.
Lebby, Michael S.; and Nelson, Ronald J., 5,748,161, Cl. 345-84.000.
Lundell, Louis J.; Oh, Sang Y.; and Newman, Terron C., 5,748,727, Cl. 379-446.000.
Mazurkiewicz, Theodore; Levendel, Gil E.; and Wang, Shay-Ping Thomas, 5,749,072, Cl. 704-275.000.
McDunn, Kevin J.; Limper-Brenner, Linda; and Press, Minoo D., 5,746,585, Cl. 417-477.110.
Natarajan, Kadathur S.; Jan, Yih G.; and Peterson, Kenneth M., 5,749,044, Cl. 455-13.100.
Nichols, Jerry R.; Siddoway, Craig F; Habbaba, Faris S.; and Garcia, Jorge L., 5,748,454, Cl. 361-814.000.
Norris, George B.; Staudinger, Joseph; and Sadowniczak, Gary W., 5,748,042, Cl. 330-277.000.
Orbach, Yair; Zmora, Eitan; and Halahmi, Dror, 5,748,071, Cl. 340-146.200.
Patterson, Audley F.; Suarez, Hector E.; and Wadin, Craig P., 5,749,056, Cl. 455-569.000.
Petersen, Ronald O., 5,747,100, Cl. 427-64.000.
Robb, Francine Y.; Robb, Stephen P.; Reynes, Jean-Michel; and Chang, Li-Hsin, 5,747,371, Cl. 438-273.000.
Rozental, Mark; Horowitz, Ilan Yehezkel; and Ben-Ayun, Moshe, 5,748,037, Cl. 330-2.000.
Shi, Song; So, Franky; and Lee, H. C., 5,747,183, Cl. 428-690.000.
Smith, Paul Fielding; and Harrison, Robert Mark, 5,748,683, Cl. 375-347.000.
Tehrani, Saied N.; and Goronkin, Herbert, 5,748,519, Cl. 365-98.000.
Valentine, Stephen Thomas; and Wray, Anthony John, 5,748,678, Cl. 375-297.000.
Viot, J. Greg; and Yishay, Oded, 5,748,490, Cl. 364-489.000.
Visinka, Radim, 5,747,963, Cl. 318-807.000.
Wei, Chengping; Shi, Song Q.; and Lee, Hsing-Chung, 5,747,363, Cl. 438-5.000.
Motoyoshi, Tsunayoshi: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, to L'Oreal. Makeup cosmetic composition in the form of a mascara containing at least a wax and a pseudo-latex of cellulose derivatives. 5,747,013, Cl. 424-707.000.
Moulinex S.A.: *See—*
Deschenes, Laurent, 5,748,853, Cl. 395-61.000.
Moulton, David S.; and Naegeli, David W., to Southwest Research Institute. Diesel fuel having improved qualities and method of forming. 5,746,785, Cl. 44-443.000.
Moy, Christian: *See—*
Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, 5,746,133, Cl. 101-484.000.
Moy, Leland Lem: *See—*
Bickley, Robert Henry; Aragaki, Taul; Moy, Leland Lem; and Waddoups, Ray Owen, 5,748,147, Cl. 342-457.000.
Moyal, Nathan Y., to Cypress Semiconductor Corporation. Voltage controlled oscillator (VCO) frequency gain compensation circuit. 5,748,048, Cl. 331-34.000.
Moyer, Richard H.: *See—*
Schnurr, Alvin D.; Clendening, Charles W., Jr.; Shwartz, Josef; and Moyer, Richard H., 5,747,720, Cl. 89-1.110.
Moyle, Matthew; Foster, David L.; and Vlasuk, George P., to Corvas International, Inc. Method of detecting neutophil inhibitory factor mimics. 5,747,296, Cl. 435-72.000.
MTI Technology Corporation: *See—*
Hicksted, Richard L.; and Glaser, Michael, 5,748,874, Cl. 395-182.220.
Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, to Robert Bosch GmbH. Piston pump in a brake system. 5,746,111, Cl. 92-168.000.
Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, to BASF Aktiengesellschaft. Poly-1-n-alkenylamines, and fuel and lubricant compositions containing them. 5,746,786, Cl. 44-412.000.
Mueller, Heinz-Juergen: *See—*
Lutz, Josef; Kinne, Marianne; and Mueller, Heinz-Juergen, 5,747,872, Cl. 257-611.000.
Mueller, Michael L.: *See—*
Porter, Robert M.; and Mueller, Michael L., 5,747,935, Cl. 315-111.510.
Muenter, Annabel A.: *See—*
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.
Muerle, John L.: *See—*
Johnson, Thomas W.; and Muerle, John L., 5,748,755, Cl. 382-115.000.
Mügge, Martin: *See—*
Weigelt, Beate; Mügge, Martin; and Decker, Detlef, 5,746,496, Cl. 362-61.000.
Muhle, Michael Elroy: *See—*
Agapiou, Agapios Kyriacos; Muhle, Michael Elroy; and Renola, Gary Thomas, 5,747,612, Cl. 526-82.000.
Muhler, Andreas: *See—*
Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
Muise, Herbert Donald: *See—*
Floyd, Stan Louis; Muise, Herbert Donald; and Stanish, Mark A., 5,747,082, Cl. 426-109.000.
Mukai, Takashi: *See—*
Nakamura, Shuji; Mukai, Takashi; and Iwasa, Naruhito, 5,747,832, Cl. 257-103.000.
Mukawa, Hiroshi: *See—*
Kondo, Tsuyoshi; and Mukawa, Hiroshi, 5,748,576, Cl. 369-32.000.
Mukhopadhyay, Tapas: *See—*
Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.
Muljadi, Eduard; and Taylor, Roger W., to Midwest Research Institute. Apparatus and method for maximizing power delivered by a photovoltaic array. 5,747,967, Cl. 320-39.000.
Mullee, William H., to Advanced Micro Devices, Inc. Process for manufacture of ultra-high purity ammonium hydroxide. 5,746,993, Cl. 423-352.000.
Muller BEM: *See—*
Muller, Patrice; Coetsier, Paul; and Douine, Denis, 5,748,301, Cl. 356-155.000.

VOL
210
ISS
1
MY
5
998
UMI

- Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, to BASF Aktiengesellschaft. Ethylene-based copolymers and their use as flow improvers in mineral oil middle distillates. 5,747,616, Cl. 526-262.000.
- Muller, John J.: *See—*
  - Gustafsson, Kjell-Ake; Muller, John J.; and Wittenberg, Roger A., 5,746,958, Cl. 264-115.000.
- Müller, Marcel: *See—*
  - Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.
- Müller, Martin: *See—*
  - Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, 5,746,133, Cl. 101-484.000.
- Müller, Michael Wolfgang; Klingelhöfer, Paul; and Weiss, Stefan, to BASF Aktiengesellschaft. Stable aqueous polyolefin wax dispersions. 5,746,812, Cl. 106-10.000.
- Muller, Patrice; Coetsier, Paul; and Douine, Denis, to Muller BEM. Device and process for the geometric inspection of wheeled vehicles. 5,748,301, Cl. 356-155.000.
- Muller, Richard C.: *See—*
  - Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.
- Müller, Ulrich: *See—*
  - Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.
- Mullin, James Thomas: *See—*
  - Bows, John Richard; Blindt, Renoo Avinash; Hurling, Robert; and Mullin, James Thomas, 5,747,086, Cl. 426-234.000.
- Multiform Desiccants, Inc.: *See—*
  - McKedy, George E.; Idol, Ronald C.; and Powers, Thomas H., 5,746,937, Cl. 252-188.280.
- Mulvihill, Daniel: *See—*
  - Stack, Francis Martin; Hennessy, Mark; Mulvihill, Daniel; and O'Kennedy, Brendan Thomas, 5,747,647, Cl. 530-365.000.
- Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, to Zymogenetics, Inc.; and University of Washington, The Board of Regents of the. Method for identifying a G protein coupled glutamate receptor agonist and antagonist. 5,747,267, Cl. 435-7.210.
- Münch, Reimund: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Muni, Ketan: *See—*
  - Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,747,591, Cl. 525-176.000.
- Munn, Edward Albert; and Smith, Trevor Stanley. Vaccine containing a protein complex form *Haemonchus contortus*. 5,747,046, Cl. 424-265.100.
- Murachi, Mikio; Okawara, Seiji; Kojima, Koichi; and Kondo, Takuya, to Toyota Jidosha Kabushiki Kaisha. Method for purifying exhaust gas of a diesel engine. 5,746,989, Cl. 423-212.00R.
- Murai, Takumi: *See—*
  - Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.
- Murai, Yasushi: *See—*
  - Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
- Murakami, Hiroshi; Tsutsui, Masanori; Asai, Katsumi; and Sasaki, Takayoshi, to Diado Metal Company Ltd. Measuring apparatus for measuring a bearing height of plain bearing half. 5,746,002, Cl. 33-517.000.
- Murakami, Kenichiro: *See—*
  - Wakahara, Tatsuo; and Murakami, Kenichiro, 5,746,677, Cl. 477-35.000.
- Murakami, Masanori; Oku, Takeo; and Otsuki, Akira, to Sony Corporation. Ohmic electrode, its fabrication method and semiconductor device. 5,747,878, Cl. 257-745.000.
- Murakami, Osamu: *See—*
  - Nozomi, Mamoru; Murakami, Osamu; Fuse, Masahiro; and Furuune, Makoto, 5,747,203, Cl. 430-58.000.
- Murakami, Seiichi: *See—*
  - Harada, Yoshihiko; Nakata, Masashi; Oshiro, Akio; and Murakami, Seiichi, 5,747,901, Cl. 310-71.000.
- Murakami, Yoshihiro: *See—*
  - Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.
- Murakami, Yutaka: *See—*
  - Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,748,607, Cl. 369-275.400.
- Murakoshi, Keiji: *See—*
  - Nebashi, Mitsuhiko; Murakoshi, Keiji; Iwaya, Satoshi; and Goto, Akihiro, 5,746,527, Cl. 400-621.000.
- Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, to Kabushiki Kaisha Riken. Exhaust gas cleaner and method of cleaning exhaust gas. 5,747,410, Cl. 502-348.000.
- Muramatsu, Kiyoji: *See—*
  - Takayanagi, Toshihiro; Yanase, Kenji; and Muramatsu, Kiyoji, 5,748,859, Cl. 395-109.000.
- Muramatsu, Masanori, to Canon Kabushiki Kaisha. Image forming apparatus capable of correcting curl of sheet. 5,749,040, Cl. 399-406.000.
- Muramatsu, Shigeru: *See—*
  - Fukuhara, Hiroyuki; Yamada, Sadayuki; and Muramatsu, Shigeru, 5,746,586, Cl. 418-55.200.
- Muramatsu. Tsuyoshi: *See—*
  - Amagai, Takayuki; and Muramatsu, Tsuyoshi, 5,748,933, Cl. 395-377.000.
- Muraoka, Akinori: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Murasaki, Ryuichi: *See—*
  - Okawa, Mitsuhisa; and Murasaki, Ryuichi, 5,745,961, Cl. 24-446.000.
- Murase, Tadashi: *See—*
  - Ito, Yutaka; Egawa, Naoko; Unai, Shogo; and Murase, Tadashi, 5,748,880, Cl. 395-183.220.
- Murata, Chikara; Takahashi, Shinichi; and Yoshida, Mitsuhiro, to Tomoegawa Paper Co., Ltd. Semi-transmissive semi-reflective film laminate and a method of production therefor. 5,746,857, Cl. 156-102.000.
- Murata, Fumio: *See—*
  - Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.
- Murata Kikai Kabushiki Kaisha: *See—*
  - Nakade, Kazuhiko, 5,748,481, Cl. 364-470.140.
- Murata Manufacturing Co., Ltd.: *See—*
  - Hasegawa, Takashi, 5,748,052, Cl. 333-1.100.
  - Kanoh, Osamu; Yoshida, Yasushi; Senda, Atsuo, deceased, 5,746,809, Cl. 106-1.110.
  - Kawahata, Kazunari, 5,748,149, Cl. 343-700.0MS.
  - Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.
- Murata, Masahide: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Murata, Masanao: *See—*
  - Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
- Murata, Yukio, to Canon Kabushiki Kaisha. Image processing method and apparatus having a plurality of image processing modes. 5,748,774, Cl. 382-181.000.
- Murayama, Susumu: *See—*
  - Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.
- Murayama, Yuichiro: *See—*
  - Hashimoto, Hiroshi; Murayama, Yuichiro; Satake, Masaki; and Okita, Tsutomu, 5,747,157, Cl. 428-332.000.
- Murcko, Robert M.: *See—*
  - Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.
- Murdock, Edward S.; Heitke, John C.; and Schulz, Kevin J., to Seagate Technology, Inc. Method and apparatus for protecting magnetoresistive sensor element from electrostatic discharge. 5,748,412, Cl. 360-113.000.
- Murphy, Andrew, to Ottenheimer Publishers, Inc. Method for transverse-fold pop-up. 5,746,689, Cl. 493-397.000.
- Murphy, Dennis Stephen: *See—*
  - Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, 5,747,442, Cl. 510-475.000.
- Murphy, James. Golf putter with offset grip shaft. 5,746,661, Cl. 473-204.000.
- Murphy, Robert H., to R.H. Murphy Co., Inc. Tray for integrated circuits. 5,746,319, Cl. 206-725.000.
- Murray, John J.: *See—*
  - Davidson, Isobel J.; McMillan, Roderick S.; and Murray, John J., 5,747,194, Cl. 429-224.000.
- Murray, John N., to United States of America, Navy. Coating evaluation system. 5,746,905, Cl. 205-791.000.
- Murray, Michael P., to Markem Corporation. Compliant doctoring cup. 5,746,129, Cl. 101-483.000.
- Murray, Steven C.: *See—*
  - McPherson, Donald M.; and Murray, Steven C., 5,747,397, Cl. 501-51.000.
- Mutka, Kari Antero: *See—*
  - Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.
- Mützel, Wolfgang: *See—*

  - Gries, Heinz; Mützel, Wolfgang; Zurth, Christian; and Weinmann, Hanns-Joachim, 5,746,999, Cl. 424-9.322.
- Mychajlowskijj, Walter: *See—*
  - Ong, Beng S.; Mychajlowskijj, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.
- Mylavarapu, Sundar R.: *See—*
  - Thelen, John E.; and Mylavarapu, Sundar R., 5,746,807, Cl. 95-123.000.
- Myouga, Takahiro: *See—*
  - Sakuma, Masafumi; Ookawa, Akemi; and Myouga, Takahiro, 5,747,912, Cl. 310-261.000.
- Myraid Genetics, Inc.: *See—*
  - Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
- Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, to Samsung Electronics Co., Ltd. Methods and apparatus for changing the color of illumination of a cooking chamber of a microwave oven. 5,747,783, Cl. 219-758.000.
- Nabeta, Takeshi: *See—*
  - Miyakawa, Takeshi; Shimizu, Mikio; and Nabeta, Takeshi, 5,747,164, Cl. 428-411.100.
- Nabisco Technology Company: *See—*
  - Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
- Nachtkamp, Klaus: *See—*
  - Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, 5,747,582, Cl. 524-591.000.
  - Schmalstieg, Lutz; Gruber, Hermann; Riberi, Bernd; and Nachtkamp, Klaus, 5,747,628, Cl. 528-60.000.
- Nada, Mitsuhiro, to Toyota Jidosha Kahushiki Kaisha. Method of controlling fuel injection in engines. 5,746,182, Cl. 123-492.000.
- Naef, Reto, to Novartis AG. Isoquinoline compounds, compositions containing them and their pharmaceutical uses. 5,747,506, Cl. 514-307.000.
- Naegeli, David W.: *See—*
  - Moulton, David S.; and Naegeli, David W., 5,746,785, Cl. 44-443.000.
- Nagai, Atsushi, to Sharp Kabushiki Kaisha. Multiple value voltage output circuit and liquid crystal display driving circuit. 5,747,979, Cl. 323-349.000.
- Nagai, Hideo: *See—*
  - Nakanishi, Hideyuki; Ueno, Akira; Nagai, Hideo; and Yoshikawa, Akio, 5,748,658, Cl. 372-43.000.
- Nagai, Junichi: *See—*
  - Nakamura, Kosei; Katsuzawa, Yukio; and Nagai, Junichi, 5,747,900, Cl. 310-58.000.
- Nagai, Ryozo; Kuroo, Makoto; and Kato, Hirohisa, to Yamasa Shoyu Kabushiki Kaisha. Antibody to smooth muscle myosin heavy chains. 5,747,652, Cl. 530-387.900.
- Nagai, Shigekazu; and Kawamoto, Tadasu, to SMC Kabushiki Kaisha. Electric actuator. 5,747,896, Cl. 310-20.000.
- Nagai, Yutaka: *See—*
  - Tsuchiya, Katsuhiro; Nagai, Yutaka; and Ikeda, Mami, 5,747,343, Cl. 436-63.000.
- Nagaishi, Katsuya: *See—*
  - Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.
- Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, to Matsushita Electric Industrial Co., Ltd. Lighting assembly, exposure apparatus and exposure method employing the lighting assembly. 5,748,288, Cl. 355-53.000.
- Nagano, Masayo: *See—*
  - Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.
- Nagano, Ryuichiro; Nagase, Yoichi; and Tamura, Hajime, to Nippon Telegraph and Telephone Corporation; and Toyokuni Electric Cable Co., Ltd. Optical fiber core. 5,748,826, Cl. 385-128.000.
- Nagarajan, Ram: *See—*
  - Burns, Ronnie R.; and Nagarajan, Ram, 5,748,241, Cl. 348-390.000.
- Nagasaka, Shigeki, to Kabushiki Kaisha Toshiba. Semiconductor memory device having multiple modes that allow the cell array to be divided into a variable number of portions. 5,748,201, Cl. 345-509.000.
- Nagasaki, Tatsuo: *See—*
  - Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, 5,748,305, Cl. 356-237.000.
- Nagase, Makoto: *See—*
  - Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.
- Nagase, Masakazu: *See—*
  - Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
- Nagase, Yoichi: *See—*
  - Nagano, Ryuichiro; Nagase, Yoichi; and Tamura, Hajime, 5,748,826, Cl. 385-128.000.
- Nagase, Yukio: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kenmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Nagata, Akitoshi. Box pallet. 5,746,463, Cl. 294-68.240.
- Nagata, Kenji: *See—*
  - Nezu, Hiroshi; and Nagata, Kenji, 5,746,592, Cl. 433-8.000.
- Nagy, Sandor; and Tyrell, John A., to Lyondell Petrochemical Company. Polysiloxane supported metallocene catalysts. 5,747,404, Cl. 502-104.000.
- Naidu, Yathi M.: *See—*
  - Becherer, Kathleen; Dattagupta, Nanibhushan; and Naidu, Yathi M., 5,747,470, Cl. 514-44.000.
- Naimer, Hubert Laurenz: *See—*
  - Alsch, Ing. Gottfried, 5,747,741, Cl. 174-84.00C.
- Naito, Sachio: *See—*
  - Oshika, Masato; and Naito, Sachio, 5,747,015, Cl. 424-70.140.
- Naito, Takeshi; and Nishio, Akitaka, to Aisin Seiki Kabushiki Kaisha. Anti-skid control system for automotive vehicle. 5,746,487, Cl. 303-158.000.
- Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, to Fuji Photo Film Co., Ltd.; and Fuji Photo Optical Co., Ltd. Photographic camera having film winding mechanism. 5,749,009, Cl. 396-395.000.
- Nakabayashi, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Interface board and instruction processing device without a local CPU. 5,748,909, Cl. 395-280.000.
- Nakabayashi, Yoshikazu; Hadano, Hiroshi; Okabe, Norikazu; and Sendou, Hideki, to Minolta Co., Ltd. Feeding device having a feed roller with a low coefficient portion. 5,746,426, Cl. 271-119.000.
- Nakade, Kazuhiko, to Murata Kikai Kabushiki Kaisha. Diagnosing method of yarn monitor and apparatus thereof. 5,748,481, Cl. 364-470.140.
- Nakagawa, Goji: *See—*
  - Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, 5,748,822, Cl. 385-90.000.
- Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Optical disc player device with a vibration prevention mechanism. 5,748,606, Cl. 369-271.000.
- Nakahara, Hitoshi: *See—*
  - Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.
- Nakahara, Takashi: *See—*
  - Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanhu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.
- Nakai, Hidekazu, to Sony Corporation. Disk drive. 5,748,591, Cl. 369-58.000.
- Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, to Matsushita Wlectric Ind. Method and system for adding effects to gray scale images. 5,748,798, Cl. 382-258.000.
- Nakajima, Masashi: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Nakajima, Norio: *See—*
  - Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.
- Nakajima, Yasuo: *See—*
  - Shimamune, Takayuki; Nakajima, Yasuo; Nishiki, Yoshinori; and Ashida, Takahiro, 5,746,896, Cl. 204-284.000.
- Nakajima, Yuji, to Ricoh Company, Ltd. Cartridge loading mechanism with a door closing assembly. 5,748,595, Cl. 369-77.200.
- Nakama, Seiji: *See—*
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Nakamichi Corporation: *See—*
  - Nakamichi, Niro, 5,748,596, Cl. 369-77.100.
  - Sakiyama, Kazuhiro, 5,748,577, Cl. 369-36.000.
- Nakamichi, Niro, to Nakamichi Corporation. Disk changer/player with disk-edge guide and transfer mechanism. 5,748,596, Cl. 369-77.100.
- Nakamikawa, Tetsuaki: *See—*
  - Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.
- Nakamoto, Masayuki; and Ohashi, Hiromichi, to Kabushiki Kaisha Toshiba. Ferroelectric cold cathode. 5,747,926, Cl. 313-495.000.
- Nakamura, Akio: *See—*
  - Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
- Nakamura, Daisuke; and Iida, Masahiko, to Sanshin Kogyo Kabushiki Kaisha. Hydraulic tilt and trim control for marine propulsion. 5,746,055, Cl. 60-454.000.
- Nakamura, Haruki: *See—*
  - Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, 5,747,451, Cl. 514-12.000.
- Nakamura, Hideo; and Furuta, Haruki, to Chinon Kabushiki Kaisha. Image pickup apparatus. 5,748,307, Cl. 358-296.000.
- Nakamura, Hiroki: *See—*

OL
2 10
ISS
1
MY
5
998
MI

Taguchi, Toshio; Agusa, Kiyoshi; Yamamoto, Shin-ichiro; and Nakamura, Hiroki, 5,748,808, Cl. 382-312.000.
Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, to Zexel Corporation. Inner cam type fuel injection pump having modified plungers. 5,746,584, Cl. 417-273.000.
Nakamura, Koji; Yamamoto, Haruo; and Hayashi, Shuji, to Mita Industrial Co. Ltd. Image gradation setting device for use in an image forming apparatus. 5,748,857, Cl. 395-109.000.
Nakamura, Kosei; Katsuzawa, Yukio; and Nagai, Junichi, to Fanuc Ltd. Electric motor with an air-cooling system. 5,747,900, Cl. 310-58.000.
Nakamura, Kosuke: *See—*
Maeda, Yasuaki; and Nakamura, Kosuke, 5,748,588, Cl. 369-54.000.
Nakamura, Masatsugu: *See—*
Maeda, Hiroshi; Itoh, Tatsuya; and Nakamura, Masatsugu, 5,748,794, Cl. 382-251.000.
Nakamura, Norinaga: *See—*
Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
Nakamura, Shinya: *See—*
Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.
Nakamura, Shuji; Mukai, Takashi; and Iwasa, Naruhito, to Nichia Chemical Industries, Ltd. Light-emitting gallium nitride-based compound semiconductor device. 5,747,832, Cl. 257-103.000.
Nakamura, Tadashi: *See—*
Hino, Yasumori; Miyatake, Norio; Birukawa, Masahiro; and Nakamura, Tadashi, 5,748,592, Cl. 369-59.000.
Nakamura, Takahiro; and Oka, Takafumi, to Hitachi, Ltd. Program rewriting method and apparatus for multiprocessor system. 5,748,967, Cl. 395-712.000.
Nakamura, Takashi: *See—*
Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.
Nakamura, Yoshisada; Ishikawa, Shun-ichi; and Matsumoto, Kazuhiko, to Fuji Photo Film Co., Ltd. Processing material and heat-developed image formation method using the same. 5,747,226, Cl. 430-348.000.
Nakanishi, Hideyuki; Ueno, Akira; Nagai, Hideo; and Yoshikawa, Akio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser device and optical pickup head. 5,748,658, Cl. 372-43.000.
Nakanishi, Masaru: *See—*
Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.
Nakanishi, Takeshi: *See—*
Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.
Nakaniwa, Masaru: *See—*
Niimura, Yasuhiro; Ikegami, Tetsuma; Hanafusa, Naoya; and Nakaniwa, Masaru, 5,746,790, Cl. 55-317.000.
Nakano, Hideo: *See—*
Hashimoto, Shunji; Taoka, Mikio; and Nakano, Hideo, 5,748,065, Cl. 336-96.000.
Nakano, Kaichiro: *See—*
Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; and Hasegawa, Etsuo, 5,747,622, Cl. 528-12.000.
Nakano, Mitsuru: *See—*
Novak, Bruce M.; and Nakano, Mitsuru, 5,747,618, Cl. 526-285.000.
Nakano, Syuuichi: *See—*
Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, 5,746,178, Cl. 123-399.000.
Nakano, Takashi: *See—*
Matsumura, Yasushi; Nakano, Takashi; Makino, Mayumi; and Morizawa, Yoshitomi, 5,747,531, Cl. 514-469.000.
Nakano, Tomio: *See—*
Iwase, Akihiro; Nakano, Tomio; and Seki, Teruo, 5,747,837, Cl. 257-173.000.
Nakao, Fumiaki: *See—*
Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.
Nakao, Hiroto, to Noritsu Koki Co., Ltd. Method and apparatus for feeding and winding plural film. 5,748,290, Cl. 355-75.000.
Nakao, Naomi L.: *See—*
Wilk, Peter J.; and Nakao, Naomi L., 5,746,694, Cl. 600-123.000.
Nakashiba, Yasutaka, to NEC Corporation. Solid state image sensor with reinforced fringe electric field at its charge transfer section. 5,747,788, Cl. 250-208.100.
Nakashima, Hayato: *See—*
Okada, Shigeyuki; Tanahashi, Naoki; and Nakashima, Hayato, 5,748,514, Cl. 364-725.030.
Nakashima, Keisuke: *See—*
Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
Nakasuji, Mamoru; and Simizu, Hiroyasu, to Nikon Corporation. Charged particle beam transfer device exhibiting low aberration. 5,747,819, Cl. 250-492.230.
Nakata, Masashi: *See—*
Harada, Yoshihiko; Nakata, Masashi; Oshiro, Akio; and Murakami, Seiichi, 5,747,901, Cl. 310-71.000.
Nakatani, Koichiro, to Nihon Velbon Seiki Kogyo Kabushiki Kaisha. Tripod. 5,746,407, Cl. 248-178.100.
Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Image data processor for processing pixel data in block buffer. 5,748,202, Cl. 345-514.000.
Nakayama, Haruki; Honda, Yuichi; and Imaizumi, Toshio, to Konica Corporation. Zoom lens barrel including a mechanism for moving lens groups. 5,748,386, Cl. 359-694.000.
Nakayama, Jun: *See—*
Gerardy-Schahn, Rita; Fukuda, Minoru; Nakayama, Jun; and Eckhardt, Matthias, 5,747,326, Cl. 435-240.200.
Nakayama, Okihiko: *See—*
Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
Nakayama, Toshimasa: *See—*
Sato, Mitsuru; Kobayashi, Masakazu; and Nakayama, Toshimasa, 5,747,224, Cl. 430-331.000.
Nakayama, Yasuhiko; Shiba, Masataka; and Komoriya, Susumu, to Hitachi, Ltd. Controlling method of forming thin film, system for said controlling method, exposure method and system for said exposure method. 5,747,201, Cl. 430-30.000.
Nakayama, Yoshihiro: *See—*
Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.
Nakayama, Yoshiyuki: *See—*
Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.
Nakazawa, Yusuke: *See—*
Kato, Eiichi; Nakazawa, Yusuke; and Osawa, Sadao, 5,747,214, Cl. 430-126.000.
Nalco/Exxon Energy Chemicals, L.P.: *See—*
Cooper, Fredrick L.; Kibala, Piotr A.; and Weismiller, Michael C., 5,746,924, Cl. 210-698.000.
Nally, Robert Marshall; Nelsen, Pete Edward; Hamilton, Douglas; and Berk, Douglas Michael, to Cirrus Logic, Inc. Requesting device capable of canceling its memory access requests upon detecting other specific requesting devices simultaneously asserting access requests. 5,748,968, Cl. 395-728.000.
Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, to Nippon Shokubai., Ltd. Production process for making high molecular weight polydioxolane. 5,747,602, Cl. 525-398.000.
Namco Ltd.: *See—*
Takeda, Masaki; and Kato, Komei, 5,748,198, Cl. 345-441.000.
Namikawa, Mamoru; Yoshimura, Satoshi; and Honda, Kenichi, to Futaba Denshi Kogyo K.K. Display device. 5,747,927, Cl. 313-495.000.
Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, to Pola Chemical Industries, Inc. Dopamine re-uptake inhibitor. 5,747,493, Cl. 514-255.000.
Nanba, Katsuhiro: *See—*
Izawa, Makoto; and Nanba, Katsuhiro, 5,747,952, Cl. 318-135.000.
Nanba, Norihiro: *See—*
Suzuki, Masao; Matoba, Kazuyuki; and Nanba, Norihiro, 5,748,339, Cl. 358-473.000.
Nanba, Shigeru: *See—*
Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
Nanbu, Tomoko: *See—*
Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.
Nanjo, Ken: *See—*
Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, 5,749,053, Cl. 455-524.000.
NanoSystems, L.L.C.: *See—*
Wiedmann, Timothy S.; Wood, Ray W.; and DeCastro, Lan, 5,747,001, Cl. 424-45.000.
Naoi, Masaki: *See—*
Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.
Narabu, Shin-ichi: *See—*
Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.
Naraghi, Ali. Method for reducing odorant depletion. 5,746,973, Cl. 422-41.000.
Narasimham, Dave: *See—*
Golecki, Ilan; and Narasimham, Dave, 5,747,096, Cl. 427-8.000.

Narayan, Rammohan; and Tran, Thang M., to Advanced Micro Devices, Inc. Byte queue divided into multiple subqueues for optimizing instruction selection logic. 5,748,978, Cl. 395-800.230.
Narikiyo, Kazuaki: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
Narisawa, Tsutomu, to Nikon Corporation. Camera having voice-input device for changing focus detection. 5,749,000, Cl. 396-121.000.
Narita, Junji: *See—*
Yokoyama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.
Narita, Masahisa: *See—*
Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.
Narita, Midori: *See—*
Tanaka, Hiroki; Mizutani, Hiroyuki; Narita, Midori; and Takada, Koichi, 5,746,847, Cl. 148-692.000.
Narukawa, Satoshi; Amazutsumi, Toru; Fukuda, Hideki; and Tamaki, Hiyoshi, to Sanyo Electric Co., Ltd. Method of manufacturing a battery containing a non-circular spiral electrode unit. 5,746,780, Cl. 29-623.100.
Naruse, Yasuhito: *See—*
Watanabe, Takuo; Naruse, Yasuhito; and Yamasue, Kotaro, 5,747,216, Cl. 430-156.000.
Nashida, Yasumasa: *See—*
Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.
Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, to Matsushita Seiko Co., Ltd.; and Mitsui Norin Co., Ltd. Antiviral filter air cleaner impregnated with tea extract. 5,747,053, Cl. 424-405.000.
Nason Company, The: *See—*
Little, Arthur J., 5,746,179, Cl. 123-401.000.
Natarajan, Govindarajan; and Pasco, Robert William, to International Business Machines Corporation. Apparatus and method for forming cavity substrates using flexible preform insert. 5,746,874, Cl. 156-285.000.
Natarajan, Kadathur S.; Jan, Yih G.; and Peterson, Kenneth M., to Motorola, Inc. Centralized dynamic channel assignment controller and methods. 5,749,044, Cl. 455-13.100.
Nation, George W.: *See—*
Hoover, Russell D.; Nation, George W.; and Valk, Kenneth M., 5,749,087, Cl. 711-108.000.
National Instruments Corporation: *See—*
Conway, Craig M.; and Odom, Brian Keith, 5,748,916, Cl. 395-287.000.
National Machinery Company, The: *See—*
Wurm, Martin J.; and Wasserman, Stanley J., 5,746,087, Cl. 72-456.000.
National Research Council of Canada: *See—*
Davidson, Isobel J.; McMillan, Roderick S.; and Murray, John J., 5,747,194, Cl. 429-224.000.
National Research Institute for Metals: *See—*
Chikyou, Toyohiro; and Koguchi, Nobuyuki, 5,748,360, Cl. 359-298.000.
National Science Council: *See—*
Chuang, Tung-Han; Lin, Ching-Bin; Tsai, Teng-Chun; and Chang, Jiin-Chyuan, 5,746,956, Cl. 264-104.000.
National Semiconductor Corporation: *See—*
Asanasavest, Chainarong, 5,747,779, Cl. 219-603.000.
Bashir, Rashid; and Kabir, Abul E., 5,747,353, Cl. 437-21.000.
Patchen, Paul J.; Fung, Hon C.; Leung, Fred; and McGinness, Steven, 5,748,981, Cl. 395-828.000.
Thomas, Michael E.; and Saadat, Irfan, 5,748,523, Cl. 365-171.000.
Natori, Masataka; Kumaoka, Shunichi; and Ueda, Shiro, to Hitachi, Ltd. Common gate line layout method for liquid crystal display device with gate scanning driver circuit on a display substrate. 5,748,267, Cl. 349-40.000.
Natori, Masataka: *See—*
Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.
Natori, Naotake: *See—*
Nishimura, Kazuo; and Natori, Naotake, 5,748,769, Cl. 382-159.000.
Naujokas, Andrius Algimantas; and Gamble, William James, to Eastman Kodak Company. Recovery of components from polyester resins. 5,747,547, Cl. 521-48.500.
Navé, Samuel D., to Siecor Corporation. Single-tube plenum ribbon cable. 5,748,823, Cl. 385-113.000.
Naves, Neil H.: *See—*
Benderev, Theodore V.; Naves, Neil H., and Legome, Mark J., 5,746,763, Cl. 606-193.000.
Naya, Rokurou: *See—*
Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.
Nazarifar, Nader: *See—*
Jung, Christopher C.; and Nazarifar, Nader, 5,747,824, Cl. 250-577.000.
NCR Corporation: *See—*
Flood, Dennis, 5,746,140, Cl. 109-50.000.
Hu, Yih-Shiuan; and Anand, Tejwansh S., 5,748,188, Cl. 345-326.000.
Miller, Thomas C., Jr.; and Obringer, Thomas J., 5,747,155, Cl. 428-327.000.
Moreland, Richard B., 5,746,522, Cl. 400-197.000.
Talvalkar, Shashi G.; and McCreight, Marion E., 5,747,176, Cl. 428-484.000.
Walter, Joanne S.; and Flynn, Tracy L., 5,747,784, Cl. 235-383.000.
Neathway, Graham; and Kiss, Bill, to Ridgeway Research Corporation. Switch with current flow detector. 5,748,094, Cl. 340-660.000.
Nebashi, Mitsuhiko; Murakoshi, Keiji; Iwaya, Satoshi; and Goto, Akihiro, to Seiko Epson Corporation. Printing apparatus provided with an auto cutter. 5,746,527, Cl. 400-621.000.
NEC Corporation: *See—*
Fujiwara, Shirou, 5,748,771, Cl. 382-168.000.
Hashimoto, Akira, 5,748,625, Cl. 370-353.000.
Hijii, Kazuyoshi, 5,748,886, Cl. 395-185.020.
Hirose, Takashi, 5,746,526, Cl. 400-619.000.
Hokari, Yasuaki, 5,748,448, Cl. 361-749.000.
Honda, Masahiko; and Miyao, Yasuhiro, 5,748,632, Cl. 370-399.000.
Iijima, Sumio, 5,747,161, Cl. 428-367.000.
Ishido, Kiminori; and Yamaguchi, Masahiro, 5,746,813, Cl. 106-14.160.
Ishikawa, Toru, 5,748,018, Cl. 327-154.000.
Isozaki, Hiroko, 5,748,965, Cl. 395-705.000.
Ito, Natsuko; and Okada, Hiroyuki, 5,747,991, Cl. 324-661.000.
Kimura, Katsuji, 5,748,041, Cl. 330-254.000.
Kitamura, Mamoru, 5,748,553, Cl. 365-230.030.
Koizumi, Hirotaka, 5,746,524, Cl. 400-306.000.
Komoda, Motoyoshi, 5,748,570, Cl. 368-202.000.
Kondo, Takayuki, 5,748,624, Cl. 370-347.000.
Konuma, Kazuo, 5,748,232, Cl. 348-219.000.
Kubo, Masato, 5,748,725, Cl. 379-387.000.
Kurosawa, Susumu, 5,748,016, Cl. 327-108.000.
Maeda, Katsumi; Iwasa, Shigeyuki; Nakano, Kaichiro; and Hasegawa, Etsuo, 5,747,622, Cl. 528-12.000.
Maezawa, Etsuo, 5,748,584, Cl. 369-44.290.
Matsui, Tsutomu, 5,748,580, Cl. 369-44.160.
Nakashiba, Yasutaka, 5,747,788, Cl. 250-208.100.
Ogawa, Masatsugu, 5,748,572, Cl. 369-13.000.
Sanpei, Tatsuya, 5,748,793, Cl. 382-251.000.
Serizawa, Masahiro, 5,748,839, Cl. 395-2.310.
Sugawara, Michinori, 5,748,540, Cl. 365-189.050.
Sugimoto, Mitsuhiro; Kondo, Yuji; Zama, Koichi; and Sato, Yuko, 5,747,916, Cl. 310-348.000.
Sugiyama, Mitsuhiro; and Tashiro, Tsutomu, 5,747,860, Cl. 257-432.000.
Takahashi, Jun-Ichi, 5,748,601, Cl. 369-112.000.
Tomita, Hideho; Ooki, Masahiro; and Furuya, Yukitsuna, 5,748,668, Cl. 375-200.000.
Torii, Kouji, 5,747,385, Cl. 438-690.000.
Tsumura, Soichi, 5,748,129, Cl. 341-155.000.
Ueda, Hiroaki, 5,748,898, Cl. 395-200.490.
Unno, Yoshihiro, 5,748,726, Cl. 379-410.000.
Utsugi, Koji, 5,747,930, Cl. 313-504.000.
Yoshida, Kousuke, 5,747,354, Cl. 437-40.000.
NEC Electronics, Inc.: *See—*
Hager, Arthur L., III; Marchant, Brian E.; Chuang, Shouping; and Kim, Ki Duk, 5,748,470, Cl. 364-187.000.
NEC USA, Inc.: *See—*
Ashar, Pranav; and Cheong, Chao, 5,748,486, Cl. 364-488.000.
Bhattacharya, Subhrajit; and Dey, Sujit, 5,748,647, Cl. 371-22.310.
Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO: *See—*
Bos, Willem Jan Wubbo; and Wesseling, Karel Hendrik, 5,746,698, Cl. 600-493.000.
Negeri, Tesfaye, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources. Frothless flotation apparatus. 5,746,910, Cl. 209-168.000.
Negoro, Masayuki: *See—*
Okazaki, Masaki; Yokoyama, Shigeki; and Negoro, Masayuki, 5,747,121, Cl. 428-1.000.
Neijzen, Jacobus H. M.; De Vaan, Adrianus J. S. M.; and Stroomer, Martinus V. C., to U.S. Philips Corporation. Picture display device. 5,748,374, Cl. 359-621.000.
Neles Controls Oy: *See—*
Pyotsia, Jouni, 5,748,469, Cl. 364-150.000.
Nellcor Incorporated: *See—*
Mannheimer, Paul D., 5,746,206, Cl. 125-633.000.
Nellcor Puritan-Bennett: *See—*
Kidd, Lisa A., 5,746,201, Cl. 128-206.240.
Nellcor Puritan Bennett Incorporated: *See—*
Aylsworth, Alonzo C.; Adriance, Kyle; and Miller, Gregory R., 5,746,806, Cl. 95-8.000.
Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Nootbaar, Michael W., 5,746,697, Cl. 600-323.000.
Nelsen, Pete Edward: *See—*
Nally, Robert Marshall; Nelsen, Pete Edward; Hamilton, Douglas; and Berk, Douglas Michael, 5,748,968, Cl. 395-728.000.
Nelson, Brad H.: *See—*
Greenberg, Philip D.; and Nelson, Brad H., 5,747,292, Cl. 435-69.700.
Nelson, Edward Dennis, to Lucent Technologies, Inc. Protective wrapping for spliced cable connectors. 5,747,742, Cl. 174-84.00R.
Nelson, L. R.: *See—*
McGivern, Patrick T.; King, Bradley S.; and Graham, Steven, 5,748,466, Cl. 364-146.000.
Nelson, Ronald J.: *See—*

  - Lebby, Michael S.; and Nelson, Ronald J., 5,748,161, Cl. 345-84.000.
- Nelson, Steven K.: *See—*
  - Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., 5,748,986, Cl. 395-763.000.
- Nemetz, Friedrich, to Wacker Siltronic Gesellschaft für Halbeitermaterialien AG. Method and apparatus for producing a single crystal. 5,746,824, Cl. 117-13.000.
- Nemoto, Hiroshi: *See—*
  - Kubo, Akio; and Nemoto, Hiroshi, 5,748,502, Cl. 364-560.000.
- Nestec, Ltd.: *See—*
  - Rowe, W. Bruce; Mark, David A.; and Madsen, David C., 5,747,459, Cl. 514-18.000.
- Nestec S.A.: *See—*
  - Huynh-Ba, Tuong; Jaeger, Daniel; and Matthey-Doret, Walter, 5,747,302, Cl. 435-117.000.
- Network Computing Devices: *See—*
  - Martin, Kevin, 5,748,864, Cl. 395-122.000.
- Neubach, Werner, to Bayer Aktiengesellschaft. Backed nonwovens prepared from synthetic fibers. 5,747,391, Cl. 442-70.000.
- Neugebauer, Charles F., to Arithmos, Inc. Channel coupled feedback circuits. 5,748,035, Cl. 327-562.000.
- Neuman, Eli, to Tedea-Huntleigh Intl. Ltd. Weighting device for bedridden patients. 5,747,745, Cl. 177-132.000.
- New England Photoconductor Corp.: *See—*
  - Youngquist, Robert C., 5,747,805, Cl. 250-338.400.
- New Mexico State University Technology Transfer Corporation: *See—*
  - Johnson, Michael D., 5,746,994, Cl. 423-594.000.
- New Oji Paper Co., Ltd.: *See—*
  - Hashiba, Hidetoshi; Aoyagi, Shoji; Fujii, Hitoshi; and Kojo, Kiyoshi, 5,747,156, Cl. 428-328.000.
- New York Medical College: *See—*
  - Darzynkiewicz, Zbigniew D.; Li, Xun; Traganos, Frank N.; and Melamed, Myron R., 5,747,258, Cl. 435-6.000.
- Newgard, Christopher B., to Board of Regents, The University of Texas System. Devices comprising genetically engineered βcells. 5,747,325, Cl. 435-240.200.
- Newman, Terron C.: *See—*
  - Lundell, Louis J.; Oh, Sang Y.; and Newman, Terron C., 5,748,727, Cl. 379-446.000.
- Newman, William: *See—*
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
- Newton, Arnold C.: *See—*
  - Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., 5,746,391, Cl. 244-54.000.
- Neyer, James U., to Rayovac Corporation. Ratchet cam alternate action mechanism. 5,746,309, Cl. 200-528.000.
- Nezu, Hiroshi; and Nagata, Kenji, to RMO, Inc. Edgewise orthodontic bracket with tie wing relief for enhancing ligature removal. 5,746,592, Cl. 433-8.000.
- Nezu, Masahiro: *See—*
  - Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.
- Ng, Timothy C., to International Business Machines Corporation. Apparatus for slave DMA emulation on a computer system bus. 5,748,944, Cl. 395-500.000.
- Ng, Timothy C., to International Business Machiens Corporation. Method for slave DMA emulation on a computer system bus. 5,748,945, Cl. 395-500.000.
- Ng, Yong-Gee; and Greason, Jeff, to Intel Corporation. Method and appararus for providing high voltage with a low voltage CMOS integrated circuit. 5,748,025, Cl. 327-333.000.
- Ngan, Kenny King-Tai: *See—*
  - Marohl, Dan A.; and Ngan, Kenny King-Tai, 5,746,460, Cl. 294-1.100.
- NGK Insulators, Ltd.: *See—*
  - Hirota, Toshikazu; Shibata, Kazuyoshi; and Takeuchi, Yukihisa, 5,747,671, Cl. 73-61.750.
  - Takahashi, Tomonori, 5,746,985, Cl. 422-173.000.
- Nguyen, Duy T.; and Ling, Tien-Feng, to BetzDearborn Inc. Methods for inhibiting organic contaminant deposition in pulp and papermaking systems. 5,746,888, Cl. 162-199.000.
- Nguyen, My-Hanh: *See—*
  - Feightner, Rick; and Nguyen, My-Hanh, 5,748,446, Cl. 361-709.000.
- Nguyen, Susan: *See—*
  - Wong, Jack T.; Fontana, Fabiano; and Nguyen, Susan, 5,748,525, Cl. 365-185.050.
- Nguyen, Tuoc Tan: *See—*
  - Bacich, Steven R.; Nguyen, Tuoc Tan; and Greelis, John Patrick, 5,746,692, Cl. 600-104.000.
- Ni, Fudi, executor: *See—*
  - Hong, Guo Fan; Zhai, Feng, deceased, 5,747,298, Cl. 435-91.100.
- Niagara Mohawk Power Corporation: *See—*
  - Johnson, William T.; and Hare, Daniel J., 5,747,697, Cl. 73-760.000.
- Niagro, Frank D.: *See—*
  - Ritchie, Branson W.; Niagro, Frank D.; and Latimer, Kenneth S., 5,747,045, Cl. 424-204.100.
- Nichia Chemical Industries, Ltd.: *See—*
  - Nakamura, Shuji; Mukai, Takashi; and Iwasa, Naruhito, 5,747,832, Cl 257-103.000.
- Nichiryo Co., Ltd.: *See—*
  - Oshikubo, Yuuji, 5,747,709, Cl. 73-864.180.
- Nicholas, David A., to United States Surgical Corporation. Surgical biopsy forceps apparatus. 5,746,740, Cl. 606-52.000.
- Nichols, Jerry R.; Siddoway, Craig F; Habbaba, Faris S.; and Garcia, Jorge L., to Motorola, Inc. Battery clip assembly for a communication device. 5,748,454, Cl. 361-814.000.
- Nichols, Lorna: *See—*
  - Bloom, Stuart J.; and Nichols, Lorna, 5,746,639, Cl. 446-98.000.
- Nichols, Rosemarie; and Weisman, Martin J., to Lip-Ink International. Lip cosmetic. 5,747,017, Cl. 424-61.000.
- Nicol, Mark D.: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; and O'Brien, Terence Paul, 5,748,922, Cl. 395-309.000.
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
- Nicola, Nicos Antony: *See—*
  - Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, 5,747,032, Cl. 424-133.100.
- Nicolaci, John F. Camera stabilizing mechanism. 5,749,011, Cl. 396-421.000.
- Nicoli, Robert: *See—*
  - Woods, Randall T.; and Nicoli, Robert, 5,747,733, Cl. 174-48.000.
- Nicoll, James Alan Ramsey: *See—*
  - Roberts, Gareth Wyn; Graham, David Ian; and Nicoll, James Alan Ramsey, 5,747,260, Cl. 435-6.000.
- Nie, Li: *See—*
  - Bassi, Sukh; Maningat, Clodualdo C.; Chinnaswamy, Rangaswamy; and Nie, Li, 5,747,648, Cl. 530-374.000.
- Niedballa, Ulrich: *See—*
  - Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.
- Nielsen, Georgene: *See—*
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Nielsen, Steven James; Rentmeester, Tammy Jo; Krueger, Allan James; and Weyenberg, Jeffrey Michael, to Kimberly-Clark Worldwide, Inc. Tampon applicator having a semi-spherically shaped pleated tip. 5,746,710, Cl. 609-14.000.
- Nielsen, Tage: *See—*
  - Thünker, Walter; Lohmann, Gabriele; Marschewski, Armim; Nielsen, Tage; and Lützen, Christian, 5,746,784, Cl. 44-361.000.
- Niemann, Ekkehard: *See—*
  - Loose, Werner; Korec, Jacek; Niemann, Ekkehard; and Boos, Alfred, 5,747,831, Cl. 257-77.000.
- Nierga, Jean-Luc: *See—*
  - Raymond, Jean-Louis; Nierga, Jean-Luc; and Planas, Pedro, 5,747,083, Cl. 426-117.000.
- Niewold, D. Wayne, to Hydra Fold Auger, Inc. Auger control. 5,746,303, Cl. 198-660.000.
- NIFCO Inc.: *See—*
  - Takahashi, Norio; and Ojima, Yukio, 5,746,338, Cl. 215-237.000.
- Night Technologies International: *See—*
  - Maag, Clifford; and Parker, Lance, 5,748,754, Cl. 381-104.000.
- Nihon Bayer Agrochem K.K.: *See—*
  - Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.
- Nihon Inter Electronics Corporation: *See—*
  - Mori, Masatomo; Nezu, Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.
- Nihon Kohden Corporation: *See—*
  - Tsuchiya, Katsuhiro; Nagai, Yutaka; and Ikeda, Mami, 5,747,343, Cl. 436-63.000.
- Nihon Velbon Seiki Kogyo Kabushiki Kaisha: *See—*
  - Nakatani, Koichiro, 5,746,407, Cl. 248-178.100.
- Nii, Koji, to Mitsubishi Denki Kabushiki Kaisha. Latch circuit operating in synchronization with clock signals. 5,748,541, Cl. 365-189.050.
- Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, to Hamamatsu Photonics K.K. Photoemitter electron tube, and photodetector. 5,747,826, Cl. 257-10.000.
- Niimi, Shigeki, to Aisin Seiki Kabushiki Kaisha. Electromagnetic valve device and manufacturing method for the same. 5,746,412, Cl. 251-129.150.
- Niimura, Yasuhiro; Ikegami, Tetsuma; Hanafusa, Naoya; and Nakaniwa, Masaru, to Ebara Corporation. Trap for collecting solid. 5,746,790, Cl. 55-317.000.
- Niiyama, Manabu: *See—*
  - Takahashi, Yutaka; Niiyama, Manabu; and Goto, Yoshiki, 5,748,024, Cl. 327-333.000.
- Niknafs, Hassan, to Norton Chemical Process Products Corporation. Packing element. 5,747,143, Cl. 428-174.000.
- Nikolchev, Julian N.: *See—*
  - Ton, Dai T.; and Nikolchev, Julian N., 5,746,769, Cl. 606-206.000.
- Nikon Corporation: *See—*
  - Ezawa, Akira, 5,746,383, Cl. 242-332.700.
  - Goto, Tetsuro, 5,748,170, Cl. 345-101.000.
  - Inadome, Kiyotaka, 5,748,387, Cl. 359-699.000.

  - Iwasaki, Hiroyuki, 5,749,001, Cl. 396-150.000.
  - Iwasaki, Hiroyuki, 5,749,002, Cl. 396-161.000.
  - Kai, Tadao; Terui, Nobuhiko; and Tsukada, Shinichi, 5,748,994, Cl. 396-55.000.
  - Kawai, Hitohsi; Kawakami, Jun; and Tsukihara, Kouichi, 5,748,315, Cl. 356-349.000.
  - Kitagawa, Yoshihisa; and Hirano, Shinichi, 5,748,995, Cl. 396-55.000.
  - Nakasuji, Mamoru; and Simizu, Hiroyasu, 5,747,819, Cl. 250-492.230.
  - Narisawa, Tsutomu, 5,749,000, Cl. 396-121.000.
  - Ohtake, Motoyuki, 5,748,383, Cl. 359-683.000.
  - Shibazaki, Kiyoshige, 5,748,236, Cl. 348-270.000.
  - Shoda, Masahiro, 5,747,863, Cl. 257-440.000.
  - Tanaka, Etsuo; Okano, Hiroshi; and Katayama, Akira, 5,748,391, Cl. 359-813.000.
  - Tanaka, Shinichi; and Kimura, Isao, 5,748,593, Cl. 369-59.000.
  - Tsukahara, Daiki; and Inoue, Hideya, 5,748,992, Cl. 396-51.000.
  - Ueta, Souichi; and Hokoi, Hayato, 5,748,800, Cl. 382-266.000.
  - Yanari, Mitsuhiro, 5,748,380, Cl. 359-646.000.
  - Yasukawa, Seiichi, 5,749,004, Cl. 396-280.000.
- Niles Parts Co., Ltd.: *See—*
  - Uchiyama, Norio; and Hattori, Yoshio, 5,747,763, Cl. 200-61.540.
  - Yamamoto, Harushige, 5,747,934, Cl. 315-82.000.
- Nim, Danny C.: *See—*
  - So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, 5,747,853, Cl. 257-355.000.
- Nin, Sigfredo Isamael, to International Business Machines Corporation. Method and means for evaluating a tetrahedral linear interpolation function. 5,748,195, Cl. 345-431.000.
- Ninomiya, Hiroshi; and Hosokai, Tetsushi, to Mazda Motor Corporation. Automotive engine control system. 5,746,187, Cl. 123-520.000.
- Nippon Crucible Co., Ltd: *See—*
  - Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, 5,747,400, Cl. 501-94.000.
- Nippon Electric Glass Co., Ltd.: *See—*
  - Kosokabe, Hiroyuki; and Hashimoto, Koichi, 5,747,399, Cl. 501-67.000.
- Nippon Kayaku Kabushiki Kaisha: *See—*
  - Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.
- Nippon Oil Co., Ltd.: *See—*
  - Ishida, Noboru; Sasaki, Umekichi; Takigawa, Katsuya; and Suda, Satoshi, 5,746,933, Cl. 252-68.000.
  - Sasaki, Makoto; Ishii, Takafumi; and Haji, Katsuhiko, 5,746,934, Cl. 252-77.000.
- Nippon Paint Co., Ltd.: *See—*
  - Nishi, Tadahiko; Takagi, Takeshi; and Okude, Yoshitaka, 5,747,558, Cl. 523-201.000.
  - Yamamoto, Masahiro; Uenaka, Akimitsu; Ueno, Tasaburo; and Tsutsui, Koichi, 5,747,150, Cl. 428-220.000.
- Nippon Paper Industries Co., Ltd.: *See—*
  - Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, 5,745,971, Cl. 29-421.100.
- Nippon Paper Industries, Ltd.: *See—*
  - Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, 5,747,414, Cl. 503-207.000.
- Nippon Shokubai., Ltd.: *See—*
  - Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.
- Nippon Soken, Inc.: *See—*
  - Kuzuya, Yoshihumi; Saito, Kimitaka; and Shibata, Hitoshi, 5,746,189, Cl. 123-568.000.
- Nippon Steel Chemical Co., Ltd.: *See—*
  - Furukawa, Nobuyuki; Fujiyama, Takeshi; and Yuasa, Masatoshi, 5,747,625, Cl. 528-26.000.
  - Nozawa, Masayuki; Shichijo, Yasuji; and Fujita, Masanari, 5,747,593, Cl. 525-193.000.
- Nippon Steel Corporation: *See—*
  - Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.
  - Iwasa, Shoichi, 5,747,845, Cl. 257-306.000.
- Nippon Telegraph and Telephone Corporation: *See—*
  - Nagano, Ryuichiro; Nagase, Yoichi; and Tamura, Hajime, 5,748,826, Cl. 385-128.000.
  - Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,748,272, Cl. 349-86.000.
  - Tsuchikawa, Megumu; Sato, Atsushi; Tomono, Akira; and Ishii, Kenichiro, 5,748,775, Cl. 382-190.000.
- Nippon Yakin Kogyo Co., Ltd.: *See—*
  - Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, 5,745,971, Cl. 29-421.100.
- Nippondenso Co., Ltd.: *See—*
  - Baba, Hironobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.
  - Ichikawa, Hideki; and Saji, Ryohei, 5,745,977, Cl. 29-598.000.
  - Iida, Makio; Fujii, Tetsuo; and Isobe, Yoshihiko, 5,747,846, Cl. 257-314.000.
  - Kato, Akira; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,747,929, Cl. 313-503.000.
  - Kato, Miki; Tamano, Yukinori; Kobayashi, Katsumi; and Noba, Michiyuki, 5,747,743, Cl. 174-254.000.
  - Tomatsu, Yutaka; and Kataoka, Mitsuhiro, 5,747,851, Cl. 257-330.000.
  - Yamamoto, Norio; Fujikawa, Takayuki; Koide, Shunichi; and Suzuki, Yoshiichi, 5,747,122, Cl. 428-1.000.
  - Yoshino, Yoshimi; and Kato, Kenzi, 5,747,691, Cl. 73-504.160.
- Nishi, Noriaki: *See—*
  - Tamada, Hitoshi; Matsumoto, Shuichi; Nishi, Noriaki; and Saito, Kimihiro, 5,748,368, Cl. 359-486.000.
- Nishi, Tadahiko; Takagi, Takeshi; and Okude, Yoshitaka, to Nippon Paint Co., Ltd. Heat-curable, water-dispersible resin composition, production thereof, water-based paint composition, method of coating and coated article. 5,747,558, Cl. 523-201.000.
- Nishida, Hiroto: *See—*
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Nishida, Koji; Kurasawa, Yoshihiro; Takagi, Kiyoji; and Sano, Hironari, to Mitsubishi Chemical Corporation. Crystalline thermoplastic resin composition. 5,747,575, Cl. 524-443.000.
- Nishida, Satoshi; and Otani, Akihiro, to Mitsubishi Denki Kabushiki Kaisha. Laser oscillator with stabilized pointing. 5,748,662, Cl. 372-55.000.
- Nishigami, Akira; and Arai, Tsugio, to Yoshino Kogyosho Co., Ltd. Pump device for a container. 5,746,350, Cl. 222-95.000.
- Nishiguchi, Masayuki; and Matsumoto, Jun, to Sony Corporation. Speech encoding method, speech decoding method and speech encoding/decoding method. 5,749,065, Cl. 704-219.000.
- Nishihama, Nobumichi: *See—*
  - Ichikawa, Masaaki; Ono, Tomoyuki; Nishihama, Nobumichi; and Isoda, Masaaki, 5,746,615, Cl. 439-227.000.
- Nishihara, Takashi; Shiraishi, Shuji; Yamamoto, Osamu; and Yano, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Tire pressure-reduction determining system for wheels of a vehicle. 5,747,686, Cl. 73-146.200.
- Nishihara, Yoshio: *See—*
  - Kobayashi, Kenichi; Makida, Seigo; Nishihara, Yoshio; and Hiji, Naoki, 5,748,228, Cl. 348-63.000.
- Nishii, Kanji: *See—*
  - Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, 5,748,305, Cl. 356-237.000.
- Nishiki, Yoshinori: *See—*
  - Shimamune, Takayuki; Nakajima, Yasuo; Nishiki, Yoshinori; and Ashida, Takahiro, 5,746,896, Cl. 204-284.000.
- Nishimoto, Tomoyuki; Chaen, Hiroto; Sugimoto, Toshiyuki; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kaguku Kenkyujo. Trehalose and its production and use. 5,747,300, Cl. 435-101.000.
- Nishimura, Kazuo; and Natori, Naotake, to Kabushiki Kaisha Toshiba. Pattern recognition apparatus. 5,748,769, Cl. 382-159.000.
- Nishimura, Shouichirou, to Funai Electric Co., Ltd. Apparatus with a built-in teletext broadcasting decoder and teletext display adjustment apparatus. 5,748,251, Cl. 348-468.000.
- Nishimura, Takashi, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Apparatus for producing an object having an aspherical surface and method of operation thereof. 5,748,482, Cl. 364-474.060.
- Nishimura, Tetsuya: *See—*
  - Torimoto, Tadashi; Asano, Yasuhiro; Kohara, Tsunehiro; and Nishimura, Tetsuya, 5,747,177, Cl. 428-537.100.
- Nishino, Seiji: *See—*
  - Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, 5,748,599, Cl. 369-103.000.
- Nishio, Akitaka: *See—*
  - Naito, Takeshi; and Nishio, Akitaka, 5,746,487, Cl. 303-158.000.
- Nishio, Ayataka; and Ogura, Yasuhiro, to Sony Corporation. Recording medium, recording apparatus and reproducing apparatus. 5,748,594, Cl. 369-59.000.
- Nishio, Takashi; Koshio, Chiharu; Tsuchiya, Kunimoto; and Matsumoto, Tetsuya, to Pioneer Electronic Corporation. Display. 5,748,159, Cl. 345-76.000.
- Nishio, Terutsune: *See—*
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Nishiyama, Takaaki: *See—*
  - Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, 5,748,873, Cl. 395-182.090.
- Nishiyama, Takanori: *See—*
  - Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.
- Nishizawa, Atsushi: *See—*
  - Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.
- Nishizawa, Hiroyuki: *See—*
  - Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,748,353, Cl. 359-197.000.

- Nisley, Donald L.: *See—*
  - El-Ibiary, Yehia; Nisley, Donald L.; and Stroobandt, Jack D., 5,746,452, Cl. 384-446.000.
- Nissan Motor Co., Ltd.: *See—*
  - Abe, Hiroshi; and Matsuno, Osamu, 5,746,174, Cl. 123-306.000.
  - Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
  - Wakahara, Tatsuo; and Murakami, Kenichiro, 5,746,677, Cl. 477-35.000.
- Nisshin Steel Co., Ltd.: *See—*
  - Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.
- Nisshinbo Industries, Inc.: *See—*
  - Saito, Kazuo; and Ishimatsu, Takeshi, 5,746,951, Cl. 264-29.100.
- Nitayama, Akihiro: *See—*
  - Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.
- Nitinol Medical Technologies, Inc.: *See—*
  - Kleshinski, Stephen J.; Simon, Morris A.; and Rabkin, Dmitry, 5,746,765, Cl. 606-198.000.
- Nitsch, Wilhelm: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Nitto Denko Corporation: *See—*
  - Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.
  - Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.
- Nitto Kohki Co., Ltd.: *See—*
  - Fukuda, Kenji; and Asano, Osamu, 5,747,762, Cl. 200-61.45R.
- NKK Corporation: *See—*
  - Gotou, Hiroshi, 5,747,854, Cl. 257-368.000.
  - Gotou, Hiroshi; and Asakawa, Toshifumi, 5,748,530, Cl. 365-185.180.
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Noba, Michiyuki: *See—*
  - Kato, Miki; Tamano, Yukinori; Kobayashi, Katsumi; and Noba, Michiyuki, 5,747,743, Cl. 174-254.000.
- Noble, John O., III. Injection system for servicing fluids into or through an enclosed region. 5,746,259, Cl. 141-92.000.
- Nock, Nigel Gerard: *See—*
  - Watkins, David Robert; Nock, Nigel Gerard; and Jackson, Michael, 5,746,852, Cl. 152-454.000.
- Noda, Isao, to Procter & Gamble Company, The. Nonwoven materials comprising biodegradable copolymers. 5,747,584, Cl. 524-801.000.
- Noda, Kazumi: *See—*
  - Kawasaki, Kotaro; and Noda, Kazumi, 5,748,292, Cl. 355-75.000.
- Noda, Satoshi, to Olympus Optical Co., Ltd. Process for producing a gradient index optical element. 5,746,797, Cl. 65-17.200.
- Noda, Shinya: *See—*
  - Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, 5,749,027, Cl. 399-113.000.
- Noda, Sukehisa: *See—*
  - Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.
- Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., to Bristol-Myers Squibb Company; and Trustees of Dartmouth College. Anti-GP39 antibodies. 5,747,037, Cl. 424-154.100.
- Nogami, Kazutaka: *See—*
  - Takahashi, Makoto; and Nogami, Kazutaka, 5,748,011, Cl. 326-83.000.
- Noguchi, Hirofumi: *See—*
  - Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, 5,747,823, Cl. 250-559.440.
- Noguchi, Kouki: *See—*
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
- Nohr, Ronald Sinclair; and MacDonald, John Gavin, to Kimberly-Clark Worldwide, Inc. Method of generating a reactive species and polymerizing an unsaturated polymerizable material. 5,747,550, Cl. 522-34.000.
- Noise Cancellation Technologies, Inc.: *See—*
  - Miller, Scott; and Shipps, J. Clay, 5,748,749, Cl. 381-71.500.
- Nokia Telecommunications Oy: *See—*
  - Loder, John Andrew, 5,748,720, Cl. 379-144.000.
  - Särkkä, Veli-Matti, 5,748,060, Cl. 333-235.000.
- Nolan, Patrick: *See—*
  - Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.
- Nolet, Roch: *See—*
  - Jacques, Michel; and Nolet, Roch, 5,746,342, Cl. 220-6.000.
- Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens barrel having a rotating barrel and linear moving barrel. 5,748,388, Cl. 359-700.000.
- Nomura, Hiroshi: *See—*
  - Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.
- Nomura, Kenji: *See—*
  - Hirai, Junji; Hiraga, Yoshiji; and Nomura, Kenji, 5,747,894, Cl. 307-104.000.
- Nomura, Shunichi: *See—*
  - Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
- Nomura, Susumu: *See—*
  - Sugano, Manabu; Nomura, Susumu; Yanagawa, Naoharu; and Suzuki, Hiroshi, 5,748,600, Cl. 369-112.000.
- Nomura, Yasushi: *See—*
  - Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, 5,746,977, Cl. 422-62.000.
- Non-Stop Networks Limited: *See—*
  - Tims, Fred William; Clowes, Richard F.; Yager, Kevin C.; and Schroeder, David J., 5,748,870, Cl. 395-182.020.
- Nonaka, Tokio, to Tuda, Shigenobu. Apparatus for covering windshield of vehicles. 5,746,469, Cl. 296-97.700.
- Nonomura, Yutaka, to Brother Kogyo Kabushiki Kaisha. Facsimile system of distinctive ringing type capable of automatic facsimile reception even when received call signal calls telephone number for telephone reception. 5,748,712, Cl. 379-93.000.
- Noone, Michael S., to Medtronic, Inc. Guidewire with non-tapered tip. 5,746,701, Cl. 600-585.000.
- Nootbaar, Michael W.: *See—*
  - Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Nootbaar, Michael W., 5,746,697, Cl. 600-323.000.
- Norand Corporation: *See—*
  - Beard, Paul, 5,747,938, Cl. 315-169.300.
  - Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.
  - Mahany, Ronald L., 5,748,676, Cl. 375-260.000.
- Nordberg, Henry T., to Tirecore Limited Partnership. Concrete block containing disposable tire sections. 5,746,037, Cl. 52-405.100.
- Nordgren, Gregory N.; and Kelly, Thomas L., to Evi Corporation. Intra-artery obstruction clearing apparatus and methods. 5,746,758, Cl. 606-159.000.
- Nordquist, Robert E.; Chen, Wei R.; Carubelli, Raoul; and Adams, Robert, to Wound Healing of Oklahoma. Chitosan-derived biomaterials. 5,747,475, Cl. 514-55.000.
- Nordson Corporation: *See—*
  - Matsunaga, Masafumi, 5,747,106, Cl. 427-201.000.
  - Smith, James C.; Hogan, Patrick T.; and Saidman, Laurence B., 5,747,102, Cl. 427-96.000.
- Norhtfield Laboratories, Inc.: *See—*
  - Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.
- Noritsu Koki Co., Ltd.: *See—*
  - Akira, Toshiro, 5,748,285, Cl. 355-39.000.
  - Nakao, Hiroto, 5,748,290, Cl. 355-75.000.
- Norman, Richard S. Direct replacement cell fault tolerant architecture. 5,748,872, Cl. 395-182.090.
- Norris, Duane Edward: *See—*
  - Clark, Michael William; Hearney, James Alfred; Norris, Duane Edward; and Benson, Paul Harrison, IV, 5,748,972, Cl. 395-750.050.
- Norris, George B.; Staudinger, Joseph; and Sadowniczak, Gary W., to Motorola, Inc. Method for altering a difference frequency signal and amplifier circuit thereof. 5,748,042, Cl. 330-277.000.
- Norsworthy, John Paul: *See—*
  - Prakash, Jaideep; Norsworthy, John Paul; and Doyle, Bruce Andrew, 5,748,127, Cl. 341-144.000.
- North American Vaccine, Inc.: *See—*
  - Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.
- North Carolina State University: *See—*
  - Cox, Robert N.; Clapp, Timothy G.; and Titus, Kimberly J., 5,746,145, Cl. 112-278.000.
- North, Michael John; Hall, Christopher; Cyster, Thomas Mark; and Chen, Chris C., to General Resources Corporation. Heat sink and circuit enclosure for high power electronic circuits. 5,748,445, Cl. 361-697.000.
- Northern Telecom Limited: *See—*
  - Johnson, Harold Joseph; Gu, Yuan Xiang; Chan, Becky Laiping; and Chow, Stanley Taihai, 5,748,741, Cl. 380-28.000.
- Northrop Grumman Corporation: *See—*
  - Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased; and Hopkins, Richard H., 5,746,827, Cl. 117-100.000.
  - Guthrie, Warren E.; and Garbe, Gary S., 5,748,047, Cl. 331-19.000.
  - McKinzie, William Edward, III; and Anderson, Tracy Lynn, 5,748,153, Cl. 343-767.000.
  - Orlando, Harold J.; Pappas, Michael L.; and Lopez, Marco A., 5,748,230, Cl. 348-187.000.

  - Rademacher, Paul E., 5,748,142, Cl. 342-159.000.
  - Rondeau, Charles J., 5,746,329, Cl. 211-123.000.
  - Smeenge, Robert E.; Pierce, George F.; and Cicero, Samuel J., 5,748,064, Cl. 336-83.000.
  - Talisa, Salvador H.; Janocko, Michael A.; Partlow, Deborah P.; and Pikto, Andrew J., 5,747,873, Cl. 257-661.000.
  - Young, Robert M.; Freidhoff, Carl B.; Braggins, Timothy T.; and Congedo, Thomas V., 5,747,815, Cl. 250-423.00R.
- Norton, Adam E.; Mallory, Chester L.; Pham, Hung V.; and Rasmussen, Paul, to KLA-Tencop. Corporation. Broadband microspectro-reflectometer. 5,747,813, Cl. 250-372.000.
- Norton Chemical Process Products Corporation: *See—*
  - Niknafs, Hassan, 5,747,143, Cl. 428-174.000.
- Norton, Eric: *See—*
  - Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, 5,748,124, Cl. 341-120.000.
- Norton, Paul R.: *See—*
  - Williams, Ronald L.; and Norton, Paul R., 5,747,804, Cl. 250-338.100.
- Noser, Martin: *See—*
  - Mark, Fritz; and Noser, Martin, 5,746,510, Cl. 366-217.000.
- Notenboom, Leo A.; Mejia, Benjamin A.; and Smith, Curtis D., to Microsoft Corporation. Prioritized co-processor resource manager and method. 5,748,468, Cl. 364-132.000.
- Notheis, Michael S.; and Kuchel, Bernhard W., to Simmons Company. Apparatus for mattress innerspring construction. 5,746,877, Cl. 156-356.000.
- Novak, Bruce M.; and Nakano, Mitsuru. Allene/alkyne copolymers. 5,747,618, Cl. 526-285.000.
- Novak, Miloslav; Trageser, Andrew B.; Summe, Isabel M.; and Kane, Susan L., to Aluminum Company of America. Load bearing automotive bench seat assembly. 5,746,476, Cl. 297-216.130.
- Novartis AG: *See—*
  - Naef, Reto, 5,747,506, Cl. 514-307.000.
- Novitsky, Thomas J.: *See—*
  - Wainwright, Norman R.; and Novitsky, Thomas J., 5,747,455, Cl. 514-12.000.
- Novo Nordisk A/J: *See—*
  - Jørgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.
- Novo Nordisk A/S: *See—*
  - Korsgaard, Niels; Piggott, James Robertson; Labroo, Virender Mohan; and Bain, Steven, 5,747,059, Cl. 424-451.000.
- Novoste Corporation: *See—*
  - Weldon, Thomas D.; Larsen, Charles E.; and Rosen, Jonathan J., 5,746,414, Cl. 251-149.600.
- Nowakowski, Edmund C.: *See—*
  - Ehrlich, Kenneth P.; Kutz, David; and Nowakowski, Edmund C., 5,746,399, Cl. 246-122.00R.
- Nozaki, Takashi: *See—*
  - Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, 5,746,676, Cl. 476-50.000.
- Nozawa, Masayuki; Shichijo, Yasuji; and Fujita, Masanari, to Nippon Steel Chemical Co., Ltd. Process for producing rubber-modified styrene resin. 5,747,593, Cl. 525-193.000.
- Nozawa, Osamu: *See—*
  - Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.
- Nozawa, Tohru: *See—*
  - Hassner, Martin; Koyama, Seiji; Nozawa, Tohru; Terukina, Asao; and Tetsuya, Tamura, 5,748,023, Cl. 327-336.000.
- Nozomi, Mamoru; Murakami, Osamu; Fuse, Masahiro; and Furuune, Makoto, to Mitsubishi Chemical Corporation. Electrophotographic photoreceptor having charge generating layer with specific polyester. 5,747,203, Cl. 430-58.000.
- NTEC Solutions, Inc.: *See—*
  - Smith, Paul K.; and Bergemann, Eugene P., 5,746,922, Cl. 210-670.000.
- NTN Corporation: *See—*
  - Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, 5,746,676, Cl. 476-50.000.
- NTT Mobile Communications Network, Inc.: *See—*
  - Sawahashi, Mamoru; and Adachi, Fumiyuki, 5,748,623, Cl. 370-342.000.
- Nu-Metrics, Inc.: *See—*
  - Sampey, Harry R.; Geary, Jeffrey A.; and Schimpf, James H., 5,748,108, Cl. 340-933.000.
- Nukui, Makoto: *See—*
  - Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, 5,747,787, Cl. 235-472.000.
- Nulman, Jaim, to Applied Materials, Inc. Method of metalizing a semiconductor wafer. 5,747,360, Cl. 437-189.000.
- Numako, Norio: *See—*
  - Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.
- Numazawa, Makoto: *See—*
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Nunn, Stephen A.: *See—*
  - Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., 5,748,418, Cl. 360-128.000.
- Nussbaum, Paul A., to Ericsson Messaging Systems Inc. Method and apparatus for developing a neural network for phoneme recognition. 5,749,066, Cl. 704-232.000.
- Nutt, Alan C. G.: *See—*
  - Gupta, Mool C.; Nutt, Alan C. G.; and Gopalan, Venkatraman, 5,748,361, Cl. 359-332.000.
- Nutting, Philip C.: *See—*
  - Gunnoe, Lowell G.; Kawada, Hideo; and Nutting, Philip C., 5,746,394, Cl. 244-111.000.
- Nyberg, Eric H., III: *See—*
  - Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl. 345-133.000.
- Nygren, William D., Jr.; and Isaar, Arwen G., to Lockheed Martin Corporation. Locking apparatus for fastening system. 5,746,558, Cl. 411-110.000.
- Nygren, William D., Jr.; and Isaac, Arwen G., to Lockheed Martin Corporation. Alignment tolerant fastening system. 5,746,561, Cl. 411-368.000.
- Nyrönen, Timo Martti Tapio: *See—*
  - Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.
- Nystrom, Robert G., to Metaltite Corporation. Truss fastener and truss assembly. 5,746,039, Cl. 52-639.000.
- O & P Company, Inc.: *See—*
  - Orensten, Henry E., 5,746,514, Cl. 383-66.000.
- Oates, Ronald Wayne: *See—*
  - Peck, Walter Richard; and Oates, Ronald Wayne, 5,746,395, Cl. 244-121.000.
- O'Bear, Raymond E.; Colin, Bruno; Tegeler, G. R.; and Staples, John L., to bioMérieux Vitek, Inc. Test sample card with improved air bubble evacuation. 5,746,980, Cl. 422-102.000.
- Oberhokamp, Dirk: *See—*
  - Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, 5,746,619, Cl. 439-352.000.
- Obermaier, Anton, to Gebruder Obermaier oHG. Sitting device. 5,746,481, Cl. 297-452.410.
- Obie, Paul: *See—*
  - Ayotte, Leo; and Obie, Paul, 5,746,240, Cl. 137-59.000.
- O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, to Advancement of Military Medicine, Henry M. Jackson Foundation for the. Detection of shiga-like toxins of enterohemoragic *Escherichia coli* . 5,747,272, Cl. 435-7.370.
- O'Brien, Stephen Caine: *See—*
  - Rees, Andrew John; O'Brien, Stephen Caine; and Krystad, Peter D., 5,748,878, Cl. 395-183.140.
- O'Brien, Terence Paul: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; and O'Brien, Terence Paul, 5,748,922, Cl. 395-309.000.
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
- Obringer, Thomas J.: *See—*
  - Miller, Thomas C., Jr.; and Obringer, Thomas J., 5,747,155, Cl. 428-327.000.
- OCD S.A.: *See—*
  - Duperrier, Marc, 5,748,205, Cl. 347-29.000.
- OCE-Nederland, B.V.: *See—*
  - Leermakers, Johannes M.H.P.L.; Van Os, Albertus M.B.M.; and Slaats, Cornelis H.J., 5,746,327, Cl. 211-50.000.
  - Rutten, Hendrik Gerard Jozef; Berkers, Jacobus Arnoldus Peter; and Vegter, Gert, 5,746,424, Cl. 270-37.000.
- Ochiai, Masashi, to Kabushiki Kaisha Toshiba. AC/DC converter power supply circuit having multiple rectifiers. 5,748,458, Cl. 363-17.000.
- Ochiai, Ryoichi: *See—*
  - Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, 5,748,822, Cl. 385-90.000.
- Ochs, Peter. Basketball retrieval apparatus and shooting system. 5,746,668, Cl. 473-433.000.
- Oda, Ayumu; and Horiuchi, Toshihiro, to Sharp Kabushiki Kaisha. Document-exposing and -scanning apparatus. 5,749,025, Cl. 399-92.000.
- Oda, Takashi: *See—*
  - Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.
- Odom, Brian Keith: *See—*
  - Conway, Craig M.; and Odom, Brian Keith, 5,748,916, Cl. 395-287.000.
- Oenoki, Hitoshi: *See—*
  - Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, 5,747,429, Cl. 508-208.000.
- Oettinger, Andreas: *See—*
  - Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.
- Ogawa, Hiroshi; Sugita, Seiichi; and Sato, Toshio, to Juki Corporation. Article combining device. 5,746,568, Cl. 414-789.600.
- Ogawa, Katsuhisa: *See—*

/OL 2 10 ISS 1 MY 5 998 JMI

Ishizaki, Akira; and Ogawa, Katsuhisa, 5,748,171, Cl. 345-101.000.

Ogawa, Kazufumi: *See—*

Mino, Norihisa; and Ogawa, Kazufumi, 5,747,158, Cl. 428-333.000.

Ogawa, Masatsugu, to NEC Corporation. Magneto-optical recording apparatus with an optical element providing a high C/N ratio. 5,748,572, Cl. 369-13.000.

Ogawa, Takashi; and Tsukasa, Toshiya, to Ricoh Co., Ltd. Braille printing apparatus. 5,746,518, Cl. 400-109.100.

Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, to Nippon Paper Industries, Ltd. Thermal recording sheet. 5,747,414, Cl. 503-207.000.

Ogino, Takayuki: *See—*

Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, 5,746,695, Cl. 600-127.000.

Ogiro, Kenji: *See—*

Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Ogiwara, Katsutoshi: *See—*

Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Ogiwara, Kazuhiko: *See—*

Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.

Ogura, Tetsuyoshi: *See—*

Eda, Kazuo; Taguchi, Yutaka; Kanaboshi, Akihiro; and Ogura, Tetsuyoshi, 5,747,857, Cl. 257-416.000.

Ogura, Yasuhiro: *See—*

Nishio, Ayataka; and Ogura, Yasuhiro, 5,748,594, Cl. 369-59.000.

Oh, Chan S.: *See—*

Yan, Cheng F.; Oh, Chan S.; and Cheng, Anthony K., 5,747,352, Cl. 436-533.000.

Oh, Sang Y.: *See—*

Lundell, Louis J.; Oh, Sang Y.; and Newman, Terron C., 5,748,727, Cl. 379-446.000.

Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, to LG Chemical Ltd. Selective thrombin inhibitors. 5,747,535, Cl. 514-507.000.

Ohashi, Hideaki: *See—*

Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, 5,747,400, Cl. 501-94.000.

Ohashi, Hideki: *See—*

Yamada, Shinsaku; Ohashi, Hideki; Shimizu, Sumio; and Imaki, Takao, 5,746,976, Cl. 422-62.000.

Ohashi, Hiromichi: *See—*

Nakamoto, Masayuki; and Ohashi, Hiromichi, 5,747,926, Cl. 313-495.000.

Ohashi, Masashi; and Taniishi, Shinnosuke, to Canon Kabushiki Kaisha. Coordinates input apparatus connected to image processing system. 5,748,182, Cl. 345-173.000.

Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, to Kubota Corporation. Microorganism and insecticide. 5,747,450, Cl. 514-12.000.

Ohbayashi, Takashi: *See—*

Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.

Ohga, Yukiharu: *See—*

Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.

Ohgiichi, Kimitoshi: *See—*

Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.

Ohguro, Hiroshi; Ikeda, Koichi; Nishiyama, Takaaki; Iwamoto, Hiroshi; Kurosawa, Kenichi; Nakamikawa, Tetsuaki; and Morioka, Michio, to Hitachi,Ltd. Fault recovering system provided in highly reliable computer system having duplicated processors. 5,748,873, Cl. 395-182.090.

Ohhira, Hideki: *See—*

Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Ohi Seisakusho Co., Ltd.: *See—*

Shimura, Ryoji, 5,746,025, Cl. 149-360.000.

Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, to Pioneer Video Corporation; and Pioneer Electronic Corporation. Optical disc having large display patterns and its manufacturing apparatus. 5,748,607, Cl. 369-275.400.

Ohishi, Maki: *See—*

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Ohishi, Yoshiko: *See—*

Asakura, Sotoo; Kimura, Sumihisa; Kado, Kazutake; Ohishi, Yoshiko; and Hata, Takehisa, 5,747,069, Cl. 424-484.000.

Ohkawa, Isao: *See—*

Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, 5,746,515, Cl. 384-115.000.

Ohkoda, Toshiyuki: *See—*

Kaneko, Satoru; and Ohkoda, Toshiyuki, 5,747,375, Cl. 438-396.000.

Ohmori, Takashi, to Sony Corporation. Magnetic head driving circuit, including magnetic head coil switching circuits and a control pulse generator for the switching circuits, which is operable with recording data transferred at a higher than normal transfer rate. 5,748,573, Cl. 369-13.000.

Ohnishi, Kazuhiko, to Kansai Paint Company, Limited. Thermosetting coating composition. 5,747,599, Cl. 525-327.300.

Ohnishi, Shinji; and Fujii, Akio, to Canon Kabushiki Kaisha. Image decoder using adjustable filtering. 5,748,795, Cl. 382-251.000.

Ohno, Hitoshi: *See—*

Shinagawa, Akio; Ohno, Hitoshi; and Abe, Yuko, 5,748,122, Cl. 341-67.000.

Ohno, Takashi; and Ooki, Jouji, to Canon Kabushiki Kaisha. Image processing apparatus and method. 5,748,862, Cl. 395-115.000.

Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, to Nippon Paper Industries Co., Ltd.; and Nippon Yakin Kogyo Co., Ltd. Method of manufacturing a pulp molding die. 5,745,971, Cl. 29-421.100.

Ohsawa, Takahashi, to Kabushiki Kaisha Toshiba. Test circuit of semiconductor memory device having data scramble function. 5,748,641, Cl. 371-21.300.

Ohshima, Toshikazu: *See—*

Yamamoto, Hiroyuki; Ohshima, Toshikazu; and Uchiyama, Shinji, 5,748,865, Cl. 395-123.000.

Ohsumi, Hideki; and Tomita, Yoshinori, to Yazaki Corporation. Connector allowing play. 5,746,624, Cl. 439-595.000.

Ohsuye, Kazuhiro: *See—*

Yabuta, Masayuki; and Ohsuye, Kazuhiro, 5,747,321, Cl. 435-220.000.

Ohta, Masafumi: *See—*

Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.

Ohta, Minoru; and Fujimoto, Akihiro, to DX Antenna Company, Limited. Signal level measuring apparatus for directing an antenna toward a satellite. 5,749,046, Cl. 455-67.100.

Ohta, Shinichi; and Hirano, Masashi, to Yamaha Corporation. Electronic musical apparatus using vocalized sounds to sing a song automatically. 5,747,715, Cl. 84-609.000.

Ohtake, Motoyuki, to Nikon Corporation. Variable focal length optical system. 5,748,383, Cl. 359-683.000.

Ohtani, Noboru: *See—*

Heard, David; Ohtani, Noboru; Unuma, Yutaka; and Fujimoto, Manabu, 5,747,796, Cl. 250-227.260.

Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, to Topcon Corporation. Marking apparatus having feedback-controlled rotational laser beam. 5,748,353, Cl. 359-197.000.

Ohtsuka, Shuichi; Yoda, Akira; and Usami, Yoshinori, to Fuji Photo Film Co., Ltd. Method of and system for predicting reproduced color image. 5,748,858, Cl. 395-109.000.

Ohwada, Junichi: *See—*

Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, to Meiji Seika Kaisha, Ltd. Derivatives of cyclodepsipeptide PF 1022. 5,747,448, Cl. 514-11.000.

Ohyama, Yoshishige: *See—*

Minowa, Toshimichi; and Ohyama, Yoshishige, 5,746,679, Cl. 477-92.000.

Oikawa, Masaharu: *See—*

Tsurugai, Kazuo; Tokoro, Hisao; and Oikawa, Masaharu, 5,747,549, Cl. 521-60.000.

Ojima, Setsuko: *See—*

Hoshino, Tatsuo; Ojima, Setsuko; and Sugisawa, Teruhide, 5,747,301, Cl. 435-105.000.

Ojima, Yukio: *See—*

Takahashi, Norio; and Ojima, Yukio, 5,746,338, Cl. 215-237.000.

Ojo-Amaize, Emmanuel, to Specialty Laboratories, Inc. Method of screening for silicone-specific hypersensitivity. 5,747,270, Cl. 435-7.240.

Ojo-Amaize, Emmanuel A.; Cottam, Howard B.; and Kini, Ganesh D., to Immune Modulation, Inc. Immunosuppression by administration of N^6,N^6-disubstituted cAMP's, analogues thereof, and related nucleosides. 5,747,474, Cl. 514-46.000.

Oka, Masahide; Yoneto, Kenkichi; and Yamaguchi, Takamasa, to Takeda Chemical Industries, Ltd. Process for producing 2-keto-L-gulonic acid using electrodialysis. 5,747,306, Cl. 435-138.000.

Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hitoshi; and Yoshihara, Toshio, to Dai Nippon Printing Co., Ltd. Transparent functional membrane containing functional ultrafine particles, transparent functional film, and process for producing the same. 5,747,152, Cl. 428-323.000.

Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, to Fumakilla Ltd.; and Hiroshima University. Purified mite allergen. 5,747,047, Cl. 424-275.100.

Oka, Takafumi: *See—*

Nakamura, Takahiro; and Oka, Takafumi, 5,748,967, Cl. 395-712.000.

Okabe, Masato, to Dai Nippon Printing Co., Ltd. Method and device for recording information, and method for measuring the transmittance of liquid crystals, which is applied to recording information. 5,748,273, Cl. 349-86.000.

Okabe, Norikazu: *See—*

Nakabayashi, Yoshikazu; Hadano, Hiroshi; Okabe, Norikazu; and Sendou, Hideki, 5,746,426, Cl. 271-119.000.

Okada, Atsunori: *See—*

Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, 5,747,945, Cl. 315-248.000.

Okada, Hiroyuki: *See—*

Ito, Natsuko; and Okada, Hiroyuki, 5,747,991, Cl. 324-661.000.

Okada, Shigeyuki; Tanahashi, Naoki; and Nakashima, Hayato, to Sanyo Electric Co., Ltd. Forward and inverse discrete cosine transform circuits. 5,748,514, Cl. 364-725.030.

Okada, Shinjiro: *See—*

Taniguchi, Osamu; Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 5,746,939, Cl. 252-299.010.

Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,748,274, Cl. 349-133.000.

Okada, Tadaaki: *See—*

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Okada, Takeshi: *See—*

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Okada, Yumiko: *See—*

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Okado, Kenji; Maeyama, Ryuichiro; and Inaba, Kouji, to Canon Kabushiki Kaisha. Image forming method and heat fixing method using a toner including a wax. 5,747,213, Cl. 430-124.000.

Okado, Kenji: *See—*

Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.

Okamoto, Satoru: *See—*

Tsubouchi, Toshiyasu; Okamoto, Satoru; and Ihara, Tomohiko, 5,747,112, Cl. 427-253.000.

Okamura, Hiroshige: *See—*

Kobayashi, Seiji; Okamura, Hiroshige; Yamatsu, Hisayuki; and Kashiwagi, Toshiyuki, 5,748,582, Cl. 369-44.260.

Okano, Hiroshi: *See—*

Tanaka, Etsuo; Okano, Hiroshi; and Katayama, Akira, 5,748,391, Cl. 359-813.000.

Okano Hitech Co., Ltd.: *See—*

Yamaoka, Syuuzi, 5,747,999, Cl. 324-501.000.

Okato, Nobuyoshi: *See—*

Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, 5,745,971, Cl. 29-421.100.

Okawa, Mitsuhisa; and Murasaki, Ryuichi, to YKK Corporation. Surface fastener. 5,745,961, Cl. 24-446.000.

Okawara, Seiji: *See—*

Murachi, Mikio; Okawara, Seiji; Kojima, Koichi; and Kondo, Takuya, 5,746,989, Cl. 423-212.00R.

Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, to Research Foundation for Microbial Diseases of Osaka. Non-A, non-B hepatitis virus genomic CDNA and antigen polypeptide. 5,747,339, Cl. 435-350.000.

Okazaki, Masaki; Yokoyama, Shigeki; and Negoro, Masayuki, to Fuji Photo Film Co., Ltd. Optical compensatory sheet. 5,747,121, Cl. 428-1.000.

Okazawa, Kensuke: *See—*

Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.

Okazawa, Koichi: *See—*

Kobayashi, Kazushi; Aoki, Takeshi; Okazawa, Koichi; and Aburano, Ichiharu, 5,749,093, Cl. 711-139.000.

O'Kennedy, Brendan Thomas: *See—*

Stack, Francis Martin; Hennessy, Mark; Mulvihill, Daniel; and O'Kennedy, Brendan Thomas, 5,747,647, Cl. 530-365.000.

Okita, Akira, to Canon Kabushiki Kaisha. Semiconductor display device with a hydrogen supply and hydrogen diffusion barrier layers. 5,747,830, Cl. 257-72.000.

Okita, Tsutomu: *See—*

Hashimoto, Hiroshi; Murayama, Yuichiro; Satake, Masaki; and Okita, Tsutomu, 5,747,157, Cl. 428-332.000.

Okoroafor, Michael O.: *See—*

Yoldas, Bulent E.; and Okoroafor, Michael O., 5,746,992, Cl. 423-338.000.

Oku, Takeo: *See—*

Murakami, Masanori; Oku, Takeo; and Otsuki, Akira, 5,747,878, Cl. 257-745.000.

Okubo, Takayuki: *See—*

Koike, Sou; Hirano, Masao; and Okubo, Takayuki, 5,746,032, Cl. 52-204.100.

Okuda, Takayuki: *See—*

Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.

Okude, Yoshitaka: *See—*

Nishi, Tadahiko; Takagi, Takeshi; and Okude, Yoshitaka, 5,747,558, Cl. 523-201.000.

Okuhira, Hiroyuki: *See—*

Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, 5,747,627, Cl. 528-59.000.

Okuma Corporation: *See—*

Hane, Kazuhiro; and Ieki, Atsushi, 5,748,373, Cl. 359-575.000.

Terasaki, Fumitoshi; Yoshimura, Kenji; and Yoshimura, Tatsuhiro, 5,746,643, Cl. 451-5.000.

Okumoto, Yutaka; and Inomata, Shigemitsu, to Japan Tobacco Inc. Method and apparatus for determining the tobacco shred filling quality of cigarette rods. 5,746,225, Cl. 131-84.100.

Okumura, Haruhiko; and Itoh, Goh, to Kabushiki Kaisha Toshiba. Display device. 5,748,169, Cl. 345-100.000.

Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, to Ebara Corporation; and Kabushiki Kaisha Toshiba. Method and apparatus for evacuating vacuum system. 5,746,581, Cl. 417-2.000.

Okumura, Yasushi: *See*

Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.

Okuno, Atsushi: *See—*

Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.

Oldenburg, Kevin R.: *See—*

Holladay, Leslie A.; and Oldenburg, Kevin R., 5,747,453, Cl. 514-12.000.

O'Leary, Timothy J.: *See—*

Bayer, Glen H., Jr.; and O'Leary, Timothy J., 5,747,107, Cl. 427-208.400.

Olgado, Donald: *See—*

Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.

Olivier, W. Christopher. Hand strap for use with a weightlifting bar. 5,745,920, Cl. 2-170.000.

Olivo, Marco: *See—*

Padoan, Silvia; Olivo, Marco; and Golla, Carla, 5,748,548, Cl. 365-226.000.

Ollendick, David P.; and Ollendick, Robert W. Apparatus for the manufacturing of prestressed reinforced concrete railroad ties and the like. 5,747,074, Cl. 425-111.000.

Ollendick, Robert W.: *See—*

Ollendick, David P.; and Ollendick, Robert W., 5,747,074, Cl. 425-111.000.

Olsen, Alvin T.: *See—*

Capaccio, Paul R.; Cohen, Gary; Olsen, Alvin T.; and Yale, Mark C., 5,746,733, Cl. 604-411.000.

Olsen, Uffe Bang: *See—*

Jorgensen, Tine Krough; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,747,481, Cl. 514-183.000.

Olson, David Alan. Collapsible, stackable, hard-sided container. 5,746,341, Cl. 220-6.000.

Olsson, Stefan; Widlund, Urban; and Söderbergh, Anders, to Molnlycke AB. Absorbent articles. 5,746,732, Cl. 604-385.200.

Olympus Optical Company Limited: *See—*

Kitagawa, Junichi, 5,748,372, Cl. 359-565.000.

Koiwai, Tamotsu; Kawai, Sumio; Kitazawa, Tatsuo; and Goto, Hisashi, 5,748,390, Cl. 359-811.000.

Noda, Satoshi, 5,746,797, Cl. 65-17.200.

Togino, Takayoshi; and Takahashi, Koichi, 5,748,378, Cl. 359-633.000.

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, 5,748,366, Cl. 359-368.000.

Omata, Keiichi: *See—*

Matsumoto, Tsuyoshi; Mizuno, Yoshihiro; Omata, Keiichi; and Eguchi, Shin, 5,748,377, Cl. 359-633.000.

Omata, Kouichi: *See—*

Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Omega Automation, Inc.: *See—*

OL
210
SS
1
MY
5
998
MI

- Humbarger, Robert Allen; Camposeo, Paul V.; and Hurtig, Terry William, 5,746,690, Cl. 493-405.000.
- Omron Corporation: *See—*
  - Tsutsui, Kazuhiro; and Imamura, Seiji, 5,748,061, Cl. 335-83.000.
- Omstead, Thomas R.: *See—*
  - Heimanson, Dorian; Moslehi, Mehrdad M.; Spronz, Paul E.; and Omstead, Thomas R., 5,746,897, Cl. 204-298.200.
- Onai, Katsuji: *See—*
  - Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.
- Onda, Kazuhiko: *See—*
  - Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, 5,749,009, Cl. 396-395.000.
- Ondrus, Mark, to Hunt-Wesson, Inc. Dual trace valve system. 5,746,239, Cl. 137-15.000.
- O'Neal, Diana; and O'Neal, Donald P. Walk board. 5,746,288, Cl. 182-118.000.
- O'Neal, Donald P.: *See—*
  - O'Neal, Diana; and O'Neal, Donald P., 5,746,288, Cl. 182-118.000.
- O'Neill, William, to BOC Group PLC, The. Method and apparatus for forming blind slots including laser melting and gas vortex. 5,747,771, Cl. 219-121.840.
- Ong, Beng S.; Mychajlowskijj, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., to Xerox Corporation. Toner compositions and processes. 5,747,215, Cl. 430-137.000.
- Ong, Beng S.: *See—*
  - Hu, Nan-Xing; Liu, Ping; and Ong, Beng S., 5,747,205, Cl. 430-59.000.
- Onishi, Masashi: *See—*
  - Fukuda, Chie; Onishi, Masashi; and Kanamori, Hiroo, 5,746,801, Cl. 65-379.000.
- Onkor, Ltd.: *See—*
  - Cannon, Thomas G.; and DeHart, Daniel L., 5,748,484, Cl. 364-479.030.
- Ono, Kazuhisa: *See—*
  - Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,747,047, Cl. 424-275.100.
- Ono, Kazuya; Yasuda, Akira; and Kitagawa, Katsuji, to Somar Corporation. Powder coating composition. 5,747,565, Cl. 523-413.000.
- Ono, Koichi: *See—*
  - Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, 5,746,178, Cl. 123-399.000.
- Ono, Nobuaki, to Ricoh Company, Ltd. Real image type zoom finder optical system. 5,748,381, Cl. 359-647.000.
- Ono, Tomoyuki: *See—*
  - Ichikawa, Masaaki; Ono, Tomoyuki; Nishihama, Nohumichi; and Isoda, Masaaki, 5,746,615, Cl. 439-227.000.
- Ono, Yoshihiro: *See—*
  - Ueda, Toshiaki; Ueno, Katsuhiko; Ono, Yoshihiro; and Koyama, Toshio, 5,748,237, Cl. 348-333.000.
- Onoda, Mariko: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Onodera, Ken: *See—*
  - Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, 5,748,772, Cl. 382-167.000.
- Onoguchi, Kazunori, to Kabushiki Kaisha Toshiba. Image processing apparatus and method. 5,748,778, Cl. 382-199.000.
- OnTrak Systems, Inc.: *See—*
  - Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.
- Onuki, Ken: *See—*
  - Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.
- Onuma, Masayuki: *See—*
  - Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.
- Ookawa, Akemi: *See—*
  - Sakuma, Masafumi; Ookawa, Akemi; and Myouga, Takahiro, 5,747,912, Cl. 310-261.000.
- Ooki, Jouji: *See—*
  - Ohno, Takashi; and Ooki, Jouji, 5,748,862, Cl. 395-115.000.
- Ooki, Masahiro: *See—*
  - Tomita, Hideho; Ooki, Masahiro; and Furuya, Yukitsuna, 5,748,668, Cl. 375-200.000.
- Ookura, Masatoshi: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Oomori, Takashi: *See—*
  - Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, 5,747,414, Cl. 503-207.000.
- Oota, Etsuji. Medium container and its spare medium. 5,746,530, Cl. 401-88.000.
- Openiano, Renato M. Multi-dimensional control of arrayed lights to produce synchronized dynamic decorative patterns of display, particularly for festival and Christmas lights. 5,747,940, Cl. 315-185.00S.
- Oppenlaender, Knut: *See—*
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Oppenländer, Knut: *See—*
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
- Oppermann, Klaus-Guenter, to Siemens Aktiengesellschaft. Integrated circuit structure with interconnect formed along walls of silicon island. 5,747,867, Cl. 257-507.000.
- Optex Corporation: *See—*
  - McLaughlin, Steven W., 5,748,117, Cl. 341-59.000.
  - McLaughlin, Steven W., 5,748,118, Cl. 341-59.000.
- Optics Research, Inc.: *See—*
  - Flake, Lance Leslie; and Shonle, Gregory Black, 5,748,400, Cl. 360-77.020.
- Or, Yat Sun: *See—*
  - Elliott, Richard L.; Or, Yat Sun; Pireh, Daisy; and Chu, Daniel T., 5,747,466, Cl. 514-29.000.
- Orbach, Yair; Zmora, Eitan; and Halahmi, Dror, to Motorola, Inc. High speed comparator with programmable reference. 5,748,071, Cl. 340-146.200.
- Orders, James B., III: *See—*
  - Roberts, Derek; and Orders, James B., III, 5,745,940, Cl. 5-727.000.
- O'Reilly, David Wayne: *See—*
  - Durham, Darrell Lee; Johnson, Mark Anthony; and O'Reilly, David Wayne, 5,746,517, Cl. 384-538.000.
- Orensten, Henry E., to O & P Company, Inc. Laundry bag and method of using same. 5,746,514, Cl. 383-66.000.
- Orlamünder, Andreas: *See—*
  - Fischer, Matthias; Feldhaus, Reinhard; and Orlamünder, Andreas, 5,748,748, Cl. 381-71.400.
- Orlando, Harold J.; Pappas, Michael L.; and Lopez, Marco A., to Northrop Grumman Corporation. Automated minimum resolvable contrast (AMRC) test. 5,748,230, Cl. 348-187.000
- Orlicky, David J., to University of Colorado, The. Nucleic acid encoding prostaglandin $F_{2\alpha}$ receptor regulatory protein. 5,747,660, Cl. 536-23.500.
- Orlov, Oleg Georgievich: *See—*
  - Smirnov, Aleksandr Vitalievich; Orlov, Oleg Georgievich; Golipad, Pyotr Nikolaevich; Koriakin, Yurii Nikolaevich; and Yegorov, Boris Mikhailovich, 5,747,561, Cl. 523-212.000.
- Orr, Michael B., to Design Intelligence, Inc. Adaptive binding. 5,748,963, Cl. 395-704.000.
- Orrico, Mario; Farhadieh, Rou; Avramovich, Rudy; and Koford, Stuart. Device and process for making coffee and espresso beverages in microwave oven. 5,747,782, Cl. 219-689.000.
- Ors, Göran, to Sivers Lab Aktiebolag. Microwave switch. 5,748,055, Cl. 333-106.000.
- Ortho Europe Ltd.: *See—*
  - Jacobs, Gilbert R., 5,746,772, Cl. 623-35.000.
- Ortolab AB: *See—*
  - Hedström, Peter J., 5,746,011, Cl. 36-44.000.
- Osada, Kuniaki: *See—*
  - Ohsawa, Okimasa; Osada, Kuniaki; Okato, Nobuyoshi; and Katagiri, Tatsuo, 5,745,971, Cl. 29-421.100.
- Osawa, Masataka: *See—*
  - Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.
- Osawa, Sadao: *See—*
  - Kato, Eiichi; Nakazawa, Yusuke; and Osawa, Sadao, 5,747,214, Cl. 430-126.000.
- Osgood, Timothy James: *See—*
  - Beal, David William; Aked, Peter Armstrong; Homer, David Antony; Osgood, Timothy James; Blondeel, Eric Jozef Gentil; and Croucher, Ewan Howden, 5,746,645, Cl. 451-11.000.
- Oshida, Haruhisa: *See—*
  - Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, 5,749,027, Cl. 399-113.000.
- Oshika, Masato; and Naito, Sachio, to Kao Corporation. Acylated silk proteins for hair care. 5,747,015, Cl. 424-70.140.
- Oshikubo, Yuuji, to Nichiryo Co., Ltd. Repetitive pipette. 5,747,709, Cl. 73-864.180.
- Oshima, Kazuyoshi: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
- Oshima, Seiichi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor power module with high speed operation and miniaturization. 5,747,875, Cl. 257-687.000.
- Oshima, Toshiu: *See—*
  - Ishitsuka, Tomoaki; Oshima, Toshio; Noguchi, Hirofumi; and Kano, Mitsunari, 5,747,823, Cl. 250-559.440.
- Oshiro, Akio: *See—*
  - Harada, Yoshihiko; Nakata, Masashi; Oshiro, Akio; and Murakami, Seiichi, 5,747,901, Cl. 310-71.000.
- Osip, Thomas Walter: *See—*

  - Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
- Osment, Donald R.: *See—*
  - Stewart, W. Brian; Osment, Donald R.; and Duchek, John W., 5,747,725, Cl. 102-521.000.
- Osram Sylvania Inc.: *See—*
  - Devir, Daniel D.; and Coushaine, Charles M., 5,747,920, Cl. 313-318.090.
  - Wei, George; Hecker, Arlene; and Goodman, David, 5,747,402, Cl. 501-152.000.
- Ossid Corporation: *See—*
  - Tolson, Sidney S., 5,746,041, Cl. 53-442.000.
- Ostfeld, Zvi: *See—*
  - Afek, Yehuda; Mansour, Yishay; and Ostfeld, Zvi, 5,748,901, Cl. 395-200.680.
- Osthoff-Senge GmbH & Co. KG: *See—*
  - Osthoff, Walter; and Ebbinghaus, Rainer, 5,745,966, Cl. 26-3.000.
- Osthoff, Walter; and Ebbinghaus, Rainer, to Osthoff-Senge GmbH & Co KG. Singeing device. 5,745,966, Cl. 26-3.000.
- O'Sullivan Industries, Inc.: *See—*
  - Saul, Greg, 5,746,477, Cl. 297-218.500.
- Ota, Satoshi: *See—*
  - Yoshizawa, Masaki; Kohno, Takanobu; and Ota, Satoshi, 5,746,384, Cl. 242-334.400.
- Ota, Yurie: *See—*
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
- Otake, Koki: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Otake, Shinichi: *See—*
  - Yabushita, Junichi; Otake, Shinichi; and Yoshii, Yuji, 5,747,905, Cl. 310-89.000.
- Otani, Akihiro: *See—*
  - Nishida, Satoshi; and Otani, Akihiro, 5,748,662, Cl. 372-55.000.
- Otatco, Inc.: *See—*
  - Grande, René Shoan, 5,748,471, Cl. 364-422.000.
- Otipoby, Keith: *See—*
  - Amlee, Dale Alan; Matouka, Michael Frank; Rausch, Richard Allen; and Otipoby, Keith, 5,747,913, Cl. 310-263.000.
- Otis Elevator Company: *See—*
  - Coste, Steven D.; and Izard, Jeff, 5,747,755, Cl. 187-394.000.
- O'Toole, Deborah A.: *See—*
  - Dornoff, Jeffrey M.; O'Toole, Deborah A.; and Davies, Michael B., 5,747,006, Cl. 424-62.000.
- Otsu, Kumi: *See—*
  - Sasaki, Takashi; Sasaki, Yasuko; Ito, Yoshiyuki; and Otsu, Kumi, 5,747,310, Cl. 435-172.300.
- Otsuka, Naoji: *See—*
  - Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
- Otsuka, Shigeru: *See—*
  - Miyasaka, Motohiro; Kondo, Makoto; and Otsuka, Shigeru, 5,746,516, Cl. 384-291.000.
- Otsuka, Tatsushi: *See—*
  - Yoshizawa, Hideki; and Otsuka, Tatsushi, 5,749,089, Cl. 711-127.000.
- Otsuki, Akira: *See—*
  - Murakami, Masanori; Oku, Takeo; and Otsuki, Akira, 5,747,878, Cl. 257-745.000.
- Ott, Harald: *See—*
  - Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, 5,746,111, Cl. 92-168.000.
- Ott, Michael G.: *See—*
  - Qin, S. Joe; Ott, Michael G.; and Wojsznis, Wilhelm K., 5,748,467, Cl. 364-148.000.
- Ottenheimer Publishers, Inc.: *See—*
  - Murphy, Andrew, 5,746,689, Cl. 493-397.000.
- Otterbach, Jurgen: *See—*
  - Heidemann, Rolf; Veith, Gustav; and Otterbach, Jurgen, 5,748,348, Cl. 359-125.000.
- Ouchi, Toshiya: *See—*
  - Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, 5,749,053, Cl. 455-524.000.
- Ouellet, Luc, to Mitel Corporation. Stabilization of the interface between aluminum and titanium nitride. 5,747,361, Cl. 437-190.000.
- Ougier, Christophe: *See—*
  - Delorme, Franck; and Ougier, Christophe, 5,748,660, Cl. 372-50.000.
- Overby, Lacy Rasco: *See—*
  - Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,747,044, Cl. 424-202.100.
- Owen, Richard Charles Andrew: *See—*
  - Mills, Karl Scott; Linstad, Lauren Emory; Brannon, Sherwood; Bonnelycke, Mark Emil; and Owen, Richard Charles Andrew, 5,748,920, Cl. 395-308.000.
- Owens-Brockway Glass Container Inc.: *See—*
  - Menzie, Andrew B., 5,746,798, Cl. 65-29.120.
- Owens-Corning Fiberglas Technology, Inc.: *See—*
  - Burton, Charles A.; Boyd, Douglas E.; Haubert, Thomas D.; and Belt, James S., 5,746,830, Cl. 118-308.000.
  - Gauchel, James V.; and Lehman, Richard N., 5,747,075, Cl. 425-114.000.
  - Hager, William G.; Wilson, Edward L.; and Krumlauf, Paul R., 5,747,607, Cl. 525-445.000.
  - Haubert, Thomas D., 5,747,105, Cl. 427-186.000.
- Owen-Schaub, Laurie B.: *See—*
  - Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.
- Oxford Glycosystems Ltd.: *See—*
  - Hawke, David Harry; Parekh, Rajesh Bhikhu; Goulding, Paul; and Charles, Stephen Alexander, 5,747,347, Cl. 436-94.000.
- Oy Robit Rocktools Ltd.: *See—*
  - Hulkkonen, Teijo, 5,746,281, Cl. 175-420.100.
- Oyentos Corporation: *See—*
  - Fukai, Hisayo, 5,746,836, Cl. 134-1.000.
- Oyo Instruments, Inc.: *See—*
  - Ricketts, Kenneth W., 5,746,519, Cl. 400-120.010.
- Ozaki, Hidenori; and Shimizu, Hideaki, to Canon Kabushiki Kaisha. Image processing apparatus for performing image processing according to colors of input image. 5,748,345, Cl. 358-537.000.
- Ozaki, Hiroyuki: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000
- Ozaki, Tohru: *See—*
  - Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.
- Ozaki, Toshiaki: *See—*
  - Iwasaki, Yasuo; Ozaki, Toshiaki; and Miyawaki, Hiroyuki, 5,748,590, Cl. 369-58.000.
- Ozaki, Yoshio; and Kohut, Michael J., to Sony Corporation; and Sony Cinema Products Corporation. Ceiling speaker and signal source. 5,748,746, Cl. 381-18.000.
- Ozluturk, Fatih, to InterDigital Technology Corp. Spreading code sequence acquisition system and method that allows fast acquisition in code division multiple access (CDMA) systems. 5,748,687, Cl. 375-367.000.
- P.A.T.H.: *See—*
  - Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, 5,746,714, Cl. 604-68.000.
- Pabo, Carl: *See—*
  - Frankel, Alan; Pabo, Carl; Barsoum, James G.; Fawell, Stephen E.; and Pepinsky, R. Blake, 5,747,641, Cl. 530-300.000.
- Pace, Jeffrey B.; Warner, Vernon R.; and Wright, Danny O., to Siemens Automotive Corporation. Method and apparatus for accurately determining opening and closing times for automotive fuel injectors. 5,747,684, Cl. 73-119.00A.
- Pacer, James M.: *See—*
  - Grace, Robert E.; Raj, Guru B.; and Pacer, James M., 5,749,023, Cl. 399-58.000.
- Pacesetter, Inc.: *See—*
  - Mar, Craig E., 5,746,616, Cl. 439-245.000.
- Pachl, Carol: *See—*
  - Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,747,039, Cl. 424-186.100.
- Pacific Biomedical Research, Inc.: *See—*
  - Brothers, Ann Janice, 5,747,341, Cl. 435-404.000.
- Packard Bell NEC: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; and O'Brien, Terence Paul, 5,748,922, Cl. 395-309.000.
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
  - Turnbull, Robert R., 5,747,964, Cl. 320-2.000.
- Packer, Alan: *See—*
  - Coelho, Rohan G. F.; Packer, Alan; and Baldes, Gary, 5,748,196, Cl. 345-433.000.
- Pacmac, Inc.: *See—*
  - Terminella, Emanuele; Terminella, Frank; and Terminella, Joseph, 5,746,043, Cl. 53-451.000.
- Padmanabhan, Prasad P.: *See—*
  - Mestha, Lingappa K.; and Padmanahhan, Prasad P., 5,749,021, Cl. 399-49.000.
- Padoan, Silvia; Olivo, Marco; and Golla, Carla, to SGS-Thomson Microelectronics S.r.l. Device for detecting a reduction in a supply voltage. 5,748,548, Cl. 365-226.000.
- Padrón, Franklin Sotolongo: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.

VOL
2 10
ISS
1
MY
5
998
JMI

Padron, Tamara: *See—*
Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, 5,747,442, Cl. 510-475.000.

Pagan, Eric, to Smiths Industries PLC. Introducer for oral tubes. 5,746,202, Cl. 128-207.140.

Pai, Deepak Keshav; and Lund, Lowell Dennis, to Ceridan Corporation. Method and apparatus to wick solder from conductive surfaces. 5,746,367, Cl. 228-19.000.

Paik, Joon-Ki: *See—*
Park, Yong-Chul; Paik, Joon-Ki; and Kim, Dong-Wook, 5,748,231, Cl. 348-208.000.

Paillard, Bruno: *See—*
L'Espérance, André; Bouchard, Martin; Paillard, Bruno; and Guigou, Catherine, 5,748,750, Cl. 381-71.500.

Painchaud, Yves; Langlois, Pierre; Galarneau, Pierre; Chandonnet, Alain; and Lauzon, Jocelyn, to Institut National D'Optique. Method for spatially controlling the period and amplitude of Bragg filters. 5,748,814, Cl. 385-37.000.

Palitto, Marcello: *See—*
Lacquaniti, Luigi; Liuzzo, Giuseppe; Palitto, Marcello; and Verdone, Nicola, 5,746,141, Cl. 110-203.000.

Palm, Charles S., to Synthonics Incorporated. Method and apparatus for converting a two dimensional motion picture into a three dimensional motion picture. 5,748,199, Cl. 345-473.000.

Palm, Herbert: *See—*
Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.

Palmer, Edward G.; and Sparrow, Ephraim M., to Solar Attic, Inc. Air distributor or collector. 5,746,653, Cl. 454-186.000.

Palmer, James D.; and Evans, Richard P., to George Mason University. Advanced integrated requirements engineering system for CE-based requirements assessment. 5,748,973, Cl. 395-759.000.

Palmer, Matthew A.: *See—*
Turturro, Vincent; Palmer, Matthew A.; Slater, Charles R.; and Gottlieb, Saul, 5,746,216, Cl. 128-751.000.

Palmqvist, Peter, to AB Volvo. Driving device with force-limiting element for a bending unit. 5,746,086, Cl. 72-450.000.

Palo Alto Design Group: *See—*
Toor, John, 5,748,442, Cl. 361-685.000.

Pamulapati, Jagadeesh: *See—*
Shen, Paul H.; Dutta, Mitra; Wraback, Michael; and Pamulapati, Jagadeesh, 5,748,359, Cl. 359-248.000.

Pan, David H.: *See—*
Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.

Pan, Jing-Jong; Cao, Simon X. F.; Shi, Yuan; and Yu, Donna S., to E-Tek Dynamics, Inc. Dense wavelength division multiplexer and demultiplexer devices. 5,748,350, Cl. 359-130.000.

Pan, Ying-Xian: *See—*
Pasternak, Gavril W.; and Pan, Ying-Xian, 5,747,279, Cl. 435-69.100.

Pan, Yirn-Sheng; and Tseng, Horng-Huei, to Vanguard International Semiconductor Corporation. Output management of processing in a manufacturing plant. 5,748,478, Cl. 364-468.050.

Panasonic Technologies, Inc.: *See—*
Lopresti, Daniel P.; and Sandberg, Jonathan S., 5,748,807, Cl. 382-310.000.

Panek, Donald C., Jr.: *See—*
Joffe, Daniel M.; and Panek, Donald C., Jr., 5,748,637, Cl. 370-516.000.

Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., to Eli Lilly and Company. Benzylidene rhodanines. 5,747,517, Cl. 514-369.000.

Panicali, Dennis L.: *See—*
Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.

Pank, Thomas E. Apparatus for separating a light from a heavy fluid. 5,746,911, Cl. 210-170.000.

Pannetier, Christophe; Cochet, Madeleine; Darche, Sylvie; and Kourilsky, Philippe, to Institute National de la Sante et de la Recherche Medicale (INSERM); and Institut Pasteur. Process for determining the quantity of a DNA fragment of interest by a method of enzymatic amplification of DNA. 5,747,246, Cl. 435-6.000.

Papanu, James S.: *See—*
Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.

Pape, Frank-Friedrich: *See—*
Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.

Papillon, Dominique: *See—*
Delacourt, Dominique; Truffer, Jean-Patrick; Papillon, Dominique; and Papuchon, Michel, 5,748,362, Cl. 359-332.000.

Pappas, Michael L.: *See—*
Orlando, Harold J.; Pappas, Michael L.; and Lopez, Marco A., 5,748,230, Cl. 348-187.000.

Papuchon, Michel: *See—*
Delacourt, Dominique; Truffer, Jean-Patrick; Papillon, Dominique; and Papuchon, Michel, 5,748,362, Cl. 359-332.000.

Paradis, Sean: *See—*
Ghilardi, Alfred; and Paradis, Sean, 5,745,925, Cl. 2-457.000.

Paradyne Corporation: *See—*
Bedingfield, John; and Hicks, Michael A., 5,748,426, Cl. 361-58.000.

Paragon Electric Company, Inc.: *See—*
Skarivoda, Edwin L., 5,747,760, Cl. 200-38.00R.

Paragon Trade Brands, Inc.: *See—*
Suzuki, Migaku; and Fukui, Hiroaki, 5,746,730, Cl. 604-385.200.

Parco Industries: *See—*
Parker, S. Alex, Jr., 5,746,545, Cl. 405-258.000.

Parekh, Rajesh Bhikhu: *See—*
Hawke, David Harry; Parekh, Rajesh Bhikhu; Goulding, Paul; and Charles, Stephen Alexander, 5,747,347, Cl. 436-94.000.

Parent, Luc; Peloquin, Guy; Tremblay, Gilles; and Vaillancourt, Andre, to Alcan International Limited. Ultrasonic probes for use in harsh environments. 5,747,672, Cl. 73-61.790.

Park, Bo Kug, to Silver Star Co. Ltd. Device for preventing reverse rotation of rotor in spinning reels. 5,746,297, Cl. 192-7.000.

Park, Byung Gook: *See—*
Lee, Jong Duk; Chun, Kuk Jin; Park, Byung Gook; and Lyu, Jeong Ho, 5,747,356, Cl. 437-44.000.

Park, Chang Jin; Kang, Dong Hoon; and Lee, Chul Woo, to Samsung Electro-Mechanics Co., Ltd. Optical scanning apparatus. 5,748,356, Cl. 359-207.000.

Park, Chang Jin, to Samsung Electro-Mechanics Co., Ltd. Optical detecting apparatus. 5,748,357, Cl. 359-216.000.

Park, Churoo: *See—*
Choi, Myung-chan; and Park, Churoo, 5,748,639, Cl. 371-212.000.

Park, Hung S.: *See—*
Parker, Anthony A.; Strickler, David A.; and Park, Hung S., 5,747,617, Cl. 526-273.000.

Park, Hyoung-Koo, to SamSung Electronics Co., Ltd. Cleaning device for electrophotographic processor. 5,749,030, Cl. 399-148.000.

Park, Hyung-Ki: *See—*
Kim, Byeong-Jun; Kim, Jae-Soo; Min, Sang-Kee; Choi, Byung-Nam; and Park, Hyung-Ki, 5,747,781, Cl. 219-685.000.

Park, Jea-Wook: *See—*
Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, 5,747,783, Cl. 219-758.000.

Park, Jin-Ho: *See—*
Suk, Jong-Wook; Park, Jin-Ho; Park, Shin-Hyun; and Kim, Chang-Sik, 5,748,297, Cl. 356-72.000.

Park, John Y.; Thomas, Larry K.; Peng, Lin; and Cafaro, Daniel P., to Allergan. Compositions and methods for disinfecting and cleaning contact lenses. 5,746,972, Cl. 422-30.000.

Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, to Samsung Electronics Co., Ltd.; and Korea Advanced Institute of Science and Technology. Vibratory microgyroscope. 5,747,690, Cl. 73-504.120.

Park, Noh-Byung: *See—*
Choi, Seung-Beom; Cho, Shung-Hyun; and Park, Noh-Byung, 5,748,971, Cl. 395-750.030.

Park, Pil-Soon: *See—*
Jeon, Jun-Young; and Park, Pil-Soon, 5,748,550, Cl. 365-226.000.

Park, Shin-Hyun: *See—*
Suk, Jong-Wook; Park, Jin-Ho; Park, Shin-Hyun; and Kim, Chang-Sik, 5,748,297, Cl. 356-72.000.

Park, Si Kyung: *See—*
Cho, Eui Hwan; Chung, Sun Gan; Lee, Kyou Heung; and Park, Si Kyung, 5,747,521, Cl. 514-420.000.

Park, Soo Min: *See—*
Lee, Sung Il; Park, Soo Min; Kim, Jeong Whan; Kim, Ho; and Gong, Woon Young, 5,747,081, Cl. 426-72.000.

Park, Soung Hwi, to LG Semicon Co., Ltd. Memory address preview control circuit. 5,748,555, Cl. 365-230.040.

Park, Sung-Yul: *See—*
Kim, Jin-Suk; Cho, Sung-Been; Lee, Hae-Won; Jin, Byeong-Won; and Park, Sung-Yul, 5,748,187, Cl. 345-302.000.

Park, Yong Cheol, to LG Electronics Inc. Apparatus for deciding DCT block classes in a DVCR. 5,748,791, Cl. 382-250.000.

Park, Yong-Chul; Paik, Joon-Ki; and Kim, Dong-Wook, to Samsung Electronics Co., Ltd. Adaptive motion vector decision method and device for digital image stabilizer system. 5,748,231, Cl. 348-208.000.

Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, to Ford Global Technologies, Inc. Method and system for controlling fuel delivery during transient engine conditions. 5,746,183, Cl. 123-492.000.

Parke, Ian, to British Telecommunications public limited company. Real time motion vector processing of image data. 5,748,248, Cl. 348-416.000.

Parker, Anthony A.; Strickler, David A.; and Park, Hung S., to Libbey-Owens-Ford Co. Copolymers of vinyl chloride, allyl glycidyl ether, a vinyl ester and an unsaturated organic trifunctional silane and method of making the same. 5,747,617, Cl. 526-273.000.

Parker, Barry John; Krinickas, Alexander; Stilwell, John Douglas; and Brown, Neil Leonard, to Sundstrand Corporation. Electromagnetic heating devices, particularly for ram air turbines. 5,746,580, Cl. 416-245.00R.

Parker, Lance: *See—*
Maag, Clifford; and Parker, Lance, 5,748,754, Cl. 381-104.000.

Parker, Mary C. Travelling hair drying curling and styling apparatus. 5,746,228, Cl. 132-232.000.

Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., to United States of America, Air Force. Vertical cavity surface emitting lasers with optical gain control (V-logic). 5,748,653, Cl. 372-8.000.

Parker, Robert D.: *See—*
Daly, Una T.; Huang, Ying-Kuei Ann; Parker, Robert D.; and Firenze, Mary E., 5,748,896, Cl. 395-200.530.

Parker, S. Alex, Jr., to Parco Industries. Ground stabilization structure. 5,746,545, Cl. 405-258.000.

Parker, William S.: *See—*
Gallant, Ben J.; Gleeman, Alan N.; and Parker, William S., 5,746,596, Cl. 433-88.000.

Parkhe, Vijay, to Applied Materials, Inc. Apparatus for controlling backside gas pressure beneath a semiconductor wafer. 5,748,435, Cl. 361-234.000.

Parks, Thomas Dewayne; Turner, Michael Rolland; Bunnell, Dale Leon; and Teeter, Gary Wilson, to Mark Andy, Inc. Variable repeat plate and blanket cylinder mechanism. 5,746,132, Cl. 101-483.000.

Parr, William; and Davis, Harry L. Pneumatic antitheft apparatus with alarm. 5,747,886, Cl. 307-10.200.

Parri, Owain Llyr: *See—*
Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.

Parrinello, Luciano M.: *See—*
Temple, Chester S.; and Parrinello, Luciano M., 5,747,162, Cl. 428-395.000.

Parsons, George H.; Johns, Margaret A.; and Rugg, Arthur E., to T Cell Diagnostics, Inc. Method for measuring the amount of a cell-associated molecule. 5,747,265, Cl. 435-7.200.

Partlo, William N.: *See—*
Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., 5,748,656, Cl. 372-35.000.

Partlow, Deborah P.: *See—*
Talisa, Salvador H.; Janocko, Michael A.; Partlow, Deborah P.; and Piloto, Andrew J., 5,747,873, Cl. 257-661.000.

Pasch, Kenneth A.; and Zeigler, Andrew, to C.R. Bard, Inc. Pulsed lavage pump with integral power source and variable flow control. 5,746,721, Cl. 604-153.000.

Pasco, Robert William: *See—*
Natarajan, Govindarajan; and Pasco, Robert William, 5,746,874, Cl. 156-285.000.

Pasini, Giovanni Battista: *See—*
Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,955, Cl. 19-102.000.
Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,745,956, Cl. 19-106.00R.

Pastan, Ira H.; Lee, Byungkook; Jung, Sun-Hee; and Brinkmann, Ulrich, to United States of America, Health and Human Services. Recombinant disulfide-stabilized polypeptide fragments having binding specificity. 5,747,654, Cl. 530-391.700.

Pasternak, Gavril W.; and Pan, Ying-Xian, to Sloan-Kettering Institute for Cancer Research. Nucleic acid molecules encoding kappa$_1$ opioid receptors, receptors encoded thereby, and uses thereof. 5,747,279, Cl. 435-69.100.

Pastor, Stephen Robert: *See—*
Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.

Patane, Michael A.: *See—*
Bock, Mark G.; Lumma, William C.; and Patane, Michael A., 5,747,490, Cl. 514-233.800.

Patchen, Paul J.; Fung, Hon C.; Leung, Fred; and McGinness, Steven, to National Semiconductor Corporation. Microcontroller with in-circuit user programmable microcode. 5,748,981, Cl. 395-828.000.

Pate, Michel: *See—*
Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, 5,748,013, Cl. 336-233.000.

Patel, Amrit M., to Colgate-Palmolive Company. Mild foaming and conditioning detergents. 5,747,435, Cl. 510-119.000.

Patel, Amrit M.; and Chopra, Suman K., to Colgate-Palmolive Company. Low static conditioning shampoo. 5,747,436, Cl. 510-124.000.

Patel, Chhotu; Lafer, Larry M.; and Tossey, Steven M., to Automotive Fluid Systems, Inc. Accumulator deflector connection and method. 5,746,065, Cl. 62-503.000.

Patel, Dennis: *See—*
Arajs, Guntis; and Patel, Dennis, 5,746,651, Cl. 454-154.000.

Patel, Raj D.: *See—*
Ong, Beng S.; Mychajlowskij, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.

Patel, Udayan: *See—*
Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,747,591, Cl. 525-176.000.

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, to F.LLi Marzoli & C. S.p.A. Flat card with toothed belt drive and upper guide for the flats. 5,745,955, Cl. 19-102.000.

Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, to F.LLI Marzoli & C. S.p.A. Automatic device for regulating and monitoring the tension of the silver transferred from the drafting unit of a card to the silver collection unit. 5,745,956, Cl. 19-106.00R.

Patno, Timothy J.: *See—*
Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., 5,746,708, Cl. 604-4.000.

Patraud, Jeanne: *See—*
Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, 5,747,013, Cl. 424-707.000.

Pattanayak, Deva Narayan, to General Electric Company. Amplified acousto-optical vibration sensor and ultrasonic transducer array. 5,748,564, Cl 367-149.000.

Patterson, Audley F.; Suarez, Hector E.; and Wadin, Craig P., to Motorola, Inc. Audio ramping technique for a radio. 5,749,056, Cl. 455-569.000.

Patterson, John C., to Atlantic Richfield Company. Through-tubing, retrievable downhole submersible electrical pump and method of using same. 5,746,582, Cl. 417-53.000.

Patterson, Robert S.: *See—*
Briggs, John C.; Patterson, Robert S.; and Dewey, Jason, 5,748,410, Cl. 360-106.000.

Patterson, Scott R.: *See—*
Leger, Gregory S.; Patterson, Scott R.; and Porter, Ryan S., 5,746,385, Cl. 242-337.000.

Patti, Giuseppe: *See—*
Bruccoleri, Melchiorre; Demicheli, Marco; Patti, Giuseppe; and Pisati, Valerio, 5,748,128, Cl. 341-144.000.

Patton, David Lynn: *See—*
Manico, Joseph Anthony; Patton, David Lynn; and Forest, Paul Henry, 5,748,289, Cl. 355-74.000.

Patty Cake, Inc.: *See—*
Song, Jin; Koch, John; and Squier, Marilyn, 5,747,007, Cl. 424-69.000.

Paul, David J.: *See—*
Dormandy, Ray H., Jr.; Berlo, Marcelyn A.; and Paul, David J., 5,746,734, Cl. 606-1.000.

Paul, D. Scott, to Hewlett-Packard Company. Self-locking friction based robotic gripper. 5,746,464, Cl. 294-116.000.

Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, to General Motors Corporation. Brake control system. 5,746,486, Cl. 303-146.000.

Paulson, Peder James: *See—*
Blackmon, Herman Lee; Drehmel, Robert Allen; Grosbach, Lyle Edwin; Haselhorst, Kent Harold; Krolak, David John; Marcella, James Anthony; and Paulson, Peder James, 5,748,919, Cl. 395-306.000.

Paulsson, Karin: *See—*
Lindgren, Per-Olov; Johansson, Karl-Erik; Johansson, Kjell-Åke; and Paulsson, Karin, 5,747,724, Cl. 102-459.000.

Pawate, Basavaraj I.; and Yim, Susan, to Texas Instruments Incorporated. Method and system for time scale modification utilizing feature vectors about zero crossing points. 5,749,064, Cl. 704-213.000.

Pawliw, Jean-Pierre: *See—*
Cherek, Bogdan; and Pawliw, Jean-Pierre, 5,748,562, Cl. 367-124.000.

Paylor, Christopher John. Adaptor tools and method to expose valve. 5,746,416, Cl. 251-291.000.

Payne, Kenneth Ray. Light sensitive switch for alerting devices. 5,748,082, Cl. 340-568.000.

Peak, Richard Allan, to Titon Hardware Limited. Ventilator. 5,746,654, Cl. 454-211.000.

Pearce, Cedric J.: *See—*
Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Albaugh, David A., 5,747,304, Cl. 435-121.000.

Pearce, Robert C., III: *See—*
Yang, Kim W.; Junginger, George J.; Mockridge, Raymond G.; and Pearce, Robert C., III, 5,747,054, Cl. 424-409.000.

Pearce, Stuart Robert: *See—*
Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, 5,748,124, Cl. 341-120.000.

Pearson, Douglas H.: *See—*
Sangregory, Jude A.; and Pearson, Douglas H., 5,748,989, Cl. 396-6.000.

Pearson, Tim: *See—*
Bell, Lem; Pearson, Tim; and Haberstroh, James, 5,746,882, Cl. 156-580.000.

Peck, John C.; Rowland, Randy; and Wu, Duanpei, to Clemson University. Apparatus and method for voice controlled apparel manufacture. 5,748,843, Cl. 395-2.840.

Peck, Walter Richard; and Oates, Ronald Wayne, to LME Inc. Helicopter seat safety system. 5,746,395, Cl. 244-121.000.

Pedain, Josef: *See—*
Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, 5,747,582, Cl. 524-591.000.

Pedder, David John, to Plessey Semiconductors Limited. Multi-chip module inductor structure. 5,747,870, Cl. 257-531.000.

Peerless Systems Corporation: *See—*
Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., 5,748,986, Cl. 395-763.000.

Pehrson, Kerstin: *See—*
Ljusberg, Helena; and Pehrson, Kerstin, 5,747,089, Cl. 426-478.000.

PeKarna, Matthew D.: *See—*

VOL
2 10
ISS
1
MY
5
998
JMI

Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.
Pelella, Antonio Raffaele; Liu, Peter Tsung-shih; and Scharff, Gerard Joseph, to International Business Machines Corporation. Fast scan GRA cell circuit. 5,748,643, Cl. 371-22.300.
Pellegrino, Thomas P.: *See—*
Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
Peloquin, Guy: *See—*
Parent, Luc; Peloquin, Guy; Tremblay, Gilles; and Vaillancourt, Andre, 5,747,672, Cl. 73-61.790.
Pelton, Edward L.: *See—*
Glabe, John R.; and Pelton, Edward L., 5,748,152, Cl. 343-767.000.
Pelz, Edgar: *See—*
Eckel, Petra; Pelz, Edgar; and Potzler, Bernd, 5,747,393, Cl. 442-272.000.
Pence, William Edward: *See—*
Flint, Ephraim Bemis; Karidis, John Peter; McVicker, Gerard; and Pence, William Edward, 5,748,443, Cl. 361-686.000.
Peng, Li-Chun: *See—*
Yang, Ching-Nan; and Peng, Li-Chun, 5,747,368, Cl. 438-217.000.
Peng, Lin: *See—*
Park, John Y.; Thomas, Larry K.; Peng, Lin; and Cafaro, Daniel P., 5,746,972, Cl. 422-30.000.
Penn State Research Foundation, The: *See—*
Allcock, Harry R.; Visscher, Karyn; and Kim, Young Baek, 5,747,604, Cl. 525-417.000.
Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, to SGS-Thomson Microelectronics S.r.l.; and Consorzio per la Ricerca sulla Microelecttronica nel Mezzogiorno. Fuzzy logic device for image noise reduction. 5,748,796, Cl. 382-254.000.
Pennisi, Robert W.: *See—*
Davis, James L.; Williams, Melanie; and Pennisi, Robert W., 5,748,438, Cl. 361-504.000.
Penrod, Bret E.: *See—*
Higby, Paige L.; Vernacotola, Dean E.; and Penrod, Bret E., 5,747,398, Cl. 501-66.000.
Pepinsky, R. Blake: *See—*
Frankel, Alan; Pabo, Carl; Barsoum, James G.; Fawell, Stephen E.; and Pepinsky, R. Blake, 5,747,641, Cl. 530-300.000.
Peppard, A. V.: *See—*
Hettinger, William P., Jr.; Moore, Howard F.; Goolsby, Terry L.; and Peppard, A. V., 5,746,321, Cl. 209-233.000.
Perceptron, Inc.: *See—*
Greer, Dale R., 5,748,505, Cl. 364-571.020.
Perclose, Inc.: *See—*
Wood, Timothy J.; and Andreas, Bernard H., 5,746,755, Cl. 606-148.000.
Perera, Liyanage Parakrama: *See—*
O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, 5,747,272, Cl. 435-7.370.
Perfecto, Eric Daniel: *See—*
McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
Perkin-Elmer Corporation, The: *See—*
Allison, Daniel B.; and Bowlby, James O., Jr., 5,748,491, Cl. 364-497.000.
Perkins, Bradley Alan, to Valence Technology, Inc. Smart battery. 5,747,189, Cl. 429-91.000.
Perkins, Christopher Mark: *See—*
Kellett, Patti Jean; Gosselink, Eugene Paul; and Perkins, Christopher Mark, 5,747,440, Cl. 510-276.000.
Perkins, Gary W. Multi-compartment aerosol spray container. 5,746,354, Cl. 222-132.000.
Permelec Electrode Ltd.: *See—*
Shimamune, Takayuki; Nakajima, Yasuo; Nishiki, Yoshinori; and Ashida, Takahiro, 5,746,896, Cl. 204-284.000.
Perrin, Gabrielle: *See—*
Le Marer, René; and Perrin, Gabrielle, 5,748,820, Cl. 385-76.000.
Perrotta, Enzo: *See—*
Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.
Pershing, John Arthur, Jr.: *See—*
Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Kirby, Orvalle Theodore; and Pershing, John Arthur, Jr., 5,748,958, Cl. 395-670.000.
Persson, Bjorn: *See—*
Le Berre, Jacques; and Persson, Bjorn, 5,748,732, Cl. 380-10.000.
Persson, Michael: *See—*
Tokarz, Marek; Persson, Michael; and Kozlowski, Roman, 5,747,171, Cl. 428-446.000.
Peru, Gilles; and Henry, Philippe, to Sollac. Device for guiding and feeding at least two sheet blanks previously brought edge to edge to form a joint plane for energy beam welding. 5,747,768, Cl. 219-121.630.
Pescher, Yvette: *See—*
MaCaudiere, Pierre; and Pescher, Yvette, 5,746,990, Cl. 423-263.000.
Peschka, Walter; and Schneider, Gottfried, to Deutsche Forschungsanstalt Fuer Luft-und Raumfahrt E.V. Process for increasing the torque of an internal combustion engine and internal combustion engine. 5,746,172, Cl. 123-292.000.
Pessier, Rudolf Carl Otto: *See—*
Scott, Danny E.; Pessier, Rudolf Carl Otto; and Boylan, Turlach Paul, 5,746,280, Cl. 175-374.000.
Pestellini, Vittorio: *See—*
Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.
Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, to Henkel Kommanditgesellschaft auf Aktien; and Raycap B.V. Container for a fluid product. 5,746,529, Cl. 401-18.000.
Peters, William C.: *See—*
Harmon, John L.; Peters, William C.; Haughton, Robert A.; and Lingenfelter, Andrew A., 5,748,691, Cl. 376-261.000.
Petersen, Jay Dee: *See—*
Kniest, James; and Petersen, Jay Dee, 5,747,714, Cl. 84-604.000.
Petersen, Ronald O., to Motorola, Inc. Phosphor and method of making same. 5,747,100, Cl. 427-64.000.
Petersen, Walter John: *See—*
Liu, Kaihai; Holley, Charles Carl; and Petersen, Walter John, 5,745,947, Cl. 15-84.000.
Peterson, Jay R.: *See—*
Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.
Peterson, Kenneth M.: *See—*
Natarajan, Kadathur S.; Jan, Yih G.; and Peterson, Kenneth M., 5,749,044, Cl. 455-13.100.
Peterson, Scott M., to Honeywell Inc. Self checking temperature sensing circuit. 5,748,429, Cl. 361-106.000.
Petkovsek, Glenn. Integral special service mailing assembly with a cut out portion and a method for using same. 5,746,450, Cl. 283-61.000.
Petre, Jean-Marie; and Fandeux, Isabelle, to Societe Anonyme Des Eaux Minerales D'Evian. Plastics bottle that, when empty, is collapsible by axial compression. 5,746,339, Cl. 215-383.000.
Petric, Paul F.: *See—*
Gordon, Michael Stuart; and Petric, Paul F., 5,747,814, Cl. 250-398.000.
Petrides, George H.; and Kirchner, Katherene J., to Wild Bird Centers of America, Inc. Convertible bird box. 5,746,156, Cl. 119-428.000.
Petruzzi, Thomas B.: *See—*
Krivec, Bert; Petruzzi, Thomas B.; and Braun, John A., 5,746,298, Cl. 192-48.300.
Pettersson, Bjorn Ola Alfons; and Holmes, Patrick W., to TecSyn, Inc. Apparatus for producing composite cylinders. 5,747,073, Cl. 425-78.000.
Pezzani, Robert, to SGS-Thomson Microelectronics S.A. Serial arrangement of photothyristors. 5,747,835, Cl. 257-113.000.
Pfaendner, Rudolf; Hoffmann, Kurt; and Herbst, Heinz, to Ciba Specialty Chemicals Corporation. Increasing the molecular weight of polyesters and premix useful for this process. 5,747,606, Cl. 525-438.000.
Pfahler, Karl: *See—*
Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, 5,747,676, Cl. 73-105.000.
Pfarr, Craig E.; and Rudy, Norman A., to Design Systems, Inc. Apparatus for a moving workpiece. 5,746,566, Cl. 414-751.000.
Pfau, Lorenz: *See—*
Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
Pfeiffer, John W.: *See—*
Ambs, Richard W.; Reiner, Mary C.; Stugard, Howard E.; and Pfeiffer, John W., 5,746,796, Cl. 55-493.000.
Pferdehirt, Thomas: *See—*
Lüer, Harald; Scheffels, Volker; and Pferdehirt, Thomas, 5,745,964, Cl. 24-687.000.
Pfizer Inc.: *See—*
Burnett, Debbie L.; Dubash, Darius D.; Ladas, Athanasios S.; and Wong, Victor M., 5,747,064, Cl. 424-443.000.
Koch, Kevin, 5,747,465, Cl. 514-28.000.
Macor, John Eugene; and Wythes, Martin James, 5,747,501, Cl. 514-376.000.
Schnur, Rodney C.; and Arnold, Lee D., 5,747,498, Cl. 514-259.000.
Pham, Hung V.: *See—*
Norton, Adam E.; Mallory, Chester L.; Pham, Hung V.; and Rasmussen, Paul, 5,747,813, Cl. 250-372.000.
Pharmacia & Upjohn Aktiebolag: *See—*
Egberg, Nils; Larsson-Backström, Carin; Jakobsson, Jan; and Lundh, Rolf, 5,747,533, Cl. 514-549.000.
Pharmaco Behavioral Associates, Inc.: *See—*
Keenan, Robert M.; and Hatsukami, Dorothy K., 5,747,512, Cl. 514-343.000.
Pharmos Corporation: *See—*
Amselem, Shimon; and Friedman, Doron, 5,747,061, Cl. 424-427.000.
Phase Dynamics Inc.: *See—*
Scott, Bentley N.; and Shortes, Samuel R., 5,748,002, Cl. 324-633.000.
Phelps, Craig A.: *See—*
Phillips, John C.; and Phelps, Craig A., 5,748,455, Cl. 361-818.000.
Philip Morris Incorporated: *See—*

Arterbery, Cynthia W.; Callaham, W. Timothy; Keritsis, Gus D.; and White, Morris F., Jr., 5,746,230, Cl. 131-331.000.
Philipp, Chris, to Stryker Corporation. Cordless, battery operated surical tool. 5,747,953, Cl. 318-139.000.
Philipps, Werner: *See—*
Dochtermann, Ulrich; Fein, Peter; Klinar, Robert; and Philipps, Werner, 5,747,885, Cl. 307-10.200.
Philips Electronics North America Corporation: *See—*
Gandhi, Harish F.; Boyce, Walter A.; and Woodward, David R., 5,747,919, Cl. 313-318.010.
Johnson, Larry D.; Memory, Joseph W., Jr.; and Prudic, Anthony F., 5,748,255, Cl. 348-553.000.
Leger, Gregory S.; Patterson, Scott R.; and Porter, Ryan S., 5,746,385, Cl. 242-337.000.
Phillips, Donald E.: *See—*
Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., 5,748,986, Cl. 395-763.000.
Phillips, Grover G.: *See—*
DuLac, Keith B.; and Phillips, Grover G., 5,748,871, Cl. 395-182.030.
Phillips, John C.; and Phelps, Craig A., to Ericsson, Inc. Electromagnetic shield for a radiotelephone. 5,748,455, Cl. 361-818.000.
Phillips, Marc: *See—*
Argyroudis, Panayotis; Bayley, Gwain; Groh, Matthew S.; Phillips, Marc; and Soliman, Samir S., 5,748,104, Cl. 340-870.110.
Phillips, Michael L.: *See—*
Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.
Phillips Petroleum Company: *See—*
Martin, Joel L., 5,747,407, Cl. 502-26.000.
Mitchell, Kent E., 5,746,908, Cl. 208-251.00R.
Phoenix Precision Graphics, Inc.: *See—*
Bliss, Arthur E., 5,748,217, Cl. 347-141.000.
Photo Dimensions: *See—*
Craig, Robert Lee, 5,748,987, Cl. 396-6.000.
Phran-Tek Ltd.: *See—*
Ginsberg, Robert L.; and Ginsberg, Frances R., 5,748,728, Cl. 379-447.000.
Physio-Control Corporation: *See—*
Yerkovich, Daniel; and Vincent, Stephen T., 5,748,427, Cl. 361-92.000.
Piccinino, Ralph L., Jr.: *See—*
Wess, Raymond E.; Piccinino, Ralph L., Jr.; and Rosenburgh, John H., 5,749,018, Cl. 396-578.000.
Piccolino, LLC: *See—*
Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R., 5,747,129, Cl. 428-36.400.
Picker International, Inc.: *See—*
DiFilippo, Frank P., 5,747,812, Cl. 250-363.100.
Gilblom, David L.; and Castro, Peter S., 5,747,825, Cl. 250-586.000.
Piemontesi, Fabrizio: *See—*
Resconi, Luigi; Piemontesi, Fabrizio; and Yu, Lin-Chen, 5,747,621, Cl. 526-351.000.
Pierce, George F.: *See—*
Smeenge, Robert E.; Pierce, George F.; and Cicero, Samuel J., 5,748,064, Cl. 336-83.000.
Pierson, William Guy: *See—*
Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
Piggott, James Robertson: *See—*
Korsgaard, Niels; Piggott, James Robertson; Labroo, Virender Mohan; and Bain, Steven, 5,747,059, Cl. 424-451.000.
Piguet, Christian; and Masgonty, Jean-Marc, to Centre Suisse D'Electronique et de Microtechnique SA. Memory element of the master-slave flip-flop type, constructed by CMOS technology. 5,748,522, Cl. 365-154.000.
Pilkington Barnes Hind, Inc.: *See—*
Freeman, Michael H., 5,748,282, Cl. 351-161.000.
Pilkington P.E. Limited: *See—*
Edwards, Hywel, 5,748,393, Cl. 359-822.000.
Piloto, Andrew J.: *See—*
Talisa, Salvador H.; Janocko, Michael A.; Partlow, Deborah P.; and Piloto, Andrew J., 5,747,873, Cl. 257-661.000.
Pine, Eli S. Back applicator container. 5,745,949, Cl. 15-244.100.
Pinkerton, Bobby L., Jr.: *See—*
Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby L., Jr., 5,748,640, Cl. 371-21.300.
Pinoca, Leonardo; Africano, Renato; and Braca, Giancarlo, to Montell North America Inc. High tenacity propylene polymer fiber and process for making it. 5,747,160, Cl. 428-364.000.
Pinter, Randall A.: *See—*
Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Clyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.
Pioneer Electronic Corporation: *See—*
Miyagi, Takahiro; Takaya, Shigeru; and Masunaga, Yoshifumi, 5,748,579, Cl. 369-44.140.
Miyazaki, Haruhito; and Ishitoya, Koichi, 5,748,834, Cl. 386-96.000.
Nishio, Takashi; Koshio, Chiharu; Tsuchiya, Kunimoto; and Matsumoto, Tetsuya, 5,748,159, Cl. 345-76.000.
Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,748,607, Cl. 369-275.400.
Sugano, Manabu; Nomura, Susumu; Yanagawa, Naoharu; and Suzuki, Hiroshi, 5,748,600, Cl. 369-112.000.
Tateishi, Kiyoshi, 5,748,045, Cl. 331-17.000.
Pioneer Hi-Bred International, Inc.: *See—*
Rutherford, William Michael; Hinds, Mark Alan; and Dennis, Scott Michael, 5,747,020, Cl. 424-93.450.
Pioneer Video Corporation: *See—*
Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,748,607, Cl. 369-275.400.
Piontek, Carl Joseph: *See—*
Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.
Piot, Bertrand: *See—*
Mougin, Nathalie; Mondet, Jean; Piot, Bertrand; Junino, Alex; and Patraud, Jeanne, 5,747,013, Cl. 424-707.000.
Pipinich, Victor: *See—*
Rotunda, John T.; Hass, Lester A.; and Pipinich, Victor, 5,747,955, Cl. 318-434.000.
Pireh, Daisy: *See—*
Elliott, Richard L.; Or, Yat Sun; Pireh, Daisy; and Chu, Daniel T., 5,747,466, Cl. 514-29.000.
Pirelli Cavi S.p.A.: *See—*
Meli, Fausto; and Roba, Giacomo Stefano, 5,748,364, Cl. 359-341.000.
Schmid, Steffen, 5,748,810, Cl. 385-7.000.
Pisati, Valerio: *See—*
Bruccoleri, Melchiorre; Demicheli, Marco; Patti, Giuseppe; and Pisati, Valerio, 5,748,128, Cl. 341-144.000.
Pisella, Christian: *See—*
Barrois, Gérard; Dominiak, Marcel; Fedeli, Jean-Marc; and Pisella, Christian, 5,748,408, Cl. 360-103.000.
Piskie, Michael Allen: *See—*
Kwun, Hegeon; Piskie, Michael Allen; and Gioutsos, Tony, 5,747,696, Cl. 73-728.000.
Pitchford, Terry L.: *See—*
Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,136, Cl. 105-199.300.
Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,137, Cl. 105-219.000.
Pitney Bowes Inc.: *See—*
Gargiulo, Joseph L.; Baker, Walter J.; and Heiden, Richard W., 5,749,078, Cl. 705-404.000.
Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., 5,746,881, Cl. 156-578.000.
Pittrof, Folker; and Steffen, Hans, to Hoffmann-La Roche Inc. Mixed micelles. 5,747,066, Cl. 424-450.000.
Pittway Corporation: *See—*
Addy, Kenneth L., 5,748,079, Cl. 340-539.000.
Plach, Herbert: *See—*
Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, 5,746,941, Cl. 252-299.630.
Plais, Antonina: *See—*
Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, 5,747,366, Cl. 438-44.000.
Planas, Pedro: *See—*
Raymond, Jean-Louis; Nierga, Jean-Luc; and Planas, Pedro, 5,747,083, Cl. 426-117.000.
Plascore, Inc.: *See—*
Huebner, Fritz; and Schoeb, Gerard J., 5,746,879, Cl. 156-516.000.
Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, to Schering Aktiengesellschaft. Use of macrocyclic metal complexes as temperature sensors. 5,747,000, Cl. 424-9.363.
Plessey Semiconductors Limited: *See—*
Pedder, David John, 5,747,870, Cl. 257-531.000.
Plisson, François; Janet, Philippe; and Puybaret, Frédéric, to Schlumberger Industries S.A. Method and apparatus for monitoring variation in the current value of a rate of fluid flow through a flow meter. 5,747,703, Cl. 73-861.770.
Plumb, Frederick G.: *See—*
Harrison, Bernard, and Plumb, Frederick G., 5,747,936, Cl. 315-111.810.
Plumton, Donald L., to Texas Instruments Incorporated. Epitaxial overgrowth method and devices. 5,747,842, Cl. 257-266.000.
Pneumatic Products Corp.: *See—*
Thelen, John E.; and Mylavarapu, Sundar R., 5,746,807, Cl. 95-123.000.
Pockets of Learning, Ltd.: *See—*
Bloom, Stuart J.; and Nichols, Lorna, 5,746,639, Cl. 446-98.000.
Podhaisky, Todd D.: *See—*
Dalton, Scott W.; and Podhaisky, Todd D., 5,748,902, Cl. 395-200.760.
Podilchuk, Christine Irene, to Lucent Technologies Inc. Color video vector quantization with chrominance codebook bypass. 5,748,242, Cl. 348-391.000.
Poglitsch, Christof, to Carl-Zeiss-Stiftung. Compensating device for compensation of a torque that depends on the angle of rotation, and medical stand with such a compensating device. 5,746,093, Cl. 74-490.050.
Pohang Iron & Steel Co., Ltd.: *See—*

OL
2 10
ISS
1
MY
5
998
MI

- Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, 5,746,804, Cl. 75-387.000.
- Pohl, Wolfgang: *See—*
  - Bergmann, Wolfgang; Dreyer, Hans; and Pohl, Wolfgang, 5,746,438, Cl. 280-433.000.
- Pohndorf, Peter J.; and Gubbin, Douglas H., to Medtronic, Inc. Suture sleeve with circumferential lead locking device. 5,746,722, Cl. 604-175.000.
- Poikolainen, Seppo: *See—*
  - Karlsson, Kai; Meriläinen, Timo; Weckström, Kurt; and Poikolainen, Seppo, 5,747,820, Cl. 250-504.00R.
- Pola Chemical Industries, Inc.: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Polaroid Corporation: *See—*
  - Cronin, David V., 5,746,621, Cl. 439-507.000.
  - Febonio, Robert L.; and Foley, James A., 5,747,219, Cl. 430-215.000.
  - Hajjahmad, Ibrahim; Reisch, Michael L.; Soini, F. Richard; and Wober, Munib A., 5,748,770, Cl. 382-167.000.
  - Wober, Munib A., 5,748,792, Cl. 382-250.000.
- Poletto, Vanni: *See—*
  - Colandrea, Francesco; and Poletto, Vanni, 5,747,975, Cl. 323-276.000.
- Poli Industria Chimica: *See—*
  - Casareto, Enrico; Leoni, Massimo; Ronzio, Enrico; and Magni, Ambrogio, 5,747,330, Cl. 435-254.100.
- Polis, David W.: *See—*
  - Shen, Sunny S.; Polis, David W.; Yoon, Hyun N.; and Tien, Tze-Pei, 5,746,949, Cl. 252-585.000.
- Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., to Waukesha-Pearce Industries, Inc. Industrial catalytic converter and combination industrial catalytic converter and silencer. 5,746,986, Cl. 422-177.000.
- Polloni, Roberto: *See—*
  - Draghetti, Fiorenzo; and Polloni, Roberto, 5,746,229, Cl. 131-281.000.
- Polster, Rudolf; and Schmidt, Werner, to Ina Waelzlager Schaeffler OHG. Fastening eye for a tensioner. 5,746,673, Cl. 474-101.000.
- Poluzzi, Rinaldo: *See—*
  - Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.
- Polytype America Corporation: *See—*
  - Gujda, Mieczyslaw; van der Griendt, Pieter S.; and Dominico, James W., 5,746,570, Cl. 414-795.600.
- Pommier, Yves; MacDonald, Timothy Lee; and Madalengoitia, Jose S. Topoisomerase II inhibitors and therapeutic uses therefor. 5,747,520, Cl. 514-412.000.
- Pond, Daniel B.: *See—*
  - Campbell, Carey V.; Chastain, James H.; Laguna, Alvaro J.; and Pond, Daniel B., 5,747,128, Cl. 428-35.700.
- Pong, Man Hay: *See—*
  - Poon, Franki Ngai Kit; and Pong, Man Hay, 5,748,457, Cl. 363-16.000.
- Pont, Joseph Luke: *See—*
  - Scheiblich, Stefan; Maier, Thomas; Baltruschat, Helmut Siegfried; and Pont, Joseph Luke, 5,747,423, Cl. 504-251.000.
- Pontes, Fatima M.: *See—*
  - Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., 5,747,554, Cl. 523-161.000.
- Pontius, Brian Wylie, to Board of Trustees of Leland Stanford Jr. University, The. Promotion of high specificity molecular assembly. 5,747,254, Cl. 435-6.000.
- Poole, Karen M.: *See—*
  - Howell, Barbara F.; and Poole, Karen M., 5,747,115, Cl. 427-514.000.
- Poon, Franki Ngai Kit; and Pong, Man Hay. Family of zero voltage switching DC to DC converters. 5,748,457, Cl. 363-16.000.
- Popa, Catrinel I.; Browder, George A., Jr.; and Segraves, Archie Dale, to Sara Lee Corporation. Two layer integrally knit lower body garment. 5,746,068, Cl. 66-176.000.
- Popenhagen, Gerald R.: *See—*
  - Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.
- Pophusen, Dirk; and von Widdern, Michael Hennig Cardinal, to Wolff Walsrode AG. Polyamide sausage casings having improved skinning characteristics. 5,747,124, Cl. 428-34.800.
- Poppe, Robert P.: *See—*
  - Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
- Porges, Charles E.: *See—*
  - Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Noothaar, Michael W., 5,746,697, Cl. 600-323.000.
- Porter, Frank Kendall, Jr.; and Kerrigan, James J., to Quality Microwave Interconnects, Inc. Self aligning coaxial connector assembly. 5,746,617, Cl. 439-248.000.
- Porter, Robert M.; and Mueller, Michael L., to Advanced Energy Industries, Inc. Method and apparatus for stabilizing switch-mode powered RF plasma processing. 5,747,935, Cl. 315-111.510.
- Porter, Ryan S.: *See—*
  - Leger, Gregory S.; Patterson, Scott R.; and Porter, Ryan S., 5,746,385, Cl. 242-337.000.
- Potter, Andrew A.: *See—*
  - Allan, Brenda J.; and Potter, Andrew A., 5,747,309, Cl. 435-172.300.
- Potter, John W.; and Chiba, Mikio, to Her Majesty in right of Canada as represented by the Minister of Agriculture and Agri-Food. Pesticide compositions containing mustard bran. 5,747,056, Cl. 424-410.000.
- Potthoff-Karl, Birgit: *See—*
  - Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.
  - Kroner, Matthias; Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.
- Potzler, Bernd: *See—*
  - Eckel, Petra; Pelz, Edgar; and Potzler, Bernd, 5,747,393, Cl. 442-272.000.
- Powell, Steven: *See—*
  - Crawford, Jamie; Powell, Steven; and Walker, John Michael, 5,748,293, Cl. 355-75.000.
- Powerchip Semiconductor Corp.: *See—*
  - Wu, Shye-Lin, 5,747,377, Cl. 438-444.000.
- Powerhorse Corporation: *See—*
  - Steinberg, David E., 5,746,005, Cl. 33-1.0PT.
- PowerLight Corporation: *See—*
  - Dinwoodie, Thomas L., 5,746,839, Cl. 136-251.000.
- Powers, Stephen B.: *See—*
  - Stephan, Allan H.; LaPorte, Brent N.; Powers, Stephen B.; and McNeely, Mark, 5,748,185, Cl. 345-173.000.
- Powers, Thomas H.: *See—*
  - McKedy, George E.; Idol, Ronald C.; and Powers, Thomas H., 5,746,937, Cl. 252-188.280.
- Powles, Trevor J.; Imran, Mir A.; Syed, Baber; and Gandhi, Deepak R., to Advanced Cytometrix, Inc. Aspiration needle apparatus incorporating its own vacuum and method and adapter for use therewith. 5,746,724, Cl. 604-240.000.
- Poza, Fausto: *See—*
  - Heiser, Stephen J.; Malvino, Joanna Mary; Wohl, Charles M.; and Poza, Fausto, 5,748,148, Cl. 342-457.000.
- PPG Industries, Inc.: *See—*
  - Beck, Leslie M.; and Raney, David A., 5,746,837, Cl. 134-2.000.
  - Kadunce, Randy R.; Shumaker, Robert T., Jr.; and Dishart, Peter T., 5,748,155, Cl. 343-713.000.
  - Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.
  - Temple, Chester S.; and Parrinello, Luciano M., 5,747,162, Cl. 428-395.000.
  - Yoldas, Bulent E.; and Okoroafor, Michael O., 5,746,992, Cl. 423-338.000.
- Prabhu, Ashok Naryan: *See—*
  - Riddle, George Herbert Needham; Prabhu, Ashok Naryan; Matthies, Dennis Lee; and Sreeram, Attiganal Narayanaswamy, 5,747,931, Cl. 313-581.000.
- Prager, Howard A. Exercise device. 5,746,688, Cl. 482-142.000.
- Prakash, Alok, to Intel Corporation. Method and apparatus for interfacing with a host computer system sharing tasks with another user on a client computer system. 5,748,930, Cl. 395-352.000.
- Prakash, Jaideep; Norsworthy, John Paul; and Doyle, Bruce Andrew, to Cirrus Logic, Inc. Two cascoded transistor chains biasing DAC current cells. 5,748,127, Cl. 341-144.000.
- Prall, Kirk; Stone, Tod S.; and Zagar, Paul S., to Micron Technology, Inc. Reduced pitch laser redundancy fuse bank structure. 5,747,869, Cl. 257-529.000.
- Pramanick, Ira: *See—*
  - Beatty, Harry John; Elmendorf, Peter Claude; Gillis, Roland Roberto; and Pramanick, Ira, 5,748,489, Cl. 364-489.000.
- Prasad, Chandrika: *See—*
  - McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
- Prasad, Keshav: *See—*
  - McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
- Precision Coatings Inc.: *See—*
  - Sweet, Norman M., 5,747,197, Cl. 430-5.000.
- Precourt, Ronald E., Jr.: *See—*
  - Leach, Edwin F., II; Markic, Marinko; and Precourt, Ronald E., Jr., 5,746,067, Cl. 63-7.000.
- Preh-Werke GmbH & Co. KG: *See—*
  - Hochgesang, Gerhard; and Grosse, Andrea, 5,747,758, Cl. 200-5.00A.
- Preidel, Walter, to Siemens Aktiengesellschaft. Electrochemical-enzymatic sensor. 5,746,898, Cl. 204-403.000.
- Preller, Peter, to Siemens Aktiengesellschaft. SMPS with low load switching frequency stabilization. 5,748,461, Cl. 363-97.000.
- President and Fellows of Harvard College, The: *See—*
  - Calderwood, Stephen B.; Butterton, Joan R.; and Mekalanos, John J., 5,747,028, Cl. 424-93.200.

- Press, James, to International Computers Limited. Access control for sensitive functions. 5,748,739, Cl. 380-25.000.
- Press, Minoo D.: *See—*
  - McDunn, Kevin J.; Limper-Brenner, Linda; and Press, Minoo D., 5,746,585, Cl. 417-477.110.
- Press, Wolf-Rudiger: *See—*
  - Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
- Presta, Leonard G.; and Snedecor, Bradley R., to Genentech, Inc. Polypeptides with increased half-life for use in treating disorders involving the LFA-1 receptor. 5,747,035, Cl. 424-144.100.
- Prestel, Stephan; Boebel, Manfred; Reich, Harry; and Messroghli, Hossein, to Richard Wolf GmbH. Medical instrument for manipulation of the uterus. 5,746,750, Cl. 606-119.000.
- Pretto, Alessio G.; and Pretto, John A. Hybrid composite expandable shaft. 5,746,387, Cl. 242-571.200.
- Pretto, John A.: *See—*
  - Pretto, Alessio G.; and Pretto, John A., 5,746,387, Cl. 242-571.200.
- Pribnow, Richard D.: *See—*
  - Scott, Steven L.; Pribnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., 5,748,900, Cl. 395-200.650.
- Pricola, Barton Anthony: *See—*
  - Manico, Joseph Anthony; Roule, Thomas Richard; Loveland, William Davis; and Pricola, Barton Anthony, 5,748,284, Cl. 355-39.000.
- Priebe, Gordon W.; and Buer, Myron, to LSI Logic Corporation. High speed method and apparatus for detecting assertion of multiple signals. 5,748,070, Cl. 340-146.200.
- Priestman, Paul Diminic: *See—*
  - Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, 5,748,326, Cl. 358-296.000.
- Primax Electronics Ltd.: *See—*
  - Fu, Alex; Wang, David; and Wu, Chris, 5,748,181, Cl. 345-165.000.
  - Hung, Jerry, 5,748,424, Cl. 361-56.000.
- Primex Technologies, Inc.: *See—*
  - McLean, Christopher H.; Lichon, Paul G.; Morris, Joseph P.; and Flugstad, Philip O., 5,746,050, Cl. 60-200.100.
  - Stewart, W. Brian; Osment, Donald R.; and Duchek, John W., 5,747,725, Cl. 102-521.000.
- Prince, Jack Edward, to Shell Oil Company. Polyester composition for use in thermoforming dual-ovenable trays. 5,747,127, Cl. 428-35.700.
- Prince, Martin R. Method of magnetic resonance arteriography using contrast agents. 5,746,208, Cl. 128-653.400.
- Principle Plastics, Inc.: *See—*
  - Hoyt, David; and Aldcroft, Gary T., 5,746,265, Cl. 150-160.000.
- Prins, Andrew Carl: *See—*
  - Veltman, Joost; Prins, Andrew Carl; and Cavanaugh, Scott R., 5,747,085, Cl. 426-233.000.
- Prise, Michael Edward: *See—*
  - Comino, Vittorio, Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.
- Probst, Heinrich: *See—*
  - Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
- Process Technology Inc: *See—*
  - Lokar, Richard A.; and Rezabek, Dennis J., 5,748,837, Cl. 392-411.000.
- Procknow, Gary: *See—*
  - Wouch, Gerald; and Procknow, Gary, 5,747,555, Cl. 523-161.000.
- Procter & Gamble Company, The: *See—*
  - Hayden, Michael Patrick; and Stuermer, Karl Heinz, 5,746,869, Cl. 156-265.000.
  - Kellett, Patti Jean; Gosselink, Eugene Paul; and Perkins, Christopher Mark, 5,747,440, Cl. 510-276.000.
  - MacBeath, Fiona Susan, 5,747,438, Cl. 510-224.000.
  - Majeti, Satyanarayana, 5,747,070, Cl. 424-650.000.
  - Noda, Isao, 5,747,584, Cl; 524-801.000.
  - Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, 5,747,443, Cl. 510-515.000.
- Proctor, Stanley Dwayne: *See—*
  - Fraser, Paul M.; and Proctor, Stanley Dwayne, 5,746,667, Cl. 473-393.000.
- Proebster, Manfred; and Schumann, Manfred. Adhesive and sealing material. 5,747,581, Cl. 524-590.000.
- Professional Footcare International, Inc.: *See—*
  - Marshall, Scott, 5,746,952, Cl. 264-40.100.
- Protein Engineering Research Institute: *See—*
  - Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, 5,747,451, Cl. 514-12.000.
- Proudfoot, John R.: *See—*
  - Hargrave, Karl D.; and Proudfoot, John R., 5,747,488, Cl. 514-219.000.
- Prudic, Anthony F.: *See—*
  - Johnson, Larry D.; Memory, Joseph W., Jr.; and Prudic, Anthony F., 5,748,255, Cl. 348-553.000.
- Przywozny, Walter; and Scheffer, Daniel, to Automatic Switch Company. Method and apparatus for preventing coil induced delay in a automatic transfer switch. 5,748,432, Cl. 361-159.000.
- Pugel, Michael Anthony, to Thomson Consumer Electronics, Inc. Video receiver user channel selection control of an RF modulator. 5,748,261, Cl. 348-724.000.
- Puligandla, Viswanadham: *See—*
  - Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.
- Pullarkat, Premila S.: *See—*
  - Pullarkat, Raju K.; Pullarkat, Premila S.; and Raguthu, Simhachalam, 5,747,346, Cl. 436-94.000.
- Pullarkat, Raju K.; Pullarkat, Premila S.; and Raguthu, Simhachalam, to Research Foundation for Mental Hygiene, Inc. Detection of novel carbohydrates directly associated with chronic alcoholism. 5,747,346, Cl. 436-94.000.
- Pullen, Jeffrey K.: *See—*
  - Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.
- Pulvirenti, Francesco: *See—*
  - Gariboldi, Roberto; and Pulvirenti, Francesco, 5,747,978, Cl. 323-313.000.
- Purgett, Mark D.: *See—*
  - Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
- Purr, Horst: *See—*
  - Kraft, Horst; Purr, Horst; and Engelhardt, Edgar, 5,747,744, Cl. 177-25.150.
- Putteman, Peter; and Wouters, Alfons Jeanne, to Janssen Pharmaceutica, N.V. Childproof dosing device. 5,746,349, Cl. 222-49.000.
- Putzmeister-Werk Maschinenfabrik GmbH: *See—*
  - Schlecht, Karl; and Hurr, Hellmut, 5,746,247, Cl. 137-625.450.
- Puybaret, Frédéric: *See—*
  - Plisson, François; Janet, Philippe; and Puybaret, Frédéric, 5,747,703, Cl. 73-861.770.
- Py, Daniel. Fluid pump without dead volume. 5,746,728, Cl. 604-298.000.
- Pyotsia, Jouni, to Neles Controls Oy. Method and apparatus for detecting a fault of a control valve assembly in a control loop. 5,748,469, Cl. 364-150.000.
- Qi, Huilin L.: *See—*
  - Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.
- Qiagen GmbH: *See—*
  - Colpan, Metin; Moritz, Peter; and Schorr, Joachim, 5,747,663, Cl. 536-25.400.
- Qin, S. Joe; Ott, Michael G.; and Wojsznis, Wilhelm K., to Fisher-Rosemont Systems, Inc. Method of adapting and applying control parameters in non-linear process controllers. 5,748,467, Cl. 364-148.000.
- QSource, Inc.: *See—*
  - Chenausky, Peter, 5,748,663, Cl. 372-64.000.
- Quaggio, Saulo, to Saulo Quaggio. Computer controlled gearshift with automatic clutch actuator for vehicles with manual gearboxes. 5,747,960, Cl. 318-625.000.
- Qualcomm Incorporated: *See—*
  - Argyroudis, Panayotis; Bayley, Gwain; Grob, Matthew S.; Phillips, Marc; and Soliman, Samir S., 5,748,104, Cl. 340-870.110.
- Quality Microwave Interconnects, Inc.: *See—*
  - Porter, Frank Kendall, Jr.; and Kerrigan, James J., 5,746,617, Cl. 439-248.000.
- Quan, Ronald, to Macrovision Corporation. Method and apparatus to reduce effects of certain copy protection purses within a video signal. 5,748,733, Cl. 380-15.000.
- Quarmby, Scott T.; and Yost, Richard A., to University of Florida. Method and device for improved trapping efficiency of injected ions for quadrupole ion traps. 5,747,801, Cl. 250-292.000.
- Quarnstrom, Doug: *See—*
  - Lesartre, Gregg; Quarnstrom, Doug; and Lotz, Jonathan P., 5,748,934, Cl. 395-392.000.
- Quashie, Sapé Kwesi: *See—*
  - Corcoran, Patrick Henry; Hazan, Isidor; and Quashie, Sapé Kwesi, 5,747,590, Cl. 525-155.000.
- Queneau, Paul: *See—*
  - Queneau, Paul E.; and Hirsch, Martin, 5,746,805, Cl. 75-446.000.
- Queneau, Paul E.; and Hirsch, Martin, to Metallgesellschaft Aktiengesellschaft; and Queneau, Paul. Process for the continuous manufacture of steel. 5,746,805, Cl. 75-446.000.
- Quentin, George Heinz; and Yannone, Robert Alfred, to Electric Power Research Institute, Inc. System to assess the starting performance of a turbine. 5,748,500, Cl. 364-551.010.
- Quillevere, Claude; and Dufal, Frédéric, to France Telecom. Electronic memory addressing device especially for a memory organized into banks. 5,749,085, Cl. 711-5.000.
- Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, to MKE-Quantum Components Colorado LLC. Tool for processing magnetic read/write heads. 5,745,983, Cl. 29-759.000.
- Quinton Instrument Company: *See—*
  - Rotunda, John T.; Hass, Lester A.; and Pipinich, Victor, 5,747,955, Cl. 318-434.000.
- R.H. Murphy Co., Inc.: *See—*

VOL 210 ISS 1 MY 5 1998 UMI

  - Murphy, Robert H., 5,746,319, Cl. 206-725.000.
- R.R. Donnelley & Sons Company: *See—*
  - Shively, J. Thomas, 5,748,860, Cl. 395-114.000.
  - Wouch, Gerald; and Procknow, Gary, 5,747,555, Cl. 523-161.000.
- Raab, Simon, to Faro Technology, Inc. Computer-aided surgery apparatus. 5,748,767, Cl. 382-128.000.
- Raatz, Donovan: *See—*
  - Feng, Taisheng; and Raatz, Donovan, 5,749,090, Cl. 711-135.000.
- Raber, Thomas Robert, to General Electric Company. Superconductive article and method of making. 5,747,181, Cl. 428-614.000.
- Rahjohns, Douglas T., to Xerox Corporation. System and method for synchronizing control clocks for a modular printing system. 5,748,941, Cl. 395-551.000.
- Rahkin, Dmitry: *See—*
  - Kleshinski, Stephen J.; Simon, Morris A.; and Rahkin, Dmitry, 5,746,765, Cl. 606-198.000.
- Raceway Components, Inc.: *See—*
  - Bera, John; and Kohaut, John E., 5,747,732, Cl. 174-48.000.
- Racine, by Francine, legal representative: *See—*
  - Racine, Roland, deceased; Racine, by Francine, legal representative; and Lanoir, Gian, 5,746,587, Cl. 431-253.000.
- Racine, Roland, deceased; Racine, by Francine, legal representative; and Lanoir, Gian. Lighter attachable to a cigarette packet. 5,746,587, Cl. 431-253.000.
- Rademacher, Paul E., to Northrop Grumman Corporation. Pulse doppler radar system which identifies and removes electromagnetic interference. 5,748,142, Cl. 342-159.000.
- Radisch, Herbert R., Jr., to Interventional Technologies, Inc. Method for manufacturing a high strength angioplasty balloon. 5,746,968, Cl. 264-529.000.
- Radüchel, Bernd: *See—*
  - Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.
- Raguthu, Simhachalam: *See—*
  - Pullarkat, Raju K.; Pullarkat, Premila S.; and Raguthu, Simhachalam, 5,747,346, Cl. 436-94.000.
- Raimondi, Russell J., Jr., to Eastman Kodak Company. Photographic film storage receptacle with constrained film spooling loops. 5,746,388, Cl. 242-595.000.
- Raines, Garry F.: *See—*
  - Kearfott, Robert T.; and Raines, Garry F., 5,746,340, Cl. 220-3.800.
- Raisio Yhtyma Oyj: *See—*
  - Lämsä, Merja; Linko, Yu-Yen; Linko, Pekka; and Uosukainen, Esa, 5,747,434, Cl. 508-485.000.
- Raj, Guru B.: *See—*
  - Grace, Robert E.; Raj, Guru B.; and Pacer, James M., 5,749,023, Cl. 399-58.000.
- Rajala, Gregory John; Gehling, Steven Craig; and Suke, Paul Daniel, to Kimberly Clark Corporation. Disposable garment and related manufacturing equipment and methods. 5,745,922, Cl. 2-243.100.
- Rall, Gerhard; and Knitza, Reinhold. Process and device for measuring vital fetal parameters during labor and delivery. 5,746,212, Cl. 128-672.000.
- Ralph, Peter: *See—*
  - Haskill, John Stephen; and Ralph, Peter, 5,747,444, Cl. 514-2.000.
- Ralph's Welding Inc.: *See—*
  - Fisher, Roy E., 5,746,458, Cl. 292-252.000.
- Ramac, Samuel C.: *See—*
  - Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.
- Raman, T. V., to Digital Equipment Corporation. Multimodal information presentation system. 5,748,186, Cl. 345-302.000.
- Rambus, Inc.: *See—*
  - Barth, Richard M.; Stark, Donald C.; Lai, Lawrence; and Richardson, Wayne S., 5,748,554, Cl. 365-230.030.
  - Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.
- Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović , Stefan; and Jung, Günther, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Determination of peptide motifs on MHC molecules. 5,747,269, Cl. 435-7.240.
- Ramot University Authority Ltd.: *See—*
  - Afek, Yehuda; Mansour, Yishay; and Ostfeld, Zvi, 5,748,901, Cl. 395-200.680.
- Ramsbey, Mark T.: *See—*
  - Wang, Hsingya Arthur; Ramsbey, Mark T.; and Sun, Yu, 5,747,882, Cl. 257-768.000.
- Rand, Robert W.: *See—*
  - Shepherd, Joseph S.; and Rand, Robert W., 5,748,700, Cl. 378-65.000.
- Randall, Gary A.: *See—*
  - Bennett, Arthur T.; Baum, Stephen L.; Rubenstein, Scott K.; and Randall, Gary A., 5,747,893, Cl. 307-100.000.
- Randall, Laura M.: *See—*
  - Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.
- Randolph, Anne: *See—*
  - Swift, Robert L.; Du Mee, Charles P.; and Randolph, Anne, 5,747,447, Cl. 514-9.000.
- Raney, David A.: *See—*
  - Beck, Leslie M.; and Raney, David A., 5,746,837, Cl. 134-2.000.
- Ranganath, Krishnappa, to Enersol Systems, Inc. Inverter for an electronic ballast having independent start-up and operational output voltages. 5,747,942, Cl. 315-224.000.
- Rankin, James Richard: *See—*
  - Bischel, Brian John; and Rankin, James Richard, 5,746,278, Cl. 175-24.000.
- Ransburg Corporation: *See—*
  - Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.
- Ransom, Ray M.: *See—*
  - Ericson, Philip G.; and Ransom, Ray M., 5,748,628, Cl. 370-384.000.
- Rasmussen, Paul: *See—*
  - Norton, Adam E.; Mallory, Chester L.; Pham, Hung V.; and Rasmussen, Paul, 5,747,813, Cl. 250-372.000.
- Rastogi, Rajiv; Underwood, Sandra J.; and Fujimoto, Harry H., to Intel Corporation. Interface between titanium and aluminum-alloy in metal stack for integrated circuit. 5,747,879, Cl. 257-751.000.
- Ratcliffe, William R.; and Lawrence, Don C., to L.A. Gear, Inc. Footwear with pulsed lights. 5,746,499, Cl. 362-103.000.
- Rau, Guenter: *See—*
  - Westphal, Dieter; Reul, Helmut; and Rau, Guenter, 5,746,575, Cl. 415-206.000.
- Raubenheimer, Hans-Juergen: *See—*
  - Denzinger, Walter; Hartmann, Heinrich; Potthoff-Karl, Birgit; Buechner, Karl-Heinz; Heider, Marc; and Raubenheimer, Hans-Juergen, 5,747,619, Cl. 526-318.500.
- Rauh, Hans-Jurgen: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Rauland, Werner: *See—*
  - Lochmahr, Karl; and Rauland, Werner, 5,747,759, Cl. 200-5.00R.
- Rausch, Richard Allen: *See—*
  - Amlee, Dale Alan; Matouka, Michael Frank; Rausch, Richard Allen; and Otipoby, Keith, 5,747,913, Cl. 310-263.000.
- Rawlings, Anthony Vincent: *See—*
  - Granger, Stewart Paton; Rawlings, Anthony Vincent; and Scott, Ian Richard, 5,747,051, Cl. 424-401.000.
- Raycap B.V.: *See—*
  - Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, 5,746,529, Cl. 401-18.000.
- Raychem Corporation: *See—*
  - Schuetz, Marlin Niles, 5,748,464, Cl. 363-131.000.
  - Wartenberg, Mark F.; Lahlouh, John G.; and Toth, James, 5,747,147, Cl. 428-209.000.
- Raymond, Jean-Louis; Nierga, Jean-Luc; and Planas, Pedro. Device of the feeding-bottle type. 5,747,083, Cl. 426-117.000.
- Raynham, Michael B.; and Tuttle, Myron R., to Hewlett-Packard Company. Redundant power supply and storage system. 5,747,889, Cl. 307-80.000.
- Rayovac Corporation: *See—*
  - Neyer, James U., 5,746,309, Cl. 200-528.000.
- Raytheon Company: *See—*
  - Williams, Ronald L.; and Norton, Paul R., 5,747,804, Cl. 250-338.100.
  - Wong, Hok-Tung; and Vinn, Charles L., 5,747,976, Cl. 323-282.000.
- Raza, S. Babar; and MacArthur, James B., to Cypress Semiconductor Corporation. Circuit for high speed serial programming of programmable logic devices. 5,748,559, Cl. 365-233.000.
- Read-Rite Corporation: *See—*
  - Lederman, Marcos M.; and Yuan, Samuel W., 5,748,413, Cl. 360-113.000.
- Ready, David C.: *See—*
  - Lawler, Christopher P.; and Ready, David C., 5,748,633, Cl. 370-401.000.
- Reagan, John T.: *See—*
  - Abatzoglou, Theagenis J.; Lam, Lawrence K.; Malek, Homayoun; and Reagan, John T., 5,748,507, Cl. 364-572.000.
- Reames, James B. Adaptive voice enhancing system. 5,748,752, Cl. 381-94.100.
- Red Ant, Inc.: *See—*
  - Kennedy, Stephen E., 5,746,605, Cl. 434-307.00R.
- Reddy, Chitranjan N.; and Medhekar, Ajit K., to Alliance Semiconductor Corporation. Laser fusible link structure for semiconductor devices. 5,747,868, Cl. 257-529.000.
- Redeker, Fred C.: *See—*
  - Rossman, Kent; Lue, Brian; and Redeker, Fred C., 5,748,434, Cl. 361-234.000.
- Reed, John C.; and Sato, Takaaki, to La Jolla Cancer Research Foundation. Nucleic acids encoding Fas associated proteins and screening assays using same. 5,747,245, Cl. 435-6.000.
- Reed, Michael W., to Epoch Pharmaceuticals, Inc. Radiohalogenation of oligonucleotides via trialkylstannylaryl conjugates. 5,746,997, Cl. 424-1.730.
- Reed, Thomas F.: *See—*
  - Whitehouse, Robert S.; and Reed, Thomas F., 5,747,559, Cl. 523-205.000.
- Reef Industries, Inc.: *See—*

  - Mohammed, Abdeally; and Wynne, Lyndell Kyle, 5,747,134, Cl. 428-57.000.
- Reel, Jon K.: *See—*
  - Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.
- Reem, Richard Carroll: *See—*
  - Manico, Joseph Anthony; and Reem, Richard Carroll, 5,747,225, Cl. 430-345.000.
- Rees, Andrew John; O'Brien, Stephen Caine; and Krystad, Peter D., to Applied Microsystems, Inc. Method and apparatus for analyzing software executed in embedded systems. 5,748,878, Cl. 395-183.140.
- Rees, James D., to Xerox Corporation. System and method for determining a location and orientation in a black and white digital scanner. 5,748,344, Cl. 358-505.000.
- Rees, Richard W.A., to Excellence Manufacturing, Inc. Reinforced seat track. 5,746,409, Cl. 248-422.000.
- Reeves Brothers, Inc.: *See—*
  - Genest, John H.; Gaworowski, Andrew J.; and Sheron, Herman D., 5,745,968, Cl. 29-270.000.
- Reeves, Robert A.: *See—*
  - Stevenson, Michael H.; and Reeves, Robert A., 5,746,961, Cl. 264-255.000.
- REFAC International, Ltd.: *See—*
  - Mann, William H., 5,747,588, Cl. 525-129.000.
- Regeneron Pharmaceuticals, Inc.: *See—*
  - Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.
- Regents Of The University Of California: *See—*
  - Balch, Joseph W.; Carrano, Anthony V.; Davidson, James C.; and Koo, Jackson C., 5,746,901, Cl. 204-606.000.
  - McLean, William, II; Balooch, Mehdi; and Siekhaus, Wigbert J., 5,747,120, Cl. 427-596.000.
- Reich, Harry: *See—*
  - Prestel, Stephan; Boebel, Manfred; Reich, Harry; and Messroghli, Hossein, 5,746,750, Cl. 606-119.000.
- Reich, Marvin Fred: *See—*
  - Albright, Jay Donald; and Reich, Marvin Fred, 5,747,487, Cl. 514-215.000.
- Reichle, Walter Thomas; Yang, Xinmin; and Karol, Frederick John, to Union Carbide Chemicals & Plastics Technology Corporation. Catalyst composition for the production of olefin polymers. 5,747,406, Cl. 502-117.000.
- Reichwein, David P., to Armstrong World Industries, Inc. Printing cylinder spray shield. 5,746,128, Cl. 101-416.100.
- Reier, George E.: *See—*
  - Auguello, Michael; Ruszkay, Thomas A.; and Reier, George E., 5,747,067, Cl. 424-464.000.
- Reimer, Jens-Peter: *See—*
  - Brede, Uwe; Bretfeld, Anton; Fibranz, Joachim; Kordel, Gerhard; Kraft, Josef; Lehniger, Peter; and Reimer, Jens-Peter, 5,746,026, Cl. 49-506.000.
- Reiner, Mary C.: *See—*
  - Ambs, Richard W.; Reiner, Mary C.; Stugard, Howard E.; and Pfeiffer, John W., 5,746,796, Cl. 55-493.000.
- Reinforced Polymer Inc.: *See—*
  - Guzauskas, Robert, 5,747,553, Cl. 523-115.000.
- Reininger, Russell A.: *See—*
  - Hunter, Craig C.; and Reininger, Russell A., 5,748,645, Cl. 371-22.310.
- Reinmann, John Joseph; and McCartney, Clifford A., to Strata Products, Inc. Mine support cribs. 5,746,547, Cl. 405-288.000.
- Reisch, Michael L.: *See—*
  - Hajjahmad, Ibrahim; Reisch, Michael L.; Soini, F. Richard; and Woher, Munib A., 5,748,770, Cl. 382-167.000.
- Reist, Elmer J., to SRI International. Benzothiophene analogs as antiviral agents. 5,747,511, Cl. 514-337.000.
- Reiter, Friedrich: *See—*
  - Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, 5,748,472, Cl. 364-424.080.
- Reiter, Thomas Carl; Soscia, Peter P.; and Brust, David P., to Eastman Kodak Company. Process for applying smooth surface to image-receiving laminate for ID card stock. 5,746,864, Cl. 156-220.000.
- Reliance Electric Industrial Company: *See—*
  - El-Ibiary, Yehia; Nisley, Donald L.; and Stroobandt, Jack D., 5,746,452, Cl. 384-446.000.
  - Sudhoff, Douglas H.; and Williams, Donald Howard, 5,747,904, Cl. 310-88.000.
- Remington, James A.; Schultz, Kenneth L.; and Hein, Russell R., to ABC Rail Products Corporation. Rail crossing assembly. 5,746,400, Cl. 246-465.000.
- Renard, Lucien; Delprat, Patrick; and Heim, Philippe, to Atohaas Holding C.V. Composition for flame-retardant cast panels made of (meth)acrylic polymers and panels obtained from this composition. 5,747,569, Cl. 524-140.000.
- Renauld, Jean-Christope: *See—*
  - Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.
- Rendall, John S.; and Ahghar, Massoud, to Solv-Ex Corporation. Method for producing thermal insulation from dry-fine oil-sands tailings. 5,746,932, Cl. 252-62.000.
- Rendi, Anthony J., Jr., to Ford Global Technologies, Inc. Rear view mirror with stowable dual view mirror. 5,748,395, Cl. 359-841.000.
- Renken, Wayne, to SensArray Corporation. Temperature calibration substrate. 5,746,513, Cl. 374-179.000.
- Renola, Gary Thomas: *See—*
  - Agapiou, Agapios Kyriacos; Muhle, Michael Elroy; and Renola, Gary Thomas, 5,747,612, Cl. 526-82.000.
- Renshaw, Barbara B.: *See—*
  - Butterfield, Stephen R.; Phillips, Donald E.; Renshaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., 5,748,986, Cl. 395-763.000.
- Rentmeester, Tammy Jo: *See—*
  - Nielsen, Steven James; Rentmeester, Tammy Jo; Krueger, Allan James; and Weyenberg, Jeffrey Michael, 5,746,710, Cl. 609-14.000.
- Reny, Timothy Shawn: *See—*
  - Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
- Renz, Reiner: *See—*
  - Faust, Eberhard; Judenhahn, Wolfram; Kassing, Lothar; Pfahler, Karl; and Renz, Reiner, 5,747,676, Cl. 73-105.000.
- Repecka, Linas Norman, to Cytec Technology Corp. Slurry-mixed heat-curable resin systems having superior tack and drape. 5,747,615, Cl. 526-262.000.
- Resconi, Luigi; Piemontesi, Fabrizio; and Yu, Lin-Chen, to Montell Technology Company BV. Reactor blend polypropylene, process for the preparation thereof and process for preparing metallocene ligands. 5,747,621, Cl. 526-351.000.
- Research Foundation for Mental Hygiene, Inc.: *See—*
  - Pullarkat, Raju K.; Pullarkat, Premila S.; and Raguthu, Simhachalam, 5,747,346, Cl. 436-94.000.
- Research Foundation for Microbial Diseases of Osaka: *See—*
  - Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, 5,747,339, Cl. 435-350.000.
- Research Institute of Industrial Science & Technology: *See—*
  - Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, 5,746,804, Cl. 75-387.000.
- Research Triangle Institute: *See—*
  - Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., 5,747,503, Cl. 514-294.000.
- Restelli, Ermenegildo: *See—*
  - Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, 5,747,295, Cl. 435-71.300.
- Reul, Helmut: *See—*
  - Westphal, Dieter; Reul, Helmut; and Rau, Guenter, 5,746,575, Cl. 415-206.000.
- Rexam Graphics Inc.: *See—*
  - Katsen, Boris Joseph; Himmelwright, Richard S.; Stewart, Barbara Jones; and Schwartz, Nate R., 5,746,817, Cl. 106-31.650.
- Reynes, Jean-Michel: *See—*
  - Robb, Francine Y.; Robb, Stephen P.; Reynes, Jean-Michel; and Chang, Li-Hsin, 5,747,371, Cl. 438-273.000.
- Reynolds, David Corder, to International Business Machines Corporation. Method of conducting asynchronous distributed collective operations. 5,748,959, Cl. 395-676.000.
- Reynolds, Walker, Jr. Golf putter. 5,746,664, Cl. 473-252.000.
- Rezabek, Dennis J.: *See—*
  - Lokar, Richard A.; and Rezabek, Dennis J., 5,748,837, Cl. 392-411.000.
- Rhoads, Geoffrey B., to Digimarc Corporation. Image steganography system featuring perceptually adaptive and globally scalable signal embedding. 5,748,763, Cl. 382-115.000.
- Rhoads, Geoffrey B., to Digimarc Corporation. Method and apparatus for robust information coding. 5,748,783, Cl. 382-232.000.
- Rhoads, W. Wistar: *See—*
  - Swanson, David W.; Kaplinsky, George T.; Salter, James G.; and Rhoads, W. Wistar, 5,748,215, Cl. 347-87.000.
- Rhone Merieux: *See—*
  - Languet, Bernard; and Desmettre, Philippe, 5,747,063, Cl. 424-442.000.
- Rhone-Poulenc Agriculture Ltd.: *See—*
  - Roberts, David Alan; Cramp, Susan Mary; Wallis, Derek Ian; and Bulot, Jean-Paul, 5,747,424, Cl. 504-271.000.
- Rhone-Poulenc Agrochimie: *See—*
  - Kodama, Hiroshi; Wada, Yasuhiro; and Yamaguchi, Rikio, 5,747,519, Cl. 514-407.000.
- Rhone-Poulenc Chimie: *See—*
  - Braconnier, Jean-Jacques, 5,746,944, Cl. 252-301.40P.
  - MaCaudiere, Pierre; and Pescher, Yvette, 5,746,990, Cl. 423-263.000.
- Rhone-Poulenc Inc.: *See—*
  - Cuif, Jean Pierre, 5,747,401, Cl. 501-103.000.
- Rhone-Poulenc Rorer S.A.: *See—*
  - Debernard, Jean-Jacques; Dubertret, Catherine; Helynck, Gérard; Leboul, Jean; and Martin, Jean-Paul, 5,747,303, Cl. 435-119.000.
- Riberi, Bernd: *See—*
  - Schmalstieg, Lutz; Gruber, Hermann; Riberi, Bernd; and Nachtkamp, Klaus, 5,747,628, Cl. 528-60.000.
- Ricciardelli, John J.: *See—*
  - Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, 5,748,221, Cl. 347-232.000.
- Rice, Joseph J.: *See—*

/OL
2 10
ISS
1
MY
5
998
JMI

Moran, P. W. Thomas; and Rice, Joseph J., 5,749,016, Cl. 396-515.000.

Rice, Robert M.; Brink, Kevin B.; and Hansen, David J., to Rogers Foods, Inc. Process for producing large quantities of viable true seed from garlic. 5,746,024, Cl. 47-58.000.

Richard Wolf GmbH: *See—*

Prestel, Stephan; Boebel Manfred; Reich, Harry; and Messroghli, Hossein, 5,746,750, Cl. 606-119.000.

Richardson, John, to Citrix Systems, Inc. Method and apparatus for client managed flow control on a limited memory computer system. 5,748,892, Cl. 395-200.300.

Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., to Check Technology Corporation. Printing system. 5,748,483, Cl. 364-478.110.

Richardson, Wayne S.: *See—*

Barth, Richard M.; Stark, Donald C.; Lai, Lawrence; and Richardson, Wayne S., 5,748,554, Cl. 365-230.030.

Richter, Herbert. Roller clip. 5,745,962, Cl. 24-488.000.

Richter, Peter; Elsner, Martin; and Vogt, Barbara, to Helopharm G. Petrik GmbH. Amidinohydrazones of ketones derived from benzo[B]furan, methods for their production, and pharmaceuticals containing these compounds. 5,747,508, Cl. 514-320.000.

Ricketts, Kenneth W., to Oyo Instruments, Inc. Bi-directional thermal print head alignment apparatus and method. 5,746,519, Cl. 400-120.010.

Ricoh Company, Ltd.: *See—*

Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, 5,747,413, Cl. 503-201.000.

Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.

Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, 5,747,210, Cl. 430-109.000.

Fukushima, Tokutaro, 5,748,947, Cl. 395-501.000.

Hosoi, Masatoshi; Sugiyama, Yoshihide; Ichikawa, Mitsuru; and Masamura, Norihisa, 5,746,162, Cl. 123-58.090.

Kikui, Shinsuke; Yasuda, Wataru; Shimeki, Ichiro; and Sugimoto, Naomi, 5,749,022, Cl. 399-50.000.

Kitajima, Tatsutoshi; and Yamamoto, Yasushi, 5,748,233, Cl. 348-220.000.

Nakajima, Yuji, 5,748,595, Cl. 369-77.200.

Ogawa, Takashi; and Tsukasa, Toshiya, 5,746,518, Cl. 400-109.100.

Ono, Nobuaki, 5,748,381, Cl. 359-647.000.

Sasaki, Kenji, 5,749,082, Cl. 707-508.000.

Satoh, Akio, 5,746,981, Cl. 422-128.000.

Takayuki, Seki, 5,749,037, Cl. 399-327.000.

Umeda, Minoru, 5,749,029, Cl. 399-128.000.

Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, 5,748,786, Cl. 382-240.000.

Ricoh Corporation: *See—*

Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, 5,748,786, Cl. 382-240.000.

Riddle, George Herbert Needham; Prabhu, Ashok Naryan; Matthies, Dennis Lee; and Sreeram, Attiganal Narayanaswamy, to David Sarnoff Research Center, Inc. Plasma display and method of making same. 5,747,931, Cl. 313-581.000.

Ridgeway Research Corporation: *See—*

Neathway, Graham; and Kiss, Bill, 5,748,094, Cl. 340-660.000.

Ridley, Stephen F.: *See—*

Luscher, Marcus P.; and Ridley, Stephen F., 5,746,850, Cl. 152-339.100.

Riedel-De Haen Aktiengesellschaft: *See—*

Lonsky, Ralph; and Lehmann, Lutz Uwe, 5,747,233, Cl. 430-522.000.

Riedel, Michael; and Heiss, Herbert, to Siemens Aktiengesellschaft. Method and circuit arrangement for forwarding message cells transmitted via an ATM communication equipment to a serving trunk. 5,748,615, Cl. 370-238.000.

Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, to Degussa Aktiengesellschaft. Method and apparatus for dispensing particles from a container. 5,746,347, Cl. 222-1.000.

Rieger, Bernhard; Hittich, Reinhard; Kurmeier, Hans Adolf; Coates, David; and Plach, Herbert, to Merck Patent Gesellschaft MIT Beschrankter Haftung. Liquid-crystalline medium. 5,746,941, Cl. 252-299.630.

Riemenschneider, Herbert: *See—*

Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.

Ries-Müller, Klaus: *See—*

Dietz, Hartmut; Ries-Müller, Klaus; and Förster, Jürgen, 5,747,679, Cl. 73-116.000.

Rietkerk, Anthony J., to Security Solutions Plus. Computer asset protection apparatus and method. 5,748,083, Cl. 340-568.000.

Rijn, Gerard Cornelis: *See—*

Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.

Riley, Robert E., to Square D Company. Data link module for time division multiplexing control systems. 5,748,616, Cl. 370-242.000.

Ring, Curtis Phillip: *See—*

Wright, Andrew; and Ring, Curtis Phillip, 5,746,249, Cl. 137-614.190.

Ringo, Marion M.: *See—*

Bailey, Jeffrey R.; and Ringo, Marion M., 5,747,750, Cl. 181-112.000.

Rink, Linda M.; Letendre, Guy R.; Teverovsky, Alexander; and Marjanski, George C., to Morton International, Inc. Reinforced ceramic air bag filters. 5,746,793, Cl. 55-385.300.

Ripka, William Charles: *See—*

Lasters, Ignace; De Maeyer, Marc; and Ripka, William Charles, 5,747,449, Cl. 514-12.000.

Rippmann, Friedrich: *See—*

Jonczyk, Alfred; Felding-Habermann, Brunhilde; Diefenbach, Beate; and Rippmann, Friedrich, 5,747,457, Cl. 514-13.000.

Risbeck, James D.: *See—*

Rockstroh, Todd J.; Crow, John M.; Lee, Ching-Pang; and Risbeck, James D., 5,747,769, Cl. 219-121.710.

Ritchie, Branson W.; Niagro, Frank D.; and Latimer, Kenneth S., to University of Georgia Research Foundation, Inc. Avian polyomavirus vaccine in psittacine birds. 5,747,045, Cl. 424-204.100.

Ritchie, Gregory. Pitcher's training device and method of training. 5,746,671, Cl. 473-454.000.

Ritter, Stanislawa: *See—*

Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.

Rivera, Benjamin C.: *See—*

Berg, Howard G.; and Rivera, Benjamin C., 5,745,997, Cl. 30-155.000.

Rizzo, Anthony: *See—*

Mimikos, Andrew N.; and Rizzo, Sam, 5,747,052, Cl. 424-402.000.

Rizzo, Michael Douglas: *See—*

Paul, Ronald; Pastor, Stephen Robert; Rizzo, Michael Douglas; Bassett, Duane Edward; Bedner, Edward John; Carson, Douglass L.; Chen, Hsien Heng; Chin, Yuen-Kwok; Ghoneim, Youssef Ahmed; Lee, Alan James; Lin, William Chin-Woei; and Ludwig, Howard Hans, 5,746,486, Cl. 303-146.000.

Rizzo, Sam: *See—*

Mimikos, Andrew N.; and Rizzo, Sam, 5,747,052, Cl. 424-402.000.

Rizzotto, Gianguido: *See—*

Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.

RMO, Inc.: *See—*

Nezu, Hiroshi; and Nagata, Kenji, 5,746,592, Cl. 433-8.000.

Roba, Giacomo Stefano: *See—*

Meli, Fausto; and Roba, Giacomo Stefano, 5,748,364, Cl. 359-341.000.

Robb, Francine Y.; Robb, Stephen P.; Reynes, Jean-Michel; and Chang, Li-Hsin, to Motorola, Inc. Method of manufacturing vertical MOSFET. 5,747,371, Cl. 438-273.000.

Robb, Stephen P.: *See—*

Robb, Francine Y.; Robb, Stephen P.; Reynes, Jean-Michel; and Chang, Li-Hsin, 5,747,371, Cl. 438-273.000.

Robbins, Gordon J.: *See—*

McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.

Robert Bosch GmbH: *See—*

Boecking, Friedrich; and Haug, Stefan, 5,746,181, Cl. 123-470.000.

Damson, Eckart; Klenk, Martin; and Miller, Stefan, 5,746,176, Cl. 123-336.000.

Dietz, Hartmut; Ries-Müller, Klaus; and Förster, Jürgen, 5,747,679, Cl. 73-116.000.

Eitrich, Frank-Thomas, 5,748,923, Cl. 395-309.000.

Kersken, Ulrich; and Claussen, Hinrich, 5,748,107, Cl. 340-905.000.

Lamm, Hubert, 5,747,956, Cl. 318-599.000.

Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.

Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, 5,746,111, Cl. 92-168.000.

Romann, Peter; and Rohde, Siegfried, 5,746,376, Cl. 239-585.400.

Siegle, Gert, 5,748,115, Cl. 341-22.000.

Voehringer, Klaus; and Spinner, Klaus, 5,747,884, Cl. 307-10.100.

Roberts, Allen L., to ERC Industries, Inc. High temperature inline expansion joint. 5,746,453, Cl. 285-47.000.

Roberts, Bryan: *See—*

Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.

Roberts, David Alan; Cramp, Susan Mary; Wallis, Derek Ian; and Bulot, Jean-Paul, to Rhone-Poulenc Agriculture Ltd. Herbicidal 4-substituted isoxazol. 5,747,424, Cl. 504-271.000.

Roberts, Derek; and Orders, James B., III. Customized modular mattress and bedding. 5,745,940, Cl. 5-727.000.

Roberts, Gareth Wyn; Graham, David Ian; and Nicoll, James Alan Ramsey, to SmithKline Beecham p.l.c. Method of prognosing chronic neurodegenerative pathology following a head injury. 5,747,260, Cl. 435-6.000.

Roberts, Luther C.; and Losee, David L., to Eastman Kodak Company. Method of making color filter arrays by transferring two or more colorants simultaneously. 5,747,199, Cl. 430-7.000.

Roberts, Mark H.: *See—*

Christiansen, Lars K.; Roberts, Mark H.; Griffiths, David J.; and Adamson, Brent R., 5,748,485, Cl. 364-479.040.

Roberts, Simon H., to ZED Instruments Ltd. Laser angroxing head employing acousto-optic modulator. 5,748,222, Cl. 347-241.000.

Robinson, George Joseph: *See—*

Junkin, John Edward; and Robinson, George Joseph, 5,746,573, Cl. 415-115.000.

Robinson, Kurt B.: *See—*

Brown, David M.; Eslick, Russell D.; and Robinson, Kurt B., 5,749,088, Cl. 711-115.000.

Robitaille, James M.; Crevling, Robert L., Jr.; and Baer, Mark E., to Shop Vac Corporation. Current regulating switch circuit. 5,747,973, Cl. 323-239.000.

Roch, Philippe: *See—*

Ginoux, Jean-Paul; Dreyer, Alain; Roch, Philippe; Baccou, Jean-Claude; and Lacan, Dominique, 5,747,043, Cl. 424-195.100.

Roche Vitamins Inc.: *See—*

Hoshino, Tatsuo; Ojima, Setsuko; and Sugisawa, Teruhide, 5,747,301, Cl. 435-105.000.

Rockefeller University, The: *See—*

Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.

Rockenfeller, Uwe: *See—*

Sarkisian, Paul; and Rockenfeller, Uwe, 5,746,059, Cl. 62-101.000.

Rockstroh, Todd J.; Crow, John M.; Lee, Ching-Pang; and Risbeck, James D., to General Electric Company. Method of laser forming a slot. 5,747,769, Cl. 219-121.710.

Rockwell Heavy Vehicle Suspension Systems, Inc.: *See—*

VanDenberg, Ervin K., 5,746,441, Cl. 280-713.000.

Rockwell International Corporation: *See—*

Fischer, Gregory M., 5,748,136, Cl. 342-33.000.

Rockwell, Marshall A., III. Liquid crystal optical waveguide display system. 5,748,825, Cl. 385-126.000.

Rocky Research: *See—*

Sarkisian, Paul; and Rockenfeller, Uwe, 5,746,059, Cl. 62-101.000.

Rodal, Eric B., to Trimble Navigation Limited. GPS timing receiver using oversampling. 5,748,144, Cl. 342-357.000.

Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., to Rolls-Royce plc. Mounting for coupling a turbofan gas turbine engine to an aircraft structure. 5,746,391, Cl. 244-54.000.

Rodgers, Scott D.: *See—*

Huck, Kamla P.; Rodgers, Scott D.; and Glew, Andrew F., 5,749,084, Cl. 711-1.000.

Rodriguez, Zaid B.: *See—*

Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., 5,747,968, Cl. 320-119.000.

Rodriques, Lester V.: *See—*

Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.

Rodts, James A.: *See—*

Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., 5,749,045, Cl. 455-31.200.

Roeper, Michael: *See—*

Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.

Roessler, Blake J.: *See—*

Davidson, Beverly L.; and Roessler, Blake J., 5,747,072, Cl. 424-93.200.

Roger, Stutz A.: *See—*

Telle, John M.; and Roger, Stutz A., 5,748,138, Cl. 342-45.000.

Rogers, Arthur A. Wind deflecting cover for a convertible vehicle. 5,746,472, Cl. 296-180.100.

Rogers Foods, Inc.: *See—*

Rice, Robert M.; Brink, Kevin B.; and Hansen, David J., 5,746,024, Cl. 47-58.000.

Rogers, Gary A.: *See—*

Lynch, Gary S.; and Rogers, Gary A., 5,747,492, Cl. 514-249.000.

Rogers, Mark D.: *See—*

Kintz, Kevin G.; and Rogers, Mark D., 5,747,792, Cl. 250-214.0VT.

Rogge, Ingo, to Hella KG Hueck & Co. Vehicle lamp mountable in an interior of a vehicle, particularly a raised auxiliary brake lamp. 5,746,498, Cl. 362-80.100.

Rohart, Claude: *See—*

Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, 5,748,013, Cl. 336-233.000.

Rohde, Siegfried: *See—*

Romann, Peter; and Rohde, Siegfried, 5,746,376, Cl. 239-585.400.

Rohm and Haas Company: *See—*

Bauer, William, Jr.; Hale, Timothy Allen; Mason, Robert Michael; and Upmacis, Rita Karina, 5,746,892, Cl. 203-38.000.

Roigas, Jan: *See—*

Wallen, Erik S.; Roigas, Jan; and Moseley, Pope L., 5,747,332, Cl. 435-272.000.

Roik, Geert: *See—*

Schulze, Thomas; Roik, Geert; Hahn, Michael; and Kleinhoff, Klaus, 5,746,848, Cl. 152-209.00R.

Roldan, Judith M.: *See—*

Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.

Rolf, Klaus W.: *See—*

Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.

Rollet, Philippe Alain Jean; and Bellera, Jacques Serge Louis, to Eurocopter France. Force-gradient cyclic stick system for a helicopter. 5,746,398, Cl. 244-223.000.

Rollins, Brian J.: *See—*

Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.

Rolls-Royce plc: *See—*

Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., 5,746,391, Cl. 244-54.000.

Rom, Paul F.; and Corace, Russell A., to Medtronic, Inc. Intravascular pump and bypass assembly and method for using the same. 5,746,709, Cl. 604-8.000.

Roman, Michael John: *See—*

Baragar, Marc Christopher; and Roman, Michael John, 5,745,952, Cl. 16-228.000.

Romann, Peter; and Rohde, Siegfried, to Robert Bosch GmbH. Valve and method for the production of a valve. 5,746,376, Cl. 239-585.400.

Romanowski, Michael J.: *See—*

Dunmead, Stephen D.; and Romanowski, Michael J., 5,746,803, Cl. 75-351.000.

Romes, Gary E.; Church, Joseph T.; Sanford, Steven; and Syme, Robert W., to Guardian Fiberglass, Inc. Method of making mineral fiber insulation batt impregnated with coextruded polymer layering system. 5,746,854, Cl. 156-62.200.

Römheld, Michael: *See—*

Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert, and Römheld, Michael, 5,746,051, Cl. 60-275.000.

Romich, Barry: *See—*

Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl. 345-133.000.

Romriell, Joseph N., to Intel Corporation. Generation of huffman tables for signal encoding. 5,748,121, Cl. 341-65.000.

Roncalli, José: *See—*

Broussard, Fabio; Adovasio, Mauro; and Roncalli, José, 5,747,601, Cl. 525-375.000.

Rondeau, Charles J., to Northrop Grumman Corporation. Hanger system. 5,746,329, Cl. 211-123.000.

Ronzio, Enrico: *See—*

Casareto, Enrico; Leoni, Massimo; Ronzio, Enrico; and Magni, Ambrogio, 5,747,330, Cl. 435-254.100.

Roovers, Wilhelmus Cornelus Waltherus Maria; and Choi, Chi Chung, to Van Doorne's Transmissie B.V. Continuously variable transmission. 5,746,678, Cl. 477-45.000.

Rorison, Judy Megan: *See—*

Duggan, Geoffrey; Teraguchi, Nobuaki; Rorison, Judy Megan; and Tomomura, Yoshitaka, 5,747,827, Cl. 257-15.000.

Ros, Marinus Antonius: *See—*

Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.

Rosaen, Eric J.: *See—*

Marsh, David Winsor; Rosaen, Lars Oscar; and Rosaen, Eric J., 5,747,701, Cl. 73-861.230.

Rosaen, Lars Oscar: *See—*

Marsh, David Winsor; Rosaen, Lars Oscar; and Rosaen, Eric J., 5,747,701, Cl. 73-861.230.

Rose, Jed E.; Behm, Frederique; and Turner, James, to Advanced Therapeutic Products, Inc.; and Duke University. Dry powder delivery system. 5,746,227, Cl. 131-270.000.

Rosemount Inc.: *See—*

Eryurek, Evren; and Lenz, Gary, 5,746,511, Cl. 374-2.000.

Rosen, Arthur L.: *See—*

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.

Rosen, Craig A.: *See—*

Hastings, Gregg A.; and Rosen, Craig A., 5,747,280, Cl. 435-69.100.

Rosen, Jonathan J.: *See—*

Weldon, Thomas D.; Larsen, Charles E.; and Rosen, Jonathan J., 5,746,414, Cl. 251-149.600.

Rosen, Perry: *See—*

Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,747,646, Cl. 530-351.000.

Rosen, Sanford: *See—*

Sibalis, Dan; and Rosen, Sanford, 5,746,711, Cl. 604-20.000.

Rosenberg, Steve; Spear, Kerry L.; and Martin, Eric J., to Chiron Corporation. Urokinase receptor ligands. 5,747,458, Cl. 514-18.000.

Rosenblatt, Michael: *See—*

Chorev, Michael; and Rosenblatt, Michael, 5,747,456, Cl. 514-12.000.

Rosenburg, John Howard: *See—*

Foster, David George; Gates, Edgar Preston; and Rosenburg, John Howard, 5,749,017, Cl. 396-578.000.

Rosenburgh, John H.: *See—*

Wess, Raymond E.; Piccinino, Ralph L., Jr.; and Rosenburgh, John H., 5,749,018, Cl. 396-578.000.

Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, to Schlumberger Technologies Inc. Analog channel for mixed-signal-VLSI tester. 5,748,124, Cl. 341-120.000.

Roshen, Waseem Ahmed; Korman, Charles Steven; and Daum, Wolfgang, to General Electric Company. Method for making magnetic and electromagnetic circuit components having embedded magnetic materials in a high density interconnect structure. 5,745,981, Cl. 29-607.000.

Rosinger, Christopher: *See—*

Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, 5,747,421, Cl. 504-214.000.

Rösli, Manfred: *See—*

Gietz, Hanspeter; Rösli, Manfred; and Bänziger, Heinz, 5,746,122, Cl. 100-43.000.

Ross, David S.; Jayaweera, Indira; and Leif, Roald N., to SRI International. Method for hydrothermal oxidation of halogenated organic compounds with addition of specific reactants. 5,746,926, Cl. 210-761.000.

Ross, Jamie S.; and Morefield, Elaine M., to Schering-Plough HealthCare Products, Inc. Sunscreen with disappering color indicator. 5,747,011, Cl. 424-59.000.

Rossman, Kent; Lue, Brian; and Redeker, Fred C., to Applied Materials, Inc. Shield for an electrostatic chuck. 5,748,434, Cl. 361-234.000.

Roth, Charles Philip: *See—*

Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,748,855, Cl. 395-800.230.

Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., to Board of Regents, The University of Texas System. Methods and compositions comprising DNA damaging agents and p53. 5,747,469, Cl. 514-44.000.

Roth, James A.: *See—*

Chihara, Kohji Y.; Roth, James A.; and Krotke, Gary A., 5,746,867, Cl. 156-242.000.

Roth, Klaus: *See—*

Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.

Roth, Stefan: *See—*

Schönfelder, Lothar; Leimer, Gerhard; and Roth, Stefan, 5,746,969, Cl. 264-645.000.

Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., to United States of America, Health and Human Services; and Research Triangle Institute. Selective inhibitors of biogenic amine transporters. 5,747,503, Cl. 514-294.000.

Rothrock, Lewis V., to Intel Corporation. Multilevel arbitration in a data conference. 5,748,618, Cl. 370-260.000.

Rotunda, John T.; Hass, Lester A.; and Pipinich, Victor, to Quinton Instrument Company. Current sensing module for a variable speed AC motor drive for use with a treadmill. 5,747,955, Cl. 318-434.000.

Rötzschke, Olaf: *See—*

Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović, Stefan; and Jung, Günther, 5,747,269, Cl. 435-7.240.

Rough, J. Kirkwood: *See—*

Lehan, John; Byorum, Henry; Hill, Russell J.; and Rough, J. Kirkwood, 5,746,894, Cl. 204-192.120.

Roule, Thomas Richard: *See—*

Manico, Joseph Anthony; Roule, Thomas Richard; Loveland, William Davis; and Pricola, Barton Anthony, 5,748,284, Cl. 355-39.000.

Roulston, Gary: *See—*

Fiore, Joseph F., Jr.; Gehret, Michael J.; Roulston, Gary; and El-Khateeb, Hesham, 5,746,020, Cl. 43-85.000.

Roussel Uclaf: *See—*

Agouridas, Constantin; Bretin, François; and Chantot, Jean-François, 5,747,467, Cl. 514-29.000.

Rowe, Eric A.: *See—*

Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.

Rowe, W. Bruce; Mark, David A.; and Madsen, David C., to Nestec, Ltd. Method for insuring adequate intracellular glutathione in tissue. 5,747,459, Cl. 514-18.000.

Rowland, Randy: *See—*

Peck, John C.; Rowland, Randy; and Wu, Duanpei, 5,748,843, Cl. 395-2.840.

Royal Housing, Inc.: *See—*

Ueno, Teruo, 5,746,657, Cl. 463-41.000.

Royal Master Grinders, Inc.: *See—*

Cheetham, Charles J., 5,746,644, Cl. 451-6.000.

Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., to MCI Corporation. Autonotification system for notifying recipients of detected events in a network environment. 5,748,884, Cl. 395-185.100.

Rozak, Michael J.; and Spoltman, James H., to Microsoft Corporation. Method and system for creating voice commands using an automatically maintained log interactions performed by a user. 5,748,191, Cl. 395-333.000.

Rozental, Mark; Horowitz, Ilan Yehezkel; and Ben-Ayun, Moshe, to Motorola, Inc. Radio transmitter power amplifier calibration. 5,748,037, Cl. 330-2.000.

Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., to Sundstrand Corporation. Position and velocity sensorless control for a motor generator system operated as a motor using exciter impedance. 5,747,971, Cl. 322-10.000.

Rozman, Rodney R.; Durante, Richard J.; Fandrich, Mickey L.; and Alexis, Ranjeet, to Intel Corporation. Memory device with a central control bus and a control access register for translating an access request into an access cycle on the central control bus. 5,748,939, Cl. 395-430.000.

RTI International Corporation: *See—*

Goldie, Glenn C., 5,749,026, Cl. 399-103.000.

Rubanyi, Gabor M.: *See—*

Kauser, Katalin; and Rubanyi, Gabor M., 5,747,509, Cl. 514-324.000.

Ruben, Janet. Toys and storage device. 5,746,429, Cl. 273-157.00R.

Rubenstein, Scott K.: *See—*

Bennett, Arthur T.; Baum, Stephen L.; Rubenstein, Scott K.; and Randall, Gary A., 5,747,893, Cl. 307-100.000.

Ruhie's Costume Co., Inc.: *See—*

Beige, Marc P.; and Kearns, John G., 5,747,144, Cl. 428-187.000.

Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, to University of California, The Regents of the. Protein kinase required for RAS signal transduction. 5,747,275, Cl. 435-15.000.

Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, to University of California, The Regents of the. Protein kinase required for Ras signal transduction. 5,747,288, Cl. 435-69.100.

Rubinsky, Boris: *See—*

Benaron, David A.; and Rubinsky, Boris, 5,746,210, Cl. 128-665.000.

Rubinsztajn, Slawomir; and Gross, David C., to General Electric Company. Process for removing silicone coatings and sealants and composition therefore. 5,747,624, Cl. 528-21.000.

Ruch, Frank E.; and Acker, Elizabeth A., to ImmuCell Corporation. Process for isolating immunoglobulins in whey. 5,747,031, Cl. 424-130.100.

Rudell, Elliot: *See—*

Cernansky, Joseph; Foster, George T.; and Rudell, Elliot, 5,746,636, Cl. 446-16.000.

Rudell, Elliot A.: *See—*

Cernansky, Joseph; Foster, George T.; and Rudell, Elliot, 5,746,636, Cl. 446-16.000.

Rudisill, Charles Albert, to Ericsson, Inc. Retractable antenna assembly. 5,748,150, Cl. 343-702.000.

Rudy, Norman A.: *See—*

Pfarr, Craig E.; and Rudy, Norman A., 5,746,566, Cl. 414-751.000.

Rueb, Christopher J.: *See—*

Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.

Rugg, Arthur E.: *See—*

Parsons, George H.; Johns, Margaret A.; and Rugg, Arthur E., 5,747,265, Cl. 435-7.200.

Rühl, Thomas: *See—*

Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.

Runciman, Robert John; and Allard, Randall N., to Bristol-Myers Squibb Company; and Terray Corporation. Bone plate template. 5,746,742, Cl. 606-69.000.

Running, Joyce: *See—*

Sheridan, Patrick; Chang, Chu-An; Running, Joyce; and Urdea, Michael S., 5,747,244, Cl. 435-6.000.

Ruoslahti, Erkki I.; and Morla, Alex, to La Jolla Cancer Research Foundation. Method of modulating tumor cell migration using fibronectin type III peptides. 5,747,452, Cl. 514-12.000.

Ruppell, Robert M.: *See—*

Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.

Russell, David John: *See—*

Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.

Russell, Howard L.; and Morris, William N., Jr., to Wilmington Rubber & Gasket Co., Inc. Two-piece hole punch. 5,746,104, Cl. 83-698.710.

Russell, John: *See—*

Angeletti, Ruth Hogue; and Russell, John, 5,747,454, Cl. 514-12.000.

Russell, Meri Charm; and Fenger, Clara K., to Mortar & Pestle Veterinary Pharmacy, Inc. Treatment of equine protozoal myeloencephalitis. 5,747,476, Cl. 514-275.000.

Russell, Randy G.: *See—*

Shackle, Peter W.; Russell, Randy G.; Crouse, Kent E.; and Bezdon, Ronald J., 5,747,941, Cl. 315-224.000.

Ruszkay, Thomas A.: *See—*

Auguello, Michael; Ruszkay, Thomas A.; and Reier, George E., 5,747,067, Cl. 424-464.000.

Rutherford, William Michael; Hinds, Mark Alan; and Dennis, Scott Michael, to Pioneer Hi-Bred International, Inc. Bacterial treatment for silage. 5,747,020, Cl. 424-93.450.

Rutkowski, James: *See—*

Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.

Rutsch, Walter: *See—*

Hettinger, Gerhard; and Rutsch, Walter, 5,746,079, Cl. 72-57.000.

Rutten, Hendrik Gerard Jozef; Berkers, Jacobus Arnoldus Peter; and Vegter, Gert, to Oce-Nederland B.V. Device for collecting folded and unfolded copy sheets. 5,746,424, Cl. 270-37.000.

Ruuskanen, Arvo Aukusti Juhani: *See—*

Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.

Ryan, Kevin J.; and Wright, Jeffrey P., to Micron Technology, Inc. Memory device with multiple internal banks and staggered command execution. 5,748,551, Cl. 365-230.030.

Ryan, Kevin J., to Micron Technology, Inc. Simplified clocked DRAM with a fast command input. 5,749,086, Cl. 711-105.000.

Ryan, Lisa L., to H. B. Fuller Licensing & Financing, Inc. High heat resistant hot melt adhesive. 5,747,573, Cl. 524-270.000.

Ryan, Terence E.: *See—*

Kink, John A.; Ryan, Terence E.; Todd, John A.; and Saeed, Badr, 5,747,240, Cl. 435-5.000.

Ryklin, Irma; and Sajic, Branko, to Stepan Company. Water-in-oil emulsions containing increased amounts of oil and methods for preparing same. 5,746,945, Cl. 252-309.000.

Ryle, Lynn S.: *See—*

Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.

Ryoden Semiconductor System Engineering Corporation: *See—*

Kuroda, Takeshi; and Kanno, Itaru, 5,746,233, Cl. 134-57.00R.

Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, 5,747,843, Cl. 257-296.000.

Ryu, Hyung S.: *See—*

Cleary, David J.; and Ryu, Hyung S., 5,746,738, Cl. 606-15.000.

Ryu, Jae-chul, to Samsung Aerospace Industries, Ltd. Multi-layered circuit substrate and manufacturing method thereof. 5,747,222, Cl. 430-312.000.

S3 Incorporated: *See—*

Ma, Chingwo; Yang, Inging; and Hsu, Wei-Chan, 5,748,126, Cl. 341-143.000.

Saadat, Irfan: *See—*

Thomas, Michael E.; and Saadat, Irfan, 5,748,523, Cl. 365-171.000.

Saadat, Vahid, to Trimedyne, Inc. Enclosure for a lasing device. 5,746,737, Cl. 606-15.000.

Sabeti, Roya R.: *See—*

Holl, Mark R.; and Sabeti, Roya R., 5,748,827, Cl. 385-134.000.

Sackler, Richard; Goldenheim, Paul; and Chasin, Mark, to Euro-Celtique, S.A. Prolonged local anesthesia with colchicine. 5,747,060, Cl. 424-426.000.

Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., to Xerox Corporation. Ink compositions. 5,747,554, Cl. 523-161.000.

Sadamori, Hiroyuki: *See—*

Hirohe, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, 5,746,505, Cl. 362-260.000.

Sadar, Michael J., to Hach Company. Particle counter verification method. 5,747,667, Cl. 73-1.020.

Sadayoshi, Seiji: *See—*

Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000.

Sadowniczak, Gary W.: *See—*

Norris, George B.; Staudinger, Joseph; and Sadowniczak, Gary W., 5,748,042, Cl. 330-277.000.

Saeed, Badr: *See—*

Kink, John A.; Ryan, Terence E.; Todd, John A.; and Saeed, Badr, 5,747,240, Cl. 435-5.000.

Saeki, Minoru; Kawanishi, Masaki; Tsuchiya, Yoshiaki; and Suzuki, Tomokiyo, to Toyota Jidosha Kabushiki Kaisha. Apparatus for estimating vehicle speed based on detected wheel speed, without influence of noise included in the detected wheel speed. 5,748,503, Cl. 364-565.000.

Safety Optical Service Company: *See—*

Simmons, Bennie F., Sr., 5,748,278, Cl. 351-44.000.

Sagawa, Morikazu: *See—*

Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,748,059, Cl. 333-204.000.

Saggi, Rajesh Jaigopai: *See—*

Cheok, Calvin Kok-Hwa; and Saggi, Rajesh Jaigopai, 5,746,353, Cl. 222-132.000.

Sagredos, Angelos: *See—*

Lemke, Stefan; and Sagredos, Angelos, 5,747,080, Cl. 426-72.000.

Saha, Badal C.; and Bothast, Rodney J., to United States of America, Agriculture. Glucose and cellobiose tolerant β-glucosidase from *Candida peltata*. 5,747,320, Cl. 435-209.000.

Sahatjian, Ronald A.: *See—*

Abele, John E.; and Sahatjian, Ronald A., 5,746,745, Cl. 606-108.000.

Sahoo, Soumya: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Saidman, Laurence B.: *See—*

Smith, James C.; Hogan, Patrick T.; and Saidman, Laurence B., 5,747,102, Cl. 427-96.000.

Saimi, Tetsuo: *See—*

Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, 5,748,599, Cl. 369-103.000.

Saint-Gobain Vitrage: *See—*

Von Alpen, Ulrich; and Sauer, M. Gerd, 5,747,170, Cl. 428-426.000.

Saito, Akio: *See—*

Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.

Saito, Izumu: *See—*

Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,747,241, Cl. 435-5.000.

Saito, Kazuo; and Ishimatsu, Takeshi, to Nisshinbo Industries, Inc. Process for production of magnetic recording medium. 5,746,951, Cl. 264-29.100.

Saito, Kimihiro: *See—*

Tamada, Hitoshi; Matsumoto, Shuichi; Nishi, Noriaki; and Saito, Kimihiro, 5,748,368, Cl. 359-486.000.

Saito, Kimitaka: *See—*

Kuzuya, Yoshihumi; Saito, Kimitaka; and Shibata, Hitoshi, 5,746,189, Cl. 123-568.000.

Saito, Koichi: *See—*

Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.

Saito, Minoru: *See—*

Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.

Saito, Shigeru: *See—*

Kasai, Takao; Yoshikawa, Kenichi; Saito, Shigeru; and Hoshi, Masami, 5,746,960, Cl. 264-234.000.

Saito, Takahide: *See—*

Kawase, Tatsuo; Hattori, Naoshi; Nozaki, Takashi; Makino, Tomoaki; and Saito, Takahide, 5,746,676, Cl. 476-50.000.

Saito, Takeshi: *See—*

Esaki, Hiroshi; Saito, Takeshi; and Matsuzawa, Shigeo, 5,748,626, Cl. 370-355.000.

Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, to Tonen Corporation. Catalyst for the polymerization of olefines and processes for the polymerization of olefines using the same. 5,747,595, Cl. 525-270.000.

Saitoo, Terumi: *See—*

Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, 5,745,972, Cl. 29-430.000.

Saji, Ryohei: *See—*

Ichikawa, Hideki; and Saji, Ryohei, 5,745,977, Cl. 29-598.000.

Sajic, Branko: *See—*

Ryklin, Irma; and Sajic, Branko, 5,746,945, Cl. 252-309.000.

Sakaguchi, Katsuhiko, to Canon Kabushiki Kaisha. Method and apparatus for inputting handwritten alphanumeric characters and for displaying the input characters. 5,748,779, Cl. 382-203.000.

Sakaguchi, Shinji: *See—*

Momota, Makoto; Sato, Kenichiro; and Sakaguchi, Shinji, 5,747,218, Cl. 430-192.000.

Sakai, Masanori; and Shimizu, Hideaki, to Canon Kabushiki Kaisha. Apparatus and method for processing an image using expansion to connect isolated neighboring image information followed by compression. 5,748,797, Cl. 382-256.000.

Sakai, Shigenobu: *See—*

Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,748,272, Cl. 349-86.000.

Sakai, Shinri: *See—*

Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Sakaki, Mamoru: *See—*

Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.

Sakakibara, Eiji: *See—*

Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.

Sakamoto, Kazushi: *See—*

Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.

Sakamoto, Shinsuke: *See—*

Watanabe, Atsushi; Terada, Tomoyuki; and Sakamoto, Shinsuke, 5,748,854, Cl. 395-93.000.

Sakanaka, Kazunobu: *See—*

Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Sakanaka, Osamu: *See—*

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Sakashita, Hiroshi; and Katagiri, Masayuki, to Sankyo Seiki Mfg. Co., Ltd. Disc drive device chucking magnet magnetizing method and magnetizing apparatus. 5,745,970, Cl. 29-407.050.

VOL
2 10
ISS
1
MY
5
998
MI

Sakiyama, Kazuhiro, to Nakamichi Corporation. Device for playing back disks. 5,748,577, Cl. 369-36.000.

Sakonjyu, Kazutaka; and Hori, Eisaku, to Jidosha Denki Kogyo Kabushiki Kaisha. Automatic vehicle speed controlling apparatus. 5,749,063, Cl. 701-93.000.

Sakuma, Masafumi; Ookawa, Akemi; and Myouga, Takahiro, to Aisin Seiki Kabushiki Kaisha. Switched reluctance motor. 5,747,912, Cl. 310-261.000.

Sakuma, Masao: *See—*
Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.

Sakurai, Akito, to Hitachi, Ltd. Knowledge base system and recognition system. 5,748,850, Cl. 395-50.000.

Sakurai, Hiroshi, to Canon Kabushiki Kaisha. Camera using film having a magnetic memory portion. 5,749,007, Cl. 396-319.000.

Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, to Nitto Denko Corporation. Casting method for forming a resin molding. 5,746,953, Cl. 264-40.400.

Sakurai, Naoki; and Sugawara, Yoshitaka, to Hitachi, Ltd. Dielectric isolated high voltage semiconductor device. 5,747,829, Cl. 257-66.000.

Sakurai, Takaaki: *See—*
Matsuo, Hideki; Kokubo, Masahiro; Ohhayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.

Salas, Jordi: *See—*
Carceller, Elena; Jimenez, Pere J.; Salas, Jordi; Almansa, Carmen; Bartroli, Javier; Merlos, Manel; Giral, Marta; Balsa, Dolors; Ferrando, Rosa; Garcia-Rafanell, Julian; and Forn, Javier, 5,747,477, Cl. 514-150.000.

Salas, Lucia Victoria: *See—*
Bory, Barbara Helen; Lunsmann, Walter Joseph; Murphy, Dennis Stephen; Padron, Tamara; and Salas, Lucia Victoria, 5,747,442, Cl. 510-475.000.

Salet, Paul: *See—*
Brillouet, François; Goldstein, Léon; Jacquet, Joël; Plais, Antonina; and Salet, Paul, 5,747,366, Cl. 438-44.000.

Sallwasser, Alan: *See—*
Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

Salminen, Seppo: *See—*
Virsu, Veijo; and Salminen, Seppo, 5,746,205, Cl. 128-630.000.

Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, to P.A.T.H.; and Vitajet Corporation. Air powered needleless hypodermic injector. 5,746,714, Cl. 604-68.000.

Salomon S.A.: *See—*
Clement, Jean-Pierre; and Dalvy, Olivier, 5,746,015, Cl. 36-93.000.

Salsman, Kenneth E.; Malik, Amjad I.; and Kingsley, Gary B., to Delta America Ltd. Optical engines for tricolor projectors having co-planar like optical elements. 5,748,379, Cl. 359-634.000.

Salter, James G.: *See—*
Swanson, David W.; Kaplinsky, George T.; Salter, James G.; and Rhoads, W. Wistar, 5,748,215, Cl. 347-87.000.

Saltman, Robert: *See—*
Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,747,591, Cl. 525-176.000.

Salz, Jack: *See—*
Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.

Samachisa, Gheorghe: *See—*
Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,747,359, Cl. 437-186.000.

Samjin Pharm. Co., Ltd.: *See—*
Cho, Eui Hwan; Chung, Sun Gan; Lee, Kyou Heung; and Park, Si Kyung, 5,747,521, Cl. 514-420.000.

Sampey, Harry R.; Geary, Jeffrey A.; and Schimpf, James H., to Nu-Metrics, Inc. Method and apparatus for analyzing traffic and a sensor therefor. 5,748,108, Cl. 340-933.000.

Samsung Aerospace Industries, Ltd.: *See—*
Lee, Ki-yul, 5,748,996, Cl. 396-63.000.
Ryu, Jae-chul, 5,747,222, Cl. 430-312.000.

Samsung Display Devices Co., Ltd.: *See—*
Kim, Dae-il; Kim, Nae-koo; Kim, Kyung-min; and Jeong, Dong-cheol, 5,747,939, Cl. 315-169.400.
Kim, Hyeong-dong, 5,747,925, Cl. 313-446.000.

Samsung Electro-Mechanics Co., Ltd.: *See—*
Kim, In Eung; and Choukh, A. M., 5,748,414, Cl. 360-113.000.
Park, Chang Jin; Kang, Dong Hoon; and Lee, Chul Woo, 5,748,356, Cl. 359-207.000.
Park, Chang Jin, 5,748,357, Cl. 359-216.000.
Song, Ci-moo; Lee, Chul-woo; and Cho, Han-ki, 5,748,172, Cl. 345-111.000.

Samsung Electronics Co., Ltd.: *See—*
Cha, Gi-ho; Kang, Chi-jung; Lee, Byung-hun; and Lee, Kyung-wook, 5,746,883, Cl. 156-580.000.
Chae, Seung-ki; Ahn, Byung-seol; Hahm, Sang-kyu; and Kim, Jong-soo, 5,746,832, Cl. 118-665.000.
Choi, Byeng-Sun, 5,748,531, Cl. 365-185.180.
Choi, Myoung-soo, 5,748,402, Cl. 360-85.000.
Choi, Myung-chan; and Park, Churoo, 5,748,639, Cl. 371-212.000.
Choi, Seung-Beom; Cho, Shung-Hyun; and Park, Noh-Byung, 5,748,971, Cl. 395-750.030.
Jang, Soon-mo, 5,748,830, Cl. 386-22.000.
Jeon, Hee-Seog, 5,747,374, Cl. 438-309.000.
Jeon, Jun-Young, 5,747,974, Cl. 323-269.000.
Jeon, Jun-Young; and Park, Pil-Soon, 5,748,550, Cl. 365-226.000.
Kang, Bok-Moon, 5,748,557, Cl. 365-230.080.
Kim, Do Weon, 5,746,069, Cl. 68-23.200.
Kim, Nak-Seok, 5,748,597, Cl. 369-94.000.
Kim, Sung-Soo, 5,748,158, Cl. 345-33.000.
Ko, Jung-wan, 5,748,119, Cl. 341-59.000.
Kwon, Suk-Chun; and Kim, Jim-Ki, 5,748,536, Cl. 365-185.250.
Lee, Gab-Youl, 5,746,655, Cl. 454-233.000.
Lee, Hee-Soo, 5,748,835, Cl. 386-104.000.
Lee, Hyong-Gon, 5,748,529, Cl. 365-185.170.
Lee, Jae-soo, 5,748,403, Cl. 360-96.500.
Lee, Jong-wan, 5,748,605, Cl. 369-222.000.
Lee, Jong-young, 5,748,722, Cl. 379-160.000.
Lee, Joung-Sun; Kim, Dae-Yul; An, Yo-Han; and Jun, Jae-Kang, 5,746,652, Cl. 454-187.000.
Lee, Kyu-pil, 5,748,521, Cl. 365-149.000.
Lee, Sang-Bo; and Cho, Soo-In, 5,748,543, Cl. 365-200.000.
Lee, Yong-soo, 5,748,332, Cl. 358-335.000.
Limberg, Allen LeRoy, 5,748,226, Cl. 348-21.000.
Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, 5,747,783, Cl. 219-758.000.
Park, Hyoung-Koo, 5,749,030, Cl. 399-148.000.
Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, 5,747,690, Cl. 73-504.120.
Park, Yong-Chul; Paik, Joon-Ki; and Kim, Dong-Wook, 5,748,231, Cl. 348-208.000.
Sim, Tae-Hyeon, 5,748,587, Cl. 369-50.000.
Suk, Jong-Wook; Park, Jin-Ho; Park, Shin-Hyun; and Kim, Chang-Sik, 5,748,297, Cl. 356-72.000.
Yoo, Jong-weon; and Kim, Keon-soo, 5,747,848, Cl. 257-316.000.

Samuelsson, Bengt Bertil: *See—*
Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, 5,747,473, Cl. 514-45.000.

Sanada, Kazuo, to Fuji Photo Film Co., Ltd. Liquid injection apparatus. 5,746,373, Cl. 239-102.200.

Sanchez, Clifton W., to Crystal Semiconductor, Inc. Resynchronization of a synchronous serial interface. 5,748,684, Cl. 375-357.000.

Sanchez, José: *See—*
Moracchini, Gérard; Sanchez, José; de Hemptinne, Jean-Charles; and Ungerer, Philippe, 5,747,674, Cl. 73-61.440.

Sanda, Tsuyoshi; and Fujiwara, Tsutomu, to Kabushiki Kaisha TEC. Printer and tractor device therefor. 5,746,525, Cl. 400-605.000.

Sandberg, Denise: *See—*
Herring, Kathryn; and Sandberg, Denise, 5,747,268, Cl. 435-7.230.

Sandberg, Jonathan S.: *See—*
Lopresti, Daniel P.; and Sandberg, Jonathan S., 5,748,807, Cl. 382-310.000.

Sanden Corporation: *See—*
Yabushita, Junichi; Otake, Shinichi; and Yoshii, Yuji, 5,747,905, Cl. 310-89.000.

Sanders, David J.: *See—*
Ong, Beng S.; Mychajlowskij, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.

Sanders, William Thomas: *See—*
Breed, David S.; and Sanders, William Thomas, 5,746,446, Cl. 280-743.100.

Sandhu, Gurtej S.: *See—*
Sharan, Sujit; and Sandhu, Gurtej S., 5,747,116, Cl. 427-534.000.

Sandia Corporation: *See—*
Benavides, Gilbert L., 5,747,915, Cl. 310-331.000.
Crow, James T., 5,748,063, Cl. 335-299.000.

Sandia National Laboratories: *See—*
Mara, Leo M., 5,746,539, Cl. 404-84.050.

Sandig, Bruce, to Infopak, Inc. Electronic telephone directory with interchangeable listings. 5,748,906, Cl. 395-251.000.

SanDisk Corporation: *See—*
Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,747,359, Cl. 437-186.000.

Saneii, Hossain; Boroomand, Mohammad R.; and Ferriell, Michael R., to Advanced ChemTech, Inc. Apparatus for automated synthesis of chemical compounds. 5,746,982, Cl. 422-134.000.

Saneshige, Ryoji; and Kuyama, Koji, to Matsushita Electric Industrial Co., Ltd. Motor including an apparatus for mounting a rotor and stator coil to a printed circuit board. 5,747,908, Cl. 310-91.000.

San Feliciano, Arturo: *See—*
Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.

Sanford, Steven: *See—*
Romes, Gary E.; Church, Joseph T.; Sanford, Steven; and Syme, Robert W., 5,746,854, Cl. 156-62.200.

Sangregory, Jude A.; and Pearson, Douglas H., to Eastman Kodak Company. One-time-use camera with manual control lever and bi-directional over-center spring for closing movable light shield of film cassette. 5,748,989, Cl. 396-6.000.

Sankyo Seiki Mfg. Co., Ltd.: *See—*
Sakashita, Hiroshi; and Katagiri, Masayuki, 5,745,970, Cl. 29-407.050.

Sannipoli, Alfred L., Sr. Multiple level vault assembly. 5,746,030, Cl. 52-136.000.

Sano, Hironari: *See—*
Nishida, Koji; Kurasawa, Yoshihiro; Takagi, Kiyoji; and Sano, Hironari, 5,747,575, Cl. 524-443.000.

Sano, Hiroshi: *See—*
Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.

Sano, Koichi: *See—*
Higashi, Noboru; and Sano, Koichi, 5,748,193, Cl. 345-427.000.

Sano, Kunio, to Tokyo Electron Limited. High-frequency-transmission printed wiring board, probe card, and probe apparatus. 5,748,006, Cl. 324-754.000.

Sano, Yoshikazu: *See—*
Shimomura, Koji; and Sano, Yoshikazu, 5,747,790, Cl. 250-208.100.

Sanpei, Tatsuya, to NEC Corporation. Quick image processor of reduced circuit scale with high image quality and high efficiency. 5,748,793, Cl. 382-251.000.

Sanserino, Jon J. Speakerphone with remote microphone having speaker cut-off for half-duplex operation. 5,748,707, Cl. 379-61.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Nakamura, Daisuke; and Iida, Masahiko, 5,746,055, Cl. 60-454.000.

Sansum Medical Research Foundation: *See—*
Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.

Santangelo, Francesco: *See—*
Montanari, Stefania; Cavalleri, Paolo; and Santangelo, Francesco, 5,747,513, Cl. 514-351.000.

Santerre,-Pierre-Yves: *See—*
Lipe, Ralph A.; and Santerre, Pierre-Yves, 5,748,980, Cl. 395-828.000.

Sanyo Chemical Industries, Ltd.: *See—*
Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, 5,747,570, Cl. 524-161.000.

Sanyo Electric Co., Ltd.: *See—*
Kaneko, Satoru; and Ohkoda, Toshiyuki, 5,747,375, Cl. 438-396.000.
Narukawa, Satoshi; Amazutsumi, Toru; Fukuda, Hideki; and Tamaki, Hiyoshi, 5,746,780, Cl. 29-623.100.
Okada, Shigeyuki; Tanahashi, Naoki; and Nakashima, Hayato, 5,748,514, Cl. 364-725.030.
Tamai, Mikitaka, 5,747,969, Cl. 320-141.000.

Sara Lee Corporation: *See—*
Popa, Catrinel I.; Browder, George A., Jr.; and Segraves, Archie Dale, 5,746,068, Cl. 66-176.000.

Saraf, Ravi: *See—*
Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.

Sarcos Group: *See—*
Jacobsen, Stephen C.; and Wells, David L., 5,747,692, Cl. 73-514.250.
Jacobsen, Stephen C.; and Wells, David L., 5,747,993, Cl. 324-109.000.

Saripella, Satish C.: *See—*
Hunt, Jeffery Scott; and Saripella, Satish C., 5,748,021, Cl. 327-312.000.

Sarkisian, Paul; and Rockenfeller, Uwe, to Rocky Research. Triple effect absorption apparatus and method. 5,746,059, Cl. 62-101.000.

Särkkä, Veli-Matti, to Nokia Telecommunications Oy. Dielectric resonator having two planar surfaces with respective adjustment plates parallel thereto. 5,748,060, Cl. 333-235.000.

Sartor, Thomas Frank: *See—*
Maase, Daniel Frederick; and Sartor, Thomas Frank, 5,748,766, Cl. 382-124.000.

Sasago, Yoshikazu: *See—*
Ikemoto, Isao; Sasago, Yoshikazu; Oshida, Haruhisa; Karakama, Toshiyuki; and Noda, Shinya, 5,749,027, Cl. 399-113.000.

Sasahara, Kenji: *See—*
Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.

Sasaki, Kenji, to Ricoh Company, Ltd. Display system including data display fields in which characters are scrolled. 5,749,082, Cl. 707-508.000.

Sasaki, Makoto; Ishii, Takafumi; and Haji, Katsuhiko, to Nippon Oil Co., Ltd. Electro rheological fluid comprising lyotropic liquid crystalline polymer. 5,746,934, Cl. 252-77.000.

Sasaki, Masaomi: *See—*
Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.

Sasaki, Seimi: *See—*
Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, 5,748,822, Cl. 385-90.000.

Sasaki, Shingo; and Yamao, Mutsunori, to Unitika Ltd. Precursor of amorphous carbon molded article. 5,747,631, Cl. 528-86.000.

Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, to Nippon Crucible Co., Ltd. Method of drying lining refractory material for instrument/apparatus. 5,747,400, Cl. 501-94.000.

Sasaki, Takamitsu: *See—*
Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,388, Cl. 359-700.000.
Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.

Sasaki, Takashi; Sasaki, Yasuko; Ito, Yoshiyuki; and Otsu, Kumi, to Meiji Milk Products Co., Ltd. Gene integration into chromosomes of *lactobacillus delbrueckii* species and integrants thereof. 5,747,310, Cl. 435-172.300.

Sasaki, Takayoshi: *See—*
Murakami, Hiroshi; Tsutsui, Masanori; Asai, Katsumi; and Sasaki, Takayoshi, 5,746,002, Cl. 33-517.000.

Sasaki, Umekichi: *See—*
Ishida, Noboru; Sasaki, Umekichi; Takigawa, Katsuya; and Suda, Satoshi, 5,746,933, Cl. 252-68.000.

Sasaki, Yasuko: *See—*
Sasaki, Takashi; Sasaki, Yasuko; Ito, Yoshiyuki; and Otsu, Kumi, 5,747,310, Cl. 435-172.300.

Sasuga, Masumi: *See—*
Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.

Satake, Masaki: *See—*
Hashimoto, Hiroshi; Murayama, Yuichiro; Satake, Masaki; and Okita, Tsutomu, 5,747,157, Cl. 428-332.000.

Sato, Akira: *See—*
Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, 5,747,864, Cl. 257-458.000.

Sato, Atsushi: *See—*
Tsuchikawa, Megumu; Sato, Atsushi; Tomono, Akira; and Ishii, Kenichiro, 5,748,775, Cl. 382-190.000.

Sato, Hajime: *See—*
Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.

Sato, Hideyuki: *See—*
Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.

Sato, Hirohide: *See—*
Tsutsui, Toshio; Sato, Hirohide; and Maruyama, Toshinori, 5,748,463, Cl. 363-127.000.

Sato, Katsuhiro: *See—*
Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, 5,747,206, Cl. 430-64.000.

Sato, Kenichiro: *See—*
Momota, Makoto; Sato, Kenichiro; and Sakaguchi, Shinji, 5,747,218, Cl. 430-192.000.

Sato, Koichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Still video apparatus having data signal suppression. 5,748,833, Cl. 386-95.000.

Sato, Koichi: *See—*
Yamamoto, Yasuhiro; and Sato, Koichi, 5,748,829, Cl. 386-46.000.

Sato, Makiko; Hisatake, Yuzo; Watanabe, Ryoichi; and Hatoh, Hitoshi, to Kabushiki Kaisha Toshiba. Liquid crystal display device and liquid crystal display apparatus. 5,748,275, Cl. 349-144.000.

Sato, Mitsuru; Kobayashi, Masakazu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Stock developer solutions for photoresists and developer solutions prepared by dilution thereof. 5,747,224, Cl. 430-331.000.

Sato, Nakako: *See—*
Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.

Sato, Osamu; and Shimada, Koichi, to Canon Denshi Kabushiki Kaisha. Light-quantity control device with spring control of light control member. 5,749,015, Cl. 396-508.000.

Sato, Ryoichi: *See—*
Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.

Sato, Takaaki: *See—*
Reed, John C.; and Sato, Takaaki, 5,747,245, Cl. 435-6.000.

Sato, Takashi: *See—*
Kobayashi, Masato; Nozawa, Osamu; Kawai, Hisao; Moroishi, Keiji; Sato, Takashi; and Horikawa, Junichi, 5,746,893, Cl. 204-192.200.

Sato, Takehiko; Takizawa, Hiroo; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Silver halid photographic material. 5,747,231, Cl. 430-514.000.

Sato, Takeo: *See—*
Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, 5,748,288, Cl. 355-53.000.

Sato, Takuma: *See—*
Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.

Sato, Toshio: *See—*
Ogawa, Hiroshi; Sugita, Seiichi; and Sato, Toshio, 5,746,568, Cl. 414-789.600.

Sato, Yoshikazu, to University of Pennsylvania, The Trustees of the. Type error checker for type-free or polymorphic computer language. 5,748,966, Cl. 395-708.000.

OL
210
ISS
1
MY
5
998
MI

Sato, Yoshinori, to Kabushiki Kaisha Youma Kohboh. Anchor unit with expansive anchor member expanded by utilizing turning force of bolt. 5,746,556, Cl. 411-42.000.

Sato, Yuko: *See—*
  Sugimoto, Mitsuhiro; Kondo, Yuji; Zama, Koichi; and Sato, Yuko, 5,747,916, Cl. 310-348.000.

Satoh, Akio, to Ricoh Company, Ltd. Method and apparatus for mixing two or more kinds of resin material liquids. 5,746,981, Cl. 422-128.000.

Satoh, Hironobu: *See—*
  Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Satoh, Yoshitaka: *See—*
  Itoh, Shigeo; Yonezawa, Yoshihisa; Toki, Hitoshi; and Satoh, Yoshitaka, 5,746,589, Cl. 432-77.000.

Satterlee, Daniel G.: *See—*
  Fioretti, William C.; Kousoulas, Konstantin; and Satterlee, Daniel G., 5,747,659, Cl. 536-23.400.

Sattler, Stephan, to Boehringer Mannheim GmbH. System for dosing liquids. 5,747,350, Cl. 436-180.000.

Sauer, M. Gerd: *See—*
  Von Alpen, Ulrich; and Sauer, M. Gerd, 5,747,170, Cl. 428-426.000.

Saul, Greg, to O'Sullivan Industries, Inc. Upholstery to furniture fastener system. 5,746,477, Cl. 297-218.500.

Saul, Jonathan R.: *See—*
  LaPointe, Larry P.; and Saul, Jonathan R., 5,747,965, Cl. 320-5.000.

Saulo Quaggio: *See—*
  Quaggio, Saulo, 5,747,960, Cl. 318-625.000.

Saunders, Derek John: *See—*
  Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, 5,747,291, Cl. 435-69.600.

Saunders, Roger N.: *See—*
  Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., 5,746,073, Cl. 68-198.000.

Saver, William E.: *See—*
  McHenry, E. Ronald; and Saver, William E., 5,746,906, Cl. 208-22.000.

Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, to Sumitomo Electric Industries, Ltd. Method of making a thermocouple. 5,747,727, Cl. 136-201.000.

Sawada, Kenzo: *See—*
  Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.

Sawada, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Synchronous semiconductor memory device with auto precharge operation easily controlled. 5,748,560, Cl. 365-233.000.

Sawada, Toru, to Alps Electric Co., Ltd. Magnetic recording/reproducing device with chassis support structure. 5,748,404, Cl. 360-99.010.

Sawahashi, Mamoru; and Adachi, Fumiyuki, to NTT Mobile Communications Network, Inc. Code division multiple access transmitter and receiver. 5,748,623, Cl. 370-342.000.

Sawaki, Takafumi: *See—*
  Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, 5,748,772, Cl. 382-167.000.

Sawasaki, Milton Hiroki; Ykman-Couvreur, Chantal; Lin, Bill; and Man, Hugo De, to IMEC. System and method for generating a hazard-free asynchronous circuit. 5,748,487, Cl. 364-489.000.

Sawert, Ulf; Ireland, Hugh Wesley; and Coha, Timothy Francis, to General Motors Corporation. Fuel system low current rheostat. 5,746,088, Cl. 73-317.000.

Sawgrass Systems, Inc.: *See—*
  Xu, Ming, 5,746,816, Cl. 106-31.250.

Sawtell, Ralph R.: *See—*
  Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.

Sbraci, Piero: *See—*
  Altamura, Maria; Arcamone, Federico Maria; Perrotta, Enzo; Pestellini, Vittorio; Sbraci, Piero; and Cascio, Giuseppe, 5,747,483, Cl. 514-195.000.

Scana Staal AS: *See—*
  Marvik, Jostein, 5,746,017, Cl. 37-446.000.

Schaaf, Daniel E.: *See—*
  Wiesemann, David L.; Schaaf, Daniel E.; and Ko, Wai-Shing P., 5,747,937, Cl. 315-159.000.

Schaede, Johannes Georg, to Koenig & Bauer-Albert Aktiengesellschaft. Device for eliminating play in gear wheels. 5,746,091, Cl. 74-409.000.

Schaenzer, Mark James; and Wrase, Ronald Henry, to Seagate Technology, Inc. Slider with oblique leading and trailing edges. 5,748,407, Cl. 360-103.000.

Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, to BASF Aktiengesellschaft. Substituted 2-phenylpiridines. 5,747,422, Cl. 504-244.000.

Schaffer, Roland: *See—*
  Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.

Schaible, Kurt: *See—*
  Seel, Holger; Schaible, Kurt; and Schenk, Bernhard, 5,746,470, Cl. 296-108.000.

Scharfenberger, James A.: *See—*
  Allen, Harold T.; Feldman, Edward T.; Howe, Varce E.; Kazkaz, Ghaffar; Khattab, Ghazi M. A.; McPherson, Jerry L., Jr.; and Scharfenberger, James A., 5,746,831, Cl. 118-621.000.

Scharff, Gerard Joseph: *See—*
  Pelella, Antonio Raffaele; Liu, Peter Tsung-shih; and Scharff, Gerard Joseph, 5,748,643, Cl. 371-22.300.

Schauss, Mark A., to Carbon Based Corporation. Disease indicator analysis system. 5,746,204, Cl. 128-630.000.

Scheetz, Jeffrey P.: *See—*
  Royce, Kevin M.; Berry, Stanley D.; Erdmann, Brian W.; Scheetz, Jeffrey P.; Cole, John D.; and Landry, Hayes J., Jr., 5,748,884, Cl. 395-185.100.

Scheffee, Robert S.; Thibodeau, Robert Lee; and Wheatley, Brian K., to Atlantic Research Corporation. Pyrotechnic method of generating a particulate-free, non-toxic odorless and colorless gas. 5,747,730, Cl. 149-47.000.

Scheffel, Herbert. Railway vehicle suspensions. 5,746,134, Cl. 105-168.000.

Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, to Hewlett-Packard Company. Inkjet print cartridge having valve connectable to an external ink reservoir for recharging the print cartridge. 5,748,216, Cl. 347-87.000.

Scheffels, Volker: *See—*
  Lüer, Harald; Scheffels, Volker; and Pferdehirt, Thomas, 5,745,964, Cl. 24-687.000.

Scheffer, Daniel: *See—*
  Przywozny, Walter; and Scheffer, Daniel, 5,748,432, Cl. 361-159.000.

Scheiblich, Stefan; Maier, Thomas; Baltruschat, Helmut Siegfried; and Pont, Joseph Luke, to American Cyanamid Company. Herbicidal 6-thienyl and 4-thienyl pyrimidines. 5,747,423, Cl. 504-251.000.

Schell, David L., to Discovision Associates. Colpitts type oscillator having reduced ringing and improved optical disc system utilizing same. 5,748,578, Cl. 369-44.140.

Schempp, Otto; and Carabetta, Francesco, to Molex Incorporated. Adapter assembly for fiber optic connectors. 5,748,821, Cl. 385-76.000.

Schenck, Robert R.; and Krevald, Walter Richard. Therapy apparatus having a passive motion device for flexing a body member. 5,746,704, Cl. 601-40.000.

Schenk, Bernhard: *See—*
  Seel, Holger; Schaible, Kurt; and Schenk, Bernhard, 5,746,470, Cl. 296-108.000.

Schenz, James L., to Minnesota Mining and Manufacturing Company. Component carrier tape. 5,747,139, Cl. 428-120.000.

Scherer, Gordon F., to Matrixx Marketing Inc. Telephone transaction processing as a part of call transport. 5,748,711, Cl. 379-91.020.

Scherer, Scott: *See—*
  Molbak, Jens H.; Gerrity, Dan; Scherer, Scott; and Finch, Aaron R., 5,746,299, Cl. 194-200.000.

Schering Aktiengesellschaft: *See—*
  Gries, Heinz; Mützel, Wolfgang; Zurth, Christian; and Weinmann, Hanns-Joachim, 5,746,999, Cl. 424-9.322.
  Kauser, Katalin; and Rubanyi, Gabor M., 5,747,509, Cl. 514-324.000.
  Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
  Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.

Schering-Plough HealthCare Products, Inc.: *See—*
  Ross, Jamie S.; and Morefield, Elaine M., 5,747,011, Cl. 424-59.000.

Scheule, Ronald K.: *See—*
  Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., 5,747,471, Cl. 514-44.000.

Schielke, Rainer, to Linotype-Hell AG. Method and apparatus for image value correction in optoelectronic transducers. 5,748,803, Cl. 382-275.000.

Schimpf, James H.: *See—*
  Sampey, Harry R.; Geary, Jeffrey A.; and Schimpf, James H., 5,748,108, Cl. 340-933.000.

Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for printing photographs of different formats. 5,748,286, Cl. 355-40.000.

Schlecht, Karl; and Hurr, Hellmut, to Putzmeister-Werk Maschinenfabrik GmbH. Slide valve for a twin-cylinder pump for viscous fluids. 5,746,247, Cl. 137-625.450.

Schleehahn, Michael: *See—*
  Fischer, Wolfgang; Baum, Sylvia; Hartig, Thorsten; and Schleehahn, Michael, 5,747,656, Cl. 534-683.000.

Schleife, Holger: *See—*
  Sinsheimer, Michael N.; Turner, Richard W.; and Schleife, Holger, 5,746,669, Cl. 473-446.000.

Schleyerbach, Rudolf; Bartlett, Robert Ryder; Kuo, Elizabeth Anne; and Little, Edward James, to Hoechst Aktiengesellschaft. N-Phenyl-2-cyano-3-hydroxycrotonamide derivatives. 5,747,664, Cl. 558-392.000.

Schlingmann, Gerhard; Milne, Lisa; Pearce, Cedric J.; Jones, E. B. Gareth; and Alhaugh, David A., to American Cyanamid Company. Fungicidal agents LL-15G256γ,δ, and ϵ produced by LL-15G256 (*Hypoxylon oceanicum*). 5,747,304, Cl. 435-121.000.

Schlumberger Industries S.A.: *See—*
  Plisson, François; Janet, Philippe; and Puybaret, Frédéric, 5,747,703, Cl. 73-861.770.

Schlumberger Technologies Inc.: *See—*
  Cecere, Michael A., 5,747,818, Cl. 250-492.210.
  Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, 5,748,124, Cl. 341-120.000.

Schmalstieg, Lutz; Gruber, Hermann; Riberi, Bernd; and Nachtkamp, Klaus, to Bayer Aktiengesellschaft. Polyisocyanates containing ether and urethane groups, a process for their preparation and their use in the production of polyurethane lacquers. 5,747,628, Cl. 528-60.000.

Schmid, Anthony P.: *See—*
  Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., 5,746,635, Cl. 445-24.000.

Schmid, Eduard; and Eder, Roman, to EMS-Inventa AG. Continuous process for activated anionic lactam polymerization. 5,747,634, Cl. 528-315.000.

Schmid, Hermann: *See—*
  Schmidt, Walter; and Schmid, Hermann, 5,746,929, Cl. 216-59.000.

Schmid, Peter: *See—*
  Lattrell, Rudolf; Dürckheimer, Walter; and Schmid, Peter, 5,747,484, Cl. 514-202.000.

Schmid, Steffen, to Pirelli Cavi S.p.A. Acousto-optical tunable waveguide switch having balanced optical paths. 5,748,810, Cl. 385-7.000.

Schmidt, Carl J.; Tobin, Frank; and Wilkinson, Francis E., to SmithKline Beechum Corporation. Method of diagnosing and monitoring prostate cancer. 5,747,264, Cl. 435-7.100.

Schmidt, Friedemann: *See—*
  Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, 5,748,425, Cl. 361-56.000.

Schmidt, Klaus: *See—*
  Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, 5,746,111, Cl. 92-168.000.

Schmidt, Randall Gene: *See—*
  Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.

Schmidt, Todd W. Lockable hinge mechanism. 5,746,533, Cl. 403-102.000.

Schmidt, Torsten; and Hoffmeister, Michael, to Engelhard Process Chemicals GmbH. Process for the simultaneous sorption of water and organic compounds. 5,746,788, Cl. 48-198.200.

Schmidt, Walter; and Schmid, Hermann, to Dyconex Patente AG. Process for structuring polymer films. 5,746,929, Cl. 216-59.000.

Schmidt, Werner: *See—*
  Polster, Rudolf; and Schmidt, Werner, 5,746,673, Cl. 474-101.000.

Schmitt, Karl R., to Textron Inc. Headlamp assembly with magnetic indicator for horizontal and vertical positioning. 5,746,000, Cl. 33-288.000.

Schmitz, Guenter: *See—*
  Schrey, Ekkehard; and Schmitz, Guenter, 5,746,164, Cl. 123-90.110.

Schmitz, Ludwig; Hess, Stefan; and Gerharz, Bettina, to Clariant GmbH. Heterogeneous vinyl acetate/ethylene dispersion. 5,747,578, Cl. 524-502.000.

Schmitz, Reinold: *See—*
  Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, 5,747,582, Cl. 524-591.000.

Schmucki, Nancy Marie: *See—*
  Carlson, Brent Allen; Huss, Frederic Lawrence; Schmucki, Nancy Marie; and Zelenski, Richard Elmer, 5,748,883, Cl. 395-184.010.

Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, to Hoechst Schering Agrevo GmbH. Formylaminophenylsulfonylureas, preparation processes and use as herbicides and plant growth regulators. 5,747,421, Cl. 504-214.000.

Schnabel, Jürgen: *See—*
  Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, 5,748,425, Cl. 361-56.000.

Schnaitmann, Dieter: *See—*
  Urban, Manfred; and Schnaitmann, Dieter, 5,746,820, Cl. 106-471.000.

Schneider, Bengt-Olaf, to International Business Machines Corporation. Method and apparatus for improved graphics picking using auxiliary buffer information. 5,748,946, Cl. 395-501.000.

Schneider, Gottfried: *See—*
  Peschka, Walter; and Schneider, Gottfried, 5,746,172, Cl. 123-292.000.

Schneider, Johannes: *See—*
  Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, 5,747,291, Cl. 435-69.600.

Schneider, Mario: *See—*
  Fuchs, Josef; and Schneider, Mario, 5,746,623, Cl. 439-578.000.

Schnetzka, Harold R.: *See—*
  Beaverson, Gregory K.; Schnetzka, Harold R.; and Frank, Timothy M., 5,746,062, Cl. 62-228.300.

Schnur, Rodney C.; and Arnold, Lee D., to Pfizer Inc. Alkynyl and azido-substituted 4-anilinoquinazolines. 5,747,498, Cl. 514-259.000.

Schnurr, Alvin D.; Clendening, Charles W., Jr.; Shwartz, Josef; and Moyer, Richard H., to TRW Inc. Tactical laser weapon system for handling munitions. 5,747,720, Cl. 89-1.110.

Schober, Michael B., to Hughes Electronics. System for tracking radar targets in background clutter. 5,748,140, Cl. 342-90.000.

Schoeb, Gerard J.: *See—*
  Huebner, Fritz; and Schoeb, Gerard J., 5,746,879, Cl. 156-516.000.

Schoen, Joel A.; and Miazga, Jay M., to Intermec Corporation. Thermal printhead with integrated printhead position sensor. 5,746,521, Cl. 400-120.160.

Schoen, Robert M.; and Anderson, Anthony J., to Chrysler Corporation. Torsion bar assist with ratchet hold mechanism for automobile deck lids. 5,746,468, Cl. 296-76.000.

Schoenenberger, Niklaus: *See—*
  Greminger, Hansueli; and Schoenenberger, Niklaus, 5,747,675, Cl. 73-104.000.

Schoenian, Richard J.; and Strader, Alan Lee, to Delco Electronics Corp. Method and apparatus for controlling transponder signaling. 5,748,106, Cl. 340-928.000.

Schofield, Philip W.: *See—*
  Weiss, Roger E.; Vladic, Daniel P.; and Schofield, Philip W., 5,748,818, Cl. 385-59.000.

Schölkens, Bernward: *See—*
  Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, 5,747,504, Cl. 514-307.000.

Scholl, Thomas: *See—*
  Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, 5,747,589, Cl. 525-146.000.
  Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.

Scholz, Wolfgang: *See—*
  Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.

Schönfeld, Axel: *See—*
  Dietz, Erwin; and Schönfeld, Axel, 5,747,175, Cl. 428-480.000.

Schönfelder, Lothar; Leimer, Gerhard; and Roth, Stefan, to Bayer AG. Process for the production of dense silicon nitride materials. 5,746,969, Cl. 264-645.000.

Schoo, Hermannus F.M.: *See—*
  Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, 5,748,271, Cl. 349-69.000.

Schorr, Joachim: *See—*
  Colpan, Metin; Moritz, Peter; and Schorr, Joachim, 5,747,663, Cl. 536-25.400.

Schotland, John Carl, to Univ. of Pennsylvania. Simultaneous absorption and diffusion tomography system and method using direct reconstruction of scattered radiation. 5,747,810, Cl. 250-358.100.

Schotland, John Carl: *See—*
  Leigh, John Scott; and Schotland, John Carl, 5,746,211, Cl. 128-665.000.

Schreiber, Daniel James: *See—*
  Waino, Ronald Arvid; and Schreiber, Daniel James, 5,747,766, Cl. 218-140.000.

Schreibmayer, Wolfgang: *See—*
  Lester, Henry A.; Dascal, Nathan; Lim, Nancy F.; Schreibmayer, Wolfgang; and Davidson, Norman, 5,747,278, Cl. 435-69.100.

Schreier, Stephan: *See—*
  Harting, Dietmar; Oberhokamp, Dirk; Bokamper, Ralf; Blomenkamp, Horst; and Schreier, Stephan, 5,746,619, Cl. 439-352.000.

Schrey, Ekkehard; and Schmitz, Guenter, to FEV Motorentechnik GmbH & Co. KG. Method of determining valve control times for a maximum cylinder charge on a piston-type internal combustion engine. 5,746,164, Cl. 123-90.110.

Schrey, Ekkehard; Kather, Lutz; and Van Der Staay, Frank, to FEV Motorentechnik GmbH & Co. KG. Method of accurately controlling the armature motion of an electromagnetic actuator. 5,748,433, Cl. 361-210.000.

Schreyer, Peter: *See—*
  Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.

Schroeder, Bruce A.; and Horak, James Michael, to Brunswick Corporation. Heat exchanger for marine engine cooling system. 5,746,270, Cl. 165-41.000.

Schroeder, David J.: *See—*
  Tims, Fred William; Clowes, Richard F.; Yager, Kevin C.; and Schroeder, David J., 5,748,870, Cl. 395-182.020.

Schroeder, Warren L.: *See—*
  Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., 5,749,045, Cl. 455-31.200.

Schuetz, Marlin Niles, to Raychem Corporation. Apparatus comprising inductive and/or power transfer and/or voltage multiplication components. 5,748,464, Cl. 363-131.000.

Schufeldt, Alan D.: *See—*
  Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.

Schuhmann-Giampieri, Gabriele: *See—*
  Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.

Schuholz, John: *See—*
  Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.

OL
2 10
ISS
1
MY
5
998
MI

Schuler Pressen GmbH & Co.: *See—*

Baur, Siegfried; Horn, Heinz; and Dexling, Hartmut, 5,746,084, Cl. 72-351.000.

Schultz, Darald R.: *See—*

Cargin, Keith K., Jr.; Mahany, Ronald L.; Durbin, Dennis A.; Boatwright, Darrell L.; Kelly, Stephen J.; Schultz, Darald R.; and Gibbs, William T., 5,747,786, Cl. 235-472.000.

Miller, Phillip; Walter, Jerry L.; Boatwright, Darrell L.; and Schultz, Darald R., 5,747,785, Cl. 235-472.000.

Schultz, Kenneth L.: *See—*

Remington, James A.; Schultz, Kenneth L.; and Hein, Russell R., 5,746,400, Cl. 246-465.000.

Schultz, Kevin L.: *See—*

Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, 5,746,103, Cl. 83-440.000.

Schultze, Gary T.: *See—*

Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.

Schulz, Kevin J.: *See—*

Murdock, Edward S.; Heitke, John C.; and Schulz, Kevin J., 5,748,412, Cl. 360-113.000.

Schulze, Thomas; Roik, Geert; Hahn, Michael; and Kleinhoff, Klaus, to Continental Aktiengesellschaft. Profiled vehicle tire and method for dimensioning the optimum phase offset between adjacent tread portions. 5,746,848, Cl. 152-209.00R.

Schumann, Manfred: *See—*

Proebster, Manfred; and Schumann, Manfred, 5,747,581, Cl. 524-590.000.

Schutte, Marlin D.: *See—*

Hutchings, William F.; Schutte, Marlin D.; Markle, Stephen L.; Berg, Joel S.; and Engel, David J., 5,746,536, Cl. 403-370.000.

Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, to Bayer Aktiengesellschaft. Aqueous coating compositions and their use for the preparation of coatings that are permeable to water vapor. 5,747,582, Cl. 524-591.000.

Schwaegerle, Paul Robert, to Geon Company, The. Opacified pearlescent multilayer louver for verticle blinds. 5,747,556, Cl. 523-171.000.

Schwark, Jan-Robert: *See—*

Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, 5,747,541, Cl. 514-622.000.

Schwarte, Stephan; and Grosch, Horst, to BASF Corporation. Aqueous coatings and processes for the production of automobile finishes. 5,747,166, Cl. 428-423.100.

Schwartz, Edward L.: *See—*

Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, 5,748,786, Cl. 382-240.000.

Schwartz, Nate R.: *See—*

Katsen, Boris Joseph; Himmelwright, Richard S.; Stewart, Barbara Jones; and Schwartz, Nate R., 5,746,817, Cl. 106-31.650.

Schwarz, Dean F.: *See—*

Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay I.; Barron, William N. G., III; and Schwarz, Dean F., 5,746,649, Cl. 452-172.000.

Schwendemann, Volker: *See—*

Kroner, Matthias, Hartmann, Heinrich; Boeckh, Dieter; Funhoff, Angelika; Baur, Richard; Kud, Alexander; Schwendemann, Volker; Potthoff-Karl, Birgit; and Buechner, Karl-Heinz, 5,747,635, Cl. 528-328.000.

Schweser, Frederick G., Jr. Floor-rollable luggage. 5,746,295, Cl. 190-18.00A.

Schwoerer, Gerald A.: *See—*

Scott, Steven L.; Pribnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., 5,748,900, Cl. 395-200.650.

SCIBIEX (SARL): *See—*

Chateau, Sophie, 5,746,975, Cl. 422-61.000.

Scientech Inc.: *See—*

Burton, Harold M., 5,748,692, Cl. 376-272.000.

Scientific Resources, Inc.: *See—*

Lombardi, Raymond A., 5,746,042, Cl. 53-305.000.

SciMed Life Systems, Inc.: *See—*

Smith, Scott R., 5,746,767, Cl. 606-200.000.

SCM Chemicals, Inc.: *See—*

Kostelnik, Robert J.; and Wen, Fu-Chu, 5,746,819, Cl. 106-447.000.

Scopelianos, Angelo: *See—*

Cooper, Kevin; Chen, Chao C.; and Scopelianos, Angelo, 5,747,390, Cl. 442-59.000.

Scott, Bentley N.; and Shortes, Samuel R., to Phase Dynamics Inc. RF probe for montoring composition of substances. 5,748,002, Cl. 324-633.000.

Scott, Danny E.; Pessier, Rudolf Carl Otto; and Boylan, Turlach Paul, to Baker Hughes Incorporated. Earth-boring bit having shear-cutting inner row elements. 5,746,280, Cl. 175-374.000.

Scott, Ian Richard: *See—*

Granger, Stewart Paton; Rawlings, Anthony Vincent; and Scott, Ian Richard, 5,747,051, Cl. 424-401.000.

Scott, Kyl W.; and Skidmore, James M., to Texas Instruments Incorporated. System and method for improving fault coverage of an electric circuit. 5,748,497, Cl. 364-551.010.

Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., to Incyte Pharmaceuticals, Inc.; and Mayo Foundation for Medical Education and Research. Basophil granule proteins. 5,747,283, Cl. 435-69.100.

Scott, Richard D., to Teledyne Industries, Inc. Cross coupled bandpass filter. 5,748,058, Cl. 333-202.000.

Scott, Russell. Tape and disc carrying device. 5,746,365, Cl. 224-676.000.

Scott, Steven L.; Pribnow, Richard D.; Logghe, Peter G.; Kunkel, Daniel L.; and Schwoerer, Gerald A., to Cray Research, Inc. Adaptive congestion control mechanism for modular computer networks. 5,748,900, Cl. 395-200.650.

Scripps Research Institute, The: *See—*

Hoch, James A.; and Huang, Shaoming, 5,747,276, Cl. 435-32.000.

Zimmerman, Theodore S.; and Fulcher, Carol A., 5,747,337, Cl. 435-337.000.

Scruggs, Robert Burks, II: *See—*

Bartley, Charles Allen; and Scruggs, Robert Burks, II, 5,745,938, Cl. 5-625.000.

Seagate Technology, Inc.: *See—*

Milo, Richard K., 5,748,396, Cl. 360-31.000.

Murdock, Edward S.; Heitke, John C.; and Schulz, Kevin J., 5,748,412, Cl. 360-113.000.

Schaenzer, Mark James; and Wrase, Ronald Henry, 5,748,407, Cl. 360-103.000.

Seanor, Donald A.: *See—*

Kaplan, Samuel; Pan, David H.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Henry, Arnold W.; and Seanor, Donald A., 5,747,212, Cl. 430-124.000.

Sebastian, Scott Anthony: *See—*

Hanafey, Michael K.; Sebastian, Scott Anthony; and Tingey, Scott Valray, 5,746,023, Cl. 47-58.000.

Secretary of State for Defense, The: *See—*

Hughes, Jonathan Rennie; and Towler, Michael John, 5,748,166, Cl. 345-97.000.

Security Solutions Plus: *See—*

Rietkerk, Anthony J., 5,748,083, Cl. 340-568.000.

See, Jackie Ray, to Bio-Sphere Technology, Inc. Dietary supplement incorporating β-sitosterol and pectin. 5,747,464, Cl. 514-26.000.

Seebauer, Joseph G.: *See—*

Luciani, Carmen V.; Lange, Richard M.; and Seebauer, Joseph G., 5,747,433, Cl. 508-479.000.

Seeböck, Robert: *See—*

Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert; and Römheld, Michael, 5,746,051, Cl. 60-275.000.

Seel, Holger; Schaible, Kurt; and Schenk, Bernhard, to Mercedes-Benz AG. Hard-top vehicle. 5,746,470, Cl. 296-108.000.

Seely, James Ervin, to Amgen Boulder Inc. Use of hydrophobic interaction chromatography to purify polyethylene glycols. 5,747,639, Cl. 528-421.000.

Seewann, Edward: *See—*

Beakes, Michael Patrick; Chappell, Barbara Alane; Chappell, Terry Ivan; Fleischer, Bruce Martin; Haring, Rudolf Adriaan; Jaber, Talal Kamel; and Seewann, Edward, 5,748,012, Cl. 326-93.000.

Segal, Russell B.: *See—*

Gregory, Brent L.; and Segal, Russell B., 5,748,488, Cl. 364-490.000.

Segal, Terry A.: *See—*

Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.

Segall, Judith M.: *See—*

Segall, Paul E.; Waitz, Harold D.; Sternberg, Hal; and Segall, Judith M., 5,747,071, Cl. 424-663.000.

Segall, Paul E.; Waitz, Harold D.; Sternberg, Hal; and Segall, Judith M., to BioTime, Inc. Plasma-like substance. 5,747,071, Cl. 424-663.000.

Segraves, Archie Dale: *See—*

Popa, Catrinel I.; Browder, George A., Jr.; and Segraves, Archie Dale, 5,746,068, Cl. 66-176.000.

Sehgal, Hansa: *See—*

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,747,649, Cl. 530-385.000.

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, to Norhtfield Laboratories, Inc. Acellular red blood cell substitute. 5,747,649, Cl. 530-385.000.

Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., to Steelcase Inc. Partition system. 5,746,035, Cl. 52-238.100.

Seidensticker, Joan, heir: *See—*

Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased; and Hopkins, Richard H., 5,746,827, Cl. 117-100.000.

Seidensticker, Raymond G., deceased (by Joan Seidensticker, heir): *See—*

Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased; and Hopkins, Richard H., 5,746,827, Cl. 117-100.000.

Seiko Clock Inc.: *See—*

Baba, Koji, 5,746,092, Cl. 74-421.00R.

Seiko Epson Corporation: *See—*

Kakutani, Toshiaki, 5,748,336, Cl. 358-458.000.

Nebashi, Mitsuhiko; Murakoshi, Keiji; Iwaya, Satoshi; and Goto, Akihiro, 5,746,527, Cl. 400-621.000.

Uchiyama, Yaeko, deceased; Itano, Masaaki; and Hayashi, Hiroko, 5,748,208, Cl. 347-43.000.

Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.

Yatake, Masahiro, 5,746,818, Cl. 106-31.860.

Yoda, Kaneo; and Tanaka, Hiroshi, 5,749,036, Cl. 399-325.000.

Seiko Instruments Inc.: *See—*

Hanami, Takayoshi, 5,748,162, Cl. 345-87.000.

Kohira, Hiroyuki, 5,746,520, Cl. 400-120.010.

Seino, Takeo: *See—*

Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Sekhar, Jainagesh A., to Moltech Invent S.A. Composite refractory/carbon components of aluminium production cells. 5,746,895, Cl. 204-279.000.

Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, to Fujitsu Limited; and Fujitsu Automation Limited. Semiconductor device, base member for semiconductor device and semiconductor device unit. 5,747,874, Cl. 257-686.000.

Seki, Teruo: *See—*

Iwase, Akihiro; Nakano, Tomio; and Seki, Teruo, 5,747,837, Cl. 257-173.000.

Sekine, Hiroshi; and Tamura, Kazuya, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle control system. 5,748,476, Cl. 364-449.000.

Sekizawa, Yasushi; and Funahashi, Takahiko, to Wacom Co., Ltd. Angular input information system relative to a tablet for determining an incline angle of a pointer or stylus. 5,748,110, Cl. 341-5.000.

Selby, Thomas Paul: *See—*

Bereznak, James Francis; Chang, Zen-Yu; Selby, Thomas Paul; and Sternberg, Charlene Gross, 5,747,497, Cl. 514-259.000.

Select Medizin-Technik Hermann Sutter GmbH: *See—*

Sutter, Hermann, 5,746,739, Cl. 606-51.000.

Selina, John R.: *See—*

Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.

Selinger, Irwin, to Graham-Field, Inc. Stethoscope with disposable chestpiece. 5,747,752, Cl. 181-131.000.

Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, to Gruppo Lepetit S.p.A. Antibiotic GE 2270 factors B_1, B_2, C_1, C_2, D_1, D_2, E and T. 5,747,295, Cl. 435-71.300.

Semantic Compaction Systems: *See—*

Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl. 345-133.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*

Konuma, Toshimitsu; Sugawara, Akira; and Tsuji, Takahiro, 5,747,355, Cl. 437-41.000.

Semikron Elektronic GmbH: *See—*

Lutz, Josef; Kinne, Marianne; and Mueller, Heinz-Juergen, 5,747,872, Cl. 257-611.000.

Semsey, Akos: *See—*

Gerum, Eduard; Laszlo, Palkovics; Semsey, Akos; and Barta, Gabor, 5,747,683, Cl. 73-118.100.

Senda, Atsuo, deceased (by Eiko Senda, Yoshio Senda, Hiroko Senda, Masako Senda, legal representatives): *See—*

Kanoh, Osamu; Yoshida, Yasushi; Senda, Atsuo, deceased, 5,746,809, Cl. 106-1.110.

Senda, Eiko, Yoshio Senda, Hiroko Senda, Masako Senda, legal representatives: *See—*

Kanoh, Osamu; Yoshida, Yasushi; Senda, Atsuo, deceased, 5,746,809, Cl. 106-1.110.

Sendou, Hideki: *See—*

Nakabayashi, Yoshikazu; Hadano, Hiroshi; Okabe, Norikazu; and Sendou, Hideki, 5,746,426, Cl. 271-119.000.

Senko Kogyo Co., Ltd.: *See—*

Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, 5,746,320, Cl. 209-127.300.

SensArray Corporation: *See—*

Renken, Wayne, 5,746,513, Cl. 374-179.000.

Sensimetrics Corporation: *See—*

Stevens, Kenneth N., 5,748,838, Cl. 395-2.700.

Sensormatic Electronics Corporation: *See—*

Bettine, Dale R.; and Frederick, Thomas J., 5,748,086, Cl. 340-572.000.

Sensui, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens. 5,748,384, Cl. 359-686.000.

Seo, Shuzo: *See—*

Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, 5,747,787, Cl. 235-472.000.

Seo, Yosuke, to Hitachi, Ltd. Method for writing servo signals onto a magnetic disk and magnetic disk drive equipped with magnetic disk(s) having servo pattern recorded by the method. 5,748,398, Cl. 360-51.000.

Serizawa, Masahiro, to NEC Corporation. Quantization of input vectors and without rearrangement of vector elements of a candidate vector. 5,748,839, Cl. 395-2.310.

Servo Corporation of America: *See—*

Dannenberg, Rand, 5,747,117, Cl. 427-535.000.

Severance, Wayne Stanley; and Winterfeldt, Duane Norman, to ESAB Group, Inc., The. Extended water-injection nozzle assembly with improved centering. 5,747,767, Cl. 219-121.500.

Seward, Eileen Mary: *See—*

Haworth, Karen Elizabeth; Seward, Eileen Mary; Swain, Christopher John; and Teall, Martin Richard, 5,747,491, Cl. 514-236.200.

Sextant Avionique: *See—*

David, Jean-François; and Gerbe, Jean-Pierre, 5,748,346, Cl. 359-15.000.

SFIM Industries: *See—*

Audren, Jean Thierry, 5,747,951, Cl. 318-114.000.

SGS-Thomson Microelectronics, Inc.: *See—*

Iyengar, Narasimhan, 5,748,556, Cl. 365-230.060.

Yin, Rong, 5,747,890, Cl. 307-87.000.

SGS-Thomson Microelectronics S.A.: *See—*

Pezzani, Robert, 5,747,835, Cl. 257-113.000.

SGS-Thomson Microelectronics, S.r.l.: *See—*

Bruccoleri, Melchiorre; Demicheli, Marco; Patti, Giuseppe; and Pisati, Valerio, 5,748,128, Cl. 341-144.000.

Campardo, Giovanni; Bedarida, Lorenzo; Fusillo, Giuseppe; and Silvagni, Andrea, 5,748,528, Cl. 365-185.130.

Colandrea, Francesco; and Poletto, Vanni, 5,747,975, Cl. 323-276.000.

Gariboldi, Roberto; and Pulvirenti, Francesco, 5,747,978, Cl. 323-313.000.

Padoan, Silvia; Olivo, Marco; and Golla, Carla, 5,748,548, Cl. 365-226.000.

Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.

Tomasini, Luciano; Castello, Rinaldo; Clerici, Giancarlo; and Bietti, Ivan, 5,748,029, Cl. 327-389.000.

Shackle, Peter W.; Russell, Randy G.; Crouse, Kent E.; and Bezdon, Ronald J., to Energy Savings, Inc. Electronic ballast that monitors direct current through lamp filaments. 5,747,941, Cl. 315-224.000.

Shadle, John K.: *See—*

Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.

Shadle, Mark A.: *See—*

Mitchell, Chauncey T., Jr.; Good, David M.; Shadle, Mark A.; and Verschuur, Gerrit L., 5,747,103, Cl. 427-123.000.

Shah, Jasvantrai C.: *See—*

Allen, John David; Chow, Ching-Hua; and Shah, Jasvantrai C., 5,748,611, Cl. 370-224.000.

Shah, Nipulkumar, to Sundstrand Corporation. Combustor for a gas turbine engine. 5,746,048, Cl. 60-39.060.

Shah, Shrenik: *See—*

Doherty, James; Dorn, Conrad; Durette, Philippe; Finke, Paul; Maccoss, Malcolm; Mills, Sander; Shah, Shrenik; Sahoo, Soumya; Hagmann, William; Hale, Jeffrey; and Lanza, Thomas, 5,747,485, Cl. 514-210.000.

Shalon, Tadmor; and Shea, John J., Jr., to Metaphase Technology Access, Ltd. Check valve and method for facilitating pressurization of a patient's middle ear. 5,746,725, Cl. 604-246.000.

Shaman Pharmaceuticals, Inc.: *See—*

Inman, Wayne D.; King, Steven Row; Evans, Joseph L.; and Luo, Jian, 5,747,527, Cl. 514-453.000.

Shanghai Institute for Biochemistry, Chinese Academy of Sciences: *See—*

Hong, Guo Fan; Zhai, Feng, deceased, 5,747,298, Cl. 435-91.100.

Shanks, Howard R.; Burns, Stanley G.; and Jeffrey, Frank R., III, to Iowa State University Research Foundation, Inc. Flexible panel display having thin film transistors driving polymer light-emitting diodes. 5,747,928, Cl. 313-498.000.

Shapland, J. Edward: *See—*

Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.

Sharan, Sujit; and Sandhu, Gurtej S., to Micron Technology, Inc. Method of forming an electrical contact to a silicon substrate. 5,747,116, Cl. 427-534.000.

Sharp, Eric Thomas: *See—*

Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.

Sharp Kabushiki Kaisha: *See—*

Amagai, Takayuki; and Muramatsu, Tsuyoshi, 5,748,933, Cl. 395-377.000.

Duggan, Geoffrey; Teraguchi, Nobuaki; Rorison, Judy Megan; and Tomomura, Yoshitaka, 5,747,827, Cl. 257-15.000.

Hata, Akihiro; Funai, Takashi; and Adachi, Masahiro, 5,747,828, Cl. 257-66.000.

Heard, David; Ohtani, Noboru; Unuma, Yutaka; and Fujimoto, Manabu, 5,747,796, Cl. 250-227.260.

Hotta, Yasuhiro, 5,748,561, Cl. 365-238.500.

Kubota, Yasushi; Yoneda, Hiroshi; and Katoh, Kenichi, 5,748,165, Cl. 345-96.000.

Maeda, Hiroshi; Itoh, Tatsuya; and Nakamura, Masatsugu, 5,748,794, Cl. 382-251.000.

Mariyama, Mitsuru, 5,747,836, Cl. 257-119.000.

Matsuoka, Teruhiko, 5,747,777, Cl. 219-497.000.

VOL
2 10
SS
1
MY
5
998
UMI

Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,748,131, Cl. 341-155.000.
Nagai, Atsushi, 5,747,979, Cl. 323-349.000.
Oda, Ayumu; and Horiuchi, Toshihiro, 5,749,025, Cl. 399-92.000.
Shimada, Takayuki; Akebi, Yasunobu; and Takafuji, Yutaka, 5,748,175, Cl. 345-127.000.
Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, 5,748,510, Cl. 364-606.000.
Yamana, Shinji, 5,748,375, Cl. 359-622.000.
Yoshida, Shigeo, 5,748,776, Cl. 382-195.000.
Shattuck-Eidens, Donna M.: *See—*
Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
Shau, Jeng-Jye. High performance semiconductor memory devices having multiple dimension bit lines. 5,748,547, Cl. 365-222.000.
Shaw, Benjamin G.: *See—*
Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
Shaw, Kurt Lee: *See—*
Van McCutchen, James; and Shaw, Kurt Lee, 5,745,936, Cl. 5-600.000.
Shaw, Leslie B.: *See—*
Bowman, Steven R.; Feldman, Barry J.; and Shaw, Leslie B., 5,746,942, Cl. 252-301.40H.
Shea, John J., Jr.: *See—*
Shalon, Tadmor; and Shea, John J., Jr., 5,746,725, Cl. 604-246.000.
Sheehan, Edward R.: *See—*
Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., 5,748,738, Cl. 380-25.000.
Sheehan, John: *See—*
Kwiat, Karol; Sheehan, John; Brown, Ricky; and Doyle, Pat, 5,746,626, Cl. 439-630.000.
Sheerin, Howard H. Programmable answering machine with multiple voice boxes and caller ID. 5,748,709, Cl. 379-67.000.
Shell Oil Company: *See—*
Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
Drent, Eit; Van Der Veer, Frits; and Wijngaarden, Rudolf Jacobus, 5,747,638, Cl. 528-392.000.
Prince, Jack Edward, 5,747,127, Cl. 428-35.700.
Wielers, Antonius Franziskus Heinrich; and Kruka, Vitold Raimond, 5,746,907, Cl. 208-251.00H.
Shelton, Sam V.: *See—*
Ford, John R.; and Shelton, Sam V., 5,746,630, Cl. 440-89.000.
Shen, Chih-Heng: *See—*
Chen, Li-Chun; and Shen, Chih-Heng, 5,747,383, Cl. 438-648.000.
Shen, Paul H.; Dutta, Mitra; Wraback, Michael; and Pamulapati, Jagadeesh, to United States of America, Army. Infrared/optical imaging techniques using anisotropically strained doped quantum well structures. 5,748,359, Cl. 359-248.000.
Shen, Sunny S.; Polis, David W.; Yoon, Hyun N.; and Tien, Tze-Pei, to Hoechst Celanese Corp. Polarizer films comprising aromatic liquid crystalline polymers comprising dichroic dyes in their main chains. 5,746,949, Cl. 252-585.000.
Shenoy, Sunil: *See—*
Heeb, Jay; Shenoy, Sunil; and Wong, Jimmy, 5,749,092, Cl. 711-138.000.
Shepherd, Henry G. Electronic trading cards. 5,748,731, Cl. 380-4.000.
Shepherd, Joseph S.; and Rand, Robert W. Radiation therapy and radiation surgery treatment system and methods of use of same. 5,748,700, Cl. 378-65.000.
Sheppard, John H. Adjustable arm sling and method of supporting an injured arm. 5,746,705, Cl. 602-5.000.
Sheridan, Patrick; Chang, Chu-An; Running, Joyce; and Urdea, Michael S., to Chiron Corporation. Nucleic acid probes immobilized on polystyrene surfaces. 5,747,244, Cl. 435-6.000.
Sheron, Herman D.: *See—*
Genest, John H.; Gaworowski, Andrew J.; and Sheron, Herman D., 5,745,968, Cl. 29-270.000.
Sherts, Charles R., to United States Surgical Corporation. Vascular suturing apparatus. 5,746,751, Cl. 606-139.000.
Sheynblat, Len, to Trumble Navigation Limited. Optimum utilization of pseudorange and range rate corrections by SATPS receiver. 5,748,651, Cl. 371-49.100.
Shi, Song; So, Franky; and Lee, H. C., to Motorola, Inc. Organic electroluminescent light emitting material and device using same. 5,747,183, Cl. 428-690.000.
Shi, Song Q.: *See—*
Wei, Chengping; Shi, Song Q.; and Lee, Hsing-Chung, 5,747,363, Cl. 438-5.000.
Shi, Weiman: *See—*
Sundburg, William J.; and Shi, Weiman, 5,747,793, Cl. 250-227.140.
Shi, Yuan: *See—*
Pan, Jing-Jong; Cao, Simon X. F.; Shi, Yuan; and Yu, Donna S., 5,748,350, Cl. 359-130.000.
Shiao, Hung Chieh: *See—*
Alamgir, Mohammed; Kejha, Joseph B.; and Shiao, Hung Chieh, 5,747,195, Cl. 429-235.000.
Shiba, Kazuyoshi: *See—*
Kuroda, Kenichi; Shiba, Kazuyoshi; and Matsuo, Akinori, 5,747,849, Cl. 257-321.000.
Shiba, Masataka: *See—*
Nakayama, Yasuhiko; Shiba, Masataka; and Komoriya, Susumu, 5,747,201, Cl. 430-30.000.
Shibahara, Akihiko, to Kabushiki Kaisha Toshiba. Computer system capable of transferring video data between card devices. 5,748,913, Cl. 395-282.000.
Shibahara, Seiji: *See—*
Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
Shibamiya, Akira: *See—*
Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., 5,748,952, Cl. 395-602.000.
Shibano, Yoshihide. Method of ultrasonically grinding workpiece. 5,746,646, Cl. 451-36.000.
Shibasaki, Kazuya: *See—*
Honda, Masami; and Shibasaki, Kazuya, 5,748,444, Cl. 361-687.000.
Shibasaki, Koji: *See—*
Hosomi, Eiichi; Tazawa, Hiroshi; Takubo, Chiaki; and Shibasaki, Koji, 5,747,881, Cl. 257-762.000.
Shibata, Hirofumi: *See—*
Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,748,274, Cl. 349-133.000.
Shibata, Hitoshi: *See—*
Kuzuya, Yoshihumi; Saito, Kimitaka; and Shibata, Hitoshi, 5,746,189, Cl. 123-568.000.
Shibata, Kazuyoshi: *See—*
Hirota, Toshikazu; Shibata, Kazuyoshi; and Takeuchi, Yukihisa, 5,747,671, Cl. 73-61.750.
Shibata, Kenichi: *See—*
Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.
Shibayama, Katsutoshi: *See—*
Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.
Shibazaki, Kiyoshige, to Nikon Corporation. Color mixing prevention and color balance setting device and method for a field-sequential color television camera. 5,748,236, Cl. 348-270.000.
Shichijo, Yasuji: *See—*
Nozawa, Masayuki; Shichijo, Yasuji; and Fujita, Masanari, 5,747,593, Cl. 525-193.000.
Shieh, Chan-Long; Lee, Hsing-Chung; and So, Franky, to Mororola, Inc. Active driven LED matrices. 5,748,160, Cl. 345-82.000.
Shieh, Han-Ping D.: *See—*
Lin, Kun-Wei; Shieh, Han-Ping D.; Chen, San-Ming; Chen, Kuang-Vu; and Chang, Chong-Min, 5,748,376, Cl. 359-629.000.
Shieh, Johnny Meng-Han, to International Business Machines Corporation. Virtual pointing device for touchscreens. 5,748,184, Cl. 345-173.000.
Shields, Steven R.: *See—*
Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.
Shiff, Victor; Fishman, Neil S.; and Brzezinski, Philip, to Microsoft Corporation. System for remotely programming a portable information device using visible optical pattern transmitted from a display device while concurrently displaying human-readable explanation of the pattern. 5,748,895, Cl. 395-200.090.
Shiga, Minoru: *See—*
Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.
Shigeta, Seiko: *See—*
Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,747,047, Cl. 424-275.100.
Shigetomi, Masahiro: *See—*
Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
Shikuma, Härüo: *See—*
Machida, Shuji; Shikuma, Härüo; Hoshino, Ayami; and Takakura, Yutaka, 5,747,620, Cl. 526-348.300.
Shim, Tae-Young, to Mando Machinery Corporation. Electronic control type brake booster for vehicle. 5,746,057, Cl. 60-545.000.
Shimada, Fumio, to Canon Denshi Kabushiki Kaisha. Shutter device. 5,749,014, Cl. 396-489.000.
Shimada, Hiroshi: *See—*
Moro, Kyoji; and Shimada, Hiroshi, 5,748,462, Cl. 363-97.000.
Shimada, Koichi: *See—*
Sato, Osamu; and Shimada, Koichi, 5,749,015, Cl. 396-508.000.
Shimada, Takayuki; Akebi, Yasunobu; and Takafuji, Yutaka, to Sharp Kabushiki Kaisha. LCD driving apparatus allowing for multiple aspect resolution. 5,748,175, Cl. 345-127.000.
Shimada, Tomoyuki: *See—*

Anzai, Mitsutoshi; Imai, Akthiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.
Shimamune, Takayuki; Nakajima, Yasuo; Nishiki, Yoshinori; and Ashida, Takahiro, to Permelec Electrode Ltd. Method of producing gas diffusion electrode. 5,746,896, Cl. 204-284.000.
Shimasaki, Yuichi: *See—*
Kuroda, Shigetaka; and Shimasaki, Yuichi, 5,747,681, Cl. 73-117.300.
Shimazaki, Yoshio; and Emura, Tetsuji, to Konica Corporation. Lens driving device. 5,748,394, Cl. 359-823.000.
Shimeki, Ichiro: *See—*
Kikui, Shinsuke; Yasuda, Wataru; Shimeki, Ichiro; and Sugimoto, Naomi, 5,749,022, Cl. 399-50.000.
Shimizu, Akira. Method of producing coreless toilet paper roll and coreless toilet paper roll produced thereby. 5,746,379, Cl. 242-160.100.
Shimizu, Hideaki: *See—*
Ozaki, Hidenori; and Shimizu, Hideaki, 5,748,345, Cl. 358-537.000.
Sakai, Masanori; and Shimizu, Hideaki, 5,748,797, Cl. 382-256.000.
Shimizu, Kikuo, to Hitachi, Ltd. Diagnosis of an optical disk apparatus using a diagnostic method contained on an optical disk medium. 5,748,589, Cl. 369-54.000.
Shimizu, Kiyoshi. Water saving device for use in water lines. 5,746,415, Cl. 251-208.000.
Shimizu, Mikio: *See—*
Miyakawa, Takeshi; Shimizu, Mikio; and Nabeta, Takeshi, 5,747,164, Cl. 428-411.100.
Shimizu, Mitsuo, to Fuji Xerox Co., Ltd. Image reading apparatus capable of rapid transition from a standby mode to a stable operational mode. 5,748,340, Cl. 358-482.000.
Shimizu, Sumio: *See—*
Yamada, Shinsaku; Ohashi, Hideki; Shimizu, Sumio; and Imaki, Takao, 5,746,976, Cl. 422-62.000.
Shimizu, Tetsuya; and Takeuchi, Yoshitaka, to Canon Kabushiki Kaisha. Encoding apparatus for encoding input information data while controlling a code quantity of encoded information data. 5,748,245, Cl. 348-405.000.
Shimizu, Yasuo: *See—*
Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.
Shimizugawa, Ryoichi: *See—*
Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.
Shimoda, Maki: *See—*
Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.
Shimomura, Koji; and Sano, Yoshikazu, to Matsushita Electronics Corporation. Solid state imaging device and method of manufacturing same. 5,747,790, Cl. 250-208.100.
Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for particle inspection. 5,748,305, Cl. 356-237.000.
Shimotori, Hitoshi: *See—*
Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
Shimoyama, Yasuki: *See—*
Baba, Horonobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.
Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Image processing method and apparatus. 5,748,799, Cl. 382-260.000.
Shimura, Ryoji, to Ohi Seisakusho Co., Ltd. Operating device for an automotive slide door. 5,746,025, Cl. 149-360.000.
Shin, Myoung Kyun: *See—*
Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, 5,746,804, Cl. 75-387.000.
Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, to Asashi Kogaku Kogyo Kabushiki Kaisha. Data symbol reading device. 5,747,787, Cl. 235-472.000.
Shin, You Seung: *See—*
Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
Shinagawa, Akio; Ohno, Hitoshi; and Abe, Yuko, to Fujitsu Limited. Data processing apparatus and data processing method. 5,748,122, Cl. 341-67.000.
Shinagawa, Akio: *See—*
Shinagawa, Tetsuo; Watanabe, Yumiko; Shinagawa, Akio; and Ito, Fumitaka, 5,748,715, Cl. 379-100.130.
Shinagawa, Tetsuo; Watanabe, Yumiko; Shinagawa, Akio; and Ito, Fumitaka, to Hitachi, Ltd. Method of communications between telephone and facsimile apparatus and facsimile apparatus capable of communications with telephone. 5,748,715, Cl. 379-100.130.
Shindo, Hitoshi: *See—*
Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,748,274, Cl. 349-133.000.
Shinkn Electric Co., Ltd.: *See—*
Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.
Shinma, Yasuhiro: *See—*
Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
Shinoda, Hosei; Ajioka, Masanobu; and Chida, Kimitaka, to Mitsui Toatsu Chemicals, Inc. Bioabsorbable polymer and process for preparing the same. 5,747,637, Cl. 528-354.000.
Shinozaki, Kenji; and Hirano, Hideki, to Sony Corporation. Recording head and recording apparatus. 5,748,211, Cl. 347-51.000.
Shinriki, Takashi: *See—*
Sugamata, Tohru; Miyama, Yasuyuki; and Shinriki, Takashi, 5,748,358, Cl. 359-245.000.
Shinto Paint Co., Ltd.: *See—*
Kondo, Yosuke, 5,746,948, Cl. 252-519.330.
Shiomi, Yasuhiko, to Canon Kabushiki Kaisha. Image stabilizing device. 5,748,993, Cl. 396-52.000.
Shioya, Hiroyuki, to Sony Corporation. Coordinate transformation apparatus and method. 5,748,869, Cl. 395-142.000.
Shioyama, Yoshiyuki; Hori, Masako; and Kimura, Koji, to Kabushiki Kaisha Toshiba. Apparatus for conveying and processing a wafer in a physically contact-free state. 5,747,780, Cl. 219-648.000.
Shipman, David A.: *See—*
Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
Shipps, J. Clay: *See—*
Miller, Scott; and Shipps, J. Clay, 5,748,749, Cl. 381-71.500.
Shirai, Katutada, to Koito Manufacturing Co., Ltd. Self-locking nut having divided and undivided circumferential portions. 5,746,559, Cl. 411-182.000.
Shiraishi, Hiroyuki: *See—*
Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
Shiraishi, Masami, to Stuff Mfg. Co., Ltd. Magnetic toy blocks. 5,746,638, Cl. 446-92.000.
Shiraishi, Shuji: *See—*
Nishihara, Takashi; Shiraishi, Shuji; Yamamoto, Osamu; and Yano, Osamu, 5,747,686, Cl. 73-146.200.
Yamamoto, Osamu; Shiraishi, Shuji; and Yano, Osamu, 5,749,062, Cl. 701-72.000.
Shiraishi, Takashi; and Yamaguchi, Masao, to Kabushiki Kaisha Toshiba. Multi-beam laser exposure unit having anamorphic lens comprising three lenses. 5,748,355, Cl. 359-206.000.
Shire, Douglas B.: *See—*
Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.
Shiseido Company, Ltd.: *See—*
Tominaga, Naoki, 5,747,049, Cl. 424-401.000.
Shiu, Leung Man, to Whitaker Corporation, The. Ground contact for a splice enclosure. 5,746,610, Cl. 439-98.000.
Shively, J. Thomas, to R.R. Donnelley & Sons Company. Image processing during page description language interpretation. 5,748,860, Cl. 395-114.000.
Shkuratoff, Allen: *See—*
Von Sacken, Ulrich; Chow, Wendy; and Shkuratoff, Allen, 5,747,188, Cl. 429-61.000.
Shoda, Masahiro, to Nikon Corporation. Infrared solid-state image pickup device and infrared solid-state image pickup apparatus equipped with this device. 5,747,863, Cl. 257-440.000.
Shogan, Gregory P.; Stroud, David J.; and Dawley, Mark, to Lisco, Inc. Playyard hinge. 5,745,954, Cl. 16-343.000.
Shonle, Gregory Black: *See—*
Flake, Lance Leslie; and Shonle, Gregory Black, 5,748,400, Cl. 360-77.020.
Shono, Keiji; Hashimoto, Yasunobu; Kuroda, Sumio; and Tamanoi, Ken, to Fujitsu, Ltd. High-density magneto-optic disk and method of manufacturing the same. 5,747,136, Cl. 428-64.300.
Shop Vac Corporation: *See—*
Robitaille, James M.; Crevling, Robert L., Jr.; and Baer, Mark E., 5,747,973, Cl. 323-239.000.
Shore, Zeev W.: *See—*
Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.
Shortes, Samuel R.: *See—*
Scott, Bentley N.; and Shortes, Samuel R., 5,748,002, Cl. 324-633.000.
Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, to Yozan Inc.; and Sharp Kabushiki Kaisha. Multiplication circuit with serially connected capacitive couplings. 5,748,510, Cl. 364-606.000.
Shou, Guoliang: *See—*
Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,748,131, Cl. 341-155.000.

/OL
2 10
ISS
1
MY
5
998
JMI

- Shouzaki, Hajime: *See—*
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,613, Cl. 526-134.000.
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,614, Cl. 526-160.000.
- Shukla, Ashok K.: *See—*
  - Shukla, Mukta M.; and Shukla, Ashok K., 5,745,918, Cl. 2-144.000.
- Shukla, Mukta M.; and Shukla, Ashok K. Necktie as an information source. 5,745,918, Cl. 2-144.000.
- Shuler, Michael L.; and Wilson, David B., to Cornell Research Foundation, Inc. System useful for the production of proteins from recombinant DNA in single celled organisms. 5,747,281, Cl. 435-69.100.
- Shultz, Christopher J.: *See—*
  - Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
- Shumaker, Robert T., Jr.: *See—*
  - Kadunce, Randy R.; Shumaker, Robert T., Jr.; and Dishart, Peter T., 5,748,155, Cl. 343-713.000.
- Shuster, Svetlana: *See—*
  - Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.
- Shwartz, Josef: *See—*
  - Schnurr, Alvin D.; Clendening, Charles W., Jr.; Shwartz, Josef; and Moyer, Richard H., 5,747,720, Cl. 89-1.110.
- Sibalis, Dan; and Rosen, Sanford, to Drug Delivery Systems, Inc. Programmable control and mounting system for transdermal drug applicator. 5,746,711, Cl. 604-20.000.
- Sibbett, Wilson: *See—*
  - Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, 5,748,664, Cl. 372-75.000.
- Sick AG: *See—*
  - Jaksic, Zeljko; Damm, Hartmut; and Meyer, Christof, 5,748,816, Cl. 385-39.000.
- Siddoway, Craig F: *See—*
  - Nichols, Jerry R.; Siddoway, Craig F; Habbaba, Faris S.; and Garcia, Jorge L., 5,748,454, Cl. 361-814.000.
- Siecor Corporation: *See—*
  - Navé, Samuel D., 5,748,823, Cl. 385-113.000.
  - Szentesi, Otto I.; and Throckmorton, Rodney A., 5,748,819, Cl. 385-60.000.
- Siegel, Craig S.; Harris, David J.; Lee, Edward R.; Hubbard, Shirley C.; Cheng, Seng H.; Eastman, Simon J.; Marshall, John; Scheule, Ronald K.; Lane, Mathieu B.; and Rowe, Eric A., to Genzyme Corporation. Cationic amphiphiles containing steroid lipophilic groups for intracellular delivery of therapeutic molecules. 5,747,471, Cl. 514-44.000.
- Siegle, Gert, to Robert Bosch GmbH. Method of inputting directional information. 5,748,115, Cl. 341-22.000.
- Siekhaus, Wigbert J.: *See—*
  - McLean, William, II; Balooch, Mehdi; and Siekhaus, Wigbert J., 5,747,120, Cl. 427-596.000.
- Siemens Aktiengesellschaft: *See—*
  - Amft, Dietrich; Branston, David-Walter; Kieser, Jörg; and Maier, Reinhard, 5,747,984, Cl. 324-71.200.
  - Angermaier, Anton, 5,747,678, Cl. 73-116.000.
  - Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, 5,747,802, Cl. 250-307.000.
  - Cianciara, Wojciech, 5,747,668, Cl. 73-1.060.
  - Dirmeyer, Josef; Probst, Heinrich; Bauer, Peter; Gruber, Robert; Mader, Gerhard; Frimberger, Manfred; and Pfau, Lorenz, 5,748,075, Cl. 340-436.000.
  - Gradischnig, Klaus, 5,748,636, Cl. 370-469.000.
  - Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, 5,749,060, Cl. 701-51.000.
  - Hartmann, Heinz-Werner, 5,748,693, Cl. 376-282.000.
  - Ho, Herbert; Hammerl, Erwin; Dobuzinsky, David M.; Palm, Herbert; Fugardi, Stephen; Ajmera, Atul; Moseman, James F.; and Ramac, Samuel C., 5,747,866, Cl. 257-506.000.
  - Hoess, Alfred, 5,748,141, Cl. 342-109.000.
  - Küsters, Karl-Heinz; Küpper, Paul; Czech, Günther; and Joswig, Hellmut, 5,747,388, Cl. 438-723.000.
  - Kieser, Jörg; Klein, Markus; Lins, Günter; Seeböck, Robert; and Römheld, Michael, 5,746,051, Cl. 60-275.000.
  - Klingler, Peter, 5,747,903, Cl. 310-75.00R.
  - Loritz, Axel; and Hillenmayer, Stefan, 5,748,441, Cl. 361-683.000.
  - May, Karl; Herm, Hartmut; and Unverzagt, Karlheinz, 5,746,590, Cl. 432-114.000.
  - Mika, Norbert; and Bittorf, Hannjoerg, 5,748,701, Cl. 378-109.000.
  - Oppermann, Klaus-Guenter, 5,747,867, Cl. 257-507.000.
  - Preidel, Walter, 5,746,898, Cl. 204-403.000.
  - Preller, Peter, 5,748,461, Cl. 363-97.000.
  - Riedel, Michael; and Heiss, Herbert, 5,748,615, Cl. 370-238.000.
  - Tresp, Volker, 5,748,848, Cl. 395-23.000.
  - Wallmeier, Eugen, 5,748,614, Cl. 370-235.000.
- Siemens Automotive Corporation: *See—*
  - Pace, Jeffrey B.; Warner, Vernon R.; and Wright, Danny O., 5,747,684, Cl. 73-119.00A.
- Siemens Corporate Research, Inc.: *See—*
  - Tam, Kwok C., 5,748,697, Cl. 378-19.000.
- Siemens Measurements Limited: *See—*
  - Foster, Stephen Leslie, 5,746,245, Cl. 137-505.350.
- Siemens Stomberg-Carlson: *See—*
  - Sonnenberg, Edward, 5,748,724, Cl. 379-212.000.
- Siemens Stromberg-Carlson: *See—*
  - Kozlowski, Mark L.; and Whiteaker, Ross, 5,747,734, Cl. 174-50.000.
- Sierra Wireless, Inc.: *See—*
  - Tahmassebpur, Mohammed, 5,748,449, Cl. 361-753.000.
- Sigal, Charles Elliott: *See—*
  - Harats, Dror; Kurihara, Hiroki; Belloni, Paula Nanette; and Sigal, Charles Elliott, 5,747,340, Cl. 435-375.000.
- Sigler, Charles E.: *See—*
  - Tisdale, William R.; and Sigler, Charles E., 5,748,742, Cl. 380-49.000.
- Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
  - Cavazza, Claudio, 5,747,536, Cl. 514-556.000.
- Sigmund, Sandra K.: *See—*
  - Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.
- Silicon Integrated Systems Corp.: *See—*
  - Huang, Hung-Ju; Yao, Jo-Tan; and Chen, Chung-Heng, 5,748,904, Cl. 395-200.770.
- Silicon Magic Corporation: *See—*
  - Fung, Michael G.; and Chiang, Paul M-Bhor, 5,748,552, Cl. 365-230.030.
- Silicon Motion, Inc.: *See—*
  - Xue, Yuan, 5,748,044, Cl. 331-2.000.
- Siliconix incorporated: *See—*
  - Williams, Richard K., 5,747,891, Cl. 307-87.000.
- Silvagni, Andrea: *See—*
  - Campardo, Giovanni; Bedarida, Lorenzo; Fusillo, Giuseppe; and Silvagni, Andrea, 5,748,528, Cl. 365-185.130.
- Silver, Michael D.: *See—*
  - Sivers, Erlvada A.; Silver, Michael D.; and Drawert, Bruce M., 5,748,768, Cl. 382-130.000.
- Silver Star Co. Ltd.: *See—*
  - Park, Bo Kug, 5,746,297, Cl. 192-7.000.
- Silverman, Kim Ernest Alexander. Adaptive methods for controlling the annunciation rate of synthesized speech. 5,749,071, Cl. 704-260.000.
- Sim, Tae-Hyeon, to Samsung Electronics Co., Ltd. Spindle servo circuit in high-speed optical disk reproducer. 5,748,587, Cl. 369-50.000.
- Simioni, Luciano; and Menegon, Sergio, to Killer Loop S.p.A. Connecting device particulary for eyeglasses. 5,748,281, Cl. 351-121.000.
- Simizu, Hiroyasu: *See—*
  - Nakasuji, Mamoru; and Simizu, Hiroyasu, 5,747,819, Cl. 250-492.230.
- Simmonds Precision Products Inc.: *See—*
  - Spillman, William Bert, Jr.; and Weissman, Eric M., 5,747,698, Cl. 73-780.000.
- Simmons, Bennie F., Sr., to Safety Optical Service Company. Eyeglass shield for removable attachment to eyeglass lens frames. 5,748,278, Cl. 351-44.000.
- Simmons Company: *See—*
  - Notheis, Michael S.; and Kuchel, Bernhard W., 5,746,877, Cl. 156-356.000.
- Simmons, Laura C.; and Yansura, Daniel G., to Genentech, Inc. Methods and compositions for secretion of heterologous polypeptides. 5,747,662, Cl. 536-24.100.
- Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., to UroMed Corporation. Urinary continence device for men and method of controlling urinary incontinence by using same. 5,746,222, Cl. 128-885.000.
- Simon, Morris A.: *See—*
  - Kleshinski, Stephen J.; Simon, Morris A.; and Rabkin, Dmitry, 5,746,765, Cl. 606-198.000.
- Simon, Richard L.: *See—*
  - Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.
- Simonetti, Sergio G.; and Andrews, Howard W., to Melnor Inc. Rotary sprinkler having a turret assembly. 5,746,374, Cl. 239-240.000.
- Simpod, Inc.: *See—*
  - Tzori, Yifatch, 5,748,875, Cl. 395-183.050.
- Sinclair, Bruce David: *See—*
  - Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, 5,748,664, Cl. 372-75.000.
- Sinclair, Colin Samuel: *See—*
  - Tallentire, Alan; and Sinclair, Colin Samuel, 5,747,110, Cl. 427-244.000.
- Sinclair, Michael J.; and Vitz, Frank E., to Georgia Tech Research Corporation. Method and apparatus for optically digitizing a three-dimensional object. 5,747,822, Cl. 250-559.190.
- Singapore Computer Systems Limited: *See—*
  - Yong, Dennis; Cheng, Viktor Choong-Hung; Yo, Christopher Leng-Hong; and Lim, Liat, 5,749,079, Cl. 707-100.000.
- Singer, Donald J.: *See—*
  - Kenny, Daniel P.; Singer, Donald J.; and Kast, Gerhard G., 5,745,996, Cl. 30-90.100.
- Singhal, Anil: *See—*
  - Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.
- Sinsheimer, Michael N.; Turner, Richard W.; and Schleife, Holger, to Sinsheimer, Michael N. Game and training device for teaching soccer skills. 5,746,669, Cl. 473-446.000.

- Sintokogio, Ltd.: *See—*
  - Tomioka, Masanori; and Yabuno, Tetsu, 5,746,870, Cl. 156-267.000.
- Sipe, Lynn Robert: *See—*
  - Consoli, John Joseph; and Sipe, Lynn Robert, 5,746,622, Cl. 439-521.000.
- Sitnik-Nieters, Theresa Ann: *See—*
  - Cole, Herbert Stanley, Jr.; and Sitnik-Nieters, Theresa Ann, 5,745,984, Cl. 29-834.000.
- Sivers, Erlvada A.; Silver, Michael D.; and Drawert, Bruce M., to Kabushiki Kaisha Toshiba. Method and apparatus for correcting distortion in an imaging system. 5,748,768, Cl. 382-130.000.
- Sivers Lab Aktiebolag: *See—*
  - Ors, Göran, 5,748,055, Cl. 333-106.000.
- Sivik, Mark Robert: *See—*
  - Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, 5,747,443, Cl. 510-515.000.
- Sixsmith, Herbert: *See—*
  - McCormick, John A.; and Sixsmith, Herber:, 5,748,005, Cl. 324-662.000.
- Sizemore, Edric. Portable personal security system. 5,748,089, Cl. 340-574.000.
- Skaar, Gary R.; Holmes, Terry L.; Lucke, Donald E.; Popenhagen, Gerald R.; Gust, Jay L.; Barron, William N. G., III; and Schwarz, Dean F., to Kraft Foods, Inc. Desinewing of boneless trim. 5,746,649, Cl. 452-172.000.
- Skaggs, John M., to E-Systems, Inc. Hole preparation apparatus and method of use. 5,746,551, Cl. 408-1.00R.
- Skantar, Elmer T., to Westinghouse Air Brake Company. Automated terminal test procedure. 5,747,685, Cl. 73-121.000.
- Skarivoda, Edwin L., to Paragon Electric Company, Inc. Timer with improved geneva drive mechanism. 5,747,760, Cl. 200-38.00R.
- Skidmore, James M.: *See—*
  - Scott, Kyl W.; and Skidmore, James M., 5,748,497, Cl. 364-551.010.
- Skinker, Benjamin H.: *See—*
  - Watts, Robert F.; Skinker, Benjamin H.; and Wang, Kai, 5,748,719, Cl. 379-142.000.
- Skipidarov, Sergei Yakovlevich: *See—*
  - Gelfgat, David Mendeloevich; Skipidarov, Sergei Yakovlevich; Yakhats, Michael; and Kamensky, Vyacheslav Tikhonovich, 5,746,702, Cl. 601-15.000.
- Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, to Myraid Genetics, Inc.; University of Utah Research Foundation; and United States of America, Secretary of Health and Human Services. 17Q-linked breast and ovarian cancer susceptibility gene. 5,747,282, Cl. 435-69.100.
- Skrzyszewska, Malgorzata: *See—*
  - Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.
- Slaats, Cornelis H.J.: *See—*
  - Leermakers, Johannes M.H.P.L.; Van Os, Albertus M.B.M.; and Slaats, Cornelis H.J., 5,746,327, Cl. 211-50.000.
- Slack, William E.: *See—*
  - Yeske, Philip E.; Slack, William E.; and Squiller, Edward P., 5,747,629, Cl. 528-70.000.
- Slade, Louise: *See—*
  - Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
- Slaney, Malcolm, to Interval Research Corporation. System for automatically morphing audio information. 5,749,073, Cl. 704-278.000.
- Slater, Charles R.: *See—*
  - Turturro, Vincent; Palmer, Matthew A.; Slater, Charles R.; and Gottlieb, Saul, 5,746,216, Cl. 128-751.000.
- Slavtcheff, Craig Steven, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Cosmetic mask. 5,747,022, Cl. 424-78.030.
- Slaymaker, Sarah: *See—*
  - Bloom, Debra; Fathman, C. Garrison; and Slaymaker, Sarah, 5,747,299, Cl. 435-91.200.
- Sloan, Ken: *See—*
  - Cross, Gary; and Sloan, Ken, 5,746,275, Cl. 172-440.000.
- Sloan-Kettering Institute for Cancer Research: *See—*
  - Pasternak, Gavril W.; and Pan, Ying-Xian, 5,747,279, Cl. 435-69.100.
- Slomski, Edward J., to Illinois Tool Works Inc. Welded container carrier. 5,746,310, Cl. 206-150.000.
- Smart, David Clinton; and Lyon, Ralph Merwin, to Eastman Kodak Company. One-time-use camera with lid flexed to uncover chamber when cassette forcibly ejected from chamber. 5,748,990, Cl. 396-6.000.
- Smart VCR Limited Partnership: *See—*
  - Levine, Michael R., 5,748,716, Cl. 379-102.030.
- SMC Kabushiki Kaisha: *See—*
  - Nagai, Shigekazu; and Kawamoto, Tadasu, 5,747,896, Cl. 310-20.000.
- Smedlund, Lars, to Smedlund Milsiosystem Ab. Refuse sorting device for refuse storage rooms. 5,746,324, Cl. 209-705.000.
- Smedlund Milsiosystem Ab: *See—*
  - Smedlund, Lars, 5,746,324, Cl. 209-705.000.
- Smeenge, Robert E.; Pierce, George F.; and Cicero, Samuel J., to Northrop Grumman Corporation. Low profile reactor. 5,748,064, Cl. 336-83.000.
- Smelcer, Kenneth T.: *See—*
  - Benz, Roger E.; Schroeder, Warren L.; Smelcer, Kenneth T.; Dahl, Kevin W.; and Rodts, James A., 5,749,045, Cl. 455-31.200.
- Smirnov, Aleksandr Vitalievich; Orlov, Oleg Georgievich; Golipad, Pyotr Nikolaevich; Koriakin, Yurii Nikolaevich; aod Yegorov, Boris Mikhailovich. Solid surface modifier. 5,747,561, Cl. 523-212.000.
- Smith, Curtis D.: *See—*
  - Notenboom, Leo A.; Mejia, Benjamin A.; and Smith, Curtis D., 5,748,468, Cl. 364-132.000.
- Smith, David K., to Corning Incorporated. Positive dispersion optical waveguide. 5,748,824, Cl. 385-124.000.
- Smith, David P., to Caterpillar Inc. Overspeed control for a hydrostatic transmission. 5,746,056, Cl. 60-447.000.
- Smith, Donald O. Apparatus for applying X-rays to an interior surface of a body cavity. 5,748,699, Cl. 378-65.000.
- Smith, Dwight D., to Ericsson, Inc. LCD with electroluminescent backlighting. 5,748,270, Cl. 349-69.000.
- Smith, Gwenevere Jane. Tennis doubles training apparatus and method. 5,746,672, Cl. 473-464.000.
- Smith, Howard T., to Hughey & Phillips, Inc. Photocell checker. 5,747,798, Cl. 250-239.000.
- Smith, Howell K., II: *See—*
  - Krepski, Larry R.; Heilmann, Steven M.; Mickus, Daniel E.; Larson, Wayne K.; Gibson, Mark T.; Purgett, Mark D.; Rueb, Christopher J.; and Smith, Howell K., II, 5,747,626, Cl. 528-28.000.
- Smith, James A.; and Kellett, George W., to Creative Products Resource, Inc. Dry-cleaning kit for in-dryer use. 5,746,776, Cl. 8-142.000.
- Smith, James C.; Hogan, Patrick T.; and Saidman, Laurence B., to Nordson Corporation. Method and apparatus for dispensing small amounts of liquid material. 5,747,102, Cl. 427-96.000.
- Smith, James L. Tire repair apparatus. 5,746,851, Cl. 152-370.000.
- Smith, Jeffrey E.: *See—*
  - Kaveh, Golnaz; Taylor, Gregory F.; and Smith, Jeffrey E., 5,748,033, Cl. 327-545.000.
- Smith, Jimmy Dean; Nicol, Mark D.; and O'Brien, Terence Paul, to Packard Bell NEC. Method and apparatus for reading data from a write only port. 5,748,922, Cl. 395-309.000.
- Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., to Packard Bell NEC. Apparatus for selecting a user programmable address for an I/O device. 5,748,982, Cl. 395-829.000.
- Smith, Kenneth L.: *See—*
  - Kulan, Stephen; and Smith, Kenneth L., 5,746,436, Cl. 279-4.040.
- Smith, Lloyd M.; Hood, Leroy E.; Hunkapiller, Michael W.; Hunkapiller, Tim J.; and Connell, Charles R., to California Institute of Technology. Automated DNA sequencing technique. 5,747,249, Cl. 435-6.000.
- Smith, Marc L.; and Daou, Fadi H., to CenRad, Inc. System for measuring jitter in a non-binary digital signal. 5,748,672, Cl. 375-226.000.
- Smith, Mark J., to APW/Wyott Foodservice Equipment Company. Rapid toasting apparatus. 5,746,116, Cl. 99-386.000.
- Smith, Michael J.; and Blaser, Giles R., to Amplas, Inc. Bag forming machine having adjustable support structure for paired work elements. 5,746,569, Cl. 414-790.400.
- Smith, Paul E., to Honeywell Inc. Sensor with an arcuate abradable rib used for positioning. 5,747,987, Cl. 324-207.130.
- Smith, Paul Fielding; and Harrison, Robert Mark, to Motorola, Inc. Multichannel transceiver having an adaptive antenna array and method. 5,748,683, Cl. 375-347.000.
- Smith, Paul K.; and Bergemann, Eugene P., to NTEC Solutions, Inc. Process for removing chromate ion from a concentrated solution of sodium sulfate. 5,746,922, Cl. 210-670.000.
- Smith, Peter John; and Mangat, Harbans Kaur, to Cookson Matthey Ceramics & Materials Limited. Cobalt glass compositions for coatings. 5,747,395, Cl. 501-5.000.
- Smith, Richard: *See—*
  - Heerze, Louis D.; Armstrong, Glen D.; and Smith, Richard, 5,747,040, Cl. 424-190.100.
- Smith, Rodney J. Stream data compression system using dynamic connection groups. 5,748,955, Cl. 395-612.000.
- Smith, Ronald L.: *See—*
  - Bill, Eugene F.; Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; Rodriques, Lester V.; Schufeldt, Alan D.; Shields, Steven R.; and Smith, Ronald L., 5,747,718, Cl. 86-23.000.
- Smith, Scott R., to SciMed Life Systems, Inc. Removable thrombus filter. 5,746,767, Cl. 606-200.000.
- Smith, Stanley K. Outboard motor flushing system. 5,746,629, Cl. 440-88.000.
- Smith, Stuart B., to Hehr International Inc. Radiant energy curable acrylic urethane prepolymer resin compositions and method. 5,747,552, Cl. 522-96.000.
- Smith, Trevor Stanley: *See—*
  - Munn, Edward Albert; and Smith, Trevor Stanley, 5,747,046, Cl. 424-265.100.
- SmithKline Beecham Corp.: *See—*
  - Lawlor, Elizabeth Jane, 5,747,313, Cl. 435-183.000.
  - Lawlor, Elizabeth Jane, 5,747,314, Cl. 435-183.000.
  - Lawlor, Elizabeth Jane, 5,747,315, Cl. 435-183.000.
  - Wallis, Nicola Gail, 5,747,286, Cl. 435-69.100.
- SmithKline Beecham p.l.c.: *See—*
  - Lawlor, Elizabeth Jane, 5,747,315, Cl. 435-183.000.
- SmithKline Beecham p.l.c.: *See—*
  - Lawlor, Elizabeth Jane, 5,747,313, Cl. 435-183.000.
  - Lawlor, Elizabeth Jane, 5,747,314, Cl. 435-183.000.

/OL
2 10
ISS
1
MY
5
998
JMI

  - Roberts, Gareth Wyn; Graham, David Ian; and Nicoll, James Alan Ramsey, 5,747,260, Cl. 435-6.000.
  - Wallis, Nicola Gail, 5,747,286, Cl. 435-69.100.
- SmithKline Beechum Corporation: *See—*
  - Schmidt, Carl J.; Tobin, Frank; and Wilkinson, Francis E., 5,747,264, Cl. 435-7.100.
- SmithKline Diagnostics, Inc.: *See—*
  - Hemmati, Goodarz Sahneh, 5,747,351, Cl. 436-514.000.
- Smithlin, Michael J. Disc repair system. 5,746,811, Cl. 106-10.000.
- Smiths Industries PLC: *See—*
  - Pagan, Eric, 5,746,202, Cl. 128-207.140.
- Smiths Industries Public Limited Corporation: *See—*
  - Tyler, Peter Michael, 5,747,946, Cl. 315-291.000.
- SMK Corporation: *See—*
  - Lee, Tangloo, 5,748,338, Cl. 358-473.000.
- Smoot, Charles H., III: *See—*
  - Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.
- SMS Schloemann-Siegmag Aktiengesellschaft: *See—*
  - Klamma, Klaus; and Bald, Wilfried, 5,746,081, Cl. 72-229.000.
- Smyth, Peter Paul: *See—*
  - Cassidy, Stephen Anthony; Smyth, Peter Paul; Williams, Douglas Lawrence; and White, Trevor Keith, 5,748,813, Cl. 385-24.000.
- Snacko A/S: *See—*
  - Fosbøl, Peder; Korremann, Birgitte; and Ullum, Henrik, 5,747,087, Cl. 426-242.000.
- Snap-on Technologies, Inc.: *See—*
  - Krivec, Bert; Petruzzi, Thomas B.; and Braun, John A., 5,746,298, Cl. 192-48.300.
- Snedecor, Bradley R.: *See—*
  - Presta, Leonard G.; and Snedecor, Bradley R., 5,747,035, Cl. 424-144.100.
- Snyder, Robert: *See—*
  - Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,747,179, Cl. 428-586.000.
- So, Franky: *See—*
  - Shi, Song; So, Franky; and Lee, H. C., 5,747,183, Cl. 428-690.000.
  - Shieh, Chan-Long; Lee, Hsing-Chung; and So, Franky, 5,748,160, Cl. 345-82.000.
- So, Hock C.: *See—*
  - Dunlap, Frank M; So, Hock C.; and Wong, Sau C., 5,748,533, Cl. 365-185.190.
  - Dunlap, Frank M.; So, Hock C.; and Wong, Sau C., 5,748,534, Cl. 365-185.210.
- So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, to MegaMos Corporation. Semiconductor structure with controlled breakdown protection. 5,747,853, Cl. 257-355.000.
- Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, to Mitsubishi Chemical Corporation. Propylene resin compositions containing talc. 5,747,576, Cl. 524-451.000.
- Sobhani, Mohi, to Hughes Electronics. Spring loaded contact device and rotary connector. 5,746,606, Cl. 439-21.000.
- Sobieralski, Linda Paula. Sanitary covering method and apparatus. 5,745,929, Cl. 4-245.100.
- Societe Anonyme Des Eaux Minerales D'Evian: *See—*
  - Petre, Jean-Marie; and Fandeux, Isabelle, 5,746,339, Cl. 215-383.000.
- Societe Cooperative de Production Bourgeois: *See—*
  - Violi, Raymond; and Ferbus, Jean-Francois, 5,746,456, Cl. 292-146.000.
- Societe d'Applications Generales d'Electricite: *See—*
  - Garcia, Salvador; Vegeais, Patrick; and Frederic, Alain, 5,748,220, Cl. 347-181.000.
- Societe Nationale d' Etude et de Construction de Moteurs d'Aviation "Snecma": *See—*
  - Honnorat, Yves Christian Louis, 5,745,994, Cl. 29-889.200.
- Societe Nationale Des Poudres Et Explosifs: *See—*
  - Chassaing, Alain; and Finck, Bernard, 5,747,729, Cl. 149-19.100.
- Söderbergh, Anders: *See—*
  - Olsson, Stefan; Widlund, Urban; and Söderbergh, Anders, 5,746,732, Cl. 604-385.200.
- Sodervall, Billy Valter; and Lundeberg, Thomas, to Adtech Holding. Deposition of silver layer on nonconducting substrate. 5,747,178, Cl. 428-624.000.
- Soejima, Kota: *See—*
  - Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.
- Sofie Instruments: *See—*
  - Canteloup, Jean, 5,748,296, Cl. 356-72.000.
- Softub, Inc.: *See—*
  - Hansen, Borg; Gonzalez, Rafael; and Fleishman, Roc V., 5,745,934, Cl. 4-541.300.
- Sogo Pharmaceutical Co. Ltd.: *See—*
  - Tominaga, Naoki, 5,747,049, Cl. 424-401.000.
- Sohda, Takashi; Makino, Haruhiko; and Baba, Atsuo, to Takeda Chemical Industries. Thienopyridine or thienopyrimidine derivatives and their use. 5,747,486, Cl. 514-211.000.
- Sohma, Hiroshi: *See—*
  - Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, 5,749,009, Cl. 396-395.000.
- Söhnlein, Dieter, to Hilti Aktiengesellschaft. Method of forming rotary drilling tools. 5,746,095, Cl. 76-108.600.
- Soini, F. Richard: *See—*
  - Hajjahmad, Ibrahim; Reisch, Michael L.; Soini, F. Richard; and Wober, Munib A., 5,748,770, Cl. 382-167.000.
- Sokol, Michael A.; and Ketchum, Kevin D., to Level One Communications, Inc. Method and apparatus for implementing a two-port ethernet bridge using a semaphoring technique. 5,748,634, Cl. 370-402.000.
- Solar Attic, Inc.: *See—*
  - Palmer, Edward G.; and Sparrow, Ephraim M., 5,746,653, Cl. 454-186.000.
- Solcz, Edward J.: *See—*
  - Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, 5,748,221, Cl. 347-232.000.
- Soliman, Samir S.: *See—*
  - Argyroudis, Panayotis; Bayley, Gwain; Grob, Matthew S.; Phillips, Marc; and Soliman, Samir S., 5,748,104, Cl. 340-870.110.
- Sollac: *See—*
  - Peru, Gilles; and Henry, Philippe, 5,747,768, Cl. 219-121.630.
- Solomon, Frank A.: *See—*
  - Erickson, Brian J.; Hilgers, Michael E.; Hendrickson, Tracy A.; Shapland, J. Edward; Solomon, Frank A.; and Knudson, Mark B., 5,746,217, Cl. 128-760.000.
- Solv-Ex Corporation: *See—*
  - Rendall, John S.; and Ahghar, Massoud, 5,746,932, Cl. 252-62.000.
- Somar Corporation: *See—*
  - Ono, Kazuya; Yasuda, Akira; and Kitagawa, Katsuji, 5,747,565, Cl. 523-413.000.
- Somnus Medical Technologies, Inc.: *See—*
  - Edwards, Stuart D., 5,746,224, Cl. 128-898.000.
- Son, Chang-Woo; and Kim, Yang-Rae, to Daewoo Electronics Co., Ltd. Electric power switch for a vacuum cleaner which has a suction control function. 5,747,764, Cl. 200-61.860.
- Son, Jeong-Hwan: *See—*
  - Kim, Dong-Wook; Son, Jeong-Hwan; Hong, Song-Cheol; and Kwon, Yeong-Se, 5,747,865, Cl. 257-480.000.
- Son, Jong-Chan; Lee, Ill-Young; Bae, Byung-Il; Han, Jeong-Sik; Choi, Joong-Kwon; and Chae, Yung-Bok, to Korea Research Institute of Chemical Technology. Antiviral 2, 4-pyrimidinedione derivatives. 5,747,500, Cl. 514-274.000.
- Song, Chung-Moo: *See—*
  - Lee, Won-Bin; Cho, Hong-Keun; Song, Chung-Moo; Kim, Yo-Hee; and Kim, Young-Soo, 5,747,985, Cl. 324-103.00R.
- Song, Ci-moo; Lee, Chul-woo; and Cho, Han-ki, to Samsung Electro-Mechanics Co., Ltd. Mirror driving method and apparatus of micro-mirror array. 5,748,172, Cl. 345-111.000.
- Song, Ci-moo: *See—*
  - Park, Kyu-yeon; Lee, Chong-won; Cho, Young-ho; and Song, Ci-moo, 5,747,690, Cl. 73-504.120.
- Song, Jin; Koch, John; and Squier, Marilyn, to Patty Cake, Inc. Dustless baby powder. 5,747,007, Cl. 424-69.000.
- Song, Tae K.: *See—*
  - Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.
- Sonigo, Pierre: *See—*
  - Alizon, Marc; Sonigo, Pierre; Wain-Hobson, Simon; and Montagnier, Luc, 5,747,242, Cl. 435-5.000.
- Sonnenberg, Edward, to Siemens Stomberg-Carlson. Method for transferring a subscriber to a new local service provider. 5,748,724, Cl. 379-212.000.
- Sono, Michio: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Sony Cinema Products Corporation: *See—*
  - Ozaki, Yoshio; and Kohut, Michael J., 5,748,746, Cl. 381-18.000.
- Sony Corporation: *See—*
  - Hayashi, Masatake; and Miyazaki, Shigeki, 5,747,932, Cl. 313-582.000.
  - Iwasaki, Yasuo; Ozaki, Toshiaki; and Miyawaki, Hiroyuki, 5,748,590, Cl. 369-58.000.
  - Kobayashi, Seiji; Okamura, Hiroshige; Yamatsu, Hisayuki; and Kashiwagi, Toshiyuki, 5,748,582, Cl. 369-44.260.
  - Kobayashi, Seiji; and Kock, Joost De, 5,748,586, Cl. 369-48.000.
  - Kondo, Tetsujiro; and Kawaguchi, Kunjo, 5,748,235, Cl. 348-222.000.
  - Kondo, Tsuyoshi; and Mukawa, Hiroshi, 5,748,576, Cl. 369-32.000.
  - Maeda, Yasuaki; and Nakamura, Kosuke, 5,748,588, Cl. 369-54.000.
  - Maekawa, Toshikazu; and Hayashi, Yuji, 5,748,026, Cl. 327-333.000.
  - Masuda, Hiroshi, 5,749,048, Cl. 455-186.100.
  - Miyamoto, Takaaki, 5,747,384, Cl. 438-685.000.
  - Murakami, Masanori; Oku, Takeo; and Otsuki, Akira, 5,747,878, Cl. 257-745.000.
  - Nakai, Hidekazu, 5,748,591, Cl. 369-58.000.
  - Nishiguchi, Masayuki; and Matsumoto, Jun, 5,749,065, Cl. 704-219.000.
  - Nishio, Ayataka; and Ogura, Yasuhiro, 5,748,594, Cl. 369-59.000.
  - Ohmori, Takashi, 5,748,573, Cl. 369-13.000.
  - Ozaki, Yoshio; and Kohut, Michael J., 5,748,746, Cl. 381-18.000.
  - Shinozaki, Kenji; and Hirano, Hideki, 5,748,211, Cl. 347-51.000.
  - Shioya, Hiroyuki, 5,748,869, Cl. 395-142.000.
  - Suzuki, Teruhiko, 5,748,243, Cl. 348-405.000.
  - Takagi, Kotaro, 5,749,057, Cl. 455-569.000.

  - Tamada, Hitoshi; Matsumoto, Shuichi; Nishi, Noriaki; and Saito, Kimihiro, 5,748,368, Cl. 359-486.000.
  - Tanji, Ichiro, 5,748,258, Cl. 348-625.000.
  - Trueblood, John, 5,748,499, Cl. 364-551.010.
  - Tsukagoshi, Ikuo, 5,748,256, Cl. 348-589.000.
  - Ueda, Toshiaki; Ueno, Katsuhiko; Ono, Yoshihiro; and Koyama, Toshio, 5,748,237, Cl. 348-333.000.
  - Usami, Yoshihiko, 5,747,924, Cl. 313-431.000.
  - Yamada, Eiichi, 5,748,397, Cl. 360-32.000.
  - Yasuda, Nobuyuki, 5,748,120, Cl. 341-61.000.
  - Yoshizawa, Masaki; Kohno, Takanobu; and Ota, Satoshi, 5,746,384, Cl. 242-334.400.
- Sony Electronics Inc.: *See—*
  - Trueblood, John, 5,748,499, Cl. 364-551.010.
- Soole, Julian Bernard Donald: *See—*
  - Amersfoort, Martin Ronald; and Soole, Julian Bernard Donald, 5,748,811, Cl. 385-15.000.
- Sorensen, Jens Ole: *See—*
  - Sorensen, Soren Christian; and Sorensen, Jens Ole, 5,746,965, Cl. 264-318.000.
- Sorensen, Soren Christian; and Sorensen, Jens Ole, to GB Electrical, Inc. Removal of injection-molded tie from mold by retracting core from between pawl and abutment surface of tie. 5,746,965, Cl. 264-318.000.
- Sorenson, Marius W.; Cipriano, Robert A.; Longoria, Jose J.; and Weaver, John D., to Dow Chemical Company, The. Ion-exchange polymers having an expanded microstructure. 5,747,546, Cl. 521-32.000.
- Soriano, Louis, to Whitaker Corporation, The. Machine and method for producing electrical harness. 5,745,991, Cl. 29-863.000.
- Sorriero, Louis Joseph; and Fitzgerald, John J., to Eastman Kodak Company. Copolymer blend for toner receiver. 5,747,145, Cl. 428-195.000.
- Soscia, Peter P.: *See—*
  - Reiter, Thomas Carl; Soscia, Peter P.; and Brust, David P., 5,746,864, Cl. 156-220.000.
- Southern Biosystems, Inc.: *See—*
  - Tipton, Arthur J.; and Holl, Richard J., 5,747,058, Cl. 424-423.000.
- Southern Cross Biotech Party, Ltd: *See—*
  - Emtage, John Spencer; and Brandon, Malcolm Roy, 5,747,290, Cl. 435-69.400.
- Southwest Research Institute: *See—*
  - Moulton, David S.; and Naegeli, David W., 5,746,785, Cl. 44-443.000.
- Soya, Takashi: *See—*
  - Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.
- Spada, Lon T.: *See—*
  - Hughen, John F.; Kennedy, Steven C.; Spada, Lon T.; Chan, Randolph W.; and Koch, Carol A., 5,747,192, Cl. 429-163.000.
- Sparks, Andrew B.: *See—*
  - Kay, Brian K; Fowlkes, Dana M.; Adey, Nils B.; and Sparks, Andrew B., 5,747,334, Cl. 435-320.100.
- Sparrow, Ephraim M.: *See—*
  - Palmer, Edward G.; and Sparrow, Ephraim M., 5,746,653, Cl. 454-186.000.
- Spatafora, Mario; and Berti, Andrea, to Azionaria Costruzioni Macchine Automatiche ACMA, SpA. Method and unit for end sealing elongated wrappings. 5,746,872, Cl. 156-274.200.
- Spaw, William J.: *See—*
  - Korta, Jean-Charles; Davis, Derek L.; Spaw, William J.; and Clark, Lawrence T., 5,748,303, Cl. 356-229.000.
- Speakes, Dale M.; and Cole, Dee Raymond, to Creative Aeronautical Accessories, Inc. Ballistic shield. 5,747,721, Cl. 89-36.110.
- Spear, Kerry L.: *See—*
  - Rosenberg, Steve; Spear, Kerry L.; and Martin, Eric J., 5,747,458, Cl. 514-18.000.
- Spear, Scott. Vacuum boost device. 5,746,583, Cl. 417-197.000.
- Specialized Bicycle Components, Inc.: *See—*
  - Egger, F. Robert, 5,745,924, Cl. 2-425.000.
- Specialty Laboratories, Inc.: *See—*
  - Ojo-Amaize, Emmanuel, 5,747,270, Cl. 435-7.240.
- Speck, Ulrich: *See—*
  - Maier, Franz-Karl; Bauer, Michael; Krause, Werner; Speck, Ulrich; Schuhmann-Giampieri, Gabriele; Muhler, Andreas; Balzer, Thomas; and Press, Wolf-Rudiger, 5,746,995, Cl. 424-1.650.
- Spector, Donald. Compact disc album. 5,748,608, Cl. 369-291.000.
- Spectral Diagnostics Inc.: *See—*
  - Jackowski, George, 5,747,274, Cl. 435-7.940.
- Speil, Walter; and Maas, Gerhard, to Ina Walzlager Schaeffler KG. Valve drive of an internal combustion engine. 5,746,165, Cl. 123-90.160.
- Spence, Orville, to American Excelsior Company. Biodegradable cup holder. 5,746,372, Cl. 229-403.000.
- Spencer, Charles P.: *See—*
  - Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,136, Cl. 105-199.300.
  - Hawthorne, Vaughn Terrey; Spencer, Charles P.; and Pitchford, Terry L., 5,746,137, Cl. 105-219.000.
- Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Magnetic position measuring device using Hall elements as sensors and method for its operation. 5,747,995, Cl. 324-207.200.
- Spillman, William Bert, Jr.; and Weissman, Eric M., to Simmonds Precision Products Inc. Capacitive z-axis strain gauge. 5,747,698, Cl. 73-780.000.
- Spilo, David A.: *See—*
  - Jiang, Chongjun (June); Spilo, David A.; Baldwin, Timothy J.; Bryfogle, Robert D.; and Pinkerton, Bobby L., Jr., 5,748,640, Cl. 371-21.300.
- Spindt, Christopher J.; Morris, David L.; Fahlen, Theodore S.; Schmid, Anthony P.; and Lovoi, Paul A., to Candescent Technologies Corporation. Methods for fabricating a flat panel display having high voltage supports. 5,746,635, Cl. 445-24.000.
- Spinner, Klaus: *See—*
  - Voehringer, Klaus; and Spinner, Klaus, 5,747,884, Cl. 307-10.100.
- Spitz, Aaron; and Sutaria, Perry, to Spitz, Aaron; and Sutaria, Perry. Flexible endoscopic apparatus and methods of use. 5,746,693, Cl. 600-112.000.
- Spoltman, James H.: *See—*
  - Rozak, Michael J.; and Spoltman, James H., 5,748,191, Cl. 395-333.000.
- Sprecher, Cindy A., to ZymoGenetics, Inc. Cytoplasmic antiproteinase-2 and cytoplasmic antiproteinase-3 and coding sequences. 5,747,645, Cl. 530-350.000.
- Spronz, Paul E.: *See—*
  - Heimanson, Dorian; Moslehi, Mehrdad M.; Spronz, Paul E.; and Omstead, Thomas R., 5,746,897, Cl. 204-298.200.
- Sproull, Robert F.; and Sutherland, Ivan E., to Sun Microsystems, Inc. Recursive multi-channel interface. 5,748,539, Cl. 365-189.040.
- Square D Company: *See—*
  - Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, 5,746,306, Cl. 200-283.000.
  - Riley, Robert E., 5,748,616, Cl. 370-242.000.
- Squier, Marilyn: *See—*
  - Song, Jin; Koch, John; and Squier, Marilyn, 5,747,007, Cl. 424-69.000.
- Squiller, Edward P.: *See—*
  - Yeske, Philip E.; Slack, William E.; and Squiller, Edward P., 5,747,629, Cl. 528-70.000.
- Squire, Herbert D. Controlled pendulum golf putter. 5,746,662, Cl. 473-206.000.
- Sreeram, Attiganal Narayanaswamy: *See—*
  - Riddle, George Herbert Needham; Prabhu, Ashok Naryan; Matthies, Dennis Lee; and Sreeram, Attiganal Narayanaswamy, 5,747,931, Cl. 313-581.000.
- SRI International: *See—*
  - Eckstrom, Donald J., 5,747,809, Cl. 250-345.000.
  - Reist, Elmer J., 5,747,511, Cl. 514-337.000.
  - Ross, David S.; Jayaweera, Indira; and Leif, Roald N., 5,746,926, Cl. 210-761.000.
- Srinivasan, Sujatha: *See—*
  - Kramer, Steven; Srinivasan, Sujatha; and Swanson, Verner, 5,746,774, Cl. 623-39.000.
- Stabilizer, Inc.: *See—*
  - Hubbs, Jonathan W.; and Hubbs, James J., Jr., 5,746,546, Cl. 405-263.000.
- Stack, Francis Martin; Hennessy, Mark; Mulvihill, Daniel; and O'Kennedy, Brendan Thomas, to Dairygold Technologies Limited. Process for the fractionation of whey constituents. 5,747,647, Cl. 530-365.000.
- Staerzl, Richard E., to Brunswick Corporation. Galvanic isolator fault monitor. 5,747,892, Cl. 307-95.000.
- Stallard, Virginia: *See—*
  - Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.
- Stamm, Michael Ross: *See—*
  - Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.
- Stanek, Terrence L.; and Tomasiak, Mark J., to Emerson Electric Co. Air seal for humidifier water bottle. 5,746,359, Cl. 222-542.000.
- Stanford Telecommunications, Inc.: *See—*
  - Bustamante, Herman A.; and Chen, Horen, 5,748,610, Cl. 370-208.000.
- Stanford University: *See—*
  - Van Duyne, Scott A., 5,748,513, Cl. 364-724.170.
- Stanish, Mark A.: *See—*
  - Floyd, Stan Louis; Muise, Herbert Donald; and Stanish, Mark A., 5,747,082, Cl. 426-109.000.
- Stanley Works, The: *See—*
  - Wertheim, Gregory D., 5,746,004, Cl. 33-768.000.
- Staples, John L.: *See—*
  - O'Bear, Raymond E.; Colin, Bruno; Tegeler, G. R.; and Staples, John L., 5,746,980, Cl. 422-102.000.
- Star Micronics Co., Ltd.: *See—*
  - Tajima, Kazushige; and Imahori, Yoshio, 5,747,906, Cl. 310-89.000.
- Staring, Aemilianus G.J.: *See—*
  - Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, 5,748,271, Cl. 349-69.000.
- Stark, Donald C.: *See—*
  - Barth, Richard M.; Stark, Donald C.; Lai, Lawrence; and Richardson, Wayne S., 5,748,554, Cl. 365-230.030.
- Stark, Donald Charles: *See—*
  - Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.
- Stark, Thomas; Zimmermann, Helmut; and Uhl, Klaus-Martin, to Andreas Stihl. Hand-held working tool with combustion air channel arranged at blower housing. 5,746,160, Cl. 123-41.700.
- State Industries, Inc.: *See—*
  - Syler, Rodney R.; Faber, Rolf E.; and Lindahl, D. Kent, 5,746,344, Cl. 220-465.000.

- Staudinger, Joseph: *See—*
  - Norris, George B.; Staudinger, Joseph; and Sadowniczak, Gary W., 5,748,042, Cl. 330-277.000.
- Steckler, Dov. Car and a device for inserting and taking out a wheel chair from a luggage compartment. 5,746,563, Cl. 414-462.000.
- Stedman, David, to AgriBioTech, Inc. Precision dispensing system. 5,746,241, Cl. 137-101.210.
- Steelcase Inc.: *See—*
  - Bodnar, David A., 5,746,479, Cl. 297-411.260.
  - Luchetti, Robert J.; Draudt, Gregg Robert; Eldon, James Bender, III; and McClanahan, David Dean, 5,746,034, Cl. 52-220.700.
  - Seiber, Charles A.; Shaw, Benjamin G.; Lada, Christopher O.; Hobson, Phillip M.; Poppe, Robert P.; Shipman, David A.; Luchetti, Robert J.; Draudt, Gregg R.; Eldon, James B., III; and McClanahan, David D., 5,746,035, Cl. 52-238.100.
- Steffen, Hans: *See—*
  - Pittrof, Folker; and Steffen, Hans, 5,747,066, Cl. 424-450.000.
- Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, to Gruenenthal GmbH. Bifunctional urokinase variants with improved fibrinolytic characteristics and thrombin inhibiting effect. 5,747,291, Cl. 435-69.600.
- Steffens, Walter L.: *See—*
  - Wilkins, John J.; and Steffens, Walter L., 5,746,305, Cl. 198-890.100.
- Stegen, Helga; Blum, Joachim; and Kerlin, Klaus-Günter, to Herberts Gesellschaft mit beschrankter Haftung. Process for the effect coating of grained plastics parts. 5,747,114, Cl. 427-380.000.
- Stein, Jay A.; and Berger, Noah, to Hologic Inc. X-ray bone densitometry. 5,748,705, Cl. 378-196.000.
- Stein, Michael Victor; and Wenker, Paul Richard, to Apple Computer, Inc. Graphical user interface with icons having expandable descriptors. 5,748,927, Cl. 395-333.000.
- Steinberg, David E., to Powerhorse Corporation. Angular position sensor. 5,746,005, Cl. 33-1.0PT.
- Steinberg, Frederic; Adams, Phyllis; and Arnoth, Frank W., to Steinberg, Frederic; and Adams, Phyllis. Circumcision instrument. 5,746,748, Cl. 606-118.000.
- Steiner, Beat: *See—*
  - Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.
- Steiner, Ivan B.; Zimmerman, Scott M.; and Beeson, Karl W., to AlliedSignal Inc. Color separating backlight. 5,748,828, Cl. 385-146.000.
- Stellon, Andrew P.: *See—*
  - Brown, David L.; Stellon, Andrew P.; and Gemma, Edward A., Jr., 5,746,311, Cl. 206-63.300.
- Stelter, Eric C.; Guth, Joseph E.; and Kasiske, W. Charles, to Eastman Kodak Company. Method for forming toner images with two distinct toners. 5,748,218, Cl. 347-158.000.
- Stengrim, Jon D. Portable carrier for off-road vehicles. 5,746,364, Cl. 224-572.000.
- Stenkvist, Sven-Einar: *See—*
  - Andersson, Karl-Hugo; Stenkvist, Sven-Einar; and Wikström, Göran, 5,748,666, Cl. 373-9.000.
- Stenstrom, Eric: *See—*
  - Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
- Stepan Company: *See—*
  - Ryklin, Irma; and Sajic, Branko, 5,746,945, Cl. 252-309.000.
- Stepanek, Stephen B., to Hampshire Holographic Manufacturing Corp. Process for transferring holographic images. 5,746,865, Cl. 156-233.000.
- Stephan, Allan H.; LaPorte, Brent N.; Powers, Stephen B.; and McNeely, Mark, to Stratos Product Development Group. Touchpad with scroll and pan regions. 5,748,185, Cl. 345-173.000.
- Stephansen, Poju R. Apparatus and process for calcification. 5,746,983, Cl. 422-162.000.
- Sterett, Robert A.; and Sudhalkar, Atul M., to Aeroquip Corporation. Method and apparatus for creating a free-form three-dimensional article using a layer-by-layer deposition of molten metal and using a stress-reducing annealing process on the deposited metal. 5,746,844, Cl. 148-522.000.
- Steris Corporation: *See—*
  - Malchesky, Paul S., 5,747,794, Cl. 250-227.230.
- Sterling Diagnostic Imaging, Inc.: *See—*
  - Torardi, Carmine C., 5,746,943, Cl. 252-301.40P.
- Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., to University of California, The Regents of the; Sansum Medical Research Foundation; and California Pacific Medical Center, Research Institute. BH55 hyaluronidase. 5,747,027, Cl. 424-94.620.
- Sternberg, Charlene Gross: *See—*
  - Bereznak, James Francis; Chang, Zen-Yu; Selby, Thomas Paul; and Sternberg, Charlene Gross, 5,747,497, Cl. 514-259.000.
- Sternberg, Hal: *See—*
  - Segall, Paul E.; Waitz, Harold D.; Sternberg, Hal; and Segall, Judith M., 5,747,071, Cl. 424-663.000.
- Stevanović , Stefan: *See—*
  - Rammensee, Hans-Georg; Falk, Kirsten; Rötzschke, Olaf; Stevanović , Stefan; and Jung, Günther, 5,747,269, Cl. 435-7.240.
- Stevens, Howard M.: *See—*
  - Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., 5,746,881, Cl. 156-578.000.
- Stevens, Kenneth N., to Sensimetrics Corporation. Method of speech representation and synthesis using a set of high level constrained parameters. 5,748,838, Cl. 395-2.700.
- Stevens, Richard B.: *See—*
  - Espinoza, Therese A.; Miller, Charles J.; and Stevens, Richard B., 5,746,822, Cl. 106-785.000.
- Stevenson, Michael H.; and Reeves, Robert A., to Stevenson, Michael J. Method for enhancement of the surfaces of molded plastic products. 5,746,961, Cl. 264-255.000.
- Stevenson, Michael J.: *See—*
  - Stevenson, Michael H.; and Reeves, Robert A., 5,746,961, Cl. 264-255.000.
- Stevenson, Randy Claude: *See—*
  - Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, 5,746,368, Cl. 228-33.000.
- Stewart, Barbara Jones: *See—*
  - Katsen, Boris Joseph; Himmelwright, Richard S.; Stewart, Barbara Jones; and Schwartz, Nate R., 5,746,817, Cl. 106-31.650.
- Stewart, J. Marcus: *See—*
  - Sutterlin, Philip H.; and Stewart, J. Marcus, 5,748,671, Cl. 375-206.000.
- Stewart, Kenneth B.: *See—*
  - deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
- Stewart, W. Brian; Osment, Donald R.; and Duchek, John W., to Primex Technologies, Inc. Pre-molded aft seal for discarding sabot projectiles. 5,747,725, Cl. 102-521.000.
- Steyer, William; and Higgins, Timothy Joseph, to Gereral Electric Company. Infrared suppressor. 5,746,047, Cl. 60-39.500.
- Steyn, Ricardo Sheath Oxford. Needle protective device. 5,746,718, Cl. 604-192.000.
- St-Germain, André; and Tessier, Luc, to Gestion De Brevets Fraco LTÉE. Self erecting scaffolding. 5,746,290, Cl. 182-146.000.
- Stigsson, Lars: *See—*
  - Backlund, Åke; and Stigsson, Lars, 5,746,886, Cl. 162-30.100.
- Stiles, David R.: *See—*
  - Van Dyke, Korbin S.; Stiles, David R.; and Favor, John G., 5,748,932, Cl. 395-375.000.
- Stilwell, John Douglas: *See—*
  - Parker, Barry John; Krinickas, Alexander; Stilwell, John Douglas; and Brown, Neil Leonard, 5,746,580, Cl. 416-245.00R.
- St. Louis, Daniel M.: *See—*
  - Johnson, Jeffrey; and St. Louis, Daniel M., 5,746,650, Cl. 454-52.000.
- Stockwell, John Oliver; Bingham, Timothy Guy; and Dungworth, Howard Roger, to Allied Colloids Limited. Method for deinking printed paper using an emulsion of crosslinked, insoluble, ionizable and swellable polymer particles. 5,746,885, Cl. 162-5.000.
- Stoevhase, Bent; and Malavalli, Kumar, to McDATA Corporation. Method and apparatus for implementing virtual circuits in a fibre channel system. 5,748,612, Cl. 370-230.000.
- Stoker, Edward J., to MCI Corporation. System and method for evaluating video fidelity by determining information frame rate. 5,748,229, Cl. 348-180.000.
- Stokes, Robert David: *See—*
  - Brady, Daniel F.; McCall, John E., Jr.; Mattia, Paul J.; Lavorata, John M.; PeKarna, Matthew D.; Stokes, Robert David; and Bailey, Clyde Arthur, 5,746,238, Cl. 137-3.000.
- Stolfo, Salvatore J. Method and apparatus for imaging, image processing and data compression. 5,748,780, Cl. 382-232.000.
- Stoll, Kurt, to Festo KG. Drive cylinder. 5,746,110, Cl. 92-13.600.
- Stolten, Detlef: *See—*
  - Kurbjuhn, Manfred; Stolten, Detlef; and Wagner, Wolfgang, 5,747,184, Cl. 429-31.000.
- Stoltz, Klas; and Gustavsson, Bo, to Färgklämman AB. Ampul and an ampul-fitted theft-deterrent device. 5,745,965, Cl. 24-704.100.
- Stone, James L., to Tenneco Packaging Inc. Shaker pour spout dispenser. 5,746,370, Cl. 229-217.000.
- Stone, Tod S.: *See—*
  - Prall, Kirk; Stone, Tod S.; and Zagar, Paul S., 5,747,869, Cl. 257-529.000.
- Stoner, Robert J: *See—*
  - Maris, Humphrey J; and Stoner, Robert J, 5,748,317, Cl. 356-357.000.
  - Maris, Humphrey J.; and Stoner, Robert J., 5,748,318, Cl. 356-381.000.
- Stoop, Michael D.: *See—*
  - Flach, Terry E.; and Stoop, Michael D., 5,748,103, Cl. 340-870.070.
- Storey, Michael C.; and Luckett, Lawane, to Texas Instruments Incorporated. Method and apparatus for determining linearity of a ramp signal. 5,748,017, Cl. 327-131.000.
- Storjohann, Kai: *See—*
  - Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, 5,749,060, Cl. 701-51.000.
- Stork Protecon-Langen B.V.: *See—*
  - Boeyen, Johannes Wilhelmus; and Meerdink, Jan Johannes, 5,746,648, Cl. 452-156.000.
- Stormceptor Canada Inc.: *See—*
  - Monteith, Joseph Gordon, 5,746,912, Cl. 210-170.000.
- Stouder, Albert E., Jr. Method and apparatus for insertion of a cannula and trocar. 5,746,720, Cl. 604-117.000.
- Stoving, Paul Newcomb: *See—*
  - Bestel, E. Fred; and Stoving, Paul Newcomb, 5,747,765, Cl. 218-155.000.

- Strader, Alan Lee: *See—*
  - Schoenian, Richard J.; and Strader, Alan Lee, 5,748,106, Cl. 340-928.000.
- Strata Products, Inc.: *See—*
  - Reinmann, John Joseph; and McCartney, Clifford A., 5,746,547, Cl. 405-288.000.
- Stratos Product Development Group: *See—*
  - Stephan, Allan H.; LaPorte, Brent N.; Powers, Stephen B.; and McNeely, Mark, 5,748,185, Cl. 345-173.000.
- Straub, Marc Alan; DiPiazza, Frank Burke; Jairazbhoy, Vivek Amir; Goenka, Lakhi Nandial; and Stevenson, Randy Claude, to Ford Motor Company. Molten solder dispensing system. 5,746,368, Cl. 228-33.000.
- Straup, Brian K.: *See—*
  - Smith, Jimmy Dean; Nicol, Mark D.; Straup, Brian K.; O'Brien, Terence Paul; Herman, Mark Layne; and Hussey, Terrence A., 5,748,982, Cl. 395-829.000.
- Streicher, Eric T.: *See—*
  - Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., 5,746,267, Cl. 164-65.000.
- Strempel, Hans-Juergen: *See—*
  - Riedemann, Thomas P.; Cavagnaro, Richard F.; Rolf, Klaus W.; Strempel, Hans-Juergen; Michael, Guenther; Brand, Gerd T.; Ernst, Andreas; Schaffer, Roland; and Riemenschneider, Herbert, 5,746,347, Cl. 222-1.000.
- Strickler, David A.: *See—*
  - Parker, Anthony A.; Strickler, David A.; and Park, Hung S., 5,747,617, Cl. 526-273.000.
- Strijbosch, Antonius Henricus J.: *See—*
  - Domburg, Bastiaan; Gupta, Anshu M.; de Ruijter, Hendrik; and Strijbosch, Antonius Henricus J., 5,747,441, Cl. 510-375.000.
- Strijckers, Hans: *See—*
  - Leenders, Luc; Defieuw, Geert; Horsten, Bart; and Strijckers, Hans, 5,747,412, Cl. 503-201.000.
- Stringfellow, Steve: *See—*
  - Voll, Benn Arild; Kebodeaux, Matthew S.; Stringfellow, Steve; and Bayne, Christian F., 5,746,274, Cl. 166-278.000.
- Strockbine, Nancy A.: *See—*
  - O'Brien, Alison; Lindgren, Susanne Ward; Perera, Liyanage Parakrama; Strockbine, Nancy A.; and Melton-Celsa, Angela Ruth, 5,747,272, Cl. 435-7.370.
- Stroobandt, Jack D.: *See—*
  - El-Ibiary, Yehia; Nisley, Donald L.; and Stroobandt, Jack D., 5,746,452, Cl. 384-446.000.
- Stroomer, Martinus V. C.: *See—*
  - Neijzen, Jacobus H. M.; De Vaan, Adrianus J. S. M.; and Stroomer, Martinus V. C., 5,748,374, Cl. 359-621.000.
- Stroud, David J.: *See—*
  - Shogan, Gregory P.; Stroud, David J.; and Dawley, Mark, 5,745,954, Cl. 16-343.000.
- Stryker Corporation: *See—*
  - Philipp, Chris, 5,747,953, Cl. 318-139.000.
- Stuart, Randolph L., to Eckel Manufacturing Company, Inc. Method of rotating a tubular member. 5,746,276, Cl. 173-1.000.
- Stuermer, Karl Heinz: *See—*
  - Hayden, Michael Patrick; and Stuermer, Karl Heinz, 5,746,869, Cl. 156-265.000.
- Stuff Mfg. Co., Ltd.: *See—*
  - Shiraishi, Masami, 5,746,638, Cl. 446-92.000.
- Stugard, Howard E.: *See—*
  - Ambs, Richard W.; Reiner, Mary C.; Stugard, Howard E.; and Pfeiffer, John W., 5,746,796, Cl. 55-493.000.
- Stuntz, Ross Maxwell: *See—*
  - Hampo, Richard Joseph; Momcilovich, Paul Theodore; and Stuntz, Ross Maxwell, 5,747,689, Cl. 73-304.00C.
- Su, Wen-Doe, to Mosel Vitelic, Inc. Modified poly-buffered isolation. 5,747,357, Cl. 437-69.000.
- Suarez, Hector E.: *See—*
  - Patterson, Audley F.; Suarez, Hector E.; and Wadin, Craig P., 5,749,056, Cl. 455-569.000.
- Subrahmanyam, Chivukula: *See—*
  - Kantimahanti, Arjun Kumar; Subrahmanyam, Chivukula; and Zhou, Mei Sheng, 5,747,369, Cl. 438-241.000.
- Subramanian, Ramnath: *See—*
  - Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.
- Subramanian, Ravi: *See—*
  - Comino, Vittorio; Foschini, Gerard Joseph; Habbab, Isam M.; Kasturia, Sanjay; Salz, Jack; Prise, Michael Edward; and Subramanian, Ravi, 5,748,681, Cl. 375-319.000.
- Suda, Satoshi: *See—*
  - Ishida, Noboru; Sasaki, Umekichi; Takigawa, Katsuya; and Suda, Satoshi, 5,746,933, Cl. 252-68.000.
- Suddeth, Bruce H.: *See—*
  - Brown, Steven E.; and Suddeth, Bruce H., 5,746,022, Cl. 47-57.600.
- Sudeora, Sanjay: *See—*
  - Xu, David Jisen; and Sudeora, Sanjay, 5,748,817, Cl. 385-51.000.
- Sudhalkar, Atul M.: *See—*
  - Sterett, Robert A.; and Sudhalkar, Atul M., 5,746,844, Cl. 148-522.000.
- Sudhoff, Douglas H.; and Williams, Donald Howard, to Reliance Electric Industrial Company. Low profile moisture drain plug with diverse drain paths for an electric motor. 5,747,904, Cl. 310-88.000.
- Suga, Kazunari, to Advantest Corp. Board exchange mechanism for semiconductor test system. 5,747,994, Cl. 324-158.100.
- Sugamata, Tohru; Miyama, Yasuyuki; and Shinriki, Takashi, to Sumitomo Osaka Cement Co., Ltd. Optical modulator with optical waveguide and traveling-wave type electrodes. 5,748,358, Cl. 359-245.000.
- Sugano, Manabu; Nomura, Susumu; Yanagawa, Naoharu; and Suzuki, Hiroshi, to Pioneer Electronic Corporation. Rotational optical head for optical recording medium. 5,748,600, Cl. 369-112.000.
- Sugawara, Akira: *See—*
  - Konuma, Toshimitsu; Sugawara, Akira; and Tsuji, Takahiro, 5,747,355, Cl. 437-41.000.
- Sugawara, Michinori, to NEC Corporation. Prevention of erroneous operation in equalizing operation in semiconductor memory device. 5,748,540, Cl. 365-189.050.
- Sugawara, Yoshitaka: *See—*
  - Sakurai, Naoki; and Sugawara, Yoshitaka, 5,747,829, Cl. 257-66.000.
- Sugaya, Tsutomu: *See—*
  - Hirobe, Junichi; Aikawa, Yukihiro; Makie, Ikuo; Sugaya, Tsutomu; and Sadamori, Hiroyuki, 5,746,505, Cl. 362-260.000.
- Sugimoto, Mitsuhiro; Kondo, Yuji; Zama, Koichi; and Sato, Yuko, to NEC Corporation. Packaged piezoelectric transformer unit. 5,747,916, Cl. 310-348.000.
- Sugimoto, Naomi: *See—*
  - Kikui, Shinsuke; Yasuda, Wataru; Shimeki, Ichiro; and Sugimoto, Naomi, 5,749,022, Cl. 399-50.000.
- Sugimoto, Toshiyuki: *See—*
  - Nishimoto, Tomoyuki; Chaen, Hiroto; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,747,300, Cl. 435-101.000.
- Sugisawa, Teruhide: *See—*
  - Hoshino, Tatsuo; Ojima, Setsuko; and Sugisawa, Teruhide, 5,747,301, Cl. 435-105.000.
- Sugita, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Semiconductor Software Co., Ltd. Ad converting apparatus including holding means indicating whether or not data after AD conversion has been previously used. 5,748,984, Cl. 395-889.000.
- Sugita, Seiichi: *See—*
  - Ogawa, Hiroshi; Sugita, Seiichi; and Sato, Toshio, 5,746,568, Cl. 414-789.600.
- Sugitani, Hiroshi: *See—*
  - Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.
- Sugiura, Horoaki; Tanaka, Fuminori; and Uesugi, Daisuke, to Yoshino Kogyosho Co., Ltd. Intermediate product capable of being formed into a biaxially oriented polyethylene terephthalate resin bottle-shaped container and method of blow-molding the same. 5,747,130, Cl. 428-36.920.
- Sugiyama, Kenji, to Victor Company of Japan, Ltd. Moving image signal coding apparatus and coded signal decoding apparatus. 5,748,784, Cl. 382-236.000.
- Sugiyama, Kenji, to Victor Company of Japan, Ltd. Hierarchy type encoding/decoding apparatus. 5,748,787, Cl. 382-240.000.
- Sugiyama, Mitsuhiro; and Tashiro, Tsutomu, to Nec Corporation. Method and apparatus for fabricating semiconductor device with photodiode. 5,747,860, Cl. 257-432.000.
- Sugiyama, Shinichi, to Jatco Corporation. Carrier connecting structure for an automatic transmission. 5,746,675, Cl. 475-278.000.
- Sugiyama, Yoshihide: *See—*
  - Hosoi, Masatoshi; Sugiyama, Yoshihide; Ichikawa, Mitsuru; and Masamura, Norihisa, 5,746,162, Cl. 123-58.090.
- Sugizaki, Yutaka: *See—*
  - Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, 5,747,206, Cl. 430-64.000.
- Suk, Jong-Wook; Park, Jin-Ho; Park, Shin-Hyun; and Kim, Chang-Sik, to Samsung Electronics Co., Ltd. Endpoint detecting apparatus in a plasma etching system. 5,748,297, Cl. 356-72.000.
- Suke, Paul Daniel: *See—*
  - Rajala, Gregory John; Gehling, Steven Craig; and Suke, Paul Daniel, 5,745,922, Cl. 2-243.100.
- Sukeno, Masahiko; and Ueda, Yasuyuki, to Matsushita Electronics Corporation. Color picture tube and in-line electron gun with focusing electrodes having elongated through holes. 5,747,922, Cl. 313-412.000.
- Sullivan, Roy H.; and Gellman, Barry N., to Boston Scientific Corporation. Needle grasping apparatus. 5,746,753, Cl. 606-147.000.
- Sumi, Shinjiro: *See—*
  - Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.
- Sumitomo Electric Industries, Ltd.: *See—*
  - Fukuda, Chie; Onishi, Masashi; and Kanamori, Hiroo, 5,746,801, Cl. 65-379.000.
  - Horie, Hiroto, 5,748,076, Cl. 340-442.000.
  - Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,747,727, Cl. 136-201.000.
  - Tsubouchi, Toshiyasu; Okamoto, Satoru; and Ihara, Tomohiko, 5,747,112, Cl. 427-253.000.

VOL 210
ISS 1
MY 5
998
UMI

  - Yada, Katsuhiro, 5,748,669, Cl. 375-202.000.
- Sumitomo Heavy Industries, Ltd.: *See*—
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Sumitomo Light Metal Industries, Ltd.: *See*—
  - Tanaka, Hiroki; Mizutani, Hiroyuki; Narita, Midori; and Takada, Koichi, 5,746,847, Cl. 148-692.000.
- Sumitomo Metal Industires Limited: *See*—
  - Suzuma, Toshiyuki, 5,747,988, Cl. 324-232.000.
- Sumitomo Metal Industries, Ltd.: *See*—
  - Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Sumitomo Osaka Cement Co., Ltd.: *See*—
  - Sugamata, Tohru; Miyama, Yasuyuki; and Shinriki, Takashi, 5,748,358, Cl. 359-245.000.
- Sumitomo Rubber Industries, Ltd.: *See*—
  - Horie, Hiroto, 5,748,076, Cl. 340-442.000.
  - Watkins, David Robert; Nock, Nigel Gerard; and Jackson, Michael, 5,746,852, Cl. 152-454.000.
- Sumiyoshi, Hideo: *See*—
  - Miura, Kazunori; Sasaki, Seimi; Ochiai, Ryoichi; Sumiyoshi, Hideo; and Nakagawa, Goji, 5,748,822, Cl. 385-90.000.
- Summe, Isabel M.: *See*—
  - Novak, Miloslav; Trageser, Andrew B.; Summe, Isabel M.; and Kane, Susan L., 5,746,476, Cl. 297-216.130.
- Sümmerer, Gunther: *See*—
  - Lücke, Christian; Sümmerer, Gunther; and Gärtner, Hartmut, 5,748,367, Cl. 359-385.000.
- Summerfelt, Scott R.: *See*—
  - Belcher, James F.; Beratan, Howard R.; and Summerfelt, Scott R., 5,746,930, Cl. 216-87.000.
- Sumpter, James E.: *See*—
  - Wason, Satish K.; and Sumpter, James E., 5,747,008, Cl. 424-52.000.
- Sun, Bao-Shiang: *See*—
  - Yu, Kuo-Cheng; Sun, Bao-Shiang; and Lin, Ching-Yi, 5,748,948, Cl. 395-555.000.
- Sun, King-Mo: *See*—
  - Brown, Richard James; Sun, King-Mo; and Frasier, Deborah Ann, 5,747,516, Cl. 514-359.000.
- Sun Microsystems, Inc.: *See*—
  - Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., 5,748,453, Cl. 361-801.000.
  - Gosling, James A., 5,748,964, Cl. 395-705.000.
  - Hagersten, Erik E., 5,749,095, Cl. 711-141.000.
  - Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., 5,749,074, Cl. 705-8.000.
  - Katiyar, Dinesh, 5,748,897, Cl. 395-200.490.
  - Lewis, Brian T.; and Hamilton, Graham, 5,748,881, Cl. 395-184.010.
  - Sproull, Robert F.; and Sutherland, Ivan E., 5,748,539, Cl. 365-189.040.
  - Tam, Kenway W., 5,748,015, Cl. 327-51.000.
  - Tremblay, Marc; and Yarlagadda, Krishna C., 5,748,935, Cl. 395-392.000.
  - Van De Vanter, Michael L., 5,748,975, Cl. 395-793.000.
- Sun, Yu: *See*—
  - Wang, Hsingya Arthur; Ramsbey, Mark T.; and Sun, Yu, 5,747,882, Cl. 257-768.000.
- Sunaga, Hideki; and Suto, Masatoshi, to Calsonic Corporation. Air conditioner for automobile use. 5,746,060, Cl. 62-126.000.
- Sunagawa, Hiroshi; Uejima, Atsushi; Iwasaki, Osamu; and Aihara, Takaaki, to Fuji Photo Film Co., Ltd. Light-source device for exposure and light-source device for image reading. 5,748,283, Cl. 355-35.000.
- Sunbeam Products, Inc.: *See*—
  - Moore, Devin Lee; McMillan, John A.; and Kopp, Joseph J., Jr., 5,748,836, Cl. 392-337.000.
- Sundburg, William J.; and Shi, Weiman, to Advanced Fiber Optechs, Inc. Variable light source compensated optical fiber sensing system. 5,747,793, Cl. 250-227.140.
- Sunds Defibrator Industries AB: *See*—
  - Forslund, Kjell, 5,746,890, Cl. 162-243.000.
  - Johansson, Ola; and Kjellqvist, Olof, 5,747,707, Cl. 73-862.623.
  - Jonsson, Age, 5,746,120, Cl. 100-4.000.
- Sundstrand Corporation: *See*—
  - McArthur, Malcolm J., 5,747,680, Cl. 73-117.300.
  - Parker, Barry John; Krinickas, Alexander; Stilwell, John Douglas; and Brown, Neil Leonard, 5,746,580, Cl. 416-245.00R.
  - Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., 5,747,971, Cl. 322-10.000.
  - Shah, Nipulkumar, 5,746,048, Cl. 60-39.060.
- Suntory Limited: *See*—
  - Yabuta, Masayuki; and Ohsuye, Kazuhiro, 5,747,321, Cl. 435-220.000.
- Suomen Yrittäjäin Tuki R.Y.: *See*—
  - Koverola, Matti, 5,746,263, Cl. 144-355.000.
- Super Sack Mfg. Corp.: *See*—
  - Derby, Norwin C., 5,746,862, Cl. 156-198.000.
- Surinak, John J. Pitless well adapter. 5,746,273, Cl. 166-85.200.
- Surka, Stefan, to United Parcel Service of America, Inc. Method and apparatus for processing images with symbols with dense edges. 5,748,804, Cl. 382-291.000.
- Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, to Hitachi Ltd.; and Hitachi Car Engineering Co., Ltd. Throttle valve control system obtaining continuous sensor output and throttle valve control method thereof. 5,746,178, Cl. 123-399.000.
- Sutaria, Perry: *See*—
  - Spitz, Aaron; and Sutaria, Perry, 5,746,693, Cl. 600-112.000.
- Sutherland, Ivan E.: *See*—
  - Sproull, Robert F.; and Sutherland, Ivan E., 5,748,539, Cl. 365-189.040.
- Suto, Masatoshi: *See*—
  - Sunaga, Hideki; and Suto, Masatoshi, 5,746,060, Cl. 62-126.000.
- Sutter, Hermann, to Select Medizin-Technik Hermann Sutter GmbH. Bipolar coagulation forceps with rinsing tube. 5,746,739, Cl. 606-51.000.
- Sutterlin, Philip H.; and Stewart, J. Marcus, to Echelon Corporation. Adaptive reference pattern for spread spectrum detection. 5,748,671, Cl. 375-206.000.
- Sutton, Granger G., III: *See*—
  - Wei, Ying-Fei; and Sutton, Granger G., III, 5,747,312, Cl. 435-183.000.
- Sutton, John Michael: *See*—
  - Carr, Jeffery Dean; and Sutton, John Michael, 5,748,240, Cl. 348-384.000.
- Suzukawa, Kazufumi: *See*—
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
- Suzuki, Azuma, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,748,558, Cl. 365-233.000.
- Suzuki, Hajime: *See*—
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, to Canon Kabushiki Kaisha. Heat fixing apparatus with temperature control based on AC power waves. 5,747,774, Cl. 219-216.000.
- Suzuki, Hiroaki, to Fujitsu Limited. Oxygen electrode and its manufacture. 5,747,669, Cl. 73-23.210.
- Suzuki, Hiroko: *See*—
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
- Suzuki, Hiroshi: *See*—
  - Sugano, Manabu; Nomura, Susumu; Yanagawa, Naoharu; and Suzuki, Hiroshi, 5,748,600, Cl. 369-112.000.
- Suzuki, Hiroyuki: *See*—
  - Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, 5,747,400, Cl. 501-94.000.
- Suzuki, Kazumi: *See*—
  - Amano, Tetsuya; Hotta, Yoshihiko; Kawaguchi, Makoto; Suzuki, Kazumi; and Masubuchi, Fumihito, 5,747,413, Cl. 503-201.000.
- Suzuki, Kenya: *See*—
  - Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.
- Suzuki, Makoto: *See*—
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Suzuki, Masahiko: *See*—
  - Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.
- Suzuki, Masanobu: *See*—
  - Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.
- Suzuki, Masao; Matoba, Kazuyuki; and Nanba, Norihiro, to Canon Kabushiki Kaisha. Image sensing apparatus. 5,748,339, Cl. 358-473.000.
- Suzuki, Migaku; and Fukui, Hiroaki, to Paragon Trade Brands, Inc. Absorbent article and method of manufacturing article. 5,746,730, Cl. 604-385.200.
- Suzuki, Naomi: *See*—
  - Matsushita, Shozo; and Suzuki, Naomi, 5,747,430, Cl. 508-209.000.
- Suzuki, Nobukazu: *See*—
  - Ohba, Michio; Iwahana, Hidenori; Sato, Ryoichi; Suzuki, Nobukazu; Ogiwara, Katsutoshi; Sakanaka, Kazunobu; Hori, Hidetaka; Asano, Shouji; and Kawasugi, Tadaaki, 5,747,450, Cl. 514-12.000.
- Suzuki, Sakae: *See*—
  - Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.
- Suzuki, Shougo: *See*—
  - Mori, Masatomo; Nezu,.Masahiro; Matsunaga, Tadao; Naya, Rokurou; Suzuki, Shougo; and Azuma, Akihiro, 5,748,567, Cl. 367-178.000.

- Suzuki, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Speech recognition apparatus and method in noisy circumstances. 5,749,068, Cl. 704-233.000.
- Suzuki, Tadashi: *See*—
  - Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.
- Suzuki, Takashi: *See*—
  - Nakagawa, Yoshiaki; Suzuki, Takashi; Nakama, Seiji; Kaneda, Masataka; Kashikawa, Masakazu; Kawata, Satoshi; Iida, Shunichi; Nishida, Hiroto; and Matsuda, Hiroyuki, 5,748,606, Cl. 369-271.000.
- Suzuki, Takehiro, to Toyo Ink Manufacturing Co., Ltd. Aqueous emulsion of alkylalkoxysilane, process for the production thereof, and use thereof. 5,746,810, Cl. 106-2.000.
- Suzuki, Teruhiko, to Sony Corporation. Method for encoding and decoding motion picture as a function of its non-linear characteristic. 5,748,243, Cl. 348-405.000.
- Suzuki, Tetsuro: *See*—
  - Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.
- Suzuki, Tomokiyo: *See*—
  - Saeki, Minoru; Kawanishi, Masaki; Tsuchiya, Yoshiaki; and Suzuki, Tomokiyo, 5,748,503, Cl. 364-565.000.
- Suzuki, Tomomi: *See*—
  - Ishizaki, Takeshi; Mori, Kenjiro; Nakayama, Yoshiyuki; Kitahara, Chiho; Kameda, Masami; and Suzuki, Tomomi, 5,748,894, Cl. 395-200.040.
- Suzuki, Tomosaburo; and Kawakami, Sanji, to Daisey Kikai Co., Ltd. Bread slicer. 5,746,105, Cl. 83-804.000.
- Suzuki, Yasumichi: *See*—
  - Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,748,335, Cl. 358-445.000.
- Suzuki, Yoshiichi: *See*—
  - Yamamoto, Norio; Fujikawa, Takayuki; Koide, Shunichi; and Suzuki, Yoshiichi, 5,747,122, Cl. 428-1.000.
- Suzuki, Yoshimi: *See*—
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Suzuki, Yoshiyuki: *See*—
  - Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, 5,748,773, Cl. 382-169.000.
- Suzuma, Toshiyuki, to Sumitomo Metal Industires Limited. Method and apparatus for flaw detection by leakage fluxes and leakage flux sensor. 5,747,988, Cl. 324-232.000.
- Svansson, Lars Göran: *See*—
  - Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, 5,747,473, Cl. 514-45.000.
- Svecom Pe SRL: *See*—
  - Marin, Giancarlo, 5,746,386, Cl. 242-571.200.
- Svenning, Bjørnar; Hals, Tormod; and Bugten, Bjarne, to Den Norske Stats Oljeselskap A.S. Method and apparatus for taking seismic measurements. 5,747,754, Cl. 181-401.000.
- Svensson, Stefan Carl Tore: *See*—
  - Classon, Björn Olof; Samuelsson, Bengt Bertil; Kvarnström, Ingemar Sven-Anders; Svansson, Lars Göran; and Svensson, Stefan Carl Tore, 5,747,473, Cl. 514-45.000.
- Svoboda, Thomas D.: *See*—
  - Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.
- Swain, Christopher John: *See*—
  - Haworth, Karen Elizabeth; Seward, Eileen Mary; Swain, Christopher John; and Teall, Martin Richard, 5,747,491, Cl. 514-236.200.
- Swaminathan, Madhavan: *See*—
  - McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
- Swan Instruments, Inc.: *See*—
  - Ko, Lawrence K. C.; and Kevill, John F., 5,748,420, Cl. 360-133.000.
- Swan, Leo, to Equipment Development Company, Inc. Press assembly for a portable masonry cut-off saw. 5,746,193, Cl. 125-13.030.
- Swanson, David W.; Kaplinsky, George T.; Salter, James G.; and Rhoads, W. Wistar, to Hewlett-Packard Company. Ink-jet printer including ink cartridge with optimum snout and alignment surfaces. 5,748,215, Cl. 347-87.000.
- Swanson, Eric A.; and Chinn, Stephen R., to Massachusetts Institute of Technology. Apparatus and methods for reading multilayer storage media using short coherence length sources. 5,748,598, Cl. 369-94.000.
- Swanson, Paul D.: *See*—
  - Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.
- Swanson, S. Keith; and Miller, Tom, to Joslyn Electronic Systems Corporation. Electrical surge protection system with condition monitoring. 5,748,093, Cl. 340-659.000.
- Swanson, Verner: *See*—
  - Kramer, Steven; Srinivasan, Sujatha; and Swanson, Verner, 5,746,774, Cl. 623-39.000.
- Swartz, Edwin; and Thomas, Gene. Durable coated magnetic development roller. 5,749,033, Cl. 399-267.000.
- Swedlow, David B.; Bernstein, Michael J.; Porges, Charles E.; Luecke, James E.; and Noothaar, Michael W., to Nellcor Puritan Bennett Incorporated. Medical diagnostic apparatus with sleep mode. 5,746,697, Cl. 600-323.000.
- Sweeney, Niall; Morigi, Adriano; and Gyure, Sandor, to Becton, Dickinson and Company. Shielded needle assembly. 5,746,726, Cl. 604-263.000.
- Sweet, Norman M., to Precision Coatings Inc. Method of preparing a phototool. 5,747,197, Cl. 430-5.000.
- Swenson, Jeff: *See*—
  - Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
- Swift, Harold E.: *See*—
  - Mohnot, Shantilal M.; Swift, Harold E.; Krivak, Thomas G.; Fear, Robert H.; Randall, Laura M.; and Jones, Laurence E., 5,747,003, Cl. 424-49.000.
- Swift, Robert L.; Du Mee, Charles P.; and Randolph, Anne, to COR Therapeutics. Stable polypeptide composition. 5,747,447, Cl. 514-9.000.
- Switched Reluctance Drives Limited: *See*—
  - Fulton, Norman Neilson, 5,747,962, Cl. 318-701.000.
- Sybase, Inc.: *See*—
  - Drewry, Raymond, 5,748,178, Cl. 345-138.000.
- Sye, Chiping: *See*—
  - Jenkins, Ian R.; Kulpa, Walter J.; Stevens, Howard M.; Sye, Chiping; and Hibberd, Christopher V., 5,746,881, Cl. 156-578.000.
- Syed, Baber: *See*—
  - Powles, Trevor J.; Imran, Mir A.; Syed, Baber; and Gandhi, Deepak R., 5,746,724, Cl. 604-240.000.
- Syler, Rodney R.; Faber, Rolf E.; and Lindahl, D. Kent, to State Industries, Inc. Tank connector construction. 5,746,344, Cl. 220-465.000.
- Symbios Logic Inc.: *See*—
  - Anderson, Michael B., 5,748,050, Cl. 331-57.000.
  - DuLac, Keith B.; and Phillips, Grover G., 5,748,871, Cl. 395-182.030.
- Symbiosis Corporation: *See*—
  - Turturro, Vincent; Palmer, Matthew A.; Slater, Charles R.; and Gottlieb, Saul, 5,746,216, Cl. 128-751.000.
- Syme, Robert W.: *See*—
  - Romes, Gary E.; Church, Joseph T.; Sanford, Steven; and Syme, Robert W., 5,746,854, Cl. 156-62.200.
- Synergy Technologies, Inc.: *See*—
  - Fisher, Jeffrey J., 5,746,019, Cl. 43-1.000.
- Syngenix Limited: *See*—
  - Lever, Andrew Michael Lindsay; and Hunter, Eric, 5,747,307, Cl. 435-172.300.
- Synopsys, Inc.: *See*—
  - Gregory, Brent L.; and Segal, Russell B., 5,748,488, Cl. 364-490.000.
- Syntex (U.S.A.) Inc.: *See*—
  - Harats, Dror; Kurihara, Hiroki; Belloni, Paula Nanette; and Sigal, Charles Elliott, 5,747,340, Cl. 435-375.000.
- Synthonics Incorporated: *See*—
  - Palm, Charles S., 5,748,199, Cl. 345-473.000.
- Syron Engineering & Manufacturing Corporation: *See*—
  - Herbermann, Alfred F.; Van't Land, Jacob J.; and Filipiak, Michael A., 5,746,567, Cl. 414-752.000.
- Sytkowski, Arthur J., to Beth Israel Deaconess Medical Center. Modified polypeptides with increased biological activity. 5,747,446, Cl. 514-8.000.
- Syverson, Charles D.; and Francis, Willard P., to Ecoair Corp. Hybrid alternator. 5,747,909, Cl. 310-156.000.
- Szabo, Paul, to Tektronix, Inc. Method and apparatus for producing self-diagnostic information from a circuit board. 5,748,644, Cl. 371-22.500.
- Szabo, Sandor: *See*—
  - Graves, Arlinda; and Szabo, Sandor, 5,746,727, Cl. 604-283.000.
- Szajewski, Richard P.: *See*—
  - Bohan, Anne E.; Buchanan, John M.; and Szajewski, Richard P., 5,747,228, Cl. 430-380.000.
- Szentesi, Otto I.; and Throckmorton, Rodney A., to Siecor Corporation. Field installable optical fiber connector and an associated method of fabrication. 5,748,819, Cl. 385-60.000.
- T & R Assembly, Inc.: *See*—
  - Grover, Douglas B., 5,746,660, Cl. 473-15.000.
- T Cell Diagnostics, Inc.: *See*—
  - Parsons, George H.; Johns, Margaret A.; and Rugg, Arthur E., 5,747,265, Cl. 435-7.200.
- T.K. Wong & Associates Ltd.: *See*—
  - Wong, Tak-Ko, 5,746,641, Cl. 446-431.000.
- Taba, Serge; and Morgan, Michael V., to U.S. Divers Co., Inc. Valve for a first stage regulator having an encapsulated head. 5,746,198, Cl. 128-204.260.
- Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Control method of a zoom lens camera. 5,748,997, Cl. 396-87.000.
- Tachizaki, Hisashi: *See*—

VOL
210
SS
1
MY
5
998
UMI

- Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.

Tada, Katsumi: *See—*
- Mizutani, Natsuko; Hatakeyama, Atsushi; Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Asakawa, Satoshi, 5,748,953, Cl. 395-606.000.

Taguchi, Toshio; Agusa, Kiyoshi; Yamamoto, Shin-ichiro; and Nakamura, Hiroki, to Yashima Electric Co., Ltd. Image reproducing method and apparatus capable of storing and reproducing handwriting. 5,748,808, Cl. 382-312.000.

Taguchi, Yasuo: *See—*
- Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, 5,747,887, Cl. 307-64.000.

Taguchi, Yutaka: *See—*
- Eda, Kazuo; Taguchi, Yutaka; Kanaboshi, Akihiro; and Ogura, Tetsuyoshi, 5,747,857, Cl. 257-416.000.

Tahmassebpur, Mohammed, to Sierra Wireless, Inc. Electrical enclosure for radio. 5,748,449, Cl. 361-753.000.

Tai, Akira: *See—*
- Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.

Tai, Joseph Y.: *See—*
- Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,747,287, Cl. 435-69.100.

Tai, King Lien: *See—*
- Dromgoole, Douglas John; Feygenson, Anatoly; Frye, Robert Charles; Lotfi, Ashraf Wagih; and Tai, King Lien, 5,747,982, Cl. 323-902.000.

Tai, Tzu Hsiung. Emergency light having smoke proof mask. 5,746,492, Cl. 362-20.000.

Taiwan Semiconductor Manufacturing Company Ltd: *See—*
- Chen, Li-Chun; and Shen, Chih-Heng, 5,747,383, Cl. 438-648.000.
- Chen, Ling; Hsu, Sung-Mu; and Fang, Weng Liang, 5,747,856, Cl. 257-390.000.
- Chen, Shun-Long; and Hsu, Kuo-Yue, 5,746,876, Cl. 156-345.000.
- Chung, Wen-Jye, 5,747,817, Cl. 250-492.200.
- Huang, Yuan-Chang; and Chang, Kuan-Hui, 5,747,379, Cl. 438-586.000.
- Huang, Yung-Sheng; Yeou, Long-Sheng; Huang, Ji-Chung; and Lin, Chang-Song, 5,747,382, Cl. 438-624.000.
- Wang, Wonder D.; Horng, Shean-Ren; and Huang, Fei-Chi, 5,747,365, Cl. 438-17.000.
- Wu, Lin-June; Yu, Chen-Hua Douglas; and Lee, Jin-Yuan, 5,747,381, Cl. 438-624.000.
- Yen, Shih Kuei; Chu, Po-Tao; and Chang, Kuang-Hui, 5,746,928, Cl. 216-37.000.
- Yu, Chen-Hua, 5,747,373, Cl. 438-305.000.
- Yu, Chen-Hua; and Jang, Syun-Ming, 5,747,380, Cl. 438-599.000.

Taiwan Semiconductor Manufacturing Company,Ltd.: *See—*
- Lee, C. H.; and Chen, Y. H., 5,746,462, Cl. 294-64.100.

Tajika, Hiroshi: *See—*
- Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.

Tajima, Hiroki: *See—*
- Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Tajima, Kazushige; and Imahori, Yoshio, to Star Micronics Co., Ltd. Electroacoustic transducer. 5,747,906, Cl. 310-89.000.

Tajima, Yoshitaka; and Akashi, Takamitsu, to Bando Chemical Industries, Ltd. Power transmission belt and method of producing the same. 5,746,674, Cl. 474-253.000.

Tajiri, Akinori: *See—*
- Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.

Takada, Kazuyuki: *See—*
- Fujisaki, Yoshihiro; Emura, Shinichi; and Takada, Kazuyuki, 5,747,833, Cl. 318-808.000.

Takada, Koichi: *See—*
- Tanaka, Hiroki; Mizutani, Hiroyuki; Narita, Midori; and Takada, Koichi, 5,746,847, Cl. 148-692.000.

Takada, Naomi: *See—*
- Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, 5,748,276, Cl. 349-144.000.

Takafuji, Yutaka: *See—*
- Shimada, Takayuki; Akebi, Yasunobu; and Takafuji, Yutaka, 5,748,175, Cl. 345-127.000.

Takagi, Kiyoji: *See—*
- Nishida, Koji; Kurasawa, Yoshihiro; Takagi, Kiyoji; and Sano, Hironari, 5,747,575, Cl. 524-443.000.

Takagi, Kotaro, to Sony Corporation. Telephone handset for hands-free use in an auto mobile. 5,749,057, Cl. 455-569.000.

Takagi, Masayuki: *See—*
- Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Takagi, Osamu, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having a charged particle control device with a selectively insulating arrangement. 5,748,212, Cl. 347-55.000.

Takagi, Takeshi: *See—*
- Nishi, Tadahiko; Takagi, Takeshi; and Okude, Yoshitaka, 5,747,558, Cl. 523-201.000.

Takagi, Yasuo: *See—*
- Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.

Takagi, Yoshio: *See—*
- Majumdar, Gourab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 5,747,876, Cl. 257-687.000.

Takahashi, Akiyoshi; Ariyama, Nakazo; Ohkawa, Isao; Matsushita, Hiroki; and Ishizuka, Kachu, to Copal Electronics Co., Ltd. Dynamic-pressure gas bearing. 5,746,515, Cl. 384-115.000.

Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, to Hitachi, Ltd. Diagnosis system. 5,748,496, Cl. 364-550.000.

Takahashi, Fumiya: *See—*
- Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.

Takahashi, Helio: *See—*
- Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.

Takahashi, Hiroharu: *See—*
- Kashiwazaki, Masanii; Kanakubo, Yukio; and Takahashi, Hiroharu, 5,748,861, Cl. 395-110.000.

Takahashi, Jun: *See—*
- Kato, Akira; Kitamura, Toru; Igarashi, Hisashi; Suzuki, Sakae; Takagi, Yasuo; Hirota, Toshiaki; and Takahashi, Jun, 5,746,680, Cl. 477-95.000.
- Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.

Takahashi, Jun-Ichi, to NEC Corporation. Optical head for use with high density optical disk having multi-valued data recorded in the disk. 5,748,601, Cl. 369-112.000.

Takahashi, Katsutoshi: *See—*
- Hanaoka, Miyoji; Ekimoto, Hisao; Kobayashi, Fumiko; Irie, Yukio; Takahashi, Katsutoshi; Suzuki, Masanobu; Nakanishi, Takeshi; Kogawa, Osamu; and Ishikawa, Keizou, 5,747,502, Cl. 514-280.000.

Takahashi, Kiichiro: *See—*
- Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.

Takahashi, Koh: *See—*
- Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, 5,746,902, Cl. 205-57.000.

Takahashi, Kohzo: *See—*
- Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, 5,747,174, Cl. 428-480.000.

Takahashi, Koichi: *See—*
- Togino, Takayoshi; and Takahashi, Koichi, 5,748,378, Cl. 359-633.000.

Takahashi, Koji, to Canon Kabushiki Kaisha. Video signal reproducing system. 5,748,832, Cl. 386-68.000.

Takahashi, Makoto; and Nogami, Kazutaka, to Kabushiki Kaisha Toshiba. Output buffer circuit. 5,748,011, Cl. 326-83.000.

Takahashi, Norio; and Ojima, Yukio, to NIFCO Inc. Cap opening and closing mechanism. 5,746,338, Cl. 215-237.000.

Takahashi, Osamu: *See—*
- Sato, Takehiko; Takizawa, Hiroo; and Takahashi, Osamu, 5,747,231, Cl. 430-514.000.
- Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.

Takahashi, Shinichi: *See—*
- Murata, Chikara; Takahashi, Shinichi; and Yoshida, Mitsuhiro, 5,746,857, Cl. 156-102.000.

Takahashi, Shouji: *See—*
- Kashiwada, Seiji; Takahashi, Shouji; Inoue, Hiroshi; Suzuki, Kenya; Harakawa, Hiromi; and Nakao, Fumiaki, 5,747,572, Cl. 524-265.000.

Takahashi, Tamotsu: *See—*
- Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.

Takahashi, Tomonori, to NGK Insulators, Ltd. Reforming reactor. 5,746,985, Cl. 422-173.000.

Takahashi, Yasuhiro; and Fukui, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting combustion state in internal combustion engine. 5,747,670, Cl. 73-35.080.

Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, to Konica Corporation. Photographic film reproducing apparatus using object brightness and exposure correction amount to develop photographed images. 5,748,287, Cl. 355-40.000.

Takahashi, Yutaka; Niiyama, Manabu; and Goto, Yoshiki, to Fujitsu Limited. Level convertor. 5,748,024, Cl. 327-333.000.

Takakura, Kou: *See—*
- Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, 5,746,964, Cl. 264-315.000.

Takakura, Yutaka: *See—*
- Machida, Shuji; Shikuma, Haruo; Hoshino, Ayami; and Takakura, Yutaka, 5,747,620, Cl. 526-348.300.

Takakuwa, Masaki: *See—*
- Baba, Horonobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.

Takami, Satoshi: *See—*
- Yamashita, Yasuo; and Takami, Satoshi, 5,745,995, Cl. 30-43.600.

Takami, Yutaka: *See—*
- Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Takamizawa, Akihisa: *See—*
- Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, 5,747,339, Cl. 435-350.000.

Takamoto, Kenji: *See—*
- Shimono, Ken; Nagasaki, Tatsuo; Takamoto, Kenji; Ito, Masami; and Nishii, Kanji, 5,748,305, Cl. 356-237.000.

Takamura, Masashi: *See—*
- Naka, Yoji; Takamura, Masashi; Sohma, Hiroshi; and Onda, Kazuhiko, 5,749,009, Cl. 396-395.000.

Takanaga, Toshiyuki; Taguchi, Yasuo; Sadayoshi, Seiji; Kato, Mikio; and Kuroki, Kazuo, to Kundenko Co., Ltd.; and Fuji Electric Co., Ltd. Multi-function electric power conversion system. 5,747,887, Cl. 307-64.000.

Takaoka, Toshifumi: *See—*
- Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, 5,746,052, Cl. 60-274.000.

Takara, Muneaki. Rotary apparatus. 5,747,902, Cl. 310-75.00D.

Takata Corporation: *See—*
- Katoh, Shigeru, 5,748,477, Cl. 364-461.000.

Takata, Toshiaki: *See—*
- Adachi, Takahiro; and Takata, Toshiaki, 5,747,632, Cl. 528-196.000.

Takato, Hiroshi: *See—*
- Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.

Takatori, Sunao: *See—*
- Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,748,131, Cl. 341-155.000.
- Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, 5,748,510, Cl. 364-606.000.

Takaya, Shigeru: *See—*
- Miyagi, Takahiro; Takaya, Shigeru; and Masunaga, Yoshifumi, 5,748,579, Cl. 369-44.140.

Takayanagi, Toshihiro; Yanase, Kenji; and Muramatsu, Kiyoji, to Brother Kogyo Kabushiki Kaisha. Method and device for transmitting and processing print data used for printer. 5,748,859, Cl. 395-109.000.

Takayuki, Seki, to Ricoh Company, Ltd. Fixing device with cleaning device for cleaning fixing roller. 5,749,037, Cl. 399-327.000.

Takazawa, Hiroshi: *See—*
- Suzuki, Hidenobu; Soya, Takashi; Nakahara, Takashi; Nashida, Yasumasa; Nanbu, Tomoko; and Takazawa, Hiroshi, 5,747,774, Cl. 219-216.000.

Takeda Chemical Industries: *See—*
- Sohda, Takashi; Makino, Haruhiko; and Baba, Atsuo, 5,747,486, Cl. 514-211.000.

Takeda Chemical Industries, Ltd.: *See—*
- Oka, Masahide; Yoneto, Kenkichi; and Yamaguchi, Takamasa, 5,747,306, Cl. 435-138.000.

Takeda, Kazuhiro: *See—*
- Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.

Takeda, Kouji, to Texas Instruments Incorporated. Input circuit. 5,748,022, Cl. 327-313.000.

Takeda, Masaki; and Kato, Komei, to Namco Ltd. Polygon data conversion device, three-dimensional simulator apparatus, and polygon data conversion method. 5,748,198, Cl. 345-441.000.

Takeda, Toshimitsu: *See—*
- Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, 5,747,627, Cl. 528-59.000.

Takehara, Hisao; Nakayama, Yoshihiro; Shimizugawa, Ryoichi; Kishikawa, Tsutomu; Murai, Takumi; Takahashi, Fumiya; and Takahashi, Koh, to Japan Metals & Chemicals Co., Ltd. Electrolytic manganese dioxide and method of manufacturing the same. 5,746,902, Cl. 205-57.000.

Takematsu, Kiyotaka: *See—*
- Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.

Takemi, Masayoshi: *See—*
- Kimura, Tatsuya; and Takemi, Masayoshi, 5,748,659, Cl. 372-46.000.

Takeshige, Mari: *See—*
- Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.

Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, to Idemitsu Kosan Co., Ltd. Process for producing aromatic vinyl compound-based copolymer. 5,747,613, Cl. 526-134.000.

Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, to Idemitsu Kosan Co., Ltd. Catalyst for producing sytrenic polymer and process for producing sytrenic polymer by using same. 5,747,614, Cl. 526-160.000.

Takeuchi, Yoshitaka: *See—*
- Shimizu, Tetsuya; and Takeuchi, Yoshitaka, 5,748,245, Cl. 348-405.000.

Takeuchi, Yukihisa: *See—*
- Hirota, Toshikazu; Shibata, Kazuyoshi; and Takeuchi, Yukihisa, 5,747,671, Cl. 73-61.750.

Takewa, Hidehito: *See—*
- Nakatsuka, Yasuhiro; Nakashima, Keisuke; Matsuo, Shigeru; Narita, Masahisa; Katsura, Koyo; Takewa, Hidehito; and Aoki, Tomoaki, 5,748,202, Cl. 345-514.000.

Takhar, Harinder S., to Jasper Consulting, Inc. Modifying a database using a fingerprint form. 5,748,765, Cl. 382-124.000.

Taki, Kazunari; and Matsuda, Riki, to Brother Kogyo Kabushiki Kaisha. Magnetic recording disk. 5,748,421, Cl. 360-135.000.

Taki, Takayuki: *See—*
- Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.

Takigawa, Katsuya: *See—*
- Ishida, Noboru; Sasaki, Umekichi; Takigawa, Katsuya; and Suda, Satoshi, 5,746,933, Cl. 252-68.000.

Takigen Manufacturing Co. Ltd.: *See—*
- Takimoto, Kazuhide, 5,746,455, Cl. 292-62.000.

Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, to Canon Kabushiki Kaisha. Toner for developing electrostatic images containing aromatic hydroxycarboxylic acid and metal compound of the aromatic hydroxycarboxylic acid. 5,747,209, Cl. 430-106.600.

Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, to Kubota Corporation. Divided combustion chamber for diesel engine. 5,746,173, Cl. 123-293.000.

Takimoto, Kazuhide, to Takigen Manufacturing Co. Ltd. Gate or door spring-biased bolt latch. 5,746,455, Cl. 292-62.000.

Takita, Hiroto: *See—*
- Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Takizawa, Hiroo: *See—*
- Sato, Takehiko; Takizawa, Hiroo; and Takahashi, Osamu, 5,747,231, Cl. 430-514.000.

Takubo, Chiaki: *See—*
- Hosomi, Eiichi; Tazawa, Hiroshi; Takubo, Chiaki; and Shibasaki, Koji, 5,747,881, Cl. 257-762.000.

Takubo, Yoneharu: *See—*
- Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, 5,748,276, Cl. 349-144.000.

Talbot, Nicholas C.; Allison, Michael T.; and Griffioen, Peter, to Trimble Navigation Limited. Real-time kinematic initialization test system. 5,748,145, Cl. 342-357.000.

Taler, George A.: *See—*
- Yost, William T.; Cantrell, John H.; and Taler, George A., 5,746,209, Cl. 128-661.030.

Talisa, Salvador H.; Janocko, Michael A.; Partlow, Deborah P.; and Piloto, Andrew J., to Northrop Grumman Corporation. Technique for fabricating hybrid high-temperature superconductor-semiconductor circuits. 5,747,873, Cl. 257-661.000.

Tallentire, Alan; and Sinclair, Colin Samuel, to Bowater Packaging Limited. Porous webs. 5,747,110, Cl. 427-244.000.

Talreja, Sanjay: *See—*
- Bauer, Mark E.; Talreja, Sanjay; Frary, Kevin W.; Atwood, Gregory; Fazio, Albert; and Javanifard, Johnny, 5,748,546, Cl. 365-210.000.

Talvalkar, Shashi G.; and McCreight, Marion E., to NCR Corporation. Ultra high scratch and smear resistant images for synthetic receivers. 5,747,176, Cl. 428-484.000.

Tam, Kenway W., to Sun Microsystems, Inc. Low voltage single ended dynamic sense amplifier. 5,748,015, Cl. 327-51.000.

Tam, Kwok C., to Siemens Corporate Research, Inc. Method and apparatus for eliminating boundary errors in cone beam imaging. 5,748,697, Cl. 378-19.000.

Tamabuchi, Satoshi: *See—*
- Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, 5,747,570, Cl. 524-161.000.

/OL
2 10
SS
1
MY
5
998
MI

Tamada, Hitoshi; Matsumoto, Shuichi; Nishi, Noriaki; and Saito, Kimihiro, to Sony Corporation. Polarization optical element. 5,748,368, Cl. 359-486.000.

Tamai, Mikitaka, to Sanyo Electric Co., Ltd. Method of charging a rechargeable battery with pulses of a predetermined amount of charge. 5,747,969, Cl. 320-141.000.

Tamaki, Hiyoshi: *See—*

Narukawa, Satoshi; Amazutsumi, Toru; Fukuda, Hideki; and Tamaki, Hiyoshi, 5,746,780, Cl. 29-623.100.

Tamano, Yukinori: *See—*

Kato, Miki; Tamano, Yukinori; Kobayashi, Katsumi; and Noba, Michiyuki, 5,747,743, Cl. 174-254.000.

Tamanoi, Ken: *See—*

Shono, Keiji; Hashimoto, Yasunobu; Kuroda, Sumio; and Tamanoi, Ken, 5,747,136, Cl. 428-64.300.

Tamaoki, Junichi: *See—*

Hagi, Masayuki; Tamaoki, Junichi; Arai, Takeshi; and Fukuda, Hiroyuki, 5,747,211, Cl. 430-110.000.

Tamukai, Keiko: *See—*

Hidaka, Katsuhiko; Kawabata, Katsuhiro; and Tamukai, Keiko, 5,747,220, Cl. 430-273.100.

Tamura, Hajime: *See—*

Nagano, Ryuichiro; Nagase, Yoichi; and Tamura, Hajime, 5,748,826, Cl. 385-128.000.

Tamura, Hiroshi: *See—*

Anzai, Mitsutoshi; Imai, Akihiro; Sasaki, Masaomi; Tamura, Hiroshi; Shimada, Tomoyuki; Suzuki, Tetsuro; and Ohta, Masafumi, 5,747,204, Cl. 430-59.000.

Sakurai, Masashi; Nakanishi, Masaru; Tamura, Hiroshi; Kubo, Takehiko; Nakamura, Takashi; and Fujita, Tatsuya, 5,746,953, Cl. 264-40.400.

Tamura, Kazuya: *See—*

Sekine, Hiroshi; and Tamura, Kazuya, 5,748,476, Cl. 364-449.000.

Tan, Hong Sheng: *See—*

De Jong, Sylvia Josefine; De Haan, Ben Rudolf; and Tan, Hong Sheng, 5,747,078, Cl. 426-9.000.

Tanabe, Minoru, to Canon Kabushiki Kaisha. Camera having flash device. 5,749,003, Cl. 396-177.000.

Tanabe, Satoshi, to Kogyo Kabushiki Kaisha. Spherical polymer particles and process for their production. 5,747,611, Cl. 526-73.000.

Tanabe, Shiro: *See—*

Kusaki, Tsutomu; Ouchi, Toshiya; Tanabe, Shiro; Nanjo, Ken; and Maki, Takeshi, 5,749,053, Cl. 455-524.000.

Tanahashi, Naoki: *See—*

Okada, Shigeyuki; Tanahashi, Naoki; and Nakashima, Hayato, 5,748,514, Cl. 364-725.030.

Tanaka, Atsushi: *See—*

Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.

Tanaka, Etsuo; Okano, Hiroshi; and Katayama, Akira, to Nikon Corporation. Camera with vibration compensation device having anti-vibration lens urging mechanism and feed screw mechanism. 5,748,391, Cl. 359-813.000.

Tanaka, Fuminori: *See—*

Sugiura, Horoaki; Tanaka, Fuminori; and Uesugi, Daisuke, 5,747,130, Cl. 428-36.920.

Tanaka, Hirokazu: *See—*

Matsumura, Yukinori; and Tanaka, Hirokazu, 5,747,772, Cl. 219-121.850.

Tanaka, Hiroki; Mizutani, Hiroyuki; Narita, Midori; and Takada, Koichi, to Sumitomo Light Metal Industries, Ltd. Aluminum alloy sheet for easy-open can ends having excellent corrosion resistance and age softening resistance and its production process. 5,746,847, Cl. 148-692.000.

Tanaka, Hiroshi, to Canon Kabushiki Kaisha. Method of manufacturing semiconductor devices and a projection exposure method comprising the steps of exposing a two-dimensional grid pattern or patterns to radiation and projecting an image of the pattern or patterns onto a wafer at different focal posi. 5,747,202, Cl. 430-30.000.

Tanaka, Hiroshi: *See—*

Fukui, Yasushi; Matsuno, Masanori; Tanaka, Hiroshi; Miono, Tadaaki; Sakamoto, Kazushi; Ariyoshi, Yasumi; and Saito, Minoru, 5,747,111, Cl. 427-250.000.

Yoda, Kaneo; and Tanaka, Hiroshi, 5,749,036, Cl. 399-325.000.

Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, to Nippon Telegraph and Telephone Corporation. Method for making an optical device using a laser beam interference pattern. 5,748,272, Cl. 349-86.000.

Tanaka, Keiji: *See—*

Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, 5,747,570, Cl. 524-161.000.

Tanaka, Koji, to Tsubakimoto Chain Co. Method of fabricating a chain link assembly having bushes each provided integrally with a resin sleeve on its inner circumference. 5,745,974, Cl. 29-458.000.

Tanaka, Koji: *See—*

Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.

Tanaka, Satoshi, to Kabushiki Kaisha Toshiba. Disc cartridge including elastically deformable lid member and engaging mechanism for locking lid member to cartridge body. 5,748,609, Cl. 369-291.000.

Tanaka, Shigeru: *See—*

Tanaka, Shinichi; and Tanaka, Shigeru, 5,746,292, Cl. 188-73.370.

Tanaka, Shinichi; and Tanaka, Shigeru, to Hino Jidosha Kogyo Kabushiki Kaisha. Disk brake device for reducing brake noise. 5,746,292, Cl. 188-73.370.

Tanaka, Shinichi; and Kimura, Isao, to Nikon Corporation. Data reproduction apparatus. 5,748,593, Cl. 369-59.000.

Tanaka, Shinichi: *See—*

Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.

Tanaka, Toshiharu; and Yamamoto, Mitsuru, to Fuji Photo Film Co., Ltd. Heat sensitive ink sheet and image forming method. 5,746,866, Cl. 156-234.000.

Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, to Hitachi, Ltd. Semiconductor nonvolatile memory device and computer system using the same. 5,748,532, Cl. 365-185.180.

Tanaka, Toshiki; Doi, Takefumi; Nakamura, Haruki; Imanishi, Takeshi; and Kodama, Tatsuhiko, to Protein Engineering Research Institute. Peptide derivatives having binding activity to modified low density lipoprotein. 5,747,451, Cl. 514-12.000.

Tanaka, Tsuyoshi: *See—*

Koda, Yasunori; and Tanaka, Tsuyoshi, 5,749,083, Cl. 707-530.000.

Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, 5,746,008, Cl. 34-211.000.

Tanaka, Yuji: *See—*

Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Tanaka, Yutaka: *See—*

Hasegawa, Takayuki; Tanaka, Yutaka; and Fujioka, Hidehiko, 5,746,562, Cl. 414-217.000.

Tanemoto, Yoshihisa. Slipper. 5,746,014, Cl. 36-11.500.

Tang, Chung L.: *See—*

Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.

Tang, James J.: *See—*

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Tang, Tsan-Bih; and Yen, Chih-Chan, to United Microelectronics Corporation. Computer system architecture that incorporates display memory into system memory. 5,748,203, Cl. 345-521.000.

Tani Electronics Industry Co., Ltd.: *See—*

Tani, Okie, 5,746,125, Cl. 101-123.000.

Tani, Nobuhiro: *See—*

Shin, Takeharu; Seo, Shuzo; Tani, Nobuhiro; Nukui, Makoto; and Ishizuka, Yukihiro, 5,747,787, Cl. 235-472.000.

Tani, Okie, to Tani Electronics Industry Co., Ltd. Enclosed multi-blade squeegee structure for screen printing. 5,746,125, Cl. 101-123.000.

Taniguchi, Osamu; Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device. 5,746,939, Cl. 252-299.010.

Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, to Canon Kabushiki Kaisha. LCD having a voltage being applied to the LC in the chiral nematic phase prior to the display driving. 5,748,274, Cl. 349-133.000.

Taniishi, Shinnosuke: *See—*

Ohashi, Masashi; and Taniishi, Shinnosuke, 5,748,182, Cl. 345-173.000.

Tanimura, Takayoshi: *See—*

Iokibe, Tadashi; Tanimura, Takayoshi; and Fujimoto, Yasunari, 5,748,851, Cl. 395-51.000.

Tanimura, Yoshinari: *See—*

Tabata, Yasushi; Numako, Norio; Tanimura, Yoshinari; Sato, Takuma; Kishimoto, Masaaki; Nomura, Hiroshi; Azegami, Kazuyoshi; and Sasaki, Takamitsu, 5,748,997, Cl. 396-87.000.

Tanji, Ichiro, to Sony Corporation. Apparatus and method for processing a video signal. 5,748,258, Cl. 348-625.000.

Tankovich, Nikolai, to Lumedics, Ltd. Cryogenic laser lithotripsy with enhanced light absorption. 5,746,736, Cl. 606-9.000.

Taoka, Mikio: *See—*

Hashimoto, Shunji; Taoka, Mikio; and Nakano, Hideo, 5,748,065, Cl. 336-96.000.

Tarascon, Jean-Marie: *See—*

Gerand, Bernard; Larcher, Dominique; and Tarascon, Jean-Marie, 5,747,193, Cl. 429-224.000.

Tarr, Morton H.: *See—*

Holmes, Daniel J.; Molnar, John W.; and Tarr, Morton H., 5,748,842, Cl. 395-2.790.

Tarro, Giulio, to Instituto Farmacoterapico Italiano S.p.A. Antigenic regions of tumor-liberated particles (TLP) complexes and antibodies against the sames. 5,747,643, Cl. 530-329.000.

Tashiro, Hirohiko; Suzuki, Yoshiyuki; Ichikawa, Hiroyuki; Kutsuwada, Satoru; Itoh, Akio; and Abe, Yoshinori, to Canon Kabushiki Kaisha. Image processing apparatus. 5,748,773, Cl. 382-169.000.

Tashiro, Tsutomu: *See—*

Sugiyama, Mitsuhiro; and Tashiro, Tsutomu, 5,747,860, Cl. 257-432.000.

Tashiro, Yoshikazu: *See—*

Nashimoto, Kazuo; Tashiro, Yoshikazu; Kosaka, Yoshiomi; and Hara, Yukihiko, 5,747,053, Cl. 424-405.000.

Tashiro, Yuji: *See—*

Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.

Tate & Lyle Public Limited Company: *See—*

Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.

Tateishi, Kiyoshi, to Pioneer Electronic Corporation. Digital PLL circuit. 5,748,045, Cl. 331-17.000.

Tatsukawa, Masashi, to Koito Manufacturing Co., Ltd. Head lamp for vehicles. 5,746,491, Cl. 362-61.000.

Tatsuno, Tadayoshi: *See—*

Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.

Taube, John Janis: *See—*

Hutson, David Dean; Johenning, Christopher Paul; Taube, John Janis; and Waibel, Terry John, 5,746,849, Cl. 152-209.00R.

Taube, Klaus: *See—*

Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.

Tavecchia, Paolo: *See—*

Selva, Enrico; Tavecchia, Paolo; Restelli, Ermenegildo; Ferrari, Pietro; and Denaro, Maurizio, 5,747,295, Cl. 435-71.300.

Tavtigian, Sean V.: *See—*

Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.

Taya, Masaaki: *See—*

Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.

Taylor, Attalee S. Surface mount socket for an electronic package, and contact for use therewith. 5,746,608, Cl. 439-70.000.

Taylor, Gregory F.: *See—*

Kaveh, Golnaz; Taylor, Gregory F.; and Smith, Jeffrey E., 5,748,033, Cl. 327-545.000.

Taylor, Jonathan Michael: *See—*

Cox, Roland; Taylor, Jonathan Michael; and Thomson, Julie Ann, 5,746,959, Cl. 264-182.000.

Taylor, Michael Demar, to Amdahl Corporation. Mechanism for maintaining data coherency in a branch history instruction cache. 5,748,976, Cl. 395-800.000.

Taylor, Roger W.: *See—*

Muljadi, Eduard; and Taylor, Roger W., 5,747,967, Cl. 320-39.000.

Taylour, James; and Glozbach, Eberhard, to Diversey Lever Inc. Lubricant compositions. 5,747,431, Cl. 508-283.000.

Tazawa, Hiroshi: *See—*

Hosomi, Eiichi; Tazawa, Hiroshi; Takubo, Chiaki; and Shibasaki, Koji, 5,747,881, Cl. 257-762.000.

TDK Corporation: *See—*

Kamijima, Akifumi, 5,747,198, Cl. 430-11.000.

Miyakoshi, Toshinobu; and Hasegawa, Hiroaki, 5,747,396, Cl. 501-32.000.

Teall, Martin Richard: *See—*

Haworth, Karen Elizabeth; Seward, Eileen Mary; Swain, Christopher John; and Teall, Martin Richard, 5,747,491, Cl. 514-236.200.

Technology Licensing Co. LLC: *See—*

Baghoomian, Hovik, 5,746,544, Cl. 405-229.000.

TecSyn, Inc.: *See—*

Pettersson, Bjorn Ola Alfons; and Holmes, Patrick W., 5,747,073, Cl. 425-78.000.

Tedea-Huntleigh Intl. Ltd.: *See—*

Neuman, Eli, 5,747,745, Cl. 177-132.000.

Teeter, Gary Wilson: *See—*

Parks, Thomas Dewayne; Turner, Michael Rolland; Bunnell, Dale Leon; and Teeter, Gary Wilson, 5,746,132, Cl. 101-483.000.

Teetz, Volker: *See—*

Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, 5,747,504, Cl. 514-307.000.

Tegeler, G. R.: *See—*

O'Bear, Raymond E.; Colin, Bruno; Tegeler, G. R.; and Staples, John L., 5,746,980, Cl. 422-102.000.

Teger-Nilsson, Ann-Catrine Elisabet: *See—*

Bylund, Ruth Elvy; and Teger-Nilsson, Ann-Catrine Elisabet, 5,747,460, Cl. 514-19.000.

Tehrani, Saied N.; and Goronkin, Herbert, to Motorola, Inc. Method of selecting a memory cell in a magnetic random access memory device. 5,748,519, Cl. 365-98.000.

Tehrani, Saied N.: *See—*

Chen, Eugene; Tehrani, Saied N.; Legge, Ronald N.; and Zhu, Xiaodong T., 5,748,524, Cl. 365-173.000.

Tektronix, Inc.: *See—*

Hu, Shane Ching-Feng, 5,748,247, Cl. 348-413.000.

Szabo, Paul, 5,748,644, Cl. 371-22.500.

Tele Digital Development, Inc.: *See—*

Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.

Telectronics Pacing Systems, Inc.: *See—*

MacFarlane, Douglas Robert; and Voelkel, Alice, 5,748,439, Cl. 361-525.000.

Teledyne Industries, Inc.: *See—*

Scott, Richard D., 5,748,058, Cl. 333-202.000.

Telefonaktiebolaget LM Ericsson: *See—*

Dahlin, Steinar, 5,749,055, Cl. 455-553.000.

Esmaeili, Sasan, 5,748,299, Cl. 356-73.100.

Telle, John M.; and Roger, Stutz A. Synchronous identification of friendly targets. 5,748,138, Cl. 342-45.000.

Teller, Bill; McCulloch, Pete; Drobnich, Vaughn J.; and Goins, Jeffrey Lee, to Lear Corporation. Removable container assembly. 5,746,363, Cl. 224-547.000.

Temic Bayern-Chemie Airbag GmbH: *See—*

Kwun, Hegeon; Piskie, Michael Allen; and Gioutsos, Tony, 5,747,696, Cl. 73-728.000.

Temic Telefunken microelectronic GmbH: *See—*

Gutsch, Henrik; Häfner, Horst; Hammel, Hermann; Schmidt, Friedemann; and Schnabel, Jürgen, 5,748,425, Cl. 361-56.000.

Temple, Chester S.; and Parrinello, Luciano M., to PPG Industries, Inc. Substrates coated with antioxidant compositions and method for inhibiting the oxidation of such compositions applied to a substrate. 5,747,162, Cl. 428-395.000.

Teng, Min: *See—*

Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.

Tenneco Packaging Inc.: *See—*

Stone, James L., 5,746,370, Cl. 229-217.000.

Teodorescu, Ioan V.; and Mazzurco, Anthony, to DSC Telecom L.P. Apparatus and method for clock alignment and switching. 5,748,569, Cl. 368-118.000.

Teofilo, Vincent L.: *See—*

Merritt, Lauren V.; Teofilo, Vincent L.; Hollandsworth, Roger Paul; Rodriguez, Zaid B.; and Lovgren, Jack G., 5,747,968, Cl. 320-119.000.

Tepman, Avi: *See—*

Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.

Tepolt, Gary B., to Integrated Solutions, Inc. Robotic wafer handler. 5,746,565, Cl. 414-744.500.

Terada, Tomoyuki: *See—*

Watanabe, Atsushi; Terada, Tomoyuki; and Sakamoto, Shinsuke, 5,748,854, Cl. 395-93.000.

Teraguchi, Nobuaki: *See—*

Duggan, Geoffrey; Teraguchi, Nobuaki; Rorison, Judy Megan; and Tomomura, Yoshitaka, 5,747,827, Cl. 257-15.000.

Terai, Haruhiko: *See—*

Karita, Seiichiro; Sugitani, Hiroshi; Koizumi, Yutaka; Kashino, Toshio; Terai, Haruhiko; Goto, Akira; Omata, Kouichi; Tajima, Hiroki; Kudo, Kiyomitsu; Ishimatsu, Shin; and Iketani, Masaru, 5,748,213, Cl. 347-63.000.

Teralogic, Incorporated: *See—*

Chui, Charles K.; and Yi, Rongxiang, 5,748,116, Cl. 341-50.000.

Teramoto, Mitsunobu; and Itou, Akira, to Toyoda Gosei Co., Ltd. Corner piece for an automobile. 5,746,471, Cl. 296-146.100.

Terasaki, Fumitoshi; Yoshimura, Kenji; and Yoshimura, Tatsuhiro, to Okuma Corporation. Method of grinding and machining non-circular workpiece and apparatus for the same. 5,746,643, Cl. 451-5.000.

Terbeek, Eric A.: *See—*

Boyd, Trace L.; Beer, Richard D.; Terbeek, Eric A.; and Wong, Vernon W. H., 5,746,434, Cl. 277-1.000.

Terminella, Emanuele; Terminella, Frank; and Terminella, Joseph, to Pacmac, Inc. Convertible form, fill and seal packaging machine and method. 5,746,043, Cl. 53-451.000.

Terminella, Frank: *See—*

Terminella, Emanuele; Terminella, Frank; and Terminella, Joseph, 5,746,043, Cl. 53-451.000.

Terminella, Joseph: *See—*

Terminella, Emanuele; Terminella, Frank; and Terminella, Joseph, 5,746,043, Cl. 53-451.000.

Terray Corporation: *See—*

Runciman, Robert John; and Allard, Randall N., 5,746,742, Cl. 606-69.000.

Terui, Nobuhiko: *See—*

Kai, Tadao; Terui, Nobuhiko; and Tsukada, Shinichi, 5,748,994, Cl. 396-55.000.

Terukina, Asao: *See—*

Hassner, Martin; Koyama, Seiji; Nozawa, Tohru; Terukina, Asao; and Tetsuya, Tamura, 5,748,023, Cl. 327-336.000.

Tesciuba, Michele: *See—*

Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.

Tessier, Luc: *See—*

OL
210
SS
1
MY
5
998
MI

  - St-Germain, André; and Tessier, Luc, 5,746,290, Cl. 182-146.000.
- Tetra Laval Holdings & Finance SA: *See—*
  - Hellenschmidt, Stephen P., 5,746,808, Cl. 96-205.000.
- Tetsuya, Tamura: *See—*
  - Hassner, Martin; Koyama, Seiji; Nozawa, Tohru; Terukina, Asao; and Tetsuya, Tamura, 5,748,023, Cl. 327-336.000.
- Teverovsky, Alexander: *See—*
  - Rink, Linda M.; Letendre, Guy R.; Teverovsky, Alexander; and Marjanski, George C., 5,746,793, Cl. 55-385.300.
- Texas Instruments Deutschland GmbH: *See—*
  - Bayer, Erich, 5,748,014, Cl. 327-72.000.
- Texas Instruments Incorporated: *See—*
  - Belcher, James F.; Beratan, Howard R.; and Summerfelt, Scott R., 5,746,930, Cl. 216-87.000.
  - Ghosh, Prosenjit; and Thomas, Sunil, 5,745,985, Cl. 29-834.000.
  - Hashimoto, Masashi, 5,748,544, Cl. 365-201.000.
  - Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,747,880, Cl. 257-759.000.
  - Markandey, Vishal; and Gove, Robert J., 5,748,250, Cl. 348-451.000.
  - Mei, Chia-Cu Peter, 5,747,850, Cl. 257-328.000.
  - Pawate, Basavaraj I.; and Yim, Susan, 5,749,064, Cl. 704-213.000.
  - Plumton, Donald L., 5,747,842, Cl. 257-266.000.
  - Scott, Kyl W.; and Skidmore, James M., 5,748,497, Cl. 364-551.010.
  - Storey, Michael C.; and Luckett, Lawane, 5,748,017, Cl. 327-131.000.
  - Takeda, Kouji, 5,748,022, Cl. 327-313.000.
  - Turner, Terry R.; Belcher, James F.; and Andrews, Gary W., 5,746,835, Cl. 118-723.0MW.
  - d'Hont, Loek, 5,748,137, Cl. 342-42.000.
- Textron Inc.: *See—*
  - Jackl, Werner, 5,748,571, Cl. 368-282.000.
  - Lukes, Richard, 5,746,096, Cl. 81-54.000.
  - Schmitt, Karl R., 5,746,000, Cl. 33-288.000.
- Thanner, Ludwig: *See—*
  - Von Ammon, Wilfried; Weidner, Herbert; and Thanner, Ludwig, 5,746,825, Cl. 117-14.000.
- Theberge, Dawn L. Floatation aid. 5,746,632, Cl. 441-115.000.
- Theirl, Scott G.; and Drake, Gerald E., to Minnesota Mining and Manufacturing Company. Hinged, adjustable mounting mechanism for an optical filter screen. 5,746,408, Cl. 248-295.110.
- Thelen, John E.; and Mylavarapu, Sundar R., to Pneumatic Products Corp. Gas handling system and adsorbent dryer regeneration apparatus. 5,746,807, Cl. 95-123.000.
- Therion Biologics Corporation: *See—*
  - Mazzara, Gail P.; Roberts, Bryan; Panicali, Dennis L.; Gritz, Linda R.; Stallard, Virginia; and Mahr, Anna, 5,747,324, Cl. 435-236.000.
- Thermall Corp.: *See—*
  - Aulbaugh, Randy; and Hawk, Gregory G., 5,746,987, Cl. 422-190.000.
- Thermopol, Inc.: *See—*
  - Alt, Yehuda, 5,748,219, Cl. 347-171.000.
- Therrien, Marc: *See—*
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wasarman, David, 5,747,275, Cl. 435-15.000.
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wasarman, David, 5,747,288, Cl. 435-69.100.
- Thetford Corporation: *See—*
  - Antos, John M.; Selina, John R.; Cameron, David B.; Byrne, James M.; Rijn, Gerard Cornelis; and Ros, Marinus Antonius, 5,746,466, Cl. 296-37.100.
- Thibodeau, Robert Lee: *See—*
  - Scheffee, Robert S.; Thibodeau, Robert Lee; and Wheatley, Brian K., 5,747,730, Cl. 149-47.000.
- Thielking Slaski, Lisa K.: *See—*
  - Grove, Carl E.; and Thielking Slaski, Lisa K., 5,748,146, Cl. 342-372.000.
- Thieret, Tracy E.: *See—*
  - Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.
- Thiessen, Jeffrey S.: *See—*
  - Griffin, Edward E.; Thiessen, Jeffrey S.; Gonzalez, Hector F.; Hazzard, Edwin W.; and Nunn, Stephen A., 5,748,418, Cl. 360-128.000.
- Thill, Anthony J.: *See—*
  - Clements, Jack T.; Thill, Anthony J.; and Mahoney, Ronald L., 5,746,792, Cl. 55-341.100.
- Thiokol Corporation: *See—*
  - Hinshaw, Jerald C.; and Hamilton, R. Scott, 5,747,603, Cl. 525-403.000.
- Thoma, Wilhelm: *See—*
  - Schütze, Detlef-Ingo; Thoma, Wilhelm; Nachtkamp, Klaus; Pedain, Josef; and Schmitz, Reinold, 5,747,582, Cl. 524-591.000.
- Thomann, Mark; and Vo, Huy Thanh, to Micron Technology, Inc. Multiport datapath system. 5,748,635, Cl. 370-465.000.
- Thomas & Betts Corporation: *See—*
  - Khokhar, Wasim; and Bailey, Mark A., 5,745,957, Cl. 24-16.0PB.
- Thomas, Dean, to Xerox Corporation. Collapsible air plenum. 5,749,039, Cl. 399-397.000.
- Thomas, Gene: *See—*
  - Swartz, Edwin; and Thomas, Gene, 5,749.033, Cl. 399-267.000.
- Thomas Industries, Inc.: *See—*
  - Lee, Kiem T., 5,746,507, Cl. 362-365.000.
- Thomas, James M. C.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Thomas, Juergen: *See—*
  - Mueller, Hans-Joachim; Marczinke, Bernd Lothar; Klimesch, Roger; Roeper, Michael; Franz, Lothar; Schreyer, Peter; Thomas, Juergen; Mohr, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,746,786, Cl. 44-412.000.
- Thomas, Larry K.: *See—*
  - Park, John Y.; Thomas, Larry K.; Peng, Lin; and Cafaro, Daniel P., 5,746,972, Cl. 422-30.000.
- Thomas, Matthew M.: *See—*
  - Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., 5,746,073, Cl. 68-198.000.
- Thomas, Michael E.; and Saadat, Irfan, to National Semiconductor Corporation. Integrated circuit magnetic memory element having a magnetizable member and at least two conductive winding. 5,748,523, Cl. 365-171.000.
- Thomas, Richard N.: *See—*
  - Barrett, Donovan L.; Thomas, Richard N.; Seidensticker, Raymond G., deceased; and Hopkins, Richard H., 5,746,827, Cl. 117-100.000.
- Thomas, Sunil: *See—*
  - Ghosh, Prosenjit; and Thomas, Sunil, 5,745,985, Cl. 29-834.000.
- Thompson, Darren M., to United States of America, Army. Tungsten as a hypergolic fuel gel additive. 5,747,665, Cl. 44-265.000.
- Thompson, Gary Allen; and Zenz, Charles Vernon, Sr., to International Business Machines Corporation. Power distribution/stiffener for active back plane technologies. 5,748,451, Cl. 361-788.000.
- Thompson, Laird B.: *See—*
  - Bednarczyk, Adam; Maute, Robert E.; and Thompson, Laird B., 5,747,749, Cl. 181-102.000.
- Thompson, Richard G.: *See—*
  - Yessik, Michael J.; and Thompson, Richard G., 5,748,655, Cl. 372-22.000.
- Thompson-Bell, Ian; Cane, Michael Roger; Beadman, Michael Andrew; Ciganko, David J.; Love, Stephen John; and Priestman, Paul Diminic, to Fisher-Price Inc. Instant special effects electronic camera. 5,748,326, Cl. 358-296.000.
- Thomson Consumer Electronics, Inc.: *See—*
  - Badger, David Mark, 5,748,046, Cl. 331-17.000.
  - George, John Barrett, 5,747,948, Cl. 315-368.180.
  - Pugel, Michael Anthony, 5,748,261, Cl. 348-724.000.
- Thomson-CSF: *See—*
  - Aparicio, Jean-Pierre; and Douchin, Christian, 5,746,625, Cl. 439-610.000.
  - Beauclair, François; Delvinquier, Jean-Pierre; Lebourgeois, Richard; Pate, Michel; and Rohart, Claude, 5,748,013, Cl. 336-233.000.
  - Delacourt, Dominique; Truffer, Jean-Patrick; Papillon, Dominique; and Papuchon, Michel, 5,748,362, Cl. 359-332.000.
- Thomson, Julie Ann: *See—*
  - Cox, Roland; Taylor, Jonathan Michael; and Thomson, Julie Ann, 5,746,959, Cl. 264-182.000.
- Thomson Multimedia S.A.: *See—*
  - Boie, Werner, 5,748,262, Cl. 348-726.000.
- Thorton-Trump, Walter E., to Baltab Holdings, Ltd. Deicer. 5,746,396, Cl. 244-134.00R.
- Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., to OnTrak Systems, Inc. Substrate processing system. 5,745,946, Cl. 15-77.000.
- Throckmorton, Rodney A.: *See—*
  - Szentesi, Otto I.; and Throckmorton, Rodney A., 5,748,819, Cl. 385-60.000.
- Thünker, Walter; Lohmann, Gabriele; Marschewski, Arnim; Nielsen, Tage; and Lützen, Christian, to Chemische Betriebe Pluto GmbH; A/S Dampskibsselskabet Svendborg; and Dampskibsselskabet AF 1912 A/S. Use of ferrocene. 5,746,784, Cl. 44-361.000.
- Thyen, Rudolf: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
- Tien, Tze-Pei: *See—*
  - Shen, Sunny S.; Polis, David W.; Yoon, Hyun N.; and Tien, Tze-Pei, 5,746,949, Cl. 252-585.000.
- Tillett, Robin D.: *See—*
  - Howarth, M. Scott; Tillett, Robin D.; and Bull, Christine R., 5,748,324, Cl. 356-425.000.
- Tilley, Anthony M.: *See—*
  - Walker, Harrell L.; and Tilley, Anthony M., 5,747,029, Cl. 424-93.500.
- Tillin, Martin David: *See—*
  - Coates, David; Parri, Owain Llyr; Greenfield, Simon; Tillin, Martin David; Goulding, Mark John; and Nolan, Patrick, 5,746,938, Cl. 252-299.010.
- Tilsley, Derek; and Tilsley, Ruth. Knee crutch. 5,746,236, Cl. 135-66.000.
- Tilsley, Ruth: *See—*
  - Tilsley, Derek; and Tilsley, Ruth, 5,746,236, Cl. 135-66.000.
- Time Inc.: *See—*
  - Flannery, James W., Jr., 5,746,425, Cl. 270-52.140.
- Timian, Vivian J.: *See—*
  - Hendershot, William J.; McDonald, Michael L.; and Timian, Vivian J., 5,746,856, Cl. 156-73.400.
- Timmermans, Patrick A. A.: *See—*

  - Janse, Cornelis P.; and Timmermans, Patrick A. A., 5,748,751, Cl. 381-93.000.
- Tims, Fred William; Clowes, Richard F.; Yager, Kevin C.; and Schroeder, David J., to Non-Stop Networks Limited. Fault-tolerant networkable computer software with access locking. 5,748,870, Cl. 395-182.020.
- Tingey, Scott Valray: *See—*
  - Hanafey, Michael K.; Sebastian, Scott Anthony; and Tingey, Scott Valray, 5,746,023, Cl. 47-58.000.
- Tingley, Daniel A. Glue-laminated wood structural member with sacrificial edges. 5,747,151, Cl. 428-299.100.
- Tioxide Specialties Limited: *See—*
  - Dahms, Gerd Herbert, 5,747,012, Cl. 424-60.000.
- Tipton, Arthur J.; and Holl, Richard J., to Southern Biosystems, Inc. High viscosity liquid controlled delivery system. 5,747,058, Cl. 424-423.000.
- Tirecore Limited Partnership: *See—*
  - Nordberg, Henry T., 5,746,037, Cl. 52-405.100.
- Tischer, Werner: *See—*
  - Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.
- Tisdale, William R.; and Sigler, Charles E., to AMSC Subsidiary Corporation. Fraud detection and user validation system for mobile earth terminal communication device. 5,748,742, Cl. 380-49.000.
- Titon Hardware Limited: *See—*
  - Peak, Richard Allan, 5,746,654, Cl. 454-211.000.
- Titus, Kimberly J.: *See—*
  - Cox, Robert N.; Clapp, Timothy G.; and Titus, Kimberly J., 5,746,145, Cl. 112-278.000.
- TLC Industries Inc.: *See—*
  - Leal, Horacio; and Kaganas, Israel, 5,748,756, Cl. 381-118.000.
- Toa Medical Electronics Co., Ltd.: *See—*
  - Kusuzawa, Hideo, 5,748,298, Cl. 356-73.000.
- Toa Steel Co., Ltd.: *See—*
  - Eguchi, Toyoaki; and Majima, Hiroshi, 5,746,842, Cl. 148-319.000.
- Toader, Adrian; and Valdez, Jose, to Interactive Media Works, L.L.C. Method for providing prepaid internet access and/or long distance calling including the distribution of specialized calling cards. 5,749,075, Cl. 705-14.000.
- Tobiasz, André, to Valeo. Sealed hydraulic coupling. 5,746,248, Cl. 137-614.030.
- Tobin, Frank: *See—*
  - Schmidt, Carl J.; Tobin, Frank; and Wilkinson, Francis E., 5,747,264, Cl. 435-7.100.
- Tobise, Masahiro; Mitsumata, Chiharu; Miura, Hisayuki; Kawai, Tetsurou; and Liao, Simon, to Hitachi Metals Ltd.; and Applied Magnetics Corporation. Magnetoresistive playback head. 5,748,416, Cl. 360-113.000.
- Toda, Takushi: *See—*
  - Isobe, Takashi; and Toda, Takushi, 5,746,191, Cl. 123-686.000.
- Todd, John A.: *See—*
  - Kink, John A.; Ryan, Terence E.; Todd, John A.; and Saeed, Badr, 5,747,240, Cl. 435-5.000.
- Togino, Takayoshi; and Takahashi, Koichi, to Olympus Optical Co., Ltd. Image display apparatus. 5,748,378, Cl. 359-633.000.
- Toh, Takehiko: *See—*
  - Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.
- Tokarz, Marek; Persson, Michael; and Kozlowski, Roman, to Eka Chemicals AB. Method of protecting a surface. 5,747,171, Cl. 428-446.000.
- Toki, Hitoshi: *See—*
  - Itoh, Shigeo; Yonezawa, Yoshihisa; Toki, Hitoshi; and Satoh, Yoshitaka, 5,746,589, Cl. 432-77.000.
- Tokioka, Masaki: *See—*
  - Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.
- Tokoro, Hisao: *See—*
  - Tsurugai, Kazuo; Tokoro, Hisao; and Oikawa, Masaharu, 5,747,549, Cl. 521-60.000.
- Tokunaga, Yuichi: *See—*
  - Ishida, Hitoshi; Shiga, Minoru; Hatashita, Toyohito; Tokunaga, Yuichi; Fukuda, Hiroyuki; and Minesaki, Shunyo, 5,749,091, Cl. 711-135.000.
- Tokutake, Naoto: *See—*
  - Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
- Tokyo Electron Limited: *See—*
  - Sano, Kunio, 5,748,006, Cl. 324-754.000.
- Tokyo Ohka Kogyo Co., Ltd.: *See—*
  - Sato, Mitsuru; Kobayashi, Masakazu; and Nakayama, Toshimasa, 5,747,224, Cl. 430-331.000.
- Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, to Torf Establishment. Peat-derived bioactive products, pharmaceutical and cosmetic compositions containing said products and processes for producing said products and compositions. 5,747,050, Cl. 424-401.000.
- Tolson, Sidney S., to Ossid Corporation. Shrinking selected portions of film wrapped around a product. 5,746,041, Cl. 53-442.000.
- Tomasiak, Mark J.: *See—*
  - Stanek, Terrence L.; and Tomasiak, Mark J., 5,746,359, Cl. 222-542.000.
- Tomasini, Luciano; Castello, Rinaldo; Clerici, Giancarlo; and Bietti, Ivan, to SGS-Thomson Microelectronics S.r.l. MOS transistor switching circuit without body effect. 5,748,029, Cl. 327-389.000.
- Tomatsu, Yutaka; and Kataoka, Mitsuhiro, to Nippondenso Co., Ltd. Semiconductor device with reduced breakdown voltage between the gate electrode and semiconductor surface. 5,747,851, Cl. 257-330.000.
- Tominaga, Naoki, to Shiseido Company, Ltd.; and Sogo Pharmaceutical Co. Ltd. Cosmetic composition. 5,747,049, Cl. 424-401.000.
- Tomioka, Masanori; and Yabuno, Tetsu, to Sintokogio, Ltd. Device for simultaneously carrying out vacuum forming, wrapping, and trimming. 5,746,870, Cl. 156-267.000.
- Tomisawa, Naoki; and Mori, Kenichi, to Unisia Jecs Corporation. Apparatus and method for detecting pressure in an engine cylinder. 5,747,677, Cl. 73-115.000.
- Tomita, Hideho; Ooki, Masahiro; and Furuya, Yukitsuna, to NEC Corporation. Spread spectrum method for transmitting an information signal as a radio signal at a high speed. 5,748,668, Cl. 375-200.000.
- Tomita, Mitsuhiro: *See—*
  - Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.
- Tomita, Tsugio: *See—*
  - Susaki, Akira; Tomita, Tsugio; Nakano, Syuuichi; and Ono, Koichi, 5,746,178, Cl. 123-399.000.
- Tomita, Yoshinori: *See—*
  - Ohsumi, Hideki; and Tomita, Yoshinori, 5,746,624, Cl. 439-595.000.
- Tomiya, Kanji: *See—*
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Tomkow, Stanislaw: *See—*
  - Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.
- Tomoe, Tetsuro: *See—*
  - Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.
- Tomoegawa Paper Co., Ltd.: *See—*
  - Murata, Chikara; Takahashi, Shinichi; and Yoshida, Mitsuhiro, 5,746,857, Cl. 156-102.000.
- Tomomura, Yoshitaka: *See—*
  - Duggan, Geoffrey; Teraguchi, Nobuaki; Rorison, Judy Megan; and Tomomura, Yoshitaka, 5,747,827, Cl. 257-15.000.
- Tomono, Akira: *See—*
  - Tsuchikawa, Megumu; Sato, Atsushi; Tomono, Akira; and Ishii, Kenichiro, 5,748,775, Cl. 382-190.000.
- Tomotsu, Norio: *See—*
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,613, Cl. 526-134.000.
  - Takeuchi, Mizutomo; Shouzaki, Hajime; and Tomotsu, Norio, 5,747,614, Cl. 526-160.000.
- Tomura, Masatoshi: *See—*
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Tomura, Naofumi: *See—*
  - Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.
- Ton, Dai T.; and Nikolchev, Julian N., to Conceptus, Inc. Endoluminal coil delivery system having a mechanical release mechanism. 5,746,769, Cl. 606-206.000.
- Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, to Murata Manufacturing Co., Ltd. High frequency hybrid switch operable in antenna diversity type portable telephone. 5,748,054, Cl. 333-104.000.
- Tonen Corporation: *See—*
  - Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, 5,747,429, Cl. 508-208.000.
  - Matsuo, Hideki; Kokubo, Masahiro; Ohbayashi, Takashi; Tashiro, Yuji; Suzuki, Tadashi; Kizaki, Masami; Hashimoto, Haruo; Shimizu, Yasuo; Sakurai, Takaaki; and Aoki, Hiroyuki, 5,747,623, Cl. 528-14.000.
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Toor, John, to Palo Alto Design Group. Personal computer and chassis having interchangeable trim plates for horizontal model and tower model configuration, one trim plate having a larger periphery for use as a base plate. 5,748,442, Cl. 361-685.000.
- Tooyota Tsusho Corporation: *See—*
  - Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, 5,746,320, Cl. 209-127.300.
- Topcon Corporation: *See—*
  - Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,748,353, Cl. 359-197.000.

- Torardi, Carmine C., to Sterling Diagnostic Imaging, Inc. X-ray intensifying screen based on barium hafnium zirconium phosphate. 5,746,943, Cl. 252-301.40P.
- Toray Industries, Inc.: *See—*
  - Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, 5,747,174, Cl. 428-480.000.
- Torch, William C. Method and apparatus for communication. 5,748,113, Cl. 341-21.000.
- Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, to General Hospital Corporation, The. Targeted co-polymers for radiographic imaging. 5,746,998, Cl. 424-9.400.
- Torf Establishment: *See—*
  - Tolpa, Stanislaw; Gersz, Tadeusz; Ritter, Stanislawa; Kukla, Ryszard; Skrzyszewska, Malgorzata; and Tomkow, Stanislaw, 5,747,050, Cl. 424-401.000.
- Torihata, Minoru: *See—*
  - Harada, Koichi; Torihata, Minoru; and Iiyama, Takayuki, 5,746,422, Cl. 269-172.000.
- Torii, Akito; and Kohara, Kimio, to Advanced Mobile Telecommunication Technology Inc. Regenerative heat exchanger. 5,746,269, Cl. 165-10.000.
- Torii, Kouji, to NEC Corporation. Method of planarizing interlayer dielectric. 5,747,385, Cl. 438-690.000.
- Torimoto, Tadashi; Asano, Yasuhiro; Kohara, Tsunehiro; and Nishimura, Tetsuya, to Ibiden Co., Ltd. Collected lumber, process for producing collected lumber and collected lumber producing device. 5,747,177, Cl. 428-537.100.
- Toro Company, The: *See—*
  - Liu, Kaibai; Holley, Charles Carl; and Petersen, Walter John, 5,745,947, Cl. 15-84.000.
- Torrent, Christophe: *See—*
  - Darlix, Jean-Luc; and Torrent, Christophe, 5,747,323, Cl. 435-235.100.
- Toshiba Corporation: *See—*
  - Hanai, Katsuyuki; and Ayame, Shogo, 5,748,723, Cl. 379-198.000.
- Tossey, Steven M.: *See—*
  - Patel, Chhotu; Lafer, Larry M.; and Tossey, Steven M., 5,746,065, Cl. 62-503.000.
- Toth, James: *See—*
  - Wartenberg, Mark F.; Lahlouh, John G.; and Toth, James, 5,747,147, Cl. 428-209.000.
- Tournois, Huibert: *See—*
  - Veelaert, Sarah; De Wit, Dirk; and Tournois, Huibert, 5,747,658, Cl. 536-18.500.
- Towler, Michael John: *See—*
  - Hughes, Jonathan Rennie; and Towler, Michael John, 5,748,166, Cl. 345-97.000.
- Townsend, Gail J.: *See—*
  - Jones, Carl H.; Blaha, John M.; and Townsend, Gail J., 5,746,221, Cl. 128-859.000.
- Townsend, John A., to Joalto Design, Inc. Side impact air bag deployable between a vehicle body and an occupant. 5,746,443, Cl. 280-730.200.
- Toyo Ink Manufacturing Co., Ltd.: *See—*
  - Suzuki, Takehiro, 5,746,810, Cl. 106-2.000.
- Toyo Seikan Kaisha, Ltd.: *See—*
  - Ito, Takurou; and Maruhashi, Yoshitsugu, 5,747,633, Cl. 528-272.000.
- Toyoda Gosei Co., Ltd.: *See—*
  - Teramoto, Mitsunobu; and Itou, Akira, 5,746,471, Cl. 296-146.100.
- Toyoda, Hisashi; Kenmochi, Toshio; Ezumi, Yosuke; and Tsukamoto, Takeshi, to Canon Kabushiki Kaisha. Image communicating apparatus with direct supply of power from a battery to various units. 5,748,327, Cl. 358-296.000.
- Toyokuni Electric Cable Co., Ltd.: *See—*
  - Nagano, Ryuichiro; Nagase, Yoichi; and Tamura, Hajime, 5,748,826, Cl. 385-128.000.
- Toyokuni, Tatsushi: *See—*
  - Kjeldsen, Thomas J.; Clausen, Henrik; Singhal, Anil; Toyokuni, Tatsushi; Takahashi, Helio; and Hakomori, Sen-itiroh, 5,747,048, Cl. 424-277.100.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Hibino, Masahiko, 5,746,053, Cl. 60-277.000.
  - Hirano, Yutaka, 5,747,682, Cl. 73-118.100.
  - Hiroshige, Atsushi, 5,746,449, Cl. 280-808.000.
  - Kidokoro, Toru; Ito, Takaaki; and Hyodo, Yoshihiko, 5,746,185, Cl. 123-516.000.
  - Kidokoro, Toru, 5,746,186, Cl. 123-516.000.
  - Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, 5,746,052, Cl. 60-274.000.
  - Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatoshi, 5,749,061, Cl. 701-68.000.
  - Murachi, Mikio; Okawara, Seiji; Kojima, Koichi; and Kondo, Takuya, 5,746,989, Cl. 423-212.00R.
  - Nada, Mitsuhiro, 5,746,182, Cl. 123-492.000.
  - Saeki, Minoru; Kawanishi, Masaki; Tsuchiya, Yoshiaki; and Suzuki, Tomokiyo, 5,748,503, Cl. 364-565.000.
- Toyota Metal Co., Ltd.: *See—*
  - Fujita, Yoshihisa; Kumagai, Masakatsu; and Aizawa, Yoshihisa, 5,746,320, Cl. 209-127.300.
- Trabucco, Robert T.: *See—*
  - Variot, Patrick; Chia, Chok J.; and Trabucco, Robert T., 5,745,986, Cl. 29-840.000.
- Traganos, Frank N.: *See—*
  - Darzynkiewicz, Zbigniew D.; Li, Xun; Traganos, Frank N.; and Melamed, Myron R., 5,747,258, Cl. 435-6.000.
- Trageser, Andrew B.: *See—*
  - Novak, Miloslav; Trageser, Andrew B.; Summe, Isabel M.; and Kane, Susan L., 5,746,476, Cl. 297-216.130.
- Tran, Hai Q.: *See—*
  - Chapman, Terri I.; Tran, Hai Q.; and Keefe, Brian J., 5,748,209, Cl. 347-50.000.
- Tran, James B.: *See—*
  - Tsui, Gary; Tran, James B.; and Alba, Tony J., 5,746,552, Cl. 408-72.00B.
- Tran, Thang M.: *See—*
  - Narayan, Rammohan; and Tran, Thang M., 5,748,978, Cl. 395-800.230.
- Travaglia, Federico: *See—*
  - Pennino, Laura; Mancuso, Massimo; Travaglia, Federico; Poluzzi, Rinaldo; and Rizzotto, Gianguido, 5,748,796, Cl. 382-254.000.
- Traver, Frank John; and Merrill, Duane Franklin, to General Elecric Company. Silicone adhesive and organic adhesive composites. 5,747,567, Cl. 524-110.000.
- Tremblay, Gilles: *See—*
  - Parent, Luc; Peloquin, Guy; Tremblay, Gilles; and Vaillancourt, Andre, 5,747,672, Cl. 73-61.790.
- Tremblay, Marc; and Yarlagadda, Krishna C., to Sun Microsystems, Inc. Reconstruction of young bits in annex after mispredicted execution branch in pipelined processor. 5,748,935, Cl. 395-392.000.
- Tresp, Volker, to Siemens Aktiengesellschaft. Learning method for a neural network. 5,748,848, Cl. 395-23.000.
- Tretter, Joseph P., III: *See—*
  - Hidem, Stephen E.; Tretter, Joseph P., III; Schuholz, John; Engfer, Robert P.; Smoot, Charles H., III; and Anderson, Hans, 5,749,052, Cl. 455-406.000.
- Trex Company, L.L.C.: *See—*
  - Gustafsson, Kjell-Ake; Muller, John J.; and Wittenberg, Roger A., 5,746,958, Cl. 264-115.000.
- Trimberger, Stephen M. Reprogrammable instruction set accelerator using a plurality of programmable execution units and an instruction page table. 5,748,979, Cl. 395-800.370.
- Trimble Navigation Limited: *See—*
  - Rodal, Eric B., 5,748,144, Cl. 342-357.000.
  - Talbot, Nicholas C.; Allison, Michael T.; and Griffioen, Peter, 5,748,145, Cl. 342-357.000.
- Trimedyne, Inc.: *See—*
  - Saadat, Vahid, 5,746,737, Cl. 606-15.000.
- Trinh, Toan: *See—*
  - Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, 5,747,443, Cl. 510-515.000.
- Trivedi, Bharat Kakidas, to Warner-Lambert Company. Chroman derivatives as anti-oxidants. 5,747,528, Cl. 514-456.000.
- Trnka, Ralph J.: *See—*
  - Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.
- Troesch, Walter: *See—*
  - Boergardts, Peter; Krischke, Wolfgang; and Troesch, Walter, 5,746,920, Cl. 210-611.000.
- Troiani, Vincent F.: *See—*
  - Gaughan, Edward W.; and Troiani, Vincent F., 5,746,484, Cl. 303-3.000.
- Trotter, Douglas H.: *See—*
  - Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., 5,748,738, Cl. 380-25.000.
- Trouche, Dominique: *See—*
  - Michel, Jacques; and Trouche, Dominique, 5,748,649, Cl. 371-40.160.
- Trowbridge, William: *See—*
  - Quintana, Dan W.; Broussalian, Chris; Keil, John, Jr.; Nielsen, Georgene; Jemelka, Jorg; Chesnutt, Robert; and Trowbridge, William, 5,745,983, Cl. 29-759.000.
- Trubetskoy, Vladimir S.: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,746,998, Cl. 424-9.400.
- Trueblood, John. Method and apparatus for sharing input devices amongst plural independent graphic display devices. 5,748,189, Cl. 345-331.000.
- Truehlood, John, to Sony Corporation; and Sony Electronics Inc. Computer graphics data recording and playback system with a VCR-based graphic user interface. 5,748,499, Cl. 364-551.010.
- Truffer, Jean-Patrick: *See—*
  - Delacourt, Dominique; Truffer, Jean-Patrick; Papillon, Dominique; and Papuchon, Michel, 5,748,362, Cl. 359-332.000.
- Trumble Navigation Limited: *See—*
  - Sheynblat, Len, 5,748,651, Cl. 371-49.100.
- Trustees of Dartmouth College: *See—*
  - Noelle, Randolph J.; Foy, Teresa M.; Aruffo, Alejandro; and Ledbetter, Jeffrey A., 5,747,037, Cl. 424-154.100.
- Trustees of Princeton University, The: *See—*
  - Lemischka, Ihor R., 5,747,651, Cl. 530-387.900.
- TRW Inc.: *See—*
  - Finkenbeiner, Pascal G.; and Kolze, Thomas J., 5,748,679, Cl. 375-305.000.
  - Foo, Chek-Peng; and Bormann, James Edward, 5,746,444, Cl. 280-735.000.
  - Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., 5,748,654, Cl. 372-19.000.

  - Schnurr, Alvin D.; Clendening, Charles W., Jr.; Shwartz, Josef; and Moyer, Richard H., 5,747,720, Cl. 89-1.110.
- TRW Technar Inc.: *See—*
  - Walton, Karl D., 5,749,059, Cl. 701-45.000.
- Tsai, Charles Su-Chang. Method of chemical vapor deposition for producing layer variation by planetary susceptor rotation. 5,747,113, Cl. 427-255.500.
- Tsai, Shin-Ter: *See—*
  - Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, 5,748,602, Cl. 369-112.000.
- Tsai, Teng-Chun: *See—*
  - Chuang, Tung-Han; Lin, Ching-Bin; Tsai, Teng-Chun; and Chang, Jiin-Chyuan, 5,746,956, Cl. 264-104.000.
- Tsao, Hsing-Ya: *See—*
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,538, Cl. 365-185.060.
  - Lee, Peter W.; Tsao, Hsing-Ya; and Hsu, Fu-Chang, 5,748,545, Cl. 365-201.000.
- Tseng, Gwou-Jong: *See—*
  - Cheng, Lee-Ming; Choy, Edmond; and Tseng, Gwou-Jong, 5,746,614, Cl. 439-157.000.
- Tseng, Horng-Huei: *See—*
  - Pan, Yim-Sheng; and Tseng, Horng-Huei, 5,748,478, Cl. 364-468.050.
- Tseng, Kuo-Shu: *See—*
  - Yao, Liang-Gi; and Tseng, Kuo-Shu, 5,746,512, Cl. 374-45.000.
- Tsenter, Boris, to Borst, Inc. Electrochemical heat exchanger. 5,746,064, Cl. 62-480.000.
- Tso, Yvonne Yuen-Yee: *See—*
  - Kasso, Chris S.; Knutson, Martin Arthur; Tso, Yvonne Yuen-Yee; and Dawson, Frank R., 5,749,074, Cl. 705-8.000.
- Tsu, Christopher A.: *See—*
  - Craik, Charles S.; and Tsu, Christopher A., 5,747,322, Cl. 435-226.000.
- Tsubakimoto Chain Co.: *See—*
  - Hashino, Michiya; Lamoureux, James G.; Fukushima, Shinichi; Shibayama, Katsutoshi; Murakami, Yoshihiro; and Hayashi, Sachio, 5,746,304, Cl. 198-781.020.
  - Tanaka, Koji, 5,745,974, Cl. 29-458.000.
- Tsubota, Kenjiro: *See—*
  - Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, 5,747,570, Cl. 524-161.000.
- Tsubouchi, Toshiyasu; Okamoto, Satoru; and Ihara, Tomohiko, to Sumitomo Electric Industries, Ltd. Process for the production of heat- and corrosion-resistant porous metal body. 5,747,112, Cl. 427-253.000.
- Tsuchikawa, Megumu; Sato, Atsushi; Tomono, Akira; and Ishii, Kenichiro, to Nippon Telegraph and Telephone Corporation. Method and apparatus for moving object extraction based on background subtraction. 5,748,775, Cl. 382-190.000.
- Tsuchiya, Hiroaki: *See—*
  - Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.
- Tsuchiya, Junichi: *See—*
  - Tsuzaki, Hiroshi; Kanaoka, Takeshi; and Tsuchiya, Junichi, 5,746,100, Cl. 83-13.000.
- Tsuchiya, Katsuhiro; Nagai, Yutaka; and Ikeda, Mami, to Nihon Kohden Corporation. Leukocyte classification reagent. 5,747,343, Cl. 436-63.000.
- Tsuchiya, Kunimoto: *See—*
  - Nishio, Takashi; Koshio, Chiharu; Tsuchiya, Kunimoto; and Matsumoto, Tetsuya, 5,748,159, Cl. 345-76.000.
- Tsuchiya, Masakazu, to Wako Pure Chemical Industries, Ltd. Process for detecting microorganisms. 5,747,277, Cl. 435-34.000.
- Tsuchiya, Mitsuru: *See—*
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
- Tsuchiya, Yoshiaki: *See—*
  - Saeki, Minoru; Kawanishi, Masaki; Tsuchiya, Yoshiaki; and Suzuki, Tomokiyo, 5,748,503, Cl. 364-565.000.
- Tsuda, Hiroshi: *See—*
  - Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
- Tsui, Gary; Tran, James B.; and Alba, Tony J. Adjustable drill bushing. 5,746,552, Cl. 408-72.00B.
- Tsuji, Hideaki: *See—*
  - Haga, Masaaki; Machida, Katsuki; and Tsuji, Hideaki, 5,749,005, Cl. 396-287.000.
- Tsuji, Takahiro: *See—*
  - Konuma, Toshimitsu; Sugawara, Akira; and Tsuji, Takahiro, 5,747,355, Cl. 437-41.000.
- Tsujikawa, Tetsuya: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Kimura, Katsutaka; Tsujikawa, Tetsuya; Oshima, Kazuyoshi; and Miyazawa, Kazuyuki, 5,748,532, Cl. 365-185.180.
- Tsujimura, Manahu: *See—*
  - Okumura, Katsuya; Mikata, Yuuichi; Tsujimura, Manabu; and Ando, Yoshio, 5,746,581, Cl. 417-2.000.
- Tsukada, Shinichi: *See—*
  - Kai, Tadao; Terui, Nobuhiko; and Tsukada, Shinichi, 5,748,994, Cl. 396-55.000.
- Tsukagoshi, Ikuo, to Sony Corporation. Subtitle data encoding/decoding method and apparatus and recording medium for the same. 5,748,256, Cl. 348-589.000.
- Tsukahara, Daiki; and Inoue, Hideya, to Nikon Corporation. Camera control device. 5,748,992, Cl. 396-51.000.
- Tsukamoto, Hideki; Ueoka, Akio; and Matsuo, Hiroshi, to Fujimak Corporation. High speed oven. 5,747,775, Cl. 219-400.000.
- Tsukamoto, Manabu; Hirai, Nobuaki; Endo, Kazuhito; Ishida, Yoshinobu; and Ishida, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Disc apparatus for selectively outputting data from a disc and a memory. 5,748,585, Cl. 369-47.000.
- Tsukamoto, Takeshi: *See—*
  - Toyoda, Hisashi; Kenmochi, Toshio; Ezumi, Yosuke; and Tsukamoto, Takeshi, 5,748,327, Cl. 358-296.000.
- Tsukasa, Toshiya: *See—*
  - Ogawa, Takashi; and Tsukasa, Toshiya, 5,746,518, Cl. 400-109.100.
- Tsukihara, Kouichi: *See—*
  - Kawai, Hitohsi; Kawakami, Jun; and Tsukihara, Kouichi, 5,748,315, Cl. 356-349.000.
- Tsumura, Soichi, to NEC Corporation. Analog to digital converter circuit. 5,748,129, Cl. 341-155.000.
- Tsunasima, Kenji: *See—*
  - Kimura, Masahiro; Takahashi, Kohzo; Kashiwakura, Naotake; Tsunasima, Kenji; and Kurome, Hirokazu, 5,747,174, Cl. 428-480.000.
- Tsunekawa, Sukeyoshi: *See—*
  - Koizumi, Koutarou; Tsunekawa, Sukeyoshi; Kawai, Kazuhiko; Shimoda, Maki; Itoh, Katsuhiko; Itoh, Haruo; and Saito, Akio, 5,747,387, Cl. 438-708.000.
- Tsuru, Shinji: *See—*
  - Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,748,272, Cl. 349-86.000.
- Tsurugai, Kazuo; Tokoro, Hisao; and Oikawa, Masaharu, to JSP Corporation. Foamed particles of polypropylene homopolymer and molded article of the foamed particles. 5,747,549, Cl. 521-60.000.
- Tsutsui, Kazuhiro; and Imamura, Seiji, to Omron Corporation. Electromagnetic relay. 5,748,061, Cl. 335-83.000.
- Tsutsui, Koichi: *See—*
  - Yamamoto, Masahiro; Uenaka, Akimitsu; Ueno, Tasaburo; and Tsutsui, Koichi, 5,747,150, Cl. 428-220.000.
- Tsutsui, Masanori: *See—*
  - Murakami, Hiroshi; Tsutsui, Masanori; Asai, Katsumi; and Sasaki, Takayoshi, 5,746,002, Cl. 33-517.000.
- Tsutsui, Toshio; Sato, Hirohide; and Maruyama, Toshinori, to Denso Corporation. Generating apparatus for vehicle. 5,748,463, Cl. 363-127.000.
- Tsutsumi, Wataru, to Daiwa Seiko, Inc. Fishing spinning reel with spool having tapered portion and guide. 5,746,382, Cl. 242-322.000.
- Tsuyuki, Masaharu: *See—*
  - Fujita, Hidehiro; Tomura, Masatoshi; Tachizaki, Hisashi; Fujimoto, Hideki; Hiraoka, Manabu; Tsuyuki, Masaharu; Hasegawa, Naoko; Komori, Tomoyasu; Suzuki, Makoto; Hori, Hiroshi; and Maruyama, Yasuo, 5,748,696, Cl. 378-4.000.
- Tsuzaki, Hiroshi; Kanaoka, Takeshi; and Tsuchiya, Junichi, to Fuji Photo Film Co., Ltd. Method of perforating film. 5,746,100, Cl. 83-13.000.
- Tuda, Shigenobu: *See—*
  - Nonaka, Tokio, 5,746,469, Cl. 296-97.700.
- Tuefco Manufacturing, Incorporated: *See—*
  - Brophy, Robert C.; Wooters, Eldon W.; and Capps, R. Scott, 5,746,541, Cl. 405-174.000.
- Tufts University: *See—*
  - Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.
- Tularik Inc.: *See—*
  - Cao, Zhaodan, 5,747,317, Cl. 435-194.000.
- Tulip, John. Gas detector for plural target zones. 5,748,325, Cl. 356-437.000.
- Turchin, Arkadiy, to Turchin, Arkadiy. Disposable lancet for finger/heel stick. 5,746,761, Cl. 606-181.000.
- Turnbull, Robert R., to Packard Bell NEC. Rechargeable battery and charging system. 5,747,964, Cl. 320-2.000.
- Turner, Craig Walton: *See—*
  - Addison, Danny Hugh; Hufford, George, III; McCray, Charles Martin; Schultz, Kevin L.; and Turner, Craig Walton, 5,746,103, Cl. 83-440.000.
- Turner, James: *See—*
  - Rose, Jed E.; Behm, Frederique; and Turner, James, 5,746,227, Cl. 131-270.000.
- Turner, Michael Rolland: *See—*
  - Parks, Thomas Dewayne; Turner, Michael Rolland; Bunnell, Dale Leon; and Teeter, Gary Wilson, 5,746,132, Cl. 101-483.000.
- Turner, Peggy B.: *See—*
  - Turner, Wayne E.; and Turner, Peggy B., 5,746,317, Cl. 206-423.000.
- Turner, Richard W.: *See—*
  - Sinsheimer, Michael N.; Turner, Richard W.; and Schleife, Holger, 5,746,669, Cl. 473-446.000.
- Turner, Terry R.; Belcher, James F.; and Andrews, Gary W., to Texas Instruments Incorporated. Retractable probe system with in situ fabrication environment process parameter sensing. 5,746,835, Cl. 118-723.0MW.
- Turner, Wayne E.; and Turner, Peggy B. Evacuative Christmas tree container. 5,746,317, Cl. 206-423.000.

/OL 2 10 ISS 1 MY 5 998 JMI

- Turturro, Vincent; Palmer, Matthew A.; Slater, Charles R.; and Gottlieb, Saul, to Symbiosis Corporation. Endoscopic multiple sample bioptome with enhanced biting action. 5,746,216, Cl. 128-751.000.
- Tuttle, Myron R.: *See—*
  - Raynham, Michael B.; and Tuttle, Myron R., 5,747,889, Cl. 307-80.000.
- Tyler, Peter Michael, to Smiths Industries Public Limited Corporation. Gas discharge lamps and systems. 5,747,946, Cl. 315-291.000.
- Tyler, Wayne A.: *See—*
  - Havlinek, Kenneth; MacDougall, Thomas D.; Sallwasser, Alan; Jaroska, Miles; LaDue, Duane; Tyler, Wayne A.; Flores, Mario; Hinton, Mark L.; Svoboda, Thomas D.; and Tesciuba, Michele, 5,746,279, Cl. 175-52.000.
- Tyrell, John A.: *See—*
  - Nagy, Sandor; and Tyrell, John A., 5,747,404, Cl. 502-104.000.
- Tyszkiewicz, Gary R.: *See—*
  - DiCosmo, Bob S.; and Tyszkiewicz, Gary R., 5,748,721, Cl. 379-155.000.
- TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH: *See—*
  - Gerhardt, Norbert, 5,746,833, Cl. 118-665.000.
  - Hofmann, Jurgen, 5,748,563, Cl. 367-147.000.
- Tzori, Yifatch, to Simpod, Inc. Digital logic simulation/emulation system. 5,748,875, Cl. 395-183.050.
- U C B S.A.: *See—*
  - Medjad, Nadia; and Billardon, Martine, 5,747,494, Cl. 514-255.000.
- U S West, Inc.: *See—*
  - Goldberg, Max Motti; Gates, Melodi Mosley; Ericksen, Susan Barbara; and White, William O., 5,748,890, Cl. 395-188.010.
- Uchida, Shunsuke: *See—*
  - Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.
- Uchida, Tetsuro: *See—*
  - Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, 5,745,969, Cl. 29-402.180.
- Uchiyama, Kazuhiro, sole heir: *See—*
  - Uchiyama, Yaeko, deceased; Itano, Masaaki; and Hayashi, Hiroko, 5,748,208, Cl. 347-43.000.
- Uchiyama, Norio; and Hattori, Yoshio, to Niles Parts Co., Ltd. Fitting structure of rotary connector and switch. 5,747,763, Cl. 200-61.540.
- Uchiyama, Shinji: *See—*
  - Yamamoto, Hiroyuki; Ohshima, Toshikazu; and Uchiyama, Shinji, 5,748,865, Cl. 395-123.000.
- Uchiyama, Yaeko, deceased (by Kazuhiro Uchiyama, sole heir); Itano, Masaaki; and Hayashi, Hiroko, to Seiko Epson Corporation. Color ink jet recording method. 5,748,208, Cl. 347-43.000.
- Udall, Kenneth F.: *See—*
  - Rodgers, Leonard J.; Newton, Arnold C.; Berry, James P.; Farrar, Peter G. G.; and Udall, Kenneth F., 5,746,391, Cl. 244-54.000.
- Ueda, Akio: *See—*
  - Sasaki, Tadao; Ohashi, Hideaki; Ueda, Akio; Honda, Norio; and Suzuki, Hiroyuki, 5,747,400, Cl. 501-94.000.
- Ueda, Atsushi: *See—*
  - Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
- Ueda, Hideaki, to Minolta Co., Ltd. Method of using photosensitive member comprising thick photosensitive layer having a specified mobility. 5,747,208, Cl. 430-97.000.
- Ueda, Hiroaki, to NEC Corporation. Image data communication system. 5,748,898, Cl. 395-200.490.
- Ueda, Hirohisa: *See—*
  - Koeda, Takashi; Sano, Hiroshi; Ueda, Hirohisa; Ikeda, Kunitoshi; Kaneko, Kunikiyo; and Adachi, Rensuke, 5,746,494, Cl. 362-32.000.
- Ueda, Hironari: *See—*
  - Katoh, Tomohiro; Oenoki, Hitoshi; Ueda, Hironari; Arai, Mikirou; and Kuribayashi, Toshiaki, 5,747,429, Cl. 508-208.000.
- Ueda, Hiroshi; and Miyazawa, Masayuki, to Minolta Co., Ltd. Lens-exchangeable camera. 5,748,999, Cl. 396-91.000.
- Ueda, Hiroshi: *See—*
  - Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, 5,747,414, Cl. 503-207.000.
- Ueda, Kimio: *See—*
  - Morinaka, Hiroyuki; Ueda, Kimio; and Mashiko, Koichiro, 5,747,847, Cl. 257-315.000.
- Ueda, Shiro: *See—*
  - Ito, Hikaru; Natori, Masataka; Suzuki, Masahiko; Ohgiichi, Kimitoshi; Matsunaga, Kuniyuki; Ohwada, Junichi; Sasuga, Masumi; and Ueda, Shiro, 5,748,179, Cl. 349-152.000.
  - Natori, Masataka; Kumaoka, Shunichi; and Ueda, Shiro, 5,748,267, Cl. 349-40.000.
- Ueda, Tatsuya: *See—*
  - Tonegawa, Ken; Nakajima, Norio; Kato, Mitsuhide; Tanaka, Koji; Ueda, Tatsuya; and Furutani, Koji, 5,748,054, Cl. 333-104.000.
- Ueda, Toshiaki; Ueno, Katsuhiko; Ono, Yoshihiro; and Koyama, Toshio, to Sony Corporation. Backlighting and color control arrangement for LCD type video camera viewfinder having multiple backlighting sources. 5,748,237, Cl. 348-333.000.
- Ueda, Yasuyuki: *See—*
  - Sukeno, Masahiko; and Ueda, Yasuyuki, 5,747,922, Cl. 313-412.000.
- Ueda, Yoshiharu: *See—*
  - Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,746,159, Cl. 122-367.100.
- Uehling, Mark Allen: *See—*
  - Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, 5,748,269, Cl. 349-58.000.
- Uejima, Atsushi: *See—*
  - Sunagawa, Hiroshi; Uejima, Atsushi; Iwasaki, Osamu; and Aihara, Takaaki, 5,748,283, Cl. 355-35.000.
- Ueki, Jun; and Morioka, Shinji, to Japan Tobacco Inc. Phospholipase D gene originated from plant. 5,747,327, Cl. 435-252.300.
- Ueki, Satoshi: *See—*
  - Saito, Toshiya; Taki, Takayuki; Nakajima, Masashi; Imanishi, Kunihiko; Murata, Masahide; Ozaki, Hiroyuki; Aiba, Kazukiyo; Ookura, Masatoshi; and Ueki, Satoshi, 5,747,595, Cl. 525-270.000.
- Uenaka, Akimitsu: *See—*
  - Yamamoto, Masahiro; Uenaka, Akimitsu; Ueno, Tasaburo; and Tsutsui, Koichi, 5,747,150, Cl. 428-220.000.
- Ueno, Akira: *See—*
  - Nakanishi, Hideyuki; Ueno, Akira; Nagai, Hideo; and Yoshikawa, Akio, 5,748,658, Cl. 372-43.000.
- Ueno, Katsuhiko: *See—*
  - Ueda, Toshiaki; Ueno, Katsuhiko; Ono, Yoshihiro; and Koyama, Toshio, 5,748,237, Cl. 348-333.000.
- Ueno, Shinya: *See—*
  - Fujita, Yukiko; Ueno, Shinya; Kawasaki, Yoko; Fukakusa, Kumiko; Matsuya, Hidefumi; Mitani, Tomomasa; Komori, Akira; and Matsumura, Mika, 5,747,597, Cl. 525-312.000.
- Ueno, Tasaburo: *See—*
  - Yamamoto, Masahiro; Uenaka, Akimitsu; Ueno, Tasaburo; and Tsutsui, Koichi, 5,747,150, Cl. 428-220.000.
- Ueno, Teruo, to Ueno, Teruo; and Royal Housing, Inc. Off-track betting systems. 5,746,657, Cl. 463-41.000.
- Ueoka, Akio: *See—*
  - Tsukamoto, Hideki; Ueoka, Akio; and Matsuo, Hiroshi, 5,747,775, Cl. 219-400.000.
- Uesugi, Daisuke: *See—*
  - Sugiura, Horoaki; Tanaka, Fuminori; and Uesugi, Daisuke, 5,747,130, Cl. 428-36.920.
- Uesugi, Mitsuru: *See—*
  - Futagi, Sadaki; and Uesugi, Mitsuru, 5,748,673, Cl. 375-232.000.
- Ueta, Souichi; and Hokoi, Hayato, to Nikon Corporation. Image reading device that selectively performs edge contrast adjustment. 5,748,800, Cl. 382-266.000.
- Ueyama, Takatsugu: *See—*
  - Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.
- Uhl, Klaus-Martin: *See—*
  - Stark, Thomas; Zimmermann, Helmut; and Uhl, Klaus-Martin, 5,746,160, Cl. 123-41.700.
- Ukawa, Kazuhiro: *See—*
  - Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.
- Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, to Matsushita Electric Works, Ltd. Electrodeless discharge lamp utilizing induced electric field generated by a high frequency electromagnetic field. 5,747,945, Cl. 315-248.000.
- Ullman, Stanley A. Tile roof structure for supporting a heavy load without damage to the tile. 5,746,029, Cl. 52-27.000.
- Ullum, Henrik: *See—*
  - Fosbøl, Peder; Korremann, Birgitte; and Ullum, Henrik, 5,747,087, Cl. 426-242.000.
- Ulm, Michael: *See—*
  - Graf, Friedrich; Storjohann, Kai; Ulm, Michael; Lenninger, Ralf-Johannes; and Kammerl, August, 5,749,060, Cl. 701-51.000.
- Ulrich, David J.: *See—*
  - Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., 5,745,937, Cl. 5-624.000.
- Ulrich, Reinhard: *See—*
  - Hamann, Oliver; and Ulrich, Reinhard, 5,748,311, Cl. 356-336.000.
- Ultradent Products, Inc.: *See—*
  - Fischer, Dan E., 5,746,598, Cl. 433-216.000.
- Umeda, Minoru, to Ricoh Company, Ltd. Electrophotographic process and apparatus therefor. 5,749,029, Cl. 399-128.000.
- Umetsu, Kenji: *See—*
  - Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.
- Umino, Mitsugu, to Yoshida Kogyo K.K. Tape cassette and automatic attaching apparatus for heat-fusible tape pieces. 5,746,880, Cl. 156-517.000.
- Umix Co., Ltd.: *See—*
  - Matsuoka, Mitsuo, 5,746,082, Cl. 72-313.000.
- Unai, Shogo: *See—*
  - Ito, Yutaka; Egawa, Naoko; Unai, Shogo; and Murase, Tadashi, 5,748,880, Cl. 395-183.220.
- Underwood, Sandra J.: *See—*

  - Rastogi, Rajiv; Underwood, Sandra J.; and Fujimoto, Harry H., 5,747,879, Cl. 257-751.000.
- Ungerer, Philippe; and Arnaud, Jean-Fabrice, to Institut Francais du Petrole; and Elf Aquitaine Production. Method for measuring with great precision the volume variation occurring when fluid phases mix in order to determine physico-chemical characteristics. 5,747,673, Cl. 73-61.410.
- Ungerer, Philippe: *See—*
  - Moracchini, Gérard; Sanchez, José; de Hemptinne, Jean-Charles; and Ungerer, Philippe, 5,747,674, Cl. 73-61.440.
- Uni-Charm Corporation: *See—*
  - Hisada, Kenichi, 5,746,731, Cl. 604-385.200.
  - Wada, Ichiro; Kondo, Hideki; and Kinoshita, Masataka, 5,746,729, Cl. 604-378.000.
- Unifi, Inc.: *See—*
  - Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., 5,746,073, Cl. 68-198.000.
- Unilever Patent Holdings B.V.: *See—*
  - Bows, John Richard; Blindt, Renoo Avinash; Hurling, Robert; and Mullin, James Thomas, 5,747,086, Cl. 426-234.000.
- Union Carbide Chemicals & Plastics Technology Corporation: *See—*
  - Reichle, Walter Thomas; Yang, Xinmin; and Karol, Frederick John, 5,747,406, Cl. 502-117.000.
- Union Switch & Signal Inc.: *See—*
  - Ehrlich, Kenneth P.; Kutz, David; and Nowakowski, Edmund C., 5,746,399, Cl. 246-122.00R.
  - Jones, Richard S.; and Williamson, N. Rodgers, Jr., 5,747,954, Cl. 318-266.000.
- Unisia Jecs Corporation: *See—*
  - Tomisawa, Naoki; and Mori, Kenichi, 5,747,677, Cl. 73-115.000.
- United Biomedical, Inc.: *See—*
  - Wang, Chang Yi; and Hosein, Barbara, 5,747,239, Cl. 435-5.000.
- United Electric Controls Company: *See—*
  - Minassian, Aram, 5,747,895, Cl. 307-118.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
  - Dunn, Malcolm Harry; Sibbett, Wilson; Christian, Peter Rahlff; Sinclair, Bruce David; and Firth, Michael Andrew, 5,748,664, Cl. 372-75.000.
- United Microelectronics Corporation: *See—*
  - Chao, Fang-Ching; and Li, Tien-Chiieh, 5,747,196, Cl. 430-5.000.
  - Doong, Yih-Yuh, 5,747,803, Cl. 250-307.000.
  - Lee, Tsai-Pao; Chen, Kwang-Cheng; and Yang, Chin-Lin, 5,748,036, Cl. 329-300.000.
  - Tang, Tsan-Bih; and Yen, Chih-Chan, 5,748,203, Cl. 345-521.000.
- United Parcel Service of America, Inc.: *See—*
  - Surka, Stefan, 5,748,804, Cl. 382-291.000.
- U.S. Divers Co., Inc.: *See—*
  - Taba, Serge; and Morgan, Michael V., 5,746,198, Cl. 128-204.260.
- United States Gypsum Company: *See—*
  - Espinoza, Therese A.; Miller, Charles J.; and Stevens, Richard B., 5,746,822, Cl. 106-785.000.
- United States Manufacturing Company: *See—*
  - Littig, David H., 5,746,773, Cl. 623-35.000.
- U.S. Medical Instruments, Inc.: *See—*
  - Manjarrez, Carlos H., 5,746,215, Cl. 128-763.000.
- United States of America
  - Agriculture: *See—*
    - Jackson, Michael A., 5,747,305, Cl. 435-134.000.
    - Saha, Badal C.; and Bothast, Rodney J., 5,747,320, Cl. 435-209.000.
  - Air Force: *See—*
    - Gaddis, Mark W., 5,748,657, Cl. 372-38.000.
    - Grove, Carl E.; and Thielking Slaski, Lisa K., 5,748,146, Cl. 342-372.000.
    - Kim, Young-Won; and Dimiduk, Dennis M., 5,746,846, Cl. 148-671.000.
    - Kirkland, Larry V.; and Wiederholt, Jere D., 5,748,846, Cl. 395-20.000.
    - Melvin, William L., Jr.; and Wicks, Michael C., 5,748,143, Cl. 342-162.000.
    - Parker, Michael A.; Michalak, Richard J.; Kimmet, James S.; Shire, Douglas B.; Swanson, Paul D.; and Tang, Chung L., 5,748,653, Cl. 372-8.000.
  - Army: *See—*
    - Abbate, Agostino; Frankel, Julius; and Doxbeck, Mark, 5,747,693, Cl. 73-622.000.
    - Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.
    - Shen, Paul H.; Dutta, Mitra; Wraback, Michael; and Pamulapati, Jagadeesh, 5,748,359, Cl. 359-248.000.
    - Thompson, Darren M., 5,747,665, Cl. 44-265.000.
  - Energy: *See—*
    - Burks, Barry L.; DePiero, Fred W.; Armstrong, Gary A.; Jansen, John F.; Muller, Richard C.; and Gee, Timothy F., 5,748,321, Cl. 356-386.000.
    - Metzger, John D.; and El-Genk, Mohamed S., 5,747,418, Cl. 505-160.000.
  - Health and Human Services: *See—*
    - Bonner, Tom I.; Brann, Mark Robert; and Buckley, Noel J., 5,747,336, Cl. 435-325.000.
    - King, C. Richter; Kraus, Matthias H.; and Aaronson, Stuart A., 5,747,261, Cl. 435-7.100.
    - Pastan, Ira H.; Lee, Byungkook; Jung, Sun-Hee; and Brinkmann, Ulrich, 5,747,654, Cl. 530-391.700.
    - Rothman, Richard; Carroll, Frank I.; Blough, Bruce; and Mascarella, Samuel W., 5,747,503, Cl. 514-294.000.
  - National Aeronautics and Space Administration: *See—*
    - Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., 5,748,090, Cl. 340-578.000.
    - Kellas, Sotiris; and Carden, Huey D., 5,746,537, Cl. 404-6.000.
    - Yost, William T.; Cantrell, John H.; and Taler, George A., 5,746,209, Cl. 128-661.030.
  - Navy: *See—*
    - Barron, Thomas D., 5,748,102, Cl. 340-850.000.
    - Bowman, Steven R.; Feldman, Barry J.; and Shaw, Leslie B., 5,746,942, Cl. 252-301.40H.
    - Howell, Barbara F.; and Poole, Karen M., 5,747,115, Cl. 427-514.000.
    - Kersey, Alan D.; and Davis, Michael A., 5,748,312, Cl. 356-345.000.
    - Kirschner, Ivan N.; and Berlam, Gary R., 5,746,018, Cl. 42-1.140.
    - Murray, John N., 5,746,905, Cl. 205-791.000.
  - Secretary of Health and Human Services: *See—*
    - Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
- U.S. Philips Corporation: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
  - Fewster, Paul F., 5,748,509, Cl. 364-578.000.
  - Flender, Gregg, 5,748,604, Cl. 369-192.000.
  - Fuchs, Manfred H., 5,747,996, Cl. 324-207.170.
  - Gobert, Jean, 5,748,849, Cl. 395-27.000.
  - Hikmet, Rifat A.M.; Braun, David B.; Staring, Aemilianus G.J.; Schoo, Hermannus F.M.; and Lub, Johan, 5,748,271, Cl. 349-69.000.
  - Janse, Cornelis P.; and Timmermans, Patrick A. A., 5,748,751, Cl. 381-93.000.
  - Le Berre, Jacques; and Persson, Bjorn, 5,748,732, Cl. 380-10.000.
  - Ludikhuize, Adrianus W., 5,747,841, Cl. 257-266.000.
  - Neijzen, Jacobus H. M.; De Vaan, Adrianus J. S. M.; and Stroomer, Martinus V. C., 5,748,374, Cl. 359-621.000.
  - Van Der Broeck, Heinz; and Wendt, Matthias, 5,747,958, Cl. 318-747.000.
  - Visser, Jan, 5,747,362, Cl. 437-225.000.
- United States Surgical Corporation: *See—*
  - Bogart, Michael W., 5,747,770, Cl. 219-121.720.
  - Brown, David L.; Stellon, Andrew P.; and Gemma, Edward A., Jr., 5,746,311, Cl. 206-63.300.
  - Nicholas, David A., 5,746,740, Cl. 606-52.000.
  - Sherts, Charles R., 5,746,751, Cl. 606-139.000.
- U.S. West Technologies, Inc.: *See—*
  - Lafer, John P.; Faust, John E.; and Williams, Michael D., 5,748,956, Cl. 395-615.000.
- United Technologies Automotive, Inc.: *See—*
  - Kelley, Jeffrey T.; and Wrenbeck, Bruce, 5,748,428, Cl. 361-94.000.
  - Miller, Robin M., 5,747,907, Cl. 310-90.000.
- Unitika Ltd.: *See—*
  - Sasaki, Shingo; and Yamao, Mutsunori, 5,747,631, Cl. 528-86.000.
- Univ. of Pennsylvania: *See—*
  - Schotland, John Carl, 5,747,810, Cl. 250-358.100.
- Universidad de Salamanca: *See—*
  - Gordaliza, Marina; Castro, Maria Angeles; San Feliciano, Arturo; del Corral, Jose Maria Migel; Lopez, Maria Luisa; and Gravalos, Dolores G., 5,747,529, Cl. 514-463.000.
- University of Alabama at Birmingham Research Foundation: *See—*
  - Crapo, James D.; and Freeman, Bruce A., 5,747,026, Cl. 424-94.300.
- University of California: *See—*
  - Gruber, Harry E.; Jolly, Douglas J.; and Kwang, Hwei-Sing, 5,747,243, Cl. 435-5.000.
- University of California, The Regents of the: *See—*
  - Bunshah, Rointan F.; Doerr, Hans J.; and Jou, Shyankay, 5,747,118, Cl. 427-577.000.
  - Carson, Dennis A.; and Kohsaka, Hitoshi, 5,747,251, Cl. 435-6.000.
  - Craik, Charles S.; and Tsu, Christopher A., 5,747,322, Cl. 435-226.000.
  - Deng, Tiliang; and Karin, Michael, 5,747,318, Cl. 435-194.000.
  - Hinck, Lindsay; Masu, Kasuko; Masu, Masayuki; Leonardo, David; and Lavigne, Marc Tessier, 5,747,262, Cl. 435-7.100.
  - Jankowski, Alan F.; and Hayes, Jeffrey P., 5,746,634, Cl. 445-14.000.
  - Kowalczykowski, Stephen C.; and Eggleston, Angela K., 5,747,247, Cl. 435-6.000.
  - Lynch, Gary S.; and Rogers, Gary A., 5,747,492, Cl. 514-249.000.
  - Mishra, Umesh Kumar; and DenBaars, Steven P., 5,747,838, Cl. 257-192.000.
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,275, Cl. 435-15.000.
  - Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,288, Cl. 435-69.100.
  - Stern, Robert; Frost, Gregory I.; Hall, Jackson; Shuster, Svetlana; Formby, Bent; and Colbern, Gail T., 5,747,027, Cl. 424-94.620.
- University of Colorado, The: *See—*
  - Orlicky, David J., 5,747,660, Cl. 536-23.500.
- University of Colorado, The Regents of the: *See—*

OL
2 10
SS
1
MY
5
998
MI

- Cathey, Wade Thomas, Jr.; and Dowski, Edward Raymond, Jr., 5,748,371, Cl. 359-558.000.
- University of Florida: *See—*
  - Quarmby, Scott T.; and Yost, Richard A., 5,747,801, Cl. 250-292.000.
- University of Georgia Research Foundation: *See—*
  - Farmer, Brian W., 5,748,295, Cl. 356-5.090.
- University of Georgia Research Foundation, Inc.: *See—*
  - Ritchie, Branson W.; Niagro, Frank D.; and Latimer, Kenneth S., 5,747,045, Cl. 424-204.100.
- University of Michigan: *See—*
  - Davidson, Beverly L.; and Roessler, Blake J., 5,747,072, Cl. 424-93.200.
- University of Michigan, The Board of Regent6s of the: *See—*
  - Levy, Robert J.; and Hirsch, Danielle, 5,746,775, Cl. 8-94.110.
- University of Minnesota, Regents of the: *See—*
  - Dahlberg, E. Dan; and Moran, Timothy J., 5,747,997, Cl. 324-252.000.
- University of New Mexico: *See—*
  - Wallen, Erik S.; Roigas, Jan; and Moseley, Pope L., 5,747,332, Cl. 435-272.000.
- University of North Carolina at Chapel Hill, The: *See—*
  - Kay, Brian K; Fowlkes, Dana M.; Adey, Nils B.; and Sparks, Andrew B., 5,747,334, Cl. 435-320.100.
- University of Notre Dame Du Lac: *See—*
  - Miller, Albert E.; and Bandyopadhyay, Supriyo, 5,747,180, Cl. 428-601.000.
- University of Pennsylvania, The Trustees of the: *See—*
  - Sato, Yoshikazu, 5,748,966, Cl. 395-708.000.
- University of Pittsburgh: *See—*
  - Gur, David, 5,748,173, Cl. 345-115.000.
- University of Puerto Rico: *See—*
  - Leyderman, Alexander, 5,746,823, Cl. 117-5.000.
- University of Saskatchewan: *See—*
  - Allan, Brenda J.; and Potter, Andrew A., 5,747,309, Cl. 435-172.300.
- University of Tennessee Research Corporation, The: *See—*
  - Hassenboehler, Charles B., Jr.; and Wadsworth, Larry C., 5,747,394, Cl. 442-328.000.
- University of Toledo, The: *See—*
  - Kramer, Steven; Srinivasan, Sujatha; and Swanson, Verner, 5,746,774, Cl. 623-39.000.
- University of Utah Research Foundation: *See—*
  - Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
- University of Washington: *See—*
  - Holl, Mark R.; and Sabeti, Roya R., 5,748,827, Cl. 385-134.000.
  - van den Engh, Ger; and Weigl, Bernhard H., 5,747,349, Cl. 436-172.000.
- University of Washington, The Board of Regents of the: *See—*
  - Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, 5,747,267, Cl. 435-7.210.
- Unno, Yasushi, to Ando Electric Co., Ltd. Optical power meter. 5,748,302, Cl. 356-224.000.
- Unno, Yoshihiro, to NEC Corporation. Echo canceller. 5,748,726, Cl. 379-410.000.
- Uno, Mitsuhiro; Takubo, Yoneharu; Kumagawa, Katsuhiko; Asada, Satoshi; and Takada, Naomi, to Matsushita Electric Industrial Co., Ltd. Liquid crystal display unit with a plurality of subpixels. 5,748,276, Cl. 349-144.000.
- Unuma, Yutaka: *See—*
  - Heard, David; Ohtani, Noboru; Unuma, Yutaka; and Fujimoto, Manabu, 5,747,796, Cl. 250-227.260.
- Unverzagt, Karlheinz: *See—*
  - May, Karl; Herm, Hartmut; and Unverzagt, Karlheinz, 5,746,590, Cl. 432-114.000.
- Uosukainen, Esa: *See—*
  - Lämsä, Merja; Linko, Yu-Yen; Linko, Pekka; and Uosukainen, Esa, 5,747,434, Cl. 508-485.000.
- Upmacis, Rita Karina: *See—*
  - Bauer, William, Jr.; Hale, Timothy Allen; Mason, Robert Michael; and Upmacis, Rita Karina, 5,746,892, Cl. 203-38.000.
- Urbach, Hansjörg: *See—*
  - Henning, Rainer; Urbach, Hansjörg; Teetz, Volker; Geiger, Rolf; and Schölkens, Bernward, 5,747,504, Cl. 514-307.000.
- Urban, Manfred; and Schnaitmann, Dieter, to Hoechst Aktiengesellschaft. Surface-treated quinacridone and dioxazine pigments. 5,746,820, Cl. 106-471.000.
- Urdea, Michael S.: *See—*
  - Sheridan, Patrick; Chang, Chu-An; Running, Joyce; and Urdea, Michael S., 5,747,244, Cl. 435-6.000.
- Ureshino, Kashiro; Amano, Itaru; Naoi, Masaki; Takakura, Kou; Mizokawa, Takumi; and Ichikawa, Katsumi, to Kabushiki Kaisha Kobe Seiko Sho. Loading system and method for a tire vulcanizing machine. 5,746,964, Cl. 264-315.000.
- Urness, Kevin J.: *See—*
  - Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
- UroMed Corporation: *See—*
  - Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., 5,746,222, Cl. 128-885.000.
- Usagawa, Toshiyuki: *See—*
  - Hasegawa, Tsuyoshi; Hosoki, Shigeyuki; Kohno, Makiko; Ichikawa, Masakazu; Nakahara, Hitoshi; and Usagawa, Toshiyuki, 5,746,826, Cl. 117-90.000.
- Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, to Canon Kabushiki Kaisha. Color image processing apparatus which forms dot images at varying positions on a scanning line. 5,748,328, Cl. 358-298.000.
- Usami, Akihiro, to Canon Kabushiki Kaisha. Image processing apparatus and method. 5,748,342, Cl. 358-500.000.
- Usami, Yoshihiko, to Sony Corporation. Picture distortion correcting apparatus. 5,747,924, Cl. 313-431.000.
- Usami, Yoshinori: *See—*
  - Ohtsuka, Shuichi; Yoda, Akira; and Usami, Yoshinori, 5,748,858, Cl. 395-109.000.
- Ushikata Mfg. Co., Ltd.: *See—*
  - Kubo, Akio; and Nemoto, Hiroshi, 5,748,502, Cl. 364-560.000.
- Ushiroda, Atsushi: *See—*
  - Moro, Takahiro; Masaki, Katsumi; Onodera, Ken; Sawaki, Takafumi; and Ushiroda, Atsushi, 5,748,772, Cl. 382-167.000.
- Ushiroda, Kouichi: *See—*
  - Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
- Uskokovic, Milan Radoje: *See—*
  - Bryce, Graeme Findlay; and Uskokovic, Milan Radoje, 5,747,479, Cl. 514-167.000.
- Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, to Seiko Epson Corporation. Ink jet recording head. 5,748,214, Cl. 347-70.000.
- Usui, Toshiki: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.
- Utsugi, Koji, to NEC Corporation. Organic thin film electroluminescent device. 5,747,930, Cl. 313-504.000.
- Utz, Joel Samuel: *See—*
  - Gupta, Subhash; Flores, Robert; Stamm, Michael Ross; Sharp, Eric Thomas; Denninger, Erich W. E.; Dye, Pamela G.; Utz, Joel Samuel; and Kai, James K., 5,746,884, Cl. 156-643.100.
- Vacca, Joseph P.: *See—*
  - Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, 5,747,540, Cl. 514-622.000.
- Vaillancourt, Andre: *See—*
  - Parent, Luc; Peloquin, Guy; Tremblay, Gilles; and Vaillancourt, Andre, 5,747,672, Cl. 73-61.790.
- Vaitekunas, Jeffrey J.: *See—*
  - Bromfield, George; and Vaitekunas, Jeffrey J., 5,746,756, Cl. 606-169.000.
- Valasopoulos, Christos. CAM lobe with offset angular movement. 5,746,166, Cl. 123-90.170.
- Valcher, Fabrice: *See—*
  - Bricaud, Herve Guy; and Valcher, Fabrice, 5,746,607, Cl. 439-66.000.
- Valdez, Jose: *See—*
  - Toader, Adrian; and Valdez, Jose, 5,749,075, Cl. 705-14.000.
- Valence Technology, Inc.: *See—*
  - Perkins, Bradley Alan, 5,747,189, Cl. 429-91.000.
  - Velasquez, David A.; Holmes, Douglas B.; and Gogolin, E. Lawrence, 5,746,781, Cl. 29-730.000.
- Valentine, Stephen: *See—*
  - Boscovic, Dragan; Valentine, Stephen; Bastani, Babak; and Wray, Anthony, 5,748,038, Cl. 330-2.000.
- Valentine, Stephen Thomas; and Wray, Anthony John, to Motorola, Inc. Radio communications apparatus. 5,748,678, Cl. 375-297.000.
- Valenty, Vivian B., to VB Cosmetics Inc. Nitrocellulose-free aqueous nail polish compositions. 5,747,018, Cl. 424-61.000.
- Valenzuela, Pablo D. T.: *See—*
  - Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,747,039, Cl. 424-186.100.
- Valeo: *See—*
  - Tobiasz, André, 5,746,248, Cl. 137-614.030.
- Valk, Kenneth M.: *See—*
  - Hoover, Russell D.; Nation, George W.; and Valk, Kenneth M., 5,749,087, Cl. 711-108.000.
- Valmet Corporation: *See—*
  - Huovila, Jyrki; and Linsuri, Ari, 5,746,889, Cl. 162-216.000.
- Van Doorne's Transmissie B.V.: *See—* .
  - Roovers, Wilhelmus Cornelus Waltherus Maria; and Choi, Chi Chung, 5,746,678, Cl. 477-45.000.
- Van Buren, Martin: *See—*
  - Massucco, Arthur A.; Fauteux, Denis G.; and Van Buren, Martin, 5,746,782, Cl. 29-730.000.
- Van Camp, Jonathan Hans: *See—*
  - Cassity, Terry Allen; Greer, David Emerson; Buchanan, Jeffrey James; Ledbetter, Steve Miles; and Van Camp, Jonathan Hans, 5,746,306, Cl. 200-283.000.
- VanDenberg, Ervin K., to Rockwell Heavy Vehicle Suspension Systems, Inc. Center beam suspension system. 5,746,441, Cl. 280-713.000.

- van den Engh, Ger; and Weigl, Bernhard H., to University of Washington. Fluorescent reporter beads for fluid analysis. 5,747,349, Cl. 436-172.000.
- Vandenriessche, Anna Maria Jozefa: *See—*
  - Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.
- Van Der Broeck, Heinz; and Wendt, Matthias, to U.S. Philips Corporation. Circuit arrangement for powering a two-phase asynchronous motor. 5,747,958, Cl. 318-747.000.
- van der Griendt, Pieter S.: *See—*
  - Gujda, Mieczyslaw; van der Griendt, Pieter S.; and Dominico, James W., 5,746,570, Cl. 414-795.600.
- Vander Heyden, William H.; and Berg, Ronald Arthur, to Badger Meter, Inc. Measuring heating value using catalytic combustion. 5,748,492, Cl. 364-499.000.
- van der Pol, Ronald, to Krohne Messtechnik GmbH & Co., KG. Meter for flowing media. 5,747,704, Cl. 73-861.357.
- Vanderpool, Daniel P.; and Cha, Charles Y., to Calgon Corporation. Alkylbenzotriazole compositions and the use thereof as copper and copper alloy corrosion inhibitors. 5,746,947, Cl. 252-394.000.
- Van Der Staay, Frank: *See—*
  - Schrey, Ekkehard; Kather, Lutz; and Van Der Staay, Frank, 5,748,433, Cl. 361-210.000.
- Van Der Veer, Frits: *See—*
  - Drent, Eit; Van Der Veer, Frits; and Wijngaarden, Rudolf Jacobus, 5,747,638, Cl. 528-392.000.
- Van der Veer, Karen: *See—*
  - Kilk, Erik; Van der Veer, Karen; and MacMillan, Leann M., 5,748,613, Cl. 370-231.000.
- van der Weide, D. W.; and Keilmann, Fritz, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften. Coherent periodically pulsed radiation spectrometer. 5,748,309, Cl. 356-326.000.
- Van De Vanter, Michael L., to Sun Microsystems, Inc. System and method for textual editing of structurally-represented computer programs with on-the-fly typographical display. 5,748,975, Cl. 395-793.000.
- Van Duyne, Scott A., to Stanford University. Method for inharmonic tone generation using a coupled mode digital filter. 5,748,513, Cl. 364-724.170.
- Van Dyke, Korbin S.; Stiles, David R.; and Favor, John G., to Advanced Micro Devices, Inc. Cache memory system for dynamically altering single cache memory line as either branch target entry or prefetch instruction queue based upon instruction sequence. 5,748,932, Cl. 395-375.000.
- Van Erden, Donald; and Malin, Art, to Illinois Tool Works Inc. Ultraviolet excited fusible ribs for plastic zipper profiles. 5,747,126, Cl. 428-35.200.
- Vanguard International Semiconductor Corporation: *See—*
  - Pan, Yirn-Sheng; and Tseng, Horng-Huei, 5,748,478, Cl. 364-468.050.
  - Yao, Liang-Gi; and Tseng, Kuo-Shu, 5,746,512, Cl. 374-45.000.
  - Yao, Liang-Gi, 5,746,591, Cl. 432-241.000.
- Vanhatalo, Minna Kristiira: *See—*
  - Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.
- Van McCutchen, James; and Shaw, Kurt Lee, to Windryder Engineering, Inc. Safety bed with dual purpose side panels. 5,745,936, Cl. 5-600.000.
- Van Os, Albertus M.B.M.: *See—*
  - Leermakers, Johannes M.H.P.L.; Van Os, Albertus M.B.M.; and Slaats, Cornelis H.J., 5,746,327, Cl. 211-50.000.
- Van Pel, Aline: *See—*
  - Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.
- Van Solingen, Pieter: *See—*
  - Bovenberg, Roelof Ary Lans; Vollebregt, Adrianus Wilhelmus Hermanus; and Van Solingen, Pieter, 5,747,285, Cl. 435-69.700.
- Van Swieten, Roy Edwin: *See—*
  - Peters, Bernd W.; Bossert, Marie-Claude; Kelders, Johannes Hubertus Jozef Maria; and Van Swieten, Roy Edwin, 5,746,529, Cl. 401-18.000.
- Van't Land, Jacob J.: *See—*
  - Herbermann, Alfred F.; Van't Land, Jacob J.; and Filipiak, Michael A., 5,746,567, Cl. 414-752.000.
- Van Zeeland, Anthony J.; and Bielik, Robert S., to Monopanel Technologies, Inc. Tamper resistant membrane switch. 5,747,757, Cl. 200-5.00A.
- Vapo Oy: *See—*
  - Hartikainen, Tarja Terttu; Martikainen, Pertti Juhani; Ruuskanen, Arvo Aukusti Juhani; Mutka, Kari Antero; Nyrönen, Timo Martti Tapio; Källström, Markku Tapio; and Vanhatalo, Minna Kristiira, 5,747,331, Cl. 435-266.000.
- Vargas, Garrett R., to Microsoft Corporation. Adjusting keyboard. 5,748,512, Cl. 364-709.120.
- Variot, Patrick; Chia, Chok J.; and Trabucco, Robert T., to LSI Logic Corporation. Method of planarizing an array of plastically deformable contacts on an integrated circuit package to compensate for surface warpage. 5,745,986, Cl. 29-840.000.
- Vasilios, Magos: *See—*
  - Schindler, Hans-Georg; Rauh, Hans-Jurgen; Fursich, Manfred; Vasilios, Magos; Nitsch, Wilhelm; Deutsch, Rainer; Hartmann, Klaus-P.; Huber, Leonhard; Benker, Gerhard; and Münch, Reimund, 5,748,286, Cl. 355-40.000.
- Vatsky, Joel. Combustion system for a coal-fired furnace having an air nozzle for discharging air along the inner surface of a furnace wall. 5,746,143, Cl. 110-297.000.
- Vazcuez, Maria Mercedes Gutiérrez: *See—*
  - Huergo, Concepción Campa; Gonzalez, Victoriano Gustavo Sierra; Vazcuez, Maria Mercedes Gutiérrez; Jorrin, Gonzalo Bisset; Imia, Luis Guillermo Garcia; de la Caridad Puentes Rizo, Gisela; Herrera, Maria del Carmen Sampedro; Padrón, Franklin Sotolongo; Morales, Eloisa Xochitl Le Riverend; and Dominguez, Manuel Alfredo Galguera, 5,747,653, Cl. 530-389.500.
- VB Cosmetics Inc.: *See—*
  - Valenty, Vivian B., 5,747,018, Cl. 424-61.000.
- Veelaert, Sarah; De Wit, Dirk; and Tournois, Huibert, to Instituut Voor Agrotechnologisch Onderzoek (ATO-DLO). Method for the oxidation of carbohydrates. 5,747,658, Cl. 536-18.500.
- Vegeais, Patrick: *See—*
  - Garcia, Salvador; Vegeais, Patrick; and Frederic, Alain, 5,748,220, Cl. 347-181.000.
- Vegter, Gert: *See—*
  - Rutten, Hendrik Gerard Jozef; Berkers, Jacobus Arnoldus Peter; and Vegter, Gert, 5,746,424, Cl. 270-37.000.
- Veith, Gustav: *See—*
  - Heidemann, Rolf; Veith, Gustav; and Otterbach, Jurgen, 5,748,348, Cl. 359-125.000.
- Velasquez, David A.; Holmes, Douglas B.; and Gogolin, E. Lawrence, to Valence Technology, Inc. Method and apparatus for preparing electrochemical cells. 5,746,781, Cl. 29-730.000.
- Veltman, Joost; Prins, Andrew Carl; and Cavanaugh, Scott R., to FMC Corporation. Continuous vessel deflection monitor device. 5,747,085, Cl. 426-233.000.
- Venet, Marc Gaston: *See—*
  - Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.
- Venkatasetty, H. V., to H.V. Setty Enterprises, Inc. Non-aqueous amperometric multi-gas sensor. 5,746,900, Cl. 204-415.000.
- Verbo, Ulysse: *See—*
  - Gautier, Jean Pierre; and Verbo, Ulysse, 5,746,107, Cl. 91-376.00R.
- Verdone, Nicola: *See—*
  - Lacquaniti, Luigi; Liuzzo, Giuseppe; Palitto, Marcello; and Verdone, Nicola, 5,746,141, Cl. 110-203.000.
- Vermeer Manufacturing Company: *See—*
  - Bischel, Brian John; and Rankin, James Richard, 5,746,278, Cl. 175-24.000.
- Vernacotola, Dean E.: *See—*
  - Higby, Paige L.; Vernacotola, Dean E.; and Penrod, Bret E., 5,747,398, Cl. 501-66.000.
- Verschuur, Gerrit L.: *See—*
  - Mitchell, Chauncey T., Jr.; Good, David M.; Shadle, Mark A.; and Verschuur, Gerrit L., 5,747,103, Cl. 427-123.000.
- Verstappen, Walter Louis Antoine: *See—*
  - Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, 5,746,840, Cl. 548-257.000.
- Vertanen, Mark W., to Gits Manufacturing Company. Adjustable actuator for a turbocharger. 5,746,058, Cl. 60-602.000.
- Vesborg, Steen, to Colgate-Palmolive Company. Container set comprising at least two containers. 5,746,260, Cl. 141-319.000.
- Vetter, Chris J.: *See—*
  - Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.
- Vettermann, Maritta: *See—*
  - Henn, Manfred; and Vettermann, Maritta, 5,746,131, Cl. 101-424.200.
- Veyhl, Rainer: *See—*
  - Dimigen, Heinz; Klages, Claus-Peter; Veyhl, Rainer; Taube, Klaus; Thyen, Rudolf; Hübsch, Hubertus; and Boettger, Eckart, 5,748,069, Cl. 338-308.000.
- Vial, Maria: *See—*
  - Vial, Silvano; and Vial, Maria, 5,746,687, Cl. 482-126.000.
- Vial, Silvano; and Vial, Maria. Multi-purpose exercise device. 5,746,687, Cl. 482-126.000.
- Vickers, Tim: *See—*
  - Ecker, David J.; Vickers, Tim; and Davis, Pete, 5,747,253, Cl. 435-6.000.
- Victor Company of Japan, Ltd.: *See—*
  - Fujiwara, Mitsuaki, 5,748,249, Cl. 348-419.000.
  - Sugiyama, Kenji, 5,748,784, Cl. 382-236.000.
  - Sugiyama, Kenji, 5,748,787, Cl. 382-240.000.
- Viebranz, Manfred G.: *See—*
  - Dust, Herbert; Lohmeier, Gerhard; and Viebranz, Manfred G., 5,746,253, Cl. 138-178.000.
- Vigil, Dennis M.; and Barath, Peter, to InterVentional Technologies Inc. Catheter for injecting fluid medication into an arterial wall. 5,746,716, Cl. 604-97.000.
- Villanueva, Robert. Adjustable storage rack. 5,746,139, Cl. 108-92.000.
- Villanueva, Robert. Drain hose assembly. 5,746,950, Cl. 261-29.000.
- Vincent, Harold Lewis: *See—*

Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.

Vincent, Stephen T.: *See—*

Yerkovich, Daniel; and Vincent, Stephen T., 5,748,427, Cl. 361-92.000.

Vines, Landon B.: *See—*

Lee, Chang-Ou; Vines, Landon B.; Fujishiro, Felix H.; and Koenigseder, Sigmund, 5,745,990, Cl. 29-852.000.

Vinn, Charles L.: *See—*

Wong, Hok-Tung; and Vinn, Charles L., 5,747,976, Cl. 323-282.000.

Vinod, Yashavant Vinayak; and Whelchel, Wayne Curtis, to Du Pont de Nemours, E. I., and Company. Decorative composite floor coverings. 5,747,133, Cl. 428-46.000.

Violi, Raymond; and Ferbus, Jean-Francois, to Societe Cooperative de Production Bourgeois. Oven door locking device. 5,746,456, Cl. 292-146.000.

Viot, J. Greg; and Yishay, Oded, to Motorola, Inc. Low power logic minimization for electrical circuits. 5,748,490, Cl. 364-489.000.

Virbac, Inc.: *See—*

Miller, Thomas A., 5,747,057, Cl. 424-411.000.

Virsu, Veijo; and Salminen, Seppo, to Helsinki University Licensing, Ltd. Method and apparatus for measuring the working condition of the brain with periodic stimuli. 5,746,205, Cl. 128-630.000.

Visinka, Radim, to Motorola, Inc. Method for controlling an electric motor and electric apparatus. 5,747,963, Cl. 318-807.000.

Viskase Corporation: *See—*

Markulin, John, 5,747,125, Cl. 428-34.800.

Visscher, Karyn: *See—*

Allcock, Harry R.; Visscher, Karyn; and Kim, Young Baek, 5,747,604, Cl. 525-417.000.

Visser, Jan, to U.S. Philips Corporation. Method of manufacturing a semiconductor device in which a layer of material is deposited on the surface of a semiconductor wafer from a process gas. 5,747,362, Cl. 437-225.000.

Vitajet Corporation: *See—*

Salo, Timothy J.; Landau, Sergio; Austin, Glenn D.; and Lennon, T. Patrick, 5,746,714, Cl. 604-68.000.

Vitalcom, Inc.: *See—*

Flach, Terry E.; and Stoop, Michael D., 5,748,103, Cl. 340-870.070.

Vitz, Frank E.: *See—*

Sinclair, Michael J.; and Vitz, Frank E., 5,747,822, Cl. 250-559.190.

Vladic, Daniel P.: *See—*

Weiss, Roger E.; Vladic, Daniel P.; and Schofield, Philip W., 5,748,818, Cl. 385-59.000.

Vlasuk, George P.: *See—*

Moyle, Matthew; Foster, David L.; and Vlasuk, George P., 5,747,296, Cl. 435-72.000.

VLSI Technology, Inc.: *See—*

Lee, Chang-Ou; Vines, Landon B.; Fujishiro, Felix H.; and Koenigseder, Sigmund, 5,745,990, Cl. 29-852.000.

Levy, Paul S.; and Cornelius, Steve, 5,748,744, Cl. 380-52.000.

Wong, Belle; Lee, Donald; and Mattos, Derwin, 5,748,019, Cl. 327-170.000.

Vo, Huy Thanh: *See—*

Thomann, Mark; and Vo, Huy Thanh, 5,748,635, Cl. 370-465.000.

Voehringer, Klaus; and Spinner, Klaus, to Robert Bosch GmbH. Arrangement for operating an adjustment drive. 5,747,884, Cl. 307-10.100.

Voelkel, Alice: *See—*

MacFarlane, Douglas Robert; and Voelkel, Alice, 5,748,439, Cl. 361-525.000.

Voest-Alpine Industrieanlagenbau GmbH: *See—*

Joo, Sang Hoon; Min, Dong Joon; and Shin, Myoung Kyun, 5,746,804, Cl. 75-387.000.

Vogel, Walter B.: *See—*

Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., 5,746,550, Cl. 408-1.00R.

Vogt, Barbara: *See—*

Richter, Peter; Elsner, Martin; and Vogt, Barbara, 5,747,508, Cl. 514-320.000.

Voith Sulzer Finishing GmbH: *See—*

Kayser, Franz, 5,746,124, Cl. 100-331.000.

Voith Sulzer Papiermaschinen GmbH: *See—*

Brugger, Hubert, 5,746,009, Cl. 34-446.000.

Voll, Benn Arild; Kebodeaux, Matthew S.; Stringfellow, Steve; and Bayne, Christian F., to Baker Hughes Incorporated. One trip cement and gravel pack system. 5,746,274, Cl. 166-278.000.

Vollebregt, Adrianus Wilhelmus Hermanus: *See—*

Bovenberg, Roelof Ary Lans; Vollebregt, Adrianus Wilhelmus Hermanus; and Van Solingen, Pieter, 5,747,285, Cl. 435-69.700.

Von Alpen, Ulrich; and Sauer, M. Gerd, to Saint-Gobain Vitrage. Bombardment-inhibiting bulletproof glass pane for automobiles. 5,747,170, Cl. 428-426.000.

Von Ammon, Wilfried; Weidner, Herbert; and Thanner, Ludwig, to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG. Method for determining the diameter of a growing monocrystal. 5,746,825, Cl. 117-14.000.

Von Borstel, Reid W.: *See—*

Lesser, Craig; and Von Borstel, Reid W., 5,746,231, Cl. 131-334.000.

Von Sacken, Ulrich; Chow, Wendy; and Shkuratoff, Allen, to Moli Energy (1990) Limited. Battery with improved safety during mechanical abuse. 5,747,188, Cl. 429-61.000.

von Widdern, Michael Hennig Cardinal: *See—*

Pophusen, Dirk; and von Widdern, Michael Hennig Cardinal, 5,747,124, Cl. 428-34.800.

Voxcom, Inc.: *See—*

Mitchell, Chauncey T., Jr.; Good, David M.; Shadle, Mark A.; and Verschuur, Gerrit L., 5,747,103, Cl. 427-123.000.

Vrotsos, Thomas A.: *See—*

Chen, Julian Zhiliang; Amerasekera, Ajith; and Vrotsos, Thomas A., 5,747,834, Cl. 257-111.000.

VTech Electronics, Ltd.: *See—*

Wong, Wai-sing; Chao, Kam-chi; and Fong, Chi-ming, 5,748,174, Cl. 345-118.000.

Vuagnoux, Jean-Claude: *See—*

Attali, Jean-Claude; and Vuagnoux, Jean-Claude, 5,747,055, Cl. 424-409.000.

Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., to Allergan. Oxo-substituted tetrahydronaphthalene derivatives having retinoid and/or retinoid antagonist-like biological activity. 5,747,542, Cl. 514-646.000.

W. L. Gore & Associates, Inc.: *See—*

Campbell, Carey V.; Chastain, James H.; Laguna, Alvaro J.; and Pond, Daniel B., 5,747,128, Cl. 428-35.700.

Gorrell, Robin E.; and Fischer, Paul J., 5,747,358, Cl. 437-183.000.

Hendershot, William J.; McDonald, Michael L.; and Timian, Vivian J., 5,746,856, Cl. 156-73.400.

Jones, Carl H.; Blaha, John M.; and Townsend, Gail J., 5,746,221, Cl. 128-859.000.

W.R. Grace & Co.-Conn.: *See—*

Blakeman, Peter John; and Johnson, Terence Richard. 5,747,579, Cl. 524-562.000.

Wacker Siltronic Gesellschaft für Halbeitermaterialien AG: *See—*

Nemetz, Friedrich, 5,746,824, Cl. 117-13.000.

Wacker Siltronic Gesellschaft für Halbleitermaterialien AG: *See—*

Von Ammon, Wilfried; Weidner, Herbert; and Thanner, Ludwig, 5,746,825, Cl. 117-14.000.

Waclawsky, John G.; Hershey, Paul C.; and Daugherty, Raymond F., to International Business Machines Corporation. Dynamic realtime routing in a data communications network. 5,748,925, Cl. 395-311.000.

Wacom Co., Ltd.: *See—*

Sekizawa, Yasushi; and Funahashi, Takahiko, 5,748,110, Cl. 341-5.000.

Wada, Hidenori: *See—*

Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, 5,748,599, Cl. 369-103.000.

Wada, Ichiro; Kondo, Hideki; and Kinoshita, Masataka, to Uni-Charm Corporation. Sanitary napkin. 5,746,729, Cl. 604-378.000.

Wada, Shigeaki: *See—*

Ukegawa, Shin; Wada, Shigeaki; Okada, Atsunori; Higashisaka, Shingo; and Kotani, Miki, 5,747,945, Cl. 315-248.000.

Wada, Takeshi: *See—*

Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,747,047, Cl. 424-275.100.

Wada, Yasuhiro: *See—*

Kodama, Hiroshi; Wada, Yasuhiro; and Yamaguchi, Rikio, 5,747,519, Cl. 514-407.000.

Waddoups, Ray Owen: *See—*

Bickley, Robert Henry; Aragaki, Taul; Moy, Leland Lem; and Waddoups, Ray Owen, 5,748,147, Cl. 342-457.000.

Wadin, Craig P.: *See—*

Patterson, Audley F.; Suarez, Hector E.; and Wadin, Craig P., 5,749,056, Cl. 455-569.000.

Wadsworth, Larry C.: *See—*

Hassenboehler, Charles B., Jr.; and Wadsworth, Larry C., 5,747,394, Cl. 442-328.000.

Waeber, Kenneth R.: *See—*

Beveridge, Keith A.; Bennett, Mark A.; Waeber, Kenneth R.; and Haynes, Clinton A., 5,746,357, Cl. 222-386.000.

Waehner, Keith D.: *See—*

Waehner, Keith David, 5,747,737, Cl. 174-59.000.

Waehner, Keith David, to Waehner, Keith D. Internally connected junction box. 5,747,737, Cl. 174-59.000.

Waeschle Inc.: *See—*

Huck, Hans J., 5,746,258, Cl. 141-67.000.

Wagner, Wolfgang: *See—*

Kurbjuhn, Manfred; Stolten, Detlef; and Wagner, Wolfgang, 5,747,184, Cl. 429-31.000.

Wahhoud, Adnan; and Hehle, Josef, to Lindauer Dornier Gesellschaft mbH. Method and apparatus for a controlled pneumatic removal of a faulty weft thread in an air jet loom. 5,746,256, Cl. 139-116.200.

Wahl, Errol Hoffman; Trinh, Toan; Gosselink, Eugene Paul; Letton, James Carey; and Sivik, Mark Robert, to Procter & Gamble Company, The. Fabric softening compound/composition. 5,747,443, Cl. 510-515.000.

Wahler, Richard O.: *See—*

Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.

Waibel, Terry John: *See—*

Hutson, David Dean; Johenning, Christopher Paul; Taube, John Janis; and Waibel, Terry John, 5,746,849, Cl. 152-209.00R.

Wain-Hobson, Simon: *See—*

Alizon, Marc; Sonigo, Pierre; Wain-Hobson, Simon; and Montagnier, Luc, 5,747,242, Cl. 435-5.000.

Waino, Ronald Arvid; and Schreiber, Daniel James, to Cooper Industries, Inc. Operating mechanism usable with a vacuum interrupter. 5,747,766, Cl. 218-140.000.

Wainwright, Norman R.; and Novitsky, Thomas J., to Associates of Cape Cod, Inc. Endotoxin binding and neutralizing protein and uses thereof. 5,747,455, Cl. 514-12.000.

Waitz, Harold D.: *See—*

Segall, Paul E.; Waitz, Harold D.; Sternberg, Hal; and Segall, Judith M., 5,747,071, Cl. 424-663.000.

Wajima, Kiyoshi: *See—*

Fujisaki, Keisuke; Wajima, Kiyoshi; Umetsu, Kenji; Sawada, Kenzo; Ueyama, Takatsugu; Toh, Takehiko; Okazawa, Kensuke; and Okumura, Yasushi, 5,746,268, Cl. 164-468.000.

Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, to Hitachi, Ltd. Video camera. 5,748,238, Cl. 348-373.000.

Wakabayashi, Osamu; and Kobayashi, Yukio, to Komatsu, Ltd. Detector for wavelength of excimer laser. 5,748,316, Cl. 356-352.000.

Wakahara, Tatsuo; and Murakami, Kenichiro, to Nissan Motor Co., Ltd. Vehicle transmission system. 5,746,677, Cl. 477-35.000.

Wakamura, Masato: *See—*

Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.

Wakano, Shoichi: *See—*

Kometani, Osamu; Wakano, Shoichi; and Asakura, Mikio, 5,748,549, Cl. 365-226.000.

Wakimoto, Mitrso: *See—*

Matsui, Komaharu; Wakimoto, Mitrso; Eda, Takeshi; Tatsuno, Tadayoshi; Kuwabara, Yutaka; and Shibata, Kenichi, 5,747,132, Cl. 428-41.700.

Wakita, Yutaka: *See—*

Ogino, Naomi; Oomori, Takashi; Ueda, Hiroshi; Midorikawa, Yoshimi; and Wakita, Yutaka, 5,747,414, Cl. 503-207.000.

Wako Pure Chemical Industries, Ltd.: *See—*

Tsuchiya, Masakazu, 5,747,277, Cl. 435-34.000.

Walker, Harrell L.; and Tilley, Anthony M. Control of weeds with a fungal pathogen derived from *M. verrucaria* . 5,747,029, Cl. 424-93.500.

Walker, John Michael: *See—*

Crawford, Jamie; Powell, Steven; and Walker, John Michael, 5,748,293, Cl. 355-75.000.

Wallace, Phillip W.: *See—*

Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., 5,748,049, Cl. 331-49.000.

Wallen, Erik S.; Roigas, Jan; and Moseley, Pope L., to University of New Mexico. Methods for purifying and synthesizing heat shock protein complexes. 5,747,332, Cl. 435-272.000.

Wallis, Derek Ian: *See—*

Roberts, David Alan; Cramp, Susan Mary; Wallis, Derek Ian; and Bulot, Jean-Paul, 5,747,424, Cl. 504-271.000.

Wallis, Nicola Gail, to SmithKline Beecham Corporation; and SmithKline Beecham p.l.c. Polynucleotides encoding a transcriptional response regulator of *Streptococcus pneumoniae*. 5,747,286, Cl. 435-69.100.

Wallmeier, Eugen, to Siemens Aktiengesellschaft. Method for scheduling message cells leaving an ATM node. 5,748,614, Cl. 370-235.000.

Wallraff, Gregory Michael: *See—*

Allen, Robert D.; Day, Richard Allen; Glatzel, Donald Herman; Hinsberg, William Dinan; Mertz, John Richard; Russell, David John; and Wallraff, Gregory Michael, 5,747,223, Cl. 430-325.000.

Walrus, Inc.: *See—*

Dishner, Teddy L.; and Breaux, Terry, 5,745,960, Cl. 24-381.000.

Walsh, Andrew J.: *See—*

Clark, Andrew Reginald; Hsu, Chung C.; and Walsh, Andrew J., 5,747,002, Cl. 424-45.000.

Walsh, Joseph Christopher, to Graphic Packaging Corporation. Method for forming carton blanks. 5,746,871, Cl. 156-268.000.

Walsh, Roger C.; and Eggins, Douglas W. Compound hose system. 5,746,255, Cl. 138-115.000.

Walter, Helmut: *See—*

Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.

Walter, Jerry L.: *See—*

Miller, Phillip; Walter, Jerry L.; Boatwright, Darrell L.; and Schultz, Darald R., 5,747,785, Cl. 235-472.000.

Walter, Joanne S.; and Flynn, Tracy L., to NCR Corporation. Method and apparatus for enhancing security in a self-service checkout station. 5,747,784, Cl. 235-383.000.

Waltke, David L.; and Bouc, Gary L., to Hoover Group, Inc. Flexible bag for liquids mounted on a frame. 5,746,343, Cl. 220-9.200.

Walton, Joseph Edward: *See—*

Mazer, Terrence Bruce; Walton, Joseph Edward; Geckle, Ronita Kay; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; Joseph, Robert Louis; Pierson, William Guy; Loughrin, Thomas Daniel; and Osip, Thomas Walter, 5,746,715, Cl. 604-83.000.

Walton, Karl D., to TRW Technar Inc. Apparatus and method for controlling an actuatable restraint device. 5,749,059, Cl. 701-45.000.

Wan, Ray-Lin: *See—*

Lin, Tien-Ler; Soejima, Kota; Takahashi, Jun; Hung, Chun-Hsiung; Liou, Kong-Mou; and Wan, Ray-Lin, 5,748,535, Cl. 365-185.220.

Waner, John, to Interstore Transfer Systems, Ltd. Directional control caster assembly. 5,745,951, Cl. 16-31.00R.

Wang, Chang Yi; and Hosein, Barbara, to United Biomedical, Inc. Synthetic peptides specific for the detection of antibodies to HCV, diagnosis of HCV infection and preventions thereof as vaccines. 5,747,239, Cl. 435-5.000.

Wang, Chun-Wen. Moisture and contaminant separator for compressed air. 5,746,791, Cl. 55-337.000.

Wang, David: *See—*

Fu, Alex; Wang, David; and Wu, Chris, 5,748,181, Cl. 345-165.000.

Wang, Hsingya Arthur; Ramsbey, Mark T.; and Sun, Yu, to Advanced Micro Devices, Inc. Device including means for preventing tungsten silicide lifting, and method of fabrication thereof. 5,747,882, Cl. 257-768.000.

Wang, Hui. Apparatus for fire protection. 5,748,072, Cl. 340-286.050.

Wang, Huili: *See—*

Llorens, Joseph R.; and Wang, Huili, 5,748,924, Cl. 395-309.000.

Wang, Jin-Der: *See—*

Langberg, Ehud; and Wang, Jin-Der, 5,748,686, Cl. 345-367.000.

Wang, Kai: *See—*

Watts, Robert F.; Skinker, Benjamin H.; and Wang, Kai, 5,748,719, Cl. 379-142.000.

Wang, Kang-Sheng: *See—*

Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,747,044, Cl. 424-202.100.

Wang, Shay-Ping T.: *See—*

Labun, Nicholas M.; McClaughry, Thomas J.; and Wang, Shay-Ping T., 5,748,845, Cl. 395-20.000.

Wang, Shay-Ping Thomas: *See—*

Mazurkiewicz, Theodore; Levendel, Gil E.; and Wang, Shay-Ping Thomas, 5,749,072, Cl. 704-275.000.

Wang, Shen-ge; and Hains, Charles M., to Xerox Corporation. Method of calibrating a digital printer using component test patches and the yule-nielsen equation. 5,748,330, Cl. 358-298.000.

Wang, Ting-S.: *See—*

Fan, Der-Tsyr; Jou, Chon-Shin; and Wang, Ting-S., 5,747,378. Cl. 438-563.000.

Wang, Wen-chou Vincent: *See—*

Beilin, Solomon I.; Chou, William T.; Lee, Michael G.; and Wang, Wen-chou Vincent, 5,746,903, Cl. 205-118.000.

Wang, Wonder D.; Horng, Shean-Ren; and Huang, Fei-Chi, to Taiwan Semiconductor Manufacturing Company, Ltd. Method for preparing semiconductor chip as SEM specimen. 5,747,365, Cl. 438-17.000.

Wang, Yao Rong: *See—*

Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.

Warabisako, Terunori: *See—*

Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, 5,747,864, Cl. 257-458.000.

Ward, Paul A.; and Kourepenis, Anthony S., to Charles Stark Draper Laboratory, Inc., The. Beat frequency motor position detection scheme for tuning fork gyroscope and other sensors. 5,747,961, Cl. 318-646.000.

Ware, Frederick Abbot: *See—*

Barth, Richard Maurice; Ware, Frederick Abbot; Dillon, John Bradly; Stark, Donald Charles; Hampel, Craig Edward; and Griffin, Matthew Murdy, 5,748,914, Cl. 395-285.000.

Warner, Anthony: *See—*

Jones, Michael William Dudleston; Geen, Nicholas; Warner, Anthony; and Hughes, Mischka, 5,748,931, Cl. 395-356.000.

Warner, Charles: *See—*

Fisher, Donald; and Warner, Charles, 5,745,989, Cl. 29-846.000.

Warner, David; Lee, Charles C.; and Li, Wu-Shyong, to Minnesota Mining and Manufacturing Company. Ink jet printing sheet. 5,747,148, Cl. 428-212.000.

Warner-Lambert Company: *See—*

Trivedi, Bharat Kakidas, 5,747,528, Cl. 514-456.000.

Warner, Vernon R.: *See—*

Pace, Jeffrey B.; Warner, Vernon R.; and Wright, Danny O., 5,747,684, Cl. 73-119.00A.

Wartenberg, Mark F.; Lahlouh, John G.; and Toth, James, to Raychem Corporation. Conductive polymer composition and device. 5,747,147, Cl. 428-209.000.

Warwaruk, Robin. Vehicle-mounted animal restraint apparatus. 5,746,157, Cl. 119-785.000.

Washington University: *See—*

Gordon, Jeffrey I.; Gokel, George W.; and Englund, Paul T., 5,747,537, Cl. 514-558.000.

Johnson, Eugene M., Jr.; Milbrandt, Jeffrey D.; Kotzbauer, Paul T.; and Lampe, Patricia A., 5,747,655, Cl. 530-399.000.

Washington, Wayne: *See—*

Beaulac, Daniel E.; Hewison, Trevor S.; and Washington, Wayne, 5,746,150, Cl. 114-248.000.

Wason, Satish K.; and Sumpter, James E., to J.M. Huber Corporation. Cost effective dental compositions containing novel sodium aluminosilicates. 5,747,008, Cl. 424-52.000.

Wassarman, David: *See—*

Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,275, Cl. 435-15.000.

Rubin, Gerry; Therrien, Marc; Chang, Henry; Karim, Felix; and Wassarman, David, 5,747,288, Cl. 435-69.100.

- Wasserman, Stanley J.: *See—*
  - Wurm, Martin J.; and Wasserman, Stanley J., 5,746,087, Cl. 72-456.000.
- Watabe, Mitsuru: *See—*
  - Kawasaki, Shumpei; Fukada, Kaoru; Watabe, Mitsuru; Noguchi, Kouki; Matsubara, Kiyoshi; Mochizuki, Isamu; Suzukawa, Kazufumi; Masumura, Shigeki; Akao, Yasushi; and Sakakibara, Eiji, 5,748,977, Cl. 395-800.000.
- Watanabe, Akira: *See—*
  - Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
- Watanabe, Atsushi; Terada, Tomoyuki; and Sakamoto, Shinsuke, to Fanuc Ltd. Robot position teaching system and method. 5,748,854, Cl. 395-93.000.
- Watanabe, Gaku; and Yamazaki, Yasuyuki, to Canon Kabushiki Kaisha. Display device for sampling input image signals. 5,748,167, Cl. 345-98.000.
- Watanabe, Kazuhito: *See—*
  - Emoto, Shigeru; Hasegawa, Kumi; Maekawa, Youichi; Watanabe, Kazuhito; and Katoh, Kouki, 5,747,210, Cl. 430-109.000.
- Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, to Seiko Epson Corporation. Ink jet type recording unit with an improved carriage structure. 5,748,210, Cl. 347-50.000.
- Watanabe, Koji: *See—*
  - Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.
- Watanabe, Masaki: *See—*
  - Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
- Watanabe, Ryoichi: *See—*
  - Sato, Makiko; Hisatake, Yuzo; Watanabe, Ryoichi; and Hatoh, Hitoshi, 5,748,275, Cl. 349-144.000.
- Watanabe, Shinya: *See—*
  - Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, 5,747,843, Cl. 257-296.000.
- Watanabe, Takuo; Naruse, Yasuhito; and Yamasue, Kotaro, to Fuji Photo Film Co, Ltd. Presensitized plate comprising two photosensitive layers wherein the layer adjacent to the support has a lower concentration of dye than the other layer. 5,747,216, Cl. 430-156.000.
- Watanabe, Tyler: *See—*
  - Lee, Eun Soo; Watanabe, Tyler; Gale, Robert M.; and Burkoth, Terry L., 5,747,065, Cl. 424-448.000.
- Watanabe, Yukiyoshi: *See—*
  - Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.
- Watanabe, Yumiko: *See—*
  - Shinagawa, Tetsuo; Watanabe, Yumiko; Shinagawa, Akio; and Ito, Fumitaka, 5,748,715, Cl. 379-100.130.
- Wataya, Hiroshi: *See—*
  - Hirata, Tetsuhiko; Koizumi, Minoru; Nagano, Masayo; Adachi, Yoshiaki; Wataya, Hiroshi; and Onuki, Ken, 5,748,893, Cl. 395-200.300.
- Watkins, David Robert; Nock, Nigel Gerard; and Jackson, Michael, to Sumitomo Rubber Industries Limited. Motorcycle radial tire with rubber member between carcass plies. 5,746,852, Cl. 152-454.000.
- Watson, M. Burnell. Piston for tank. 5,746,112, Cl. 92-205.000.
- Watson, Tom A.; Partlo, William N.; Larson, Donald G.; Fomenkov, Igor V.; de Ruyter, Anthony J.; and Das, Palash P., to Cymer, Inc. Laser having improved beam quality and reduced operating cost. 5,748,656, Cl. 372-35.000.
- Watterston, James: *See—*
  - Malhotra, Arun; Ang, Jane; Gray, G. Robert; and Watterston, James, 5,748,417, Cl. 360-126.000.
- Watts, Robert F.; Skinker, Benjamin H.; and Wang, Kai, to Compaq Computer Corporation. Relay circuit for telephone interface. 5,748,719, Cl. 379-142.000.
- Watts, Steven J.: *See—*
  - Chadha, Atul; Haderle, Donald J.; Shibamiya, Akira; Lyle, Robert W.; and Watts, Steven J., 5,748,952, Cl. 395-602.000.
- Waugh, Raymond Mitchell: *See—*
  - Bayruns, John Thomas; Waugh, Raymond Mitchell; Wallace, Phillip W.; Bayruns, Robert J.; and DeNigris, Thomas D., 5,748,049, Cl. 331-49.000.
- Waukesha-Pearce Industries, Inc.: *See—*
  - Pollock, Bobby G.; Segal, Terry A.; Dusek, John E., Jr.; Bodin, Alvin L.; Maas, Cyde D.; Coen, Edward C.; and Pinter, Randall A., 5,746,986, Cl. 422-177.000.
- WCM Industries, Inc.: *See—*
  - Ball, William T., 5,745,931, Cl. 4-286.000.
- Weatherston, Roger C.: *See—*
  - Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 5,745,992, Cl. 29-888.022.
- Weaver, John D.: *See—*
  - Sorenson, Marius W.; Cipriano, Robert A.; Longoria, Jose J.; and Weaver, John D., 5,747,546, Cl. 521-32.000.
- Weaver, Kathleen L.: *See—*
  - Weckerle, Judith C.; and Weaver, Kathleen L., 5,747,751, Cl. 181-131.000.
- Webb, Alan L.: *See—*
  - Brassfield, Steven R.; and Webb, Alan L., 5,746,578, Cl. 416-190.000.
- Webb, Charles Franklin; Farrell, Mark Steven; Check, Mark Anthony; and Liptay, John Stephen, to International Business Machines Corporation. Specialized millicode instructions which reduce cycle time and number of instructions necessary to perform complex operations. 5,748,951, Cl. 395-595.000.
- Webb, Michael C., to Environ Products, Inc. Pipe coupling assembly. 5,746,454, Cl. 285-92.000.
- Webb, Mike: *See—*
  - Gulick, Dale E.; Lambrecht, Andy; Webb, Mike; Hewitt, Larry; and Barnes, Brian, 5,748,983, Cl. 395-842.000.
- Weber, Gerd; and Biebel, Willi, to Deutsche Rockwool Mineralwall-GmbH. Method of neutralizing hot inclusions present in a web of mineral wool and apparatus for carrying out the method. 5,748,479, Cl. 364-470.010.
- Weber, Joachim, to Hoechst Aktiengesellschaft. Water-insoluble azo colorants based on aminoquinazolinediones. 5,747,566, Cl. 524-93.000.
- Weber, John G., to Chaparral Communications. High-performance antenna structure. 5,748,156, Cl. 343-762.000.
- Weber, Leland E.: *See—*
  - Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., 5,747,971, Cl. 322-10.000.
- Weber, Wayne Woodrow, II; Messing, Calvin Roman; and Logan, Margaret Elizabeth, to Johnson & Johnson Clinical Diagnostics, Inc. Calcium specific diaza-18-crown-6-ether chromoionophores. 5,747,345, Cl. 436-74.000.
- Weckerle, Judith C.; and Weaver, Kathleen L. Disposable cover for stethoscope head. 5,747,751, Cl. 181-131.000.
- Weckström, Kurt: *See—*
  - Karlsson, Kai; Meriläinen, Timo; Weckström, Kurt; and Poikolainen, Seppo, 5,747,820, Cl. 250-504.00R.
- Weeks, Eric L., to Ear Craft Technologies. Air conduction hearing device. 5,748,743, Cl. 381-68.600.
- Wei, Chengping; Shi, Song Q.; and Lee, Hsing-Chung, to Motorola, Inc. Method of manufacturing an integrated electro-optical package. 5,747,363, Cl. 438-5.000.
- Wei, George; Hecker, Arlene; and Goodman, David, to OSRAM Sylvania Inc. Translucent polycrystalline alumina and method of making same. 5,747,402, Cl. 501-152.000.
- Wei, Ying-Fei; and Sutton, Granger G., III, to Human Genome Sciences, Inc. Human AlkB polypeptide. 5,747,312, Cl. 435-183.000.
- Weiberth, Franz Josef, to Hoechst Marion Roussel, Inc. Retractable batch reactor sampler. 5,747,708, Cl. 73-863.810.
- Weichert, Andreas; Brendel, Joachim; Kleemann, Heinz-Werner; Lang, Hans Jochen; Schwark, Jan-Robert; Albus, Udo; and Scholz, Wolfgang, to Hoechst Aktiengesellschaft. Substituted benzoylguanidines, a process for their preparation, their use as medicament of diagnostic agent, and medicament comprising them. 5,747,541, Cl. 514-622.000.
- Weider, Richard: *See—*
  - Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; Weider, Richard; and Scholl, Thomas, 5,747,589, Cl. 525-146.000.
  - Köhler, Burkhard; Tischer, Werner; Ebert, Wolfgang; Weider, Richard; Scholl, Thomas; and Dhein, Rolf, 5,747,586, Cl. 525-67.000.
- Weidlich, Peter: *See—*
  - Karrer, Lothar; Pape, Frank-Friedrich; Köhler, Ulrich; Becker, Rainer; Weidlich, Peter; Hüllmann, Michael; and Kneuper, Heinz-Josef, 5,747,411, Cl. 502-353.000.
- Weidner, Charles H.: *See—*
  - Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.
- Weidner, Herbert: *See—*
  - Von Ammon, Wilfried; Weidner, Herbert; and Thanner, Ludwig, 5,746,825, Cl. 117-14.000.
- Weigelt, Beate; Mügge, Martin; and Decker, Detlef, to Hella KG Hueck & Co. Blink lamp. 5,746,496, Cl. 362-61.000.
- Weigl, Bernhard H.: *See—*
  - van den Engh, Ger; and Weigl, Bernhard H., 5,747,349, Cl. 436-172.000.
- Weiland, Rainer: *See—*
  - Arnold, Norbert; Hummler, Klaus; Levine, Ernest; and Weiland, Rainer, 5,747,802, Cl. 250-307.000.
- Weinblatt, Lee S.; and Langer, Thomas, to Weinblatt, Lee S. Monitoring identity of computer users accessing data bases, and storing information about the users and the accessed data base. 5,748,889, Cl. 395-187.010.
- Weiner, Amy Joan: *See—*
  - Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,747,044, Cl. 424-202.100.
- Weinmann, Daniel James: *See—*
  - Corley, Larry Steven; Ghosh, Kalyan; Hunter, Joseph Michael; Kincaid, Derek Scott; Meilus, Leo; and Weinmann, Daniel James, 5,746,935, Cl. 252-182.230.
- Weinmann, Hanns-Joachim: *See—*
  - Gries, Heinz; Mützel, Wolfgang; Zurth, Christian; and Weinmann, Hanns-Joachim, 5,746,999, Cl. 424-9.322.
  - Platzek, Johannes; Radüchel, Bernd; Niedballa, Ulrich; Weinmann, Hanns-Joachim; Bauer, Hans; and Roth, Klaus, 5,747,000, Cl. 424-9.363.
- Weir, Steven P., to Harris Corporation. Integrated network switch with flexible serial data packet transfer system. 5,748,627, Cl. 370-384.000.

- Weisman, Martin J., to Martens, Charles S. Nail polish top coat free of toluene. 5,747,019, Cl. 424-61.000.
- Weisman, Martin J.: *See—*
  - Nichols, Rosemarie; and Weisman, Martin J., 5,747,017, Cl. 424-61.000.
- Weismiller, Matthew W.; Ulrich, David J.; Butterbrodt, Jay T.; Kramer, Kenneth L.; Brooke, Jason C.; Meyer, Eric R.; Branson, Gregory W.; and Thomas, James M. C., to Hill-Rom, Inc. Support surfaces for a bed. 5,745,937, Cl. 5-624.000.
- Weismiller, Michael C.: *See—*
  - Cooper, Fredrick L.; Kibala, Piotr A.; and Weismiller, Michael C., 5,746,924, Cl. 210-698.000.
- Weiss, Eugene G.: *See—*
  - Richardson, Michael M.; Brittle, Allan C., Jr.; Fiedler, Lee B.; Gorham, Kent; Peterson, Jay R.; Schultze, Gary T.; Vetter, Chris J.; and Weiss, Eugene G., 5,748,483, Cl. 364-478.110.
- Weiss, Gerhard: *See—*
  - Lochbrunner, Eduard; Buss, Heiko; Haarer, Werner; Oettinger, Andreas; Kronberger, Maximilian; Blanc, Régis; and Weiss, Gerhard, 5,746,168, Cl. 123-90.380.
- Weiss, Roger E.; Vladic, Daniel P.; and Schofield, Philip W. Massive parallel optical interconnect system. 5,748,818, Cl. 385-59.000.
- Weiss, Stefan: *See—*
  - Müller, Michael Wolfgang; Klingelhöfer, Paul; and Weiss, Stefan, 5,746,812, Cl. 106-10.000.
- Weissman, Eric M.: *See—*
  - Spillman, William Bert, Jr.; and Weissman, Eric M., 5,747,698, Cl. 73-780.000.
- Welbon, Edward Hugh: *See—*
  - Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,748,855, Cl. 395-800.230.
- Welch Allyn, Inc.: *See—*
  - Fletcher-Haynes, Peter, 5,748,504, Cl. 364-571.010.
- Welch, Harold D.: *See—*
  - Marschke, Carl R.; Welch, Harold D.; and Cummings, James A., 5,746,010, Cl. 34-631.000.
- Welch, James R.: *See—*
  - Mactaggart, Iain Ross; Welch, James R.; and Fiedler, Alan, 5,748,020, Cl. 327-218.000.
- Weldon, Thomas D.; Larsen, Charles E.; and Rosen, Jonathan J., to Novoste Corporation. Fluid access and flow control valve. 5,746,414, Cl. 251-149.600.
- Welker, Brian H.: *See—*
  - Beeler, Mark T.; and Welker, Brian H., 5,746,328, Cl. 211-59.300.
- Weller, Thomas: *See—*
  - Alig, Leo; Hadvary, Paul; Hürzeler, Marianne; Müller, Marcel; Steiner, Beat; and Weller, Thomas, 5,747,522, Cl. 514-423.000.
- Wells, David L.: *See—*
  - Jacobsen, Stephen C.; and Wells, David L., 5,747,692, Cl. 73-514.250.
  - Jacobsen, Stephen C.; and Wells, David L., 5,747,993, Cl. 324-109.000.
- Wen, Fu-Chu: *See—*
  - Kostelnik, Robert J.; and Wen, Fu-Chu, 5,746,819, Cl. 106-447.000.
- Wendel, Peter: *See—*
  - Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, 5,748,472, Cl. 364-424.080.
- Wenderoth, Bernd: *See—*
  - Müller, Hans-Joachim; Wenderoth, Bernd; Berger, Albin; Littmann, Dieter; Klimesch, Roger; Oppenländer, Knut; Marczinke, Bernd Lothar; Rühl, Thomas; and Heider, Marc, 5,747,616, Cl. 526-262.000.
- Wendt, Greg Arthur; Chiu, Kai F.; Burazin, Mark Alan; Farrington, Theodore Edwin, Jr.; and Heaton, David Alan, to Kimberly-Clark Worldwide, Inc. Method of making soft tissue products. 5,746,887, Cl. 162-109.000.
- Wendt, Matthias: *See—*
  - Van Der Broeck, Heinz; and Wendt, Matthias, 5,747,958, Cl. 318-747.000.
- Wenker, Jack A. Golf putter. 5,746,665, Cl. 473-313.000.
- Wenker, Paul Richard: *See—*
  - Stein, Michael Victor; and Wenker, Paul Richard, 5,748,927, Cl. 395-333.000.
- Wertheim, Gregory D., to Stanley Works, The. Tape rule housing. 5,746,004, Cl. 33-768.000.
- Wess, Raymond E.; Piccinino, Ralph L., Jr.; and Rosenburgh, John H., to Eastman Kodak Company. Photographic process with improved replenishment monitoring system. 5,749,018, Cl. 396-578.000.
- Wesseling, Karel Hendrik: *See—*
  - Bos, Willem Jan Wubbo; and Wesseling, Karel Hendrik, 5,746,698, Cl. 600-493.000.
- West, Brian H.: *See—*
  - Compere, Alicia L.; Griffith, William L.; Dorsey, George F.; and West, Brian H., 5,746,783, Cl. 44-301.000.
- West, James Edward: *See—*
  - Kubli, Robert Alfred; and West, James Edward, 5,748,757, Cl. 381-168.000.
- West, James W.: *See—*
  - Borg, Stephen E.; West, James W.; Lawrence, Robert M.; Harper, Samuel E., Jr.; and Alderfer, David W., 5,748,090, Cl. 340-578.000.
- West, Richard L.: *See—*
  - Giesler, Richard C.; Miles, Myra P.; Lovelace, Susan L.; Patno, Timothy J.; and West, Richard L., 5,746,708, Cl. 604-4.000.
- Western Atlas U.K. Limited: *See—*
  - Kovarovic, Josef; and Kowalewsky, John Ralph, 5,746,083, Cl. 72-315.000.
- Western Design Corporation: *See—*
  - Golden, Michael D., 5,745,953, Cl. 16-260.000.
- Westinghouse Air Brake Company: *See—*
  - Engle, Thomas H., 5,746,293, Cl. 188-151.00R.
  - Gaughan, Edward W.; and Troiani, Vincent F., 5,746,484, Cl. 303-3.000.
  - Harris, David Bennitt; Mathieu, Barry Morris; Dobratz, Jeffrey Alan; Uehling, Mark Allen; and Kull, Robert Charles, 5,748,269, Cl. 349-58.000.
  - Jamieson, Paul E., 5,746,485, Cl. 303-19.000.
  - Skantar, Elmer T., 5,747,685, Cl. 73-121.000.
- Westinghouse Electric Corporation: *See—*
  - Amos, Dennis Ray; Bachman, Sallie Ann; and Chen, Jianqiang, 5,746,579, Cl. 416-204.00A.
  - Iacono, Vincent M.; Kimmich, John R.; Mayhood, Keith L.; Vogel, Walter B.; and McGettigan, John J., 5,746,550, Cl. 408-1.00R.
  - Junkin, John Edward; and Robinson, George Joseph, 5,746,573, Cl. 415-115.000.
- Westley, Scott: *See—*
  - Buckalew, Gregory; Chang, Lydia; Cirincione, Richard; Garufi, Robert; Graham, Warren; Hui, Philip; Rutkowski, James; and Westley, Scott, 5,747,723, Cl. 102-282.000.
- Westphal, Dieter; Reul, Helmut; and Rau, Guenter, to Baxter International, Inc. Blood pump as centrifugal pump. 5,746,575, Cl. 415-206.000.
- Westphalen, Karl-Otto: *See—*
  - Schäfer, Peter; Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; König, Hartmann; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 5,747,422, Cl. 504-244.000.
- Westvaco Copration: *See—*
  - Claytor, Robinson Camden Perkins, 5,747,141, Cl. 428-143.000.
- Westvaco Corporation: *See—*
  - Bartley, Charles Allen; and Scruggs, Robert Burks, II, 5,745,938, Cl. 5-625.000.
- Wetter, Carol A.: *See—*
  - Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., 5,747,154, Cl. 428-327.000.
- Wetzel, Gerhard: *See—*
  - Mueller, Erwin; Alaze, Norbert; Wetzel, Gerhard; Schmidt, Klaus; and Ott, Harald, 5,746,111, Cl. 92-168.000.
- Wexler, Ronald Myron; James, Robert Owen; DePalma, Vito A.; Decory, John Francis; and Lobo, Lloyd A., to Eastman Kodak Company. Photographic element. 5,747,234, Cl. 430-523.000.
- Weyenberg, Jeffrey Michael: *See—*
  - Nielsen, Steven James; Rentmeester, Tammy Jo; Krueger, Allan James; and Weyenberg, Jeffrey Michael, 5,746,710, Cl. 609-14.000.
- Weyer, Frank M. Customizable credit card overlay. 5,746,451, Cl. 283-65.000.
- Wheatley, Brian K.: *See—*
  - Scheffee, Robert S.; Thibodeau, Robert Lee; and Wheatley, Brian K., 5,747,730, Cl. 149-47.000.
- Whelchel, Wayne Curtis: *See—*
  - Vinod, Yashavant Vinayak; and Whelchel, Wayne Curtis, 5,747,133, Cl. 428-46.000.
- Whitaker Corporation, The: *See—*
  - Brown, Michael Dale; Duncan, Frank Louis; and Bentley, Ralph Talmadge, II, 5,746,611, Cl. 439-135.000.
  - Consoli, John Joseph; and Sipe, Lynn Robert, 5,746,622, Cl. 439-521.000.
  - Klinedinst, Steven Zane, 5,745,982, Cl. 29-753.000.
  - Shiu, Leung Man, 5,746,610, Cl. 439-98.000.
  - Soriano, Louis, 5,745,991, Cl. 29-863.000.
  - Xu, David Jisen; and Sudeora, Sanjay, 5,748,817, Cl. 385-51.000.
- White Consolidated Industries, Inc.: *See—*
  - Bailey, Jack W.; and Howard, Joseph E., 5,746,070, Cl. 68-24.000.
- White, George Eugene: *See—*
  - McAllister, Michael; Perfecto, Eric Daniel; McDonald, James; Prasad, Keshav; Robbins, Gordon J.; Prasad, Chandrika; Swaminathan, Madhavan; and White, George Eugene, 5,747,095, Cl. 427-8.000.
- White, James E.; and Griesser, Kenneth P., to Intel Corporation. Method and apparatus for providing an optimized compare-and-branch instruction. 5,748,950, Cl. 395-595.000.
- White, Michael W.: *See—*
  - Bisbee, Stephen F.; Moskowitz, Jack J.; Sheehan, Edward R.; Trotter, Douglas H.; and White, Michael W., 5,748,738, Cl. 380-25.000.
- White, Morris F., Jr.: *See—*
  - Arterbery, Cynthia W.; Callahain, W. Timothy; Keritsis, Gus D.; and White, Morris F., Jr., 5,746,230, Cl. 131-331.000.
- White, Trevor Keith: *See—*
  - Cassidy, Stephen Anthony; Smyth, Peter Paul; Williams, Douglas Lawrence; and White, Trevor Keith, 5,748,813, Cl. 385-24.000.
- White, William O.: *See—*
  - Goldberg, Max Motti; Gates, Melodi Mosley; Ericksen, Susan Barbara; and White, William O., 5,748,890, Cl. 395-188.010.
- Whiteaker, Ross: *See—*
  - Kozlowski, Mark L.; and Whiteaker, Ross, 5,747,734, Cl. 174-50.000.
- Whitehill, James Harry: *See—*
  - Ahmadian, Mehdi; Gray, Laurence William; McGrew, Dean Zeal; Kurtzhals, William Anthony; Whitehill, James Harry; and Jaramillo, Jennifer Lynn, 5,746,135, Cl. 105-196.000.
- Whitehouse, Robert S.; and Reed, Thomas F., to Cabot Corporation. Polymeric compositions. 5,747,559, Cl. 523-205.000.
- Whitehouse, Robert S.: *See—*

  - Flenniken, Cindy L.; Menashi, Jameel; and Whitehouse, Robert S., 5,747,563, Cl. 523-215.000.
- Whiteis, David E., to Firefly Network, Inc. System and method for recommending items to a user. 5,749,081, Cl. 707-102.000.
- Whiteman, Nicole F.: *See—*
  - deGroot, Jacquelyn A.; Hazlitt, Lonnie G.; Jain, Pradeep; Karande, Seema V.; Mergenhagen, Laura K.; Moldovan, Dan G.; Stewart, Kenneth B.; and Whiteman, Nicole F., 5,747,594, Cl. 525-240.000.
- Whitesitt, Celia A.: *See—*
  - Panetta, Jill A.; Phillips, Michael L.; Reel, Jon K.; Shadle, John K.; Sigmund, Sandra K.; Simon, Richard L.; and Whitesitt, Celia A., 5,747,517, Cl. 514-369.000.
- Whitney, John K.: *See—*
  - Flick, Roland E.; and Whitney, John K., 5,745,939, Cl. 5-648.000.
- Whittaker, Mark: *See—*
  - Beckett, Raymond Paul; Whittaker, Mark; Miller, Andrew; and Martin, Fionna Mitchell, 5,747,514, Cl. 514-352.000.
- Whizard Protective Wear Corp.: *See—*
  - Kraatz, Gerald A., 5,745,919, Cl. 2-161.600.
- Whyte, Robert: *See—*
  - Rosenthal, Daniel; Konath, Kannan; Whyte, Robert; Norton, Eric; and Pearce, Stuart Robert, 5,748,124, Cl. 341-120.000.
- Wick, John Leslie. Portable automatic sprinkling system. 5,746,250, Cl. 137-624.110.
- Wicks, Michael C.: *See—*
  - Melvin, William L., Jr.; and Wicks, Michael C., 5,748,143, Cl. 342-162.000.
- Wicnienski, Michael F. Analog to digital converter having multi-state output. 5,748,130, Cl. 341-155.000.
- Wictor, Mats: *See—*
  - Jönsson, Anders; and Wictor, Mats, 5,746,493, Cl. 362-31.000.
- Widlund, Urban: *See—*
  - Olsson, Stefan; Widlund, Urban; and Söderbergh, Anders, 5,746,732, Cl. 604-385.200.
- Widmer, Benedikt; Müller, Martin; Flückiger, Daniel; Moy, Christian; and Chollet, Philippe, to Ascom Hasler Mailing Systems AG. Postage meter with rotor movement and die cover sensor. 5,746,133, Cl. 101-484.000.
- Widmer, Michael B.: *See—*
  - Grabstein, Kenneth H.; and Widmer, Michael B., 5,747,024, Cl. 424-85.200.
- Wiederholt, Jere D.: *See—*
  - Kirkland, Larry V.; and Wiederholt, Jere D., 5,748,846, Cl. 395-20.000.
- Wiedmann, Timothy S.; Wood, Ray W.; and DeCastro, Lan, to NanoSystems, L.L.C. Aerosols containing beclomethazone nanoparticle dispersions. 5,747,001, Cl. 424-45.000.
- Wiegand, Gregory P.: *See—*
  - Baretich, David F.; and Wiegand, Gregory P., 5,747,972, Cl. 323-223.000.
- Wielers, Antonius Franziskus Heinrich; and Kruka, Vitold Raimond, to Shell Oil Company. Method to remove metals from residuals. 5,746,907, Cl. 208-251.00H.
- Wiersema, Dale T.: *See—*
  - Griffin, David C.; Wiersema, Dale T.; Eldridge, Richard A.; and Klingbeil, William R., 5,747,773, Cl. 219-130.100.
- Wiesemann, David L.; Schaaf, Daniel E.; and Ko, Wai-Shing P., to Heath Company, Inc. Two-level security lighting system. 5,747,937, Cl. 315-159.000.
- Wijngaarden, Rudolf Jacobus: *See—*
  - Drent, Eit; Van Der Veer, Frits; and Wijngaarden, Rudolf Jacobus, 5,747,638, Cl. 528-392.000.
- Wikström, Göran: *See—*
  - Andersson, Karl-Hugo; Stenkvist, Sven-Einar; and Wikström, Göran, 5,748,666, Cl. 373-9.000.
- Wild Bird Centers of America, Inc.: *See—*
  - Petrides, George H.; and Kirchner, Katherene J., 5,746,156, Cl. 119-428.000.
- Wilde, Craig G.: *See—*
  - Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,747,283, Cl. 435-69.100.
- Wilder, Joseph; and Dreyfuss, David, to Johnson & Johnson Vision Products, Inc. Method and system for automatically inspecting ophthalmic lenses. 5,748,300, Cl. 356-124.000.
- Wilk, Peter J.; and Nakao, Naomi L. Endoscope biopsy channel liner and associated method. 5,746,694, Cl. 600-123.000.
- Wilkerson, Jack, to Geomarine Systems, Inc. Simplified control for lateral rotation therapy mattresses. 5,745,942, Cl. 5-715.000.
- Wilkins, Elizabeth W.: *See—*
  - Massey, Richard J.; Blackburn, Gary F.; Wilkins, Elizabeth W.; and Leland, Jonathan K., 5,746,974, Cl. 422-52.000.
- Wilkins, John J.; and Steffens, Walter L., to HK Systems, Inc. Slat sorter. 5,746,305, Cl. 198-890.100.
- Wilkinson, Francis E.: *See—*
  - Schmidt, Carl J.; Tobin, Frank; and Wilkinson, Francis E., 5,747,264, Cl. 435-7.100.
- Wilkinson, William T.: *See—*
  - Dicker, Timothy P.; and Wilkinson, William T., 5,745,917, Cl. 2-69.000.
- Willard, Cindylee. Rectovaginal surgical repair instrument. 5,746,749, Cl. 606-119.000.
- Willemsens, Albert Louis Anna; Verstappen, Walter Louis Antoine; Copmans, Alex Herman; Vandenriessche, Anna Maria Jozefa; De Knaep, Alfons Gaston Maria; and Venet, Marc Gaston, to Janssen Pharmaceutica, N.V. Process for preparing enantiomerically pure 6-(4-chlorophenyl) (1 H-1,2,4-triazol-1-YL) methyl)-1-methyl-1 H-benzotriazole. 5,746,840, Cl. 548-257.000.
- Williams, David Randall: *See—*
  - Campbell, Bruce Crinean; Martin, Thomas William; King, Ronald Stewart; Williams, David Randall; and Hesser, Frederick W., 5,747,415, Cl. 503-227.000.
- Williams, Donald Howard: *See—*
  - Sudhoff, Douglas H.; and Williams, Donald Howard, 5,747,904, Cl. 310-88.000.
- Williams, Douglas Lawrence: *See—*
  - Cassidy, Stephen Anthony; Smyth, Peter Paul; Williams, Douglas Lawrence; and White, Trevor Keith, 5,748,813, Cl. 385-24.000.
- Williams, Fred E., Jr.: *See—*
  - Green, Nicholas A.; and Williams, Fred E., Jr., 5,746,764, Cl. 606-194.000.
- Williams, Jeffery W. Extension for metered dose inhaler. 5,746,197, Cl. 128-200.230.
- Williams, Jeffrey A.: *See—*
  - Dicke, Grant D.; and Williams, Jeffrey A., 5,746,406, Cl. 248-166.000.
- Williams, Jeffrey L.: *See—*
  - Hauser, Stephen A.; and Williams, Jeffrey L., 5,748,905, Cl. 395-200.790.
- Williams, Joe W., to Excel Modular Scaffold and Leasing Corporation. Scaffold hatch system. 5,746,289, Cl. 182-129.000.
- Williams, Kevin Jon. Method of forcing the reverse transport of cholesterol from a body part to the liver while avoiding harmful disruptions of hepatic cholesterol homeostasis. 5,746,223, Cl. 128-898.000.
- Williams, Mason Lamar, III: *See—*
  - Fontana, Robert Edward, Jr.; Lane, Linda Hope; Williams, Mason Lamar, III; and Yeack-Scranton, Celia Elizabeth, 5,745,979, Cl. 29-603.120.
- Williams, Melanie: *See—*
  - Davis, James L.; Williams, Melanie; and Pennisi, Robert W., 5,748,438, Cl. 361-504.000.
- Williams, Michael D.: *See—*
  - Lafer, John P.; Faust, John E.; and Williams, Michael D., 5,748,956, Cl. 395-615.000.
- Williams, Richard K., to Siliconix incorporated. Method of blocking bidirectional flow of current. 5,747,891, Cl. 307-87.000.
- Williams, Ronald L.; and Norton, Paul R., to Raytheon Company. Method and apparatus for sensing infrared radiation utilizing a micro-electromechanical sensor. 5,747,804, Cl. 250-338.100.
- Williamson, N. Rodgers, Jr.: *See—*
  - Jones, Richard S.; and Williamson, N. Rodgers, Jr., 5,747,954, Cl. 318-266.000.
- Williamson, Robert C.: *See—*
  - Croft, James Joseph; and Williamson, Robert C., 5,748,759, Cl. 381-193.000.
- Willis, Clifford: *See—*
  - Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., 5,748,453, Cl. 361-801.000.
- Willis, John P. Point-of-care analyzer module. 5,747,666, Cl. 73-1.020.
- Willis, Paul: *See—*
  - Cox, David; Ingall, Anthony; and Willis, Paul, 5,747,496, Cl. 514-258.000.
- Willmann, Donald F., to E-Systems, Inc. Cable retractor. 5,746,389, Cl. 242-615.100.
- Willms, Lothar: *See—*
  - Schnabel, Gerhard; Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Rosinger, Christopher, 5,747,421, Cl. 504-214.000.
- Willy, Patricia J.: *See—*
  - Evans, Ronald M.; Mangelsdorf, David J.; and Willy, Patricia J., 5,747,661, Cl. 536-24.100.
- Wilmington Rubber & Gasket Co., Inc.: *See—*
  - Russell, Howard L.; and Morris, William N., Jr., 5,746,104, Cl. 83-698.710.
- Wilson, David B.: *See—*
  - Shuler, Michael L.; and Wilson, David B., 5,747,281, Cl. 435-69.100.
- Wilson, Edward L.: *See—*
  - Hager, William G.; Wilson, Edward L.; and Krumlauf, Paul R., 5,747,607, Cl. 525-445.000.
- Wilson, James Warren, to International Business Machines Corporation. Semiconductor chip package with enhanced thermal conductivity. 5,747,877, Cl. 257-703.000.
- Wilson, Michael S., to Wykle Research, Inc. Mixing capsule and method of manufacturing same. 5,746,313, Cl. 206-220.000.
- Wind Strom Frisia GmbH: *See—*
  - Hennchen, Norbert, 5,748,423, Cl. 361-31.000.
- Windryder Engineering, Inc.: *See—*
  - Van McCutchen, James; and Shaw, Kurt Lee, 5,745,936, Cl. 5-600.000.
- Winick, Alan Lee: *See—*
  - Carney, James M.; Desilets, Dave; Willis, Clifford; Winick, Alan Lee; and Chiodo, Christopher E., 5,748,453, Cl. 361-801.000.
- Winkelman, Kurt-Helfried, to Linotype-Hell AG. Method and apparatus for the analysis and correction of the image gradation in image originals. 5,748,802, Cl. 382-271.000.
- Winkler, Gary A.: *See—*

  - Cochran, Stuart A.; Goll, Steven J.; Lippincott, Howard C.; and Winkler, Gary A., 5,747,084, Cl. 426-120.000.
- Winkless, Robert A.: *See—*
  - Hartman, Mark W.; Shore, Zeev W.; Tang, James J.; Aschberger, Anton A.; Gogola, Michael R.; Irvine, William O.; Trnka, Ralph J.; Wahler, Richard O.; and Winkless, Robert A., 5,746,080, Cl. 72-61.000.
- Winski, Ernest P., to Goldco Industries, Inc. Conveying apparatus and methods of use. 5,746,572, Cl. 414-796.300.
- Winterfeldt, Duane Norman: *See—*
  - Severance, Wayne Stanley; and Winterfeldt, Duane Norman, 5,747,767, Cl. 219-121.500.
- Winthrop, Neil: *See—*
  - Bayron, Harry; and Winthrop, Neil, 5,746,199, Cl. 128-205.240.
- Wireway/Husky Corp.: *See—*
  - Young, Ronald A.; and Young, Gregory C., 5,746,040, Cl. 52-775.000.
- Wirtz, Hans-Peter, to Ford Global Technologies, Inc. Torque converter having lock-up clutch. 5,746,296, Cl. 192-3.290.
- Wisconsin Alumni Research Foundation: *See—*
  - Donohue, Timothy J.; Barber, Robert D.; and Witthuhn, Vern, 5,747,328, Cl. 435-252.300.
- Wise, Gordon A.; Saunders, Roger N.; Thomas, Matthew M.; Maynard, Raymond W.; and Mangrum, Ronald W., to Unifi, Inc. Dye tube spacer for package dyeing. 5,746,073, Cl. 68-198.000.
- Wiseman, Roger W.: *See—*
  - Skolnick, Mark H.; Goldgar, David E.; Miki, Yoshio; Swenson, Jeff; Kamb, Alexander; Harshman, Keith D.; Shattuck-Eidens, Donna M.; Tavtigian, Sean V.; Wiseman, Roger W.; and Futreal, P. Andrew, 5,747,282, Cl. 435-69.100.
- WiseVision AS: *See—*
  - Kjorsvik, Reidar, 5,748,190, Cl. 345-329.000.
- Wisniewski, Stephen J.: *See—*
  - Geesin, Jeffrey C.; Cole, Curtis A.; and Wisniewski, Stephen J., 5,747,010, Cl. 424-59.000.
- Wisnosky, Carl J.: *See—*
  - Simon, John G.; Wisnosky, Carl J.; Cerier, Jeffrey C.; Coulter, Christopher C.; and Coats, David E., 5,746,222, Cl. 128-885.000.
- Withers, William David. Wear indicators for seal strip of a suction roll of a paper making machine. 5,746,891, Cl. 162-371.000.
- Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, to Xerox Corporation. Method and apparatus for supplementing significant portions of a document selected without document image decoding with retrieved information. 5,748,805, Cl. 382-306.000.
- Wittenberg, Roger A.: *See—*
  - Gustafsson, Kjell-Ake; Muller, John J.; and Wittenberg, Roger A., 5,746,958, Cl. 264-115.000.
- Witter, Robert. Replaceable, self-cleaning cartridge for a cyclonic air cleaning device. 5,746,795, Cl. 55-472.000.
- Witthuhn, Vern: *See—*
  - Donohue, Timothy J.; Barber, Robert D.; and Witthuhn, Vern, 5,747,328, Cl. 435-252.300.
- Wittmann, Heinz: *See—*
  - Freisinger, Henry; and Wittmann, Heinz, 5,746,016, Cl. 36-117.100.
- Wnendt, Stephan: *See—*
  - Steffens, Gerd J.; Wnendt, Stephan; Schneider, Johannes; Heinzel-Wieland, Regina; and Saunders, Derek John, 5,747,291, Cl. 435-69.600.
- Wober, Munib A., to Polaroid Corporation. Large kernel filtering using a fixed-size block processor. 5,748,792, Cl. 382-250.000.
- Wober, Munib A.: *See—*
  - Hajjahmad, Ibrahim; Reisch, Michael L.; Soini, F. Richard; and Wober, Munib A., 5,748,770, Cl. 382-167.000.
- Woerner, Ulrich: *See—*
  - Dyer, David J.; Geisler, Claus J.; and Woerner, Ulrich, 5,746,447, Cl. 280-743.200.
- Wohl, Charles M.: *See—*
  - Heiser, Stephen J.; Malvino, Joanna Mary; Wohl, Charles M.; and Poza, Fausto, 5,748,148, Cl. 342-457.000.
- Wohlfeil, Stefan: *See—*
  - Connell, Richard; Goldmann, Siegfried; Müller, Ulrich; Beuck, Martin; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Wohlfeil, Stefan, 5,747,505, Cl. 514-307.000.
- Wojsznis, Wilhelm K.: *See—*
  - Qin, S. Joe; Ott, Michael G.; and Wojsznis, Wilhelm K., 5,748,467, Cl. 364-148.000.
- Wolberg, Gerald: *See—*
  - Krenitsky, Thomas Anthony; Averett, Devron Randolph; Koszalka, George Walter; and Wolberg, Gerald, 5,747,472, Cl. 514-45.000.
- Wolbert, Harold Aloysius: *See—*
  - Benzing, James Alfred, II; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,101, Cl. 83-34.000.
  - Benzing, James Alfred, III; Head, William James; Downing, Daniel Ray; Gehrett, Larry James; and Wolbert, Harold Aloysius, 5,746,102, Cl. 83-34.000.
- Wold, Kermit A., to Cargill, Incorporated. Dispenser for pulverulent material. 5,746,355, Cl. 222-189.020.
- Wolf, Gerald L.: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,746,998, Cl. 424-9.400.
- Wolf, Michael: *See—*
  - Jonas, Rochus; Wolf, Michael; and Klockow, Michael, 5,747,489, Cl. 514-222.500.
- Wölfel, Thomas: *See—*
  - Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; and Wölfel, Thomas, 5,747,271, Cl. 435-7.240.
- Wolff Walsrode AG: *See—*
  - Pophusen, Dirk; and von Widdern, Michael Hennig Cardinal, 5,747,124, Cl. 428-34.800.
- Wolford, Jeff W.: *See—*
  - Angelo, Michael F.; and Wolford, Jeff W., 5,748,888, Cl. 395-186.000.
- Wollscheid, Heinz-Peter: *See—*
  - Konder, Wolfgang; and Wollscheid, Heinz-Peter, 5,748,322, Cl. 356-394.000.
- Wong, Belle; Lee, Donald; and Mattos, Derwin, to VLSI Technology, Inc. Output buffer driver with load compensation. 5,748,019, Cl. 327-170.000.
- Wong, Grace H. W.: *See—*
  - Goeddel, David V.; and Wong, Grace H. W., 5,747,023, Cl. 424-85.100.
- Wong, Harold N.: *See—*
  - Vuligonda, Vidyasagar; Johnson, Alan T.; Beard, Richard L.; Teng, Min; Song, Tae K.; Wong, Harold N.; and Chandraratna, Roshantha A., 5,747,542, Cl. 514-646.000.
- Wong, Hok-Tung; and Vinn, Charles L., to Raytheon Company. Constant on-time architecture for switching regulators. 5,747,976, Cl. 323-282.000.
- Wong, Jack T.; Fontana, Fabiano; and Nguyen, Susan, to Advanced Micro Devices, Inc. Array cell circuit with split read/write line. 5,748,525, Cl. 365-185.050.
- Wong, Jacob Y., to Engelhard Sensor Technologies. NDIR gas sensor. 5,747,808, Cl. 250-343.000.
- Wong, Jimmy: *See—*
  - Heeb, Jay; Shenoy, Sunil; and Wong, Jimmy, 5,749,092, Cl. 711-138.000.
- Wong, Sau C.: *See—*
  - Dunlap, Frank M; So, Hock C.; and Wong, Sau C., 5,748,533, Cl. 365-185.190.
  - Dunlap, Frank M.; So, Hock C.; and Wong, Sau C., 5,748,534, Cl. 365-185.210.
- Wong, Tak-Ko, to T.K. Wong & Associates Ltd. Toy. 5,746,641, Cl. 446-431.000.
- Wong, Vernon W. H.: *See—*
  - Boyd, Trace L.; Beer, Richard D.; Terbeek, Eric A.; and Wong, Vernon W. H., 5,746,434, Cl. 277-1.000.
- Wong, Victor M.: *See—*
  - Burnett, Debbie L.; Dubash, Darius D.; Ladas, Athanasios S.; and Wong, Victor M., 5,747,064, Cl. 424-443.000.
- Wong, Wai-sing; Chao, Kam-chi; and Fong, Chi-ming, to VTech Electronics, Ltd. Video display system including graphic layers with sizable, positionable windows and programmable priority. 5,748,174, Cl. 345-118.000.
- Wong, Yiu-Huen: *See—*
  - Eom, Chang-Beom; Jin, Sungho; Kochanski, Gregory Peter; McCormack, Mark Thomas; and Wong, Yiu-Huen, 5,747,918, Cl. 313-309.000.
- Wood, Peter N.: *See—*
  - Houk, Talbott M.; and Wood, Peter N., 5,747,943, Cl. 315-225.000.
- Wood, Ray W.: *See—*
  - Wiedmann, Timothy S.; Wood, Ray W.; and DeCastro, Lan, 5,747,001, Cl. 424-45.000.
- Wood, Robert. Portable electronic flow meter. 5,747,700, Cl. 73-861.120.
- Wood, Timothy J.; and Andreas, Bernard H., to Perclose, Inc. Method and device for providing hemostasis at vascular penetration sites. 5,746,755, Cl. 606-148.000.
- Woods, Randall T.; and Nicoli, Robert. Wiring duct entrance fitting enclosure. 5,747,733, Cl. 174-48.000.
- Woodstream Corporation: *See—*
  - Fiore, Joseph F., Jr.; Gehret, Michael J.; Roulston, Gary; and El-Khateeb, Hesham, 5,746,020, Cl. 43-85.000.
- Woodward, David R.: *See—*
  - Gandhi, Harish F.; Boyce, Walter A.; and Woodward, David R., 5,747,919, Cl. 313-318.010.
- Woog, Heinrich: *See—*
  - Kohnert, Ulrich; Fischer, Stephan; Markl, Hans-Jörg; and Woog, Heinrich, 5,747,030, Cl. 424-94.640.
- Woolley, Curtis Scott, Sr.; and Inocelda, Arthur Corpuz, to Emhart Inc. Unitary throat plate/putty plate for a faucet. 5,746,244, Cl. 137-359.000.
- Wooten, David R.: *See—*
  - Angelo, Michael F.; Miller, Craig A.; and Wooten, David R., 5,748,940, Cl. 395-490.000.
- Wooters, Eldon W.: *See—*
  - Brophy, Robert C.; Wooters, Eldon W.; and Capps, R. Scott, 5,746,541, Cl. 405-174.000.
- Worcester Polytechnic Institute: *See—*
  - Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.
- World Power Technologies, Inc.: *See—*
  - Bayly, Elliott, 5,746,576, Cl. 416-16.000.
- Worp, Nicholas Jacob. Method and apparatus for measuring the inherent capacitance of a circuit supporting substrate. 5,749,049, Cl. 455-226.100.
- Worth, Brian A.: *See—*

VOL
210
ISS
1
MY
5
998
UMI

  - Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
- Worthy, David G. System and method for estimating characteristics of broadcast radio audiences. 5,749,043, Cl. 455-2.000.
- Wotton, Harold M., III: *See—*
  - Kraus, Karl H.; Chu, George E.; Rollins, Brian J.; Wotton, Harold M., III; Luongo, Danielle L.; Kallio, Donald M., Jr.; Cotton, Bryan E.; and Brooks, David P., II, 5,746,741, Cl. 606-54.000.
- Wouch, Gerald; and Procknow, Gary, to R. R. Donnelley & Sons Co. Water-based publication gravure ink. 5,747,555, Cl. 523-161.000.
- Wound Healing of Oklahoma: *See—*
  - Nordquist, Robert E.; Chen, Wei R.; Carubelli, Raoul; and Adams, Robert, 5,747,475, Cl. 514-55.000.
- Wouters, Alfons Jeanne: *See—*
  - Putteman, Peter; and Wouters, Alfons Jeanne, 5,746,349, Cl. 222-49.000.
- Wraback, Michael: *See—*
  - Shen, Paul H.; Dutta, Mitra; Wraback, Michael; and Pamulapati, Jagadeesh, 5,748,359, Cl. 359-248.000.
- Wrase, Ronald Henry: *See—*
  - Schaenzer, Mark James; and Wrase, Ronald Henry, 5,748,407, Cl. 360-103.000.
- Wray, Anthony: *See—*
  - Boscovic, Dragan; Valentine, Stephen; Bastani, Babak; and Wray, Anthony, 5,748,038, Cl. 330-2.000.
- Wray, Anthony John: *See—*
  - Valentine, Stephen Thomas; and Wray, Anthony John, 5,748,678, Cl. 375-297.000.
- Wrenbeck, Bruce: *See—*
  - Kelley, Jeffrey T.; and Wrenbeck, Bruce, 5,748,428, Cl. 361-94.000.
- Wright, Andrew; and Ring, Curtis Phillip, to 569.396 Alberta, Ltd. Oil well blow-out preventer and sealing device. 5,746,249, Cl. 137-614.190.
- Wright, Danny O.: *See—*
  - Pace, Jeffrey B.; Warner, Vernon R.; and Wright, Danny O., 5,747,684, Cl. 73-119.00A.
- Wright, James A.: *See—*
  - Gutman, Jose; and Wright, James A., 5,748,100, Cl. 340-825.440.
- Wright, Jeffrey P.: *See—*
  - Ryan, Kevin J.; and Wright, Jeffrey P., 5,748,551, Cl. 365-230.030.
  - Zheng, Hua; and Wright, Jeffrey P., 5,748,542, Cl. 365-194.000.
- Wright Medical Technology, Inc.: *See—*
  - Clement, Lemuel Vance, Jr.; Clift, Joseph S., Jr.; and Houfburg, Rodney L., 5,746,771, Cl. 623-16.000.
- Wright, Steve Robin; and Crouch, Harry Steven, to Innovatech, Inc. Apparatus for separating particulates from a fluid stream. 5,746,789, Cl. 55-306.000.
- Wright, Steven: *See—*
  - Heisner, Douglas Lester; Ingwersen, Peter; Pellegrino, Thomas P.; Stenstrom, Eric; Urness, Kevin J.; and Wright, Steven, 5,745,975, Cl. 29-564.600.
- Wu, Chris: *See—*
  - Fu, Alex; Wang, David; and Wu, Chris, 5,748,181, Cl. 345-165.000.
- Wu, Duanpei: *See—*
  - Peck, John C.; Rowland, Randy; and Wu, Duanpei, 5,748,843, Cl. 395-2.840.
- Wu, Lin-June; Yu, Chen-Hua Douglas; and Lee, Jin-Yuan, to Taiwan Semiconductor Manufacturing Company, Ltd. Technique for the removal of residual spin-on-glass (SOG) after full SOG etchback. 5,747,381, Cl. 438-624.000.
- Wu, Rong-Tsun: *See—*
  - Chang, Ching-Te; Chen, Kuo-Mou; Liu, Wann-Huang; Lin, Fen-Lan; and Wu, Rong-Tsun, 5,747,525, Cl. 514-444.000.
- Wu, Shye-Lin, to Powerchip Semiconductor Corp. Process for forming shallow trench isolation. 5,747,377, Cl. 438-444.000.
- Wuertemberger, Kim, to Contract Industrial Tooling, Inc. Rigid storage device with variable sized cells. 5,746,333, Cl. 211-189.000.
- Wulf, Jens-Peter: *See—*
  - Günther, Eckhard; Wulf, Jens-Peter; Engel, Jürgen; and Kutscher, Bernhard, 5,747,534, Cl. 514-492.000.
- Wulfing, James J.: *See—*
  - Langseth, Lee M.; Wulfing, James J.; Hubbling, David L.; and Gagnier, Jerome V., 5,748,419, Cl. 360-133.000.
- Wurm, Martin J.; and Wasserman, Stanley J., to National Machinery Company, The. Heading slide guiding system. 5,746,087, Cl. 72-456.000.
- Wycherley, Kaye: *See—*
  - Metcalf, Donald; Nicola, Nicos Antony; Boyd, Andrew Wallace; Layton, Judith Eleanor; and Wycherley, Kaye, 5,747,032, Cl. 424-133.100.
- Wykle Research, Inc.: *See—*
  - Wilson, Michael S., 5,746,313, Cl. 206-220.000.
- Wynne, Lyndell Kyle: *See—*
  - Mohammed, Abdeally; and Wynne, Lyndell Kyle, 5,747,134, Cl. 428-57.000.
- Wythes, Martin James: *See—*
  - Macor, John Eugene; and Wythes, Martin James, 5,747,501, Cl. 514-376.000.
- X-Ray Optical Systems, Inc.: *See—*
  - York, Brian R.; Xiao, Oi-fan; and Gao, Ning, 5,747,821, Cl. 250-505.100.
- Xenophon Design Inc.: *See—*
  - Baragar, Marc Christopher; and Roman, Michael John, 5,745,952, Cl. 16-228.000.
- Xerox Corporation: *See—*
  - Castelli, Vittorio; Solcz, Edward J.; Ricciardelli, John J.; Anderson, Harold; and Brown, Harold, 5,748,221, Cl. 347-232.000.
  - Crawford, Jamie; Powell, Steven; and Walker, John Michael, 5,748,293, Cl. 355-75.000.
  - Damji, Dhirendra C.; and Herzog, Richard W., 5,749,028, Cl. 399-117.000.
  - Folkins, Jeffrey J., 5,749,034, Cl. 399-303.000.
  - Fromm, Paul M.; and Hanzlik, Edward C., 5,749,038, Cl. 399-327.000.
  - Gerroir, Paul J.; Listigovers, Nancy Ann; Cunningham, Michael F.; Enright, Thomas E.; and Creatura, John A., 5,747,577, Cl. 524-458.000.
  - Grace, Robert E.; Raj, Guru B.; and Pacer, James M., 5,749,023, Cl. 399-58.000.
  - Guibas, Leonidas John; and Marimont, David H., 5,748,197, Cl. 345-438.000.
  - Hirsch, David Edward, 5,748,809, Cl. 382-317.000.
  - Hu, Nan-Xing; Liu, Ping; and Ong, Beng S., 5,747,205, Cl. 430-59.000.
  - Malhotra, Shadi L.; and Foley, Diane M., 5,746,814, Cl. 106-18.000.
  - Mantell, David A.; and Eschbach, Reiner, 5,748,785, Cl. 382-237.000.
  - Mestha, Lingappa K., 5,749,019, Cl. 399-46.000.
  - Mestha, Lingappa K.; Wang, Yao Rong; Dianat, Sohail A.; Khargonekar, Pramod P.; Koditschek, Daniel E.; Jackson, Eric; and Thieret, Tracy E., 5,749,020, Cl. 399-49.000.
  - Mestha, Lingappa K.; and Padmanabhan, Prasad P., 5,749,021, Cl. 399-49.000.
  - Ong, Beng S.; Mychajlowskijj, Walter; Kmiecik-Lawrynowicz, Grazyna E.; Patel, Raj D.; Sanders, David J.; and Drappel, Stephan V., 5,747,215, Cl. 430-137.000.
  - Rabjohns, Douglas T., 5,748,941, Cl. 395-551.000.
  - Rees, James D., 5,748,344, Cl. 358-505.000.
  - Sacripante, Guerino G.; Pontes, Fatima M.; Drappel, Stephan V.; Foucher, Daniel A.; and Breton, Marcel P., 5,747,554, Cl. 523-161.000.
  - Thomas, Dean, 5,749,039, Cl. 399-397.000.
  - Wang, Shen-ge; and Hains, Charles M., 5,748,330, Cl. 358-298.000.
  - Withgott, M. Margaret; Newman, William; Bagley, Steven C.; Huttenlocher, Daniel P.; Kaplan, Ronald M.; Cass, Todd A.; Halvorsen, Per-Kristian; Brown, John Seely; and Kay, Martin, 5,748,805, Cl. 382-306.000.
  - Young, David K., 5,749,024, Cl. 399-85.000.
- Xiao, Han Xiong; Geng, Peng; and Frisch, Kurt C., to Hi-Tex, Inc. Stain resistant, water repellant, interpenetrating polymer network coating-treated textile fabric. 5,747,392, Cl. 442-82.000.
- Xiao, Oi-fan: *See—*
  - York, Brian R.; Xiao, Oi-fan; and Gao, Ning, 5,747,821, Cl. 250-505.100.
- Xilinx, Inc.: *See—*
  - Duncan, Robert G., 5,748,942, Cl. 395-500.000.
- Xin, Ying; He, Wangsong; Lucas, Michael S. P.; Fei, Xin; and Kao, Yi-Han, to Midwest Superconductivity Inc. High T_c superconductor magnetic shields and method of making same. 5,747,425, Cl. 505-150.000.
- Xu, David Jisen; and Sudeora, Sanjay, to Whitaker Corporation, The. Fiber optic coupler package having a cover overlapping the base. 5,748,817, Cl. 385-51.000.
- Xu, Ming, to Sawgrass Systems, Inc. Liquid ink process and printing method. 5,746,816, Cl. 106-31.250.
- Xue, Yuan, to Silicon Motion, Inc. Dual VCO phase-locked loop. 5,748,044, Cl. 331-2.000.
- Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Plane type strip-line filter in which strip line is shortened and dual mode resonator in which two types microwaves are independently resonated. 5,748,059, Cl. 333-204.000.
- Yabuno, Tetsu: *See—*
  - Tomioka, Masanori; and Yabuno, Tetsu, 5,746,870, Cl. 156-267.000.
- Yabushita, Junichi; Otake, Shinichi; and Yoshii, Yuji, to Sanden Corporation. Hermetic motor driven fluid apparatus having improved insulating structure. 5,747,905, Cl. 310-89.000.
- Yabuta, Masayuki; and Ohsuye, Kazuhiro, to Suntory Limited. Mutant *Staphylococcus aureus* V8 proteases. 5,747,321, Cl. 435-220.000.
- Yachi, Shinya: *See—*
  - Takiguchi, Tsuyoshi; Okado, Kenji; Taya, Masaaki; Fujita, Ryoichi; Kanbayashi, Makoto; Inaba, Kohji; Iida, Wakashi; Kato, Kazunori; Ida, Tetsuya; and Yachi, Shinya, 5,747,209, Cl. 430-106.600.
- Yada, Katsuhiro, to Sumitomo Electric Industries, Ltd. Method and apparatus for transmitting information converted to spread spectrum signal. 5,748,669, Cl. 375-202.000.
- Yaegashi, Hisao: *See—*
  - Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.
- Yaegashi, Takehisa: *See—*
  - Kinugasa, Yukio; Igarashi, Kouhei; Itou, Takaaki; Yaegashi, Takehisa; and Takaoka, Toshifumi, 5,746,052, Cl. 60-274.000.
- Yager, Kevin C.: *See—*
  - Tims, Fred William; Clowes, Richard F.; Yager, Kevin C.; and Schroeder, David J., 5,748,870, Cl. 395-182.020.

- Yakhats, Michael: *See—*
  - Gelfgat, David Mendeloevich; Skipidarov, Sergei Yakovlevich; Yakhats, Michael; and Kamensky, Vyacheslav Tikhonovich, 5,746,702, Cl. 601-15.000.
- Yale, Mark C.: *See—*
  - Capaccio, Paul R.; Cohen, Gary; Olsen, Alvin T.; and Yale, Mark C., 5,746,733, Cl. 604-411.000.
- Yale University: *See—*
  - Flavell, Richard A.; Kantor, Fred S.; Barthold, Stephen W.; and Fikrig, Erol, 5,747,294, Cl. 435-70.210.
- Yamada, Eiichi, to Sony Corporation. Audio signal processing apparatus and recording and/or reproducing apparatus for a tape-shaped recording medium. 5,748,397, Cl. 360-32.000.
- Yamada, Hiroshi: *See—*
  - Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
- Yamada, Izumi: *See—*
  - Takahashi, Fuminobu; Koike, Masahiro; Uchida, Shunsuke; Fujimori, Haruo; Yamada, Izumi; Fukuzaki, Takaharu; and Nagase, Makoto, 5,748,496, Cl. 364-550.000.
- Yamada, Kiyomichi: *See—*
  - Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.
- Yamada, Kouichi: *See—*
  - Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,747,727, Cl. 136-201.000.
- Yamada, Masami: *See—*
  - Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,747,826, Cl. 257-10.000.
- Yamada, Masanori: *See—*
  - Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
- Yamada, Masatoshi: *See—*
  - Kono, Katsumi; Ito, Hiroshi; Fukumura, Kagenori; Nakamura, Shinya; Osawa, Masataka; Hibino, Ryoichi; and Yamada, Masatushi, 5,749,061, Cl. 701-68.000.
- Yamada, Michio; and Kawaguchi, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Electric leakage current prevention using an equivalent impedance. 5,748,459, Cl. 363-21.000.
- Yamada, Naoki: *See—*
  - Akiyama, Nobuyuki; Kai, Fumitaka; Maeda, Masahiko; Hajime, Hirofumi; and Yamada, Naoki, 5,747,364, Cl. 438-14.000.
- Yamada, Sadayuki: *See—*
  - Fukuhara, Hiroyuki; Yamada, Sadayuki; and Muramatsu, Shigeru, 5,746,586, Cl. 418-55.200.
- Yamada, Shigeru; Shiraishi, Hiroyuki; Nishio, Terutsune; Morimoto, Hideaki; Matsuda, Keiji; Uchida, Tetsuro; Takahashi, Tamotsu; Matsuno, Tsutomu; Kamegawa, Keizi; Numazawa, Makoto; Moritani, Ryuzo; Ito, Hidekuni; Kondo, Toshio; Ohhira, Hideki; and Horinouchi, Shunji, to Sumitomo Heavy Industries, Ltd.; Kawasaki Steel Corporation; NKK Corporation; Sumitomo Metal Industries, Ltd.; and Kansai Netukagaku Kabushiki Kaisha. Method and apparatus for repairing a coke oven. 5,745,969, Cl. 29-402.180.
- Yamada, Shinsaku; Ohashi, Hideki; Shimizu, Sumio; and Imaki, Takao, to Horiba Ltd. Detachable gas analyzing apparatus. 5,746,976, Cl. 422-62.000.
- Yamada, Shuichi: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Yamada, Takashi: *See—*
  - Aoki, Masami; Yamada, Takashi; Takato, Hiroshi; Ozaki, Tohru; Hieda, Katsuhiko; and Nitayama, Akihiro, 5,747,844, Cl. 257-296.000.
- Yamaguchi, Atsushi: *See—*
  - Takii, Osamu; Yamada, Shuichi; Muraoka, Akinori; Hataura, Kiyoshi; Yamaguchi, Atsushi; Hasegawa, Hideo; Miyazaki, Manabu; and Miyazaki, Hideya, 5,746,173, Cl. 123-293.000.
- Yamaguchi, Hiroshi: *See—*
  - Higuchi, Tetsuya; Nomura, Shunichi; Ichiba, Shigeru; Yamaguchi, Hiroshi; Goromaru, Masaomi; Watanabe, Akira; Takeda, Kazuhiro; Morita, Mikio; Fujita, Kazuhisa; and Moriyama, Yasuyuki, 5,747,640, Cl. 528-502.00F.
  - Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.
- Yamaguchi, Ichiro: *See—*
  - Seki, Masaaki; Sono, Michio; Yamaguchi, Ichiro; Mitobe, Kazuhiko; Hai, Lim Cheang; Otake, Koki; Abe, Susumu; Kasai, Junichi; Sakuma, Masao; Suzuki, Yoshimi; and Shinma, Yasuhiro, 5,747,874, Cl. 257-686.000.
- Yamaguchi, Joe: *See—*
  - Hashimoto, Kaoru; Chiyonobu, Tatuo; Kawano, Kyoichiro; Watanabe, Koji; Wakamura, Masato; and Yamaguchi, Joe, 5,746,927, Cl. 216-18.000.
- Yamaguchi, Kohichi: *See—*
  - Takahashi, Yoshiharu; Fujii, Yasutoshi; Kawazu, Keiichi; Isoguchi, Seiichi; Yamaguchi, Kohichi; and Nagaishi, Katsuya, 5,748,287, Cl. 355-40.000.
- Yamaguchi, Kyoko: *See—*
  - Ishihara, Jun; and Yamaguchi, Kyoko, 5,749,008, Cl. 396-373.000.
- Yamaguchi, Masahiro: *See—*
  - Ishido, Kiminori; and Yamaguchi, Masahiro, 5,746,813, Cl. 106-14.160.
- Yamaguchi, Masao: *See—*
  - Shiraishi, Takashi; and Yamaguchi, Masao, 5,748,355, Cl. 359-206.000.
- Yamaguchi, Rikio: *See—*
  - Kodama, Hiroshi; Wada, Yasuhiro; and Yamaguchi, Rikio, 5,747,519, Cl. 514-407.000.
- Yamaguchi, Takamasa: *See—*
  - Oka, Masahide; Yoneto, Kenkichi; and Yamaguchi, Takamasa, 5,747,306, Cl. 435-138.000.
- Yamaha Corporation: *See—*
  - Matsumoto, Shuichi, 5,747,716, Cl. 84-609.000.
  - Ohta, Shinichi; and Hirano, Masashi, 5,747,715, Cl. 84-609.000.
- Yamaha Hatsudoki Kabushiki Kaisha: *See—*
  - Adachi, Shuhei; and Inami, Junichi, 5,745,993, Cl. 29-888.440.
- Yamaji, Akira: *See—*
  - Sobajima, Yoshihiro; Akashige, Etsushi; Hamaura, Masahide; Hiramatsu, Takeshi; and Yamaji, Akira, 5,747,576, Cl. 524-451.000.
- Yamakawa, Junichi: *See—*
  - Katayama, Akihiro; Ishida, Yoshihiro; and Yamakawa, Junichi, 5,748,777, Cl. 382-199.000.
- Yamamoto, Haruo: *See—*
  - Nakamura, Koji; Yamamoto, Haruo; and Hayashi, Shuji, 5,748,857, Cl. 395-109.000.
- Yamamoto, Harushige, to Niles Parts Co., Ltd. Lighting switch assembly with internal daytime running light control circuit. 5,747,934, Cl. 315-82.000.
- Yamamoto, Hiroaki, to Green Tokai Co., Ltd. Method of insert molding plastic parts to provide covered edge surfaces. 5,746,962, Cl. 264-266.000.
- Yamamoto, Hiroaki; Saimi, Tetsuo; Nishino, Seiji; Komma, Yoshiaki; and Wada, Hidenori, to Matsushita Electric Industrial Co., Ltd. Holographic optical device. 5,748,599, Cl. 369-103.000.
- Yamamoto, Hiroyuki; Ohshima, Toshikazu; and Uchiyama, Shinji, to Canon Kabushiki Kaisha. Range image shape measurement using hierarchical ordering of multiresolution mesh data from delaunay triangulation. 5,748,865, Cl. 395-123.000.
- Yamamoto, Makoto: *See—*
  - Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,748,131, Cl. 341-155.000.
  - Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, 5,748,510, Cl. 364-606.000.
- Yamamoto, Masahiro; Uenaka, Akimitsu; Ueno, Tasaburo; and Tsutsui, Koichi, to Nippon Paint Co., Ltd. Electrostatic powder coating method. 5,747,150, Cl. 428-220.000.
- Yamamoto, Masamichi: *See—*
  - Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,746,159, Cl. 122-367.100.
- Yamamoto, Masaya, to Yasaki Corporation. Engaging structure of a terminal and a connector housing. 5,746,628, Cl. 439-752.000.
- Yamamoto, Mitsuru: *See—*
  - Tanaka, Toshiharu; and Yamamoto, Mitsuru, 5,746,866, Cl. 156-234.000.
- Yamamoto, Norio; Fujikawa, Takayuki; Koide, Shunichi; and Suzuki, Yoshiichi, to Nippondenso Co., Ltd. Antiferroelectric liquid crystal cell. 5,747,122, Cl. 428-1.000.
- Yamamoto, Osamu; Shiraishi, Shuji; and Yano, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Reference value correcting device in driven wheel slip control system. 5,749,062, Cl. 701-72.000.
- Yamamoto, Osamu: *See—*
  - Nishihara, Takashi; Shiraishi, Shuji; Yamamoto, Osamu; and Yano, Osamu, 5,747,686, Cl. 73-146.200.
- Yamamoto, Shin-ichiro: *See—*
  - Taguchi, Toshio; Agusa, Kiyoshi; Yamamoto, Shin-ichiro; and Nakamura, Hiroki, 5,748,808, Cl. 382-312.000.
- Yamamoto, Takahisa: *See—*
  - Matsumoto, Shigeru; and Yamamoto, Takahisa, 5,749,080, Cl. 707-100.000.
- Yamamoto, Takeshi: *See—*
  - Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
- Yamamoto, Yasuhiro; and Sato, Koichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Still image signal processing device employing pedestal level data. 5,748,829, Cl. 386-46.000.
- Yamamoto, Yasuo: *See—*
  - Agata, Takeshi; Imai, Akira; Yamamoto, Yasuo; Sugizaki, Yutaka; and Sato, Katsuhiro, 5,747,206, Cl. 430-64.000.
- Yamamoto, Yasushi: *See—*
  - Kitajima, Tatsutoshi; and Yamamoto, Yasushi, 5,748,233, Cl. 348-220.000.
- Yamamoto, Yoshikatsu: *See—*
  - Usui, Minoru; Hara, Kazuhiko; Miyazawa, Yoshio; Tanaka, Yuji; Akahane, Fujio; Katakura, Takahiro; Sakai, Shinri; Kishida, Yasushi; Abe, Tomoaki; Usui, Toshiki; Seino, Takeo; and Yamamoto, Yoshikatsu, 5,748,214, Cl. 347-70.000.

Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.

Yamana, Shinji, to Sharp Kabushiki Kaisha. Magnifying lens and display apparatus. 5,748,375, Cl. 359-622.000.

Yamanaka, Kazuya: *See—*

Miyoshi, Nobuhiro; and Yamanaka, Kazuya, 5,748,517, Cl. 364-760.010.

Yamane, Toshiyuki, to Brother Kogyo Kabushiki Kaisha. Printer. 5,748,206, Cl. 347-37.000.

Yamao, Mutsunori: *See—*

Sasaki, Shingo; and Yamao, Mutsunori, 5,747,631, Cl. 528-86.000.

Yamaoka, Nobuki: *See—*

Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,748,607, Cl. 369-275.400.

Yamaoka, Syuuzi, to Okano Hitech Co., Ltd. Feed control element used in substrate inspection and method and apparatus for inspecting substrates. 5,747,999, Cl. 324-501.000.

Yamasa Shoyu Kabushiki Kaisha: *See—*

Nagai, Ryozo; Kuroo, Makoto; and Kato, Hirohisa, 5,747,652, Cl. 530-387.900.

Yamasaki, Kyoko: *See—*

Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.

Yamasawa, Yuuzi: *See—*

Arita, Setsuo; Ito, Tetsuo; Ohga, Yukiharu; Murata, Fumio; Higashikawa, Yuichi; Sato, Hideyuki; Kudo, Mitsuru; and Yamasawa, Yuuzi, 5,748,495, Cl. 364-550.000.

Yamashita, Hideki: *See—*

Fujiwara, Shigeki; Yamashita, Hideki; and Maeda, Hiroshi, 5,746,282, Cl. 180-6.200.

Yamashita, Hiroshi: *See—*

Nagano, Hiroyuki; Inoue, Takashi; Yamashita, Hiroshi; Sato, Takeo; and Fujita, Keiji, 5,748,288, Cl. 355-53.000.

Yamashita, Natsuko: *See—*

Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.

Yamashita, Teppei; Murata, Masanao; Tanaka, Tsuyoshi; Morita, Teruya; Kawano, Hitoshi; Hayashi, Mitsuhiro; Okuno, Atsushi; and Nakamura, Akio, to Shinko Electric Co., Ltd. Electronic substrate processing system using portable closed containers. 5,746,008, Cl. 34-211.000.

Yamashita, Yasuo; and Takami, Satoshi, to Kyushu Hitachi Maxell, Ltd. Electric shaver with swinging cutter unit. 5,745,995, Cl. 30-43.600.

Yamasue, Kotaro: *See—*

Watanabe, Takuo; Naruse, Yasuhito; and Yamasue, Kotaro, 5,747,216, Cl. 430-156.000.

Yamatsu, Hisayuki: *See—*

Kobayashi, Seiji; Okamura, Hiroshige; Yamatsu, Hisayuki; and Kashiwagi, Toshiyuki, 5,748,582, Cl. 369-44.260.

Yamauchi, Hiroyuki: *See—*

Asaka, Hideo; and Yamauchi, Hiroyuki, 5,748,520, Cl. 365-149.000.

Yamauchi, Takashi: *See—*

Mizushima, Koichi; Kinno, Teruyuki; Yamauchi, Takashi; and Inomata, Koichiro, 5,747,859, Cl. 257-421.000.

Yamazaki, Yasuyuki: *See—*

Watanabe, Gaku; and Yamazaki, Yasuyuki, 5,748,167, Cl. 345-98.000.

Yan, Cheng F.; and Yein, Fredrick S., to Beckman Instruments, Inc. Homogeneous DNA probe titration assay. 5,747,256, Cl. 435-6.000.

Yan, Cheng F.; Oh, Chan S.; and Cheng, Anthony K., to Beckman Instruments, Inc. Reagents and methods for the rapid and quantitative assay of pharmacological agents. 5,747,352, Cl. 436-533.000.

Yan, Wang Zhoa: *See—*

Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.

Yanagawa, Naoharu: *See—*

Sugano, Manabu; Nomura, Susumu; Yanagawa, Naoharu; and Suzuki, Hiroshi, 5,748,600, Cl. 369-112.000.

Yanagi, Akihiko: *See—*

Goto, Toshio; Ito, Seishi; Ukawa, Kazuhiro; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,747,420, Cl. 504-209.000.

Yanagi, Masayuki: *See—*

Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.

Yanagisawa, Ryozo: *See—*

Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, 5,748,183, Cl. 345-173.000.

Yanari, Mitsuhiro, to Nikon Corporation. Eyepiece lens with long eye relief. 5,748,380, Cl. 359-646.000.

Yanase, Kenji: *See—*

Takayanagi, Toshihiro; Yanase, Kenji; and Muramatsu, Kiyoji, 5,748,859, Cl. 395-109.000.

Yanase, Yuji: *See—*

Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, 5,747,518, Cl. 514-403.000.

Yancopoulos, George D.: *See—*

Davis, Samuel; Gale, Nicholas W.; Aldrich, Thomas H.; Maisonpierre, Peter C.; Goldfarb, Mitchell; and Yancopoulos, George D., 5,747,033, Cl. 424-134.100.

Yang, Ching-Nan; and Peng, Li-Chun, to Mosel Vitelic Inc. Process for manufacturing CMOS device. 5,747,368, Cl. 438-217.000.

Yang, Chin-Lin: *See—*

Lee, Tsai-Pao; Chen, Kwang-Cheng; and Yang, Chin-Lin, 5,748,036, Cl. 329-300.000.

Yang, Deng-Ke: *See—*

Huang, Xiao-Yang; Bos, Philip J.; and Yang, Deng-Ke, 5,748,277, Cl. 349-169.000.

Yang, Inging: *See—*

Ma, Chingwo; Yang, Inging; and Hsu, Wei-Chan, 5,748,126, Cl. 341-143.000.

Yang, Kim W.; Junginger, George J.; Mockridge, Raymond G.; and Pearce, Robert C., III. Compositions of gypsum pesticide briquets. 5,747,054, Cl. 424-409.000.

Yang, Tsung-Ming: *See—*

Chao, Zu-Wen; Yang, Tsung-Ming; Tsai, Shin-Ter; Ju, Jau-Jiu; and Liu, Pei-Yih, 5,748,602, Cl. 369-112.000.

Yang, Xinmin: *See—*

Reichle, Walter Thomas; Yang, Xinmin; and Karol, Frederick John, 5,747,406, Cl. 502-117.000.

Yang, Yaw-Kuen. Combination padlock. 5,746,075, Cl. 70-25.000.

Yang, Yeasing; Bee, Gary; and McDonough, Sherrol, to Gen-Probe Incorporated. Nucleic acid probes and amplification oligonucleotides for Neisseria species. 5,747,252, Cl. 435-6.000.

Yannone, Robert Alfred: *See—*

Quentin, George Heinz; and Yannone, Robert Alfred, 5,748,500, Cl. 364-551.010.

Yano, Kentaro: *See—*

Inui, Toshiharu; Otsuka, Naoji; Sakaki, Mamoru; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Tajika, Hiroshi; Arai, Atsushi; Yaegashi, Hisao; Yano, Kentaro; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,748,207, Cl. 347-43.000.

Yano, Masayoshi; and Mochizuki, Kohei, to Hitachi, Ltd. Three-dimensional quadrupole mass spectrometer. 5,747,800, Cl. 250-292.000.

Yano, Osamu: *See—*

Nishihara, Takashi; Shiraishi, Shuji; Yamamoto, Osamu; and Yano, Osamu, 5,747,686, Cl. 73-146.200.

Yamamoto, Osamu; Shiraishi, Shuji; and Yano, Osamu, 5,749,062, Cl. 701-72.000.

Yansura, Daniel G.: *See—*

Simmons, Laura C.; and Yansura, Daniel G., 5,747,662, Cl. 536-24.100.

Yao, Jo-Tan: *See—*

Huang, Hung-Ju; Yao, Jo-Tan; and Chen, Chung-Heng, 5,748,904, Cl. 395-200.770.

Yao, Liang-Gi; and Tseng, Kuo-Shu, to Vanguard International Semiconductor Corporation. Method for reducing crack of polysilicon in a quartz tube and boat. 5,746,512, Cl. 374-45.000.

Yao, Liang-Gi, to Vanguard International Semiconductor Corporation. Semiconductor furnace for reducing particulates in a quartz tube and boat. 5,746,591, Cl. 432-241.000.

Yaoita, Yasuhito. Direct fuel injection stratified charge engine. 5,746,171, Cl. 123-275.000.

Yarlagadda, Krishna C.: *See—*

Tremblay, Marc; and Yarlagadda, Krishna C., 5,748,935, Cl. 395-392.000.

Yarranton, Geoffrey Thomas: *See—*

Bebbington, Christopher Robert; and Yarranton, Geoffrey Thomas, 5,747,308, Cl. 435-172.300.

Yasaki Corporation: *See—*

Yamamoto, Masaya, 5,746,628, Cl. 439-752.000.

Yasar, Gulson: *See—*

Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.

Yashima Electric Co., Ltd.: *See—*

Taguchi, Toshio; Agusa, Kiyoshi; Yamamoto, Shin-ichiro; and Nakamura, Hiroki, 5,748,808, Cl. 382-312.000.

Yasuda, Akira: *See—*

Ono, Kazuya; Yasuda, Akira; and Kitagawa, Katsuji, 5,747,565, Cl. 523-413.000.

Yasuda, Nobuyuki, to Sony Corporation. Sampling frequency converting device and memory address control device. 5,748,120, Cl. 341-61.000.

Yasuda, Wataru: *See—*

Kikui, Shinsuke; Yasuda, Wataru; Shimeki, Ichiro; and Sugimoto, Naomi, 5,749,022, Cl. 399-50.000.

Yasui, Naoki; Iwata, Hiroshi; Katsurada, Hiroyuki; Ito, Keiji; and Ogino, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Front end structure of endoscope. 5,746,695, Cl. 600-127.000.

Yasukawa, Seiichi, to Nikon Corporation. Option setting device and method of operating same for use with a camera. 5,749,004, Cl. 396-280.000.

Yasunaga, Koji; Fujiwara, Hiroshi; Hamada, Masami; Fukaya, Takashi; Kinukawa, Masahiko; Ishikawa, Tomonori; Kaneda, Masanori; and Okada, Takeshi, to Olympus Optical Co., Ltd. Surgical microscope. 5,748,366, Cl. 359-368.000.

Yatake, Masahiro, to Seiko Epson Corporation. Pigment ink composition capable of forming image having no significant bleeding or feathering. 5,746,818, Cl. 106-31.860.

Yatsu, Masahiko: *See—*

Wakabayashi, Manabu; Ogiro, Kenji; Nishiyama, Takanori; Takita, Hiroto; Takami, Yutaka; Satoh, Hironobu; Maruyama, Takesuke; Yatsu, Masahiko; Kobayashi, Kenji; Itoh, Shigeyuki; Matsumoto, Kenji; and Aizawa, Iwao, 5,748,238, Cl. 348-373.000.

Yatsugi, Yoshitaka: *See—*

Kosaka, Akio; Nakayama, Okihiko; Yatsugi, Yoshitaka; Kishi, Norimasa; Watanabe, Masaki; Yamada, Kiyomichi; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,748,109, Cl. 340-995.000.

Yazaki Corporation: *See—*

Ishii, Takashi; and Matsuoka, Naoki, 5,748,067, Cl. 337-160.000.

Kanamori, Yasuo, 5,747,574, Cl. 524-436.000.

Kiyota, Hirotaka, 5,748,068, Cl. 337-208.000.

Ohsumi, Hideki; and Tomita, Yoshinori, 5,746,624, Cl. 439-595.000.

Yazawa, Yoshiaki: *See—*

Kitatani, Takeshi; Yazawa, Yoshiaki; Minemura, Junko; Sato, Akira; and Warabisako, Terunori, 5,747,864, Cl. 257-458.000.

Yeack-Scranton, Celia Elizabeth: *See—*

Fontana, Robert Edward, Jr.; Lane, Linda Hope; Williams, Mason Lamar, III; and Yeack-Scranton, Celia Elizabeth, 5,745,979, Cl. 29-603.120.

Yegorov, Boris Mikhailovich: *See—*

Smirnov, Aleksandr Vitalievich; Orlov, Oleg Georgievich; Golipad, Pyotr Nikolaevich; Koriakin, Yurii Nikolaevich; and Yegorov, Boris Mikhailovich, 5,747,561, Cl. 523-212.000.

Yeh, Chin-Yung: *See—*

Zoughi, Reza; Yeh, Chin-Yung; Ganchev, Stoyan I.; and Huber, Christian, 5,748,003, Cl. 324-644.000.

Yein, Fredrick S.: *See—*

Yan, Cheng F.; and Yein, Fredrick S., 5,747,256, Cl. 435-6.000.

Yen, Chih-Chan: *See—*

Tang, Tsan-Bih; and Yen, Chih-Chan, 5,748,203, Cl. 345-521.000.

Yen, Shih Kuei; Chu, Po-Tao; and Chang, Kuang-Hui, to Taiwan Semiconductor Manufacturing Company Ltd. Process for cleaning an electrostatic chuck of a plasma etching apparatus. 5,746,928, Cl. 216-37.000.

Yeou, Long-Sheng: *See—*

Huang, Yung-Sheng; Yeou, Long-Sheng; Huang, Ji-Chung; and Lin, Chang-Song, 5,747,382, Cl. 438-624.000.

Yerkovich, Daniel; and Vincent, Stephen T., to Physio-Control Corporation. Method and system for detecting relay failure. 5,748,427, Cl. 361-92.000.

Yeske, Philip E.; Slack, William E.; and Squiller, Edward P., to Bayer Corporation. Low surface energy polyisocyanates and their use in one-or two-component coating compositions. 5,747,629, Cl. 528-70.000.

Yessik, Michael J.; and Thompson, Richard G., to American Dental Technologies. Intracavity modulated pulsed laser and methods of using the same. 5,748,655, Cl. 372-22.000.

Yi, Rongxiang: *See—*

Chui, Charles K.; and Yi, Rongxiang, 5,748,116, Cl. 341-50.000.

Yim, Susan: *See—*

Pawate, Basavaraj I.; and Yim, Susan, 5,749,064, Cl. 704-213.000.

Yin, Gerald Zheyao: *See—*

Maydan, Dan; Mak, Steve S. Y.; Olgado, Donald; Yin, Gerald Zheyao; Driscoll, Timothy D.; Papanu, James S.; and Tepman, Avi, 5,746,875, Cl. 156-345.000.

Yin, Rong, to SGS-Thomson Microelectronics, Inc. Power supply switch reference circuitry. 5,747,890, Cl. 307-87.000.

Yip, Kit Chuen, to G.E.W. Corporation Limited. Electric toaster—bunwarmer. 5,746,115, Cl. 99-339.000.

Yishay, Oded: *See—*

Viot, J. Greg; and Yishay, Oded, 5,748,490, Cl. 364-489.000.

YKK Architectural Products Inc.: *See—*

Koike, Sou; Hirano, Masao; and Okubo, Takayuki, 5,746,032, Cl. 52-204.100.

YKK Corporation: *See—*

Lüer, Harald; Scheffels, Volker; and Pferdehirt, Thomas, 5,745,964, Cl. 24-687.000.

Okawa, Mitsuhisa; and Murasaki, Ryuichi, 5,745,961, Cl. 24-446.000.

Ykman-Couvreur, Chantal: *See—*

Sawasaki, Milton Hiroki; Ykman-Couvreur, Chantal; Lin, Bill; and Man, Hugo De, 5,748,487, Cl. 364-489.000.

Yo, Christopher Leng-Hong: *See—*

Yong, Dennis; Cheng, Viktor Choong-Hung; Yo, Christopher Leng-Hong; and Lim, Liat, 5,749,079, Cl. 707-100.000.

Yoda, Akira: *See—*

Ohtsuka, Shuichi; Yoda, Akira; and Usami, Yoshinori, 5,748,858, Cl. 395-109.000.

Yoda, Kaneo; and Tanaka, Hiroshi, to Seiko Epson Corporation. Image forming apparatus with oil supply consumption prediction. 5,749,036, Cl. 399-325.000.

Yoder, Brian: *See—*

Baker, Bruce R.; Yoder, Brian; Hershberger, David; Romich, Barry; Nyberg, Eric H., III; and Conti, Robert V., 5,748,177, Cl. 345-133.000.

Yokayama, Tetsuhiro; Fujikawa, Keiji; Fukuoka, Yoouichi; Fujiwara, Yooichi; Narita, Junji; Saitoo, Terumi; and Inoue, Hiroo, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Method of producing parts/substrate assemblies. 5,745,972, Cl. 29-430.000.

Yokohama Rubber Co., Ltd., The: *See—*

Kimura, Kazushi; Takeda, Toshimitsu; Hosoda, Hiroyuki; Ishikawa, Kazunori; and Okuhira, Hiroyuki, 5,747,627, Cl. 528-59.000.

Yokota, Hideo, to Canon Kabushiki Kaisha. Polarizing beam splitter and an illuminating device provided with the same. 5,748,369, Cl. 359-487.000.

Yokota, Hiroshi; and Yokota, Shingo, to Kabushiki Kaisha Yokota Seisakusho; Yokota, Hiroshi; and Yokota, Shingo. Water hammer preventing check valve. 5,746,246, Cl. 137-514.000.

Yokota, Shingo: *See—*

Yokota, Hiroshi; and Yokota, Shingo, 5,746,246, Cl. 137-514.000.

Yokota, Yasuhiro, to Fujitsu Limited. Miniature antenna for portable radio communication equipment. 5,748,154, Cl. 343-702.000.

Yokoyama, Shigeki: *See—*

Okazaki, Masaki; Yokoyama, Shigeki; and Negoro, Masayuki, 5,747,121, Cl. 428-1.000.

Yokoyama, Tomomitsu: *See—*

Miyata, Kaori; Igarashi, Masaaki; Masuyama, Fujimitsu; Komai, Nobuyoshi; and Yokoyama, Tomomitsu, 5,746,843, Cl. 148-335.000.

Yokoyama, Yuichi: *See—*

Baba, Horonobu; Mizuno, Tiaki; Imai, Masahito; Yokoyama, Yuichi; Takakuwa, Masaki; and Shimoyama, Yasuki, 5,747,694, Cl. 73-723.000.

Matsuo, Hiroshi; Watanabe, Shinya; Yokoyama, Yuichi; and Inoue, Shinya, 5,747,843, Cl. 257-296.000.

Yoldas, Bulent E.; and Okoroafor, Michael O., to PPG Industries, Inc. Silica aerogel produced under subcritical conditions. 5,746,992, Cl. 423-338.000.

Yoneda, Hiroshi: *See—*

Kubota, Yasushi; Yoneda, Hiroshi; and Katoh, Kenichi, 5,748,165, Cl. 345-96.000.

Yoneta, Toshio: *See—*

Ohyama, Makoto; Ohishi, Maki; Okada, Yumiko; Koyama, Masao; Sumi, Shinjiro; Murai, Yasushi; Takagi, Masayuki; Okada, Tadaaki; Sakanaka, Osamu; Yoneta, Toshio; Iinuma, Katsuharu; and Shibahara, Seiji, 5,747,448, Cl. 514-11.000.

Yoneto, Kenkichi: *See—*

Oka, Masahide; Yoneto, Kenkichi; and Yamaguchi, Takamasa, 5,747,306, Cl. 435-138.000.

Yonezawa, Masami, to Koyo Seiko Co., Ltd. Rack supporting device. 5,746,285, Cl. 180-428.000.

Yonezawa, Yoshihisa: *See—*

Itoh, Shigeo; Yonezawa, Yoshihisa; Toki, Hitoshi; and Satoh, Yoshitaka, 5,746,589, Cl. 432-77.000.

Yong, Dennis; Cheng, Viktor Choong-Hung; Yo, Christopher Leng-Hong; and Lim, Liat, to Singapore Computer Systems Limited. End user query facility including a query connectivity driver. 5,749,079, Cl. 707-100.000.

Yoo, Jong-weon; and Kim, Keon-soo, to Samsung Electronics Co., Ltd. Nonvolatile memory devices including arrays of discrete floating gate isolation regions. 5,747,848, Cl. 257-316.000.

Yoon, Hyun N.: *See—*

Shen, Sunny S.; Polis, David W.; Yoon, Hyun N.; and Tien, Tze-Pei, 5,746,949, Cl. 252-585.000.

Yoon, Man Hee. Audio system with language exercise function. 5,746,601, Cl. 434-156.000.

York, Brian R.; Xiao, Oi-fan; and Gao, Ning, to X-Ray Optical Systems, Inc. Radiation focusing monocapillary with constant inner dimension region and varying inner dimension region. 5,747,821, Cl. 250-505.100.

York International Corporation: *See—*

Beaverson, Gregory K.; Schnetzka, Harold R.; and Frank, Timothy M., 5,746,062, Cl. 62-228.300.

Yoshida, Hiroaki; and Isogawa, Sachihiro, to Daido Tokushuko Kabushiki Kaisha. Method for manufacturing high-strength member of precipitation hardening martensitic stainless steel. 5,746,845, Cl. 148-587.000.

Yoshida, Iwao: *See—*

Okayama, Hiroto; Fuke, Isao; Mori, Chisato; Takamizawa, Akihisa; and Yoshida, Iwao, 5,747,339, Cl. 435-350.000.

Yoshida, Kenji: *See—*

Yoshimura, Noriyuki; and Yoshida, Kenji, 5,747,898, Cl. 310-49.00R.

Yoshida, Kiyohide: *See—*

Muramatsu, Gyo; Ogiwara, Kazuhiko; Yoshida, Kiyohide; Abe, Akira; Irite, Naoko; Mochida, Shoji; and Onai, Katsuji, 5,747,410, Cl. 502-348.000.

Yoshida Kogyo K.K.: *See—*

Umino, Mitsugu, 5,746,880, Cl. 156-517.000.

Yoshida, Kousuke, to NEC Corporation. Semiconductor device having an improved anti-radioactivity and method of fabricating the same. 5,747,354, Cl. 437-40.000.

Yoshida, Masaki: *See—*

Maeda, Hiroshi; Akaike, Takaaki; Miyamoto, Yoichi; and Yoshida, Masaki, 5,747,495, Cl. 514-258.000.

Yoshida, Masanori: *See—*

Watanabe, Kohji; Fujioka, Satoshi; Akahane, Fujio; Yamamoto, Yoshikatsu; Murayama, Susumu; Okuda, Takayuki; Yoshida, Masanori; and Nishizawa, Atsushi, 5,748,210, Cl. 347-50.000.

Yoshida, Minoru; Mizuguchi, Hideki; Kobayashi, Nobuhisa; and Ishida, Masaharu, to Japan Steel Works, Ltd., The. Granulating device for thermoplastic resin. 5,747,077, Cl. 425-183.000.

Yoshida, Mitsuhiro: *See—*

OL
2 10
SS
1
MY
5
998
MI

Murata, Chikara; Takahashi, Shinichi; and Yoshida, Mitsuhiro, 5,746,857, Cl. 156-102.000.
Yoshida, Naoto: *See—*
Matsuura, Tadashi; Ushiroda, Kouichi; Makita, Tatsuo; Nagase, Masakazu; Tajiri, Akinori; Yoshida, Naoto; Nanba, Shigeru; and Saito, Koichi, 5,748,690, Cl. 376-260.000.
Yoshida, Shigeo, to Sharp Kabushiki Kaisha. Feature-region extraction method and feature-region extraction circuit. 5,748,776, Cl. 382-195.000.
Yoshida, Takehiro, to Canon Kabushiki Kaisha. Image communication apparatus having the function of ECM (error correction mode communication). 5,748,333, Cl. 358-445.000.
Yoshida, Takehiro, to Canon Kabushiki Kaisha. Facsimile apparatus capable of performing a standard procedure and a non-standard procedure. 5,748,334, Cl. 358-435.000.
Yoshida, Takehiro, to Canon Kabushiki Kaisha. Data communication apparatus for informing a destination of periodic communication. 5,748,714, Cl. 379-100.060.
Yoshida, Yasushi: *See—*
Kanoh, Osamu; Yoshida, Yasushi; Senda, Atsuo, deceased, 5,746,809, Cl. 106-1.110.
Yoshihara, Toshio: *See—*
Oka, Motohiro; Tsuchiya, Mitsuru; Nakamura, Norinaga; Takematsu, Kiyotaka; Ota, Yurie; Suzuki, Hiroko; Yamashita, Natsuko; Katagiri, Hiroomi; Yamada, Hiroshi; and Yoshihara, Toshio, 5,747,152, Cl. 428-323.000.
Yoshii, Taketo: *See—*
Nakai, Masaru; Yoshii, Taketo; Morita, Katsuyuki; Miyabe, Yoshiyuki; and Matsui, Mika, 5,748,798, Cl. 382-258.000.
Yoshii, Yuji: *See—*
Yabushita, Junichi; Otake, Shinichi; and Yoshii, Yuji, 5,747,905, Cl. 310-89.000.
Yoshikawa, Akio: *See—*
Nakanishi, Hideyuki; Ueno, Akira; Nagai, Hideo; and Yoshikawa, Akio, 5,748,658, Cl. 372-43.000.
Yoshikawa, Kenichi: *See—*
Kasai, Takao; Yoshikawa, Kenichi; Saito, Shigeru; and Hoshi, Masami, 5,746,960, Cl. 264-234.000.
Yoshikawa, Ryoko: *See—*
Miwa, Tadashi; Kanda, Hidehiro; Matsuoka, Isao; Makino, Toru; Yan, Wang Zhoa; Yoshikawa, Ryoko; Tai, Akira; Tokutake, Naoto; and Shigetomi, Masahiro, 5,749,031, Cl. 399-228.000.
Yoshikawa, Yukihiro; Tomiya, Kanji; Katsuta, Hiroyuki; Kawashima, Hideo; Takahashi, Osamu; Inami, Shunichi; Yanase, Yuji; Kishi, Junro; Shimotori, Hitoshi; and Tomura, Naofumi, to Mitsui Toatsu Chemicals, Inc. Substituted thiophene derivative and agricultural and horticultural fungicide containing the same as active ingredient. 5,747,518, Cl. 514-403.000.
Yoshiki, Masahiko: *See—*
Matsunaga, Hideki; Yamaguchi, Hiroshi; Tomita, Mitsuhiro; Doi, Seizou; Yoshiki, Masahiko; Kozuka, Shoji; and Onuma, Masayuki, 5,746,829, Cl. 117-203.000.
Yoshiko, Yuji: *See—*
Namiki, Takayuki; Morimoto, Toshihiro; Kishii, Kenichi; Kawakatsu, Nobuyuki; Kimura, Makoto; Yamasaki, Kyoko; Onoda, Mariko; Yoshiko, Yuji; Harada, Kazunori; Yanagi, Masayuki; Yamamoto, Takeshi; Inazu, Masato; and Mitani, Masaki, 5,747,493, Cl. 514-255.000.
Yoshimatsu, Akira: *See—*
Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, 5,747,016, Cl. 424-401.000.
Yoshimura, Kenji: *See—*
Terasaki, Fumitoshi; Yoshimura, Kenji; and Yoshimura, Tatsuhiro, 5,746,643, Cl. 451-5.000.
Yoshimura, Noriyuki; and Yoshida, Kenji, to Minebea Co., Ltd. Method for driving stepping motor of multiphase hybrid type. 5,747,898, Cl. 310-49.00R.
Yoshimura, Osamu: *See—*
Ban, Keiji; Tomoe, Tetsuro; Fuchi, Masami; Tsuchiya, Hiroaki; Yoshimura, Osamu; and Tanaka, Shinichi, 5,749,035, Cl. 399-316.000.
Yoshimura, Satoshi: *See—*
Namikawa, Mamoru; Yoshimura, Satoshi; and Honda, Kenichi, 5,747,927, Cl. 313-495.000.
Yoshimura, Tatsuhiro: *See—*
Terasaki, Fumitoshi; Yoshimura, Kenji; and Yoshimura, Tatsuhiro, 5,746,643, Cl. 451-5.000.
Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; Tokioka, Masaki; and Sato, Hajime, to Canon Kabushiki Kaisha. Information processing apparatus. 5,748,183, Cl. 345-173.000.
Yoshino, Kenichirou: *See—*
Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,748,353, Cl. 359-197.000.
Yoshino Kogyosho Co., Ltd.: *See—*
Nishigami, Akira; and Arai, Tsugio, 5,746,350, Cl. 222-95.000.
Sugiura, Horoaki; Tanaka, Fuminori; and Uesugi, Daisuke, 5,747,130, Cl. 428-36.920.
Yoshino, Yoshimi; and Kato, Kenzi, to Nippondenso Co., Ltd. Angular velocity sensor apparatus. 5,747,691, Cl. 73-504.160.
Yoshizawa, Atsutomo: *See—*
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,748,328, Cl. 358-298.000.
Yoshizawa, Hideki; and Otsuka, Tatsushi, to Fujitsu Limited. Cache-memory system having multidimensional spread cache. 5,749,089, Cl. 711-127.000.
Yoshizawa, Masaki; Kohno, Takanobu; and Ota, Satoshi, to Sony Corporation. Tape tension control apparatus. 5,746,384, Cl. 242-334.400.
Yoshizumi, Akira: *See—*
Hanyu, Koshi; and Yoshizumi, Akira, 5,747,557, Cl. 523-201.000.
Yost, Richard A.: *See—*
Quarmby, Scott T.; and Yost, Richard A., 5,747,801, Cl. 250-292.000.
Yost, William T.; Cantrell, John H.; and Taler, George A., to United States of America, National Aeronautics and Space Administration. Method of and apparatus for histological human tissue characterizationusing ultrasound. 5,746,209, Cl. 128-661.030.
You, Qimin, to Becton, Dickinson and Company. Materials and methods for species-specific detection of mycobacterium kansasii nucleic acids. 5,747,259, Cl. 435-6.000.
Youn, Gab-Jin, to Daewoo Electronics Co., Ltd. Washing machine having a washing liquid pumping apparatus. 5,746,071, Cl. 68-53.000.
Young, David K., to Xerox Corporation. Printing system for automatically delivering transparencies and regular sheets in proper order with different output modules. 5,749,024, Cl. 399-85.000.
Young, Gregory C.: *See—*
Young, Ronald A.; and Young, Gregory C., 5,746,040, Cl. 52-775.000.
Young Industries, Inc., The: *See—*
Ambs, Richard W.; Reiner, Mary C.; Stugard, Howard E.; and Pfeiffer, John W., 5,746,796, Cl. 55-493.000.
Young, Mark E.: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
Young, Mary Beth: *See—*
Coburn, Craig A.; Hungate, Randall W.; Isaacs, Richard C. A.; Vacca, Joseph P.; and Young, Mary Beth, 5,747,540, Cl. 514-622.000.
Young, Robert M.; Freidhoff, Carl B.; Braggins, Timothy T.; and Congedo, Thomas V., to Northrop Grumman Corporation. Micro-miniature ionizer for gas sensor applications and method of making micro-miniature ionizer. 5,747,815, Cl. 250-423.00R.
Young, Ronald A.; and Young, Gregory C., to Wireway/Husky Corp. Modular wall construction. 5,746,040, Cl. 52-775.000.
Youngquist, Robert C., to New England Photoconductor Corp. Fully integrating resistive array electronic multiplexor. 5,747,805, Cl. 250-338.400.
Youre, Gary D.: *See—*
Thrasher, David L.; Ryle, Lynn S.; Ruppell, Robert M.; Hearne, John S.; Krussell, Wilbur C.; and Youre, Gary D., 5,745,946, Cl. 15-77.000.
Yozan, Inc.: *See—*
Motohashi, Kazunori; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,748,131, Cl. 341-155.000.
Shou, Guoliang; Motohashi, Kazunori; Yamamoto, Makoto; and Takatori, Sunao, 5,748,510, Cl. 364-606.000.
Ysui, Yan Man: *See—*
So, Koon Chong; Hshieh, Fwu-Iuan; Nim, Danny C.; Line, True-Lon; and Ysui, Yan Man, 5,747,853, Cl. 257-355.000.
Yu, Chen-Hua, to Taiwan Semiconductor Manufacturing Company Ltd. Nitride-oxide sidewall spacer for salicide formation. 5,747,373, Cl. 438-305.000.
Yu, Chen-Hua; and Jang, Syun-Ming, to Taiwan Semiconductor Manufacturing Company, Ltd. Robust end-point detection for contact and via etching. 5,747,380, Cl. 438-599.000.
Yu, Chen-Hua Douglas: *See—*
Wu, Lin-June; Yu, Chen-Hua Douglas; and Lee, Jin-Yuan, 5,747,381, Cl. 438-624.000.
Yu, Donna S.: *See—*
Pan, Jing-Jong; Cao, Simon X. F.; Shi, Yuan; and Yu, Donna S., 5,748,350, Cl. 359-130.000.
Yu, Kuo-Cheng; Sun, Bao-Shiang; and Lin, Ching-Yi, to Holtek Microelectronics Inc. Reset signal generator. 5,748,948, Cl. 395-555.000.
Yu, Li-Fu. Pre-washing device for water circulating tube of massaging bath tub. 5,745,933, Cl. 4-541.100.
Yu, Lin-Chen: *See—*
Resconi, Luigi; Piemontesi, Fabrizio; and Yu, Lin-Chen, 5,747,621, Cl. 526-351.000.
Yu, Mason K. Automated, classified expenditure data card recording system. 5,748,908, Cl. 395-244.000.
Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, to SanDisk Corporation. Method of patterning polysilicon layers on substrate. 5,747,359, Cl. 437-186.000.
Yuan, Samuel W.: *See—*
Lederman, Marcos M.; and Yuan, Samuel W., 5,748,413, Cl. 360-113.000.
Yuasa, Masatoshi: *See—*
Furukawa, Nobuyuki; Fujiyama, Takeshi; and Yuasa, Masatoshi, 5,747,625, Cl. 528-26.000.
Yui, Koji; Takeshige, Mari; Oda, Takashi; Yoshimatsu, Akira; Itou, Takashi; Sato, Nakako; and Kure, Naohisa, to Kao Corporation. Organopolysiloxanes and a method of setting hair using the same. 5,747,016, Cl. 424-401.000.
Yuki, Tsuyoshi: *See—*

Date, Masashi; Tanaka, Keiji; Yuki, Tsuyoshi; Tsubota, Kenjiro; and Tamabuchi, Satoshi, 5,747,570, Cl. 524-161.000.
Yukitake, Masashi: *See—*
Namba, Takashi; Kobayashi, Hiroya; Minami, Kenji; Itoh, Hiroshi; Kuriyama, Toshiaki; and Yukitake, Masashi, 5,747,602, Cl. 525-398.000.
Yun, David I.; Sawtell, Ralph R.; Hunt, Warren H.; Baumgartner, H. Robert; Streicher, Eric T.; and Ehman, Michael F., to Aluminum Company of America. Monolithic metal matrix composite. 5,746,267, Cl. 164-65.000.
Yun, Ho Seok: *See—*
Myung, Soon-Hwan; Kim, Sang-Jin; Lee, Chya-Hyung; Park, Jea-Wook; and Yun, Ho Seok, 5,747,783, Cl. 219-758.000.
Yun, Mi Kyung: *See—*
Oh, Yeong Soo; Kim, Sang Soo; Hwang, Sang Yeul; Yun, Mi Kyung; Hwang, Seong Ryul; Hong, Seong Won; Lee, Yong Hee; Jeong, Yi Na; Lee, Koo; and Shin, You Seung, 5,747,535, Cl. 514-507.000.
Z-Communications, Inc.: *See—*
Lewis, Charles, 5,748,051, Cl. 331-117.00R.
Zaccagni, Gregory R.; and Kiely, Joseph A., to ZMC, Inc. Article-rolling machine having selectively positionable dispenser for sheet metal coil. 5,746,077, Cl. 72-183.000.
Zagar, Paul S.: *See—*
Prall, Kirk; Stone, Tod S.; and Zagar, Paul S., 5,747,869, Cl. 257-529.000.
Zaklika, Krzysztof A.; Busman, Stanley C.; and Cuny, Gregory D., to Minnesota Mining And Manufacturing Company. Laser-induced mass transfer imaging materials and methods utilizing colorless sublimable compounds. 5,747,217, Cl. 430-158.000.
Zalesinski, Jerzy M.: *See—*
Booth, Richard B.; Gaynes, Michael A.; Murcko, Robert M.; Puligandla, Viswanadham; Roldan, Judith M.; Saraf, Ravi; and Zalesinski, Jerzy M., 5,747,101, Cl. 427-96.000.
Zama, Koichi: *See—*
Sugimoto, Mitsuhiro; Kondo, Yuji; Zama, Koichi; and Sato, Yuko, 5,747,916, Cl. 310-348.000.
Zambon Group, S.P.A.: *See—*
Montanari, Stefania; Cavalleri, Paolo; and Santangelo, Francesco, 5,747,513, Cl. 514-351.000.
Zamel, James M.: *See—*
Marabella, Leonard J.; Berg, Jacqueline G.; Holleman, Gerald W.; Injeyan, Hagop; and Zamel, James M., 5,748,654, Cl. 372-19.000.
Zandi, Ahmad; Allen, James D.; Schwartz, Edward L.; and Boliek, Martin, to Ricoh Company, Ltd.; and Ricoh Corporation. Apparatus for compression using reversible embedded wavelets. 5,748,786, Cl. 382-240.000.
Zannoni, Joseph Michael: *See—*
Denhartog, Lisa; Heath, Christopher Robin; Ketelsen, Sandra Mills; Melega, Valerie; Miller, Gary Allen; and Zannoni, Joseph Michael, 5,747,091, Cl. 426-548.000.
Zapata, Elizabeth: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
Zaske, James L.: *See—*
Arov, Gennady, 5,746,423, Cl. 269-266.000.
Zastrow, Lyn R., to Zilog, Inc. Method of demodulating chirp spread spectrum. 5,748,670, Cl. 375-204.000.
ZED Instruments Ltd.: *See—*
Roberts, Simon H., 5,748,222, Cl. 347-241.000.
Zeigler, Andrew: *See—*
Pasch, Kenneth A.; and Zeigler, Andrew, 5,746,721, Cl. 604-153.000.
Zeitels, Jerrold Roy; and Grewe, David Douglas. Endoscopic retriever. 5,746,770, Cl. 606-207.000.
Zelenski, Richard Elmer: *See—*
Carlson, Brent Allen; Huss, Frederic Lawrence; Schmucki, Nancy Marie; and Zelenski, Richard Elmer, 5,748,883, Cl. 395-184.010.
Zenz, Charles Vernon, Sr.: *See—*
Thompson, Gary Allen; and Zenz, Charles Vernon, Sr., 5,748,451, Cl. 361-788.000.
Zepeda, Alfred: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Shultz, Christopher J.; and Fong, Jon, 5,748,216, Cl. 347-87.000.
Zexel Corporation: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Matsubara, Jun; Narikiyo, Kazuaki; Machida, Hajime; Abe, Noriyuki; Motoyoshi, Tsunayoshi; and Ueda, Atsushi, 5,746,584, Cl. 417-273.000.
ZF Friedrichshafen AG: *See—*
Gebhard, Wolfgang; and Mann, Egon, 5,746,509, Cl. 366-61.000.
Gruhle, Wolf Dieter; Escher, Manfred; Jauch, Friedemann; Reiter, Friedrich; and Wendel, Peter, 5,748,472, Cl. 364-424.080.
Zhai, Feng, deceased (by Fudi Ni, executor): *See—*
Hong, Guo Fan; Zhai, Feng, deceased, 5,747,298, Cl. 435-91.100.
Zhang, Wei-Wei: *See—*
Roth, Jack A.; Fujiwara, Toshiyoshi; Grimm, Elizabeth A.; Mukhopadhyay, Tapas; Zhang, Wei-Wei; and Owen-Schaub, Laurie B., 5,747,469, Cl. 514-44.000.
Zhang, Xiaoying: *See—*
Parke, Alastair William; Doering, Jeffrey Allen; Mingo, Paul Charles; Zhang, Xiaoying; and Marzonie, Robert Matthew, 5,746,183, Cl. 123-492.000.
Zheng, Hua; and Wright, Jeffrey P., to Micron Technology, Inc. Circuit and method for providing a substantially constant time delay over a range of supply voltages. 5,748,542, Cl. 365-194.000.
Zhou, Mei Sheng: *See—*
Kantimahanti, Arjun Kumar; Subrahmanyam, Chivukula; and Zhou, Mei Sheng, 5,747,369, Cl. 438-241.000.
Zhu, Bizhong: *See—*
Katsoulis, Dimitris Elias; Keryk, John Robert; McGarry, Frederick Jerome; Schmidt, Randall Gene; Subramanian, Ramnath; Vincent, Harold Lewis; and Zhu, Bizhong, 5,747,608, Cl. 525-477.000.
Zhu, Wei: *See—*
Graebner, John Edwin; Jin, Sungho; and Zhu, Wei, 5,746,931, Cl. 216-88.000.
Zhu, Xiaodong T.: *See—*
Chen, Eugene; Tehrani, Saied N.; Legge, Ronald N.; and Zhu, Xiaodong T., 5,748,524, Cl. 365-173.000.
Ziegler, David A.: *See—*
Girard, Mark T.; Bennin, Jeffry S.; and Ziegler, David A., 5,748,409, Cl. 360-104.000.
Zielinski, Paul A.: *See—*
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; and Zielinski, Paul A., 5,747,235, Cl. 430-583.000.
Farid, Samir Y.; Lenhard, Jerome R.; Chen, Chin H.; Muenter, Annabel A.; Gould, Ian R.; Godleski, Stephen A.; Zielinski, Paul A.; and Weidner, Charles H., 5,747,236, Cl. 430-583.000.
Zigler, Robert A., to Intermec Corporation. Stylus sheath for use with touch-sensitive screens. 5,747,748, Cl. 178-18.000.
Zilberberg, David. Back up system for the supply of voltage in television cable systems. 5,747,888, Cl. 307-66.000.
Zilog, Inc.: *See—*
Zastrow, Lyn R., 5,748,670, Cl. 375-204.000.
Zimmer, John. Method of compacting trash on a platform. 5,746,121, Cl. 100-35.000.
Zimmerman, Ellen L.: *See—*
Carey, Julia M.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Dzurenko, Theresa E.; McHugh, Kevin; and Zimmerman, Ellen L., 5,747,092, Cl. 426-560.000.
Zimmerman, Scott M.: *See—*
Steiner, Ivan B.; Zimmerman, Scott M.; and Beeson, Karl W., 5,748,828, Cl. 385-146.000.
Zimmerman, Theodore S.; and Fulcher, Carol A., to Scripps Research Institute, The. New factor VIII coagulant polypeptides and monoclonal antibodies to them. 5,747,337, Cl. 435-337.000.
Zimmermann, Helmut: *See—*
Stark, Thomas; Zimmermann, Helmut; and Uhl, Klaus-Martin, 5,746,160, Cl. 123-41.700.
Ziph-Schatzberg, Leah, to Agfa Division, Bayer Corporation. Condition sensitive method and apparatus for imaging a lithographic printing plate. 5,748,225, Cl. 347-262.000.
Zirkiev, Arkady. Food slicer device. 5,745,999, Cl. 30-278.000.
Zittritsch, Terrance John: *See—*
Bertolet, Allan Robert; Clinton, Kim P. N.; Fuller, Christine Marie; Gould, Scott Whitney; Hartman, Steven Paul; Iadanza, Joseph Andrew; Keyser, Frank Ray; Millham, Eric Ernest; Reny, Timothy Shawn; Worth, Brian A.; Yasar, Gulson; and Zittritsch, Terrance John, 5,748,009, Cl. 326-39.000.
ZMC, Inc.: *See—*
Zaccagni, Gregory R.; and Kiely, Joseph A., 5,746,077, Cl. 72-183.000.
Zmora, Eitan: *See—*
Orbach, Yair; Zmora, Eitan; and Halahmi, Dror, 5,748,071, Cl. 340-146.200.
Zoppi, Erminio: *See—*
Cutolo, Domingo; and Zoppi, Erminio, 5,747,137, Cl. 428-74.000.
Zorabedian, Paul, to Hewlett-Packard Company. Signal-to-noise ratio of second harmonic interferometers. 5,748,313, Cl. 356-345.000.
Zoughi, Reza; Yeh, Chin-Yung; Ganchev, Stoyan I.; and Huber, Christian, to Colorado State University Research Foundation. Microwaves used for determining fatigue and surface crack features on metal surfaces. 5,748,003, Cl. 324-644.000.
Ztek Corporation: *See—*
Hsu, Michael S., 5,747,185, Cl. 429-44.000.
Zupanovich, John D., to Calgon Corporation. Methods and apparatus for monitoring and controlling PH phosphate and sodium to phosphate ratio in boiler systems operating with captive alkalinity. 5,747,342, Cl. 436-55.000.
Zurawin, Michael. Stackable paint roller tray with integral paint brush storage trough rest. 5,746,345, Cl. 220-735.000.
Zurth, Christian: *See—*
Gries, Heinz; Mützel, Wolfgang; Zurth, Christian; and Weinmann, Hanns-Joachim, 5,746,999, Cl. 424-9.322.
Zymogenetics, Inc.: *See—*
Mulvihill, Eileen Ranae; Hagen, Frederick Stamner; Houamed, Khaled M.; and Almers, Wolfhard, 5,747,267, Cl. 435-7.210.
Sprecher, Cindy A., 5,747,645, Cl. 530-350.000.
3Com Corporation: *See—*
Lawler, Christopher P.; and Ready, David C., 5,748,633, Cl. 370-401.000.
4P S.r.l.: *See—*
Mansutti, Silvano; and Cardin, Roberto, 5,748,511, Cl. 364-708.100.
569.396 Alberta, Ltd.: *See—*
Wright, Andrew; and Ring, Curtis Phillip, 5,746,249, Cl. 137-614.190.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5th DAY OF MAY, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, David C.: *See—*
Hassell, David A.; and Anderson, David C., RE. 35,780, Cl. 222-129.200.
Buley, Todd W.: *See—*
Sandhu, Gurtej S.; and Buley, Todd W., RE. 35,785, Cl. 438-681.000.
Camacho, Salvador L.: *See—*
Circeo, Louis J., Jr.; and Camacho, Salvador L., RE. 35,782, Cl. 405-128.000.
Circeo, Louis J., Jr.; and Camacho, Salvador L. In-situ landfill pyrolysis, remediation and vitrification. RE. 35,782, Cl. 405-128.000.
Engel Maschinenbau Gesellschaft m.b.H.: *See—*
Leonhartsberger, Heinz; Naderhirn, Helmut; Kappelmüller, Werner; and Urbanek, Otto, RE. 35,783, Cl. 425-589.000.
Hassell, David A.; and Anderson, David C., to IMI Cornelius Inc. Constant ratio post-mix beverage dispensing valve. RE. 35,780, Cl. 222-129.200.
IMI Cornelius Inc.: *See—*
Hassell, David A.; and Anderson, David C., RE. 35,780, Cl. 222-129.200.
Kappelmüller, Werner: *See—*
Leonhartsberger, Heinz; Naderhirn, Helmut; Kappelmüller, Werner; and Urbanek, Otto, RE. 35,783, Cl. 425-589.000.
Kensey Nash Corporation: *See—*
Nash, John; and Michels, Mark, RE. 35,787, Cl. 606-128.000.
Kimura, Tomohiro: *See—*
Ono, Fumitaka; Kino, Shigenori; Yoshida, Masayuki; and Kimura, Tomohiro, RE. 35,781, Cl. 341-51.000.
Kino, Shigenori: *See—*
Ono, Fumitaka; Kino, Shigenori; Yoshida, Masayuki; and Kimura, Tomohiro, RE. 35,781, Cl. 341-51.000.
Leonhartsberger, Heinz; Naderhirn, Helmut; Kappelmüller, Werner; and Urbanek, Otto, to Engel Maschinenbau Gesellschaft m.b.H. Injection molding machine having tiltable mounting plates. RE. 35,783, Cl. 425-589.000.
Linkow, Leonard I.; and Rinaldi, Anthony W., to Vent-Plant Corporation. Submergible screw-type dental implant and method of utilization. RE. 35,784, Cl. 433-174.000.
Michels, Mark: *See—*
Nash, John; and Michels, Mark, RE. 35,787, Cl. 606-128.000.
Micron Technology, Inc.: *See—*
Sandhu, Gurtej S.; and Buley, Todd W., RE. 35,785, Cl. 438-681.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Ono, Fumitaka; Kino, Shigenori; Yoshida, Masayuki; and Kimura, Tomohiro, RE. 35,781, Cl. 341-51.000.
Naderhirn, Helmut: *See—*
Leonhartsberger, Heinz; Naderhirn, Helmut; Kappelmüller, Werner; and Urbanek, Otto, RE. 35,783, Cl. 425-589.000.
Nash, John; and Michels, Mark, to Kensey Nash Corporation. Stone destroying catheter and method of use. RE. 35,787, Cl. 606-128.000.
Ohara, Makoto, to Sega Enterprises, Ltd. Television game apparatus. RE. 35,786, Cl. 463-44.000.
Ono, Fumitaka; Kino, Shigenori; Yoshida, Masayuki; and Kimura, Tomohiro, to Mitsubishi Denki Kabushiki Kaisha. Coding method of image information. RE. 35,781, Cl. 341-51.000.
Rinaldi, Anthony W.: *See—*
Linkow, Leonard I.; and Rinaldi, Anthony W., RE. 35,784, Cl. 433-174.000.
Sandhu, Gurtej S.; and Buley, Todd W., to Micron Technology, Inc. Low-pressure chemical vapor deposition process for depositing high-density highly-conformal, titanium nitride films of low bulk resistivity. RE. 35,785, Cl. 438-681.000.
Sega Enterprises, Ltd.: *See—*
Ohara, Makoto, RE. 35,786, Cl. 463-44.000.
Urbanek, Otto: *See—*
Leonhartsberger, Heinz; Naderhirn, Helmut; Kappelmüller, Werner; and Urbanek, Otto, RE. 35,783, Cl. 425-589.000.
Vent-Plant Corporation: *See—*
Linkow, Leonard I.; and Rinaldi, Anthony W., RE. 35,784, Cl. 433-174.000.
Yoshida, Masayuki: *See—*
Ono, Fumitaka; Kino, Shigenori; Yoshida, Masayuki; and Kimura, Tomohiro, RE. 35,781, Cl. 341-51.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allied-Signal Inc.: *See—*
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 076,920, Cl. 210-243.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 164,084, Cl. 210-243.000.
Bauer, Heinz; and Becker, Hans, to Linde Aktiengesellschaft. Process for the recovery of low molecular weight C_{2+} hydrocarbons from a cracking gas. B1 520,724, Cl. 95-169.000.
Becker, Hans: *See—*
Bauer, Heinz; and Becker, Hans, B1 520,724, Cl. 95-169.000.
Blake, William S. Trigger sprayer. B1 982,900, Cl. 239-333.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., to Allied-Signal Inc. Electrostatically dissipative fuel filter. B1 076,920, Cl. 210-243.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., to Allied-Signal Inc. Electrostatically dissipative fuel filter. B1 164,084, Cl. 210-243.000.
de Ruiter, Ernest: *See—*
von Blücher, Hasso; and de Ruiter, Ernest, B1 350,443, Cl. 96-135.000.
Endotherapeutics Corporation: *See—*
Moll, Frederic H., B1 601,710, Cl. 604-165.000.
Everest Medical Corporation: *See—*
Rydell, Mark A.; and O'Brien, Joseph A., B1 445,638, Cl. 606-51.000.
Hans, Jeremy: *See—*
Ippoliti, J. Thomas; Mabbott, Gary A.; Hans, Jeremy; and Stohlmeyer, Michelle, B1 455,359, Cl. 548-314.400.
Hrenyo, John, to Tekni-Plex, Inc. Molded plastic overwrap tray. B1 018,623, Cl. 206-557.000.
Ippoliti, J. Thomas; Mabbott, Gary A.; Hans, Jeremy; and Stohlmeyer, Michelle, to Research Corporation Technologies, Inc. Metal ion binding monomer and polymer. B1 455,359, Cl. 548-314.400.
John Crane Inc.: *See—*
Wasser, James R.; Volden, Douglas J.; and Netzel, James P., B1 375,853, Cl. 277-366.000.
Kesavan, Sunil K.: *See—*
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 076,920, Cl. 210-243.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 164,084, Cl. 210-243.000.
Linde Aktiengesellschaft: *See—*
Bauer, Heinz; and Becker, Hans, B1 520,724, Cl. 95-169.000.
Mabbott, Gary A.: *See—*
Ippoliti, J. Thomas; Mabbott, Gary A.; Hans, Jeremy; and Stohlmeyer, Michelle, B1 455,359, Cl. 548-314.400.
Martin, James W.: *See—*
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 076,920, Cl. 210-243.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 164,084, Cl. 210-243.000.
Moll, Frederic H., to Endotherapeutics Corporation. Trocar assembly. B1 601,710, Cl. 604-165.000.
Netzel, James P.: *See—*
Wasser, James R.; Volden, Douglas J.; and Netzel, James P., B1 375,853, Cl. 277-366.000.
O'Brien, Joseph A.: *See—*
Rydell, Mark A.; and O'Brien, Joseph A., B1 445,638, Cl. 606-51.000.
Pereira, James S.: *See—*
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 076,920, Cl. 210-243.000.
Danowski, Daniel R.; Kesavan, Sunil K.; Martin, James W.; and Pereira, James S., B1 164,084, Cl. 210-243.000.
Research Corporation Technologies, Inc.: *See—*
Ippoliti, J. Thomas; Mabbott, Gary A.; Hans, Jeremy; and Stohlmeyer, Michelle, B1 455,359, Cl. 548-314.400.

Rydell, Mark A.; and O'Brien, Joseph A., to Everest Medical Corporation. Bipolar coagulation and cutting forceps. B1 445,638, Cl. 606-51.000.
Stohlmeyer, Michelle: *See—*
Ippoliti, J. Thomas; Mabbott, Gary A.; Hans, Jeremy; and Stohlmeyer, Michelle, B1 455,359, Cl. 548-314.400.
Tekni-Plex, Inc.: *See—*
Hrenyo, John, B1 018,623, Cl. 206-557.000.
Volden, Douglas J.: *See—*
Wasser, James R.; Volden, Douglas J.; and Netzel, James P., B1 375,853, Cl. 277-366.000.
von Blücher, Hasso; and de Ruiter, Ernest. Filter sheet material for passenger cabins in motor vehicles. B1 350,443, Cl. 96-135.000.
Wasser, James R.; Volden, Douglas J.; and Netzel, James P., to John Crane Inc. Gas lubricated barrier seal. B1 375,853, Cl. 277-366.000.

LIST OF DESIGN PATENTEES

ABC International Traders, Inc.: *See—*
Larian, Isaac, 394,056, Cl. D14-124.000.
Akutsu, Akira. Portable case. 393,940, Cl. D3-226.000.
Akutsu, Akira. Portable case. 393,941, Cl. D3-226.000.
Aleco Furniture Mfg. Inc.: *See—*
Diramarian, Arsho, 393,953, Cl. D6-366.000.
Alves, Kasidy W.; and Nimpoeno, Roy, to Scosche Industries, Inc. Multimedia organizer case. 393,947, Cl. D3-303.000.
Ambrose, Rosemary. Foot scrubbing device. 394,134, Cl. D32-47.000.
Amundson, Neil Thomas: *See—*
Mackert, Ross Austin; and Amundson, Neil Thomas, 394,124, Cl. D26-85.000.
Anam Industrial Co., Ltd.: *See—*
Hwang, In Gil, 394,042, Cl. D13-171.000.
Andersen Corporation: *See—*
Bruchu, Todd W.; and Plummer, David D., 394,115, Cl. D25-52.000.
Plummer, David D., 394,116, Cl. D25-52.000.
Anderson, Carl. Clamp. 393,998, Cl. D8-394.000.
Anderson, Torrence: *See—*
Whitehead, Stephen P.; Anderson, Torrence; and Uffner, Michael G., 393,961, Cl. D6-464.000.
Anderson, Torrence C.: *See—*
Whitehead, Stephen P.; Vogler, Michael R.; and Anderson, Torrence C., 393,990, Cl. D8-10.000.
Arko, Robert Peter: *See—*
Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, 393,968, Cl. D6-500.000.
Arnfelt, David A. Lid for a cooler. 393,984, Cl. D7-606.000.
Aspen Marketing, Inc.: *See—*
Chun, Lee Cheuk, 394,062, Cl. D14-192.000.
AST Research, Inc.: *See—*
Smith, Kim C., 394,051, Cl. D14-114.300.
Atkinson, Charles W. Cuticle Shaper/Nail file. 394,128, Cl. D28-57.000.
Atlantech Inc.: *See—*
Mauffette, Claude, 394,036, Cl. D12-203.000.
Mauffette, Claude, 394,037, Cl. D12-203.000.
Aura Systems, Inc,: *See—*
Hart, Patrick, 394,063, Cl. D14-214.000.
Bailey, Hugh D.: *See—*
Franklin, Ronnie P.; and Bailey, Hugh D., 393,943, Cl. D3-273.000.
Bakic, Dieter, to Dieter Bakic S.r.l. Bottle. 394,012, Cl. D9-545.000.
Ban, Tetsuo; and Takahashi, Daisuke, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 394,027, Cl. D12-110.000.
Barowsky, Helmut: *See—*
Pollrich, Volker; and Barowsky, Helmut, 394,068, Cl. D15-9.000.
Barrette, David W., to Minnesota Mining and Manufacturing Company. Mouse pad. 394,049, Cl. D14-114.000.
Barry, Barbara, to Boyd Lighting Company. Lamp with tapered hexagonal stem. 394,125, Cl. D26-87.000.
Bausch & Lomb Incorporated: *See—*
Hennessy, John P.; Ryan, Howard Scott; and Goff, James A., 394,073, Cl. D16-135.000.
Bean, Frederick R.: *See—*
Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.
Bellofatto, Steven; and Salmon, Scott, to Healthscan Products, Inc. Portable peak flow meter. 394,016, Cl. D10-96.000.
Bergelin, Christopher S., to Henredon Furniture Industries, Inc. Table. 393,964, Cl. D6-480.000.
Bernt Borgstrom Mekanisk Verkstad AB: *See—*
Borgström, Lars, 393,946, Cl. D3-295.000.
Bitzer Kuehlmaschinenbau GmbH & Co. KG: *See—*
Pollrich, Volker; and Barowsky, Helmut, 394,068, Cl. D15-9.000.
Black & Decker Inc.: *See—*
Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.
Concari, Gabriel E.; and Snider, Gregory Scott, 394,122, Cl. D26-38.000.
Boeing North American, Inc.: *See—*
Cummings, Darold B., 394,039, Cl. D12-333.000.
Boix Gacia, Maria. Ballpoint pen. 394,087, Cl. D19-51.000.
Borgström, Lars, to Bernt Borgstrom Mekanisk Verkstad AB. Tool case. 393,946, Cl. D3-295.000.
Boston Technology, Inc.: *See—*
Meade, John, 394,052, Cl. D14-114.500.
Meade, John, 394,053, Cl. D14-114.500.
Bourgerie, Richard A., to Thomson Consumer Electronics. Projection television. 394,057, Cl. D14-128.000.
Boyd Lighting Company: *See—*
Barry, Barbara, 394,125, Cl. D26-87.000.
Bradford, Michael H. Bioentrainment module. 394,114, Cl. D24-200.000.
Braun, Rainer, to Daimler-Benz Aktiengesellschaft. Front face of a vehicle wheel. 394,038, Cl. D12-211.000.
Bridgestone/Firestone, Inc.: *See—*
Lassan, Timothy J.; Wallet, Bill J.; and Molnar, Joseph F., 394,030, Cl. D12-147.000.
Bruchu, Todd W.; and Plummer, David D., to Andersen Corporation. Double hung window. 394,115, Cl. D25-52.000.
Bunschoten, Gerrit K.; and Van Gendt, Patrick, to Diversey Lever, Inc. Soap dispenser. 393,975, Cl. D6-545.000.
Burns, Jack A. Retractable tethered ball baseball practice device. 394,093, Cl. D21-199.000.
California Institute of Technology: *See—*
O'Neal, Michael; Sabahi, Dara; and Tauber, Michael, 394,040, Cl. D12-325.000.
Campanella, Vincent; and Vasconcelos, Osvaldo M., to Wakefield Engineering, Inc. Clamping heat sink. 394,043, Cl. D13-179.000.
Canon Kabushiki Kaisha: *See—*
Matsumura, Yoshiyuki; and Chih, Chien Chun, 394,076, Cl. D16-209.000.
Tashiro, Naoki; and Chiba, Toshimi, 394,082, Cl. D18-43.000.
Carnegie Fabrics, Inc.: *See—*
Kane, Brian, 393,956, Cl. D6-334.000.
Cerato, Silverio, to Silmar S.P.A. Ornamental chain. 394,019, Cl. D11-13.000.
Cerato, Silverio, to Silmar S.p.A. Ornamental chain. 394,020, Cl. D11-13.000.
Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., to Black & Decker Inc. Table saw with telescoping fence assembly. 394,071, Cl. D15-133.000.
Chan, Yip Kwong, to Y & H Industrial Limited. Embossing device. 394,080, Cl. D18-19.000.
Chanel, S.A.: *See—*
Moncourtois, Dominique; and Vandenbussche, Francis, 393,958, Cl. D6-444.000.
Chang, Jack; and Chen, Tony, to UMAX Data Systems Inc. Scanner. 394,047, Cl. D14-107.000.
Chen, Tony: *See—*
Chang, Jack; and Chen, Tony, 394,047, Cl. D14-107.000.
Chiba, Toshimi: *See—*
Tashiro, Naoki; and Chiba, Toshimi, 394,082, Cl. D18-43.000.
Chih, Chien Chun: *See—*
Matsumura, Yoshiyuki; and Chih, Chien Chun, 394,076, Cl. D16-209.000.
Chi-Jui, Huang: *See—*
Spriester, Bart; and Chi-Jui, Huang, 394,041, Cl. D13-123.000.
Cho, Yoon-Young, to LG Electronics Inc. Window adhesive-type air conditioner. 394,098, Cl. D23-353.000.
Chun, Lee Cheuk, to Aspen Marketing, Inc. Head mounted radio. 394,062, Cl. D14-192.000.
Commercial Trade Corp.: *See—*
Dixon, Randy J., 394,132, Cl. D32-21.000.
Compte, Philippe, to S. T. Dupont S.A. Ball-point pen. 394,086, Cl. D19-51.000.
Comtec Systems Co. Ltd.: *See—*
Lee, Myunghoon, 394,048, Cl. D14-113.000.
Concari, Gabriel E.; and Snider, Gregory Scott, to Black & Decker Inc. Combined rechargeable flashlight and base therefor. 394,122, Cl. D26-38.000.
Contico International, Inc.: *See—*
Foster, Donald D.; and Finch, John, 394,007, Cl. D9-448.000.
Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,008, Cl. D9-448.000.
Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,009, Cl. D9-448.000.
Corporation in Glass Co Ltd.: *See—*
Morelli, Michel, 394,002, Cl. D9-415.000.
Cowlen, Nicholas J. Golf bag accessory belt. 393,948, Cl. D3-320.000.
Cris-Metal Móveis Para Banheiro Ltda.: *See—*

VOL
210
ISS
1
MY
5
998
UMI

- Kato, Taro, 393,972, Cl. D6-523.000.

Cummings, Darold B., to Boeing North American, Inc. Airplane. 394,039, Cl. D12-333.000.

Curry, John C. Four column packet dispenser. 393,971, Cl. D6-515.000.

Daimler-Benz Aktiengesellschaft: *See—*
- Braun, Rainer, 394,038, Cl. D12-211.000.
- Sacco, Bruno; and Pfeiffer, Peter, 393,996, Cl. D8-347.000.

Dart Industries Inc.: *See—*
- Laib, Douglas M., 394,014, Cl. D10-46.200.
- Molo, Nicholas J., 393,987, Cl. D7-694.000.

Davis, Omar, to Salton-Maxim Housewares, Inc. Shower dispenser radio. 393,974, Cl. D6-544.000.

Davis, Stephen J.; and Terzaghi, André, to Prince Manufacturing, Inc. Tennis racquet. 394,094, Cl. D21-212.000.

Davis, William S., Jr., to Quorum International. Ceiling fan housing. 394,105, Cl. D23-411.000.

De Bergen, Stephane, to Le Creuset S.A. Corkscrew. 393,993, Cl. D8-43.000.

Delta International Machinery Corp.: *See—*
- Garcia, Jaime E.; and Hollinger, David N., 394,070, Cl. D15-124.000.

Dieter Bakic S.r.l.: *See—*
- Bakic, Dieter, 394,012, Cl. D9-545.000.

Dijkstra, Tjeerd, to Pollyflame International B.V. Clock combined with radio. 394,060, Cl. D14-170.000.

Diramarian, Arsho, to Aleco Furniture Mfg. Inc. Swivel chair. 393,953, Cl. D6-366.000.

Diversey Lever, Inc.: *See—*
- Bunschoten, Gerrit K.; and Van Gendt, Patrick, 393,975, Cl. D6-545.000.

Dixon, Randy J., to Commercial Trade Corp. Mobile self-contained pumping unit. 394,132, Cl. D32-21.000.

Dolan, Patrick S. Lamp glass shade. 394,126, Cl. D26-134.000.

Dolan, Patrick S. Lamp glass shade. 394,127, Cl. D26-134.000.

Drelles, Mark Scott: *See—*
- Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, 393,968, Cl. D6-500.000.

Duback, Jeffrey E.; and Friday, Mark G., to Parker Medical Associates Limited Partnership. Ankle brace. 394,110, Cl. D24-192.000.

Duback, Jeffrey E.; and Friday, Mark G., to Parker Medical Associates Limited Partnership. Ankle brace. 394,111, Cl. D24-192.000.

Duback, Jeffrey E.; and Friday, Mark G., to Parker Medical Associates. Ankle brace. 394,112, Cl. D24-192.000.

Dukes, Gary L.: *See—*
- Jenkins, Larry G.; and Dukes, Gary L., 393,969, Cl. D6-511.000.

Dwiggins, John H.: *See—*
- Schulz, Galyn A.; Wiese, Pamela J.; and Dwiggins, John H., 393,949, Cl. D5-53.000.

Ebert, Patricia Lynn. Lotion applicator. 394,108, Cl. D24-119.000.

Ecolab Inc.: *See—*
- Mackert, Ross Austin; and Amundson, Neil Thomas, 394,124, Cl. D26-85.000.

Edgar, Mark S. Mount for securing a sighting light to a firearm. 394,096, Cl. D22-110.000.

Ellis, Robert T. Sailing training aide. 394,088, Cl. D19-62.000.

Feider, Georges Gaston; Gillard, Jean-Michel; and Spaeth, Susan Marie, to Goodyear Tire & Rubber Company, The. Tire tread. 394,034, Cl. D12-147.000.

Feider, Georges Gaston: *See—*
- Gillard, Jean-Michel; and Feider, Georges Gaston, 394,029, Cl. D12-141.000.

Ferguson Copeland, LLC: *See—*
- Ferguson, Darrell C., 393,954, Cl. D6-369.000.

Ferguson, Darrell C., to Ferguson Copeland, LLC. Seat. 393,954, Cl. D6-369.000.

Ferrara, Daniel A., Jr.: *See—*
- Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.

Finch, John: *See—*
- Foster, Donald D.; and Finch, John, 394,007, Cl. D9-448.000.

Finch, Michael J., to Northern Falls Water Company, L.L.C. Bottle. 394,011, Cl. D9-538.000.

Fink, David, to Windsor Industries, Inc. Combined computer-style radio and alarm clock. 394,061, Cl. D14-170.000.

Fitzgerald, Robert M. Cordless telephone headset. 394,058, Cl. D14-142.000.

Ford Global Technologies, Inc.: *See—*
- Liao, Shangshyan S.; and Schumaker, Nevenka, 394,017, Cl. D10-103.000.

Fort James Corporation: *See—*
- Schulz, Galyn A.; Wiese, Pamela J.; and Dwiggins, John H., 393,949, Cl. D5-53.000.

Foster, Donald D.; and Finch, John, to Contico International, Inc. Trigger sprayer housing having horizontal ribs. 394,007, Cl. D9-448.000.

Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, to Contico International Inc. Trigger sprayer housing. 394,008, Cl. D9-448.000.

Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, to Contico International, Inc. Trigger sprayer housing. 394,009, Cl. D9-448.000.

Franklin, Ronnie P.; and Bailey, Hugh D. Tool tote bucket. 393,943, Cl. D3-273.000.

Freadman, Tommyca. Sub woofer. 394,064, Cl. D14-214.000.

Freightliner Corporation: *See—*
- Hellhake, Ferdinand F.; Hurayt, Mark S.; and Runyon, Sigmun D., 394,026, Cl. D12-96.000.

Friday, Mark G.: *See—*
- Duback, Jeffrey E.; and Friday, Mark G., 394,110, Cl. D24-192.000.
- Duback, Jeffrey E.; and Friday, Mark G., 394,111, Cl. D24-192.000.
- Duback, Jeffrey E.; and Friday, Mark G., 394,112, Cl. D24-192.000.

Fuji Xerox Co., Ltd.: *See—*
- Nagata, Kazuteru; and Seki, Hiroo, 394,084, Cl. D18-47.000.

Fujitsu General Limited: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.

Fujitsu Limited: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.

Funawatari, Takatsugu, to Sony Corporation. Magnetic disc for computer. 394,050, Cl. D14-114.000.

Galante, Richard Louis; Windham, Terrell Dean; Nowacki, Colleen Anne; and Lawrence, Jay Kevin, to Goodyear Tire & Rubber Company, The. Tire tread. 394,031, Cl. D12-147.000.

Garcia, Jaime E.; and Hollinger, David N., to Delta International Machinery Corp. Planer apparatus. 394,070, Cl. D15-124.000.

Garcia, Marcos. Transmitter for locating keys. 394,018, Cl. D10-104.000.

Gee, Jack W., II; and Tsuji, Masao, to Hunter Fan Company. Combined ceiling fan motor housing, switch housing, and blade irons unit. 394,102, Cl. D23-411.000.

Gee, Jack W., II; and Tsuji, Masao, to Hunter Fan Company. Combined ceiling fan motor housing, switch housing, and blade irons unit. 394,104, Cl. D23-411.000.

Gee, Jack W., II: *See—*
- Tsuji, Masao; and Gee, Jack W., II, 394,107, Cl. D23-411.000.

Gehret, Robert S.: *See—*
- Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.

Geier, James; and Jobes, Jim, to 555 Design Fabrication Management, Inc. Counter top retail display unit. 393,959, Cl. D6-457.000.

Geier, James; and Jobes, Jim. Hexagonal retail display unit. 393,960, Cl. D6-457.000.

Geliebter, Mel B., to R.S.V. Sport, Inc. Combined jeans fly and waist band portions, and jewelry therefor. 394,025, Cl. D11-226.000.

General Signal Corporation: *See—*
- McAvinney, Thomas A.; Hancock, Gregory P.; Kehr, Frederick W.; and Townsend, Jeffrey A., 394,072, Cl. D15-148.000.

Genuin, Alessandro, to Genuin Golf & Dress of America, Inc. Golf shoe. 393,938, Cl. D2-906.000.

Genuin Golf & Dress of America, Inc.: *See—*
- Genuin, Alessandro, 393,938, Cl. D2-906.000.

Gillard, Jean-Michel; and Feider, Georges Gaston, to Goodyear Tire & Rubber Company, The. Tire tread. 394,029, Cl. D12-141.000.

Gillard, Jean-Michel: *See—*
- Feider, Georges Gaston; Gillard, Jean-Michel; and Spaeth, Susan Marie, 394,034, Cl. D12-147.000.

Goff, James A.: *See—*
- Hennessy, John P.; Ryan, Howard Scott; and Goff, James A., 394,073, Cl. D16-135.000.

Goodyear Tire & Rubber Company, The: *See—*
- Feider, Georges Gaston; Gillard, Jean-Michel; and Spaeth, Susan Marie, 394,034, Cl. D12-147.000.
- Galante, Richard Louis; Windham, Terrell Dean; Nowacki, Colleen Anne; and Lawrence, Jay Kevin, 394,031, Cl. D12-147.000.
- Gillard, Jean-Michel; and Feider, Georges Gaston, 394,029, Cl. D12-141.000.
- Maxwell, Paul Bryan, 394,032, Cl. D12-147.000.

Goss, Lorane, to Mikron Industries, Inc. Window component extrusion. 394,117, Cl. D25-124.000.

Goss, Lorane, to Mikron Industries, Inc. Window component extrusion. 394,120, Cl. D25-124.000.

Goto, Masaaki: *See—*
- Ninomiya, Shigetada; Goto, Masaaki; and Onoda, Akira, 394,075, Cl. D16-202.000.

Graat, Kenneth T.; and Jones, Donald H., to Lucks Company, The. Commercial baking oven. 393,978, Cl. D7-348.000.

Graat, Kenneth T., to Lucks Company, The. Commercial baking oven door. 393,979, Cl. D7-405.000.

Greene, Pamela S., to Nike, Inc. Side element of a shoe upper. 393,939, Cl. D2-972.000.

Grosfillex, Raymond, to Grosfillex Sarl. Shelving support spindle. 393,966, Cl. D6-495.000.

Grosfillex, Raymond, to Grosfillex Sarl. Shelving support spindle. 393,967, Cl. D6-495.000.

Grosfillex Sarl: *See—*
- Grosfillex, Raymond, 393,966, Cl. D6-495.000.
- Grosfillex, Raymond, 393,967, Cl. D6-495.000.

Groves, George D. Vegetation barrier. 393,989, Cl. D8-1.000.

Gruenbacher, Dana P.; and Wiles, Jerald R., to Procter & Gamble Company, The. Flexible gusseted package. 393,999, Cl. D9-302.000.

Haffly, Shelly: *See—*
- Peebles, Douglas D.; Kornely, David J.; Wasko, Kenneth M.; and Haffly, Shelly, 394,044, Cl. D13-184.000.

Hancock, Gregory P.: *See—*
- McAvinney, Thomas A.; Hancock, Gregory P.; Kehr, Frederick W.; and Townsend, Jeffrey A., 394,072, Cl. D15-148.000.

Hankel, Willi; and Scholl, Winfried, to HEWI Heinrich Wilke GmbH. Handle for doors. 393,994, Cl. D8-302.000.

Hart, Patrick, to Aura Systems, Inc.,. Pair of speaker enclosures. 394,063, Cl. D14-214.000.

Hartzheim, G. Douglas. Bolster bar. 393,997, Cl. D8-354.000.

Hashimoto, Akira: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.

Hayashi, Katsuhiko: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.

Hayashi, Kyo; and Miura, Hitoshi, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Seiko Co., Ltd. Ventilating fan. 394,101, Cl. D23-370.000.

Healthscan Products, Inc.: *See—*
- Bellofatto, Steven; and Salmon, Scott, 394,016, Cl. D10-96.000.

Heartport, Inc.: *See—*
- Miller, Scott H.; and Roth, Alex T., 394,109, Cl. D24-133.000.

Hellhake, Ferdinand F.; Hurayt, Mark S.; and Runyon, Sigmun D., to Freightliner Corporation. Day cab truck exterior surface. 394,026, Cl. D12-96.000.

Hennessy, John P.; Ryan, Howard Scott; and Goff, James A., to Bausch & Lomb Incorporated. Magnifier with gripper handle. 394,073, Cl. D16-135.000.

Henredon Furniture Industries, Inc.: *See—*
- Bergelin, Christopher S., 393,964, Cl. D6-480.000.

Henson, Celia Jane. Beetle sandal. 393,936, Cl. D2-899.000.

Henson, Celia Jane. Spider sandal. 393,937, Cl. D2-899.000.

Herring, Oren. Lockable razor holder. 393,973, Cl. D6-526.000.

HEWI Heinrich Wilke GmbH: *See—*
- Hankel, Willi; and Scholl, Winfried, 393,994, Cl. D8-302.000.

Hines, Peyton H. Comfort headband for headgear. 393,935, Cl. D2-891.000.

Hollinger, David N.: *See—*
- Garcia, Jaime E.; and Hollinger, David N., 394,070, Cl. D15-124.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
- Ban, Tetsuo; and Takahashi, Daisuke, 394,027, Cl. D12-110.000.

Hunter Fan Company: *See—*
- Gee, Jack W., II; and Tsuji, Masao, 394,102, Cl. D23-411.000.
- Gee, Jack W., II; and Tsuji, Masao, 394,104, Cl. D23-411.000.
- Tsuji, Masao, 394,099, Cl. D23-356.000.
- Tsuji, Masao; and Gee, Jack W., II, 394,107, Cl. D23-411.000.

Hurayt, Mark S.: *See—*
- Hellhake, Ferdinand F.; Hurayt, Mark S.; and Runyon, Sigmun D., 394,026, Cl. D12-96.000.

Hwang, In Gil, to Anam Industrial Co., Ltd. Switch. 394,042, Cl. D13-171.000.

Ifuji, Takashi: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.

Iino, Masaaki, to Kabushiki Kaisha Toshiba. Electronic computer. 394,045, Cl. D14-106.000.

Inami, Ushio, to Kabushiki Kaisha Toshiba. Keyboard for electronic computers. 394,054, Cl. D14-115.000.

Industrie Natuzzi, Spa: *See—*
- Natuzzi, Pasquale; and Scarati, Arcangelo, 393,957, Cl. D6-381.000.

Instron Corporation: *See—*
- Kellstedt, Charles W., Jr.; and Lieblein, Joel M., 394,015, Cl. D10-83.000.

Ishizuka, Akihiko: *See—*
- Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089. Cl. D20-10.000.

Ito, Masafumi; Takita, Haruki; and Takashima, Katsuhiro, to Teac Corporation. Digital audio tape recorder. 394,059, Cl. D14-164.000.

Iverson, Spencer. Toothpick. 394,130, Cl. D28-64.000.

Jarrell, Robert B., to Mikron Industries, Inc. Window component extrusion. 394,119, Cl. D25-124.000.

JB Research, Inc.: *See—*
- Loud, Craig M., 393,976, Cl. D6-601.000.

Jenkins, Larry G.; and Dukes, Gary L. Retractable round card table top. 393,969, Cl. D6-511.000.

Jobes, Jim: *See—*
- Geier, James; and Jobes, Jim, 393,959, Cl. D6-457.000.
- Geier, James; and Jobes, Jim, 393,960, Cl. D6-457.000.

Joergensen, Carsten, to PI-Design AG. Cheese grater. 393,986, Cl. D7-678.000.

John Manufacturing Limited: *See—*
- Yuen, Se Kit, 394,123, Cl. D26-44.000.

Johnson & Johnson Consumer Products, Inc.: *See—*
- Walsh, Stacy; and Stowell, Davin, 394,113, Cl. D24-197.000.

Johnson, Walter M., III, to Net/Werk/USA, Inc. Self locking strap buckle. 394,024, Cl. D11-218.000.

Jones, Donald H.: *See—*
- Graat, Kenneth T.; and Jones, Donald H., 393,978, Cl. D7-348.000.

Julian, Joseph G. Telephone handset sanitary guard. 394,066, Cl. D14-250.000.

Jyoroku, Kazuo, to Mita Industrial Co., Ltd. Toner cartridge. 394,083, Cl. D18-43.000.

Kabushiki Kaisha Toshiba: *See—*
- Iino, Masaaki, 394,045, Cl. D14-106.000.
- Inami, Ushio, 394,054, Cl. D14-115.000.
- Kurokawa, Mayumi, 394,046, Cl. D14-107.000.
- Yamanouchi, Toshiyuki, 394,074, Cl. D16-202.000.

Kane, Brian, to Carnegie Fabrics, Inc. Chair. 393,956, Cl. D6-334.000.

Kato, Taro, to Cris-Metal Móveis Para Banheiro Ltda. Toilet paper holder. 393,972, Cl. D6-523.000.

Kato, Yuji, to Tomy Company, Ltd. Toy plane. 394,090, Cl. D21-87.000.

Kato, Yuji, to Tomy Company, Ltd. Toy car remote control device. 394,092, Cl. D12-141.100.

Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, to Fujitsu General Limited; and Fujitsu Limited. Display device. 394,089, Cl. D20-10.000.

Kehr, Frederick W.: *See—*
- McAvinney, Thomas A.; Hancock, Gregory P.; Kehr, Frederick W.; and Townsend, Jeffrey A., 394,072, Cl. D15-148.000.

Kellermann, Robert F. Pro grid/iron griddle. 393,980, Cl. D7-409.000.

Kellstedt, Charles W., Jr.; and Lieblein, Joel M., to Instron Corporation. Hardness tester. 394,015, Cl. D10-83.000.

Kon, Yukio. Pump for moving liquid through a tube. 394,067, Cl. D15-7.000.

Kornely, David J.: *See—*
- Peebles, Douglas D.; Kornely, David J.; Wasko, Kenneth M.; and Haffly, Shelly, 394,044, Cl. D13-184.000.

Kuan, Frank C. Float. 394,095, Cl. D21-237.000.

Kurokawa, Mayumi, to Kabushiki Kaisha Toshiba. Data transfer machine for a computer. 394,046, Cl. D14-107.000.

Labute, Maurice H. Drum percussion device. 394,078, Cl. D17-22.000.

Laib, Douglas M., to Dart Industries Inc. Measuring spoon. 394,014, Cl. D10-46.200.

Landlove Industries, Ltd.: *See—*
- Vilos, Sophie, 394,001, Cl. D9-347.000.

Larian, Isaac, to ABC International Traders, Inc. Virtual reality walkie talkie. 394,056, Cl. D14-124.000.

Lassan, Timothy J.; Wallet, Bill J.; and Molnar, Joseph F., to Bridgestone/Firestone, Inc. Tire tread. 394,030, Cl. D12-147.000.

Lawrence, Jay Kevin: *See—*
- Galante, Richard Louis; Windham, Terrell Dean; Nowacki, Colleen Anne; and Lawrence, Jay Kevin, 394,031, Cl. D12-147.000.

Lawson Mardon Picopac B.V.: *See—*
- Marijnissen, Koert, 394,005, Cl. D9-416.000.

Le Creuset S.A.: *See—*
- De Bergen, Stephane, 393,993, Cl. D8-43.000.

Lee, Ching-Tan. Combined ceiling fan motor housing and light. 394,103, Cl. D23-411.000.

Lee, James, to Organize It All. Door-mounted cap rack. 393,970, Cl. D6-514.000.

Lee, Myunghoon, to Comtec Systems Co. Ltd. Liquid crystal display. 394,048, Cl. D14-113.000.

Leedy, Curtis B. Dart pen. 394,085, Cl. D19-42.000.

Leung, Szu Pui, to Stelex Electronics Company Limited. Calculator with container for stationery kit. 394,079, Cl. D18-7.000.

Lewis, Sally Sirkin. Seat. 393,952, Cl. D6-334.000.

LG Electronics Inc.: *See—*
- Cho, Yoon-Young, 394,098, Cl. D23-353.000.

Liaklev, Geir Jørn, to O. Mustad & Son. Track for storing fish hooks. 393,942, Cl. D3-260.000.

Liao, Shangshyan S.; and Schumaker, Nevenka, to Ford Global Technologies, Inc. Front panel for an automotive climate control. 394,017, Cl. D10-103.000.

Lieblein, Joel M.: *See—*
- Kellstedt, Charles W., Jr.; and Lieblein, Joel M., 394,015, Cl. D10-83.000.

Lipkowitz, John M., to Rio Properties, Inc. Party tray. 393,981, Cl. D7-553.000.

Litton, Garfield, to Revlon Consumer Products Corporation. Nail file. 394,129, Cl. D28-59.000.

Litton, Garfield, to Revlon Consumer Products Corporation. Compact case. 394,131, Cl. D28-82.000.

Lockhart, Larry, to Shelter Pro, LLC. Concealment tape. 393,950, Cl. D5-64.000.

Loud, Craig M., to JB Research, Inc. Massaging system seat cushion. 393,976, Cl. D6-601.000.

Lucent Technologies Inc.: *See—*
- Nuttall, Michael John; Robinette, Christopher A.; and Schaffeld, John Henry, 394,065, Cl. D14-248.000.

Lucks Company, The: *See—*
- Graat, Kenneth T.; and Jones, Donald H., 393,978, Cl. D7-348.000.
- Graat, Kenneth T., 393,979, Cl. D7-405.000.

Lynd, L. Grant, to National Packaging Corporation. Squeeze bottle. 394,010, Cl. D9-531.000.

M. H. Rhodes, Inc.: *See—*
- Morelli, Joseph L.; and Mendes, Helen M., 394,013, Cl. D10-40.000.

Mackert, Ross Austin; and Amundson, Neil Thomas, to Ecolab Inc. Decorative housing. 394,124, Cl. D26-85.000.

Mansour, James, to Sony Corporation; and Sony Corp. of America. Video display cart. 393,963, Cl. D6-478.000.

Marijnissen, Koert, to Lawson Mardon Picopac B.V. Container. 394,005, Cl. D9-416.000.

OL
2 10
SS
1
MY
5
998
MI

- Matsumura, Yoshiyuki; and Chih, Chien Chun, to Canon Kabushiki Kaisha. Camera. 394,076, Cl. D16-209.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Hayashi, Kyo; and Miura, Hitoshi, 394,101, Cl. D23-370.000.
  - Ninomiya, Shigetada; Goto, Masaaki; and Onoda, Akira, 394,075, Cl. D16-202.000.
- Matsushita Seiko Co., Ltd.: *See—*
  - Hayashi, Kyo; and Miura, Hitoshi, 394,101, Cl. D23-370.000.
- Matye, Randy P. Earring. 394,021, Cl. D11-44.000.
- Mauffette, Claude, to Atlantech Inc. Car mat. 394,036, Cl. D12-203.000.
- Mauffette, Claude, to Atlantech Inc. Car mat. 394,037, Cl. D12-203.000.
- Maxwell, Paul Bryan, to Goodyear Tire & Rubber Company, The. Tire tread. 394,032, Cl. D12-147.000.
- McAvinney, Thomas A.; Hancock, Gregory P.; Kehr, Frederick W.; and Townsend, Jeffrey A., to General Signal Corporation. Drive for an industrial mixer. 394,072, Cl. D15-148.000.
- McClure, Eric Thomas: *See—*
  - Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, 393,968, Cl. D6-500.000.
- Mead, Mike L. Combined toothbrush cleaner and holder. 394,133, Cl. D32-35.000.
- Meade, John, to Boston Technology, Inc. Icon for a computer display. 394,052, Cl. D14-114.500.
- Meade, John, to Boston Technology, Inc. Icon for a computer display. 394,053, Cl. D14-114.500.
- Meccano, S.A.: *See—*
  - Urvoy, Jean-Jacques, 393,945, Cl. D3-282.000.
- Mendes, Helen M.: *See—*
  - Morelli, Joseph L.; and Mendes, Helen M., 394,013, Cl. D10-40.000.
- Mikron Industries, Inc.: *See—*
  - Goss, Lorane, 394,117, Cl. D25-124.000.
  - Goss, Lorane, 394,120, Cl. D25-124.000.
  - Jarrell, Robert B., 394,119, Cl. D25-124.000.
- Miller, Scott H.; and Roth, Alex T., to Heartport, Inc. Bi-leaf surgical instrument handle. 394,109, Cl. D24-133.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Barrette, David W., 394,049, Cl. D14-114.000.
- Mita Industrial Co., Ltd.: *See—*
  - Jyoroku, Kazuo, 394,083, Cl. D18-43.000.
- Miura, Hitoshi: *See—*
  - Hayashi, Kyo; and Miura, Hitoshi, 394,101, Cl. D23-370.000.
- Molnar, Joseph F.: *See—*
  - Lassan, Timothy J.; Wallet, Bill J.; and Molnar, Joseph F., 394,030, Cl. D12-147.000.
- Molo, Nicholas J., to Dart Industries Inc. Pizza cutter. 393,987, Cl. D7-694.000.
- Moncourtois, Dominique; and Vandenbussche, Francis, to Chanel, S.A. Combined lighted booth and mirror. 393,958, Cl. D6-444.000.
- Morelli, Joseph L.; and Mendes, Helen M., to M. H. Rhodes, Inc. Tooth brushing timer. 394,013, Cl. D10-40.000.
- Morelli, Michel, to Corporation in Glass Co Ltd. Display box. 394,002, Cl. D9-415.000.
- Motorola, Inc.: *See—*
  - Peebles, Douglas D.; Kornely, David J.; Wasko, Kenneth M.; and Haffly, Shelly, 394,044, Cl. D13-184.000.
- Muranen, Martti, to Tamrock OY. Cabin for a drilling machine. 394,069, Cl. D15-30.000.
- Nagata, Kazuteru; and Seki, Hiroo, to Fuji Xerox Co., Ltd. Sorter for copying machine. 394,084, Cl. D18-47.000.
- Nakamura, Yasushi, to Shimano Inc. Bicycle chain. 394,028, Cl. D12-124.000.
- National Packaging Corporation: *See—*
  - Lynd, L. Grant, 394,010, Cl. D9-531.000.
- Natuzzi, Pasquale; and Scarati, Arcangelo, to Industrie Natuzzi, Spa. Seat. 393,957, Cl. D6-381.000.
- Nelson, Philip L.: *See—*
  - Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,008, Cl. D9-448.000.
  - Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,009, Cl. D9-448.000.
- Net/Werk/USA, Inc.: *See—*
  - Johnson, Walter M., III, 394,024, Cl. D11-218.000.
- Nike, Inc.: *See—*
  - Greene, Pamela S., 393,939, Cl. D2-972.000.
- Nimpoeno, Roy: *See—*
  - Alves, Kasidy W.; and Nimpoeno, Roy, 393,947, Cl. D3-303.000.
- Ninomiya, Shigetada; Goto, Masaaki; and Onoda, Akira, to Matsushita Electric Industrial Co., Ltd. Video camera with video tape recorder. 394,075, Cl. D16-202.000.
- Nivin, Donna: *See—*
  - Nivin, John D.; and Nivin, Donna, 394,097, Cl. D23-309.000.
- Nivin, John D.; and Nivin, Donna. Toilet seat lifter. 394,097, Cl. D23-309.000.
- Northern Falls Water Company, L.L.C.: *See—*
  - Finch, Michael J., 394,011, Cl. D9-538.000.
- Nowacki, Colleen Anne: *See—*
  - Galante, Richard Louis; Windham, Terrell Dean; Nowacki, Colleen Anne; and Lawrence, Jay Kevin, 394,031, Cl. D12-147.000.
- Nuttall, Michael John; Robinette, Christopher A.; and Schaffeld, John Henry, to Lucent Technologies Inc. Portable telephone handset. 394,065, Cl. D14-248.000.
- O. Mustad & Son: *See—*
  - Liaklev, Geir Jørn, 393,942, Cl. D3-260.000.
- O'Banion, Michael L.: *See—*
  - Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.
- Ochs, Mark: *See—*
  - Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,008, Cl. D9-448.000.
  - Foster, Donald D.; Nelson, Philip L.; and Ochs, Mark, 394,009, Cl. D9-448.000.
- O'Neal, Michael; Sabahi, Dara; and Tauber, Michael, to California Institute of Technology. Mars aeroshell. 394,040, Cl. D12-325.000.
- Onoda, Akira: *See—*
  - Ninomiya, Shigetada; Goto, Masaaki; and Onoda, Akira, 394,075, Cl. D16-202.000.
- Organize It All: *See—*
  - Lee, James, 393,970, Cl. D6-514.000.
- Palenchar, Thomas J.: *See—*
  - Stosel, Dennis E.; and Palenchar, Thomas J., 394,035, Cl. D12-163.000.
- Parker Medical Associates: *See—*
  - Duback, Jeffrey E.; and Friday, Mark G., 394,112, Cl. D24-192.000.
- Parker Medical Associates Limited Partnership: *See—*
  - Duback, Jeffrey E.; and Friday, Mark G., 394,110, Cl. D24-192.000.
  - Duback, Jeffrey E.; and Friday, Mark G., 394,111, Cl. D24-192.000.
- Parry, Stuart. Toy construction piece. 394,091, Cl. D21-108.000.
- Peebles, Douglas D.; Kornely, David J.; Wasko, Kenneth M.; and Haffly, Shelly, to Motorola, Inc. Front panel for infrastructure equipment. 394,044, Cl. D13-184.000.
- Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, to Steelcase Inc. Chair. 393,968, Cl. D6-500.000.
- Pfeiffer, Peter: *See—*
  - Sacco, Bruno; and Pfeiffer, Peter, 393,996, Cl. D8-347.000.
- PI-Design AG: *See—*
  - Joergensen, Carsten, 393,986, Cl. D7-678.000.
- Pingel, Donna: *See—*
  - Pingel, Wayne; and Pingel, Donna, 394,033, Cl. D12-114.000.
- Pingel Enterprise, Inc.: *See—*
  - Pingel, Wayne; and Pingel, Donna, 394,033, Cl. D12-114.000.
- Pingel, Wayne; and Pingel, Donna, to Pingel Enterprise, Inc. Brace for wheelie bar. 394,033, Cl. D12-114.000.
- Piretti, Giancarlo, to Pro-Cord S.r.l. Chair. 393,955, Cl. D6-373.000.
- Plummer, David D., to Andersen Corporation. Picture window. 394,116, Cl. D25-52.000.
- Plummer, David D.: *See—*
  - Bruchu, Todd W.; and Plummer, David D., 394,115, Cl. D25-52.000.
- Pollrich, Volker; and Barowsky, Helmut, to Bitzer Kuehlmaschinenbau GmbH & Co. KG. Compressor. 394,068, Cl. D15-9.000.
- Pollyflame International B.V.: *See—*
  - Dijkstra, Tjeerd, 394,060, Cl. D14-170.000.
- Porter, David A.: *See—*
  - Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.
- Prince Manufacturing, Inc.: *See—*
  - Davis, Stephen J.; and Terzaghi, André, 394,094, Cl. D21-212.000.
- Pro-Cord S.r.l.: *See—*
  - Piretti, Giancarlo, 393,955, Cl. D6-373.000.
- Procter & Gamble Company, The: *See—*
  - Gruenbacher, Dana P.; and Wiles, Jerald R., 393,999, Cl. D9-302.000.
  - Toleman, James Robert, 394,006, Cl. D9-435.000.
- Promseeda, Watcharin, to Wanavit Group. Air cleaner. 394,100, Cl. D23-364.000.
- Pulitano, Frank. Table top organizer for condiment containers, menus and napkins. 393,982, Cl. D7-590.000.
- Pulitano, Frank. Table top organizer for condiment containers and napkins. 393,983, Cl. D7-590.000.
- Puzio, Daniel: *See—*
  - Ceroll, Warren A.; Gehret, Robert S.; Puzio, Daniel; Bean, Frederick R.; O'Banion, Michael L.; Porter, David A.; and Ferrara, Daniel A., Jr., 394,071, Cl. D15-133.000.
- Quorum International: *See—*
  - Davis, William S., Jr., 394,105, Cl. D23-411.000.
  - Webb, Jill, 394,106, Cl. D23-411.000.
- R.S.V. Sport, Inc.: *See—*
  - Geliebter, Mel B., 394,025, Cl. D11-226.000.
- Ravenscroft, Samantha A. Household screen. 393,951, Cl. D6-332.000.
- Revlon Consumer Products Corporation: *See—*
  - Litton, Garfield, 394,129, Cl. D28-59.000.
  - Litton, Garfield, 394,131, Cl. D28-82.000.
- Rio Properties, Inc.: *See—*
  - Lipkowitz, John M., 393,981, Cl. D7-553.000.
- Robinette, Christopher A.: *See—*
  - Nuttall, Michael John; Robinette, Christopher A.; and Schaffeld, John Henry, 394,065, Cl. D14-248.000.
- Rogers, Ian Derrick. Plate holder. 393,988, Cl. D7-701.000.
- Roth, Alex T.: *See—*
  - Miller, Scott H.; and Roth, Alex T., 394,109, Cl. D24-133.000.
- Rowe, Gretchen A.: *See—*

  - Rowe, Jacqueline A.; and Rowe, Gretchen A., 394,000, Cl. D9-337.000.
- Rowe, Jacqueline A.; and Rowe, Gretchen A. Dispensing container for denture cleaner. 394,000, Cl. D9-337.000.
- Runyon, Sigmun D.: *See—*
  - Hellbake, Ferdinand F.; Hurayt, Mark S.; and Runyon, Sigmun D., 394,026, Cl. D12-96.000.
- Ryan, Howard Scott: *See—*
  - Hennessy, John P.; Ryan, Howard Scott; and Goff, James A., 394,073, Cl. D16-135.000.
- S. T. Dupont S.A.: *See—*
  - Compte, Philippe, 394,086, Cl. D19-51.000.
- Sabahi, Dara: *See—*
  - O'Neal, Michael; Sabahi, Dara; and Tauber, Michael, 394,040, Cl. D12-325.000.
- Sacco, Bruno; and Pfeiffer, Peter, to Daimler-Benz Aktiengesellschaft. Key. 393,996, Cl. D8-347.000.
- Salmon, Scott: *See—*
  - Bellofatto, Steven; and Salmon, Scott, 394,016, Cl. D10-96.000.
- Salton-Maxim Housewares, Inc.: *See—*
  - Davis, Omar, 393,974, Cl. D6-544.000.
- Sandy, Hal. End panel for shelving, tables, and furniture. 393,965, Cl. D6-492.000.
- Scarati, Arcangelo: *See—*
  - Natuzzi, Pasquale; and Scarati, Arcangelo, 393,957, Cl. D6-381.000.
- Schaffeld, John Henry: *See—*
  - Nuttall, Michael John; Robinette, Christopher A.; and Schaffeld, John Henry, 394,065, Cl. D14-248.000.
- Scholl, Winfried: *See—*
  - Hankel, Willi; and Scholl, Winfried, 393,994, Cl. D8-302.000.
- Schulz, Galyn A.; Wiese, Pamela J.; and Dwiggins, John H., to Fort James Corporation. Pattern for an embossed paper product. 393,949, Cl. D5-53.000.
- Schumaker, Nevenka: *See—*
  - Liao, Shangshyan S.; and Schumaker, Nevenka, 394,017, Cl. D10-103.000.
- Scientific-Atlanta, Inc.: *See—*
  - Spriester, Bart; and Chi-Jui, Huang, 394,041, Cl. D13-123.000.
- Scosche Industries, Inc.: *See—*
  - Alves, Kasidy W.; and Nimpoeno, Roy, 393,947, Cl. D3-303.000.
- Seid, Barre, to Tri-Lite, Inc. Dock light. 394,121, Cl. D26-28.000.
- Seki, Hiroo: *See—*
  - Nagata, Kazuteru; and Seki, Hiroo, 394,084, Cl. D18-47.000.
- Shaw, Donald. Wall mounted planter. 394,023, Cl. D11-151.000.
- Shelter Pro, LLC: *See—*
  - Lockhart, Larry, 393,950, Cl. D5-64.000.
- Shimano Inc.: *See—*
  - Nakamura, Yasushi, 394,028, Cl. D12-124.000.
- Silmar S.P.A.: *See—*
  - Cerato, Silverio, 394,019, Cl. D11-13.000.
  - Cerato, Silverio, 394,020, Cl. D11-13.000.
- Smith, Kim C., to AST Research, Inc. User interface icon for a display screen. 394,051, Cl. D14-114.300.
- Snider, Gregory Scott: *See—*
  - Concari, Gabriel E.; and Snider, Gregory Scott, 394,122, Cl. D26-38.000.
- Sony Corporation: *See—*
  - Funawatari, Takatsugu, 394,050, Cl. D14-114.000.
  - Mansour, James, 393,963, Cl. D6-478.000.
- Sony Corp. of America: *See—*
  - Mansour, James, 393,963, Cl. D6-478.000.
- Spaeth, Susan Marie: *See—*
  - Feider, Georges Gaston; Gillard, Jean-Michel; and Spaeth, Susan Marie, 394,034, Cl. D12-147.000.
- Spotswood, Ashley Wiltshire, to Village Smith, L.P. Chair base. 393,962, Cl. D6-499.000.
- Spriester, Bart; and Chi-Jui, Huang, to Scientific-Atlanta, Inc. Cable radio frequency signal splitter. 394,041, Cl. D13-123.000.
- Springer, Sharon A. Chair cover. 393,977, Cl. D6-610.000.
- Steelcase Inc.: *See—*
  - Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, 393,968, Cl. D6-500.000.
- Steffens, James P.: *See—*
  - Penning, Kenneth James; Arko, Robert Peter; McClure, Eric Thomas; Steffens, James P.; and Drelles, Mark Scott, 393,968, Cl. D6-500.000.
- Stelex Electronics Company Limited: *See—*
  - Leung, Szu Pui, 394,079, Cl. D18-7.000.
- Stosel, Dennis E.; and Palenchar, Thomas J., to Volvo GM Heavy Truck Corporation. Vehicle air intake grille. 394,035, Cl. D12-163.000.
- Stowell, Davin: *See—*
  - Walsh, Stacy; and Stowell, Davin, 394,113, Cl. D24-197.000.,
- Stowell, William V. Combined carrying case and display stand. 393,944, Cl. D3-276.000.
- Suncast Corporation: *See—*
  - Tisbo, Thomas A.; and Whitehead, Stephen P., 393,991, Cl. D8-10.000.
  - Whitehead, Stephen P.; Anderson, Torrence; and Uffner, Michael G., 393,961, Cl. D6-464.000.
  - Whitehead, Stephen P.; Vogler, Michael R.; and Anderson, Torrence C., 393,990, Cl. D8-10.000.
- Suorsa, Peter A. Eyeglasses. 394,077, Cl. D16-306.000.
- Takahashi, Daisuke: *See—*
  - Ban, Tetsuo; and Takahashi, Daisuke, 394,027, Cl. D12-110.000.
- Takashima, Katsuhiro: *See—*
  - Ito, Masafumi; Takita, Haruki; and Takashima, Katsuhiro, 394,059, Cl. D14-164.000.
- Takita, Haruki: *See—*
  - Ito, Masafumi; Takita, Haruki; and Takashima, Katsuhiro, 394,059, Cl. D14-164.000.
- Tamrock OY: *See—*
  - Muranen, Martti, 394,069, Cl. D15-30.000.
- Tanner, Brian S. Jewelry clasp. 394,022, Cl. D11-87.000.
- Tashiro, Naoki; and Chiba, Toshimi, to Canon Kabushiki Kaisha. Image forming apparatus. 394,082, Cl. D18-43.000.
- Tate, John. Golf repair tool and ball marker presentation case. 394,003, Cl. D9-415.000.
- Tate, John. Golf repair tool and ball marker presentation case. 394,004, Cl. D9-415.000.
- Tauber, Michael: *See—*
  - O'Neal, Michael; Sabahi, Dara; and Tauber, Michael, 394,040, Cl. D12-325.000.
- Teac Corporation: *See—*
  - Ito, Masafumi; Takita, Haruki; and Takashima, Katsuhiro, 394,059, Cl. D14-164.000.
- Terzaghi, André: *See—*
  - Davis, Stephen J.; and Terzaghi, André, 394,094, Cl. D21-212.000.
- Thompson Lock & Supply Corporation: *See—*
  - Thompson, Robert L., 393,995, Cl. D8-331.000.
- Thompson, Robert L., to Thompson Lock & Supply Corporation. Display case lock. 393,995, Cl. D8-331.000.
- Thomson Consumer Electronics: *See—*
  - Bourgerie, Richard A., 394,057, Cl. D14-128.000.
- Tisbo, Thomas A.; and Whitehead, Stephen P., to Suncast Corporation. Snow scoop. 393,991, Cl. D8-10.000.
- Toleman, James Robert, to Procter & Gamble Company, The. Bottle cap. 394,006, Cl. D9-435.000.
- Tomy Company, Ltd.: *See—*
  - Kato, Yuji, 394,090, Cl. D21-87.000.
  - Kato, Yuji, 394,092, Cl. D12-141.100.
- Townsend, Jeffrey A.: *See—*
  - McAvinney, Thomas A.; Hancock, Gregory P.; Kehr, Frederick W.; and Townsend, Jeffrey A., 394,072, Cl. D15-148.000.
- Tri-Lite, Inc.: *See—*
  - Seid, Barre, 394,121, Cl. D26-28.000.
- Tsuji, Masao, to Hunter Fan Company. Humidifier. 394,099, Cl. D23-356.000.
- Tsuji, Masao; and Gee, Jack W., II, to Hunter Fan Company. Center band for a ceiling fan. 394,107, Cl. D23-411.000.
- Tsuji, Masao: *See—*
  - Gee, Jack W., II; and Tsuji, Masao, 394,102, Cl. D23-411.000.
  - Gee, Jack W., II; and Tsuji, Masao, 394,104, Cl. D23-411.000.
- Tyler, Kelly D. Memory pack for video games. 394,055, Cl. D14-121.000.
- Uffner, Michael G.: *See—*
  - Whitehead, Stephen P.; Anderson, Torrence; and Uffner, Michael G., 393,961, Cl. D6-464.000.
- UMAX Data Systems Inc.: *See—*
  - Chang, Jack; and Chen, Tony, 394,047, Cl. D14-107.000.
- Urvoy, Jean-Jacques, to Meccano, S.A. Carrying case. 393,945, Cl. D3-282.000.
- Vandenbussche, Francis: *See—*
  - Moncourtois, Dominique; and Vandenbussche, Francis, 393,958, Cl. D6-444.000.
- Van Gendt, Patrick: *See—*
  - Bunschoten, Gerrit K.; and Van Gendt, Patrick, 393,975, Cl. D6-545.000.
- Vasconcelos, Osvaldo M.: *See—*
  - Campanella, Vincent; and Vasconcelos, Osvaldo M., 394,043, Cl. D13-179.000.
- Village Smith, L.P.: *See—*
  - Spotswood, Ashley Wiltshire, 393,962, Cl. D6-499.000.
- Vilos, Sophie, to Landlove Industries, Ltd. Food container. 394,001, Cl. D9-347.000.
- Vogler, Michael R.: *See—*
  - Whitehead, Stephen P.; Vogler, Michael R.; and Anderson, Torrence C., 393,990, Cl. D8-10.000.
- Volvo GM Heavy Truck Corporation: *See—*
  - Stosel, Dennis E.; and Palenchar, Thomas J., 394,035, Cl. D12-163.000.
- Wakefield Engineering, Inc.: *See—*
  - Campanella, Vincent; and Vasconcelos, Osvaldo M., 394,043, Cl. D13-179.000.
- Wallet, Bill J.: *See—*
  - Lassan, Timothy J.; Wallet, Bill J.; and Molnar, Joseph F., 394,030, Cl. D12-147.000.
- Walsh, Stacy; and Stowell, Davin, to Johnson & Johnson Consumer Products, Inc. Baby bottle. 394,113, Cl. D24-197.000.
- Wanavit Group: *See—*
  - Promseeda, Watcharin, 394,100, Cl. D23-364.000.
- Wasko, Kenneth M.: *See—*
  - Peebles, Douglas D.; Kornely, David J.; Wasko, Kenneth M.; and Haffly, Shelly, 394,044, Cl. D13-184.000.
- Webb, Jill, to Quorum International. Medallion for use on a ceiling fan. 394,106, Cl. D23-411.000.
- West, Donavan J. Automotive splined clutch alignment tool. 393,992, Cl. D8-14.000.

- Whitehead, Stephen P.; Anderson, Torrence; and Uffner, Michael G., to Suncast Corporation. Mini ball rack with five poles. 393,961, Cl. D6-464.000.
- Whitehead, Stephen P.; Vogler, Michael R.; and Anderson, Torrence C., to Suncast Corporation. Telescoping snow shovel for vehicles. 393,990, Cl. D8-10.000.
- Whitehead, Stephen P.: *See—*
  - Tisbo, Thomas A.; and Whitehead, Stephen P., 393,991, Cl. D8-10.000.
- Wiese, Pamela J.: *See—*
  - Schulz, Galyn A.; Wiese, Pamela J.; and Dwiggins, John H., 393,949, Cl. D5-53.000.
- Wiles, Jerald R.: *See—*
  - Gruenbacher, Dana P.; and Wiles, Jerald R., 393,999, Cl. D9-302.000.
- Windham, Terrell Dean: *See—*
  - Galante, Richard Louis; Windham, Terrell Dean; Nowacki, Colleen Anne; and Lawrence, Jay Kevin, 394,031, Cl. D12-147.000.
- Windsor Industries, Inc.: *See—*
  - Fink, David, 394,061, Cl. D14-170.000.
- Y & H Industrial Limited: *See—*
  - Chan, Yip Kwong, 394,080, Cl. D18-19.000.
- Yamaguchi, Hidefumi: *See—*
  - Kawasaki, Kazuo; Hashimoto, Akira; Hayashi, Katsuhiko; Ishizuka, Akihiko; Yamaguchi, Hidefumi; and Ifuji, Takashi, 394,089, Cl. D20-10.000.
- Yamanouchi, Toshiyuki, to Kabushiki Kaisha Toshiba. Electronic still camera. 394,074, Cl. D16-202.000.
- Yuen, Se Kit, to John Manufacturing Limited. Twins spotlight. 394,123, Cl. D26-44.000.
- 555 Design Fabrication Management, Inc.: *See—*
  - Geier, James; and Jobes, Jim, 393,959, Cl. D6-457.000.

LIST OF PLANT PATENTEES

- Adam, Sinclair A., Jr. Philox plant named 'Shortwood'. 10,379, Cl. Plt.-87.700.
- Barnhoorn, Andre, to Hadeco (Pty.) Ltd. Hippeastrum (amaryllis) plant named 'Rozetta'. 10,373, Cl. Plt.-68.100.
- Barnhoorn, Andre, to Hadeco (Pty.) Ltd. Hippeastrum (Amaryllis) plant named 'Double six'. 10,374, Cl. Plt.-68.100.
- Bos, Henny. Vriesia plant named 'Prominent'. 10,382, Cl. Plt.-88.800.
- Bos, Henny. Guzmania plant named 'Sunstar'. 10,383, Cl. Plt.-88.800.
- Burr, Jay B.: *See—*
  - Meier, Virgil D.; and Burr, Jay B., 10,384, Cl. Plt.-90.200.
- Clearwater Nursery, Inc.: *See—*
  - Hesse, Peter S., 10,376, Cl. Plt.-82.300.
- Ebihara, Hiroshi, to Miyoshi & Co. Ltd. Hydrangea plant named 'Frau Nobuko'. 10,371, Cl. Plt.-67.100.
- Ebihara, Hiroshi, to Miyoshi & Co. Ltd. Hydrangea plant named 'Frau Taiko'. 10,372, Cl. Plt.-67.100.
- Funakoshi, Hidefumi: *See—*
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,377, Cl. Plt.-84.000.
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,378, Cl. Plt.-84.000.
- Glicenstein, Leon, to Yoder Brothers, Inc. Chrysanthemum plant named 'Arabella'. 10,375, Cl. Plt.-78.000.
- Goldsmith Seeds, Inc.: *See—*
  - Hanes, Mitchell Eugene, 10,380, Cl. Plt.-87.120.
- Hadeco (Pty.) Ltd.: *See—*
  - Barnhoorn, Andre, 10,373, Cl. Plt.-68.100.
  - Barnhoorn, Andre, 10,374, Cl. Plt.-68.100.
- Hanes, Mitchell Eugene, to Goldsmith Seeds, Inc. Geranium named 'Free Light Lau'. 10,380, Cl. Plt.-87.120.
- Hesse, Peter S., to Clearwater Nursery, Inc. Chrysanthemum plant named 'Orange State'. 10,376, Cl. Plt.-82.300.
- Jepsen, Knud, to Knud Jepsen A/S. Kalanchoe plant named 'Sofie' . 10,381, Cl. Plt.-87.150.
- Knud Jepsen A/S: *See—*
  - Jepsen, Knud, 10,381, Cl. Plt.-87.150.
- Meier, Virgil D.; and Burr, Jay B., to OMS Investments, Inc. Ba 78-258 Kentucky Bluegrass. 10,384, Cl. Plt.-90.200.
- Miyoshi & Co. Ltd.: *See—*
  - Ebihara, Hiroshi, 10,371, Cl. Plt.-67.100.
  - Ebihara, Hiroshi, 10,372, Cl. Plt.-67.100.
- Nishinomiya City: *See—*
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,377, Cl. Plt.-84.000.
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,378, Cl. Plt.-84.000.
- Nose, Kenkichi: *See—*
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,377, Cl. Plt.-84.000.
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,378, Cl. Plt.-84.000.
- OMS Investments, Inc.: *See—*
  - Meier, Virgil D.; and Burr, Jay B., 10,384, Cl. Plt.-90.200.
- Panzer, Fred, to Panzer Nursey, Inc. Azalea—'Jean Panzer'. 10,370, Cl. Plt.-57.000.
- Panzer Nursey, Inc.: *See—*
  - Panzer, Fred, 10,370, Cl. Plt.-57.000.
- Sakazaki, Ushio: *See—*
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,377, Cl. Plt.-84.000.
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,378, Cl. Plt.-84.000.
- Suntory Limited: *See—*
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,377, Cl. Plt.-84.000.
  - Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, 10,378, Cl. Plt.-84.000.
- Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, to Suntory Limited; and Nishinomiya City. Fuchsia plant, Sanistanf. 10,377, Cl. Plt.-84.000.
- Tanaka, Toshi; Funakoshi, Hidefumi; Nose, Kenkichi; and Sakazaki, Ushio, to Suntory Limited; and Nishinomiya City. Fuchsia plant, Sanihanf. 10,378, Cl. Plt.-84.000.
- Yoder Brothers, Inc.: *See—*
  - Glicenstein, Leon, 10,375, Cl. Plt.-78.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
5th DAY OF MAY, 1998

- Biller, Scott A.; Lawrence, R. Michael; and Poss, Michael A., to Bristol-Myers Squibb Company. Method for preparing compounds employing solid phase synthesis and novel linker-resin. H1,729, Cl. 525-54.110.
- Boyle, Damon J.: *See—*
  - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Bristol-Myers Squibb Company: *See—*
  - Biller, Scott A.; Lawrence, R. Michael; and Poss, Michael A., H1,729, Cl. 525-54.110.
- Chen, Victor C. CFAR time-frequency processor for signal detection and extraction in noise. H1,726, Cl. 342-93.000.
- Davis, Scott R.: *See—*
  - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Jones, Gregory K.; and Shepard, Mary E. Heat sealable packaging materials having a peelable, easy-opening feature. H1,727, Cl. 428-35.700.
- Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., to United States of America. Navy. Simulator. H1,728, Cl. 434-43.000.
- Lawrence, R. Michael: *See—*
  - Biller, Scott A.; Lawrence, R. Michael; and Poss, Michael A., H1,729, Cl. 525-54.110.
- Lee, Gim: *See—*
  - Modic, Michael John; Wroczynski, Ronald; Scobbo, James; and Lee, Gim, H1,725, Cl. 252-1.000.
- Modic, Michael John; Wroczynski, Ronald; Scobbo, James; and Lee, Gim, to Shell Oil Company. Clear polyphenylene ether/block copolymer composition. H1,725, Cl. 252-1.000.
- Perdue, David T.: *See—*
  - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Poss, Michael A.: *See—*
  - Biller, Scott A.; Lawrence, R. Michael; and Poss, Michael A., H1,729, Cl. 525-54.110.
- Pratz, Gary L.: *See—*
  - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Scobbo, James: *See—*
  - Modic, Michael John; Wroczynski, Ronald; Scobbo, James; and Lee, Gim, H1,725, Cl. 252-1.000.
- Shell Oil Company: *See—*
  - Modic, Michael John; Wroczynski, Ronald; Scobbo, James; and Lee, Gim, H1,725, Cl. 252-1.000.
  - Sutherland, Robert Jude, H1,730, Cl. 525-299.000.
- Shepard, Mary E.: *See—*
  - Jones, Gregory K.; and Shepard, Mary E., H1,727, Cl. 428-35.700.
- Sutherland, Robert Jude, to Shell Oil Company. Functionalized star polymers. H1,730, Cl. 525-299.000.
- United States of America
  - Navy: *See—*
    - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Vojik, Douglas M.: *See—*
  - Kelso, Thomas M.; Perdue, David T.; Pratz, Gary L.; Boyle, Damon J.; Davis, Scott R.; and Vojik, Douglas M., H1,728, Cl. 434-43.000.
- Wroczynski, Ronald: *See—*
  - Modic, Michael John; Wroczynski, Ronald; Scobbo, James; and Lee, Gim, H1,725, Cl. 252-1.000.

VOL
210
ISS
1
MY
5
998
UMI

CLASSIFICATION OF PATENTS

ISSUED CLASSIFICATION OF PATENTS

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

16	5,745,916
69	5,745,917
144	5,745,918
161.6	5,745,919
170	5,745,920
181	5,745,921
243.1	5,745,922
411	5,745,923
425	5,745,924
457	5,745,925

CLASS 4

144.1	5,745,926
213	5,745,927
225.1	5,745,928
245.1	5,745,929
246.1	5,745,930
286	5,745,931
498	5,745,932
541.1	5,745,933
541.3	5,745,934

CLASS 5

13	5,745,935
600	5,745,936
624	5,745,937
625	5,745,938
648	5,745,939
710	5,745,941
715	5,745,942
727	5,745,940

CLASS 7

107	5,745,943

CLASS 8

94.11	5,746,775
142	5,746,776
	5,746,777
402	5,746,778
426	5,746,779

CLASS 12

117.4	5,745,944

CLASS 15

77	5,745,945
	5,745,946
84	5,745,947
104.12	5,745,948
244.1	5,745,949
316.1	5,745,950

CLASS 16

31 R	5,745,951
228	5,745,952
260	5,745,953
343	5,745,954

CLASS 19

102	5,745,955
106 R	5,745,956

CLASS 24

16 PB	5,745,957
16 R	5,745,958
68 SK	5,745,959
381	5,745,960
446	5,745,961
488	5,745,962
685 K	5,745,963
687	5,745,964
704.1	5,745,965

CLASS 26

3	5,745,966

CLASS 29

40	5,745,967
270	5,745,968
402.18	5,745,969
407.05	5,745,970
421.1	5,745,971
430	5,745,972
432	5,745,973
458	5,745,974
564.6	5,745,975
597	5,745,976
598	5,745,977
603.08	5,745,978
603.12	5,745,979
603.14	5,745,980
607	5,745,981
623.1	5,746,780
730	5,746,781
	5,746,782
753	5,745,982
759	5,745,983
834	5,745,984
	5,745,985
840	5,745,986
	5,745,987
841	5,745,988
846	5,745,989
852	5,745,990
863	5,745,991
888.022	5,745,992
888.44	5,745,993
889.2	5,745,994

CLASS 30

43.6	5,745,995
90.1	5,745,996
155	5,745,997
249	5,745,998
278	5,745,999

CLASS 33

1 PT	5,746,005
288	5,746,000
484	5,746,001
517	5,746,002
542	5,746,003
768	5,746,004

CLASS 34

136	5,746,006
187	5,746,007
211	5,746,008
446	5,746,009
631	5,746,010

CLASS 36

3 B	5,746,012
3 R	5,746,013
11.5	5,746,014
44	5,746,011
93	5,746,015
117.1	5,746,016

CLASS 37

446	5,746,017

CLASS 42

1.14	5,746,018

CLASS 43

1	5,746 019
85	5,746,020
131	5,746,021

CLASS 44

265	5,747,665
301	5,746,783
361	5,746,784
412	5,746,786
443	5,746,785
621	5,746,787

CLASS 47

57.6	5,746,022
58	5,746,023
	5,746,024

CLASS 48

198.2	5,746,788

CLASS 49

506	5,746,026

CLASS 52

1	5,746,027
6	5,746,028
27	5,746,029
136	5,746,030
170	5,746,031
204.1	5,746,032
213	5,746,033
220.7	5,746,034
238.1	5,746,035
295	5,746,036
405.1	5,746,037
590.1	5,746,038
639	5,746,039
775	5,746,040

CLASS 53

305	5,746,042
442	5,746,041
451	5,746,043
461	5,746,044

CLASS 55

306	5,746,789
317	5,746,790
337	5,746,791
341.1	5,746,792
385.3	5,746,793
	5,746,794
472	5,746,795
493	5,746,796

CLASS 56

13.3	5,746,045

CLASS 57

350	5,746,046

CLASS 60

39.06	5,746,048
39.5	5,746,047
200.1	5,746,050
274	5,746,049
	5,746,052
275	5,746,051
277	5,746,053
310	5,746,054
447	5,746,056
454	5,746,055
545	5,746,057
602	5,746,058

CLASS 62

101	5,746,059
126	5,746,060
127	5,746,061
228.3	5,746,062
331	5,746,063
480	5,746,064
503	5,746,065
612	5,746,066

CLASS 63

7	5,746,067

CLASS 65

17.2	5,746,797
29.12	5,746,798
111	5,746,799
169	5,746,800
379	5,746,801

CLASS 66

176	5,746,068

CLASS 68

23.2	5,746,069
24	5,746,070
53	5,746,071
178	5,746,072
198	5,746,073

CLASS 70

18	5,746,074
25	5,746,075
277	5,746,076
424	5,746,078

CLASS 71

9	5,746,802

CLASS 72

57	5,746,079
61	5,746,080
183	5,746,077
229	5,746,081
313	5,746,082
315	5,746,083
351	5,746,084
355.6	5,746,085
450	5,746,086
456	5,746,087

CLASS 73

1.02	5,747,666
	5,747,667
1.06	5,747,668
23.21	5,747,669
35.08	5,747,670
61.41	5,747,673
61.44	5,747,674
61.75	5,747,671
61.79	5,747,672
104	5,747,675
105	5,747,676
115	5,747,677
116	5,747,678
	5,747,679
117.3	5,747,680
	5,747,681
118.1	5,747,682
	5,747,683
119 A	5,747,684
121	5,747,685
146.2	5,747,686
277	5,747,687
304 C	5,747,689
317	5,746,088
379.01	5,747,688
504.12	5,747,690
504.16	5,747,691
514.25	5,747,692
622	5,747,693
723	5,747,694
728	5,747,696
760	5,747,697
780	5,747,698
800	5,747,699
861.12	5,747,700
861.23	5,747,701
861.357	5,747,704
861.53	5,747,702
861.77	5,747,703
862.59	5,747,705
862.623	5,747,707
863.81	5,747,708
864.18	5,747,709
866.5	5,747,710

CLASS 74

7 E	5,746,089
89.17	5,746,090
409	5,746,091
421 R	5,746,092
490.05	5,746,093
502.4	5,746,094

CLASS 75

351	5,746,803
387	5,746,804
446	5,746,805

CLASS 76

108.6	5,746,095

CLASS 81

54	5,746,096
99	5,746,097
143	5,746,098
165	5,746,099

CLASS 83

13	5,746,100
34	5,746,101
	5,746,102
440	5,746,103
698.71	5,746,104
804	5,746,105
884	5,746,106

CLASS 84

291	5,747,711
306	5,747,712
313	5,747,713
604	5,747,714
609	5,747,715
	5,747,716

CLASS 86

23	5,747,718

CLASS 89

1.1	5,747,719
1.11	5,747,720
36.11	5,747,721

CLASS 91

376 R	5,746,107
444	5,746,108
448	5,746,109

CLASS 92

13.6	5,746,110
168	5,746,111
205	5,746,112

CLASS 95

8	5,746,806
123	5,746,807
169	B1 520,724

CLASS 96

135	B1 350,443
205	5,746,808

CLASS 99

323	5,746,113
331	5,746,114
339	5,746,115
386	5,746,116
407	5,746,117
427	5,746,118
451	5,746,119

CLASS 100

4	5,746,120
35	5,746,121
43	5,746,122
125	5,746,126
208	5,746,123
331	5,746,124

CLASS 101

123	5,746,125
	5,746,127
416.1	5,746,128
424	5,746,130
424.2	5,746,131
483	5,746,129
	5,746,132
484	5,746,133

CLASS 102

275.11	5,747,722
282	5,747,723
459	5,747,724
521	5,747,725

CLASS 105

168	5,746,134
196	5,746,135
199.3	5,746,136
219	5,746,137

CLASS 106

1.11	5,746,809
2	5,746,810
10	5,746,811
	5,746,812
14.16	5,746,813
18	5,746,814
31.25	5,746,815
	5,746,816
31.65	5,746,817
31.86	5,746,818
447	5,746,819
471	5,746,820
496	5,746,821
785	5,746,822

CLASS 108

92	5,746,139
145	5,746,138

CLASS 109

50	5,746,140

CLASS 110

203	5,746,141
248	5,746,142
297	5,746,143
345	5,746,144

CLASS 112

278	5,746,145

CLASS 114

67 A	5,746,146
162	5,746,147
230	5,746,148
	5,746,149
248	5,746,150
343	5,746,151
363	5,746,152

CLASS 117

5	5,746,823
13	5,746,824
14	5,746,825
90.	5,746,826
100	5,746,827
201	5,746,828
203	5,746,829

CLASS 118

308	5,746,830
621	5,746,831
665	5,746,832
	5,746,833
715	5,746,834
723 MW	5,746,835

CLASS 119

14.01	5,746,153
57.8	5,746,154
230	5,746,155
428	5,746,156
785	5,746,157
858	5,746,158

CLASS 122

367.1	5,746,159

CLASS 123

41.7	5,746,160
41.72	5,746,161
58.09	5,746,162
65 VC	5,746,163
90.11	5,746,164
90.16	5,746,165
90.17	5,746,166
90.35	5,746,167
90.38	5,746,168
193.6	5,746,169
196 AB	5,746,170
275	5,746,171
292	5,746,172
293	5,746,173
306	5,746,174
322	5,746,175
336	5,746,176
337	5,746,177
399	5,746,178
401	5,746,179
447	5,746,180
470	5,746,181
492	5,746,182
	5,746,183
510	5,746,184
516	5,746,185
	5,746,186
520	5,746,187
549	5,746,188
568	5,746,189
	5,746,190
686	5,746,191

CLASS 124

1	5,746,192

CLASS 125

13.03	5,746,193
633	5,746,206

CLASS 126

91 A	5,746,194
391	5,746,195

CLASS 128

200.23	5,746,197
204.26	5,746,198
205.24	5,746,199
206.11	5,746,200
206.24	5,746,201
207.14	5,746,202
630	5,746,203
	5,746,204
	5,746,205
639	5,746,207
653.4	5,746,208
661.03	5,746,209
665	5,746,210
	5,746,211
672	5,746,212
686	5,746,213
693	5,746,214
751	5,746,216
760	5,746,217

763	5,746,215
845	5,746,218
	5,746,219
859	5,746,221
885	5,746,222
898	5,746,223
	5,746,224

CLASS 131

84.1	5,746,225
226	5,746,226
270	5,746,227
281	5,746,229
331	5,746,230
334	5,746,231

CLASS 132

54	5,746,232
232	5,746,228

CLASS 134

1	5,746,836
2	5,746,837
27	5,746,838
57 R	5,746,233
64 R	5,746,234

CLASS 135

29	5,746,235
66	5,746,236
88.06	5,746,237

CLASS 136

201	5,747,727
203	5,747,728
251	5,746,839

CLASS 137

3	5,746,238
15	5,746,239
59	5,746,240
101.21	5,746,241
177	5,746,242
231	5,746,243
359	5,746,244
505.35	5,746,245
514	5,746,246
614.03	5,746,248
614.19	5,746,249
624.11	5,746,250
625.12	5,746,251
625.45	5,746,247
625.47	5,746,252

CLASS 138

32	5,746,254
115	5,746,255
178	5,746,253

CLASS 139

116.2	5,746,256
383 AA	5,746,257

CLASS 141

67	5,746,258
92	5,746,259
319	5,746,260

CLASS 144

24.12	5,746,261
24.13	5,746,262
355	5,746,263

CLASS 148

280	5,746,841
319	5,746,842
335	5,746,843
522	5,746,844
587	5,746,845
671	5,746,846
692	5,746,847

CLASS 149

19.1	5,747,729
47	5,747,730
360	5,746,025

CLASS 150

160	5,746,265

CLASS 152

209 R	5,746,848
	5,746,849
339.1	5,746,850
370	5,746,851
454	5,746,852
531	5,746,853

CLASS 156

62.2	5,746,854
64	5,746,855
73.4	5,746,856
102	5,746,857
108	5,746,858
	5,746,859
111	5,746,860
182	5,746,861
198	5,746,862
218	5,746,863
220	5,746,864
233	5,746,865
234	5,746,866
242	5,746,867
247	5,746,868
265	5,746,869
267	5,746,870
268	5,746,871
274.2	5,746,872
274.4	5,746,873
285	5,746,874
345	5,746,875
	5,746,876
356	5,746,877
364	5,746,878
516	5,746,879
517	5,746,880
578	5,746,881
580	5,746,882
	5,746,883
643.1	5,746,884

CLASS 160

84.05	5,746,266

CLASS 162

5	5,746,885
30.1	5,746,886
109	5,746,887
199	5,746,888
216	5,746,889
243	5,746,890
371	5,746,891

CLASS 164

65	5,746,267
468	5,746,268
516	5,746,272

CLASS 165

10	5,746,269
41	5,746,270
53	5,746,271

CLASS 166

85.2	5,746,273
278	5,746,274

CLASS 172

440	5,746,275

CLASS 173

1	5,746,276
184	5,746,277

CLASS 174

40 CC	5,747,731
48	5,747,732
	5,747,733
50	5,747,734
51	5,747,735
59	5,747,737
66	5,747,738
67	5,747,739
68.1	5,747,740
84 C	5,747,741
84 R	5,747,742
254	5,747,743

CLASS 175

24	5,746,278
52	5,746,279
374	5,746,280
420.1	5,746,281

CLASS 177

25.15	5,747,744
132	5,747,745
134	5,747,746
145	5,747,747

CLASS 178

18	5,747,748

CLASS 180

6.2	5,746,282
65.3	5,746,283
167	5,746,284
428	5,746,285

CLASS 181

102	5,747,749
112	5,747,750
131	5,747,751
	5,747,752
282	5,747,753
401	5,747,754

CLASS 182

2.9	5,746,286
70	5,746,287
118	5,746,288
129	5,746,289
146	5,746,290

CLASS 187

223	5,746,291
394	5,747,755

CLASS 188

73.37	5,746,292
151 R	5,746,293
163	5,746,294

CLASS 190

18 A	5,746,295

CLASS 192

3.29	5,746,296
7	5,746,297
48.3	5,746,298

CLASS 194

200	5,746,299

CLASS 198

347.3	5,746,300
370.04	5,746,301
496	5,746,302
660	5,746,303
781.02	5,746,304
890.1	5,746,305

CLASS 200

5 A	5,747,756
	5,747,757
	5,747,758
5 R	5,747,759
38 R	5,747,760
61.45 R	5,747,761
	5,747,762
61.54	5,747,763
61.86	5,747,764
283	5,746,306
303	5,746,307
344	5,746,308
528	5,746,309

CLASS 203

38	5,746,892

CLASS 204

192.12	5,746,894
192.2	5,746,893
279	5,746,895
284	5,746,896
298.2	5,746,897
403	5,746,898
415	5,746,899
	5,746,900
606	5,746,901

CLASS 205

57	5,746,902
118	5,746,903
757	5,746,904
791	5,746,905

CLASS 206

63.3	5,746,311
150	5,746,310
217	5,746,312
220	5,746,313
308.1	5,746,314
310	5,746,315
379	5,746,316
423	5,746,317
494	5,746,318
557	B1 018,623
725	5,746,319

CLASS 208

22	5,746,906
251 H	5,746,907
251 R	5,746,908
390	5,746,909

CLASS 209

127.3	5,746,320
168	5,746,910
233	5,746,321
393	5,746,322
539	5,746,323
705	5,746,324

CLASS 210

170	5,746,911
	5,746,912
189	5,746,913
243	B1 076,920
	B1 164,084
266	5,746,914
363	5,746,915
500.23	5,746,916
500.37	5,746,917
603	5,746,919
611	5,746,920
617	5,746,921
670	5,746,922
696	5,746,923
698	5,746,924
728	5,746,925
761	5,746,926

CLASS 211

40	5,746,325
41.17	5,746,326
50	5,746,327
59.3	5,746,328
70.6	5,746,330
123	5,746,329
149	5,746,331
153	5,746,332
189	5,746,333
205	5,746,334

CLASS 213

43	5,746,335
75 TC	5,746,336

CLASS 215

44	5,746,337
237	5,746,338
383	5,746,339

CLASS 216

18	5,746,927
37	5,746,928
59	5,746,929
87	5,746,930
88	5,746,931

CLASS 218

140	5,747,766
135	5,747,765

CLASS 219

121.5	5,747,767
121.63	5,747,768
121.71	5,747,769
121.72	5,747,770
121.84	5,747,771
121.85	5,747,772
130.1	5,747,773
216	5,747,774
400	5,747,775
497	5,747,777
506	5,747,778
603	5,747,779
648	5,747,780
685	5,747,781
689	5,747,782
758	5,747,783

CLASS 220

3.8	5,746,340
6	5,746,341
	5,746,342
9.2	5,746,343
465	5,746,344
735	5,746,345
736	5,746,346

CLASS 222

1	5,746,347
39	5,746,348
49	5,746,349
95	5,746,350
106	5,746,351
107	5,746,352
129.2	RE. 35,780
132	5,746,353
	5,746,354
189.02	5,746,355
212	5,746,356
386	5,746,357
479	5,746,358
542	5,746,359

CLASS 223

85	5,746,360

CLASS 224

258	5,746,361
331	5,746,362
547	5,746,363
572	5,746,364
676	5,746,365

CLASS 226

189	5,746,366

CLASS 228

19	5,746,367
33	5,746,368

CLASS 229

120.03	5,746,369
217	5,746,370
222	5,746,371
403	5,746,372

CLASS 235

383	5,747,784
472	5,747,785
	5,747,786
	5,747,787

CLASS 239

102.2	5,746,373
240	5,746,374
245	5,746,375
333	B1 982,900
585.4	5,746,376

CLASS 241

73	5,746,377
99	5,746,378

CLASS 242

160.1	5,746,379
171	5,746,380
261	5,746,381
322	5,746,382
332.7	5,746,383
334.4	5,746,384
337	5,746,385
571.2	5,746,386
	5,746,387
595	5,746,388
615.1	5,746,389

CLASS 244

12.3	5,746,390
54	5,746,391
76 B	5,746,392
103 S	5,746,393
111	5,746,394
121	5,746,395
134 R	5,746,396
135 R	5,746,397
223	5,746,398

CLASS 246

122 R	5,746,399
465	5,746,400

CLASS 248

62	5,746,401
118	5,746,402
	5,746,403
123.11	5,746,404
146	5,746,405
166	5,746,406
178.1	5,746,407
295.11	5,746,408
422	5,746,409
441.1	5,746,410
635	5,746,411

CLASS 250

208.1	5,747,788
	5,747,789
	5,747,790
214 R	5,747,791
214 VT	5,747,792
227.14	5,747,793
227.23	5,747,794
227.24	5,747,795
227.26	5,747,796
231.14	5,747,797
239	5,747,798
288	5,747,799
292	5,747,800
	5,747,801
307	5,747,802
	5,747,803
338.1	5,747,804
338.4	5,747,805
339.12	5,747,806
339.13	5,747,807
343	5,747,808
345	5,747,809
358.1	5,747,810
363.1	5,747,812
372	5,747,813
398	5,747,814
423 R	5,747,815
491.1	5,747,816
492.2	5,747,817
492.21	5,747,818
492.23	5,747,819
504 R	5,747,820
505.1	5,747,821
559.19	5,747,822
559.44	5,747,823
577	5,747,824
586	5,747,825

CLASS 251

129.15	5,746,412
	5,746,413
149.6	5,746,414
208	5,746,415
291	5,746,416
315.12	5,746,417

CLASS 252

62	5,746,932
68	5,746,933
77	5,746,934
182.23	5,746,935
187.25	5,746,936
188.28	5,746,937
299.01	5,746,938
	5,746,939
	5,746,940
299.63	5,746,941
301.4 H	5,746,942
301.4 P	5,746,943
	5,746,944
309	5,746,945
392	5,746,946
394	5,746,947
519.33	5,746,948
585	5,746,949

CLASS 257

10	5,747,826
15	5,747,827
66	5,747,828
	5,747,829
72	5,747,830
77	5,747,831
103	5,747,832
111	5,747,834
113	5,747,835
119	5,747,836
173	5,747,837
192	5,747,838
233	5,747,840
253	5,747,839
266	5,747,841
	5,747,842
296	5,747,843
	5,747,844
306	5,747,845
314	5,747,846
315	5,747,847
316	5,747,848
321	5,747,849
328	5,747,850
330	5,747,851
336	5,747,852
355	5,747,853
368	5,747,854
369	5,747,855
390	5,747,856
416	5,747,857
417	5,747,858
421	5,747,859
432	5,747,860
435	5,747,861
436	5,747,862
440	5,747,863
458	5,747,864
480	5,747,865
506	5,747,866
507	5,747,867
529	5,747,868
	5,747,869
531	5,747,870
586	5,747,871
611	5,747,872
661	5,747,873
686	5,747,874
687	5,747,875
	5,747,876
703	5,747,877
745	5,747,878
751	5,747,879
759	5,747,880
762	5,747,881
768	5,747,882

CLASS 261

29	5,746,950
820	5,748,456

CLASS 264

29.1	5,746,951
40.1	5,746,952
40.4	5,746,953
87	5,746,954
103	5,746,955
104	5,746,956
109	5,746,957
115	5,746,958
182	5,746,959
234	5,746,960

255	5,746,961
266	5,746,962
271.1	5,746,963
315	5,746,964
318	5,746,965
338	5,746,966
406	5,746,967
529	5,746,968
645	5,746,969

CLASS 266

225	5,746,970

CLASS 267

136	5,746,418
140	5,746,419

CLASS 269

32	5,746,420
41	5,746,421
172	5,746,422
266	5,746,423

CLASS 270

37	5,746,424
52.14	5,746,425

CLASS 271

119	5,746,426
176	5,746,427

CLASS 273

146	5,746,428
157 R	5,746,429
	5,746,430
247	5,746,431
274	5,746,432
302	5,746,433

CLASS 277

1	5,746,434
	5,746,435
366	B1 375,853

CLASS 279

4.04	5,746,436

CLASS 280

304.1	5,746,437
433	5,746,438
602	5,746,439
652	5,746,440
713	5,746,441
730.1	5,746,442
730.2	5,746,443
735	5,746,444
741	5,746,445
743.1	5,746,446
743.2	5,746,447
801.1	5,746,448
808	5,746,449

CLASS 283

61	5,746,450
65	5,746,451

CLASS 285

47	5,746,453
92	5,746,454

CLASS 290

1 B	5,747,883

CLASS 292

62	5,746,455
146	5,746,456
216	5,746,457
252	5,746,458
341.16	5,746,459

CLASS 294

1.1	5,746,460
19.1	5,746,461
64.1	5,746,462
68.24	5,746,463
116	5,746,464

CLASS 296

37.1	5,746,466
65.1	5,746,465
68.1	5,746,467
76	5,746,468
97.7	5,746,469
108	5,746,470
146.1	5,746,471
180.1	5,746,472
181	5,746,473
191	5,746,474
223	5,746,475

CLASS 297

216.13	5,746,476
218.5	5,746,477
256.13	5,746,478
411.26	5,746,479
411.35	5,746,480
452.41	5,746,481

CLASS 300

11	5,746,482

CLASS 303

3	5,746,484
19	5,746,485
146	5,746,486
158	5,746,487

CLASS 307

10.1	5,747,884
10.2	5,747,885
	5,747,886
64	5,747,887
66	5,747,888
80	5,747,889
87	5,747,890
	5,747,891
95	5,747,892
100	5,747,893
104	5,747,894
118	5,747,895

CLASS 310

20	5,747,896
49 R	5,747,897
	5,747,898
58	5,747,900
71	5,747,901
75 D	5,747,902
75 R	5,747,903
88	5,747,904
89	5,747,905
	5,747,906
90	5,747,907
91	5,747,908
156	5,747,909
180	5,747,910
239	5,747,911
261	5,747,912
263	5,747,913
318	5,747,914
331	5,747,915
348	5,747,916

CLASS 312

196	5,746,488
223.3	5,746,489
334.5	5,746,490

CLASS 313

231.31	5,747,917
309	5,747,918
318.01	5,747,919
318.09	5,747,920
346 R	5,747,921
412	5,747,922
431	5,747,923
	5,747,924
446	5,747,925
495	5,747,926
	5,747,927
498	5,747,928
503	5,747,929
504	5,747,930
581	5,747,931
582	5,747,932

CLASS 315

1	5,747,933
82	5,747,934
111.51	5,747,935
111.81	5,747,936
159	5,747,937
169.3	5,747,938
169.4	5,747,939
185 S	5,747,940
224	5,747,941
	5,747,942
225	5,747,943
241 P	5,747,944
248	5,747,945
291	5,747,946
308	5,747,947
368.18	5,747,948
382.1	5,747,949

CLASS 318

5	5,747,950
114	5,747,951
135	5,747,952
139	5,747,953
266	5,747,954
434	5,747,955
599	5,747,956
625	5,747,960
646	5,747,961
701	5,747,962
747	5,747,958
762	5,747,959
807	5,747,963
808	5,747,833

CLASS 319

799	5,747,957

CLASS 320

2	5,747,964
5	5,747,965
6	5,747,966
39	5,747,967
119	5,747,968
141	5,747,969
151	5,747,970

CLASS 322

10	5,747,971

CLASS 323

223	5,747,972
239	5,747,973
269	5,747,974
276	5,747,975
282	5,747,976
284	5,747,977
313	5,747,978
349	5,747,979
356	5,747,980
362	5,747,981
902	5,747,982

CLASS 324

71.1	5,747,983
71.2	5,747,984
103 R	5,747,985
109	5,747,993
158.1	5,747,994
207.13	5,747,986
	5,747,987
207.17	5,747,996
207.2	5,747,995
232	5,747,988
235	5,747,989
252	5,747,997
263	5,747,998
501	5,747,999
601	5,748,000
624	5,748,001
633	5,748,002
644	5,748,003
661	5,747,991
	5,748,004
662	5,748,005
663	5,747,992
754	5,748,006
755	5,748,007
763	5,748,008

CLASS 326

39	5,748,009
80	5,748,010
83	5,748,011
93	5,748,012

CLASS 327

51	5,748,015
72	5,748,014
108	5,748,016
131	5,748,017
154	5,748,018
170	5,748,019
218	5,748,020
312	5,748,021
313	5,748,022
333	5,748,024
	5,748,025
	5,748,026
336	5,748,023
350	5,748,027
374	5,748,028
389	5,748,029
513	5,748,030
525	5,748,031
536	5,748,032
545	5,748,033
551	5,748,034
562	5,748,035

CLASS 329

300	5,748,036

CLASS 330

2	5,748,037
	5,748,038
253	5,748,040
254	5,748,041
277	5,748,042

CLASS 331

1 A	5,748,043
2	5,748,044
17	5,748,045
	5,748,046
19	5,748,047
34	5,748,048
49	5,748,049
57	5,748,050
117 R	5,748,051

CLASS 333

1.1	5,748,052
103	5,748,053
104	5,748,054
106	5,748,055
112	5,748,056
134	5,748,057
202	5,748,058
204	5,748,059
235	5,748,060

CLASS 335

83	5,748,061
294	5,748,062
299	5,748,063

CLASS 336

83	5,748,064
96	5,748,065
233	5,748,013

CLASS 337

1	5,748,066
160	5,748,067
208	5,748,068

CLASS 338

308	5,748,069

CLASS 340

146.2	5,748,070
	5,748,071
286.05	5,748,072
323 R	5,748,073
328	5,748,074
436	5,748,075
442	5,748,076
450	5,748,077
506	5,748,078
539	5,748,079
	5,748,080
555	5,748,081
568	5,748,082
	5,748,083
	5,748,084
572	5,748,085
	5,748,086
573	5,748,087
	5,748,088
574	5,748,089
578	5,748,090
583	5,748,091
604	5,748,092
659	5,748,093
660	5,748,094
664	5,748,095
686	5,748,096
	5,748,097
825.16	5,748,098
825.31	5,748,101
825.44	5,748,100
850	5,748,102
870.07	5,748,103
870.11	5,748,104
870.21	5,748,105
905	5,748,107
928	5,748,106
933	5,748,108
995	5,748,109

CLASS 341

5	5,748,110
11	5,748,111
17	5,748,112
21	5,748,113
22	5,748,114
	5,748,115
50	5,748,116
51	RE. 35,781
59	5,748,117
	5,748,118
	5,748,119
61	5,748,120
65	5,748,121
67	5,748,122
70	5,748,123
120	5,748,124
136	5,748,125
143	5,748,126
144	5,748,127
	5,748,128
155	5,748,129
	5,748,130
	5,748,131
156	5,748,132
161	5,748,133
172	5,748,134
176	5,748,135

CLASS 342

33	5,748,136
42	5,748,137
45	5,748,138
51	5,748,139
90	5,748,140
109	5,748,141
159	5,748,142
162	5,748,143
357	5,748,144
	5,748,145
372	5,748,146
457	5,748,147
	5,748,148

CLASS 343

700 MS	5,748,149
702	5,748,150
	5,748,154
713	5,748,155
753	5,748,151
762	5,748,156
767	5,748,152
	5,748,153

CLASS 345

31	5,748,157
33	5,748,158
76	5,748,159
82	5,748,160
84	5,748,161
87	5,748,162
88	5,748,163
89	5,748,164
96	5,748,165
97	5,748,166
98	5,748,167
100	5,748,169
101	5,748,170
	5,748,171
111	5,748,172
115	5,748,173
118	5,748,174
127	5,748,175
131	5,748,176
133	5,748,177
138	5,748,178
161	5,748,180
165	5,748,181
173	5,748,182
	5,748,183
	5,748,184
	5,748,185
302	5,748,186
	5,748,187
326	5,748,188
329	5,748,190
331	5,748,189
367	5,748,686
425	5,748,192
427	5,748,193
	5,748,194
431	5,748,195
433	5,748,196
438	5,748,197
441	5,748,198
473	5,748,199
507	5,748,200
509	5,748,201
514	5,748,202
521	5,748,203

CLASS 347

2	5,748,204
29	5,748,205
37	5,748,206
43	5,748,207
	5,748,208
50	5,748,209
	5,748,210
51	5,748,211
55	5,748,212
63	5,748,213
70	5,748,214
87	5,748,215
	5,748,216
141	5,748,217
158	5,748,218
171	5,748,219
181	5,748,220
232	5,748,221
241	5,748,222
	5,748,223
262	5,748,225

CLASS 348

21	5,748,226
63	5,748,228
180	5,748,229
187	5,748,230
208	5,748,231
219	5,748,232
220	5,748,233
222	5,748,234
	5,748,235
270	5,748,236
333	5,748,237
373	5,748,238
	5,748,239
384	5,748,240
390	5,748,241
391	5,748,242
403	5,748,244
405	5,748,243
	5,748,245
413	5,748,247
416	5,748,248
419	5,748,249
451	5,748,250
468	5,748,251
516	5,748,252
552	5,748,253
	5,748,254
553	5,748,255
589	5,748,256
615	5,748,257
625	5,748,258
634	5,748,259
663	5,748,260
724	5,748,261
726	5,748,262
734	5,748,263
746	5,748,264
825	5,748,265

CLASS 349

39	5,748,266
40	5,748,267
47	5,748,268
58	5,748,269
69	5,748,270
	5,748,271
86	5,748,272
	5,748,273
133	5,748,274
144	5,748,275
	5,748,276
152	5,748,179
169	5,748,277

CLASS 351

44	5,748,278
45	5,748,279
110	5,748,280
121	5,748,281
161	5,748,282

CLASS 355

35	5,748,283
39	5,748,284
	5,748,285
40	5,748,286
	5,748,287
53	5,748,288
74	5,748,289
75	5,748,290
	5,748,291
	5,748,292
	5,748,293

CLASS 356

4.01	5,748,294
5.09	5,748,295
72	5,748,296
	5,748,297
73	5,748,298
73.1	5,748,299
124	5,748,300
155	5,748,301
224	5,748,302
229	5,748,303
236	5,748,304
237	5,748,305
247	5,748,306
310	5,748,308
326	5,748,309
334	5,748,310
336	5,748,311
345	5,748,312
	5,748,313
346	5,748,314
349	5,748,315
352	5,748,316
357	5,748,317
381	5,748,318
382	5,748,319
385	5,748,320
386	5,748,321
394	5,748,322
399	5,748,323
425	5,748,324
437	5,748,325

VOL 210
ISS 1
MY 5
1998
UMI

CLASS 358

296	5,748,307
	5,748,326
	5,748,327
298	5,748,328
	5,748,329
	5,748,330
302	5,748,331
335	5,748,332
435	5,748,334
445	5,748,333
	5,748,335
458	5,748,336
468	5,748,337
473	5,748,338
	5,748,339
482	5,748,340
488	5,748,341
500	5,748,342
501	5,748,343
505	5,748,344
537	5,748,345

CLASS 359

15	5,748,346
23	5,748,347
125	5,748,348
130	5,748,349
	5,748,350
193	5,748,351
196	5,748,352
197	5,748,353
205	5,748,354
206	5,748,355
207	5,748,356
216	5,748,357
245	5,748,358
248	5,748,359
298	5,748,360
332	5,748,361
	5,748,362
341	5,748,363
	5,748,364
366	5,748,365
368	5,748,366
385	5,748,367
486	5,748,368
487	5,748,369
558	5,748,371
565	5,748,372
575	5,748,373
621	5,748,374
622	5,748,375
629	5,748,376
633	5,748,377
	5,748,378
634	5,748,379
646	5,748,380
647	5,748,381
676	5,748,382
683	5,748,383
686	5,748,384
691	5,748,385
694	5,748,386
699	5,748,387
700	5,748,388
811	5,748,389
	5,748,390
813	5,748,391
819	5,748,392
822	5,748,393
823	5,748,394
841	5,748,395

CLASS 360

31	5,748,396
32	5,748,397
51	5,748,398
66	5,748,399
77.02	5,748,400
78.14	5,748,401
85	5,748,402
96.5	5,748,403
99.01	5,748,404
99.12	5,748,406
103	5,748,407
	5,748,408
104	5,748,409
106	5,748,410
107	5,748,411
113	5,748,412
	5,748,413
	5,748,414
	5,748,415
	5,748,416
126	5,748,417
128	5,748,418
133	5,748,419
	5,748,420
135	5,748,421

CLASS 361

18	5,748,422
31	5,748,423
56	5,748,424
	5,748,425
58	5,748,426
92	5,748,427
94	5,748,428
106	5,748,429
119	5,748,430
154	5,748,431
159	5,748,432
210	5,748,433
234	5,748,434
	5,748,435
	5,748,436
302	5,748,437
504	5,748,438
525	5,748,439
683	5,748,440
	5,748,441
685	5,748,442
686	5,748,443
687	5,748,444
697	5,748,445
709	5,748,446
749	5,748,448
753	5,748,449
777	5,748,450
788	5,748,451
790	5,748,452
801	5,748,453
814	5,748,454
818	5,748,455

CLASS 362

20	5,746,492
31	5,746,493
32	5,746,494
	5,746,495
61	5,746,491
	5,746,496
80	5,746,497
80.1	5,746,498
103	5,746,499
	5,746,500
	5,746,501
223	5,746,502
248	5,746,503
252	5,746,504
260	5,746,505
351	5,746,506
365	5,746,507
367	5,746,508

CLASS 363

16	5,748,457
17	5,748,458
21	5,748,459
	5,748,460
97	5,748,461
	5,748,462
127	5,748,463
131	5,748,464

CLASS 364

132	5,748,465
	5,748,468
146	5,748,466
148	5,748,467
150	5,748,469
187	5,748,470
422	5,748,471
424.055	5,748,473
424.08	5,748,472
426.036	5,748,474
449	5,748,476
461	5,748,477
468.05	5,748,478
470.01	5,748,479
470.09	5,748,480
470.14	5,748,481
474.06	5,748,482
478.11	5,748,483
479.03	5,748,484
479.04	5,748,485
488	5,748,486
489	5,748,487
	5,748,489
	5,748,490
490	5,748,488
491	5,748,475
497	5,748,491
499	5,748,492
514 C	5,748,493
525	5,748,494
550	5,748,495
	5,748,496
551.01	5,748,497
	5,748,498
	5,748,499
	5,748,500
560	5,748,502
565	5,748,503
571.01	5,748,504
571.02	5,748,505
	5,748,506
572	5,748,507
578	5,748,508
	5,748,509
606	5,748,510
708.1	5,748,511
709.12	5,748,512
724.17	5,748,513
725.03	5,748,514
736.5	5,748,515
748.03	5,748,516
760.01	5,748,517
764	5,748,518

CLASS 365

98	5,748,519
149	5,748,520
	5,748,521
154	5,748,522
171	5,748,523
173	5,748,524
185.05	5,748,525
185.06	5,748,538
185.09	5,748,526
	5,748,527
185.13	5,748,528
185.17	5,748,529
185.18	5,748,530
	5,748,531
	5,748,532
185.19	5,748,533
185.21	5,748,534
185.22	5,748,535
185.25	5,748,536
185.33	5,748,537
189.04	5,748,539
189.05	5,748,540
	5,748,541
194	5,748,542
200	5,748,543
201	5,748,544
	5,748,545
210	5,748,546
222	5,748,547
226	5,748,548
	5,748,549
	5,748,550
230.03	5,748,551
	5,748,552
	5,748,553
	5,748,554
230.04	5,748,555
230.06	5,748,556
230.08	5,748,557
233	5,748,558
	5,748,559
	5,748,560
238.5	5,748,561

CLASS 366

61	5,746,509
217	5,746,510

CLASS 367

124	5,748,562
147	5,748,563
149	5,748,564
154	5,748,565
158	5,748,566
178	5,748,567

CLASS 368

82	5,748,568
118	5,748,569
202	5,748,570
282	5,748,571

CLASS 369

13	5,748,572
	5,748,573
	5,748,574
30	5,748,575
32	5,748,576
36	5,748,577
44.14	5,748,578
	5,748,579
44.16	5,748,580
44.23	5,748,581
44.26	5,748,582
44.28	5,748,583
44.29	5,748,584
47	5,748,585
48	5,748,586
50	5,748,587
54	5,748,588
	5,748,589
58	5,748,590
	5,748,591
59	5,748,592
	5,748,593
	5,748,594
77.1	5,748,596
77.2	5,748,595
94	5,748,597
	5,748,598
103	5,748,599
112	5,748,600
	5,748,601
	5,748,602
	5,748,603
192	5,748,604
222	5,748,605
271	5,748,606
275.4	5,748,607
291	5,748,608
	5,748,609

CLASS 370

208	5,748,610
224	5,748,611
230	5,748,612
231	5,748,613
235	5,748,614
238	5,748,615
242	5,748,616
244	5,748,617
260	5,748,618
278	5,748,619
328	5,748,620
337	5,748,621
	5,748,622
342	5,748,623
347	5,748,624
353	5,748,625
355	5,748,626
384	5,748,627
	5,748,628
389	5,748,629
395	5,748,630
398	5,748,631
399	5,748,632
401	5,748,633
402	5,748,634
465	5,748,635
469	5,748,636
516	5,748,637

CLASS 371

21.2	5,748,638
21.3	5,748,640
	5,748,641
22.1	5,748,642
22.3	5,748,643
22.31	5,748,645
	5,748,646
	5,748,647
22.5	5,748,644
40.16	5,748,649
43.1	5,748,650
49.1	5,748,651
53	5,748,652
212	5,748,639

CLASS 372

8	5,748,653
19	5,748,654
22	5,748,655
35	5,748,656
38	5,748,657
43	5,748,658
46	5,748,659
50	5,748,660
	5,748,661
55	5,748,662
64	5,748,663
75	5,748,664
96	5,748,665

CLASS 373

9	5,748,666

CLASS 374

2	5,746,511
45	5,746,512
179	5,746,513

CLASS 375

200	5,748,667
	5,748,668
	5,748,891
202	5,748,669
204	5,748,670
206	5,748,671
226	5,748,672
232	5,748,673
233	5,748,674
257	5,748,675
260	5,748,676
285	5,748,677
297	5,748,678
305	5,748,679
317	5,748,680
319	5,748,681
344	5,748,682
347	5,748,683
357	5,748,684
367	5,748,687
368	5,748,688

CLASS 376

204	5,748,689
260	5,748,690
261	5,748,691
272	5,748,692
282	5,748,693
313	5,748,694
446	5,748,695

CLASS 378

4	5,748,696
19	5,748,697
54	5,748,704
65	5,748,699
	5,748,700
109	5,748,701
152	5,748,703
196	5,748,705

CLASS 379

37	5,748,706
61	5,748,707
67	5,748,708
	5,748,709
88	5,748,710
91.02	5,748,711
93	5,748,712
95	5,748,713
100.06	5,748,714
100.13	5,748,715
102.03	5,748,716
120	5,748,717
131	5,748,718
142	5,748,719
144	5,748,720
155	5,748,721
160	5,748,722
198	5,748,723
212	5,748,724
387	5,748,725
410	5,748,726
446	5,748,727
447	5,748,728

CLASS 380

4	5,748,731
10	5,748,732
15	5,748,733
21	5,748,734
	5,748,735
	5,748,736
24	5,748,737
25	5,748,738
	5,748,739
	5,748,740
28	5,748,741
49	5,748,742
52	5,748,744

CLASS 381

1	5,748,745
18	5,748,746
61	5,748,747
68.6	5,748,743
71.4	5,748,748
71.5	5,748,749
	5,748,750
93	5,748,751
94.1	5,748,752
96	5,748,753
104	5,748,754
118	5,748,756
168	5,748,757
176	5,748,758
193	5,748,759
199	5,748,760

CLASS 382

107	5,748,761
111	5,748,762
115	5,748,755
	5,748,763
117	5,748,764
124	5,748,765
	5,748,766
128	5,748,767
130	5,748,768
159	5,748,769
167	5,748,770
	5,748,772
168	5,748,771
169	5,748,773
181	5,748,774
190	5,748,775
195	5,748,776
199	5,748,777
	5,748,778
203	5,748,779
232	5,748,780
	5,748,781
	5,748,782
	5,748,783
236	5,748,784
237	5,748,785
240	5,748,786
	5,748,787
243	5,748,788
	5,748,789
246	5,748,790
250	5,748,791
	5,748,792
251	5,748,793
	5,748,794
	5,748,795
254	5,748,796
256	5,748,797
258	5,748,798
260	5,748,799
266	5,748,800
270	5,748,801
271	5,748,802
275	5,748,803
291	5,748,804
306	5,748,805
310	5,748,807
312	5,748,808
317	5,748,809

CLASS 383

66	5,746,514

CLASS 384

115	5,746,515
291	5,746,516
446	5,746,452
538	5,746,517

CLASS 385

7	5,748,810
15	5,748,811
18	5,748,812
24	5,748,813
37	5,748,814
	5,748,815
39	5,748,816
51	5,748,817
59	5,748,818
60	5,748,819
76	5,748,820
	5,748,821
90	5,748,822
113	5,748,823
124	5,748,824
126	5,748,825
128	5,748,826
134	5,748,827
146	5,748,828

CLASS 386

22	5,748,830
46	5,748,829
	5,748,831
68	5,748,832
95	5,748,833
96	5,748,834
104	5,748,835

CLASS 392

337	5,748,836
411	5,748,837

CLASS 395

2.31	5,748,839
2.63	5,748,840
2.66	5,748,841
2.7	5,748,838
2.79	5,748,842
2.84	5,748,843
10	5,748,844
20	5,748,845
	5,748,846
23	5,748,847
	5,748,848
27	5,748,849
50	5,748,850
51	5,748,851
61	5,748,852
	5,748,853
93	5,748,854
102	5,748,856
109	5,748,857
	5,748,858
	5,748,859
110	5,748,861
114	5,748,860
115	5,748,862
122	5,748,863
	5,748,864
123	5,748,865
128	5,748,866
130	5,748,867
133	5,748,868
142	5,748,869
182.02	5,748,870
182.03	5,748,871
182.09	5,748,872
	5,748,873
182.22	5,748,874
183.01	5,748,876
183.05	5,748,875
183.12	5,748,877
183.14	5,748,878
183.18	5,748,879
183.22	5,748,880
184.01	5,748,881
	5,748,882
	5,748,883
185.01	5,748,885
185.02	5,748,886
185.05	5,748,887
185.1	5,748,884
186	5,748,888
187.01	5,748,889
188.01	5,748,890
200.04	5,748,894
200.09	5,748,895
200.3	5,748,892
	5,748,893
200.49	5,748,897
	5,748,898
200.52	5,748,899
200.53	5,748,896
200.65	5,748,900
200.68	5,748,901
200.76	5,748,902
200.77	5,748,903
	5,748,904
200.79	5,748,905
202	5,748,907
244	5,748,908
251	5,748,906
280	5,748,909
281	5,748,910
	5,748,911
282	5,748,912
	5,748,913
285	5,748,914
	5,748,915
287	5,748,916
306	5,748,806
	5,748,917
	5,748,918
	5,748,919
308	5,748,920
	5,748,921
309	5,748,922
	5,748,923
	5,748,924
311	5,748,925
326	5,748,926
333	5,748,191
	5,748,927
352	5,748,929
	5,748,930
356	5,748,931
375	5,748,932
377	5,748,933
392	5,748,934
	5,748,935
394	5,748,936
	5,748,937
430	5,748,939
457	5,748,985
465	5,748,938
490	5,748,940
500	5,748,942
	5,748,943
	5,748,944
	5,748,945
501	5,748,946
	5,748,947
551	5,748,941
555	5,748,948
557	5,748,949
595	5,748,950
	5,748,951
602	5,748,952
606	5,748,953
610	5,748,954
612	5,748,955
615	5,748,956
652	5,748,957
670	5,748,958
676	5,748,959
683	5,748,960
701	5,748,961
	5,748,962
704	5,748,963
705	5,748,964
	5,748,965
708	5,748,966
712	5,748,967
728	5,748,968
732	5,748,969
733	5,748,970
750.03	5,748,971
750.05	5,748,972
759	5,748,973
	5,748,974
763	5,748,986
793	5,748,975
800	5,748,976
	5,748,977
800.23	5,748,855
	5,748,978
800.37	5,748,979
828	5,748,980
	5,748,981
829	5,748,982
842	5,748,983
889	5,748,984

CLASS 396

6	5,748,987
	5,748,988
	5,748,989
	5,748,990
51	5,748,992
52	5,748,993
55	5,748,994
	5,748,995
63	5,748,996
87	5,748,997
88	5,748,998
91	5,748,999
121	5,749,000
150	5,749,001
161	5,749,002
177	5,749,003
280	5,749,004
287	5,749,005
310	5,749,006
319	5,749,007
373	5,749,008
395	5,749,009
420	5,749,010
421	5,749,011
435	5,749,012
489	5,749,014
508	5,749,015
515	5,749,016
578	5,749,017
	5,749,018

CLASS 399

46	5,749,019
49	5,749,020
	5,749,021
50	5,749,022
58	5,749,023
85	5,749,024
92	5,749,025
103	5,749,026
113	5,749,027
117	5,749,028
128	5,749,029
148	5,749,030
228	5,749,031
233	5,749,032
267	5,749,033
303	5,749,034
316	5,749,035
325	5,749,036
327	5,749,037
	5,749,038
397	5,749,039
406	5,749,040

CLASS 400

109.1	5,746,518
120.01	5,746,519
	5,746,520
120.16	5,746,521
197	5,746,522
306	5,746,524
605	5,746,525
619	5,746,526
621	5,746,527
625	5,746,528

CLASS 401

18	5,746,529
88	5,746,530
139	5,746,531
175	5,746,532

CLASS 403

102	5,746,533
133	5,746,534
258	5,746,535
316	5,746,548
370	5,746,536

CLASS 404

6	5,746,537
	5,746,538
84.05	5,746,539

CLASS 405

128	RE. 35,782
131	5,746,540
174	5,746,541
186	5,746,542
	5,746,543
229	5,746,544
258	5,746,545
263	5,746,546
288	5,746,547

CLASS 407

102	5,746,549

CLASS 408

1 R	5,746,550
	5,746,551
72 B	5,746,552

CLASS 409

132	5,746,553

CLASS 410

12	5,746,554

CLASS 411

14	5,746,555
42	5,746,556
60	5,746,557
110	5,746,558
182	5,746,559
188	5,746,560
368	5,746,561

CLASS 414

217	5,746,562
462	5,746,563
607	5,746,564
744.5	5,746,565
751	5,746,566
752	5,746,567
789.6	5,746,568
790.4	5,746,569
795.6	5,746,570
795.7	5,746,571
796.3	5,746,572

CLASS 415

115	5,746,573
	5,746,574
206	5,746,575

CLASS 416

16	5,746,576
178	5,746,577
190	5,746,578
204 A	5,746,579
245 R	5,746,580

CLASS 417

2	5,746,581
53	5,746,582
197	5,746,583
273	5,746,584
477.11	5,746,585

CLASS 418

55.2	5,746,586

CLASS 419

2	5,749,041

CLASS 422

16	5,746,971
30	5,746,972
41	5,746,973
52	5,746,974
61	5,746,975
62	5,746,976
	5,746,977
68.1	5,746,978
72	5,746,979
102	5,746,980
128	5,746,981
134	5,746,982
162	5,746,983
169	5,746,984
173	5,746,985
177	5,746,986
190	5,746,987
292	5,746,988

CLASS 423

2	5,749,042
212 R	5,746,989
263	5,746,990
	5,746,991
338	5,746,992
352	5,746,993
594	5,746,994

CLASS 424

1.65	5,746,995
1.69	5,746,996
1.73	5,746,997
9.322	5,746,999
9.363	5,747,000
9.4	5,746,998
45	5,747,001
	5,747,002
49	5,747,003
	5,747,004
50	5,747,005
52	5,747,008
59	5,747,009
	5,747,010
	5,747,011
60	5,747,012
61	5,747,017
	5,747,018
	5,747,019
62	5,747,006
69	5,747,007
70.11	5,747,014
70.14	5,747,015
73	5,747,021
78.03	5,747,022
85.1	5,747,023
85.2	5,747,024
93.2	5,747,028
	5,747,072
93.45	5,747,020
93.461	5,747,025
93.5	5,747,029
94.3	5,747,026
94.62	5,747,027
94.64	5,747,030
130.1	5,747,031
133.1	5,747,032
134.1	5,747,033
137.1	5,747,034
144.1	5,747,035
	5,747,036
154.1	5,747,037
186.1	5,747,039
190.1	5,747,040
195.1	5,747,042
	5,747,043
202.1	5,747,044
204.1	5,747,045
265.1	5,747,046
275.1	5,747,047
277.1	5,747,048
401	5,747,016
	5,747,049
	5,747,050
	5,747,051
402	5,747,052
405	5,747,053
409	5,747,054
	5,747,055
410	5,747,056
411	5,747,057
423	5,747,058
426	5,747,060
427	5,747,061
442	5,747,063
443	5,747,064
448	5,747,065
450	5,747,066
451	5,747,059
464	5,747,067
465	5,747,068
484	5,747,069
650	5,747,070
663	5,747,071
707	5,747,013

CLASS 425

78	5,747,073
111	5,747,074
114	5,747,075
145	5,747,076
183	5,747,077
589	RE. 35,783

CLASS 426

9	5,747,078
67	5,747,079
72	5,747,080
	5,747,081
109	5,747,082
117	5,747,083
120	5,747,084
233	5,747,085
234	5,747,086
242	5,747,087
425	5,747,088
478	5,747,089
532	5,747,090
548	5,747,091
560	5,747,092
617	5,747,093

CLASS 427

8	5,747,094
	5,747,095
	5,747,096
58	5,747,098
62	5,747,099
64	5,747,100
96	5,747,101
	5,747,102
123	5,747,103
136	5,747,104
186	5,747,105
201	5,747,106
208.4	5,747,107
242	5,747,108
	5,747,109
244	5,747,110
250	5,747,111
253	5,747,112
255.5	5,747,113
380	5,747,114
514	5,747,115
534	5,747,116
535	5,747,117
577	5,747,118
585	5,747,119
596	5,747,120

CLASS 428

1	5,747,121
	5,747,122
12	5,747,123
34.8	5,747,124
	5,747,125
35.2	5,747,126
35.7	5,747,127
	5,747,128
36.4	5,747,129
36.92	5,747,130
40.1	5,747,131
41.7	5,747,132
46	5,747,133
57	5,747,134
64.1	5,747,135
64.3	5,747,136
74	5,747,137
113	5,747,138
120	5,747,139
131	5,747,140
143	5,747,141
167	5,747,142
174	5,747,143
187	5,747,144
195	5,747,145
206	5,747,146
209	5,747,147
212	5,747,148
220	5,747,150
299.1	5,747,151
323	5,747,152
324	5,747,153
327	5,747,154
	5,747,155
328	5,747,156
332	5,747,157
333	5,747,158
335	5,747,159
364	5,747,160
367	5,747,161
395	5,747,162
404	5,747,163
411.1	5,747,164
423.1	5,747,166
	5,747,167
425.8	5,747,168
426	5,747,169
	5,747,170
446	5,747,171
447	5,747,172
480	5,747,174
	5,747,175
484	5,747,176
537.1	5,747,177
586	5,747,179
601	5,747,180
614	5,747,181
624	5,747,178
690	5,747,182
	5,747,183

CLASS 429

31	5,747,184
44	5,747,185
53	5,747,186
58	5,747,187
61	5,747,188
91	5,747,189
124	5,747,190
	5,747,191
163	5,747,192
224	5,747,193
	5,747,194
235	5,747,195

CLASS 430

5	5,747,196
	5,747,197
7	5,747,199
11	5,747,198
22	5,747,200
30	5,747,201
	5,747,202
58	5,747,203
59	5,747,204
	5,747,205
64	5,747,206
66	5,747,207
97	5,747,208
106.6	5,747,209
109	5,747,210
110	5,747,211
124	5,747,212
	5,747,213
126	5,747,214
137	5,747,215
156	5,747,216
158	5,747,217
192	5,747,218
215	5,747,219
273.1	5,747,220
311	5,747,221
312	5,747,222
325	5,747,223
331	5,747,224
345	5,747,225
348	5,747,226
363	5,747,227
380	5,747,228
465	5,747,229
503	5,747,230
514	5,747,231
	5,747,232
522	5,747,233
523	5,747,234
583	5,747,235
	5,747,236
596	5,747,237

CLASS 431

253	5,746,587
354	5,746,588

CLASS 432

77	5,746,589
114	5,746,590
241	5,746,591

CLASS 433

8	5,746,592
	5,746,593
9	5,746,594
80	5,746,595
88	5,746,596
102	5,746,597
174	RE. 35,784
216	5,746,598

CLASS 434

44	5,746,599
98	5,746,600
156	5,746,601
169	5,746,602
219	5,746,603
307 R	5,746,604
	5,746,605

CLASS 435

5	5,747,239
	5,747,240
	5,747,241
	5,747,242
	5,747,243
6	5,747,244
	5,747,245
	5,747,246
	5,747,247
	5,747,248
	5,747,249
	5,747,250
	5,747,251
	5,747,252
	5,747,253
	5,747,254
	5,747,255
	5,747,256
	5,747,257
	5,747,258
	5,747,259
	5,747,260
7.1	5,747,261
	5,747,262
	5,747,264
7.2	5,747,265
7.21	5,747,267
7.23	5,747,268
7.24	5,747,269
	5,747,270

OL
2 10
SS
1
MY
5
998
MI

	5,747,271
7.37	5,747,272
7.9	5,747,266
7.94	5,747,273
	5,747,274
15	5,747,275
32	5,747,276
34	5,747,277
69.1	5,747,278
	5,747,279
	5,747,280
	5,747,281
	5,747,282
	5,747,283
	5,747,286
	5,747,287
	5,747,288
69.4	5,747,290
69.6	5,747,291
69.7	5,747,285
	5,747,292
70.21	5,747,294
71.3	5,747,295
72	5,747,296
	5,747,297
91.1	5,747,298
91.2	5,747,299
101	5,747,300
105	5,747,301
117	5,747,302
119	5,747,303
121	5,747,304
134	5,747,305
138	5,747,306
172.3	5,747,307
	5,747,308
	5,747,309
	5,747,310
176	5,747,311
183	5,747,312
	5,747,313
	5,747,314
	5,747,315
194	5,747,317
	5,747,318
199	5,747,319
209	5,747,320
220	5,747,321
226	5,747,322
235.1	5,747,323
236	5,747,324
240.2	5,747,325
	5,747,326
252.3	5,747,327
	5,747,328
252.33	5,747,329
254.1	5,747,330
266	5,747,331
272	5,747,332
283.1	5,747,333
320.1	5,747,334
325	5,747,335
	5,747,336
337	5,747,337
348	5,747,338
350	5,747,339
375	5,747,340
404	5,747,341

CLASS 436

55	5,747,342
63	5,747,343
66	5,747,344
74	5,747,345
94	5,747,346
	5,747,347
106	5,747,348
172	5,747,349
180	5,747,350
514	5,747,351
533	5,747,352

CLASS 437

21	5,747,353
40	5,747,354
41	5,747,355
44	5,747,356
69	5,747,357
183	5,747,358
186	5,747,359
189	5,747,360
190	5,747,361
225	5,747,362

CLASS 438

5	5,747,363
14	5,747,364
17	5,747,365
44	5,747,366
152	5,747,367
217	5,747,368
241	5,747,369
267	5,747,370
273	5,747,371
298	5,747,372
305	5,747,373
309	5,747,374
396	5,747,375
443	5,747,376
444	5,747,377
563	5,747,378
586	5,747,379
599	5,747,380
624	5,747,381
	5,747,382
648	5,747,383
681	RE. 35,785
685	5,747,384
690	5,747,385
692	5,747,386
708	5,747,387
723	5,747,388
783	5,747,389

CLASS 439

21	5,746,606
66	5,746,607
70	5,746,608
92	5,746,609
98	5,746,610
135	5,746,611
139	5,746,612
157	5,746,613
	5,746,614
227	5,746,615
245	5,746,616
248	5,746,617
352	5,746,618
	5,746,619
404	5,746,620
507	5,746,621
521	5,746,622
578	5,746,623
595	5,746,624
610	5,746,625
630	5,746,626
721	5,746,627
752	5,746,628

CLASS 440

88	5,746,629
89	5,746,630

CLASS 441

64	5,746,631
115	5,746,632
123	5,746,633

CLASS 442

59	5,747,390
70	5,747,391
82	5,747,392
272	5,747,393
328	5,747,394

CLASS 445

14	5,746,634
24	5,746,635

CLASS 446

16	5,746,636
72	5,746,637
92	5,746,638
98	5,746,639
213	5,746,640
431	5,746,641
438	5,746,642

CLASS 451

5	5,746,643
6	5,746,644
11	5,746,645
36	5,746,646
343	5,746,647

CLASS 452

156	5,746,648
172	5,746,649

CLASS 454

52	5,746,650
154	5,746,651
186	5,746,653
187	5,746,652
211	5,746,654
233	5,746,655

CLASS 455

2	5,749,043
13.1	5,749,044
31.2	5,749,045
67.1	5,749,046
67.4	5,749,047
186.1	5,749,048
226.1	5,749,049
228	5,749,050
324	5,749,051
406	5,749,052
524	5,749,053
553	5,749,055
569	5,749,056
	5,749,057

CLASS 463

41	5,746,657
42	5,746,656
44	RE. 35,786

CLASS 464

130	5,746,658
135	5,746,659

CLASS 473

15	5,746,660
204	5,746,661
206	5,746,662
211	5,746,663
252	5,746,664
313	5,746,665
328	5,746,666
393	5,746,667
433	5,746,668
446	5,746,669
451	5,746,670
454	5,746,671
464	5,746,672

CLASS 474

101	5,746,673
253	5,746,674

CLASS 475

278	5,746,675

CLASS 476

50	5,746,676

CLASS 477

35	5,746,677
45	5,746,678
92	5,746,679
95	5,746,680

CLASS 482

53	5,746,681
54	5,746,682
57	5,746,683
62	5,746,684
93	5,746,685
125	5,746,686
126	5,746,687
142	5,746,688

CLASS 493

397	5,746,689
405	5,746,690

CLASS 501

5	5,747,395
32	5,747,396
51	5,747,397
66	5,747,398
67	5,747,399
94	5,747,400
103	5,747,401
152	5,747,402

CLASS 502

26	5,747,407
62	5,747,403
104	5,747,404
113	5,747,405
117	5,747,406
171	5,747,408
	5,747,409
348	5,747,410
353	5,747,411

CLASS 503

201	5,747,412
	5,747,413
207	5,747,414
227	5,747,415

CLASS 504

115	5,747,416
116	5,747,417
187	5,747,419
209	5,747,420
214	5,747,421
244	5,747,422
251	5,747,423
271	5,747,424

CLASS 505

150	5,747,425
160	5,747,418
166	5,747,426
476	5,747,427

CLASS 508

151	5,747,428
208	5,747,429
209	5,747,430
283	5,747,431
462	5,747,432
479	5,747,433
485	5,747,434

CLASS 510

119	5,747,435
124	5,747,436
177	5,747,437
224	5,747,438
255	5,747,439
276	5,747,440
375	5,747,441
475	5,747,442
515	5,747,443

CLASS 514

2	5,747,444
4	5,747,445
8	5,747,446
9	5,747,447
11	5,747,448
12	5,747,449
	5,747,450
	5,747,451
	5,747,452
	5,747,453
	5,747,454
	5,747,455
	5,747,456
13	5,747,457
18	5,747,458
	5,747,459
19	5,747,460
23	5,747,461
	5,747,462
25	5,747,463
26	5,747,464
28	5,747,465
29	5,747,466
	5,747,467
42	5,747,468
44	5,747,469
	5,747,470
	5,747,471
45	5,747,472
	5,747,473
46	5,747,474
55	5,747,475
150	5,747,477
167	5,747,478
	5,747,479
179	5,747,480
183	5,747,481
184	5,747,482
195	5,747,483
202	5,747,484
210	5,747,485
211	5,747,486
215	5,747,487
219	5,747,488
222.5	5,747,489
233.8	5,747,490
236.2	5,747,491
249	5,747,492
255	5,747,493
	5,747,494
258	5,747,495
	5,747,496
259	5,747,497
	5,747,498
267	5,747,499
274	5,747,500
275	5,747,476
280	5,747,502
294	5,747,503
307	5,747,504
	5,747,505
	5,747,506
312	5,747,507
320	5,747,508
324	5,747,509
333	5,747,510
337	5,747,511
343	5,747,512
351	5,747,513
352	5,747,514
359	5,747,515
	5,747,516
369	5,747,517
376	5,747,501
403	5,747,518
407	5,747,519
412	5,747,520
420	5,747,521
423	5,747,522
427	5,747,523
443	5,747,524
444	5,747,525
448	5,747,526
453	5,747,527
456	5,747,528
463	5,747,529
468	5,747,530
469	5,747,531
491	5,747,532
492	5,747,534
507	5,747,535
549	5,747,533
556	5,747,536
558	5,747,537
570	5,747,538
618	5,747,539
622	5,747,540
	5,747,541
646	5,747,542
651	5,747,543
729	5,747,544
742	5,747,545

CLASS 521

32	5,747,546
48.5	5,747,547
57	5,747,548
60	5,747,549

CLASS 522

34	5,747,550
95	5,747,551
96	5,747,552

CLASS 523

115	5,747,553
161	5,747,554
	5,747,555
171	5,747,556
201	5,747,557
	5,747,558
205	5,747,559
209	5,747,560
212	5,747,561
215	5,747,562
	5,747,563
413	5,747,565

CLASS 524

93	5,747,566
110	5,747,567
	5,747,568
140	5,747,569
161	5,747,570
190	5,747,571
265	5,747,572
270	5,747,573
436	5,747,574
443	5,747,575
451	5,747,576
458	5,747,577
502	5,747,578
562	5,747,579
576	5,747,580
590	5,747,581
591	5,747,582
801	5,747,584
845	5,747,585

CLASS 525

67	5,747,586
87	5,747,587
129	5,747,588
146	5,747,589
155	5,747,590
176	5,747,591
191	5,747,592
193	5,747,593
240	5,747,594
270	5,747,595
298	5,747,596
312	5,747,597
314	5,747,598
327.3	5,747,599
329.4	5,747,600
375	5,747,601
398	5,747,602
403	5,747,603
417	5,747,604
437	5,747,605
438	5,747,606
445	5,747,607
477	5,747,608

CLASS 526

68	5,747,609
73	5,747,610
	5,747,611
82	5,747,612
134	5,747,613
160	5,747,614
262	5,747,615
	5,747,616
273	5,747,617
285	5,747,618
318.5	5,747,619
348.3	5,747,620
351	5,747,621

CLASS 528

12	5,747,622
14	5,747,623
21	5,747,624
26	5,747,625
28	5,747,626
59	5,747,627
60	5,747,628
70	5,747,629
71	5,747,630
86	5,747,631
196	5,747,632
272	5,747,633
315	5,747,634
328	5,747,635
354	5,747,637
392	5,747,638
421	5,747,639
502 F	5,747,640

CLASS 530

300	5,747,641
304	5,747,642
329	5,747,643
350	5,747,645
351	5,747,646
365	5,747,647
374	5,747,648
385	5,747,649
387.7	5,747,650
387.9	5,747,651
	5,747,652
389.5	5,747,653
391.7	5,747,654
399	5,747,655
402	5,747,293

CLASS 534

635	5,747,657
683	5,747,656

CLASS 536

18.5	5,747,658
23.4	5,747,659
23.5	5,747,660
24.1	5,747,661
	5,747,662
25.4	5,747,663

CLASS 548

257	5,746,840
314.4	B1 455,359

CLASS 558

392	5,747,664

CLASS 600

36	5,746,691
104	5,746,692
112	5,746,693
123	5,746,694
127	5,746,695
139	5,746,696
323	5,746,697
493	5,746,698
529	5,746,699
556	5,746,700
585	5,746,701

CLASS 601

15	5,746,702
38	5,746,703
40	5,746,704

CLASS 602

5	5,746,705
21	5,746,707

CLASS 604

4	5,746,708
8	5,746,709
20	5,746,711
22	5,746,713
68	5,746,714
83	5,746,715
97	5,746,716
102	5,746,717
117	5,746,720
151	5,746,719
153	5,746,721
165	B1 601,710
175	5,746,722
178	5,746,723
192	5,746,718
240	5,746,724
246	5,746,725
263	5,746,726
283	5,746,727
298	5,746,728

378	5,746,729
385.2	5,746,730
	5,746,731
	5,746,732
411	5,746,733

CLASS 606

1	5,746,734
9	5,746,735
	5,746,736
15	5,746,737
	5,746,738
41	5,746,746
51	5,746,739
	B1 445,638
52	5,746,740
54	5,746,741
69	5,746,742
96	5,746,743
108	5,746,745
114	5,746,747
118	5,746,748
119	5,746,749
	5,746,750
128	RE. 35,787
139	5,746,751
	5,746,752
147	5,746,753
148	5,746,754
	5,746,755
	5,746,757
159	5,746,758
169	5,746,756
170	5,746,759
171	5,746,760
181	5,746,761
192	5,746,762
193	5,746,763
194	5,746,764
198	5,746,765
	5,746,766
200	5,746,767
205	5,746,768
206	5,746,769
207	5,746,770

CLASS 609

14	5,746,710

CLASS 623

16	5,746,771
35	5,746,772
	5,746,773
39	5,746,774

CLASS 701

23	5,749,058
45	5,749,059
51	5,749,060
68	5,749,061
72	5,749,062
93	5,749,063

CLASS 704

213	5,749,064
219	5,749,065
232	5,749,066
233	5,749,067
	5,749,068
240	5,749,069
242	5,749,070
260	5,749,071
275	5,749,072
278	5,749,073

CLASS 705

8	5,749,074
14	5,749,075
36	5,749,077
404	5,749,078

CLASS 707

100	5,749,079
	5,749,080
102	5,749,081
508	5,749,082
530	5,749,083

CLASS 711

1	5,749,084
5	5,749,085
105	5,749,086
108	5,749,087
115	5,749,088
127	5,749,089
135	5,749,090
	5,749,091
138	5,749,092
139	5,749,093
	5,749,094
141	5,749,095

CLASSIFICATION OF DESIGNS

D2—	891	393,935
	899	393,936
		393,937
	906	393,938
	972	393,939
D3—	226	393,940
		393,941
	260	393,942
	273	393,943
	276	393,944
	282	393,945
	295	393,946
	303	393,947
	320	393,948
D5—	53	393,949
	64	393,950
D6—	332	393,951
	334	393,952
		393,956
	366	393,953
	369	393,954
	373	393,955
	381	393,957
	444	393,958
	457	393,959
		393,960
	464	393,961
	478	393,963
	480	393,964
	492	393,965
	495	393,966
		393,967
	499	393,962
	500	393,968
	511	393,969
	514	393,970
	515	393,971
	523	393,972
	526	393,973
	544	393,974
	545	393,975
	601	393,976
	610	393,977
D7—	348	393,978
	405	393,979
	409	393,980
	553	393,981
	590	393,982
		393,983
	606	393,984
	678	393,986
	694	393,987
	701	393,988
D8—	1	393,989
	10	393,990
		393,991
	14	393,992
	43	393,993
	302	393,994
	331	393,995
	347	393,996
	354	393,997
	394	393,998
D9—	302	393,999
	337	394,000
	347	394,001
	415	394,002
		394,003
		394,004
	416	394,005
	435	394,006
	448	394,007
		394,008
		394,009
	531	394,010
	538	394,011
	545	394,012
D10—	40	394,013
	46.2	394,014
	83	394,015
	96	394,016
	103	394,017
	104	394,018
D11—	13	394,019
		394,020
	44	394,021
	87	394,022
	151	394,023
	218	394,024
	226	394,025
D12—	96	394,026
	110	394,027
	114	394,033
	124	394,028
	141	394,029
	141.1	394,092
	147	394,030
		394,031
		394,032
		394,034
	163	394,035
	203	394,036
		394,037
	211	394,038
	325	394,040
	333	394,039
D13—	123	394,041
	171	394,042
	179	394,043
	184	394,044
D14—	106	394,045
	107	394,046
		394,047
	113	394,048
	114	394,049
		394,050
	114.3	394,051
	114.5	394,052
		394,053
	115	394,054
	121	394,055
	124	394,056
	128	394,057
	142	394,058
	164	394,059
	170	394,060
		394,061
	192	394,062
	214	394,063
		394,064
	248	394,065
	250	394,066
D15—	7	394,067
	9	394,068
	30	394,069
	124	394,070
	133	394,071
	148	394,072
D16—	135	394,073
	202	394,074
		394,075
	209	394,076
	306	394,077
D17—	22	394,078
D18—	7	394,079
	19	394,080
	43	394,082
		394,083
	47	394,084
D19—	42	394,085
	51	394,086
		394,087
	62	394,088
D20—	10	394,089
D21—	87	394,090
	108	394,091
	199	394,093
	212	394,094
	237	394,095
D22—	110	394,096
D23—	309	394,097
	353	394,098
	356	394,099
	364	394,100
	370	394,101
	411	394,102
		394,103
		394,104
		394,105
		394,106
		394,107
D24—	119	394,108
	133	394,109
	192	394,110
		394,111
		394,112
	197	394,113
	200	394,114
D25—	52	394,115
		394,116
	124	394,117
		394,119
		394,120
D26—	28	394,121
	38	394,122
	44	394,123
	85	394,124
	87	394,125
	134	394,126
		394,127
D28—	57	394,128
	59	394,129
	64	394,130
	82	394,131
D32—	21	394,132
	35	394,133
	47	394,134

CLASSIFICATION OF PLANTS

P.—	57	10,370
	67.1	10,371
		10,372
	68.1	10,373
		10,374
	78	10,375
	82.3	10,376
	84	10,377
		10,378
	87.12	10,380
	87.15	10,381
	87.7	10,379
	88.8	10,382
		10,383
	90.2	10,384

STATUTORY INVENTION REGISTRATIONS

252—	1	H1,725
342—	93	H1,726
428—	35.7	H1,727
434—	43	H1,728
525—	54.11	H1,729
	299	H1,730

/OL
2 10
ISS
1
MY
5
998
JMI

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,746,021
	5,746,664
	5,747,058
	5,747,073
	5,747,307
	5,747,665
	5,748,080
02 :	5,746,283
	5,746,364
	5,746,757
04 :	5,745,978
	5,746,445
	5,746,506
	5,746,546
	5,746,660
	5,746,856
	5,746,961
	5,747,018
	5,747,100
	5,747,128
	5,747,183
	5,747,363
	5,747,371
	5,747,757
	5,747,806
	5,747,807
	5,747,839
	5,747,858
	5,748,042
	5,748,140
	5,748,147
	5,748,160
	5,748,161
	5,748,303
	5,748,389
	5,748,475
	5,748,519
	5,748,524
	5,748,661
	5,748,665
	5,748,744
	5,748,906
	5,748,950
	5,749,043
	5,749,044
	5,749,092
05 :	5,746,043
	5,746,450
	5,746,458
	5,746,749
06 :	5,745,917
	5,745,924
	5,745,934
	5,745,941
	5,745,946
	5,745,933
	5,745,979
	5,745,980
	5,745,986
	5,745,989
	5,745,998
	5,746,024
	5,746,029
	5,746,030
	5,746,035
	5,746,048
	5,746,099
	5,746,106
	5,746,113
	5,746,151
	5,746,163
	5,746,188
	5,746,198
	5,746,206
	5,746,210
	5,746,215
	5,746,219
	5,746,224
	5,746,231
	5,746,234
	5,746,236
	5,746,244
	5,746,252
	5,746,265
	5,746,277
	5,746,352
	5,746,401
	5,746,404
	5,746,405
	5,746,421
	5,746,430
	5,746,434
	5,746,451
	5,746,460
	5,746,472
	5,746,473
	5,746,499
	5,746,507
	5,746,508
	5,746,513
	5,746,528
	5,746,539
	5,746,552
	5,746,555
	5,746,594
	5,746,602
	5,746,606
	5,746,613
	5,746,614
	5,746,616
	5,746,626
	5,746,631
	5,746,633
	5,746,634
	5,746,635
	5,746,636
	5,746,637
	5,746,663
	5,746,672
	5,746,686
	5,746,687
	5,746,691
	5,746,692
	5,746,693
	5,746,697
	5,746,702
	5,746,713
	5,746,716
	5,746,724
	5,746,734
	5,746,736
	5,746,737
	5,746,755
	5,746,760
	5,746,763
	5,746,769
	5,746,773
	5,746,781
	5,746,787
	5,746,838
	5,746,839
	5,746,855
	5,746,875
	5,746,894
	5,746,901
	5,746,903
	5,746,926
	5,746,952
	5,746,968
	5,746,971
	5,746,972
	5,746,988
	5,747,002
	5,747,005
	5,747,017
	5,747,019
	5,747,023
	5,747,027
	5,747,034
	5,747,035
	5,747,039
	5,747,044
	5,747,065
	5,747,071
	5,747,074
	5,747,079
	5,747,085
	5,747,113
	5,747,118
	5,747,120
	5,747,147
	5,747,189
	5,747,192
	5,747,200
	5,747,223
	5,747,243
	5,747,244
	5,747,245
	5,747,247
	5,747,248
	5,747,251
	5,747,252
	5,747,253
	5,747,254
	5,747,256
	5,747,262
	5,747,270
	5,747,275
	5,747,276
	5,747,278
	5,747,283
	5,747,288
	5,747,296
	5,747,299
	5,747,317
	5,747,319
	5,747,322
	5,747,326
	5,747,337
	5,747,338
	5,747,340
	5,747,341
	5,747,348
	5,747,351
	5,747,352
	5,747,353
	5,747,359
	5,747,360
	5,747,389
	5,747,397
	5,747,447
	5,747,449
	5,747,452
	5,747,453
	5,747,457
	5,747,458
	5,747,464
	5,747,470
	5,747,474
	5,747,482
	5,747,492
	5,747,509
	5,747,511
	5,747,527
	5,747,532
	5,747,542
	5,747,591
	5,747,615
	5,747,641
	5,747,661
	5,747,662
	5,747,680
	5,747,710
	5,747,718
	5,747,720
	5,747,728
	5,747,779
	5,747,798
	5,747,804
	5,747,808
	5,747,809
	5,747,813
	5,747,818
	5,747,821
	5,747,824
	5,747,825
	5,747,838
	5,747,840
	5 747,852
	5,747,853
	5,747,856
	5,747,868
	5,747,882
	5,747,889
	5,747,891
	5,747,917
	5,747,938
	5,747,940
	5,747,943
	5,747,968
	5,747,976
	5,747,977
	5,747,982
	5,748,000
	5,748,010
	5,748,015
	5,748,019
	5,748,023
	5,748,031
	5,748,034
	5,748,035
	5,748,044
	5,748,051
	5,748,057
	5,748,066
	5,748,072
	5,748,083
	5,748,091
	5,748,093
	5,748,096
	5,748,101
	5,748,103
	5,748,104
	5,748,116
	5,748,124
	5,748,126
	5,748,144
	5,748,145
	5,748,148
	5,748,152
	5,748,153
	5,748,156
	5,748,163
	5,748,178

OL
2 10
ISS
1
MY
5
998
JMI

5,748,189
5,748,192
5,748,194
5,748,195
5,748,197
5,748,199
5,748,209
5,748,215
5,748,216
5,748,217
5,748,230
5,748,241
5,748,253
5,748,264
5,748,267
5,748,268
5,748,279
5,748,280
5,748,313
5,748,323
5,748,350
5,748,365
5,748,396
5,748,399
5,748,413
5,748,416
5,748,417
5,748,420
5,748,434
5,748,435
5,748,442
5,748,470
5,748,488
5,748,491
5,748,499
5,748,500
5,748,507
5,748,512
5,748,513
5,748,523
5,748,525
5,748,533
5,748,534
5,748,535
5,748,538
5,748,545
5,748,546
5,748,547
5,748,552
5,748,554
5,748,559
5,748,565
5,748,610
5,748,627
5,748,628
5,748,634
5,748,642
5,748,651
5,748,654
5,748,655
5,748,656
5,748,671
5,748,679
5,748,700
5,748,707
5,748,733
5,748,736
5,748,746
5,748,747
5,748,758
5,748,766
5,748,786
5,748,805
5,748,806
5,748,809
5,748,812
5,748,817
5,748,825
5,748,840
5,748,841
5,748,856
5,748,864
5,748,875
5,748,881
5,748,891
5,748,896
5,748,897
5,748,912
5,748,914
5,748,917
5,748,918
5,748,927
5,748,929
5,748,932
5,748,935
5,748,936
5,748,939
5,748,942
5,748,952
5,748,961
5,748,964
5,748,975
5,748,976
5,748,979
5,748,986
5,749,059
5,749,070
5,749,073
5,749,074
5,749,088
5,749,095
B1 601,710
08 : 5,745,936
5,745,983
5,746,228
5,746,266
5,746,385
5,746,435
5,746,464
5,746,558
5,746,561
5,746,850
5,746,871
5,747,099
5,747,639
5,747,660
5,747,667
5,747,935
5,747,967
5,748,003
5,748,050
5,748,105
5,748,164
5,748,324
5,748,371
5,748,400
5,748,504
5,748,578
5,748,617
5,748,709
5,748,884
5,748,890
5,748,910
5,748,934
5,748,956
5,748,962
09 : 5,746,004
5,746,039
5,746,175
5,746,254
5,746,311
5,746,374
5,746,425
5,746,727
5,746,740
5,746,751
5,746,779
5,746,881
5,746,946
5,747,004
5,747,011
5,747,022
5,747,060
5,747,098
5,747,129
5,747,294
5,747,465
5,747,488
5,747,498
5,747,501
5,747,505
5,747,722
5,747,755
5,747,770
5,747,907
5,748,133
5,748,382
5,748,663
5,748,721
5,748,804
5,748,895
5,749,026
5,749,071
5,749,078
10 : 5,746,023
5,746,943
5,747,133
5,747,516
5,747,621
5,748,309
11 : 5,747,261
5,747,526
12 : 5,745,921
5,745,928
5,745,973
5,746,146
5,746,149
5,746,197
5,746,199
5,746,203
5,746,216
5,746,218
5,746,226
5,746,232
5,746,271
5,746,307
5,746,321
5,746,332
5,746,389
5,746,393
5,746,542
5,746,573
5,746,662
5,746,666
5,746,807
5,746,827
5,746,888
5,746,921
5,747,123
5,747,167
5,747,268
5,747,318
5,747,553
5,747,801
5,747,805
5,748,038
5,748,082
5,748,085
5,748,086
5,748,100
5,748,426
5,748,430
5,748,438
5,748,454
5,748,506
5,748,568
5,748,716
5,748,724
5,748,756
5,748,767
5,748,892
5,748,960
5,749,049
5,749,056
13 : RE. 35,782
5,745,944
5,746,036
5,746,064
5,746,284
5,746,358
5,746,414
5,746,547
5,746,851
5,746,877
5,746,891
5,747,021
5,747,045
5,747,550
5,747,552
5,747,610
5,747,742
5,747,784
5,747,822
5,748,188
5,748,295
5,748,537
5,748,717
5,748,836
16 : RE. 35,785
5,745,932
5,747,116
5,747,190
5,747,191
5,747,386
5,747,855
5,747,869
5,748,527
5,748,542
5,748,551
5,748,635
5,748,745
5,749,086
17 : 5,745,975
5,746,000
5,746,007
5,746,056
5,746,077
5,746,112
5,746,136
5,746,137
5,746,184
5,746,237
5,746,287
5,746,302
5,746,303
5,746,310
5,746,312
5,746,348
5,746,356
5,746,362
5,746,406
5,746,413
5,746,461
5,746,480
5,746,560
5,746,580
5,746,585
5,746,609
5,746,640
5,746,704
5,746,708
5,746,822
5,746,882
5,746,922
5,746,945
5,746,980
5,747,125
5,747,126
5,747,240
5,747,305
5,747,320
5,747,426
5,747,459
5,747,466
5,747,649
5,747,733
5,747,782
5,747,914
5,747,941
5,747,942
5,747,970
5,747,971
5,747,987
5,748,047
5,748,064
5,748,089
5,748,111
5,748,130
5,748,306
5,748,308
5,748,466
5,748,620
5,748,677
5,748,727
5,748,760
5,748,845
5,748,860
5,748,924
5,749,045
5,749,072
B1 375,853
18 : 5,745,937
5,745,943
5,746,250
5,746,333
5,746,533
5,746,720
5,746,742
5,746,831
5,746,867
5,747,180
5,747,510
5,747,517
5,747,524
5,747,548
5,747,563
5,747,642
5,747,734
5,747,883
5,747,904
5,747,913
5,747,948
5,748,046
5,748,106
5,748,252
5,748,261
19 : 5,746,058
5,746,096
5,746,275
5,746,278
5,746,919
5,747,020
5,747,476
5,747,785
5,747,786
5,747,928
5,748,097
5,748,136
5,748,431
5,748,619
5,748,676
20 : 5,745,931
5,746,201
5,746,553
5,746,668
5,747,425
5,747,648
5,748,871
5,749,075
21 : 5,746,306
5,746,545
5,746,982
5,747,154
5,747,687
22 : 5,746,074
5,746,121
5,746,289
5,746,329
5,746,354
5,746,629
5,746,703
5,747,029
5,747,580
23 : 5,745,960
5,746,240
5,746,721
5,747,031
5,748,157
5,748,743
24 : 5,745,918
5,745,923
5,746,156
5,746,193
5,746,365
5,746,550
5,746,689
5,746,808
5,746,819
5,746,905
5,746,911
5,746,942
5,746,974
5,747,008
5,747,115
5,747,259
5,747,272
5,747,280
5,747,312
5,747,336
5,747,503
5,747,512
5,747,520
5,747,523
5,747,654
5,748,269
5,748,349
5,748,359
5,748,493
5,748,692
5,748,738
5,748,749
5,748,847
5,748,925
5,749,081
25 : 5,745,925
5,745,987
5,746,013
5,746,034
5,746,047
5,746,067
5,746,154
5,746,222
5,746,272
5,746,304
5,746,402
5,746,403
5,746,432
5,746,617
5,746,621
5,746,632
5,746,639
5,746,661
5,746,699
5,746,719
5,746,735
5,746,741
5,746,745
5,746,753
5,746,759
5,746,761
5,746,765
5,746,776
5,746,782
5,746,811
5,746,817
5,746,878
5,746,998
5,747,028
5,747,036
5,747,185
5,747,265
5,747,269
5,747,324
5,747,402
5,747,416
5,747,446
5,747,455
5,747,456
5,747,471
5,747,545
5,747,559
5,747,562
5,747,618
5,747,666
5,747,895
5,747,961
5,747,998
5,748,004
5,748,092
5,748,135
5,748,186
5,748,225
5,748,437
5,748,453
5,748,539
5,748,598
5,748,604
5,748,629
5,748,630
5,748,631
5,748,633
5,748,672
5,748,699
5,748,703
5,748,705
5,748,731
5,748,770
5,748,792
5,748,818
5,748,838
5,748,842
5,748,844
5,748,885
5,748,905
5,749,011
26 : 5,746,045
5,746,049
5,746,065
5,746,088
5,746,114
5,746,161
5,746,177
5,746,183
5,746,208
5,746,242
5,746,361
5,746,363
5,746,368
5,746,370
5,746,409
5,746,419
5,746,443
5,746,444
5,746,466
5,746,468
5,746,474
5,746,475
5,746,479
5,746,486
5,746,503
5,746,504
5,746,548
5,746,567
5,746,618
5,746,650
5,746,658
5,746,667
5,746,707
5,746,709
5,746,775
5,746,803
5,746,844
5,746,858
5,746,863
5,746,879
5,746,966
5,746,984
5,747,006
5,747,052
5,747,072
5,747,138
5,747,197
5,747,392
5,747,403
5,747,528
5,747,551
5,747,555
5,747,608
5,747,689
5,747,937
5,747,953
5,747,964
5,747,965
5,747,981
5,748,395
5,748,428
5,748,505
5,748,575
5,748,675
5,748,899
5,748,908
5,748,922
5,748,943
5,748,982
27 : RE. 35,780
5,745,947
5,746,019
5,746,148
5,746,158
5,746,217
5,746,238
5,746,316
5,746,341
5,746,355
5,746,367
5,746,408
5,746,511
5,746,514

5,746,576
5,746,627
5,746,653
5,746,670
5,746,722
5,746,767
5,746,900
5,747,001
5,747,107
5,747,139
5,747,148
5,747,217
5,747,573
5,747,626
5,747,705
5,747,909
5,747,997
5,748,020
5,748,070
5,748,077
5,748,407
5,748,409
5,748,412
5,748,415
5,748,418
5,748,429
5,748,451
5,748,483
5,748,765
5,748,852
5,748,883
5,748,919
5,748,957
5,749,052
5,749,087
B1 445,638
B1 455,359
28 : 5,747,461
5,748,021
5,748,616
29 : 5,745,935
5,746,066
5,746,243
5,746,359
5,746,400
5,746,517
5,746,599
5,746,725
5,746,754
5,746,792
5,746,806
5,746,834
5,747,537
5,747,544
5,747,655
30 : 5,746,317
5,746,397
31 : 5,746,295
5,746,343
5,746,541
32 : 5,746,059
5,746,204
5,746,313
5,748,113
5,748,874
33 : 5,746,027
5,746,129
5,746,319
5,746,538
5,746,565
5,746,701
5,746,805
5,746,865
5,747,037
5,747,219
5,747,588
5,747,920
5,748,781
34 : 5,745,949
5,746,042
5,746,080
5,746,143
5,746,167
5,746,323
5,746,347
5,746,446
5,746,488
5,746,570
5,746,644
5,746,688
5,746,726
5,746,733
5,746,748
5,746,764
5,746,766
5,746,768
5,746,770
5,746,772
5,746,815
5,746,931
5,746,949
5,746,957
5,746,995
5,746,996
5,747,051
5,747,064
5,747,067
5,747,091
5,747,092
5,747,093
5,747,096
5,747,108
5,747,109
5,747,169
5,747,193
5,747,390
5,747,401
5,747,406
5,747,423
5,747,428
5,747,435
5,747,436
5,747,439
5,747,442
5,747,478
5,747,479
5,747,485
5,747,560
5,747,590
5,747,646
5,747,651
5,747,708
5,747,723
5,747,732
5,747,740
5,747,789
5,747,793
5,747,861
5,747,886
5,747,931
5,748,049
5,748,078
5,748,234
5,748,242
5,748,300
5,748,432
5,748,473
5,748,486
5,748,566
5,748,608
5,748,637
5,748,647
5,748,681
5,748,686
5,748,697
5,748,713
5,748,734
5,748,757
5,748,780
5,748,790
5,748,807
5,748,811
5,748,828
5,748,882
5,748,889
B1 982,900
B1 018,623
35 : 5,745,958
5,746,459
5,746,932
5,746,994
5,747,332
5,747,915
5,748,058
5,748,063
5,748,138
5,748,657
36 : RE. 35,784
5,745,929
5,745,939
5,745,942
5,745,981
5,745,984
5,745,999
5,746,001
5,746,028
5,746,037
5,746,063
5,746,068
5,746,127
5,746,194
5,746,251
5,746,293
5,746,345
5,746,366
5,746,387
5,746,388
5,746,427
5,746,531
5,746,536
5,746,581
5,746,694
5,746,711
5,746,723
5,746,743
5,746,746
5,746,762
5,746,795
5,746,814
5,746,828
5,746,859
5,746,864
5,746,874
5,746,897
5,746,925
5,746,937
5,746,958
5,747,033
5,747,084
5,747,095
5,747,117
5,747,144
5,747,145
5,747,172
5,747,181
5,747,199
5,747,212
5,747,215
5,747,225
5,747,228
5,747,232
5,747,234
5,747,235
5,747,236
5,747,239
5,747,258
5,747,279
5,747,281
5,747,287
5,747,304
5,747,311
5,747,329
5,747,345
5,747,346
5,747,404
5,747,415
5,747,418
5,747,454
5,747,487
5,747,547
5,747,567
5,747,577
5,747,585
5,747,596
5,747,624
5,747,650
5,747,688
5,747,693
5,747,697
5,747,737
5,747,739
5,747,752
5,747,802
5,747,814
5,747,844
5,747,866
5,747,877
5,747,980
5,748,007
5,748,012
5,748,074
5,748,079
5,748,087
5,748,117
5,748,118
5,748,142
5,748,143
5,748,146
5,748,204
5,748,218
5,748,221
5,748,239
5,748,240
5,748,284
5,748,289
5,748,291
5,748,326
5,748,330
5,748,344
5,748,347
5,748,361
5,748,443
5,748,452
5,748,489
5,748,564
5,748,643
5,748,653
5,748,687
5,748,718
5,748,728
5,748,755
5,748,764
5,748,785
5,748,824
5,748,870
5,748,941
5,748,946
5,748,951
5,748,958
5,748,959
5,748,974
5,748,988
5,748,989
5,748,990
5,749,006
5,749,016
5,749,017
5,749,018
5,749,019
5,749,020
5,749,021
5,749,023
5,749,024
5,749,028
5,749,034
5,749,038
5,749,039
5,749,066
37 : 5,745,954
5,746,040
5,746,041
5,746,046
5,746,073
5,746,103
5,746,104
5,746,145
5,746,227
5,746,328
5,746,395
5,746,477
5,746,490
5,746,493
5,746,611
5,746,669
5,746,789
5,747,026
5,747,334
5,747,444
5,747,472
5,747,751
5,747,918
5,747,992
5,748,008
5,748,150
5,748,455
5,748,464
5,748,691
5,748,694
5,748,695
5,748,819
5,748,823
5,748,944
5,748,945
5,748,972
5,748,987
5,749,033
5,749,051
38 : 5,746,070
5,748,419
39 : 5,745,919
5,745,948
5,745,992
5,746,005
5,746,087
5,746,101
5,746,102
5,746,239
5,746,261
5,746,305
5,746,357
5,746,441
5,746,522
5,746,574
5,746,578
5,746,630
5,746,665
5,746,690
5,746,715
5,746,774
5,746,798
5,746,799
5,746,821
5,746,830
5,746,837
5,746,846
5,746,849
5,746,854
5,746,869
5,746,895
5,746,906
5,746,914
5,746,962
5,746,967
5,747,070
5,747,075
5,747,094
5,747,102
5,747,105
5,747,127
5,747,143
5,747,150
5,747,153
5,747,155
5,747,176
5,747,295
5,747,398
5,747,433
5,747,440
5,747,443
5,747,556
5,747,571
5,747,584
5,747,607
5,747,617
5,747,738
5,747,747
5,747,769
5,747,794
5,747,812
5,747,910
5,747,911
5,748,277
5,748,422
5,748,711
5,748,837
40 : 5,746,270
5,746,436
5,746,453
5,746,908
5,747,407
5,747,475
41 : 5,745,997
5,746,031
5,746,192
5,746,322
5,746,336
5,746,554
5,746,758
5,746,993
5,747,151
5,747,266
5,747,600
5,747,879
5,747,972
5,748,001
5,748,025
5,748,027
5,748,033
5,748,121
5,748,196
5,748,247
5,748,446
5,748,618
5,748,644
5,748,763
5,748,768
5,748,783
5,748,903
5,748,930
5,748,937
5,749,047
5,749,084
42 : RE. 35,787
5,745,982
5,746,020
5,746,061
5,746,062
5,746,128
5,746,144
5,746,211
5,746,213
5,746,223
5,746,267
5,746,335
5,746,369
5,746,390
5,746,399
5,746,429
5,746,454
5,746,476
5,746,484
5,746,532
5,746,608
5,746,610
5,746,620
5,746,622
5,746,642
5,746,747
5,746,750
5,746,796
5,746,892
5,746,909
5,746,947
5,746,992
5,747,003
5,747,010
5,747,135
5,747,162
5,747,195
5,747,257
5,747,264
5,747,286
5,747,313
5,747,314
5,747,315
5,747,342
5,747,347
5,747,480
5,747,490
5,747,497
5,747,540
5,747,598
5,747,604
5,747,685
5,747,719
5,747,725
5,747,810
5,747,815
5,747,873
5,747,973
5,748,088
5,748,108
5,748,155
5,748,173
5,748,177
5,748,650
5,748,667
5,748,680
5,748,682
5,748,762
5,748,954
5,749,077
44 : 5,746,018
5,747,701
5,748,102
5,748,317
5,748,318
5,748,571
B1 076,920
B1 164,084
45 : 5,745,940
5,745,968
5,746,022
5,746,179
5,746,257
5,746,431
5,746,452
5,746,485
5,746,579
5,746,705
5,746,816
5,747,767
5,747,773
5,747,954
5,748,843
47 : 5,745,957
5,746,288
5,746,344
5,746,417
5,746,771
5,746,783
5,747,103
5,747,394
5,747,711
5,748,255
5,748,321
48 : 5,745,920
5,745,950
5,745,985
5,745,990
5,746,038
5,746,116
5,746,139
5,746,152
5,746,168
5,746,221
5,746,258
5,746,259
5,746,274
5,746,276
5,746,279
5,746,280
5,746,334
5,746,353
5,746,372
5,746,392
5,746,465
5,746,519
5,746,551
5,746,582
5,746,583
5,746,595
5,746,596
5,746,605
5,746,752
5,746,785
5,746,835
5,746,862
5,746,884
5,746,907
5,746,924
5,746,930
5,746,935
5,746,950
5,746,954
5,746,963
5,746,973
5,746,986

/OL
2 10
ISS
1
MY
5
998
JMI

5,746,987
5,747,007
5,747,054
5,747,057
5,747,101
5,747,104
5,747,134
5,747,163
5,747,273
5,747,325
5,747,367
5,747,469
5,747,546
5,747,592
5,747,594
5,747,595
5,747,612
5,747,659
5,747,696
5,747,749
5,747,750
5,747,792
5,747,834
5,747,842
5,747,850
5,747,880
5,747,890
5,747,893
5,747,983
5,748,002
5,748,017
5,748,028
5,748,040
5,748,048
5,748,127
5,748,137
5,748,184
5,748,229
5,748,250
5,748,278
5,748,467
5,748,490
5,748,497
5,748,516
5,748,556
5,748,569
5,748,611
5,748,640
5,748,645
5,748,670
5,748,683
5,748,684
5,748,719
5,748,740
5,748,855
5,748,863
5,748,866
5,748,876
5,748,877
5,748,888
5,748,902
5,748,907
5,748,911
5,748,916
5,748,921
5,748,938
5,748,940
5,748,949
5,748,968
5,748,978
5,748,981
5,748,983
5,749,010
5,749,041
5,749,064
5,749,090
49 : 5,746,447
5,746,544
5,746,598
5,746,756
5,746,793
5,747,282
5,747,603
5,747,692
5,747,993
5,748,151
5,748,263
5,748,410
5,748,485
5,748,754
5,748,846
5,748,867
50 : 5,745,945
5,745,959
5,746,684
5,747,698
5,748,005
5,748,009
51 : 5,745,930
5,745,938
5,745,976
5,746,135
5,746,155
5,746,209
5,746,230
5,746,331
5,746,340
5,746,537
5,746,543
5,746,603
5,746,604
5,746,671
5,746,685
5,746,738
5,747,141
5,747,203
5,747,684
5,747,730
5,748,056
5,748,062
5,748,084
5,748,090
5,748,226
5,748,270
5,748,312
5,748,706
5,748,735
5,748,737
5,748,742
5,748,750
5,748,752
5,748,973
53 : 5,745,951
5,746,050
5,746,132
5,746,147
5,746,241
5,746,299
5,746,394
5,746,428
5,746,521
5,746,540
5,746,566
5,746,656
5,746,681
5,746,714
5,746,955
5,746,997
5,747,024
5,747,048
5,747,059
5,747,082
5,747,088
5,747,179
5,747,267
5,747,292
5,747,349
5,747,645
5,747,714
5,747,721
5,747,748
5,747,756
5,747,955
5,748,176
5,748,185
5,748,191
5,748,254
5,748,379
5,748,427
5,748,440
5,748,468
5,748,613
5,748,753
5,748,759
5,748,789
5,748,827
5,748,878
5,748,920
5,748,963
5,748,980
5,749,042
54 : 5,746,330
5,747,629
5,747,919
55 : 5,745,922
5,746,006
5,746,010
5,746,273
5,746,286
5,746,298
5,746,309
5,746,351
5,746,423
5,746,495
5,746,564
5,746,569
5,746,572
5,746,649
5,746,710
5,746,887
5,747,249
5,747,328
5,747,358
5,747,630
5,747,760
5,747,765
5,747,766
5,747,892
5,748,492
5,748,704
5,748,900
56 : 5,746,437
5,748,484

DESIGN PATENTS

01 : 393,962
04 : 394,134
05 : 393,944
393,969
06 : 393,947
393,952
393,953
393,956
393,976
393,977
393,997
394,003
394,004
394,006
394,018
394,025
394,039
394,040
394,055
394,056
394,063
394,065
394,085
394,109
394,125
08 : 394,058
09 : 393,951
393,982
393,983
394,013
12 : 393,971
394,000
394,014
394,024
394,088
394,133
13 : 393,943
394,041
394,130
17 : 393,959
393,960
393,961
393,990
393,991
394,121
18 : 394,057
20 : 393,965
21 : 393,950
22 : 393,935
24 : 394,071
394,122
25 : 394,015
394,043
394,052
394,053
394,077
26 : 393,968
394,011
394,017
394,128
27 : 393,984
394,049
394,115
394,124
29 : 393,948
393,989
394,007
394,008
394,009
30 : 394,132
32 : 393,981
34 : 393,970
393,974
394,016
394,129
394,131
36 : 393,963
393,995
394,061
394,064
394,072
394,073
394,113
37 : 393,964
394,035
394,110
394,111
394,112
39 : 393,999
394,010
394,030
394,031
394,032
394,114
41 : 393,939
394,026
394,093
394,126
394,127
42 : 393,998
394,066
394,070
394,094
394,117
394,120
45 : 393,954
393,973
47 : 393,980
394,099
394,102
394,104
394,107
48 : 394,021
394,044
394,051
394,105
394,106
50 : 394,097
53 : 393,936
393,937
393,978
393,979
393,992
394,096
394,119
55 : 393,949
394,033
394,108
394,116

PLANT PATENTS

06 : 10,375
10,376
10,380
39 : 10,384
41 : 10,370
42 : 10,379

STATUTORY INVENTION REGISTRATIONS

24 : H1,728
34 : H1,729
48 : H1,725
H1,730
51 : H1,726
55 : H1,727

U. S. GOVERNMENT PRINTING OFFICE : 1998 O - 179-273 QL 3

CHANGE OF ADDRESS FORM

NAME - FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY

STATE

ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Goverment Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

VOL
210
ISS
1
MY
5
998
UMI

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
* 5606

☐ **YES,** enter ______ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $______. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

For privacy protection, check the box below:
☐ Do not make my name available to other mailers

Check method of payment:
☐ Check payable to Superintendent of Documents
☐ GPO Deposit Account ☐☐☐☐☐☐☐ – ☐
☐ VISA ☐ MasterCard
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
☐☐☐☐ (expiration date)

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Charge your order. It's easy!

MasterCard
VISA

Fax your orders (202) 512–2250

Phone your orders (202) 512–1800

Thank you for your order!

VOL
210

ISS
1

MY
5

1998

UMI

VOL
12 10
ISS
1

VOL
210

ISS
2

MY
12

998

MI

Route to:

U.S.
DEPARTMENT
OF COMMERCE

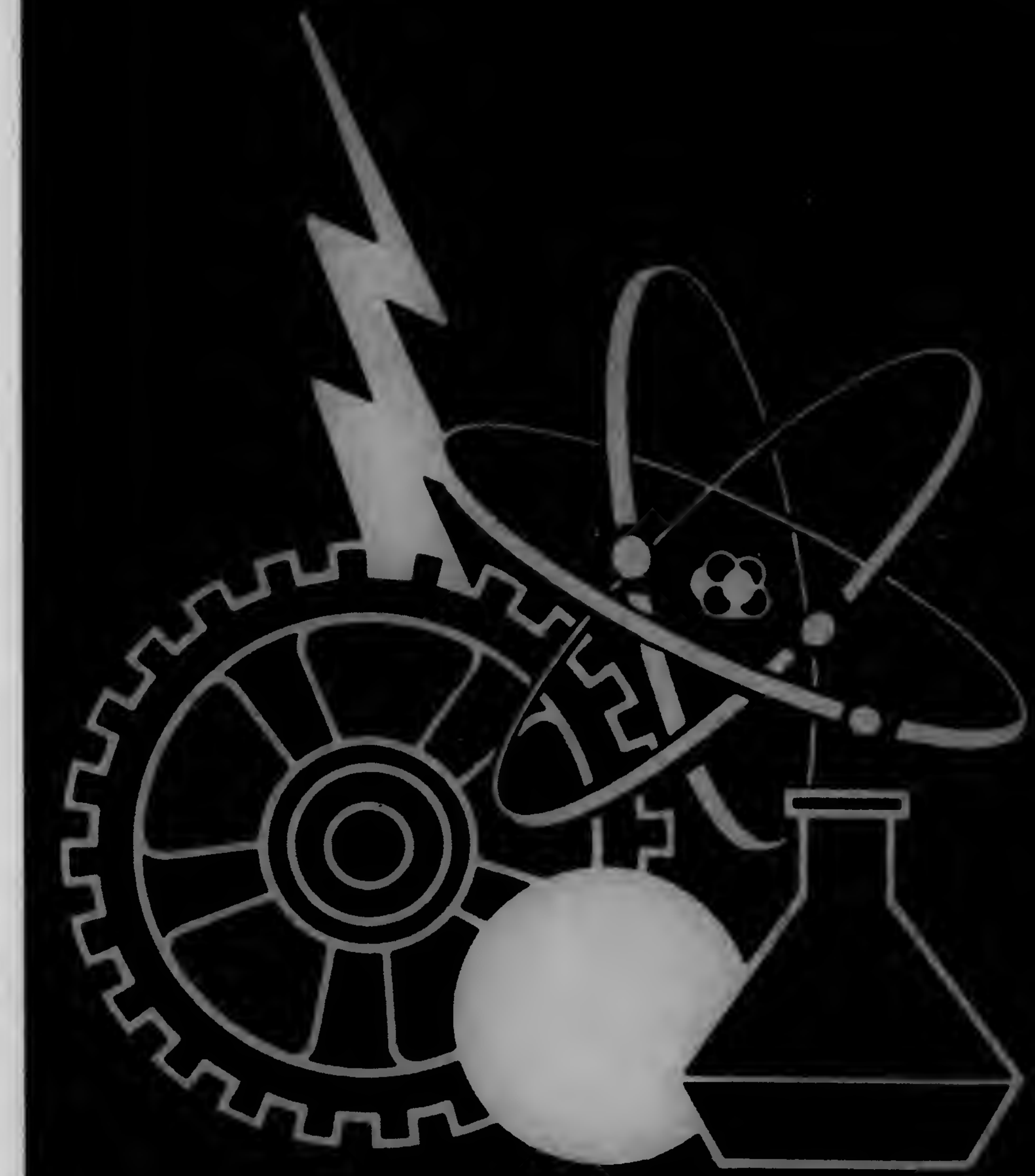
Patent
and
Trademark
Office

Vol. 1210 Number 2

OFFICIAL GAZETTE
of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 12, 1998



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OL
210
SS
2
MY
12
998
MI

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 12, 1998 Volume 1210 Number 2

CONTENTS

Page
Patent and Trademark Office Notices
  Patent Cooperation Treaty (PCT) Information .... 1210 OG 27
  Patent Cooperation Treaty Update .... 1210 OG 27
  Announcement of Certain Amendments to the Regulations Under the Patent Cooperation Treaty (PCT) .... 1210 OG 29
  Notice of Maintenance Fees Payable .... 1210 OG 43
  Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee .... 1210 OG 43
  Patents Reinstated Due to the Acceptance of a Late Maintenance Fee from 03/06/98 .... 1210 OG 50
  Reissue Applications Filed .... 1210 OG 50
  Requests for Reexamination Filed .... 1210 OG 51
  Notice of Expiration of Trademark Registrations Due To Failure to Renew .... 1210 OG 51
  Notice Regarding Technical Center Box Issue Fee Mailings .... 1210 OG 54
  37 CFR 1.47 Notice by Publication .... 1210 OG 54
  Patents Available for License or Sale .... 1210 OG 54
  Registration to Practice .... 1210 OG 54
  Service by Publication .... 1210 OG 54
  Errata .... 1210 OG 55
  Certificates of Correction .... 1210 OG 55
  Summary of Final Decisions Issued by the Trademark Trial and Appeal Board .... 1210 OG 56
Special Boxes for Mail .... 1210 OG 57
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries .... 1210 OG 59
Patent Examining Corps .... 1210 OG 61
Condition of Trademark Applications .... 1210 OG 62
Reexaminations 1091
Reissue Patents Granted (35,788) 1093
Plant Patents Granted (10,385) 1097
Patents Granted May 12, 1998 — Errata 1099
Patents Granted
  General and Mechanical (5,749,096) 1101
  Chemical (5,749,923) 1381
  Electrical (5,750,877) 1647
Design Patents Granted (394,135) 2125
Index of Patentees .... PI 1
Indices of Reissue, Reexaminations, Design and Plant Patents .... PI 158
Classification of
  Patents (Including Reissues and Reexaminations) .... PI 167
  Designs and Plants Applications .... PI 173
Geographical Index of Residence of Inventors
  Patents (Including Reissues and Reexaminations) .... PI 175
  Designs and Plant Applications .... PI 178
Change of Address Form .... PI 179
Subscription Order Form .... PI 181

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202)-512-1800.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP; Washington, DC 20402-9328

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1250.00
International fees	
Basic fee	455.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	105.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	105.00
— Confirmation fee	52.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	49.00	98.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	360.00	720.00
USPTO was ISA but not IPEA	395.00	790.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	535.00	1070.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	465.00	930.00
Other National fees		
— For each independent claim in excess of 3	41.00	82.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	135.00	270.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

Nov. 10, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Patent Cooperation Treaty Update

Accession by Cyprus

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Cyprus deposited its instrument of accession to the PCT on January 1, 1998. Cyprus will become a Contracting State of the PCT on April 1, 1998. Consequently, nationals and residents of Cyprus are entitled to file international applications under the PCT on and after April 1, 1998, and from the same date it is possible to file international applications designating and electing Cyprus (country code: CY).

Since Cyprus will also become bound by the European Patent Convention on April 1, 1998, it will be possible, in any international application filed on or after that date, to designate Cyprus for the purpose of obtaining a European patent in addition to or instead of a national patent. Any international application filed on or after that date and containing the designation of a State party to the European Patent Convention will include the designation of Cyprus unless expressly excluded.

Accession by Croatia

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Croatia deposited its instrument of accession to the PCT on April 1, 1998. Croatia will become a Contracting State of the PCT on July 1, 1998.

Consequently, nationals and residents of Croatia are entitled to file international applications under the PCT on and after July 1, 1998, and from the same date it is possible to file international applications designating and electing Croatia (country code: HR).

Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(1) Central African Republic[2]	Accession	15 September 1971	24 January 1978
(2) Senegal[2]	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi[5]	Accession	16 May 1972	24 January 1978
(5) Cameroon[2]	Accession	15 March 1973	24 January 1978
(6) Chad[2]	Accession	12 February 1974	24 January 1978
(7) Togo[2]	Ratification	28 January 1975	24 January 1978
(8) Gabon[2]	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany[3]	Ratification	19 July 1976	24 January 1978
(11) Congo[2]	Accession	08 August 1977	24 January 1978
(12) Switzerland[3]	Ratification	14 September 1977	24 January 1978
(13) United Kingdom[3]	Ratification	24 October 1977	24 January 1978
(14) France[3]	Ratification	25 November 1977	25 February 1978
(15) Russian Federation[6]	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg[3]	Ratification	31 January 1978	30 April 1978
(18) Sweden[3]	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark[3]	Ratification	01 September 1978	01 December 1978
(21) Austria[3]	Ratification	23 January 1979	23 April 1979
(22) Monaco[3]	Ratification	22 March 1979	22 June 1979
(23) Netherlands[3]	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein[3]	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium[3]	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania[2]	Accession	13 January 1983	13 April 1983
(34) Sudan[5]	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali[2]	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy[3]	Ratification	28 December 1984	28 March 1985
(40) Benin[2]	Accession	26 November 1986	26 February 1987
(41) Burkina Faso[2]	Accession	21 December 1988	21 March 1989
(42) Spain[3]	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece[3]	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Cosm̂te d'Ivoire[2]	Ratification	31 January 1991	30 April 1991
(47) Guinea[2]	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991
(49) Czech Republic	Declaration[4]	18 December 1992	01 January 1993
(50) Ireland[3]	Ratification	01 May 1992	01 August 1992
(51) Portugal[3]	Accession	24 August 1992	24 November 1992
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration[4]	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration[4]	30 December 1992	01 January 1993
(56) Niger[2]	Accession	21 December 1992	21 March 1993
(57) Kazakstan[6]	Declaration[4]	16 February 1993	25 December 1991
(58) Belarus[6]	Declaration[4]	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991
(61) China	Accession	01 October 1993	01 January 1994
(62) Slovenia	Accession	01 December 1993	01 March 1994
(63) Trinidad and Tobago	Accession	10 December 1993	10 March 1994
(64) Georgia	Declaration[4]	18 January 1994	25 December 1991
(65) Kyrgyzstan[6]	Declaration[4]	14 February 1994	25 December 1991
(66) Republic of Moldova[6]	Declaration[4]	14 February 1994	25 December 1991
(67) Tajikistan	Declaration[4]	14 February 1994	25 December 1991
(68) Kenya[5]	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia[6]	Declaration[4]	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland[5]	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda[5]	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan[6]	Declaration[4]	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho[5]	Accession	21 July 1995	21 October 1995
(82) Azerbaijan[6]	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996
(84) Israel	Ratification	01 March 1996	01 June 1996
(85) Cuba	Accession	16 April 1996	16 July 1996
(86) Saint Lucia	Accession	30 May 1996	30 August 1996
(87) Bosnia and Herzegovina	Accession	7 June 1996	7 September 1996
(88) Federal Republic of Yugoslavia[7]	Ratification	01 November 1996	01 February 1997
(89) Ghana[5]	Accession	26 November 1996	26 February 1997
(90) Zimbabwe[5]	Accession	11 March 1997	11 June 1997
(91) Sierra Leone	Accession	17 March 1997	17 June 1997
(92) Indonesia	Accession	05 June 1997	05 September 1997
(93) Gambia[5]	Accession	09 September 1997	09 December 1997
(94) Guinea-Bissau	Accession	12 September 1997	12 December 1997
(95) Cyprus	Accession	01 January 1998	01 April 1998
(96) Croatia	Accession	01 April 1998	01 July 1998

[1] Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2] Member of African Intellectual Property Organization (OAPI) regional patent system.

[3] Member of European Patent Convention (EPC) regional patent system.

[4] Declaration of continued application.

[5] Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

[6] Member of Eurasian Patent Organization (EAPO) regional patent system.

[7] The Federal Republic of Yugoslavia is comprised of the Republics of Serbia and Montenegro. The World Intellectual Property Organization has utilized the two-letter code "YU" to refer to the Federal Republic of Yugoslavia becoming a party to the Patent Cooperation Treaty. The United States understands that the scope of the territory covered by the designation encompasses only the Republics of Serbia and Montenegro.

April 14, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Announcement of Certain Amendments to the Regulations Under the Patent Cooperation Treaty (PCT)

Certain of the Regulations under the Patent Cooperation Treaty were amended with effect from July 1, 1998, unless a different date is indicated in a footnote to the amended Regulations which are reproduced below. The following highlight some of the amendments made:

(1) PCT Gazette - the two separate English and French paper editions of the Gazette were replaced by a single bilingual paper version;

(2) Language of the international application - the existing provisions as to the languages in which international applications may be filed,

(3) Priority claims - PCT Rule 4.10 has been completely revised to simplify correction procedures in cases of mistakes and/or omissions, to simplify requirements relating to the contents of priority claims and to liberalize requirements relating to the furnishing of priority documents;

(4) Demand for international preliminary examination - a safeguard has been introduced for the situation in which a demand is not filed with the competent International Preliminary Examining Aiuthority (IPEA);

(5) Access - copies of documents in the files of the International Bureau and the IPEA will become more readily available to third parties after international publication for international applications filed on or after July 1, 1998;

(6) Payment of fees - time limits for payment of different fees during the international phase have been made more uniform and other features of relevant rules have been clarified;

(7) Sequence listings - a new standard for the presentation of nucleotide and amino acid sequences will be adopted and will replace the current various requirements of the International Searching Authorities, IPEAs and designated and elected offices; and

(8) Deposits - the scope of PCT Rule 13*bis* has been broadened to cover deposits of biological material.

AMENDMENTS OF THE REGULATIONS UNDER THE PATENT COOPERATION TREATY (PCT)

TEXT OF THE AMENDED RULES[1]

Rule 3
The Request (Form)

3.1 and 3.2 [No change]

3.3 Check List

(a) The request shall contain a list indicating:

(i) the total number of sheets constituting the international application and the number of the sheets of each element of the international application: request, description (separately indicating the number of sheets of any sequence listing part of the description), claims, drawings, abstract;

(ii) where applicable, that the international application as filed is accompanied by a power of attorney (i.e., a document appointing an agent or a common representative), a copy of a general power of attorney, a priority document, a sequence listing in computer readable form, a document relating to the payment of fees, or any other document (to be specified in the check list);

(iii) [No change]

(b) [No change]

3.4 [No change]

Rule 4
The Request (Contents)

4.1 to 4.9 [No change]

4.10 Priority Claim

(a) Any declaration referred to in Article 8(1) ("priority claim") shall, subject to Rule 26*bis*.1, be made in the request; it shall consist of a statement to the effect that the priority of an earlier application is claimed and shall indicate:

(i) the date on which the earlier application was filed, being a date falling within the period of 12 months preceding the international filing date;

(ii) the number of the earlier application;

(iii) where the earlier application is a national application, the country party to the Paris Convention for the Protection of Industrial Property in which it was filed;

(iv) where the earlier application is a regional application, the authority entrusted with the granting of regional patents under the applicable regional patent treaty;

(v) where the earlier application is an international application, the receiving Office with which it was filed.

(b) In addition to any indication required under paragraph (a)(iv) or (v):

(i) where the earlier application is a regional application or an international application, the priority claim may indicate one or more countries party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed;

(ii) where the earlier application is a regional application and the countries party to the regional patent treaty are not all party to the Paris Convention for the Protection of Industrial Property, the priority claim shall indicate at least one country party to that Convention for which that earlier application was filed.

(c) For the purposes of paragraphs (a) and (b), Article 2(vi) shall not apply.

(d) [Deleted]

(e) [Deleted]

4.11 to 4.17 [No change]

Rule 5
The Description

5.1 [No change]

5.2 Nucleotide and/or Amino Acid Sequence Disclosure

(a) Where the international application contains disclosure of one or more nucleotide and/or amino acid sequences, the description shall contain a sequence listing complying with the standard provided for in the Administrative Instructions and presented as a separate part of the description in accordance with that standard.

(b) Where the sequence listing part of the description contains any free text as defined in the standard provided for in the Administrative Instructions, that free text shall also appear in the main part of the description in the language thereof.

Rule 11
Physical Requirements of the International Application

11.1 to 11.13 [No change]

11.14 Later Documents

Rules 10, and 11.1 to 11.13, also apply to any document-for example, corrected pages, amended claims, translations-submitted after the filing of the international application.

Rule 12
Language of the International Application and Translation for the Purposes of International Search

12.1 Languages Accepted for the Filing of International Applications

(a) An international application shall be filed in any language which the receiving Office accepts for that purpose.

(b) Each receiving Office shall, for the filing of international applications, accept at least one language which is both:

(i) a language accepted by the International Searching Authority, or, if applicable, by at least one of the International Searching Authorities, competent for the international searching of international applications filed with that receiving Office, and

(ii) a language of publication.

(iii) [Deleted]

(c) Notwithstanding paragraph (a), the request shall be filed in a language which is both a language accepted by the receiving Office under that paragraph and a language of publication.

(d) Notwithstanding paragraph (a), any text matter contained in the sequence listing part of the description referred to in Rule 5.2(a) shall be presented in accordance with the standard provided for in the Administrative Instructions.

12.2 Language of Changes in the International Application

(a) Any amendment of the international application shall, subject to Rules 46.3, 55.3 and 66.9, be in the language in which the application is filed.

(b) Any rectification under Rule 91.1 of an obvious error in the international application shall be in the language in which the application is filed, provided that:

(i) where a translation of the international application is required under Rule 12.3(a), 48.3(b) or 55.2(a), rectifications referred to in Rule 91.1(e)(ii) and (iii) shall be filed in both the language of the application and the language of that translation;

(ii) where a translation of the request is required under Rule 26.3*ter*(c), rectifications referred to in Rule 91.1(e)(i) need only be filed in the language of that translation.

(c) Any correction under Rule 26 of a defect in the international application shall be in the language in which the international application is filed. Any correction under Rule 26 of a defect in a translation of the international application furnished under Rule 12.3 or 55.2(a), or in a translation of the request furnished under Rule 26.3*ter*(c), shall be in the language of the translation.

12.3 Translation for the Purposes of International Search

(a) Where the language in which the international application is filed is not accepted by the International Searching Authority that is to carry out the international search, the applicant shall, within one month from the date of receipt of the international application by the receiving Office, furnish to that Office a translation of the international application into a language which is all of the following:

(i) a language accepted by that Authority, and

(ii) a language of publication, and

(iii) a language accepted by the receiving Office under Rule 12.1(a), unless the international application is filed in a language of publication.

(b) Paragraph (a) shall not apply to the request nor to any sequence listing part of the description.

(c) Where, by the time the receiving Office sends to the applicant the notification under Rule 20.5(c), the applicant has not furnished a translation required under paragraph (a), the receiving Office shall, preferably together with that notification, invite the applicant:

(i) to furnish the required translation within the time limit under paragraph (a);

(ii) in the event that the required translation is not furnished within the time limit under paragraph (a), to furnish it and to pay, where applicable, the late furnishing fee referred to in paragraph (e), within one month from the date of the invitation or two months from the date of receipt of the international application by the receiving Office, which ever expires later.

(d) Where the receiving Office has sent to the applicant an invitation under paragraph (c) and the applicant has not, within the applicable time limit under paragraph (c)(ii), furnished the required translation and paid any required late furnishing fee, the international application shall be considered withdrawn and the receiving Office shall so declare. Any translation and any payment received by the receiving Office before that Office makes the declaration under the previous sentence and before the expiration of 15 months from the priority date shall be considered to have been received before the expiration of that time limit.

(e) The furnishing of a translation after the expiration of the time limit under paragraph (a) may be subjected by the receiving Office to the payment to it, for its own benefit, of a late furnishing fee equal to 50% of the basic fee.

Rule 13*bis*
Inventions Relating to Biological Material

13*bis*.1 Definition

For the purposes of this Rule, "reference to deposited biological material" means particulars given in an international application with respect to the deposit of biological material with a depositary institution or to the biological material so deposited.

13*bis*.2 References (General)

Any reference to deposited biological material shall be made in accordance with this Rule and, if so made, shall be considered as satisfying the requirements of the national law of each designated State.

13*bis*.3 References: Contents; Failure to Include Reference or Indication

(a) A reference to deposited biological material shall indicate:

(i) [No change]

(ii) the date of deposit of the biological material with that institution;

(iii) and (iv) [No change]

(b) Failure to include a reference to deposited biological material or failure to include, in a reference to deposited biological material, an indication in accordance with paragraph (a), shall have no consequence in any designated State whose national law does not require such reference or such indication in a national application.

13*bis*.4 References: Time Limit for Furnishing Indications

(a) Subject to paragraphs (b) and (c), if any of the indications referred to in Rule 13*bis*.3(a) is not included in a reference to deposited biological material in the international application as filed but is furnished to the International Bureau:

(i) within 16 months from the priority date, the indication shall be considered by any designated Office to have been furnished in time;

(ii) after the expiration of 16 months from the priority date, the indication shall be considered by any designated Office to have been furnished on the last day of that time limit if it reaches the International Bureau before the technical preparations for international publication have been completed.

(b) If the national law applicable by a designated Office so requires in respect of national applications, that Office may require that any of the indications referred to in Rule 13*bis*.3(a) be furnished earlier than 16 months from the priority date, provided that the International Bureau has been notified of such requirement pursuant to Rule 13*bis*.7(a)(ii) and has published such requirement in the Gazette in accordance with Rule 13*bis*.7(c) at least two months before the filing of the international application.

(c) Where the applicant makes a request for early publication under Article 21(2)(b), any designated Office may consider any indication not furnished before the technical preparations for international publication have been completed as not having been furnished in time.

(d) The International Bureau shall notify the applicant of the date on which it received any indication furnished under paragraph (a), and

(i) if the indication was received before the technical preparations for international publication have been completed, indicate that date, and include the relevant data from the indication, in the pamphlet published under Rule 48;

(ii) if the indication was received after the technical preparations for international publication have been completed, notify that date and the relevant data from the indication to the designated Offices.

13*bis*.5 References and Indications for the Purposes of One or More Designated States; Different Deposits for Different Designated States; Deposits with Depositary Institutions Other than Those Notified

(a) A reference to deposited biological material shall be considered to be made for the purposes of all designated States, unless it is expressly made for the purposes of certain of the designated States only; the same applies to the indications included in the reference.

(b) References to different deposits of the biological material may be made for different designated States.

(c) Any designated Office may disregard a deposit made with a depositary institution other than one notified by it under Rule 13*bis*.7(b).

13*bis*.6 Furnishing of Samples

(a) [Deleted]

Pursuant to Articles 23 and 40, no furnishing of samples of the deposited biological material to which a reference is made in an international application shall, except with the authorization of the applicant, take place before the expiration of the applicable time limits after which national processing may start under the said Articles. However, where the applicant performs the acts referred to in Articles 22 or 39 after international publication but before the expiration of the said time limits, the furnishing of samples of the deposited biological material may take place, once the said acts have been performed. Notwithstanding the previous provision, the furnishing of samples of the deposited biological material may take place under the national law applicable by any designated Office as soon as, under that law, the international publication has the effects of the compulsory national publication of an unexamined national application.

13*bis*.7 National Requirements: Notification and Publication

(a) Any national Office may notify the International Bureau of any requirement of the national law:

(i) that any matter specified in the notification, in addition to those referred to in Rule 13*bis*.3(a)(i), (ii) and (iii), is required to be included in a reference to deposited biological material in a national application;

(ii) that one or more of the indications referred to in Rule 13*bis*.3(a) are required to be included in a national application as filed or are required to be furnished at a time specified in the notification which is earlier than 16 months from the priority date.

(b) Each national Office shall notify the International Bureau of the depositary institutions with which the national law permits deposits of biological materials to be made for the purposes of patent procedure before that Office or, if the national law does not provide for or permit such deposits, of that fact.

(c) [No change]

Rule 13*ter*

Nucleotide and/or Amino Acid Sequence Listings

13*ter*.1 Sequence Listing for International Authorities

(a) Where the International Searching Authority finds that the international application contains disclosure of one or more nucleotide and/or amino acid sequences but:

(i) the international application does not contain a sequence listing complying with the standard provided for in the Administrative Instructions, that Authority may invite the applicant to furnish to it, within a time limit fixed in the invitation, a sequence listing complying with that standard;

(ii) the applicant has not already furnished a sequence listing in computer readable form complying with the standard provided for in the Administrative Instructions, that Authority may invite the applicant to furnish to it, within a time limit fixed in the invitation, a sequence listing in such a form complying with that standard.

(b) [Deleted]

(c) If the applicant does not comply with an invitation under paragraph (a) within the time limit fixed in the invitation, the International Searching Authority shall not be required to search the international application to the extent that such noncompliance has the result that a meaningful search cannot be carried out.

(d) Where the International Searching Authority finds that the description does not comply with Rule5.2(b), it shall invite the applicant to file the required correction. Rule 26.4 shall apply mutatis mutandis to any correction offered by the applicant. The International Searching Authority shall transmit the correction to the receiving Office and to the International Bureau.

(e) Paragraphs (a) and (c) shall apply mutatis mutandis to the procedure before the International Preliminary Examining Authority.

(f) Any sequence listing not contained in the international application as filed shall not, subject to Article 34, form part of the international application.

13*ter*.2 Sequence Listing for Designated Office

Once the processing of the international application has started before a designated Office, Rule13*ter*.1(a) shall apply mutatis mutandis to the procedure before that Office. No designated Office shall require the applicant to furnish to it a sequence listing other than a sequence listing complying with the standard provided for in the Administrative Instructions.

(b) [Deleted]

Rule 14

The Transmittal Fee

14.1 The Transmittal Fee

(a) [No change]

(b) The amount of the transmittal fee, if any, shall be fixed by the receiving Office.

(c) The transmittal fee shall be paid within one month from the date of receipt of the international application. The amount payable shall be the amount applicable on that date of receipt.

Rule 15

The International Fee

15.1 Basic Fee and Designation Fee

Each international application shall be subject to the payment of a fee for the benefit of the International Bureau ("international fee") to be collected by the receiving Office and consisting of,

(i) [No change]

(ii) as many "designation fees" as there are national patents and regional patents sought under Rule4.9(a), except that, where Article 44 applies in respect of a designation, only one designation fee shall be due for that designation, and that the Schedule of Fees may indicate a maximum number of designation fees payable.

15.2 Amounts

(a) [No change]

(b) The basic fee and the designation fee shall be payable in the currency or one of the currencies prescribed by the receiving Office ("prescribed currency"), it being understood that, when transferred by the receiving Office to the International Bureau, they shall be freely convertible into Swiss currency. The amounts of the basic fee and of the designation fee shall be established, for each receiving Office which prescribes the payment of those fees in any currency other than Swiss currency, by the Director General after consultation with the receiving Office of, or acting under Rule19.1(b) for, the State whose official currency is the same as the prescribed currency. The amounts so established shall be the equivalents, in round figures, of the amounts in Swiss currency set out inthe Schedule of Fees. They shall be notified by the International Bureau to each receiving Office prescribing payment in that prescribed currency and shall be published in the Gazette.

(c) [No change]

(d) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish new amounts in the prescribed currency according to directives given by the Assembly. The newly established amounts shall become applicable two months after the date of their publication in the Gazette, provided that the receiving Office referred to in the second sentence of paragraph (b) and the Director General may agree on a date falling during the said two-month period, in which case the said amounts shall become applicable from that date.

15.3 [Deleted]

15.4 Time Limit for Payment; Amount Payable

(a) The basic fee shall be paid within one month from the date of receipt of the international application. The amount payable shall be the amount applicable on that date of receipt.

(b) The designation fee shall be paid within a time limit of:

(i) one year from the priority date, or

(ii) one month from the date of receipt of the international application if that one-month period expires later than one year from the priority date.

(c) Where the designation fee is paid before the expiration of one month from the date of receipt of the international application, the amount payable shall be the amount applicable on that date of receipt. Where the time limit under paragraph (b)(i) applies and the designation fee is paid before the expiration of that time limit but later than one month from the date of receipt of the international application, the amount payable shall be the amount applicable on the date of payment. (i) and (ii) [Deleted]

15.5 Fees Under Rule 4.9(c)

(a) Notwithstanding Rule 15.4(b), the confirmation under Rule 4.9(c) of any designations made under Rule 4.9(b) shall be subject to the payment to the receiving Office of as many designation fees (for the benefit of the International Bureau) as there are national patents and regional patents sought by the applicant by virtue of the confirmation, together with a confirmation fee (for the benefit of the receiving Office) equal to 50% of the sum of the designation fees payable under this paragraph. Such fees shall be payable in respect of each designation so confirmed, even if the maximum number of designation fees referred to in item 2(a) of the Schedule of Fees is already payable or if a designation fee is already payable in respect of the designation under Rule 4.9(a) of the same State for a different purpose.

(b) [No change]

15.6 Refund

The receiving Office shall refund the international fee to the applicant:

(i) if the determination under Article 11(1) is negative,

(ii) if, before the transmittal of the record copy to the International Bureau, the international application is withdrawn or considered withdrawn, or

(iii) if, due to prescriptions concerning national security, the international application is not treated as such.

Rule 16

The Search Fee

16.1 Right to Ask for a Fee

(a) [No change]

(b) The search fee shall be collected by the receiving Office. The said fee shall be payable in the currency or one of the currencies prescribed by that Office ("receiving Office currency"), it being understood that, if any receiving Office currency is not that, or one of those, in which the International Searching Authority has fixed the said fee ("fixed currency"), it shall, when transferred by the receiving Office to the International Searching Authority, be freely convertible into the currency of the State in which the International Searching Authority has its headquarters ("headquarters currency"). The amount of the search fee in any receiving Office currency, other than the fixed currency, shall be established by the Director General after consultation with the receiving Office of, or acting under Rule 19.1(b) for, the State whose official currency is the same as the receiving Office currency. The amounts so established shall be the equivalents, in round figures, of the amount established by the International Searching Authority in the headquarters currency. They shall be notified by the International Bureau to each receiving Office prescribing payment in that receiving Office currency and shall be published in the Gazette.

(c) [No change]

(d) Where the exchange rate between the headquarters currency and any receiving Office currency, other than the fixed currency or currencies, becomes different from the exchange rate last applied, the Director General shall establish the new amount in the said receiving Office currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that any receiving Office referred to in the third sentence of paragraph (b) and the Director General may agree on a date falling during the said two-month period, in which case the said amount shall become applicable for that Office from that date.

(e) [No change]

(f) As to the time limit for payment of the search fee and the amount payable, the provisions of Rule15.4(a) relating to the basic fee shall apply mutatis mutandis.

16.2 Refund

The receiving Office shall refund the search fee to the applicant:

(i) if the determination under Article 11(1) is negative,

(ii) if, before the transmittal of the search copy to the International Searching Authority, the international application is withdrawn or considered withdrawn, or

(iii) if, due to prescriptions concerning national security, the international application is not treated as such.

16.3 [No change]

Rule 16*bis*

Extension of Time Limits for Payment of Fees

16*bis*.1 Invitation by the Receiving Office

(a) Where, by the time they are due under Rules 14.1(c), 15.4(a) and 16.1(f), the receiving Office finds that no fees were paid to it, or that the amount paid to it is insufficient to cover the transmittal fee, the basic fee and the search fee, the receiving Office shall invite the applicant to pay to it the amount required to cover those fees, together with, where applicable, the late payment fee under Rule 16*bis*.2, within a time limit of one month from the date of the invitation.

(b) Where, by the time they are due under Rule 15.4(b), the receiving Office finds that no fees were paid to it, or that the amount paid to it is insufficient to cover the designation fees necessary to cover all the designations under Rule 4.9(a), the receiving Office shall invite the applicant to pay to it the amount required to cover those fees, together with, where applicable, the late payment fee under Rule 16*bis*.2, within a time limit of one month from the date of the invitation. The amount payable in respect of any designation fee shall be the amount applicable on the last day of the one-year period from the priority date if the time limit under Rule 15.4(b)(i) applies or the amount applicable on the date of receipt of the international application if the time limit under Rule 15.4(b)(ii) applies.

(c) Where the receiving Office has sent to the applicant an invitation under paragraph (a) or (b) and the applicant has not, within the time limit referred to in that paragraph, paid in full the amount due, including, where applicable, the late payment fee under Rule 16*bis*.2, the receiving Office shall, subject to paragraph (d):

(i) to (iii) [No change]

(d) Any payment received by the receiving Office before that Office sends the invitation under paragraph (a) or (b) shall be considered to have been received before the expiration of the time limit under Rule 14.1(c), 15.4(a) or (b) or 16.1(f), as the case may be.

(e) Any payment received by the receiving Office before that Office makes the applicable declaration under Article 14(3) shall be considered to have been received before the expiration of the time limit referred to in paragraph (a) or (b).

16*bis*.2 Late Payment Fee

(a) The payment of fees in response to an invitation under Rule 16*bis*.1(a) or (b) may be subjected by the receiving Office to the payment to it, for its own benefit, of a late payment fee. The amount of that fee shall be:

(i) and (ii) [No change]

(b) The amount of the late payment fee shall not, however, exceed the amount of the basic fee referred to in item 1(a) of the Schedule of Fees.

Rule 17
The Priority Document

17.1 Obligation to Submit Copy of Earlier National or International Application

(a) Where the priority of an earlier national or international application is claimed under Article 8, a copy of that earlier application, certified by the authority with which it was filed ("the priority document"), shall, unless already filed with the receiving Office together with the international application in which the priority claim is made, and subject to paragraph (b), be submitted by the applicant to the International Bureau or to the receiving Office not later than 16 months after the priority date, provided that any copy of the said earlier application which is received by the International Bureau after the expiration of that time limit shall be considered to have been received by that Bureau on the last day of that time limit if it reaches it before the date of international publication of the international application.

(b) Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request shall be made not later than 16 months after the priority date and may be subjected by the receiving Office to the payment of a fee.

(c) If the requirements of neither of the two preceding paragraphs are complied with, any designated State may disregard the priority claim, provided that no designated Office shall disregard the priority claim before giving the applicant an opportunity to furnish the priority document within a time limit which shall be reasonable under the circumstances.

17.2 Availability of Copies

(a) Where the applicant has complied with Rule 17.1(a) or (b), the International Bureau shall, at the specific request of the designated Office, promptly but not prior to the international publication of the international application, furnish a copy of the priority document to that Office. No such Office shall ask the applicant himself to furnish it with a copy. The applicant shall not be required to furnish a translation to the designated Office before the expiration of the applicable time limit under Article 22. Where the applicant makes an express request to the designated Office under Article 23(2) prior to the international publication of the international application, the International Bureau shall, at the specific request of the designated Office, furnish a copy of the priority document to that Office promptly after receiving it.

(b) [No change]

(c) Where the international application has been published under Article 21, the International Bureau shall furnish a copy of the priority document to any person upon request and subject to reimbursement of the cost unless, prior to that publication:

(i) [No change]

(ii) the relevant priority claim was withdrawn or considered, under Rule 26*bis*.2(b), not to have been made.

(iii) [Deleted]

(d) [Deleted]

Rule 19
The Competent Receiving Office

19.1 to 19.3 [No change]

19.4 Transmittal to the International Bureau as Receiving Office

(a) Where an international application is filed with a national Office which acts as a receiving Office under the Treaty but

(i) that national Office is not competent under Rule 19.1 or 19.2 to receive that international application, or

(ii) that international application is not in a language accepted under Rule 12.1(a) by that national Office but is in a language accepted under that Rule by the International Bureau as receiving Office, or

(iii) that national Office and the International Bureau agree, for any reason other than those specifiedunder items (i) and (ii), and with the authorization of the applicant, that the procedure under this Rule should apply,

that international application shall, subject to paragraph (b), be considered to have been received by that Office on behalf of the International Bureau as receiving Office under Rule 19.1(a)(iii).

(b) [No change]

(c) For the purposes of Rules 14.1(c), 15.4(a) to (c) and 16.1(f), where the international application was transmitted to the International Bureau under paragraph (b), the date of receipt of the international application shall be considered to be the date on which the international application was actually received by the International Bureau. For the purposes of this paragraph, the last sentence of paragraph (b) shall not apply.

Rule 20
Receipt of the International Application

20.1 to 20.3 [No change]

20.4 Determination Under Article 11(1)

(a) and (b) [No change]

(c) For the purposes of Article 11(1)(ii), it shall be sufficient that the part which appears to be a description (other than any sequence listing part thereof) and the part which appears to be a claim or claims be in a language accepted by the receiving Office under Rule 12.1(a).

(d) If, on October 1, 1997, paragraph (c) is not compatible with the national law applied by the receiving Office, paragraph (c) shall not apply to that receiving Office for as long as it continues not to be compatible with that law, provided that the said Office informs the International Bureau accordingly by December 31, 1997. The information received shall be promptly published by the International Bureau in the Gazette.

20.5 to 20.9 [No change]

Rule 22
Transmittal of the Record Copy and Translation

22.1 Procedure

(a) to (g) [No change]

(h) Where the international application is to be published in the language of a translation furnished under Rule 12.3, that translation shall be transmitted by the receiving Office to the International Bureau together with the record copy under paragraph (a) or, if the receiving Office has already transmitted the record copy to the International Bureau under that paragraph, promptly after receipt of the translation.

22.2 [Remains deleted]

22.3 [No change]

Rule 23
Transmittal of the Search Copy, Translation and Sequence Listing

23.1 Procedure

(a) Where no translation of the international application is required under Rule 12.3(a), the search copy shall be transmitted by the receiving Office to the International Searching Authority at the latest on the same day as the record copy is transmitted to the International Bureau unless no search fee has been paid. In the latter case, it shall be transmitted promptly after payment of the search fee.

(b) Where a translation of the international application is furnished under Rule 12.3, a copy of that translation and of the request, which together shall be considered to be the search copy under Article 12(1), shall be transmitted by the receiving Office to the International Searching Authority, unless no search fee has been paid. In the latter case, a copy of the said translation and of the request shall be transmitted promptly after payment of the search fee.

(c) Any sequence listing in computer readable form which is furnished to the receiving Office shall be transmitted by that Office to the International Searching Authority.

Rule 26
Checking by, and Correcting Before, the Receiving Office of Certain Elements of the International Application

26.1 and 26.2 [No change]

26.3 Checking of Physical Requirements Under Article 14(1)(a)(v)

(a) Where the international application is filed in a language of publication, the receiving Office shall check:

(i) the international application for compliance with the physical requirements referred to in Rule 11 only to the extent that compliance therewith is necessary for the purpose of reasonably uniform international publication;

(ii) any translation furnished under Rule 12.3 for compliance with the physical requirements referred to in Rule 11 to the extent that compliance therewith is necessary for the purpose of satisfactory reproduction.

(b) Where the international application is filed in a language which is not a language of publication, the receiving Office shall check:

(i) the international application for compliance with the physical requirements referred to in Rule 11 only to the extent that compliance therewith is necessary for the purpose of satisfactory reproduction;

(ii) any translation furnished under Rule 12.3 and the drawings for compliance with the physical requirements referred to in Rule 11 to the extent that compliance therewith is necessary for the purpose of reasonably uniform international publication.

26.3*bis* Invitation under Article 14(1)(b) to Correct Defects Under Rule 11

The receiving Office shall not be required to issue the invitation under Article 14(1)(b) to correct a defect under Rule 11 where the physical requirements referred to in that Rule are complied with to the extent required under Rule 26.3.

26.3*ter* Invitation to Correct Defects Under Article 3(4)(i)

(a) Where the abstract or any text matter of the drawings is filed in a language which is different from the language of the description and the claims, the receiving Office shall, unless(i) a translation of the international application is required under Rule 12.3(a), or

(ii) the abstract or the text matter of the drawings is in the language in which the international application is to be published,

invite the applicant to furnish a translation of the abstract or the text matter of the drawings into the language in which the international application is to be published. Rules 26.1(a), 26.2, 26.3, 26.3*bis*, 26.5 and 29.1 shall apply mutatis mutandis.

(b) If, on October 1, 1997, paragraph (a) is not compatible with the national law applied by the receiving Office, paragraph (a) shall not apply to that receiving Office for as long as it continues not to be compatible with that law, provided that the said Office informs the International Bureau accordingly by December 31, 1997. The information received shall be promptly published by the International Bureau in the Gazette.

(c) Where the request does not comply with Rule 12.1(c), the receiving Office shall invite the applicant to file a translation so as to comply with that Rule. Rules 3, 26.1(a), 26.2, 26.5 and 29.1 shall apply mutatis mutandis.

(d) If, on October 1, 1997, paragraph (c) is not compatible with the national law applied by the receiving Office, paragraph (c) shall not apply to that receiving Office for as long as it continues not to be compatible with that law, provided that the said Office informs the International Bureau accordingly by December 31, 1997. The information received shall be promptly published by the International Bureau in the Gazette.

26.4 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

26.5 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

26.6 [No change]

Rule 26*bis*
Correction or Addition of Priority Claim

26*bis*.1 Correction or Addition of Priority Claim

(a) The applicant may correct or add a priority claim by a notice submitted to the receiving Office or the International Bureau within a time limit of 16 months from the priority date or, where the correction or addition would cause a change in the priority date, 16 months from the priority date also changed, whichever 16-month period expires first, provided that such a notice may be submitted until the expiration of four months from the international filing date. The correction of a priority claim may include the addition of any indication referred to in Rule 4.10.

(b) Any notice referred to in paragraph (a) received by the receiving Office or the International Bureau after the applicant has made a request for early publication under Article 21(2)(b) shall be considered not to have been submitted, unless that request is withdrawn before the technical preparations for international publication have been completed.

(c) Where the correction or addition of a priority claim causes a change in the priority date, any time limit which is computed from the previously applicable priority date and which has not already expired shall be computed from the priority date as so changed.

26*bis*.2 Invitation to Correct Defects in Priority Claims

(a) Where the receiving Office or, if the receiving Office fails to do so, the International Bureau, finds that a priority claim does not comply with the requirements of Rule 4.10 or that any indication in a priority claim is not the same as the corresponding indication appearing in the priority document, the receiving Office or the International Bureau, as the case may be, shall invite the applicant to correct the priority claim.

(b) If, in response to an invitation under paragraph (a), the applicant does not, before the expiration of the time limit under Rule 26*bis*.1(a), submit a notice correcting the priority claim so as to comply with the requirements of Rule 4.10, that priority claim shall, for the purposes of the procedure under the Treaty, be considered not to have been made and the receiving Office or the International Bureau, as the case may be, shall so declare and shall inform the applicant accordingly, provided that a priority claim shall not be considered not to have been made only because the indication of the number of the earlier application referred to in Rule 4.10(a)(ii) is missing or because an indication inthe priority claim is not the same as the corresponding indication appearing in the priority document.

(c) Where the receiving Office or the International Bureau has made a declaration under paragraph(b), the International Bureau shall, upon request made by the applicant and received by the International Bureau prior to the completion of the technical preparations for international publication, and subject to the payment of a special fee whose amount shall be fixed in the Administrative Instructions, publish, together with the international application, information concerning the priority claim which was considered not to have been made. A copy of that request shall be included in the communication under Article 20 where a copy of the pamphlet is not used for that communication or where the international application is not published by virtue of Article 64(3).

Rule 29
International Applications or Designations Considered Withdrawn

29.1 Finding by Receiving Office

(a) If the receiving Office declares, under Article 14(1)(b) and Rule 26.5 (failure to correct certain defects), or under Article 14(3)(a) (failure to pay the prescribed fees under Rule 27.1(a)), or under Article 14(4) (later finding of non-compliance with the requirements listed in items (i) to (iii) of Article 11(1)), or under Rule 12.3(d) (failure to furnish a required translation or, where applicable, to pay a late furnishing fee), or under Rule 92.4(g)(i) (failure to furnish the original of a document), that the international application is considered withdrawn:

(i) to (iv) [No change]

(b) [No change]

29.2 [Remains deleted]

29.3 and 29.4 [No change]

Rule 34
Minimum Documentation

34.1 Definition

(a) and (b) [No change]

(c) Subject to paragraphs (d) and (e), the "national patent documents" shall be the following:

(i) the patents issued in and after 1920 by France, the former Reichspatentamt of Germany, Japan, the former Soviet Union, Switzerland (in the French and German languages only), the United Kingdom, and the United States of America,

(ii) the patents issued by the Federal Republic of Germany and the Russian Federation,

(iii) [No change]

(iv) the inventors' certificates issued by the former Soviet Union,

(v) and (vi) [No change]

(d) [No change]

(e) Any International Searching Authority whose official language, or one of whose official languages, is not Japanese, Russian or Spanish is entitled not to include in its documentation those patent documents of Japan, the Russian Federation and the former Soviet Union as well as those patent documents in the Spanish language, respectively, for which no abstracts in the English language are generally available. English abstracts becoming generally available after the date of entry into force of these Regulations shall require the inclusion of the patent documents to which the abstracts refer no later than six months after such abstracts become generally available. In case of the interruption of abstracting services in English in technical fields in which English abstracts were formerly generally available, the Assembly shall take appropriate measures to provide for the prompt restoration of such services in the said fields.

(f) [No change]

Rule 37
Missing or Defective Title

37.1 [No change]

37.2 Establishment of Title

If the international application does not contain a title and the International Searching Authority has not received a notification from the receiving Office to the effect that the applicant has been invited to furnish a title, or if the said Authority finds that the title does not comply with Rule 4.3, it shall itself establish a title. Such title shall be established in the language in which the international application isto be published or, if a translation into another language was transmitted under Rule 23.1(b) and the International Searching Authority so wishes, in the language of that translation.

Rule 38
Missing or Defective Abstract

38.1 [No change]

38.2 Establishment of Abstract

(a) If the international application does not contain an abstract and the International Searching Authority has not received a notification from the receiving Office to the effect that the applicant has been invited to furnish an abstract, or if the said Authority finds that the abstract does not comply with Rule 8, it shall itself establish an abstract. Such abstract shall be established in the language in which the international application is to be published or, if a translation into another language was transmitted under Rule 23.1(b) and the International Searching Authority so wishes, in the language of that translation.

(b) [No change]

Rule 43
The International Search Report

43.1 to 43.3 [No change]

43.4 Language

Every international search report and any declaration made under Article 17(2)(a) shall be in the language in which the international application to which it relates is to be published or, if a translation into another language was transmitted under Rule 23.1(b) and the International Searching Authority so wishes, in the language of that translation.

43.5 to 43.8 [No change] 43.9 Additional Matter

The international search report shall contain no matter other than that specified in Rules 33.1(b) and (c), 43.1 to 43.3, 43.5 to 43.8, and 44.2, and the indication referred to in Article 17(2)(b), provided that the Administrative Instructions may permit the inclusion in the international search report of any additional matter specified in the Administrative Instructions. The international search report shall not contain, and the Administrative Instructions shall not permit the inclusion of, any expressions of opinion, reasoning, arguments, or explanations.

43.10 [No change]

Rule 44
Transmittal of the International Search Report, Etc.

44.1 [No change]

44.2 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

44.3 [No change]

Rule 46
Amendment of Claims Before the International Bureau

46.1 to 46.4 [No change]

46.5 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

Rule 47
Communication to Designated Offices

47.1 and 47.2 [No change]

47.3 Languages

(a) The international application communicated under Article 20 shall be in the language in which it is published.

(b) Where the language in which the international application is published is different from the language in which it was filed, the International Bureau shall furnish to any designated Office, upon the request of that Office, a copy of that application in the language in which it was filed.

47.4 [No change]

Rule 48
International Publication

48.1 [No change]

48.2 Contents

(a) The pamphlet shall contain:

(i) to (vii) [No change]

(viii) the relevant data from any indications in relation to deposited biological material furnished under Rule 13*bis* separately from the description, together with an indication of the date on which the International Bureau received such indications,

(ix) any information concerning a priority claim considered not to have been made under Rule26*bis*.2(b), the publication of which is requested under Rule 26*bis*.2(c).

(b) to (i) [No change]

48.3 Languages of Publication

(a) If the international application is filed in Chinese, English, French, German, Japanese, Russian or Spanish ("languages of publication"), that application shall be published in the language in which it was filed.

(a-*bis*) If the international application is not filed in a language of publication and a translation into a language of publication has been furnished under Rule 12.3, that application shall be published in the language of that translation.

(b) If the international application is filed in a language which is not a language of publication and no translation into a language of publication is required under Rule 12.3(a), that application shall be published in English translation. The translation shall be prepared under the responsibility of the International Searching Authority, which shall be obliged to have it ready in time to permit international publication by the prescribed date, or, where Article 64(3)(b) applies, to permit the communication under Article 20 by the end of the 19th month after the priority date. Notwithstanding Rule 16.1(a), the International Searching Authority may charge a fee for the translation to the applicant. The International Searching Authority shall give the applicant an opportunity to comment on the draft translation. The International Searching Authority shall fix a time limit reasonable under the circumstances of the case for such comments. If there is no time to take the comments of the applicant into account before the translation is communicated or if there is a difference of opinion between the applicant and the said Authority as to the correct translation, the applicant may send a copy of his comments, or what remains of them, to the International Bureau and each designated Office to which the translation was communicated. The International Bureau shall publish the relevant portions of the comments together with the translation of the International Searching Authority or subsequently to the publication of such translation.

(c) [No change]

48.4 to 48.6 [No change]

Rule 49
Copy, Translation and Fee Under Article 22

49.1 to 49.4 [No change]

49.5 Contents of and Physical Requirements for the Translation

(a) For the purposes of Article 22, the translation of the international application shall contain the description (subject to paragraph (a-*bis*)), the claims, any text matter of the drawings and the abstract. If required by the designated Office, the translation shall also, subject to paragraphs (b), (c-*bis*) and (e),

(i) to (iii) [No change]

(a-*bis*) No designated Office shall require the applicant to furnish to it a translation of any text matter contained in the sequence listing part of the description if such sequence listing part complies with Rule 12.1(d) and if the description complies with Rule 5.2(b).

(b) to (l) [No change]

Rule 54
The Applicant Entitled to Make a Demand

54.1 [No change]

54.2 Right to Make a Demand

The right to make a demand under Article 31(2) shall exist if the applicant making the demand or, if there are two or more applicants, at least one of them is a resident or national of a Contracting State bound by Chapter II and the international application has been filed with a receiving Office of or acting for a Contracting State bound by Chapter II.

(i) and (ii) [Deleted]

54.3 [No change]

54.4 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

Rule 55
Languages (International Preliminary Examination)

55.1 [No change]

55.2 Translation of International Application

(a) Where neither the language in which the international application is filed nor the language in which the international application is published is accepted by the International Preliminary Examining Authority that is to carry out the international preliminary examination, the applicant shall, subject to paragraph (b), furnish with the demand a translation of the international application into a language which is both:

(i) a language accepted by that Authority, and

(ii) a language of publication.

(b) Where a translation of the international application into a language referred to in paragraph (a) was transmitted to the International Searching Authority under Rule 23.1(b) and the International Preliminary Examining Authority is part of the same national Office or intergovernmental organization as the International Searching Authority, the applicant need not furnish a translation under paragraph(a). In such a case, unless the applicant furnishes a translation under paragraph (a), the international preliminary examination shall be carried out on the basis of the translation transmitted under Rule 23.1(b).

(c) [No change]

(d) If the applicant complies with the invitation within the time limit under paragraph (c), the said requirement shall be considered to have been complied with. If the applicant fails to do so, the demand shall be considered not to have been submitted and the International Preliminary Examining Authority shall so declare.

(e) [Deleted]

55.3 [No change]

Rule 57
The Handling Fee

57.1 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

57.2 Amount

(a) [No change]

(b) [Remains deleted]

(c) The handling fee shall be payable in the currency or one of the currencies prescribed by the International Preliminary Examining Authority ("prescribed currency"), it being understood that, when transferred by that Authority to the International Bureau, it shall be freely convertible into Swiss currency. The amount of the handling fee shall be established, in each prescribed currency, for each International Preliminary Examining Authority which prescribes the payment of the handling fee in any currency other than Swiss currency, by the Director General after consultation with the Office with which consultation takes place under Rule 15.2(b) in relation to that currency, or, if there is no such Office, with the Authority which prescribes payment in that currency. The amount so established shall be the equivalent, in round figures, of the amount in Swiss currency set out in the Schedule of Fees. It shall be notified by the International Bureau to each International Preliminary Examining Authority prescribing payment in that prescribed currency and shall be published in the Gazette.

(d) and (e) [No change]

57.3 Time Limit for Payment; Amount Payable

The handling fee shall be paid within one month from the date on which the demand was submitted, provided that, where the demand was transmitted to the International Preliminary Examining Authority under Rule 59.3, the handling fee shall be paid within one month from the date of receipt by that Authority. The amount payable shall be the amount applicable on that date of submittal or date of receipt, as the case may be. For the purposes of the preceding two sentences, Rule 59.3(e) shall not apply.

(b) [Remains deleted]

(c) [Deleted]

57.4 [Deleted]

57.5 [Remains deleted]

57.6 Refund

The International Preliminary Examining Authority shall refund the handling fee to the applicant:

(i) [No change]

(ii) if the demand is considered, under Rule 54.4, not to have been submitted.

Rule 58
The Preliminary Examination Fee

58.1 Right to Ask for a Fee

(a) [No change]

(b) The amount of the preliminary examination fee, if any, shall be fixed by the International Preliminary Examining Authority. As to the time limit for payment of the preliminary examination fee and the amount payable, the provisions of Rule 57.3 relating to the handling fee shall apply mutatis mutandis.

(c) [No change]

58.2 [Deleted]

58.3 [No change]

Rule 58*bis*
Extension of Time Limits for Payment of Fees

58*bis*.1 Invitation by the International Preliminary Examining Authority

(a) Where, by the time they are due under Rules 57.3 and 58.1(b), the International Preliminary Examining Authority finds that no fees were paid to it, or that the amount paid to it is insufficient to cover the handling fee and the preliminary examination fee, the Authority shall invite the applicant to pay to it the amount required to cover those fees, together with, where applicable, the late payment fee under Rule 58*bis*.2, within a time limit of one month from the date of the invitation.

(b) Where the International Preliminary Examining Authority has sent an invitation under paragraph(a) and the applicant has not, within the time limit referred to in that paragraph, paid in full the amount due, including, where applicable, the late payment fee under Rule 58*bis*.2, the demand shall, subject to paragraph (c), be considered as if it had not been submitted and the International Preliminary Examining Authority shall so declare.

(c) Any payment received by the International Preliminary Examining Authority before that Authority sends the invitation under paragraph (a) shall be considered to have been received before the expiration of the time limit under Rule 57.3 or 58.1(b), as the case may be.

(d) Any payment received by the International Preliminary Examining Authority before that Authority proceeds under paragraph (b) shall be considered to have been received before the expiration of the time limit under paragraph (a).

58*bis*.2 Late Payment Fee

(a) The payment of fees in response to an invitation under Rule 58*bis*.1(a) may be subjected by the International Preliminary Examining Authority to the payment to it, for its own benefit, of a late payment fee. The amount of that fee shall be:

(i) 50% of the amount of unpaid fees which is specified in the invitation, or,

(ii) if the amount calculated under item (i) is less than the handling fee, an amount equal to the handling fee.

(b) The amount of the late payment fee shall not, however, exceed double the amount of the handling fee.

Rule 59
The Competent International Preliminary Examining Authority

59.1 and 59.2 [No change]

59.3 Transmittal of Demand to the Competent International Preliminary Examining Authority

(a) If the demand is submitted to a receiving Office, an International Searching Authority, or an International Preliminary Examining Authority which is not competent for the international preliminary examination of the international application, that Office or Authority shall mark the date of receipt on the demand and, unless it decides to proceed under paragraph (f), transmit the demand promptly to the International Bureau.

(b) If the demand is submitted to the International Bureau, the International Bureau shall mark the date of receipt on the demand.

(c) Where the demand is transmitted to the International Bureau under paragraph (a) or submitted to it under paragraph (b), the International Bureau shall promptly:

(i) if there is only one competent International Preliminary Examining Authority, transmit the demand to that Authority and inform the applicant accordingly, or

(ii) if two or more International Preliminary Examining Authorities are competent, invite the applicant to indicate, within 15 days from the date of the invitation or 19 months from the priority date, whichever is later, the competent International Preliminary Examining Authority to which the demand should be transmitted.

(d) Where an indication is furnished as required under paragraph (c)(ii), the International Bureaushall promptly transmit the demand to the competent International Preliminary Examining Authority indicated by the applicant. Where no indication is so furnished, the demand shall be considered not to have been submitted and the International Bureau shall so declare.

(e) Where the demand is transmitted to a competent International Preliminary Examining Authority under paragraph (c), it shall be considered to have been received on behalf of that Authority on the date marked on it under paragraph (a) or (b), as applicable, and the demand so transmitted shall be considered to have been received by that Authority on that date.

(f) Where an Office or Authority to which the demand is submitted under paragraph (a) decides to transmit that demand directly to the competent International Preliminary Examining Authority, paragraphs (c) to (e) shall apply mutatis mutandis.

Rule 60
Certain Defects in the Demand or Elections

60.1 Defects in the Demand

(a) and (b) [No change]

(c) Subject to paragraph (d), if the applicant does not comply with the invitation within the time limit under paragraph (a), the demand shall be considered as if it had not been submitted and the International Preliminary Examining Authority shall so declare.

(d) to (g) [No change]

60.2 Defects in Later Elections

(a) and (b) [No change]

(c) Subject to paragraph (d), if the applicant does not comply with the invitation within the time limit under paragraph (a), the notice shall be considered as if it had not been submitted and the International Bureau shall so declare.

(d) [No change]

Rule 61
Notification of the Demand and Elections

61.1 Notification to the International Bureau and the Applicant

(a) The International Preliminary Examining Authority shall indicate on the demand the date of receipt or, where applicable, the date referred to in Rule 60.1(b). The International Preliminary Examining Authority shall promptly either send the demand to the International Bureau and keep a copy in its files or send a copy to the International Bureau and keep the demand in its files.

(b) The International Preliminary Examining Authority shall promptly notify the applicant of the date of receipt of the demand. Where the demand has been considered under Rules 54.4, 55.2(d), 58*bis*.1(b) or 60.1(c) as if it had not been submitted or where an election has been considered under Rule 60.1(d) as if it had not been made, the International Preliminary Examining Authority shall notify the applicant and the International Bureau accordingly.

(c) [No change]

61.2 and 61.3 [No change]

61.4 Publication in the Gazette

Where a demand has been filed before the expiration of 19 months from the priority date, theInternational Bureau shall, promptly after the filing of the demand but not before the international publication of the international application, publish in the Gazette information on the demand and the elected States concerned, as provided in the Administrative Instructions.

Rule 62
Copy of Amendments Under Article 19 for the International Preliminary Examining Authority

62.1 Amendments Made Before the Demand is Filed

Upon receipt of a demand, or a copy thereof, from the International Preliminary Examining Authority, the International Bureau shall promptly transmit a copy of any amendments under Article 19, and any statement referred to in that Article, to that Authority, unless that Authority has indicated that it has already received such a copy.

62.2 Amendments Made After the Demand is Filed

If, at the time of filing any amendments under Article 19, a demand has already been submitted, the applicant shall preferably, at the same time as he files the amendments with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments and any statement referred to in that Article. In any case, the International Bureau shall promptly transmit a copy of such amendments and statement to that Authority.

Rule 66
Procedure Before the International Preliminary Examining Authority

66.1 to 66.7 [No change]

66.8 Form of Amendments

(a) Subject to paragraph (b), the applicant shall be required to submit a replacement sheet for every sheet of the international application which, on account of an amendment, differs from the sheet previously filed. The letter accompanying the replacement sheets shall draw attention to the differences between the replaced sheets and the replacement sheets and shall preferably also explain the reasons for the amendment.

(b) Where the amendment consists in the deletion of passages or in minor alterations or additions, the replacement sheet referred to in paragraph (a) may be a copy of the relevant sheet of the international application containing the alterations or additions, provided that the clarity and direct reproducibility of that sheet are not adversely affected. To the extent that any amendment results inthe cancellation of an entire sheet, that amendment shall be communicated in a letter which shall preferably also explain the reasons for the amendment.

66.9 Language of Amendments

(a) Subject to paragraphs (b) and (c), if the international application has been filed in a language other than the language in which it is published, any amendment, as well as any letter referred to in Rule 66.8, shall be submitted in the language of publication.

(b) to (d) [No change]

Rule 69
Start of and Time Limit for International Preliminary Examination

69.1 [No change]

69.2 Time Limit for International Preliminary Examination

The time limit for establishing the international preliminary examination report shall be:

(i) 28 months from the priority date, or

(ii) eight months from the date of payment of the fees referred to in Rules 57.1 and 58.1(a), or

(iii) eight months from the date of receipt by the International Preliminary Examining Authority of the translation furnished under Rule 55.2,

whichever expires last.

Rule 70
The International Preliminary Examination Report

70.1 to 70.6 [No change]

70.7 Citations Under Article 35(2)

(a) The report shall cite the documents considered to be relevant for supporting the statements made under Article 35(2), whether or not such documents are cited in the international search report. Documents cited in the international search report need only be cited in the report when they are considered by the International Preliminary Examining Authority to be relevant.

(b) [No change]

70.8 to 70.15 [No change]

70.16 Annexes to the Report

Each replacement sheet under Rule 66.8(a) or (b), each replacement sheet containing amendments under Article 19 and each replacement sheet containing rectifications of obvious errors authorized under Rule 91.1(e)(iii) shall, unless superseded by later replacement sheets or amendments resulting in the cancellation of entire sheets under Rule 66.8(b), be annexed to the report. Amendments under Article 19 which have been considered as reversed by an amendment under Article 34 and letters under Rule 66.8 shall not be annexed.

70.17 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

Rule 76
Copy, Translation and Fee Under Article 39(1); Translation of Priority Document

76.1 to 76.3 [Remain deleted]

76.4 Time Limit for Translation of Priority Document

The applicant shall not be required to furnish to any elected Office a translation of the priority document before the expiration of the applicable time limit under Article 39.

76.5 and 76.6 [No change]

Rule 80
Computation of Time Limits

80.1 to 80.5 [No change]

80.6 [No change, except for the deletion of the redundant numbering of paragraph "(a)"]

80.7 [No change]

Rule 82*ter*
Rectification of Errors Made by the Receiving Office or by the International Bureau

82ter.1 Errors Concerning the International Filing Date and the Priority Claim

If the applicant proves to the satisfaction of any designated or elected Office that the international filing date is incorrect due to an error made by the receiving Office or that the priority claim has been erroneously considered by the receiving Office or the International Bureau not to have been made, and if the error is an error such that, had it been made by the designated or elected Office itself, that Office would rectify it under the national law or national practice, the said Office shall rectify the error and shall treat the international application as if it had been accorded the rectified international filing date or as if the priority claim had not been considered not to have been made.

Rule 86[2]
The Gazette

86.1 Contents and Form

(a) The Gazette referred to in Article 55(4) shall contain:

(i) for each published international application, the data specified by the Administrative Instructions taken from the front page of the pamphlet published under Rule 48, the drawing (if any) appearing on the said front page, and the abstract,

(ii) to (v) [No change]

(b) The information referred to in paragraph (a) shall be made available in two forms:

(i) as a Gazette in paper form, which shall contain the data specified by the Administrative Instructions taken from the front page of the pamphlet published under Rule 48 ("bibliographic data") and the matters referred to in paragraph (a)(ii) to (v);

(ii) as a Gazette in electronic form, which shall contain the bibliographic data, the drawing (if any) appearing on the said front page, and the abstract.

86.2 Languages; Access to the Gazette

(a) The Gazette in paper form shall be published in a bilingual (English and French) edition. It shall also be published in editions in any other language, provided the cost of publication is assured through sales or subventions.

(b) [No change]

(c) The Gazette in electronic form referred to in Rule 86.1(b)(ii) shall be made accessible, in English and French at the same time, by any electronic ways and means specified in the Administrative Instructions. The translations shall be ensured by the International Bureau in English and French. TheInternational Bureau shall ensure that the making accessible of the Gazette in electronic form shall be effected on, or as soon as possible

after, the date of publication of the pamphlet containing the international application.

86.3 to 86.6 [No change]

Rule 89*bis*[3]
Filing, Processing and Transmission of International Applications and Other Documents in Electronic Form or by Electronic Means

89*bis*.1 International Applications

(a) International applications may, subject to paragraphs (b) to (e), be filed and processed in electronic form or by electronic means, in accordance with the Administrative Instructions, provided that any receiving Office shall permit the filing of international applications on paper.

(b) These Regulations shall apply mutatis mutandis to international applications filed in electronic form or by electronic means, subject to any special provisions of the Administrative Instructions.

(c) The Administrative Instructions shall set out the provisions and requirements in relation to the filing and processing of international applications filed, in whole or in part, in electronic form or by electronic means, including but not limited to, provisions and requirements in relation to acknowledgment of receipt, procedures relating to the according of an international filing date, physical requirements and the consequences of non-compliance with those requirements, signature of documents, means of authentication of documents and of the identity of parties communicating with Offices and authorities, and the operation of Article 12 in relation to the home copy, the record copy and the search copy, and may contain different provisions and requirements in relation to international applications filed in different languages.

(d) No national Office or intergovernmental organization shall be obliged to receive or process international applications filed in electronic form or by electronic means unless it has notified theInternational Bureau that it is prepared to do so in compliance with the applicable provisions of the Administrative Instructions. The International Bureau shall publish the information so notified in the Gazette.

(e) No receiving Office which has given the International Bureau a notification under paragraph (d) may refuse to process an international application filed in electronic form or by electronic means which complies with the applicable requirements under the Administrative Instructions.

89*bis*.2 Other Documents

Rule 89*bis*.1 shall apply mutatis mutandis to other documents and correspondence relating to international applications.

89*bis*.3 Transmittal Between Offices

Where the Treaty, these Regulations or the Administrative Instructions provide for documents, notifications, communications or correspondence to be transmitted by one national Office or intergovernmental organization to another, such transmittal may, where so agreed by both the sender and the receiver, be effected in electronic form or by electronic means.

Rule 89*ter*[4]
Copies in Electronic Form of Documents Filed on Paper

89*ter*.1 Copies in Electronic Form of Documents Filed on Paper

Any national Office or intergovernmental organization may provide that, where an international application or other document relating to an international application is filed on paper, a copy thereof in electronic form, in accordance with the Administrative Instructions, may be furnished by the applicant.

Rule 91
Obvious Errors in Documents

91.1 Rectification

(a) to (c) [No change]

(d) Rectification may be made on the request of the applicant. The authority having discovered what appears to be an obvious error may invite the applicant to present a request for rectification as provided in paragraphs (e) to (g-quater). Rule 26.4 shall apply mutatis mutandis to the manner in which rectifications shall be requested.

(e) to (g-quater) [No change]

Rule 92
Correspondence

92.1 [No change]

92.2 Languages

(a) Subject to Rules 55.1 and 66.9 and to paragraph (b) of this Rule, any letter or document submitted by the applicant to the International Searching Authority or the International Preliminary Examining Authority shall be in the same language as the international application to which it relates. However, where a translation of the international application has been transmitted under Rule23.1(b) or furnished under Rule 55.2, the language of such translation shall be used.

(b) [No change]

(c) [Remains deleted]

(d) and (e) [No change]

92.3 [No change]

92.4 Use of Telegraph, Teleprinter, Facsimile Machine, Etc.

(a) A document making up the international application, and any later document or correspondence relating thereto, may, notwithstanding the provisions of Rules 11.14 and 92.1(a), but subject to paragraph (h), be transmitted, to the extent feasible, by telegraph, teleprinter, facsimile machine or other like means of communication resulting in the filing of a printed or written document.

(b) to (h) [No change]

Rule 93
Keeping of Records and Files

93.1 to 93.3 [No change]

93.4 Reproductions

For the purposes of this Rule, records, copies and files may be kept as photographic, electronic or other reproductions, provided that the reproductions are such that the obligations to keep records, copies and files under Rules 93.1 to 93.3 are met.

Rule 94[5]
Access to Files

94.1 Access to the File Held by the International Bureau

(a) At the request of the applicant or any person authorized by the applicant, the International Bureau shall furnish, subject to reimbursement of the cost of the service, copies of any document contained in its file.

(b) The International Bureau shall, at the request of any person but not before the international publication of the international application and subject to Article 38, furnish, subject to the reimbursement of the cost of the service, copies of any document contained in its file.

94.2 Access to the File Held by the International Preliminary Examining Authority

At the request of the applicant or any person authorized by the applicant, or, once the international preliminary examination report has been established, of any elected Office, the International Preliminary Examining Authority shall furnish, subject to reimbursement of the cost of the service, copies of any document contained in its file.

94.3 Access to the File Held by the Elected Office

If the national law applicable by any elected Office allows access by third parties to the file of a national application, that Office may allow access to any documents relating to the internationalapplication, including any document relating to the international preliminary examination, contained in its file, to the same extent as provided by the national law for access to the file of a national application, but not before the international publication of the international application. The furnishing of copies of documents may be subject to reimbursement of the cost of the service.

SCHEDULE OF FEES

as in force from January 1 to June 30, 1998[6]

Fees	Amounts
1. Basic Fee: (Rule 15.2(a))	
(a) if the international application contains not more than 30 sheets	650[7] Swiss francs
(b) if the international application contains more than 30 sheets	650[7] Swiss francs plus 15 Swiss francs for each sheet in excess of 30 sheets
2. Designation Fee: (Rule15.2(a))	
(a) for designations made under Rule 4.9(a)	150[7] Swiss francs per designation, provided that any designation made under Rule 4.9(a) in excess of 11 shall not require the payment of a designation fee
(b) for designations made under Rule 4.9(b) and confirmed under Rule 4.9(c)	150[7] Swiss francs per designation
3.[6]Confirmation Fee: (Rule 15.5(a))	50% of the sum of the designation fees payable under item 2(b)
4[6]Handling Fee:(Rule 57.2(a))	233 Swiss francs

All fees are reduced by 75% for international applications filed by any applicant who is a natural person and who is a national of and resides in a State whose per capita national income is below US $3,000 (according to the average per capita national income figures used by the United Nations for determining its scale of assessments for the contributions payable for the years 1995, 1996 and1997); if there are several applicants, each must satisfy those criteria.

SCHEDULE OF FEES

as in force from July 1, 1998[8]

Fees	Amounts
1. Basic Fee: (Rule 15.2(a))	
(a) if the international application contains not more than 30 sheets	650[9] Swiss francs
(b) if the international application contains more than 30 sheets	650[9] Swiss francs plus 15 Swiss francs for each sheet in excess of 30 sheets
2. Designation Fee: (Rule15.2(a))	
(a) for designations made under Rule 4.9(a)	150[9] Swiss francs per designation, provided that any designation made under Rule 4.9(a) in excess of 11 shall not require the payment of a designation fee
(b) for designations made under Rule 4.9(b) and confirmed under Rule 4.9(c)[10]	150[9] Swiss francs per designation
3.Handling Fee: (Rule 57.2(a))	233 Swiss francs

All fees are reduced by 75% for international applications filed by any applicant who is a natural person and who is a national of and resides in a State whose per capita national income is below US $3,000 (according to the average per capita national income figures used by the United Nations for determining its scale of assessments for the contributions payable for the years 1995, 1996 and 1997); if there are several applicants, each must satisfy those criteria.

---

1. The amendments will enter into force on July 1, 1998, except where otherwise indicated.

2. The amendments of Rule 86 will enter into force on January 1, 1998, on the understanding that, for practical reasons, it may not be possible for the new formats of the Gazette to be implemented from that date, in which case the International Bureau will continue to publish the Gazette in the present format for a short period after January 1, 1998, and the new formats will be introduced as soon as possible after that date.

3. Rules 89*bis* and 89*ter*, to be inserted in Part F (Rules Concerning Several Chapters of the Treaty) before Rule 90, will enter into force at the same time as the modifications of the Administrative Instructions implementing those Rules, the effective date to be included in the promulgation of those modifications by the Director General.

4. Rules 89*bis* and 89*ter*, to be inserted in Part F (Rules Concerning Several Chapters of the Treaty) before Rule 90, will enter into force at the same time as the modifications of the Administrative Instructions implementing those Rules, the effective date to be included in the promulgation of those modifications by the Director General.

5. Rule 94 as amended will apply only in respect of international applications filed on or after July 1,1998; present Rule 94 will continue to apply after July 1, 1998, in respect of international applications filed before that date.

6. The Schedule of Fees appearing on this page will enter into force on January 1, 1998; it will be further amended with effect from July 1, 1998, by deleting item 3 and renumbering item 4 as item 3 (see the following page).

7. The new amounts of the basic fee and the designation fee will apply only to international applications filed on or after January 1, 1998.

8. The Schedule of Fees appearing on this page will enter into force on July 1, 1998.

9. The new amounts of the basic fee and the designation fee will apply only to international applications filed on or after January 1, 1998.

10. See also Rule 15.5(a) for the confirmation fee, which is also payable.

Apr. 21, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 9, 1995 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,412,810 through 5,414,866
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 7, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,012,525 through 5,014,352
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 5, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,662,005 through 4,663,778
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f))	$525.00
By other than a small entity	$1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f))	$1,050.00
By other than a small entity	$2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f))	$1,580.00
By other than a small entity	$3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f))	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable	$700.00
(2) unintentional	$1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED March 4, 1998
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 34,173	07/606,243	02/02/93
(4,904,542)	(07/255,454)	(02/27/90)
Re. 34,242	07/843,872	05/04/93
(4,904,676)	(07/228,856)	(02/27/90)
Re. 34,351	07/795,975	08/24/93
(4,903,638)	(07/271,507)	(02/27/90)
Re. 34,545	07/749,976	02/15/94
(4,903,636)	(07/066,952)	(02/27/90)
4,573,226	06/570.894	03/04/86
4,573,243	06/614,731	03/04/86
4,573,254	06/686,121	03/04/86
4,573,256	06/526,849	03/04/86
4,573,267	06/590,024	03/04/86
4,573,272	06/655,169	03/04/86
4,573,277	06/686,441	03/04/86
4,573,282	06/596,381	03/04/86
4,573,289	06/501,341	03/04/86
4,573,317	06/710,445	03/04/86
4,573,319	06/400,769	03/04/86
4,573,331	06/543,928	03/04/86
4,573,368	06/604,960	03/04/86
4,573,371	06/342,587	03/04/86
4,573,372	06/763,872	03/04/86
4,573,373	06/585,007	03/04/86
4,573,379	06/493,697	03/04/86
4,573,380	06/493,745	03/04/86
4,573,383	06/564,026	03/04/86
4,573,384	06/636,696	03/04/86
4,573,388	06/590,645	03/04/86
4,573,390	06/694,203	03/04/86

Patent Number	Serial Number	Issue Date
4,573,392	06/648,719	03/04/86
4,573,403	06/662,272	03/04/86
4,573,404	06/604,127	03/04/86
4,573,405	06/632,598	03/04/86
4,573,406	06/657,847	03/04/86
4,573,407	06/437,741	03/04/86
4,573,416	06/469,311	03/04/86
4,573,419	06/570,554	03/04/86
4,573,424	06/569,636	03/04/86
4,573,426	06/576,281	03/04/86
4,573,428	06/610,747	03/04/86
4,573,430	06/669,165	03/04/86
4,573,438	06/473,828	03/04/86
4,573,455	06/564,507	03/04/86
4,573,466	06/383,184	03/04/86
4,573,472	06/421,643	03/04/86
4,573,482	06/600,444	03/04/86
4,573,488	06/599,317	03/04/86
4,573.499	06/593,817	03/04/86
4,573,515	06/475,692	03/04/86
4,573,518	06/608,278	03/04/86
4,573,547	06/560,834	03/04/86
4,573,556	06/599,730	03/04/86
4,573,561	06/507,263	03/04/86
4,573,563	06/746,368	03/04/86
4,573,567	06/470,238	03/04/86
4,573,569	06/624,275	03/04/86
4,573,592	06/732,891	03/04/86
4,573,593	06/668,734	03/04/86
4,573.606	06/530,893	03/04/86
4,573,615	06/569,580	03/04/86
4,573,620	06/657,654	03/04/86
4,573,633	06/624,153	03/04/86
4,573,643	06/596,210	03/04/86
4,573,645	06/554,736	03/04/86
4,573,646	06/602,921	03/04/86
4,573,649	06/519,251	03/04/86
4,573,653	06/598,262	03/04/86
4,573,663	06/611,813	03/04/86
4,573,666	06/630,931	03/04/86
4,573,672	06/701,182	03/04/86
4,573,678	06/500,554	03/04/86
4,573,679	06/624,021	03/04/86
4,573,684	06/673,224	03/04/86
4,573,690	06/681,380	03/04/86
4,573,691	06/669,950	03/04/86
4,573,712	06/456,632	03/04/86
4,573,713	06/443,367	03/04/86
4,573,714	06/488,835	03/04/86
4,573,727	06/652,591	03/04/86
4,573,733	06/652,225	03/04/86
4,573,740	06/621,714	03/04/86
4,573,742	06/549,275	03/04/86
4,573,760	06/585,784	03/04/86
4,573,767	06/615,612	03/04/86
4,573,770	06/620,329	03/04/86
4,573,771	06/627,318	03/04/86
4,573,775	06/409,467	03/04/86
4,573,779	06/567,298	03/04/86
4,573,796	06/568,768	03/04/86
4,573,811	06/719,360	03/04/86
4,573,816	06/613,269	03/04/86
4,573,821	06/709,972	03/04/86
4,573,828	06/596,254	03/04/86
4,573,830	06/622,913	03/04/86
4,573,834	06/687,590	03/04/86
4,573,835	06/300,968	03/04/86
4,573,837	06/576,910	03/04/86
4,573,842	06/469,254	03/04/86
4,573,843	06/507,143	03/04/86
4,573,847	06/522,898	03/04/86
4,573,848	06/558,106	03/04/86
4,573,850	06/679,216	03/04/86
4,573,851	06/495,642	03/04/86
4,573,852	06/693,822	03/04/86
4,573,858	06/580,990	03/04/86
4,573,860	06/607,452	03/04/86
4,573,869	06/514,030	03/04/86
4,573,872	06/545,646	03/04/86
4,573,875	06/615,016	03/04/86
4,573,876	06/657,599	03/04/86
4,573,878	06/620,463	03/04/86
4,573,886	06/481,441	03/04/86
4,573,887	06/532,671	03/04/86
4,573,901	06/694,757	03/04/86
4,573,908	06/743,498	03/04/86
4,573,918	06/675,125	03/04/86
4,573,922	06/571,182	03/04/86
4,573,932	06/578,024	03/04/86
4,573,942	06/524,522	03/04/86
4,573,952	06/575,891	03/04/86
4,573,954	06/647,035	03/04/86
4,573,955	06/539,789	03/04/86
4,573,958	06/627,871	03/04/86
4,573,959	06/457,032	03/04/86
4,573,965	06/580,091	03/04/86
4,573,971	06/560,925	03/04/86
4,573,972	06/560,935	03/04/86
4,573,978	06/680,407	03/04/86
4,573,983	06/635,017	03/04/86
4,573,989	06/449,364	03/04/86
4,573,993	06/537,055	03/04/86
4,573,995	06/659,122	03/04/86
4,573,997	06/590,813	03/04/86
4,574,001	06/587,259	03/04/86
4,574,014	06/656,631	03/04/86
4,574,016	06/585,479	03/04/86
4,574,018	06/567,265	03/04/86
4,574,028	06/573,411	03/04/86
4,574,044	06/608,229	03/04/86
4,574,045	06/649,147	03/04/86
4,574,058	06/477,281	03/04/86
4,574,066	06/583,643	03/04/86
4,574,067	06/707,721	03/04/86
4,574,068	06/717,467	03/04/86
4,574,069	06/577,632	03/04/86
4,574,070	06/510,490	03/04/86
4,574,074	06/622,083	03/04/86
4,574,075	06/678,858	03/04/86
4,574,078	06/582,546	03/04/86
4,574,080	06/523,635	03/04/86
4,574,086	06/258,373	03/04/86
4,574,096	06/740,115	03/04/86
4,574,098	06/520,913	03/04/86
4,574,099	06/572,466	03/04/86
4,574,103	06/709,009	03/04/86
4,574,105	06/580,438	03/04/86
4,574,143	06/670,171	03/04/86
4,574,144	06/682,202	03/04/86
4,574,151	06/522,413	03/04/86
4,574,165	06/540,463	03/04/86
4,574,172	06/602,088	03/04/86
4,574,173	06/607,329	03/04/86
4,574,174	06/612,087	03/04/86
4,574,177	06/671,027	03/04/86
4,574,179	06/584,962	03/04/86
4,574,180	06/622,296	03/04/86
4,574,182	06/552,975	03/04/86
4,574,184	06/732,140	03/04/86
4,574,193	06/686,564	03/04/86
4,574,194	06/547,628	03/04/86
4,574,204	06/405,804	03/04/86
4,574,210	06/511,396	03/04/86
4,574,211	06/391,145	03/04/86
4,574,212	06/712,323	03/04/86
4,574,222	06/565,319	03/04/86
4,574,228	06/679,336	03/04/86
4,574,237	06/534,301	03/04/86
4,574,238	06/609,450	03/04/86
4,574,241	06/525,017	03/04/86
4,574,242	06/391,097	03/04/86
4,574,253	06/700,380	03/04/86
4,574,257	06/577,430	03/04/86
4,574,260	06/561,607	03/04/86
4,574,261	06/768,884	03/04/86
4,574,262	06/328,636	03/04/86

Patent Number	Serial Number	Issue Date
4,574,264	06/552,201	03/04/86
4,574,265	06/481,859	03/04/86
4,574,266	06/503,961	03/04/86
4,574,269	06/721,882	03/04/86
4,574,270	06/498,617	03/04/86
4,574,274	06/406,336	03/04/86
4,574,275	06/477,541	03/04/86
4,574,276	06/473,211	03/04/86
4,574,277	06/527,944	03/04/86
4,574,280	06/462,029	03/04/86
4,574,282	06/476,649	03/04/86
4,574,290	06/570,574	03/04/86
4,574,291	06/645,577	03/04/86
4,574,296	06/515,279	03/04/86
4,574,298	06/565,101	03/04/86
4,574,303	06/506,459	03/04/86
4,574,306	06/574,462	03/04/86
4,574,313	06/680,847	03/04/86
4,574,320	06/565,630	03/04/86
4,574,321	06/443,220	03/04/86
4,574,322	06/578,948	03/04/86
4,574,338	06/658,220	03/04/86
4,574,350	06/379,731	03/04/86
4,574,351	06/471,944	03/04/86
4,574,352	06/472,521	03/04/86
4,574,357	06/582,109	03/04/86
4,574,363	06/397,703	03/04/86
4,574,370	06/691,839	03/04/86
4,574,381	06/431,253	03/04/86
4,574,382	06/539,249	03/04/86
4,903,346	07/350,847	02/27/90
4,903,351	07/270,196	02/27/90
4,903,354	07/338,629	02/27/90
4,903,355	07/387,176	02/27/90
4,903,357	07/336,689	02/27/90
4,903,358	07/247,937	02/27/90
4,903,359	07/323,676	02/27/90
4,903,362	07/255,909	02/27/90
4,903,366	07/237,276	02/27/90
4,903,367	07/233,277	02/27/90
4,903,373	07/208,245	02/27/90
4,903,382	07/400,849	02/27/90
4,903,383	07/169,812	02/27/90
4,903,387	07/227,946	02/27/90
4,903,389	07/200,321	02/27/90
4,903,392	07/209,817	02/27/90
4,903,394	07/291,970	02/27/90
4,903,395	07/357,781	02/27/90
4,903,404	07/263,653	02/27/90
4,903,407	07/184,296	02/27/90
4,903,411	07/280,560	02/27/90
4,903,412	07/164,971	02/27/90
4,903,415	07/252,969	02/27/90
4,903,416	07/297,486	02/27/90
4,903,418	07/281,500	02/27/90
4,903,419	07/197,887	02/27/90
4,903,426	07/357,984	02/27/90
4,903,427	07/307,338	02/27/90
4,903,428	07/325,786	02/27/90
4,903,429	07/222,050	02/27/90
4,903,432	07/136,205	02/27/90
4,903,435	07/285,986	02/27/90
4,903,441	07/076,140	02/27/90
4,903,445	07/294,400	02/27/90
4,903,446	07/186,434	02/27/90
4,903,447	07/368,914	02/27/90
4,903,449	07/351,788	02/27/90
4,903,456	07/276,606	02/27/90
4,903,457	07/276,607	02/27/90
4,903,461	07/276,738	02/27/90
4,903,463	07/325,278	02/27/90
4,903,467	07/078,160	02/27/90
4,903,473	07/239,583	02/27/90
4,903,481	07/286,164	02/27/90
4,903,489	07/236,352	02/27/90
4,903,490	07/257,898	02/27/90
4,903,491	07/206,094	02/27/90
4,903,492	07/246,137	02/27/90
4,903,495	07/310,566	02/27/90
4,903,498	07/236,878	02/27/90
4,903,499	07/255,960	02/27/90
4,903,500	07/364,934	02/27/90
4,903,502	07/236,875	02/27/90
4,903,503	07/144,300	02/27/90
4,903,506	07/183,443	02/27/90
4,903,507	07/355,276	02/27/90
4,903,508	07/346,938	02/27/90
4,903,511	07/370,960	02/27/90
4,903,516	07/255,552	02/27/90
4,903,517	07/192,594	02/27/90
4,903,523	07/097,599	02/27/90
4,903,531	07/239,300	02/27/90
4,903,537	07/187,862	02/27/90
4,903,539	07/275,180	02/27/90
4,903,547	07/290,654	02/27/90
4,903,553	07/338,846	02/27/90
4,903,554	07/293,547	02/27/90
4,903,556	07/289,565	02/27/90
4,903,568	07/305,349	02/27/90
4,903,570	07/282,007	02/27/90
4,903,571	07/281,389	02/27/90
4,903,572	07/255,751	02/27/90
4,903,579	07/235,959	02/27/90
4,903,583	07/367,717	02/27/90
4,903,584	07/273,488	02/27/90
4,903,587	07/176,415	02/27/90
4,903,588	07/357,252	02/27/90
4,903,589	07/269,126	02/27/90
4,903,593	07/320,968	02/27/90
4,903,595	07/234,958	02/27/90
4,903,598	07/338,083	02/27/90
4,903,607	07/227,987	02/27/90
4,903,610	07/126,475	02/27/90
4,903,616	07/144,031	02/27/90
4,903,617	07/280,887	02/27/90
4,903,618	07/258,680	02/27/90
4,903,626	07/207,580	02/27/90
4,903,632	07/281,891	02/27/90
4,903,637	07/203,125	02/27/90
4,903,641	07/316,415	02/27/90
4,903,644	07/382,897	02/27/90
4,903,645	07/339,683	02/27/90
4,903,649	07/279,573	02/27/90
4,903,650	07/378,965	02/27/90
4,903,653	07/360,273	02/27/90
4,903,663	07/254,641	02/27/90
4,903,666	07/281,144	02/27/90
4,903,672	07/316,042	02/27/90
4,903,673	07/223,504	02/27/90
4,903,678	07/222,140	02/27/90
4,903,679	07/257,901	02/27/90
4,903,682	07/275,645	02/27/90
4,903,686	07/269,474	02/27/90
4,903,690	07/244,091	02/27/90
4,903,694	07/321,280	02/27/90
4,903,696	07/254,203	02/27/90
4,903,697	07/240,346	02/27/90
4,903,712	07/366,296	02/27/90
4,903,714	07/089,692	02/27/90
4,903,715	07/367,792	02/27/90
4,903,719	07/352,396	02/27/90
4,903,721	06/719,586	02/27/90
4,903,722	07/330,501	02/27/90
4,903,724	07/332,026	02/27/90
4,903,737	07/132,954	02/27/90
4,903,743	07/198,362	02/27/90
4,903,744	07/238,905	02/27/90
4,903,746	06/905,859	02/27/90
4,903,747	07/387,508	02/27/90
4,903,748	07/205,442	02/27/90
4,903,751	07/267,260	02/27/90
4,903,761	07/056,845	02/27/90
4,903,764	07/220,555	02/27/90
4,903,766	07/292,127	02/27/90
4,903,768	07/292,796	02/27/90
4,903,771	07/239,637	02/27/90

Patent Number	Serial Number	Issue Date
4,903,773	07/319,830	02/27/90
4,903,774	07/297,737	02/27/90
4,903,778	07/344,771	02/27/90
4,903,781	07/202,538	02/27/90
4,903,790	07/167,888	02/27/90
4,903,795	07/260,697	02/27/90
4,903,798	07/293,395	02/27/90
4,903,806	07/190,859	02/27/90
4,903,810	06/534,820	02/27/90
4,903,817	07/179,422	02/27/90
4,903,818	07/196,499	02/27/90
4,903,819	07/317,735	02/27/90
4,903,821	07/204,711	02/27/90
4,903,822	07/149,430	02/27/90
4,903,827	07/337,027	02/27/90
4,903,828	07/023,061	02/27/90
4,903,835	07/258,966	02/27/90
4,903,837	07/232,724	02/27/90
4,903,842	07/248,281	02/27/90
4,903,843	07/171,848	02/27/90
4,903,846	07/166,830	02/27/90
4,903,848	07/224,164	02/27/90
4,903,853	07/363,851	02/27/90
4,903,858	07/340,921	02/27/90
4,903,860	07/293,802	02/27/90
4,903,865	07/245,694	02/27/90
4,903,869	07/189,906	02/27/90
4,903,873	07/334,715	02/27/90
4,903,874	07/254,039	02/27/90
4,903,876	07/207,063	02/27/90
4,903,878	07/258,824	02/27/90
4,903,885	07/317,558	02/27/90
4,903,886	07/317,596	02/27/90
4,903,894	07/246,664	02/27/90
4,903,895	07/322,289	02/27/90
4,903,896	07/333,960	02/27/90
4,903,900	07/309,681	02/27/90
4,903,901	07/276,822	02/27/90
4,903,902	07/350,579	02/27/90
4,903,904	07/352,130	02/27/90
4,903,924	07/302,798	02/27/90
4,903,925	07/253,493	02/27/90
4,903,929	07/309,110	02/27/90
4,903,936	07/247,550	02/27/90
4,903,947	07/188,449	02/27/90
4,903,956	07/264,724	02/27/90
4,903,958	07/299,321	02/27/90
4,903,968	07/350,455	02/27/90
4,903,970	07/091,408	02/27/90
4,903,971	07/260,618	02/27/90
4,903,975	07/255,961	02/27/90
4,903,988	07/279,809	02/27/90
4,903,994	07/268,182	02/27/90
4,904,013	07/348,563	02/27/90
4,904,014	07/240,039	02/27/90
4,904,018	07/260,123	02/27/90
4,904,020	07/238,343	02/27/90
4,904,024	07/210,660	02/27/90
4,904,038	06/615,111	02/27/90
4,904,044	07/241,606	02/27/90
4,904,048	07/153,910	02/27/90
4,904,053	07/322,966	02/27/90
4,904,055	07/251,641	02/27/90
4,904,057	07/278,569	02/27/90
4,904,063	07/199,535	02/27/90
4,904,065	07/209,937	02/27/90
4,904,066	07/065,271	02/27/90
4,904,069	07/283,719	02/27/90
4,904,078	07/207,272	02/27/90
4,904,084	07/289,865	02/27/90
4,904,093	07/236,056	02/27/90
4,904,095	07/287,077	02/27/90
4,904,098	07/150,806	02/27/90
4,904,112	07/385,565	02/27/90
4,904,116	07/315,416	02/27/90
4,904,117	07/157,866	02/27/90
4,904,118	07/214,695	02/27/90
4,904,120	07/250,341	02/27/90
4,904,126	07/315,385	02/27/90
4,904,131	07/174,432	02/27/90
4,904,134	07/268,293	02/27/90
4,904,135	07/318,397	02/27/90
4,904,144	07/294,421	02/27/90
4,904,148	07/237,794	02/27/90
4,904,149	07/234,306	02/27/90
4,904,153	07/119,839	02/27/90
4,904,156	07/285,631	02/27/90
4,904,159	07/221,031	02/27/90
4,904,162	07/215,208	02/27/90
4,904,163	07/263,895	02/27/90
4,904,168	07/291,947	02/27/90
4,904,169	07/222,272	02/27/90
4,904,172	07/208,930	02/27/90
4,904,177	07/273,446	02/27/90
4,904,178	07/203,169	02/27/90
4,904,182	07/223,233	02/27/90
4,904,195	07/210,867	02/27/90
4,904,198	07/265,329	02/27/90
4,904,204	07/242,995	02/27/90
4,904,205	07/202,009	02/27/90
4,904,206	07/382,079	02/27/90
4,904,207	07/373,419	02/27/90
4,904,211	07/332,529	02/27/90
4,904,213	07/334,024	02/27/90
4,904,218	07/287,799	02/27/90
4,904,219	07/237,278	02/27/90
4,904,221	07/228,685	02/27/90
4,904,224	07/200,079	02/27/90
4,904,238	07/135,730	02/27/90
4,904,240	07/204,246	02/27/90
4,904,243	07/217,349	02/27/90
4,904,244	07/158,767	02/27/90
4,904,254	07/191,168	02/27/90
4,904,255	06/942,272	02/27/90
4,904,258	07/074,047	02/27/90
4,904,269	07/361,666	02/27/90
4,904,270	07/172,363	02/27/90
4,904,271	07/354,771	02/27/90
4,904,276	07/191,075	02/27/90
4,904,281	07/219,955	02/27/90
4,904,283	07/257,119	02/27/90
4,904,285	07/225,760	02/27/90
4,904,287	07/288,698	02/27/90
4,904,296	07/121,552	02/27/90
4,904,300	07/233,299	02/27/90
4,904,301	07/183,570	02/27/90
4,904,303	07/251,662	02/27/90
4,904,304	07/137,940	02/27/90
4,904,310	07/236,880	02/27/90
4,904,311	07/291,504	02/27/90
4,904,313	07/205,711	02/27/90
4,904,314	07/206,051	02/27/90
4,904,318	07/229,771	02/27/90
4,904,327	07/344,772	02/27/90
4,904,328	07/258,521	02/27/90
4,904,335	07/218,288	02/27/90
4,904,336	07/185,476	02/27/90
4,904,342	07/243,004	02/27/90
4,904,345	06/937,248	02/27/90
4,904,346	07/407,861	02/27/90
4,904,347	07/134,036	02/27/90
4,904,348	07/255,622	02/27/90
4,904,358	07/156,321	02/27/90
4,904,360	07/149,434	02/27/90
4,904,365	07/316,704	02/27/90
4,904,370	07/192,748	02/27/90
4,904,378	07/184,078	02/27/90
4,904,381	07/238,212	02/27/90
4,904,385	07/196,176	02/27/90
4,904,390	07/177,180	02/27/90
4,904,398	07/167,719	02/27/90
4,904,412	07/204,378	02/27/90
4,904,415	07/235,066	02/27/90
4,904,416	07/223,961	02/27/90
4,904,419	07/322,921	02/27/90
4,904,425	07/211,351	02/27/90

Patent Number	Serial Number	Issue Date
4,904,426	07/175,716	02/27/90
4,904,429	07/281,319	02/27/90
4,904,434	07/263,915	02/27/90
4,904,449	07/167,011	02/27/90
4,904,454	07/229,761	02/27/90
4,904,458	06/700,714	02/27/90
4,904,470	07/021,125	02/27/90
4,904,487	07/174,761	02/27/90
4,904,488	07/174,701	02/27/90
4,904,490	07/356,503	02/27/90
4,904,504	07/240,657	02/27/90
4,904,506	07/004,399	02/27/90
4,904,510	07/376,903	02/27/90
4,904,511	07/178,407	02/27/90
4,904,518	07/213,261	02/27/90
4,904,526	07/237,855	02/27/90
4,904,529	07/220,351	02/27/90
4,904,534	07/370,119	02/27/90
4,904,536	07/316,609	02/27/90
4,904,538	07/326,757	02/27/90
4,904,545	07/215,032	02/27/90
4,904,555	07/132,477	02/27/90
4,904,559	07/261,659	02/27/90
4,904,564	07/207,574	02/27/90
4,904,566	07/147,909	02/27/90
4,904,568	07/219,443	02/27/90
4,904,571	07/219,638	02/27/90
4,904,576	07/170,289	02/27/90
4,904,578	07/303,233	02/27/90
4,904,580	07/181,970	02/27/90
4,904,581	06/877,609	02/27/90
4,904,582	07/061,874	02/27/90
4,904,590	07/290,724	02/27/90
4,904,592	07/219,927	02/27/90
4,904,602	06/894,421	02/27/90
4,904,616	07/224,089	02/27/90
4,904,623	07/228,811	02/27/90
4,904,625	06/914,931	02/27/90
4,904,626	07/300,976	02/27/90
4,904,632	07/064,329	02/27/90
4,904,638	07/163,426	02/27/90
4,904,643	07/060,446	02/27/90
4,904,644	07/227,963	02/27/90
4,904,647	07/222,056	02/27/90
4,904,655	07/302,810	02/27/90
4,904,660	07/160,173	02/27/90
4,904,664	06/880,849	02/27/90
4,904,666	07/181,729	02/27/90
4,904,668	07/101,005	02/27/90
4,904,670	07/196,621	02/27/90
4,904,671	07/311,317	02/27/90
4,904,680	07/146,955	02/27/90
4,904,685	07/301,422	02/27/90
4,904,686	07/179,601	02/27/90
4,904,691	07/321,950	02/27/90
4,904,692	07/283,111	02/27/90
4,904,694	07/180,107	02/27/90
4,904,695	06/892,972	02/27/90
4,904,696	07/150,990	02/27/90
4,904,697	07/036,227	02/27/90
4,904,700	07/327,465	02/27/90
4,904,702	07/317,010	02/27/90
4,904,704	07/289,082	02/27/90
4,904,706	07/220,980	02/27/90
4,904,715	07/231,113	02/27/90
4,904,722	06/788,963	02/27/90
4,904,727	07/318,045	02/27/90
4,904,729	07/256,450	02/27/90
4,904,731	07/293,535	02/27/90
4,904,737	07/129,486	02/27/90
4,904,741	07/012,230	02/27/90
4,904,743	07/235,001	02/27/90
4,904,745	07/170,571	02/27/90
4,904,749	07/285,507	02/27/90
4,904,750	07/287,424	02/27/90
4,904,754	07/242,161	02/27/90
4,904,761	07/275,018	02/27/90
4,904,767	07/068,815	02/27/90
4,904,773	07/023,619	02/27/90
4,904,778	07/262,122	02/27/90
4,904,779	07/299,423	02/27/90
4,904,780	07/224,971	02/27/90
4,904,782	07/161,540	02/27/90
4,904,783	07/245,602	02/27/90
4,904,784	07/314,814	02/27/90
4,904,787	07/177,045	02/27/90
4,904,791	07/174,518	02/27/90
4,904,794	07/159,981	02/27/90
4,904,798	07/295,462	02/27/90
4,904,800	07/181,376	02/27/90
4,904,812	07/281,915	02/27/90
4,904,813	07/165,581	02/27/90
4,904,824	07/236,096	02/27/90
4,904,825	07/268,903	02/27/90
4,904,831	07/293,164	02/27/90
4,904,835	07/348,864	02/27/90
4,904,837	07/259,124	02/27/90
4,904,840	07/242,619	02/27/90
4,904,841	07/232,478	02/27/90
4,904,842	07/111,870	02/27/90
4,904,845	07/108,114	02/27/90
4,904,850	07/325,079	02/27/90
4,904,860	07/234,480	02/27/90
4,904,862	07/299,999	02/27/90
4,904,865	07/177,389	02/27/90
4,904,866	07/272,641	02/27/90
4,904,869	07/284,378	02/27/90
4,904,873	07/315,579	02/27/90
4,904,875	07/303,928	02/27/90
4,904,877	07/234,453	02/27/90
4,904,882	07/289,295	02/27/90
4,904,898	07/270,989	02/27/90
4,904,900	07/377,781	02/27/90
4,904,901	07/349,452	02/27/90
4,904,912	07/254,273	02/27/90
4,904,914	07/314,059	02/27/90
4,904,917	07/090,181	02/27/90
4,904,925	07/346,478	02/27/90
4,904,928	07/281,783	02/27/90
4,904,936	07/171,162	02/27/90
4,904,938	07/203,968	02/27/90
4,904,954	07/191,961	02/27/90
4,904,966	07/100,515	02/27/90
4,904,975	07/297,819	02/27/90
4,904,976	07/326,670	02/27/90
4,904,980	07/234,436	02/27/90
4,904,982	07/161,458	02/27/90
4,904,983	07/049,227	02/27/90
4,904,995	06/820,071	02/27/90
4,905,004	07/179,962	02/27/90
4,905,013	07/147,970	02/27/90
4,905,016	07/233,154	02/27/90
4,905,022	07/329,808	02/27/90
4,905,024	07/278,448	02/27/90
4,905,050	07/290,787	02/27/90
4,905,076	06/895,961	02/27/90
4,905,078	07/084,074	02/27/90
4,905,083	07/239,089	02/27/90
4,905,087	07/237,191	02/27/90
4,905,089	07/293,068	02/27/90
4,905,102	07/229,132	02/27/90
4,905,121	07/066,745	02/27/90
4,905,127	07/309,614	02/27/90
4,905,136	07/277,247	02/27/90
4,905,144	07/116,804	02/27/90
4,905,148	07/228,404	02/27/90
4,905,151	07/165,015	02/27/90
4,905,156	07/161,947	02/27/90
4,905,158	07/159,584	02/27/90
4,905,159	07/138,754	02/27/90
4,905,171	07/117,864	02/27/90
4,905,173	07/130,161	02/27/90
4,905,178	06/909,521	02/27/90
4,905,182	07/025,500	02/27/90
4,905,187	07/202,657	02/27/90
4,905,196	07/105,448	02/27/90

Patent Number	Serial Number	Issue Date
4,905,204	07/379,488	02/27/90
4,905,211	07/326,951	02/27/90
4,905,214	07/298,025	02/27/90
4,905,217	07/272,939	02/27/90
4,905,221	07/236,019	02/27/90
4,905,224	07/247,680	02/27/90
4,905,227	07/163,484	02/27/90
4,905,241	07/120,545	02/27/90
4,905,242	07/059,696	02/27/90
4,905,249	07/294,465	02/27/90
4,905,251	07/267,820	02/27/90
4,905,252	07/245,176	02/27/90
4,905,254	07/203,652	02/27/90
4,905,256	07/129,197	02/27/90
4,905,257	07/238,383	02/27/90
4,905,258	07/229,558	02/27/90
4,905,260	07/270,879	02/27/90
4,905,261	07/300,572	02/27/90
4,905,263	07/336,854	02/27/90
4,905,269	07/155,708	02/27/90
4,905,272	07/235,253	02/27/90
4,905,279	07/278,455	02/27/90
4,905,290	07/378,674	02/27/90
4,905,292	07/095,784	02/27/90
4,905,295	07/118,528	02/27/90
4,905,299	07/392,877	02/27/90
4,905,303	07/215,354	02/27/90
4,905,308	07/333,633	02/27/90
4,905,312	07/380,756	02/27/90
5,289,595	07/857,933	03/01/94
5,289,597	07/545,495	03/01/94
5,289,600	08/022,921	03/01/94
5,289,601	07/379,638	03/01/94
5,289,603	07/976,148	03/01/94
5,289,607	08/017,383	03/01/94
5,289,609	07/844,535	03/01/94
5,289,612	07/929,310	03/01/94
5,289,616	07/941,547	03/01/94
5,289,618	07/983,760	03/01/94
5,289,621	08/070,827	03/01/94
5,289,624	07/890,567	03/01/94
5,289,629	07/968,070	03/01/94
5,289,637	07/857,320	03/01/94
5,289,638	08/020,834	03/01/94
5,289,640	08/047,805	03/01/94
5,289,649	07/833,815	03/01/94
5,289,655	07/910,040	03/01/94
5,289,657	07/851,424	03/01/94
5,289,659	07/777,341	03/01/94
5,289,666	06/841,858	03/01/94
5,289,668	07/988,735	03/01/94
5,289,670	07/939,598	03/01/94
5,289,676	08/012,694	03/01/94
5,289,680	07/666,785	03/01/94
5,289,682	07/998,075	03/01/94
5,289,693	08/007,211	03/01/94
5,289,700	08/048,156	03/01/94
5,289,711	07/893,603	03/01/94
5,289,714	08/043,029	03/01/94
5,289,715	07/791,786	03/01/94
5,289,717	07/731,006	03/01/94
5,289,722	07/873,756	03/01/94
5,289,723	07/893,721	03/01/94
5,289,731	07/970,105	03/01/94
5,289,743	08/052,506	03/01/94
5,289,752	07/823,718	03/01/94
5,289,760	07/933,688	03/01/94
5,289,762	07/712,665	03/01/94
5,289,766	08/012,262	03/01/94
5,289,769	07/930,774	03/01/94
5,289,772	07/947,402	03/01/94
5,289,778	07/909,215	03/01/94
5,289,781	07/995,681	03/01/94
5,289,783	07/951,778	03/01/94
5,289,786	08/009,176	03/01/94
5,289,788	07/926,180	03/01/94
5,289,790	08/069,823	03/01/94
5,289,792	07/500,744	03/01/94
5,289,794	07/948,567	03/01/94
5,289,798	08/004,831	03/01/94
5,289,806	08/088,551	03/01/94
5,289,811	08/058,851	03/01/94
5,289,816	07/965,807	03/01/94
5,289,818	07/793,795	03/01/94
5,289,829	07/903,287	03/01/94
5,289,830	07/810,671	03/01/94
5,289,832	08/027,033	03/01/94
5,289,833	07/853,783	03/01/94
5,289,837	07/987,597	03/01/94
5,289,843	08/073,844	03/01/94
5,289,846	07/813,481	03/01/94
5,289,852	07/957,523	03/01/94
5,289,857	07/798,817	03/01/94
5,289,860	07/940,100	03/01/94
5,289,861	07/855,233	03/01/94
5,289,864	08/011,379	03/01/94
5,289,865	08/062,791	03/01/94
5,289,883	07/963,487	03/01/94
5,289,898	08/008,591	03/01/94
5,289,904	07/937,546	03/01/94
5,289,908	07/944,677	03/01/94
5,289,912	07/942,581	03/01/94
5,289,918	08/059,251	03/01/94
5,289,920	07/698,402	03/01/94
5,289,925	07/851,854	03/01/94
5,289,926	07/944,950	03/01/94
5,289,928	07/967,169	03/01/94
5,289,938	08/009,051	03/01/94
5,289,939	07/970,551	03/01/94
5,289,940	07/933,767	03/01/94
5,289,943	07/870,954	03/01/94
5,289,945	07/846,255	03/01/94
5,289,947	08/023,885	03/01/94
5,289,956	08/012,868	03/01/94
5,289,957	07/854,819	03/01/94
5,289,960	07/942,026	03/01/94
5,289,961	07/838,025	03/01/94
5,289,981	08/060,473	03/01/94
5,289,983	07/924,593	03/01/94
5,289,987	07/880,165	03/01/94
5,289,997	08/030,649	03/01/94
5,289,998	07/776,028	03/01/94
5,289,999	08/015,258	03/01/94
5,290,001	07/883,480	03/01/94
5,290,002	07/953,214	03/01/94
5,290,008	08/069,523	03/01/94
5,290,013	08/014,316	03/01/94
5,290,017	08/024,447	03/01/94
5,290,027	07/838,526	03/01/94
5,290,031	07/997,211	03/01/94
5,290,034	08/009,921	03/01/94
5,290,038	07/959,643	03/01/94
5,290,039	07/933,349	03/01/94
5,290,040	07/990,037	03/01/94
5,290,041	08/011,738	03/01/94
5,290,042	07/974,483	03/01/94
5,290,049	07/761,368	03/01/94
5,290,050	07/938,424	03/01/94
5,290,053	07/847,953	03/01/94
5,290,054	07/960,858	03/01/94
5,290,057	07/626,681	03/01/94
5,290,058	08/029,414	03/01/94
5,290,062	07/838,372	03/01/94
5,290,064	08/044,770	03/01/94
5,290,065	07/965,432	03/01/94
5,290,078	07/891,072	03/01/94
5,290,080	08/096,542	03/01/94
5,290,086	07/972,988	03/01/94
5,290,090	07/930,274	03/01/94
5,290,093	07/898,417	03/01/94
5,290,133	08/020,569	03/01/94
5,290,149	07/835,461	03/01/94
5,290,160	08/035,499	03/01/94
5,290,165	07/878,594	03/01/94
5,290,175	07/815,648	03/01/94
5,290,183	07/814,858	03/01/94

Patent Number	Serial Number	Issue Date
5,290,195	08/041,574	03/01/94
5,290,198	07/569,413	03/01/94
5,290,199	08/053,904	03/01/94
5,290,201	07/897,047	03/01/94
5,290,203	07/884,040	03/01/94
5,290,204	07/983,311	03/01/94
5,290,210	07/884,424	03/01/94
5,290,212	07/754,063	03/01/94
5,290,213	08/028,908	03/01/94
5,290,215	08/023,085	03/01/94
5,290,216	07/910,404	03/01/94
5,290,218	07/978,993	03/01/94
5,290,219	07/983,397	03/01/94
5,290,222	07/776,440	03/01/94
5,290,226	07/995,697	03/01/94
5,290,241	07/962,150	03/01/94
5,290,242	07/960,729	03/01/94
5,290,261	07/969,470	03/01/94
5,290,265	07/889,510	03/01/94
5,290,266	07/929,350	03/01/94
5,290,268	07/977,196	03/01/94
5,290,270	08/098,749	03/01/94
5,290,272	07/851,822	03/01/94
5,290,276	07/832,058	03/01/94
5,290,292	07/866,860	03/01/94
5,290,295	07/913,208	03/01/94
5,290,299	08/016,484	03/01/94
5,290,304	07/699,722	03/01/94
5,290,311	08/020,903	03/01/94
5,290,324	07/903,453	03/01/94
5,290,326	07/821,077	03/01/94
5,290,335	07/969,927	03/01/94
5,290,352	07/969,333	03/01/94
5,290,355	07/868,846	03/01/94
5,290,363	07/688,245	03/01/94
5,290,366	08/032,470	03/01/94
5,290,374	07/966,930	03/01/94
5,290,380	07/824,101	03/01/94
5,290,390	07/949,584	03/01/94
5,290,398	07/993,751	03/01/94
5,290,401	07/807,844	03/01/94
5,290,405	07/843,509	03/01/94
5,290,408	07/928,486	03/01/94
5,290,432	07/736,474	03/01/94
5,290,444	08/062,245	03/01/94
5,290,453	07/916,095	03/01/94
5,290,473	08/031,768	03/01/94
5,290,475	07/935,133	03/01/94
5,290,478	07/875,654	03/01/94
5,290,482	07/891,519	03/01/94
5,290,485	07/863,483	03/01/94
5,290,494	07/914,992	03/01/94
5,290,508	07/847,992	03/01/94
5,290,512	07/966,770	03/01/94
5,290,516	07/965,058	03/01/94
5,290,520	07/990,213	03/01/94
5,290,529	07/809,440	03/01/94
5,290,530	07/891,180	03/01/94
5,290,534	07/973,510	03/01/94
5,290,537	08/016,630	03/01/94
5,290,541	07/900,640	03/01/94
5,290,567	07/894,126	03/01/94
5,290,573	07/474,510	03/01/94
5,290,574	07/859,524	03/01/94
5,290,576	07/810,010	03/01/94
5,290,579	07/870,912	03/01/94
5,290,587	07/914,153	03/01/94
5,290,588	07/812,244	03/01/94
5,290,589	07/743,827	03/01/94
5,290,590	07/822,259	03/01/94
5,290,593	07/851,907	03/01/94
5,290,595	07/917,277	03/01/94
5,290,596	08/066,616	03/01/94
5,290,599	08/054,497	03/01/94
5,290,606	08/043,597	03/01/94
5,290,632	07/877,319	03/01/94
5,290,634	07/649,963	03/01/94
5,290,636	07/875,359	03/01/94
5,290,639	07/893,539	03/01/94
5,290,643	08/054,014	03/01/94
5,290,669	07/907,135	03/01/94
5,290,677	07/828,444	03/01/94
5,290,688	07/752,625	03/01/94
5,290,689	07/951,973	03/01/94
5,290,690	07/398,706	03/01/94
5,290,715	07/815,689	03/01/94
5,290,737	06/757,718	03/01/94
5,290,738	07/789,688	03/01/94
5,290,751	07/804,322	03/01/94
5,290,752	07/963,256	03/01/94
5,290,756	06/386,455	03/01/94
5,290,759	07/864,168	03/01/94
5,290,773	07/497,508	03/01/94
5,290,784	07/912,791	03/01/94
5,290,788	07/848,941	03/01/94
5,290,790	07/814,450	03/01/94
5,290,791	07/714,726	03/01/94
5,290,793	07/968,455	03/01/94
5,290,797	07/846,218	03/01/94
5,290,798	07/951,637	03/01/94
5,290,804	07/867,573	03/01/94
5,290,806	08/085,255	03/01/94
5,290,814	07/971,252	03/01/94
5,290,818	07/989,256	03/01/94
5,290,843	08/053,137	03/01/94
5,290,848	07/993,474	03/01/94
5,290,859	07/906,722	03/01/94
5,290,876	08/007,779	03/01/94
5,290,878	08/072,488	03/01/94
5,290,887	08/056,699	03/01/94
5,290,891	07/868,796	03/01/94
5,290,899	07/952,140	03/01/94
5,290,922	07/958,368	03/01/94
5,290,933	07/794,311	03/01/94
5,290,938	07/966,268	03/01/94
5,290,941	07/960,623	03/01/94
5,290,947	08/033,232	03/01/94
5,290,949	07/997,369	03/01/94
5,290,950	07/799,566	03/01/94
5,290,957	07/949,548	03/01/94
5,290,963	07/696,201	03/01/94
5,290,970	07/947,227	03/01/94
5,290,971	07/801,384	03/01/94
5,290,977	07/961,747	03/01/94
5,290,982	08/034,965	03/01/94
5,290,985	08/024,279	03/01/94
5,290,989	08/021,147	03/01/94
5,290,991	07/913,391	03/01/94
5,290,997	07/980,584	03/01/94
5,291,000	07/840,047	03/01/94
5,291,004	07/900,548	03/01/94
5,291,013	07/975,853	03/01/94
5,291,018	08/012,128	03/01/94
5,291,030	07/894,315	03/01/94
5,291,039	07/953,114	03/01/94
5,291,055	07/827,177	03/01/94
5,291,066	07/791,690	03/01/94
5,291,069	07/991,864	03/01/94
5,291,073	07/957,935	03/01/94
5,291,085	07/980,749	03/01/94
5,291,090	07/991,774	03/01/94
5,291,091	07/818,003	03/01/94
5,291,092	07/874,284	03/01/94
5,291,101	07/920,670	03/01/94
5,291,119	08/000,864	03/01/94
5,291,138	07/884,757	03/01/94
5,291,143	07/849,112	03/01/94
5,291,145	07/851,628	03/01/94
5,291,152	07/969,312	03/01/94
5,291,154	07/927,206	03/01/94
5,291,155	07/925,829	03/01/94
5,291,159	07/916,238	03/01/94
5,291,181	07/860,324	03/01/94
5,291,183	08/028,266	03/01/94
5,291,194	08/045,156	03/01/94
5,291,195	07/821,241	03/01/94

Patent Number	Serial Number	Issue Date
5,291,196	07/933,190	03/01/94
5,291,201	08/021,203	03/01/94
5,291,202	06/892,447	03/01/94
5,291,203	08/027,433	03/01/94
5,291,204	07/549,835	03/01/94
5,291,211	07/979,333	03/01/94
5,291,216	07/788,132	03/01/94
5,291,229	07/810,717	03/01/94
5,291,242	07/918,042	03/01/94
5,291,250	07/957,997	03/01/94
5,291,261	07/475,543	03/01/94
5,291,267	07/823,936	03/01/94
5,291,268	07/874,167	03/01/94
5,291,279	07/749,676	03/01/94
5,291,290	07/348,603	03/01/94
5,291,330	07/431,549	03/01/94
5,291,333	08/088,979	03/01/94
5,291,337	07/964,231	03/01/94
5,291,338	07/778,108	03/01/94
5,291,341	08/083,221	03/01/94
5,291,346	07/829,059	03/01/94
5,291,360	07/846,270	03/01/94
5,291,377	07/815,156	03/01/94
5,291,378	07/901,259	03/01/94
5,291,379	08/040,206	03/01/94
5,291,400	07/866,806	03/01/94
5,291,401	07/792,785	03/01/94
5,291,407	07/709,236	03/01/94
5,291,411	07/790,811	03/01/94
5,291,415	07/807,544	03/01/94
5,291,431	07/965,141	03/01/94
5,291,462	07/606,534	03/01/94
5,291,508	07/907,555	03/01/94
5,291,510	07/820,356	03/01/94
5,291,517	07/999,625	03/01/94
5,291,522	07/725,610	03/01/94
5,291,530	07/678,782	03/01/94
5,291,569	07/880,448	03/01/94
5,291,570	07/942,638	03/01/94
5,291,586	07/916,797	03/01/94
5,291,588	07/455,818	03/01/94
5,291,595	07/911,261	03/01/94
5,291,597	07/747,308	03/01/94

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 03/06/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,508,267	06/482,349	04/05/83	04/02/85	03/09/98
4,736,950	06/810,779	12/19/85	04/12/88	03/11/98
4,825,542	07/009,389	01/30/87	05/02/89	03/09/98
5,062,185	07/619,598	11/29/90	11/05/91	03/06/98
5,084,044	07/380,200	07/14/89	01/28/92	03/12/98
5,094,182	07/673,745	03/21/91	03/10/92	03/11/98
5,124,058	07/626,137	12/12/90	06/23/92	03/11/98
5,206,900	07/708,722	05/31/91	04/27/93	03/12/98
5,227,160	07/219,401	07/15/88	07/13/93	03/11/98
5,228,229	07/761,342	09/06/91	07/20/93	03/06/98
5,240,086	07/880,684	05/08/92	08/31/93	03/09/98
5,253,377	07/849,515	03/11/92	10/19/93	03/12/98
5,272,838	07/823,353	01/21/92	12/28/93	03/09/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

Re. 34,886, Re. S.N. 09/019,112, Feb. 5, 1998, Cl. 315/083, ELECTRICAL SYSTEM FOR VEHICLE DAYTIME RUNNING LIGHTS, Tsutomu Irie, Owner of Record: *See-Me Lights Corp., Plymouth, Mich.*, Attorney or Agent: John G. Posa, Ex. Gp.: 2502

5,500,820, Re. S.N. 09/040,294, Mar. 18, 1998, Cl. 365/189.01, SEMICONDUCTOR MEMORY DEVICE, Yuji Nakaoka, Owner of Record: *Nec Corp., Tokyo, Japan*, Attorney or Agent: J. Frank Osha, Ex. Gp.: 2511

5,382,322, Re. S.N. 09/042,415, Mar. 13, 1998, Cl. 162/30.110, METHOD FOR PRODUCING FULLY OXIDIZED WHITE LIQUOR, Vincent L. Magnotta, et. al., Owner of Record: *Air Products and Chemicals Inc., Allentown, Pa.*, Attorney or Agent: John M. Fernbacher, Ex. Gp.: 1303

5,450,999, Re. S.N. 08/932,652, Sept. 18, 1997, Cl. 236/049.3, VARIABLE AIR VOLUME ENVIRONMENTAL MANAGEMENT SYSTEM INCLUDING A FUZZY LOGIC CONTROL SYSTEM, Jean Henry Albert Scholten, et. al., Owner of Record: *EMS Control Systems International, Osborne Park, West Australia*, Attorney or Agent: William N. Hulsey III, Ex. Gp.: 3404

5,492,151, Re. S.N. 09/037,330, Jan. 22, 1998, Cl. 138/121, VACUUM CLEANER HOSE AND METHOD AND APPARATUS FOR MAKING THE SAME, Keith E. Wood, et. al., Owner of Record: *Dayco Products, Inc., Dayton, Ohio*, Attorney or Agent: Joseph V. Tassone, Ex. Gp.: 3405

5,498,240, Re. S.N. 08/843,711, Apr. 16, 1997, Cl. 604/096, INTRAVASCULAR CATHETER WITH A REPLACEABLE SHAFT SECTION, Celso S. J. Bagaoisan, et. al., Owner of Record: *Advanced Cardiovascular Systems Inc., Santa Clara, Calif.*, Attorney or Agent: Edward J. Lynch, Ex. Gp.: 3306

5,500,838, Re. S.N. 09/044,132, Mar. 19, 1998, Cl. 369/13, PHOTOMAGNETIC DISC RECORD/PRODUCTION APPARATUS INCLUDING IMPROVED MAGNETIC HEAD LIFTING MECHANISM, Motoyoshi Matsumoto, et. al., Owner of Record: *Kabushiki Kaisha Kenwood, Tokyo, Japan*, Attorney or Agent: Eric J. Robinson, Ex. Gp.: 2516

5,503,953, Re. S.N. 09/045,204, Mar. 20, 1998, Cl. 430/49, LITHOGRAPHIC PLATE, Katsuya Ito, et. al., Owner of Record: *Toyo Boseki Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Allen E. Hoover, Ex. Gp.: 1113

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,788,975, Reexam. No. 90/004,942, Feb. 19, 1998, Cl. 606/007, CONTROL SYSTEM AND METHOD FOR IMPROVED LASER ANGIOPLASTY, Leonid Shturman, et. al., Owner of Record: *Trimedyne, Inc., Irvine, Calif.*, Attorney or Agent: Robert J. Koch, Fulbright and Jaworski, Washington, D.C., Ex. Gp.: 3309, Requester: Owner

5,143,722, Reexam. No. 90/004,938, Mar. 12, 1998, Cl. 424/063, COSMETIC MAKEUP COMPOSITIONS COMPRISING WATER-IN-OIL EMULSIONS CONTAINING PIGMENT, Jane Hollenberg, et. al., Owner of Record: *Revlon Consumer Products Corp., New York, N.Y.*, Attorney or Agent: Fitzpatrick Cella Harper and Scinto, New York, N.Y., Ex. Gp.: 1615, Requester: Owner

5,200,248, Reexam. No. 90/004,941, Mar. 17, 1998, Cl. 428/131, OPEN CAPILLARY CHANNEL STRUCTURES, IMPROVED PROCESS FOR MAKING CAPILLARY CHANNEL STRUCTURES, AND EXTRUSION DIE FOR USE THEREIN, Hugh A. Thompson, et. al., Owner of Record: *The Procter and Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Gregory W. Allen, The Procter and Gamble Co., Cincinnati, Ohio, Ex. Gp.: 1773, Requester: Eastman Chemical Co., Kingsport, Tenn.

5,263,363, Reexam. No. 90/004,943, Mar. 16, 1998, Cl. 073/61.44, APPARATUS AND METHOD FOR DETERMINING THE PERCENTAGE OF A FLUID IN A MIXTURE OF FLUIDS, Joram Agar, Owner of Record: *Agar Corp., Inc., Houston, Tex.*, Attorney or Agent: Richard T. Redano, Rosenblatt and Redano, Houston, Tex., Ex. Gp.: 2212, Requester: Owner

5,368,392, Reexam. No. 90/004,944, Mar. 19, 1998, Cl. 374/121, METHOD AND APPARATUS FOR MEASURING TEMPERATURE USING INFRARED TECHNIQUES, Milton B. Hollander, et. al., Owner of Record: *Omega Engineering, Stamford, Conn.*, Attorney or Agent: William E. Drucker, Washington, D.C., Ex. Gp.: 3108, Requester: Owner

5,501,393, Reexam. No. 90/004,939, Mar. 13, 1998, Cl. 229/092.8, MAILING FORM, Gerard F. Walz, Owner of Record: *Walz Postal Solutions, Inc., Fallbrook, Calif.*, Attorney or Agent: Brown Martin Haller and McClain, San Diego, Calif., Ex. Gp.: 3207, Requester: Owner

5,524,984, Reexam. No. 90/004,945, Mar. 19, 1998, Cl. 374/121, METHOD AND APPARATUS FOR MEASURING TEMPERATURE USING INFRARED TECHNIQUES, Milton B. Hollander, et. al., Owner of Record: *Omega Engineering, Stamford, Conn.*, Attorney or Agent: William E. Drucker, Washington, D.C., Ex. Gp.: 3108, Requester: Owner

5,573,277, Reexam. No. 90/004,937, Mar. 10, 1998, Cl. 283/079, MAILPIECE AND/OR SHIPPING MAILING AND A METHOD FOR ASSEMBLING A MAILPIECE AND/OR SHIPPING ITEM REQUIRING SPECIAL SERVICES, Glenn Petkovsek, Owner of Record: *Inventor*, Attorney or Agent: Hill Steadman and Simpson, Chicago, Ill., Ex. Gp.: 3206, Requester: Moore USA, Inc., c/o Nixon and Vanderhye, Arlington, Va.

5,664,725, Reexam. No. 90/004,940, Mar. 13, 1998, Cl. 229/092, MAILING FORM, Gerard F. Walz, Owner of Record: *Walz Postal Solutions, Inc., Fallbrook, Calif.*, Attorney or Agent: Brown Martin Haller and McClain, San Diego, Calif., Ex. Gp.: 3207, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration maybe renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED MARCH 17, 1998 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
117,021	71/101,474	06/12/1917
117,055	71/095,719	06/12/1917
346,721	71/382,140	06/08/1937
346,729	71/383,383	06/08/1937
346,731	71/383,544	06/08/1937
346,740	71/384,805	06/08/1937
346,786	71/387,022	06/08/1937
346,803	71/387,491	06/08/1937
346,804	71/387,492	06/08/1937
346,823	71/387,650	06/08/1937
346,834	71/387,757	06/08/1937
346,860	71/388,312	06/08/1937
346,861	71/388,320	06/08/1937
346,868	71/388,422	06/08/1937
346,876	71/388,552	06/08/1937
633,941	71/695,879	09/04/1956
646,685	72/001,208	06/11/1957
646,687	71/698,649	06/11/1957
646,692	72/000,924	06/11/1957
646,694	72/002,317	06/11/1957
646,699	72/012,448	06/11/1957
646,700	72/013,370	06/11/1957
646,701	72/014,958	06/11/1957
646,703	72/016,690	06/11/1957
646,704	72/017,255	06/11/1957
646,712	72/013,803	06/11/1957
646,719	72/014,903	06/11/1957
646,726	72/000,503	06/11/1957
646,729	72/011,842	06/11/1957
646,731	72/019,283	06/11/1957
646,741	72/013,352	06/11/1957
646,774	72/006,082	06/11/1957
646,781	72/016,037	06/11/1957
646,790	72/019,184	06/11/1957
646,801	72/015,308	06/11/1957
646,802	72/008,187	06/11/1957
646,806	72/020,477	06/11/1957
646,809	72/020,952	06/11/1957
646,812	72/020,956	06/11/1957
646,813	72/020,957	06/11/1957
646,814	72/020,958	06/11/1957
646,822	71/684,833	06/11/1957
646,834	72/020,710	06/11/1957
646,838	72/015,336	06/11/1957
646,861	72/014,853	06/11/1957
646,873	72/016,419	06/11/1957
646,885	72/010,005	06/11/1957
646,892	72/003,516	06/11/1957
646,894	72/010,521	06/11/1957
646,896	72/011,463	06/11/1957
646,897	72/011,464	06/11/1957
646,903	72/016,394	06/11/1957
646,922	72/006,461	06/11/1957
646,934	72/018,749	06/11/1957
646,939	72/002,967	06/11/1957
646,940	72/003,052	06/11/1957

Reg. Number	Serial Number	Reg. Date
1,067,017	73/045,711	06/07/1977
1,067,021	73/078,375	06/07/1977
1,067,022	73/081,551	06/07/1977
1,067,023	73/082,028	06/07/1977
1,067,024	73/084,280	06/07/1977
1,067,025	73/086,511	06/07/1977
1,067,027	73/097,395	06/07/1977
1,067,029	73/099,438	06/07/1977
1,067,033	73/099,680	06/07/1977
1,067,034	73/099,685	06/07/1977
1,067,035	73/105,689	06/07/1977
1,067,036	73/106,054	06/07/1977
1,067,037	73/106,104	06/07/1977
1,067,038	73/106,105	06/07/1977
1,067,040	73/063,458	06/07/1977
1,067,044	73/083,587	06/07/1977
1,067,047	73/089,352	06/07/1977
1,067,050	73/095,607	06/07/1977
1,067,051	73/097,340	06/07/1977
1,067,053	73/099,724	06/07/1977
1,067,054	73/100,782	06/07/1977
1,067,055	73/100,903	06/07/1977
1,067,056	73/100,921	06/07/1977
1,067,061	73/103,160	06/07/1977
1,067,065	73/086,999	06/07/1977
1,067,069	73/075,489	06/07/1977
1,067,070	73/076,118	06/07/1977
1,067,071	73/078,518	06/07/1977
1,067,072	73/081,829	06/07/1977
1,067,073	73/082,664	06/07/1977
1,067,077	73/097,893	06/07/1977
1,067,082	73/105,283	06/07/1977
1,067,084	73/105,667	06/07/1977
1,067,085	73/105,668	06/07/1977
1,067,086	73/105,669	06/07/1977
1,067,087	73/105,671	06/07/1977
1,067,088	73/105,672	06/07/1977
1,067,091	73/068,224	06/07/1977
1,067,102	73/048,219	06/07/1977
1,067,104	73/058,488	06/07/1977
1,067,105	73/063,664	06/07/1977
1,067,109	73/084,916	06/07/1977
1,067,112	73/091,388	06/07/1977
1,067,113	73/092,584	06/07/1977
1,067,114	73/093,793	06/07/1977
1,067,116	73/094,773	06/07/1977
1,067,118	73/096,251	06/07/1977
1,067,120	73/099,005	06/07/1977
1,067,124	73/086,457	06/07/1977
1,067,126	73/096,855	06/07/1977
1,067,129	73/055,417	06/07/1977
1,067,131	73/059,784	06/07/1977
1,067,132	73/065,807	06/07/1977
1,067,134	73/080,413	06/07/1977
1,067,144	73/100,837	06/07/1977
1,067,146	73/102,518	06/07/1977
1,067,152	73/100,654	06/07/1977
1,067,156	73/080,373	06/07/1977
1,067,171	73/088,509	06/07/1977
1,067,174	73/045,557	06/07/1977
1,067,178	73/069,489	06/07/1977
1,067,185	73/083,680	06/07/1977
1,067,191	73/090,884	06/07/1977
1,067,192	73/091,017	06/07/1977
1,067,194	73/094,025	06/07/1977
1,067,195	73/097,899	06/07/1977
1,067,200	73/086,593	06/07/1977
1,067,201	73/094,376	06/07/1977
1,067,203	73/097,037	06/07/1977
1,067,206	73/036,884	06/07/1977
1,067,207	73/050,881	06/07/1977
1,067,208	73/061,443	06/07/1977
1,067,210	73/072,990	06/07/1977
1,067,218	73/084,091	06/07/1977
1,067,220	73/105,455	06/07/1977
1,067,223	73/076,562	06/07/1977
1,067,224	73/090,193	06/07/1977
1,067,225	73/090,203	06/07/1977
1,067,230	73/084,149	06/07/1977
1,067,231	73/084,562	06/07/1977
1,067,239	73/099,207	06/07/1977
1,067,245	73/073,258	06/07/1977
1,067,246	73/073,726	06/07/1977
1,067,250	73/089,318	06/07/1977
1,067,252	73/093,139	06/07/1977
1,067,253	73/093,716	06/07/1977
1,067,255	73/094,558	06/07/1977
1,067,256	73/095,785	06/07/1977
1,067,258	73/098,446	06/07/1977
1,067,260	73/102,827	06/07/1977
1,067,262	73/086,836	06/07/1977
1,067,266	73/094,735	06/07/1977
1,067,267	73/094,736	06/07/1977
1,067,268	73/094,738	06/07/1977
1,067,269	73/094,739	06/07/1977
1,067,270	73/094,740	06/07/1977
1,067,271	73/094,741	06/07/1977
1,067,272	73/094,742	06/07/1977
1,067,275	73/034,949	06/07/1977
1,067,276	73/040,541	06/07/1977
1,067,280	73/061,782	06/07/1977
1,067,299	73/091,695	06/07/1977
1,067,303	73/094,592	06/07/1977
1,067,304	73/094,832	06/07/1977
1,067,307	73/096,111	06/07/1977
1,067,310	73/097,604	06/07/1977
1,067,312	73/100,586	06/07/1977
1,067,315	73/103,266	06/07/1977
1,067,318	73/103,454	06/07/1977
1,067,319	73/103,527	06/07/1977
1,067,321	73/103,536	06/07/1977
1,067,322	73/103,583	06/07/1977
1,067,324	73/105,119	06/07/1977
1,067,335	73/105,905	06/07/1977
1,067,337	73/067,830	06/07/1977
1,067,341	73/086,242	06/07/1977
1,067,342	73/093,583	06/07/1977
1,067,346	73/065,286	06/07/1977
1,067,347	73/078,517	06/07/1977
1,067,349	73/086,764	06/07/1977
1,067,354	73/065,484	06/07/1977
1,067,356	73/088,729	06/07/1977
1,067,360	73/068,617	06/07/1977
1,067,364	73/086,765	06/07/1977
1,067,366	73/094,913	06/07/1977
1,067,367	73/096,431	06/07/1977
1,067,368	73/097,474	06/07/1977
1,067,369	73/101,489	06/07/1977
1,067,374	73/088,139	06/07/1977
1,067,375	73/088,356	06/07/1977
1,067,378	73/100,651	06/07/1977
1,067,387	73/029,230	06/07/1977
1,067,388	73/050,269	06/07/1977
1,067,390	73/071,387	06/07/1977
1,067,391	73/091,322	06/07/1977
1,067,392	73/058,861	06/07/1977
1,067,393	73/074,440	06/07/1977
1,067,396	73/089,163	06/07/1977
1,067,397	73/089,164	06/07/1977
1,067,402	73/067,324	06/07/1977
1,067,403	73/074,179	06/07/1977
1,067,406	73/047,973	06/07/1977
1,067,410	73/064,979	06/07/1977
1,067,411	73/065,966	06/07/1977
1,067,412	73/068,881	06/07/1977
1,067,421	73/046,521	06/07/1977
1,067,423	73/067,657	06/07/1977
1,067,428	73/083,388	06/07/1977
1,067,429	73/084,796	06/07/1977
1,067,430	73/085,373	06/07/1977
1,067,431	73/085,394	06/07/1977
1,067,433	73/086,947	06/07/1977
1,067,438	73/090,973	06/07/1977
1,067,439	73/092,431	06/07/1977
1,067,443	73/094,586	06/07/1977
1,067,450	73/104,280	06/07/1977

Reg. Number	Serial Number	Reg. Date
1,067,454	72/424,702	06/07/1977
1,067,462	73/089,074	06/07/1977
1,067,464	73/013,068	06/07/1977
1,067,465	73/066,972	06/07/1977
1,067,466	73/068,094	06/07/1977
1,067,467	73/075,135	06/07/1977
1,067,469	73/035,326	06/07/1977
1,067,471	73/088,074	06/07/1977
1,067,473	73/011,731	06/07/1977
1,067,474	73/096,505	06/07/1977
1,067,478	73/041,364	06/07/1977
1,067,179	73/041,365	06/07/1977
1,067,480	73/041,367	06/07/1977
1,067,483	73/032,420	06/07/1977
1,067,484	73/032,421	06/07/1977
1,067,489	73/069,161	06/14/1977
1,067,490	73/075,194	06/14/1977
1,067,491	73/081,169	06/14/1977
1,067,492	73/082,609	06/14/1977
1,067,495	73/089,264	06/14/1977
1,067,500	73/093,115	06/14/1977
1,067,502	73/094,873	06/14/1977
1,067,505	73/098,781	06/14/1977
1,067,506	73/098,800	06/14/1977
1,067,518	73/055,649	06/14/1977
1,067,521	73/080,826	06/14/1977
1,067,525	73/088,409	06/14/1977
1,067,526	73/089,191	06/14/1977
1,067,528	73/091,713	06/14/1977
1,067,533	73/098,783	06/14/1977
1,067,534	73/099,456	06/14/1977
1,067,535	73/099,458	06/14/1977
1,067,537	73/100,492	06/14/1977
1,067,538	73/104,108	06/14/1977
1,067,539	73/104,110	06/14/1977
1,067,542	73/104,128	06/14/1977
1,067,545	73/104,397	06/14/1977
1,067,546	73/404,515	06/14/1977
1,067,547	73/404,556	06/14/1977
1,067,552	73/086,790	06/14/1977
1,067,553	73/091,941	06/14/1977
1,067,554	73/095,604	06/14/1977
1,067,555	73/098,429	06/14/1977
1,067,559	73/058,445	06/14/1977
1,067,560	73/061,751	06/14/1977
1,067,561	73/071,034	06/14/1977
1,067,562	73/075,604	06/14/1977
1,067,563	73/078,988	06/14/1977
1,067,572	73/087,097	06/14/1977
1,067,575	73/090,604	06/14/1977
1,067,576	73/091,318	06/14/1977
1,067,578	73/094,597	06/14/1977
1,067,579	73/095,222	06/14/1977
1,067,584	73/097,535	06/14/1977
1,067,581	73/050,847	06/14/1977
1,067,588	73/095,408	06/14/1977
1,067,596	73/073,367	06/14/1977
1,067,599	73/074,599	06/14/1977
1,067,605	73/092,364	06/14/1977
1,067,606	73/093,790	06/14/1977
1,067,608	73/098,042	06/14/1977
1,067,610	73/098,274	06/14/1977
1,067,614	73/099,939	06/14/1977
1,067,613	73/104,485	06/14/1977
1,067,615	73/092,150	06/14/1977
1,067,617	73/061,305	06/14/1977
1,067,618	73/069,112	06/14/1977
1,067,622	73/080,224	06/14/1977
1,067,626	73/090,270	06/14/1977
1,067,635	73/062,389	06/14/1977
1,067,638	73/086,900	06/14/1977
1,067,639	73/089,971	06/14/1977
1,067,642	73/097,264	06/14/1977
1,067,643	73/018,796	06/14/1977
1,067,647	73/079,889	06/14/1977
1,067,651	73/090,410	06/14/1977
1,067,653	73/094,980	06/14/1977
1,067,655	73/038,210	06/14/1977
1,067,657	73/049,112	06/14/1977
1,067,660	73/070,243	06/14/1977
1,067,664	73/075,575	06/14/1977
1,067,666	73/082,471	06/14/1977
1,067,670	73/085,935	06/14/1977
1,067,673	73/090,881	06/14/1977
1,067,674	73/091,560	06/14/1977
1,067,679	73/095,420	06/14/1977
1,067,681	73/096,625	06/14/1977
1,067,687	73/098,467	06/14/1977
1,067,691	73/099,426	06/14/1977
1,067,694	73/083,920	06/14/1977
1,067,696	73/088,367	06/14/1977
1,067,700	73/043,083	06/14/1977
1,067,704	73/083,530	06/14/1977
1,067,705	73/097,635	06/14/1977
1,067,709	73/073,777	06/14/1977
1,067,711	73/088,882	06/14/1977
1,067,715	73/054,199	06/14/1977
1,067,717	73/073,840	06/14/1977
1,067,718	73/074,490	06/14/1977
1,067,719	75/074,492	06/14/1977
1,067,720	73/084,586	06/14/1977
1,067,723	73/094,754	06/14/1977
1,067,724	73/101,307	06/14/1977
1,067,731	73/084,602	06/14/1977
1,067,733	73/094,897	06/14/1977
1,067,735	73/066,552	06/14/1977
1,067,739	73/084,929	06/14/1977
1,067,745	73/092,180	06/14/1977
1,067,754	73/040,561	06/14/1977
1,067,755	73/061,900	06/14/1977
1,067,764	73/061,022	06/14/1977
1,067,765	73/069,209	06/14/1977
1,067,771	73/085,036	06/14/1977
1,067,774	73/086,809	06/14/1977
1,067,775	73/089,807	06/14/1977
1,067,776	73/091,780	06/14/1977
1,067,777	73/092,263	06/14/1977
1,067,782	73/100,587	06/14/1977
1,067,785	73/069,278	06/14/1977
1,067,786	73/073,282	06/14/1977
1,067,787	73/084,823	06/14/1977
1,067,794	73/101,484	06/14/1977
1,067,795	73/101,485	06/14/1977
1,067,800	73/068,158	06/14/1977
1,067,804	73/084,577	06/14/1977
1,067,802	73/087,760	06/14/1977
1,067,807	73/094,448	06/14/1977
1,067,809	73/095,793	06/14/1977
1,067,811	73/096,287	06/14/1977
1,067,816	73/103,039	06/14/1977
1,067,823	73/084,646	06/14/1977
1,067,825	73/089,267	06/14/1977
1,067,826	73/094,911	06/14/1977
1,067,827	73/101,431	06/14/1977
1,067,830	73/050,898	06/14/1977
1,067,831	75/064,595	06/14/1977
1,067,832	73/067,356	06/14/1977
1,067,833	73/072,969	06/14/1977
1,067,838	73/098,404	06/14/1977
1,067,839	73/400,505	06/14/1977
1,067,840	73/05,577	06/14/1977
1,067,843	73/083,006	06/14/1977
1,067,845	75/092,280	06/14/1977
1,067,846	73/404,244	06/14/1977
1,067,852	73/084,239	06/14/1977
1,067,857	73/098,536	06/14/1977
1,067,858	73/062,853	06/14/1977
1,067,865	73/074,282	06/14/1977
1,067,866	73/074,887	06/14/1977
1,067,867	73/074,943	06/14/1977
1,067,874	73/090,754	06/14/1977
1,067,877	73/100,469	06/14/1977
1,067,884	73/075,996	06/14/1977
1,067,882	73/078,056	06/14/1977
1,067,893	73/061,654	06/14/1977
1,067,900	73/082,339	06/14/1977

Reg. Number	Serial Number	Reg. Date
1,067,901	73/085,615	06/14/1977
1,067,902	73/085,633	06/14/1977
1,067,910	73/098,802	06/14/1977
1,067,911	73/099,626	06/14/1977
1,067,917	72/457,295	06/14/1977
1,067,918	72/457,363	06/14/1977
1,067,922	73/068,085	06/14/1977
1,067,923	73/058,766	06/14/1977
1,067,925	73/070,550	06/14/1977
1,067,928	73/100,908	06/14/1977
1,067,929	73/060,016	06/14/1977
1,067,932	73/114,646	06/14/1977
1,067,935	73/077,721	06/14/1977

Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998 NICHOLAS P. GODICI
Deputy Assistant Commissioner
for Patents (Acting)

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Willi Stumpf) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.497. The international application number is PCT/EP95/01400 and was filed on 13 April 1995, in the names of Klaus Hornberger and Willi Stumpf for the invention entitled WARNING DEVICE FOR BREATHING MASKS. The national stage application number is 08/750,104 and has a 35 U.S.C. 371(c) date of 07 February 1997.

Patents Available For License or Sale

5,557,989	BAND SAW BLADE TENSIONING DEVICE
Contact:	Kenneth Southall Troutman Sanders LLP 600 Peachtree St., NE Suite 5200 Atlanta, Ga. 30308-2216 (voice) : (404) 885-3290
5,681,203	BUBBLE POPPING DEVICE
Contact:	Melvin Arnold P. O. Box 696 Wheatley Heights, N.Y. 11798-0696 (voice) : (516) 643-9290

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 26, 1998.

Dean, Karen A., 1704 Old Stage Rd., Alexandria, Va. 22308

Kaplan, Adrian M., 44 Dunfield Ave., #316, Toronto, Ont., M4S 2H2, Canada

Korytnyk, Peter G., 1121 S. 20th St., #1B, Arlington, Va. 22202

Kushan, Jeffrey P., 601 Burton Pl., Vienna, Va. 22180

Millard, Allan P., #2-329 Wilbrod St., Ottawa, K1N 6M4, Canada

Zemel, Irina S., 6137 Farver Rd., McLean, Va. 22102

April 16, 1998 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration to Practice

The following person successfully passed the registration examination that was held August 28, 1996, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 26, 1998.

Weigell, Charles T. J., 5712 Tellefson Rd., Culver City, Calif. 90230

April 16, 1998 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrants at their last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Mariner Performance, Inc., Santee, Calif., Reg. No. 1,887,988, for the mark "WET TRAX", Canc. No. 26,061.

Makaha, Inc., New York, N.Y., Reg. Nos. 1,743,043 and 1,170,299, for the mark "MAKAHA", Canc. No. 26,643.

Creative Designs Imports, Inc., Los Angeles, Calif., for the mark "PP AND DESIGN", Reg. No. 1,351,673, Canc. No. 27,322.

Patricia O'Hanlon Hudson, Omaha, Nebr., Reg. No. 1,930,674, for the mark "HUDSON CENTER FOR BRIEF THERAPY", Canc. No. 27,152.

JEAN BROWN
Technical Program Manager
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Errata

"All reference to Patent No. 5,739,583 to Tetsuya Fujisawa, et al., of Japan, for SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE UNIT FOR A STACK ARRANGEMENT appearing in the Official Gazette of April 14, 1998, should be deleted since no patent was granted."

"All reference to Patent No. 5,742,485 to Michael R. Gardner, et al, of Mount Prospect, Ill., for SHIELD FOR AN ELECTRICAL CIRCUIT ON A SUBSTRATE appearing in the Official Gazette of April 21, 1998, should be deleted since no patent was granted."

Certificates of Correction for May 12, 1998

D. 385,823
D. 386,532
D. 387,069
D. 389,072
D. 389,563
D. 391,195
D. 391,619
Re. 35,408
Re. 35,576
4,762,129
4,965,881
5,114,119
5,167,703
5,212,391
5,248,906
5,272,252
5,294,633
5,321,319
5,343,292
5,359,182
5,368,300
5,377,519
5,403,738
5,422,499
5,459,027
5,474,687
5,498,204
5,506,957
5,510,902
5,515,091
5,516,289
5,525,480
5,530,009
5,533,937
5,543,749
5,545,690
5,547,006
5,547,159
5,551,433
5,565,923
5,567,287
5,567,977
5,573,957
5,574,180
5,579,770
5,580,774
5,582,620
5,582,682
5,586,516
5,587,842
5,590,562
5,593,605
5,597,029
5,597,204
5,604,004
5,605,028
5,612,431
5,612,666
5,614,602
5,614,898
5,615,327
5,616,514
5,618,860
5,619,986
5,620,415
5,620,584
5,621,699
5,623,633
5,624,720
5,624,829
5,626,072
5,626,932
5,627,048
5,627,777
5,629,184
5,629,760
5,629,886
5,630,011
5,631,189
5,633,231
5,633,404
5,633,597
5,636,206
5,638,986
5,639,731
5,643,575
5,644,494
5,645,397
5,646,121
5,648,818
5,648,871
5,649,318
5,649,672
5,649,830
5,649,847
5,650,131
5,650,870
5,651,578
5,652,075
5,652,194
5,652,947
5,653,433
5,653,697
5,654,033
5,654,584
5,654,814
5,656,015
5,656,098
5,656,410
5,657,080
5,658,214
5,658,367
5,658,502
5,658,605
5,659,572
5,659,623
5,660,528
5,660,837
5,661,508
5,661,767
5,661,884
5,661,951
5,663,094
5,663,288
5,663,367
5,663,670
5,663,953
5,664,053
5,664,240
5,664,459
5,665,128
5,666,610
5,666,950
5,667,213
5,668,254
5,670,492
5,671,270
5,671,550
5,672,472
5,672,576
5,673,064
5,673,537
5,673,588
5,674,490
5,674,776
5,674,894
5,675,135
5,675,356
5,676,363
5,676,651
5,676,971
5,677,498
5,677,778
5,678,100
5,678,106
5,678,164
5,678,557
5,678,989
5,679,490
5,679,716
5,679,779
5,680,040
5,680,166
5,682,364
5,683,223
5,683,459
5,683,643
5,684,057
5,684,274
5,684,353
5,684,482
5,684,685
5,684,893
5,686,433
5,686,984
5,688,551
5,689,055
5,689,746
5,689,772
5,689,833
5,690,679
5,691,747
5,691,807
5,691,821
5,692,036
5,692,284
5,692,966
5,693,443
5,696,824
5,698,226
5,698,487
5,698,691
5,698,728
5,699,275
5,699,655
5,700,258
5,700,320
5,700,730
5,701,171
5,701,644
5,701,740
5,701,944
5,702,674
5,702,682
5,703,060
5,703,110
5,703,740
5,703,838
5,703,967
5,704,595
5,704,597
5,704,728
5,705,229
5,705,845
5,706,191
5,707,812
5,707,863
5,708,117
5,708,415
5,709,031
5,709,948
5,710,620
5,710,851
5,711,943
5,712,030
5,712,630
5,712,692
5,712,922
5,713,132
5,713,462
5,713,601
5,713,693
5,714,177
5,714,627
5,715,161
5,715,162
5,716,080
5,716,410
5,716,904
5,717,433
5,717,549
5,718,088
5,718,882
5,718,903
5,718,934
5,719,227
5,719,281
5,719,551
5,720,966
5,721,207
5,721,298
5,721,324
5,721,400
5,721,945
5,722,510
5,722,593
5,722,757
5,723,310
5,723,451
5,724,242
5,724,249
5,725,683
5,726,076
5,728,891
5,728,970

Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

March 23-27, 1998

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
3-23	EX	74/684,146	Rose Tree Gallery, Inc.	2(d)	Refusal Affirmed		"TOOTSIE" (in stylized lettering) [dolls, doll clothes, doll shoes, doll hats, and doll story cards]	"TOOTSIETOY" [miniature toys, namely, automobiles, boats, dishes, doll-houses, bedroom suites, diningroom sets, etc.]	No
3-24	CANC	22,249	Clear Choice, Inc. v. Mission Kleensweep Products, Inc.	2(d)	Petition to Cancel Granted	"CLEAR CHOICE" [cleaner, stain and spot remover for carpets]	"CLEAR CHOICE" [all purpose cleaner degreaser, spot and stain remover]		No
3-24	EX	74/602,204	Royal Appliance Mfg. Co.	2(e)(1)	Refusal Affirmed		"MAXIMUM VACUUM POWER" [electrical vacuum cleaners for both domestic and industrial use]		No
3-25	EX	74/543,143	Sport-Design, Inc.	2(d)	Refusal Affirmed		"STARS OF TOMORROW" [children's sports products, namely, baseballs, baseball bats and gloves, tennis rackets, footballs, basketballs and soccer balls]	"STAR OF TOMORROW" [golf clubs]	No
3-26	EX	74/554,300	Captain Morgan's Retreat, Ltd.	2(d)	Refusal Reversed		"CAPTAIN MORGAN'S RETREAT" [resort and hotel services, including activities such as boating, scuba-diving, tours, fishing, swimming, snorkling and restaurant services featuring gourmet dining]	"CAPTAIN MORGAN'S SEAFOOD" [restaurant services]	No

[1]EX5EX PARTE APPEAL; OPP5OPPOSITION; CANC5CANCELLATION; CU5CONCURRENT USE; (SJ)5SUMMARY JUDGMENT;(R)5REQ. FOR RECONSIDERATION; (MD)5MOTION TO DISMISS; (MR)5MOTION TO REOPEN

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box ____________
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box ____________
FEE (or NO FEE)
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box ___________
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) in Sunnyvale, California.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	Not Yet Operational
	New Haven Free Public Library	Not Yet Operational
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(954) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 978-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	Not Yet Operational
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510 Ext. 113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director	308-0661	01/08/96
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	06/04/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	06/17/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	05/06/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	10/12/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	10/25/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	03/15/96
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-3900	03/15/96
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	12/05/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	08/19/96
TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director	305-3900	06/09/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	305-3293	04/26/96
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	11/28/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	11/26/96
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	01/17/96
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	01/23/96
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	12/03/96

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of April 1, 1998

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/03/97	01/29/98
Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/25/97	12/31/97
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/06/97	03/09/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/02/97	01/23/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/22/97	12/28/97
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/25/97	11/05/97
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/04/97	12/19/97
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/16/97	12/23/97
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/01/97	01/26/98
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/19/98	—0—
Renewals (All Classes)	02/19/98	—0—
Section 12(c) Publications (All Classes)	02/02/98	—0—

---

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

MAY 12, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 5,292,801 (3513th)

DOPED SOL-GEL GLASSES FOR OBTAINING CHEMICAL INTERACTIONS

David Avnir; Michael Ottolenghi; Sergei Braun, and Riyka Zusman, all of Jerusalem, Israel, assignors to YISSUM, Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Reexamination Request No. 90/004,560, Feb. 21, 1997.

Reexamination Certificate for Patent 5,292,801, issued Mar. 8, 1994, Ser. No. 937,258, Aug. 31, 1992.

Division of Ser. No. 637,873, Jan. 8, 1991.

Claims priority, application Israel, Jan. 23, 1990, 93134

Int. Cl.^{6} C08G *63/48;* **B01D** *53/00;* **G01N** *33/00;21/00*

U.S. Cl. 525—54.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–5** dependent on an amended claim, are determined to be patentable.

1. A process for the preparation of a reactive sol-gel glass, comprising polymerizing at least one monomer of the formula $M(R)_n(P)_m$ and selected from the group consisting of metal alkoxides, semi-metal alkoxides, metal esters and semi-metal esters, wherein M is a metallic or semi-metallic element, R is a hydrolyzable substituent, n is an integer of 1 to 6, P is a non-polymerizable substituent and m is an integer of 0 to 6, and optionally an organic monomer, under acidic, neutral or basic conditions and in the presence of a dopant *which is mixed with the monomer of the formula* $M(R)_n(P)_m$ *as such* to form a porous xerogel containing the dopant trapped therein, said polymerization including a gelling step conducted at not greater than 45° C., said dopant being selected from the group consisting of organic compounds, stable organic radicals, organometallic compounds, inorganic compounds and molecules of biological origin, the dopant being reactive after preparation of the xerogel.

B1 5,477,259 (3514th)

MULTIPLE BEAM SCANNING APPARATUS, LIGHT SOURCE UNIT, AND METHOD OF MANUFACTURING THE SAME

Hiroshi Iwasa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Reexamination Request No. 90/004,481, Dec. 13, 1996.

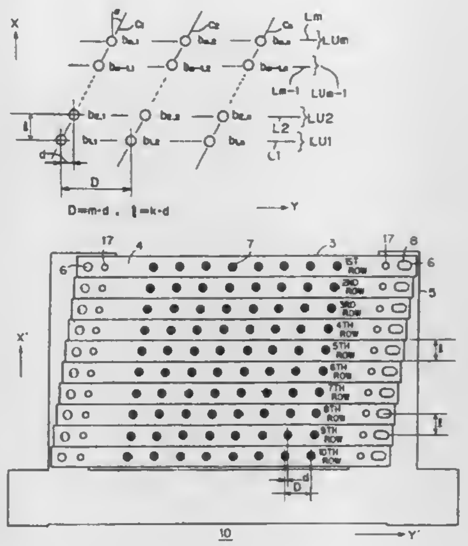
Reexamination Certificate for Patent 5,477,259, issued Dec. 19, 1995, Ser. No. 96,958, Jul. 26, 1993.

Claims priority, application Japan, Jul. 29, 1992, 4-223403

Int. Cl.^{6} B41J *2/45*

U.S. Cl. 347—238

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims **19–23** is confirmed.

Claims **3** and **4** are cancelled.

Claims **1**, **2**, **9** and **10** are determined to be patentable as amended.

Claims **5–8** and **11–18**, dependent on an amended claim, are determined to be patentable.

1. A multiple beam scanning apparatus comprising:
(a) a recording medium;
(b) means for generating m by n (m, n:) recording information signals, where m and n are each integers of at least 2;
(c) means for emitting m by n optical beams being independently modulated in response to said recording information signals respectively, said m by n optical beams being so arranged in a plane perpendicular to the travelling direction thereof that there are m optical beam groups, each including n optical beams spaced at intervals of a first space and arranged in a second direction that is perpendicular to a first direction said groups being arranged at [regular] intervals *of a third space* in said first direction and shifted at intervals of a second space with respect to said second direction, said first space corresponding to m time said second space, *said third space corresponding to integral times said second space*;
(d) means for reducing a beam-to-beam pitch of said m by n optical beams being received from said means (c) and focusing reducing said m by n optical beams on said recording medium, said beam-to-beam pitch corresponding to a center distance between adjacent ones of said m by n optical beams; and
(e) means for scanning said m by n optical beams, begin imaged on said recording medium, in said first direction.

REISSUES

MAY 12, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

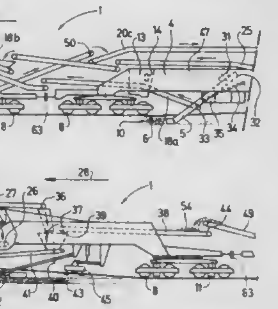
Re. 35,788
METHOD OF AND ARRANGEMENT FOR REHABILITATING A BALLAST BED OF A TRACK

Josef Theurer, Vienna, and Manfred Brunninger, Altenberg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Original No. 5,479,725, dated Jan. 2, 1996, Ser. No. 258,666, Jun. 13, 1994. Application for reissue Feb. 20, 1996, Ser. No. 603,206

Int. Cl.^{6} E02F *5/22*

U.S. Cl. 37—104 **22 Claims**



1. A method of rehabilitating a ballast bed by installing a protective layer between a subgrade and a layer of ballast, comprising the steps of:

exposing the subgrade by continuously removing old ballast from the ballast bed;

withdrawing and comminuting at least a portion of old ballast;

mixing sand with comminuted old ballast to form a ballast-sand mixture; and

discharging [comminuted old ballast] *the ballast-sand mixture* over the exposed subgrade to form at least part of the protective layer[; and

mixing sand with comminuted old ballast to form a ballast-sand mixture and discharging the mixture upon the exposed subgrade for formation of the protective layer after removal of remaining old ballast].

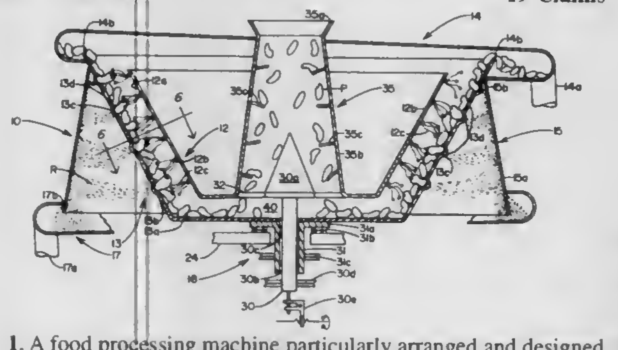
Re. 35,789
FOOD PROCESSING MACHINE

John H. Amstad, 6807 W. 100th Ter., Overland Park, Kans. 66212-1634

Original No. 5,307,738, dated May 3, 1994, Ser. No. 81,229, Jun. 25, 1993. Application for reissue Apr. 24, 1996, Ser. No. 641,301

Int. Cl.^{6} A23N *7/00;* **A47J** *17/14*

U.S. Cl. 99—625 **19 Claims**



1. A food processing machine particularly arranged and designed to abrade, peel and otherwise treat the exterior surface of various food products, including:

a. a support framework;

b. [a pair of centrically arranged conical members rotatably provided] *an inner conical member and an outer conical member* on said framework and positioned in [radially] spaced relation from one another to provide a product treatment area therebetween;

c. means for [selectively, rotatably] driving said conical members, *said outer conical member being rotatably driven*;

d. means for introducing the food product to be treated into said product treatment area;

e. refuse passing apertures provided through the exterior of the outer conical member for passing removed particulates from said treatment area due to [the horizontal component of] the centrifugal force provided by rotation of said [exterior] *outer* conical member;

f. product surface contacting means carried [on the exterior surface of the interior] *by at least one* of said conical members *and* extending into said treatment area for treating the exterior surface of the product to a desired condition;

g. exit means at the upper end of said treatment area for delivery of the treated product, the product advancing to said exit means due to [the vertical component of] the centrifugal force provided by rotation of said [exterior] *outer* conical member.

Re. 35,790
SYSTEM FOR DRILLING DEVIATED BOREHOLES

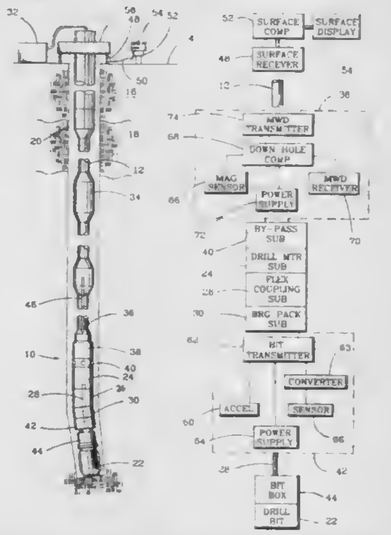
Randal Harold Pustanyk, Millet, and Laurier Emile Comeau, Ledoc, both of Canada, assignors to Baroid Technology, Inc., Houston, Tex.

Original No. 5,163,521, dated Nov. 17, 1992, Ser. No. 750,650, Aug. 27, 1991. Application for reissue Jan. 2, 1996, Ser. No. 582,832

Claims priority, application Canada, Aug. 27, 1990, 2024061

Int. Cl.^{6} E21B *7/08;47/12*

U.S. Cl. 415—40 **20 Claims**



1. A method of drilling a borehole through earth formations with a drill string including a rotary bit at the lower end thereof, and obtaining information regarding a downhole parameter indicative of the borehole or the earth formations, the bit being powered by a drill motor within the drill string and including a power assembly of the drill motor for converting pressurized fluid to rotation of a mandrel interconnected with the bit, a bearing assembly between the power assembly and the bit for guiding the mandrel, and a bearing housing for housing the bearing assembly, the method comprising:

sensing the downhole parameter using a sensor fixedly located in the drill string at a location axially below the power assembly;
transmitting signals functionally related to the sensed downhole parameter from a location axially below the power assembly;
receiving the transmitted signals at the surface to determine the downhole parameter; and
altering the drilling trajectory in response to the transmitted signals.

15. A system for drilling a deviated borehole through earth formations, including a drill string including a drill bit, the bit powered by a drill motor having a power assembly for converting pressurized fluid to rotation of a mandrel interconnected with the bit, a bearing assembly between the power assembly and the bit for guiding the mandrel, and a bearing housing for housing the bearing assembly, the system comprising:
a sealed cavity within the drill string at a location below the power assembly;
a sensor within the sealed cavity for sensing a downhole parameter;
a transmitter within the cavity for transmitting signals functionally related to the sensed downhole parameter; and
a receiver spaced axially above the drill motor for receiving the transmitted signals and outputting downhole parameter signals.

Re. 35,791

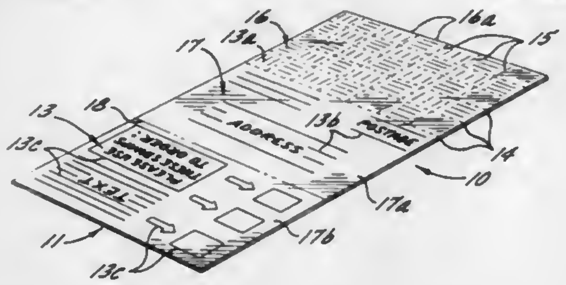
PRINTED SHEET WITH INTEGRALLY FORMED STAMPS

Richard J. Volz, Box 460, R.R. 1, Jermyn, Pa. 18433, assignor to Richard J. Volz, Jermyn, Pa.

Original No. 5,344,190, dated Sep. 6, 1994, Ser. No. 38,454, Mar. 29, 1993. Application for reissue Jul. 26, 1995, Ser. No. 506,899

Int. Cl.^{6} G09F *3/00*

U.S. Cl. 283—71 **18 Claims**



18. A combination printed sheet and stamps comprising
a sheet of readily imprintable material having a substantially uniform thickness and including a first portion and a second portion, said first portion having fracturable lines dividing said first portion into interconnected but removable stamps, said second portion having at least one medial fold line extending transversely thereof dividing said second portion into first and second segments,
printed indicia on one side of said first portion between the fracturable lines to produce stamp information thereon,
printed indicia on one side of said second portion to produce cover information thereon,
a first adhesive coating on the other side of said first portion to provide for attachment of the stamps to a surface,
a second adhesive coating on the other side of said second portion for securing said first and second segments together when said second portion is folded about said fold line, and
whereby said second portion may be folded along said fold line to position said first and second segments thereof in superposed relation and with the adhesive coated sides thereof contiguous, the adhesive coating being activatable to secure said first and second segments together.

Re. 35,792

DISK STORAGE DRIVE

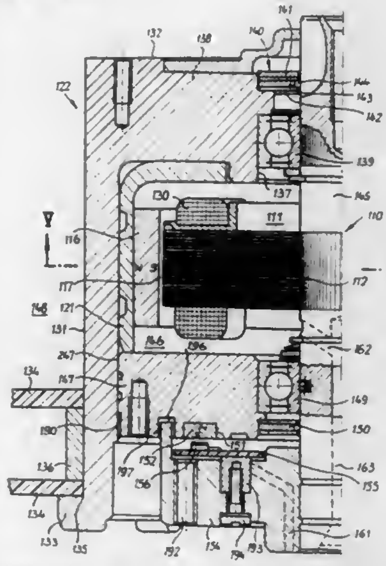
Dieter Elsasser, St. Georgen; Johann von der Heide, Schramberg, and Heinrich Cap, Peterzell, all of Germany, assignors to Papst Licensing, GmbH, Spaichingen, Germany

Original No. 4,894,738, dated Jan. 16, 1990, Ser. No. 201,736, Jun. 2, 1988. Continuation-in-part of Ser. No. 38,049, Apr. 14, 1987, Pat. No. 4,843,500, and Ser. No. 32,954, Mar. 31, 1987, Pat. No. 4,779,165, which is a continuation of Ser. No. 733,231, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 412,093, Aug. 27, 1982, abandoned, said Ser. No. 38,049 is a continuation-in-part of Ser. No. 767,671, Aug. 21, 1985, Pat. No. 4,658,312, which is a continuation of Ser. No. 412,093, Aug. 27, 1982, abandoned. Application for reissue Apr. 1, 1997, Ser. No. 829,941

Claims priority, application Germany, Sep. 7, 1981, 3135385; Switzerland, Jun. 1, 1984, 26801/84; Mar. 30, 1985, 13741

Int. Cl.^{6} G11B *17/08; 17/02*

U.S. Cl. 360—98.07 **7 Claims**



12. A disk memory drive having a brushless drive motor, comprising a stator having a predetermined axial extension, a coaxially positioned outer rotor and circling the stator and defining therebetween a substantially cylindrical air gap, the rotor having a predetermined axial extension, a cylindrically shaped permanent motor magnet disposed adjacent the air gap on the inner circumference of the rotor to rotate therewith and magnetically interact with the stator, a hub on the outer circumference of the rotor firmly fixed to the motor magnet, the hub being provided on its outer circumference with a disk mounting section which extends through the central opening in a storage disk to mount the disk and allowing at least one storage disk to be accommodated thereon, a clean chamber surrounding the disk mounting section to contain the mounted disk therein, at least half of the axial extension of both the stator winding and of the motor magnet interacting therewith being positioned within the space encompassed by the disk mounting section of the hub, a stationary shaft having upper and lower bearing means mounted thereon for rotatably mounting the rotor with hub on the shaft, and seals located axially above the upper and below the lower bearings for sealing the space therebetween from the outer clean chamber.

Re. 35,793

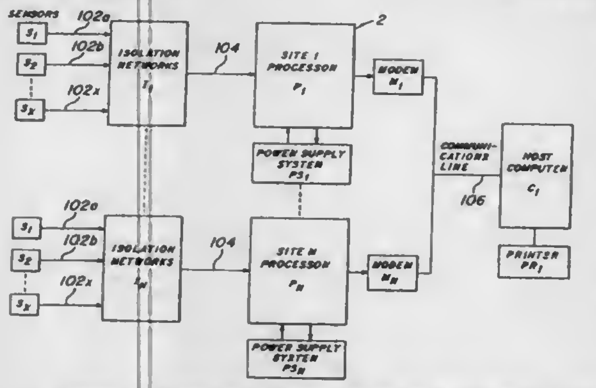
MEASURING AND MONITORING SYSTEM

B. James Halpern, Shrewsbury, N.J., assignor to Measuring & Monitoring Services, Inc., Tinton Falls, N.J.

Original No. 5,301,122, dated Apr. 5, 1994, Ser. No. 836,049, Feb. 12, 1992. Application for reissue Oct. 3, 1994, Ser. No. 317,251

Int. Cl.^{6} G01R *21/00;* **G06F** *17/40;* **G08C** *15/06*

U.S. Cl. 364—483 **97 Claims**



1. A system for [sampling, formatting, storing, processing and communicating to] *determining power usage data at* a central location [data representing the power usage of] *from* a plurality of power consuming devices *that are located* at a remote site, *said system* comprising:
(a) [a host computer located at said central location;
(b) a plurality of sensors each with an output representing] *a plurality of sensors coupled to a respective plurality of power consuming devices which are sampled repetitively by said sensors, each respective sensar detecting* the on-off condition of a respective one of said plurality of power consuming devices [, each of said sensors being located at a respective one of said power consuming devices] *at pre-determined time intervals for pre-determined time periods thereby defining on-off data*;
(b) a host computer located at said central location, said host computer comprising storage means for storing operating data about each of the power consuming devices and sensor data about each of said sensors and further comprising means for processing said on-off data to generate said power usage data;
(c) a processor, coupled to said plurality of sensors, at said remote site comprising:
  (1) means for storing said *on-off* data[, said data comprising said on-off condition information for each of said power consumer devices, sampled repetitively, at a pre-determined time interval for a predetermined time period];
  (2) a real time clock/calendar *for providing time and date information to said processor; and*
  (3) a micro-controller;
(d) means[, coupled to said processor,] for communicating said *on-off* data from said [remote site directly] *processor* to said [central location] *host computer,* said means for communicating [said data] comprising ordinary public telephone lines and being independent of any power transmission lines or means; [and]
(*e*) said host computer *further* comprising means for controlling the operation and timing of said processor [comprising means for], *said controlling means* communicating status and command information from said host computer [directly] to said [remote site,] *processor via* said means for communicating;
(*f*) said [status and central information] *processor further* comprising [ordinary public telephone lines and being independent of any power transmission lines or means, and means in said processor for storing] *means for storing and processing* said status and command information.

Re. 35,794

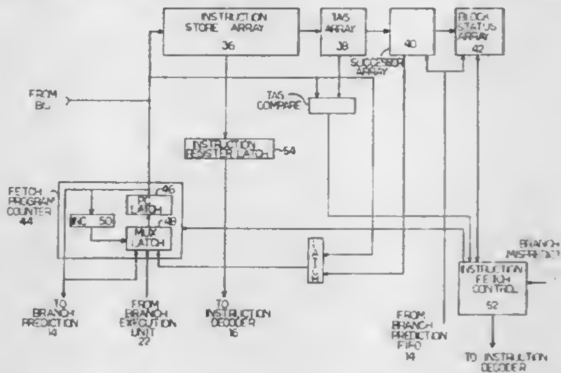
SYSTEM FOR REDUCING DELAY FOR EXECUTION SUBSEQUENT TO CORRECTLY PREDICTED BRANCH INSTRUCTION USING FETCH INFORMATION STORED WITH EACH BLOCK OF INSTRUCTIONS IN CACHE

William M. Johnson, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Original No. 5,136,697, dated Aug. 4, 1992, Ser. No. 361,870, Jun. 6, 1989. Application for reissue Aug. 4, 1994, Ser. No. 285,520

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—586 **27 Claims**


INSTRUCTION STORE ARRAY 36
TAS ARRAY 38
40
BLOCK STATUS ARRAY 42
SUCCESSOR ARRAY
FROM BEU
TAS COMPARE
INSTRUCTION EXECUTION...54
FETCH PROGRAM COUNTER 44
INC 50
LATCH
MUX LATCH
BRANCH MISPREDICTED
INSTRUCTION FETCH CONTROL 52
TO BRANCH PREDICTION 14
FROM BRANCH EXECUTION UNIT 22
TO INSTRUCTION DECODER 16
FROM BRANCH PREDICTION FIFO 14
TO INSTRUCTION DECODER 16

1. A branch prediction method, comprising *the steps of*:
a. loading a plurality of instruction blocks into an instruction cache memory, each of said instruction blocks comprising a plurality of instructions and instruction fetch information, wherein said instruction fetch information comprises an address tag, a predicted target branch address, a branch block index and a successor index that includes a successor valid bit;
b. generating and supplying a fetch program counter *value* to said instruction cache memory in order to prefetch one of said plurality of instruction blocks [and store] *stored* in said instruction cache memory;
c. determining whether said successor valid bit of said prefetched instruction block is set to a predetermined condition which indicates that a branch instruction within said prefetched instruction block is predicted as taken;
d. [incrementing said fetch program counter and supplying the incremented fetch program counter value to said instruction cache memory to prefetch a succeeding instruction block if said successor valid bit is not set to said predetermined condition, and] generating a branch location address indicative of the location of said branch instruction within said instruction [memory] cache *memory* and a predicted target branch address if said successor valid bit is set to said predetermined condition;
e. storing said predicted target branch address and said branch location address in a branch prediction memory *if said successor valid bit is set to said predetermined condition*;
f. *incrementing said fetch program counter value and supplying the incremented fetch program counter value to said instruction cache memory to prefetch a succeeding instruction block if said successor valid bit is not set to said predetermined condition;*
g. executing said branch instruction with an execution unit and generating an actual branch address and a target branch address for the executed branch instruction;

[g.] *h.* comparing said actual *branch* address generated by said execution unit with said branch location *address* stored in said branch prediction memory and generating a *first* misprediction signal if *a branch corresponding to said branch instruction was taken on execution and either* said actual *branch* address is not equal to said branch location *address or said executed target branch address is not equal to said predicted target branch address stored in said branch prediction memory*;

[h.] *i.* comparing [the executed target] *said actual* branch address with [the predicted] *said* branch *location* address stored in said branch prediction memory and generating a *second* misprediction signal if [the executed target] *said branch corresponding to said branch instruction was not taken on execution and said actual* branch address is [not] equal to [the predicted target] *said* branch *location* address;

[i.] *j.* updating the successor valid bit and instruction fetch information for said instruction block in response to said *first or second* misprediction signal; and

[j.] *k.* updating said *fetch* program counter value with the target branch address *in response to said first or second misprediction signal.*

Re. 35,795

METHOD OF MAKING FLOWABLE ALKALINE THIOSULFATE/ALKALINE SULFITE AND THE PRODUCT THEREOF

Hongzoon Kim, Boonton, and Charles J. Pfeiffer, Wayne, both of N.J., assignors to Fuji Hunt Photographic Chemicals, Inc., Paramus, N.J.

Original No. 5,328,814, dated Jul. 12, 1994, Ser. No. 118,593, Sep. 10, 1993. Division of Ser. No. 828,672, Jan. 31, 1992, Pat. No. 5,270,154. Application for reissue Jul. 5, 1996, Ser. No. 676,063

Int. Cl.^{6} G03C *5/38*

U.S. Cl. 430—458 **25 Claims**

1. A flowable powdered mixture comprising (a) a member selected from the group consisting of a hygroscopic alkaline thiosulfate, a hygroscopic alkaline sulfite, and a mixture thereof, and (b) a dry alkali metal [arylsulfonate.formaldehyde] *arylsulfonate•formaldehyde* in an amount from about 0.05 to 10%, by weight, of said mixture which is effective to provide flowability to the mixture.

PLANT PATENTS

GRANTED MAY 12, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,385

PLUM TREE "JOANNA RED"

Chris Floyd Zaiger, 929 Grimes Ave.; Gary Neil Zaiger, 1907 Elm Ave.; Leith Marie Gardner, 1207 Grimes Ave., and Grant Gene Zaiger, 4005 California Ave., all of Modesta, Calif. 95358

Filed Dec. 23, 1996, Ser. No. 771,862

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—38.1 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by its large size, vigorous, upright growth and being a regular and productive bearer of medium to large, yellow flesh, freestone fruit, having a good balance between acid and sugar to produce good flavor and eating quality; the fruit is further characterized by its firmness which facilitates its good handling and shipping qualities, the ability to remain firm on the tree 6 to 7 days after shipping ripe and in comparison to Casselman Plum (non-patented), the new variety has heavier production of larger size fruit with a greater degree of attractive red skin color and matures approximately 5 days earlier.

10,386

INTERSPECIFIC TREE "GEO PRIDE"

Chris Floyd Zaiger, 929 Grimes Ave.; Gary Neil Zaiger, 1907 Elm Ave.; Leith Marie Gardner, 1207 Grimes Ave., and Grant Gene Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Feb. 13, 1997, Ser. No. 800,718

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—38.1 **1 Claim**

1. A new and distinct variety of interspecific tree, substantially as illustrated and described, characterized by its large size, vigorous, semi-upright growth and a productive and regular bearer of medium size, firm, freestone fruit; the fruit is further characterized by having a good balance between sugar and acid, excellent flavor and eating quality, good handling and shipping quality and, in comparison to the interspecific tree Flavor King (U.S. Plant Pat. No. 8,026), the fruit of the new variety is approximately 21 days earlier in maturity.

10,387

PEACH TREE 'VALLEY SWEET'

Chris Floyd Zaiger, 929 Grimes Ave.; Gary Neil Zaiger, 1907 Elm Ave.; Leith Marie Gardner, 1207 Grimes Ave., and Grant Gene Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Jan. 17, 1997, Ser. No. 784,490

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous and upright growth, is a regular and productive bearer of large, firm, yellow flesh freestone fruit with sweet, subacid flavor; the fruit is further characterized by being relatively uniform in size throughout the tree, holding firm on the tree 6–7 days after maturity (shipping ripe) and, in comparison to O'Henry Peach (U.S. Plant Pat. No. 2,964), the fruit has a higher degree of attractive red skin color and is approximately 10 days earlier in maturity.

10,388

RHODODENDRON PLANT NAMED 'NORTHERN STARBURST'

Steven M. McCulloch, Olympia, Wash., assignor to Briggs Nursery, Inc., Olympia, Wash.

Filed Oct. 16, 1996, Ser. No. 732,139

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and distinct variety of *Rhododendron dauricum sempervirens*× *Rhododendron carolinianum* plant characterized particularly as to novelty by the following combination of characteristics:

(a) is a tetraploid;
(b) forms leaves that are heavier in substance than those of 'PJM Compact Form' (non-patented in the United States).
(c) forms thicker stems than 'PJM Compact Form',
(d) forms substantially larger blossoms than 'PJM Compact Form' that are of varying shades of lavender/pink and are somewhat lighter in coloration, and
(e) exhibits an attractive compact dense upright spreading growth habit;

substantially as illustrated and described.

10,389

OSTEOSPERMUM PLANT NAMED 'CAPE DAISY ZULU'

Carl Aksel Kragh Sorensen, Åbyhoj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Aug. 9, 1996, Ser. No. 695,306

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Zulu', as illustrated and described.

10,390

CHRYSANTHEMUM PLANT NAMED 'RASPBERRY ICE'

Peter S. Hesse, Nipomo, Calif., assignor to Clearwater Nursery, Inc., Nipoma, Calif.

Filed Sep. 12, 1996, Ser. No. 713,167

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct chrysanthemum plant named 'Raspberry Ice' substantially as herein described and shown, characterized by the grey-purple color of the ray florets.

10,391

CHRYSANTHEMUM PLANT NAMED 'TRAVIATA'

Leon Glicenstein, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 19, 1996, Ser. No. 702,295

Int. Cl.^{6} H01H *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct Chrysanthemum plant named Traviata, as described and illustrated.

10,392

PHALAENOPSIS ORCHID PLANT NAMED 'ABYLOS'

Renate Plate, Bremen, Germany, assignor to Wolfgang Bock, Pflanzenexport KG, Bremen, Germany

Filed Nov. 4, 1996, Ser. No. 743,070

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.3 **1 Claim**

1. A new and distinct cultivar of *Phalaenopsis* Orchid plant named 'Abylos', as illustrated and described.

10,393

DORITAENOPSIS ORCHID PLANT NAMED 'APOSYA'

Renate Plate, Bremen, Germany, assignor to Wolfgang Bock Pflanzenexport KG, Bremen, Germany

Filed Nov. 4, 1996, Ser. No. 744,351

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.3 **1 Claim**

1. A new and distinct cultivar of *Doritaenopsis* Orchid plant named 'Aposya', as illustrated and described.

10,394

PHALAENOPSIS ORCHID PLANT NAMED 'SYLBA'

Renate Plate, Bremen, Germany, assignor to Wolfgang Bock Pflanzenexport KG, Bremen, Germany

Filed Dec. 9, 1996, Ser. No. 762,798

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.3 **1 Claim**

1. A new and distinct cultivar of Phalaenopsis Orchid plant named 'Sylba,' as illustrated and described.

10,395

GERANIUM PLANT NAMED 'PURPLE ROSE'

Scott C. Trees, Arroyo Grande, Calif., assignor to Ball Horticultural Company, West Chicago, Ill.

Filed Aug. 21, 1996, Ser. No. 697,258

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant named 'Purple Rose', substantially as herein shown and described, which:

(a) exhibits attractive semi-double fuschia florets having an eye of orange and red,
(b) forms attractive medium green foliage with zonation, and
(c) exhibits a vigorous self-branching growth habit in the absence of a growth regulator.

10,396

GERANIUM PLANT NAMED 'PINK PASSION'

Scott C. Trees, Arroyo Grande, Calif., assignor to Ball Horticultural Company, West Chicago, Ill.

Filed Aug. 21, 1996, Ser. No. 697,259

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant named 'Pink Passion', substantially as herein shown and described, which:

(a) exhibits attractive small single deep pink florets having a deep rose eye on each petal,
(b) forms attractive small medium green foliage with slight zonation, and
(c) exhibits a compact cascading self-branching growth habit in the absence of a growth regulator.

10,397

GERANIUM PLANT NAMED 'BFP-1409 LIGHT SALMON'

Scott C. Trees, Arroyo Grande, Calif., assignor to Ball Horticultural Company, West Chicago, Ill.

Filed Aug. 21, 1996, Ser. No. 697,264

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar Geranium plant named 'BFP-1409 Light Salmon', substantially as kerein shown and described, which:

(a) exhibits attractive semi-double salmon florets,
(b) forms attractive medium green foliage with slight zonation, and
(c) exhibits a vigorous self-branching growth habit in the absence of the use of a growth regulator.

10,398

GERANIUM PLANT NAMED 'BFP-484 WHITE'

Scott C. Trees, Arroyo Grande, Calif., assignor to Ball Horticultural Company, West Chicago, Ill.

Filed Aug. 21, 1996, Ser. No. 701,150

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant named 'BFP-484 White', substantially as herein shown and described, which:

(a) exhibits attractive semi-double pure white florets,
(b) forms attractive medium green foliage with slight zonation, and
(c) exhibits a vigorous self-branching growth habit in the absence of a growth regulator.

10,399

GERANIUM PLANT NAMED 'BFP-1328 RED'

Scott C. Trees, Arroyo Grande, Calif., assignor to Ball Horticultural Company, West Chicago, Ill.

Filed Aug. 21, 1996, Ser. No. 701,151

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant named 'BFP-1328 Red', substantially as herein shown and described, which:

(a) exhibits attractive semi-double velvety intense red florets,
(b) forms attractive medium green foliage with zonation, and
(c) exhibits a vigorous self-branching growth habit in the absence of a growth regulator.

10,400

VRIESEA PLANT NAMED APOLLO

Luc Pieters, and Caroline Demeyer, both of Laarne, Belgium, assignors to Exotic Plant, Laarne, Belgium

Filed Dec. 20, 1996, Ser. No. 772,097

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Vriesea plant named 'Apollo', as illustrated and described.

PATENTS

GRANTED May 12, 1998

ERRATA

For CLASS	See PATENT NO.
124—025	5,749,348
131—070	5,749,378
198—441	5,749,631
482—079	5,749,668
405—036	5,749,672
431—008	5,749,713
446—060	5,749,761
384—620	5,749,820
600—204	5,749,892
424—133	5,750,078
438—787	5,750,403
512—004	5,750,498
528—373	5,750,656
549—210	5,750,716
562—109	5,750,742
375—222	5,751,114
320—038	5,751,163
399—046	5,751,381
356—446	5,751,443
358—298	5,751,470
361—056	5,751,507
361—042	5,751,523
361—042	5,751,524
361—056	5,751,525
379—210	5,751,760
399—176	5,751,801
355—800	5,752,062

PATENTS

GRANTED MAY 12, 1998

GENERAL AND MECHANICAL

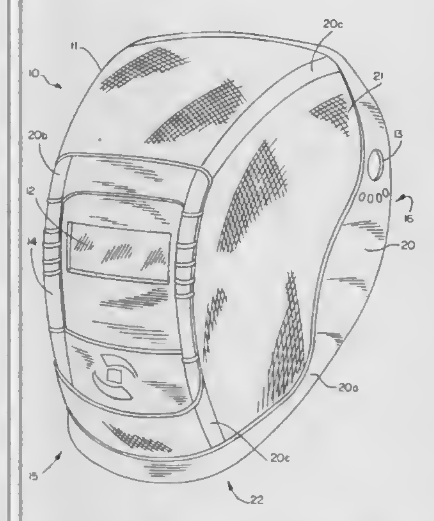
5,749,096

HELMET WITH HIGH PERFORMANCE HEAD AND FACE PROTECTION UTILIZING COMPLEMENTARY MATERIALS

Jeffrey K. Fergason, Menlo Park, Calif.; David Fry, Holland, Mich., and Stephen M. Brunnell, Palo Alto, Calif., assignors to Ilixco, Inc., Menlo Park, Calif.

Filed Jul. 1, 1994, Ser. No. 270,633
Int. Cl.^{6} A42B *3/00*

U.S. Cl. 2—8 **41 Claims**



1. A protective head gear structure comprising a composite material and a frame-like support material including a plurality of frame members forming a plurality of areas therebetween, said composite material being relatively nontransmissive of light and being disposed substantially within said areas and integrally coupled to said frame members to form an integral structure, mounting means for mounting the structure relative to the head of a person to position said composite material in protective relation to at least a portion of the head of the person, and further comprising a viewing port in the structure.

5,749,097

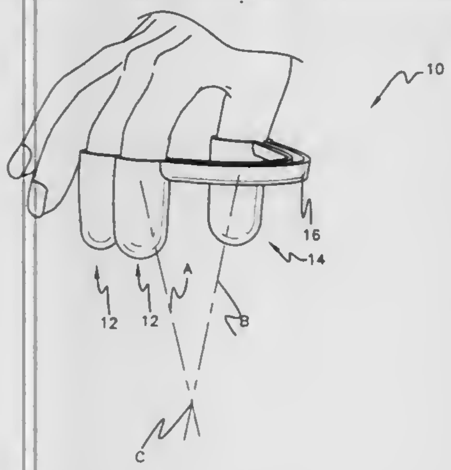
THREE DIGIT FINGERNAIL PROTECTOR

Anita Mallory Garrett-Roe, 1400 Ocean Dr., No. 802B, Corpus Christi, Tex. 78404

Filed Mar. 10, 1997, Ser. No. 813,436
Int. Cl.^{6} A41D *13/00*

U.S. Cl. 2—21 **7 Claims**

1. A protector for digits of the hand of a person working with solvents, comprising:



- a plurality of cylindrical, mutually open and abutting first sheaths each having a first proximal open end and a first distal closed end;
- a second sheath having a second proximal open end and a second distal closed end; and
- a flexible tether connecting said second sheath to said first sheaths,

said protector fabricated from a flexible material which is resistant to solvents and prevents the digits of the hand from becoming wet.

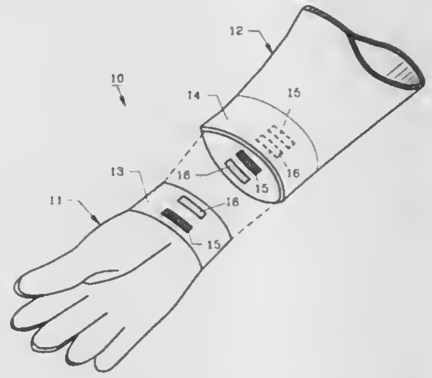
5,749,098

FOLDABLE GARMENT ATTACHMENT ASSEMBLY

Gretta S. Evans, 8244 Montgomery Ridge Rd., Belews Creek, N.C. 27009

Filed Dec. 8, 1995, Ser. No. 569,734
Int. Cl.^{6} A41D *19/00;* A41B *7/00*

U.S. Cl. 2—123 **18 Claims**



1. A foldable garment attachment assembly comprising:

(a) a major garment section, a first means for attaching said major garment section, said major garment first attaching means positioned on said major garment section interiorly thereof, a second means for attaching said major garment section, said major garment second attaching means positioned on said major garment section interiorly thereof in spatial axial relation to said major garment first attaching means, said major garment first attaching means selectively engageable with said major garment second attaching means whereby said major garment section can be folded axially with said major garment first attaching means engaging said major garment second attaching means; and

(b) a minor garment section, a first means for attaching said minor garment section, said minor garment first attaching means positioned on said minor garment section exteriorly thereof, a second means for attaching said minor garment section, said minor garment second attaching means positioned on said minor garment section exteriorly thereof in spatial axial relation from said minor garment first attaching means, said major garment section sized to receive said minor garment section, said first and said second major garment attaching means being engageable with said first and said second minor garment attaching means, whereby said major garment section is selectively attachable to said minor garment section.

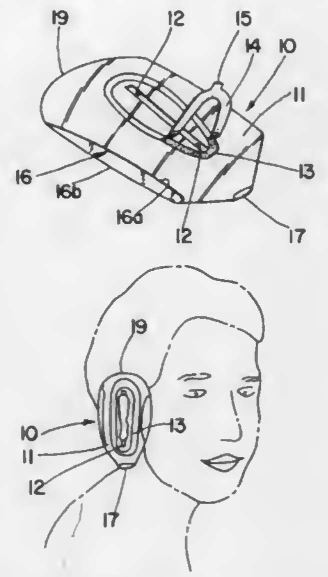
5,749,099
DRAINING DISPOSABLE FLUID-TIGHT EAR PROTECTOR

Donna Sue Voorhees, 3353 Rubio Crest Dr., Altadena, Calif. 91101

Filed May 1, 1997, Ser. No. 847,003

Int. Cl.^{6} A61F *11/14*

U.S. Cl. 2—209 **8 Claims**



1. An ear protector, comprising:

a) a supple envelope having a first distinct opening on a side for receiving an outer ear and tapering to form a second distinct opening on one end, and

b) affixing means for affixing the ear protector to the skin around the base of the ear, whereby said second opening is worn oriented downwardly to act as a drain when said envelope is affixed over the ear.

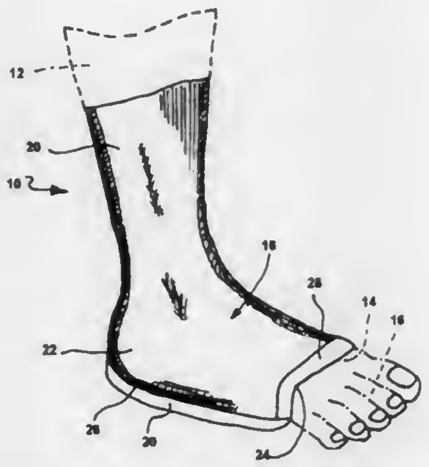
5,749,100
OPEN TOE SOCK

Iris Rosenberg, 203 Links Dr. West, Oceanside, N.Y. 11572

Filed Oct. 7, 1996, Ser. No. 727,000

Int. Cl.^{6} A41B *11/00*

U.S. Cl. 2—239 **2 Claims**



1. An open toe sock, comprising:

a) a foot engaging portion having a heel area, an open toe area being disposed in front of said heel area of said foot engaging portion, and a bottom area extending from said heel area of said foot engaging portion to said open toe area of said foot engaging portion; said foot engaging portion replaceably and comfortably engaging a foot of a wearer with toes of the foot of the wearer extending replaceably outwardly through said open toe area of said foot engaging portion and being exposed;

b) a leg engaging portion being integrally formed with, and extending generally perpendicularly upwardly from, said foot engaging portion, and replaceably and comfortably engaging a leg of the wearer;

c) said foot and leg engaging portions formed of a non-silicon-fabric material;

d) a thin resilient circumferential band encircling said open toe area of said foot engaging portion so as to allow said open toe area of said foot engaging portion to engage the foot of the wearer when the toes of the foot of the wearer are passed therethrough; said thin resilient circumferential band being silicon so as to repel polish from sticking to said open toe sock when used in a pedicure application and thereby providing a clean look therefor; and

e) a skid resistant sole extending continuously along said bottom area of said foot engaging portion, from said open toe area of said foot engaging portion to said heel area of said foot engaging portion so as to prevent the wearer of said open toe sock from slipping when walking and wear to said bottom area of the foot engaging portion is prevented; said skid resistant sole being silicon so as to repel debris from sticking to said skid resistant sole on said bottom area of said foot engaging portion when the wearer of said open toe sock is walking.

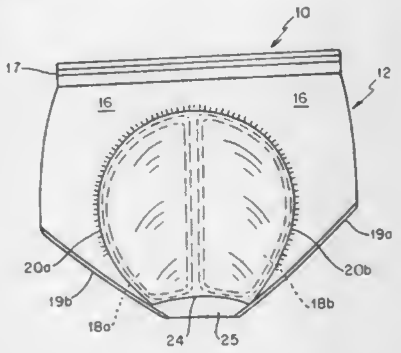
5,749,101
MEN'S PADDED BRIEF

Harold Breindel, 75 Albertson Ave., Albertson, N.Y. 11507

Continuation of Ser. No. 493,921, Jun. 23, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 766,937

Int. Cl.^{6} A41B *9/02*

U.S. Cl. 2—403 **3 Claims**



1. An improved men's padded brief for use in enhancing the appearance of a wearer's rear end, said brief comprising:

a garment shell having a front side and a rear side which form an upper waistband opening and two lower leg openings separated by a lower crotch panel;

two semi-circular shaped removable pads mountable on said rear side of said garment shell so as to form a circular-shaped padding to cover the rear end of an intended wearer to thereby enlarge the appearance thereof; and

means for releasably mounting said two semi-circular shaped removable pads on said rear side of said brief spaced from said upper waistband opening and said lower crotch panel so that said pads are positioned generally opposite to the rear end of an intended wearer to thereby enlarge the appearance thereof, said means comprising a garment panel partially secured to an inner face of said rear side of said garment shell, said garment shell and said garment panel having a mid-seam extending vertically from the crotch panel to the waistband opening to form two side-by-side semi-circular shaped pockets each having an opening in which each of said removable semi-circular shaped pads is insertable into an opposite one of said side-by-side semi-circular shaped pockets, said openings being disposed adjacent to said crotch panel, inside said garment shell, and said openings having a width which is smaller than the width of said removable semi-circular shaped pad and wherein said pad is resilient to allow the same to be compressed so as to enable it to be introduced into and removed from said opening in said side-by-side semi-circular shaped pocket.

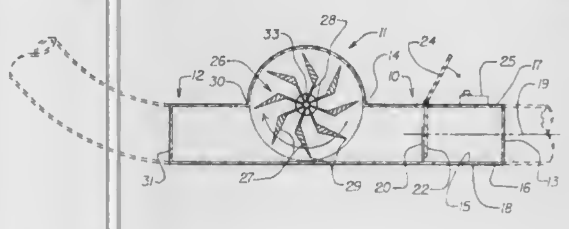
5,749,102
IN-LINE SEWAGE PUMP

Samuel I. Duell, 7524 Brookshire Dr., Prince George, Va. 23875-3145

Filed Jan. 31, 1997, Ser. No. 792,444

Int. Cl.^{6} E03D *11/00*

U.S. Cl. 4—431 **5 Claims**



1. A pumping apparatus for use in association with a toilet having a bowl and means for the rapid addition of water to said bowel to initiate a flushing action which flows toward a sewage-conveying pipe located above said toilet, said apparatus comprising:

a) a horizontally disposed intake conduit having interior and exterior surfaces, upper and lower regions, an upstream extremity that communicates with said bowl, an open downstream extremity, and a center axis of elongation,

b) flow sensing means positioned within said intake conduit and adapted to be restorably displaced in the direction of said downstream extremity in response to the flow of water through said intake conduit,

c) pivot means associated with said intake conduit for supporting said flow sensing means,

d) an activation finger disposed exteriorly of said intake conduit in rigid association with said flow sensing means and moveable toward the exterior surface of said conduit in response to displacement of said flow sensing means in the direction of said downstream extremity,

e) electrical switch means disposed upon the exterior surface of the upper region of said intake conduit and positioned in a manner to be contacted by said activation finger,

f) a pump housing communicating with the downstream extremity of said intake conduit, said housing having front and rear faces, said front face having a servicing aperture covered by a removable access panel,

g) a multi-bladed impeller positioned within said housing and rotatable upon an axle positioned at an elevation adjacent the upper region of said intake conduit, said blades having distal extremities which are of resilient construction and angled rearwardly with respect to the direction of rotation of said impeller,

h) a discharge conduit having an entrance extremity that communicates with said housing, and an open exit extremity that leads toward said sewage-conveying pipe,

i) an electric motor that drives said impeller when activated by said switch, and

j) an access panel removably associated with said housing.

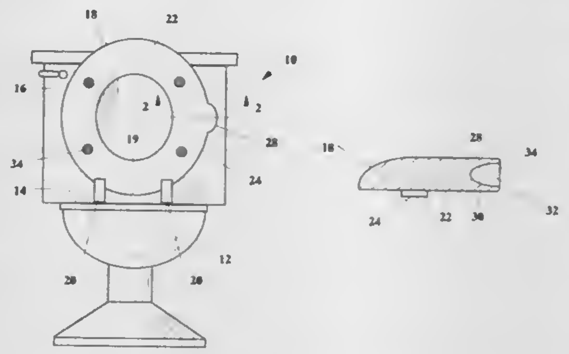
5,749,103
TOILET SEAT HAVING A SANITARY LIFTING SURFACE

Gary Allen Kreemer, Pickerington, Ohio, assignor to The Sanilift Company, Ltd., Pickerington, Ohio

Continuation-in-part of Ser. No. 372,224, Jan. 13, 1995, Pat. No. 5,511,252. This application Mar. 18, 1996, Ser. No. 617,137

Int. Cl.^{6} A47K *13/00*

U.S. Cl. 4—237 **4 Claims**



1. A toilet seat having a lifting surface which remains sanitary throughout a range of toilet seat positions between a toilet bowl and a toilet tank, said toilet seat having upper and lower surfaces bounded in an outward direction by an outer perimeter wall;

a) said toilet seat having a hinged end, said outer perimeter wall having a cavity therein defining said lifting surface, said cavity having a smooth inner surface gradually converging to a closed end, and an open end facing outwardly from said toilet bowl, said cavity having generously rounded outer edges leading from said inner surface to said outer perimeter wall, said inner surface being shielded from splashes when one urinates into said toilet bowl with said toilet seat located anywhere within a range of positions, said inner surface also being shielded from bacteria laden aerosolized toilet water spraying outward from said toilet bowl when said toilet bowl is flushed;

b) a hinging means connecting said hinged end of said seat to said toilet bowl such that a user placing a finger in said cavity and pressing against said smooth inner surface may pivot said toilet seat about said hinging means within said range of toilet seat positions without contamination of said finger from urine splash and bacteria laden toilet water spraying outward from said toilet bowl.

5,749,104
ERGONOMIC TOILET SEAT ASSEMBLY FOR ADULTS AND CHILDREN

Hank A. Evans, 3300 Rollingbrook #1018, Baytown, Tex. 77521

Filed May 11, 1995, Ser. No. 439,039

Int. Cl.^{6} A47K *13/06*

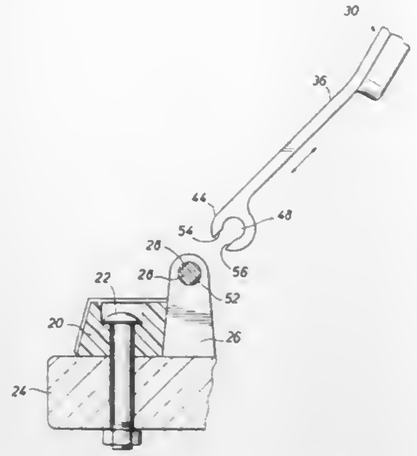
U.S. Cl. 4—239 **11 Claims**

1. An ergonomic adult/child toilet seat assembly for mounting on a toilet fixture and for use by adults and children, comprising:

(a) a toilet seat of a dimension for use by adults and defining a central opening;

(b) a child's toilet seat having interfitting supported engagement with said toilet seat and adapting said toilet seat for use by children by covering rear and side portions of said central opening;

(c) a pair of toilet seat pivot assemblies for supporting said toilet seat and said child's toilet seat in independently pivotal relation with said the toilet fixture and for supporting said child's toilet seat for pivotal movement thereof between a seated position in engagement with said toilet seat and an upstanding out of the way position to permit use of said toilet seat by



adults, each of said toilet seat pivot assemblies having a pivot pin having a circular cross-section of a defined diameter, said toilet seat being pivotal about said circular cross-section of said pivot pins, each of said pivot pins also having a child's seat insert pivot section defining a pair of spaced parallel flat surfaces having a distance of spacing less than said defined diameter and being oriented at an angle between the horizontal and the vertical to permit assembly and removal of said child's toilet seat relative to said pivot pins only at an angular position thereof between said seated and upstanding positions; and

(d) said child's toilet seat having a rigid tailpiece extending therefrom and having a pair of rigid hinge connections defining a pivot receptacle having a circular hinge opening of a dimension for rotation about said circular cross-section of said pivot pin, said rigid hinge connection having spaced internal parallel flat surfaces defining an access opening for lateral assembly and disassembly of said rigid hinge connection relative to said pivot pins when said spaced internal parallel surfaces of said hinge connection are in aligned registry with said spaced external parallel surfaces of said pivot pins, thereby permitting assembly of said child's toilet seat to said pivot pins and permitting separation of said child's toilet seat from said pivot pins by movement of said child's toilet seat in a direction transverse to said pivot pins.

5,749,105

DRAIN ASSEMBLY

James F. Bruno, 650 Greentree, Ada, Mich. 49301, and Albert L. Hass, Grand Rapids, Mich., assignors to James F. Bruno, Ada, Mich.

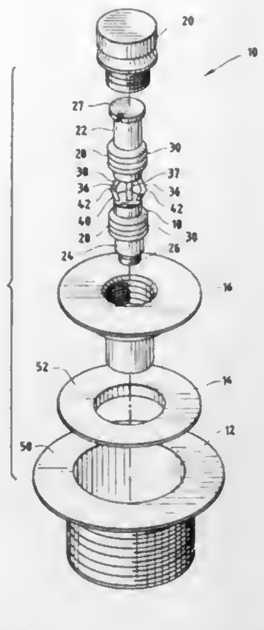
Filed Sep. 7, 1995, Ser. No. 525,361

Int. Cl.^{6} A47K *1/14*

U.S. Cl. 4—295 **15 Claims**

1. A cartridge for a drain assembly comprising:

a substantially cylindrical body having a circumference and substantially cylindrical upstream and downstream portions connected by a plurality of outwardly extending bowlike structures having an outermost surface extending beyond the circumference of the body; and



a plurality of finlike structures extending radially from the body and having edges that extend beyond the circumference of the body.

5,749,106

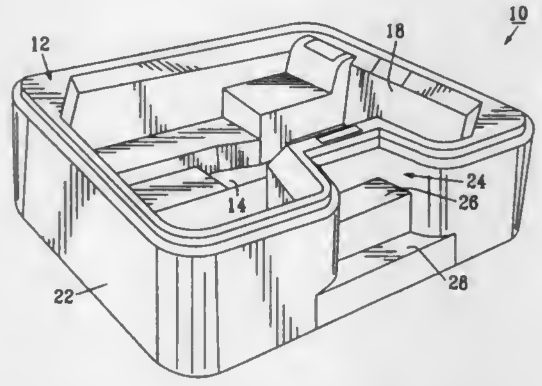
PORTABLE SPA WITH ACCESS STAIRWAY SET INTO INDENTATION WITHIN SIDE WALLS

Casey Loyd, and Buzz Loyd, both of 4722 W. Mission Blvd., Ontario, Calif. 91762

Filed May 14, 1996, Ser. No. 645,819

Int. Cl.^{6} A47K *3/00*

U.S. Cl. 4—541.1 **9 Claims**



9. A portable spa comprising a bottom and side walls, the side walls being generally linear or outwardly arcuate, wherein:

(a) the bottom and side walls are molded;

(b) a portion of at least one of the side walls is inwardly indented to form an indentation;

(c) the indented portion is at least one foot in length;

(d) the indented portion is at least one foot in depth;

(e) at least one stair tread is disposed within the indentation to facilitate ingress to and egress from the portable spa;

(f) the indented side wall has an exterior surface and an interior surface, and wherein the interior surface defines at least one stair tread to facilitate ingress to and egress from the portable spa; and

(g) the side walls have an exterior surface and an interior surface and wherein a skirt is disposed around the exterior surface of the side walls, the skirt having an indentation corresponding to the indentation in the at least one of the side walls.

5,749,107

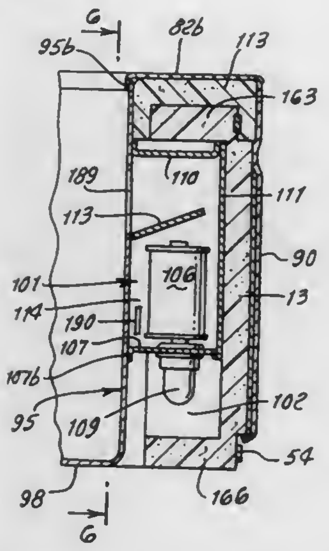
SPA APPARATUS WITH HANGING STRUCTURAL LINER

Borg Hansen, Long Beach; Rafael Gonzalez, Palmdale, and Roc V. Fleisaman, Venice, all of Calif., assignors to Softub, Inc., Chatsworth, Calif.

Division of Ser. No. 661,029, Jun. 10, 1996. This application May 8, 1997, Ser. No. 813,047

Int. Cl.^{6} A47K *3/00*

U.S. Cl. 4—541.1 **14 Claims**



12. A spa tub comprising in combination,

a) a flexible structural liner bounding a water-receiving zone to contain hydraulic loading exerted by water in said zone,

b) a panel assembly bounding said liner at locations spaced from the liner, whereby an air space is maintained between the liner and said panel assembly,

c) the panel assembly providing insulation, and locating the liner, the panel assembly sufficiently stiff to provide load-carrying capability for people seated on the panel assembly,

d) said panel assembly including multiple lightweight, molded, plastic panels,

e) said flexible liner hanging generally vertically throughout its major vertical extent, adjacent said air space,

f) and including a water filter supported in said air space, there being an access opening provided to said filter via said hanging liner.

5,749,108

SPRING TO METAL RAIL ASSEMBLY

Clayton M. Barnett, Frankfort, Ky., assignor to L&P Property Management Co., South Gate, Calif.

Filed Jul. 10, 1997, Ser. No. 889,946

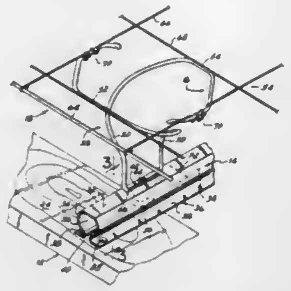
Int. Cl.^{6} A47C *23/00;23/02*

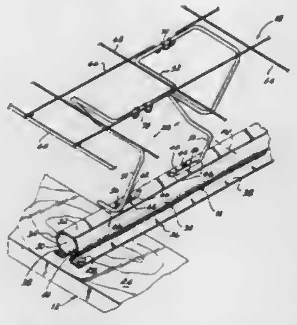
U.S. Cl. 5—264.1 **22 Claims**

1. A bedding foundation comprising:

a frame including at least one frame rail member, said rail member having a horizontal top portion, two opposed sidewalls extending downwardly from said top portion and planar flanges extending outwardly from the bottom of said sidewalls, each of said sidewalls having a bottom portion defining a lower throat between them, said top portion having at least one slot therethrough,

at least one wire spring module having an upright yieldable portion supported on said at least one rail member by a generally vertically oriented U-shaped mounting foot at the lower end of said upright portion, said foot being insertable within said slot, said foot comprising a pair of spaced leg portions joined together by a connecting portion urging said leg portions apart, each leg portion having a notch therein for engaging said slot to retain said foot in said slot and said throat defined between said sidewalls being sized so as to





engage said connecting portion of said foot and prevent lateral movement of said foot,

an upper deck secured to said at least one spring module,

padding overlying said deck,

an upholstered covering enclosing said padding, said frame and said at least one spring module.

5,749,109

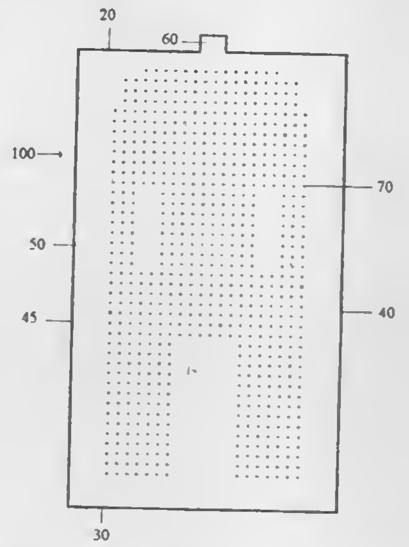
INFLATABLE BLANKET HAVING SELECTIVE AIR FLOW PATTERNS

Thomas F. Kappel, St. Louis, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Continuation of Ser. No. 544,907, Oct. 18, 1995, abandoned. This application Apr. 16, 1997, Ser. No. 834,383

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 5—423 **3 Claims**



1. An inflatable blanket for a forced air convection system comprising:

an upper sheet of material having a generally rectangular shape with an upper end, a lower end and two sides;

a lower sheets of material having a generally rectangular shape with an upper end, a lower end and two sides;

wherein said upper sheets and said lower sheet are sealed together around their peripheral edges at their respective upper ends, lower ends and sides, to create a full body blanket with an inflatable cavity having an upper end, a lower end and two sides therebetween;

an inflation port connecting said inflatable cavity with the atmosphere and through which inflation medium may be introduced to side inflatable cavity to inflate said blanket; and

wherein said lower sheet includes a plurality of perforations formed therethrough which are arranged in a specific pattern to allow air to exit only toward selective portions of a patient's body, said lower sheet having perforations only in said specific pattern, and said specific pattern being selected from the group consisting of perforations only in an area of said lower sheet which will cover a patient's chest, and perforations in an area of said lower sheet only in a pattern having said patient's general body shape.

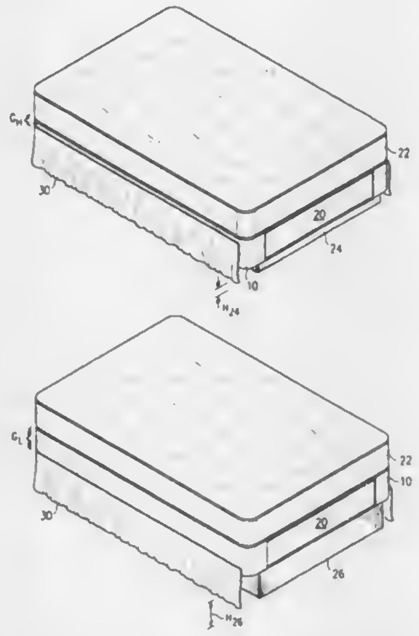
5,749,110
BOX SPRING WRAP AND DUST RUFFLE SYSTEM

Richard A. Gamble, 2501 Crestview Cir., Irving, Tex. 75602, and Anthony V. Borino, 2221 High Country Dr., Carrollton, Tex. 75007

Filed Jan. 13, 1997, Ser. No. 782,402

Int. Cl.⁶ A47C *21/00*

U.S. Cl. 5—493 **10 Claims**



1. A box spring wrap and dust ruffle systems adapted to be used with any one of a plurality of box spring sizes, each of the plurality of box spring sizes having a height and a perimeter, wherein at least the perimeter of the plurality of box spring sizes differ from one another comprising:

- a box spring wrap comprising a generally rectangular strip of material having a width that is wider than the height of each of the plurality of box spring sizes, and having a length that is longer than the length of two sides and a foot of a first one of the plurality of box spring sizes, and no longer than the perimeter of a second one of the plurality of box spring sizes, the second one of the plurality of box spring sizes being smaller than the first one of the plurality of box spring sizes; and
- a dust ruffle comprising:
  - a strip of decorative material, having a length corresponding to the length of two sides and a foot of one_of the plurality of box spring sizes; and
  - attaching means, located along an edge of the strip of decorative material, for attaching the dust ruffle to the box spring wrap at any location of the wrap.

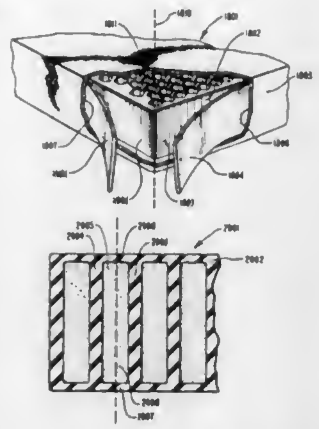
5,749,111
GELATINOUS CUSHIONS WITH BUCKLING COLUMNS

Tony M. Pearce, Alpine, Utah, assignor to TekSource, LC, Draper, Utah

Filed Feb. 14, 1996, Ser. No. 601,374

Int. Cl.⁶ A47C *27/00;27/14*

U.S. Cl. 5—652 **120 Claims**



1. A yieldable cushioning element that includes a flexible, resilient, gel cushioning media having shape memory and being substantially solid and non-flowable at temperatures below 130 degrees Fahrenheit, the cushioning element comprising:

- a quantity of gel cushioning media formed to have a top, a bottom, and an outer periphery, the cushioning media being compressible so that it will deform under the compressive force of a cushioned object, and
- a plurality of hollow columns situated in said cushioning media, each of said columns having a longitudinal axis along its length, each of said columns having a column wall which defines a column interior, and each of said columns having a column top and a column bottom;
- wherein the cushioning element is adapted to have a cushioned object placed in contact with said cushioning element top; wherein the column top and the column bottom of one of said columns are located at two different points on said longitudinal axis of said column;
- wherein said column's longitudinal axis is located generally parallel to the direction of a compressive force exerted on the cushioning element by a cushioned object in contact with said column top;
- wherein at least one of said column walls is capable of buckling beneath a protuberance that is located on a cushioned object; and
- wherein the cushioning element is yieldable as a result of compressibility of said cushioning media and bucklability of said column.

5,749,112
INVALID BED GUARD SHEET

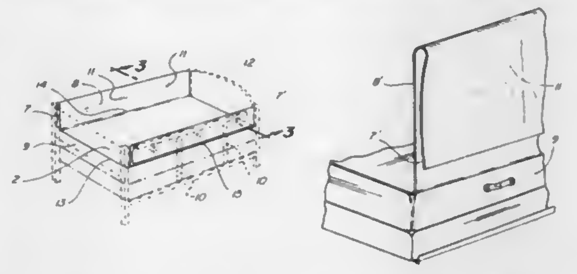
Donald L. Metzler, 1003 Frontage Rd., Collinsville, Ill. 62234

Filed Sep. 30, 1996, Ser. No. 720,415

Int. Cl.⁶ A47G *9/02;* A47C *21/08*

U.S. Cl. 5—663 **5 Claims**

1. A sheet for an invalid bed, said bed having an upper mattress with a head, foot and left and right edges, and left and right raisable metal guard rails, comprising:



(a) a continuous bed sheet having a central section that covers the entire upper surface of said mattress and left and right attachable guardrail pad sections;

(b) wherein each guardrail pad section is integral with and attached along the full length of said left and right mattress edges, respectively and wherein each pad section has an inner and outer portion such that each pad section may be placed over and fastened to a raised metal guardrail by fastening said inner and outer portions together with fastening means, providing padding for the inside and outside of said metal rail.

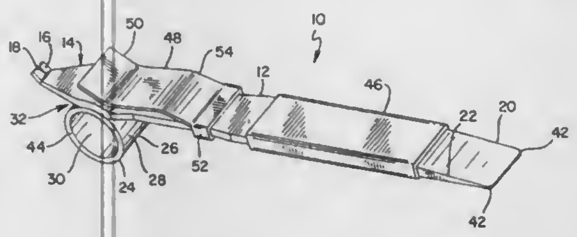
5,749,113
DRYWALL TOOL

Lowell F. Witter, 450 S. Belmont, Elgin, Ill. 60123

Filed Feb. 20, 1996, Ser. No. 603,402

Int. Cl.⁶ B66F *15/00*

U.S. Cl. 7—166 **21 Claims**



1. A drywall nail removal apparatus, said apparatus comprising:

a) a shaft portion having a first end and a second end;

b) a radius portion extending from said shaft portion, wherein:

- i) the radius portion has a contact surface that is rounded, the contact surface having a first width;
- ii) the radius portion comprises a cylinder having at least one height and a diameter; and
- iii) the one height of the cylinder comprises the first width, and the diameter comprises a distance the radius portion extends from said shaft portion;

c) a narrowing portion having a narrowing portion first end attached to the shaft portion first end and a second end having a second width narrower than the first width, the narrowing portion and the shaft portion, in combination, being substantially flat;

d) a prong placed at an obtuse angle to the narrowing portion on the narrowing portion second end, the prong having a third width narrower than the first width; and

e) the radius portion and the narrowing portion forming a gap area between the prong and the radius portion,

wherein said prong lies in a plane, said plane extending substantially tangential to the radius portion.

5,749,114
POULTRY HOUSE CLEANER APPARATUS

A. Glenn Miller, Jr., and Martha C. Miller, both of 1041 Hwy 84 West, Thomasville, Ga. 31792

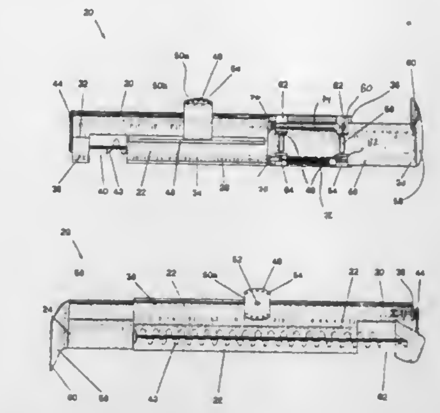
Filed Jul. 12, 1996, Ser. No. 678,830

Int. Cl.⁶ A01K *31/04*

U.S. Cl. 15—93.1 **17 Claims**

1. A cleaner device adapted to be removably secured to a conventional tractor and for use with a conventional chicken house for removing debris from a wall of the conventional chicken house, said cleaner device comprising:

- an attachment means for enabling attachment to a conventional tractor;
- a blade having a first side and a second side;
  - said blade being secured to said attachment means;
- a sliding plate;
- a sliding means being secured to said blade and said sliding plate;
  - said sliding plate being slideably attached to said first side of said blade via said sliding means;
- a scraping means being located on said sliding plate;
- said scraping means scrapes and removes debris from a wall of a conventional chicken house; and
- a transportation means extends from said first side of said blade to said second side of said blade for enabling the debris to be transported from said sliding plate to said blade and to said second side for removal.



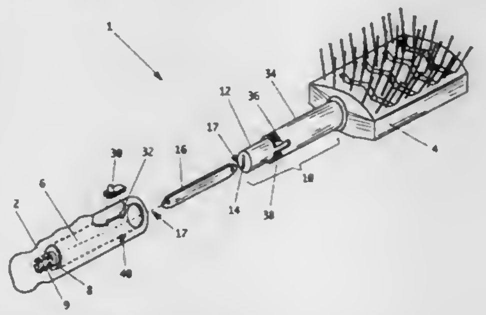
5,749,115
ROTATABLE HEAD HAIRBRUSH

John Franke, 1200 Garin Ave., Hayward, Calif. 94544-6820

Continuation-in-part of Ser. No. 239,505, May 9, 1994, Pat. No. 5,502,860. This application Oct. 27, 1995, Ser. No. 549,012

Int. Cl.⁶ A46B *3/70;7/02*

U.S. Cl. 15—160 **5 Claims**



1. A Rotatable Head Hairbrush comprising:

- a brush head having bristles and a connection end;
- an elongated handle forming a hollowed receiving cavity and having an outer surface, an inner surface, and an inner base;
- a flexible blade spring having a first connection tip affixed to said connection end of said brush head and a second connection tip affixed to said inner base within said receiving cavity of said handle, said flexible blade spring for producing a rotational torque means providing increasing resistance to and commensurate with increasing rotation of said brush head with respect to said handle; and
- locking means for temporarily preventing rotation of said brush head relative to said handle.

5,749,116
TONGUE HYGIENE DEVICE

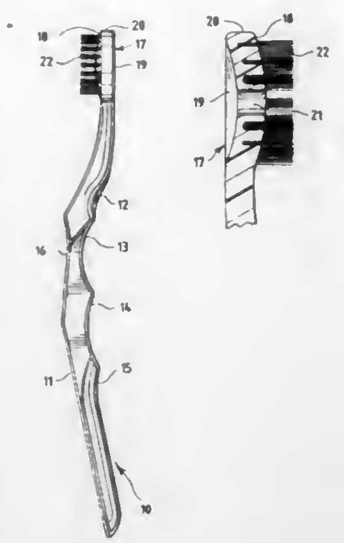
Steven M. Wieder, and Thomas A. Oechslin, both of Sarasota, Fla., assignors to Peak Enterprises, Inc., Sarasota, Fla.

Filed Jan. 13, 1997, Ser. No. 782,923

Int. Cl.⁶ A46B *9/02;9/06*

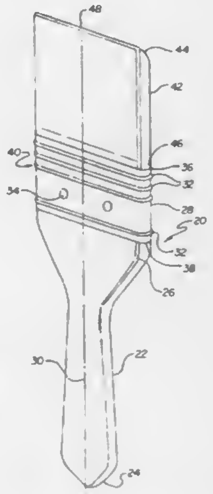
U.S. Cl. 15—160 **10 Claims**

1. A tongue hygiene device for use with a mildly abrasive cleansing medium, comprising:



- a generally elongate handle having a top surface, a bottom surface, and proximal and distal ends, said handle being ergonomically designed to provide finger notches for placement of a user's fingers on the top surface of said distal handle portion and wherein the bottom surface is substantially smooth except for a single thumb notch for placement of a user's thumb and;
- a generally disk-shaped cleansing head portion disposed at the proximal end of said handle portion structured to fit within a user's mouth, said cleansing head portion having a bottom face, a top face, a side edge and an aperture located centrally therethrough to permit passage of fluid and air; and
- a plurality of bristles protruding from the bottom face of said cleansing head portion in a generally perpendicular relation thereto.

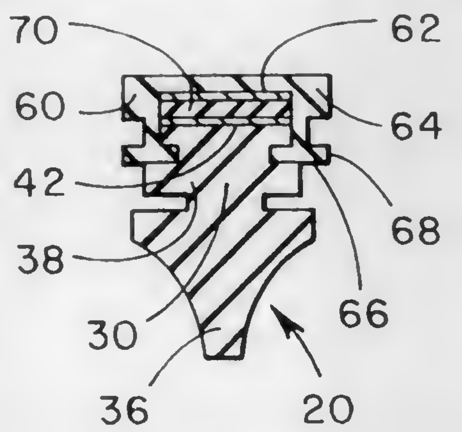
5,749,117
PAINT APPLICATOR HAVING AN IMPROVED WORKING TIP
Ladd B. Forsline, 201 S. Kemp St., Lyons, Pa. 19536
Filed Sep. 20, 1996, Ser. No. 717,090
Int. Cl.⁶ B05C *17/00*
U.S. Cl. 15—245.1 **16 Claims**



10. A device for application and manipulation of paint on a substrate, comprising:

- a handle having a distal end, a proximal end with a longitudinal axis defined therebetween, the distal end including structure defining a cavity therein; and
- a working tip inserted into the cavity and attached to the distal end of the handle, the working tip being a flexible, non-porous material which varies in durometer from a proximal end of the working tip to a distal end of the working tip.

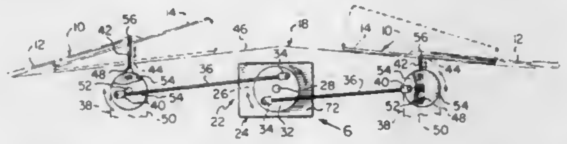
5,749,118
HEATED WIPER BLADE
Dewey T. Holland, 2275 Hamptons Crossing, Alpharetta, Ga. 30005
Filed Feb. 5, 1993, Ser. No. 14,320
Int. Cl.⁶ B60S *1/04;1/38*
U.S. Cl. 15—250.07 **7 Claims**



1. A wiper blade assembly capable of being heated and operating at a substantially constant temperature, said blade assembly comprising:

- an elongated wiper blade consisting of a one-piece structure and an attachment member connected thereto; and
- an elongated heating element in physical contact with said blade and said attachment member, and extending substantially parallel to said blade along the length of said blade, said heating element consisting of (a) a pair of spaced apart, elongated conductive members extending parallel to and substantially the length of said blade and (b) a material with a positive temperature coefficient of resistance disposed between and in electrical contact with said conductive members along the length of said blade;
- wherein said attachment member is positioned over an upper surface of said blade and captures said heating element between itself and said blade.

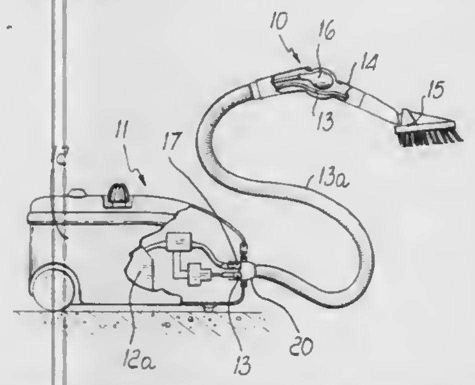
5,749,119
WINDSHIELD WIPER BLADE DEICER
Amos Isaac, 139-34 231st St., Laurelton, N.Y. 11413
Filed Apr. 16, 1997, Ser. No. 843,575
Int. Cl.⁶ B60S *1/04;1/32*
U.S. Cl. 15—250.19 **9 Claims**



1. A windshield wiper blade deicer comprising means for lifting and lowering two spring biased wiper arms of a pair of windshield wipers repeatedly with respect to a windshield of a motor vehicle, so that snow, ice and slush will be loosened and knocked off two windshield wiper blades and the windshield of the motor vehicle to increase visibility for a driver of the motor vehicle, wherein said lifting and lowering means includes:

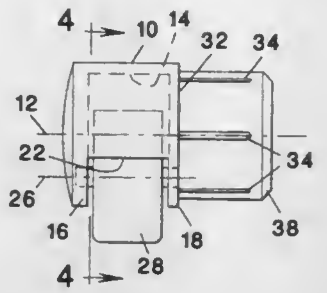
- a) an electric oscillating motor having a shaft, said electric oscillating motor affixed onto a dashboard adjacent an interior of the windshield between the windshield wipers on an exterior of the windshield of the motor vehicle;
- b) a disc secured onto said shaft of said electric oscillating motor;
- c) a first pair of pivot connectors, in which each said pivot connector is mounted oppositely onto said disc;
- d) a pair of elongated bars, in which each said elongated bar is attached at a first end to one said pivot connector, so that said elongated bars will extend in opposite directions away from said electric oscillating motor;
- e) a pair of oscillator brackets, each said oscillator bracket attached onto the dashboard adjacent the interior of the windshield behind one windshield wiper on the exterior of the windshield of the motor vehicle;
- f) a second pair of pivot connectors, in which each said pivot connector of said second pair is attached to a second end of one said elongated bar and one said oscillator bracket, respectively;
- g) a pair of push rods, each said push rod extending through an aperture in a lower portion of a frame of the windshield to make contact with one spring biased wiper arm of one windshield wiper; and
- h) a third pair of pivot connectors, in which each said pivot connector of said third pair is attached to an inner end of one said push rod and one said oscillator bracket, respectively, so that when said electric oscillating motor is turned on said elongated bars will oscillate said oscillator bracket to move said push rods in and out through the apertures in the lower portion of the frame of the windshield, to lift and lower the spring biased wiper arms of the windshield wipers.

5,749,120
CONTROL DEVICE, PARTICULARLY FOR STEAM-GENERATING APPLIANCES FOR HOUSEHOLD AND/OR INDUSTRIAL CLEANING
Luigi Amoretti, Romano d'Ezzelino, Italy, assignor to T.P.A. Impex S.p.A., Romano d'Ezzelino, Italy
Filed Jun. 3, 1996, Ser. No. 657,244
Claims priority, application Italy, Jun. 5, 1995, PD95A0112
Int. Cl.⁶ A47L *9/00*
U.S. Cl. 15—339 **11 Claims**



1. Control device, particularly for steam-generating appliances used in the field of household and/or industrial cleaning, comprising at least one component having a variable internal volume that is accommodated in the handle of the fixture of the steam-generating appliance, said component being filled with an electrically nonconducting fluid, said at least one component having a variable internal volume being connected, by means of an actuation tube, to a pressure transducer that is accommodated inside the body of said steam-generating appliance and is coupled to a steam delivery control means, wherein said pressure transducer comprises a pressure switch that converts a fluidic pressure variation signal into an electrical signal, and wherein said pressure switch comprises a membrane provided with an electric bridge that is normally adjacent to, but not in contact with, electrical contacts, said membrane, subjected to a low-pressure pulse, being arranged for closing a circuit between said electrical contacts.

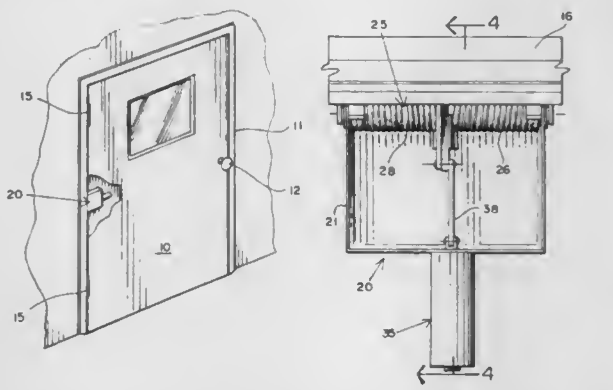
5,749,121
WHEEL AND HOUSING FOR TABLE LEG
William A. Loescher, Redding, Conn., assignor to Howe Furniture Corporation, Trumbull, Conn.
Filed Mar. 13, 1997, Ser. No. 816,252
Int. Cl.⁶ A47B *91/00;* B60B *33/00*
U.S. Cl. 16—43 **6 Claims**



1. A wheel and housing mountable onto the tubular end of the horizontal portion of an inverted T-shaped table leg which comprises:

- a substantially right circular cylindrical housing having a central longitudinal axis and defining a recess therein extending through a side of said housing as an opening subtending an arc less than 180° about said longitudinal axis;
- an axle pin extending through said housing parallel to said longitudinal axis and spaced therefrom a distance less than the radius of said housing and substantially centrally of said opening;
- a wheel rotatably mounted on said axle pin within said housing and extending through said opening; and
- a substantially right circular cylindrical plug extending from, and coaxial with, said housing, said plug being insertable into said said tubular end.

5,749,122
INTERIOR DOOR CLOSER AND METHOD
Walter B. Herbst, 1875 N. Pond La., Lake Forest, Ill. 60045
Continuation-in-part of Ser. No. 480,693, Jun. 7, 1995, Pat. No. 5,634,508. This application Jan. 4, 1996, Ser. No. 582,920
Int. Cl.⁶ E05F *1/08;3/02*
U.S. Cl. 16—70 **12 Claims**



1. For use in a door having a hollow interior closer receiving portion, said door having two lateral edges, one such lateral edge having a latch assembly and the other lateral edge having a hinge assembly securing the same to a door frame, which frame includes a jamb, a door closer comprising, in combination,

- a torsion spring assembly, said assembly having one or more torsion springs and,
- a torsion spring shaft secured to said one or more torsion springs for the rotation of said shaft,
- said shaft having a crank which is secured to the torsion spring shaft which shaft is rotationally mounted about its axis,

- a door link and dampener link extending in opposite directions from and secured to the crank,
- the door link being secured to a door link mount secured on the door jamb, and the dampener link being secured to a dampener assembly,

whereby the door closer including the dampener assembly may be mounted interiorly of a door adjacent the hinge edge for closing the door and dampening the closing of the door by retarding the torsion spring means with a pre-determined offsetting effort by the dampener assembly.

5,749,123
SAFETY DEVICE

Andrew Warren, 86 Derwent Road, Palmers Cross, Tettenhall West Midlands WV6 9ET, England, and Desmond Corbett, Sunnyside, Station Road, Haughton, Stafford, England, ST18 9HJ

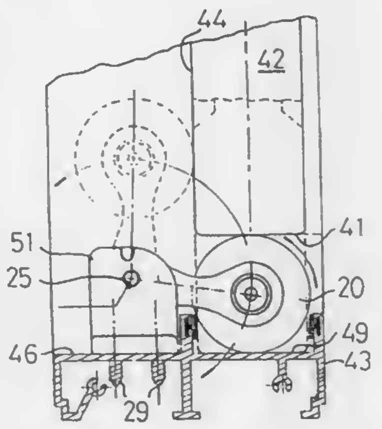
PCT No. PCT/GB94/01238, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO94/29556, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 8, 1994, Ser. No. 557,014

Claims priority, application United Kingdom, Jun. 10, 1993, 9311982; Mar. 17, 1994, 9405239

Int. Cl.⁶ E05F *5/04*

U.S. Cl. 16—83 **8 Claims**



1. A safety device which includes an abutment means, carrier means carrying said abutment means, a rigid mounting arm mounting said carrier means, pivot means carrying said mounting arm, said pivot means being substantially parallel to said carrier means, rigid support means supporting said pivot means, resilient bias means urging said mounting arm towards an abutment condition, said resilient bias means being separate from but connected between said rigid mounting arm and said rigid support means, said abutment means being movable manually in one direction to an inoperative position against said resilient bias, retaining means to hold said abutment means in said inoperative position, said retaining means being releasable to permit said rigid mounting arm and said abutment means carried by said mounting arm to be moved in the direction opposed to said one direction by the resilient bias, said support means including a pair of walls, said walls locating said mounting arm therebetween, and wherein said mounting arm includes a pair of planar arm sections, said planar arm sections mounting said carrier means therebetween, and wherein one of said walls defines a recess, a peg within said recess, said peg acting as a retaining member for said mount arm against said resilient bias means.

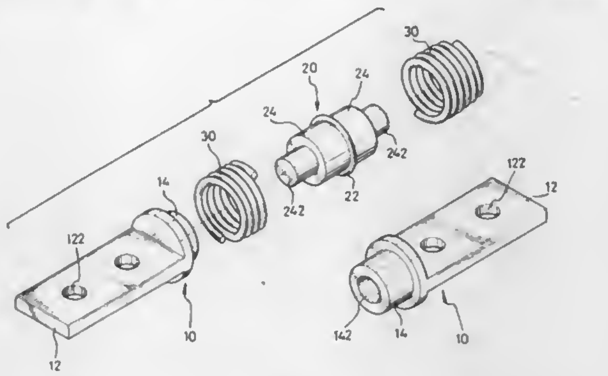
5,749,124
HINGE FOR NOTEBOOK COMPUTER

Sheng-nan Lu, No. 174, Chunying St., Shulin Chen, Taipei Hsien, Taiwan

Filed Dec. 20, 1996, Ser. No. 770,242

Int. Cl.⁶ E05F *1/08;* **E05C** *17/64*

U.S. Cl. 16—307 **8 Claims**



1. A hinge for a notebook computer, comprising:

- a pair of hinge members each having a cylindrical end and a fixing portion, said fixing portion having apertures defined therein;
- an intermediate member disposed between and pivotally connected to said pair of hinge members, said intermediate member having opposite cylindrical ends respectively aligned with and adjacent to said cylindrical ends of said pair of hinge members; and
- a pair of helical springs with leads extending in directions opposite to each other, each of said pair of helical springs retained around to grip, and thereby form a retaining force on respective corresponding adjacent ends of said intermediate member and said pair of hinge members, each of said pair of helical springs having a different magnitude of retaining force;
- whereby said hinge provides a damping torque which is smaller in a given rotational direction and larger in the opposite direction due to said differing retaining forces.

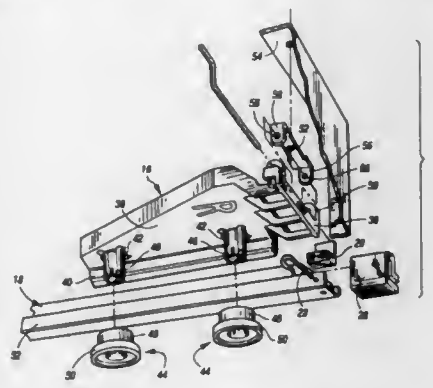
5,749,125
HINGE BRACKET FOR A CABINET DOOR

Keith L. Davis, Wapello, and Kirk A. Petersen, Muscatine, both of Iowa, assignors to Hon Industries Inc., Muscatine, Iowa

Filed Jul. 24, 1996, Ser. No. 685,717

Int. Cl.⁶ E05D *5/00*

U.S. Cl. 16—382 **10 Claims**



1. A hinge bracket assembly for a cabinet door comprising:

- a bracket body having top and bottom sides and a lengthwise edge;
- a flange portion extending at right angles to said bottom side and disposed along said edge;

- a pair of spaced rollers along said edge closely spaced from said flange portion defining slots between said rollers and said flange portion;
- hinge means configured along a forward edge of said body for attachment to a cabinet door;
- wherein said bracket flange portion is insertable into and is slidable lengthwise of a generally elongate channel member, said channel member having an upstanding flange portion receivable in said slots such that said rollers can bear on said channel flange portion and serve to inhibit rotational movement of said bracket body relative to said channel as said body is guided lengthwise of said channel.

5,749,126
DEVICE FOR GUIDING AND COUPLING THE SLIDING FLAT WITH THE DRIVE BELT IN A FLAT CARD

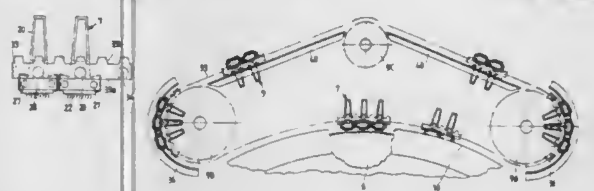
Silvano Patelli; Antonio Cossandi, and Giovanni Battista Pasini, all of Palazzolo Sull'oglio, Italy, assignors to F.LLI Marzoli & C. S.p.A., Bergamo, Italy

Filed Mar. 3, 1997, Ser. No. 810,371

Claims priority, application Italy, Mar. 4, 1996, M196A0414

Int. Cl.⁶ D01G *15/08*

U.S. Cl. 19—102 **16 Claims**



◆ 1. A flat carding machine comprising a pair of toothed drive belts (23, 33) in laterally aligned spaced relationship spanned by flats (7) and including upper and lower drive belt flights, each flat (7) including a pair of pins (27, 27) projecting from opposite ends of each flat, said pairs of pins (27, 27) being adapted to support said flat upon laterally spaced guides (10, 10), means (26, 27', 34, 28, 28', 41, 46) for articulately coupling each flat end to an associated drive belt in the absence of fixed retention means, said coupling means including coupling cavities (26, 26', 34) of a substantially cylindrical configuration formed in said drive belts and coupling pins (28, 28', 41, 46) of circular cross-sectional configuration projecting from opposite ends of each flat, and said coupling pins (28, 28', 41, 46) being freely rotatably received in and confined by said coupling cavities (26, 26', 34).

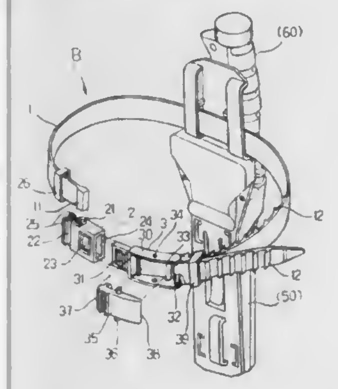
5,749,127
EASILY ADJUSTABLE FASTENING BELT FOR HOLDING A DIVE KNIFE

Hsing-Chi Hsieh, 1 Fl., No. 22, Lane 125, Jen Ai St., Sanchung City, Taipei Hsien, Taiwan

Filed Jun. 4, 1997, Ser. No. 869,123

Int. Cl.⁶ A44B *11/00*

U.S. Cl. 24—3.13 **1 Claim**



1. An easily adjustable fastening belt for holding a dive knife, comprising a belt holding a sheath of dive knife, a male fastening means attached to a first end of said belt, and a female fastening means associated with a second end of said belt;

- said first end of said belt being formed with a belt head, and a length of said belt near said second end thereof being provided at an inner surface with a plurality of parallel teeth transversing a width of said belt;
- said male fastening means being formed at one end with a first hole to fitly receive said belt head therein, at an outer side wall surface with a second hole, and at another end opposite to said first hole with a third hole which is communicable with said second hole; two legs with stopping flanges formed at outer ends extending from one side of said first hole facing said belt head to form a clamping means, a first loop being located between said stopping flanges and said first hole to encircle said clamping means, firmly associating said male fastening means with said belt head at said first end of said belt; and
- said female fastening means including a frame body, an inclined spring plate extending from an end of said frame body facing said male fastening means for sliding into said third hole of said male fastening means and being retained thereto by engaging into said second hole of said male fastening means, a round bar extending across another end of said frame body opposite to said inclined spring plate, such that said second end of said belt can be extended to pass through and turn about at said round bar and be secured to said belt again by a second loop, a leaf spring provided near a body-facing side of said frame body, and a cover plate pivotally connected to a front or outer side of said frame body opposite to said leaf spring; wherein one end of said leaf spring being normally pressing against a force-applying end of said cover plate near said inclined spring plate, so that another resistance end of said cover plate near said round bar always presses against a portion of said belt turning about at said round bar and closes the front side of said frame body;
- whereby when said cover plate of said female fastening means presses said resistance end against said belt turning about at said round bar, said toothed second end of said belt can be pulled forward only in one direction to pass through said resitance end of said cover plate without the possibility of being pulled backward and thereby the fastening belt for holding the dive knife can be tightened around a wearer's leg, and when said force-applying end of said cover plate is depressed, said resistance end of said cover plate immediately becomes disengaged from said belt turned about at said round bar, allowing said toothed second end of said belt to be quickly pulled backward to adjust its tightness against the wearer's leg.

5,749,128
EXTENSIBLE CLASP FOR A BRACELET

Cyril Cuche, Bienne, Switzerland, assignor to SMH Management Services AG, Biel, Switzerland

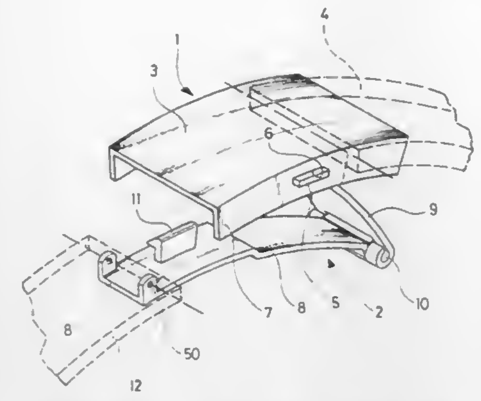
Filed Feb. 26, 1997, Ser. No. 806,641

Claims priority, application France, Mar. 8, 1996, 96 02975

Int. Cl.⁶ A44C *5/00*

U.S. Cl. 24—71 J **6 Claims**

1. An extensible clasp for a bracelet, in particular for a watch bracelet of an unfolding buckle type, including a first assembly comprising a cap to which is secured a first bracelet strand and a push-piece permitting opening of the clasp and an adjustment of a length of the clasp, said push-piece emerging from an opening formed in a side of the cap, and a second assembly on which the first assembly is adapted to slide in a longitudinal direction of the bracelet, such second assembly comprising first and second blades foldable back on one another and attached together at their first



ends by an articulation, the first blade having a hook while its second end has a means for attaching to a second bracelet strand, the second blade being attached by an articulation at its second end to an arrangement which the hook can grasp so as to block the clasp, and on which the push-piece acts in order to open the clasp by allowing the first and second blades to be folded away from one another, said arrangement and said push-piece being respectively provided with indexing means and positioning means which release from and interengage with one another for permitting adjustment in length of the clasp and for retaining in memory such adjustment when said clasp is opened.

5,749,129

MOLDED SURFACE FASTENER, AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

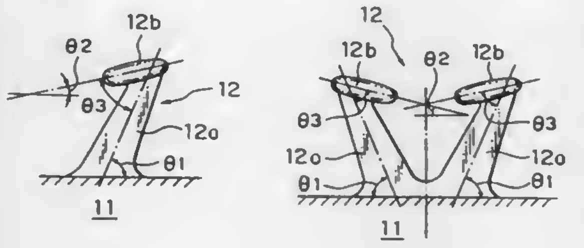
Ryuichi Murasaki; Toshiaki Takizawa; Mitsuru Akeno; Keisuke Sakakibara, and Tsuyoshi Minato, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Nov. 5, 1996, Ser. No. 743,663

Claims priority, application Japan, Nov. 6, 1995, 7-287583

Int. Cl.^{6} A44B *18/00*

U.S. Cl. 24—452 **5 Claims**



1. A surface fastener molded of synthetic resin, comprising:
a substrate sheet; and
a multiplicity of engaging elements standing on a front surface of said substrate sheet;
wherein each of said engaging elements is composed of a stem rising from said substrate sheet and inclined at a predetermined angle (θ1) with respect to said front surface, and an engaging head one end of which is integrally supported on an upper end of said stem and the other end of which extends in a direction opposite to the direction of inclination of said stem in such a manner that an extension line in a direction of extension of said engaging head crosses said front surface of the substrate sheet at a predetermined acute angle (θ2).

5,749,130

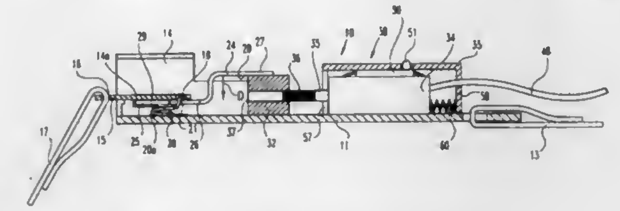
CHILD-PROOF SEAT BELT BUCKLE ASSEMBLY

Paul D. Bilyeu, 1212 Sherwood Dr., Danville, Ind. 46122; Felicia M. Hinant, 530 W. 44th St., Indianapolis, Ind. 46208; James H. Hobby, 19040 Fairfield Blvd., Noblesville, Ind. 46060, and Donel A. Hoffman, 2448 Fox Harbour South Dr., Indianapolis, Ind. 46227

Filed Dec. 4, 1996, Ser. No. 760,189

Int. Cl.^{6} A44B *11/16*

U.S. Cl. 24—637 **19 Claims**



1. A locking seat belt buckle assembly, comprising:
a tongue;
a latch;
locking means between said tongue and said latch to lock said tongue to said latch;
latch release means for releasing said locking means to permit disengagement of said tongue from said latch, said latch release means including a release plate pivotably mounted to said chassis to be depressed from outside the seat belt buckle assembly to release said locking means;
stop means operable on said latch release means to prevent operation of said latch release means; and
a chassis for supporting said latch, said locking means, said latch release means and said stop means,
wherein said stop means includes a stop block slidably disposed between said chassis and said release plate to move between a first position in which said stop block prevents depression of said release plate and a second position in which said stop block does not prevent depression of said release plate.

5,749,131

TRANSPORT DEVICE FOR A CONTINUOUS MOVING SHEET, IN PARTICULAR STRETCHING DEVICE FOR A PLASTIC FILM WEBS

Jürgen Breil, Grabenstätt, and Manfred Steffl, Grassau, both of Germany, assignors to Bruckner Maschinenbau GmbH, Siegsdorf, Germany

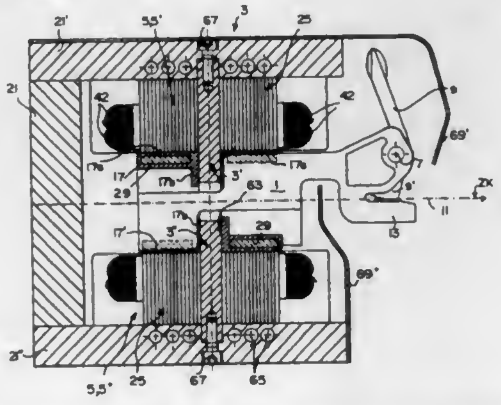
PCT No. PCT/EP96/01113, § 371 Date Nov. 20, 1996, § 102(e) Date Nov. 20, 1996, PCT Pub. No. WO96/29190, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 14, 1996, Ser. No. 737,827

Claims priority, application Germany, Mar. 21, 1995, 195 10 281.9

Int. Cl.^{6} D06C *3/04*

U.S. Cl. 26—89 **16 Claims**



1. A transport device for a moving material web comprising:
a guide rail system having a first guide rail;

a tenter element for clamping and retaining the moving material web and supported by said first guide rail;
a linear motor drive including a first linear motor;
said first guide rail being integrally incorporated in said first linear motor; and
a sliding bearing carried by said guide rail system between said tenter element and said first guide rail for enabling sliding movement of said tenter along said guide rail.

5,749,132

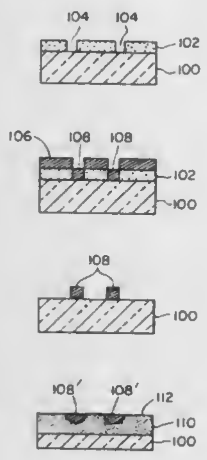
METHOD OF FABRICATION AN OPTICAL WAVEGUIDE

Amaresh Mahapatra, and S. Anantba Narayanan, both of Lowell, Mass., assignors to Ramar Corporation, Northboro, Mass.

Continuation-in-part of Ser. No. 521,608, Aug. 30, 1995. This application Feb. 16, 1996, Ser. No. 602,698

Int. Cl.^{6} H01L *41/08;* G02B *6/10*

U.S. Cl. 29—25.35 **13 Claims**



1. A method of fabricating an optical waveguide in a lithium niobate crystalline material comprising the steps of:
forming a layer of titanium on a surface of the lithium niobate crystalline material;
diffusing the titanium into the crystalline material by heating the crystalline material to a diffusion temperature for a time between about 8 hours and about 18 hours to form a titanium diffusion region having a titanium diffusion depth;
outdiffusing lithium oxide from the crystalline material to produce an outdiffused region in the crystalline material having a depth greater than the titanium diffusion depth.

5,749,133

METHOD AND APPARATUS FOR FORMING STRINGS OF POCKETED SPRINGS

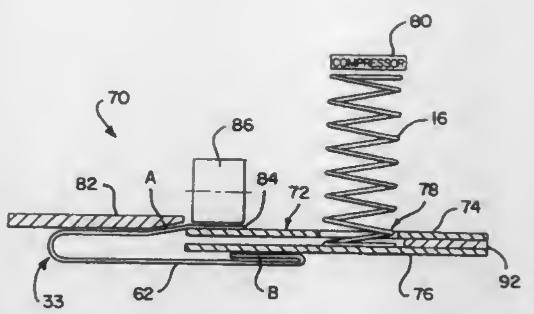
Michael W. Mauldin, Hiram, and Bernhard W. Kucbel, Stone Mountain, both of Ga., assignors to Simmons Company, Atlanta, Ga.

Filed Sep. 10, 1996, Ser. No. 711,484

Int. Cl.^{6} B68G *7/00*

U.S. Cl. 29—91.1 **23 Claims**

17. A method of forming a string of coil springs wherein each of the coil springs is enclosed within an individual fabric pocket having flat overlapping side seams, the method comprising the steps of:
folding an elongated web of fabric a first time to create a longitudinally extending first flap;
folding said web of fabric a second time to create a second longitudinally extending flap which underlies said first flap laterally, thereby defining a fabric tube having a flap side and a back side with said first flap on said flap side laterally overlapping said second flap on said flap side;



conveying said fabric tube longitudinally across a spring inserter in a manner such that said spring inserter separates said overlapping flaps thereby forming a laterally extending opening in said tube;
inserting a compressed coil spring into the opening in said tube;
conveying said fabric tube to an anvil and thereby closing the opening in said tube with said first flap laterally overlapping said second flap; and
interconnecting said laterally overlapping first and second flaps to form a lap seal therebetween.

5,749,134

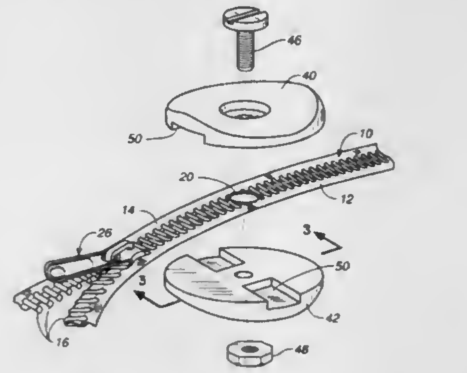
SLIDE FASTENER REPAIR SYSTEM

Martin S. Zemitis, 436 Citadel Dr., Davis, Calif. 95616

Filed Jul. 18, 1996, Ser. No. 683,084

Int. Cl.^{6} B23P *6/00*

U.S. Cl. 29—402.08 **7 Claims**



1. A method of repairing a slide fastener, said slide fastener including a pair of elongated slide fastener strips each slide fastener strip having a row of fastener elements having a pair of spaced row ends connected thereto and a slider slidably positionable on said rows of fastener elements for selectively securing said rows of fastener elements, said method comprising the steps of:
forming an opening in said slide fastener at a location adjacent to said slider to create a gap in at least one of said rows of fastener elements;
sliding said slider along at least one of said rows of fastener elements to said opening;
separating said slider from the remainder of said slider fastener by disengaging said slider from fastener elements adjoining said gap and passing at least a portion of said slider through said opening;
positioning a replacement slider at said opening;
passing at least a portion of said replacement slider through said opening;
engaging said replacement slider with fastener elements adjoining said gap;

sliding said replacement slider along at least one of said rows of fastener elements in a direction away from said opening; and

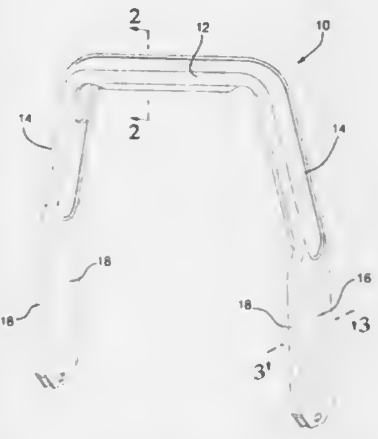
while said replacement slider is spaced from said opening and slidably engaged with at least one row of fastener elements, attaching a slider stop to said slide fastener at a location thereon which will result in engagement between said slider stop and said replacement slider when said replacement slider is slid along at least one row of fastener elements toward said opening, said slider stop upon engagement therewith by said replacement slider preventing movement of said replacement slider toward said opening and further preventing disengagement of the replacement slider from the associated at least one row of fastener elements.

5,749,135
METHOD FOR EXTRUDING INTEGRAL SEAT BACK FRAME

Robert Scott Crane, Waterford; David Philip Kolena, Bloomfield Hills, and Alan Dean Berg, North Washington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1997, Ser. No. 820,598
Int. Cl.^{6} B23P *17/00*

U.S. Cl. 29—415 **3 Claims**



1. A method for producing a generally U shaped seat back frame from a single extruded blank, comprising the steps of,

extruding a straight blank with a substantially circular cross section comprised of a pair of arcs which have equal length, parallel cords separated by a pair of integral, parallel flat crests having a constant width and a separation equal to the cords of said arcs,

cutting said straight blank to a desired end to end length,

providing a solid mandrel of generally rectangular cross section with flat side surfaces substantially equal in width to said arc cords and parallel, flat edges substantially equal in thickness to the width of said crests,

inserting said mandrel partially into each end of said straight blank with said edges engaged with said crests,

flattening the arcs of said straight blank inwardly against said solid mandrel's side surfaces, thereby creating rectangular cross section lower legs at each end of said blank having a pair of flattened side walls partly supported by said mandrel side surfaces, but having a total width greater than the width of said mandrel side surfaces, and simultaneously creating a pair of flat, shorter walls having a width substantially equal to the thickness of said mandrel edges, but totally unsupported by said mandrel edges, and

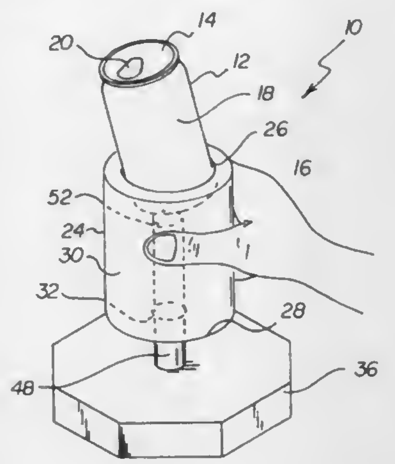
bending said flattened ends into the desired final U shape, thereby creating a unitary seat back frame leaving an upper beam and adjacent side beams with the same substantially circular cross section as said blank, so as to efficiently resist twisting forces, but with rectangular cross section lower legs suitable for attachment to other seat frame components.

5,749,136
INSULATING SLEEVE REMOVING DEVICE

Glen Bodiford, 6641 Viking Way, Theodore, Ala. 36582

Filed Oct. 15, 1996, Ser. No. 730,132
Int. Cl.^{6} B23P *19/02*

U.S. Cl. 29—426.5 **2 Claims**



1. An insulating sleeve removing device for removing an insulating sleeve from a cylindrical beverage can comprising, in combination:

an aluminum can having an upper end, a lower end and a cylindrical side wall therebetween, the upper end having a drinking aperture formed therethrough, the aluminum can adapted to hold a liquid beverage therein;

a cylindrical insulating sleeve having an open upper end, a closed lower end and a cylindrical side wall therebetween, the open upper end dimensioned to receive the aluminum can therein, the closed lower end having a venting aperture therethrough, the venting aperture being of a reduced diameter as compared to the open upper end of the insulating sleeve;

a base member with a width of about 5 and ¾ inches and a length of about 5 and ¾ inches having an octagonal configuration, the base member having a planar upper surface and a planar lower surface, a side wall of the base member having indicia thereon; and

a shaft member having a cylindrical configuration, the shaft member having a lower end secured to a center of the planar upper surface of the base member in an orthogonal relationship, the shaft member having a diameter equal to the diameter of the venting aperture of the cylindrical insulating sleeve, the shaft member having a length equal to a height of the aluminum can, an upper end of the shaft member being receivable within the venting aperture for dislodging the aluminum can from within the cylindrical insulating sleeve when positioned therein;

wherein the insulating sleeve removing device is constructed from wood;

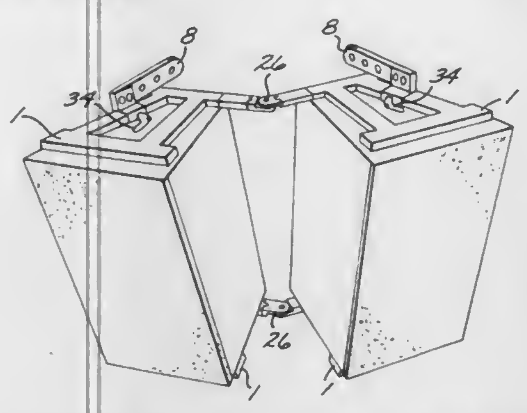
whereby the a user may place the base member on a flat recipient surface and grasp the aluminum can with the sleeve attached thereto and place the shaft member of the device through the bottom venting aperture of the insulating sleeve and pull the insulating sleeve downwardly thereby pressing the shaft member against the lower end of the aluminum can thus removing the insulating sleeve from the aluminum can.

5,749,137
MODULAR LOUDSPEAKER ENCLOSURE SUSPENSION RIGGING METHOD

Andrew Terry Martin, ATM Group Attn: Andrew Martin 20960 Brant Ave., Carson, Calif. 90810-1040

Division of Ser. No. 243,718, May 17, 1994. This application Mar. 18, 1996, Ser. No. 613,029
Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—434 **12 Claims**



1. A method of adjustably connecting a pair of adjacent loudspeakers in an array of loudspeakers to universally adjust said adjacent loudspeakers to selected positions and orientations, said method including the steps of:

selecting a pair of frame members including coupling elements;

mounting said pair of frame members to said pair of loudspeakers;

selecting a connector having a pair of elongated oppositely disposed connecting arms with articulated proximal ends pivotally engaged about a centrally interposed first axis to form a first pivot joint and pivotally mounted to said connecting arms about respective second and third axes oriented substantially orthogonal to said first axis to form respective second and third pivot joints whereby said first, second and third pivot joints cooperate to form a universal joint; and

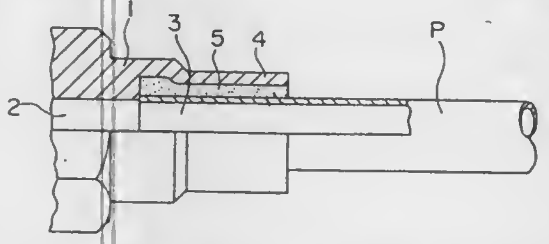
attaching said connector between said pair of loudspeakers by coupling the distal ends of said connecting arms to respective said coupling elements of respective said loudspeakers.

5,749,138
CONNECTING AND FIXING METHOD FOR METALLIC PIPES WITH SMALL DIAMETER

Masayoshi Usui, and Katsushi Umezawa, both of Numazu, Japan, assignors to Usui Kokusai Sangyo Kaisha Limited, Japan

Continuation of Ser. No. 276,555, Jul. 18, 1994, Pat. No. 5,492,376. This application Jul. 27, 1995, Ser. No. 507,818
Claims priority, application Japan, Jul. 20, 1993, 5-200378
Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—516 **8 Claims**



1. A connecting and fixing method for metallic pipes with small diameter, said method comprising the steps of:

providing a piping component having an axial core with a passage hole with a selected inside diameter extending axially therethrough, said piping component having a tube wall projecting from said axial core, said tube wall defining an expanded chamber communicating with said passage hole and defining an initial diameter greater than the inside diameter of said passage hole;

providing a pipe member having a connecting end and having a nominal outside diameter less than the diameter of said expanded chamber of said piping component and larger than said inside diameter of said passage hole;

providing a tubular annular sealing component formed from an elastic material and having an inside diameter selected for fitting said sealing component over said pipe member and an outside diameter selected for fitting said sealing component inside said expanded chamber;

forming at least one circumferential discontinuity in said pipe member in proximity to the end thereof such that said circumferential discontinuity defines an outside diameter different from said nominal outside diameter of said pipe member;

inserting said end of said pipe members including the circumferential discontinuity thereof, through said sealing component and into said expanded chamber of said tube wall until said end of said pipe member abuts said axial core; and

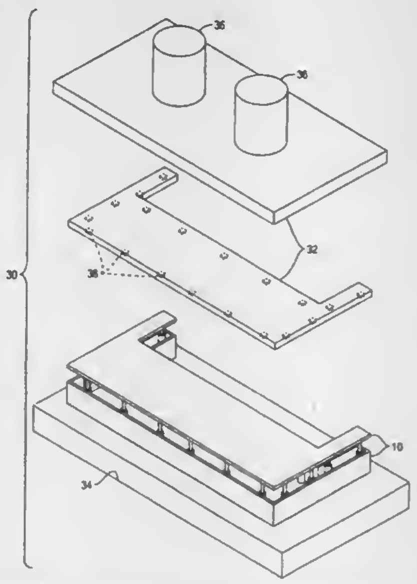
forming at least one diameter reducing area along a portion of said tube wall after inserting the end of said pipe member into said expanded chamber, the diameter reducing area being substantially registered with the circumferential discontinuity in the pipe member and maintaining said initial diameter along other portions of said tube wall so as to squeeze and tightly seal portions of said sealing component between said diameter reducing area and said circumferential discontinuity into connecting engagement with the circumferential discontinuity on the pipe member for holding said end of said pipe member in the expanded chamber of said piping component.

5,749,139
SYSTEM AND METHOD FOR ASSEMBLING A PART HAVING A BODY AND A COVER HAVING INTERFERENCE FIT RETAINING PINS AND BODY SHAFTS

James M. Seybold, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 28, 1996, Ser. No. 653,857
Int. Cl.^{6} B23P *19/02*

U.S. Cl. 29—525 **4 Claims**



1. A method of assembling a part, comprising:

providing a cover having a top side and a bottom side, said bottom side of said cover having a plurality of interference fit retaining pins;

providing a body having a plurality of body shafts, each of said body shafts for receiving a corresponding interference fit retaining pin of said plurality of interference fit retaining pins;

providing a substantially flat base plate under said body;
providing a substantially flat top plate having a top side and a bottom side, said bottom side of said top plate having a plurality of deflectable inserts mounted thereon, said top plate covering said plurality of interference fit retaining pins;
applying a force to said top side of said top plate, said force being concentrated through said plurality of deflectable inserts, said force fully inserting said plurality of interference fit retaining pins into said plurality of body shafts, wherein said plurality of deflectable inserts compensate for dimensional variations by deforming after a corresponding interference fit retaining pin of said plurality of interference fit retaining pins is fully inserted into a corresponding body shaft of said plurality of body shafts; and
removing said force being concentrated through said plurality of deflectable inserts from said top side of said top plate when said force has fully inserted said plurality of interference fit retaining pins into said plurality of body shafts.

5,749,140

BALLISTIC RESISTANT METAL ARMOR PLATE

Anthony J. Polito, Amity; Ronald E. Bailey; William W. Timmons, both of Pittsburgh, and Robert H. Bell, Washington, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1995, Ser. No. 398,934
Int. Cl.⁶ F41H *5/04;* C22C *38/60*
U.S. Cl. 29—527.1 3 Claims

1. The method of producing steel armor plate with improved resistance to penetration by projectiles, the method comprising:
providing an alloy steel armor plate having inclusions oriented substantially parallel to the plate surface, the plate composition comprises, by weight percentage, 0.2–0.8 carbon, 2–4 nickel, 0.1–0.6 molybdenum, 0.3–1.2 chromium, less than 1 manganese, less than 0.5 silicon, the balance iron and residual impurities,
said inclusions resulting from at least one element of the steel composition, by weight percentage, selected from the group of sulfur and oxygen, wherein sulfur ranges from 0.015 to 0.150 and oxygen from 0.0025 to 0.1000,
the armor plate characterized by a higher V50 protection for a given plate thickness.

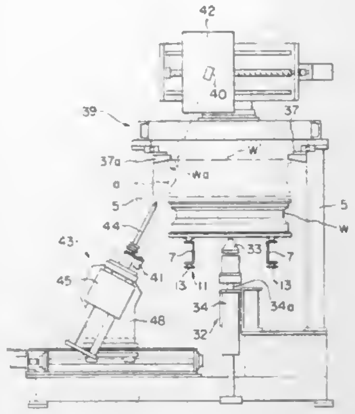
5,749,141

AUTOMATIC TIRE VALVE INSERTION APPARATUS FOR TUBELESS TIRE

Shinji Matsumoto, Kiryu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo-To, Japan

Filed Dec. 28, 1995, Ser. No. 580,329
Claims priority, application Japan, Jan. 6, 1995, 7-000880
Int. Cl.⁶ B23P *19/00*
U.S. Cl. 29—714 6 Claims

1. An automatic tire valve insertion apparatus for use in inserting a valve in a tubeless tire, comprising:



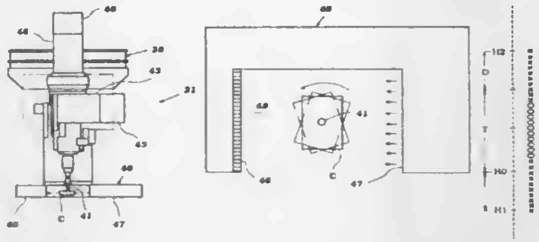
a wheel rotating device to mount and rotate a wheel and to adjust a position of a hole of the wheel to a predetermined attitude appropriate for inserting a tubeless tire valve into the hole;
a wheel size detecting device provided near the wheel to detect a wheel size thereof and to generate a wheel size signal;
a valve press-fitting device located at the wheel rotating device side to insert the tubeless tire valve into the hole;
a support device to mount the valve press-fitting device and to adjust the predetermined attitude in accordance with the wheel size signal;
a light emitting unit mounted on the wheel rotating device to emit light through the hole in a perpendicular direction against a circular path of the hole when the wheel is rotated on the wheel rotating device; and
a light receiving unit mounted on the valve press-fitting device to receive the light in an area with a predetermined width elongated in a radius direction of the wheel and to identify the wheel size, a position of the valve press-fitting device being correctly adjusted to straightforwardly insert the tubeless tire valve into the hole by aligning an axis of the light with an inserting direction of the press-fitting device.

5,749,142

METHOD AND DEVICE FOR ADJUSTING NOZZLE HEIGHT FOR RECOGNITION IN SURFACE MOUNTER

Naoki Hanamura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 17, 1995, Ser. No. 544,014
Claims priority, application Japan, Oct. 19, 1994, 6-253813
Int. Cl.⁶ H05K *3/30;13/04;* B23Q *17/22;* G01B *11/02*
U.S. Cl. 29—833 14 Claims



8. A method for accurately positioning components on a substrate utilizing a pickup device adapted to pickup said components and position said components, a sensing station having a finite range of measurement in a first plane, said method comprising the steps of moving said pickup device and said component in the direction of said first plane into said sensing station and within said sensing station in successive intervals in the direction of said first plane to successive locations within said sensing station, taking successive recognitions of components in said sensing station at the successive locations, selecting the optimum successive location position of said components and said pickup device in said sensing

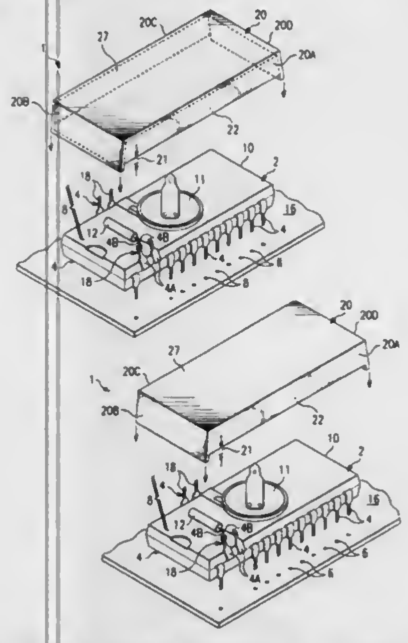
station from such measurements, and memorizing that data so that subsequent components will be only positioned in that optimum successive location position in the sensing station for measurement.

5,749,143

PROCESS FOR FORMING A MODULE

Joe Guillot; Michael Quan Dinh, both of Plano; Bill Roberts, Greenville, and Linda M. McLemore, Dallas, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Division of Ser. No. 330,764, Oct. 28, 1994, abandoned. This application Aug. 12, 1996, Ser. No. 695,443
Int. Cl.⁶ H05K *3/30*
U.S. Cl. 29—841 12 Claims



1. A process for forming a module to be mounted on a printed circuit board, said process comprising the following steps:
(a) providing a cap having at least one notch on a side wall thereof;
(b) filling said cap with a preselected amount of encapsulant; and
(c) placing an electrical assembly of at least two electrical components in said cap filled with said preselected amount of encapsulant and allowing said electrical assembly to seat to a proper depth, wherein at least one of the electrical components of said electrical assembly of electrical components has at least one electrical lead and wherein said at least one electrical lead is placed adjacent to the notch in said cap and said proper depth allows said at least one electrical lead to remain substantially free of said encapsulant to create a module.

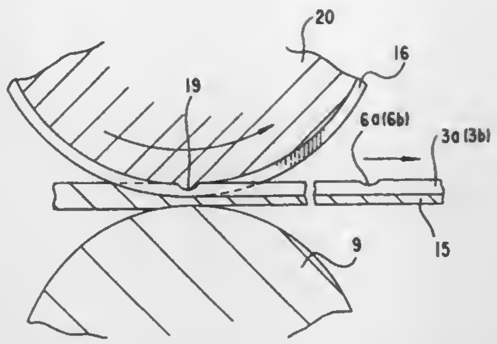
5,749,144

METHOD OF MAKING REFRIGERANT TUBES FOR HEAT EXCHANGERS

Hirosaburo Hirano; Yuji Yamamoto, and Shinji Ito, all of Tochigi, Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Division of Ser. No. 283,504, Aug. 1, 1994, Pat. No. 5,553,377, which is a division of Ser. No. 77,069, Jun. 16, 1993, abandoned. This application Jun. 17, 1996, Ser. No. 665,310
Claims priority, application Japan, Mar. 26, 1993, 5-68578
Int. Cl.⁶ B23P *15/26*
U.S. Cl. 29—890.04 L 5 Claims

1. A method of producing a refrigerant tube for use in heat exchangers comprising a flat aluminum tube having parallel refrigerant passages in its interior and comprising flat upper and lower walls and a plurality of reinforcing walls connected between the upper and lower walls, the reinforcing walls extending longitudinally of the tube and being spaced apart from one another by a predetermined distance, the method comprising rolling an aluminum sheet blank having a thickness greater than the wall thickness of the refrigerant tube to be produced with upper and lower rolling rolls one of which has parallel annular grooves and thereby reducing the thickness of the blank to the specified tube wall thickness with the peripheral surfaces of the rolling rolls to form a flat portion serving as at least one of the upper wall and the lower wall and form vertical ridges projecting from the flat portion integrally therewith and providing the reinforcing walls with the annular grooves.

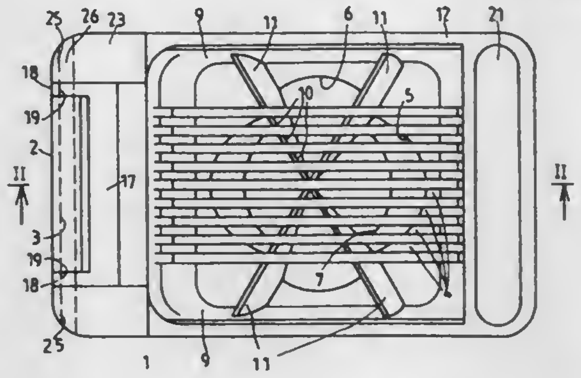


5,749,145

EGG CUTTER

Horst Baukloh, Südstrasse 8, D-58540 Meinerzhagen, Germany

Filed May 20, 1997, Ser. No. 859,661
Claims priority, application Germany, Jun. 28, 1996, 196 25 914.2
Int. Cl.⁶ B26B *3/00;* A21C *5/08;* A22C *9/00*
U.S. Cl. 30—114 4 Claims



1. An egg cutter comprising a rectangular base plate which has webs running parallel to a first lateral edge and separated by gaps, the profile of which webs forms an elliptical depression in which to place an egg, and comprising a cutting frame which is pivotable about a second lateral edge, oriented perpendicularly to the first lateral edge, of the base plate and has parallel-tensioned wires aligned with the gaps between the webs, for cutting slices, wherein a second cutting frame for cutting pieces is pivotable about an axis parallel to the second lateral edge and has cutting wires arranged in the shape of a star, and wherein cross slots are provided in the webs of the base plate to correspond to the cutting wires.

5,749,146
SCISSORS TYPE STEEL SHEARING APPARATUS WITH POLYGONAL SHEARING BLADES

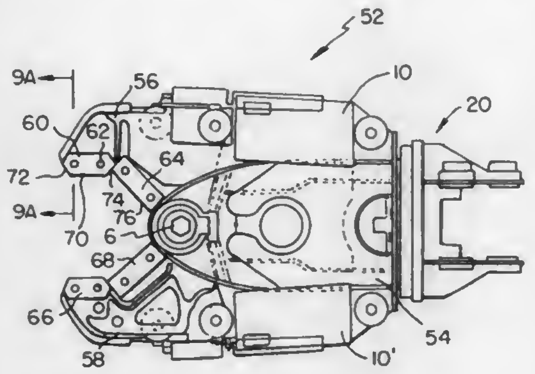
Sumio Morikawa; Toshiji Ohga, and Masahiro Kondoh, all of Osaka, Japan, assignors to Ohyodo Diesel Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 101,358, Aug. 3, 1993. This application Sep. 8, 1995, Ser. No. 525,986

Claims priority, application Japan, Jun. 16, 1993, 5-144448

Int. Cl.^{6} B25P *19/00*

U.S. Cl. 30—134 **4 Claims**



1. A shearing apparatus comprising:
an upper jaw;
a first leading shearing blade on said upper jaw;
a first trailing shearing blade on said upper jaw;
said first leading shearing blade having a first outline;
said first outline forming a first main shearing edge and a first auxiliary shearing edge at a forward end thereof;
said first main shearing edge and said first auxiliary shearing edge forming a first angle therebetween;
said first trailing shearing blade abutting a trailing end of said first outline;
a lower jaw;
a second leading shearing blade on said lower jaw;
a second trailing shearing blade on said lower jaw;
said second leading shearing blade having a second outline;
said second outline forming a second main shearing edge and a second auxiliary shearing edge at a forward end thereof;
said second main shearing edge and said second auxiliary shearing edge forming a second angle therebetween;
said second trailing shearing blade abutting a trailing portion of said second outline;
said first and second angles being greater than 90 degrees; and
means for permitting rotation of at least one of said upper jaw and said lower jaw, whereby shearing engagement between shearing blades on said upper and lower jaws is enabled.

5,749,147
GRIPPING SCISSORS

Yoshinobu Hasegawa, Seki, Japan, assignor to Hasegawa Hamono Kabushiki Kaisha, Japan

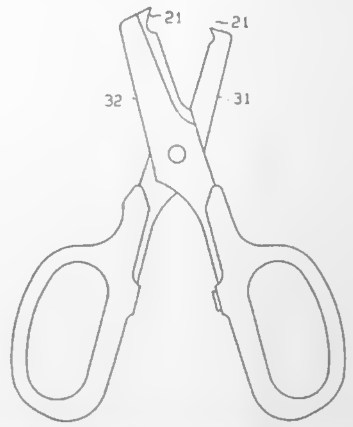
Filed Jul. 31, 1996, Ser. No. 690,537

Claims priority, application Japan, Apr. 26, 1996, 8-107023; May 31, 1996, 8-139074

Int. Cl.^{6} B26B *13/00*

U.S. Cl. 30—134 **1 Claim**

1. Scissors having a first scissor member and a second scissor member pivotally coupled to each other, said scissors comprising:
a blade formed with and extending along at least one of the scissor members;
fastening means, provided on at least a tip portion of the other one of the scissor members, for fastening the associated scissor member to an object to be cut, said fastening means includes a hook for holding the object to be cut; and
said one of the scissor members which has the blade being shorter than the other one of the scissor members which has the fastening means, and further includes a pointed tip oriented toward the hook.



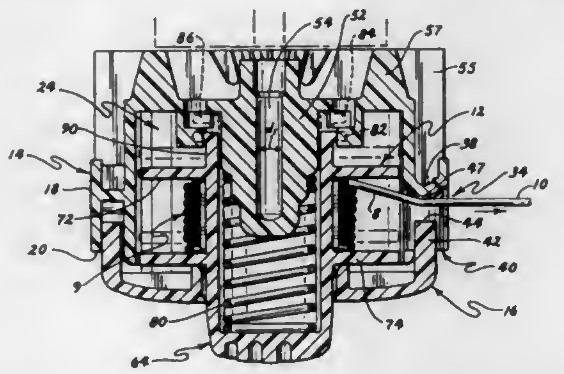
5,749,148
FILAMENT TRIMMER HEAD

Donald M. White, III, Chanhassen, and Chris A. Wadzinski, Plymouth, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Division of Ser. No. 172,010, Dec. 22, 1993. This application Jun. 6, 1995, Ser. No. 469,105

Int. Cl.^{6} A01D *34/67;* **B26B** *27/00*

U.S. Cl. 30—276 **8 Claims**



1. An improved filament trimmer of the type having a trimmer head, a spool having a spool core and upper and lower spool flanges extending radially outwardly from the core to define a line storage area between the spool flanges with the spool flanges having outermost peripheral edges, a supply of filament line wound around the core and located in the line storage area of the spool with a free end of the line extending radially outwardly from the spool to form a cutting length of line located exteriorly of the head, drive means for rotating the trimmer head about an axis to cause the cutting length of line to be spun in a cutting plane to sever vegetation, and indexing means for feeding additional line out from the spool, wherein the indexing means includes a first group of indexing teeth comprising first and second sets of indexing teeth that are spaced apart relative to one another along the axis of rotation, the indexing teeth in each set thereof being circumferentially spaced apart relative to one another and the indexing teeth in the first and second sets thereof being circumferentially offset relative to one another, the indexing means further including a second group of locking teeth comprising at least one set of locking teeth in which the locking teeth are circumferentially spaced apart relative to one another, the locking teeth in the second group being alternately engageable with the indexing teeth in the first and second sets of indexing teeth in the first group in response to relative reciprocal motion along the axis of rotation between the first and second groups of teeth, wherein the improvement relates to the indexing means and comprises:

(a) the spool including a core extension attached to the spool core and which vertically protrudes past the spool flanges such that the core extension is located vertically outside of the line storage area of the spool;
(b) wherein one of the two groups of teeth in the indexing means is carried by and integrally formed on the core extension and is vertically spaced from the spool flange closest to the one group of teeth carried by the core extension, wherein the teeth in the one group of teeth carried by the core extension extend radially outwardly from the core extension but do not extend radially outwardly past the outermost peripheral edges of the spool flanges; and
(c) wherein the spool including the spool core, the spool flanges, the core extension and the one group of teeth carried by the core extension are integrally molded in one piece from a plastic material.

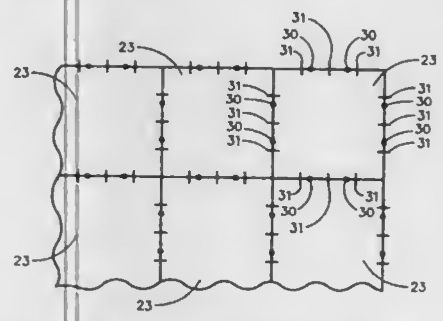
5,749,149
METHOD AND APPARATUS FOR DESIGNING QUILTS

Nancy A. Claytor, 217 E. Liberty St., York, S.C. 29745

Filed Jun. 19, 1996, Ser. No. 666,049

Int. Cl.^{6} B43L *13/20;* **A41H** *3/00;1/00*

U.S. Cl. 33—1 F **5 Claims**



1. Apparatus for use in a quilt graphing system that enables a quilter to custom design quilts having fabric squares pieced together with seams to form a design, said apparatus comprising:
(a) at least one quilt graphing grid comprising a sheet of transparent plastic drafting film having a matte finish on one surface and including a plurality of uniformly sized squares printed on the transparent film, with different types of dimensional markings applied to all sides of each square in the grid and wherein one type of dimensional marking is a dot that designates a third of the length of their respective lines and another type of dimensional marking is a dash that designates a quarter of the length of their respective lines;
(b) at least one template square of the same size as the fabric squares and having a plurality of holes spaced inwardly from each of its sides and wherein the holes in the template square are spaced from each other with the same spacing as the dots and dashes have from each other on the lines of the squares in the quilt graphing grid, and
(c) a straightedge, the straightedge including:
  (i) one side for measuring lines of cut in the fabric squares,
  (ii) a side opposed to said one side for guiding the lines of cut.

5,749,150
DIRECTION INDICATOR FOR NAVIGATION

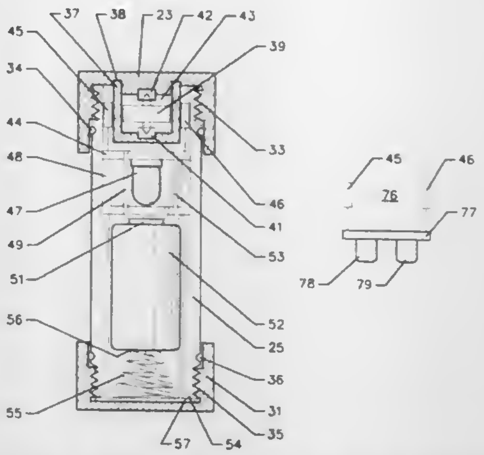
Kevin McDermott, 196 Phillips Dr., Hampstead, Md. 21074

Division of Ser. No. 376,773, Mar. 1, 1995, which is a division of Ser. No. 979,786, Nov. 20, 1992, Pat. No. 5,383,280. This application Dec. 20, 1996, Ser. No. 770,799

Int. Cl.^{6} G01C *17/02*

U.S. Cl. 33—361 **32 Claims**

1. An electronic navigation device comprising:
a housing assembly; and
an electronic assembly for indicating when said housing assembly is oriented at a first predetermined azimuthal angle relative to the Earth's magnetic field, said electronic assembly further comprising a direction indicator coupled to a power source via a control circuit, said direction indicator further including a vibrating means for creating a vibration and a means to transmit said vibration to the body of a user of said electronic navigation device, said control circuit selectively energizing said direction indicator when said housing assembly attains said first predetermined azimuthal angle relative to the Earth's magnetic field.



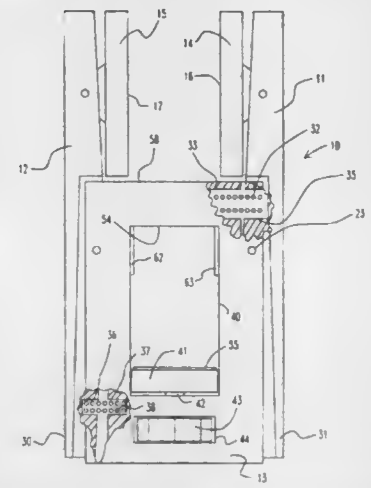
5,749,151
LEVEL MOUNT AND METHOD OF MEASURING THE LEVEL OF A MEMBER

Daniel B. Scott, 3617 W. 1100 North, and Michael S. Franklin, 3596 W. 1100 North, both of New Palestine, Ind. 46163

Filed Jul. 31, 1996, Ser. No. 688,989

Int. Cl.^{6} G01C *9/00*

U.S. Cl. 33—370 **7 Claims**



1. A device for holding a level tool on a member for measuring same comprising:
a frame having a level hole;
spring biased clamping means movably mounted to said frame and operable to removably clamp onto a member;
level clamping means on said frame and operable to removably hold a level in a desired position on said frame,
said level clamping means having adjustable means movably mounted to said frame and positioned within said level hole operable to allow sizing of said level hole depending upon the level extending therein; and
gripping means pivotally mounted to said spring biased clamping means and having mutually facing gripping surfaces to engagingly hold the member therebetween.

5,749,152

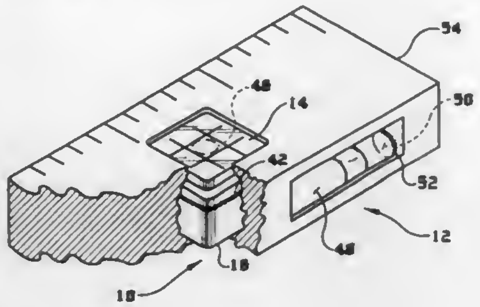
SPIRIT LEVEL VIAL CONSTRUCTION

William A. Goss, 283 Egrets Walk, Orange Park, Fla. 32073, and Lawrence T. Goss, 257 Main St., Wakefield, R.I. 02879

Continuation of Ser. No. 500,263, Jul. 10, 1995, abandoned. This application May 15, 1997, Ser. No. 856,589

Int. Cl.^{6} G01C *9/28*

U.S. Cl. 33—381 **2 Claims**



1. A level comprising:

a housing having a square receiving section and a rectangular receiving section;

a sonically welded, square-shaped vial having an injection molded, clear sight glass cover and an injection molded fluid receptacle sonically welded together with a dyed mineral spirits fluid permanently sealed therein, said square-shared vial installed within said square receiving section for providing planar level information relative to an object;

a sonically welded, cylindrical shaped vial having an injection molded, clear sight glass body and an injection molded, clear end cap sonically welded together with a dyed mineral spirits fluid permanently sealed therein, said cylindrical shaped vial installed within said rectangular receiving section for providing linear level information relative to the object;

each said vial being formed of injection molded acrylic plastic material.

5,749,153

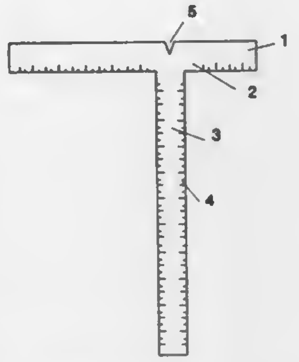
WALLBOARD T-SQUARE WITH SHARPENER

Raymond J. Viens, 10 Birch Dr., Corning, N.Y. 14830

Filed Sep. 14, 1995, Ser. No. 528,024

Int. Cl.^{6} B43L *7/02*

U.S. Cl. 33—474 **5 Claims**



1. A wallboard T-square comprising:

a) a generally T-shaped body comprising an upper straightedge having upper and lower edges and a lower straightedge attached orthogonally to the upper straightedge along the lower edge thereof; and

b) knife sharpener means for sharpening a blade, mounted on the upper edge of the upper straightedge, such that the knife sharpener can be used when the body is held in an operative position with the upper and lower straightedges held flat against a sheet of wallboard.

5,749,154

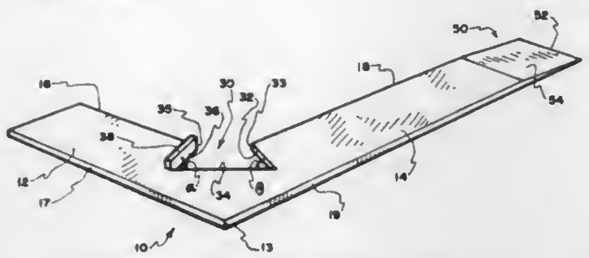
BULL NOSE CORNER MARKING APPARATUS

Robert E. Scharf, 145 E. 200 South, Manti, Utah 84642

Filed May 20, 1996, Ser. No. 650,494

Int. Cl.^{6} B43L *7/027*

U.S. Cl. 33—563 **19 Claims**



1. A bull nose corner marking apparatus, comprising:

a first section;

a second section coupled to the first section;

an intersection location formed by the first section and the second section, the intersection location defining an area corresponding to an outside bull nose corner molding piece, the intersection location allowing a person to mark a piece of molding to cut an outside bull nose corner molding piece.

5,749,155

DEVICE FOR REMOVING LIQUID ON A GAUZE CONVEYOR AND HOLLOW ROLL COMPRISING A TUBE FOR USE IN SUCH A DEVICE

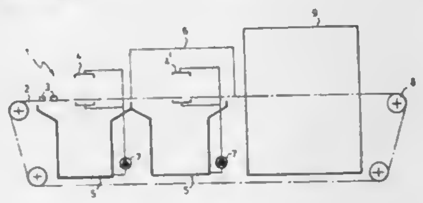
Donald Lazarz, Elk Grove Village, Ill., and Jurjen Jan De Jong, LB Buitenpost, Netherlands, assignors to American National Can Company, Chicago, Ill., and VMI-EPE-Holland B.V., Netherlands

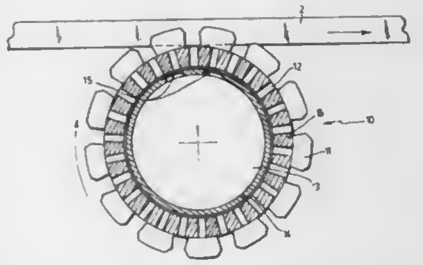
Division of Ser. No. 481,295, Jun. 27, 1995, Pat. No. 5,659,973. This application Jan. 28, 1997, Ser. No. 789,274

Claims priority, application Netherlands, Dec. 30, 1992, 9202288

Int. Cl.^{6} F26B *19/00*

U.S. Cl. 34—90 **4 Claims**





1. Industrial washing device comprising a washing installation, a gauze conveyor for conveying products through the washing installation and a device for removing liquid on the gauze conveyor, the gauze conveyor having an upper side for carrying products and being provided with link portions and having a gauze pattern, the device for removing liquid comprising a hollow rotatable roll having a cavity, placed directly under the gauze conveyor, said roll being provided with rows of separate projecting teeth, said rows extending axially on the roll, the teeth fitting into the gauze pattern and the link portions being enclosable by the teeth, the roll comprising holes between the teeth which holes extend into the cavity of the roll, the device for removing liquid comprising an extractor means connected to the cavity of the roll for removing liquid from the upper side of the gauze conveyor by extraction.

5,749,156

DRYING APPARATUS FOR CANS USING HEATED AIR

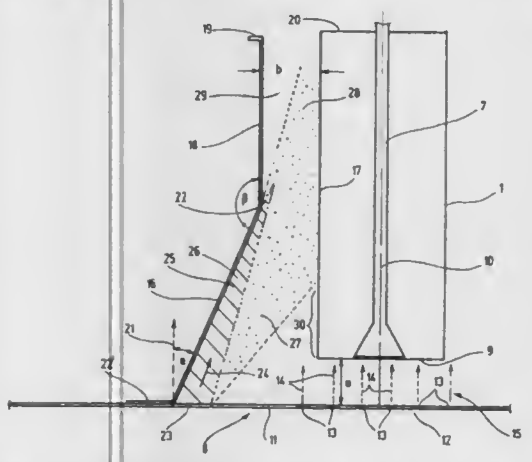
Bernhard Mokler, Markgröningen, Germany, assignor to LTG Lufttechnische Gesellschaft mit beschrankrankter Haftung, Germany

Filed Jan. 27, 1997, Ser. No. 788,371

Claims priority, application Germany, Jan. 26, 1996, 196 02 784.5

Int. Cl.^{6} F26B *25/00*

U.S. Cl. 34—105 **17 Claims**



1. A drying apparatus for drying surface treated cans, the apparatus comprising:

a can conveyor having at least one can holder thereon adapted for supporting a can with the base region of the can facing in one direction;

a hot air supply apparatus for surface drying a can, the hot air apparatus comprising:

a first air conducting device for directing at least one first stream of hot air at the base region of the can;

at least one air conducting wall for directing at least one second stream of air, the air conducting wall including at least a portion extending obliquely toward the wall of the can in the direction from below the base of the can toward the top of the can, the air conducting wall being spaced a distance laterally away from the wall of the can so that the air conducting wall directs the second stream of air to form a wall jet at least in one area.

5,749,157

DRYER SECTION FOR AN APPARATUS FOR THE PRODUCTION OF A PAPER WEB

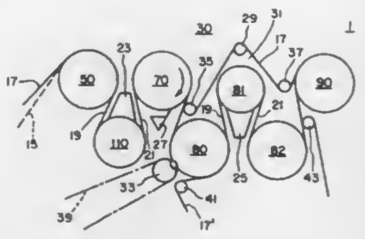
Werner Leitenberger, Schlier-Wetzisreute, and Helmut Heinzmann, Bohmenkirch, both of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

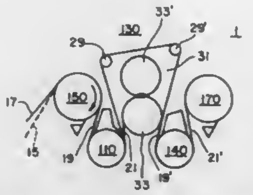
Filed Dec. 20, 1996, Ser. No. 771,277

Claims priority, application Germany, Dec. 22, 1995, 195 48 308.1; Jan. 26, 1996, 196 02 697.0

Int. Cl.^{6} D21F *5/00*

U.S. Cl. 34—117 **15 Claims**





1. A dryer section in an apparatus used for the production of a continuous material web, said dryer section comprising:

at least one dryer group including a plurality of dryer cylinders and carrier rollers, each said dryer group also including at least one conveyer belt carried by said plurality of dryer cylinders and said carrier rollers, said conveyor belt directing the continuous material web around said plurality of dryer cylinders and carrier cylinders and defining a direction of travel through said dryer group; and

at least one pressure cylinder positioned in association with one of said plurality of dryer cylinders and carrier rollers, said at least one pressure cylinder compressing or smoothening the material web, said pressure cylinder contained within a region between a second and a second-to-last one of said dryer cylinders, relative to the direction of travel through said dryer group.

5,749,158

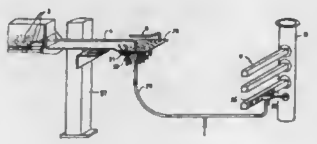
APPARATUS FOR THE APPLICATION OF STEAM ONTO A PAPER WEB

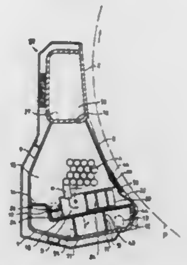
Dieter Muller, Sontheim, and Markus Oechsle, Bartholoma, both of Germany, assignors to Voith Sulzer Papiermaschinen Gmbh, Germany

Filed Sep. 18, 1996, Ser. No. 718,145

Int. Cl.^{6} D21F *5/00*

U.S. Cl. 34—119 **13 Claims**





1. An apparatus for the application of steam onto a material web passing along a web path through a paper-manufacturing machine, comprising:

an elongated steam blower box extending transversely to the web path over the entire width of the web;

a plurality of zone chambers arranged side by side over the width of the web;

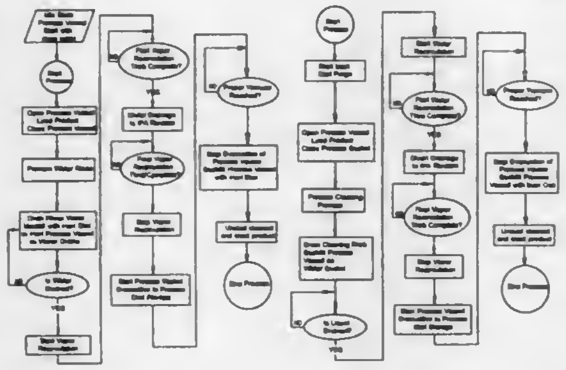
a plurality of sectional steam lines for connecting each zone chamber to a steam source, each sectional steam line comprising an outflow end within the steam blower box, an inflow end and a control valve, both located outside the steam blower box;

wherein

each of said control valves is arranged laterally at a distance from the steam blower box and is connected to the inflow end of said sectional steam line via a movable part of said sectional steam line.

5,749,159
METHOD FOR PRECISION CLEANING AND DRYING SURFACES

Robert S. Schwenkler, 340 Old Saybrook Dr., Boise, Id. 83706
Division of Ser. No. 721,353, Sep. 26, 1996, Pat. No. 5,715,612, which is a continuation-in-part of Ser. No. 516,235, Aug. 17, 1995, abandoned. This application May 22, 1997, Ser. No. 861,967
Int. Cl.⁶ F26B *7/00*
U.S. Cl. 34—426 **9 Claims**

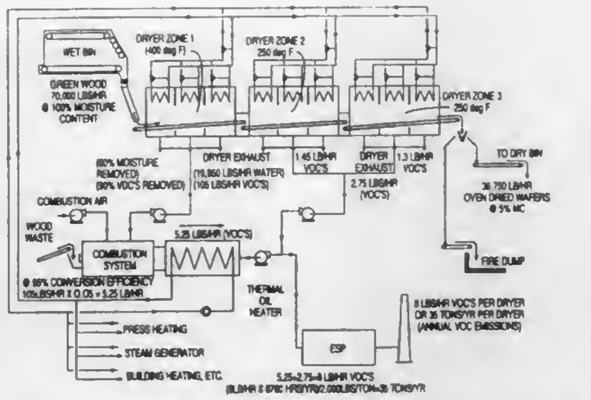


1. A method for rinsing and drying objects in a vapor dryer having a process vessel, a vapor generator, a process gas storage vessel, an inert gas source and a liquid storage vessel, comprising the steps of:

placing the objects to be rinsed and dried in the processing vessel;
sealing the processing vessel;
filling the processing vessel with water;
rinsing the objects;
draining the water from the process vessel while venting the process vessel so that the water is drained in an unimpeded manner;
recirculating a vapor of a drying fluid with an inert carrier gas through the process vessel for a predetermined time;
evacuating the vapor of the drying fluid from the process vessel and depositing it in the process gas storage vessel for vapor condensation; and
removing the objects from the process vessel.

5,749,160
MULTI-ZONE METHOD FOR CONTROLLING VOC AND NOX EMISSIONS IN A FLATLINE CONVEYOR WAFER DRYING SYSTEM

Jeffrey L. Dexter; David C. Siemers; Larry J. Head; Donald E. Miller, all of Evansville, Ind.; Bruce Grebe, Bemidji, Minn.; William Nowack, Twin Lakes, Wis., and Daniel Wolff, Norcross, Ga., assignors to George Koch Sons, Inc., Evansville, Ind.
Continuation-in-part of Ser. No. 388,075, Feb. 14, 1995, Pat. No. 5,524,361. This application Jun. 10, 1996, Ser. No. 660,954
Int. Cl.⁶ F26B *3/00*
U.S. Cl. 34—502 **7 Claims**

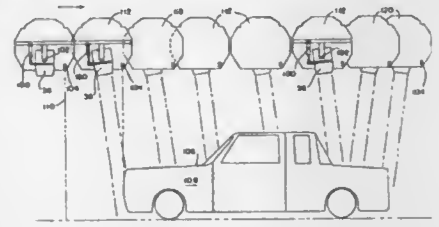


1. Multi-zone method for controlling VOC and NO_x emissions in a flatline conveyor wafer drying system embodying a plurality of dryer zones comprising:

a. advancing wafers in random array on a flat wire conveyor belt having laterally restrictive openings with the wood wafers being supported upon the conveyor and the conveyor being supported on a planar surface, such that wafers are substantially suspended without contact above the planar surface;
b. forcing heated air upwardly through spaced-apart holes of varying diameter and distribution defined in the planar surface, then forcing heated air above the planar surface, while laterally shielding heated air above the planar surface, then forcing heated air through the random array of advancing wafers, wherein the size and distribution of holes within the planar surface are a control of distributing heated air;
c. heating the dryer zones in successively lower temperatures in the range 500° F. to 200° F. by flowing heating air upwardly through the flatline conveyor;
d. removing VOC-rich exhaust air from a primary dryer zone while flowing heated air upwardly therein, and;
e. removing VOC-rich exhaust air from a secondary dryer zone while flowing heated air upwardly therein.

5,749,161
MOTOR VEHICLE DRYER WITH COANDA EFFECT DRYING

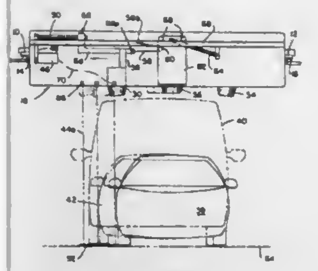
Allen Jones, Oneida, Wis., assignor to PDQ Manufacturing, Inc., Green Bay, Wis.
Division of Ser. No. 324,351, Oct. 17, 1994, Pat. No. 5,596,818. This application Dec. 4, 1996, Ser. No. 763,617
Int. Cl.⁶ F26B *21/06*
U.S. Cl. 34—541 **25 Claims**

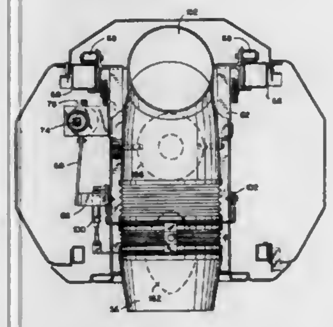


1. A dryer used to dry a surface of a motor vehicle, comprising:
a gas generator having an outlet to provide a stream of high velocity gas, and
a support to position said gas generator outlet at an elevated position with respect to said surface to direct said gas stream along said surface to dry said surface by the Coanda effect.

5,749,162
MOTOR VEHICLE DRYER

Allen Jones, Oneida, Wis., assignor to PDQ Manufacturing, Inc., Green Bay, Wis.
Division of Ser. No. 324,351, Oct. 17, 1994, Pat. No. 5,596,818. This application Dec. 4, 1996, Ser. No. 763,619
Int. Cl.⁶ F26B *21/00*
U.S. Cl. 34—566 **16 Claims**

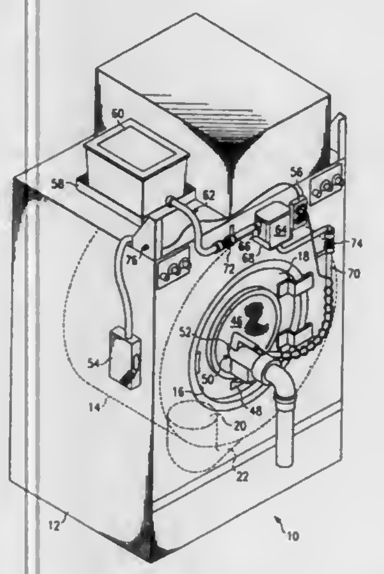




1. A dryer used to dry a motor vehicle, comprising:
a nozzle;
a blower for providing a gas at a high velocity to said nozzle;
a support for supporting said nozzle;
a sensor positioned to sense the position of the vehicle relative to the nozzle, the sensor generating a signal related to the position of the vehicle; and
a mechanism for moving said nozzle from a first position, in which said nozzle is directed toward the front portion of said vehicle, to a second position, in which said nozzle is directed toward the rear portion of said vehicle, the nozzle being moved from the first position to the second position based on the signal from the sensor.

5,749,163
APPARATUS AND METHOD FOR IMPARTING WRINKLE-RESISTANT PROPERTIES TO GARMENTS AND OTHER ARTICLES

John Christian Staub; Kent Delmar Ubil, both of Garland, and Pamela Jane Throgmorton, Lucas, all of Tex., assignors to Haggar Clothing Co., Dallas, Tex.
Filed Mar. 8, 1995, Ser. No. 399,078
Int. Cl.⁶ F26B *11/02*
U.S. Cl. 34—597 **6 Claims**

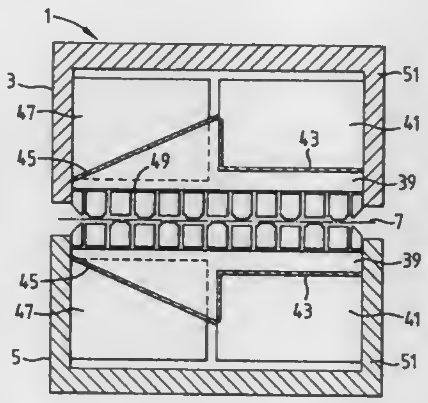


1. An apparatus for impregnating garments or fabrics with durable press resin for the manufacture of wrinkle-resistant garments, said apparatus comprising:

a dryer having a housing and an access door hingedly connected to said housing, said access door having an outer face and a hole therethrough;
a drum rotatable on a generally horizontal axis and disposed within said housing, said rotatable drum having an open end adjacent said access door through which garments or fabrics may be inserted, whereby when garments or fabrics are inserted into said drum and said drum is rotated, a tunnel defined by said garments or fabrics is formed;
at least one atomizer unit disposed adjacent said outer face of said access door and positioned to inject a durable press resin through said hole in said access door and into said tunnel formed by said garments or fabrics; and
said dryer having a blower and a heating element capable of injecting heated air in a generally vertically downward direction through said drum, and said dryer further including exhaust means allowing said air to be exhausted through said drum.

5,749,164
WEB DRYER WITH COANDA AIR BARS

Edwin Vincent Bowden, Riddlesden, United Kingdom, assignor to Spooner Industries Limited, Ilkley, United Kingdom
PCT No. PCT/GB94/02549, § 371 Date Aug. 5, 1996, § 102(e) Date Aug. 5, 1996, PCT Pub. No. WO95/14199, PCT Pub. Date May 26, 1995
PCT Filed Nov. 18, 1994, Ser. No. 649,676
Claims priority, application United Kingdom, Nov. 19, 1993, 9323954
Int. Cl.⁶ E26B *9/00*
U.S. Cl. 34—641 **9 Claims**



1. A web dryer (1) comprising two air bar assemblies (3,5) between which a web (7) travels, each air bar assembly (3,5) comprising a plurality of parallel and spaced apart air bars (9), each air bar (9) being elongate and arranged such that its longitudinal axis is transverse to the longitudinal axis of the dryer (1), each of the air bar assemblies (3,5) including at least two sets of air bar, a first set (13) comprising coanda air bars, each having at least two air nozzles, and the second set (15) comprising jet impingement air bars and in which the air bar assemblies (3,5) are arranged such that in use each coanda air bar (13) from one assembly faces a jet impingement air bar (15) from the other assembly characterized in that air flows flowing from each of the air nozzles of a coanda bar converge towards the center of said bar.

5,749,165
ELECTRIC PRESSING IRON WITH COATED SOLEPLATE

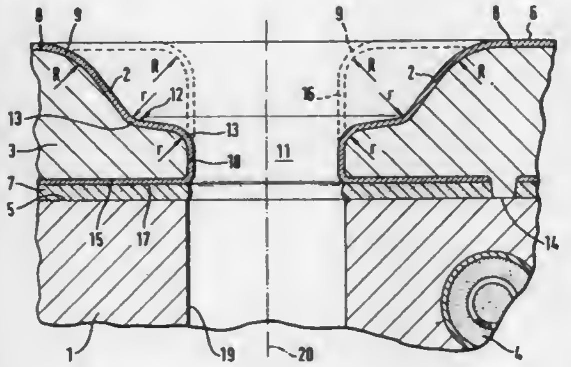
Hartmut Schönborn, Neu-Anspach; Günther Alschweig, Eschborn; Hans-Herbert Fuchs, Hofheim; Andrea Hahnewald, Dreieich, all of Germany; Augustin Auria, Esplugues de Llobregat, Spain, and Joseph Recarsens Carcia, Barcelona, Spain, assignors to Braun Aktiengesellschaft, Kronberg, Germany

Filed Sep. 27, 1996, Ser. No. 720,407

Claims priority, application Germany, Apr. 6, 1994, 44 11 790.6

Int. Cl.^{6} D06F *75/38;* **C23C** *10/02*

U.S. Cl. 38—93 **23 Claims**



1. An electric pressing iron, comprising an iron body made of cast aluminum containing silicon; an electric heater; and a plate-shaped soleplate made of an aluminum material with a low silicon content attached to said iron body such as to be in good thermal contact with said iron body, wherein an outer surface of the soleplate defines an ironing surface, said ironing surface provided with an aluminum oxide coating produced by anodizing.

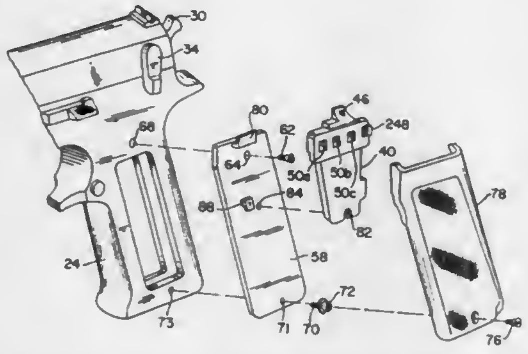
5,749,166
GUN LOCK ASSEMBLY

Frank Brooks, Jupiter, Fla., assignor to SAF T LOK Corporation, Tequesta, Fla.

Continuation-in-part of Ser. No. 929,201, Aug. 13, 1992, Pat. No. 5,457,907, which is a continuation-in-part of Ser. No. 645,565, Jan. 24, 1991, Pat. No. 5,140,766, and Ser. No. 645,566, Jan. 24, 1991, Pat. No. 5,229,532, said Ser. No. 645,565 and Ser. No. 645,566, each is a continuation-in-part of Ser. No. 556,016, Jul. 20, 1990, Pat. No. 5,090,148, and Ser. No. 202,988, Jun. 6, 1988, Pat. No. 4,987,693. This application Jun. 8, 1995, Ser. No. 489,070

Int. Cl.^{6} F41A *17/00*

U.S. Cl. 42—70.11 **6 Claims**



1. An adaptor for locking firearms having a firing mechanism and a handle frame, comprising:

fastening structure for engaging the firearm, said fastening structure comprising a plate dimensioned to the handle frame of the firearm;

engagement structure for engaging at least a portion of the firing mechanism and having a first position preventing operation of the firearm and having a second position permitting operation of the firearm.

5,749,167
FISHING EQUIPMENT

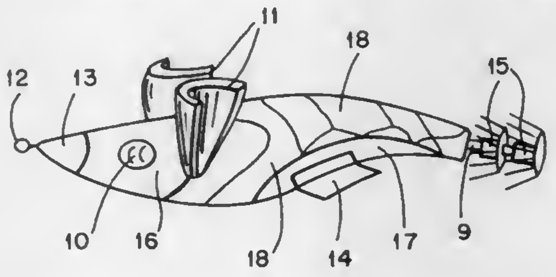
Josip Vlahek, 54 Gordon Street, Tullamarine, Victoria 3043, Australia

Filed Feb. 21, 1995, Ser. No. 390,975

Claims priority, application Australia, Feb. 22, 1994, PM4005/94

Int. Cl.^{6} A01K *85/00*

U.S. Cl. 43—42.06 **6 Claims**



1. A fishing lure, capable of exhibiting a degree of motion when in use in water, which acts as a continuous source of berley, said fishing lure comprising an aperture with a spring loaded member which, when depressed, allows for an injection of berley, a fin being located in a recess in a belly of the lure, and an open aperture for allowing a release of the berley, so that a position in which the fin is fixed determines the size of the open aperature for release of the berley, and means for attachment to at least one hook or a squid jig.

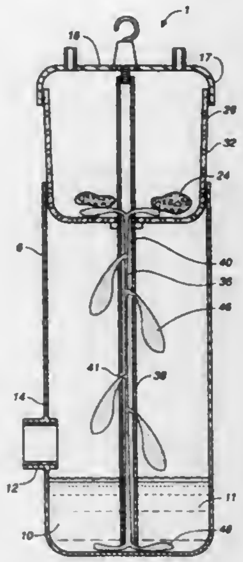
5,749,168
FLY AND INSECT TRAP

Chris A. Chrysanthis, 158 Westdale Ave., Daly City, Calif. 94015

Filed Oct. 10, 1996, Ser. No. 729,249

Int. Cl.^{6} A01M *1/20*

U.S. Cl. 43—122 **18 Claims**



4. Fly and insect trap apparatus including:

a body forming an interior cavity:

an inlet port for admitting flying insects;

means for externally venting bait aroma, the aroma venting means having a cup attached to the body and

outlet perforations in the cup communicating externally of the apparatus;

a glue solution reservoir;

a wick vertically supported in the body and extending down into the reservoir;

at least one insect-contacting member connected in fluid communication with the wick;

a tube having a hollow axial core;

an open bottom end of the tube; and

at least one side tube aperture in the tube, the aperture communicating with the core, wherein the wick is disposed in the core and exits the open bottom tube end, and the contacting member is threaded out a tube aperture.

5,749,169
USE OF THE INDETERMINATE GAMETOPHYTE GENE FOR MAIZE IMPROVEMENT

Steven P. Briggs, Des Moines, Iowa, assignor to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Jun. 7, 1995, Ser. No. 488,277

Int. Cl.^{6} C12N *15/29;15/82;* **A01H** *1/00;5/00*

U.S. Cl. 47—58 **8 Claims**

1. A method for ascertaining gene function, comprising the steps of:

(a) selecting two maize parent plants, wherein the first plant is capable of producing paternal haploid offspring and carries the indeterminate gametophyte (ig) gene, and wherein the second plant carries at least one mutation produced by the insertion into its genome of a transposable element;

(b) crossing the first plant as a female parent with the second plant as the male parent to produce a plurality of haploid F_1 progeny plants which contain genetic material only from said second plant;

(c) screening said haploid offspring for the simultaneous presence of a transposable element and a mutant phenotype which differs from a parental phenotype; and

(d) cloning DNA from said mutant haploid that is associated with insertion of the transposon.

5,749,170
AUTOMATIC WATER SUPPLY DEVICE

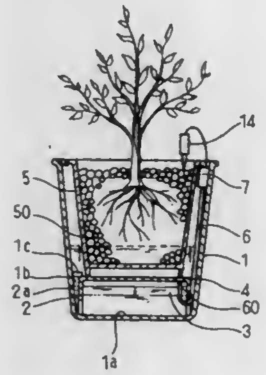
Mikio Furuta, Nagoya, Japan, assignor to Fulta Electric Machinery Co., Ltd., Nagoya, Japan

Filed Jun. 25, 1996, Ser. No. 673,153

Claims priority, application Japan, Jun. 30, 1995, 7-164903; Aug. 23, 1995, 7-214940; Jan. 30, 1996, 8-014454

Int. Cl.^{6} A01G *31/00*

U.S. Cl. 47—62 **5 Claims**



1. An automatic water supply device comprising:

(a) a pot-shaped case having a space enclosing a flowerpot in an inside;

(b) a supporting bed of reverse bowl shape enclosed upside down in said pot-shaped case in an attachable or detachable state for supporting the flowerpot thereon;

(c) a control unit arranged between an inner surface of said pot-shaped case and the flowerpot in an attachable or detachable state and containing at least an air pump, a controller and a timer;

(d) an air tube connected to the outlet side of said air pump and having a front end part arranged communicating with an inside of said supporting bed; and

(e) exhaust means for exhausting air within said supporting bed when the water supply is complete.

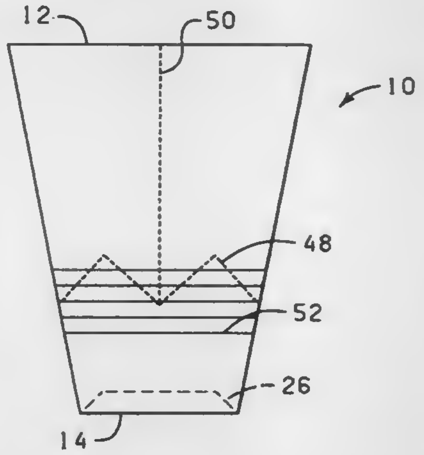
5,749,171
SLEEVE HAVING A DETACHABLE PORTION FORMING A SKIRT AND METHODS

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 237,078, May 3, 1994, Pat. No. 5,625,979, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851. This application Jan. 27, 1997, Ser. No. 788,616

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 47—72 **32 Claims**



1. A tubular sleeve for covering a pot means having an outer peripheral surface, the tubular sleeve in unitary construction comprising:

a base portion having a lower end, an upper end, an outer peripheral surface, and an area of excess material comprising one or more preformed creases or folds positioned in a horizontal orientation for allowing extension of a portion of the base portion and having an opening extending from the upper end to the lower end; and

an upper sleeve portion extending from the upper end of the base portion and detachable therefrom, and wherein when the upper portion is detached from the upper end of the base portion, the area of excess material can be expanded to cause portions of the base portion to extend angularly from the base.

5,749,172
RETRACTABLE BALCONY GLASS STRUCTURE

Jouko Isopahkala, Hirvisentie 20, 60200 Seinajoki, Finland

Filed Aug. 4, 1995, Ser. No. 511,304

Claims priority, application Finland, Aug. 17, 1994, U940412

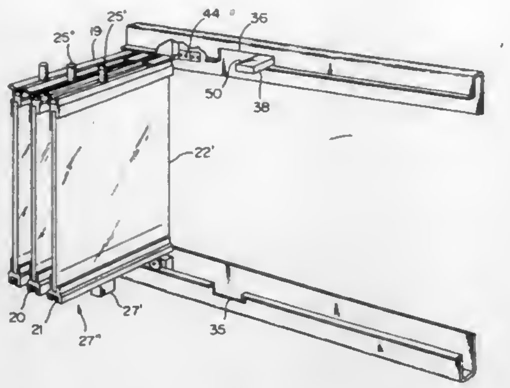
Int. Cl.^{6} E05D *15/26*

U.S. Cl. 49—127 **2 Claims**

1. An extensible/retractable panel assembly having a retracted end, a retracted condition and comprising:

an upper guide,

a lower guide and



- a plurality of panel subassemblies, each of said subassemblies having a vertical edge and an outer surface and an inner surface, one of said subassemblies being pivotally attached to said upper and lower guides at said retracted end about an axis near to and parallel to said vertical edge, the remainder of said subassemblies further comprising:
  - an upper fitting,
  - a lower fitting,
  - a pivoted guide fitting assembly and a guide fitting attached to said upper fitting and
  - a pivoted guide fitting assembly and a guide fitting assembly attached to said lower fitting,
  - said guide fitting assemblies and said guide fitting engaging said guides such that said subassemblies are slidable sequentially to said retracted end and pivotable on said pivoted guide fitting assemblies such that in said retracted condition said inner surfaces and said outer surfaces interface with each other,
  - said upper guide comprising a channel having an outer flange and an inner flange, said outer flange having an inner surface, said assembly further comprising a plurality of leaf springs, one for each of said remainder of subassemblies, each of said plurality of leaf springs engaging said pivoted guide fitting assembly attached to said upper fitting when said subassemblies are in said retracted condition,
  - said pivoted guide fitting assemblies attached to said upper fittings further comprising cam means for disengaging said leaf springs from said pivoted guide fitting assemblies when said subassemblies are positioned to slide in said guides,
  - said guide fittings and said guide fitting assemblies attached to said lower fittings further comprising rollers which engage said lower guide to support said subassemblies.

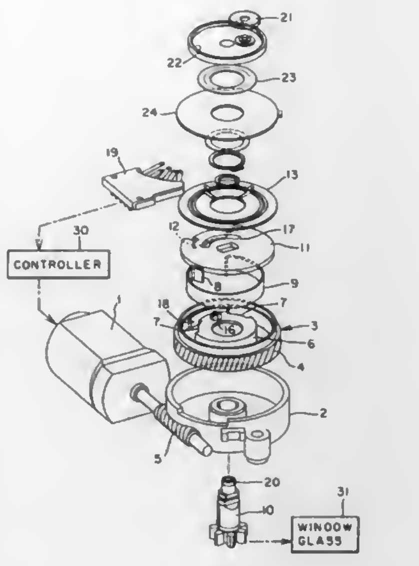
5,749,173
POWER WINDOW REGULATOR APPARATUS

Toshihiko Ishida, Anjyo; Toshimitsu Oka, Okazaki; Naofumi Fujie, Nagoya; Hitoshi Ishikawa, Nishio, and Yasuaki Suzuki, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 20, 1997, Ser. No. 803,244
Claims priority, application Japan, Feb. 29, 1996, 8-067513
Int. Cl.⁶ E05F *15/08*

U.S. Cl. 49—349 **12 Claims**

1. A power window regulator apparatus comprising:
- a worm rotated by an electric motor;
- a driving element having a worm wheel for meshing with said worm;
- a driven element connected to said driving element via a displaceable ring spring;
- an output shaft connected to said driven element;
- a printed circuit board synchronized to said output shaft and provided with a first switch having first and second states, said first switch switching from its first to second state when displacement of the ring spring exceeds a predetermined amount during descent of a window glass, and a second switch having first and second states, said second switch switching from its first to second state when displacement of the ring spring exceeds a predetermined amount during ascent of the window glass, and
- a controller for receiving a signal from said first switch when it is switched to its second state in response to an increase in resistance during descent of the window glass causing the ring spring to exceed the predetermined amount, and reversing the direction of the window glass from ascent to descent following switching of said first switch to its second state during descent and the occurrence during ascent of current increase to the electric motor greater than a predetermined value.

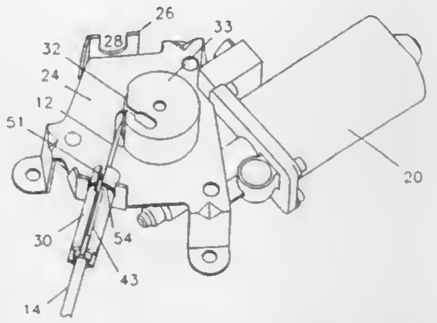


5,749,174
WINDOW REGULATOR WITH SPRING RETAINER

James Gregory Mariel, Mishawaka, Ind., assignor to Excel Industries, Inc., Elkhart, Ind.

Filed Mar. 11, 1996, Ser. No. 613,362
Int. Cl.⁶ E05F *11/01*

U.S. Cl. 49—352 **23 Claims**



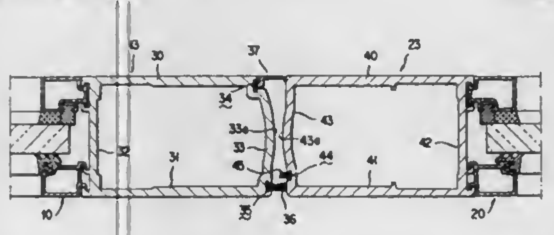
1. A cable-drum regulator for controlling the movement of a windowpane, comprising, in combination:
- drive means for moving the windowpane;
- a cable assembly for connecting the drive means to the windowpane, comprising a cable and a spring maintaining tension in the cable, the spring being positioned coaxially around the cable; and
- a retainer assembly for securing the spring on the cable, comprising:
  - a retainer having a first end and a second end and a hollow interior sized to receive the cable and the spring, and
  - an endpiece which secures the spring in the retainer, inserted in the second end of the retainer, being axially slidably interconnected with the retainer after insertion into the retainer.

5,749,175
STRUCTURE OF MATING PORTIONS OF DOUBLE DOOR ASSEMBLY

Sou Koike, and Masao Hirano, both of Toyama-ken, Japan, assignors to YKK Architectural Products Inc., Tokyo, Japan

Filed Jan. 28, 1997, Ser. No. 790,368
Claims priority, application Japan, Feb. 1, 1996, 8-016440
Int. Cl.⁶ E06B *7/16*

U.S. Cl. 49—368 **13 Claims**



1. A structure of mating portions of a double door assembly in which first and second doors, each having a center, an indoor side, and an outdoor side, are respectively mounted to bilateral vertical frame members of a door frame so that each door can swing both inwardly and outwardly, the structure comprising:
- a first mating frame element constituting said first door and providing a first mating surface;
- a second mating frame element constituting said second door and providing a second mating surface; and
- a fin-shaped seal member having a front end portion and being attached to said first mating surface to project toward said second mating surface, said fin-shaped seal member being so adapted that the front end portion of said fin-shaped seal member is in pressure contact with said second mating surface when the first and second doors are closed,
- wherein said first mating surface comprises a portion having an indoor side and being retracted inwardly to the center of said first door and a portion protruded outwardly from the center of said first door, said second mating surface comprises a portion retracted inwardly to the center of said second door and a portion protruded outwardly from the center of said second door, and said fin-shaped seal member is attached to said inwardly retracted portion of said first mating surface and contacts said inwardly retracted portion of said second mating surface when the first and second doors are closed.

5,749,176
MOTOR VEHICLE DOOR

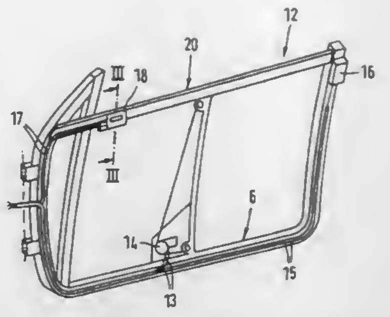
Gunther Heim, Mainhausen; Thomas Überreiter, Mühlheim; Jürgen Hock, Aschaffenburg, and Holger Bischoff, Obertshausen, all of Germany, assignors to Ymos Aktiengesellschaft Industrieprodukte, Obertshausen, Germany

Filed Aug. 8, 1996, Ser. No. 695,749
Claims priority, application Germany, Aug. 8, 1995, 195 29 088.7

Int. Cl.⁶ B60J *5/04*

U.S. Cl. 49—502 **11 Claims**

1. A motor vehicle door having an inside wall and an outside wall defining a door hollow therebetween, supply lines including at least one of electrical lines, mechanical linkages and Bowden cables arranged in the door hollow, and a door support element which is disposed in the door hollow; and wherein: the supply lines are arranged at least adjacent the support element; said support element has a rib-shaped extension which extends in a substantially vertical direction, which is disposed between said supply lines and said outer wall of said door, and which, together with the support element, covers the supply lines in a direction toward said outer wall of said vehicle door; and further comprising a rib disposed on an inner surface of said inside wall and extending toward said extension and adjacent said supplying lines.

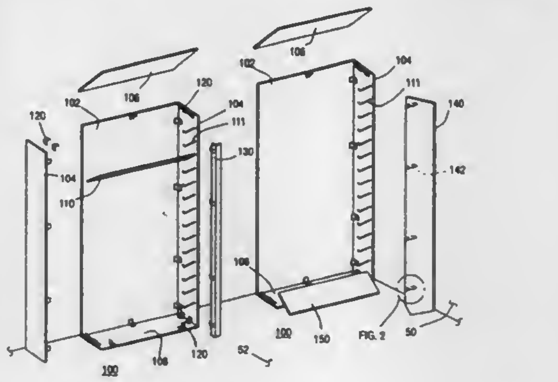


5,749,177
PISTOL RANGE BACKSTOP

John Pontus, Rock Hill, S.C., and Stephen H. Young, Huntsville, Ala., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Nov. 15, 1994, Ser. No. 339,819
Int. Cl.⁶ F41J *1/12;* **E04H** *1/00*

U.S. Cl. 52—79.1 **27 Claims**



1. A shooting range backstop for installation across a structure comprising two side walls defining a width, the backstop comprising:
- one or more backstop modules selected from a plurality of standardized width modules of two or more different widths;
- a wall plate for covering a gap between a module and a side wall, wherein the wall plate is slidably connected to the module.

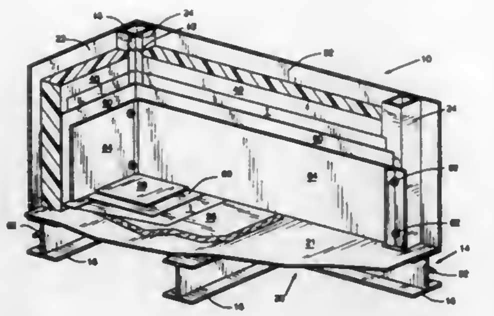
5,749,178
SHIELDED ENCLOSURE

Victor H. Garmong, R.D. #1, Kennerdell, Pa. 16374

Filed Aug. 6, 1996, Ser. No. 689,340
Int. Cl.⁶ E04H *1/00*

U.S. Cl. 52—79.1 **14 Claims**

1. Apparatus for protecting a plurality of electrical components, comprising:
- a shell member fabricated from a first electrically conductive material, having an interior surface and defining an interior space for enclosing said plurality of electrical components therein;
- grounding means attached to said shell member for conducting electrical current created when a lightning strike communicates with said shell member to a ground; and
- a non-laminated magnetic shield means, comprising a second material, attached to said interior surface of said first material in a spaced relationship to create a space therebetween for



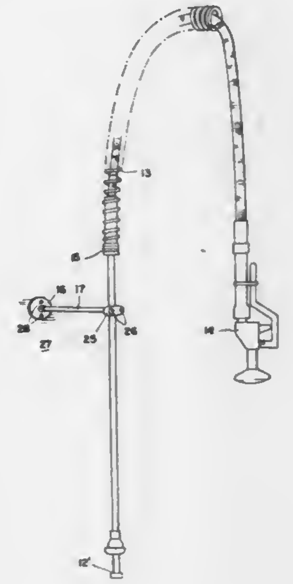
receiving a thermal insulating material therein, and adapted to substantially attenuate an electromagnetic field created inside the shell of said first material when said lightning strike communicates with said shell member and to substantially shield said plurality of electrical components from electromagnetic fields created in said first material when said lightning strike communicates with said shell member.

5,749,179
WALL BRACKET FOR A PRE-RINSE ASSEMBLY

Richard P. Bohacik, Lanoka Harbor, N.J., assignor to Component Hardware Group, Inc., Lakewood, N.J.

Filed Jun. 2, 1995, Ser. No. 459,742
Int. Cl.⁶ B05B *15/06*

U.S. Cl. 52—127.2 **6 Claims**



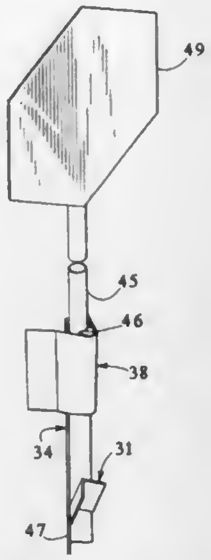
1. A pre-rinse assembly comprising
- a wall bracket having a base for mounting on a wall, a tubular portion extending from said base with an external thread thereon, a rod having one end telescopically received in said tubular portion, a ferrule disposed on said rod and abutted against an end of said tubular portion and a compression nut concentric to said ferrule and said rod, said nut having an internal shoulder at one end abutting said ferrule and an opposite end threaded onto said thread of said tubular portion to sandwich said ferrule between said nut and said end of said tubular portion while circumferentially pressing said ferrule into clamping engagement with said rod;
- a vertically disposed riser pipe secured to a second end of said rod for receiving an upward flow of water; and
- a hose having one end secured to said pipe to convey water therethrough.

5,749,180
GROUND ANCHOR

Thomas E. Jewett, Morrison, and Thomas B. Bird, Westminster, both of Colo., assignors to Asset Purchase Co. LLC, Commerce City, Colo.

Filed Oct. 31, 1996, Ser. No. 742,201
Int. Cl.⁶ E02D *5/80*

U.S. Cl. 52—154 **19 Claims**



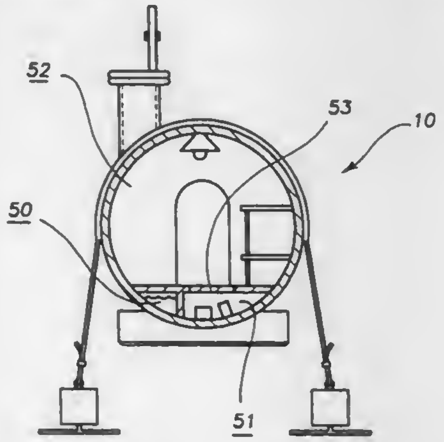
1. A ground anchor comprising:
- a leg comprising a lower portion that is connected to a lower barb and an upper portion that is connected to a fin structure, the leg further comprising two sidewalls that meet at a corner and terminate at two diverging ends, the lower barb extending upward from the lower portion of the leg at a non-vertical angle,
- the fin structure comprising a central crease disposed opposite to the corner of the leg and between two diverging fins, each of said diverging fins connected to one of said diverging ends of said sidewalls at the upper portion of the leg to form a socket between the crease and diverging fins of the fin structure and the corner and sidewalls of the leg, said lower barb providing a means for displacing soil from the socket as the ground anchor is driven into the ground.

5,749,181
UNDERGROUND EMERGENCY SHELTER SYSTEM

Michael James Bauman, P.O. Box 328, Silverhill, Ala. 36576

Filed Apr. 17, 1996, Ser. No. 633,666
Int. Cl.⁶ E04H *9/12*

U.S. Cl. 52—169.6 **18 Claims**



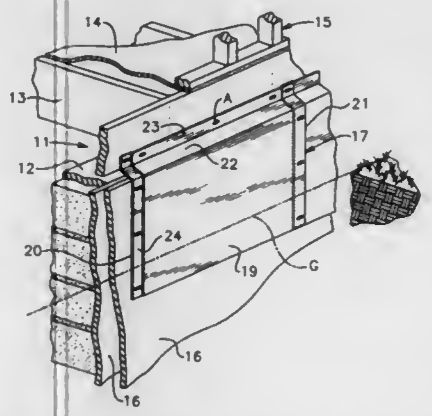
1. An underground emergency shelter system comprising:
- a shell member having a tubular central section and first and second hemispherical end sections that define a sanctuary compartment within said shell member, a waste holding tank integrally formed within said sanctuary compartment, a potable water holding tank integrally formed within said sanctuary compartment, and a dry storage compartment having a hinged access door;
- a tubular entranceway in connection with said sanctuary compartment through an outer wall of said tubular central section that extends outward from said tubular central section a distance of at least fifteen inches;
- a first air intake vent stack, in airflow connection with said sanctuary compartment, having a 180 degree arc formed in a first distal end thereof, extending radially outward from said tubular central section a distance of about fifteen inches at a farthest point;
- a first air output vent stack, in airflow connection with said sanctuary compartment, having a 180 degree arc formed in a second distal end thereof, extending radially outward from said tubular central section a distance of about fifteen inches at a farthest point;
- a second air intake vent stack; said first and second air intake vent stacks being each located on an end of said tubular central section, said first air output vent stack being positioned between said first and second air intake vent stacks;
- at least three anchor band channels extending from an outer surface of said tubular central section extending at least 180 degrees around said circumference thereof along a section of said tubular central section that includes said first air intake and first air output vent stacks;
- four spaced stabilizing feet assemblies extending tangentially from said outer surface of said tubular central section;
- six anchor assemblies, each anchor assembly including a T-shaped butterfly anchor having a central member having a cable attaching aperture formed therein at a distal end thereof;
- three flexible, stainless steel cable members having attachment fittings at either end thereof adapted for securement to one of said attachment apertures of said six T-shaped butterfly anchors;
- a chemical toilet facility in operable connection with said waste holding tank;
- an air intake system having a first electric air intake blower in airflow connection with said first air intake vent stack; and
- an air output system having an electric air output blower in airflow connection with said first air output vent stack.

5,749,182
FOUNDATION PROTECTION PANEL SYSTEM

Ronald Vavrinak, P.O. Box 15, Farmdale, Ohio 44417

Filed Feb. 21, 1997, Ser. No. 804,719
Int. Cl.⁶ E02D *19/00*

U.S. Cl. 52—169.14 **10 Claims**



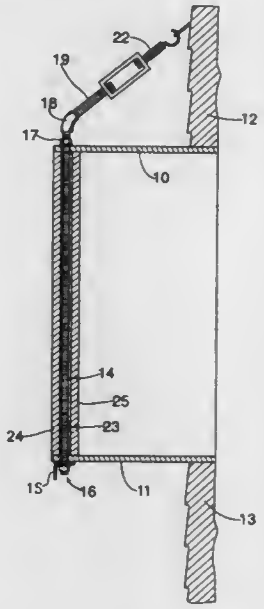
1. A foundation wall protection system on the foundation walls above grade of a building comprising; a first main protection panel made of a thin stiff material, said first main protection panel is of a generally rectangular configuration having oppositely disposed ends, an elongated offset upper portion, an upstanding engagement mounting flange extending from said offset portion, an offset tongue extending from one of said panel ends, means for securing said main protection panel to said building, a corner transition strip engaging with over adjacent panel ends of said main protection panels, means for securing said corner transition strip to said adjacent panel ends and said foundation walls, and secondary means for selectively securing said first main protection panel to said building structure.

5,749,183
BAY OR BOW WINDOW SUPPORT SYSTEM

William Wright, 163 Kiel Ave., Butler, N.J. 07405

Filed Nov. 4, 1996, Ser. No. 743,384
Int. Cl.⁶ E06B *1/38*

U.S. Cl. 52—201 **5 Claims**



1. A window support system securing a bay window to a structure having a house header, head board, and a seat board, the improvement comprising:
- (a) two vertically extending spaced apart glass panes;
- (b) a pair of vertically extending parallel and spaced apart rods disposed between said glass panes and extending the entire length thereof;
- (c) a horizontally extending support member extending across the bottom of said seat board;
- (d) fastening means securing said horizontally extending support member and said pair of vertically extending rods to said seat board;
- (e) fastening means securing said pair of vertically extending support rods to said head board;
- (f) a pipe elbow disposed about the upper end of said vertically extending rods;
- (g) a first rod threadably engaging another opening in said pipe elbow;
- (h) a turnbuckle threadably engaging the other end of said first rod;
- (i) a second rod threadably engaging the distal end of said turnbuckle;
- (j) a bolt disposed in said house header; and
- (k) means attaching said bolt to said second rod whereby when said turnbuckle is rotated in either a clockwise or counterclockwise direction the window support system gives up or takes up slack for the purpose of leveling and securing the bay window.

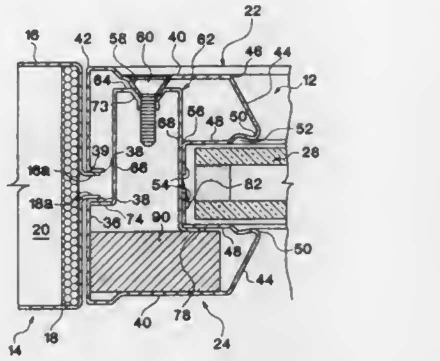
5,749,184
LIGHT FRAME SYSTEM WITH FASTENER CLIPS

H. Smith McKann, Fredericksburg, Va., assignor to General Products Company, Inc., Fredericksburg, Va.

Continuation-in-part of Ser. No. 584,550, Jan. 11, 1996, Pat. No. 5,644,874, which is a continuation-in-part of Ser. No. 415,460, Apr. 3, 1995, abandoned. This application Nov. 13, 1996, Ser. No. 747,897

Int. Cl.^{6} E06B *1/04;3/58*

U.S. Cl. 52—204.1 **11 Claims**



1. A frame assembly for a door light, comprising

inner and outer half-frames sandwiching a translucent panel therebetween, each of said half-frames having a plurality of side members defining a closed polygon;

each of said side members including, in cross-section,

a flat portion for supporting the frame in an opening in a support,

a face portion extending in a generally perpendicular direction from said flat portion toward a center of said polygon,

a third portion extending generally inwardly from said face portion toward the other half-frame to a position adjacent said translucent panel, and

a fourth portion extending from said third portion in a direction generally parallel to said face portion and away from the center of said polygon;

lips extending from said first portions and spaced from said face portions of said side members of said outer half-frame and extending generally toward the center of the polygon;

bores extending through said face portions of said inner half-frame;

clips attached to said outer half-frame, each clip being adjustably slidable along the respective side member, each said clip including

a base with an opening,

a first leg extending from said base and having first flange extending angularly therefrom and engaging the respective lip, and

a second leg extending from said base and adjacent a peripheral edge of said translucent panel and having a second flange extending angularly therefrom and engaging the respective fourth portion of said outer half-frame; and

elongated fasteners extending through said bores and said openings and engaging said clips to couple and secure said half-frames in the support opening.

5,749,185
METHOD AND APPARATUS FOR AN INTERMEDIATE ANCHORAGE OF A POST-TENSION SYSTEM

Felix L. Sorkin, P.O. Box 1503, Stafford, Tex. 77477

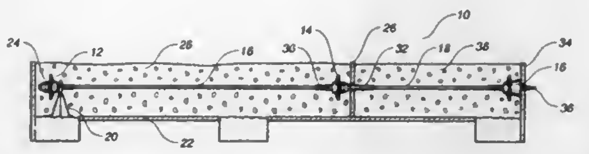
Filed Apr. 25, 1996, Ser. No. 638,973

Int. Cl.^{6} E04C *5/12*

U.S. Cl. 52—223.13 **18 Claims**

1. An intermediate anchorage for a post-tension system comprising:

an anchor member having an interior passageway extending therethrough;



a tendon extending through said interior passageway of said anchor, said tendon having a sheathed portion and an unsheathed portion extending outwardly from a first side and a second side of said anchor member;

a first split tubular member having a single split extending longitudinally therealong, said first split tabular member received at one end by said anchor member and extending over said unsheathed portion of said tendon extending outwardly from said first side of said anchor member, said first split tubular member having another end extending over said sheathed portion of said tendon extending outwardly from said first side of said anchor member, said single split of said first split tubular member having a first longitudinal edge and a second longitudinal edge, said first and second longitudinal edges being separable by a distance greater than a diameter of said tendon, said first split tubular member having a sealing means formed adjacent at least one of said longitudinal edges for forming a liguid-tight seal between said longitudinal edges; and

a second split tubular member affixed at one end to said second side of said tubular member and extending over the unsheathed portion of said tendon extending outwardly from said second side of said anchor member, said second split tubular member having another end extending over the sheathed portion of said tendon extending outwardly from said second side of said anchor member, said second split tubular member having a single split extending longitudinally therealong, said single split of said second split tubular member having longitudinal edges in overlapping relationship and separable by a distance not less than a diameter of said tendon, said second split tubular member having a sealing means formed adjacent said longitudinal edges for forming a liquid-tight seal between said longitudinal edges of said second split tubular member.

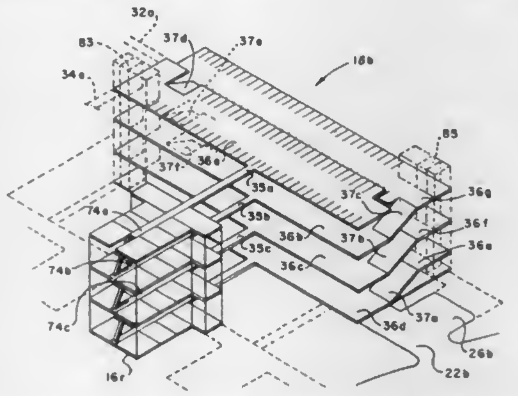
5,749,186
MULTISTORY BUILDING COMPLEX WITH ACCESS BETWEEN GARAGE PARKING DECKS AND EACH BUILDING FLOOR AT SAME ELEVATION

Mark I. Kaufman, and Donald J. Meeks, Jr., both of 15995 N. Barkers Landing, Houston, Tex. 77079

Filed Feb. 27, 1996, Ser. No. 607,872

Int. Cl.^{6} E04H *14/00*

U.S. Cl. 52—236.3 **12 Claims**



1. In combination, a multistory building having plural vertically spaced floors above ground level and multiple dwelling units on each floor, each floor of said building having corridor means extending to an entrance to each of said multiple dwelling units on each floor;

a multilevel vehicle parking garage disposed adjacent to said building and having a plurality of vertically spaced parking decks for parking vehicles thereon, respectively, at least two of said decks being disposed, respectively, at an elevation corresponding to the elevation of one of said floors, respectively;

a bridge interconnecting each of said at least two decks with said corridor means of a corresponding floor at said elevation and forming a pathway between said corridor means of said floors and the corresponding deck whereby an occupant of a unit on each of said floors may move between said unit and said corresponding deck; and

at least one elevator disposed in said garage and being movable between said decks and an article loading and unloading zone disposed adjacent said garage at ground level for moving articles between said zone and said elevator for transport of said articles between said zone and a unit of said building without a change in elevation, except in said elevator.

5,749,187
PARTITION WALL

Kazuyuki Umehara; Masayuki Uchida, and Tomoya Hasegawa, all of Tokyo, Japan, assignors to Yoshino Gypsum Co., Ltd., Tokyo, Japan

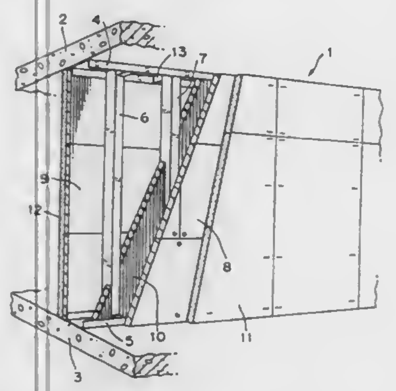
PCT No. PCT/JP95/01754, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO96/07800, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 4, 1995, Ser. No. 635,949

Claims priority, application Japan, Sep. 2, 1994, 6-209881

Int. Cl.^{6} E04B *2/28*

U.S. Cl. 52—241 **3 Claims**



1. A partition wall comprising:

a first substrate with an upper runner;

a second substrate with a lower runner;

basic face materials which are fitted to both the upper runner and the lower runner through sound insulation materials so that said basic face materials face one another in parallel relation;

studs secured to the upper runner and the lower runner, said studs being located between the basic face materials; and

hard gypsum sheets arranged on an outer side of each of said basic face materials, wherein said hard gypsum sheets comprise a gypsum core containing 0.5 to 5 parts by weight of dispersed fibers per 100 parts by weight of hemi-hydrate plaster and a base paper covering the gypsum core, and have a specific gravity ranging from 1 to 1.6, and wherein the studs are fitted to the basic face materials in a zigzag arrangement.

5,749,188
RAISED FLOOR WITH MODULAR SLABS

Maurice Belbenoit, 45, avenue du General de Gaulle, Villeneuve-sur-Yonne, 89500, France

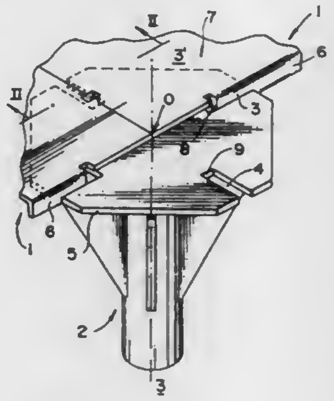
PCT No. PCT/FR94/00356, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/23152, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 30, 1994, Ser. No. 525,657

Claims priority, application France, Mar. 31, 1993, 93 03757; Mar. 31, 1993, 93 03758

Int. Cl.^{6} E04B *5/43*

U.S. Cl. 52—263 **21 Claims**



1. A raised floor comprising:

a plurality of modular slabs, each of said modular slabs having a regular polygonal shape with a plurality of sides, and a surface of the raised floor being exclusively formed of said plurality of modular slabs arranged adjacent to each other;

each of said modular slabs having a respective plate portion, forming a substantially horizontal base surface, and a plurality of substantially vertical edges extending substantially perpendicularly from said base surface;

a plurality of substantially vertically extending supports, each of said supports comprising an upper head extending substantially horizontally and forming a periphery, said upper heads supporting said base surfaces of said modular slabs;

said upper heads having a plurality of radially extending slots terminating at said respective peripheries of said upper heads; and

said modular slabs being arranged so that respective pairs of edges of abutting slabs face against each other and at least a predetermined portion of each of said pairs of edges are tightly fitted into a respective radially extending slot of one of said plurality of supports, said predetermined portion of each of said pairs of edges which are tightly fitted into a radial slot of a support comprises a radially extending elastic strip formed by a horizontal cut in each edge of said pair of edges.

5,749,189
POST DEVICE

Dan Öberg, Danderyd, Sweden, assignor to Dekont Teknik AB, Danderyd, Sweden

PCT No. PCT/SE94/00573, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO95/00708, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 13, 1994, Ser. No. 564,186

Claims priority, application Sweden, Jun. 18, 1993, 9302126

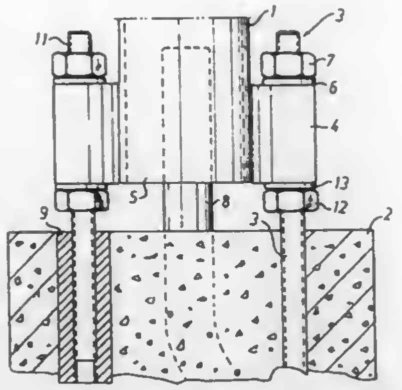
Int. Cl.^{6} E01F *9/01*

U.S. Cl. 52—298 **18 Claims**

1. A post device, yieldable when hit by a vehicle, comprising:

a foundation with a fixing device supporting at least three spaced-apart rods;

a post having a base with at least three spaced-apart fixtures rigidly fixed to an outside of the base, each fixture being slit at least partially through its thickness in a substantially longitudinal direction of said post and having embracing portions

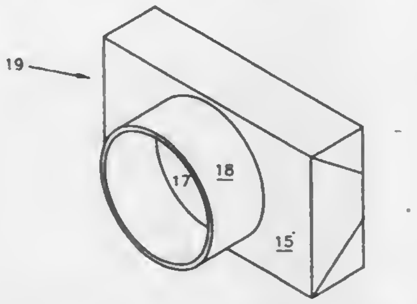


that embrace an associated one of said rods and that are able to deform when the post device is hit by a vehicle to release the associated rod from the embracing portions and allow the post device to yield without the fixture detaching from the outside of the base; and

stop devices that each engage an associated one of said rods and an upper portion of the associated fixture.

5,749,190
HVAC REGISTER BOX

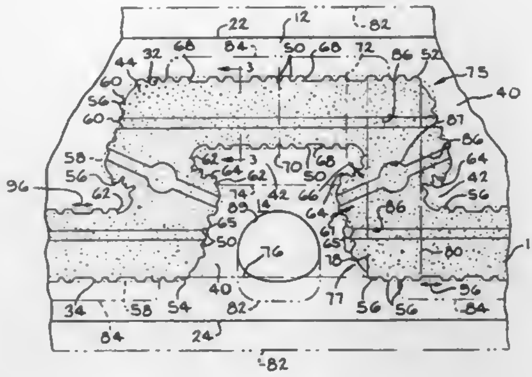
Steven Ray Williams, 8171 Ellington Ave., Hilmar, Calif. 95324
Filed Dec. 19, 1994, Ser. No. 359,063
Int. Cl.^{6} E04F *17/04*
U.S. Cl. 52—302.1 **2 Claims**



1. An HVAC register box consisting of a hollow six-sided metallic box open on one side comprised of:
- a.) four rectangular-shaped sides which meet at substantially right angles to form four corners;
- b.) a rectangular-shaped inlet-side with at least one opening for accommodating incoming HVAC ductwork;
- c.) one rectangular-shaped, open-side for receiving the register opposite to the inlet-side; and
- d.) a continuous, double-thickness, excess-metal member of triangular shape located at each said corner lying flat against an adjacent rectangular side.

5,749,191
INSULATED MASONRY MEMBER CONFIGURED TO COMPENSATE FOR MOLD WEAR

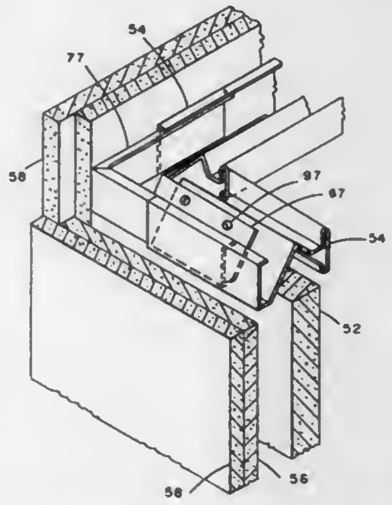
Donald T. Schmid, 10835 Park Ave., Clarence, N.Y. 14031-2242
Filed Jun. 24, 1996, Ser. No. 668,950
Int. Cl.^{6} E04B *1/74*
U.S. Cl. 52—405.1 **10 Claims**



1. A masonry unit having two opposite and parallel sidewalls each having a length and two opposite and parallel ends, said sidewalls and said ends being generally perpendicular to one another, the masonry unit comprising two spaced supporting parts extending along a length of the masonry unit sidewalls so that each supporting part defines at least a portion of a corresponding one of the masonry unit sidewalls, each of said supporting parts having an inner surface defining a side of the space between said supporting parts, an insulating malleable member positioned within and substantially filling the space between said supporting parts and having a pair of surfaces which engage said supporting part inner surfaces respectively, said supporting part inner surfaces and said insulating malleable member surfaces shaped to interlockingly engage said insulating member to said supporting parts, and means defining grooves in said insulating member surfaces to partially receive malleable adjacent land portions thereon to accommodate supporting parts which are enlarged due to mold wear.

5,749,192
CORNER CLIPS FOR HORIZONAL FRAMING

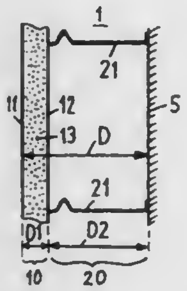
Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Charlotte, N.C.
Continuation of Ser. No. 22,590, Feb. 25, 1993, abandoned. This application Sep. 13, 1996, Ser. No. 713,612
Int. Cl.^{6} E04B *1/00*
U.S. Cl. 52—489.1 **12 Claims**



1. A horizontal stud wall corner structure comprising two vertical walls abutting one another at an angle and forming thereat a vertical wall corner, each said wall comprising a plurality of horizontal metal studs and a plurality of rigid, horizontally extending core boards disposed between said studs whereby said wall has alternating horizontal studs and horizontally extending core boards, said horizontal studs of each of said walls being at substantially the same vertical height as said horizontal studs of the other of said walls, said two walls being adjoined at said corner by a plurality of stud corner clips, each said stud corner clip having two segments extending at an angle, one to the other, equal to said angle between said walls, each of said studs comprising an inner flange, an outer flange and a web joining said inner and outer flanges, said outer flange and a portion of said web being bent to a cross-sectional shape including a confined space, said segments being each respectively affixed to one of said horizontal studs by extending into said confined space and thereby interconnecting with said stud.

5,749,193
IMPACT WALL ELEMENT

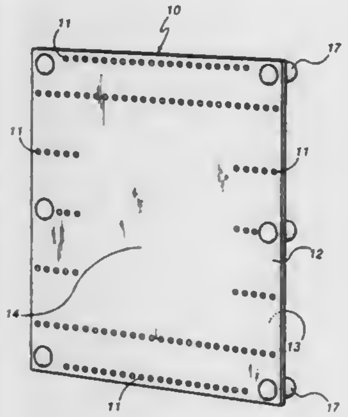
Peter Bucher, Pfäffikon, Switzerland, assignor to Bucher Leichtbau AG, Fällanden, Switzerland
Filed Sep. 14, 1995, Ser. No. 528,237
Claims priority, application Switzerland, Sep. 18, 1994, 02821/94
Int. Cl.^{6} B60R *21/055*
U.S. Cl. 52—506.06 **23 Claims**



1. An impact element comprising
- a first zone having a lightweight deformable cover plate including a thin outer cover layer, an inner cover layer and a deformable support core with cavities therein sandwiched between said outer cover layer and said inner cover layer; and
- a second zone having a plurality of plastically deformable spacing elements discretely spaced and extending from against said inner cover layer of said first zone to abut a fixed substrate to transmit impact forces on said first zone to the substrate while plastically deforming, said second zone having a thickness at least twice the thickness of said first zone.

5,749,194
SERVICE BOARD FOR MOUNTING SERVICES TO BASE MATERIAL

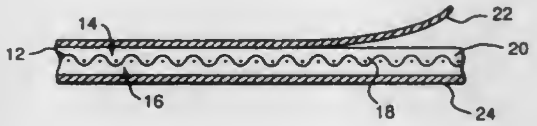
James J. Andres, 8120 Miles Rd., East Amherst, N.Y. 14051, and Ladd M. Kline, 18 Madaline La., Depew, N.Y. 14043
Filed Jan. 11, 1997, Ser. No. 802,551
Int. Cl.^{6} E41C *1/40*
U.S. Cl. 52—506.06 **3 Claims**



1. An apparatus for affixing services to a base material comprising:
- a service board having a front surface and a back surface, a plurality of standoffs, and a plurality of fastening holes passing through said front surface and back surface of said service board;
- said standoffs are cup-shaped and extending outward from said back surface of said service board.

5,749,195
SEALING MEMBRANE AND METHOD OF SEALING

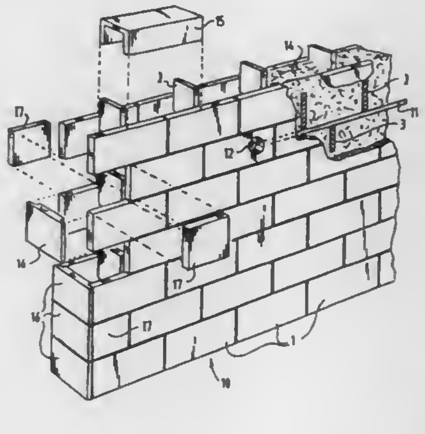
David Laventure, 97 Highview Ter., Manchester, N.H. 03104
Filed Dec. 10, 1996, Ser. No. 763,069
Int. Cl.^{6} E02D *37/00*
U.S. Cl. 52—514 **18 Claims**



1. A malleable sealing membrane for sealing at least one region of a structure, said malleable sealing membrane comprising:
- a mesh substrate having a first side and a second side, said mesh substrate including a plurality of interstices extending through said mesh substrate from said first side to said second side;
- a sealing compound coated on at least one of said first side and said second side of said mesh substrate and embedded within said plurality of interstices; and
- at least one release backing covering said sealing compound coated on said at least one of said first side and said second side of said mesh substrate, for protecting said sealing compound on said at least one of said first side and said second side prior to removing said at least one release backing.

5,749,196
BUILDING AND BUILDING ELEMENT THEREFOR

Pier Bangma, Abbega, Netherlands, assignor to Buro Eco-Home, Netherlands
PCT No. PCT/NL95/00038, § 371 Date Jul. 25, 1996, § 102(e) Date Jul. 25, 1996, PCT Pub. No. WO95/20709, PCT Pub. Date Aug. 3, 1995
PCT Filed Jan. 27, 1995, Ser. No. 682,534
Claims priority, application Netherlands, Jan. 27, 1994, 9400124
Int. Cl.^{6} E04B *1/02*
U.S. Cl. 52—561 **12 Claims**



1. Building structure of a number of construction elements each comprising two plate-like side parts having dimensions defining an outer perimeter, which are mutually connected at a distance parallel to each other by at least one connecting part which protrudes

partially outside the outer perimeter of these side parts in a certain direction and fits between side parts of an adjoining construction element, characterized in that said connecting part extends between said side parts over a distance in said certain direction of substantially half the dimension of said side parts and over a substantially equal distance outside said side parts, and said connecting parts of adjoining construction elements having spaces between each other so that the structure substantially has a plurality of mutually connected interspaces defining one continuous interspace within the structure.

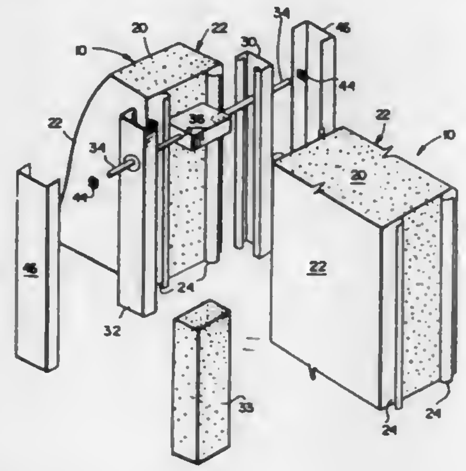
5,749,197
PANEL JOINT SYSTEM

Colin Kenneth Jolly, Southampton, England, assignor to Reddie & Grose, Hampshire, United Kingdom

Filed Jan. 21, 1997, Ser. No. 786,136

Int. Cl.⁶ E04B *1/38*

U.S. Cl. 52—584.1 **8 Claims**



1. A panel system comprising:

a plurality of panel members, each of which comprises a panel body disposed between and secured to a pair of planar facing members; each of said facing members being shaped so as to define a trough extending along at least one edge surface of said panel body and opening towards the face of the panel body to which said facing member is secured, and

means for securing adjacent panel members together edge-to-edge; said means for securing said panel members including first and second channel members each having a pair of arms joined by means of a web, the arms of each channel member, in use, engaging one in each of the troughs formed along the adjacent edge surfaces of a pair of neighbouring panel members; said means for securing adjacent panel members together further comprising first and second fastening means engageable with the first and second channel members respectively and with an insulating spacer, the first and second fastening means and the insulating spacer together extending between neighbouring panel members to fasten together the channel members on opposite sides thereof.

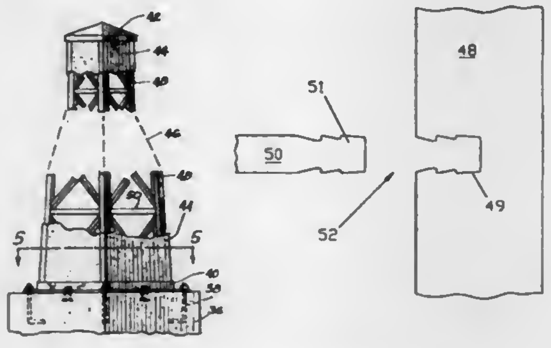
5,749,198
TAPERED COMPOSITE ELEVATED SUPPORT STRUCTURE

David W. Johnson, San Diego, Calif., assignor to Ebert Composites Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 7,079, Jan. 29, 1993, Pat. No. 5,319,901, Ser. No. 828,499, Jan. 31, 1992, Pat. No. 5,285,613, and Ser. No. 715,912, Jun. 14, 1991, Pat. No. 5,247,774, which is a continuation-in-part of Ser. No. 541,547, Jun. 21, 1990, Pat. No. 5,024,036, which is a continuation-in-part of Ser. No. 231,379, Aug. 12, 1898, Pat. No. 4,991,726, which is a continuation-in-part of Ser. No. 137,101, Dec. 23, 1987, Pat. No. 4,809,146, and Ser. No. 137,100, Dec. 23, 1987, Pat. No. 4,825,620, which is a continuation-in-part of Ser. No. 848,573, Apr. 7, 1986, Pat. No. 4,715,503, said Ser. No. 137,101 is a continuation-in-part of Ser. No. 848,573. This application Sep. 28, 1993, Ser. No. 128,800

Int. Cl.⁶ E04H *12/02*

U.S. Cl. 52—651.04 **1 Claim**



1. A high voltage electrical transmission line support structure for use in areas where maximum limits on EMF at the ground level are desirable in the vicinity of transmission lines comprising:

(a) a vertically oriented tapered trunk having a peaked top end and a bottom end, said tapered trunk having:
  (i) at least three longitudinal ribs converging from a wider stance at said bottom end to a converging peak at said top end, and,
  (ii) a plurality of cross bracing members interconnecting said ribs and substantially rigidifying same;
  (iii) a rigid external structural skin substantially completely sheathing and enclosing said ribs and cross bracing members substantially completely from said top end to said bottom end to produce a tower having an external appearance suggestive of a monolithic pole and said sheathing being integrally connected to said cross bracing members and said ribs such that said skin is monocoquely structurally reinforcing same;

(b) means for supporting at least three high-voltage wire conductors, for conducting at least partially mutually out-of-phase currents, adjacent the top portion of said tapered trunk in a predetermined configuration in which said high-voltage wire conductors are each spaced from the next closest of said wire conductors at least a minimum predetermined distance from said vertically oriented tapered support structure, at least a portion of said support structure including said external skin and substantially all of said internal cross bracing members in the vicinity of said three high voltage wire conductors being constructed of composite material permitting the compacting of said conductors whereby the resulting ground level EMF is reduced and said vertically oriented tapered support structure is formed with reduced vertical height compared to a tower constructed of steel with a comparable industry-standard voltage rating; and,

said ribs having snap-in detent structure cooperating with mating brace detent structure defined by said cross bracing members such that said ribs and cross bracing structure interconnect substantially without fasteners.

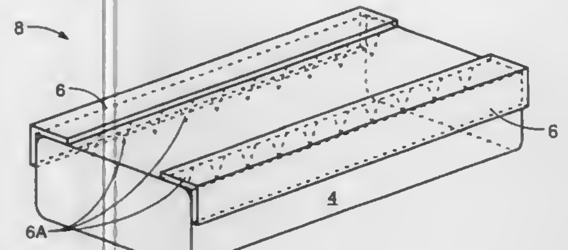
5,749,199
FIBER BALE COMPOSITE STRUCTURAL BUILDING SYSTEM

Joseph Allen, Clarkston, Wash., assignor to Bale Built, Inc., Lewiston, Id.

Filed Sep. 19, 1996, Ser. No. 715,994

Int. Cl.⁶ E04C *3/36*

U.S. Cl. 52—729.1 **44 Claims**



1. A truss having chord members and a web member, comprising:

a. a bale; and

b. a pair of trussing members operatively connected to the bale so that the trussing members form the chord members of the truss and the bale forms the web member of the truss.

5,749,200
METHOD OF REINFORCING CONCRETE MADE CONSTRUCTION AND FIXTURE USED THEREFOR

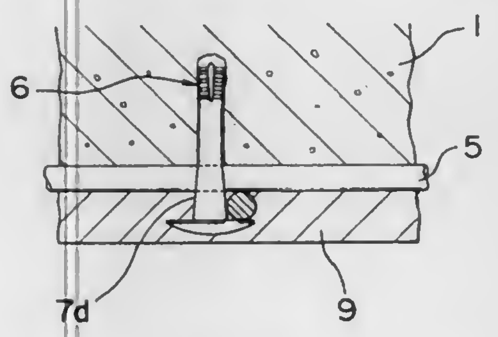
Katsumi Fukuoka, Fukuoka, Japan, assignor to Kyouryou Hozen Inc., Fukuoka, Japan

Filed Jun. 5, 1996, Ser. No. 658,570

Claims priority, application Japan, Jun. 14, 1995, 7-172810

Int. Cl.⁶ E04B *1/00*

U.S. Cl. 52—741.1 **16 Claims**



1. A method of reinforcing a concrete construction, comprising the steps of:

(1) providing a reinforcing grating member,

(2) providing a fixture having (a) an anchor having two ends, including an insertion portion at one end of the anchor, a head portion formed at the other end of the anchor, an expanding slot formed at one end of the insertion portion away from the head, a through hole formed axially through the anchor, and a tapered portion disposed between the insertion portion and the head portion and having a cross sectional area increasing from the insertion portion to the head portion; and (b) a pin constructed to fit in said through hole; and

(3) fixing the grating member to a surface of the concrete construction with the fixture, whereby the tapered portion of the fixture is in contact with the grating member and a tension force is imparted to the grating member in a plane of the grating member.

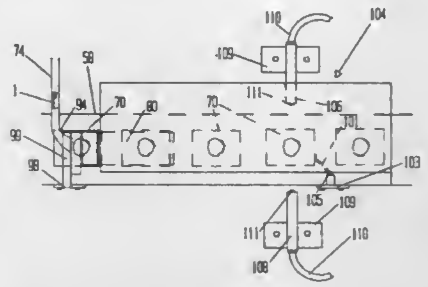
5,749,201
LASER BONDED TAMPER PROOF PRESS-ON CAP AND SEAL

Benjamin Cochrane, P. O. Box 835, Danville, Calif. 94526

Filed Aug. 19, 1996, Ser. No. 699,166

Int. Cl.⁶ B65B *3/00*

U.S. Cl. 53—281 **5 Claims**

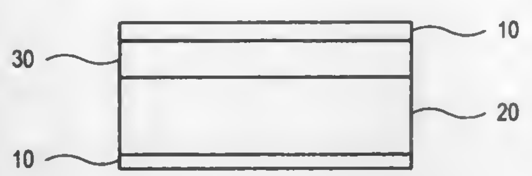


1. In a bottling line having a filling station for filling plastic bottles with comestible liquids, each of the bottles having an open neck at its upper end with a neck finish including a plurality of grooves extending circumferentially about the neck, said bottling line including a capping station for capping the filled bottles with press-on plastic caps, each cap having a top disc and a downwardly dependent skirt with sealing beads on the inner wall of said skirt to seat into said bottle neck finish grooves, said bottling line including a bottle conveyor for transporting empty plastic bottles to said bottle filling station, with the bottle filling station having an automated bottle filler with a plurality of filler valves with means to move the valves into registration with the open necks of respective bottles delivered by the conveyor and including filler controls for metering a measured quantity of said comestible liquid into the bottle and including a filled bottle conveyor to received filled bottles from said filler station and transport the filled bottles in single file to said capping station, with the capping station including a cap conveyor to deliver, place and secure a single cap on each of the filled bottles during their transport on said filled bottle conveyor, the improvement comprising:

a. said press-on plastic bottle caps each having an annular tear band defined by a pair of spaced apart circumferential grooves about said skirt to permit the user to separate the cap into a top reclosure cap and a bottom tamper proof ring, and at least two sealing beads extending circumferentially about the internal wall of said skirt, at least one of which is located above said tear band;

b. a cap to bottle bonding station incorporated into said bottling line following said capping station and including:
  1. at least two laser beam end effectors comprising an internally reflecting light tube terminating in a laser beam focusing element which are spaced at opposite sides of said filled bottle conveyor and are positioned to discharge a focused laser beam on said tamper proof ring of each of said plastic caps when the respective filled and capped bottle is at a target location between said effectors, during the transport of the filled and capped bottles on said filled bottle conveyor; and
  2. a laser beam generator and controller including a power supply, controller and multiplexer with multiple fiber optic beam delivery cables extending from said generator and controller to each of said laser beam end effectors to apply at least two laser-welded spots at a circumferentially spaced-apart angular increment about said tamper proof ring to bond said ring to said neck of said plastic bottle.

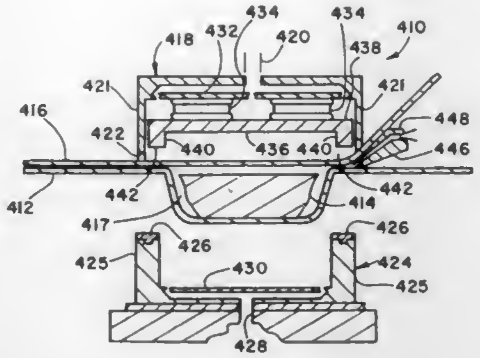
5,749,202
STRETCH WRAP FILMS
George Elchbauer, Fairport, N.Y., assignor to Tenneco Packaging, Evanston, Ill.
Filed Mar. 12, 1996, Ser. No. 614,299
Int. Cl.^{6} B65B *53/00*
U.S. Cl. 53—399 **54 Claims**



32. A method for stretch wrapping an item, comprising:
wrapping the item with a multilayer, thermoplastic stretch wrap film containing at least four polymeric film layers, said film comprising:
(a) a first outer polymeric film layer comprising a linear low density polyethylene resin having a density from about 0.89 to about 0.94 g/cm^3 and having a melt index of from 1 to 10 g/10 min., said resin containing from about 2 to about 8 weight percent n-hexane extractibles;
(b) a second outer polymeric film layer comprising a linear low density polyethylene resin having a density from about 0.89 to about 0.94 g/cm^3 and having a melt index of from 1 to 10 g/10 min., said resin containing from about 2 to about 8 weight percent n-hexane extractibles;
said first and said second outer film layers having a cling force to each other of at least about 140 grams/inch as determined by ASTM D5458-94;
(c) a puncture resistant, inner polymeric film layer, located between said first and second outer layers, said puncture resistant layer comprising at least 40 weight percent of a polyethylene copolymer or terpolymer resin, said polyethylene resin having a polydispersity of from 1 to 4, a melt index of from 0.5 to 10 g/10 min., and a melt flow ratio (I_{20}/I_2) of from 12 to 22; and
(d) a tear resistant, inner polymeric film layer, located between said first outer layer and said puncture resistant inner layer, said tear resistant layer comprising a high pressure low density polyethylene resin having a density of from about 0.90 to about 0.935 g/cm^3 and a melt index of from about 0.5 to 10 g/10 min.;
wherein said stretch wrap film has a transverse direction tear resistance of at least 500 g/mil, a machine direction tear resistance of at least about 175 g/mil, and a F-50 dart drop value of at least 150 g/mil. as determined by ASTM D1709.

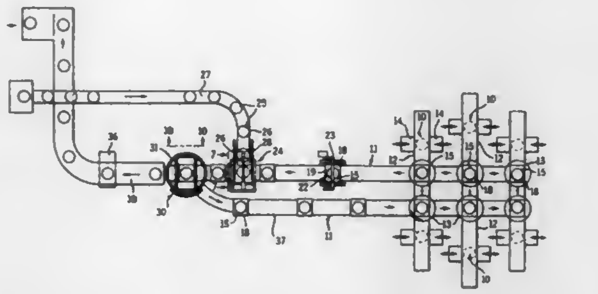
5,749,203
METHOD OF PACKAGING A MEDICAL ARTICLE
James Earl McGowan, Jr., Tucson, Ariz., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sep. 23, 1994, Ser. No. 311,669
Int. Cl.^{6} B65B *31/02*
U.S. Cl. 53—432 **42 Claims**

32. A method of sterilizing an article comprising:
placing the article into a formed bottom web;
forming a housing by overlying the formed bottom web containing the article with a top web;
partially closing the housing containing the article;
positioning a gas nozzle within the housing containing the article;
evacuating, through the gas nozzle, at least some of the gases within the housing containing the article, wherein the pressure within the housing at the conclusion of the evacuation step is between about 30 to about 100 millibars of mercury;
introducing, through the gas nozzle, steam and a sterilizing gas into the evacuated housing, wherein the pressure within the housing at the conclusion of the introducing step is between 300 and 700 millibars of mercury and wherein the percent, by volume, of sterilizing gas present in the housing is at least 4%;



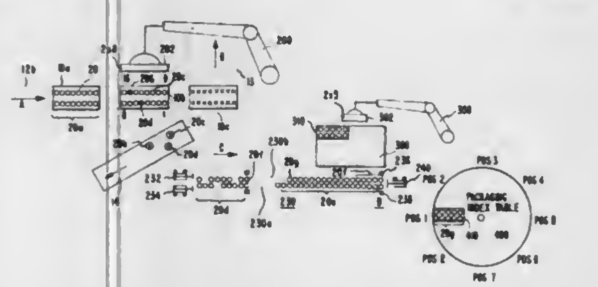
removing the gas nozzle and closing the sterilizing gas containing housing; and
heating the closed housing containing the sterilizing gas to between about 120° Fahrenheit to about 140° Fahrenheit for at least about four hours,
wherein the concentration of sterilizing gas at the conclusion of the introducing step is about 10% or less by volume of the housing.

5,749,204
BULK CHEESE TRANSFER AND CONTAINERIZING SYSTEM
Paul R. Bokelmann, Fond du Lac; Thomas R. Schumacher, Marshall, and Arvid E. Winberg, Fond du Lac, all of Wis., assignors to Damrow Company, Inc., Fond du Lac, Wis.
Filed Sep. 10, 1996, Ser. No. 712,054
Int. Cl.^{6} B65B *3/04;25/06*
U.S. Cl. 53—471 **24 Claims**



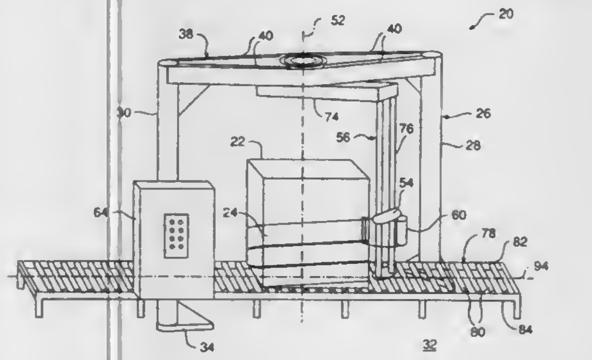
8. A method for containerizing bulk cheese comprising the steps of:
(1) providing a first container having an enclosing outer wall and a false bottom movable vertically inside the outer wall;
(2) positioning the first container below the lower end of a vertically formed cheese;
(3) positioning the false bottom in contact with the lower end of the cheese on a reciprocable support extended vertically through the container from below;
(4) lowering the support to bring the false bottom and a portioned length of the cheese into the first container;
(5) placing an inverted open top second container over the first container and the length of cheese therein;
(6) inverting the containers and cheese;
(7) vertically separating the first container from the cheese and the second container so the cheese remains in the second container; and,
(8) closing the open top of the second container to enclose the cheese therein.

5,749,205
AUTOMATED APPARATUS AND METHOD FOR CONSOLIDATING PRODUCTS FOR PACKAGING
Russell James Edwards; Mary Louis Dolan, both of Jacksonville, Fla.; Svend Christensen, Allinge; Borge Peter Gundersen, Tikob, both of Denmark; John Mark Lepper, Jacksonville, Fla.; Daniel Tsu-Fang Wang, Jacksonville, Fla.; Richard Wayne Abrams, Jacksonville, Fla., and Thomas Christian Ravn, Helsignor, Denmark, assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.
Division of Ser. No. 257,791, Jun. 10, 1994, Pat. No. 5,528,878. This application Jun. 5, 1995, Ser. No. 464,243
Int. Cl.^{6} B65B *35/30*
U.S. Cl. 53—542 **10 Claims**



1. A consolidation buffer for consolidating a plurality of products having random variations in product arrangement, said buffer comprising:
(a) at least one vacuum rail, said vacuum rail having a vacuum plenum, an input end and an output end, said vacuum rail receiving a plurality of products with random variations in the arrangement thereof at said input end, said vacuum plenum having at least one aperture therein to enable a vacuum drawn in said plenum to lightly grip a product placed on said rail;
(b) at least one product follower mounted for reciprocal movement along said rail from said input end to said output end, said product follower engaging products placed on said rail when reciprocating and sliding them along said rail from said input end to said output end to consolidate said plurality of products;
(c) a longitudinal drive for reciprocating said product follower along said rail; and
(d) a sensor for determining the presence of product at the output and of said rail, and initiating a signal for said longitudinal drive to reciprocate said product follower to said input position.

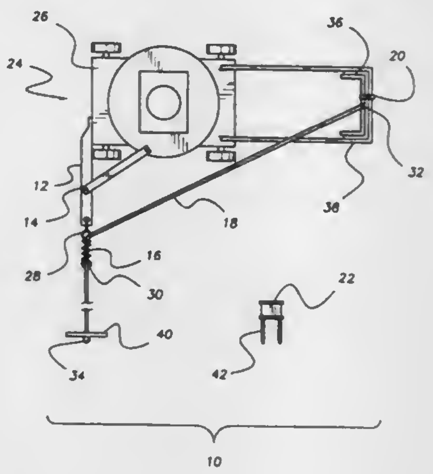
5,749,206
STRETCH WRAPPING APPARATUS
Phillip Moore, Mount Washington; Patrick R. Lancaster, and Robert Denley, both of Louisville, all of Ky., assignors to Lantech, Inc., Louisville, Ky.
Filed Nov. 9, 1995, Ser. No. 555,824
Int. Cl.^{6} B65B *53/00*
U.S. Cl. 53—556 **13 Claims**



9. A stretch wrapping apparatus for stretch wrapping a load with a stretch wrapping material, the apparatus comprising:
a dispenser for dispensing the stretch wrapping material;
means for rotating the dispenser around an axis of rotation to wrap the stretch wrapping material around the load;
a conveyor for transferring the load to and from a wrapping area, the conveyor having two sides and defining a centerline therebetween that intersects the axis of rotation; and
a frame for supporting the dispenser, the frame having only two upright legs, each of the legs being disposed adjacent one of the sides of the conveyor and being spaced from a line perpendicularly intersecting the conveyor centerline at the axis of rotation and positioned diagonally across the conveyor.

5,749,207
LAWN MOWER PILOTING SYSTEM
Wayne E. Coats, 1635 N. Columbia Pl., Tulsa, Okla. 74110-2619

Filed Mar. 28, 1996, Ser. No. 623,252
Int. Cl.^{6} A01B *69/00;* **A01D** *34/78*
U.S. Cl. 56—10.2 A **20 Claims**



1. A lawn mower piloting system connectable to a self-propelled lawn mower having a mower handle and a kill switch including a kill switch handle, said lawn mower piloting system comprising:
a first rigid member detachably connectable to the mower;
a second rigid member detachably connectable to the mower and connected to said first rigid member;
a spring having a first spring end and a second spring end, said first spring end being connected to an end of said first rigid member;
a flexible tension member having a first end and a second end, said first end being connectable to the kill switch handle of the mower, said flexible tension member being threaded through said spring, said flexible tension member being connected to said second spring end between said first end and said second end; and
a hitch pin detachably securable about the kill switch handle and the mower handle for maintaining the kill switch handle in an operational position.

5,749,208
MOWING APPARATUS

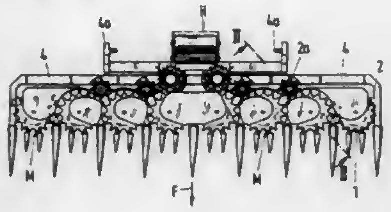
Richard Wuebbels, Borken, and Alfons Resing, Stadtlohn, both of Germany, assignors to Maschinenfabrik Kemper GmbH, Stadtlohn, Germany

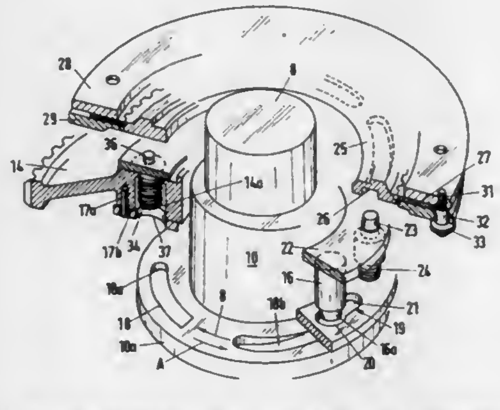
Filed Sep. 26, 1996, Ser. No. 720,283

Claims priority, application Germany, Sep. 30, 1995, 295 15 634.1

Int. Cl.^{6} A01D *34/76*

U.S. Cl. 56—10.3 **14 Claims**





1. A mowing apparatus for driving a mowing implement rotatable about a vertical axis, said mowing apparatus comprising a housing, a drive shaft rotatable in said housing, a rotatable implement drive member in said housing and operable to effect rotation of said mowing implement, a freewheel means in said housing, said freewheel means including a freewheel ring element mounted on said drive shaft to preclude relative rotary movement between said drive shaft and said freewheel ring element, said freewheel means further comprising a movable drive means moveable between a connect position providing a driving connection between said freewheel ring element and said implement drive member and a disconnect position which disconnects the driving connection between said implement drive member and said freewheel ring element upon stoppage of said drive shaft, said moveable drive means being in a lowered position when in said connect position and in a lifted position when in said disconnect position, said freewheel ring element being operable to lift said moveable drive means from said lowered position to said lifted position, and braking means activated when said movable drive means is in said disconnect position for braking rotation of said implement drive member.

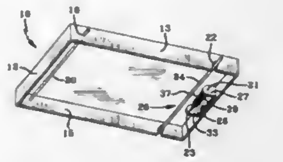
5,749,209
SINGLE LEVER HEIGHT ADJUSTMENT MECHANISM AND METHOD FOR A LAWN MOWER

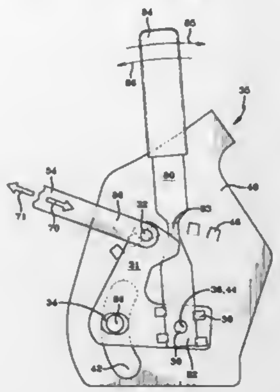
Scott Thomason, Maple Heights, Ohio, assignor to MTD Products Inc, Cleveland, Ohio

Filed Sep. 5, 1996, Ser. No. 708,372

Int. Cl.^{6} A01D *34/68*

U.S. Cl. 56—17.2 **21 Claims**





10. A height adjustment mechanism for adjusting the height of an associated apparatus at two axles, the apparatus having front and back axles each having first and second ends, the apparatus also having a body with first and second sides each having a front axle opening and a back axle slot, the first and second ends of the front axle received within the front axle openings of the first and second sides, the first and second ends of the back axle rotatably received within the back axle slots of the first and second sides, the height adjustment mechanism comprising:

a first adjustment bracket, said first adjustment bracket being fixedly attached to the first side of the body, said first adjustment bracket having a third axle slot for rotatably receiving the first end of the back axle;

a first back pivot assembly having a first back pivot arm and a first back pivot bolt, said first back pivot arm having a first back arm axle slot for rotatably receiving the first end of the back axle, said first back pivot arm also having a first back pivot hole for rotatably receiving said first back pivot bolt, said first back pivot bolt operatively attached to the first side of the body, said first back pivot arm selectively pivotable about said first back pivot bolt;

a first front pivot arm having a first wheel hole for rotatably receiving an associated wheel, the first end of the front axle being fixedly connected to said first front pivot arm, said first front pivot arm pivotable about the first end of the front axle;

a second front pivot arm having a first wheel hole for rotatably receiving an associated wheel, the second end of the front axle being fixedly connected to said second front pivot arm, said second front pivot arm pivotable about the second end of the front axle;

connecting means for connecting said first back pivot arm to said first front pivot arm;

adjusting means for selectively adjusting said first back pivot assembly; and,

securing means for securing said adjusting means to said first adjustment bracket.

5,749,210
CREEL WITH TWO-FOR-ONE TWISTING UNITS

Koichi Kikuchi, and Tadashi Tukamoto, both of Shimada, Japan, assignors to Kikuchi Kogyo Co., Ltd., Shizuoka, Japan

PCT No. PCT/JP95/00496, § 371 Date Oct. 9, 1996, § 102(e) Date Oct. 9, 1996, PCT Pub. No. WO96/10664, PCT Pub. Date Apr. 11, 1996

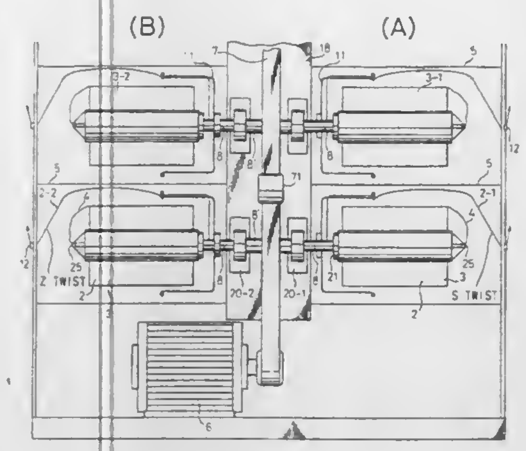
PCT Filed Mar. 17, 1995, Ser. No. 596,288

Claims priority, application Japan, Oct. 3, 1994, 6/239183

Int. Cl.^{6} D01H *1/10*

U.S. Cl. 57—58.49 **10 Claims**

1. A creel comprising a plurality of spindles rotatably held on a frame, each carrying bobbins on which non-twisted yarns are wound, wherein the non-twisted yarns withdrawn from the bobbins are twisted and the thus-twisted yarns are arranged in parallel to each other to form a yarn sheet, characterized in that each of the spindles has a horizontal rotary shaft section which is rotatably supported at a center portion of said rotary shaft on a creel frame via bearings, and a bobbin carrying section provided on the respective side of the rotary shaft section for carrying the bobbin on which the non-twisted yarn is wound; a suitable driving means is provided and engaged with the rotary shaft section; and a two-for-one twisting device is provided on the bobbin carrying section.



5,749,211
FIBER-REINFORCED PLASTIC BAR AND PRODUCTION METHOD THEREOF

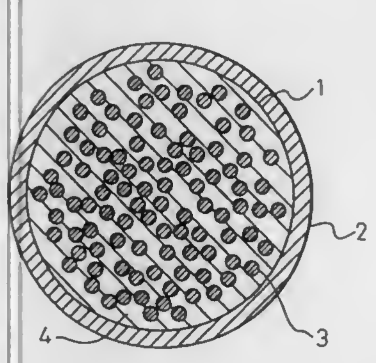
Hiromi Kimura; Kanji Yamada, and Yasuhiro Hirato, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 256,271, Jul. 5, 1994, abandoned. This application Jul. 1, 1996, Ser. No. 674,299

Claims priority, application Japan, Nov. 6, 1992, 4-321382

Int. Cl.^{6} D02G *3/36*

U.S. Cl. 57—217 **2 Claims**



1. A method for producing a fiber-reinforced plastic bar comprising:

providing a fiber bundle comprising high strength continuous fiber;

impregnating said fiber bundle with uncured thermosetting resin;

forming a core member having a core surface from at least one fiber bundle;

providing a spun yarn spun from polypropylene fiber having a shrinkage ratio of at least 5% under curing heat-treatment conditions of the resin;

braiding said spun polypropylene fiber yarn on said core surface in a manner such that said spun polypropylene yarn covers at least 60% of said core surface;

heat treating said braided core to cure said thermosetting resin; and

shrinking said polypropylene fiber at least 5% during the curing heat-treatment.

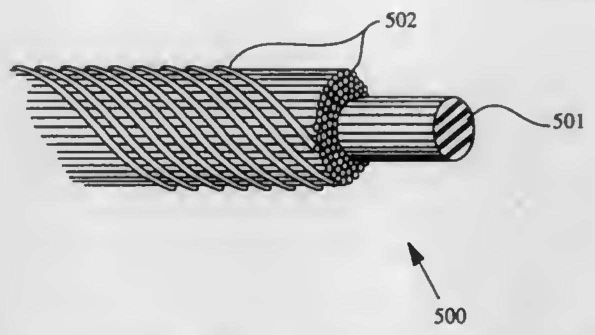
5,749,212
ELASTOMERIC CORE/STAPLE FIBER WRAP YARN

John Joseph M. Rees, Signal Mountain, Tenn., and Leonard L. Hixon, Jr., Dalton, Ga., assignors to Dixy Yarns, Inc., Chattanooga, Tenn.

Filed Jun. 6, 1995, Ser. No. 470,209

Int. Cl.^{6} D02G *3/02;3/36*

U.S. Cl. 57—225 **19 Claims**



1. A substantially twistless core/wrapped elastic yarn product, comprising:

a unitary filament elastomeric core yarn; and

staple fibers in a substantially untwisted non-yarn form provided contiguously around said elastomeric core, wherein an inner portion of said staple fibers extends in substantially the same direction as said elastomeric core, and an outer wrapper portion of said staple fibers is generally helically wound around and holds said inner portion of said staple fibers on said elastomeric core.

5,749,213
PROCESS AND DEVICE TO CONNECT A NEGATIVE-PRESSURE CHANNEL TO A NEGATIVE-PRESSURE LINE IN TEXTILE MACHINES

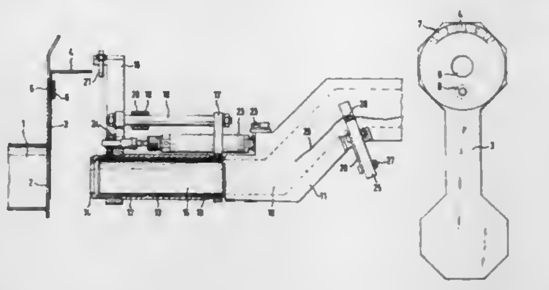
Adalbert Stephan, Beilngries, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed Jun. 25, 1996, Ser. No. 670,404

Claims priority, application Germany, Jul. 22, 1995, 195 26 837.7

Int. Cl.^{6} D01H *11/00;13/26*

U.S. Cl. 57—304 **13 Claims**



1. A negative pressure system for a textile machine having a plurality of adjacently disposed work stations, said pressure system comprising:

a negative pressure channel extending alongside said textile machine, said channel comprising an opening at each said work station;

a swiveling flap disposed at each said opening to cover said opening in an airtight manner in a closed position and to uncover said opening in an open position thereof;

a traveling service unit configured to travel alongside said textile machine, said service unit further comprising an operable member for swiveling said swiveling flap, said operable member movable from a starting position on said service unit in a direction substantially traverse to direction of movement of said travel unit towards said flap to engage and swivel said flap to said open position, said operable member releasing said flap upon moving back to said starting position; and

a movable line segment configured with said traveling service unit to move into an engaging configuration with said opening after said operable member swivels said flap to said open position so as to connect said negative pressure channel to said service unit.

5,749,214
BRAIDED OR TWISTED LINE

Roger B. Cook, 16708 255th Ave., Spirit Lake, Iowa 51360
Filed Oct. 4, 1996, Ser. No. 725,995
Int. Cl.⁶ D02J *1/22*

U.S. Cl. 57—310 **43 Claims**

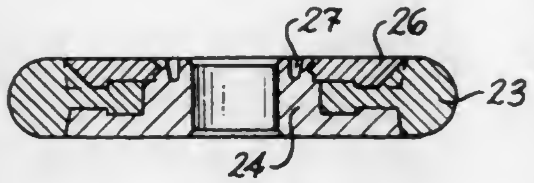
1. A process for increasing tenacity in a twisted or braided fishing line made of gel spun polyolefin yarns, said process comprising

stretching a braided or twisted line of 3–64 gel spun polyolefin yarns, wherein each yarn is within the range from about 20 denier to about 1000 denier, at a temperature within the range from about 110° C. to about 150° C. and at a total draw ratio within the range from about 1.0 to about 2.0.

5,749,215
ROTATOR ASSEMBLY

Edward F. Harrison, Jr., and J. Bennette Cornwell, III, both of Greenville, S.C., assignors to Hurley & Harrison, Inc. (the New Entity), Greenville, S.C.
Continuation of Ser. No. 552,252, Nov. 2, 1995, abandoned, which is a continuation of Ser. No. 350,659, Dec. 7, 1994, abandoned, which is a division of Ser. No. 273,777, Jul. 12, 1994, Pat. No. 5,400,507, which is a continuation of Ser. No. 966,302, Oct. 26, 1992, abandoned. This application Oct. 1, 1996, Ser. No. 724,158
Int. Cl.⁶ D02G *1/06*

U.S. Cl. 57—337 **2 Claims**



1. A rotator assembly having a central bore therethrough for receipt of a shaft around which said assembly rotates, said central bore having a substantially constant cross-section, said rotator assembly comprising:

two disc-shaped base members, each said disc-shaped member defining a central bore therethrough and having outer circumferential edges;

a disc-shaped middle section defining a central opening therethrough and having a tubular circumferential exterior surrounding a decreased thickness portion having first and second faces, said middle section matingly fitted between said base members with the tubular exterior extending beyond and overlapping said outer circumferential edges of said base members, said base members contacting one another through said central opening of said middle section and each said base members fitting against one of said first and second faces of said decreased thickness portion of said middle section causing said rotator assembly to have flush faces;

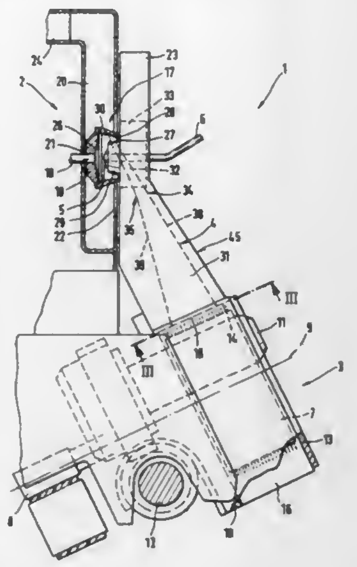
whereby said two base members and said middle section fit together in a mating fashion; and

said central bore of said rotator assembly being formed by walls of said central bore of at least one of said two disc-shaped base members.

5,749,216
OPEN END SPINNING APPARATUS

Kurt Lang, Lauterstein, and Friedbert Schmid, Ueberkingen, both of Germany, assignors to Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH, Suessen, Germany
Filed Mar. 14, 1997, Ser. No. 818,307
Int. Cl.⁶ D01H *4/00*

U.S. Cl. 57—413 **19 Claims**



1. An open-end spinning arrangement comprising a spinning rotor arranged in a rotor housing, to which a vacuum of at least 500 mm water column is applied, also comprising an opening roller arranged in an opening roller housing, and further comprising a tapering fibre feed channel for feeding fibres, which fibre feed channel starts with an entry opening in the opening roller housing and ends in the rotor housing with an outlet opening, which has a cross sectional area of at least 19 mm² and is directed onto a sliding wall of the spinning rotor, said sliding wall being disposed between a fibre collecting groove and an open edge of the spinning rotor, wherein the fibre feed channel has a bend in the direction of the fibre collecting groove and wherein the cross sectional area of the outlet opening amounts to at least 30% of the cross sectional area of the entry opening.

5,749,217
LOW EMISSION COMBUSTION SYSTEM FOR A GAS TURBINE ENGINE

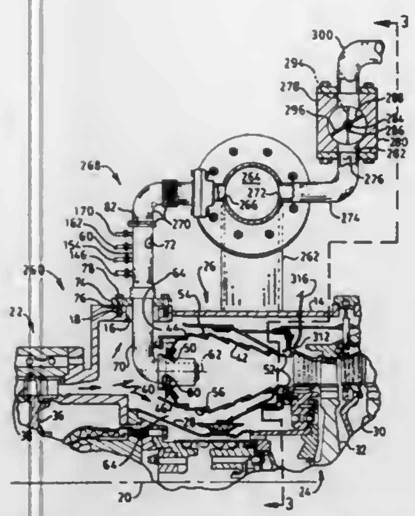
Colin J. Etheridge, Chula Vista, Calif., assignor to Caterpillar Inc., Peoria, Ill.
Division of Ser. No. 94,205, Dec. 26, 1991, Pat. No. 5,457,953. This application Apr. 26, 1995, Ser. No. 427,920
Int. Cl.⁶ F02C *9/18*

U.S. Cl. 60—39.23 **6 Claims**

1. A combustor adapted for use in an engine, said engine having an outer housing, a compressor positioned within the outer housing and having a flow of compressed air exiting therefrom during operation of the engine and a turbine positioned within the outer housing and being connected in driving relationship to the compressor; said combustor comprising:

an outer shell positioned within the outer housing, an inner shell positioned inwardly of the outer shell, an inlet end connected to the compressor and an outlet end connected to the turbine;

a plurality of injection nozzles being generally positioned within the inlet end and being supported from the outer housing, each of said injection nozzles having a combustor end portion, an exterior end portion and a main air passage extending between the ends; one of said main air passage and a secondary air passage having a preestablished area through which a portion of the compressed air flows; and an orifice having a preestablished area communicating with the main air passage and through which a portion of the compressed air passes while being vented;



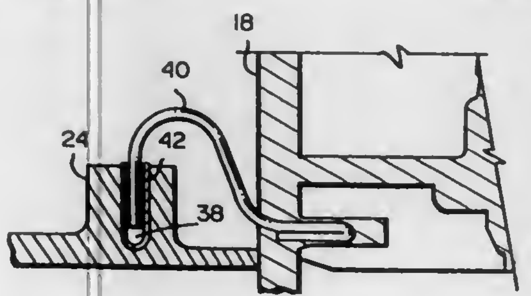
a source of fuel being connected with the one of the main air passage and the secondary air passage; and

means for reducing the flow of compressed air through the main air passage from entering into the combustor by venting a portion of the compressed air through the orifice to a common manifold.

5,749,218
WEAR REDUCTION KIT FOR GAS TURBINE COMBUSTORS

Robert H. Cromer, Johnstown, N.Y., and Kenneth B. Potter, Simpsonville, S.C., assignors to General Electric Co., Schenectady, N.Y.
Continuation-in-part of Ser. No. 169,134, Dec. 17, 1993, abandoned, Ser. No. 169,135, Dec. 17, 1993, abandoned, Ser. No. 169,133, Dec. 17, 1993, abandoned, Ser. No. 169,120, Dec. 17, 1993, abandoned, and Ser. No. 169,121, Dec. 17, 1993, abandoned. This application Sep. 28, 1995, Ser. No. 535,864
Int. Cl.⁶ F02C *7/20*

U.S. Cl. 60—39.31 **14 Claims**



1. A wear reduction kit for a combustion system of a turbine comprising:

a) a plurality of U-shaped inserts for use with a gas turbine transition piece having a peripheral end frame at one end thereof, said peripheral end frame having a continuous U-shaped peripheral slot therein, open in a radially outward direction wherein said plurality of U-shaped inserts are sized and shaped for insertion within said peripheral slot, and further wherein said U-shaped inserts are formed of material having a hardness greater than said end frame;

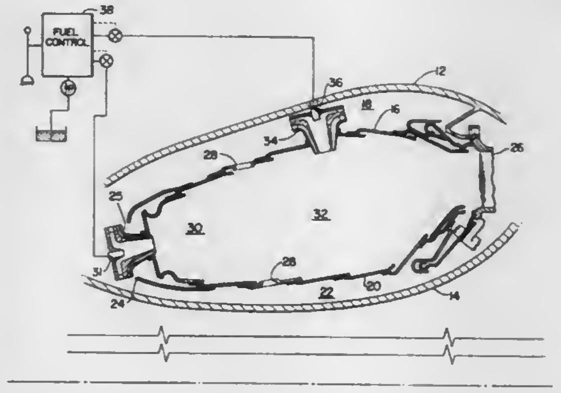
b) at least a pair of substantially H-shaped guide block elements for use in securing a transition piece of a gas turbine combustor to a transition piece support, wherein each of said guide block elements is securable to said transition piece and adapted for engagement with a respective pair of cooperating guide finger elements secured to said support; and at least a pair of covers for said pair of guide finger elements, and wherein said guide block elements are formed of material having a hardness greater than said finger element covers; and

c) cooperating combustor flow sleeve and combustor liner stop elements wherein the first stop element is adapted to be secured to a combustor flow sleeve and said liner stop element is adapted to be secured to a combustion liner, wherein said first and second stop elements have cooperating engagement surfaces, said engagement surfaces of said flow sleeve stop element having a hardness less than the engagement surfaces of said liner stop element.

5,749,219
COMBUSTOR WITH FIRST AND SECOND ZONES

Thomas L. DuBell, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Nov. 30, 1989, Ser. No. 443,549
Int. Cl.⁶ F02C *3/08; 1/00*

U.S. Cl. 60—39.36 **3 Claims**



1. An annular combustor having a first axially extending, annular shaped liner, a second axially extending, annular shaped liner concentrically mounted to and spaced from said first liner, said first liner and said second liner defining an annular chamber where combustion ensues, a dome interconnecting said first liner and said second liner at the forward end for enclosing said forward end, the aft end of said annular chamber being opened for flowing the products of combustion, spaced inner casing and outer casing surrounding said first liner and said second liner and defining a pair of cavities for receiving cooling air, said annular chamber having a first combustion zone at the forward end of said annular chamber, at least a first fuel nozzle mounted in said dome for issuing fuel into said first combustion zone, at least a first air swirler in said dome for issuing air into said first combustion zone, an opening in said liner for radially flowing cooling air into said first combustion zone, a second combustion zone immediately downstream relative to the flow of combustion products of said first combustion zone and axially spaced from said opening, a second fuel nozzle in said first liner for issuing fuel directly into said second combustion zone at a predetermined combustor operation after said first combustion zone is in operation, a second air swirler in said first liner for radially issuing the only air for fuel/air mixing into said second combustion zone, and means responding to said predetermined combustor operation for controlling the flow of fuel into said second fuel nozzle to match the fuel/air ratio of the combustion products leaving the first combustion zone.

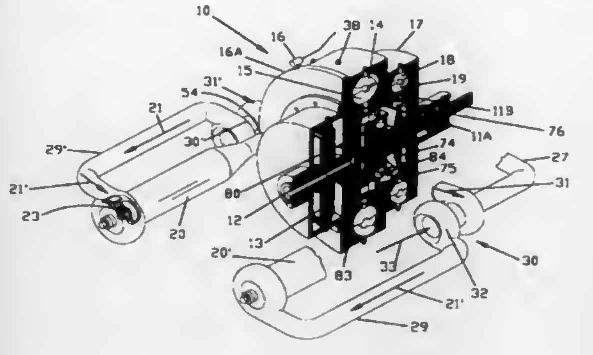
5,749,220
TURBOCHARGED RAM TORNADO ENGINE WITH TRANSMISSION AND HEAT RECOVERY SYSTEM

William Herbert Batchelor, Melbourne, Fla., assignor to Devine Rendezvous, Providenciales, Turks/Caicos Islands

Continuation-in-part of Ser. No. 5,262, Oct. 13, 1995. This application Feb. 7, 1996, Ser. No. 597,945

Int. Cl.^{6} F02C *3/00*

U.S. Cl. 60—39.75 **4 Claims**



1. A turbocharged, ram tornado engine comprising:
- a first and second combustor jet,
- a first and second engine case having two annular chambers, and an assembly of a first and second turbine wheel mounted on a first and second shaft for rotation, and fins mounted on said first and second turbine wheels and within said annular chambers to form an air/gas/steam screw to convert the flow of gases exiting from said first combustor jet into a tornado formation thus increasing the speed of said gases to sufficient velocity to create lift on said fins and accelerated rotary movement of said turbine wheels,
- water injection means connected to said engine case for injecting water into said tornado swirl for creating steam and cooling said gases,
- transmission means mounted on said second shaft within a chamber inside said engine for transmitting power to an external load, through the medium of a fluid serving also as a liquid balancing and cooling agent for said turbine wheels,
- turbocharger means connected between said first and said second engine cases for removing exhaust from said first chamber and connected to said first combustor jet for providing fresh air to said first combustor jet, and
- a muffler/water recovery means attached to said second engine case for removing exhaust, and condensing and recovering water injected into said engine.

5,749,221
AIR-FUEL RATIO CONTROL SYSTEM AND METHOD THEREOF

Izuru Kawahira, Musashino, and Yoshihiko Miyachi, Kunitachi, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

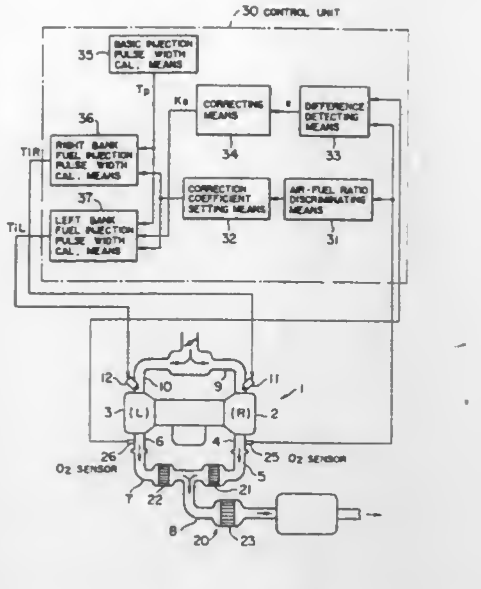
Continuation of Ser. No. 383,378, Feb. 3, 1995, abandoned. This application Dec. 4, 1996, Ser. No. 753,976

Claims priority, application Japan, Feb. 9, 1994, 6-015068

Int. Cl.^{6} F01N *3/20*

U.S. Cl. 60—274 **17 Claims**

1. An air-fuel ratio control system for an engine having a first bank of cylinders, a second bank of cylinders, a first intake pipe connected to said first bank, a second intake pipe connected to said second bank, a first exhaust pipe connected to said first bank for exhausting gases from the first bank, a second exhaust pipe connected to said second bank for exhausting gases from the second bank, and a collecting pipe connected to both said first and second exhaust pipes for collecting said gases from said exhaust pipes, the air-fuel ratio control system comprising:


30 CONTROL UNIT
35
BASIC INJECTION PULSE WIDTH CAL. MEANS
Tp
Ke
CORRECTING MEANS
DIFFERENCE DETECTING MEANS
34
33
36
TIR
RIGHT BANK FUEL INJECTION PULSE WIDTH CAL. MEANS
37
TIL
LEFT BANK FUEL INJECTION PULSE WIDTH CAL. MEANS
CORRECTION COEFFICIENT SETTING MEANS
AIR-FUEL RATIO DISCRIMINATING MEANS
32
31
12
10
9
11
1
3
(L)
(R)
2
6
4
26
O2 SENSOR
25 O2 SENSOR
5
7
22
21
8
20
23

- a first catalytic converter inserted in said first exhaust pipe for purifying said gases from said first bank;
- a second catalytic converter inserted in said second exhaust pipe for purifying said gases from said second bank;
- an auxiliary catalytic converter provided in said collecting pipe for further purifying said gases from both said first and second exhaust pipes;
- first oxygen sensing means inserted in said first exhaust pipe for detecting a first oxygen concentration in the first exhaust pipe and for outputting a first oxygen concentration signal corresponding to said first oxygen concentration;
- second oxygen sensing means inserted in said second exhaust pipe for detecting a second oxygen concentration in the second exhaust pipe and for outputting a second oxygen concentration signal corresponding to said second oxygen concentration;
- air-fuel ratio discriminating means responsive to said first oxygen concentration signal for discriminating a rich-lean condition of said gases in the first exhaust pipe and for outputting a discriminating signal corresponding to the discriminated rich-lean condition;
- feedback correction coefficient setting means responsive to said discriminating signal for setting an air-fuel ratio feedback correction coefficient on the basis of the discriminated rich-lean condition and for producing a feedback correction signal corresponding to said set air-fuel ratio feedback correction coefficient;
- difference detecting means responsive to said first and second oxygen concentration signals for detecting a difference between the detected first and second oxygen concentrations and for generating a difference signal corresponding to said detected difference;
- difference correcting means responsive to said difference signal for setting a difference correction coefficient according to the detected difference and for outputting a difference correction coefficient signal corresponding to the difference correction coefficient;
- first bank fuel injection pulse width calculating means responsive to said feedback correction signal for calculating a first fuel injection pulse width for the second bank on the basis of a basic injection pulse width and the set air-fuel ratio feedback correction coefficient; and
- second bank fuel injection pulse width calculating means responsive to said feedback correction signal and said difference correction coefficient signal, for calculating a second fuel injection pulse width for the first bank on the basis of the set air-fuel ratio feedback correction coefficient and the set difference correction coefficient so as to effectively control the air fuel ratio of the engine at an optimum value for any operating condition of the engine.

5,749,222
CATALYST SOUNDNESS ASSESSMENT DEVICE

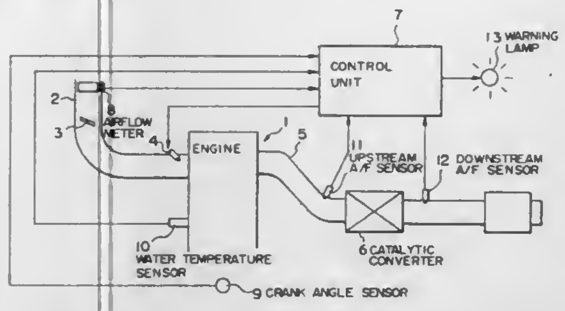
Yuki Nakajima, Yokosuka, and Mikio Matsumoto, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 6, 1996, Ser. No. 611,815

Claims priority, application Japan, Mar. 9, 1995, 7-049866

Int. Cl.^{6} F01N *3/20*

U.S. Cl. 60—274 **12 Claims**



1. A catalyst soundness assessment device for an engine, said engine being connected to an exhaust passage, and a catalytic converter using a catalyst being interposed in said exhaust passage for cleaning exhaust gas in said exhaust passage said catalyst soundness assessment device comprising:
- an upstream air-fuel ratio sensor for outputting a signal indicative of whether an air-fuel mixture supplied to said engine is lean or rich relative to a predetermined value, said upstream air-fuel ratio sensor sensing the exhaust gas in said exhaust passage upstream of said converter;
- a downstream air-fuel ratio sensor for outputting a signal indicative of whether the air-fuel mixture supplied to said engine is lean or rich relative to the predetermined value, said downstream air-fuel ratio sensor sensing the exhaust gas in said exhaust passage downstream of said converter;
- a feedback controller for controlling an air-fuel ratio of the air-fuel mixture supplied to said engine based on the signal output from said upstream air-fuel ratio sensor;
- a timing mechanism for measuring a response delay time from when the signal output from said upstream air-fuel ratio sensor changes overt to when the signal output from said downstream air-fuel ratio sensor changes over;
- a calculator for calculating a dispersion value of a corresponding value based on said response delay time; and
- an analyzer for determining that said catalyst has deteriorated when said dispersion value is equal to or less than a predetermined value.

5,749,223
EXHAUST MANAGEMENT SYSTEM

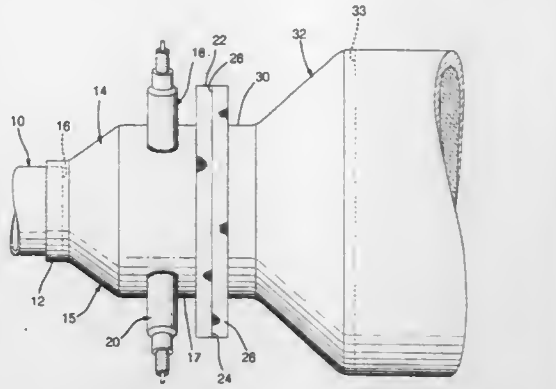
John Eric Kreucher, Davison; Barry Odell Christenson, Fenton; Roger Kurt Starke, Swartz Creek; Stephen Joe Myers, Owosso, and John Arthur Horton, Clio, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1996, Ser. No. 611,944

Int. Cl.^{6} F01N *3/28*

U.S. Cl. 60—300 **6 Claims**

3. An exhaust management system comprising:
- a catalytic converter having a catalyst operative to reduce HC emissions from a flow of exhaust gas from an automotive internal combustion engine when the catalyst is above a light-off temperature:
- a heater assembly mounted in the flow of exhaust gas, upstream of the catalyst and exterior of the catalytic converter, wherein the heater assembly includes an electric heater located at least two inches from a front surface of the catalyst, wherein no catalyst substrates are included within the heater assembly or between the electric heater and the front surface of the catalyst, wherein the electric heater comprises a heated flow director for transferring heat to the flow of exhaust gas flowing through the flow director and wherein the electric heater comprises a housing defining a tubular flow passage having an inlet end, an outlet end, an inner tubular wall and a mounting section on the inner tubular wall between the first and second ends, wherein the inner tubular wall has a first diameter at the mounting section and a conical section between the mounting section and the inlet end, wherein the inlet end of the tubular wall has a second diameter unequal to the first diameter at the mounting section, wherein the outlet end includes means for attachment to a conventional catalytic converter inlet.



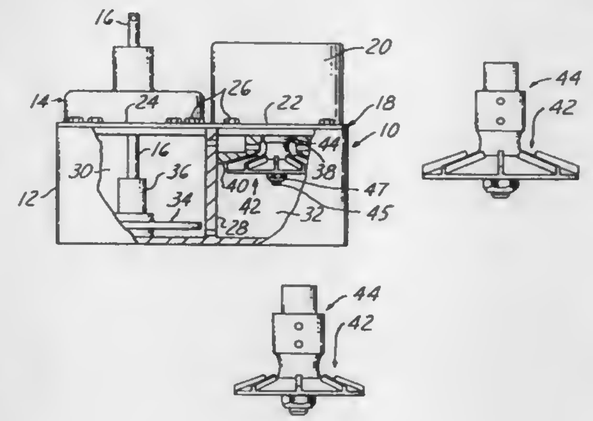
5,749,224
EXTENDED RANGE THRUSTER SYSTEM AND METHOD OF DETERMINING THRUST

Douglas W. Bebensee, Jeddo, and Michael J. Stringer, Capac, both of Mich., assignors to Patriot Sensors & Controls Corporation, Clawson, Mich.

Filed Sep. 15, 1995, Ser. No. 529,000

Int. Cl.^{6} F16D *31/02*

U.S. Cl. 60—473 **15 Claims**



1. An electrohydraulic actuator system wherein thrust pressure on a piston is developed by a motor driven impeller, the system having a large thrust range capability using a standard set of parts and a choice of motors and impellers comprising:
- a housing open at one side and divided by a medial web into two portions comprising a pump chamber and a cylinder, and including passages for fluid flow between the pump chamber and the cylinder;
- a cylinder lid for covering the cylinder and including a central bore;
- a pushrod slidably extending through the bore;
- a piston in the bore attached to the pushrod for actuating the push rod;
- a motor selectable from motors of different types;

a pump lid for covering the pump chamber having an industry standard motor mount for mounting the motor outside the chamber, and having an inner recess inside the pump chamber; and

an impeller selectable from impellers of different diameters, the impeller being located in the inner recess and coupled to the motor, whereby the motor type and impeller diameter determine the actuator thrust.

5,749,225

HYDRAULIC SYSTEMS AND VALVE ASSEMBLIES

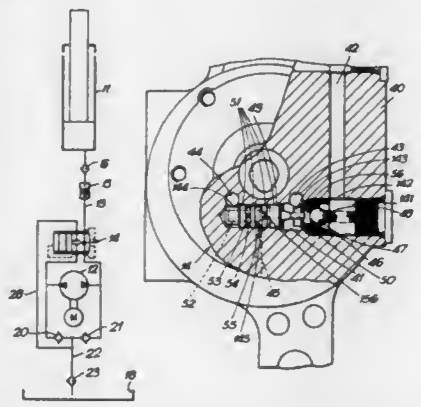
Gifford James Olney, Oxfordshire, England, assignor to Smiths Industries PLC, London, England

Filed Feb. 18, 1997, Ser. No. 801,145

Claims priority, application United Kingdom, Feb. 23, 1996, 9603894

Int. Cl.⁶ F16D ***31/02***

U.S. Cl. 60—477 **7 Claims**



1. An hydraulic system comprising an hydraulically-operated device; a reversible pump; a first fluid line extending between said device and said pump; a tank; a second fluid line extending between said pump and said tank; a check valve assembly, said check valve assembly having a check valve including a valve seat and a valve element operable to locate on said seat, said valve seat being located between a first and second port such that said valve element allows flow from said second port to said first port but prevents flow in the opposite direction, said check valve assembly having a shuttle member located between said second port and a third port such that a greater pressure at said third port than said second port causes said shuttle member to move from a first position in which said shuttle member does not displace said valve element to a second position in which said shuttle member unseats said valve element from said valve seat, and said valve assembly having a fourth port that is substantially closed when said shuttle member is in its first position but that is open when said shuttle member is in its second position such that fluid can flow between said third port and said fourth port; a connection of said first port to said device via said first fluid line; a connection of said second port to said pump via said first fluid line; a connection of said third port to said pump via said second fluid line; and a connection of said fourth port to said tank via said second fluid line, such that when said pump is operated to supply fluid in a first direction said check valve opens to allow substantially unrestricted flow of fluid along said first line in said first direction to said device and prevents flow from said pump to said tank via said check valve assembly, and such that when said pump is operated in reverse to enable fluid flow in a second direction opposite to said first direction along said first fluid line, said check valve assembly enables fluid to flow from said first fluid line to said tank via said check valve, pump, said third and fourth ports and said second fluid line.

5,749,226

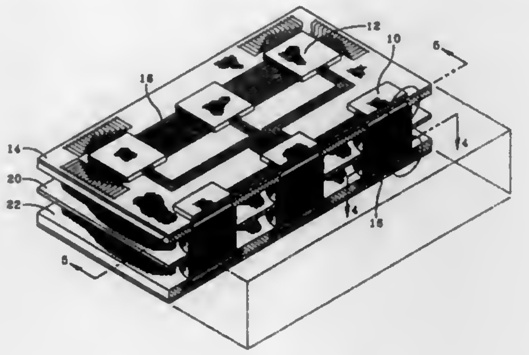
MICROMINIATURE STIRLING CYCLE CRYOCOOLERS AND ENGINES

Lyn Bowman, Athens, Ohio, and Jarlath McEntee, Castine, Me., assignors to Ohio University, Athens, Ohio

Continuation-in-part of Ser. No. 333,356, Nov. 2, 1994, Pat. No. 5,457,956, which is a continuation of Ser. No. 190,582, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 17,265, Feb. 12, 1993, abandoned. This application Oct. 12, 1995, Ser. No. 541,260

Int. Cl.⁶ F02G ***1/04***

U.S. Cl. 60—520 **47 Claims**



1. An improved thermomechanical transducer having:

(a) a pressure containing vessel defining an enclosed work space containing fluid passageways and a compressible and expansible fluid and comprising at least one heat accepting region, at least one heat rejecting region, and at least one heat regenerating region interposed between said heat accepting and heat rejecting regions; and

(b) a displacer which alternately transports the working fluid through the said heat regenerating region between the heat accepting region and the heat rejecting region;

wherein the improvement comprises the fluid passageways in the work space being sufficiently narrow to provide a Wolmersley number, which is characteristic of the irreversibilities generated by the oscillatory flow of the working fluid in the work space, below substantially 5 and the amplitude of the oscillatory flow of the working fluid being sufficiently small to provide the working fluid a maximum Mach number below substantially 0.1 at operating frequencies above 500 Hz.

5,749,227

STEAM SEAL AIR REMOVAL SYSTEM

James S. Smith, Old Lyme; Glenn N. Levasseur, Colchester; John H. Chapman, Groton; Daniel J. Link, No. Stonington, and Kevin M. Didona, East Lyme, all of Conn., assignors to Electric Boat Corporation, Groton, Conn.

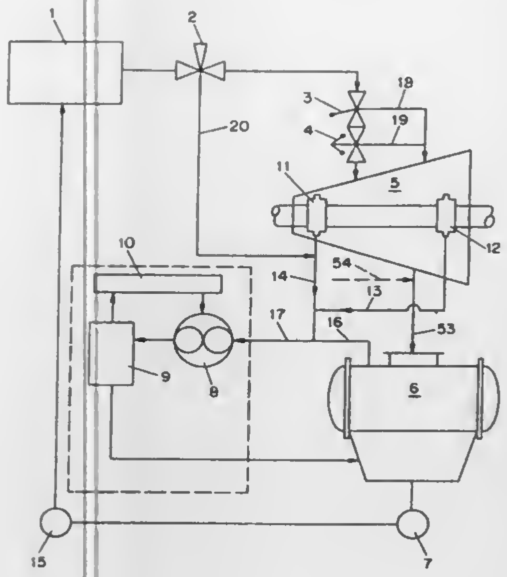
Filed Jun. 7, 1995, Ser. No. 488,299

Int. Cl.⁶ F01B ***31/00***

U.S. Cl. 60—657 **14 Claims**

1. A power generation system comprising at least one turbine comprising a rotor and a sealing system including a plurality of turbine rotor glands positioned along the rotor,

a vapor generation means feeding the turbine, at least one condenser for condensing vapors from the at least one turbine and a common vacuum header which exhausts air from the at least one condenser and exhausts air from at least one of the plurality of turbine rotor glands before the air mixes with vapor in the turbine and enters the condenser, and evacuation means for exhausting the vacuum header and minimizing return of dissolved gases in the condensate returned to the vapor generation means.



5,749,228

STEAM-TURBINE POWER PLANT AND STEAM TURBINE

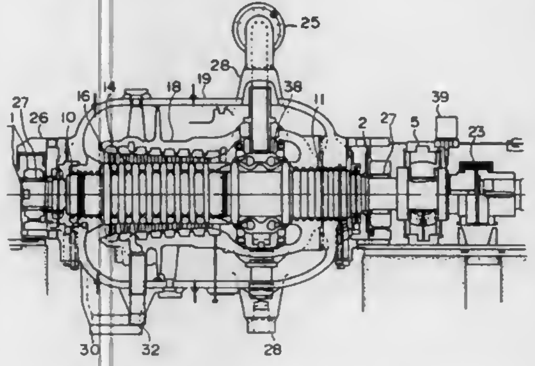
Masao Shiga, Hitachi; Ryo Hiraga, Hitachiota; Takeshi Onoda; Nobuo Shimizu, both of Hitachi; Norio Yamada, Hitachiota; Mitsuo Kuriyama, Ibaraki-ken; Kishio Hidaka, Hitachi; Shigeyoshi Nakamura, Katsuta; Yutaka Fukui, Hitachi, and Toshio Fujita, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 391,945, Feb. 21, 1995. This application May 30, 1995, Ser. No. 453,556

Claims priority, application Japan, Feb. 22, 1994, 6-023962

Int. Cl.⁶ F01K ***7/22;*** **B63H** ***1/26***

U.S. Cl. 60—679 **16 Claims**



1. A steam-turbine power plant having a high-pressure turbine, an intermediate-pressure turbine and a low-pressure turbine, the improvement comprising:

steam inlet of each of the high-pressure and intermediate-pressure turbines leading to moving blades of a first stage included in each of said high-pressure and intermediate-pressure turbines being at a temperature of 610°–660° C.;

steam inlet of said low-pressure turbine leading to moving blades of a first stage included in said low-pressure turbine being at a temperature of 380°–475° C.;

a rotor shaft, said moving blades, fixed blades and a casing, which are included in each of said high-pressure and intermediate-pressure turbines and which are exposed to the temperature of said steam inlet of each of said high-pressure and intermediate-pressure turbines, being made of high-strength martensitic steel comprising 8–13 weight-% of Cr; and

a final-stage blade portion of the moving blades in said low-pressure steam turbine having a length over 1016 mm and made of a Ti-based alloy.

5,749,229

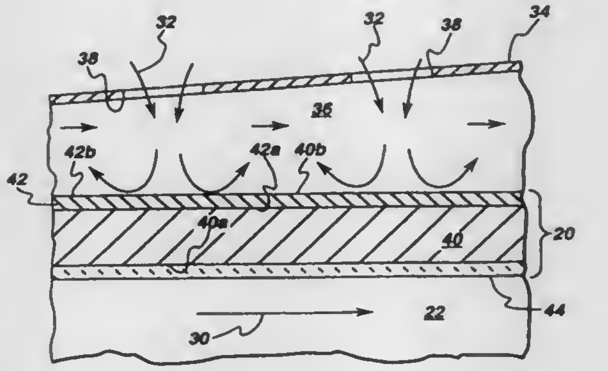
THERMAL SPREADING COMBUSTOR LINER

Nesim Abuaf, Schenectady, and Steven George Goebel, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1995, Ser. No. 542,982

Int. Cl.⁶ F02C ***1/00***

U.S. Cl. 60—752 **14 Claims**



1. A combustion liner for use and exposure within a hot gas environment, said liner comprising:

a thermal barrier layer for direct exposure to said hot gas, said thermal barrier layer having a first coefficient of thermal conductivity at an average local temperature of said thermal barrier layer;

an inner structural layer having a second coefficient of thermal conductivity at an average local temperature of said inner structural layer;

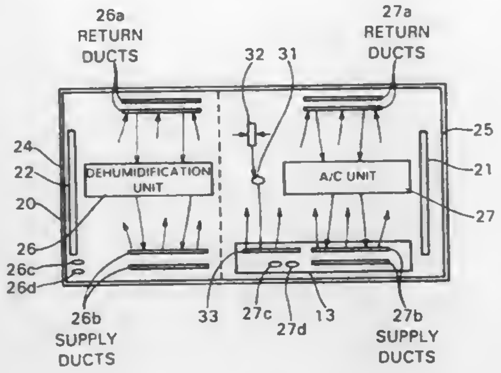
a thermal spreading layer for direct exposure to a cooling flow, said thermal spreading layer having a third coefficient of thermal conductivity at an average local temperature of said thermal spreading layer;

wherein said thermal spreading layer has a greater coefficient of thermal conductivity at said average local temperature of said thermal spreading layer than each of said inner structural layer and said thermal barrier layer at said respective average local temperatures of said inner structural layer and said thermal barrier layer, so as to thermally conduct heat through said liner from relatively hot regions to relatively cooler regions, and said thermal barrier layer has a coefficient of thermal conductivity at said average local temperature of said thermal barrier layer less than said inner structural layer at said average local temperature of said inner structural layer; and

wherein said inner structural layer and said thermal spreading layer have a coefficient of thermal expansion that is substantially equal so as to minimize thermal stress caused by differential expansion and contraction.

5,749,230
METHOD FOR CREATING A HUMIDITY GRADIENT WITHIN AN AIR CONDITIONED ZONE

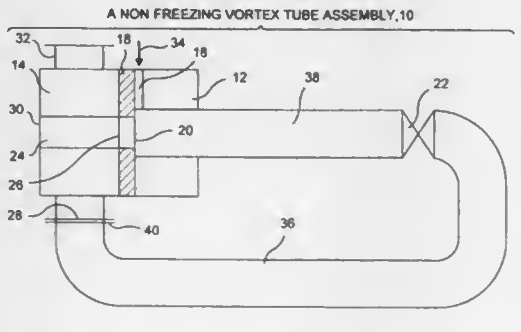
James A. Coellner, Philadelphia, Pa., and Dean Scott Calton, Vincenttown, N.J., assignors to Engelhard/ICC, Hatboro, Pa.
Filed Jan. 18, 1991, Ser. No. 642,990
Int. Cl.^{6} F25D *17/06*
U.S. Cl. 62—94 **18 Claims**



1. A method for creating a humidity gradient within a single air conditioned zone by segregating said zone into a low humidity area and a high humidity area comprising the steps of:
- (a) withdrawing return air from the low humidity area;
- (b) withdrawing return air from the high humidity area;
- (c) passing said return air from said low humidity area through a dehumidification unit to obtain low humidity supply air;
- (d) passing said return air from said high humidity area through an air conditioning unit to obtain high humidity supply air;
- (e) separately injecting substantially all of said low humidity supply air into said low humidity area; and
- (f) separately injecting substantially all of said high humidity supply air into said high humidity area to effectively segregate said low humidity and high humidity areas thereby minimizing air flow between the high and low humidity areas.

5,749,231
NON-FREEZING VORTEX TUBE

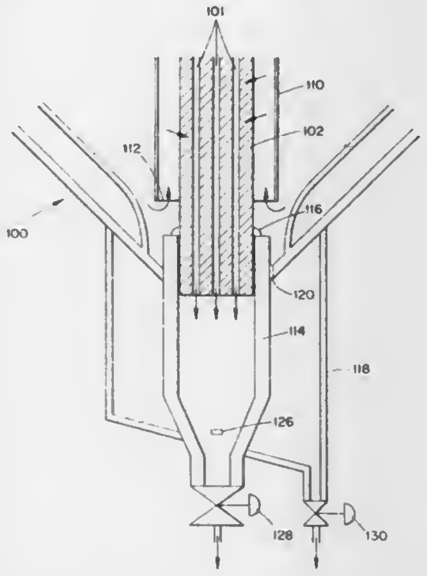
Lev Tunkel, Edison, N.J.; Boris Krasovitski, Nesher, Israel, and Rorbert L. Foster, Manasquan, N.J., assignors to Universal Vortex, Inc., Robbinsville, N.J.
Filed Aug. 13, 1996, Ser. No. 699,778
Int. Cl.^{6} F25B *9/02*
U.S. Cl. 62—5 **23 Claims**



1. A method for a non-freezing vortex tube to operate with non-dried even wet inlet gas flow in a broad range of a vortex tube's cold fraction value, said non-freezing vortex tube including a heat exchanger and a vortex tube comprising a slender tube, a diaphragm having a hole in the center thereof and closing one end of the slender tube, one or more tangential nozzles piercing the slender tube just inside the diaphragm and a throttle on the other end of the slender tube, the method comprising ways of connecting the non-freezing vortex tube as follows:
- a) attaching a heat exchanger to an outward side of a vortex tube's diaphragm;
- b) connecting a vortex tube's diaphragm hole for discharging a cold fraction flow with a heat exchanger's inlet opening and then connecting the inlet opening through a heat exchanger's inner passage with a heat exchanger's outlet openings to discharge a cold fraction flow from the non-freezing vortex tube; and
- c) connecting a vortex tube throttle at the far end of the slender tube with another heat exchanger's inlet opening, thus providing for the hot flow discharged from the vortex tube to heat up the vortex tube's diaphragm and then directing the hot flow to the another heat exchanger's outlet opening to leave the non-freezing vortex tube.

5,749,232
APPARATUS AND METHOD FOR PRODUCING AND INJECTING STERILE CRYOGENIC LIQUIDS

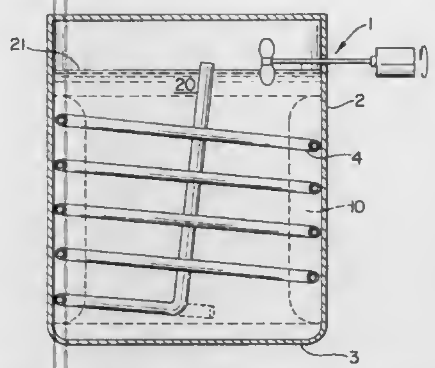
Richard A. Sauer, Hinsdale, Ill., assignor to Air Liquide America Corporation, Houston, Tex.
Filed Dec. 18, 1996, Ser. No. 769,276
Int. Cl.^{6} F17C *7/02*
U.S. Cl. 62—50.1 **26 Claims**



1. An apparatus for producing a sterile cryogenic liquid, the apparatus comprising:
- (a) a tank having insulating means, the tank adapted to contain a raw cryogenic liquid;
- (b) a cryogenic liquid filter positioned within the tank to retain contaminants;
- (c) a sheath positioned over a portion of the cryogenic liquid filter and adapted to be connected to a supply of sterilization fluid for sterilizing the filter; and
- (d) a sterile cryogenic liquid outlet for outflowing sterile cryogenic liquid which has been filtered by the cryogenic liquid filter.

5,749,233
METHOD AND DEVICE FOR COOLING AND CARBONATING A LIQUID

Bengt Adolfsson, Stockholm, Sweden, assignor to Post-Mix Equipment AB, Solna, Sweden
PCT No. PCT/SE94/00870, § 371 Date Jun. 28, 1996, § 102(e) Date Jun. 28, 1996, PCT Pub. No. WO95/09124, PCT Pub. Date Apr. 6, 1995
PCT Filed Sep. 19, 1994, Ser. No. 619,695
Claims priority, application Sweden, Sep. 28, 1993, 9303160
Int. Cl.^{6} F17C *9/02*
U.S. Cl. 62—50.2 **18 Claims**

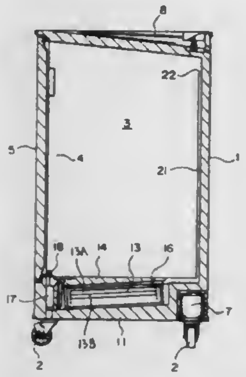


1. A method for treating a liquid in a tank, comprising the step of:

expanding carbon dioxide within a space which is separate from said liquid but which creates a thermal coupling with said liquid, said liquid being cooled by said thermal coupling.

5,749,234
TRANSPORTABLE STORAGE CABINET

Yoshiaki Takano, Ota, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Oct. 28, 1996, Ser. No. 739,148
Claims priority, application Japan, Oct. 27, 1996, 8-280467
Int. Cl.^{6} F25B *49/02*
U.S. Cl. 62—125 **9 Claims**



9. A transportable storage cabinet, which includes a storage chamber wherein goods are stored, a refrigerant for cooling said storage chamber, and a refrigerator for freezing said refrigerant in response to a supply of power, comprising:

temperature detection means for acquiring a temperature reading for said refrigerant;

refrigerant temperature display means for displaying said temperature reading for said refrigerant acquired by said temperature detection means before said refrigerant is frozen;

power supply detection means for detecting a supply of power to said refrigerator;

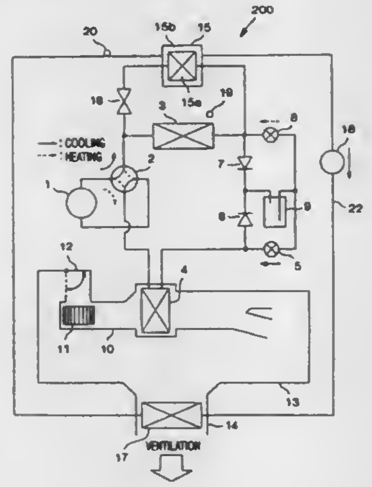
determination means for determining whether there exists conditions where said temperature reading for said refrigerant that is acquired by said temperature detection means is equal to or lower than a substantial freezing point, and said power supply detection means detects power being supplied to said refrigerator, and when said conditions exist, creating an output signal;

a timer, to be activated by said output signal from said determination means, for measuring elapsed time following powering on and initiation of freezing of said refrigerant; and

time display means for displaying said elapsed time that is measured by said timer.

5,749,235
AIR CONDITIONER FOR VEHICLES

Katsumi Ueda, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Apr. 2, 1996, Ser. No. 626,378
Claims priority, application Japan, Apr. 6, 1995, 7-081360
Int. Cl.^{6} F25B *13/00;29/00*
U.S. Cl. 62—160 **6 Claims**



1. An air conditioner for a vehicle comprising:

a heat pump system for heating and cooling and including a refrigerant circuit and a ventilation passage for venting air from a passenger compartment of said vehicle outside of said vehicle, wherein said heat pump system includes an external heat exchanger mounted outside said passenger compartment, an internal heat exchanger mounted inside said passenger compartment and coupled to said external heat exchanger, a compressor disposed in a refrigerant circuit, said refrigerant circuit placing said external heat exchanger in fluid communication with said internal heat exchanger to permit refrigerant flow between said external and internal heat exchangers; and

accelerating means for accelerating evaporation of a refrigerant during air cooling and condensation of a refrigerant during air heating by recovering and using energy from air exhausted outside of said vehicle through said ventilation passage, wherein said accelerating means includes a first heat exchanger connected to said heat pump system in parallel to said external heat exchanger, a second heat exchanger disposed in said ventilation passage and connected to said first heat exchanger for exchanging heat between a working fluid and air exhausted outside of said vehicle through said ventilation passage, and a pump disposed between said first heat exchanger and said second heat exchanger for circulating said working fluid.

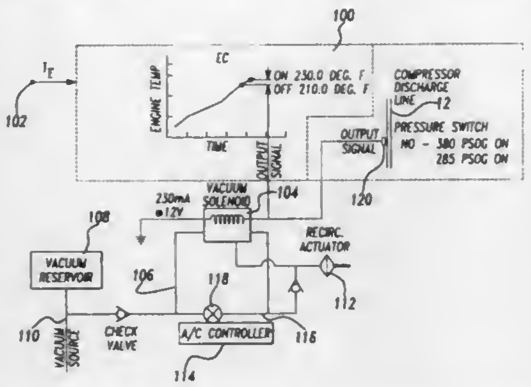
5,749,236
AUTOMATIC AIR RECIRCULATION SYSTEM

Armando Tavian, Farmington Hills, and Alexander Kargilis, Southfield, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Jan. 27, 1997, Ser. No. 789,359

Int. Cl.^{6} F25D *17/00;17/04;29/00*

U.S. Cl. 62—186 **11 Claims**



1. An automatic air recirculation system for a vehicle air conditioning system, comprising:

- an air cooling system including a compressor, a condenser, and an evaporator;
- an outside air passage for allowing air to pass from outside said vehicle through said evaporator; a recirculation air passage for allowing air from inside said vehicle to pass through said evaporator;
- a recirculation door movable between a first position for closing off said recirculation air passage to a second position for opening said recirculation air passage; and
- a controller for opening and closing said recirculation door, said controller including an engine temperature sensor, wherein said controller opens said recirculation door when a temperature detected by said engine temperature sensor exceeds a predetermined temperature.

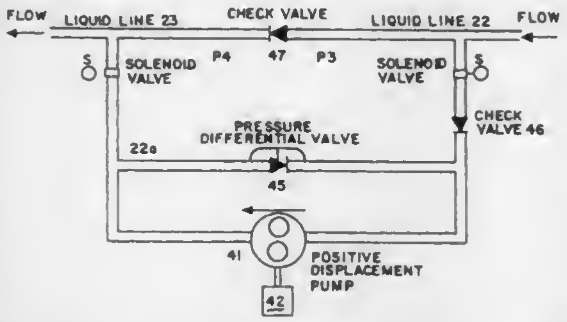
5,749,237
REFRIGERANT SYSTEM FLASH GAS SUPPRESSOR WITH VARIABLE SPEED DRIVE

Marc D. Sandofsky, Natick, and David F. Ward, Framingham, both of Mass., assignors to JDM, Ltd., Worcester, Mass.

Continuation-in-part of Ser. No. 380,739, Jan. 30, 1995, abandoned, which is a continuation of Ser. No. 127,976, Sep. 28, 1993, Pat. No. 5,435,148. This application Oct. 26, 1995, Ser. No. 548,690

Int. Cl.^{6} F25B *1/00;41/00*

U.S. Cl. 62—209 **23 Claims**



1. Any refrigeration, air conditioning or process cooling system using a reciprocating screw, scroll, centrifugal or other similar type of compressor and any type of refrigerant,

the improvement including

- a first positive-displacement pimp used in a parallel piping arrangement which arrangement is parallel to a conventional liquid conduit between a condenser and an expansion valve, and parallel with a differential pressure regulating valve and a check valve,
- a variable speed drive, driving said positive displacement pump, and
- a drive controller connected to and controlling said variable speed drive and having as input a signal from a sensor of a variable proportional to refrigerant flow in the system or a related variable,

whereby the speed of the positive displacement pump is adjusted to the minimum speed necessary to add a predetermined increment of pressure to the liquid conduit or to eliminate flash gas.

5,749,238
CONTROL ARRANGEMENT FOR A COOLING APPARATUS

Frede Schmidt, Ahlmannsvej 45, DK-6400 Sønderborg, Denmark

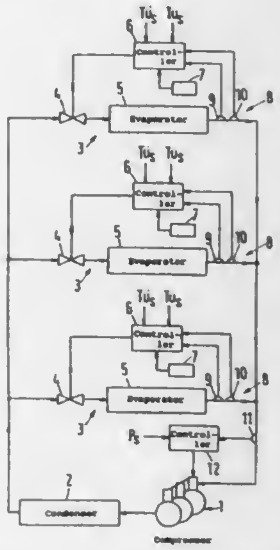
PCT No. PCT/DK95/00294, § 371 Date Feb. 14, 1997, § 102(e) Date Feb. 14, 1997, PCT Pub. No. WO96/07065, PCT Pub. Date Mar. 7, 1996

PCT Filed Jul. 7, 1995, Ser. No. 793,817

Claims priority, application Germany, Aug. 27, 1994, 44 30 468.4

Int. Cl.^{6} F25B *41/00*

U.S. Cl. 62—211 **7 Claims**



1. A control arrangement for a cooling apparatus having a cooling circuit in which a compressor, a condenser and at least one branch with an expansion valve and a downstream evaporator are connected in series, the cooling apparatus further having a controller, a measuring device connected to the controller for measuring superheat temperature of the vapor of a liquid coolant evaporated in the evaporator and a sensor connected to the controller for sensing ambient temperature of the evaporator, the controller being connected to the expansion valve for controlling the expansion valve in dependence on a difference in a desired value and actual value of the superheat temperature for the purpose of reducing the difference, and flow of liquid coolant to the evaporator being controllable in dependence on the measured value of the ambient temperature for the purpose of maintaining the ambient temperature at a constant value, the controller having a continuous action, and the controller being switchable between a first operating mode in which the superheat refrigeration temperature is reduced while complying with the maximum admissible state of fill of liquid coolant in the evaporator and, after a desired refrigeration temperature is reached, a second operating mode in which the state of fill of liquid coolant in the evaporator is controlled by the expansion valve for the purpose of maintaining the refrigeration temperature.

5,749,239
REFRIGERANT FLUID RESERVOIR FOR A HEAT PUMP INSTALLATION

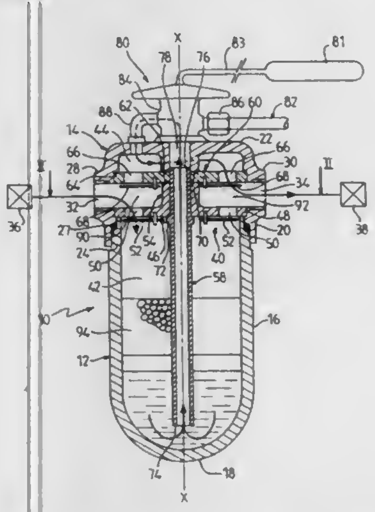
Vincent Pomme, Montigny le Bretonneux, France, assignor to Valeo Climatisation, La Verriere, France

Filed Nov. 14, 1996, Ser. No. 749,175

Claims priority, application France, Nov. 20, 1995, 95 13736

Int. Cl.^{6} F25B *41/04*

U.S. Cl. 62—225 **13 Claims**



1. A refrigerant fluid reservoir for a heat pump installation comprising a fluid circuit, a condenser connected in said circuit, and an evaporator connected in the circuit, the reservoir having a fluid inlet and a fluid outlet for connection to said condenser and said evaporator respectively, the reservoir further including a dehumidifying filter contained within it, wherein the reservoir defines an internal inlet chamber and an internal outlet chamber, and further includes a separating member separating said inlet and outlet chambers from each other, the dehumidifying filter being contained in the inlet chamber, and the reservoir further including an expansion device and means connecting the expansion device operatively between said inlet and outlet chambers further including a first non-return valve interposed between said inlet of the reservoir and said inlet chamber, for preventing flow of fluid from the inlet chamber to the inlet, and a second non-return valve interposed between said outlet of the reservoir and the outlet chamber, for preventing flow of fluid from the outlet of the reservoir to the outlet chamber.

5,749,240
FROZEN PRODUCT STORAGE AND DISPENSING APPARATUS

Shane Robert McGill, Rochester, England, assignor to McGill Technology Limited, England

Filed Jun. 25, 1996, Ser. No. 669,905

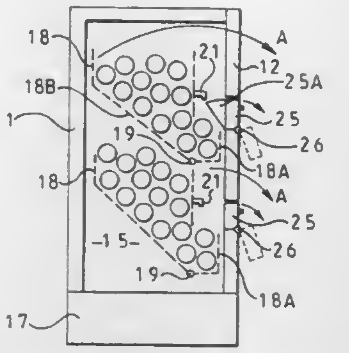
Claims priority, application United Kingdom, Mar. 14, 1996, 9605378

Int. Cl.^{6} A47F *3/04*

U.S. Cl. 62—250 **13 Claims**

1. Refrigerated storage apparatus for storing containers of frozen food product which comprises:

- a refrigerated compartment for, storing said containers at below freezing temperatures,
- a main access door permitting full access into the compartment,
- at least one access opening of a smaller size than the main access door, said access opening permitting access of individual containers from the compartment,



- closeable access means over said access opening, and
- storage means for said containers associated with said access opening said storage means being of open construction in the form of basket means to allow circulation of air around the containers and the storage means having a base inclined to the horizontal whereby containers are fed towards said access opening under gravity, the containers being randomly located within the storage means, and means for separating said frozen food product, frozen together, and facilitating feeding of the product towards the opening.

5,749,241
FREEZER COMPARTMENT STRUCTURE FOR REFRIGERATORS

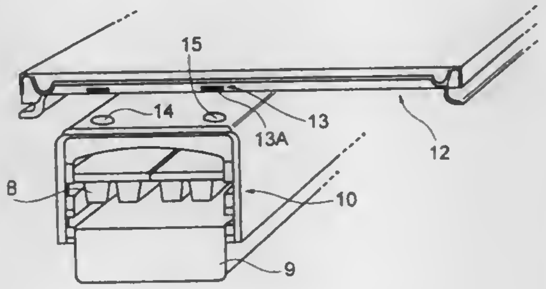
Sang Chul Ryu, and Ik Geun Kim, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 27, 1996, Ser. No. 722,495

Claims priority, application Rep. of Korea, Dec. 29, 1995, 1995-65559

Int. Cl.^{6} F25C *1/00*

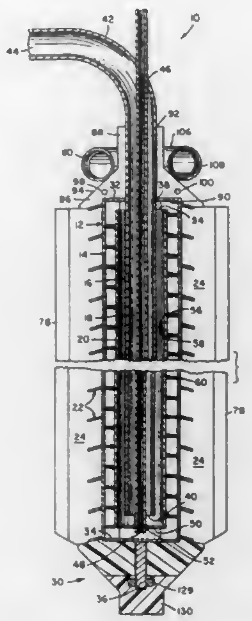
U.S. Cl. 62—340 **11 Claims**



11. A refrigerator comprising:

- a housing forming a freezer compartment; and
- a shelf structure disposed in said freezer compartment, comprising:
  - a horizontal shelf adapted to support food, said shelf including downwardly dependent projections each including a narrow portion, and a wide portion disposed at a lower end of said narrow portion;
  - a base supported by said shelf, said base including holes for receiving respective ones of said projections, each hole including an insert portion sized to enable said wide portion to pass vertically therethrough, and a locking portion smaller than said insert portion and large enough to enable said narrow portion to slide horizontally thereinto, said locking portion being smaller than said wide portion to enable said base to rest on said wide portion, a portion of an edge of said hole including an elastic part which elastically retains said narrow portion in sid locking portion; and
  - an ice cube tray and an ice cube storage bin removably supported in said base.

5,749,242
EVAPORATOR FOR AN ICE MAKING MACHINE
Timothy W. Mowery, 4723 Lois La., Wichita Falls, Tex. 76306
Filed Mar. 24, 1997, Ser. No. 822,495
Int. Cl.^{6} F25C *1/12*
U.S. Cl. 62—347 **18 Claims**



16. An evaporator for an ice making machine, comprising:

a first tubular member having a polygonal cross section so as to provide such with a plurality of planar side walls, said first tubular member also having a closed bottom end and a closed top end with a first aperture therein;

a second tubular member concentrically disposed within said first tubular member, said second tubular member having a closed bottom end, with a second aperture therein, spaced from the closed bottom end of said first tubular member, and said second tubular member also having an open top end, spaced from the closed top end of said first tubular member, which connects said first tubular member with said second tubular member for refrigerant flow;

a third tubular member concentrically disposed within said second tubular member, said third tubular member having an open bottom end, spaced from the closed bottom end of said second tubular member, which connects said second tubular member with said third tubular member for refrigerant flow, and said third tubular member also having a top end extending through said first aperture in said first tubular member;

a fourth tubular member concentrically disposed within said third tubular member and extending through said second aperture in said second tubular member, said fourth tubular member having an open bottom end located between the closed bottom end of said second tubular member and the closed bottom end of said first tubular member which connects said first tubular member with said fourth tubular member for refrigerant flow;

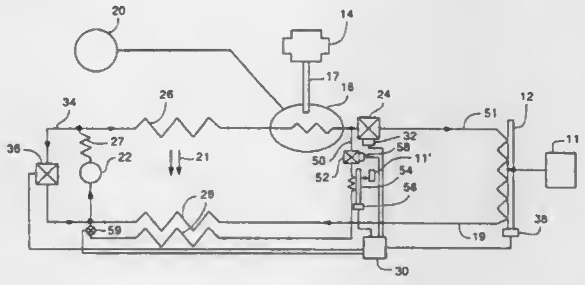
a helical baffle plate coiled around second tubular member for restricting refrigerant flow in the annular space between said first and second tubular members;

a plurality of annular fins secured around said first tubular member in a spaced-apart relationship, each of said annular fins having opposed top and bottom surfaces and a central opening, sized to snugly receive said first tubular member, connecting said top and bottom surfaces, and the top surface of each of said annular fins being sloped downwardly from said central opening;

a plurality of longitudinal fins concentrically positioned around said first tubular member and engaged with the top and bottom sand bottom surfaces of said annular fins so as to divide such into a plurality of laterally segregated segments, each of said longitudinal fins having an inner edge secured against said first tubular member along one of the junctions between said planar side walls and an outer edge spaced outwardly from the outer peripheral edge of each of said annular fins relative to said first tubular member; and

means for delivering a freezable liquid onto said first tubular member and said annular and longitudinal fins.

5,749,243
LOW-TEMPERATURE REFRIGERATION SYSTEM WITH PRECISE TEMPERATURE CONTROL
James Marsh Lester, Redstone, Colo., assignor to Redstone Engineering, Carbondale, Colo.
Continuation of Ser. No. 386,671, Feb. 10, 1995, Pat. No. 5,606,870. This application Feb. 21, 1997, Ser. No. 804,327
Int. Cl.^{6} F25D *17/02;* F25B *19/00*
U.S. Cl. 62—434 **23 Claims**



1. A method for cooling an instrument which produces a thermal load that varies over time, comprising:

providing a cooling source means having a first cooling output;

providing a thermal interface means for receiving heat from said instrument;

providing a flow means to and from said thermal interface means, said flow means having a second cooling output, and comprising a delivery line to said thermal interface means and a receiving line from said thermal interface means;

providing a thermal capacitor means, associated with said cooling source means and with said flow means;

transmitting heat from said instrument to said thermal interface means;

delivering a refrigerant to said thermal interface means by way of said delivery line and removing said refrigerant from said thermal interface means by way of said receiving line;

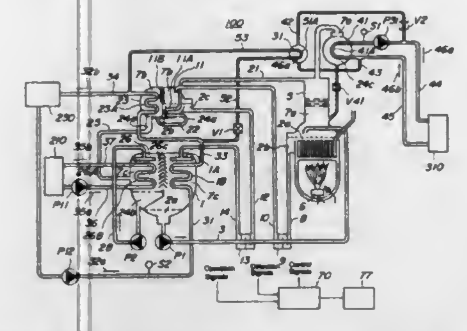
delivering said first cooling output to said thermal capacitor means from said cooling source means;

varying said second cooling output relative to said first cooling output; and

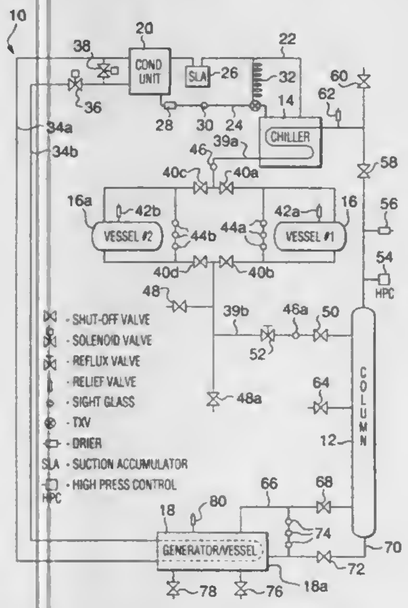
exchanging heat between said delivery line and said receiving line.

5,749,244
ABSORPTION TYPE REFRIGERATOR
Tomoyuki Murayama, Tatebayashi; Syoichi Turuta, Ohta; Sumio Ikeda, Ohra-gun; Toshiyuki Hoshino, Ohra-gun; Shuji Ishizaki, Ohra-gun, and Shinichi Uegomori, Ohra-gun, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan
Filed Mar. 25, 1997, Ser. No. 824,357
Claims priority, application Japan, Mar. 29, 1996, 8-077320
Int. Cl.^{6} F25B *15/00*
U.S. Cl. 62—476 **6 Claims**

1. An absorption type refrigerator with a cooled absorber in which refrigerant vapor is absorbed into an absorption solution by a first heat operation fluid and a condenser for condensing refrigerant vapor and for heating a second heat operation fluid to be provided to a heating load with high-temperature refrigerant vapor separated from the absorption solution in a regenerator, wherein the absorption type refrigerator comprises cooling means for cooling the second heat operation fluid through heat exchange between the first heat operation fluid and the second heat operation fluid when the temperature of the second heat operation fluid is higher than a predetermined temperature.



5,749,245
REFRIGERANT SEPARATION SYSTEM
James V. Thomas, Fall River; Devin James Thomas, Halifax, and Kenneth Garfield Ross, Dartmouth, all of Canada, assignors to Climate Supply (Atlantic) Inc., Dartmouth, Canada
Continuation of Ser. No. 492,329, Jun. 19, 1995, abandoned. This application Jan. 24, 1997, Ser. No. 773,802
Int. Cl.^{6} F25B *3/00*
U.S. Cl. 62—623 **13 Claims**



1. A refrigerant separation system for separating a mixture containing at least two refrigerants, each refrigerant in the mixture having a different volatility, comprising:

(i) a vapour generator for volatizing the mixture;

(ii) a chilling unit for condensing the mixture;

(iii) a fractional distillation column (FDC) in fluid communication between the vapour generator and chilling unit for effecting counter-current flow of gas and liquid phases of the mixture;

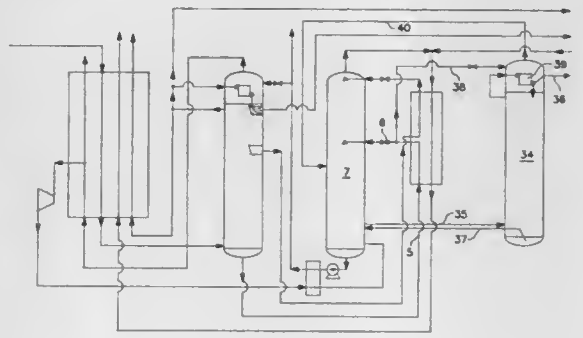
(iv) a first storage vessel between the chilling unit and FDC for holding a liquid phase of the mixture from the chilling unit and for feeding the liquid phase to the FDC, the size of the first storage vessel being selected to ensure the first storage vessel is flooded and the chilling unit is partially flooded during a separation run;

(v) means for controlling the reflux of liquid phase of the mixture from the first storage vessel to the FDC;

(vi) second storage vessel for storing liquid phase of the mixture from the FDC and for supplying liquid phase of the mixture to the vapour generator, the first and second storage vessels being in fluid communication only through the FDC;

wherein the system is closed and the chilling unit includes means for maintaining a self-regulating equilibrium between vaporization and condensation of refrigerant within the chilling unit for a given reflux.

5,749,246
METHOD AND DEVICE FOR OBTAINING OXYGEN AND NITROGEN AT SUPERATMOSPHERIC PRESSURE
Dietrich Rottmann, München, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
Filed Nov. 25, 1996, Ser. No. 756,012
Claims priority, application Germany, Nov. 25, 1995, 195 43 953.8
Int. Cl.^{6} F25J *3/04*
U.S. Cl. 62—654 **11 Claims**



1. A method for obtaining oxygen and nitrogen at superatmospheric pressure by low-temperature separation of air in a rectification column system which has a pressure column (4) and a low-pressure column (7), having the following steps:

(a) introducing compressed and purified feed air (1, 3) into the pressure column (4),

(b) introducing (6) at least a portion of a first liquid fraction (5) from the lower region of the pressure column (4) into the low-pressure column (7),

(c) introducing (9) a second liquid fraction (8) from the upper or middle region of the pressure column (4) into the low-pressure column (7),

(d) evaporating a third liquid fraction (17) from the lower region of the low-pressure column (7) in indirect heat exchange (12) with condensing vapour (11) from the upper region of the pressure column (4),

(e) introducing at least a portion of the vapour (22, 24, 26, 27) obtained during the indirect heat exchange into the low-pressure column (7),

(f) introducing at least a portion of the condensate (13) obtained during the indirect heat exchange into the pressure column (4),

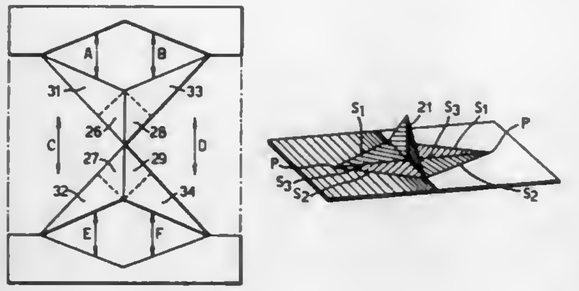
(g) extracting a pressurized nitrogen fraction (10, 14, 15) as product from the upper region of the pressure column (4), characterized in that

(h) the pressure of the third liquid fraction (17) from the lower region of the low-pressure column (7) is increased upstream of the indirect heat exchange (12) with condensing vapour (11) from the upper region of the pressure column (4), and

(i) that portion (24) of the vapour which is obtained during the indirect heat exchange and is led back into the low-pressure column (7) is expanded (25) before being introduced (27) into the low-pressure column (7).

5,749,247
KNITTED COVER AND A KNITTING METHOD

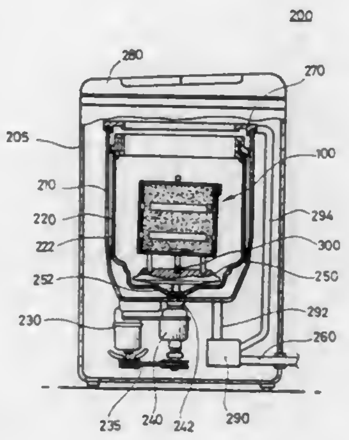
Keith Jeffcoat, Nuneaton, United Kingdom, assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 546,262, Oct. 20, 1995, Pat. No. 5,577,398.
This application Aug. 23, 1996, Ser. No. 704,443
Claims priority, application United Kingdom, Nov. 10, 1994, 9422650
Int. Cl.^{6} D04B *1/22*
U.S. Cl. 66—198 **8 Claims**



1. A three-dimensional continuously weft knitted fabric cover having a pouch formed therein, said pouch having a major axis extending in a wale-wise direction in the knitted cover, coursewise regions of said cover adjoining said pouch and said pouch being formed of an even number of two-dimensional weft knitted portions having edges joined by knit sutures such that suture lines extend from said pouch in said coursewise regions of said cover on each coursewise side of said pouch.

5,749,248
WASHING MACHINE HAVING A DETACHABLE WASHING BUCKET

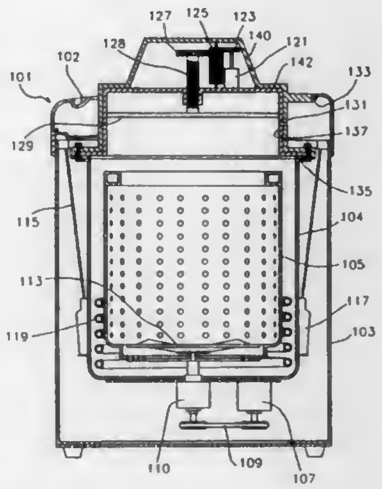
Sung-Bum Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 29, 1995, Ser. No. 580,596
Claims priority, application Rep. of Korea, Apr. 29, 1995, 95-9064
Int. Cl.^{6} D06F *1/12*
U.S. Cl. 68—4 **8 Claims**



1. A washing machine comprising:
a housing;
an outer tub disposed in the housing so as to receive a washing liquid from a liquid source;
a spin tub accommodated in the outer tub;
a motor for generating a driving force, the motor disposed at a lower portion of the outer tub;
a first means for generating a swirl-shaped liquid flow in the spin tub, the first means being rotated by the motor, the first means including a pulsator mounted on a bottom wall of the spin tub;
a second means for receiving an extremely dirty article so as to wash the article therein, the second means being rotated as the first means rotates the second means including a washing bucket mounted on an upper surface of the pulsator, the washing bucket having a body which is formed at its upper portion with a washing bucket cover for preventing the article from moving out of the washing bucket, the body being formed at its side wall with a plurality of cutting portions for receiving the washing liquid from the spin tub, the body being formed at its inner wall with a washing brush; and
a third means for detachably assembling the second means to the first means.

5,749,249
WASHING MACHINE

Sung-Chil Jung, Kwangju City, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 20, 1996, Ser. No. 667,802
Claims priority, application Rep. of Korea, Jun. 23, 1995, 95-17114
Int. Cl.^{6} D06F *37/18*
U.S. Cl. 68—15 **7 Claims**

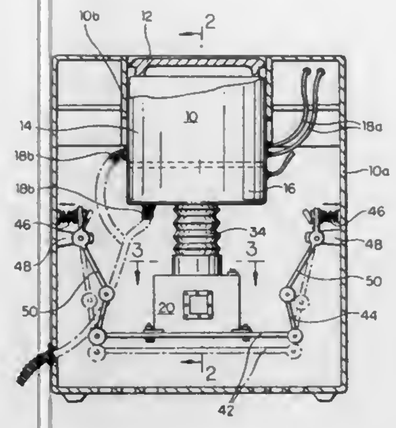


1. A washing machine comprising:
an outer tub containing the laundry and washing water therein;
a heater for heating said laundry and washing water; and
a cylinder frame connected to the upper portion of said outer tub by means of a hinge to be capable of swinging thereabout, and installed with pressurizing means for raising an internal pressure of said outer tub;
wherein said pressurizing means comprises:
a cylinder formed to the inner side of said cylinder frame;
a piston fitted with said cylinder to correspond to the shape of said cylinder for being able to feed in the up and down direction; and
driving means for driving said piston.

5,749,250
WASHING MACHINE

Hae In Kim, 940-22, Sihewng-3dong, Kuro-ku, Seoul, 152-033, Rep. of Korea
PCT No. PCT/KR95/00011, § 371 Date Aug. 6, 1996, § 102(e) Date Aug. 6, 1996, PCT Pub. No. WO95/21954, PCT Pub. Date Aug. 17, 1995
PCT Filed Feb. 14, 1995, Ser. No. 666,365
Claims priority, application Rep. of Korea, Feb. 14, 1994, 1994/2573; Jan. 24, 1995, 1995/1235
Int. Cl.^{6} D06F *27/00*
U.S. Cl. 68—171 **7 Claims**

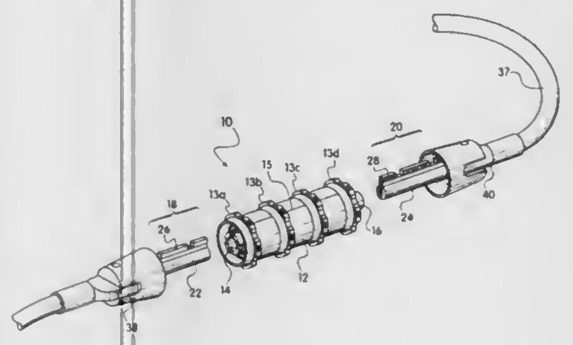
1. A washing machine comprising:



a case (**10***a*) for constituting an external shell of a washing machine, said case having at least one wall defining sides of said case, one of said sides having an integral guide (**10***b*) at a center of said one side;
a washing vessel (**10**) for sliding within said guide and having an inside and detachably coupled sealing cap (**12**) on an opening into said inside;
shaking means coupled with said washing vessel for shaking said washing vessel; and
balancing means mounted to an inside of said at least one wall for supporting said shaking means from said at least one wall, for absorbing vibrations of said shaking relative to said case, and for maintaining a balance of said case.

5,749,251
LOCKING DEVICE AND SKI SECURITY SYSTEM

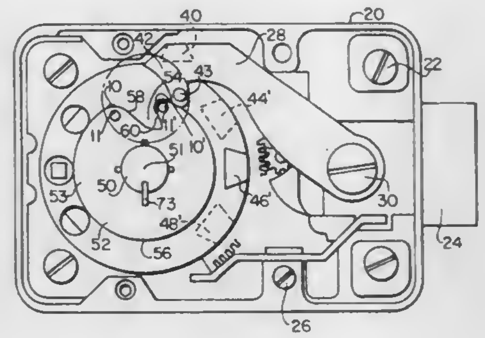
Jerome F. Keefe, 18 Priscilla Rd., Hopkinton, Mass. 01748
Filed Jan. 31, 1995, Ser. No. 381,714
Int. Cl.^{6} E05B *37/06*
U.S. Cl. 70—30 **6 Claims**



1. A lock including in combination:
a first shackle leg,
a second shackle leg, and
a casing having an axis and a plurality of axially-spaced rotatable locking members and an axially-extending aperture for receiving said first and second shackle legs, said received shackle legs being axially spaced from one another wherein each locking member radially surrounds a single received shackle leg so that said shackle legs are independently lockable to said casing.

5,749,252
MANIPULATION RESISTANT COMBINATION LOCK AND METHOD

Martin Richard Rhoades, Lexington, Ky., assignor to Sargent & Greenleaf, Nicholasville, Ky.
Filed Apr. 15, 1996, Ser. No. 632,577
Int. Cl.^{6} E05B *37/08;47/00*
U.S. Cl. 70—276 **18 Claims**



1. An improved manipulation resistant combination lock including manipulation defeating means for impeding unauthorized opening of the combination lock through manipulation of the lock components, wherein said lock includes:
a housing;
a bolt slidably mounted for movement in the housing between a locked extended position and an unlocked retracted position;
a pivotably mounted movable fence lever having a nose portion;
a fence member mounted on said fence lever;
a drive cam mounted for rotation in said housing and having an outer periphery in which a drive gate having a pulling surface and a pushing surface is provided;
said nose portion of said movable fence lever being urged into contact with the outer periphery of said drive cam;
a plurality of tumbler wheels that are alienable with said fence member when said tumbler wheel gates are positioned in a predetermined manner;
a pulling side multi-surface contact roller mounted for rotation about a roller rotation axis on said rotary drive cam adjacent the outer periphery of said rotary drive cam and also adjacent said pulling surface of said drive gate and positioned to engage said nose portion in response to rotation of said drive cam;
a pushing side multi-surface contact roller mounted for rotation about a roller rotation axis on said rotary drive cam adjacent the outer periphery of said drive cam and also adjacent said pushing surface of said drive gate and positioned to engage said nose portion in response to rotation of said rotary drive cam;
a first one of said multi-surface contact rollers having a plurality of non-identical nose contact surfaces each of which is uniquely radially positioned and oriented relative to the rotation axis of said first multi-surface contact roller so that said nose portion will engage one of said nose contact surfaces in response to rotation of said one drive cam and cause rotation of said multi-surface contact roller to position another one of said nose contact surfaces for engagement by said nose portion during a subsequent rotation of said drive cam so that the angular position of the drive cam at each time of contact of said one multi-surface contact roller is randomly variable for each such contact so as to prevent repetitive manually detectable characteristics during subsequent rotation of the drive cam.

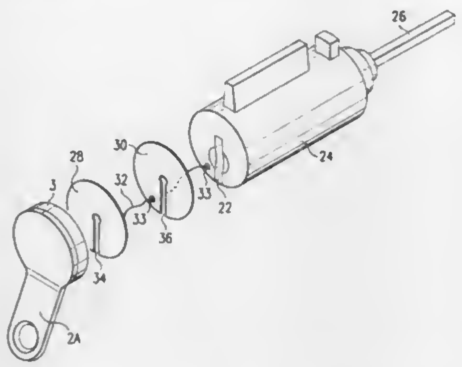
5,749,253
ELECTRICAL/MECHANICAL ACCESS CONTROL SYSTEMS AND METHODS

Mark Glick, Carrollton; Nicholas M.G. Fekete, Richardson; Michael L. Bolan, Dallas, and Jeffrey D. Owens, Colony, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 220,425, Mar. 30, 1994, abandoned. This application Jun. 19, 1996, Ser. No. 663,859

Int. Cl.⁶ E05B *49/00*

U.S. Cl. 70—278 47 Claims



1. An access control system, comprising;

a retro-fit electromechanical door handle assembly adapted to be similar in appearance and to replace an existing mechanical door handle assembly on a door, said retro-fit electromechanical door handle assembly comprising;

a locking mechanism including a motor mechanically coupled to a latch mechanism for locking and unlocking the latch mechanism, thereby locking and unlocking the door, and

a door handle having an electrical key insert means and a mechanical key insert means, wherein

- the electrical key insert means has a data probe on an exterior location of the door handle for communicating with an electrical key and the electrical key insert means is for activating the motor to unlock the locking mechanism upon contact of an authorized electrical key with the data probe independently of a mechanical key and independently of the mechanical key insert means, and
- the mechanical key insert means is for mechanically unlocking the locking mechanism upon internally receiving an authorized mechanical key independently of an electrical key and independently of the electrical key insert means,
- the electrical key insert means and the mechanical key insert means being substantially coaxially aligned and arranged such that alternatively both mechanical and electrical keys can be received at the same exterior location of the door handle.

5,749,254
AIR BEARING ASSIST IN PNEUMATIC FORMING OF THIN FOIL MATERIALS

Herbert L. Hall, Jr., Newark, Ohio, assignor to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation-in-part of Ser. No. 238,992, Oct. 25, 1994, Pat. No. 5,540,075. This application Mar. 30, 1995, Ser. No. 413,676

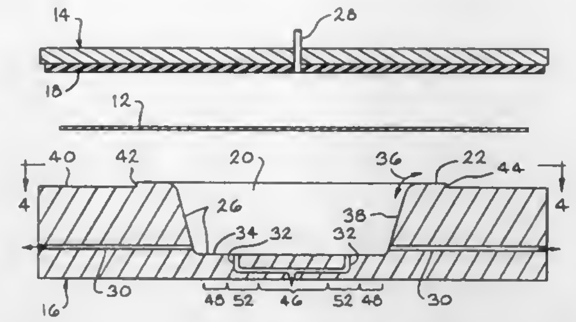
Int. Cl.⁶ B21D *26/02;* **B23P** *17/00*

U.S. Cl. 72—60 20 Claims

1. A method for pneumatic forming of foil workpieces comprising:

positioning a foil workpiece between a first and a second forming element, the second forming element having at least one forming cavity;

moving the first and second forming elements into a clamping relationship with the foil workpiece;



increasing pneumatic pressure between the first forming element and the foil workpiece to form the foil workpiece into the forming cavity;

supplying a gas between the foil and the second forming element sufficient to enable the foil workpiece to move along the surface of the second forming element during the forming of the foil workpiece into the forming cavity;

venting the gas from the area between the foil and the second forming element during forming to assist in moving the foil along the surface of the second forming element; and,

removing the foil workpiece in a formed condition from between the first and second forming elements.

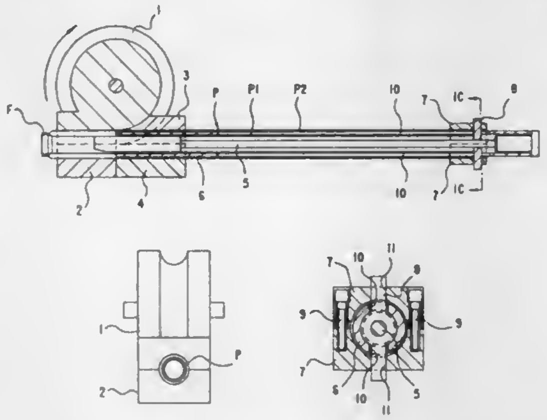
5,749,255
BENDING DEVICE FOR HOLLOW DOUBLE-STRUCTURED PIPE

Saburo Arai, Urawa, Japan, assignor to Sankei Giken Kogyo Kabushiki Kaisya, Tokyo, and Kabushiki Kaisya VISTA, Saitama, both of Japan

Filed Dec. 6, 1996, Ser. No. 761,829

Int. Cl.⁶ B21D *9/04*

U.S. Cl. 72—150 1 Claim



1. An apparatus for bending a hollow double-structured pipe, wherein said hollow double-structured pipe has a fixed end side, an intermediate part, and an inner pipe within an outer pipe such that a gap between said inner pipe and said outer pipe houses a tubular core metal and an inner core metal is housed within said inner pipe, said pipe bending apparatus comprising:

a fixing die;

a bending die located above said fixing die, wherein said fixed end side of said hollow double-structured pipe is fastened to said bending die and said fixing die and said bending die is rotated in a direction in which said hollow double-structured pipe is bent;

a shoe located adjacent said bending die;

a pressing die located below said shoe and adjacent said fixing die, wherein said shoe and said pressing die slidably hold said intermediate part of said double-structured pipe;

a holding member having an end surface in contact with open end faces of both said inner and outer pipes of said hollow double-structured pipe;

a chuck located adjacent to said holding member, wherein said chuck and said holding member are fixed on peripheral surfaces of said outer pipe, at an open end side of said hollow double-structured pipe, and are connected to each other through a long guide slot formed in said tubular core metal of said hollow double-structured pipe in such a manner that said tubular core metal can be made rotatable with respect to said inner core metal.

5,749,256
METHOD AND APPARATUS FOR MANUFACTURING A HOT ROLLED BEAM

Ernest R. Bodnar, Don Mills, Canada, assignor to Rotary Press Systems Inc., Toronto, Canada

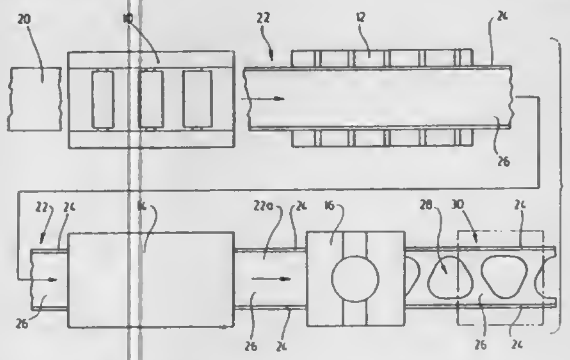
PCT No. PCT/CA94/00620, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/13151, PCT Pub. Date May 18, 1995

PCT Filed Nov. 8, 1994, Ser. No. 640,907

Claims priority, application Canada, Nov. 12, 1993, 2103002

Int. Cl.⁶ B21D *28/32*

U.S. Cl. 72—333 17 Claims



1. A method of manufacturing a one piece integral metallic beam (**22**) having flanges (**24**), and a web (**26**) joining said flanges, said beam having been hot rolled from a heated metal workpiece (**20**), to produce an integral one piece beam having flanges, and a web extending therebetween, said flanges having a predetermined first thickness, and said web having a predetermined second thickness less than said first thickness, and characterized by the steps of;

heating said web (**26**) to a hot forming temperature; passing said heated web (**26**) through at least one metal forming die set (**16**) for forming openings in (**28**) said web, and planar clamping die portions for flattening said web;

repeatedly closing said at least one die set (**16**) on said web (**26**), without forming said flanges (**24**), whereby to form openings (**28**) in said web (**26**);

wherein said step of closing said at least one die set (**16**) on said web (**26**) forms lips (**30**) around said openings (**28**), at an angle to said web; and,

clamping said web (**26**) to flatten said web (**26**) around said openings (**28**).

5,749,257
RIVET IN A CONVERTED CAN END, METHOD OF MANUFACTURE, AND TOOLING

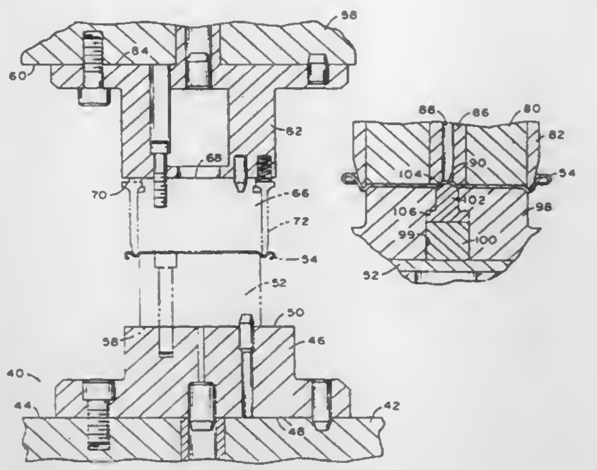
Carl McEldowney, Russia, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 336,459, Nov. 9, 1994. This application Jul. 15, 1996, Ser. No. 680,736

Int. Cl.⁶ B21D *22/00;31/00*

U.S. Cl. 72—354.6 10 Claims

1. Tooling for the conversion of a can end shell into an easy open can end having a pull tab comprising (a) a first station for forming an integral bubble in a panel portion of the can end shell and (b) at least a second station for the further forming of said integral bubble, said panel portion being of a predetermined thickness and having a beverage side and a consumer side, said first station including first station upper tooling and first station lower tooling, said first station lower tooling having a rounded head configured to contact and support the beverage side of said panel portion, said first station upper tooling having a hollow die member defining a central longitudinal orifice shaped to cooperate with and receive thereinto said rounded head, said first station upper and lower tooling cooperating to cold work said integral bubble such that said coldworked bubble includes a rounded cone-shaped head and a truncated base portion and said bubble truncated base portion has a thickness that varies along its height such that said bubble truncated base portion is of a lesser thickness proximate the cone shaped head than proximate the panel, and at least a second tooling station including upper tooling and lower tooling configured to coldwork the integral bubble to form from said coldworked integral bubble a rivet having a shank portion being of a predetermined diameter.



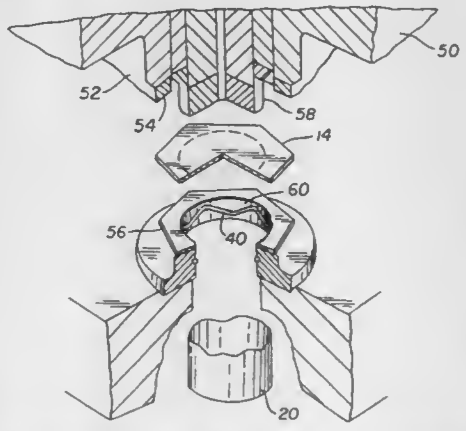
5,749,258
TOOLING AND METHOD FOR FORMING A CONTAINER

Elmer D. Werth, 7025 W. 61st Ave., Arvada, Colo. 80003

Continuation-in-part of Ser. No. 524,480, Sep. 7, 1995, Pat. No. 5,630,337. This application Feb. 14, 1997, Ser. No. 801,039

Int. Cl.⁶ B21D *22/20*

U.S. Cl. 72—467 25 Claims



1. A tool for forming a blank into a container body having an open end, comprising:

a die having an annular shaping surface about a central axis; wherein:

said shaping surface is of substantially uniform radius with respect to said central axis; and

7

at a plurality of preselected, spaced locations about the annular shaping surface, an edge of the shaping surface is disposed at an acute angle with respect to the central axis.

5,749,259

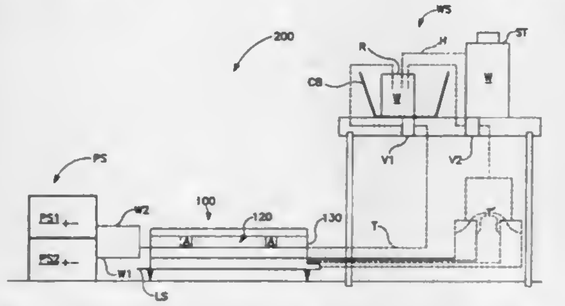
APPARATUS FOR SIMULATING THE THERMOREGULATORY RESPONSES OF HUMAN SKIN AND RELATED METHOD FOR PREDICTING FABRIC COMFORT LEVEL

Hechmi Hamouda; Roger L. Barker, both of Raleigh, N.C., and Darrin S. Millsaps, Lawrenceville, Ga., assignors to North Carolina State University, Raleigh, N.C.

Filed May 12, 1995, Ser. No. 439,662

Int. Cl.⁶ G01N *25/00;33/36*

U.S. Cl. 73—159 **20 Claims**



17. A method for predicting the thermal comfort of a fabric comprising:

(A) providing a sweating hot plate apparatus having a top surface adapted to change temperature for simulation of skin surface thermoregulatory responses of a human, the apparatus including:
  (i) an inner plate including (a) a fluid permeable top layer having a top surface, (b) a base layer having one or more channels disposed therein, and (c) a circumference and a bottom;
  (ii) a guard plate surrounding the circumference and the bottom of the inner plate and including (a) a fluid permeable top layer having a top surface, and (b) a base layer having one or more channels disposed therein;
  (iii) the top surface of the sweating hot plate being defined by the inner plate top surface and the guard plate top surface;
  (iv) a fluid input source connected to the inner plate base layer and the guard plate base layer to provide a selected fluid flow to the one or more channels of the inner plate and the one or more channels of the guard plate;
  (v) a thermal input source electrically connected to the sweating hot plate to provide a selected constant power flux to the inner plate and the guard plate; and
  (vi) a temperature sensor operatively connected to the surface of the sweating hot plate to determine the temperature thereof;
(B) providing a fluid flow through the fluid input source and providing a power flux through the thermal input source at preselected and constant levels, respectively, corresponding to a predetermined human sweating output level and thermal output level, respectively;
(C) placing a fabric on the top surface of the sweating hot plate;
(D) observing the changing temperature of the top surface of the sweating hot plate as the temperature changes to simulate the human skin surface thermoregulatory responses; and
(E) analyzing the changing temperature of the top surface of the sweating hot plate and determining therefrom the comfort level of the fabric.

5,749,260

Patent Not Issued For This Number

5,749,261

NOISE INSULATION ARRANGEMENT FOR SHIFT LEVER

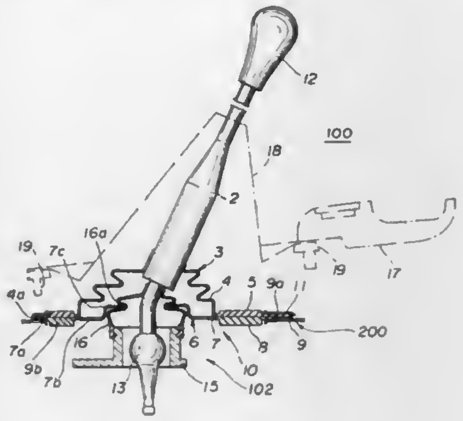
Youichi Numakami, Chiba, Japan, assignor to Kinugawa Rubber Ind. Co., Ltd., Chiba, Japan

Filed Jan. 31, 1996, Ser. No. 594,990

Claims priority, application Japan, Jan. 31, 1995, 7-013610

Int. Cl.⁶ G05G *9/00;* F16J *15/52*

U.S. Cl. 74—18.1 **24 Claims**



1. A noise insulation arrangement comprising:

a partition cover having a margin with a perimeter defining an opening;

a shift lever assembly extending through said opening and including a shift lever movable within said opening relative to said perimeter;

a noise insulator connected between said shift lever and said margin of said partition to close said opening, said noise insulator including a first noise barrier portion disposed in said opening adjacent to said perimeter and extending along said perimeter through the whole length thereof and a first resilient portion extending between said first noise barrier portion and said shift lever, said first noise barrier portion being thicker than said first resilient portion; and

an insulator cover connected between said shift lever and said margin of said partition cover, said insulator cover including a second noise barrier portion disposed in said opening adjacent to said perimeter and extending along said perimeter through the whole length thereof and a second resilient portion extending between said second noise barrier portion and said shift lever over said first resilient portion of said noise insulator, said second noise barrier portion being thicker than said second resilient portion, wherein said second noise barrier portion covers said first noise barrier portion.

5,749,262

CRANK MECHANISM

George Frederic Galvin, 9 Christchurch Road, Sidcup, Kent DA15 7HG, England

PCT No. PCT/GB94/02484, § 371 Date Jul. 5, 1996, § 102(e) Date Jul. 5, 1996, PCT Pub. No. WO95/13464, PCT Pub. Date May 18, 1995

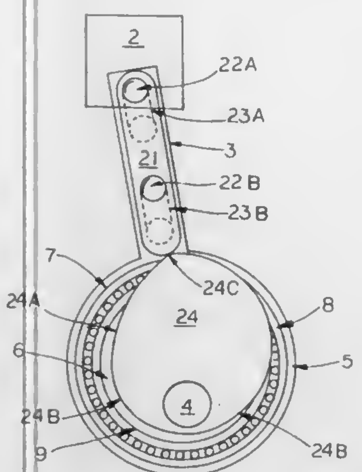
Continuation-in-part of Ser. No. 165,969, Dec. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 910,186, Jul. 16, 1992, Pat. No. 5,297,448. This PCT application Nov. 11, 1994, Ser. No. 464,872

Claims priority, application United Kingdom, Nov. 11, 1993, 9323191

Int. Cl.⁶ F16H *21/34*

U.S. Cl. 74—44 **24 Claims**

1. A crank mechanism for an internal combustion engine, the crank mechanism comprising a cylinder, a piston reciprocable within the cylinder, and a rotatable shaft, the piston being in drivable connection with the shaft via a connecting rod, a drive ring and a torque lobe, the connecting rod being pivotally fixed to the piston, and the drive ring being rigidly attached to the free end of the connecting rod, the torque lobe being a circular plate eccentrically mounted on the shaft for rotation therewith about the axis thereof, the drive ring being an annular sleeve which is rotatable around the rim of the torque lobe, whereby rectilinear movement of the piston is converted to rotary movement of the torque lobe or vice versa, the connecting rod being constituted by a main connecting rod and at least one auxiliary connecting rod, the or each auxiliary connecting rod being slidably fixed to the main connecting rod for axial movement relative thereto, the piston being fixed to the or each auxiliary connecting rod, and the main connecting rod being fixed to the drive ring, the or each auxiliary connecting rod being associated with a respective cam fixed to the torque lobe.



5,749,263

TOOTHED-WHEEL GEARCHANGE

Gerhard Buri, Markdorf, and Josef Bader, Friedrichshafen, both of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

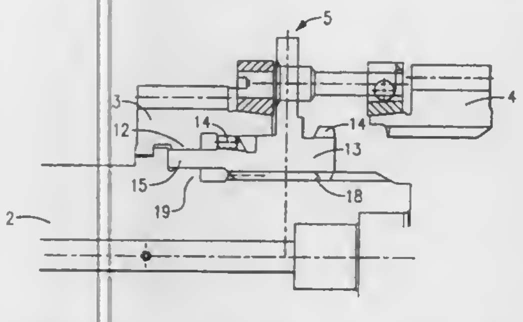
PCT No. PCT/EP94/00425, § 371 Date Aug. 10, 1995, § 102(e) Date Aug. 10, 1995, PCT Pub. No. WO94/19623, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 15, 1994, Ser. No. 492,124

Claims priority, application Germany, Feb. 19, 1993, 43 05 103.0

Int. Cl.⁶ F16H *3/093*

U.S. Cl. 74—331 **19 Claims**



1. A toothed-wheel gear change having a radially and axially supported input shaft and a coaxial and floating output shaft and having a power distribution over a plurality of countershafts, at least one input gear being provided on said input shaft for transmitting torque to gears meshing therewith and firmly connected with said plurality of countershafts, and said torque being transmitted to loose gears being axially fixed but being radially freely movably situated on said output shaft, and said torque being transmitted to said output shaft by way of a respective coordinated coupling device;

wherein said at least one input gear is provided on said input shaft, for torque transmission, as an axially fixed and radially freely movable loose gear (3), said at least one input gear is coupled with said input shaft by a shifting device (5) and said at least one input gear is radially fixed, upon engagement of said at least one gear, by a movable securing device (12, 15, 19) which is at least partially located, during said coupling, between said at least one gear and said input shaft.

5,749,264

GEAR CHANGE MECHANISM

Roland James Broadbent, Banbury, England, assignor to Prodrive Engineering Limited, North Wales, England

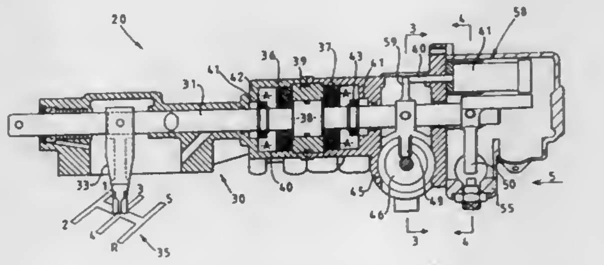
PCT No. PCT/GB94/01553, § 371 Date Jan. 16, 1996, § 102(e) Date Jan. 16, 1996, PCT Pub. No. WO95/02775, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 18, 1994, Ser. No. 581,568

Claims priority, application United Kingdom, Jul. 17, 1993, 9314951.6

Int. Cl.⁶ F16H *51/00*

U.S. Cl. 74—335 **16 Claims**



1. A gear change mechanism for a gearbox (13, 35) which comprises a drive assembly (11, 12), a gearbox selector (33) connectable to the drive assembly, an actuator (19A, 19B, 19C, 19D) for actuating the drive assembly; and

control (17) means for controlling the operation of the drive assembly according to instructions received from the actuator and according to programming of the control means;

the drive assembly including:

a shaft (31) drivingly connectable to the gearbox selector (33), the shaft being movable in its axial direction and about its axis to move a plurality of positions according to the gear to be selected in the gearbox (35) and a neutral gear position;

a first piston assembly (36–43) wherein the shaft (31) is operatively driven in its axial direction by the first piston assembly which is coaxial with the shaft, pressure fluid being applied selectively to the first piston assembly to move the shaft in the axial direction;

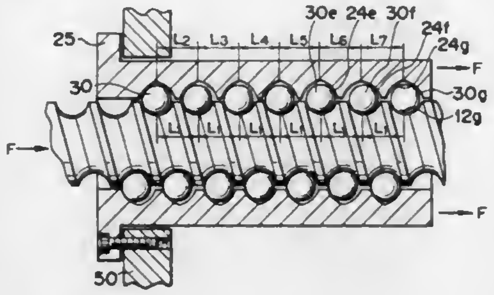
the first piston assembly comprising a pair of collars (42, 43) acting as first abutment means restricting the axial movement of the shaft (31) and a pair of annular pistons (36, 37) located about the shaft and each piston is movable selectively towards a gear engaging position and towards a neutral gear position;

a cylinder (40) comprising a pair of recesses (41) located at opposite ends of the cylinder (40) walls to engage with the collars (42, 43);

second abutment means (39) carried by the cylinder (40), the movement of each piston (36, 37) towards a neutral gear position being limited by the second abutment means (39), and during said movement each piston (36, 37) is engageable with the second abutment means (39) which is located between the pistons, and pressure fluid being applied to opposite sides of the pistons to urge the pistons towards the neutral gear position, the first abutment means (42, 43) acting upon movement in the gear engaging direction.

5,749,265
BALL SCREW DEVICE

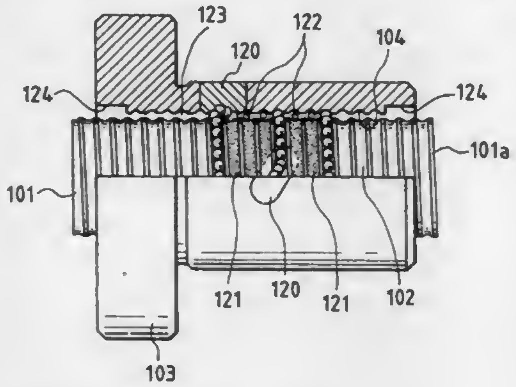
Ken Namimatsu, Maebashi, and Manabu Matsuura, Takasaki, both of Japan, assignors to NSK, Ltd., Tokyo, Japan
Continuation of Ser. No. 226,328, Apr. 12, 1994, abandoned. This application Sep. 28, 1995, Ser. No. 534,927
Claims priority, application Japan, Apr. 12, 1993, 5-084442; Apr. 12, 1993, 5-084443
Int. Cl.⁶ F16H *25/22*
U.S. Cl. 74—459 **36 Claims**



1. A ball screw device, comprising:
- a ball screw shaft having an outer periphery formed with a spiral groove;
- a ball nut having an inner periphery formed with a spiral groove facing the groove of said ball screw shaft, and having an attachment portion to be fixed to a fixing member; and
- a plurality of balls rotatably interposed between said grooves to transmit axial force from said ball screw shaft to said ball nut upon rotation of said ball screw shaft;
- wherein the ball nut groove is configured such that, for a ball in a first portion of the ball nut groove farther from the attachment portion, a gap defined by the ball and a wall of the groove portion along a load acting line on which the ball transmits an axial force component from the ball screw shaft to the ball nut is smaller than a corresponding gap for a ball in a second portion of the ball nut groove closer to said attachment portion, by an amount corresponding to an elastic deformation of the first groove portion by a predetermined axial force acting on said ball nut.

5,749,266
BALL SCREW-NUT MACHINE WITH A LUBRICANT SUPPLY MEMBER

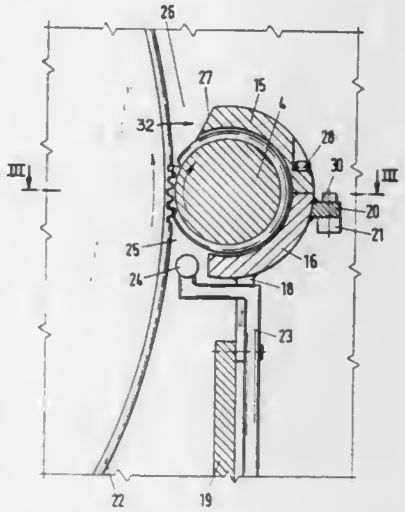
Toru Tsukada, Gunma, Japan, assignor to NSK LTD., Tokyo, Japan
Division of Ser. No. 319,729, Oct. 7, 1994, Pat. No. 5,694,811. This application Apr. 19, 1996, Ser. No. 635,015
Claims priority, application Japan, Oct. 7, 1993, 5-54555; Oct. 12, 1993, 5-254401; Oct. 25, 1993, 5-266449
Int. Cl.⁶ F16H *55/17*
U.S. Cl. 74—459 **10 Claims**



1. A ball screw-nut machine comprising:
- a screw shaft comprising a first spiral thread on an outer surface thereof;
- a ball screw-nut screwed to said screw shaft comprising on an inner surface thereof a second spiral thread opposed to said first spiral thread of said screw shaft, said ball screw-nut having ball circulating paths;
- a spiral load element rolling space defined by said first spiral thread and said second spiral thread;
- a number of balls circulated endlessly within endless ball circulating paths which are formed by the spiral load element rolling space and the ball circulating paths;
- a spiral block space defined in the spiral load element rolling space between the ball circulating paths; and
- a lubricant supply member substantially filling said spiral block space.

5,749,267
DEVICE TO REDUCE VENTILATION LOSS OF A HIGH-SPEED GEAR MECHANISM

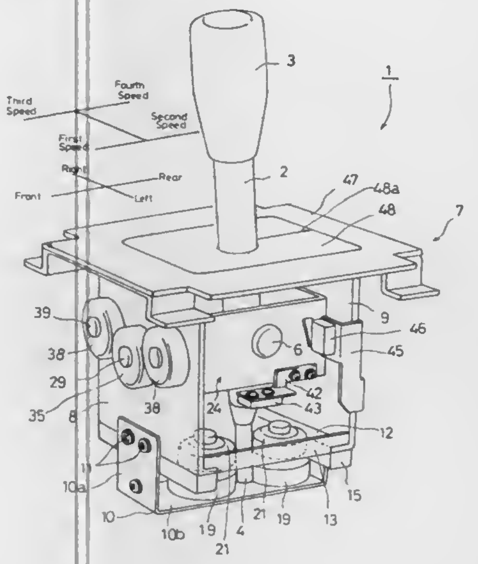
Bernhard Kock, Duisburg, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany
Filed Jun. 26, 1996, Ser. No. 670,902
Claims priority, application Germany, Jun. 29, 1995, 195 25 102.4
Int. Cl.⁶ F16H *57/04*
U.S. Cl. 74—467 **8 Claims**



1. A device for reducing ventilation loss of a high-speed gear mechanism having a gear housing which encloses an intermeshing pinion and gear wheel wherein the pinion is driven by the gear wheel, the device comprising: means for spraying lubricant to a narrowing engagement area of the pinion and gear wheel so as to reduce friction; means for encapsulating only the pinion over more than 180° of its perimeter so that the encapsulating means has a front end in the engagement area and a back end in a disengagement area of the pinion and the gear wheel, the back end of the encapsulating means being configured to constantly enlarge a non-covered cross-sectional area between the pinion and the gear wheel so as to utilize pressure that is automatically established in the engagement and disengagement areas; and, means for sealing the encapsulating means on both sides relative to non-toothed shaft sections of the pinion.

5,749,268
SIMULATING MULTI-STAGE SPEED CHANGE SHIFT LEVER OPERATING DEVICE

Eiji Nishimura, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan
Filed Feb. 16, 1995, Ser. No. 391,419
Claims priority, application Japan, Feb. 21, 1994, 6-046355
Int. Cl.⁶ B60K *20/04*
U.S. Cl. 74—473 R **16 Claims**

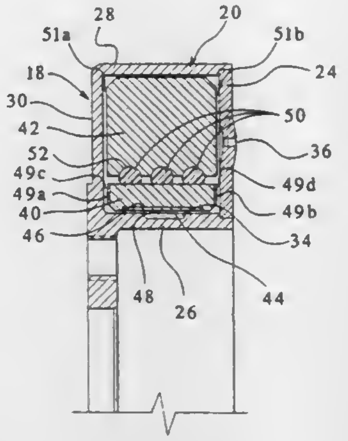


10. A simulating multi-stage speed change shift lever operating device in which a shift lever substantially upright in a vertical direction is operated along a flat plane in compliance with a predetermined locus having a front, rear, right and left directional pattern for shifting relative to a user, comprising:
- a base block;
- an oscillation supporting member pivotally supported for movement relative to said base block around a first axis directed in a front-and-rear direction, the shift lever pivotally supported for movement relative to said oscillation supporting member around a second axis directed perpendicularly to said first axis with a lower end extending below said oscillation supporting member;
- a resilient returning means for biasing the oscillation supporting member and the shift lever to a vertical plane passing through said first axis; and
- a plurality of resilient guide rollers positioned adjacent a lower end of said shift lever and rotatably pivoted around vertical axes displaced from said vertical plane passing through said first axis in a right-and-left direction, the lower end of the shift lever contacts circumferential surfaces of the resilient guide rollers as the user moves the shift lever through the directional pattern so that the lower end of the shift lever provides a curved locus of movement as it contacts and moves around the guide rollers.

5,749,269
DUAL-MODE, VISCOUS CRANKSHAFT VIBRATION DAMPER

John George Szymanski, Buffalo; Robert Henry Stanley, Jr., Niagara Falls, and Fredrick Richard Roland, Hamburg, all of N.Y., assignors to Vibratech, Inc., Alden, N.Y.
Filed Apr. 26, 1996, Ser. No. 638,177
Int. Cl.⁶ F16F *15/10*
U.S. Cl. 74—574 **19 Claims**

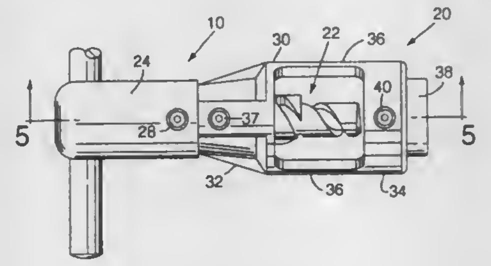
1. A viscous torsion damper comprising:
- a central hub;



- an annular chamber surrounding and connected to said central hub;
- a first annular inertia mass closely coupled for lateral vibration to an inside annular surface of said annular chamber;
- a second annular inertia mass arranged entirely radially outward from and concentric of said first annular inertia mass and defining a gap therebetween;
- said first and second inertia masses moveable relative to said central hub within said annular chamber defining one or more shear planes therebetween;
- a resilient damping element arranged within said gap mechanically coupling said first and second inertia masses via friction for damping lateral vibration, said resilient damping element spaced from said one or more shear planes; and
- a viscous fluid disposed at least between said second inertia mass and an inside surface of said annular chamber.

5,749,270
COAXIAL CABLE CORING TOOL

Roger R. Bourbeau, Glastonbury, Conn., assignor to Ben Hughes Communication Products Company, Chester, Conn.
Filed Jan. 29, 1997, Ser. No. 789,837
Int. Cl.⁶ H02G *1/12*
U.S. Cl. 81—9.4 **20 Claims**



1. In a coaxial cable coring tool for use with a coaxial cable having an axially extending cylindrical central conductor, a generally cylindrical dielectric core in coaxially surrounding engagement with the conductor, and a generally cylindrical tubular outer sheath in coaxially surrounding engagement with the core, the coring tool including a cutter holder and an axially elongated cutter mounted in and projecting axially outwardly from the cutter holder, the cutter having an outer end and a coaxial cylindrical bore defined by a bore wall and opening through the outer end for receiving an end portion of the conductor therein, said bore having a diameter at least equal to the diameter of the conductor, said cutter including a generally cylindrical coring portion extending to the said outer end having an outside diameter substantially equal to the inside diameter of the tubular outer sheath, said coring portion including a first cutting edge for cutting away a portion of the core when said cutting tool is coaxially rotated in a cutting direction and

in cutting engagement with and relative to the cable, and guide means mounted on the cutter holder and cooperating with an associated cable for maintaining the associated cable in generally coaxial alignment with the cutter as the cutter is rotated relative to the cable, the improvement comprising said first cutting edge extending outward from said bore wall to a termination point on the outer peripheral surface of said outer end, said termination point being spaced radially outwardly from the axis of said bore a distance less than the radial dimension of said cylindrical coring portion.

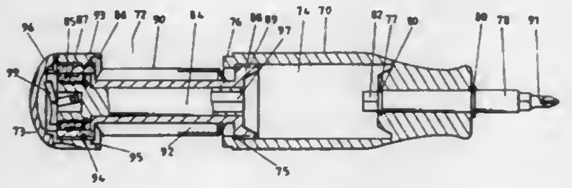
5,749,271
DUAL PURPOSE RATCHET SCREWDRIVER

Tasi-Fa Liu, 2F, No.3-1, Alley 15, Lane Shui Ching,Peitun District 406, Taichung City, Taiwan

Filed Jun. 24, 1996, Ser. No. 668,699

Int. Cl.^{6} B25B *13/46*

U.S. Cl. 81—60 **2 Claims**



1. A dual purpose ratchet screwdriver of the type comprising a handle, a ratchet mechanism, a bit locking means and a rear cap, wherein

said handle has a chamber of a predetermined depth formed at a rear end thereof and extending inwardly, said chamber being provided with a stop block and an engaging edge at the respective inner and outer sides of a rear portion thereof, said chamber further having an insert groove at an inner wall of a front portion thereof, a guide hole being provided to extend from a middle portion of said chamber to a front end of said handle for insertion of a shaft; said shaft being turnable and positioned at its respective ends by a C-clip, said shaft being provided with a receiving hole at the front end thereof and a polygonal post at the rear end thereof for extending into the rear end of said chamber;

said bit locking means is injection molded from plastic materials and is inserted into said chamber of said handle, said bit locking means having a through hole connecting its ends for receiving a drive sleeve of said ratchet mechanism, a rear end of said bit locking means being enlarged to form a support portion for accommodating said ratchet mechanism, said support portion being internally and externally provided with a toothed surface, said toothed surface on the inner wall of said support portion matching a ratchet ring of said ratchet mechanism, and a positioning ring at a middle section of said ratchet ring being used to position said support portion and said ratchet ring, said bit locking means further having an annular seat at a front end thereof, said annular seat being externally and circumferentially provided with a plurality of recesses which should align with said stop block of said chamber to permit insertion of said bit locking means into said chamber; the part of said bit locking means between said annular seat and said support portion being divided into a plurality of compartments by means of a plurality of partition plates for accommodating a plurality of bits of different specifications and sizes;

said rear cap is fitted onto said rear end of said handle and has a hollow cap body for receiving said support portion of said bit locking means, said cap body having an inner wall provided with a toothed surface for matching the toothed surface formed externally on said support portion, said toothed surface of said cap body having a raised ring at a middle portion thereof, and a shallow terrace being formed at the inner wall of said cap body near its front end for matching said engaging edge of said chamber, and a non-skid curved cap element being provided at a bottom side of said cap body for facilitating turning.

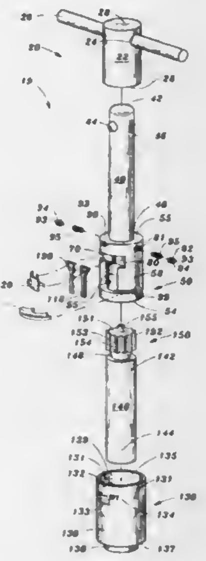
5,749,272
RATCHET SCREW DRIVER

Tan Thanh Phan, 4316 25th Ave., Sac., Calif. 95820

Filed Apr. 24, 1996, Ser. No. 636,977

Int. Cl.^{6} B25B *13/46*

U.S. Cl. 81—62 **19 Claims**



1. A ratchet screw driver comprising in combination:

a primary shaft,

a ratchet housing secured to said primary shaft,

a bore oriented within said ratchet housing,

a secondary shaft having a outer diameter less than an inner diameter of said bore, said second shaft having clutch teeth extending radially from a portion of said second shaft, said clutch teeth oriented within said bore of said housing, and

a driver tip secured to said secondary shaft and including means to interface with a device which is to be rotated, in a manner causing the device to rotate when said driver tip rotates,

said ratchet housing including a shelf oriented in a shelf plane substantially parallel to said secondary shaft, said shelf plane being closer to a central axis of said secondary shaft than said clutch teeth, such that said clutch teeth extend above said shelf plane and into an opening,

said ratchet housing including at least two pawls adjacent said shelf, said pawls sized to both rest on said shelf simultaneously with a portion of each said pawl oriented between said clutch teeth of said secondary shaft and said primary shaft.

5,749,273
METHOD AND APPARATUS FOR ADVANCING A TOOL ON A LATHE

Charles H. Rimlinger, Jr., 928 Forest Acres Ct., Nashville, Tenn. 37220

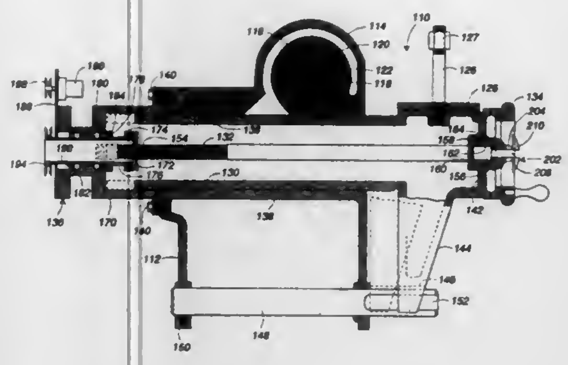
Filed Oct. 23, 1995, Ser. No. 546,775

Int. Cl.^{6} B23B *21/00;* B23Q *5/40*

U.S. Cl. 82—1.11 **24 Claims**

1. A method for imparting relative motion between a tool that is carried by a tool holder and a workpiece on a lathe, which method comprises:

a) providing a feed screw having a first end and a second end and having a threaded portion near the first end thereof;



b) fixing the tool holder with respect to the feed screw, so that axial motion of the feed screw will be translated to the tool carried by the tool holder;

c) providing a hollow drive tube that is disposed to rotate about its long axis, which drive tube has an internal diameter large enough to accommodate the feed screw;

d) mounting the drive tube at a location that is fixed with respect to the workpiece;

e) attaching a nut that is threaded to mate with the threaded portion of the feed screw to one end of the drive tube;

f) attaching a drive means to the drive tube;

g) locking the second end of the feed screw so as to temporarily prohibit rotational motion of the feed screw;

h) mating the nut with the threaded portion of the feed screw so that at least a portion of the feed screw extends into the drive tube;

i) rotating the drive tube with the drive means so as to impart axial motion to the feed screw as the nut rotates thereabout and to impart relative motion thereby to the tool that is carried by the tool holder.

5,749,274
CYLINDRICAL MEMBER AND METHOD OF MANUFACTURING THE SAME

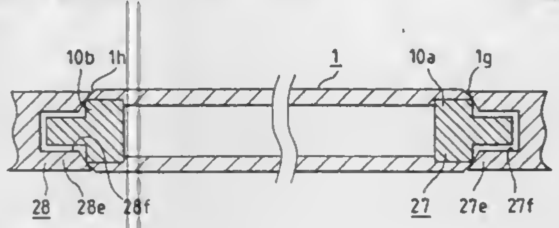
Hiroshi Chiba, Ebina, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1996, Ser. No. 663,362

Claims priority, application Japan, Jun. 21, 1995, 7-178260; May 15, 1996, 8-145155

Int. Cl.^{6} B23B *1/00*

U.S. Cl. 82—1.11 **3 Claims**



1. A processing method for a developing sleeve or a developing drum to be used for an image forming apparatus, comprising the steps of:

engaging a flange member having a shaft portion into an opened portion of a hollow cylindrical member;

forming a tapered portion on an outer periphery of the opened portion of the cylindrical member in which the flange member is engaged;

forming a tapered portion on a holding member for holding the cylindrical member;

holding the cylindrical member in a non-rotating condition by the tapered portion of the holding member; and

processing an outer peripheral surface of the cylindrical member held in the non-rotating condition by a rotating process means.

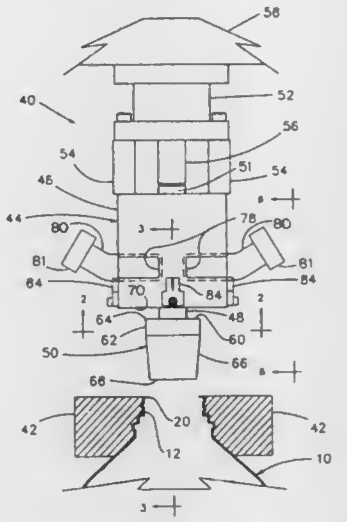
5,749,275
APPARATUS FOR TRIMMING THE NECK OF BLOW MOLDED PLASTIC BOTTLES AND METHOD

Dennis L. Dundas, Dover, and Paul W. Klinedinst, Windsor, both of Pa., assignors to Graham Engineering Corporation, York, Pa.

Filed Sep. 14, 1995, Ser. No. 528,347

Int. Cl.^{6} B26D *7/02;5/08*

U.S. Cl. 83—24 **31 Claims**



1. An apparatus for trimming an inner edge of a flange extending radially inwardly from the top of the neck of a plastic bottle, the apparatus comprising a bottle neck clamp a punch shaft having a forward end and a rear end, a reverse punch mounted on the forward end of the punch shaft adjacent to the neck clamp, the reverse punch having a leading end adjacent the neck clamp, a trailing end remote from the neck clamp, a flange bend surface and a circumferential cutting edge adjacent the trailing end; a punch drive connected to the punch shaft so that extension of the drive moves the bend surface into engagement with the flange to bend the flange inwardly and permit the reverse punch to move into the bottle, and retraction of the drive moves the cutting edge into engagement with and past the flange to cut a plastic ring surrounding the punch shaft from the flange.

5,749,276
CUTTING APPARATUS AND AUTOMATIC CUTTING SYSTEM OF BLADE'S RAW MATERIAL OF BLANKING DIE

Byung-Jun Song, 1203-1101 Jukong Apt. Chulsandong, Kwangmyungshi, Kyunggi-do, Rep. of Korea

PCT No. PCT/KR92/00074, § 371 Date Jul. 21, 1993, § 102(e) Date Jul. 21, 1993, PCT Pub. No. WO93/11900, PCT Pub. Date Jun. 24, 1993

Continuation of Ser. No. 480,702, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 90,080, Jul. 21, 1993, abandoned. This PCT application Dec. 10, 1992, Ser. No. 698,758

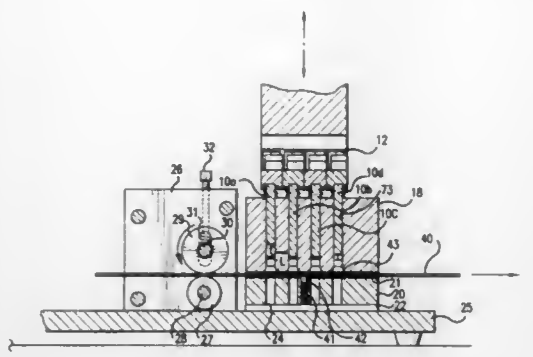
Claims priority, application Rep. of Korea, Dec. 11, 1991, 91-22620; Dec. 17, 1991, 91-23178

Int. Cl.^{6} B26D *5/12*

U.S. Cl. 83—76.9 **17 Claims**

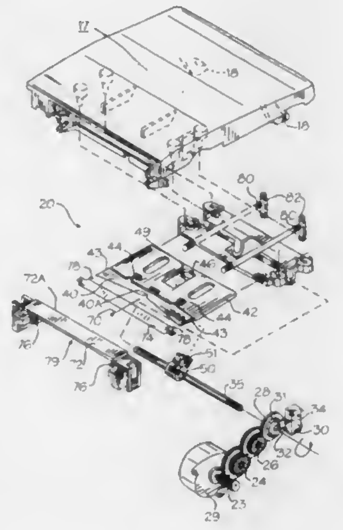
1. A cutting apparatus for cutting of band shaped raw material, consisting essentially of:

at least two cutters having different cutting shapes located solely above the raw material, said cutters being in a side-by-side array with each one of said cutters being independently movable and having blade or cutting edges in a plane parallel to a feeding direction of said raw material and receiving portions directly below and axially aligned with a cutter and directly below the raw material;



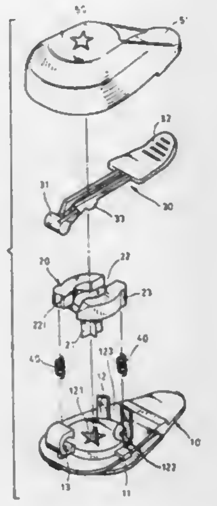
- a stationary cutter guiding section including (1) a plurality of vertical guide slots, each one of the guide slots having a respective one of said cutters therein for guiding said cutters to perpendicularly move downwardly against a plane of said raw material, and (2) means for biasing said cutters upwardly;
- means including an element spaced above said cutters for applying force to perpendicularly move and press said cutters into said plane of the raw material;
- a cutter die for supporting said raw material against the pressing force of said cutters and simultaneously interacting with said cutters to execute a cutting pattern on the raw material;
- a plurality of hydraulic pressure members located lower than and to one side of said element, each one of said pressure members being selectively movable between said element and a respective one of said cutters for transferring the pressing force to the respective one of said cutters;
- driving means for selectively moving the pressure members beneath said element;
- a control section for controlling said driving means and each said receiving portion collecting cut raw material.

5,749,277
CUTTING MECHANISM FOR RECEIPT PRINTER
Alan H. Walker, Barton, N.Y., assignor to Axiohm IPB Inc, Ithaca, N.Y.
Filed May 23, 1996, Ser. No. 652,744
Int. Cl.⁶ B26D *1/06*
U.S. Cl. 83—563 **26 Claims**



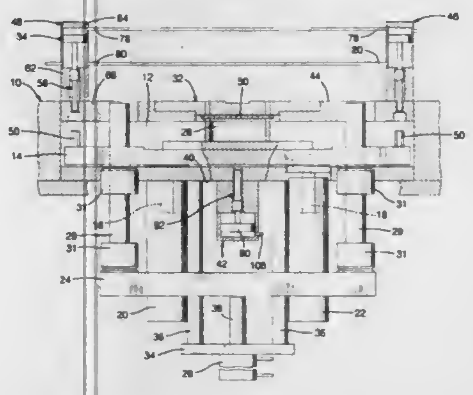
1. A cutting mechanism for a receipt printer, comprising:
- a printer housing;
- means defining a paper-web path disposed in said printer housing;
- a movable cutting blade being movable between a retracted position and a cutting position, said movable cutting blade intersecting said paper-web path in order to cut a receipt therefrom;
- a supply of paper supported by said printer housing, said supply of paper furnishing a web of paper for traversal along said paper-web path;
- drive means connected to said movable cutting blade for moving said movable cutting blade between said retracted position and said cutting position; and
- a guide member disposed along said paper-web path for receiving said movable cutting blade as it moves toward its cutting position, said guide member having a guide plate with at least one end tab for coaxing said movable cutting blade into conformity with said guide member, said guide member having a stationary cutting edge for receiving said movable cutting blade, to initiate and complete the severing of said paper web, and said stationary cutting edge being tensioned and bowed with respect to said printer housing.

5,749,278
MOLD-PRESSING DEVICE
Cheng Ho Lee, 5F, No. 12, Alley 29, Lane 10, Sec. 3, Shiow Laang Rd., Jong Her City, Taipei Hsien, and Cheng Nan Chen, No. 12, Lane 122, Sec. 2, Shih Wann Rd., Shih Jyy Jenn, Taipei Hsien, both of Taiwan
Filed Jun. 13, 1997, Ser. No. 874,554
Int. Cl.⁶ B26F *1/02*
U.S. Cl. 83—588 **4 Claims**



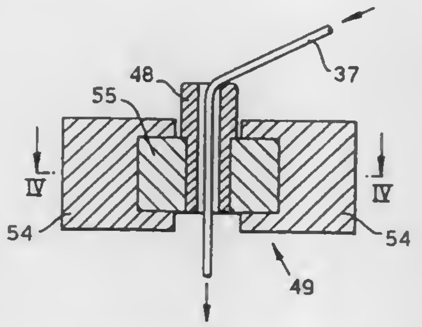
1. A mold-pressing device comprising:
- a seat body formed with a horizontal fissure at one end and a vertical chamber, a bottom of the chamber being formed with an opening communicated with the fissure, a pair of opposite notches being formed on the periphery of the chamber, an insertion cavity being disposed in one notch opposite to the other notch, a bottom of the seat body being formed with a through hole communicated with the fissure opposite to the opening;
- a mold block disposed on the seat body, one face of the mold block facing the fissure being disposed with a solid die, the other face of the mold block being disposed with a channel passing through the mold block;
- a pressing lever disposed in the channel of the mold block, one end of the pressing lever being disposed with a pivot shaft for rotatably inserting in the insertion cavity of the seat body, whereby the pressing lever is pivotally disposed on the seat body, the other end of the pressing lever being disposed with an upward bent pressing section, the pressing lever being further formed with a protuberance extending in a direction reverse to that of the pressing section; and
- at least one resilient member fitted under the mold block in the chamber of the seat body.

5,749,279
HYDRAULIC PUNCH ACTUATOR WITH CENTERING APPARATUS
Thomas Haley Gardner, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 20, 1996, Ser. No. 618,949
Int. Cl.⁶ B26D *5/04;5/12*
U.S. Cl. 83—639.1 **2 Claims**



1. A hydraulic punch apparatus for providing neutral positioning of a punch, comprising:
- a table;
- punch retainer means having first and second surfaces disposed in a cavity in said table;
- said punch secured to the first surface;
- a fluid motor attached to said table and having a reciprocal output members for engaging said second surface of said punch retainer means for driving said punch to cut a sheet of material;
- a source of fluid pressure;
- a plurality of selectively energizable centering motors attached to said table, each having an extendable rod member extendable toward said cavity for selectively contacting one of said surfaces of said punch retainer means to urge said punch retainer means to a predetermined position in said cavity;
- at least two of said plurality of centering motors being attached to said table and each said extendable rod member thereof being positionable at a first travel extent of the extendable rod members of said two centering motors to limit movement of said punch retainer means in one direction;
- means for selectively connecting said source with said centering motors including means for directing fluid pressure to energize said centering motors;
- and at least an additional one of said plurality of centering motors being attached to said table and said extendable rod member thereof being extendable toward said cavity for selectively contacting the other one of said surfaces of said punch retaining means, said extendable rod member of said additional centering motor being positionable at a second travel extent to limit movement of said punch retainer means in a direction opposite said one direction.

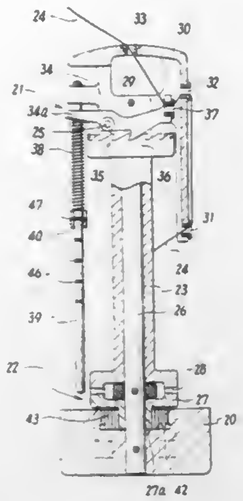
5,749,280
CIRCULAR BRAIDING MACHINE WITH INNER AND OUTER SPOOLS ARRANGED ON CIRCULAR TRACK
Werner Scherzinger, Bisingen, Germany, assignor to Sipra Patententwicklungs- U. Beteiligungsgesellschaft MBH, Albstadt, Germany
Filed Jun. 29, 1995, Ser. No. 496,395
Claims priority, application Germany, Jun. 30, 1994, 44 22 893.7
Int. Cl.⁶ D04C *3/48*
U.S. Cl. 87—48 **18 Claims**



1. A circular braiding machine, comprising: an axis of rotation (1); a group each of inner and outer spools (31, 38) arranged on a circular track coaxial with the axis of rotation (1) and each carrying a strand (32, 37); drive means (9–11, 17, 29, 42–45) for moving the groups of spools in opposite directions (r,s) around the circular track; strand guide members (48) for guiding at least the strands (37) of one of the groups of spools (38) at a location between the latter and a braiding point (35), said strand guide members (48) being mounted to reciprocate in guide tracks (49) arranged with such an angle relative to the axis of rotation (1) that the distance of the strand guide member (48) from the braiding point (35) is substantially constant during the whole path of movement; rotating crank levers (82, 126) provided in the drive means; and means operating synchronously with said drive means, being coupled to said strand guide members (48) for crossing the strands (32, 37) of the inner and outer spools (31, 38) and having levers (50), said levers (50) being arranged substantially in the extension of said guide tracks (49) and being articulated in the manner of connecting rods to one end to said strand guide members (48) and at the other end to respective ones of said rotating crank levers (82, 126).

5,749,281
YARN TENSIONING METHOD AND DEVICE FOR TEXTILE WEAVING MACHINES
Masahiko Kimbara, Tsukuba, Japan, assignor to Three-D Composites Research Corporation, Tsukuba, Japan
Division of Ser. No. 313,043, Oct. 3, 1994, Pat. No. 5,584,223. This application Oct. 1, 1996, Ser. No. 720,754
Claims priority, application Japan, Feb. 3, 1993, 5-39551; Mar. 25, 1993, 5-90833; Mar. 25, 1993, 5-90834; Mar. 25, 1993, 5-90835
Int. Cl.⁶ D04C *3/14*
U.S. Cl. 87—56 **2 Claims**

1. A yarn tensioning device for a textile weaving machine of the type which is arranged to weave a three-dimensional fabric by interweaving a number of yarns fed from a corresponding number of yarn carriers, said yarn carriers being driven by a carrier drive mechanism to shift the respective positions along predetermined loci of movements within a common carrier shifting plane, said yarn tensioning device comprising:
- a high tensioning mechanism mounted on each one of said yarn carriers and arranged to act with a small yarn drawback capacity and a high yarn tensioning capacity relative to a feed yarn being withdrawn from a bobbin on said carrier to impart a high unwinding tension thereto; and



a low tensioning mechanism mounted between said carrier and bobbin and arranged to act with a large yarn drawback capacity and a low yarn tensioning capacity relative to the bobbin through a rotational coupling therewith;

said high tensioning mechanism being adapted to impart a high tension to said feed yarn being withdrawn from the bobbin in a yarn draw-out phase of operation; and

said low tensioning mechanism being adapted to take over from said high tensioning mechanism to impart a low tension to the feed yarn being rewound onto the bobbin in a yarn draw-back phase of operation at a limit point of yarn draw-back by said high tensioning mechanism to take up any slack remaining in the feed yarn after drawback by said high tension mechanism;

wherein said bobbin is rotatably fitted on a bobbin support shaft erected non-rotatably at the center of said yarn carrier, and said high tensioning mechanism has a support member mounted on an upper end portion of said bobbin support shaft, said support member having a yarn guide for a yarn to be unwound from said bobbin and fed out upward of said bobbin support shaft.

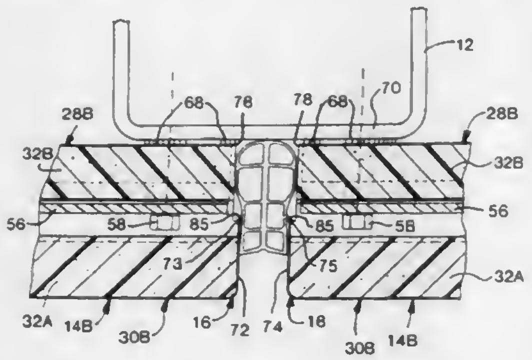
5,749,282
BUILDING PANEL WITH DOUBLE INTERLOCK JOINT AND INTERNAL GUTTER

Richard A. Brow, Bethel Park, and Robert I. Hossli, Pittsburgh, both of Pa., assignors to United Dominion Industries, Charlotte, N.C.

Filed Jun. 29, 1995, Ser. No. 496,364

Int. Cl.^{6} E04H *1/00;3/00*

U.S. Cl. 52—235 **21 Claims**



15. A building wall assembled from individual panels supported on vertical columns, said building wall comprising:

said panels each comprising spaced-apart ends forming vertical joints with ends of horizontally adjacent building panels;

said panels each comprising upper and lower side edges forming horizontal joints with vertically adjacent building panels;

said panels each comprising inner and outer facing sheets and a structural foam core adhesively connected with said facing sheets;

gutter means disposed intermittently between said inner and outer facing sheets at said upper side edge of each of said panels, said gutter means comprising means for accommodating liquid that enters said horizontal joints and for diverting such liquid away from said horizontal joints;

vertically extending liquid discharge channels, disposed at said vertical joints, in fluid communication with said gutter means, said vertically extending liquid discharge channels comprising means for receiving liquid from said gutter means and directing liquid away from said gutter means;

said inner facing sheets lie along a given generally vertical plane;

gasket means disposed in at least one of said vertical joints, said gasket means having an outer portion and an inner portion, said inner portion having at least a portion extending inwardly at least into alignment with the plane defined along said inner facing sheets;

said gasket means being disposed to seal said ends of said panels and prevent the progression of liquid towards said inner facing means.

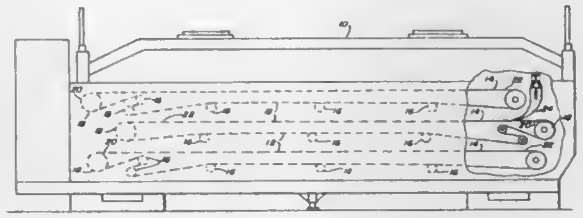
5,749,283
OVEN WITH SLIDE-OUT TRANSFER GUIDES

Garrett T. Funk, Fullerton, Calif., assignor to Casa Herrera, Inc., Pomona, Calif.

Filed Dec. 18, 1996, Ser. No. 769,497

Int. Cl.^{6} A23L *1/00;* **A47J** *37/00;* **A21B** *1/42*

U.S. Cl. 99—339 **3 Claims**



1. An improved oven having a plurality of generally horizontal conveyers spaced vertically and rotating alternately in opposite directions to define a serpentine path from an entrance at a first end of an uppermost conveyor to an exit at a lowermost conveyor, said conveyors comprised of endless belts mounted on rollers disposed between opposed first and second walls, at least one of said rollers driving said belt, said conveyors used to transport items along said serpentine path from said entrance to said exit, said improvement comprising:

a transfer guide spaced from a conveyor and having a curved receiving surface for receiving items exiting a first conveyor and for transferring said items to an adjacent lower conveyor, said transfer guide further comprising mounting bracket means for mounting said transfer guide in said oven;

support beam means mounted within said oven and cooperating with said mounting bracket means to slidably support said transfer guide while permitting said transfer guide to slide horizontally into and out of said oven; and

a transfer guide access port on said first wall sized to receive said transfer guide therethrough and aligned with said transfer guide, said access port further comprising a closing means for closing said access port.

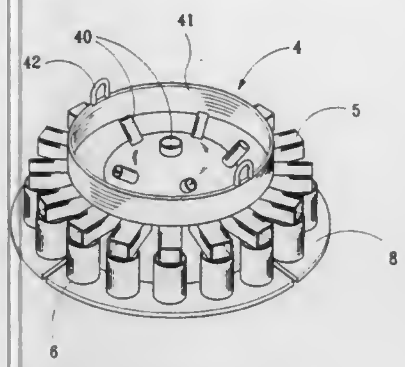
5,749,284
EARTHEN KILN COOKING POT

Chun-Mu Chiu, Fl., 1, No. 304, Wu Feng N. Rd., Chia Yi City, Taiwan

Filed Jun. 9, 1997, Ser. No. 871,553

Int. Cl.^{6} A23L *1/00;* **A47J** *27/00*

U.S. Cl. 99—340 **5 Claims**



1. An earthen kiln cooking pot comprising

a pot body with a slight projection in the center, a ventilation tube on the top surface and a retention wall surrounding its circumference;

a plurality of hollow erection posts to support the pot body;

a plurality of hollow support columns to support the erection posts;

whereby in its application a pit is dug on the ground, the material so dug out is used to fill the erection posts and the support columns and to cover the surface of the pot body where the material is retained within the pot body by means of the retention wall while the ventilation tube is exposed outside the material; then the support columns are arranged around the circumference of the pit according to the size of the pot body, the erection posts are placed on the support columns, and the pot body is placed on the erection posts to complete the erection of the present invention; for cooking purpose a fuel is placed and burned within the pit to heat the pot body, the erection posts and the support columns as well as the material therein while by action of the ventilation tube on the pot body, the fuel is kept on burning, till the pot body, the erection posts and the support columns as well as the material therein reach a certain temperature and the fire is extinguished, the erection posts and the support columns are placed within the pit, an appropriate quantity of food is placed in the pit and the pot body is used to cover up the food; finally, by heating effect of the residual heat energy in the pot body, the erection posts and the support columns as well as the material therein, the food is cooked.

5,749,285
FOOD PROCESSOR

Stefan Dörner, Solingen; Uwe Kemker, Wuppertal; Hans-Peter Simm, Wuppertal, and Oliver Lapp, Wuppertal, all of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Germany

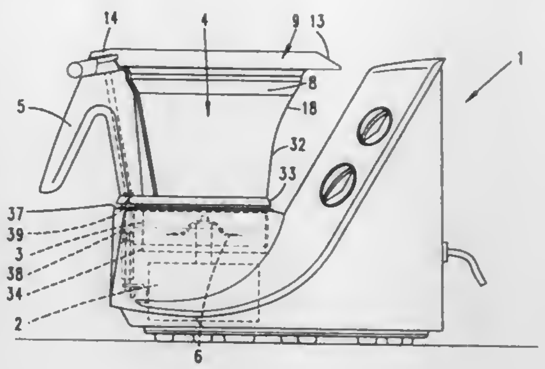
PCT No. PCT/EP95/01634, § 371 Date Jan. 21, 1997, § 102(e) Date Jan. 21, 1997, PCT Pub. No. WO95/29618, PCT Pub. Date Nov. 9, 1995

PCT Filed Apr. 28, 1995, Ser. No. 737,307

Claims priority, application Germany, Apr. 28, 1994, 44 14 822.4

Int. Cl.^{6} A47J *43/04;43/07*

U.S. Cl. 99—348 **62 Claims**



1. A food processor (1) comprising a mixing vessel (4) and a drive (2) for an agitator (6) in the mixing vessel (4), a lower region (a) of the mixing vessel (4) having a circular horizontal opening cross-section, an upper horizontal opening cross-section of the mixing vessel (4) being elliptical, and a geometrical centre point (19') of the upper opening cross-section being offset laterally in the direction of a horizontal axis (x) with respect to a geometrical centre point (19) of a lower opening cross-section.

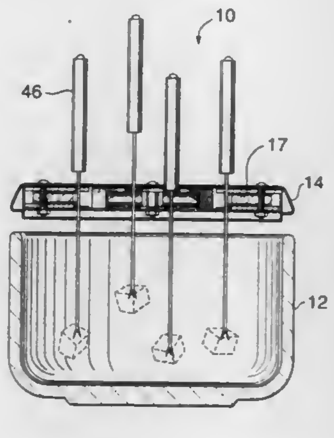
5,749,286
FONDUE COOKING APPARATUS

Michel Payette, 2078 De Romagne, Vimont, Laval, Que. H7M5Z1, Canada

Filed May 30, 1995, Ser. No. 454,577

Int. Cl.^{6} A47J *37/04*

U.S. Cl. 99—413 **11 Claims**



1. A cooking apparatus comprising a combination of

a vessel having an upstanding wall defining an upper edge providing a supporting surface for

a removable cover having a centrally located opening therein, said cover is adapted to fit over the upper edge of said vessel;

a number of holding elements located on said cover, each of said holding elements is adapted to hold a utensil for carrying food;

wherein each of said holding elements comprises

an insulation housing and

suspension means adapted to immovably suspend said utensil for carrying food within said vessel in vertical position, thus preventing entanglement or cris-crossing of said utensil with other suspended utensils for carrying food when in use;

wherein said suspension means comprises a combination of

a magnetic element accommodated within said insulation housing and

a utensil-receiving slot formed in said insulation housing, said utensil receiving slot is adjacent to said magnetic element and facilitates stable vertical positioning of said utensil for carrying food suspended by said magnetic element.

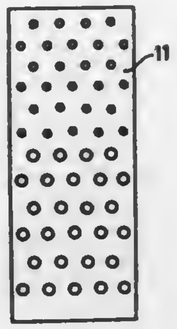
5,749,287
PERFORATED DRAINAGE PIPE FOR DRAINING WHEY/CURD MASS

Frank Schouten, Donkerbroek, Netherlands, assignor to Tebel-MKT B.V., Netherlands

Filed Oct. 26, 1994, Ser. No. 329,597

Int. Cl.⁶ A01J *25/00*

U.S. Cl. 99—458 **14 Claims**



1. Drainage pipe with perforations for draining whey from a whey/curd mass, the perforations are formed by a plurality of small holes (4) defining an open surface, the hole size lies within the range of 0.05–3 mm, while the hole density lies within the range of 5–50,000 holes/cm^2, the hole size and/or the hole density is varied over the surface of the pipe (2), characterized in that the open surface defined by the holes (4) increases from one end of the pipe (2) to the other end of the pipe (2).

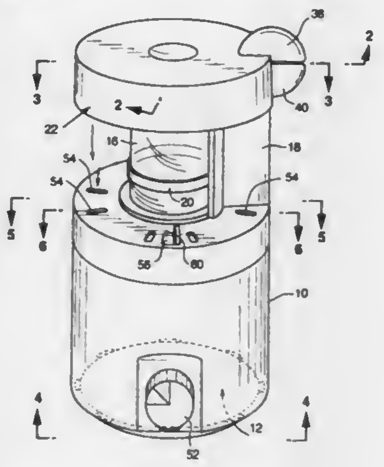
5,749,288
DEVICE FOR HOME ROASTING OF COFFEE BEANS

Tim Skaling, 3538 Gird Rd., Fallbrook, Calif. 92028

Filed Sep. 20, 1996, Ser. No. 710,708

Int. Cl.⁶ A47J *37/00;* **A23N** *12/12;* **F26B** *17/00*

U.S. Cl. 99—483 **4 Claims**



1. A roaster for coffee beans comprising:
- a housing having an air intake opening,
- a transparent roasting chamber mounted on the housing and having a perforated bottom for receiving heated air and an open top for permitting escape of air and chaff,
- an electrical heater and fan assembly mounted in the housing for taking air from inside the housing, heating the air and blowing the heated air upwardly through the perforated bottom of the roasting chamber to fluidize and roast beans in the chamber,
- a cover for the roasting chamber positioned to receive air and chaff discharged from the open top of the chamber, trap the chaff and discharge the chaff free heated air adjacent to the housing, and
- an adjustable flow control for recycling at least some of the heated air discharged from the cover to the inside of the housing to control the temperature of the air taken in by the heater and fan assembly with the adjustable flow control being adjustable while the heater is operating to adjust the temperature of air heated by the heater.

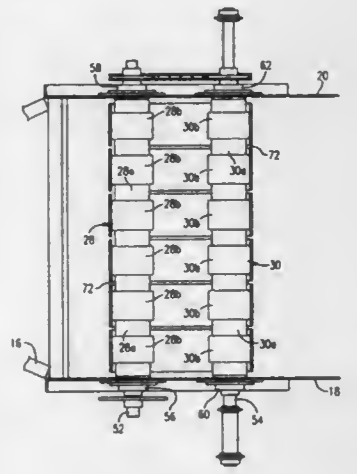
5,749,289
TALL SLEEVES FOR ROUND BALER DRIVE ROLLS

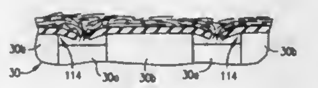
J. Dale Anderson, Canton, and LaVern Roy Goossen, Newton, both of Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Filed Oct. 18, 1996, Ser. No. 733,757

Int. Cl.⁶ A01F *15/07*

U.S. Cl. 100—88 **8 Claims**





1. In a round baler having a plurality of flexible, side-by-side belts driven in a longitudinal direction by at least one transversely extending drive roll around which the belts are looped, the improvement comprising:
- said drive roll having a longitudinal central body and a plurality of belt-engaging portions projecting radially from the central body at points spaced along the length of the body, each of said portions underlying a corresponding belt,
- said portions each having a top surface that engages the corresponding belt and cooperates with the central body to define a portion height that is at least 1.25 times the corresponding belt thickness,
- said top surface being narrower than the corresponding belt such that the sides of the belt each overhang the portion by a distance that is no less than 2.0 times the corresponding belt thickness.

5,749,290
PRESS TRANSFER APPARATUS

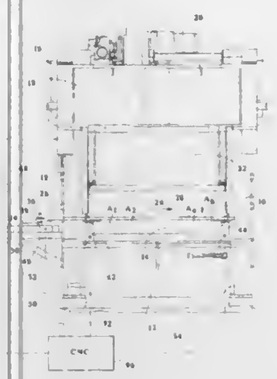
Lawrence A. Johnson, 9041 N. Fielding Rd., Bayside, Wis. 53217, and Heinz H. Schmeisser, 3437 S. Crandon Pl., Greenfield, Wis. 53219

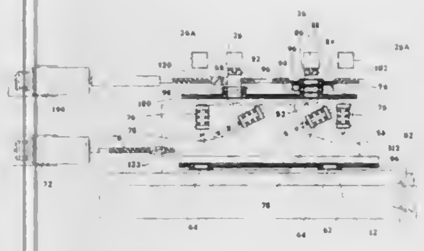
Filed Sep. 20, 1996, Ser. No. 717,245

Int. Cl.⁶ B30B *15/30*

U.S. Cl. 100—207 **10 Claims**

1. A press transfer mechanism for use on a multi-station press, comprising:
- first and second elongated transfer bars extending generally parallel to a transfer line of the multi-station press;
- transfer means for moving said first and second elongated transfer bars in endwise directions;
- engaging means for moving said first and second elongated transfer bars alternately together and apart in a direction generally transverse to their length;
- lift means for alternately lifting and lowering said first and second elongated transfer bars, said lift means comprising:
  - a first member mounted generally stationary relative to said multi-station press;
  - a second member having a first part adjacent said first member and a second part spaced from said first member to define a space;
  - a horizontal bearing between said first member and said first part of said second member to enable said second member to be moved generally horizontally in a direction transverse to the transfer line of the multi-station press;
  - a third member disposed in said space between said first member and said second part of said second member, said third member being connected to said first and second elongated transfer bars;
  - a vertical bearing between said first member and said third member to enable said third member to move generally vertically relative to said first member;
  - an angled bearing between said third member and said second part of said second member; and
- means for moving said second member in a horizontal direction relative to said first member so that said third member is caused to move in a vertical direction relative to said first member by action of said angled bearing.





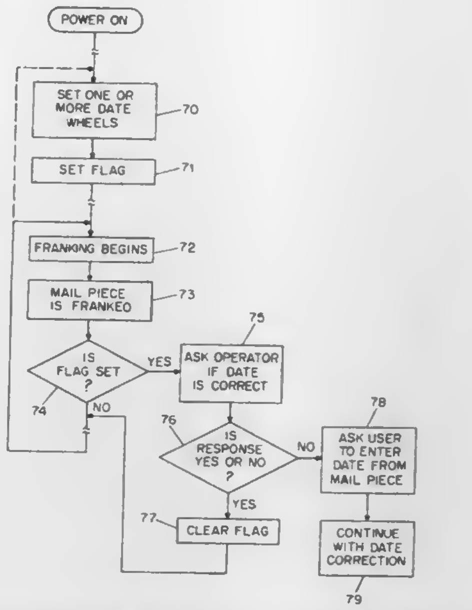
5,749,291
SYSTEM FOR SETTING DATE WHEELS IN A POSTAGE METER

Kurt Nast, Bern; Erwin Berger, Thörishaus; Stefan Etter, Oberhofen; Christian Moy, Grossaffoltern, and Martin Müller, Langenthal, all of Switzerland, assignors to Ascom Hasler Mailing Systems AG, Bern, Switzerland

Filed Apr. 14, 1995, Ser. No. 421,902

Int. Cl.⁶ B41L *47/46*

U.S. Cl. 101—91 **4 Claims**



1. A date-setting method for use in a postage meter having date wheels, the method comprising the steps of:
- setting the date wheels;
- printing on a mail piece whereby a date is printed on the mail piece by the date wheels;
- requesting an input indicating whether the date printed on the mail piece is correct;
- receiving a response in the negative;
- receiving information indicative of the date printed on the mail piece;
- resetting the date wheels;
- logging a record indicative of the negative response and the resetting action;
- printing on a mail piece whereby a date is printed on the mail piece by the date wheels;
- requesting an input indicating whether the date printed on the mail piece is correct;
- receiving a response in the negative;
- receiving information indicative of the date printed on the mail piece;
- resetting the date wheels;
- logging another record indicative of the negative response and the resetting action; and
- annunciating the records indicative of negative responses.

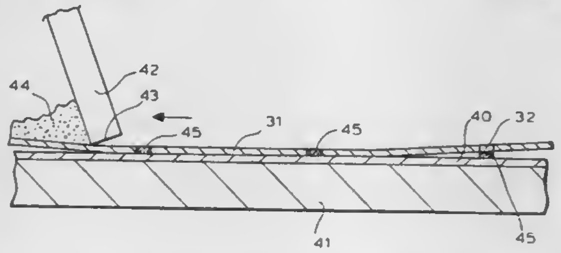
5,749,292
RELIEF DECORATING OF CERAMIC ARTICLES USING SCREEN PRINTING PROCESSES

Norman P. De Bastiani, So Hadley, and Richard R. Carlson, Worcester, both of Mass., assignors to Chartpak, Inc., Leeds, Mass.

Filed Sep. 25, 1996, Ser. No. 719,766

Int. Cl.⁶ B41M *1/12*

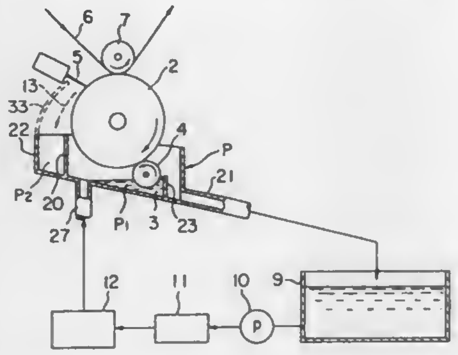
U.S. Cl. 101—129 **21 Claims**



10. A process for relief decorating of ceramic articles, which comprises
- (a) providing a transfer decal sheet,
- (b) by a screen printing process, depositing a projecting relief design on an upper surface of said transfer decal sheet,
- (c) said relief design being formed by a screen-printed deposit of ceramic ink of a thick, flow resistant character to a thickness not less than 0.015 inch,
- (d) drying the ceramic ink of said relief design,
- (e) transferring said relief design from said transfer decal sheet to a ceramic article, and

(f) heating said ceramic article to fuse said ceramic ink with said article to form a permanent, outwardly projecting relief design on said article.

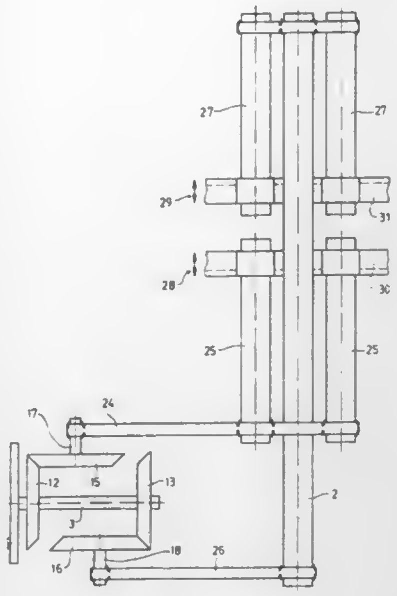
5,749,293
INKING APPARATUS FOR USE IN PRINTING PRESS
Hisaki Ota, and Takamasa Nakamura, both of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan
Filed Mar. 29, 1996, Ser. No. 623,527
Claims priority, application Japan, Apr. 5, 1995, 7-080458
Int. Cl.^{6} B41F *31/07;31/20*
U.S. Cl. 101—157 **11 Claims**



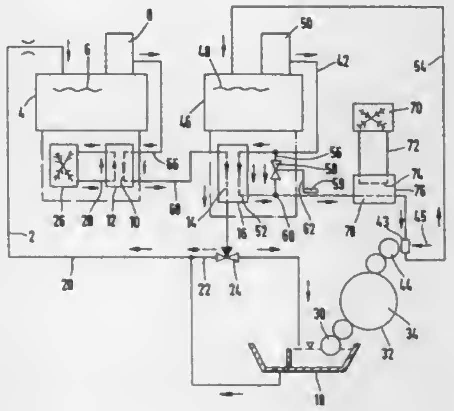
1. A printing press comprising:
a plate cylinder;
an upwardly open ink pan having a first part and a second part, said first part being disposed below said plate cylinder and having ink retaining means on a bottom thereof;
an ink furnisher roll disposed under said plate cylinder in contact therewith and positioned relative to said ink retaining means to be dipped in an ink in said ink retaining means;
a doctor blade provided in contact with an outer surface of said plate cylinder for removing surplus ink resting on said surface of said plate cylinder, said doctor blade being positioned on a lateral side of the said plate cylinder;
said second part of the said ink pan being located substantially below said lateral side of said plate cylinder for receiving therein surplus ink scraped off by said doctor blade from said surface of said plate cylinder;
an ink tank;
ink supply means for supplying an ink from said ink tank through a filter into said ink retaining means; and
surplus ink discharge means for discharging surplus ink that has been received in said second part of said ink pan into said ink tank.

5,749,294
DEVICE FOR CENTRALLY ADJUSTING SHEET-GUIDING ELEMENTS OF A SHEET-FED ROTARY PRINTING PRESS
Bernd Ruf, Weiterstadt, and Kurt Lötsch, Wiesenbach, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Nov. 25, 1996, Ser. No. 753,365
Claims priority, application Germany, Nov. 24, 1995, 195 43 774.8
Int. Cl.^{6} B41F *21/14*
U.S. Cl. 101—232 **6 Claims**

1. Printing press having a device for centrally adjusting sheet-guiding elements located on both sides of the printing press, the adjusting device comprising a drive member including a rotatable shaft axially displaceable into three settings whereby said drive member is selectively couplable with an adjusting member on one side of the printing press, with an adjusting member on an other side of the printing press, or simultaneously with both of the adjusting members on both sides of the printing press.

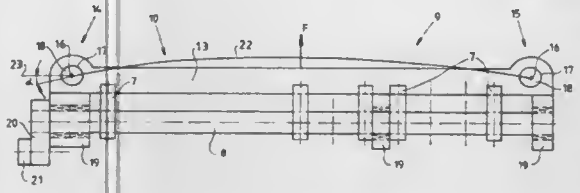


5,749,295
TEMPERATURE CONTROL DEVICE IN PRINTING MACHINES
Hans-Joachim Kurz, Grossaitingen, Germany, assignor to Baldwin-Gegenheimer GmbH, Germany
Filed Jul. 21, 1995, Ser. No. 505,554
Claims priority, application Germany, Jul. 22, 1994, 44 26 077.6
Int. Cl.^{6} B41F *31/06;* **F28D** *7/00*
U.S. Cl. 101—350.1 **20 Claims**



19. A temperature control device for an offset printing machine for controlling the temperature of at least two separate liquids in the printing machine, the device comprising:
a respective first and second circuit for each of the first and second liquids; a first heat exchanger through which the first circuit passes for adjusting temperature of the liquid in the first circuit;
a respective second heat exchanger through which both of the first and the second liquid circuits pass for adjusting the temperature in the second circuit based at least partially on the temperature in the first circuit;
and means in the second circuit for selectively bypassing flow away from or through the second heat exchanger for controlling temperature of the liquid in the second circuit.

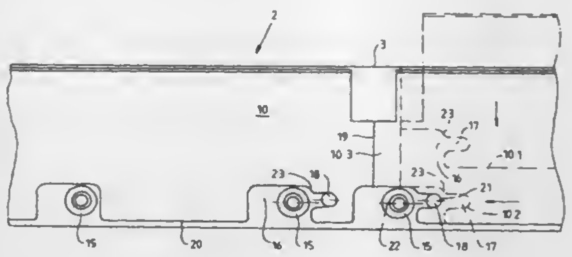
5,749,296
SHEET TRANSFER DEVICE OF A SHEET-FED ROTARY PRINTING PRESS
Rudi Haupenthal, Epfenbach, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany
Filed Mar. 20, 1997, Ser. No. 821,685
Claims priority, application Germany, Mar. 21, 1996, 196 11 124.2
Int. Cl.^{6} B65H *9/06*
U.S. Cl. 101—410 **20 Claims**



1. A feed cylinder for a sheet-fed rotary printing press, said feed cylinder comprising:
a body having an axis of rotation;
a sheet transfer device to transfer a sheet along a sheet path;
said sheet transfer device comprising a device for registration correction by deforming the leading edge of a sheet being transferred by said sheet transfer device; and
said device for registration correction comprising:
a shaft having a longitudinal axis;
a gripping device to grip a sheet for transport along a sheet path;
said gripping device being disposed along said shaft;
a mounting apparatus to mount said shaft to said body of said feed cylinder;
a deflection device to generate a force to deform said shaft and thereby deform a leading edge of a sheet;
said deflection device being operatively connected to said shaft to deform said shaft upon a force being generated by said deflection device;
said mounting apparatus being attached to said body of said feed cylinder;
said shaft comprising a first end portion and an axially opposite second end portion;
each of said first and second end portions of said shaft being rotatably mounted on said mounting apparatus;
said shaft being disposed to be bendable along the axis of said shaft during receipt of a force from said deflection device to deform said shaft and thereby deform a leading edge of a sheet;
said mounting apparatus comprising a pivoting arrangement; and
said pivoting arrangement being disposed to permit pivoting of each of said first and second end portions of said shaft during bending of said shaft.

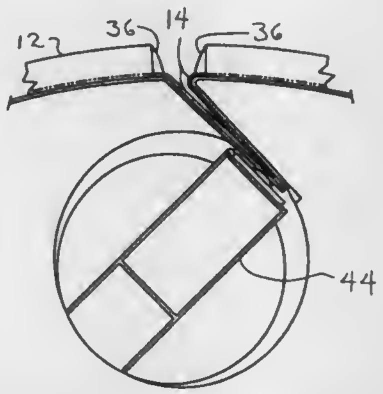
5,749,297
DEVICE FOR CONNECTING RETAINING ELEMENTS AND A CROSSPIECE ON A PRINTING-FORM CYLINDER
Francois Récolet, Breuil-le-Vert, and Jacques Métrope, Laigneville, both of France, assignors to Heidelberg Harris S.A., Montatalre Cedex, France, and Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed May 6, 1996, Ser. No. 643,637
Claims priority, application France, May 4, 1995, 95 05352
Int. Cl.^{6} B41F *13/00*
U.S. Cl. 101—415.1 **10 Claims**

1. In combination with a printing-form cylinder of a rotary printing press, the printing-form cylinder having a gap formed therein with a front edge, a device for fixing a flexible printing form having a front edge and a rear edge to a circumference of the printing-form cylinder, the front edge of the flexible printing form being able to straddle the front edge of the gap formed in the cylinder, the device comprising:



a crosspiece disposed in the gap of the printing-form cylinder;
a plurality of resilient retaining elements each having an end and a hook-shaped projection at said end and being mountable alongside one another on said crosspiece, said hooked-shaped projection directed towards a circumferential surface of the flexible printing form and engaging the rear edge of the flexible printing form for tensioning the flexible printing form;
said retaining elements having recesses formed therein; and
stop elements disposed on said crosspiece for form-lockingly locking with said recesses of said retaining elements, and said retaining elements locking on said crosspiece when moved parallel to an axis of the printing-form cylinder toward said recesses.

5,749,298
ARRANGEMENT FOR SECURING A PRINTING BLANKET TO A CYLINDER
Francesco Castelli; Gianpietro Invernizzi, both of Lodi, and Omar Reale, Crema, all of Italy, assignors to Reeves Brothers, Inc., Spartanburg, S.C.
Filed Jun. 10, 1997, Ser. No. 872,795
Int. Cl.^{6} B41F *1/28*
U.S. Cl. 101—415.1 **22 Claims**



1. A metal-backed printing blanket for mounting on a cylinder that includes a gap, comprising:
a metal base plate having top and bottom surfaces and ends which include leading and trailing edges adapted for engaging the cylinder gap;
a compressible, elastomeric printing blanket secured to the top surface of the base plate but not the ends and having an upper face adapted for contact transfer of ink to a printable substrate; and
an anti-slip layer provided upon at least a portion of the top surface of at least one end of the base plate to facilitate the retention of the base plate ends within the gap during rotation of the cylinder;
wherein the anti-slip layer has a coefficient of friction that is greater than that of the base plate and a thickness sufficient to permit insertion of the base plate edges and ends into the cylinder gap.

5,749,299

METHOD AND APPARATUS FOR FASTENING AND CLAMPING PRINTING PLATES WITH BEVELED EDGES

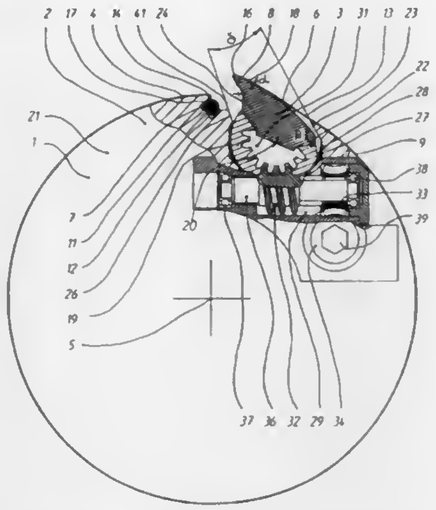
Claus Dieter Barrois, Erlenbach; Georg Johann Lindner, Veitshöchheim, and Hans-Jürgen Zelfel, Würzburg, all of Germany, assignors to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Filed Oct. 7, 1996, Ser. No. 716,933

Claims priority, application Germany, Oct. 7, 1995, 195 37 420.7

Int. Cl.^{6} B41F *27/12*

U.S. Cl. 101—483 **7 Claims**



1. A method for fastening and clamping a printing plate having beveled ends on a plate cylinder of a rotary printing press including:

providing a rotatable clamping spindle having a suspension lip and an axis of rotation in the plate cylinder;

supporting said clamping spindle for rotation in a cylinder trough of the plate cylinder;

locating said clamping spindle axis of rotation at a first point;

providing a movable suspension lip resting surface and a trailing suspension lip surface on said suspension lip;

providing a movable suspension lip support surface and a trailing abutment support surface in said cylinder trough;

rotating said clamping spindle about said axis of rotation located at said first point;

bringing said movable suspension lip resting surface into contact with said movable suspension lip support surface;

shifting said clamping spindle in said cylinder trough;

locating said clamping spindle axis of rotation at a second point in response to said shifting of said clamping spindle;

bringing said trailing suspension lip surface into contact with said trailing abutment support surface by rotating said clamping spindle about said axis of rotation located at said second point; and

situating said clamping spindle in a defined end clamping position.

5,749,300

TRANSFER ROLLING PROCESS AND DEVICE FOR PRODUCING BANNERS

Kyoung Ho Park, Seoul, Rep. of Korea, assignor to Whal-Sun Lee, Chungnam, Rep. of Korea

Filed Oct. 29, 1996, Ser. No. 740,467

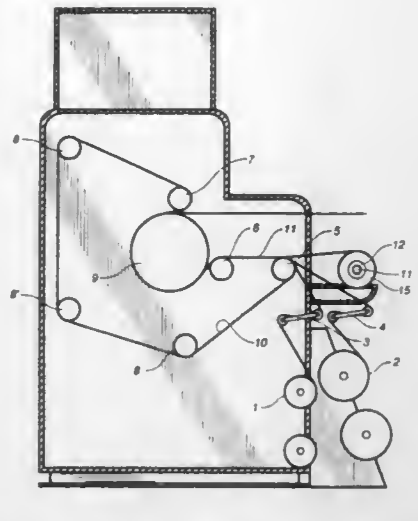
Claims priority, application Rep. of Korea, Nov. 15, 1995, 41491/95

Int. Cl.^{6} B41L *35/14*

U.S. Cl. 101—488 **1 Claim**

1. A process for producing a banner comprising the steps of:

forming stencil letters or figures from a releasable transfer sheet and attaching said stencil letters or figures to a transfer sheet in a way such that when it is necessary to produce a banner with a white background, the stencil letters or figures are attached to a white transfer sheet, but when it is necessary to produce a banner with a color background, the stencil letters or figures are attached to a transfer sheet of the same color as the background of the banner;



winding said transfer sheet with the stencil letters or figures onto a torsionless pipe in a way such that the stencil letters or figures are directed radially inward;

starting a transfer roll device in order to cause paper and cloth from respective rolls to pass over respective tension control rollers, said paper and cloth in turn being fed to a belt table and overlapping the transfer sheet from said torsionless pipe prior to passing over a heating drum at a speed of 1–3 m/min, said heating drum being heated to a temperature ranging from 220° C. to 240° C.

5,749,301

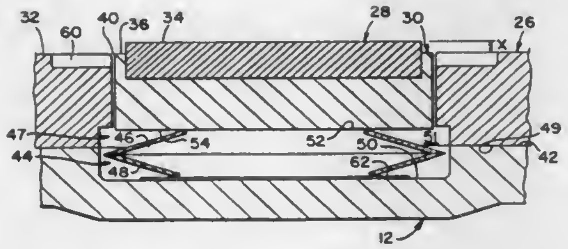
MULTI-RATE VERTICAL LOAD SUPPORT FOR AN OUTBOARD BEARING RAILWAY TRUCK

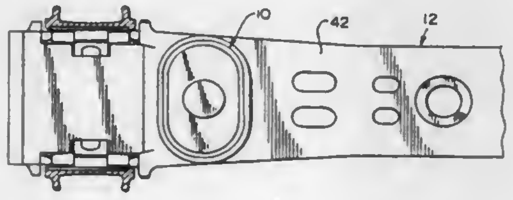
Robert D. Wronkiewicz, Park Ridge, Ill.; Terry L. Pitchford, St. Louis, Mo.; Daniel J. Schuller, Downers Grove, Ill., and Emmanuel Vander Vennen, Delran, N.J., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 13, 1996, Ser. No. 713,869

Int. Cl.^{6} B61F *5/00*

U.S. Cl. 105—199.3 **14 Claims**





1. A constant-contact load-bearing assembly between a truck bolster and a body bolster of a railcar, which body bolster has a lower side and at least one constant-contact, body-bolster, bearing with a wear surface mounted on said lower side,

said truck bolster having an upper side and extending between a first side frame and a second side frame of a railcar-truck assembly, said constant-contact, load-bearing assembly comprising:

a first and outer pad of a first polymeric material with a first coefficient of friction, said first pad having a top surface, a bottom surface and defining a generally centrally located through-port;

a second and inner pad of a second material with a second coefficient of friction greater than said first coefficient of friction, said second pad having an upper surface and a lower surface, said second pad positioned and movable in said through-port;

means for biasing said second pad, which biasing means contacts said second pad lower surface to bias said second pad in said through-port;

said constant-contact, load-bearing assembly mounted on said truck bolster upper side and generally in vertical alignment with said body-bolster bearing, said load-bearing assembly having said first pad bottom surface mounted on said truck-bolster upper side,

said biasing means positioned and operable between said second pad lower surface and said truck-bolster upper side to bias said second pad with said upper surface vertically displaced above said first pad top surface a predetermined distance at a reference position with said railcar nonladen, said second pad upper surface continuously contacting said body-bolster load-bearing wear surface,

said second pad upper surface contacting said wearing surface to solely bear the weight and load forces of said railcar body at an empty-car state and deflectable against said biasing means to transfer said weight and load forces to said truckbolster with said higher coefficient of friction material in the unloaded and empty-car state,

said biasing means deflectable at a loaded-car state to provide contact between said wearing surface and both of said first pad top surface and said second pad upper surface cooperating to bear the weight of said railcar body and lading at a loaded-car state to communicate said railcar body and lading weight to said truck bolster and side frames.

5,749,302

RAIL-BORNE MOTOR COACH

Ferdinand Tegeler, Berlin, Germany, assignor to ABB Henschel AG, Berlin, Germany

Filed May 30, 1996, Ser. No. 656,415

Claims priority, application Germany, Sep. 30, 1994, 9415771 U

Int. Cl.^{6} B61D *17/00*

U.S. Cl. 105—397 **25 Claims**

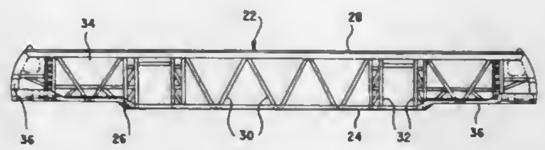
1. Rail-borne motor coach for conveying passengers, comprising:

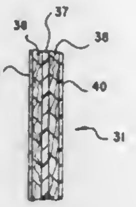
a coach body defining a trough;

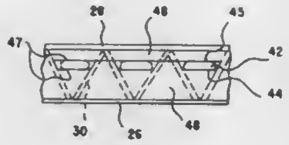
said coach body having a coach-body floor and adjoining side walls, said side walls being formed with window openings and entry regions with door openings;

said side walls being a framework formed from lower longitudinal girders, upper longitudinal flanges, and side-wall pillars extending between said lower longitudinal girders and said upper longitudinal flanges, said sides-wall pillars being mutually adjacent and all enclosing an angle of 60° +/– 10° against one another;

said side walls including vertical pillars disposed only at said entry regions; and







connecting bars bracing said upper longitudinal flanges against . one other.

5,749,303

AUTO-RACK SIDESCREEN SECUREMENT APPARATUS FOR THE PREVENTION OF THEFT AND VANDALISM

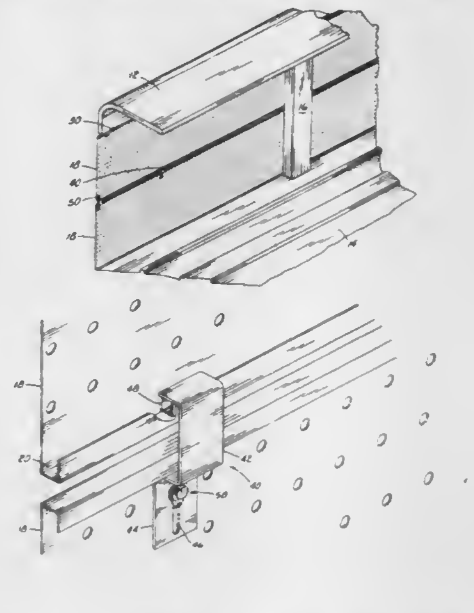
John W. Close, Jr., 980 S. 72nd st., Suite 206, Omaha, Nebr. 68114, and Martin L. Wulf, 19102 S. 156th St., Springfield, Nebr. 68059

Filed Mar. 19, 1996, Ser. No. 618,147

Int. Cl.^{6} B61D *17/00*

U.S. Cl. 105—404 **14 Claims**

1. An auxiliary securement apparatus on an auto-rack railroad car having a roof, a plurality of vertical support beams, and a plurality of channel-edged sidescreens extending between the vertical support beams, wherein the securement apparatus comprises:



sidescreen-sidescreen securement means operatively engaging adjacent spaced locations on adjacent upper and lower sidescreens and located at a spaced location from said support beams, wherein the sidescreen-sidescreen securement means includes an elongate, contoured securement member having a lower portion adapted to engage the lower sidescreen, an upper portion adapted to engage the upper sidescreen, and a generally U-shaped portion dimensioned to accommodate adjacent edge channels of the upper and lower sidescreens; and

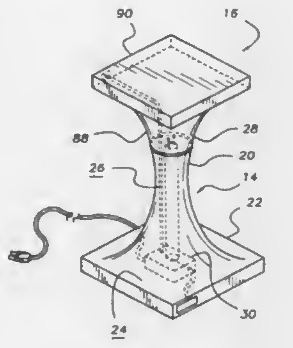
blind fastener means for affixing said securement member to the interior of said sidescreens.

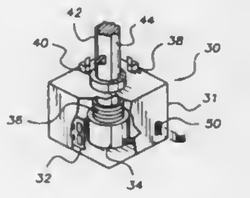
5,749,304
TELEVISION STAND
Cornelius E. Turner, 5640 Cyanamid Rd. Apt. H, Milton, Fla. 32583

Filed Mar. 5, 1997, Ser. No. 811,647

Int. Cl.^{6} A47B *85/00*

U.S. Cl. 108—20 **6 Claims**





1. A television stand comprising:

a base having a base bearing plate positioned on an exterior surface thereof and a motor drive compartment and a shaft passageway formed in said base for receiving a motor drive assembly and a drive shaft respectively; and

a rotatable turntable having a turntable drive socket formed therein adjacent to an exteriorly positioned turntable bearing plate; and

a motor drive assembly positioned within said motor drive compartment, said motor drive assembly including a motor a clutch coupled between a motor output shaft and a first end of a turntable drive shaft, said turntable drive shaft having a turntable drive gear attached to second end thereof, said turntable drive gear being positioned exteriorly of said base and over said base bearing plate;

a turntable thrust bearing having a central bearing aperture and a plurality of rotatably entrapped bearings, a section of said drive shaft being positioned through said central bearing aperture, to engage said drive socket said turntable thrust bearing being positioned between said base thrust bearing plate and said turntable thrust bearing plate.

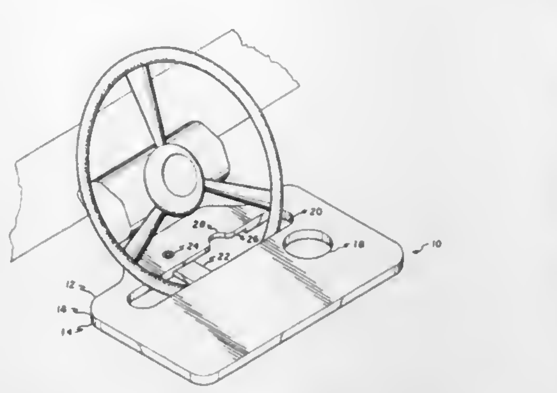
5,749,305
TRAY FOR USE IN AUTOMOBILES
Matthew George Jacovelli, P.O. Box 152, Cedarbrook, N.J. 08018

Filed Jul. 16, 1996, Ser. No. 682,917

Int. Cl.^{6} A47B *23/00*

U.S. Cl. 108—44 **20 Claims**

1. An automobile tray comprising:



a tray with an upper surface, a lower surface, and an outside edge;

an elongated hole in the tray, between the upper surface and the lower surface, with an inside edge that does not contact the outside edge; and

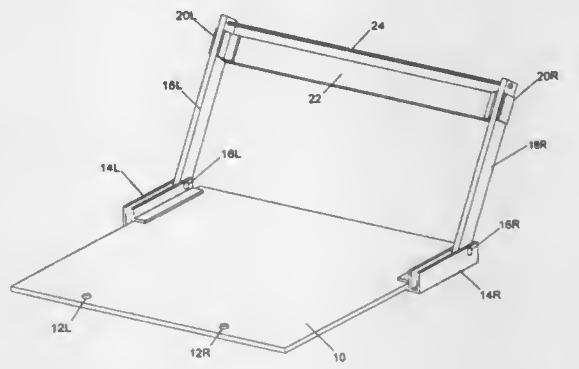
an attachment tab that is connected to the tray, and can be moved between a first position in which it crosses the elongated hole, and a second position in which it does not cross the elongated hole.

5,749,306
PORTABLE, STEERING WHEEL MOUNTABLE, COMPUTER TABLE
Erich H. Breuner, 8880 SW. Hillview Ter., Portland, Oreg. 97225

Filed Nov. 26, 1996, Ser. No. 757,050

Int. Cl.^{6} A47B *23/00*

U.S. Cl. 108—44 **5 Claims**



1. A portable steering wheel table for use in a vehicle, comprising:

a planar table surface;

a pair of control channels attached to opposite sides of the table surface; and

a pair of supports, each connected to a respective one of said control channels by pivots, the pivots allowing the table surface to rotate with respect to the supports from an open position wherein the table surface extends at an angle from the supports to a closed position wherein the table surface lies adjacent the supports and the supports rest flush with the control channels.

5,749,307
REFUSE INCINERATION FACILITY INCLUDING MATERIAL CRUSHER AND MELT BURNER
Noboru Okigami; Yoshitoshi Sekiguchi; Kunio Sasaki; Hideo Shimotani, and Masaharu Terashima, all of Osaka, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

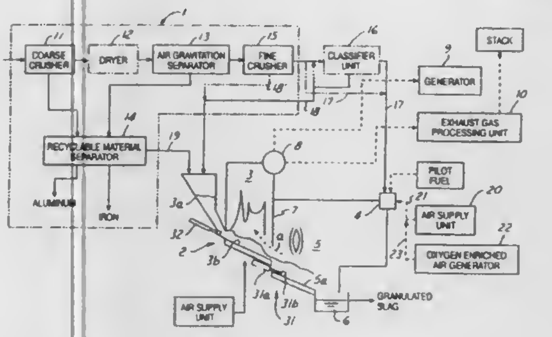
PCT No. PCT/JP96/01897, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO97/03320, PCT Pub. Date Jan. 30, 1997

PCT Filed Jul. 8, 1996, Ser. No. 776,636

Claims priority, application Japan, Jul. 10, 1995, 7-172641

Int. Cl.^{6} F23G *5/02*

U.S. Cl. 110—222 **5 Claims**



1. A refuse incineration facility comprising a pretreatment facility (1) for pretreating waste, and an incineration/melting facility (2) for heating and incinerating the waste treated by the pretreatment facility, and then for continuously melting its residue,

said pretreatment facility (1) comprising:

a coarse crusher (11) for crushing the waste;

a coarse crushed material classifier (13) for classifying light crushed material mainly consisting of combustible and heavy crushed material containing much noncombustible from the coarse crushed material crushed by the coarse crusher;

a recyclable separator (14) for separating and removing recyclable metals from the heavy crushed material; and

a fine crusher (15) for further crushing light crushed material discharged from the coarse crushed material classifier;

said incineration/melting facility (2) comprising:

an incineration chamber (3) for heating and incinerating the material to be incinerated;

a melting chamber (5) formed integrally with the incineration chamber (3), being capable of continuously transferring incineration residue generated in the incineration chamber from the incineration chamber, and having a burner (4);

fuel supply means (17) for introducing at least a portion of the fine crushed material crushed by the fine crusher into the burner (4) in said melting chamber; and

crushed material supply means (18, 18', 19) for introducing the heavy crushed material separated by the recyclable separator (14) and any remaining fine crushed material crushed by the fine crushed (15) into the incineration chamber (3).

5,749,308
APPARATUS AND PROCESS FOR CARBON REMOVAL FROM FLY ASH
Alan Bachik, Houston, Tex., assignor to U.S. Scientific, L.L.C., Houston, Tex.

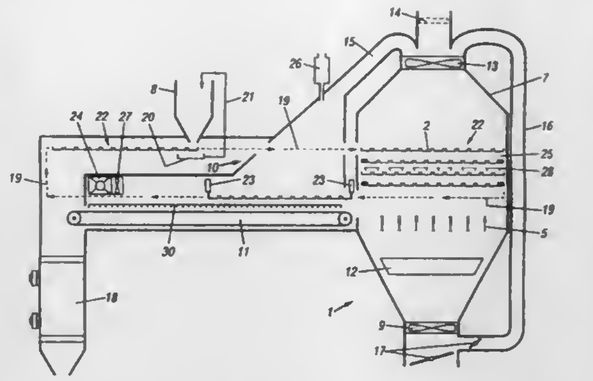
Division of Ser. No. 406,707, Mar. 20, 1995, abandoned. This application Nov. 25, 1996, Ser. No. 753,447

Int. Cl.^{6} F23J *3/00*

U.S. Cl. 110—344 **15 Claims**

1. A method for lowering the carbon content of fly ash comprising the steps of:

transporting a bed of fly ash through an ignition chamber;



contacting the fly ash in the ignition chamber with an oxygen-containing gas at a temperature that is at least the ignition temperature of carbon for a time sufficient to ignite the carbon in the fly ash;

transporting the bed of fly ash and ignited carbon to a burnout chamber;

maintaining carbon combustion in the burnout chamber at combustion sustaining gas temperature and oxygen levels for a time sufficient to reduce the carbon content of the fly ash to a desired level; and

recovering the fly ash from the burnout chamber.

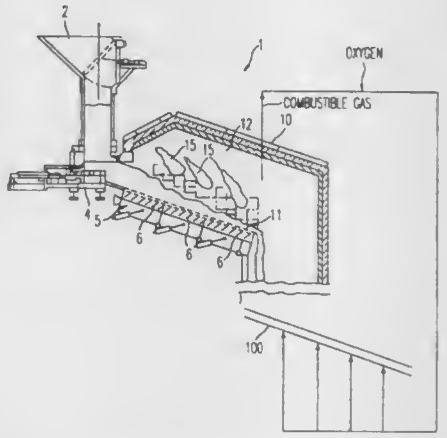
5,749,309
PROCESS AND APPARATUS FOR THE THERMAL PRODUCTION OF ENERGY FROM WASTE MATERIAL, PARTICULARY REFUSE
Stefan Forsberg, Obfelden, and Hans Rüegg, Wohlen, both of Switzerland, assignors to Von Roll Umwelttechnik AG, Zurich, Switzerland

Filed May 11, 1995, Ser. No. 439,126

Claims priority, application Switzerland, May 16, 1994, 01510/94

Int. Cl.^{6} F23G *5/00*

U.S. Cl. 110—346 **18 Claims**



1. Process for the thermal production of energy from waste material, comprising the steps of:

arranging the waste material in a layer on a grate;

conveying the waste material on the grate through a combustion chamber while simultaneously heating and mixing the layers of waste via the grate without feeding a gaseous oxidizing agent through the grate, thereby liberating combustible volatile substances from the waste material; and

feeding a quantity of a gaseous oxidizing agent into the combustion chamber from above the layer of waste on the grate, said quantity being such that the gaseous oxidizing agent cooperates with the combustible volatile substances liberated from the waste material to produce flames for radiantly heating the combustible volatile substances, thereby producing refuse coke free from combustible volatile substances and such that unburnt volatile substances remain in the form of combustible gas.

5,749,310

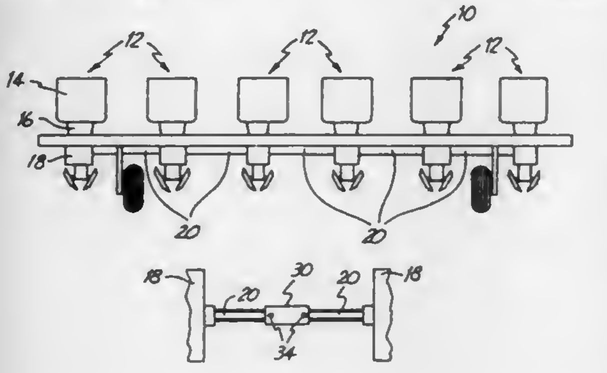
PLANTER HEX DRIVE SHAFT REPAIR KIT

Allen O. Klinkner, Lake Crystal, and Larry R. Hancock, North Mankato, both of Minn., assignors to Alwyn Company, Inc., Mankato, Minn.

Filed May 6, 1996, Ser. No. 642,884

Int. Cl.^{6} B65G *23/06*

U.S. Cl. 111—200 **3 Claims**



1. A repaired agricultural planter, comprising;

a plurality of seed planting assemblies for handling and planting seeds, the plurality of seed planting assemblies attached to the planter so as to plant seeds in a plurality of rows as the planter is pulled across the ground;

a power generating apparatus attached to the planter for generating rotational power and providing such rotational power to a transfer mechanism;

a plurality of drive shafts hexagonal in cross-section connected to the seed planting assemblies and the power generating apparatus transfer mechanism, the plurality of drive shafts for transferring rotational power from the transfer mechanism to each of the seed planting assemblies, wherein one of the plurality of drive shafts includes a discontinuity;

a substantially cylindrical repair sleeve attached to the discontinuous hex drive shaft, the repair sleeve having an inner surface configured to closely surround the discontinuous drive shaft such that each of the plurality of planar surfaces of the drive shaft is in juxtaposition with a corresponding portion of the repair sleeve inner surface;

a first holding mechanism attached to the repair sleeve capable of interacting with one of the plurality of planar surfaces, the first holding mechanism attached to the repair sleeve at a first axial end thereof; and

a second holding mechanism attached to the repair sleeve capable of interacting with one of the plurality of planar surfaces, the second holding mechanism attached to the repair sleeve at a second axial end thereof, the second axial end and the second axial end being opposite one another.

5,749,311

PRESSER FOOT DEVICE FOR SEWING MACHINE

Hideyuki Kobayashi, and Koichi Toda, both of Utsunomiya, Japan, assignors to The Singer Company N.V., Curaco, Netherlands Antilles

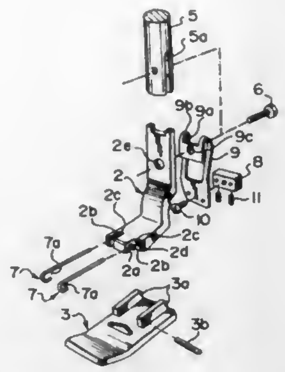
Filed Aug. 1, 1996, Ser. No. 693,812

Int. Cl.^{6} D05B *29/00*

U.S. Cl. 112—240 **2 Claims**

1. A presser foot device comprising:

at least two clamp members;



a presser foot plate;

a hinge pin releasably coupled to said presser foot plate;

a presser foot shank having an upper portion, and a lower portion defining at least two through holes for slidably receiving and guiding said clamp members for movement in a forward and backward direction, said lower portion having a front surface defining a groove for receiving said hinge pin;

an elastic member coupled to said upper portion of said presser foot shank and adapted to receive and urge said clamp members in said backward direction;

said clamp members each having a tip defining a hook portion for retaining said hinge pin of said presser foot plate; and wherein

said hinge pin is engageable with said hook portions and is biased against a rear wall of said groove by said elastic member.

5,749,312

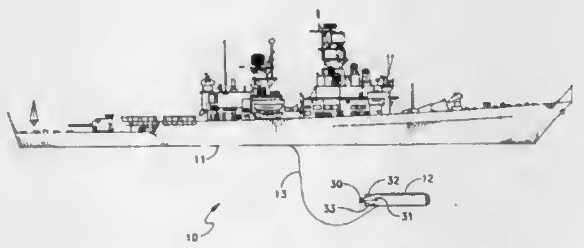
SYSTEM FOR DEPLOYING WEAPONS CARRIED IN AN ANNULAR CONFIGURATION IN A UUV

Christopher F. Hillenbrand, Bristol, and Donald T. Gomez, Little Compton, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1995, Ser. No. 540,609

Int. Cl.^{6} B63G *8/28*

U.S. Cl. 114—21.2 **9 Claims**



1. An unmanned undersea vehicle system comprising:

a remote-controlled, unmanned undersea vehicle having (i) a plurality of weapon deployment devices symmetrically disposed about a central core, each weapon deployment device having a weapon canister for carrying a weapon, the weapon deployment devices being pivotable between a retracted, non-deployed position and an extended, deployed position, and configured so that, when in their extended, deployed positions the respective weapon canisters are positioned beyond the vehicle's diameter, each weapon canister having a sidewall conforming to the shape of the weapon contained therein, and end caps at opposing ends, the end caps being discharged when the weapon contained therein is fired to allow seawater to enter, and (ii) an erectable observation mast for obtaining environmental information, and (iii) control means for controlling pivoting of the weapon deployment devices from the retracted, non-deployed position to the extended, deployed position to facilitate firing of at least one weapon, and further controlling pivoting of the weapon deployment devices from

the extended, deployed position to the retracted, non-deployed position after firing, the weapon canisters from which weapons have been fired retaining seawater so as to provide for a generally axi-symmetrical distribution of mass as among those weapon deployment devices whose weapons have been fired and those weapon deployment devices whose weapons have not been fired;

a mother vehicle for generating command information for controlling the control means and for receiving unmanned undersea vehicle status information from said unmanned undersea vehicle and processing it for use in generating the command information; and

a communication link for interconnecting said unmanned undersea vehicle and said mother vehicle to facilitate transfer of command information from said mother vehicle to said unmanned undersea vehicle and to further facilitate transfer of unmanned undersea vehicle status information from said unmanned undersea vehicle to said mother vehicle.

5,749,313

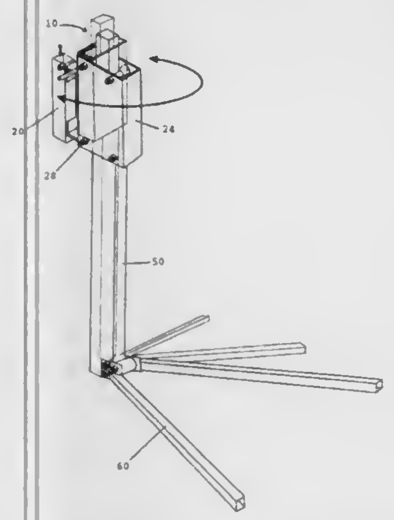
WATERCRAFT LIFT

Francis H. Shackelford, Jr., Hwy. 123 South, Hookerton, N.C. 28538

Filed Jan. 28, 1997, Ser. No. 788,425

Int. Cl.^{6} B63C *1/02*

U.S. Cl. 114—48 **8 Claims**



1. A personal watercraft lift to be used in combination with a mooring location for moving a watercraft into a body of water for use and out of a body of water for storage and comprising:

a mounting means for mounting the lift to the mooring location, which mounting means connects above the water's surface;

a guide means connected to said mounting means, which guide means connects above the water's surface and rests above the surface when not in use and further, wherein said guide means comprises a tubular housing having a plurality of roller means positioned for rotation therein;

an elongate member operatively associated with said guide means and being mounted for reciprocating movement, said elongate member having an upper end and a lower end;

a support bracket means connected to said elongate member proximate the lower end thereof and being adapted to support a watercraft resting thereon; and

a winch means operatively associated with said guide means for raising and lowering said elongate member;

whereby the watercraft may be placed in and removed from the water.

5,749,314

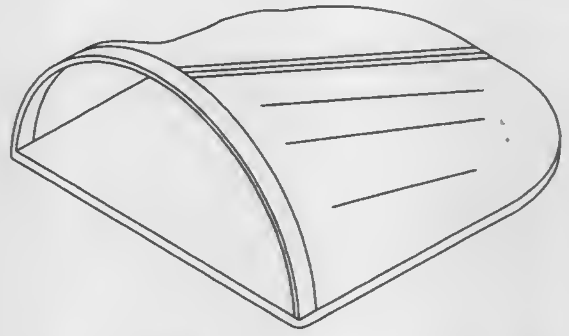
COVERED DOG BED

Marilyn M. Pelham, 7204 Mignonette, Bakersfield, Calif. 93308, and Richard T. Hollar, 1010 33rd St., Bakersfield, Calif. 93301

Filed Nov. 29, 1996, Ser. No. 753,747

Int. Cl.^{6} A01K *1/035*

U.S. Cl. 119—28.5 **4 Claims**



1. A pet bed comprising:

a bottom member formed of cushioning material and configured to receive a pet in a sleeping position,

a blanket covering said bottom member and forming an overlying layer above said bottom member, said blanket being secured to said bottom member about approximately 75% of the periphery of said bed to define an entrance portion, and

a semi-rigid flexible non-metallic member, secured to said bottom member forming an arch about said entrance portion and serving to support an edge portion of said blanket to define a doorway for said pet.

5,749,315

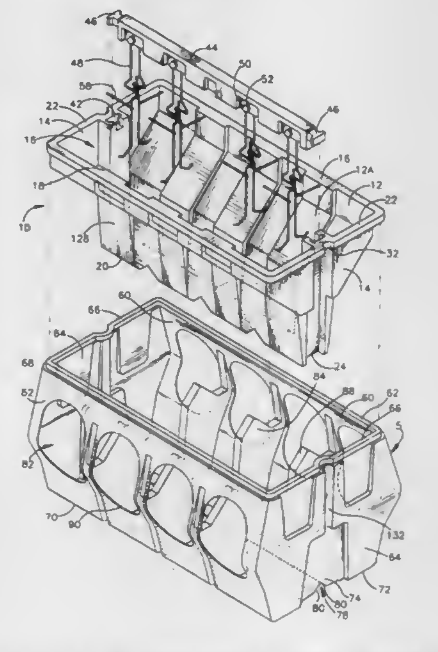
ANIMAL FEEDER

Jörg R. Bärenwäld, Bainbridge, Ohio, assignor to ACO Polymer Products, Inc., Chardon, Ohio

Filed Jun. 4, 1996, Ser. No. 658,171

Int. Cl.^{6} A01K *5/01*

U.S. Cl. 119—52.1 **22 Claims**



1. An animal feeder comprising a hopper portion including hopper wall structure having first and second ends and defining a hopper cavity having a first end perimeter and a second end perimeter that is smaller than said first end perimeter, a trough portion including trough wall structure defining a trough cavity,

said hopper portion releasably cooperating with said trough portion to suspend said second end perimeter within said trough cavity, said trough wall structure including at least one void therein, whereby feed disposed within said hopper cavity flows into said trough cavity and is accessible through said at least one void, said first end perimeter of said hopper portion including at least one support member facilitating dispersement of feed into said trough cavity.

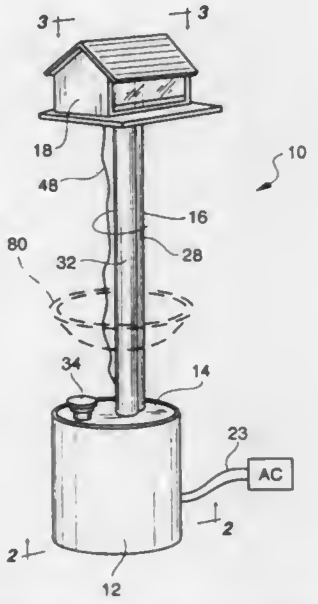
5,749,316
AUTOMATIC SELF-FILLING BIRD FEEDER

John C. Deagan, Long Grove, Ill., assignor to Thomas R. Vigil, Barrington, Ill.

Filed Jan. 21, 1997, Ser. No. 785,875

Int. Cl.^{6} A01K *39/00*

U.S. Cl. 119—57.8 **18 Claims**



1. An automatic self-filling bird feeder comprising:
a container for receiving bird seed;
an electrically powered blower mounted in said container and having an air outlet for supplying pressurized air to the interior of said container;
a seed filling opening in said container for supplying seed to said container;
a cover for said seed filling opening;
a tube assembly extending from said seed receiving container;
an enclosed bird feeder housing mounted to an outer end of said tube assembly;
means for sensing the level of seed in said seed receiving container; and
means responsive to said level of seed sensed in said bird feeder housing for controlling the operation of said electrically powered blower.

5,749,317
PET LITTER CABINET

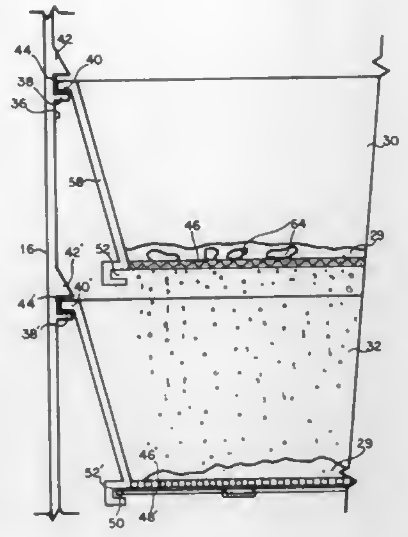
Richard Mark Richey, and Sandra Barbara Richey, both of 7033 Gillis, Boise, Id. 83703

Filed Jan. 17, 1996, Ser. No. 588,016

Int. Cl.^{6} A01K *29/00*

U.S. Cl. 119—166 **12 Claims**

2. A pet litter cabinet for use with adsorbent material, the cabinet comprising:
an enclosure defining an interior space, the enclosure comprising a sidewall and a top wall, the sidewall having a drawer-removal doorway for providing access to a lower region of the interior space and a pet doorway for providing access into an upper region of said interior space, wherein the sidewall comprises a front wall having both said drawer-removal doorway and said pet doorway, and wherein said pet doorway is located directly above said drawer-removal doorway;
a door connected to the enclosure and extending across said drawer-removal doorway;
a first drawer and a second drawer received in the said interior space lower region for receiving adsorbent, said first drawer being in a top position in said lower region and said second drawer being in a bottom position in said lower region, each of said first and second drawers having a bottom with a screening means, and a removable cover means for temporarily blocking the screening means;
wherein said pet doorway provides a pet access to said first drawer in the top position for use as a litter area; and
support means for supporting said first and second drawers in the interior space, wherein each of said first and second drawers may be independently pulled out and removed from the enclosure through said drawer-removal doorway and wherein each of said first and second drawers may be replaced independently in either the top position or bottom position in said lower region of the interior space; and
whereby the first drawer, when in the top position, is cleaned by removing the cover means of the first drawer so that clean adsorbent falls through the screening means into the second drawer in the bottom position, by removing the first drawer from said enclosure and emptying pet waste, and by switching said second drawer to the top position and said first drawer to the bottom position.



5,749,318
SELF-CLEANING LITTER BOX FOR ANIMALS

Gérard Barbot, 254 Boulevard Voltaire, Paris, France, F-75011; Cyril Rameau, 9, Grande-rue, Maule, France, F-78580, and Patrick F. Sanchez, 141, rue Paul et Camille-Thomoux, Neuilly sur Marne, France, F-93330

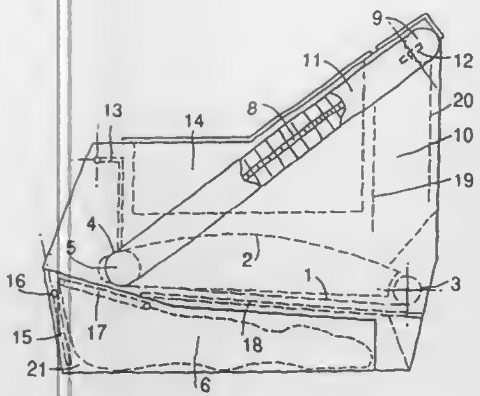
Filed Feb. 6, 1996, Ser. No. 595,879

Claims priority, application France, Aug. 6, 1993, 03/09707

Int. Cl.^{6} A01K *1/035*

U.S. Cl. 119—166 **14 Claims**

1. A litter box for an animal, comprising
a main receptacle for holding litter accessible to the animal, said first receptacle having a bottom;
a reserve receptacle for holding clean, recycled litter or a combination there of, said reserve receptacle being connected to feed the litter to the main receptacle;
a flexible screen for separating litter which is clumped together by excrement from the animal from unsoiled litter, said flexible screen being disposed against the bottom within the main receptacle and being movable along the bottom to transport litter within the main receptacle;
means for collecting unsoiled litter transported by the flexible screen and recycling the unsoiled litter to the reserve receptacle; and
a waste receptacle for receiving excrement and soiled matter transported by the flexible screen, said waste receptacle being disposed below the main receptacle.



5,749,319
PEARL AND METHOD FOR PRODUCING SAME

Tokuzo Hirose, 13-13, Higashiyama-cho, Ashiya-shi, Hyogo, Japan

Filed Sep. 26, 1996, Ser. No. 721,120

Claims priority, application Japan, Jul. 1, 1996, 8-171459

Int. Cl.^{6} A01K *61/00*

U.S. Cl. 119—244 **4 Claims**

1. A method for producing a pearl comprising:
incorporating mantle genes of pearl forming shellfish into genes of monads or ultramicro organisms which generate a viscous secretion;
propagating said organisms in a bath which contains seawater or freshwater containing an abundance of calcium ions, magnesium ions, or other metal ions, capable forming a pearl layer, as well as anions such as carbonate ions; and
depositing a pearl layer, by the organisms, onto outer peripheral surface of a core composed of a small chip of a synthetic resin, shell, ceramic, wood, or metal formed into any optional shape placed in said bath.

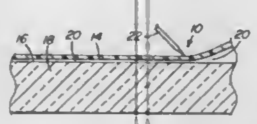
5,749,320
FISH AQUARIUM BACKGROUND DEVICE AND METHOD FOR PROVIDING

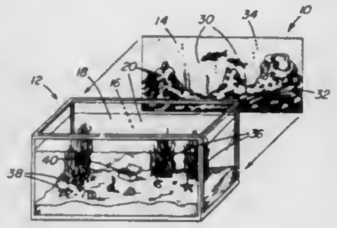
Anita S. Sydenstricker, 4613 Camp Creek Dr., Huntington, W. Va. 15026

Filed Jan. 27, 1997, Ser. No. 789,746

Int. Cl.^{6} A01K *63/00*

U.S. Cl. 119—253 **19 Claims**





16. A method of providing an aquarium background at the outside surface of the rear glass of an aquarium for viewing through the aquarium from the front thereof, the method comprising the steps of:
liberally applying a clear liquid to the outside surface of the rear glass;
providing a thin sheet of plastic material with a first side having a nonadhesive surface thereon, said sheet having first image means for being viewed at said first side;
installing said sheet with said first side on the outside surface while initially entrapping said clear liquid therebetween;
squeegeeing said sheet toward the outside surface to remove excess said clear liquid from between said first side and the outside surface to leave some of said clear liquid therebetween; and
said step of squeegeeing reduces a distance between said first side and the outside surface, causes said some of said clear liquid to fill any areas of greater separation between said first side and the outside surface, and causes said sheet to adhere to the outside surface until being selectively removed by said sheet being separated from the outside surface to allow said some of said clear liquid to escape from therebetween.

5,749,321
ANIMAL REARING APPARATUS

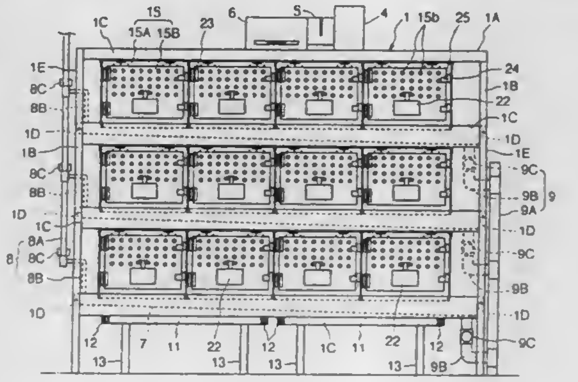
Toshimi Ikuse, Nara; Mitsuhiro Nishiwaki, Kobe; Tamotsu Yonekura, Sakai; Kaoru Nakamura, Nakagyo-ku; Yoshinori Watatani, and Mamoru Ueshiba, both of Osaka, all of Japan, assignors to Santen Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1996, Ser. No. 651,738

Claims priority, application Japan, May 24, 1995, 7-125018

Int. Cl.^{6} A01K *1/00;31/04*

U.S. Cl. 119—458 **11 Claims**



1. An animal rearing apparatus comprising:
an animal rearing cage;
framework to which a plurality of side plates together forming the periphery of the animal rearing cage are detachably attached;
wherein, at the bottom of the animal rearing cave, there are provided a bottom plate detachably attached thereto and defining a plurality of openings vertically extending therethrough and an excreta collecting portion for receiving and collecting animal excreta dropped through the openings of the bottom plate, the animal rearing cage having a ceiling thereof sectioned by a top plate or the excreta collecting portion belonging to an animal rearing cage on the upper stage;
the framework or an attachment member thereof includes, at portions thereof corresponding in level to the ceiling of the animal rearing cage, engaging portions for detachably engaging and suspending engaged portions provided at upper portions of the respective side plates;
wherein the framework or the attachment member thereof includes a contact restricting portion for restricting, through contact, a pivotal movement of each side plate suspended from the engaging portion in a direction away from the animal rearing cage, and a pivotal movement of the side plate in the opposite direction toward the center of the animal rearing cage is restricted by contact between this side plate and the

bottom plate or by contact between the other side plate opposed to said side plate and the bottom plate.

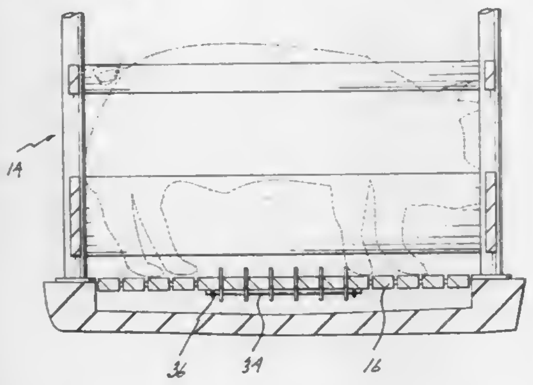
5,749,322
ANIMAL STALL

Florent Chagnon, 2133 rue Principale, St. Dominique, Quebec, Canada, JOH 1L0

Filed Apr. 7, 1997, Ser. No. 838,437

Int. Cl.^{6} A01K *1/02*

U.S. Cl. 119—509 **9 Claims**



1. A farrowing pen comprising a floor and a wall, at least a portion of said floor lying in a generally horizontal plane, said floor having at least one aperture formed therein, a member having a first end moveable in a generally vertical direction through said aperture from a first position wherein said first end lies substantially coplanar with said horizontal plane to a second position wherein said first end lies in a plane above said horizontal plane.

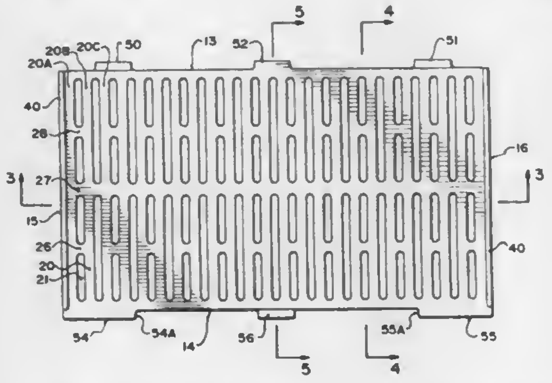
5,749,323
FLOORING SLAT FOR AN ANIMAL PEN

Jonathan Kleinsasser, Box 10, Ste. Agathe, Manitoba, Canada, R0G 1Y0

Filed Dec. 18, 1995, Ser. No. 573,934

Int. Cl.^{6} A01K *1/00*

U.S. Cl. 119—530 **11 Claims**



1. A floor structure for an animal containment pen comprising:
a plurality of generally rectangular slats;
each slat having an upper surface for receiving the animal thereon, two end edges spaced by a length of the slat and two side edges spaced by a width of the slat;
a support structure for supporting the slats in a row in side by side relationship so that the end edges of the slats at one end lie in a first common line along one side of the floor structure and the end edges at an opposed end lie in a second common line parallel to the first common line along an opposed side of the floor structure so that the floor structure has a first dimension equal to a length of the slats and a second dimension at right angles to the first dimension which is the sum of the widths of the plurality of the slats;
wherein each slat includes on the upper surface thereof at the end edges thereof a respective one of a pair of raised ribs each of which is shaped to provide an inner side of the rib and an outer side of the rib standing upwardly from the upper surface and a top surface of the rib, the inner side of the rib having an angle to the upper surface which is greater than an angle of the outer side of the rib relative to the upper surface.

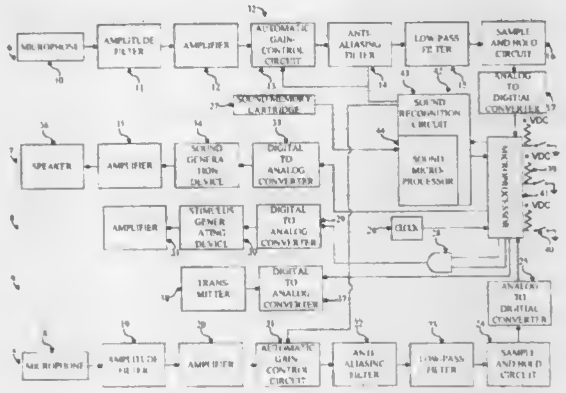
5,749,324
APPARATUS AND METHOD FOR CONTROLLING ANIMAL BEHAVIOR

Steven Jerome Moore, 9 Sonoma Rd., Cortlandt Manor, N.Y. 10566

Filed Jan. 2, 1996, Ser. No. 581,807

Int. Cl.^{6} A01K *15/00*

U.S. Cl. 119—719 **11 Claims**



1. An apparatus for controlling the behavior of an animal comprising:
a sound-processing means for processing one or more specific sound vocalizations produced by said animal distinctly related to the emotional state of said animal, such as whimpering, barking, purring, growling, yawning or other animal vocalization; said sound processing means differentiating between different animal sounds by comparing said animal sounds with data stored in memory;
an actuator means electronically coupled to said sound-processing means, said actuator being actuated by said sound-processing means upon recognition by said sound-processing means of said one or more specific sounds;
a stimulus-generating means coupled to said actuator means, said stimulus-generating means providing a stimulus to said animal upon actuation of said actuator, said stimulus consisting of, or including, a human voice command responsive to the said specific sound vocalization.

5,749,325
MULTI-PURPOSE STRAP FOR PETS

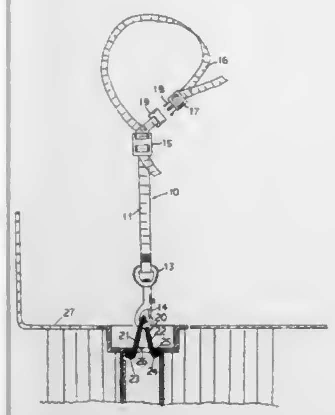
Guido Albanese, 23 Rockview Gardens, Concord, Ontario, Canada, L4K 2J5

Filed May 1, 1996, Ser. No. 640,574

Int. Cl.^{6} A01K *1/06;1/04*

U.S. Cl. 119—792 **6 Claims**

1. A multi-purpose strap comprising
an elongated web member made of a strong flexible and washable material,
a releasable latch member mounted at one end of said web member,
a slip buckle member mounted at a second end of said web member, the position of said slip buckle member on said web member being variable by adjusting the length of said second end of said web member extending beyond said slip buckle member,
a collar web member secured to said slip buckle member,
a quick release snap buckle member adjustably mounted at one end portion of said collar web member,
an associated buckle member mounted at a second end of said collar web member, said quick release snap buckle member being operative to engage with said associated buckle member to form a loop for being worn over the neck portion of a pet,
a spring bracket member removably attached to said releasable latch member and being operative to engage releasably with a drain opening of a bath tub.



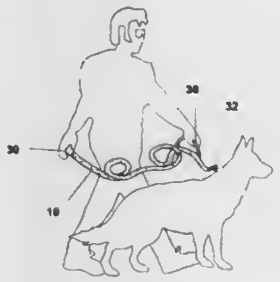
5,749,326
EXTENDIBLE RESTRAINING DEVICE

Robert A. Jones, and Jill S. Jones, both of 6763 Devonshire, Canton, Mich. 48187, assignors to Robert A. Jones, and Jill S. Jones

Filed Nov. 12, 1996, Ser. No. 745,464

Int. Cl.^{6} A01K *27/00*

U.S. Cl. 119—798 **14 Claims**



1. A restraining devise comprising of:
a. a unitary stretch member having a length of hollow braid and an elastic member affixed therein, substantially between a first and second end section so as to retract said unitary stretch member from a fully extended state;
b. said hollow braid able to radially expand and angularly displace, aiding retraction of said unitary stretch member;
c. said unitary stretch member having a length that is variable, including a first length in a retracted state and a second length in a fully extended state;
d. said elastic member having a cross section which is proportioned considerably smaller than cross section of said hollow braid allowing relative radial displacement between hollow braid and elastic member inturn creating forces that curls said unitary stretch member to benefit retraction.

5,749,327
METHOD FOR CONTROLLING GAS SUPPLY OF A GAS BOILER

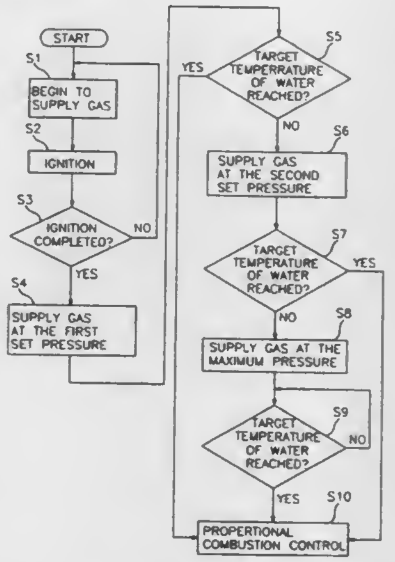
Si-Hwan Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 2, 1996, Ser. No. 753,888

Claims priority, application Rep. of Korea, Nov. 30, 1995, 1995-45951

Int. Cl.^{6} F22B *5/00*

U.S. Cl. 122—13.1 **7 Claims**


START
S1
BEGIN TO SUPPLY GAS
S2
IGNITION
S3
IGNITION COMPLETED?
NO
YES
S4
SUPPLY GAS AT THE FIRST SET PRESSURE
S5
TARGET TEMPERRATURE OF WATER REACHED?
YES
NO
S6
SUPPLY GAS AT THE SECOND SET PRESSURE
S7
TARGET TEMPERATURE OF WATER REACHED?
YES
NO
S8
SUPPLY GAS AT THE MAXIMUM PRESSURE
S9
TARGET TEMPERATURE OF WATER REACHED?
NO
YES
S10
PROPERTIONAL COMBUSTION CONTROL

1. A method for controlling gas supply of a gas boiler comprising the steps of:
supplying gas into a gas burner at a gas supply pressure which is higher than an ignition pressure for igniting the gas;
igniting the gas supplied into said gas burner;
gradually increasing the gas supply pressure during a predetermined time until a fluid to be heated reaches a target temperature set by a user, when the gas supplied into said gas burner is ignited; and
supplying the gas at a corresponding gas supply pressure to the target temperature when a temperature of the fluid reaches the target temperature.

5,749,328
BOILER FOR HEATING A WORKING FLUID

Rémi Guillet, Pierrefitte, France, assignor to Gaz de France, Paris, France

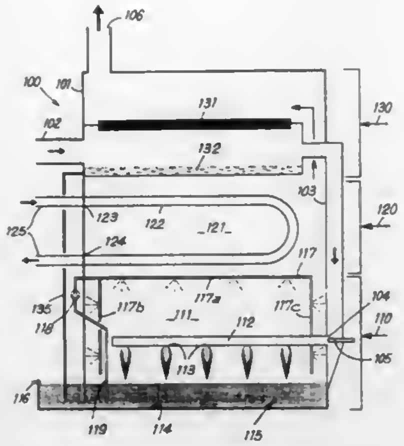
Filed Nov. 16, 1995, Ser. No. 559,063

Claims priority, application France, Nov. 16, 1994, 94 13689

Int. Cl.^{6} F22B *1/02*

U.S. Cl. 122—31.1 **12 Claims**

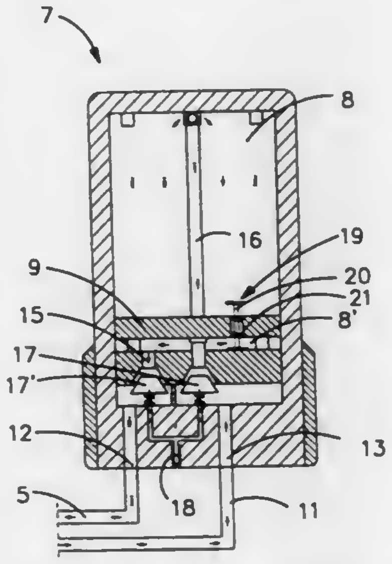
1. A boiler for heating a working fluid, the boiler comprising an enclosure into which there penetrates at least one circuit portion for circulating the working fluid, and a hearth which is situated inside the enclosure and in which a fuel gas is subjected to combustion, wherein the boiler comprises at least:
a) a first module containing the hearth, a burner fed by said fuel gas, and an internal water circuit for wetting the hearth and creating a first level of mass and heat exchange due to vaporization without heat transfer to the working fluid;
b) a second module comprising an exchanger-condenser associated with said circuit portion for circulating the working fluid and receiving the combustion gases laden with water vapor coming from the hearth of the first module to create a second level of mass and heat exchange due to condensation transferring the heat energy produced in the first module to an external circuit for working fluid circulation without there being direct contact between the combustion gases and the working fluid; and



c) a third module comprising a water vapor pump providing a third level of mass and heat exchange between the combustion gases coming from the second module and the oxidizing air injected into the enclosure via an air inlet, means being provided to direct the oxidizing air to the first module after it has been heated and wetted by passing through the third module, thereby enabling the heated and wetted air to be mixed inside the burner with the fuel gas.

5,749,329
HEAT-STORAGE DEVICE

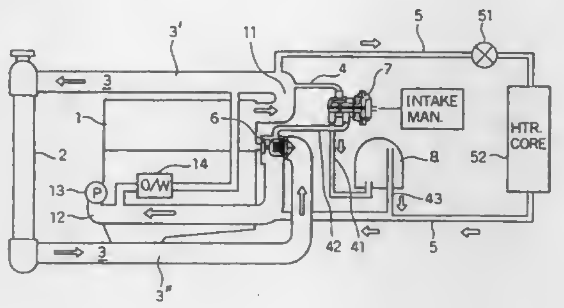
Jens Thurfjell, Vastra Varvsgatan 24 A, S-972 36 Lulea, Sweden
PCT No. PCT/SE95/01188, § 371 Date Jun. 16, 1997, § 102(e) Date Jun. 16, 1997, PCT Pub. No. WO96/15365, PCT Pub. Date May 23, 1996
PCT Filed Oct. 13, 1995, Ser. No. 836,580
Claims priority, application Sweden, Nov. 14, 1994, 9403907; Mar. 20, 1995, 9500964
Int. Cl.^{6} F01P *11/20*
U.S. Cl. 123—41.14 **6 Claims**



1. A heat-storage device pertaining to a liquid-cooled internal combustion engine and intended for heating the engine prior to starting the engine, wherein the engine block (2) has a coolant pump (3) and coolant circulating passageways, wherein the heat-storage device includes a thermally-insulated storage container (7) for storing heated coolant, a reciprocatingly movable plunger means (9) mounted in the container (7) and functioning to divide said container into two chambers (8, 8') which are connected with the inlet and outlet of the engine-block coolant passageways, and a pump (10) by means of which coolant can be passed from the engine-block passageways to the storage container (7), characterized in that the two chambers (8, 8') can be placed in flow-communication with one another through the medium of at least one valve means (19) provided in the movable plunger means (9), so as to enable coolant to flow through the storage container (7) while the engine (1) is running; and in that the pump (10) functions in a known manner to pump coolant into one (8') of the storage container chambers (8, 8') in a direction opposite to the flow direction of the engine coolant prior to starting-up the engine, the valve means (19) in the movable plunger means (9) being closed.

5,749,330
COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yoshimitsu Inque, Toyoake; Yasutoshi Yamanaka, Kariya; Ryuichi Matsushiro, deceased, late of Okazaki, by Kunie Matsushiro, legal representative; Hikaru Sugi, Nagoya; Takayuki Hayashi, Aichi-gun; Tatsuo Sugimoto, Ooba; Koichi Ito, Kariya; Hiroyuki Fukunaga, Okazaki; Tokio Kohama, Nishio, and Toshihiko Igashira, Toyokawa, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, and Nippon Soken, Inc., Nishio, both of Japan
Filed Feb. 26, 1996, Ser. No. 607,349
Claims priority, application Japan, Feb. 24, 1995, 7-061834; Jun. 28, 1995, 7-162162
Int. Cl.^{6} F01P *7/14*
U.S. Cl. 123—41.1 **26 Claims**



1. A cooling system for an internal combustion engine, said system comprising:

a first cooling water passage for conveying cooling water flowing from a cooling water outlet of said internal combustion engine to an inlet of a radiator and a second cooling water passage for conveying cooling water from an outlet of said radiator to a cooling water inlet of said internal combustion engine;

a bypass passage for returning said cooling water just after flowing from said cooling water outlet of said internal combustion engine to said cooling water inlet of said internal combustion engine without passing through said radiator;

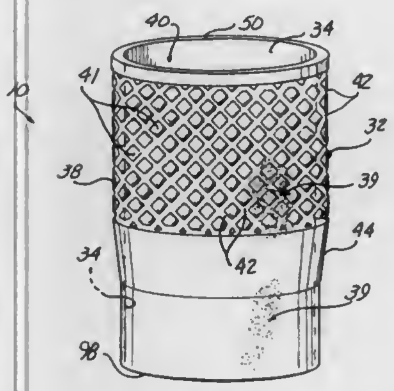
load state detecting means for detecting a load state of said internal combustion engine;

a valve for opening said bypass passage corresponding to a reduction of load of said internal combustion engine detected by said load state detecting means; and

a heat accumulator connected to said bypass passage.

5,749,331
POWDERED METAL CYLINDER LINERS

Bjorn Ola Alfons Pettersson, Huntsville; Alex Plavnik, Owens Cross Roads, both of Ala., and Eric Boreczky, Royal Oak, Mich., assignors to Tecsyn, Inc., Canada
Continuation-in-part of Ser. No. 299,441, Sep. 1, 1994, Pat. No. 5,466,414, which is a division of Ser. No. 855,881, Mar. 23, 1992, Pat. No. 5,346,529. This application Aug. 18, 1995, Ser. No. 516,976
Int. Cl.^{6} B22F *7/06*
U.S. Cl. 123—193.2 **28 Claims**



1. A cylinder liner for use in an internal combustion engine having a cylinder block with a cylinder bore adapted to carry a piston therein, the liner comprising:

a body formed from a powdered metal material, the body formed therefrom being rigid and wear resistant, the body comprising:
  a smooth, inner, piston-directing surface;
  an outer, cylinder bore-contacting surface; and
  an upper, combustion containing area;

means for improving transfer of heat from the combustion containing area to the cylinder block comprising an isostatically formed, rough surface finish extending about the outer, cylinder bore-contacting surface, the surface finish having micropores dispersed therein, wherein the rough surface finish and micropores promote a substantially complete metal-to-metal bond between the body and the cylinder bore; and

means, disposed within the piston-directing surface, for improving piston ring and piston scuff resistance while maintaining piston-directing surface smoothness.

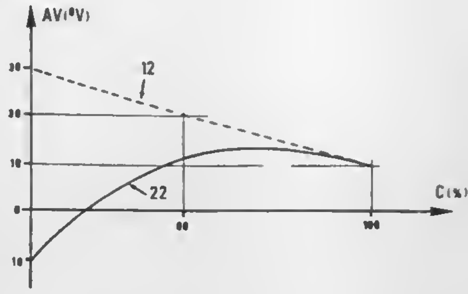
5,749,332

Patent Not Issued For This Number

5,749,333
TWO-STROKE INTERNAL-COMBUSTION ENGINE DEPOLLUTION PROCESS AND ASSOCIATED APPLICATIONS

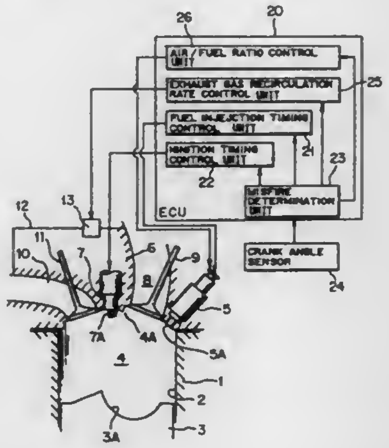
Pierre Duret, Sartrouville, France, assignor to Institute Francais du Petrole, Rueil-Malmaison, France
Filed Sep. 5, 1996, Ser. No. 709,329
Claims priority, application France, Sep. 8, 1995, 95 10797
Int. Cl.^{6} F02B *17/00;* **F02P** *5/04*
U.S. Cl. 123—295 **11 Claims**

1. A two-stroke internal-combustion engine depollution process comprising scavenging burned gases from the combustion chamber using a gas comprising air, separating and delaying delivery of fuel in relation to gas comprising air used for scavenging the burned gases, advancing ignition as a function of load at least over a portion of the operating range of the engine, and delaying the advanced ignition over a portion of the operating range from the optimal advanced ignition, wherein said delay in relation to the optimal advanced ignition allows an increase in exhaust gas temperature and a post-oxidation of unburned hydrocarbons contained in said exhaust gases, and wherein said delay is at a maximum for low loads.



5,749,334
CONTROL SYSTEM AND METHOD FOR IN-CYLINDER INJECTION INTERNAL COMBUSTION ENGINE

Hideyuki Oda; Hitoshi Kamura, and Nobuaki Murakami, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 12, 1997, Ser. No. 813,201
Claims priority, application Japan, Mar. 8, 1996, 8-051911; Aug. 28, 1996, 8-227220
Int. Cl.^{6} F02B *5/00*
U.S. Cl. 123—305 **34 Claims**


26
20
AIR/FUEL RATIO CONTROL UNIT
EXHAUST GAS RECIRCULATION RATE CONTROL UNIT
25
FUEL INJECTION TIMING CONTROL UNIT
21
IGNITION TIMING CONTROL UNIT
23
22
MISFIRE DETERMINATION UNIT
ECU
CRANK ANGLE SENSOR
24
12
13
11
10
7
6
8
9
5
7A
4A
4
5A
1
2
3A
3

1. A control system for an in-cylinder injection internal combustion engine capable of selecting an intake stroke injection mode, in which an injection of fuel is performed primarily in an intake stroke, or a compression stroke injection mode, in which an injection of fuel is performed primarily in a compression stroke, as a fuel injection mode in accordance with a state of operation, comprising:

a fuel injection valve for directly injecting fuel into a combustion chamber of said internal combustion engine;

a spark plug arranged in said combustion chamber to ignite an air-fuel mixture in said combustion chamber;

an exhaust gas recirculation system for recirculating a portion of exhaust gas of said internal combustion engine to an intake system of said internal combustion engine;

burning fluctuation detecting unit for detecting a fluctuated state of burning in said internal combustion engine;

fuel injection timing control unit for controlling a fuel injection timing of said fuel injection valve on a basis of a target fuel injection timing preset corresponding to a state of operation of said internal combustion engine during normal operation of said internal combustion engine;

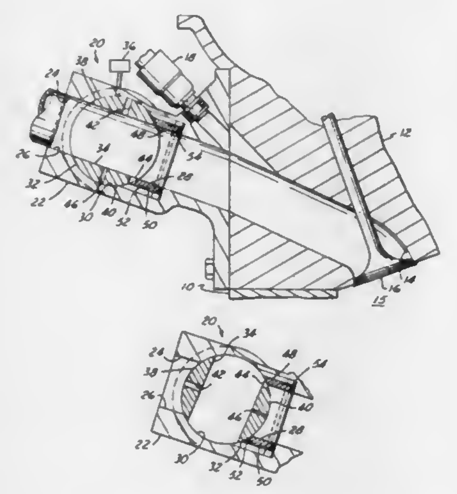
ignition timing control unit for controlling an ignition timing of said spark plug on a basis of a target ignition timing preset corresponding to a state of operation of said internal combustion engine during normal operation of said internal combustion engine; and

exhaust gas recirculation rate control unit for controlling an exhaust gas recirculation rate of said exhaust gas recirculation system on a basis of a target exhaust gas recirculation rate preset corresponding to a state of operation of said internal combustion engine during normal operation of said internal combustion engine;

whereby during said compression stroke injection mode, said control system corrects at least one of said fuel injection timing, said ignition timing and said exhaust gas recirculation rate in accordance with results of a detection by said burning fluctuation detecting unit so that burning fluctuations are reduced.

5,749,335
BARREL THROTTLE VALVE

Ansel Bernard Flanery, Jr., Brighton; Lowell Allan Reams, Canton, and Mark Alan Zagata, Livonia, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Jul. 15, 1996, Ser. No. 679,917
Int. Cl.^{6} F02D *9/16*
U.S. Cl. 123—337 **12 Claims**

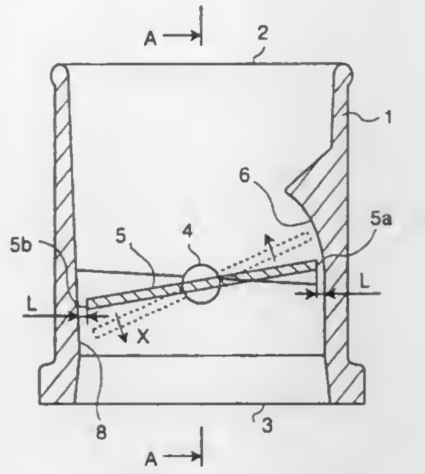


1. A barrel throttle valve for use in the air stream of an intake system of an internal combustion engine comprising:

- a throttle valve housing having a barrel cavity enclosed therein and a main bore extending from the barrel cavity, with the main bore and barrel cavity enclosing a portion of the air stream;
- a barrel rotatably mounted within the barrel cavity, having a primary bore selectively alignable with the main bore and forming an upstream land and a downstream land, with the barrel further including an idle control notch formed in the downstream land and including means for receiving air through the upstream land; and
- means for controlling the rotational motion of the barrel valve within the throttle body to allow for selective changing of the idle air flow past the barrel.

5,749,336
INTAKE VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shigeo Tamaki, and Shigeru Tokumoto, both of Hitachinaka, Japan, assignors to Hitachi, Ltd., and Hitachi Car Engineering Co., Ltd., both of Japan
Filed Sep. 20, 1996, Ser. No. 717,249
Claims priority, application Japan, Sep. 20, 1995, 7-241376
Int. Cl.^{6} F02D *9/08*
U.S. Cl. 123—337 **10 Claims**

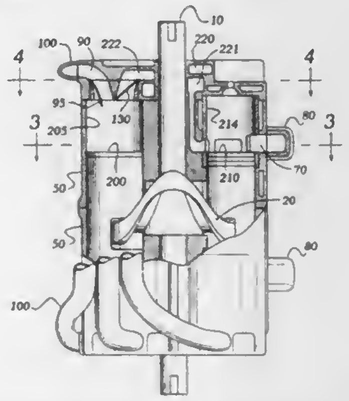


1. An intake valve control apparatus for an internal combustion engine, comprising a throttle body member which forms an intake air passage, and a throttle valve which is mounted rotatably in said throttle body member and has a first outer circumference which rotates in a direction upstream of said throttle body member and a second outer circumference which rotates in a direction downstream of said throttle body member, wherein said throttle body member has

- a spherical surface formed on a first internal wall thereof and opposite to said first outer circumference of said throttle valve; and
- a cylindrical surface formed on a second internal wall thereof and opposite to said second outer circumference of said throttle valve.

5,749,337
BARREL TYPE INTERNAL COMBUSTION ENGINE

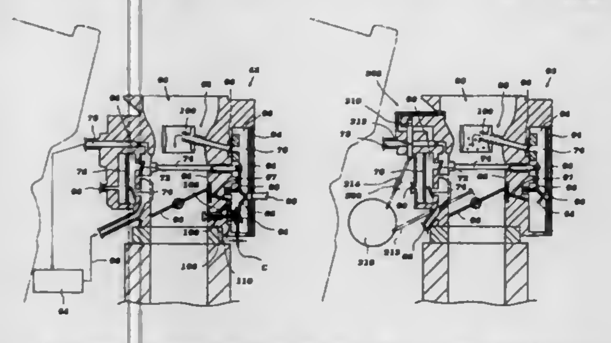
Dennis Palatov, 36 Nightingale Dr., Aliso Viejo, Calif. 92656
Filed Mar. 31, 1997, Ser. No. 829,282
Int. Cl.^{6} F02B *75/06*
U.S. Cl. 123—56.2 **10 Claims**



1. An internal combustion engine of a barrel type comprising two halves, each half of said engine having a plurality of pumping cylinders and a plurality of power cylinders, said power cylinders being equal in number to said pumping cylinders, said power cylinders operating with a two-stroke working cycle, and said pumping cylinders and said power cylinders being formed by a number of pistons being slidably received within a corresponding number of cylinder bores, and, transfer ducts to place said pumping cylinders within each half of said engine in communication with said power cylinders within the same engine half.

5,749,338
FUEL-INCREASING SYSTEM FOR AN ENGINE

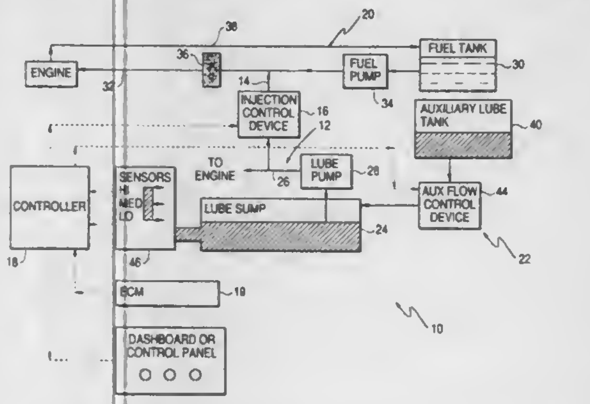
Yoshihiro Gohara; Hiroaki Fujimoto, and Masayoshi Nanami, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan
Filed Sep. 6, 1996, Ser. No. 706,670
Claims priority, application Japan, Sep. 6, 1995, 7-229346
Int. Cl.^{6} F02B *33/04;* **F02M** *7/08*
U.S. Cl. 123—73 A **41 Claims**



1. An engine comprising an engine block with at least one combustion chamber therein, a piston mounted in said chamber, a first fuel source, an air source, an intake for providing air from said air source and fuel from said first fuel source to said combustion chamber, a return fuel line for returning excess fuel delivered to said first fuel source but not delivered to said intake, a second fuel line in communication with said return fuel line for delivering a second source of fuel to said combustion chamber, and a valve for selectively opening and closing said second fuel line.

5,749,339
ELECTRONICALLY CONTROLLED CONTINUOUS LUBRICATING OIL REPLACEMENT SYSTEM

John P. Graham, Columbus, Ind.; Jerry C. Wang, Waterloo, Iowa; Leslie A. Roettgen, Columbus; Donald P. Carver, Henryville, both of Ind.; Colin I. Black, Wadmalaw Island, S.C.; David M. Stehouwer, Cookeville, Tenn., and Ray C. Hatton, Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.
Filed Feb. 28, 1996, Ser. No. 608,305
Int. Cl.^{6} F02B *33/04*
U.S. Cl. 123—73 AD **32 Claims**

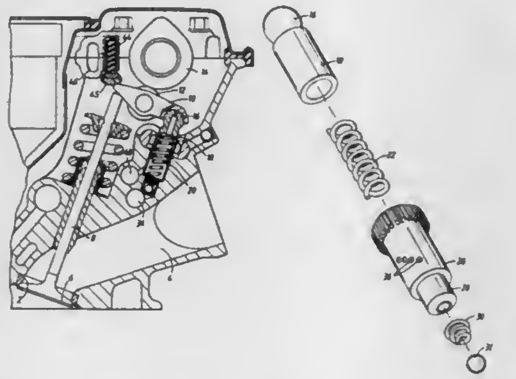


1. An electronically controlled continuous lube oil replacement system for an engine having a fuel supply system for supplying fuel to the engine, comprising:

- engine lube oil supply means including a lube oil supply circuit for delivering a supply of lube oil to the engine;
- a lube oil injection circuit connected to said lube oil supply circuit and the fuel supply system for permitting an injection flow of lube oil from said lube oil supply circuit to said fuel supply system for injecting lube oil into said fuel supply system for mixing with the fuel;
- an engine lube oil injection control means positioned along said lube oil injection circuit for controlling said injection flow of lube oil to define a lube oil injection rate;
- engine operating condition detecting means for detecting at least one engine operating condition and generating an engine operating condition signal indicative of said at least one engine operating condition;
- processing means for receiving said engine operating condition signal, calculating an engine operating severity value based on said engine condition signal and generating an injection flow control signal based on said engine operating severity value, said injection flow control signal controlling the operation of said lube oil injection control means to variably control said injection rate; and
- an auxiliary lube oil supply means including an auxiliary lube oil supply circuit for providing an auxiliary supply flow of lube oil to said main lube oil supply means and an auxiliary lube oil tank containing a supply of auxiliary lube oil, further including an auxiliary lube oil flow control means positioned along said auxiliary lube oil supply circuit for controlling said auxiliary supply flow of lube oil to said engine lube oil supply means to define an auxiliary supply flow rate, said processing means generating a flow control signal for controlling the operation of said auxiliary lube oil flow control means to variably control said auxiliary supply flow rate.

5,749,340
HYDRAULIC TAPPETS

Alan Warburton, Steyning, and Graham Atkin, Norwich, both of England, assignors to Ricardo Consulting Engineers Limited, West Sussex, England
Filed Jun. 11, 1997, Ser. No. 872,769
Claims priority, application United Kingdom, Jun. 11, 1996, 9612178
Int. Cl.^{6} F01L *13/00;1/16;1/245*
U.S. Cl. 123—90.16 **5 Claims**

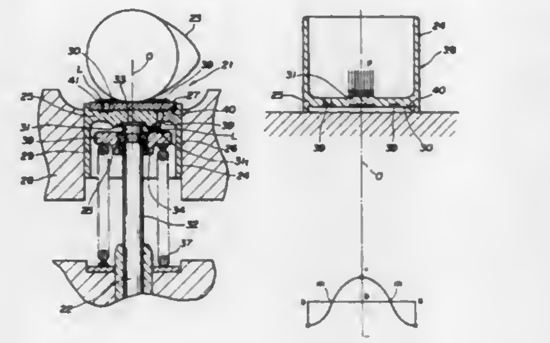


1. A hydraulic tappet comprising:

- a cylinder having a cylinder wall, an axis and two ends, one of said ends being open and the other one of said ends having an end wall;
- a piston having two ends slidably accommodated in said cylinder, one of said ends projecting out of said open end of said cylinder and being adapted to engage a valve rocker;
- means operatively associated with said cylinder to effect rotation of said cylinder relative to said piston about said axis of said cylinder, said piston being rotationally fixed;
- said cylinder defining an oil chamber therein located beyond said other end of said piston;

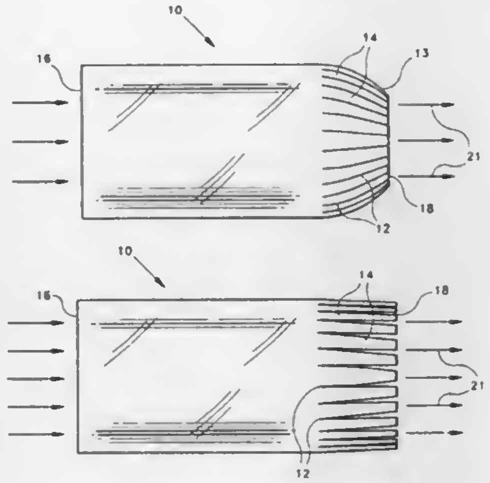
said oil chamber being in communication with a pathway which communicates with a source of pressurized oil via a non-return valve to provide oil to said chamber;
said cylinder wall having a plurality of spaced holes arranged in line extending in the longitudinal and peripheral directions of said cylinder;
said oil chamber being in communication with an oil discharge pathway which includes one of said plurality of holes in said cylinder wall, only one of said holes communicating with said oil discharge pathway at any one time;
the flow of oil through said oil discharge pathway adapted to be interrupted by said piston as said piston moves into said cylinder to a position to seal the opening of said pathway; and
said oil discharge pathway being at a pressure substantially below that of said pathway of pressurized oil.

5,749,341
VALVE LIFTER FOR INTERNAL COMBUSTION ENGINES
Noriomi Hosaka; Tadashi Kikyohara; Seiji Tsuruta, all of Kanagawa; Sadayuki Abo; Masaki Toriumi, both of Yokohama, and Kenji Ariga, Kanagawa, all of Japan, assignors to Unisia Jecs Corporation, Atsugi, and Nissan Motor Co., Ltd., Yokohama, both of Japan
Filed Apr. 23, 1997, Ser. No. 839,176
Claims priority, application Japan, Apr. 23, 1996, 8-100912
Int. Cl.^{6} F01M *9/10;* **F01L** *1/16*
U.S. Cl. 123—90.35 **10 Claims**



1. A valve lifter for an internal combustion engine, comprising:
a head section having a recessed portion on an upper face thereof;
a skirt section formed integral with said head section and adapted to be in sliding-contact with a lifter guiding bore bored in an engine cylinder head;
a mechanical valve-clearance adjusting shim accommodated in said recessed portion and adapted to be in contact with a cam on a camshaft;
an annular groove formed in an upper face of a bottom wall of said recessed portion;
a first through-opening formed in said shim to communicate with said annular groove;
a second through-opening formed in said head section to communicate with said annular groove and to penetrate said head section; and
said annular groove and said first and second through-openings being cooperative with each other for supply of lubricating oil on said shim to a contact area between a central boss-like portion formed in a lower face of said head section and an end of a valve stem;
wherein said annular groove and said second through-opening are formed in an essentially zero bending moment area midway between a central axis of said head section and a peripheral wall of said recessed portion.

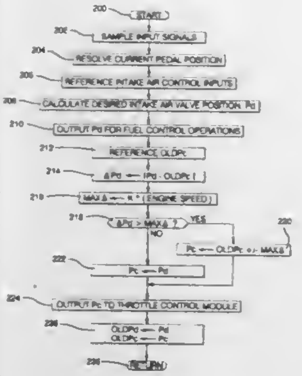
5,749,342
MOVEABLE APERTURE FOR ALTERATION OF INTAKE MANIFOLD CROSS SECTIONAL AREA
Raymond Chao, 619 N. Jimenez La., Placentia, Calif. 92670
Filed Sep. 3, 1996, Ser. No. 711,326
Int. Cl.^{6} F02M *39/00*
U.S. Cl. 123—184.56 **9 Claims**



1. A device for the passive variation of an air fluid stream entering an engine comprising:
a body having an exterior wall and an interior wall said interior wall defining an interior cavity;
an intake aperture at a first end of said body;
an outlet aperture at a second end of said body said outlet aperture having a center axis point;
said interior cavity of said body communicating with said intake aperture and said outlet aperture defining a fluid stream passageway through said body;
an outlet aperture area adjustment means whereby the area of said outlet aperture varies to produce desired fluid stream characteristics therethrough, said outlet aperture adjustment means comprising; an inward curve in the wall of said body at said second end of said body toward said center axis point of said outlet aperture; a plurality of slits in the wall of said body along said inward curve of said wall of said body, said slits defining flexible vanes; said vanes having a calculated bias towards the center axis point of said outlet aperture whereby the cross sectional area of said outlet aperture varies from a smaller area to a larger area to produce said desired fluid stream characteristics through said outlet aperture.

5,749,343
ADAPTIVE ELECTRONIC THROTTLE CONTROL
Gary Arthur Nichols, Farmington Hills, and Roger Allen Clark, Waterford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 7, 1996, Ser. No. 729,750
Int. Cl.^{6} F02D *11/10;41/04*
U.S. Cl. 123—350 **8 Claims**

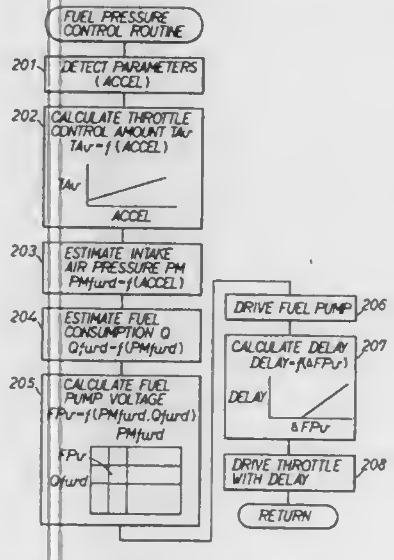
1. An adaptive electronic throttle control method for adapting internal combustion engine intake air control system responsiveness, comprising the steps of:
establishing a response value representing responsiveness of an engine parameter control system that is controlled substantially in synchronism with the intake air control system to change in an engine operating condition;
determining a change limit as a function of the established response value;
sensing a change in a commanded engine operating condition;
generating a commanded change in engine intake air rate as a function of the sensed change;
comparing the commanded change to the change limit;



START
SAMPLE INPUT SIGNALS
RESOLVE CURRENT PEDAL POSITION
REFERENCE INTAKE AIR CONTROL INPUTS
CALCULATE DESIRED INTAKE AIR VALVE POSITION
OUTPUT FOR FUEL CONTROL OPERATIONS
YES
NO
RETURN

limiting the commanded change in engine intake air rate to the change limit when the commanded change exceeds the change limit; and
controlling engine intake air rate in accordance with the limited commanded change.

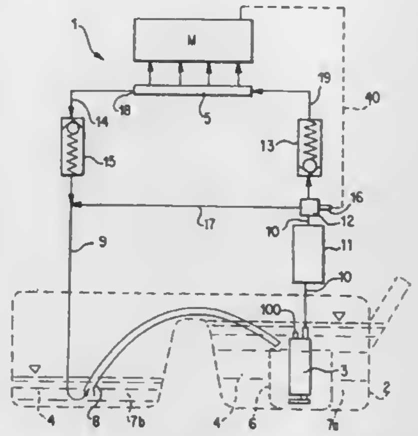
5,749,344
FUEL SUPPLY CONTROL FOR INTERNAL COMBUSTION ENGINE BY INTAKE AIR PRESSURE ESTIMATION
Naoki Yoshiume, and Makoto Miwa, both of Kariya, Japan, assignors to Denso Corporation, Kariya, Japan
Filed Dec. 5, 1996, Ser. No. 760,987
Claims priority, application Japan, Dec. 20, 1995, 7-331335
Int. Cl.^{6} F02M *37/08*
U.S. Cl. 123—399 **22 Claims**



FUEL PRESSURE CONTROL ROUTINE
201
DETECT PARAMETERS (ACCEL)
202
CALCULATE THROTTLE CONTROL AMOUNT TAr TAr=f(ACCEL)
TAr
ACCEL
203
ESTIMATE INTAKE AIR PRESSURE PM PMfurd=f(ACCEL)
204
ESTIMATE FUEL CONSUMPTION Q Qfurd=f(PMfurd)
205
CALCULATE FUEL PUMP VOLTAGE FPv=f(PMfurd,Qfurd)
PMfurd
FPv
Qfurd
DRIVE FUEL PUMP
206
CALCULATE DELAY DELAY=f(δFPv)
207
DELAY
δFPv
DRIVE THROTTLE WITH DELAY
208
RETURN

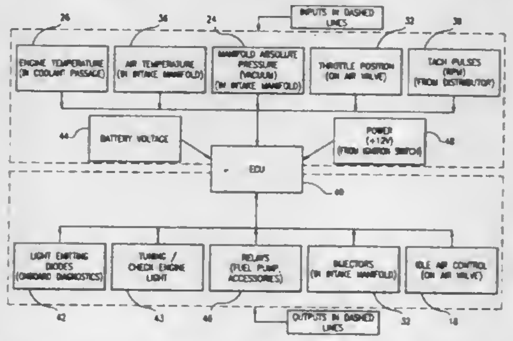
1. A fuel supply control apparatus for an internal combustion engine have a throttle valve and a fuel tank, the apparatus comprising:
a fuel injecting valve for injecting fuel to said engine;
an electrically-driven fuel pump for supplying fuel from said fuel tank to said fuel injecting valve;
intake air pressure estimating means for estimating intake air pressure which will occur at a point downstream of said throttle valve after a transport delay of intake air from an operating state of said engine which influences the intake air pressure after the transport delay; and
fuel pump controlling means for regulating fuel pressure supplied to said fuel injecting valve by controlling fuel pump rotational speed, said controlling means controlling the fuel pump rotational speed in accordance with the estimated intake air pressure.

5,749,345
FUEL SYSTEM
Christian Treml, Munich, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft
Filed Nov. 4, 1996, Ser. No. 743,612
Claims priority, application Germany, Nov. 2, 1995, 195 40 892.6
Int. Cl.^{6} F02M *41/00*
U.S. Cl. 123—456 **24 Claims**



1. Fuel system for a motor vehicle having a fuel tank with a fuel pump arranged therein which delivers fuel through a forward flow pipe by way of a filter into an injection strip of an engine, and having a return flow pipe through which the fuel not required by the engine flows back into the fuel tank,
wherein the fuel acts upon a pressure regulator which opens above a predetermined limit pressure so that the not required fuel can flow by way of a return flow pipe into the fuel tank,
wherein a check valve is connected downstream of the pressure regulator in the direction of the engine,
wherein a further return flow pipe is connected on the engine side with the injection strip and leads to a pressure limiting valve,
wherein the pressure limiting valve is connected to the return flow pipe on the respective opposite outlet side, and
wherein the valves used in the fuel system, and the pressure regulator are integrated in one component.

5,749,346
ELECTRONIC CONTROL UNIT FOR CONTROLLING AN ELECTRONIC INJECTOR FUEL DELIVERY SYSTEM AND METHOD OF CONTROLLING AN ELECTRONIC INJECTOR FUEL DELIVERY SYSTEM
Todd Halvorson, Ft. Lauderdale, Fla.; Stephen R. Bickham, Bay City, Mich., and David Cutler, Plantation, Fla., assignors to Hirel Holdings, Inc., Pompano Beach, Fla.
Filed Feb. 23, 1995, Ser. No. 393,315
Int. Cl.^{6} F02M *51/00*
U.S. Cl. 123—486 **40 Claims**



INPUTS IN DASHED LINES
26
36
24
32
30
ENGINE TEMPERATURE (IN COOLANT PASSAGE)
AIR TEMPERATURE (IN INTAKE MANIFOLD)
MANIFOLD ABSOLUTE PRESSURE (VACUUM) (IN INTAKE MANIFOLD)
THROTTLE POSITION (ON AIR VALVE)
TACH PULSES (RPM) (FROM DISTRIBUTOR)
BATTERY VOLTAGE
POWER (+12V) (FROM IGNITION SWITCH)
ECU
60
LIGHT EMITTING DIODES (ONBOARD DIAGNOSTICS)
TUNING / CHECK ENGINE LIGHT
RELAYS (FUEL PUMP, ACCESSORIES)
INJECTORS (IN INTAKE MANIFOLD)
IDLE AIR CONTROL (ON AIR VALVE)
OUTPUTS IN DASHED LINES

1. A method for controlling an electronic fuel delivery system, comprising:

- a) running an engine by at least injecting fuel into said engine in fuel pulse width amounts for specific pairs of engine operating parameters corresponding to fuel pulse widths in an initial fuel map, said initial fuel map defining a plurality of fuel pulse widths for corresponding pairs of defined engine operating parameters;
- b) adjusting fuel pulse width at least one increment in one of a rich and a lean direction of operation for a specific pair of engine operating parameters, determining if engine performance is one of improved, not improved, and degraded after each adjustment, and if improvement is detected continuing said adjustment until one of no improvement and degradation in performance is detected;
- c) reversing direction of adjustment at least one increment when degradation in performance is detected; and
- d) repeating said steps "a" through "c" for any additional pairs of engine parameters at which said engine is operated.

5,749,347
FUEL LEAKAGE PREVENTION SYSTEM HAVING LATCH-ENGAGED VALVE

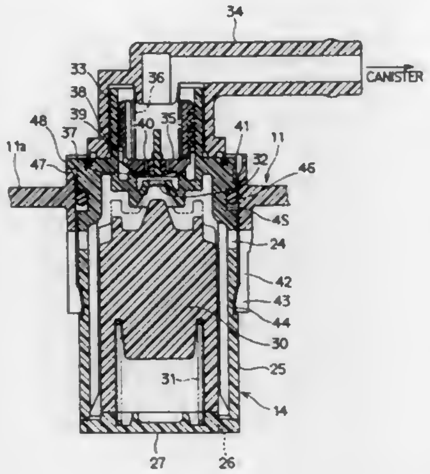
Mikio Torii, Hekinan, and Seiji Tanizawa, Aichi-gun, both of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Jul. 28, 1997, Ser. No. 901,267

Claims priority, application Japan, Jul. 30, 1996, 8-199947

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—516 **13 Claims**



1. A fuel leakage prevention system having a fuel tank comprising:
- an installation wall shaped cylindrically and attached to the fuel tank, the installation wall having a resilient tongue with a first engagement part on an inner surface thereof;
- a cylindrical housing inserted into the installation wall and having a communication hole communicating an inside thereof with an inside of the fuel tank, the cylindrical housing having a second engagement part on an outer surface thereof for a latch-engagement with the first engagement part of the resilient tongue;
- a passage communicating the inside of the housing with an outside of the fuel tank; and
- a float-type valve disposed axially movably in the inside of the housing to open and close the passage.

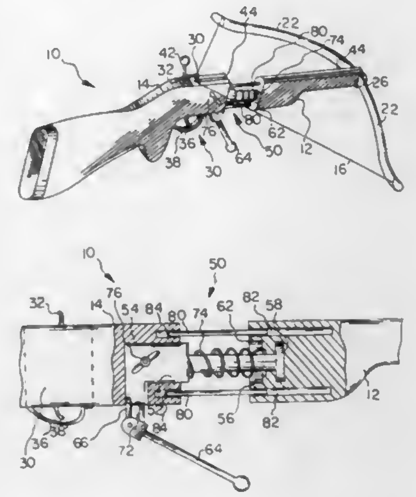
5,749,348
SEPARATING STOCK HYDRAULIC CROSSBOW

Alfonso Oviedo-Reyes, 730 NW. 106 Ave., Unit 2, Miami, Fla. 33172

Filed Feb. 26, 1996, Ser. No. 606,560

Int. Cl.^{6} F41B *5/12*

U.S. Cl. 124—25 **12 Claims**



7. A crossbow apparatus comprising:
- a crossbow stock comprising a rearward stock portion including bow string engaging means, and a forward stock portion including a bow fitted with a bow string;
- and interconnection means interconnecting said rearward stock portion and said forward stock portion and including drive means for driving apart said rearward stock portion and said forward stock portion while said bow string is engaged by said engaging means, to draw said bow, such that said crossbow stock increases in length as said rearward stock portion and said forward stock portion are driven apart from each other.

5,749,349
FUEL VAPOR CONTROL SYSTEM

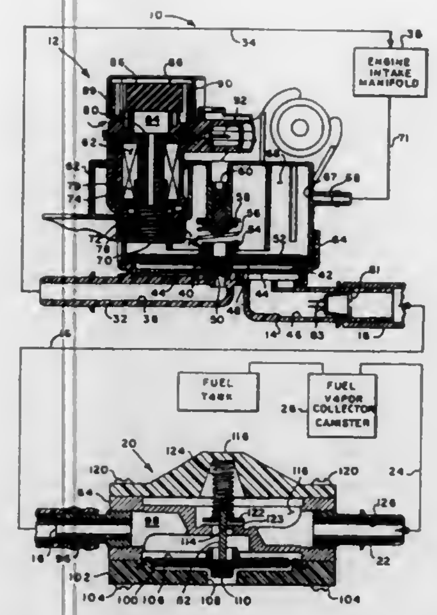
Charles A. Detweiler, Durand; Daniel L. Deland, Davison, and Gerrit V. Beneker, Algonac, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 24, 1996, Ser. No. 738,939

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—520 **10 Claims**

1. A system for controlling the injection of fuel tank vapors into the inlet manifold of an internal combustion engine comprising:
- (a) an electrically controlled vacuum operated flow control valve having an inlet and outlet and vacuum signal port, with the outlet and vacuum signal port thereof connected to said inlet manifold;
- (b) a regulator valve having the outlet thereof connected to the inlet of said flow control valve and the inlet of said regulator valve adapted for connection to a fuel tank vapor collection canister, said regulator valve having:
  - (i) a body defining said inlet and a valving chamber communicating with said inlet, said chamber defining a valving port communicating with a passage which communicates with said regulator valve outlet,
  - (ii) an obturator member disposed in said valving chamber for movement with respect to said valving port and means biasing said obturator to close said valving port;
  - (iii) a pressure responsive member forming a portion of said outlet passage,
  - (iv) means connecting said pressure responsive member to said obturator member, and
  - (v) means resiliently biasing said obturator member in a direction tending to close said valving port; and,



wherein, with vacuum in said regulator outlet less than a predetermined level said valving port is closed by said obturator member; and, with engine running and said control valve operative to provide a predetermined level of vacuum in said regulator outlet, wherein said level of vacuum applied to said pressure responsive member causes said obturator to be opened with respect to said valving port and wherein, with the engine off, said valving port is closed and fuel tank vapor pressure above atmospheric is operative to act on said obturator and assists in closing said valving port.

5,749,350
VALUE CONTROL FOR AN INTERNAL COMBUSTION ENGINE

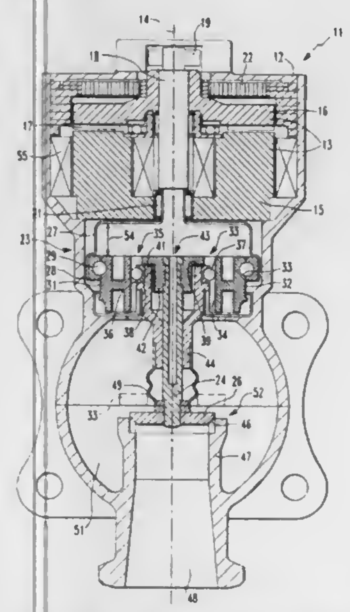
Franz Bender, Wendlingen, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

Filed Jan. 31, 1997, Ser. No. 792,476

Claims priority, application Germany, Feb. 1, 1996, 196 03 592.9

Int. Cl.^{6} F02M *25/07*

U.S. Cl. 123—571 **20 Claims**



1. A valve control for an internal combustion engine, particularly for an exhaust gas recirculation valve, comprising a housing a valve member having a valve disc and a valve guide structure including a valve stem axially movably supported for moving said valve disc out of, and into, seating engagement with a valve seat for opening and closing a gas flow passage, a rotary magnet arrangement supported in axial alignment with said valve member, and a motion transmitting mechanism including an actuator arrangement for converting rotation of said rotary magnet arrangement to axial motion of said valve member, said actuator arrangement comprising a cam track structure disposed between a rotatable structure connected for rotation with said rotary magnet arrangement and said valve guide for axially moving said valve stem and, together therewith, said valve disc away from, and onto, said valve seat.

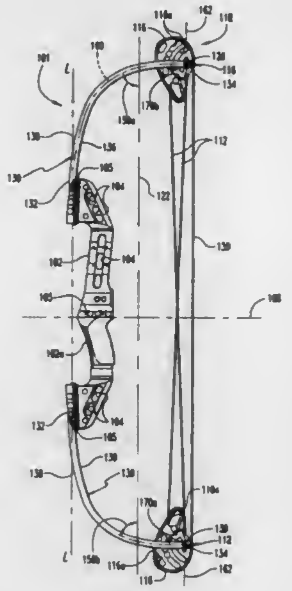
5,749,351
COMPOUND ARCHERY BOW

James R. Allshouse, Newburgh, Ind., and Christopher P. Petrole, Chicago, Ill., assignors to Indian Industries, Inc., Evansville, Ind.

Filed Dec. 14, 1995, Ser. No. 572,510

Int. Cl.^{6} F41B *5/10*

U.S. Cl. 124—25.6 **38 Claims**



1. A compound archery bow for shooting an arrow, comprising:
- a rigid handle;
- a pair of resilient bow limbs each with a mounting portion opposing a tip portion, said mounting portion of each of said pair of limbs being attached to said handle opposite the other, each of said tip portions being positioned outward from said handle;
- a means mounted to each said tip portion for providing let off, said means including a bowstring; and,
- wherein each of said pair of bow limbs extends toward said bowstring along a path from said handle to said tip portion and said path turns at least 75 degrees from said handle to said tip portion when said bowstring is undrawn.

14. A compound archery bow assembly for reducing the forces propelling said bow forward upon shooting an arrow from said bow, comprising:
- a rigid handle;
- a pair of resilient bow limbs each having:
  - a mounting portion opposing a tip portion, said mounting portion of each of said pair of limbs being attached to said handle opposite the other;
  - a pre-curved portion between said mounting portion and said tip portion, said pre-curved portion of each of said pair of bow limbs being configured to position said tip portion outward from said handle;

a pair of wheels each pivotally mounted to a corresponding tip portion for each of said pair of bow limbs, said pair of wheels being configured for interconnection by a pulley system, each of said pair of wheels when not interconnected by the pulley system being positioned to the rear of a plane, said plane intersecting said handle and said pair of bow limbs and not said pair of wheels, said pair of wheels being further configured to increase bow limb curvature when interconnected by the pulley system.

21. A method to manufacture a compound archery bow, comprising the steps of:

(1) forming a pair of bow limbs each with a tip portion, a mounting portion, and a pre-curved portion between the tip portion and mounting portion, the pre-curved portion having a first radius of curvature;

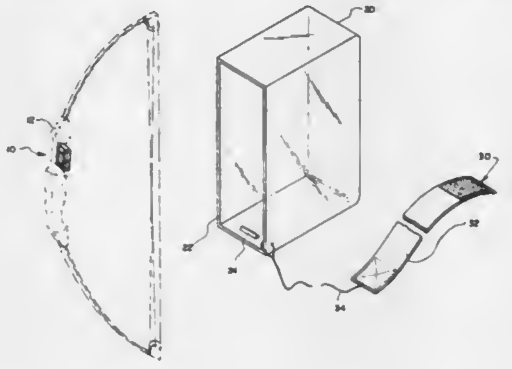
(2) attaching the mounting portion of each of the pair of bow limbs to a handle opposite one another, each bow limb extending outwardly from the handle;

(3) establishing a second radius of curvature smaller than the first radius of curvature along the corresponding curved portion of each of the pair of bow limbs, said second radius of curvature sweeping an angle of at least 75 degrees;

(4) connecting a let off pulley system with a bowstring under tension between each of the corresponding tip portions of the pair of bow limbs to secure the pair of bow limbs in the configuration of step (3), the bowstring being configured to engage an arrow for shooting.

5,749,352
ARCHERY CROSS HAIR SIGHT PROTECTOR
Lawrence McFarlin, Rt. 2 Box 538, Glencoe, Okla. 74032
Filed Dec. 9, 1996, Ser. No. 762,270
Int. Cl.^{6} F41B *5/00*

U.S. Cl. 124—87 **11 Claims**

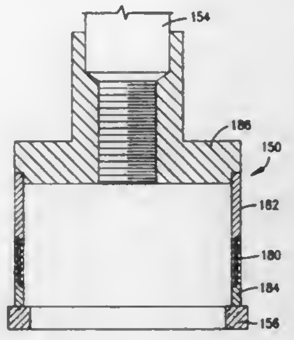


1. An archery cross hair sight protector comprising:

a protective cover with an opening formed to encase a cross hair sight of an archery bow; a securing means attached to said protective cover and removably attached to said bow, said securing means including a cord secured at one end to said protective cover and a securing strap mounted on said cord at an end thereof opposite of said protective cover, said securing strap having hook and loop fastenings means thereon for removably securing said securing strap to a bow such that said securing means secures said protective cover to said bow when said protective cover is removed from engagement with said cross hair sight.

5,749,353
CUTTING BLADE WITH AN IMPACT LOAD PREVENTION LAYER
Charles E. Markley, Lee's Summit, Mo., and Rick Younger, Las Vegas, Nev., assignors to Diamant Boart, Inc., Kansas City, Mo.
Continuation of Ser. No. 252,687, Jun. 2, 1994, Pat. No. 5,560,348. This application Sep. 30, 1996, Ser. No. 723,684
Int. Cl.^{6} B28D *1/14;1/12*

U.S. Cl. 125—20 **8 Claims**



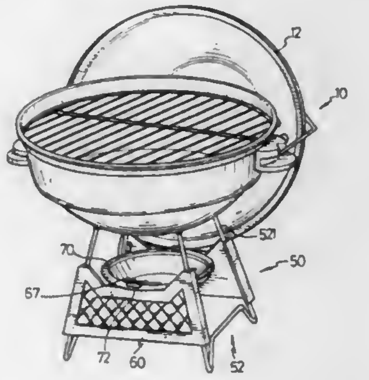
1. A core drill comprising:

a cylindrical cutting blade having a top end and a bottom end interconnected by a cylindrical side wall, said bottom end being open and having embedded hardened particles that project out therefrom, said top end being adapted for driving said cylindrical cutting blade about a rotational axis during a cut; and

a resilient isolation layer, formed in said cylindrical side wall between said top end and said bottom end of said cylindrical cutting blade, for preventing impact loads between said particles on said bottom end and a cutting surface of a material, said resilient isolation layer being uninterrupted and having outerfacing surfaces on opposite sides of said side wall of said cylindrical cutting blade.

5,749,354
FRAME FOR A TABLETOP BARBECUE GRILL
Patrick Lin, 3rd Fl., No. 128, Sec. 3, Minsheng E. Rd., Taipei, Taiwan
Filed Jun. 3, 1997, Ser. No. 867,920
Int. Cl.^{6} F24B *3/00*

U.S. Cl. 126—25 R **9 Claims**



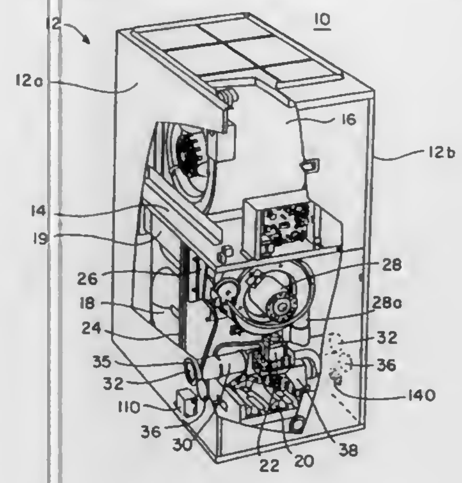
1. A frame for a tabletop barbecue grill, said tabletop barbecue grill having a fire bowl with a lid, said frame comprising:

a pair of legs for supporting the fire bowl, each of the legs being substantially U-shape and having two branches; and

a pair of supporting panels, each of said supporting panels being mounted between a leg of one pair of the legs and a leg of the other pair of the legs.

5,749,355
MULTI-POSITION FURNACE WITH CONDENSING HEAT EXCHANGER
Rodney S. Roan, Carrollton; Mark R. Rakowski, Frisco, and Myron C. Oglesby, Jr., Hickory Creek, all of Tex., assignors to Lennox Industries Inc., Richardson, Tex.
Filed Aug. 27, 1996, Ser. No. 703,640
Int. Cl.^{6} F24H *3/02*

U.S. Cl. 126—110 R **18 Claims**



1. In a furnace for supplying heated air to an indoor space, said furnace being adapted for at least horizontal flow operation, said furnace having a burner for burning a combustible fuel-air mixture, a heat exchanger having an inlet communicating with said burner for receiving products of combustion therefrom and an outlet, a header communicating with said outlet for receiving products of combustion from said heat exchanger, an inducer communicating with said header for inducing a flow of products of combustion through said heat exchanger and for exhausting products of combustion from said header, and a drain for draining condensation from said header, wherein the improvement comprises:

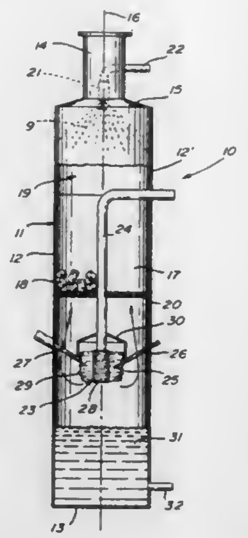
a manifold located inside said header, said manifold defining first and second chambers within said header, said first chamber being inside said manifold and said second chamber being outside said manifold; and

means for sensing differential fluid pressure between said first and second chambers and for disabling said furnace in response to said differential fluid pressure being less than a predetermined magnitude.

5,749,356
LOW NOX AND CO EMISSIONS DIRECT CONTACT HIGH TEMPERATURE WATER HEATER
Luc Mandeville, Terrebonne; Pascal Bocherel, Montreal; Kébir Ratnani, Boucherville; Michel Dallaire, Saint-Bruno-de-Montarville, and Stéphane Brunet, Saint-Laurent, all of Canada, assignors to Gaz de France, La Plaine, France; Gaz Metropolitain, Montreal, Canada; New York Gas Group, New York, N.Y., and Sofame, Montreal, Canada
PCT No. PCT/CA94/00574, § 371 Date Jun. 13, 1997, § 102(e) Date Jun. 13, 1997, PCT Pub. No. WO96/12146, PCT Pub. Date Apr. 25, 1996
PCT Filed Oct. 17, 1994, Ser. No. 817,160
Int. Cl.^{6} F24H *1/10*

U.S. Cl. 126—359 **11 Claims**

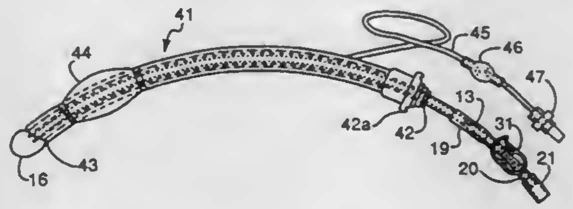
1. A gas-fired water heater comprising a vertical housing (**11**) having a circumferential side wall (**12**), a closed bottom end (**13**), and flue (**14**) connected to a top end portion (**15**) thereof; a packing (**17**) of heat exchange elements (**18**) supported inside said housing (**11**) in an uppermost region (**19**) thereof, water discharge means (**21**) disposed above said packing (**17**) and connected to a water supply (**22**) for releasing water (**9**) on said packing, an axial burner (**23**) disposed substantially centrally within said housing (**11**) under



said packing (**17**), a feed pipe (**24**) connected to said burner (**23**) and extending at least partly axially within said housing, a gas-air mixture fed to said burner (**23**) through said feed pipe (**24**), and ignition means (**25**) to ignite said burner; said water being heated by contact with said packing (**17**), an inner surface (**12**) of said housing (**11**) and in a space below said packing during the gravitational displacement of water droplets from said discharge means to a collection means (**31**) below said burner.

5,749,357
MALLEABLE INTRODUCER
Gerald S. Linder, P.O. Box 1085, Pacific Palisades, Calif. 90272
Filed May 19, 1995, Ser. No. 445,368
Int. Cl.^{6} A61M *16/00*

U.S. Cl. 128—200.26 **17 Claims**



9. In a soft, inflatable introducer adapted to be inserted into a hollow, cylindrical endotracheal catheter having open proximal and distal ends, the introducer being positioned and inflated to aid the intubation of the endotracheal catheter into a laryngotracheal passageway of a patient, and being deflated and withdrawn following intubation, comprising in combination:

(a) a long, hollow tube having open proximal and distal ends, said hollow tube having an external diameter less than the inside diameter of the hollow endotracheal catheter with which it is to be used, and having a length approximately equal to the length of the hollow endotracheal catheter;

(b) a cylindrical, elongated, inflatable sheath surrounding and enclosing the distal end portion and the open distal tip of said hollow tube, said inflatable sheath being composed of thin, soft and pliable material and having a sealed, smooth, rounded tip portion; said sheath being elongated and cylindrical in shape in its noninflated condition and the smooth, round tip portion being spaced apart from the open distal tip of said hollow tube approximately one-third of the length of the sheath when in its noninflated condition, the end portion of said cylindrical, inflatable sheath opposite the smooth, rounded tip portion being securely attached to the outside cylindrical surface of said hollow tube for forming a fluidtight seal between the inside of said inflatable sheath and the distal end portion of said hollow tube, the outer diameter of said thin, cylindrical, elongated sheath being larger than the external diameter of said long, hollow tube and being less than the inside diameter of the hollow endotracheal catheter; said cylindrical sheath and the distal end portion of said hollow tube being adapted for insertion into the hollow endotracheal catheter with the smooth, rounded tip portion of said inflatable sheath protruding beyond the open distal end of the hollow endotracheal catheter, the open proximal end portion of said hollow tube being adapted for receiving fluid of sufficient pressure to expand said cylindrical, inflatable sheath situated within the distal end portion of the hollow endotracheal catheter to a diameter at least as large as the inside diameter of the hollow endotracheal catheter to provide physical contact between the outer cylindrical surface of said thin, elongated sheath and the inner cylindrical surface of the distal end portion of the hollow endotracheal catheter, the expansion of said cylindrical inflatable sheath by fluid under pressure causing the smooth, rounded tip portion protruding beyond the open distal end of the hollow endotracheal catheter to expand to a diameter approximately equal to the outside diameter of the hollow endotracheal catheter; and

(c) means associated with the open proximal end portion of said hollow tube for closing the open proximal end portion of said hollow tube after said inflatable sheath has been inflated to hold and maintain said sheath in its expanded condition to prevent sliding of said cylindrical, elongated sheath relative to the hollow endotracheal catheter as the catheter is being intubated, the inflated smooth rounded tip portion of said inflatable introducer having a soft, pliable, fluid-filled cushion ahead of the distal end of the hollow endotracheal catheter for entry into a patient's laryngotracheal passageway through which the hollow endotracheal catheter is to be intubated, the improvement wherein:

said long, hollow tube is of thick-walled metal with a range of malleability accommodating varied-sized endotracheal tubes as catheters for different-sized patients, said thick walls of said long, hollow metal tube resisting buckling and kinking when bent;

said open distal tip having a diameter on the same order as said thick walls of said long, hollow metal tube; whereby

said long hollow metal tube providing means for resisting deformation during intubation yet malleably deforms during manual manipulation prior to and during intubation.

5,749,358

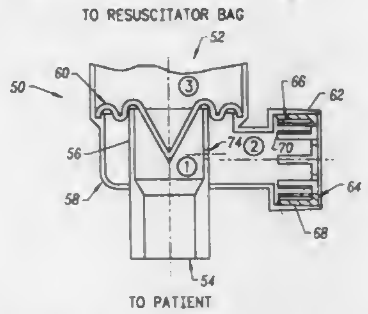
RESUSCITATOR BAG EXHAUST PORT WITH CO_2 INDICATOR

Robert J. Good, Raytown, Mo., and Joel Colburn, Hayward, Calif., assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.

Filed Oct. 10, 1996, Ser. No. 729,618

Int. Cl.⁶ A62B *9/02*

U.S. Cl. 128—205.23 **15 Claims**



1. A resuscitator for supplying gas to a patient, comprising:

a flexible container having inlet and outlet openings;

a regulator coupled to said outlet opening and providing a passageway from said flexible container to said patient;

an exhaust housing in fluid communication with said regulator, said housing having an exhaust port end and a regulator end, said regulator end adjacent said regulator, said exhaust port exhausting into ambient air, said exhaust port including at least a portion which is transparent; and

a carbon dioxide indicator mounted in said exhaust port adjacent said transparent portion.

5,749,359

PORTABLE AIR CONDITIONER

Iver Hansen, Gjerdalsveien 3, N-3442 Hyggen, Norway

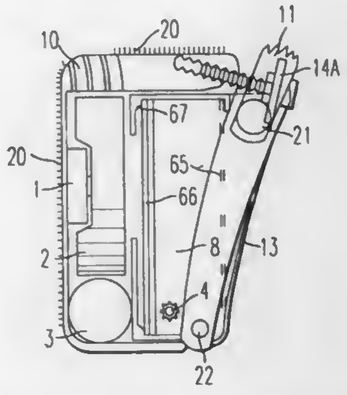
PCT No. PCT/NO93/00088, § 371 Date Dec. 1, 1994, § 102(e) Date Dec. 1, 1994, PCT Pub. No. WO93/24168, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 1, 1993, Ser. No. 360,768

Claims priority, application Norway, Jun. 1, 1992, 921853

Int. Cl.⁶ A62B *7/10*

U.S. Cl. 128—205.25 **32 Claims**



1. A portable fan for directing a forced air stream toward a user's face without use of a facemask, comprising:

(1) a fan unit having a motorized fan, said fan unit having means for positioning said fan unit on the chest of the user;

(2) an air inlet in said fan unit;

(3) an air outlet in said fan unit, wherein air flows into said air inlet and flows out through said air outlet by action of said motorized fan;

(4) means connected to said fan unit and positioned entirely below the face of the user when said fan unit is positioned on the chest of the user for directing said forced air stream through and in contact with ambient air toward the user's face; and

(5) means for adjusting the distance between said air outlet and the chest of the user.

5,749,360

TRACHEOSTOMY MASK WITH TRACHEOSTOMY TUBE ALIGNMENT STABILIZER

William J. Lacey, Stuart, Fla., and John Elkins, St. James, N.Y., assignors to Hospitak, Inc., Farmingdale, N.Y.

Filed Feb. 3, 1997, Ser. No. 794,606

Int. Cl.⁶ A61M *16/00*; A62B *9/06*

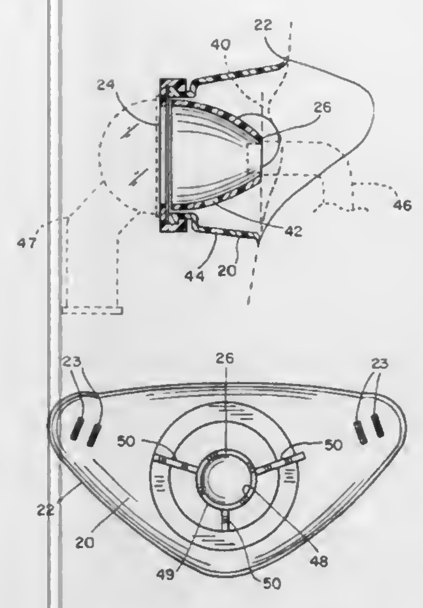
U.S. Cl. 128—207.14 **4 Claims**

1. A tracheostomy mask for delivering gaseous therapeutics to a patient fitted with an tracheostomy tube, the mask comprising:

a mask body, the mask body having a forward portion, a rear portion, and an interior surface extending between the rear and forward portions, the interior surface being in communication with a tracheostomy tube when the mask is engaged on the neck of the patient, the rear portion having a perimeter for sealing engagement with the neck of a patient, the forward portion having an opening for receiving gaseous therapeutics;

a stabilizer, the stabilizer receiving a tracheostomy tube affixed to a patient; and

stabilizer support means, the stabilizer support means affixing the stabilizer to the mask body in a position to receive and align the tracheostomy tube, the stabilizer support means being sized, shaped and positioned to minimize contact between the patient and the stabilizer support means.



5,749,361

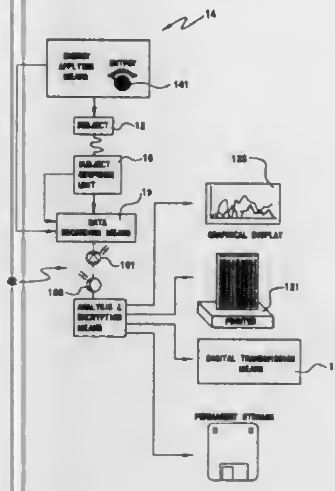
SOFT-TISSUE INJURY ASSESSMENT SYSTEM

Peter T. Mateyko, 608 Drymen Cres., Mississauga, Ontario, Canada, L5G 2P1

Filed Jun. 13, 1995, Ser. No. 489,678

Int. Cl.⁶ A61B *5/00*

U.S. Cl. 128—653.1 **16 Claims**



1. A system for assessing soft-tissue injury in a mammalian subject comprising:

a) a means for applying ultrasound energy as internally to tissue of the subject in an inaudible and invisible manner;

b) an energy control means for varying parameters of said ultrasound energy connected to said applying means;

c) a subject response unit having an input means adaptable for control by the subject in accordance with perceived sensation in tissue acted upon by said ultrasound energy applying means; and

d) a data recording means for simultaneously recording parameters of the ultrasound energy application from said ultrasound energy applying means and parameters of perceived sensation from said subject response unit, said data recording means in communication with said ultrasound energy applying means and said subject response unit. ·

5,749,362

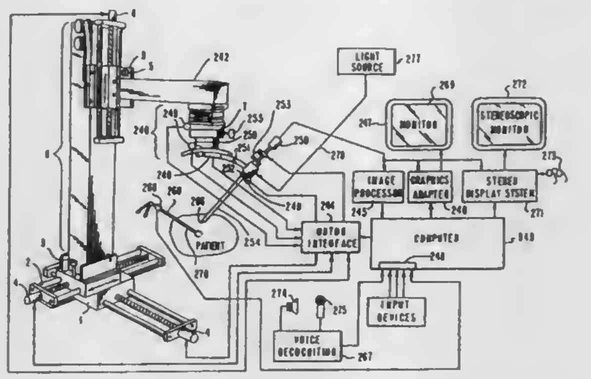
METHOD OF CREATING AN IMAGE OF AN ANATOMICAL FEATURE WHERE THE FEATURE IS WITHIN A PATIENT'S BODY

Janez Funda, Valhalla; David Arthur LaRose, Croton on Hudson, and Russell Highsmith Taylor, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 889,215, May 27, 1992, Pat. No. 5,417,210. This application Jan. 26, 1995, Ser. No. 378,700

Int. Cl.⁶ A61B *5/05*

U.S. Cl. 128—653.1 **3 Claims**



1. A method of creating a multiscale image of an anatomical feature within a patient's body comprising the steps of:

generating a static image of the anatomical feature as it would appear from a predetermined vantage point within the patient's body;

inserting an instrument into the patient's body, the instrument having a means for transmitting visual images, including at least one image appearing from said predetermined vantage point, out of the patient's body;

transmitting a live image of an area of the anatomical feature, including said at least one image appearing from said predetermined vantage point, out of the patient's body; and

displaying a composite image having said static image at a first magnification scale and having said live image of said area at a second magnification scale, said second magnification scale larger than said first magnification scale, said live image overlaying a portion of said static image, so that said overlaid portion is displayed as a magnified window of said area at a proper registration within said static image.

5,749,363

OSTEOPOROSIS DIAGNOSING APPARATUS AND METHOD

Tetsuya Ishii; Masashi Kuriwaki, and Yasuyuki Kubota, all of Kyoto, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisya, Osaka, Japan

PCT No. PCT/JP95/02569, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO96/18342, PCT Pub. Date Jun. 20, 1996

PCT Filed Dec. 14, 1995, Ser. No. 687,440

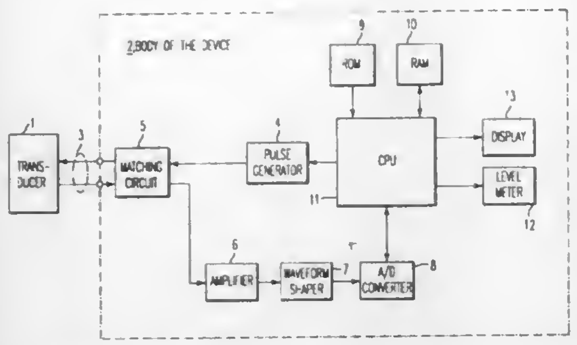
Claims priority, application Japan, Dec. 14, 1994, 6-310445; Jun. 7, 1995, 7-140730; Jun. 7, 1995, 7-140731; Jun. 7, 1995, 7-140732; Jun. 7, 1995, 7-140733; Jun. 7, 1995, 7-140734

Int. Cl.⁶ A61B *8/00*

U.S. Cl. 128—661.03 **44 Claims**

1. An osteoporosis diagnosing apparatus comprising:

an ultrasonic transducer having a transducer surface for submitting and receiving ultrasonic impulses, said transducer surface adapted to be set on a skin of an examinee and repeatedly radiate ultrasonic impulses from the transducer surface toward a surface of a bone beneath the skin and receive at the



transducer surface echos of the radiated ultrasonic impulses reflected at the surface of the bone while a direction of the transducer surface is changed in various directions including a direction perpendicular to the surface of the bone;

an echo level detector which detects echo levels of said echos;

a maximum echo extraction unit which extracts a maximum echo level from the echo levels detected by said echo level detector; and

a decision unit which determines that the bone is osteoporosis when a value of said maximum echo level extracted by said maximum echo extraction unit is lower than a predetermined fixed value.

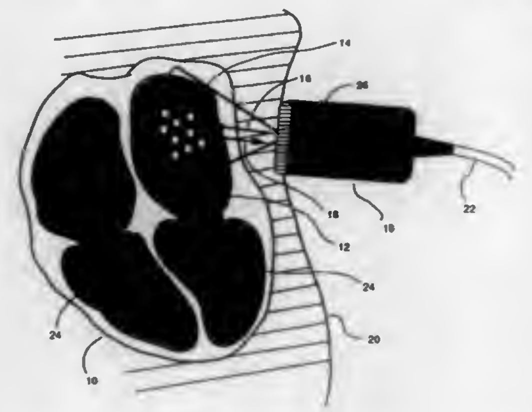
5,749,364
METHOD AND APPARATUS FOR MAPPING PRESSURE AND TISSUE PROPERTIES

John W. Sliwa, Jr., Los Altos; Michelle L. Jung, Campbell; Paul E. Chandler, Santa Cruz; Amin M. Hanafy, Los Altos, and David J. Napolitano, Menlo Park, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed Jun. 21, 1996, Ser. No. 667,765

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—662.02 **54 Claims**



1. A method of mapping and presenting a fluid pressure parameter in a living body comprising the steps of:

introducing microbubbles into said body;

applying ultrasound waves to the body wherein returned waves from the microbubbles contribute to the formation of an acoustic spectrum associated with the microbubbles;

determining a fluid pressure parameter in response to at least one characteristic of the acoustic spectrum; and

mapping the fluid pressure parameter in at least two dimensions.

5,749,365
HEALTH MONITORING

Alan Magill, 1 Russel Chambers, Covent Gardens, London, United Kingdom, WC2E 8AA

PCT No. PCT/GB92/02064, § 371 Date May 5, 1994, § 102(e) Date May 5, 1994, PCT Pub. No. WO93/08734, PCT Pub. Date May 13, 1993

PCT Filed Nov. 9, 1992, Ser. No. 232,147

Claims priority, application United Kingdom, Nov. 7, 1991, 9123638

Int. Cl.^{6} A61B *05/04*

U.S. Cl. 128—671 **25 Claims**

1. A method for monitoring vital signs of a human or animal subject, comprising;

a) clothing the subject in a shirt or undershirt,

b) removably attaching a carrier carrying a sensor to the shirt or undershirt adjacent the thoracic and abdominal regions of the subject;

c) sensing elastic deformations of the shirt or undershirt corresponding to one or more of the group of vital signs comprising respiration, heart function, heart rhythm and associated sounds;

d) generating electrical signals representative of the elastic deformations; and

e) transmitting the signals from a transmitter to a receiver remote from the shirt or undershirt.

5,749,366
MOTION COMPENSATING PULSE RATE MONITOR WITH MOTION SENSOR AND LEVEL DISCRIMINATOR

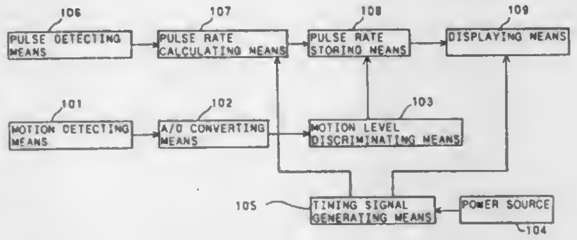
Hiroyuki Odagiri, Chiba, and Naoaki Yasukawa, Suwa, both of Japan, assignors to Seiko Instruments Inc., and Seiko Epson Corporation, both of Japan

Filed Mar. 22, 1996, Ser. No. 620,930

Claims priority, application Japan, Mar. 23, 1995, 7-064405; Feb. 23, 1996, 8-036815

Int. Cl.^{6} A61B *5/024*

U.S. Cl. 128—690 **17 Claims**



1. A pulse rate monitor, comprising: motion detecting means for detecting motion of a user using a motion sensor and for outputting an analog signal having a characteristic that varies in accordance with the magnitude of detected motion; A/D converting means for converting the output analog signal of the motion detecting means into a digital signal; motion level discriminating means for discriminating whether it is possible to accurately measure the user's pulse based on the digital signal output from the A/D converting means and for outputting a control signal when a result of the discrimination indicates that accurate pulse measurement is possible; pulse detecting means for detecting the user's pulse and outputting a periodic signal corresponding to the detected pulse; pulse rate calculating means for converting the periodic signal output from the pulse detecting means into pulse rate data; pulse rate storing means for storing the pulse rate data output from the pulse rate calculating means in response to the control signal output from the motion level discriminating means; display means for displaying the pulse rate data output from the pulse rate storing means; and timing signal generating means for outputting a predetermined timing signal to the pulse rate calculating means and the display means.

5,749,367
HEART MONITORING APPARATUS AND METHOD

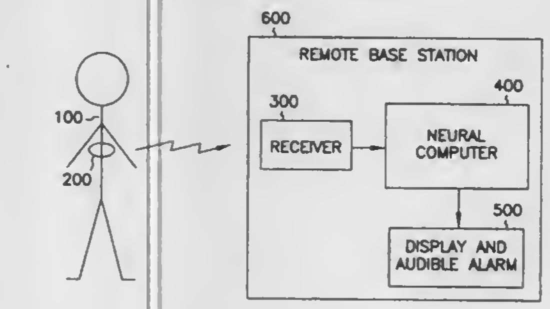
Lee Gamlyn, Folkstone, United Kingdom; Siobhan O'Sullivan, Caheordavinlawn, Ireland; Philip Needham, Bracknell, United Kingdom, and Tom Harris, Lightwater, United Kingdom, assignors to Cardionetics Limited, Hampshire, Great Britain

Filed Sep. 5, 1996, Ser. No. 709,539

Claims priority, application United Kingdom, Sep. 5, 1995, 9518094

Int. Cl.^{6} A61B *5/0452*

U.S. Cl. 128—696 **74 Claims**



1. Heart monitoring apparatus comprising:

detection means for obtaining an electrocardiograph signal from a patient during a monitoring phase,

preprocessing means for processing said electrocardiograph signal to enhance the salient features of the electrocardiograph signal and suppress the noise, and to generate a plurality n of values representative of the features of said electrocardiograph signal,

storage means for storing a plurality m of n dimensional reference vectors;

Kohonen neural network means for receiving said plurality of values during the monitoring phase, for forming an n dimensional vector from said plurality of values and for comparing said n dimensional vector with said stored plurality m of n dimensional reference vectors defining an n dimensional Kohonen feature map to determine the proximity of said n dimensional vector to said reference vectors, and

output means for outputting a signal if said Kohonen neural network means determines that said n dimensional vector is within or beyond a threshold range of said reference vectors.

5,749,368
BREATH AIR FLOW GAUGE

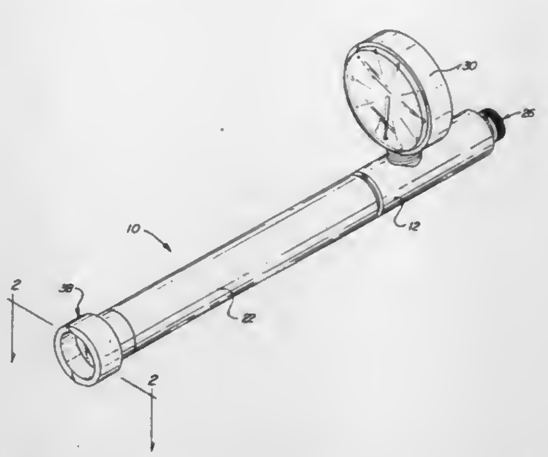
John C. Kase, N70 W5860 Bridge Rd., Cedarburg, Wis. 53012

Filed Jul. 21, 1994, Ser. No. 278,097

Int. Cl.^{6} A61B *5/087*

U.S. Cl. 128—725 **8 Claims**

1. A new breath air flow gauge comprising:



a main body having a hollow interior with an exit aperture extending therethrough;

an elongated extension tube removably coupled to said main body in fluid communication with said interior;

adjustment means for selectively varying a cross sectional area of said exit aperture, thereby regulating a flow of air through said hollow interior of said main body, thereby to simulate air flow through various musical instruments;

a pressure gauge removably mounted to said main body and in fluid communication with said hollow interior for indicating air pressure within said interior of said main body relative to ambient exterior air pressure;

a mouthpiece, and an adapter means removably coupled to said extension tube for facilitating a removable coupling of said mouthpiece to said extension tube in fluid communication with said interior, said adapter means comprises a substantially cylindrical body including a first bore of a first diameter and a second bore of a second diameter, the cylindrical body being removably coupled to said extension tube by a threaded connection, with said first diameter of said first bore being substantially greater than said second diameter of said second bore.

5,749,369
METHOD AND DEVICE FOR STABLE IMPEDANCE PLETHYSMOGRAPHY

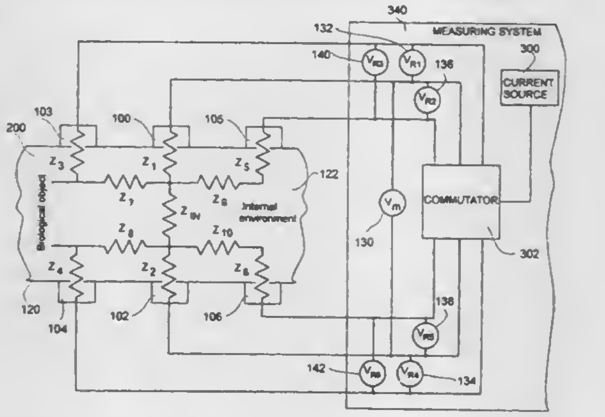
Pavel Rabinovich, Jerusalem; Michael Shochat, Matan; Vladimir Zeldin, and Oscar Milman, both of Maale Adumim, all of Israel, assignors to R.S. Medical Monitoring Ltd., Jerusalem, Israel

Continuation of Ser. No. 693,660, Aug. 9, 1996. This application Mar. 17, 1997, Ser. No. 820,464

Int. Cl.^{6} A61B *5/05*

U.S. Cl. 128—734 **23 Claims**

1. A method for monitoring the internal electrical impedance of a biological object, with compensation for skin-electrode resistance drift, during an extended monitoring period, comprising the steps of:



(a) placing a first measurement electrode and a second measurement electrode on the biological object, said first measurement electrode and said second measurement electrode being part of a measurement circuit;

(b) placing a first reference electrode and a second reference electrode on the biological object, substantially adjacent to said first measurement electrode, said first measurement electrode and said first reference electrode being part of a first reference circuit, said first measurement electrode and said second reference electrode being part of a second reference circuit, said first reference electrode and said second reference electrode being part of a third reference circuit;

(c) at least once during the monitoring period:

- (i) measuring a first electrical impedance of said measurement circuit;
- (ii) measuring a second electrical impedance of said first reference circuit;
- (iii) measuring a third electrical impedance of said second reference circuit; and
- (iv) measuring a fourth electrical impedance of said third reference circuit.

5,749,370

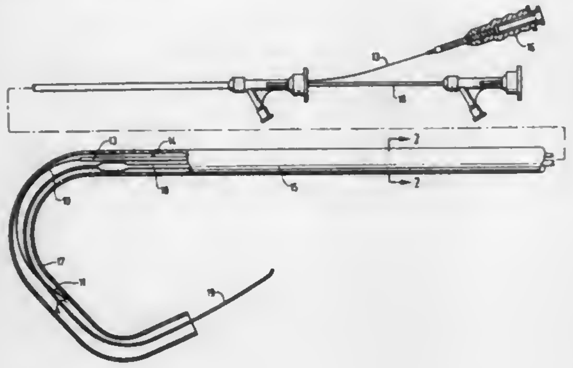
METHOD AND SYSTEM FOR HOLDING THE POSITION OF A GUIDING MEMBER

Dennis L. Brooks, Santa Clara; Alfredo G. Bayot, Newark; Mina W. B. Chow, San Jose, and Paul F. Muller, San Carlos, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 324,010, Oct. 14, 1994, Pat. No. 5,558,101. This application Jun. 7, 1995, Ser. No. 483,478

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—772 **4 Claims**



1. A guiding catheter having an elongated shaft with proximal and distal ends, a distal portion shaped to facilitate entry into a patient's coronary ostium, a first inner lumen extending from the proximal end to the distal end configured to slidably receive a catheter and guidewire and a second inner lumen extending from the proximal end to a discharge port at a location spaced proximally from the distal end and configured to slidably receive an elongated torqueable engaging device which has a flexible distal portion configured to extend out the discharge port and wrap around and rotatively engage a distal portion of a guidewire disposed within the first inner lumen between the distal end of the guiding catheter and the discharge port.

5,749,371

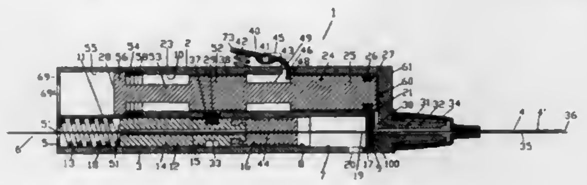
AUTOMATIC GUIDEWIRE PLACEMENT DEVICE FOR MEDICAL CATHETERS

Filiberto P. Zadini, 16814 Rayen St., North Hills, Calif. 91343, and Giorgio Zadini, 2237 Hilltop La., Camarillo, Calif. 93012

Filed Oct. 6, 1995, Ser. No. 540,197

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—772 **19 Claims**



1. A guidewire placement device for insertion of a guidewire into the interior of a blood vessel comprising:

a hollow needle,

a vacuum chamber for vacuum pressure said vacuum chamber having means for sealingly engaging a guidewire which is slidable within said hollow needle, said guidewire having at least one segment adapted to maintain said vacuum pressure within said vacuum chamber, said vacuum pressure accelerating backflow of blood upon blood vessel penetration by said needle and

self-propelled means for advancing said guidewire into the interior of the blood vessel upon said blood vessel penetration.

5,749,372

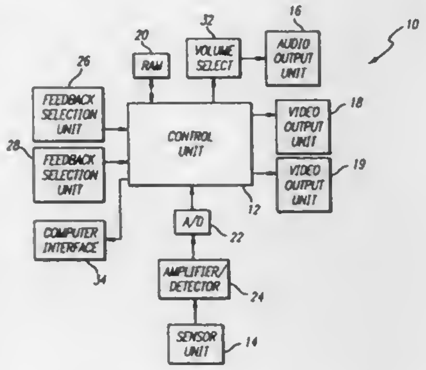
METHOD FOR MONITORING ACTIVITY AND PROVIDING FEEDBACK

Richard P. Allen, 110 Glen Oban Dr., Arnold, Md. 21012, and David T. Krausman, #1 Ridgecliff Ct., Kingsville, Md. 21087

Filed Mar. 2, 1995, Ser. No. 397,585

Int. Cl.^{6} A61B *5/103*

U.S. Cl. 128—782 **15 Claims**



1. A method for monitoring a user's exercise performance, a method comprising:

providing portable monitor sensing and recording means for sensing a user's exercise level and cumulative exercise accomplishment for a preselected time interval, providing visual feedback of acceleration of physical body movements by the user, providing audible feedback of said acceleration of physical body movements by the user, and recording the total amount of acceleration of physical body movements of said user for a predetermined time period.

5,749,373

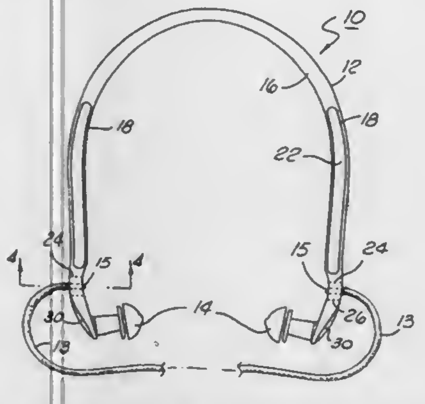
HEADBAND WITH BREAK-AWAY CORD ATTACHMENT

Dan Dix, Irvine, Calif., assignor to Moldex-Metric, Inc., Culver City, Calif.

Filed Apr. 10, 1997, Ser. No. 824,473

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 128—864 **16 Claims**



1. A headband ear protector apparatus with break-away cord attachment including

a pair of ear protectors,

a resilient headband supporting, at opposite ends of the headband, the ear protectors to form a band which positions the ear protectors to lie by the opposite sides of the head of a person,

the headband formed of a combination of harder and softer materials and having the following structure,

the harder material formed as a main support member for the ear protectors to extend between the ear protectors and provide resilience so the ear protectors will lie by the opposite sides of the head of the person,

the main support member including at least two regions having structure to receive the softer material,

the softer material received by the regions formed with openings having a particular size, and

a break-away cord attachment for the headband including a flexible cord having a hard tip at each end of the cord and with the hard tips having a size larger than the particular size of the openings in the softer material to have each tip held in an opening by pressure and friction.

5,749,374

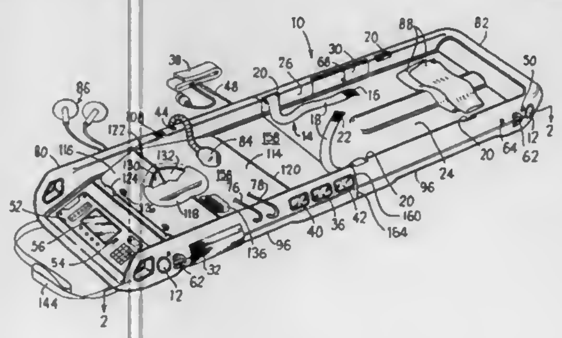
PATIENT-TRANSPORT AND TREATMENT APPARATUS

Charles W. Schneider, Sr., Kalamazoo, Mich., assignor to Cardi-Act, L.L.C., Plainwell, Mich.

Continuation-in-part of Ser. No. 306,127, Sep. 14, 1994, Pat. No. 5,494,051. This application Sep. 11, 1995, Ser. No. 526,467

Int. Cl.^{6} A61F *5/37*

U.S. Cl. 128—870 **24 Claims**



1. A patient transport apparatus that is adapted to receive a patient from a remote location to support the patient to facilitate transporting the patient to a primary care medical facility, the apparatus comprising:

a portable patient transport litter with;

a monitor adapted to monitor and generate data responsive to the patient's vital signs, the monitor being connected with a data processing unit in the litter;

a data processing unit integrally mounted in the litter and connected with the monitor, the data processing unit being responsive to the monitor to receive and process the data; and

a display integrally mounted in the litter and connected with the data processing unit, the display being responsive to the data processing unit to display the data.

5,749,375

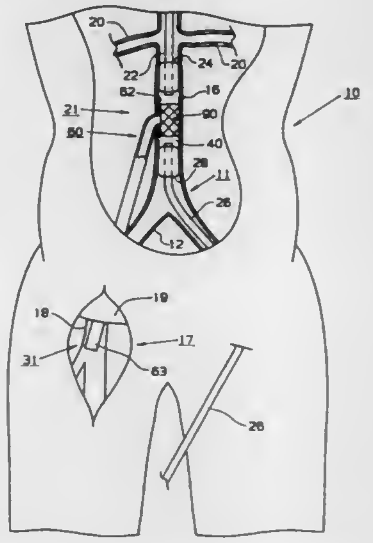
METHOD FOR IMPLANTING AN END PORTION OF A GRAFT WITHIN THE BODY OF A PATIENT DURING A BYPASS GRAFTING PROCEDURE

Thomas J. Maginot, 741 Meadow La., Crown Point, Ind. 46307

Continuation of Ser. No. 391,960, Feb. 21, 1995, Pat. No. 5,571,167, which is a continuation of Ser. No. 138,912, Oct. 18, 1993, Pat. No. 5,456,712, which is a division of Ser. No. 56,371, May 3, 1993, Pat. No. 5,304,220, which is a continuation-in-part of Ser. No. 725,597, Jul. 3, 1991, Pat. No. 5,221,683. This application Aug. 23, 1996, Ser. No. 702,742

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **4 Claims**



1. A method for implanting an end portion of a graft within the body of a patient during a bypass grafting procedure, comprising the steps of:

making an arteriotomy in a sidewall of a blood vessel at a first area to create a communicating aperture between a first location inside of the blood vessel and a second location outside of the blood vessel, wherein the arteriotomy making step is performed while the first area is covered by a substantially intact portion of the epidermis of the body;

advancing the end portion of the graft to the first area, wherein the advancing step is performed while the first area is covered by the substantially intact portion of the epidermis of the body; and

forming an anastomosis between the end portion of the graft and the blood vessel at the first area, wherein the anastomosis forming step is performed while the first area is covered by the substantially intact portion of the epidermis of the body, wherein the anastomosis forming step includes the step of securing the end portion of the graft to the blood vessel at the first area with an expandable stent.

5,749,376

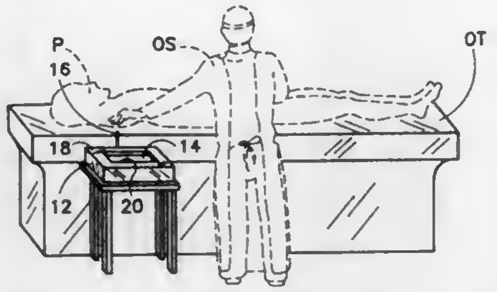
MEDICAL TREATMENT AND WASTE DISPOSAL METHOD

Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023; Charles L. Knoll, 52 Crescent Ave., Passaic, N.J. 07055, and Eugene Wexler, 133 Lexington Ave., New, N.Y. 10016

Continuation-in-part of Ser. No. 138,405, Oct. 18, 1993, abandoned. This application Nov. 21, 1995, Ser. No. 561,399

Int. Cl.⁶ A61B *19/00*

U.S. Cl. 128—898 10 Claims



1. A medical method comprising the steps of:

providing a medical instrument made of a biocompatible material;

also providing, in the same room as a patient, a container of a fluidic material which is a solvent for said biocompatible material, said container being other than or different from said patient;

using said medical instrument in a medical procedure on the patient in said room;

upon completed use of said instrument, depositing said instrument in said container in said room; and

dissolving said instrument in said container.

5,749,377

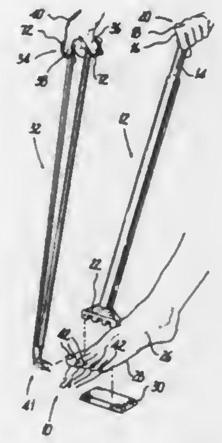
PEDICURE KIT

Alphonse J. Desario, 205 Montreal Ave., Staten Island, N.Y. 10306

Filed Aug. 29, 1996, Ser. No. 705,174

Int. Cl.⁶ A45D *29/18;29/22*

U.S. Cl. 132—73.5 25 Claims



1. A pedicure kit, comprising:

a) an elongated and slender toe spreader having a slender handle portion being releasibly engagable in the palm of the hand of a user, and a toe spreader portion being remote from said slender handle portion of said elongated and slender toe spreader and releasibly engaging and separating the toes of the foot of the user from each other without the user having to bend, so that the toes of the foot of the user who has difficulty bending can be separated from each other without the user having to bend and separate the toes of the foot of the user with the other hand of the user; said elongated and slender toe spreader further having an elongated, slender, and generally rectangular-parallelepiped-shaped body with a proximal end from which said slender handle portion of said elongated and slender toe spreader extends coplanarally upwardly, and a distal end from which said toe spreader portion of said elongated and slender toe spreader extends coplanarally downwardly; said slender handle portion of said elongated and slender toe spreader being narrower than said elongated, slender, and generally rectangular-parallelepiped-shaped body of said elongated and slender toe spreader so as to provide a pair of lateral shoulders, so that a stop is provided when the palm of the hand of the user grips said slender handle portion of said elongated and slender toe spreader that prevents downward slipping thereof; and

b) an elongated and slender toe nail scissor being separate from said elongated and slender toe spreader and having a handle portion releasibly engagable by the thumb and the index finger of the other hand of the user, and a cutting portion remote from said handle portion of said elongated and slender toe nail scissor and cutting the toe nails on the toes of the foot of the user without the user having to bend, so that the toe nails on the toes of the foot of the user who has difficulty bending can be cut without the user having to bend.

5,749,378

TOBACCO PRODUCT FOR THE SELF-PREPARATION OF A CIGARETTE, ESPECIALLY OF FILTER-TIPPED CIGARETTE AND METHOD OF FORMING THE CIGARETTE

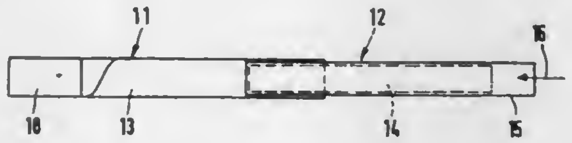
Heinrich W. Ruppert, and Klaus G. Gätschmann, both of Trossingen, Germany, assignors to EFKA-Werke Fritz Kiehn GmbH, Germany

Continuation of Ser. No. 806,089, Dec. 19, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 229,399

Claims priority, application Germany, Dec. 7, 1990, 40 39 159.0

Int. Cl.⁶ A24C *5/02*

U.S. Cl. 131—70 13 Claims



1. A tobacco product for the self-preparation of a cigarette including a filter-tipped cigarette, including a cigarette paper tube (11) having a cylindrical tobacco receiving space (13) including a prescribed cross section and length similar to a factory prepared cigarette, comprising a cylindrical tobacco portion (14) for filling of said cigarette paper tube and having an air permeable outer surface preventing combustion and smoking of the tobacco portion per se and wherein the tobacco portion (14) includes an outer surface consisting of completely smokable material, and wherein the tobacco portion (14) is dimensionally stable with a prescribed cylindrical shape and has a cross-section and length matched with the tobacco receiving space (13) of said cigarette paper tube (11) with the outer surface of the tobacco portion in intimate engagement with the interior surface of the cigarette paper tube for smoking while the prescribed cylindrical shape of the tobacco portion is retained, the improvement comprising an outer bar wrap (15) surrounding the tobacco portion (14) as a prefabricated product for assembly with said cigarette paper tube, said bar wrap being open at either end, and formed of a non-smokable material, said tobacco portion (14) and said bar wrap (15) being constructed and arranged for ready movement of said tobacco portion from said bar wrap in said dimensionally stable state by applying a relatively low force to one end of said tobacco portion relative to said bar wrap whereby said tobacco portion is manually transferable from said bar wrap (15) directly into said cigarette paper tube (11) without necessity of auxiliary force applying devices while substantially retaining the prescribed cylindrical shape of said tobacco portion and said bar wrap.

5,749,379

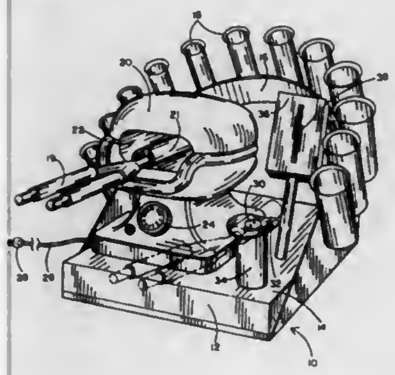
NON-NUMERIC TEMPERATURE INDICATING METHOD FOR A HAIR STYLING IRON

Ross I. Stillwagon, Santa Fe Springs; Fernando Fischbach, Downey, and Allen Bennett, Mission Viejo, all of Calif., assignors to Golden Supreme, Inc., Santa Fe Springs, Calif.

Filed Apr. 25, 1996, Ser. No. 637,859

Int. Cl.⁶ A45D *1/20*

U.S. Cl. 132—200 1 Claim



1. A non-numeric indicating method of accurately determining the appropriate temperature of a heated curling iron for a selected hair thickness to curl that thickness hair without heat damaging it; the method comprising the following steps:

a) providing a thermocouple in proximity to at least one curling iron heated to a temperature in the range of at least 250 degrees F. to at least 425 degrees F.;

b) connecting said thermocouple to an electronic circuit comprising an array of light emitting diodes for sequential activation of said diodes in response to the actual temperature of a curling iron in contact with said thermocouple; and

c) calibrating said electric circuit to activate said diodes in sequence in accordance with increasing temperature at said thermocouple, said calibration providing a visual correlation between appropriate hair thickness temperature and the number and position of the activated diodes.

5,749,380

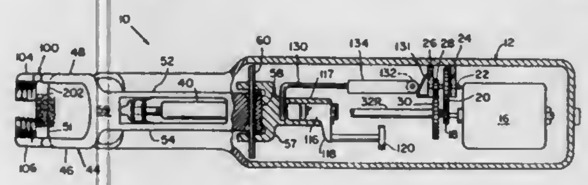
AUTOMATED DENTAL CLEANER

William H. Zebuhr, Nashua, N.H., assignor to Dynaproducts, Inc., Nashua, N.H.

Division of Ser. No. 418,837, Apr. 7, 1995, Pat. No. 5,647,385. This application Apr. 2, 1997, Ser. No. 831,861

Int. Cl.⁶ A45D *40/30*

U.S. Cl. 132—216 12 Claims



1. A dental cleaner comprising:

a fork having a pair of tines for receiving teeth to be cleaned therebetween;

first and second brushes, each brush being attached to a respective tine and having bristles extending inward between the tines for engaging lingual and buccal tooth surfaces simultaneously;

a third brush attached to the fork and having bristles extending medially thereof for engaging tooth top surfaces; and

a drive mechanism for reciprocating each of the first, second and third brushes in a back-and-forth linear motion.

5,749,381

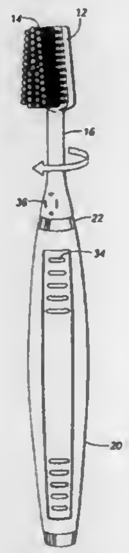
TOOTHBRUSH FOR IMPLEMENTING THE BASS BRUSHING TECHNIQUE

C. P. Butler, 4615 Shumart Dr., Lithonia, Ga. 30058, and F. M. Butler, Jr., 3118 SW. 20th Ter., Del Ray Beach, Fla. 33445

Filed Mar. 26, 1996, Ser. No. 622,697

Int. Cl.⁶ A45D *44/18;8/18;* **A46B** *9/04*

U.S. Cl. 132—309 16 Claims



1. A toothbrush for easily implementing the Bass technique of brushing teeth and gums, comprising:

a generally cylindrical handle, having a top portion, a central portion, a bottom portion, a longitudinal axis, and a cross-section defined by a circular portion for supporting one or more fingers and a flat portion for supporting a thumb and fingertips, wherein said handle is formed of a deformable material which is slightly depressed when a gripping force is applied thereto;

rotation means attached to the top portion of said handle which may be selectively positioned at one of a plurality of locations about the longitudinal axis of said handle, wherein said rotation means comprises a rotating disk; and

a stem connected to said rotation means, said stem comprising means for laterally adjusting the position of said stem relative to the longitudinal axis of said handle, said stem further comprising a head having a front portion with a plurality of tufts of bristles anchored therein, said front portion being arranged so that in one of said plurality of locations of said rotation means the bristles of the head are at about a forty-five degree angle relative to the surface of the teeth and gums when said flat portion of said handle is generally parallel to the surface of the teeth, and a bendable wire centrally located in said stem of a size and stiffness sufficient to maintain the head and stem configuration selected by the user while at the same time sustaining the forces applied to said head and stem during brushing

whereby the Bass technique of brushing teeth and gums is implemented by the user of the toothbrush by moving the toothbrush in short strokes against the surface of the teeth in a conventional manner.

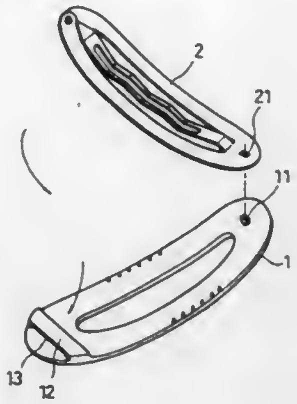
5,749,382
HAIR CLIP AND ORNAMENTAL PLATE ARRANGEMENT

Kai-Mou Tsai, 4/F., No. 1, Lane 135, Tao-Hsiang Rd., Peitou Dist., Taipei City, Taiwan

Filed Feb. 20, 1997, Ser. No. 803,513

Int. Cl.⁶ A45D *8/12*

U.S. Cl. 132—275 **7 Claims**



1. A hair clip and ornamental plate arrangement comprising a hair clip and an ornamental plate fastened to said hair clip, wherein said hair clip has a fixed end provided with a coupling hole, and a free end; said ornamental plate has a retainer rod at one end coupled to the coupling hole of said hair clip, and holding means at an opposite end adapted for holding the free end of said hair clip, said holding means being a bridge transversely raised from said ornamental plate at one end and defining a gap for holding the free end of said hair clip.

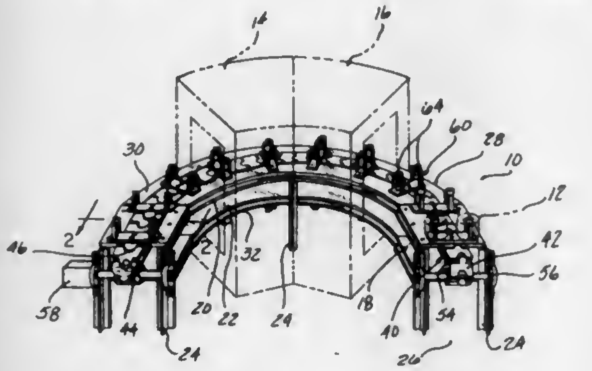
5,749,383
NON-LINEAR CHAIN BELT TYPE CONVEYOR

Harold W. Parslow, Jr., Washington, Mich., assignor to Grapar Corporation, Warren, Mich.

Filed Aug. 2, 1994, Ser. No. 284,258

Int. Cl.⁶ B08B *13/00*

U.S. Cl. 134—56 R **35 Claims**



13. A conveyor comprising:
- a frame;
- a conveyor bed supported by said frame, and said conveyor bed having at least one side wall defining an upper guide slot corresponding to an upper non-linear conveyor path and a lower guide slot beneath said upper guide slot corresponding to a lower non-linear return path for forming a predetermined, continuous non-linear path;
- a sprocket supported on lateral axes by said frame at the ends of said upper and lower non-linear paths and said sprocket rotating in a substantially vertical plane;
- a conveyor chain belt having a plurality of similar, unitarily constructed chain links having complementary surfaces for cooperatively engaging one another, and said conveyor chain belt being slidably supported by said conveyor bed and being guided by said upper guide slot and said lower guide slot along said predetermined, continuous non-linear path, and said unitarily constructed chain links of said conveyor chain belt cooperatively and directly engaging said sprockets; and
- means for indiscriminately sensing the presence of said article at an unloading station downstream of said non-linear path, and said conveyor chain belt responsive to said indiscriminate sensing means so that said conveyor chain belt stops when said article is present at said unloading station of said upper non-linear conveyor path and starts when said article is absent from said unloading station of said upper non-linear conveyor path.

5,749,384
METHOD AND APPARATUS FOR PERFORMING PREVENTIVE MAINTENANCE ON THE BOTTOM PORTION OF A REACTOR PRESSURE VESSEL USING CAVITATION BUBBLES

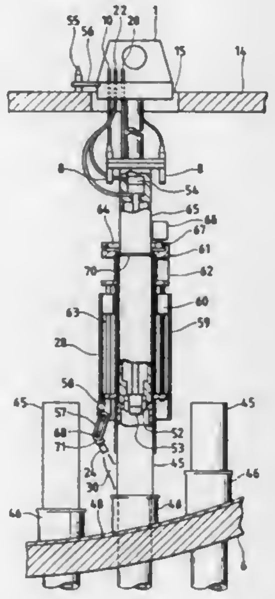
Eisaku Hayashi; Koichi Kurosawa, both of Hitachi; Fujio Yoshikubo, Mito; Hideyasu Furukawa; Ren Morinaka, both of Hitachi; Kunio Enomoto, Tokai-mura; Masahiro Otaka, Hitachi; Noboru Chiba, Tokai-mura, and Kazunori Sato, Kure, all of Japan, assignors to Hitachi, Ltd.; Babcock-Hitachi Kabushiki Kaisha, both of Tokyo; Hitachi Nuclear Engineering Co., Ltd., and Hitachi Kiso Co., Ltd., both of Ibaraki, all of Japan

Filed Mar. 24, 1995, Ser. No. 409,689

Claims priority, application Japan, Mar. 31, 1994, 6-062408

Int. Cl.⁶ B08B *9/02*

U.S. Cl. 134—167 R **14 Claims**



1. An apparatus for performing preventive maintenance on a bottom portion of a reactor pressure vessel under water to improve a stress condition in an internal structure in said reactor pressure vessel by directing a high pressure jet accompanying generation of cavitation bubbles from a jet nozzle toward the internal structure of the reactor pressure vessel under water, which comprises:
- a fixed structural body fixed to a CRD housing in said reactor pressure vessel, and a rotating body mounted on said fixed structural body so as to be capable of rotating in the horizontal plane; and
- an articulated arm mounted on said rotating body so as to be capable of swinging in a plane having an angle with the rotating plane of said rotating body;
- said jet nozzle being supported by said articulated arm.

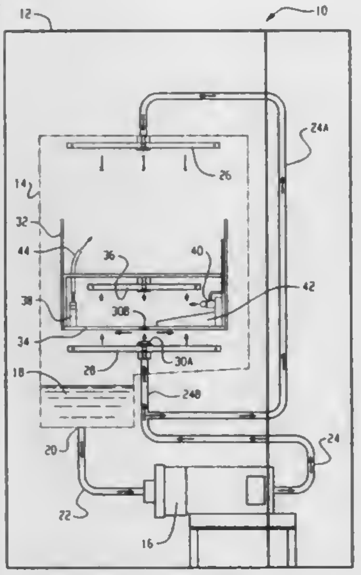
5,749,385
METHOD AND APPARATUS FOR LOOSELY RETAINING INSTRUMENTS IN A WASHING SYSTEM RACK ASSEMBLY

Daniel Rochette; John Wood, both of Charlesbourg, and Christian Angers, Ancienne-Lorette, all of Canada, assignors to Steris Corporation, Mentor, Ohio

Filed Nov. 26, 1996, Ser. No. 756,438

Int. Cl.⁶ B08B *3/02;9/02*

U.S. Cl. 134—199 **21 Claims**



1. A washer including a washing chamber having jets for spraying a washing and rinsing liquid into the washing chamber, an instrument basket positioned within the washing chamber for retaining instruments or equipment to be washed, the washer further comprising:
- an instrument holder associated with the instrument basket for loosely holding an instrument, the instrument holder including:
  - a tube body having a cavity for receiving an end portion of the instrument; and
  - a retainer cap removably retained on the tube body, the retainer cap having a resilient end wall covering an open end portion of the tube body cavity, the end wall having a central aperture therein which resiliently yields to the instrument end portion when inserted in the cavity and which retains the instrument end portion sufficiently loosely that washing and rinsing liquids flow freely between the instrument end portion and the retainer cap end wall during a washing and rinsing operation.

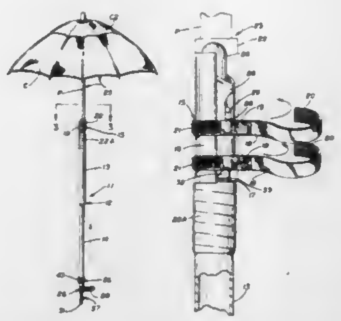
5,749,386
GOLF UMBRELLA AND SUPPORT

Vincent D. Samuel, Jr., 6561 Mulholland, Cincinnati, Ohio 45140

Filed Oct. 18, 1996, Ser. No. 733,729

Int. Cl.⁶ A45B *11/00*

U.S. Cl. 135—16 **19 Claims**



1. A golf umbrella comprising; a plurality of interconnected tubular sections slideably endwise within one another, said tubular sections having an upper portion, and a lower portion, an umbrella extending from the free end of said upper portion, a ground engaging spike extending from said distal end of said lower portion, a ground insert pedal pivotally secured to said spike, means for selectively removing said spike from said lower portion, means for storing said spike in said upper portion of said tubular sections and means for activating said umbrella.

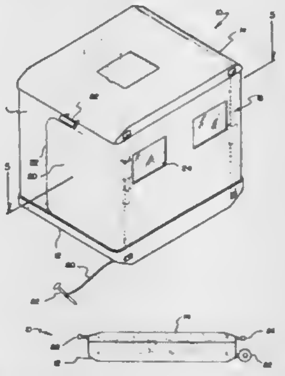
5,749,387
PORTABLE ICE FISHING HUT

Todd Thompson, 502 Birch Ave., Eldora, Iowa 50627

Filed Jan. 7, 1997, Ser. No. 779,445

Int. Cl.⁶ E04H *15/48*

U.S. Cl. 135—146 **1 Claim**



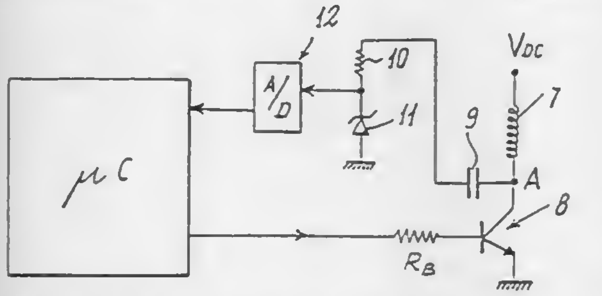
1. A portable and collapsible shelter comprising:
- a substantially rigid protective enclosure, said enclosure including a base shell and a roof shell, said base shell and said roof shell being conformingly engageable together to form said enclosure; said base shell includes at least one integral fishing access hole in a floor section, said access hole having a lid hingedly disposed thereover;
- a collapsible support frame pivotally connected between said base shell and said roof shell, said collapsible support frame being substantially retained within said enclosure when said portable shelter is in a stored collapsed position;
- said collapsible support frame includes at least one vertical support member, said vertical support member having a hinge joint to facilitate a collapsing thereof into a folded stored position; said vertical support member includes a first arm pivotally connected to said roof shell and a second arm pivotally connected to said base shell; said hinge joint being pivotally attaching the free end of said first arm to the free end of said second arm;
- a hinge locking means securing said first arm and second arm in an axially aligned position whereby said shelter is maintained in an open operable position; said hinge locking means comprising the first arm and the second arm positioned within a fixed sleeve, a pin extending through the sleeve and between the first and second arms, a locking block disposed on a free end of the pin and positioned between the first and second arms in a locked orientation, a spring disposed on the pin and coupled with the locking block for biasing the locking block in the locked orientation whereby pushing inwardly on the pin will move the locking block from its position between the first and second arms thereby facilitating folding of the vertical supports;
- a flexible covering connected between said base shell and said roof shell, said flexible covering being substantially retained within said enclosure when said portable shelter is in a stored

collapsed position, said flexible covering functioning as walls for said shelter so as to define a protective enclosed space between said base shell and said roof shell when said shelter is in an open operable position.

5,749,388
METHOD AND CIRCUIT FOR INCREASING THE LIFE OF SOLENOID VALVES

Robert S. Elliott, Stevensville, Mich., and Luca Frasnetti, Cunardo, Italy, assignors to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Aug. 27, 1996, Ser. No. 708,157
Claims priority, application Italy, Sep. 1, 1995, MI95A1856
Int. Cl.^{6} F16K *31/06*
U.S. Cl. 137—1 **9 Claims**



1. A method for prolonging the useful life of solenoid valves used for fluid flow shutoff, the solenoid valve comprising a coil, a body provided with a valve seat, and a mobile core loaded by a return spring and presenting a valving member formed from an elastomer and arranged to cooperate with the valve seat of said body, the method comprising:

energizing the coil during the closure stroke of the mobile core for applying a braking force to the mobile core for counteracting the bias provided by the return spring while the mobile core is moving towards the valve seat such that the energy involved in the impact between the valving member and the mobile core seat is reduced.

5,749,389
PURGEABLE CONNECTION FOR GAS SUPPLY CABINET

Joe Ritrosi, Crystal Lake, Ill.; Gary Schmitt, Scotts Valley, Calif.; Carl Quintino, San Jose, Calif., and Gerhard Kasper, Walnut Creek, Calif., assignors to Liquid Air Corporation, Walnut Creek, Calif.

Filed Dec. 22, 1993, Ser. No. 173,398
Int. Cl.^{6} B08B *9/02;9/06*
U.S. Cl. 137—15 **6 Claims**

1. A system for purging a selected portion of an ultra-high purity gas supply manifold, with a purge gas, said system comprising:

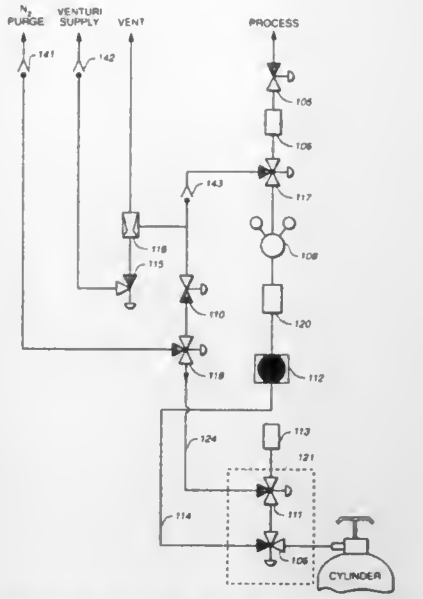
a process connection through which ultra-high purity gas is communicated to a process;

a first conduit in selective flow communication with an ultra-high purity gas source, and with a purge gas source;

a second conduit in selective flow communication with said process connection, and with said ultra-high purity gas source;

a vacuum connection for selectively placing a vacuum means in communication with said first conduit for evacuation thereof during a purge cycle; and

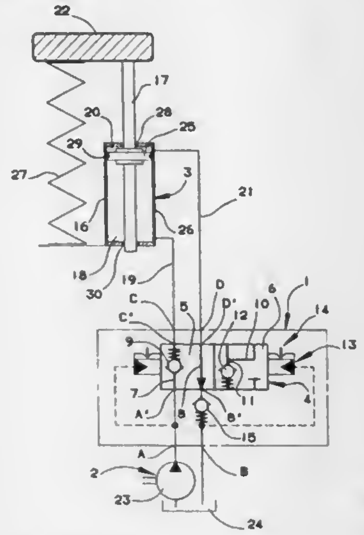
a valve means comprising an inlet port in flow communication with an ultra-high purity process gas source, and a first outlet port in selective communication with said purge gas supply through a first connection with said first conduit, and a second outlet port in selective communication with said process connection through a second connection with said second conduit, said valve means adapted to reduce the volume of purging one of the selected first and second conduits during a purging operation with said purge gas by way of said valve means being selectively operable to isolate said first conduit from said inlet port during normal ultra-high purity process gas flow conditions through said second conduit, and further operable to isolate said second conduit from said inlet port during said purging with said purge gas, thereby reducing contaminants in said first and second conduits below acceptable levels.



5,749,390
VALVE HAVING FOUR CONNECTION PORTS AND TWO POSITIONS

Rino Ermacora, St-Jean Saverne; Pierre Fischbach, Otterstthal; Roland Helfer, Lampertheim; Martin Walch, Dettwiller; Bernard Wattron, Haegen, and Joel Wilhelm, Saint-Louis, all of France, assignors to Kuhn S.A., Saverne Cedex, France

Filed Oct. 30, 1995, Ser. No. 550,208
Claims priority, application France, Oct. 28, 1994, 94 13107
Int. Cl.^{6} F16K *11/06*
U.S. Cl. 137—106 **5 Claims**



1. A valve unit comprising:

a first and a second connection ports which are adapted to be connected directly or indirectly to a fluid power source;

a third and a fourth connection ports which are adapted to be connected directly or indirectly to at least one mechanism to be driven by fluid whose flow is controlled by the valve unit;

a distributor comprising a first, a second, a third and a fourth ports which are connected to said first, second, third and fourth connection ports, respectively, said distributor being adapted to be able to take first or second positions;

a control device which controls said distributor to take said first or second positions;

a locking device which locks said distributor in said first or second positions;

a first valve provided so as to allow flow only from said first port to said third port when said distributor is in said first position;

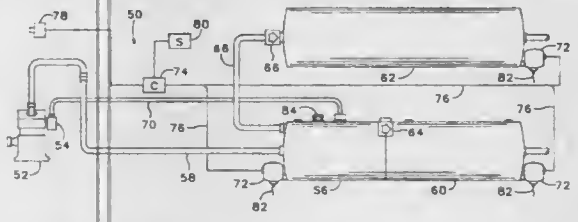
a second valve provided so as to allow flow only from said third and fourth ports to said first port when said distributor is in said second position; and

said second and fourth ports being directly connected and said first and third ports being connected via said first valve when said distributor is in said first position, and said third and fourth ports being directly connected and said third and fourth ports being connected to said first port via said second valve when said distributor is in said second position.

5,749,391
CONDENSATE DRAINAGE SYSTEM FOR PNEUMATIC TANKS

Douglas J. Loutzenhiser, Lake Oswego, Oreg., assignor to Freightliner Corporation, Portland, Oreg.

Filed Feb. 14, 1996, Ser. No. 601,190
Int. Cl.^{6} F16T *1/00*
U.S. Cl. 137—204 **24 Claims**



1. A condensate draining system for a pneumatic system of an engine powered vehicle, the vehicle having pneumatically operated components responsive to the pneumatic system, the system comprising:

(a) a drain valve connected to the pneumatic system, the drain valve having an open position for discharging condensate and a closed position for containing pressurized air within the pneumatic system; and

(b) a controller having a logic system, the controller being coupled to the drain valve and being operable to control the position of the valve between open and closed positions; and

(c) a sensor for sending an engine status signal indicative of a first operational engine status and a second operational engine status, the operational engine statuses relating to a status of the engine when the engine is running;

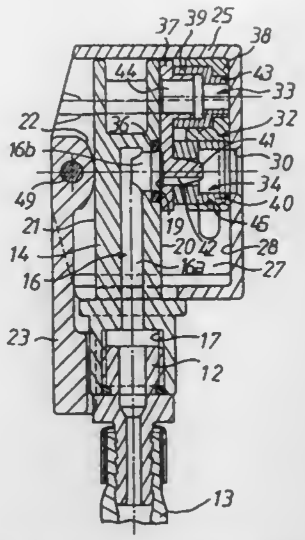
(d) wherein the controller receives the engine status signal and is operable to control the position of the drain valve according to a first schedule in response to the first operational engine status and a second schedule in response to the second operational engine status so as to prevent the accumulation of condensate in the pneumatic system.

5,749,392
PUMP CONNECTOR DEVICE

Joël Glotin, Yerres, France, assignor to Zefal, Aubervilliers, France

Filed Nov. 29, 1996, Ser. No. 753,728
Claims priority, application France, Nov. 28, 1995, 95 14081
Int. Cl.^{6} F16K *15/20*
U.S. Cl. 137—231 **9 Claims**

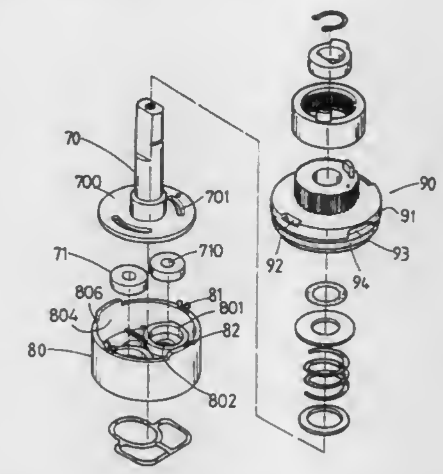
1. A pump connector device for inflating a pneumatic tire comprising an air ejector passage adapted to be connected to a pump and a mobile member containing at least two different connectors and movable in a housing between at least two predetermined positions in which one of said connectors communicates with a downstream end of said passage in a position in which it can be connected to a pneumatic tire valve, said mobile member comprising a slider movable along a straight path in a housing, and said ejector passage opening into said housing to communicate with one of said connectors when said slider is in a corresponding predetermined position.



5,749,393
VALVE SEALING MECHANISM FOR FAUCET

Tsai Chen Yang, P.O. Box 63-99, Taichung, Taiwan

Filed Jun. 5, 1997, Ser. No. 869,643
Int. Cl.^{6} F16K *5/10*
U.S. Cl. 137—454.2 **1 Claim**



1. A valve for a faucet comprising:

a housing including a bottom having an inlet and an outlet, said housing being cylindrical and including an inner peripheral surface and including an upper peripheral edge, said housing including at least two retainers and at least one stop extended upward from said upper peripheral edge,

a stem including a bottom end having a disc, said disc including two curved slots for engaging with said inlet and said outlet of said housing and for controlling water flowing into said housing and flowing outward of said housing, and

a cap including an annular flange extended radially outward for engaging with said upper peripheral edge of said housing and including at least two orifices for engaging with said at least two retainers and for securing said cap to said housing, said annular flange of said cap including at least one notch for engaging with said at least one stop and for preventing said cap from rotating relative to said housing and for solidly securing said cap to said housing, said cap including a lower peripheral portion having a sealing ring for engaging with said inner peripheral surface of said housing and for making a water tight seal between said housing and said cap and for preventing water from flowing out of said housing.

5,749,394

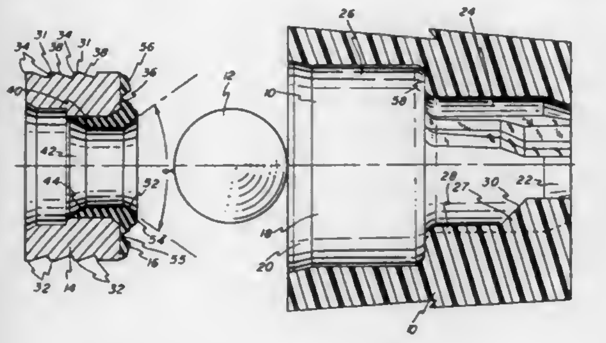
CHECK VALVE INCLUDING MOLDED VALVE SEAT

Dennis A. Boehmer, Beavercreek, and Richard L. Gibson, Jr., Springfield, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Oct. 9, 1996, Ser. No. 728,496

Int. Cl.^{6} F16K *15/00*

U.S. Cl. 137—533.15 **11 Claims**



1. A check valve comprising:

a housing including a through bore defining a fluid passage, and an inlet port and an outlet port located at ends of said fluid passage;

a ball element movably positioned in said housing and located between said inlet port and said outlet port;

a rigid insert member located at said inlet port, said insert member including an interior surface defining a through aperture;

an elastomeric element molded onto said insert member such that said elastomeric element is bonded to said insert member to form a unitary structure for insertion into said housing during assembly of said valve, said insert member defining a substrate supporting said elastomeric element facing said outlet port for engagement with said ball element; and

wherein said insert member immovably supports said elastomeric element to facilitate grinding of a ball seat into said elastomeric element, said ball seat being formed in said elastomeric element at a precise angle matching a tangential angle of contact with said ball element such that engagement of said ball element with said ball seat forms a seal which prevents fluid flow from said outlet port through said inlet port.

5,749,395

SELECTOR VALVE AGGREGATE

Bunya Hayashi; Yoshio Asou, and Makoto Ishikawa, all of Yawara-mura, Japan, assignors to SMC Corporation, Tokyo, Japan

Continuation of Ser. No. 560,705, Nov. 20, 1995, abandoned. This application Feb. 10, 1997, Ser. No. 797,412

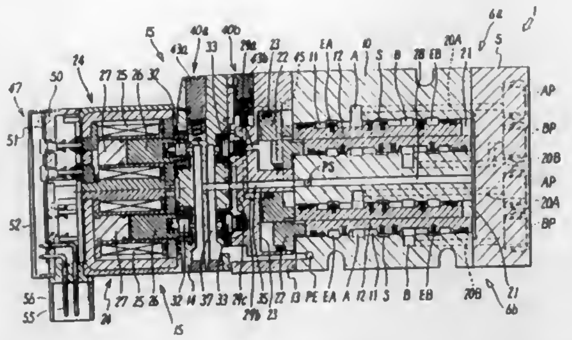
Claims priority, application Japan, Dec. 27, 1994, 6-338126

Int. Cl.^{6} F15B *13/08*

U.S. Cl. 137—596.16 **1 Claim**

1. A selector valve aggregate, which comprises:

a plurality of composite type selector valves which are interconnected in a row wherein each of said composite type selector valves comprises a plurality of selector valve mechanisms,



said valve mechanisms switching over a flow of a pressure fluid and being interconnected; and

a longitudinally elongated rectangular valve body having a small width dimension and a height dimension greater than the width dimension, in which said plurality of selector valve mechanisms are positioned, said valve mechanisms independently switching over the flow of the pressure fluid and being positioned in a vertical arrangement in said valve body wherein a plurality of said composite type selector valves are arranged in a lateral direction;

wherein each of the selector valve mechanisms comprises a plurality of valve members switching over the flow of the pressure fluid and a driving mechanism driving said valve members, said valve members being interconnected within said valve body and said driving mechanism being integrally assembled with said valve body;

said valve body comprising joint surfaces formed on both sides thereof in said lateral direction thereof wherein a supply bore and discharge bores are provided in said valve body which communicate pressure fluid leading to each of the selector valve mechanisms, said bores being opened to and being communicated with bores of an adjacent composite type selector valve; and

an output port which is communicated with each of the selector valve mechanisms and which is provided on a port block on a front end surface of the valve body and wherein said driving mechanism comprises an electromagnetically operated pilot valve.

5,749,396

PRESSURIZED FLUID SUPPLY HOSE AND METHOD OF MANUFACTURING THE SAME

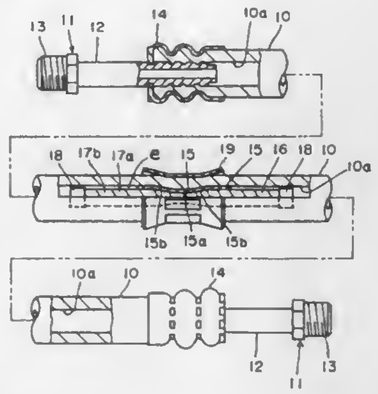
Hiroyuki Takahashi, and Nobuhiko Yamamoto, both of Okazaki, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 2, 1996, Ser. No. 626,792

Claims priority, application Japan, Apr. 3, 1995, 7-077944

Int. Cl.^{6} F16L *55/04*

U.S. Cl. 138—26 **8 Claims**



1. A pressurized fluid supply hose comprising:

a spiral tube;

a nipple caulked on an outer surface of said spiral tube so as to form at its inner surface a flat portion and two taper portions which are successive thereto and sloped to gradually increase the inner diameter toward both ends of said nipple, so that the outer surface of said spiral tube is so deformed as to be secured to said nipple by said flat portion and said taper portions;

a flexible rubber hose for receiving said spiral tube which is secured to said nipple; and

means for fixing said nipple to said rubber hose.

5,749,397

PIPE TRACTOR

Ole Molaug, Tytebærholen 30, N-4340 Bryne, Norway

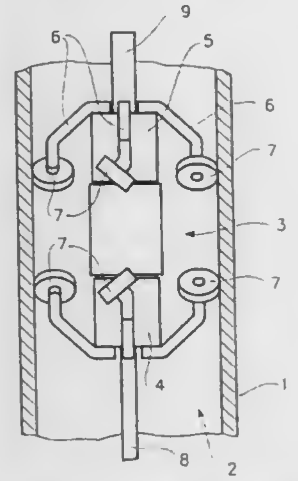
PCT No. PCT/NO93/00180, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/12827, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 30, 1993, Ser. No. 446,879

Claims priority, application Norway, Dec. 1, 1992, 924621

Int. Cl.^{6} B05B *7/04*

U.S. Cl. 138—89 **4 Claims**



1. A pipe tractor adapted to move along a bore axis internally within a pipe or channel comprising a chassis body positioned on a longitudinal axis which is alignable along said bore axis, said chassis body carrying at least one rotary power source; a pair of rotatable housings, each respectively positioned axially adjacent the chassis body, and means for connecting said at least one rotary power source to said rotatable housings to cause respective rotation about said longitudinal axis; a set of resilient arms connected to each of said rotatable housings, the respective arms in said set being arranged at approximate equal angular displacements about said longitudinal axis, and each resilient arm having an outer rotatable wheel aligned at a bevel angle relative to said longitudinal axis; whereby said wheels follow respective helical paths within said pipe or channel when said rotary power source is actuated to rotate said rotatable housings.

5,749,398

SOLIDIFIABLE FLEXIBLE TUBE

Goro Kambara, 13730 Via Encantado, Valley Center, Calif. 92082

Filed Feb. 12, 1996, Ser. No. 600,300

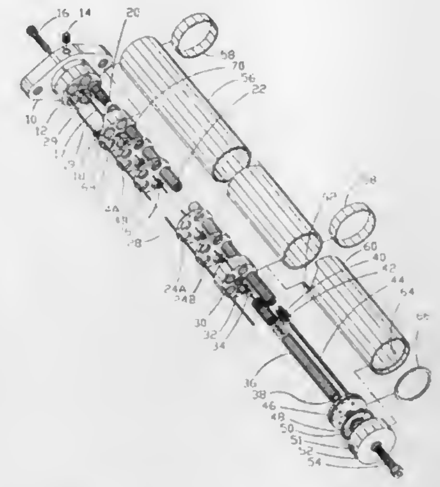
Int. Cl.^{6} F16L *9/18*

U.S. Cl. 138—113 **19 Claims**

1. A solidifiable tube for simulating a contoured conduit comprising:

a cylindrical array of bendable wires;

spacing means for retaining said array of bendable wires so as to allow the individual wires of said array to slide longitudinally with respect to one another;



an elastic cover tube having an inside diameter sufficient to encompass said cylindrical array of bendable wires and an outside diameter of a size to simulate the conduit to be formed from measurements made upon said solidifiable tube;

at least one elastomeric tube within said elastic cover tube;

means for applying pressure to said elastomeric tube so as to cause it to expand within the confines of said elastic cover tube.

5,749,399

END SECTIONS OF CONNECTIONS FOR MINERAL WOOL CONDUITS OF THE "CLIMAVER PLUS" TYPE

Juan A. Reyes Zorrilla, Madrid, Spain, assignor to Isover Saint-Gobain, Cedex, France

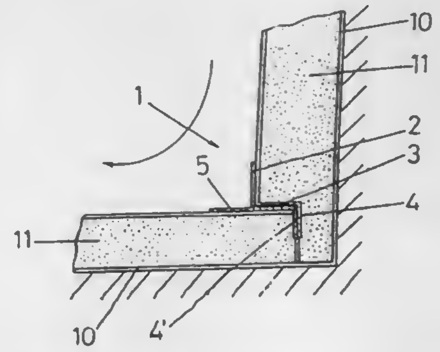
PCT No. PCT/ES96/00183, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO97/11319, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 20, 1996, Ser. No. 849,956

Claims priority, application Spain, Sep. 22, 1995, 9502440 U

Int. Cl.^{6} F16L *9/22*

U.S. Cl. 138—155 **6 Claims**



2. A shaping member for the finishing of junctions for "Climaver Plus" type glass wool piping, comprising:

a unitary flat plate of a bendable material;

the flat plate folded along an elongated first fold line to form a first vertical section (2) with the lower area of forming a horizontal wing section (3) having a vertical extension (4) which is folded back to form a section (4') against the surface of extension section (4) and is folded horizontally to back against the lower surface of horizontal wing section (3) and extending horizontally beyond vertical section (2) and first fold line;

whereby said shaping member can be placed at the junction of two glass wool elements with said sections (3), (4) and (4') and said proximal portion of section (5) being situated between said glass wool elements, and with said section (2) and said distal portion of section (5) being situated outside said joined glass wool elements.

5,749,400
PROCESS FOR THE MANUFACTURE OF A FIGURED ELASTIC FABRIC MADE BY THE JACQUARD SYSTEM

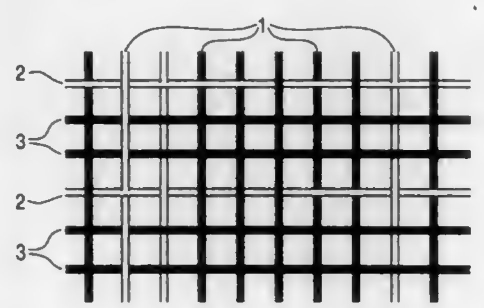
D. Samual Botella Pascual, Alicante, Spain, assignor to M. Hidalgo Beistequi, S.A., Alicante, Spain

Continuation-in-part of Ser. No. 357,998, Dec. 16, 1994, abandoned. This application Sep. 11, 1996, Ser. No. 712,568

Claims priority, application Spain, Dec. 16, 1993, 92 02 608

Int. Cl.^{6} D03D *15/08*

U.S. Cl. 139—421 **17 Claims**



1. A process of manufacturing a figured, elastic fabric comprising the steps of:

preparing a design program for a relief pattern on fabric to be woven on a loom;

providing weft and warp threads to be used by said loom;

wherein a majority of said weft threads are made of elastic material and a minority of said weft threads are made of non-elastic material;

applying tension to said weft threads sufficient to stretch said elastic weft threads;

shedding and interlacing said warp and weft threads on said loom according to said design program;

providing floats along a plurality of said elastic weft threads thereby forming said relief pattern throughout said fabric according to said design program, each of said floats passing on one side of said fabric over a plurality of adjacent warp threads and extending inside a respective pair of binding points; and

interlacing said warp and elastic weft threads outside said pairs of binding points.

5,749,401
POWDER FILLING METHOD

Nozomi Shinya, Toyonaka, and Masami Eda, Kobe, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 8, 1996, Ser. No. 727,299

Claims priority, application Japan, Oct. 12, 1995, 7-292202

Int. Cl.^{6} B65B *1/26*

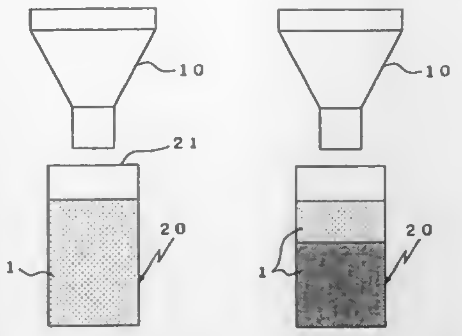
U.S. Cl. 141—80 **12 Claims**

1. A powder filling method for filling a container with powder, comprising:

a first step of supplying the powder from powder supplying means into the container;

a second step of pressurizing air inside the container;

a third step of restoring the air inside the container to an atmospheric pressure; and



thereafter, a fourth step of supplying additional powder from powder supply means into the container with the powder supplied in the first step.

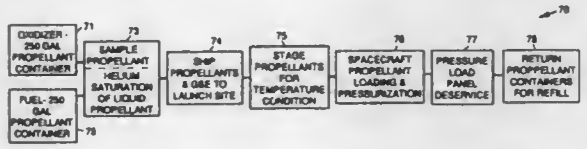
5,749,402
INTEGRATED STORAGE AND TRANSFER SYSTEM AND METHOD FOR SPACECRAFT PROPULSION SYSTEMS

L. Scott Stotelmyer, Manhattan Beach, and Don K. Fulkerson, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 250,084, May 27, 1994, Pat. No. 5,479,959, which is a continuation of Ser. No. 173,736, Dec. 23, 1993, Pat. No. 5,499,656. This application Jun. 7, 1995, Ser. No. 476,923

Int. Cl.^{6} B65B *1/04;* **F16K** *24/00*

U.S. Cl. 141—83 **4 Claims**


70
OXIDIZER - 250 GAL PROPELLANT CONTAINER
71
FUEL- 250 GAL PROPELLANT CONTAINER
72
SAMPLE PROPELLANT
HELIUM SATURATION OF LIQUID PROPELLANT
73
SHIP PROPELLANTS & GSE TO LAUNCH SITE
74
STAGE PROPELLANTS FOR TEMPERATURE CONDITION
75
SPACECRAFT PROPELLANT LOADING & PRESSURIZATION
76
PRESSURE LOAD PANEL DESERVICE
77
RETURN PROPELLANT CONTAINERS FOR REFILL
78

1. A method of loading propellant into a spacecraft having a propellant storage tank, said method comprising the steps of:

loading and storing propellant in a portable propellant loading tank at a loading site;

sampling the propellant in the loading tank at the loading site to verify that there no contaminants therein;

transferring the portable propellant loading tank to a launch site;

temperature conditioning the propellant in the portable propellant loading tank;

coupling the portable propellant loading tank to the propellant storage tank in the spacecraft; and

pressurizing the portable propellant loading tank to transfer the propellant directly into the propellant storage tank in the spacecraft.

5,749,403
PROCESS FOR FILLING CONTAINERS, IN PARTICULAR CANS, WITH LIQUIDS, AND A FILLER VALVE GROUP FOR CARRYING OUT THE PROCESS

Lucio Conforti, Fornovo Taro, Italy, assignor to SASIB Beverage S.p.A., Parma, Italy

Filed Apr. 26, 1995, Ser. No. 433,543

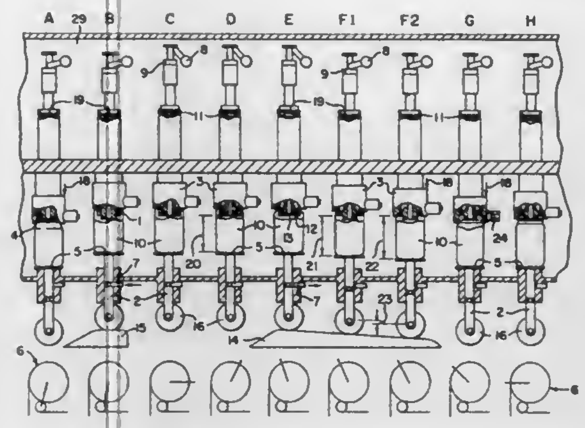
Claims priority, application Italy, Oct. 30, 1992, PR92A0046; Apr. 16, 1993, PR93A0014

Int. Cl.^{6} B65B *1/104*

U.S. Cl. 141—276 **13 Claims**

1. A process for filling containers, in particular cans, comprising phases of:

establishing a sealed coupling between a mouth of a container and a filler valve group, including a lifting of the container towards the filler valve group;



opening a gas valve and a liquid valve and subsequently closing said valves once a filling operation has been effected; during said opening an inferior end of a gas inflow pipe is positioned at a same level as an inferior end of a liquid inflow pipe, or at a higher level with respect thereto, such that when a liquid level in the container reaches and closes the liquid inflow pipe, the liquid level also closes the gas pipe, or respectively the gas pipe remains open;

separating the container from the valve group;

wherein when the liquid level in the container reaches at least the liquid pipe, when the gas valve and the liquid valve are still mechanically open, a liquid level correction phase in the container occurs, by means of a gradual and adjustable change in a height position of the container with respect to the valve group, the size of the change being in accordance with a required level of liquid in the container.

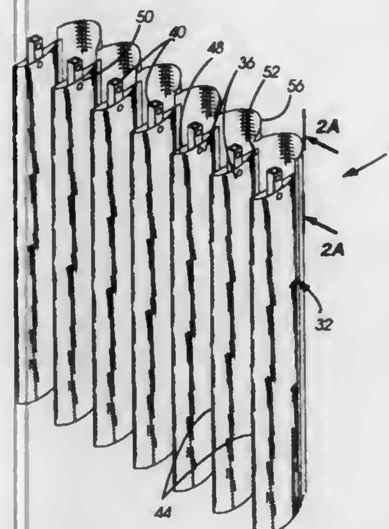
5,749,404
FABRIC FOR AN ARCHITECTURAL COVERING AND METHOD AND APPARATUS OF MANUFACTURING SAME

Wendell B. Colson, Boulder, Colo., assignor to Hunter Douglas Inc., Upper Saddle River, N.J.

Filed May 10, 1995, Ser. No. 437,960

Int. Cl.^{6} E06B *9/06*

U.S. Cl. 160—84.04 **76 Claims**



1. A fabric for an architectural covering device comprising a plurality of elongated vanes having opposite longitudinal ends and at least one longitudinally extending side edge, each vane having a pair of flaps along said edge, and at least one sheet of material interconnecting said vanes, said at least one sheet being secured to said vanes along longitudinal lines of attachment by securing said at least one sheet to said vanes between said flaps.

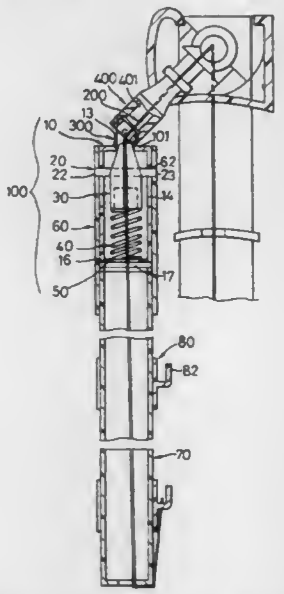
5,749,405
OPERATING DEVICE FOR A VENETIAN BLIND TO CONTROL RAISING AND LOWERING OF THE SALTS AND TO ADJUST TILTING ANGLE OF THE SLATS

Tai-Long Huang, No. 382, Sec. 1, Yuan-Lu Rd., Fu-Hsing Hsiang, Chang Hua Hslen, Taiwan

Filed Apr. 18, 1997, Ser. No. 844,406

Int. Cl.^{6} E06B *9/30*

U.S. Cl. 160—168.1 R **4 Claims**



1. An operating device for a Venetian blind which includes an elongated top housing, a horizontally disposed shaft journalled in the top housing, a plurality of horizontal slats suspended one above another from the top housing, each of the slats having two opposite longitudinal sides, a bottom rail disposed below the slats, a pair of pull ropes, each of the pull ropes having a first end portion which passes through the housing and through the slats and which is mounted to the bottom rail, and a second end portion which extends out of the housing, two pairs of tilting cords, each of the pairs of tilting cords being disposed on a respective one of the opposite longitudinal sides of the slats and having an upper end secured to the shaft and a lower end mounted on the bottom rail, and a plurality of suspending strings disposed below each of the slats and connecting one of the pairs of tilting cords to the other one of the pairs of tilting cords, said operating device comprising:

a rotary tilt control unit having first and second ends, said first end being adapted to be coupled to the shaft of the Venetian blind such that axial rotation of said tilt control unit results in corresponding axial rotation of the shaft to adjust tilting angles of the slats;

a positioning tube connected to said second end of said tilt control unit, said positioning tube having a top wall formed with a top opening and a surrounding wall extending downwardly from a periphery of said top wall, said top wall and said surrounding wall cooperatively confining a receiving space, said top opening being adapted to permit extension of the second end portions of the pull ropes through said positioning tube, said surrounding wall having an axially extending slot unit formed therethrough;

a retaining member axially movable in said receiving space of said positioning tube, said retaining member having a tapered upper end portion which is extendible through said top opening of said positioning tube, a hollow lower end portion and a radial pin hole aligned with said slot unit, said retaining member being provided with a pair of axially extending guiding grooves for receiving the pull ropes, each of said

guiding grooves having a depth not greater than diameter of each of the pull ropes;
a biasing spring disposed in said positioning tube under said retaining member for biasing said retaining member upwardly so that the pull ropes can be clamped between said tapered upper end portion of said retaining member and said top wall of said positioning tube;
an elongated sleeve disposed around said positioning tube and formed with a radial hole aligned with said pin hole of said retaining member, said elongated sleeve having a length sufficient to conceal major sections of the second end portions of the pull ropes that extend out of said positioning tube, said elongated sleeve further having an outer surface with at least one hook projection adapted for hooking the second end portions of the pull ropes that extend out of said elongated sleeve thereon; and
an insert pin extending through said radial hole of said elongated sleeve, said slot unit of said positioning tube and into said pin hole of said retaining member;
said elongated sleeve being movable downwardly relative to said positioning tube so that said insert pin and said retaining member are moved downwardly against biasing action of said biasing spring together with said elongated sleeve, thereby retracting said tapered upper end portion of said retaining member into said positioning tube for releasing the pull ropes.

5,749,406

VERTICAL BLIND WITH A CRANK ROD FOR OPERATION

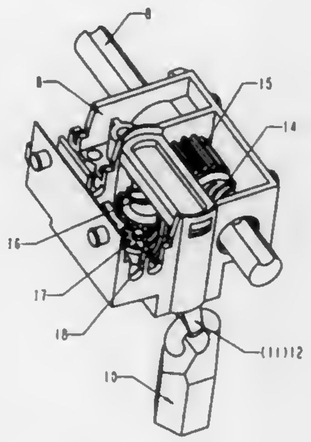
Siegfried Benthin, Bremerhaven, Germany, assignor to Benthin Aktiengesellschaft, Bremerhaven, Germany

Filed Jun. 28, 1996, Ser. No. 672,555

Claims priority, application Germany, Jul. 11, 1995, 195 25 139.3

Int. Cl.⁶ E06B *9/36*

U.S. Cl. 160—176.1 V **14 Claims**



1. A vertical blind device, comprising:
a crank rod for operation of the device;
a plurality of vertically oriented planar slats jointly pivotable about the vertical axis by 180° from a stopped substantially coplanar closed hanging position, defining a closed hanging plane and substantially parallel to one another, into another stopped substantially coplanar closed hanging position in said closed hanging place;
a housing;
a pivot pin connected to said housing and connected to said crank rod for rotation upon rotation of said crank rod;
pivot drive means connected to said crank rod via said pivot pin and connected to said slats for driving said slats for pivoting said slats about said vertical axis; and
pivot shifting means for changing a tilt direction of said pivot pin upon actuation of said drive means.

5,749,407

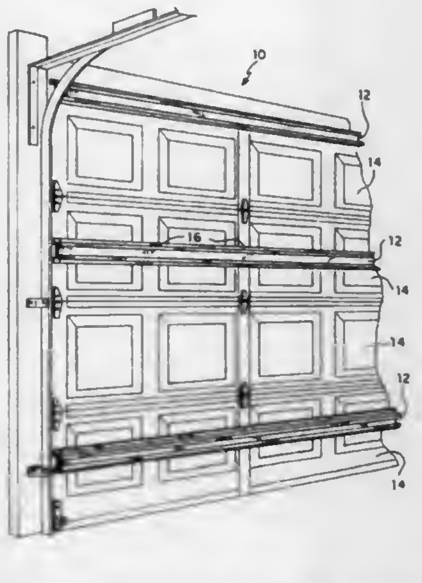
FOLDING GARAGE DOOR WITH REINFORCING STRUTS

Richard A. Brenner, Winston-Salem, N.C., and Dennis Romanelli, Pompano Beach, Fla., assignors to Amarr Company, Winston-Salem, N.C., and RBI, Inc., Pompano Beach, Fla.

Filed Mar. 18, 1997, Ser. No. 819,340

Int. Cl.⁶ E06B *3/48*

U.S. Cl. 160—229.1 **10 Claims**



1. A reinforcing strut for a garage door, said strut comprising:
a battlement shaped top including a crenel between two merlons;
flat sidewalls extending perpendicularly from each merlon;
each sidewall having a base flange outwardly disposed therefrom; and
each flange having a lip portion parallel to said sidewall, said strut having a strut length for reinforcing a width of a garage door; whereby a series of garage door struts are adapted to be fastened horizontally across the rear of said garage door to protect against wind damage due to extreme sudden positive and negative pressures.

5,749,408

METHOD FOR FREEFORM FABRICATION BY MOLTEN METAL DEPOSITION

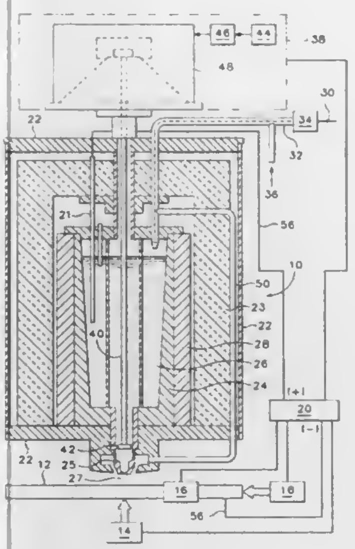
David W. Gore, Corvallis, Oreg., assignor to Incre, L.L.C., Corvallis, Oreg.

Filed Jul. 31, 1996, Ser. No. 692,908

Int. Cl.⁶ B22D *46/00*

U.S. Cl. 164—4.1 **7 Claims**

1. A method for measuring the height of a layer of material that is formed by molten deposition of electrically conductive material comprising:
(a) forming a first layer of material by ejecting a series of continuous elongated extrusions of molten material at a known ejection speed from an ejection head that is separated from a surface onto which said material is deposited by a first predetermined distance;
(b) measuring a first make time for each said extrusion equal to the time between when the ejection of said extrusion is initiated and when said extrusion first contacts said surface;
(c) using said first make time and the election speed to calculate a first gap between the ejection head and said surface for each extrusion;
(d) increasing the separation between the ejection head and said surface by a second predetermined distance;
(e) forming a second layer of material on top of said first layer of material;



(f) measuring a second make time for each extrusion in said second layer of material;
(g) using said second make time to calculate a second gap for each extrusion in said second layer; and
(h) calculating the height of the portion of said first layer formed from each extrusion by subtracting the respective second gap from the sum of the associated first gap and said second predetermined distance.

5,749,409

METHOD OF FORMING REFRACTORY COATED FOUNDRY CORE

June-Sang Siak; Scott William Biederman, both of Troy; William Thomas Whited, Saginaw, and Mark Allen Datte, Auburn, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1995, Ser. No. 573,646

Int. Cl.⁶ B22C *3/00;9/10*

U.S. Cl. 164—23 **8 Claims**

1. A method of making a coated foundry core comprising the steps of shaping and curing a mixture of foundry sand and water-soluble gelatin into a core having a desired configuration, permeating and sealing a surface of said core with a water-insoluble substance so as to form a water impermeable barrier at said surface, contacting said surface with an aqueous suspension of refractory particles to deposit a layer of said refractory particles atop said barrier, and drying said layer to adhere said refractory particles to said surface.

5,749,410

PROCESS FOR CASTING PIPE WITH TRANSVERSAL HOLE, AND CASTING DIE FOR THE SAME

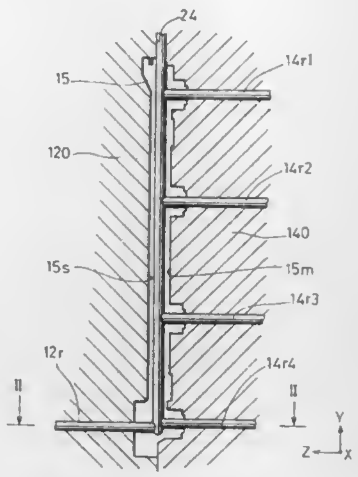
Seiji Uda; Mitsuhiro Karaki, both of Okazaki; Shinichi Yoshida, Toyota; Hidehiko Kadono, Toyota; Atsushi Ota, Toyota, and Hiroaki Mori, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Continuation-in-part of Ser. No. 357,184, Dec. 13, 1994, abandoned. This application Nov. 5, 1996, Ser. No. 743,211

Claims priority, application Japan, Dec. 15, 1993, 5-315271; Dec. 24, 1993, 5-328326; Nov. 21, 1994, 6-286562

Int. Cl.⁶ B22D *17/10*

U.S. Cl. 164—113 **5 Claims**



1. A process for die-casting a pipe, the pipe having an elongate longitudinal hole and a transversal hole, the elongate longitudinal hole being closed at a front end and the transversal hole communicating with the longitudinal hole in a substantially normal direction thereto at a vicinity of the closed end, the process comprising the steps of:
positioning a mandrel pin having a front face at a front end for forming the transversal hole by fixing the mandrel pin with respect to a casting die;
positioning a rod like center pin having a free end at a front end for forming the longitudinal hole by fixing the center pin with respect to the casting die; a side face of the center pin in the vicinity of the free end and the front face of the mandrel pin being nearly in contact with a fine clearance between the faces; and
charging high pressure molten metal toward the center pin into a die cavity after the center pin and the mandrel pin have been positioned with respect to the casting die to cause the center pin to elastically bend towards the mandrel pin so that the side face of the center pin in the vicinity of the free end is in contact with the front face of the mandrel pin; and drawing out the center pin and the mandrel pin from a cast product.

4. A casting die for die-casting a pipe, the pipe having an elongate longitudinal hole and a pair of transversal holes, the elongate longitudinal hole being closed at a front end and the pair of transversal holes communicating with the longitudinal hole in a substantially normal direction thereto from opposite sides at a vicinity of the closed end, the die comprising:
a casting die defining a cavity for forming a cast product;
a first mandrel pin having a front face at a front end for forming one of the transversal holes, the first mandrel pin being fixedly positioned with respect to the casting die;
a rod like center pin having a free end at a front end for forming the longitudinal hole, the center pin being fixedly positioned with respect to the casting die, a side face of the center pin in the vicinity of the free end and the front face of the first mandrel pin being nearly in contact with a fine clearance between the faces;
a second mandrel pin having a front face at a front end for forming the other of the transversal holes, the second mandrel pin being biased towards the first mandrel pin with respect to the casting die so that the center pin is elastically bent towards the first mandrel pin until the side face of the center pin in the vicinity of the free end is in contact with the front face of the first mandrel pin when the casting die is closed;
whereby high pressure molten metal is charged into the cavity in the condition that a side face of the center pin in the vicinity of the free end is surrounded by the front faces of the pair of the mandrel pins.

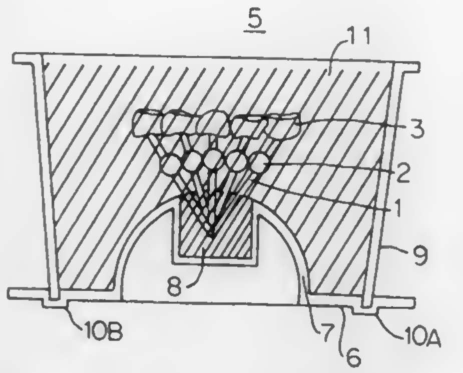
5,749,411
SPRUING ASSEMBLY

David M. Zielinski, West Seneca, and Melvin A. Engelman, Wappingers Falls, both of N.Y., assignors to Dentifax International, Inc.

Filed Jul. 9, 1996, Ser. No. 675,989

Int. Cl.^{6} B22C *7/02*

U.S. Cl. 164—244 **8 Claims**



1. A spruing assembly for receiving investment material in the production of an investment mold for castings comprising:

a multiple unit to be cast comprising a plurality of wax patterns,
a plurality of sprues connected at one ends thereof to corresponding ones of said plurality of wax patterns,
said plurality of sprues being in a tee-pee arrangement in which one sprue of said plurality of sprues is in a vertical position and the remaining ones of said plurality of sprues are angled toward said one sprue whereby said plurality of sprues are of different lengths,
a plurality of reservoirs maintained on said plurality of sprues being shaped so as to uniformly distribute stress over its entire surface and spaced a predetermined distance from said plurality of wax patterns,
said plurality of reservoirs being moveably positioned on said plurality of sprues so that all of said reservoirs are connected together and maintained at the same horizontal level to thereby create a heat center for the investment mold despite the differing lenghts of said plurality of sprues,
a hollow chamber,
base means within said chamber,
the other ends of said tee-pee arranged plurality of sprues being inserted in said base member to thereby provide support for the combination of said plurality of sprues, said plurality of reservoirs and said plurality of wax patterns, and
investment material contained within said chamber surrounding said plurality of sprues, said plurality of reservoirs and said plurality of wax patterns.

5,749,412
HEAT EXCHANGER HAVING A TUBULAR HEADER WITH A FASTENING LUG

Patrick Balthazard, Guignicourt, France, assignor to Valeo Thermique Moteur, Le Mesnil-Saint Denis, France

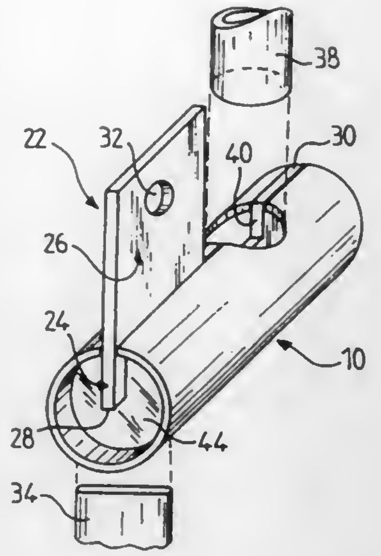
Filed May 2, 1997, Ser. No. 850,521

Claims priority, application France, May 3, 1996, 96 05578

Int. Cl.^{6} F28F *9/02*

U.S. Cl. 165—67 **11 Claims**

1. A heat exchanger comprising: a header in the form of a tubular wall having aligned through holes; heat exchanger tubes having end portions received in the aligned holes in the header; and a fastening member comprising at least one fastening lug projecting outwardly from the said tubular wall, wherein the tubular wall defines a longitudinal slot of given length and width, the header including a member comprising a spine portion, and the fastening lug, the fastening lug being fixed with respect to, and projecting from, the spine portion, the spine portion having a length and a width which are matched to the length and width, respectively, of the slot in the tubular wall, so that the spine portion can be assembled with the tubular wall by being introduced into the slot and then brazed to the tubular wall, the spine portion defining an inner longitudinal edge disposed within the tubular wall of the header and spaced away therefrom, on a side of the header defining the holes.



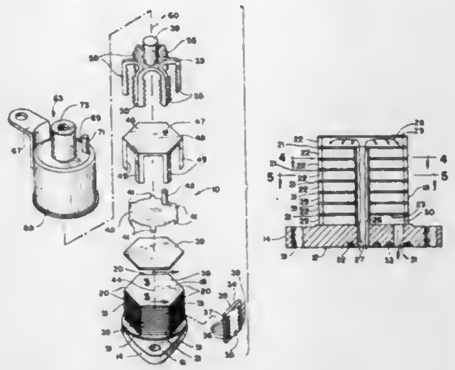
5,749,413
HEAT EXCHANGER FOR HIGH POWER ELECTRICAL COMPONENT AND PACKAGE INCORPORATING SAME

Lawrence E. Crowe, Lindenwood, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 23, 1991, Ser. No. 764,238

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 165—80.1 **24 Claims**



15. A power electronics package comprising:

a series of orifice plates stacked in an axial direction and separated from one another by spacer plates, the plates all terminating at an outer flat wall portion and the orifice plates having offset axial apertures therethrough, the flat wall being adapted to receive a semiconductor device; and a base to which the heat exchanger is joined;
wherein the base and heat exchanger have aligned axial channels therein for admittance of coolant whereby thermal conduction paths are established in a radial direction and wherein the orifice plates may be thermally linked by coolant flowing in the axial direction therebetween; said heat exchanger further including a distribution plenum and a collection plenum at opposite axial ends thereof; and
a power bus disposed on the heat exchanger and adapted to interconnect multiple electrode leads of a semiconductor device.

5,749,414
CONNECTION BETWEEN TUBES AND TUBE BOTTOM FOR A HEAT EXCHANGER

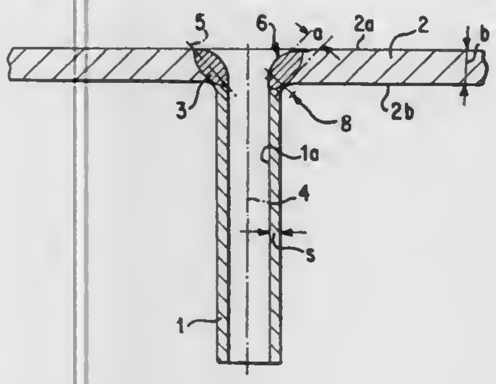
Herbert Damsohn, Aichwald, and Albert Schmitz, Simmozheim, both of Germany, assignors to BEHR GmbH & Co., Stuttgart, Germany

Continuation of Ser. No. 359,190, Dec. 19, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 766,048

Claims priority, application Germany, Dec. 22, 1993, 43 43 825.3

Int. Cl.^{6} F28F *9/18*

U.S. Cl. 165—178 **13 Claims**



1. A heat exchanger assembly for a motor vehicle radiator comprising:

an aluminum tube bottom adjoining a collecting tank which defines a collecting space,
a plurality of aluminum tubes extending parallel to one another and having respective tube ends thereof fully inserted into respective tube bottom openings having uniform cross-sections,
and laser weld seams, formed only from the tube ends and a portion of the tube bottom, surrounding an entire circumference of each of the respective tube ends to sealingly connect the tube ends in the respective tube bottom openings,
wherein each laser weld seam exhibits an inner contour extending from a position flush with an interior tube wall surface to a position flush with a side of the tube bottom facing an interior of the collecting space,
wherein each respective weld seam, measured at an angle of 45° at an intersecting point between an outer tube wall and an underside of the tube bottom, has a thickness which is larger than the thickness of the tube wall.

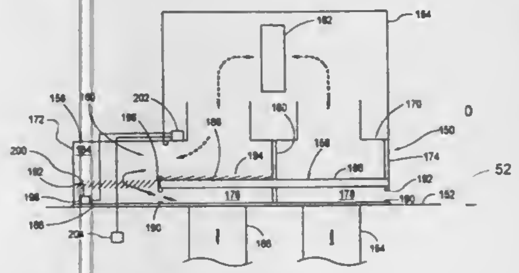
5,749,415
ROOF CURB ASSEMBLY WITH INTEGRAL DEHUMIDIFIER HEAT PIPE CONTROLLED BY A BYPASS SYSTEM

Khanh Dinh, Gainesville, Fla., assignor to Heat Pipe Technology, Inc., Alacnua, and Tropic-Kool Engineering Corp., Largo, both of Fla.

Filed Feb. 19, 1997, Ser. No. 802,117

Int. Cl.^{6} G05D *23/00*

U.S. Cl. 165—297 **15 Claims**



1. A roof curb assembly comprising:

(A) an enclosure configured for mounting on a roof of a building and for supporting an air conditioning unit, said enclosure including
  (1) a supply passage extending vertically therethrough and having an upper inlet and a lower outlet,
  (2) a return passage extending vertically therethrough and having a lower inlet and an upper outlet, and
  (3) a bypass passage having an inlet in fluid communication with the inlet of one of said supply and return passages and an outlet in fluid communication with the outlet of said one passage;
(B) a heat pipe disposed in said enclosure curb, said heat pipe including an evaporator portion disposed in said return passage and a condenser portion disposed in said supply passage; and
(C) bypass means for selectively and alternatively
  (1) facilitating airflow through said one passage while inhibiting airflow through said bypass passage, and
  (2) inhibiting airflow through said one passage while facilitating airflow through said bypass passage.

5,749,416
DOWNHOLE PUMP DRIVE HEAD ASSEMBLY

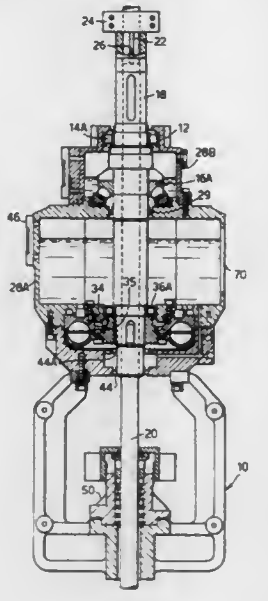
Iain Russell Belcher, Timperley, United Kingdom, assignor to Mono Pumps Limited, United Kingdom

Continuation-in-part of Ser. No. 613,158, Mar. 8, 1996, abandoned. This application Jan. 22, 1997, Ser. No. 787,204

Claims priority, application United Kingdom, Apr. 10, 1995, 9507396

Int. Cl.^{6} E21B *43/00;* **F16D** *9/10*

U.S. Cl. 166—68.5 **10 Claims**



1. A downhole pump drive head assembly for driving the rod string which rotates the rotor of a downhole pump, said assembly comprising a frame, a bearing assembly mounted to said frame, a drive shaft rotatably supported in said bearing assembly for rotation about a vertical axis, a driving connection between said drive shaft and an upper rod of said rod string drivingly engaging the upper rod, a body surrounding said bearing assembly, a hydraulic retarder associated with said body, said hydraulic retarder comprising a retarder housing, a retarder stator turbine affixed within said housing, a retarder rotor turbine operatively connected to said drive shaft within said housing and closely adjacent said retarder stator turbine, said stator and rotor turbines being mounted coaxially With one another and an operative connection between said retarder turbine rotor and said drive shaft, the retarder being effective to brake rotation of said drive shaft in one direction of

rotation of said drive shaft only, but allowing relative rotation therebetween in the opposite direction of rotation of said drive shaft.

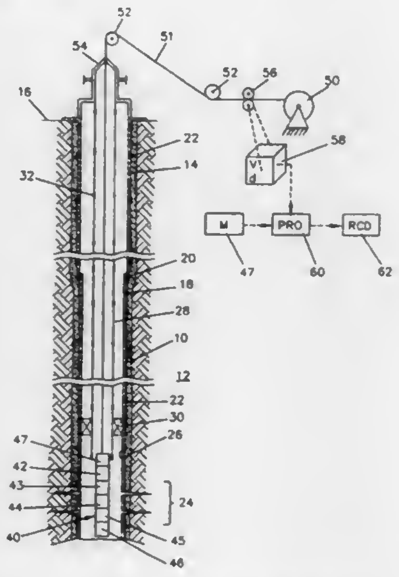
5,749,417
PRODUCTION LOG

Leroy C. Delatorre, League City, Tex., assignor to Panex Corporation, Sugar Land, Tex.

Filed Mar. 5, 1996, Ser. No. 610,759

Int. Cl.^{6} E21B *47/06*

U.S. Cl. 166—254.2 **12 Claims**



1. A method of correlating production data from a well bore of a producing well traversing earth formations comprising the steps of:

disposing a well tool in the well bore on a wireline and collecting data in a memory in the well tool as a function of real time where said data includes pressure, temperature, fluid flow velocity and depth;

moving said well tool along said well bore with a surface located wireline means connected by wireline to the well tool;

measuring the velocity of the tool movement of the wireline as a function of real time;

measuring the depth of the well tool as a function of real time;

removing the well tool from the well bore: and

combining the velocity of the tool movement measured on the real time basis with the fluid flow velocity indicated in the well tool on the real time basis and extracting an actual velocity of fluid flow in the well bore from the velocity of the tool movement.

5,749,418
CEMENTITIOUS COMPOSITIONS AND METHODS FOR USE IN SUBTERRANEAN WELLS

Sudhir Mehta, Plano, Tex., and William J. Caveny, Rush Springs, Okla., assignors to Halliburton Energy Services, Inc., Duncan, Okla., and Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 14, 1997, Ser. No. 834,065

Int. Cl.^{6} E21B *33/13;* C04B *22/12*

U.S. Cl. 166—292 **20 Claims**

1. A method of cementing a wellbore comprising the steps of:

forming a cementitious composition comprising a hydraulic cement which contains more than about 0.3% alkali sulfate by weight thereof, sufficient water to form a pumpable slurry, and iron chloride present in an amount in the range of from about 0.1% to about 10% by weight of said cement;

pumping the slurry into the wellbore; and

allowing the slurry to solidify within the wellbore.

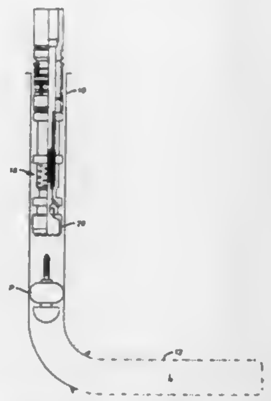
5,749,419
COMPLETION APPARATUS AND METHOD

Martin P. Coronado, Cypress, Tex., and Alan Mackenzie, Muscat, Oman, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 9, 1995, Ser. No. 555,598

Int. Cl.^{6} E21B *33/12*

U.S. Cl. 166—387 **29 Claims**



1. A method of completing a wellbore, comprising:

running in a plug having an inflatable element and a separate anchoring mechanism;

isolating a lower zone in a wellbore by inflating said element and releasably locking with a locking device said anchoring mechanism in a set position;

deflating said element with a subsequently installed deflation tool;

continuing support for said plug with said locked anchoring mechanism after said deflation until a predetermined release force is exerted which is sufficient to overcome said locking device.

5,749,420
DEVICE FOR PARTICLES DETECTION IN A PIPELINE

Lennart Carl Erik Jansson, Värmdö , Sweden, assignor to Firefly AB, Huddinge, Sweden

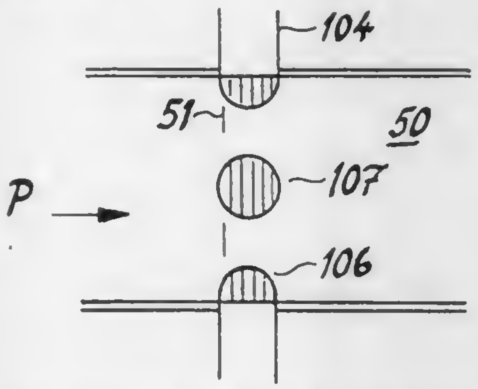
PCT No. PCT/SE94/00908, § 371 Date Apr. 4, 1996, § 102(e) Date Apr. 4, 1996, PCT Pub. No. WO95/10330, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 3, 1994, Ser. No. 624,486

Claims priority, application Sweden, Oct. 8, 1993, 9303306

Int. Cl.^{6} A62C *3/00*

U.S. Cl. 169—54 **16 Claims**



1. A safety system for use with a process in which loosely formed process material is produced in a first unit and transported to a receiving second unit along a path between the first and the second units, the material produced by said first unit being liable to produce discrete particles which have a temperature sufficiently high to initiate fire within at least the second unit, the path including a stabilizing zone, a high-temperature particle indicating zone, and an extinguishing zone having extinguishing means for extinguishing the discrete particles, the safety system comprising:

a sensor arrangement having at least two particle sensors located in the indicating zone, and

an indicating and activating unit,

the particle sensors including means for coacting with the indicating and activating unit by each sending an intensity signal for each of the discrete particles, the sensor arrangement having means for sensing over a cross section of the path an intensity of each of the discrete particles, the indicating and activating unit having means for evaluating a particle temperature intensity for one of said discrete particles from each of the intensity signals corresponding to said one discrete particle received from each of said sensors, and means for coordinating the intensity signals with each other such that a likelihood of at least one of the discrete particles to initiate the fire is calculated and established on a basis of the signals received from each of the sensors.

5,749,421
PNEUMATIC IMPACT BREAKER

Ingemar Sven Johansson, Haninge, and Ake Lennart Nilsson, Enskede, both of Sweden, assignors to Atlas Copco Berema AB, Nacka, Sweden

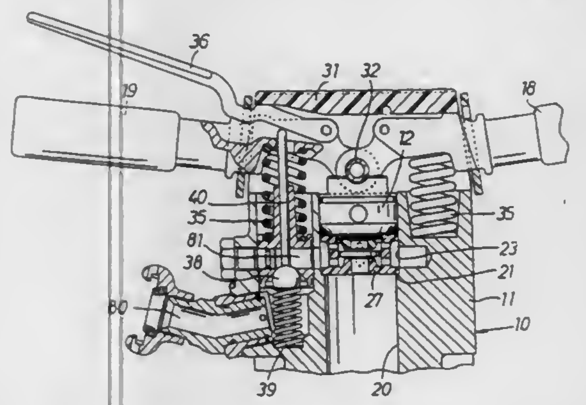
PCT No. PCT/SE95/00210, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO95/23050, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 28, 1995, Ser. No. 700,527

Claims priority, application Sweden, Feb. 28, 1994, 9400685

Int. Cl.^{6} B25D *17/04*

U.S. Cl. 173—162.2 **19 Claims**



1. A pneumatic impact breaker comprising:

a housing provided at a rear end thereof with at least one handle;

a longitudinal cylinder bore formed in said housing;

a hammer piston reciprocally guided in said cylinder bore;

a socket formed in a front portion of said housing for receiving a rear impact receiving end of a working implement;

an air distributing valve located in a rear portion of said cylinder bore and arranged to direct motive pressure air alternatingly to opposite ends of said hammer piston to make said hammer piston reciprocate in said cylinder bore; and

a cylinder head forming a closure for said cylinder bore as well as an axial support for said air distributing valve;

wherein said cylinder head at least partly extends into said rear portion of said cylinder bore;

wherein said housing is formed at said rear end thereof with two parallel wall portions both extending rearwardly beyond said cylinder head;

wherein said at least one handle extends in between said two parallel wall portions; and

wherein a wedge bolt is mounted between said two parallel wall portions and extends perpendicularly to said two parallel wall portions as well as to said cylinder bore to form an axial lock for said cylinder head and a mounting member for said at least one handle.

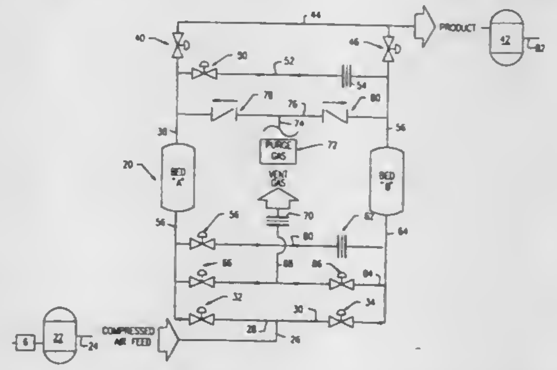
5,749,422
NON-CRYOGENIC NITROGEN FOR ON-SITE DOWNHOLE DRILLING AND POST DRILLING OPERATIONS

Keith Michael, Spring, Tex., assignor to MG Nitrogen Services, Inc., Malvern, Pa.

Continuation of Ser. No. 387,266, Feb. 13, 1995, which is a continuation-in-part of Ser. No. 77,014, Jun. 14, 1993, Pat. No. 5,388,650. This application Sep. 4, 1996, Ser. No. 707,352

Int. Cl.^{6} E21B *21/00*

U.S. Cl. 175—71 **30 Claims**



1. A method for enhancing gas or oil production in which a compressed nitrogen rich gas is delivered to a target area selected from the group consisting of a well and a reservoir containing said gas or oil, the improvement comprising:

(a) removing at least a substantial portion of the oxygen contained within a feed stream of air at the site of said drilling to produce a nitrogen rich gas and an oxygen enriched waste gas;

(b) inserting a vessel into the target area;

(c) placing a cement-like material around the vessel to secure the same within the target area;

(d) delivering the nitrogen rich gas to the target area; and

(e) injecting the nitrogen rich gas into the cement-like material to reduce the density and improve the flow properties of the cement-like material.

5,749,423
BELTED WORK MACHINE

Jerry J. Burckhartzmeyer, Peoria; Elmer R. Crabb, Aurora, both of Ill.; Terry F. Lehnhoff, Vichy, Mo., and Alva L. Watson, Jr., Pekin, Ill., assignors to Caterpillar Inc., Peoria, Ill.

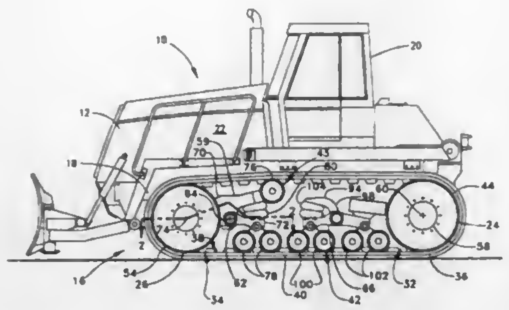
Filed Sep. 22, 1995, Ser. No. 532,441

Int. Cl.^{6} B62D *55/14*

U.S. Cl. 180—9.54 **3 Claims**

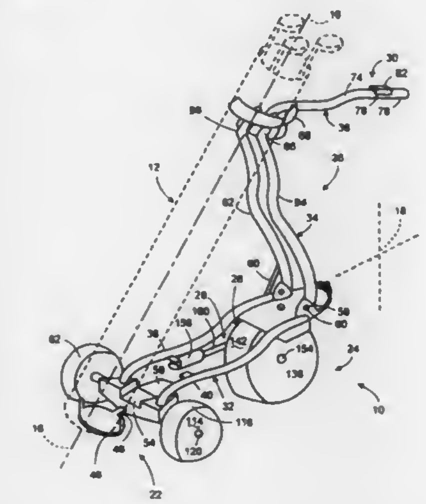
1. In an undercarriage for a heavy duty belt laying work machine, said undercarriage including a driver wheel, an idler wheel longitudinally spaced from said driver wheel, a mid-roller and an inextensible belt, said belt being entrained about said driver wheel, said idler wheel and said mid-roller, said driver wheel being adapted for drivingly engaging said belt, said undercarriage comprising:

an idler support system having an idler support arm, a mid-roller support arm and a carry-roller, each of such support arms being separately pivotally mounted to an axle, said idler support arm having said idler wheel rotatably mounted to a leading portion thereof and said carry-roller rotatably



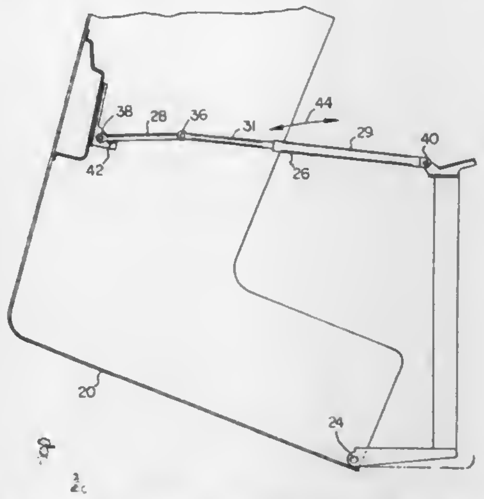
mounted to a trailing portion thereof with said axle being located between said idler wheel and said carry-roller, said mid-roller support arm having said mid-roller rotatably mounted thereto; and
a forward force reaction structure disposed between said idler support arm and said mid-roller support arm adapted to bias said idler support arm against said mid-roller support arm.

5,749,424
POWERED CART FOR GOLF BAG
Eric W. Reimers, 1235 Starwood, Missoula, Mont. 59802
Filed Jan. 26, 1995, Ser. No. 378,662
Int. Cl.^{6} B62D *51/04*
U.S. Cl. 180—19.2 **6 Claims**



1. A powered golf bag cart for use in conjunction with a golf bag, comprising:
a collapsible frame assembly including a base portion having a rear end and a front end, a central portion and a handle portion;
a power delivery assembly mounted on said frame assembly;
a drive wheel assembly, depending from said frame assembly below said rear end of said base portion and actively coupled with said power delivery assembly so as to be turned thereby;
a free wheel assembly including two opposed wheel members;
a steering assembly for adjusting the orientation of said drive wheel assembly with respect to said frame assembly; and
user operable control assembly means for controlling said power delivery assembly and said steering assembly, wherein
said frame assembly is formed such that it may be folded into a compact storage mode wherein the central portion nests within the base portion and the handle portion nests within the frame assembly, and said free wheel assembly is formed such that it may be horizontally folded, and the golf bag cart may be expanded into a use mode wherein the portions of said frame assembly and said free wheel assembly fold outward and are secured in place.

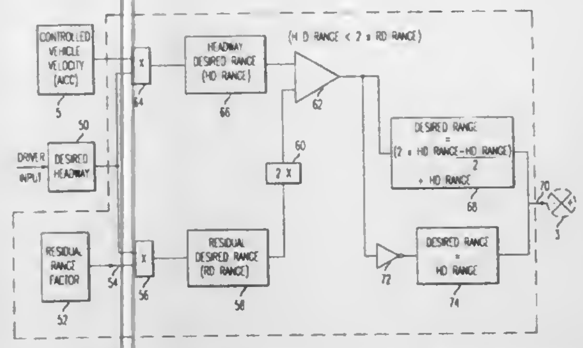
5,749,425
VEHICLE HOOD CHECK AND DAMPING MECHANISM
Charles Cudden, Farmington Hills, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Jun. 7, 1996, Ser. No. 660,367
Int. Cl.^{6} B62D *25/10*
U.S. Cl. 180—69.2 **6 Claims**



1. An automotive vehicle, comprising a vehicle body having an engine compartment, and an upright radiator in said engine compartment;
a forwardly-opening hood for said engine compartment having a swing axis located forwardly from the vehicle front tires at bumper level;
said hood being swingable through an arc of about seventy degrees during movement between the open and closed positions;
a two-way dampening mechanism for said hood;
said dampening mechanism comprising a variable length strut and a link pivotably connected to said strut;
said strut being swingable around an axis located above the radiator so as to swing through an arc of about one hundred sixty degrees during the opening-closing movement of the hood;
said link having a swingable connection with the hood for movement between a forwardly buckled connection with the strut when the hood is closed and an aligned connection with the strut when the hood is fully opened;
said strut and link being arranged so that the strut experiences a length increase as the hood approaches its open and closed positions, whereby said resilient force means generates a hood-movement damping force.

5,749,426
APPARATUS AND METHOD FOR CRUISE CONTROL
Simon Peter Gilling, Milton Keynes, England, assignor to Lucas Industries Public Limited Company, Solihull, United Kingdom
Filed Dec. 12, 1995, Ser. No. 571,302
Claims priority, application United Kingdom, Dec. 13, 1994, 9425057
Int. Cl.^{6} B60K *31/00*
U.S. Cl. 180—167 **1 Claim**

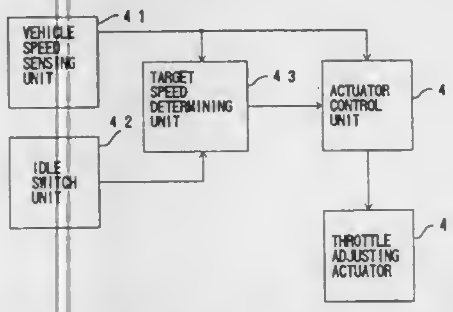
1. A cruise control system for controlling the speed of a controlled vehicle in relation to a target vehicle which is running ahead of said controlled vehicle with no other vehicles therebetween, comprising:
DESIRED HEADWAY means having a desired headway request manually input by a driver of the controlled vehicle in order to establish a driver's DESIRED HEADWAY values defined in terms of a desired time interval between said controlled vehicle and said target vehicle;
means for measuring the velocity of said controlled vehicle;


CONTROLLED VEHICLE VELOCITY (ACC)
5
DRIVER INPUT
DESIRED HEADWAY
50
RESIDUAL RANGE FACTOR
52
54
x
64
x
56
HEADWAY DESIRED RANGE (HD RANGE)
66
RESIDUAL DESIRED RANGE (RD RANGE)
58
2 X
60
(H D RANGE < 2 x RD RANGE)
62
DESIRED RANGE = (2 x HD RANGE−HD RANGE)/2 + HD RANGE
68
72
DESIRED RANGE = HD RANGE
74
70
3

means for multiplying together said driver's DESIRED HEADWAY value and said measured velocity of said controlled vehicle to establish a HEADWAY DESIRED RANGE (HD Range) value;
RESIDUAL RANGE FACTOR means which receives said DESIRED HEADWAY value and which provides at its output a RESIDUAL RANGE factor which increases in proportion to said DESIRED HEADWAY value, but wherein said proportion reduces as said DESIRED HEADWAY value increases;
means for multiplying together said driver's DESIRED HEADWAY value and said RESIDUAL RANGE factor to establish a RESIDUAL DESIRED RANGE (RD Range) value;
means for comparing said HEADWAY DESIRED RANGE value with a value equal to approximately twice the value of said RESIDUAL DESIRED RANGE; and
means for establishing a DESIRED RANGE to be targeted by the system wherein said DESIRED RANGE is selected to be equal to said HEADWAY DESIRED RANGE (HD Range) value, unless said HEADWAY DESIRED RANGE value falls below approximately two times said RESIDUAL DESIRED RANGE value, in which case the DESIRED RANGE targeted by the system is selected to be calculated from the expression: DESIRED RANGE=(2×RD Range−HD Range)+HD Range.

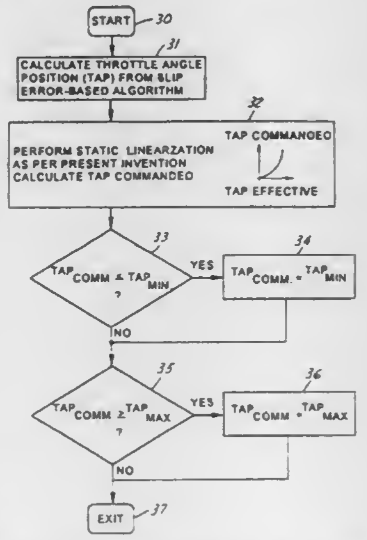
$$\text{DESIRED RANGE} = \left(2 \times RD\text{ Range} - \frac{HD\text{ Range}}{2}\right) + HD\text{ Range}$$

5,749,427
CONSTANT SPEED REGULATOR APPARATUS
Hisashi Satonaka, and Setsuo Tokoro, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan
Filed Jul. 11, 1996, Ser. No. 678,213
Claims priority, application Japan, Sep. 18, 1995, 7-238664
Int. Cl.^{6} B60K *31/04;* **G06F** *15/16*
U.S. Cl. 180—179 **15 Claims**


VEHICLE SPEED SENSING UNIT
41
TARGET SPEED DETERMINING UNIT
43
ACTUATOR CONTROL UNIT
44
IDLE SWITCH UNIT
42
THROTTLE ADJUSTING ACTUATOR
45

1. A constant speed regulator apparatus of an automotive vehicle in which a throttle opening angle of a throttle valve changes in response to a position of an accelerator pedal set by a vehicle operator and in response to an action of a driven throttle adjusting actuator, comprising:
a vehicle speed sensing unit for detecting a vehicle speed of the automotive vehicle;
an idle switch unit for detecting an OFF state of the throttle valve;
a throttle adjusting actuator for adjusting a throttle opening angle of the throttle valve to control the vehicle speed;
a target speed determining unit for determining a target speed by using the vehicle speed which is detected by the vehicle speed sensing unit immediately after the OFF state of the throttle valve is detected by the idle switch unit; and
an actuator control unit for controlling the throttle adjusting actuator to set the throttle opening angle of the throttle valve at a controlled level to maintain the vehicle speed at the target speed determined by the target speed determining unit, wherein when the accelerator pedal is pressed to exceed the level of the throttle opening angle controlled by the throttle adjusting actuator during a constant-speed running mode, the actuator control unit controls the throttle adjusting actuator to temporarily decrease the throttle opening angle to zero, and wherein a new target speed is determined based on the vehicle speed detected after the accelerator pedal is released and an OFF state of the throttle valve is detected by the idle switch unit.

5,749,428
TRACTION CONTROL THROUGH AN EFFECTIVE STATIC LINEARIZATION
Davorin D. Hrovat, and Minh N. Tran, both of Dearborn, Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Mar. 5, 1996, Ser. No. 610,939
Int. Cl.^{6} B60K *15/00*
U.S. Cl. 180—197 **1 Claim**


START
30
CALCULATE THROTTLE ANGLE POSITION (TAP) FROM SLIP ERROR-BASED ALGORITHM
31
PERFORM STATIC LINEARZATION AS PER PRESENT INVENTION CALCULATE TAP COMMANDED
TAP COMMANDED
TAP EFFECTIVE
32
TAP COMM ≤ TAP MIN ?
33
YES
NO
TAP COMM. = TAP MIN
34
TAP COMM ≥ TAP MAX ?
35
YES
NO
TAP COMM = TAP MAX
36
EXIT
37

1. A method of controlling traction for a vehicle having an internal combustion engine with electronically controlled operating parameters, including the steps of:
determining wheel slip error;
calculating throttle angle position based on wheel slip error;
performing static linearization of a throttle angle position to torque transfer function in view of the engine and powertrain non-linearities;
experimentally developing a table through a steady-state relation between wheel torque and the throttle position for each of a plurality of engine speeds, said table relating powertrain torque and throttle angle so that the total transfer function of the table and the internal combustion engine and powertrain is a linear transfer function, thus making traction control easier;
establishing a desired amount of wheel slip in percent slip or an equivalent rpm wheel speed;
detecting actual wheel slip;

determining an error wheel slip by comparing the actual and desired amount of wheel slip;
processing the error wheel slip using a proportional—integral—derivative controller and a filter to produce a calculated throttle angle position;
applying the throttle angle position to a transfer function generating a command throttle angle position;
establishing a predetermined minimum throttle angle position and a predetermined maximum throttle angle position from the statically linearized calculated throttle angle position;
determining if the commanded throttle angle position is less than the predetermined minimum throttle angle position;
if yes, setting commanded throttle angle position equal to the predetermined minimum throttle angle;
if no, determining if the commanded throttle angle position is greater than the predetermined maximum throttle angle position; and
if the commanded throttle angle position is greater than the predetermined maximum throttle angle position, then setting the commanded throttle angle position equal to the predetermined maximum throttle angle position.

5,749,429

POWER ASSIST APPARATUS OF POWER ASSISTED BICYCLE

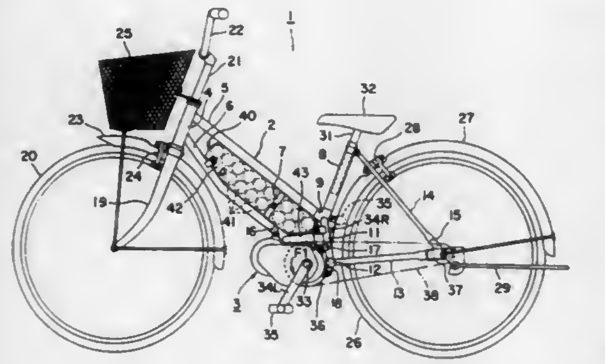
Kosaku Yamauchi, Shizuoka-ken; Shinobu Tsutsumikoshi, and Hisao Nagai, both of Hamamatsu, all of Japan, assignors to Suzuki Kabushiki Kaisha, Japan

Filed Mar. 28, 1996, Ser. No. 623,188

Claims priority, application Japan, Apr. 3, 1995, 7-077769; Jul. 31, 1995, 7-195587; Sep. 26, 1995, 7-247739; Sep. 26, 1995, 7-247740; Sep. 26, 1995, 7-247741; Sep. 29, 1995, 7-252773; Oct. 27, 1995, 7-280689

Int. Cl.^{6} B62M *7/12*

U.S. Cl. 180—205 **21 Claims**



1. A power assist apparatus of a power assisted bicycle comprising:
a crank shaft to be driven for rotation by a pedaling force;
an electric motor for generating an assisting power;
a force composition device for composing the pedaling force and assisting power to output a composed force to a driving wheel side and at the same time for generating two thrust component forces having magnitude proportional to pedaling force and assisting power;
a thrust component force magnitude difference detection means for detecting the difference in magnitude between said two thrust component forces; and
a control means for controlling an output of the electric motor so as to bring the difference in magnitude between said two thrust component forces to "0" and to an optional magnitude difference based on an input from the thrust component force magnitude difference detection means.

5,749,430

Patent Not Issued For This Number

5,749,431

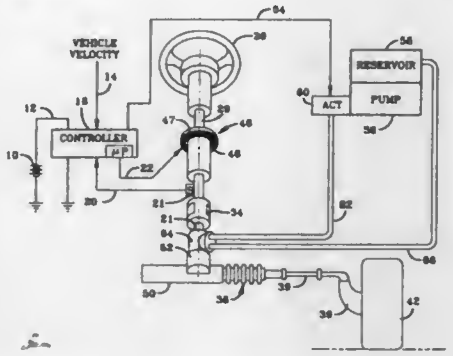
VEHICLE POWER STEERING SYSTEM

Terry Robert Peterson, Higley, Ariz., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1996, Ser. No. 656,958

Int. Cl.^{6} B62D *5/06*

U.S. Cl. 180—422 **6 Claims**



1. A vehicle power steering system comprising:
an electronic controller generating first and second control commands;
an electromagnetic mechanism including rotary and stationary magnetic circuits controllably coupled to the electronic controller and mechanically coupled to the power steering system, wherein a torque output of the electromagnetic mechanism varies in response to the first control command from the electronic controller, wherein the torque output from the electromagnetic mechanism is mechanically transferred to the power steering system to provide at least one of assist and resist torque to the power steering system; and
a hydraulic assist unit including a controllable valve controllably coupled to the electronic controller and responsive to the second control command therefrom, wherein the hydraulic assist unit is mounted to provide assist torque to the power steering system, wherein the hydraulic assist unit provides the assist torque responsive to the control of the controllable valve by the electronic controller.

5,749,432

POWER STEERING GEAR FOR MOTOR VEHICLE

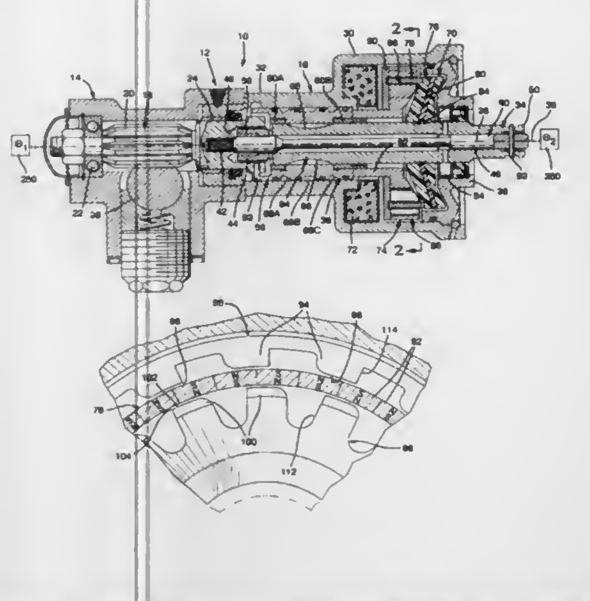
Joel Edward Birsching, Unionville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1996, Ser. No. 673,468

Int. Cl.^{6} B62D *5/04;5/083*

U.S. Cl. 180—443 **3 Claims**

1. In a motor vehicle power steering gear having a proportional control valve comprising a valve spool connected to a steered wheel of the vehicle, a valve body connected to a manual steering wheel of the vehicle and rotatable with respect to the valve spool, and a torsion bar having a first end rotationally coupled to a steerable wheel of the vehicle and a second end connected to the manual steering wheel of the vehicle, the valve spool having a center position relative to the valve body with the torsion bar resisting relative rotation of the valve spool from the center position with a restoring torque proportional to the amount of twist of the torsion bar caused by manual effort applied at the manual steering wheel of the vehicle, and an electromagnetic apparatus for varying the magnitude of the restoring torque of the torsion bar comprising a stationary exciting coil, a permanent magnet assembly including a cylindrical permanent magnet ring connected to the valve spool for rotation as a unit therewith and having a first plurality of permanent magnets thereon of alternating radial polarity, each permanent magnet being separated circumferentially from adjacent permanent magnets by boundaries, and a pole piece connected to the valve body for rotation as a unit therewith and magnetically coupled to the exciting coil, the pole piece having a magnetic flux conducting outer ring disposed radially outboard of the permanent magnet ring and defining a second plurality, half the first plurality, of outer pole teeth extending radially inward toward the permanent magnet ring and a magnetic flux conducting inner ring disposed radially inboard of the permanent magnet ring and defining a third plurality, equal to the second plurality, of inner pole teeth extending radially outward toward the permanent magnet ring, each of the inner pole teeth defining with one of the outer pole teeth a pole tooth pair with a region of circumferential overlap, the improvement comprising:
the permanent magnet ring being oriented, with the valve spool in its center position, in a position of zero electromagnetic and mechanical torque with no current in the exciting coil and with alternate ones of the boundaries separating the permanent magnets aligned substantially at the centers of the regions of circumferential overlap of successive pole tooth pairs, whereby current in the exciting coil provides torque between the permanent magnet ring and pole piece in and to both sides of the center position of the valve spool.



5,749,433

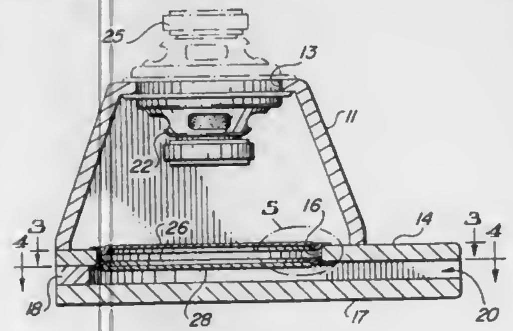
MASSLINE LOUDSPEAKER ENCLOSURE

Michael Jackson, 4524 N. 35th Pl., Phoenix, Ariz. 85018

Filed Feb. 13, 1996, Ser. No. 600,497

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 181—156 **21 Claims**



1. A speaker enclosure including in combination:
a primary sealed enclosure having a first predetermined volume and having at least first and second flat walls therein with a first aperture of predetermined dimensions, and having a first predetermined area, through said first wall for mounting a loudspeaker of complementary dimensions to said predetermined dimensions of said first aperture therein;
a second aperture through said second wall of said primary sealed enclosure, said second aperture having second predetermined dimensions;
a first passive plate movably mounted in said second aperture in said second wall sealing said second aperture against passage of air therethrough;
a second passive plate spaced from said first passive plate and movably mounted in said second aperture further sealing said second aperture against passage of air therethrough to form a sealed airspace between said first and second passive plates having a volume not greater than twenty percent of said first predetermined volume, wherein said first and second passive plates are independently mounted and are separated by a predetermined distance selected to permit each of said first and second passive plates to undergo a full range of independent acoustic excursions without mechanically interfering with one another; and
an elongated sealed cavity attached to said second wall of said primary enclosure over said second passive plate and having an open slot therein in a plane perpendicular to said second wall, said open slot having a second predetermined area which is less than said first predetermined area.

5,749,434

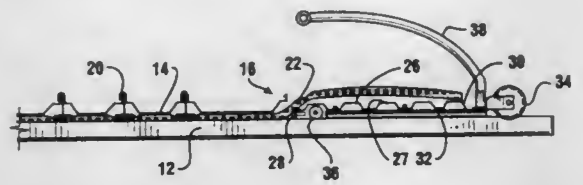
ROOF EDGE PROTECTION SYSTEM

James G. Walcher, Willard; James R. Limbird, Attica, and Arthur C. Herner, Monroeville, all of Ohio, assignors to Safety Equipment Inc., Monroeville, Ohio

Filed Apr. 11, 1994, Ser. No. 226,128

Int. Cl.^{6} E04G *3/12*

U.S. Cl. 182—45 **9 Claims**



1. A method for minimizing the risk of falls during installation of a roof deck on a building frame, said building frame having a plurality of beam members extending in a first direction and wherein said roof comprises a plurality of deck panels extending traversely of said beam members, and wherein each said panel has a traversely extending front edge and back edge connectible to adjacent back and front edges of adjacent panels respectively, comprising the steps of:
placing a first deck panel in supported relation on said building frame; providing a platform supportably movable in said building frame, said platform having a trailing edge adjacent said front edge of said first deck panel;
supporting a second deck panel on said platform with a back edge of said second panel in abutting relation with the front edge of the first deck panel;
securing the back edge of said second deck panel to the front edge of said first deck panel while said second panel is supported on said platform; and
moving said platform in the first direction on said building frame so that said second panel is no longer supported on said platform and said trailing edge of said platform is adjacent said front edge of said second deck panel.

5,749,435

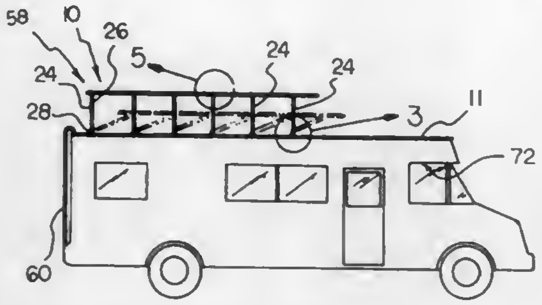
Patent Not Issued For This Number

5,749,436
COLLAPSIBLE RAILING FOR MOUNTING ON A VEHICLE ROOF

Thomas Erwin Satchwell, III, 1036 LaSalle St., Jacksonville, Fla. 32207

Filed Dec. 6, 1995, Ser. No. 567,910
Int. Cl.^{6} E06C ***5/00***

U.S. Cl. 182—127 **3 Claims**



1. A new and improved collapsible railing comprising, in combination:
a vehicle with a roof;
a generally rectangular railing including a tubular rod with a linear rear section, an arcuate front section, and a pair of linear side sections defining an interior space;
a plurality of collapsible stanchions, each of the stanchions having an upper end and a lower end, the lower end comprising a base mounted to the roof of the vehicle and a pivotal means allowing each of the stanchions to collapse;
a plurality of generally T-shaped sleeve joints, each of the sleeve joints having a horizontal upper sleeve secured about the railing and a lower sleeve pivotally coupled to the upper sleeve and secured about the upper end of the corresponding stanchion; and
a ladder access section comprising a portion of the railing adjacent to a ladder coupled to the vehicle, the ladder access section hingably coupled at a first end to a sleeve joint and releasably coupled at a second end to a sleeve, the ladder access section further having an upright orientation for allowing access to the interior space of the railing and a prone orientation for precluding access thereto;
wherein at least one of the pivotal means comprises a locking hinge having a circular first portion with a plurality of teeth formed in an exterior periphery thereof and a threaded aperture centrally disposed therein, the first portion coupled to the base of the stanchion; a circular second portion with a plurality of teeth formed in an interior periphery thereof and a threaded aperture centrally disposed therein, the second portion having a sleeve coupled thereto for securing about the lower end of the stanchion; and a wing bolt for inserting within the threaded apertures and having a first disengaged orientation for allowing disengagement of the teeth thereby allowing the stanchions and railing to swivel between an upright and collapsed position, the wing bolt further having an inserted orientation for allowing engagement of the teeth thereby precluding the stanchions and railing from swiveling between the upright and collapsed position.

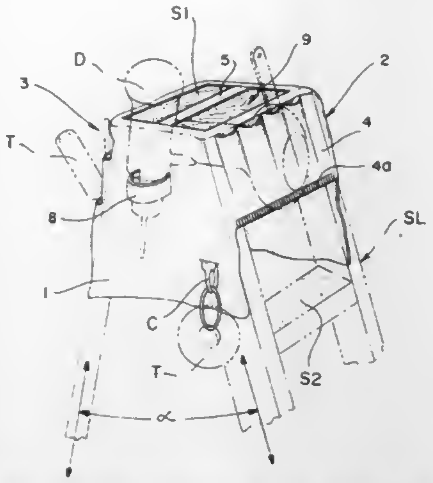
5,749,437
FREE-STANDING LADDER SUPPORTED TOOL HOLDER

Ronald K. Weller, 10615-Snyder Rd., San Diego, Calif. 91941

Filed Apr. 2, 1996, Ser. No. 626,519
Int. Cl.^{6} B65D ***85/00***

U.S. Cl. 182—129 **14 Claims**

1. In combination:
a) tool holder, comprising:
a skirt including a front side sheet, a rear side sheet, a left side sheet, and a right side sheet connected together at sides thereof to form a generally tubular structure having a top opening and a bottom opening;



said skirt narrowing towards the top thereof, and said top opening having a smaller size than said bottom opening;
said front side sheet, said rear side sheet, said right side sheet, and said left side sheet each being made of a substantially flat but flexible material;
at least one of said front side sheet, said rear side sheet, said right side sheet, and said left side sheet having at least one pocket for holding a tool;
said top opening being delineated by upper edges of each of said front side sheet, said rear side sheet, said right side sheet, and said left side sheet;
a handle extending across said top opening and attached to said upper edges of either said front side sheet, said rear side sheet, said right side sheet, and said left side sheet, at opposite sides of said top opening, said handle being made of a substantially flat but flexible material;
whereby when placed upon a free-standing ladder the top surface of the free-standing ladder can be exposed through the top opening and the handle can rest on a top platform of the free-standing ladder so that the top platform will remain unobstructed in normal use of the free-standing ladder;
b) a free-standing ladder having a hinged supporting frame topped with a top platform; and
c) said tool holder being fitted over the top platform of said free-standing ladder with a lower surface of said handle resting on an upper surface of said top platform.

5,749,438
SAFETY DEVICE FOR EMERGENCY EXITS

Horst Rothkirch, Rietschelstrasse 4, D-01069, Dresden, Germany

PCT No. PCT/DE94/00824, § 371 Date Jan. 19, 1996, § 102(e) Date Jan. 19, 1996, PCT Pub. No. WO95/03091, PCT Pub. Date Feb. 2, 1995

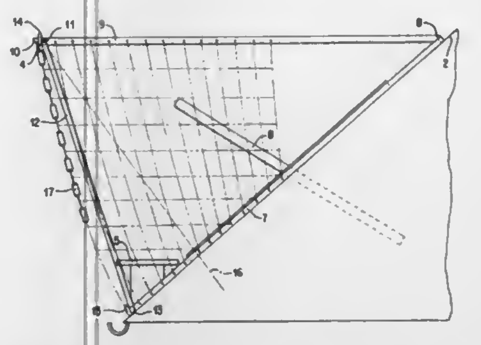
PCT Filed Jul. 18, 1994, Ser. No. 578,666

Claims priority, application Germany, Jul. 19, 1993, 43 24 196.4

Int. Cl.^{6} A62B ***5/00***

U.S. Cl. 182—138 **12 Claims**

1. A safety device for an emergency exit window on a surface of a building which is extendable from a substantially flat inoperative position to an extended operative position, the safety device comprising:
a safety bracket having shanks with first ends connected by a cross member and second ends having means for pivotally attaching to said surface of said building such that when said safety bracket is in the inoperative position the shanks are parallel to the surface of the building on either side of the window and said cross member is below said window and such that when said safety bracket is pivoted to the operative position said shanks extend approximately horizontally in front of the window and said cross member is positioned in front of said window;



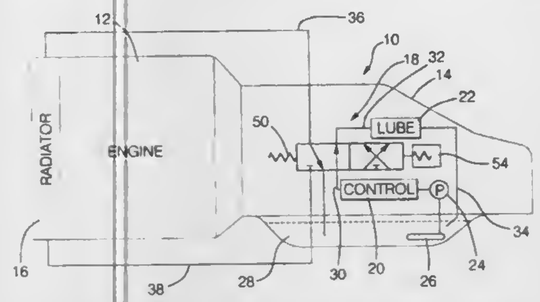
a support member having a first end pivotably disposed on at least one of said shanks of the safety bracket;
a guide rail anchorable on the building essentially parallel to the inoperative position of said at least one of the shanks and having a slidable bearing means for slidably and pivotally supporting a second end of said support member such that said guide rail, said at least one of said shanks and said support member lie parallel when said safety device is in said inoperative position;
said slidable bearing means being free to slide along a longitudinal axis of the guide rail when said safety bracket is extended from said inoperative position to said operative position, and said guide rail having a stop mounted at a lower end of the guide rail at a position for stopping said slidable bearing means such that said support member pivots through a angle greater than 90° relative to said at least one of said shanks when said safety device is extended from said inoperative position to said operative position to stably support said safety bracket; and
a safety net connected to the cross member of the safety bracket and attachable to the surface of the building to enclose an area for accepting persons when said safety device is in said operative position.

5,749,439
HYDRAULIC FLUID STORAGE FOR A POWERTRAIN

Keith D. Van Maanen, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1997, Ser. No. 821,836
Int. Cl.^{6} F01M ***9/00***

U.S. Cl. 184—6.12 **3 Claims**



1. Oil storage structure in a power transmission comprising:
a transmission housing;
a primary storage reservoir for continuously storing hydraulic fluid for use in the power transmission, said hydraulic fluid having a desired operating range including a first temperature and a second temperature;
a secondary storage reservoir comprising a cooling structure remote from said transmission housing for storing and cooling hydraulic transmission fluid when the temperature is at or above said second temperature; and
a valve mechanism including a flow directing element, a thermally responsive spring, and a bias spring, said bias spring maintaining said flow directing element in a first position to prevent fluid flow to said secondary reservoir when said fluid is at or below said first temperature and simultaneously permit fluid in said secondary reservoir to return to said primary reservoir, said thermally responsive spring moving said flow directing element to a second position to direct fluid to said secondary reservoir and from said secondary reservoir to a lube circuit and prevent direct flow from said secondary reservoir to said primary reservoir.

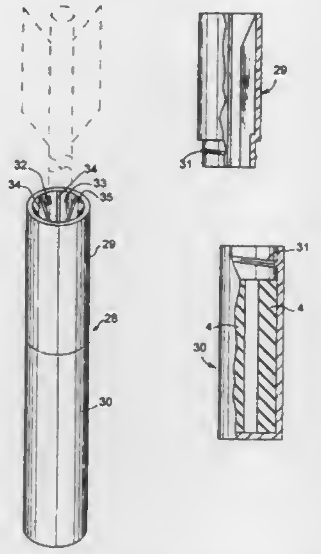
3. Oil storage structure in a power transmission comprising:
a transmission housing;
a primary storage reservoir formed within said transmission housing for continuously storing hydraulic fluid for use in the power transmission, said hydraulic fluid having a desired operating range including a first temperature and a second temperature;
a secondary storage reservoir comprising a cooling structure remote from said transmission housing for storing and cooling hydraulic transmission fluid when the temperature is at or above said second temperature; and
a valve mechanism including a flow directing element, a thermally responsive spring, and a bias spring, said bias spring maintaining said flow directing element in a first position to prevent fluid flow to said secondary reservoir when said fluid is at or below said first temperature and simultaneously permit fluid in said secondary reservoir to return to said primary reservoir, said thermally responsive spring moving said flow directing element to a second position to direct fluid to said secondary reservoir and from said secondary reservoir to a lube circuit and prevent direct flow from said secondary reservoir to said primary reservoir.

5,749,440
ARROW LUBRICANT CONTAINER-APPLICATOR SYSTEM

B. Howard Coffey, LaGrange, and Gary L. Coffey, Glendale, both of Ky., assignors to Coffey Marketing Corporation, LaGrange, Ky.

Continuation of Ser. No. 471,020, Jun. 6, 1995, Pat. No. 5,564,527, which is a continuation-in-part of Ser. No. 154,930, Nov. 19, 1993, Pat. No. 5,445,243. This application Oct. 15, 1996, Ser. No. 730,239
Int. Cl.^{6} F01M ***1/00***

U.S. Cl. 184—102 **15 Claims**



1. An arrow lubricant container-applicator for lubrication of an arrow tip comprising a tubular casing having an open top end and an absorbent medium selectively positioned therein, said absorbent medium providing means for receiving and cooperatively engaging said arrow tip, and a liquid lubricant received by said absorbent medium for lubricating said arrow tip which touches said absorbent medium.

5,749,441

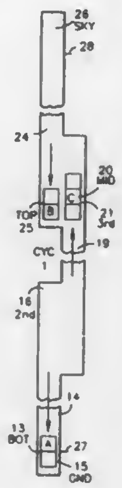
EXTRA DECK ELEVATOR SHUTTLE

Joseph Bittar, Avon; Paul Bennett, Waterbury; Gilbert W. Wierschke, West Simsbury; Samuel C. Wan, Simsbury; Bruce A. Powell, Canton; Frederick H. Barker, Bristol; Richard C. McCarthy, Simsbury, and Anthony Cooney, Unionville, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jan. 18, 1996, Ser. No. 588,577

Int. Cl.^{6} B66B *9/00*

U.S. Cl. 187—249 **22 Claims**



1. An elevator shuttle system for a building having a plurality of levels, comprising:

at least three overlapping elevator hoistways, each having a multi-deck elevator car frame movable from a low end of the corresponding hoistway to a high end of the corresponding hoistway, the low end of each hoistway except the lowest of said hoistways in said system being at the same intermediate building level as and adjacent to the high end of another of said hoistways, the high end of each hoistway except the highest of said hoistways in said system being at the same intermediate building level as and adjacent to the low end of another one of said hoistways;

a plurality of elevator cabs, there being a number, N, of said cabs for each of said car frames, said cabs being movable horizontally between said car frames;

a pair of said car frames, one movable in said lowest of said hoistways and one movable in said highest of said hoistways, each having twice as many decks as said number, N, of cabs per car frame; each other car frame in said system except said pair of car frames having 2N plus one decks;

a car motion means for each of said car frames, each for moving the corresponding car frame in successive runs in either of two directions along the corresponding hoistway, said car frames each being moved to align the decks of said pair of car frames with the lowest 2N decks of a related car frame in the corresponding adjacent hoistway at the end of each alternate run of a given direction and being moved to align the decks of a first and a second car frames of said pair of car frames with the highest 2N decks of said related car frame at the end of each run in said given direction intermediate said alternate runs; and

means for transferring one of said cabs from one deck of one of said car frames to a deck of an adjacent car frame aligned with said one deck and for transferring another of said cabs from another deck of said adjacent car frame to a deck of said one car frame aligned with said another deck.

5,749,442

LEAD FRAME MAGAZINE FASTENING STRUCTURE

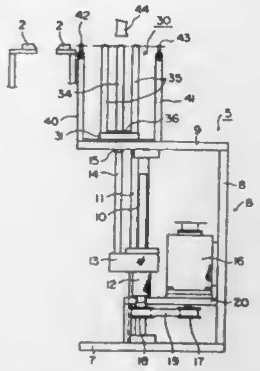
Eiji Kikuchi, Musashimurayama, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Jun. 25, 1996, Ser. No. 673,680

Claims priority, application Japan, Jun. 26, 1995, 7-182165

Int. Cl.^{6} B66B *9/04*

U.S. Cl. 187—272 **3 Claims**



3. A structure for fastening a lead frame magazine to an elevator device wherein:

said lead frame magazine comprising:

a bottom plate with a through opening provided therein, said bottom plate being provided with a positioning hole on a bottom surface thereof,

a frame supporting plate provided on said bottom plate so as to cover said opening in a separable fashion from said bottom plate, a plurality of lead frames being placed on said frame supporting plate in a stacked fashion, and

a plurality of frame accommodating members secured to said bottom plate so as to define a lead frame accommodation area surrounded by said plurality of frame accomodation members so as to accommodate said plurality of lead frames therein, and

said elevator device comprising:

a magazine setting plate provided at a top portion of said elevator device so that said bottom plate of said lead frame magazine is set thereon,

raising-and-lowering means provided in said elevator device so as to be moved up and down while passing through said magazine setting plate, said raising-and-lowering means penetrate said through opening of said bottom plate of said lead frame magazine when said raising-and-lowering means is moved up so as to raise said lead frame supporting plate of said lead frame magazine, and

a positioning means and a vacuum suction holding means provided in said magazine setting plate of said elevator device, said positioning means being engageable with said positioning hole of said bottom plate of said lead frame magazine and said vacuum suction holding means coming into contact with said bottom plate of said lead frame magazine so as to positionally secure said bottom plate of said lead frame magazine on said magazine setting plate of said elevator device.

5,749,443

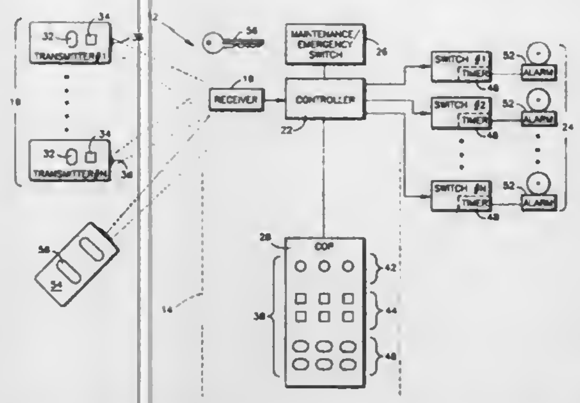
ELEVATOR BASED SECURITY SYSTEM

Ulisses G. Romão, São Paulo, Brazil, assignor to Otis Elevator Company, Farmington, Conn.

Filed May 12, 1995, Ser. No. 440,435

Int. Cl.^{6} B66B *1/42*

U.S. Cl. 187—384 **11 Claims**



1. An elevator security system for controlling access to a building having an elevator system, the elevator system having an elevator car, a plurality of landings, the elevator car providing access to the plurality of landings, wherein the elevator system includes a car operating panel within the elevator car and having a plurality of call buttons designating each of the landings, the elevator security system including:

means for securing access to one or more of the plurality of landings;

a plurality of transmitters, each of the plurality of transmitters corresponding to one of the secured landings, and each of the plurality of transmitters providing access to only the corresponding secured landing of the plurality of secured landings by emitting a signal that provides access to only the corresponding secured landing;

a receiver that receives the signal, determines the corresponding secured landing authorized for access by the signal, and enters a request for the corresponding secured landing;

a switch for each landing having an on-position and an off-position, the on-position providing secured access such that the call button designating that particular landing may not be activated, the off-position providing open access such that the call button designating that particular landing may be activated; and

a timer that triggers an alarm after the expiration of a predetermined time period subsequent to the switch being placed into the off-position.

5,749,444

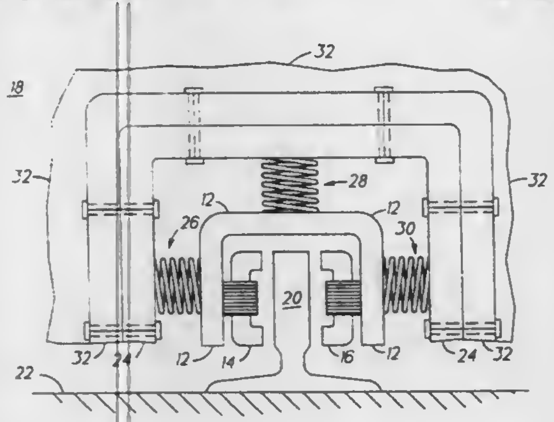
CONTACTLESS SLIDE GUIDE FOR ELEVATORS

Clement A. Skalski, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 31, 1995, Ser. No. 550,969

Int. Cl.^{6} B66B *7/04*

U.S. Cl. 187—409 **16 Claims**



1. A guide system for guiding an elevator car vertically along a hoistway rail, comprising:

a housing connected to a frame of said elevator;

a yoke, connected to said housing by spring means;

electromagnet actuator means connected to said yoke for positioning adjacent said hoistway rail and responsive to an electromagnet drive signal for said guiding said elevator car vertically along said hoistway rail;

a position sensor for sensing a position of said electromagnet with respect to said hoistway rail or a gap between said electromagnet actuator means and said hoistway rail for providing a sensed gap signal;

a controller, responsive to a position or gap reference signal and to said sensed gap signal for providing said electromagnet drive signal to said electromagnet actuator means for maintaining said gap constant.

5,749,445

DISK BRAKE WITH IMPROVED RECOIL

Josep Ruiz Busquets, Barcelone, Spain, assignor to AlliedSignal Europe Services Techniques, Drancey, France

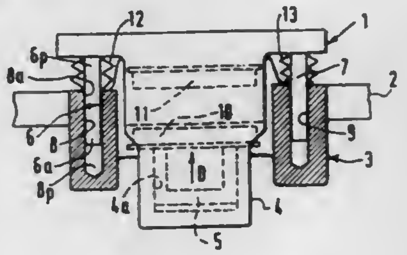
PCT No. PCT/FR94/01523, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO95/18928, PCT Pub. Date Jul. 13, 1995

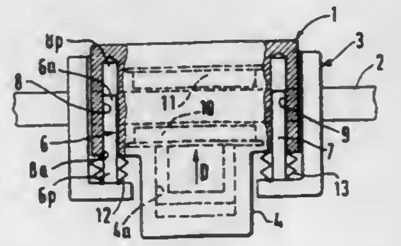
PCT Filed Dec. 22, 1994, Ser. No. 387,879

Claims priority, application France, Jan. 7, 1994, 94 00125

Int. Cl.^{6} B16D *55/224*

U.S. Cl. 188—73.45 **1 Claim**





1. A disk brake for use a motor vehicle, comprising:

first and second brake elements which can move one with respect to each other, said first brake element being a caliper which straddles a brake disk, said second brake element being a carrier which is fixed to a stationary member on said vehicle;

clamping means comprising a cylinder secured to said caliper, said clamping means having an opening facing said brake disk, said opening having a piston located therein and pointing in a first direction;

guide means for allowing said caliper to slide with respect to said carrier on actuation of said clamping means, said guide means comprising at least one guide pin fixed to one of said first and second brake elements and a blind bore formed in the other of said first and second brake elements, said at least one guide pin sliding in said blind bore, and an elastically deformable annular sleeve which surrounds an opening of said bore and said at least one guide pin, said at least one guide pin having a free end located in a rear part of said blind bore adjacent a bottom of the blind bore; and

first and second friction pads pointing towards opposite first and second faces on said brake disk, said first and second friction pads being clamped between said piston and said caliper on actuation of said clamping means, characterized in that said at least one guide pin is carried by said carrier and in that said bore is pierced in said caliper, said bore having an opening pointed in a second direction opposite from the first direction such that air present in and capable of escaping from said bore is at least partially contained therein and compressed as said at least one guide pin moves toward said bottom of said blind bore on actuation of said clamping means, said compressed air on termination of said actuation of said clamping means expanding to move said caliper to a rest position.

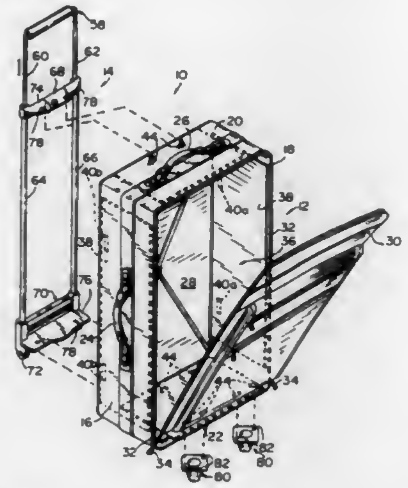
5,749,446
COLLAPSIBLE LUGGAGE PIECE AND CART

Aquino Hsieh, Hangzhou, China, assignor to Jet General Investment Company, Lincolnwood, Ill.

Filed Apr. 10, 1996, Ser. No. 630,835

Int. Cl.^{6} A45C *7/00;5/14;13/38*

U.S. Cl. 190—107 **6 Claims**



1. A collapsible luggage piece and cart combination having an assembled state and an unassembled state, the combination comprising:

a collapsible luggage body having a collapsed configuration and an erect configuration, the body comprising
  a front panel,
  a rear panel,
  a collapsible wall structure disposed between the front and rear panels for cooperation therewith to define an expandable compartment, the wall structure having a first aperture therethrough,
  a first erecting panel connected to the collapsible wall structure, the first erecting panel having a first locking element disposed thereon, wherein in the erect configuration the first erecting panel is substantially perpendicular to the rear panel and the first locking element is disposed through the first aperture to rigidly attached to the collapsible wall structure to maintain the luggage body in the erect configuration and wherein in the collapsed configuration at least a portion of the first erecting panel is moved to a position not perpendicular to the rear panel to allow the luggage body to collapse; and

a luggage cart having a first connecting member having a first connecting aperture, wherein in the assembled state the first locking element is disposed through the first aperture and the first connecting aperture, whereby the body is releasably connected to the luggage cart.

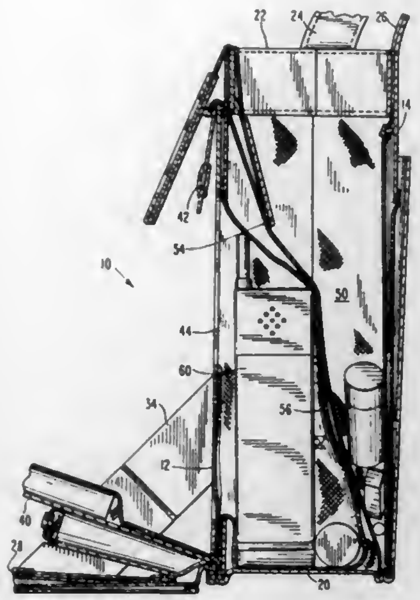
5,749,447
HANDBAG HAVING COMPARTMENTALIZED STORAGE AREA

Ahron Hersh, Brooklyn, N.Y., and Chi Yueh Chen, Taipei, Taiwan, assignors to Rosetti Handbags and Accessories Ltd., New York, N.Y.

Filed Jul. 20, 1995, Ser. No. 504,995

Int. Cl.^{6} A45C *3/06*

U.S. Cl. 190—112 **24 Claims**



1. A handbag which comprises an enclosure having opposed front and rear walls, opposed side walls, a bottom wall, and an opening for providing access into an interior storage space of the enclosure, the interior storage space being subdivided into at least first and second storage regions, the first storage region being accessible through said opening for storing objects therein through said opening, and the second storage region being accessible for storing objects therein through a portal formed in at least one of said walls, a closure panel extending over said portal and being movable from a first position wherein said portal is covered, to a second position wherein said portal is exposed to provide access to said second storage region, and an access panel associated with said at least one wall and movable between a first position which covers said closure panel to a second position which exposes said closure panel, said access panel being smaller along at least one dimension than said at least one wall.

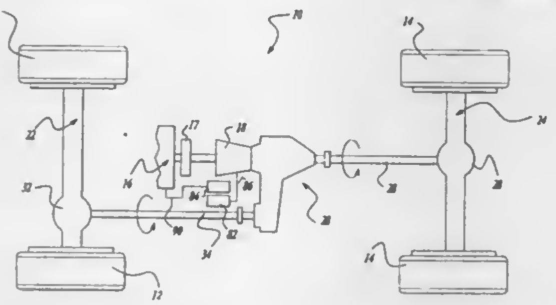
5,749,448
BRAKING SYSTEM INCORPORATING CONTINUOUSLY VARIABLE TRANSMISSION

Karen Maile, 1225 W. Gunn Rd., Rochester, Mich. 48308

Filed Aug. 21, 1995, Ser. No. 517,144

Int. Cl.^{6} B60K *41/26*

U.S. Cl. 192—4 A **20 Claims**



12. A braking system for use in a wheeled vehicle, the braking system comprising:

a power source having an output end;
an operator-controlled power source accelerator;
a continuously variable transmission connected to said output end of said power source;
an axle assembly;
a brakeable wheel, said brakeable wheel being operatively associated with said axle assembly;
a velocity sensor operatively associated with said axle assembly, said velocity sensor being capable of sensing the velocity of said brakeable wheel;

a feedback control circuit operatively associated with said continuously variable transmission, said feedback control circuit having a predetermined value for maximum desired percent slip that corresponds to maximum possible braking force of said brakeable wheel in relation to a road surface slip generally being defined as

$$\frac{V-\omega r}{V}$$

where V=the forward velocity of the wheeled vehicle and ω=the rotational speed of said brakeable wheel (radius/sec):

an operator-controlled brake operatively associated with said continuously variable transmission, said operator-controlled brake including means for slowing the wheeled vehicle at a rate that is a percentage of said predetermined value for maximum percent slip in response to the velocity of said brakeable wheel sensed by said velocity sensor; and

means for transmitting braking force between said continuously variable transmission and said brakeable wheel.

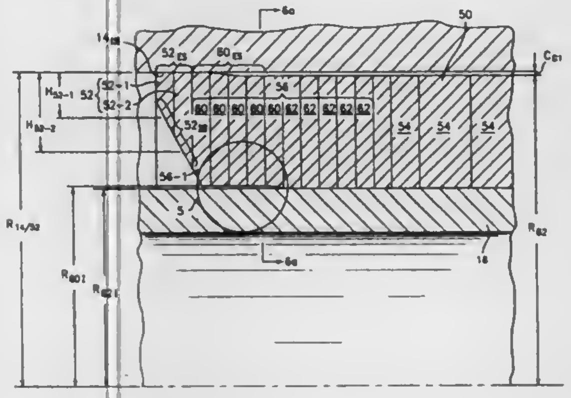
5,749,449
COIL SPRING FOR OVERRUNNING SPRING CLUTCHES

Hugh L. Kearney, Cheshire; Charles J. Isabelle, Winsted; Jules G. Kish, Milford, and William L. Noehren, Trumbull, all of Conn., assignors to Sikorsky Aircraft Corporation, Stratford, Conn.

Filed Dec. 16, 1996, Ser. No. 767,562

Int. Cl.^{6} F16D *13/12*

U.S. Cl. 192—41 S **14 Claims**



1. A coil spring (**50**) including teaser coils (**52**) disposed at each end thereof, central coils (**54**) disposed intermediate the teaser coils (**52**), and transition coils (**56**) disposed between and adjoining the teaser coils (**52**) and the central coils (**54**), the coil spring (**50**) operative for use in an overrunning spring clutch assembly having a central arbor (**16**) for centering and supporting the coil spring (**50**) in an overrunning operating mode, the central arbor (**16**) having an external bearing surface ($\mathbf{16}_{ES}$) corresponding to each of the transition coils (**56**), the coil spring (**50**) being characterized by:

each of said transition coils (**56**) defining an interface surface ($\mathbf{56}_{IS}$), said interface surface ($\mathbf{56}_{IS}$) being substantially complementary to the corresponding external bearing surface ($\mathbf{16}_{ES}$) of the central arbor (**16**) for limiting radial deflection of said transition coils (**56**) in the overrunning operating mode.

5,749,450

Patent Not Issued For This Number

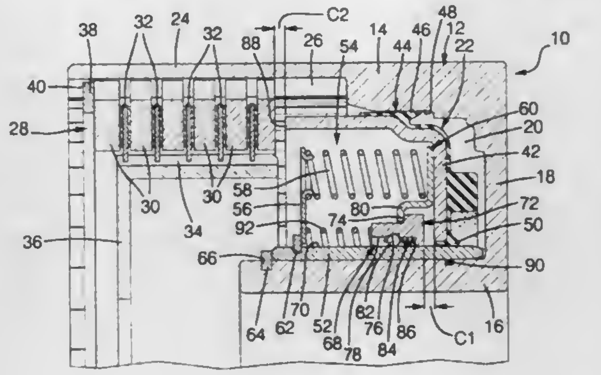
5,749,451
CLUTCH ASSEMBLY WITH A PISTON STROKE ADJUSTER

Edwin Thomas Grochowski, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1996, Ser. No. 721,430

Int. Cl.^{6} F16D *13/75;25/0638*

U.S. Cl. 192—70.25 **4 Claims**



1. A fluid operated selectively engageable friction assembly comprising:

a housing having an annular cavity defined therein;
an annular apply piston slidably disposed in said cavity; and
a one-way mechanism defined by a plurality of spheres disposed between a wall of said cavity and the apply piston for permitting free sliding movement of the apply piston in an engaging direction and limiting the movement of the apply piston in a disengaging direction to a predetermined amount.

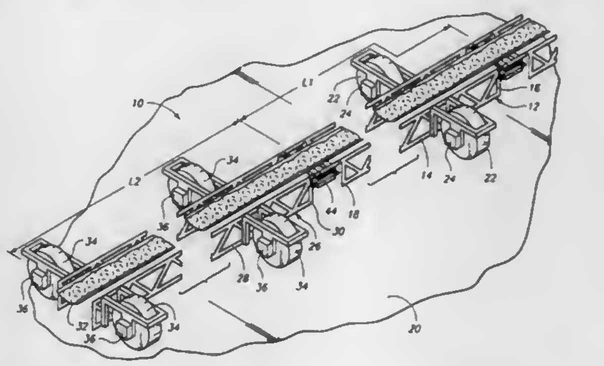
5,749,452
MOBILE CONVEYOR INCLUDING ALIGNMENT SYSTEM

Bryon M. Kanenwischer, Spokane, Wash., assignor to R.A. Hanson Company, Inc., Spokane, Wash.

Filed Jul. 27, 1995, Ser. No. 508,125

Int. Cl.^{6} B65G *43/00*

U.S. Cl. 198—301 **19 Claims**



1. An articulated mobile conveyor which is movable relative to the ground, the conveyor comprising:

a first conveyor section including a frame having first and second ends, and a length between the first and second ends, the frame being supported from the ground for movement relative to the ground in at least a direction transverse to the length;

a second conveyor section including a frame having first and second ends, and a length between the first and second ends, the frame of the second conveyor section being supported from the ground for movement relative to the ground in at least a direction transverse to the length of the second conveyor section;

a joint connecting the second end of the first conveyor section to the first end of the second conveyor section for pivotal movement about a first axis; and

a cylinder/piston assembly having a piston connected to the first conveyor section and movable with the first conveyor section, having a cylinder mounted to the second conveyor section and movable with the second conveyor section, the piston being slidably received in the cylinder, and a transmitter and a receiver capable of determining the location of the piston in the cylinder, the transmitter and receiver being located within the cylinder.

5,749,453

APPARATUS FOR ORIENTING EGGS ON A SECOND CONVEYOR WITH THEIR POINTS TO ONE SIDE

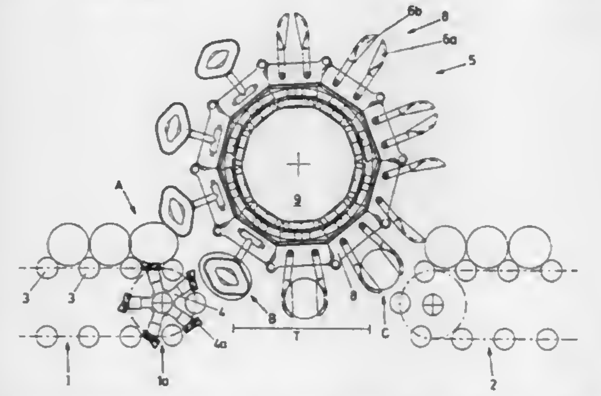
Martin Doornekamp, Nijker; Willem Van Veldhuisen, and Willem Marius De Greef, both of Lunteren, all of Netherlands, assignors to FPS Food Processing Systems B.V., Netherlands

Filed Mar. 8, 1996, Ser. No. 614,842

Claims priority, application Netherlands, Mar. 13, 1995, 9500496

Int. Cl.^{6} B65G *47/22*

U.S. Cl. 198—400 **11 Claims**



1. An apparatus for transferring eggs from a first moving roller conveyor to a second moving roller conveyor, with an orienting operation taking place during the transfer, so that the eggs on the second conveyor are all oriented with their points to one side, the rollers of the first roller conveyor being substantially hourglass-shaped and comprising a roller center part which is substantially cylindrical, the apparatus comprising:

a pre-orienting means located between two successive rollers of said first roller conveyor for bringing each egg into a pre-oriented position at the end of the first roller conveyor; and

a moving transfer conveyor having a gripper means for picking up the eggs from their respective pre-oriented positions, bringing the eggs into a different aligned position and transferring the eggs from the different aligned position to the second conveyor.

5,749,454

CONVEYOR SYSTEM WITH DRIVEN ROLLER TRANSFER ASSEMBLY

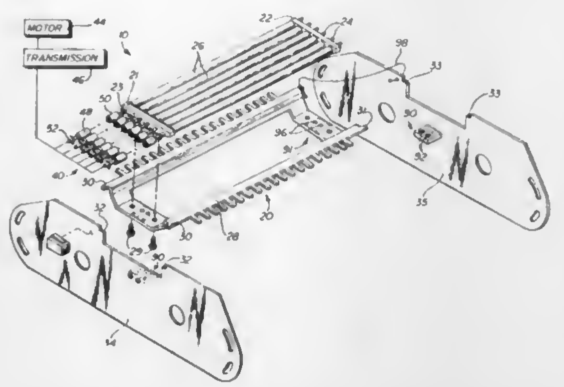
James L. Layne, Scottsville, Ky., assignor to Span Tech Corporation, Glasgow, Ky.

Continuation-in-part of Ser. No. 451,614, May 26, 1995, Pat. No. 5,584,373. This application May 2, 1996, Ser. No. 642,030

Int. Cl.^{6} B65G *43/00*

U.S. Cl. 198—464.4 **14 Claims**

1. In a conveyor system for articles including a first conveyor having a feeding portion and a second conveyor having a receiving portion and a frame between said portions, the improvement comprising:



a conveyor transfer assembly for moving articles feeding along the system spanning between said conveyor portions;

a conveying surface formed on top of said transfer assembly for moving said articles from said feeding portion to said receiving portion;

support means of said transfer assembly positively attached to said frame;

magnet means to provide a magnetic force for establishing said positive attachment; and

drive means including at least one magnetic coupling for driving said conveying surface;

whereby an article jam or the like adjacent said transfer assembly, sufficient to overcome the magnetic force provided by said magnet means and to disconnect said magnetic coupling, causes said assembly to be bodily lifted and released to prevent damage.

5,749,455

METHOD AND APPARATUS FOR TRANSFERRING WORKPIECES

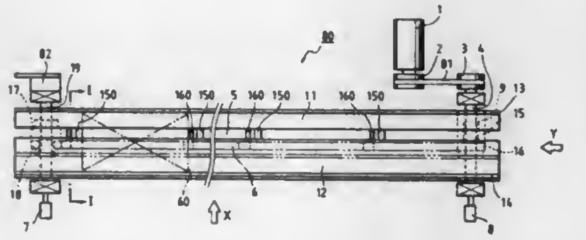
Akira Mizuta, and Masazumi Ogawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1995, Ser. No. 496,784

Claims priority, application Japan, Jul. 11, 1994, 6-159000

Int. Cl.^{6} B65G *15/14*

U.S. Cl. 198—626.5 **18 Claims**



1. In a method for transferring a plurality of workpieces in one direction with a predetermined interval being maintained between adjacent workpieces, the improvement wherein each workpiece is transferred with front and rear edges thereof being held by a first transfer means and a second transfer means, respectively, wherein said first and second transfer means respectively hold said front and rear edges, said front and rear being defined as viewed from a direction in which said workpieces are transferred, wherein a drive means includes a drive shaft and a driven shaft for moving said first and second transfer means together in said conveyance direction and for moving only one of said first and second transfer means to change the distance there between and wherein detecting means detects the rotary position of said drive shaft and said driven shaft to determine a position of said first and second transfer means.

5,749,456

STACK TRANSPORT DEVICE

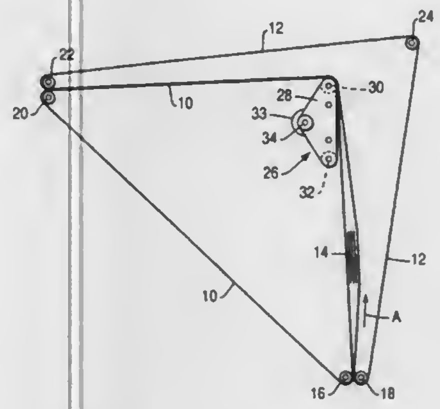
Alexander W. Logie, West Lothian, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 9, 1996, Ser. No. 599,219

Claims priority, application United Kingdom, Oct. 21, 1995, 9521615

Int. Cl.^{6} B65G *37/00*

U.S. Cl. 198—626.5 **8 Claims**



1. A stack transport device for transporting a stack of sheets along a feed path defined between an entry point to the feed path and an exit point from the feed path, the stack transport device comprising:

first and second belt arrangements defining the feed path and cooperating with each other to hold and feed a stack of sheets along the feed path from the entry point to the exit point;

a support member for supporting the first and second belt arrangements such that the entry direction of feed leaving the entry point along the feed path is at an angle relative to the exit direction of feed of a stack of sheets approaching the exit point along the feed path, the support member being pivotable between a first position in which a first portion of the feed path is awaiting receipt of a stack of sheets from the entry point and a second position in which a second portion of the feed path is awaiting release of a stack of sheets towards the exit point;

a pivot post for allowing the support member to pivot between the first and second positions; and

a controller for (i) controlling the support member to pivot about the pivot post in a first direction from the first position to the second position when a stack of sheets is received in the first portion of the feed path from the entry point, and (ii) controlling the support member to pivot about the pivot post in a second direction which is opposite the first direction from the second position back to the first position when a stack of sheets is released from the second portion of the feed path towards the exit point.

5,749,457

ELECTRONIC DEVICE WITH SWITCH AND PIVOTABLE ACTUATOR ASSEMBLY

Julio C. Castaneda, Coral Springs; Troy V. Frandsen, Sunrise, and Paul M. Greco, Boca Raton, all of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 23, 1996, Ser. No. 774,047

Int. Cl.^{6} H01H *3/12*

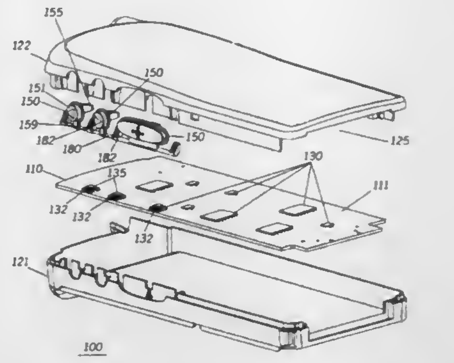
U.S. Cl. 200—343 **16 Claims**

1. An electronic device, comprising:

a device housing;

a circuit carrying substrate mounted within the device housing, the circuit carrying substrate having a surface with electrical components mounted thereon;

a flat switch mounted on the surface, and having a direction of actuation substantially perpendicular to the surface;



a plurality of pivotable button actuators each having a user interface portion, and having an actuator member positioned within the device housing, wherein the actuator member pivots from a first position adjacent to the switch to a second position engaging the switch when the user interface portion is depressed; and

a shaft integrally attached to the plurality of pivotable button actuators and anchored within the device housing on either side of each pivotable button actuator, wherein each of the plurality of pivotable button actuators is pivotable to create a torque within the shaft, such that the shaft provides an opposing spring bias return force for the user interface portion and actuator member when the user interface portion is depressed.

5,749,458

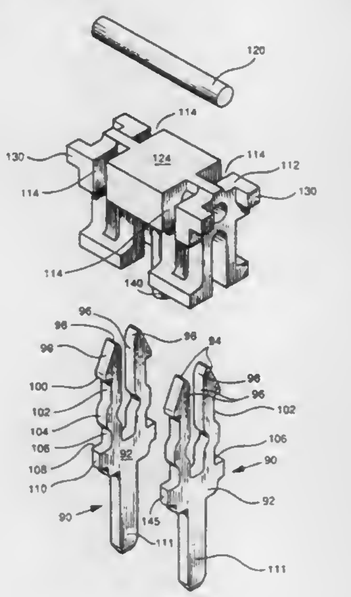
MINIATURE JUMPER SWITCH WITH WIRE CONTACT MAKER

Giuseppe Bianca, Temecula, and Robert M. Bogursky, Encintas, both of Calif., assignors to Auto Splice Systems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 606,368, Feb. 23, 1996, Pat. No. 5,620,086. This application Nov. 15, 1996, Ser. No. 751,030

Int. Cl.^{6} H01H *15/06*

U.S. Cl. 200—541 **20 Claims**



1. A jumper switch comprising:

a) a pair of contact members each having first contact portions and a second solderable portion,

b) a switch housing mounted on and partially surrounding a portion of the contact members and wherein the entire housing is movable on the contact members from a first switch position to a second switch position to break and make, respectively, an electrical connection between the first contact portions of the two contact members,

c) said second solderable portions extending out from the housing and configured for being soldered to conductive areas of external pads or through-holes,

d) electrically-conductive means fixed on the housing and movable therewith for making contact to both of the first contact portions of the two contact members when the housing is in its second position.

5,749,459

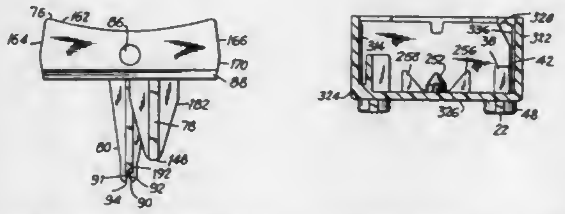
ELECTRICAL ROCKER TYPE SWITCH

David B. Balaban, Hauppauge, and Anthony Tufano, North Massapequa, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation of Ser. No. 583,242, Jan. 5, 1996, abandoned, which is a continuation of Ser. No. 376,982, Jan. 23, 1995, abandoned, which is a continuation of Ser. No. 168,587, Dec. 14, 1993, Pat. No. 5,384,441, which is a continuation of Ser. No. 984,397, Dec. 9, 1992, abandoned. This application Dec. 24, 1996, Ser. No. 777,982

Int. Cl.⁶ H01H *21/82*

U.S. Cl. 200—559 **4 Claims**



1. An electrical switching device containing two or more electrical switches comprising:

a) a housing having a base member, said base member having an interior surface with two or more spring pivots thereon projecting upwardly from said interior surface of said base member;

b) two or more movable input means, one for each of said electrical switches, each connected to said housing and suitable for direct contact by a user;

c) two or more actuating means, one for each of said input means and responsive to the movement of its associated input means, for effectuating on/off control of its associated electrical switch in response to said user contact;

d) two or more toggle means, one for each of said input means and responsive to the movement of its associated input means, for retaining its associated electrical switch in a position established by said user contact;

e) two or more toggle springs, one for each of said toggle means, each toggle spring having a first end and a second end and positioned such that said first end is in contact with its associated toggle means and said second end is in contact with its associated spring pivot, each of said toggle springs being compressed during a first portion of travel of its associated input means and being expanded during a second portion of travel of its associated input means;

f) two spring rests for each of said toggle springs, said spring rests extending upwardly from said interior surface of said base member in the same direction as its associated spring pivot to support its associated toggle spring and space said second end of said toggle spring above said interior surface of said base member;

g) two or more terminal assemblies, one for each of said input means, each of said terminal assemblies having a first contact thereon; and

h) a brush assembly having two or more movable brush arms, one for each of said terminal assemblies, each of said movable brush arms having a second contact thereon and being responsive to movement of its associated actuating means to permit said second contact to move into and out of engagement with its associated first contact thereby effecting on/off control of its associated electrical switch, said brush assembly being coupled to a single, common electrical power input to provide electrical power to each of said movable brush arms simultaneously.

5,749,460

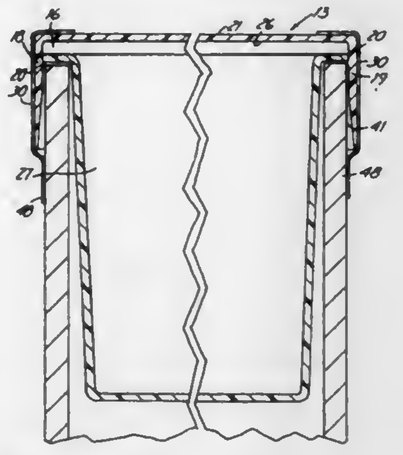
UNDERCUP ASSEMBLY

Michael J. Rice, St. Paul, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Jun. 6, 1995, Ser. No. 469,195

Int. Cl.⁶ B65D *21/02;51/28*

U.S. Cl. 220—23.83 **4 Claims**



1. A package comprising:

a first container that includes a rimmed end;

a cap that includes an elastic annular wall with an annular lug that has a retaining surface, the cap attachable to the first container when the annular lug is retained adjacent to the rimmed end; and

a cup with a flexible, flanged rim wherein the cup is attachable to the first container by positioning the flanged rim of the cup to contact the retaining surface of the annular lug.

5,749,461

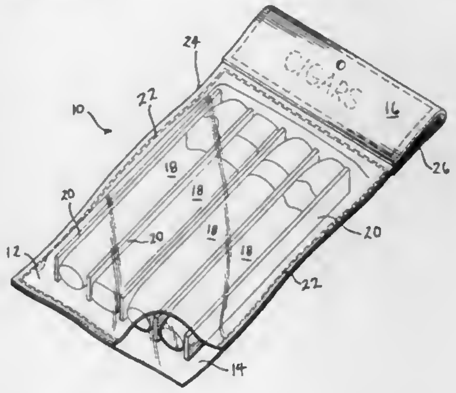
AIRTIGHT CIGAR PACKAGE

Eri Guzman, Guzman & Co Holdings Inc., P.O. Box 70106, San Juan, 00936-8106, Puerto Rico

Filed May 7, 1997, Ser. No. 852,533

Int. Cl.⁶ B65D *85/12*

U.S. Cl. 206—245 **7 Claims**



1. An airtight cigar package comprising:

a transparent front sheet and a transparent rear sheet;

a plurality of individually wrapped cigars;

a heat seal extending continuously around the periphery of said front sheet and said rear sheet, and connecting said front and rear sheets together, thereby forming an airtight envelope to sealingly contain said plurality of cigars therein; and

a first plurality of rectangular support members, each of said first plurality of support members positioned intermediate adjacent cigars and being substantially the same height and the same length as said plurality of cigars.

7. An airtight cigar package comprising:

a rectangular transparent front sheet and a rectangular transparent rear sheet, both of said sheets made of polyethylene having a thickness in the range of 3 mils;

four individually wrapped cigars;

a heat seal extending continuously around the periphery of said front sheet and said rear sheet, and connecting said front and rear sheets together, thereby forming an airtight envelope to sealingly contain said four cigars therein, said heat seal configured so as to define an envelope top end with a one and one half inch head;

a paper label affixed to and embracing said head portion of said top of said rectangular envelope; and

five rectangular cardboard support members, each of said support members being substantially the same height and the same width as said four cigars, three of said support members positioned intermediate adjacent ones of said four cigars, and two of said support members positioned intermediate end ones of said four cigars and an edge of said envelope.

5,749,462

IMPROVEMENTS IN FLIP-TOP TYPE CARTON CONTAINERS

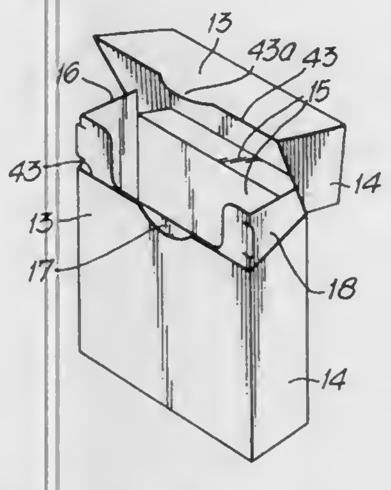
Kenneth Arthur Houghton, Hull, England, assignor to Reckitt & Colman Products Limited, London, United Kingdom

Filed May 30, 1996, Ser. No. 654,757

Claims priority, application United Kingdom, Jun. 2, 1995, 9511216

Int. Cl.⁶ B65D *85/10;43/16*

U.S. Cl. 206—268 **4 Claims**



1. A breachable flip-top container having:

a body part including a front panel and a liner panel internal of the front panel, said liner panel having an upper edge; and

a top part hingedly connected to the body part and having an edge defined by a break line and having a lug extending from the top part

characterized in that when the container is breached, and the top part is in a closed position, the lug is inwardly deflected and engaged over and behind a part of the upper edge of the liner panel.

5,749,463

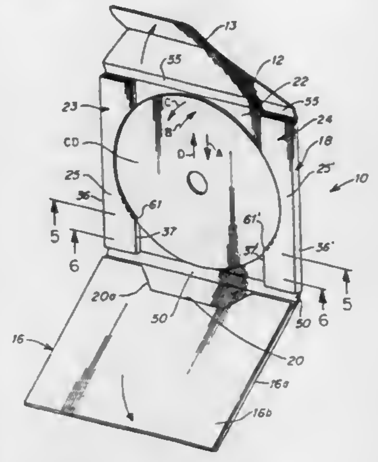
COMPACT DISC PACKAGE WITH SPINES

William Collins, 30 Durham Rd., New Hyde Park, N.Y. 10040

Filed Dec. 21, 1995, Ser. No. 576,497

Int. Cl.⁶ B65D *85/57*

U.S. Cl. 206—308.1 **40 Claims**



1. A disc package, comprising:

a retention panel defining a plane;

first and second folded sidewall sections extending out of said plane from said retention panel, said first and second folded sidewall sections having edges facing each other and the facing edges being contoured to substantially correspond to a periphery of a disc for accommodating insertion of the disc between the facing edges; and

tabs extending from at least a portion of at least one of said first and second folded sidewall sections toward the other of said folded sidewall sections, and being spaced from said plane by a distance sufficient for accommodating a thickness of the disc between said plane and said tabs, said tabs extending over a surface portion of the inserted disc to contact the disc at spaced apart peripheral portions to retain the disc therein;

wherein each of said first and second folded sidewall sections includes at least first and second substantially adjacent panels, the first panel being interposed between the retention panel and the second panel, each of the first and second panels defining at least a portion of a facing edge, which portion has a radius of curvature which substantially conforms to a radius of curvature of the disc.

5,749,464

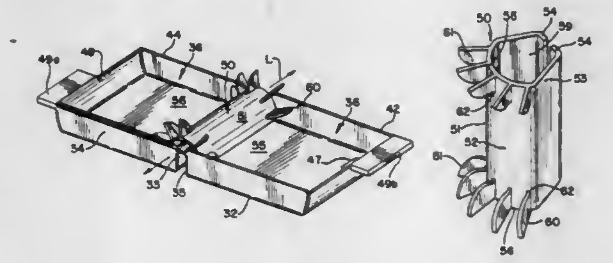
COMPACT DISC BINDER AND DISC CARRIER USED IN SAME

Albert B. Cheris, Highland Park, Ill.; Robert B. Staubitz, Collinsville, and Timothy Repp, New Hartford, both of Conn., assignors to Tenex Corporation, Elk Grove Village, Ill.

Filed Nov. 1, 1996, Ser. No. 813,232

Int. Cl.⁶ B65D *85/57*

U.S. Cl. 206—308.1 **23 Claims**



1. A binder for housing a plurality of compact discs, comprising: a binder housing having two opposing housing half portions joined together along a common line of the binder housing; a resilient

spine disposed within said binder housing and extending between the binder housing half portions, the spine further spanning the binder housing common line, said spine further including a plurality of positioners disposed thereon; a plurality of disc carriers detachably engaging the positioners, said spine being deformable between an untensioned configuration when said binder housing is closed and a tensioned configuration when said binder housing is opened, whereby in the tensioned configuration, said disc carriers are displayed in a radial fashion.

5,749,465
CONTAINER

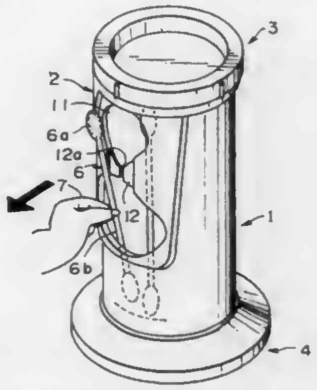
Kimio Hashimoto, Kunitachi, Japan, assignor to Kabushikigaisha Daiwa Riken Kogyo, Kunitachi, Japan

PCT No. PCT/JP94/00153, § 371 Date Mar. 21, 1996, § 102(e) Date Mar. 21, 1996, PCT Pub. No. WO95/21110, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 3, 1994, Ser. No. 635,935

Int. Cl.⁶ B65D *85/20*

U.S. Cl. 206—361 **14 Claims**



1. A container for accommodating elongated objects, each of which has a stem and a head portion, the container comprising:

a cylindrical body having a circumferential wall;

a retrieving area formed on said circumferential wall, said retrieving area including a retrieving port, a through-hole for passing the head portion of an object therethrough, and a neck portion formed between said retrieval port and said through-hole, said neck portion creating a slot which communicates with said retrieving port and said through-hole; and

a shutter portion including a shutter attached to an annular ring, said annular ring rotatably supported on said circumferential wall of said cylindrical body for rotation between a first position, wherein said shutter portion closes said retrieving area, and a second position, wherein said retrieving area is open.

5,749,466
PACKAGING METHOD AND PACKAGING STRUCTURE FOR ARTICLES SUCH AS THOSE HAVING RECTANGULAR PARALLELEPIPED SHAPE

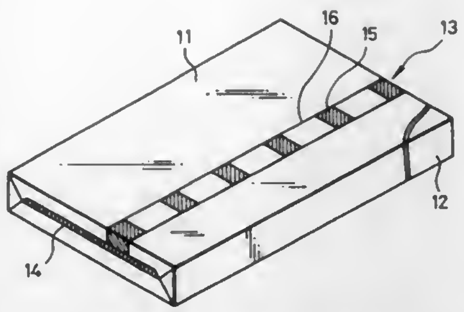
Seizo Seki, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 515,599, Aug. 16, 1995, abandoned. This application Oct. 30, 1996, Ser. No. 741,292

Claims priority, application Japan, Aug. 29, 1994, 6-203617; Oct. 4, 1994, 6-239959

Int. Cl.⁶ B65D *85/575;65/14*

U.S. Cl. 206—387.1 **16 Claims**



1. A packaging method using a film-shaped packaging material comprising the steps of:

forming a fixing portion, at least one printed semi-fixing portion, and at least one printed non-fixing portion on said film-shaped packaging material having a first end and a second end, wherein said semi-fixing portion is adjacent said non-fixing portion and the first end of said film-shaped packaging material and the second end of said film-shaped packaging material form an overlapped portion when a packaged article is packaged by said film-shaped packaging material, the first and second ends being unbroken in said overlapped portion;

wrapping said packaged article with said film-shaped packaging material;

packaging said packaged article by fixing said fixing portion and said semi-fixing portion; and

leaving said non-fixing portion as an unwrapping start portion.

5,749,467
WAFER SUSPENSION BOX

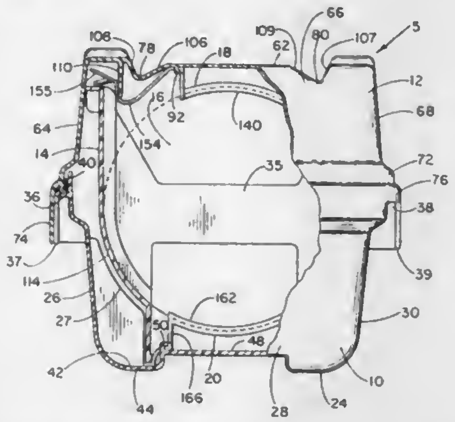
Barry Gregerson, Colorado Springs, Colo., assignor to Empak, Inc., Chanhassen, Minn.

Continuation of Ser. No. 425,259, Apr. 18, 1995, Pat. No. 5,555,981, which is a continuation of Ser. No. 136,316, Oct. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 887,965, May 26, 1992, Pat. No. 5,273,159. This application Apr. 4, 1996, Ser. No. 628,024

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.⁶ B65D *81/02*

U.S. Cl. 206—445 **5 Claims**



1. A cushion apparatus for use in suspending a plurality of disk products, said cushion apparatus comprising:

(a) a container for holding said plurality of disk products, said container having a cover and a base;

(b) a plurality of spaced apart substantially rectangular disk engaging members, each disk engaging member having a first end, a second end, a first substantially planar surface extending between said first and second ends and a second substantially planar surface extending between said first and second ends opposite said first surface and a flexible disk receiving area extending along said first substantially planar surface;

(c) a first support extending transverse from said second surface of said plurality of disk engaging members on said first end;

(d) a second support extending transverse from said second surface of said plurality of disk engaging members on said second end; and

(e) means on said cover for engaging said first and second supports whereby said cushion is positioned in said container with each said disk engaging members conforming to an edge profile of one of said plurality of disks received in said disk receiving area and said first and second generally rectangular supports are positioned substantially orthogonal to said cover.

2. A cushion system for use in suspending a plurality of disk products in a container for holding said plurality of disk products, said cushion system comprising:

(a) said container having a cover and a base;

(b) a first cushion having a plurality of spaced apart substantially rectangular members, each said member adapted to engage one of said plurality of disk products, and each said member having a flexible disk engaging surface whereby said flexible disk engaging surface conforms to a profile edge of a suspended disk product;

(c) a first support extending from said plurality of substantially rectangular members opposite said flexible disk engaging surface and oriented substantially orthogonal to said plurality of spaced apart generally rectangular members;

(d) a second support extending from said plurality of substantially rectangular members opposite said flexible disk engaging surface and oriented substantially orthogonal to said plurality of spaced apart generally rectangular members whereby said first and second supports extend between said cover and said plurality of substantially rectangular members; and;

(e) a second cushion having a concave surface with a plurality of disk engaging members located in said concave surfaces second cushion located in said base.

3. A cushion system of claim 2 comprising:

(a) a first securing means on said first cushion for securing said first cushion to said cover;

(b) a second securing means on said second cushion for securing said second cushion to said base container.

4. A cushion suspension and packaging apparatus for holding a plurality of disk products, said cushion suspension and packaging apparatus comprising:

(a) a package top having an upper surface and four walls extending transversely from said upper surface;

(b) a package base having a lower surface and four walls extending transversely from said lower surface;

(c) a first cushion having a plurality of parallel spaced apart, substantially rectangularly configured disk engaging members, each said disk engaging member having a flexible disk engaging surface whereby said flexible disk engaging surface conforms to a profile edge of a suspended disk product, first and second spaced apart lateral supports oriented perpendicular to said plurality of disk engaging members, each said disk engaging member spans the distance between said first and second lateral supports and said first cushion having means for securing said first cushion to said package top whereby substantial movement of said first and second lateral supports in response to shock is prevented;

(d) a second cushion having a concave surface, a plurality of disk engaging members located in said concave surface and a pair of support members extending transversely from such concave surface with means for securing said second cushion to said package base; and

(e) a second cushion securing means located on said lower surface of said package base for securing said second cushion to said package base.

5. A wafer cushion system for use in suspending a plurality of wafers in a container to prevent wafer damage from movement caused by vibration and shock, said wafer cushion system comprising:

(a) said container having a cover and a base;

(b) a plurality of spaced apart substantially rectangularly configured wafer engaging members, each said wafer engaging member having a flexible wafer engaging surface;

(c) a first and a second lateral support in parallel spaced apart arrangement with each said wafer engaging member spanning the distance between said first and second lateral supports, said first and second lateral supports extending unidirectionally between said plurality of wafer engaging members and said cover.

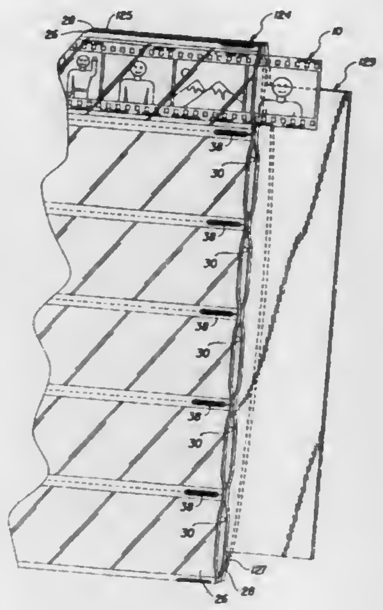
5,749,468
FILM HOLDER FOR USE IN MAKING AN INDEX PRINT

Joseph Anthony Manico, Rochester; David Lynn Patton, Webster; Thomas Richard Roule, Honeoye Falls; John Randall Fredlund, Rochester, and Anthony Ronald Berardi, Rush, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 203,149, Feb. 28, 1994. This application Jan. 8, 1997, Ser. No. 780,483

Int. Cl.⁶ B65D *85/00*

U.S. Cl. 206—455 **21 Claims**



1. A holder having a plurality of locations for holding film image areas spatially separated apart to facilitate digital scanning thereof to develop a digital record, the holder made of a first material that allows digital scanning, when it is located on the platen of a digital scanner, of any film image area in any of said locations and the compilation of the digital record therefrom and having datum means thereon associated spatially with said plurality of locations, said datum means made of a second material that is distinguishable from said first material when scanned into said digital record and is recognizable in said digital record as non-image data for identifying image data related to said plurality of locations and for identifying the orientation of said holder with respect to the scanner platen .

2. A holder for holding a plurality of filmstrips in spaced apart relation to facilitate digital scanning of the filmstrips to obtain a digital record thereof when placed on a digital scanner platen, said holder comprising first and second sheets secured together along a plurality of elongated lines of contact extending parallel to one another to provide a plurality of sleeves therebetween, each sleeve being configured so as to receive a filmstrip, said first and second sheets being made of a first material that allows digital scanning therethrough of any filmstrips placed in any of said sleeves to develop a digital record of said holder including said filmstrips comprising image data and non-image data, said holder having datum associated with each of said sleeves for orienting the position of said holder with respect to said digital scanner platen, said datum formed of a second material that is distinguishable from said first material when scanned and is recognizable in said digital record for identifying the locations of said sleeves and filmstrips located therein when said holder holding at least one filmstrip is digitally scanned.

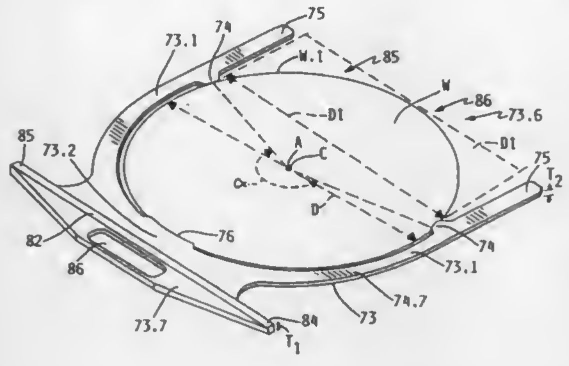
5,749,469
WAFER CARRIER

Randall S. Williams, Chaska, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 251,017, May 31, 1994, abandoned, which is a continuation of Ser. No. 883,181, May 15, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,692

Int. Cl.^{6} B65D *85/30*

U.S. Cl. 206—710 **12 Claims**



1. A closeable container for containing and retaining semiconductor wafers having a substantially circular peripheral edge, the container comprising:

a) a box comprised of a receptacle portion and a removable cover portion; and

b) and a plurality of axially aligned C-shaped wafer holders each having an open side and an opposite closed side, the holders each engageable with the peripheral edge of one of the semiconductor wafers, the holders each comprised of an intermediate portion at the closed side and a pair of resilient discrete arcuate arm portions extending from the intermediate portion, the intermediate portions attached to and stationary with the plastic box, the arm portions flexible outwardly and having a retaining position and an expanded release position whereby a wafer may be retained within each wafer holder in the retaining position and received or released from each wafer holder in the release position.

5,749,470
INSTALLATION FOR DECONTAMINATING A RADIOACTIVELY CONTAMINATED SURFACE

Hermann Operschall, Lauf; Jakob Weber, Baiersdorf; Klaus-Alfred Steiner, and Stefan Ring, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 8, 1995, Ser. No. 569,717

Claims priority, application Germany, Jun. 8, 1993, 43 19 095.2

Int. Cl.^{6} B03B *9/00*

U.S. Cl. 209—2 **6 Claims**

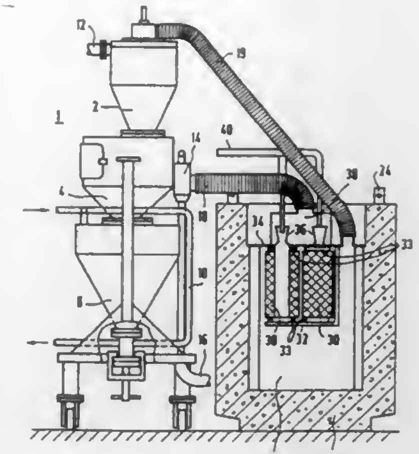
1. An installation for suction extracting and separating a radioactively contaminated abrasive/dust mixture, comprising:

a) an extractor for suction extraction of an extraction gas together with an abrasive/dust mixture produced during blasting;

b) a separator disposed upstream of said extractor for separating the abrasive/dust mixture aspirated by said extractor into a dust fraction and a re-usable abrasive fraction;

c) a storage bin connected between said extractor and said separator;

d) said storage bin including a filter device having a filter for filtering the extraction gas flowing from said separator to said storage bin and then flowing through said storage bin to said extractor, and a blowoff line to be connected to said filter device for blowing off said filter.



5,749,471
VIBRATING SCREEN

Anders Andersson, Arbrå , Sweden, assignor to Svedala-Arbra AB, Arbra, Sweden

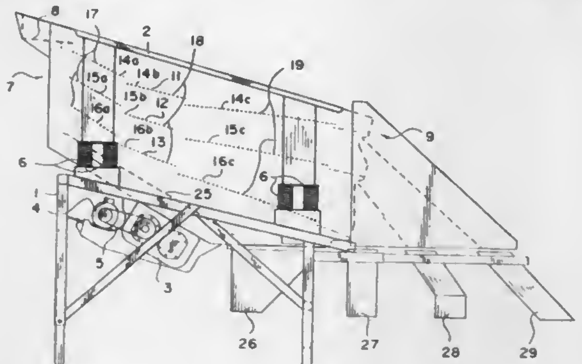
PCT No. PCT/SE94/00380, § 371 Date Nov. 7, 1995, § 102(e) Date Nov. 7, 1995, PCT Pub. No. WO94/26427, PCT Pub. Date Nov. 24, 1994

PCT Filed Apr. 28, 1994, Ser. No. 545,814

Claims priority, application Sweden, May 10, 1993, 9301592

Int. Cl.^{6} B07B *1/28*

U.S. Cl. 209—314 **12 Claims**



1. A vibrating screen for the sizing of granular material, comprising a frame (1) and an oblong screen body (2) which is movable in relation to said frame, oscillating movements to be imparted to said screen body by means of a motor powered vibrator mechanism (3) connected to said screen body, said screen body being at one end, the feed end (7), arranged to receive unscreened material and furthermore being provided with an upper screen deck and one or more underneath said upper deck located lower screen decks (11–13) provided with successively decreasing screen openings for each lower deck, the decks being inclined downwards from said feed end (7) towards an opposite end of said screen body, the discharge end (9), and each screen deck being composed of three or more component screens (**14***a–c*, **15***a–c*, **16***a–c*) arranged one after the other and provided with screening elements (**17–18**), said component screens being arranged with successively decreasing inclinations relative to the horizontal plane, said vibrator mechanism (3) being arranged to impart to said screen body (2) directional oscillating movements which impart to said material lifting or throwing movements obliquely forwards and upwards in a direction towards said discharge end (9), at least one said component screen in a lower screen deck having a greater inclination in relation to the corresponding component screen of the nearest deck above.

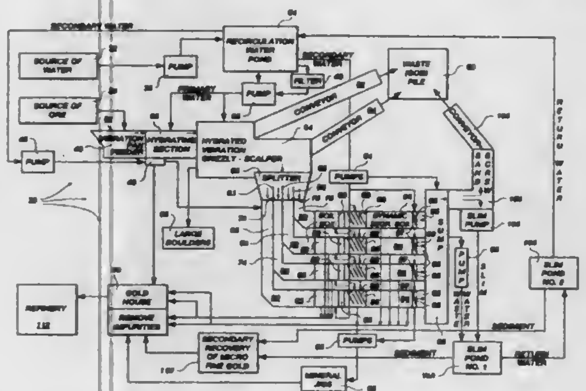
5,749,472
DYNAMIC MINING SYSTEM COMPRISING HYDRATED MULTIPLE RECOVERY SITES AND RELATED METHODS

Noel Tanner, Lakeshore, Utah, assignor to A.U. Mines, Inc., Calgary, Canada, and Rennat Trust, Lakeshore, Utah

Continuation of Ser. No. 212,745, Mar. 14, 1994, Pat. No. 5,544,756. This application Mar. 29, 1996, Ser. No. 624,236

Int. Cl.^{6} B03B *5/28*

U.S. Cl. 209—458 **35 Claims**



1. A gold recovery apparatus comprising:

a trough comprising a bottom wall in which a stream of ore and carrier water turbulently flows;

structure by which flow adjacent to the trough bottom wall is slowed to laminar flow;

at least one slot extending through the bottom wall into which gold particles move to a site outside of the trough from the laminar flow.

5,749,473
APPARATUS FOR SORTING SHEETS OR THE LIKE

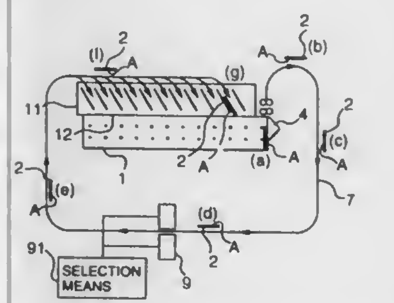
Taichiro Yamashita; Yasunori Hamada, both of Tsuchiura; Kazushi Yoshida, Ibaraki-ken; Tadashi Osaka, Ibaraki-ken, and Junichi Tamamoto, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 362,877, Dec. 23, 1994, Pat. No. 5,593,044. This application Oct. 21, 1996, Ser. No. 734,128

Claims priority, application Japan, Dec. 28, 1993, 5-334947

Int. Cl.^{6} B07C *5/36;* **B65H** *85/00*

U.S. Cl. 209—584 **2 Claims**



1. An apparatus for sorting and distributing sheet-like items, said apparatus comprising:

feeder means for feeding sheet-like items from a source thereof;

separation means for successively separating the items fed from the feeder means;

a plurality of stacking means positioned above the feeder means for stacking the items;

means defining a conveying path connecting the separation means to the stacking means, said conveying path being directed upwardly from the separation means, reversing in direction to extend downwardly, passing below the feeder means to head away from the separation means to a point beyond the one of the plurality of stacking means farthest from the separation means, changing direction to extend upwardly from below the feeder means to a point above the stacking means, and again changing direction to head toward the separation means; and

a single means for sorting and stacking the items in the plurality of stacking means, while conveying the items from said one of the stacking means farthest from the separation means toward the one of the stacking means nearest the separation means, and for reversing the conveying path direction to exchange the leading edge and the traveling edge of each conveyed item, said single means being midway the conveying path.

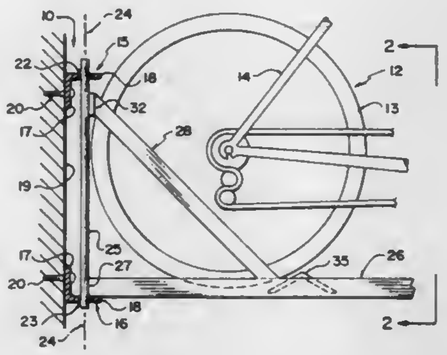
5,749,474
BICYCLE DISPLAY RACK

Timothy P. Woodcock, 2 Arundel Road, Winnipeg, Manitoba, Canada, R2J 2K9

Filed Sep. 22, 1995, Ser. No. 532,526

Int. Cl.^{6} A47F *7/00*

U.S. Cl. 211—18 **8 Claims**



1. A rack for mounting on a wall for displaying a plurality of bicycles comprising:

a substantially rectangular wall mount frame having a first upper horizontal rail, a second lower horizontal rail, each for mounting along the wall at a height spaced from the floor and a pair of vertical connecting members each arranged at respective aligned ends of the rails for connecting the rails to form a rigid structure, each rail comprising an angle member defining a first flat flange for lying flat against the wall and being fastened thereto by fasteners extending through holes in the flange and a second flange at right angles to the first flange so as to project outwardly from the wall at right angles to the wall such that the second flanges of the rails are aligned one above the other;

and a plurality of rack members each for receiving a respective one of the bicycles for display;

the rails having a plurality of mounting means therein each for receiving a respective one of the rack members, the mounting means consisting solely of a pair of aligned holes in each of the second flanges of the upper and lower rails, each pair being aligned relative to and coaxial about a vertical axis with the axes spaced longitudinally along the rails;

each rack member comprising:

a vertical post portion defining an upper pin end projecting through the hole in the flange of the upper rail and a lower pin projecting through the respective hole in the flange of the lower rail so that the post portion is supported on the rails and is maintained vertical for pivotal movement about the vertical axis;

the upper pin end being longer than the lower pin end such that the post portion can be lifted vertically to a position in which the upper pin projects through the hole in the second flange of the upper rail to release the lower pin end from the lower rail and such that the post portion when released can be readily removed from and replaced on the rails;

a horizontal rail portion attached to the post portion for pivotal movement therewith and projecting outwardly from the wall, the rail portion defining a channel for confining a bottom edge of the wheels of the bicycle;

and a pair of angle braces each inclined from a point on the rail portion spaced from the post portion upwardly and toward the post portion with each angle brace on a respective side of the channel to hold the rail portion horizontal and to locate that wheel of the bicycle adjacent the post portion.

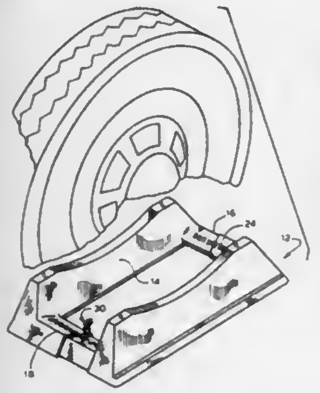
5,749,475
TIRE SUPPORT

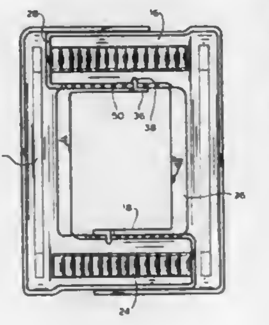
Jimmy M. Krebs, Round Lake, Ill., assignor to Benchmarc Display, Incorporated, Vernon Hills, Ill.

Filed Mar. 24, 1997, Ser. No. 822,063

Int. Cl.⁶ A47F *7/00*

U.S. Cl. 211—24 **13 Claims**





1. A tire support assembly comprising:

first and second opposing support members, wherein each support member includes an upright portion and spaced first and second legs affixed to said upright portion, said legs extending horizontally therefrom in opposing relation to said legs extending from said opposing support member, whereby opposing legs overlap one another; and

locking means for selectively fastening together said overlapped legs, wherein said locking means comprises tab means positioned on one of said overlapped legs and receptacle means positioned on said opposing overlapped leg for receipt of said tab means, said tab means comprising an arm member hinged to said respective leg and an insert member carried on said arm member.

5,749,476
RACK FOR A SWITCHING CABINET

Horst Besserer, Herborn; Udo Münch, Sinn; Markus Neuhof, Ehringshausen; Walter Nicolai, Buseck; Adam Pawlowski, Dillenburg; Matthias Schüler, Dietzhölztal, and Heinrich Strackbein, Biebertal, all of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Herborn, Germany

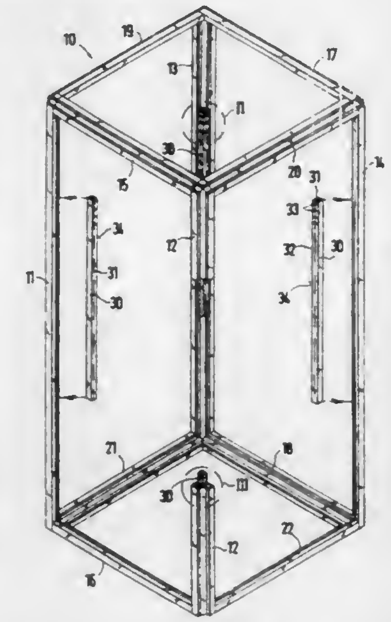
PCT No. PCT/EP94/03461, § 371 Date Apr. 10, 1996, § 102(e) Date Apr. 10, 1996, PCT Pub. No. WO95/11536, PCT Pub. Date Apr. 27, 1995

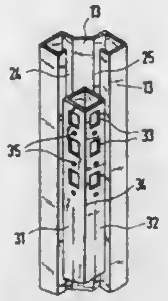
PCT Filed Oct. 21, 1994, Ser. No. 628,621

Claims priority, application Germany, Oct. 23, 1993, 43 36 204.4

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—26 **29 Claims**





1. In a rack for a switchgear cabinet having a plurality of frame pieces constituting a support framework, a plurality of mounting rails with mounting rail profile sides, extending along a length of the frame pieces and connected to the frame pieces such that they project into an interior of the support framwork with said mounting rail profile sides exposed, said mounting rail profile sides extending at right angles to each other and each forming at least one row of fastening receivers,

the improvement comprising:

the mounting rails (**30**), each of which extend at least over a portion of the length of an associated said frame piece (**11** to **22**), being fixed in a receiver extending parallel thereto and constituted by two lateral frame piece profiled sections (**24**, **25**) of the frame pieces (**11** to **22**), and the mounting rails profile sides (**31**, **32**) having said at least one row of fastening receivers (**33**) together forming an inner edge (**34**) of the rack.

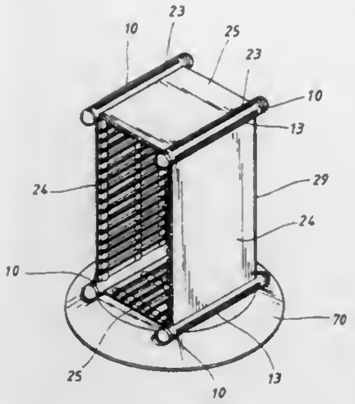
5,749,477
VIDEO/AUDIO MEDIUM RACK

I-Chen Chang, 2F, No. 41, Man-Ping St., Pan-Ch'iao City, Taipei Hsien, Taiwan

Filed Sep. 20, 1996, Ser. No. 718,237

Int. Cl.⁶ A47G *29/00;* **A47B** *81/06*

U.S. Cl. 211—40 **7 Claims**



1. A video/audio medium rack at least comprising four connecting rods, four wall boards and a back board, wherein

each connecting rod is a cylindrical body composed of two identical hollow semicylindrical members and two cap members, an inner side of the semicylindrical member being formed with an arch concave having a central engaging slot, an inner edge of the engaging slot being formed with a right angle plane face, two lateral edges of the semicylindrical member being formed with recesses each of which together with the arch concave define a right angle plane face, each end of the semicylindrical member being formed with an annular projection, four knot sections being disposed on the inner side of the semicylindrical member at equal intervals, two of the four knot sections adjacent to one end being disposed with tenons, while the other two knot sections adjacent to the other end being disposed with mortises, two middle knot sections being disposed with hook bodies directed to the same direction, whereby when the two semicylindrical members are assembled, the hook bodies are hooked with each other and the tenons and engaged with the mortises and the recesses together form another engaging slot, the cap member being tightly fitted with the annular projection **15** to form the connecting rod with upper, lower, left and right engaging slots;

the wall boards are rectangular or square board bodies, each lateral side of the wall board being disposed with multiple tenons having engaging blocks on two sides for passing through and engaging with the engaging slot, a rear side of the wall board being disposed with a channel for the back board to insert therein, the wall board being disposed with multiple slide rails perpendicular to the channel, multiple arch guiding ribs being are disposed across the slide rails parallel to the channel;

the back board is a rectangular or square plate body formed with peripheral stopper flange for fitting into the channels of the wall boards, whereby the tenons of the rectangular wall boards and square wall boards are interlacedly engaged in the engaging slots of the four connecting rods.

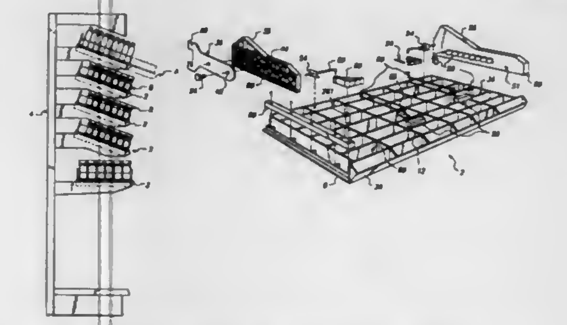
5,749,478
IN-LINE GRAVITY FEED SHELF SYSTEM

M. Jeffrey Ellis, Spring Valley, N.Y., assignor to Burns Philp Food Inc., San Francisco, Calif.

Filed Jan. 26, 1995, Ser. No. 378,598

Int. Cl.⁶ A47F *1/04*

U.S. Cl. 211—59.2 **6 Claims**



6. A display shelf mounted to a gondola, comprising:

a tray having a front lip for retaining product there behind;

means for sliding the tray in a generally horizontal manner to and from the gondola, wherein the sliding means comprises means for supporting the tray and means for adjusting an angle between the tray and the gondola;

means for locking the tray in at least three predetermined horizontal positions alone the sliding means; and

means for releasing the locking means.

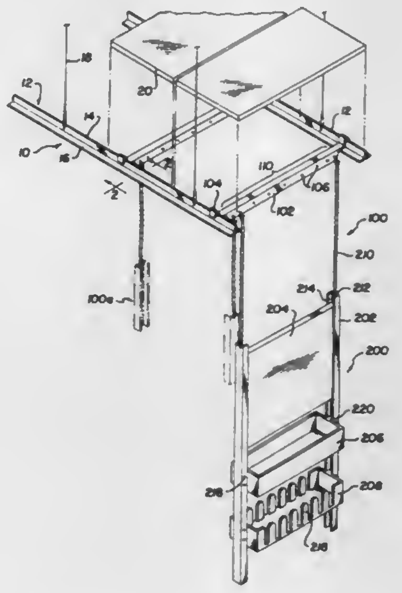
5,749,479
DISPLAY ASSEMBLY

Paul Belokin; Martin P. Belokin, and Norman P. Belokin, all of P.O. Box 1907, Denton, Tex. 76202

Filed Jan. 18, 1996, Ser. No. 588,547

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—113 **28 Claims**



1. A display assembly for suspension from a ceiling having a grid of supports for accepting ceiling tiles, and wherein said supports have a horizontal portion and a vertical portion, said assembly comprising:

(a) a bracket having first and second ends, said ends having a flange which overlaps the horizontal portion of the ceiling supports; and

(b) a display attached to the bracket by hanging means.

5,749,480
PIVOTAL DISPLAY RACK

Graham Robert Wood, Glencoe, Ill., assignor to Stamford Investments, Inc., Prospect Hts., Ill.

Filed Jan. 17, 1997, Ser. No. 785,649

Int. Cl.⁶ A47F *5/12*

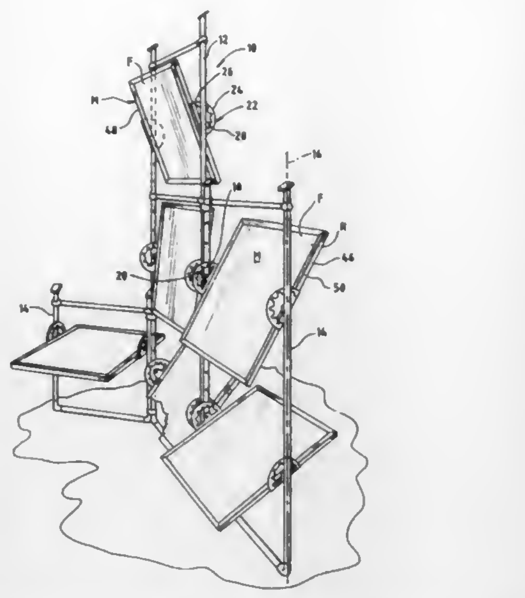
U.S. Cl. 211—169.1 **10 Claims**

1. A display rack for supporting an associated shelf-like member in a range of inclinations, comprising:

at least one support member having a longitudinal axis;

at least two spaced apart support pegs extending from said support member generally transverse to said longitudinal axis; and

a support bracket defining a mounting plane, said bracket being mountable to the shelf-like member and mountable to said support member, said bracket including an arcuate portion and a straight portion contiguous therewith defining an open central region, said straight portion defining a central notch therein discontiguous with said open central region, said arcuate portion defining a plurality of spaced apart, radially oriented notches formed therein contiguous with said open central region,



wherein said bracket is engageable with said support pegs having one of said support pegs engageable with said central notch and the other of said support pegs engageable with a selected one of said radially oriented notches for orienting the shelf-like member at a selected orientation, and wherein successively engaging the other of said support pegs with each of said radially oriented notches defines a range of inclinations of said mounting plane of substantially 180 degrees relative to said longitudinal axis.

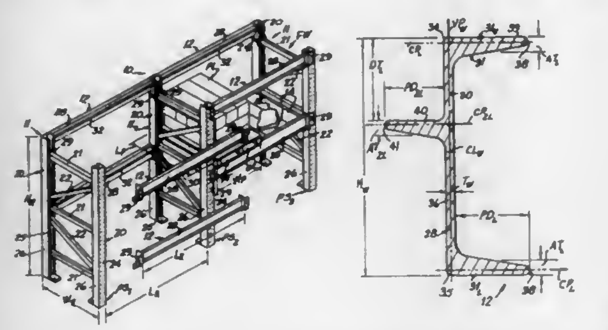
5,749,481
STORAGE RACK AND STRUCTURAL BEAM THEREFOR

Myron W. Miller, 723 Greenhouse Patio Dr., Kennesaw, Ga. 30144

Filed Jan. 3, 1994, Ser. No. 176,771

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 211—191 **10 Claims**



1. A structural beam for use with a decking member having opposed ends comprising:
- an elongate planar central web section having a unitary cross-section and defining a longitudinal central axis along the length thereof, a web plane extending longitudinally thereof along which said axis extends, and side edges thereon on opposite sides of and parallel to said central axis;
- a pair of spaced apart, elongate first leg sections, each of said first leg sections having a unitary cross-section and defining a first inboard end and a first projecting end thereon, each of said first leg sections integral with one of said side edges of said central web section at said first inboard end thereof and projecting outwardly from said central web section on one side of and substantially perpendicular to said web plane so that said first projecting end of each of said first leg sections is spaced a prescribed distance from said central plane, and so that said first leg sections and said central web section define a generally U-shaped cross-sectional shape; and,
- an elongate second leg section having a unitary cross-section and defining a second inboard end and a first projecting end thereon said second leg section integrally joining said central web section at said second inboard end thereof along a path parallel to said central axis of said central web section and spaced inboard of the opposed side edges of said central web section; said second leg section projecting out from said central web section on that side of said web plane opposite said first leg sections; oriented perpendicular to said web plane; and, oriented substantially parallel to said first leg sections, said second leg section further defining a secondary planar support surface on one side thereof oriented perpendicular to said web plane so that when said beam is oriented generally horizontally while said web plane is generally vertically oriented and said secondary planar support surface is facing upwardly, one end of the decking member can be supported on said secondary planar support surface.

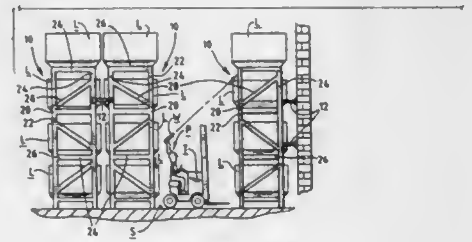
5,749,482
STORAGE RACK BEAM HAVING SURFACE ENABLING INDICIA AT LOW ELEVATION TO BE EASILY READ

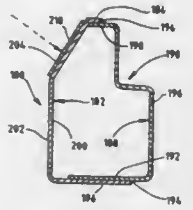
William L. Clark, Pinehurst, N.C., assignor to Unarco Material Handling, Inc., Springfield, Tenn.

Continuation of Ser. No. 591,294, Jan. 25, 1996, Pat. No. 5,655,675, which is a division of Ser. No. 341,749, Nov. 18, 1994, Pat. No. 5,526,945, which is a division of Ser. No. 95,607, Jul. 21, 1993, Pat. No. 5,368,174, which is a continuation-in-part of Ser. No. 926,458, Aug. 7, 1992, abandoned. This application Sep. 23, 1996, Ser. No. 717,372

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 211—191 **6 Claims**





1. A storage rack positioned on a substantially horizontal surface, the storage rack including a front portion facing an aisle and a rear portion facing away from the aisle, the storage rack comprising an upright frame including two front columns, each front column having a side wall and a front wall meeting the side wall at a vertical corner, so as to correct informalities noted in the claim, a platform defined by a wooden or steel deck or by spaced wooden or steel braces, a support beam extending horizontally between the front columns and connected to the front columns, the support beam having an uppermost edge and having a surface supporting the end portion of the platform, the supporting surface being spaced below the upper edge, the support beam having two ends and an end flange at each end, the end flange being connected to a given one of the front columns, the end flange having a side portion and a front portion meeting the side portion at a vertical corner, the side portion being welded to said end of the support beam and facing the side wall of the same one of the front columns, the front portion facing the front wall of the same one of the front columns, the support beam having an inclined wall facing upwardly and frontwardly at an angle in a range from about 10° to about 80° relative to a vertical plane, the inclined wall extending to the uppermost edge.

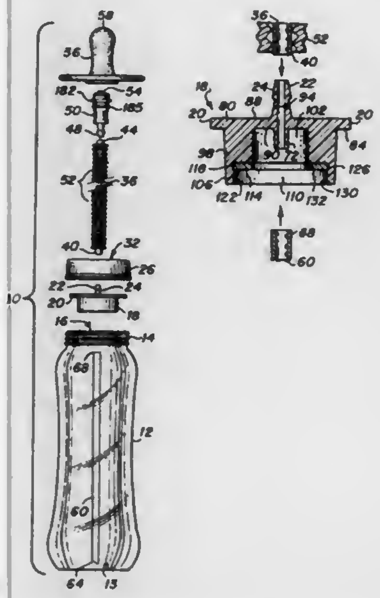
5,749,483
BABY BOTTLE

Jason Tebeau, 737 Judith Ct., Petaluma, Calif. 94952

Filed Dec. 14, 1995, Ser. No. 572,760

Int. Cl.^{6} A61J *9/00*

U.S. Cl. 215—11.4 **10 Claims**



1. A baby bottle device comprising:
- a container for holding a liquid therewithin;
- a nipple for liquid removal from said container;
- a liquid flow tube having a first end in fluid communication with said container and a second end, said second end being in fluid communication with said nipple;
- a liquid flow control means being disposed in fluid communication with said liquid flow tube means and functioning to control the flow of liquid from said bottle to said nipple, wherein said liquid flow control means includes a valve device having a resilient member disposed therewithin, said resilient member acting against a movable valve member to releasably control the flow of liquid through said valve device;
- said container being formed with a neck portion for the inletting and outletting of liquid therethrough;
- a disk member being removably disposed upon said neck portion to form a liquid tight seal with said neck portion of said container, said disk member having a liquid flow tube engagement member projecting outwardly therefrom and a liquid flow passage formed within said liquid flow tube engagement member, said first end of said liquid flow tube means being removably engagable with said liquid flow tube engagement member;
- said disk member further including a container flow tube engagement means projecting in an opposite direction to said liquid flow tube engagement means; said liquid flow passage extending through said container flow tube engagement means;
- a container flow tube being engaged to said container flow tube engagment means and extending into said container, whereby liquid within said container will flow through said container flow tube towards said nipple;
- said disk member further including a downwardly depending cylindrical sidewall that defines an upper cylindrical chamber and a lower cylindrical chamber, wherein said upper cylindrical chamber is formed with a smaller diameter than said lower cylindrical chamber, and wherein said container flow tube engagement means resides solely within said upper cylindrical chamber.

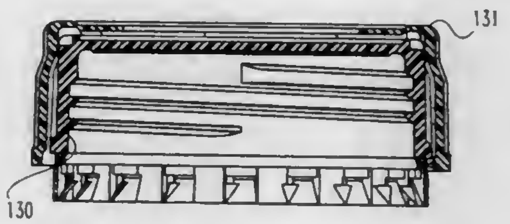
5,749,484
TAMPER-EVIDENT CHILD-RESISTANT CLOSURE

Stanley D. Trout, Huntington, Ind., assignor to Rieke Corporation, Auburn, Ind.

Continuation-in-part of Ser. No. 532,157, Sep. 22, 1995, Pat. No. 5,609,262. This application Oct. 17, 1996, Ser. No. 733,223

Int. Cl.^{6} B65D *55/02*

U.S. Cl. 215—219 **11 Claims**



1. A tamper-evident closure for a container having an externally-threaded neck finish, said tamper-evident closure comprising:
- a closure cap having an upper wall and an internally-threaded, surrounding sidewall, said sidewall extending between said upper wall and a lower edge portion, said closure cap further including an annular bead extending beyond said lower edge portion; and
- tamper-indicating means comprising a break-away annular ring depending from said lower edge portion of the sidewall, a plurality of frangible elements detachably securing said annular ring to said lower edge portion, and a plurality of tabs bent upwardly, said frangible elements being radially spaced outwardly from said annular bead and defining therewith an annular channel, a portion of said tabs being positioned within said annular channel, whereby said annular bead is used to hold said tabs in their folded position, and whereby said tabs cooperate with said neck finish during removal of said closure cap, causing said frangible elements to break, thereby separating said annular ring from the remainder of said closure cap.

5,749,485
PORTABLE OIL CONTAINER

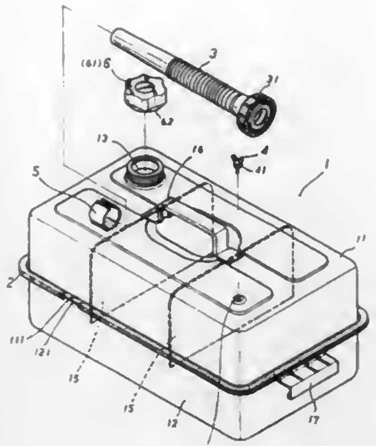
Chun Ta Chiu, 8F-2, No. 185 Fu Kou Road, Kaohsiung, Taiwan

Filed May 19, 1997, Ser. No. 858,118

Int. Cl.^{6} B65D *25/00*

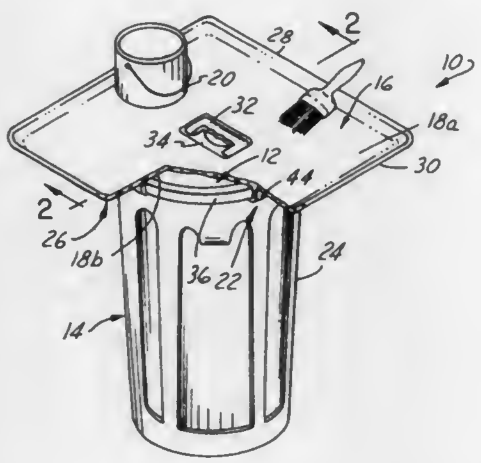
U.S. Cl. 220—4.12 **3 Claims**

1. A portable oil container comprising a steel housing defining an oil chamber for an oil and having an oil port through which an oil is filled into or poured out of said oil chamber and an internally threaded air vent for communication between said oil chamber and the atmosphere, a carrying handle provided at a top side of said housing, a wing screw threaded into said air vent to seal its passage, and a feed pipe adapted to be connected to said oil port, and a sealing cap adapted to seal said oil port when said feed pipe is not connected to said oil port, wherein said housing is comprised of an upper cover shell having an outward bottom coupling flange, a bottom cover shell having an outward top coupling flange fastened to the outward bottom coupling flange of said upper cover shell, and a rubber packing strip fastened to said outward bottom coupling flange and said outward top coupling flange to seal the gap; a springy pipe clamp is welded to said upper cover shell on the outside and adapted for holding said feed pipe when said feed pipe is not connected to said oil port; a handhold is provided at one peripheral side of said housing remote from said oil port; a plurality of flat bumpers are transversely disposed in parallel inside said



upper cover shell and adapted to buffer the oil contained in said housing when said housing is moved or turned.

5,749,486
WORK PLATFORM PROVIDING REFUSE CONTAINER LID
Scott D. Porter, 1872 Stoddard Rd., Richmond, Mich. 48062
Filed Jul. 8, 1996, Ser. No. 682,934
Int. Cl.⁶ B65D *21/02*
U.S. Cl. 220—23.86 **18 Claims**



1. A lid for interfitting with a sidewall of a refuse container so as to cover a mouth thereof, said lid comprising:

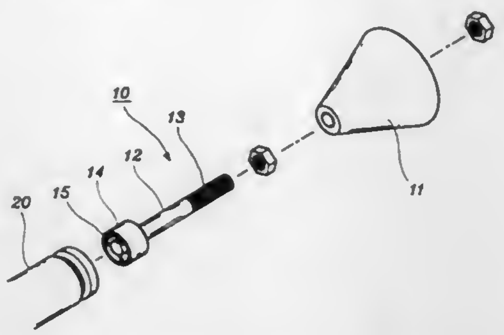
a substantially planar, rigid platform member having an upper surface and an opposite lower surface, said platform member having a periphery, said periphery having a first cross-section; and

interface member means for interfitting with a sidewall of a refuse container at the mouth thereof to thereby cover the mouth and provide a work platform at said upper surface of said platform member;

wherein said interface member means has a second cross-section, said first cross-section being larger than said second cross-section which thereby defines an overhang of said platform member with respect to the sidewall of the refuse container at the mouth thereof;

wherein said overhang is substantially at least one inch all around said periphery.

5,749,487
DEVICE FOR PREVENTING GUSH OF FUEL OIL FROM THE FUEL TANK
Kim Sae Il, Ulsan, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea
Filed Sep. 6, 1996, Ser. No. 706,717
Claims priority, application Rep. of Korea, Sep. 6, 1995, 95-24173
Int. Cl.⁶ B65D *25/00*
U.S. Cl. 220—86.2 **3 Claims**



1. A device for preventing a gush of fuel oil from the filler neck during the oil supplying with the refueling gun, the device comprising:

a conical hollow dispersing plate for dispersing the injected oil from the filler neck, the conical dispersing plate having a through hole formed at the top portion thereof;

a cylindrical extension rod for supporting the dispersing plate adjacent to the lower end of the filler neck, the extension rod including a thread formed at one end to couple with the dispersing plate via the through hole; and

an insert for securely mounting the other end of the extension rod and for placing onto the lower end portion of filler neck, the end portion of filler neck having a stepped section to secure the insert within the filler neck, the insert having an axial pipe for coupling with the other end of the extension rod, and a plurality of ribs radially formed around the axial pipe to support the insert, thereby forming a plurality of passages within the insert.

5,749,488
CAN END WITH RECESSED CENTER PANEL FORMED DOWNWARDLY FROM COIN
Alan C. Bagwell, Chesterfield County, and Daniel A. Edwards, Henrico County, both of Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Oct. 2, 1995, Ser. No. 537,484
Int. Cl.⁶ B65D *17/34*
U.S. Cl. 220—269 **22 Claims**

1. An easy-open container end with a non-detachable tab for making an opening therethrough suitable for pouring, comprising:

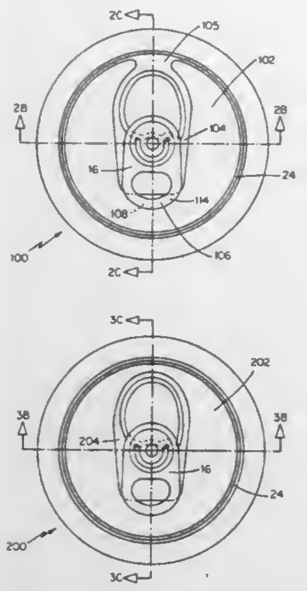
an end wall formed with a center panel and a seaming panel,

a rupturable score line in the center panel defining most of the periphery of a nonremovable tear panel, while leaving an integral hinge between the panel and the remainder of the end wall, said score line extending away from one end of the hinge, around a bight where it is distant from the hinge, and back to the other end of the hinge,

said tab extending generally parallel and close to an underlying area of the end wall, a rear part of the tab defining a finger gripping portion being engageable for upward lifting, and a forward part of the tab overlying a minor portion of the tear panel, and

attaching means on the end wall in a region thereof adjacent the score line and outside the tear panel, said attaching means being nondetachably secured to connecting means on the tab,

said attaching and connecting means permitting pivotal movement of the tab when the rear part of the tab is lifted up from



the container and, while the forward end of the tab correspondingly swings down,

the score line being subject to initial rupture when the rear end of the tab is partially lifted to cause the forward end of the tab to press down on the panel,

continued pivotal movement of the tab, about an axis generally parallel to the underlying area of the end wall and close to the said attaching means, being effective to propagate the rupture of the score line and to swing the panel down about its hinge to open position,

and wherein said end wall is formed with a coined area substantially entirely circumscribing the center panel, and at least one downwardly recessed area defining a major portion of said center panel and being formed immediately radially inwardly adjacent the coined area.

5,749,489
PAPERBOARD CONTAINER FOR FLUIDS HAVING AN IMPROVED LOWER FITMENT RESTRAINT STRUCTURE
Christopher T. Benner, Vancouver, and Nicholas Harambasic, Seattle, both of Wash., assignors to Longview Fibre Company, Longview, Wash.
Filed Feb. 7, 1996, Ser. No. 598,079
Int. Cl.⁶ B65O *5/56;5/74*
U.S. Cl. 220—465 **28 Claims**

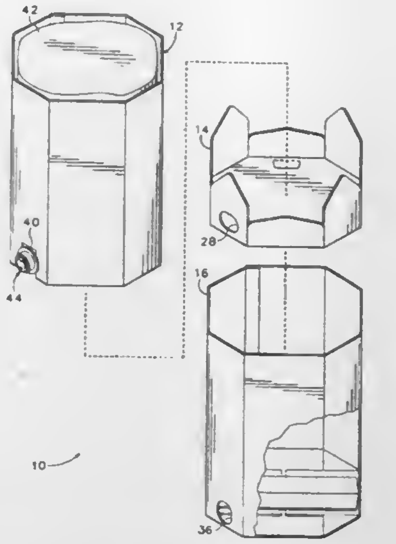
1. A container for fluid materials comprising:

(a) an upright tubular shell having a top end and a bottom end, said shell including at least three upright first sidewalls having a first width and at least two upright second sidewalls having a second width that is less than said first width, each of said second sidewalls being interdisposed between a respective pair of said first sidewalls;

(b) means for closing said bottom end of said shell

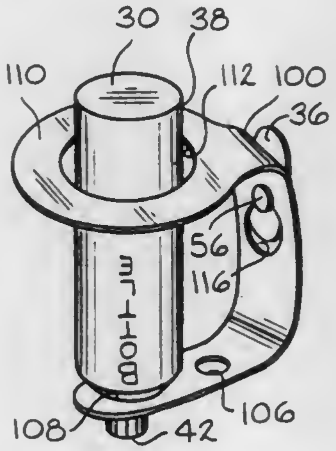
(c) a flexible, impervious liner located within said shell;

(d) a fitment attached to said liner for emptying said liner of fluid materials; and



(e) a lower portion of said upright second sidewall defining an outer opening suitable for a portion of said fitment to be inserted therethrough.

5,749,490
DISPENSING BOTTLE HANGER
Roger Myron Keicher, Lancaster, N.Y., assignor to RKR Advantage Inc., Lancaster, N.Y.
Continuation-in-part of Ser. No. 187,174, Jan. 26, 1994. This application Jun. 7, 1995, Ser. No. 473,522
Int. Cl.⁶ B65D *25/28*
U.S. Cl. 220—481 **10 Claims**



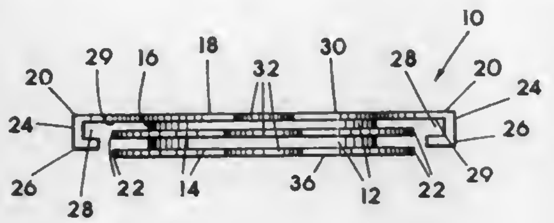
1. In combination with a dispensing bottle having an elongate body portion for containing a material, a neck portion defining an opening to said body portion, and a cap removably attachable to said neck portion for closing said opening, a hanger for hanging said bottle, said hanger comprising a single-piece elongate web of material having a pair of end portions and a central portion between said end portions, means defining at least one first opening in one of said end portions of said web which said means defining the first opening is sized to receive said body portion, means defining at least one second opening in the other of said end portions of said web which said means defining the second opening is sized to receive said neck and to be held between said bottle body and said cap, and said central portion having means for removably attaching said web to a wall to support said bottle upside down for dispensing.

5,749,491
REUSABLE COVER FOR RENDERING A CONVENTIONAL REUSABLE DRINKING CONTAINER SPILL RESISTANT

Robert N. Wylder, 7018 Fernhill Dr., Malibu, Calif. 90265, and Martin C. Steinbrecher, 462 Orsett St., Chula Vista, Calif. 91911

Filed Jul. 1, 1996, Ser. No. 672,950
Int. Cl.^{6} A47G *19/22*

U.S. Cl. 220—719 **8 Claims**



1. An engageable, removable and reusable cover for use on a conventional reusable drinking container for rendering the drinking container spill resistant;

said cover comprising,

a disk-shaped body of fluid impervious material for insertion into and spanning across an open top interior of the drinking container; said disk-shaped body including a relatively stiff central portion and a readily deformable flexible and resilient lateral side periphery extending outward from said stiff central portion; said stiff central portion sized smaller in diameter than the open top interior of the drinking container; said disk-shaped body baving an overall diameter larger than the open top interior of the drinking container; said disk-shaped body sized to be insertable into the open top interior of the drinking container wherein said stiff central portion supports said lateral side periphery tightly abutting against and friction-ally adhering to an annular sidewall interior surface of the drinking container;

multiple extending arm members each connected to said disk-shaped body and each having a relaxed condition of extending laterally outward beyond said disk-shaped body; said extending arm members each made of resilient flexible material readily bendable with bending force for allowing upward positioning of said extending arm members to allow insertion of said disk-shaped body into the drinking container with said extending arm members bent upward; said extending arm members each sufficiently resilient to return, absent applied bending force, to said relaxed condition of extending laterally outward beyond said disk-shaped body; said extending arm members each having a distal end with the distal ends in spaced relationship to one another and to said disk-shaped body; said extending arm members each supporting

a hook structure, one said hook structure on the distal end of each of said extending arm members with the hook structures in spaced relationship with one another, the hook structures positioned on said extending arm members so as to be restable atop an upper rim of the drinking container when said extending arm members are bent upward with said disk-shaped body inserted into the drinking container and recessed below the upper rim, whereby the hook structures can be abutted against the upper rim of the drinking container for serving as stops for aiding in determining a suitable distance said disk-shaped body is insertable downward into the drinking container below the upper rim;

a dispensing opening through said disk-shaped body for allowing access to beverage within the drinking container when said cover is engaged with the drinking container; said dispensing opening positioned in spaced relationship from each of said extending arm members and substantially off-centered of said. disk-shaped body so as to be adjacent the annular sidewall interior surface of the drinking container when said cover is engaged with the drinking container;

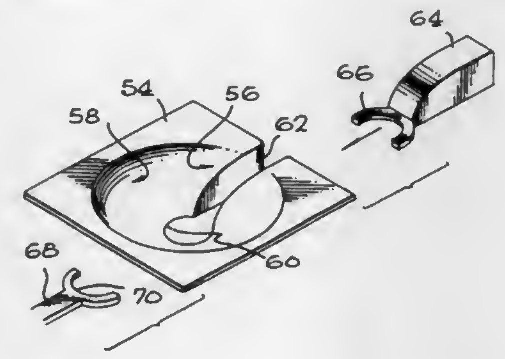
a vent opening through said disk-shaped body for preventing a vacuum within the drinking container when said cover is engaged with the drinking container.

5,749,492
SHEET DISPENSER AND METHOD

Tor Petterson, 96 Yacht Harbor Dr., Rancho Palos Verdes, Calif. 90274

Filed May 4, 1995, Ser. No. 433,978
Int. Cl.^{6} A47K *10/24*

U.S. Cl. 221—1 **22 Claims**



4. A dispenser for the dispensing of individual sheets of a flexible and foldable fibrous sheet product from a center fed roll of such product, said dispenser comprising:

(a) a plate for receiving a roll of the sheet product in a selected orientation with respect to the plate;

(b) an opening in said plate positioned with respect to said roll for receiving the sheets of the product and allowing a user to pull the same outwardly through the opening;

(c) an elongate slot in said plate in communication with an inner portion of said opening and an edge of said plate, and said opening and slot forming an elongate dispensing aperture; and

(d) aperture control means associated with said elongate dispensing aperture in said plate to selectively control the size of the elongate dispensing aperture to enable accommodation of sheets with different thickness or physical conditions.

5,749,493
CONDUIT MEMBER FOR COLLAPSIBLE CONTAINER

Debra Cheryl Boone, Atlanta, Ga., and Mladomir Tomic, Appleton, Wis., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 542,322, Oct. 17, 1983, abandoned. This application Nov. 10, 1987, Ser. No. 119,034
Int. Cl.^{6} B65D *83/00*

U.S. Cl. 222—105 **20 Claims**

1. A method for producing a disposable flexible bag for use in containing and dispensing a liquid and including a spout having an opening through which the bag is to be filled and emptied, and said bag also including a liquid passage means inside of said bag for providing at least one elongated liquid channel open to the interior of said bag and in liquid flow communication with said spout opening as said bag progressively collapses against said liquid passage means, said method comprising the steps of:

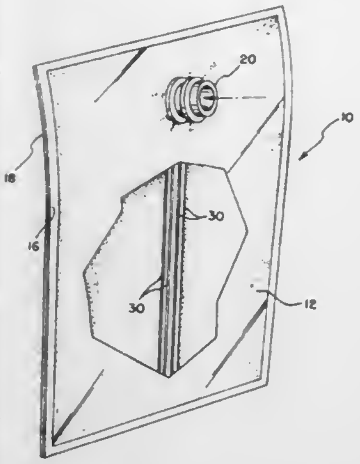
a) providing flexible bag wall means for use in forming said bag;

b) providing a spout in said bag wall means having an opening therethrough and a longitudinal axis substantially perpendicular to said bag wall;

c) positioning said liquid passage means having said liquid channel inside of said bag wall means prior to forming said bag wall means into a bag;

d) positioning said liquid passage means inside of said bag wall means such that when said bag wall means are formed into a bag having no liquid contained therein, said liquid channel of said liquid passage means will be in liquid flow communication with said spout opening and transversely disposed thereto, substantially perpendicular to said longitudinal axis of said spout; and

e) forming said bag wall means into a bag with said spout being connected through a bag wall, with said liquid passage means being secured inside of said bag to maintain said elongated channel in liquid flow communication with said opening in said spout.

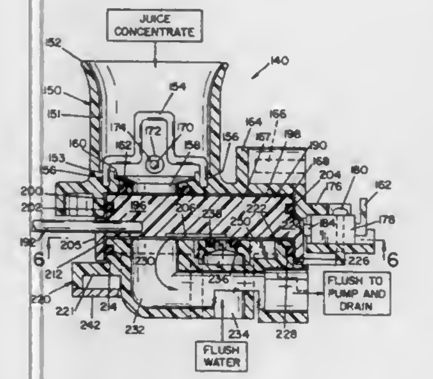


5,749,494
JUICE DISPENSER

Peter Wolski, Algonquin, and Michael S. Long, Wauconda, both of Ill., assignors to IMI Wilshire Inc., Anoka, Minn.

Filed Aug. 12, 1996, Ser. No. 695,726
Int. Cl.^{6} B67D *5/56*

U.S. Cl. 222—129.1 **81 Claims**



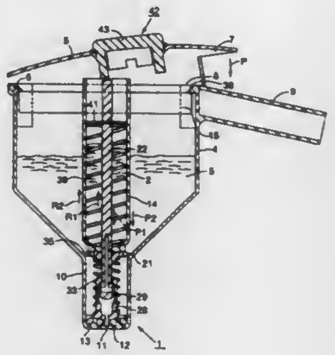
1. A beverage dispenser comprising a housing, at least one container means for enclosing a liquid, discharge means for dispensing said liquid, and fluid metering controller means for controlling the flow rate of said liquid from said container means to said discharge means, said fluid metering controller means including pump means for controllably moving said liquid to said discharge means and container coupling means for providing a passageway from said container means to said pump means, said container coupling means including a flush valve movably mounted and substantially sealed between a container adaptor and a connector bottom, said connector bottom including a bottom base, a seating section extending from said bottom base and bottom sealing means extending about the peripheral edge of said seating section for substantially sealing said flush valve to said connector bottom, said flush valve including base including base cavity means for telescopically receiving said seating section of said connector bottom.

5,749,495
DISPENSER FOR DISPENSING TWO LIQUID PRODUCTS

Leif Einar Stern, Lomma, Sweden, assignor to Aspect International AB, Lund, Sweden

Filed May 28, 1996, Ser. No. 654,245
Claims priority, application Sweden, May 30, 1995, 9501968
Int. Cl.^{6} B67D *5/60*

U.S. Cl. 222—134 **13 Claims**



1. Dispenser for manually feeding out at least a first and a second liquid product on food products, comprising:

a first container for containing one liquid product and having an inner wall and an outer discharge space,

a second container having an outer wall and a valve housing and movably provided substantially within the first container for containing an other liquid product, the second container being movable between a return position and a dispensing position,

an outer sealing means located on the outer wall of the second container, said sealing means sealingly engaging the inner wall of the first container when said second container is moved into a dispensing position to feed or press out, while sealingly engaging the first container, such units of said one liquid product in the outer discharge space in said first container,

an inner piston movably provided within the second container, the inner piston being movable between a return position and a dispensing position to feed or press out, while sealingly or tightly engaging the walls of the valve housing of the second container, such units of said other liquid product gathered in a lower discharge or feed-out chamber in the valve housing of the second container,

the outer sealing means when moved to the return position, cooperating with means for admitting units of said one of the liquid products into the outer discharge space,

at least one of the inner piston and the valve housing cooperating with means to admit units of said other liquid product into the lower discharge or feed-out chamber in said valve housing, when said inner piston is moved from the dispensing position to the return position, wherein the second chamber and the inner piston are movable relative to each other,

means for moving the second chamber from a return position to a dispensing position without moving the inner piston from a return position to a dispensing position so that only units of said one liquid product can be dispensed,

means for moving the inner piston from a return position to a dispensing position without moving the second container from a return position to a dispensing position so that only units of said other liquid product can be dispensed, and

means for moving the second container and the inner piston from respective return positions to respective dispensing positions at the same time so that units of said one liquid as well as said other liquid product can be dispensed simultaneously.

5,749,496

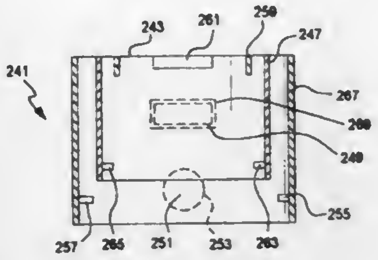
SQUEEZE AND ROTATE TO LIFT CAPTIVE CAP DISPENSER

Stuart DeJonge, Sr., Easton, Pa., and Jack Weinstein, Manchester Township, Ocean County, N.J., assignors to Primary Delivery Systems, Inc., Easton, Pa.

Filed Jun. 19, 1996, Ser. No. 665,988

Int. Cl.^{6} B65D *47/00;* **B67D** *5/06*

U.S. Cl. 222—153.14 **27 Claims**



1. A captive cap dispenser device closure comprising:

(a) a container having a base for holding contents, a neck and an open mouth, said neck defining said open mouth, said neck having an inner surface and an external surface, said neck external surface having at least a first recess track, said first recess track having a first end and a second end, said first recess track first end having a first impression defined therein, said first recess track second end having a second impression defined therein, said first and second impressions having a greater depth than said first recess track; and

(b) a dispenser cap being manually rotatable between a first closed position and a second open position, said cap having means for non-removably retaining said cap to said neck of said container, wherein said cap comprises:

a top and an annular sidewall extending from said top, said top having an inner surface, said annular sidewall having an inner and an outer surface, said annular sidewall being semi-flexible, said annular sidewall also having a dispensing orifice thereon such that said dispensing orifice is closed by said neck when said cap is in said first closed position and open when said cap is in said second open position, said annular sidewall outer surface having a first squeeze point and a second squeeze point opposite said first squeeze point, said annular sidewall inner surface having at least a first locking protrusion, said first locking protrusion being spaced equally between said first and second squeeze points such that said first locking protrusion will be forcibly biased outwardly when inward pressure is applied to said first and second squeeze points, said first locking protrusion being located and confined within said first recess track and being in frictional contact therewith, said first locking protrusion being securely located within said first recess track first impression when said cap is in said first closed position, said first locking protrusion being removably located within said first recess track second impression when said cap is in said second open position, said cap being capable of rotation from said first closed position to said second open position only when said first and second squeeze points are biased inwardly such that said first internal locking protrusion is displaced from said first recess track first impression.

5,749,497

CONTAINER AND RETRACTABLE HANGER SYSTEM

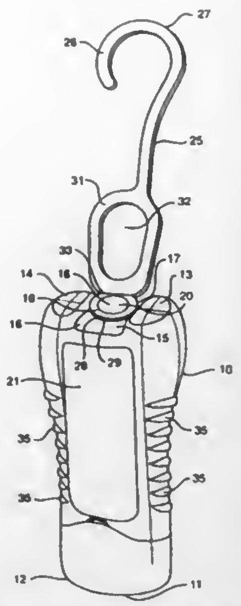
Brian T. Davis, Waterford, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jul. 3, 1996, Ser. No. 679,464

Int. Cl.^{6} B67D *5/06*

U.S. Cl. 222—181.2 **13 Claims**

1. A container and retractable hanger system comprising:



a container having a dispenser at one end, a cylindrical boss extending from an opposite end, a side extending between said ends, and a lip extending from a portion of said boss; and

an elongated, elastic hanger having (i) a hook at one end, (ii) a coupler with an opening, with which said boss is pivotally couplable by insertion of said portion with said lip through said coupler, at an opposite end, and (iii) a hinge adjacent said coupler between said hook and said coupler.

5,749,498

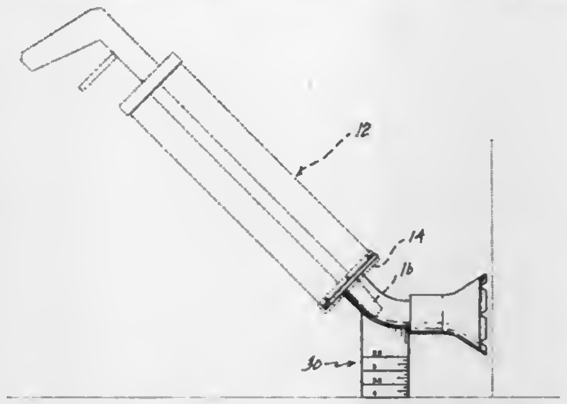
APPLICATOR AND SPREADER TOOL FOR ADHESIVES

Pierre Lavoie, 8996 Lionel Giroux, St. Leonard, Quebec, Canada, H1R 3K9; Andre Lavoie, 1864 Albert, St. Hubert, Quebec, Canada, J4T 1V2, and Denis Lavoie, 1504 Rocheleau, St. Anne de Sabrevoie, Quebec, Canada, J0G 2J0

Filed Jul. 3, 1996, Ser. No. 675,145

Int. Cl.^{6} B67D *5/06*

U.S. Cl. 222—192 **16 Claims**



1. A tool suitable for use with a cartridge gun adapted to dispense a product from a cartridge, the tool comprising a first nozzle member having an inlet end, a second nozzle member having a dispensing end, a fluid passageway extending between said inlet end and said dispensing end of said first and second nozzle members respectively, said first and second nozzle members being rotatably movable such that the position of said second nozzle member can be moved through 180° with respect to said first nozzle member, at least one of said first and second nozzle members having an arcuate configuration extending through between at least 25° and 60°, guide means associated with said tool to guide said dispensing end through a prescribed path spaced from a fixed object; wherein said guide means comprises a breakaway member.

5,749,499

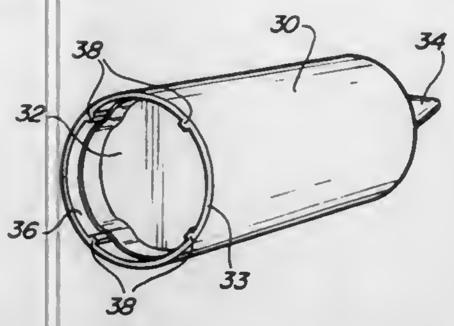
CAULKING TUBE AIR ESCAPE STRUCTURE

Frederick Binder, Windsor, Canada, assignor to Research Plastics, Inc., Windsor, Canada

Continuation of Ser. No. 641,821, May 2, 1996, Pat. No. 5,628,433. This application Apr. 16, 1997, Ser. No. 834,363

Int. Cl.^{6} B65D *88/54*

U.S. Cl. 222—327 **17 Claims**



1. A tube for receiving a fluent material comprising:

a tube body being elongated and extending from a rear end to a forward nozzle end to define an axial length;

a plunger member received within said tube body adjacent said rear end; and

said plunger body having an outer peripheral surface closely matched to an inner peripheral surface of said hollow tube body, air spaces being formed between said outer peripheral surface of said plunger and said inner peripheral surface of said tube body, said air spaces being formed between said plunger and said tube body for a distance that is greater than the axial distance of said plunger and said air spaces extending from a position adjacent said rear end forwardly toward said nozzle end.

5,749,500

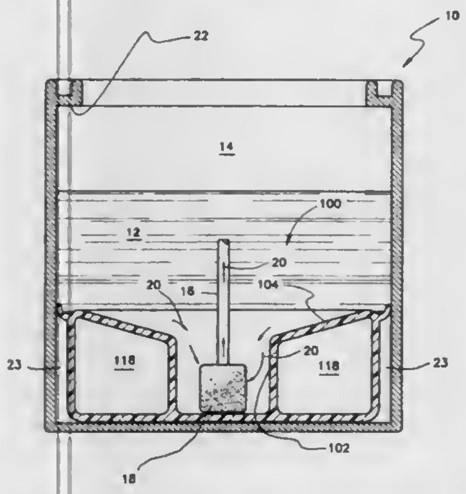
LIQUID RETRIEVING ADAPTOR FOR CYLINDRICAL CONTAINERS

Joey Kraus; Jamie Keeble, both of 2935 Severn Dr., Reno, Nev. 89503, and Jimmy Moore, 3565 Ashfork Dr., Reno, Nev. 89509

Filed Apr. 23, 1996, Ser. No. 636,400

Int. Cl.^{6} B65D *83/32*

U.S. Cl. 222—377 **2 Claims**



1. In combination with a cylindrical container, where said cylindrical container includes a container inner wall and a container bottom wall:

an insertable adaptor for providing a sump and funnel for retrieving liquid stored in said cylindrical container by a pressure responsive dispensing system, said adaptor having an adaptor top wall, said adaptor top wall comprising a funnel having a circular top surface and a lowermost opening;

a sump disposed below said lowermost opening, said sump having a vertically upright wall;

a lateral adaptor outer wall connected to and depending from said adaptor top wall;

an adaptor bottom wall connected to and extending continuously between said lateral adaptor outer wall and said sump; and

a flexible flange projecting radially from said insertable adaptor and where said funnel, said sump, said lateral adaptor outer wall, said adaptor bottom wall, and said flexible flange are monolithically formed; whereby

said insertable adaptor is dimensioned and configured such that it will fit smoothly within said cylindrical container and that said radially projecting flexible flange interacts with said cylindrical container inner wall to form a seal between said adaptor top wall and said adaptor bottom wall such that when said insertable adaptor is placed within said cylindrical container when said container contains a liquid and is moved towards said container bottom wall, liquid is displaced within said container towards said adaptor top wall and away from said adaptor bottom wall through the seal formed by said flexible flange and said container inner wall while preventing backflow and the displaced liquid is thus directed into said funnel and said sump.

5,749,501

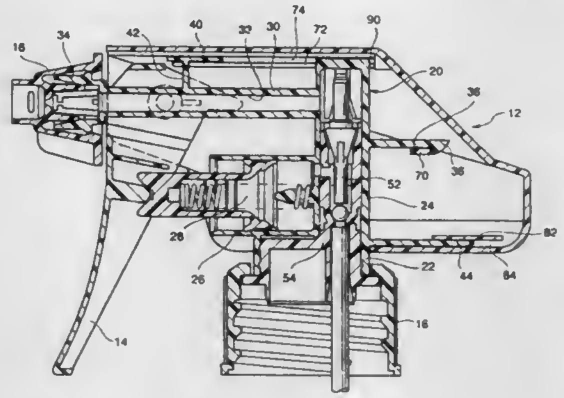
SHROUD AND SKELETAL BODY FOR TRIGGER SPRAYER

Wilhelmus J. J. Maas, and Petrus L. W. Hurkmans, both of Someren, Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Filed Jun. 10, 1996, Ser. No. 660,868

Int. Cl.^{6} B65D *37/00*

U.S. Cl. 222—384 **6 Claims**

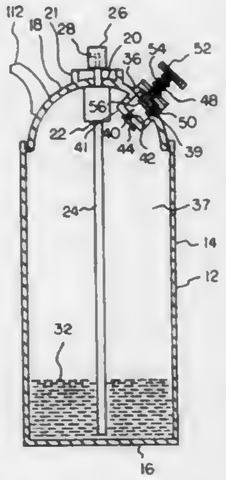


1. A shroud and skeletal body assembly for a trigger sprayer comprising: a skeletal body including a lower portion, an upright body portion extending upwardly from said lower portion and having a forwardly extending piston receiving portion, a waterway defining portion above said piston receiving portion and extending forwardly of the upright body portion, and hook means extending rearwardly from said upright body portion; and a shroud having a top wall, spaced apart side walls, a back wall, and a short rear bottom wall extending forwardly from said back wall, and latch means located between said side walls at a position to be engaged by said hook means when said shroud is brought into engagement with said skeletal body; and, said skeletal body including shroud engaging means in the form of lateral projecting means or slot means above said waterway defining portion; said shroud having skeletal body engaging means in the form of mating slot means or mating lateral projectig means adapted to engage said shroud engaging means when said shroud is brought into engagement with said skeletal body, and said shroud engaging means of said skeletal body or said skeletal body engaging means of said shroud comprising at least one lateral projection and said skeletal means of

said skeletal body including at least one rib or rail extending inwardly from an inner surface of at least one of said side walls of said shroud and longitudinally of said shroud or outwardly from said skeletal body, for defining, with a longitudinally extending surface of said shroud or of said skeletal body, a slot for receiving said at least one lateral projection.

5,749,502
ADVANCED AEROSOL CONTAINER

Frank C. Hinds, 2010 Guntersvile Rd., Arab, Ala. 35016
Filed Jan. 17, 1996, Ser. No. 587,637
Int. Cl.^{6} B65D *83/00*
U.S. Cl. 222—401 3 Claims



1. Apparatus for the storage of a liquid and for its dispensing therefrom in a mist form comprising, in combination:

a container having cylindrical side walls, a bottom and a spherical dome-shaped top with a corresponding radius, a central vertical hole aligned with a vertical axis extending therethrough, and a flange formed about the central vertical hole for releasably coupling with a conventional aerosol cap, the container including a space at the upper extent thereof;

a dispenser formed of a hollow tube extending from a lower extent of the container to above the hole in the top of the container with a button secured to the top of the tube, the button having a horizontal opening in fluid communication with the tube for the flow of liquid from the bottom of the container to the exterior of the button and the container;

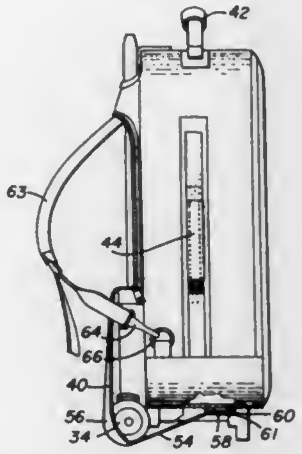
a pressure generator for creating a high pressure atmosphere in the upper extent of the container; the pressure generator including a valve formed at the top of the container in a side of the spherical dome-shaped top offset from the hole; the pressure generator having a cylindrical chamber extending into the canister a distance less than the radius of the dome-shaped top, the cylindrical chamber having a first lower opening with an associated first lower movable one way diaphragm located within the container coupled at an end thereof to an outer surface of the chamber; a reciprocal member having a central axis with an approximate 45 degree departure from the vertical axis of the canister, the reciprocal member having a cylindrical plunger within the chamber and a button exterior of the chamber and container with a central aperture through the plunger and button coupling the chamber and exterior of the chamber and atmosphere; and a second upper movable one way diaphragm located within the chamber coupled at an end thereof to an outer surface of the reciprocal member within the chamber whereby when the pressure generator button is pushed, pressurized air will flow from the chamber into the container and when the pressure generator button is moved upwardly, air will flow from atmosphere passed the upper diaphragm into the chamber;

an arcuate handle attached to the dome-shaped top diametrically opposite the pressure generator; and

a spring wrapped about the reciprocal member exterior the container and chamber to resiliently urge the pressure generator button to the raised position.

5,749,503
CONVERTIBLE LUGGAGE SYSTEM

Katherine Wulf, Vista, and Richard Steven Barker, Escondido, both of Calif., assignors to Eagle Creek, Inc., San Marcos, Calif.
Filed Mar. 27, 1996, Ser. No. 625,392
Int. Cl.^{6} A45F *4/02;* **A45C** *5/14*
U.S. Cl. 224—153 18 Claims



1. A luggage container comprising:

a first compartment having a first edge;

a second compartment affixed to said first compartment;

a first cover operable to provide access to said second compartment;

an elongated axle affixed to said first edge of said first compartment;

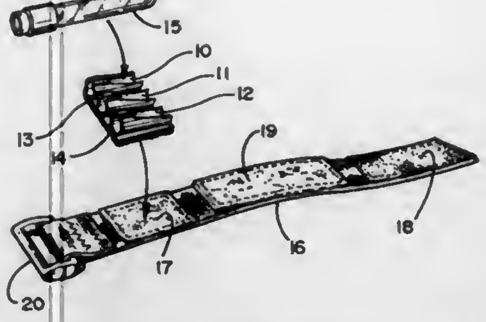
a pair of wheels, one of said wheels rotatably mounted at one end of said elongated axle and the other of said wheels mounted at the other, opposite end of said axle;

a pair of shoulder straps positioned in and deployable from said second compartment, such that when said straps are deployed from said second compartment, the luggage container can be carried on a user's back, and wherein said first cover when opened covers only the portions of said wheels which are exposed to said user's back when said straps are deployed and said luggage container is worn on said user's back, whereby said first cover does not cover the portions of said wheels which contact the ground when said luggage container is rested upon the ground.

5,749,504
BLOOD COLLECTION TUBE HOLDER

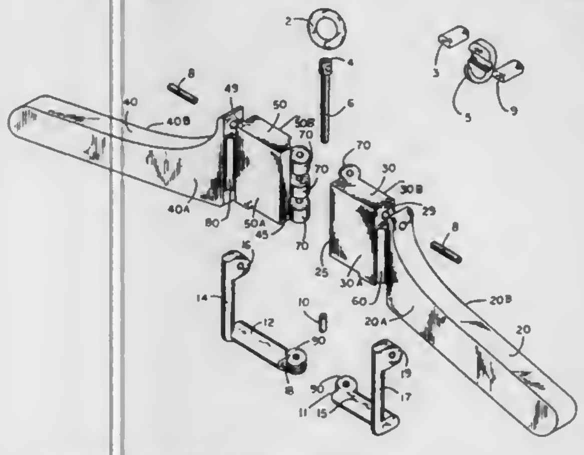
Michael C. Bieker, 6358 Los Altos Dr., Rockford, Mich. 49341
Filed Jun. 9, 1994, Ser. No. 257,685
Int. Cl.^{6} A45F *3/14*
U.S. Cl. 224—221 10 Claims

1. In combination, a blood collection tube holder and a plurality of blood collection tubes removably mounted therein, the blood collection tube holder comprising a wrist band adapted to be fastened around a user's wrist and a plurality of blood collection tube holders mounted side by side on an exterior surface of the wrist band, each of the tube holders comprising a resilient clip member having an opening in a side facing away from the wrist band that receives one of said plurality of blood collection tubes laterally therethrough, each of the clip members having an inside size at least slightly smaller than the outside diameter of the blood collection tube mounted therein, such that the tube is resiliently gripped and held by the clip member.



5,749,505
AUTOFOLDABLE GARMENT HANGER FOR MOTOR VEHICLE

Daniel Reyes, 11530 Griffing Blvd. #11, North Miami, Fla. 33161
Filed Jan. 30, 1995, Ser. No. 380,037
Int. Cl.^{6} B60R *7/00*
U.S. Cl. 224—482 2 Claims



1. A foldable garment hanger, comprising:

A) a foldable body assembly including first and second arm members horizontal and outwardly extending from centrally disposed first and second hanger body assemblies, respectively, and said first and second arm members having each a front surface and a rear surface, and said first and second hanger body assemblies having each a front surface and a rear surface, and said first hanger body assembly being adjacent and connected to said second hanger body assembly by a first hinge assembly, and said first hinge assembly being mounted to said rear surface of said first and second hanger body assemblies and said first hinge assembly having a first pivot pin member with first and second ends where said first end has a head member including an opening;

B) a foldable handle assembly for holding said garment hanger and bringing more stability to said garment hanger when a motor vehicle is moving, and said handle assembly including two L-shaped handle means having first and second handle members horizontally disposed and third and fourth arm members parallel and apart disposed with respect to each other, and said first handle member having said third and fourth ends, and said second handle member having fifth and sixth ends, and third and fifth ends being connected by a vertically and centrally disposed second hinge assembly having a second pivot pin member, and said third and fifth ends each having a stopping surface adjacent to each other, and said third arm member having said fourth end for said first handle member and seventh end, and said fourth arm member having said sixth end for said second handle member and eight end, and said seventh end being connected to a third hinge member with a third pivot pin member, and said eight end being connected to a fourth hinge member with a fourth pivot pin member, and said third and fourth hinge members being finally mounted within first and second cavities of said first and second body assemblies, respectively;

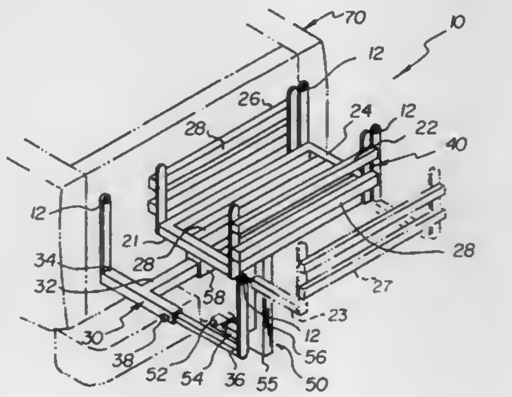
C) a loop member for holding said garment hanger and said loop member being mounted in said opening of said head member of said first pivot pin member;

D) a hook means for being rigidly mounted inside a motor vehicle and for supporting said loop means and said handle assembly; and

E) a pair of supporting means being rigidly mounted inside a motor vehicle and located to the both sides of said hook means, and said pair of supporting means for supporting said first and second handle members and bringing more stability to said garment hanger while keeping said first and second handle members in parallel relationship with respect to the ground.

5,749,506
WILD GAME FIELD REMOVAL SYSTEM

Glen T. Davies, 32102 Glaser, Browns Town, Rockwood, Mich. 48173
Filed Aug. 8, 1996, Ser. No. 694,038
Int. Cl.^{6} B60R *9/06*
U.S. Cl. 224—501 7 Claims



1. A wild game field removal system comprising:

an elongate U-shaped basket for engaging a wild game carcass, said U-shaped basket having a lateral width and longitudinally-spaced ends;

a first adjustable support slidably secured to one longitudinal end of the U-shaped basket to permit longitudinal movement of said first support with respect to said U-shaped basket;

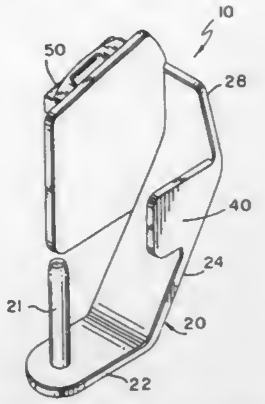
a second adjustable support slidably secured to the longitudinal end of the U-shaped basket opposite of the first adjustable support to permit longitudinal movement of said second support with respect to said U-shaped basket; and

a vehicle securing means secured to the U-shaped basket for securing to a vehicle;

wherein said first and second adjustable supports each comprise a U-shaped structure formed by an L-shaped member and a reverse L-shaped member, said L-shaped member and said reverse L-shaped member being laterally moveable with respect to each other to permit adjustment of the lateral spacing therebetween, wherein the lateral spacing between the L-shaped and reverse L-shaped members of each said adjustable support is adjustable independently of the lateral spacing of the other said adjustable support and independently of the lateral width of said U-shaped basket.

5,749,507
CONCEALED WEAPON HOLDER

Lonnie Wood, 550 13th Pl., Vero Beach, Fla. 32960
Filed Feb. 28, 1997, Ser. No. 808,732
Int. Cl.⁶ F41C *33/02*
U.S. Cl. 224—587 **3 Claims**



1. A holder for a weapon with a barrel opening having a trigger to be concealed beneath a user's garment, comprising:

A. an elongated support plate member having two ends, being substantially flat and having two longitudinally extending lateral edges, and further including a base portion at one end, a central portion extending at an angle with respect to said base portion and an upper portion extending from said central portion at an angle with respect to the central portion defining the other end, and said upper portion being in substantial perpendicular relationship with respect to said base portion, and said base portion includes a supporting pin that is removably received within said opening;

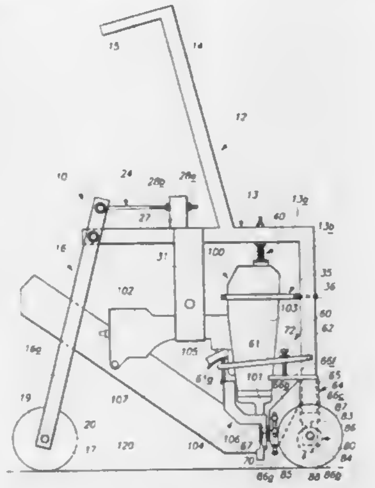
B. a front guiding plate member perpendicularly mounted to one of said lateral edges on said upper and central portions;

C. a rear guiding plate perpendicularly mounted to the other lateral edge on said central portion and cooperatively positioned to substantially coincide with the trigger area of said weapon;

D. clip means for removably attaching said holder to a user's garment and said clip means being securely mounted to said front guiding plate.

5,749,508
NAILING GUN CARRIER

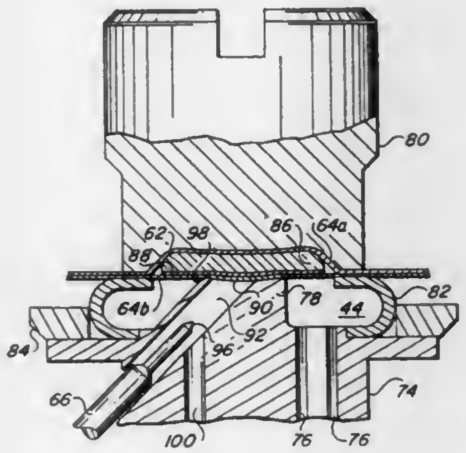
Darrell S. Clothier, 1985 Hwy 35, Kalispell, Mont. 59901
Filed Mar. 4, 1996, Ser. No. 610,206
Int. Cl.⁶ B27F *7/02*
U.S. Cl. 227—7 **12 Claims**



1. A nailing gun carrier which comprises a frame for carrying a nailing gun and moving the nailing gun along a surface to be nailed; a gun holder for attaching the nailing gun to said frame; and a gun firing assembly for positioning the nailing gun in proper position for firing a nail into the surface to be nailed, said gun firing assembly comprising a trigger-engaging arm positioned to depress a trigger of the nailing gun so as to cause the nailing gun to fire, a trigger safety release positioned to engage and release a trigger safety mechanism of the nailing gun to enable the gun to be fired, and a cam mechanism carried by said frame and operative to cycle said trigger-engaging arm between firing and non-firing modes and to cycle said trigger safety release between engaged and released modes so that said frame may be moved along the surface to be nailed and so that the nailing gun carried by said frame can be periodically fired to nail according to the cycles of said cam mechanism.

5,749,509
RESILIENTLY EXPANDABLE RING SEAL FOR COMBUSTION CHAMBER OF PROPELLANT TOOL

David L. Remerowski, Cincinnati, Ohio, assignor to Sencorp, Newport, Ky.
Filed Jun. 5, 1995, Ser. No. 462,709
Int. Cl.⁶ B25C *1/08*
U.S. Cl. 227—10 **12 Claims**



1. A propellant tool for driving an object by combustion of a caseless propellant charge, comprising:

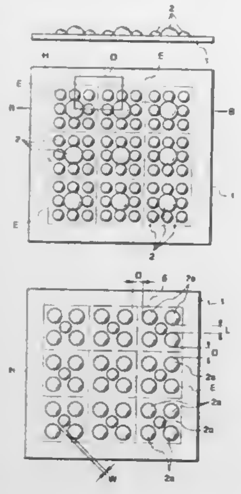
a body, said body defining a combustion chamber for receiving a caseless propellant charge and a cylinder in fluid communication with the combustion chamber, the combustion chamber being at least partially formed by first and second members that are movable relative to each other; and

an annular ring having opposite axial ends interposed between the first and second members of the combustion chamber for providing a sealing relationship therebetween, said ring being resiliently expandable in an axial direction under combustion pressure created in the combustion chamber by ignition of the propellant charge so as to increase sealing pressure between the annular ring and said first and second members of the combustion chamber in response to pressure created in the combustion chamber.

5,749,510
SEMICONDUCTOR CHIP BONDING METHOD

Hideki Eifuku, Oomuta, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 12, 1996, Ser. No. 631,123
Claims priority, application Japan, Apr. 25, 1995, 7-099173
Int. Cl.⁶ H01L *21/58*
U.S. Cl. 228—122.1 **14 Claims**

1. A method of bonding a chip on a substrate, comprising steps of:



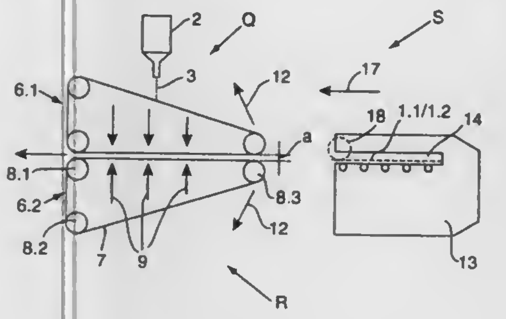
dissecting a chip mounting section defined on a flush surface of said substrate into a plurality of subsections;

applying bond within the chip mounting section on said flush surface of said substrate in a discrete manner so that a plurality of bonding bumps are arranged within each region of said subsections, wherein a minimum clearance between two bonding bumps in the same subsection being smaller than a minimum clearance between two bonding bumps belonging to adjacent to subsections; and

mounting a chip on said plurality of bonding bumps by applying a force thereon, thereby mashing said plurality of bonding bumps by a bottom surface of said chip.

5,749,511
METHOD AND APPARATUS FOR CONNECTING TWO WORKPIECES TOGETHER

Hans Aebersold, Birmensdorf; Norbert Gross, Zürich, and Werner Urech, Kaiserstuhl, all of Switzerland, assignors to Elpatronic AG, Zug, Switzerland
Filed May 9, 1996, Ser. No. 646,996
Claims priority, application Switzerland, May 15, 1995, 01 409/95
Int. Cl.⁶ B23K *15/00;31/02*
U.S. Cl. 228—212 **7 Claims**

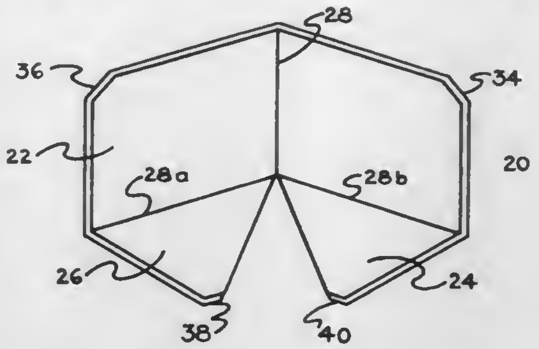


1. Method for connecting two workpieces together by a welded seam, in which the workpieces are held in a welding station between opposed tracks comprising a plurality of members, running around guide rollers in a conveying direction, characterized in that

a clearance in the section of the path of the tracks which is first in the conveying direction is changed upon insertion of the workpieces between the tracks.

5,749,512
SELF-ADHESIVE CORNER REINFORCEMENT FOR CARDBOARD BOXES

Lynn Gingras-Taylor, 4041 - 17th Ave., Bettendorf, Iowa 52722
Filed Nov. 27, 1995, Ser. No. 563,160
Int. Cl.⁶ B65D *5/50*
U.S. Cl. 229—199 **2 Claims**

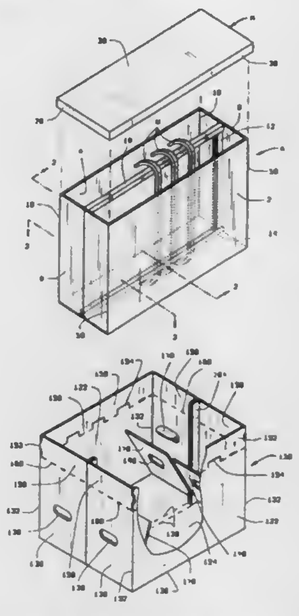


1. A corner reinforcement for a cardboard box, comprising:

a sheet of resilient material having first and second side panels pivotally connected along a vertical hingeline and having first and second base flaps pivotally connected to said first and second side panels along first and second horizontal hingelines, wherein said side panels and said base flaps further comprise a layer of adhesive for securement to the cardboard box, and wherein said side panels are substantially rectangular in shape and said base flaps are substantially ninety degree isosceles triangles.

5,749,513
CORRUGATED PAPERBOARD BOX WITH REINFORCED SIDE WALLS

Buford R. Strauser, Wentzville, Mo., assignor to Innovative Enterprises, Inc., Washington, Mo.
Filed Aug. 23, 1996, Ser. No. 702,289
Int. Cl.⁶ B65D *5/50*
U.S. Cl. 229—199 **14 Claims**



1. A box comprising: an upright front wall; an upright back wall spaced from the front wall; a bottom wall connected to the front and back walls; upright side walls extended between and connected to the front and back walls, each side wall including a first side panel connected to the front wall and a second side panel connected to the back wall, each side panel of each side wall including an extension, the extensions for the side panels of each

side wall being joined together to form a column which is located between the front and back walls and imparts enhanced strength to the side wall, the columns of the two side walls being spaced apart; and a separate beam attached to and supported by the columns between which it extends, the beam being spaced from the bottom wall.

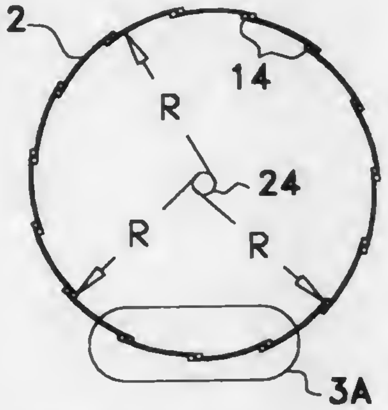
5,749,514
HOLLOW STACKABLE PRODUCT WITH CURVED SIDESTRIPS IN LONGITUDINAL FOLDS OF CONICALLY CONTOURED SIDEWALLS

Paul Philip Brown, Carlsbad, Calif., and Jens Ole Sorensen, Cayman Kai, Cayman Islands, assignors to Universal Ventures, Cayman Islands

Filed May 20, 1996, Ser. No. 650,167

Int. Cl.^{6} B65D *3/06*

U.S. Cl. 229—400 **22 Claims**



1. A hollow stackable injection-molded product, comprising at least a section of a generally conically contoured sidewall having a plurality of longitudinal folds of alternating ridges and furrows, each fold including
- a first side strip laterally extending from the top of a first said ridge to the bottom of a first said furrow; and
- a second side strip laterally extending from the bottom of the first said furrow to the top of a second said ridge next to the first said ridge;
- wherein the first side strips have a greater wall thickness than the second side strips; and
- wherein over at least most of the longitudinal extent of the section of the sidewall, at least a predominant portion of each of a plurality of the second side strips has an outward lateral curvature.

5,749,515
VALVE VENTING APPARATUS

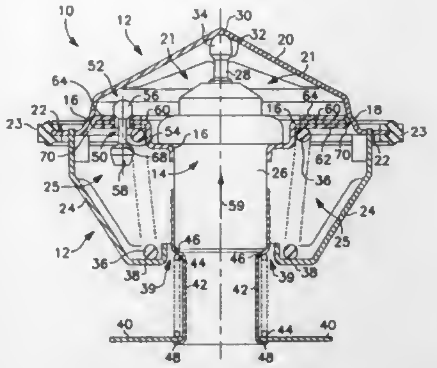
Wayne R. Duprez, Waltham, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed Feb. 11, 1997, Ser. No. 799,113

Int. Cl.^{6} F01P *7/16*

U.S. Cl. 236—34.5 **12 Claims**

1. A thermostat for controlling coolant fluid flow in an engine, the thermostat comprising:
- a stationary valve member formed to include an annular valve seat configured to define an opening,
- a movable valve member coupled to the stationary valve member for movement into and out of engagement with the annular valve seat, the movable valve member being formed to include a vent opening defined by an edge wall,
- a spring for biasing the valve member to a normally closed position against the annular valve seat of the-stationary valve member,



- an actuator for selectively moving the movable valve member to an opened position away from the annular valve seat,
- a jiggle pin having a neck portion located in the vent opening of the movable valve member, a head portion, and an anchor portion, the jiggle pin being movable within the vent open so that the anchor portion opens and closes the vent opening, and
- an elastomeric material located on the movable valve member covering the edge wall to reduce wear on the jiggle pin.

5,749,516
VEHICLE HEATER WITH CONTROL DEVICE

Michael Humburg, Göppingen, Germany, assignor to J. Eberspächer GmbH & Co., Esslingen, Germany

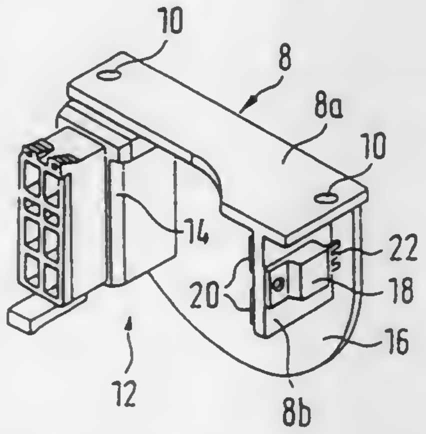
PCT No. PCT/EP94/04309, § 371 Date Jun. 3, 1996, § 102(e) Date Jun. 3, 1996, PCT Pub. No. WO95/18342, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 27, 1994, Ser. No. 656,184

Claims priority, application Germany, Dec. 31, 1993, 43 45 056.3

Int. Cl.^{6} G05D *23/00*

U.S. Cl. 237—2 A **11 Claims**



1. A vehicle heater, comprising:
- a burner;
- a combustion air blower for feeding combustion air to the burner, said combustion air blower including a blower housing;
- a fuel feed pump, said burner including a combustion chamber surrounded by a heat exchanger, said fuel feed pump for feeding fuel to said burner in order to generate a flame in said combustion chamber;
- a control device arranged on a circuit board and containing electronic components for controlling the operation of said burner;
- heat conduction means providing a heat conducting connection between said blower housing and said control device, said control device being fastened at said heat conduction means to said blower housing.

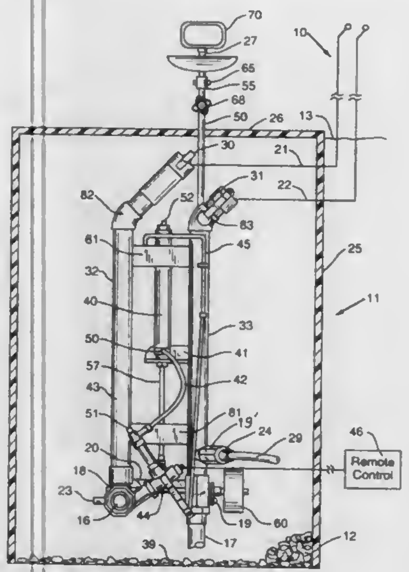
5,749,517
CONTROL SYSTEM FOR SNOW MAKING DEVICES

Herman K. Dupre, c/o Seven Springs, Champion, Pa. 15622

Continuation-in-part of Ser. No. 633,128, Apr. 16, 1996, which is a continuation-in-part of Ser. No. 534,837, Sep. 27, 1995, Pat. No. 5,628,456. This application Mar. 10, 1997, Ser. No. 813,412

Int. Cl.^{6} F25C *3/04;* **F16K** *11/14;31/12*

U.S. Cl. 239—14.2 **23 Claims**



1. In a snow making system including a snow making device for producing a spray of artificially manufactured snow from a combination of compressed air and water supplied under pressure thereto from remote compressed air and water supplies, air and water valves operatively connected between said snow making device and the respective supplies of compressed air and water for controlling the supply of air and water to the snow making device, said air and water valves ganged for simultaneous valving of the air and water supply and said valves adapted for draining water from the connected snow making device when said valves are in their off position, an air operated drive connected for actuating said ganged valves simultaneously and connected to said air supplied under pressure for maintaining said ganged valves on when the pressure of said supplied air is above a predetermined minimum, the improvement comprising; said ganged valves having a ganged lever operating mechanism which is weighted for turning off said ganged valves when said predetermined minimum air pressure is attained.

5,749,518
ADJUSTABLE MULTI-PATTERN MINIATURE FOUNTAIN SPRINKLER

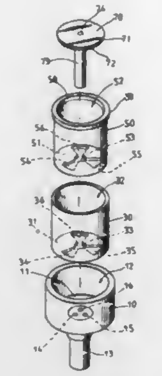
Yulis Wang, Taipei, Taiwan, assignor to Eiko Electric Products Corp., Taipei, Taiwan

Filed May 21, 1996, Ser. No. 651,959

Int. Cl.^{6} B05B *17/08*

U.S. Cl. 239—17 **4 Claims**

1. An adjustable miniature fountain sprinkler, comprising a base having a bottom surface, a water duct connected to said bottom surface of said base with a plurality of water holes disposed therebetween; adjusting means consisting of an upper adjusting seat and a lower adjusting seat fitted together and disposed within an inner hole of said base, said upper adjusting seat and said lower adjusting seat respectively having an inner hole and a bottom surface provided with a central hole which extends outwardly to form sector-like holes; and a cover consisting of a cover plate and a stem, said cover being fitted onto said upper adjusting seat such that said stem extends downwardly through the respective central holes of said upper adjusting seat and said lower adjusting seat, said cover plate being provided with a multiplicity of inclined indentations at its peripheral rim.



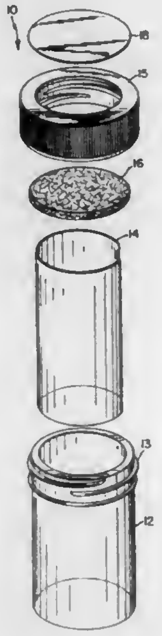
5,749,519
LIQUID AIR FRESHENER DISPENSER DEVICE WITH NONPOROUS WICKING MEANS

Eric J. Miller, Mt. Pleasant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 13, 1996, Ser. No. 766,836

Int. Cl.^{6} A61L *9/00*

U.S. Cl. 239—44 **12 Claims**

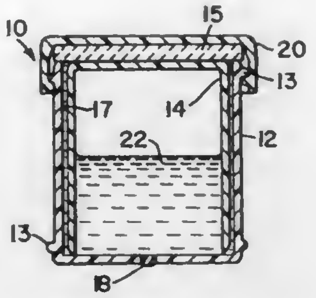


1. An air freshener dispenser device comprising:
- (a) a sheer sidewall container which encloses a reservoir of liquid air freshener medium;
- (b) a nonporous insert sleeve which is in coextensive proximity to the container sidewall interior surface, and which is in contact with the air freshener medium; and
- (c) a container closure comprising a vapor-emanating surface means which is in contact with the interior insert sleeve; wherein the sidewall interior surface and insert sleeve surface are in a capillary spacing proximity which provides a wicking means for transmission of the liquid air freshener medium from the enclosed reservoir to the vapor-emanating surface for evaporation into the atmosphere.

5,749,520

LIQUID AIR FRESHENER DISPENSER DEVICE WITH CAPILLARY WICKING MEANS

John Martin, Caledonia, and Eric J. Miller, Mt. Pleasant, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Dec. 18, 1996, Ser. No. 768,549
Int. Cl.^{6} A61L *9/00*
U.S. Cl. 239—44 **14 Claims**

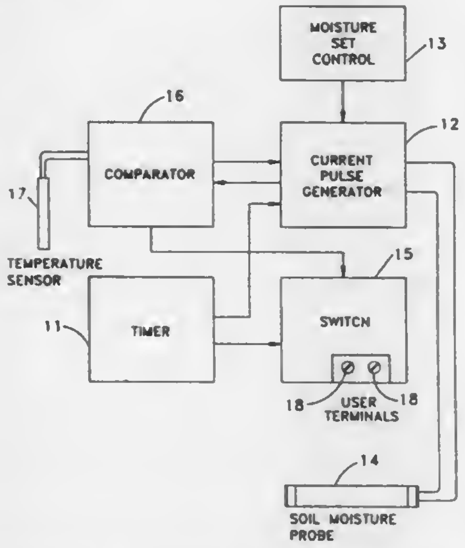


1. An air freshener dispenser device comprising:
- (a) a first sheer sidewall container with an upside open end, and a downside closed end having a porthole means accessing the container interior;
- (b) a second sheer sidewall container which is inverted and internally-nested within the first container, with a downside open end and an upside closed end, wherein the coextensive sidewalls of the two containers are in a capillary spacing proximity;
- (c) a closure in the first container which comprises a vapor-emanating surface means that is in contact with the upside closed end of the inverted internally-nested second container; and
- (d) a cover means which is removably attached to the first container, and which seals and isolates the vapor-emanating surface from the atmosphere.

5,749,521

MOISTURE SENSING ELECTRONIC IRRIGATION CONTROL

Jerome E. Lattery, Albuquerque, N. Mex., assignor to Lore Parker, Albuquerque, N. Mex.
Filed May 22, 1996, Ser. No. 651,740
Int. Cl.^{6} B05B *12/12;* **A01G** *25/16*
U.S. Cl. 239—64 **5 Claims**

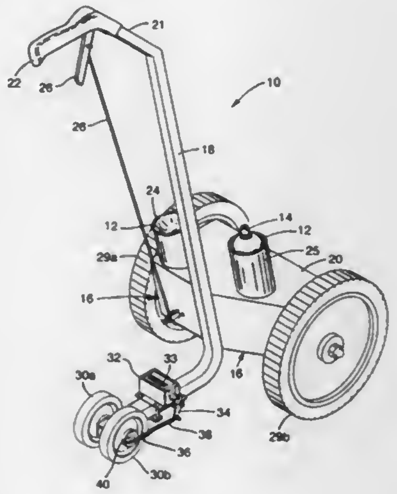


1. An apparatus for comparing the amount of moisture in soil with a reference setting and controlling the application of irrigation water, comprising:
- an electronic means for generating periodic electrical current pulses that pass through the soil between two conductive electrodes fixed upon a nonconductive support and disposed beneath the surface of the soil, said electrical current being in the form of a unipolar pulse of the briefest practical duration followed immediately by a unipolar pulse of the same duration and current amplitude having opposite polarity,
- an electronic comparator means that compares the voltage potential difference produced by said electrical current pulses between said conductive electrodes with a voltage potential expressing a reference setting,
- an electronic sensor means for measuring temperature of the air or soil and applying a correction to said voltage potential that expresses said reference setting, equal to the effect from change with temperature of the apparent electrical resistance in the soil medium,
- an electronic switching means that completes an electrical circuit for electrically controlled irrigation valves when the voltage potential difference produced by said electrical current between said conductive electrodes exceeds said voltage potential expressing the reference setting,
- and an electronic means that detects the presence of an external control signal and that causes cessation of said periodic electrical current pulses during the presence of said external control signal.

5,749,522

MARKING DEVICE WITH DISTANCE MEASURING CAPABILITY

Thomas J. Smrt, 9716 S. Grant Hwy., Marengo, Ill. 60152
Filed Mar. 21, 1996, Ser. No. 622,036
Int. Cl.^{6} B67D *5/08*
U.S. Cl. 239—71 **6 Claims**

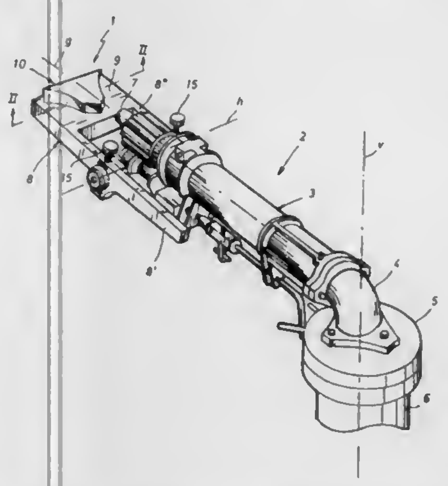


1. A device for discharging the contents of an aerosol container onto a surface which allows an operator to determine the distance the device travels when moved relative to the surface, the device comprising:
- a housing;
- means disposed on the housing for holding an aerosol container, wherein the container has an actuator mounted on the container that moves between discharging and non-discharging positions;
- actuating means which effects movement of the aerosol container actuator between the discharging and non-discharging positions;
- means disposed on the device for controlling the actuating means which allows an operator to discharge the contents of the aerosol container onto the surface;
- at least one rotatable wheel disposed on the device which contacts the surface and rotates as the device is moved relative to the surface;
- a counter disposed on the device for counting the number of revolutions of the at least one wheel;
- a lever arm attached to the counter which moves between non-actuated and actuated positions thereby actuating the counter; and
- a linkage having a second end attached to the lever arm and a first end attached directly to the at least one wheel such that rotation of the wheel moves the lever arm between the actuated and non-actuated positions thereby actuating the counter and allowing an operator to determine the distance the device has traveled.

5,749,523

JET ACTUATOR PARTICULARLY FOR PULSE SPRINKLERS

Arno Drechsel, Via Castel Mareccio 4, 39100 - Bolzano, Italy
PCT No. PCT/EP95/00278, § 371 Date Jan. 29, 1997, § 102(e) Date Jan. 29, 1997, PCT Pub. No. WO95/31288, PCT Pub. Date Nov. 23, 1995
PCT Filed Jan. 26, 1995, Ser. No. 732,280
Claims priority, application Italy, May 12, 1994, VI94A0069
Int. Cl.^{6} B05B *3/14*
U.S. Cl. 239—233 **23 Claims**

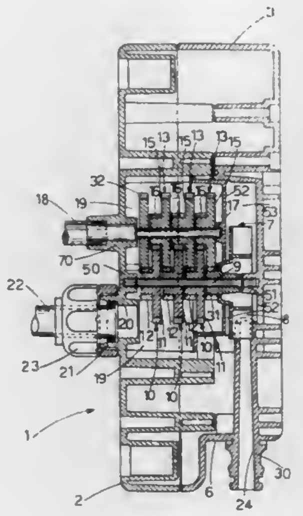


1. A jet actuator, particularly for actuating hydraulic apparatus such as rotating pulse sprinklers, which comprises:
- a nozzle for generating a free jet of water directed along a first longitudinal axis, said nozzle being located at the free end of a spout, said spout being coupled to a line of pressurized water by means of a rotatable joint having a second rotation axis that is transverse to said first longitudinal axis;
- a deflector which can freely oscillate in a transverse direction between a first end position wherein the deflector lies completely outside the jet and a second end position wherein the deflector is immersed to the maximum extent in the jet so as to draw part of its energy; and
- a support means for oscillably mounting said deflector on said spout to transfer the energy drawn from the jet to said spout to promote a stepwise movement thereof about said second rotation axis;
- wherein said deflector has at least one main surface having a curved and convex shape suitable to laterally enter the jet while remaining. substantially aligned with the jet, so as to generate a negative pressure force tending to move said deflector towards the interior of the jet upon initial oscillation and during steady-state oscillatory operation, and a secondary surface that is substantially flat and forms with respect to the curved main surface a solid angle that is relatively large so as to generate a reaction force with a component which is opposite to the negative pressure force produced on said curved main surface and tending to expel said deflector away from the jet thus starting and maintaining the steady-state operation.

5,749,524

SIDE DRIVING ELEMENT FOR AN IRRIGATION DEVICE WITH AN OSCILLATING ARM

Gianfranco Roman, Pasiano (Pordenone), Italy, assignor to Claber S.p.A., Fiume Veneto (Pordenone), Italy
Filed Dec. 28, 1995, Ser. No. 580,520
Claims priority, application Italy, Jan. 3, 1995, MI95002 U
Int. Cl.^{6} B05B *3/04*
U.S. Cl. 239—240 **10 Claims**



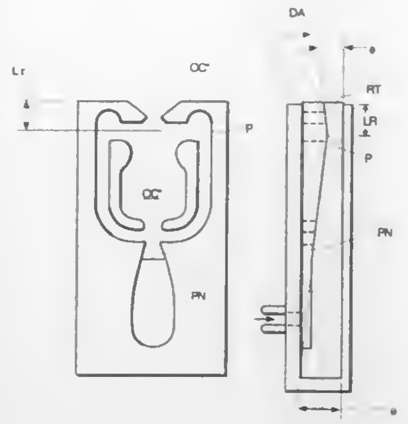
1. A side driving element for an irrigation device with an oscillating sprinkling arm, comprising:
- a casing having a bottom wall forming a flat resisting plane arranged for sliding movement, a top wall and two side walls, the oscillating arm extending from one of the two side walls, a turbine rotor being housed inside said casing, the turbine rotor having an axis of rotation parallel to that of the oscillating arm of the irrigation device, said rotor driving the oscillating arm, and
- an external mouth extending from said casing in a position close to said resting plane for connecting a supply conduit of an irrigation liquid,
- wherein said mouth has an axis parallel to said resting plane and orthogonal to the axis of rotation of the rotor, the mouth communicating with an internal rectilinear conduit aligned with said mouth and directed toward said rotor, so that a fully rectilinear liquid supply path extends from said external mouth to said rotor.

5,749,525

FLUIDIC WASHER SYSTEMS FOR VEHICLES

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.
Filed Apr. 19, 1996, Ser. No. 636,765
Int. Cl.^{6} F15C *1/08;* **B05B** *1/10*
U.S. Cl. 239—284.1 **2 Claims**

1. In a vehicle washer nozzle system having a source of washer fluid under pressure, a fluidic oscillator having a power nozzle, an oscillation chamber having an upstream end coupled to said power nozzle for issuing a jet of washer liquid into said oscillation chamber and a downstream end having an outlet aperture for issuing a jet of wash fluid to ambient, and side and top and bottom walls, an oscillation inducing means in said oscillation chamber for causing said jet of wash fluid to rhythmically sweep back and forth between said sidewalls and said oscillation chamber, the improvement wherein said top and bottom walls first gradually diverge for



predetermined distance in a downstream direction and then gradually converge towards each other through said outlet aperture.

5,749,526

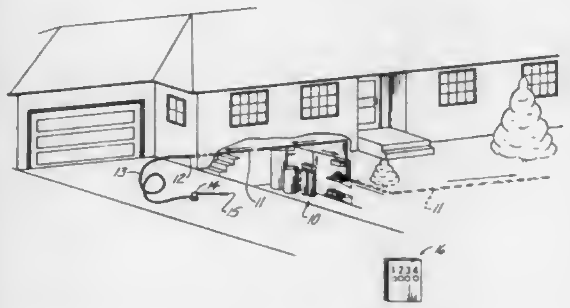
CENTRALLY INSTALLED CLEANING/WASHING SYSTEM FOR BUILDINGS

Gary R. Laabs, 2155 James Ave., Britt, Iowa 50423, and Donald R. Anderson, Britt, Iowa, assignors to Gary R. Laabs, Britt, Iowa

Filed Aug. 28, 1995, Ser. No. 519,754

Int. Cl.^{6} B05B *15/00*

U.S. Cl. 239—307 **11 Claims**



10. Apparatus comprising:
- an enclosed building having outside walls;
- a water line disposed in said building for supplying water at a pressure in a first pressure range;
- a pump having an inlet operably attached to said water line and an outlet for delivering water at a pressure higher than that of the pressure of said first pressure range;
- a valve comprising:
  - an inlet port and an outlet port;
  - a valve body;
  - a valve seat in said valve body in fluid communication with said valve inlet port;
  - a valve head disposed in said valve body having a closed position in sealing contact with said valve seat and an open position spaced from said valve seat;
  - a fluid passageway associated with said valve body for connecting said valve inlet port to said outlet port when said valve head is in said open position;
  - means for biasing said valve head to said closed position thereof;
  - handle means on the outside of the building for selectively overcoming the biasing means to move the valve head to said open position thereof; and
  - pressure means associated with said valve head for causing said valve head to remain in said open position in response to a buildup of pressure upstream of said valve head due to the operation of said pump in association with the restriction of flow by said nozzle;
- a fluid conduit operably attached at one end thereof to said pump outlet and at the other end thereof to the inlet port of said valve;
- a spray wand, including an outlet nozzle;
- means for selectively, operatively connecting or disconnecting said spray wand to said outlet port of the valve;
- means for operably introducing a cleaning chemical into the fluid passing through said fluid conduit; and
- wireless remote control means for selectively turning said pump on or off from a location remote from said pump.

5,749,527

SOLENOID FUEL INJECTION VALVE

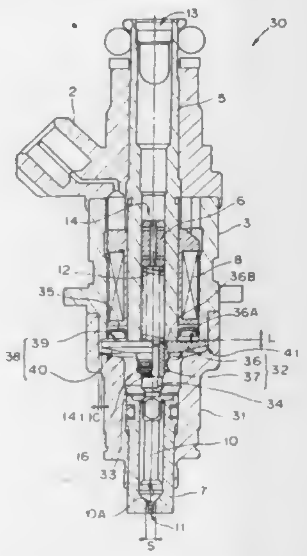
Takuya Fujikawa, and Katsuhiko Abe, both of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 594,272

Claims priority, application Japan, Feb. 3, 1995, 7-037739

Int. Cl.^{6} B05B *1/30;* **F16K** *31/02*

U.S. Cl. 239—585.3 **13 Claims**



1. A solenoid fuel injection valve for an engine having at least one cylinder comprising:
- a valve housing;
- a solenoid winding provided in the valve housing;
- an armature responsive to energizing of the solenoid winding, the armature having a coupling section and a flat section integral with the coupling section;
- a fuel supply port;
- a fuel passage coupled to the fuel supply port;
- a valve seat formed with a nozzle communicable with the fuel supply port through the fuel passage;
- a needle valve coupled to the coupling section of the armature, the needle valve enabling fuel to be injected from the nozzle into the cylinder of the engine when it is raised together with the armature in response to energizing of the solenoid winding;
- an armature chamber accommodating the armature, wherein the flat portion of the armature partitions the armature chamber into an upper armature chamber and a lower armature chamber; and
- a portion of the fuel passage communicating the upper armature chamber and the lower armature chamber being provided at a location other than the flat section of the armature, the portion of the fuel passage being an axial fuel passage formed in the coupling section of the armature to face into the armature chamber.

5,749,528

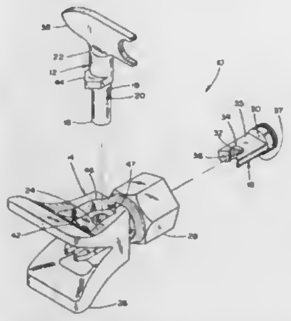
REVERSIBLE SPRAY TIP

Danuta H. Carey, Stockholm; John D. Geberth, Ramsey; John Walsh, Madison, and Daniel S. Hosley, Clinton, all of N.J., assignors to Titan Tool, Inc., Oakland, N.J.

Filed Dec. 27, 1995, Ser. No. 578,864

Int. Cl.^{6} B05B *1/28;15/02*

U.S. Cl. 239—119 **27 Claims**



1. A reversible spray tip adapted to be secured to the discharge end of a spray gun for hydraulically atomizing and spraying liquids, said reversible spray tip comprising:
- a) a housing having a forward extending spray tip guard integrally formed therewith;
- b) a cylindrically shaped rotatable turret member received for rotation in a transverse bore in said housing, said turret member including a diametric bore therethrough;
- c) a spray tip insert received in said diametric bore of said turret member, said spray tip insert having a fluid bore therethrough terminating adjacent an end of said diametric bore in a spray orifice;
- d) a one piece seal insert received in an axial through bore of said housing upstream of said turret member and extending from said turret member to the spray gun discharge end, said seal insert including a transverse bore therein having a forwardly facing sidewall opening corresponding to the spray orifice of said spray tip insert, said transverse bore having a diameter smaller than the diameter of said cylindrical turret member so as to receive said turret member with an interference fit so as to releasably secure said turret member in said reversible spray tip, said seal insert having an axial fluid bore therein communicating between the spray gun discharge end and the transverse bore of said seal insert diametrically opposite the forward facing sidewall opening and in alignment with said fluid bore of said spray tip insert;
- e) means coupled with said seal insert for enhancing the sealing pressure between said seal insert and said turret member and between said seal insert and the spray gun discharge end during spray gun operation; and
- f) means for securing said housing to the spray gun discharge end.

5,749,529

METHOD OF PRODUCING CORONA DISCHARGE AND ELECTROSTATIC PAINTING SYSTEM EMPLOYING CORONA DISCHARGE

Shigenori Kazama, Sagamihara, and Ryo Sasaki, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

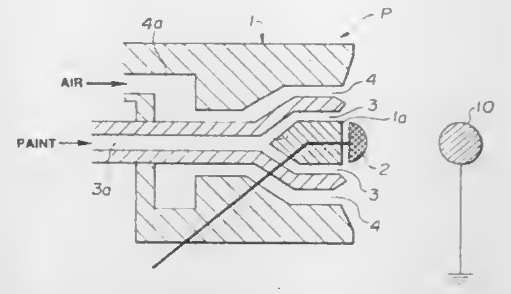
Filed Jul. 28, 1995, Ser. No. 508,512

Claims priority, application Japan, Jul. 29, 1994, 6-179005; Jun. 1, 1995, 7-135427

Int. Cl.^{6} B05B *5/00*

U.S. Cl. 239—690 **21 Claims**

1. An electrostatic painting system comprising:
- a spray gun including:
  - means for atomizing a liquid paint to obtain atomized particles of the paint, and
- electrode means for forming an electrostatic field and a corona discharge field between said electrode and an object to be painted and for providing electric charge to the atomized particles of the paint, said electrode being formed of one of a wire netting-like material and an electrically conductive plastic.



5,749,530

METHOD FOR OPERATING AN ECCENTRIC JAW CRUSHER

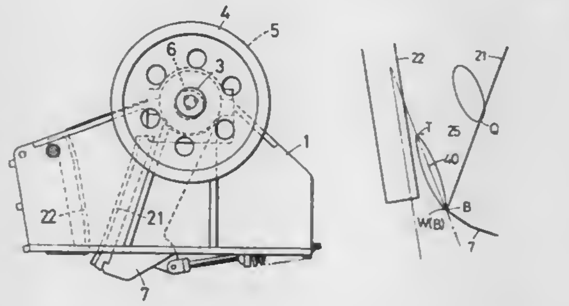
Hiroshi Nakayama, Chiba; Koichiro Ogushi, and Tomio Aimori, both of Saga, all of Japan, assignors to Nakayama Iron Works, Ltd., Saga, Japan

Filed Nov. 6, 1996, Ser. No. 746,200

Claims priority, application Japan, Nov. 10, 1995, 7-317173

Int. Cl.^{6} B02C *1/02*

U.S. Cl. 241—27 **9 Claims**



1. A method for operating an eccentric jaw crusher having a fixed crushing plate and a movable crushing plate in which a selected point on said movable crushing plate moves with respect to said fixed crushing plate, comprising the steps of:
- moving said movable crushing plate with respect to said fixed crushing plate along a path defined by a closed hysteresis curve having a top dead point and a bottom dead point and which is inclined with respect to a facing surface of said fixed crushing plate, and
- selectively moving said movable plate to traverse said hysteresis curve in a first direction for crushing a first material or in a reverse direction for crushing a second material.

5,749,531

YARN CREELS

William Ewart Alan Shelton, and Mark Alan Shelton, both of Croft, England, assignors to Alan Shelton Limited, England

PCT No. PCT/GB94/00017, § 371 Date Sep. 26, 1995, § 102(e) Date Sep. 26, 1995, PCT Pub. No. WO94/16130, PCT Pub. Date Jul. 21, 1994

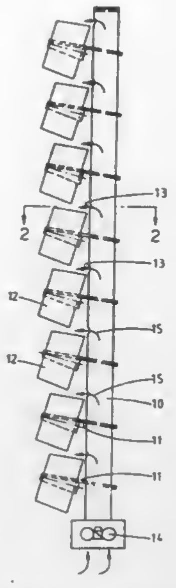
PCT Filed Jan. 5, 1994, Ser. No. 495,438

Claims priority, application United Kingdom, Jan. 6, 1993, 9300184; Feb. 19, 1993, 9303407; Aug. 3, 1993, 9316040

Int. Cl.^{6} B65H *49/02;* **A47L** *15/00;5/14;* **D01H** *11/00*

U.S. Cl. 242—131.1 **4 Claims**

1. An apparatus for mounting yarn packages, comprising:
- a duct having therein a plurality of openings,



- a plurality of mounting points mounted directly on said duct and adapted to receive the yarn packages; each of said mounting points being disposed closely adjacent to a respective one of the openings;
- and gas flow means operative to create a flow of gas outwardly through the openings in said duct,
- wherein the flow of gas impinges upon the yarn packages to entrain lint deposited thereon.

5,749,532

Patent Not Issued For This Number

5,749,533

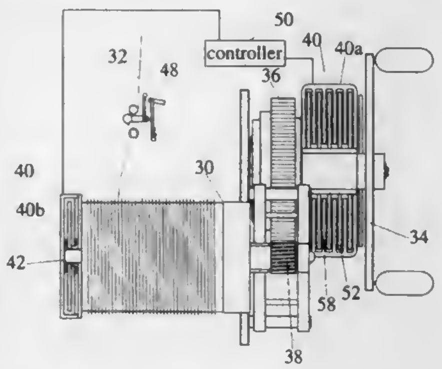
FISHING REEL WITH ELECTRONICALLY VARIABLE BRAKE FOR PREVENTING BACKLASH

John J. Daniels, 323 Roosevelt Dr., Seymour, Conn. 06483

Filed Aug. 3, 1995, Ser. No. 510,818

Int. Cl.^{6} A01K *89/02*

U.S. Cl. 242—287 **20 Claims**



11. A fishing reel, comprising: a spool for holding and releasing a length of fishing line; an electronically variable brake couplable with the spool for applying a braking force to resist rotation of the spool during casting to prevent the spool from overrunning the length of fishing line being released from the spool; determining means for determining an overrun status of the length of fishing line being released from the spool and generating an electronic status signal dependent thereon; and controlling means receptive of the electronic status signal for controlling the electronically variable brake to apply the braking force to resist rotation of the spool during casting when the determining means determines an overrun status so that a braking force is applied when the overrun status determined by the determining means indicates that the spool is overrunning the length of fishing line being released, the braking force being applied until the overrun status determined by the determining means indicates that the spool is not overrunning the length of fishing line so as to prevent the spool from further overrunning the length of fishing line being released.

5,749,534

BRAKE MECHANISM FOR DOUBLE-BEARING FISHING REEL

Shinichi Morimoto, Nishinomiya, Japan, assignor to Shimano Inc., Osaka, Japan

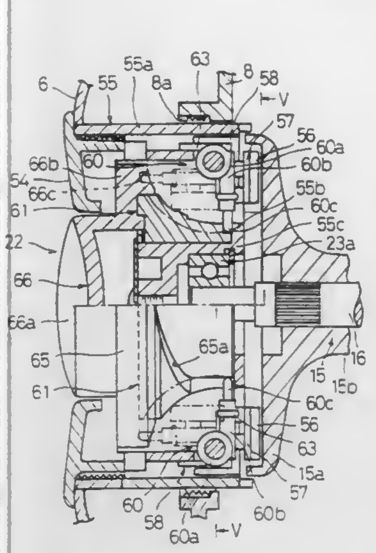
Filed May 8, 1997, Ser. No. 853,017

Claims priority, application Japan, May 16, 1996, 8-121879

Int. Cl.^{6} A01K *89/033;89/0155*

U.S. Cl. 242—288 **8 Claims**

1. A brake mechanism for a double-bearing fishing reel comprising:
- a reel body;
- a spool rotatably mounted on said reel body;
- an electric conductor rotatable with said spool;
- at least one magnet; and



- at least one magnet positioning means, said magnet positioning means capable of variably positioning said magnet between a first position in which a surface of said magnet is generally parallel to a surface of said electric conductor, and a second position in which said surface of said magnet is generally perpendicular to said surface of said electric conductor.

5,749,535

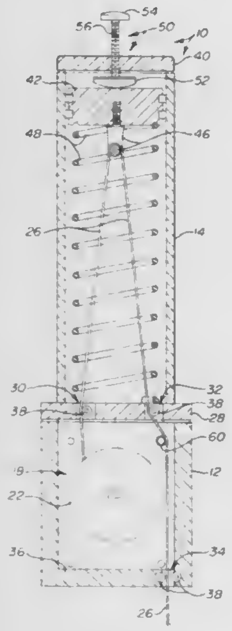
DECELERATION DEVICE

H. Dante Kahn, III, 4855 Velasquez St., Pensacola, Fla. 32504

Filed Dec. 11, 1995, Ser. No. 570,500

Int. Cl.^{6} B63B *21/00*

U.S. Cl. 242—371 **14 Claims**



1. A deceleration device comprising:
- a base;
- a spool located within the base;
- a pneumatic chamber attached to the base;
- a piston, slidably disposed within pneumatic chamber;
- an energy storage means, located within the pneumatic chamber, for biasing movement of the piston;
- a linear medium, having a first end attached to the spool and a second end, that passes into the pneumatic chamber and attaches to the piston and then passes out of the device; and
- a rewind means, for rewinding the linear medium onto the spool.

5,749,536

COUPLING FOR TORQUE TRANSFER FROM A PROPELLANT-OPERATED ROTARY DRIVE, ON A BELT SHAFT OF A SEAT BELT RETRACTOR FOR TENSIONING A SEAT BELT

Martin Specht, Feldafing, and Walter Krauss, München, both of Germany, assignors to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany

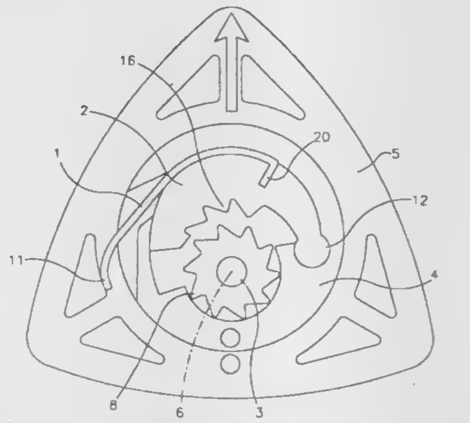
PCT No. PCT/EP96/01538, § 371 Date Dec. 10, 1996, § 102(e) Date Dec. 10, 1996, PCT Pub. No. WO96/32305, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 10, 1996, Ser. No. 750,371

Claims priority, application Germany, Apr. 10, 1995, 295 06 208 U

Int. Cl.^{6} B60R *22/46*

U.S. Cl. 242—374 **21 Claims**



1. A coupling for torque transfer from a propellant-operated rotary drive to a belt shaft of a seat belt retractor for tensioning a seat belt, said coupling comprising:
- a first component which is rotatively driven by the rotary drive with a first angular velocity;
- a second component which is operatively coupled to said first component for being driven thereby with a second angular velocity which is higher than said first angular velocity;
- a coupling element pivotally mounted on said second component; and
- an engaging part connected to the belt shaft,
- said coupling element being displaceable between a rest condition in which said coupling element does not engage said engaging part and an engagement condition in which said coupling element engages said engaging part for torque transfer from said second component to said engaging part,
- said coupling element being retained in said rest condition by a retaining means which is overcome by a force generated upon activation of the rotary drive.

5,749,537

METHOD OF WRAPPING CRYOGENIC INSULATION AROUND AN INNER CRYOGENIC TANK

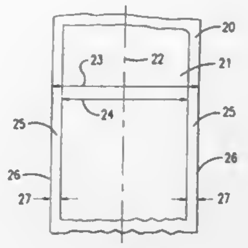
Joseph R. Muzio, Jr., Latham, and Kenneth James McGivern, Sr., Cohoes, both of N.Y., assignors to Lydall, Inc., Manchester, Conn.

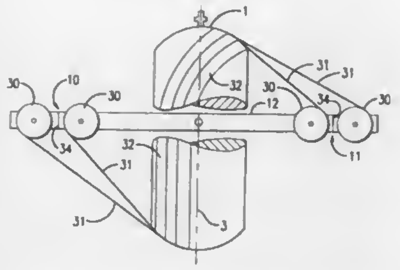
Filed Nov. 7, 1995, Ser. No. 554,719

Int. Cl.^{6} B65H *81/00*

U.S. Cl. 242—439.5 **20 Claims**

1. In a method of wrapping cryogenic insulation around an inner tank disposable within an outer tank of a cryogenic tank system comprising unrolling cryogenic insulation paper from at least one roll thereof, wrapping the paper in serially disposed wraps around the inner tank, unrolling cryogenic insulating metal foil from at least one roll thereof and wrapping the foil in serially disposed wraps onto respective serial wraps of the paper, the improvement comprising:





(1) providing at least one combined roll of cryogenic insulation having alternating combined layers of the paper of a defined first width and foil of a defined second width wherein the defined second width is less than the defined first width and the foil is centered on the paper so as to provide edge portions at each edge of the paper which are not contacted by the foil

(2) unrolling from the combined roll lengths of combined layers; and

(3) wrapping the lengths of combined layers in serially disposed wraps around the inner tank.

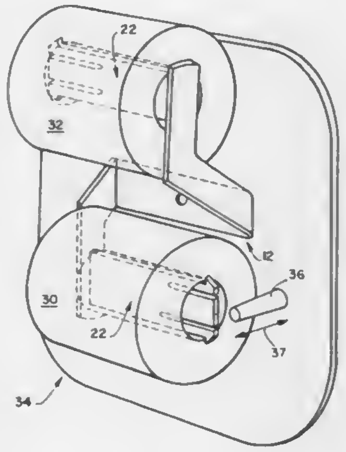
5,749,538
GRAVITY-OPERATED DISPENSING APPARATUS

John Hiram Brown, Marietta, Ga.; Kenneth Harry LaCount, Pulaski, Wis., and Terry Lyle Petty, Roswell, Ga., assignors to Kimberly-Clark Corp., Neenah, Wis.

Filed Aug. 2, 1995, Ser. No. 510,210

Int. Cl.^{6} B65H *9/10*

U.S. Cl. 242—559.2 **20 Claims**



1. A gravity-operated apparatus for sequentially dispensing sheet material from rolls of sheet material, the apparatus comprising:

a housing having an opening;

a turret rotatable about a central point said turret being located on a vertical wall of the housing and rotatable in a plane generally parallel to the plane of the vertical wall;

arms extending perpendicularly from the turret at respective locations radially outward from said central point a sufficient distance to provide clearance for a roll of sheet material;

a cantilevered spindle extending perpendicularly from a portion of each arm in the general direction of the central point so that each spindle is positioned generally parallel to the plane of rotation of the turret and is adapted to receive a roll of sheet material, each spindle having a length that is greater than the longest distance between the points where the arms extend from the turret, whereby the difference between the length of each spindle and the longest distance between the points where the arms extend from the turret causes imbalance when a full roll of sheet material is loaded on one spindle and the other spindle has a substantially depleted roll of sheet material thereby urging the turret to rotate under the influence of gravity to position the full roll of sheet material in a dispensing position;

retaining means to secure the roll of sheet material on each spindle; and

a limit gate located adjacent said dispensing position to impede rotation of the turret when the limit gate encounters a roll of sheet material that is less than substantially depleted.

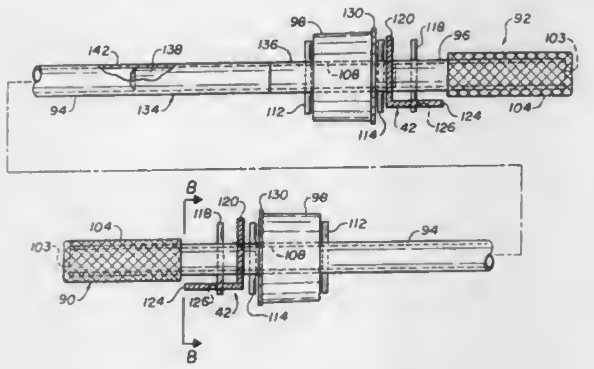
5,749,539
DUNNAGE-CREATING MACHINE WITH PLUGLESS PAPER ROLL AND METHOD

Richard O. Ratzel, Westlake, Ohio, and Dirk Johannes Siekmann, Sittard, Netherlands, assignors to Ranpak Corp., Concord Township, Ohio

Filed Jun. 29, 1994, Ser. No. 267,960

Int. Cl.^{6} B65H *16/02; 19/12; 75/22*

U.S. Cl. 242—598.3 **38 Claims**



1. A dunnage-creating machine for producing dunnage product from sheet-like stock material supplied as a roll having a hollow core, said dunnage-creating machine comprising conversion assemblies for converting the sheet-like stock material into a three-dimensional cushioning product, and a stock roll support assembly for rotatably supporting a roll of sheet-like stock material from which the sheet-like stock material is payed off for conversion by the machine into a dunnage product, said stock roll support assembly comprising a pair of laterally spaced apart mounts and a stock roll holder having opposite end portions removably supported on said mounts, said stock roll holder including first and second holder portions each including a respective spindle member having an axially outer portion forming a respective one of said opposite end portions, a core insert rotatably supported on and axially carried by said spindle member for telescopic insertion into the stock roll core at an adjacent end thereof thereby to support the stock roll for rotation with said core insert, and an axial abutment axially carried on said spindle member axially outwardly of said core insert and projecting radially outwardly beyond said core insert to form an abutment for engaging the adjacent end of the stock roll core thereby to limit axial outward movement of the stock roll core relative to said spindle member.

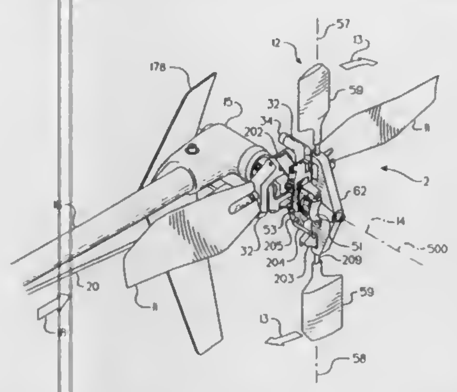
5,749,540
SYSTEM FOR CONTROLLING AND AUTOMATICALLY STABILIZING THE ROTATIONAL MOTION OF A ROTARY WING AIRCRAFT

Paul E. Arlton, 1132 Anthrop Dr., West Lafayette, Ind. 47906

Filed Jul. 26, 1996, Ser. No. 687,649

Int. Cl.^{6} B64C *27/82*

U.S. Cl. 244—17.13 **47 Claims**



1. A device for stabilizing yaw motion of a rotary wing aircraft including an aircraft body and a main rotor rotating relative to the aircraft body about an aircraft axis of rotation, the device comprising

thrust-producing means for generating a thrust force along a thrust axis that is substantially perpendicular to the aircraft axis of rotation,

thrust-varying means for permitting a pilot to remotely control the thrust-producing means to vary the magnitude of the thrust force produced by the thrust-producing means,

gyro rotor means for automatically controlling the thrust-producing means to vary the magnitude of the thrust force produced by the thrust-producing means to oppose rotational motion of the rotary wing aircraft about the aircraft axis of rotation during flight, the gyro rotor means being adapted to be mounted to an aircraft body to maintain a fixed position relative to the thrust-producing means, and

means for independently connecting each of the gyro rotor means and thrust-varying means to the thrust-producing means so that each of the thrust-varying means and the gyro rotor means operates independently to vary the thrust force generated by the thrust-producing means and so that the gyro rotor remains in a fixed position relative to the thrust-producing means when the pilot operates the thrust-varying means to vary the magnitude of the thrust force produced by the thrust-producing means.

5,749,541

Patent Not Issued For This Number

5,749,542
TRANSITION SHOULDER SYSTEM AND METHOD FOR DIVERTING BOUNDARY LAYER AIR

Jeffrey William Hamstra, Fort Worth; Brent Neal McCallum, Benbrook; Thomas Gerard Sylvester; Brett William Denner, both of Fort Worth, and Jeffrey Allen Moorehouse, Arlington, all of Tex., assignors to Lockheed Martin Corporation, Fort Worth, Tex.

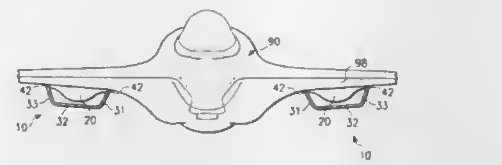
Filed May 28, 1996, Ser. No. 654,295

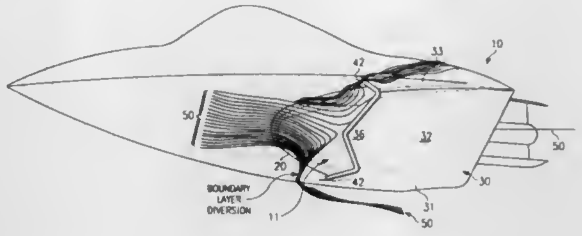
Int. Cl.^{6} B64D *33/02*

U.S. Cl. 244—53 B **28 Claims**

1. A system for diverting boundary layer air from an aircraft engine inlet, comprising:

a surface raised outwardly from the body of the aircraft, said surface comprising:





a compression surface near the opening of said inlet;

a diffuser fairing; and

a transition shoulder beginning at the Bstop station and ending at the throat station, said transition shoulder having a varying rate of change of surface slope relative to radial location on the surface of said transition shoulder, said transition shoulder operable to create a greater spanwise static pressure gradient to increase the amount of boundary layer air diverted from the aircraft inlet.

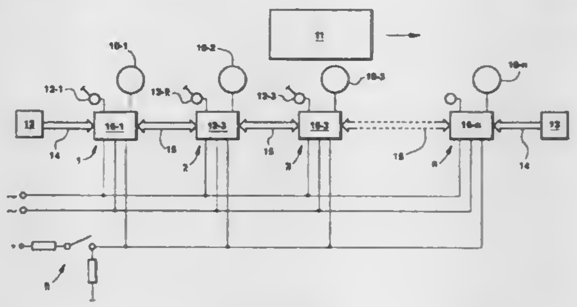
5,749,543
METHOD AND APPARATUS FOR CONTROLLING CARGO IN AN AIRCRAFT

Thomas Huber, Iffeldorf, Germany, assignor to Telair International Cargo Systems GmbH, Germany

Filed Feb. 8, 1996, Ser. No. 511,247

Int. Cl.^{6} B64C *01/20;* **B65G** *43/02; 13/06; 47/51*

U.S. Cl. 244—118.1 **5 Claims**



1. Loading apparatus for loading and unloading a cargo area in an aircraft with containers, comprising:

a plurality of roller drive units;

a switch device to start and to stop a transport process via said roller drive units and to determine a transport direction;

each of said roller drive units comprising:

a drive roller;

a controllable drive motor to rotate the drive roller in a predetermined direction according to the transport direction;

a sensor means for each roller drive unit to detect the presence or absence of a container in the region of action of said drive roller thereof;

a control means for each roller drive unit, said control means connected to said sensor means of said roller drive unit;

control leads connected between said control means of adjacent roller drive units;

each sensor means including a testing means which tests the functionality of its associated sensor means and, in the case of a loss of function of the sensor means, disables said control means in such a way that the drive motor of the associated roller drive unit can be turned on and off independently of the presence or absence of a container in the region of action of the drive roller of that drive unit; and

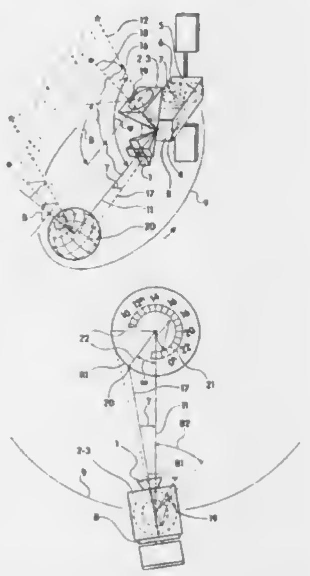
whereby during a transport process, the drive motor of one of said roller drive units is only turned on when the sensor means associated with said drive unit detects the presence of a container in the region of action of the drive roller of said drive unit in the absence of the detection of another container prior to the detection of said container in the region of action of the drive roller of the next adjacent roller drive unit in the direction of transport.

5,749,544

Patent Not Issued For This Number

5,749,545
AUTONOMOUS ON-BOARD SATELLITE CONTROL SYSTEM

Sevastian Dmitrievich Gnatjuk, ul. Engelsa, 26-42, g.Khimki Moskovskoi obl., Russian Federation
PCT No. PCT/RU93/00262, § 371 Date Aug. 23, 1995, § 102(e) Date Aug. 23, 1995, PCT Pub. No. WO94/18073, PCT Pub. Date Aug. 18, 1994
PCT Filed Nov. 10, 1993, Ser. No. 505,262
Claims priority, application Russian Federation, Feb. 9, 1993, 93007754
Int. Cl.^{6} B64G ***1/24***
U.S. Cl. 244—164 **4 Claims**



1. Autonomous on-board satellite control system, comprising

an Earth sensor having an output, a Pole star sensor having an output, a computer having inputs which are connected with said output of said Earth sensor and said output of said Pole star sensor and which determines angular misalignments between satellite internal building axes and external coordinate system axes, and forms control signals for supporting the input relative to location of said coordinate system axes;

a timing device having an output which is connected with a computer input;

actuator units having an input which is connected with a computer output;

a navigational star sensor and a storage device of inertial longitude readout base parameters, and said parameters include the Pole star right ascension and an angle relative to the Pole star, and an Earth sensor general sensitivity plane, that is equal to an angle between the plane, containing an axis connecting the Earth center with the Pole star and an axis connecting the Earth center with the Pole of the World;

the plane, containing an axis connecting the Earth center with the Pole star and the Earth center with the navigational star;

said computer making a satellite location point latitude determination on the angle of the Earth center to satellite to the Pole star and providing an angular orientation control for the yaw control;

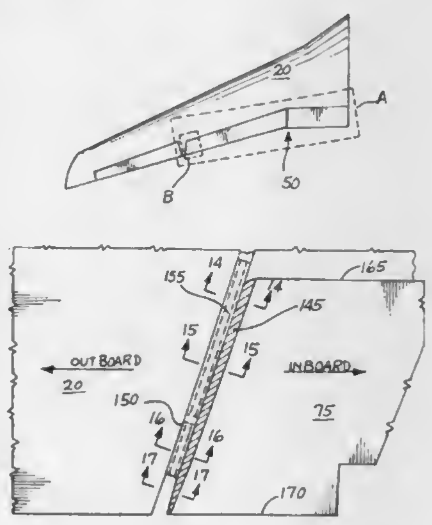
said computer measuring corresponding angular misalignments and forming control signals, during which, general sensitivity plane of the Earth and the Pole star sensors, containing satellite longitudinal axis is combined with the plane, containing the Earth center, satellite and the Pole star;

said computer making a determination of satellite location point inertial longitude according to azimuth angle of chosen navigational star turning around the direction of satellite to the Pole star, to be counted in corresponding field of view from the base angular position of the plane, containing directions satellite to the navigational star and satellite to the Pole star, taking into account inertial longitude of this readout base, such that outputs of the navigational star sensor and the storage device are connected with the corresponding computer inputs; and

said computer calculating a correction, determined as a multiplication of polar distance of the Pole star onto cosine of the angle, equal to the difference of the value of current inertial longitude and right ascension of the Pole star.

5,749,546
METHOD AND APPARATUS FOR REDUCING AIRFRAME AEROSOUND

Anthony M. Blackner, Kirkland, and Thomas A. Zierten, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jul. 10, 1995, Ser. No. 501,246
Int. Cl.^{6} B64C ***3/50***
U.S. Cl. 244—215 **11 Claims**



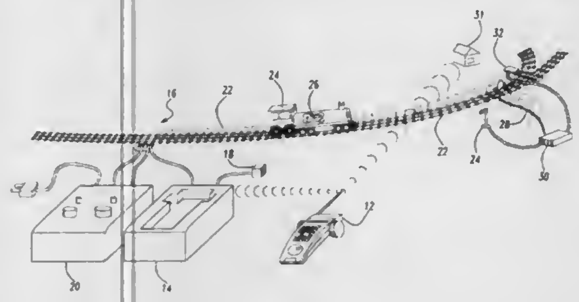
1. In an airplane wing having an inboard portion and an outboard portion, an upper wing surface, a lower wing surface, and a trailing edge formed at the juncture of said upper and lower surfaces, said wing being capable of relative motion through a fluid, an apparatus for reducing noise levels created by said wing when said wing is moving through said fluid, comprising:

a flap positioned at said trailing edge on said wing and disposed between said inboard portion and said outboard portion of said wing, said flap having an upper surface, a lower surface and at least one lateral edge exposed to said fluid when said airplane is landing, and

a smooth, arcuate, continuously convex-shaped surface formed at said lateral edge of said flap, whereby as fluid moves from said flap lower surface to the upper surface of said flap a primary vortex is produced, said arcuate surface substantially reducing any noise-generating secondary vortices that may be produced by said flap edge when said edge is exposed to said fluid.

5,749,547
CONTROL OF MODEL VEHICLES ON A TRACK

Neil P. Young, 3240 Bear Gulch Rd., Redwood City, Calif. 94062, and David Hampton, Nevada City, Calif., assignors to Neil P. Young, Redwood City, Calif.
Continuation-in-part of Ser. No. 134,102, Oct. 8, 1993, Pat. No. 5,441,223, which is a continuation-in-part of Ser. No. 833,869, Feb. 11, 1992, Pat. No. 5,251,856. This application Aug. 11, 1995, Ser. No. 514,052
Int. Cl.^{6} B61L ***7/08;27/00***
U.S. Cl. 246—4 **13 Claims**



1. A control system for transmitting control signals to an alternating current (AC) powered first model vehicle on a track, comprising:

a hand-held remote transmitter for transmitting user input signals;

input means for receiving said user input signals;

first control means, coupled to said input means, for generating direct current (DC) control signals for said first model vehicle; and

a transmitter means, coupled to said first control means and to said track, for transmitting said DC control signals such that said DC control signals can be received by circuitry on said first model vehicle; and

said control system further controlling at least a second model vehicle, the system comprising:

second control means, coupled to said track and responsive to said user input signals from said hand-held remote transmitter, for generating electromagnetic control signals along said track; and

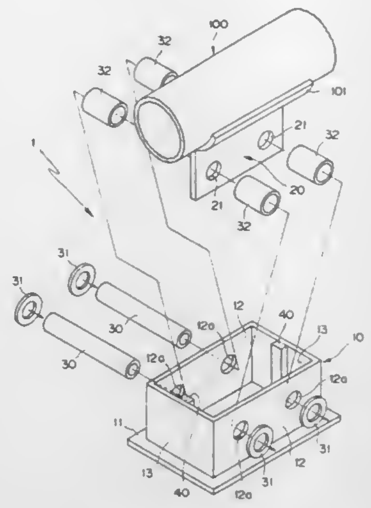
receiving means, located on said second model vehicle, for receiving said electromagnetic control signals, and directing the operation of said second model vehicle in response to said electromagnetic control signals.

5,749,548
THERMAL INSULATING SUPPORT DEVICE FOR PIPING

Kouji Tamura, Aichiken; Mamoru Morohashi, Yokohama; Akira Okada, Kamakura; Kenji Matsumura, and Satoshi Hama, both of Yokohama, all of Japan, assignors to JGC Corporation, Japan
Filed Sep. 19, 1996, Ser. No. 724,273
Claims priority, application Japan, Aug. 22, 1996, 8-221315
Int. Cl.^{6} F16B ***7/00;*** **F16L** ***3/00;*** **F16M** ***13/00***
U.S. Cl. 248—49 **2 Claims**

1. A thermal insulating support device for piping, comprising:

a base frame comprising a bottom plate, a pair of side plates and a pair of end plates integrally formed with each other;



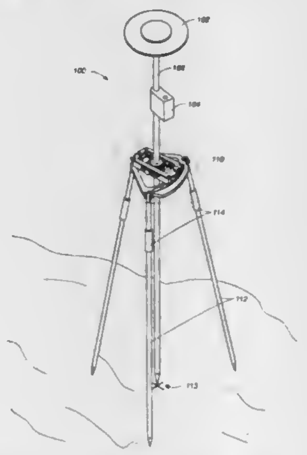
a support frame of a plate shape and formed with a support hole, the support frame being fixed at a bottom of the piping;

a support shaft made of resin material extending through the support hole of the support frame and fixedly supported by the pair of side plates on the base frame, the support shaft having thermal insulation properties and mechanical strength sufficient for supporting the piping; and

a pair of stopper blocks provided on inside faces of the pair of end plates in the base frame such as to be interposed between the edges of the support frame and the end plates, the stopper blocks **40** being made of a material having thermal insulation properties and mechanical strength sufficient for supporting the support frame.

5,749,549
SATELLITE POSITIONING SYSTEM ANTENNA SUPPORTING TRIPOD

Javad Ashjaee, Saratoga, Calif., assignor to Javad Positioning, LLC, Saratoga, Calif.
Filed Dec. 29, 1995, Ser. No. 578,169
Int. Cl.^{6} F16M ***11/38***
U.S. Cl. 248—168 **27 Claims**



1. A tripod head for adjusting and securing a position of a surveyor's rod, the rod defining a longitudinal axis having an angular position Θx relative to an x-axis in a horizontal plane and an angular position Θy relative to a y-axis in said horizontal plane, said head comprising:

a base platform connectable to a plurality of support legs, said platform defining a central opening therein and including at least one slot defining a path;

a first housing slidably mounted on said platform, said first housing defining a first central cavity therein, said first housing including at least one guiding and locking member mating with said slot for guiding the sliding motion of said first housing along the path defined by said at least one slot, and for locking said first housing into a first desired position relative to said platform;

a second housing slidably mounted within said first central cavity of said first housing, said second housing defining a second central cavity therein, said second housing including a second locking member for locking said second housing into a second desired position relative to said first housing; and

gimbal means pivotally disposed within said second central cavity of said second housing for retaining said rod and for enabling at least one angular position of the rod to be adjusted to a desired position, said second locking means releasably engaging said gimbal means for locking said gimbal means and the rod into said desired angular position.

5,749,550

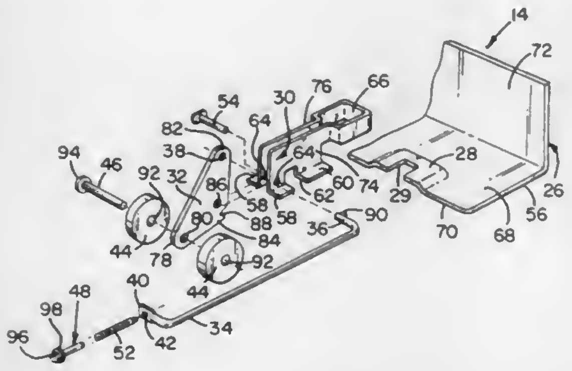
APPLIANCE LEVELING SYSTEM ALLOWING ADJUSTMENT OF REAR SUPPORTS WITHOUT ACCESS TO REAR OF CABINET

Wade Lee Jackson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 28, 1996, Ser. No. 653,915

Int. Cl.^{6} F16M *11/24*

U.S. Cl. 248—188.2 **20 Claims**



1. A leveling system for leveling an appliance, the appliance including a support having a rear rail with at least one notch pad formed thereon and a front rail having an adjusting screw opening extending therethrough, said leveling system comprising:

a rail bracket comprising a u-shaped cutout, said rail bracket comprising a rear pair of flanged feet and a front pair of flanged feet, and a pin opening, said rail bracket configured to be engaged to the rear rail at the one notch pad;

a leveling link having a substantially triangular shape, a first corner of said link having a first opening extending therethrough, a second corner of said link having a second opening extending therethrough, and a third corner of said link having a third opening extending therethrough;

a link arm having first and second ends, said first end of said link arm extending through said second opening in said leveling link, said second end of said link arm having a threaded opening extending therethrough;

an adjusting screw comprising a head and a threaded portion, said screw configured to extend through the opening in the front rail and said threaded portion extending through and in threaded engagement with said threaded opening in said second end of said link arm;

at least one leveling roller having an opening extending therethrough;

a first pin extending through said opening in said leveling roller and said first opening in said leveling link; and

a second pin extending through said pin opening in said rail bracket and through said third opening in said leveling link.

5,749,551

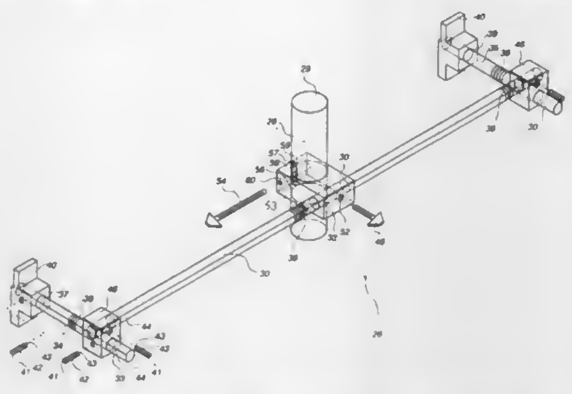
PORTABLE DEVICE TO ALLOW FOR SIMULTANEOUS DUPLEX PRINTING AND SCANNING ON SINGLE PASS MACHINES

Eric R. Torres, 21 W. 581 North Ave., Lombard, Ill. 60148, and Jesus Almanza, 504 Valerie La., Apt. 4, Addison, Ill. 60101

Filed Sep. 3, 1996, Ser. No. 707,112

Int. Cl.^{6} A47B *96/06*

U.S. Cl. 248—205.1 **20 Claims**



1. A device for juxtaposing a plurality of print-heads to a single-pass print table, said device comprising:

a.) plurality of first elongated members, each first elongated member having a first end and a second end;

b.) a first coupling means adapted to receive said first end;

c.) a second coupling means adapted to receive said second end;

d.) a second elongated member having a first end adapted to be received by said first coupling means, and having a second end adapted to be received by a first attachment means, wherein the longitudinal axis of the second elongated member extends along a line which differs from the line along which the longitudinal axis of the first elongated members extend;

e.) a third elongated member having a first end adapted to be received by said second coupling means and having a second end adapted to be received by a second attachment means wherein the longitudinal axis of the third elongated member extends along a line which differs from the line along which the longitudinal axis of the first elongated members extend; and

f.) a means for holding the plurality of print-heads, said means slidably received by said first elongated members, wherein said holding means slides along said first elongated members and between said first and second coupling means, whereby the first and second attachment means removably position the device to the print table.

5,749,552

SHOWER HEAD MOUNTING ASSEMBLY

Chen-tung Fan, Room F/23, 4th Fl., No. 5, Sec. 5, Hsinyi Rd., Taipei, Taiwan

Filed May 6, 1996, Ser. No. 643,480

Int. Cl.^{6} A47G *29/00;* **A47K** *3/22*

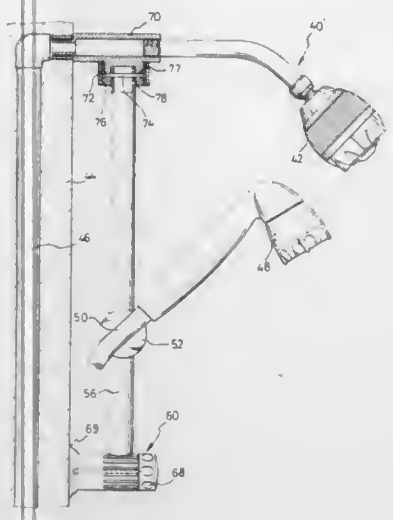
U.S. Cl. 248—205.8 **3 Claims**

1. A mounting assembly for mounting a bracket for attaching a hand-held shower head in relation to a wall of a bathroom, comprising:

a fitting having a first end adapted to be connected with a fixed spray head, a second end adapted to be connected to a water supply pipe and a first extending portion;

a post adapted to allow a bracket for attaching a hand-held shower head to be slidably locked therealong, said post comprising a first end for fixedly connecting with the first extending portion and a second end; and

a vacuum mounting device attached on the second end of said post for mounting the second end of said post on a flat surface with a vacuum pressure, said vacuum mounting device comprising a housing, a second extending portion integrally formed with the housing for receiving the second end of said post, a sucker linearly movably mounted on said housing and a sucker controlling means rotatably mounted on said housing and connected with said sucker for controlling the linear movement of said sucker in relation to said housing, wherein said sucker controlling means comprises a rod threadedly engaged with said housing, said rod having a first end fixedly connected with said sucker and a second end fixedly connected with a knob.



5,749,553

DEFLECTOR MOUNTING

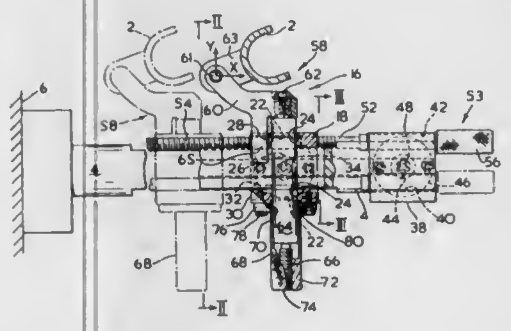
Willi Meyer, Effretikon, Switzerland, assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Jul. 21, 1995, Ser. No. 505,091

Claims priority, application United Kingdom, Jul. 21, 1994, 9414740

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 248—298.1 **4 Claims**



1. An adjustable mounting for a deflector of a trough assembly in a glass machine, comprising

an axially horizontally extending support, said axially extending support having an axially extending slot extending horizontally therethrough,

a first supporting block mounted on said support for sliding movement lengthwise of said support,

a first supporting bracket for supporting the deflector,

means for mounting said first supporting bracket on said first supporting block with said bracket extending through said axially extending support slot for movement transversely of said support,

first adjusting means for displacing said first supporting block lengthwise of said support, and

second adjusting means for displacing said first supporting bracket transversely of said support.

5,749,554

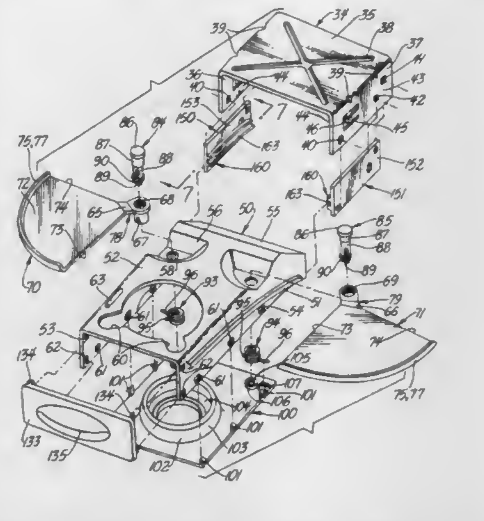
TRAY ASSEMBLY

Javier Avila, Troy; James Andrew Obermeyer, Dayton; Michael H. Speck, Troy, all of Ohio, and Ronald Henry Dybalski, Royal Oak, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1996, Ser. No. 650,537

Int. Cl.^{6} B60N *3/10*

U.S. Cl. 248—311.2 **17 Claims**



1. A tray assembly for use in a vehicle having a recessed compartment, the tray assembly comprising:

a housing adapted to be slidably mounted on the recessed compartment for movement between an open position in which the housing is substantially outside the recessed compartment and a closed position in which the housing is substantially concealed within the recessed compartment;

at least one generally planar tray portion pivotally connected to the housing for movement between a laterally outward deployed position when the housing is in the open condition and a laterally inward folded position when the housing is in the closed position;

at least one pivot pin for pivotally mounting the tray portion to the housing;

a coil spring surrounding the pivot pin, the coil spring for biasing the tray portion laterally outward towards the deployed position; and a cup plate disposed on the housing, the cup plate having a cupholder portion thereon, the pivot pin engaging the cup plate, and the coil spring including one end engaging the cup plate and another end engaging the tray portion for biasing the tray portion laterally outward towards the deployed position.

5,749,555

HEIGHT COMPENSATING DEVICE

Donald H. Albrecht, Carrollton, Tex., assignor to Composite Structures International, Inc., Dallas, Tex.

Filed Aug. 9, 1995, Ser. No. 512,879

Int. Cl.^{6} A47C *3/04*

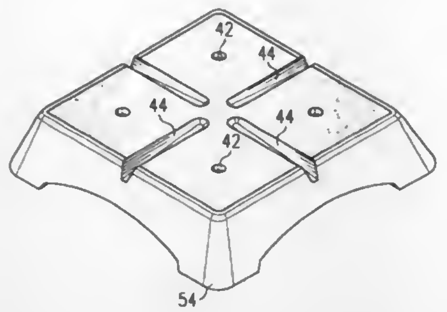
U.S. Cl. 248—346 **27 Claims**

1. A height compensating device comprising:

(a) a support surface defining a predetermined shape;

(b) a sidewall extending downwardly and outwardly from said support surface;

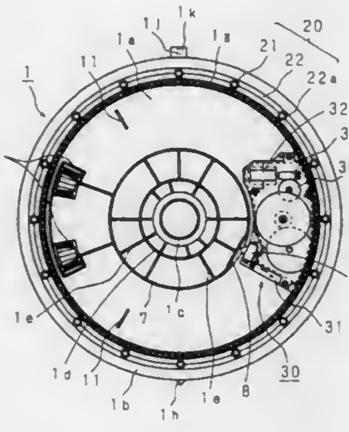
(c) said device having a weight of 8 pounds or more and having a non-porous surface; and



(d) at least one sloped channel formed in said support surface and positioned to drain fluid.

5,749,556
ROTATING APPARATUS

Hiroshi Matsuoka; Kazuo Chimura, and Shigeki Kariya, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 28, 1994, Ser. No. 365,403
Claims priority, application Japan, Dec. 28, 1993, 5-335382
Int. Cl.^{6} F16M *13/00;* F16H *1/16*
U.S. Cl. 248—349.1 **16 Claims**



1. A rotating apparatus for rotating an object, comprising:

a base;

a rotation table rotatably supported on said base wherein said rotation table can support the object;

a driving unit for rotating said rotation table; and

a motor for supplying torque to said driving unit, wherein said driving unit includes:

a worm gear fixed on a rotatable axle of said motor;

a worm wheel engaged with said worm gear; and

a gear for transferring to said rotation table torque supplied from said worm gear to said worm wheel,

first and second spring members projecting upward from said base and having a first predetermined arcuate distance therebetween for establishing a first rotation range of said rotation table,

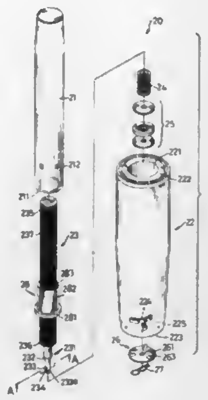
a bar projecting downward from said rotation table,

wherein when said rotation table is rotated by said driving unit to a limit of the first rotation range, said bar is caught by one of said spring members thereby stopping rotation, and

wherein when said rotation table is rotated manually to the limit of the first rotation range, said bar is caught by one of said spring members thereby stopping rotation until a sufficient manual rotating force is applied to deform said spring members and permit further rotation beyond the first rotation range.

5,749,557
HEIGHT ADJUSTING DEVICE FOR A CHAIR

Shu-chuan Chang, Tainan Hsien, Taiwan, assignor to Huang Ching-Feng, Taipei, Taiwan
Filed May 23, 1996, Ser. No. 652,135
Int. Cl.^{6} F16M *11/00*
U.S. Cl. 248—405 **12 Claims**



1. A height adjusting device comprising:

an inner tube having an upper end and a lower end;

a bushing fixedly connected with the lower end of the inner tube and defining internal threads;

a positioning tube having an upper end and a lower end, a sleeve securely mounted in said upper end of said positioning tube and having an inner diameter slightly greater than an outer diameter of said inner tube for fitting and partially receiving the inner tube and allowing axial and rotational movement of said inner tube, and a base plate securely mounted to the lower end of the positioning tube and having a central hole and a plurality of downward protrusions arranged around the central hole;

a screw defining a threaded upper section for the bushing to be screwed thereto and to be moved therealong and a reduced lower section, said threaded upper section comprising a top and bottom blocking means for limiting the traveling of the bushing therealong between a top position and a bottom position, said reduced lower section defining a bottom and extending through the central hole of the base plate;

a bearing assembly and a spring mounted around the reduced lower section of the screw and located between the base plate and the threaded upper section of the screw; and

an engaging member fixedly attached to the bottom end of the reduced lower section of the screw and defining a plurality of upward protrusions for releasably engaging with the downward protrusion defined in the base plate.

5,749,558
WALL-MOUNTED PICTURE HANGER

William H. Wallo, 8 Leeward Island, Clearwater, Fla. 34630
Filed Feb. 10, 1997, Ser. No. 797,825
Int. Cl.^{6} A47G *1/00*
U.S. Cl. 248—475.1 **6 Claims**

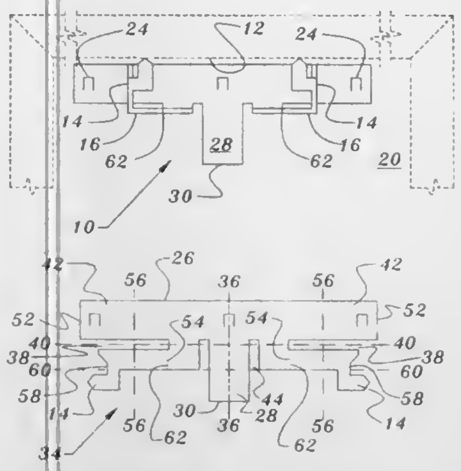
1. Apparatus for hanging a picture frame or like object from a vertical supporting surface, the apparatus symmetrical about a mirror plane, the apparatus comprising

a back plate having a top, a bottom, two sides, a front surface and a rear surface, the back plate adapted for attachment to the vertical supporting surface so that the rear surface of the plate is adjacent the vertical supporting surface;

two cantilevered arm portions, each cantilevered arm portion attached to the back plate on a respective side of the mirror plane, each of the cantilevered arm portions extending laterally outward from its respective attachment to the back plate;

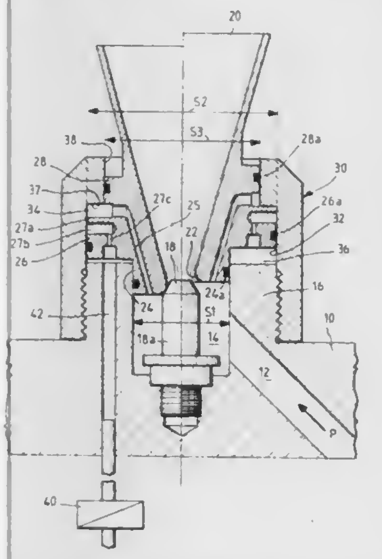
two intermediate arm segments, each of the intermediate arm segments attached to a respective cantilevered arm segment adjacent that end of the cantilevered arm segment that is distal from the back plate, each intermediate arm segment substantially perpendicular to the back plate and disposed adjacent the front surface thereof; and

two upstanding end portions, each of the upstanding end portions attached adjacent that end of a respective intermediate arm segment that is distal from the back plate.



5,749,559
DEVICE FOR CONTROLLING A SPACECRAFT BY GATING GAS VIA A MOVING NOZZLE

André Dumortier, Merignac, and Jean-Gabriel Faget, Bordeaux, both of France, assignors to Societe Europeene de Propulsion, Suresnes, France
Filed Oct. 18, 1996, Ser. No. 732,704
Claims priority, application France, Oct. 20, 1995, 95 12362
Int. Cl.^{6} F16K *31/40;31/383*
U.S. Cl. 251—30.03 **3 Claims**



1. A device for controlling a spacecraft by gating gas, said device comprising:

a nozzle having a gate seat integrally formed therewith:

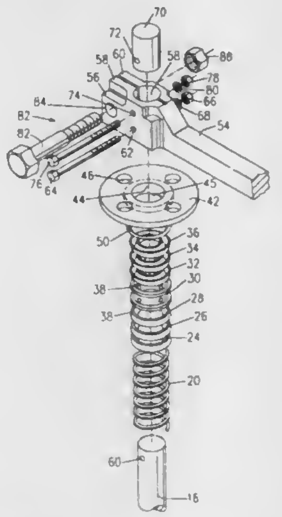
a hot gas feed duct in selective communication with said nozzle;

a plunger constituting with said seat a gate interposed between said hot gas feed duct and said nozzle; and

control means including a pilot valve for controlling the opening and the closing of said gate in order to selectively open or close communication between said hot gas feed duct and said nozzle, wherein said nozzle is integrally formed with a movable piston housed in a cylinder and divides the inner volume of the cylinder into a first chamber permanently connected to said hot gas feed duct, and a second chamber in communication with said first chamber and connected to said pilot valve via an exhaust duct opening into the second chamber, wherein said plunger is fixed with respect to said cylinder, and wherein the opening and closing of said gate is caused by hot gas admitted through said hot gas feed duct and acting directly on said piston to move said nozzle away or towards said plunger under the control of said pilot valve.

5,749,560
VALVE PACKING ASSEMBLY

Larry L. Wolford, Long Beach, and Brian K. Prince, Riverside, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Division of Ser. No. 568,261, Dec. 6, 1995, Pat. No. 5,657,785.
This application Mar. 18, 1997, Ser. No. 819,282
Int. Cl.^{6} F16K *41/00*
U.S. Cl. 251—214 **19 Claims**



1. A valve packing assembly for sealing a shaft of a valve to prevent leaks, the shaft extending through a stuffing box and having an end external to the valve, the valve packing assembly comprising:

a) a compression member on the valve shaft and against the stuffing box;

b) at least one compressible first packing ring on the valve shaft and against the compression member;

c) at least one compressible second packing ring on the valve shaft;

d) a lantern ring on the valve shaft between the first packing ring and the second packing ring;

g) a stub shaft; and

h) a joint detachably connecting the stub shaft and the end of valve shaft external to the valve.

5,749,561
PLUG ASSEMBLY

Albert Edward Worthington, Christchurch, New Zealand, assignor to Wes Wastes Limited, New Zealand
Filed Oct. 4, 1996, Ser. No. 726,079
Claims priority, application New Zealand, Oct. 31, 1995, 280356
Int. Cl.^{6} A47K *1/14;* F16K *31/46;31/528*
U.S. Cl. 251—229 **13 Claims**

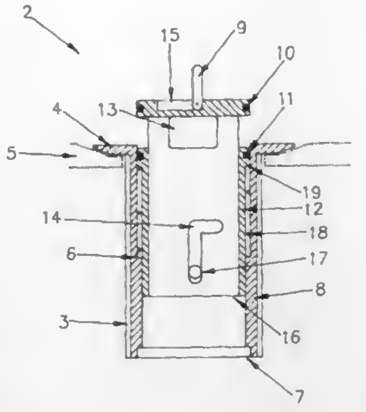
1. A plug assembly unit including:

a sink waste pipe unit of known type;

a plug with a closed top and side with holes formed in the side for the draining of fluid therethrough;

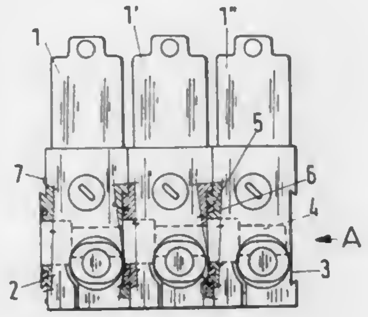
means for draining fluid from said sink to said pipe;

means to move the plug between an open and the closed position;



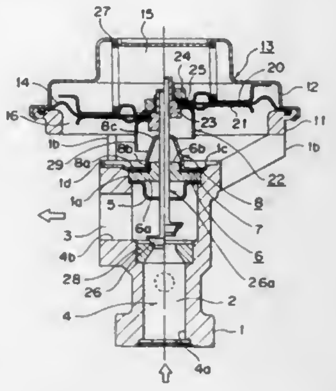
means to enable said plug to be left in an open position which includes a spring means;
said plug assembly unit including inter-engaging means for said pipe and plug and means to secure said plug relative to said pipe such that said plug can be moved relative to said pipe but cannot be removed therefrom under normal operating conditions; wherein
said opening means and means to leave the plug in the open position includes spring means positioned between the plug and the waste pipe; wherein
said plug can be moved between the open and the closed position and said fluids drain through at least one peripheral hole in said plug through the interior of said plug to the pipe; and
wherein the arrangement of the plug sides, the means to enable the plug to be left in the open position and the opening means is such that said fluid does not touch said spring means when said fluid passes through said plug to the pipe.

5,749,562
MODULAR VALVE ARRANGEMENT
Rudolf Möller, Gehrden, and Peter Müller, Hanover, both of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany
Filed Mar. 25, 1996, Ser. No. 621,846
Claims priority, application Germany, Mar. 24, 1995, 195 12 263.1
Int. Cl.⁶ F16K *31/44*
U.S. Cl. 251—367 **8 Claims**



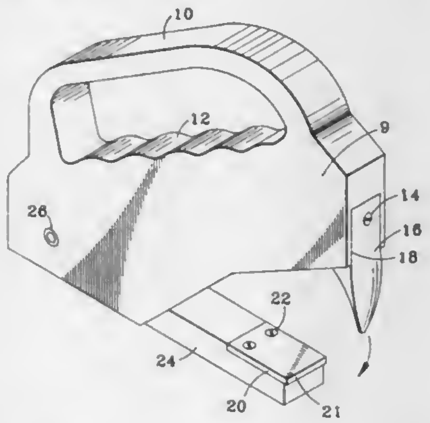
1. A valve, comprising:
a valve body having a front, a back and two oppositely directed sides;
a dovetail tenon arranged on a first of the sides so as to run from the front to the back;
a dovetailed mortise provided in a second of the sides so as to run from the front to the back;
a through passage perpendicular to the tenon and the mortise;
a nub provided on one of the sides; and
a depression provided in the other of the sides so as to correspond to the nub.

5,749,563
EXHAUST GAS RECIRCULATION SYSTEM
Yuji Hosaka; Yasuhiro Makibayashi; Tomoyuki Kumagai, and Tatsuaki Nakanishi, all of Aichi-Ken, Japan, assignors to Taiho Kogyo Co., Ltd., and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan
Filed Jan. 21, 1997, Ser. No. 785,897
Claims priority, application Japan, Jan. 26, 1996, 8-032655
Int. Cl.⁶ F16K *31/126;* **F02M** *25/07*
U.S. Cl. 251—61.5 **7 Claims**



1. An exhaust gas recirculation system comprising an exhaust gas recirculation passage formed in a housing, a diaphragm case disposed within the housing, a diaphragm disposed in the diaphragm case to partition the diaphragm case to define pressure chambers, a valve connected to the diaphragm to be driven for movement back and forth to engage with and disengage from a valve seat mounted on the housing to open and close the exhaust gas recirculation passage, a guide bushing mounted on the housing for guiding the valve for movement back and forth in which the guide bushing is covered by a securing protective cover, and a cup-shaped movable protective cover mounted on the diaphragm to prevent foreign matter located between the covers from ingressing between the guide bushing and the valve;
characterized in that an air passage is formed in the movable protective cover and spaced away from the securing protective cover to substantially prevent entrainment of such foreign matter by air flow between the covers.

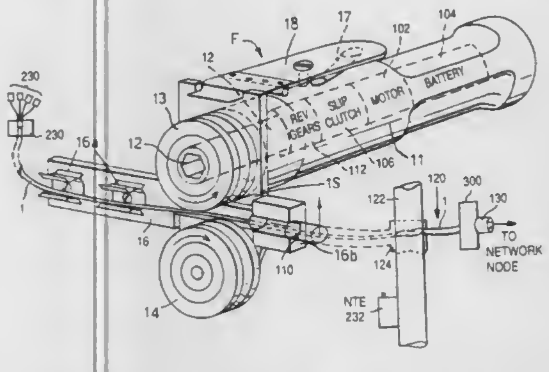
5,749,564
STAPLE REMOVING DEVICE
Shahin Shane Malek, 45 Rapp Rd., Albany, N.Y. 12203
Filed Sep. 4, 1996, Ser. No. 706,239
Int. Cl.⁶ B25C *11/00*
U.S. Cl. 254—28 **20 Claims**



1. A device for removing staples of given width and leg length, comprising:
a first arm, pivotally attached to a second arm at a pivot point,

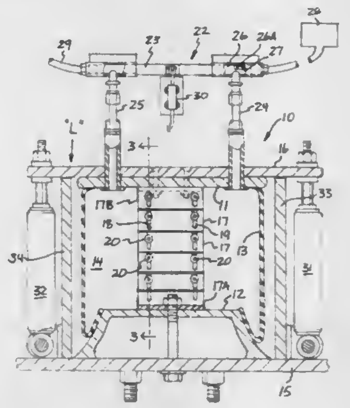
said first arm including a wedge-shaped piece having a tip at one end, a second end, and a central region between said one end and said second end, and
said second arm including a plate with a flat edge shaped to conform to said wedge-shaped piece when the two arms are pivoted together, wherein
said wedge-shaped piece varies in width such that it is narrowest at its tip and becomes gradually wider toward its central region; wherein
said wedge-shaped piece varies in thickness such that it is narrowest at its tip and becomes gradually thicker toward its central region; wherein
a front surface of said wedge-shaped pieced is curved in an arc with a radius of curvature determined such that the origin of the arc coincides substantially with the position of said pivot point; wherein
at a point of closest proximity between said wedge-shaped piece and said flat edge of said plate when the two arms are pivoted together, said plate is affixed to the second arm along a first plane substantially perpendicular to a second plane tangent to said front surface of said wedge shaped piece; and wherein
at said central region, the sum of said width plus twice said thickness of said wedge-shaped piece exceeds the total sum of the width plus twice the leg length of said staples which said device is to be used to remove; whereby
when the first and second arms are pivoted together, said front surface of said wedge-shaped piece and said flat edge of said plate closest to said front surface will remain at a small, substantially fixed distance from one another as said wedge-shaped piece moves past said plate.

5,749,565
OPTICAL FIBRE INSTALLATION TOOL
Peter Lewis John Frost, Suffolk, and Paul David Jessop, Essex, both of United Kingdom, assignors to British Telecommunications public limited company, London, England
PCT No. PCT/GB95/00450, § 371 Date Dec. 15, 1995, § 102(e) Date Dec. 15, 1995, PCT Pub. No. WO95/23988, PCT Pub. Date Sep. 8, 1995
Continuation-in-part of Ser. No. 230,382, Apr. 20, 1994, Pat. No. 5,503,369. This PCT application Mar. 2, 1995, Ser. No. 433,426
Claims priority, application European Pat. Off., Mar. 2, 1994, 94301511
Int. Cl.⁶ B65H *59/00*
U.S. Cl. 254—134.4 **5 Claims**



1. A hand held tool for installing an optical fibre transmission line between the inside of a customer's premises and the outside thereof along a pre-installed tubular pathway which passes through an aperture in a wall of said premises, the tool comprising:
a housing,
a motor mounted within the housing,
a motor output shaft, and
a pair of drive wheels,
at least one of the drive wheels being drivably connected to the output shaft of the motor,
the drive wheels being mounted on the housing for relative movement towards/away from one another,
guide means for guiding the optical fibre transmission line to the nip between the drive wheels,
support means for supporting an end portion of the tubular pathway at the other side of the nip,
wherein an air injector unit constitutes the guide means and the support means,
the air injector unit being provided with means for injecting pressurised air into the tubular pathway, and
whereby the optical fibre transmission line can be driven along the tubular pathway by the inter-engagement of the counter-rotating drive wheels.

5,749,566
SELF COMPENSATING FLUID SPRING ASSEMBLY
Ralph Vitale, and Frank Vitale, both of 164 Beacon Ave., New Haven, Conn. 06512
Filed May 7, 1996, Ser. No. 646,044
Int. Cl.⁶ F16F *9/04*
U.S. Cl. 267—64.23 **2 Claims**



1. A self compensating fluid actuated spring assembly for resiliently supporting a vehicle load under variable load and/or road conditions comprising:
a pair of opposed mounting surfaces disposed in spaced relationship,
a resilient circumscribing tubular wall interconnected between said opposed mounting surfaces to define an expandable chamber for movement between an extended and distended position in response to load variations and road conditions,
limit means disposed within said expandable chamber to limit the extended position of said expandable chamber beyond a predetermined limit,
and control means for automatically inflating and deflating said expandable chamber in response to load variations and road conditions,
said limiting means comprising
a plurality of interconnected links disposed within said expandable chamber to define a chain of connected links,
said chain of connected links including a pair of opposed anchor links,
each of said anchor links being connected to the mounting surface adjacent thereto, and
an intermediate link interconnected between said anchor links,
means for slidably interconnecting said links,
each of said interconnecting links comprising:
a flat plate,
said means for slidably interconnecting said links including a pair of laterally spaced elongated slots so that the elongated slots of one flat plate are axially aligned with the slots of the next adjacent flat plate,
and a stud extending through the aligned slots of adjacent flat plates for slidably interconnecting said adjacent flat plates to allow said plate links to extend and distend as

said expandable chamber extends and distends within predetermined limits.

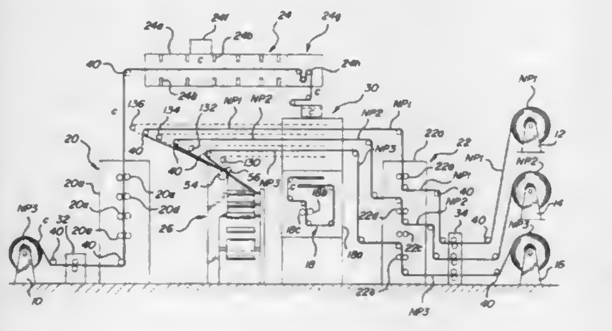
5,749,567
PRINTING METHOD AND APPARATUS

Andrew V. DeAngelis, 164 Kirkwood Ct., Bloomfield Hills, Mich. 48304

Division of Ser. No. 168,752, Dec. 16, 1993, which is a continuation-in-part of Ser. No. 902,840, Jun. 23, 1992, Pat. No. 5,320,334. This application Mar. 27, 1996, Ser. No. 624,007

Int. Cl.^{6} B41F *13/58;* **B42D** *1/00*

U.S. Cl. 270—7 **19 Claims**



1. A method of forming a plurality of books comprising the steps of:

providing first, second and third moving webs of paper;

printing the first, second and third moving webs of paper at first, second and third printing stations respectively;

providing a folder;

providing an interleaver;

defining first and second web path s for said first and second moving webs extending from the first and second printing stations respectively, extending through the interleaver along spaced but aligned interleaver path portions, and extending to the folder;

defining a third web path for said third moving web extending from said third printing station to said interleaver; and

providing a plurality of alternate entry path portions for said third web as it enters the interleaver with at least some of said entry path portions providing different interleave relations with respect to the spaced interleaver path portions of the first and second webs.

5,749,568
APPARATUS AND METHOD FOR SUPPLYING PRINTED PRODUCTS TO A PROCESSING SECTION

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 6, 1995, Ser. No. 540,546

Claims priority, application Switzerland, Oct. 27, 1994, 03215/94

Int. Cl.^{6} B65H *3/44*

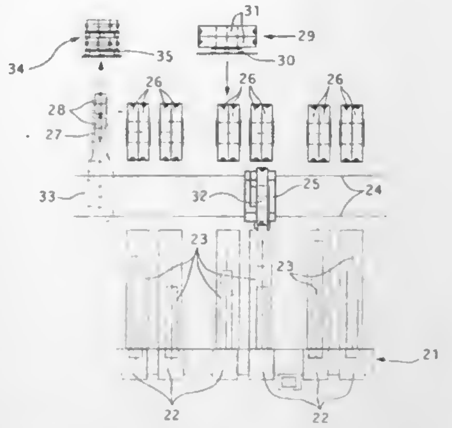
U.S. Cl. 271—9.01 **17 Claims**

1. An apparatus for supplying printed products to a processing section having a plurality of stations, the apparatus comprising:

a buffer assigned for each respective station, each buffer including means for discharging printed products onto the processing section at a discharge speed;

a mobile supply device having a storage unit for holding a plurality of printed products, a drive for the storage unit, and a conveying device for removing printed products from the storage unit at a conveying speed, the mobile supply device being temporarily connectable to one of the buffers for intermittently charging that buffer with printed products at the conveying speed;

the conveying speed being greater than the discharge speed.



5,749,569
DOCUMENT FEEDING APPARATUS HAVING IMPROVED FORWARDING MEANS

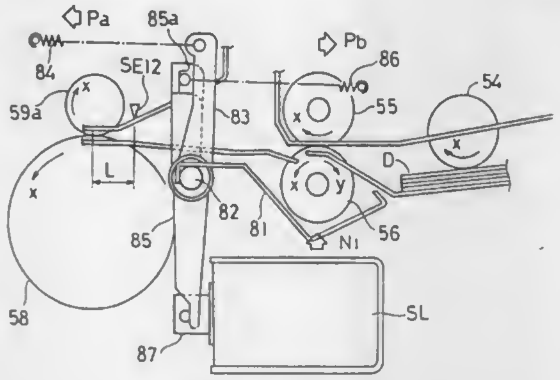
Tomoyuki Atsumi; Yuusuke Morigami, and Hirokazu Matsuo, all of Toyohashi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 135,730, Oct. 13, 1993, abandoned. This application Jun. 16, 1994, Ser. No. 260,949

Claims priority, application Japan, Oct. 15, 1992, 4-277482; Oct. 15, 1992, 4-277483; Oct. 15, 1992, 4-277484

Int. Cl.^{6} B65H *5/00*

U.S. Cl. 271—10.11 **5 Claims**



4. A sheet feeding apparatus, comprising:

means for successively forwarding a plurality of sheets accommodated in a state of stacked layer one by one, said forwarding means movable between a forwarding position where the forwarding means is brought in contact with the leading end of the stacked sheets for forwarding sheets and a retracted position where the forwarding means is separated away from the sheets;

transport means for receiving sheets forwarded by the forwarding means and transporting the sheet toward a predetermined transport direction;

detecting means provided between said forwarding means and said transport means for detecting a sheet forwarded by the forwarding means;

means for controlling the transport of a sheet by controlling said transport means corresponding to a result of a detection conducted by said detecting means; and

control means for controlling a timing of movement of said forwarding means, wherein the control means forwards a sheet by positioning the forwarding means at a forwarding position and moves the forwarding means to a retracted position after the leading edge of the sheet is forwarded by the forwarding means, and further starts moving the forwarding means to the forwarding position for forwarding the following sheet before the rear end of the sheet previously forwarded passes through the detecting means.

5,749,570
SHEET CONVEYING APPARATUS

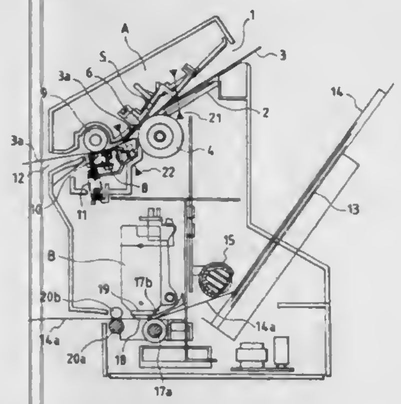
Naohiro Iwata, Yokosuka; Minoru Yokoyama, Yokohama; Yuji Nakano, Kawasaki; Shunji Kawashima, Wako, and Hideyuki Terashima, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed May 23, 1996, Ser. No. 652,416

Claims priority, application Japan, May 24, 1995, 7-124718

Int. Cl.^{6} B65H *5/00*

U.S. Cl. 271—10.13 **8 Claims**



1. A sheet conveying apparatus comprising:

a first rotary member for conveying a sheet;

a second rotary member disposed at a down-stream side of said first rotary member in a sheet conveying direction for conveying the sheet;

a single motor;

first transmission means for transmitting a force of said single motor to said first rotary member, said first transmission means being provided with clutch means for effecting connection/disconnection of the force to said first rotary member and first delay means for delaying transmission of the force, said clutch means including a rotary member rotatable about a shaft, said first delay means including a first pair of engagement portions between which play can be formed;

second transmission means for transmitting the force of said single motor to said second rotary member and provided with second delay means including a second pair of engagement portions between which play can be formed, wherein:

(1) in a first step, said clutch means is connected by normal rotation of said single motor to rotate said first rotary member for conveying the sheet;

(2) in a second step, said single motor is rotated reversely when a tip end of the sheet is located between said first and second rotary members, to disconnect said clutch means thereby not to rotate one of the first paired engagement portions and not to form the play therebetween but to thereby rotate one of the second paired engagement portions and to form the play therebetween;

(3) in a third step, said single motor is rotated normally to connect said clutch means to thereby rotate said first rotary member for conveying the sheet through the first paired engagement portions between which no play is formed, but to thereby not rotate said second rotary member until the play formed in the second paired engagement portions is canceled, so that the tip end of the sheet conveyed by said first rotary member is abutted against said second rotary member, and

(4) in a fourth step, said single motor continues the normal rotation to cancel the play in the second paired engagement portions to thereby rotate said second rotary member for conveying the sheet.

5,749,571
DEVICE FOR FORMING A SHEET PILE

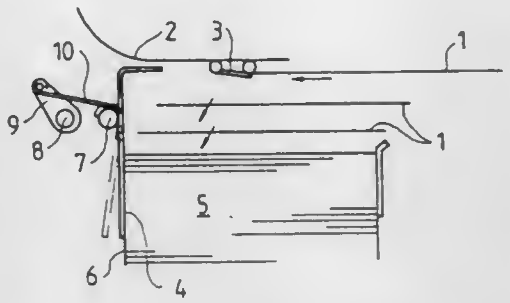
Peter Heiler, Forst, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Nov. 29, 1995, Ser. No. 564,418

Claims priority, application Germany, Nov. 29, 1994, 44 42 385.3

Int. Cl.^{6} B65H *31/04*

U.S. Cl. 271—213 **4 Claims**



1. Device for forming a sheet pile from a sheet stream made up of substantially horizontally oriented descending sheets of paper, having leading-edge stops for the sheets, the stops being disposed on a front side of the pile; a stop shaft carrying the leading-edge stops; a stop lever which is secured to the stop shaft and is pivotable between a first and a second stop lever position in the course of a change between a first and a second mode of operation of the device, respectively, the stop lever, in the first stop lever position, keeping the leading-edge stops in engagement with the pile and, in the second stop lever position, keeping the leading-edge stops in a release position pivoted away from the pile; a spring engaging with the stop lever and, in a state of tension, having a tendency to keep the stop lever in the first stop lever position; a catch device with catch arms which, in the first operating mode of the device, are located in a basic position outside the sheet stream and, in the second operating mode, are in a catch position wherein they enter into the sheet stream; catch levers to which the catch arms are articulatedly connected; a catch lever shaft parallel to the stop shaft and carrying the catch levers; and a tilt lever secured to the catch lever shaft and being pivotable between a first and a second tilt lever position upon a change between the first operating mode and the second operating mode, respectively, the tilt lever, in the first tilt lever position, maintaining the catch arms in the basic position thereof and, in the second tilt lever position, maintaining the catch arms in the catch position thereof, comprising a cam adjustable along an adjusting path between a first and a second cam position; said cam maintaining the spring in a state of tension in said first cam position and along a segment of said adjusting path originating at said first cam position, and maintaining the stop lever in the second stop lever position in said second cam position; the tilt lever being formed with a slot or coulisse; a sliding block adjustable jointly with said cam being engageable in said slot formed in the tilt lever; said sliding block maintaining the tilt lever in the first and second tilt lever position, respectively, when said cam assumes said first and second cam position thereof, respectively.

5,749,572
GRIPPER CONTROL FOR A CYCLICALLY ROCKINGLY DRIVEN PREGRIPPER FOR SINGLE-SHEET TRANSPORT IN A SHEET-FED PRINTING PRESS

Andreas Fricke, Eberbach; Heiner Luxem, Wilhelmsfeld, and Lothar Stadler, Eppelheim, all of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

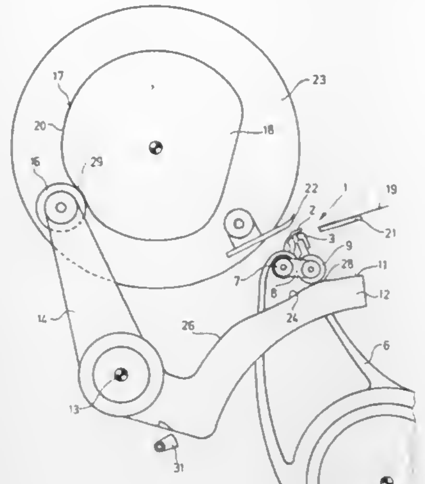
Filed Nov. 21, 1996, Ser. No. 757,543

Claims priority, application Germany, Nov. 21, 1995, 195 43 381.5

Int. Cl.^{6} B65H *5/12*

U.S. Cl. 271—268 **3 Claims**

1. Gripper control for a cyclically rockingly driven pregripper for single-sheet feeding in a sheet-fed printing press, the pregripper being disposed at a free end of a rocker lever, which is swivelable



about a rocker shaft fixed to a frame of the printing press, and having at least one sheet gripper forcibly movable by cams about an articulated shaft disposed parallel to the rocker shaft, for closing and opening the sheet gripper when the sheet is taken over and transferred, respectively, one of the cams being revolvable a single revolution, and another of the cams being disposed on a locally stationarily swivelable roller lever carrying a cam roller engaging with the one cam, the other cam being swivelable cyclically in the position thereof, the position of the cams determining the closing time and opening time of the gripper, comprising an indexing mechanism for fixing the other cam on the locally stationarily swivelable roller lever, the other cam having a first gripper-closing cam region and a first gripper-opening cam region, said first gripper-closing cam region having a second gripper-opening cam region, the one cam revolvable a single revolution having a second gripper-closing cam region operatively associated with the second gripper-opening cam region for compensation.

5,749,573
SORTER WITH DIFFERENT BIN POSITIONS

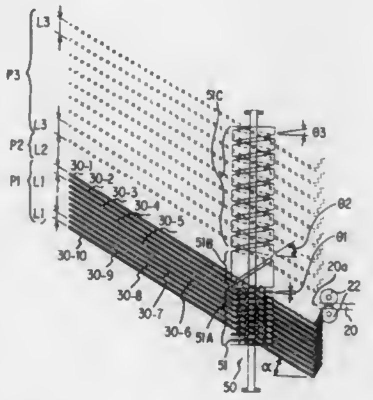
Misao Kobayashi, Yamanashi, Japan, assignor to Nisca Corporation, Yamanashi-ken, Japan

Division of Ser. No. 226,626, Apr. 12, 1994, Pat. No. 5,607,147. This application Aug. 22, 1996, Ser. No. 701,678

Claims priority, application Japan, May 27, 1993, 5-148667; Nov. 24, 1993, 5-319149

Int. Cl.⁶ B65H *39/10*

U.S. Cl. 271—293 **16 Claims**



1. A sorter for receiving sheets supplied from a sheet supply machine, comprising:

a sheet distributing section for distributing sheets supplied from the sheet supply machine,

a plurality of bins situated near the sheet distributing section for receiving the sheets from the sheet distributing section, said bins being arranged adjacent to each other and being movable relative to the sheet distributing section,

means for positioning the bins to a home position, a sheet receiving position and a sheet taking position, and

return signal means for actuating the positioning means electrically connected to the positioning means, said positioning means, when receiving a signal from the return signal means, positioning the bins to a predetermined position,

said home position being located at one side relative to the sheet distributing section, wherein the bins are stacked adjacent to each other with a distance (L1), and all the bins can be located in the home position,

said sheet receiving position facing the sheet distributing section to receive one of the sheets onto one of the bins, wherein a sheet receiving bin except a top bin is situated away from a bin located above the sheet receiving bin with a distance (L2),

said sheet taking position being located at the other side opposite to the home position relative to the sheet receiving position, wherein a plurality of said bins is stacked adjacent to each other with a distance (L3) greater than the distance L1 and less than the distance (L2), at least one bin being located in the sheet taking position when the sheets are supplied to at least tow bins so that the sheets can be easily removed from the bins.

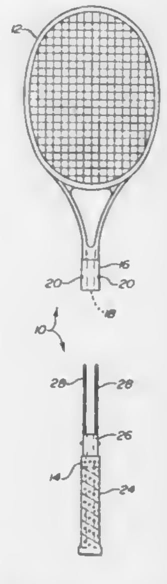
5,749,574
COLLAPSIBLE SPORTS RACQUET

Stephen Curtis, 2128 Longview Dr., Tallahassee, Fla. 32303

Filed Jun. 7, 1996, Ser. No. 660,100

Int. Cl.⁶ A63B *49/08*

U.S. Cl. 273—73 J **4 Claims**



1. A collapsible sports racquet comprising:

a handle having a male end with a pair of prongs extending therefrom;

a racquet head having a receptacle, in corresponding shape to the shape of the male end, with a pair of opposing openings;

a pair of channel openings locatable within the receptacle;

a pair of channels extending inwardly from the pair of channel openings for receiving the pair of prongs; and

a pair of detents, located on the male end of the handle receivable within the pair of openings.

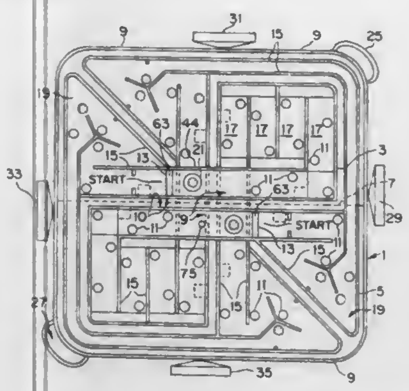
5,749,575
DUAL MAZE

Neal German, 81 Beaver Lake Pl., Divide, Colo. 80814

Filed Mar. 6, 1997, Ser. No. 811,744

Int. Cl.⁶ A63F *7/00*

U.S. Cl. 273—113 **4 Claims**



1. A dual maze game board and playing pieces comprising:

rollable playing pieces;

two substantially identical game boards joined together within an enclosure with each of said boards having surface ramps, upright obstacles and holes through which said playing pieces can fit; and

player control means mounted on said enclosure for tilting the playing surface of each of said playing boards independently of the other board, said control means including two controllers for each player oriented generally perpendicular to each other mounted under the playing board's surface and having control handles extending from said enclosure, said control means also including game board suspensions for vertically supporting said game board by vertically disposed rods having lower hinged joints to connect them to a horizontally disposed common shaft.

5,749,576
GAMING MACHINE

Horst Heinen, Stromberg; Konrad Rieck, Gau-Algesheim; Martin Kawka, Waldalgesheim, and Jürgen Schattauer, Hüttelsheim, all of Germany, assignors to NSM Aktiengesellschaft, Germany

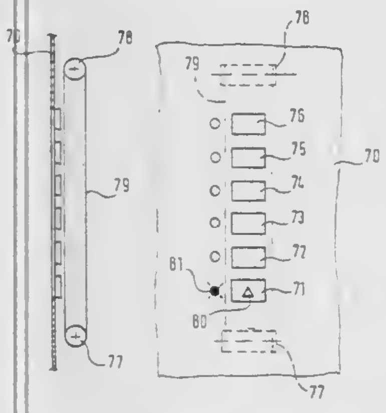
PCT No. PCT/EP94/03204, § 371 Date Aug. 28, 1995, § 102(e) Date Aug. 28, 1995, PCT Pub. No. WO95/18428, PCT Pub. Date Jul. 6, 1995

PCT Filed Sep. 26, 1994, Ser. No. 507,457

Claims priority, application Germany, Dec. 30, 1993, 43 45 021.0

Int. Cl.⁶ A63F *9/00*

U.S. Cl. 273—138.1 **1 Claim**



1. Gaming machine, comprising a movable disk provided with windows positioned in predetermined positions; carrier means located behind the windows and provided with at least one symbol; and means for moving the carrier means and for randomly stopping the carrier means, a win being obtained if at the randomly determined standstill of the carrier means the symbol appears in a predetermined window, wherein the windows are positioned in predetermined positions in a row and the carrier means comprises a belt.

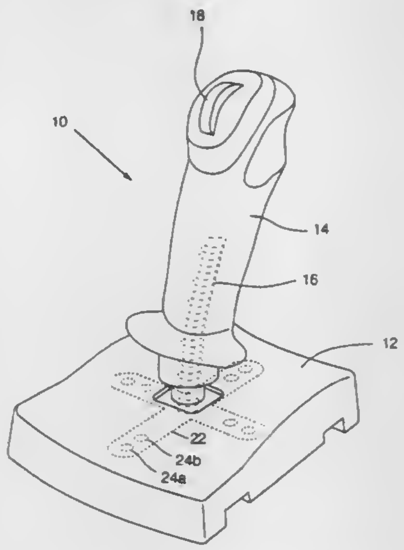
5,749,577
PERPHERAL INPUT DEVICE WITH SIX-AXIS CAPABILITY

Johnny D. Couch, Redwood City, and James L. Huether, Cupertino, both of Calif., assignors to Sega Enterprises, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 36,218, Mar. 15, 1995, Pat. No. Des. 376,392, which is a continuation-in-part of Ser. No. 36,221, Mar. 15, 1995, Pat. No. Des. 378,931, which is a continuation-in-part of Ser. No. 36,205, Mar. 15, 1995, Pat. No. Des. 378,768, which is a continuation-in-part of Ser. No. 36,220, Mar. 15, 1995, Pat. No. Des. 369,835, which is a continuation-in-part of Ser. No. 36,219, Mar. 15, 1995, Pat. No. Des. 370,941. This application May 31, 1995, Ser. No. 454,609

Int. Cl.⁶ A63F *9/00*

U.S. Cl. 273—148 B **3 Claims**



1. Peripheral input device for use with a game console allowing six-axis input which comprises:

a) two independent three-axis input devices;

b) a control pad with a microprocessor, with two input ports for establishing an electrical connection between the two three-axis input devices and the control pad and with an output port for establishing an electrical connection between a control pad microprocessor and the game console;

c) control pad microprocessor for determining whether one or two of the two three-axis input devices are connected to the control pad input ports

wherein the control pad microprocessor determines whether the two input ports are connected to three-axis input devices and, based upon the results of the determination, outputs an address signal to the game console through the control pad output port which indicates to the game console whether one or two three-axis input devices are connected to the control pad input ports.

5,749,578

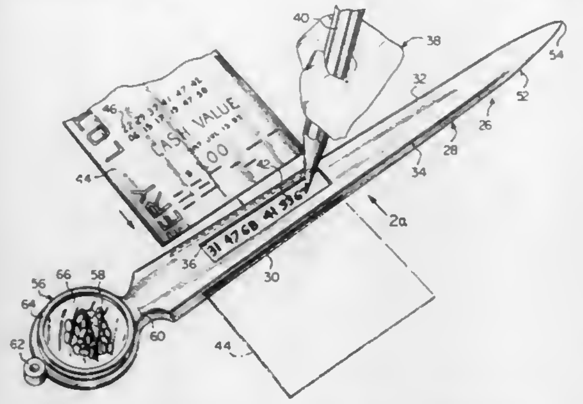
COMBINATION LOTTO CHECKER AND SCRAPER

Karen Lynne Stacey, 1 West St., Farmingdale, N.Y. 11735

Filed May 5, 1997, Ser. No. 851,579

Int. Cl.^{6} A47L *25/00;* A63F *3/06*

U.S. Cl. 273—148 R **20 Claims**



12. A combination lotto checker and scraper comprising:

a) a handle/blade having a transverse slot extending through opposite side edges thereof and a top recessed surface above said transverse slot, so that in a first instance a person can write with a writing instrument winning numbers within said top recessed surface and insert and slide a lotto ticket through said transverse slot to compare the winning numbers with numbers on the lotto ticket, while in a second instance the person can use said side edges of said handle/blade to scratch off lottery cards to see the numbers thereon;

b) a display case;

c) a personalized logo carried within said display case;

d) a tang between a first side of said display case and said handle/blade; and

e) a loop on a second side of said display case opposite from said tang, so that said loop can be used to hang up said combination lotto checker and scraper when not in use and engage with a key ring.

5,749,579

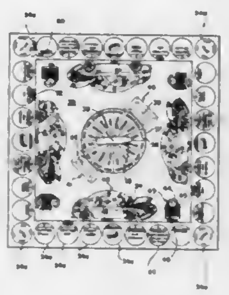
SIMULATING THE ASSEMBLY OF AN AUTOMOBILE

Ray Piacentino, 39 Cypress Rd., Dumont, N.J. 07628

Filed Dec. 16, 1996, Ser. No. 764,998

Int. Cl.^{6} A63F *3/00;9/24*

U.S. Cl. 273—237 **1 Claim**



1. A game simulating the assembly of various parts to complete an automobile in a game played by a plurality of players comprising:

a game board having a plurality of playing circles arranged about the periphery of the board, said circles including circles labeled for various automobile parts, circles labeled ignition key, circles labeled spin and circles labeled pick-a-card, and the outline of an automobile opposite each player;

means for generating random numbers;

a plurality of visually distinguishable drivers, one for each player, said drivers marking the location of a player on said game board;

a plurality of automobile parts corresponding to the playing circles having labeled automobile parts shown on the game board, each of said players having automobile parts corresponding to the respective playing circles;

a plurality of cards positioned on the board relating to the pick-a-card circles and labeled with particular moves;

a rotatable dial mounted centrally on the board and a circle divided into segments extending outwardly from the dial, each of said segments being labeled with a color and an odd/even designation;

a lock positioned on the game board opposite each player having a plurality of peg apertures and a key aperture;

an ignition key and a plurality of pegs mounted in their respective lock apertures;

a power supply mounted to the game board, a motor and a contact coupling the motor to the power supply;

a means for engaging the ignition key with the contact; and,

wherein the players' drivers move about the playing circles in accordance with the means for generating random numbers and the card indications to complete the automobile assembly on the board outline, remove the pegs from their apertures and lastly the ignition key from its aperture, said key being used to engage the contact to electronically activate the motor signalling completion of the game by a particular player.

5,749,580

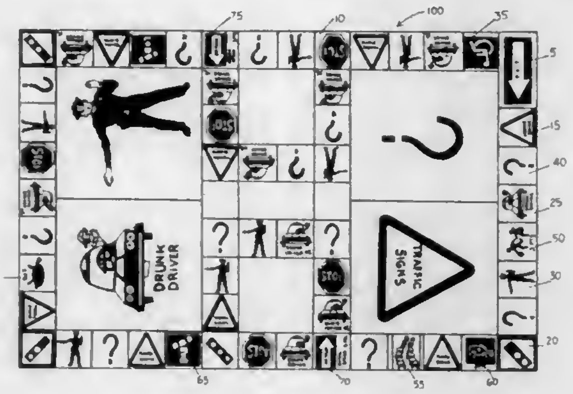
EDUCATIONAL BOARD GAME FOR PREPARING FOR A DRIVER'S LICENSE EXAMINATION

Gilberto Lopez, PO Box 8703, Fernandez Juncos Station, San Juan, Puerto Rico, 00910

Filed Oct. 30, 1996, Ser. No. 740,480

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—243 **16 Claims**



1. A new and improved educational board game which assists the players in the preparation for the driver's license examination, the board game comprising:

a gameboard, said gameboard being generally rectangular and having a plurality of squares, said squares defining a path,

said path including policeman squares, question mark squares, drunk driver squares, and traffic sign squares, said drunk driver squares including a percent alcohol indication thereon,

a plurality of decks of cards, said plurality of decks of cards disposed on said gameboard, said decks including a policeman deck, a question mark deck, a drunk driver deck and a traffic sign deck, each of said decks further having a plurality of questions located thereon,

a scorecard, said scorecard to keep track of points awarded when the player correctly solves the question posed on said picked card and to keep track of percent alcohol accumulated by landing on said drunk driver squares,

whereby the players move on said path and pick a card from one of said plurality of decks of cards when they land on the associated one of said squares on said path, and must attempt to correctly answer the question posed on said card, wherein said question is relevant to the questions posed on the driver's license examination.

5,749,581

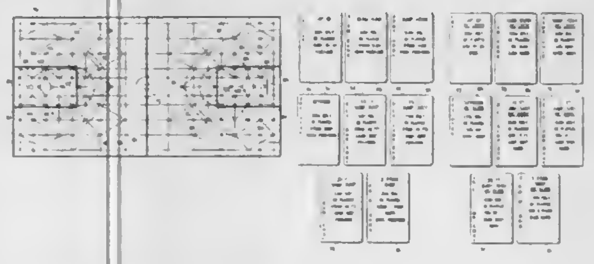
APPARATUS AND METHOD OF PLAYING A BASKETBALL BOARD GAME

Renald Poisson, 13223 Champions Centre Dr., #266, Houston, Tex. 77069

Filed Aug. 16, 1996, Ser. No. 697,021

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—244 **49 Claims**



48. A game system comprising:

a basketball game board having a representation of a basketball court thereon including two basketball goals, a center court position, two paint areas, a plurality of playing positions, wherein each of said plurality of playing positions being connected to other of the playing positions by a plurality of connecting lines, wherein any two playing positions are connected only by a single line, said plurality of playing positions including a plurality of shot positions wherein the plurality of connecting lines represent passing lanes;

a game piece representing a game ball;

a deck of passing cards, a deck of rebound cards, a deck of foul shot cards and a deck of playing cards, wherein at least a portion of the passing deck the rebound deck, and the playing deck carries instructions for their use to replicate the progress of a basketball game;

wherein the passing deck of cards comprises a plurality of pass cards, each having a type of pass accompanied with an instruction indicating the number of playing positions the game ball can advance selected from the group consisting of:
bounce pass,
chest pass,
cross court pass,
full court pass,
behind the back pass, and
alley oop pass;

wherein the rebound deck of cards comprises a plurality of rebound cards being selected from the group consisting of:
offensive rebound, and
defensive rebound;

wherein the foul shot deck of cards comprises a plurality of foul shooting cards being selected from the group consisting of:
foul shot no good, and
foul shot good;

wherein the playing deck of cards comprises a plurality of situation play cards, a plurality of offense cards and a plurality of defense cards,

wherein the plurality of situation play cards, each situation play card having an instruction concerning a movement an action or a shot, are selected from the group consisting of:
steal,
block shot,
jump ball,
traveling,
non-shooting foul,
shooting foul,
technical foul, and
illegal defense;

wherein the plurality of offense cards, each having a type of shot corresponding to one of said types of shots represented by said shot positions, are selected from the group consisting of:
lay up,
slam dunk
jump hook
sky hook
10 foot jump shot,
15 foot jump shot,
20 foot jump shot, and
3 point shot;

wherein the plurality of defense cards, each having a type of shot that is no good corresponding to a type of shot on said shot cards, are selected from the group consisting of:
lay up no good,
slam dunk no good,
jump hook no good,
sky hook no good,
10 foot jump shot no good,
15 foot jump shot no good,
20 foot jump shot no good, and 3 point shot no good.

5,749,582

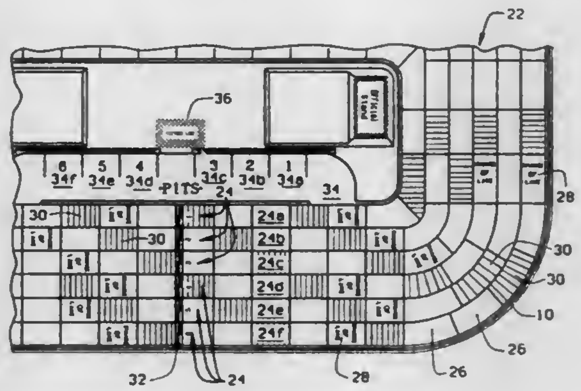
AUTOMOBILE RACING BOARD GAME

Bernard L. Fritz, 6300 Eichelberger, and Bryan L. Fritz, 5847 Holly Hills, both of St. Louis, Mo. 63109

Continuation-in-part of Ser. No. 588,233, Jan. 18, 1996, abandoned. This application Jul. 29, 1996, Ser. No. 681,795

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—246 **17 Claims**



1. A method of playing a race game on a game board having an endless loop track divided into a plurality of lanes, each lane being divided into a plurality of spaces, some of the spaces being designated as lane change spaces, some of the spaces being designated as action card spaces, the loop track having a start/finish line extending across the track generally perpendicularly to the lanes, and a pit area positioned inside the loop track on the game board, the method comprising the steps of:

each player taking a turn moving a playing piece around the spaces in a lane of the track, the player having an option of changing lanes if at the end of the player's turn his or her playing piece is on a lane change space, no player's playing piece being allowed to pass over another player's playing piece in the same lane, the player drawing an action card if at the end of the player's turn his or her playing piece is on an action space, at least one action card designated as a lane change card, the player moving his or her playing piece according to the action card, the player moving his or her playing piece to a different lane when the lane change card is drawn, the player receiving a flag each time his or her playing piece crosses the start/finish line, the player removing the flag and replacing it with a yellow flag each time his or her playing piece lands on the pit area, play continuing until one player's playing piece has traversed the track a predetermined number of times.

5,749,583

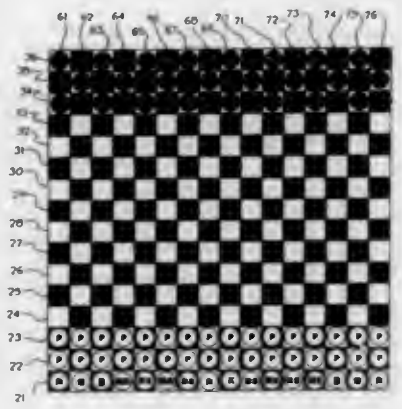
APPARATUS AND METHOD OF PLAYING AN EXPANDED CHESS GAME

Tengiz Sadounichvili, and Larisa Sadounichvili, both of 5950 Bathurst St., Apt. #605, North York, Ontario, Canada, M2R 1Y9

Filed Apr. 3, 1997, Ser. No. 832,446

Int. Cl.^{6} A63F *3/02*

U.S. Cl. 273—261 **19 Claims**



1. An Expanded Chess Game Apparatus for play by a first player against a second player comprising:

a rectangular game board having a playing surface comprising sixteen rows and sixteen columns of alternating colored squares;

a reducer having four lateral sides in surrounding relationship with a rectangular aperture formed therebetween, the reducer being positionable upon the rectangular game board and forming a reduced playing surface comprising twelve rows and twelve columns of alternating colored squares;

a first set of game pieces for play upon the reduced playing surface comprising a king, a queen, two rooks, two bishop-2's, two knight-2's, two bishops, two knights and a plurality of pawns, the king, the queen, the rooks, the bishops, the knights and said pawns operating according to the rules of a traditional chess game; and

a second set of game pieces for play upon the reduced playing surface comprising a king, a queen, two rooks, two bishop-2's, two knight-2's, two bishops, two knights and a plurality of pawns, the king, the queen, the rooks, the bishops, the knights and the pawns operating according to the rules of the traditional chess game, the second set of game pieces being distinguishable from the first set of game pieces; and wherein said first set of game pieces has twelve pawns and said second set of game pieces has twelve pawns.

5,749,584

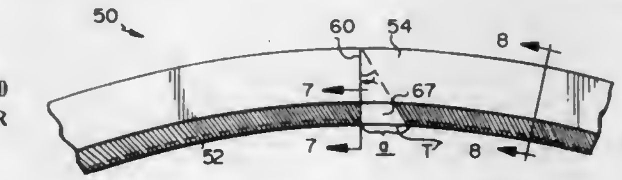
COMBINED BRUSH SEAL AND LABYRINTH SEAL SEGMENT FOR ROTARY MACHINES

David Robert Skinner, Pattersonville; Bharat S. Bagepalli, Schenectady; Robert Harold Cromer, Johnstown, all of N.Y.; Osman Saim Dine, Istanbul, Turkey; Norman Arnold Turnquist, Cobleskill, and Christopher Edward Wolfe, Niskayuna, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 672,665, Jun. 28, 1996, which is a continuation-in-part of Ser. No. 438,228, May 9, 1995, which is a division of Ser. No. 342,011, Nov. 16, 1994, Pat. No. 5,474,306, which is a continuation of Ser. No. 978,731, Nov. 19, 1992, abandoned. This application Sep. 25, 1996, Ser. No. 719,667

Int. Cl.^{6} F16J *15/447*

U.S. Cl. 277—53 **14 Claims**



1. An annular brush seal for disposition between a rotatable component having an axis of rotation and another component about said axis, comprising:

a plurality of arcuate segments for forming an annulus about and lying in a plane normal to said axis and between said components, each said segment including an arcuate array of discrete, generally linearly extending bristles secured to said segment and extending therefrom at angles offset from radii of said segments;

each of said segments having opposite ends along radii thereof for substantial registration with ends of adjoining segments such that, upon assembly of the segments into an annulus, the opposed ends of each pair of adjoining segments lie substantially along a radius of the annulus with the bristles extending at angles offset from radii of the segments.

5,749,585

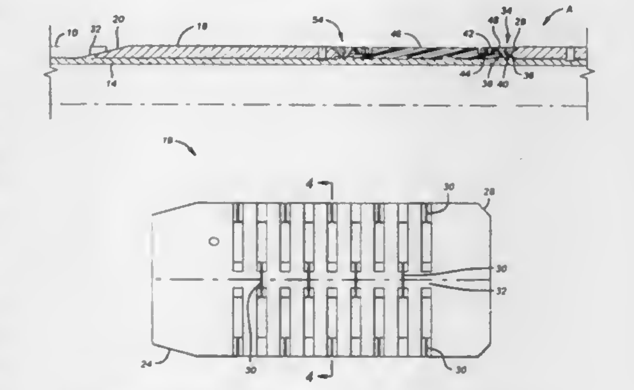
DOWNHOLE TOOL SEALING SYSTEM WITH CYLINDRICAL BIASING MEMBER WITH NARROW WIDTH AND WIDER WIDTH OPENINGS

Jeffrey J. Lembcke, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Dec. 18, 1995, Ser. No. 573,824

Int. Cl.^{6} F16J *15/06*

U.S. Cl. 277—116.2 **21 Claims**



1. A sealing system for a downhole tool, comprising:

a body having a longitudinal axis;

a nonelastomeric sealing element on said body;

compressing means on said body to longitudinally compress said sealing element downhole; and

at least one biasing member, said biasing member capable of storing a potential energy force, said biasing member mounted to said body such that after actuation of said compressing means, a substantially longitudinal biasing force is exerted on said nonelastomeric sealing element which varies in response to varying thermal or fluid pressure loads acting on said nonelastomeric element;

said biasing member further comprises a cylindrically shaped element having a plurality of circumferential openings and a longitudinal axis;

said openings are elongated and substantially transverse to said longitudinal axis; and

said openings comprise narrow width openings and wider width openings.

5,749,586

GASKET FOR SANITARY PIPING AND METHOD OF MANUFACTURING THE SAME

Makoto Abe; Katsuo Wada; Takeshi Miyoshi, all of Hyogo; Tosiyasu Tanimura, and Tetsuya Akai, both of Kyoto, all of Japan, assignors to Nippon Pillar Packing Co., Ltd., Osaka, Japan

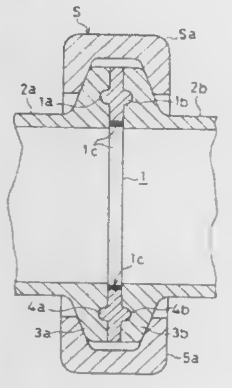
PCT No. PCT/JP95/02195, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO96/12903, PCT Pub. Date Feb. 5, 1996

PCT Filed Oct. 23, 1995, Ser. No. 666,274

Claims priority, application Japan, Oct. 24, 1994, 6-257823

Int. Cl.^{6} F16J *15/00*

U.S. Cl. 277—608 **8 Claims**



1. An annular gasket for sanitary piping wherein a whole body of said gasket, excluding an inner circumferential surface layer, is made of porous polytetrafluoroethylene (PTFE) and a pore-free fused solidified PTFE layer is formed only at said inner circumferential surface layer.

5,749,587

HAND TRUCK FOR EASY REMOVAL OF CARRIED OBJECTS

Jose Colon, 763 Banks Rd., Margate, Fla. 33063

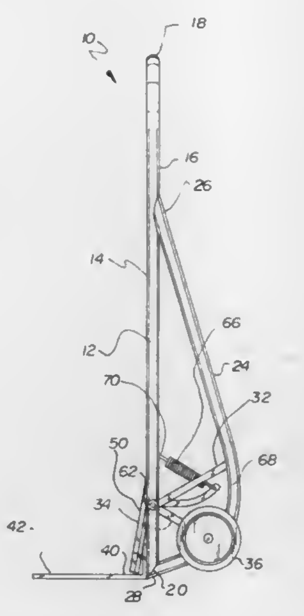
Filed Feb. 20, 1996, Ser. No. 603,361

Int. Cl.^{6} B62B *1/12*

U.S. Cl. 280—47.27 **1 Claim**

1. A new and improved hand truck for easy removal of carried objects comprising, in combination:

a hand truck having an inverted generally U-shaped frame with a front face and a rear face and a curved upper end for handling free lower ends positionable near the ground, a pair of curved supports having upper ends secured to the rear face of the frame adjacent to upper regions thereof and having lower ends secured to the rear face of the frame adjacent to lower regions thereof, a plurality of support brackets on each side of the frame coupling the lower portions of the frame to



the central regions of the supports, a pair of wheels rotatably supported about horizontal axes secured to the supports near lower regions thereof;

an L-shaped retainer having an elongated generally horizontal portion and a short generally vertical portion secured to each other and to the front face of the frame adjacent to the lower ends thereof;

a pusher member including a small horizontally extending plate positionable in a first rest orientation adjacent to the vertical plate of the retainer with an associated small vertically extending plate extending upwardly from the small plate with an enlarged rectangular backing plate coupling the horizontal and vertical plates, the pusher member capable of moving from a rest orientation to a pushing orientation for urging a box seated on the horizontal portion of the L-shaped retainer;

a rearwardly extending upwardly curved lever extending rearwardly from the vertically extending plate of the pusher member and between the supports, the rearwardly extending curved lever having a pivot pin coupling the lever to the frame adjacent to a lower region thereof; and

a plurality of coil springs with lower ends secured to the rearward portion of the lever and upper ends coupled to the frame adjacent a central extent thereof.

5,749,588

COMPOSITE HAND TRUCK

John J. Stallbaumer, Wichita, Kans., assignor to Harper Trucks, Inc., Wichita, Kans.

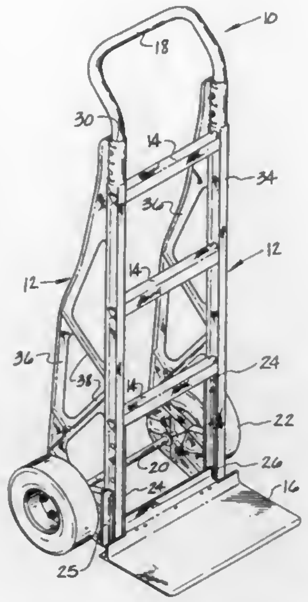
Filed Jul. 29, 1996, Ser. No. 681,825

Int. Cl.^{6} B62B *1/02*

U.S. Cl. 280—47.27 **8 Claims**

1. In a two-wheeled, industrial hand truck which comprises a pair of side frames having handles at their upper ends, the side frames being joined by cross rails along their length and a toe plate for supporting the load joining the lower ends of the side frames, an axle and a pair of wheels also attached to said lower ends, the improvement comprising:

said side frames of the truck each constructed of molded plastic in a single piece formed in an open truss having compressive



and tensile members, separated by diagonal members, the truss lying in a vertical plane normal to the axle of the truck.

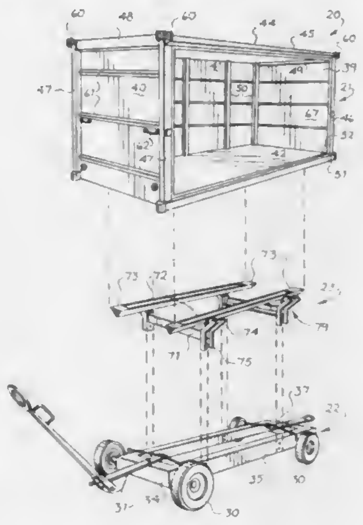
5,749,589
AIRLINE BAGGAGE CART

Anthony Hopkins, Bartlett, Ill.; Dale Matlock, Twins Lakes, Wis.; John Senter, Gurnee, Ill.; Fred Shield, Hanover Park, Ill.; Chet Malanowski, Barrington, Ill.; James Ortery, Aurora, Ill.; Frank Wilson, Woodridge, Ill.; Leonard Timpone, LaGrange, Ill.; Richard Pugh, Glendale, Ill.; Joel Heyndricks, Woodstock, Ill.; Ronald Kotlarz, Elk Grove, Ill.; Stanley Lorenz, McHenry, Ill., and Ralph Unrath, Round Lake Beach, Ill., assignors to United Air Llines, Chicago, Ill.

Filed Oct. 27, 1995, Ser. No. 549,342

Int. Cl.^{6} B62D *21/00*

U.S. Cl. 280—47.34 **10 Claims**



1. An airline baggage cart comprising:
a cart body;
a frame for attaching said cart body to a wheeled chassis said frame comprising:
a first pair and a second pair of angle brackets adapted to be secured to said chassis, said angle brackets having a lower portion and an upper portion separated by an angle of approximately 135 degrees;
at least one dampening pad mounted to each of said upper portions of said angle brackets;
a first runner member secured to the dampening pads of said first pair of angle brackets;
a second runner member secured to the dampening pads of said second pair of angle brackets;
said runner members being rigidly secured to said cart body; and
a first crossbar connecting one of said angle brackets in said first pair to one of said angle brackets in said second pair.

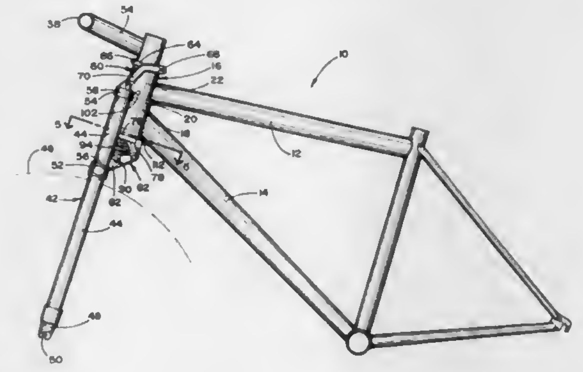
5,749,590
SUSPENSION FORK ASSEMBLY

Scott Roerig, 13888 Clear Creek Dr., Lowell, Mich. 49331

Filed Jul. 13, 1995, Ser. No. 502,188

Int. Cl.^{6} B62K *25/08*

U.S. Cl. 280—276 **16 Claims**



1. A front fork assembly for a bicycle or motorcycle, having a frame comprising:
a hollow head tube mounted on a front end of the frame in a generally upright position;
a hollow steerer tube rotatably mounted in the head tube and including upper and lower ends that extend out of the top and bottom ends respectively of the head tube;
an elongated resilient biasing means positioned in the steerer tube and mounted at an upper end to an upper portion of the interior of the steerer tube, the biasing means having a lower end that extends out of a lower end of the steerer tube;
a fork that supports a front wheel at a lower end thereof, the fork comprising a pair of parallel fork arms interconnected by a cross member mechanism extending between the fork arms at longitudinally spaced locations on an upper portion of the fork arms;
an upper pivot link bracket attached to the steerer tube above the head tube;
a pair of upper pivot links pivotally attached at rear ends to the upper pivot link bracket on opposite sides of the steerer tube and extending forwardly to front ends that are pivotally attached to the fork at laterally spaced locations thereon;
a lower pivot link bracket attached to the steerer tube below the head tube;
a pair of lower pivot links pivotally attached at rear ends to the lower pivot link bracket on opposite sides of the steerer tube and extending forwardly to front ends that are pivotally attached to the fork at laterally spaced locations thereon; and
shock absorber fastener means for drivingly interconnecting the lower pivot links with the lower end of the resilient biasing means at a position spaced away from the position where the lower pivot links are pivotally attached to the lower pivot link bracket, such that pivotal movement of the lower pivot links by upward reciprocation of the fork causes deflection of the resilient biasing means to cushion the movement of the fork.

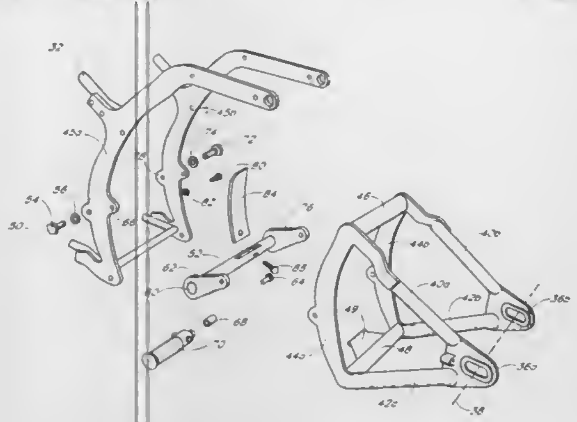
5,749,591
MOTORCYCLE LEAF SPRING SUSPENSION SYSTEM

Kenneth R. Thurm, 2348 Rockridge Cir., Orange, Calif. 92667

Filed Aug. 17, 1995, Ser. No. 516,499

Int. Cl.^{6} B62K *25/00*

U.S. Cl. 280—284 **5 Claims**



1. A suspension system for a motorcycle, comprising:
a frame;
a swing arm pivotally mounted to said frame on a pivot axis, said swing arm having a pair of wheel mounts located on a wheel axis spaced to receive a wheel, a pair of arms extending from each of said wheel mounts, a connector connecting each said pair of arms, each connector being joined to the other connector by an upper transverse cross member and a lower transverse cross member,
a shaft extending along said pivot axis: and
a leaf spring having a first end connected to said shaft and a second end configured to engage said swing arm in a manner such that pivoting movement of said swing arm is resiliently restrained by said spring, wherein said leaf spring engages said upper transverse cross member of said swing arm.

5,749,592
TOWING DEVICE FOR TWO-OR THREE-WHEEL VEHICLES

Carlo Marchetto, via Postale Vecchia, 19-36070 Trissino (VI), Italy

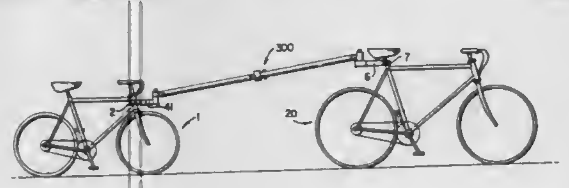
PCT No. PCT/EP94/01543, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/26580, PCT Pub. Date Nov. 24, 1994

PCT Filed May 13, 1994, Ser. No. 545,861

Claims priority, application Italy, May 14, 1993, VI93A0080; Oct. 1, 1993, VI93A0154

Int. Cl.^{6} B62K *13/02*

U.S. Cl. 280—292 **7 Claims**



1. A towing device for vehicle comprising:
at least two rigid bars;
a coupler for connecting the two bars in substantially coaxial alignment, said bars being rotatable one with respect to the other along an alignment axis, said at least two rigid bars having free ends disposed distally from the coupler;
a connector for each free end of the rigid bars, said connector being rotatably coupled with the free end about a first rotation axis perpendicular to the alignment axis, said connector for connection to the vehicle on a second rotation axis perpendicular to the first rotation axis and the alignment axis, said connector including a pin and a hub sleevable on the pin, at least one of the pin and hub being connectable to the vehicle;
said coupler including a male portion having sectors extending radially outwardly from the alignment axis and female portion having recesses extending radially outwardly from the alignment axis for mating relationship with the sectors, said male and female portions including confronting surfaces of the respective sectors and recesses for engaging each other and securing the coupler together, said male and female portions being rotatable for decoupling the coupler.

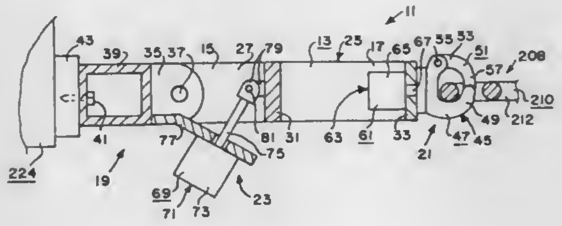
5,749,593
CONVERTER DOLLY LIFT MECHANISM

Dennis Earl Phillips, 7660 State Rte. 100 East, Jacks Creek, Tenn. 38347, and Dennis Nathan Wright, 381 Kitchen Dr., Henderson, Tenn. 38340

Filed Mar. 25, 1996, Ser. No. 620,977

Int. Cl.^{6} B60D *1/00;* **B62D** *53/08*

U.S. Cl. 280—476.1 **1 Claim**



1. In combination:
(a) a tractor;
(b) a convertor dolly; and
(c) a lift mechanism comprising:
  (i) an elongated arm having a first end and a second end; said arm including a first elongated side beam, a second elongated side beam, and a cross beam extending between said first and second side beams with said beams joined together to form a rigid A-frame structure;
  (ii) tractor attachment means pivotally attaching said first end of said arm to said tractor; said tractor attachment means including a support beam fixedly attached to said tractor, including a plurality of ears attached to said support beam, and including a pivot rod pivotally attaching said first end of said arm to said ears;
  (iii) convertor dolly attachment means attaching said second end of said arm to said convertor dolly; said convertor dolly attachment means including a pintle having a locked position and an unlocked position and including pintle piston means for moving said pintle between said locked and unlocked positions;
  (iv) actuating means for raising said second end of said arm; said actuating means including an actuating means piston means extending between said tractor attachment means and said arm for raising said second end of said arm; and
  (v) a pneumatic system for activating said pintle piston means and said actuating means piston means; said pneumatic system including a pressurized air source, a pintle piston valve for controlling the flow of pressurized air from said pressurized air source to said pintle piston means, and a actuating means piston valve for controlling the flow of pressurized air from said pressurized air source to said actuating means piston means.

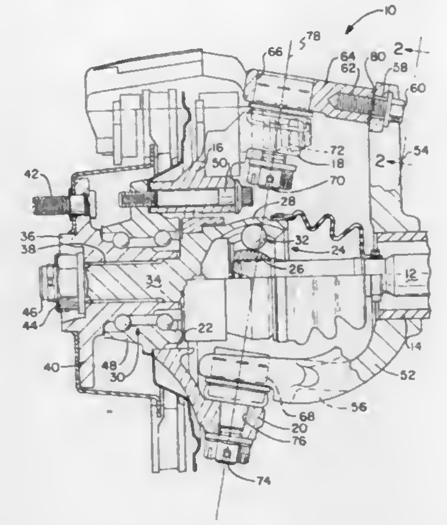
5,749,594
METHOD AND STRUCTURE FOR CAMBER AND CASTER ADJUSTMENT FOR MOTOR VEHICLE WHEEL END ASSEMBLY

James A. Krisher, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 20, 1996, Ser. No. 754,204

Int. Cl.⁶ B62D *17/00*

U.S. Cl. 280—661 **20 Claims**



1. A wheel end assembly for a steering axle of a motor vehicle, said wheel end assembly comprising:

a tube yoke capable of being attached to an axle tube of the motor vehicle, said tube yoke having an upper arm portion having an opening formed therethrough and a lower arm, said lower arm having a bore formed therethrough;

an upper arm extension member having a first end and a second end, said first end including an internal opening and said second end including a bore therethrough;

a steering knuckle rotatably coupled to a wheel spindle of the motor vehicle, said steering knuckle having an upper mounting boss positioned adjacent said bore in said upper arm extension member and a lower mounting boss positioned adjacent said bore in said lower arm of said tube yoke, wherein said upper mounting boss and said lower mounting boss of said steering knuckle each include a bore extending therethrough;

at least one shim of predetermined thickness positioned between said upper arm portion of said tube yoke and said upper arm extension member to establish a desired camber of said wheel end assembly; and

a removable fastener inserted through said opening extending through said upper arm portion of said tube yoke and into said internal opening in said first end of said upper arm extension member to establish the desired caster of said wheel end assembly.

5,749,595
TRAILER SUSPENSION

Gregg M. Hoss, Bedford; James E. Thompson, Ft. Worth; Thomas Franklin Johnson, Uvalde; Martin Kirbie, Grand Prairie, and Andrew J. Speer, III, Arlington, all of Tex., assignors to JHC Ventures, L.P., Irving, Tex.

Continuation-in-part of Ser. No. 430,788, Apr. 27, 1995, Pat. No. 5,549,359, which is a continuation-in-part of Ser. No. 392,630, Feb. 22, 1995, Pat. No. 5,551,759. This application Jun. 15, 1995, Ser. No. 490,596

Int. Cl.⁶ B60G *5/00*

U.S. Cl. 280—688 **2 Claims**

1. A rigidified suspension for a load-carrying vehicle, such as a dual use belly-dumping and end-dumping trailer, of the type having a frame with left and right side beams connected together and having a plurality of axles and wheel assemblies attached, said rigidified suspension comprising:

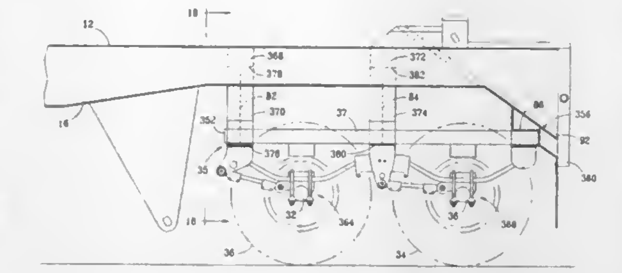
a) left and right suspension rails, each having a forward end and a rearward end and each being horizontally disposed inward from and below said left and right side beams of said frame;

b) a rear plate fastened to said left and right side beams of said frame and extending downward therefrom adjacent to said rearward end of said left and right suspension rails;

c) a rear cross beam, rigidly fastening said rearward ends of said left and right rails to each other and to said rear plate and thereby to said frame;

d) a forward cross beam rigidly fastening said forward ends of said left and right suspension rails to said frame and to each other; and

e) an intermediate cross beam rigidly fastening said left and right suspension rails to said frame at a position intermediate of said forward ends and said rearward ends.



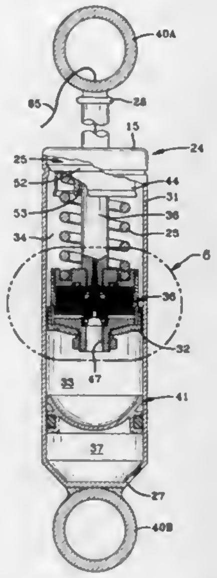
5,749,596
LATCHABLE STABILIZER BAR ACTUATOR

Eric Lee Jensen, Dayton; William Charles Kruckemeyer, Beavercreek, and John David Fehring, Waynesville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 16, 1996, Ser. No. 724,289

Int. Cl.⁶ B60G *21/00*

U.S. Cl. 280—689 **5 Claims**



1. A latchable stabilizer bar actuator comprising:

a tube having a first end that is closed and a second end closed by a rod guide defining a cavity that is permanently sealed;

a piston slidably carried in the tube and separating the cavity into a compression chamber and an extension chamber;

a rod connected to the piston, extending through the extension chamber and exiting the cavity through the rod guide;

a gas cup slidably carried in the tube and separating a gas charged compensation chamber off from the compression chamber within the tube wherein the gas charge applies a first force on the piston tending to drive the rod out of the cavity; and

a spring extending between the rod guide and the piston wherein the spring applies a spring force to the piston that offsets the first force so that when the actuator is in an at-rest condition the combination of the first force and the spring force places the piston at a mid-stroke position within the tube.

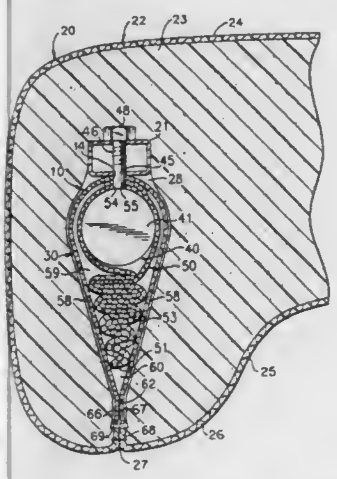
5,749,597
INTEGRAL COVER-DEPLOYMENT CHUTE FOR SIDE AIRBAG MODULE

Davin G. Saderholm, Wolfsweg 42, 74321 Bietigheim-Bissingen, Germany

Filed Mar. 7, 1997, Ser. No. 812,436

Int. Cl.⁶ B60R *21/20*

U.S. Cl. 280—728.2 **12 Claims**



1. An airbag module for attachment to a vehicle, the module comprising:

an inflator for generating gas;

an airbag coupled to the inflator and deployable upon generation of gas by the inflator;

a pouch made of fabric material, the pouch having wall portions surrounding the airbag and inflator, the wall portions defining a pouch interior containing the inflator and the airbag substantially therein such that the inflator and the airbag are housed within the pouch, the pouch including a frangible seam being breakable to define a pouch deployment opening; and

the pouch including a fabric chute portion being a continuous extension of the fabric material of the pouch and extending beyond the frangible seam, the chute portion having a first end adjacent the frangible seam and an opposite free end;

whereby upon airbag deployment, the airbag breaks open the frangible seam of the pouch to permit deployment of the airbag out through the pouch deployment opening and the chute portion of the pouch such that the pouch guides the airbag during deployment.

5,749,598
STEERING WHEEL ASSEMBLY

Gregory F. Exner, Woodhaven; John Curtis Hofer, Troy; Sheryar Durrani, Canton, and Richard L. Matsu, Plymouth, all of Mich., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Mar. 20, 1997, Ser. No. 821,616

Int. Cl.⁶ B60R *21/16*

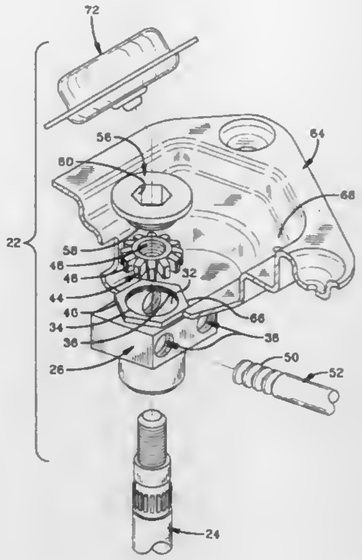
U.S. Cl. 280—728.2 **15 Claims**

1. A steering wheel and airbag assembly comprising:

a hub having a cavity defined by an upper surface at an axial outer end of said cavity;

an airbag assembly mounted on said hub;

a gear having circumferentially spaced teeth complementary to a wormgear, said gear further including threads, said gear disposed in said cavity of said hub below said upper surface.



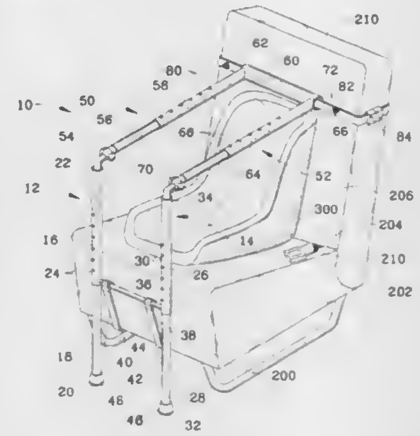
5,749,599
VEHICLE AIR BAG GUARD

Henry J. Gardner, 1002 Bayview Rd., Greenacres, Fla. 33463

Filed Nov. 22, 1996, Ser. No. 754,980

Int. Cl.⁶ B60R *21/02*

U.S. Cl. 280—748 **17 Claims**



10. An air bag guard for a vehicle for use in protecting a child during the inflation of a vehicle air bag, said air bag guard comprising:

a pair of support posts, each support post having a top end and a bottom end;

a pair of horizontal support bars, each support bar having a first end and a second end, said first ends coupled to said top ends respectively;

whereby said horizontal support bars are positionable beneath a child's car seat and said support posts are positionable over said child's car seat wherein said air bag guard provides a cage to prevent contact between air bag deployment and the child.

5,749,600

DOOR TRIM ENERGY ABSORBING STRUCTURE

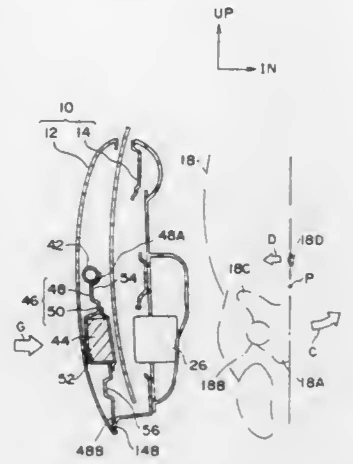
Shigeo Yamada, Okazaki; Takero Kato; Hiromi Nagai, both of Toyota, and Kazuo Kitamura, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 521,757, Aug. 31, 1995, abandoned. This application Sep. 25, 1997, Ser. No. 937,744

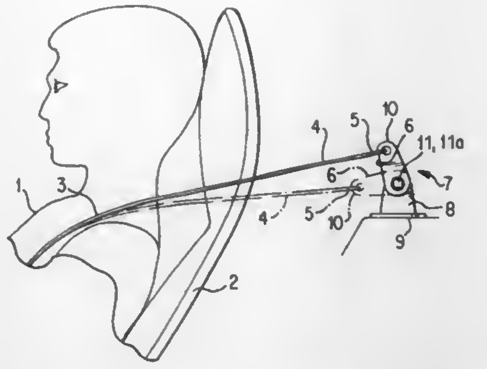
Claims priority, application Japan, Aug. 31, 1994, 6-206821

Int. Cl.⁶ B60R *21/04*

U.S. Cl. 280—751 **14 Claims**



1. A door trim energy absorbing structure comprising:
- a door member disposed at a vehicle side portion;
- a door trim provided at a vehicle inner side of said door member,
- an energy absorbing member absorbing energy from a vehicle exterior and provided at said door trim so as to correspond to a region which is lower than an ilium of a vehicle occupant sitting generally adjacent the door member and which absorbing member is constructed and arranged to actively absorb energy only at the femur,
- a pushing member constructed and arranged to push said energy absorbing member by a surface of said pushing member contacting a surface of said energy absorbing member, wherein said pushing member is a second energy absorbing member provided at a vehicle outer side with respect to said energy absorbing member, and
- a second holding member holding said second energy absorbing member at a predetermined position, wherein said second energy absorbing member holding member is a strip-shaped member.



to said vehicle-fixed structure due to a tensile load on said shoulder strap, said energy-absorbing component absorbing energy of said tensile load.

5,749,601

BELT FORCE LIMITER FOR A VEHICLE SEAT BELT

Heinz Knoll, Stuttgart, and Wolfgang Fischer, Leinfelden-Echterdingen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Mar. 26, 1997, Ser. No. 825,157

Claims priority, application Germany, Apr. 15, 1996, 196 14 730.1

Int. Cl.⁶ B60R *22/28*

U.S. Cl. 280—805 **13 Claims**

1. A belt force limiter for a vehicle seat belt, comprising a pivot lever which is aligned approximately vertically in a rest position, a first end of said pivot lever being connected to a vehicle-fixed structure via an energy-absorbing component, a shoulder strap of the vehicle seat belt being secured to said pivot lever proximate a free end of the pivot lever located opposite said first end, said free end of the pivot lever being pivotable about said first end to allow a limited forward displacement of said shoulder strap with respect to said vehicle-fixed structure due to a tensile load on said shoulder strap, said energy-absorbing component absorbing energy of said tensile load.

5,749,602

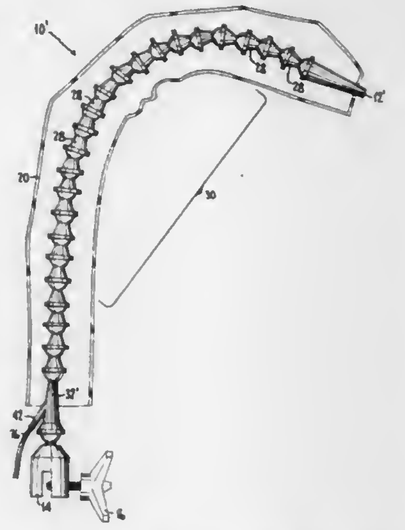
MEDICAL DEVICE

Michael R. Delaney, Springfield, Mo., and Allen D. Tilley, Chapel Hill, N.C., assignors to Mend Technologies, Inc., Dallas, Tex.

Filed Jul. 29, 1996, Ser. No. 681,836

Int. Cl.⁶ B01D *46/42;* **F16L** *27/00*

U.S. Cl. 285—61 **9 Claims**



1. A medical device for aiding evacuation of airborne and hazardous biological smoke fumes produced by surgically burnt tissue in an operating room, the device comprising:
- a nozzle;
- a hose fitting connected in fluid communication with the nozzle;
- a base fixture for mounting to a stable support structure in the operating room;
- an elongated chain of multiple inter-connected segments, which chain extends between and interconnects the nozzle and base fixture; and,
- an elongated flexible liner encasing the nozzle and chain substantially from a point of origin about the nozzle, to a point of termination toward the base fixture;
- wherein, each one segment is configured to be capable of connecting to another adjacent segment such that frictional gripping between the one and other segment holds the one and other segments in a relatively rigid given alignment, the segments being further configured such that the frictional gripping therebetween can be sufficiently overcome by an applied external force such as the gripping and pulling and thrusting by a user so that the alignment of the chain as a whole is diversely changeable from one given alignment of relative flexion to another; and,
- wherein the hose fitting and sheath are sized and arranged to permit a evacuator hose connected to suction and filtration equipment to connect to the hose fitting and allow the evacuator hose to extend away to the suction and filtration equipment in a direction relatively away from the terminal end of the sheath; whereby aiming the nozzle at a source of the hazardous biological smoke fumes draws the fumes in through the nozzle and safely away to the suction and filtration equipment.

5,749,603

HOLDING DEVICE FOR A HOSE CLIP

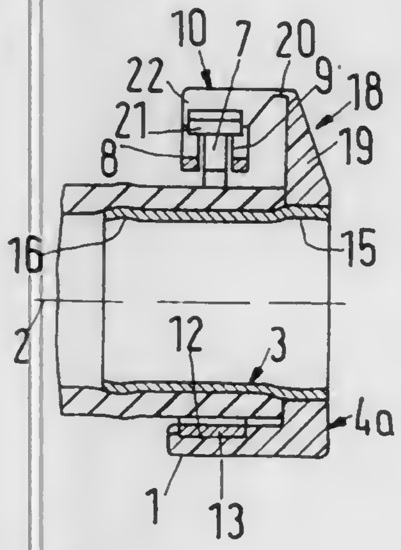
Stephan Mann, Bieber, Germany, assignor to Rasmussen GmbH, Maintal, Germany

Filed May 16, 1996, Ser. No. 645,797

Claims priority, application Germany, May 20, 1995, 195 18 628.1

Int. Cl.⁶ F16L *33/20;* **B65D** *63/02*

U.S. Cl. 285—23 **25 Claims**



1. A holding device comprising:
- a plurality of holding arms positioned substantially parallel to and around an axis; and
- a connecting body secured to said holding arms at one end of said holding arms to connect together said holding arms;
- a tubular element secured to said connecting body and spaced from each of said holding arms;
- a clip band having an axial width, wherein
- each of said holding arms has a radially inward side with a groove defined therein;
- said grooves of said holding arms are in the same transverse plane and have a width corresponding to the axial width of the clip band so that the clip band may be received within said grooves.

5,749,604

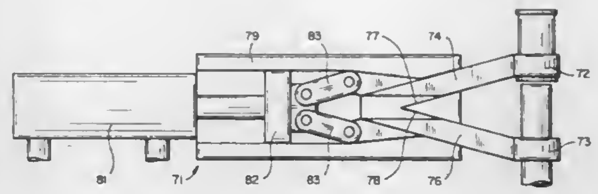
PIPE COUPLING SYSTEM AND METHOD

Anthony D. Williams, 929 Washington St., San Carlos, Calif. 94070

Continuation-in-part of Ser. No. 541,308, Jun. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 336,671, Apr. 11, 1989, Pat. No. 5,064,225, which is a continuation-in-part of Ser. No. 179,062, Apr. 8, 1988, Pat. No. 4,819,969. This application Apr. 23, 1992, Ser. No. 872,715

Int. Cl.⁶ F16L *35/00*

U.S. Cl. 285—39 **7 Claims**



1. In a pipe coupling system: first and second tubular pipe members, one of said pipe members having a tapered wall adapted for press-fit engagement with a wall of the other of said pipe members, and means for pressing the two pipe members together to bring the tapered wall and the other wall into tight press-fit engagement, the tapered wall having a preformed taper which extends substantially the full length of the engagement between the walls of the pipe members, and said means for pressing the two pipe members together comprising a tool having jaws engagable with the pipe members and movable toward each other, linkage means connected to the jaws for moving the jaws toward each other along a straight line, and an actuator connected to the linkage means for moving the jaws toward each other with a force sufficient to press the pipe members together.

5,749,605

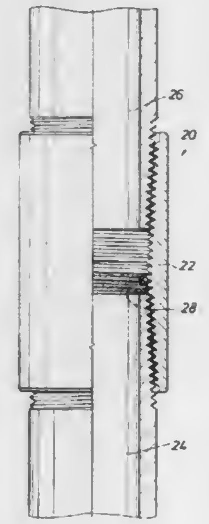
ELECTRICALLY INSULATIVE THREADED CONNECTION

John T. Hampton, III; William F. Trainor, both of Houston, and Thomas R. Bandy, Katy, all of Tex., assignors to Protechnics International, Inc., Houston, Tex.

Filed Mar. 18, 1996, Ser. No. 618,283

Int. Cl.⁶ F16L *11/12*

U.S. Cl. 285—48 **12 Claims**

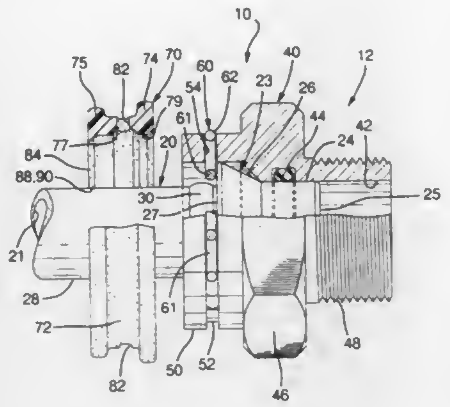


1. An electrically insulative threaded connection, comprising:
- a tubular joint having a threaded pin end;
- a box having threads therein, the threads of the box being adapted to receive the threads of the tubular joint matingly; and
- an electrically insulative coating therebetween, the coating having a selected thickness and comprising insulative plastic having dispersed therein insulative particles, the particles having a maximum dimension less than the selected thickness.

5,749,606
CONNECTOR ASSEMBLY WITH RETAINER

Jian Gang Lu, Troy, and Ronald Lee Beckmann, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1996, Ser. No. 600,909
Int. Cl.^{6} F16L *37/088;55/00*
U.S. Cl. 285—86 **19 Claims**



1. A connector assembly comprising:

a female member having an axial bore extending therethrough;

a male member for axial insertion into the bore of the female member, the male member having a tapered portion terminating in a shoulder portion, the male member having an axial axis including an axial length;

a resilient member disposed on the female member and extending partially into the bore, the resilient member for axially sliding over the tapered portion and engaging the shoulder portion of the male member to lock the male member in position within the female member when the male member is fully inserted into the female member, the resilient member having a relaxed condition when the male member is fully inserted into the female member and the resilient member engages the shoulder portion, the resilient member having a radially expanded condition when engaging the tapered portion when the male member is partially inserted into the female portion;

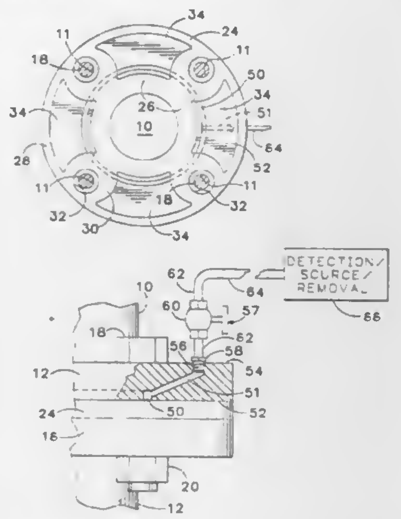
a retainer initially mounted on the male member and slidable from the male member onto the female member upon full insertion of the male member into the female member, the retainer having an internal retainer groove being axially alignable along the length of the axis for receiving the resilient member therein when the male member is fully inserted in the female member and the retainer is coaxially connected to the female member, the internal retainer groove being axially misaligned along the length of the axis with the resilient member when the resilient member engages the tapered portion and is in the expanded condition when the male member is partially inserted into the female member, the tapered portion being shaped and sized for radially enlarging the resilient member larger than the retainer when the resilient member engages the tapered portion, such that when the resilient member is in the relaxed condition and engages the shoulder portion of the male member, the retainer groove is axially alignable along the length of the axis with the resilient member for snap-fitted engagement of the resilient member into the retainer groove indicating that the male member is fully inserted in the female member and such that when the resilient member is in the expanded condition and engages the tapered portion of the male member, the retainer groove is axially misaligned along the length of the axis with the resilient member and the resilient member is disengaged from the retainer groove thereby indicating that the male member is partially inserted in the female member.

5,749,607
JOINT ASSEMBLY EMPLOYING MULTI-RING GASKET

Ronald L. Carr, Rainier, Oreg., assignor to KC Multi-Ring Products, Inc., Kelso, Wash.

PCT No. PCT/US93/05343, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO93/25836, PCT Pub. Date Dec. 23, 1993

Continuation-in-part of Ser. No. 893,653, Jun. 5, 1992, Pat. No. 5,362,115. This PCT application Jun. 4, 1993, Ser. No. 347,407
Int. Cl.^{6} F16J *15/00*
U.S. Cl. 285—93 **26 Claims**



1. An assembly comprising:

(a) a first flange;

(b) a second flange disposed substantially adjacent and parallel to said first flange, thereby defining a joint between said first flange and said second flange, said second flange comprising an inside surface and an outside surface, a groove disposed in said inside surface, and a channel in communication, at one end thereof, with said groove and, at the other end thereof, with said outside surface of said flange;

(c) a first strip of sealing material formed in a substantially-continuous loop having a predetermined shape, said first strip having an outer periphery whose size is greater than the inner periphery of said pipe flanges and being disposed between said first flange and said second flange;

(d) a second strip of sealing material formed in a substantially-continuous loop having a predetermined shape, said second strip having an inner periphery whose size is greater than said outer periphery of said first strip and less than the outer periphery of said flanges and being disposed between said first flange and said second flange;

(e) a plurality of fasteners disposed around said flanges; and

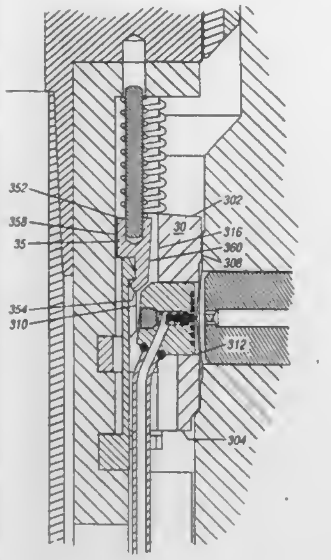
(f) a plurality of spokes of sealing material, each disposed between and attached to said first strip and said second strip, and extending between said first strip and said second strip, said first strip, said second strip and said spokes having a substantially uniform thickness between said inner periphery of said flanges and said outer periphery of said flanges.

5,749,608
LATERAL CONNECTOR FOR TUBE ASSEMBLY

Robert Lee Wilkins; Steven Dwayne Gullion, both of Houston, and Charles Edward Jones, Humble, all of Tex., assignors to Kvaerner Oilfield Products, Houston, Tex.

Division of Ser. No. 361,357, Dec. 21, 1994, Pat. No. 5,582,438. This application Oct. 4, 1996, Ser. No. 725,974
Int. Cl.^{6} F16L *37/28*
U.S. Cl. 285—123.12 **3 Claims**

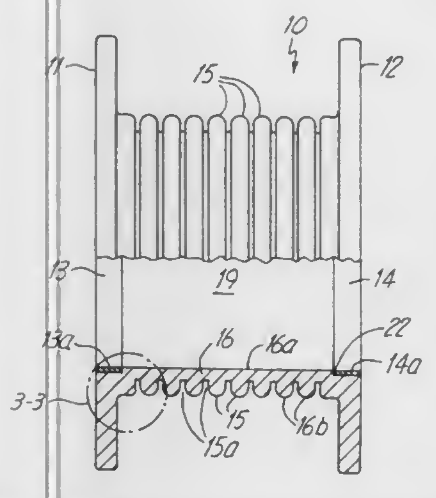
1. A coupling element having a first end and a second end, said coupling element having a flange positioned at the first end and a generally cylindrical nose-piece protruding from a face of the flange, said nose piece having a first end and a second end, said second end of said nose piece forming a generally flat sealing surface that corresponds to the second end of the coupling element, said coupling element forming a passage extending from the first end to the second end, said passage being partially closed at the second end and being divided into a plurality of openings at the second end of the coupling element, said openings being positioned in a generally annular pattern.



5,749,609
FLEXIBLE CONNECTOR WITH FLOW PASSAGE INTEGRITY

James R. Steele, Stillwater, Minn., assignor to Dynamic Air, Inc., St. Paul, Minn.

Filed Nov. 4, 1996, Ser. No. 743,491
Int. Cl.^{6} F16L *21/00*
U.S. Cl. 285—226 **14 Claims**



1. A flexible tube connector for conveying materials therein with the tube connector having a flow passage that retain its flow passage integrity whether the flexible tube connector is in a straight or bent condition comprising:

a tube having a first end and a second end, said tube having an interior surface and an exterior surface; said interior surface having a smooth finish to permit flow of materials thereover without accumulation of the material thereon, said exterior surface having a plurality of integral spaced ribs extending around said tube, said ribs spaced from each other by a plurality of valleys with said ribs and said valleys coacting so that when said tube is bent the ribs maintain the flow integrity of the fluid passage therein by distributing a bending force to prevent kinking of said tube;

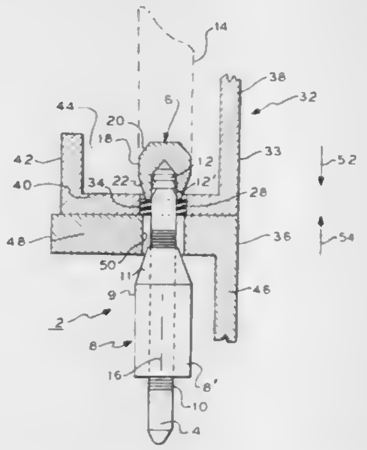
a flange, said flange integrally connected to said first end of said tube with said tube and said flange made from a compressible but bendable material to permit said flange to be compression fastened in a sealing relationship with a conveying apparatus; and

a rigid reinforcing band, said rigid reinforcing band concentrically positioned within said flange so that when said flange is compressed during the compression fastening said rigid reinforcing band prevents said flange from deformably penetrating into the flow passage within the tube, said reinforcing band having an inner surface that is in substantial alignment with the interior surface of said tube so that material can flow through said tube without accumulation on said rigid reinforcing band or said interior surface.

5,749,610
BOLT SEAL ASSEMBLY AND TOOL THEREFOR

Terrence N. Brammall, Angola; Randel Mills, Pleasant Lake; Rodney Ridenour, Fremont, and David Stevenson, Angola, all of Ind., assignors to Transguard Industries, Inc., Angola, Ind.

Filed Mar. 19, 1996, Ser. No. 618,132
Int. Cl.^{6} E05B *39/02*
U.S. Cl. 292—327 **21 Claims**



1. A bolt seal assembly for attachment to a hasp having a bolt receiving aperture comprising:

an elongated bolt having a longitudinal axis and opposing ends, said bolt for passing through the aperture;

a bolt head having proximal and distal ends, said head being secured to one end of the bolt, the head proximal end being dimensioned to be received in said aperture, the head distal end having at least a portion enlarged relative to said aperture to preclude being received in the aperture; and

a seal for locking attachment to the bolt for locking the bolt to the hasp, said seal having proximal and distal ends, said seal proximal end for being received in said aperture, said seal distal end being enlarged relative to said aperture to preclude being received in the aperture, said seal and bolt including means arranged to permit the seal to be axially displaced and locked to the bolt in a range of longitudinal axial positions for causing said head and seal proximal ends to engage said aperture in opposing relation while permitting transverse displacement of the bolt relative to the hasp.

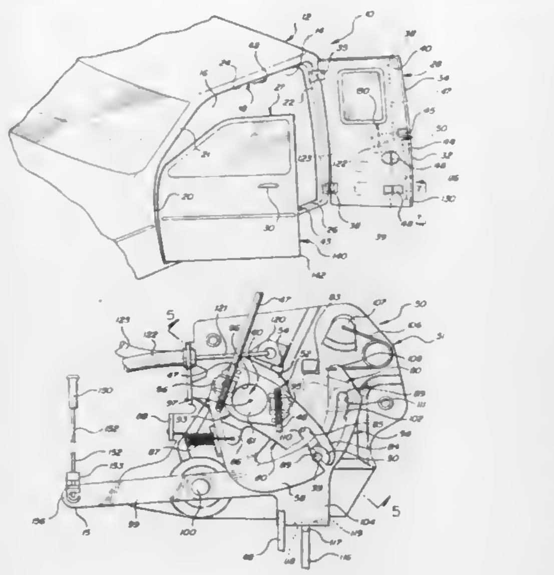
5,749,611
DOOR LATCH REMOTE CONTROL ASSEMBLY

Earl L. Watson, Walled Lake, and Nicolaas C. Akemann, South Lyon, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 30, 1996, Ser. No. 706,386

Int. Cl.^{6} E05B *3/00*

U.S. Cl. 292—336.3 **19 Claims**



1. A latch remote control assembly for mounting on a vehicle door adapted to control first and second door latches, said assembly comprising:

a back plate, a pair of operating levers pivoted on a back plate split-pin, each having a radiused seat on one end and a connector on an opposite end, for movement in one direction between a spring biased rest position and a latch releasing position, by associated first and second handle means on the door, with each said handle means for being linked to an associated one of said operating lever connectors;

a release lever, pivoted on said split-pin, having a leg formed with a first arcuate guide slot receiving a link pin, said release lever connectable by linking means to each said door latch, such that pivoting said release lever in said one direction between a biased rest position and a latch unlatching position unlatches said door latches;

a locking lever having a first portion pivoted on said back plate and a second portion located intermediate said operating levers, spring means for being connected between said back plate and said second portion, for overcenter snap movement of said locking lever between a latch releasing mode and a latch locking mode, and said link pin received in a second arcuate guide slot in said second portion; wherein

with said locking lever in its latch releasing mode, said link pin is at a proximate end of said second slot and said link pin is yieldably held at a distal end of said first slot, while said release lever biases said link pin into each said operating lever radiused seat, whereby actuation of either handle means swings its associated operating lever and said release lever in said one direction, unlatching the door latches; and

with said locking lever snapped overcenter to its latch locking mode said link pin is yieldably held at a proximate end of said first slot, such that actuation of either handle means causes its associated operating lever to freewheel, obviating unlatching of the door latches.

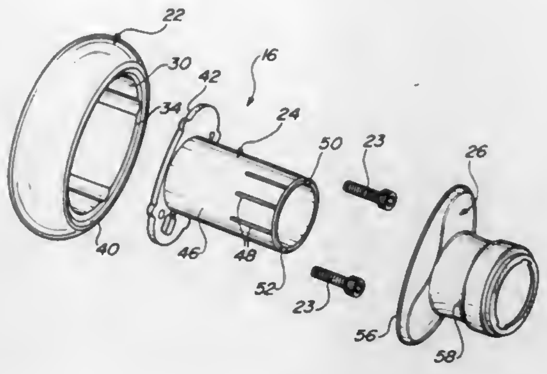
5,749,612
OVAL DOOR KNOB CONSTRUCTION

Leslie A. Meck, Fleetwood, and Philip C. Ellis, Reading, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.

Filed Jul. 19, 1996, Ser. No. 683,940

Int. Cl.^{6} E05B *1/00*

U.S. Cl. 292—347 **9 Claims**



1. A door knob construction operably connected to a spindle of a lock mechanism mounted within door, said door knob construction comprising:

a knob body with an ellipsoid configuration, an interior chamber and an opening to said chamber;

a shank attached to said knob body, said shank having a substantially funnel-shaped configuration with an elliptical head portion fastened to said knob body and a neck portion, said neck portion including at least one longitudinal ridge, a longitudinal slot and a notch having a different widths, said slot and notch adapted to engage corresponding lugs on the lock spindle to orient said shank and knob body in only one orientation on the spindle;

means for fastening said shank to said knob body; and

a shank cover engaging said knob body and matingly mounted on said shank to conceal said shank, said at least one longitudinal ridge forming an interference fit between said shank and shank cover.

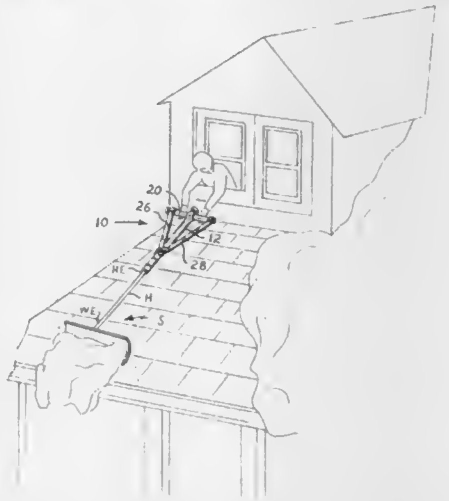
5,749,613
TOOL HANDLE EXTENSION

Doris R. Rapp, 2143 Fairview Ave., Mt. Penn, Pa. 19606-1809

Filed Jun. 26, 1996, Ser. No. 670,426

Int. Cl.^{6} B25G *1/04;3/02*

U.S. Cl. 294—58 **20 Claims**



1. A tool handle extension, comprising:

a tool handle attachment member comprising a straight, elongate cylindrical tube having a tool attachment portion and end and an opposite handle end, with said tool attachment portion being adapted to secure to the handle of a tool having a straight, elongate, cylindrical handle, with the tool handle being secured within said tool attachment portion of said tool handle attachment member;

a crossmember handle comprising a straight, elongate cylindrical tube having a first end and an opposite second end, said crossmember handle being permanently affixed to and coplanar with said handle end of said tool handle attachment member and substantially normal thereto, so that said tool handle attachment member and said crossmember handle form an intersection having a substantially T shaped configuration, and;

said tool handle attachment member including a reinforcement strap attachment point immediately adjacent said tool attachment portion thereof, with a first and an opposite second elongate diagonal reinforcement strap each having a first end permanently affixed to said reinforcement strap attachment point of said tool handle attachment member, and an opposite second end permanently affixed to said crossmember handle respectively adjacent said first end and said second end thereof.

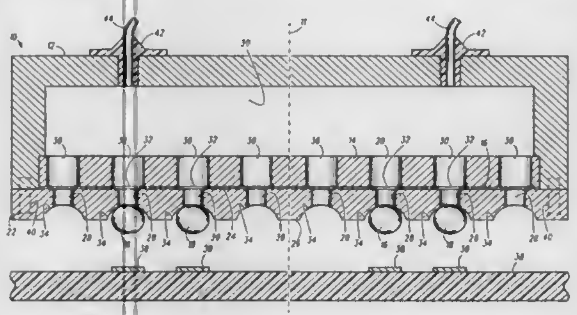
5,749,614
VACUUM PICKUP TOOL FOR PLACING BALLS IN A CUSTOMIZED PATTERN

Ellen Margaret Reid, Boca Raton, Fla.; Douglas Bruce Feicht, Phoenix, Ariz.; Dennis Brian Miller, Barrington, Ill.; Daniel Joseph Viza, Phoenix, Ariz., and Mark William McGarry, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1995, Ser. No. 567,012

Int. Cl.^{6} B25J *15/06*

U.S. Cl. 294—64.1 **12 Claims**



1. A vacuum pickup tool for carrying balls arranged in a desired pattern, the vacuum pickup tool comprising:

a manifold defining a vacuum chamber and comprising a carrier plate having an inner face adjacent to the vacuum chamber and an outer face, said manifold further comprising a plurality of manifold bores arranged in a pattern at the outer face, each manifold bore being sized and shaped to retain a ball in response to reduced gas pressure within the vacuum chamber; and

a retaining plate overlying the inner face and comprising a plurality of retaining plate bores arranged in a pattern such that each retaining plate bore registers with a corresponding manifold bore, said retaining plate being effective to secure a stencil formed of a gas-impermeable foil against the inner face to prevent gas flow between a manifold bore and a corresponding retaining plate bore.

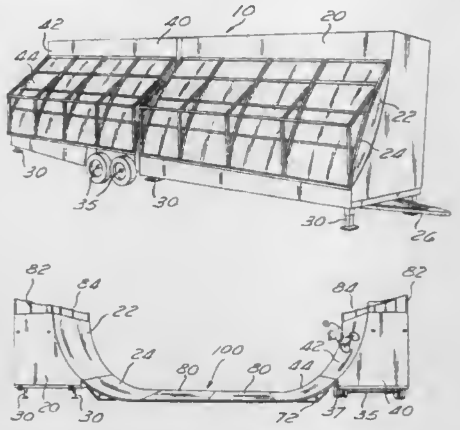
5,749,615
CYCLING AND SKATING RAMP TRAILER

Joseph Derwood Itson, Huntington Beach, Calif., assignor to GT Bicycles, Inc., Santa Ana, Calif.

Filed Dec. 1, 1995, Ser. No. 566,065

Int. Cl.^{6} B62D *39/00*

U.S. Cl. 296—26 **11 Claims**



1. A trailer detachable from a tow vehicle and rapidly erectable into a half pipe ramp for cycling and skating exhibitions, said trailer comprising:

a first trailer portion attachable to the tow vehicle;

a second trailer portion releasably fixed to said first trailer portion;

an upper ramp formed on each of said trailer portions; and

a lower ramp attachable to each of the upper ramps to form continuous ramps;

said continuous ramps positionable to substantially oppose each other.

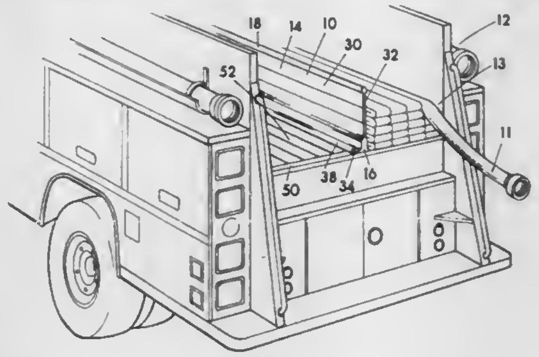
5,749,616
HOSE BED DIVIDER FOR A FIRE TRUCK

Joel A. Steever, Reading, Pa., assignor to Thomas Body Parts, Inc., Reading, Pa.

Filed Oct. 30, 1996, Ser. No. 739,190

Int. Cl.^{6} A62C *27/00*

U.S. Cl. 296—37.6 **11 Claims**



1. An improved fire truck hose bed dividing structure of the type including an elongated divider panel connected with fasteners to stationary structuring within a fire truck hose bed, the divider panel extending vertically upward from said stationary structuring and dividing the fire truck hose bed into at least two areas; wherein the improvements comprise:

the divider panel comprising a one-piece extruded structure substantially of aluminum and including a relatively wide top rail integrally connected to a relatively thin intermediate panel portion integrally connected to a widened mount-base portion continuous along a bottom edge of said intermediate panel portion; the mount-base portion extending laterally outward of each of two sides of said intermediate panel portion and providing a widened base centralized beneath said intermediate panel portion, the mount-base portion including a plurality of multiple-diameter fastener receipt holes with said fasteners in-part within said holes and with heads of said fasteners recessed within an upper diameter of the holes and primarily below a top surface of said mount-base portion.

5,749,617
MOTOR VEHICLE ROOF WITH A CONTROL BY WHICH IT CAN BE OPENED BY MOTOR THROUGH VARIOUS INTERIM STAGES

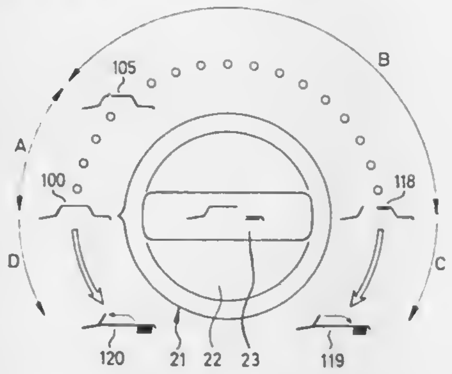
Alfons Weissbrich, Gauting; Martin Danzl, Müchen, and Johann Mayer, Petershausen, all of Germany, assignors to Webasto Karosseriesysteme GmbH, Stockdorf, Germany

Filed Mar. 31, 1995, Ser. No. 414,215

Claims priority, application Germany, Mar. 31, 1994, 44 11 338.9

Int. Cl.^{6} B60J ***7/00***

U.S. Cl. 296—107 **10 Claims**



1. A motor vehicle roof comprising several movable roof components which are movable, at least in part, independently of one another by separate drives for partially exposing a roof opening in a roof surface of a motor vehicle in several interim positions and for completely exposing a passenger compartment of the motor vehicle in a convertible roof manner by stowing the entire roof, including all of said roof components, in a stowage space of the motor vehicle; wherein said separate drives are activated by a single rotary switch, the rotary switch, starting from a zero position, being rotatable in a first direction through sequentially arranged peripheral areas of the rotary switch in a first switch mode for opening said roof components one after another as each of said peripheral areas is reached by operation of one or more of said drives being selectively actuated for starting predetermined opening stages when a respective one the peripheral areas is reached, and being rotatable from said zero position in an opposite direction in a second switch mode for activating all of the drives in a predetermined sequence for completely closing the vehicle roof.

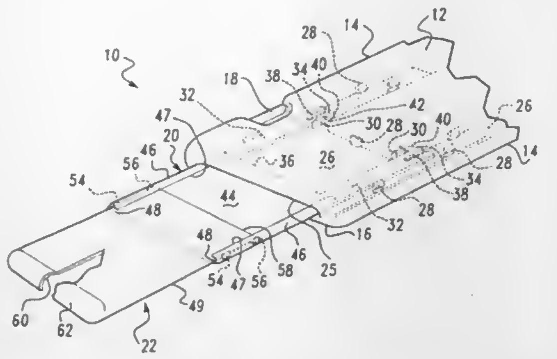
5,749,618
VISOR WITH TELESCOPING EXTENDER BLADE

James Gavin Jones, Dryden, Mich., assignor to Irvin Automotive Products, Inc., Auburn Hills, Mich.

Filed May 17, 1996, Ser. No. 651,044

Int. Cl.^{6} B60J ***3/00***

U.S. Cl. 296—978 **20 Claims**



1. A sun visor assembly for use in a motor vehicle, said assembly comprising:
- a visor body having a pair of opposing sides and a pair of opposing ends;
- a first panel movably mounted to said visor body and adapted for movement between a stored position and a use position, said first panel includes a pair of longitudinally extending legs at one end thereof, said legs defining an open area therebetween, said first panel being generally coinciding with said visor body when in said stored position and generally extending beyond one edge of said visor body when in said use position, said first panel including a pair of opposing sides and each of said sides including a returnly bent portion terminating in oppositely facing edges, said returnly bent portions defining channels being open in a direction toward one another;
- a second panel being movably mounted to said first panel in said channels and adapted for telescoping movement relative to said first panel between a retracted position and an extended position, said second panel generally coinciding with said first panel in said retracted position and generally extending axially beyond one end of said first panel when in said extended position; and
- means for retaining said first and second panels to said visor body.

5,749,619
MOTOR VEHICLE WITH FOLDABLE ROOF, AND FOLDABLE ROOF FOR SUCH A MOTOR VEHICLE

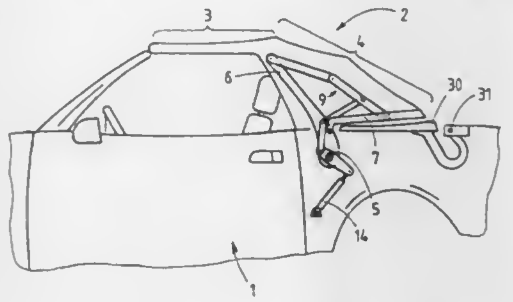
Laurentius A. G. Mentink, Haaksbergen, Netherlands, assignor to Applied Power Inc., Butler, Wis.

Filed Mar. 6, 1996, Ser. No. 611,584

Claims priority, application Netherlands, Mar. 21, 1995, 9500543

Int. Cl.^{6} B60J ***7/08***

U.S. Cl. 296—107 **16 Claims**



1. A motor vehicle with a foldable roof, which foldable roof comprises a bow assembly with a main bow, a fabric tensioning bow for a rear part of the foldable roof which fabric tensioning bow can be pivoted up and down, and a buggy-link system with two links which are pivotably connected to the fabric tensioning bow and to a fixing point of the bow assembly respectively, the foldable roof also comprising a power drive unit which is connected for drive purposes to the buggy-link system and can move the buggy-link system between an extended position, in which the links thereof lie essentially in line with each other and thereby force the fabric tensioning bow downwards, and an angled position, in which the links lie at an angle relative to each other, wherein the power drive unit is placed in a side wall part of the vehicle, and a transmission mechanism is present, which transmission mechanism connects the drive unit for drive purposes to one of the links of the buggy-link system.

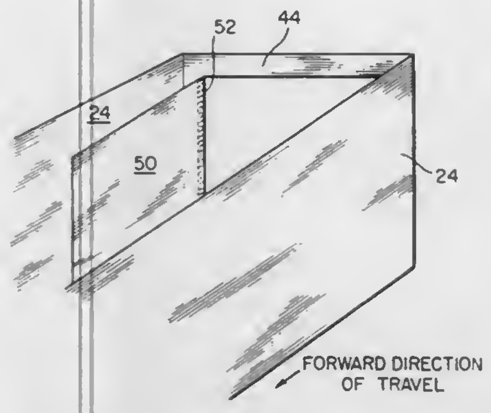
5,749,620
TAILGATE ASSEMBLY FOR OPEN TOP LOAD CARRYING CONTAINER

Thomas Gordon Carrier, Brookville, Pa., assignor to Carlisle Management Company, Syracuse, N.Y.

Filed Jun. 25, 1996, Ser. No. 673,613

Int. Cl.^{6} B62D ***35/00***

U.S. Cl. 296—180.1 **12 Claims**



2. A tailgate assembly for an open top load carrying container, the tailgate assembly comprising:
- (a) a tailgate frame movably connected to the container between a frame open position and a frame closed position, the tailgate frame having a venting opening; and
- (b) a venting door connected to the tailgate frame and movable about a substantially vertical axis between a door closed position occluding the venting opening and a door open position substantially within the container.

5,749,621
OPENING ROOF FOR A VEHICLE

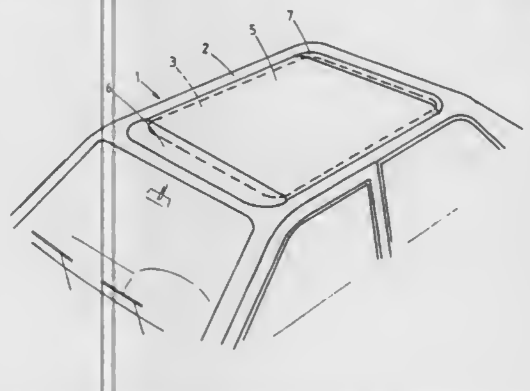
Robert Smith, Wolverhampton, Great Britain, assignor to Inalfa Industries B.V., Venray, Netherlands

Filed Jan. 25, 1996, Ser. No. 591,724

Claims priority, application United Kingdom, Jan. 26, 1995, 9501533; Netherlands, Oct. 25, 1995, 1001499

Int. Cl.^{6} B60J ***7/12***

U.S. Cl. 296—219 **26 Claims**



17. An opening roof for a vehicle having an opening in a fixed roof, comprising:
- a frame to be mounted around the opening, the frame having guide rails along two opposite sides;
- a flexible cover guided in the guide rails to a forward position to close the opening;
- a drive motor for driving the cover along the guide rails in order to open and close the opening; and
- a mount for the drive motor, the mount allowing movement of the drive motor in order to tension the cover, after the drive motor has moved the cover to the forward position.

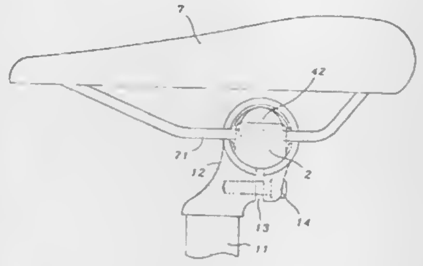
5,749,622
CONTRACTING STRUCTURE ON BICYCLE SEATS

Shao-Chien Tseng, No. 130 Sec 2. Yang-Shin Rd., Yang-Mei Taoyuan 326, Taiwan

Filed Mar. 25, 1997, Ser. No. 825,146

Int. Cl.^{6} B60N ***2/38;*** **B25G** ***3/36;3/18***

U.S. Cl. 297—195.1 **1 Claim**



1. A contracting structure for a seat on a bicycle comprising:
- a clamper seat, two clamping blocks and two contracting semicircular annuli in a lock head on a post pipe of the bicycle seat, so that two seat frames at a bottom of said bicycle seat can be pressed and engaged by said clamper seat and said two clamping blocks;
- said lock head includes a clamping gap through which a screw is extended, so that the diameter of said lock head can be reduced by tightening said screw, said lock head includes a grooved inner wall; and
- said two semi-circular annuli are arciform and are engaged in said grooved inner wall of said lock head, an inner wall of each of said two arciform semi-circular annuli is formed to have a ridge with bevelled stop surfaces;
- sides of said clamper seat are formed with two arciform rod grooves, said clamper seat has a base surface for receiving said two clamping blocks between said rod grooves;
- outer lateral sides of said two clamping blocks are formed as two arciform clamping grooves corresponding respectively by position to said two rod grooves of said clamper seat to thereby form two clamping mouths which can be opened and closed for clamping said two seat frames;
- top edges of said clamping grooves are provided respectively with two outwardly bevelled surfaces which form pushing force bearing surfaces;
- inner lateral sides of said two clamping blocks are formed respectively with two inwardly bevelled surfaces which correspond to an upper one of said bevelled stop surfaces of an upper said arciform semi-circular annuli;
- inner lateral sides of said two clamping blocks are further provided with two spring grooves in which a spring is received, so that said clamping grooves of said two clamping blocks can be adjustably moved to and fro relative to said two clamping mouths; such that
- before a pressing force in a normal direction is exerted to press and engage said seat frames at the bottom of said bicycle seat in said two clamping mouths respectively, said seat frames having a given distance therebetween firstly contacts and presses said outwardly bevelled surfaces of said two clamping blocks to retract said two clamping blocks, now said spring in said two clamping blocks is compressed, when said seat frames are pressed and engaged in said two clamping mouths respectively, said two clamping blocks subjecting to the elastic restoring force of said spring clamp and engage said seat frames, then said screw on said lock head is screwed tight to contract said seat frames.

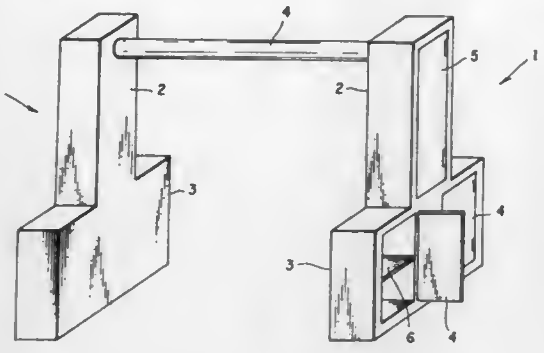
5,749,623
REVERSIBLE SWING WITH STORAGE CABINETS

Thakor R. Mistry, and Jyotsna T. Mistry, both of 9000 Cheltenham Dr., Brandywine, Md. 20613

Filed Jan. 28, 1997, Ser. No. 789,135

Int. Cl.^{6} A47D *13/10*

U.S. Cl. 297—281 **13 Claims**



1. An article of furniture comprising:
- a) a support frame comprising a first hollow vertical support having an upper end, a second hollow vertical support having an upper end, and a horizontal strut connecting the upper end of the first vertical support to the upper end of the second vertical support;
- b) a bench comprising a horizontal support member, a plurality of arm rests mounted on said support member, a seat back, and a means for pivotably mounting said seat back to said plurality of arm rests; and
- c) a means for suspending the bench from the horizontal strut;
- wherein the interior of at least one of the vertical supports is accessible through at least one door provided in said at least one of the vertical supports; and
- wherein (i) said first and second hollow vertical supports are adapted to support a first defined total weight of the horizontal strut, the bench suspended from the horizontal strut, and a plurality of adult humans or on the bench; and (ii) said horizontal strut is adapted to support a second defined total weight of said bench and said plurality of adult humans.

5,749,624
SEAT RECLINING DEVICE

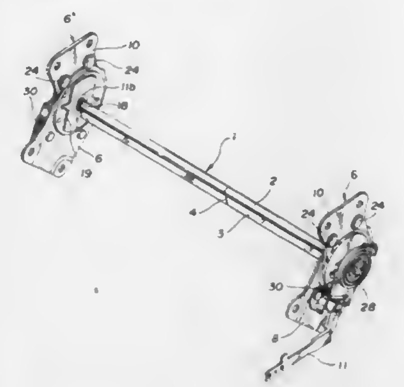
Tomonori Yoshida, Yokohama, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Nov. 6, 1996, Ser. No. 744,479

Claims priority, application Japan, Nov. 8, 1995, 7-314701

Int. Cl.^{6} B60N *2/02*

U.S. Cl. 297—367 **13 Claims**



1. A reclining device adapted for use in a seat including a seat cushion and a seat back having a flexible pad packed therein, said reclining device being adapted to pivot the seat back to a desired angular Position relative to the seat cushion, said reclining device comprising:
- first and second side reclining mechanisms which are substantially the same in construction and are adapted to be mounted to respective sides of the seat to allow the seat back to be locked at the desired angular position;
- a connecting rod extending between said first and second side reclining mechanisms, said connecting rod adapted to induce a locked condition of the seat back when turned in a first direction about an axis thereof and adapted to induce an unlocked condition of the seat back when turned in a second direction about the axis, said connecting rod being adapted to pass through a narrow tunnel formed in the flexible pad of the seat back;
- a control lever connected to one end of said connecting rod to pivot therewith; and
- an elongate plate part formed on and substantially extending along an entire length of said connecting rod, said elongate part extending radially outwardly from said connecting rod.

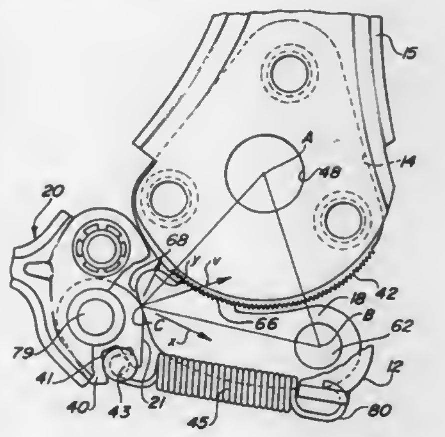
5,749,625
SEAT RECLINER FOR REDUCING CHUCKING

David L. Robinson, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Continuation of Ser. No. 623,465, Mar. 28, 1996, Pat. No. 5,622,410. This application Feb. 14, 1997, Ser. No. 799,216

Int. Cl.^{6} B60N *2/02*

U.S. Cl. 297—367 **1 Claim**



1. A pivot mechanism for a vehicle seat, comprising:
- a quadrant adapted to be coupled with a seat back, said quadrant being pivotally mounted about a first pivot and having a set of teeth;
- a locking pawl having a first cam surface and a set of teeth engaging said quadrant teeth for releasably locking said quadrant in position, said locking pawl being pivotally mounted about a second pivot and moving from a first pawl position engaging said quadrant to a second pawl position disengaging said quadrant enabling movement of said quadrant;
- a cam member pivotally mounted on a third pivot and having a second cam surface for engaging said first cam surface of said locking pawl when said cam member is in a first cam position, said cam member being biased in said first cam position so as to exert a locking force on said locking pawl when said locking pawl is in said first pawl position and movable to a second cam position enabling rotation of said locking pawl to said second pawl position, such that when said cam member is in said first cam position the locking force exerted against said locking pawl creates a force vector that is directed between said first and second pivots so as to substantially bisect a line extending between said first and second pivots to thereby reduce the chucking of the seat back and ensure that the locking pawl teeth and quadrant teeth firmly mesh.

5,749,626
ROTARY-CAM TYPE RECLINING DEVICE

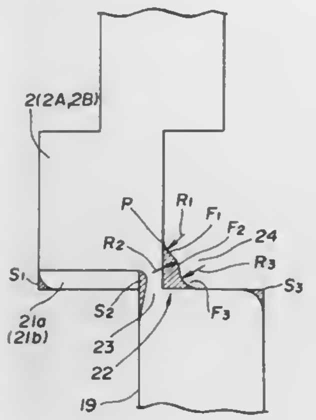
Tomonori Yoshida, Yokohama, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 20, 1997, Ser. No. 859,114

Claims priority, application Japan, May 22, 1996, 8-150201

Int. Cl.^{6} B60N *2/22;* **B21K** *1/30*

U.S. Cl. 297—367 **7 Claims**



1. A reclining device, comprising:
- a stationary base (**1**) adapted to be fixedly connected to a seat cushion (**32**);
- a pivotable, press-worked arm (**2**) adapted to be fixedly connected to a seat back (**33**) and pivotally supported on said base by a pivot shaft (**4**), said arm (**2**) formed integral with a recessed portion (**19**) having an inner toothed portion (**21***a;* **21***b*) on an inner peripheral wall thereof;
- a toothed block (**12**A; **12**B) slidably disposed between said base (**1**) and said arm (**2**) and having an outer toothed portion (**13**) on an outer periphery thereof;
- said base (**1**) being formed integral with a recessed guide (**10**) having guiding side walls for slidably guiding said toothed block (**12**A; **12**B) outwardly away from a center of rotation of said arm or inwardly towards the center of rotation of said arm;
- a rotary cam (**16**) in cam-connection with said toothed block (**12**A; **12**B) for producing an outward sliding motion of said toothed block to mesh said outer toothed portion (**13**) with said inner toothed portion (**21***a;* **21***b*) by a rotary motion of said cam in a first rotational direction and for producing an inward sliding motion of said toothed block to unmesh said outer toothed portion (**13**) from said inner toothed portion (**21***a;* **21***b*) by a rotary motion of said cam in a second rotational direction opposing said first rotational direction; and
- an operating lever (**3**) mechanically linked to said cam for producing said rotary motion of said cam;
- wherein a thick-walled reinforced portion (**24**) of a lack-of-fill suppressive geometry and shape, being composed of at least two outside curved faces, is integrally formed with said arm all around a circumferentially-extending stepped portion (**22**) on an arm outside face opposed to an arm inside face formed with said inner toothed portion (**21***a;* **21***b*).

5,749,627
PUSHCHAIR WITH BACKREST ADJUSTMENT BY CENTRALIZED CONTROL

Gianluca Perego, Arcore, Italy, assignor to Peg Perego Pines S.p.A., Arcore, Italy

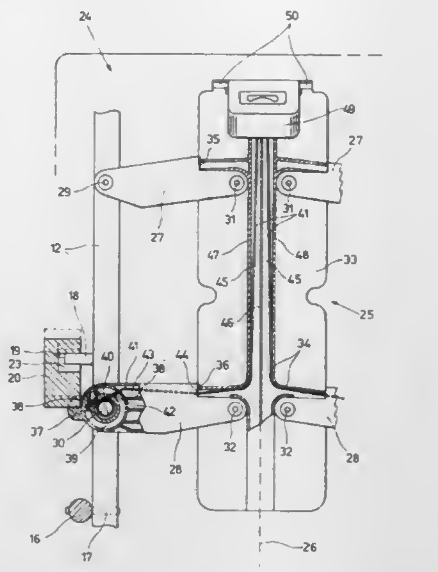
Filed Nov. 28, 1994, Ser. No. 345,625

Claims priority, application Italy, Nov. 29, 1993, MI930929 U

Int. Cl.^{6} B60N *2/20*

U.S. Cl. 297—370 **18 Claims**

13. A pushchair comprising:



- a frame;
- a backrest pivotally connected to said frame;
- first and second arms pivotally connected to said frame and movable between a first position and a second position, said arms being positioned on substantially opposite sides of said backrest, said arms defining a plurality of engaging notches;
- first and second engaging pins positioned on said backrest and cooperating with said first and second arms respectively, said engaging pins engaging with said engaging notches in said first position to block movement of said backrest relative to said frame, said engaging pins disengaging with said engaging notches in said second position;
- single engaging means mounted directly on said backrest and for simultaneously moving said arms between said first and second positions;
- said engaging means directly moves said arms simultaneously from said first position to said second position;
- spring means acting directly on said first and second arms to continuously bias said first and second arms toward said first position.

5,749,628
VERTICALLY ADJUSTABLE CHAIR ARM WITH ROTATABLE ARMREST

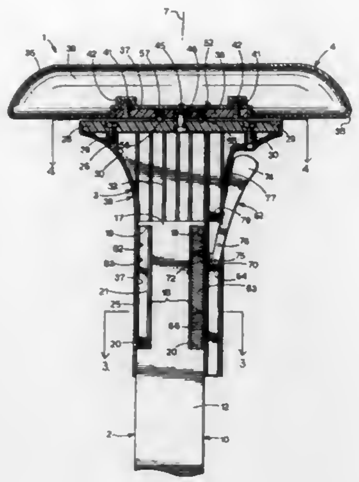
Bobbie L. Synder, Kansas City; C. Thomas Bradley, Raytown, both of Mo., and Paul W. Horner, Overland Park, Kans., assignors to Fixtures Manufacturing Corporation, Kansas City, Mo.

Filed Jun. 11, 1996, Ser. No. 661,369

Int. Cl.^{6} A47C *7/54*

U.S. Cl. 297—411.36 **16 Claims**

1. An adjustable chair arm assembly for a chair having a seat member and comprising:
- (a) an arm support member extending upwardly from a chair seat member, said arm support member having a planar cross section with opposite edges;
- (b) an armrest housing mounted in slidable relation to said support member and enabling substantially vertical movement of said housing relative to said support member, said housing including a flattened hollow stem section with opposite edge regions, said stem section being received about said support member in sliding, telescoping relation;
- (c) a slide retainer mechanism engaged between said housing and said support member and releasably retaining said housing in a selected vertical position relative to said support member, said slide retainer mechanism including:
  - (1) a ratchet surface extending substantially along an edge of said support member;
  - (2) a pawl lever pivotally mounted in said stem section at one of said edge regions thereof;



(3) said pawl lever including a bawl end positioned internally within said stem section and including a pawl surface, said pawl surface facing said ratchet surface;

(4) a pawl spring engaged between said stem section and said pawl lever and resiliently urging said pawl surface into engagement with said ratchet surface to releasably retain said housing in said selected vertical position relative to said support member; and

(5) said pawl lever having a control end opposite said pawl end, said control end being positioned external to said stem section for enabling manual pivoting of said pawl lever by one hand upon gripping said stem section to thereby release said bawl surface from engagement with said ratchet surface and enabling said vertical movement of said housing relative to said support member;

(d) an armrest pad member pivotally connected to said housing and enabling pivotal movement of said pad member about a substantially vertical axis; and

(e) a pivot retainer mechanism engaged between said housing and said pad member and releasably retaining said pad member in a selected pivotal position relative to said housing.

5,749,629
CONSOLE ASSEMBLY WITH ADJUSTABLE ARMREST

Gerald Arthur Heath, Canton; Kelly Michael Obriot, Dearborn; Ionel Eugene Simplicean, Dearborn Hgts., and Sorin Stancu, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 16, 1997, Ser. No. 784,699

Int. Cl.^{6} A47C *7/54*

U.S. Cl. 297—411.36 **5 Claims**

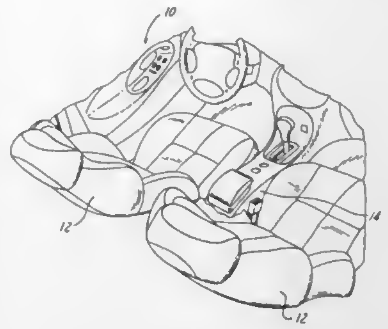
1. A console assembly providing a vertically and horizontally adjustable armrest in an automotive vehicle, the assembly comprising:

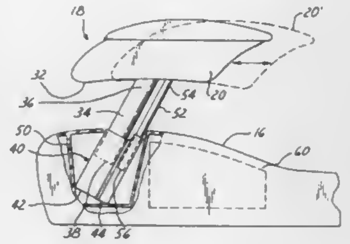
(a) a center console adapted to extend between a pair of seats and having a mounting well and a first storage compartment therein;

(b) a second storage compartment, adjustable with respect to the console, and having a lid with an outer surface for receiving an arm of a vehicle occupant thereon;

(c) at least one telescoping member angularly mounted with respect to a vertical axis for simultaneously adjusting the second storage compartment both in a vertical direction and in a fore-aft direction with respect to the console, the telescoping member mounted to a storage compartment bottom of the second storage compartment on a first end and a telescoping member sleeve mounted within the mounting well on a second end;

(d) a slide bracket attached to the storage compartment bottom for horizontally adjusting the storage compartment relative to the console; and





(e) a stabilizing rod mounted within a stabilizing rod sleeve integral with the telescoping member sleeve substantially parallel to the at least one telescoping member for preventing rotation of the second storage compartment about said at least one telescoping member.

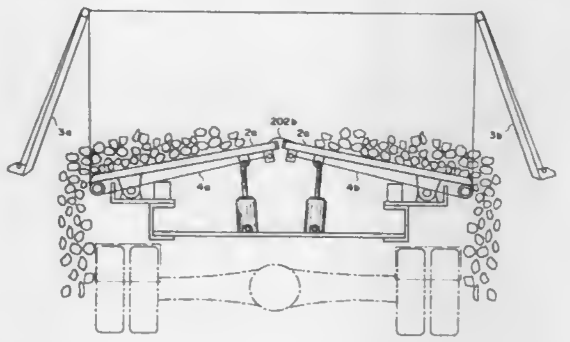
5,749,630
GRAVITY UNLOADING MECHANISM

Lu-Hsiung Ung, Fl. 2, No. 5, Lane 3, Hsing Tong Street, Taipei, Taiwan

Filed Jun. 7, 1996, Ser. No. 660,394

Int. Cl.^{6} B60P *1/34*

U.S. Cl. 298—18 **9 Claims**



1. An unloading mechanism for a box having split bottom plates comprising:

a pair of rectangular split bottom plates having long sides running parallel to the longitudinal axis of the box, the plates mutually abutting at one of the long sides of the plates, each of said bottom plates being pivoted about an axis parallel to the abutting side and at a distance from this abutting side;

a pair of rectangular side plates each having a free end abutting one of the bottom plates and a pivoted end, pivoted along an upper part of the side plate, which is not abutting one of the bottom plates, wherein each of the side plates has an outside face away from the bottom plates;

a pair of cables, one end of each of the cables being secured to a respective bottom plate adjacent the abutting side, the other end of each of the cables extending along the respective bottom plate to the other long side of the respective bottom plate, through a pulley, turning vertically and extending to a pulley at the pivoted end of the respective side plate, down the outside face of the side plate and secured at the free end of the side plate;

a plurality of hydraulic cylinders arranged in two rows along the abutting sides of the bottom plates with piston rods pivoted to a respective bottom plate;

wherein by extending the piston rods of the hydraulic cylinders the abutting sides of the bottom plates are lifted, rotating the bottom plates and pivoting the side plates through the cables.

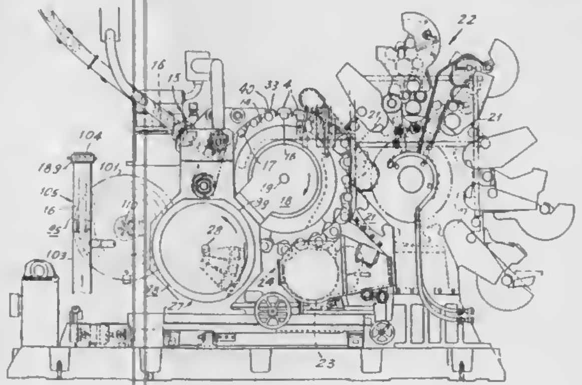
5,749,631
DUAL CAN ROTATING TRANSFER PLATE TO CONVEYOR BELT

Robert Williams, Randolph, N.J., assignor to Sequa Corporation, Hackensack, N.J.

Filed Apr. 30, 1996, Ser. No. 640,012

Int. Cl.^{6} B65G *47/84*

U.S. Cl. 198—441 **20 Claims**



1. Apparatus for conveying containers each of which has an open end and a closed end opposite said open end, said apparatus including:

continuous motion first and second transfer conveyors rotatable about laterally spaced respective first and second axes that are generally parallel to each other;

a continuous motion mandrel carrier rotatable about a third axis, and a continuous motion belt conveyor including a first flight section;

said first transfer conveyor being disposed axially forward of both said second transfer conveyor and said carrier, and said first flight section passing in front of said second transfer conveyor;

a plurality of container carrying mandrels on said carrier, extending forward therefrom;

a plurality of container carrying holding units on said first transfer conveyor, projecting rearward therefrom, and being in an array surrounding said first axis;

said second transfer conveyor being provided with a container receiving forward facing generally planar surface that is generally perpendicular to said second axis and from which a first attracting force extends to draw containers rearward from said first transfer conveyor toward said second transfer conveyor to operatively engage and be held at said planar surface while portions of said planar surface travel through a holding zone;

portions of said carrier and said first transfer conveyor being in confronting relationship at a first transfer zone where said holding units receive containers that are being carried by said mandrels;

portions of said first and second transfer conveyors being in confronting relationship at a second transfer zone where said generally planar surface receives containers that project rearward from said holding units;

portions of said first flight section and said second transfer conveyor being in confronting relationship at a loading zone where containers which project forward from said second transfer conveyor are received by said first flight section of said belt conveyor, with containers so received being held on said first flight section by another attracting force;

said loading zone being downstream of said second transfer zone, and said holding zone extending between said second transfer zone and said loading zone;

said closed ends being forward of said open ends while said containers are at said first and second transfer zones and at said loading zone;

at said second transfer zone said open ends being in operative engagement with said generally planar surface, at said first transfer zone said closed ends being in operative engagement with said holding units, and at said loading zone said closed ends being in operative engagement with said first flight section.

5,749,632

Patent Not Issued For This Number

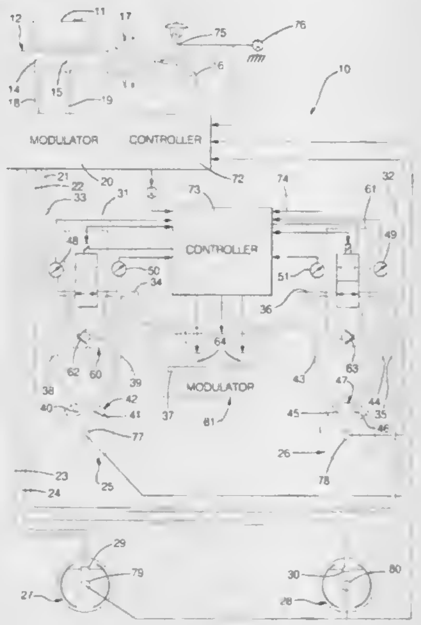
5,749,633
BRAKE BY WIRE SYSTEM

Ernst Severin Baumgartner, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1997, Ser. No. 854,459

Int. Cl.^{6} B60T *8/34*

U.S. Cl. 303—113.1 **6 Claims**



1. A braking system comprising:

a master cylinder;

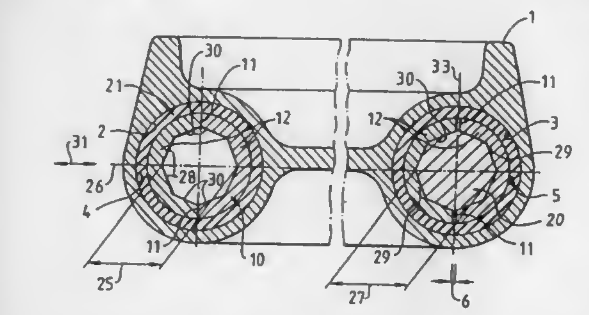
a wheel brake connected to the master cylinder by a brake line and including a caliper assembly with first and second pistons;

an electro-hydraulic modulator including a motor and being connected to the wheel brake; and

a pressure control block associated with the wheel brake including a first port communicating with the brake line so that fluid pressure generated by the master cylinder is communicable through the pressure block to the first and the second pistons of the caliper assembly for operation of the braking system in a manual apply mode and, the pressure control block including a second port communicating with the electro-hydraulic modulator so that fluid pressure generated by the electro-hydraulic modulator is communicable through the pressure control block to the second piston of the caliper assembly and is prevented from being communicated to the first piston of the caliper assembly by a solenoid valve assembly positioned in the pressure control block.

5,749,634
ELASTIC MOUNTING FOR TRACK PIVOT PINS IN ENDLESS HINGED VEHICULAR CRAWLER DRIVE TRACKS

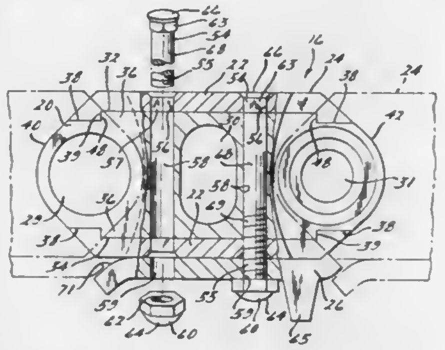
Hagen Heinz Wiesner, Solingen, and Klaus Spies, Remscheid, both of Germany, assignors to Diehl Remscheid GmbH & Co., Germany
PCT No. PCT/EP95/00258, § 371 Date Apr. 11, 1996, § 102(e) Date Apr. 11, 1996, PCT Pub. No. WO95/21089, PCT Pub. Date Aug. 10, 1995
PCT Filed Jan. 25, 1995, Ser. No. 624,644
Claims priority, application Germany, Feb. 1, 1994, 44 02 946.2
Int. Cl.⁶ B62D *55/215*
U.S. Cl. 305—42 **16 Claims**



1. An endless hinged vehicular crawler drive track comprising:
a. a plurality of linked track link members, wherein each track link member defines a bore;
b. a prestressed rubber mounting concentrically mounted within the bore;
c. a bushing concentrically mounted within the prestressed rubber mounting, and having at least one dividing gap extending along a longitudinal direction of the bushing;
d. a track pivot pin concentrically mounted within the bushing, and wherein the internal width of the bushing is smaller than the diameter of the track pivot pin.

5,749,635
REVERSIBLE TRACK LINK FOR AN ENDLESS TRACK

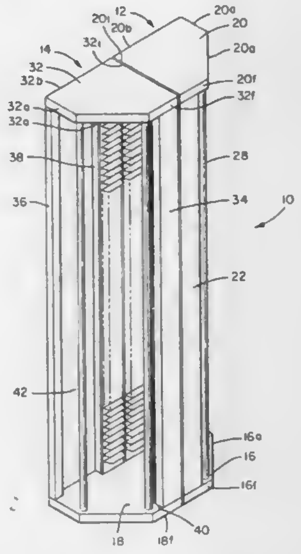
Daryl Umbarger, 790 W. Ironwood, Gwinn, Mich. 49841
Filed Mar. 8, 1995, Ser. No. 400,808
Int. Cl.⁶ B62D *55/20*
U.S. Cl. 305—190 **19 Claims**



1. A reversible track link assembly for an endless track of a track type vehicle characterized by:
a track link having upper and lower surfaces and at least one bore transversely extending through said track link and intersecting respective upper and lower surfaces of said track link;
a wear bar removably affixed to said upper surface and having at least one aperture being counter bored and aligned with said at least one bore in said track link;
a track shoe removably affixed on said lower surface and having at least one aperture aligned with said at least one bore in said track link;
an elongated fastener having a head counter sunk in said counter-bored aperture in said wear bar and extending through a respective bore in said track link and through a respective aperture in said track shoe and having an end extending therefrom;
a female fastener engaging said end of said elongated fastener to assemble said shoe, link and wear bar together.

5,749,636
STORAGE RACK FOR COMPACT DISCS OR THE LIKE

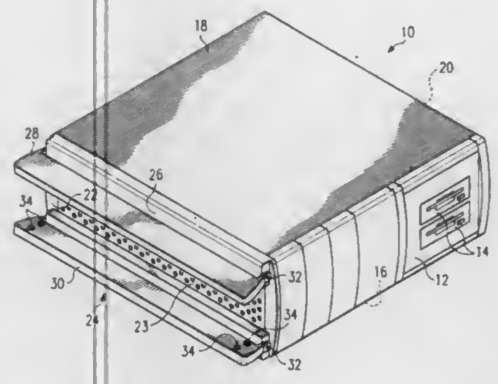
Nabil Boury, 120 Sunset Ave., Glen Ellyn, Ill. 60137
Filed Jun. 28, 1995, Ser. No. 495,894
Int. Cl.⁶ A47B *87/00*
U.S. Cl. 312—201 **18 Claims**



1. A storage rack for retaining a plurality of storage media comprising first and second storage rack tower components adapted to assume either a locked or unlocked mode, the first storage rack tower component including a top piece having opposed front and back edges, the front edge having a length less than the length of the back edge, a base piece complementing the top piece, at least two upright segments joining the top piece with the base piece defining an interior region disposed proximate to an upright peripheral segment of the first storage tower component and one or more recesses provided in the interior region adapted to receive one or more of the storage media; the second storage rack tower component having an upright peripheral segment cooperating with the peripheral segment of the first storage rack tower component; when in the locked mode, said first storage rack component assuming an upright abutting relation with said second storage rack component thereby preventing hand access to storage media retained in the interior region, said storage rack components being adapted to assume any selected upright relative angular position when in the unlocked mode.

5,749,637
COMPUTER SYSTEM CHASSIS HAVING A SELECTIVELY EXTENDIBLE SUPPORT ASSEMBLY FOR CONVERSION BETWEEN DESKTOP AND TOWER PATFORMS

Robert L. McMahan, Cedar Park, and Maureen Martinez, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.
Filed Oct. 5, 1995, Ser. No. 539,383
Int. Cl.⁶ A47B *91/00*
U.S. Cl. 312—223.2 **6 Claims**

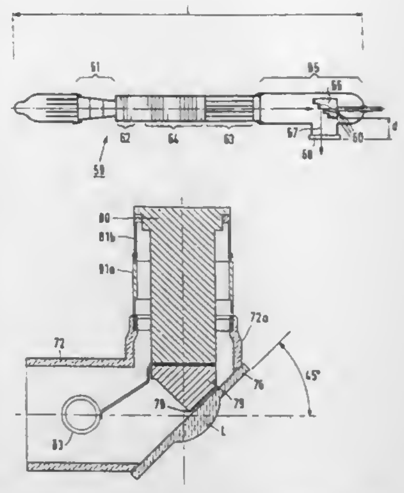


1. A computer system which is configurable between desktop and tower platforms, comprising:
a chassis for enclosing components, the chassis comprising:
a first side being proximate and substantially parallel to a first supporting surface during resting of the chassis in a desktop position; and
a second side being proximate and substantially parallel to a second supporting surface during resting of the chassis in a tower position, the second side having a length and being bounded between a first outer edge and a second outer edge, each of the outer edges located along the length of the second side;
a chassis support assembly for stabilizing the chassis in the tower position, the chassis support assembly being connected to the second side of the chassis and comprising a bracket and a support member, the bracket being connected to the second side proximate the first outer edge of the second side;
and wherein the support member is connected to the bracket by a pin such that the support member is pivotable about the bracket between a retracted position and an extended position, the extended position being characterized in that the support member extends outwardly from the second side beyond the first outer edge of the second side, the retracted position being characterized in that the support member lies substantially between the first outer edge and the second outer edge.

5,749,638
RAPIDLY SCANNING CATHODE-RAY TUBE LASER

Hugo J. Cornelissen; Cornelis J. Savert, and Johannes T.H. Leijten, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 30, 1996, Ser. No. 643,067
Claims priority, application European Pat. Off., Nov. 14, 1995, 95203101.1
Int. Cl.⁶ H01J *29/62*
U.S. Cl. 313—461 **6 Claims**

1. An electron-optical device comprising a cathode ray tube having an envelope containing a laser-crystal target for producing laser light when excited by an electron beam, an electron gun for producing an electron beam directed along an axis for deflection across the target, and means for focusing the electron beam at the target, said envelope comprising:
a) a longitudinally-extending tubular portion, disposed about the axis, through which the electron beam propagates to the target; and



b) a target-containing portion, in which the target is secured, including a window through which the laser light may leave the envelope;
said window extending at an acute angle relative to the axis and having a laser-light transmitting region which is substantially closer to the target than the tubular portion is to the axis;
said target being oriented for emitting the laser light through said laser-light transmitting portion of said window.

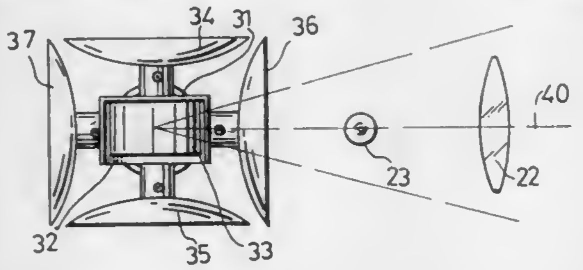
5,749,639
Patent Not Issued For This Number

5,749,640

APPARATUS FOR PROJECTING MOVING AND CHANGING COLORED LIGHT RAYS ALONG A HORIZONTAL AXIS, THE LIGHT RAYS BEING ROTATABLE SYNCHRONOUSLY ABOUT THE HORIZONTAL AXIS

Jason Yu, Taipei, Taiwan, assignor to J.A.L. Taiwan Ltd., Chung Ho, Taiwan

Filed Feb. 5, 1997, Ser. No. 795,074
Int. Cl.^{6} G03B *21/28*
U.S. Cl. 353—51 5 Claims



1. An apparatus for projecting a plurality of moving and changing colored light rays, comprising:
- a first stepper motor having a first rotor and a first output shaft coupled to and driven by said first rotor;
- a mounting frame fixed to and rotatable with said first output shaft;
- a second stepper motor having a second rotor and a second output shaft coupled to and driven by said second rotor, said second stepper motor being mounted on said mounting frame such that said second output shaft is transverse to said first output shaft, and is rotatable relative to said mounting frame;
- at least a first reflector fixed to and rotatable with said second output shaft, said first reflector having a light reflecting surface and a plurality of differently colored reflecting facets disposed around an axis of said second output shaft and on said reflecting surface; and
- a light source radially disposed and spaced from said first output shaft such that light emitted by said light source is reflected by said light reflecting surface of said first reflector when said mounting frame is turned stepwise by said first output shaft so as to move said first reflector on a route of the emitted light.

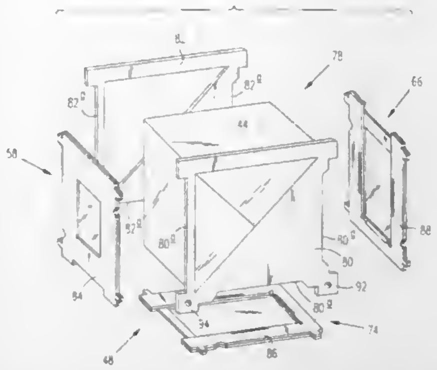
5,749,641

OPTICAL PROJECTOR

Steve Brice, Portland; Gary Kingsley, Tigard, and David Payne, Hillsboro, all of Oreg., assignors to Delta America Ltd., Fremont, Calif.

Division of Ser. No. 590,395, Jan. 25, 1996, Pat. No. 5,605,390. This application Jan. 14, 1997, Ser. No. 782,652
Int. Cl.^{6} G03B *21/14*
U.S. Cl. 353—81 5 Claims

1. A prismatic cube-mounting frame for use in an optical projector including a housing, the frame comprising:
- first and second opposing frame members extending around a first and opposing face of the prismatic cube, each of said first and second frame members including a lip region extending beyond the edges of the first and second opposing faces of the cube a predetermined distance, said lip regions defining corresponding opposing edges of said first and second frame members;
- third and a fourth frame members extending between said first and said second opposing frame members, said third and fourth frame members bearing optical elements thereon through which light beams may be directed into and out of the prismatic cube, said third and fourth frame members being adhered to said edges of said lip regions of said first and second frame members to position and align said optical elements borne thereby with the prismatic cube.

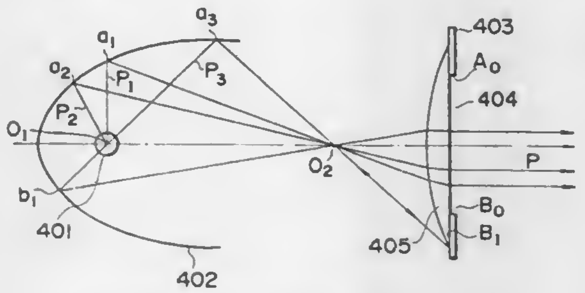


5,749,642

ILLUMINATING OPTICAL SYSTEM AND PROJECTOR UTILIZING THE SAME

Kazumi Kimura, Atsugi; Hideaki Mitsutake, Tokyo; Kohtaro Yano, Yokohama; Shigeru Kawasaki, Isehara, and Junko Kuramochi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 461,557, Jun. 5, 1995, abandoned, which is a division of Ser. No. 453,441, May 30, 1995, which is a division of Ser. No. 30,571, Mar. 12, 1993, abandoned. This application Mar. 17, 1997, Ser. No. 819,408
Claims priority, application Japan, Mar. 18, 1992, 4-62293
Int. Cl.^{6} G03B *21/28*
U.S. Cl. 353—98 7 Claims



1. An illuminating optical system comprising:
- an elliptical reflector for reflecting the light from a light source, positioned at a focal point thereof, toward an area to be illuminated;
- an optical element for converting the light beam. from said elliptical reflector, into a substantially parallel light beam; and
- a flat mirror having an aperture of a cross section different from that of the light beam coming by way of said optical element, said mirror being positioned substantially perpendicularly to the optical axis of the light beam from said optical element.

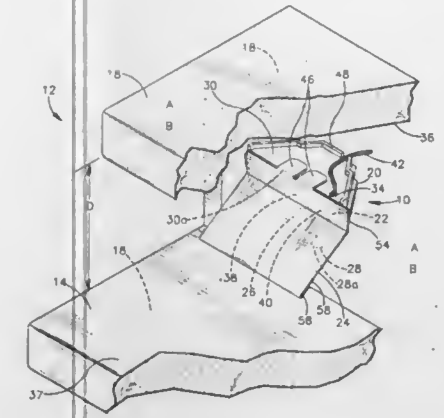
5,749,643

STEP LIGHT WITH DIFFUSER

David H. Porter, Chagrin Falls, and Libbe A. Milicia, North Royalton, both of Ohio, assignors to The L.D. Kichler Co., Cleveland, Ohio

Filed Mar. 14, 1997, Ser. No. 820,644
Int. Cl.^{6} F21S *1/02*
U.S. Cl. 362—146 3 Claims

1. A step light, comprising: a housing including an upper wall portion adapted to be secured to the underside of a step and a front face that forms a light emitting opening, a lamp in said housing for emitting light through said opening, and a louver overhanging said opening, said louver extending downwardly from said upper housing wall and away from said front face in order to direct light downward onto the tread of a step below said housing.

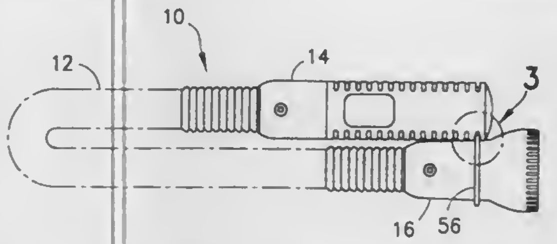


5,749,644

FLEXIBLE ELECTRICAL DEVICE WITH ATTACHABLE ENDS

Richard C. Carbone, Southbury, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 28, 1996, Ser. No. 738,741
Int. Cl.^{6} F21L *15/20*
U.S. Cl. 362—198 14 Claims



1. In a flashlight having a flexible core, a power supply end connected to a first end of the flexible core, and an illumination end connected to an opposite second end of the flexible core, wherein the improvement comprises:
- the power supply end having a recess on its exterior and the illumination end having a projection extending from its exterior surface, wherein the projection is adapted to be inserted into the recess and thereby mechanically connect the power supply end to the illumination end said projection comprising a resilient O-ring.

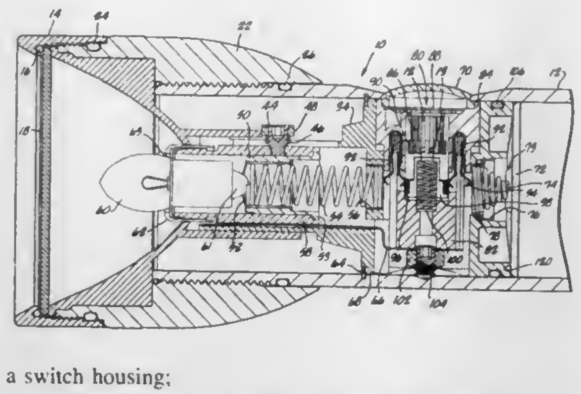
5,749,645

FLASHLIGHT

Anthony Maglica, Anaheim, Calif., assignor to MAG Instrument, Inc., Ontario, Calif.

Continuation of Ser. No. 138,918, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 832,857, Feb. 7, 1992, Pat. No. 5,260,858, which is a continuation-in-part of Ser. No. 719,156, Jun. 21, 1991, Pat. No. 5,113,326, which is a continuation-in-part of Ser. No. 553,977, Jul. 16, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 483,381
Int. Cl.^{6} F21L *7/00*
U.S. Cl. 362—205 11 Claims

1. A flashlight comprising
- a flashlight barrel;
- a switch housing;
- a retainer adjacent one side of the switch housing; and
- a resilient member between the flashlight barrel and the switch housing.

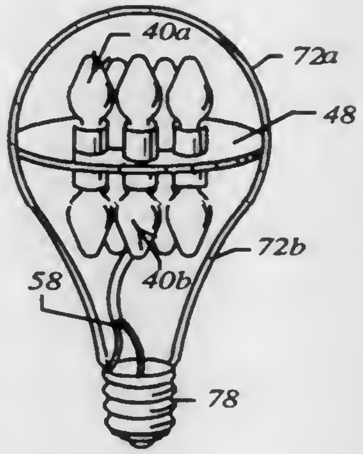


5,749,646

SPECIAL EFFECT LAMPS

Gerald A. Brittell, 2849 Coulter Rd., Whiteoak, Pa. 15131

Continuation-in-part of Ser. No. 990,533, Dec. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 822,596, Jan. 17, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 339,922
Int. Cl.^{6} F21V *9/10*
U.S. Cl. 362—231 20 Claims



1. An electrical lamp assembly comprised of:
- (a) a plurality of colored light generating units each comprised of a plural number of light sources ad coloring means to individually color the light emitted by each light source a desired color,
- (b) lamp electrical means providing an electrical circuit between an external power supply and each of the light sources to energize said light sources and to make them shine when desired,
- (c) light source timing means to cause different of the individual said light sources at least some times to shine at least one-at-a-time at different points of time providing that a different color frequency of resultant light can be emitted from individual of said colored light generating units at different times,
- (d) lamp-part holding means to hold all parts of said lamp assembly together in desired placement,
- (e) light blocking partitioning means between said colored light generating units to determine an extent of mixing together or blending of the resultant light emitted from individual of said colored tight generating units with the resultant light emitted by the other colored light generating units,
- (f) a background light affecting area and at least one foreground light affecting area, each of the light affecting areas with a light affecting property selected from a group of light affecting properties including translucent. transparent, opaque,

refractive, and reflective, and any degree and combination of these properties, each of the light affecting areas illumined with the resultant light emitted from at least one of said colored light generating units, each of the light affecting areas affecting the resultant light according to said property,

(g) a superimposed configuration of the light affecting areas and the colored light generating units, said illumined light affecting areas and said colored light generating units so held by lamp-part holding means that at least some of the light originally emitted by the at lest one colored light generating unit illumining said background light affecting area passes by and around at least part of a periphery of at least one of the illumined foreground light affecting areas superimposed before the illumined background light affecting area, the extent of mixing of the resultant light from the individual colored light generating units determined by said light blocking partitioning means,

(h) whereby the lamp assembly can simultaneously illuminate a plural number of light diffusing areas with colored light, each area changing from one color to another.

5,749,647
MATRIX ARRAY DISPLAY PANEL

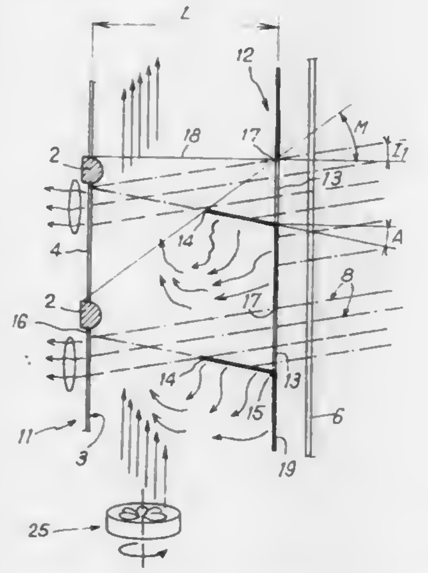
Philippe Migny, Saint Cyr-sur-Loire, France, assignor to Securite et Signalisation, Tours Cedex, France

Filed Sep. 6, 1996, Ser. No. 708,190

Claims priority, application France, Sep. 6, 1995, 95 10427

Int. Cl.^{6} F21V ***1/00***

U.S. Cl. 362—248 **5 Claims**



1. A display panel of the type comprising a plurality of light emitting elements arranged in matrix array on a vertical display surface and means for preventing the sun's rays from directly striking said light emitting elements beyond a given minimum incidence in a vertical plane, while allowing an observer to see an image constituted by said light emitting elements at an angle of observation smaller than a given maximum angle of observation,

wherein said means are constituted by a mask disposed in front of the display surface and at a distance therefrom, said mask comprising a vertical wall parallel to the display surface, which represents a plurality of openings each disposed opposite a light emitting element, said openings being dimensioned and positioned with respect to the light emitting elements so that the light emitted thereby is visible by an observer who is looking at said panel at an angle of observation smaller than the given maximum angle of observation, and further comprising a plurality of fins directed towards the display surface and intended to intercept at least in part the sun's rays passing through said openings, in order that the light emitting elements not be struck by the sun's rays at an angle of incidence greater than the minimum angle of incidence.

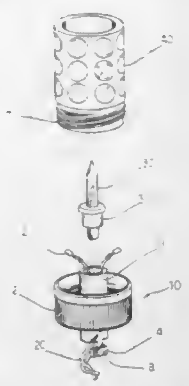
5,749,648
LAMP FOR DECORATIVE LIGHT STRINGS

Wen-Chien Lin, P.O. Box 82-144, Taipei, Taiwan

Filed Jun. 12, 1997, Ser. No. 873,799

Int. Cl.^{6} F21V ***11/00***

U.S. Cl. 362—353 **3 Claims**



1. A lamp for decorative light strings, comprising a lamp holder, a lamp base mounted in said lamp holder and holding a lamp bulb, a lampshade fastened to said lamp holder around said lamp base and said lamp bulb, and two electric wires respectively extended out of said lamp holder and having a respective contact terminal disposed in contact with the positive and negative terminals of said lamp bulb respectively, wherein said lamp holder comprises a cup-like holder base, an inner thread disposed around an inside wall of said cup-like holder base, a plurality of air vents at a bottom side of said cup-like holder base, a center barrel vertically disposed at the center of said cup-like holder base and defining a top receptacle, which receives said lamp base, and a hinged cap closed on one end of said center barrel remote from said top receptacle and having two semicircular notches for the passing of said electric wires; said lampshade has an outer thread around a bottom end thereof threaded into the inner thread of said cup-like holder base.

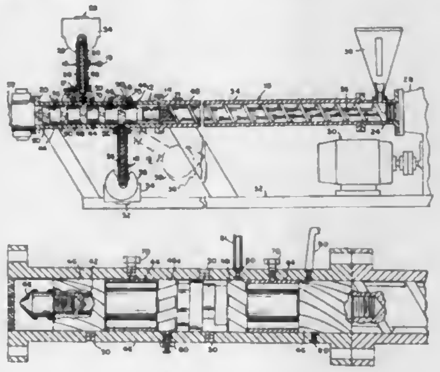
5,749,649
SATELLITE EXTRUDER ARRANGEMENT FOR POLYMER MELT MIXING WITH A DYNAMIC MIXER

Desider G. Schobert-Csongor, Manchester, and Nick Reinhold Schott, Westford, both of Mass., assignors to Dynamic Mixers Inc., Manchester, Mass.

Filed Mar. 5, 1996, Ser. No. 611,453

Int. Cl.^{6} B29B ***7/40;*** **B01F** ***7/08***

U.S. Cl. 366—76.4 **10 Claims**



1. An extrusion arrangement for the controlled compounding and mixing of a plurality of time, pressure and condition sensitive substances in a single screw plastic extrusion machine, comprising:

a main support shaft of a dynamic melt mixer connected to the downstream end of a single screw plastic extrusion machine, said support shaft enclosed within a barrel shaped housing;

at least one stator secured to an inner surface of said barrel shaped housing, and arranged about said support shaft and one rotor secured onto said support shaft, within said barrel shaped housing;

at least one satellite extrusion feeder arranged to supply an additive to said barrel shaped enclosure through an introduction port, said introduction port arranged at a location radially adjacent said rotor on said support shaft;

said stators having an internal bore therethrough, said internal bore having a plurality of helically disposed channels machined thereon; and

each of said rotors having a plurality of blades circumferentially disposed therearound, each of said blades having a helical disposition thereto, said stators arranged to be removed and remounted with respect to said barrel shaped housing, said rotors arranged to be removed with respect to said support shaft to permit reversal thereon, to permit the change of the handedness of the helical disposition of said rotors and said stators.

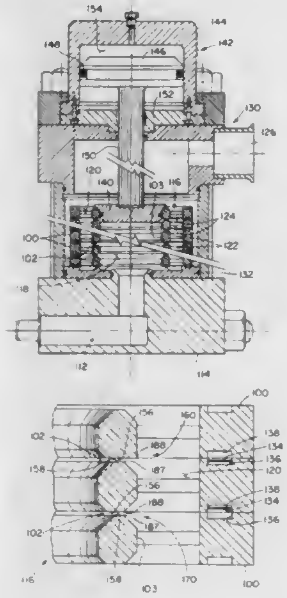
5,749,650
HOMOGENIZATION VALVE

Richard R. Kinney, Boxford; William D. Pandolfe, Billerica, and R. Daniel Ferguson, Melrose, all of Mass., assignors to APV Homogenizer Group, a Division of APV North America, Inc., Wilmington, Mass.

Filed Mar. 13, 1997, Ser. No. 816,278

Int. Cl.^{6} B01F ***5/00***

U.S. Cl. 366—176.2 **17 Claims**



1. A homogenizer valve comprising flow restricting surfaces opposing each other on either side of a laterally extended valve gap, wherein downstream terminations of the opposed surfaces are staggered by at least a distance necessary to inhibit chattering of the valve but wherein the overlap is small enough such that mixing layers of a fluid being expressed through the valve gap converge with a homogenization zone beyond the terminations of the surfaces.

5,749,651
COMBINED FEED AND MIXING DEVICE

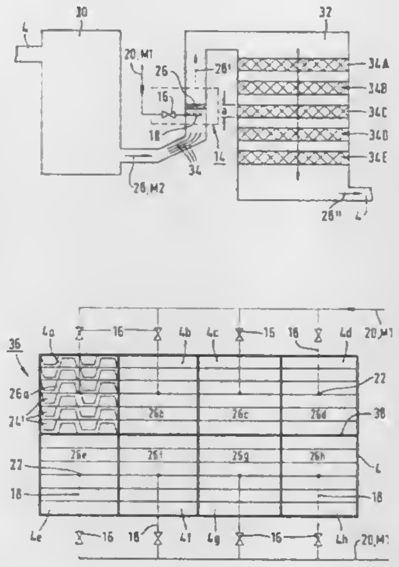
Klaus Hüttenhofer, Heroldsberg; Wolfgang Herr, Friesen; Josef Sprehe, Fürth, and Horst Spielmann, Baiersdorf, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 25, 1996, Ser. No. 710,978

Claims priority, application Germany, Mar. 25, 1994, 44 10 237.2

Int. Cl.^{6} B01F ***3/02;5/06***

U.S. Cl. 366—181.5 **9 Claims**



1. In an assembly including a flow duct conducting a gaseous second fluid medium in a given flow direction and having a given cross-sectional area and a given hydraulic diameter, a combined feed and mixing device for introducing a first fluid medium into the second fluid medium in the flow duct and for mixing the fluid media, comprising:

at least one tube conducting the first fluid medium, said at least one tube having from 0.05 to 10 feed orifices per m^2 of the given cross-sectional area;

a mixing insert disposed downstream of said feed orifices in the given flow direction, said mixing insert being spaced apart from said feed orifices by a distance of from 0.05 to 3 times the given hydraulic diameter; and

said mixing insert having mixing elements being small relative to the given hydraulic diameter and being disposed in mutually parallel rows in a plane oriented at an angle to the given flow direction, and said mixing elements of each of said rows being inclined relative to a plane in the same direction to one another and in opposite direction to said mixing elements of each adjacent row.

5,749,652
MIXING APPARATUS AND METHOD

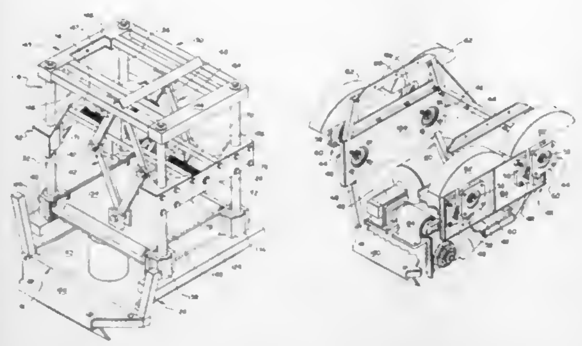
Randy J. Brunn, Brooklyn Park; William O. Gran, Circle Pines, and James P. Junk, Bloomington, all of Minn., assignors to Red Devil Equipment Company, Brooklyn Park, Minn.

Continuation-in-part of Ser. No. 411,948, Mar. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 330,122, Oct. 27, 1994, abandoned. This application Mar. 28, 1996, Ser. No. 620,800

Int. Cl.^{6} B01F ***11/00***

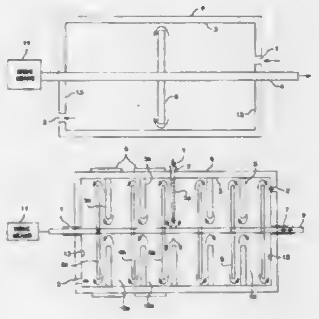
U.S. Cl. 366—209 **13 Claims**

1. A securing apparatus for securing a container of fluid to be mixed in a mixing device having a main frame and a subframe movably coupled to the main frame, said securing apparatus comprising:



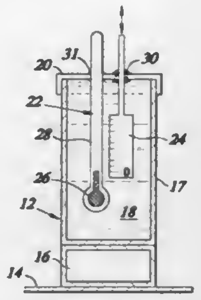
- a frame assembly carried on said subframe and including a frame assembly top;
- a first clamping member movably supported by said frame assembly and a second clamping member mounted on the subframe, said second clamping member generally parallel to the first clamping member; and
- drive means carried by said frame assembly for moving said first clamping member toward and away from said second clamping member, wherein said drive means comprises a motor and a scissors linkage operably coupling the motor and the first clamping member.

5,749,653
CONTINUOUS SQUEEZE FLOW MIXING PROCESS
Stuart Jacob Kurtz, Martinsville, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Continuation-in-part of Ser. No. 623,190, Mar. 28, 1996. This application Mar. 24, 1997, Ser. No. 822,507
Int. Cl.⁶ B01F ***11/00***
U.S. Cl. 366—256 **11 Claims**



1. A continuous, energy efficient process for dispersively mixing a viscoelastic material, which comprises:
- i) introducing the material at a substantially constant rate into a single stage mixing device comprising:
  - a) a housing having an axis, an inner surface, two end walls, an inlet, and an outlet;
  - b) a central shaft located parallel to or on the axis of the housing that is reciprocatively movable parallel to or along the axis of the housing, said central shaft comprising a plate extending substantially perpendicularly therefrom, wherein the plate does not touch the inner surface of the housing; and
  - c) drive means operatively attached to said central shaft for moving the central shaft through the housing in a reciprocating fashion;
- ii) squeezing the material between the plate and the end walls of the housing at a Hencky strain greater than 2 and at a rate corresponding to a Deborah Number greater than 10; and
- iii) withdrawing the material from the device at a substantially constant rate.

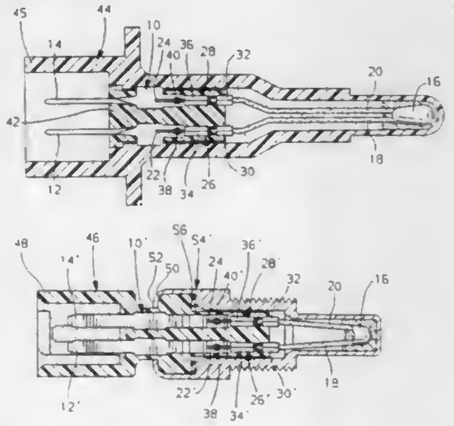
5,749,654
CALORIMETRIC WATTMETER FOR TESTING MICROWAVE OVENS
Oliver E. Gibson, Jr., 1430 Solomon Rd., Santa Maria, Calif. 93455
Filed Jan. 16, 1996, Ser. No. 584,318
Int. Cl.⁶ G01K ***17/00***
U.S. Cl. 374—32 **1 Claim**



1. A calorimetric wattmeter for testing microwave ovens, comprising in combination:
- a calorimeter including
  - a body including an upright vessel for holding a particular quantity of a liquid;
  - a thermometer having a sensor portion and an indicator portion;
  - a thermometer scale;
  - first means connecting said thermometer to said body for holding the sensor portion of the thermometer in the liquid;
  - second means connecting said thermometer scale to said body for permitting said thermometer scale to be moved relative to the indicator portion of said thermometer; and,
- an enclosure connected to said calorimeter and containing a quantity of gaseous neon.

5,749,655
Patent Not Issued For This Number

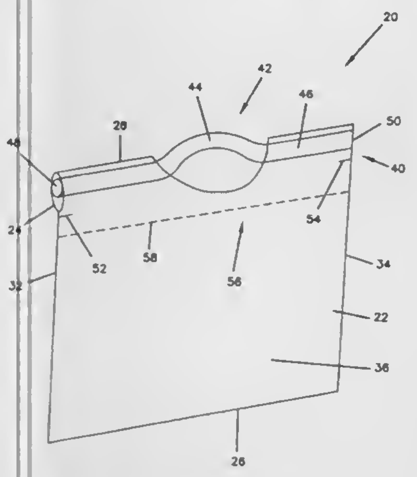
5,749,656
THERMAL PROBE ASSEMBLY WITH MOLD-OVER CRIMP SENSOR PACKAGING
Michael James Boehm; Peter John Straub, both of Warren, and Richard Darrell Kirkwood, Bristolville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 514,079, Aug. 11, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 914,201
Int. Cl.⁶ G01K ***7/22;*** **H01R** ***4/20***
U.S. Cl. 374—185 **3 Claims**



1. A thermal sensor comprising:

- a thermistor and a pair of wires leading therefrom, each wire having an insulation covering a portion thereof so that one end of the wire is exposed, a male terminal for each wire, the male terminal having a metal crimp having a first finger crimped to the insulation covering the wire and a second finger crimped to the exposed end of the wire, and wherein the exposed end of the wire is resistance welded to the crimp;
- a pre-mold sealing off on the first finger and encapsulating the second finger, the resistance weld, and only a portion of the first finger leaving a portion exposed.

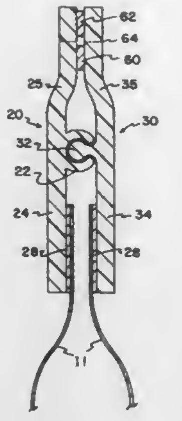
5,749,657
FLEXIBLE PACKAGE WITH HANGHOLE AND TEAR STRING AND METHOD AND APPARATUS FOR MAKING THE SAME
Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.
Filed May 10, 1996, Ser. No. 644,092
Int. Cl.⁶ B65D ***33/14***
U.S. Cl. 383—9 **13 Claims**



1. A flexible package comprising:
- first and second opposed panel sections;
- a header section positioned adjacent the first and second panel sections and enclosing a portion of the package, the header section having a hanghole;
- a reclosable system attached to the header section and selected from the group consisting of a reclosable zipper and a pressure sensitive adhesive; and
- a tear string enclosed and arranged in the header section to strengthen the header section and positioned within the hanghole for hanging support at the hanghole and to tear open the enclosed portion in response to a pulling force.

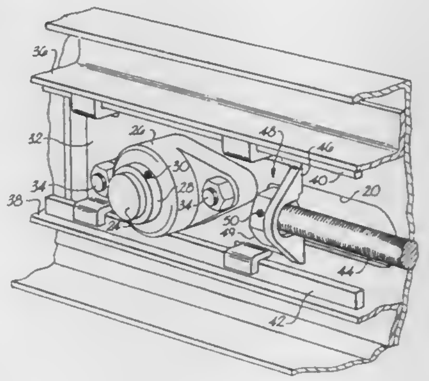
5,749,658
CLOSURE ARRANGEMENT FOR ATTACHMENT TO OUTSIDE OF BAG
Catherine E. Kettner, Appleton, Wis., assignor to Reynolds Consumer Products, Inc., Appleton, Wis.
Filed Sep. 12, 1996, Ser. No. 712,917
Int. Cl.⁶ B65D ***33/24***
U.S. Cl. 383—204 **28 Claims**

1. A zipper for a recloseable bag of a polymeric film having an interior and an exterior surface, the zipper comprising:
- first and second generally parallel extruded base strips,
- a first closure profile on the inner surface of the first base strip and a second closure profile on the inner surface of the second base strip, the closure profiles positioned above the flange portions and configured to interlock with one another above the bag films; and



- a heat-setting sealant compound coextruded, coated or laminated to the inner surface of the flange portions for permanently adhering the inner surfaces of the flange portions to the exterior surfaces of the film below the first and second closure profiles,
- wherein the thickness of the flange portions is less than the thickness of the base strips above the flange portions.

5,749,659
BEARING TAKE-UP APPARATUS UTILIZING CONVENTIONAL FLANGE BEARING
Donald L. Nisley, Greenville, S.C., assignor to Reliance Electric Industrial Company, Cleveland, Ohio
Filed Nov. 14, 1996, Ser. No. 749,299
Int. Cl.⁶ F16C ***23/02***
U.S. Cl. 384—260 **17 Claims**



1. A bearing take-up apparatus comprising:
- a first elongated member including a first longitudinal rail:
- a second elongated member spaced apart from said first elongated member, said second elongated member including a second longitudinal rail situated in parallel with said first longitudinal rail;
- a bearing carrier mounted between said first elongated member and said second elongated member, said bearing carrier including guide structures engaging said first and second longitudinal rails to move axially therealong;
- a bearing assembly defining a shaft bore for receipt of a shaft therein, said bearing assembly including a bearing housing removably mounted to said bearing carrier such that said guide structures of said bearing carrier are operatively maintained in position on said first and second longitudinal rails independently of said bearing housing and
- an adjustment mechanism operatively connected to said bearing carrier to effect axial movement of said bearing carrier and said bearing assembly mounted thereto.

5,749,660
BEARING ASSEMBLY WITH DYNAMIC DRAINAGE SUPPLIED WITH LUBRICANT

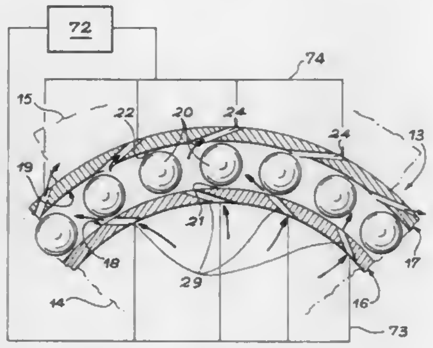
Guy Franck Paul Dusserre-Telmon, Sivry-Courtry; Daniel Georges Plona, Vulaines Sur Seine, and Christophe Yvon Gabriel Tourne, Montgeron, all of France, assignors to Societe Nationale d'Etude de Contruction de Moteurs d'Aviation "Snecma", Paris, France

Filed Oct. 8, 1996, Ser. No. 727,041

Claims priority, application France, Oct. 18, 1995, 95 12204

Int. Cl.⁶ F16C *33/58*

U.S. Cl. 384—475 **9 Claims**



1. A bearing assembly, which comprises:
a bearing housing an inner ring and an outer ring;
a plurality of bearing elements engaged between said inner ring and said outer ring wherein at least one of said rings has a plurality of drainage orifices formed therein, said orifices draining lubricating liquid to a location outside said bearing and being inclined in a direction of rotation of said bearing to facilitate flow of the lubricating liquid.

5,749,661
PLASTIC SEPARATOR CAGE FOR BALL BEARINGS

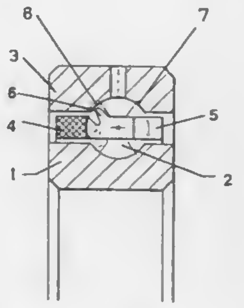
Rainer Moller, Stammheim, Germany, assignor to FAG OEM und Handel AG, Germany

Filed Jan. 30, 1997, Ser. No. 792,437

Claims priority, application Germany, Feb. 13, 1996, 296 02 481.3

Int. Cl.⁶ F16C *33/46*

U.S. Cl. 384—526 **14 Claims**



1. A separator for the rolling bodies of an antifriction bearing, wherein the separator comprises
a generally flat strip including webs extending transversely of the strip, adjacent webs defining pockets between them for respective rolling bodies;
the strip being bendable to form a ring;
the strip having opposite sides; elastic holding noses being defined on at least one of the sides of the strip and projecting out of the strip, the noses being shaped and sized to project radially out of the ring into which the strip is bent, whereby the noses are engageable in one bearing ring of the antifriction bearing for preventing axial direction movement of the separator that has been formed into a ring.

5,749,662
PRINTING METHOD FOR RECORDING APPARATUS WITH MULTIPLE PRINT HEADS

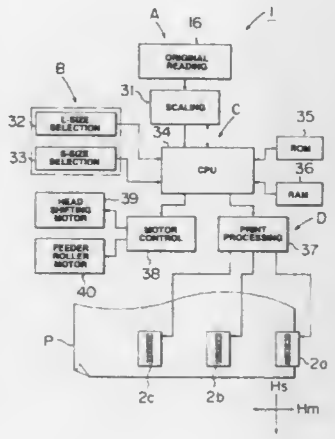
Souhei Shibasaki; Yukio Sawano, both of Tokyo; Shuzo Hanaoka, and Hiroyoshi Takano, both of Nagano, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 11, 1996, Ser. No. 763,784

Claims priority, application Japan, Dec. 15, 1995, 7-348036; Dec. 15, 1995, 7-348037

Int. Cl.⁶ B41J *3/54*

U.S. Cl. 400—82 **14 Claims**



1. A printing method of a recording apparatus for performing enlargement printing of one continuous line by simultaneously shifting a plurality of printing heads arranged at a given interval in a primary scanning direction by a shifting magnitude, said printing method comprising the steps of:
performing an enlarging process for image data;
setting said shifting magnitude of said printing heads in said primary scanning direction to be greater than a shifting magnitude utilized in standard printing;
setting dividing points for shifting traces of each of said printing heads such that the shifting traces of adjacent ones of said printing heads partially overlap one another;
establishing divided printing zones between said dividing points to be printed by each of said printing heads in a non-overlapping manner; and
controlling a printing timing of the respective printing heads for performing an enlarging printing of the one continuous line.

5,749,663
MULTIPLEX WRITING INSTRUMENT

Kazunari Takahashi, Yoshikawa, Japan, assignor to Pentel Kabushiki Kaisha, Japan

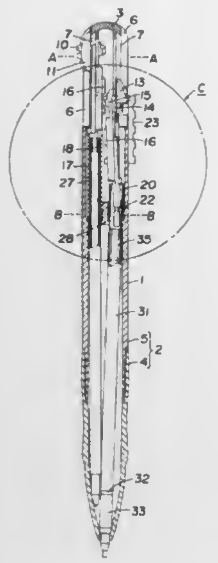
Filed Jul. 30, 1996, Ser. No. 688,442

Claims priority, application Japan, Jul. 31, 1995, 7-214241; Oct. 31, 1995, 7-306507; Nov. 30, 1995, 7-336160; May 30, 1996, 8-158879

Int. Cl.⁶ B43K *7/00*

U.S. Cl. 401—31 **4 Claims**

1. A multiplex writing instrument in which a plurality of writing elements including at least one mechanical pencil are provided in a barrel body and are respectively urged rearward by resilient members, said writing elements being arranged so that a selected writing element is projected from said barrel body when a pressure member secured to a rear end of said selected writing element is made to move forward, and in which said mechanical pencil comprises an external member connected to a corresponding pressure member, and a lead feeding mechanism disposed inside said external member, a knock member for operating said lead feeding mechanism being disposed on said corresponding pressure member.



5,749,664
COSMETIC CONTAINER HAVING AN INSERT SLEEVE TO IMPROVE AIR TIGHTNESS AND ROTATIONAL CHARACTERISTICS

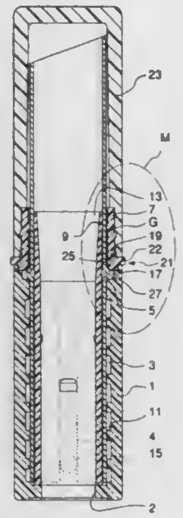
Takashi Inoue, Fujisawa; Kenichi Ito, Funabashi; Tetsuo Kobayashi, Nagareyama; Hirobumi Matayoshi, Toride; Masahisa Koyama, Tsukuba, and Hideo Fujita, Kashiwa, all of Japan, assignors to Hidan Co., Chiba, Japan

Filed Jul. 7, 1995, Ser. No. 499,146

Claims priority, application Japan, Jul. 8, 1994, 6-179659; Mar. 31, 1995, 7-097517

Int. Cl.⁶ B43K *21/08;23/00*

U.S. Cl. 401—78 **26 Claims**



1. A cosmetic container comprising: a main body provided at a lower portion thereof with slot means extending in a longitudinal direction; an outer body having an open upper end and being provided with a continuous spiral groove on an inner peripheral surface thereof, said outer body surrounding said main body substantially in close relation to each other but allowing relative rotation therebetween; a cosmetic holder accommodated within said main body substantially in close relation to each other but allowing relative longitudinal sliding movement therebetween, said cosmetic holder being provided with projection means projecting outwardly therefrom through said slot means to be in engagement with said continuous spiral groove so that said cosmetic holder moves longitudinally with respect to said main body in response to rotation of said outer body; an insert sleeve surrounding said main body and arranged fixedly with respect to said outer body; said main body being provided on an outer peripheral surface thereof with an annular projection which contacts with a bottom portion of said insert sleeve and is spaced apart from an inner peripheral surface of the open upper end portion of said outer body.

5,749,665
KNOCK-TYPE LIQUID APPLICATOR

Naoki Kato, Ishioka, and Masayuki Kawasaki, Soka, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

PCT No. PCT/JP94/01998, § 371 Date Jul. 20, 1995, § 102(e) Date Jul. 20, 1995, PCT Pub. No. WO95/15265, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 29, 1994, Ser. No. 500,882

Claims priority, application Japan, Nov. 30, 1993, 5-068943 U; Jan. 31, 1994, 6-027424; Jan. 31, 1994, 6-027432; Jan. 31, 1994, 6-087751; May 31, 1994, 6-140984

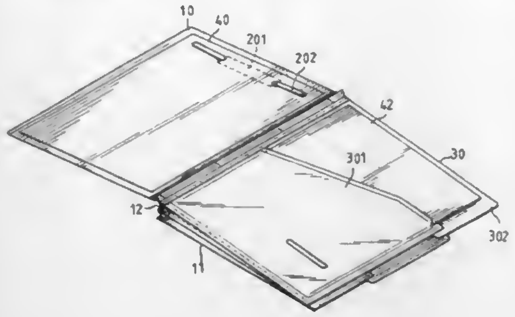
Int. Cl.⁶ B43K *5/18;5/00;* **F04B** *43/00*

U.S. Cl. 401—264 **4 Claims**

1. A knock-type applicator comprising:
a main body having a first end and a second end;
a storage chamber located in the main body for storing a coating solution;
an application member having a first end and a second end for retaining by a capillary force a coating solution supplied from the storage chamber and supplying the coating solution to an article to be coated, the application member being mounted in and extending into the main body;
an absorbing member mounted in the main body for absorbing by a capillary force the coating solution and supplying the coating solution to the application member, the absorbing member having a first end, a second end, a first recess at the first end thereof connected to the second end of the application member, and a second recess at the second end thereof, the second end of the absorbing member being connected with and in fluid communication with the second end of the application member;
a valve disposed between the storage chamber and the absorbing member for directing the coating solution from the storage chamber to the absorbing member;
a first space defined between an outer periphery of the absorbing member and the main body;
a second space defined between an outer periphery of the application member and the main body, the second space opening to the outside of the main body and being in fluid communication with the first space; and
an actuator for actuating the valve to direct the coating solution from the storage chamber to the absorbing member, the valve comprising a valve body connected to the actuator and movably mounted in the second recess at the second end of the absorbing member, and a cover member having a tubular portion disposed in the second recess, the tubular portion having a valve seat for engagement by the valve body, the actuator comprising a movable member having a pressing portion and a flexible portion integrally connecting the pressing portion and the main body so that the pressing portion is axially movable in the main body, the pressing portion being connected to the valve body, the flexible portion comprising a first disc portion, a second disc portion smaller than the first disc portion, and a cylindrical wall portion connecting the first and second disc portions to one another, the cylindrical wall portion having a thickness greater than a thickness of each of the first and second disc portions.

5,749,666
EXPANDING FILE

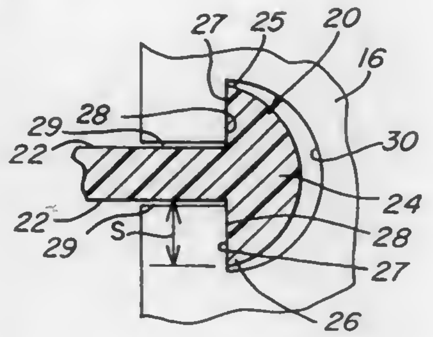
Chung Cheng Yu, No. 12-5, Alley 1, Lane 31, Ta-Li St., Ta-Li City, Taichung, Taiwan
Filed Mar. 18, 1996, Ser. No. 617,367
Int. Cl.^{6} B42F *13/06*
U.S. Cl. 402—18 3 Claims



1. An expanding file comprising:
an upper cover, a bottom cover and at least one plate arranged between said upper cover and said bottom cover, each of said upper cover, said bottom cover and said plate having an inner side and an outer side;
a document folder having at least one open side, the document holder fixedly attached to the at least one plate;
an elongated connecting member having a first side and a second side each extending along a longitudinal axis thereof, said first side and said second side thereof respectively fixedly disposed to one of said two adjacent inner sides of said upper cover, said bottom cover and said plate, and
a fastener binder, said fastener binder having a base portion with two ends and being fixedly attached to at least one of said upper cover, and said bottom cover by way of ultrasonic weld, a deformable extension part extending from each one of said two ends of said base portion.

5,749,667
NOTEBOOK SYSTEM

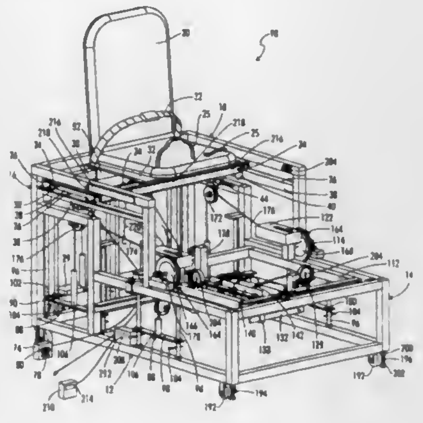
Jacobo Feldman, and Shirley Czukerberg, both of 2101 NW. 53rd St., Boca Raton, Fla. 33496
Continuation of Ser. No. 488,242, Jun. 7, 1995, Pat. No. 5,553,959. This application Aug. 14, 1996, Ser. No. 696,390
Int. Cl.^{6} B42F *13/00*
U.S. Cl. 402—79 9 Claims



1. A plurality of refill sheets for use in a notebook system, the refill sheets comprising:
a plurality of sheets arranged in a stack;
each sheet of said stack having a plurality of openings therein, which openings are spaced apart along an edge of the sheets, the respective openings of each sheet in the stack being aligned with each other;
each opening having:
a generally mushroom-shape configuration with a bulbous opening portion and a stem opening portion which connects said bulbous opening portion to an open edge of said sheet, said bulbous opening portion defined by an arcuate surface having opposite ends and a substantially flat bearing surface having opposite ends which are substantially coincident with the opposite ends of said arcuate surface;
and said stem opening portion being defined by a narrow channel opening having a width smaller than a width of said flat bearing surface and connecting the open edge of said sheet to said flat bearing surface, and wherein said narrow channel opening of said stem opening portion is defined by opposite, substantially flat surfaces; and
wherein a plurality of disk-like fastening members are insertable in respective openings of said stack of sheets to retain said sheets in said stack.

5,749,668
APPARATUS FOR EXERCISING AND/OR REHABILITATING AN ANKLE

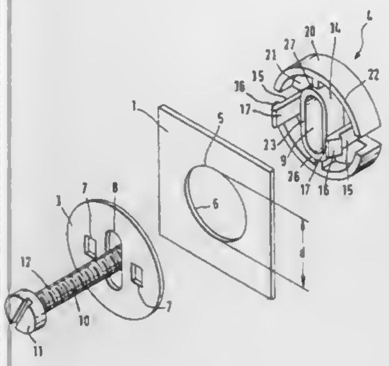
Gary Eugene McIlvain, 4423 Soper Ave., Nashville, Tenn. 37204, and Charles Neil McIlvain, 5625 Constantine Dr., Rockvale, Tenn. 37153
Filed Aug. 21, 1996, Ser. No. 703,352
Int. Cl.^{6} A63B *23/08*
U.S. Cl. 482—79 31 Claims



1. An apparatus for exercising an ankle, comprising:
a base frame;
a seat mounted on the base frame;
a foot carriage assembly comprising a foot carriage frame pivotally attached at spaced apart sides to the base frame enabling plantar and dorsiflexion of the foot;
the foot carriage frame further including a foot plate assembly comprising a support arm pivotally attached at spaced apart ends to the foot carriage frame such that the support arm pivots about a longitudinal axis of the apparatus enabling inversion and eversion of the foot, and a foot platform pivotally attached to the support arm such that the platform pivots laterally about a pivot point at a rear portion of the platform enabling abduction and adduction of the foot: and
a resistance system operably connected to the foot carriage assembly for providing resistance against a force applied by a person during use.

5,749,669
DEVICE FOR THE MUTUAL ALIGNMENT AND ATTACHMENT OF TWO COMPONENTS

Alfons Ketteler, Darmstadt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Dec. 13, 1996, Ser. No. 766,305
Claims priority, application Germany, Feb. 2, 1996, 196 03 751.4
Int. Cl.^{6} F16B *39/00*
U.S. Cl. 403—12 7 Claims

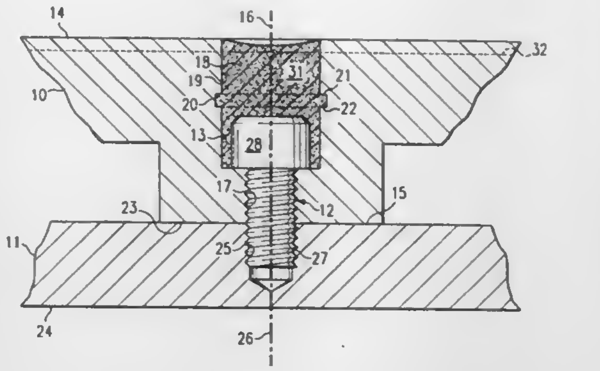


1. Device for fastening together first and second components in spaced relationship, the first component having an opening, said device comprising:
a spacer configured to be received between said first and second components, said spacer having a slot flanked by a pair of fingers configured so as to be extendable through said opening in said first component,
a washer having a slot flanked by a pair of holes spaced to receive said fingers therethrough when said slot in said washer is aligned with said slot in said spacer, said washer having an outside diameter which is configured to be larger than the opening in the first component as said fingers are extended through said opening in said first component and received in said holes in said washer, and
a screw member received in through said slot in said washer, and said slot in said spacer, said slots both being elongated, and said fingers and holes being positioned so that when said fingers are in said holes, the slots in the washer and spacer are both elongated in the same direction transverse to said screw member, said screw member being moveable in said elongated slots in the transverse direction to provide adjusting relative movement of said first and second components during fastening of said first component in spaced relationship with said second component.

5,749,670
METHOD FOR FASTENING PARTS TOGETHER AND RESULTING STRUCTURE

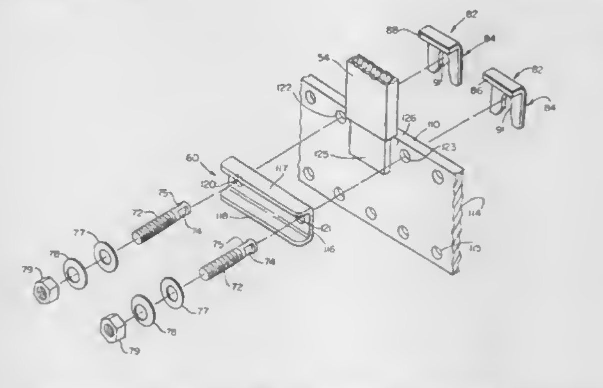
John J. Astor, Bradford, Pa., assignor to Dresser-Rand Company, Olean, N.Y.
Filed Apr. 4, 1996, Ser. No. 627,465
Int. Cl.^{6} F16B *5/02;5/08*
U.S. Cl. 403—269 20 Claims

12. A structure of joined elements comprising:
a first element having first and second surfaces with a first hole extending through said first element from said first surface to said second surface, said first hole having a longitudinal axis and a first axial section and a second axial section having larger radial dimensions than said first axial section and being positioned along said longitudinal axis, said second axial section having an annular sidewall surface with at least one recessed cavity formed in said annular sidewall surface, each said at least one recessed cavity having a first wall portion and a second wall portion with each said second wall portion being located between the first wall portion of the respective recessed cavity and the first axial section of said first hole and with each said first wall portion extending generally outwardly with respect to the longitudinal axis of said first hole;
a second element having a first surface and a second hole opening in said first surface of said second element, said second hole having threads and a longitudinal axis, wherein said second structural element is positioned with respect to the first structural element such that said first hole and said second hole are substantially coaxial with each other with said second axial section being remote from said second structural element;
a fastener having a head portion, the fastener being positioned in said first and second holes so as to join said first and second elements, such that said fastener occupies only a portion of said second axial section of said first hole and thereby creates an unoccupied portion of said second axial section of said first hole, the unoccupied portion including a portion of said second axial section located between the head portion of said fastener and said first surface of said first structural element and including said at least one recessed cavity, and wherein said fastener has threads for engaging the threads of said second hole;
a hardened cast material contained within said first hole so as to fill the unoccupied portion of said second axial section of said first hole and said at least one recessed cavity wherein said hardened cast material is thereby mechanically retained in said first structural element.



5,749,671
BUS BAR ASSEMBLY, FASTENING SYSTEM THEREFOR, AND METHOD

Jacques Chauquet, Ayse-Bonneville, France, assignor to Erico International Corporation, Solon, Ohio
Filed Nov. 13, 1995, Ser. No. 556,582
Int. Cl.^{6} F16B *5/06;* **H01R** *4/38*
U.S. Cl. 403—384 16 Claims



1. A fastening system for bus bar panels comprising a headless stud having threads on one end and at least one flat on the other end whereby the flatted end may be inserted through a hole in a bus bar with the threaded end projecting toward the front, and a clip adapted to be slipped behind the bus bar to engage the flat

whereby a nut and washer assembly may be used on the threads to make a bus bar connection, including at least three closely spaced parallel bars in the panel forming a phase, the flatted end extending between at least two bus bars of the phase to make a connection between said two bars, said clip extending between the second and third bar.

5,749,672
IRRIGATION PROCESS

Peter Chamberlain, Shipley, United Kingdom, and Richard Everett Cole, Oakdale, Calif., assignors to Allied Colloids Limited, West Yorkshire, United Kingdom

Filed Jul. 13, 1995, Ser. No. 502,218

Claims priority, application United Kingdom, Jul. 15, 1994, 9414302

Int. Cl.⁶ E02B *13/00*

U.S. Cl. 405—36 **20 Claims**

1. A process of irrigating soil adjacent to an elongated furrow that leads from an inlet end to an outlet end, the process comprising

providing a supply of water from a header into the inlet end and allowing the supplied water to flow along the furrow and to infiltrate from the furrow into the soil adjacent the furrow as the water advances towards the outlet during an advance stage and thereafter as the water runs-off from the outlet end, and

then terminating the supply, and in which

erosion of the furrow is reduced and the infiltration is increased throughout the process by flocculating suspended soil particles from the water, the flocculating being caused by a process comprising providing a water-erodible block material which contains water-soluble polymeric flocculent at a dissolution position in the header or inlet end of the furrow and flowing the supply of water turbulently over the block material whereby water falls onto exposed surfaces of the block material from the start of the advance stage and thereby dissolving flocculent into the water.

and removing any residual block material from the dissolution position before substantial run-off occurs.

5,749,673
STACKABLE VERTICAL PANEL

Jack H. Kulp, San Juan Capistrano, Calif., and Billy E. Wehring, Austin, Tex., assignors to Traffix Devices, San Clemente, Calif.

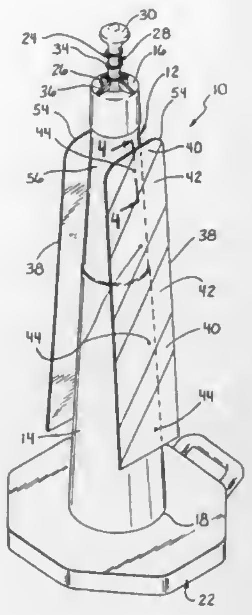
Continuation-in-part of Ser. No. 195,119, Feb. 10, 1994, Pat. No. 5,560,732. This application Jul. 18, 1995, Ser. No. 503,264

Int. Cl.⁶ E01F *9/012*

U.S. Cl. 404—10 **20 Claims**

20. A method of storing or transporting a plurality of vertical panel delineators for use in identifying road construction zones, each of which comprises a conical body portion fabricated of molded plastic and having at least one rectangular generally planar vertical panel having a flexible highly reflective material fixedly attached thereto, a portion of said vertical panel extending tangentially along a portion of said conical body portion, the method comprising the steps of:

standing a first one of said delineators in an upright position; and stacking a second one of said delineators over said first delineator in a nesting fashion such that the vertical panel attached to the first delineator wraps about the conical body portion thereof as the second delineator slides over the first vertical panel.



5,749,674
METHOD OF PAVEMENT REPAIR

Jack H. Wilson, Sr., 3775 Coker Rd., Jackson, Miss. 39213

Filed Sep. 4, 1996, Ser. No. 707,449

Int. Cl.⁶ E01C *7/32*

U.S. Cl. 404—75 **12 Claims**

1. A method of repairing pavement, comprising the steps of:

a) coating all exposed surfaces of a void in a paved area as well as a portion of the pavement surface surrounding the void with a liquid waterproof material;
b) filling a substantial portion of the void with concrete;
c) allowing the concrete to set for a sufficient period of time;
d) applying a layer of polymer fortified portland cement of sufficient thickness to fill the remaining portion of the void and overlapping the surrounding pavement surface;
e) allowing the layer of polymer fortified portland cement to cure for a sufficient period of time;
f) applying a waterproof sealer layer over the entire repaired area.

5,749,675
UNDERGROUND TANK FOR STORAGE OF LIQUIDS AT AMBIENT TEMPERATURE AND LOW TEMPERATURE LIQUIFIED GASES

Franco Ferrari, Rome, Italy, assignor to Ing Nino Ferrari-Impresa Construzioni Generale SRL, Italy

Filed Aug. 17, 1995, Ser. No. 516,103

Claims priority, application Italy, Nov. 17, 1994, GE94A0129; Apr. 14, 1995, GE95A0040

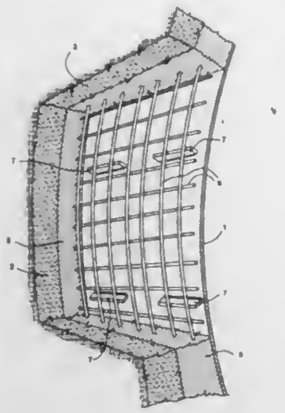
Int. Cl.⁶ B65G *5/00;* **E21F** *17/16*

U.S. Cl. 405—52 **14 Claims**

1. An underground storage tank consisting of an internal metal containment structure (**1**), an outer static facing (**2**) in touch with surrounding soil (**3**) and a filler (**5**), poured between the metal structure (**1**) and the static facing (**2**) through first and second feed bushes (**13**, **15**), the metal structure (**1**) being formed by rings (**1***a*, **1***b*, **1***c*, **1***d*) placed side by side with some spacing and featuring transverse (**4**) and longitudinal channels, welded onto edges of these rings, for location and drainage of leaks, the transverse channels (**4**) being formed by omega sections (**8**) and flats (**9**), whereas horizontal channels are formed by flats (**10**, **11**) and the metal structure (**1**) is supported by the static facing (**2**) by means of, insulating, U-bolts (**20**) to which the external omega sections (**8**) of the transverse channels (**4**) are secured, characterized in that:

a netting (**6**) is fastened by flat joint plates (**7**) positioned on the outside of the metal structure in the direction of a longitudinal tank axis, so that the netting (**6**) is embedded in the filler (**5**) and will act as a stabilizer;

vessels (**18**) are combined with the second feed bush and a third feed bush (**15**, **16**) through which the filler (**5**) is charged in order to apply a greater load on the filler material, to provide for thickening of the filler (**5**) and a better bond to walls of the metal structure (**1**) and of the static facing (**2**), at least in an upper tank zone as well as to ensure optimum structural stability of the tank.



5,749,676
METHOD OF ACCESSING A SUB SEA WELL AND A GUIDE ARRANGEMENT THEREFOR

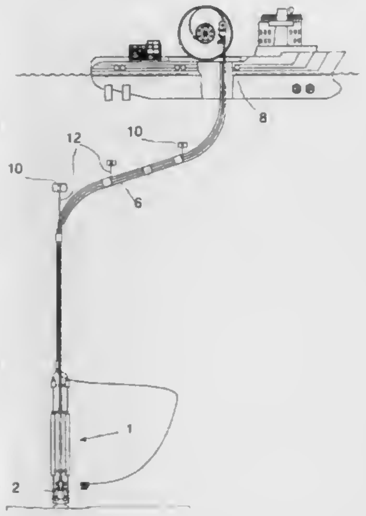
Philip Head, 6 Leith Mansions, Grantully Road, London W9 1LQ, Great Britain

Filed Jan. 18, 1996, Ser. No. 588,196

Claims priority, application United Kingdom, Jan. 18, 1995, 950 09 54.4

Int. Cl.⁶ E21B *33/043;33/072;41/04;* **F16L** *11/133*

U.S. Cl. 405—171 **11 Claims**



11. A method for accessing a subsea well comprising the steps of:

(a) positioning a surface vessel above a well head of a subsea well;
(b) tethering at least one buoy of a guide arrangement to said well head with a guide line, said guide arrangement having a guide alignable with said well head;
(c) evacuating said at least one buoy to tension said line, render said guide arrangement rigid and align said guide with said well head;
(c) feeding a flexible coil tubing from said vessel through said guide to said well head;
(e) extending said tubing between said vessel and said guide for a length sufficient to compensate for movement of said vessel relative to said well head; and
(f) controlling a profile of at least a stretch of said tubing between said vessel and said well head by affixing to said stretch adjustable buoyancy members and controlling the buoyancy of said members.

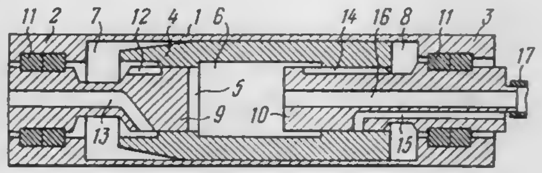
5,749,677
APPARATUS FOR IMPACT ACTION

Vladimir Alexandrovich Grigoraschenko; Veniamin Viktorovich Kamensky, both of Novosibirsk; Vladimir Alexeevich Klimenko, Omsk; Mikhail Vladimirovich Kurlenya, Novosibirsk; Vladimir Dmitrievich Plavskih, Novosibirsk; Anatoly Antonovich Repin, Novosibirsk; Sergei Konstantinovich Tupitsin, Novosibirsk, and Sergei Jurievich Fetisov, Novosibirsk, all of Russian Federation, assignors to Institut gornogo dela Sibirskogo otdelenia Rossiiskoi Akademii nauk, Russian Federation

Filed Jun. 10, 1996, Ser. No. 658,442

Int. Cl.⁶ E02F *5/10;* **E21B** *4/14;* **B25D** *9/00*

U.S. Cl. 405—184 **5 Claims**



1. An apparatus for impact action comprising:

a body;

a striker having a through central channel, the striker being positioned inside said body and capable of performing reciprocal movement therein;

a front chamber defined by said body and said striker;

a rear chamber defined by said body and said striker;

an air duct; and

an air distribution system which is autonomous for each of said front chamber and said rear chamber, said air distribution system including first separate channel for the inlet of a fluid medium into said front chamber, second separate channel for the exhaust of the fluid medium from said front chamber, third separate channel for the inlet of the fluid medium into said rear chamber, and fourth separate channel for the exhaust of the fluid medium from said rear chamber, whereby separate autonomous control of each of said front chamber and said rear chamber is achieved.

5,749,678
DEVICE FOR DRIVING A TUNNEL OR DRAIN PIPE

Rolf Dose, Filderstadt, and Arnold Diehl, Neckartailfingen, both of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Germany

PCT No. PCT/EP95/01137, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO95/30065, PCT Pub. Date Nov. 9, 1995

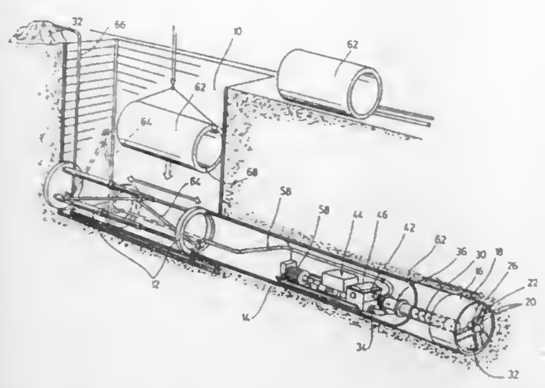
PCT Filed Mar. 25, 1995, Ser. No. 732,395

Claims priority, application Germany, May 3, 1994, 44 15 399.6

Int. Cl.⁶ F16L *1/00;* **E03F** *3/06*

U.S. Cl. 405—184 **13 Claims**

1. An arrangement for driving a tunnel or drain pipe along a driving stretch leading from a starting shaft to a target shaft,



comprising a driving head, which has a cylindrical shell and a drilling disk, which can be rotated on the front side about a center axis of the shell and can be driven by a motor, a number of pipe pieces, which can be introduced one after the other through the starting shaft into the driving stretch, a first pipe piece of the pipe pieces rests axially against the shell of the driving head, a pressing carriage, which can be supported on an abutment within the starting shaft, presses the pipe pieces axially in the direction of the driving stretch, a cutting chamber, which can be loaded with around spoil through openings in the drilling disk, a transporting pipe for the removal of the spoil from the cutting chamber to a spoil transporting stretch connected to an outlet end of the transporting pipe which transporting pipe is equipped with a conveyor worm or a pair of conveyor-worms, and a stone trap, which can be closed off pressure-tight, and a vacuum side of a thick matter pump, which vacuum side can be closed off pressure-tight, can be connected one after the other to the outlet end of the transporting pipe, the thick matter pump being connected on the pressure side to a successively extendable conveyor line for the spoil, the thick matter pump being a hydraulically operatable piston pump with one or two conveyor cylinders, the conveyor cylinder or cylinders respectively end or ends in a material-feed container, which can be closed off pressure-tight, and into which extends a pipe switch connected to the conveyor line and alternately connectable to one conveyor cylinder or the conveyor cylinders.

5,749,679

METHOD AND DEVICE FOR LETTING OUT GAS FROM LIFE JACKETS OF DIVERS

Thomas Kromp, Essen, Germany, assignor to GfT Gesellschaft fuer Tauchtechnik mbH & Co. KG, Essen, Germany

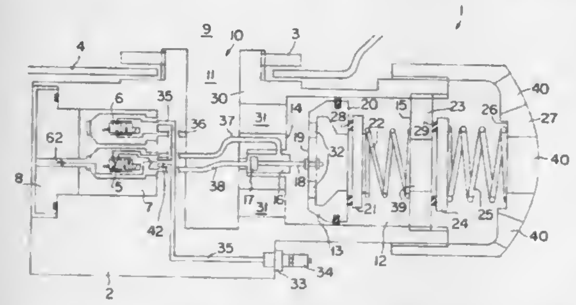
PCT No. PCT/EP94/02719, § 371 Date Feb. 20, 1996, § 102(e) Date Feb. 20, 1996, PCT Pub. No. WO95/05306, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 16, 1994, Ser. No. 596,227

Claims priority, application Germany, Aug. 19, 1993, 43 27 833.7; Jul. 16, 1994, 44 25 223.4

Int. Cl.⁶ B63C *11/02*

U.S. Cl. 405—186 **47 Claims**



1. A method of letting out gas from a life jacket for divers through a device adapted to be in gas flow communication with an interior of the life jacket, the method comprising the steps of:

drawing gas into the device from the interior of the life jacket;
compressing the gas in the device;
discharging the gas from the device to a medium surrounding the device;
performing the steps of drawing, compressing and discharging by:
  utilizing an actuating element and a piston each being a part of the device, the actuating element being operatively connected to the piston; and
  actuating the actuating element between two end positions; and
determining the end positions of the piston by utilizing a limit switch.

5,749,680

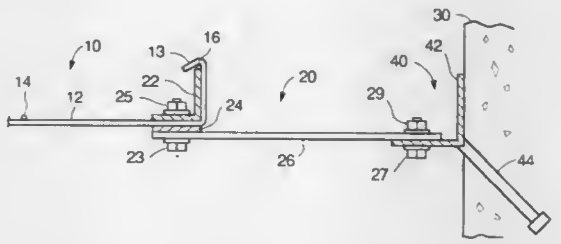
WIRE MAT CONNECTOR

William K. Hilfiker, 3718 Grapevine Dr., Grepevine, Tex. 76051, and Thomas P. Taylor, Euless, Tex., assignors to William K. Hilfiker, Grapevine, Tex.

Filed Nov. 5, 1996, Ser. No. 743,191

Int. Cl.⁶ E02D *29/02*

U.S. Cl. 405—262 **28 Claims**



1. An apparatus for retaining an earthen formation, comprising:
a face panel vertically disposed with a back face facing the earthen formation and preformed to include an anchor embedded in the face panel and extending from the back face in at least one predetermined location,
a soil reinforcing mat horizontally disposed within the earthen formation in general correspondence with the predetermined location, said mat having an end adjacent the face panel folded to form substantially a right angle portion of the mat including a vertical face and a horizontal face,
first right angle member having a vertical face and a horizontal face disposed in contact with the corresponding vertical face and horizontal face of the right angle portion of the mat, and
means for securing the first right angle member to the anchor such that the right angle portion of the mat is rigidly clamped therebetween.

5,749,681

HIGH TENSILE STRAND, ANCHORAGES AND METHODS OF INSTALLATION THEREOF

Jeffrey Doidge, Cardiff, and Terence Cassidy, Sheffield, both of United Kingdom, assignors to Edgar Allen Engineering Limited, Sheffield, United Kingdom

PCT No. PCT/GB95/00274, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO95/23277, PCT Pub. Date Aug. 31, 1995

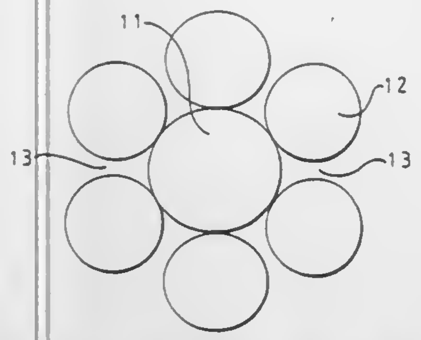
PCT Filed Feb. 10, 1995, Ser. No. 696,974

Claims priority, application United Kingdom, Feb. 25, 1995, 9403675

Int. Cl.⁶ E21D *20/02*

U.S. Cl. 405—302.2 **8 Claims**

1. An anchorage in rock of a high tensile strand, the strand comprising a core wire and a ring of outer wires, each outer wire being arranged in a helical pattern around the core wire and contacting the core wire along a length of each outer wire, the strand being located in a bore formed in the rock and the strand being anchored therein by a bonding agent, the strand being fitted within the bore with a clearance sufficient to permit easy insertion of the strand and to allow flow of bonding agent therearound;
  wherein the diameter of the core wire is between 5% and 50% greater than the diameter of the outer wires and sufficient gaps are provided between adjacent outer wires by which a bonding agent impregnates into the strand through the gaps between adjacent outer wires for securing the stand within a bore formed in the rock.



5,749,682

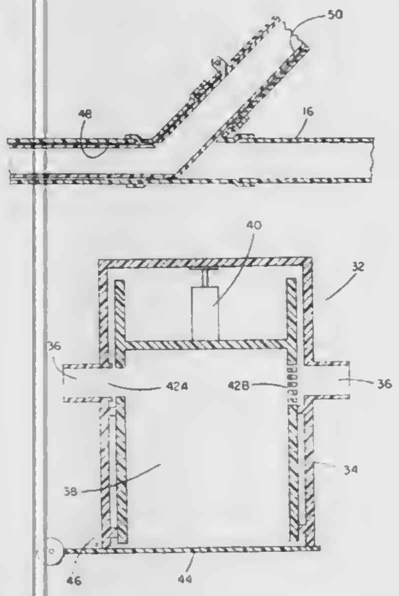
ARTICLE COLLECTION AND DISTRIBUTION SYSTEM

J. Carrol Epting, Pfafftown, N.C., assignor to Renfro Corporation, Mount Airy, N.C.

Filed Sep. 10, 1996, Ser. No. 707,946

Int. Cl.⁶ B65G *51/02*

U.S. Cl. 406—1 **4 Claims**



1. Apparatus for pneumatically conveying a plurality of articles selectively from at least one of a plurality of sources of the articles to at least one of a plurality of remote locations, the apparatus comprising:
  auxiliary conduits each having an inlet and an outlet and connected at the inlet thereof to a respective one of the plurality of the sources of the articles;
  secondary conduits each having an inlet and an outlet and connected at the outlet thereof to a respective one of the plurality of the remote locations;
  a primary conduit connected to the auxiliary conduits at the outlets thereof and the secondary conduits at the inlets thereof;
  a plurality of tubular sleeves slidably carried within the primary conduit each proximate a respective one of the auxiliary conduits and having a wall and a side opening in the wall, wherein each of the tubular sleeves is selectively slidable between a first position wherein the side opening thereof and the inlet of the respective auxiliary conduit coincide with one another to open the outlet of the respective auxiliary conduit for selectively conveying the articles from the respective source of the articles to the primary conduit, and a second position wherein the side opening thereof and the inlet of the respective auxiliary conduit are displaced from one another to close the outlet of the respective auxiliary conduit;
  a plurality of tubular liners carried within the primary conduit each having an end cut at an angle proximate the inlet of a respective one of the secondary conduits; and
  a plurality of tubular inserts each slidable carried within the respective secondary conduit and having an end cut at an angle proximate the primary conduit for selectively joining with the cut end of a respective one of the tubular liners, wherein each of the tubular inserts is selectively slidable between a first position partially inserted into the primary conduit to close the primary conduit wherein the cut ends of the tubular insert thereof and the respective tubular liner are joined together for selectively conveying the articles from the primary conduit to the respective remote location, and a second position withdrawn from the primary conduit to open the primary conduit.

5,749,683

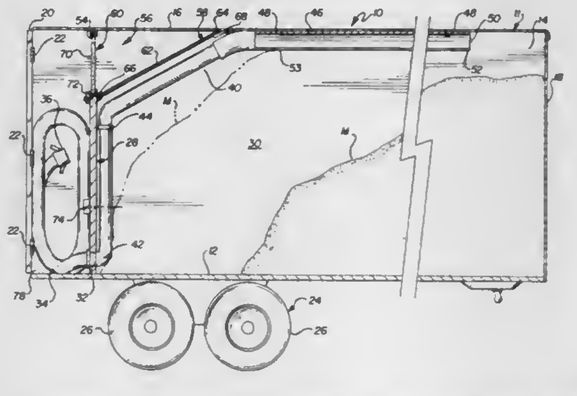
DRY VAN TRAILER CONVERSION AND MATERIAL HANDLING METHOD

Thomas R. Kunse, Clare, Mich., assignor to Northern Logistics, L.L.C., Clare, Mich.

Filed Sep. 30, 1996, Ser. No. 723,524

Int. Cl.⁶ B65G *53/24*

U.S. Cl. 406—41 **16 Claims**



1. A trailer construction for receiving and transporting flowable dry solids material in bulk, comprising:
  an elongate dry van trailer body having a bottom wall, a top wall, a pair of side walls, a front wall, and at least one closable back door;
  a wheel carriage supporting said trailer body;
  a bulkhead adjacent the back of said trailer body enclosing an interior space within said trailer body, said bulkhead having a material inlet and an air outlet;
  an exterior flexible fill tube having a first end coupled to said material inlet of said bulkhead and an opposite free end connectable to a source of pressurized flowable dry solids material so as to direct a high velocity flow of such material through said exterior fill tube and into the interior of said trailer body;
  an integral interior distribution conduit supported by said trailer body within the interior of said trailer body and coupled at one end thereof to said material inlet, said conduit extending longitudinally forwardly of said inlet above said bottom wall to an open end adjacent said front wall of said trailer body, said conduit including a longitudinal material distribution opening extending rearwardly from said open end of said

conduit to a closed rearward end of said opening adjacent said back of said trailer so as to discharge the high velocity flow of material from said conduit in a manner to fill said trailer generally from front to back; and

a filter system arranged between said interior of said trailer and said air outlet of said bulkhead to permit the passage of air therethrough out of said trailer through said air outlet while preventing the escape of the solids material from through said air outlet.

5,749,684
PARTICULATE MATERIAL FEEDING APPARATUS AND PROCESS

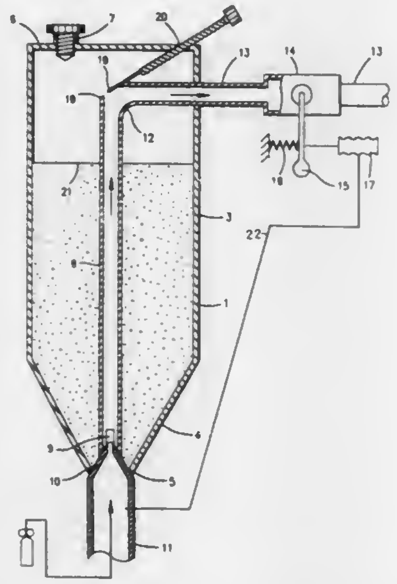
Franziskus Horn Feja, Santiago, Chile, assignor to Fosfoquim S.A., Santiago, Chile

Filed Jun. 3, 1996, Ser. No. 655,697

Claims priority, application United Kingdom, Jun. 7, 1995, 9511494

Int. Cl.⁶ B65G *53/50*

U.S. Cl. 406—141 **15 Claims**



1. Apparatus for feeding a free-flowing particulate material entrained in a carrier gas from a bed of the particulate material, said apparatus comprising a riser tube having an inlet in an inlet region of the riser tube, the inlet being for the particulate material and adapted to be immersed in the bed of the particulate material, means for pneumatically propelling the particulate material entrained in the carrier gas from the inlet region, thru the riser tube, a duct for onward forwarding of the gas-entrained material to an onward location, a bend leading from the riser tube remote from the inlet arranged to deflect the gas-entrained particulate material thru the bend into the duct for onward forwarding, and an aperture in the bend passing thru an outer periphery of the bend, directed substantially in axial alignment with the riser tube, and being generally outside the bed of particulate material, to intercept and eject a proportion of the gas-entrained particulate material by momentum thereof to control a rate of the feeding, thereby correspondingly reducing a proportion destined for onward forwarding.

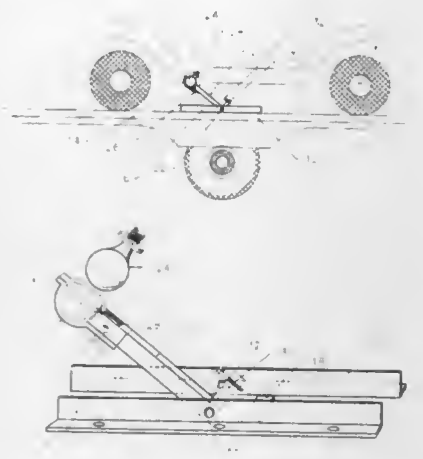
5,749,685
ADJUSTABLE SECURING APPARATUS

Ronald J. Hain, 213 Mtn View, Anaconda, Mont. 59711

Filed Mar. 20, 1997, Ser. No. 822,341

Int. Cl.⁶ B60P *7/08*

U.S. Cl. 410—7 **1 Claim**



1. An new adjustable securing apparatus in combination with a bed of a transport vehicle for use with a trailer ball secured on a vehicle to be transported, said adjustable securing apparatus comprising:

a frame;

said frame comprising two pieces of angle iron, said two pieces of angle iron being positioned parallel with one another in longitudinal arrangement on the bed of the transport vehicle and securely mounted to the bed of the transport vehicle via fastening means;

said frame comprising a strap, said strap being attached perpendicularly to one of said two pieces of angle iron and lying flat on the bed of the transport vehicle;

a swing arm, said swing arm having a first and a second end thereof;

said swing arm being mounted in a hinged manner on said first end thereof to and between said two pieces of angle iron;

said swing arm being capable of swinging from said first end thereof from a resting position parallel with and on the bed of the transport vehicle to a raised attachment position for engaging said trailer ball secured on the vehicle to be transported;

said swing arm having a trailer ball coupler mounted on said second end thereof, said trailer ball coupler providing for attachment to the trailer ball secured on the vehicle to be transported;

said swing arm having an L-shaped extension on said first end thereof; and,

said L-shaped extension having a threaded bolt mounted therethrough, said threaded bolt providing for adjustment of said swing arm relative to the bed of the transport vehicle by abutting and adjusting against said strap after the vehicle to be transported is secured to said swing arm.

5,749,686
PIVOTABLE SIDEWALL MOUNTED CONTAINER STOP FOR RAILCAR WELL

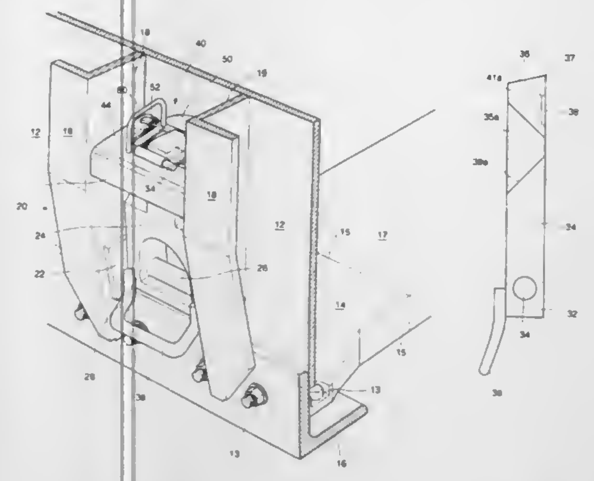
Ronald S. Butcher, and Ilario A. Coslovi, both of Burlington, Canada, assignors to National Steel Car Ltd., Ontario, Canada

Filed Apr. 30, 1996, Ser. No. 641,377

Int. Cl.⁶ B60P *7/135;* **B61D** *45/00*

U.S. Cl. 410—94 **14 Claims**

9. An apparatus for preventing displacement of a cargo container when said cargo container is received in a cargo hold of a transport vehicle or vessel, the apparatus comprising:



an elongate stop member having a base end portion and a distal end portion, the elongate stop member being adapted for pivotable mounting adjacent the base end portion thereof onto the transport vehicle or vessel for rotatable movement of the distal end portion between a retracted position, wherein the distal end portion does not extend into said cargo hold when said elongate stop member is mounted as aforesaid, and an extended position, wherein the distal end portion extends into said cargo hold to thereby prevent longitudinal displacement of the cargo container past the distal end portion when said elongate stop member is mounted as aforesaid;

locking means for releasably retaining the elongate stop member in the retracted position, the locking means being adapted for mounting onto the transport vehicle or vessel, the locking means when mounted as aforesaid being moveable between a lock position, wherein the elongate member is prevented from rotatable movement to its extended position and a release position, wherein the elongate stop member is enabled for rotatable movement to its extended position, the locking means being biased to said lock position; and

wherein the distal end portion of the elongate member is shaped for urging the locking means away from the lock position when the elongate member is brought from its extended position to its retracted position, the locking means being returned to the lock position by said bias when the elongate member has achieved its retracted position.

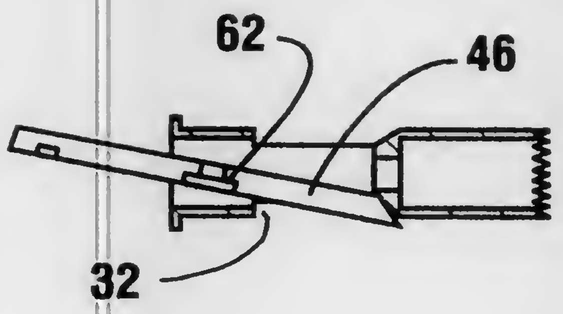
5,749,687
WALL TOGGLE

John C. Kilgore, III, 522 River Rd., Hinckley, Ohio 44233

Filed Apr. 25, 1996, Ser. No. 639,334

Int. Cl.⁶ F16B *21/00*

U.S. Cl. 411—29 **25 Claims**



1. A wall toggle apparatus for securing a fastening member on a wallboard, comprising:

a generally cylindrical body, said body including a passage extending in said body between a first opening and a second opening, wherein said first opening is disposed at a first axial end of said body, and wherein said second opening comprises a pair of radially opposed second openings through said body, said second opening axially disposed from said first end, wherein said body comprises a second axial end opposed of said first axial end, and further comprising at least one cutting tooth in operative connection with said second end, whereby rotation of said body enables said body to cut through said wallboard;

a toggle member, wherein said toggle member is movably mounted on said body and wherein said toggle member is selectively movable in said passage to a projecting position wherein said toggle member extends radially outward from said second opening, whereby in said projecting position said toggle member is engageable with said wallboard to hold said fastening member therein,

wherein said toggle member is moveable in said passage from a generally axially extending position to a first generally radially extending position wherein said toggle member extends radially from one of said second openings in said pair, and wherein said toggle member is movable to a second radially extending position wherein said toggle portion extends radially outward from each of said second openings in said pair,

wherein said toggle member further comprises a ratchet means for engaging with a tool through said first opening to move said toggle member from the first radially extending position to the second radially extending position when said tool is engaged therewith and rotated.

5,749,688
SCREW FIXING PLUG

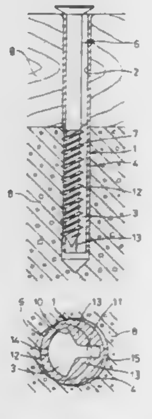
Takao Wakai, Osaka, Japan, assignor to Wakai & Co., Ltd., Osaka, Japan

Filed Oct. 11, 1996, Ser. No. 729,531

Claims priority, application Japan, Oct. 17, 1995, 7-268687

Int. Cl.⁶ F16B *13/04*

U.S. Cl. 411—42 **15 Claims**



1. A screw fixing plug comprising:

a trunk having first and second axial ends, a screw inserting bore extending axially from said first axial end to an axial mid-portion of said trunk, and a composite hole extending axially from said axial mid-portion toward said second end;

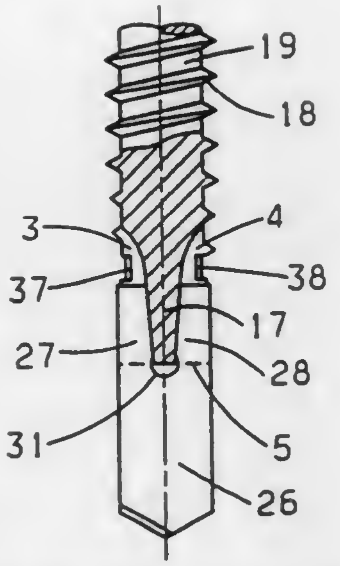
wherein said trunk includes two inwardly projecting axial ribs on an inner periphery thereof;

wherein said two axial ribs are located symmetrically about a symmetry point on a circumference of said trunk; and

wherein said trunk has no inwardly projecting rib at a location on said inner periphery thereof opposite said symmetry point.

5,749,689
DRILL, PARTICULARY DRILLING SCREW

Gottfried Konig, Bad Laube, Germany, assignor to EJOT Verbindung Stechnik GmbH & Co. KG
PCT No. PCT/EP95/00841, § 371 Date Dec. 26, 1996, § 102(e) Date Dec. 26, 1996, PCT Pub. No. WO95/25901, PCT Pub. Date Sep. 28, 1995
PCT Filed Mar. 7, 1995, Ser. No. 704,769
Claims priority, application Germany, Mar. 23, 1994, 44 10 027.2
Int. Cl.^{6} F16B *25/00;13/04*
U.S. Cl. 411—387 **15 Claims**

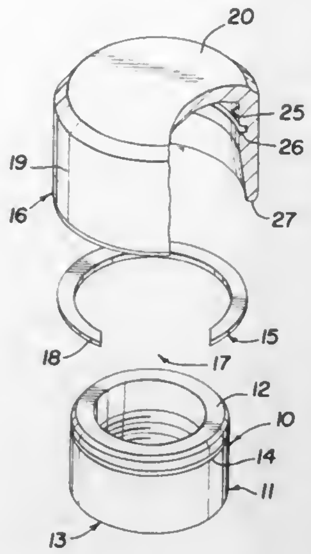


1. Drill with a drilling shank (1), particularly with a screw shank (19, 40) comprising a self-tapping thread (18), and with a fork-shaped hard-material drilling tip (10, 26, 32, 39, 41, 53) disposed opposite the driving end (2) of the shank (1, 19, 40), said drilling tip (10, 26, 32, 39, 41, 53) being inserted into a holder in the shank (1, 19, 40), said holder comprising two grooves (3, 4; 45, 46), disposed diametrically with respect to each other in the shank (1, 19, 40), for accommodating prongs (13, 14; 27, 28; 42, 43; 49, 50) of the drilling tip (10, 26, 32, 39, 41, 53), the width of said drilling tip (10, 26, 32, 39, 41, 53) corresponding to the diameter of the drilling shank (1), characterized in that the shank (1, 19, 40) terminates bluntly in an essentially radially flat end surface (5) from which the grooves (3, 4; 45, 46) extend towards the driving end (2) in such a manner that exclusively the two prongs (13, 14; 27, 28; 42, 43; 49, 50) of the drilling tip (10, 26, 32, 39, 41, 53), pressed axially into the grooves (3, 4; 45, 46) and snugly seated therein, hold the drilling tip (10, 26, 32, 39, 41, 53) self-lockingly on the shank (1, 19, 40), the torque being transmitted from the shank (1, 19, 40) via the walls of the grooves (3, 4; 45, 46) to the two prongs (13, 14; 27, 28; 42, 43; 49, 50).

5,749,690
SCREW NUT FASTENER ASSEMBLY

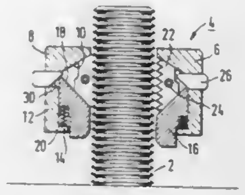
Kurt Kutz, 1408 Cherokee Trail, Atlanta, Tex. 75551
Filed Mar. 17, 1997, Ser. No. 819,117
Int. Cl.^{6} F16B *19/00;33/00;37/14*
U.S. Cl. 411—431 **20 Claims**

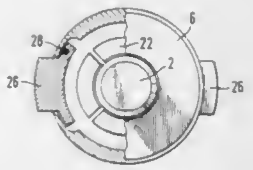
1. A screw nut fastener assembly comprising:
- a nut member, a cap member and a snap ring member;
- said nut member being in the general shape of a thick walled round cylinder section having essentially flat first and second end surfaces, and interior wall surface threaded for mating engagement with a bolt element, and an essentially smooth exterior wall surface, said exterior wall surface having a peripheral groove therein positioned between said end surfaces;
- said cap member being in the general shape of a thick walled round cylinder section having a closed end and an open end and an essentially smooth interior wall surface, said cap member being of a length and internal diameter to accommodate said nut member substantially totally therewithin; said interior wall surface having a peripheral groove positioned at a distance from said open end that it is substantially the same as the distance between the said first end surface and said peripheral groove of said nut member;
- said snap ring member being of a size to rest untensioned partly within said peripheral groove in said nut member and partially within said peripheral groove in said cap member when said cap member is positioned to accommodate said nut member therewithin.



5,749,691
REACTION NUT WITH CAM ACTION QUICK FASTENING

David Campbell, Ashington, United Kingdom, assignor to Hedley Purvis Ltd A Company of Great Britain and Northern Ireland, Morpeth, United Kingdom
PCT No. PCT/GB95/01264, § 371 Date Dec. 3, 1996, § 102(e) Date Dec. 3, 1996, PCT Pub. No. WO95/33931, PCT Pub. Date Dec. 14, 1995
PCT Filed Jun. 1, 1995, Ser. No. 750,070
Claims priority, application United Kingdom, Jun. 7, 1994, 9411313
Int. Cl.^{6} F16B *37/08*
U.S. Cl. 421—433 **9 Claims**

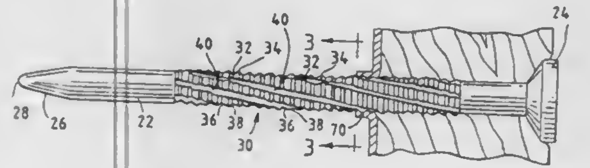




1. A reaction nut used for location on a threaded bolt, the nut comprising:
- a plurality of internally-threaded segments (22) movable between an outermost inoperative position radially spaced from one another so as to be positioned out of engagement with the bolt (2), and an operative position radially together so as to make threaded engagement with the bolt (2), said segments (22) having tapering surfaces thereon,
- a primary ring member (16) movable axially relative to the segments (22) and having a corresponding tapering surface (18) thereon,
- first resilient means (20) for biasing the tapering surface (18) of the primary ring member (16) into engagement with the tapering surfaces on said segments (22),
- cam means (26) for moving the primary ring member (16) from a rest position to an axially displaced position against the bias of said first resilient means (20), and
- associated second resilient means (24) for moving associated segments between their operative and inoperative positions after said cam means moves said primary rind member to the displaced position.

5,749,692
FASTENER WITH POLYMER-COATED SHANK

Frederick A. Kish, Wheeling; Elizabeth J. Eckmann, Chicago, and Lawrence S. Shelton, Morton Grove, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Continuation of Ser. No. 472,906, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 293,003, Aug. 19, 1994, Pat. No. 5,489,179. This application Jun. 5, 1997, Ser. No. 869,500
Int. Cl.^{6} F16B *15/06;15/08*
U.S. Cl. 411—453 **5 Claims**

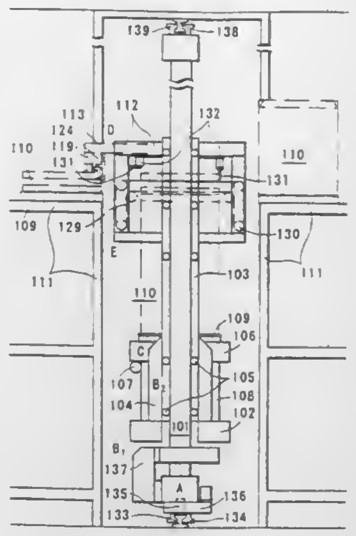


1. A fastener formed from steel wire so as to have a shank, an enlarged head formed at one end of the shank, and a generally pointed tip formed at the other end of the shank, the shank having a ringed portion formed with annular grooves defining annular rings, wherein substantially all of the shank is coated with a thermoset, polymeric material which has a softening point that does not exceed the temperature that the fastener reaches when driven so as to flow upon penetration and so as to resist corrosion, to improve ease of driving the fastener, and to increase holding power of the fastener, as when the fastener is driven through a wooden plywood, or plasterboard workpiece and then through a steel framing member.

5,749,693
METHOD AND APPARATUS FOR PICKING UP PACKAGED SHEETS

Morimasa Hanaya, Mishima, Japan, assignor to Tokushu Paper Mfg. Co., Ltd., Shizuoka-ken, Japan
Division of Ser. No. 441,427, May 15, 1995, Pat. No. 5,630,692. This application Dec. 16, 1996, Ser. No. 768,071
Claims priority, application Japan, May 16, 1994, 6-125801; Jun. 28, 1994, 6-170300; Nov. 2, 1994, 6-293910
Int. Cl.^{6} B65G *1/04*
U.S. Cl. 414—277 **11 Claims**

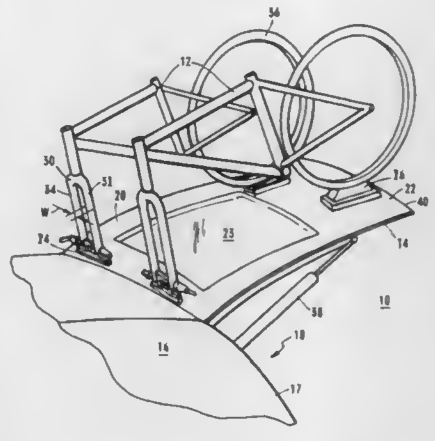
1. An apparatus for picking up a ream of packaged sheets of a desired kind from a plurality of reams of one or more kinds stacked on a respective one of cells in an automated warehouse and loading the picked-up ream on a pallet, the cells constituting a plurality of vertically spaced groups of horizontally extending racks, the apparatus comprising:



- a traveling mechanism constructed to travel horizontally along a respective rack;
- a lifting mechanism attached to said traveling mechanism and constructed to move vertically along the cells disposed vertically in series, the lifting mechanism being provided with an inching function;
- a lifting and pulling mechanism attached to said traveling mechanism and constructed to position the pallet at a prescribed position; and
- a pick-up device attached to the lifting mechanism, said pick-up device being positionable above the ream and picking up the ream, by a suction, of the desired kind from the plurality of reams of one or more kinds stacked up on a respective cell, the pick-up device including a picking, gripping and pulling mechanism upwardly picking and gripping the stacked ream by suction, and a discharging and stacking mechanism withdrawing the pulled ream and discharging and stacking the pulled ream on said pallet.

5,749,694
REAR LIFT GATE-MOUNTED BICYCLE MOUNT FOR PASSENGER VAN

Robert S. Ackerman, Bloomfield, and L. John Ozark, Grosse Pointe Woods, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Jan. 3, 1996, Ser. No. 582,250
Int. Cl.^{6} B60P *9/00*
U.S. Cl. 414—462 **19 Claims**



17. A bicycle mounting system for a passenger van having a rear lift gate defining upper and lower portions, comprising:
- an upper mount affix able to the upper portion of the lift gate for holding a first component of a bicycle; and

a lower mount affixable to the lower portion of the lift gate for holding a second component of the bicycle, wherein the first component includes left and right fork elements of a bicycle front fork and the second component is a bicycle rear tire, and the upper mount includes:
- a base, the base including a base surface attachable to the upper portion of the lift gate and a hollow base holder spaced from the base surface and defining a channel therethrough, the base holder defining left and right ends; and
- a clamp element engaged with the channel of the base holder, the clamp element being movable between a release configuration, wherein left and right fork elements of a bicycle's front fork can be advanced between the clamp element and the respective left and right ends of the base holder, and a clamp configuration, wherein left and right fork elements of a bicycle's front fork can be clamped between the clamp element and the base holder.

5,749,695

FORKLIFT TRUCK MOUNTING FRAME

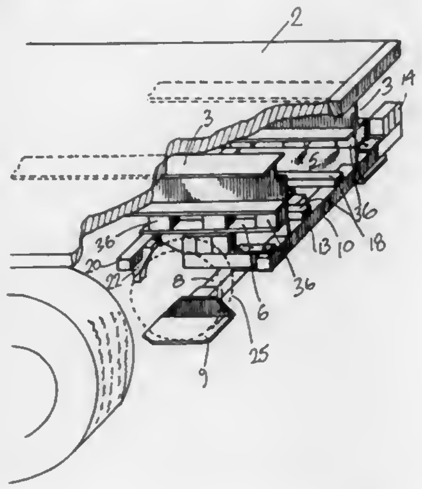
Robert Moffett; Carol Moffett; James McAdam, all of Clontibret; Paul Quinn, Castleblaney; Gerard McHugh, Carrickmacross; Gerard Harte, Castleblaney; Andrew Wylie, Ballybay; Martin McVicar, Killybrone, and Thomas Cadden, Monaghan, all of Ireland, assignors to Moffett Research and Development Limited, Monaghan, Ireland

Filed May 30, 1997, Ser. No. 865,931

Claims priority, application Ireland, May 31, 1996, 960398

Int. Cl.⁶ B66F *9/06*

U.S. Cl. 414—467 **19 Claims**



1. A universal mounting frame for fitting to a rear end of carrier vehicles having a chassis comprising at least two spaced apart chassis support beams of variable spacing and above ground heights and for mounting a forklift truck of a type having a pair of front wheels and load supporting forwardly projecting height adjustable forks comprising:
- a rear support beam having top and bottom surfaces;
- a front support beam having top and bottom surfaces;
- a pair of spaced apart hanger plates interconnecting the front and rear support beams to form a composite prefabricated support framework with the bottom surface of one of the support beams spaced apart from the top surface of the other support beam with respect to the hanger plates;
- chassis engaging means formed on each hanger plate by cranking the plates intermediate their ends to lie across and above the support framework to provide a longitudinally and laterally extending chassis support beam engaging surface;
- a pair of forklift front wheel rest plates mounted in spaced apart relationship on the rear support beam; and
- a pair of spaced apart hollow socketed support bars for reception of the forks of a forklift truck, each bar rigidly connected to the bottom surface of one support beam and to the top surface of the other support beam and substantially parallel to the hanger plates.

5,749,696

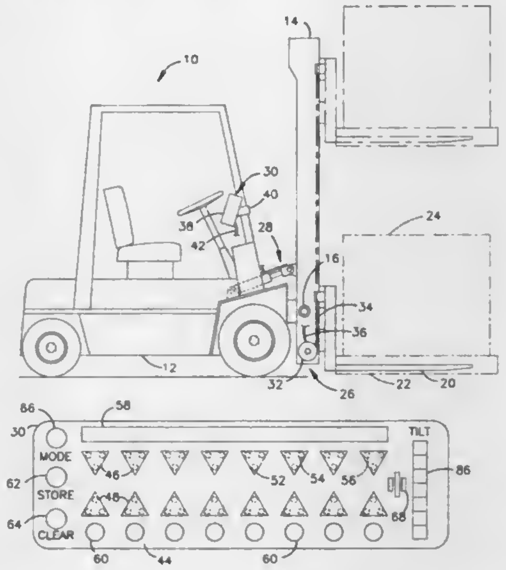
HEIGHT AND TILT INDICATOR FOR FORKLIFT TRUCK

Marc Johnson, Olathe, Kans., assignor to Scott Westlake, Overland Park, Kans.

Continuation of Ser. No. 919,051, Jul. 23, 1992, abandoned. This application Jan. 30, 1996, Ser. No. 594,378

Int. Cl.⁶ B66F *9/06*

U.S. Cl. 414—635 **7 Claims**



1. A position indicator for a forklift, the forklift having a chassis, a vertical mast mounted to the chassis for pivotal movement about a horizontal pivot axis, and a pair of lifting forks mounted to the mast for vertical movement thereon, comprising:
- means, adapted to be mounted between the mast and the lifting forks, for sensing the position of the forks with respect to the mast and generating position signals indicating such position;
- a controller connected to said sensing means and including a memory for storing information indicating a plurality of predetermined positions on said mast, said controller being operative for receiving said position signals, for comparing said signals with said information, and for generating display signals based upon the comparison of said signals and said stored information;
- a display, having a plurality of sets of height indicators for providing an indication, to an operator of the forklift, of the position of the forks on said mast with respect to a selected one of said predetermined positions stored in said memory, each of said indicator sets including an above portion and spaced therefrom a below portion, means for selectively illuminating each of said portions in a first area and in a second area, said display being operative for receiving said display signals from said controller, said controller including means for illuminating said first area in said above portion of each said indicator set when the forks are above said selected one of said predetermined positions, and illuminating said first area in said below portion when the forks are below said selected one of said predetermined positions, and wherein each said above portion and said below portion of said sets of height indicators further includes means for simultaneously illuminating said second area in said above portion a first color when said forks are substantially located at said selected one of said predetermined positions, said first areas being independently illuminated a second color when said forks are not substantially located at, but are within a first selected distance from said selected one of said predetermined positions, and a third color when said forks are greater than said first selected distance from a predetermined position.

5,749,697

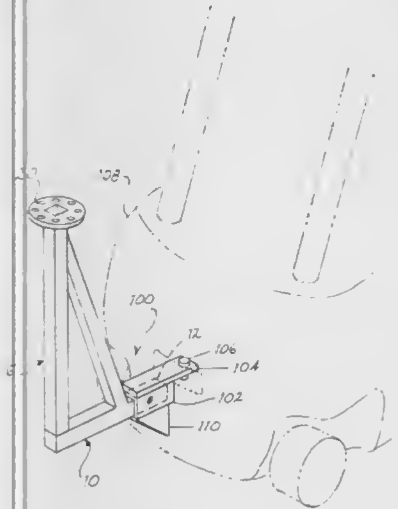
MULTI-PURPOSE MOBILE HOIST

Gary E. Davis, Rt. 9 Box 408-D, Statesville, N.C. 28677

Filed Aug. 1, 1994, Ser. No. 283,555

Int. Cl.⁶ G66F *19/00*

U.S. Cl. 414—680 **21 Claims**



1. A multi-purpose boom hoist for use with a variety of implements having a mounting socket affixed to an associated structure and with a conventional forklift vehicle having a trailor hitch, said hoist comprising:
- an upstanding mast having a bottom mast section and a top mast section;
- an elongated retaining core disposed within at least a portion of said top and bottom mast sections about which said top mast section rotates;
- a bottom load bearing flange carried by an upper end of said bottom mast section;
- a top flange carried by a lower end of said top mast section;
- said top and bottom flanges mating together in a rotational relationship;
- a lock carried with said flanges for locking said top and bottom flanges together in a desired rotational position;
- a cantilevered boom arm carried by an upper end of said top mast section;
- a base carried by a lower end of said bottom mast section having a tongue which slidably fits with said socket of said associated structure for supporting said mast in a generally upright operating position; and
- a forklift mount assembly for mounting said boom hoist to said conventional forklift vehicle; and said forklift mount assembly comprising a socket for receiving said tongue of said hoist, a hitch connector supporting said socket for connecting to said trailer hitch of said forklift, and a stabilizer carried by said socket for engaging a rear surface of said forklift vehicle.

5,749,698

SUBSTRATE TRANSPORT APPARATUS AND SUBSTRATE TRANSPORT PATH ADJUSTMENT METHOD

Hideaki Miyoshi, Tokyo, Japan, assignor to Kaijo Corporation, Tokyo, Japan

Continuation of Ser. No. 474,489, Jun. 7, 1995, abandoned,. This application Feb. 10, 1997, Ser. No. 796,474

Int. Cl.⁶ B65G *47/24*

U.S. Cl. 414—786 **12 Claims**

1. A substrate transport path adjustment method, comprising steps of:
- arranging a substrate between first and second guide members which are capable of supporting the sides of said substrate so as to guide said substrate along a prescribed path and which can be moved towards and away from each other in a direction perpendicular to the direction of the prescribed path by a first driving means for driving said first guide member and a second driving means for driving said second guide member;
- operating said first driving means to move said first guide member towards said second guide member while said second guide member is stationary; and
- engaging said substrate with said first and second guide members, and operating said first and second driving means in synchrony to move said first and second guide members in the same direction in synchronization to center said substrate with respect to a centerline of said prescribed path.

5,749,699

Patent Not Issued For This Number

5,749,700

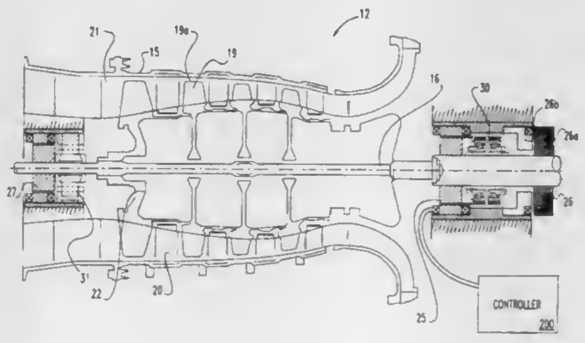
HIGH SPEED, HIGH TEMPERATURE HYBRID MAGNETIC THRUST BEARING

Mark S. Henry, Indianapolis, and Brian P. King, Greenwood, both of Ind., assignors to Allison Engine Company, Inc., and Allison Advanced Development Company, both of Indianapolis, Ind.

Filed Jul. 17, 1996, Ser. No. 682,107

Int. Cl.⁶ F01D *3/00*

U.S. Cl. 415—104 **41 Claims**



1. In combination:
- a gas turbine engine; and
- a magnetic thrust bearing rotor within said engine, comprising:
  - a rotatable magnetically attractable member; and
  - a high specific strength composite ring positioned circumferentially about said magnetically attractable member for resisting non-magnetic forces applied to said magnetically attractable member.

5,749,701

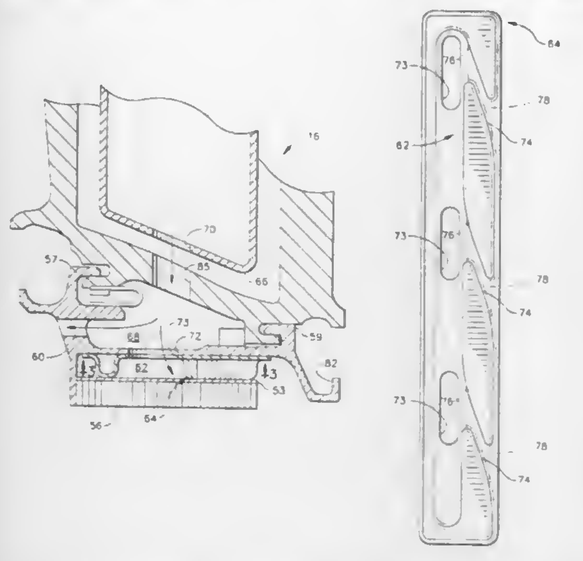
INTERSTAGE SEAL ASSEMBLY FOR A TURBINE

Jonathon P. Clarke, West Chester; Charles E. Steckle, Loveland; Kevin W. McMahan, Cincinnati; George A. Durgin, West Chester, and Randall C. Bauer, Hamilton, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 28, 1996, Ser. No. 740,450

Int. Cl.^{6} F01D *11/02*

U.S. Cl. 415—115 **10 Claims**



1. A seal assembly positioned between forward and aft rotor stages in a turbine to separate a forward cavity and an aft cavity, comprising:

(a) a seal body connected to a platform portion of a stator nozzle located between said forward and aft rotor stages, wherein an inner seal cavity in flow communication with an insert in said stator nozzle is formed therebetween;

(b) a static seal member arranged in sealing relationship with a rotary toothed member between said forward and aft cavities, said static seal member being connected to said seal body; and

(c) an intermediate member positioned between said seal body and said static seal member to define a plenum therebetween in flow communication with said inner seal cavity, said intermediate member having a plurality of angled passages formed therein, each passage having a first end in flow communication with said plenum and a respective second end in flow communication with said aft cavity;

wherein air entering into said stator nozzle insert flows into said inner seal cavity and then into said plenum so that it exits through said angled passages into said aft cavity at an angle with respect to an axis of rotation of said aft rotor stage, whereby such air will acquire a tangential velocity component in a direction of rotation of said aft rotor stage.

5,749,702

FAN FOR AIR HANDLING SYSTEM

Dipti Kr. Datta, Mississauga, and Werner Richarz, Ottawa, both of Canada, assignors to Air Handling Engineering Ltd., Buffalo, N.Y.

Filed Oct. 15, 1996, Ser. No. 732,522

Int. Cl.^{6} F04D *29/66*

U.S. Cl. 415—119 **27 Claims**

25. An air fan unit for an air handling system comprising:

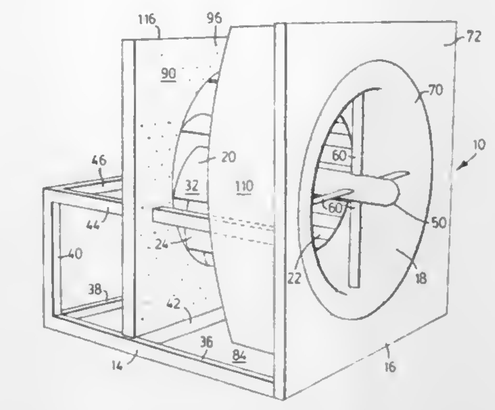
a support structue including a generally planar wall with an inwardly converging air inlet opening formed therein;

a blade fan wheel mounted on said support structure for rotation about a central axis and having an axial air intake on a front side thereof confronting said inlet opening, said fan wheel having an annular, circumferential air outlet; and

an annular curved lip extending around said air inlet opening and projecting substantially outwardly from a planar front surface of said wall, said lip being filled with sound attenuating material and having a curved surface extending from said air inlet opening to said front surface of the wall,

wherein said wall contains sound attenuating material at least in an area surrounding said air inlet opening;

said fan unit further include an elongate centerbody rigidly mounted in the center of said air inlet opening and coaxial with said fan wheel, said centerbody being filled with sound attenuating material and directing air flow through said air inlet opening.



5,749,703

SHAFT ASSEMBLY FOR GAS CONTROL FLAP IN A GAS TURBINE

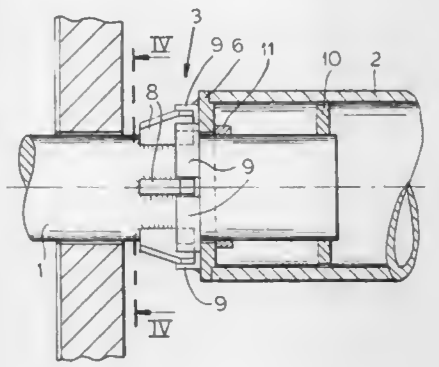
Volker Von Erichsen, Recklinhausen, Germany, assignor to Stober + Morlock Warmekraft Gesellschaft mbh, Recklinghausen, Germany

Filed May 9, 1996, Ser. No. 644,849

Claims priority, application Germany, May 19, 1995, 195 18 174.3: Sep. 23, 1995, 195 35 469.9

Int. Cl.^{6} F04D *29/44*

U.S. Cl. 415—148 **5 Claims**



1. In a gas turbine system having a duct traversed by hot gas, the improvement which comprises:

at least one flap pivotable in said duct to switch a flow direction or block flow through said duct;

a shaft assembly connected to said flap to apply torque thereto, said shaft assembly comprising a solid drive stub shaft and a hollow pipe-shaped shaft connected to said solid stub shaft, said solid stub shaft projecting with play axially into said hollow pipe-shaped shaft; and

a mechanical entrainer system angularly coupling said solid stub shaft with said hollow pipe-shaped shaft for imparting torque to said flap and free from radial force transfer between said solid stub shaft with said hollow pipe-shaped shaft.

5,749,704

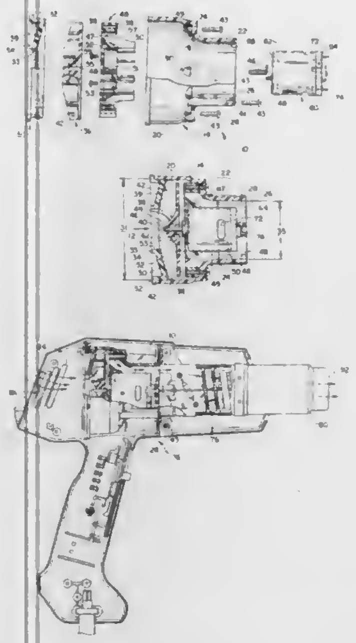
HEAT GUN FAN ASSEMBLY

Jeffrey S. Jerdee, Brooklyn Center, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Jan. 6, 1997, Ser. No. 779,323

Int. Cl.^{6} F01D *1/02*

U.S. Cl. 415—211.2 **20 Claims**



20. A heat gun fan assembly comprising:

a. a blower housing having an interior hollow region, an inlet region at a first end thereof, and an outlet region at a second end thereof downstream of the inlet region;

b. an electric motor at the interior of the blower housing and having a rotatable drive shaft and a case, the case defining a motor interior and a motor exterior, the case further having at least a first aperture and at least a second aperture;

c. an impeller attached to the drive shaft of the motor; and

d. a flow straightener downstream from the impeller, the flow straightener having an upstream end, a downstream end, and a radially interior wall, such that air moved by the impeller into the upstream end of the flow straightener is directed axially downstream by the interior wall of the flow straightener toward the blower housing outlet region, and further wherein the second aperture of the motor is located downstream of at least a portion of the flow straightener with the result that air is forced past the motor exterior and across the second aperture creating a lower pressure region at the motor exterior than in the motor interior to pull air into the motor interior through the first aperture and out through the second aperture;

such that the interior wall of the flow straightener generates increased airflow through the interior of the motor to draw heat away from the motor.

5,749,705

RETENTION SYSTEM FOR BAR-TYPE DAMPER OF ROTOR BLADE

Jonathon P. Clarke, West Chester, and Brian A. Norton, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 11, 1996, Ser. No. 728,710

Int. Cl.^{6} F01D *5/26*

U.S. Cl. 416—190 **12 Claims**

12. A rotor assembly for a gas turbine engine, comprising:

(a) a rotor disk including means for receiving a root portion of a rotor blade arranged on the outer circumference of said rotor disk;

(b) at least one rotor blade, comprising:

(1) a root portion received by said receiving means of said rotor disk;

(2) a platform portion connected to said root portion and having a damper pocket formed therein, said damper pocket having a substantially triangular cross-section and including:

(a) a rear surface having an upper portion and a lower portion at an angle to said upper portion;

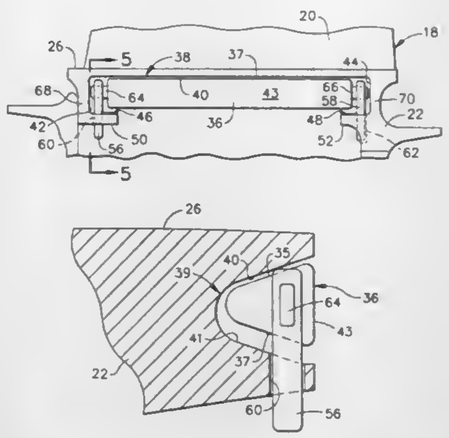
(b) a pair of spaced side surfaces; and

(c) a pair of spaced, substantially coplanar lower surfaces extending from said rear surface lower portion, said damper pocket lower surfaces being provided by a first flange extending laterally inward from one of said side surfaces and a second flange extending laterally inward from the other of said side surfaces;

(3) an airfoil portion connected to said platform portion;

(4) a generally bar-shaped damping member loosely arranged in said damper pocket having at least one scrubbing surface; and

(5) first and second retainer pins extending through and being connected to said first and second flanges, respectively, and being connected to opposite ends of said bar-shaped damping member so as to retain said bar-shaped damping member within said damper pocket.



5,749,706

TURBINE BLADE WHEEL ASSEMBLY WITH ROTOR BLADES FIXED TO THE ROTOR WHEEL BY RIVETS

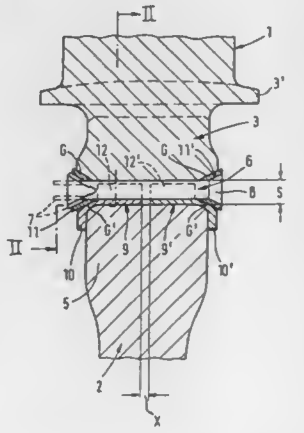
Karl Maar, Pfaffenhofen, Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany

Filed Jan. 24, 1997, Ser. No. 794,191

Claims priority, application Germany, Jan. 31, 1996, 196 03 388.8

Int. Cl.^{6} F01D *5/32*

U.S. Cl. 416—220 R **20 Claims**

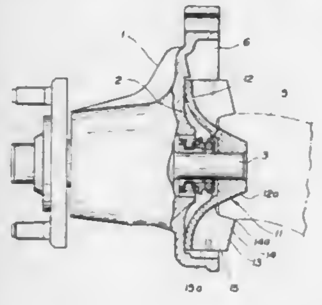


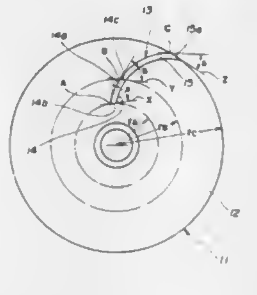
1. A rotor blade wheel assembly comprising

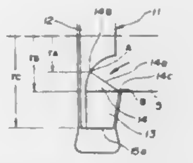
a rotor wheel having a plurality of toothed axial grooves that include groove teeth and that are arranged on a circumference of a wheel rim thereof,
a plurality of rotor blades respectively having toothed blade roots that include root teeth and that are respectively engaged in said toothed axial grooves, with a respective radial gap between a radially inner root end of each said blade root and a floor of each said axial groove,
two respective inserts arranged on each said axial groove floor in each said radial gap,
two respective wedge-shaped seating collars respectively arranged at two opposite axial ends of each said radial gap, and seated against respective wedge-shaped angled seating surfaces provided on said inserts and on said blade roots adjacent each said radial gap, and
a respective rivet arranged in each said radial gap, wherein each said rivet has a shaft guidedly extending along and in contact with said two inserts in said radial gap, and first and second rivet heads at two opposite axial ends of said shaft seated against and surrounded by said two respective seating collars such that said rivet heads clamp said two respective seating collars axially and radially against said respective wedge-shaped angled seating surfaces.

5,749,707
WATER PUMPS

Yuji Nomoto, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan
Filed Sep. 13, 1996, Ser. No. 713,352
Claims priority, application Japan, Sep. 20, 1995, 7-241041
Int. Cl.^{6} F04B *49/00*
U.S. Cl. 416—223 B **2 Claims**





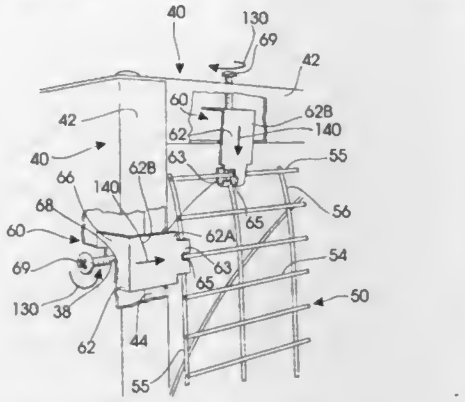


1. A water pump, comprising:
a housing having an end formed with an inlet port for cooling water;
a drive shaft arranged through said housing; and
an impeller mounted to said drive shaft at an end thereof, said impeller including a rotor main body and vanes arranged to protrude from an end face of said rotor main body and to be disposed radially, each vane having an inlet portion which faces an inlet port of said housing and has an inner end, said inner end being substantially perpendicular to the direction of cooling water flowing from said inlet port to the inner periphery of each vane, each vane having an outlet portion at the outer periphery of said rotor main body which is formed continuously with respect to said inlet portion and with constant radius of curvature, said inlet portion having a circular arc with an inclination angle which is substantially identical to an inflow angle of cooling water.

2. An impeller for a water pump having a housing with an inlet port for cooling water, comprising:
a rotor main body; and
vanes arranged to protrude from an end face of said rotor main body and disposed radially, each vane having an inlet portion which faces the inlet port of the housing and has an inner end, said inner end being substantially perpendicular to the direction of cooling water flowing from the inlet port to the inner periphery of each vane, each vane having an outlet portion at the outer periphery of said rotor main body which is formed continuously with respect to said inlet portion and with a constant radius of curvature, said inlet portion having a circular arc with an inclination angle which is substantially identical to an inflow angle of cooling water.

5,749,708
EASILY SERVICEABLE FAN WITH UNIVERSAL SUBFRAME ASSEMBLY AND TENSIONABLE GUARDS

Carl G. Matson, Little Rock, Ark., assignor to Triangle Engineering of Arkansas Inc., Jacksonville, Ark.
Filed May 20, 1996, Ser. No. 650,483
Int. Cl.^{6} F04D *29/70*
U.S. Cl. 416—247 R **12 Claims**

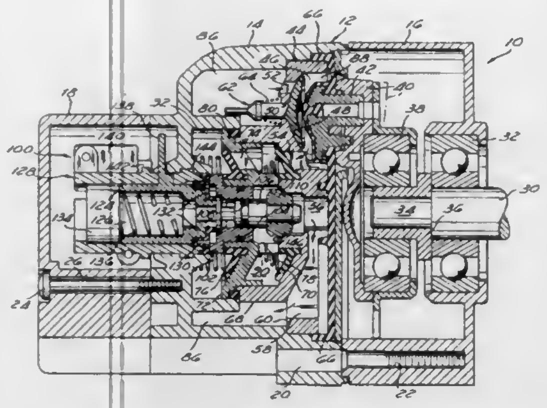


1. A high volume ventilation fan comprising:
a rigid housing adapted to be disposed upon a supporting surface and aimed at a target, said housing comprising:
a generally parallelepiped frame defining an air intake end and a high velocity air output end;
reinforced edges circumscribing said frame, each edge comprising a plurality of regularly spaced apart slits penetrating each of said edges;
a pair of selectively removable guards, each guard comprising a series of criss-crossed, vertically and horizontally oriented filamentary members and a periphery;
tensioning means for coupling said guards to said edges, each of said tensioning means penetrating one of said slits.

5,749,709
POSITIVE DISPLACEMENT PUMP INCLUDING MODULAR PUMP COMPONENT

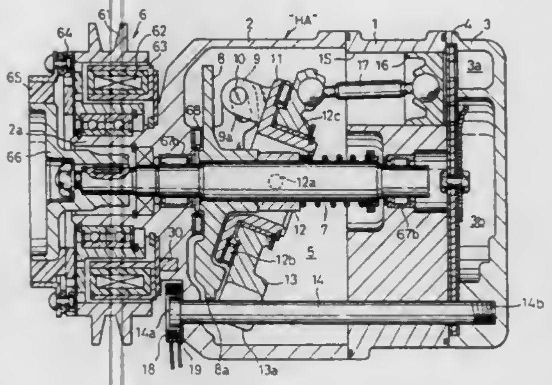
Benjamin R. Du, 22832 Skyview Ave., Laguna Beach, Calif. 92677
Division of Ser. No. 648,317, May 15, 1996, Pat. No. 5,613,834. This application Dec. 5, 1996, Ser. No. 760,467
Int. Cl.^{6} F04B *49/06*
U.S. Cl. 417—44.8 **9 Claims**

1. A positive displacement pump, comprising:
a housing defining a pump inlet port and a pump outlet port;
a chamber plate disposed within the housing and at least partially defining a pump inlet chamber which fluidly communicates with the inlet port and a pump outlet chamber which fluidly communicates with the outlet port;
a wobble plate disposed within the housing and adapted to pump fluid from the inlet chamber to the outlet chamber; and
an unloader valve attached to the housing and cooperatively engaged to the chamber plate such that said unloader valve is operable to facilitate the flow of fluid from the outlet chamber to the inlet chamber when the fluid pressure in the outlet chamber exceeds a first level, thus causing the fluid to be re-circulated within the housing;
said unloader valve being modularly configured for detachment from the housing and replacement with an alternative modular pump component to selectively modify the operational characteristics of the pump.



5,749,710
REFRIGERANT COMPRESSOR WITH ROTATION DETECTING MEANS

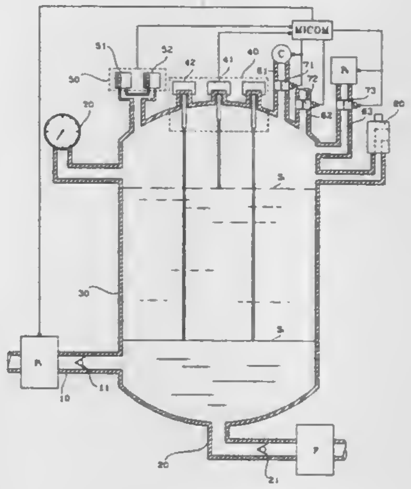
Kazuya Kimura, and Yoshihiro Makino, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Filed May 22, 1996, Ser. No. 651,774
Claims priority, application Japan, May 26, 1995, 7-128665
Int. Cl.^{6} F04B *49/02*
U.S. Cl. 417—63 **9 Claims**



1. A refrigerant compressor comprising:
a housing assembly formed by a plurality of framework members combined together;
a mechanical combining means for mechanically combining said plurality of framework members in a fluid-tight condition;
a drive shaft rotatably supported in said housing assembly and having a drive portion thereof within said housing assembly, and an axial extension outwardly extending from said drive portion thereof so as to receive a drive power from an external drive source via a solenoid clutch having a stator element containing a solenoid;
a compressing means mounted on said drive portion of said drive shaft within said housing assembly for performing a repetitive motion upon being driven by said drive shaft to compress a refrigerant gas; and
a rotation detecting means which comprises in combination:
a magnetic circuit means for permitting magnetic flux leaking from said solenoid clutch to circulatively flow through said drive shaft, said compressing means, and said mechanical combining means;
a magnetic detecting means arranged in said magnetic circuit means in a region outside said housing assembly for detecting a change in the magnetic flux which occurs in response to the repetitive motion of said compressing means to thereby produce an output signal representing a rotating speed of said compressor; and
a permanent magnet means fixedly arranged in one of said plurality of framework members at a position close to said magnetic detecting means and where said permanent magnet means confronts said compressing means, said permanent magnet means being arranged to generate an additional magnetic flux increasing the density of the magnetic flux circulating through said magnetic circuit means at a position close to said magnetic detecting means to thereby activate the detecting operation of said magnetic detecting means.

5,749,711
AUTOMATIC PNEUMATIC PUMP INCLUDING A TANK WITH INLET AND OUTLET AND A PUMP CONNECTED TO THE INLET

Sae Joon Park, 175-20, Sadang 3-dong, Dongjak-ku, Seoul, Rep. of Korea, 156-093
Filed Dec. 24, 1996, Ser. No. 784,531
Claims priority, application Rep. of Korea, May 13, 1995, 1955/11798
Int. Cl.^{6} F04F *1/02;* **E03F** *5/22;1/00;* **B67D** *5/54*
U.S. Cl. 417—120 **1 Claim**



1. An automatic pneumatic pump comprising:
a liquid tank for receiving liquid therein, said tank having a liquid inlet pipe, liquid outlet pipe, air pressure pipe and first and second air exhaust pipes, said liquid inlet and outlet pipes being provided on a lower portion of said tank, while said air pressure and exhaust pipes being provided on an upper portion of said tank;
a pair of sensing units provided in said tank and adapted for sensing liquid level and air pressure inside said tank, respectively;
a plurality of solenoid valves mounted to said air pressure and exhaust pipes, respectively, and selectively opened to open said air pressure and exhaust pipes in accordance with the liquid level inside said tank;
a pair of check valves mounted to said liquid inlet and outlet pipes, respectively;
an air compressor mounted to said air pressure pipe and selectively operated during a time when the liquid level inside said tank reduces from a predetermined top level to a predetermined bottom level;

- a vacuum pump mounted to said second air exhaust pipe and selectively operated during a time when the liquid level inside said tank increases from said bottom level to said top level;
- a liquid pump adapted for forcibly feeding the liquid into said tank through said liquid inlet pipe; and
- a microcomputer adapted for controlling said solenoid valves, air compressor, vacuum pump and liquid pump in response to signals output from said sensing units.

5,749,712
VARIABLE DISPLACEMENT SWASH PLATE TYPE COMPRESSOR

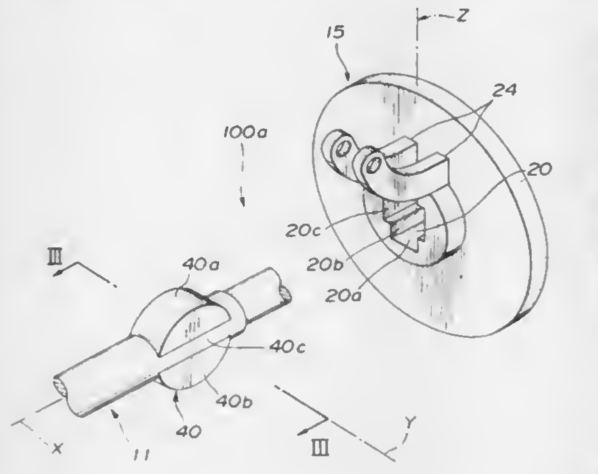
Yukio Umemura, Yokohama, Japan, assignor to Calsonic Corporation, Tokyo, Japan

Filed Sep. 13, 1996, Ser. No. 712,604

Claims priority, application Japan, Sep. 14, 1995, 7-237087; Nov. 27, 1995, 7-307748

Int. Cl.^{6} F09B *1/14*

U.S. Cl. 417—269 **18 Claims**



1. A variable displacement swash plate type compressor comprising:
- a casing having a plurality of cylinder bores circumferentially arranged therein;
- a plurality of pistons incorporated with the cylinder bores respectively;
- a drive shaft extending in said casing;
- a swash plate disposed about said drive shaft;
- a hinge mechanism for achieving a hinged connection between said drive shaft and said swash plate;
- means for making a hinged and slidable connection between the swash plate and each of the pistons to make a reciprocating movement of each piston when the swash plate is rotated together with said drive shaft;
- a coil spring disposed about drive shaft for biasing said swash plate in a given direction; and
- a coupling structure arranged between said drive shaft and said swash plate in order to allow said swash plate to be movable along the drive shaft and inclinable relative to the same, said coupling structure including:
  - a bearing portion provided on said drive shaft to rotate therewith, said bearing portion including first and second semicylindrical outer walls which are symmetrically arranged with respect to an axis of said drive shaft and first and second flat side walls which are symmetrically arranged with respect to said axis, each of said first and second semicylindrical outer walls being perpendicular to each of said first and second flat side walls; and
  - means defining a center bore in a hub portion of said swash plate, said center bore being so sized and shaped as to intimately and slidably receive therein said bearing portion.

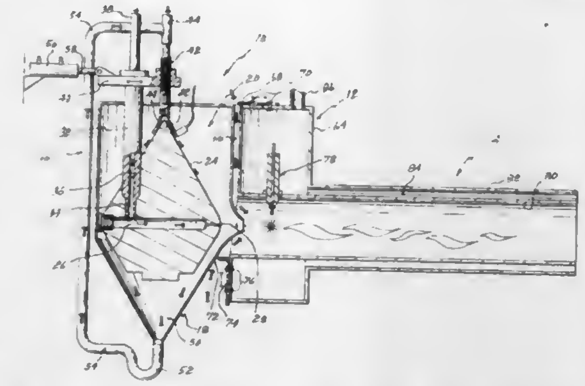
5,749,713
LIQUID FUEL BURNERS

Albert Heylbroeck, 5743 Auteuil, Brossard, Quebec, Canada, J4Z 1M6

Filed Sep. 18, 1996, Ser. No. 714,000

Int. Cl.^{6} F23C *5/00*

U.S. Cl. 431—8 **12 Claims**



9. A method of burning a liquid fuel having contaminants therein, the method comprising the step of supplying an apparatus having a fuel distributing member, the fuel distributing member having a generally conical configuration with a narrow upper portion and a wider portion downwardly thereof, a vaporizing aperture formed in an exterior wall of said conically shaped member, feeding a liquid fuel to said upper portion of said fuel distributing member to allow a thin liquid film to flow downwardly from said upper portion, feeding a pressurized gas to said vaporizing aperture to thereby cause atomization of the liquid fuel at said aperture, igniting said atomized fuel, and controlling the distance between a source of ignition and said vaporizing aperture.

5,749,714
MUFFLER FOR A RECIPROCATING COMPRESSOR

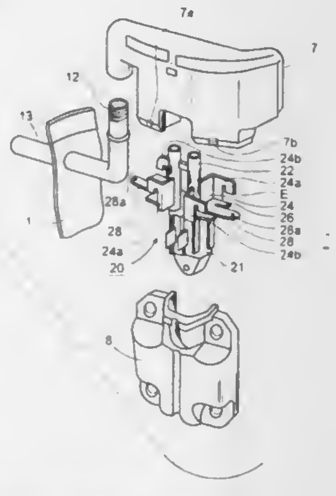
Sung Tae Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 5, 1996, Ser. No. 760,718

Claims priority, application Rep. of Korea, Dec. 5, 1995, 95-46748

Int. Cl.^{6} F04B *39/00*

U.S. Cl. 417—312 **7 Claims**



1. A reciprocating compressor comprising:
- a cylinder forming a bore for receiving gaseous refrigerant;
- a piston mounted for reciprocation in the bore for compressing the gaseous refrigerant;
- a cylinder head mounted on the cylinder at one end of the bore for conducting for conducting gas to and from the bore;
- a suction muffler connected to the cylinder head and comprising:

- a muffler body for receiving gas to be compressed, and
- a base member fixed to the cylinder head for delivering the gas to the bore, the base member being connected to a leading portion of the muffler body which is installed in the base member in a forward direction of installation, the leading portion and base member including mutually engageable securing surfaces securing the muffler body to the base member, the base member including an elastic element pushing elastically against the muffler body in a rearward direction opposite the forward direction of installation for pressing the mutually engageable securing surfaces against one another to prevent relative movement between the muffler body and base member in forward and rearward directions.

5,749,715
CIRCULATION-HEATING ELEMENT DEVICE

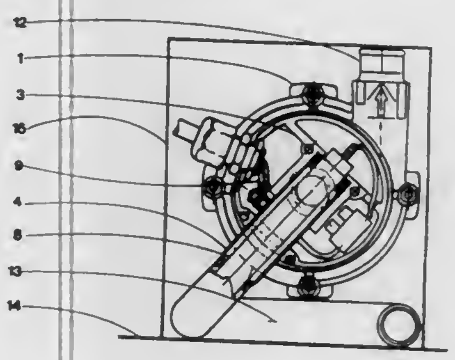
Karsten Andreas Laing, 1253 La Jolla Rancho Rd., La Jolla, Calif. 92037

Filed Feb. 18, 1997, Ser. No. 800,452

Claims priority, application Germany, Feb. 21, 1996, 196 06 369.8

Int. Cl.^{6} H05B *1/02;* **F24H** *1/12*

U.S. Cl. 417—313 **1 Claim**



1. A circulation unit comprising a motor-pump-unit having a circulation pump with a pump housing and a resistance heating element which is situated in a suction pipe of the pump in order to heat fluid content of a hot tub, characterized in that
- a) the suction pipe (4) having a rod-shaped heating element (8) therein, the suction pipe (4) being bent to form a support which carries the motor-pump-unit,
- b) an end of the suction pipe (4) facing the pump has a lateral opening through which the inside of the pipe communicates with an inlet port of the pump housing (1),
- c) the inlet port of the pump housing (1) lies in a semi-cylindrical groove (5),
- d) a lid (3) which is connected by screws to the pump housing (1) presses the end portion of the pipe (4) against an 0-ring (6) which forms a seal between the pipe (4) and the inlet port of the pump,
- e) a second ring (7) seals an annular space between the inside of the pipe (4) and an end portion of the heating element (8),
- f) leads of the heating element (8) end in a dry chamber formed by the lid (3) and the pump housing (1),
- g) an outlet end of the pipe (4) runs upwards and forms an angle of 45° with the vertical,
- h) a lower part of the pipe (4) is bent in a U-shape, whereby two portions (13) run parallel to each other and rest on a base (14).

5,749,716
INTEGRATED OIL PUMP ROTOR AND COUPLING PIECE FOR AN OIL-SEALED VACUUM PUMP

Thomas Abelen, Cologne; Lutz Arndt, Troisdorf, and Peter Muller, Cologne, all of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Germany

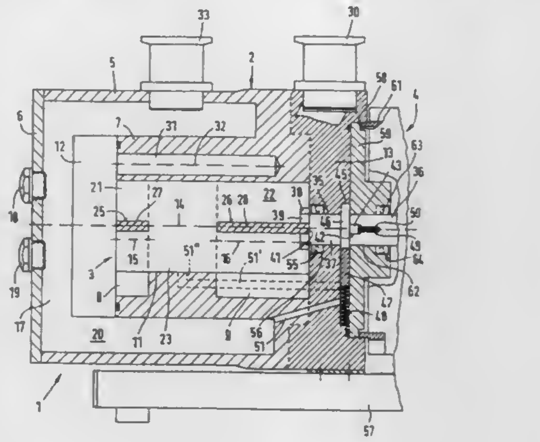
PCT No. PCT/EP94/01680, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO95/04222, PCT Pub. Date Feb. 9, 1995

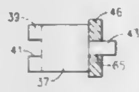
PCT Filed May 26, 1994, Ser. No. 586,928

Claims priority, application Germany, Jul. 28, 1993, 43 25 285.0

Int. Cl.^{6} F04B *17/00*

U.S. Cl. 417—410.3 **14 Claims**





1. Oil-sealed vacuum pump (1) with a pump chamber (8, 9), with a rotor 3 rotatively mounted therein, with a bearing piece (13) delimiting the pump chamber on a drive side and with a passage (35) in the bearing piece (13) which contains a coupling piece (37) used to interlock the rotor (3) with a shaft (36) of a drive motor (4) and a sealing ring (55) to seal off the coupling piece from the passage (35) in the bearing piece (13), wherein the creation of connections with a positive fit between rotor (3) and coupling piece (37) as well as between coupling piece (37) and shaft (36) is effected via projections and corresponding recesses; and that the coupling piece (37) is a support for a rotor (46) for an oil pump (45, 46), a pump chamber (45) of which is formed in a working piece (13).

5,749,717
ELECTROMAGNETIC FUEL PUMP FOR A COMMON RAIL FUEL INJECTION SYSTEM

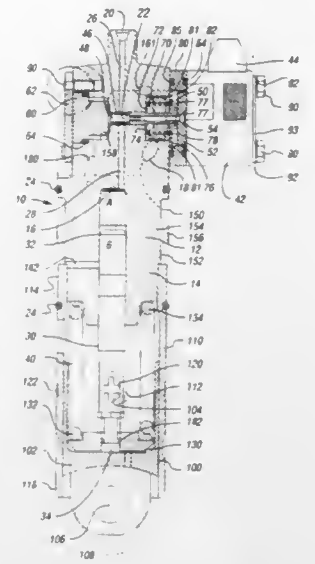
Robert D. Straub, Lowell; Richard Frederic Teerman, Wyoming; Thomas M. Stegink, Kalamazoo, and Daniel B. Ogren, Hudsonville, all of Mich., assignors to Deisel Technology Company, Wyoming, Mich.

Filed Sep. 12, 1995, Ser. No. 527,364

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 417—505 **35 Claims**

1. A pump for a fuel injection system, the pump comprising:
- a pump body having a pump body end portion, a pumping chamber, a fuel inlet for supplying fuel to said pumping chamber, an outlet port, and a control valve chamber between said pumping chamber and said outlet port;
- a reciprocating plunger disposed in said pumping chamber, said plunger having a head end and a tail end, said plunger being reciprocatable over a stroke range between an extended position and a retracted position;
- a plunger spring for resiliently biasing said plunger to the retracted position;



- a control valve disposed in said control valve chamber for controlling fuel;
- a cam follower assembly including a housing receiving the tail end of said plunger therein; and
- cylindrical sleeve having first and second end portions, said pump body end portion being press-fit into the first end portion of the cylindrical sleeve, the second end portion of the cylindrical sleeve relatively reciprocatably interfitting with said cam follower assembly for allowing said cam follower assembly to drive said plunger thereby reciprocating said plunger with respect to said cylindrical sleeve over the stroke range.

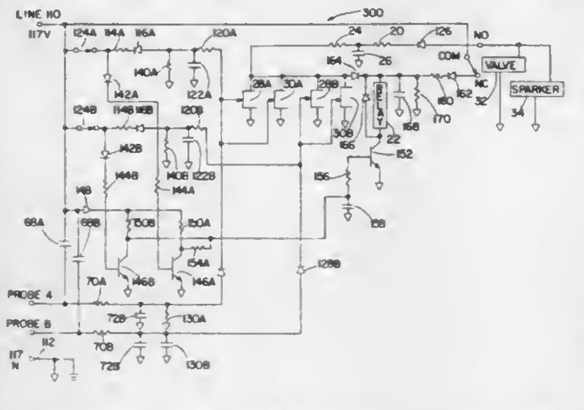
5,749,718
MULTI-BURNER GAS CONTROL APPARATUS

Don A. Berlincourt, Chagrin Falls, Ohio, assignor to Channel Products, Inc., Chesterland, Ohio

Continuation of Ser. No. 973,631, Nov. 9, 1992, Pat. No. 5,582,516. This application Jan. 9, 1995, Ser. No. 370,448

Int. Cl.^{6} F23N *5/00*

U.S. Cl. 431—60 4 Claims



1. A system for controlling the operation of a main gas valve which regulates the flow of fuel to a plurality of manual gas valves each controlling fuel flow to an associated burner within a plurality of burners comprising:

- relay means responsive to the application of power thereto, said relay means controlling the operation of the main gas valve;
- first switching means associated with each manual gas valve for each burner within the plurality of burners;
- means for storing power for application to said relay means;
- means for detecting the presence of a flame at each burner within the plurality of burners; and
- means for controlling the application of power to said relay means, said controlling means comprising first timing means and second switching means, actuation of said at least one of said first switching means causing said power storing means to apply power stored therein to said relay means actuating said relay means allowing power from an electrical power source to be applied to the main gas valve and causing said first timing means to co-operate with said second switching means permitting power from said electrical power source to continue to be applied to said relay means and the main gas valve for a first pre-determined period of time and preventing the continued application of power from said electrical power source to said relay means and the main gas valve after the expiration of said first pre-determined period of time unless said detecting means determines that a flame is present at each burner whose associated first switching means has been actuated.

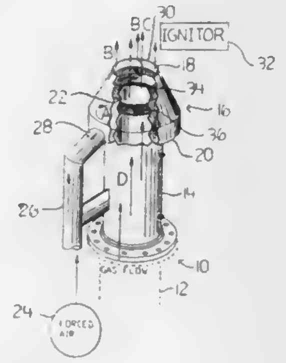
5,749,719
VELOCITY SEALED FLARE TIP

Robert Karl Rajewski, R.R. #1, Donalda, Alberta, Canada, T0B 1H0

Filed Oct. 25, 1996, Ser. No. 736,944

Int. Cl.^{6} F23D *5/00*

U.S. Cl. 431—202 5 Claims



1. A flare stack, comprising:

- a pipe having a flare tip;
- a conical shield having an apical end and a base, and being secured to and spaced from the flare tip to allow gas to flow between the conical shield and the flare tip, the conical shield being open at the apical end;
- the conical shield being sealed around the flare tip at the base of the conical shield, and
- means connected to the conical shield for providing a flow of gas between the conical shield and the flare tip.

5,749,720
GAS HEATING APPARATUS WITH DUAL BURNERS

Seiji Fukuda; Sunao Nakamura, and Yotaro Ohno, all of Kawasaki-ku, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Oct. 17, 1995, Ser. No. 544,116

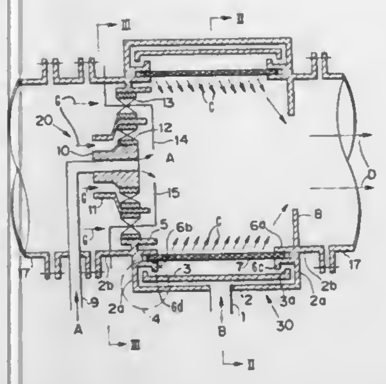
Claims priority, application Japan, Apr. 21, 1995, 7-096857

Int. Cl.^{6} F23D *23/00;14/12*

U.S. Cl. 431—285 12 Claims

1. A gas-heating apparatus comprising:

- a cylindrical outer shell coupled in a path of a piping or a duct in which a gas to be heated is supplied, said cylindrical outer shell having opposite ends in an axial direction of said outer shell;
- a pre-mixture gas supply tube connected to said outer shell for supplying a pre-mixture gas to an interior of said outer shell; and
- a combustion device including a cylindrical sintered fiber mat disposed inside said outer shell across a spacing and integrally formed in a cylindrical shape to correspond to the shape of the piping or the duct, said sintered fiber mat having opposite ends which are secured to protrusions located at respective opposite ends of said outer shell, an inner surface of said sintered fiber mat, facing the interior of said outer shell, the combustion device further including a combustion surface for combusting said supplied pre-mixture gas.



5,749,721
CERAMIC COMBUSTION SUPPORT ELEMENT FOR SURFACE BURNERS AND PROCESS FOR PRODUCING THE SAME

Bernd Klinge, Leipzig; Michael Gutknecht, Dassendorf; Bernd Weise, Berlin, and Ingo Birnkraut, Hamburg, all of Germany, assignors to Gossler Thermal Ceramics GMBH, Reinbek/Hamburg, Germany

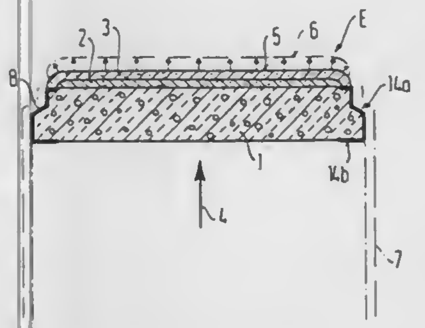
PCT No. PCT/EP94/02419, § 371 Date May 29, 1996, § 102(e) Date May 29, 1996, PCT Pub. No. WO95/03511, PCT Pub. Date Feb. 2, 1995

PCT Filed Jul. 22, 1994, Ser. No. 592,429

Claims priority, application Germany, Jul. 22, 1993, 43 24 644.3

Int. Cl.^{6} F23D *14/12*

U.S. Cl. 431—328 33 Claims



1. A combustion support element for surface burners, said element comprising

- a ceramic material having a plurality of throughflow openings.
- said the combustion support element being a multi-layer composite body having three layers.
- said first layer being built up of ball-like or hollow ball-like aggregates and forms a porous conglomeration ceramic.
- and the second and third layer are each of a solid reinforced conglomeration of mullite fibers or other crystalline (single and/or poly-crystalline) temperature resistant fibers or fiber mixtures,
- the material of the second layer having a greater temperature resistance than the material of the first layer.
- and the third layer having a greater temperature resistance than the first and the second layer.

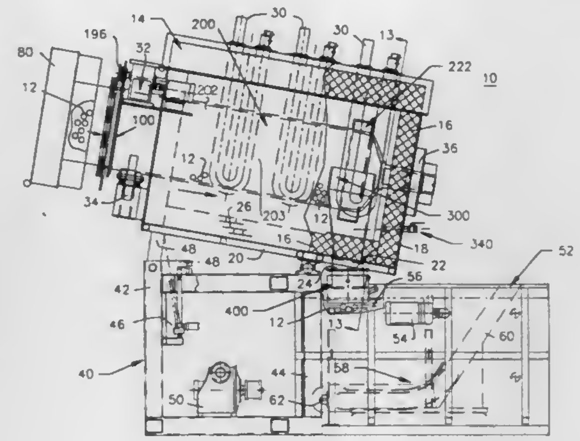
5,749,722
SINGLE CHARGE CONTINUOUS ROTARY RETORT FURNACE WITH AN ACCESSIBLE DOOR

Michael E. Driscoll, Marlboro; Michael A. Dorio, Whitehouse Station, and Frank T. Keogh, Lebanon, all of N.J., assignors to American Gas Furnace Company, Rancocas, N.J.

Filed May 28, 1996, Ser. No. 654,254

Int. Cl.^{6} F27B *7/14*

U.S. Cl. 432—118 17 Claims



1. A single charge continuous rotary retort furnace for heat treating machine parts in a sealed atmosphere, comprising:

- a) a rotary retort furnace housing having an inlet and outlet end;
- b) a feeder assembly at said inlet end having at least one chamber for supplying the machine parts to said rotary retort furnace housing to be heat treated;
- c) a locking collar assembly for connecting said feeder assembly to the inlet end of said rotary retort furnace housing;
- d) locking means for locking said feeder assembly to said locking collar assembly;
- e) means for rotating said locking collar assembly relative to said feeder assembly;
- f) means for sealing said feeder assembly relative to said locking collar assembly to create an atmospheric seal in said retort furnace housing for enabling the machine parts to be heat treated;
- g) drive means for rotating as a unit said retort furnace housing, said feeder assembly and said locking collar assembly for heat treating the machine parts;
- h) an internal discharge chute assembly cooperating with the outlet end of said rotary retort furnace housing for removing therefrom the heat-treated machine parts; and
- i) an outer discharge chute assembly cooperating with said internal discharge chute assembly for receiving the heat-treated machine parts from said internal discharge chute assembly and for transferring the machine parts to a quench medium in a quench tank.

5,749,723
HEAT TREATMENT APPARATUS

Wataru Okase, Kanagawa-Ken, Japan, assignor to Tokyo Electron Limited, Tokyo-to, and Tokyo Electron Tohoku Ltd, Iwate-ken, both of Japan

Filed Jun. 13, 1995, Ser. No. 489,937

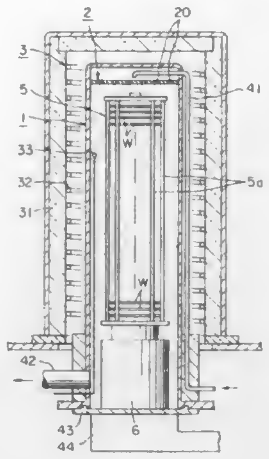
Claims priority, application Japan, Jun. 17, 1994, 6-159533

Int. Cl.^{6} F27D *3/12*

U.S. Cl. 432—241 24 Claims

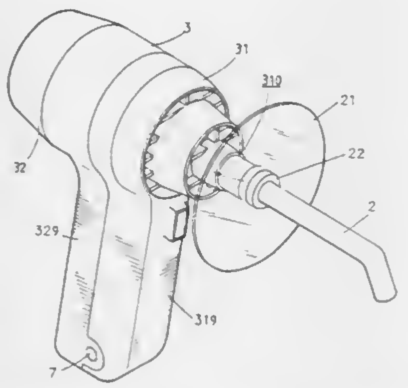
1. A heat treatment apparatus which comprises:

- a heat source;
- a heat treatment atmosphere forming device; and
- a reaction vessel which is heated by said heat source and within which said atmosphere forming device forms a heat treatment atmosphere, said reaction vessel being comprised of a first and a second layer with the first layer having a heat treatment



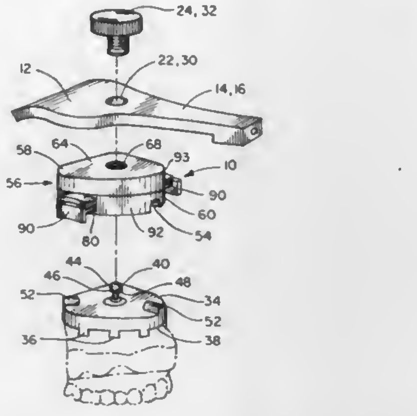
atmosphere contacting interior surface and said second layer being positioned external to said first layer,
said first layer being comprised of a synthetic quartz glass,
said second layer being comprised of a molten quartz glass, and
wherein said first layer forms a monolithic body having an open bottom, closed top and side wall, and said second layer forms a monolithic body having an open bottom, closed top and side wall.

5,749,724
DENTAL LIGHT CURING DEVICE
Sterling Cheng, No. 226, Kong-Shieh-Sir Village, Chungli, Taiwan
Filed May 12, 1997, Ser. No. 854,457
Int. Cl.⁶ A61C *3/00*
U.S. Cl. 433—29 **6 Claims**



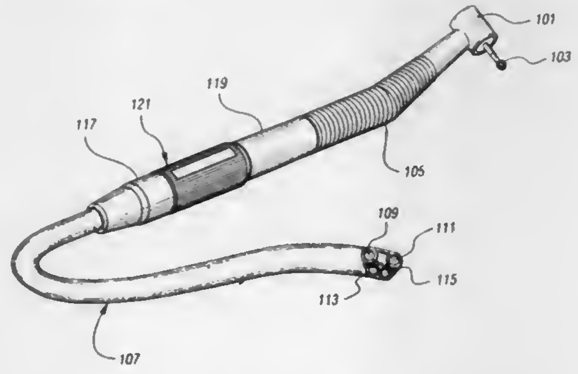
1. A dental light curing device comprising a housing having a first casing member and a second casing member, the second casing member being matingly engageable with the first casing member to define the housing, the first casing member having an interior space for receiving and fixing therein a light source, the second casing member having an optical fiber mounted thereon to have an inner end of the optical fiber positioned in the proximity of the light source to receive light therefrom, each of the first and second casing members having an elongated extension formed therewith and matingly engageable with each other, each of the extensions having a lower end with a pivotal connection provided thereon so as to allow the second casing member to be rotatable about the pivotal connection with respect to the first casing member between a closed position where the casing members and the extensions thereof engage each other and an open position where the second casing member is away from the first casing member.

5,749,725
MOUNTING PLATE ASSEMBLY FOR USE WITH A DENTAL ARTICULATOR
Donald B. Chinlund, 208 E. Lakeshore Dr., Cary, Ill. 60013
Filed Oct. 31, 1996, Ser. No. 741,723
Int. Cl.⁶ A61C *11/00*
U.S. Cl. 433—60 **22 Claims**



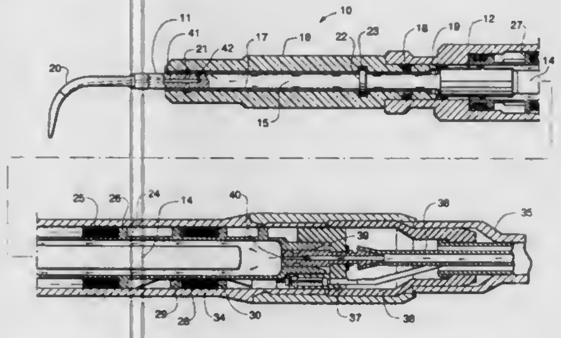
1. In a dental articulator having a mounting plate assembly connected therewith, the mounting plate assembly being adapted for supporting a dental cast of a patient, the improvement of the mounting plate assembly comprising:
(a) a mounting plate structure having a plurality of raised portions on a first side of the mounting plate structure, the mounting plate structure having a pin member extending perpendicular from a centermost portion of a second side of the mounting plate structure; and
(b) a base plate structure including a portion having a slot adapted to receive an end portion of the pin member, the slot being positionable with respect to the pin member from an unlocked position to a locked position upon movement of the portion of the base plate structure to secure the base plate structure and mounting plate structure in fixed position with one another.

5,749,726
DISPOSABLE POINT OF USE FILTRATION ELEMENT FOR PURIFYING AIR AND WATER SUPPLIES TO DENTAL HANDPIECES
David I. Kinsel, Sylvania, Ohio, assignor to Gelman Sciences, Ann Arbor, Mich.
Filed Mar. 2, 1995, Ser. No. 397,396
Int. Cl.⁶ A61G *17/02;* **A61C** *1/08*
U.S. Cl. 433—80 **16 Claims**



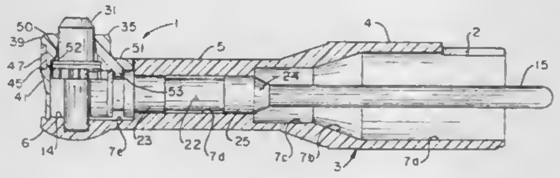
1. A multicompartmental filter component suitable to filter cooling water and cooling air supplied to a turbine driven dental handpiece, comprising:
a polymeric housing having an inlet end and an outlet end, said inlet end having a turbine air supply passage, a turbine air return passage, a cooling water inlet passage, and a cooling air inlet passage;
said outlet end having a turbine air supply passage, a turbine air return passage, a cooling water outlet passage, and a cooling air outlet passage;
said housing comprising minimally four compartments;
a first compartment in communication with said turbine air supply passage in said inlet end and said turbine air supply passage in said outlet end;
a second compartment in communication with said turbine air return passage in said inlet end and said turbine air return passage in said outlet end;
a third compartment in communication with said cooling air inlet passage and said cooling air outlet passage, said third compartment containing a microporous air filtration membrane positioned such that all cooling air entering the device through said cooling air inlet passage must pass through said microporous air filtration membrane before exiting the device through said cooling air outlet passage;
a fourth compartment in communication with said cooling water inlet passage and said cooling water outlet passage, said fourth compartment containing a microporous hydrophilic water filtration membrane positioned such that all cooling water entering the device through said cooling water inlet passage must pass through said microporous hydrophilic water filtration membrane before exiting the device through said cooling water outlet passage.

5,749,727
TRANSDUCER ACTIVATED SUBGINGIVAL TOOL TIP
Huy-Can Dao, North Brunswick, N.J.; George H. Warrin, North Merrick, N.Y.; Harvey B. Foulkes, Commack, N.Y.; Rene Perdreaux, Brooklyn, N.Y., and Edward W. Lee, Bethpage, N.Y., assignors to Dentsply Research & Development Corp., Milford, Del.
Continuation-in-part of Ser. No. 268,418, Aug. 26, 1994, Pat. No. 5,531,597. This application Apr. 19, 1996, Ser. No. 635,083
Int. Cl.⁶ A61C *1/07;3/03;3/08*
U.S. Cl. 433—119 **42 Claims**



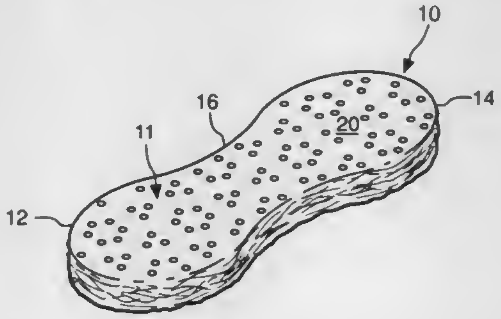
1. A transducer activated subgingival tool for contacting subgingival tooth surfaces and directing a fluid adjacent to said surfaces, comprising:
an activated tip having a fluid inlet end, a subgingival outlet end, a step in the surface of the outer wall of said tip between said inlet end and said subgingival outlet end, and a fluid passageway having a wall internal to said tip formed in said inlet end generally along the longitudinal center axis of said inlet end of the tip, said subgingival outlet end being shaped to contact said tooth surfaces, said fluid passageway having a central axis which is offset from said center axis of said inlet end of the tip such that said fluid passageway wall ends at an edge providing a fluid discharge orifice formed in the side of said tip and said passageway being displaced from said center axis of said tip, the length of said subgingival end of said tip within 0.03 inch from the terminus of said subgingival outlet end, having an outer diameter less than 0.03 inch;
an activating transducer connecting body connecting said tip to an activating transducer; and
a fluid source connected to said tip fluid passageway and providing a flow of fluid discharging from said tip fluid passageway discharge orifice.

5,749,728
METHOD OF ASSEMBLING A DENTAL PROPHYLAXIS ANGLE
Ronald L. Bailey, Harvester, Mo., assignor to Young Dental Manufacturing Company, Earth City, Mo.
Continuation of Ser. No. 224,263, Apr. 7, 1994, Pat. No. 5,503,555, which is a continuation of Ser. No. 963,132, Oct. 19, 1992, Pat. No. 5,328,369, which is a continuation-in-part of Ser. No. 613,366, Nov. 15, 1990, Pat. No. 5,156,547. This application Mar. 29, 1996, Ser. No. 626,178
Int. Cl.⁶ A61C *3/06*
U.S. Cl. 433—125 **14 Claims**



1. A method of producing a dental prophylaxis angle comprising a step of molding a one-piece body part, including a sleeve, a neck, a head, and a continuous opening extending from a rearward end of the sleeve through the neck and into the head, the continuous opening having a reduced diameter bearing portion in the neck, a forward end of the reduced diameter bearing portion forming a forwardly facing shoulder in the one-piece body part, the shoulder being rearward of the head; a step of molding a drive part including a shaft and a forward part, the forward part having a larger diameter than the shaft; and a step of inserting the drive part shaft-first through the head into the continuous opening until the forward part of the drive part abuts the forwardly facing shoulder.

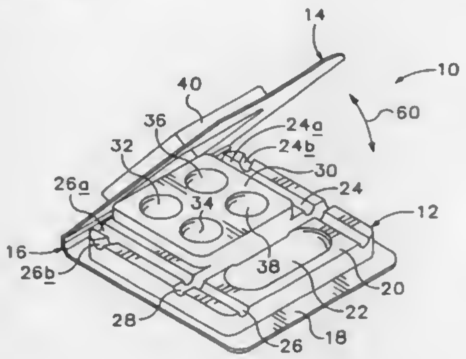
5,749,729
DENTAL ABSORBENCY DEVICE
Gregory C. Skinner, 250 S. Lyon Ave., Hemet, Calif. 92543, and Gaylen J. Cox, 129 W. Parkway, Provo, Utah 84604
Filed Nov. 27, 1996, Ser. No. 757,387
Int. Cl.⁶ A61C *5/14*
U.S. Cl. 433—136 **19 Claims**



1. A dental absorbency device for collecting fluids, comprising:
a flat section comprising a single sheet of a highly absorbent material, said flat section including a first end, a second opposing end, and a midsection disposed in connection therebetween, said flat section formed having a contoured elongated shape sized to fit comfortably within a human mouth;

- an upper surface of said flat section, said upper surface comprising means for resisting slippage of the flat section, said upper surface having at least one porous opening formed therein for absorbing said fluids therethrough;
- a lower surface of said flat section providing means for absorbing said fluids therethrough;
- edges formed along an outer periphery of said flat section, said peripheral edges being unobstructed to fluid flow wherein providing means for absorbing said fluids therethrough; and
- a collection reservoir disposed between said upper surface and said lower surface of said flat section, said collection reservoir providing means for retaining said fluids therein.

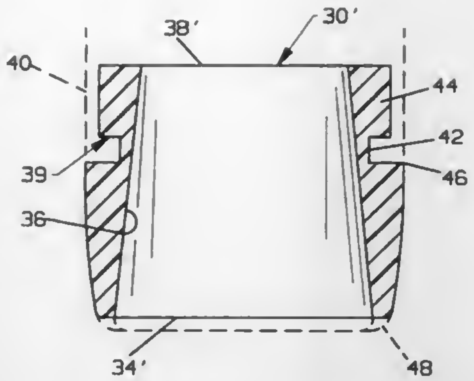
5,749,730
DENTAL ORGANIZER FOR LIGHT-SENSITIVE MATERIALS
James B. Johnsen, Beaverton, and Hal J. Oien, Ashland, both of Oreg., assignors to Jordco, Inc., Beaverton, Oreg.
Filed Feb. 20, 1996, Ser. No. 604,114
Int. Cl.^{6} A61C *3/00*
U.S. Cl. 433—163 **18 Claims**



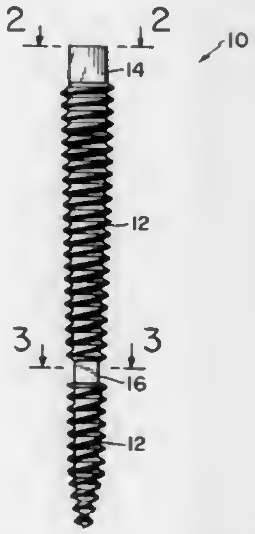
1. A dental organizer for use in carrying light-sensitive materials, said dental organizer comprising:
- an opaque base which defines a plateau structure with a plurality of wells, each being configured to contain a quantity of light-sensitive material;
- an opaque cover configured to shield with said base in a closed orientation, thereby denying light to light-sensitive materials within said wells, said cover defining a cavity configured matingly to receive said plateau structure upon positioning said cover in said closed orientation, said cover being releasably held in said closed orientation by frictional forces resulting from mating engagement of said plateau structure with said cavity; and
- a resilient hinge mounted intermediate said base and said cover to accommodate pivotal opening and closing of said cover relative to said base, said hinge being configured to bias said cover toward an open orientation wherein said cover at least partially shades said wells of said base from light.

5,749,731
APPARATUS FOR PRESERVING INTERDENTAL PAPILLA AND METHOD FOR USING
Vincent J. Morgan, Boston, and Norman J. Shepherd, Merrimack, both of Mass., assignors to DIRO, Inc., Boston, Mass.
Continuation-in-part of Ser. No. 293,308, Aug. 22, 1994, Pat. No. 5,499,918. This application Jan. 16, 1996, Ser. No. 586,951
Int. Cl.^{6} A61C *8/00*
U.S. Cl. 433—173 **5 Claims**

1. An emergence cuff member for use in preserving the interdental papilla during the procedure of placing an abutment on a root member implanted in the alveolar bone of a patient in which the abutment has a frusto-spherical basal surface portion and a conical surface portion having a selected height extending therefrom comprising a generally annular member formed of biocompatible synthetic plastic having first and second ends, a bore extending from the first to the second ends, the bore having a taper generally matching that of the conical surface portion of the abutment, the larger end of the bore being at the first end, the outer surface of the annular member forming a feathered edge with the bore at the first end of the annular member, the distance between the first and second ends being less than the height of the conical surface, the diameter of the cuff member increasing in the direction going from the first end to the second end, and locking means formed at the second end to lock a temporary crown thereto.



5,749,732
DENTAL IMPLANTATION
Victor Sendax, 70 E. 77th St., New York, N.Y. 10021
Filed Oct. 3, 1995, Ser. No. 538,680
Int. Cl.^{6} A61C *8/00*
U.S. Cl. 433—174 **11 Claims**



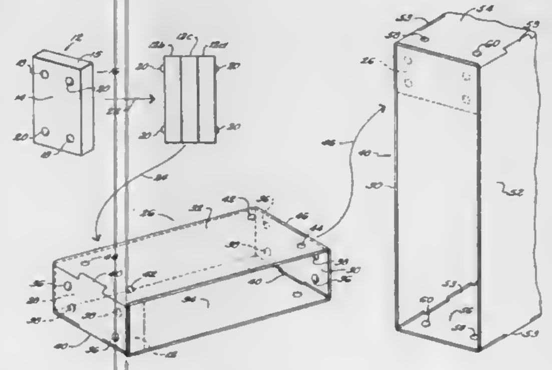
1. A dental mini-implant comprising a shaft having two opposite ends, one of which is tapered and the other of which is connected to a non-circular abutment, wherein,
- (A) the shaft ranges in diameter from about 1 mm to about 2 mm and in length from about 12 mm to about 16 mm;
- (B) a portion along a surface of the shaft at a location beginning between 5 mm to 8 mm from the tapered end is provided with a flattened area, free of thread, the flattened area in cross-section defining a chord of a circle;
- (C) the shaft being threaded essentially over its entire length except for said portion in (B);
- (D) the non-circular abutment ranges in length from about 2 mm to about 6 mm; and
- (E) the dental mini-implant ranges in overall length from about 15 mm to about 20 mm.

5,749,733
ONE-COMPONENT PRIMER/BONDING-RESIN SYSTEM
Xuejun Qian, Bartlett; Byoung I. Suh, Oak Brook; Martin Hamer, Skokie, and Russell H. Tobias, Cary, all of Ill., assignors to Bisco, Inc., Schaumburg, Ill.
Division of Ser. No. 382,617, Feb. 2, 1995, Pat. No. 5,658,963. This application Apr. 25, 1997, Ser. No. 846,006
Int. Cl.^{6} C08F *2/46*
U.S. Cl. 433—228.1 **26 Claims**

1. A method of enhancing the bonding of dental restorative materials and dental components to dental substrates comprising the steps of:
- (1) optionally pre-treating the substrate with a suitable etchant, decalcifying agent and/or abrasive;
- (2) contacting the substrate with a primer/bonding resin composition comprising:
  - (A) a polymerizable resin component comprising a mixture of
    - (i) at least one of a hydrophilic primer monomer having at least one carboxylic acid group and at least one polymerizable vinyl group, said primer monomer comprising a reaction product of at least one of an anhydride and a dianhydride compound with a compound having at least one vinyl group and at least one hydroxyl group,
    - (ii) at least one high viscosity bonding resin compound having at least one reactive vinyl group, and
    - (iii) a reactive monomer for diluting the viscosity of at least one of said high viscosity bonding resin compound and said hydrophilic primer monomer, said reactive monomer having at least one vinyl group reactive with at least one of said high viscosity bonding resin and said hydrophilic monomer:
  - (B) a photo-initiator system for initiating polymerization of said resin component when said system is combined with said resin component and exposed to activating radiation; and
  - (C) a solvent for dissolving or suspending said resin component and said photo-initiator system in a flowable form,

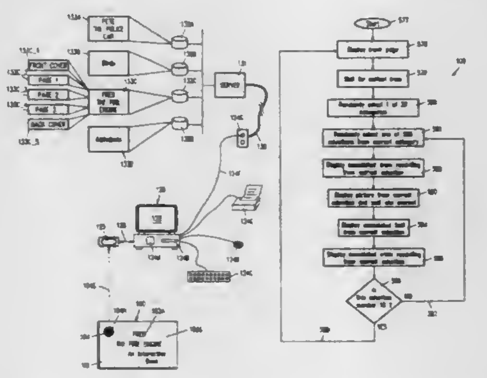
  wherein said resin component, said photo-initiator system and said solvent are selected so that a mixture thereof results in a shelf stable composition substantially polymerizable upon exposure of said mixture to at least one of an activating radiation and an external polymerization catalyst;
- (3) at least partially light curing said composition; and
- (4) contacting said at least partially cured composition with a desired dental restorative material or component and effecting polymerization of said composition to adhere said material or component to said substrate.

5,749,734
MATHEMATICAL TEACHING APPARATUS
Elon Kohlberg, 122 Brattle St., Cambridge, Mass. 02138
Filed Nov. 19, 1996, Ser. No. 752,639
Int. Cl.^{6} G09B *23/02*
U.S. Cl. 434—195 **26 Claims**



1. A mathematical teaching apparatus comprising:
- a plurality of block elements;
- a block element container, for organizing and holding a plurality of block elements, wherein a plurality of block elements will lock and hold within said block element container only when a predetermined number of block elements are inserted into said block element container; and
- a container for block element containers, for organizing and holding a plurality of block element containers, wherein a plurality of block element containers will lock and hold within said container for block element containers only when a same said predetermined number of block element containers are inserted into said container for block element containers.

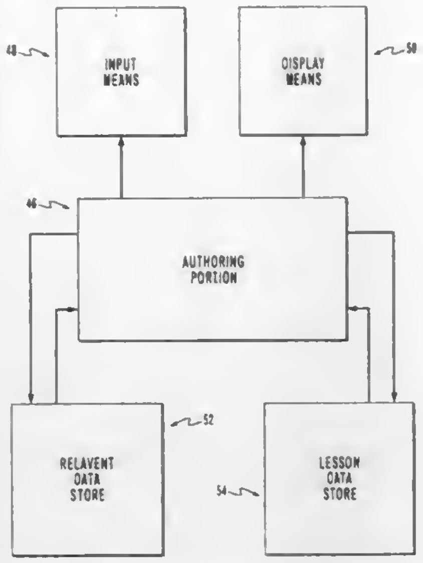
5,749,735
INTERACTIVE BOOK, MAGAZINE AND AUDIO/VIDEO COMPACT DISK BOX
Peter M. Redford, Los Gatos, and Donald S. Stern, San Jose, both of Calif., assignors to TV Interactive Data Corporation, San Jose, Calif.
Division of Ser. No. 269,492, Jul. 1, 1994, Pat. No. 5,624,265. This application Nov. 3, 1995, Ser. No. 552,836
Int. Cl.^{6} G09B *1/00*
U.S. Cl. 434—307 R **13 Claims**



1. A method for displaying on a display device included in a host device, information to be retrieved from a storage media accessible by said host device, the method comprising:
- sensing, in a printed publication, a touching on a surface portion of said printed publication;
- generating, from said printed publication, a wireless signal in response to said sensing;
- receiving said wireless signal at said host device;
- selecting, in response to said wireless signal, a selection of information at random from a plurality of selections accessible by said host device; and
- displaying at least a portion of said randomly selected selection.

5,749,736
METHOD AND SYSTEM FOR COMPUTERIZED LEARNING, RESPONSE, AND EVALUATION
Michael R. Griswold, Provo; Thierry Guillerm, Salt Lake City; Wayne Jiang; Bruce Mossman, both of Provo; Spencer Rogers, Orem, and Giovanni Tata, Provo, all of Utah, assignors to Taras Development, Provo, Utah
Continuation of Ser. No. 408,734, Mar. 22, 1995, abandoned. This application May 31, 1996, Ser. No. 653,664
Int. Cl.^{6} G09B *3/00;7/00*
U.S. Cl. 434—322 **13 Claims**

13. A computer-readable medium having computer-executable instructions comprising:
- means to create a plurality of pages which together form a lesson adapted for use in a presentation portion of a computerized learning, response and evaluation system:

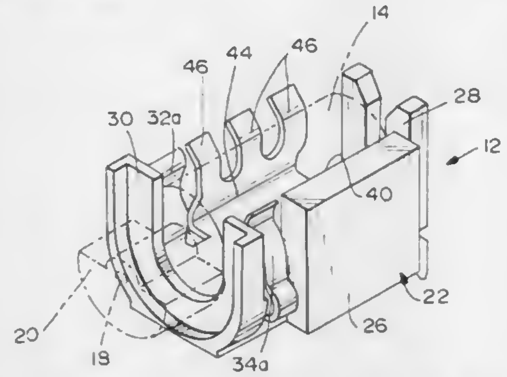


means to associate at least one resource comprising at least one of text, graphics, or sound with each of said plurality of pages so that said lesson comprises a plurality of such resources; and

means for identifying which of said at least one resource associated with said plurality of pages may be used by said computerized learning, response and evaluation system to create questions by a process which selects a plurality of resources from said plurality of pages and assembles the selected resources into a question, said means for identifying adapted for eliminating identified resources from use by said process.

5,749,737
MOTOR MOUNTING BRACKET FOR PCB

Gianni Zuin, Mestrino-Padova, Italy, assignor to Molex Incorporated, Lisle, Ill.
Filed Jul. 2, 1996, Ser. No. 677,437
Int. Cl.^{6} H01R *3/00*
U.S. Cl. 439—500 **6 Claims**



1. A bracket for mounting a generally cylindrical motor on a printed circuit board, the motor including a pair of terminals positioned on opposite sides of a longitudinal axis, the bracket comprising:

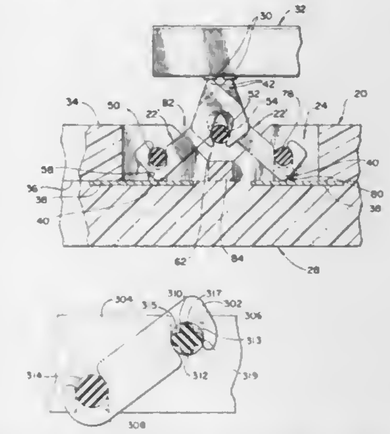
an elongated dielectric housing adapted to receive the motor and having a longitudinal axis which corresponds generally to the longitudinal axis of the motor;

a pair of conductive contacts mounted on the housing on opposite sides of the longitudinal axis, each contact including a contact portion adapted for engaging a respective one of the motor terminals and a tail portion adapted for connection to an appropriate circuit trace on the printed circuit board; and

receptacle means adapted for holding the motor in position in the bracket such that the motor terminals are in engagement with the contact portions of the contacts, wherein the receptacle means is formed in part on one side of the longitudinal axis by a portion of the dielectric housing having a gripping arm for embracing one side of the motor, and in part on the other side of the longitudinal axis by a portion of at least one of the conductive contacts having a spring arm for embracing an opposite side of the motor.

5,749,738
ELECTRICAL INTERCONNECT CONTACT SYSTEM

David A. Johnson, Wayzata; Eric V. Kline, Stillwater, and Donald L. Fulcher, Fridley, all of Minn., assignors to JohnsTech International Corporation, Minneapolis, Minn. Continuation-in-part of Ser. No. 362,206, Dec. 22, 1994, Pat. No. 5,634,801, which is a continuation-in-part of Ser. No. 56,677, May 3, 1993, Pat. No. 5,388,996, which is a continuation-in-part of Ser. No. 801,694, Dec. 2, 1991, Pat. No. 5,207,584, which is a continuation of Ser. No. 639,126, Jan. 9, 1991, Pat. No. 5,069,629. This application Apr. 26, 1996, Ser. No. 638,510
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—66 **14 Claims**



1. Apparatus for electrically interconnecting a lead of a device to a terminal spaced at a distance from the lead, comprising:

(a) an elastomeric element having a perimeter formed by a uniformly irregular surface defining a plurality of substantially identical recesses;

(b) a substantially rigid contact engagable by the lead and further engagable by the spaced terminal; said contact having a surface confining said elastomeric element about at least 180° of said perimeter;

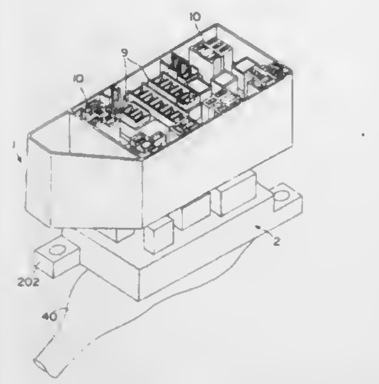
(c) a housing mounting said contact and having a surface, together with said surface of said contact, confining said elastomeric element about a full 360° of the perimeter; and

(d) wherein, as said contact is engaged by the lead, said elastomeric element deforms to permit movement of said contact, the deformation of said elastomeric element causing a portion of said elastomeric element to flow at least partially into at least one recess.

5,749,739
BRANCH CONNECTION DEVICE FOR AN AUTOMOTIVE VEHICLE

Yuuji Saka, and Hideaki Shibata, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan
Filed Sep. 11, 1995, Ser. No. 526,262
Claims priority, application Japan, Sep. 14, 1994, 6-220357
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—76.2 **7 Claims**

1. A branch connection device for connecting a plurality of circuit control components (6, 7) to at least one wiring harness (40) of an automotive vehicle, comprising:



a device main body (1) having first and second surfaces,

a plurality of circuit control sockets (9, 10) provided on the first surface of the device main body (1) and into which a plurality of the circuit control components (6, 7) are connectable, respectively,

a plurality of connector sockets (11) provided on the second surface of the device main body (1) and being disposed and configured for connection with conductors of the at least one wiring harness (40),

wiring conductors (12) in the device main body (1) and between the first and second surfaces thereof for establishing specified connections of each said connector socket (11) to at least one other of said sockets (9, 10, 11) of said device main body (1),

an auxiliary connecting member (2) having a first surface and a second surface,

a plurality of auxiliary connector portions (22) provided on the first surface of the auxiliary connecting member (2), said plurality of auxiliary connector portions (22) being disposed and configured for detachably engaging a plurality of the respective connector sockets (11) on the second surface of the device main body (1),

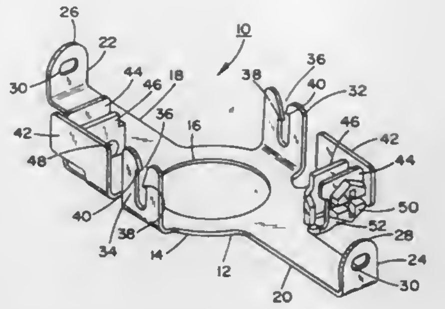
a plurality of auxiliary sockets (23) provided on the second surface of the auxiliary connecting member (2), the auxiliary sockets 23 being connected with the conductors of said at least one wiring harness (40),

at least one auxiliary wiring conductor connected to at least one said auxiliary socket (23) for enabling connections between the conductors of the at least one wiring harness (40) and the circuit control components (6, 7) that are different from the specified connections established by the wiring conductors (12) of the device main body (1), and

an intermediate connecting member (60) between the device main body (1) and the auxiliary connecting member (2), the auxiliary wiring conductor being at least partly disposed in the intermediate connecting member (60).

5,749,740
BONDING STRAP FOR NON-METALLIC ELECTRICAL ENCLOSURE

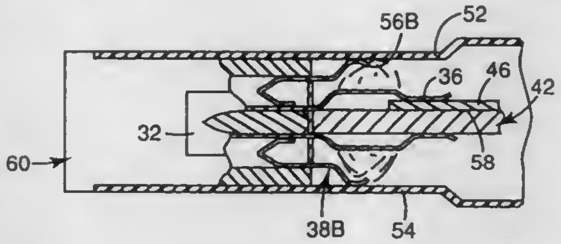
Thomas R. Swift, Monroe, and Kevin R. Richter, North Haven, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.
Filed Sep. 20, 1996, Ser. No. 717,506
Int. Cl.^{6} H01R *13/648*
U.S. Cl. 439—92 **13 Claims**



1. A bonding strap for at least one electrical device arranged in a non-metallic electrical enclosure, said bonding strap comprising an elongated planar member; means at opposite ends of said elongated planar member for fastening said bonding strap to an electrical device; a central aperture in said elongated planar member intermediate the opposite ends thereof; means extending transversely in a center portion of said elongated planar member for clampingly engaging interior surface structure of said electrical enclosure; and means on opposite sides of said elongated planar member forming terminations for grounding conductors.

5,749,741
ELECTRICAL CONNECTOR WITH GROUND CLIP

Jeffrey J. Bellas, Columbia, Mo.; Clyde W. Boling, Austin, Tex.; Dennis M. Brunner, Centralia, Mo., and Steven Feldman, Madison, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 12, 1996, Ser. No. 678,832
Int. Cl.^{6} H01R *4/66*
U.S. Cl. 439—95 **23 Claims**



1. An electrical connector for use with a circuit card having a generally planar substrate with a plurality of conductive elements disposed along at least one edge of said generally planar substrate, each of said plurality of conductive elements coupled to an electrically conductive trace on said generally planar substrate, and at least one generally planar conductive cover panel mounted to and covering said generally planar substrate, said electrical connector comprising:

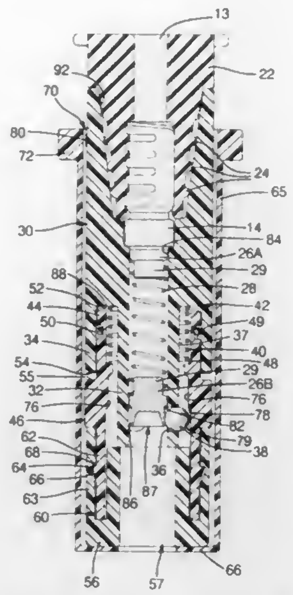
an electrical coupling which includes a plurality of electrical contacts, wherein each of said plurality of electrical contacts is coupled to an associated electrical terminal which is mated with one of said plurality of conductive elements; and

a grounding clip mounted on at least one of said associated electrical terminals, said grounding clip having a conductive member extending therefrom adapted to engage said at least one generally planar conductive cover panel while said at least one generally planar conductive cover panel is mounted to said generally planar substrate wherein at least one electrically conductive trace on said generally planar substrate is electrically coupled through a conductive element, said electrical coupling and said grounding clip to said at least one generally planar conductive cover panel.

5,749,742
MAXIMUM RETENTION SERVICEABLE HIGH VOLTAGE SPARK PLUG ADAPTER

Dale Charles Bertuzzi, Jr.; Michael James Bezusko, both of Warren, and David Allen Nuss, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 15, 1996, Ser. No. 730,026
Int. Cl.^{6} H01R *13/44*
U.S. Cl. 439—125 **13 Claims**

1. A spark plug adapter for making electrical and mechanical connection to a spark plug comprising:



a spark plug cable having a terminal at one end for making electrical connection to a spark plug terminal, a connector body having a central bore formed therein for receiving the cable terminal, said connector body having a first downwardly extending tubular sleeve for receiving said cable terminal and a portion of a spark plug terminal post, said first downwardly extending tubular sleeve having a hole formed near one end for receiving a spark plug terminal retaining ball;

a compression spring surrounding a portion of an outside wall of said first tubular sleeve, a sliding retainer constructed and arranged for slidable movement on the outer surface of the first tubular sleeve, said sliding retainer having an upwardly extending leg constructed and arranged to be spaced a distance from said first tubular member and defining a gap between the outer wall of the first tubular sleeve and the upwardly extending leg portion for receiving said compression spring, said sliding retainer including a ledge extending inwardly towards the first tubular sleeve to provide a stop and pressure point for the compression spring;

a main body portion of the sliding retainer extending downwardly from the ledge and having a first flat inside surface spaced a distance from the first tubular sleeve, and a second flat inside surface spaced from the first tubular sleeve a distance greater than the first flat surface and a shoulder extending between the first and second flat surfaces;

the sliding retainer being movable from a first retracted position wherein no spark plug is connected to the adapter and wherein the ball engages the second flat surface of the sliding retainer, and wherein the sliding retainer is movable from the first position to a second position wherein the sliding retainer is moved downwardly so that the shoulder engages the ball forcing the ball to move radially inward towards the spark plug terminal until the shoulder moves passed the ball and the ball is trapped between the first flat surface of the sliding retainer and the spark plug terminal and wherein said ball applies a force to the spark plug terminal to mechanically hold the spark plug in place.

5,749,743

BULB SOCKET FOR VEHICULAR LAMP

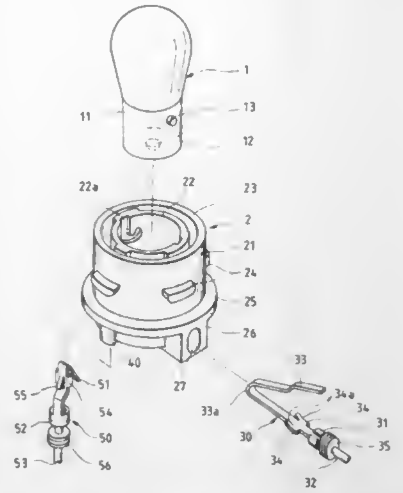
Tadashi Harada, and Kihachiro Uchida, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1995, Ser. No. 581,427

Claims priority, application Japan, Jan. 14, 1995, 7-021047; Oct. 17, 1995, 7-293531

Int. Cl.^{6} H01R *4/50*

U.S. Cl. 439—336 **15 Claims**



1. A bulb socket comprising:

a tubular body for receiving a base of a bulb; and a positive terminal insertion portion formed at a bottom portion of said socket body, said positive terminal insertion portion opening in a direction perpendicular to a longitudinal axis of said socket body; at least one positive terminal inserted into said socket body through said positive terminal insertion portion and held on an inner bottom portion of said socket body, said positive terminal contacting a positive electrode formed on said base of said bulb, said positive terminal insertion portion being formed generally diametrically of said socket body and having a length larger than a diameter of said socket body, said positive terminal being supported in said positive terminal insertion portion along the length thereof, and said positive terminal having a length larger than the diameter of said socket body; a negative terminal insertion portion with a first opening at the bottom of said socket body communicating with an axially disposed longitudinal slot and a negative terminal having a narrow longitudinal shape and being insertable into said first opening and supported in said longitudinal slot on an inner peripheral surface of said socket body, said negative terminal contacting a negative electrode on said base of said bulb.

5,749,744

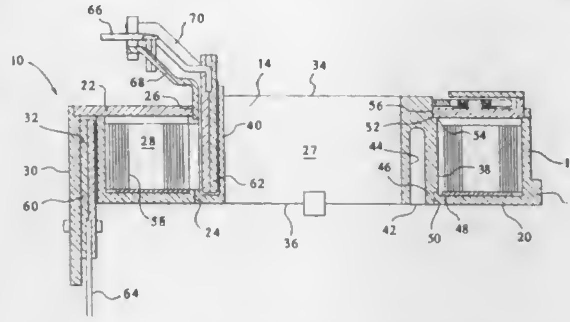
ELECTRICAL CONNECTOR WITH EMI/RFI SHIELDING

Brent E. Henderson, R.R. 1, Box 1A, Golden, Ill. 62339; Pat A. Bolen, 914 Main St., Carthage, Ill. 62321, and John A. DeFranco, 29733 Deer Run, Farmington, Mich. 48331

Filed Jun. 26, 1996, Ser. No. 671,261

Int. Cl.^{6} H01R *3/00*

U.S. Cl. 439—164 **8 Claims**



1. A clockspring for carrying electrical signals through a steering wheel comprising:

a housing having an outer radial wall and a top formed of conductive plastic;

a hub rotatably mounted to the housing formed of conductive plastic; and

a ribbon cable coiled around the hub and connected to the housing and the hub, wherein the ribbon cable is shielded from EMI/RFI.

5,749,745

ADAPTER CONNECTOR AND CAMERA ASSEMBLY EQUIPPED WITH SAID ADAPTER CONNECTOR

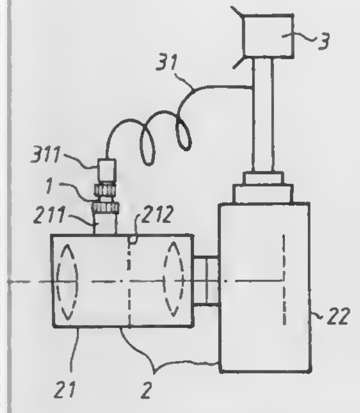
Werner Flöther, and Gerhard Hohberg, both of Aalen, Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Nov. 7, 1995, Ser. No. 551,795

Claims priority, application Germany, Nov. 9, 1994, 9417946 U

Int. Cl.^{6} H01R *13/627*

U.S. Cl. 439—349 **9 Claims**



1. An adapter for receiving an insertable connector plug therein and, in turn being insertable into a receiving socket, the adapter comprising:

an elongated body having first and second longitudinal ends;

said elongated body having an adapter socket defining a hollow cylinder formed on said first longitudinal end thereof for receiving the insertable connector plug therein;

a clamping device for exclusively engaging and pressing in said hollow cylinder to tightly clamp the insertable connector plug therein;

said elongated body further having an adapter connector plug formed on said second longitudinal end and said adapter connector plug including an external cylinder with a projecting latch nose for insertion into the receiving socket;

said elongated body defining a first central through bore;

an elongated insulating part fixedly seated in said first central bore and said insulating part defining a second bore coaxial with said first central bore;

a connector pin disposed in said second central bore;

the insertable connector plug being part of a commercially available control line of a flash device of a camera assembly and the receiving socket being mounted on the camera assembly; and

said adapter being compatible with the insertable connector plug and the receiving socket.

5,749,746

CABLE CONNECTOR STRUCTURE

Haw-Chan Tan, and Frank C. Ma, both of Diamond Bar, Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan

Filed Sep. 26, 1995, Ser. No. 534,049

Int. Cl.^{6} H01R *13/54*

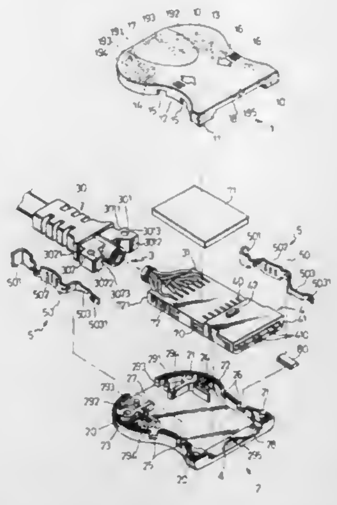
U.S. Cl. 439—357 **10 Claims**

1. A cable connector comprising:

a casing defining therein an interior space having a first and a second openings;

a connector body disposed within the interior space of the casing with a coupling end partially projecting out of the first opening of the casing adapted to couple to a counterpart connector;

a cable containing at least one conductor, having a joint end received within the casing through the second opening of the casing with said at least one conductor electrically connected to the connector body with a connection means including a circuit board soldered to the connector body and in electrical connection with said at least one conductor;



a pair of insulation pads attached to two opposite surfaces of the circuit board for enclosing and protecting the circuit board; and

lock-in means comprising two spring plates, each having a rear retaining section retained within the casing and a front lock-in section projecting out of the casing to be movable between a first position where the lock-in section engages a counterpart lock-in member provided on the counterpart connector to secure the cable connector to the counterpart connector and a second position where the lock-in section disengages from the counterpart lock-in member of the counterpart connector, a pushbutton section being integrally connected between the retaining section and the lock-in section and user-operable to move the lock-in section between the first and second positions; wherein

the lock-in section of each of the spring plates comprises a projection formed thereon adapted to be engageable with a notch formed on the counterpart lock-in member of the counterpart connector.

5,749,747

PARTIAL-FITTING PREVENTION CONNECTOR

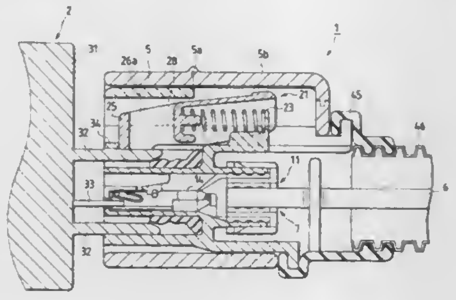
Shigemitsu Inaba; Makoto Yamanashi; Yukio Ohta; Masaru Fukuda, and Eiji Fukuda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 27, 1996, Ser. No. 773,573

Claims priority, application Japan, Dec. 28, 1995, 7-343456

Int. Cl.^{6} H01R *13/627*

U.S. Cl. 439—358 **12 Claims**



1. A partial-fitting prevention connector, comprising:

a first connector having a plurality of terminal accommodating chambers extending in a longitudinal direction for receiving first terminals therein;

a second connector having a plurality of terminal accommodating chambers for receiving second terminals therein, said second connector being adapted to be mated with said first connector upon relative movement of said second connector in a rearward direction with respect to said first connector, said rearward direction being parallel to said longitudinal direction, said second connector including a retaining projection;

retaining means connected to said first connector for retaining said first connector to said second connector in a completely locked position, said retaining means including a lock member which is slidably secured to said first connector so as to be moveable in said longitudinal direction and which is pivotable with respect to said first connector; and

biasing means for urging said lock member toward said second connector in a forward direction, opposite said rearward direction, wherein said lock member is engageable with said retaining projection when said first and second connectors are in said completely locked position.

5,749,748

Patent Not Issued For This Number

5,749,749

ELECTRIC LOW-VOLTAGE CONNECTING TERMINAL, IN PARTICULAR FOR LUMINOUS SIGNALLERS

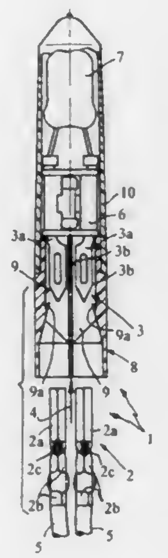
Flavio Gallone, Cornaredo, Italy, assignor to Signal Lux S.p.A., Novara, Italy

Filed Sep. 6, 1996, Ser. No. 709,103

Claims priority, application European Pat. Off., Dec. 13, 1995, 95830511

Int. Cl.^{6} H01R *17/00*

U.S. Cl. 439—617 **6 Claims**



1. An electric luminous signaller low-voltage connecting terminal (**1**), comprising a socket connector (**2**) and a plug connector (**3**) constructed to be mutually coupled to provide low voltage electrical contact,

said socket connector (**2**) has a tubular coupling portion (*2a*), said plug connector (**3**) has a reed-like coupling portion (*3a*), said reed-like coupling portion having two opposite side edges spaced apart from each other,

said tubular coupling portion being sized to provide electric contact between substantially only said two opposite side edges of said reed-like coupling portion and inner walls of said tubular coupling portion when said socket connector and said plug connector are coupled, and

locking means (**8**) to releasably lock said plug connector (**3**) to said socket connector (**2**).

5,749,750

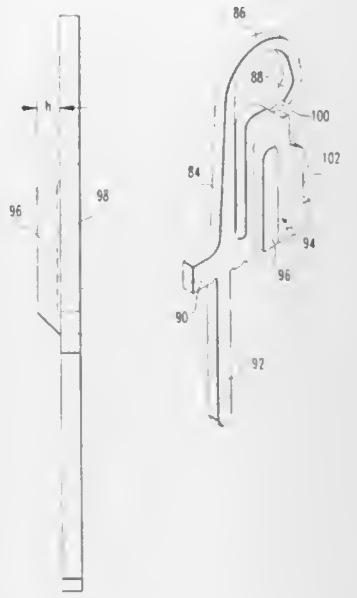
CONNECTOR

Wang-I Yu, Taipei, and Jui-Chu Lin, Tao-Yuan, both of Taiwan, assignors to Berg Technology, Inc., Reno, Nev.

Filed Aug. 23, 1995, Ser. No. 526,797

Int. Cl.^{6} H01R *23/70*

U.S. Cl. 439—637 **6 Claims**



1. A connector for receiving a circuit board comprising, an elongated housing having opposed ends and a pair of parallel longitudinal sides and a longitudinal board receiving groove interposed between said longitudinal sides such that an edge of the circuit board is receivable in said board receiving groove, transverse contact receiving slots having opposed side walls with an axial projection receiving groove in one of said side walls and at least one longitudinal row of electrical contact elements positioned adjacent said board receiving groove and at least one of the contact elements having a transverse plate which has a projection extending in normal relation from said plate to engage the axial projection receiving groove in one of the side walls of one of the transverse contact receiving slots for imparting an axial retention force on the at least one contact element and wherein the at least one contact has a contact tip portion spaced from the plate and the plate is positioned to be engageable by said contact tip portion so as to provide an overstress protection surface for the contact.

5,749,751

CIRCUIT BREAKER

James Joseph Shortt, Galway, and Shay Joseph Lavelle, Westport, both of Ireland, assignors to Square D Company, Palatine, Ill.

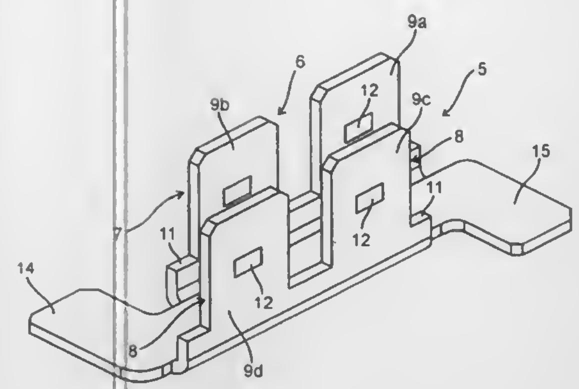
Filed Mar. 27, 1996, Ser. No. 624,777

Claims priority, application Ireland, Apr. 4, 1995, 950239

Int. Cl.^{6} H01R *9/22*

U.S. Cl. 439—721 **17 Claims**

1. A circuit breaker having a circuit breaker housing with at least two supply terminals and a terminal connector electrically connected to at least one supply terminal, the terminal connector being formed from a strip of conducting material having at least two upstanding spaced apart rows of laterally arranged male spade connectors interconnected by a mounting plate, adjacent male spade connectors in different rows being offset laterally, the mounting plate incorporating at least two oppositely directed, locking lugs, for engaging a corresponding formation on the circuit breaker housing.



5,749,752

ELECTRICAL CONNECTOR

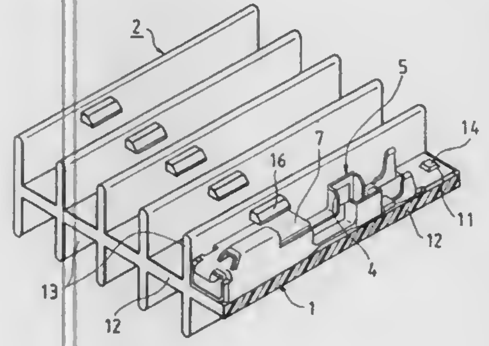
Motohisa Kashiyama, and Masanori Tsuji, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 670,982

Claims priority, application Japan, Jun. 30, 1995, 7-166107

Int. Cl.^{6} H01R *13/42*

U.S. Cl. 439—733.1 **8 Claims**



1. A connector, comprising:

a terminal holder having a plurality of terminal accommodating chambers separated by partition walls, said terminal accommodating chambers being defined by said partition walls and bottom walls, said bottom walls each having a fitting portion projecting therefrom; and

a plurality of terminals respectively provided in said terminal accommodating chambers, said terminals each including an opening in a bottom surface thereof which receives therein the respective fitting portion of said terminal holder to prevent said terminal from being withdrawn from said terminal accommodating chamber in a rearward direction of said terminal,

wherein said plurality of terminals are initially secured to each other via a carrier strip, wherein a plurality of said openings function as feed holes for conveyance of said strip, and wherein said terminals are individually severed from said strip with said openings remaining in said terminals.

5,749,753

JOINT CONNECTOR

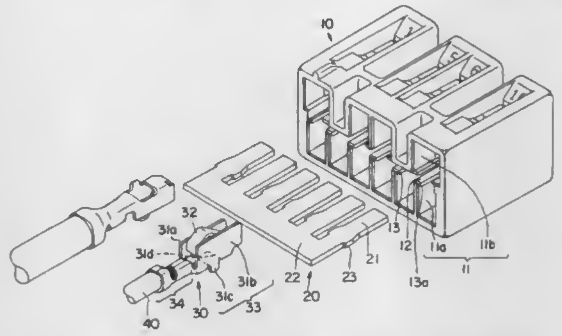
Masamitsu Chishima, and Tomonari Ito, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed May 28, 1996, Ser. No. 654,195

Claims priority, application Japan, Jun. 6, 1995, 7-164651

Int. Cl.^{6} H01R *13/514*

U.S. Cl. 439—752.5 **11 Claims**



1. A joint connector assembly comprising a terminal and a connector housing

said terminal having a front portion, facing said connector housing, and a rear portion, facing away from said connector housing, said front portion including a first upstanding wall and a second upstanding wall, said first wall extending longitudinally of said terminal toward said rear portion, said second wall being substantially parallel to and laterally spaced apart from said first wall, thereby forming a space therebetween,

said connector housing having a receptacle for said terminal adapted to receive said front portion with said first wall and said second wall in a predetermined orientation,

said first wall being lower than said second wall, said receptacle having a low portion, complementary to said first wall, and a high portion complementary to said second wall when said terminal is in said predetermined orientation, said low portion being lower than said second wall whereby, if said terminal is in other than said predetermined orientation, it cannot be introduced into said receptacle, a resilient tongue in said space and extending vertically out of said space when no downward pressure is exerted thereon, whereby contact is obtained between said tongue and an adjacent portion of said housing.

5,749,754

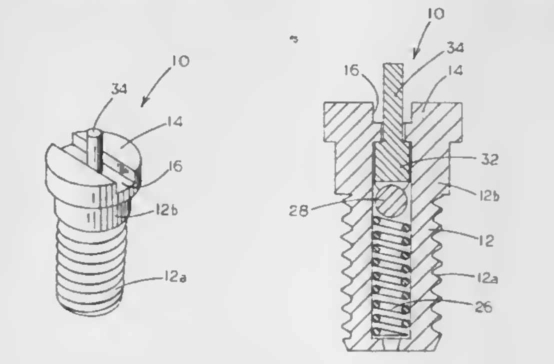
RADIOTELEPHONE HAVING A COMBINATION FASTENER AND ELECTRICAL CONNECTOR

Gregory S. Patterson, Morrisville, and Darrell G. Epperson, Wake Forest, both of N.C., assignors to Ericsson, Inc., RTP, N.C.

Filed Jul. 19, 1996, Ser. No. 684,391

Int. Cl.^{6} H01R *13/24*

U.S. Cl. 439—824 **29 Claims**



1. A combination fastener and electrical connector, comprising:

a) a fastener having external threads for securing two components together;
b) a cavity formed in the fastener and including an outer opening;
c) a movable electrical connector movably contained within the cavity and wherein the electrical connector and the fastener form a unit conductor;
d) a spring disposed within the cavity for biasing the electrical connector outwardly from the cavity so as to expose the electrical connector exteriorly of the fastener; and
e) wherein the electrical connector may be pressed inwardly into the cavity against the spring.

5,749,755
FEMALE ELECTRIC TERMINAL

Alessandro Genta, Turin, and Renzo Rampone, Moncalieri, both of Italy, assignors to Framatome Connectors International S.A., Courbevoie, France

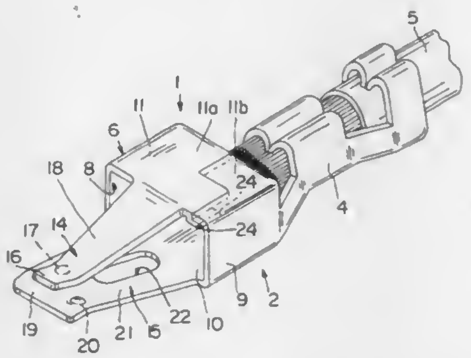
PCT No. PCT/EP94/03416, § 371 Date Apr. 17, 1996, § 102(e) Date Apr. 17, 1996, PCT Pub. No. WO95/11535, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 17, 1994, Ser. No. 628,697

Claims priority, application Italy, Oct. 18, 1993, TO93 A 000768

Int. Cl.⁶ H01R *13/11*

U.S. Cl. 439—856 **6 Claims**



1. A female electric terminal made of conductive sheet metal and comprising, integrally, a contact body with contact means for cooperating with a male terminal, and a portion for connection to an electric cable, said contact means comprising first and second flexible blade means projecting from opposite walls of said contact body, extending on opposite sides of an insertion plane of said male terminal for cooperating elastically with respective opposite faces of said male terminal, said blade means defining, when undeformed, a gap smaller than a thickness of said male terminal, wherein said first and second blade means are asymmetrical in relation to said insertion plane of said male terminal so as to define transversely offset contact areas on respective faces of said male terminal, said first and second blade means comprising respective flexible portions having a substantially identical flexural rigidity, wherein said first blade means comprise a single first blade, and said second blade means comprise a single second blade, and said first blade having a width less than a width of second blade.

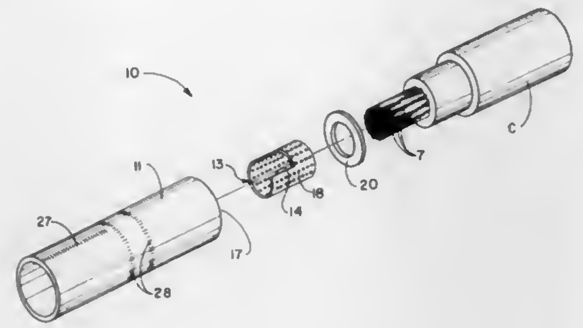
5,749,756
SEALED CORROSION-PROOF CRIMPED TERMINAL OF SPLICE

William Joseph Vockroth, Harrisburg; James Donald Engle, Bainbridge; Ralph Richard Goss, Palmyra; Richard Dean Heim, Landisville; Ronald Joseph Maley, Landisville, and David Keith Schrum, Hummelstown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 17, 1996, Ser. No. 733,286

Int. Cl.⁶ H01R *4/20*

U.S. Cl. 439—879 **11 Claims**



1. A crimped assembly for terminating an end of a wire, the assembly having a housing, the housing having a hollow barrel provided with an insert sleeve which is received within the barrel and abuts against an interior wall thereon, wherein the wire is received through the open end of the barrel and within the insert sleeve, and wherein the housing is crimped over the insert sleeve and the wire, thereby retaining the wire; a protruding lug on the barrel, the protruding lug extends axially from the interior wall, radially inwardly of the barrel, and in the direction toward the open end thereof, and the insert sleeve having a notch receiving the protruding lug on the barrel, thereby circumferentially keying the insert sleeve to the barrel and preventing relative rotation therebetween, improving heat dissipation, and reinforcing the housing and the insert sleeve when the housing is crimped over the insert sleeve and the wire.

5,749,757
IMPELLER SHAFT JOURNAL FOR JET PUMP

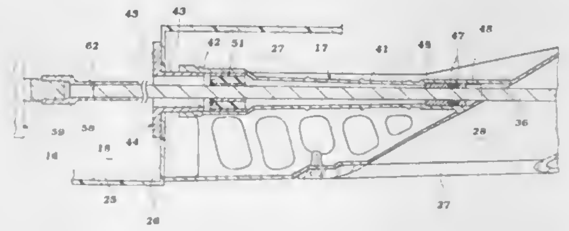
Noboru Suganuma, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan

Continuation of Ser. No. 576,125, Dec. 21, 1995, abandoned. This application Apr. 9, 1997, Ser. No. 838,679

Claims priority, application Japan, Dec. 26, 1994, 6-322271

Int. Cl.⁶ B63H *11/02*

U.S. Cl. 440—83 **4 Claims**



1. An elastic bearing support for the impeller shaft of a water jet propulsion unit comprised of an outer housing having a tubular extension through which an impeller shaft extends, a plane bearing having a slidable support with the forward end of said impeller shaft, an elastomeric element directly affixed to said plane bearing and tubular housing for accommodating transverse movement of said plane bearing relative to said tubular extension, and a seal received in an integral cavity formed at one end of said plane bearing in sealing engagement with said impeller shaft.

5,749,758
VESSEL FOR PRODUCTION AND/OR LOADING/UNLOADING AND TRANSPORT OF HYDROCARBONS FROM OFFSHORE FIELDS, AND/OR FOR CARRYING OUT WELL OPERATIONS

Kåre Breivik, Tau; Trygve G. Egge, Hafrsfjord, and Sverre Herstad, Langhus, all of Norway, assignors to Den Norske Stats Oljeselskap A.S., I & K Patent, Stavenger, Norway

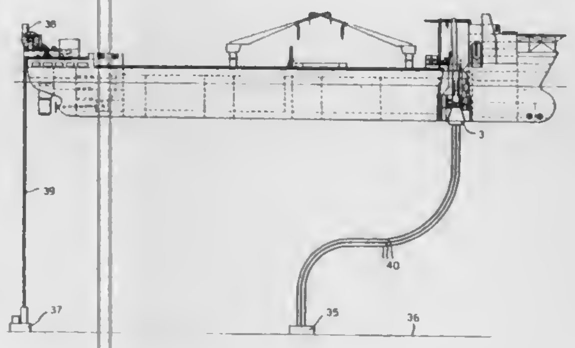
PCT No. PCT/NO95/00022, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/21091, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 1, 1995, Ser. No. 687,597

Claims priority, application Norway, Feb. 2, 1994, 940352

Int. Cl.⁶ B63B *22/02*

U.S. Cl. 441—5 **8 Claims**



1. A vessel capable of alternating between operation as a production ship for hydrocarbon production, as a storage ship on offshore fields, and as a shuttle tanker, the vessel comprising in combination:
(a) a submerged, downwardly-open receiving space at a bow of the vessel for receiving a bottom-anchored underwater buoy for transfer of hydrocarbons,
(b) a service shaft extending between the receiving space and a deck of the vessel,
(c) a swivel unit arranged at a lower end of the service shaft, for connection of the buoy to a pipe system on the vessel, the swivel unit being movably arranged to be taken away from the shaft and clear the shaft when the swivel is not in use,
(d) a coupling head and equipment for connection of a hose for loading/unloading of oil, the coupling head being disposed at a stern of the vessel, and the equipment being disposed at the stern for execution of operations on sea bed installations or wells at the same time as the vessel is anchored to the underwater buoy.

5,749,759
AQUADYNAMIC SWIM APPARATUS

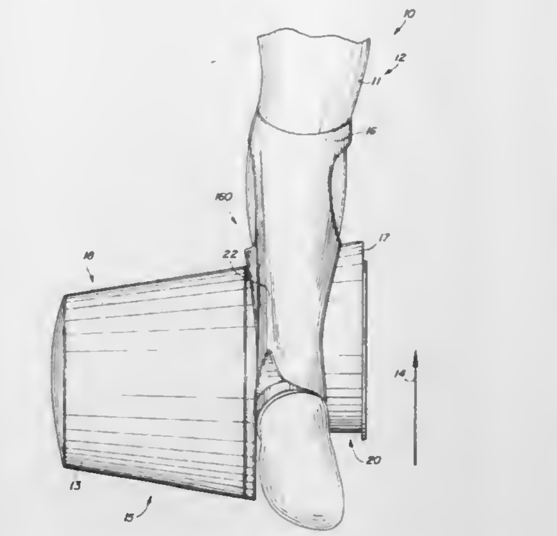
William J. Hopper, 1270 North Marine Drive, Suite 101, Tamuning, Guam, 96911

Filed Sep. 6, 1996, Ser. No. 708,926

Int. Cl.⁶ A63B *31/12*

U.S. Cl. 441—60 **22 Claims**

1. An apparatus for aiding a swimmer to swim, comprising:
a leg cuff adapted to attach to a leg of the swimmer;
a first foil connected to said leg cuff, said first foil having a working surface and a working surface profile having a curvilinear shape taken along a longitudinal plane of said working surface;
said first foil being pivotally coupled to said leg cuff so as to permit relative rotation therebetween,
an attitude control mechanism coupled between said first foil and said leg cuff for controlling said rotation of said first foil; and
said attitude control mechanism comprising:
  a control arm coupled to said first foil and extending away from said working surface, and



  an extensible member pivotally coupled to said control arm at a distal end of said control arm a length of said extensible member self adjusting in response to a force applied to said working surface.

5,749,760
ELECTRON GUN ASSEMBLING APPARATUS AND METHOD OF ASSEMBLING ELECTRON GUN

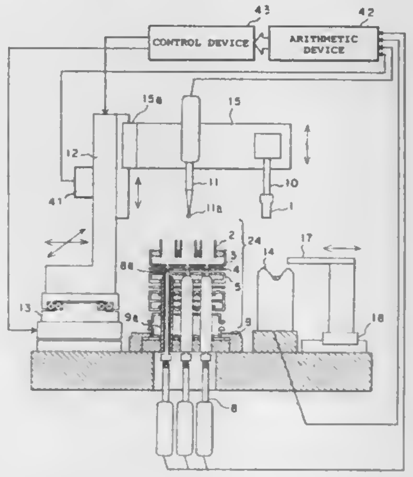
Yasuki Kimura; Takashi Shirase; Masamitsu Okamura, and Shuichi Maezono, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1996, Ser. No. 686,402

Claims priority, application Japan, Feb. 28, 1996, 8-041969

Int. Cl.⁶ H01J *9/18;9/42*

U.S. Cl. 445—4 **19 Claims**

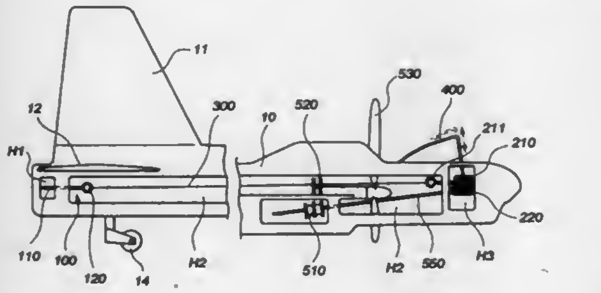


1. A method of assembling an electron gun, for positioning and fixing a cathode to an electron gun assembly in which at least first and second electrodes are supported by an insulating glass and are arranged at a predetermined interval, said method comprising the steps of: measuring a position of a surface of said cathode at a cathode surface measuring position outside said electron gun assembly;

measuring a position of an upper surface of said first electrode in said electron gun assembly;
measuring a position of said second electrode in the electron gun assembly;
determining an interval between said first electrode and said second electrode in said electron gun assembly on the basis of at least the measured positions of the upper surface of said first electrode and said second electrode, and a measured and known thickness of said first electrode;
calculating an optimal value of an interval between said first electrode and said cathode, which depends on the interval between said first electrode and said second electrode;
moving said cathode from the cathode surface measuring position to a cathode assembling position where said cathode is incorporated into said electron gun assembly;
determining a current position of the surface of said cathode from the position of the surface of said cathode at the cathode surface measuring position and a variation in position of the surface of said cathode which is caused by a movement of said cathode to the cathode assembling position; and
positioning and fixing said cathode by inserting said cathode into said electron gun assembly until a difference between the current position of the cathode surface and the position of the first electrode upper surface reaches the optimal value calculated.

5,749,761
MODEL GLIDER HAVING TWIN PROPELLERS

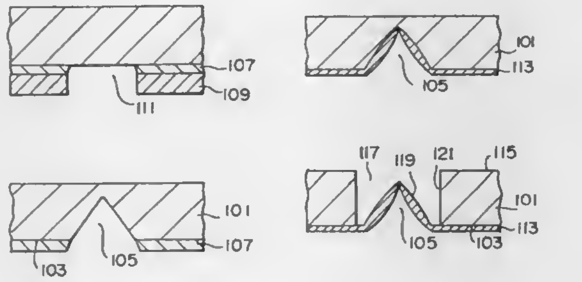
Cho-kwon Kim, Kwachon, Rep. of Korea, assignor to Kang-hee Hahn, Seoul, Rep. of Korea
Filed Oct. 31, 1996, Ser. No. 741,132
Claims priority, application Rep. of Korea, Oct. 31, 1995, 95-31826
Int. Cl.⁶ A63H *27/00*
U.S. Cl. 446—60 **3 Claims**



1. A model glider comprising:
a central frame which forms a body of the glider;
a vertical tail mounted on a rear part of the body;
a pair of horizontal tails respectively provided on both sides of the rear part of the body;
a pair of main wings horizontally provided on both sides of a middle part of the body;
a rotating member having a first and second end, the first end is fixed in a hole formed through the central frame of the body;
a power transmitting part having a main gear and an auxiliary gear which are engaged with each other and arranged in a front part of the body;
an elastic band member having a first end connected with the second end of the rotating member and a second end coaxially connected to the main gear, wherein the elastic band member is twisted by the rotation of the rotating member and restored by its restoring force;
a stopper having one end fixed at a predetermined position on the body and another end located on the main gear configured to interrupt the rotation of the main gear;
a driving part comprising twin propellers respectively formed in front of the main wings, a first pulley mounted coaxially with the auxiliary gear via a connecting members a pair of pulleys respectively mounted coaxially with the twin propellers, and connecting belts which connect the first pulley with the pair of pulleys configured to rotate the propellers by restoring force of the elastic band member; and
a link lever provided in the rear part of the body and an having one end connected to the rotating member for twisting the elastic band.

5,749,762
FIELD EMISSION COLD CATHODE AND METHOD FOR PRODUCTION THEREOF

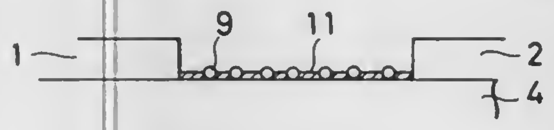
Masayuki Nakamoto, Yokohama, and Tomio Ono, Yamato, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan
Division of Ser. No. 209,928, Mar. 14, 1994, Pat. No. 5,483,118. This application Oct. 4, 1995, Ser. No. 539,072
Claims priority, application Japan, Mar. 15, 1993, 5-054018
Int. Cl.⁶ H01J *1/30;9/02*
U.S. Cl. 445—50 **5 Claims**



1. A method for the production of a field emission cold cathode, comprising the steps of:
(a) preparing a substrate having a first main surface and a second main surface;
(b) providing holes each having a sharp point in said first main surface of said substrate;
(c) forming a first insulation layer on said first main surface having dents corresponding to said holes, each said dent shaped as a sharply pointed cone;
(d) forming windows by incising said second main surface of said substrate so that a back surface of said first insulation layer is exposed, each of said windows being formed at a position corresponding to each of said holes formed in said first main surface of said substrate; and
(e) forming an emitter layer in conformity with a contour of a front surface of said first insulation layer, said emitter layer including a plurality of emitters each having a sharp point at a lead end part thereof transferred from said sharply pointed cone of said first insulation layer.

5,749,763
DISPLAY DEVICE WITH ELECTRON-EMITTING DEVICE WITH ELECTRON-EMITTING REGION INSULTED FROM ELECTRODES

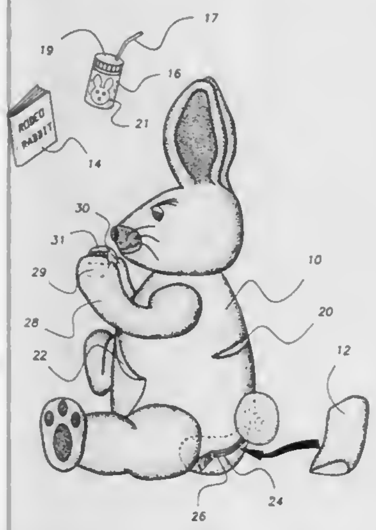
Seishiro Yoshioka, Hiratsuka; Ichiro Nomura, Yamato; Hidetoshi Suzuki, Atsugi; Toshihiko Takeda, Tokyo; Tetsuya Kaneko, Yokohama; Yoshikazu Banno, Atsugi, and Kojiro Yokono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 396,066, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 191,065, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 705,720, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 218,203, Jul. 13, 1988, Pat. No. 5,066,883. This application Jun. 7, 1995, Ser. No. 474,324
Claims priority, application Japan, Jul. 15, 1987, 62-174837; Oct. 2, 1987, 62-250448; Oct. 9, 1987, 62-255063; Oct. 9, 1987, 62-255068; Apr. 27, 1988, 63-102485; Apr. 27, 1988, 63-102486; Apr. 27, 1988, 63-102487; Apr. 27, 1988, 63-102488; Jun. 21, 1988, 62-154516
Int. Cl.⁶ H01J *9/02;1/30*
U.S. Cl. 445—51 **4 Claims**



2. A method of preparing an electron-emitting device comprising (a) electrodes disposed on a substrate, and (b) an electron emitting portion disposed between said electrodes, wherein electrons are emitted by said electron emitting portion by applying a voltage between said electrodes, comprising the steps of:
(i) coating an insulating layer containing fine particles on said substrate to form said electron emitting portion:
(ii) thereafter baking said coating; and
(iii) forming said electrodes on said insulating layer.

5,749,764
AMUSEMENT SYSTEM FOR CHILDREN

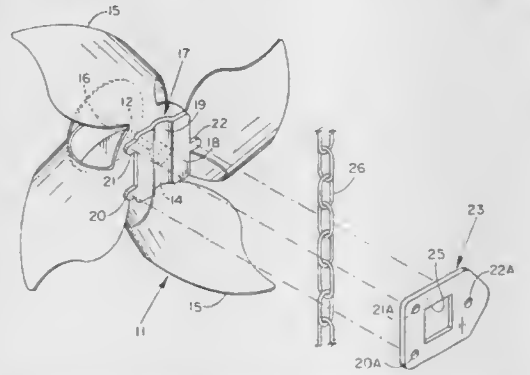
Jeffrey L. Bailey, 4517 Wainwright Ave., Lansing, Mich. 48911
Filed Mar. 1, 1996, Ser. No. 609,352
Int. Cl.⁶ A63H *33/00;3/00;3/28;3/02*
U.S. Cl. 446—27 **1 Claim**



1. An amusement system for children comprising:
a soft sculpture character having at least two open access pockets and at least one sealable pocket having a fastening mechanism interconnectable in a manner to seal said opening into said sealable pocket;
a fabric bag containing a plurality of high density particles, said fabric bag being of a size sufficient to fit entirely within said at least one sealable pocket and, in combination with said plurality of high density particles, having a weight sufficient to maintain said soft sculpture character in an upright position, said fabric bag filled with said high density particles being removably positionable within said at least one sealable pocket;
a tape player assembly including a tape player device and a headphone assembly, connectable with said tape player device, having an over said head support piece;
an illustrated book containing a story that includes said soft sculpture character;
a cassette tape recording having said story recorded thereon in a manner to be played by said tape player device;
a costume element wearable by a child having visual characteristics identifiable with said soft sculpture character; nd
a drinking vessel bearing indica on an outer surface thereof that corresponds to said soft sculpture character, said drinking vessel including a straw type drinking tube extending from a top cover of said drinking vessel;
said costume element being a representation of ear appendages as depicted in said soft sculpture character, said costume element being detachably attachable to said over the head support piece of said headphone assembly with at least one crimp connector, each said crimp connector including a pair of gripping edges curlable around and frictionally gripping a portion of said headphone assembly;
said soft sculpture character having a rearwardly facing open access pocket that is sized to simultaneously receive and allow storage therein of both said illustrated book and said drinking vessel and a forward facing open access pocket that is provided on a stomach area of said soft sculpture character that is sized to receive and allow storage therein of said tape player;
said soft sculpture character further including a first and a second forward paw, each said first and second forward paws each having a portion of a hook and pile type fastener attached at an end thereof in a manner that allows said first and second paws to be secured together to assist in maintaining said tape player within said forward facing access pocket.

5,749,765
PINWHEELS FOR PLAYGROUND EQUIPMENT

Jahn Stopperan, 16145 Hyland Ave. South, Lakeville, Minn. 55044
Filed Jun. 17, 1996, Ser. No. 664,534
Int. Cl.⁶ A63H *33/40*
U.S. Cl. 446—217 **10 Claims**



1. In combination with a rotatable pinwheel mounted for rotation on a pinwheel shaft and means for activation by a stream of moving air, with the pinwheel shaft being coupled at its distal end to a support post; fastener means for joining said support post to a base member movable in the ambient air, said fastening means comprising:
(a) base bracket means comprising a "C"-shaped arcuate pad defining an inner concave base member contacting surface on

a convex outer surface, and means including a plurality of radially extending ears for securely engaging a resilient flexible locking strap across said concave base member contacting surface;

(b) a resilient flexible locking strap having a body in the form of a generally rectangular sheet with ear hooking openings formed adjacent the edges thereof and adapted to be coupled across the edges of said "C"-shaped arcuate pad and to close the opening of said pad; and

(c) a socket integral with said "C"-shaped arcuate pad and positioned on the convex outer surface thereof to retainably receive the proximal end of said support post therewithin.

5,749,766

Patent Not Issued For This Number

5,749,767

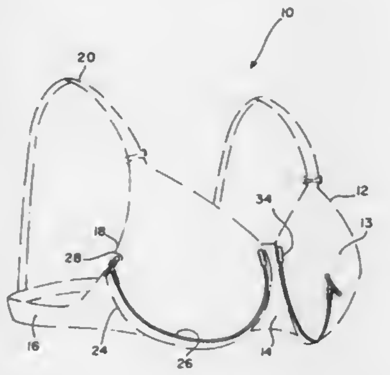
PROTECTIVE TIPS FOR BRASSIERE WIRES

Kathie Ann Arceo, 2029 S. Hickory, Santa Ana, Calif. 92707

Filed Dec. 20, 1996, Ser. No. 771,010

Int. Cl.⁶ A41C *3/10;3/14*

U.S. Cl. 450—41 **1 Claim**



1. Protective tips for brassiere wires comprising, in combination:

a brassiere having a pair of opposed cups coupled by a connecting member, a torso strap coupled to sides of the cups opposite the connecting cloth wherein an upper edge of the torso strap and a periphery of the cups adjacent thereto form a concave arcuate continuous edge, a pair of shoulder straps coupled between an upper extent of each cup and the torso strap, a closed sleeve formed along the periphery of each cup between an upper edge of the connecting member and the interconnection of the upper edge of the torso strap and respective cup;

an elongated wire situated within the sleeve and extending along the entire length thereof;

a pair of T-shaped tips each including a cylinder and an arcuate member integrally coupled at a central extent thereof to the cylinder, whereby one of the cylinders of the T-shaped members is integrally coupled to an end of each wire, wherein each arcuate member resides coincident with the concave edge of a respective cup;

said arcuate member being approximately 1 inch in length and extending about ½ an inch from either side of the cylinder of the associated T-shaped tips;

a seam formed in the brasserie which encompasses each arcuate member; and

a pair of cylindrical tips each including a cylinder, whereby one of the cylindrical tips is integrally coupled to an end of each wire opposite the respective T-shaped tip;

said cylinders having a diameter greater than that of the wire;

said tips being coated with polytetrafluroethylene.

5,749,768

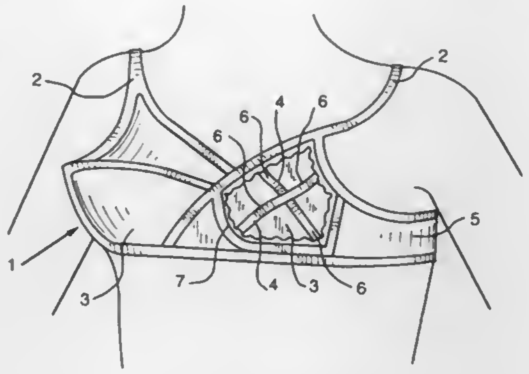
ADJUSTABLE CUP BRA

Andre Green, 912 Portland St., Apt. #4, Pittsburgh, Pa. 15206

Filed Mar. 26, 1997, Ser. No. 824,266

Int. Cl.⁶ A41C *3/00;3/10;3/12*

U.S. Cl. 450—65 **6 Claims**



1. An adjustable cup bra comprising a pair of breast cups and a plurality of adjustable straps symmetrically spaced about a periphery of each cup and extending radially inwardly of the cup toward a center thereof, whereby on changing the length of straps the size of each cup may be changed.

5,749,769

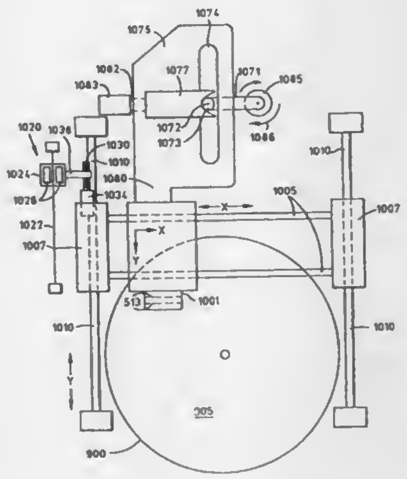
LAPPING PROCESS USING MICRO-ADVANCEMENT FOR OPTIMIZING FLATNESS OF A MAGNETIC HEAD AIR BEARING SURFACE

Mark A. Church, Los Gatos, and Alain Michel Desouches, Santa Cruz, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 476,787, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 358,124, Dec. 16, 1994, Pat. No. 5,603,156. This application Jul. 1, 1996, Ser. No. 674,054

Int. Cl.⁶ B24B *37/04*

U.S. Cl. 451—5 **25 Claims**



1. A method of lapping a workpiece comprising the steps of:

(a) providing a lapping machine that has a lapping plate including a grinding surface, a linear motion mechanism for moving the workpiece over the grinding surface in a first direction, and a micro-advance mechanism for controllably advancing the workpiece over the grinding surface in a second direction;

(b) affixing the workpiece to the lapping machine proximate to the lapping plate;

(c) depositing an abrasive slurry on the grinding surface of the lapping plate;

(d) performing an initial lapping stage including moving the grinding surface with respect to the workpiece, so that the workpiece is lapped to a first predetermined lapping target specification;

(e) washing the grinding surface; and

(f) performing a micro-advanced lapping stage including micro-advancing the workpiece in the second direction and simultaneously linear lapping the workpiece in the first direction to provide a second predetermined lapping target specification.

5,749,770

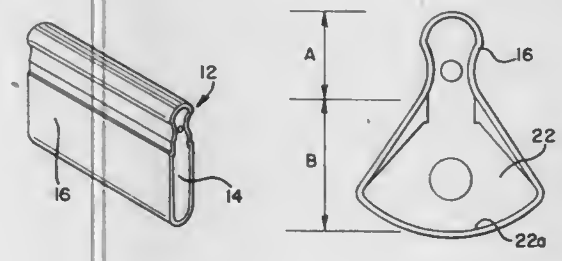
METHOD AND APPARATUS FOR SANDING A PLURALITY OF WORK-PIECES HAVING RESPECTIVE SURFACES OF VARYING CONTOURS

Albert I. Uzumcu, Hoffman Estates; Matthew Malone, River Grove, and Russell J. Schweizer, Crystal Lake, all of Ill., assignors to S-B Power Tool Company, Chicago, Ill.

Filed Jul. 8, 1996, Ser. No. 675,224

Int. Cl.⁶ B24B *1/00;7/19;7/30*

U.S. Cl. 451—28 **14 Claims**



1. An apparatus for sanding a plurality of work-pieces having respective surfaces of varying contours comprising:

(a) a continuous flexible tubular member having an inner surface and an outer abrasive surface; and (b) a plurality of contour members each having a length as defined along a longitudinal axis of the contour member and each having a uniform cross-section in a plane perpendicular to said axis the cross-section being defined by a first external portion and a second external portion, the first portion of each contour member having the same cross-sectional shape as the first portions of the other contour members, the second portion of each contour member having a cross-sectional shape which is different from the cross-sectional shape of the second portions of the other contour members and including a contour section configured to conform substantially to the shape of the work-piece to be sanded, each contour member being received one-at-a-time within said tubular member with at least parts of said first external portion and said second external portion in engagement with the inner surface of the tubular member and each contour member being dimensioned such that the tubular member will be in a taut condition when the tubular member has one of the contour members received therein and (1) is clamped to the first portion of said one contour member and (2) has the abrasive surface thereof adjacent the contour section of said one contour member brought into engagement with the work-piece to be sanded.

5,749,771

POLISHING APPARATUS FOR FINISHING SEMICONDUCTOR WAFER AT HIGH POLISHING RATE UNDER ECONOMICAL RUNNING COST

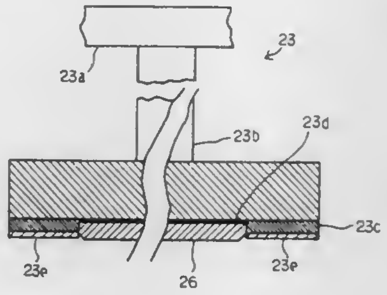
Akira Isobe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 394,169

Claims priority, application Japan, Feb. 22, 1994, 6-049769

Int. Cl.⁶ B24B *29/00*

U.S. Cl. 451—41 **18 Claims**



1. A polishing apparatus for grinding a semiconductor wafer, comprising:

a table driven for rotation;

a polishing pad provided on a surface of said table that rotates together with said table;

a slurry supplying system provided over said polishing pad for supplying a polishing slurry thereto;

a wafer holder system retaining at least one semiconductor wafer for pressing a surface of said at least one semiconductor wafer against said polishing pad; and

a pad conditioning system operative to clean said polishing pad while said semiconductor wafer is being polished on said polishing pad;

wherein said wafer holder system and said pad conditioning system are combined into a combined system which comprises:

- a movable arm member;
- a carrier block connected to said arm member and moved into and out of a space over said polishing pad;
- a retainer retaining said at least one semiconductor wafer in cooperation with said carrier block and allowing said at least one semiconductor wafer to project therefrom; and
- a cleaner attached to said retainer;

said carrier block concurrently pressing said at least one semiconductor wafer and said cleaner against said polishing pad.

5,749,772

METHOD AND APPARATUS FOR POLISHING WAFER

Kimiaki Shimokawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1996, Ser. No. 756,902

Claims priority, application Japan, Feb. 28, 1996, 8-040795

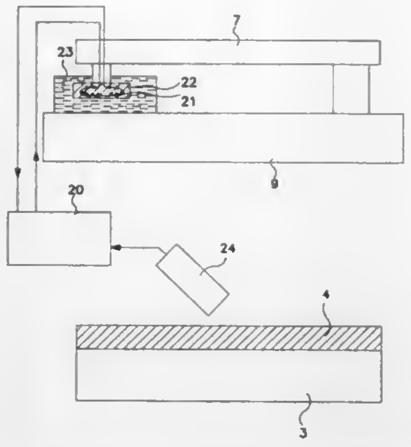
Int. Cl.⁶ B24B *53/00*

U.S. Cl. 451—53 **15 Claims**

1. A method of polishing a wafer, comprising the following steps:

a step for pressing the wafer against a polishing portion on a polish wheel and applying relative motion between the wafer and the polish wheel so as to polish the surface of the wafer;

a step for controlling a conditioning tool to a predetermined temperature; and



a step for conditioning the polishing portion using the conditioning tool.

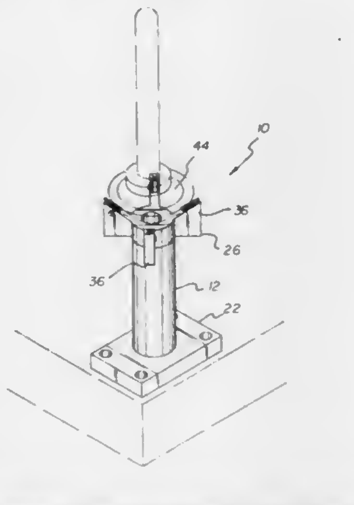
5,749,773
SOLID BUFFING COMPOUND

Toshikazu Tabata, 3-6, Miyake 1-chome, Minami-ku, Fukuoka-shi Fukuoka 815, Japan
Continuation of Ser. No. 381,813, Feb. 8, 1995, abandoned. This application Mar. 18, 1996, Ser. No. 616,921
Claims priority, application Japan, Aug. 11, 1992, 4-257116; Apr. 6, 1993, 5-105084
Int. Cl.^{6} C09G *1/02*
U.S. Cl. 451—66 3 Claims

1. Buffing equipment for polishing a metal surface comprising a buff and a solid buffing compound applied to the buff, the solid buffing compound comprising a mixture of polishing powder and a bonding agent substantially made of a water soluble surface active agent, wherein said bonding agent is water soluble and has a melting point of 40° to 80° C.

5,749,774
VALVE REFACING TOOL

John R. Foster, P.O. Box 147, Lincolnville, Me. 04849-0147
Filed Sep. 27, 1996, Ser. No. 721,673
Int. Cl.^{6} B24B *3/05*
U.S. Cl. 451—252 2 Claims



1. A new and improved valve refacing tool for restoring concentricity between the valve center line and the valve face, comprising, in combination:

a hollow cylindrical die cast aluminum column having an upper end and a lower end and having a central bore throughout its entire length, the column having exterior threads at its upper end and an outwardly flared cylindrical support at its lower end for being coupled with respect to a recipient surface;

a crown having a central vertical bore with internal threads removably received by the threads at the upper end of the column, the crown having a lower surface with a radial interior edge adapted to be supported on the upper end of the column, the crown having four radially extending fins each with an enlarged height at its radially exterior edge and an upper surface at an angle of 45 degrees with respect to the vertical, each upper surface having a dove tail recess;

cylindrical bushing sleeve positioned within the bore of the column, the bushing sleeve having an upper end located at an intermediate extent of the column and a lower end located beneath the lower end of the column, the bushing sleeve having an exterior surface in contact with the interior surface of the column, the bushing sleeve having an internal surface with spaced bushings of a bearing material adapted to receive and rotatably support the cylindrical stem of a valve to be ground, the bearing material being selected from the class of bearing materials including NYLON and BRONZE;

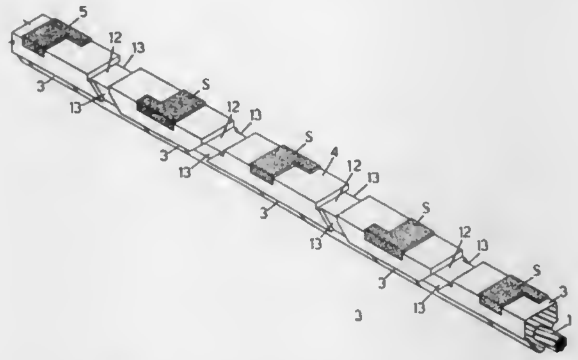
an aperture formed in an intermediate extent of the column with a securement component positioned in the aperture to contact and position the sleeve with respect to the column; and

a plurality of grind pads, each with an upper surface and a lower dove-tail projection positioned in an associated dove-tail slot of the crown with an associated locking bolt extended through a threaded aperture in an associated fin to secure the pads at a preset position on the upper surface of the crown, the grind pads each having on its upper surface an abrasive hard aluminum flex file with an adhesive backing for securing such abrasive material to the grind pad at spaced lateral locations on the upper surface thereof;

said grinding pads being off center to allow the pads to be rotated 180 degrees to allow use of both sides of the pads.

5,749,775
DIAMOND BELT FOR CUTTING STONES

Donald D. Fish, 1212 K St., Bedford, Ind. 47421
Filed Oct. 23, 1996, Ser. No. 735,733
Claims priority, application Italy, Nov. 8, 1995, SV95A0025
Int. Cl.^{6} B28D *1/08*
U.S. Cl. 451—298 12 Claims



1. An endless and continuous diamond belt for cutting stones, said belt having a flexible core with a main body with length and a first side and an opposite second side and comprising:

a least one cable;

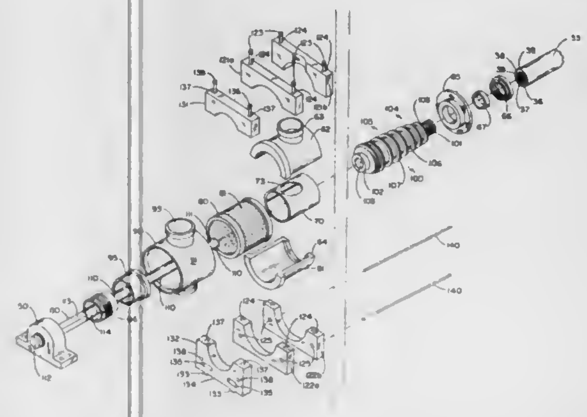
a plurality of rigid metal segments with bores through which said cable extends, said segments spaced apart along said cable forming intervals between segments;

a flexible material forming the main body and extending into said bores of said rigid segments and said intervals holding said segments together and to said cable, said flexible material at least partially covering said segments; and wherein:

said segments having sintered diamond elements projecting above said flexible material and outwardly from the main body facing the stone to be cut, said elements having profiles with main stems and tongues connected together with said main stems extending transversely atop and from said first side to said opposite second side across the main body and said tongues extending downwardly therefrom adjacent the first side and the opposite second side, said tongues extend longitudinally from said main stems along the length of the main body in alternate directions, said main body having transverse and lateral grooves.

5,749,776
MEAT DEBONING APPARATUS

Daniel R. Evans, Braintree, Mass., assignor to Evans Machine Company, Inc., Brockton, Mass.
Filed Dec. 2, 1996, Ser. No. 759,842
Int. Cl.^{6} B02C *19/22;* **A22C** *17/00*
U.S. Cl. 452—138 17 Claims



1. An improved meat deboning apparatus of the type disposing an auger means through a pressure feed can and a cylindrical screen housing, and having motor means connecting to said auger means for inducing its direct drive in rotation during functioning of the apparatus, said motor means, auger means, pressure feed can and screen housing being fully supported by a base member, said feed can being of the type having an infeed region for depositing bone laden material therein, conveying said boney material by means of rotation of said auger means within the feed can to achieve its pre-pressurization before its transfer into the screen housing for therein effecting substantial separation of the bone from the material as said material passes through the screen, and conveying the residue bone from the discharge end of the screen housing, the improvement comprising:

a pressure feed can comprised of a split feed can having two longitudinally-split, half-cylinder segments, a bottom half base segment and a removable top half feed segment, said feed segment having a circular infeed sleeve formed on its surface through which the ground bone laden material yet to be deboned enters into the feed can;

a hollow replaceable cylindrical insert contained within said split feed can, said insert having an aperture corresponding to the feed can infeed sleeve;

an auger means comprised of a one-piece feed and compression auger divided into two longitudinal segments, a rearward feed segment and a forward compression segment, said auger having a proximal end and a distal end, said auger having a significantly increasing diametrical dimension along its length, from the auger proximal end to the auger distal end, said auger being disposed such that said feed segment is disposed within said insert and said compression segment is disposed within said screen housing, said auger also having a cylindrical aperture bored out along its center longitudinal axis;

a motor drive shaft interconnecting said motor means with said auger proximal end;

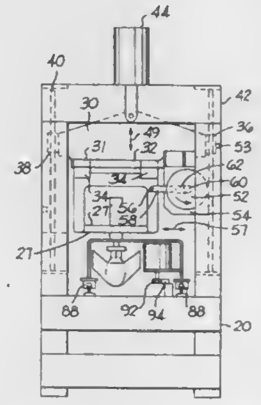
two split pillow blocks, a forward block and a rearward block, having spherical, self-aligning, roller bearings, said blocks attached to said base and arranged to support said motor shaft;

an auger shaft having a proximal end and a distal end, said shaft being slip fitted through the length of the auger central aperture so that the proximal end of the auger shaft abuts the said motor shaft;

a roller bearing, adapter-mounted end pillow block attached to said base and arranged to support the distal end of said auger shaft.

5,749,777
SLABBING APPARATUS AND METHOD

Ronald H. Burch, Harahan; Warren E. Cancienne, Jr., River Ridge; Somsak S. Rodboon, Kenner, and Eric W. Morales, New Orleans, all of La., assignors to The Laitram Corporation, Harahan, La.
Filed Jun. 1, 1995, Ser. No. 457,820
Int. Cl.^{6} A22C *25/18*
U.S. Cl. 452—149 39 Claims



1. A fish cutting apparatus for subdividing a fish body into slab sections, comprising:

a frame;

a feed track mounted on the frame defining a transport path and including means for aligning a fish body longitudinally along the transport path;

a cutting mechanism at an end of the feed track for cutting along a cutting plane crossing the transport path;

means for sequentially transporting the fish body in preselected increments along the feed track into a stationary cutting position intersecting the cutting plane;

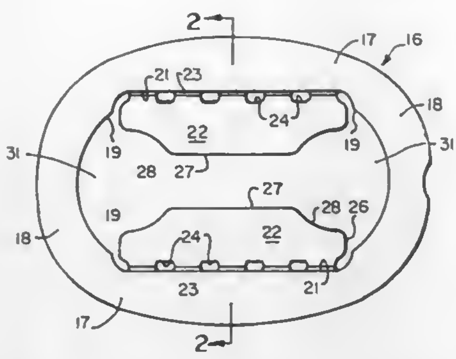
means for coordinating the cutting mechanism with the means for sequentially transporting to cut through the stationary fish body along the cutting plane when the fish body is sequentially transported into the cutting position in preselected increments, the cutting mechanism thereby sequentially subdividing the longitudinally aligned fish body into slab sections; and

means for attaching a registrable holder to the subdivided slab sections in the same orientation relative to the skeletal or meat structure of the fish body for all the slab sections to permit the slab sections to be retained in registration in downstream processing.

5,749,778
HINGED POULTRY HOCK RETAINER

Daniel J. Volk, Alpharetta, Ga., assignor to Volk Enterprises, Inc., Turlock, Calif.
Filed Dec. 23, 1996, Ser. No. 772,459
Int. Cl.^{6} A22C *21/00*
U.S. Cl. 452—174 11 Claims

1. A retainer for fowl having hocks having distal knuckles comprising a thin, unitary member having a body formed in a ring



with an opening, a flap, a hinge connecting said flap to said ring, said opening being shaped for passage through the opening of a pair of hocks to hold the hocks against a fowl carcass, said flap being shaped to flex distally as said hocks are inserted through said opening and then to retract at least partially toward initial position to engage proximally against the knuckles.

5,749,779

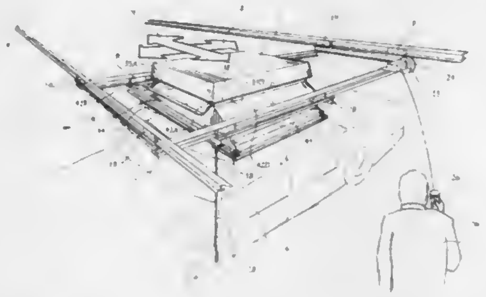
MOVABLE OVERHEAD VENTILATION ASSEMBLY AND FILTERING METHOD

Donald William Wilburn, and Gary Francis Faiello, both of Monroe, N.C., assignors to Wilburn's Body Shop, Inc., Charlotte, N.C.

Filed Nov. 9, 1995, Ser. No. 552,462

Int. Cl.^{6} B05B *15/00*

U.S. Cl. 454—65 **14 Claims**



1. A movable overhead ventilation assembly for use in a work facility to be positioned in close proximity to a source of airborne environmental material, said ventilation assembly comprising:

(a) a supporting frame located within the work facility, and comprising longitudinally-disposed overhead track means;

(b) a movable chassis carried by said track means;

(c) a ventilation housing carried by said chassis for overhead translational movement of said ventilation housing within the work facility, said ventilation housing including an open bottom defining an air inlet zone thereof, a plurality of attached side walls, and an enlarged top hood positioned on the side walls and cooperating with the side walls to form a plurality of side openings, the side openings collectively defining an air outlet zone of said ventilation housing;

(d) air movement means comprising an exhaust fan located within said ventilation housing between the inlet zone and the outlet zone thereof for creating an upwardly moving air stream in the area surrounding the source of airborne environmental material;

(e) a cone-shaped air diffuser located adjacent to an interior surface of the hood for directing the upwardly moving air stream outwardly towards an outer periphery of the hood and through the side openings of the ventilation housing;

(f) a filtration medium positioned between the inlet zone of said ventilation housing and the exhaust fan for capturing and separating material entrained in the upwardly moving air stream as the air stream enters the ventilation housing through the inlet zone thereof and exits through the outlet zone thereof; and

(g) ventilation housing movement means for moving said chassis along said track means within the work facility.

5,749,780

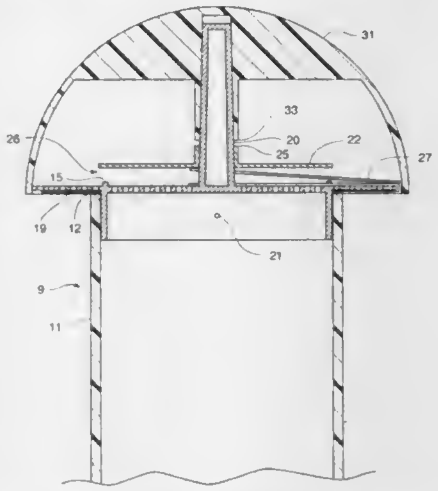
ROOF VENT

Sven Harder, Vallensbaek, and Jan Borst, Elsinore, both of Denmark, assignors to Icopa A/S, Herlev, Denmark

Filed Sep. 5, 1996, Ser. No. 711,416

Int. Cl.^{6} F24F *7/02*

U.S. Cl. 454—359 **10 Claims**



1. A roof vent comprising a conduit having an open entry end adapted for being arranged in sealing communication with an aperture in a roof surface, and an exit end spaced from said entry end, said roof vent further comprising a shield means adapted for preventing entry of rain into said conduit, a valve assembly for controlling flow of air or gas, said valve assembly comprising a valve member adapted for opening to passage of air or gas when the pressure at the entry end exceeds the pressure at the exit end and adapted for closing on other conditions to prevent backflow of air or gas, and thermostat means adapted for opening said valve member to bidirectional passage of air or gas when the temperature at said thermostat means exceeds a predetermined level.

5,749,781

Patent Not Issued For This Number

5,749,782

EQUIPMENT FOR CONVEYING ARTICLES OF ROD-LIKE APPEARANCE, IN PARTICULAR CIGARETTES

Fulvio Boldrini, Ferrara, Italy, assignor to G. D. S.p.A., Bologna, Italy

Filed Sep. 9, 1996, Ser. No. 709,741

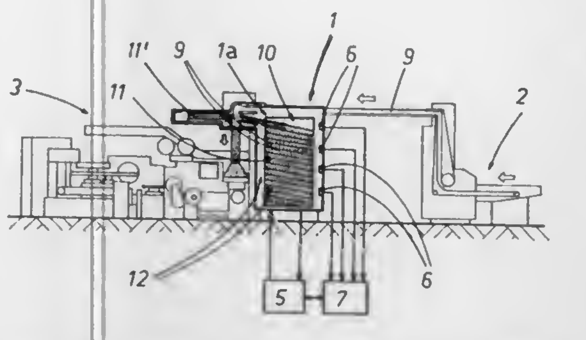
Claims priority, application Italy, Sep. 7, 1995, BO95A0417

Int. Cl.^{6} A24C *5/00*

U.S. Cl. 454—370 **5 Claims**

1. Equipment for conveying rod-like articles, comprising:

at least one magazine located between at least one station or machine dispensing such rod-like articles and at least one station or machine receiving said articles, each said magazine having channels serving to support and transfer said articles, at least some of said channels constituting respective enclosures arranged to accommodate said articles;



means for conditioning air internally of said enclosures, said means for conditioning air including an air-conditioning unit that is connected with said enclosures, sensing means interlocked to said air-conditioning unit and located within said enclosures, said sensing means being arranged to monitor at least one of operating parameters of said equipment and conditions relative to the said air and an electronic monitoring and control unit connected to and operating in conjunction with the sensing means and being arranged to control operation of said air-conditioning unit.

5,749,783

DEVICE FOR AUTOMATIC FILLING OF LOAD CONTAINERS

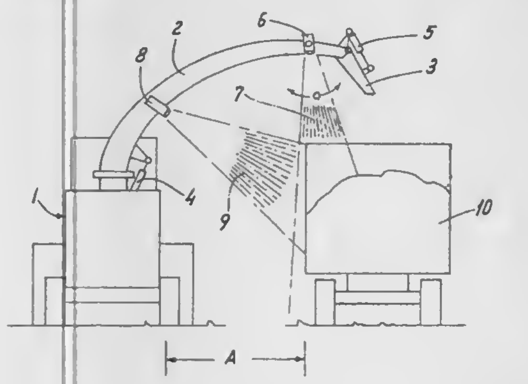
Manfred Pollklas, Rheda-Wiedenbrück, Germany, assignor to Claas KGaA, Harsewinkel, Germany

Filed Aug. 28, 1996, Ser. No. 703,983

Claims priority, application Germany, Aug. 29, 1995, 195 31 662.2

Int. Cl.^{6} A01D *90/00;90/10;* **A01F** *12/48*

U.S. Cl. 460—119 **20 Claims**



1. A device for automatic filing of a traveling load container with a product stream at an adjacent traveling harvesting machine, comprising an ejection element turnable about at least one axis selected from the group consisting of a vertical axis and a horizontal axis and connectable with a harvesting machine; at least one distance sensor arranged on said ejection element and generating distance signals; an electronic evaluating and control unit receiving said distance signals from said distance sensor and correspondingly controlling a turning position of said ejection element; and at least one additional distance sensor arranged on said ejection element to measure a lateral distance between said traveling harvesting machine and said load container and to produce distance values which are also supplied to said electronic evaluating and control devices so as to provide additional control of said ejection element.

5,749,784

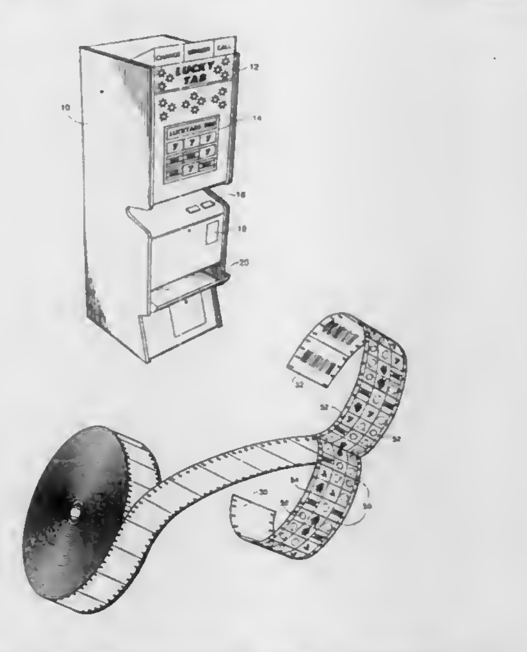
ELECTRONIC GAMING APPARATUS AND METHOD

Ronald C. Clapper, Jr., 20753 Horace St., Chatsworth, Calif. 91311

Continuation of Ser. No. 306,130, Sep. 14, 1994, Pat. No. 5,536,008, which is a continuation-in-part of Ser. No. 999,268, Nov. 16, 1992, Pat. No. 5,377,975, which is a continuation-in-part of Ser. No. 879,747, May 6, 1992, Pat. No. 5,348,299. This application Nov. 27, 1995, Ser. No. 562,834

Int. Cl.^{6} A63F *3/06*

U.S. Cl. 463—17 **43 Claims**



37. An electronic gaming apparatus capable of displaying indicia upon actuating the apparatus and where displayed indicia is correlated to that on a drawn gaming ticket, said apparatus comprising:

a) a ticket having a first surface and an oppositely disposed second surface;

b) indica used in the play of the game on the first surface of said ticket;

c) a code associated with said ticket which is machine readable and not readily discernable by visual examination;

d) reading means associated with said apparatus for reading the code corresponding to the indicia on the ticket; and

e) means for displaying indicia which is the same as that on the ticket which is dispensed and in the same arrangement.

5,749,785

COMMUNICATIONS SYSTEM USING BETS

Michael T. Rossides, 3666 Upton St., N.W., Wash., D.C. 20008

Continuation-in-part of Ser. No. 309,677, Sep. 21, 1994, Pat. No. 5,575,474, and Ser. No. 547,503, Oct. 24, 1995, abandoned. This application Dec. 8, 1995, Ser. No. 569,883

Int. Cl.^{6} A63F *9/22*

U.S. Cl. 463—25 **1 Claim**

1. A communications apparatus for the automated transaction of bets over a network, said apparatus comprising in combination,

a computer including input/output means, memory means, processing means, and program means,

said apparatus holding a central data base and connected to a network of input/output terminals,

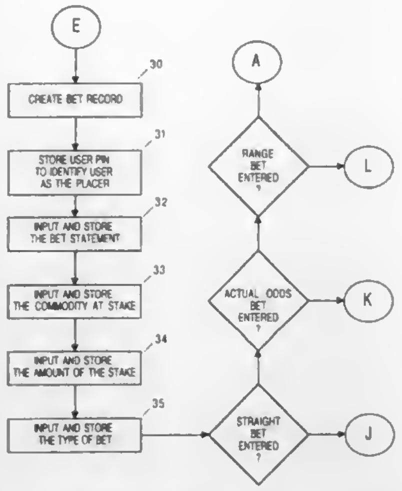
said program means directing the operation of said apparatus,

said program means directing said apparatus to enable users to choose from among several

modes for entering information into said central data base, including:

a user account mode for enabling a user to establish a user account in said data base,

a search mode for enabling a user to search said data base,


E
A
30
CREATE BET RECORD
31
STORE USER PIN TO IDENTIFY USER AS THE PLACER
32
INPUT AND STORE THE BET STATEMENT
33
INPUT AND STORE THE COMMODITY AT STAKE
34
INPUT AND STORE THE AMOUNT OF THE STAKE
35
INPUT AND STORE THE TYPE OF BET
RANGE BET ENTERED ?
L
ACTUAL ODDS BET ENTERED ?
K
STRAIGHT BET ENTERED ?
J

a placing a bet mode for enabling a first user to enter a bet into said data base,

an accepting a bet mode for enabling a second user to accept said bet,

a changing a bet mode for enabling either of said users to change said bet and,

a settling a bet mode for enabling said users to settle said bet;

when a user chooses said user account mode, said program means directing said apparatus to execute the steps of:

creating a user record for identification data, contact data, billing data, credit/debit data, bet data, and bet result data,

creating a user identification number (PIN) and storing it in said user record,

outputting said PIN to said user,

inputting and storing said user's name, contact, billing, and credit/debit data in said user record;

when a user chooses said search mode, said program means directing said apparatus to execute the steps of:

inputting search parameters for a bet,

checking to see if a bet matching said parameters is in said data base,

if said bet is not found, outputting a message saying that no such bet is found,

if said bet is found, outputting the bet;

when a user chooses said place a bet mode, said program means directing said apparatus to execute the steps of:

creating a user bet statement record (UBSR) for storing data for a bet,

storing the user's PIN in the record to identify said user as the Placer of said bet,

inputting and storing in said record a bet statement,

inputting and storing a designation that the Placer is making a guarantee (G-bet),

inputting and storing in said record the type of commodity being bet,

inputting and storing in said record the amount at stake,

inputting and storing in said record an acceptance fee,

inputting and storing a designation of the divide the pot method,

inputting and storing an identifier identifying a beneficiary account for the acceptance fee,

inputting and storing the necessary to accept the G-bet,

inputting and storing a deadline for acceptances,

outputting the information stored in said bet UBSR;

when a user chooses said accept a bet mode, said program means directing said apparatus to execute the steps of:

inputting search parameters for a bet,

finding said bet,

creating a UBSR for the user, called an Acceptor,

outputting the identity of each Acceptor,

outputting how many Acceptors there are,

if the deadline has expired,

stopping the inputting of acceptances,

dividing the acceptance lee by the number of Acceptors, yielding an Acceptor's Share of the Fee,

deducting the Acceptor's Share of the Fee from each Acceptor's account,

crediting the beneficiary account with the fees deducted from each Acceptor's account;

when a user chooses said settle a bet mode, said program means directing said apparatus to execute the steps of:

inputting search parameters for a bet,

finding said bet,

checking said user's PIN to see if said user is either the Placer or Acceptor,

if no, outputting a message, "You are not authorized to report a result,"

if yes, receiving an input for a judge or a bet result,

if said input is for a judge, sending a message to a CSUB judge,

if said input is a bet result,

storing the result in the bet record under the user identified by the PIN,

checking to see if results have been entered by both Placer and Acceptor,

if no, alerting the other party of said stored result,

if yes, checking to see if results match,

if the results do not match, alerting both parties of the clashing results,

if the results match, storing the matching result in the bet and users' records, alerting the Placer and Acceptor that bet is settled,

if the matching result is "Undecided," declaring neither party the winner,

if the bet settles in favor of the Placer, registering the result in the Placer's and in each Acceptor's UBSR,

if the bet settles in favor of the Acceptors,

dividing the Placer's stake by the number of Acceptors, yielding a Share of the Stake,

deducting the stake form the Placer's account and add the Share of the Stake to each Acceptor's account,

registering the result in the Placer's and each Acceptor's UBSR.

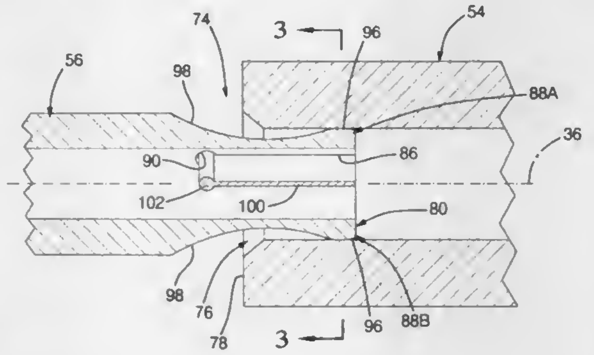
5,749,786
SHAFT COUPLING IN MOTOR VEHICLE STEERING SHAFT

Eric David Pattok, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1996, Ser. No. 767,566

Int. Cl.^{6} F16D ***3/00***

U.S. Cl. 464—106 **4 Claims**



1. A shaft coupling between a first shaft element and a second shaft element comprising:

a socket in an end of said first shaft element having a plurality of planar sides parallel to a longitudinal centerline of said first shaft element cooperating in defining an opposite pair of wedge-shaped corners of said socket,

a plunger on an end of said second shaft element disposed in said socket,

a longitudinal slot in said end of said second shaft element dividing said plunger into a pair of cantilever springs flexible laterally relative to a longitudinal centerline of said second shaft element,

a plurality of planar sides on said plunger parallel to said longitudinal centerline of said second shaft element and cooperating in defining an external wedge on each of said cantilever springs facing corresponding ones of said wedge-shaped corners of said socket,

a transverse convex lobe on each of said planar sides of said plunger engageable tangentially on a corresponding one of said planar sides of said socket,

a pair of span dimensions of said plunger across said convex lobes on said planar sides of said plunger exceeding a pair of span dimensions of said socket across said planar sides thereof so that each of said cantilever springs is resiliently flexed when said plunger is in said socket and said external wedges on said plunger at said convex lobes thereon are wedged into said corresponding ones of said wedge-shaped corners of said socket, and

a recess on each of said planar sides of said plunger adjacent a corresponding one of said transverse convex lobes accommodating relative articulation between said first and said second shaft elements about fulcrums defined at lines of tangential contact between said transverse convex lobes and said corresponding ones of said planar sides of said socket.

5,749,787
FLOOR COVER, ESPECIALLY SPORTS FIELD COVER

Werner A. Jank, Sonnhaldenstrasse 8, CH-6052 Hergiswil, Switzerland, assignor to Werner A. Jank, Hergiswil, Switzerland

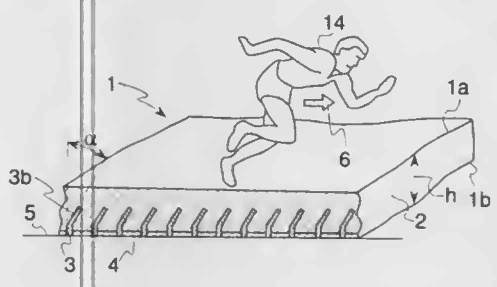
PCT No. PCT/CH95/00008, § 371 Date Nov. 7, 1995, § 102(e) Date Nov. 7, 1995, PCT Pub. No. WO95/19822, PCT Pub. Date Jul. 27, 1995

PCT Filed Jan. 12, 1995, Ser. No. 530,135

Claims priority, application Switzerland, Jan. 19, 1994, 165/94

Int. Cl.^{6} A63C ***19/10***

U.S. Cl. 472—92 **18 Claims**



1. A support covering for supporting objects, the support surface comprising:

a material positionable on a base and having a surface contactable with the objects to provide support to the objects, said material having elasticity, said material having elastically anisotropic means for being anisotropic with respect to said elasticity in directions substantially parallel to said surface.

5,749,788
TUNABLE JOINT FOR A POOL CUE HAVING COMPRESSIVE INSERTS

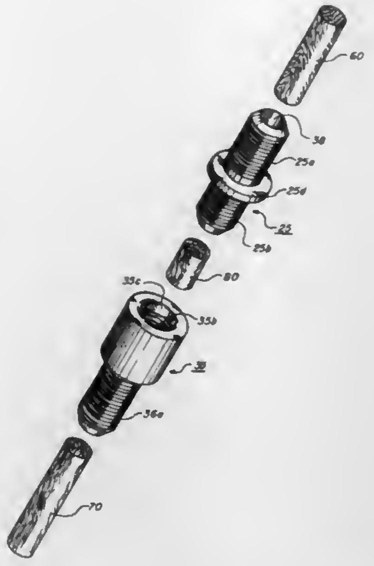
Daniel R. Bourque, 5 Brompton St., Sanford, Me. 04074

Filed Dec. 12, 1996, Ser. No. 764,144

Int. Cl.^{6} A63F ***15/08***

U.S. Cl. 473—44 **14 Claims**

1. A threadable joint of hard material for joining together a butt and a shaft section of a wooden pool cue, said joint comprising:



a first and second flanged joint having two separable halves threaded respectively for connection together at one end and adapted at the other end for connection respectively into separate butt and shaft cue sections;

a cylindrical bore, extending longitudinally through the joint;

a pair of wooden inserts seated in said joint bore for contact at a seated end with the cue wood of the butt and shaft sections respectively; and

a third center wooden insert spanning the flanged section of said joint for compressibly fitting within said bore and adopted to provide a wood-to-wood continuum for said cue.

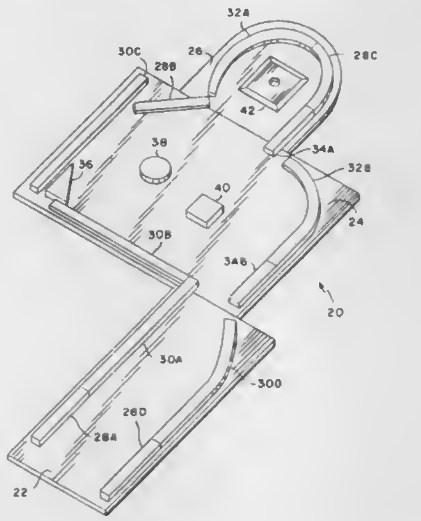
5,749,789
PORTABLE MINIATURE GOLF GAME

James S. Karl, 2731 Ross Rd., Palo Alto, Calif. 94303

Filed Aug. 12, 1996, Ser. No. 695,919

Int. Cl.^{6} A63B ***67/02***

U.S. Cl. 473—162 **16 Claims**



1. A portable miniature golf game to be played with a putter and ball, comprising:

a flexible putting mat having a bottom surface, a marginal edge, and a top playing surface, said top playing surface formed substantially of loop-like fibers,

a retaining rail having a top surface, a base surface, and a mount device incorporated into said retaining rail, said mount device comprising a top cap, a base cap, and a connector, said connector connecting said top cap to said base cap, said base cap having hook-like projections disposed thereon enabling said retaining rail to be detachably attached to a desired location on said putting mat when said hook-like projections interlock with said loop-like fibers of said top playing surface.

5,749,790

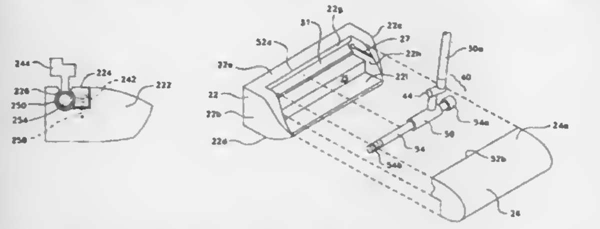
ADJUSTABLE GOLF CLUB

James L. Van Alen, II; Robert B. Van Alen; Jeanne B. Van Alen; James L. Van Alen, Jr., all of Newtown Square, Pa., and Alexander Van Alen, Fort Collins, Colo., assignors to Arrowhead Innovations Corporation, Newtown Square, Pa.

Filed Sep. 16, 1996, Ser. No. 714,473

Int. Cl.^{6} A63B *53/06;53/16*

U.S. Cl. 473—245 **21 Claims**



1. An adjustable golf club comprising:
- A) a club head having a ball striking surface, a heel, a toe, a sole, a top surface, and a heel-to-toe axis;
- B) a shaft having a grip end and a connection end;
- C) means for connecting the shaft to the club head at a connection point along the heel-to-toe axis and at a line-of-play alignment angle and a heel-to-toe alignment angle;
- D) balance adjustment means for adjusting the connection point of the club head in infinite increments along the heel-to-toe axis of the club to adjust the balance of the club head;
- E) alignment adjustment means for adjusting the line-of-play alignment angle of the shaft in infinite increments: and
- G) means for limiting adjustment of the line-of-play alignment angle of said club within the ranges specified by the U.S.G.A. rules of golf.

5,749,791

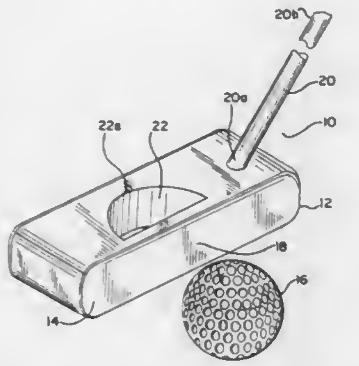
GOLF BALL PUTTER

Robert V. Passeri, Jr., 6925 W. Hobart Ave., Chicago, Ill. 60631

Filed Sep. 18, 1996, Ser. No. 716,554

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—251 **8 Claims**



1. For a golf ball putter comprising an elongated head having a face for striking a golf ball, said face including a sweet spot, the putter further comprising a shaft having a proximal end connected to said head and a distal end extending away from said head, an improvement to the head for better alignment of the golf ball with the sweet spot, the improvement comprising a generally arcuate aperture in spaced relationship from said face and centered about said sweet spot, said aperture extending vertically through said head and having a diameter and an apex, said diameter being parallel to and proximate to said face and having a length substantially equal to the diameter of a golf ball, said apex oriented such that said apex is aligned with said sweet spot.

5,749,792

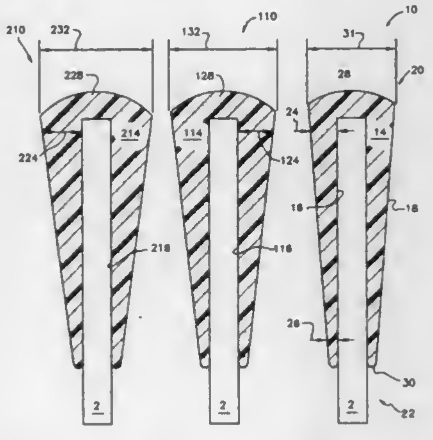
GOLF CLUB HANDLE OVERSIZE GRIP KIT

Jeffrey R. Engfer, 859 Littleton Rd., Parsippany, N.J. 07054, and Michael J. Britton, 14 Osage Dr., W. Milford, N.J. 07480

Filed Aug. 30, 1996, Ser. No. 705,987

Int. Cl.^{6} A63B *57/00*

U.S. Cl. 473—300 **6 Claims**



1. A kit of auxiliary grips for golf clubs, comprising a plurality of auxiliary grips each comprising a sleeve having a circumferential wall having an internal cavity cooperating with the handle of the golf club and a linearly and continuously tapered external surface, a proximal end and a distal end, and an integral cap closing said proximal end, said distal end being open, said circumferential wall being of variable thickness, said circumferential wall having a first thickness dimension at said proximal end of said circumferential wall and a second thickness dimension at said distal end of said circumferential wall, said first thickness dimension being of greater magnitude than that of said second thickness dimension,

each one said auxiliary grip having an outside diameter of magnitude different from every other one said auxiliary grip, said cavity of each said auxiliary grip being identical to said auxiliary grip of every other said auxiliary grip; and

an enclosure enclosing said plurality of auxiliary grips.

5,749,793

MONOLITHIC PEBBLE HEAD GOLF CLUB

Joseph J. Lucetti, Escondido, Calif., assignor to Chad A. Emarine, Escondido, Calif.

Continuation-in-part of Ser. No. 692,799, Jul. 30, 1996. This application Nov. 19, 1996, Ser. No. 746,912

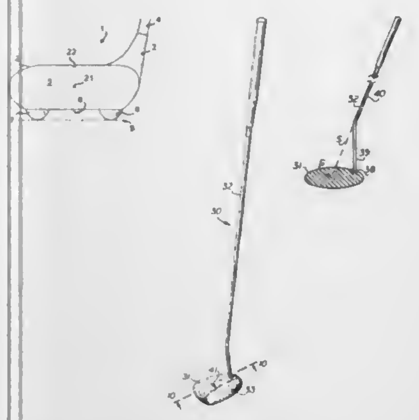
Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—324 **11 Claims**

1. A golf club which comprises:

a section of natural composite intrusive igneous forming a monolithic striking head, and having a substantially flat lateral striking face and a hole drilled into a top surface section; and,

a shaft having a lower end secured into said hole.



5,749,794

GOLF CLUB HEAD

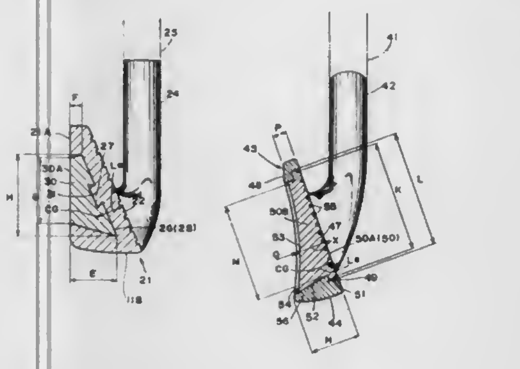
Kenji Kobayashi, and Hitoshi Takeda, both of Tsubame, Japan, assignors to Kabushiki Kaisha Endo Seisakusho, Niigata-Ken, Japan

Continuation-in-part of Ser. No. 245,971, May 19, 1994, Pat. No. 5,522,593. This application Aug. 31, 1995, Ser. No. 521,951

Claims priority, application Japan, May 31, 1993, 5-129608; Aug. 27, 1993, 5-213039; Mar. 31, 1994, 6-63532; Mar. 31, 1994, 6-63538; Mar. 23, 1995, 7-64025

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—342 **12 Claims**



1. A golf club head comprising:

a head body having a front and a back, said front having a face and said back having a concave portion, said concave portion being defined by a rear surface of the head body and an entire peripheral portion of the back to form a thickened portion;

a balance weight which is secured into said concave portion,

wherein said concave portion is provided with a protrusion in approximately a center of a bottom thereof, said protrusion having a width increasingly greater in a direction defined from said front to said back of said head body, so as to be securely fitted into a front side of said balance weight.

5,749,795

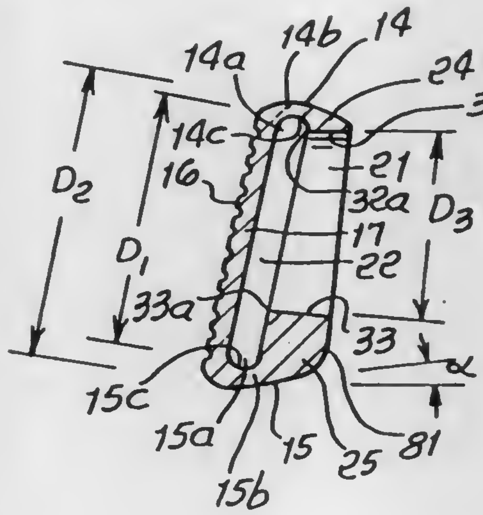
IRON GOLF CLUB HEAD WITH DUAL INTERSECTING RECESSES

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation of Ser. No. 235,930, May 2, 1994, Pat. No. 5,472,203, which is a continuation-in-part of Ser. No. 52,697, Apr. 30, 1993, Pat. No. 5,330,187, which is a continuation-in-part of Ser. No. 921,857, Aug. 5, 1992, Pat. No. 5,282,625. This application Oct. 16, 1995, Ser. No. 543,647

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—350 **85 Claims**



1. A golf club head having a body defining a heel, toe, top wall, bottom wall, and a front wall defining an upwardly and rearwardly inclined front face and rear face, and also defining corner walls between said top wall and said heel and toe, and between said bottom wall and said heel and toe, and comprising
- a) said body defining a forwardly extending main recess located rearwardly of said front wall,
- b) said body also defining an undercut recess located directly rearwardly of said front wall to intersect said main recess and extending outwardly from said main recess toward at least one of said top wall and bottom walls, and also toward at least one of said corner walls, proximate said rear face,
- c) the thickness of said one wall measured in a plane generally parallel to said front wall front face and proximate said rear face being less than the thickness of said one wall measured in a plane generally parallel to said front face and distal said rear face.

5,749,796

WOUND GOLF BALL

Hirotaka Shimosaka, and Keisuke Ihara, both of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

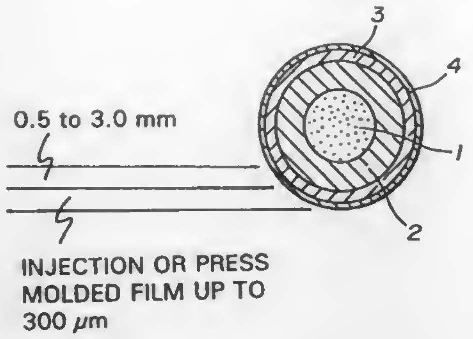
Division of Ser. No. 510,275, Aug. 2, 1995, abandoned. This application Apr. 22, 1997, Ser. No. 847,999

Claims priority, application Japan, Aug. 9, 1994, 6-208004

Int. Cl.^{6} A63B *37/12*

U.S. Cl. 473—365 **12 Claims**

1. A wound golf ball comprising a center ball, thread rubber wound thereon, a first cover layer enclosing the wound center, and a second cover layer comprising a resin composition and having a thickness of up to 300 µm enclosing the first cover layer, said



second cover layer being formed by injection molding the resin composition to enclose the first cover layer.

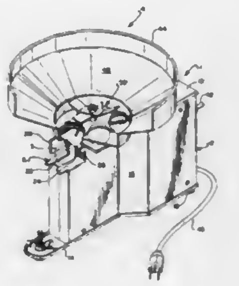
5,749,797
AUTOMATIC PITCHING DEVICE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

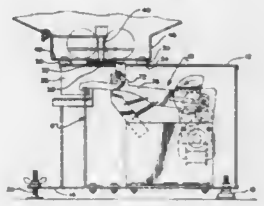
Robert Sunseri, 165 S. Opdyke Rd., Lot 6, Auburn Hills, Mich. 48326, and Earl Sunseri, 2233 London Bridge Dr., Unit J40, Rochester Hills, Mich. 48307

Filed Mar. 1, 1996, Ser. No. 609,850

Int. Cl.^{6} A63B *7/00*

U.S. Cl. 473—451 15 Claims





1. An object ejecting device comprising:
support means for supporting an object to be ejected;
impacting means for impacting against said object at a relatively large velocity for forcibly ejecting said object from said support means;
means for supplying a plurality of said objects, one at a time, to said support means in a predetermined cyclical period;
actuating means for cyclically actuating both said impacting means and said supplying means in said predetermined cyclical period;
said actuating means comprising a rigid member movable in a substantially linear fashion, said rigid member having a first projecting portion engageable and disengageable with said impacting means for actuating said impacting means, and a second projecting portion engageable with said supplying means for actuating said supplying means; and
wherein said actuating means further comprises a motorized mechanism operatively connected to said rigid member for moving said rigid member in said substantially linear fashion.

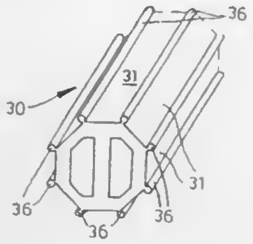
5,749,798
RACKET FOR TENNIS OR THE LIKE GAMES

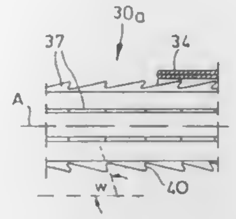
Siegfried Kuebler, Uberlingen, Germany, and Frank Garrett, Barrington, Ill., assignors to Wilson Sporting Goods Co., Chicago, Ill., a part interest

Filed Aug. 15, 1996, Ser. No. 700,734

Int. Cl.^{6} A63B *49/08*

U.S. Cl. 473—549 18 Claims





1. A racket for tennis games having a frame (**12**) for accommodating stringing (**18**,**19**) and comprising a hollow profile bar (**14**) and a handle (**24**) which is of polygonal cross-section and which is wound around with a grip strip (**28**) and having a blank provided at the corners of the cross-section with longitudinal edges (**32**) separating each two longitudinal surfaces (**31**) of said blank, wherein longitudinal ribs (**36**, 36_a to 36_c, **37**) extend at the longitudinal edges (**32**) of the handle (**24**).

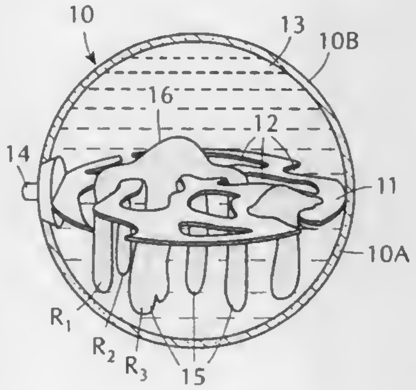
5,749,799
LAVA-PRODUCING PLAYBALL

Ann Jasperson, 349 Havirland Rd., Stamford, Conn. 06903

Filed Jun. 18, 1997, Ser. No. 872,000

Int. Cl.^{6} A63B *41/00*

U.S. Cl. 473—594 9 Claims



1. A playball which when manipulated by a player produces a display simulating the flow of lava, said playball comprising:
A. a sphere formed of transparent plastic material having a partition therein dividing the sphere into upper and lower half-sections, and partition having openings dispersed therein; and
B. a clear oil filling the sphere having a charge of a water-based syrup having a distinctive color deposited therein which is immiscible with the oil and normally forms a pool at the bottom of the lower section of the sphere, whereby when a player turns the sphere upside down, the pool is then in the upper section of the sphere and by gravity flow the pool impinges on the partition and is separated thereby at the partition to pass through the openings to form rivulets which simulate lava and collect at the bottom of the sphere to reform the pool.

5,749,800
SYNCHRONOUS BELT DRIVE

Thomas Nagel, Dresden, and Ulf Richard, Frankfurt an der Oder, both of Germany, assignors to Technische Universitaet Dresden, Dresden, Germany

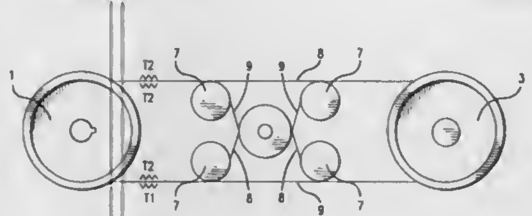
PCT No. PCT/DE94/01445, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO95/16152, PCT Pub. Date Jun. 15, 1995

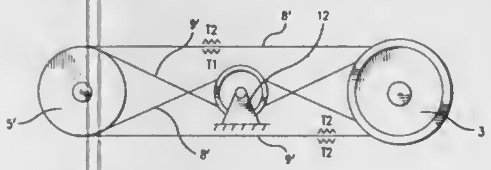
PCT Filed Dec. 6, 1994, Ser. No. 652,557

Claims priority, application Germany, Dec. 7, 1993, 43 41 572.5

Int. Cl.^{6} F16H *19/06*

U.S. Cl. 474—84 21 Claims





10. A synchronous belt drive comprising:
first and second belt drive assemblies each having:
- a toothed belt with teeth on opposing first and second sides having first and second pitches respectively; and
- a driving toothed wheel, a driven toothed wheel, and at least one return wheel interconnected by said toothed belt;
- said driving toothed wheel engaging said teeth having said first pitch and said driven toothed wheel engaging said teeth having said second pitch;

first coupling means for coupling said driving toothed wheels of said first and second belt drive assemblies to prevent independent rotation of said driving toothed wheels of said first and second belt drive assemblies;
second coupling means for coupling said driven toothed wheels of said first and second belt drive assemblies to prevent independent rotation of said driven toothed wheels of said first and second belt drive assemblies; and
said first and second pitches of said toothed belt of said first belt drive assembly being equal and said first and second pitches of said toothed belt of said second belt drive assembly being unequal such that products of a number of teeth of said driving wheel and said first pitch of each of said first and second belt drive assemblies are different.

5,749,801
DIFFERENTIAL UNIT

Masao Teraoka, and Nobushi Yamazaki, both of Tochigi, Japan, assignors to Tochigi Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan

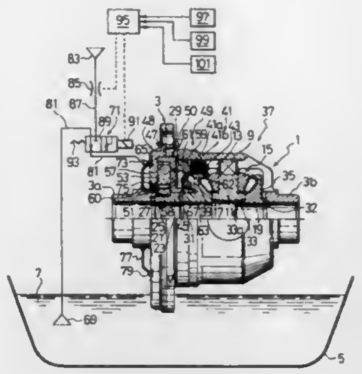
Filed Mar. 27, 1996, Ser. No. 623,326

Claims priority, application Japan, Mar. 28, 1995, 7-070083; Jun. 30, 1995, 7-166047; Nov. 17, 1995, 7-300012

Int. Cl.^{6} F16H *1/455;* **B60K** *17/20*

U.S. Cl. 475—88 20 Claims

1. A differential unit comprising:
a differential case to be rotated by drive force of an engine;
a differential gear mechanism for outputting rotations of said differential case from a pair of side gears thereof through a pinion gear supported in a portion adjacent to said differential case:
a frictional clutch for limiting differential of said differential gear mechanism;



an oil pump to be rotated due to differential rotations of said differential gear mechanism;
an oil passage for causing an oil reservoir in a differential carrier for rotatively supporting said differential case and said oil pump to communicate with each other to allow oil to flow to said oil pump; and
a hydraulic actuator which receives oil discharge pressure from said oil pump so as to press and clutch said frictional clutch, wherein
said oil pump includes plural sets of gear pumps and a pump housing,
said plural sets of gear pumps consists of a pump drive gear and a plurality of pump gears,
said pump drive gear is arranged so as to integrally rotate together with one of said differential case and said side gear,
said pump housing is arranged so as to integrally rotate together with the other of said differential case and said side gear,
said plurality of pump gears are engaged to said pump drive gear and rotatively supported by said pump housing, and
said oil pump and said hydraulic actuator are disposed in a space formed between said differential gear mechanism and said differential case.

5,749,802
AUTOMATIC TRANSMISSION CONTROL APPARATUS

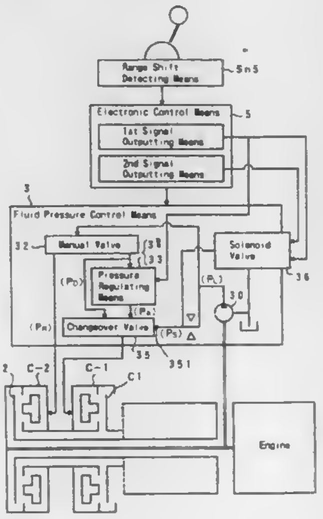
Katsuyuki Tanahashi; Hiroshi Tsutsui; Yoshihisa Yamamoto, and Kazumasa Tsukamoto, all of Aichi-ken, Japan, assignors to Aisin AW Co., Ltd., Aichi-ken, Japan

Filed May 8, 1996, Ser. No. 646,467

Claims priority, application Japan, May 12, 1995, 7-138377

Int. Cl.^{6} F16H *61/00*

U.S. Cl. 475—120 6 Claims


Range Shift Detecting Means
5n5
Electronic Control Means
5
1st Signal Outputting Means
2nd Signal Outputting Means
3
Fluid Pressure Control Means
32
Manual Valve
31
33
Solenoid Valve
36
(P0)
Pressure Regulating Means
(PL)
30
(PA)
(PM)
Changeover Valve
(PS)
35
351
C2
C-2
C-1
C1
Engine

1. An automatic transmission control apparatus, comprising:

- a first friction engaging element which, when a forward driving range is selected, is engaged to achieve forward driving;
- a second friction engaging element which, when a reverse driving range is selected, is engaged to achieve reverse driving;
- first hydraulic servo and second hydraulic servo for engaging and releasing said first friction engaging element and said second friction engaging element, respectively;
- fluid pressure control means for controlling fluid pressure supply to said first hydraulic servo and said second hydraulic servo;
- range shift detecting means for detecting shift to said forward driving range and shift to said reverse driving range; and
- electronic control means for controlling said fluid pressure control means on the basis of a signal of detection of the range shift detecting means,
- said fluid pressure control means comprising:
  - an oil pump driven together with revolution of an engine, said oil pump forming a fluid pressure source for a line pressure;
  - a manual valve for supplying a forward driving range pressure as said line pressure to said first hydraulic servo when said forward driving range is selected, and for supplying a reverse driving range pressure as said line pressure to said second hydraulic servo when said reverse driving range is selected;
  - pressure regulating means disposed between said manual valve and said first hydraulic servo, for regulating said forward driving range pressure on the basis of a signal from said electronic control means to output a regulated fluid pressure;
  - a changeover valve having a signal pressure port to which a signal pressure is selectively supplied, said changeover valve supplying said forward driving range pressure to said first hydraulic servo when said signal pressure is being supplied to said signal pressure port, and said changeover valve supplying said regulated fluid pressure from said pressure regulating means to said first hydraulic servo when said signal pressure is not supplied to the signal pressure port; and
  - a solenoid valve for supplying said signal pressure as said line pressure to said signal pressure port of said changeover valve when magnetized on the basis of a signal from said electronic control means, and for discharging said signal pressure from said signal pressure port when demagnetized,
  - said electronic control means comprising:
    - first signal outputting means for, when said range shift detecting means has detected shift to said forward driving range, outputting a signal to magnetize said solenoid valve and to cause said pressure regulating means to output a predetermined regulated fluid pressure; and
    - second signal outputting means for, when said range shift detecting means has detected shift to said reverse driving range, outputting a signal to magnetize said solenoid valve.

5,749,803

DIFFERENTIAL APPARATUS

Masao Teraoka, and Nobushi Yamazaki, both of Tochigi-ken, Japan, assignors to Tochigi Fuji Sangyo Kabushiki Kaisha, Japan

Filed Aug. 15, 1996, Ser. No. 689,900

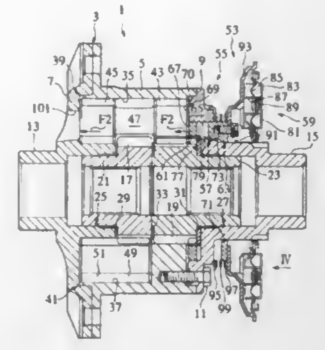
Claims priority, application Japan, Sep. 13, 1995, 7-235651

Int. Cl.⁶ F16H *1/445;* **B60K** *17/16*

U.S. Cl. 475—249 **7 Claims**

1. A differential apparatus comprising:

- a differential casing rotated by driving force of an engine;
- a pair of output side gears rotatably supported within the differential casing;
- at least one pair of pinion gears arranged outside said side gears in a diametrical direction and having first gear portions separately engaged with the side gears and second gear portions engaged with each other;
- storing holes formed in the differential casing and sidably and rotatably storing the respective pinion gears;



- a locked member coupled to a differential rotating member with respect to the differential casing in a rotating direction;
- a lock member integrally rotated with the differential casing;
- a clutch mechanism formed between the locked member and the lock member, and locking a differential rotation by locking the locked member to the differential casing through the lock member;
- an actuator for coupling and operating the clutch mechanism; and
- a cam mechanism for increasing coupling force of the clutch mechanism by receiving differential torque when the clutch mechanism is coupled.

5,749,804

CONTINUOUSLY VARIABLE TRANSMISSION CONTROL APPARATUS

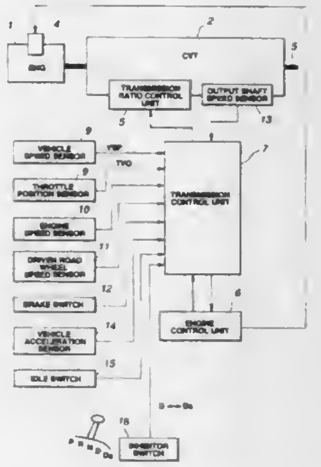
Nobusuke Toukura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 18, 1996, Ser. No. 733,877

Claims priority, application Japan, Oct. 20, 1995, 7-272945

Int. Cl.⁶ F16H *59/48*

U.S. Cl. 477—47 **4 Claims**



1. An apparatus for controlling a continuously variable transmission for use with an automotive vehicle including an accelerator pedal, the transmission having an input and output shaft, the transmission being operable at a variable speed ratio for transmitting a drive from the input shaft to the output shaft, comprising:

- means for sensing vehicle operating conditions including vehicle acceleration and vehicle speed;
- means for producing a released accelerator pedal indicative signal when the accelerator pedal is released;
- means for calculating a target value for the speed of rotation of the input shaft based on the sensed vehicle operating conditions;
- means for correcting the target input shaft speed value to bring the vehicle acceleration into a predetermined range in the presence of the released accelerator pedal indicative signal;

- means for setting an upper limit for the target input shaft speed value based on the vehicle speed;
- means for limiting the corrected target input shaft speed value below the upper limit; and
- means for controlling the speed ratio to bring the input shaft speed into coincidence with the corrected target input shaft speed value.

5,749,805

APPARATUS FOR CONTROLLING GEAR SHIFT IN AUTOMATIC TRANSMISSION

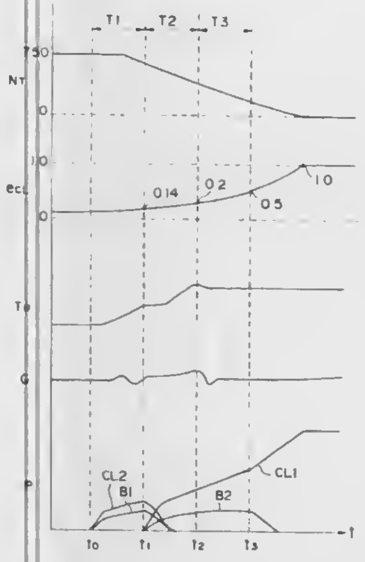
Takamichi Shimada, Sakado, and Noboru Sekine, Kasukabe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1996, Ser. No. 597,014

Claims priority, application Japan, Feb. 6, 1995, 7-041378

Int. Cl.⁶ F16H *1/28*

U.S. Cl. 477—116 **21 Claims**



1. An apparatus for controlling a gear shift in an automatic transmission having an input shaft, an output shaft disposed parallel to the input shaft, a plurality of power transmitting gear trains juxtaposed between the input shaft and the output shaft and making up a combination of forward power transmitting paths that can be selected one at a time, a plurality of frictional engaging elements for selecting one of the forward power transmitting paths at a time, and a one-way clutch for establishing a starting gear position among the forward power transmitting paths, the frictional engaging elements being controllable for engagement and disengagement to establish at least a forward gear range composed of forward gear positions and a neutral gear range for cutting off power transmission between the input shaft and the output shaft, said apparatus comprising:

- gear engaging control detecting means for detecting a gear shift to be made from the neutral gear range to the forward gear range; and
- gear shift control means responsive to an output signal from said gear engaging control detecting means, for preliminarily engaging one of the frictional engaging elements which mechanically connects to the one-way clutch and is not used for establishing the starting range, thereafter starting engaging one of the frictional engaging elements which is necessary to establish the starting gear position, then releasing said at least one of the frictional engaging elements which was preliminarily and partially engaged but not use for establishing the starting gear position when an actual shift from the neutral gear range to the forward gear range is judged to be ready.

5,749,806

SYSTEM AND METHOD FOR CONTROLLING HYDRAULIC PRESSURE OF AN AUTOMATIC TRANSMISSION FOR VEHICLES

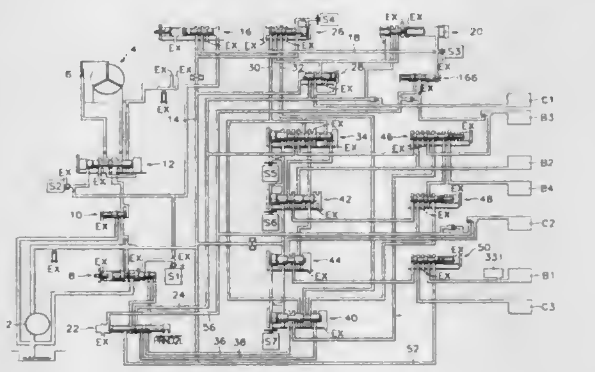
Jae Dirk Jang, and Kibeen Lim, both of Kyungki-do, Rep. of Korea, assignors to Hyundai Motor Company, Seoul, Rep. of Korea

Filed May 31, 1996, Ser. No. 656,436

Claims priority, application Rep. of Korea, May 31, 1995, 95-14255

Int. Cl.⁶ B60K *41/10*

U.S. Cl. 477—133 **14 Claims**



1. A hydraulic control system of an automatic transmission for a vehicle, comprising:

- a line pressure control means for converting line pressure from a hydraulic pump into constant hydraulic pressure;
- a torque pressure generating means for converting the constant hydraulic pressure fed from the line pressure control means via a manual valve into torque pressure in accordance with the operation of a transmission control unit;
- a torque pressure switching means for switching the supply direction of the torque pressure fed from the torque pressure generating means in accordance with the operation of the transmission control unit; and
- a shift means for primarily feeding the torque pressure fed from the torque pressure switching means to friction members and for secondary feeding drive pressure to the friction members after converting the line pressure fed from the line pressure control means into the drive pressure.

5,749,807

EXERCISE APPARATUS AND ASSOCIATED METHOD INCLUDING RHEOLOGICAL FLUID BRAKE

Gregory M. Webb, Independence, Va., assignor to Nautilus Acquisition Corporation, Independence, Va.

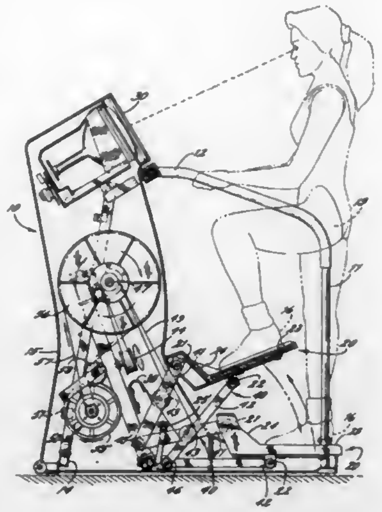
Division of Ser. No. 221,743, Mar. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 6,362, Jan. 19, 1993, Pat. No. 5,374,227. This application Jun. 7, 1995, Ser. No. 483,141

Int. Cl.⁶ A63B *22/00;23/10*

U.S. Cl. 482—52 **12 Claims**

1. A method for providing a user selected resistance during exercise on an exercise apparatus of a type including a frame, and user actuation means connected and moveable relative to the frame for being engaged and moved by at least one limb of a user during exercise, wherein the user actuation means includes receiving means receiving the limb of a user and providing an interface for engaging the apparatus, said method comprising the steps of:

- engaging a limb of the user with the respective receiving means;
- coupling a theological fluid brake to the user actuation means, the rheological fluid brake comprising a rheological fluid having a controllable viscosity; and
- applying a predetermined field strength to the rheological fluid based upon a user selected resistance value to thereby provide

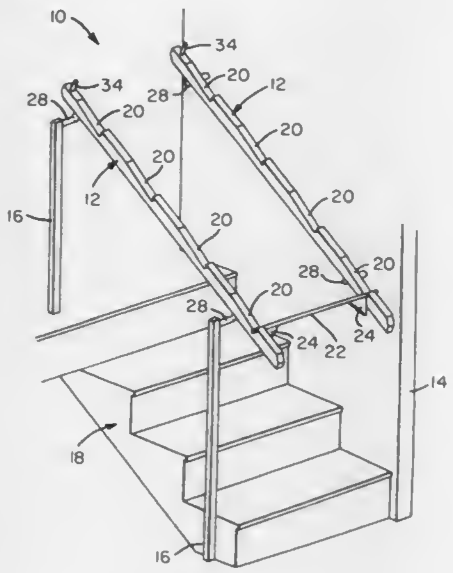


a desired resistance to movement of the user actuation means and receiving by the user.

5,749,808
STAIRWAY CLIMBING APPARATUS AND METHOD

James Alexander Harris, 6905 Tennyson Ter., Rockville, Md. 20855

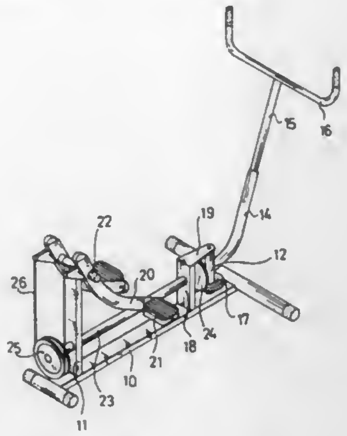
Filed Nov. 5, 1996, Ser. No. 743,822
Int. Cl.^{6} A63B *23/04;* **E04H** *17/00*
U.S. Cl. 482—52 **15 Claims**



1. A stair climbing apparatus, comprising:
a pair of rails for mounting on opposite sides of a flight of stairs, said rails having plurality of spaced notches in their respective upper surfaces;
a rod adapted to be sustained by said notches in said rails; and,
a pair of guides secured adjacent the opposed ends of said rod for allowing said rod to be lifted from said rails but preventing said rod from laterally sliding or twisting from engagement with said rails.

5,749,809
STEPPING AND SWINGING EXERCISER

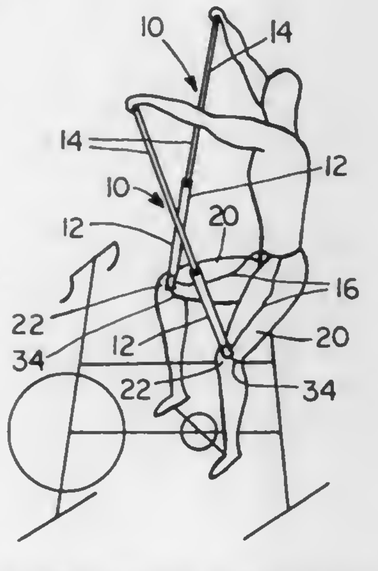
Ting Fung Lin, 12F-1, No. 83, Suei Yuan Road, Taipei, Taiwan
Filed Jun. 20, 1997, Ser. No. 879,311
Int. Cl.^{6} A63B *22/00*
U.S. Cl. 482—52 **4 Claims**



1. An exerciser comprising:
a base including a front portion and including a rear portion having a post extended upward from said base, said post including an upper portion having a pivot shaft,
a pair of foot supports pivotally coupled to said post at said pivot shaft,
an axle rotatably secured on said front portion of said base and adapted to be rotated about a vertical axis,
a handle secured to said axle and rotated in concert with said axle about said vertical axis, and
means for coupling said foot supports to said axle and for applying a rotational operation to said axle by a rotational movement of said foot supports about said pivot shaft.

5,749,810
UPPER BODY EXERCISER

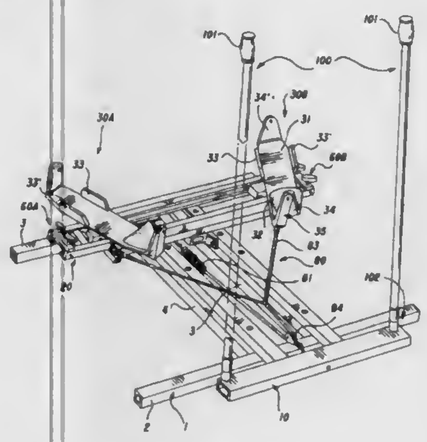
Charles L. Fenstermaker, 2765 Valley View Ave., Salt Lake City, Utah 84117-5467
Filed Oct. 24, 1995, Ser. No. 547,282
Int. Cl.^{6} A63B *22/12*
U.S. Cl. 482—57 **1 Claim**



1. A pair of portable hand-held elongate exercise supports for use while bicycle pedaling, each support comprising a lower tubular rod; a leg engaging member integrally connected to said lower rod and having a bottom padded thigh engaging portion, said portion sized and contoured to engage the thigh of a user; an upper T-shaped tubular rod adapted to be telescopically and adjustably received within said lower tubular rod, the T-portion of said rod functioning as a hand grip, a lower collar secured to said lower rod, and at least one cord attached to said collar and having a clip for attachment to the user for releasably securing a respective support to the user; whereby said leg engaging member is maintained in engagement with a leg of the person and the arms move in unison with the movement of the person's knees while pedaling.

5,749,811
SKIING SIMULATOR

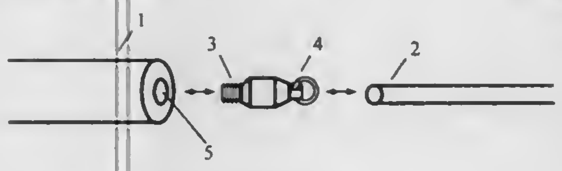
Roger F. Wilson, 1923 Wood Hollow La., Sarasota, Fla. 34235
Filed Nov. 2, 1994, Ser. No. 334,346
Int. Cl.^{6} A63B *69/18*
U.S. Cl. 482—71 **21 Claims**



1. A skiing simulation device, comprising:
a support frame;
a track mounted on said support frame for rotation on said support frame about an inclined axis, said track including a channel and a pair of track cars mounted in said channel each having a friction reducing member for enabling each said track car to move freely along said channel; and
a foot platform for a user's foot mounted on each track car and slidable with said track car along said channel independently of the other foot platform mounted on the other track car slidable along said channel.

5,749,812
SPEED JUMP ROPE BALL-BEARING SWIVEL ATTACHMENT

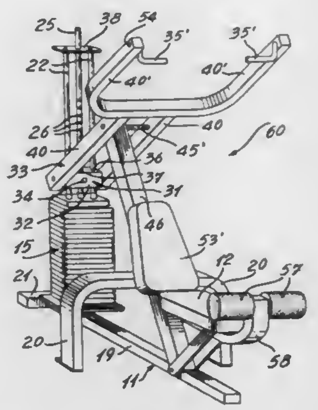
Paul N. Feciura, 1906 Coppersmith Ter., and Anthony N. Lee, 1922 Coppersmith Ter., both of Woodbridge, Va. 22191
Filed Jan. 8, 1997, Ser. No. 780,355
Int. Cl.^{6} A63B *11/02*
U.S. Cl. 482—82 **1 Claim**



1. A jump rope device comprising:
(a) a pair of substantially tubular handles defining a bore, each handle having a closed first end and a second end having a threaded bore,
(b) a pair of ball bearing swivel housings each having a threaded cap end and a spindle end having an O-ring, the threaded cap ends attached to the threaded bores of said handles,
(c) a jump rope having each end attached to said O-ring; said jump rope having a longitudinal axis aligned generally co-axial to the longitudinal axis of each said handle; and wherein the swivel housings remain external to the handles.

5,749,813
EXERCISING MACHINE WITH DIRECT DRIVE TO WEIGHT STACK

Ken Domzalski, Milford, Pa., assignor to 3266974 Canada Inc., Boucherville, Canada
Filed Jul. 5, 1996, Ser. No. 675,474
Int. Cl.^{6} A63B *21/06*
U.S. Cl. 482—97 **6 Claims**

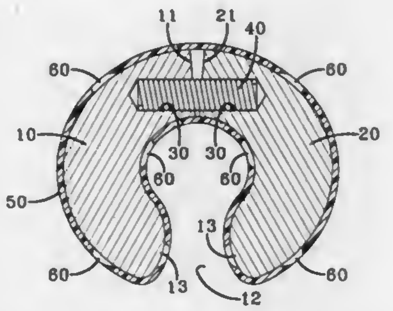


1. An exercising machine comprising a support frame having a seat to accommodate a user person, a weight stack having a plurality of predetermined weight elements guidingly connected to a pivoting support platform, restraining guide means secured to said pivoting support platform to permit said weight elements to be displaced therealong in a predetermined stack form, an elongated carrier means extending freely through said weight stack and having a plurality of attachment points along a prescribed length thereof, connection means to secure a selected one of said weight elements to one of said attachment points to form said predetermined stack, a pivotal connecting linkage secured to said carrier means and pivotally connected to a rear end portion of a pivoting exercising frame engageable by a user person to perform an exercise, said pivoting exercising frame having a pivotal connection to a stationary frame member intermediate said weight stack and said seat, said pivoting exercising frame further having a user engagement means in a front portion thereof, said predetermined stack being displaced along said restraining guide means during a pivoting displacement of said pivoting exercising frame about said pivotal connection while said pivoting support platform and pivotal connecting linkage pivot to accommodate an arcuate displacement of a rear end portion of said pivoting exercising frame when displaced about said pivotal connection, said pivotal connecting linkage being adjustably secured to a selected one of said attachment points whereby to adjust the pivotal angle of said pivoting exercising frame to position said user engagement means of said exercising frame at a desired position relative to said seat to adapt said exercise machine to a particular user person, said pivotal connecting linkage being comprised of a connecting block pivotally connected at opposed ends thereof between parallel frame members secured to said rear end portion of said pivoting exercising frame and said elongated carrier means which is an elongated rod extending freely through aligned apertures of said plurality of predetermined weight elements, said elongated rod having a plurality of equidistantly spaced holes therein constituting said attachment points, said connecting block having a rod receiving aperture through which said elongated carrier means extends, a locking pin bore in a side wall of said block and extending to said rod receiving aperture, a locking pin to engage said block within a selected one of said spaced holes, and one or more guide holes for receiving therethrough one or more restraining rods which are secured at a lower end to said pivoting support platform and which extend through respective aligned guide holes provided in said weight elements of said stack, said restraining rods constituting

said restraining guide means, said pivotal connection being disposed at opposed ends of said block said user engagement means comprising a pair of spaced apart arms extending substantially parallel to one another on respective sides of said seat.

5,749,814
STRUCTURE OF MATCHING WEIGHTS FOR A HEALTH EXERCISE MACHINE

Chao-Yueh Chen, Taipei, Taiwan, assignor to Fitness Quest, Inc., Canton, Ohio
Filed Dec. 16, 1996, Ser. No. 767,510
Int. Cl.⁶ A63B *21/06*
U.S. Cl. 482—93 **7 Claims**



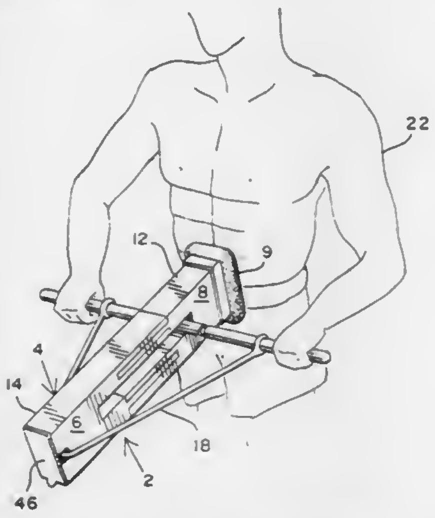
1. An add-on weight including:

a pair of arch-shaped weight blocks having opposed top end surfaces and bottom neck portions, each of said end surfaces having a top and a bottom wherein the opposed end surfaces slope from the top to the bottom thereof, and said neck portions forming an opening therebetween; and

spring means mounted in and extending between the end surfaces for biasing the neck portions toward each other for clipping the weight on a portion of a health exercise machine which extends through the opening.

5,749,815
PORTABLE EXERCISE DEVICE

John D. Lipps, 1514 Ridgecrest Dr., Kent, Ohio 44240
Filed May 30, 1997, Ser. No. 865,728
Int. Cl.⁶ A63B *21/02*
U.S. Cl. 482—122 **20 Claims**



1. A portable exercise device which comprises:

a. a two segment main body section having a first terminal end and a second terminal end;

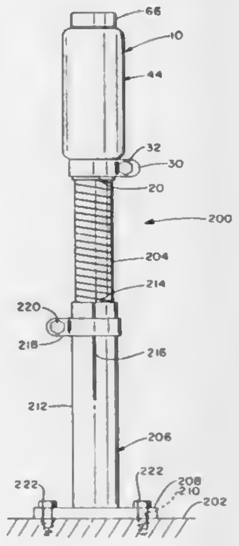
b. a cushion which is detachably attached to the first terminal end of the main body section;

c. a limb which is positioned in a slot which is integral with said main body section;

d. a elastic band the mid section of which is attached to the second terminal end of said main body section the terminal ends of said elastic band being attached to opposite sides of said limb outboard of said main body section.

5,749,816
FLOOR MOUNTABLE AND ADJUSTABLE ROTATING RESISTANCE EXERCISER

Thomas E. Froelich, Sr., 2332 12th St., Cuyahoga Falls, Ohio 44223, and Jeffrey T. Bertka, Cuyahoga Falls, Ohio, assignors to Thomas E. Froelich, Sr., Cuyahoga Falls, Ohio
Division of Ser. No. 589,559, Jan. 22, 1996, Pat. No. 5,634,871, which is a continuation-in-part of Ser. No. 249,958, May 27, 1994, Pat. No. 5,487,709. This application Feb. 19, 1997, Ser. No. 801,017
Int. Cl.⁶ A63B *21/02*
U.S. Cl. 482—123 **8 Claims**



1. A floor mounted resistance exerciser, comprising:

a base mountable to a floor;

a tubular support member extending outwardly from said base;

a rotating resistance exerciser; and

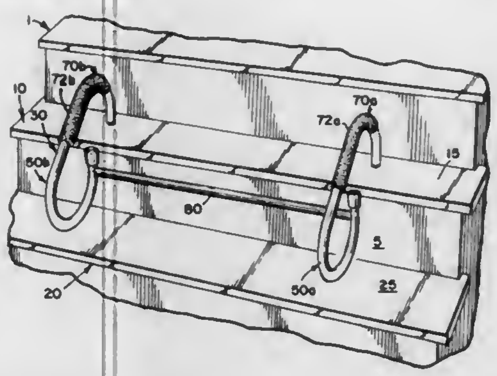
a flexible member telescopically received and selectively secured at one end to said tubular support member and telescopically received and selectively secured at the opposite end to said rotating exerciser, wherein said rotating resistance exerciser rotates around said flexible member which is flexible transversely with respect to said tubular support member.

5,749,817

Patent Not Issued For This Number

5,749,818
EXERCISE APPARATUS AND METHOD FOR PERFORMING PUSH-UP EXERCISES AND THE LIKE

Bradley T. Sather, 4702 Rose Creek Pkwy., Fargo, N. Dak. 58103
Division of Ser. No. 205,941, Mar. 3, 1994, Pat. No. 5,527,252. This application Jun. 7, 1996, Ser. No. 664,242
Int. Cl.⁶ A63B *23/12*
U.S. Cl. 482—141 **12 Claims**



1. A method for performing push-up exercises with an exercise apparatus, the exercise apparatus being configured to provide at least one hand hold on a staircase, the method comprising the steps of:

(a) selecting a desired level of difficulty, wherein the level of difficulty varies with the placement of the exercise apparatus at a plurality of elevations on the staircase;

(b) placing the exercise apparatus at the elevation corresponding to the desired level of difficulty;

(c) grasping the at least one hand hold on the exercise apparatus;

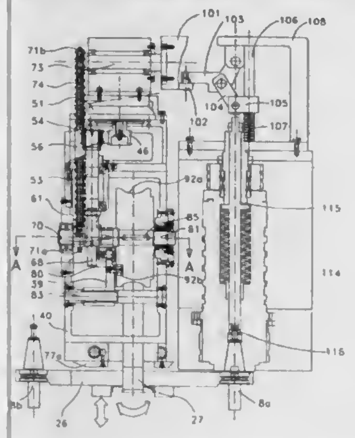
(d) performing push-up exercises; and

(e) providing the exercise apparatus with means for supporting the exercise apparatus on foot receiving surfaces of first and second steps in the staircase simultaneously, and means for restricting movement of the exercise apparatus in a direction generally parallel to the foot receiving surfaces of the first and second steps; whereby rocking of the exercise apparatus during the performing step is reduced.

5,749,819
AUTOMATIC TOOL CHANGING APPARATUS

Hong-Sen Yan; Wen-Miin Hwang; Fu-Chen Chen, all of Tainan; Philine Huang, and Yang-Sheng Fan, both of Taichung, all of Taiwan, assignors to National Science Council, Taipei, Taiwan
Filed Jun. 14, 1996, Ser. No. 663,971
Int. Cl.⁶ B23Q *3/157*
U.S. Cl. 483—39 **7 Claims**

1. An automatic tool changing apparatus connected to a power source within a machine body, said automatic tool changing apparatus comprising:



a reducer connected to the power source for adjusting a speed provided by the power source and for altering an axis of rotation provided by the power source,

a driving shaft connected to said reducer, said reducer rotating said driving shaft,

a compound cam rotationally driven by said driving shaft,

a four-bar mechanism connected to said compound cam, whereby said compound cam provides oscillation movement to said four-bar mechanism,

a spline pivotally connected to the machine body and rotationally connected to said compound cam,

a spline shaft pivotally connected to the machine body and axially driven by said four-bar mechanism,

a tool changing arm connected to said spline and said spline shaft, said spline rotating said tool changing arm, said spline shaft axially moving said tool changing arm,

a cylindrical cam driven by said reducer,

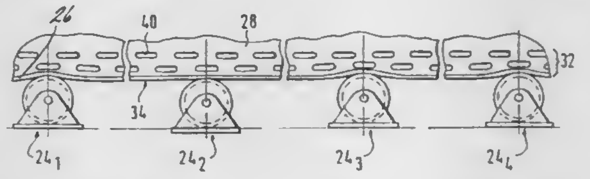
a toggle mechanism driven by said cylindrical cam to oscillate,

a draw bar axially driven by said toggle mechanism, and

a spindle head attached to said draw bar for grabbing and holding a tool.

5,749,820
SUSPENSION DEVICE FOR A ROTATING BODY

Emile Lonardi, Bascharage, and Giovanni Cimenti, Fentange, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg
Filed Dec. 12, 1996, Ser. No. 764,534
Int. Cl.⁶ F16C *19/30*
U.S. Cl. 384—620 **23 Claims**



1. A suspension device for a heavy body rotating about a substantially vertical axis of rotation, including:

a running strip attached to said body, said running strip having an annular running surface therein;

at least n rollers positioned to engage and press against said running surface to support said body, wherein n is an integer greater than 3;

compressible elastic means between and connecting said running strip and said body to enable elastic deformation of said running surface about the points of contact between said rollers and said running surface;

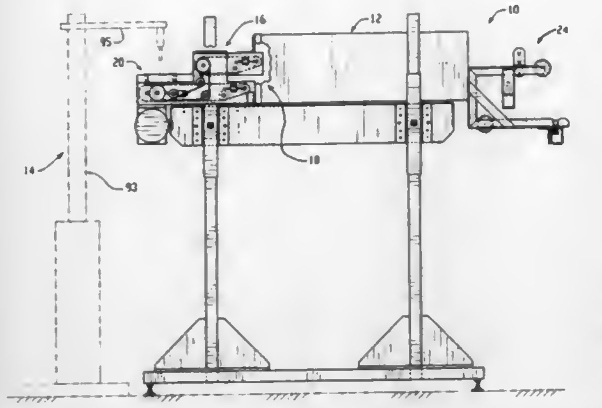
said compressible elastic means being effective to permit elastic deformations sufficient to establish weight bearing contact between said n rollers and said running surface; and

said compressible elastic means being effective to permit elastic deformations sufficient substantially to correct an unequal distribution of the weight of said body over said rollers resulting from slight defects in the coplanarity of said n rollers.

5,749,821
CUSHIONING CONVERSION SYSTEM FOR CONVERTING PAPER STOCK INTO CUSHIONING MATERIAL WITH A STAGING AREA AND A PICK AND PLACE ASSEMBLY

James A. Simmons, Painsville Township, Ohio, assignor to Ranpak Corp., Concord, Ohio
Filed Jul. 21, 1995, Ser. No. 505,108
Int. Cl.⁶ B31B *1/00*
U.S. Cl. 493—3 **6 Claims**

1. A cushioning conversion system, comprising:



- a cushioning conversion machine including a conversion assembly which converts stock paper into pads;
- a conveyor system positioned to receive a pad produced by the cushioning conversion machine and to move the pad to a staging area, the staging area including a first sensor for sensing a presence or absence of a pad in the staging area and generating a representative signal in response to the sensing;
- a pick and place assembly for retrieving the pad from the staging area; and
- a controller which receives the representative signal regarding the presence or absence of a pad in the staging area from the first sensor and which controls the operation of the cushioning conversion machine to produce a pad when a pad is absent from the staging area and controls the pick and place assembly to obtain a pad from the staging area when a pad is present in the staging area.

5,749,822

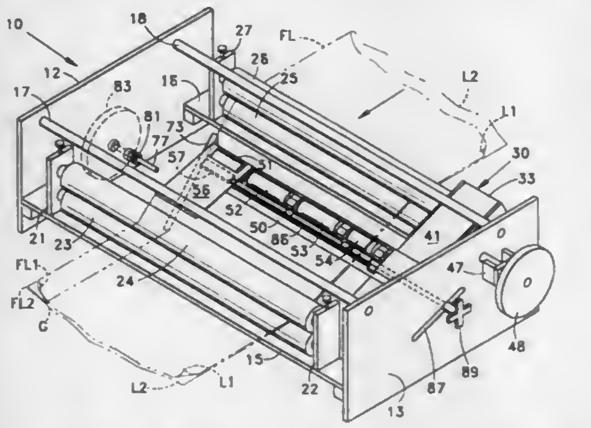
GUSSET FOLDING MECHANISM AND METHOD FOR PLASTIC BAG MAKING MACHINE

William D. Ellsworth, Fairport; David Z. Dike, Port Gibson, and David I. Laber, Victor, all of N.Y., assignors to Proven Designs, Inc., Palmyra, N.Y.

Filed Mar. 18, 1996, Ser. No. 617,251

Int. Cl.^{6} B31B *17/26;23/00*

U.S. Cl. 493—248 **13 Claims**



1. A method of forming a gusset of predetermined depth between the two overlapping layers of an elongate non-tubular web of material that is folded about a single fold line extending longitudinally of the folded web medially of its registering, separate longitudinal side edges, comprising

- causing the folded web to advance from a pair of inlet rolls to a pair of outlet rolls spaced from said inlet rolls,
- during the initial advance of said web gradually separating the longitudinal side edges and adjacent, registering portions of said web from each other to a distance equal to twice the predetermined depth to which the gusset is to be formed in the web, thereby causing the remaining portions of the web at opposite sides of said fold line initially to extend transversely between the separated portions of said web,
- thereafter, during the remainder of the advance of the web to the outlet rolls, causing the previously separated adjacent portions of said web gradually to become reengaged, and
- during the reengagement of said adjacent portions of the web causing said remaining portions of the web to be folded as a gusset progressively inwardly to said predetermined depth between said adjacent portions of the web as they become reengaged.

3. In a bag making machine of the type in which the overlapped halves of an elongate non-tubular web of material, which is folded about a single fold line extending medially of its separable longitudinal side edges, travel from the nip between a pair of inlet rolls to the nip between a pair of outlet rolls spaced from the inlet rolls, a gusset forming mechanism located in the space between said pairs of rolls and comprising,

- web separating means including a pair of elongate wing members extending in spaced, parallel relation to each other between said overlapped halves of web transversely of said longitudinal side edges thereof, and part way toward said fold line, and having thereon web guiding surfaces operative during travel of said web from said inlet to said outlet rolls initially to effect disengagement and gradual separation of said side edges and adjacent, registering portions of said web a predetermined distance, and then gradual reengagement of said adjacent portions of the web,
- gusset folding means operative during the gradual reengagement of said adjacent portions of said web to engage and urge said fold line progressively inwardly to a predetermined depth between said adjacent portions of said web, thereby to fold the remaining portions of said web at opposite sides of said fold line progressively inwardly to form a gusset of said predetermined depth between said adjacent portions of said web, and
- means mounting said wing members for limited movement selectively toward or away from each other thereby selectively to adjust the space between said wing members and said web guiding surfaces thereof.

5,749,823

SIGNATURE CONTROL IN A HIGH SPEED PRINTING PRESS

John Richards, Barrington, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.

Filed Mar. 28, 1995, Ser. No. 412,038

Int. Cl.^{6} B31B *1/04*

U.S. Cl. 493—417 **18 Claims**

1. An apparatus for positioning a signature on a table surface, the apparatus comprising:

- a first actuator including
  - a first magnetic core arranged adjacent to the table surface;
  - a first coil arranged radially outside the first magnetic core;
  - a first pivoting arm arranged adjacent to the table surface and opposite of the first magnetic core; and
  - a first positioner, at least a portion of which is formed of ferromagnetic material, coupled with the first pivoting arm;
- a second actuator including
  - a second magnetic core arranged adjacent to the table surface;
  - a second coil arranged radially outside the second magnetic core;
  - a second pivoting arm arranged adjacent to the table surface and opposite of the second magnetic core; and
  - a second positioner, at least a portion of which is formed of ferromagnetic material, coupled with the second pivoting arm;
  - a sensor for sensing the position of a signature moving on the table;
  - a controller coupled to the sensor and to the first and second coils for providing a current to the first and second coils,

wherein, when a current is provided through the first coil, the first magnetic core attracts the first positioner toward the table surface so that the first positioner contacts a first portion of the signature to retard motion of the first portion of the signature across the table surface and wherein when a current is provided through the second coil, the second magnetic core attracts the second positioner toward the table surface so that the second positioner contacts a second portion of the signature to retard motion of the second portion of the signature across the table surface to control the signature's path of movement on the table.

5,749,824

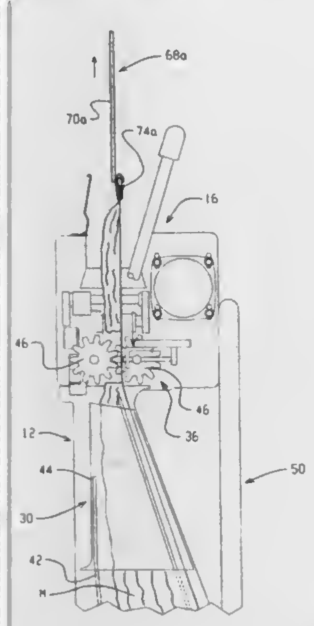
CONVERSION MACHINE LOADER AND METHOD

Paul J. Guth, Beachwood, Ohio, assignor to Ranpak Corp., Concord Township, Ohio

Filed Sep. 5, 1996, Ser. No. 708,735

Int. Cl.^{6} B31F *5/02;7/00*

U.S. Cl. 493—464 **21 Claims**



1. A device for loading sheet stock material from a supply thereof into a cushioning conversion machine for conversion of the stock material into a cushioning dunnage product, said loading device comprising:

- an elongated threading member which passes through a stock material path of the cushioning conversion machine without interference, said threading member including a row of slots, including at least one slot extending from an attachment end of the threading member longitudinally along the threading member; and
- at least one attachment device at the attachment end of the threading member which attaches the stock material to the threading member.

5,749,825

MEANS METHOD FOR TREATMENT OF STENOSED ARTERIAL BIFURCATIONS

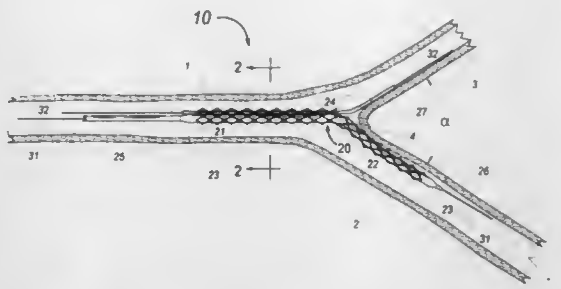
Robert E. Fischell, Dayton, Md.; David R. Fischell, Fair Haven, N.J.; Tim A. Fischell, Richland, Mich., and Todd H. Turnland, Sunnyvale, Calif., assignors to IsoStent, Inc., Belmont, Calif.

Filed Sep. 18, 1996, Ser. No. 714,315

Int. Cl.^{6} A61N *5/00*

U.S. Cl. 600—3 **19 Claims**

1. A stent delivery catheter system including a stent for insertion at an arterial bifurcation or arterial side branch, the system comprising:



- a first guide wire adapted to be inserted through a main artery and into a continuation artery of that main artery;
- a second guide wire adapted to be inserted through the main artery and into a side branch artery of the main artery, the side branch artery and the continuation of the main artery forming an arterial bifurcation therebetween;
- a balloon angioplasty catheter having an inner shaft which has a distal end and also an inflatable balloon located at a distal section of the balloon angioplasty catheter, the inflatable balloon having a proximal end and a distal end, the distal end of the balloon being sealingly joined to the distal end of the inner shaft, the inner shaft being adapted to be slidingly advanced over the first guide wire;
- a side branch tube being joined to the balloon near the balloon's proximal end and also being joined to the balloon at a central attachment point which is near the longitudinal center of the balloon from which central attachment point the side branch tube extends for a length of greater than 1 mm in a distal direction free from attachment to the balloon, the side branch tube having a proximal portion and a distal portion and being adapted to be slidingly advanced over the second guide wire, and, .
- an expandable stent having a proximal portion and a distal portion and having an open space therebetween through which open space the side branch tube projects in a distal direction, the proximal portion of the side branch tube lying within the proximal portion of the stent and the distal portion of the side branch tube lying outside the distal portion of the stent.

5,749,826

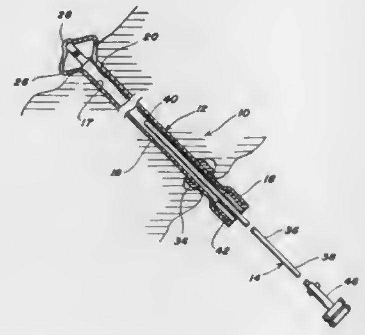
URINARY INCONTINENCE CONTROL DEVICE

James W. Faulkner, 20 Regent Wood, Northfield, Ill. 60093

Filed Nov. 6, 1996, Ser. No. 743,709

Int. Cl.^{6} A61F *2/00*

U.S. Cl. 600—29 **8 Claims**



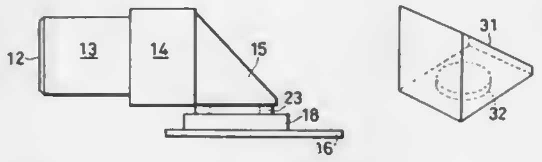
3. A urinary incontinence control device for placement and removal in the urinary tract of a human female comprising:

- a catheter having a distal end and a proximal end, said catheter adapted to be inserted into a urethra of a patient;
- a plurality of retractable, flexible flanges formed at the distal end of the catheter, said flanges being biased outwardly in their natural state and adapted to retain the catheter in a bladder of a patient;

a semi-rigid stylet having a distal end and a proximal end attached to a plug, said stylet slidably disposed in said catheter and said distal end of the stylet effective to retract the flanges, said retracted flanges adapted to pass through a urethra into a bladder;
a connector is attached to the proximal end of the catheter within which the plug on the proximal end of the stylet is inserted and locked when the flanges are retracted by the stylet, said plug blocking the flow of urine through the connector,
a slidably adjustable anchoring structure at the proximal end of the catheter having a diameter larger than a urethra for preventing migration of the catheter at an external opening of a urethra,
whereby said catheter and stylet form a unitary structure facilitating insertion and removal of the catheter.

5,749,827
OBJECTIVE OPTICAL MEMBER WITH AIR GAP FOR ENDOSCOPE IMAGING UNIT

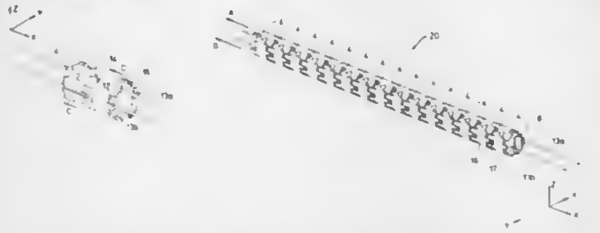
Itsuji Minami, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Feb. 26, 1996, Ser. No. 607,351
Claims priority, application Japan, Mar. 7, 1995, 7-074588
Int. Cl.^{6} A61B *1/04*
U.S. Cl. 600—109 **4 Claims**



1. An endoscope imaging unit comprising:
an imaging device with a color filter provided on an imaging plane thereof; and
an objective optical member which is in contact with said color filter of said imaging device, and which is provided with an air gap corresponding to said imaging plane and wherein said air gap separates said imaging device and said objective optical member; and
wherein said objective optical member has a prism which is provided with a groove as said air gap, and which is disposed on an upper surface of said imaging device.

5,749,828
BENDING NECK FOR USE WITH INVASIVE MEDICAL DEVICES

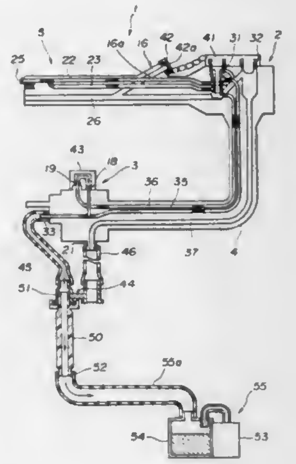
Rodney J. Solomon, Andover, and Hubert K. Yeung, Lynnfield, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 22, 1995, Ser. No. 576,940
Int. Cl.^{6} A61B *1/00*
U.S. Cl. 600—141 **4 Claims**



1. A bending neck for a remotely controlled head assembly used in invasive medical procedures, the bending neck comprising:
a series of cylindrical links having a concave socket at a first end and having a convex ball at the second end, the convex ball of each link in the series adapted for engaging the concave socket of an adjacent link in the series;
a series of tubular sleeves for encircling the links, each sleeve corresponding to a link in the series;
a plurality of channels formed in each link, encased by the tubular sleeve, the channels spanning the length of the links;
a plurality of tabs, at least one tab of the plurality of tabs protruding from each link of the series, engaging the tubular sleeve;
a pair of swivel joints, diametrically opposed, positioned at a first end of each of the sleeves;
a pair of swivel sockets, diametrically opposed, positioned at a second end of each of the sleeves adapted to receive the pair of swivel joints;
a central lumen formed within each of the links, the lumens of the links collectively forming a center conduit, through the length of the bending neck; and
a plurality of retractable cables, anchored to the head assembly, each cable threaded through a corresponding channel, and wherein the bending neck is articulated by retraction of at least one the retractable cables.

5,749,829
ENDOSCOPE SYSTEM

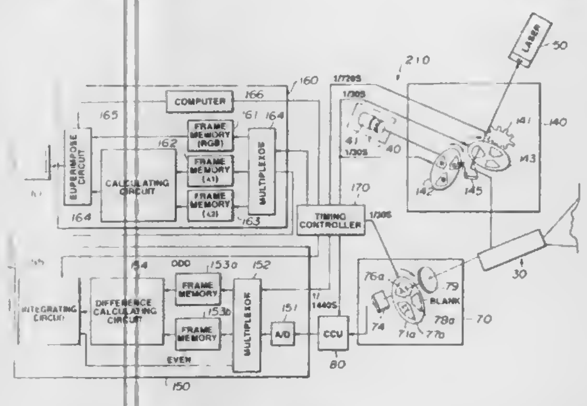
Takeshi Yokoi, Hino; Takahiro Kishi, Machida; Tsutomu Ishiguro, Hachioji; Masaaki Nakazawa, Hino; Yukio Takahashi, Hachioji; Hideo Ito, Akishima; Hisao Yabe, Hachioji, and Satoshi Nakagawasai, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1996, Ser. No. 593,341
Claims priority, application Japan, May 16, 1995, 7-117525
Int. Cl.^{6} A61B *1/00*
U.S. Cl. 600—153 **19 Claims**



1. An endoscope system, comprising:
an endoscope having an insertional part, an operation unit, and a connector unit wherein said connector unit is connected to said operation unit via a universal chord including tubes and said insertional part is connected to said operation unit via channels, said insertional part having a distal section, wherein said distal section has an opening formed therein for communicating with said operation unit via said channels; and
at least one cleaning means for cleaning out any one of a group consisting of said tubes between said connector unit and said operation unit and said channels between said insertional part and said operation unit, said cleaning means having a flexible tube that can be connected to an opening formed in any one of a group consisting of said operation unit and said connector unit of said endoscope via an adaptor and said flexible tube having an overall length of greater than or equal to 30 cm or larger.

5,749,830
FLUORESCENT ENDOSCOPE APPARATUS

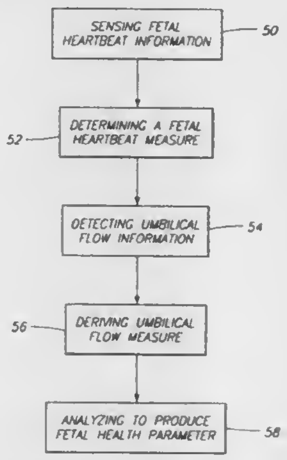
Mamoru Kaneko, Hannou; Yasuhiro Ueda, Kokubunji; Sakae Takehana, Machida; Masaya Yoshihara, Hino; Masahiko Iida, Hachioji; Naruto Shinkai, Machida; Kazunari Nakamura, Hino; Nobuhiko Washizuka, Tama; Yoshinao Oaki, Hino, and Katsuya Suzuki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Oct. 27, 1994, Ser. No. 329,909
Claims priority, application Japan, Dec. 3, 1993, 5-304428; Dec. 3, 1993, 5-304429; Dec. 3, 1993, 5-304432; Feb. 10, 1994, 6-016879
Int. Cl.^{6} A61B *1/06*
U.S. Cl. 600—160 **6 Claims**



1. A fluorescent endoscope apparatus, comprising:
an endoscope including a light guide for transmitting light with which a subject portion to be observed is irradiated and an image guide for transmitting an image obtainable from the subject portion to be observed that has been irradiated with light transmitted through said guide;
a normal observation light source apparatus for emitting normal light for performing normal light endoscope observation;
at least one fluorescent observation light source apparatus for emitting excitation light for performing fluorescent light observation;
an introduced-light switching apparatus for selectively introducing, to said light guide of said endoscope, normal light emitted by said normal observation light source apparatus or excitation light emitted by said fluorescent observation light source apparatus, said introduced-light switching apparatus having a housing provided with an endoscope connection portion to which said light guide of said endoscope is connected, a normal light receiving portion for receiving said normal light emitted by said normal observation light source apparatus, and an excitation light receiving portion for receiving said excitation light emitted by said fluorescent observation light source apparatus;
an externally-attached-type camera including a rotative filter that selectively transmits a normal light image obtained due to irradiation of the subject portion to be observed with normal light or excitation light and transmitted through said image guide of said endoscope or a fluorescent image obtained due to irradiation with excitation light to form on one solid-state image sensing device, said externally-attached-type camera being attached to an ocular portion of said endoscope;
a timing controller for synchronizing said image selectively sensed by said externally-attached type camera with light which is introduced from said introduced-light switching apparatus to said light guide of said endoscope;
an image processing apparatus for converting said image synchronized by said timing controller and formed on said image sensing device of said externally-attached-type camera into video data for the normal observation and converting said fluorescent image formed on said image sensing device and obtained due to the irradiation with excitation light into video data with which fluorescent diagnosis can be performed to determine whether or not the subject portion to be observed is normal,
wherein said image processing apparatus comprises sensitivity improving means for improving sensitivity of the fluorescent image obtained due to the irradiation with excitation light;
wherein said sensitivity improving means comprises a two-dimensional lock-in amplifier for calculating a difference and for integrating the fluorescent image obtained due to the irradiation with excitation light,
wherein said two-dimensional lock-in amplifier comprises;
  an A/D converter for converting an image signal into digital data;
  a multiplexor for distributing image data converted by said A/D converter;
  a frame memories for storing data distibuted by said multiplexor;
  a difference-calculating circuit for canceling a noise component by calculating difference of data in said two-frame memories; and
  an integrating circuit for accumulating image data from which the noise component has been canceled by said difference-calculating circuit,
  wherein the number of integration operations performed by said integrating circuit is changed in accordance with the brightness of the fluorescent image transmitted through said image guide of said endoscope and obtained due to the irradiation with excitation light so that S/N ratio is improved; and
display switch means for switching display between a mode in which normal observation video data and fluorescent observation video data processed by said image processing apparatus are simultaneously displayed and a mode in which they are displayed in a time-divided manner.

5,749,831
FETAL CARDIAC MONITORING UTILIZING UMBILICAL BLOOD FLOW PARAMETERS AND HEARTBEAT INFORMATION

Donald A. Baker, P.O. Box 742, Deer Park, Wash. 99006-0742
Filed Jun. 23, 1997, Ser. No. 880,352
Int. Cl.^{6} A61B *5/026*
U.S. Cl. 600—301 **36 Claims**


SENSING FETAL HEARTBEAT INFORMATION
50
DETERMINING A FETAL HEARTBEAT MEASURE
52
DETECTING UMBILICAL FLOW INFORMATION
54
DERIVING UMBILICAL FLOW MEASURE
56
ANALYZING TO PRODUCE FETAL HEALTH PARAMETER
58

29. A fetal monitoring system for monitoring a fetus carried within a mother, the system comprising:
at least one fetal heart sensor for sensing fetal heartbeat information;
at least one umbilical flow detector for detecting umbilical blood flow information which indicates flow of blood within an umbilical cord which extends between the fetus and a placenta carried by the mother;
at least one processor connected to receive said fetal heartbeat information from the at least one fetal heartbeat sensor, and connected to receive umbilical flow information from the at least one umbilical flow detector, said at least one processor deriving therefrom at least one fetal health parameter.

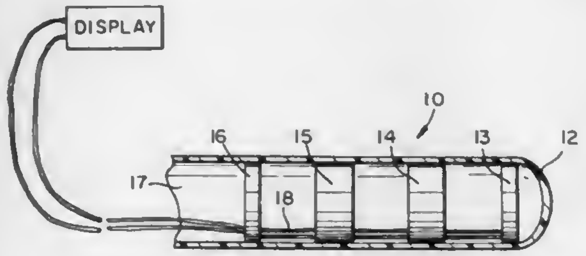
5,749,832
MONITORING SYSTEMS

Pankaj Madganlal Vadgama, Manchester, and Paul William Crump, Brinsworth, both of United Kingdom, assignors to The Victoria University of Manchester, Manchester, England
PCT No. PCT/GB93/00163, § 371 Date Oct. 6, 1994, § 102(e) Date Oct. 6, 1994, PCT Pub. No. WO93/14693, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 28, 1993, Ser. No. 256,981
Claims priority, application United Kingdom, Feb. 1, 1992, 9202172; Feb. 28, 1992, 9204253
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 600—345 **17 Claims**

1. A method for monitoring various body parameters which comprises the steps of installing an electrode in place in vivo, providing, at a site of introduction of the said electrode, a liquid protecting medium having the properties of (a) suppressing adverse depressive effects on the electrode's output induced by the biological environment at the site of introduction of the electrode in the absence of the protecting medium and (b) not injuring the biological environment around the site of introduction of the electrode, and flowing the protecting medium into the biological environment, and wherein the liquid protecting medium is introduced into the site in which the electrode is to be used prior to the insertion of the electrode, and measuring signal outputs of the electrode to provide a measure of the body parameter being monitored.

5,749,833
COMBINED ECHO-ELECTROCARDIOGRAPHIC PROBE

A-Hamid Hakki, and Said I. Hakky, both of 8547 Merrimoor Blvd., E., Largo, Fla. 34647-3145
Filed Aug. 15, 1995, Ser. No. 515,315
Int. Cl.⁶ A61R *5/042;8/12;* **A61B** *8/12*
U.S. Cl. 600—380 **7 Claims**



1. An esophageal probe for use in diagnosis or as a stimulant comprising:

a flexible elongated conduit having a proximal end and a distal end;

a first EKG electrode positioned on said conduit near said distal end;

a first ultrasonic transducer longitudinally positioned on said conduit in selective spaced relationship to said first electrode;

a second ultrasonic transducer longitudinally positioned on said conduit in selective spaced relationship to said first transducer;

a second EKG electrode positioned on said conduit in selective spaced relationship to said second ultrasonic transducer and spaced at a distance from the proximal end;

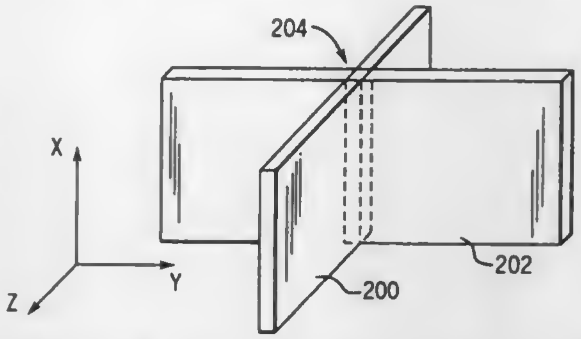
the ultrasonic transducers being positioned between the EKG electrodes, conductive pathways connected to said electrodes and transducers;

said proximal end being adapted for receiving the conductive pathways from each of the electrodes and transducers for connection with electrocardiological and echocardiographic devices; and

wherein the selective spaced relationship between each electrode and transducer is equal and not more than 5 centimeters.

5,749,834
INTERSECTING MULTISLICE MRI DATA ACQUISTION METHOD

Stephen G. Hushek, Brookfield, Wis., assignor to General Electric Company, Waukesha, Wis.
Filed Dec. 30, 1996, Ser. No. 777,494
Int. Cl.⁶ A61B *5/055*
U.S. Cl. 600—410 **4 Claims**



1. A method for producing multiple slice images with an MRI system depicting a subject in multiple planes that intersect within a region of interest, the steps comprising:

a) producing a series of slice select magnetic field gradient pulses corresponding to the multiple planes;

b) producing concurrently with the slice select magnetic field gradient pulses a corresponding series of selective RF excitation pulses which produce transverse magnetization in each of said multiple planes;

c) producing phase encoding magnetic field gradient pulses for each of said multiple planes;

d) producing an RF refocusing pulse which refocuses the transverse magnetization in all of said multiple planes at a series of echo signal times;

e) producing a readout magnetic field gradient pulse at each of said echo signal times;

f) acquiring an echo signal for each of said multiple planes;

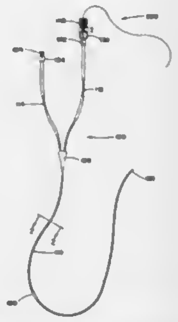
g) repeating steps a) through f) until echo signals are acquired for a preselected number of different phase encodings; and

h) reconstructing a slice image for each of said multiple planes using the corresponding acquired echo signals; and

wherein the flip angles of the RF excitation pulses are chosen such that the echo signal intensity at the intersections of said multiple planes is a preselected level relative to the echo signal intensity throughout the multiple planes.

5,749,835
METHOD AND APPARATUS FOR LOCATION OF A CATHETER TIP

Jerald Glantz, Lake Elmo, Minn., assignor to SIMS Deltec, Inc., St. Paul, Minn.
Continuation of Ser. No. 644,734, May 10, 1996, abandoned, which is a continuation of Ser. No. 301,869, Sep. 6, 1994, abandoned. This application Jan. 9, 1997, Ser. No. 782,518
Int. Cl.⁶ A61B *5/05*
U.S. Cl. 600—424 **12 Claims**



1. A method for determining the location of a tip of a catheter, inside biological tissue, wherein the catheter includes a distal end and a proximal end and a lumen positioned therebetween, the method comprising the steps of:

a) providing a source;

b) providing a detector locked within the lumen of the catheter remote from the distal end of the catheter, the detector operable in generating a voltage when the source is proximate the detector;

c) trimming the distal end of the catheter as to define a trimmed distal end;

d) unlocking the detector from within the lumen of the catheter;

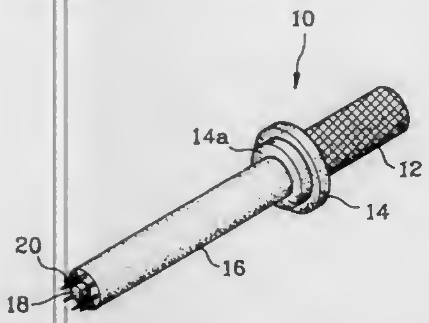
e) positioning the detector proximate the trimmed distal end of the catheter;

f) positioning the trimmed distal end of the catheter within the biological tissue; and

g) placing the source proximate the detector to locate the trimmed distal end of the catheter.

5,749,836
QUANTITATIVE SKIN ALLERGIC TEST DEVICE

Ray-Ling Hsiao, 4F, No. 12, Alley 15, Lane 175, Sec. 2, Ho-Ping East Rd., Taipei, Taiwan
Filed Mar. 26, 1996, Ser. No. 621,939
Int. Cl.⁶ A61B *5/04*
U.S. Cl. 600—556 **3 Claims**



1. In a skin allergic test device of the type which includes a finger grip, an elongated stem extending therefrom, and a plurality of punctures provided at an end of said elongated stem, the improvement comprising:

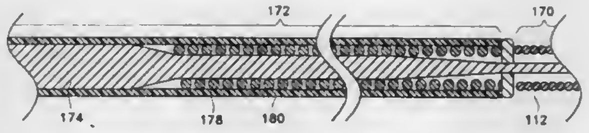
the end of said elongated stem having at least a raised portion, which is in a spaced apart relationship with respect to said punctures so to act as a stop,

each of said punctures extending from the end of said elongated stem, substantially parallel to the longitudinal axis of said elongated stem as well as the axis of said raised portion, and each said puncture having a length greater than the height of said raised portion by a predetermined value which is less than the thickness of the epidermis layer of human skin, so that each puncture will not penetrate through the epidermis layer of the skin of a patient due to said raised portion being acting as a stop during a skin allergic test, in order to obtain an accurate interpretation of the test result.

5,749,837
ENHANCED LUBRICITY GUIDEWIRE

Thomas J. Palermo, Palo Alto; Gene Samson, Milpitas; Gregory E. Mirigian, Fremont, and U. Hiram Chee, San Carlos, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.
Continuation of Ser. No. 346,143, Nov. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 62,456, May 11, 1993, Pat. No. 5,409,015. This application Aug. 1, 1996, Ser. No. 695,185
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 600—585 **24 Claims**

1. A guidewire section suitable for guiding a catheter within a blood vessel, comprising



a.) an elongated flexible metal wire core having a proximal section and a distal tip section.

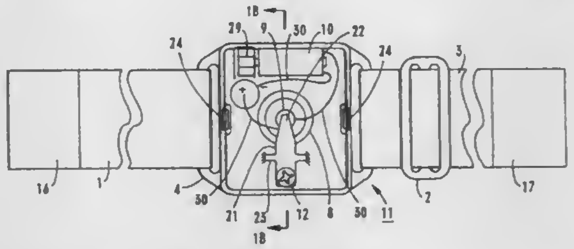
b.) a polymeric tie layer disposed about at least a portion of said distal section,

c.) a lubricious polymer layer disposed about the polymeric tie layer, and

d.) a malleable metal wire coil disposed about another distally located portion of said distal tip section, said malleable metal wire coil having a section length uncoated by said polymeric tie layer.

5,749,838
POSTURE TRAINING DEVICE

Daniel S. Kline, P.O. Box 188236, Carlsbad, Calif. 92009
PCT No. PCT/US95/15631, § 371 Date Dec. 29, 1995, § 102(e) Date Dec. 29, 1995, PCT Pub. No. WO96/17548, PCT Pub. Date Jun. 13, 1996
PCT Filed Dec. 1, 1995, Ser. No. 578,559
Int. Cl.⁶ A61H *11/00*
U.S. Cl. 601—71 **23 Claims**



1. A posture training device, comprising:

a rigid frame positionable against the back of a person at the intersection of a backbone curve defined by the person's backbone and a transverse curve thereof;

a rigid generally box-shaped hollow module disposed in the frame and movably engaged therewith between a good posture position, corresponding to respective first convexities of the curves, and a poor posture position, corresponding to one or both of respective second convexities of the curves, each second convexity being greater than the respective first convexity; and

a tactile signal generator mounted on the module for generating a tactile signal when the module is in the poor posture position.

5,749,839
DIRECT MECHANICAL BI-VENTRICULAR CARDIAC ASSIST DEVICE

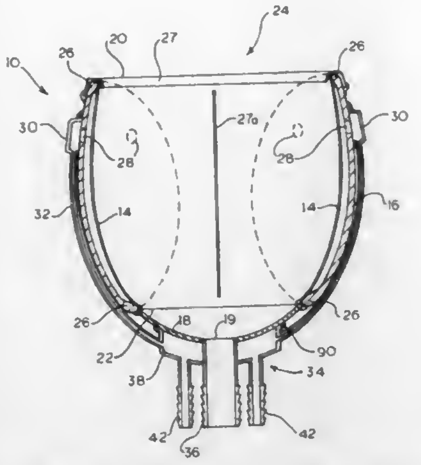
Stephen G. Kovacs, Durham, N.C., assignor to Duke University, Durham, N.C.
Continuation of Ser. No. 292,726, Aug. 18, 1994, abandoned. This application May 21, 1996, Ser. No. 655,310
Int. Cl.⁶ A61H *31/00*
U.S. Cl. 601—153 **18 Claims**

1. A ventricular assist device, comprising:

(a) a cup having an open top and defining a heart cavity sized to receive a human heart, said cup being formed of a material with sufficient rigidity to form a self-supporting shell;

(b) an annular diaphragm disposed along an inner surface of the cup and thereby defining a fluid chamber therebetween;

(c) a pressure inlet in said cup communicating with said fluid chamber for alternately applying positive and negative pres-



sures to said fluid chamber to actuate said diaphragm, wherein the diaphragm distends to compress the heart when a positive pressure is applied to said fluid chamber, and contracts when negative pressure is applied to said fluid chamber allowing said heart to relax; and

(d) a size-adjustment assembly to allow for size adjustment of the open top of said cup relative to the human heart inserted into said heart cavity of said cup, said assembly including (i) an inflatable compensation ring adjacent said open top of said cup and positioned between said inner surface of said cup and said diaphragm, (ii) an opening formed in said cup adjacent to said compensation ring, and (iii) a fill valve positioned in said opening and fluid-connectable to said compensation ring to allow fluid to be injected into said compensation ring and thereby inflate the same, whereby the size of said open top of said cup is adjusted.

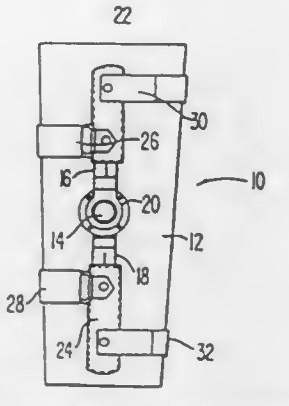
5,749,840
DYNAMIC SPLINT

Andrew L. Mitchell, Wilmington, Del., and Kenneth A. Patchel, Chadds Ford, Pa., assignors to Ultraflex Systems, Inc., Malvern, Pa.

Division of Ser. No. 443,200, May 17, 1995, Pat. No. 5,658,241, which is a continuation of Ser. No. 210,763, Mar. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 740,387, Aug. 5, 1991, Pat. No. 5,358,469, which is a continuation-in-part of Ser. No. 447,460, Dec. 7, 1989, abandoned. This application Oct. 31, 1995, Ser. No. 550,603

Int. Cl.⁶ A61F *5/00*

U.S. Cl. 602—5 **24 Claims**



1. A bias adjustment assembly for an adjustable splint device having a first splint strut member, a second splint strut member, a joint assembly for mounting said first and second strut members for relative pivotal movement and a bias unit having a first end and a second end, the bias unit operating to oppose relative pivotal movement of said strut members in a first direction, the bias adjustment assembly comprising:

a mounting unit mounted at said joint assembly,

a rotatable adjustment unit including an elongate adjustment shaft mounted on said mounting unit, and a gear member having gear teeth mounted on said adjustment shaft for rotation, and

an elongate rotatable actuator mounted for rotation on said mounting unit, said rotatable actuator having threads which mesh with said gear teeth of said gear member to rotate said gear member to one of a plurality of rotational positions and to hold said gear member in a rotational position when said rotational actuator ceases to rotate,

the first end of said bias unit being attached to said rotatable adjustment unit and said bias unit being adapted to wrap around said adjustment shaft as said rotatable adjustment unit is rotated to increase the bias of said bias unit.

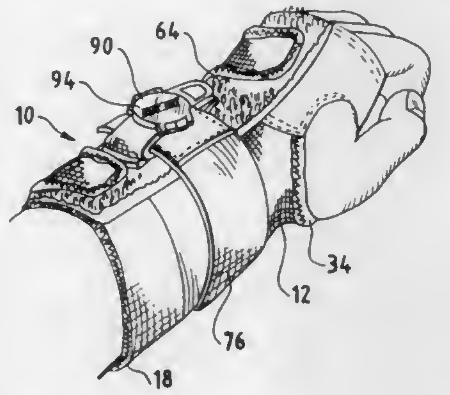
5,749,841
WRIST BRACE WATCH

Jay Gary Moore, 720 W. Shubert Ave., Chicago, Ill. 60614

Filed Jun. 7, 1995, Ser. No. 478,871

Int. Cl.⁶ A61F *5/00*

U.S. Cl. 602—21 **6 Claims**



1. A wrist brace comprising: a flexible tube having an inner surface and an outer surface, said inner surface of said tube having sufficient diameter to encompass a wrist of a person wearing said brace, a front open end in said tube through which the fingers of said person may extend and a rear open end in said tube through which the forearm of said person may extend, said tube comprising a web with a first edge and a second edge which, while in an open position said web can loosely cover said wrist, a part of said hand and a part of said forearm, and when said first edge and said second edge of said web are rolled near to each other into a closed position to form said tube, said tube can securely encompass said wrist, a part of said hand and a part of said forearm, a top side of said tube which is generally disposed above said wrist when said wrist brace is being worn by said person and a bottom side of said tube which is disposed generally below said wrist when said wrist brace is being worn by said person;

at least one elongated reinforcement member made of substantially rigid material for supporting said wrist against excessive bending and being housed along said tube outside said inner surface;

a strip of multiple tiny loops attached to said tube;

at least one strap having a proximal end attached adjacent to one of said first edge and said second edge, said strap having a strip of multiple tiny hooks thereon which can securely engage said multiple tiny loops on said tube to attach said strap to said outer surface of said tube to maintain said web in said closed position;

a looped band for receiving a remote end of said strap therethrough, a strip of multiple tiny loops being attached to an interior surface of said looped band for engaging said multiple tiny hooks on said strap to secure said loosed band to said strap, and a strip of multiple tiny hooks being attached to an exterior surface of said looped band for engaging said strip of multiple tiny loops on said tube to secure the looped band to said tube, thereby also securing the remote end of said strap to said tube, said looped band comprising a first band with a proximate end and a remote end and a second band with a proximate end and a remote end;

a time piece attached to an exterior surface of said looped band, said time piece including a first dowel setting supporting a first dowel and a second dowel setting supporting a second dowel each on opposed sides of said time piece, said proximate end of said first band being secured to said first dowel and said proximate end of said second band being secured to said second dowel, a strip of multiple tiny hooks attached to said remote end of said first band which engages a strip of multiple tiny loops on said remote end of said second band, and said proximate end of said first band being split into a first arm and a second arm and said first arm attaches to said first dowel and said second arm attaches to said second dowel.

5,749,842
WOUND DRESSING PACKAGE

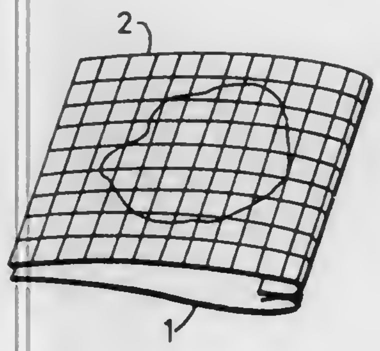
Catherine L. Cheong, Burnley, and David Rigby, Slough, both of United Kingdom, assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Aug. 22, 1994, Ser. No. 293,864

Claims priority, application United Kingdom, Aug. 31, 1993, 9318016

Int. Cl.⁶ A61F *5/00;* A61I *17/02*

U.S. Cl. 602—41 **19 Claims**



1. A package containing a separate sterile wound dressing, the package comprising a first web and a second web hermetically sealed together around their peripheries, each of the first and second webs having an inner surface and an outer surface, said inner surfaces facing each other to define a package interior, said package interior being sterile, wherein each of the first and second webs include transparent areas and wherein the inner surface of one of the first and second webs at the transparent area thereof is receptive to marking and has a grid pattern.

14. A method for recording the area of a wound which comprises:

providing a wound dressing package containing a wound dressing, the package comprising: a first web and a second web hermetically sealed together around their peripheries, each of the first and second webs having an inner surface and an outer surface, said inner surfaces facing each other to define a package interior, said package interior being sterile, wherein each of the first and second webs include transparent areas and wherein the inner surface of one of the first and second webs at the transparent area thereof is receptive to marking;

opening the package;

folding one web onto the other web so that the outer surfaces of the webs are in contact and the transparent areas are superimposed;

placing the folded package on the wound with the markable surface remote from the wound; and

marking on the markable surface an outline of the wound.

5,749,843
WOVEN OR KNITTED ELASTIC BANDAGES HAVING CONTROLLED COMPRESSIVE FORCES

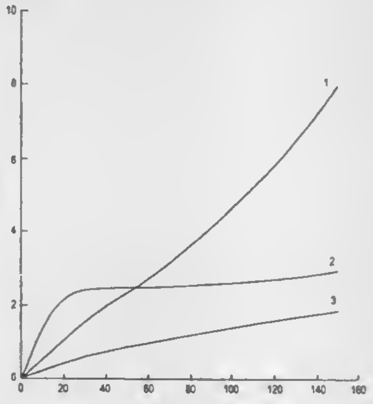
Nigel David Miller, Little Neston, United Kingdom, assignor to Smith & Nephew Group Research Centre, Henslington, England

Continuation of Ser. No. 200,934, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 75,863, Jun. 11, 1993, abandoned, which is a continuation of Ser. No. 928,543, Aug. 13, 1992, abandoned, which is a continuation of Ser. No. 837,550, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 476,408, Jun. 1, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 479,560

Claims priority, application United Kingdom, Feb. 25, 1989, 8904375; Jul. 27, 1989, 891721

Int. Cl.⁶ A61L *15/00*

U.S. Cl. 602—75 **19 Claims**



1. An elastic bandage comprising a knitted or woven fabric containing both inelastic and elastic yarns, knitted or woven together, in which the ratio of inelastic yarns to elastic yarns is from 1:1 to 12:1 and in which the bandage achieves an effective compressive force at an extension of between 20 to 60% after which any further extension of the bandage up to 100% is accompanied by an increase of less than 40% in compressive force above the effective compressive force.

5,749,844

Patent Not Issued For This Number

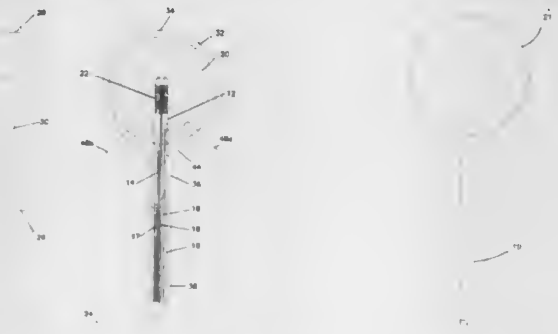
5,749,845
DELIVERING AN AGENT TO AN ORGAN

Keith R. Hildebrand, Houlton, Wis., and J. Edward Shapland, Shoreview, Minn., assignors to Iotek, Inc., Minneapolis, Minn.

Filed Jan. 25, 1995, Ser. No. 377,845

Int. Cl.⁶ A61N *1/30*

U.S. Cl. 604—21 **23 Claims**



1. A method of delivering an agent from a catheter having an inflatable portion to an organ from the group consisting of a

bladder and a uterus, the organ having an inner surface and folds of tissue along the inner surface, the method comprising the steps of:
(a) inserting the inflatable portion of the catheter into the organ;
(b) inflating the inflatable portion so that it expands the organ and removes folds of tissue along the inner surface of the organ; and
(c) delivering the agent from the inflatable portion into the wall of the organ.

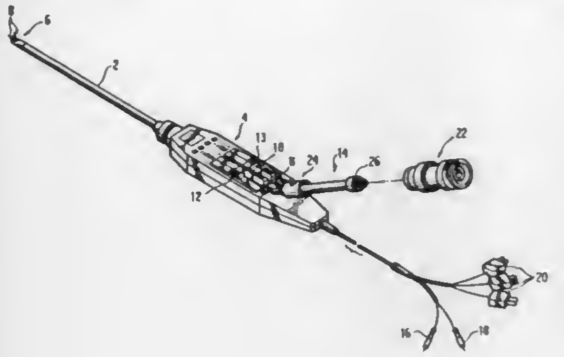
5,749,846
MEDICAL PROBE DEVICE WITH OPTICAL VIEWING CAPABILITY

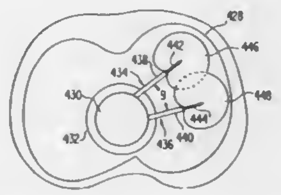
Stuart D. Edwards, Los Altos; Hugh R. Sharkey, Redwood City; Ingemar H. Lundquist, Pebble Beach; Ronald G. Lax, Grass Valley, and James Allen Baker, Jr., Palo Alto, all of Calif., assignors to Vidamed, Inc., Fremont, Calif.

Continuation of Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, which is a continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, and Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675. This application Jun. 7, 1995, Ser. No. 485,802

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 604—22 **30 Claims**





1. A medical probe device for medical treatment of tissue of a prostate through a urethra defined by a urethral wall comprising a guide housing having proximal and distal extremities and having a passageway extending from the proximal extremity to the distal extremity, a stylet mounted in the guide housing, means carried by the distal extremity of the guide housing and in communication with said passageway for directing the stylet sidewise of the guide housing, the stylet including a flexible radio frequency electrode and an insulating sleeve coaxially mounted on the electrode, handle means coupled to the proximal extremity of the guide housing for introducing the distal extremity of the guide housing into the urethra into the vicinity of the prostate, said handle means including means secured to the stylet for advancing the stylet from the passageway of the guide housing to cause the radio frequency electrode and the insulating sleeve to penetrate the urethral wall and to extend into the tissue of the prostate with the insulating sleeve extending through the urethral wall and the radio frequency electrode having a predetermined length in the tissue of the prostate, means for supplying radio frequency energy to the radio frequency electrode to cause the temperature of the tissue of the prostate adjacent the predetermined length of the radio frequency electrode to be raised to cause destruction of cells in the tissue of the prostate and an optical viewing device positioned in the guide housing having a viewing field that extends forwardly and sidewardly of the guide housing to permit viewing of the radio frequency electrode and the insulating sleeve as they are deployed sidewise from the distal extremity of the guide housing.

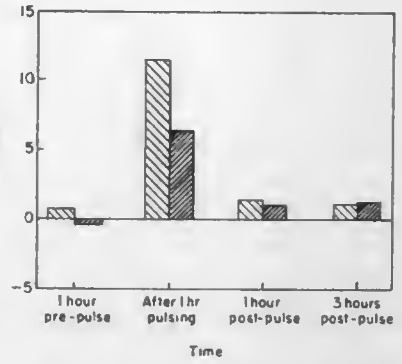
5,749,847
DELIVERY OF NUCLEOTIDES INTO ORGANISMS BY ELECTROPORATION

Thomas E. Zewert, Boston; Uwe Pliquett, Cambridge; Robert S. Langer, Newton, and James C. Weaver, Sudbury, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 96,512, Jul. 23, 1993, Pat. No. 5,547,467, which is a continuation-in-part of Ser. No. 705,778, May 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 331,263, Mar. 30, 1989, Pat. No. 5,019,034, which is a continuation-in-part of Ser. No. 146,343, Jan. 21, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 471,642

Int. Cl.^{6} A61M *31/00*

U.S. Cl. 604—49 **49 Claims**



1. A method for delivering a nucleotide component of a composition into an organism, comprising:
a) applying the compositions which includes the nucleotide components to stratum corneum of the organism, whereby said nucleotide component directly contacts said stratum corneum; and thereafter
b) electroporating the stratum corneum, whereby at least a portion of the composition enters or passes across the stratum corneum, thereby delivering the nucleotide component into the organism.

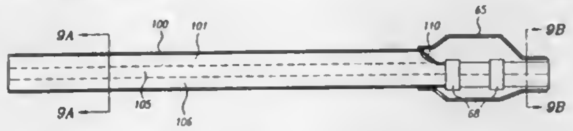
5,749,848
CATHETER SYSTEM HAVING IMAGING, BALLOON ANGIOPLASTY, AND STENT DEPLOYMENT CAPABILITIES, AND METHOD OF USE FOR GUIDED STENT DEPLOYMENT

Yue-Teh Jang, Fremont; Stephen M. Salmon, Sunnyvale; David A. White, and Rizza A. Garcia, both of San Jose, all of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Filed Nov. 13, 1995, Ser. No. 556,660

Int. Cl.^{6} A61M *31/00;29/00;* A61F *2/04;* A61B *8/12*

U.S. Cl. 604—53 **39 Claims**



1. A method for guided placement and implanting of a prosthesis within a body passageway using a catheter having proximal and distal regions, wherein the prosthesis is associated with the distal region of the catheter, said prosthesis having proximal and distal ends, said method comprising the steps of:
advancing the catheter into the body passageway until the prosthesis lies within a region of interest;
imaging by ultrasound using an imaging assembly from within the body passageway at least one of the proximal and distal ends of the prosthesis to ensure that the prosthesis is positioned at a desired location; and
expanding the prosthesis at the region of interest while maintaining the imaging assembly within the region of interest.

5,749,849
VARIABLE STIFFNESS BALLOON CATHETER

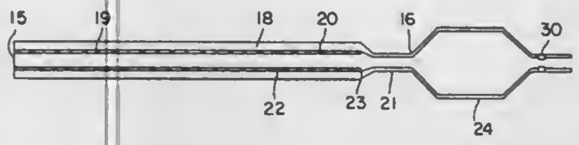
Erik T. Engelson, Menlo Park, Calif., assignor to Target Therapeutics, Inc., Fremont, Calif.

PCT No. PCT/US94/05679, § 371 Date Aug. 12, 1996, § 102(e) Date Aug. 12, 1996, PCT Pub. No. WO94/27668, PCT Pub. Date Dec. 8, 1994

Continuation-in-part of Ser. No. 71,284, Jun. 2, 1993, Pat. No. 5,437,632. This PCT application May 20, 1994, Ser. No. 557,075

Int. Cl.^{6} A61M *31/00*

U.S. Cl. 604—53 **15 Claims**



1. A single lumen valved balloon catheter for use in combination with a guidewire, said catheter comprising an elongate tubular body having a proximal end a distal end and a lumen extending between said ends for receiving the guidewire, said body comprising:
(a) an inflatable balloon segment intermediate said ends, proximate said distal end;
(b) an outer coaxial tube extending continuously between the proximal end and the balloon; and
(c) proximal and distal inner coaxial polymeric tube sections positioned contiguously in tandem proximal to the inflatable balloon segment and located within a portion of the outer coaxial tube; wherein a distal end of the distal inner coaxial tube section is proximal said balloon, the distal inner coaxial tube section being less stiff than the proximal inner coaxial tube section but stiffer than the portion of the outer coaxial tube extending from the distal inner coaxial tube section to the balloon.

5,749,850
BREAST PUMP

Roger Leonard Williams, Herts, and David Anthony Edgerley, London, both of United Kingdom, assignors to Cannon Rubber Limited, London, England

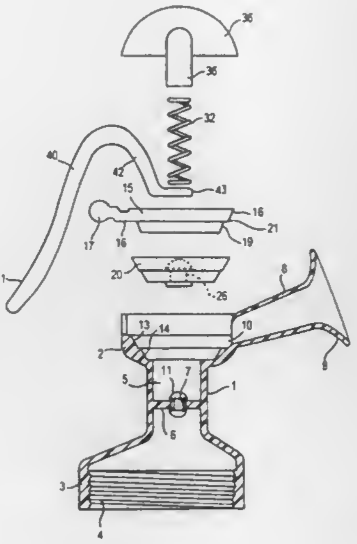
Filed Mar. 21, 1996, Ser. No. 619,171

Claims priority, application United Kingdom, Mar. 24, 1995, 9506014

Int. Cl.^{6} A61M *1/06*

U.S. Cl. 604—74 **21 Claims**

1. A breast pump comprising:
a body, said body having an inlet;
a breast receiving portion connected to the inlet and shaped to receive a portion of a user's breast and nipple;
means for releasably connecting an expressed milk collecting container to said body;
a deformable diaphragm disposed in the body;
actuating means operatively connected to the diaphragm for cyclicly moving said diaphragm to generate a negative pressure in the inlet; and



valve means mounted in the body for cyclically releasing the negative pressure which is generated in the inlet.

5,749,851
STENT INSTALLATION METHOD USING BALLOON CATHETER HAVING STEPPED COMPLIANCE CURVE

Lixiao Wang, Maple Grove, Minn., assignor to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Mar. 2, 1995, Ser. No. 397,615

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **16 Claims**

1. A balloon for a dilation procedure, the balloon having first and second adjacent body longitudinal portions the first body portion having a generally linear compliance curve to burst pressure and the second body portion having a stepped compliance curve characterized by a low pressure segment defined by a low inflation pressure range, said low pressure segment being generally collinear with a corresponding segment of the compliance curve of the first body portion which is defined by said low inflation pressure range, a transition segment during which the balloon expands rapidly relative to the first body portion and a high pressure segment during which the compliance curve of the second portion expands slowly relative to the transition region.

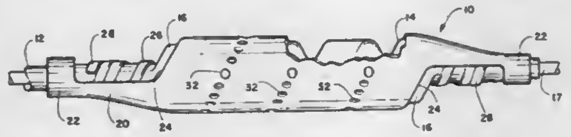
5,749,852
SHEATH SYSTEM FOR AUTOPERFUSION DILATATION CATHETER BALLOON

Sharon Schwab, San Diego; Glen L. Lieber, Poway; Don H. Tran, Westminster; Michael P. Brose, and Maritess E. Minas, both of San Diego, all of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 23, 1996, Ser. No. 685,119

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **16 Claims**



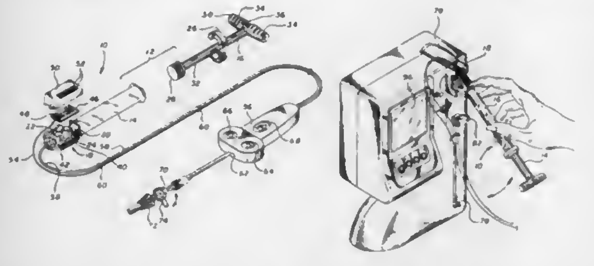
1. A sheath for a catheter balloon of predetermined length and diameter and having a spiral axial pattern of lobes and channels which comprises:
a generally tubular body having a central axis and having an inside diameter and length sized to fit over said spiral catheter balloon;

ends of said tubular body at least partially configured to correspond to end lobes of said spiral axial lobe pattern;
wherein a plurality of openings are formed in said tubular body at locations corresponding to said spiral balloon channels when placed on said balloon; and
wherein said ends of said tubular body have edges that include an integral bead.

5,749,853
INFLATION CONTROL SYSTEM WITH ELAPSED TIME MEASUREMENT

Joseph A. O'Donnell, and Douglas R. Hamper, both of Escondido, Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Mar. 17, 1995, Ser. No. 406,202
Int. Cl.^{6} A61M *29/00;1/00*
U.S. Cl. 604—97 **13 Claims**

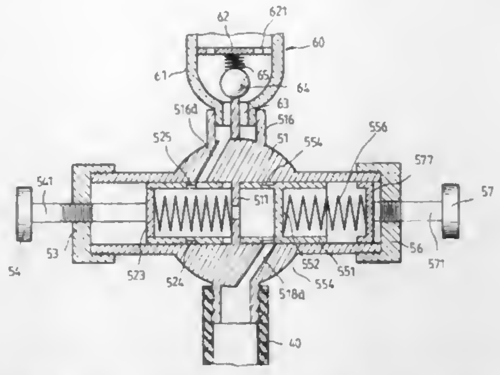


1. A system for controlling the inflation of an inflatable device and for measuring elapsed time during inflation control, the system comprising:
an inflation medium disposed in the inflatable device, the extent of inflation controlled by the pressure of the inflation medium;
a sensor that senses the pressure of the inflation medium and provides a pressure sense signal;
a manually operable pressure-decrease switch that provides a pressure decrease control signal;
a pressure control device that receives the pressure sense signal and the pressure decrease signal, controls the pressure of the inflation medium in response to the pressure decrease control signal, and provides a timer activation signal;
a timer that receives the timer activation signal, measures elapsed time, and provides a time signal; and
a display that receives the time signal and displays the elapsed time based on the time signal;
wherein the timer begins timing elapsed deflation time after the pressure-decrease switch has been activated, the pressure sense signal indicates that the pressure of the inflation medium has reached a predetermined threshold, and the pressure-decrease switch is then inactivated; and
wherein the display displays the elapsed inflation time.

5,749,854
PNEUMATIC CONTROLLED INFUSION DEVICE

Chung-Shan Shen, Suite 2, 7F, No. 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan

Filed Jun. 11, 1996, Ser. No. 661,468
Int. Cl.^{6} A61M *37/00*
U.S. Cl. 604—131 **7 Claims**

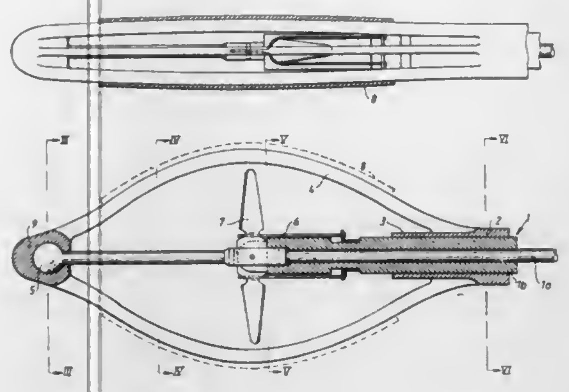


1. A pneumatic controlled infusion device comprising:
an infusion bag, said bag having an internal wall for containing a predetermined amount of medicament therein and an external wall connected together with the internal wall at their corresponding upper and lower portions, a receiving space being defined between said internal and external walls for receiving pneumatic pressure therein, a tubular air outlet at a bottom communicating with the medicament including a pierceable blockage therein, a tubular air inlet at a bottom symmetrical to said outlet and communicating to said receiving space and insertable by an external hose therein and a hollow cylinder chamber having a central recess communicating with said receiving space and an outward opening formed at a bottom between said air inlet and outlet, said cylinder chamber being provided to secure a pressure release valve therein which is sealed by a sealing ring;
a pneumatic fluid control assembly connected with said infusion bag via said tubular air inlet by a hose, said control assembly comprising a spherical body, a transverse circular hole radially extended through the body thereof and separated by a first vertical partition at a middle of said hole which defines a first and a second chamber by said partition, an aperture formed at a center of said partition for communicating said chambers, each of said chambers having a tubular extension projected outward from said body and each of said extensions having a threaded outer periphery at a free end thereof, a tubular air inlet projected upward from said body, said air inlet having a threaded inner periphery, a stem projected upward from a center therein and communicated to said first chamber via a first air passage, a tubular outlet projected downward from a bottom of said body and communicated to said second chamber via a second air passage therebetween, said tubular outlet having a corrugated outer periphery engageable with an other end of said hose, a first piston slidingly disposed into said first chamber and secured by a first cap onto the free end of said extension for operating said pneumatic fluid control assembly, a second piston slidingly disposed into said second chamber and secured by a second cap onto the free end of said second extension for adjusting the amount of pneumatic fluid passing through the aperture of said partition, said first and second caps each having a threaded inner periphery and a threaded central bore at a bottom thereof, and a pneumatic source engaged into said tubular inlet of said body and opened by said stem for supplying pneumatic fluid into said body.

5,749,855
CATHETER PUMP

Oyvind Reitan, Villebradsvagen 10, s-226 53 Lund, Sweden

Filed Feb. 27, 1995, Ser. No. 387,941
Claims priority, application Sweden, Sep. 2, 1992, 92.02517
Int. Cl.^{6} A61M *1/00*
U.S. Cl. 604—151 **25 Claims**

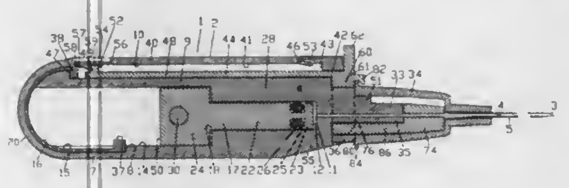


1. An implantable catheter pump for pumping blood comprising a drive cable including a first end and a second end, said first end of said drive cable being connectable to a drive source, a collapsible drive propeller attached proximate to said second end of said drive cable, means for adjusting said collapsible drive propeller between a closed configuration in which said collapsible drive propeller is collapsed upon said drive cable and an open configuration in which said collapsible drive propeller is expanded so as to be operative as an impeller, and elongated sleeve means extending between a first location on said drive cable on a first side of said collapsible drive propeller and a second location on said drive cable on a second side of said collapsible drive propeller thereby surrounding said collapsible drive propeller, said elongated sleeve means movable between a first configuration proximate to said drive cable when said collapsible drive propeller is in said closed configuration and a second configuration expanded about said drive cable for accommodating said collapsible drive propeller in said open configuration said sleeve means further having an open configuration thereby permitting said blood to flow through said sleeve means and said collapsible drive propeller when said collapsible drive propeller is in said open configuration.

5,749,856
NEEDLE STICK PROTECTIVE APPARATUS FOR MANUAL CATHETER PLACEMENT DEVICES

Filiberto P. Zadini, 16814 Rayen St., North Hills, Calif. 91343, and Giorgio C. Zadini, 2237 Hilltop La., Camarillo, Calif. 93012

Filed Nov. 24, 1995, Ser. No. 562,524
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—162 **10 Claims**

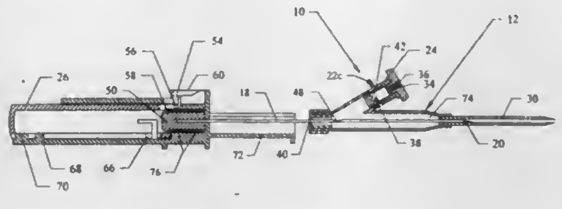


1. A needle stick protector comprising:
a hollow needle having a tip;
a vacuum chamber in flow communication with the hollow needle;
means for creating a vacuum within the vacuum chamber,
an interface member, engaged with said means for creating vacuum, said interface member having a front portion slideable over the needle, wherein said front portion of the interface member slideable over the needle is also adapted to enclose the tip of said needle upon full forward advancement of said interface member, said forward advancement being initiated by said means for creating vacuum,
an engaging means for converting a rearward displacement of said vacuum creating means into a forward displacement of said interface member,
said means for creating vacuum being manually displaceable upon blood vessel penetration by said needle to enable a manually driven advancement of said interface member;
said interface member being irreversibly lockable in its advanced position by locking means to provide a needle stick protection with said front portion of said interface member.

5,749,857
CATHETER SYSTEM

Michael J. Cuppy, 13805 Frontier La., Burnsville, Minn. 55337

Filed Apr. 25, 1996, Ser. No. 637,867
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—164 **1 Claim**



1. A catheter assembly of the over-the-needle type for a user to percutaneously introduce a liquid into a bloodstream of a patient from a conduit, said catheter assembly comprising:
a catheter housing defining an interior region, a first port, and a second port, the conduit being operatively connected to said first port in fluid communication therewith such that the liquid may flow from the conduit into said interior region of said catheter housing;
a needle carried on said catheter housing and selectively removable therefrom, said needle having a proximal end and a distal end;
a catheter tube operatively connected to and extending from said catheter housing in covering relation to said needle, said catheter tube defining a lumen fluidly communicating with said interior region of said catheter housing and a distal end received within the bloodstream of the patient such that the fluid may flow from the interior of the catheter housing into the bloodstream of the patient;
a check valve operatively connected to said catheter housing and fluidly communicating with said first port, said check valve preventing blood or the liquid from flowing from said interior of said catheter housing out through said first port;
a self-sealing injection site connected to said catheter housing in sealing relation to said second port, said catheter housing, said check valve, and said self-sealing injection site forming a closed hub configuration external to the patient and to which the conduit is attached to introduce the liquid into the bloodstream of the patient, at least a portion of said needle extending through and being selectively removable front said self-sealing injection site and said catheter tube;
a safety tube assembly operatively connected to said catheter housing, at least a portion of said safety tube assembly being retractable relative to said catheter housing, said proximal end of said needle being operatively connected to said safety tube assembly such that when said portion of said safety tube assembly is retracted said distal end of said needle is completely withdrawn through said self-sealing injection site and received within said safety tube assembly;
a latching mechanism for engaging and maintaining said portion of said safety tube assembly which is retractible against rearward movement relative to said catheter housing, said latching mechanism including a trigger member which may be selectively actuated by the user; and
a biasing mechanism for urging said portion of said safety tube assembly which is retractible rearwardly relative to said catheter housing, such that when the user selectively actuates said trigger member said latching mechanism releases said portion of said safety tube assembly such that it retracts and withdraws said distal end of said needle through said self-sealing injection site and completely into said safety tube assembly.

5,749,858
METHOD OF USING AN ASPIRATION CATHETER

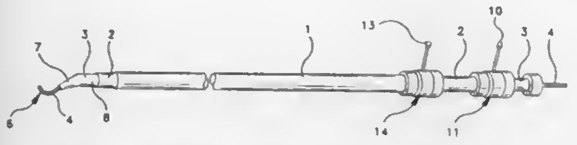
Bernhard M. Cramer, Wuppertal, Germany, assignor to Schneider (Europe) A.G., Bulach, Switzerland

Division of Ser. No. 262,206, Jun. 20, 1994, Pat. No. 5,569,204. This application Oct. 24, 1996, Ser. No. 736,560

Claims priority, application European Pat. Off., Jun. 24, 1993, 93110061

Int. Cl.^{6} A61M *25/01*

U.S. Cl. 604—164 **12 Claims**



1. A method of aspirating a blood vessel comprising:

(a) providing an aspiration device comprising:
  (i) an outer catheter having a proximal end and a distal end, and
  (ii) an inner catheter removably configured at least partially within the outer catheter, adapted for removal from the proximal end of the outer catheter, and having a proximal end and a distal end;

(b) inserting the aspiration device into a blood vessel and advancing the aspiration device adjacent a treatment site;

(c) aspirating thrombus and/or emboli through the inner catheter until the inner catheter becomes clogged;

(d) after the inner catheter becomes clogged, removing the inner catheter through the proximal end of the outer catheter while at least part of the outer catheter remains in the blood vessel;

(e) cleaning the clogged inner catheter to provide a cleaned inner catheter;

(f) inserting the cleaned inner catheter into the outer catheter through the proximal end of the outer catheter while at least part of the outer catheter remains in the blood vessel; and

(g) continuing to aspirate thrombus and/or emboli through the cleaned inner catheter.

5,749,859
CATHETER OR CANNULA SYSTEM

Andrew Robert Powell, Largs Bay, Australia, assignor to Parashar Holdings Pty Ltd, Adelaide, Australia

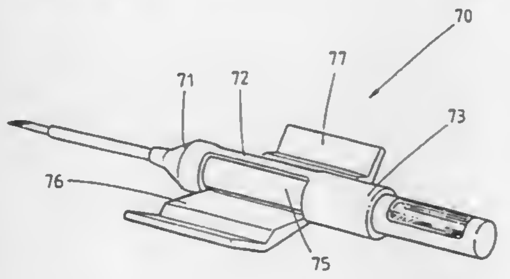
PCT No. PCT/AU93/00763, § 371 Date Aug. 27, 1996, § 102(e) Date Aug. 27, 1996, PCT Pub. No. WO95/15779, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 9, 1994, Ser. No. 656,232

Claims priority, application Australia, Dec. 10, 1993, PM2895

Int. Cl.^{6} A61M *5/178;5/00*

U.S. Cl. 604—167 **29 Claims**



1. A cannula adapted to be mounted on to a trocar, the cannula incorporating a press point which is adapted to be resiliently deformed by externally applied pressure by at least one finger of a person during the insertion of the cannula and trocar assembly into a patient and removal of the trocar so as to prevent a flow of fluid through the cannula during the insertion and removal, and at least one integrally moulded hinged valve piece bearing against the press point and resiliently deform the press point to prevent flow through the cannula.

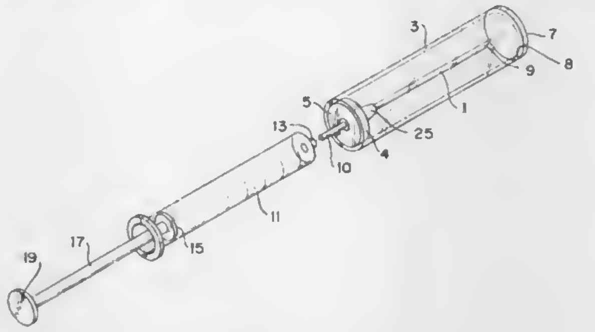
5,749,860
DISPOSABLE SELF-CAPPING NEEDLE

Terreena Kyte, 28071 Everett, Southfield, Mich. 48076

Filed Sep. 30, 1996, Ser. No. 722,962

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—192 **3 Claims**



1. A disposable self-capping needle comprising:

a hollow needle having a front exit opening and a rear plunger assembly;

a normally closed sheath completely enclosing said needle and having an openable front hinged lid end and a protective rear end seal;

means on the lid for maintaining said hinged front lid in a closed position when said lid is closed;

means on the sheath to engage said means on the lid for maintaining said hinged front lid in an opened position when said lid is opened; and

a syringe capable of containing fluids and adapted to engage said needle's rear end plunger assembly when the sheath's protective rear seal does not obstruct engagement.

5,749,861
CONNECTOR WITH PROTECTION VALVE FOR MEDICAL INFUSION/TRANSFUSION LINES AND THE LIKE

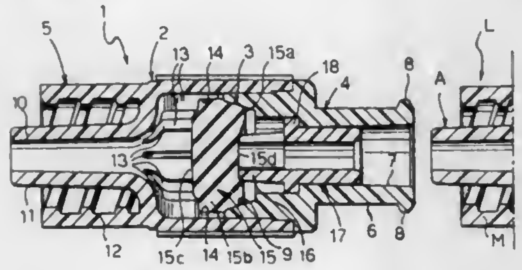
Ernesto Guala, and Gianni Guala, both of Turin, Italy, assignors to Industrie Borla S.p.A., Turin, Italy

Filed Feb. 26, 1997, Ser. No. 806,418

Claims priority, application Italy, Feb. 26, 1996, T096A0132

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—249 **14 Claims**



1. A connector for medical infusion/transfusion lines and the like, comprising a tubular body having first and second ends between which an axial flow path is defined, said body having at said first end an inlet fitting to axially receive therein a fluid dispenser member, and having an outlet at said second end thereof; an annular valve seat provided in said fluid path between said inlet fitting and said outlet, on the side of said inlet fitting; a valve obturator including a resilient member housed within the body transversally to said fluid path, on the side of said outlet, and having a peripheral circumferential sealing edge normally co-operating under closing contact with said annular valve seat to hermetically isolate said inlet fitting from said outlet; and tubular push means axially slidable within the body on the side of said inlet fitting from a retracted position to an advanced position to elastically strain said valve obturator, following axial introduction of said fluid dispenser member into said inlet fitting, so as to move said circumferential edge of the valve obturator away from said annular valve seat and open thereby communication between said inlet fitting and said outlet, wherein:

said valve obturator has a generally solid disk configuration,

said connector body has an annular reaction surface juxtaposed and adjacent to said annular valve seat and against which said obturator disk bears on the side of said outlet,

said tubular push means operate, in said advanced position, so as to press said obturator disk into said annular reaction surface thus elastically stretching said obturator disk in the axial direction towards said outlet, whereby said circumferential sealing edge of said obturator disk radially retracts moving away from said annular valve seat.

5,749,862
CONDOM IMPROVING DEVICE

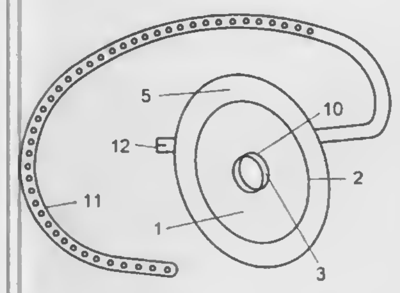
Kai-Ming Lau, Flat B1, 18/F, Block B, 18-26 Kin Wah Street, North Point, Hong Kong, Hong Kong

Filed Jul. 22, 1996, Ser. No. 685,030

Claims priority, application United Kingdom, Aug. 7, 1995, 6516156; Mar. 8, 1996, 9605012; Jun. 4, 1996, 9611632

Int. Cl.^{6} A61F *5/44;6/04*

U.S. Cl. 604—353 **10 Claims**



1. A condom improving device comprising a groin covering panel and a retention means wherein:

said groin covering panel comprises first and second impermeable sheets;

said first impermeable sheet being highly elastic and being surrounded by said second impermeable sheet which is substantially non-elastic, and

said first sheet is provided with an aperture which compressively retains a condom on a penis both in the fully-excited and un-excited states by exerting a substantially radial force on and along the perimeter of said penis and said condom by the resilience of said first impermeable sheet,

said aperture being expandable between an un-stretched size and a fully stretched size which is defined by the junction between said first and second sheets, and

said aperture being surrounded by an elastic collar means which is expandable and contractible in response to expansion and contraction of said aperture,

said collar means comprising an axially extending flange portion which compressively retains said condom on said penis both in the fully-excited and un-excited states by exerting a substantially radial force on and along the perimeter of said penis and said condom by the resilience of said collar means, and wherein

said retention means comprises means for retaining said condom improving device so that the groin covering panel substantially covers the groin area of an user.

5,749,863
FLUID ACQUISITION AND DISTRIBUTION MEMBER FOR ABSORBENT CORE

Michael Payne, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 210,831, Mar. 18, 1994, abandoned. This application Jul. 11, 1996, Ser. No. 678,119

Int. Cl.^{6} C08L *97/00;97/02;* **A61F** *13/15*

U.S. Cl. 604—376 **4 Claims**

1. A disposable absorbent article comprising a liquid pervious topsheet, a liquid impervious backsheet and an absorbent core positioned between said topsheet and said backsheet, said absorbent core comprising: (i) a fluid acquisition and distribution member having a dry density ranging from 0.03 to 0.20 g/cc and consisting essentially of C_2–C_9 polycarboxylic acid crosslinked cellulose fibers, said fibers having crosslinks which are primarily intra-fiber, said fibers having an amount of a C_2–C_9 polycarboxylic acid crosslinking agent reactant therein in a intra-fiber ester crosslink bond form providing a water-retention value of from about 25 to 60, and having distributed thereon from about 0.005% to 1% by weight, on a dry fiber basis, of a surface active agent, said fluid acquisition and distribution member having a top surface adjacent said topsheet and a bottom surface; and (ii) a fluid storage member having a top surface in contact with the bottom surface of the fluid acquisition and distribution member in comprising discrete particles of absorbent gelling materials.

5,749,864

Patent Not Issued For This Number

5,749,865
ABSORBENT ARTICLE OF PANTS TYPE

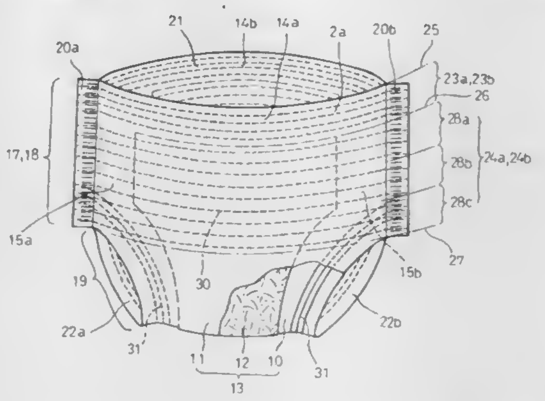
Masamitsu Yamamoto; Takamitsu Igaue, and Toru Sasaki, all of Ehime-ken, Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Filed Aug. 1, 1996, Ser. No. 691,047

Claims priority, application Japan, Aug. 2, 1995, 7-197732

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **11 Claims**



1. An absorbent pants type article, comprising a laminated panel including a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid absorbent core panel disposed between said topsheet and said backsheet, said laminated panel having a transverse direction and a longitudinal direction, said laminated panel being folded in two sections which are bonded together along

transversely opposite side edges thereof except along longitudinally intermediate regions so as to define front and rear waist regions, a crotch region, a waist-opening and a pair of leg-openings; a first elastic member extending around said waist-opening so as to be circumferentially stretchable, a second elastic member extending around each of said leg-openings so as to be circumferentially stretchable and a third elastic member located between said waist-opening and said leg-openings and extending transversely across said core panel so as to be circumferentially stretchable;

- said first elastic member being arranged in front and rear waist-opening marginal stretchable regions defined between respective portions of an upper end of said waist-opening and respective first border lines extending transversely along respective upper ends of said core panel in said front and rear waist regions;
- said third elastic member being provided on said front waist region in a front waist stretchable region defined between said first border line in said front waist region and a second border line in said front waist region connecting respective upper portions of said pair of leg-openings;
- said front waist stretchable region comprises upper, intermediate and lower stretchable subregions and said third elastic member provided in each of said subregions; and
- said first elastic member in said front waist-opening marginal stretchable region has an elongation stress higher than an elongation stress of said third elastic member in each of said upper and lower stretchable subregions and said third elastic member in said upper and lower stretchable subregions has an elongation stress higher than an elongation stress of said third elastic member in said intermediate stretchable subregion.

5,749,866

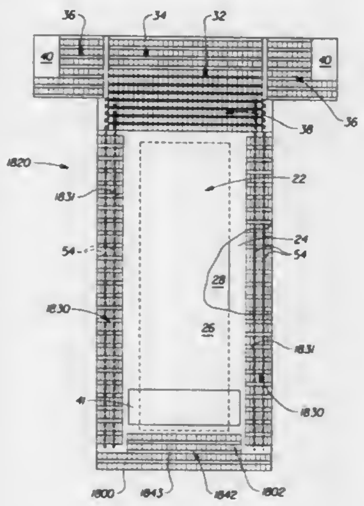
ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE

Donald Carroll Roe, West Chester; David Joseph Kenneth Goulait; Sheila Snyder Rodriguez, both of Cincinnati; Edward Paul Carlin, Maineville; Kimberly Ann Dreier, Cincinnati; Carolyn Mae Jasper, Cincinnati, and Dean Jeffrey Daniels, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 448,951, May 24, 1995, Pat. No. 5,569,232, which is a division of Ser. No. 203,456, Feb. 28, 1994, Pat. No. 5,554,145. This application Sep. 27, 1996, Ser. No. 720,103

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **19 Claims**



1. A disposable absorbent article comprising:

- a chassis assembly having a longitudinal centerline, a longitudinal direction parallel to the longitudinal centerline, a lateral centerline, a lateral direction parallel to this lateral centerline, lateral edges and leg edges, said chassis assembly comprising a topsheet, a backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet, said absorbent core having side edges and waist edges; and
- an extensible back waist feature joined with said chassis assembly adjacent one of said lateral edges, said back waist feature comprising a hip panel extending longitudinally outwardly from said chassis assembly, a central waistband panel joined with and extending longitudinally outwardly from said hip panel, and a pair of side panels joined with and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel, said central waistband panel comprising a structural elastic-like film web, said web comprising a strainable network of at least two contiguous, distinct and dissimilar regions, said strainable network including at least a first region and a second region having one or more deformations which extend beyond the surface of said first region, said first region having a surface-pathlength less than the surface-pathlength of said second region as measured parallel to a predetermined axis while said web is in an untensioned condition such that said web exhibits at least two-stages of controlled resistive forces along said predetermined axis when subjected to an applied axial elongation in a direction parallel to said predetermined axis.

5,749,867

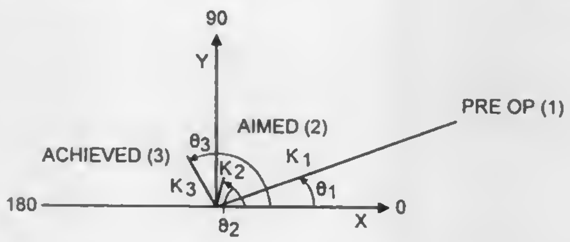
METHOD OF ANALYSING ASTIGMATISM AND APPARATUS FOR PERFORMING CORNEAL SURGERY

Noel Ami Alpins, 7 Chesterville Road., Cheltenham, Vic. 3192, Australia

Division of Ser. No. 313,056, Sep. 30, 1994, Pat. No. 5,514,124, which is a continuation-in-part of Ser. No. 927,016, Aug. 10, 1992, abandoned. This application Mar. 19, 1996, Ser. No. 618,535

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 606—4 **31 Claims**



1. An article encoded with a computer readable program for operating a processing means of a computer to obtain magnitude and angle parameters for a surgical procedure to correct astigmatism in the eye of a patient, said program being provided with magnitude and angle values of measured pre-operative astigmatism of an eye of a patient, magnitude and angle values of aimed astigmatism to be achieved following surgery on the eye of the patient, and magnitude and angle values of surgically induced astigmatism after a prior surgery intended to correct said pre-operative astigmatism, said program being operative to determine surgical parameters to treat the cornea of the eye of the patient to achieve said aimed astigmatism by;

- vectorially adding the pre-operative astigmatism and the aimed astigmatism to obtain an aimed induced astigmatism vector;
- vectorially adding the pre-operative astigmatism and said surgically induced astigmatism to obtain a surgically induced astigmatism vector, and
- vectorially subtracting the surgically induced astigmatism vector from the aimed astigmatism vector to obtain a difference vector which represents the vector difference between said aimed astigmatism and said surgically induced astigmatism;
- said program providing magnitude and angle components of said difference vector which are indicative of parameters of a further surgical procedure to achieve said aimed astigmatism.

5,749,868

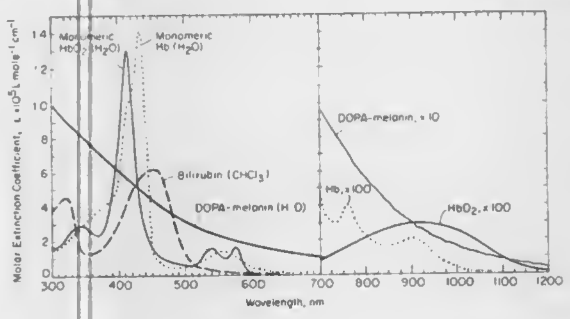
NEAR INFRA-RED SELECTIVE PHOTOTHERMOLYSIS FOR ECTATIC VESSELS AND METHOD THEREFOR

Horace W. Furumoto, Wellesley, Mass., assignor to Cynosure, Inc., Chelmsford, Mass.

Continuation of Ser. No. 353,565, Dec. 9, 1994. This application Sep. 26, 1996, Ser. No. 720,267

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 606—9 **34 Claims**



1. A near-infrared selective photothermolysis device for treatment of vascular targets, the device comprising:

- a laser system for generating near-infrared laser light pulses having wavelengths in a range of approximately 750 to 780 nm and durations that concentrate heat from the light pulses in the vascular targets and selectively damage the vascular targets; and
- a delivery system for receiving the laser light pulses from the laser system and transmitting the laser light pulses to the vascular targets of a patient.

5,749,869

HIGH-FREQUENCY SURGICAL GENERATOR FOR CUTTING TISSUE

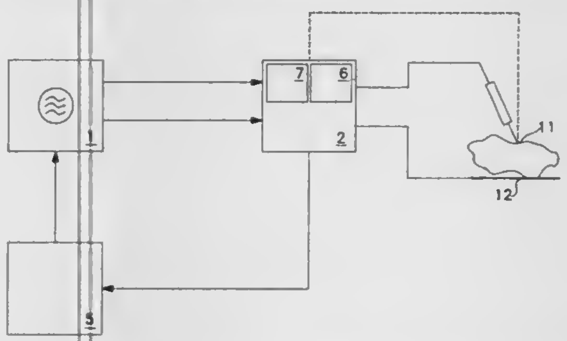
Heinz Lindenmeier, Planegg; Georg Lohr, Ottobrunn; Karl Fastenmeier, Munich, and Gerhard Flachenecker, deceased, late of Ottobrunn, all of Germany, by Hildegard Flachenecker, legal representative, assignors to Karl Storz GmbH & Co., Tuttlingen, Germany

Division of Ser. No. 193,109, Jul. 18, 1994. This application Jun. 1, 1995, Ser. No. 457,106

Claims priority, application Germany, Aug. 12, 1991, 41 26 607.2; Oct. 24, 1991, 41 35 180.2; Oct. 24, 1991, 41 35 184.3

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—34 **6 Claims**



1. A high frequency surgical generating system having a device for setting the maximum power output sufficient for tissue being operated on with respect to material detected at an operation site comprising:

- a high frequency generator having an output; indicating means, said indicating means comparing a spectrum of power from said high frequency generator output influenced by electrical values dependent thereon; said indicating means comparing the power spectrum of at least two different frequency ranges; display means receiving and displaying an electric signal representing said power; an evaluating circuit receiving an output from said indicating means, said evaluating circuit having a desire-value transmitter for setting a desired output value from said high frequency generator that is dependent upon a ratio of a plurality of output signals representing said at least two different frequency ranges from said indicating means.

5,749,870

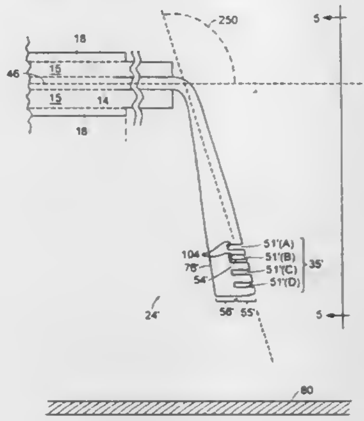
ELECTRODE FOR COAGULATION AND RESECTION

David Gloth, Boston, and Jeffrey A. Dann, Worcester, both of Mass., assignors to NEBL, Inc., Worcester, Mass.

Filed Aug. 23, 1996, Ser. No. 701,916

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—45 **18 Claims**



1. An electrode for a monopolar electrosurgical instrument, which electrode comprises an elongated electrically-conducting member having a distal end, a proximal end, and a longitudinal axis, wherein the proximal end is adapted to be connected to a source of electric current and the distal end terminates in a loop of electrically-conducting metal wire, which loop is disposed at an angle of at least 45 degrees transverse to the longitudinal axis of the member and has top and bottom portions, each having a respective outward area defined by a respective substantially uniform surface, and a retrograde operating edge defined by another portion of the loop, which portion has a plurality of gaps disposed parallel to the longitudinal axis.

5,749,871

METHOD AND APPARATUS FOR MODIFICATIONS OF VISUAL ACUITY BY THERMAL MEANS

Larry L. Hood, Laguna Hills, Calif., and Antonio Mendez G., Mexicali, Mexico, assignors to Refractec Inc., Laguna Hills, Calif.

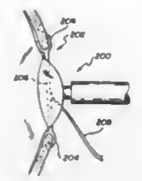
Continuation-in-part of Ser. No. 171,255, Dec. 20, 1993, which is a continuation-in-part of Ser. No. 111,296, Aug. 23, 1993, Pat. No. 5,523,999. This application Aug. 9, 1994, Ser. No. 287,657

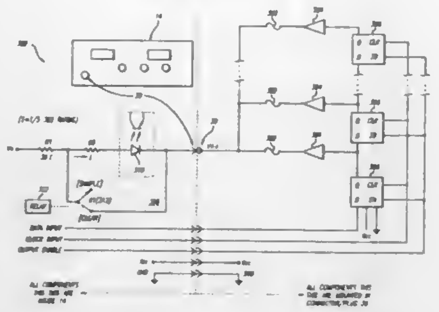
Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—50 **11 Claims**

1. A thermokeratoplastic probe system for reshaping a cornea, comprising:

- a power source which contains a radio frequency generator that generates an alternating current;
- a first electrode that is coupled to said radio frequency generator and which transfers the alternating current from said radio frequency generator to the cornea which is in contact with said first electrode;
- a lid speculum that is coupled to said power source and the cornea to create a return path so that the alternating current





flows from said first electrode, through the cornea and back into said lid speculum.

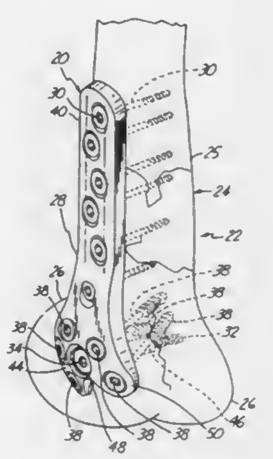
5,749,872
KEYED/KEYLESS BARREL FOR BONE PLATES

Richard F. Kyle, Long Lake, Minn.; Richard H. Clewett, Los Angeles, and Drew D. Wright, Santa Monica, both of Calif., assignors to Ace Medical Company, El Segundo, Calif.

Filed Sep. 8, 1995, Ser. No. 525,853

Int. Cl.^{6} A61B *17/58*

U.S. Cl. 606—69 **9 Claims**



1. A fixating system for internally fixating bone fractures, the system comprising:

a fixator including:

a plate portion, the plate portion defining at least one plate aperture extending through the plate portion for receiving fastening means to fasten the fixator to a shaft of a bone;

a head portion extending from the plate portion; and

a barrel extending from the head portion, the barrel having a length and a means for receiving at least one of a keyless lag screw and a keyed lag screw, the means defining at least one key way recessed into a cylindrical inner surface of the barrel along at least a portion of a length of the barrel, and

a first keyed lag screw having a threaded end portion for fastening to a bone fragment and a smooth end portion for being slidably received within the barrel, the smooth end portion having a length and an outer surface defining at least one key protruding from and integral and unitary with the outer surface and extending at least partially along the length for being received by the key way of the barrel to prevent rotation of the first lag screw within the barrel; and

a compression screw adapted to be threadably fastened to the smooth end portion of the first lag screw and configured to bear against the head portion of the plate portion to hold the bone fragment in compression.

5,749,873
APPARATUS FOR THE MOBILE FIXATION OF BONES

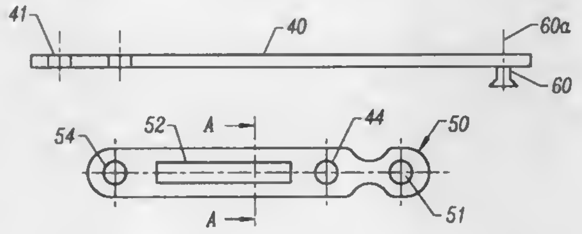
Jeffrey D. Fairley, Haeberlstrasse 5, 80337, Munich, Germany

Continuation of Ser. No. 344,938, Nov. 23, 1994, abandoned. This application Jul. 17, 1996, Ser. No. 683,620

Claims priority, application Germany, Nov. 26, 1993, 43 40 398.0

Int. Cl.^{6} A61B *17/80*

U.S. Cl. 606—70 **7 Claims**



1. A physiologically-compatible apparatus configured to passively but rigidly maintain at least a first bone or bone segment and a second bone or bone segment in a substantially coplanar relation, one to the other, while permitting substantially linear movement of said bones or bone segments along a bone growth axis, said apparatus comprising:

a first assembly plate which is configured to be fixed on said first bone or bone segment by a first fixing means and which has a first connecting part;

a second assembly plate which is configured to be fixed on said second bone or bone segment by a second fixing means and which has a second connecting part;

a connecting element located between said first and second assembly plates, said connecting element being mounted on said first and second connecting parts, said connecting element having a connecting element axis fixedly attached to said second connecting part of said second assembly plate said connecting element having one guide pin having a guide pin axis, said guide pin fixedly attached to said first connecting part of said first assembly plate, said guide pin slidably and rotatably attached to said connecting element axis,

so that said first and second assembly plates are configured to be initially moved together as far as possible along said connecting element axis when said first and said second fixing means are fixed on said first and second bones or bone segments,

wherein movement of said first and second assembly plates in relation to each other is substantially possible linearly between said guide pin attached to said first connecting part of said first assembly plate along said connecting element axis attached to said second connecting part of said second assembly plate, and rotationally around said guide pin axis of said guide pin,

wherein said first and second assembly plates are configured to move freely from each other substantially along said connecting element axis in response to bone growth along said bone growth axis, and wherein said first and second assembly plates and said connecting element are configured to maintain said substantially coplanar relation between said first and second bones or bone segments.

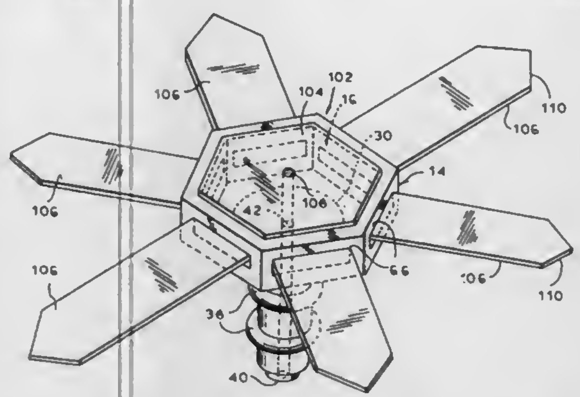
5,749,874
CARTILAGE REPAIR UNIT AND METHOD OF ASSEMBLING SAME

Robert E. Schwartz, Manhasset, N.Y., assignor to Matrix Biotechnologies, Inc., Melville, N.Y.

Continuation of Ser. No. 659,174, Jun. 5, 1996, abandoned, which is a continuation-in-part of Ser. No. 384,849, Feb. 7, 1995, Pat. No. 5,632,745. This application Dec. 30, 1996, Ser. No. 774,390

Int. Cl.^{6} A61B *17/68*

U.S. Cl. 606—75 **13 Claims**



9. A method of assembling a bio-absorbable cartilage repair system for regenerating damaged or destroyed articular cartilage on a surface of a bone by establishing a chondrogenic growth-supporting matrix between an area of damaged or destroyed articular cartilage that has been removed and an adjacent healthy area of articular cartilage and cancellous bone, the system comprising an assembly of:

(A) a bio-absorbable delivery unit configured and dimensioned to be mounted in both an area of damaged or destroyed articular cartilage that has been removed and an adjacent healthy area of articular cartilage and cancellous bone; and

(B) a deformable, porous, bio-absorbable insert supported by the delivery unit and establishing communication between the removed area and the adjacent healthy area for a chondrogenic growth-supporting matrix;

the delivery unit having a support portion which supports the insert to allow cellular migration to the sides of the insert by an adjacent healthy area of articular cartilage;

the method comprising the steps of:

(a) directly placing the insert on the support portion of the delivery unit so as to leave a top of the insert exposed;

(b) applying a flexible, porous fabric piece consisting substantially of bio-absorbable material over the exposed top of the insert, the fabric piece including a central body portion configured and dimensioned to substantially cover the exposed top of the insert and a plurality of leg portions extending outwardly from the body portion; and

(c) using the leg portions to secure the insert on the delivery unit.

5,749,875
BONE PLATE SYSTEM FOR PROXIMAL TIBIAL OSTEOTOMY

Giancarlo Puddu, Rome, Italy, assignor to Arthrex, Inc., Naples, Fla.

Division of Ser. No. 440,306, Mar. 24, 1995, Pat. No. 5,620,448. This application Jan. 14, 1997, Ser. No. 783,203

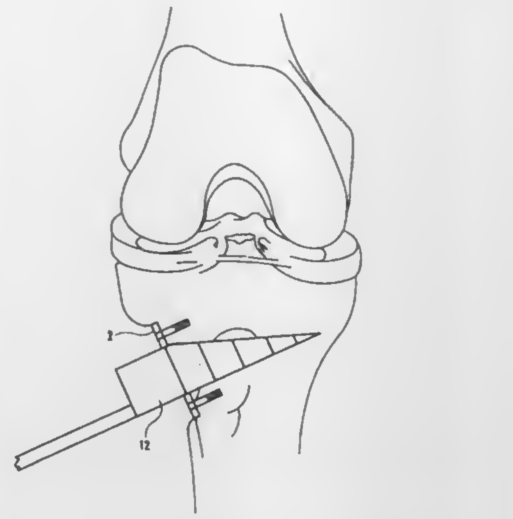
Int. Cl.^{6} A61B *17/58*

U.S. Cl. 606—87 **12 Claims**

1. A system for performing opening wedge osteotomies in which a bone is resected so as to have an opening on one side governed by a bony hinge on the other side, the system comprising:

a plurality of bone plates, each bone plate having two ends, a width, a proximal side, and a distal side, the distal side having at least one projection with a length and a depth for insertion into the opening to prevent closure of the opening, the projection having opposed edges for engaging and propping open the bone, the plate extending toward the ends on either side of the projection for engaging an outer surface of the bone; and

a tool having a distal end and a proximal end, the distal end of the tool including a wedge having two prongs, the two prongs being separated from each other by a distance greater than the width of the bone plates, the prongs of the wedge having a substantially linearly tapered thickness beginning at the distal end for wedging and holding open the resected bone and receiving between the prongs a selected bone plate for propping open the wedged open resected bone.



5,749,876
APPARATUS FOR RESECTION OF THE CONDYLES OF THE KNEE FOR PUTTING A PROSTHESIS INTO PLACE, AND METHOD FOR PUTTING SUCH AN APPARATUS INTO POSITION

Eric Duvillier, Paris; Jean-Marie Gineston, Neuilly, and Olivier De Roaldes, Longpont-Sur-Orge, all of France, assignors to Biomicron, Clichy, and Ortho Diffusion & Recherche, Caen, both of France

PCT No. PCT/FR95/00923, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO96/01588, PCT Pub. Date Jul. 25, 1996

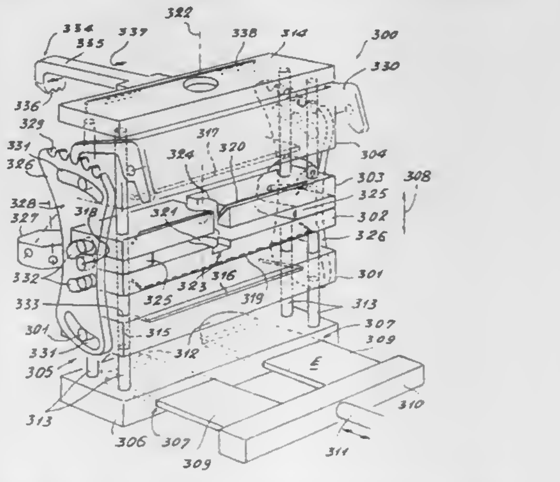
PCT Filed Jul. 11, 1995, Ser. No. 612,917

Claims priority, application France, Jul. 12, 1994, 94 08670

Int. Cl.^{6} A61B *17/15*

U.S. Cl. 606—88 **18 Claims**

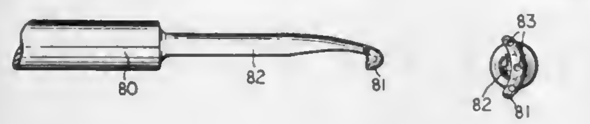
1. An apparatus for resection of condyles of a knee for putting a prosthesis into place, comprising a femoral cutting devices, including said femoral cutting device comprising:



- a support element equipped with a lower baseplate able to cooperate, in a bearing manner, with femoral condyles;
- a guide for blades for femoral cuts, being anterior cut, beveled anterior cut, beveled posterior cut, posterior cut, and distal cut, said guide being fixed and comprising at least three blocks, of which at least two blocks are movable in relation to said support element, said blocks being adjustable in height in relation to one another, one of the blocks comprising means for guiding at least one cut from among the anterior cut, the posterior cut, the beveled anterior cut, and the beveled posterior cut, and the other blocks comprising means for guiding remaining cuts from among the anterior cut, the posterior cut, the beveled anterior cut, and the beveled posterior cut;
- an intramedullary femoral rod for orienting and centering of said device; and
- means for tracing an anterior cortical portion of the femur, said tracing means being integral with said guide.

5,749,877
TOOL BIT FOR USE IN ULTRASONIC REMOVAL OF PLASTICS EMBEDMENT OF AN OSTEAL PROSTHESIS

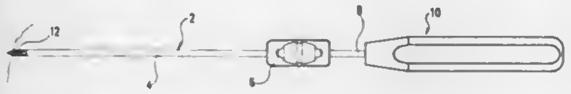
Michael John Radley Young, Ashburton, United Kingdom, assignor to Orthosonics Ltd., Ashburton, United Kingdom
Division of Ser. No. 216,805, Mar. 23, 1994, Pat. No. 5,536,272. This application Apr. 17, 1995, Ser. No. 422,989
Claims priority, application United Kingdom, Mar. 26, 1993, 9306380
Int. Cl.⁶ A61B *17/56*
U.S. Cl. 606—99 **5 Claims**



1. A tool for use in revision arthroplasty wherein a prosthetic member to be removed is at least partially encumbered by bone cement, characterized in that it comprises an elongate stem adapted for connection to ultrasonic longitudinal oscillation, said stem having a distally facing convexly rounded spoon-shaped distal end provided with one or more spaced longitudinal apertures through which said cement melted by ultrasonic vibration of said tool may pass for external removal, said tool being so dimensioned that it is adapted to remove said cement immediately adjacent said prosthetic member.

5,749,878
ENDOSCOPIC SCREW ANCHOR EXTRACTOR

Barton W. Bracy, and Reinhold Schmieding, both of Naples, Fla., assignors to Arthrex, Inc., Naples, Fla.
Filed Feb. 21, 1997, Ser. No. 804,210
Int. Cl.⁶ A61B *17/04*
U.S. Cl. 606—104 **11 Claims**

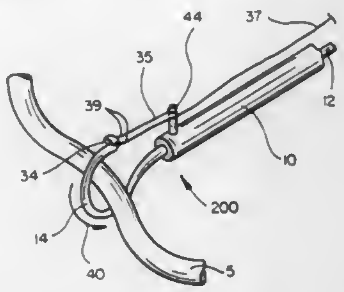


1. A suture anchor extractor for capturing and extracting a suture anchor, the extractor comprising:

- a suture anchor driver having elongated shaft with an outer shaft diameter and a distal end;
- a suture anchor having threads and disposed on the distal end of the suture anchor driver;
- an elongated cylindrical tube having a length extending over a portion of the shaft, the tube having a distal end and a proximal end, the tube having an inner diameter dimensioned such that the tube is disposed slidably over the shaft of the suture anchor driver to advance the tube such that the distal end of the tube extends beyond the distal end of the shaft to frictionally engage the threads of the suture anchor and thereby capture the suture anchor; and
- means for gripping the tube for facilitating longitudinal sliding of the tube along the shaft.

5,749,879
DEVICE OR APPARATUS FOR MANIPULATING MATTER

Lee M. Middleman, Portola Valley; Walter R. Pyka, Redwood City, both of Calif.; Michael Buhler, Madeira Beach, Fla.; Philippe Poncet; Karl van Dyk, both of Fremont, Calif.; James E. Jervis, Atherton, Calif., and Reza Zadno, Newark, Calif., assignors to Medtronic, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 843,775, Feb. 28, 1992, Pat. No. 5,632,746, which is a continuation-in-part of Ser. No. 594,768, Oct. 9, 1990, abandoned, and Ser. No. 608,117, Nov. 1, 1990, abandoned, and Ser. No. 594,769, Oct. 9, 1990, abandoned, and Ser. No. 608,121, Nov. 1, 1990, abandoned, and Ser. No. 594,871, Oct. 9, 1990, abandoned, and Ser. No. 594,896, Oct. 9, 1990, abandoned, and Ser. No. 594,874, Oct. 9, 1990, abandoned, and Ser. No. 594,873, Oct. 9, 1990, abandoned, and Ser. No. 656,651, Feb. 15, 1991, abandoned, and Ser. No. 631,809, Dec. 21, 1990, Pat. No. 5,509,923, which is a continuation-in-part of Ser. No. 394,463, Aug. 16, 1989, abandoned. This application Feb. 24, 1993, Ser. No. 22,259
Int. Cl.⁶ A61B *17/12*
U.S. Cl. 606—139 **16 Claims**



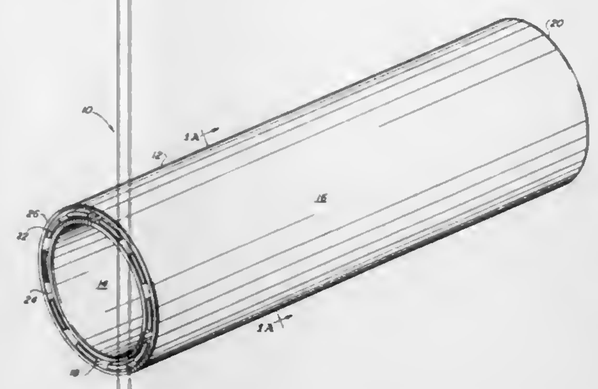
1. An apparatus for passing a ligature around an object, said apparatus comprising:

- (a) a cannula hating a longitudinal bore extending therethrough;
- (b) a member disposed within said longitudinal bore and expendable therefrom, said member having, i) a proximal segment, and ii) a distal segment coupled to said proximal segment and at least partially constructed of an elastic material, said distal segment assuming a first shape when extended from said bore and assuming a second shape when withdrawn into said bore;
- (c) a distal end structure, at a distal end of said member, for contacting the object to be manipulated; and
- (d) retainer means, located near a distal end of said distal segment of said member, for retaining a segment of the ligature during movement of said member into or out of said cannula, so to enable passing the ligature around the object during movement of said member.

5,749,880
ENDOLUMINAL ENCAPSULATED STENT AND METHODS OF MANUFACTURE AND ENDOLUMINAL DELIVERY

Christopher E. Banas, Mesa, and Tarun J. Edwin, Chandler, both of Ariz., assignors to Impra, Inc., Tempe, Ariz.
Continuation-in-part of Ser. No. 401,871, Mar. 10, 1995. This application Jul. 27, 1995, Ser. No. 508,033
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 606—198 **21 Claims**

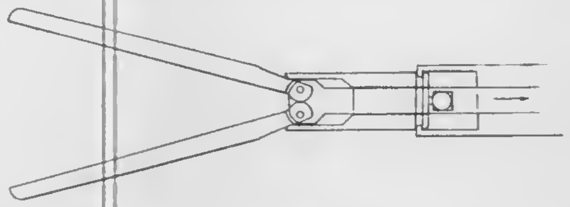
1. A radially expandable reinforced vascular graft comprising:



- at least one tubular radially expandable support member having a plurality of openings passing through walls of the support member, and
- an expanded polytetrafluoroethylene tubular member circumferentially surrounding and at least substantially enclosing the at least one tubular radially expandable support member and passing into and through the plurality of openings passing through the walls of the support member, the expanded polytetrafluoroethylene tubular member being radially expandable with the support member to an expanded diameter; wherein the expanded polytetrafluoroethylene tubular member further comprises a node-fibril microstructure which undergoes nodal elongation during radial expansion to the expanded diameter.

5,749,881
LAPAROSCOPIC SURGICAL CLAMP

Jonathan M. Sackier, Del Mar; Michael L. Jones, Capistrano Beach, and Edward E. Dolendo, Huntington Beach, all of Calif., assignors to Applied Medical Resources, Laguna Hills, Calif.
PCT No. PCT/US94/12105, § 371 Date Jul. 1, 1996, § 102(e) Date Jul. 1, 1996, PCT Pub. No. WO95/11620, PCT Pub. Date May 4, 1995
PCT Filed Oct. 20, 1994, Ser. No. 632,484
Int. Cl.⁶ A61B *17/04*
U.S. Cl. 606—151 **41 Claims**

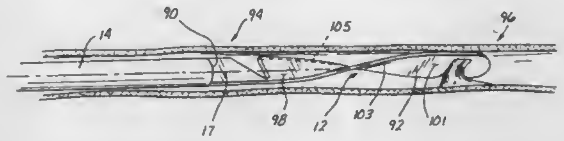


1. A surgical clamp having a longitudinal configuration and an axis extending between a proximal end and a distal end, the clamp comprising:

- a support structure;
- first and second opposed jaws coupled to the support structure, the first jaw being pivotally attached to one of the support structure and the second jaw and the jaws being operable between an open state wherein the first jaw is spaced from the second jaw to accept a body conduit, and a closed state wherein the jaws are proximate to at least partially occlude the body conduit;
- means for biasing the first jaw to the open state;
- portions of the first jaw defining a beveled surface which is disposed at an angle to the axis of the clamp;
- means carried by the support structure and movable relative to the support structure for engaging at least the first jaw to move the first jaw relative to the second jaw between the open state and the closed state; and
- a screw included in the engaging means and disposed at the proximate end of the clamp, the screw being operable to move axially along the beveled surface of the first jaw in the open state to move the first jaw toward the closed state.

5,749,882
APPARATUS FOR DISRUPTING VEIN VALVES

Charles C. Hart, Huntington Beach; Eduardo Chi Sing, and Mark P. Ashby, both of Laguna Niguel, all of Calif., assignors to Applied Medical Resources Corporation, Laguna Hills, Calif.
Filed Oct. 18, 1995, Ser. No. 544,860
Int. Cl.⁶ A61B *17/32*
U.S. Cl. 606—159 **25 Claims**



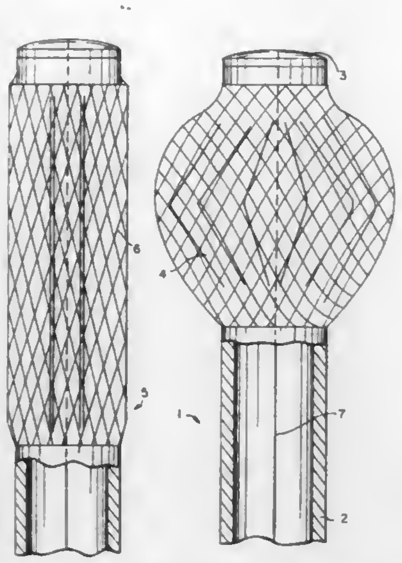
1. A valvulotome for disrupting valve cusps in a vein of a patient, comprising:

- a shaft having an elongate configuration and being sized and configured for insertion into the vein;
- a cutting member having an axis extending between a proximal end and a distal end, the axis defining an axial direction extending along the axis and an angular direction extending around the axis, the proximal end of the cutting member being attached to the shaft;
- first portions of the cutting member defining a first cutting edge extending generally outwardly of the axis of the cutting member; and
- second portions of the cutting member defining a second cutting edge extending generally outwardly of the axis of the cutting member;
- third portions of the cutting member defining a shoulder disposed in close proximity to the first portions of the cutting member, the third portions defining with the first portions a slot which extends proximally with progressive outward positions along the cutting member;
- the cutting member having the configuration of a blade extending longitudinally along the axis and being twisted about the axis so that the first portions of the cutting member are axially disposed along and angularly disposed about the axis relative to the second portions of the cutting member; whereby
- the first cutting edge and the second cutting edge are positioned to engage and disrupt different cusps of the valve when the shaft is withdrawn axially from the vein.

5,749,883
MEDICAL INSTRUMENT

David Marcos Halpern, Avenida Gaona 2645, Buenos Aires, Argentina
Filed Aug. 26, 1996, Ser. No. 703,192
Claims priority, application Argentina, Aug. 30, 1995, 333334
Int. Cl.⁶ A61B *17/22*
U.S. Cl. 606—159 **11 Claims**

1. A medical instrument comprising: an elastic tubular portion formed as a weaving portion; and an actuating element arranged so that by its displacement it acts on said tubular portion so that said tubular portion assumes a first position in which it is expanded radially to assume a globe shape, and a second position in which it is reduced radially to assume a substantially cylindrical shape with a diameter substantially smaller than a diameter of said globe shape, said tube having a proximal end, a distal end, and elastic sections connecting said ends with one another, said actuating element having a distal end connected with said distal end of said tube so as to displace a distal end of said tube relative to said



proximal end and therefore to expand said elastic sections and to straighten said elastic sections correspondingly.

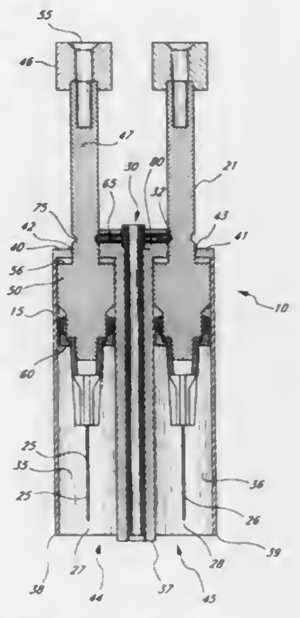
5,749,884
BONE ANCHOR IMPLANTATION DEVICE AND METHOD

Theodore V. Benderev, San Juan Capistrano; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Boston Scientific Technology, Inc., Maple Grove, Minn.

Continuation of Ser. No. 862,847, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Nov. 23, 1994, Ser. No. 345,003

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 606—167 **18 Claims**



1. A bone anchor implantation device for directing a bone anchor at a selected site, comprising:

a housing having at least a first and a second stationary and generally parallel probe channels;

at least a first and a second generally parallel probes axially slidably extending through the housing the first and second probes being disposed in the first and second probe channels, respectively; and

a guide channel extending through the housing generally parallel to the first and second probe channels, the guide channel being situated generally in between the first and second probe channels such that a line extending transversely between the first and second probe channels intersects at least a portion of the guide channel, wherein the guide channel has a slot extending through a wall of the guide channel and longitudinally throughout substantially the entire length of the guide channel.

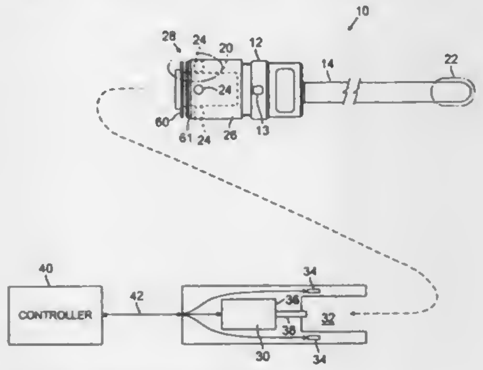
5,749,885
SURGICAL INSTRUMENT WITH EMBEDDED CODING ELEMENT

Douglas D. Sjostrom, Reading, Mass.; Michael A. Fritschy, Derry; Peter M. Cesarini, Londonderry, both of N.H.; Alexander Grinberg, Newton; William G. McGee, Tyngsboro, both of Mass., and Graham Smith, Plaistow, N.H., assignors to Smith & Nephew, Inc., Andover, Mass.

Filed Oct. 2, 1995, Ser. No. 538,298

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—170 **47 Claims**



1. A surgical instrument comprising

a hollow outer member having an opening in a distal region thereof for admitting tissue,

an inner member disposed for movement within said outer member, a distal region of said inner member supporting a surgical tool adjacent to said opening,

a plastic hub mounted to a proximal region of said outer member and including a passage therethrough for receiving a proximal region of said inner member, said plastic hub including a wall that encloses said passage and includes a hole oriented radially with respect to a longitudinal axis of the hub, and

at least one detectable coding element embedded in said hole of said wall.

5,749,886
DISPOSABLE GUARDED FINGER SCALPEL FOR INSERTING A LINE IN A PATIENT AND BLADE THEREFOR

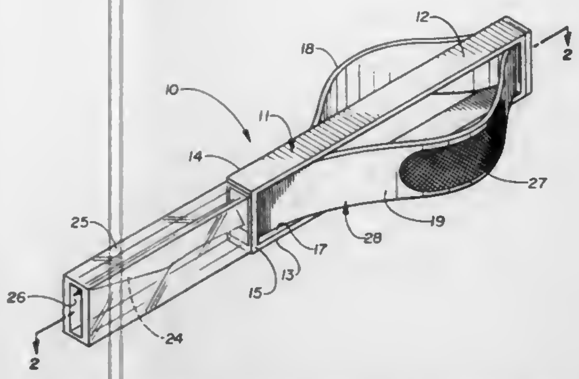
Michael R. Abidin, Birmingham, Ala., and Steven P. Lehmbeck, Baltimore, Md., assignors to Leonard Bloom, Towson, Md., a part interest

Continuation-in-part of Ser. No. 287,123, Aug. 8, 1994, Pat. No. 5,545,175, which is a continuation-in-part of Ser. No. 79,985, Jun. 18, 1993, Pat. No. 5,370,654. This application Apr. 8, 1996, Ser. No. 629,217

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—182 **7 Claims**

1. In a kit for a central line to be installed in a patient, the combination of a needle for making a puncture in the patient's skin above one of the veins, a guarded finger scalpel having a blade attached thereto for enlarging the puncture in the patient's skin, guard means on the guarded finger scalpel, the guard means having a normal position in which the blade is covered and further having a retracted position in which the blade is exposed, the blade having a planar body provided with a top edge and a lower cutting edge,



and the blade terminating forwardly thereof in a tip portion defined by a front edge connecting the top edge of the blade with the lower cutting edge of the blade, the front edge and the lower cutting edge forming an acute angle therebetween, the acute angle being sufficiently large to prevent the blade from cutting into the vein adjacent to the puncture in the patent's skin, and wherein the guard means does not contact the lower cutting edge of the blade during relative movement between the guard means and the blade, thereby avoiding an inadvertent dulling of the lower cutting edge of the blade.

5,749,887
TWISTED STRAND LOCALIZATION WIRE

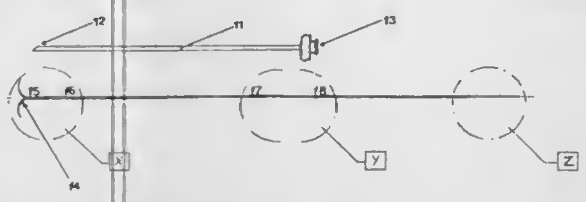
Norbert Heske, and Thomas Heske, both of Turkenfeld, Germany, assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jun. 1, 1995, Ser. No. 457,480

Claims priority, application Germany, Jul. 13, 1994, 44 24 394.4

Int. Cl.^{6} A61B *17/34*

U.S. Cl. 606—185 **8 Claims**



1. A device for marking tissue locations, comprising:

a hollow needle having a cutting point at its forward end;

a localization wire dimensioned to be inserted through said hollow needle, said localization wire including at least two twisted wire strands, said at least two twisted wire strands having forward ends, said forward ends of said wire strands being formed into barbs.

5,749,888
METHOD OF USING ANGIOPLASTY APPARATUS FACILITATING RAPID EXCHANGES

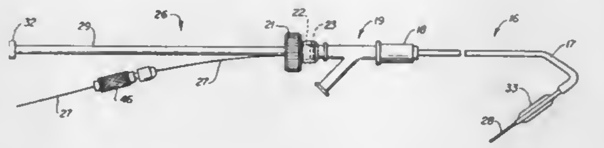
Paul G. Yock, 1216 San Mateo Dr., Menlo Park, Calif. 94025

Continuation of Ser. No. 208,972, Mar. 9, 1994, Pat. No. 5,451,233, which is a division of Ser. No. 10,458, Jan. 27, 1993, Pat. No. 5,300,085, which is a continuation of Ser. No. 774,479, Oct. 10, 1991, abandoned, which is a continuation of Ser. No. 548,200, Jul. 5, 1990, Pat. No. 5,061,273, which is a continuation of Ser. No. 361,676, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 117,357, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 852,197, Apr. 15, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 473,534

Int. Cl.^{6} A61M *25/10*

U.S. Cl. 606—194 **2 Claims**

1. A method for performing an intravascular procedure at a desired location within a patient's artery, comprising:



a) providing within the patient's vasculature a guiding catheter having a proximal end, a distal end, a port in the distal end and an inner lumen extending therein to the port in the distal end with the proximal end of the guiding catheter extending out of the patient and the distal end of the guiding catheter being located proximal to the location where the intravascular procedure is to be performed;

b) providing within the patient's vasculature an elongated guidewire being slidably disposed within the inner lumen of the guiding catheter and having a flexible distal section extending out the distal end of the guiding catheter and beyond the desired location where the intravascular procedure is to be performed and a proximal portion which extends out of the proximal end of the guiding catheter;

c) providing an intravascular catheter comprising:
    an elongated shaft which has proximal and distal ends, which is configured for percutaneous introduction into the patient's vasculature and which has a guidewire receiving lumen extending to the distal end of the shaft,
    a distal guidewire opening in the distal end of the catheter shaft in fluid communication with the guidewire receiving lumen, a proximal guidewire opening spaced a relatively short distance proximally from the distal end and a relatively long distance from the proximal end of the catheter shaft in fluid communication with the guidewire receiving inner lumen, and
    means to perform an intravascular procedure which is disposed on a distal section of the catheter shaft between the proximal and distal guidewire openings, which is configured to perform said procedure in a patient's artery and which is spaced closer to the distal guidewire opening than the proximal guidewire opening,

d) mounting the intravascular catheter onto the proximal end of the guidewire which extends out of the proximal end of the guiding catheter with the proximal portion of the guidewire being slidably disposed within the guidewire receiving lumen of the intravascular catheter and extending out the proximal guidewire opening;

e) introducing the intravascular catheter into the patient's vasculature over the guidewire, while holding a portion of the guidewire which extends out of the proximal guidewire opening in position and advancing the catheter therein until the means to perform an intravascular procedure is positioned within the desired location within the patient's artery, with the distal guidewire opening being distal to the desired location within the patient where the procedure is to be performed and the proximal guidewire opening being within the inner lumen of the guiding catheter proximal to the desired location;

f) performing an intravascular procedure at the desired location within the artery by said means; and

g) withdrawing the intravascular catheter from the patient.

5,749,889
METHOD AND APPARATUS FOR PERFORMING BIOPSY

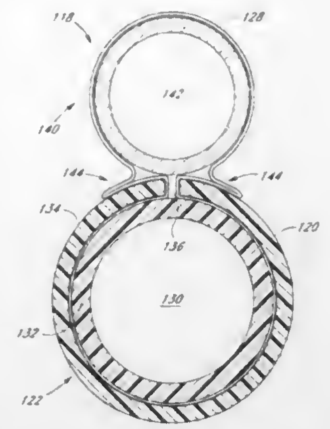
Steven R. Bacich, Laguna Niguel; John P. Greelis, Aliso Viejo; Hien Nguyen, Santa Ana, and Tuoc Nguyen, Westminster, all of Calif., assignors to Imagyn Medical, Inc., Laguna Niguel, Calif.

Filed Feb. 13, 1996, Ser. No. 600,608

Int. Cl.^{6} A61M *29/00;5/178;5/32;5/00*

U.S. Cl. 606—198 **25 Claims**

1. A surgical access device for obtaining tissue during endoscopic surgery, said surgical device having a proximal end, a distal end and an elongate body extending therebetween, said surgical access device also having an outer surface defining at any particu-



lar location along its longitudinal axis, a cross-sectional profile, said surgical access device comprising:

a first channel providing a first lumen for the insertion of an instrument, endoscope or other visualization device;

an open-loop member at a distal end of said first channel, said open-loop member having a transverse aperture formed therethrough, said aperture facing laterally outwardly from the longitudinal axis of said surgical access device; and

at least one secondary channel providing a secondary lumen for the insertion of an instrument, endoscope or other visualization device, said secondary channel being mounted on said surgical access device so as to be positioned along said outer surface thereof, said secondary channel being constructed from a thin pleated membrane which, prior to dilation of said secondary channel, is self-retained along the outer surface of said first channel.

5,749,890

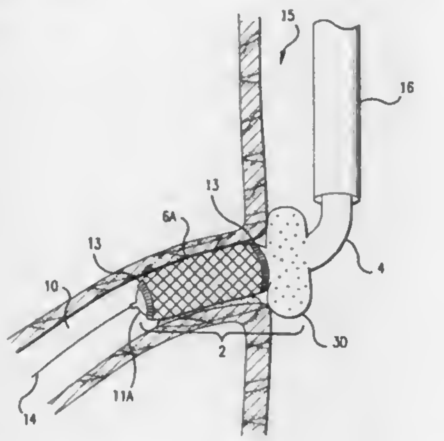
METHOD AND SYSTEM FOR STENT PLACEMENT IN OSTIAL LESIONS

Alexander Shaknovich, 1349 Lexington Ave., Apt. 7F, New York, N.Y. 10128

Filed Dec. 3, 1996, Ser. No. 753,912

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—198 **1 Claim**



1. A method for placing a stent in a first vessel, branching off of a parent conduit second vessel, said first vessel having an ostial lesion, in a patient in need of such treatment, comprising

(i) passing an ostial stent delivery catheter having, at its distal end, an ostial deployment segment comprising (a) a break segment capable of reversible expansion; and (b) an independently expandable portion onto which a stent is mounted;

(ii) positioning the ostial deployment segment such that the break segment is located in the parent conduit second vessel;

(iii) activating the break segment such that it assumes an expanded configuration;

(iv) advancing the ostial stent delivery catheter until the activated break segment stops as it is pressed against the wall of the parent conduit second vessel, whereby the stent is positioned within the ostial lesion;

(v) deploying the stent within the lesion;

(vi) deactivating the break segment so that it is no longer in an expanded configuration; and

(vii) withdrawing the ostial stent delivery catheter from the patient.

5,749,891

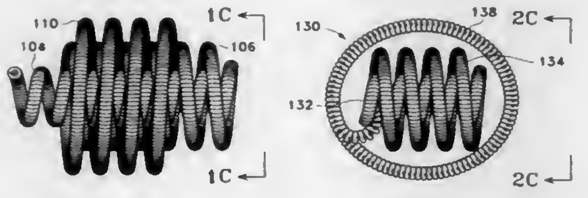
MULTIPLE LAYERED VASO-OCCLUSIVE COILS

Christopher G. M. Ken, San Mateo, and Erik T. Engelson, Menlo Park, both of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Continuation of Ser. No. 466,039, Jun. 6, 1995, abandoned. This application Jan. 7, 1997, Ser. No. 779,378

Int. Cl.^{6} A61B *17/00;17/12*

U.S. Cl. 606—200 **26 Claims**



1. A vaso-occlusive device comprising a primary coil constructed of a plurality of helically wound turns of a biocompatible wire said helical primary coil shaped into a secondary form having a single longitudinal axis with at least a first section having a first section end and a second section end and a second section, said first and second sections constructed of a plurality of helically wound turns of said primary coil and wherein said second section is at least partially surrounded by said first section between said first section end and said second section end.

5,749,892

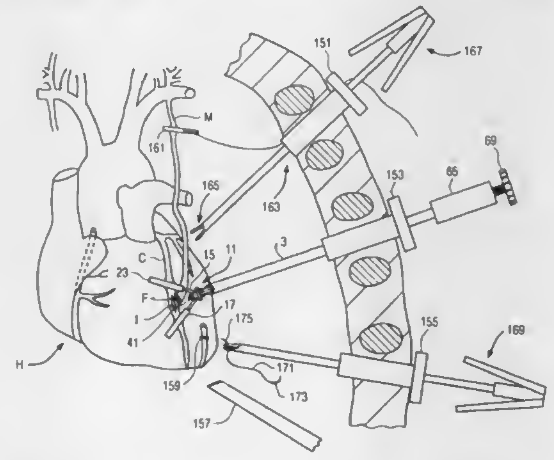
DEVICE FOR ISOLATING A SURGICAL SITE

Mark A. Vierra, Woodside, and Alex T. Roth, Redwood City, both of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Continuation of Ser. No. 298,646, Aug. 31, 1994, abandoned. This application Jul. 24, 1996, Ser. No. 686,073

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 600—204 **21 Claims**



19. An endoscopic device for engaging a patient's heart to isolate a surgical site on a coronary artery of the patient's heart, comprising:

a shaft having a distal end and a proximal end; and

a heart engaging member having only two arms extending from the distal end of the shaft, the two arms each extending away from the shaft to a free end, the free ends of the two arms being spaced apart for stabilizing a section of a coronary artery between the two arms for performing an anastomosis at the section of the coronary artery, the two arms also each having a contact surface for engaging a patient's heart, the contact surfaces of the two arms lying adjacent one another and not facing one another, the contact surfaces also being oriented in generally the same direction.

5,749,893

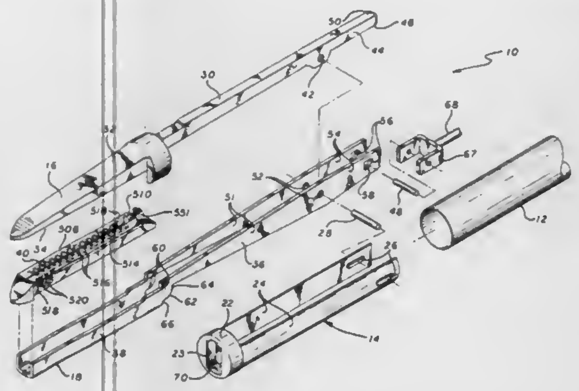
SURGICAL INSTRUMENT HAVING AN ARTICULATED JAW STRUCTURE AND A DETACHABLE KNIFE

Claude A. Vidal; Alan K. Plyley, both of Santa Barbara; Russell J. Redmond, and Roger Lagerquist, both of Goleta, all of Calif., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 291,331, Aug. 17, 1994, abandoned, which is a continuation of Ser. No. 55,824, Apr. 30, 1993, abandoned. This application Feb. 5, 1996, Ser. No. 596,938

Int. Cl.^{6} A61B *17/068*

U.S. Cl. 606—205 **10 Claims**



9. A surgical instrument with articulated jaw structure for capturing tissue of a body, comprising:

a tubular frame having an outer end;

an actuating mechanism movable inside the tubular frame, the actuating mechanism having a cam;

a first jaw having a proximal portion inside the tubular frame and a distal portion outside the tubular frame, the proximal portion defining a camming surface for engaging the cam;

a second jaw having a proximal portion inside the tubular frame and a distal portion outside the tubular frame, the second jaw pivotally mounted relative to the first jaw, the proximal portion of the second jaw also defining a camming surface for engaging the cam;

the cam and camming surfaces configured such that upon movement of the cam between a first position and a second position, the jaws pivot relative to each other between an open position and an intermediate position, respectively;

a cam stop disposed on one of said jaws for engaging the cam when the cam is in the second position such that upon further movement of the cam between the second position and a third position, the jaws move axially in the tubular frame; and

one of said jaws further comprising a ramp that engages the outer end of the tubular frame upon axial retraction of the jaws, the ramp configured such that the jaws move in a substantially parallel relation between the intermediate position and an approximated position upon movement of the cam between the second position and the third position, respectively.

5,749,894

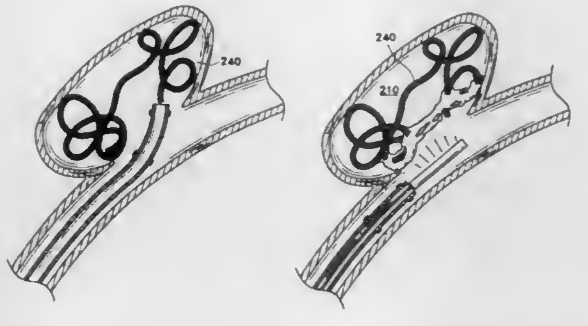
ANEURYSM CLOSURE METHOD

Erik T. Engelson, Menlo Park, Calif., assignor to Target Therapeutics, Inc., Fremont, Calif.

Filed Jan. 18, 1996, Ser. No. 588,195

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—213 **23 Claims**



1. A procedure for at least partially filling an aneurysm comprising the steps of:

a. introducing a vaso-occlusive device into an aneurysm,

b. introducing a formable polymeric material into said aneurysm, and

c. reforming said polymeric material in said aneurysm to bind said vaso-occlusive device.

5,749,895

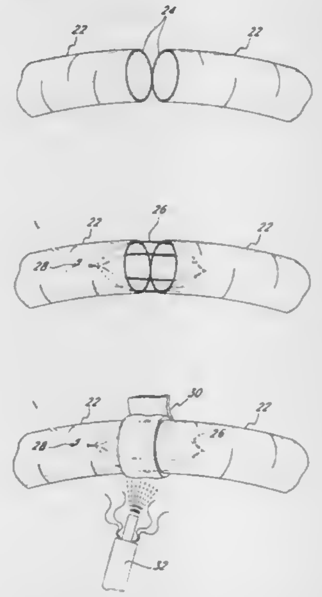
METHOD FOR BONDING OR FUSION OF BIOLOGICAL TISSUE AND MATERIAL

Philip N. Sawyer, Brooklyn, N.Y.; Donald G. Wallace, Menlo Park, and Ronald K. Yamamoto, San Francisco, both of Calif., assignors to Fusion Medical Technologies, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 7,691, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 832,171, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 654,860, Feb. 13, 1991, Pat. No. 5,156,613. This application Sep. 6, 1994, Ser. No. 303,336

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—214 **10 Claims**



1. A method for joining cylindrical biological structures, said method comprising the following steps:

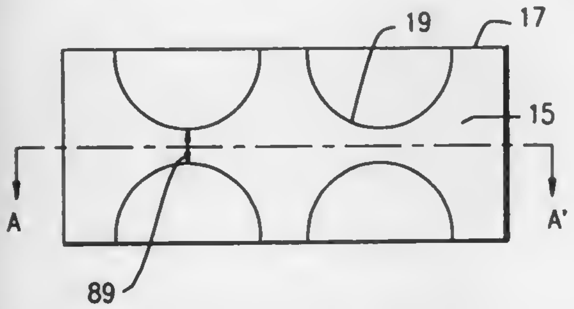
drawing ends of the cylindrical biological structures together;

placing weldable material over said ends wherein the weldable material is selected from the group consisting of collagen, gelatin, albumin, fibrin and elastin; and

applying energy to the weldable material while the ends of the cylindrical biological structures remain drawn together; denaturing or melting said weldable material and adjacent biological tissue of said biological structures with the applied energy to cause mixing of the denatured or melted weldable material and adjacent biological tissue, thus joining or restructuring said biological structures.

5,749,896
STAPLE OVERLAP

Melvin S. Cook, 8 Saddle Ridge Rd., Hohokus, N.J. 07423
Continuation of Ser. No. 502,988, Jul. 18, 1995, abandoned. This application Jan. 21, 1997, Ser. No. 786,195
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—219 **2 Claims**

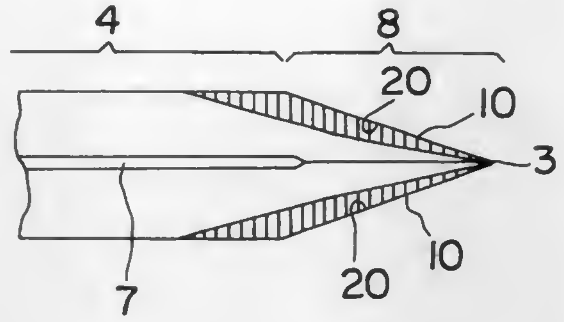


1. A stapling arrangement for stapling tissue comprising:
at least one staple having a crown and two legs, each leg having a tip, each leg further including at least one deformation zone, each said at least one deformation zone being more susceptible to bending than regions of said leg adjacent to each said at least one deformation zone,
an anvil having grooves for deforming said legs of said at least one staple,
said anvil lying on the opposite side of said tissue from the side into which insertion of said tips of said legs of said at least one staple occurs,
a staple pusher connected to said anvil and arranged to push on said crown of said at least one staple such that each of said tips of said legs of said at least one staple pass through said tissue and impinge against at least one groove of said anvil in order to deform said legs of said at`least one staple,
said grooves of said anvil being arranged to cause said deformation of said legs such that there is a single overlap of said legs of each staple with respect to each other formed by said deformation.

5,749,897
SURGICAL NEEDLE AND MOLD FOR MANUFACTURING THE SAME

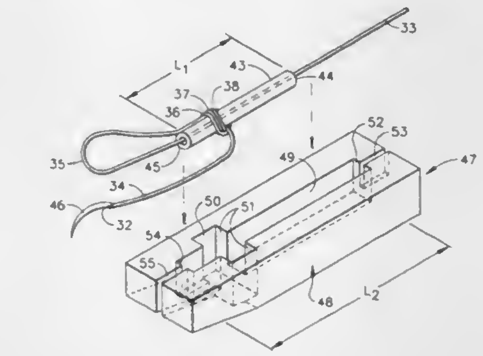
Kanji Matsutani; Motoichi Sugino, and Hiroshi Yagisawa, all of Tochigi-ken, Japan, assignors to Kabushiki Kaisha, and Matsutani Seisakusho, both of Tochigi-ken, Japan
Filed Mar. 7, 1995, Ser. No. 399,477
Claims priority, application Japan, Aug. 23, 1994, 6-198333
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—222 **2 Claims**

1. A method of producing a surgical needle with a substantially triangular cross section comprising the steps of:
extending austenitic stainless steel by wiredrawing to make a material blank having fibrous texture at its surface;
forming a needle material blank with a substantially triangular cross section by pressing ,said material blank using a mold formed with a pair of blocks which have oblique faces to form a cavity so as to make a projecting angle between them less than 180°; and
forming a pair of cutting edges on both sides of another face of said needle material opposing an edge which is formed between two pressed faces formed by said oblique faces of said mold by removing surface of said another face.



5,749,898
SUTURE CARTRIDGE ASSEMBLY FOR A SURGICAL KNOT

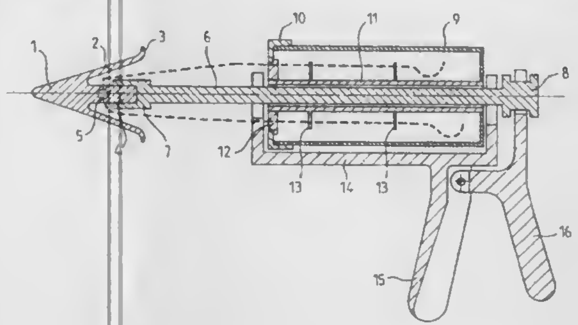
Dale R. Schulze, Lebanon, Ohio, and Troy A. McMillen, Champaign, Ill., assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio
Filed Apr. 8, 1997, Ser. No. 841,962
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—228 **9 Claims**



1. A suture cartridge assembly comprising:
a) a suture filament having proximal and distal ends, said filament being formed into a partially tied surgical knot for facilitating the fastening of bodily tissue, said knot having a first loop formed between the proximal and distal ends of said suture filament, and a plurality of knot loops formed about said first loop so as to form a common loop core;
b) a core tube wherein said partially tied knot is secured to said tube; and
c) a suture cartridge containing a tube slot for receiving said core tube, said tube slot having a proximal edge and a distal edge, and said suture cartridge containing a knot recess for receiving said knot loops, said knot recess embedded in said tube slot between the proximal and distal edges of said tube slot.

5,749,899
INTRAOSSEOUS ANCHORING METHOD AND DEVICE

Daniel Bardin, Saint Saturnin les Avignon, France, assignor to T Deux C, Saint Saturnin Les Avignon, France
PCT No. PCT/FR95/00392, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO95/26684, PCT Pub. Date Oct. 12, 1995
PCT Filed Mar. 29, 1995, Ser. No. 564,132
Claims priority, application France, Mar. 30, 1994, 94 04080
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—232 **8 Claims**

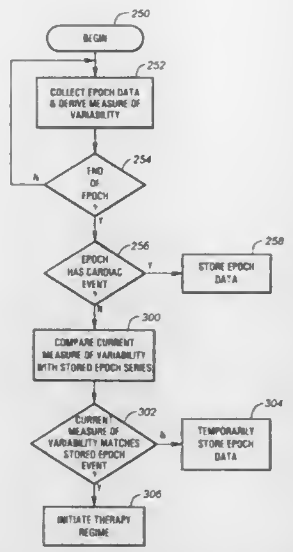


1. An automatic intraosseous anchoring device comprising:
a conical member with a bottom and a tip;
said conical member having an inner frusto-conical cutout extending from said bottom of said conical member toward said tip such that a conical wall is formed, wherein said cutout has a bottom surface;
said conical member having a cylindrical part connected to said bottom surface of said cutout and extending toward said bottom of said conical member;
said conical wall being slotted from said bottom of said conical member in a direction of said bottom surface of said cutout so as to form flexible blades of an initial shape;
said cylindrical part comprising a transverse bore;
a positioning rod with a first and a second end, said first end having means for detachably engaging said cylindrical part;
a chamber for storing at least one suture filament, said positioning rod extending through said chamber and being displaceable therein, said chamber has an opening facing said conical member; a washer is positioned in said opening so as to be displaceable by said positioning rod for freeing the at least one suture filament;
wherein the at least one suture filament is guided from said chamber to said cylindrical part and threaded through said transverse bore;
wherein said conical member is inserted into a bone bore with said flexible blades being transversely compressed and is anchored in the bone by self-blocking of said flexible blades by spreading outwardly and recovering said initial shape after having passed through the bone bore; and
wherein said positioning rod is detached from said cylindrical part after anchoring of said conical member in the bone.

5,749,900
IMPLANTABLE MEDICAL DEVICE RESPONSIVE TO HEART RATE VARIABILITY ANALYSIS

Edward A. Schroeppel; David Prutchi, and André G. Routh, all of Lake Jackson, Tex., assignors to Sulzer Intermedics Inc., Angleton, Tex.
Filed Dec. 11, 1995, Ser. No. 570,727
Int. Cl.^{6} A61N *1/365*
U.S. Cl. 607—4 **5 Claims**

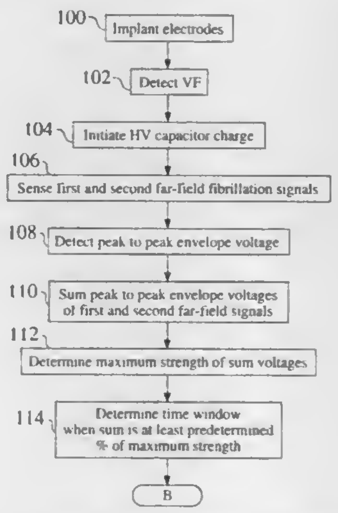
1. A medical device, comprising:
an electrode for detecting a series of heart beat signals from the heart of a patient;
means for providing a therapy regime to a heart of a patient;
memory having stored therein at least one heart rate variability zone with a corresponding therapy regime; and


250
BEGIN
252
COLLECT EPOCH DATA & DERIVE MEASURE OF VARIABILITY
254
END OF EPOCH ?
N
Y
256
EPOCH HAS CARDIAC EVENT ?
Y
258
STORE EPOCH DATA
N
300
COMPARE CURRENT MEASURE OF VARIABILITY WITH STORED EPOCH SERIES
302
CURRENT MEASURE OF VARIABILITY MATCHES STORED EPOCH EVENT ?
N
304
TEMPORARILY STORE EPOCH DATA
Y
306
INITIATE THERAPY REGIME

control circuitry in electrical communication with said electrode, said control circuitry having
means for receiving said series of heart beat signals and for computing a measurement of heart rate variability,
means for comparing said measurement of heart rate variability to said heart rate variability zone,
means for initiating said therapy regime if said heart rate variability zone includes said measurement of heart rate variability,
means for modifying said heart rate variability zone if said heart rate variability zone does not include said measurement of heart rate variability and said control circuitry detects a cardiac anomaly, and
means for storing said modified heart rate variability zone in said memory.

5,749,901
METHOD AND APPARATUS FOR DELIVERING DEFIBRILLATION SHOCKS WITH IMPROVED EFFECTIVENESS

M. Elizabeth Bush, Fremont, and Eric S. Fain, Menlo Park, both of Calif., assignors to Pacesetter, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 450,168, May 25, 1995, Pat. No. 5,531,767, which is a continuation of Ser. No. 219,605, Mar. 29, 1994, Pat. No. 5,500,008. This application May 7, 1996, Ser. No. 646,409
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—5 **7 Claims**


100
Implant electrodes
102
Detect VF
104
Initiate HV capacitor charge
106
Sense first and second far-field fibrillation signals
108
Detect peak to peak envelope voltage
110
Sum peak to peak envelope voltages of first and second far-field signals
112
Determine maximum strength of sum voltages
114
Determine time window when sum is at least predetermined % of maximum strength
B

1. A method for defibrillating a patient's heart with an implantable defibrillator, comprising the steps of:

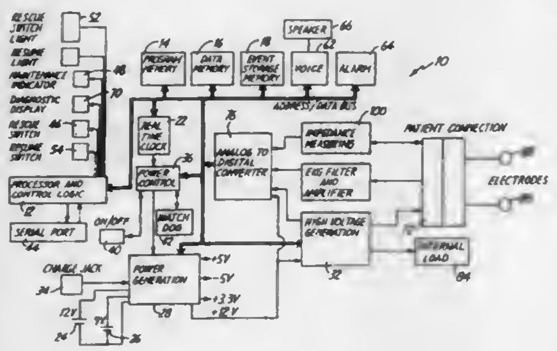
(a) detecting fibrillation in said patient's heart;
(b) charging a high voltage capacitor in said implantable defibrillator;
(c) sensing first and second far-field fibrillation signals, and detecting peak to peak envelope voltages of said first and second far-field fibrillation signals;
(d) summing said peak to peak envelope voltages of said first and second far-field fibrillation signals to obtain a sum voltage;
(e) determining a maximum strength of said sum voltage during said charging step;
(f) after completion of said charging step, determining a time window when said sum is at least a predetermined percentage of said maximum strength determined in step (e); and
(g) delivering a defibrillation shock to said patient's heart during said time window.

5,749,902

RECORDED DATA CORRECTION METHOD AND APPARATUS FOR ISOLATED CLOCK SYSTEMS

Kenneth F. Olson, Edina, and William S. Parker, Maple Grove, both of Minn., assignors to SurVivaLink Corporation, Minneapolis, Minn.

Filed May 22, 1996, Ser. No. 651,553
Int. Cl.⁶ A61N *1/39*
U.S. Cl. 607—5 **22 Claims**



7. A method for analyzing recorded response times of emergency medical personnel administering care with an automated external defibrillator wherein a computer implemented software device is used to make corrections in the recorded response times, comprising the device-implemented steps of:
storing time information relating to the administration of care in the automated external defibrillator;
calculating the time difference between a clock located on the automated external defibrillator and a clock located on a personal computer;
downloading the administration of care time information from the automated external defibrillator to the personal computer; and
adjusting the administration of care time information according to the calculated time difference.

5,749,903

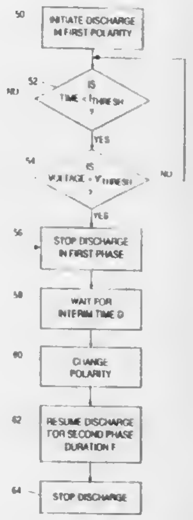
Patent Not Issued For This Number

5,749,904

ELECTROTHERAPY METHOD UTILIZING PATIENT DEPENDENT ELECTRICAL PARAMETERS

Bradford E. Gliner, Bellevue; Thomas D. Lyster, Bothell; Clinton S. Cole, Seattle; Daniel J. Powers, Issaquah, and Carlton B. Morgan, Bainbridge Island, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 103,837, Aug. 6, 1993, abandoned, and Ser. No. 227,553, Sep. 14, 1994, Pat. No. 5,607,454. This application Jul. 31, 1996, Ser. No. 690,529
Int. Cl.⁶ A61N *1/39*
U.S. Cl. 607—7 **17 Claims**


INITIATE DISCHARGE IN FIRST POLARITY
IS TIME < T_THRESH ?
YES
NO
IS VOLTAGE < V_THRESH ?
YES
NO
STOP DISCHARGE IN FIRST PHASE
WAIT FOR INTERIM TIME D
CHANGE POLARITY
RESUME DISCHARGE FOR SECOND PHASE DURATION F
STOP DISCHARGE

1. A method for delivering electrotherapy to a patient through electrodes connectable to a plurality of capacitors, the method comprising the following steps:
discharging at least one of the capacitors across the electrodes to deliver electrical energy to the patient;
monitoring a patient-dependent electrical parameter during the discharging step; and
adjusting energy delivered to the patient based on a value of the electrical parameter.

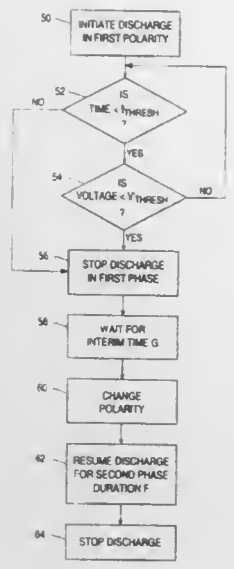
5,749,905

ELECTROTHERAPY METHOD UTILIZING PATIENT DEPENDENT ELECTRICAL PARAMETERS

Bradford E. Gliner, Bellevue; Thomas D. Lyster, Bothell; Clinton S. Cole, Kirkland; Daniel J. Powers, and Carlton B. Morgan, both of Bainbridge Island, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Continuation of Ser. No. 103,837, Aug. 6, 1993, abandoned. This application Aug. 2, 1996, Ser. No. 691,755
Int. Cl.⁶ A61N *1/39*
U.S. Cl. 607—7 **11 Claims**

1. A method for delivering electrotherapy to a patient through electrodes connected to an energy source, the method comprising the following steps:
discharging the energy source across the electrodes to deliver electrical energy to the patient;
monitoring a patient-dependent electrical parameter during the discharging step;
adjusting energy delivered to the patient based on a value of the electrical parameter.

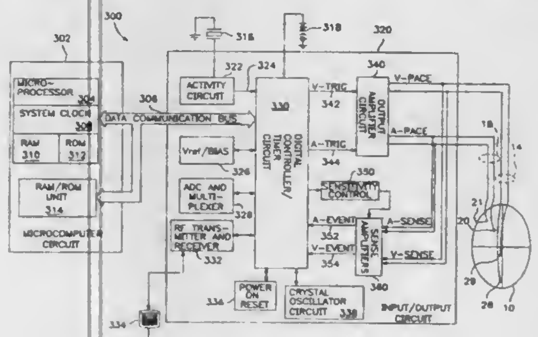

INITIATE DISCHARGE IN FIRST POLARITY
IS TIME < T_THRESH ?
NO
YES
IS VOLTAGE < V_THRESH ?
NO
YES
STOP DISCHARGE IN FIRST PHASE
WAIT FOR INTERIM TIME G
CHANGE POLARITY
RESUME DISCHARGE FOR SECOND PHASE DURATION F
STOP DISCHARGE

5,749,906

DUAL CHAMBER PACING SYSTEM AND METHOD WITH CONTINUAL ADJUSTMENT OF THE AV ESCAPE INTERVAL SO AS TO MAINTAIN OPTIMIZED VENTRICULAR PACING FOR TREATING CARDIOMYOPATHY

Robert S. Kieval, Golden Valley, and Michael F. Hess, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 391,883, Feb. 21, 1995, Pat. No. 5,626,620. This application Dec. 3, 1996, Ser. No. 753,867
Int. Cl.⁶ A61N *1/36*
U.S. Cl. 607—9 **11 Claims**



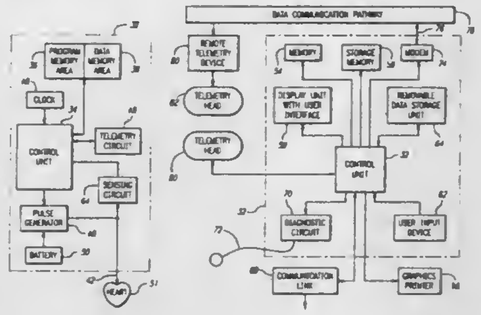
1. A method of operating a pacemaker in a non-tracking mode adapted to apply when said pacemaker is implanted in a patient with a heart having atrial events, comprising:
(a) delivering ventricular pace pulses to a patient without a timed relationship to atrial events,
(b) lengthening a V—V escape interval of delivered ventricular pace pulses, and determining when one or more said lengthened interval delivered ventricular pace pulses fail to result in fall capture of the ventricle, and
(c) shortening said V—V escape interval in response to a determination of such a failure.

5,749,907

SYSTEM AND METHOD FOR IDENTIFYING AND DISPLAYING MEDICAL DATA WHICH VIOLATE PROGRAMMABLE ALARM CONDITIONS

Brian M. Mann, Edgartown, Mass., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Feb. 18, 1997, Ser. No. 801,281
Int. Cl.⁶ A61N *1/37*
U.S. Cl. 607—27 **42 Claims**



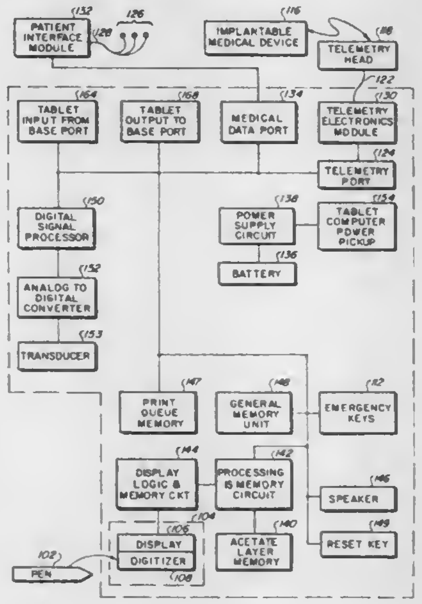
1. A diagnostic system for use with an implantable medical device, the system comprising:
telemetry means for receiving medical data transmitted by the medical device;
means for defining at least one alarm condition;
long-term storage means for storing the at least one alarm condition;
first control means for applying the at least one alarm condition to the medical data to determine if any medical data values violate at least one alarm condition; and
second control means for marking portions of the medical data which violate at least one alarm condition.

5,749,908

METHODS AND APPARATUS FOR ANNOTATING DATA IN AN IMPLANTABLE DEVICE PROGRAMMER USING DIGITALLY RECORDED SOUND

Jeffery D. Snell, Oak Park, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Dec. 18, 1996, Ser. No. 768,734
Int. Cl.⁶ A61N *1/36*
U.S. Cl. 607—30 **32 Claims**



1. An implantable device programmer comprising:
processing means;

memory means coupled to said processing means for storing digital data;

display means coupled to said processing means for displaying a graphical representation of at least a part of a patient data set;

transducing means for converting audio signals into electrical signals; and

analog to digital converter means coupled to said processing means and said transducing means for converting said electrical signals into digital voice data, wherein said processing means causes said digital voice data to be stored in said memory means and linked to a portion of said patient data set.

5,749,909

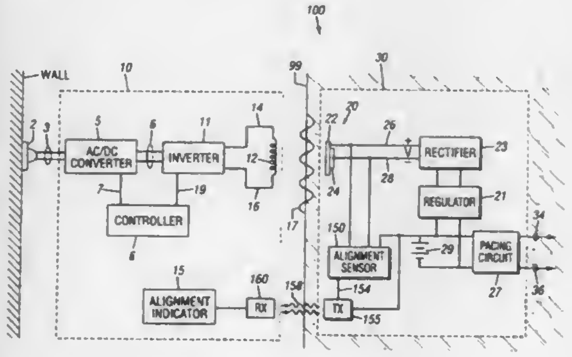
TRANSCUTANEOUS ENERGY COUPLING USING PIEZOELECTRIC DEVICE

Edward A. Schroeppel, and Paul R. Spehr, both of Lake Jackson, Tex., assignors to Sulzer Intermedics Inc., Angleton, Tex.

Filed Nov. 7, 1996, Ser. No. 746,220

Int. Cl.^{6} A61N ***1/378***

U.S. Cl. 607—33 **19 Claims**



1. A cardiac stimulation system comprising: a cardiac stimulator having:

a hermetically sealed container,

a cardiac stimulation circuit within said container for producing an output to stimulate the heart,

an electrode coupled to said cardiac stimulation circuit for delivering said output to the heart,

a rechargeable battery coupled to said cardiac stimulation circuit,

a rectifier coupled to said battery, and

a piezoelectric device coupled to said rectifier said piezoelectric device including a ferromagnetic plate and a ceramic disc, said piezoelectric device capable of responding to any of at least two different types of external stimuli,

and

an external charging unit having

means for displacing said piezoelectric device to cause said piezoelectric device to vibrate.

5,749,910

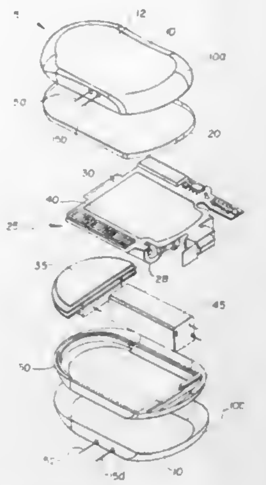
SHIELD FOR IMPLANTABLE CARDIOVERTER DEFIBRILLATOR

Dennis A. Brumwell, Bloomington; Joseph S. Perttu, Chanhassen; Mark W. Kroll, Minnetonka, and Randall S. Nelson, Pine Springs, all of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Filed Jun. 7, 1995, Ser. No. 486,759

Int. Cl.^{6} A61N ***1/375***

U.S. Cl. 607—36 **21 Claims**



1. An implantable cardioverter defibrillator capable of subcutaneous positioning within a patient for delivering at least one electrical cardioversion/defibrillation countershocks of at least 0.5 Joules to at least two electrodes adapted to be positioned proximate the heart of the patient, the implantable cardioverter defibrillator comprising:

a housing comprising a biocompatible material;

circuitry positioned within the housing to control delivery of the countershocks, the circuitry being susceptible to undesirable coupling effects of origin external to the circuitry;

an energy source coupled with the circuitry to provide electrical energy to the circuitry;

a conductive shield disposed between the housing and the circuitry to shield the circuitry against the coupling effects; and

a reference point in the circuitry, the conductive shield being in electrical connection with the reference point to cause the conductive shield to shield the circuitry from the coupling effects.

5,749,911

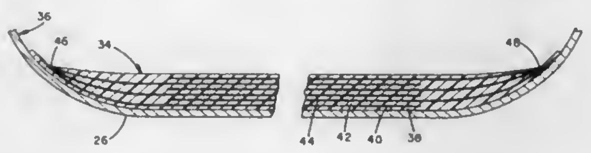
IMPLANTABLE TISSUE STIMULATOR INCORPORATING DEPOSITED MULTILAYER CAPACITOR

Randy W. Westlund, Minneapolis, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jan. 24, 1997, Ser. No. 787,264

Int. Cl.^{6} A61N ***1/375***

U.S. Cl. 607—36 **18 Claims**



1. A tissue stimulating device comprising:

(a) a hermetically sealed chamber defined by a metal housing, the housing having inner and outer wall surfaces of a predetermined contour;

(b) a battery disposed within the sealed chamber;

(c) capacitor means for storing a charge;

(d) an electronic circuit means coupled to said capacitor means for periodically discharging said capacitor means into a tissue load; and

(e) said capacitor means comprising a multilayer configuration of alternating dielectric and metal layers including an acrylate base layer deposited, in situ, on and conforming to at least a portion of the inner wall surface of the housing.

5,749,912

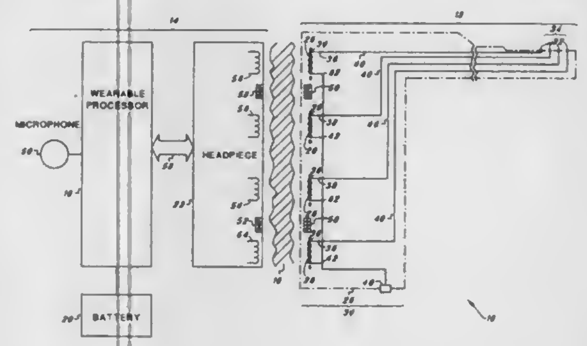
LOW-COST, FOUR-CHANNEL COCHLEAR IMPLANT

Chaoying Zhang, Alhambra; Franco Portillo, Covina; Fan-Gang Zeng, Montrose; Robert V. Shannon, La Canada, all of Calif., and Gerald E. Loeb, Kingston, Canada, assignors to House Ear Institute, Los Angeles, and Advanced Bionics Corporation, Sylmar, both of Calif.

Continuation-in-part of Ser. No. 328,260, Oct. 24, 1994, Pat. No. 5,549,658. This application Aug. 26, 1996, Ser. No. 697,524

Int. Cl.^{6} A61N ***1/32;*** **H04R** ***25/00***

U.S. Cl. 607—57 **20 Claims**



1. A low-cost, multi-channel cochlear stimulation system comprising:

a passive, implantable receiver/electrode array comprising:

an elongate silicone rubber carrier in which is embedded a plurality of coil assemblies at a proximal end of the carrier and a corresponding plurality of electrodes at a distal end of the carrier,

the distal end of the carrier being adapted for insertion into a human cochlea, with the plurality of electrodes being spaced apart along the distal end,

the proximal end of the carrier holding the plurality of coil assemblies in a predetermined pattern,

the coil assemblies each comprising a prescribed number of turns of a first wire wound to form a coil,

a first end of the first wire of each coil assembly being bonded to a second wire that extends the length of the elongate carrier inside of the carrier to a respective electrode at the distal end of the carrier,

second end of the first wire of each coil assembly being bonded to a third wire that extends less than the length of the elongate carrier to a common electrode exposed at the surface of the carrier,

each electrode at the distal end of the carrier comprising a ball formed by flaming a distal end of the second wire, a portion of which ball is exposed through the surface of the carrier,

implantable alignment means for aligning the plurality of coil assemblies with corresponding external coils, and

an hermetically sealed case made from a biocompatible material that houses said coil assemblies; and

an external wearable processor comprising:

microphone means for generating an electrical signal representative of sensed audible sounds,

filter means for dividing the electrical signal into a plurality of frequency bands, thereby creating a corresponding plurality of frequency band signals, the number of frequency bands being the same as the number of implanted coil assemblies and electrodes, whereby there is an implanted coil assembly and corresponding electrode for each filter means,

speech processing means for processing each of the plurality of frequency band signals in accordance with a prescribed speech processing strategy to produce respective biphasic stimulation signals, and

an external headpiece having a plurality of external coils, each connected to receive one of the respective biphasic stimulation signals,

external alignment means for positioning the external headpiece in alignment with the implantable alignment means to align each of the external coils of the external headpiece with respective ones of the plurality of coil assemblies of the implantable receiver/electrode array;

whereby the biphasic stimulation signals received by each of the plurality of external coils are inductively coupled to respective ones of the plurality of implantable coil assemblies, thereby causing a biphasic stimulation current to flow between respective ones of the implantable electrodes and the common electrode.

5,749,913

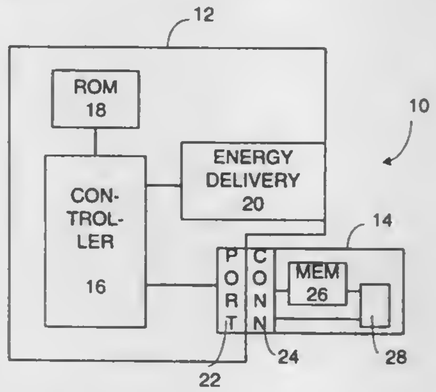
SYSTEM AND METHOD FOR COLLECTING AND STORING ELECTROTHERAPY DATA ON A DETACHABLE MEMORY DEVICE

Clinton S. Cole, Seattle, Wash., assignor to Heartstream, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 314,395, Sep. 28, 1994, Pat. No. 5,549,115. This application May 16, 1996, Ser. No. 649,414

Int. Cl.^{6} A61N ***1/37***

U.S. Cl. 607—59 **12 Claims**



1. A method of operating an electrotherapy device comprising the following steps:

using the electrotherapy device to collect electrotherapy information;

using a clock in the memory device to associate time information with the electrotherapy information; and

storing the electrotherapy information and the time information on a detachable memory device.

5,749,914

CATHETER FOR OBSTRUCTED STENT

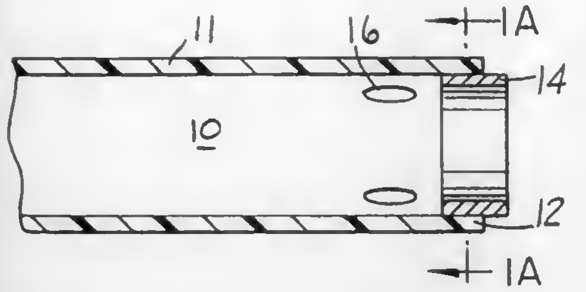
Michael Janssen, Englewood, Colo., assignor to Advanced Coronary Intervention, Englewood, Colo.

Continuation-in-part of Ser. No. 531,453, Sep. 21, 1995, Pat. No. 5,626,576, which is a division of Ser. No. 230,439, Apr. 19, 1994, Pat. No. 5,454,809, which is a continuation of Ser. No. 96,651, Jul. 22, 1993, abandoned, which is a continuation of Ser. No. 974,670, Nov. 12, 1992, abandoned, which is a continuation of Ser. No. 849,638, Mar. 5, 1992, abandoned, which is a continuation of Ser. No. 637,992, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 294,270, Jan. 6, 1989, abandoned. This application May 28, 1996, Ser. No. 654,146

Int. Cl.^{6} A61N ***1/44***

U.S. Cl. 607—116 **41 Claims**

1. A device for ablation of obstructive material within a stent, the device comprising:



an elongate flexible tube having a distal end and a proximal end and an interior surface therebetween, the tube defining an axial direction along a length of the tube and a radial direction radially away from the tube;

a first ablation electrode positioned within said interior surface proximate the distal end;

an ablation power supply in electrical communication with said ablation electrode;

wherein said first ablation electrode is shielded from physical contact with the stent by said tube when the first ablation electrode is positioned within the stent; and wherein said first ablation electrode is positioned so that it is electrically unobstructed in the radial direction by the tube while being shielded from physical contact with the stent, thereby being electrically operative in the radial direction with respect to its position along the axial direction.

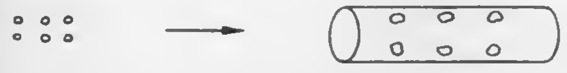
5,749,915
POLYMERIC ENDOLUMINAL PAVING PROCESS

Marvin J. Slepian, Tucson, Ariz., assignor to Focal, Inc., Lexington, Mass.

Continuation of Ser. No. 118,978, Sep. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 987,357, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 857,700, Mar. 25, 1992, Pat. No. 5,213,580, which is a continuation of Ser. No. 593,302, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 235,998, Aug. 24, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 481,220

Int. Cl.⁶ A61F *2/04;2/06*

U.S. Cl. 623—1 **58 Claims**



1. An in vivo method for forming a biocompatible polymeric coating on tissue or tissue-contacting surfaces which comprises the steps of:

a) providing a biocompatible polymeric material which is non-fluent at body temperature and which is fluent at an elevated temperature;

b) positioning the polymeric material at a position substantially adjacent to the tissue or tissue-contacting surface to be coated;

c) heating the polymeric material to render the polymeric material fluent;

d) molding the fluent polymeric material into substantially conforming contact with the surface; and

e) allowing the polymeric material to cool into a non-fluent biocompatible coating on the surface,

wherein the polymeric coating is biodegradable.

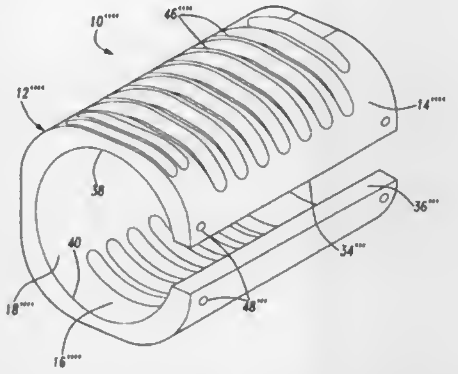
5,749,916
FUSION IMPLANT

Marc Richelsoph, Memphis, Tenn., assignor to Spinal Innovations, Memphis, Tenn.

Filed Jan. 21, 1997, Ser. No. 786,020

Int. Cl.⁶ A61F *2/44*

U.S. Cl. 623—17 **25 Claims**



1. A fusion implant for insertion between opposing vertebrae, said implant comprising: a body including an inner surface defining a hollow inner chamber for containing a graft material therein, said body including stress transfer means for transferring stress from the vertebrae surrounding said implant to the graft material contained within said implant.

5,749,917

Patent Not Issued For This Number

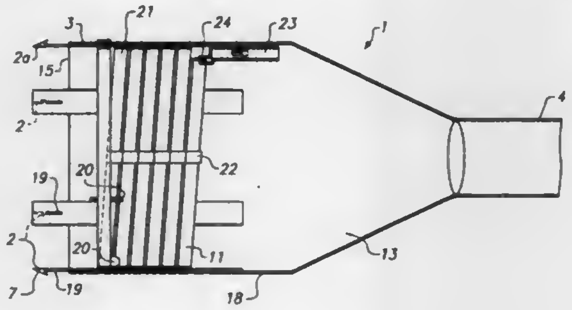
5,749,918
INTRALUMINAL GRAFT AND METHOD FOR INSERTING THE SAME

Michael Hogendijk, County of Santa Clara, Calif., and Mark H. Wholey, County of Allegheny, Pa., assignors to Endotex Interventional Systems, Inc., Menlo Park, Calif.

Filed Jul. 20, 1995, Ser. No. 504,592

Int. Cl.⁶ A61F *2/06*

U.S. Cl. 623—1 **11 Claims**



1. An intraluminal graft, comprising:

a generally tubular body having an interior surface and being biocompatible;

a plurality of spaced apart anchors attached to the tubular body, the anchors being sized and positioned to penetrate a luminal wall, at least one of the plurality of spaced apart anchors being a main anchor; and

a helical coil having a plurality of loops, the helical coil having a delivery state wherein the plurality of loops are stretched to a reduced diameter, and a deployed state, wherein the plurality of loops have an expanded diameter and are located adjacent to one another, the helical coil being positioned adjacent the interior surface of the tubular body, a first end of the helical coil being attached to the tubular body and a second end of the helical coil being sized and configured for attachment to an insertion device;

a lock affixed to the second end of the helical coil, the lock being adapted to lockingly receive an end of the main anchor when the helical coil is expanded to the deployed state.

5,749,919
RESILIENT PROSTHESIS FOR WIDENING A CHANNEL, PARTICULARLY A BLOOD VESSEL, AND METHOD FOR MAKING SAME

Louis Blanc, Lutry, Switzerland, assignor to Microfil Industries S.A., Renens, Switzerland

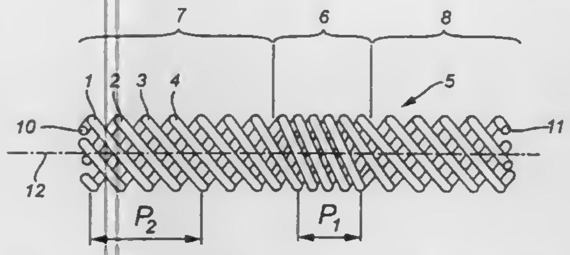
PCT No. PCT/CH94/00247, § 371 Date Sep. 7, 1995, § 102(e) Date Sep. 7, 1995, PCT Pub. No. WO95/18585, PCT Pub. Date Jul. 13, 1995

PCT Filed Dec. 30, 1994, Ser. No. 513,909

Claims priority, application France, Jan. 10, 1994, 94 00302

Int. Cl.⁶ A61F *2/04*

U.S. Cl. 623—1 **14 Claims**



1. An elastic prosthesis, having a median section bound by regions of extremity, for widening a conduit in a living being, in particular a blood vessel, said elastic prosthesis being of a substantially elongated and cylindrical shape, wherein said elastic prosthesis (5, 20) comprises a plurality of elastic wire filaments (1, 2, 3, 4, 22) having a helical spiral configuration in which the helical spirals have a direction which is the same for each wire filament except in the regions of extremity of the prosthesis, the wire filaments (1, 2, 3, 4, 22) being intercalated with one another without crossing so as to form the said substantially cylindrical shape.

5,749,920
MULTICAPSULE INTRALUMINAL GRAFTING SYSTEM AND METHOD

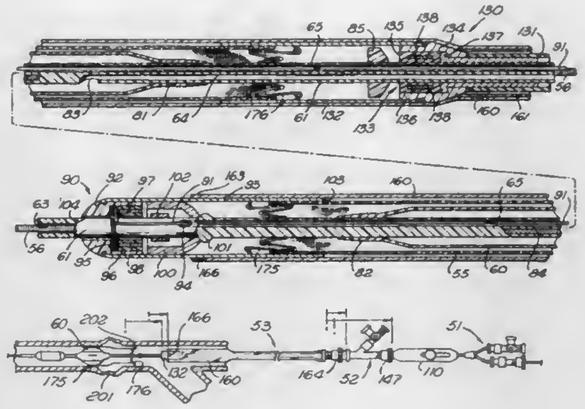
Dinah B. Quiachon, San Jose; Alec A. Piplani, Mountain View, and Larry G. Baughman, Cambell, all of Calif., assignors to EndoVascular Technologies, Inc., Menlo Park, Calif.

Continuation of Ser. No. 102,576, Aug. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 553,530, Jul. 13, 1990, Pat. No. 5,275,622, which is a continuation-in-part of Ser. No. 166,093, Mar. 9, 1988, Pat. No. 5,104,399, which is a continuation-in-part of Ser. No. 940,907, Dec. 10, 1986, Pat. No. 4,787,899, which is a continuation of Ser. No. 559,935, Dec. 9, 1983, abandoned. This application Nov. 22, 1995, Ser. No. 562,351

Int. Cl.⁶ A61F *2/06*

U.S. Cl. 623—1 **7 Claims**

1. A system for placing a graft in a lumen formed by a wall in a body, said system comprising:



a tubular graft having a superior extremity and an inferior extremity, said graft being deformable between a collapsed condition and an expanded condition;

first anchoring means secured to the superior extremity of said graft for attaching the superior extremity of said graft to the lumen wall;

second anchoring means secured to the inferior extremity of said graft for attaching the inferior extremity of said graft to the lumen wall;

said first and second anchoring means each including a plurality of wall engaging members and a continuous wire frame configured to provide a plurality of vees;

a distal capsule assembly for covering said first anchoring means;

a proximal capsule assembly for covering said second anchoring means, wherein at least a portion of said graft between said first and second anchoring means remains uncovered;

placement means for positioning said graft, said distal capsule assembly and said proximal capsule assembly at a desired location in the lumen,

said placement means including means for moving said distal capsule assembly relative to said proximal capsule assembly to uncover said first anchoring means and means for moving said proximal capsule assembly relative to said graft to uncover said second anchoring means;

wherein said placement means includes first catheter means having a balloon secured to a flexible elongate shaft having an inflation lumen in fluid communication with the balloon, the first catheter means being capable of moving the balloon within said graft and into engagement with said first anchoring means and with said second anchoring means:

wherein said distal capsule assembly includes a distal capsule and a proximal cap slidably retained in the distal capsule and secured on the shaft of the first catheter means of said placement means, wherein the shaft extends through the proximal capsule assembly, the proximal cap, and the distal capsule: and

a removable sleeve of a flexible material, said removable sleeve including a main sheath having an expanded diameter configured to extend over said proximal capsule assembly, said graft and at least a portion of said distal capsule assembly, wherein a smooth transition is provided between said distal capsule assembly and said proximal capsule assembly.

5,749,921

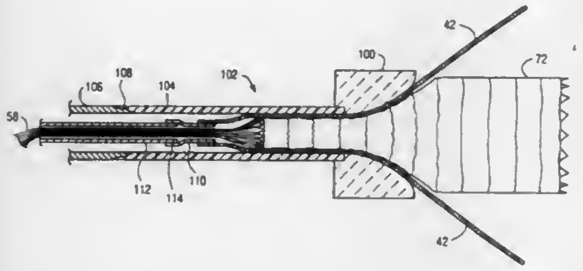
APPARATUS AND METHODS FOR COMPRESSION OF ENDOLUMINAL PROSTHESES

Jay A. Lenker, Los Altos Hills; Michael A. Evans, Palo Alto; Steven W. Kim, Sunnyvale, all of Calif., and Edward V. Kinney, Louisville, Ky., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 20, 1996, Ser. No. 603,755

Int. Cl.^{6} A61F *2/06*

U.S. Cl. 623—1 **13 Claims**



1. An endoluminal prosthesis system comprising:

a tubular body having a lumen;

a radially compressible endoluminal prosthesis having an end with a plurality of engageable structures radially disbursed thereabout;

a plurality of tensionable flexible filament loops, wherein each loop extends radially from the lumen of the tubular body to engage an engageable structure and returns back toward the tubular body so that tensioning the loops draws the end of the prosthesis radially inward toward the lumen; and

a sheath which is slidable distally over the prosthesis when the loops are tensioned to compress the prosthesis adjacent the engageable structures.

5,749,922

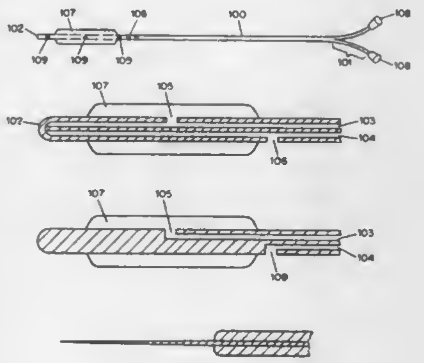
BIODEGRADABLE POLYMERIC ENDOLUMINAL SEALING PROCESS, APPARATUS AND POLYMERIC PRODUCTS FOR USE THEREIN

Marvin J. Slepian, Tucson, Ariz., and Anton Schindler, Durham, N.C., assignors to Endoluminal Therapeutics, Inc., Tucson, Ariz.

Division of Ser. No. 182,516, Jan. 14, 1994, which is a division of Ser. No. 651,346, Apr. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 593,302, Oct. 3, 1990, abandoned, and a continuation-in-part of Ser. No. 235,998, Aug. 24, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 472,757

Int. Cl.^{6} A61F *2/04;2/06*

U.S. Cl. 623—1 **29 Claims**



1. A substantially cylindrical polymeric article having a radius and axial length constructed and arranged for paving or stabilizing an irregularly contoured tissue surface of a lumen or hollow organ of a mammal, the article being partially preformed and having a surface moldable in vivo, under conditions tolerable by the tissue surface, into intimate and conforming contact with the tissue surface by way of expansion of the radius of the article with essentially no change in axial length of the article.

CHEMICAL

5,749,923

METHOD FOR BLEACHING DENIM TEXTILE MATERIAL

Vinzenz Olip, Schä chtestrasse, Austria, and Norbert Steiner, Upper Saddle River, N.J., assignors to Degussa Aktiengellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 347,146, Nov. 22, 1994, Pat. No. 5,549,715. This application May 24, 1996, Ser. No. 651,785

Claims priority, application Austria, Nov. 23, 1993, AT 2378/93

Int. Cl.^{6} D06L *3/10*

U.S. Cl. 8—102 **26 Claims**

1. A method for chlorine-free bleaching of denim textile material composed of warp yarn which is dyed with at least one of (a) indigo dye and at least one sulfur dye, and (b) at least one derivative of indigo dye and at least one sulfur dye, and weft yarn which is undyed and substantially white and which continues to be substantially white after bleaching to provide a denim textile material having a gray cast, the method comprising the steps of:

a. placing denim textile material in water and heating;

b. adding to the water a dispersing agent which is effective to retard deposition of dyestuff stripped from the warp yarn during bleaching onto the weft yarn and which is comprised of polyvinylpyrrolidone; and

c. bleaching the denim textile material by adding to the water an aqueous alkaline bleaching agent which contains a bleaching agent which is selective for the indigo dye or the derivative of indigo dye of the warp yarn and which is selected from the group consisting of formamidine sulfinic acid, and a mixture of formamidine sulfinic acid and at least one reducing carbohydrate,

wherein the least one sulfur dye includes a sulfur black dye, and wherein the method provides denim textile material having a gray cast.

5,749,924

CLEANING/SANITIZING METHODS, COMPOSITIONS, AND/OR ARTICLES FOR FABRIC

Bruce Prentiss Murch, Newcastle Upon Tyne, United Kingdom; Brian Joseph Roselle, Fairfield, Ohio; Kyle David Jones, West Chester, Ohio; Keith Homer Baker, Cincinnati, Ohio; Thomas Edward Ward, Oxford, Ohio, and Toan Trinh, Maineville, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 495,287, Jun. 27, 1995, abandoned. This application Apr. 7, 1997, Ser. No. 834,584

Int. Cl.^{6} A61L *2/18;* **C11D** *1/04*

U.S. Cl. 8—137 **14 Claims**

1. A method for reducing the level of microorganisms on fabric comprising the step of contacting the fabric with an aqueous cleaning solution comprising at least about 0.5% by weight of detergent surfactant and having a basic pH of greater than 10.5 for a time in excess of about one minute and sufficient to effect a significant reduction in microorganisms as compared to the same process where the solution is immediately rinsed off.

5,749,925

DYEING OR PRINTING PROCESS WITH NEW AND KNOWN CATIONIC 4,5-DIHYDRO-IH-1,2,3-TRIAZOLIUM COMPOUNDS AS DYESTUFFS AND NEW CATIONIC 4,5-DIHYDRO-1H-1,2,3-TRIAZOLIUM COMPOUNDS

Thomas Böcker, Leichlingen; Horst Berneth, Leverkusen, and Henry Giera, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

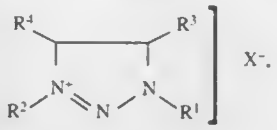
Filed Jun. 26, 1996, Ser. No. 670,913

Claims priority, application Germany, Jul. 3, 1995, 195 24 133.9

Int. Cl.^{6} D06P *1/42;3/76*

U.S. Cl. 8—436 **8 Claims**

1. A method of dyeing or printing cationically dyeable fibers, tannin-treated cellulose materials, paper, silk or leather, which comprises applying to said cationically dyeable fiber, tannin-treated cellulose material, paper, silk or leather at least one 4.5-dihydro-1H-1.2.3-triazolium compound of the formula (I)



(I)

in which

R^1 and R^2 independently of one another denote C_6–C_4-aryl or a heterocyclic radical having up to 3 rings and up to 4 heteroatoms from the series consisting of O, S and N,

R^3 and R^4 independently of one another denote hydrogen. C_1–C_{12}-alkyl. C_2–C_{12}-alkenyl. C_4–C_8-cycloalkyl. C_7–C_{17}-aralkyl, C_6–C_{14}-aryl or nitrile or

R^3 and R^4 together denote a 2- to 5-membered C bridge, which can optionally be interrupted by up to two oxygen or nitrogen atoms, and

X^- denotes an anion,

wherein all the alkyl. alkenyl, cycloalkyl, aralkyl and aryl radicals and fused and heterocyclic radicals present can be unsubstituted or substituted by nonionic substituents, carboxyl groups, ammonium groups or pyridinium groups.

5,749,926

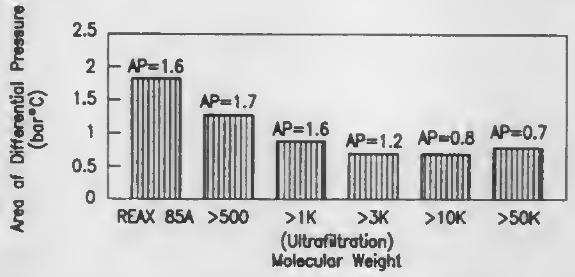
METHOD OF PREPARING HIGH ACTIVITY SULFONATED LIGNIN DYE DISPERSANTS

Peter Dilling, Mt. Pleasant, and Sallie B. Huguenin, Folly Beach, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Sep. 12, 1996, Ser. No. 712,907

Int. Cl.^{6} D06P *1/48;1/50*

U.S. Cl. 8—524 **11 Claims**



1. A method for preparing a dyestuff composition comprising combining a dye cake and a lignin dispersant selected from the group of sulfonated lignins and sulfomethylated lignins, wherein the lignin dispersant is prepared by subjecting a lignin material recovered from black liquor from an alkaline wood pulping process to a treatment for removal of the portion thereof which has a molecular weight of less than 3,000 and reacting the remaining lignin with sodium sulfite and formaldehyde.

5,749,927

CONTINUOUS PROCESS TO PRODUCE LITHIUM-POLYMER BATTERIES

Terry Song-Hsing Chern, Midlothian, Va.; David Gerard Keller, Baltimore, and Kenneth Orville MacFadden, Highland, both of Md., assignors to W. R. Grace & Co. -Conn., New York, N.Y.

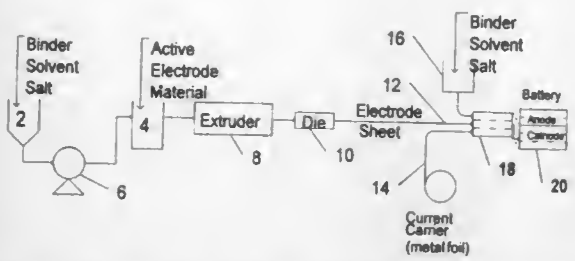
Filed May 24, 1996, Ser. No. 653,172

Int. Cl.^{6} H01M *10/40*

U.S. Cl. 29—623.5 **13 Claims**

1. A process for forming a solid polymer electrolyte-electrode product comprising the step of:

extruding a mixture of a solid active electrode material with a solid polymer electrolyte composition to provide an extruded composite; and



coating the composite with a layer of a solid polymer separator.

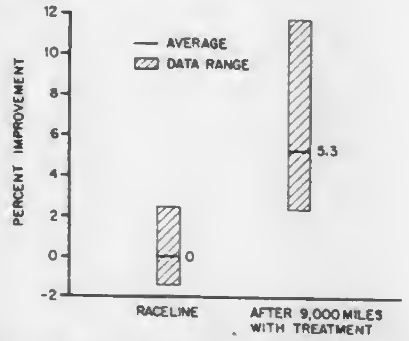
5,749,928
METHOD FOR REDUCING EMISSIONS FROM OR INCREASING THE UTILIZABLE ENERGY OF FUEL FOR POWERING INTERNAL COMBUSTION ENGINES

W. Robert Epperly, New Canaan; Barry N. Sprague, Bethlehem, both of Conn.; Danny T. Kelso, Houston, Tex., and Wayne E. Bowers, North Vassalboro, Me., assignors to Platinum Plus, Inc., Stamford, Conn.

Continuation of Ser. No. 439,697, May 12, 1995, abandoned, and a continuation-in-part of Ser. No. 897,869, Aug. 19, 1986, Pat. No. 4,891,050, and a continuation of Ser. No. 120,651, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 896,896, Jun. 10, 1992, abandoned, which is a continuation of Ser. No. 794,329, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 291,245, Dec. 28, 1988, abandoned, said Ser. No. 439,097 is a continuation-in-part of Ser. No. 897,864, Aug. 19, 1986, Pat. No. 4,892,562, which is a continuation-in-part of Ser. No. 796,428, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,954, Dec. 4, 1984, abandoned, and a continuation-in-part of Ser. No. 790,738, Oct. 24, 1985, abandoned, said Ser. No. 897,869 is a continuation-in-part of Ser. No. 796,428, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,954, Dec. 4, 1984, abandoned, and a continuation-in-part of Ser. No. 790,738, Oct. 24, 1985, abandoned. This application Feb. 14, 1996, Ser. No. 601,530

Int. Cl.^{6} C10L *1/30*

U.S. Cl. 44—358 **37 Claims**



1. A method for improving the operation of the post-combustion pollution control device installed on a fuel-powered vehicle, the method comprising admixing with the fuel an additive which comprises a platinum group metal composition.

5,749,929
FUEL ADDITIVE COMPOSITIONS CONTAINING AROMATIC ESTERS OF POLYALKYLPHENOXYALKANOLS AND POLY (OXYALKYLENE) AMINES

Richard E. Cherpeck, Cotati; Jack E. Morris, El Cerrito, and Majid R. Ahmadi, Pinole, all of Calif., assignors to Chevron Chemical Company, San Ramon, Calif.

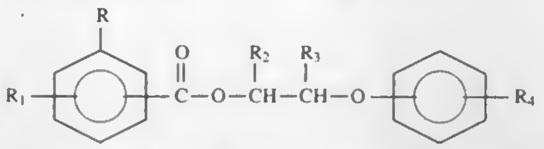
Continuation-in-part of Ser. No. 647,486, May 14, 1996, Pat. No. 5,618,320. This application Apr. 7, 1997, Ser. No. 833,463

Int. Cl.^{6} C10L *1/22;1/18*

U.S. Cl. 44—387 **85 Claims**

1. A fuel additive composition comprising:

(a) an aromatic ester compound of the formula:



(I)

or a fuel soluble salt thereof, wherein R is hydroxy, nitro or —$(CH_2)_x$—NR_5R_6, wherein R_5 and R_6 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms and x is 0 or 1;

R_1 is hydrogen, hydroxy, nitro or —NR_7R_8, wherein R_7 and R_8 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms;

R_2 and R_3 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms; and

R_4 is a polyalkyl group having an average molecular weight in the range of about 450 to 5,000; and

(b) a poly(oxyalkylene) amine having at least one basic nitrogen atom and a sufficient number of oxyalkylene units to render the poly(oxyalkylene) amine soluble in hydrocarbons boiling in the gasoline or diesel fuel range.

5,749,930
MIST COLLECTOR ARRANGEMENT FOR GAS WASHERS

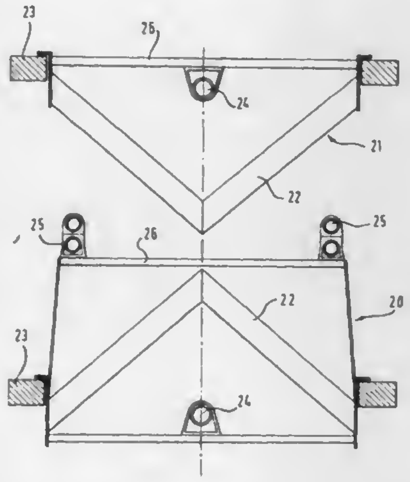
Hubert Wolf, Meerbusch, Germany; Siegfried Bulang, GL Kerkrade, Netherlands, and Olaf Cohrs, Blatzheim-Kerpen, Germany, assignors to Munters Euroform GMBH, Aachen, Germany

Filed Jun. 5, 1996, Ser. No. 658,265

Claims priority, application Germany, Jun. 10, 1995, 195 21 178.2

Int. Cl.^{6} B01D *45/08*

U.S. Cl. 55—242 **6 Claims**



1. A mist collector arrangement for gas washers, comprising, in gas flow direction, a downstream and an upstream mist collector layer consisting of at least one row of mist collector profiles positioned in the form of a V or of an inverse V, respectively, wherein a respective row of the downstream and upstream mist collector layers are arranged one behind the other in gas flow direction without mutual lateral offset, and a rinsing means for the periodical rinsing of the flow-on and flow-off sides of both mist collector layers, wherein the profiles of the successively arranged rows of the downstream and upstream mist collector layers are oppositely arranged with respect to one another in gas flow direction.

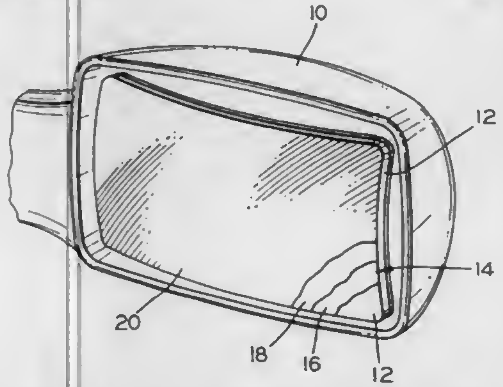
5,749,931
COATINGS ON GLASS

Ronald D. Goodman, Toledo; Michel J. Soubeyrand, Holland, both of Ohio, and Timothy Jenkinson, Wigan, England, assignors to Libbey-Owens-Ford Co., Toledo, Ohio, and Pilkington PLC, England

Continuation-in-part of Ser. No. 87,329, Jul. 8, 1993, Pat. No. 5,505,989. This application Jun. 7, 1995, Ser. No. 471,909

Int. Cl.^{6} C03C *17/00;25/02*

U.S. Cl. 65—60.1 **16 Claims**



1. A method of producing mirrors including depositing onto a ribbon of hot float glass during travel thereof through the float bath section of a float glass production line a coating comprising, in sequence, at least one pyrolytic reflecting layer, and at least two reflection enhancing layers, the outer of which is tin oxide whereby the mirrors exhibit a bright silver or chrome appearance and have a visible light reflection of at least 45% and less than 70%.

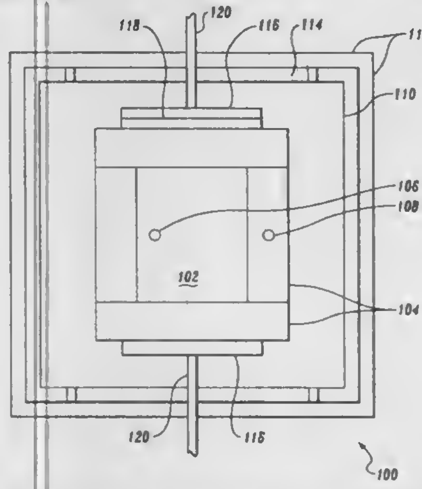
5,749,932
REFRACTORY ELECTRODES FOR JOULE HEATING AND METHODS OF USING SAME

David A. Lamar, West Richland; Chris C. Chapman, Richland, and Michael L. Elliott, Kennewick, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Mar. 29, 1996, Ser. No. 625,021

Int. Cl.^{6} C03B *5/027;5/03*

U.S. Cl. 65—135.7 **22 Claims**



1. An electrode for melting glass or ceramic materials, said electrode, comprising:

(a) at least one electrically conductive metal oxide wherein the metal of the metal oxide is selected from the group of chrome, rhodium, ruthenium, and combinations thereof, said at least one electrically conductive metal oxide present in an amount of at most about 91.2 wt %; and

(b) a balance of substantially at least one other metal oxide, the electrode having an AC resistivity of less than or about 10 ohm-cm at about 1200° C. said AC electrical resistivity decreasing with increasing temperature.

5,749,933
APPARATUS AND METHOD FOR PRODUCING GLASS FIBERS

Sureshcbandra Chintaman Ghorpade; Jack Everett Chittum, both of Littleton, Colo., and Mark Anthony Romero, Tucson, Ariz., assignors to Johns Manville International, Inc., Denver, Colo.

Filed Mar. 28, 1996, Ser. No. 623,495

Int. Cl.^{6} C03B *37/095;5/44;37/10*

U.S. Cl. 65—511 **27 Claims**

1. An improved apparatus for making glass fibers comprising a bushing for holding molten glass with orifices in said bushing for extruding said molten glass into beads and streams for forming glass fibers, cooling members for cooling said molten glass as it exits said orifices to form beads or cones and fibers, the improvement comprising said cooling members having parts thereof of alloys selected from the group consisting of alloys of palladium containing a minor amount of iridium and alloys of palladium containing a minor amount of nickel.

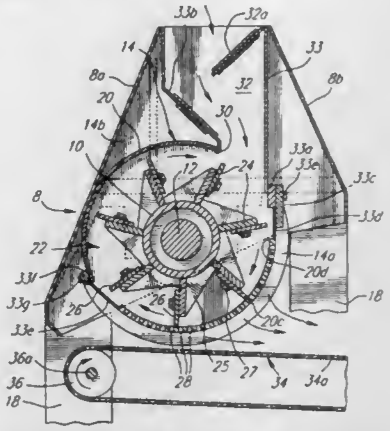
5,749,934
PEAT BASED COMPOSITIONS

Leon-Etienne Parent, 4480-L, Rue des Bosquets St.-Augustin de Desmaures, Quebec, Canada, G3A 1C2; Alexandre Mailloux, 1428 Labrie Longueuil, Quebec, Canada, J4G 2K1, and Bruno Breton, 8521 des Harfangs Levis, Quebec, Canada, G6V 8S9

Filed May 14, 1996, Ser. No. 645,990

Int. Cl.^{6} C05F *11/02*

U.S. Cl. 71—24 **13 Claims**



1. In a process for making a peat based fertilizer comprising a mixing stage wherein a peat material is mixed with an added source of nitrogen so as to form a mixture thereof, the improvement wherein said peat material is a peat material having a pH of 3.0 to 6.0 after equilibration in solution of KCl 1N, and a humification value of H4 or more on the Von Post humification scale, and said added source of nitrogen consists of one of urea, diammonium phosphate, monoammonium phosphate and ammonia.

5,749,935
MANGANESE FERTILIZER

Hisao Takehara, Tokyo; Ryoichi Shimizugawa, and Toshihiko Tokai, both of Takaoka, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd., Tokyo, Japan

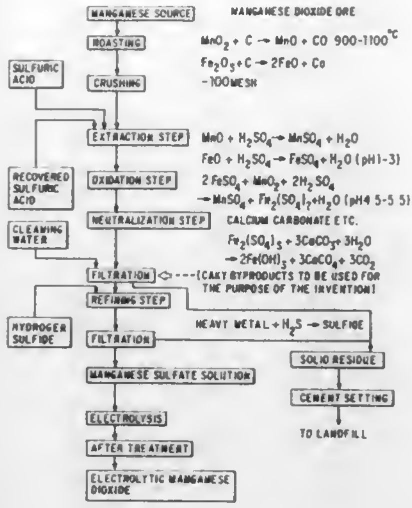
Filed Aug. 8, 1994, Ser. No. 286,194

Claims priority, application Japan, May 25, 1994, 6-111458

Int. Cl.^{6} C05D *1/00*

U.S. Cl. 71—62 **4 Claims**

1. An inorganic fertilizer which contains solid residue including citric acid-soluble manganese (C—MnO) and water-soluble manganese (W—MnO), left after removing manganese content from a source of manganese by extraction, which is one of the steps in the course of manufacturing electrolytic manganese dioxide, SiO_2.



Al_2O_3 and Fe_2O_3, said inorganic fertilizer comprising 3 to 20 wt % of said citric acid-soluble manganese (C—MnO) and 0.5 to 7.0 wt % of said water-soluble manganese (W—MnO), wherein said citric acid-soluble manganese and said water-soluble manganese are byproducts produced in the course of manufacturing electrolytic manganese dioxide, and

wherein the wt % of said citric acid-soluble manganese and said water-soluble manganese is regulated by controlling said manufacturing parameters.

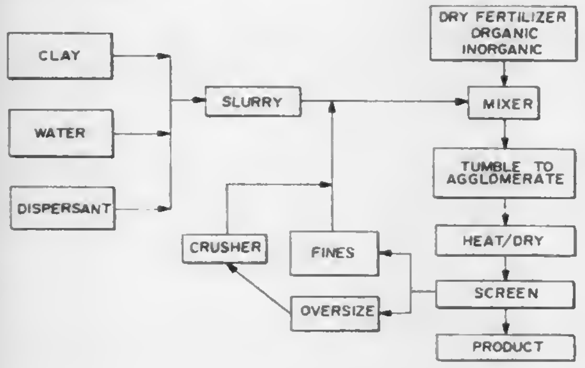
5,749,936
METHOD OF PRODUCING DRY GRANULAR FERTILIZER AND SOIL AMENDMENTS USING CLAY SLURRY AND DRY CHEMICALS

Robert D. Humphries, Edgewood, Md.; Delbert R. Dreese, Etters, Pa.; Louis L. Taylor, West Friendship, and Dennis Clay Parker, Sparks, both of Md., assignors to A.J. Sackett and Sons Company, Baltimore, Md.

Filed Jun. 7, 1996, Ser. No. 657,591

Int. Cl.^{6} A01N *25/00*

U.S. Cl. 71—64.05 **14 Claims**



14. The method of producing a homogeneous dry granular fertilizer comprising the steps of:

providing an aqueous solution of a dispersant,

adding a quantity of clay to the aqueous dispersant and mixing to produce a slurry having at least 12% by weight of clay, the clay being selected from the group consisting of palygorskite, attapulgite and sepiolite,

intimately mixing the slurry with dry, particulate fertilizer, wherein the dry particles are coated with the slurry,

tumbling the coated particles to agglomerate the particles into granules,

drying the granules and

screening the granules.

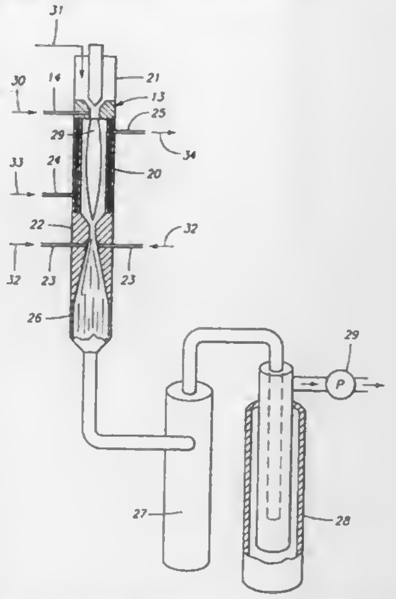
5,749,937
FAST QUENCH REACTOR AND METHOD

Brent A. Detering; Alan D. Donaldson; James R. Fincke, and Peter C. Kong, all of Idaho Falls, Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Mar. 14, 1995, Ser. No. 404,395

Int. Cl.^{6} C22B *4/06;4/08*

U.S. Cl. 75—10.19 **57 Claims**



1. A fast quench reactor for thermal conversion of one or more reactants in a thermodynamically stable high temperature gaseous stream to a desired end product in the form of a gas or ultrafine solid particles, comprising:

a reactor chamber having axially spaced inlet and outlet ends along a reactor axis;

a high temperature heating means positioned at the inlet end of the reactor chamber;

a reactant stream inlet for introducing a stream comprising at least one reactant within the reactor chamber where said stream is heated by said high temperature heating means to produce a hot gaseous stream flowing axially toward the outlet end of the reactor chamber;

the reactor chamber having a predetermined length sufficient to effect heating of the reactant stream by the high temperature heating means to a selected equilibrium temperature at which a desired end product is available within the reactant stream as a thermodynamically stable reaction product at a location adjacent the outlet end of the reaction chamber;

a convergent-divergent nozzle located coaxially within the outlet end of the reactor chamber for rapidly cooling the gaseous stream by converting thermal energy to kinetic energy as a result of adiabatic and isentropic expansion as the gaseous stream flows axially through the nozzle; and

a cool down chamber leading from the nozzle for retaining the desired end product within the flowing gaseous stream, and wherein the nozzle and cool down chamber are designed to minimize back reactions.

5,749,938
PRODUCTION OF POWDER

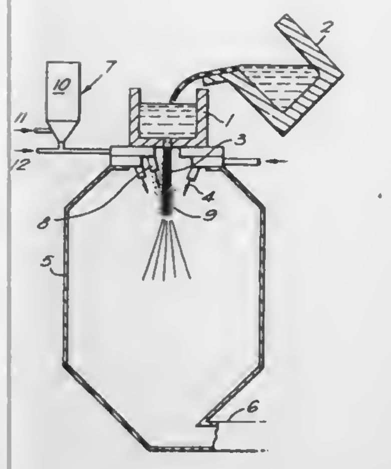
Jeffrey Stuart Coombs, West Glamorgan, United Kingdom, assignor to FHE Technology Limited, United Kingdom

Continuation of Ser. No. 495,477, Sep. 15, 1995, abandoned. This application Jul. 18, 1997, Ser. No. 896,719

Claims priority, application United Kingdom, Feb. 6, 1993, 9302387

Int. Cl.^{6} B22F *1/02*

U.S. Cl. 75—332 **14 Claims**



5. A method of producing flux coated metal or metal alloy powder comprising atomizing a stream of molten metal or metal alloy to form a spray of molten droplets, introducing into said stream or spray a material comprising a mixture of potassium fluoride and aluminium fluoride in molten or particulate form and which is of different composition and is substantially immiscible and insoluble in said molten metal or metal alloy, contacting said introduced material with the stream of molten metal or the molten and/or solidifying metal droplets of the spray such that a film of molten material spreads around the surface of the metal droplets providing a flux coating for said metal, and solidifying the material and droplets during flight to form said flux coated metal or metal alloy powder.

5,749,939
MELTING OF NI LATERITE IN MAKING NI ALLOYED IRON OR STEEL

David M. Kundrat, Cincinnati, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Dec. 4, 1996, Ser. No. 760,363

Int. Cl.^{6} C21C *5/00*

U.S. Cl. 75—560 **31 Claims**

25. A method of producing a nickel-chromium-alloyed ferrous bath in a refining reactor, comprising:

providing a chromium-alloyed iron/slag bath mixture containing a dissolved metalloid and carbon within the reactor,

the metalloid from the group consisting of aluminum, silicon and calcium carbide,

the reactor including means for top-blowing the bath mixture and means for bottom-stirring the bath mixture,

charging Ni laterite ore into the bath mixture,

injecting oxygen gas through the blowing means and oxygen-containing gas through the stirring means to oxidize the metalloid and the carbon, and to vigorously stir the bath mixture until the Ni laterite ore is melted thereby forming a chromium-nickel-alloyed ferrous bath, a portion of the oxygen gas being discharged above or into the bath mixture to effect post-combustion of CO and H_2 and the remainder of the oxygen gas being injected into the bath mixture to effect the oxidation of the carbon and the metalloid,

injecting an inert gas through the stirring means,

charging a sulfur-bearing Ni concentrate and aluminum into the ferrous bath whereby the inert gas is continued until sulfur is transferred to the slag from the ferrous bath,

discharging the sulfur-containing slag from the reactor, and

injecting the oxygen-containing gas through the stirring means, if necessary, to decarburize the ferrous bath until reaching a final carbon specification, and

charging additional of the metalloid and injecting the inert gas through the stirring means into the ferrous bath to recover Cr from the slag and to transfer sulfur to the slag wherein the ferrous bath contains ≤ 0.03 wt. % S.

5,749,940
METHOD FOR PRODUCING HIGH GRADE REDUCED SILVER

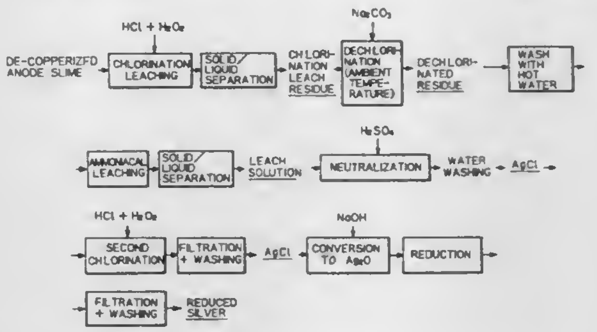
Katutoshi Narita, Ibaraki, Japan, assignor to Nippon Mining & Metals Co., Inc., Tokyo, Japan

Filed Mar. 11, 1997, Ser. No. 814,235

Claims priority, application Japan, May 27, 1996, 8-131928

Int. Cl.^{6} C22B *11/00*

U.S. Cl. 75—711 **6 Claims**



1. A method for producing high-grade reduced silver from a crude silver chloride, which is prepared by chlorination leaching of a de-copperized anode slime, comprising the steps of:

adding hydrochloric acid and hydrogen peroxide to a liquor which contains the de-copperized anode slime, and separating a first chlorination leach residue and a first chlorination leach solution from one another;

adding sodium carbonate to the first chlorination leach residue at ambient temperature, thereby dechlorinating the first chlorination leach residue and separating a dechlorinated residue and a leach solution from one another;

adding ammonia to the dechlorinated residue, and separating a leach residue and an ammoniacal leach solution from one another;

adding sulfuric acid to the ammoniacal leach solution to neutralize the ammoniacal-leach solution and precipitating mainly silver chloride;

adding hydrochloric acid and hydrogen peroxide to the precipitate, and separating a second chlorination-leach residue which essentially consists of silver chloride, and a second chlorination leach solution, from one another;

obtaining a slurry of the second chlorination-leach residue;

adding sodium hydroxide to the slurry of the second chlorination-leach residue to convert the silver chloride to silver oxide (I); and,

adding a reductant, such as reducing sugar or hydrazine to reduce silver oxide (I) in the slurry to silver.

5,749,941
METHOD FOR GAS ABSORPTION ACROSS A MEMBRANE

Albert Edward Jansen, Houten, and Paul Hubert Maria Feron, Zeist, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, Delft, Netherlands

PCT No. PCT/NL95/00116, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO95/26225, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 24, 1995, Ser. No. 716,159

Claims priority, application Netherlands, Mar. 25, 1994, 9400483; Jul. 27, 1994, 9401233

Int. Cl.^{6} B01D *53/22;53/14*

U.S. Cl. 95—44 **23 Claims**

1. Method for the absorption of one or more gaseous components from a gas phase in a membrane system, in that the gas phase with the component(s) to be absorbed present therein is brought into contact with a liquid phase, wherein the gas phase and the liquid phase are separated by a hydrophobic membrane, and the gaseous components are absorbed into said liquid phase through

the hydrophobic membrane and then removed from the membrane system while absorbed in said liquid phase, wherein

- the gaseous components are chosen from carbon dioxide and/or hydrogen sulfide;
- the membranes are composed of polypropene, polyethene, polyvinylidene fluoride or polysulfone;
- the liquid phase comprises water and a water-miscible and/or water-soluble absorbent;
- the liquid phase has a surface tension at 20° C. of more than 60×10^{-3} N/m;
- the liquid phase does not give rise to any leakage from the membrane or is effective in preventing or counteracting leakage from the membrane;

with the proviso that the liquid phase is not an aqueous solution consisting solely of monoethanolamine (MEA) and water.

5,749,942

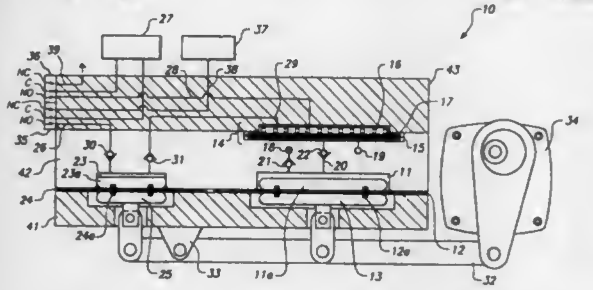
APPARATUS FOR EXTRACTING A GAS FROM A LIQUID AND DELIVERING THE GAS TO A COLLECTION STATION

John Seymour Mattis, Sunnyvale, and David C. Bliven, San Jose, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 14, 1997, Ser. No. 798,283

Int. Cl.^{6} B01D *19/00;53/22*

U.S. Cl. 95—46 **20 Claims**



1. A method for extracting dissolved gas from a gas-containing liquid and delivering the extracted gas to a collection station, comprising the steps of:

- (a) providing an external reservoir of a gas-containing liquid having at least one gas dissolved therein;
- (b) providing a separation cell partitioned into a feed chamber and a permeate chamber by a permselective membrane which permits the at least one gas to diffuse thereacross but is substantially impermeable to the gas-containing liquid;
- (c) circulating the gas-containing liquid between the external reservoir and the feed chamber, the circulating action being provided by a liquid pumping chamber wherein
  - (i) an elastic first diaphragm forms a wall of the liquid pumping chamber; and
  - (ii) a reciprocable first actuator is attached to the first diaphragm, the first actuator pressing the first diaphragm inwardly during its forward stroke and pulling the first diaphragm outwardly during its reverse stroke;
- (d) permitting the at least one gas to diffuse across the permselective membrane and collect in the permeate chamber as extracted gas;
- (e) circulating the extracted gas between the permeate chamber and a collection station, the pumping action being provided by a gas pumping chamber wherein
  - (i) an elastic second diaphragm forms a wall of the gas pumping chamber; and
  - (ii) a reciprocable second actuator is attached to the second diaphragm, the second actuator pressing the second diaphragm inwardly during its forward stroke and pulling the second diaphragm outwardly during its reverse stroke;

wherein the reciprocating action of the first and second reciprocable actuators is provided by a lever-and-fulcrum combination in which the lever is connected to the first and second reciprocable actuators such that rocking the lever causes a reciprocating action in the first and second actuators, with the first actuator being in its forward stroke when the second actuator is in its reverse stroke and vice-versa; the rocking action of the lever being provided by a drive means for rocking the lever.

5,749,943

METHOD OF SELECTIVELY SEPARATING UNSATURATED HYDROCARBON

Akira Shimazu; Kenichi Ikeda, and Hisao Hachisuka, all of Osaka, Japan, assignors to Petroleum Energy Center, Tokyo, Japan

Filed Feb. 22, 1996, Ser. No. 605,357

Claims priority, application Japan, Feb. 27, 1995, 7-038851; Sep. 11, 1995, 7-232413; Sep. 11, 1995, 7-232426

Int. Cl.^{6} B01D *53/22*

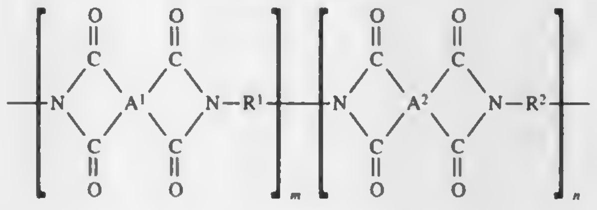
U.S. Cl. 95—50 **5 Claims**

1. A method of selectively separating olefin from a mixed gas of olefin and saturated hydrocarbon, comprising the steps of:

contacting said mixed gas onto one surface of a membrane comprising a polyimide resin, which comprises fluorine, as a main component;

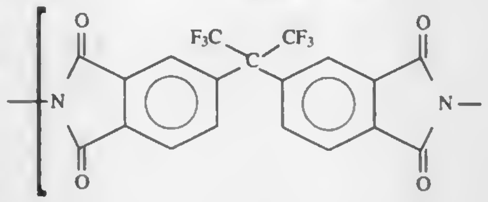
wherein the polyimide resin comprises a repeating molecular unit selected from at least one of the following Chemical Formula A and Formula B as a main component:

Chemical Formula A



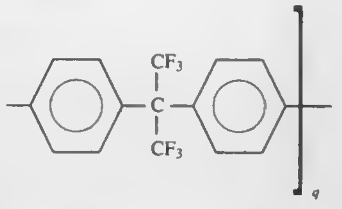
where A^1 and A^2 are tetravalent organic groups selected from the group consisting of aromatic, alicyclic and aliphatic hydrocarbon groups, said aromatic hydrocarbon group having one to four five-membered or six-membered rings which bond with each other directly or via a bivalent organic or inorganic group, said alicyclic hydrocarbon group having four to eight carbon atoms, said aliphatic hydrocarbon group having four to six carbon atoms; R^1 and R^2 are bivalent groups selected from the group consisting of aromatic hydrocarbon groups, alicyclic hydrocarbon groups, aliphatic hydrocarbon groups and bivalent organic groups in which said bivalent aromatic, alicyclic or aliphatic hydrocarbon groups are coupled with bivalent organic coupling groups, said aromatic hydrocarbon groups having one to four five-membered or six-membered rings which bond with each other directly or via a bivalent organic or inorganic group, said alicyclic hydrocarbon group having four to eight carbon atoms, said aliphatic hydrocarbon group having two to six carbon atoms; at least one organic group selected from the group consisting of A^1, A^2, R^1 and R^2 comprises at least three fluorine atoms; and m and n indicate a degree of polymerization and are positive natural numbers,

Chemical Formula B



-continued

Chemical Formula B



where q indicates a degree of polymerization and is a positive natural number, and

permeating said olefin through said membrane, thus separating said olefin from said saturated hydrocarbon,

wherein a solubility coefficient ratio between the olefin and the saturated hydrocarbon at 25° C. and 50 Torr is 1.2 or more when absorption of hydrocarbon to the polyimide resin that comprises fluorine is in equilibrium.

5,749,944

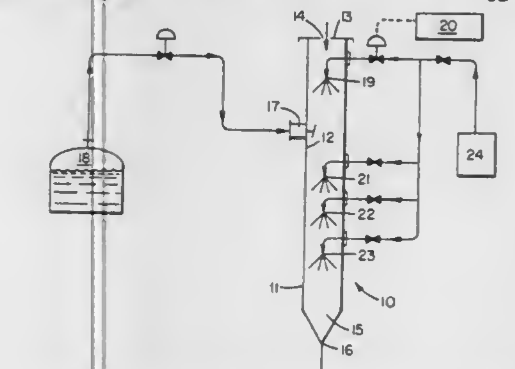
PROCESS AND APPARATUS FOR THE REMOVAL OF DIMETHYL ESTER VAPORS OR PARTICLES EMITTED DURING THE STORAGE OF DIMETHYL ESTERS

Elliott Will Henry Johnson; Robert Wellington Stepp, III, and William L. Cook, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 11, 1997, Ser. No. 814,372

Int. Cl.^{6} B01D *47/06*

U.S. Cl. 95—150 **12 Claims**



1. A method for removing dimethyl ester vapors or particles emitted from a molten dimethyl ester storage tank comprising the step of contacting a gaseous mixture containing dimethyl ester vapors or particles and an inert gas with air and water to form a foamy mixture of dimethyl ester, air and water thereby separating the dimethyl ester from the gaseous mixture.

5,749,945

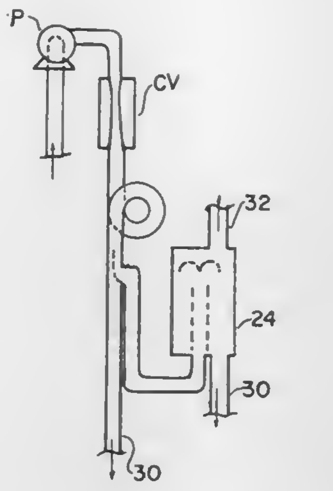
APPARATUS FOR RAPIDLY DEGASSING AND DECONTAMINATING LIQUIDS

Earl Joseph Beck, 125 Feliz Dr., Oak View, Calif. 93022

Filed Jul. 22, 1996, Ser. No. 684,826

Int. Cl.^{6} B01D *19/00*

U.S. Cl. 95—248 **9 Claims**



1. A decontamination process for removing micro-bubbles of dissolved gasses and contaminants contained within a liquid flow, comprising the steps of:

- (a) moving the flow through a venturi at a sufficient pressure and velocity to combine the micro-bubbles of gasses and contaminants into a multiplicity of coalesced bubbles, the venturi comprising an entrance integrated with a middle throat and diffuser end section, whereby the coalesced bubbles form in the throat and diffuser end section of the venturi, such that an exit flow from the venturi has a measurably decreased concentration of the micro-bubbles of gasses and contaminants when compared to the concentration at said entrance;
- (b) concentrating the coalesced bubbles into a separate stream contained within a predetermined region of the venturi exit flow by directionally accelerating the venturi exit flow with a centrifugal separator;
- (c) breaking the coalesced bubbles contained within the stream by impinging the coalesced bubbles against a surface, thereby releasing the gasses and contaminants;
- (d) exposing the gasses and contaminants to a vacuum; and
- (e) guiding the flow through a disposal duct.

5,749,946

ANTICORROSIVE PIGMENT PREPARATION CONTAINING METAL OXIDE-COATED PLATELET ADJUVANT

Ralf Glausch, Darmstadt; Georg Reinhard, Dresden; Renate Jircik, Dresden, and Ursula Rammelt, Dresden, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Germany

Filed May 3, 1996, Ser. No. 642,267

Int. Cl.^{6} C04B *9/02*

U.S. Cl. 106—14.17 **13 Claims**

1. A pigment preparation comprising an organic binder containing

- (i) 10–80% by wt. of a platelet-shaped substrate coated with a metal oxide, and
- (ii) 20–90% by wt. of an active pigment.

5,749,947

USE OF GUANIDINIUM SALTS OF UNSATURATED FATTY ACIDS AS CORROSION INHIBITORS

Juergen Geke, Duesseldorf; Horst-Dieter Speckmann, Langenfeld; Bernd Stedry, Kempen, and Alfred Westfechtel, Hilden, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/03931, § 371 Date Apr. 14, 1997, § 102(e) Date Apr. 14, 1997, PCT Pub. No. WO96/12054, PCT Pub. Date Apr. 25, 1996

PCT Filed Oct. 5, 1995, Ser. No. 817,458

Claims priority, application Germany, Oct. 14, 1994, 44 36 764.3

Int. Cl.^{6} C09D *5/08;* **C23F** *11/14;11/10*

U.S. Cl. 106—14.42 **20 Claims**

1. A method for protection of metal surfaces from corrosion which comprises applying to the metal surface to be protected guanidinium salts of unsaturated fatty acids containing 6 to 44 carbon atoms.

5,749,948

EXPANDABLE, FLAME-RETARDANT COATING COMPOSITIONS

Guido Scholz, Cologne, and Wolf-Dieter Pirig, Euskirchen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 644,586, May 10, 1996, abandoned, which is a continuation of Ser. No. 350,821, Dec. 7, 1994, abandoned. This application Jan. 7, 1997, Ser. No. 779,427

Claims priority, application Germany, Dec. 21, 1993, P 43 43 668.4

Int. Cl.^{6} C09D *5/18;* **C09K** *21/10;21/12*

U.S. Cl. 106—18.15 **4 Claims**

1. An expandable, flame-retardant coating composition comprising:

from 4 to 25% by weight of a film forming binder selected from the group consisting of a vinyl acetate-vinyl ester copolymer, an anionic, aliphatic polyester-polyurethane, a styrene-acrylate copolymer, a homopolymer based on vinyl acetate, and mixtures thereof;

from 10 to 40% by weight of ammoniumpolyphosphate;

from 8 to 40% by weight of at least one substance which is carbonized under the effect of heat and which contains an ammonium salt of a mono- or dialkylphosphate or mixture thereof;

from 6 to 25% by weight of expansion agent;

from 0 to 25% by weight of fillers; and

from 0 to 5% by weight of dispersants.

5,749,949

ANTI-ABRASION INK ADDITIVES AND PRINTING INKS CONTAINING SUCH ADDITIVES

Bruce Tavares, Blairstown, N.J., assignor to Rheox, Inc., Hightstown, N.J.

Filed Nov. 27, 1996, Ser. No. 758,069

Int. Cl.^{6} C09D *11/02;11/12*

U.S. Cl. 106—313 **17 Claims**

16. An ink formulation containing from about 0. 1 % to 10% by weight of an anti-abrasion additive comprising:

a) about 40 to 70 parts by weight of irradiated sintered polytetrafluoroethylene; and

b) about 30 to 60 parts by weight of one or more pharmaceutical grade petrolatums.

5,749,950

INK AND COATING COMPOSITIONS CONTAINING SILICON-TREATED CARBON BLACK

Khaled Mahmud, Tyngsboro; James A. Belmont, Acton; Curtis E. Adams, Watertown, all of Mass., and John K. Foster, Windham, N.H., assignors to Cabot Corporation, Boston, Mass.

Division of Ser. No. 663,693, Jun. 14, 1996. This application Jan. 28, 1997, Ser. No. 789,984

Int. Cl.^{6} C09D *11/00*

U.S. Cl. 106—316 **21 Claims**

1. An ink composition comprising an aggregate comprising a carbon phase and a silicon-containing species phase and an aqueous or non-aqueous vehicle.

5,749,951

INK COMPOSITION FOR COLOR INK JET RECORDING AND RECORDING METHOD WITH THE SAME

Etsuko Yoshiike; Kiyohiko Takemoto, and Kazuhide Kubota, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,412

Claims priority, application Japan, Apr. 19, 1995, 7-094014; Apr. 5, 1996, 8-083638

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—31.27 **9 Claims**

1. A set of ink compositions for color ink jet recording each containing at least a dye, a water-soluble high boiling low volatility organic solvent and water, comprisinng in combination a magenta ink composition having C.I. Direct Red 227 incorporated therein as a dye in an amount of from 0.3 to 3.5% by weight, a yellow ink composition having a 1:3 to 3:1 mixture by weight of C.I. Direct Yellow 86 and C.I. Direct Yellow 132 incorporated therein as a dye in an amount of from 0.3 to 3.0% by weight, and a cyan ink composition having a dye selected from the group consisting of C.I. Direct Blue 86 and C.I. Direct Blue 199 incorporated therein as a dye in an amount of from 1.0 to 4.0% by weight.

5,749,952

PREPARATION OF MICROEMULSION AND MICELLAR COLOR INKS FROM MODIFIED WATER-SOLUBLE COLOR CHROMAPHORES FOR THERMAL INK-JET PRINTING

Joseph W. Tsang, and John R. Moffatt, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1996, Ser. No. 742,097

Int. Cl.^{6} C09D *11/00*

U.S. Cl. 106—31.64 **24 Claims**

1. A thermal ink-jet ink for thermal ink-jet printing comprising:

(a) a vehicle comprising (1) about 0.1 to 50 wt % of at least one substantially water-insoluble organic oil, (2) 0 to about 50 wt % of at least one organic cosolvent, (3) 0 to about 40 wt % of at least one amphiphile, and (4) 0 to about 3 wt % of at least one high molecular weight colloid;

(b) about 0.5 to 20 wt % of at least one macromolecular chromophore comprising a chemically-modified, water-soluble pigment; and

(c) the balance water, wherein said ink exists as a microemulsion of said components, said microemulsion comprising a swelled micellar phase and a bulk water-rich phase, and wherein said macromolecular chromophore is dissolved in said bulk water-rich phase.

5,749,953

HIGH SHEAR ASPHALT COMPOSITIONS

Michael P. Doyle, Phoenix, Ariz., assignor to Vinzoyl Technical Services, LLC, Tempe, Ariz.

Filed Jan. 17, 1996, Ser. No. 587,964

Int. Cl.^{6} C08L *95/00;* **C09D** *195/00*

U.S. Cl. 106—273.1 **18 Claims**

1. An asphalt composition comprising the reaction product of a mixture comprising an asphalt component containing naturally-occurring asphaltic acids and a strong base, said mixture being substantially free of added sources of resin acids and fatty acids, which mixture has been blended with high shear for a sufficient period of time to saponify at least a major portion of said naturally-occurring asphaltic acids.

2. An asphalt composition comprising the reaction product of a mixture comprising an asphalt component containing naturally-occurring asphaltic acids and a strong base, said mixture being substantially free of added sources of resin acids and fatty acids, which mixture has been blended with high shear for at least about 30 minutes, so as to saponify at least a portion of said naturally-occurring asphaltic acids.

5,749,954

PERLITE-BASED INSULATION BOARD

David Chee-Fai Law; Christopher Paul Sandoval, and Ruben G. Garcia, all of Littleton, Colo., assignors to Johns Manville International, Inc., Denver, Colo.

Filed Jul. 15, 1996, Ser. No. 680,091

Int. Cl.^{6} D21H *17/28;17/66;* **D21J** *1/00*

U.S. Cl. 106—282 **15 Claims**

1. A perlite-based insulation board comprising:

between about 50% and about 76% by dry weight expanded, perlite;

between about 15% and about 45% by dry weight fibers wherein between about 50% and about 95% by dry weight of said fibers are recycled newsprint fibers and between about 5% and about 50% by dry weight of said fibers are virgin cellulose fibers which have not been subjected to chemical pulping to remove lignin;

about 1% to about 5% by dry weight binder;

about 2% to about 9% by dry weight bituminous material; and

about 0% to about 3% by dry weight alum.

5,749,955

CLAY ACTIVATION WITH METAL SALTS

Dov Shaked, Buffalo Grove, Ill.; Amos Banin, Rehovot, Israel; William F. Moll, Crystal Lake, and Iwona M. Aguilar, Forest View, both of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Jun. 28, 1995, Ser. No. 495,847

Int. Cl.^{6} C04B *33/13*

U.S. Cl. 106—287.17 **17 Claims**

1. A method for producing a bleaching clay which comprises combining an attapulgite-smectite mixture with a metal salt that is a Lewis acid in an amount sufficient to increase the amount of available surface acid sites present in the attapulgite-smectite mixture.

7. A method for producing a bleaching clay which comprises combining a smectite-opal mixture with a metal salt that is a Lewis acid in an amount sufficient to increase the amount of available surface acid sites present in the smectite-opal.

9. A method for producing a bleaching clay which comprises combining a clay mineral of hormite group with titanium sulfate in an amount sufficient to increase the amount of available surface acid sites present in the clay mineral.

10. A method for producing a bleaching clay which comprises combining a clay mineral of hormite group with ferrous sulfate in an amount sufficient to increase the amount of available surface acid sites present in the clay mineral.

5,749,956

NON-OZONE DEPLETING CO-SOLVENT COMPOSITIONS AND ADHESIVE PROMOTER COMPOSITIONS BASED THEREON

Edward Fisher, Rocky Hill, and Ju-Chao Liu, West Hartford, both of Conn., by Tehyi Lui, his legal representative, assignors to Loctite Corporation, Hartford, Conn.

Filed Aug. 2, 1996, Ser. No. 691,598

Int. Cl.^{6} C09D *5/00*

U.S. Cl. 106—287.28 **9 Claims**

1. A non-ozone depleting, non-flammable adhesive promoter composition comprising:

(i) a carrier solution comprising:

(a) a co-solvent solution of a fluorinated first component selected from the group consisting of perfluorocarbons, dihydropolyfluoroalkanes having 5 to 7 carbons, trihydropolyfluoroalkanes having 5 to 7 carbons, parachlorobenzotrifluoride, monochlorotoluene, 3,4-dichlorobenzotrifluoride, perchloroethylene, alpha, alpha, alpha-trifluorotoluene, bromochloroethane and mixtures thereof; and

(b) a aliphatic or aromatic hydrocarbon having from 6 to 20 carbon atoms; and

(ii) an active material which is dispersible or dissolvable in said carrier solution.

5,749,957

EFFECT POWDER COATINGS

Manfred Kieser, Darmstadt; Afred Hennemann, Pfungstadt, and Otto Stahlecker, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Nov. 22, 1995, Ser. No. 561,939

Claims priority, application Germany, Dec. 5, 1994, 44 43 048.5

Int. Cl.^{6} C09C *1/62*

U.S. Cl. 106—403 **21 Claims**

1. A powder coating composition exhibiting a luster effect comprising a powder coating component and from 0.1 to 10% by weight of at least one conductive pigment.

5,749,958

DELAMINATED KAOLIN PIGMENTS THEIR PREPARATION AND USE IN PAPER COATING

Sanjay Behl, Macon, Ga.; Saad Nemeh, West Long Branch, N.J.; Mitchell J. Willis, Macon, Ga., and Joseph P. Berberich, Barnegat, N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 384,973, Feb. 7, 1995, abandoned. This application Jul. 10, 1996, Ser. No. 677,758

Int. Cl.^{6} C04B *14/04*

U.S. Cl. 106—416 **8 Claims**

1. A delaminated kaolin pigment in the form of thin plate-like particles derived from kaolin stacks and consisting essentially of thin platelike particles which are at least 85% finer than 2 micrometers, e.s.d., have an average particle size in the range of 0.55 micrometers to 0.90 micrometers and are less than 10% by weight finer than 0.2 micrometers, said particles having a BET surface area in the range of 9 to m^2/g and a ratio of surface area as measured by Mercury porosimetry to surface area as measured by BET in the range of 0.6 to 0.95, said pigment having a Delamination Index in the range of to 45.

5,749,959

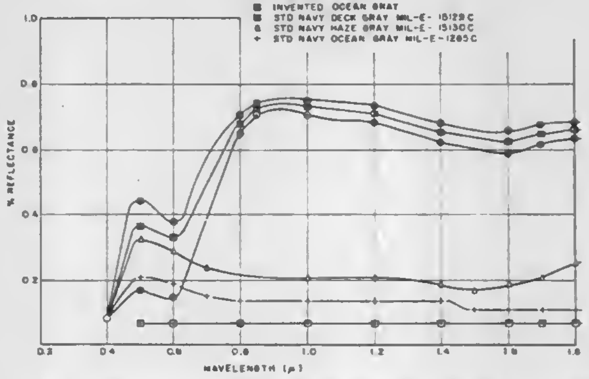
DARK COATING WITH LOW SOLAR INFRARED ABSORBING PROPERTIES

Robert F. Supcoe, and Melvin Greenberg, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1969, Ser. No. 801,237

Int. Cl.^{6} C09C *1/04;* **H01Q** *17/00*

U.S. Cl. 106—428 **4 Claims**



1. An exterior grey paint coating mixture having low solar absorptance and low luminous reflectance comprising:

3 to 24% titanium dioxide, 0–17% zinc oxide, 11–15% fibrous magnesium aluminum silicate, approximately 40–57% alkyd resin, 1–20% antimony trisulfide, 0.7% drier comprising metallic naphthenate and 15–21% thinner having a mineral spirit base.

5,749,960

FORMULATION FOR PRODUCING HEAT INSULATING MATERIAL AND METHOD FOR PRODUCING THE SAME

Vladimir Petrovich Belyayev, Moscow, Russian Federation, assignor to Radva Corporation, Radford, Va.

Filed Mar. 20, 1997, Ser. No. 821,094

Int. Cl.^{6} E04B *1/74*

U.S. Cl. 106—600 **17 Claims**

1. A heat insulating material formed by mixing ingredients comprising:
- a) water glass 35–52% by weight
- b) sodium hydroxide 3–4% by weight
- c) filler 25–36% by weight; and
- d) iron silicon 20–22% by weight.

5,749,961

CONCRETE OR MORTAR RESISTANT TO SPALLING UNDER FIRE ATTACK

Hans Jaklin, Erlenhof, Aacherweg 15, D-5000 Trier, Germany

Continuation of Ser. No. 519,746, Aug. 28, 1995, abandoned, which is a division of Ser. No. 79,266, Jun. 21, 1993, Pat. No. 5,472,497. This application Apr. 10, 1997, Ser. No. 838,828

Claims priority, application Germany, Jun. 20, 1992, 42 20 274.4

Int. Cl.^{6} C04B *28/00*

U.S. Cl. 106—672 **12 Claims**

1. A prefabricated member or part of high strength concrete resistant to spalling under fire attack characterized in that it comprises cement and auxiliary ingredients, said auxiliary ingredients comprising
- 2 to 6% by weight, based on the weight of said cement, of a finely divided precipitated silicic acid having at least 90% by weight SiO_2 or a finely divided precipitated active silicate of magnesium, calcium, barium or aluminum having a BET surface area of from 50 to 200 m^2/g and a $d_{5)}$
- value of below 20 μm; and
- fibers in a concentration of from 0.1 to 0.3 volume percent of the concrete, said fibers being capable of forming capillary pores having a diameter of between 10 μm and 100 μm and a length of between 5 mm and 35 mm.

5,749,962

METHOD OF MAKING CEMENT FROM BASE METAL SMELTER SLAG

David Krofchak, Copper Cliff, Canada, assignor to Fenicem Minerals, Inc., Copper Cliff, Canada

Continuation-in-part of Ser. No. 494,665, Jun. 26, 1995, Pat. No. 5,593,493. This application Nov. 26, 1996, Ser. No. 756,861

Int. Cl.^{6} C04B *7/147;7/153;7/19*

U.S. Cl. 106—714 **4 Claims**

1. A method of making cement from base metal smelter slag produced by a nickel, copper, lead or zinc smelter, said slag containing by weight from about 15 to about 40% silica (SiO_2), from about 35 to about 60% iron oxide (Fe_2O_3), and from about 2 to about 20% calcium oxide (CaO), comprising:
- grinding the slag to a size within the range of from about −250 to about 425 mesh to produce ground slag cement, and mixing the ground slag cement with Type 3 high strength Portland cement in a ratio of at least about 0.5:1 by weight to produce a blended cement.

5,749,963

HARDENABLE MORTAR COMPOSITION

Norbert Arnold, Waldachtal; Willi Haug, Freudenstadt-Musbach, and Stefan Lind, Waldachtal, all of Germany, assignors to fischerwerke, Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Feb. 13, 1997, Ser. No. 799,272

Claims priority, application Germany, Mar. 7, 1996, 196 08 807.0

Int. Cl.^{6} C04B *24/00;24/04;24/24;24/40*

U.S. Cl. 106—724 **15 Claims**

15. A hardenable mortar composition containing
- a bonding agent component comprising
  - a hydraulic bonding agent consisting of at least one member selected from the group consisting of cement, gypsum and quicklime and
  - a paste-forming agent consisting of a water-insoluble, non-polar liquid solvent selected from the group consisting of alkanes, ethers, chlorinated hydrocarbon, fluorocarbons, silicone oils and paraffin oils, wherein the hydraulic bonding agent and the paste-forming agent are present in relative amounts sufficient to form a bonding paste; and
- an aqueous component comprising water and a hydrophobic adsorbent or absorbent for binding said water-insoluble non-polar liquid solvent when said aqueous component is mixed with said bonding agent component to form a mixture, said hydrophobic adsorbent or absorbent being present in said aqueous component in an amount sufficient to bind said water-insoluble non-polar liquid solvent so that said water-insoluble non-polar liquid solvent remains in said mixture;
- wherein said aqueous component is kept separate from said bonding agent component until said aqueous component is mixed with said bonding agent component to form said mixture, and said aqueous component and said bonding agent component are mixed in relative amounts such that said mixture hardens to form a hardened mortar composition; and
- wherein the hydrophobic adsorbent or absorbent is a hydrophobic silica gel, a hydrophobic zeolite, or a hydrophobic diatomaceous earth.

5,749,964

BUILDING MATERIAL MIXTURE

Heinz-Josef Mann, Saulheim, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Nov. 22, 1996, Ser. No. 754,986

Claims priority, application Germany, Nov. 25, 1995, 195 43 933.3

Int. Cl.^{6} C04B *24/10*

U.S. Cl. 106—805 **13 Claims**

1. A building material mixture comprising (A) at least one inorganic binder, and (B) a cellulose ether onto which a hydrophobicizing agent has been sprayed.

5,749,965

Patent Not Issued For This Number

5,749,966

PROCESS FOR DEPOSITING DIAMOND AND REFRACTORY MATERIALS

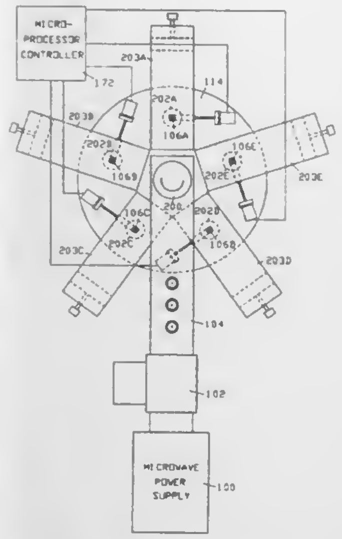
Steven C. Shates, Santa Clara, Calif., assignor to Modular Process Technology Corp., San Jose, Calif.

Division of Ser. No. 62,975, May 14, 1993, Pat. No. 5,387,288. This application Oct. 14, 1994, Ser. No. 324,074

Int. Cl.^{6} C30B *25/02*

U.S. Cl. 117—79 **10 Claims**

1. A method for forming a thin film layer of material such as a diamond on a substrate surface, comprising the steps of:



- coupling a source of microwave radiation into a process chamber with an antenna;
- providing a reactant gas into said process chamber to be ignited by said microwave radiation to form said plasma;
- swingably rotating said antenna about a pivot axis with respect to said substrate surface to move said plasma to a desired locus of points on said substrate surface;
- moving said substrate in a vertical direction with respect to said antenna to optimize plasma to substrate contact over said substrate surface.

5,749,967

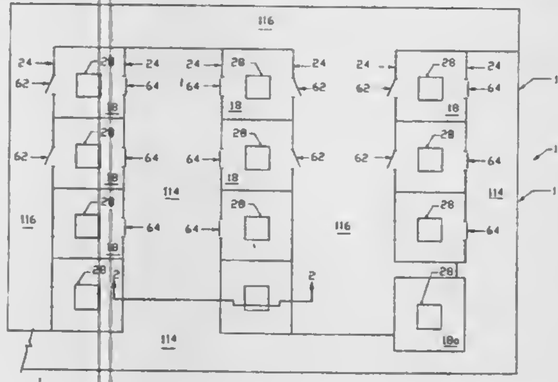
PULLER CELL

Kazuo Sakauchi; Yoshihiro Hirano, and Akira Uchikawa, all of Vancouver, Wash., assignors to SEH America, Inc., Vancouver, Wash.

Division of Ser. No. 499,832, Jul. 10, 1995, Pat. No. 5,641,354. This application Sep. 5, 1996, Ser. No. 708,464

Int. Cl.^{6} C30B *35/00*

U.S. Cl. 117—200 **13 Claims**



1. A crystal puller cell located within a growing hall and providing a Czochralski type crystal puller with an environment having reduced airborne particulate contamination, comprising:
- plural cell walls and a cell ceiling isolating the environment within the cell from the environment in a growing hall outside the cell;
- a first floor positioned at a first level for supporting a crystal puller;
- a second floor for accessing the crystal puller; and
- an adjustable air contamination control system for maintaining airborne particulate within the cell below a specified level, the specified level being adjustable to correspond to the activity performed in the housing and being controllable independently of the flow rate in the growing hall outside of the cell.

5,749,968

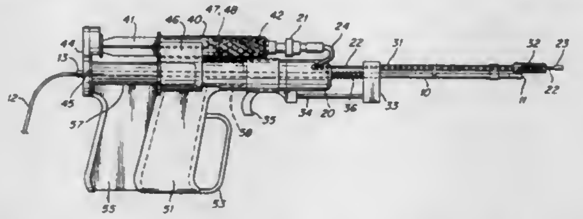
DEVICE FOR PRIMING FOR IMPROVED ADHERENCE OF GELS TO SUBSTRATES

David A. Melanson, Hudson, N.H.; Marc Alan Levine, Sharon, Mass.; John C. Spiridigliozzi, Dedham, Mass.; Thomas S. Bromander, Andover, Mass.; Dean M. Pichon, Concord, Mass.; George Selecman, Marblehead, Mass., and David J. Nedder, Attleboro, Mass., assignors to Focal, Inc., Lexington, Mass.

Continuation-in-part of Ser. No. 410,037, Mar. 23, 1995, and Ser. No. 379,848, Jan. 27, 1995, Pat. No. 5,626,863, and Ser. No. 24,657, Mar. 1, 1993, Pat. No. 5,573,934. This application Jun. 7, 1995, Ser. No. 472,745

Int. Cl.^{6} B05C *5/00*

U.S. Cl. 118—300 **29 Claims**



1. A combination device for conducting a primed photopolymerization treatment in a biological or medical setting comprising:
- a shaft having a proximal end to be held by a person administering the treatment and a distal end from which one or more fluids are dispensed;
- a first conduit fluidly connectable to a first reservoir containing a photoinitiator and fluidly connected to the distal end of the shaft;
- a second conduit fluidly connectable to a second reservoir containing a monomer solution and fluidly connected to the distal end of the shaft; and
- near the distal end of the shaft, a source of electromagnetic radiation of a wavelength that causes activation of the photoinitiator.

5,749,969

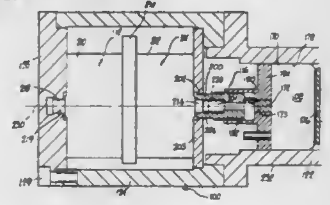
FLUID DISPENSING SYSTEM

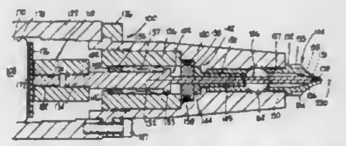
Roger Leo Kobak, Castlerock; Gary L. Yount, Morrison; James S. Stirbis, Littleton, and William W. Weil, Golden, all of Colo., assignors to Preferred Machining Corporation, Englewood, Colo.

Continuation of Ser. No. 322,791, Oct. 13, 1994, abandoned, which is a continuation of Ser. No. 977,259, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 666,656, Mar. 8, 1991, abandoned. This application May 29, 1996, Ser. No. 654,624

Int. Cl.^{6} B05B *1/30;* **F16K** *31/02*

U.S. Cl. 118—319 **22 Claims**





13. A sealant applying machine for applying sealant to can lid members and comprising:
- a plurality of circumferentially spaced sealant applying stations supported on a rotatable carriage;
- each of said stations comprising:
  - a lid holding device; and

a sealant dispensing apparatus mounted adjacent said lid holding device;

each sealant dispensing apparatus comprising:

an elongated housing having a lower housing portion, an upper housing portion and an intermediate housing portion;

a nozzle located on the lower housing portion and having a sealant dispensing opening, a needle valve seat surface and a sealant flow passage;

a needle valve axially slidably movably mounted in said lower housing portion and being selectively axially movable between an open sealant applying position and a closed non-flow position relative to said needle valve seat surface;

a needle valve actuator solenoid mounted in a spaced coaxial relationship to said needle valve in said intermediate housing portion and being operatively connected to said needle valve; and

a flow gap adjustment solenoid mounted in said upper housing portion in a spaced coaxial relationship with said needle valve actuator solenoid and being operatively connected to said needle valve actuator solenoid; and

a sealing mechanism in contact with said needle valve.

18. A nozzle actuating and adjustment system for applying sealant to a can lid member and comprising:

a nozzle unit having:

a sealant dispensing opening;

a sealant flow passage in fluid communication with said sealant dispensing opening; and

a needle valve member which is selectively axially movable along a longitudinal axis in centered relationship to said sealant dispensing opening between an open sealant applying upper position and a closed non-flow lower position;

a needle valve actuator solenoid operatively connected to said needle valve member;

a flow gap size adjustment solenoid operatively connected to said needle valve actuator solenoid.

5,749,970

APPARATUS FOR COATING OUTER PERIPHERAL SURFACE OF COLUMNAR STRUCTURAL BODY WITH A COATING MATERIAL

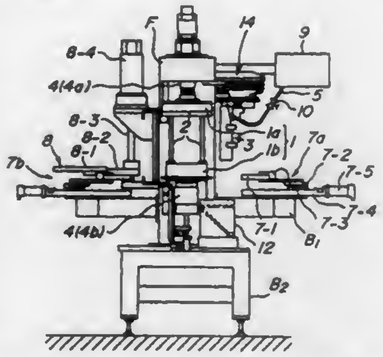
Ken Fukuta, Ama-Gun; Toshihiro Sano, and Tsutomu Hirota, both of Gifu, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 26, 1996, Ser. No. 622,012

Claims priority, application Japan, Mar. 30, 1995, 7-073204

Int. Cl.^{6} B05B *13/04;* **B05C** *5/00;11/02*

U.S. Cl. 118—320 **15 Claims**



1. Apparatus for coating an outer periphery of a columnar structural body, comprising:

(a) a holder for supporting a columnar structural body; (b) a coater for coating the outer periphery of the columnar structural body with a coating material; (c) a feeder for feeding the coating material to the coater; (d) a driving unit for rotating at least one of the columnar structural body and the coater relative to each other around an axis of the holder; and (e) a doctor blade directly opposed and spaced from the outer periphery of the columnar structural body by a given distance for directly and uniformly spreading a coating material applied around the outer periphery of the columnar structural body.

5,749,971

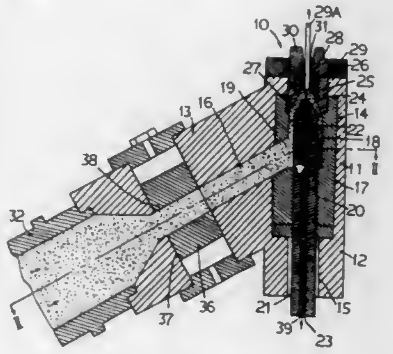
APPARATUS FOR MAKING A WELDING FLUX COATING CONTINOUSLY ON A WELDING ELECTRODE

Chong Yang Ni, 75 Springbrook Dr., Richmond Hill, Ontario, Canada, L4B 3R3

Filed Mar. 28, 1996, Ser. No. 623,111

Int. Cl.^{6} B05C *3/02;3/12*

U.S. Cl. 118—407 **10 Claims**



1. A coating apparatus for continously applying a single layer of welding flux material mixture to an elongated metal core passing through a coating station comprising,

a cast body having said coating station mounted at a top portion therein, said coating station being in communication with an annular chamber located within said cast body,

an elongated guide member mounted in said cast body and having an elongated opening extending throughout the entire longitudinal length therein and being operative for guiding said metal core towards said coating station,

at least two supply bins coupled to said cast body and containing the same said welding flux material mixture, and adapted to supply said welding flux material mixture from one bin at a time alternately to said coating station,

a sliding control valve member connected to said supply bins and to said cast body, said control valve member being operative to connect said supply bins, one bin at a time, alternately and selectively to said annular chamber for supplying said welding flux material mixture to said coating station from one supply bin, while simultaneously closing communication of the second supply bin from said annular chamber.

5,749,972

APPARATUS FOR THE APPLICATION OF AT LEAST ONE LIQUID MEDIUM ONTO A MOVING MATERIAL WEB

Richard Bernert, Giengen, and Stefan Reich, Heidenheim, both of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Filed Apr. 12, 1995, Ser. No. 420,471

Claims priority, application Germany, Apr. 15, 1994, 44 13 232.8

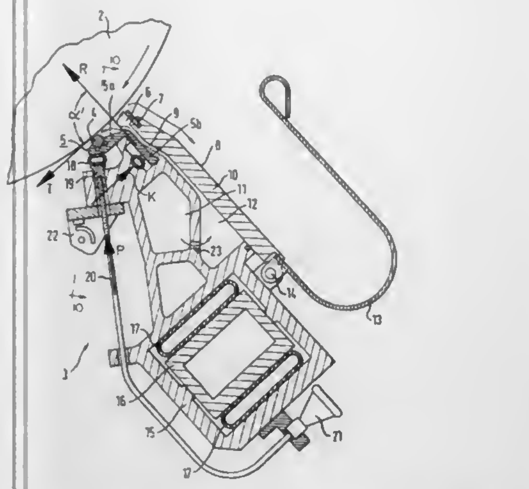
Int. Cl.^{6} B05C *3/02;11/02*

U.S. Cl. 118—414 **12 Claims**

1. Apparatus for the application of at least one liquid medium onto a moving material web comprising:

an application mechanism (3) for the liquid medium,

and a roller (2) positioned and arranged near the application mechanism (3) for receiving the liquid medium on the roller surface in the case of indirectly applying the liquid medium to the material web or for guiding the material web (1) in the case of directly applying the medium to the material web and wherein:



the application mechanism (3) has a dosaging blade (4) and a damming strip (7) positioned and arranged at a distance from the dosaging blade with respect to the direction of rotation of the roller (2), the damming strip defining an application chamber (6) with the dosaging blade (4);

a running-off surface (8) is provided on the application mechanism (3) over which excess liquid medium passing out of the application chamber (6) over the damming strip (7) flows under the influence of gravitational force; and

the dosaging blade (4) has a blade holder (5) with a base strip (5*b*) which is mounted in the application mechanism (3);

characterized in that the blade holder (5) is bent such that the cross-sectional extension (arrow R) of the base strip (5*b*) forms an angle (α) with the roller rotational direction (arrow T) at the dosaging blade (4) of at least approximately 90° or more, and

the application mechanism (3) is provided with a pressing device (18, 19, 20, 21) extending parallel the dosaging blade (4), said pressing device having a plurality of adjusting means for selectively adjusting the pressing force of the pressing device at each of a plurality of locations across the width of the roller.

5,749,973

APPARATUS FOR SPRAYING PARTICULATE MATERIAL IN AN EVAPORATABLE DISPERSION HAVING ELECRICAL POTENTIAL

Akihiko Komura; Kenji Onuma, and Mayumi Akena, all of Hiratsuka, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 164,772, Dec. 10, 1993, abandoned, which is a continuation of Ser. No. 982,056, Nov. 25, 1992, abandoned, which is a continuation of Ser. No. 852,499, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 498,739, Mar. 26, 1990, abandoned, which is a division of Ser. No. 202,567, Jun. 6, 1988, Pat. No. 4,971,829. This application Jun. 7, 1995, Ser. No. 473,986

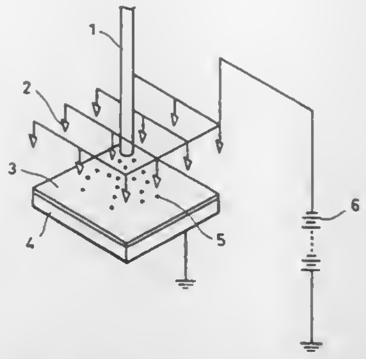
Claims priority, application Japan, Jun. 8, 1987, 61-141366; May 12, 1988, 63-115533

Int. Cl.^{6} B05B *5/025*

U.S. Cl. 118—626 **4 Claims**

1. An apparatus for making a chiral smectic liquid crystal cell by spraying a spacer material on a plate constituting the liquid crystal cell, comprising:

a single spraying means having only one nozzle for spraying towards a top surface of said plate an admixture of a spacer material and adhesive particles, said spacer material comprising spherical silica having a particle size of from 0.5–5 microns, said adhesive particles comprising an epoxy compound and being mixed in a ratio of 1.5 to 100 particles per particle of the spacer material in a dispersant comprising a compound selected from the group consisting of isopropyl alcohol, n-hexane, butane and a fluorinated hydrocarbon;



charging means for applying an electrical charge of only one polarity to the spacer material and the adhesive particles, said charging means comprising a first discharging pin provided inside said nozzle and a plurality of second discharging pins provided above said plate around the outside of said nozzle of the spraying means; and

means for imparting a potential of only the other polarity to an electrode disposed at a rear surface of the plate with respect to said top surface receiving the spacer material, said potential causing electrical attraction between the charged spacer material of the one polarity and the electrode applied with the other polarity, wherein said apparatus is capable of providing that the density of said spacer material particles on said cell plate measured at ten locations is at most 500 particles/mm^2 and varies at most ±1% per mm^2.

5,749,974

METHOD OF CHEMICAL VAPOR DEPOSITION AND REACTOR THEREFOR

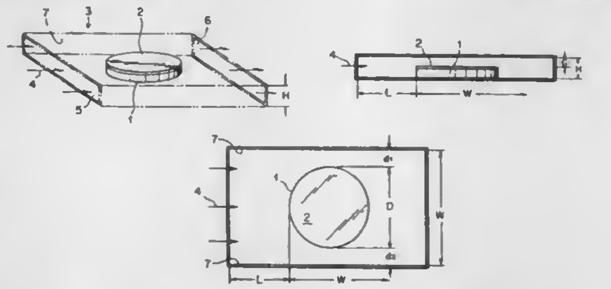
Hitoshi Habuka; Masanori Mayuzumi, both of Gunma-ken, Japan; Naoto Tate, Camas, Wash., and Masatake Katayama, Gunma-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 502,042

Claims priority, application Japan, Jul. 15, 1994, 6-186460

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—725 **4 Claims**



1. A chemical vapor deposition reactor comprising:

a cold-wall type reaction chamber for growing a silicon crystalline thin film, said reaction chamber being equipped with a reactant gas inlet at an upstream end and a reactant gas outlet at a downstream end for flowing a reactant gas horizontally in one direction through said reaction chamber;

means for supporting a semiconductor substrate in said reaction chamber so that a main surface of the semiconductor substrate is aligned horizontally;

means for heating the semiconductor substrate to a temperature for growing a silicon crystalline film on the semiconductor substrate, said temperature being sufficient to create natural convection between the semiconductor substrate and internal side walls of the reaction chamber due to temperature differences therebetween;

wherein the semiconductor substrate is arranged within a distance W measured from a leading edge of the semiconductor substrate which leading edge is located at a most upstream portion of the reaction chamber, along a direction toward said gas outlet, and the semiconductor substrate is arranged in a location in which a W/G ratio is 15 or larger so that a rotation number of a vertical vortex due to natural convection is suppressed to 1 or less within the distance W measured from a leading edge of the semiconductor substrate and,

wherein W is an internal width of said reaction chamber and G is a distance between the main surface of the at least one semiconductor substrate and a ceiling of said reaction chamber above the at least one semiconductor substrate.

5,749,975

PROCESS FOR DRY CLEANING WAFER SURFACES USING A SURFACE DIFFUSION LAYER

Li Li, Meridian, and Richard C. Hawthorne, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Dec. 28, 1995, Ser. No. 579,943

Int. Cl.^{6} B08B *7/00*

U.S. Cl. 134—1.3 **17 Claims**

1. A method for cleaning a silicon surface comprising:

locating the silicon surface in a reaction chamber;

forming a liquid surface diffusion layer on the silicon surface;

forming an atmosphere of a gaseous chlorine in the reaction chamber;

exposing said atmosphere of said gaseous chlorine to ultraviolet light so as to form therefrom gaseous radicals of chlorine;

conducting a cleaning process on the silicon surface while the liquid surface diffusion layer is on the silicon surface by diffusing said gaseous radicals of chlorine through the surface diffusion layer.

5,749,976

CLEANING SOLUTION FOR AUTOMATED ANALYZERS

Timothy J. Fischer, Raleigh, N.C.; Maria L. Bell, Melbourne, Fla., and Regina J. Bowling, Creedmore, N.C., assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/US94/12029, § 371 Date Jul. 10, 1996, § 102(e) Date Jul. 10, 1996, PCT Pub. No. WO95/11290, PCT Pub. Date Apr. 27, 1995

Continuation-in-part of Ser. No. 141,441, Oct. 21, 1993, Pat. No. 5,395,545. This PCT application Oct. 21, 1994, Ser. No. 633,793

Int. Cl.^{6} C11D *10/00;10/02*

U.S. Cl. 134—22.12 **8 Claims**

1. An aqueous cleaning solution comprising:

a. bile salt;

b. anionic surfactant;

c. sodium ions; and

d. water,

wherein said solution has a pH in the range of about 1 to about 4 and removes substantially all of a reagent selected from the group consisting of thrombin, thromboplastin, and phospholipids from a surface.

5,749,977

PROCESS AND COMPOSITION FOR DEGREASING THE SURFACE OF AN OBJECT

Jean-Pierre Lallier, Levallois-Perret, and Daniel Bignon, Fontenay-Sous-Bois, both of France, assignors to Elf Atochem S.A., Puteaux, France

Continuation of Ser. No. 424,455, Apr. 27, 1995, abandoned. This application Oct. 28, 1996, Ser. No. 738,691

Claims priority, application France, Oct. 28, 1992, 92 12846

Int. Cl.^{6} B08B *3/04;* **C23G** *5/02;5/024;5/032*

U.S. Cl. 134—40 **20 Claims**

1. A process for degreasing a surface of a metal, ceramic, glass or plastic object having oil or grease on said surface, which comprises applying thereto a composition consisting essentially of at least 60% by weight based on the total weight of the composition of an amphiphilic compound of formula A—B, wherein A is a lipophilic and hydrophobic radical and B is a hydrophilic radical, water and optionally an agent which promotes miscibility of the amphiphilic compound in water, such that the amphiphilic compound dissolves the oil or grease or is highly miscible therein so as to form an amalgam of oil or grease with compound A—B;

then rinsing the surface with water so as to eliminate the amalgam from the surface.

5,749,978

METHOD AND DEVICE FOR THE CONTROLLED FORMING AND FEEDING OF A GASEOUS ATMOSPHERE HAVING AT LEAST TWO COMPONENTS, AND APPLICATION IN PLANTS OF THERMAL OR CARBURIZING TREATMENT

Piero Colombani, Milan, and Alessandro Stucchi, Buccinasco, both of Italy, assignors to Lentek S.r.l., Corsico, Italy

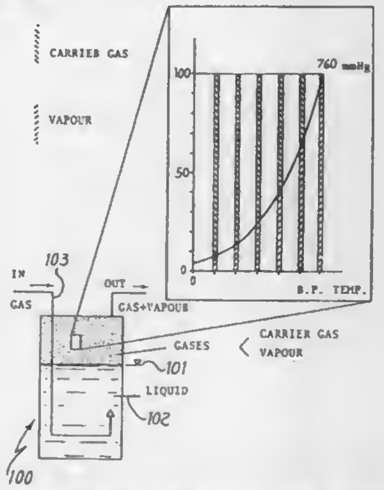
PCT No. PCT/EP94/02918, § 371 Date Mar. 25, 1996, § 102(e) Date Mar. 25, 1996, PCT Pub. No. WO95/08387, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 2, 1994, Ser. No. 619,464

Claims priority, application Italy, Sep. 24, 1993, MI93A2040

Int. Cl.^{6} C23C *8/20;8/40;* **B01F** *3/02*

U.S. Cl. 148—216 **31 Claims**



1. A plant for the thermal treatment of metal materials inside an oven (**40**) in the presence of a treating atmosphere and comprising means (**44**, **45**, **46**) for continuously detecting the composition of the treating atmosphere within the oven, comprising at least a saturator device (**1**, **1***a*, **1***b*, **1***c*, **1***d*) containing a liquid compound, said saturator device (**1**, **1***a*, **1***b*, **1***c* **1***d*) having means (**6**, **7**, **10**', **10**", **12 13**) to regulate the temperature of said liquid compound, as well as means (**15**, **16**, **17**) to cause a flow of carrier gas to bubble within said liquid compound and allow the formation and transfer to said oven (**40**) of a gas vapor mixture having a controlled composition in response to the detected composition of the treating atmosphere, so as to allow a continuous regulation of the composition of the treating atmosphere within said oven.

5,749,979

14K GOLD ALLOY WITH SILVER, COPPER, ZINC AND COBALT

Richard Carrano, Attleboro, Mass., and Mark C. Hanna, Barrington, R.I., assignors to Dalow Industries Inc., Long Island City, N.Y.

Filed Sep. 3, 1996, Ser. No. 707,067

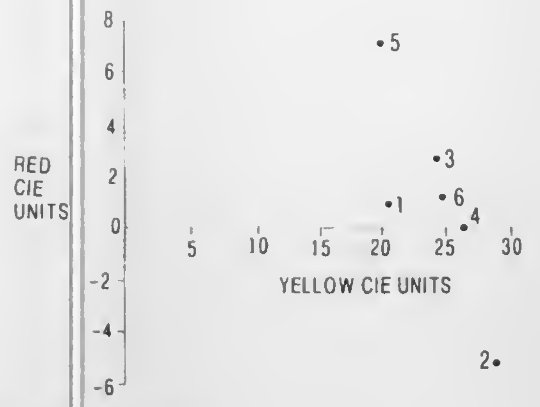
Int. Cl.^{6} C22C *5/02*

U.S. Cl. 148—430 **17 Claims**

1. A hardenable gold alloy, consisting essentially of, by weight:

58.53 to 58.80% gold;

12.80 to 14.39% silver;



22.96 to 24.80% copper;

3.50 to 4.08% zinc; and

0.20 to 0.50% cobalt;

and wherein said alloy is hardenable over a range of greater than 100 (VHN).

5,749,980

METHOD FOR IMPROVING ALUMINUM ALLOY CAST STRUCTURAL MEMBER

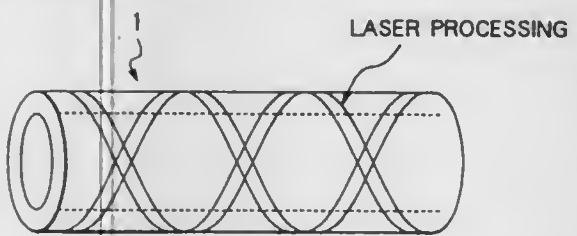
Shuhei Izuchi, and Tsuyoshi Matsumoto, both of Fujisawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 297,113, Aug. 26, 1994, Pat. No. 5,576,112. This application Jul. 23, 1996, Ser. No. 681,517

Claims priority, application Japan, Aug. 28, 1993, 5-235765

Int. Cl.^{6} B23K *26/14*

U.S. Cl. 148—525 **16 Claims**



1. A method, comprising:

irradiating the periphery of a casting with a laser under a gas, thereby melting a portion of said casting; and

resolidifying said portion of said casting;

wherein said casting consists essentially of 3.5 to 12.0 wt % Si, at most 0.10 wt % Fe, at most 0.3 cc hydrogen per 100 g of said casting, and the balance aluminum and inevitable impurities, and

said gas comprises an inert gas.

5,749,981

PROCESS FOR PRODUCING PATENTED STEEL WIRE

Charles N. A. Tonteling, Bissen, Luxembourg; Kenneth Joseph Palmer, Wadsworth; Farrel Bruce Helfer, Akron, both of Ohio; Rodger Todd, Heffingen, and Josy Jean Blum, Ell, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 475,734, Jun. 7, 1995, Pat. No. 5,595,617, which is a continuation of Ser. No. 44,785, Apr. 12, 1993, abandoned. This application Dec. 16, 1996, Ser. No. 767,467

Int. Cl.^{6} C22C *38/00*

U.S. Cl. 148—595 **15 Claims**

1. A process for producing a high strength filament for use in elastomeric reinforcements, said process comprising the steps of:

(1) heating a steel wire to a temperature which is within the range of approximately 850° C. to about 1050° C. for a period of at least about 2 seconds;

wherein said steel wire is comprised of a microalloyed high carbon steel which consists essentially of about 97.03 to about 98.925 weight percent iron, from about 0.72 to about 0.92 weight percent carbon, from about 0.3 to about 0.8 weight percent manganese, from about 0.05 to about 0.4 weight percent silicon, and from about 0.005 to about 0.85 weight percent of at least one member selected from the group consisting of chromium, vanadium, nickel, and boron, with the proviso that the total amount of silicon, manganese, chromium, vanadium, nickel and boron in the microalloyed high carbon steel is within the range of about 0.7 to 0.9 weight percent;

(2) continuously cooling the steel wire at a cooling rate of 20° C. to 60° C. per second to a temperature which is within the range of about 500° C. to about 650° C. until a transformation from austenite to pearlite begins;

(3) allowing the transformation from austenite to pearlite to proceed with an increase in the wire temperature resulting from recalescence to produce a patented steel wire, wherein the increase in wire temperature resulting from recalescence is an increase in temperature which is within the range of about 20° C. to about 70° C.;

(4) cooling the patented steel wire to ambient temperature;

(5) brass-plating the patented steel wire to produce a brass-plated steel wire; and;

(6) cold-drawing the brass-plated steel wire to a diameter which is within the range of about 0.15 mm to about 0.40 mm to produce a high strength filament.

5,749,982

RIM AND ASSEMBLY OF TIRE AND/OR RING-SHAPED TREAD SUPPORT ON SAME

Olivier Muhlhoff, Clermont-Ferrand, and Jean-Pierre Pompier, Volvic, both of France, assignors to Compagnie Générale Des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand Cedex, France

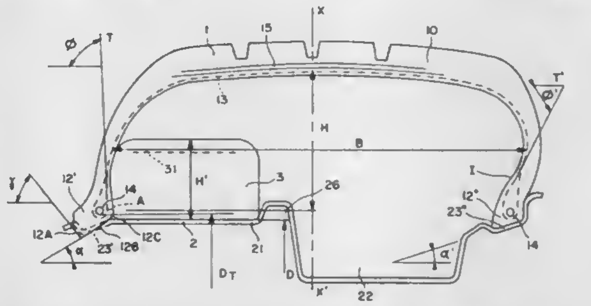
PCT No. PCT/EP94/03873, § 371 Date Jun. 3, 1996, § 102(e) Date Jun. 3, 1996, PCT Pub. No. WO95/15863, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 22, 1994, Ser. No. 647,972

Claims priority, application France, Dec. 8, 1993, 93 14702

Int. Cl.^{6} B60B *21/02;21/10;* **B60C** *3/00;17/06*

U.S. Cl. 152—158 **13 Claims**



1. A rim (**2**) intended for mounting a tire (**1**) comprising two reinforced beads (**12**', **12**"), axially delimited by two rim edges which are axially separated by the rim width S, and comprising, viewed axially outwardly in meridional section with respect to the equatorial plane, a first rim seat (**23**') and a second rim seat (**23**"), the first rim seat (**23**') having a generatrix, the axially outer end of which is on a circle of diameter less than the diameter of the circle on which the axially inner end is situated, the rim characterized in that the first rim seat (**23**') is axially outwardly extended by a shoulder or hump of low height h_1 and in that the second rim seat (**23**") has a generatrix, the axially outer end of which is on a circle having a diameter at least equal to the diameter of the circle on which the axially inner end is situated, the said second rim seat (**23**") being axially inwardly extended by a shoulder or hump (**25**")

of low height, and axially outwardly by a rim flange (**24**), the diameter of the said flange being greater than the diameter of any part of the rim included between the said flange and the rim edge which is axially nearest to the said flange.

5,749,983

PNEUMATIC TIRE WITH CAP AND BASE STRUCTURE

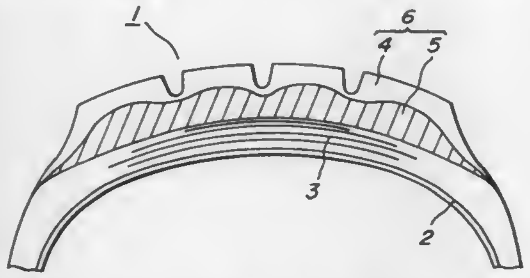
Hideaki Yokoyama, Toda, and Uchu Mukai, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 30, 1995, Ser. No. 565,395

Claims priority, application Japan, Nov. 30, 1994, 6-296657; Nov. 27, 1995, 7-307919

Int. Cl.⁶ B60C *1/00;11/00*

U.S. Cl. 152—209 R **8 Claims**



1. A pneumatic tire comprising; a tread of cap and base structure, said base structure of the tread being made from a rubber composition comprising 2–50 parts by weight of a rubber-reinforcing thermoplastic resin which is prepared by polymerizing a polymer as a conjugated diene rubber component with a resin component having a glass transition temperature of 100°–140° C., based on 100 parts by weight of rubber ingredient; said rubber-reinforcing thermoplastic resin consisting of 10–65% by weight of said conjugated diene rubber component and, the remainder of said rubber-reinforcing thermoplastic resin being said resin component having a glass transition temperature of 100°–140° C.

5,749,984

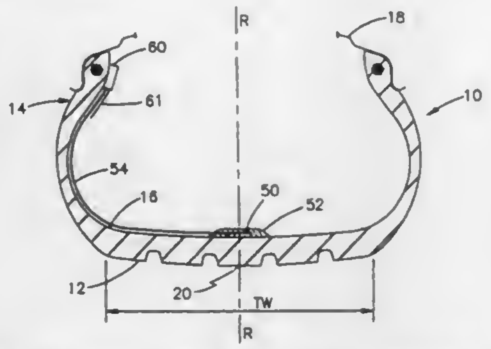
TIRE MONITORING SYSTEM AND METHOD

Normam Walter Frey, Laurens, and Robert Jeffery Albertson, Belton, both of S.C., assignors to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland

Filed Dec. 29, 1995, Ser. No. 586,015

Int. Cl.⁶ B60C *23/02;23/06;* **B60R** *16/02*

U.S. Cl. 152—415 **17 Claims**



1. In a tire mounted on a wheel of a vehicle having a tread portion that contacts a ground surface over a tread contact surface during rolling of the tire under nominal operating conditions of vehicle load and speed, a tire monitoring system comprising:

a reference point on said tread contact surface of said tread portion defining a circumferential location on said tread portion;

a sensor device located within said tire associated with said reference point for generating first electrical signals when said reference point is included within said tread contact length and for generating second electrical signals when said reference point is not within said tread contact length;

an electronics package removed from said sensor device within said tire for energizing said sensor device and for receiving said first and said second electrical signals from said sensor device;

a digital monitoring device of said electronics package for interrogating said first and second electrical signals at a sampling frequency sufficient to obtain a first plurality of electrical pulses each revolution cycle of said tire and a second plurality of digital pulses each revolution cycle of the tire corresponding to said first and second electrical signals respectfully;

a digital logic circuit of said electronics package for determining a sum of the number of said first and second electrical pulses and an ratio of the number of said first electrical pulses to the number of said second electrical pulses each revolution cycle of the tire;

a memory device of said electronics package for storing said sum of electrical pulses and said ratio of said electrical pulses;

an operator display device for an operator of said vehicle to monitor performance of said tire;

digitized transceiver devices for transmitting and receiving a plurality of said sum values and a plurality of said ratio values, corresponding to a tire monitoring time, from said memory device of said tire to said operator display device of said vehicle; and

an on-board computer associated with said operator display device for calculating and displaying at least tire deflection values using said plurality of ratio values, wherein said tire can be monitored for proper inflation pressures to provide a predetermined tire deflection.

5,749,985

PROCESS FOR OPTIMIZING MULTILAYERED TUBES MADE OF COMPOSITE MATERIALS AND TUBES OBTAINED THROUGH THE PROCESS

Charles Sparks, Le Vesinet; Jacques Schmitt, Bois Colombe; Guy Metivaud, Talence, and Marcel Auberon, Le Haillan, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, and Societe Aerospatiale, Paris, both of France

Continuation of Ser. No. 540,749, Jun. 20, 1990, abandoned. This application Feb. 17, 1993, Ser. No. 18,522

Claims priority, application France, Jun. 20, 1989, 89/08308

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—64 **7 Claims**

1. A process for manufacturing a multilayered tube fashioned of composite materials, the multilayered tube including a plurality of layers of composite materials with each layer comprising several strips of helically wound fibers, each of said layers being defined by at least two parameters so that an elongation due to temperature, pressure and stress to which the different layers are subjected correspond to predefined maximum values of tensile and pressure forces that are to be applied to the respective layers, the process comprising the steps of:

defining a set of values for said parameters of an initial tube;

determining limit values of said elongation and stress for the initial tube;

determining an incidence on said limit values of said elongation and stress of slight deviation successively applied to each one of said parameters to establish linear relationships relating to the values of each of said limit values of elongation and stress to the deviations;

determining inverse relationships expressing an incidence of variations of said limit values of elongation and stress on the values of the different parameters;

selecting step by step variations imposed on the parameters to define the multilayered tube in order to obtain limit values of each elongation and stress substantially corresponding to said set of values for the initial tube; and

winding said layers having said limit values of elongation and stress defined in the selecting step to form the multilayered tube.

5,749,986

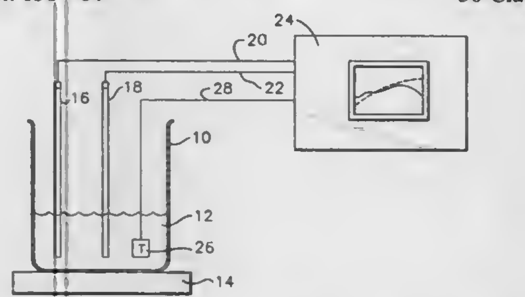
CONTROL OF BATCHING AND CURING PROCESSES

W. Tison Wyatt, Candler, N.C., assignor to Tracy A. Wyatt, Arden, N.C., a part interest

Continuation-in-part of Ser. No. 189,790, Feb. 1, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 509,975

Int. Cl.⁶ B32B *31/00;* **G01N** *27/26;* **G01R** *27/00*

U.S. Cl. 156—64 **30 Claims**



16. A method for monitoring change in a substance which changes in at least one characteristic over time, said method comprising:

placing a pair of electrodes in contact with the substance, the electrodes being not electrochemically dissimilar;

monitoring voltage between the electrodes produced by the substance as a function of time, without applying any external voltage; and

employing the monitored voltage to control a process.

5,749,987

METHOD OF CONTROLLING THE POWER OF A WELDING UNIT IN ULTRASONIC WELDING OPERATIONS AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

Andreas Wannebo, Lindome, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

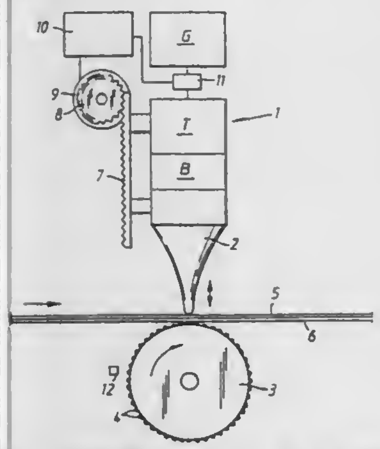
PCT No. PCT/SE94/00586, § 371 Date Dec. 13, 1995, § 102(e) Date Dec. 13, 1995, PCT Pub. No. WO95/00316, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 14, 1994, Ser. No. 564,094

Claims priority, application Sweden, Jun. 17, 1993, 9302106

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—64 **9 Claims**



1. A method of controlling the power of a stationary welding unit when ultrasonically welding webs of material (**5**, **6**) which pass between an ultrasonic horn (**2**) of the welding unit (**1**) and an anvil holder (**3**) equipped with anvils (**4**), comprising

controlling a mean distance of the ultrasonic horn (**2**) from the anvil (**4**) so that power for the welding unit coincides with a predetermined control value.

5,749,988

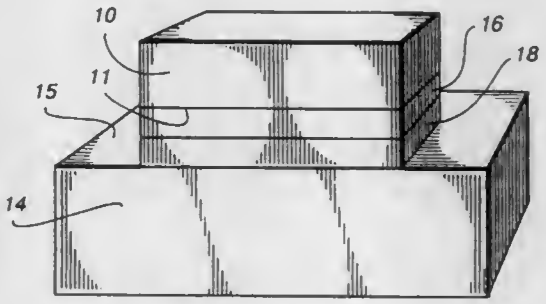
REWORKABLE DIE ATTACHMENT TO HEAT SPREADER

Jacques Leibovitz, 1536 Larkspur Dr., San Jose, Calif. 95125; Peter F. Dawson, 25 Tintern La., Portola Valley, Calif. 94025; Voddarahalli K. Nagesh, 20276 Pintage Pkwy., Cupertino, Calif. 95014, and Greg M. Irby, 2260 Cherry Ave., San Jose, Calif. 95125

Continuation of Ser. No. 988,639, Dec. 10, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 310,358

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—94 **16 Claims**



1. A method for forming a releasable, compliant bond between a component having a component bond surface and a heat spreader having a heat spreader bond surface, wherein the component and the heat spreader possess different coefficients of thermal expansion, the method comprising the steps of:

coating the bond surface of at least one of said component and said heat spreader with a thermoplastic adhesive;

allowing said thermoplastic adhesive to harden;

adhering said component to said heat spreader by coating at least one of said component bond surface and said heat spreader bond surface with a compliant thermosetting adhesive and, thereafter, bringing said component bond surface and said heat spreader bond surface together;

curing said thermosetting adhesive;

wherein the compliant thermosetting adhesive makes the bond compliant, the compliance of the compliant bond maintains the component and the heat spreader bonded to each other throughout their different expansions and contractions accompanying temperature excursions during operation; and

wherein the thermoplastic adhesive makes the bond reworkable.

5,749,989

CONTINUOUS, HIGH-SPEED METHOD FOR PRODUCING A PANT-STYLE GARMENT HAVING A PAIR OF ELASTICIZED LEG OPENINGS

E. Kelly Linman, and Russell P. Bridges, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

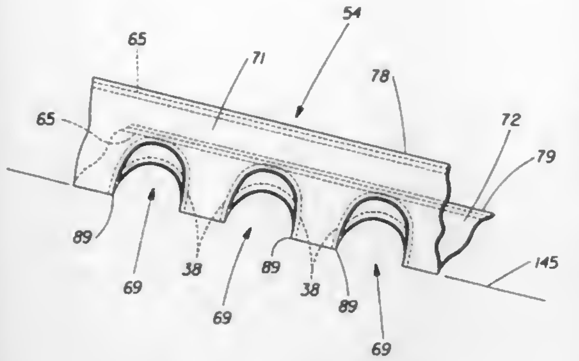
Continuation-in-part of Ser. No. 318,597, Oct. 5, 1994, Pat. No. 5,518,566, which is a division of Ser. No. 132,730, Oct. 6, 1993, Pat. No. 5,393,360. This application May 13, 1996, Ser. No. 645,399

Int. Cl.⁶ A61F *13/15*

U.S. Cl. 156—160 **2 Claims**

1. A continuous, high-speed method for producing a pant-style garment having a pair of fully elasticized leg openings, said method comprising the steps of:

a) metering a first tensioned elastic ribbon and a second tensioned elastic ribbon tangentially toward a plurality of mandrels, each of said mandrels being spaced apart by a gap along



a common centerline and having a top surface and side walls depending therefrom whereby at least a portion of each of said tensioned elastic ribbons projects above said uppermost surface of said mandrels;

b) clamping said first and second tensioned elastic ribbons between each of said plurality of mandrels by pushing said first tensioned elastic ribbon toward said common centerline and by pushing said second tensioned elastic ribbon toward said common centerline, thereby encircling said side walls of each of said mandrels, as said first and second tensioned elastic ribbons meet at said common centerline;

c) sealing said first and second tensioned elastic ribbons where they are clamped together in order to form a ribbon seal between each of said plurality of mandrels;

d) cutting said first and second tensioned elastic ribbons within said ribbon seal between each of said plurality of mandrels so that when cut, said tensioned elastic ribbons form individual tensioned garters about said side walls of said plurality of mandrels, each said tensioned garter having an upper portion being upward of said mandrel top surface and a lower portion, said upper portion of said tensioned garter having sufficient tension to cause said upper portion of said tensioned garter to fold over onto said top surface of said mandrel to form a garter flange while said lower portion of said tensioned garter clings to said side walls of said mandrel;

e) placing a substrate having two mutually opposed longitudinal edges, and a longitudinal centerline adjacent to said garter flange;

f) sealing said substrate to said garter flange thereby forming a continuously sealed garter comprising a continuous seal, said sealed garter having an inner edge and an outer edge;

g) removing said lower portion of said sealed garter from said substrate;

h) weakening said continuous seal inboard of said inner edge thereby forming an unsecured substrate portion inboard of said inner edge;

i) stripping said substrate and said garter flange from said mandrel while applying vacuum from said top surface of said mandrel to said unsecured substrate portion within said continuous seal so that said inner edge is broken when said substrate and said tensioned garter are stripped off said mandrel, thereby releasing said substrate from said mandrel and forming an aperture about which said tensioned garter contracts;

j) folding said substrate along said longitudinal centerline thereby aligning said longitudinal edges of said substrate;

k) joining said folded substrate in a direction perpendicular to said longitudinal centerline, along a plurality of lines of joinder extending from said longitudinal edge to said tensioned edge of said aperture; and

l) cutting said substrate through said lines of joinder to form a pant-style garment having a pair of elasticized leg openings.

5,749,990

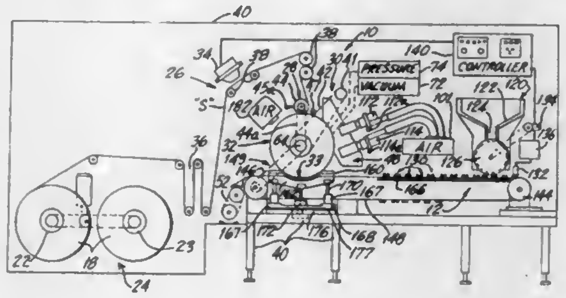
METHOD AND APPARATUS FOR APPLYING LABELS TO ARTICLES USING BOTTOM FEED CONVEYING UNIT

Robert Michael Rello, Slatington; Michael Yager, Shaver, and Ramon Antonio Martinez, Wilkes-Barre, all of Pa., assignors to CMS Gillbreth Packaging Systems, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 342,780, Nov. 21, 1994, abandoned. This application Apr. 21, 1995, Ser. No. 427,289

Int. Cl.^{6} B65C *9/00*

U.S. Cl. 156—187 **72 Claims**



1. A method for applying a label onto a substantially cylindrical article comprising the steps of

feeding a thin layer, heat activated adhesive backed label onto the surface of a label drum so that the adhesive back faces outward from the drum, wherein the label has a length at least about twice the circumference of the article,

rotating the drum to move the label retained thereto into an article wrapping position positioned at a lower portion of the drum,

heating the adhesive as the drum rotates so that the adhesive obtains a sufficient temperature to melt by moving the label while retained on the label drum through a closed heat tunnel positioned adjacent the label drum which has at least one spaced hot air blower that blows hot air into the tunnel so that the adhesive is activated,

conveying a cylindrical article substantially horizontally along a predetermined path of travel into the article wrapping position at the lower portion of the label drum and into rotative engagement with the heated label retained on the label drum without the adhesive on the label having had sufficient time to cool, and

transferring the label onto the cylindrical article by wrap around labeling wherein the wrapped article is spun at least about twice while sufficient pressure is maintained on the wrapped article so that the label wraps about twice around the article.

5,749,991

METHOD OF AFFIXING A TUBULAR OBJECT

Kenneth Åberg, Täby, Sweden, assignor to Niblick International AB, Taby, Sweden

PCT No. PCT/SE94/00359, § 371 Date Apr. 10, 1996, § 102(e) Date Apr. 10, 1996, PCT Pub. No. WO95/00595, PCT Pub. Date Jan. 5, 1995

PCT Filed Apr. 22, 1994, Ser. No. 571,843

Claims priority, application Sweden, Jun. 23, 1993, 9302167

Int. Cl.^{6} A63B *53/14;* B29C *63/06;63/18;* C09J *7/02*

U.S. Cl. 156—187 **14 Claims**

1. A system comprising a handgrip intended to be attached to a shaft of a golf club and an adhesive, said handgrip having an inner surface and an outer surface, said adhesive comprising about 15 to 85 percent by weight of a water-soluble glue and about 15 to 50 percent by weight of a low molecular weight tetrafluoroethylene polymer; wherein said adhesive is capable of being applied to said shaft so as to give a sticking capacity of about at least 0.3N/cm in accordance with ASTM test D-429-B; and wherein when said adhesive is wetted with water, said wetted adhesive gives a sliding friction coefficient of about 0.1 to 0.3 which facilitates sliding said handgrip on to said shaft.

5,749,992

PROCESS FOR PRODUCING AN ADHESIVE BOND IN A FOLDER JOINT

Karl-Gunnar Eklund, and Tommy Mattsson, both of Kyrkhult, Sweden, assignors to AB Volvo, Gothenburg, Sweden

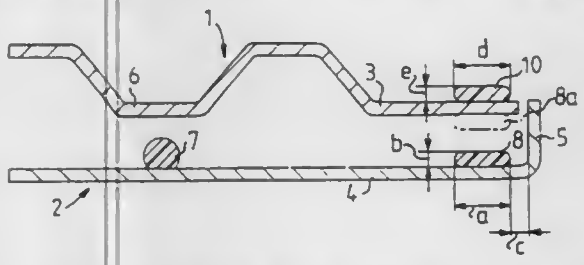
PCT No. PCT/SE94/00266, § 371 Date Sep. 20, 1995, § 102(e) Date Sep. 20, 1995, PCT Pub. No. WO94/21740, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 24, 1994, Ser. No. 535,197

Claims priority, application Sweden, Mar. 25, 1993, 9300998

Int. Cl.^{6} B23P *25/00;* B32G *31/00*

U.S. Cl. 156—212 **5 Claims**



1. A process for producing an adhesive bond in a folded joint between a first component (1) and a second component (2), said first component (1) having an essentially flat edge area (3) and said second component (2) having an essentially flat edge area (4) with a bent-up edge flange (5) for bending about the edge area (3) of the first component (1), said process comprising the steps of:

application of a first adhesive string (8) on a surface of one of the edge areas (3, 4) which faces the other one of the edge areas, the first adhesive string (8) being a short distance from an edge of the first component (1) when applied thereto or from the edge flange (5) of the second component (2) when applied thereto, the amount of adhesive in the first adhesive string (8) being adjusted so that the adhesive, upon pressing together of the first component (1) and the second component (2), is forced past and covers the edge of the first component (1); and

application of a second adhesive string (10) on a surface of the edge area (3) of the first component (1) against which surface the edge flange (5) of the second component (2) is to be bent, the second adhesive string (10) being a short distance from the edge of the first component (1) and applied with a portion thereof extending past the area of the first component that is covered by the edge flange of the second component after bending down the edge flange, and the amount of adhesive in the second adhesive string (10) being adapted so that the adhesive, upon bending over the edge flange (5) of the second component (2), is pressed into contact with the adhesive in the first adhesive string (8) and is made to cover the edge of the edge flange (5).

5,749,993

METHOD OF MAKING AN AUTOMOTIVE CARPETING WITH PRECUT CONFORMING FOAM UNDERLAYMENT

Denys Denney, Riverside; Jose de Jesus Munoz Contreras, Apple Valley, both of Calif.; Vincenzo A. Bonaddio, Boothwyn, Pa., and David M. Johnsin, Riverside, Calif., assignors to Foamex L.P., Linwood, Pa.

Filed Feb. 1, 1996, Ser. No. 595,573

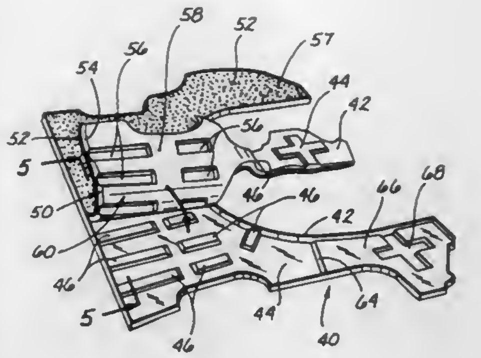
Int. Cl.^{6} B26D *1/02;* B28B *11/14;* B32B *31/04*

U.S. Cl. 156—214 **13 Claims**

1. A method of making an automotive carpet assembly having a thermal and acoustic barrier of compressible synthetic foam, comprising the steps of:

making a three dimensional pattern having cavities and raised portions complementary to a three dimensional shape of an automotive floor-pan surface;

providing a sheet of resiliently compressible synthetic foam having a first surface and a second surface;



pressing said three-dimensional pattern against said first surface of said sheet;

cutting away portions of said foam pressed into cavities of said pattern while substantially sparing portions of said foam compressed by said raised portions to make a modified surface on said sheet generally complementary to the three dimensional shape of said floor pan surface;

providing a carpet blank, said blank having a fiber side and a backing side; and

affixing said second surface of said sheet to said backing side of the carpet blank

whereby the carpet assembly comprised of said blank and said sheet may be installed with said first surface of said foam sheet in complementary relationship to the floor pan surface.

5,749,994

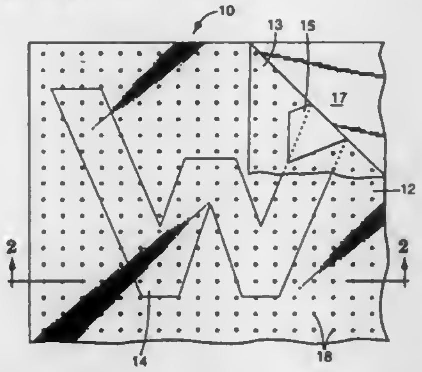
LAMINATE FOR PRECISE APPLICATION OF GRAPHICS TO A SUBSTRATE

Douglas C. Sundet, North Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 559,025, Nov. 16, 1995, Pat. No. 5,665,446. This application May 19, 1997, Ser. No. 858,305

Int. Cl.^{6} B32B *31/14*

U.S. Cl. 156—230 **3 Claims**



1. A method of making a laminate by which graphics can be precisely applied to a substrate, which method comprises the steps of:

applying a layer of aggressive pressure-sensitive adhesive to a flexible low-adhesion carrier web,

applying a decorative polymeric film to the layer of aggressive pressure-sensitive adhesive,

cutting graphics into the decorative polymeric and the aggressive pressure-sensitive adhesive without cutting through the carrier web,

removing and discarding the adhesive-bearing weed between the graphics,

applying a layer of removable pressure-sensitive adhesive to a transparent polymeric sheet

venting the adhesive coated transparent polymeric sheet over its entire area, and

adhering the transparent polymeric sheet to the exposed faces of the graphics by the layer of removable pressure-sensitive adhesive.

5,749,995

WATERTIGHT COUPLING BETWEEN A TUBE AND AN ENDPIECE AND METHOD OF MANUFACTURING IT

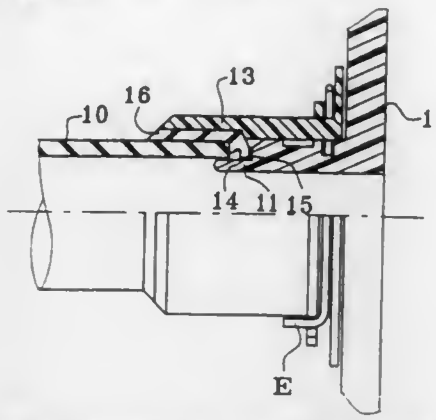
Denis Godeau, Les Grands Pres, France, assignor to Hutchinson, Paris, France

Divislon of Ser. No. 170,014, Dec. 20, 1993, Pat. No. 5,505,495. This application Feb. 26, 1996, Ser. No. 606,837

Claims priority, application France, Jan. 7, 1993, 93 00079

Int. Cl.^{6} F16L *47/00*

U.S. Cl. 156—242 **8 Claims**



1. A method of manufacturing a waterproof coupling between a tube and an endpiece, the method comprising the steps of molding a sealing member of an elastomer-type material on the tube for providing sealing between the tube and the endpiece and securing the sealing member to an annular fitting adapted for coupling the tube to the endpiece.

5,749,996

METHOD OF PRODUCING RECLAIMED JOINT SHEET AND THE RECLAIMED JOINTSHEET

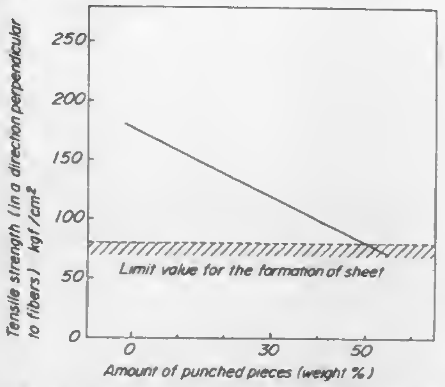
Tsutomu Tomizawa; Yoshihiko Tatemichi, both of Wako; Ken Fujiwara, Urawa; Masamichi Hoshi, Urawa, and Hiroyuki Nakano, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Nippon Leakless Industry Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 452,142, May 26, 1995, Pat. No. 5,658,657. This application May 13, 1997, Ser. No. 855,470

Claims priority, application Japan, Jun. 17, 1994, 6-135741

Int. Cl.^{6} B29C *47/00*

U.S. Cl. 156—244.24 **1 Claim**



1. A method of producing a reclaimed joint sheet, which comprises kneading a composition for the formation of the joint sheet comprising inorganic fibers or organic fibers or a mixture thereof, a rubber material, rubber chemicals and a filler, inserting the kneaded composition between a pair of a hot roll and a cold roll to heat and roll the composition to thereby laminate the composition on the hot roll in the form of a sheet, peeling off the laminated sheet from the hot roll to obtain a joint sheet, punching out the joint sheet into a shape to be used as a packing, finely pulverizing the resulting punched pieces of the joint sheet into particles having a particle size of not more than 1.4 mm by means of a grinder, and then adding the resulting particles to the same composition as mentioned above in an amount of not more than 50 weight % to reuse as a composition for the formation of a subsequent joint sheet.

5,749,997

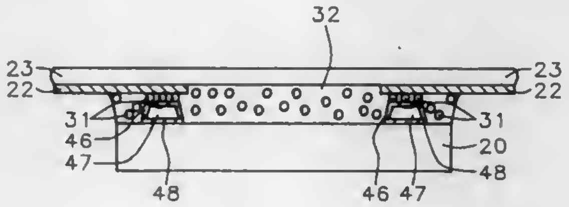
COMPOSITE BUMP TAPE AUTOMATED BONDING METHOD AND BONDED STRUCTURE

Pao-Yun Tang; Shyh-Ming Chang, both of Hsinchu; Yu-Chi Lee, Taipei, and Su-Yu Fang, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Filed Dec. 27, 1995, Ser. No. 578,929

Int. Cl.^{6} H05K *3/30;* **C09J** *9/02;* **H01L** *23/485;* **H01R** *4/04*

U.S. Cl. 156—249 **19 Claims**



1. A method of forming a bonded structure, comprising the steps of:

providing an integrated circuit element having composite bump bonding pads wherein each of said composite bump bonding pads comprises a first polymer body covered by a first conductive metal coating;

providing an anisotropic conductive film comprising conductive particles dispersed in a layer of insulating adhesive formed on a protective film;

providing a first dielectric layer formed of first dielectric material;

providing a lead array having a number of conductive leads formed on said first dielectric layer wherein each said conductive lead has an inner lead end and an outer lead end, said first dielectric layer has an inner perimeter forming a window having no first dielectric material, and each said inner lead end extends beyond said inner perimeter into said window;

providing an isolation film comprising a layer of support metal formed on a layer of second dielectric material;

providing a thermode whereby heat energy can be supplied for a selected time at a selected temperature and pressure;

placing a preformed piece of said anisotropic conductive film over said integrated circuit element so that said conductive particles dispersed in a layer of insulating adhesive contact said composite bump bonding pads;

delivering heat energy at a first temperature and a first pressure for a first time through said protective film to said anisotropic conductive film by means of said thermode;

removing said protective film;

forming a number of bonding pairs comprising one of said inner lead ends, one of said composite bump bonding pads, and said conductive particles between one of said inner lead ends and one of said composite bump bonding pads by means of placing said lead array over said conductive particles dispersed in a layer of insulating adhesive so that each said inner lead end is over a composite bump bonding pad;

placing a preformed piece of said isolation film over said lead array whereby said preformed piece of isolation film covers said window; and

delivering heat energy at a second temperature and a second pressure for a second time to said isolation film, said lead array, said conductive particles dispersed in a layer of insulating dielectric, and said bonding pairs by means of said thermode thereby forming an electrical bond between said conductive particles, said inner lead end, and said composite bump bonding pads in each said bonding pair.

5,749,998

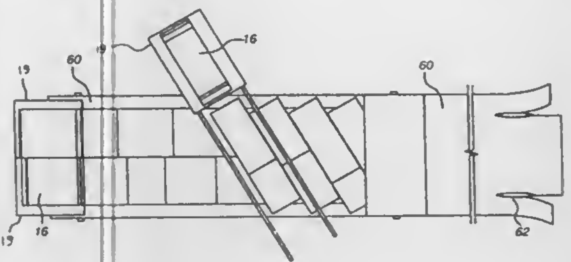
ASSEMBLY OF CORRUGATED PANELS INTO A WEB

Larkin P. Skinner, P.O. Box 162841, Austin, Tex. 78716

Continuation-in-part of Ser. No. 31,669, Mar. 15, 1993, Pat. No. 5,413,662. This application May 11, 1995, Ser. No. 438,848

Int. Cl.^{6} B32B *31/10:31/12;31/20*

U.S. Cl. 156—265 **16 Claims**



1. A process for manufacturing a laminated cardboard web comprising the steps of:

(a) laying a first series of cardboard panels edge to edge, said first series of panels extending in a first direction;

(b) laying a second series of cardboard panels edge to edge on top of said first series, said second series of panels extending in said first direction, said panels of said second series being laid so that the edge to edge joints between said panels of said second series are angled with respect to the edge to edge joints between said panels of said first series; and

(c) bonding said first series of panels to said second series of panels.

5,749,999

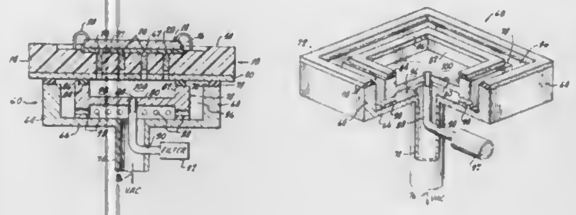
METHOD FOR MAKING A SURFACE-MOUNT TECHNOLOGY PLASTIC-PACKAGE BALL-GRID ARRAY INTEGRATED CIRCUIT

Sanjay Dandia, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Feb. 4, 1994, Ser. No. 191,887

Int. Cl.^{6} H01L *21/58;21/68;* **H05K** *13/04*

U.S. Cl. 156—285 **4 Claims**



1. A method of making a surface-mount technology plastic-package ball-grid array integrated circuit assembly, said method comprising the steps of:

providing for said integrated circuit assembly a surface-mount ball-grid array package which has a circuit chip recess from which through vias extend to open on a bottom surface of said package;

holding said package on a vacuum chuck by applying vacuum to a peripheral portion of said package around said vias;

communicating substantially ambient pressure to the openings of said vias on said bottom surface of said package;

placing an adhesive material in said recess to extend partially through said open vias; and

disposing a circuit chip in said recess on said adhesive material.

5,750,000

SEMICONDUCTOR MEMBER, AND PROCESS FOR PREPARING SAME AND SEMICONDUCTOR DEVICE FORMED BY USE OF SAME

Takao Yonehara, Atsugi; Nobuhiko Sato, Yokohama; Kiyofumi Sakaguchi, Atsugi, and Shigeki Kondo, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

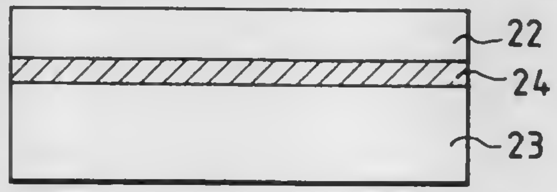
Continuation of Ser. No. 551,450, Nov. 1, 1995, abandoned, which is a division of Ser. No. 514,984, Aug. 14, 1995, abandoned, which is a continuation of Ser. No. 355,117, Dec. 13, 1994, abandoned, which is a continuation of Ser. No. 191,767, Feb. 4, 1994, abandoned, which is a continuation of Ser. No. 921,232, Jul. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 740,439, Aug. 5, 1991, Pat. No. 5,371,037.

This application Nov. 25, 1996, Ser. No. 755,356

Claims priority, application Japan, Aug. 3, 1990, 2-206548; Jul. 29, 1991, 3-210369; Jul. 29, 1991, 3-210370; Aug. 1, 1991, 3-214241; Aug. 1, 1991, 3-214242; Aug. 1, 1991, 3-214243; Aug. 1, 1991, 3-214244; Aug. 2, 1991, 3-216573; Aug. 2, 1991, 3-216574; Aug. 2, 1991, 3-216575

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 156—630.1 **69 Claims**



1. A method of manufacturing a semiconductor device comprising a substrate having a surface composed of an insulating material and a non-porous monocrystalline semiconductor region disposed on the surface comprising the steps of:

preparing a body comprising a porous monocrystalline semiconductor region and said non-porous monocrystalline semiconductor region formed thereon,

bonding the substrate having a surface composed of an insulating material to the body so that the surface composed of an insulating material is adhered to the surface of said non-porous noncrystalline semiconductor region, and

removing the porous monocrystalline semiconductor region by etching.

5,750,001

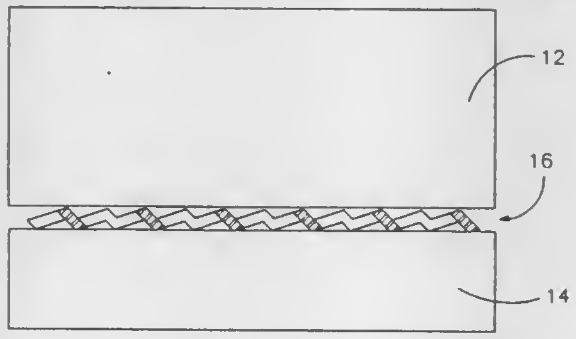
METAL REINFORCED PLASTIC ARTICLE AND METHOD OF FORMING SAME

Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50325

Filed Jul. 15, 1996, Ser. No. 679,892

Int. Cl.^{6} B29C *31/00;* **B32B** *31/20;* **B65C** *9/25*

U.S. Cl. 156—303.1 **25 Claims**



1. A method of forming a metal reinforced plastic article comprising:

(a) providing a first plastic member;

(b) providing a second plastic member;

(c) providing a metal reinforcing member having at least one aperture;

(d) heating said metal reinforcing member;

(e) placing said heated metal reinforcing member between said first plastic member and said second plastic member; and

(f) pressing said first plastic member and said second plastic member together, said pressing resulting in said first plastic member and said second plastic member bonding together through said aperture in said metal reinforcing member, and said pressing resulting in said metal reinforcing member becoming encapsulated between said first plastic member and said second plastic member.

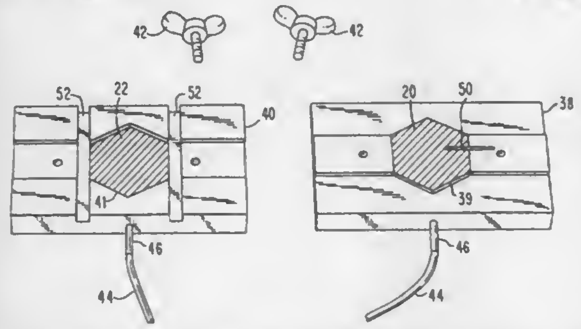
5,750,002
METHOD FOR FABRICATING PIEZOELECTRIC POLYMER ACOUSTIC SENSORS

Thomas E. Hall, Jr., Newport News, and Timothy D. Bryant, Gloucester, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 319,142, Oct. 4, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 622,175

Int. Cl.⁶ H01B *13/00;* **B29C** *63/02;65/54;* **B32B** *3/08*

U.S. Cl. 156—313 **4 Claims**



1. A method for forming a sensor having a first film and a second film bonded together with an internal connection tab therebetween, the first film and second film each having an inner and an outer surface, the method comprising:

maintaining the first and second films in substantially flat positions with the inner surface of the first film adjacent to the inner surface of the second film;

positioning the internal connection tab between the inner surfaces of the first and second films;

applying a conductive adhesive to at least one of the internal connection tab, the inner surface of the first film and the inner surface of the second film, the conductive adhesive being applied to a location which will allow the inner surfaces of the first and second films and the internal connection tab to be electrically connected via the adhesive when the sensor is formed; and

pressing the first and second films together to bond the inner surfaces of the first and second films together with the internal connection tab therebetween, thereby bonding the first and second films and the internal connection tab together to form the sensor.

5,750,003
CHUCK FOR HOLDING SEMICONDUCTOR PHOTOLITHOGRAPHY MASKS

Lee Meng Chun, Taipei, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-chu, Taiwan

Filed May 20, 1996, Ser. No. 650,358

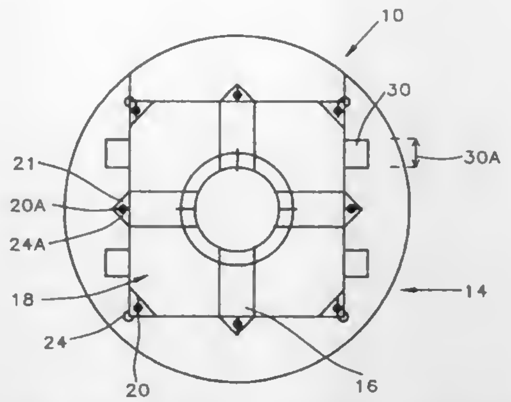
Int. Cl.⁶ H01L *21/00;* **B44C** *1/22*

U.S. Cl. 156—345 **19 Claims**

1. A mask chuck for fabricating a semiconductor mask which reduces spinning turbulence comprising:

a) a cylindrical top plate attached to a base by supports, said top plate having a top surface;

b) said top plate having a cylindrical shape, a top surface, and rounded edges;



c) said top plate having an opening, said opening have four corners;

d) four ledges extending out from along said corners of said opening; and

e) pins on said ledges, said pins extending upward towards the top surface of said top plate whereby a mask rests on said pins and said pins are adjusted so that the top surface of said mask is even with the top surface of said top plate.

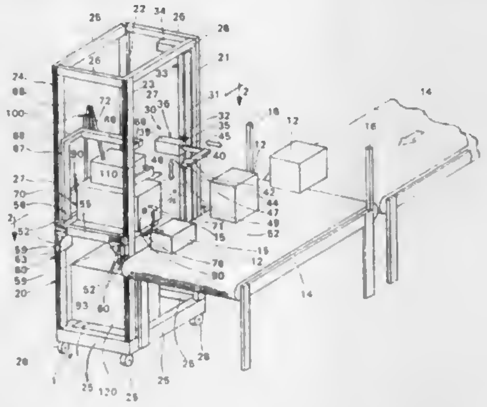
5,750,004
LABEL APPLICATOR

Albert Wurz, Doylestown; Edward P. Yeh, Harleysville, and Thomas J. Brobst, Allentown, all of Pa., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Continuation of Ser. No. 235,157, Apr. 29, 1994, abandoned. This application Jun. 7, 1996, Ser. No. 665,042

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—360 **6 Claims**



1. A label applicator for applying a label to an article in motion along a given path, the applicator comprising:

label printing means, for providing a printed label at a label feed position, positioned alongside the article path in a plane parallel thereto, said means mounted for vertical adjustment to an expected median article height;

label transport means, located adjacent to the label printing means, that moves to a home position, where it is not over the article path and is aligned with the label feed position, to receive and retain a label, obtains the printed label, moves vertically to an article intercept position, and moves outwardly and over the article path to apply the label on the article;

means for locating the label feed position and transmitting label feed position data;

article detection means which provides article dimension and position data; and

a controller which receives the article data, directs label printing, label transporting, and label application in accordance with that data and then returns the label transport inwardly and away from the article path.

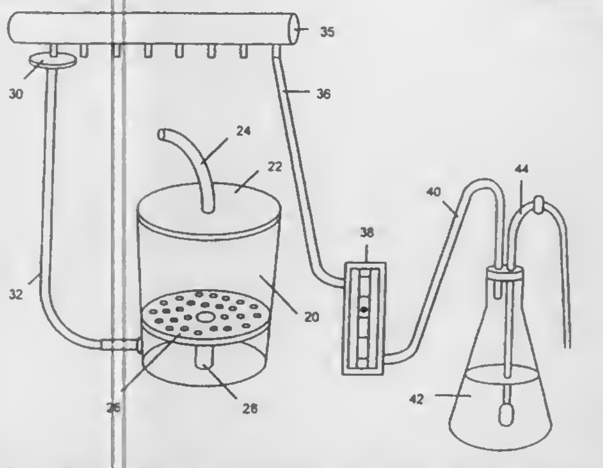
5,750,005
METHOD OF ENHANCING BIOPULPING EFFICACY

Masood Akhtar, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 289,479, Aug. 11, 1994, Pat. No. 5,620,564. This application Feb. 14, 1997, Ser. No. 801,704

Int. Cl.⁶ D21C *3/00;3/20*

U.S. Cl. 162—72 **13 Claims**



1. A method of making a wood pulp comprising the steps of:

(a) chipping wood into wood chips;

(b) inoculating the wood chips with a liquid inoculum of a white rot fungi and corn steep liquor;

(c) introducing the wood chips into a bioreactor, wherein step (c) may take place before or after step (b);

(d) incubating the wood chips under conditions favoring the propagation of the fungus through the wood chips for a sufficient amount of time for the fungus to modify a significant amount of the lignin naturally present in the wood chips; and

(e) mechanically pulping the wood chips degraded by the fungus into a paper pulp.

5,750,006
PROCESS FOR MAKING PAPER AND CARDBOARD

Giordano Donelli, Brescia; Massimiliano Rosellini, Leno; Raffaella Taliento, Concesio, and Fausto Dore', Brescia, all of Italy, assignors to Industrie Chimiche Caffaro, S.p.A., Milan, Italy

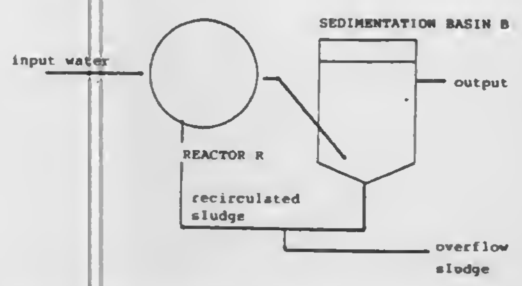
PCT No. PCT/EP94/03225, § 371 Date Jun. 18, 1996, § 102(e) Date Jun. 18, 1996, PCT Pub. No. WO95/09817, PCT Pub. Date Apr. 13, 1995

PCT Filed Sep. 27, 1994, Ser. No. 619,750

Claims priority, application Italy, Oct. 1, 1993, MI93A2094

Int. Cl.⁶ D21H *17/01;* **C02F** *3/30*

U.S. Cl. 162—181.5 **20 Claims**



1. A process for denitrifying process wastewater produced from a papermaking process during which papermaking process, prior to formation of paper sheet or cardboard from solid material comprising fibers, filler material and cellulose reactive rosin, is added at least one compound represented by the formula (I):

$$Me_2(OH)_x(NO_3)_y \qquad (I)$$

where

Me is Al or Fe (III),

x is a numeral between 0 and 5,

y is a numeral between 1 and 6,

and x+ y=6,

said process for denitrifying wastewater comprising subjecting said wastewater to a biological denitrification treatment by using a denitrifying anoxic sludge which is able to denitrify in the absence of molecular oxygen, said denitrification treatment being performed at a pH value in the range between 8 and 8.5, said wastewater, before said denitrification containing:

(a) a carbon-containing organic substrate expressed as C.O.D. (Chemical Oxygen Demand) in an amount, with respect to the nitrogen expressed as nitric nitrogen, to meet at least the weight ratio C.O.D.:
N= 5:1; and

(b) an amount of phosphorus to meet at least the weight ratio P:N= 1:5.

5,750,007
PROCESS FOR THE RECOVERY OF A CARBONYLATION PRODUCT

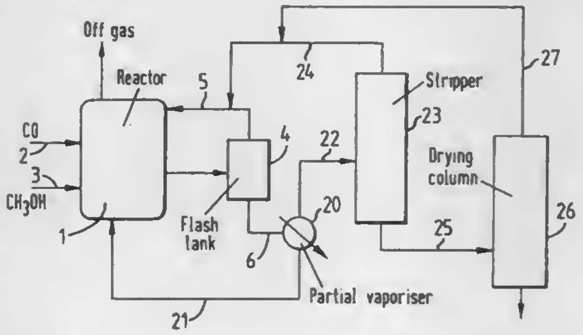
Kirsten Everald Clode, North Humberside; Derrick John Watson, East Yorkshire, both of England, and Carl Josef Elsa Vercauteren, St Gillis-Waas, Belgium, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 173,694, Dec. 23, 1993, abandoned. This application May 31, 1995, Ser. No. 454,620

Claims priority, application United Kingdom, Mar. 26, 1993, 9306409

Int. Cl.⁶ B01D *3/42;* **C07C** *51/12;51/44*

U.S. Cl. 203—3 **3 Claims**



1. A process for the recovery of a fraction comprising a carboxylic acid carbonylation product of an alcohol, ester, hydrocarbyl halide and/or hydrocarbyl ether carbonylatable reactant from a liquid carbonylation reaction composition comprising carboxylic acid carbonylation product, free or combined iridium carbonylation catalyst and ester derivative of the carbonylatable reactant which process comprises: (a) subjecting the liquid carbonylation reaction composition to a vaporization in a first vaporization zone to produce, with or without the addition of heat, a first vapor fraction comprising at least a portion of the ester derivative in the liquid carbonylation reaction composition and a first liquid fraction comprising the remainder of the ester derivative in the liquid carbonylation reaction composition, at least a portion of the carboxylic acid product and the iridium carbonylation catalyst, and maintaining a concentration of water of at least 0.5% by weight to 50% by weight for the purpose of stabilizing the iridium catalyst in the first liquid fraction; and (b) passing the first liquid fraction to a second vaporization zone wherein the first liquid fraction is subjected to a vaporization, with or without the addition of heat, to produce a second vapor fraction comprising carboxylic acid carbonylation product and a second liquid fraction comprising iridium carbonylation catalyst and maintaining in the second liquid fraction a concentration of water of at least 0.5% by weight for the purpose of stabilizing the catalyst; and (c) recycling said stabilized iridium carbonylation catalyst.

5,750,008
METHOD AND DEVICE FOR THE EXTRACTION TREATMENT OF A SAMPLE

Werner Lautenschläger, Waldstrasse 15, D-88299 Leutkirch, Germany

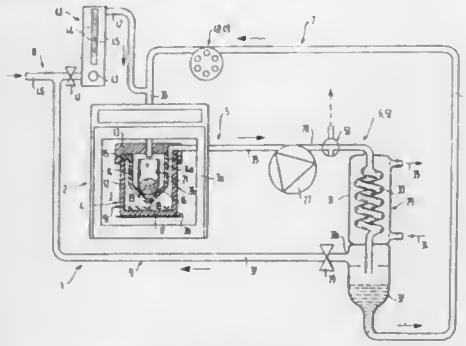
PCT No. PCT/EP96/00329, § 371 Date Oct. 2, 1996, § 102(e) Date Oct. 2, 1996, PCT Pub. No. WO96/23565, PCT Pub. Date Aug. 8, 1996

PCT Filed Jan. 26, 1996, Ser. No. 716,315

Claims priority, application Germany, Feb. 3, 1995, 195 03 591.7

Int. Cl.^{6} B01D *11/00;3/00*

U.S. Cl. 203—43 **18 Claims**



1. Method for the extraction treatment of a sample with a solvent which is liquid at normal ambient temperature and normal pressure, said method comprising the steps of:

- introducing the solvent into a sample chamber and there bringing the solvent into contact with the sample whereby a portion of the solvent evaporates;
- drawing off the solvent vapor which arises in the sample chamber in such a manner as to produce a vacuum in the sample chamber, whereby a further part of the liquid solvent passes into the vapor phase;
- subjecting the drawn-off solvent to a positive pressure; and
- cooling and liquefying at least a portion of the drawn off and pressurized solvent vapor to recover pure solvent.

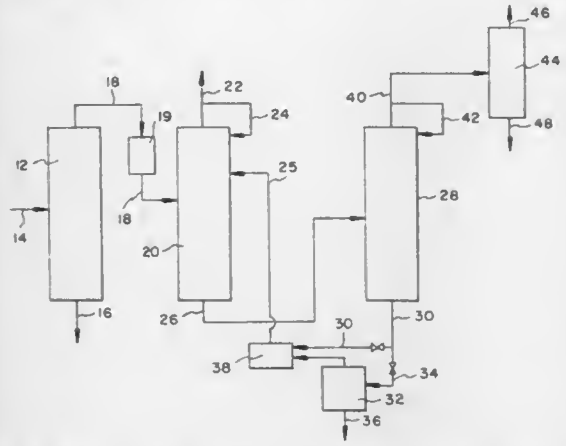
5,750,009
METHOD FOR PURIFYING NATURAL CRESYLIC ACID MIXTURES

David H. Duncan, Beulah; Gene G. Baker, Hazen; Alfred K. Kuhn, Beulah; Dana J. Maas, and Kevin M. Mohl, both of Hazen, all of N. Dak., assignors to Dakota Gasification Company, Beulah, N. Dak.

Continuation of Ser. No. 298,835, Aug. 31, 1994, abandoned. This application May 28, 1996, Ser. No. 653,815

Int. Cl.^{6} B01D *3/40;* **C07C** *37/74*

U.S. Cl. 203—64 **5 Claims**



1. A process for producing a purified natural cresylic acid mixture including in its boiling range a mixture of phenols including at least the C_7 through C_9 phenols comprising the steps of:

a. distilling a natural cresylic acid feedstock containing said mixture of phenols and pitch materials boiling higher than said C_9 phenols and at least one member selected from the group consisting of tar base substances and neutral oil substances to separate said pitch materials from said feedstock and producing a depitched feedstock containing said mixture of phenols and said member;

b. extractively distilling said depitched feedstock consisting essentially of the entire said mixture of phenols and said member with a polyhydric alcohol solvent, said solvent having a boiling point sufficiently higher than said depitched feedstock with which it is used to permit subsequent separation therefrom, whereby said member is separated from said solvent containing said mixture of phenols;

c. subsequently separating said mixture of phenols from said solvent by distilling to provide said purified natural cresylic acid mixture as an overhead product and said solvent as a bottoms product; and

d. recycling said solvent to step b.

5,750,010
PROCESS FOR PHOTOCHLORINATION

C. Bradford Boyce; Guy P. Pittman, both of Baton Rouge, and Bolivar F. Lewis, III, Prairieville, all of La., assignors to LaRoche Industries, Inc., Atlanta, Ga.

Filed Oct. 3, 1995, Ser. No. 537,355

Int. Cl.^{6} C07C *17/00*

U.S. Cl. 204—157.94 **6 Claims**

1. In a process comprising (i) treating a liquid mixture of 1,1-dichloro-1-fluoroethane and at least one unsaturated carbon-containing compound with chlorine (ii) irradiating said chlorine-treated liquid mixture with ultraviolet light, thereby to selectively convert at least a portion of said at least one unsaturated carbon-containing compound to photochlorinated products thereof and (iii) separating said 1,1-dichloro- 1-fluoroethane from said photochlorinated products, the improvement comprising conducting said irradiation of step (ii) with an ultraviolet light source having an ultraviolet radiation efficiency of 0.01 to 0.7 Einsteins\inch of arc\100 watts with an input power of 1.5 watts per inch of arc and whose radiation output is in the wavelength region that is substantially the same as the wavelength absorption band of chlorine.

5,750,011
APPARATUS AND METHOD FOR PRODUCING GASEOUS IONS BY USE OF X-RAYS, AND VARIOUS APPARATUSES AND STRUCTURES USING THEM

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi Miyaga-ken 980, Japan; Hitoshi Inaba, Tokyo, and Tomoyuki Ikedo, Shizuoka-ken, both of Japan, assignors to Tadahiro Ohmi; Takasago Netsugaku Kogyo Kabushiki Kaisa, and Hamamatsu Photonics Kabushiki Kaisha, all of Japan

PCT No. PCT/JP93/01145, § 371 Date Mar. 22, 1995, § 102(e) Date Mar. 22, 1995, PCT Pub. No. WO94/05138, PCT Pub. Date Mar. 3, 1994

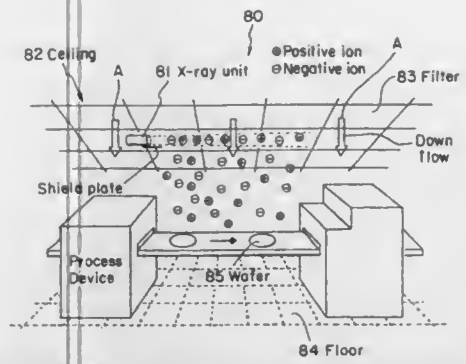
PCT Filed Aug. 13, 1993, Ser. No. 387,712

Claims priority, application Japan, Aug. 14, 1992, 4-216807

Int. Cl.^{6} H05F *3/06*

U.S. Cl. 204—164 **20 Claims**

13. A method of neutralizing electricity of an electrified object comprising the step of applying electromagnetic wave irradiation in a soft X-ray region to atmospheric air surrounding the electrified object, to ionize the atmospheric air and to form one of positive ions, negative ions, electrons, and a mixture thereof in the ionized atmospheric air, wherein a negative charge of a said electrified object is neutralized by positive ions, and a positive charge of a said electrified object is neutralized by negative ions, electrons or a mixture of negative ions and electrons.



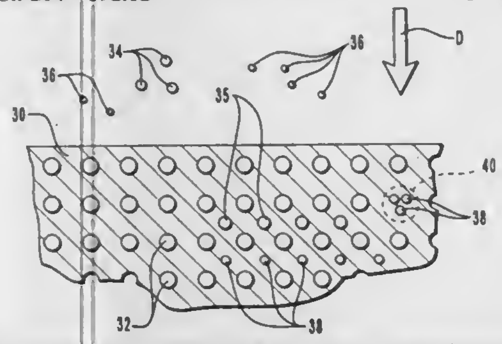
5,750,012
MULTIPLE SPECIES SPUTTERING FOR IMPROVED BOTTOM COVERAGE AND IMPROVED SPUTTER RATE

P. J. Ireland, Nampa; Howard Rhodes, Boise; Sujit Sharan, Boise; Sukesh Sandhu, Boise; Tim O'Brien, Boise, and Tim Johnson, Eagle, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Apr. 4, 1996, Ser. No. 627,262

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—192.12 **37 Claims**



1. A method for depositing a fill material by sputtering comprising: providing a target comprising at least one material to be sputtered, and a substrate; producing a plasma, said plasma comprising an ionized first species having a first molecular weight, an ionized second species having a second molecular weight greater than said first molecular weight, and an ionized third species; sustaining the production of the plasma before the start of substantial deposition while removing said third species from said plasma; sputtering said target in said plasma with said first and second ionized species to create a flux of sputtered atoms of said at least one material ejected from a surface of said target; and exposing said substrate to said flux, wherein the proportion of ions of said first species to ions of said second species approaching said target is greater than one to one, whereby the perpendicularity of said flux ejected from the surface of said target is increased over that achieved by sputtering in a plasma of one of said first and second species.

5,750,013
ELECTRODE MEMBRANE ASSEMBLY AND METHOD FOR MANUFACTURING THE SAME

Andrew S. Lin, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

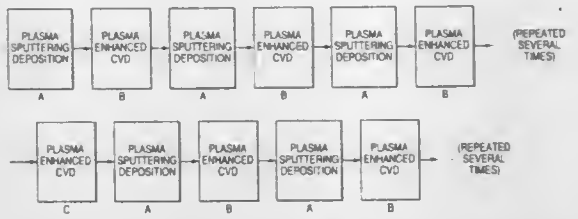
Filed Aug. 7, 1996, Ser. No. 689,493

Int. Cl.^{6} C23C *16/26;16/50*

U.S. Cl. 204—192.14 **11 Claims**

1. A method for manufacturing an electrode membrane assembly, comprising conducting the following steps on a gas diffusible and electrically conductive substrate:

(A) forming a micro-particle metal layer on said substrate in a vacuum chamber by plasma sputtering deposition, then,



(B) introducing a first reactive gas into the vacuum chamber and forming a porous electrically conductive layer on said micro-particle metal layer by plasma enhanced chemical vapor deposition.

wherein steps (A) and (B) are conducted at least one time to form an active catalytic layer comprising micro-particle metal layer(s) and porous electrically conducting layer(s);

(C) introducing a second reactive gas into said vacuum chamber and forming a solid polymer membrane layer as electrolyte layer on said active catalytic layer by plasma enhanced chemical vapor deposition; and

(D) subsequently on said solid polymer membrane layer, repeating steps (A) and (B) at least one time to form another active catalytic layer comprising micro-particle metal layer(s) and porous electrically conducting layer(s) to give the electrode assembly.

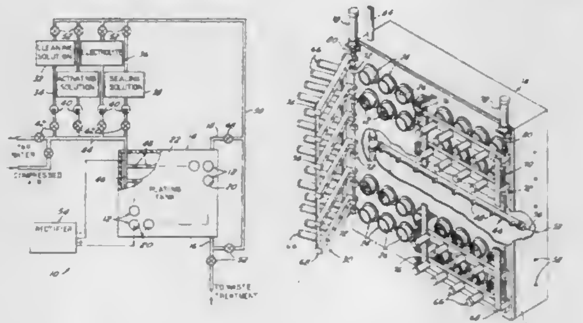
5,750,014
APPARATUS FOR SELECTIVELY COATING METAL PARTS

David M. Stadler, Lathrup Village, and Jeffrey R. Pernick, Commerce, both of Mich., assignors to International Hardcoat, Inc., Detroit, Mich.

Continuation of Ser. No. 540,655, Oct. 11, 1995, abandoned, which is a continuation-in-part of Ser. No. 386,012, Feb. 9, 1995, Pat. No. 5,534,126. This application Jul. 9, 1996, Ser. No. 677,164

Int. Cl.^{6} C25B *15/00;* **C25D** *17/04;5/02;7/00*

U.S. Cl. 204—224 R **20 Claims**



1. An apparatus for simultaneously generating an electrolytic coating on a first surface portion of each of at least two electrically-conductive workpieces using an electrolyte, said apparatus comprising:

- a first tank having an interior defined in part by a wall having at least two apertures formed therein, and a drain;
- at least one electrode extending into said first tank;
- means mounted on said first tank for temporarily securing each of said workpieces relative to each of said apertures, respectively, said securing means including a plurality of fixtures adapted to receive and support said workpieces in alignment with said apertures, respectively, said securing means further including actuator means mounted on the first tank for translating said workpieces supported by said fixtures toward said apertures;
- sealing means disposed between each of said workpieces and each of said apertures, respectively, for sealing said apertures about said workpieces when said workpieces are secured relative to said apertures, such that only the first surface portions of said workpieces are placed in fluid communication with the interior of said first tank;

a second tank for containing the electrolyte;

means for directing the electrolyte from said second tank into said first tank when said workpieces are secured relative to said apertures, such that the electrolyte bridges each of said workpieces and said at least one electrode; and

a power supply connected to said workpieces and said at least one electrode, respectively, for applying a current across the electrolyte when the electrolyte is directed into said first tank, where an electrolytic coating is simultaneously generated on the first surface portion of each of said workpieces.

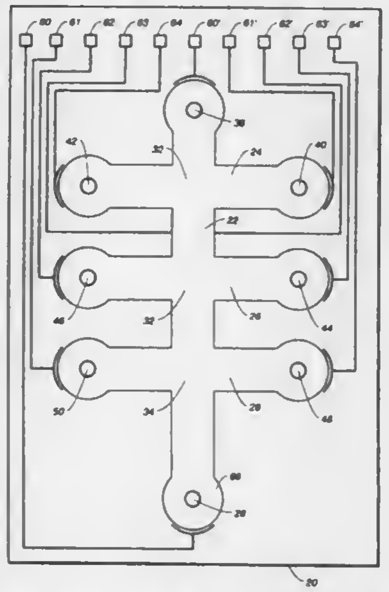
5,750,015
METHOD AND DEVICE FOR MOVING MOLECULES BY THE APPLICATION OF A PLURALITY OF ELECTRICAL FIELDS

David S. Soane, and Zoya M. Soane, both of Piedmont, Calif., assignors to Soane Biosciences, Hayward, Calif.

Continuation-in-part of Ser. No. 430,134, Apr. 26, 1995, abandoned, which is a continuation of Ser. No. 196,763, Feb. 14, 1994, abandoned, which is a continuation of Ser. No. 880,187, May 7, 1992, abandoned, which is a continuation of Ser. No. 487,021, Feb. 28, 1990, Pat. No. 5,126,022. This application Mar. 13, 1996, Ser. No. 615,642

Int. Cl.^{6} G01N *27/26;27/447*

U.S. Cl. 204—454 **47 Claims**



4. In a method for moving charged particles through a medium in a movement area comprising a trench of capillary dimensions using an electrical field with spaced apart electrodes positioned to be in electrical contact with a medium when present in said trench to produce said field, the improvement comprising:

supporting said medium with a non-porous polymer substrate having a substantially uncharged surface.

5,750,016
PROCESS FOR PLATING PALLADIUM OR PALLADIUM ALLOY ONTO IRON-NICKEL ALLOY SUBSTRATE

Sung-Soo Moon, 265-12, Hakjang-dong, Sasang-ku, Pusan, Rep. of Korea, 617-020

Filed Sep. 13, 1996, Ser. No. 713,579

Claims priority, application Rep. of Korea, Sep. 16, 1995, 95-30313; Feb. 7, 1996, 96-2912; May 1, 1996, 96-14102; Jun. 14, 1996, 96-21467

Int. Cl.^{6} C25D *5/10;5/12;* **B32B** *15/01;* **B41M** *5/20*

U.S. Cl. 205—50 **19 Claims**

1. A process for plating palladium or a palladium alloy onto an iron-nickel alloy substrate, which comprises the steps of: i) plating a metal selected from the group consisting of copper, tin, a nickel-tin alloy and a copper-tin alloy onto the substrate to form a first primer layer; ii) plating nickel or a gold alloy onto the first primer layer to form a second primer layer; and iii) plating palladium or a palladium alloy onto the second primer layer to form a palladium or a palladium alloy layer.

19. A semiconductor lead frame prepared by the process of any one of claims 1 to 18.

5,750,017
TIN ELECTROPLATING PROCESS

Yun Zhang, Berkeley Heights, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 21, 1996, Ser. No. 697,150

Int. Cl.^{6} C25D *5/18*

U.S. Cl. 205—102 **10 Claims**

1. A process for electroplating tin or tin alloy onto a metal substrate comprising:

placing a metal substrate in an aqueous plating bath comprising a stannous sulfonate selected from the group consisting of stannous alkyl sulfonate and stannous alkoyl sulfonate, a sulfonic acid selected from the group consisting of alkyl sulfonic acid or alkoyl sulfonic acid, and at least one organic additive that is an organic compound with at least one heterocyclic moiety, wherein the sulfonic acid in the bath has a concentration that is sufficient to provide the bath with a pH of about 1 or less and the organic additive in the bath has a concentration of about 0.08 g/l to about 0.8 g/l;

introducing a pulsed current into the bath under conditions sufficient to provide a tin or tin alloy coating on the substrate with well-polygonized grains having an average grain size of about 2 μm to about 8 μm.

5,750,018
CYANIDE-FREE MONOVALENT COPPER ELECTROPLATING SOLUTIONS

William R. Brasch, Nesconset, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Filed Mar. 18, 1997, Ser. No. 819,061

Int. Cl.^{6} C25D *3/38*

U.S. Cl. 205—295 **20 Claims**

16. A method of plating copper onto a substrate, which comprises preparing a cyanide-free monovalent copper plating solution by mixing a source of copper ions, a reducing agent capable of reducing divalent copper ions to monovalent copper ions, an alkali material in an amount sufficient to maintain the solution in a pH range of about 7 to about 10, and a complexing agent of an imide or hydantoin compound, wherein the combined amount of completing agent and reducing agent are sufficient to reduce divalent copper ions to monovalent copper ions; adjusting the solution to a temperature range of about 60° to 160° F.; immersing the substrate in the solution; and electroplating copper onto the substrate.

5,750,019
PROCESS FOR HYDROMETALLURGIC AND ELECTROCHEMICAL TREATMENT OF SULFUR ANTIMONY ORES WITH PRODUCTION OF ELECTROLYTIC ANTIMONY AND ELEMENTAL SULFUR

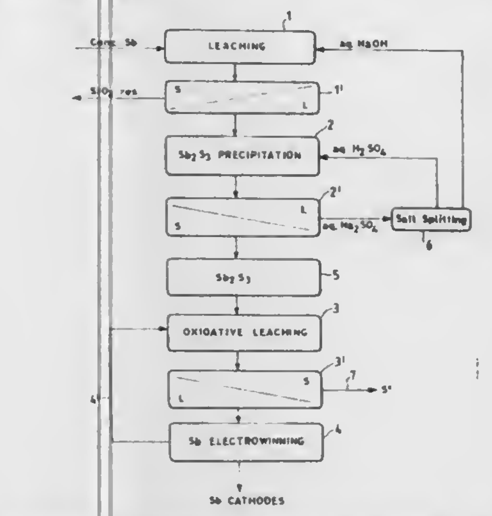
Marco Olper, Monza, Italy, assignor to Engitec S.p.A., Milan, Italy

Filed May 5, 1997, Ser. No. 851,022

Claims priority, application Italy, May 6, 1996, MI96A0890

Int. Cl.^{6} C25C *1/22*

U.S. Cl. 205—563 **5 Claims**



1. Process of treatment of a sulfur antimony ore wherein electrolytic antimony and elemental sulfur are produced, comprising the following steps:

a) leaching said sulfur antimony ore with an alkaline solution, wherein a solution of sulfur salts $NaSbS_2$ and $NaSbSO$ is obtained,

b) acidifying said solution of sulfur salts with insoluble Sb_2S_3 precipitating, which is separated,

c) treating said Sb_2S_3 by means of ferric fluoborate according to the reaction

$$Sb_2S_3+6Fe(BF_4)_3\rightarrow 2Sb(BF_4)_3+6Fe(BF_4)_2+3S^0 \qquad (3)$$

and separating the so obtained elemental sulfur,

d) treating the solution obtained from said (c) step in an electrowinning cell inside whose cathodic compartment the reaction

$$Sb^{3+}+3e^-\rightarrow Sb$$

takes place, wherein pure antimony is thus recovered at a cathode.

5,750,020
PROCESS FOR REMOVING SULFUR OXIDES OR NITROGEN OXIDES FROM A GASEOUS MIXTURE IN AN FCC PROCESS

Alakananda Bhattacharyya, Wheaton; Michael J. Foral, Aurora, and William J. Reagan, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 488,872, Jun. 9, 1995, Pat. No. 5,591,418, which is a continuation-in-part of Ser. No. 252,175, Jun. 1, 1994, Pat. No. 5,426,083. This application Oct. 1, 1996, Ser. No. 720,797

Int. Cl.^{6} C10G *11/00*

U.S. Cl. 208—113 **6 Claims**

1. A process for the cyclic, fluidized catalytic-cracking of a hydrocarbon feedstock including a nitrogen-containing organic compound wherein:

(i) the feedstock is mixed with a particulate cracking catalyst in a reaction zone at a temperature in the range of about 430 degrees C. to about 730 degrees C. to produce cracked hydrocarbons and to produce a coke containing nitrogen, relatively volatile components, and relatively less volatile components;

(ii) the cracking catalyst is separated from the cracked hydrocarbons and passed to a stripping zone where the catalyst is exposed to a stripping gas stream to substantially elutriate the volatile components from the cracking catalyst;

(iii) the cracking catalyst is passed to a catalyst regeneration zone where the nitrogen and the relatively less volatile components are substantially eradicated from the cracking catalyst by burning in the presence of an oxidizing gas at a temperature in the range of about 200 degrees C. to about 900 degrees C. to produce a gas stream including a carbon oxide and a nitrogen oxide; and

(iv) the cracking catalyst is returned to the reaction zone;

wherein the total amount of nitrogen oxides in the gas stream of the regeneration zone is reduced by the method which comprises:

chemically converting at least a portion of a nitrogen oxide in the regeneration zone to produce nitrogen by exposing the gas stream to a fluidizable particulate solid which comprises a dehydrated and at least partially collapsed composition of the formula:

$$M_{2m}^{2+}Al_{2-p}M_p^{3+}T_rO_{7+r\cdot s}$$

where M^{2+} is a divalent metal selected from the group consisting of magnesium, calcium, zinc, strontium and barium;

p is about 0.01 to about 0.4;

M^{3+} is a trivalent metal selected from the group consisting of cerium, lanthanum, iron, chromium, vanadium, and cobalt;

r is about 0.01 to about 0.2;

T is vanadium, tungsten or molybdenum;

s is 2.5 when T is vanadium or 3 when T is tungsten or molybdenum; and

the collapsed composition being substantially composed of solid solution microcrystallites having aluminum oxide dispersed in an oxide of the divalent metal and of spinel microcrystallites, each of the microcrystallites having the greatest linear dimension in the range of about 0.1 to about 30 nanometers.

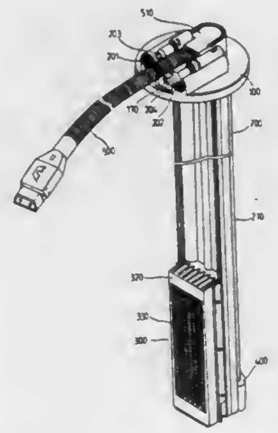
5,750,021
OIL SUPPLY AND RETURN TUBE STRUCTURE FOR OIL TANKS IN CARS AND SHIPS

Chung-Ho Liang, 2/F., No. 66, Sec. 2, Cheng-Tai Rd., Wu-Ku Village, Taipei County, Taiwan

Filed Nov. 26, 1996, Ser. No. 753,480

Int. Cl.^{6} B01D *35/027*

U.S. Cl. 210—86 **2 Claims**



1. An oil supply and return tube structure for oil tanks in cars and trucks, comprising:

a base having an upper surface, a lower surface and a side surface, a float hole extending from said upper surface to said lower surface, a large oil intake hole extending from said lower surface to said side surface, a large oil return hole extending from said lower surface to said side surface, a small oil intake hole extending from said lower surface to said side surface, a small oil return hole extending from said lower surface to said side surface, a securing screw hole extending from said upper surface to said lower surface, and an air inlet extending from said lower surface to said side surface, said base further having a first screw rod threadedly engaged with the float hole and extending downwardly from said lower surface, a second screw rod threadedly engaged with said large oil return hole and extending downwardly from said lower surface, a third screw rod threadedly engaged with said small oil return hole and extending downwardly from said lower surface, and a fourth screw rod extending through said securing screw hole;

an oil intake rod, an oil return rod and an air intake rod extending outwardly from said side surface and being connected to said small oil intake hole, said small oil return hole, and said air inlet, respectively;

and an air discharge valve connected to said air inlet and extending downwardly from said lower surface;

a sensor for detecting a level of oil in said tank,

a sinuous tube fastened in said float hole at said upper surface for protecting said sensor, and cap means for connecting said sinuous tube to said float hole;

metal conduit means secured to and extending downwardly from the lower surface of said base by a hollow securing rod and said securing screw, said metal conduit means further having a float conduit receiving said hollow securing rod, and a large oil intake conduit communicating with said large oil intake hole, a large oil return conduit receiving said second screw rod and communicating with said large oil return hole, a small oil intake conduit receiving said third screw rod and communicating with said small oil intake hole, and a small oil return conduit communicating with said small oil return hole, wherein each said conduit includes a through hole in a respective peripheral wall thereof;

a filter means for covering the through holes of said conduits, said filter means comprising a lower seat connected to said conduit means, an upper seat connected to said lower seat, and a pleated filter mesh clamped between said lower seat and said upper seat;

wherein upper and lower sides of said lower seat include a plurality of clamping grooves, said filter mesh being disposed in said plurality of clamping grooves and being clamped in said clamping grooves by a plurality of clamping plates of said upper seat, and wherein sides of said filter mesh are clamped within retaining grooves located on sides of said metal conduit means by L-shaped securing plates located on sides of said upper seat;

means for joining together said upper seat and said lower seat; and

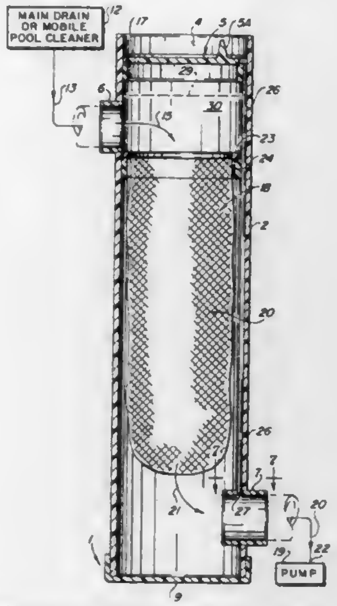
a float provided on said float shaft of said metal conduit, said float being integrally formed from foam rubber and having a C-shaped groove slidingly fitted about said float shaft, said float further having a hole at either side of a front rim of a top portion thereof, said hole accommodating therein a magnet, each said magnet being sealed within a respective hole using an epoxy resin, wherein said float is used in combination with said sensor, wherein said sensor is located within said float conduit and is responsive to a position of said magnets carried by said float for detecting the level of oil in said oil tank;

whereby said filter means filters impurities from said oil; and said metal conduit allows oil to flow into and out of said tank.

5,750,022

VACUUM SYSTEM FOR REMOVAL OF DEBRIS FROM SWIMMING POOLS

Andy F. Blake, Phoenix, and William C. Tarr, Waddell, both of Ariz., assignors to Shasta Industries, Inc., Phoenix, Ariz.
Filed Nov. 29, 1995, Ser. No. 564,779
Int. Cl.^{6} E04H *4/16*
U.S. Cl. 210—169 **5 Claims**



1. A swimming pool debris removal system, comprising in combination:

(a) a recirculating pump having a suction inlet;

(b) a vacuum chamber having an access port, an inlet port, and an outlet port, the inlet port being connected to receive water and debris suspended in water pumped from the pool by the pump;

(c) tubing connected between the suction inlet of the pump and the output port of the vacuum chamber;

(d) a removable vacuum seal lid disposed in the access port and forming a vacuum seal with an inner surface of the access port; (e) wherein the removable vacuum seal lid includes

(1) a disk including an upper surface, a lower surface, and a circumferential portion having a first annular groove therein, a handle attached to the upper surface; and

(2) a resilient seal ring attached to the plastic disk and disposed around the circumferential portion, the seal ring including

i. a base portion engaging the circumferential portion, and

ii. an inclined flange portion extending outward and upward from the circumferential portion to provide slidable, vacuum sealing engagement with an irregular inner surface of the access port.

5,750,023

SELF-PRIMING PUMPING DEVICE FOR HYDRAULIC CIRCUITS

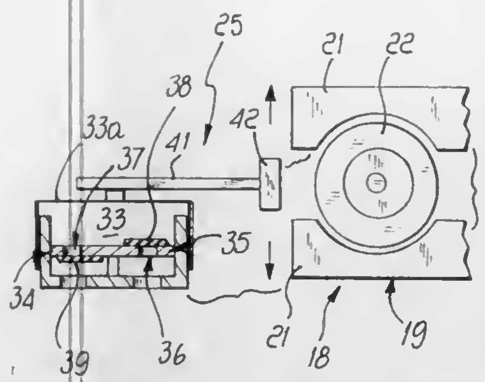
Paolo Pettenon, Cittadella, Italy, assignor to Sicce S.p.A., San Pietro in Gu', Italy
Filed Feb. 8, 1996, Ser. No. 598,314
Claims priority, application Italy, Feb. 24, 1995, PD95A0050
Int. Cl.^{6} A01K *63/04;* **B01D** *35/32;* **F04B** *23/14;43/04*
U.S. Cl. 210—169 **12 Claims**

1. An apparatus comprising an aquarium and an external aquarium filter, said external aquarium filter accommodating filtering masses in a hermetic container placed under a water head with respect to an aquarium;

a lid for said container;

a suction duct and a delivery duct respectively connecting said aquarium with said container;

a pump accomodated inside said lid, said pump having an electric motor which is at least partially not submersed; and

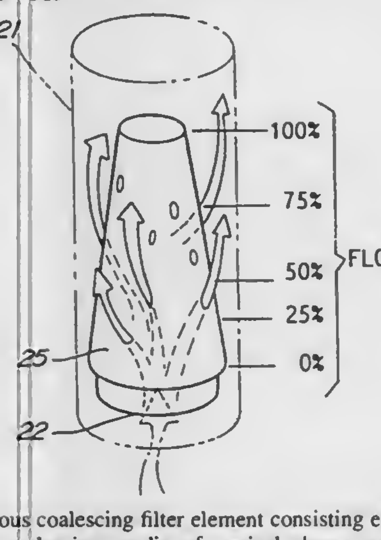


a volumetric suction machine connected to said lid and driven by said electric motor for producing a negative pressure suction for priming said pump, said volumetric suction machine having a suction inlet connected to a suction inlet of said pump by means of ducts that are controlled by valve means.

5,750,024

CONICAL COALESCING FILTER

Michael R. Spearman, St. Paul, Minn., assignor to Porous Media Corporation, St. Paul, Minn.
Continuation of Ser. No. 952,611, Nov. 12, 1992, Pat. No. 5,454,945. This application Mar. 31, 1995, Ser. No. 414,273
Int. Cl.^{6} B01D *27/08;39/06;39/20*
U.S. Cl. 210—315 **55 Claims**



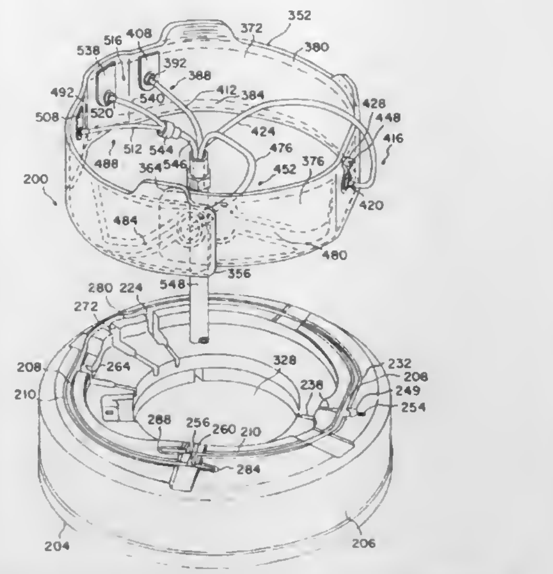
20. A porous coalescing filter element consisting essentially of a non-woven coalescing media of conical shape, said coalescing filter media having at least one end with said end having an annular sealing surface thereon, wherein coalescing takes places within the coalescing media as fluid flows from the inside to the outside of the media, said filter element further including at least one layer of a suitable thin sheet material wrapped around said conical porous filter media and being in intimate contact therewith.

5,750,025

DISPOSABLE FOR AN APHERESIS SYSTEM WITH A CONTOURED SUPPORT

Brian M. Holmes, Evergreen; Jeffrey J. Blakeslee, Arvada, and Victor D. Dolecek, Englewood, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.
Filed Jun. 7, 1995, Ser. No. 482,285
Int. Cl.^{6} B01D *21/26;33/00*
U.S. Cl. 210—361 **15 Claims**

1. A disposable for an apheresis system, said apheresis system comprising a blood processing channel, said disposable comprising:



(a) a blood processing vessel positionable in said channel, said blood processing vessel comprising:

(i) first and second interconnected sidewalls defining said blood processing vessel;

(ii) a blood inlet port; and

(iii) a platelet outlet port interfacing with one of said first and second sidewalls; said disposable further comprising:

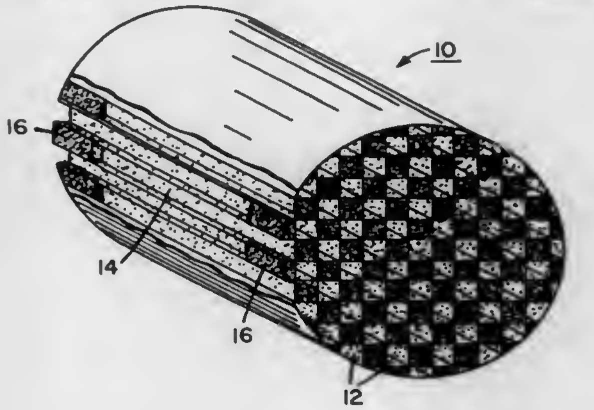
(b) a contoured support disposed proximate to and extending from said platelet outlet port; and

(c) means for movably attaching said contoured support to said one of said first and second sidewalls on an exterior surface of said blood processing vessel in overlapping relation with said exterior surface of said blood processing vessel.

5,750,026

DEVICE FOR REMOVAL OF CONTAMINANTS FROM FLUID STREAMS

Kishor P. Gadkaree, Big Flats, and Timothy V. Johnson, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Continuation of Ser. No. 459,450, Jun. 2, 1995, abandoned. This application Jan. 15, 1997, Ser. No. 784,165
Int. Cl.^{6} C02F *1/28;* **B01D** *24/46*
U.S. Cl. 210—502.1 **12 Claims**



1. A device for purifying a workstream, the device comprising:

a) a monolithic porous particulate filter made of material selected from the group consisting of ceramic, glass ceramic, glass, metal, and combinations thereof; and

b) a continuous uninterrupted coating of activated carbon distributed over the outer surface and interlocked within the porosity of the filter the activated carbon being derived from a carbon precursor.

5,750,027

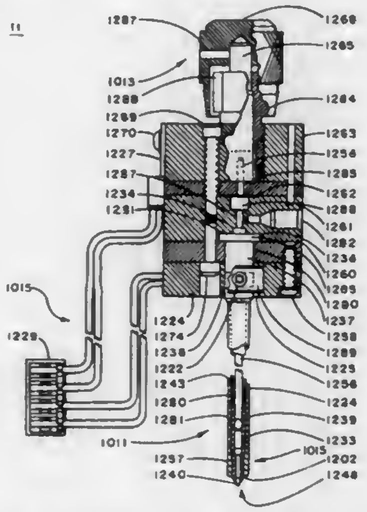
APPARATUS AND METHOD FOR SUPERCRITICAL FLUID EXTRACTION OR SUPERCRITICAL FLUID CHROMATOGRAPHY

Robert W. Allington; Henry LeRoy Walters; Daniel Gene Jameson, all of Lincoln, Nebr., and Yoossef Tehrani, Ashland, Mass., assignors to Isco, Inc., Lincoln, Nebr.

Division of Ser. No. 542,683, Oct. 13, 1995, Pat. No. 5,614,089, which is a continuation of Ser. No. 96,919, Jul. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 27,257, Mar. 5, 1993, Pat. No. 5,268,103, which is a continuation-in-part of Ser. No. 908,458, Jul. 6, 1992, Pat. No. 5,198,197, which is a division of Ser. No. 795,987, Nov. 22, 1991, Pat. No. 5,160,624, which is a continuation-in-part of Ser. No. 553,119, Jul. 13, 1990, Pat. No. 5,094,753. This application Feb. 25, 1997, Ser. No. 804,682

Int. Cl.^{6} B01D *11/04*

U.S. Cl. 210—511 **10 Claims**



1. Apparatus for supercritical extraction including a high pressure liquid pump, a heater to bring pumped liquid to supercritical temperature, an extraction chamber with a plurality of fluid flow ports and a variable restrictor for controlling fluid flow;

said variable restrictor incorporating controllable metering means having an outlet;

at least part of said metering means being movable to effect its said control;

said metering means outlet being substantially immediately surrounded by a region comprising an analyte collection means.

5,750,028

BIOMASS SEPARATION APPARATUS AND METHOD WITH MEDIA RETURN

Sam Frisch, Manalapan, N.J., assignor to Envirogen, Inc., Lawrenceville, N.J.

Filed Sep. 18, 1996, Ser. No. 715,199

Int. Cl.^{6} C02F *3/08*

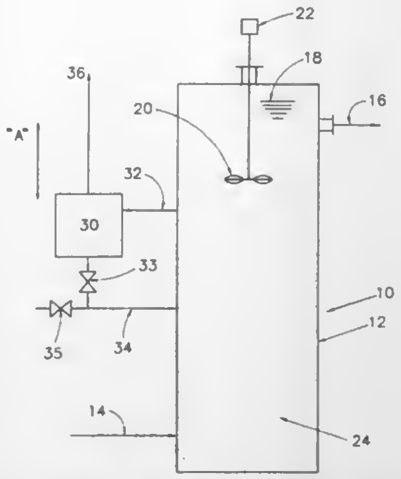
U.S. Cl. 210—618 **20 Claims**

1. A separator for use with a bioreactor having a reaction chamber for containing a fluidized bed comprising a slurry of liquid, media and biomass, said separator being adapted to discharge media from said slurry and return discharged media to said fluidized bed, said separator comprising:

a separator body for separating liquid, media and biomass and capable of discharging said biomass;

a media discharge for flow of media from said separator body, said media discharge being connected to a return passage for flow of said media from said media discharge and toward said fluidized bed;

means connected adjacent to said separator body for urging a portion of said slurry from said fluidized bed and toward said separator body;



means for selectively permitting or preventing flow of media into said return passage from said media discharge; and

means for selectively permitting or preventing flow of a transport fluid into said return passage;

wherein said media flow means permits said flow of media into said return passage from said media discharge, and said transport fluid flow means prevents said flow of said transport fluid into said return passage, as said slurry means urges slurry from said fluidized bed toward said media discharge; and

wherein said media flow means prevents said flow of media into said return passage from said media discharge, and said transport fluid flow means permits said flow of transport fluid into said return passage, to urge media contained within said return passage through said return passage toward said fluidized bed.

5,750,029

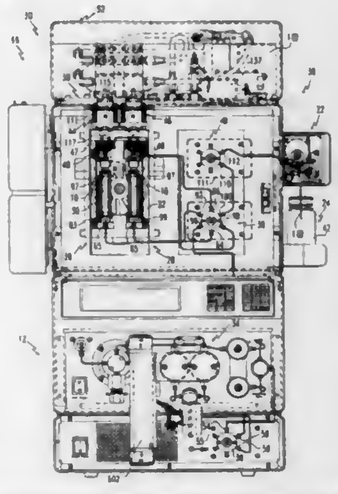
METHOD AND APPARATUS FOR DETERMINATION OF ANALYTE CONCENTRATION

Raymond K. Houck, Oakmont; Douglas J. Koebler, Irwin; Glen P. Williams, Springdale; Joseph M. Levy, Gibsonia, and Victor G. Danielson, Harrison, all of Pa., assignors to Suprex Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 962,463, Oct. 16, 1992, abandoned. This application Feb. 13, 1995, Ser. No. 388,274

Int. Cl.^{6} B01D *11/00*

U.S. Cl. 210—634 **77 Claims**



14. A method for extracting analyte comprising the steps of:

pumping solvent at a supercritical pressure;

extracting analyte from N samples essentially simultaneously with the solvent at a supercritical pressure, where N≧2 and is an integer, said N samples separate and distinct from each other;

passing the solvent to a restrictor which reduces the solvent pressure to below supercritical pressure after the solvent has passed through a valve which controls the flow of solvent from the N samples;

adjusting the restrictor automatically to avoid clogging in the restrictor; and

collecting the analyte of the N samples from the solvent.

5,750,030

USE OF SYNTHETIC GRANULATE OR POWDER FOR THE REMOVAL OF LIQUID, GASEOUS AND/OR DISSOLVED CONSTITUENTS FROM A PROCESS STREAM

Elwin Schomaker, Velp; Johannes Bos, Westervoort, and Erik Leonard Middelhoek, Arnhem, all of Netherlands, assignors to Akzo Nobelnv, Arnhem, Netherlands

Filed Aug. 16, 1996, Ser. No. 699,003

Claims priority, application Netherlands, Aug. 17, 1995, 1000997

Int. Cl.^{6} B01D *15/00;53/02*

U.S. Cl. 210—679 **13 Claims**

1. A process for the removal of liquid, gaseous and/or dissolved constituents from a process stream by contacting that process stream with a synthetic granulate or powder with a particle size of 0.1 to 10 mm as the packing material for the removal of the liquid, gaseous and/or dissolved constituents from the process stream, which packing material is made up of a porous, polymer having an overall porosity of 50% to 95% by volume, which is used as an extracting medium and has pores of a diameter of 0.01 to 50 μm, with an extracting liquid immobilised therein, or which is used as a coalescence medium and has a cellular body/window structure with the diameter of more than 50% by volume of the bodies being in the range of 100 to 700 μm, which packing material is obtained by dissolving a polymer in one or more liquid and miscible compounds at a temperature above the upper critical phase separation temperature Tc, followed by a lowering of the temperature and mechanical diminution of the polymer filled with the liquid compounds, optionally followed by removal of the liquid therefrom and, optionally, refilling of at least 10% of the pore volume with an extracting liquid, wherein the polymer solution incorporates 5% to 60% by volume of filler, calculated on the overall solids content.

5,750,031

PROCESS FOR PRODUCING SURFACTANT HAVING A LOW METAL ION LEVEL AND DEVELOPER PRODUCED THEREFROM

M. Dalil Rahman, Flemington, N.J., and Daniel P. Aubin, Voluntown, Conn., assignors to Clariant Finance (BVI) Limited, Virgin Islands (Br.)

Filed Sep. 26, 1995, Ser. No. 533,828

Int. Cl.^{6} B01D *15/04*

U.S. Cl. 210—681 **8 Claims**

1. A process for producing a developer containing a surfactant having a very low level of metal ions, which comprises:

a) washing an acidic ion exchange resin with deionized water, followed by a mineral acid solution and thereby reducing the level of sodium and iron ions in the acidic ion exchange resin to less than 200 ppb each;

b) providing a solution of 1 to 35 weight percent of a surfactant in a deionized solvent;

c) passing the surfactant solution of b) through the acidic ion exchange resin of a) and thereby reducing the level of sodium and iron ions in the surfactant solution to no more than 1,000 ppb each;

d) adding an aqueous base to the deionized solution to adjust the pH to from about 7 to 8;

e) formulating a developer composition by providing an admixture of:

(1) the acidic ion exchange resin treated surfactant solution in a deionized solvent; and

(2) mixing the surfactant solution of e) (1) with a metal ion free developer.

5,750,032

REMOVAL OF LITHIUM FROM POLYMER CEMENTS

Zaida Diaz, and John David Wilkey, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 23, 1996, Ser. No. 652,260

Int. Cl.^{6} B01D *15/04*

U.S. Cl. 210—688 **5 Claims**

1. A process for removing an alkali metal compound from an acid solution also containing nickel and aluminum compounds, comprising:

contacting the acid solution first with an ion exchange resin functional to remove the nickel and aluminum compounds from the acid solution; and

then contacting the acid solution with an ion exchange resin which is more selective to remove the alkali metal compound from the acid solution.

5,750,033

METHOD OF TREATING WASTE WATER TO REMOVE HARMFUL ION BY COAGULATING SEDIMENTATION

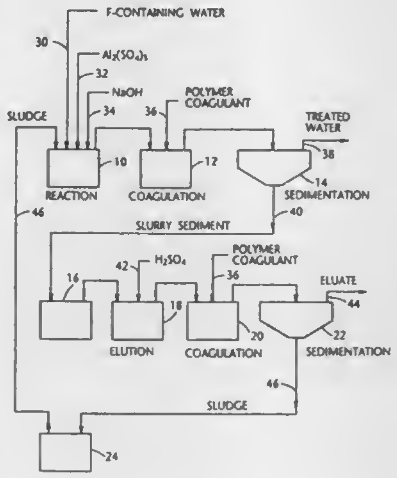
Kenichi Ikeda; Yuichi Asai, and Yuji Arai, all of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 31, 1996, Ser. No. 690,590

Claims priority, application Japan, Apr. 19, 1996, 8-097248

Int. Cl.^{6} C02F *1/58*

U.S. Cl. 210—711 **7 Claims**



1. A method of treating waste water containing fluorine ion, comprising the steps of:

(a) adjusting the pH of the waste water and adding an inorganic coagulant to the waste water to form a hydroxide sediment which takes in fluorine ion in insoluble form;

(b) separating said hydroxide sediment from treated water;

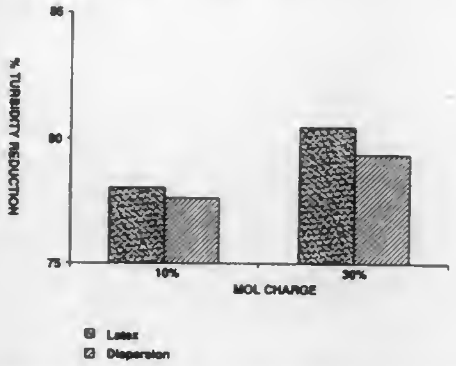
(c) adjusting the pH of a mixture of the separated sediment and water to cause elution of fluorine ion from the sediment and separating the sediment from the eluate containing fluorine ion; and

(d) reusing the sediment separated from said eluate as said hydroxide sediment in step (a).

5,750,034
HYDROPHILIC DISPERSION POLYMERS FOR THE CLARIFICATION OF DEINKING PROCESS WATERS

Jane B. Wong Shing, Aurora, and Karen R. Tubergen, Mt. Prospect, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Nov. 1, 1996, Ser. No. 743,437
Int. Cl.^{6} C02F *1/24;1/56*
U.S. Cl. 210—705 **7 Claims**

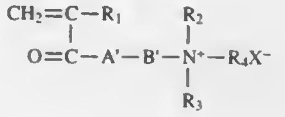


1. A method for clarifying ink-laden paper process water, comprising:

dosing the water with a coagulant to produce a coagulated process stream;

dosing solids from the coagulated process stream with a hydrophilic dispersion polymer, to form a floc containing ink and other impurities, wherein said hydrophilic dispersion polymer consists essentially of:

(a) a cationic monomer represented by the following general formula (I):



$$CH_2{=}C(R_1){-}C({=}O){-}A'{-}B'{-}N^+(R_2)(R_3){-}R_4X^-$$

wherein R_1 is H or CH_3; each of R_2 and R_3 is an alkyl group having 1 to 2 carbon atoms; R_4 is H or an alkyl group of 1 to 2 carbon atoms; A' is an oxygen atom; B' is an alkylene group of 2 to 4 carbon atoms; and X^- is an anionic counterion; and

(b) a second monomer comprising (meth)acrylamide in an aqueous solution of a polyvalent anionic salt, wherein the polymerization of (a) and (b) is carried out in the presence of a polymer selected from the group consisting of an organic high molecular weight multivalent cationic water-soluble polymer containing at least one monomer of formula (I); and

effecting solid-liquid separation of the floc from the process stream, wherein the solid-liquid separation is carried out by dissolved air flotation.

5,750,035
PROCESS FOR DYE REMOVAL

Paul W. Shepperd, III, Mooresville; Larry W. Becker, Charlotte, and Robert J. Cundiff, Mt. Holly, all of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 574,009, Dec. 18, 1995, Pat. No. 5,611,934. This application Sep. 20, 1996, Ser. No. 717,444
Int. Cl.^{6} C02F *1/56;1/70*
U.S. Cl. 210—719 **1 Claim**

1. A process for treating liquid effluent containing dye comprising the steps of:

treating the effluent with a reducing agent at a concentration of 50–100 parts per million of reducing agent per 1000 ADMI units of color;

treating the liquid effluent with a charge neutralization mixture wherein said neutralization mixture comprises at least one member of the group consisting of magnesium chloride, magnesium carbonate and magnesium sulfate in an amount not exceeding 1000 parts per million per 1000 ADMI color units until the Zeta potential reaches± 15 millivolts; and

subjecting the mixture to a flocculating process by adding 1–5 parts per million of at least one compound selected from the group consisting of: anionic polymers selected from the group consisting of acrylic acid/ acrylamide copolymers having a molecular weight greater than 2 million and; nonionic polymers selected from the group consisting of polyacrylamides having a molecular weight greater than 2 million.

5,750,036
COMPOSITION AND METHOD FOR GROUND WATER REMEDIATION

Timothy Mark Sivavec, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

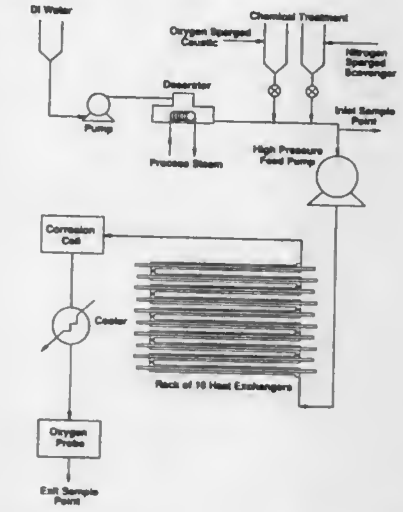
Filed Apr. 22, 1996, Ser. No. 636,005
Int. Cl.^{6} C02F *1/70*
U.S. Cl. 210—747 **8 Claims**

1. A method of in-situ remediation of ground water contaminated with halogenated hydrocarbon compounds which comprises: forming a reactive zone comprising a ferrous ion modified clay or a ferrous ion modified ferric mineral in the path of a flowing plume of contaminated ground water allowing the contaminated ground water to pass through the reactive zone wherein reductive dehalogenation of the halogenated hydrocarbon compounds is achieved.

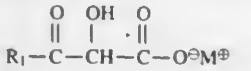
5,750,037
USE OF TARTRONIC ACID AS AN OXYGEN SCAVENGER

Paul M. Bizot, Lisle; Bruce R. Bailey, Batavia, and Peter D. Hicks, Oak Park, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 15, 1996, Ser. No. 732,545
Int. Cl.^{6} C02F *1/70*
U.S. Cl. 210—750 **10 Claims**



1. A method for removing dissolved oxygen from alkaline water at a temperature greater than 400° F. which comprises adding to alkaline water containing dissolved oxygen an effective oxygen-scavenging amount of a water-soluble carboxylate of the formula:



$$R_1{-}C({=}O){-}CH(OH){-}C({=}O){-}O^{\ominus}M^{\oplus}$$

wherein M is selected from the group consisting of hydrogen, sodium, zinc, potassium, morpholine, cyclohexylamine, methoxypropylamine, diethylaminoethanol and diethyl hydroxylamine; and R_1 is selected from the group consisting of hydrogen, hydroxy, C_1- C_6 alkyl, aryl, and —CH_2—OH.

5,750,038
METHOD FOR THE PREPARATION OF ACID-RESISTANT CALCIUM SILICATE

Shuji Tsunematsu; Hideo Yamada; Eiichi Abe, and Kozo Inoue, all of Tosu, Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo-to, Japan

Division of Ser. No. 345,398, Nov. 21, 1994. This application Mar. 7, 1997, Ser. No. 813,684
Claims priority, application Japan, Jan. 17, 1994, 6-17912
Int. Cl.^{6} B01D *37/02*
U.S. Cl. 210—777 **6 Claims**

1. A method for the filtration of an aqueous acidic solution or slurry which comprises employing, as a filter aid, an acid-resistant calcium silicate in the form of a powder produced by a process which comprises the steps of:

(a) subjecting a blend of a silica-containing material, of which the content of silica is at least 50% by weight, and a calciferous material, with the ratio of calcium in the calciferous material, calculated as CaO, to silicon in the silica-containing material, calculated as SiO_2 ($CaO:SiO_2$), in the ratio from 0.4 to 0.8 as moles, to a hydrothermal reaction in an aqueous medium at a temperature in the range from 120° to 190° C. for a length of time in the range from 4 to 12 hours to form calcium silicate;

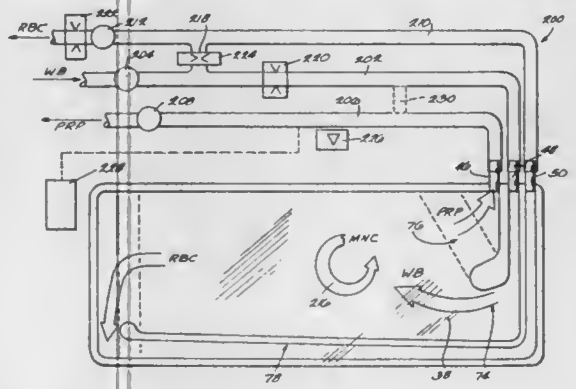
(b) separating the calcium silicate from the aqueous medium; and

(c) subjecting the calcium silicate to a heat treatment at a temperature in the range from 800° to 1200° C. for a length of time in the range 0.5 to 2 hours.

5,750,039
BLOOD PROCESSING SYSTEMS AND METHODS FOR COLLECTING MONO NUCLEAR CELLS

Richard I. Brown, Northbrook, and Kyungyoon Min, Arlington Heights, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 472,750, Jun. 7, 1995, Pat. No. 5,573,678, which is a continuation-in-part of Ser. No. 814,403, Dec. 23, 1991, abandoned, and Ser. No. 748,244, Aug. 21, 1991, Pat. No. 5,322,620, which is a continuation of Ser. No. 514,995, May 26, 1989, Pat. No. 5,104,526, which is a continuation of Ser. No. 9,179, Jan. 30, 1987, Pat. No. 4,834,890. This application Nov. 8, 1996, Ser. No. 745,779
Int. Cl.^{6} B01D *21/26*
U.S. Cl. 210—782 **10 Claims**



1. A blood separation system for separating mono nuclear cells from whole blood comprising

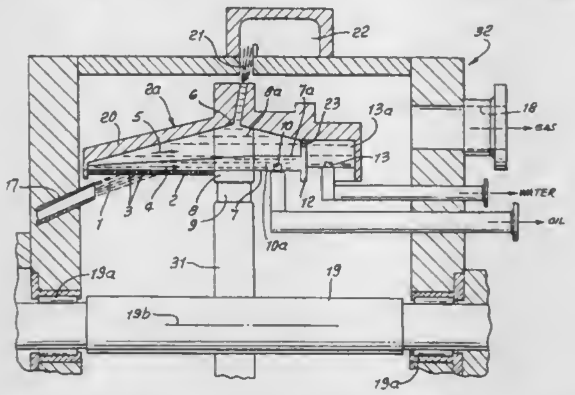
a chamber for rotation about a rotational axis, the chamber including an inlet region where whole blood enters for separation into red blood cells having an exit hematocrit value, a plasma constituent, and an interface carrying mono nuclear cells between the red blood cells and the plasma constituent, and

a controller operable is a first mode to convey whole blood into the inlet region while removing red blood cells and the plasma constituent from the chamber and while maintaining the interface within the chamber, the controller also being operable in the first mode to control the exit hematocrit value by recirculating a portion of the red blood cells removed from the chamber for mixing with whole blood entering the inlet region, and the controller being operable in a second mode to remove the interface from the chamber.

5,750,040
THREE-PHASE ROTARY SEPARATOR

Lance G. Hays, La Crescenta, Calif., assignor to Biphase Energy Company, Placentia, Calif.

Filed May 30, 1996, Ser. No. 655,480
Int. Cl.^{6} B01D *21/26*
U.S. Cl. 210—787 **19 Claims**



1. In the method of operating a separator apparatus, which is rotating, to which fluid, including gas and liquids is supplied in a fluid jet as via a nozzle, the steps that include

a) separating the liquids from the gas in said stream, at a first zone within said rotating apparatus, and

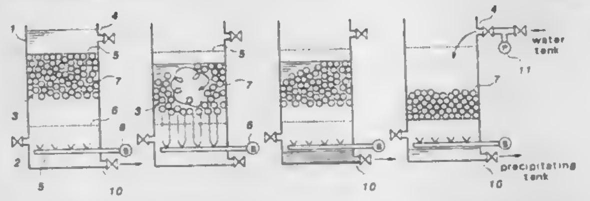
b) separating the liquids into liquids of differing density at a second zone within said apparatus,

c) said separating including providing a scoop immersed in at least one of said liquids traveling relative to the scoop.

5,750,041
METHOD FOR BACKWASHING WATER PROCESSING SYSTEMS

Ken Hirane, 10-9 Shimomeguro 5 chome, Meguro-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 506,738, Jul. 26, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 767,469
Claims priority, application Japan, Aug. 15, 1994, 6-213193
Int. Cl.^{6} B01D *24/46*
U.S. Cl. 210—795 **13 Claims**



1. A method for backwashing a water processing system using a buoyant filter layer which is constrained in a middle portion of a processing vessel by upper and lower constraining means extending across said processing vessel, comprising the steps of:

lowering a water surface level in said processing vessel to a level which is below said upper constraining means and above said lower constraining means; and

maintaining said water surface level at a level which is below said upper constraining means and above said lower constraining means while releasing air from under said buoyant filter layer to separate substances clogging said filter layer therefrom, and while allowing the release of air out of said vessel from an upper part thereof.

5,750,042

Patent Not Issued For This Number

5,750,043

FLUOROCHEMICAL FOAM STABILIZERS AND FILM FORMERS

Kirtland P. Clark, West Greenwich, R.I., assignor to Dynax Corporation, Elmsford, N.Y.

Filed Aug. 25, 1994, Ser. No. 296,003

Int. Cl.^{6} A62D *1/00*

U.S. Cl. 252—2 **15 Claims**

1. A water soluble foam stabilizer and film former comprising a polyamine with a molecular weight from 100 to 100,000 with 3 to 2200 nitrogens and a minimum of 3 primary or secondary amino groups, wherein said amino groups are partially or completely substituted by

a) an oleophobic and hydrophobic perfluoroalkyl group,
b) a hydrophilic group other than an amino group, and
c) optionally a non-perfluoroalkyl hydrophobic group.

5,750,044

MAGNET AND BONDED MAGNET

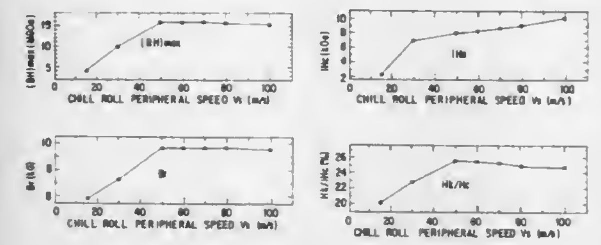
Tetsuhito Yoneyama; Tomomi Yamamoto; Tetsuya Hidaka, and Akira Fukuno, all of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 11, 1995, Ser. No. 500,578

Claims priority, application Japan, Jul. 12, 1994, 6-182776; Mar. 10, 1995, 7-079431

Int. Cl.^{6} C04B *35/04*

U.S. Cl. 252—62.54 **10 Claims**



1. A magnet consisting essentially of 4 to 8 at % of R, 10 to 20 at % of nitrogen, 2 to 20 at % of M, and the balance of T wherein R is at least one rare earth element, Sm being present in R in a proportion of at least 50 at %, T is Fe or Fe and Co, M is Zr with or without partial replacement by at least one element selected from the group consisting of Ti, V, Cr, Nb, Hf, Ta, Mo, W, Al, C, and P,

said magnet comprising a hard magnetic phase based on R, T and nitrogen and containing at least one crystalline phase selected from the group consisting of $TbCu_7$ structure, Th_2Zn17 structure, and Th_2Ni_{17} structure and a soft magnetic phase consisting of a T phase having a bcc structure, said soft magnetic phase having a mean grain size of 5 to 60 nm and being present in a proportion of 10 to 60% by volume.

5,750,045

PREPARATION OF FERRITE MATERIALS

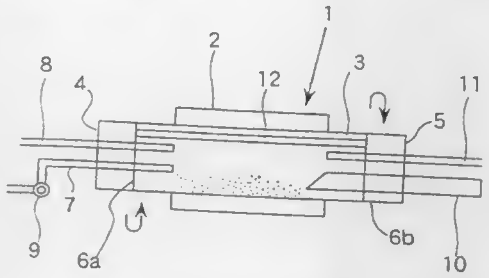
Yoshito Nihira; Takeshi Nomura, and Masahiro Onizuka, all of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 499,293

Claims priority, application Japan, Jul. 8, 1994, 6-180746

Int. Cl.^{6} C01B *49/00*

U.S. Cl. 252—62.56 **17 Claims**



1. A method for preparing a ferrite material comprising the steps of:

mixing iron chloride, another optional metal chloride, iron oxide, and another optional metal oxide to form a mixture as a starting raw material, and

roasting the raw material, at least a part of the roasting step being carried out in a steam-containing atmosphere so that the raw material may undergo pyrolysis reaction and solid phase reaction at the same time.

5,750,046

REFRIGERANT SYSTEM LUBRICANT AND METHOD

William B. Wheeler, P.O. Box 1188, Concord, N.C. 28026

Continuation of Ser. No. 701,076, Aug. 21, 1996, abandoned, which is a continuation of Ser. No. 337,864, Nov. 14, 1994, abandoned. This application May 27, 1997, Ser. No. 863,837

Int. Cl.^{6} C09K *5/04*

U.S. Cl. 252—68 **12 Claims**

1. A method of changing the refrigerant gas in a refrigerant system comprising the steps of:

(a) removing the old refrigerant gas from the system;
(b) introducing a flush solvent to the refrigerant system comprising a butyl oleate composition;
(c) moving the flush solvent through the refrigerant system;
(d) adding a lubricant to the refrigerant system; and
(e) adding a new refrigerant gas to the refrigerant system.

5,750,047

ANTI-ICING FLUIDS

Solomon Lemma, Broadview Heights, Ohio, assignor to The B.F. Goodrich Company, Richfield, Ohio

Filed Mar. 13, 1997, Ser. No. 815,650

Int. Cl.^{6} C09K *3/18*

U.S. Cl. 252—70 **33 Claims**

1. A thickened composition for use as a de-icing fluid comprising a glycol based aqueous solution thickened with about 0.01 to about 5.0% by weight of at least one cross-linked, carboxylic acid polymer, which has a mucilage viscosity of at least 25,000 cP at 0.5% by weight polymer dosage, and a shear thinning index of at least 20, and a shear loss of less than 15% when used to thicken the deicing fluid, whereby said fluid will have a holdover time of at least 60 minutes and acceptable aerodynamic performance.

5,750,048

ELECTROVISCOUS FLUID

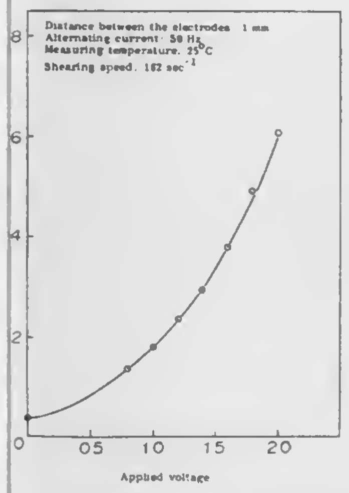
Koji Shima, Yokohama; Eiji Hattori, Machida, and Yasuo Oguri, Tokyo, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 266,093, Jun. 27, 1994, abandoned, which is a continuation of Ser. No. 115,700, Sep. 3, 1993, abandoned, which is a continuation of Ser. No. 790,086, Nov. 13, 1991, abandoned, which is a continuation of Ser. No. 491,821, Mar. 12, 1990, abandoned. This application Mar. 28, 1995, Ser. No. 417,145

Claims priority, application Japan, Mar. 14, 1989, 1-61454

Int. Cl.^{6} C10M *171/00;169/04*

U.S. Cl. 252—71 **6 Claims**



1. An electroviscous fluid, consisting essentially of an electrically insulating liquid and from 5 to 50% by volume solid electrolyte particles dispersed therein, wherein said solid electrolyte particles are $Na_3Zr_2PSi_2O_{12}$.

5,750,049

CHIRAL OPTICAL POLYMER BASED INFORMATION STORAGE MATERIAL

Mark M. Green, New York, N.Y., assignor to Hayes Soloway, Hennessey, Grossman & Hage, Manchester, N.H.

Filed Jan. 16, 1996, Ser. No. 587,234

Int. Cl.^{6} G09K *19/52;* **G07F** *1/13*

U.S. Cl. 252—299.01 **8 Claims**

1. An optical information storage material which can reversibly store said information comprising a chiral polymeric material with a dependence of optical activity on temperature characterized in that the optical activity is substantially invariant at temperatures below Tg of said polymer, and variant at temperatures at or near or above the Tg.

5,750,050

DISCOTIC COMPOUNDS FOR USE IN LIQUID CRYSTAL MIXTURES

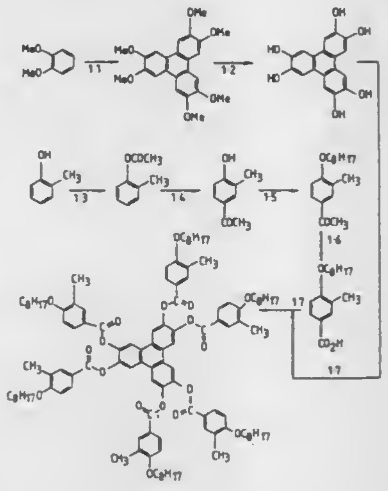
John William Goodby; Michael Hird; David Richard Beattie; Paul Hindmarsh, all of Hull; George William Gray, Dorset; Damien Gerard McDonnell, Worcestershire; John Clifford Jones, Worcestershire, and Timothy Jonathan Phillips, Worcestershire, all of United Kingdom, assignors to Secretary of State for Defence in her Britannic Majesty's Government of the U.K. of Gt. Britain, United Kingdom, and N. Ireland of Defence Evaluation Research Agency, DRA

PCT No. PCT/GB93/01291, § 371 Date Feb. 28, 1996, § 102(e) Date Feb. 28, 1996, PCT Pub. No. WO94/29263, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 16, 1993, Ser. No. 564,211

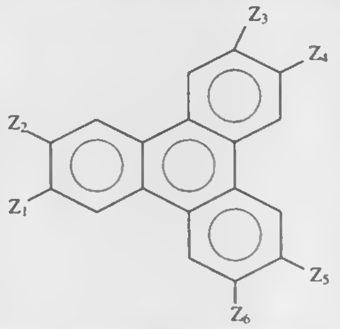
Int. Cl.^{6} C09K *19/32;19/52;* **C07C** *69/76*

U.S. Cl. 252—299.62 **10 Claims**



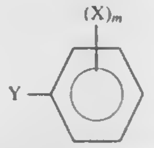
1. A 2,3,6,7,10,11 triphenylene discotic compound of Formula I:

Formula I



where each of Z_{1-6} is given by Formula II:

Formula II



where Y for each of Z_{1-6} is independently selected from the group consisting of COO and OCO, m defines the number of substituents on each of Z_{1-6} and is independently selected from the group consisting of 1–5, and X is independently on each of Z_{1-6} selected from the group consisting of a straight chain, branched and chiral alkyl a straight chain, branched or chiral alkoxy, a straight chain, branched or chiral alkanoyl, a straight chain, branched or chiral alkenyl, halogen, a straight chain, branched or chiral halogenoalkyl and CN, provided that at least one of Z_{1-6} has at least one substituent X which is in the ortho or meta position relative to the Y group excluding where m is 5 for each Z_{1-6}, Y is COO for each of Z_{1-6} and for each Z_{1-6} X is as n-alkoxy positioned para to Y and fluorine for all other substituents.

5,750,051

REACTIVE TERPHENYLS

Mark Goulding; David Coates, and Simon Greenfield, all of Dorset, Great Britain, assignors to Merck Patent Gesellschaft Mit Beschraankter Haftung, Darmstadt, Germany

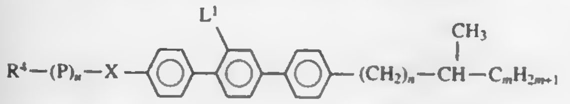
Filed Mar. 28, 1996, Ser. No. 623,163

Claims priority, application European Pat. Off., Mar. 29, 1995, 95104633

Int. Cl.^{6} C09K *19/12;19/52;* **C08F** *22/00*

U.S. Cl. 252—299.65 **9 Claims**

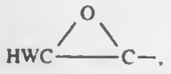
1. Monofunctional reactive terphenyl of formula I



I

in which

R^4 is CH_2=CW—COO—,



HWN—, CH_2=CH—, CH_2=CH—O— or HS—CH_2—$(CH_2)_m$—COO— with W being H, Cl or alkyl with 1–5 C atoms and m being 1–7,

P is alkylene with up to 12 C atoms, it being also possible for one or more non adjacent CH_2 groups to be replaced by —O—,

L^1 is F,

X is —O—, —S—, —COO—, —OCO— or a single bond.

u is 0 or 1,

n is an integer 1 to 8, and

m is an integer 2 to 8.

5,750,052

FOAM CONTROL METHOD

Paul R. Hart, and Michael A. Dion, both of The Woodlands, Tex., assignors to BetzDearborn Inc., Trevose, Pa.

Filed Aug. 30, 1996, Ser. No. 697,851

Int. Cl.^{6} B01D *19/04;* **C01G** *49/22*

U.S. Cl. 252—321 **6 Claims**

1. A method for controlling foam in a hydrocarbon liquid within a petroleum hydrocracker unit separator comprising adding a foam inhibiting amount of

a) an alkylphenolformaldehyde resin alkoxylate; and

b) a propylene oxide/ethylene oxide block copolymer having a molecular weight of from about 2000 to 6000 and having from about 20% to about 80% ethoxylation or an alkylarylsulfonic acid or alkylarylsulfonic acid amine salt to said hydrocarbon liquid.

5,750,053

CORROSION INHIBITOR FOR REDUCING CORROSION IN METALLIC CONCRETE REINFORCEMENTS

Boris A. Miksic, North Oaks; Christophe Chandler, Woodbury; Margarita Kharshan, Little Canada; Alla Furman, Shoreview; Barry Rudman, Woodbury, and Larry Gelner, St. Paul, all of Minn., assignors to Cortec Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 377,761, Jan. 24, 1995, Pat. No. 5,597,514. This application Jan. 31, 1996, Ser. No. 594,597

Int. Cl.^{6} C09K *3/00;* **C04B** *9/02;40/00;7/32;24/00*

U.S. Cl. 252—389.52 **2 Claims**

1. A corrosion inhibitor for reducing corrosion of metallic reinforcement within concrete structures comprising a mixture of the following formulation:

(a) a glucoheptonate selected from the group consisting of alkali metal glucoheptonates in the range of between about 30% by weight to 37% by weight;

(b) a zinc gluconate in the range of between about 1% by weight to about 3% by weight of alkali metal glucoheptonate;

(c) a molybdate selected from the group consisting of alkali metal molybdates in the range of from between about 8% by weight to 12% by weight;

(d) water in the range of from between about 52% to 58%; and

(e) wherein the formulation is provided in admixture with raw concrete in an amount ranging from between about 8 ounces by weight and 48 ounces by weight per cubic yard.

5,750,054

ANTI-GLARE, ANTI-STATIC COATING FOR A REFLECTIVE-TRANSMISSIVE SURFACE

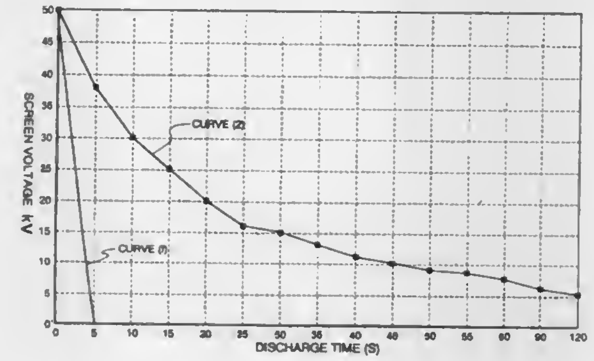
Patrizia Cinquina, Vasto; Giuseppe Magnone, Alatri, and Guido Manciocco, Colleferro, all of Italy, assignors to Videocolor, S.p.A., Anagni, Italy

Filed Sep. 12, 1996, Ser. No. 712,815

Claims priority, application Italy, Apr. 30, 1996, MI96A0846

Int. Cl.^{6} H01B *1/12;1/14;1/20*

U.S. Cl. 252—500 **5 Claims**



1. A composition for reducing glare and for providing an antistatic property when applied to a reflective-transmissive surface comprising 5 to 25 wt. % electroconductive polyethylenedioxythiophene, 0.5 to 3 wt. % of a siliceous material selected from the group consisting of lithium-stabilized silica sol and tetraethoxysilane, and the balance, a solvent selected from the group consisting of an alcohol and deionized water.

5,750,055

PROCESS FOR THE PREPARATION OF INDUSTRIALLY APPLICABLE DIFUNCTIONAL ANIONIC POLYMERIZATION INITIATORS AND THEIR USE

Frederik Hendrik Van Der Steen, and Judith Johanna Berendina Walhof, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 15, 1995, Ser. No. 491,017

Claims priority, application European Pat. Off., Jul. 27, 1994, 94201847

Int. Cl.^{6} C07F *1/02*

U.S. Cl. 260—665 R **10 Claims**

1. A process for the preparation of an efficient industrial organolithium diinitiator, comprising the reaction of two equivalents of a mono-organolithium initiator with one equivalent of 1,3-diisopropenyl benzene at a temperature in the range of from −20° to 60 ° C., in an apolar hydrocarbon solvent, and in the presence of a monofunctional tertiary amine in a molar ratio relative to mono-organolithium initiator from 0.5 to 2, followed by addition to the reaction mixture of a small amount of conjugated diene monomer, at a temperature in the range of from 0° to 30° C., to form a solution of an α,ω-dilithio poly(conjugated diene), having an apparent molecular weight in the range of from 1000 to 3000.

5,750,056

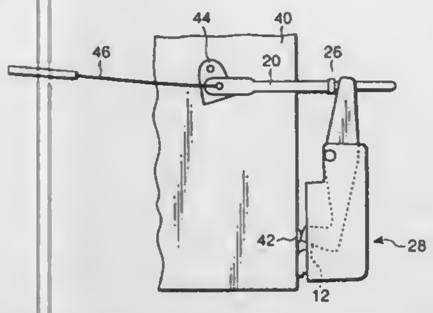
REMOTELY CONTROLLED PRIMER ACTUATOR FOR POWER EQUIPMENT ENGINES

Richard James Pitman, Nashville, and Thomas Doyle Baggett, Antioch, both of Tenn., assignors to Murray, Inc., Brentwood, Tenn.

Filed Sep. 18, 1996, Ser. No. 715,623

Int. Cl.^{6} F02M *1/16*

U.S. Cl. 261—37 **3 Claims**



1. A combined remotely controlled engine speed and fuel primer actuation arrangement for an engine mounted on a piece of power equipment, said engine including a throttle control lever for controlling engine speed and a primer bulb which, when actuated, introduces fuel to the engine to supplement that normally introduced from a fuel supply, said arrangement comprising:

a single control cable connected between said throttle control lever and a remote location on said piece of power equipment for selectively displacing the throttle control lever; and

an actuator selectively connected between the throttle control lever and the primer bulb for actuating the primer bulb in response to displacement of the throttle control lever.

5,750,057

INSENSITIVE BINARY EXPLOSIVE PRODUCTION PROCESS

Jerry S. Brown, Woodford, Va., and John A. Conkling, Chestertown, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 622,174, Feb. 28, 1996. This application Jun. 5, 1997, Ser. No. 869,724

Int. Cl.^{6} C06B *21/00*

U.S. Cl. 264—3.2 **8 Claims**

1. A method of preparing an explosive from a two component explosive composition comprising admixing 2-ethylhexyl nitrate and a granular solid oxidizer and mixing the two components together in a container until a uniform mixture of a damp sand consistency is reached.

5,750,058

METHOD FOR THE PREPARATION OF HIGH MODULUS CARBON AND GRAPHITE ARTICLES

Daniel H. Hecht, Duluth, and David A. Schulz, Flowery Branch, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 355,514, Dec. 14, 1994, Pat. No. 5,552,008, which is a division of Ser. No. 76,538, Jun. 14, 1993, abandoned. This application Jul. 8, 1996, Ser. No. 677,688

Int. Cl.^{6} C01B *31/00*

U.S. Cl. 264—29.6 **6 Claims**

1. A method for the preparation of a carbon article consisting of fused, mesophase pitch-based carbon fiber and having a thermal conductivity greater than 50 w/m-°K, a modulus greater than 300,000 psi , a tensile strength greater than 500 psi, and a density greater than 1.8 g/cc, said articles consisting of fused, mesophase pitch-based carbon fiber, said method comprising the steps of:

(a) providing a mesophase pitch fiber mat, said mat comprising aqueous nitric acid and thermoplastic, fusible pitch fiber selected from the group consisting of felted pitch fiber and continuous pitch fiber;

(b) fabricating a preform structure from said mesophase pitch fiber mat; and

(c) carbonizing said preform structure by a thermal treatment conducted in a substantially inert gas atmosphere to a final temperature in a range of from about 3000° to about 3500° C. thereby forming said carbon article.

5,750,059

METHOD OF MOLDING RESIN TO SEAL ELECTRONIC PARTS

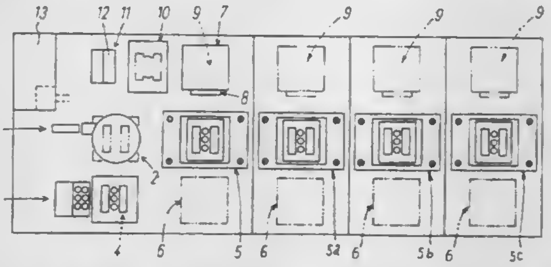
Kazuhiko Bandoh, Kyoto, Japan, assignor to Towa Corporation, Uji, Japan

Filed Jun. 29, 1994, Ser. No. 268,849

Claims priority, application Japan, Jul. 22, 1993, 5-202689; Jul. 22, 1993, 5-202690; Dec. 14, 1993, 5-343141

Int. Cl.^{6} B29C *33/30;45/02*

U.S. Cl. 264—39 **18 Claims**



1. A method of molding resin for sealing electronic parts mounted on lead frames with a resin material, using a molding apparatus including at least a first molding unit having a mold, a mold driving unit connected to said mold and adapted to open and close said mold, resin supply pots arranged in said mold, resin pressurizing plungers provided on said pots, cavities provided in mold surfaces of said mold, and resin passages provided between said cavities and said pots, said method comprising:

a step of adjusting the number of molding units included in said molding apparatus by detachably mounting an additional second molding unit with respect to said first molding unit;

a step of supplying unsealed lead frames having electronic parts mounted thereon and resin tablets into each said molding unit;

a step of molding resin to seal said electronic parts in each said molding unit; and

a step of removing said sealed electronic parts from each said molding unit.

5,750,060

METHOD AND APPARATUS FOR INJECTION COMPRESSION MOLDING AND EJECTING PAIRED THERMOPLASTIC SPECTACLE LENS SUITED FOR FULLY AUTOMATED DIP HARDCOATING

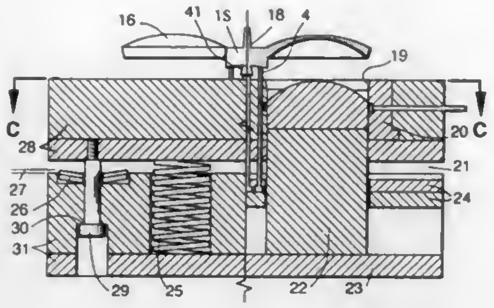
Steven M. Maus, Osseo, and George J. Galic, Columbia Heights, both of Minn., assignors to Galic Maus Ventures, Columbia Heights, Minn.

Division of Ser. No. 533,126, Sep. 25, 1995, Pat. No. 5,718,849. This application Feb. 5, 1997, Ser. No. 795,903

Int. Cl.^{6} B29D *11/00;* **B29C** *45/66*

U.S. Cl. 264—40.5 **3 Claims**

1. An injection-compression molding process for reduced parting line flash on at least one molded thermoplastic article, within a moldset mounted within an injection molding machine having programmable control of means for applying clamping forces and opening forces onto a parting line formed between an A side and an B side of said moldset, and the injection molding machine having programmable control of means for moving forward or back an



ejector assembly within the B side of said moldset using said moldset having at least one edge-gated variable-volume mold cavity, said mold cavity having partforming surfaces on opposing paired A side insert and B side insert facing the parting line, wherein at least one extendable and compressible passive resilient member of varying length which determines a cavity height dimension of said mold cavity within preset mechanical limits, the resilient member being an operative combination of

- i) steel coil die spring to provide a moderate spring force over a long distance in a first clamping position of said moldset, with
- ii) stacked Belleville steel spring washers to provide a stiff spring force over a short distance in a second clamping position of said moldset, the resilient member being mounted between a side parting line mold plate and B side clamp plate of said moldset and exerting combined spring forces to bias forward the B side parting line mold plate toward the parting line, such that

when there is less clamping force exerted by the injection molding machine than a first spring force equal to the steel coil die spring force acting alone to bias forward the B side parting line mold plate toward the parting line, the resilient member length will be a maximum within the preset mechanical limits in the first clamping position of said moldset, and

when there is more clamping force than the first spring force equal to the steel coil die spring force acting alone to bias forward toward the parting line but less clamping force than a second spring force equal to the steel coil die spring acting together with steel spring washer force to bias forward the B side parting line mold plate toward the parting line, the resilient member length will be an intermediate value in a second clamping position of said moldset, and

when there is more clamping force than the second spring force equal to the steel coil die spring acting together with steel spring washer force to bias forward the B side parting line mold plate toward the parting line, the resilient member length will be a minimum within the preset mechanical limits in a third clamping position of said moldset,

the process comprising the steps of:

- a.) Pre-enlarging said mold cavity by substantially closing a perimeter of said mold cavity at the parting line so as to prevent molten thermoplastic from flashing, in the first clamping position of said moldset, such that a first cavity height equal to the sum of the desired compression stroke-length plus a final thickness of the molded article is determined, before injection starts
- b.) Partially filling said mold cavity after injection has started by progressively reducing cavity height to the second clamping position, by increasing clamp force applied to exceed the first spring force but less than the second spring force;
- c.) Completely filling said mold cavity by further progressively reducing cavity height to reach the third clamping position of said moldset, by increasing clamp force applied to exceed the second spring force;
- d.) Cooling said molded article within said mold cavity until the thermoplastic is shape stable, by maintaining cavity height substantially at the third clamping position of said moldset;
- e.) Ejecting said molded article by releasing clamp force and opening the moldset along the parting line.

5,750,061

HALOHYDANTOIN FORMS PRODUCED BY MELT EXTRUSION AND METHOD FOR MAKING

Thomas Edward Farina, Flemington; Kenneth Scott Geick, Mercerville, and Julia Anne Falter, Glen Gardner, all of N.J., assignors to Lonza Inc., Fair Lawn, N.J.

Continuation-in-part of Ser. No. 554,476, Nov. 7, 1995, abandoned. This application May 16, 1996, Ser. No. 645,798

Int. Cl.^{6} B29B *9/10;9/02*

U.S. Cl. 264—117 **20 Claims**

1. A method for the production of a solid halogenated hydantoin product containing from 5 to 20 mole % of methylethylhydantoin and from 80 to 95 mole % of dimethylhydantoin, comprising:

- (a) extruding said halogenated hydantoin under conditions sufficient to only partially melt said halogenated hydantoins for a residence time of not greater than 40 seconds;
- (b) cooling said extrudate to solidify said halogenated hydantoin; and
- (c) recovering a substantially dust-free solid product.

4. A solid halogenated hydantoin product containing at least 5 mole % of methylethylhydantoin and not more than 95 mole % of dimethylhydantoin made by:

- (a) extruding said halogenated hydantoin under conditions sufficient to only partially melt said halogenated hydantoins for a residence time of not greater than 40 seconds;
- (b) cooling said extrudate to solidify said halogenated hydantoin; and
- (c) recovering a substantially dust-free solid product.

5,750,062

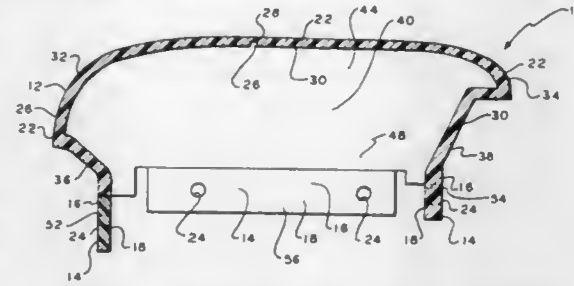
METHOD OF MANUFACTURING AN AIR BAG COVER

Yasuhiro Tsukamoto, Patchogue, N.Y., assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 955,419, Oct. 2, 1992, abandoned. This application Jul. 31, 1995, Ser. No. 508,422

Int. Cl.^{6} B29C *45/14;45/16*

U.S. Cl. 264—154 **5 Claims**



1. A method for manufacturing a cover for an inflatable type occupant restraint device, said cover comprising a top lid member having an upper surface and an under surface, said top lid member formed from a single layer of a flexible thermoplastic synthetic resin material in a first mold cavity of a first injection-mold means and a side wall member defined by a plurality of side walls generally defining a rectangular configuration extending from said under surface, each side wall of said plurality of side walls having an upper edge and a lower edge and said each side wall integrally connected along its respective said upper edge to said under surface of said top lid member, said side wall member formed from a single laser of a rigid thermoplastic synthetic resin material in a second mold cavity to a second injection-mold means, said second injection-mold means mounted in alignment with and in vertical communication with said first injection-mold means, comprising the steps of:

- a) mounting said second injection-mold means on, and vertically above said first injection-mold means so that said first mold cavity is directly below and under said second mold cavity, and said first mold cavity and said second mold cavity are in vertical communication with each other only along a line defined by a meeting of said upper edge of said each side wall and said under surface of said top lid member;
- b) injecting said flexible thermoplastic synthetic resin material through a first gate means in said first injection-mold means into said first mold cavity for completely forming said top lid member; and,
- c) injecting said rigid thermoplastic synthetic resin material through a second gate means in said second injection-mold means for forming only said side wall member in said second mold cavity, said rigid thermoplastic synthetic resin material merging with said flexible thermoplastic synthetic resin material only along said line defined by said meeting of said upper edge of said each side wall and said under surface of said top lid member for integrally connecting said top lid member and said side wall member for forming said cover.

5,750,063

PLATE-TYPE SHEATH/CORE-SWITCHING DEVICE AND METHOD OF USE

Matthew B. Hoyt, Arden, N.C., assignor to BASF Corporation, Mt. Olive, N.J.

Continuation-in-part of Ser. No. 623,125, Mar. 28, 1996, abandoned. This application Jun. 10, 1997, Ser. No. 872,130

Int. Cl.^{6} D01D *4/06;* **D01F** *8/04*

U.S. Cl. 264—172.15 **37 Claims**

19. A method for switching sheath and core phases in a first sheath/core multicomponent fluid stream comprising a sheath phase and a core phase comprising the steps of:

(1) providing a sheath/core-switching device comprising:

at least one first plate having formed on a front face thereof at least one first flow path comprising: a first chamber disposed to receive flow of said sheath/core multicomponent fluid stream in an axial direction so as to cause said fluid stream to split upon receipt thereof by said first chamber into a core-stream and multiple sheath-substreams, said core-stream comprising said core phase of said stream and said sheath-substreams comprising said sheath phase of said stream; a first central-port disposed in fluid communication with said first chamber, said first central-port being disposed to receive flow of the core-stream; multiple outwardly-extending first channels disposed downstream of and in fluid communication with said first chamber, said first channels being disposed to receive flow of the sheath-substreams; and multiple first outer-ports formed in downstream ends of the first channels and disposed to receive flow of said sheath-substreams, the first outer-ports being radially disposed around the first central-port; and

at least one second plate having formed on a front face thereof at least one second flow path comprising: a second chamber disposed downstream of and in fluid communication with said first central-port, said second chamber being disposed to receive flow of the core-stream in an axial direction so as to cause said core-stream to split upon receipt thereof by said second chamber into multiple core-substreams; multiple outwardly-extending second channels disposed downstream of and in fluid communication with said second chamber, said second channels being disposed to receive flow of the core-substreams; multiple second outer-ports disposed in downstream ends of said second channels, said second outer-ports being disposed to receive flow of the core-substreams; multiple inwardly-extending third channels disposed downstream of and in fluid communication with said first outer-ports, the third channels having inlet-ends disposed to receive flow of the sheath-substreams in an axial direction; and multiple second central-ports disposed in downstream ends of said third channels, said second central-ports being disposed to receive flow of the sheath-substreams, the second outer-ports being radially disposed around the second central-ports such that said core-substreams exiting said second outer-ports and said sheath-substreams exiting said second central-ports are mutually aligned in a sheath/core configuration such that the core of said configuration comprises said sheath-substreams and said sheath of said configuration comprises said core-substreams;

(2) directing the stream into the first chamber in the axial direction, whereby the stream is split upon impact with the first chamber into the core-stream and the sheath-substreams;

(3) passing the core-stream through the first central-port and passing the sheath-substreams through the first channels and the first outer-ports;

(4) directing the core-stream into the second chamber in the axial direction, whereby the core-stream is split upon impact with the second chamber into the core-substreams;

(5) passing the core-substreams through the second channels and the second outer-ports; and

(6) directing the sheath-substreams into the inlet-ends of the third channels;

(7) passing the sheath-substreams through the third channels and the second central-ports, whereby said core-substreams exiting said second outer-ports and said sheath-substreams exiting said second central-ports are mutually aligned in said sheath/core configuration wherein the core of said configuration comprises said sheath-substreams and said sheath of said configuration comprises said core-substreams.

5,750,064

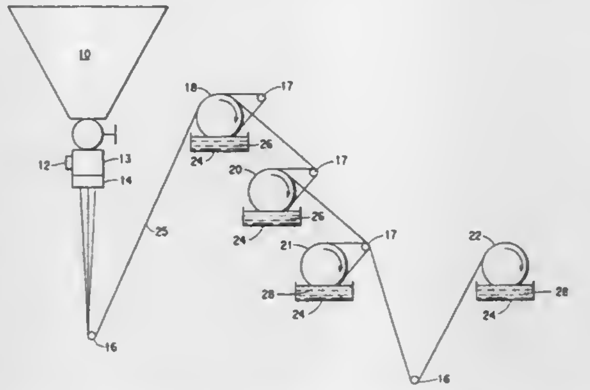
DRY SPINNING PROCESS FOR PRODUCING ZEIN FIBERS

William Cheng Uy, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 16, 1997, Ser. No. 783,725

Int. Cl.^{6} D01F *4/00*

U.S. Cl. 264—204 **12 Claims**



1. A process for the dry spinning of zein fiber from solution by dissolving zein in a solvent to form a solution, extruding said solution through a spinneret, and evaporating said solvent to form said zein fiber, wherein the improvement comprises, using as a solvent a first component whose boiling point is about 0° C. to 50° C., and optionally a second component whose boiling point is greater than 50° C., provided that:

a starting weight fraction of zein in said solution is about 0.40 to about 0.60, based on the total amount of solvent and zein in said solution; and

a weight fraction of said first component in said solution is

$$S \geqq 1 - \frac{Z}{0.675}$$

wherein S is a starting weight fraction of said first component in said solution, and Z is said starting weight fraction of zein in said solution.

5,750,065

ADSORPTION OF PCB'S USING BIOSORBENTS

John J. Kilbane, II, Woodstock, Ill., assignor to Institute of Gas Technology, Des Plaines, Ill.

Filed Jan. 25, 1993, Ser. No. 8,212

Int. Cl.⁶ B29B *17/00*

U.S. Cl. 264—344 **9 Claims**

1. A method for selective adsorption of PCBs comprising the steps of:

mixing at least one proteinaceous material with a molar excess of at least one PCB congener mixture forming a protein/PCB congener mixture;

drying said protein/PCB congener mixture;

extracting each of said PCB congeners from said dried protein/PCB congener mixture forming a biosorbent in the form of an imprinted protein; and

contacting a PCB-containing environment with said imprinted protein resulting in selective adsorption of said PCBs.

5,750,066

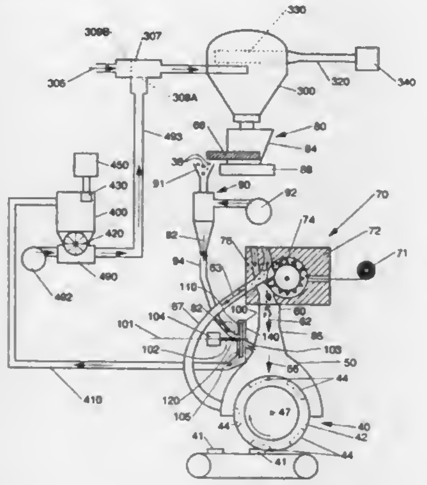
METHOD FOR FORMING AN INTERMITTENT STREAM OF PARTICLES FOR APPLICATION TO A FIBROUS WEB

Michael Francis Vonderhaar, and James Michael Fleming, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 139,249, Oct. 19, 1993, abandoned. This application May 19, 1995, Ser. No. 445,268

Int. Cl.⁶ B27N *3/02*

U.S. Cl. 264—510 **14 Claims**



1. A method for forming an intermittent stream of discrete particles for application to a fibrous web, the method comprising the steps of:

forming a supply stream of the discrete particles, wherein at least some of the discrete particles comprise an absorbent gelling material;

continuously moving a mask having a diverting surface relative to the stream of discrete particles; and

directing the supply stream of discrete particles to form an acute included angle with the diverting surface and splitting the supply stream of discrete particles into a first intermittent stream passing through the mask and a second intermittent stream deflected by the diverting surface.

5,750,067

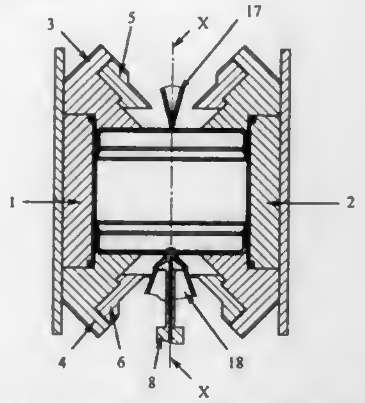
METHOD FOR BLOW MOLDING HOLLOW ARTICLE WITH ANNULAR CHIME AND DEEPLY RECESSED ENDS

Luiz Henrique Hellbrugge, 3886 Sheldrake Ave., Okemos, Mich. 48864

Filed Oct. 7, 1996, Ser. No. 729,694

Int. Cl.⁶ B29C *49/04;49/20*

U.S. Cl. 264—515 **6 Claims**



1. A molding apparatus for blow molding thermoplastic containers having their opposite ends reinforced by reinforcing hoops partially fused to the circumferential wall of the container and projecting axially above at least a portion of said container ends, the apparatus comprising:

an extruder head for extruding a tubular parison;

a gas emitting nozzle for blow molding said tubular parison;

a mold divided into two central halves which are movable between an extended position wherein said mold central halves are spaced from one another and a closed position wherein said mold central halves engage one another to form a continuous circumferential interior surface;

each of said mold central halves having an upper end and a lower end;

each of said mold central halves having an upper groove in its interior surface adjacent to said upper end thereof and a lower groove in its interior surface adjacent to said lower end thereof;

said upper grooves in each of said mold central halves being aligned with one another so as to form a continuous upper groove when said mold central halves are in their closed position;

said lower grooves in each of said mold central halves being aligned with one another so as to form a continuous lower groove when said mold central halves are in their closed position;

said continuous upper and lower grooves, said upper groove adapted to receive and retain the outer peripheral edges of an upper reinforcing hoop and said lower groove adapted to receive and retain the outer peripheral edges of a lower reinforcing hoop;

an intermediate upper mold section half overlying said upper end of each of said mold central halves; and a lower intermediate mold section half overlying said lower end of each of said mold central halves;

said intermediate mold sections being movable with said mold central halves between their said extended position and their said closed position;

said upper and lower intermediate mold sections being movable towards one another when said central mold halves are in their said closed position to retain and engage the outer periphery and partially retain and engage the inner surface of said upper and lower reinforcing hoops in place;

an upper movable end mold section half sliding on an incline on said upper intermediate mold section; and a lower movable end mold section half sliding on an incline on said lower intermediate mold section;

said end mold sections being movable with said mold central halves between their said extended position and their said closed position;

said end mold sections being movable towards one another on an incline when said central and intermediate mold halves are in their said closed position to pinch or press the parison closed and totally close mold cavity;

said end mold sections being movable apart from each other on an incline when said central and intermediate mold halves are in their said closed position to release the pinched-off parison;

said intermediate mold sections being movable apart from each other when said central mold halves are in their said closed position and end mold section halves are in their said extended position to release internal surface of said reinforcing hoops;

said central mold section halves movable to said fully extended position to allow said blow molded container to be demolded.

5,750,068

GAS-INTRODUCED INJECTION MOLDING AND METHOD OF OBTAINING THE SAME

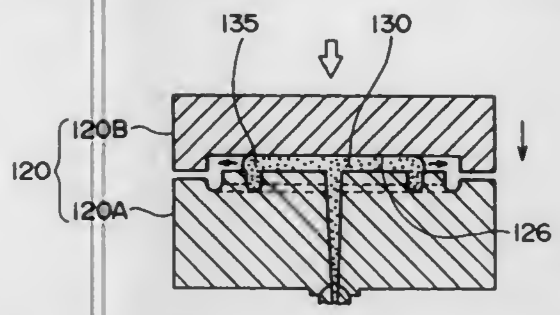
Hirofumi Gouda, and Takayoshi Tanaka, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 232,773, Apr. 25, 1994, Pat. No. 5,514,447. This application Oct. 5, 1995, Ser. No. 539,598

Claims priority, application Japan, Apr. 26, 1993, 5-099350; Apr. 28, 1993, 5-102539; May 20, 1993, 5-118540

Int. Cl.⁶ B29C *45/00*

U.S. Cl. 264—572 **17 Claims**



11. A method of gas-introduced molding for forming a molding within a cavity of a die, said cavity being defined by opposing surfaces of opposed die sections, said die including resin injection means for charging molten resin into said cavity, gas injection means for injecting gas into said molten resin and displacement means for moving said die sections one relative to the other between a closed state and an open state, said die sections being spaced apart when in said open state, said opposing surfaces of said die sections defining a first gap portion of said cavity for forming a framework portion of said molding and defining a second gap portion of said cavity narrower than said first gap portion for forming a sheet portion of said molding which is integral with said framework portion, said method comprising:

charging said molten resin into said cavity when said die is in said open position in an amount required to form said molding in said cavity;

closing said die from said open state to said closed state to press said charged molten resin into said first and second gap portions of said cavity, said closing of said die being started before the end of said charging of said molten resin;

introducing said gas into said charged molten resin in said first gap portion of said cavity to define a hollow cavity within said framework portion of said molding, said introducing of said gas being started before the end of said charging of said molten resin to continuously move said charged molten resin in combination with said closing of said die throughout said first and second gap portions of said cavity to define said framework portion and said sheet portion of said molding; and

discontinuing said introducing of said gas when said die is in said closed state such that said molding is formed by said die when in said closed state.

5,750,069

METHOD AND APPARATUS FOR DISCRIMINATING VEHICLE TYPES

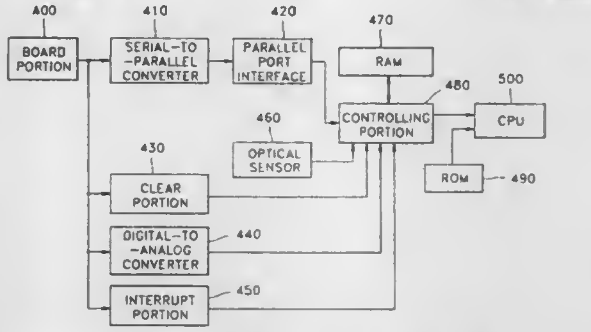
Yung-bai Lew; Won-seo Park, both of Sungnam; Yong-sung Park; Young-ho Kim, both of Kyungki-do; Sang-il Park, Seoul; In-soo Kim, and Chang-sup Woo, both of Suwon, all of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 777,068

Claims priority, application Rep. of Korea, Dec. 30, 1995, 95-69691

Int. Cl.⁶ G08G *1/01*

U.S. Cl. 340—933 **19 Claims**



1. A vehicle-type discriminating apparatus comprising:

a board portion for outputting a serial digital signal from a contact-point board in which said board portion makes contact with a tire of a passing vehicle;

a serial-to-parallel converting portion for converting said serial digital signal output from said board portion into a parallel digital signal;

a parallel port interface;

a clearing portion for resetting an uncertain signal output from said board portion;

a digital-to-analog converting portion for converting said digital signal into an analog signal for counting the number of axles of said passing vehicle;

an interrupt portion for determining whether contact-point boards are pressed, and setting a parallel-input-serial-output (P/S) signal at a high level, to wait to receive an input signal;

an optical sensing portion for projecting an optical signal to discriminate between continuously passing vehicles;

a controlling portion for controlling the signals output from said parallel port interface, said clearing portion, said digital-analog portion, said interrupt portion, and said optical sensing portion and for storing the signals in a first memory;

a second memory for storing a predetermined vehicle-type discriminating program; and

a central processing portion for discriminating said vehicle by calculating the tire width, the distance between the left and right tires, and the number of the axles of said vehicle, on the basis of said predetermined vehicle-type discriminating program stored in said second memory, according to a signal output from said controlling portion.

5,750,070

USE OF BIODEGRADABLE POLYMERS IN PREVENTING CORROSION AND SCALE BUILD-UP

Jiansheng Tang, Naperville, Ill.; Raymond T. Cunningham, Mechanicsville, Va., and Bo Yang, Naperville, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

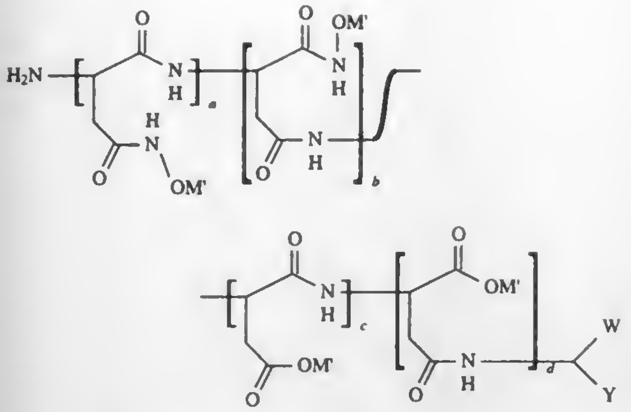
Filed Jul. 19, 1996, Ser. No. 686,616

Int. Cl.⁶ C23F *11/04;11/16;* **C02F** *5/00;* **C09K** *3/00*

U.S. Cl. 422—16 **4 Claims**

1. A method of reducing corrosion on metallic surfaces caused by a water, the method comprising:

adding a corrosion inhibiting composition to the solution, the composition comprising a poly(amino acid) polymer including hydroxamic acid-containing side chains and having the formula



wherein W is selected from the group consisting of CO_2M^2 and CONHOH wherein M^2 is a metal ion; Y is selected from the group consisting of $CH_2CONHOH$ and $CH_2CO_2M^3$ wherein M^3 is a metal ion; M^1 is selected from the group consisting of an alkaline metal, an alkaline earth metal and ammonium; (a+b)/(a+b+c+d)×100%+(c+d)/(a+b+c+d)×100%=100%; (a+b)/(a+b+c+d)×100% ranges from about 10% to about 50%; (c+d)/(a+b+c+d)×100% ranges from 50% to 90%; a/(a+b)×100% ranges from 0% to 100%; b/(a+b)×100% ranges from 0% to 100%; c/(c+d)×100% ranges from 0% to 100%; d/(c+d)×100% ranges from 0% to 100%; and c/(c+d)×100%+d/(c+d)×100%=100%, the composition having a molecular weight ranging from 300 to 10,000.

5,750,071
CORROSION PROTECTION EMPLOYING ALTERNATING VOLTAGE

Mary E. Fiorino, Bridgewater; Robert P. Frankenthal, and James D. Sinclair, both of Summit, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 8, 1995, Ser. No. 488,666

Int. Cl.^{6} C23F *11/00*

U.S. Cl. 422—7 **23 Claims**

1. In a system containing a cable that is exposed to a corrosive environment, wherein said cable contains at least one conductive sheathing, a method of protecting said at least one conductive sheathing from corrosion, comprising the steps of:

providing a cable that is exposed to a corrosive environment, wherein said cable contains at least one conductive sheathing;

inducing a polarity in said at least one conductive sheathing: and alternating said polarity at a predetermined rate.

5,750,072
STERILIZATION BY MAGNETIC FIELD STIMULATION OF A MIST OR VAPOR

Bruce Sangster, 8252 Delfino Cir., Huntington Beach, Calif. 92646, and James D. Bond, 3857 Birch St. Ste 556, Newport Beach, Calif. 92660

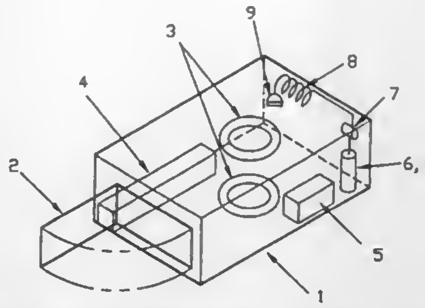
Continuation-in-part of Ser. No. 514,697, Aug. 14, 1995, abandoned. This application Jan. 27, 1997, Ser. No. 790,754

Int. Cl.^{6} A61L *2/02;2/16;* **C12N** *13/00*

U.S. Cl. 422—22 **12 Claims**

7. A method of sterilizing and disinfecting comprising the steps of:

a) providing a sterilizing fluid and a workpiece to be sterilized;
b) pressurizing the sterilizing fluid so as to direct the fluid to a means for spraying;
c) positioning the means for spraying relative to the workpiece so that the sterilizing fluid is directed as a fine mist toward the workpiece;
d) amplifying an electric signal;
e) modulating the electric signal;



f) applying the modulated electric signal to a magnetic coil means for generating an oscillating magnetic field;
g) applying the oscillating magnetic field to the mist to create free radicals on the workpiece for sterilizing and disinfecting the workpiece.

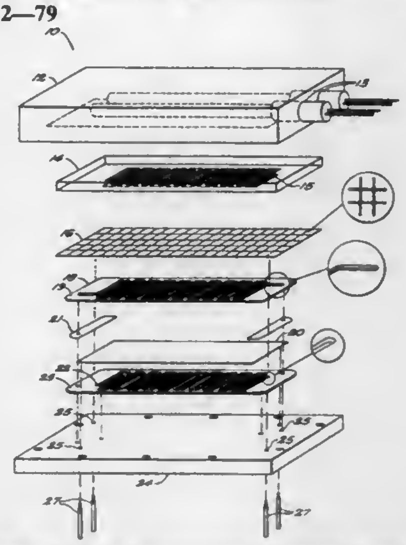
5,750,073
REAGENTLESS OXIDATION REACTOR IN A CARBON MEASURING SYSTEM

Richard D. Godec, Longmont; Paul P. Kosenka, and Richard S. Hutte, both of Boulder, all of Colo., assignors to Sievers Instruments, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 869,308, Apr. 16, 1992, Pat. No. 5,443,991, which is a division of Ser. No. 487,720, Mar. 2, 1990, Pat. No. 5,132,094. This application Jun. 20, 1994, Ser. No. 263,610

Int. Cl.^{6} G01N *31/12;33/00*

U.S. Cl. 422—79 **43 Claims**



1. An apparatus for the measurement of carbon compounds in an aqueous sample in a sample stream, comprising:

(a) a reactor for the conversion of organic compounds in the sample stream to carbon dioxide, said reactor comprising:
  (i) a first chamber for the conversion of organic compounds into carbon dioxide and a second chamber, separated from the first chamber by a hydrogen-permeable, electrically-conductive material; further wherein said first and second chambers each define adjacent serpentine channels separated by said hydrogen-permeable, electrically-conductive material; and
  (ii) means for electrically connecting said first and second chambers to a power supply so as to establish a first electrical potential across said first chamber between a first chamber anode means and said hydrogen-permeable, electrically-conductive material and a second electrical potential across said second chamber between said hydrogen-permeable, electrically-conductive material and second chamber cathode means; and,
(b) a carbon dioxide sensor in communication with the oxidation reactor to measure the carbon dioxide to determine the carbon concentration in the sample stream.

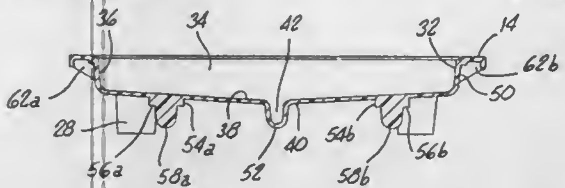
5,750,074
REAGENT SEGMENT

Steven P. Katzman, Yorba Linda, and Ronald C. Glenday, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 23, 1995, Ser. No. 376,574

Int. Cl.^{6} G01N *27/447;* **B01L** *3/00*

U.S. Cl. 422—102 **20 Claims**



1. In an automated capillary electrophoresis apparatus comprising multiple capillaries, a dispenser probe for dispensing reagent into a reagent segment and transport means having at least two cavities, the improvement comprising a reagent segment for feeding reagent to the multiple capillaries of the automated capillary electrophoresis apparatus wherein the reagent segment comprises:

a) an elongated body;
b) an elongated, open, continuous trough in the body, the trough having a floor and being sufficiently long and wide to simultaneously receive multiple capillaries of the automated analyzer;
c) a drainage zone in the floor of the trough, the drainage zone being deeper than the remainder of the trough with the floor of the trough sloping toward the drainage zone so reagent can be substantially completely removed from the trough by aspiration; and
d) a fill section in the trough sufficiently wide to receive the dispenser probe.

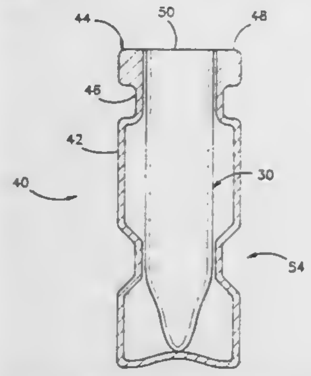
5,750,075
CHROMOTOGRAPHY VIAL

Frederick W. Spike, Wilmington, N.C., assignor to Sun International Trading , Ltd., Wilmington, N.C.

Filed Feb. 15, 1996, Ser. No. 601,684

Int. Cl.^{6} B01L *3/00*

U.S. Cl. 422—102 **11 Claims**



1. A chromatography sampling vial assembly comprising:

a) an insert vial having a generally cylindrical main body and a closed bottom so as to form a receptacle for receiving a sample;
b) a distinct glass chromatography carrier vial for receiving and holding said insert vial, said carrier vial including:
  i) a generally cylindrical main body including an upper section having a predetermined inner diameter and a lower section disposed along a longitudinal axis;
  ii) a head portion at an upper end of said main body, said head portion including a vial opening of a predetermined determined diameter axially aligned with said longitudinal axis;
  iii) a closed bottom positioned at said lower section having an inner diameter substantially the same as said predetermined inner diameter of said upper section so as to form a receptacle for receiving a sample; and
  iv) a reduced diameter mid-section between said upper section and said lower section of said main body; said mid-section having both a reduced inner diameter and a reduced outer diameter with respect to said main body of said carrier vial;
c) wherein said reduced diameter mid-section is axially aligned with said vial opening for axially aligning said insert vial in said carrier vial when the insert vial is inserted into the carrier vial.

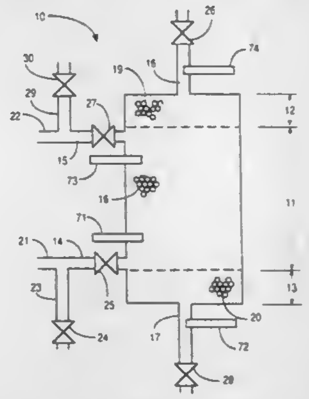
5,750,076
APPARATUS FOR THE TWO-STAGE SELECTIVE OXIDATION OF CARBON MONOXIDE IN A HYDROGEN-CONTAINING GAS MIXTURE

Richard F. Buswell, Glastonbury, Conn.; Ronald Cohen, Boca Raton, Fla.; Leonard McNeilly, Burnaby, and David S. Watkins, Coquitlam, both of Canada, assignors to Ballard Power Systems Inc., Burnaby, Canada

Division of Ser. No. 293,653, Aug. 22, 1994, Pat. No. 5,518,705. This application Dec. 20, 1995, Ser. No. 580,078

Int. Cl.^{6} F16K *17/00;* **G01D** *7/00;* **F01N** *3/10;* **B01D** *50/00*

U.S. Cl. 422—115 **14 Claims**



1. An apparatus for selectively oxidizing carbon monoxide to carbon dioxide in a fuel stream comprising hydrogen and carbon monoxide, said apparatus comprising:

(a) a primary reaction chamber comprising a primary catalyst bed for promoting oxidation of carbon monoxide to carbon dioxide, said primary reaction chamber further comprising:
  (i) a first inlet and a first outlet, said first inlet fluidly connected to said first outlet for directing said fuel stream through said primary catalyst bed in a first direction;
  (ii) a second inlet and a second outlet, said second inlet fluidly connected to said second outlet for directing said fuel stream through said primary catalyst bed in a second direction, wherein said second direction is substantially the reverse of said first direction;

said apparatus further comprising:

(b) a flow controller for iteratively switching said flow direction of said fuel stream through said primary catalyst bed between said first flow direction and said second flow direction.

5,750,077
COMPACT MAN-PORTABLE EMERGENCY OXYGEN SUPPLY SYSTEM

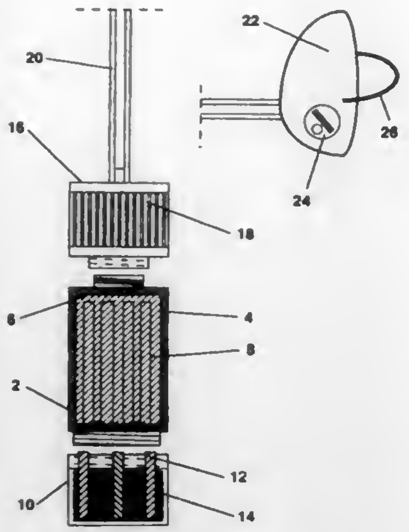
Neil C. Schoen, 9817 Freestate Pl., Gaithersburg, Md. 20879

Filed Jul. 22, 1996, Ser. No. 685,969

Int. Cl.^{6} A62B *7/08*

U.S. Cl. 422—122 **10 Claims**

1. A light weight man-portable emergency oxygen generator device comprising: a reaction canister means to contain catalyzed reaction products and the input thermal energy necessary to maintain a molecular oxygen producing reaction; chemical composition for producing said molecular oxygen, which undergo chemically catalyzed endothermic or low enthalpy change reactions which are not self-sustaining; separate energy means to create temperature



levels sufficient to allow chemical compounds to undergo said chemically catalyzed endothermic or low enthalpy change reactions to produce said molecular oxygen; separate filter means to collect and cool said molecular oxygen from other products produced by said catalyzed reactions; and means to control both the concentration of said molecular oxygen by mixing with ambient air, and the delivery of a breathable atmosphere to people in emergency situations by said oxygen generator device.

5,750,078

PROCESS FOR PRODUCING HUMANIZED CHIMERA ANTIBODY

Kenya Shitara, Tokyo; Nobuo Hanai; Mamoru Hasegawa, both of Kanagawa; Hiromasa Miyaji, Tokyo, all of Japan, and Yoshihisa Kuwana, Munich, Germany, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 292,178, Aug. 17, 1994, abandoned, which is a continuation of Ser. No. 947,674, Sep. 17, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 408,133

Claims priority, application Japan, Sep. 18, 1991, 3-238375

Int. Cl.^{6} C07K *16/46;* **A61K** *39/395*

U.S. Cl. 424—133.1 **3 Claims**

1. A pharmaceutical composition comprising a human chimeric antibody KM-871 produced by a transformant KM-871 (FERM BP-3512) which is reactive with ganglioside GD_3.

5,750,079

POLYMERIZATION APPARATUS OF PRODUCING VINYL CHLORIDE TYPE POLYMER

Takuya Ueda, Kamisu-machi; Kikuo Nakajima, Hasaki-machi; Yoichi Tanifuji, Kamisu-machi; Tadashi Amano, Kamisu-machi, and Shuji Ohnishi, Kamisu-machi, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

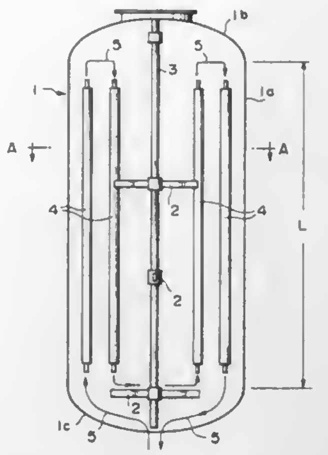
Division of Ser. No. 364,449, Dec. 27, 1994, Pat. No. 5,612,437. This application Nov. 27, 1996, Ser. No. 758,022

Claims priority, application Japan, Dec. 27, 1993, 5-351850

Int. Cl.^{6} C08F *2/18*

U.S. Cl. 422—138 **12 Claims**

1. A polymerization apparatus comprising a polymerization vessel comprising a substantially cylindrical container, wherein said polymerization vessel has a reflux condenser at its upper part; a cooling jacket at its outside; an agitator consisting of an agitation shaft equipped with baffles, said agitating shaft being placed alone the axis of the polymerization vessel; a plurality of baffles each having a cooling function comprised of pipes vertically extending in said polymerization vessel; and serpentine pipelines each of which is placed between two adjacent baffles and is extended in a repeated serpentine fashion along the polymerization vessel inner wall from the lower part to the upper part of the polymerization vessel with said serpentine pipeline being apart from said inner wall, and a refrigerant is passed through said baffles and said serpentine pipelines.



5,750,080

METHOD FOR IN-SITU MODERNIZATION OF A UREA SYNTHESIS REACTOR

Giorgio Pagani, Milan, Italy, assignor to Urea Casale S.A., Lugano-Besso, Switzerland

PCT No. PCT/IB95/00720, § 371 Date Mar. 7, 1997, § 102(e) Date Mar. 7, 1997, PCT Pub. No. WO96/07474, PCT Pub. Date Mar. 14, 1996

PCT Filed Aug. 31, 1995, Ser. No. 793,995

Claims priority, application Switzerland, Sep. 9, 1994, 2751/94-2

Int. Cl.^{6} B01J *8/04*

U.S. Cl. 422—193 **18 Claims**

1. Method for in-situ modernization of a reactor for urea synthesis at high pressure and temperature, of the type wherein a co-current flow of a gaseous phase and a liquid phase takes place, comprising a vertical tubular shell (2) in which is supported a plurality of superimposed Perforated plates (**6*a*–6*f***) extending horizontally in said shell (2), with said method characterized in that it comprises the step of providing on at least one of said perforated plates (**6*a*–6*f***) a plurality of structurally independent caps (**8**) having at the top a plurality of holes (**11**), with said caps (**8**) supported at a predetermined distance from said perforated plate (**6*a*–6*f***) with which they form a plurality of lateral apertures (**13**), said holes (**11**) and said apertures (**13**) defining respective preferential paths for the gaseous phase and the liquid phase respectively.

5,750,081

SOLVENT EXTRACTION OF METAL CONTAINING SPECIES

Neil Graham Smart, Preston, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

PCT No. PCT/GB95/00891, § 371 Date Jan. 31, 1996, § 102(e) Date Jan. 31, 1996, PCT Pub. No. WO95/28999, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 20, 1995, Ser. No. 571,846

Claims priority, application United Kingdom, Apr. 21, 1994, 9407892

Int. Cl.^{6} C01G *56/00*

U.S. Cl. 423—3 **11 Claims**

1. A method of extracting metal species from a metal species containing medium which comprises contacting the medium with an extractant solvent which comprises a supercritical fluid and a complexant for solubilising metal species in the said medium and also a conditioning agent for changing the oxidation state of the metal species.

5,750,082

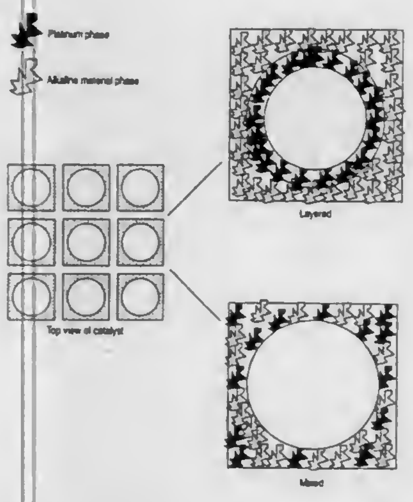
NOX TRAP WITH IMPROVED PERFORMANCE

Jeffrey Scott Hepburn, Dearborn; Eva Thanasiu, Trenton, both of Mich.; William Lewis Henderson Watkins, Toledo, Ohio; Carolyn Parks Hubbard, Dearborn Heights, Mich.; Douglas A. Dobson, Livonia, Mich., and Haren Sakarlal Gandhi, Farmington Hills, Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Sep. 21, 1995, Ser. No. 531,512

Int. Cl.^{6} B01D *53/94;* **B01J** *20/04;23/02*

U.S. Cl. 423—213.5 **17 Claims**



1. A nitrogen oxide trap useful for trapping nitrogen oxide present in the exhaust gases generated during lean-burn operation of an internal combustion engine, said trap comprising distinct catalyst phases:

(a) a porous support loaded with catalyst comprising 0.1 to 5 weight % platinum; and

(b) another porous support loaded with 2 to 30 weight % catalyst of at least one alkaline metal material selected from the group consisting of alkali metal elements and alkaline earth elements, said phase (a) being essentially free of said alkaline metal material, the weight % of catalyst being based on the weight of its porous support, and wherein the catalyst phases (a) and (b) are provided as an intimate mixture thereof.

5,750,083

METHOD FOR THE REMOVAL OF HYDROGEN SULFIDE PRESENT IN GASES

Tomio Mimura; Shigeru Shimojo, both of Osaka; Masaki Iijima, Tokyo, and Shigeaki Mitsuoka, Hiroshima, all of Japan, assignors to The Kansai Electric Power Co., Inc., Osaki, and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of Japan

Division of Ser. No. 405,628, Mar. 15, 1995, Pat. No. 5,609,840. This application Nov. 1, 1996, Ser. No. 742,747

Claims priority, application Japan, Mar. 18, 1994, 6-48704; Mar. 18, 1994, 6-48705; Mar. 18, 1994, 6-48706

Int. Cl.^{6} C01B *17/16;* **B01D** *53/50*

U.S. Cl. 423—228 **5 Claims**

1. A method for the removal of the H_2S from a gas containing less than 1 vol % of H_2S which comprises bringing the gas into contact with an aqueous solution consisting essentially of triethylenediamine which, upon use, reduces the H_2S concentration in the treated gas to 10 ppm or less.

5,750,084

FLUIDIZED-BED DENITRATING METHOD

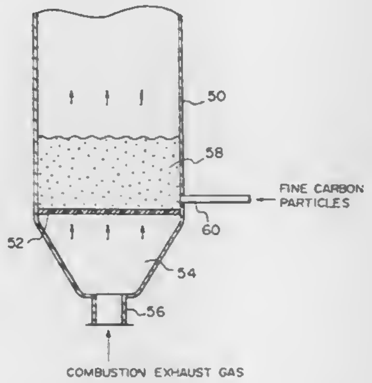
Kazuo Tsutsumi; Tomoaki Takada, both of Kobe; Yasufumi Sakakida, and Tarou Kawamura, both of Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 12, 1995, Ser. No. 570,959

Claims priority, application Japan, Dec. 28, 1994, 6-338509

Int. Cl.^{6} C01B *21/02*

U.S. Cl. 423—239.1 **4 Claims**



1. A fluidized-bed denitrating method comprising:

introducing a combustion exhaust gas containing at least nitrogen monoxide and oxygen into a fluidized bed made of fluid medium particles having particle sizes in a range of 30 to 500 µm; causing fine carbon particles having particle sizes of not more than 3 µm to adhere on the fluid medium particles;

causing the fluid medium particles with the fine carbon particles adhered thereto to adsorb the nitrogen monoxide so that the nitrogen monoxide is oxidized to nitrogen dioxide on the surfaces of said fluid medium particles;

decomposing the nitrogen dioxide into carbon dioxide and nitrogen by the reducing agency of the fine carbon particles which are arrested by and moved with the fluid medium particles.

5,750,085

PROCESS FOR MANUFACTURING A SILICA POROUS MATERIAL

Yuri Yamada; Shinji Inagaki, both of Nagoya, and Yoshiaki Fukushima, Aichi-ken, all of Japan, assignors to Kabushiki Kaisha Toyota Chou Kenyusho, Aichi-ken, Japan

Filed Feb. 8, 1996, Ser. No. 598,352

Claims priority, application Japan, Feb. 8, 1995, 7-044944; Jan. 29, 1996, 8-035648

Int. Cl.^{6} C01B *33/26*

U.S. Cl. 423—328.2 **12 Claims**

1. A process for manufacturing a silica porous material comprising the steps of:

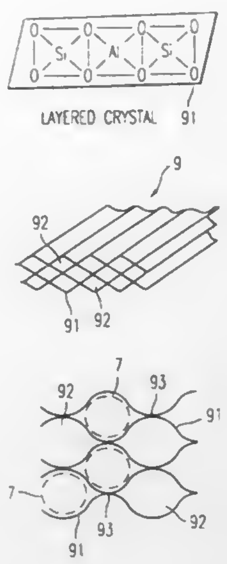
adding a compound of a metallic element except for silicon to a waterglass to form a waterglass mixture, said metallic element capable of taking a tetrahedral configuration;

aging said waterglass mixture;

calcining said aged waterglass mixture to form a layered crystal comprising a SiO_4 tetrahedral and a tetrahedral metal oxide containing said metallic element;

incorporating an organic substance between adjacent layers of said layered crystal;

crosslinking said adjacent layers to form pores in said layered crystal; and



removing said organic substance from said crosslinked layered crystal to obtain a silica porous material.

5,750,086

PROCESS FOR PRODUCING ULTRAFINE PARTICLES OF COLLOIDAL CALCIUM CARBONATE

Kyu Jae You, 48, Nackdong-ri, Nam-myon, Jungsun-kun, Kangwon-do, Rep. of Korea

Filed Jan. 31, 1997, Ser. No. 792,481

Claims priority, application Rep. of Korea, Feb. 2, 1996, 96-2535

Int. Cl.^{6} C01F *11/18*

U.S. Cl. 423—432 **2 Claims**

1. A process for producing chain-shaded ultrafine particles of colloidal calcium carbonate having an average diameter not greater than 0.01 μm, and an average length not less than 0.05 μm, the process comprising the steps of:

(a) adding magnesium sulfate into an aqueous suspension of calcium hydroxide having a concentration of 3 to 14% by weight and a temperature of about 14° to 30° C., the amount of magnesium sulphate added being in the range of 0.01 to 0.03 moles per mole of the calcium hydroxide initially contained in the aqueous suspension;

(b) carbonating said aqueous suspension from step (a) by introducing carbon dioxide thereinto; and

(c) adding zinc sulfate alone or together with sulfuric acid into the aqueous suspension simultaneously with the carbonation step the amount of the zinc sulphate or the amount of the zinc sulfate and the sulfuric acid being in the range of 0.02 to 0.15 moles per mole of the calcium hydroxide initially contained in the aqueous suspension and, in the case of the zinc sulfate being added with sulfuric acid, the ratio of the zinc sulfate to the sulfuric acid being in the range of 1:1 to 10:1 by weight.

5,750,087

PROCESS FOR THE REDUCTION OF COPPER OXIDE

Joseph A. Corella, II, Zelienople, and Kevin M. Neigh, Butler, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 27, 1996, Ser. No. 673,201

Int. Cl.^{6} C01G *3/02*

U.S. Cl. 423—604 **20 Claims**

1. A method of reducing copper oxide comprising the step of reacting the copper oxide with a reducing agent selected from the group consisting of morpholine borane, ethylene diamine borane, ethylene diamine bisborane, t-butylamine borane, piperazine borane, imidazole borane, and methoxyethylamine borane.

5,750,088

STABLE HYDRAZONES LINKED TO A PEPTIDE MOIETY AS REAGENTS FOR THE PREPARATION OF RADIOPHARMACEUTICALS

Michael Sworin, Tyngsboro; Milind Rajopadhye, Westford, both of Mass.; Thomas David Harris, Salem, N.H.; David Scott Edwards, Burlington, Mass.; Edward Hollister Cheesman, Lunenburg, Mass., and Shuang Liu, Chelmsford, Mass., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 218,861, Mar. 28, 1994, which is a continuation-in-part of Ser. No. 40,336, Mar. 30, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,296

Int. Cl.^{6} A61K *51/08;38/00;* **C07D** *401/00*

U.S. Cl. 424—1.69 **7 Claims**

1. A reagent having the formula:

$$(Q)_{d'}L_n\text{—}H_z,$$

and pharmaceutically acceptable salts thereof wherein,

Q is a biologically active group selected from the group: peptides, polypeptides, and peptidomimetics;

d' is 1–20;

L_n is a linking group of formula:

$$M^1\text{—}[Y^1(CR^{55}R^{56})_{f}Y^2]_{f'}\text{—}M^2,$$

wherein:

M^1 is $\text{—}[(CH_2)_gZ^1]_{g'}\text{—}(CR^{55}R^{56})_{g''}\text{—}$;

M^2 is $\text{—}(CR^{55}R^{56})_{g''}\text{—}[Z^1(CH_2)_g]_{g'}\text{—}$;

g is independently 0–10;

g' is independently 0–1;

g" is independently 0–10;

f is independently 0–10;

f' is independently 0–10;

f" is independently 0–1;

Y^1 and Y^2, are independently selected at each occurrence from: a bond, O, NR^{56}, C=O, C(=O)O, OC(=O)O, C(=O)NH—, C=NR^{56}, S, SO, SO_2, SO_3, NHC(=O), $(NH)_2C(=O)$, $(NH)_2C=S$;

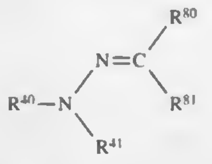
Z^1 is independently selected at each occurrence from a C_6–C_{14} saturated, partially saturated, or aromatic carbocyclic ring system, substituted with 0–4 R^{57}; and a heterocyclic ring system, substituted with 0–4 R^{57};

R^{55} and R^{56} are independently selected at each occurrence from: hydrogen; C_1–C_{10} alkyl substituted with 0–5 R^{57}; alkaryl wherein the aryl is substituted with 0–5 R^{57};

R^{57} is independently selected at each occurrence from the group: hydrogen, OH, NHR^{58}, $C(=O)R^{58}$, $OC(=O)R^{58}$, $OC(=O)OR^{58}$, $C(=O)OR^{58}$, $C(=O)NR^{58}$, C≡N, SR^{58}, SOR^{58}, SO_2R^{58}, $NHC(=O)R^{58}$, $NHC(=O)NHR^{58}$, $NHC(=S)NHR^{58}$; or, alternatively, when attached to an additional molecule Q, R^{57} is independently selected at each occurrence from the group: O, NR^{58}, C=O, C(=O)O, OC(=O)O, C(=O)N—, C=NR^{58}, S, SO, SO_2, SO_3, NHC(=O), $(NH)_2C(=O)$, $(NH)_2C=S$; and,

R^{58} is independently selected at each occurrence from the group: hydrogen; C_1–C_6 alkyl; benzyl, and phenyl;

H_z is a stable hydrazone of formula:



wherein,

R^{40} is independently selected at each occurrence from the group: a bond to L_n, C_1–C_{10} alkyl substituted with 0–3 R^{52}, aryl substituted with 0–3 R^{52}, cycloaklyl substituted with 0–3 R^{52}, heterocycle substituted with 0–3 R^{52}, heterocycloalkyl substituted with 0–3 R^{52}, aralkyl substituted with 0–3 R^{52} and alkaryl substituted with 0–3 R^{52};

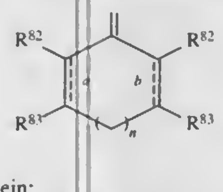
R^{41} is independently selected from the group: hydrogen, aryl substituted with 0–3 R^{52}, C_1–C_{10} alkyl substituted with 0–3 R^{52}, and a heterocycle substituted with 0–3 R^{52};

R^{52} is independently selected at each occurrence from the group: a bond to L_n, =O, F, Cl, Br, I, —CF_3, —CN, —CO_2R^{53}, —C (=O)R^{53}, —C (=O)N (R^{53})$_2$, —CHO, —CH_2OR^{53}, —OC(=O)R^{53}, —OC(=O)OR^{53a}, —OR^{53}, —OC(=O)N(R^{53})$_2$, —NR^{53}C (=O) R^{53}, —NR^{54}C (=O)OR^{53a}, —NR^{53}C(=O)N(R^{53})$_2$, —$NR^{54}SO_2N(R^{53})_2$, —$NR^{54}SO_2R^{53a}$, —SO_3H, —SO_2R^{53a}, —SR^{53}, —S(=O)R^{53a}, —$SO_2N(R^{53})_2$, —N(R^{53})$_2$, —NHC(=NH)NHR^{53}, —C(=NH)NHR^{53}, =NOR^{53}, NO_2, —C(=O)$NHOR^{53}$, —C (=O)$NHNR^{53}R^{53a}$, —OCH_2CO_2H, 2-(1-morpholino)ethoxy;

R^{53}, R^{53a}, and R^{54} are each independently selected at each occurrence from the group: hydrogen, C_1–C_6 alkyl, and a bond to L_n;

R^{80} and R^{81} are independently selected from the group: H; C_1–C_{10} alkyl; —CN; —CO_2R^{85}; —C(=O)R^{85}; —C(=O)N(R^{85})$_2$; C_2–C_{10} 1-alkene substituted with 0–3 R^{84}; C_2–C_{10} 1-alkyne substituted with 0–3 R^{84}; aryl substituted with 0–3 R^{84}; unsaturated heterocycle substituted with 0–3 R^{84}; and unsaturated carbocycle substituted with 0–3 R^{84}; provided that when one of R^{80} and R^{81} is H or alkyl, then the other is not H or alkyl;

or, alternatively, R^{80} and R^{81}, may be taken together with the shown divalent carbon radical to form:



wherein:

R^{82} and R^{83} may be independently selected from the group: H; R^{84}; C_1–C_{10} alkyl substituted with 0–3 R^{84}; C_2–C_{10} alkenyl substituted with 0–3 R^{84}; C_2–C_{10} alkynyl substituted with 0–3 R^{84}; aryl substituted with 0–3 R^{84}; heterocycle substituted with 0–3 R^{84}; and carbocycle substituted with 0–3 R^{84};

or, alternatively, R^{82}, R^{83} may be taken together to form a fused aromatic or heterocyclic ring;

a and b indicate the positions of optional double bonds and n is 0 or 1,

R^{84} is independently selected at each occurrence from the group: =O, F, Cl, Br, I, —CF_3, —CN, —CO_2R^{85}, —C(=O)R^{85}, —C(=O)N(R^{85})$_2$, —N(R^{85})$_3^+$ —CH_2OR^{85}, —OC (=O)R^{85}, —OC(=O)OR^{85a}, —OR^{85}, —OC(=O)N(R^{85})$_2$, —NR^{85}C(=O)R^{85}, —NR^{86}C(=O)OR^{85a}, —NR^{85}C(=O)N(R^{85})$_2$, —$NR^{86}SO_2N(R^{85})_2$, —$NR^{86}SO_2R^{85a}$, —SO_3H, SO_3Na, —SO_2R^{85a}, —SR^{85}, —S(=O)R^{85a}, —$SO_2N(R^{85})_2$, —N(R^{85})$_2$, —NHC(=NH)NHR^{85}, —C(=NH)NHR^{85}, =NOR^{85}, —C(=O)$NHOR^{85}$, —OCH_2CO_2H, 2-(1-morpholino)ethoxy; and

R^{85}, R^{85a}, and R^{86} are each independently selected at each occurrence from the group: hydrogen, C_1–C_6 alkyl.

5,750,089

HALOGENATED NEUROPROBE FOR MAPPING MONOAMINE REUPTAKE SITES

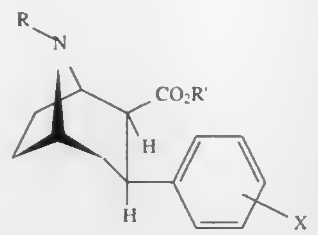
John L. Neumeyer, Wayland; Richard A. Milius, Boston; Gilles Tamagnan, Framingham, and Shaoyin Wang, Lexington, all of Mass., assignors to Neuro Imaging Technologies, LLC, Boston, Mass.

Filed Jan. 11, 1996, Ser. No. 584,617

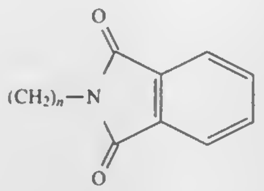
Int. Cl.^{6} A61K *51/04*

U.S. Cl. 424—1.85 **15 Claims**

1. A neuroprobe having the formula:



wherein R=



wherein n=2–8;

R'=C_wH_{2w+1} wherein w=0–6 and C includes an isotope of carbon; and

X=an isotope of Cl, an isotope of Br, an isotope of F, an isotope of I, or Sn(R''_1 R''_2 R''_3), wherein

R''_1=a C_pH_{2p+1} group where p=1–6, or an aryl group;

R''_2=a C_pH_{2p+1} group where p=1–6, or an aryl group; and

R''_3=a C_pH_{2p+1} group where p=1–6, or an aryl group.

5,750,090

SILICA-CERIUM OXIDE COMPOSITE PARTICLES, METHOD FOR THE PREPARATION THEREOF AND RESIN COMPOSITION AND A COSMETIC COMPOSITION COMPOUNDED THEREWITH

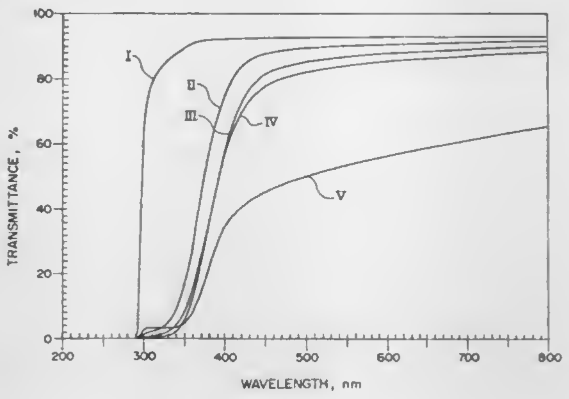
Sakae Yoshida; Satomi Shinnumadate; Shinryo Yabe; Shigeyoshi Momose, and Kiminori Hirai, all of Tokyo, Japan, assignors to Nippon Inorganic Colour & Chemical Co., Ltd., and Kose Corporation, both of Tokyo, Japan

Filed Dec. 31, 1996, Ser. No. 777,790

Claims priority, application Japan, May 27, 1996, 8-132284

Int. Cl.^{6} A61K *7/42*

U.S. Cl. 424—59 **17 Claims**



1. Silica-cerium oxide composite particles as a composite of cerium oxide and amorphous silica of which the content of silica is in the range from 5 to 60% by weight calculated as SiO_2 based on the total amount of silica and cerium oxide.

5,750,091

METHODS FOR INCREASING MELANIN CONTENT IN MELANOCYTES USING DIACYLGLYCEROLS AND USES THEREOF

Barbara A. Gilchrest, Brookline, Mass., and Philip R. Gordon, Philadelphia, Pa., assignors to The Trustees of Boston University, Boston, Mass.

Division of Ser. No. 934,872, Aug. 21, 1992, Pat. No. 5,352,440, which is a continuation of Ser. No. 625,236, Dec. 10, 1990, abandoned, and Ser. No. 625,405, Dec. 11, 1990, abandoned, and a continuation-in-part of Ser. No. 624,453, Dec. 10, 1990, abandoned, which is a continuation of Ser. No. 175,129, Mar. 30, 1988, abandoned. This application Sep. 28, 1994, Ser. No. 314,475

Int. Cl.^{6} A61K *7/42;31/22;31/225*

U.S. Cl. 424—59 **4 Claims**

1. A method for increasing pigmentation of human skin by increasing the melanin content of melanocytes present in human skin, comprising topically or subcutaneously administering to the human an effective amount of a diacylglycerol compound wherein the 3 position is a hydroxy and the 1 and 2 position are independently carboxylic acid esters 1 to 18 carbon atoms long, in a pharmaceutically acceptable carrier.

5,750,092

SUNLESS TANNING COMPOSITION AND METHOD

Thomas A. Meyer, Germantown; Michael E. Ando, and Jimmy B. Powell, both of Memphis, all of Tenn., assignors to Schering-Plough HealthCare Products, Inc., Memphis, Tenn.

Filed Mar. 12, 1997, Ser. No. 820,324

Int. Cl.^{6} A61K *7/42;7/44;7/00*

U.S. Cl. 424—59 **41 Claims**

1. A kit for imparting an artificial tan to skin, comprising:

(a) a fluid formulation comprising dihydroxyacetone; and

(b) a fluid formulation comprising a secondary polyamine;

wherein there is also present in the formulation of (b) a color modifying amount of a modifier selected from the group consisting of: an amino acid; a substituted ethylenediamine having the formula

$$L\text{-}(CH_2)_n\text{-}NH\text{-}(CH_2)_2\text{-}NH\text{-}M$$

wherein L is OH or COOH, M is hydrogen or L-$(CH_2)_n$, and each n is independently an integer of 1 to about 22; a carboxylic acid having the formula HOOC-$(CH_2)_n$-COOH or R-CH(OH)-COOH, wherein n is an integer up to about 22 and R is hydrogen or an alkyl, cycloalkyl or aryl group having up to about 22 carbon atoms; and mixtures of any two or more of the foregoing.

5,750,093

33 LIPOMELANIN SUNSCREEN COMPOSITION

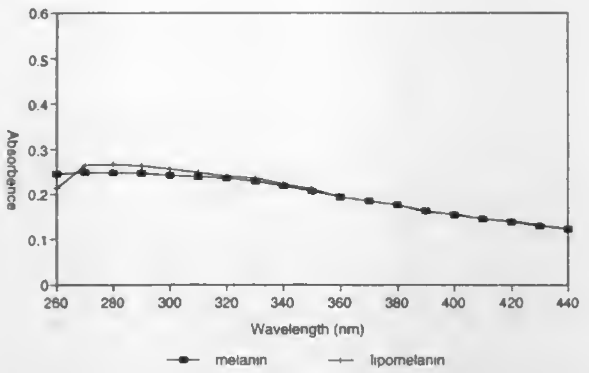
I. Aravindakshan Menon, North York, and Herbert F. Haberman, Toronto, both of Canada, assignors to DUSA Pharmaceuticals, Inc., Ontario, Canada

Division of Ser. No. 54,271, Apr. 30, 1993, Pat. No. 5,643,554. This application Jun. 25, 1997, Ser. No. 882,697

Int. Cl.^{6} A61K *7/42;31/20*

U.S. Cl. 424—59 **22 Claims**

1. A lipomelanin sunscreen comprising a melanin compound substantially chemically bound to a substantially unsaturated lipid to form a lipomelanin in combination with an ultraviolet radiation absorbing compound, and wherein said unsaturated lipid is selected from the group consisting of unsaturated fats, fatty acids, phosphoglycerides, or a combination of one or more of the same.



5,750,094

LIPSTICK OVERCOAT COMPOSITION

Satoshi Tomomasa; Tomiyuki Nanba, and Yoshikazu Soyama, all of Yokohama, Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan

Filed May 25, 1995, Ser. No. 451,089

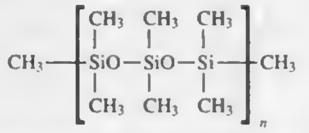
Claims priority, application Japan, May 24, 1994, 6-110859; May 25, 1994, 6-110858

Int. Cl.^{6} A61K *7/025;31/695;31/08*

U.S. Cl. 424—64 **2 Claims**

2. A water-in-oil type emulsion lipstick overcoat composition comprising:

(i) 40 to 70% by weight of dimethyl polysiloxane having the formula (I)



$$CH_3-\left[\begin{matrix}CH_3 & CH_3 & CH_3\\ | & | & |\\ SiO- & SiO- & Si\\ | & | & |\\ CH_3 & CH_3 & CH_3\end{matrix}\right]_n-CH_3 \qquad (I)$$

wherein n is 26–600 on average,

in an outer oil phase; and

(ii) (a) water and (b) 0.5 to 10% by weight of at least one powder selected from the group consisting of silica powder and alumina powder in an inner water phase.

5,750,095

ANHYDROUS COSMETIC OR DERMATOLOGICAL COMPOSITION CONTAINING THE COMBINATION OF A SILICONE OIL AND A WAX MADE FROM AN ETHYLENE HOMOPOLYMER OR COPOLYMER

Pascal Arnaud, Creteil, and Myriam Mellul, L'Hay Les Roses, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 377,382, Jan. 25, 1995, Pat. No. 5,556,613. This application Jun. 26, 1996, Ser. No. 672,082

Claims priority, application France, Jan. 26, 1994, 94 00843

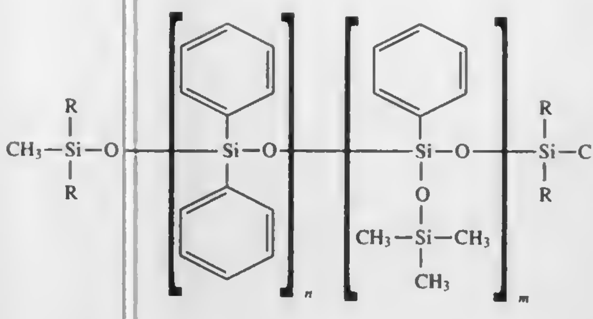
Int. Cl.^{6} A61K *7/02;7/027*

U.S. Cl. 424—64 **10 Claims**

1. An anhydrous silicone oil-based make-up composition containing:

(a) a homogeneous fatty phase, said fatty phase comprising a mixture of:

(i) 5 to 90% by weight of said fatty phase of at least one silicone oil having the formula:



(I)

wherein;

R represents alkyl having 1 to 30 carbon atoms, aryl or aralkyl,

n represents a whole number between 0 and 100, and

m represents a whole number between 0 and 100, provided that the sum of n+m is between 1 and 100;

(ii) 3 to 50% by weight of said fatty phase of an ethylene homopolymer wax having a melting point between 50° C. nd 135° C. and a molecular weight between 200 and 1,500, and

(iii) 0.5 to 85% by weight of said fatty phase of a fatty substance selected from the group consisting of an oil, a wax and a mixture thereof, and

(b) 0.5 to 97% by weight of said anhydrous make-up composition of a solid compound in powder form.

5,750,096

LOW RESIDUE ANTIPERSPIRANT GEL-SOLID STICK COMPOSITIONS CONTAINING SELECT GELLANTS

Gerald John Guskey, Montgomery, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1996, Ser. No. 771,091

Int. Cl.^{6} A61K *7/34*

U.S. Cl. 424—65 **14 Claims**

1. An anhydrous antiperspirant gel-solid stick compositions comprising:

(A) from about 0.5% to about 60% by weight of particulate antiperspirant active;

(B) from about 1% to about 15% by weight of a solid non-polymeric gellant selected from the group consisting of 12-hydroxystearic acid, esters of 12-hydroxystearic acid, amides of 12-hydroxystearic acid, and combinations thereof; and

(C) from about 10% to about 80% by weight of an anhydrous liquid carrier having an average solubility parameter of from about 3 to about 13 $(cal/cm^3)^{0.5}$ and

wherein the composition has a visible residue index of from about 11 to about 30 L-value, a product hardness of from about 500 gram.force to about 5,000 gram.force, and a ratio of an elastic to viscous moduli of from about 0.1 to about 100, and wherein the refractive indices of the particulate antiperspirant active, the solid non-polymeric gellant, and the anhydrous liquid carrier are not matched, and wherein the solid non-polymeric gellant in the composition is in the form of elongated crystalline particles having an aspect ratio of at least about 2 and an average gellant particle size of less than about 1 μm.

5,750,097

USE OF DIACETYL TARTRATE ESTERS OF FATTY ACID GLYCERIDES AS HAIR CONDITIONER ADDITIVES

Holger Leidreiter, and Felix Müller, both of Essen, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Mar. 7, 1995, Ser. No. 399,796

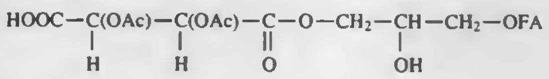
Claims priority, application Germany, Mar. 15, 1994, 44 08 668.7

Int. Cl.^{6} A61K *7/08*

U.S. Cl. 424—70.1 **2 Claims**

1. A hair care composition containing 0.1 to 10% by weight of a conditioning agent comprising:

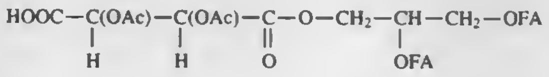
a) 60 to 100% by weight of



$$HOOC-\underset{H}{\underset{|}{C}}(OAc)-\underset{H}{\underset{|}{C}}(OAc)-\underset{O}{\underset{\|}{C}}-O-CH_2-\underset{OH}{\underset{|}{CH}}-CH_2-OFA$$

and

b) 40 to 0% by weight of



$$HOOC-\underset{H}{\underset{|}{C}}(OAc)-\underset{H}{\underset{|}{C}}(OAc)-\underset{O}{\underset{\|}{C}}-O-CH_2-\underset{OFA}{\underset{|}{CH}}-CH_2-OFA$$

wherein

Ac is an acetyl group, and

FA is an acyl group of a fatty acid or of a fatty acid mixture with 8 to 18 carbon atoms c) detergent surfactant selected from the group consisting of anionic, amphoteric, zwitterionic, and nonionic surfactant and d) water.

5,750,098

SILICONE COMPOSITIONS FOR SKIN CARE

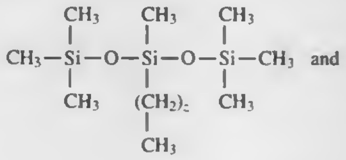
Gary Edward LeGrow, and John Cyrus Smith, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 5, 1993, Ser. No. 13,877

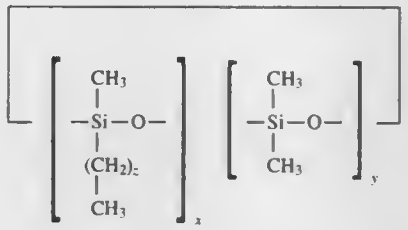
Int. Cl.^{6} A61K *7/48;7/00*

U.S. Cl. 424—70.12 **13 Claims**

1. A composition comprising (i) from 30.0 to 97.8 percent by weight of an alkylmethylsiloxane having a formula selected from the group consisting of



$$CH_3-\overset{CH_3}{\overset{|}{\underset{CH_3}{\underset{|}{Si}}}}-O-\overset{CH_3}{\overset{|}{\underset{\underset{CH_3}{\underset{|}{(CH_2)_z}}}{\underset{|}{Si}}}}-O-\overset{CH_3}{\overset{|}{\underset{CH_3}{\underset{|}{Si}}}}-CH_3 \quad \text{and}$$



in which the sum of the integers x and y is four, five, or six, with the proviso that x and y cannot be zero; and z is an integer having a value of 5 to 7; (ii) from 0.2 to fifty percent by weight of a cyclopolysiloxane having the formula $[(CH_3)_2SiO]_a$ in which a is an integer having a value of three to ten; and (iii) two to twenty percent by weight of a silicone gum selected from the group consisting of silanol endblocked polydimethylsiloxane gums having the formula $HO(CH_3)_2SiO[(CH_3)_2SiO]_nSi(CH_3)_2OH$, and polydimethylsiloxane gums having the formula $(CH_3)_3SiO[(CH_3)_2SiO]_nSi(CH_3)_3$, in which n is an integer having a value of from five thousand to fifty thousand.

5,750,099

TWO-PACK TYPE KERATINOUS FIBER TREATING COMPOSITION

Toru Yoshihara, and Emi Chugun, both of Tokyo, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 170,663, Dec. 16, 1993, abandoned, which is a continuation of Ser. No. 928,030, Aug. 11, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,550

Claims priority, application Japan, Aug. 13, 1991, 3-203018

Int. Cl.^{6} A61K *7/06;7/13*

U.S. Cl. 424—70.17 **4 Claims**

1. A two-pack keratinous fiber treating composition consisting of a first pack containing one or more organic solvents selected from the group consisting of benzyl alcohol, N-methylpyrrolidone, N-octylpyrrolidone and N-laurylpyrrolidone and one or more weak acids selected from the group consisting of citric acid, glycolic acid, succinic acid, tartaric acid, lactic acid, acetic acid, fumaric acid, malic acid, butyric acid, valeric acid, oxalic acid, maleic acid, phthalic acid, mandelic acid and phosphoric acid and a second pack containing a cationic polymer which is a diallyl quaternary ammonium salt polymer and an anionic surfactant, an amphoteric surfactant, or an anionic surfactant and an amphoteric surfactant;

wherein the total amount of the anionic surfactant, amphoteric surfactant, or combination thereof, is 0.01 to 10% by weight based on the total weight of the second pack;

wherein the amount of the organic solvents is 5 to 50% by weight based on the total weight of the first pack;

the amount of the one or more weak acids is 0.01 to 25% by weight based on the total weight of the first pack;

the first pack has a pH of 2.0 to 5.0;

and the total amount of the cationic polymer is 0.01 to 10% by weight based on the total weight of the second pack.

5,750,100

SUSTAINED RELEASABLE PARENTERAL PHARMACEUTICAL PREPARATIONS AND METHOD OF PRODUCING THE SAME

Yutaka Yamagata, Kobe; Katsumi Iga, and Hiroaki Okada, both of Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 294,972, Aug. 24, 1994, Pat. No. 5,628,993. This application Oct. 21, 1996, Ser. No. 734,636

Claims priority, application Japan, Aug. 26, 1993, 5-235923

Int. Cl.^{6} A61K *38/02;38/21;47/14*

U.S. Cl. 424—85.2 **16 Claims**

1. A method for treating or preventing diseases in a subject for which a physiologically active peptide or protein is effective, which method comprises administering by injection or implantation to the subject a sustained releasable pharmaceutical preparation comprising a matrix containing an effective amount of the physiologically active peptide or protein and a polyglycerol diester of a saturated fatty acid.

5,750,101

OVO IMMUNIZATION OF AVIAN EMBRYOS WITH OIL-EMULSION VACCINES

Henry D. Stone, Winterville, Ga., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 269,325, Jun. 30, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 530,698

Int. Cl.^{6} C12N *5/00;15/00;* **A61K** *48/00*

U.S. Cl. 424—85.2 **16 Claims**

1. A method for immunizing avian embryos comprising

puncturing an egg containing said avian embryo with a puncturing means at the longitudinal midline over the egg's air cell in order to administer an oil emulsion vaccine in said egg's albumin end,

injecting said vaccine into the egg by vertically inserting a needle means through said air cell to the albumin end,

administering said vaccine into the albumin end of the egg, and hatching said egg to obtain an immunized avian species.

5,750,102

DOUBLE TRANSFECTANTS OF THE MHC GENES AS CELLULAR VACCINES FOR IMMUNO PREVENTION OF TUMOR METASTASIS

Lea Eisenbach, and Michael Feldman, both of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation of Ser. No. 28,293, Mar. 9, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,512

Claims priority, application European Pat. Off., Mar. 13, 1992, 92104382

Int. Cl.^{6} A61K *35/12;* **C12N** *5/08;15/06;15/09*

U.S. Cl. 424—93.21 **14 Claims**

1. A cellular composition that provokes an immune response in a human patient when said cellular composition is used to treat a patient having a heterozygous haplotype, said cellular composition comprising:

(a) tumor cells isolated from said patient to be treated into which at least two genes encoding MHC proteins of different haplotypes have been inserted, wherein said genes are expressed in said tumor cells and at least one of said MHC proteins has the same haplotype as a haplotype of the heterozygous patient to be treated; and

(b) a pharmaceutically acceptable carrier.

5,750,103

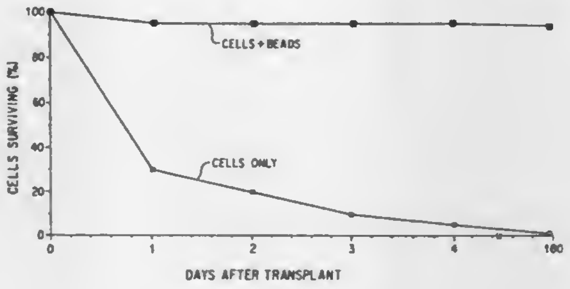
METHOD FOR TRANSPLANTING CELLS INTO THE BRAIN AND THERAPEUTIC USES THEREFOR

Bruce D. Cherksey, Hoboken, N.J., assignor to The New York University Medical Center, New York, N.Y.

Division of Ser. No. 91,629, Jul. 13, 1993, Pat. No. 5,618,531, which is a continuation of Ser. No. 823,654, Jan. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 599,802, Oct. 19, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 460,700

Int. Cl.^{6} A61K *9/14;35/12;* **A61M** *5/178;* **C12N** *11/00*

U.S. Cl. 424—93.21 **11 Claims**



1. A syringe containing therein viable cells that are adhered to the surface of a support matrix, wherein the viable cells are selected from the group consisting of retinal pigment epithelial cells, chromaffin cells, cells of neural origin, cells of paraneural origin, cells engineered by somatic cell hybridization and cells derived from the adrenal medulla.

5,750,104

HIGH BUFFER-CONTAINING ENTERIC COATING DIGESTIVE ENZYME BILE ACID COMPOSITIONS AND METHOD OF TREATING DIGESTIVE DISORDERS THEREWITH

Tibor Sipos, Lebanon, N.J., assignor to Digestive Care Inc., Lebanon, N.J.

Filed May 29, 1996, Ser. No. 654,900

Int. Cl.^{6} A61K *38/43*

U.S. Cl. 424—94.21 **5 Claims**

1. In an improved buffered digestive enzyme composition in the form of microencapsulated particles having a diameter of from about 10 mesh to about 40 mesh for the treatment of digestive enzyme/buffer deficiency of a mammal comprising:

a) from about 10 to about 70% w/w of an enzyme selected from the group consisting of pancreatic proteases, lipases, nucleases and amylases;

b) from about 0.5 to about 16% of a disintegrant selected from the group consisting of ursodiol, starch, modified starches, microcrystalline cellulose and propylene glycol alginate;

c) from about 1 to about 19% w/w of an adhesive polymer selected from the group consisting of polyvinylpyrrolidone, hydroxypropyl cellulose, cellulose acetate phthalate, ethyl cellulose and hydroxypropylmethyl cellulose; and

d) from about 7.0 to about 25% w/w of an non-porous, gastric acid-resistant and pharmaceutically acceptable polymer-coating which contains less than 2% talc and which is insoluble in the pH range of from about 1.5 to about 5 but is soluble in the pH range of from about 5.5 to about 9, said polymer-coating comprises a polymer selected from the group consisting of hydroxypropyl methyl cellulose phthalate, cellulose acetate phthalate, diethyl phthalate, dibutyl phthalate, an enteric coating polymeric, dispersion, and an acrylic based polymeric dispersion.

the improvement consisting essentially of:

from about 45 to 60% w/w of a buffering agent selected from the group consisting of: anhydrous sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, ammonium carbonate, tromethamine, di(tris(hydroxymethyl)amino-methane)carbonate, tris-glycine, di-arginine, tri-arginine, poly-arginine, di-lysine, tri-lysine, poly-lysine, diethylamine and triethanolamine, said buffering agent providing a pH of from 7 to 9 in the small intestine of said mammal, and said lipase having an activity of from 24% to 100% at said pH of from 7 to 9.

5,750,105

RECOMBINANT ANTIBODIES FOR HUMAN THERAPY

Roland A. Newman, San Diego; Nabil Hanna, Olivenhain, and Ronald W. Raab, San Diego, all of Calif., assignors to IDEC Pharmaceuticals Corporation, San Diego, Calif.

Division of Ser. No. 379,072, Dec. 5, 1995, which is a continuation of Ser. No. 912,292, Jul. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 856,281, Mar. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 735,064, Jul. 25, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 476,349

Int. Cl.^{6} A61K *39/395;39/40;39/42;* **C12P** *21/08*

U.S. Cl. 424—133.1 **10 Claims**

1. An improved method for treatment of a subject which comprises the administration of an antibody to a subject in need for such treatment, wherein the improvement comprises the administration of a therapeutically or prophylactically effective amount of an antibody which comprises an Old World monkey variable region which binds to an antigen, or antigen-binding portion thereof, and a human constant domain.

5,750,106

HUMAN MONOCLONAL ANTIBODIES TO CYTOMEGALOVIRUS

Lars G. Ostberg, Convent Station, N.J., assignor to Novartis AG, Basel, Switzerland

Continuation of Ser. No. 10,228, Jan. 28, 1993, abandoned. This application Jun. 25, 1993, Ser. No. 82,623

Int. Cl.^{6} A61K *39/42;* **C07K** *16/08;* **C12N** *5/24*

U.S. Cl. 424—142.1 **14 Claims**

1. A monoclonal antibody having peptide SEQ ID NO:3 for its V_H region and peptide SEQ ID NO:4 for its V_L region.

6. A pharmaceutical composition for treatment of a cytomegalovirus (CMV) viral infection, comprising a human anti-CMV antibody which binds to a CMV gH glycoprotein and neutralizes CMV, the antibody comprising a human immunoglobulin heavy chain having a variable region sequence of SEQ ID NO:3 and a human immunoglobulin light chain having a variable region sequence of SEQ ID NO:4.

14. A method for treating a CMV viral infection in a patient, said method comprising the step of administering a pharmaceutical composition according to claim **6**.

5,750,107

HAIR GROWTH PROMOTER

Manabu Nomura, 2763-7, Ohaza Imaizumi Kiyotake-cho, Miyazaki-gun Miyazaki 889-16, Japan

Continuation-in-part of Ser. No. 167,828, Dec. 16, 1993, abandoned. This application Jun. 12, 1996, Ser. No. 661,970

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 424—195.1 **25 Claims**

1. A composition for increasing the rate of hair growth during anagen phase, comprising an effective amount of extract obtained from a plant having a pseudo bulb, wherein said plant is of a genera selected from the group consisting of Calanthe R. Br. and Phaius Lour.

5,750,108

HAIR TREATMENT SYSTEM AND KIT FOR INVIGORATING HAIR GROWTH

William Thomas Edwards, West Hollywood, Calif., assignor to Regenix Marketing Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 529,791, Sep. 18, 1995, abandoned. This application Mar. 31, 1997, Ser. No. 829,623

Int. Cl.^{6} A61K *33/20;35/78;31/34*

U.S. Cl. 424—195.1 **17 Claims**

1. A method of hair treatment comprising:

periodically applying a first treatment solution comprising tea tree oil to the scalp for at first treatment period of a least 10 days;

after said first treatment period, periodically applying a second treatment solution comprising chlorine dioxide to the scalp, immediately followed by application of an acidic solution having an acidity effective to release the oxygen in the chlorine dioxide solution, for a second treatment period of at least 1 month; and

after said second treatment period, periodically applying a third treatment solution comprising saw palmetto berry extract to the scalp for at least 1 month.

5,750,109

ROTAVIRUS REASSORTANT VACCINE

H. Fred Clark; Paul Offit, both of Philadelphia, Pa., and Stanley A. Plotkin, Paris, France, assignors to The Wistar Institute of Anatomy & Biology, and The Children's Hospital of Philadelphia, both of Philadelphia, Pa.

Continuation of Ser. No. 353,547, Dec. 9, 1994, Pat. No. 5,626,851, and a continuation-in-part of Ser. No. 249,696, May 26, 1994, abandoned, which is a continuation of Ser. No. 902,321, Jun. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 558,884, Jul. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 126,477, Nov. 30, 1987, abandoned, said Ser. No. 353,547 is a continuation-in-part of Ser. No. 121,220, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 558,884, which is a continuation-in-part of Ser. No. 126,477. This application Jun. 1, 1995, Ser. No. 456,906

Int. Cl.^{6} A61K *39/12;39/295;* **C12N** *7/00;* **C12Q** *1/70*

U.S. Cl. 424—205.1 **20 Claims**

1. A vaccine useful for preventing or reducing the clinical symptoms associated with gastroenteritis caused by infection with rotaviruses of multiple human serotypes, said vaccine comprising multiple rotavirus reassortants, each said reassortant containing RNA comprising bovine rotavirus gene segments and human rotavirus gene segments, wherein reassortants in said vaccine contain RNA which comprise the gene segments encoding the viral proteins (v.p.) 7 derived from human reassortant serotype strains G1, G2, G3 and G4.

11. A vaccine useful for preventing or reducing the clinical symptoms associated with gastroenteritis caused by infection with rotavirus, said vaccine comprising a rotavirus reassortant having RNA comprising a gene segment encoding viral protein (v.p.) 4 derived from a human rotavirus, at least one gene segment derived from a bovine rotavirus, and the remaining rotavirus gene segments derived from a human rotavirus, a bovine rotavirus or a combination thereof.

5,750,110

VACCINE COMPOSITION CONTAINING ADJUVANTS

John Paul Prieels, Brussels; Nathalie Marie-Josephe Claude Garcon-Johnson, Wavre; Moncef Slaoui, and Pietro Pala, both of Rixensart, all of Belgium, assignors to SmithKline Beecham Biologicals, s.a, England

PCT No. PCT/EP93/01524, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO94/00153, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 15, 1993, Ser. No. 356,372

Claims priority, application United Kingdom, Jun. 25, 1992, 9213559; Dec. 17, 1992, 9226283; Mar. 1, 1993, 9304056

Int. Cl.^{6} A61K *39/00;39/21;39/38*

U.S. Cl. 424—208.1 **26 Claims**

1. A vaccine composition comprising:

(a) an antigen;

(b) QS21; and

(c) 3-De-O-acylated monophosphoryl lipid A (3D-MPL).

5,750,111

MILD NEWCASTLE DISEASE VIRUS VACCINE

Carla Christina Schrier, Boxmeer, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 509,914, Aug. 1, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 781,436

Int. Cl.^{6} A61K *39/17;* **C12N** *7/00;7/04*

U.S. Cl. 424—214.1 **9 Claims**

1. A virus having all of the indentifying characteristics of the NDV C2 strain deposited at the CNCM of the Institute Pasteur, Paris, France under accession No. I-1614.

5,750,112

CANINE CORONAVIRUS VACCINE FROM FELINE ENTERIC CORONAVIRUS

Michael A. Gill, Burnsville, Minn., assignor to Solvay Animal Health, Inc., Mendota Heights, Minn.

Continuation-in-part of Ser. No. 24,165, Feb. 26, 1993, abandoned. This application Dec. 8, 1993, Ser. No. 163,922

Int. Cl.^{6} A61K *39/02;39/215;39/155;38/00*

U.S. Cl. 424—221.1 **19 Claims**

1. A method of immunizing a dog against disease caused by canine coronavirus which comprises administering to the dog a dose of a feline enteric coronavirus vaccine comprising an effective immunizing amount of an inactivated feline enteric coronavirus and a suitable carrier.

5,750,113

POULTRY VACCINE

Jane Kathleen Alexandra Cook, Huntingdon, United Kingdom, assignor to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 282,689, Aug. 1, 1994, abandoned. This application Dec. 14, 1995, Ser. No. 574,561

Claims priority, application European Pat. Off., Jul. 30, 1993, 93306033

Int. Cl.^{6} C12N *5/00;1/00;7/00;* **A61K** *39/215*

U.S. Cl. 424—222.1 **6 Claims**

1. An isolated infectious bronchitis virus (IBV), which is of the same serotype as that of the IBV strain 4/91 deposited at the European Collection of Animal Cell Cultures, Porton Down, UK, under accession no. V93070612, wherein the IBV strain is cross-neutralized by antisera raised in chickens against said deposited IBV, to the extent that said strain has an r value of greater than 50 by the method of Archetti and Horsfall.

5,750,114

RECOMBINANT HERPES SIMPLEX GB-GD VACCINE

Rae Lyn Burke, San Francisco; Carol Pachl, Oakland, and Pablo D. T. Valenzuela, San Francisco, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 385,731, Feb. 8, 1995, which is a continuation of Ser. No. 990,919, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 416,425, Oct. 2, 1989, Pat. No. 5,171,568, which is a continuation of Ser. No. 79,605, Jul. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,213, Oct. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 597,784, Apr. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 631,669, Jul. 17, 1984, Pat. No. 4,618,578. This application May 30, 1995, Ser. No. 452,963

Int. Cl.^{6} A61K *39/245;* **C12P** *21/02*

U.S. Cl. 424—231.1 **19 Claims**

1. A method for preparing a vaccine for the treatment or prevention of herpes simplex virus (HSV) infection in humans comprising:

(a) synthesizing in a eukaryotic host a glycosylated full-length mature HSV glycoprotein B polypeptide or a glycoprotein B polypeptide that has a deletion of all or a portion of the transmembrane anchor region;

(b) synthesizing in a eukaryotic host a glycosylated full-length mature HSV glycoprotein D polypeptide or a glycoprotein D polypeptide that has a deletion of all or a portion of the transmembrane anchor region,

wherein said synthesizing in steps (a) and (b) is done via the expression of recombinant DNA constructs;

(c) isolating the polypeptides from the host; and

(d) formulating the polypeptides with a physiologically acceptable medium at levels effective to treat or prevent HSV infection, to render a vaccine composition.

5,750,115

ESCHERICHIA COLI VACCINE

Johannes Franciscus Van Den Bosch, Boxmeer, Netherlands, assignor to Akzo Nobel N. V., Arnhem, Netherlands

Continuation of Ser. No. 967,912, Oct. 25, 1992, abandoned, which is a continuation of Ser. No. 711,128, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 562,527, Aug. 3, 1990, abandoned. This application Apr. 10, 1995, Ser. No. 420,454

Claims priority, application European Pat. Off., Aug. 3, 1989, 89202110

Int. Cl.^{6} A61K *39/108;* **C12N** *1/20*

U.S. Cl. 424—241.1 **7 Claims**

1. A vaccine for the protection of a bird against infection by *E. coli* having flagellar toxin, comprising an effective amount for protecting a bird against *E. coli* flagellar toxin toxic activity of isolated and purified *E. coli* toxic flagella having flagellin subunits with a molecular weight range of about 37 to about 69 kD found associated in and/or with filamentous aggregates, not naturally possessing bound carbohydrate residues, having immunizing activity against *E. coli* flagellar toxin toxic activity in birds, having toxic activity against Vero cells and day-old chicks, and retaining toxicity on heating for 1 hour at 100° C., and a pharmaceutically acceptable carrier.

5,750,116

HAEMOPHILUS INFLUENZAE PILUS VACCINES

Charles C. Brinton, Jr., Export, Pa., assignor to Bactex, Inc., Pittsburgh, Pa.

Filed Jun. 2, 1995, Ser. No. 459,823

Int. Cl.^{6} A61K *39/02;39/102*

U.S. Cl. 424—242.1 **10 Claims**

1. Purified whole *H. influenzae* LKP pili having serotypes selected from the group consisting of LKP9 through LKP 16 and LKP18 through LKP20,

previously separated from other *H. influenzae* components, said pili being aaglutinable by at least one antiserum selected from the group consisting of antisera derived from purified LKP pili, previously separated from other *H. influenzae* components, derived from one of the following organisms:

H. influenzae LKP9 (86-0214) ATTC 55771;
H. influenzae LKP10 (86-0807) ATTC 55772;
H. influenzae LKP11 (CB-59) ATTC 55773;
H. influenzae LKP12 (88-0677) ATTC 55774;
H. influenzae LKP13 (86-0762) ATTC 55775;
H. influenzae LKP14 (88-0473) ATTC 55776;
H. influenzae LKP15 (89-1163) ATTC 55777;
H. influenzae LKP16 (88-0715) ATTC 55778;
H. influenzae LKP18 (88-0909) ATTC 55779;
H. influenzae LKP19 (88-1219) ATTC 55780; and
H. influenzae LKP20 (88-1225) ATTC 55781.

5,750,117

Patent Not Issued For This Number

5,750,118

VACCINE METHOD AGAINST SWINE DYSENTERY

Joris Frans Vandeputte, Diemoz; Marc Jean Guillaud, Lyon, and Francis William Milward, Tassin, all of France, assignors to Rhone Merieux, Lyon, France

PCT No. PCT/FR94/00850, § 371 Date Mar. 14, 1996, § 102(e) Date Mar. 14, 1996, PCT Pub. No. WO95/01805, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 8, 1994, Ser. No. 571,944

Claims priority, application France, Jul. 8, 1993, 93 08396

Int. Cl.^{6} A61K *39/02*

U.S. Cl. 424—262.1 **13 Claims**

1. Method of vaccinating pigs against haemorrhagic dysentery, in which a preparation comprising inactivated *Serpulina hyodysenteriae* antigen and an adjuvant is administered intradermally to the pig.

5,750,119

IMMUNOTHERAPEUTIC STRESS PROTEIN-PEPTIDE COMPLEXES AGAINST CANCER

Pramod K. Srivastava, Riverdale, N.Y., assignor to Mount Sinai School of Medicine Of The City University of New York, New York, N.Y.

Continuation-in-part of Ser. No. 180,685, Jan. 13, 1994. This application Sep. 30, 1994, Ser. No. 315,892

Int. Cl.^{6} A61K *39/00;39/385;35/12;38/00*

U.S. Cl. 424—277.1 **48 Claims**

1. A method for treating a mammal having a tumor sensitive to treatment with a mammalian stress protein-peptide complex comprising administering to the mammal a composition comprising:

(a) an amount of a purified immunogenic mammalian stress protein-peptide complex isolated from a tumor cell sufficient to elicit an immune response against the tumor, wherein the peptide is noncovalently associated with the stress protein; and

(b) a pharmaceutically acceptable carrier.

2. The method of claim 1 wherein the tumor cell is from the mammal.

5,750,120

COSMETIC COMPOSITION IN THE FORM OF A SOLID DISPERSION COMPRISING A FATTY PHASE, A POLYHYDRIC ALCOHOL AND COLORLESS FILLERS

Dolores Miguel-Colombel, L'Hay-les-Roses, France, assignor to L'Oreal, Paris, France

Filed Mar. 1, 1996, Ser. No. 609,684

Claims priority, application France, Mar. 3, 1995, 95-02522

Int. Cl.^{6} A61K *7/48;7/027*

U.S. Cl. 224—401 **15 Claims**

1. An anhydrous cosmetic composition comprising a solid dispersion that comprises at least one fatty phase and at least one polyhydric alcohol, said composition further comprising at least 5% by weight of at least one colorless filler, and wherein said composition is free of pigment.

5,750,121
COLOR COSMETIC COMPOSITION CONTAINING ALCOHOL MODIFIED WAX

Karen Lee Rokitowski, Beacon, N.Y., assignor to Elizabeth Arden, New York, N.Y.

Filed Mar. 15, 1996, Ser. No. 616,793

Int. Cl.^{6} A61K *7/021*

U.S. Cl. 424—401 **12 Claims**

1. A color mascara composition comprising:
- a) from about 1 to about 99 wt. % of a natural wax modified with a C_{20}–C_{40} alkanol to substantially esterify C_{12}–C_{60} free fatty acids of the wax to form an esterified wax;
- b) from about 0.001 to about 20 wt. % of a colorant; and
- c) 35 to 70 wt. % of a cosmetically acceptable carrier to deliver active ingredients of the composition,

the composition being substantially stable after four weeks in storage at room temperature.

5,750,122
COMPOSITIONS FOR TREATING HAIR OR SKIN

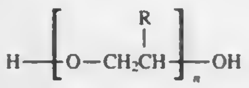
Joel Franklin Evans, Cincinnati, Ohio; Bruce Russell Cox, Kobe, Japan; Michael Thomas Dodd, Edgewood, Ky., and Jeffrey Jon Hopkins, West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 587,162, Jan. 16, 1996, abandoned. This application Apr. 8, 1996, Ser. No. 629,256

Int. Cl.^{6} A61K *7/48;7/06*

U.S. Cl. 424—401 **19 Claims**

1. A hair or skin composition comprising:
- (a) a safe and effective amount of panthenol,
- (b) at least one polyalkylene glycol corresponding to the structure



$$H-\left[O-CH_2\overset{R}{\overset{|}{C}}H\right]_n-OH$$

wherein R is selected from the group consisting of H, CH_3, and mixtures thereof, and n is an integer from 3 to about 8, and
- (c) a polyacrylamide selected from the group consisting of cross linked and noncrosslinked nonionic and cationic polyacrylamide
- (d) a silicone conditioning agent wherein the silicone agent comprises a mixture of a polydimethylsiloxane gum, having a viscosity greater than about 1,000,000 centistokes and polydimethylsiloxane fluid having a viscosity of from about 10 centistokes to about 100,000 centistokes, wherein the ratio of gum to fluid is from about 30:70 to about 70:30
- (e) a topical vehicle,

wherein the weight ratio of said polyalkylene glycol to panthenol is from about 10:1 to about 1:10.

5,750,123
VITAMIN C DELIVERY SYSTEM

Alexander Paul Znaiden, Trumbull; Brian Andrew Crotty, Branford, and Anthony Johnson, Fairfield, all of Conn., assignors to Chesebrough-Pond's Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Aug. 13, 1996, Ser. No. 696,422

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 424—401 **7 Claims**

1. A cosmetic composition comprising:
- (i) from 0.1 to 10% by weight of ascorbic acid;
- (ii) from 0.5 to 10% by weight of dimethyl isosorbide;
- (iii) from 0.1% to 30% of a cross linked non-emulsifying siloxane elastomer and
- (iv) a pharmaceutically acceptable carrier present in an effective amount to deliver the ascorbic acid to skin.

5,750,124
W/O/W EMULSIONS

Sven Gohla; Anja Müller, both of Hamburg, and Jens Nielsen, Henstedt, all of Germany, assignors to Beiersdorf Ag, Hamburg, Germany

PCT No. PCT/DE94/01157, § 371 Date Jun. 17, 1996, § 102(e) Date Jun. 17, 1996, PCT Pub. No. WO95/17155, PCT Pub. Date Jun. 29, 1995

PCT Filed Oct. 1, 1994, Ser. No. 663,138

Claims priority, application Germany, Dec. 22, 1993, 43 43 833.4

Int. Cl.^{6} A61K *9/113;* **B01J** *13/00*

U.S. Cl. 424—401 **25 Claims**

1. Multiple emulsions of the W/O/W type consisting of a continuous external aqueous phase, an oily phase dispersed therein and a second (internal) aqueous phase dispersed in this oily phase, comprising,
- (a) at least one emulsifier (emulsifier A), chosen from the group consisting of emulsifiers, the lipophilicity of which increases with increasing temperature and the hydrophilicity of which increases with decreasing temperature, the emulsifier or emulsifiers changing from an HLB value <10 to an HLB value >10 in the temperature range of 40°–90° C., the HLB value of the emulsifier or emulsifiers at room temperature being between 11 and 18, and the emulsifier not being completely soluble in the oily phase when the oily phase is combined with the aqueous phase,
- (b) an oily phase, the base constituents of the oily phase being chosen from the group consisting of physiologically tolerated oils, fats and waxes, where

the single base constituent of the oily phase, if this comprises only a single oil component, or

the combination of the base constituents of the oily phase, if the oily phase comprises several oil components has a "required HLB value" (RLBH) of 10–20, and/or a polarity, (determined in units of surface tension) of less than 30 mN/m,
- (c) an external and an internal aqueous phase, these aqueous phases comprising from about 0.3–8% by weight (based on the total composition) of physiologically tolerated organic and/or inorganic electrolytes with mono-, di- or trivalent cations,
- (d) if desired further auxiliaries and/or additives, the chief purpose of which is to stabilize the multiple emulsion droplets, after in situ formation thereof, and which can be incorporated into the oily phase and/or the aqueous phases, and
- (e) if desired other bases, auxiliaries, additives and/or active compounds customary in cosmetics or medical galenics, which can be incorporated into the oily phase and/or the aqueous phases.

5,750,125
CLEAR COSMETIC STICKS AND PROCESS FOR ITS PREPARATION

Konstantinos M. Lahanas, Paramus, N.J.; Daniela Toma, Floral Park, N.Y.; Andrew J. Bevacqua, East Setauket, N.Y., and Gheorghe Cloca, Lake Grove, N.Y., asslgnors to Estee Lauder, Inc., New York, N.Y.

Filed Jun. 19, 1996, Ser. No. 666,750

Int. Cl.^{6} A61K *7/00;7/32;7/42*

U.S. Cl. 424—401 **40 Claims**

1. A solid, substantially clear composition suitable for topical application to human skin, which consists of:
- (1) DBMSA in an amount from about 0.5% by weight to about 30% by weight of the composition; and
- (2) a refractory material in an amount from about 70% by weight to about 99.5% by weight of the composition, said refractory material having a refractive index between about 1.50 and about 1.65 and said refractory material comprising a carrier fluid in an amount from about 50.0% by weight to about 99.0% by weight of the composition.

5,750,126
LABILE INSECTICIDE COMPOSITIONS

Kelly L. Smith, and Scott H. Herbig, both of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Continuation of Ser. No. 189,905, Feb. 1, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 584,986

Int. Cl.^{6} A01N *25/28*

U.S. Cl. 424—405 **6 Claims**

1. In a pesticidal composition comprising
- (a) particles of pesticidal active ingredient,
- (b) a non-lignin-based pH sensitive polymer encapsulating the pesticidal active ingredient particles, and
- (c) a light-absorbing agent,

the improvement comprising the inclusion of a lignin-based light-absorbing agent that is itself encapsulated together with said pesticidal active ingredient particles by said non-lignin-based pH-sensitive polymer, wherein said pesticidal active ingredient is a viral insecticide; said non-lignin-based pH-sensitive polymer comprises a polymer selected from cellulose acetate phthalate, polyvinyl acetate phthalate, vinyl acetate and crotonic acid copolymers, acrylic and methacrylic acids and esters, and copolymers thereof, and shellac; and said lignin-based light-absorbing agent comprises a Kraft-derived lignin, a lignin selected form sodium lignin sulfonate, calcium lignin sulfonate, sodium-calcium lignin sulfonate, carboxylated sodium lignin sulfonate, partially desulfonated lignin sulfonate, and ammonia lignin sulfonate.

5,750,127
COLOR COSMETIC COMPOSITION CONTAINING ALCOHOL MODIFIED WAX

Karen Lee Rokitowski, Beacon, N.Y., assignor to Elizabeth Arden, a Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 616,793, Mar. 15, 1996. This application Feb. 5, 1997, Ser. No. 795,096

Int. Cl.^{6} A61K *7/00;7/021*

U.S. Cl. 424—401 **14 Claims**

1. A color mascara composition comprising:
- a) from about 1 to about 99 wt. % of a natural wax modified with a C_{20}–C_{60} alkanol to substantially esterify C_{12}–C_{60} free fatty acids of the wax to form an esterified wax;
- b) from about 0.001 to about 20 wt. % of a colorant; and
- c) an effective amount of a cosmetically acceptable carrier to deliver active ingredients of the composition,

the composition being substantially stable after four weeks in storage at room temperature.

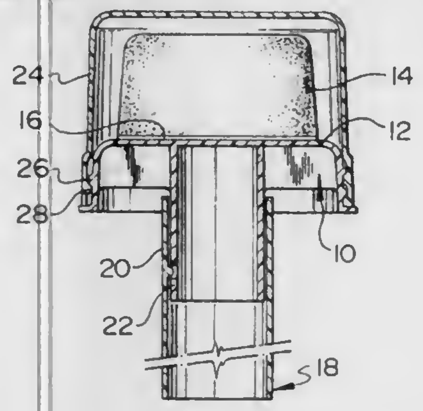
5,750,128
PESTICIDE COMPOSITION

Peter O. Paulson, Calgary, Canada, assignor to Weed-Master Western Inc., Regina, Canada

Division of Ser. No. 230,710, Apr. 21, 1994, Pat. No. 5,505,019. This application Feb. 16, 1996, Ser. No. 602,475

Int. Cl.^{6} A01N *25/24*

U.S. Cl. 424—407 **3 Claims**



1. A pesticide composition consisting essentially of:
- (A) 75–90% by weight of a solid carrier, the solid carrier having a melting point of at least 35° C. and including 1–30% microcrystalline wax, 5–40% paraffin oil and 60–95% paraffin wax;
- (B) 10–25% by weight of flour and/or starch; and,
- (C) 0.5–5.0%, by volume, of a pesticide.

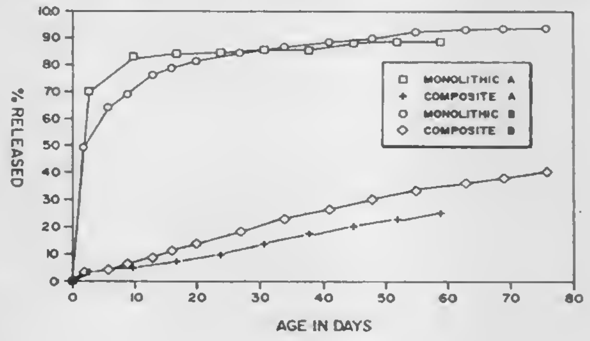
5,750,129
COMPOSITE POLYMER MATRICES FOR CONTROLLED RELEASE OF SEMIOCHEMICALS

David A. Wakarchuk, Burnaby, Canada, assignor to Phero Tech Inc., Delta, Canada

Continuation-in-part of Ser. No. 242,021, May 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 937,469, Aug. 28, 1992, abandoned. This application Jul. 25, 1996, Ser. No. 686,471

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 424—408 **7 Claims**



1. A composite polymer semiochemical controlled release dispenser comprising:
- (a) a cylindrical polyurethane reservoir formed in one-reaction step from a reaction mixture of
  - (i) a polyol selected from the group consisting of hydroxy-terminated polybutadiene resins, hydroxy-terminated polyether resins, and hydroxy-terminated polyester resins; and
  - (ii) an isocyanate selected from the group consisting of monomeric or polymeric diphenylmethane diisocyanate, toluene diisocyanate, isophorone diisocyanate, hexamethylene diisocyanate and polymeric hexamethylene diisocyanate; and as non-reactive active ingredient
  - (iii) a semiochemical which is unreactive with the polyol and isocyanate, said semiochemical being selected from the group consisting of alkanes, alkenes, alkynes, aromatic hydrocarbons, ethers, esters, epoxides, aldehydes, ketones, lactones, nitriles, imines, tertiary amines, thioethers, sulfoxides, sulfones, disulfide compounds, thioesters, organohalides, and mixtures thereof, and which semiochemical is compatible with the polyol and isocyanate and does not lose its semiochemical properties; and
- (b) a tubular semiochemical permeable polymeric membrane covering the circumferential surface of the cylindrical polyurethane reservoir and regulating the release of the semiochemical from the reservoir, said membrane being selected from the group consisting of polyvinylchloride, polyvinylchloride/polyvinyl copolymers, low and high density polyethylene, polyethylene/polyvinyl copolymers, polyethylvinyl acetate and copolymers thereof, polyethylene terpthalate and copolymers thereof, polypropylene, polyamide, polyimide, polyuretnane, polyvinylidene fluoride, fluorinated ethylene propylene polymers, polytetrafluoroethylene, silicone rubber, butyl rubber, neoprene rubber, isoprene rubber, cellulose acetate and laminated (co-extruded) membranes comprising polyvinylchloride/fluorinated ethylene propylene polymers, polyethylene/ethylvinyl acetate, and polyethylene/polyethylene terpthalate, said polymeric tubing being of a

substance which has a semiochemical permeability which is different from the semiochemical permeability of the polyurethane reservoir.

5,750,130
PRESTICIDE COMPOSITIONS

Paul Ferrell, 5316 Oakwood Dr., Sheffield, Ohio 44054, and Alice P. Hudson, 184 Sims Creek La., Jupiter, Fla. 33458

Continuation of Ser. No. 385,104, Feb. 7, 1995, abandoned. This application Aug. 9, 1996, Ser. No. 694,871

Int. Cl.⁶ A01N *25/12*

U.S. Cl. 424—417 8 Claims

1. A pesticide product comprising at least one granular substrate chosen from the group consisting of granular fertilizers and inert granular materials, said granular substrate having applied to the surface thereof a coating comprising at least one pesticidal compound chosen from the group consisting of dinitroaniline herbicides, and at least one carrier which is an abrasion resistant solid at temperatures below about 50° C. and a liquid with viscosity less than about 200 centistokes above about 120° C., chosen from the group consisting of waxes, wax soluble surfactants, and mixtures thereof, wherein the pesticidal compound is from about 0.05 to about 7% by weight of the total composition, and the weight ratio of the pesticidal compound to the carrier is from about 40 to 60 to about 70 to 30.

5,750,131
IFOSFAMIDE LYOPHILIZATE PREPARATIONS

Burkhard Wichert, Bielefeld; Dieter Sauerbier, Oerlinghausen, and Jurgen Rawert, Werther, all of Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

Filed Nov. 19, 1996, Ser. No. 752,069

Int. Cl.⁶ A61K *9/00;31/715*

U.S. Cl. 424—422 21 Claims

1. A lyophilized preparation, consisting of ifosfamide and 0.1 part by weight up to at most the amount of one or more amino acids needed for rendering a ready-to-use solution isotonic and, if appropriate, other customary pharmaceutical auxiliaries.

5,750,132
TREATMENT OF ADVERSE EFFECTS ASSOCIATED WITH ADMINISTRATION OF EXTRACELLULAR HEMOGLOBIN

Michael J. Gerber, Denver, Colo., assignor to Somatogen, Inc., Boulder, Colo.

Division of Ser. No. 106,138, Aug. 13, 1993. This application May 26, 1995, Ser. No. 451,370

Int. Cl.⁶ A61F *2/02;* **A61L** *9/04;* **A61K** *9/70;31/555*

U.S. Cl. 424—423 14 Claims

1. A method of treating various disorders selected from or resulting from the group consisting of radiation or anemia or tissue ischemia comprising administering to those in need thereof a therapeutically effective amount of extracellular, recombinant hemoglobin.

5,750,133

Patent Not Issued For This Number

5,750,134
BIOADHESIVE COMPOSITION AND PATCH

Matthew T. Scholz, Woodbury; Robert A. Scherrer, White Bear Lake; Nelda M. Marecki, Township of May, County of Washington; Yen-Lane Chen, New Brighton, and Joan K. Barkhaus, Minneapolis, all of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 842,222, Feb. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 486,554, Feb. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 431,664, Nov. 3, 1989, abandoned. This application May 31, 1995, Ser. No. 510,046

Int. Cl.⁶ A61K *47/32;* **A61L** *15/58*

U.S. Cl. 424—434 24 Claims

1. A bioadhesive composition that comprises:

1) a particulate polymeric resin polymerized from monomers selected from the group consisting essentially of acrylic acid, itaconic acid, citraconic acid, and methacrylic acid and comprising at least about 55% by weight of carboxylic acid groups based on the total weight of the polymeric resin and containing less than about 20% by weight, based on the total weight of all monomers in the polymer, of ethylenically unsaturated comonomers;

2) from about 20 parts to about 250 parts by weight of a hydrophobic elastomeric synthetic polymer component, based on 100 parts by weight of the resin, said elastomeric synthetic polymer component selected from the group consisting essentially of a block styrene-butadiene-styrene copolymer, a block styrene-isoprene-styrene copolymer, a polyisobutylene, a polybutadiene, an isoprene rubber, a carboxy-functional polyisoprene, a hydroxy-functional polyisoprene, an acrylate elastomer, or a mixture of two or more of the foregoing,

wherein the resin is dispersed substantially throughout the elastomeric component, and which composition adheres to a mucosal surface, prepared by a process comprising the steps of:

1) adding to a mill the constituent or constituents of the elastomeric component;

2) milling the constituent or constituents of the elastomeric component to afford a substantially homogeneous elastomeric component;

3) milling the particulate polymeric resin, and the substantially homogeneous elastomeric component from step (2) to form a homogeneous composition.

5,750,135
STABILIZED FEED ADDITIVE AND PROCESS FOR THE PREPARATION THEREOF

Werner Schleicher, Bigen/Rhein, and Herbert Werner, Ingelheim am Rhein, both of Germany, assignors to Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Germany

Continuation of Ser. No. 914,685, Jul. 15, 1992, abandoned, which is a continuation of Ser. No. 759,709, Sep. 12, 1991, abandoned, which is a continuation of Ser. No. 624,510, Dec. 7, 1990, abandoned, which is a continuation of Ser. No. 227,202, Aug. 1, 1988, abandoned. This application Aug. 9, 1994, Ser. No. 287,577

Claims priority, application Germany, Aug. 5, 1987, 3725946.6

Int. Cl.⁶ A23K *1/165;* **A61K** *47/00;9/00;38/12*

U.S. Cl. 424—442 13 Claims

1. A process for producing a coated feed additive for use in animal husbandry, wherein the feed additive is selected from the group consisting of virginiamycin, tylosin, spiramycin, nosiheptide, penicillins, zinc bacitracin, chlorotetracyclins, oxytetracyclins, tetracyclins, erythromycins, furazolidone, nitrofuran, trimethoprin, sulphonamides, dimetridozole, and neomycin base, the process which comprises introducing the feed additive in powder form into an air controlled granulating system to fluidize the feed additive powder and spraying the fluidized feed additive powder with a liquid coating material to produce granules of the coated feed additive.

5,750,136
BIOADHESIVE COMPOSITION AND PATCH

Matthew T. Scholz, Woodbury; Robert A. Scherrer, White Bear Lake; Nelda M. Marecki, May; Yen-Lane Chen, New Brighton, and Joan K. Barkhaus, Minneapolis, all of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 842,222, Feb. 26, 1992, abandoned, which is a continuation of Ser. No. 607,863, Nov. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 486,554, Feb. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 431,664, Nov. 3, 1989, abandoned. This application May 31, 1995, Ser. No. 456,021

Int. Cl.⁶ A61K *9/10;15/58;47/32;* **C09J** *113/00*

U.S. Cl. 424—448 52 Claims

1. A bioadhesive composition that comprises;

1) a particulate polymeric resin polymerized from monomers selected from the group consisting essentially of acrylic acid, itaconic acid, citraconic acid, and methacrylic acid that contains at least about 55% by weight of carboxylic acid groups based on the total weight of the polymeric resin and comprises less than about 20% by weight, based on the total weight of all monomers in the polymer, of esthetically unsaturated comonomers; and

2) from about 20 parts to about 250 parts by weight of a hydrophobic elastomeric synthetic polymer component, based on 100 parts by weight of the resin elastomeric synthetic polymer component selected from the group consisting essentially of a block synthetic-butadiene-styrene copolymer, a block styrene-isoprene-styrene copolymer, a polyisobutylene, a polybutadiene, an isoprene rubber, a carboxy-functional polyisoprene, a hydroxy-functional polyisoprene, an acrylate elastomer, or a mixture of two or more of the foregoing,

wherein the resin is dispersed substantially throughout the elastomeric component, and which composition adheres to a mucosal surface.

5,750,137
MONOGLYCERIDE/LACTATE ESTER PERMEATION ENHANCER

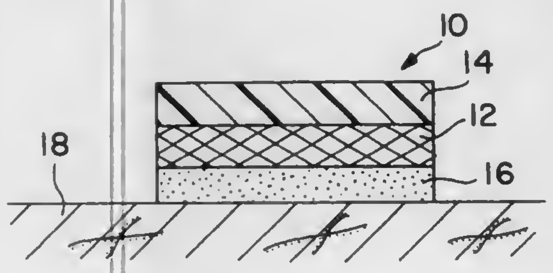
Lina Tormen Taskovich, 751 Gailen Ave., Palo Alto, Calif. 94303; Su Il Yum, 1021 Runnymead Ct., Los Altos, Calif. 94021; Eun Soo Lee, 108 W. Danbury, Redwood City, Calif. 94061, and Nieves Marzan Crisologo, 787 Madrone Ave., Sunnyvale, Calif. 94086

PCT No. PCT/US94/11120, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/09006, PCT Pub. Date Apr. 6, 1995

Continuation-in-part of Ser. No. 129,494, Sep. 29, 1993, abandoned. This PCT application Sep. 29, 1994, Ser. No. 637,678

Int. Cl.⁶ A61F *13/02*

U.S. Cl. 424—448 15 Claims



1. A composition of matter for application to a body surface or membrane to administer a drug by permeation through the body surface or membrane, the composition comprising, in combination:

(a) the drug to be administered, in a therapeutically effective amount; and

(b) a permeation-enhancing mixture comprising:

(i) 20% by weight of a monoglyceride or a mixture of monoglycerides, and

(ii) 12% by weight of a lactate ester or a mixture of lactate esters.

5,750,138
ADHESIVE PATCH FOR THE TRANSDERMAL ADMINISTRATION OF A MEDICATION

Ary Saaman; Patrick Poscio, both of Lausanne, and Michael Graetzel, Saint-Sulpice, all of Switzerland, assignors to Westonbridge International Limited, Dublin, Ireland

PCT No. PCT/IB94/00416, § 371 Date Jul. 17, 1996, § 102(e) Date Jul. 17, 1996, PCT Pub. No. WO95/16439, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 13, 1994, Ser. No. 663,220

Claims priority, application Switzerland, Dec. 17, 1993, 3784/93

Int. Cl.⁶ A61F *13/02*

U.S. Cl. 424—448 5 Claims

1. Adhesive patch for the delayed transdermal administration of a medication comprising:

a reservoir or a matrix containing the medication; and

a membrane device, the membrane device comprising:

a porous cellulose support upon which is grafted a polymer which is sensitive to pH; and

a delay layer comprising a gelatinous hydrolyzable ester;

wherein the membrane device interacts with the reservoir or matrix such that the membrane device changes, after a delay period, from being impermeable to being permeable through modification of its physico-chemical structure, the delay period beginning when protons from the reservoir or matrix are brought into contact with the delay layer, the contact between the source of protons and the delay layer triggering an autocatalytic process of the hydrolysis of the ester.

5,750,139
TRANSDERMAL THERAPEUTIC SYSTEM FOR THE DELIVERY OF 5,6-BENZO-ALPHA-PYRONE

Jürg Lutz, Binningen, and Henning F. Cierpka, Reinach, both of Switzerland, assignors to Drossapharm AG, Basel, Switzerland

Continuation of Ser. No. 389,387, Feb. 16, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 785,044

Claims priority, application Switzerland, Feb. 18, 1994, 00 495/94

Int. Cl.⁶ A61F *13/02*

U.S. Cl. 424—448 4 Claims

1. A transdermal therapeutic system, comprising an impermeable top layer; a microporous membrane welded to the impermeable top layer so that the impermeable top layer and the microporous membrane form together an inner space; and a pharmaceutical formulation contained in the inner space, wherein the pharmaceutical formulation contains as an active ingredient 5 to 50% by weight of 5,6-benzo-alpha-pyrone and is capable of absorbing perspiration and, as a result of the effect of perspiration, permits a constant release of the active ingredient during at least 24 hours.

5,750,140
TRANSDERMAL DELIVERY OF TIAGABINE

Helle Weibel, Hillerød, and Peter Bonne Eriksen, Værløse, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed May 12, 1995, Ser. No. 440,155

Claims priority, application Denmark, May 20, 1994, 0577/94

Int. Cl.⁶ A61M *37/00;* **A61K** *9/70*

U.S. Cl. 424—449 10 Claims

1. A transdermal delivery system comprising one or more permeation enhancers and a compound selected from the group consisting of tiagabine, pharmaceutically acceptable salts or pharmaceutically acceptable C_{1-6}-alkylesters thereof and ionpairs of tiagabine and salicylic or oleic acid, wherein the penetration enhancer is selected from the group consisting of saturated and unsaturated fatty acids and esters thereof in propylene glycol, bisabolol in ethanol/water, cineol in ethanol/water, hydroxypropyl-β-cyclodextrin in ethanol/water or decylmethylsulfoxide in ethanol/water and the ratio by weight of the compound to the one or more permeation enhancers is 1:1.

5,750,141

ADMINISTRATION OF VASO-ACTIVE AGENT AND THERAPEUTIC AGENT

Michael Stephen Roberts, Westlake; Sheree Elizabeth Cross, Tarragindi, both of Australia, and Parminder Singh, Sussern, N.Y., assignors to The University of Queensland, Queensland, Australia

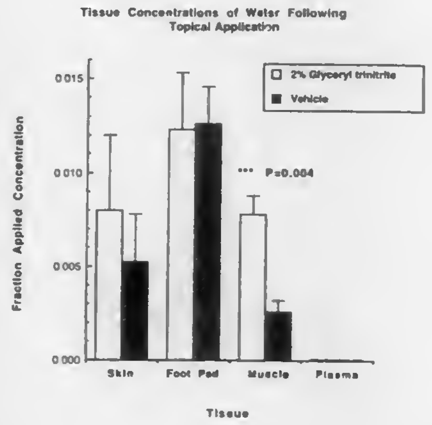
PCT No. PCT/AU94/00174, § 371 Date Dec. 4, 1995, § 102(e) Date Dec. 4, 1995, PCT Pub. No. WO94/23748, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 8, 1994, Ser. No. 535,270

Claims priority, application Australia, Apr. 8, 1993, PL8224; Nov. 10, 1993, PM2306

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—449 **24 Claims**



1. A method of topical and/or transdermal administration of a vaso-active agent in combination with a therapeutic agent to increase local perfusion and/or concentration of the therapeutic agent adjacent to an administration site of the vaso-active agent, said therapeutic agent being selected from the group consisting of an anti-inflammatory agent and an anesthetic, comprising the steps of:

(i) selecting a targeted location under the stratum corneum from the group consisting of dermis epidermis, subcutaneous tissue, fascia, smooth muscle, muscle, fat pad, deep muscle joint tissue, bone, and plasma;

(ii) correlating the concentration of the vaso-active agent topically and/or transdermally administered with the degree of penetration of the therapeutic agent to the targeted location adjacent to the administration site of the vaso-active agent, relative to an initial concentration of the therapeutic agent which is applied topically or locally;

determining a concentration of the vaso-active agent to increase local perfusion and/or concentration of the therapeutic agent adjacent to the administration site of the vaso-active agent; and

(iv) topically and/or transdermally administering the vaso-active agent, using at least the concentration of said vaso-active agent determined in step (iii), in combination with the therapeutic agent at said initial concentration, wherein the vaso-active agent is administered separately to or in combination with the therapeutic agent.

5,750,142

DRY COMPOSITIONS FOR PREPARING SUBMICRON EMULSIONS

Doron Friedman, Karmei-Yosef, and Yanir Aldouby, Modiin, both of Israel, assignors to Pharmos Corporation, New York, N.Y.

Continuation of Ser. No. 486,791, Jun. 7, 1995, abandoned, which is a division of Ser. No. 16,913, Feb. 12, 1993, Pat. No. 5,472,706. This application Apr. 11, 1997, Ser. No. 840,177

Claims priority, application Israel, Feb. 18, 1992, 101007

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 420—450 **39 Claims**

1. A lyophilized composition comprising:

from about 0.2 to about 40 weight percent of an oil;

from about 40 to about 90 weight percent of a cryoprotectant, wherein said cryoprotectant comprises an amino compound and is present in an amount that is equal to or greater than the amount of said oil; and

from about 0.1 to about 20 weight percent of an emulsifier;

the components being present in combination such that, when combined with an appropriate quantity of an aqueous liquid, the composition forms an oil-in-water emulsion; wherein the amino compound is selected from the group consisting of a straight amino acid, a branched amino acid, a nontoxic salt of a straight amino acid, a nontoxic salt of a branched amino acid, an ester of a straight amino acid, an ester of a branched amino acid, a peptide, and a protein hydrolysate.

5,750,143

CONTROLLED RELEASE DEVICE

Abdul Rashid, Glasgow; Howard Norman Ernest Stevens, Drymen; Julie Stephanie Binns, Glasgow, all of United Kingdom, and James Leonard Mackie, Windsor, Canada, assignors to R.P. Scherer Corporation, Troy, Mich.

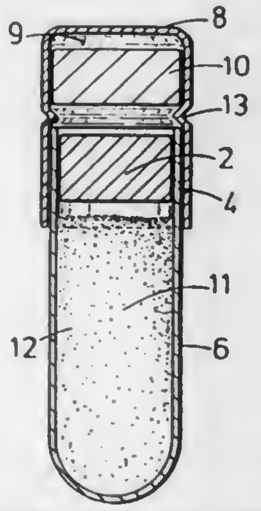
PCT No. PCT/GB93/02271, § 371 Date Jun. 27, 1995, § 102(e) Date Jun. 27, 1995, PCT Pub. No. WO94/09746, PCT Pub. Date May 11, 1994

PCT Filed Nov. 4, 1993, Ser. No. 424,377

Claims priority, application United Kingdom, Nov. 4, 1992, 9223144

Int. Cl.^{6} A61K *9/48;9/52*

U.S. Cl. 424—451 **12 Claims**



1. A controlled release capsule which comprises a male plug engaged within a female body:

the plug being formed of a water swellable material which swells so as to disengage the female body upon exposure of the capsule to an aqueous medium;

a cap of a water soluble material fitted over a mouth of the female body and enclosing the male plug such as to define a first containing a first unit dosage of a pharmaceutically active material; and

the female body and the male plug defining a second volume containing a second unit dosage of a pharmaceutically active material;

wherein the cap and the female body are provided with cooperating pre-lock means to removeably attach the cap to the female body.

5,750,144

METHOD FOR ALLEVIATING THE SYMPTOMS OF ARTHRITIS IN MAMMALS

Eugene R. Moore, 5600 Woodview Pass, Midland, Mich. 48642

Continuation-in-part of Ser. No. 202,723, Feb. 28, 1994, Pat. No. 5,529,786. This application Apr. 9, 1996, Ser. No. 629,743

Int. Cl.^{6} A61K *9/10;9/48;35/32;35/44*

U.S. Cl. 424—451 **17 Claims**

1. A method for alleviating the symptoms of arthritis in mammals which comprises orally administering a composition obtained by separating water-insoluble undenatured Type II collagen containing animal tissue from animal tissue not containing Type II collagen, subdividing and sterilizing said tissue under conditions which do not change the original structure of the Type II collagen, in an amount effective and for time effective to alleviate such symptoms.

5,750,145

STABLE GELATIN COATED ASPIRIN TABLETS

Mahesh Patell, Edison, N.J., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jul. 28, 1995, Ser. No. 508,647

Int. Cl.^{6} A61K *9/38;9/40;31/60*

U.S. Cl. 424—478 **10 Claims**

1. An aspirin dosage unit comprising:

a: a solid core containing a therapeutically effective amount of aspirin;

b: a first coating on said core comprising a pharmaceutically acceptable film forming polymer and an amount of pepsin which is effective to stabilize the aspirin for a period of at least 13 weeks when the dosage unit is stored at 40° C. and 75% relative humidity or 26 weeks when it is stored at 35° C. and 75% relative humidity; and

c: a gelatin coating enrobing said first coating.

5,750,146

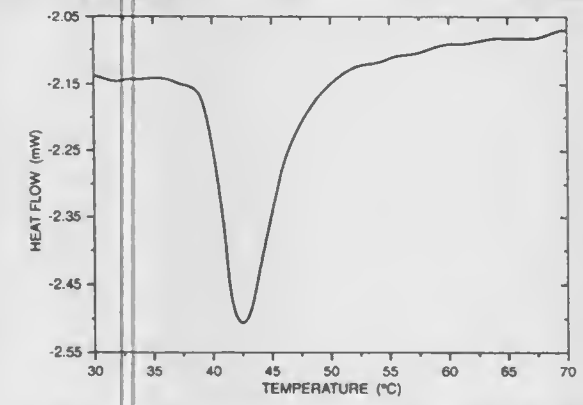
TRANSLUCENT COLLAGEN FORMULATIONS WITH A CYTOTOXIC DRUG

Richard E. Jones, Palo Alto, and Mike T. Li, Cupertino, both of Calif., assignors to Matrix Pharmaceutical, Inc., Menlo Park, Calif.

Filed Apr. 28, 1995, Ser. No. 431,084

Int. Cl.^{6} A61K *9/10;47/42*

U.S. Cl. 424—484 **18 Claims**



1. An optically translucent proteinaceous composition in which the protein component comprises from about 30% to about 100% of collagen, which protein component is dispersed in an aqueous medium to provide an amorphous flowable mass having a collagen concentration of from about 5 to about 100 mg/ML and an effective amount of a compatible cytotoxic drug to render the composition optically translucent wherein the collagen in said proteinaceous composition has a single transition temperature in the temperature range of from 30° C. to about 45° C.

5,750,147

METHOD OF SOLUBILIZING AND ENCAPSULATING ITRACONAZOLE

Martin L. Kantor, Mamaroneck, N.Y., assignor to Emisphere Technologies, Inc., Hawthorne, N.Y.

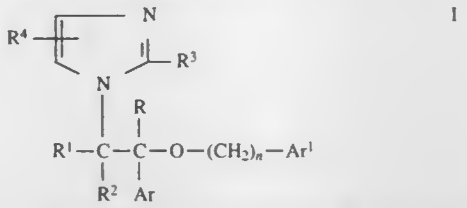
Filed Jun. 7, 1995, Ser. No. 475,887

Int. Cl.^{6} B01J *13/04;* **A61K** *9/64;31/415;* **A01N** *43/50*

U.S. Cl. 424—491 **4 Claims**

1. A microsphere comprising

(a) a solubilized imidazole derivative active agent comprising an imidazole derivative having the formula



I

wherein R, R^1, and R^2 are independently hydrogen or lower alkyl;

R^3 is hydrogen, methyl or ethyl;

R^4 is hydrogen or methyl

Ar is phenyl, monohalophenyl, dihalophenyl, trihalophenyl, mono(lower alkyl)phenyl, di(lower alkyl)phenyl, lower alkoxyphenyl, or halothienyl;

Ar^1 is phenyl, monohalophenyl, dihalophenyl, trihalophenyl, mono(lower alkyl)phenyl, di(lower alkyl)phenyl, lower alkoxyphenyl, or cyanophenyl; and

n is 1 or 2; and a solvent,

wherein the solution comprises from about 3 to about 40 percent by weight of solute and from about 60 to about 97 parts by weight of solvent based upon 100 parts by weight of solution; and

(b) a microsphere forming carrier selected from the group consisting of

- (i) a proteinoid of mixed amino acids;
- (ii) an acylated amino acid or poly amino acid or a salt thereof;
- (iii) a sulfonated amino acid or poly amino acid or a salt thereof;
- (iv) a protein or a salt thereof; and
- (v) any combination thereof.

5,750,148

METHOD FOR PREPARING SOLID ENTERIC PHARMACEUTICAL PREPARATION

Naosuke Maruyama; Hiroyasu Kokubo, and Shin-Ichiro Nakamura, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Aug. 15, 1995, Ser. No. 515,119

Claims priority, application Japan, Aug. 19, 1994, 6-195469; Dec. 1, 1994, 6-298094

Int. Cl.^{6} A61K *9/36;9/62*

U.S. Cl. 424—494 **6 Claims**

1. A method for preparing a solid enteric pharmaceutical preparation comprising the steps of dissolving a cellulosic enteric base in an organic solvent capable of being admixed with water in any proportion or a mixed solvent of the organic solvent and water to give a polymer solution; mixing the polymer solution with water, then removing the organic solvent to give a concentrate; adding an anionic surfactant to the concentrate in an amount ranging from 2 to 17 weight ratio with respect to the real quantity of the cellulosic

enteric base ranging from 83 to 98 weight ratio, then drying the mixture to give polymer powder; introducing the polymer powder into water to give an emulsion containing polymer particles having an average particle size of not more than 1 μm; dispersing the emulsion in water containing a plasticizer to give a coating liquid; and then coating a drug with the coating liquid.

5,750,149
PHARMACEUTICAL AND DERMOCOSMETIC COMPOSITIONS CONTAINING EQUINE COLOSTRUM
Rosa Maria Gobbi, Milan, Italy, assignor to Horse Vitality Ltd, Dublin, Ireland
PCT No. PCT/EP93/03655, § 371 Date Aug. 14, 1995, § 102(e) Date Aug. 14, 1995, PCT Pub. No. WO94/16675, PCT Pub. Date Aug. 4, 1994
PCT Filed Dec. 22, 1993, Ser. No. 464,904
Claims priority, application Italy, Jan. 26, 1993, MI93A0118; Jul. 1, 1993, MI93A1417
Int. Cl.^{6} A61K *35/20*
U.S. Cl. 424—535 **3 Claims**

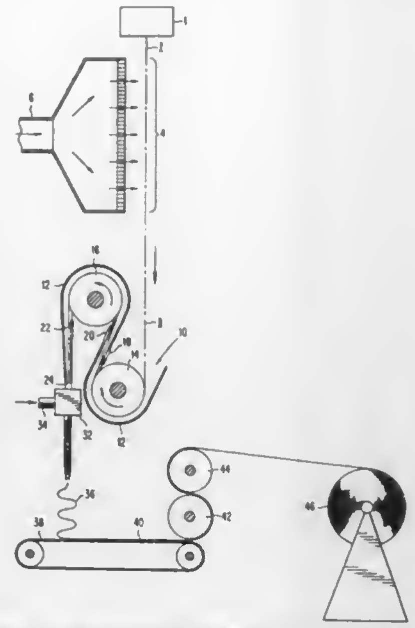
1. A composition for use in the topical treatment of skin disorders and injuries comprising as the principal active ingredient equine colostrum having an immunoglobulin content of at least 1000 mg/dl, or a mixture of said equine colostrum and equine milk in a ratio of 1:10 to 3:1 by weight, in admixture with suitable excipients and adjuvants, said principal active ingredient being present in an amount of 1.0% to 50% by wt.

5,750,150
COMPOSITIONS FOR TREATING AFFECTED TISSUES, METHOD FOR THE PREPARATION AND USAGE THEREOF
Hideo Okazaki, Tokyo, and Kinuko Oku, Naha, both of Japan, assignors to Traditional Chinese Medicine Research Laboratory, Inc., Naha, Japan
Continuation-in-part of Ser. No. 411,704, May 15, 1995, abandoned, and Ser. No. 424,523, May 26, 1995, abandoned. This application May 28, 1996, Ser. No. 652,648
Claims priority, application Japan, Sep. 18, 1992, 4-275132; Nov. 17, 1993, 5-288323; Jul. 22, 1994, 6-192219
Int. Cl.^{6} A61K *33/04;33/06;33/10;31/70*
U.S. Cl. 424—682 **34 Claims**

1. A composition comprising a water-soluble aluminum compound, a chelating agent, tannic acid and sodium hydrogen sulfite, said water-soluble aluminum being contained in a concentration ranging from 0.01 mole to 0.5 mole, said tannic acid being contained at a rate of 0.01% to 25.0% with respect to said water-soluble aluminum compound, said chelating agent being contained at a rate of from 10% to 80% with respect to said water-soluble aluminum compound, and said sodium hydrogen sulfite being contained at a rate of from 50% to 200% with respect to the amount of said tannic acid, wherein a pH of said composition ranges from pH 1.0 to pH 3.5.

5,750,151
SPUN-BONDED WEB
Edward L. Brignola, Old Hickory; Alvin A. Fleck, Madison; Price W. LaCroix, Hendersonville; Edward K. Willis, Mt. Juliet, and Leon H. Zimmerman, deceased, late of Nashville, all of Tenn., by Patricia B. Zimmerman, legal representative, assignors to Reemay Inc., Old Hickory, Tenn.
Division of Ser. No. 622,312, Mar. 27, 1996, Pat. No. 5,665,300. This application May 9, 1997, Ser. No. 853,873
Int. Cl.^{6} B29C *55/00*
U.S. Cl. 425—66 **7 Claims**

1. An apparatus for the production of a spun-bonded web comprising in combination:

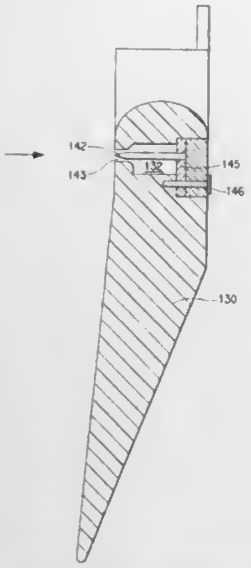


- a plurality of melt extrusion orifices for forming a multifilamentary spinline upon the extrusion of a molten thermoplastic polymeric material therethrough.
- a gaseous quench zone in which said molten multifilamentary thermoplastic polymeric spinline travels and is solidified following the melt extrusion thereof,
- at least two spaced driven draw rolls located downstream from said quench zone and arranged to be contacted by said multifilamentary thermoplastic polymeric spinline for exerting a pulling force on said multifilamentary thermoplastic polymeric spinline to accomplish the drawing thereof adjacent said extrusion orifices, a shroud for the passage of said multifilamentary thermoplastic polymeric spinline when contacting said draw rolls, with said shroud completely surrounding areas of said draw rolls contacted by said multifilamentary thermoplastic polymeric spinline, said shroud including an entrance end and an exit end,
- a pneumatic forwarding jet located adjacent said exit end of said shroud for the creation of an uninterrupted flow of gas from the entrance end to the exit end of said shroud which is directed for assisting the contact of said multifilamentary thermoplastic polymeric spinline with said spaced driven draw rolls and expelling said multifilamentary thermoplastic polymeric spinline in the direction of its length from said exit end of said shroud,
- a support located in a spaced relationship below said pneumatic forwarding jet for receiving said multifilamentary thermoplastic polymeric spinline and facilitating the laydown thereof to form a web, and
- bonding means for bonding said multifilamentary thermoplastic polymeric spinline following said web formation to form a spun-bonded web.

5,750,152
WAND PURGING FOR ELECTROSTATIC CHARGING SYSTEM IN FLASH SPINNING APPARATUS
Ervin Townsend Powers, Jr., Midlothian, Va., and Edgar North Rudisill, Hermitage, Tenn., assignors to E. I. du Pont de Nemours and company, Wilmington, Del.
Division of Ser. No. 348,684, Dec. 2, 1994, Pat. No. 5,558,830. This application Apr. 19, 1996, Ser. No. 635,314
Int. Cl.^{6} B29C *37/00*
U.S. Cl. 425—72.2 **3 Claims**

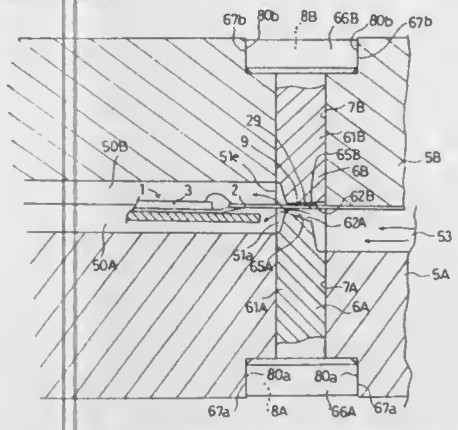
1. An apparatus for flash spinning fiber forming polymer into plexifilamentary film-fibril webs and forming nonwoven sheet therefrom, the apparatus comprising:

- means for flash spinning the polymer into a plexifilamentary film-fibril web;



- an electrostatic charging system including at least one electrically charged needle and a conductive target spaced across the path of the web to provide an electrostatic charge to the web passing therebetween;
- means for laying the web into a sheet; and
- means for directing a gaseous fluid across the at least one electrically charged needle, including a plenum and an annular channel arranged proximately to the distal end of each needle wherein the annular channel substantially circumscribes the needle so that the gaseous fluid passes from the annular channel to sweep away dust or debris that might otherwise collect on the needle.

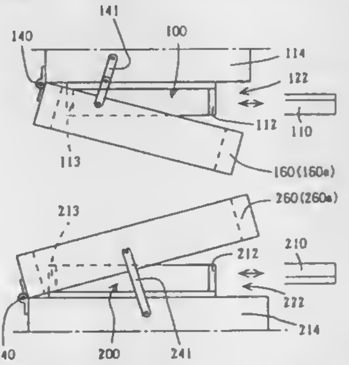
5,750,153
MOLD DEVICE AND PROCESS FOR RESIN-PACKAGING SEMICONDUCTOR DEVICES
Kazutaka Shibata, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto, Japan
Filed Aug. 28, 1996, Ser. No. 704,978
Claims priority, application Japan, Aug. 31, 1995, 7-223456
Int. Cl.^{6} B29B *45/02;45/14;45/27*
U.S. Cl. 425—116 **7 Claims**



1. A mold device for resin-packaging semiconductor devices comprising:

- a first cavity block having a first molding cavity;
- a second cavity block having a second molding cavity in corresponding relation to the first molding cavity; and
- a gate for injecting a resin material into the first and second cavities through a runner;
- wherein the gate is defined between an opposed pair of first and second gate pins at a corresponding corner portion of each molding cavity, the first gate pin being separate from but removably insertable into the first cavity block, the second gate pin being separate from but removably insertable into the second cavity block, the gate being directly open to both of the first and second molding cavities.

5,750,154
RESIN SEALING/MOLDING APPARATUS FOR ELECTRONIC PARTS
Keiji Maeda, and Yoshihisa Kawamoto, both of Kyoto, Japan, assignors to Towa Corporation, Uji, Japan
Filed Oct. 25, 1996, Ser. No. 738,096
Claims priority, application Japan, Oct. 30, 1995, 7-306910
Int. Cl.^{6} B29C *45/02;45/14;45/34*
U.S. Cl. 425—116 **8 Claims**



3. A resin sealing/molding apparatus for electronic parts comprising an upper mold section, a lower mold section being opposed to said upper mold section, a pot for supplying a resin material being arranged on at least one of said upper and lower mold sections, cavities for resin molding being oppositely arranged on said upper and lower mold sections, a resin passage being provided between said pot and said cavities for transferring a melted resin material, a plunger for pressurizing resin being engaged in said pot, an upper mounting plate mounting said upper mold section, a lower mounting plate mounting said lower mold section, a sealing mechanism for isolating at least an internal space part consisting of said pot, said resin passage and said cavities from the outside air, a decompression mechanism for decompressing an air isolation space part being formed by said sealing mechanism, and a vacuum path for communicationally connecting said air isolation space part with said decompression mechanism, wherein said upper mold section is formed by an upper base and an upper chase unit being detachably exchanged with respect to said upper base, said lower mold section is formed by a lower base and a lower chase unit being detachably exchanged with respect to said lower base, and said sealing mechanism is formed by an upper air isolation member being provided around the outer side of said upper mold section for enclosing said upper mold section, a lower air isolation member being provided around the outer side of said lower mold section for enclosing said lower mold section, a first sealing member being provided on at least one of said upper air isolation member being mounted on said upper mounting plate and said upper mounting plate for sealing a clearance therebetween, a second sealing member being provided on at least one of said lower air isolation member being mounted on said lower mounting plate and said lower mounting plate for sealing a clearance therebetween, and a third sealing member being provided on at least one of engaging surfaces of said upper and lower air isolation members being defined in engagement thereof, while said upper mounting plate is provided with an upper rotational member for making said upper air isolation member freely rotatable, an upper rotational position regulating member for regulating and fixing the rotational position of said upper air isolation member and a fixture for fixing said upper air isolation member to said upper mounting plate and said lower mounting plate is provided with a lower rotational member for making said lower air isolation member freely rotatable and a lower rotational position regulating member for regulating the rotational position of said lower air isolation member, so that said upper chase unit is exchanged through an upper opening being defined by said upper mounting plate and

rotated said upper air isolation member and said lower chase unit is exchanged through a lower opening being defined by said lower mounting plate and rotated said lower air isolation member by releasing said fixture.

5,750,155

DEVICE FOR THE INJECTION MOLDING OF PLASTIC OBJECTS ENCLOSING HOLLOW SPACES AND PROCESS FOR OPERATING IT

Helmut Eckardt, Meinerzhagen; Klaus Schröder, Marienbeide; Jürgen Ehritt, Hilchenbach, and Uwe Hübel, Lüdenscheid, all of Germany, assignors to Battenfeld GmbH, Meinerzhagen, Germany

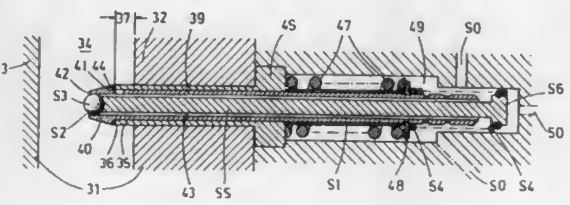
PCT No. PCT/EP93/02608, § 371 Date May 5, 1995, § 102(e) Date May 5, 1995, PCT Pub. No. WO94/07675, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 25, 1993, Ser. No. 406,945

Claims priority, application Germany, Sep. 28, 1992, 42 29 168.2; Oct. 21, 1992, 42 35 526.5

Int. Cl.^{6} B29C *45/23*

U.S. Cl. 425—130 **4 Claims**



1. A device for injection molding of articles having hollow spaces directly from a low-viscosity plastic material melt, the device comprising:

a mold having a mold cavity for receiving a plastic material melt; means for injecting the plastic material melt into the mold cavity; and

means for introducing a pressurized medium into the plastic material melt when the plastic material melt is received in the mold cavity, the introducing means comprising:

a hollow needle extending into the mold cavity at a location spaced from a location at which the plastic material melt is introduced into the mold cavity, the hollow needle having a discharge end defining a discharge aperture through which the pressurized medium is introduced into the plastic material melt;

a needle core axially displaceable in the needle for varying a cross-section of the discharge aperture, the needle core having at an end thereof located in the mold cavity an enlarged head having a diameter exceeding a diameter of the discharge aperture of the needle and defining, together with the discharge end of the needle, the cross-section of the discharge aperture; and

a power means for displacing the needle core between a first position in which the discharge aperture is substantially closed by the needle core head, and a position in which the discharge aperture is open;

wherein the needle core includes a discharge passage, and wherein the device further comprises valve means for blocking the discharge passage in an open position of the discharge aperture, and means for retaining the valve means in a blocking position, the valve means being actuated to an open position thereof upon pressure in the mold cavity exceeding a retaining force applied by the retaining means to the valve means.

5,750,156

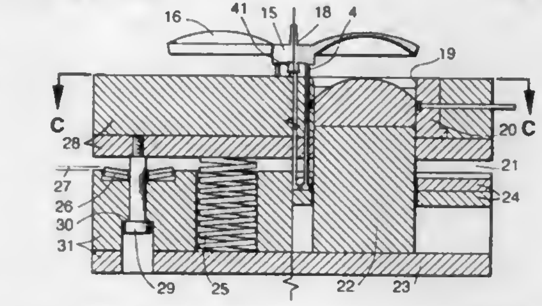
APPARATUS FOR INJECTION-COMPRESSION MOLDING AND EJECTING PAIRED THERMOPLASTIC SPECTACLE LENS SUITED FOR FULLY AUTOMATED DIP HARDCOATING

Steven M. Maus, Osseo, and George J. Galic, Columbia Heights, both of Minn., assignors to Galic Maus Ventures, Columbia Heights, Minn.

Division of Ser. No. 533,126, Sep. 25, 1995, Pat. No. 5,718,849. This application Feb. 5, 1997, Ser. No. 795,613

Int. Cl.^{6} B29C *45/76*

U.S. Cl. 425—139 **16 Claims**



1. A molding apparatus for particulate-minimizing automated ejection of molded pairs of thermoplastic spectacle lenses out of a multi-cavity injection-compression moldset comprising:

a.) an injection molding machine having programmable control of means for clamping and opening a parting line formed between an A side mold plate and a B side mold plate of said moldset mounted on a stationary platen and a movable platen respectively, and having programmable control of means for moving forward or back an ejector assembly within said moldset;

b.) said moldset comprising

i) a melt delivery system located substantially at the parting line joining the A side mold plate and the B side mold plate, having at least one sprue bushing in fluid communication with an injection source of molten thermoplastic located substantially equidistant between at least one pair of mold cavities, a melt passageway having at least one undercut located on the B side in fluid communication between the sprue bushing and a gate located on a side quadrant of a bore edge of each of the pair of mold cavities, so as to form after cooling therein a cold sprue and cold-runner having a degree of mechanical retention onto the B side mold plate,

ii) at least one hanger tab cavity on a B side parting line plate per pair of mold cavities, in fluid communication with the melt delivery system, so as to form one hanger tab per pair of molded lenses extending from the cold sprue and cold runner,

iii) at least one pair of variable volume mold cavities having optically polished partforming surfaces on opposing paired A side concave inserts and B side convex inserts, the inserts having perimeter clearance gaps within the bores of the parting line mold plates, the bores having a drafted surface which forms an outer diameter edge of the molded lens such that the outer diameter edge will create a slight mechanical interference at a smallest inner diameter of the B side bore, and a back surface of the A side inserts being mounted for loadbearing support against an A side clamp plate and a back surface of the B side inserts being mounted for loadbearing support against pillars onto B side clamp plates, the clamp plates being mounted onto the stationary platen and a movable platen respectively,

iv) at least one extendable and compressible passive resilient member of varying length which determines a cavity height dimension of the paired variable volume mold cavities within preset mechanical limits, the resilient member mounted between the parting line mold plate and clamp plate of B side of the moldset and exerting a force biased forward toward the parting line, such that when there is less clamping force exerted by the injection molding machine than resilient member force biased forward toward the parting line, the length will be a maximum within the preset mechanical limits, and when there is more clamping force than resilient member force biased forward toward the parting line, the length will be a minimum within the preset mechanical limits,

v) at least one ejector pin per pair of mold cavities, with a first end located at a B side parting line surface forming the cold sprue and cold-runner and a second end mechanically tied into the ejector assembly within said moldset, the ejector pin being capable of slideably moving forward to a first position or back to a second position of the ejector assembly, and a length between a first end and a second end sufficient to make the first end extend past the B side parting line mold plate when the resilient member length is at its maximum if the ejector assembly is in its first position, yet insufficient to make the first end extend past a B side parting line mold plate when the resilient member length is at its maximum if the ejector assembly is in its second position, and insufficient to make the first end extend past the B side parting line mold plate when the resilient member length is at its minimum if the ejector assembly is in its second position.

vi) means for cooling said molded paired lenses;

c) a programmably controlled takeout robot mounted onto a platen of the injection molding machine, the takeout robot having an arm fitted with end-of-arm gripping tooling, and the arm being capable of extending to a first position inside the open moldset wherein the end-of-arm gripping tooling can grasp onto said molded paired lenses while being stripped off of the B side mechanical retention when the ejector assembly is in its first position, while the moldset parting line is fully open, and the arm being capable of retracting to at least a second position being a product destination outside the closed moldset wherein the end-of-arm gripping tooling grasping onto said molded paired lenses while the moldset parting line is being closed, with timing being coordinated between the programmable controls of the injection molding machine and of the takeout robot;

d) a cleanroom enclosure substantially surrounding the moldset and a motion path of the takeout robot between the first and second positions, the cleanroom enclosure being fitted with means for supplying clean filtered air at sufficient pressure and flow.

5,750,157

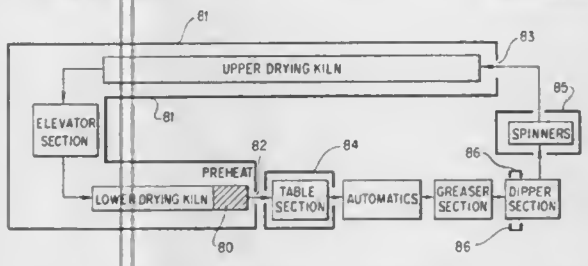
APPARATUS FOR THE MANUFACTURE OF PHARMACEUTICAL CELLULOSE CAPSULES

Ralph R. Grosswald, Fairfield, Iowa; Jeffory B. Anderson, Springville, and Clair S. Andrew, Provo, both of Utah, assignors to GS Technologies, Inc., Fairfield, Iowa

Continuation of Ser. No. 463,053, Jun. 5, 1995, abandoned, which is a division of Ser. No. 377,669, Jan. 24, 1995, which is a continuation of Ser. No. 893,091, May 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 708,023, May 31, 1991, abandoned. This application Oct. 10, 1996, Ser. No. 716,932

Int. Cl.^{6} B29C *41/14;41/40;41/42;41/46*

U.S. Cl. 425—143 **41 Claims**



1. An apparatus for manufacturing pharmaceutical cellulose capsules, the capsules suitable for filling by capsule filling machines, each capsule consisting of a capsule body and a capsule cap formed from an aqueous solution of a thermogelling cellulose ether composition, comprising:

a plurality of pinbars, each pinbar having a bar with a plurality of pins mounted to the bar;

greaser means for greasing the pins;

dipper means for dipping hot pins into the solution to cause solution to gelatinize on the surface of the pins;

dryer means for drying gelatinized solution on the surface of the pins of a drying group of pinbars, as a group, to form capsule bodies and capsule caps;

differential heater means for differentially heating the pins of the drying group;

automatics means for removing the capsule parts from the pins; and

transport means for moving the pinbars in a closed loop path through the greaser means, the dipper means, the dryer means, the differential heater means, and the automatics means;

wherein the differential heater means is positioned to receive the drying group of pinbars as a group, and includes means for differentially heating the pins of the drying group of pinbars in accordance with the expected differential heat loss from the pins as the pins move from the differential heater means through the automatics means and through the greaser means to the dipper means.

5,750,158

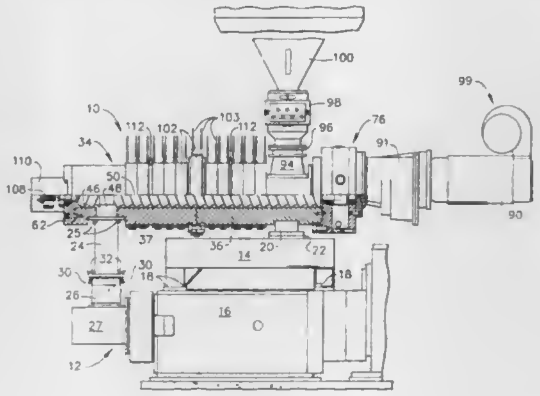
PREHEATING APPARATUS FOR AN EXTRUDER

Siegfried R. Wissmann; William T. Schmitt, and David E. Murdock, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation of Ser. No. 8,014, Jan. 22, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,876

Int. Cl.^{6} B29C *47/40;47/80*

U.S. Cl. 425—144 **7 Claims**



1. An apparatus for preheating thermoplastic material prior to entry of the material into an extruder barrel, comprising:

an elongated housing having a central bore, an inlet adjacent a first end of the housing, and an outlet between the inlet and a second end opposite the first end of the housing, both the inlet and the outlet intersecting the central bore;

a material flow path beginning at the inlet, continuing through the central bore, and passing from the central bore through the outlet;

a pair of adjacent, parallel feed screws received within the central bore of the housing for blending the thermoplastic material and advancing it along the material flow path, each feed screw having

a main body section having a helical flight configured to form a screw channel that is generally U-shared in cross-section and to advance the material from the inlet toward the outlet when the feed screw is rotated,

an open section having a constant diameter, and

a terminal section having a helical flight configured to form a screw channel that is generally U-shaped in cross-section and with a lead opposite that of the main body section,

such that the main body section extends from the inlet to the open section which is adjacent the outlet, and the terminal section extends from the open section to the second end of the housing;

drive means for rotating the feed screws in the same direction within the central bore; and means for heating the thermoplastic material to a desired temperature as it is blended and advanced along the material flow path.

5,750,159

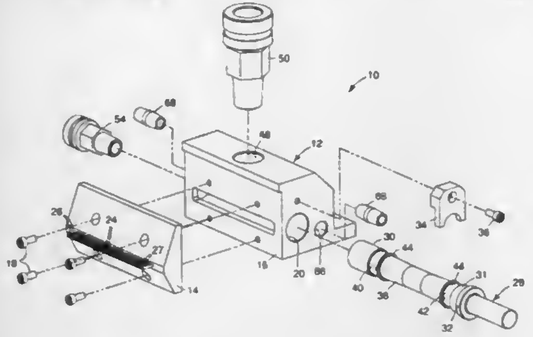
DIE FOR EXTRUDING ONE OR MORE FLUID STREAMS

Michael D. Delmore, Moundsview, Minn., and Gary W. Maier, Warren Township, Wis., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Jun. 24, 1996, Ser. No. 672,014

Int. Cl.^{6} B29C *47/10*

U.S. Cl. 425—190 **10 Claims**



1. A die for extruding multiple fluid streams comprising:

a housing having a first outlet passageway, a second outlet passageway and inner wall sections defining a chamber; and

an insert received in said chamber, said insert having a central axis, a first body portion, and a second body portion next to said first body portion in directions along said central axis, said first body portion and said second body portion each including a flow-controlling peripheral surface extending in an arc about said central axis for controlling the flow of respective fluid streams passing through said chamber, each peripheral surface remaining stationary during passage of fluid streams through said chamber,

said housing including a first inlet passageway,

said insert including a second inlet passageway extending to the second body portion peripheral surface said insert including a second inlet passageway,

one of said housing and said insert including at least one rib in sealing engagement with the other of said housing and said insert, said rib being located between said first body portion and said second body portion and separating said chamber into a first part surrounding said first body portion and a second part surrounding said second body portion, said first part communicating said first inlet passageway with said first outlet passageway, said second part communicating said second inlet passageway with said second outlet passageway, said first part being in non-communication with said second part.

5,750,160

NICKEL SHELL DOOR MOLDS AND METHOD OF FORMING SAME

Reinhart Weber, and Robert E. Sheppard, both of Midland, Canada, assignors to Weber Manufacturing Limited, Midland, Canada

PCT No. PCT/CA95/00061, § 371 Date Sep. 19, 1996, § 102(e) Date Sep. 19, 1996, PCT Pub. No. WO95/21733, PCT Pub. Date Aug. 17, 1995

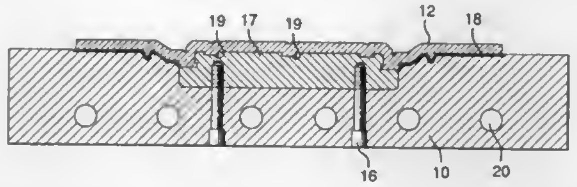
PCT Filed Feb. 9, 1995, Ser. No. 693,088

Claims priority, application United Kingdom, Feb. 9, 1994, 9402471

Int. Cl.^{6} B29C *51/32;* **C23C** *16/06*

U.S. Cl. 425—290 **3 Claims**

1. A method of forming a nickel shell for a mold to reproduce an article surface comprising the steps of securing the article to be reproduced to a base having a perimeter, forming a dam about the perimeter, filling the interior of the dam with a silicone, mounting a register plate over the article within the dam in contact with the silicone, and allowing the silicone to cure whereby the silicone forms a negative master of the article surface, removing the negative master from the article and positioning a steel mandrel over the negative master to define a cavity therebetween, feeding a silicone which is not adherent to the negative master into said cavity to fill the cavity and allowing the silicone to cure whereby the silicone forms a positive master which adheres to the steel mandrel, removing the negative master from the positive master, and depositing a layer of nickel by nickel vapour deposition onto the positive master to form a nickel shell.



2. A mold comprising a nickel shell produced by the method of claim 1, a steel base with encapsulated inner and outer shear inserts, and means for securing the nickel shell to the steel base to form a nickel shell insert.

5,750,161

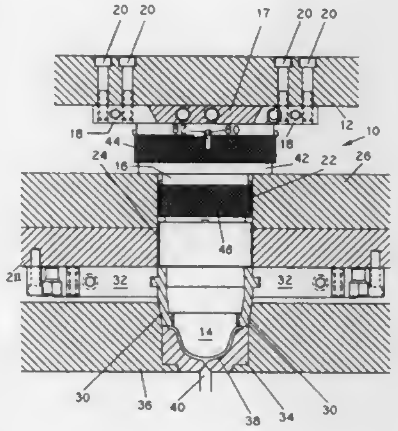
QUICK CHANGE MOLD TOOLING

Richard J. Schock, Jr., Miamisburg, and Charles J. Brun, Jr., Xenia, both of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio

Filed May 5, 1995, Ser. No. 435,699

Int. Cl.^{6} B29C *45/03*

U.S. Cl. 425—468 **12 Claims**



1. A mold core assembly for removable installation in a molding machine including a core retainer, the mold core assembly comprising

a first lock element attached to a core and defining a circumferentially extending peripheral groove,

a second lock element including a plurality of balls sized to fit within the peripheral groove and movably attached to the core retainer, the plurality of balls being movable between a locked position fitted in locking connection with the peripheral groove and an unlocked position separated from the peripheral groove,

a slip ring positioned to surround the peripheral groove and engage and hold the plurality of balls in the locked position.

5,750,162

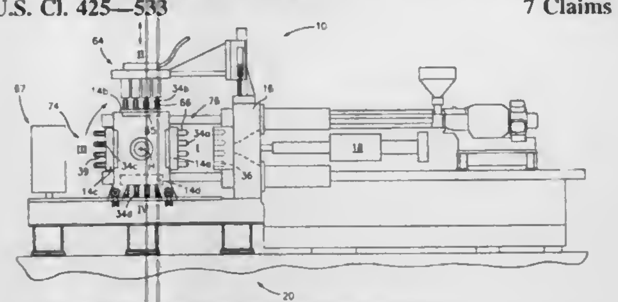
TURRET ARTICLE MOLDING MACHINE INCLUDING BLOW MOLDING STATION

Robert Schad, Toronto, and Robin Arnott, Alliston, both of Canada, assignors to Husky Injection Molding Systems Ltd., Canada

Continuation-in-part of Ser. No. 611,362, Mar. 6, 1996. This application Sep. 24, 1996, Ser. No. 718,788

Int. Cl.^{6} B29C *49/06*

U.S. Cl. 425—533 **7 Claims**



1. An injection molding machine comprising:

a first mold half having one of at least one mold cavity and at least one mold core;

a rotatable turret means rotatable on an axis for rotating a plurality of movable mold halves thereof into alignment with said first mold half, each of said movable mold halves including one of at least one mold cavity and at least one mold core matable with said first mold half for forming a mold for molding a molded article, said rotatable turret means further clamping said movable mold halves and said first mold half together;

means for moving said rotatable turret means relative said first mold half;

a first injection means for injecting melt into said at least one mold cavity; and

further including at least one means for performing at least one operation in addition to said molding, wherein said at least one means for performing comprises a blow molding station.

5,750,163

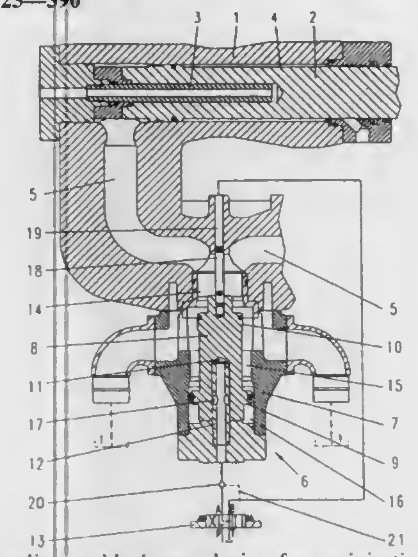
HYDRAULIC MOULD CLOSURE DEVICE FOR AN INJECTION MOULDING MACHINE

Heinz Hermann Klein, Rossbach, and Werner Filippi, Bonefeld, both of Germany, assignors to Dr. Boy GmbH, Germany

Filed Jun. 21, 1996, Ser. No. 667,397

Int. Cl.^{6} B29C *45/67*

U.S. Cl. 425—590 **4 Claims**



1. Hydraulic mould closure device for an injection moulding machine for processing plastic materials, the mould closure device comprising:

a closure cylinder housing,

at least one closure piston which operates in the closure cylinder housing and has a pressure side,

a hydraulic tank,

a hydraulic pump,

a passage which leads to the pressure side of the closure piston and is connectable to the hydraulic tank,

and a pressure convertor which is connected to the passage;

a pressure convertor including,

a pressure convertor housing,

a piston element which performs a reciprocating movement in the pressure convertor housing between an open position and a closed position and constitutes a high pressure piston and a low pressure piston, the low pressure piston having a pressure side,

a low pressure cylinder for the low pressure piston, the low pressure cylinder defining a diameter,

an actuating cylinder which is formed in the low pressure piston and is open on the pressure side of the low pressure piston,

a tubular actuating piston which extends into the actuating cylinder and is connectable to the hydraulic pump and to the hydraulic tank, the tubular actuating piston having lateral openings, a space which is adjacent to the low pressure cylinder on the pressure side of the low pressure piston and defines a diameter which is greater than the diameter of the low pressure cylinder, the space forming a transition to the low pressure cylinder;

wherein the movement of the piston element of the pressure convertor to the closed position the high pressure piston sealingly enters into the passage leading to the pressure side of the closure piston and thus creates a closure pressure for the closure piston, the passage constituting a high pressure cylinder for the high pressure piston and causing the low pressure piston of the piston element to expose the lateral opening in the actuating piston; and

wherein in the open position of the piston element of the pressure convertor the passage leading to the pressure side of the closure piston is open and the low pressure piston of the piston element has entered into the space adjacent to the low pressure cylinder, the spacing of the low pressure piston from the transition between the space and the low pressure cylinder corresponding at most to the stroke of the piston element.

5,750,164

METHOD OF DECREASING CHOLESTEROL CONCENTRATION IN FOOD

Chiaki Saito, Machida, and Kozo Ohuchi, Hasuda, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 538,048, Oct. 2, 1995, abandoned, which is a continuation of Ser. No. 368,761, Jan. 4, 1995, abandoned, which is a continuation of Ser. No. 103,040, Jul. 28, 1993, abandoned, which is a continuation of Ser. No. 810,340, Dec. 19, 1991, abandoned. This application Sep. 5, 1996, Ser. No. 709,327

Claims priority, application Japan, Dec. 21, 1990, 2-405028

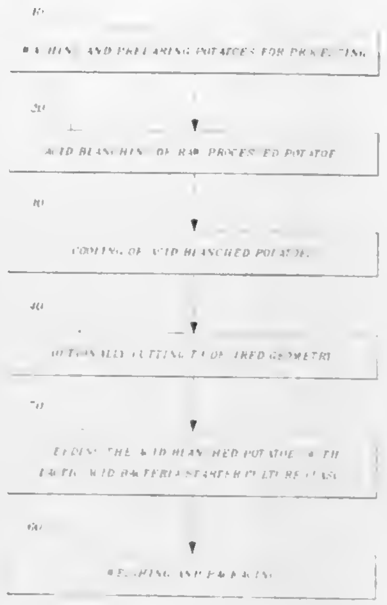
Int. Cl.^{6} A23L *1/015;1/32*

U.S. Cl. 426—47 **4 Claims**

1. In a method of decreasing cholesterol concentration in eggs or egg-containing foodstuffs by subjecting the eggs or egg-containing foodstuffs to a cholesterol-decreasing treatment, wherein the improvement comprises hydrolyzing phospholipids in the eggs or egg-containing foodstuffs at a temperature of 2° to 70° C. and for a period of time of 10 seconds to 100 hours with from 1×10^{-1} to 1×10^{5} units of phospholipase D per gram by weight of the phospholipid in the eggs or egg-containing foodstuffs while maintaining the pH of the eggs or egg-containing foodstuffs to be the pH originally possessed by the eggs or egg-containing foodstuffs, during or before the cholesterol-decreasing treatment.

5,750,165
METHOD OF PREPARING A REFRIGERATED POTATO PRODUCT

Dale E. Erway, R.D. #2 Box 253, Genesee, Pa. 16923
Filed Apr. 16, 1996, Ser. No. 632,897
Int. Cl.^{6} A23B *7/10;* **A23K** *1/00;3/00;* **A23C** *3/00*
U.S. Cl. 426—49 **16 Claims**


10
WASHING AND PREPARING POTATOES FOR PROCESSING
20
ACID BLANCHING OF RAW PROCESSED POTATOE
30
COOLING OF ACID BLANCHED POTATOE
40
OPTIONALLY CUTTING TO DESIRED GEOMETRY
50
SEEDING THE ACID BLANCHED POTATOE WITH LACTIC ACID BACTERIA STARTER CULTURE
60

1. A method of preparing a refrigerated potato product comprising the steps of:
- a) washing and preparing raw potatoes for processing;
- b) acid blanching of the prepared raw potatoes in a solution of Glucono delta-lactone (GDL);
- c) cooling of the acid blanched potatoes;
- d) seeding the acid blanched potatoes with a lactic acid bacteria starter culture, wherein said seeding includes the provision of a population of living cells of lactic acid bacteria cells to the potato product to inhibit the growth of a food spoilage or pathogenic organisms in the potato product by causing fermentation of the potato substrate by said population of living cells; and
- e) packaging the potatoes.

5,750,166
COMPOSITION AND METHOD FOR FLAVORING POPCORN PRODUCT

Steven R. Schellhaass, Plymouth, Minn., assignor to Golden Valley Microwave Foods, Inc., Edina, Minn.
Filed Aug. 29, 1996, Ser. No. 711,732
Int. Cl.^{6} A23L *1/36*
U.S. Cl. 426—93 **17 Claims**

1. A method for preparing an unpopped popcorn product; said method including the steps of:
- (a) applying an aqueous-based adhesive composition onto kernels of unpopped popcorn;
- (b) after said step of applying an aqueous-based adhesive composition, applying dry flavorant onto the kernels of unpopped popcorn kernels; and
- (c) after said step of applying dry flavorant onto the kernels of unpopped popcorn, applying a non-fat flowable flavorant facilitator to the kernels.

5,750,167

Patent Not Issued For This Number

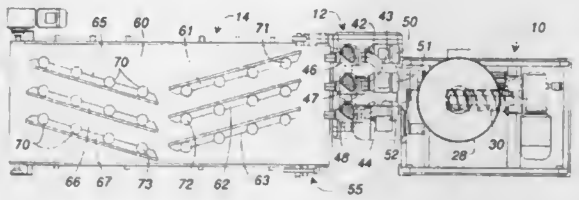
5,750,168
TAPIOCA STARCH CONTAINING FRENCH FRY FORMULATIONS AND METHOD OF MAKING

John Harold Woerman, Highlands Ranch, and Yangsheng Wu, Englewood, both of Colo., assignors to Penwest Foods Co., Englewood, Colo.
Continuation-in-part of Ser. No. 465,939, Jun. 6, 1995, Pat. No. 5,648,110. This application Jan. 31, 1997, Ser. No. 791,182
Int. Cl.^{6} A23L *1/0522*
U.S. Cl. 426—102 **10 Claims**

1. A process for preparing a frozen potato product with a film-like coating on the outer surface, which comprises:
- cutting the raw potatoes;
- blanching the potatoes;
- partially drying the potatoes;
- coating the potatoes with an aqueous starch slurry, the starch slurry having an as is solids content comprising not less than 30% by weight ungelatinized crosslinked tapioca starch characterized by a crosslinking level of from 300 to 1000 ppm;
- parfrying the potatoes in hot oil; and
- freezing the potatoes.

5,750,169
METHOD AND APPARATUS FOR DIVIDING BAKER'S DOUGH INTO DOUGH BALLS

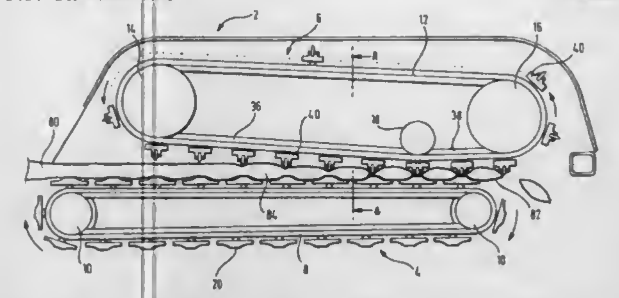
Jackie Lee Rose, Kathleen, Fla., and Sterrett P. Campbell, Atlanta, Ga., assignors to Southern Bakeries, Inc., Orangeburg, S.C.
Filed Apr. 21, 1997, Ser. No. 840,505
Int. Cl.^{6} A21C *9/00;* **A21D** *6/00*
U.S. Cl. 426—231 **8 Claims**



7. A method of delivering baker's dough from a mass of dough in parallel paths of dough balls to separate sheeter-molder-panners of a dough processing system, comprising the steps of:
- pumping the dough from a supply of dough with a stuffing pump in a single stream of dough;
- diverting the single stream of dough into multiple continuous streams of dough;
- passing each multiple stream of dough through a metering pump;
- controlling with each metering pump the volume of dough passing through each metering pump;
- dividing each stream of dough passed through the metering pumps into a series of dough pieces in separate columns of dough pieces;
- moving each column of dough pieces separately along a processing path toward a sheeter-molder-panner;
- weighing the dough pieces of each parallel processing path; and
- adjusting the speed of operation of the metering pumps in response to the weighing of the dough pieces as necessary to deliver pieces of dough of equal weight in each processing path to the sheeter-molder-panners.

5,750,170
PROCESS FOR PROVIDING FILLED, EXTRUDED DOUGH PRODUCTS

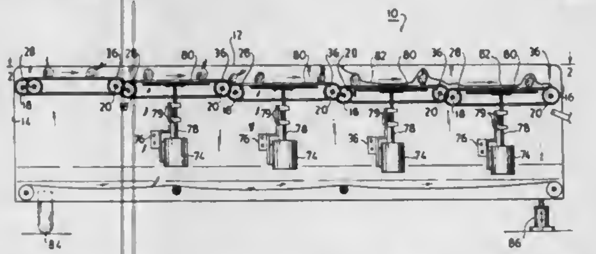
Alain Daouse, Noailles, and Alain Plessier, Bresles, both of France, assignors to Nestec S.A., Vevey, Switzerland
Filed Dec. 21, 1995, Ser. No. 576,273
Int. Cl.^{6} A21D *13/00*
U.S. Cl. 426—283 **13 Claims**



1. A process for the production of filled dough products comprising:
- co-extruding dough and a filling to provide a filled tube of the dough surrounding the filling;
- transporting the filled tube on a movable support through a cutting station having a plurality of movable blades spaced from one another by a distance corresponding to a selected length of the filled dough product, a lower surface of the filled tube being supported by the movable support;
- causing the lower surface of the filled tube, between adjacent portions to be engaged by a movable blade, to progressively take on a convex shape with progressive movement of the filled tube; and
- cutting the convex shaped filled tube by causing the plurality of blades to move with the filled tube and progressively towards the movable support and into the filled tube with progressive movement of the filled tube through the cutting station, whereby the filling in any portion of the tube engaged by a blade is progressively pushed out of this portion prior to cutting when the blade engages the moving support.

5,750,171
FINISH TOPPING MACHINE FOR BULB CROPS

Lee N. Shuknecht, Elba, N.Y., assignor to Lee Shuknecht & Sons, Inc., Elba, N.Y.
Filed Jul. 8, 1997, Ser. No. 889,487
Int. Cl.^{6} A23N *7/00;15/00;15/02*
U.S. Cl. 426—481 **22 Claims**



22. A method for shearing a portion of the stem from the bulb of a bulbous root crop to leave a residual stem on the bulb, comprising the steps of:
- a) providing a first conveyance assembly including a drivable belt having an upper surface;
- b) providing a second conveyance assembly spaced apart from and substantially parallel to said first conveyance assembly and having an upper surface substantially coplanar with said belt upper surface;
- c) providing a cutting blade at a distance below said assembly upper surfaces corresponding to the desired length of said residual stem;
- d) placing said bulb on said first and second conveyance assemblies so that said bulb touches a portion of each of said upper surfaces;
- e) driving said belt past said second conveyance assembly to create a velocity difference therebetween for gyrating said bulb to an inverted position wherein said stem extends downwards between said first and second conveyance assemblies to engage said blade; and
- f) driving said blade to sever said stem to leave said desired length of stem residual with said bulb.

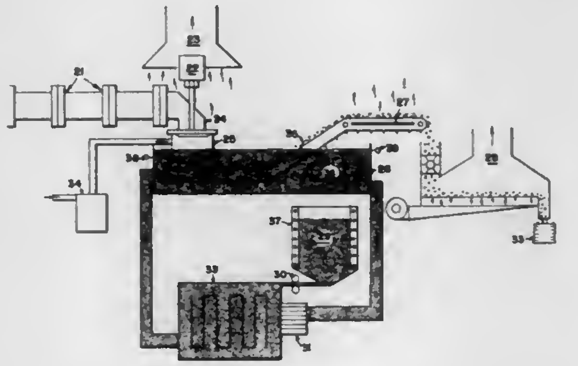
5,750,172
TRANSGENIC NON HUMAN MAMMAL MILK

Harry Meade, Newton, Mass., and Nils Lonberg, New York, N.Y., assignors to Pharming B.V., Leiden, Netherlands
Continuation of Ser. No. 322,984, Oct. 14, 1994, which is a continuation of Ser. No. 109,865, Aug. 20, 1993, abandoned, which is a continuation of Ser. No. 332,293, Mar. 31, 1989, abandoned, which is a division of Ser. No. 65,994, Jun. 23, 1987, Pat. No. 4,873,316. This application Jun. 5, 1995, Ser. No. 460,959
Int. Cl.^{6} C12P *21/06;21/02;21/04*
U.S. Cl. 426—580 **5 Claims**

1. Nonhuman mammal's milk comprising detectable levels of a recombinant polypeptide chain, wherein the recombinant polypeptide chain is produced by a nonhuman transgenic mammal whose somatic and germ cells contain an expression system comprising a DNA sequence coding for the recombinant polypeptide chain operably linked to a casein promoter and a signal peptide sequence, wherein the recombinant polypeptide chain is selected from the group consisting of coagulation factors VIII and IX, tissue plasminogen activator (TPA), urokinase, growth hormone, insulin, interferons, interleukins, peptide hormones, immunoglobulins and biologically active fragments thereof.

5,750,173
METHOD OF MANUFACTURING SYRUP-INFUSED FOOD PIECES

Massoud Kazemzadeh, Bloomington, Minn., assignor to MJM Technologies, L.L.P., Stacy, Minn.
Filed Nov. 5, 1996, Ser. No. 743,207
Int. Cl.^{6} A23L *1/00*
U.S. Cl. 426—516 **14 Claims**



1. A method of manufacturing syrup-infused food pieces which comprises:
- (a) extruding a food composition to form an extrudate and water vapors exiting through a die area with cutting means;
- (b) simultaneously venting off the water vapors and cutting the extrudate into food pieces by the cutting means into a heated syrup medium placed in a container, thereby infusing the syrup medium into the food pieces:
- (c) separating the syrup-infused food pieces from the syrup medium by transport means; and
- (d) removing the syrup medium from the container.

5,750,174

PROCESS AND APPARATUS FOR PASTEURIZING LIQUID CONTAINED IN CONTAINERS

Ronald Lucassen, Schijndel, Netherlands, assignor to Heineken Technical Services B.V., Amsterdam, Netherlands

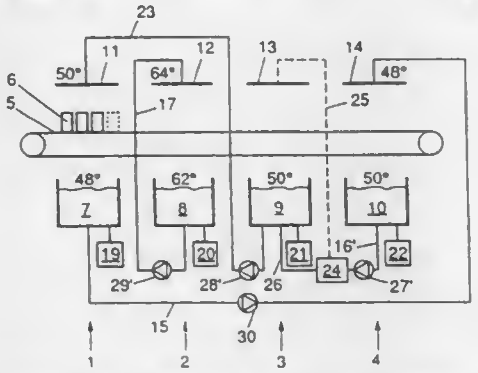
PCT No. PCT/NL94/00054, § 371 Date Aug. 30, 1995, § 102(e) Date Aug. 30, 1995, PCT Pub. No. WO94/19968, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 4, 1994, Ser. No. 525,577

Claims priority, application Netherlands, Mar. 5, 1993, 9300404

Int. Cl.^{6} A23L *3/00*

U.S. Cl. 426—521 **16 Claims**



1. A process for the pasteurization of liquid contained in containers in a tunnel pasteurizer comprising at least a pre-heating zone, a pre-pasteurization zone, a pasteurization zone and a cooling zone, each zone comprising a plurality of sprayers, comprising heating and cooling the containers through spraying with water received in a plurality of separate receiving means, spraying the containers in the cooling zone with water received from the pre-heating zone, and, during a normal, continuous feeding of the containers through the pasteurizer, preventing the supply of water to the sprayers in the pasteurization zone.

5,750,175

GEL TEXTURED HONEY PRODUCT

Brenda C. Hubbell, 2016 Tooles Bend Rd., Knoxville, Tenn. 37922

Filed Apr. 22, 1996, Ser. No. 635,775

Int. Cl.^{6} A23L *1/08*

U.S. Cl. 426—573 **8 Claims**

1. A gelatinized honey composition having a soluble solids content of about 68° to about 74° Brix, said composition comprising from about 80% to about 89% wt. natural honey, from about 0.05% wt. to about 0.16% wt. anhydrous sodium citrate, from about 0.10% to about 0.30% wt. gellan gum and from about 10% to about 19% wt. water wherein said honey composition exhibits full bodied honey flavor.

5,750,176

TRANSGENIC NON-HUMAN MAMMAL MILK COMPRISING 2'-FUCOSYL-LACTOSE

Pedro Antonio Prieto, Columbus, Ohio; David Fletcher Smith, Athens, Ga.; Richard Dale Cummings, Edmond, Okla.; John Joseph Kopchick, Athens; Pradip Mukerji, Gahanna, both of Ohio; Kelley Wilson Moremen, and James Michael Pierce, both of Athens, Ga., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 9, 1994, Ser. No. 208,889

Int. Cl.^{6} A23G *9/00;* **A23C** *9/00;9/16;* **A61K** *35/16*

U.S. Cl. 426—580 **5 Claims**

1. A milk produced by a transgenic, non-human mammal whose genome comprises a DNA sequence encoding an H blood group α-1,2-fucosyltransferase operably linked to a mammary gland specific promoter, wherein said milk comprises a detectable level of H blood group human α-1,2-fucosyltransferase and a detectable level of at least 2'-fucosyl-lactose.

5,750,177

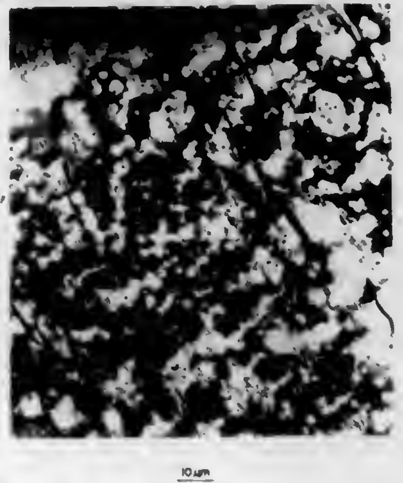
CHEESE WITH IMPROVED MELT PROPERTIES AND METHODS OF PRODUCING SAME

Jeng-Jung Yee; Lawrence I. Bell, and Raj G. Narasimmon, all of Green Bay, Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.

Filed Nov. 4, 1992, Ser. No. 970,696

Int. Cl.^{6} A23C *19/084*

U.S. Cl. 426—582 **38 Claims**



1. A cheese composition free of emulsifying agents and comprising undenatured whey proteins and casein, and having a whey proteins to casein weight ratio of at least 1:16, a Schreiber melt test value of at least 1.75 and a Mettler melt temperature of less than 200° F.

5,750,178

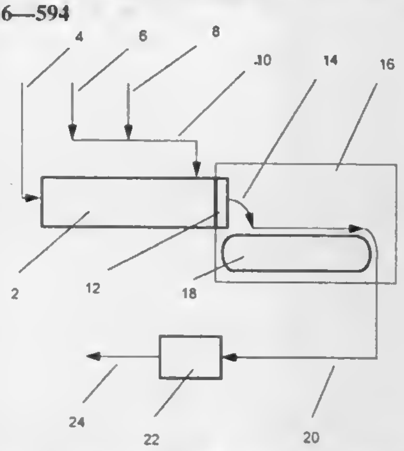
METHOD OF MAKING COFFEE PARTICLES CONTAINING AROMA

Pu-Sheng Cheng, Dublin; Robert Garwood, Bellefontaine; Zenon Ioannis Mandralis, Dublin, all of Ohio; James Tuot, Newtown, Conn., and Scott Westfall, Marysville, Ohio, assignors to Nestec S.A., Vevey, Switzerland

Filed Jun. 18, 1996, Ser. No. 665,786

Int. Cl.^{6} A23F *5/00*

U.S. Cl. 426—594 **17 Claims**



1. A method of producing coffee particles containing entrapped aroma; the method comprising:

introducing soluble coffee solids into a heating and mixing zone and raising the temperature to form a mass of molten soluble coffee solids;

introducing an aroma-containing substrate into the mass of molten soluble coffee solids to form a molten mixture of the aroma-containing substrate and the molten soluble coffee solids, the molten mixture containing a gas under pressure;

extruding the molten mixture into a pressure zone in which the pressure is greater than the pressure of the gas in the molten mixture and retaining the molten mixture in the pressure zone until the molten mixture solidifies to form a hardened glass; and

comminuting the glass into coffee particles.

5,750,179

PROCESS FOR PRODUCING A WATER-SOLUBLE LIPIDIC HOP EXTRACT

James A. Guzinski, and Mark H. Schulze, both of Kalamazoo, Mich., assignors to Kalamazoo Holdings, Inc., Kalamazoo, Mich.

Filed Sep. 13, 1994, Ser. No. 305,134

Int. Cl.^{6} C12C *3/00;3/08*

U.S. Cl. 426—600 **16 Claims**

1. A process for producing a water-dispersible lipidic hop extract composition, comprising at least 10% by weight of free fatty acid substances derived from hops, as determined by A.O.C.S. Method 5A-40, which is water-dispersible when said composition is combined with water or with wort, which consists essentially of admixing the lipidic components of a hop extract which are essentially free of alpha and isoalpha acids with sufficient alkali to raise the pH of the mixture to at least about 13, saponifying the the lipidic components and optionally removing any aqueous phase, thereby producing said lipidic hop extract composition comprising at least 10% by weight of free fatty acid substances derived from hops, which is dispersible in water and wort.

5,750,180

PROCESS FOR OBTAINING LIPID FRACTIONS FROM EGG PRODUCTS IN POWDER FORM

Jurgen Heidlas, Trostberg; Jan Cully, Garching; Franz Michlbauer, Kirchweidach, and Heinz-Rudiger Vollbrecht, Altenmarkt, all of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

PCT No. PCT/EP94/00793, § 371 Date Sep. 7, 1995, § 102(e) Date Sep. 7, 1995, PCT Pub. No. WO94/21763, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 14, 1994, Ser. No. 513,911

Claims priority, application Germany, Mar. 15, 1993, 43 07 980.6

Int. Cl.^{6} A23L *1/32;* **C07F** *9/02*

U.S. Cl. 426—614 **15 Claims**

1. A method for isolating a lipid fraction from an egg product in powdered form having phospholipids comprising:

(a) exposing said egg product to a liquefied gas consisting of propane and no more than 45 percent by weight butane at a pressure of ≦200 bar and a temperature of ≦70 ° C. to obtain a first extraction fraction and a first extraction residue,

(b) exposing said first extraction residue to an extraction mixture of an aliphatic alcohol having from 1 to 4 carbon atoms a liquefied gas consisting of propane and no more than 45 percent by weight butane to obtain a second extraction residue and a second extraction fraction; and

(c) isolating a lipid fraction from said second extraction fraction obtained in step (b).

5,750,181

PREPARATION OF FRESH COMMINUTED ONIONS

Gary S. Greff, 3rd St. E. Box 184, Regent, N. Dak. 58650

Filed Apr. 12, 1996, Ser. No. 631,541

Int. Cl.^{6} A23B *7/10;* **A23L** *1/05*

U.S. Cl. 426—615 **8 Claims**

1. A preparation of fresh comminuted onions which may be refrigerated comprising:

(a) from 95% to 97% of ground raw onions;
(b) from 0.4% to 0.8% of citric acid;
(c) from 0.2% to 0.53% of sodium erythorbate;
(d) from 0.05% to 0.25% of xanthan gum;
(e) from 0.2% to 0.5% of salt;
(f) from 0.8% to 4% water;
(g) from 0.02% to 0.1% of a preservative; and
(h) from 0.01% to 1.0% of maltol.

5,750,182

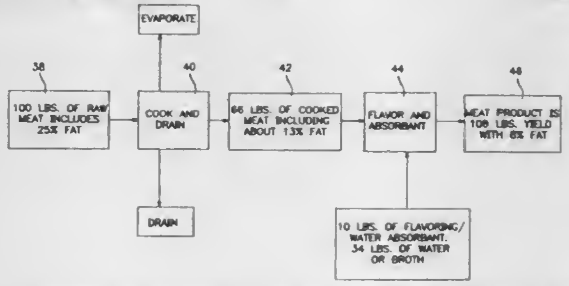
METHOD FOR PRODUCING A LOW FAT MEAT PRODUCT

Geoffrey Margolis, 12229 Falkirk La., Los Angeles, Calif. 90049, and Joaquin Pelaez, 17901 Von Karman, Irvine, Calif. 92614

Continuation of Ser. No. 699,011, Aug. 16, 1996, Pat. No. 5,652,012, Division of Ser. No. 303,321, Sep. 9, 1994, Pat. No. 5,584,236. This application Nov. 15, 1996, Ser. No. 749,810

Int. Cl.^{6} A23L *1/314;1/317*

U.S. Cl. 426—646 **1 Claim**


EVAPORATE
38
40
42
44
46
100 LBS. OF RAW MEAT INCLUDES 25% FAT
COOK AND DRAIN
66 LBS. OF COOKED MEAT INCLUDING ABOUT 13% FAT
FLAVOR AND ABSORBANT
MEAT PRODUCT IS 100 LBS. YIELD WITH 8% FAT
DRAIN
10 LBS. OF FLAVORING/ WATER ABSORBANT. 34 LBS. OF WATER OR BROTH

1. A method for producing low fat, chunky ground meat of high yield comprising the steps of:

a. providing a cooking vessel with at least one drainage opening, a drainage slot member disposed on the vessel adjacent each drainage opening, the drainage slot member configured to allow liquified fat to pass therethrough but to inhibit the passage of meat product therethrough, means for selectively closing and opening each drainage slot member, said means being moveable from a first position wherein the slot member is closed, thereby preventing the slot member from being plugged with meat, to a second position wherein the slot member is open, thereby permitting liquified fat to readily pass therethrough, and at least one protrusion provided on each of said closing and opening means and arranged to fit within each drainage slot member to substantially close each drainage slot member upon the closing and opening means being moved into the first position;
b. closing each drainage slot member;
c. cooking a raw meat product in the vessel following step (b) so as to form liquified fat and broth;
d. opening each drainage slot member following the initiation of step (c),
e. draining liquified fat out of the vessel through each drainage slot member; and
f. adding water, a water absorbent compound, and taco flavor flavoring agent to the meat after step (e).

5,750,183

PROCESS FOR PRODUCING PROTEINACEOUS MICROPARTICLES

Norio Yamamoto; Yoshihiro Yamamoto, both of Itami; Tetsuo Nunome, Kawanishi; Koutarou Muroyama, Itami, and Hiroaki Kusaka, Takarazuka, all of Japan, assignors to Takeda Food Products, Ltd., and Miki Trading Co., Ltd., both of Osaka, Japan

Filed Nov. 15, 1994, Ser. No. 341,899

Claims priority, application Japan, Nov. 16, 1993, 5-286552

Int. Cl.^{6} A23J *1/20*

U.S. Cl. 426—656 **6 Claims**

1. A process for producing proteinaceous microparticles which comprises:

lowering pH of a liquid mixture, which contains a whey protein together with a metal element, to a pH of from 3 to 5 by using an acid;
removing insoluble material formed by the pH lowering from the liquid mixture; raising the pH of the liquid mixture after the removal of the insoluble material to a pH of from 6 to 9; and
mixing the resulting liquid mixture after the raising of the pH with a hydrophilic organic solvent to precipitate proteinaceous microparticles in the liquid mixture.

5,750,184

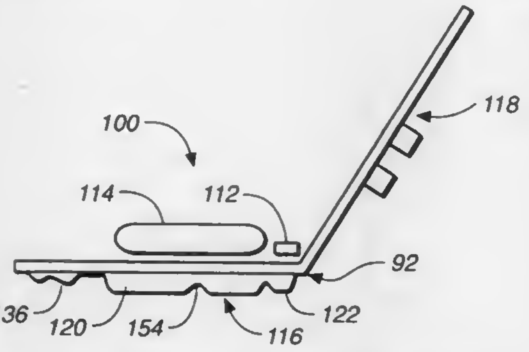
UNITARY BIOLOGICAL INDICATOR FOR GASEOUS STERILANTS AND PROCESS

Richard Imburgia, Vernon Hills, Ill., assignor to Pharmaceutical Systems, Inc., Mundelein, Ill.

Filed Dec. 19, 1995, Ser. No. 574,642

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 427—2.13 **14 Claims**



11. A process of making a biological indicator, comprising:
providing a cavity member sheet of deformable material having an initial surface with an axis there along and an edge intersecting the axis;
deforming the cavity member sheet to form a pathway protruding from the initial surface and generally extending in the direction of the axis from adjacent to the end, the pathway defining a first pathway portion adjacent to the edge, an interior pathway portion, and a middle pathway portion therebetween, the first pathway portion having at least one 90° angle with respect to the axis;
disposing a frangible ampule in the middle pathway portion and a carrier in the interior pathway portion, the frangible ampule having microorganism growth medium therein, the carrier having microorganism spores thereon;
sealing a backing member sheet to the initial surface; and,
creating a fold line between the first pathway portion and the middle pathway portion, the fold line adapted to facilitate selectively crimping the pathway between the edge and the ampule and thereby retarding fluid communication into the pathway.

5,750,185

METHOD FOR ELECTRON BEAM DEPOSITION OF MULTICOMPONENT EVAPORANTS

Klaus Goedicke; Christoph Metzner; Volker Kirchhoff; Wolfgang Hempel, all of Dresden, and Nicolas Schiller, Helmsdorf, all of Germany, assignors to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V., Munich, Germany

Filed Apr. 29, 1996, Ser. No. 638,393

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—8 **3 Claims**

1. A method for controlling electron beam deposition of a multicomponent material, said method comprising steps of:
feeding a multicomponent material to be vaporized into a molten bath at a material feed rate;
impinging at least one electron beam on a surface of said molten bath to vaporize said multicomponent material in an electron beam deflection pattern, said electron beam having an electron beam power;
depositing said vaporized multicomponent material on a substrate;
measuring in situ an X-radiation signal omitted from at least one point of said electron beam impingement on said surface; and
controlling at least one of said material feed rate, said electron beam deflection pattern, and said electron beam power, such that said measured X-radiation signal remains constant with respect to time to achieve a constant composition of components of said multicomponent material deposited on said substrate.

5,750,186

METHOD OF COATING A SURFACE

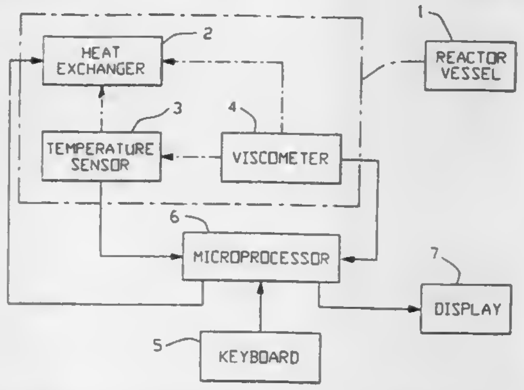
Joseph Frazzitta, 279 Cherry Pl., East Meadow, N.Y. 11554

PCT No. PCT/US94/07923, § 371 Date Jan. 15, 1997, § 102(e) Date Jan. 15, 1997, PCT Pub. No. WO96/02327, PCT Pub. Date Feb. 1, 1996

Continuation-in-part of Ser. No. 29,681, Mar. 11, 1993, Pat. No. 5,384,160. This PCT application Jul. 15, 1994, Ser. No. 765,940

Int. Cl.^{6} B05D *1/36*

U.S. Cl. 427—8 **20 Claims**



1. A method for depositing an aqueous coating composition onto an ink layer or uninked surface in a printing process comprising:
1). Depositing a first layer of ink onto a surface to be coated;
2). Drying said ink layer;
3). Determining a desired viscosity of an aqueous coating composition to be deposited onto said ink layer or said surface, said composition comprising:
  a. about 15% to about 85% by weight of a film-forming polymer, said film-forming polymer comprising a mixture of high molecular weight and low molecular weight film-forming polymers, said mixture of polymers comprising about 5% to about 95% by weight of a high molecular weight film-forming polymer and about 5% to about 95% by weight of a low molecular weight film-forming polymer, said high molecular weight film-forming polymer having an average molecular weight ranging from about 30,000 to about 5,000,000 and said low molecular weight having an average molecular weight ranging from about 100 to about 25,000;
  b. an amount of a wetting agent effective to substantially eliminate levelling problems after deposition caused by surface tension; and
  c. the remainder of said composition comprising a mixture of water or water and at least one solvent in the form of a volatile organic compound;
4). Determining the temperature above or below ambient temperature at which said composition attains the viscosity determined in step 3);

5). Maintaining the viscosity of said composition at the temperature determined in step 4); and
6). Depositing onto said ink layer or said surface said aqueous coating composition at said temperature.

5,750,187

PROCESS OF MANUFACTURING A CATHODE-RAY TUBE WITH AN ANTI-GLARE, ANTI-STATIC, DARK FACEPLATE COATING

Giuseppe Magnone, Alatri; Guido Manciocco, Colleferro, and Patrizia Cinquina, Vasto, all of Italy, assignors to Videocolor, S.p.A., Anagni, Italy

Filed Dec. 14, 1995, Ser. No. 572,429

Claims priority, application Italy, Aug. 9, 1995, MI95A1768

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 427—64 **7 Claims**

1. A process of manufacturing a cathode-ray tube (CRT) having an anti-glare, dark coating on an exterior surface of a CRT faceplate comprising the steps of:
forming a substantially homogeneous initial carbon dispersion containing substantially equal parts, by weight, of carbon particles and an organic vehicle;
combining between 0.6 to 1.4 wt. % of said homogeneous initial carbon dispersion with about 2.2 wt. % of lithium polysilicate and the balance deionized water to form a final dispersion comprising between 0.22 and 0.50 wt. % carbon and about 0.8 wt. % lithium polysilicate; and
applying said final dispersion to said faceplate to form said anti-glare, dark coating.

5,750,188

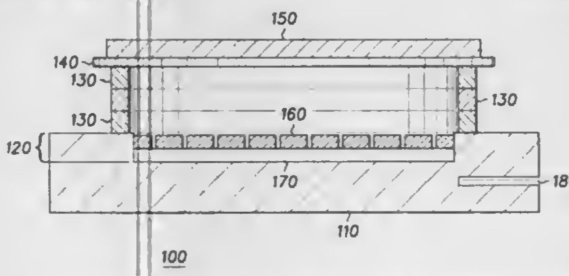
METHOD FOR FORMING A THIN FILM OF A NON-STOICHIOMETRIC METAL OXIDE

Eric P. Menu, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1996, Ser. No. 705,361

Int. Cl.^{6} B05D *5/13*

U.S. Cl. 427—126.3 **22 Claims**



1. A method for forming a thin film of a non-stoichiometric metal oxide including the steps of:
providing a mixture including powdered graphite and a powdered metal oxide, the powdered graphite 20–80% by volume of the mixture;
providing a substrate made from a material capable of withstanding high temperatures and having a surface, disposing said mixture and the surface of said substrate within a confined environment, the surface of the substrate being spaced from said mixture by a distance;
heating the mixture to a first temperature within 400–1000 degrees Celsius;
providing within the confined environment a partial pressure of oxygen, the first temperature of the mixture and the partial pressure of oxygen forming a reducing environment, the reducing environment forming a gaseous transport species of the metal;
maintaining the surface of the substrate at a second temperature, the second temperature being less than the first temperature thereby defining a temperature gradient between the surface of the substrate and the mixture; and
controlling the temperature gradient to provide transport of the gaseous transport species of the metal from the mixture to the substrate.

5,750,189

PROCESS FOR PROTECTING A SURFACE FROM NON-DESIRED CONTAMINATION

Sigfrid Svensson, Bryssel, Belgium, assignor to Polysaccharide Industries AB PSI, Bromma, Sweden

PCT No. PCT/SE95/00307, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO95/25604, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 23, 1995, Ser. No. 714,058

Claims priority, application Sweden, Mar. 23, 1994, 9400976

Int. Cl.^{6} B65B *33/00*

U.S. Cl. 421—154 **23 Claims**

1. A process for protecting a surface from contamination and facilitating the removal of contamination therefrom comprising the following steps:
(i) preparing a polysaccharide containing solution which comprising at least two different polysaccharides, the first polysaccharide being one which directly forms a film when precipitated by evaporation of a solvent in the solution, and wherein the second polysaccharide itself forms a film at least partially via gel formation when precipitated from a solution by evaporation of a solvent contained therein or the second polysaccharide forms a film at least partially via gel formation upon interaction with said first polysaccharide upon precipitation by evaporation of a solvent contained therein, said films being redissolvable or swellable, and wherein the polysaccharide containing solution comprises a buffer which compensates for pH changes in the film;
(ii) applying the solution of step (i) onto a surface which is to be subjected to a source of contamination;
(iii) allowing the applied solution to dry on said surface to produce a solid film on said surface, at least partially via gel formation;
(iv) exposing the surface to a source of potential contamination;
(v) treating the film-coated surface with a liquid capable of redissolving the film or swelling the film;
(vi) removing non-desired contamination deposited on said surface by complete or partial removal of said film from said surface.

5,750,190

PROTECTIVE COATING AND METHOD OF USING SUCH COATING

Edward W. Woodhall, 10450 W. Loyola Dr., Los Altos, Calif. 94022, and Nicholas Kondrats, 5702 Cathedral Oaks Rd., Goleta, Calif. 93117

Continuation-in-part of Ser. No. 209,796, Mar. 10, 1994, Pat. No. 5,411,760, which is a division of Ser. No. 16,872, Feb. 11, 1993, Pat. No. 5,362,786, which is a continuation of Ser. No. 972,037, Nov. 5, 1992, Pat. No. 5,302,413, which is a continuation-in-part of Ser. No. 788,006, Nov. 5, 1991, Pat. No. 5,186,978, which is a continuation-in-part of Ser. No. 614,330, Nov. 16, 1990, abandoned. This application May 1, 1995, Ser. No. 432,024

Int. Cl.^{6} B65B *33/00;* **C08K** *5/54*

U.S. Cl. 427—156 **25 Claims**

1. A method of temporarily protecting portions of a motor vehicle surface from paint, said method comprising the steps of:
a) applying a masking material to said surface portions of said motor vehicle, wherein said applying is effective to produce a substantially continuous film of a masking material over said surface portions of said motor vehicle, said masking material comprising
  (i) between about 5% to about 25%, by weight, polyvinyl alcohol;

(ii) less than about 20%, by weight, ethyl alcohol, based on 190 proof alcohol;
(iii) a surfactant composition present in an amount effective to produce a coating that lays out smoothly in a substantially continuous thin film;
(iv) less than about 4%, by weight, a blocking agent selected from the group consisting of polyethylene oxide, polypropylene oxide, polyethylene oxide/polyoropylene oxide copolymer, polyethylene glycol, and lecithin; and
(v) water; with the proviso that components (ii) and (iii) are present;

b) painting said surface of said motor vehicle, wherein said masking material is effective to prevent paint to cause contact with said surface portions of said motor vehicle to be protected; and
c) removing said masking material from said surface portions of said motor vehicle to be protected by peeling or with a water wash, whereby paint applied to said protected portions of said surface of said motor vehicle is removed together with said masking material.

20. A composition for the temporary protection of portions of a motor vehicle surface from paint, said composition comprising:
between about 1% to 30% polyvinyl alcohol by weight;
a surfactant composition present in an amount effective to produce a coating that lays out smoothly in a substantially continuous thin film;
at least about 0.1%, by weight, of a plasticizer; and
at least about 60% water by weight.

5,750,191

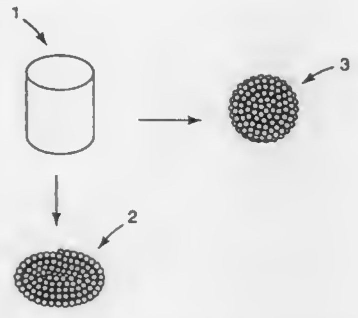
RETROREFLECTIVE ELEMENTS

Kathleen A. Hachey; Larry K. Stump, both of Hudson, Wis.; Terrance L. Beseup, Woodbury, Minn., and Thomas V. Kusilek, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 418,514, Apr. 7, 1995, Pat. No. 5,571,362, which is a division of Ser. No. 247,056, May 20, 1994, Pat. No. 5,417,515. This application Jul. 18, 1995, Ser. No. 503,532

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—163.4 **22 Claims**



1. A process of preparing a retroreflective element comprising:
(a) combining a bed of optical elements and one or more core elements comprising a thermoplastic material wherein the ratio of the diameter of the optical elements to the diameter of the core elements is no greater than about 1:2; and
(b) agitating the combination of optical elements and core elements for a sufficient period of time and at a sufficient temperature to coat the optical elements onto the core elements to form one or more retroreflective elements.

5,750,192

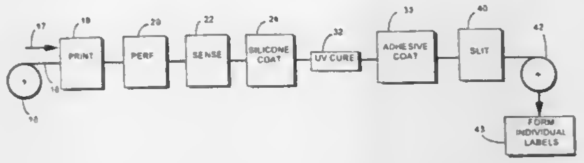
METHOD OF PRODUCING LINERLESS THERMAL LABELS

Douglas M. Smith, 2 Radcliffe Rd., Buffalo, N.Y. 14214

Division of Ser. No. 416,287, Apr. 4, 1995, Pat. No. 5,578,352. This application Aug. 13, 1996, Ser. No. 689,659

Int. Cl.^{6} B05D *5/10*

U.S. Cl. 427—208 **15 Claims**



1. A method of producing linerless thermal labels, from a web of thermal transfer base stock having a first face with a thermal transfer coating thereon, and a second face and comprising a plurality of individual labels having edges extending in a first direction, comprising the steps of:
(a) moving the web in the first direction; while the web is moving in the first direction:
(b) applying spaced patterns of adhesive release material directly to the first face thermal transfer coating substantially along the first direction and covering less than 50% of the thermal transfer coating on the first face;
(c) applying spaced patterns of adhesive to the second face substantially along the first direction, and substantially in alignment with the patterns of adhesive release material, and covering less than 50% of the second face;
wherein steps (b) and (c) are practiced to apply the patterns along edges extending in the first direction of individual labels, and so that the adhesive release material patterns are slightly wider than the adhesive patterns.

5,750,193

PROCESS FOR PRODUCING TIN SINTERED BODIES AND COATINGS

Rüdiger Nass, Riegelsberg; Mesut Aslan, Pirmasens; Sener Albayrak; Helmut Schmidt, both of Saarbrücken, all of Germany, and Ertugrul Arpac, Antalya, Turkey, assignors to Institut Für Neue Materialien Gemeinnützige GmbH, Saarbrücken, Germany

PCT No. PCT/EP94/03335, § 371 Date May 6, 1996, § 102(e) Date May 6, 1996, PCT Pub. No. WO95/10491, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 10, 1994, Ser. No. 632,502

Claims priority, application Germany, Oct. 11, 1993, 43 34 639.1

Int. Cl.^{6} B05D *7/00*

U.S. Cl. 427—213.31 **17 Claims**

1. A process for producing TiN sintered bodies or coatings, comprising the steps of:
adding TiN powder comprising agglomerated nanocrystalline TiN particles to a dispersion medium in the presence of at least one organic surface-modifying agent;
deagglomerating said powder by allowing said organic surface-modifying agent to react or interact with a surface of said nanocrystalline TiN particles, thereby forming a nanodisperse suspension of surface-modified nanocrystalline TiN particles;
processing said surface-modified nanocrystalline TiN particles into a green body or coating; and
sintering said green body or coating;
wherein said dispersion medium is removed.

5,750,194

PROCESS FOR PRODUCING A METAL PASTE

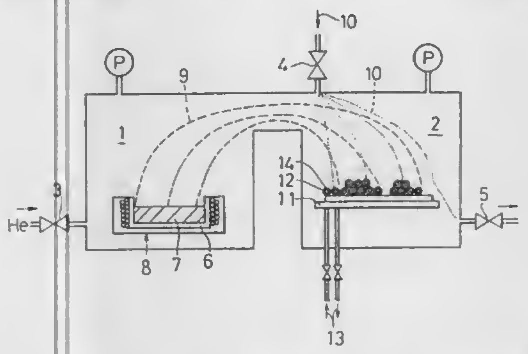
Kazuhiro Watanabe, Tsuchiura; Michihiro Oshima, Hachinohe; Kazuhiro Setoguchi, Chiba, and Masaaki Oda, Yachimatamachi, all of Japan, assignors to Vacuum Metallurgical Co., Ltd., Chiba-ken, Japan

Division of Ser. No. 677,190, Mar. 29, 1991, Pat. No. 5,587,111, which is a continuation-in-part of Ser. No. 622,569, Dec. 5, 1990, abandoned. This application Aug. 28, 1996, Ser. No. 704,250

Claims priority, application Japan, Mar. 29, 1990, 2-81635

Int. Cl.^{6} B05D *7/14;* **C23C** *14/12*

U.S. Cl. 427—216 **4 Claims**



1. A process for producing a metal paste, comprising the steps of evaporating a metal in a vacuum chamber in an atmosphere of inert gas at a pressure of 10 Torr or less, introducing a vapor of an organic solvent into said vacuum chamber while said metal is being evaporated, and collecting vapor of the evaporated metal on a cooling surface in the form of ultrafine particles having a particle size of 1000 angstroms or less and covered with the organic solvent.

5,750,195

DEPOSITION OF DIAMOND ON OXIDIZABLE MATERIAL

Mark B. Moran, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 702,208, May 16, 1991. This application May 14, 1997, Ser. No. 856,153

Int. Cl.^{6} C23C *16/26*

U.S. Cl. 427—249 **5 Claims**

1. A method of depositing a layer of a first material from an activated mixture of gases, wherein said depositing of said layer of said first material is facilitated by oxygen in the activated mixture; wherein the layer of the first material is deposited directly on a second material oxidized by oxygen in the activated mixture; and wherein the method comprises providing an activated mixture of gases substantially without oxygen at the beginning of said depositing of said layer of said first material and providing an activated mixture of gases with oxygen after said layer of said first material is deposited to a thickness sufficient to protect said second material from oxidation by oxygen in the activated mixture.

5,750,196

PROCESS FOR MANUFACTURING DOG CHEW TOYS OF TIRE SIDEWALLS

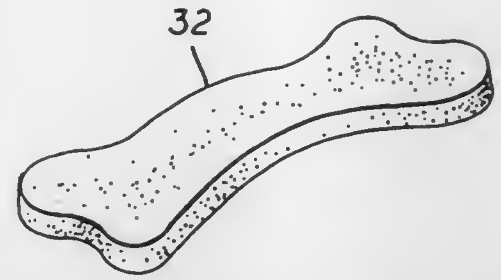
James W. Welch, El Paso, Tex., assignor to CB Worldwide Inc., Mammoth Lakes, Calif.

Continuation-in-part of Ser. No. 631,370, Apr. 12, 1996, Pat. No. 5,609,913. This application Mar. 14, 1997, Ser. No. 818,960

Int. Cl.^{6} B05D *3/10;3/12;7/02*

U.S. Cl. 427—290 **26 Claims**

1. A process for manufacturing dog chew toys of tire sidewalls, comprising the steps of:



cutting a chew toy base from a tire sidewall;
cleaning the chew toy base by scrubbing it with a brush and rinsing it with water; and
soaking the chew toy base in a conditioning solution.

5,750,197

METHOD OF PREVENTING CORROSION OF METALS USING SILANES

Wim J. van Ooij, Fairfield; Vijay Subramanian, and Chunbin Zhang, both of Cincinnati, all of Ohio, assignors to The University of Cincinnati, Cincinnati, Ohio

Filed Jan. 9, 1997, Ser. No. 781,126

Int. Cl.^{6} B05D *7/14*

U.S. Cl. 427—318 **43 Claims**

1. A method of treating a metal substrate to improve corrosion resistance, comprising the steps of:
(a) providing a metal substrate; and
(b) applying a coating of a first treatment solution directly onto the surface of said metal, said first treatment solution consisting essentially of at least one multi-functional silane having at least two trisubstituted silyl groups wherein the substituents are individually chosen from the group consisting of alkoxy and acetoxy, wherein said multi-functional silane has been at least partially hydrolyzed, and wherein said first treatment solution has a pH of less than about 7.

5,750,198

COMPOSITION AND PROCESS FOR PREPAINTING TREATMENT OF PLASTICS

Osamu Furuyama, Yokohama; Kazunari Hamamura, Sagamihara, and Masahiro Motozawa, Hiratsuka, all of Japan, assignors to Henkel Corporation, Plymouth Meeting, Pa.

PCT No. PCT/US94/08696, § 371 Date Feb. 12, 1996, § 102(e) Date Feb. 12, 1996, PCT Pub. No. WO95/04608, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 9, 1994, Ser. No. 596,249

Claims priority, application Japan, Aug. 11, 1993, 5-219176

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—322 **12 Claims**

1. A process for treating a surface of a plastic material by contacting said surface, for a sufficient time at a sufficient temperature to decrease the spreading angle of water on said surface from the value of the spreading angle of water on said surface before such treating, with an aqueous solution consisting essentially of water and
(A) a total of at least 0.05% by weight of one or more acids selected from the group consisting of carboxylic acids that do not contain any terminal alkyl group in their molecular structures, and hydroxycarboxylic acids that do not contain any terminal alkyl group in their molecular structures; and, optionally, one or more of
(B) a component selected from acids that are not part of component (A) and
(C) a component of surfactants not part of components (A) or (B);
said aqueous solution being free of an amount, sufficient to cause an initial increase in surface energy of the surface of plastic

materials treated to be reduced by drying and elapse of time, of acid molecules that contain a terminal alkyl group in their molecular structures.

5,750,199

APPARATUS AND METHOD FOR MOUNTING SOLDERING BALLS ONTO SURFACES OF ELECTRONIC COMPONENTS

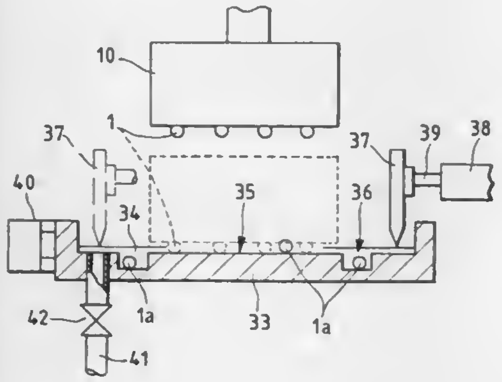
Shoji Sakemi, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 439,948, May 12, 1995, Pat. No. 5,680,984. This application Jun. 3, 1997, Ser. No. 867,801

Claims priority, application Japan, May 13, 1994, 6-99636; Jan. 31, 1995, 7-13918

Int. Cl.^{6} B05D *3/12*

U.S. Cl. 427—357 **2 Claims**



2. A method for applying flux to at least one ball comprising:
adding a flux in a reservoir;
adjusting a height of a blade a predetermined distance below a surface of said flux;
moving said blade longitudinally in said reservoir to flatten a surface of said flux at said height; and
moving said at least one of said at least one ball and said reservoir toward the other thereof to immerse a predetermined portion of a bottom of said at least one ball in said flux.

5,750,200

INK JET RECORDING SHEET AND PROCESS FOR ITS PRODUCTION

Susumu Ogawa; Hideaki Senoh; Masaru Andoh, and Hideki Nomura, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Division of Ser. No. 417,784, Apr. 6, 1995, Pat. No. 5,576,088. This application Aug. 16, 1996, Ser. No. 689,913

Claims priority, application Japan, May 19, 1994, 6-105310; Jun. 22, 1994, 6-139977; Oct. 20, 1994, 6-255408

Int. Cl.^{6} B05D *3/12*

U.S. Cl. 427—361 **6 Claims**

1. A process for producing an ink jet recording sheet, which comprises forming on a support at least one ink-receiving layer in an amount of at least 1 g/m^2 consisting essentially of a pigment and a binder, then coating on the ink-receiving layer a coating composition consisting essentially of a pigment and a binder, wherein at least 70 parts by weight in 100 parts by weight of the pigment in the coating composition are constituted by colloidal particles having an average particle size of at most 300 nm, to form a gloss-providing layer and press-contacting a heated specular roll directly to the surface of the gloss-providing layer for specular finish while the surface is still in a wet state.

5,750,201

PROCESS FOR BINDING LIGNOCELLULOSIC MATERIAL

Christopher Phanopoulos, Tervuren, and Jacobus Margareta Valentijn Vanden Ecker, Balen, both of Belgium, assignors to Imperial Chemical Industries PLC, Millbank, England

Filed Mar. 15, 1996, Ser. No. 616,796

Claims priority, application United Kingdom, Apr. 13, 1995, 95200936

Int. Cl.^{6} B27N *1/00*

U.S. Cl. 427—375 **13 Claims**

1. Process for binding lignocellulosic material comprising the steps of
a) brining said lignocellulosic material in contact with an organic polyisocyanate composition and
b) subsequently allowing said material to bind, characterised in that said lignocellulosic material is also brought into contact with a lignin solvent which is a cyclic urea, either simultaneously with or separately from the organic polyisocyanate composition.

5,750,202

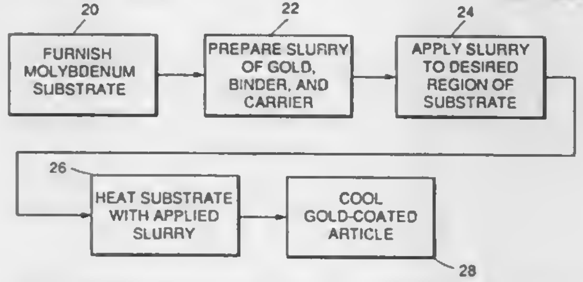
PREPARATION OF GOLD-COATED MOLYBDENUM ARTICLES AND ARTICLES PREPARED THEREBY

Timothy S. Romano; Tom K. Evans; Gary B. Hughes, all of Goleta, and Karl H. Neumann, Santa Barbara, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 19, 1994, Ser. No. 277,459

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—376.4 **16 Claims**


20
FURNISH MOLYBDENUM SUBSTRATE
22
PREPARE SLURRY OF GOLD, BINDER, AND CARRIER
24
APPLY SLURRY TO DESIRED REGION OF SUBSTRATE
26
HEAT SUBSTRATE WITH APPLIED SLURRY
COOL GOLD-COATED ARTICLE
28

15. A method for preparing a gold-coated article, comprising the steps of:
furnishing a substrate made of a material selected from the group consisting of pure molybdenum and an alloy of molybdenum;
preparing a slurry of gold powder, an acrylic-containing fluid, and acetone;
applying the slurry to a portion of a surface of the substrate;
heating the substrate with applied slurry in vacuum to an elevated temperature of from about 2030° F. to about 2050° F. to form a gold-coated article; and
cooling the gold-coated article to ambient temperature.

5,750,203

METHOD OF PREPARING ORGANICALLY MODIFIED ALUMINOSILCATES SOL-GEL FILMS

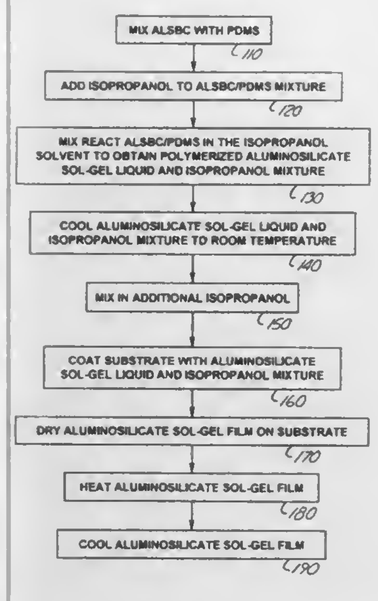
Young Chung, Calabasas, Calif., assignor to Rockwell International Corp., Seal Beach, Calif.

Filed Sep. 7, 1995, Ser. No. 524,978

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—380 **14 Claims**

1. A method of preparing an aluminosilicate sol-gel film comprising:
mixing in a 1:1 ratio by weight, chelated aluminum alkoxide and polydimethylsiloxane, the aluminum alkoxide and polydimethylsiloxane being mixed in a solvent and refluxed at approximately the boiling temperature of the solvent to produce a sol-gel mixed with the solvent, the sol-gel including polymerized aluminosilicate;


MIX ALSBC WITH PDMS
110
ADD ISOPROPANOL TO ALSBC/PDMS MIXTURE
120
MIX REACT ALSBC/PDMS IN THE ISOPROPANOL SOLVENT TO OBTAIN POLYMERIZED ALUMINOSILICATE SOL-GEL LIQUID AND ISOPROPANOL MIXTURE
130
COOL ALUMINOSILICATE SOL-GEL LIQUID AND ISOPROPANOL MIXTURE TO ROOM TEMPERATURE
140
MIX IN ADDITIONAL ISOPROPANOL
150
COAT SUBSTRATE WITH ALUMINOSILICATE SOL-GEL LIQUID AND ISOPROPANOL MIXTURE
160
DRY ALUMINOSILICATE SOL-GEL FILM ON SUBSTRATE
170
HEAT ALUMINOSILICATE SOL-GEL FILM
180
COOL ALUMINOSILICATE SOL-GEL FILM
190

cooling the sol-gel and solvent mixture to room temperature;
adding additional solvent to the sol-gel and solvent mixture to reduce the viscosity of the mixture;
coating a substrate with the reduced viscosity sol-gel and solvent mixture;
drying the sol-gel and solvent mixture on the substrate to evaporate at least a portion of the solvent and to produce an organically modified aluminosilicate sol-gel film on the substrate;
heating the sol-gel film; and
cooling the sol-gel film.

5,750,204

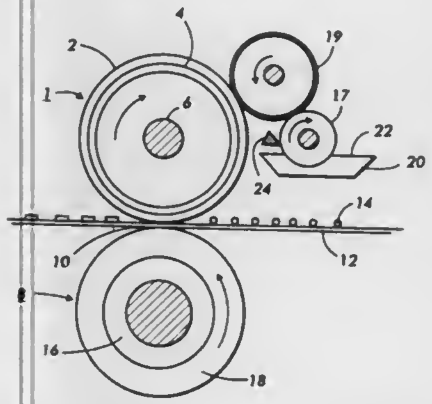
FLUOROELASTOMER SURFACES AND METHODS THEREOF

Santokh S. Badesha, Pittsford; George J. Heeks, Rochester, and Arnold W. Henry, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1996, Ser. No. 623,292

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—387 **19 Claims**



1. A ball milling-free and roll milling-free method for providing a fluoroelastomer on a supporting substrate comprising:
a) dissolving a fluoroelastomer;
b) adding and reacting an amino silane in an amount of from about 0.5 to about 10 weight percent based on the weight of said fluoroelastomer to said dissolved fluoroelastomer to form a resulting homogeneous fluoroelastomer solution; and
c) subsequently providing at least one layer of the homogeneous fluoroelastomer solution to said supporting substrate.

5,750,205

SURFACE TREATMENT OF METALS BY SHOCK-COMPRESSED PLASMA

Sergei Gennadievich Shashkovsky; Alexander Semyonovich Kamrukov, both of Moscow; Dmitry Vyacheslavovich Chepegin, Nizhnekamsk, and Victor Vladimirovich Bandurkin, Moscow, all of U.S.S.R., assignors to Woodford Trading Limited, Jersey, Channel Islands

Filed Aug. 1, 1995, Ser. No. 509,866

Claims priority, application U.S.S.R., Aug. 3, 1994, 94028267

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—535 **3 Claims**

1. A method for surface treating a metallic substrate to enhance its corrosion resistance, the method comprising the step of applying to the surface of the substrate a pulse treatment with a beam of intense high-temperature radiation generated by a coaxial plasma accelerator having a plasma focus, the power current density of the radiation beam being within a range of about 10^5–10^7 W·cm^{-2} of surface face under treatment, the pulse being within a range of about 10^{-5}–3×10^{-1} s, the pressure of the gaseous atmosphere being within a range of about 1–10^5 Pa, the operating voltage of the accelerator being within a range of about 800V–5 KV, and the substrate comprising steel.

5,750,206

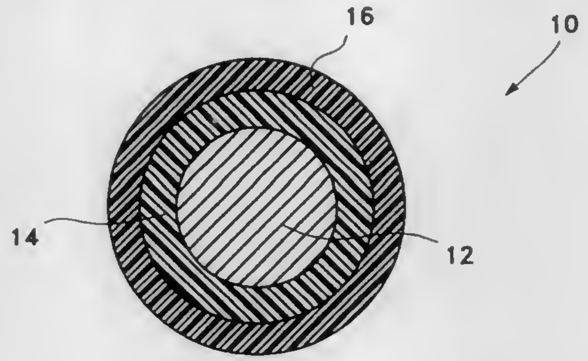
METHOD OF PRETREATING METAL SURFACES FOR SUBSEQUENT POLYMER COATING

Robert Hergenrother, Fremont; Uriel Hiram Chee, San Carlos, and Laurent Schaller, Los Altos, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Division of Ser. No. 97,458, Jul. 27, 1993, Pat. No. 5,388,343. This application Apr. 27, 1995, Ser. No. 429,599

Int. Cl.^{6} C08J *7/18*

U.S. Cl. 427—490 **12 Claims**

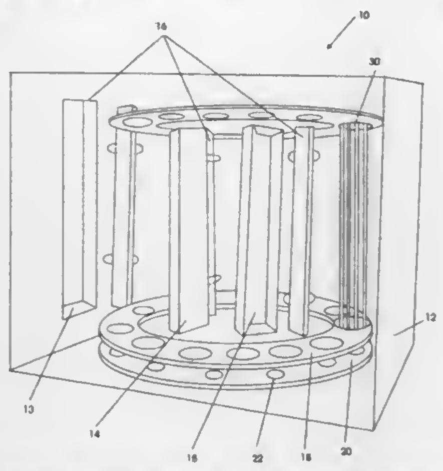


1. A method of coating a metal surface with a polymer comprising the following steps:
exposing a metal surface to a hydrocarbon plasma to deposit a hydrocarbon residue on the metal surface,
depositing a photocrosslinkable system on the hydrocarbon residue, the photocrosslinkable system comprising molecules of a polymer and a chemical linking moiety possessing a photochemically reactive group capable upon activation of covalently bonding to the hydrocarbon residue; and
activating the photochemically reactive group of the chemical linking moiety to cause the photochemically reactive group to covalently bind to the hydrocarbon residue.

5,750,207
SYSTEM AND METHOD FOR DEPOSITING COATING OF MODULATED COMPOSITION

Mark S. Hammond, and Timothy W. McClain, both of Houston, Tex., assignors to SI Diamond Technology, Inc., Austin, Tex.

Filed Feb. 17, 1995, Ser. No. 390,542
Int. Cl.^{6} H05H *1/24*
U.S. Cl. 427—576 **20 Claims**



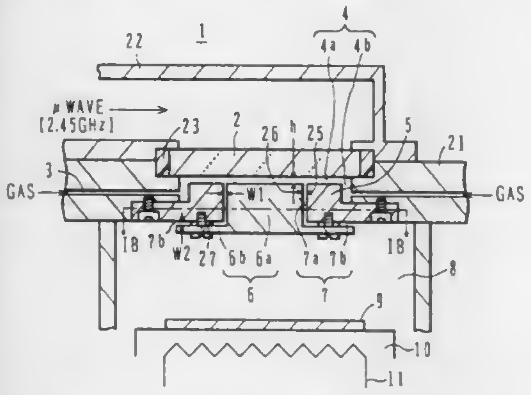
1. Apparatus for depositing a coating of a modulated composition of transition metal compounds from a reactive plasma cathodic arc on to articles, comprising:

a vacuum chamber having inlets for controlling entry of a selected gas;
a movable carriage;
a movable support member attached to the carriage, the support member being electrically isolated from the chamber and adapted to support articles to be coated;
a plurality of cathode assemblies, at least one cathode being of a composition different from the composition of a second cathode, the cathode assemblies being placed so as to form a plasma in the region along the path through which the movable support member passes when the carriage is moved, the cathode assemblies being spaced apart along the path;
an anode; and
means for moving the carriage and the support member.

5,750,208
METHOD FOR PLASMA DOWNSTREAM PROCESSING

Satoru Mihara, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 498,347, Jul. 5, 1995, Pat. No. 5,562,775. This application Jul. 17, 1996, Ser. No. 682,134
Claims priority, application Japan, Aug. 12, 1994, 6-190212
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 427—539 **11 Claims**



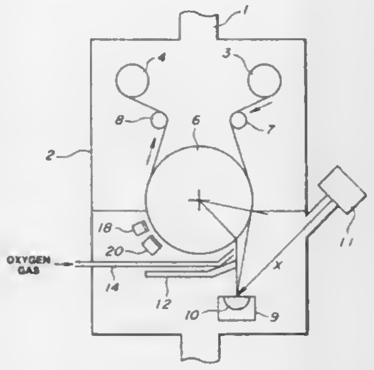
1. A method for performing plasma downstream processing comprising the steps of:

generating plasma of an oxygen-containing gas with a microwave, in a space having a thickness of 1/10 or less of a wavelength μ of the microwave, the space being defined between a microwave transmitting window and a microwave shield, the microwave shield comprising a central member and an outer member, the central member including a solid central portion facing a central portion of the microwave transmitting window, and a brim extending outwardly from a bottom portion of the solid central portion, the outer member being disposed around the solid central portion through a first gap normal to the space, and above the brim through a second gap parallel to the space, the first gap and the second gap being connected to form a composite gap of folded cross section in a plane including the solid central portion and being normal to the space, the composite gap preventing direct pass-through of particles without collision;
deriving species of the generated plasma of the oxygen containing gas from said space through said first gap and said second gap from an opening formed around a central portion of said plasma generating space, the first gap and the second gap annihilating charged particles generated in said plasma and allowing passage of neutral particles; and
irradiating the neutral particles generated in said plasma of the oxygen-containing gas and derived through said first gap and said second gap to an object to be processed.

5,750,209
METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM AND APPARATUS THEREFOR

Tetsuo Samoto, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1996, Ser. No. 718,231
Claims priority, application Japan, Sep. 26, 1995, 7-248061
Int. Cl.^{6} H05H *1/24*
U.S. Cl. 427—569 **9 Claims**



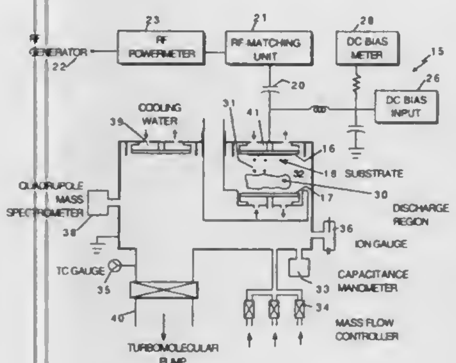
1. A method for producing a magnetic recording medium including a non-magnetic substrate, a magnetic layer formed on one surface of said non-magnetic substrate and a back coat layer formed on an opposite surface of said non-magnetic substrate, both the magnetic layer and backing layer being formed in a single common apparatus comprising the steps of:

forming a magnetic layer on one surface of a non-magnetic substrate in a single common apparatus by vapor deposition;
forming a back coat layer on an opposite surface of said non-magnetic substrate in said single common apparatus by a plasma chemical vapor deposition; and
supplying a lubricant, substantially at the time when said back coat layer is formed by the plasma chemical vapor deposition, such that the lubricant is introduced into said back coat layer.

5,750,210
HYDROGENATED CARBON COMPOSITION

Paul Herman Schmidt, West Boylston, Mass., and John C. Angus, Cleveland Heights, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Continuation of Ser. No. 114,917, Sep. 1, 1993, abandoned, which is a division of Ser. No. 344,990, Apr. 28, 1989, Pat. No. 5,266,409. This application May 22, 1995, Ser. No. 445,589
Int. Cl.^{6} H05H *1/24;* **C23C** *14/06;14/14;14/32*
U.S. Cl. 427—577 **19 Claims**



1. A method of controlling wearability of a composition formed by depositing constituents of a formation gas onto a substrate, said constituents including carbon and hydrogen, or ions thereof, and optionally including one or more elements selected from a group consisting of fluorine, boron, oxygen, argon, and helium, or ions thereof, said method comprising the steps of:

including silicon, or ions thereof, in said constituents of said formation gas,
selecting in accordance with said wearability:
a) molar ratios between said carbon, hydrogen, and silicon in said formation gas, wherein said molar ratios of carbon to silicon and hydrogen to silicon are, respectively, 5.6:1 and 0.3:1 or greater, such that decreasing said molar ratios of carbon or hydrogen to silicon increases said wearability, and
b) an impact energy within a range of 30 eV to 200 eV, inclusive, between ions of said constituents in said formation gas and said substrate, such that increasing said impact energy increases said wearability,
placing said substrate in a chamber,
introducing into said chamber said formation gas having a pressure between 5 mtorr and 100 mtorr and said selected molar ratios of said carbon to silicon, and said hydrogen to silicon, and
energizing said formation gas to cause said ions of said constituents in said formation gas to strike said substrate with said selected impact energy,
whereby said constituents are deposited on said substrate to form said composition with said wearability in accordance with said selected molar ratios and said selected impact energy, said composition having a density of between 0.29 moles of atoms per cubic centimeter and at least 0.18 moles of atoms per cubic centimeter, and having the formula:

$$C_{1-z-w}Si_zA_w(H_{1-x}F_x)_y$$

wherein A is boron or oxygen, and $0<z+w\leqq 0.15$, $0<z$, $0\leqq w\leqq 0.05$, $0\leqq x\leqq 0.10$, and $0<y<1.5$.

5,750,211
PROCESS FOR DEPOSITING A SIO$_x$ FILM HAVING REDUCED INTRINSIC STRESS AND/OR REDUCED HYDROGEN CONTENT

Mark Weise, and Dean R. Denison, both of San Jose, Calif., assignors to LAM Research Corporation, Fremont, Calif.

Continuation of Ser. No. 701,749, May 17, 1991, abandoned. This application Jul. 16, 1993, Ser. No. 106,768
Int. Cl.^{6} B05D *3/06;* **C23C** *16/40*
U.S. Cl. 427—579 **29 Claims**

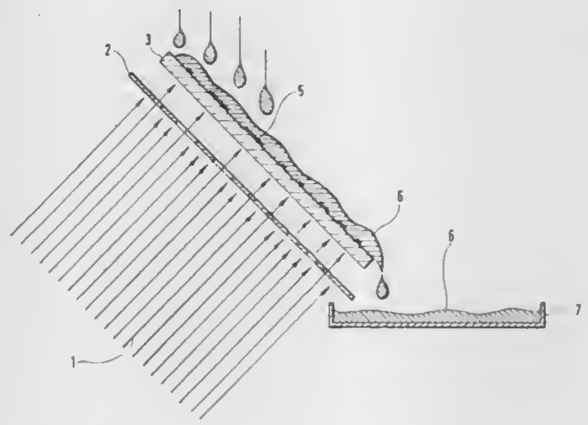
1. An ECR CVD process for growing a SiO$_x$ film having reduced intrinsic stress, comprising the steps of:

providing a substrate in a reaction zone of an ECR CVD reactor;
simultaneously introducing first, second and third gases into the reaction zone, the first gas being a carbon-free silicon containing gas and the third gas consisting essentially of oxygen;
growing the film on the substrate by decomposing the first gas and reacting the decomposed gas on a surface of the substrate, the growing film comprising atoms in ordered and disordered crystallographic states; and
reducing intrinsic stress in the film by removing atoms from the growing film in the disordered crystallographic state, the disordered atoms being removed by reacting a chemically active species of the second gas with the growing film, the second gas being a carbon-free halogen containing gas and the film growing and intrinsic stress reducing steps being performed simultaneously, the film growing and intrinsic stress reducing steps being performed under ECR condition in a vacuum environment.

5,750,212
PROCESS FOR THE DEPOSITION OF STRUCTURED METALLIC COATINGS ON GLASS SUBSTRATES

Jorg Kickelhain, Neustadt, Germany, assignor to LPKF CAD/CAM Systeme GmbH, Germany

Filed Jul. 30, 1992, Ser. No. 923,220
Claims priority, application Germany, Aug. 3, 1991, 41 25 863.0
Int. Cl.^{6} B05D *3/06;5/12;* **C23C** *18/14*
U.S. Cl. 427—581 **8 Claims**



1. A process for depositing a layer of copper in a pattern on the back face of a flat silica glass piece having a back face and a front face comprising, maintaining said back face in contact with a reductive copper liquid solution, positioning a mask having an open area that is shaped in said pattern between said front face and a source of an excimer laser beam having sufficient energy to cause copper to deposit on said back face, directing said excimer laser beam through said mask and onto said front face whereby copper in said pattern deposits from said liquid onto said back face.

5,750,213

POLYMERIZABLE COMPOUND AND LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME

Noriaki Onishi, Nara; Nobuaki Yamada, Higashiosaka; Masahiko Yoshida, Soka; Hoyo Mizobe, Soka, and Kenji Suzuki, Soka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, and Kanto Kagaku Kabushiki Kaisha, Tokyo, both of Japan

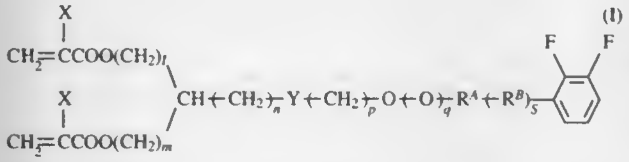
Filed Feb. 25, 1997, Ser. No. 806,100

Claims priority, application Japan, Feb. 26, 1996, 8-038517

Int. Cl.^{6} C09K *19/30*

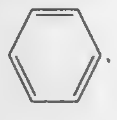
U.S. Cl. 428—1 **8 Claims**

1. A polymerizable compound represented by Formula (I):

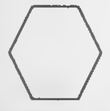


(I)

where X is a hydrogen atom or a methyl group; l and m are independently an integer of 0 to 14; Y is a single bond, —COO—, —OCO—, or —O—; n and p are independently an integer of 0 to 18; q and s are independently an integer of 0 or 1; and R^A and R^B are independently represented by Formula (II) or (III);



(II)



(III)

provided that, when q=1, p≧2; and when R^A is represented by the Formula (II), R^B is represented by the Formula (II).

5. A liquid crystal display device comprising: a pair of substrates; and a liquid crystal layer interposed between the substrates including a polymer and a liquid crystal region surrounded by the polymer,

wherein the polymer is made from a polymerization precursor containing at least the polymerizable compound of claim 1.

5,750,214

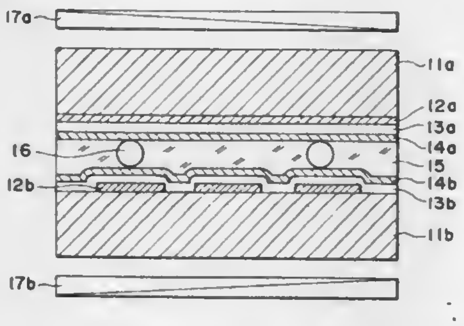
LIQUID CRYSTAL DEVICE

Nobuhiro Ito, Sagamihara; Yasuaki Takeda, Chigasaki; Yukio Hanyu, Isehara; Masanobu Asaoka, Yokohama; Ikuo Nakazawa, Atsugi; Yasufumi Asao, Isehara, and Takashi Moriyama, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1996, Ser. No. 766,883

Int. Cl.^{6} G02F *1/1337*

U.S. Cl. 428—1 **17 Claims**



1. A liquid crystal device, comprising: a pair of substrates at least one of which is provided with an alignment control film, and a liquid crystal composition disposed between the substrates and contacting said alignment control film, wherein said alignment control film comprises an amide polymer and a pyridine-based polymer.

5,750,215

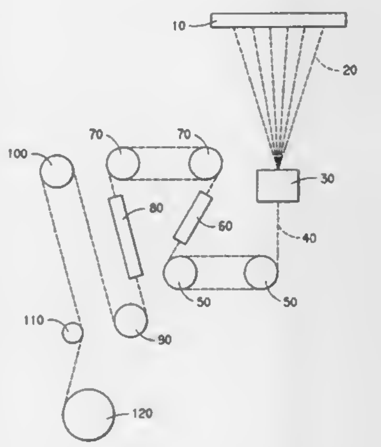
HIGH SPEED PROCESS FOR MAKING FULLY-ORIENTED NYLON YARNS AND MADE THEREBY

Walter John Jaegge, Ponca City, Okla.; Francis Joseph Malone, Jr., Hixson, Tenn.; Frank Hudson Overton, Signal Mountain, Tenn.; Roger Allen Ross, Chattanooga, Tenn., and Ronald Edward Steele, Hixson, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 642,298, May 3, 1996, abandoned, which is a continuation of Ser. No. 380,911, Feb. 7, 1995, Pat. No. 5,558,826. This application Mar. 11, 1997, Ser. No. 814,851

Int. Cl.^{6} B27N *0/00;* **D02G** *3/00;* **B65D** *85/66;* **B65H** *18/28*

U.S. Cl. 428—34.2 **3 Claims**



1. A package comprising a cardboard tube and a yarn wound on the tube, the yarn comprising nylon **66** polymer having a formic acid relative viscosity (RV) of about 40 to about 60 and having an elongation at break of about 22% to about 60%, a boil-off shrinkage of about 3% to about 10%, a tenacity of about 3 to about 7 gpd, a crystalline perfection index of about 61 to about 85, an orientation angle of about 12 to about 19, a long period spacing of about 79Å to about 103Å and a long period intensity of about 165 to about 2240, having a Yarn Tube Compression insufficient to crush the tube.

5,750,216

BAG FOR BAG-IN-BOX

Morikatsu Horino; Tsuyoshi Kage, both of Tokyo-to; Yutaka Takahashi, and Akira Shimomi, both of Kanagawa-ken, all of Japan, assignors to Kirin Beer Kabushiki Kaisha; Kirin Beverage Corporation, and Mitui Petrochemical Industries, Ltd., all of Tokyo-to, Japan

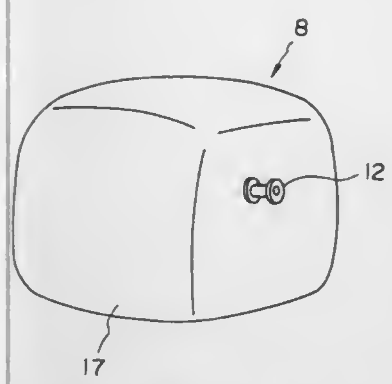
Continuation of Ser. No. 105,172, Aug. 12, 1993, abandoned. This application Oct. 2, 1995, Ser. No. 537,328

Claims priority, application Japan, Aug. 12, 1992, 4-214907

Int. Cl.^{6} B29D *22/00*

U.S. Cl. 428—34.3 **17 Claims**

1. A bag-in-box combination wherein the bag is made of film material so as to be collapsible to push out contents therein such as beverage syrups and liquid foods, wherein the bag collapsible bag body is a collapsible bag body made of polyester resin from an injection molded preform through a blow-formation process so as to provide a thickness of 20–150 μm, and a mouthpiece provided on the bag body for passing the contents therethrough, said bag body having a volume expansion rate of 100–240 in the blow-formation process, and wherein the box is made of cardboard.



5,750,217

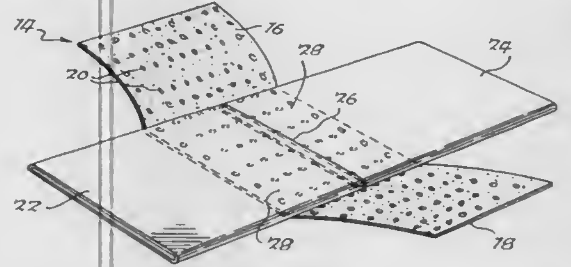
METHODS AND MATERIALS FOR SPLICING TUBULAR FOOD CASINGS

Ronald S. Kearby, Williamsport, Ind.; Mark Lee Fox, Liberty, and Mark David Kelley, Kansas City, both of Mo., assignors to Devro-Teepak, Inc., Westchester, Ill.

Filed Jan. 25, 1993, Ser. No. 10,021

Int. Cl.^{6} B65D *81/34;* **B65H** *69/08*

U.S. Cl. 428—34.8 **11 Claims**



1. A splice for regenerated cellulose tubular food casing comprising a splicing tape comprising a regenerated cellulose film coated on at least one surface with a polyvinylidene chloride polymer and having a film thickness of 0.002 to 0.01 inches and being perforated to remove from ten to thirty percent of the area of the film and to provide an elongation of from ten to at least twenty percent at a stretching tensile force of between 500 and 1250 psi in a direction transverse to the direction of the longitudinal axis of the casing, said tape having a tensile strength at break of at least 100 psi greater than the stretching tensile force, said splicing tape being wrapped around and sealed at the coated surface to a leading end of a first regenerated cellulose tubular food casing and a trailing end of a second regenerated cellulose tubular food casing wherein the ends are proximate each other, said splice being capable of passing over the horn ring of a stuffing horn while maintaining its integrity.

5,750,218

BIODEGRADABLE ALIPHATIC POLYESTER, MELT-EXTRUSION FILM THEREOF, AND PROCESS FOR THE PRODUCTION THEREOF

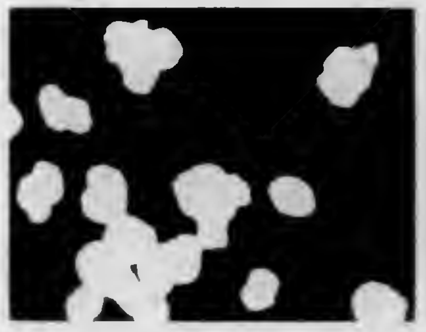
Haruo Nishida; Mitsuhiro Yamashita; Yoshiki Ochi, and Tetsuo Kuwaki, all of Tokuyama, Japan, assignors to Tokuyama Corporation, Tokuyama, Japan

Filed Apr. 25, 1995, Ser. No. 428,640

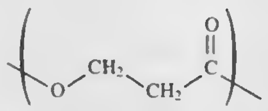
Claims priority, application Japan, Jun. 22, 1994, 6-139905

Int. Cl.^{6} B32B *1/08*

U.S. Cl. 428—35.5 **9 Claims**



1. A biodegradable aliphatic polyester melt-extrusion film, which comprises a biodegradable aliphatic polyester containing a recurring unit of the formula (1),



(1)

as a main recurring unit and having a weight average molecular weight of 20,000 to 2,000,000, and which has a water vapor transmission rate of 300 to 700 g/m^2·24 hours·25 μm and heat-fusing strength of 500 to 5,000 gf/15 mm.

5,750,219

ESTER COPOLYMER RESIN, ALLOY THEREOF AND PACKAGING MATERIAL USING THE SAME

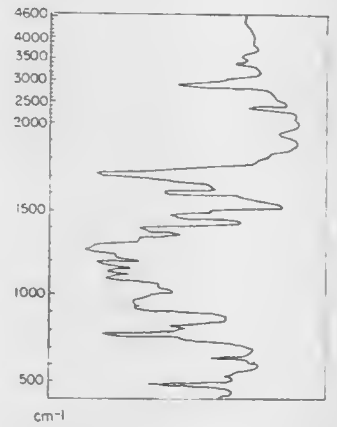
Yasuhiro Harada; Shinichiro Mori; Kayo Hasegawa; Junichi Kitagawa; Yoichiro Inoue; Eiichi Kai; Shinichi Sekine; Yuuzou Fukawa; Takashi Shirane, and Kazuhiro Hamauji, all of Tokyo, Japan, assignors to NKK Corporation, and Kyodo Printing Co., Ltd., both of Tokyo, Japan

Filed Aug. 25, 1995, Ser. No. 519,608

Claims priority, application Japan, Aug. 25, 1994, 6-201042; Feb. 14, 1995, 7-049209; Mar. 17, 1995, 7-059370; Jun. 22, 1995, 7-179575

Int. Cl.^{6} B29D *22/00;* **B32B** *1/08;* **C08G** *63/02*

U.S. Cl. 428—35.7 **12 Claims**



1. An ester copolymer resin having a general formula [I]

$$\text{HO}\!\left(\text{COArCOORO}\right)_n\text{H} \qquad [I]$$

wherein Ar represents a 2,6-naphthalene group or a phenylene group and consists of 30 to 98 mol % of said 2,6-naphthalene group and 70 to 2 mol % of said phenylene group, R represents an ethylene group or a 1,4-cyclohexylene group and consists of 5 to 90 mol % of said ethylene group and 95 to 10 mol % of said 1,4-cyclohexylene group, wherein said 1,4-cyclohexylene group has a cis/trans ratio of 0/100 to 40/60, and n is selected from a range of 100 to 1000.

5,750,220
FUEL TANK AND A PROCESS FOR PRODUCING THE FUEL TANK

Roger Edgar Charles Barton, and Johannes Clemens Maria Jordaan, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed May 30, 1996, Ser. No. 655,364
Claims priority, application European Pat. Off., May 30, 1995, 95201403
Int. Cl.^{6} B29D *22/00*
U.S. Cl. 428—35.7 6 Claims

1. A fuel tank comprised of more than one part, at least one of said parts being prepared by a process comprising injection molding a polymer composition containing a linear alternating copolymer of carbon monoxide and olefinically unsaturated compounds into one or more parts of the tank and joining the parts of the tank together; wherein said copolymer comprises repeating units of the formula $—CO—(CH_2—CH_2—)—$ and repeating units of the formula $—CO—(G)—$, G is a moiety originating from an olefinically unsaturated compound of at least 3 carbon atoms, the molar ratio of $—CO—(G)—$ to $—CO—(CH_2—CH_2—)—$ is between 0.02 and 0.15, and the copolymer has a limiting viscosity number, measured in m-cresol at 60° C. of between 1.4 and 2.0 dl/g.

5,750,221
ABRASION-RESISTANT FLUOROPOLYMER MIXTURES

Helmut Scheckenbach, Langen; Andreas Schleicher, Einhausen; Jürgen Kulpe, Frankfurt am Main; Wolfgang Neumann, Kraiburg, and Bernd Jansen, Emmerting, all of Germany, assignors to Hoechst AG, Frankfurt, Germany
Division of Ser. No. 475,077, Jun. 7, 1995, abandoned, which is a division of Ser. No. 271,848, Jul. 7, 1994, abandoned. This application Mar. 26, 1997, Ser. No. 824,340
Int. Cl.^{6} B29D *22/00*
U.S. Cl. 428—35.7 17 Claims

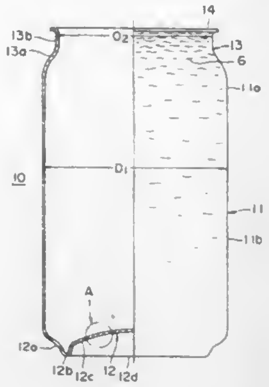
1. An extruded tube produced from a mixture comprising
(A) from 75 to 99% by weight of a fluorocarbon polymer,
(B) from 1 to 25% by weight of an oxidized polyarylene sulfide which is a linear or branched polyarylene system having a molecular weight of from 4000 to 200,000 containing recurring units of the formula

$$—[(Ar^1)_d—X]_n—[(Ar^2)_i—Y]_j—[Ar^3)_k—Z]_l—[(Ar^4)_o—W]_p— \quad (IX)$$

the indices n, m, i, j, k, l, o and p are identical or different and are integers from 0 to 4, where their sum must be at least 2,
Ar^1, Ar^2, Ar^3 and Ar^4, are identical or different and are simple or directly para-, meta- or ortho-linked arylene systems having 6 to 18 carbon atoms, and W, X, Y and Z are identical or different and are linking groups selected from $—SO_2—$, $—S—$, $—SO—$, $—CO—$, $—CO_2—$, alkyl or alkylidene groups having 1–6 carbon atoms, with the proviso that component (B) contains at least one SO or SO_2 group and polymers from the class consisting of polyether sulfones are excluded and,
based on the sum (A)+(B),
(C) from 0 to 15% by weight of a filler.

5,750,222
SEAMLESS CAN WITH NECKED-IN PORTION

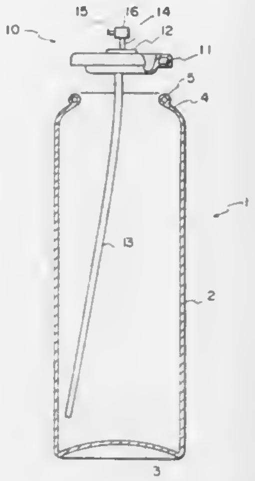
Ikuo Komatsu, Yokohama; Nobuyuki Sato, Ebina, and Katsuhiro Imazu, Yokohama, all of Japan, assignors to Toyo Seikan Kaisya, Ltd., Tokyo, Japan
Filed May 1, 1995, Ser. No. 431,979
Claims priority, application Japan, May 2, 1994, 6-113350
Int. Cl.^{6} B65D *1/14;23/02*
U.S. Cl. 428—35.8 4 Claims



1. An organic resin-coated seamless can with necked-in portion, which is produced by subjecting a resin-coated steel sheet to drawing-re-drawing for reducing thickness or to drawing-re-drawing-ironing for reducing thickness and which has a ratio of diameter of necked-in portion to diameter of body of 0.9 or less, said steel sheet being coated by 5- to 30-μm thick organic resin layer on both surfaces of aluminum-killed, surface treated steel sheet of 0.01 to 0.13% by weight in total carbon amount and not more than 6.5 μm in average grain diameter having been subjected to over-aging at 350°–500° C. after continuous annealing to adjust to not more than 10 ppm in solid-dissolved carbon amount and a nitrogen content not exceeding 0.006% by weight.

5,750,223
POLYAMIDEIMIDE INNER SURFACE-COATED METAL CONTAINER

Akira Tada, and Toshihiko Hayashi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Jul. 18, 1996, Ser. No. 683,205
Claims priority, application Japan, Jul. 21, 1995, 7-185620
Int. Cl.^{6} B29D *22/00*
U.S. Cl. 428—35.8 9 Claims



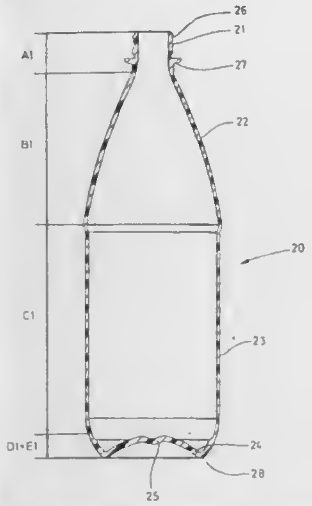
1. An inner surface-coated metal container made of a metal having a cured polyamideimide coating and exhibiting excellent resistance against the contents, wherein said coating has an absorbancy ratio as defined by the following formula (1),

$$R=I_{1720}/I_{1650} \quad (1)$$

wherein I_{1720} denotes an absorbency of infrared characteristic absorption of an imide group at a wave number of about 1720 cm^{-1}, and I_{1650} denotes an absorbancy of infrared characteristic absorption of an amide group at a wave number of about 1650 cm^{-1}, of not smaller than 2.5.

5,750,224
PLASTIC CONTAINER

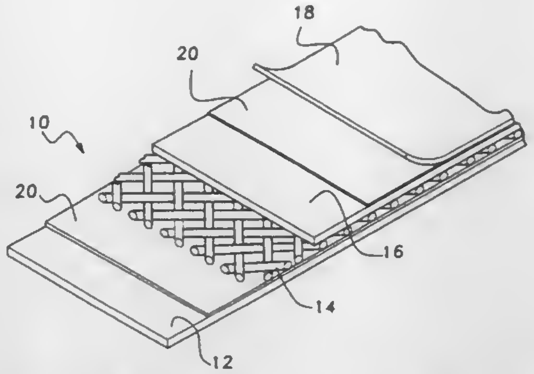
Mikael Quasters, Lidköping, Sweden, assignor to PLM AB, Malmo, Sweden
Division of Ser. No. 107,804, Apr. 19, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 467,669
Claims priority, application Sweden, Jan. 7, 1992, 9102090
Int. Cl.^{6} B65D *1/40*
U.S. Cl. 428—35.7 7 Claims



1. A container of plastic material made by forming and expanding a preform, wherein said preform comprises a mouth portion, a substantially conical upper shoulder portion extending in an expanding manner from said mouth portion, a cylindrical central portion extending from said shoulder portion, a transitional portion extending from said cylindrical central portion, and a bottom portion extending from said transitional portion and wherein said container comprises a mouth portion, a shoulder portion extending from said mouth portion, a substantially cylindrical central portion extending from said shoulder portion, and a bottom portion extending from said cylindrical portion, the shoulder portion of said container being formed substantially only of plastic material from the conical shoulder portion of said preform, and the central portion of said container being formed substantially only of plastic material from the cylindrical central portion of said preform, wherein
a quotient of an axial length of the conical shoulder portion of said preform divided by an axial length of said cylindrical central portion of said preform has values in an approximate range of 0.25–0.35,
a quotient of an axial length of the shoulder portion of said container divided by an axial length of the central portion of said container has values in an approximate range of 0.6–0.8, material of said shoulder portion of said container and said central portion of said container during the expansion being stretched in an axial direction, and
wherein the material in the bottom portion of the container, is substantially non-oriented material, and the central bottom portion of the container, that corresponds to the central portion at the bottom of the preform, has substantially the same shape in the container as in the preform.

5,750,225
LAMINATED VAPOR BARRIER

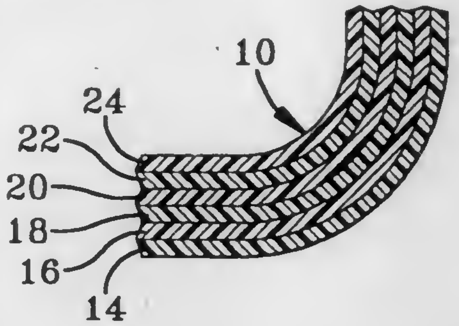
Charles J. Petty, Blairstown, N.J., assignor to Compac Corporation, Netcong, N.J.
Filed May 26, 1995, Ser. No. 452,297
Int. Cl.^{6} B32B *27/36;* **C09J** *7/02*
U.S. Cl. 428—362 15 Claims



1. A laminated facing barrier for insulation applications comprising:
a first kraft paper insulating support sheet having a first surface;
a reinforcing scrim web bonded to said first side of said first kraft paper insulating support sheet;
a second kraft paper insulating support sheet having a first surface adhesively bonded to said scrim web and first kraft paper insulating support sheet and a second surface; and
a vapor barrier sheet adhesively bonded to said second surface of said second kraft paper insulating support sheet.

5,750,226
LIGHT EXCLUDING MULTI-LAYER PLASTIC BARRIER BOTTLE

Richard Peter Macauley, Westerville; Lewis Henry Sita, Worthington, and Elwood Lamar Stokesbury, Westerville, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Mar. 2, 1994, Ser. No. 204,715
Int. Cl.^{6} B29D *22/00*
U.S. Cl. 428—36.4 3 Claims

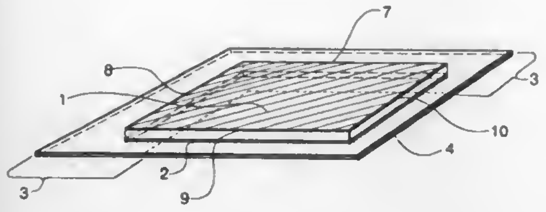


1. A plastic container for a light sensitive nutritional product, comprising a multilayer plastic container, said container comprising a wall having six layers which comprise from the exterior of the container to the interior of the container: (a) a layer of food grade polypropylene; (b) a layer of high temperature adhesive; (c) a layer comprising an oxygen barrier of ethyl-vinyl-alcohol; (d) a layer of a high temperature adhesive; (e) a layer of regrind material; and (f) a layer of food-grade polypropylene; and wherein said polypropylene and regrind layers contain at least about 5% by weight and about 1% by weight respectively but not more than about 8% by weight of titanium dioxide, said titanium dioxide serving to reduce the extent of light transmission through said wall by at least about 99.5%.

5,750,227
TILED SURFACE COVERING

David J. Adams, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Dec. 16, 1996, Ser. No. 767,278
Int. Cl.^{6} B32B *7/06*
U.S. Cl. 428—42.2 6 Claims

1. A surface covering system comprising a plurality of tiles, each tile being square or rectangular, and having two, opposed surfaces, wherein each tile has edges A, B, C, and D between the two surfaces wherein edge A is adjacent to edge B at one corner, and



edge C is adjacent to edge D at one corner, and further, wherein each tile has a coating of a pressure sensitive adhesive and an underlay adhering to the surface having the coating of pressure sensitive adhesive, wherein further, the underlay extends beyond the surface a certain distance over edges C and D, wherein the underlay has an L-shaped release strip which can optionally be removed from the tile to expose the pressure sensitive adhesive coating wherein removal of the L-shaped strip exposes the coating on each tile in an area along edges A and B of each tile, wherein further after the removal of the L-shaped strip the area of exposed coating surface extends a distance across the tile from edges A and B, wherein the distance across the exposed coating on the tile is equal to or greater than the distance that the underlay extends beyond the surface over edges C and D.

5,750,228

OPTICAL INFORMATION STORAGE MEDIUM

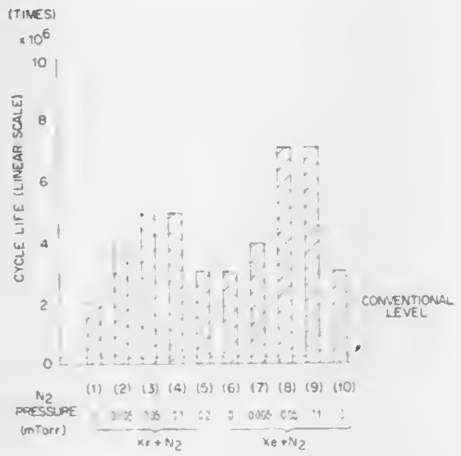
Yoshitaka Sakaue, Nara; Eiji Ohno, Hirakata; Kazuhisa Ide, Osaka; Kenichi Nagata, Nishinomiya, and Noboru Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 199,550, Feb. 22, 1994, Pat. No. 5,505,835. This application Dec. 1, 1995, Ser. No. 565,992

Claims priority, application Japan, Feb. 22, 1993, 5-31591; Mar. 23, 1993, 5-63671

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—64.1 **24 Claims**



1. An optical information storage medium comprising a multilayer structure formed on a substrate, the multilayer structure being formed by a sputtering process in a discharge gas including at least one of the group consisting of Kr and Xe and including at least a first dielectric layer, a recording layer which shows reversible phase change between an amorphous phase and a crystal phase, and a second dielectric layer,

wherein the amount of the discharge gas contained in the recording layer is about 0.3 at % or less.

5,750,229

PHTHALOCYANINE COMPOUND AND OPTICAL RECORDING MEDIUM CONTAINING IT

Takahisa Oguchi, Mobara; Hideki Umehara, Yokohama; Kenichi Sugimoto, Yokohama; Ryu Oi, Yokohama, and Hisato Itoh, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, and Yamamoto Chemicals, Inc., Yao, both of Japan

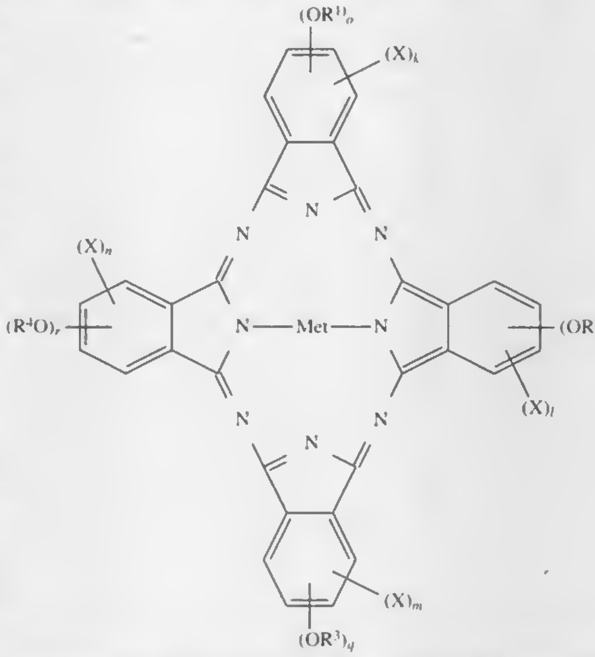
Division of Ser. No. 531,059, Sep. 20, 1995, Pat. No. 5,646,273, which is a continuation of Ser. No. 221,257, Mar. 31, 1994, abandoned. This application Jan. 6, 1997, Ser. No. 779,358

Claims priority, application Japan, Apr. 9, 1993, 5-082353

Int. Cl.^{6} G03G *5/06*

U.S. Cl. 428—64.1 **7 Claims**

1. An optical recording medium formed by adding to a recording layer a phthalocyanine represented by the formula (1)



(1)

wherein each of (OR^1), (OR^2), (OR^3) and (OR^4) is independently a branched alkoxy group substituted by 0 to 5 halogen atoms and having 5 to 20 carbon atoms, an alkenyloxy group substituted by 0 to 5 halogen atoms and having 2 to 20 carbon atoms or an alkynyloxy group substituted by 0 to 5 halogen atoms and having 2 to 20 carbon atoms, wherein each halogen atom substituted on R^1, R^2, R^3 and R^4 is chlorine, bromine or iodine and at least one of R^1, R^2, R^3 and R^4 is substituted by the halogen atom; X is a halogen atom; each of k, l, m and n is independently a value of from 0 to 3; each of o, p, q and r is independently a value of 0, 1 or 2, and all of them are not 0 simultaneously; each sum of k and o, l and p, m and q, and n and r is independently in the range of from 0 to 4; Met is two hydrogen atoms, a divalent metal atom, a trivalent mono-substituted metal atom, a tetravalent di-substituted metal atom or an oxy-metal atom.

5,750,230

MAGNETIC RECORDING MEDIA AND MAGNETIC RECORDING SYSTEM USING THE SAME

Akira Ishikawa, Menlo Park, Calif.; Yuzuru Hosoe, Hino, Japan; Yoshihiro Shiroishi, Hachioji, Japan; Masatoshi Takeshita, Iruma, Japan; Yotsuo Yahisa, Kokubunji, Japan; Tomoo Yamamoto, Hachioji, Japan; Akira Osaki, Odawara, Japan; Kiwamu Tanahashi, Musashino, Japan; Jun Fumioka, Hadano, Japan; Yoshiki Kato, Tokyo, Japan; Masaki Ohura, Odawara, Japan, and Yukio Katoh, Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

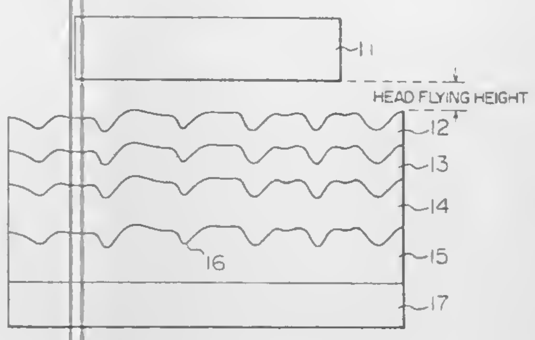
Filed Nov. 22, 1993, Ser. No. 155,515

Claims priority, application Japan, Nov. 20, 1992, 4-310652; Dec. 18, 1992, 4-338323; Feb. 18, 1993, 5-029371

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—65.3 **27 Claims**

1. A magnetic recording medium, comprising:



a non-magnetic disk substrate; and

a magnetic film formed on the non-magnetic disk substrate directly or via an underlayer, a surface average roughness factor Ra(r) on a surface of the medium, which roughness factor is measured substantially perpendicularly to a direction of movement of the magnetic head, being in a range from 0.3 nm to 3 nm, and a coercivity Hc (θ) measured by applying a magnetic field substantially along the recording direction being greater than another coercivity Hc(r) measured by applying a magnetic field substantially perpendicularly to the recording direction within the substrate surface plane, wherein a ratio defined as $\{Hc(\theta)-Hc(r)\}/\{Hc(\theta)+Hc(r)\}$ is in a range of from 0.1 to 0.7.

5,750,231

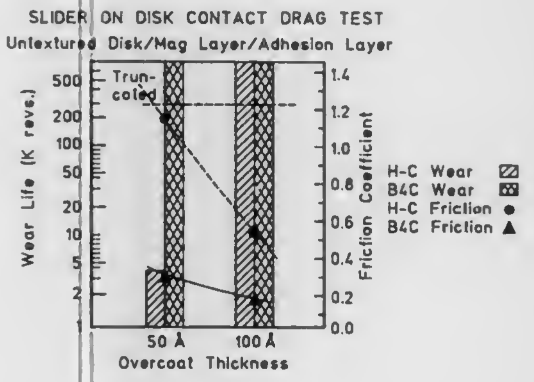
MAGNETIC DISK WITH BORON CARBIDE OVERCOAT LAYER

Richard Henry Ahlert, San Jose; James Kent Howard, Morgan Hill; Muhammad Inayet Ullah, Morgan Hill, and Richard Donald Umphress, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 372,410, Jan. 13, 1995, Pat. No. 5,552,204. This application Apr. 3, 1996, Ser. No. 626,813

Int. Cl.^{6} G11B *05/66*

U.S. Cl. 428—65.5 **26 Claims**



1. A magnetic disk comprising:

a substrate;

a magnetic layer on top of the substrate;

a boron carbide overcoat layer consisting essentially of B4C on top of the magnetic layer;

the boron carbide overcoat layer having a thickness equal to or less than 100 Å; and

the boron carbide overcoat layer having predetermined concentrations of boron and carbon which are uniform throughout said thickness.

5,750,232

PLASTIC COMPOSITE MATERIAL, A METHOD OF PRODUCING IT AND THE USE OF THIS MATERIAL

Roland Eugen Steenblock, Meckenbeim, and Joachim Bührmann, Bonn, both of Germany, assignors to Elf Atochem Deutschland GmbH, Dusseldorf, Germany

Filed Jun. 27, 1995, Ser. No. 495,802

Claims priority, application Germany, Jul. 14, 1994, 44 24 864.4

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—98 **5 Claims**

1. A plastic composite material which comprises:

a thermoplastic plastic sheet and, bonded to one side thereof,

a thermoplastic a hot-melt copolyamide adhesive in the form of a spun felt which is produced by applying the hot-melt copolyamide adhesive in a hot, melted state onto the plastic sheet so as to hot-melt adhesively bond the spun felt to the plastic sheet; wherein,

the hot-melt copolyamide adhesive has a lower melting temperature than the plastic sheet, the melting temperature being determined as the maximum of the melting temperature range as determined by differential scanning calorimetry: and,

the copolyamide is a polymerization reaction product of

10 to 50% by weight of caprolactam,

20 to 70% by weight of laurolactam, and

10 to 40% by weight of an adduct comprising equimolar amounts of piperazine, and

C_6–C_{13} dicarboxylic acids or C_{36} dimerised fatty acids.

5,750,233

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Tuneo Yoshida, and Shinichi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 26, 1996, Ser. No. 670,667

Claims priority, application Japan, Jul. 20, 1995, 7-205125

Int. Cl.^{6} G11B *5/708*

U.S. Cl. 428—141 **29 Claims**

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer containing a ferromagnetic metal powder and an abrasive dispersed in a binder, wherein said ferromagnetic metal powder comprises iron as a main component and aluminum in an amount of from 1 to 25 atm % based on Fe atom, said abrasive of the magnetic layer has a Moh's hardness equal to or more than 6 and is present in an amount from 4 to 18 parts by weight per 100 parts by weight of the ferromagnetic metal powder, and an abrasive exposure unit which comprises said abrasive and which has a size equal to or more than 0.3 μm observed through an electron microscope on a surface of said magnetic layer is equal to or less than 3.5 pieces/100 μm^2.

5,750,234

INTERIOR AUTOMOTIVE LAMINATE WITH THERMOPLASTIC LOW GLOSS COATING

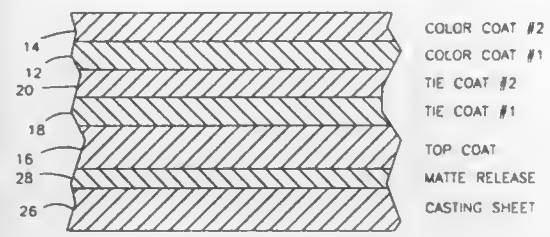
John R. Johnson, Valparaiso, Ind., and Diana M. Mercier, Novi, Mich., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Jun. 7, 1996, Ser. No. 660,908

Int. Cl.^{6} B32B *5/16;3/30*

U.S. Cl. 428—141 **18 Claims**

1. A decorative and structural plastic skin component for use as a functional covering for interior automotive instrument panels, comprising a thermoplastically formable dry paint transfer sheet having a protective outer clear coat layer comprising a polymeric material and an underlying base coat layer comprising a polymeric material containing a dispersed pigment, and a self-supporting thermoplastically formable resinous backing sheet adhered to the dry paint transfer sheet on the side thereof opposite from the outer clear coat, the outer surface of the clear coat layer having a



transferred mirco-roughness surface to reduce the surface gloss thereof, the composite of the dry paint transfer sheet and the backing sheet having been subjected to thermoforming to thermoplastically elongate and thereby produce thereon a three-dimensionally shaped contoured outer surface, the clear coat layer containing uniformly dispersed filler particles in an amount below about 10 parts by weight per 100 parts of the total resinous binder solids contained in the outer clear coat, the combination of said transferred surface micro-roughness and said dispersed filler particles producing on the outer surface of the thermoformed clear coat layer a substantially uniformly dispersed micro-roughness forming a low gloss having a measured 60 degree gloss level of less than about 15 gloss units.

5,750,235

BASE BOARD FOR LAYERED CORRUGATED FIBERBOARD STRUCTURE

Yokoyama Yoshimasa, Hyohgo, Japan, assignor to Yokoyama Sankoh Co., Ltd., and Hitachi Zosen Corporation, both of Japan

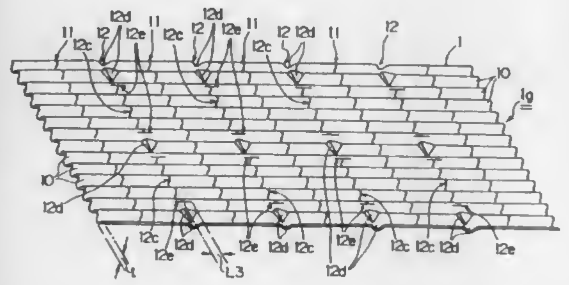
PCT No. PCT/JP95/00959, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31330, PCT Pub. Date Nov. 23, 1995

PCT Filed May 18, 1995, Ser. No. 737,417

Claims priority, application Japan, May 18, 1994, 6-103602; Dec. 27, 1994, 6-324591

Int. Cl.^{6} B32B *3/28*

U.S. Cl. 428—182 **47 Claims**



1. A base board for a layered corrugated fiberboard structure comprising:

a corrugated fiberboard material including a corrugating medium having flutes;

first folds along which the corrugated fiberboard material is folded in the shape of the inverted letter V; and

second folds along which the corrugated fiberboard material is folded in the shape of the letter V;

said first folds and said second folds being formed in said corrugated fiberboard material in parallel to each other and in an alternate arrangement so as to extend perpendicularly or at an angle other than a right angle to the flutes;

wherein said second folds are lines of perforations, and portions of the corrugated fiberboard material that forms an outer surface when the corrugated fiberboard material is folded are incised along the lines of perforations.

5,750,236

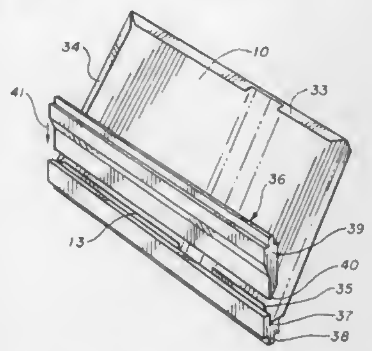
APPARATUS AND METHOD FOR FORMING COMPOUND SHAPED SURFACES

Carlos Joaquin Aros, and Sylvan S. Throndson Aros, both of Bellflower, Calif., assignors to Royal Truck Bodies, Inc., Paramount, Calif.

Filed Apr. 26, 1996, Ser. No. 638,352

Int. Cl.^{6} B32B *1/00;* **B23P** *11/02*

U.S. Cl. 428—178 **14 Claims**



1. A compound multi-curved shaped structure comprising:

an outer skin of a rigid material having an outer peripheral edge and a plurality of compound multiple curved sections having a plurality of spaced folded flanges about the outer peripheral edge thereof; contoured;

a generally planar inner panel having an outer peripheral edge of a rigid material spaced from said skin removably interconnected to said skin along mating peripheral edges of both said panel and said skin, said flanges overlapping said outer peripheral edge of said panel; and

a plurality of stiffening members of rigid material interconnecting said panel to said skin sandwiched therebetween, said members including at least one member being fixedly interconnected to said skin along one longitudinally extending side thereof and at least another member being fixedly interconnected to said skin along a second longitudinally extending side thereof spaced from said first mentioned side and parallel thereto, said at least one member and said at least another member being secured to said liner.

5,750,237

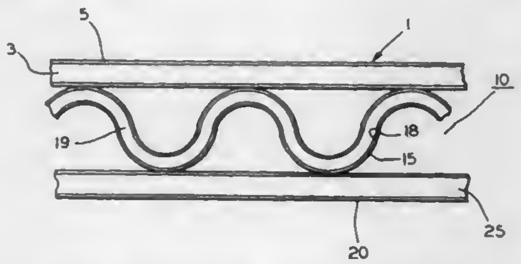
DOUBLE-FACED LINER BOARD

Gaylord Allin, W. Monroe, and Mark Gorham, Shreveport, both of La., assignors to Dallas Enviro-Tek International, Inc., Dallas, Tex.

Filed May 31, 1995, Ser. No. 454,863

Int. Cl.^{6} B32B *3/28*

U.S. Cl. 428—182 **5 Claims**



1. A double-faced liner board comprising a top layer, a medium corrugated layer and a bottom layer, the top layer having a coating from a coating composition suitable for coating a liner board comprising an emulsion in water of (A) a curable prepolymer of a styrene-butadiene copolymer, and (B) TiO_2;

the medium layer having a coating applied from an aqueous treating coating composition suitable for coating a middle corrugated layer of a double-faced liner board, the composition comprising

(A) an emulsion of wax particles, and

(B) a binder that is

(1) an alkali metal alginate, or

(2) a solvent soluble styrene/acrylic copolymer, or

(3) a mixture of the styrene/acrylic copolymer with a water-soluble melamine/formaldehyde prepolymer;

the bottom layer having a coating applied from an aqueous coating composition comprising (A) a latex of a styrene-butadiene copolymer or a latex of a carboxylated styrene-butadiene copolymer and (B) wax.

5,750,238

ELECTROSTATIC INFORMATION RECORDING MEDIUM

Masayuki Iijima; Osamu Shimizu; Yuichi Nakayasu; Yoshiaki Tsuruoka, and Kayoko Sugiyama, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

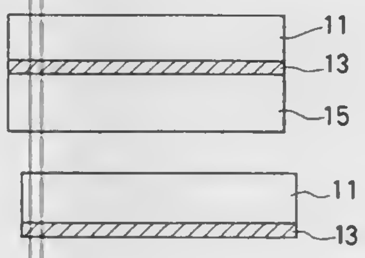
Division of Ser. No. 75,581, Oct. 25, 1993, Pat. No. 5,527,589.

This application Mar. 19, 1996, Ser. No. 619,842

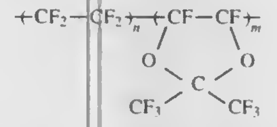
Claims priority, application Japan, Oct. 16, 1991, 3-267505; Oct. 17, 1991, 3-269427; Oct. 17, 1991, 3-269428; Nov. 12, 1991, 3-295529

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—195 **7 Claims**



1. An electrostatic information recording medium having an electric charge retaining layer stacked on at least an electrode layer, wherein said electric charge retaining layer comprises a fluorine-containing thermoplastic resin consisting of a repeating unit represented by formula (1)



(where the content of the dioxonol component represented by the number m of repeating units is in the range of 20 mol % to 90 mol %, and where n is a positive integer)

said fluorine containing thermoplastic resin having a melt viscosity of 10^2 to 10^4 Pa.sec at a temperature which is 90° C. to 110° C. higher than its glass transition temperature.

5,750,239

PROCESS OF MAKING TRUE COPIES OF MAJOLICA TILES AND THE LIKE

Luigi Fratello, and Michele Calocero, both of Via Caldarulo 2, San Mango Piemonte, Italy, 84090

Filed Sep. 13, 1996, Ser. No. 713,537

Claims priority, application Italy, Sep. 14, 1995, MI95A1907

Int. Cl.^{6} B32B *9/00*

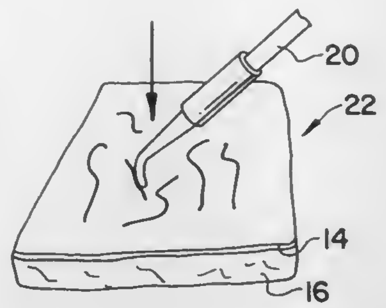
U.S. Cl. 428—195 **9 Claims**

1. A process for making a visually and tactually faithful replica of an old, time-worn majolica tile, comprising:

(a) frontally photographing a selected old, time-worn majolica tile to obtain a photograph;

(b) printing the photograph to obtain a trial print;

(c) comparing the trial print with said selected tile;



(d) if the trial print is chromatically faithful to the selected tile, accepting the trial print as a final print, but

(d') if the trial print is chromatically unfaithful to the selected tile, correcting printing of the trial print, so as to obtain a corrected trial print which is chromatically faithful to the selected tile, and accepting the corrected trial print as a final print;

(e) facially adhering the back side of the final photographic print to a front side of a three-dimensional support which has peripheral edges;

(f) finishing said edges and the front surface of the final print by:

(i) three-dimensionally distressing the front surface of the final print and the edges of the support to replicate defects in the selected tile, and

(ii) providing the distressed edges of support with a coating which resembles the appearance of fired terracotta clay.

5,750,240

COATING OF SURFACES OF ARTICLES

Philip Findley, Linton; Keith Mortimer, Wooley, and David Marshall, Tealby, all of United Kingdom, assignors to Technoflex Innovations Limited, United Kingdom

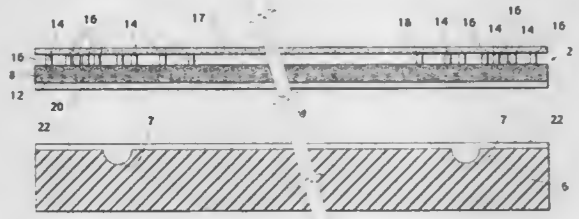
Continuation of Ser. No. 341,643, Nov. 17, 1994, abandoned.

This application May 27, 1997, Ser. No. 863,777

Claims priority, application United Kingdom, May 17, 1994, 9409813; Jun. 28, 1994, 9412921

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—195 **13 Claims**



1. A three dimensional article of furniture, which article comprises:

a rigid base with at least one surface area of known dimension said area having multiple contour changes;

a sheet of plastics material having a first planar surface to be applied to a surface of said base including said multiple contour changes and a second planar surface, said contour changes and said known dimension form a three dimensional surface area prior to application of said plastics sheet;

an ink pattern applied to at least one said planar surface of said sheet;

a layer of adhesive applied to said first planar surface of said plastics sheet to adhere said sheet to the surface area to form the coating therefor; and

wherein said ink pattern is applied to at least one said planar surface of the sheet material over an area determined by said known dimension of the surface area of the base, said ink pattern in register with the surface area of the base including said contour changes and said ink pattern has at least one change in register with at least one said contour change.

5,750,241

METHOD OF FORMING COLORED RELIEF-AND-INDENTATION PATTERNS AND A THERMAL TRANSFER FOIL

Koichi Kobayashi; Wataru Iwanami, and Taiyo Kanai, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

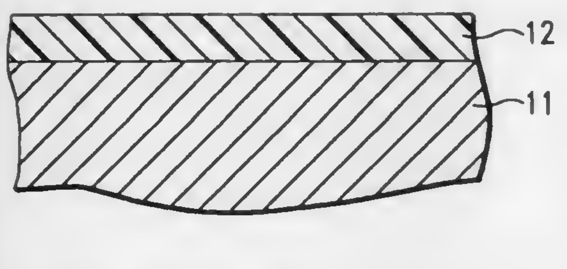
PCT No. PCT/JP94/00306, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/20312, PCT Pub. Date Sep. 15, 1994

PCT Filed Feb. 25, 1994, Ser. No. 325,468

Claims priority, application Japan, Mar. 8, 1993, 5-009499; Mar. 8, 1993, 5-046908

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—199 **37 Claims**



1. A thermal transfer foil comprising a base film, a separable processing layers contacting one side of the base film, a protective coloring layer, a reflection layer, and a thermoplastic resin layer, wherein said separable processing layer, said protective coloring layer, said reflection layer and said thermoplastic resin layer are stacked in the order recited on the one side of said base film.

5,750,242

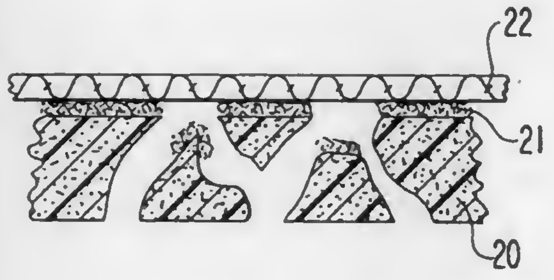
INFRA-RED REFLECTIVE COVERINGS

Gregory D. Culler, Nottingham, Pa., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 419,777, Apr. 11, 1995, abandoned. This application Sep. 30, 1996, Ser. No. 723,369

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—209 **7 Claims**



1. An infra-red reflective covering for covering objects, which comprises:

(a) a microporous polymeric membrane that is air-permeable, moisture vapor permeable, liquid-waterproof, and drapable, in which the pores extend from one side of the membrane to the other;

(b) said membrane being laminated to a textile material;

(c) a heat-reflecting metal present as a coating on the pore walls near the surface of one side of the membrane which serves to provide the infra-red reflection;

(d) the other surface of the membrane being non-metallized.

5,750,243

SURFACE ACOUSTIC WAVE DEVICE AND DIAMOND BASE MATERIAL FOR THE SAME

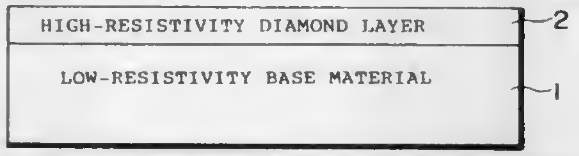
Shin-ichi Shikata; Hideaki Nakahata; Kenjiro Higaki; Satoshi Fujii, and Akihiro Hachigo, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Jun. 16, 1995, Ser. No. 521,382

Claims priority, application Japan, Jun. 20, 1994, 6-137628

Int. Cl.^{6} H03H *9/145*

U.S. Cl. 428—216 **4 Claims**



1. A diamond base material for surface acoustic wave device, comprising: a low-resistivity base material, and a high-resistivity diamond layer having a thickness of 5–50 μm disposed on the low-resistivity base material.

5,750,244

HIGH STRENGTH POLYMERIC-FIBER COMPOSITES

Richard M. Christensen, 388 Paraiso, Danville, Calif. 94526, and T. T. Chiao, 1031 Valley Oak Way, Fairfield, Calif. 94533

Continuation-in-part of Ser. No. 345,694, May 1, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 664,036

Int. Cl.^{6} B32B *5/14*

U.S. Cl. 428—308.4 **12 Claims**

1. In a fiber-matrix resinous composite material comprising a resin phase selected from the group consisting of epoxies, polyesters, vinylesters, polyimides, neoprene, bismaleinides, nylon, polyethylene, polyetheretherketone, and polyphenylene sulfite and a fiber phase selected from the group consisting of carbon, glass, aramid polymer, polyolefin, boron and silicon carbide, said fiber phase of high density, aligned continuous fibers between 40% and 75% of the volume of the composite, the improvement comprising providing at least 10% of the volume of the matrix of evenly distributed non-diluent inclusions in the matrix, said inclusions selected from the group consisting of low stiffness solids or fluids, voids or gas that will permit expansion to take the strain of deformation from the polymer, said inclusions having low volumetric resistance and a sub-micron size.

5,750,245

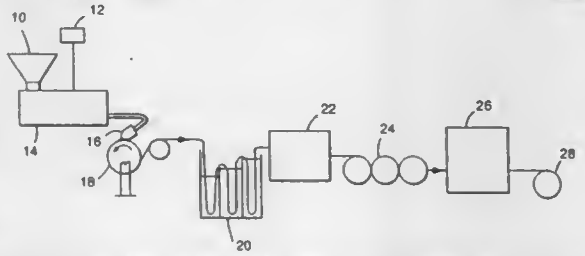
THERMALLY INDUCED PHASE SEPARATED AZLACTONE MEMBRANE

Bert J. Exsted, Stillwater, and Steven L. Kangas, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 11,366, Jan. 29, 1993, abandoned. This application Jun. 26, 1995, Ser. No. 464,795

Int. Cl.^{6} B32B *3/10*

U.S. Cl. 428—315.5 **11 Claims**



1. A microporous membrane comprising crystallizable extrusion grafted azlactone thermoplastic composition having an azlactone functional monomer extrusion grafted to a thermoplastic polymer, wherein the microporous material has sufficient crystallinity to thermally induce phase separate, and has an internal structure characterized by a multiplicity of spaced, randomly disposed, non-uniformly shaped, equiaxed particles of the extrusion grafted azlactone thermoplastic composition, adjacent particles throughout the material being separated from one another to provide the material with a network of interconnected micropores and being connected to each other by a plurality of fibrils of the extrusion grafted azlactone thermoplastic composition.

5,750,246

FACING FOR SEAT

Hiroshi Yuasa, Funabashi, and Kozo Furuichi, Gotenba, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama-ken, and Ikeda Bussan Co., Ltd., Kanagawa-ken, both of Japan

Filed Mar. 8, 1996, Ser. No. 612,540

Claims priority, application Japan, Mar. 10, 1995, 7-050964

Int. Cl.^{6} B32B *27/12*

U.S. Cl. 428—318.4 **5 Claims**

1. A facing for a seat cushion, which comprises a backing layer, a flexible cellular plastic middle layer provided on said backing layer, and a surface layer made of fabric provided on said middle layer;

wherein said backing layer has a coefficient of dynamic friction of 0.3 to 1.0 and is formed by coating and drying a latex of synthetic resin on said middle layer, and wherein said latex is selected from the group consisting of an oxidized polyethylene wax latex, a polyvinylidene chloride latex, an ethylene-vinyl acetate copolymer latex and mixtures thereof.

5,750,247

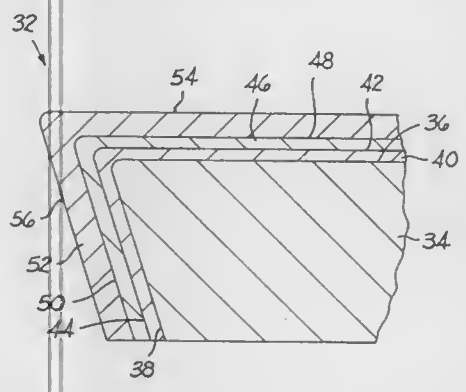
COATED CUTTING TOOL HAVING AN OUTER LAYER OF TIC

William A. Bryant, McKeesport, and A. T. Santhanam, Monroeville, both of Pa., assignors to Kennametal, Inc., Latrobe, Pa.

Filed Mar. 15, 1996, Ser. No. 616,800

Int. Cl.^{6} B23B *27/14*

U.S. Cl. 428—323 **46 Claims**



1. A coated cutting tool for the milling of ductile iron, the cutting tool comprising:

a rake face and a flank face, a cutting edge at the a juncture of the rake face and the flank face, and the cutting tool having a coating and a substrate;

the substrate comprising a tungsten carbide based cemented carbide having a bulk composition of no more than 7 weight percent tantalum, no more than 3 weight percent niobium, no more than 5 weight percent titanium, no more than 1 weight percent chromium, between about 5 and about 13 weight percent cobalt, and the balance tungsten carbide; and

the coating comprising an innermost coating scheme including at least one layer adjacent to the substrate, and the coating further including an outermost layer comprising titanium carbide applied by chemical vapor deposition layer.

5,750,248

MAGNETIC RECORDING MEDIUM PREPARED FROM A SPECIFIED MAGNETIC PAINT

Takeshi Yatsuka, Ohtsu, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 29, 1996, Ser. No. 608,602

Claims priority, application Japan, Mar. 3, 1995, 7-044356

Int. Cl.^{6} G11B *05/66*

U.S. Cl. 428—323 **4 Claims**

1. A magnetic paint comprising magnetic powder, a binder and organic solvents,

the magnetic paint being prepared by first dispersing the magnetic powder and an amount of the binder in the range from about 20% to about 80% by weight based on the weight of the total binder in a poor solvent of the binder so as to obtain a first dispersion, adding a good solvent of the binder and the rest of the binder into the first dispersion, and then dispersing the mixture so as to obtain a second dispersion,

wherein the binder and the solvent of the binder for the first dispersion and the second dispersion are selected so as to satisfy the following equation (1):

$$R_1/R_2>1.2 \tag{1}$$

where R_1 represents a weight of the binder adsorbed to 1 g of the magnetic powder, when the magnetic powder, in an amount four times the solid weight of the binder, is dispersed in a solution in which the binder for the first dispersion is dissolved in a solvent for the first dispersion at 7.5% by weight concentration; and R_2 represents a weight of the binder adsorbed to 1 g of the magnetic powder, when the magnetic powder, in an amount four times the solid weight of the binder, is dispersed in a solution in which the binder for the second dispersion is dissolved in a solvent for the second dispersion at 7.5% by weight concentration.

2. A magnetic recording medium comprising a substrate and a magnetic layer, the magnetic layer being prepared front the magnetic paint of claim 1.

5,750,249

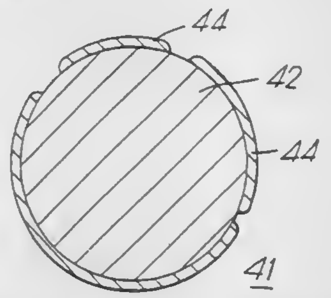
GALVANICALLY COMPATIBLE CONDUCTIVE FILLER AND METHODS OF MAKING SAME

James F. Walther, Mountain Lakes; Robert J. Teichmann, Towaco, and Andrew M. Wasowicz, West Paterson, all of N.J., assignors to Potters Industries, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 535,365, Jun. 8, 1990, Pat. No. 5,175,056. This application Feb. 5, 1993, Ser. No. 955,906

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—328 **50 Claims**



1. A composite particle, suitable for incorporation in an electrically conductive composition, said composite particle being galvanically compatible in respect of a metallic material, said particle comprising in combination:

a) an electrically conductive solid core material which
  i) is metallic and has a metallic analysis substantially the same as said metallic material;
  ii) is substantially electrochemically inert in respect of said metallic material; or
  iii) includes a first portion having a metallic analysis substantially the same as said metallic material and a second

portion which is substantially electrochemically inert in respect of said metallic material; and

b) an electrically conductive material bonded to the core material, which electrically conductive material is substantially inert to participation in or catalysis of cathodic reaction involving the electrochemical reduction of molecular oxygen or water;

such that the combination of said core material and said electrically conductive material in said composite particle, when incorporated in said electrically conductive composition, is galvanically compatible in respect of said metallic material and wherein, when said core material and said electrically conductive material each has a metallic constituent, the metal of said constituent of the core material is not the same as the metal of the metallic constituent of the electrically conductive material.

5,750,250

HEMATITE PARTICLES AND MAGNETIC RECORDING MEDIUM HAVING A NON-MAGNETIC UNDER-COAT LAYER CONTAINING HEMATITE (FE_2O_3) PARTICLES.

Kazuyuki Hayashi; Keisuke Iwasaki; Yasuyuki Tanaka, and Hiroko Morii, all of Hiroshima-ken, Japan, assignors to Toda Kogyo Corporation, Japan

Filed Oct. 18, 1996, Ser. No. 733,790

Claims priority, application Japan, Oct. 20, 1995, 7-297852

Int. Cl.^{6} G11B *5/708*

U.S. Cl. 428—328 **20 Claims**

1. Hematite particles for a non-magnetic undercoat layer for a magnetic recording medium, comprising: acicular hematite particles having an average major axial diameter of not more than 0.3 µm, a major axial diameter distribution in geometrical standard of not more than 1.50 and a BET specific surface area of not less than 35 m^2/g, showing a pH of not less than 8, and containing soluble sodium salt of not more than 300 ppm, calculated as Na, and containing soluble sulfate of not more than 150 ppm, calculated as SO_4.

5,750,251

MULTILAYERED SOFT MAGNETIC FILM AND MAGNETIC HEAD USING THE SAME

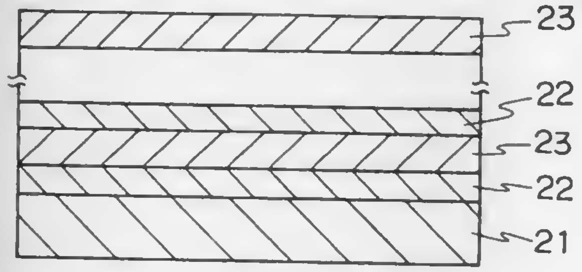
Hiroshi Ohji, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1993, Ser. No. 139,110

Claims priority, application Japan, May 6, 1993, 5-105520

Int. Cl.^{6} G11B *5/60*

U.S. Cl. 428—332 **23 Claims**



1. A multilayered soft magnetic film comprising:

at least one compound layer alternately comprising

a base film composed of either Ni-fe alloy or alloy containing Ni and Fe as main components and

a main magnetic film composed of either Fe or an alloy containing Fe as a main component,

said base film and said main magnetic film being stacked alternately and repeatedly on a substrate so as to form a cyclic structure,

wherein the thickness of said main magnetic film is in a range of $0<t\leqq 500$ nm, the thickness of said base film is in a range of $0<t\leqq 20$ nm, and the thickness ratio of said main magnetic film to said base film is at least 15.

5,750,252

PROTECTIVE COATING FOR METAL SURFACES

Mark C. Danner, Newark, and Kenneth E. Klaber, Reynoldsburg, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 2, 1995, Ser. No. 460,160

Int. Cl.^{6} B32B *15/04;15/08;27/08;27/00*

U.S. Cl. 428—332 **18 Claims**

1. A protective coating for a metal surface comprising:

a) an adhesive film for adhering the coating to the metal surface consisting essentially of:

i) a first layer of a copolymer of ethylene and acrylic acid; and

ii) a second layer consisting essentially of a blend of low density polyethylene and maleic anhydride: and

b) an extrudate of low density polyethylene, said extrudate forming a film to extrudate interface with said second layer of said adhesive film, the film to extrudate interface having a peel strength of at least about 50 pounds per inch.

5,750,253

PRINTING PAPER AND NEWSPRINT PAPER WITH IMPROVED WATER ABSORPTIVITY AND THE MANUFACTURING PROCESS

Toshimi Satake; Toshiyuki Takano; Motoi Fukuda, and Yukiko Uehori, all of Tokyo, Japan, assignors to Nippon Paper Industries Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1995, Ser. No. 579,942

Claims priority, application Japan, Dec. 28, 1994, 6-339083; Dec. 6, 1995, 7-344832

Int. Cl.^{6} B32B *23/08*

U.S. Cl. 428—342 **15 Claims**

1. A printing paper having a coated surface, said paper having a droplet water absorption degree in the range of 10–1000 seconds, as measured by the time required to absorb 1 µl of water dropped on the coated surface of said paper, or having a contact angle in the range of 80° to 90° when determined 5 seconds after 5 µl of water is dropped on the coated surface of said paper, said paper comprising:

a base paper; and

a coating layer formed on said base paper, said coating comprising a water-absorbency controlling composition comprising:

component A which is a water-soluble polyacrylamide selected from the group consisting of cationic polyacrylamides and amphoteric polyacrylamides having cation monomer units containing at least a tertiary amine group or a quaternary ammonium base; and

component B which is a water-soluble anionic copolymer of a styrenic monomer and an acid monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, isocrotonic acid, 2-ethylacrylic acid, 3-tertiary-butylacrylic acid, maleic acid, methylmaleic acid, phenylmaleic acid, cloromaleic acid, fumaric acid, itaconic acid and muconic acid; or a copolymer of an olefinic monomer and an acid monomer selected from the group consisting of maleic acid, methylmaleic acid, phenylmaleic acid, cloromaleic acid, fumaric acid, itaconic acid, and meconic acid;

wherein said coating layer is formed on said base paper in an amount effective to a achieve said droplet water absorption degree or said contact angle; wherein the weight ratio of said component A to said component B is in the range of 20:80 to 80:20.

5,750,254

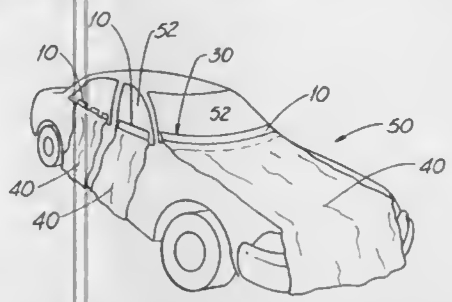
TAPE WITH PLURAL ADHESIVE ZONES AND AN AUTOMOBILE PROTECTION ARRANGEMENT

John F. Starkey, Waterford, Wis., assignor to RSW, Inc., Specialty Tapes Division, Racine, Wis.

Filed Jun. 5, 1995, Ser. No. 462,299

Int. Cl.^{6} C09J *7/02*

U.S. Cl. 428—343 **12 Claims**



1. In combination, a flexible sheet, a motor vehicle having a finish protected by the sheet, and an elongate strip of tape securing the sheet with respect to the motor vehicle and wherein the tape includes:

first and second opposed surfaces;

a first zone and a second zone disposed on the first surface substantially parallel to each other, the first and second zones being elongated and extending along the tape;

an intermediate zone disposed between the first and second zones;

a first layer of adhesive disposed at the first zone and adhering only to the sheet;

a second layer of adhesive disposed at the second zone and removably adhering to the finish;

the second surface is substantially free of adhesive; and

the finish, the sheet, the tape and its layers are substantially coplanar,

whereby the first surface is substantially coated with adhesive, and the tape is substantially permanently affixed to the sheet and is readily removable from the vehicle, thereby temporarily protecting the vehicle finish.

5,750,255

HIGH STRENGTH ROCK WOOL AND PROCESS FOR PRODUCING SAME

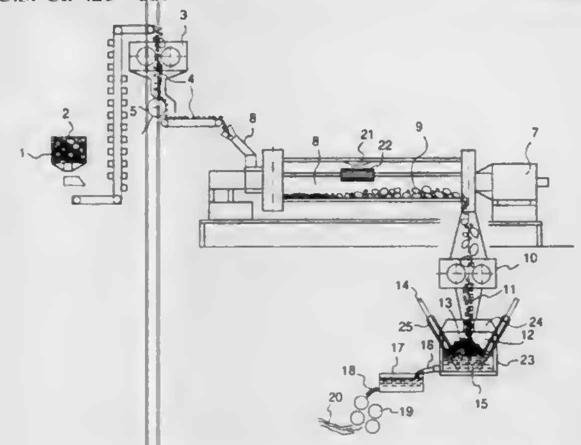
Shizuo Yoshida; Masakazu Tamura; Eiichi Sakamoto; Akira Okada, all of Chiba, and Atsushi Yamasawa, Funabashi, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jul. 9, 1996, Ser. No. 677,396

Claims priority, application Japan, Jul. 12, 1995, 7-197959

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—359 **13 Claims**



1. A high strength rock wool obtained by preliminarily calcining the starting material comprising the industrial wastes generated in the course of the production of a rock wool in a calcination temperature region of from 1,000° to 1,250° C. for a time of at least 1 minute but within 60 minutes in an oxygen gas with the oxygen gas concentration of 2 to 10%, immediately crushing and pulverizing the resulting blocks, introducing the resulting particles into an electric furnace to melt the same and fiberizing the resulting melt by a spinner wheels, wherein said rock wool has a metallic iron content of 0.05% by weight or less, a total sulfur content of 0.10% by weight or less, a total carbon content is 0.10% by weight or less, and has an average tensile strength of 200 kg/mm^2 or more.

5,750,256

WATER-REPELLENT FIBER AND NONWOVENS MADE OF THE FIBER

Hidemi Ito; Masahiko Taniguchi; Yoshimi Tsujiyama, all of Moriyama, and Masahito Katsuya, Yasu-gun, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 9, 1996, Ser. No. 629,507

Claims priority, application Japan, Apr. 17, 1995, 7-116484

Int. Cl.^{6} D06M *13/256;13/402;* **D04H** *1/42*

U.S. Cl. 428—375 **8 Claims**

1. A water-repellent fiber of a thermoplastic resin, which is a fiber having adhered to the fiber surface a textile oil comprising a surfactant composition, wherein the textile oil comprises:

(A) 5–15% by weight of at least one alkylosulfonate,

(B) 5–45% by weight of at least one compound selected from the group consisting of polyol esters and aliphatic acid alkanol amides, and

(C) 40–90% by weight of at least one compound selected from the group consisting of dibasic acid esters and polyethylene glycol esters, and the amount of the textile oil is 0.1–0.8% by weight of the fiber.

5,750,257

INSULATED ELECTRIC WIRE

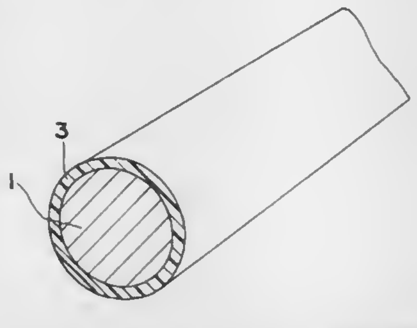
Hideo Doshita; Masahiro Koyano; Akihiro Goto; Kazuhisa Ishimoto, and Makoto Tai, all of Amagasaki, Japan, assignors to Optec Dai-Itchi Denko Co., Ltd., Amagasaki, and Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, both of Japan

Filed Jun. 27, 1996, Ser. No. 671,484

Claims priority, application Japan, Jun. 29, 1995, 7-164020; Oct. 3, 1995, 7-256593

Int. Cl.^{6} B32B *15/00*

U.S. Cl. 428—379 **12 Claims**



1. An insulated electrical wire with good solderability, which comprises an electrical conductor having thereover an insulation of a polyamide-imide copolymer of anhydrotrimellitic acid, a mixture of an aliphatic dicarboxylic acid, and an aromatic dicarboxylic acid, and a diisocyanate, wherein the molar ratio of said diisocyanate to all of said acids is from about 0.9:1.0 to about 1.1:1.0, the molar ratio of said anhydrotrimellitic acid to the total of said acids is from about 0.2:1.0 to about 0.7:1.0, and the molar ratio of said aliphatic dicarboxylic acid to the total of said acids is from about 0.2:1.0 to about 0.7:1.0.

5,750,258

CROSSLINKED RESIN-COATED SILICA FINE PARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Kazuhiko Sakai; Tatsuhiko Adachi; Norihiro Nakayama, and Kenichi Fujino, all of Gifu, Japan, assignors to Ube Nitto Kasei Co., Ltd., Japan

PCT No. PCT/JP95/00685, § 371 Date Nov. 21, 1995, § 102(e) Date Nov. 21, 1995, PCT Pub. No. WO95/27680, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 7, 1995, Ser. No. 553,442

Claims priority, application Japan, Apr. 11, 1994, 6-071991

Int. Cl.^{6} B32B *5/16;* **B05D** *7/00*

U.S. Cl. 428—405 **9 Claims**

1. Crosslinked resin-coated silica fine particles comprising
- (a) calcined silica particles which are surface-treated with silicone alkoxide or a partial hydrolysis product thereof after calcination, and
- (b) crosslinked resin coatings each of which has a structure of a single layer or a plurality of layers formed on a surface of each calcined silica fine particle through a vinyl-containing silane coupling agent.

5,750,259

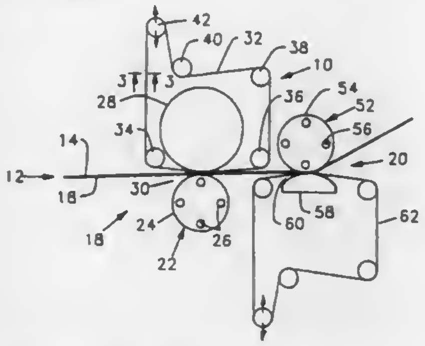
METHOD AND APPARATUS FOR FINISHING A CONTINUOUS SHEET OF PAPER

Thomas M. Neider, 3 Cardinal Dr., Washingtonville, N.Y. 10992, and Robert L. Rudt, 9 Birch Ct., Highland Mills, N.Y. 10930

Division of Ser. No. 342,864, Nov. 21, 1994, Pat. No. 5,546,856, which is a division of Ser. No. 221,470, Apr. 1, 1994, Pat. No. 5,400,707, which is a continuation of Ser. No. 150,760, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 957,804, Oct. 9, 1992, abandoned. This application May 8, 1995, Ser. No. 438,051

Int. Cl.^{6} B32B *9/04*

U.S. Cl. 428—411.1 **30 Claims**



1. A continuous belt capable of use in finishing a surface of a web of paper passing through a hot soft nip calendering apparatus comprising:
- plurality of substantially parallel belt carrier rolls;
- a continuous belt surrounding said belt carrier rolls, said belt comprising a flexible substrate and having an inner surface facing said belt carrier roll and an outer finishing surface facing away from said belt carrier rolls;
- a calendar roll parallel to said belt carrier rolls disposed substantially adjacent said outer finishing surface of the belt and in proximity to at least one said belt carrier roll;
- pressure application means disposed substantially adjacent the inner surface of said belt at a location in proximity to said calender roll, said pressure application means for urging said belt against said calender roll such that a calender nip is defined intermediate the calender roll and the outer surface of said belt for receiving a web of paper therebetween; and
- heating means for heating said calender roll to a temperature of at least about 400° F. to achieve an elevated temperature in said nip sufficient to finish a web of paper passing through said nip;
- said belt adapted to be removably mountable around said plurality of parallel rolls, said inner backing layer capable of engaging said carrier rolls to drive said continuous belt through said apparatus and said outer finishing layer formed from a flexible elastomeric material capable of use in said apparatus at said elevated temperatures at said nip.

5,750,260

DEVELOPMENT/TRANSPORT ROLLERS HAVING A FLUOROCARBON COATING FOR USE IN AUTOMATED THERMAL DEVELOPMENT EQUIPMENT

Robert James Ryther, St. Paul, Minn., assignor to Imation Corp, Oakdale, Minn.

Filed Nov. 22, 1996, Ser. No. 755,265

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—421 **12 Claims**

1. A heated development/transport roller comprising
- (a) a rotatable metal support tube having an inner surface and an outer surface;
- (b) a means for heating said roller attached to said inner surface of said tube or housed within the core of said tube;
- (c) a resilient layer deposited on said outer surface of said metal tube; and
- (d) a fluorocarbon coating adjacent to said resilient layer, wherein said fluorocarbon coating comprises a fluorocarbon material selected from the group consisting of ammonium salt derivatives of perfluoroalkyl sulfonamides and ammonium salt derivatives of perfluoroalkyl sulfonates.

5,750,261

MAGNETIC RECORDING MEDIUM COMPRISING MAGNETIC PARTICLES, BINDER, AND A CURE AGENT OF ISOCYANURATE TRIMERS, PENTAMERS AND HEPTAMERS

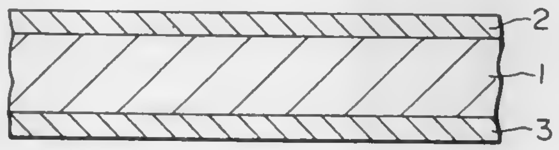
Kenichi Kurihara; Masafumi Ata; Masataka Matsute, and Haruo Watanabe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 3, 1996, Ser. No. 674,880

Claims priority, application Japan, Jul. 7, 1995, 7-195791

Int. Cl.^{6} G11B *5/702*

U.S. Cl. 428—422.8 **7 Claims**



1. A magnetic recording medium comprising:
- a non-magnetic base layer; and a magnetic layer disposed on said base layer, said magnetic layer comprising a coating comprising:
  - 100 parts by weight of a magnetic powder;
  - a resin binder comprising a 1:1 mixture of a polyurethane resin and a vinyl chloride copolymer resin having active hydrogen functionality and polar group functionality; and
  - 2–30% by weight based on the total weight of the resin binder of a curing agent comprising a mixture of oligomers of diisocyanate monomers, said curing agent including 70% by weight or more of isocyanurate trimers, pentamers and heptamers of said diisocyanate monomers, at least 30% by weight or more of said curing agent being pentamers and/or heptamers.

5,750,262

HEAT-SEALABLE MULTILAYER FILM HAVING GOOD SURFACE SLIP WITH IMPROVED THERMOFORMABILITY BASED ON POLYAMIDE AND POLYOLEFINS

Andreas Gasse, and Rudi Klein, both of Walsrode, Germany, assignors to Wolff Walsrode AG, Walsrode, Germany

Filed Jun. 21, 1996, Ser. No. 668,558

Claims priority, application Germany, Jun. 29, 1995, 195 28 131.4

Int. Cl.^{6} B32B *27/06;27/34*

U.S. Cl. 428—423.5 **15 Claims**

1. A heat-sealable composite film comprising
- at least one layer of aliphatic polyamide (A) and
- at least one layer of a polymer blend (B) consisting of 10–60 wt. % of amorphous polyamide and 40–90% of aliphatic polyamide and
- at least one thermoplastic heat sealing layer (C) having a crystallite melting point of 150° C. or below and being selected from the group consisting of polyethylenes, polyethylene copolymers, polypropylene, polypropylene copolymers, polybutylenes and ionomers, and
- at least one bonding layer (D),

arranged in such a manner that a heat sealing layer and a layer of aliphatic polyamide are located on the outer sides of the film, and in that the film is not stretched.

5,750,263

LOW FOGGING RUBBERY POLYMER

Hung Dang Ngoc, Limeil Brevannes, and Mariano Salazar, Orsay, both of France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 573,983, Dec. 18, 1995, Pat. No. 5,674,933, which is a continuation-in-part of Ser. No. 440,032, May 12, 1995, Pat. No. 5,504,160, which is a division of Ser. No. 306,291, Sep. 15, 1994, Pat. No. 5,415,940, which is a division of Ser. No. 43,076, Apr. 5, 1993, Pat. No. 5,380,785. This application Mar. 17, 1997, Ser. No. 818,990

Int. Cl.^{6} B32B *27/08*

U.S. Cl. 428—424.4 **15 Claims**

1. A panel for automotive applications which is low fogging and which is comprised of a semirigid urethane foam which is supported by a rigid backing, wherein said semirigid urethane foam is covered with a leathery skin which is comprised of (1) polyvinyl chloride, (2) a plasticizer, and (3) a rubbery polymer which is comprised of repeat units which are comprised of (a) butyl acrylate, (b) at least one member selected from the group consisting of methyl methacrylate, ethyl methacrylate, methyl acrylate, and ethyl acrylate, (c) acrylonitrile, (d), styrene, (e) a surfactant selected form the group consisting of sulfonates and sulfate derivatives, (f) a dispersant selected from the group consisting of aromatic formaldehyde condensation products and polycarboxylates, and (g) a crosslinking agent.

5,750,264

ELECTRONIC COMPONENT AND METHOD FOR FABRICATING THE SAME

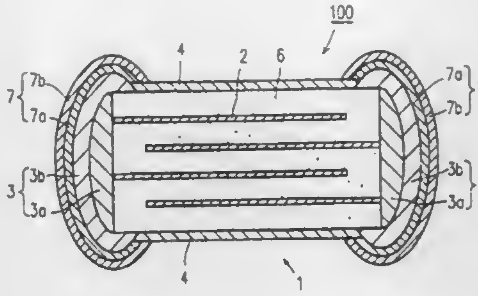
Iwao Ueno, Kyoto, and Yasuo Wakahata, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Inc., Kadoma, Japan

Filed Oct. 16, 1995, Ser. No. 543,805

Claims priority, application Japan, Oct. 19, 1994, 6-253420; May 31, 1995, 7-133335

Int. Cl.^{6} B32B *17/00*

U.S. Cl. 428—426 **22 Claims**



1. An electronic component comprising: an element having an internal electrode therein; an external electrode formed on an end portion of the element where an end face of the internal electrode is exposed; and a protection layer formed on the entire surface of the element except for the end portion of the element, wherein the protection layer is made of a metal oxide.

5,750,265

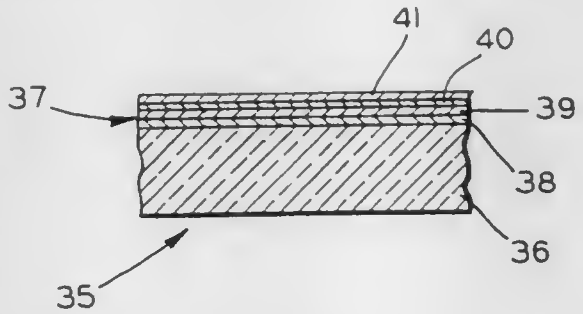
COATED GLASS ARTICLE HAVING A PYROLYTIC SOLAR CONTROL COATING

Ronald D. Goodman, Toledo, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Jan. 11, 1996, Ser. No. 585,106

Int. Cl.^{6} B32B *17/06*

U.S. Cl. 428—432 **33 Claims**



1. A coated glass article comprising:
- (A) a glass substrate, having a surface;
- (B) a first coating of titanium dioxide deposited on and adhering to the surface of the glass substrate;
- (C) a coating of silicon dioxide deposited on and adhering to the coating of titanium dioxide;
- (D) a second coating of titanium dioxide deposited on and adhering to the coating of silicon oxide; and
- (E) a coating of conductive tin oxide deposited on and adhering to said second coating of titanium dioxide, said coated glass article having a visible light transmittance (Illuminant C) of greater than 65%, a solar heat transmittance of less than 50%, and an emittance less than or equal to about 0.2.

5,750,266

SLIDING MATERIAL FOR LIGHT METAL MATERIALS

Tatsuei Sakata, Kashiwazaki, Japan, assignor to Kahushiki Kaisha Riken, Tokyo, Japan

Filed May 29, 1996, Ser. No. 654,590

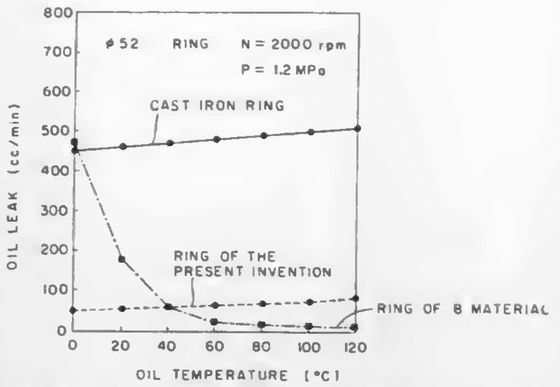
Int. Cl.^{6} B32B *15/08;* **B65D** *53/06*

U.S. Cl. 428—457 **6 Claims**

1. A sliding material, which is in sliding contact with a light metal material and sealing oil applied to the sliding contact surface between them, consisting of polyether-ether ketone and sericite, 20~35 wt % of sericite being added therein.

2. A sliding material, which is in sliding contact with a light metal material and sealing oil applied to the sliding contact surface between them, consisting of polyether-nitride and sericite, 20~35 wt % of sericite being added therein.

3. A sliding material which is in sliding contact with a light metal material and sealing oil applied to the sliding contact surface



between them, consisting of polyether-ether ketone, polyether-nitride and sericite, 20~35 wt % of sericite being added therein.

5,750,267
TRANSPARENT CONDUCTIVE LAMINATE

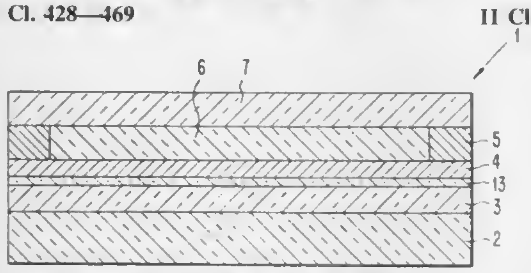
Mitsuo Takase, Kamagaya; Nobuhiro Fukuda, Yokohama, and Toshihiro Dodo, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 186,922, Jan. 27, 1994, Pat. No. 5,493,102. This application Nov. 6, 1995, Ser. No. 554,596

Claims priority, application Japan, Jan. 27, 1993, 5-011536; Jan. 29, 1993, 5-013262; Apr. 2, 1993, 5-076540

Int. Cl.⁶ H05B *3/10*

U.S. Cl. 428—469 **11 Claims**



1. A transparent laminate obtained by laminating
- (a) at least one transparent thin layer made of an oxynitride of at least one selected from the group consisting of silicon, indium, tin, boron, aluminum, gallium and silicon carbide, or made of a hydride nitride of at least one selected from said group, and
- (b) at least one substantially light-transmittable metallic layer, on a surface of a transparent substrate.

5,750,268
MULTILAYER POLYMER SYSTEM COMPRISING AT LEAST ONE ENGINEERING THERMOPLAST LAYER AND AT LEAST ONE SOFT TOUCH COMPOSITION LAYER, AND COMPOSITIONS TO BE USED THEREFORE

Jean-Michel Mace, and Jacques Moerenhout, both of Louvain-la-Neuve, Belgium, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 9, 1996, Ser. No. 731,127

Claims priority, application European Pat. Off., Oct. 26, 1995, 95307632

Int. Cl.⁶ C08L *77/00;* **B32B** *9/04;27/08*

U.S. Cl. 428—475.8 **6 Claims**

1. A multilayer polymer composition comprising at least one relatively soft touch layer comprising at least one block copolymer derived from a monovinyl aromatic and a conjugated diene, and at least one layer of relatively hard, rigid thermoplastic, which layers have intimate contact with each other, comprising:
- (a) at least one relatively soft touch layer comprising
  - (i) a polar engineering thermoplast in an amount of from 5 to 50 wt %,
  - (ii) from 10 to 70 wt % of a selectively hydrogenated block copolymer, having at least two poly(monovinyl aromatic) blocks and at least one poly(conjugated diene) block, wherein the residual ethylenic unsaturation after hydrogenation is at most 5%,
  - (iii) from 5 to 85 wt % of a selectively hydrogenated block copolymer, having at least two poly(monovinyl aromatic) blocks and at least one poly(conjugated diene) block wherein the residual ethylenic unsaturation after hydrogenation is at most 5%, said block copolymer having been functionalized by means of introduced polar groups,
  - (iv) a plasticizer in an amount of from 0 to 40 wt %, and wherein all ingredients amounts relative to the weight of the total soft touch layer composition and the sum of the respective amounts of the ingredients (i) to (iv) is 100 wt %, and
- (b) at least one relatively hard, rigid layer comprising at least a polar engineering thermoplast.

5,750,269
REMOVABLE COATING COMPOSITION AND PROCESS FOR PROTECTING SURFACES

Vernon Kee Park, Longview, Tex., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 28, 1995, Ser. No. 579,682

Int. Cl.⁶ B32B *27/00;27/30;27/32;* **C08K** *5/01*

U.S. Cl. 428—484 **12 Claims**

1. A coating composition comprising a) about 10 to 50 weight percent of an oxidized low molecular weight polyethylene wax having an acid number of 10 to 40, a Brookfield Thermosel viscosity of 50 to 2500 cP at 125° C., and a RBSP of 90° to 130° C., b) about 10 to 80 weight percent of a paraffin wax having a RBSP of 30° to 75° C., and c) about 10 to 80 weight percent of a thermoplastic acrylic copolymer containing 15 to 75 weight percent hard monomer, 20 to 70 weight percent soft monomer, and 0 to 30 weight percent acid monomer.

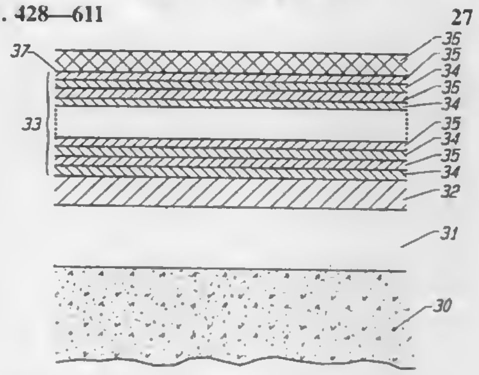
5,750,270
MULTI-LAYER MAGNETIC RECORDING MEDIA

Xiaoxia Tang, San Jose, and Ga-Lane Chen, Fremont, both of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Filed Feb. 7, 1995, Ser. No. 385,107

Int. Cl.⁶ G11B *5/66*

U.S. Cl. 428—611 **27 Claims**



1. A magnetic recording medium, comprising:
- a substrate having deposited thereon a nucleating layer of a nonmagnetic metal selected from the group consisting of palladium or platinum having a thickness of greater than 50 Å and a recording layer comprising a plurality of bilayers of a magnetic metal, or an alloy thereof, having perpendicular magnetic anisotropy and having a first thickness and a nonmagnetic metal selected from the group consisting of palladium or platinum having a second thickness, and a keeper layer having a third thickness, said keeper layer disposed between said nucleating layer and said substrate,
- wherein the thickness of the nucleating layer, the first thickness, the second thickness, and the number of bilayers are selected such that the medium possesses a coercivity of greater than about 1000 Oe, a signal output of greater than 54 mv, a signal noise level of less than 44 mv, and a signal to noise ratio of greater than 7 dBm.

5,750,271
METHOD OF FORMING SOLDER FILM

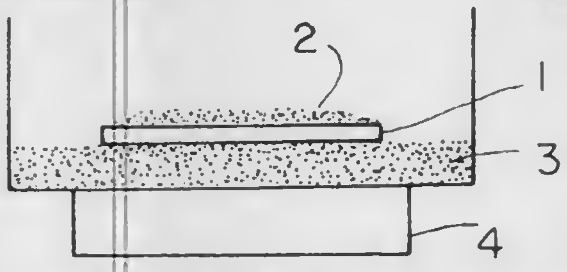
Takeo Kuramoto; Masataka Watabe; Satoshi Noda, all of Tokyo; Takashi Shoji, and Takekazu Sakai, both of Saitama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 332,488, Oct. 31, 1994, Pat. No. 5,556,023, which is a continuation-in-part of Ser. No. 144,322, Nov. 1, 1993, abandoned. This application Aug. 10, 1995, Ser. No. 513,549

Claims priority, application Japan, Oct. 30, 1992, 4-315738; Jan. 11, 1993, 5-19366

Int. Cl.⁶ H05K *3/24*

U.S. Cl. 428—624 **3 Claims**



1. A printed circuit board obtained by a method which comprises selectively imparting tackiness to only a predetermined part of a metallic surface of an article by means of a tacky layer-forming solution, adhering a powdered solder to the resulting tacky part, and then melting the solder by heating to thereby form a solder film; wherein said tacky layer-forming solution comprises at least one compound selected from the group consisting of benzotriazole derivatives, naphthotriazole derivatives, imidazole derivatives, benzoimidazole derivatives, mercaptobenzothiazole derivatives, benzothiazole thiofatty acid derivatives, and triazine derivatives.

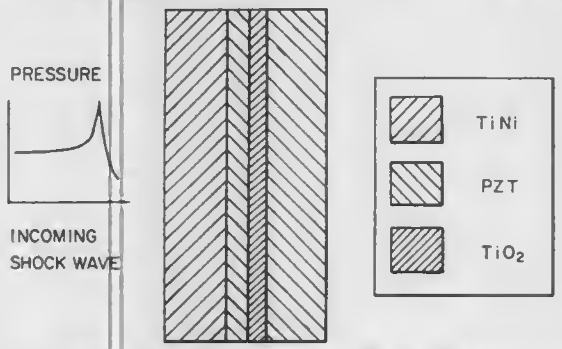
5,750,272
ACTIVE AND ADAPTIVE DAMPING DEVICES FOR SHOCK AND NOISE SUPPRESSION

A. Peter Jardine, Setauket, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,454

Int. Cl.⁶ B32B *15/04;* **H04R** *17/00;* **H01L** *41/053*

U.S. Cl. 428—686 **34 Claims**



1. A vibration damping device including at least a multilayer heterostructure which comprises:
- a layer of ferroelastic or Shape Memory Effect material for receipt of a vibration wave;
- a first layer of ferroelectric material coupled to said ferroelastic or Shape Memory Effect material; and
- a second layer of ferroelectric material coupled to said first layer of ferroelectric material with a layer of dielectric material therebetween.

5,750,273
SOFT MAGNETIC THIN FILM AND THIN FILM MAGNETIC ELEMENT USING THE SAME

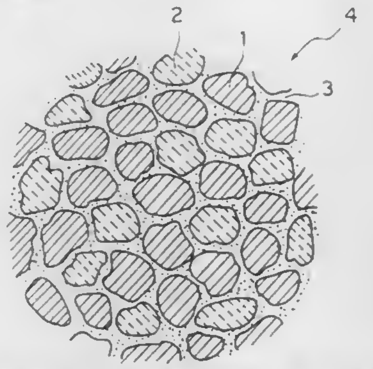
Tetsuo Inoue, Yokohama; Hiroshi Tomita, Tokyo; Tetsuhiko Mizoguchi, Yokohama, and Hiromi Fuke, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1996, Ser. No. 623,529

Claims priority, application Japan, Mar. 30, 1995, 7-072955

Int. Cl.⁶ G11B *5/66*

U.S. Cl. 428—692 **10 Claims**



1. A soft magnetic film characterized by having a composition substantially represented by the general formula:

$$T_{100-x-z}M_x(AO_v) \qquad (2)$$

wherein T stands for at least one element selected from the group consisting of Fe and Co, M for at least one element selected from the group consisting of Zr, Hf, Nb, and Y, and A for at least one element selected from the group consisting of Si, Ge, Sn, B, P, and C, and x, z, and v respectively satisfy the expressions, $5 \leqq x \leqq 20$ at. %, $1 \leqq z \leqq 10$ at. %, and $0 \leqq v \leqq 2$ and having a microstructure consisting of a microcrystalline phase and a first amorphous phase and a second amorphous phase disposed around said phases.

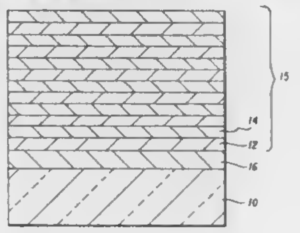
5,750,274
MULTILAYER MAGNETOOPTIC RECORDING MEDIA

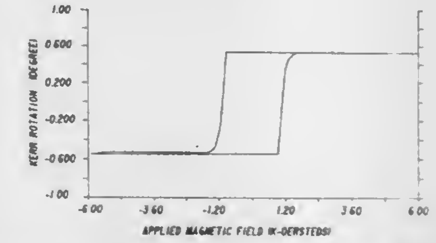
Tukaram K. Hatwar, Penfield; Yuan-Sheng Tyan, Webster, and Charles F. Brucker, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1996, Ser. No. 674,226

Int. Cl.⁶ G11B *5/66;* **B32B** *5/16*

U.S. Cl. 428—694 MM **5 Claims**





1. A magnetooptic medium comprising a substrate, an amorphous seed layer composed of $(In_2O_3)_{1-x}(SnO_2)_x$ where x=0.21 to 0.90 and a recording multilayer deposited onto the seed layer wherein the seed layer has a thickness of greater than 20 nm but less than 200 nm and is selected to improve the recording sensitivity coercivity, squareness, and Kerr rotation of the Kerr hysteresis loop of the recording multilayer, and the recording multilayer

includes alternating layers of cobalt and platinum or cobalt and palladium or cobalt and platinum-palladium alloy.

5,750,275

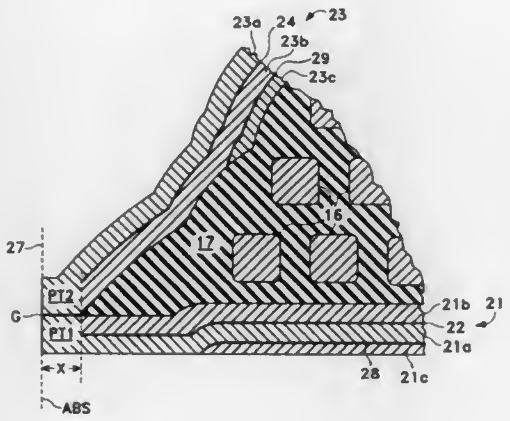
THIN FILM HEADS WITH INSULATED LAMINATIONS FOR IMPROVED HIGH FREQUENCY PERFORMANCE

Eric R. Katz, and David I. Berger, both of San Jose, Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Jul. 12, 1996, Ser. No. 679,228

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—694 R **6 Claims**



1. A magnetic disk recording head incorporating a thin film transducer for recording signals on a planar magnetic disk comprising:
- a first magnetic pole member and a second magnetic pole member;
- said first and said second magnetic pole members each having pole tip portions spaced from each other at one end of each of said pole members, said ends of said pole tip portions defining an air bearing surface;
- each of said first and said second pole members being formed of a plurality of adjacent laminated magnetic members; and
- nonmagnetic insulating material disposed between said adjacent laminated members of said first and said second pole members along the lengths thereof to a distance spaced from said air-bearing surface.

5,750,276

TREATMENTS FOR CONCRETE

Christopher Lyndon Page, Birmingham, United Kingdom, assignor to Tarmac Construction Limited, West Midlands, United Kingdom

PCT No. PCT/GB92/02345, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/12052, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 17, 1992, Ser. No. 244,959

Claims priority, application United Kingdom, Dec. 19, 1991, 9126899

Int. Cl.^{6} B32B *17/00*

U.S. Cl. 428—703 **16 Claims**

1. A method of inhibiting one of alkali-aggregate or alkali-silica reactions in hardened concrete which comprises the steps of introducing a substance into the concrete and applying an electric field to the concrete after it hardens to cause the substance to migrate within the hardened concrete, wherein the substance inhibits one of alkali-aggregate or alkali-silica reactions in the hardened concrete.

5,750,277

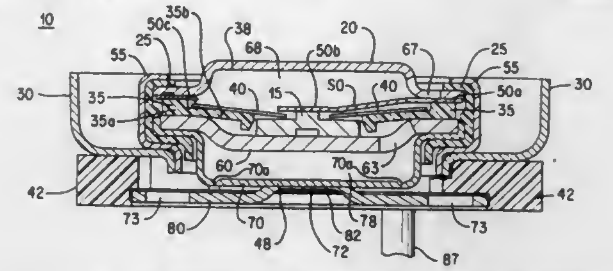
CURRENT INTERRUPTER FOR ELECTROCHEMICAL CELLS

Viet H. Vu, Milford, Mass.; Lucien P. Fontaine, Lincoln, R.I.; William T. McHugh, Westwood, Mass.; Robert J. Pinault, West Warwick, R.I.; Jane A. Blasi, Acton, Mass.; Steven K. Sullivan, Cranston, R.I.; Geoffrey J. Paquin, North Attleboro, Mass.; Stephen S. Johnson, Attleboro, Mass.; Gary K. Maus, South Attleboro, Mass., and Lance E. Cambra, Acushnet, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex., and Duracell Inc., Bethel, Conn.

Filed Oct. 2, 1996, Ser. No. 720,585

Int. Cl.^{6} H01M *2/12;10/50*

U.S. Cl. 429—7 **51 Claims**



1. An end cap assembly for application to an electrochemical cell having a positive and a negative terminal and a pair of internal electrodes (anode and cathode), said end cap assembly comprising a housing and an end cap plate, said plate functional as a cell terminal, said end cap assembly having an electrically conductive pathway therethrough permitting the end cap plate to be electrically connected to a cell electrode when said end cap assembly is applied to a cell, said end cap assembly further comprising a) thermally responsive means for preventing current from flowing through said electrical pathway, wherein said thermally responsive means is activatable when the temperature within said end cap assembly reaches a predetermined level causing a break in said electrical pathway and b) pressure responsive means for preventing current from flowing through said electrical pathway, wherein said pressure responsive means is activatable when gas pressure applied to at least a portion of said electrical pathway reaches a predetermined level causing a break therein.

5,750,278

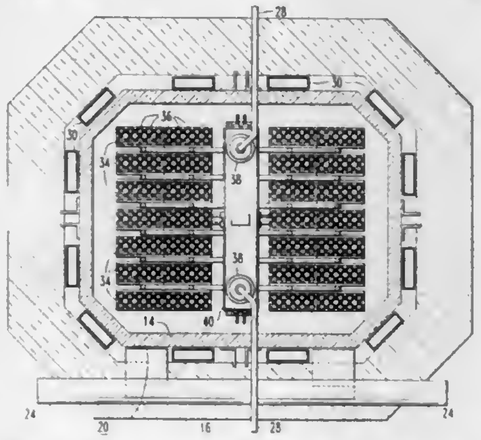
SELF-COOLING MONO-CONTAINER FUEL CELL GENERATORS AND POWER PLANTS USING AN ARRAY OF SUCH GENERATORS

James E. Gillett, Greensburg; Jeffrey T. Dederer, Valencia, and Paolo R. Zafred, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1995, Ser. No. 513,468

Int. Cl.^{6} H01M *8/04;2/00*

U.S. Cl. 429—24 **19 Claims**



1. A self-cooling mono-container fuel cell generator apparatus, comprising: a layer of interior insulation; a layer of exterior insulation; a single metal housing having top, bottom and side sections with at least the side section of the housing disposed between the insulation layers, said section having cooling ducts therein, the ducts functioning only to pass cooling oxidant gas, which ducts in the side section communicate to a source of cooling oxidant gas; a plurality of fuel cells containing electrodes and electrolyte surrounded by the interior insulation; a gaseous oxidant inlet; and a gaseous fuel inlet connected to fuel channels to allow fuel passage to the fuel cells.

5,750,279

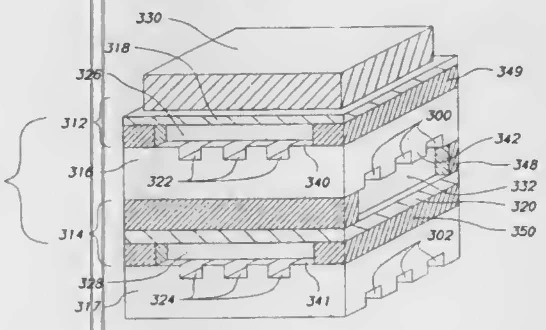
SERIES PLANAR DESIGN FOR SOLID ELECTROLYTE OXYGEN PUMP

Michael Francis Carolan; Paul Nigel Dyer, both of Allentown; Eric Minford, Laurys Station; Steven Lee Russek, Allentown, all of Pa.; Merrill Anderson Wilson, West Jordan, Utah; Dale M. Taylor, Salt Lake City, Utah, and Brett Tamatea Henderson, Salt Lake City, Utah, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 843,303, Feb. 28, 1992, Pat. No. 5,338,623. This application May 9, 1994, Ser. No. 240,054

Int. Cl.^{6} H01M *8/04*

U.S. Cl. 429—32 **15 Claims**



1. An electrochemical solid-state device for transporting ions through an electrolyte comprising: a plurality of planar electrolytic cells connected in series by an electrically conductive interconnect layer and a sealing means to form a gas-tight seal therebetween, each electrolytic cell comprising an ion conducting electrolyte layer, a first electrode layer situated contiguous to a first surface of the electrolyte layer and a second electrode layer situated contiguous to a second surface of the electrolyte layer; a first surface of the interconnect layer comprising at least one gas passage for receiving a feedstream containing a component capable of being transported ionically through the electrolyte, which first surface of the interconnect layer is connected to the second electrode layer of a first planar electrolytic cell and a second surface of the interconnect layer which is connected to the first electrode layer of a second planar electrolytic cell, the second surface of the interconnect layer comprising at least one gas passage for withdrawing the component being transferred through the electrolyte layer, wherein a means for reducing gas phase diffusion resistance is attached to the first and second surfaces of the interconnect layer of each respective electrolytic cell which project into the gas passage, the interconnect layer further providing a pathway for movement of electrons between the first electrode layer of the second planar electrolytic cell and the second electrode layer of the first planar electrolytic cell.

5,750,280

FUEL CELL SYSTEM

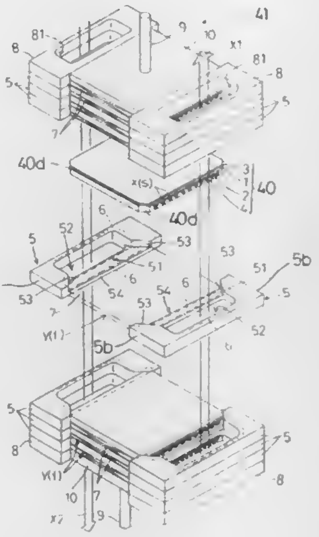
Kosuke Akagi, Ikoma, Japan, assignor to Osaka Gas Co., Ltd., Osaka, Japan

Filed Aug. 22, 1995, Ser. No. 517,599

Claims priority, application Japan, Aug. 23, 1994, 6-198084; Mar. 29, 1995, 7-071168; Jun. 1, 1995, 7-134897

Int. Cl.^{6} H01M *8/12;8/24*

U.S. Cl. 429—32 **29 Claims**



1. A fuel cell system comprising:
- cells (**40**) in form of rectangular plates defined by two pairs of parallel sides; each cell including:
  - an electrolyte layer (**1**) having an oxygen electrode (**2**) applied to one surface thereof and a fuel electrode (**3**) applied to the other surface; and
  - a passage-defining member (**4**) for defining intracellular passages (x) opposed to one of said oxygen electrode (**2**) and said fuel electrode (**3**);
  - said cells (**40**) being stacked in a spaced relationship to form a cell assembly (**41**), with intercellular passages (y) formed between said cells; and a plurality of pairs of cell holders (**5**), each pair for holding one of said cells;
  - wherein said intracellular passages (x) are open at one of said pairs of parallel sides and closed at the other of said pairs of parallel sides of each cell;
  - said intercellular passages (y) are closed at said sides (**40***b*) where said intracellular passages (x) are open, and open at said sides (**40***c*) where said intracellular passages (x) are closed;
  - said cell holders (**5**) define notches (**51**) for receiving the opposite sides (**40***a*) where said intracellular passages (x are open;
- said notch
- said notches (**51**) each include contact surfaces (**53**) for contact with said closed sides (**40***c*) adjacent opposite ends of each of said open sides (**40***a*), each of said notches having substantially the same depth as a thickness of one of said cells; and
- said cell assembly (**41**) is formed by said cells (**40**) stacked with said open sides (**40***a*) fitted into said notches (**41**) of opposed pairs of said cell holders (**5**).

5,750,281

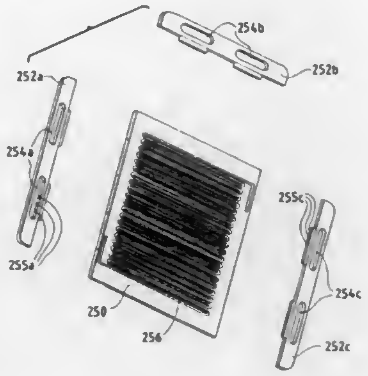
EDGE MANIFOLD ASSEMBLY FOR AN ELECTROCHEMICAL FUEL CELL STACK

Kirk B. Washington, Richmond; John T. Kenna, North Vancouver; Greg A. James, Vancouver, and Shiraz N. Ramji, Burnaby, all of Canada, assignors to Ballard Power Systems Inc., Burnaby, Canada

Continuation-in-part of Ser. No. 363,889, Dec. 27, 1994, Pat. No. 5,514,487. This application Dec. 28, 1995, Ser. No. 579,243

Int. Cl.^{6} H01M *8/04*

U.S. Cl. 429—39 **46 Claims**



1. An edge manifold assembly for an electrochemical fuel cell stack comprising a plurality of fuel cells, said assembly comprising a plurality of manifold plates, each of said fuel cells having at least three manifold plates attached thereto, each of said manifold plates having at least one manifold opening formed therein for containing a fluid and having at least one channel formed therein for effecting fluid communication between said manifold opening and the fuel cell to which each of said manifold plates is attached.

5,750,282

PROCESS FOR IMPROVING LITHIUM ION CELL

Ignacio Chi, Dracut; Karthik Ramaswami, Framingham; Han C. Kuo, Burlington, and Christa Todino, Woburn, all of Mass., assignors to Duracell inc., Bethel, Conn.

Continuation of Ser. No. 473,894, Jun. 7, 1995, abandoned. This application Jan. 3, 1997, Ser. No. 778,560

Int. Cl.^{6} H01M *10/40;10/42*

U.S. Cl. 429—49 **17 Claims**

1. A process for increasing the thermal stability of a rechargeable lithium ion cell which is in a charged state wherein said lithium ion cell in said charged state has a negative electrode comprising carbon and lithium ions, a positive electrode comprising a lithiated metal oxide and an electrolyte comprising a metal salt in a non-aqueous solvent, and wherein said cell has a passivating layer on a surface of the carbon negative electrode; said process comprising the steps of maintaining said charged lithium ion cell at a temperature from about 45° C. to about 60° C. for a period of time of from about 1 hour to about 72 hours to increase the passivating efficacy of the carbon negative electrode passivating layer, said process having the effect of limiting exothermic reaction between electrolyte and said negative electrode upon exposure of said lithium ion cell to a temperature above about 100° C.

5,750,283

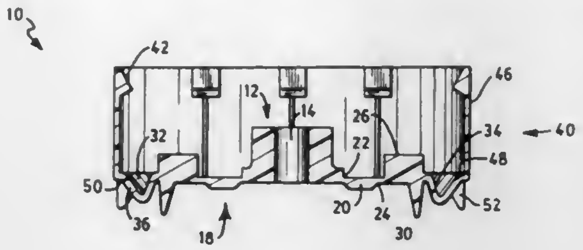
SEAL FOR ELECTROCHEMICAL CELL

Christopher L. DePalma, Framingham, Mass.; Lucian P. Fontaine, Lincoln, R.I.; Peter Rick Moses, Winham, N.H.; Marian Wiacek, Holliston, Mass.; Robert A. Yoppolo, Woonsocket, R.I.; Peter Pope, Balcombe, England; Francis Bruce Tubby, Durham, Conn., and Douglas J. Woodnorth, Needham, Mass., assignors to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 295,336, Aug. 24, 1994, abandoned. This application Feb. 22, 1996, Ser. No. 605,533

Int. Cl.^{6} H01M *2/12*

U.S. Cl. 429—56 **21 Claims**



1. An electrically nonconductive, disk shaped seal member for an electrochemical cell including a centrally located, cylindrical hub joined to an outer rim by a base which includes in outward radial sequesnce an annular pressure vent and a raised annular boss having an inner wall and an outer wall, said vent comprising an annular diaphragm having a thin membrane ring along its inner periphery and said thin membrane ring located adjacent to and circumventing said hub, said thin membrane ring rupturable in pressure induced shear along its entire inner periphery, said annular diaphragm having an annular hinge at its outer periphery, said annular hinge being integrally attached to the inner wall of said raised annular boss, said annular hinge designed to flex when said thin membrane ring ruptures in pressure induced shear.

5,750,284

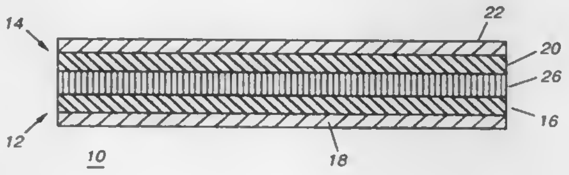
ELECTROLYTE COMPOSITION FOR RECHARGEABLE ELECTROCHEMICAL CELLS

Shekhar L. Pendalwar, Lawrenceville; Manuel Oliver, and Ganesh Venugopal, both of Duluth, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 8, 1997, Ser. No. 780,264

Int. Cl.^{6} H01M *10/40*

U.S. Cl. 429—197 **4 Claims**



1. An elertrolyte system for a rechargeable electrochemical cell having a carbon-containing anode and a lithiated transition metal cathode said electrolyte system comprising a polymeric support structure having an electrolyte active species dispersed therein, said electrolyte active species comprising an electrolyte salt dispersed in an organic solvent, wherein said organic solvent is a ternary system comprising at least 90% diethyl carbonate and the balance being propylene carbonate (PC), and one additional solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, dipropylcarbonate, dimethylsulfoxide, acetonitrile, dimethoxyethane, tetrahydrofuran, n-methyl-2-pyrrolidone, and combinations thereof, such that the amount of PC is always greater than the one additional solvent.

5,750,285

LIFE INDICATOR AND LEAD-ACID STORAGE BATTERY WITH LIFE INDICATOR

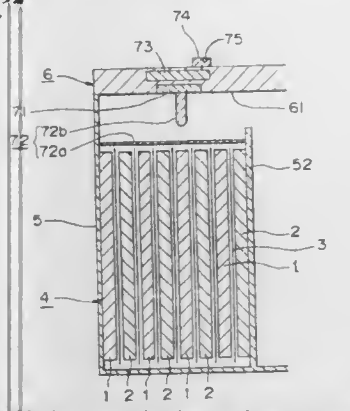
Tadamasa Akutagawa, Tokyo; Shigeru Sano, and Aya Nishino, both of Takatsuki, all of Japan, assignors to Yuasa Corporation, Tokyo, Japan

Filed Aug. 23, 1995, Ser. No. 518,333

Claims priority, application Japan, Aug. 25, 1994, 6-200518; Aug. 9, 1995, 7-203251

Int. Cl.^{6} H01M *10/48*

U.S. Cl. 429—92 **19 Claims**



1. A battery life indicator having at least a sensor portion, a sending means sending a chance of electric parameter detected by the sensor portion as an electric signal, a receiving means receiving a sent signal, and an indicator means indicating the received signal, and

the sensor portion is adapted to receive an applied pressure based on an elongation of a positive plate lattice body, so as to detect the applied pressure as a chance of electric parameter, in which the sending means has a primary coil, the receiving means has a secondary coil, and the both means are adapted to transmit the electric signal through electromagnetic induction.

5,750,286

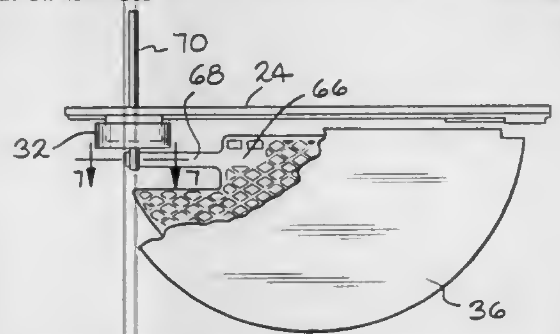
DUAL CONNECTION TAB CURRENT COLLECTOR

William M. Paulot, Lancaster; Joseph M. Probst, Williamsville, and William B. Elliott, Alden, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Jul. 31, 1996, Ser. No. 690,007

Int. Cl.^{6} H01M *4/04;2/26*

U.S. Cl. 429—211 **31 Claims**



1. A current collector means, which comprises:

a) a substrate having a perimeter defining an internal support surface intended for supporting an electrode active material;

b) an internal connection tab mostly surrounded by the support surface; and

c) an external connection tab continuous with a portion of the internal connection tab not surrounded by the support surface such that the perimeter of the current collector is only broken by a width of the internal tab continuous with and substantially co-equal to that of the external tab throughout the extent of the tabs, wherein the internal tab and the external tab provide for selective connection of the current collector means to a lead means.

5,750,287

ORGANIC ELECTROLYTIC CELL

Hajime Kinoshita; Nobuo Ando; Akihiro Anekawa; Takeshi Hashimoto; Yukinori Hato, all of Osaka, and Shizukuni Yata, Kako-gun, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

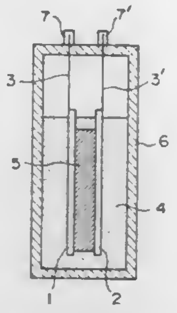
PCT No. PCT/JP94/01557, § 371 Date Mar. 21, 1996, § 102(e) Date Mar. 21, 1996, PCT Pub. No. WO95/08852, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 22, 1994, Ser. No. 619,489

Claims priority, application Japan, Sep. 22, 1993, 5-259403

Int. Cl.^{6} H01M *10/40;4/02*

U.S. Cl. 429—218 **13 Claims**



1. An organic electrolytic cell comprising a positive electrode, a negative electrode and a solution of lithium salt in an aprotic organic solvent as an electrolytic solution, wherein

(1) the positive electrode contains a metallic oxide,

(2) the negative electrode comprises an infusible, insoluble substrate having a polyacene skeletal structure and a hydrogen/carbon atomic ratio of 0.5 to 0.05, said substrate being a heat-treated product of an aromatic condensation polymer, and

(3) the total amount of lithium contained in the cell corresponds to a charge and discharge capacity of at least 500 mAh/g, and the amount of lithium originating in the negative electrode corresponds to a charge and discharge capacity of at least 100 mAh/g, based on the infusible, insoluble substrate.

5,750,288

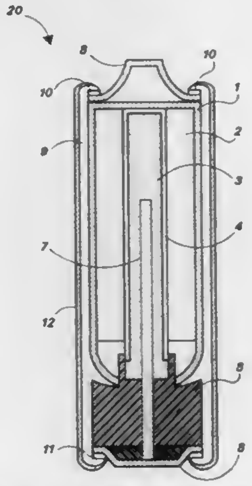
MODIFIED LITHIUM NICKEL OXIDE COMPOUNDS FOR ELECTROCHEMICAL CATHODES AND CELLS

Like Xie; David T. Fouchard, both of Madison, Wis.; Walter B. Ebner, Gastonia, N.C., and El-Sayed Megahed, Madison, Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Oct. 3, 1995, Ser. No. 538,252

Int. Cl.^{6} H01M *4/02*

U.S. Cl. 429—229 **33 Claims**



1. A composition of matter represented by the formula $Li_xR_yNi_{1-y}O_z$, wherein "R" comprises at least one non-transition metal selected from the group consisting of aluminum, gallium, tin, and zinc. "x" is initially between about 0.95 and about 1.05. "y" is

between about 0.02 and about 0.30, "z" is about 2 and the composition having a crystalline structure corresponding to an α-$NaCrO_2$ structure.

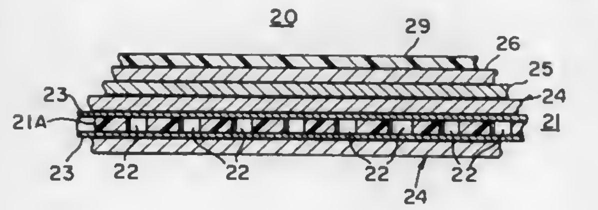
5,750,289
LIGHTWEIGHT CURRENT COLLECTORS AND CARRIERS

Joseph B. Kejha, Lithium Technology Corporation 5115 Campus Dr., Plymough Mtg., Pa. 19462-1129

Continuation-in-part of Ser. No. 281,011, Jul. 27, 1994, abandoned. This application Oct. 3, 1996, Ser. No. 724,862

Int. Cl.^{6} H01M *4/64*

U.S. Cl. 429—233 **23 Claims**



1. An assembly wherein a current collector and carrier is included in at least one of the electrodes of an alkali metal polymer electrolyte electrochemical device, which device includes a negative electrode, a polymer ion conductive layer, and a positive electrode, wherein the current collector and carrier consists of

a ribbon of expanded metallized plastic, with the metal selected from the group consisting of nickel, copper, aluminum, and chrome.

5,750,290
PHOTO MASK AND FABRICATION PROCESS THEREFOR

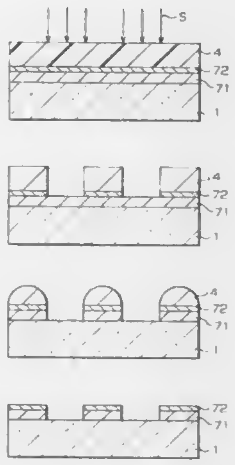
Tadao Yasuzato, and Shinji Ishida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 19, 1996, Ser. No. 634,983

Claims priority, application Japan, Apr. 20, 1995, 7-095087

Int. Cl.^{6} G03L *9/00*

U.S. Cl. 430—5 **33 Claims**



1. A photo mask comprising:

a transparent substrate;

a light shielding layer of ruthenium formed on said transparent substrate; and

a reflection preventing layer of ruthenium oxide formed on said light shielding layer.

5,750,291
IMAGE-FORMING PROCESS

Nicholas Eric Ivory, Glastonbury, and Wrenford John Thatcher, Frome, both of England, assignors to Coates Brothers PLC, England

Division of Ser. No. 351,137, Nov. 30, 1994, Pat. No. 5,556,735, which is a continuation of Ser. No. 960,422, Dec. 23, 1992, abandoned. This application Jun. 13, 1996, Ser. No. 662,309

Claims priority, application United Kingdom, Jun. 27, 1990, 9014325; Mar. 27, 1991, 9106561

Int. Cl.^{6} G03F *7/00*

U.S. Cl. 430—11 **2 Claims**

1. A circuit board having solder resist and solder applied thereto formed by the steps of:

(i) forming a solder resist layer capable of withstanding soldering, said solder resist layer formed by a process chosen from the group of processes consisting of screen printing, curtain coating, electrostatic spraying, dip coating, roller coating, spin coating and spraying, said solder resist consisting essentially of an aqueous emulsion of a photocurable organic solvent solution of an epoxy acrylate derived from an epoxy novalak resin selected from the group of resins consisting of resins produced by reacting ethylenically unsaturated carboxylic acid and polyepoxy compound, and resins produced by reacting ethylenically unsaturated carboxylic acid, polyepoxy compound and dicarboxylic anhydride, upon substantially the entire surface of the board;

(ii) drying the solder resist layer to a non-tacky state by removing said organic solvent and water of said aqueous emulsion;

(iii) imagewise exposing the solder resist layer to radiation to cure portions of the solder resist layer exposed to the radiation;

(iv) removing portions of the solder resist layer which are unexposed, and thereby uncured, by washing with an aqueous solution of an alkali, thereby leaving said cured portions to form a patterned solder resist;

(v) completely drying the patterned resist layer; and

(vi) applying solder to the circuit board, thereby soldering connections left exposed after portions of the solder resist are removed.

5,750,292
ULTRAVIOLET ABSORBER PRECURSOR COMPOUND, PHOTOSENSITIVE RESIN COMPOSITION COMPRISING THE SAME AND IMAGE FORMING PROCESS

Morimasa Sato, and Takekatsu Sugiyama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 8, 1996, Ser. No. 676,837

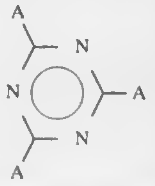
Claims priority, application Japan, Jul. 11, 1995, 7-174860

Int. Cl.^{6} G03C *3/00;* **C07D** *251/00*

U.S. Cl. 430—15 **20 Claims**

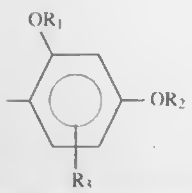
17. A multi-color image, formed by a process comprising the steps of:

(a) providing on a substrate a photosensitive resin layer composition comprising a coloring agent and an ultraviolet absorber precursor compound represented by the following formula (1):



(1)

wherein A represents a group represented by the following formula (2):



(2)

wherein R_1 represents a substituted or unsubstituted alkylcarbonyl, aralkylcarbonyl, arylcarbonyl or alkoxycarbonyl group; R_2 represents a hydrogen atom or a substituted or unsubstituted alkylcarbonyl, aralkylcarbonyl, arylcarbonyl or alkoxycarbonyl group; and R_3 represents a hydrogen atom or a lower alkyl group to prepare an image forming material;

(b) exposing said photosensitive resin layer composition to light through a photomask;

(c) developing the material to remove either the exposed or the unexposed areas of the photosensitive resin layer to form picture elements on said substrate;

(d) heat-treating the picture elements formed on said substrate; and

(e) repeating the series of steps (a) to (d) at least one time using a photosensitive resin composition comprising a coloring agent having a different hue.

5,750,293
METHOD OF RECORDING AND REPRODUCING INFORMATION

Michiharu Abe, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 966,722, Oct. 26, 1992, abandoned. This application Jul. 27, 1994, Ser. No. 281,524

Claims priority, application Japan, Oct. 28, 1991, 3-308388

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 430—21 **2 Claims**

1. A method of recording and reproducing information using an optical recording medium comprising a transparent substrate provided with guide grooves with a depth of 42 to 86 nm, an organic dye-containing layer formed on said substrate, and a light reflection layer formed on said organic dye-containing layer, said organic dye-containing layer comprising cyanine dye and being free of resin and showing a light absorption ratio of 20% or more with respect to a light beam with a wavelength of 500 to 750 nm, and showing a light absorption ratio of 20% or less with respect to a light beam with a wavelength of 760 to 830 nm, which method comprises the steps of:

applying said light beam of 500 to 750 nm to the side of said transparent substrate of said optical recording medium to record information therein, and

applying said light beam with a wavelength of 760 to 830 nm to the side of said transparent substrate of said optical recording medium to reproduce the recorded information.

5,750,294
BEST FOCUS DETERMINING METHOD

Masanobu Hasegawa, Utsunomiya; Minoru Yoshii, Tokyo, and Seiji Takeuchi, Utsunomiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1996, Ser. No. 685,464

Claims priority, application Japan, Jul. 26, 1995, 7-211230

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—22 **8 Claims**

1. A method of determining a best focus position of a projection lens in an arrangement wherein a reticle is placed on a plane perpendicular to an optical axis of the projection lens, wherein a pattern having periodicity in a predetermined direction is provided on a surface of the reticle, wherein the pattern is transferred to a photosensitive substrate by the projection lens to form a printed pattern thereon, wherein the pattern formation is repeated with different focus positions, and wherein the best focus position of the projection lens is determined on the basis of different printed patterns transferred to the photosensitive substrate, said method comprising the steps of:

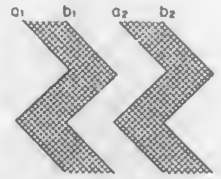
providing the pattern by using a plurality of zigzag openings of a constant line width, extending in a direction perpendicular to the predetermined direction and being arrayed with a constant periodicity along that direction;

transferring the pattern to the photosensitive substrate sequentially with different focus positions to form plural printed patterns thereon;

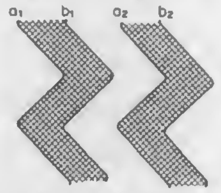
imaging the printed patterns upon an image pickup surface of photoelectrically converting means;

calculating, from an imagewise signal produced by the photoelectrically converting means, information related to one frequency component of zigzag lines, constituting an outline of an image of the zigzag opening; and

determining the best focus position on the basis of the information.



EDGE PROFILE BY BEST FOCUS



EDGE PROFILE BY DEFOCUS

5,750,295
METHOD FOR SCREENING A PANEL OF A COLOR CRT

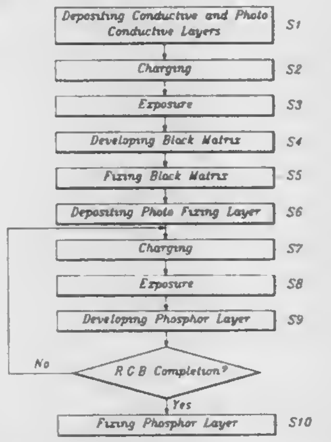
Choong-lak Kim, Daejeon, and Jong-ho Cho, Kyungki-do, both of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Feb. 13, 1997, Ser. No. 800,289

Claims priority, application Rep. of Korea, Nov. 19, 1996, 96-55270

Int. Cl.^{6} G03G *13/00;* **G03C** *5/00*

U.S. Cl. 430—25 **9 Claims**



1. A method for screening a panel for a color cathode ray tube, said panel having an organic conductive formed thereon, and an organic Photoconductive layer formed on the organic conductive layer, said method comprising the steps of:

developing a black matrix on the organic photoconductive layer of the panel in a predetermined pattern;

fixing the black matrix developed on the organic photoconductive layer of the panel;

forming a light fixing layer on the panel, said light fixing layer having adhesive characteristics when subjected to light;
charging the panel to a potential;
exposing a portion of the charged panel to light so that the potential on the panel can be maintained in a predetermined pattern;
developing first phosphor particles having a same or opposite potential as the remaining potential on the panel, thereby forming the first phosphor layer;
repeating the charging, exposing and developing steps for at least second and third phosphor layers; and
radiating light to the light fixing layer so that the light fixing layer has adhesive characteristics, thereby fixing the developed phosphor layers.

5,750,296

PHOTO-CONDUCTIVE COMPOSITION AND CRT BULB HAVING PHOTO-CONDUCTIVE LAYER FORMED OF THE SAME

Min-ho Kim, Suwon; Bong-mo Jeong; Jae-ho Shim, both of Seoul; Wan-woo Park, Yongin, and Deuk-yong Yang, Suwon, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Aug. 14, 1996, Ser. No. 696,786

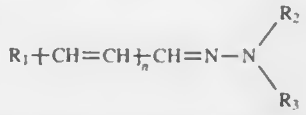
Claims priority, application Rep. of Korea, Dec. 29, 1995, 95-66819

Int. Cl.^{6} G03C *5/00;* **G03G** *5/09*

U.S. Cl. 430—28 **5 Claims**

5. A CRT bulb comprising a face plate on which a conductive layer, a photo-conductive layer and a phosphor screen are sequentially formed, a funnel which is connected to said face plate and provided with an electron gun and a deflection yoke, wherein said photo-conductive layer is formed of a composition comprising:

5–15 wt % of a charge transmitting substance, represented by the structural formula (1);



$$R_1 \left(CH=CH \right)_n CH=N-N \begin{matrix} \diagup R_2 \\ \diagdown R_3 \end{matrix} \qquad (1)$$

where R_1 is selected from the group consisting of a phenyl group substituted by one to three substituents selected from the group consisting of amino, dialkylamino, C_1–C_6 alkoxy, C_1–C_6 alkyl and cyano groups; 9-alkyl carbazole group; naphthyl group, and R_2 and R_3 are same or different independently from each other, each being selected from the group consisting of hydrogen and C_1–C_6 alkyl, phenyl and naphthyl groups, and n is between 0 and 2;

1–15 wt % of a charge generating substance which absorbs light in the wavelength range of an ultraviolet region;
70–94 wt % of a binder; and
0.05–1 wt % of a surfactant.

5,750,297

COLOR LITHOGRAPHIC REPRODUCTION

Damon F. Evenstad, 617 Meadow Dr., Glenview, Ill. 60025, and Steven C. Evenstad, 442 Green Bay Rd., Kenilworth, Ill. 60043

Filed Dec. 5, 1995, Ser. No. 567,302

Int. Cl.^{6} G03G *13/26*

U.S. Cl. 430—42 **8 Claims**

1. The method of initial preparation of an electrostatic master with a first side, for contribution to color lithographic reproduction of a subject image with polychrome pictorial content, comprising during one time period steps of
supplying the subject image to a color copier with a color separations function and as for copying the subject image, and
presenting the master to the copier as for making a copy of the subject image on the first side; and
after the time period, the step of operating the copier in the separations function with reference to the subject image and the master.

5,750,298

YELLOW TONER FOR DEVELOPING ELECTROSTATIC IMAGE, TWO COMPONENT DEVELOPER, IMAGE SHEET

Makoto Kanbayashi, Kawasaki, and Ryoichi Fujita, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1997, Ser. No. 815,921

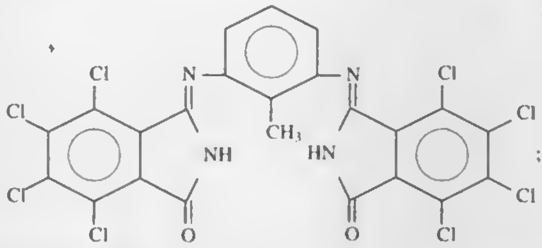
Claims priority, application Japan, Mar. 15, 1996, 8-059140; Dec. 6, 1996, 8-326779

Int. Cl.^{6} G03G *9/09*

U.S. Cl. 430—45 **49 Claims**

1. A yellow toner for developing an electrostatic image, comprising yellow color toner particles having at least a binder resin and a yellow colorant, and an external additive, wherein;
said binder resin has a polyester resin having an acid value of from 2 mg KOH/g to 25 mg KOH/g and a glass transition temperature of from 52° C. to 65° C.;
said yellow colorant has a compound represented by the following Formula (I):

(I)



said external additive has a fine titanium oxide powder or fine aluminum oxide powder subjected to hydrophobic treatment, having an average primary particle diameter of from 0.01 μm to 2 μm; and
said yellow toner has a weight average particle diameter of from 3.0 μm to 15.0 μm.

5,750,299

METHOD OF FORMING COLORED IMAGE BY USE OF INORGANIC TONER, INORGANIC TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGE, AND COLORED TONER IMAGE BEARING IMAGE TRANSFER MEDIUM

Kouchi Ohshima, Mishima; Shinichi Kuramoto, Numazu; Hiromitsu Kawase, Mishima; Yoichiro Watanabe, Fuji; Takamichi Enomoto, Numazu; Masanaga Imamura, Fujinomiya; Katsumi Kuboshima, and Junji Toda, both of Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1996, Ser. No. 672,481

Claims priority, applicatinn Japan, Jun. 26, 1995, 7-182118; Apr. 30, 1996, 8-132734

Int. Cl.^{6} G03G *13/16*

U.S. Cl. 430—47 **53 Claims**

1. A method of forming a toner image layer comprising at least one colored toner image layer on an image formation film, comprising the steps of:
developing a latent electrostatic image with at least one color toner which comprises an inorganic coloring material and a binder resin to a colored toner image;
transferring said colored toner image to a surface of an image formation film of an image transfer medium which comprises an image formation film comprising a heat-vanishing material and/or a thermofusible inorganic material one time or a plurality of times; and

fixing said colored toner image to said image formation film at least one time to form a colored toner image layer thereon.

5,750,300

PHOTOCONDUCTOR COMPRISING A COMPLEX BETWEEN METAL OXIDE PHTHALOCYANINE COMPOUNDS AND HYDROXY COMPOUNDS

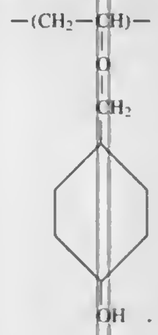
Khe C. Nguyen, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 18, 1996, Ser. No. 634,495

Int. Cl.^{6} G03G *5/05*

U.S. Cl. 430—78 **19 Claims**

1. An electrophotographic photoconductive film layer comprising a complex between a metal oxide phthalocyanine and a binder, wherein the binder comprises a monomer unit comprising:



5,750,301

TONER FOR A TWO-COMPONENT TYPE DEVELOPER

Masatoml Funato; Yoshitake Shimizu; Seijiro Ishimaru; Norio Kubo; Kazuya Nagao, and Terumichi Asano, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Chuo-Ku, Japan

Continuation of Ser. No. 364,792, Dec. 27, 1994, abandoned. This application Jun. 5, 1996, Ser. No. 658,725

Claims priority, application Japan, Aug. 31, 1994, 6-207412; Aug. 31, 1994, 6-207444

Int. Cl.^{6} J03G *9/083*

U.S. Cl. 430—106.6 **5 Claims**

1. Toner for a two-component developer, comprising toner particles including a binder resin and a magnetic powder dispersed in said binder resin,
wherein said binder resin is a polymer having an anionic group and a wax grafted portion,
an acid value of the binder resin is in the range from 4 to 15 mgKOH/g,
said magnetic powder is contained in said toner particles in the range between 0.1 to 5 parts by weight per 100 parts by weight of said binder resin, and the toner does not contain a charge control agent.

5,750,302

MAGNETIC TONER FOR DEVELOPING ELECTROSTATIC IMAGE, IMAGE FORMING PROCESS, AND PROCESS CARTRIDGE

Yoshihiro Ogawa, Numazu; Koichi Tomiyama, Yokohama; Osamu Tamura, Kashiwa; Nobuyuki Okubo, Yokohama, and Shunji Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

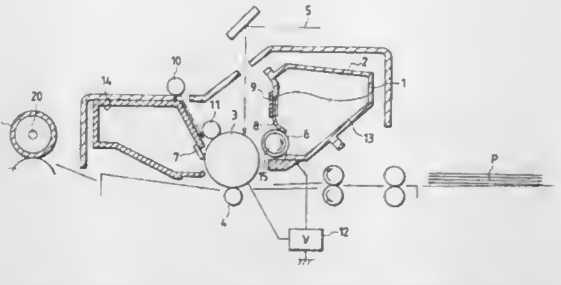
Filed Mar. 24, 1997, Ser. No. 822,650

Claims priority, application Japan, Mar. 22, 1996, 8-091851; Mar. 22, 1996, 8-091852

Int. Cl.^{6} G03G *9/083;13/09;15/09*

U.S. Cl. 430—106.6 **86 Claims**

1. A magnetic toner for developing an electrostatic image, comprising magnetic toner particles containing at least a binder resin and magnetic iron oxide particles, wherein;



said magnetic iron oxide particles have been surface-treated with an aliphatic alcohol having carbon atoms of from 12 to 300 on the average; and
said magnetic toner has a weight average particle diameter of 13.5 μm or smaller, and contains magnetic toner particles with particle diameters of 3.17 μm or smaller in an amount not less than 1% by number as number-based percentage determined from number distribution.

5,750,303

TONER FOR DEVELOPING ELECTROSTATIC IMAGE

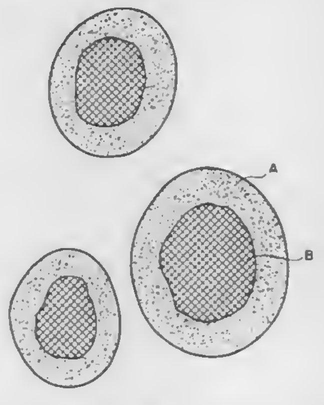
Kohji Inaba, Yokohama; Kazunori Kato, Mitaka, and Kengo Hayase, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 649,464, May 17, 1996, abandoned. This application Apr. 30, 1997, Ser. No. 841,337

Claims priority, application Japan, May 22, 1995, 7-145201

Int. Cl.^{6} G03G *9/087;9/097*

U.S. Cl. 430—110 **45 Claims**



1. A toner for developing an electrostatic image, comprising toner particles wherein said toner particles comprise at least a binder resin, a colorant, a polar resin and a release agent;
wherein said polar resin has at least one terminal group which has been modified by a polycarboxylic acid having at least three carboxyl groups, said polar resin having an acid value of 3–35 mgKOH/g.

5,750,304

ENCAPSULATED TONER FOR HEAT-AND-PRESSURE FIXING AND METHOD FOR PRODUCING THE SAME

Takashi Yamaguchi; Tetsuya Asano; Yoshihiro Fukushima; Koji Akiyama, and Kuniyasu Kawabe, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 16, 1996, Ser. No. 633,211

Claims priority, application Japan, Apr. 28, 1995, 7-129765

Int. Cl.^{6} G03G *9/097;9/093*

U.S. Cl. 430—110 **9 Claims**

1. An encapsulated toner for heat-and-pressure fixing comprising a heat-fusible core material containing at least a thermoplastic resin and a coloring agent and a shell comprising a hydrophilic resin formed thereon so as to cover the surface of the core material, wherein the core material contains a silicone oil having a kinematic viscosity of from 10 to 500 cSt at 25° C., wherein said hydrophilic

resin comprises an amorphous polyester as a main component and wherein the encapsulated toner is obtained by in situ polymerization method.

5,750,305

POLY[(2-(SULFONAMIDOMETHYLENE)-2-CYANOACETAMIDO)PHENYL ACRYLATE] CHARGE-CONTROL AGENTS FOR ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS

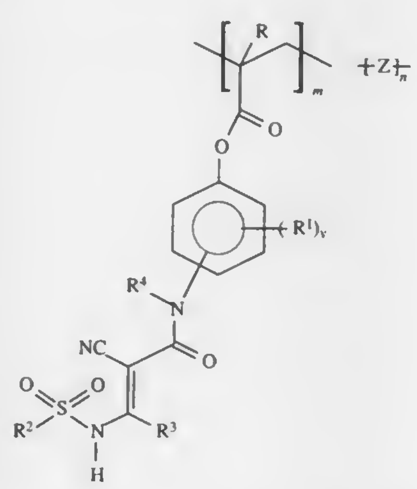
John C. Wilson, and Robert D. Fields, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1997, Ser. No. 831,552

Int. Cl.^{6} G03G *9/097*

U.S. Cl. 430—110 **8 Claims**

1. An electrostatographic toner comprising a poly[(2-(sulfonamidomethylene)-2-cyanoacetamido)phenyl acrylate]charge-control agent having recurring units according to the structure (I):



I

R and R^4 represent hydrogen or C_1 to C_3 alkyl; and the 2-(sulfonamidomethylene)-2-cyanoacetamido group is ortho, meta or para substituted on the phenyl ring relative to the acrylate group;

R^1 represents hydrogen, alkyl, alkoxy, halo, nitro, alkylsulfonyl, carboxyl, carboalkoxy, cyano, acyl, trihaloalkyl or aryl; or R^1 represents sufficient atoms, together with the phenyl ring to which it is attached, to form naphthyl;

R^2 represents C_1 to C_{18} linear, branched or cyclic alkyl; or C_6 to C_{10} aryl;

R^3 represents hydrogen, linear, branched or cyclic C_1 to C_{17} alkyl or C_6 to C_{10} aryl and

m and n are weight percent and together equal 100 weight percent;

y is an integer from 0 to 4; and

$$+Z+$$

represents any copolymerized comonomer selected from the group consisting of acrylamides, acrylic acid, acrylonitrile, alkyl acrylates, alkyl methacrylates, alkyl vinyl ethers, styrenes, maleic anhydride, methacrylamides, methacrylic acid, methacrylonitrile, silyl methacrylates, vinyl esters, vinyl amides and vinyl halides.

5,750,306

GRAFT COPOLYMERS AND COLORLESS, TRANSPARENT ELECTROPHOTOGRAPHIC TONERS COMPRISING THESE

Raimund Josef Faust; Danuta Eva Allen, both of Wiesbaden, and Silvia Lutz, Mainz, all of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

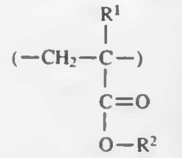
Filed Dec. 27, 1995, Ser. No. 579,433

Claims priority, application Germany, Dec. 29, 1994, 44 47 106.8

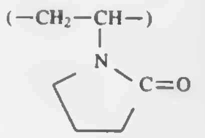
Int. Cl.^{6} G03G *9/13*

U.S. Cl. 430—115 **18 Claims**

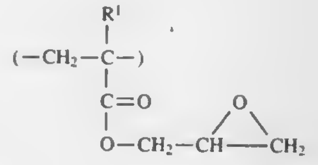
1. A colorless, transparent negatively chargeable liquid toner comprising a stable dispersion of a graft copolymer comprising recurring units A, B, C, and D in the main chain



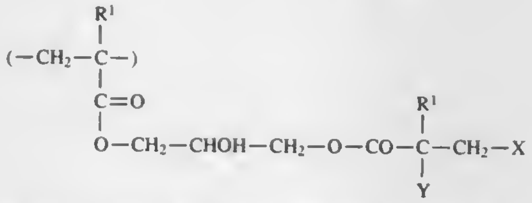
$$(-CH_2-\overset{R^1}{\underset{\underset{O-R^2}{C=O}}{C}}-) \quad (A)$$



(B)

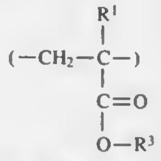


(C)



$$(-CH_2-\overset{R^1}{\underset{\underset{O-CH_2-CHOH-CH_2-O-CO-\overset{R^1}{\underset{Y}{C}}-CH_2-X}{C=O}}{C}}-) \quad (D)$$

in which X and Y are initiator radicals or grafted-on polymeric radicals of units B and E



$$(-CH_2-\overset{R^1}{\underset{\underset{O-R^3}{C=O}}{C}}-) \quad (E)$$

and not more than one of the radicals X and Y is an initiator radical, wherein

R^1 is a hydrogen atom or a methyl group,

R^2 is an alkyl group having 6 to 18 carbon atoms and

R^3 is an alkyl group having 1 to 3 carbon atoms and in at least some of the units E, R^1 is a hydrogen atom, in a liquid dispersant.

5,750,307

PHOTOCONDUCTOR CLEANING BRUSH TO PREVENT FORMATION OF PHOTOCONDUCTOR SCUM

James C. Maher, North Rose; Dinesh Tyagi, Fairport, and John R. Locke, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1996, Ser. No. 753,866

Int. Cl.^{6} G03G *15/095*

U.S. Cl. 430—125 **2 Claims**

1. A brush having synthetic fibers coated with a polymer material; wherein the polymeric material has (a) a Young's Modulus greater than 5 MPa and at least one thermal transition above 50° C. and (b) is selected from the group consisting of:

(i) 80 weight percent styrene and 20 weight percent butyl acrylate, (ii) a block copolymer of styrene of styrene and ethylene propylene, (iii) poly vinyl formal and (iv) bis-phenol A polyester.

5,750,308

ELECTROPHOTOGRAPHIC DEVELOPING METHOD USING DEVELOPING BIAS VOLTAGE BASED ON LIGHT DECAY CHARACTERISTICS OF PHOTOSENSITIVE MATERIAL

Mitsuji Tsujita; Nariaki Tanaka; Takashi Terada; Takuji Terada; Ichiro Yamazato, and Eiichi Miyamoto, all of Chuo-ku, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 544,985, Oct. 30, 1995, abandoned. This application Nov. 21, 1996, Ser. No. 754,624

Claims priority, application Japan, Oct. 31, 1997, 6-267792

Int. Cl.^{6} G03G *13/06*

U.S. Cl. 430—120 **8 Claims**

1. An electrophotographic method comprising electrically charging a single-layer organic photosensitive material, exposing the photosensitive material to image-bearing light to form electrostatic latent image, and developing the electrostatic latent image in a state where a developing bias voltage is applied, wherein said developing bias voltage is set to a potential which has a polarity same as the polarity of the electric charge in the photosensitive material, and is higher than a potential (EH) that corresponds to a point where a straight line approximating to a light decay characteristics curve in the zone of a large amount of exposure to light and a straight line approximating to said curve in the zone of a small amount of exposure to light intersect each other.

5,750,309

CHEMICALLY AMPLIFIED POSITIVE RESIST COMPOSITION

Jun Hatakeyama; Shigehiro Nagura; Kiyoshi Motomi; Takeshi Nagata, and Toshinobu Ishihara, all of Nakakubiki-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1996, Ser. No. 684,481

Claims priority, application Japan, Jul. 20, 1995, 7-206684

Int. Cl.^{6} G03F *7/004*

U.S. Cl. 430—170 **20 Claims**

1. A chemically amplified, positive resist composition comprising

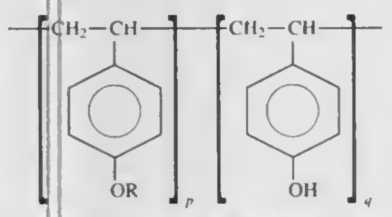
(A) an organic solvent,

(B) a resin,

(C) a dissolution inhibitor, and

(D) a photoacid generator,

wherein the resin comprises at least two polyhydroxystyrene polymers having different molecular weights and some protected hydroxyl groups, and has the following general formula:



(1)

wherein R is an acid labile group and letters p and q are numbers such that p/(p+q) is at least 0.05, wherein at least one polymer is

a high molecular weight polymer having a weight average molecular weight Mw1 and a molecular weight dispersity of up to 1.5,

and remaining polymer or polymers are low molecular weight polymers having a weight average molecular weight Mw2 and a molecular weight dispersity of up to 5.0, and

the ratio of Mw1/Mw2 is at least 1.5/1.

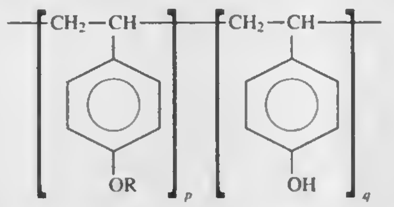
3. A chemically amplified, positive resist composition comprising

(A) an organic solvent,

(B) a resin, and

(D) a photoacid generator,

wherein the resin comprises at least two polyhydroxystyrene polymers having different molecular weights and some protected hydroxyl groups, and has the following general formula:



(1)

wherein R is an acid labile group and letters p and q are numbers such that p/(p+q) is at least 0.05, wherein at least one polymer is

a high molecular weight polymer having a weight average molecular weight Mw1 and a molecular weight dispersity of up to 1.5,

and remaining polymer or polymers are low molecular weight polymers having a weight average molecular weight Mw2 and a molecular weight dispersity of up to 5.0, and

the ratio of Mw1/Mw2 is at least 1.5/1.

5,750,310

POSITIVE PHOTORESIST COMPOSITION

Kenichiro Sato; Shinji Sakaguchi, and Makoto Momota, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

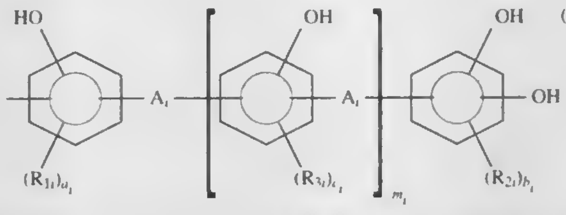
Filed Apr. 23, 1996, Ser. No. 636,408

Claims priority, application Japan, Apr. 27, 1995, 7-104307; Jan. 18, 1996, 8-006694

Int. Cl.^{6} G03F *7/023*

U.S. Cl. 430—192 **8 Claims**

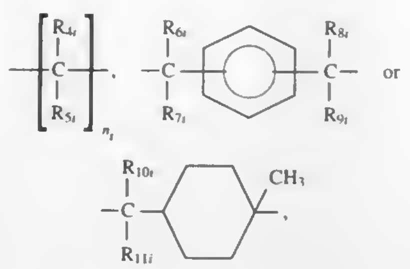
1. A positive photoresist composition comprising an alkali-soluble resin and at least one of a 1,2-naphthoguinonediazide-5-sulfonic ester of a polyhydroxy compound or a 1.2-naphthoguinonediazide-4-sulfonic ester of a polyhydroxy compound represented by the following formula (I_t), wherein the tetraester component of the at least one 1,2-naphthoguinonediazide-5-sulfonic ester of a polyhydroxy compound or 1,2-naphthoguinonediazide-4-sulfonic ester of a polyhydroxy compound represented by formula (I_t) account for 50% or more of the entire pattern area determined by high-performance liquid chromatography using ultraviolet rays of 254 nm:



(I_t)

wherein R_{1t}, R_{2t}, and R_{3t}, which are the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an alkoxy group, an aryl group or an alkenyl group;

the A_t groups, which are the same or different, each represents a single bond, —O—, —S—, —SO—, —SO_2—, —CO—, —COO—,



R_{4i} and R_{5i}, which are the same or different, each represents a hydrogen atom or an alkyl group, provided that R_{4i} and R_{5i} may be combined to form a ring;
R_{6i}, R_{7i}, R_{8i}, R_{9i}, R_{10i} and R_{11i}, which are the same or different, each represents a hydrogen atom or an alkyl group;
a_i, b_i and c_i each represents 0, 1, 2 or 3;
m_i represents 2 or 3; and
n_i represents 1 or 2.

5,750,311
IMAGE-FORMABLE MATERIAL WITH RELEASEABLE CUSHION LAYER

Tetsuya Taniguchi; Nobumasa Sasa, and Kunio Shimizu, all of Hino, Japan, assignors to Konica Corporation and Mitsubishi Chemical Corporation, Japan
Filed Jan. 11, 1996, Ser. No. 584,746
Claims priority, application Japan, Jan. 18, 1995, 7-023501
Int. Cl.^{6} G03C *3/00*
U.S. Cl. 430—253 **4 Claims**

1. An image-formable material which comprises a support provided thereon a releasable cushion layer and an image-formable layer in this order,
   wherein the image-formable layer can be peeled off from the releasable cushion layer, the image-formable layer is transferable, and the releasable cushion layer comprises two or more layers and satisfies all of the following conditions (1), (2) and (3):
   (1) a lower layer itself has a Vicat softening temperature measured according to JIS-K7206 of 65° C. or lower;
   (2) 65° C.<Vicat softening temperature measured according to JIS-K7206 of uppermost layer resin ≦150° C.; and
   (3) film thickness (μm) of uppermost layer $<[10\log\{(X-65)/230+1\}]^{-1}$ wherein X represents a Vicat softening temperature measured according to JIS-K7206 of an uppermost layer resin.

5,750,312
PROCESS FOR FABRICATING A DEVICE

Edwin Arthur Chandross, Berkeley Heights; Omkaram Nalamasu, Basking Ridge; Elsa Reichmanis, Westfield; Gary Newton Taylor, Bridgewater, and Larry Flack Thompson, Millington, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Continuation of Ser. No. 121,976, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 823,083, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 575,047, Aug. 30, 1990, abandoned. This application May 2, 1994, Ser. No. 236,706
Int. Cl.^{6} G03C *5/00;* **G03F** *7/00*
U.S. Cl. 430—273.1 **19 Claims**

1. A process for fabricating a device comprising the steps of forming a radiation sensitive resist layer on a substrate, exposing in a pattern said resist to said radiation, developing said patterned resist, and employing said developed resist in defining regions of said device characterized in that said exposure generates an acid in said resist which induces a further compositional change in said resist and an expedient is employed during said exposure to prevent substantial reaction of environmental basic moieties with said acid in said resist on said substrate.

15. A protective topcoat disposed on a substrate comprising an ultraviolet-, e-beam-, or x-ray- radiation sensitive acid-catalyzed resist composition, the topcoat comprising a thin film of a polymeric film-forming composition which is sufficiently impermeable to vapors of organic and inorganic bases to prevent desensitization of the resist composition, wherein said topcoat comprises a polymer having acidic moieties, and said topcoat is soluble in aqueous alkaline developer.

5,750,313
PHOTOSENSITIVE RESIN COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Hiroshi Tamada; Shigetora Kashio, and Tamio Adachi, all of Okazaki, Japan, assignors to Toray Industries, Inc., Japan
Continuation of Ser. No. 394,154, Feb. 24, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 782,716
Claims priority, application Japan, Feb. 28, 1994, 6-030424
Int. Cl.^{6} G03F *7/028;7/032*
U.S. Cl. 430—280.1 **1 Claim**

1. A process for producing a photopolymerizable resin composition comprising reacting partially saponified polyvinyl alcohol having a degree of saponification of 60 to 99 mol % and a number average degree of polymerization of 300 to 2,000 with 0.001–20 parts by weight of a carboxylic acid anhydride in a molten state to prepare modified polyvinyl alcohol and mixing (A) 100 parts by weight of said modified polyvinyl alcohol with (B) from 0.1 to 10 parts by weight of an unsaturated epoxy compound, (C) from 20 to 200 parts by weight of a polymerizable unsaturated compound having an ethylenic double bond in the molecule thereof, and (D) from 0.1 to 10 parts by weight of a photopolymerization initiator.

5,750,314
METHOD FOR SELECTIVELY IMAGING A LITHOGRAPHIC PRINTING PLATE

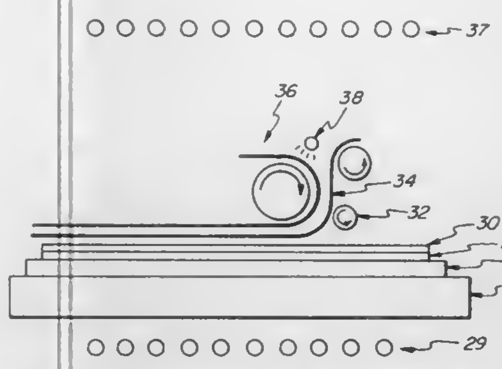
Howard A. Fromson, P.O. Box 122, Stonington, Conn. 06378; Robert F. Gracia, Woodstock Valley, and Steven A. Rubin, Glastonbury, both of Conn., assignors to Howard A. Fromson, Stonington, Conn.
Filed Dec. 5, 1995, Ser. No. 567,690
Int. Cl.^{6} G03F *7/00*
U.S. Cl. 430—302 **27 Claims**

1. Method for selectively imaging a planographic substrate, said method comprising the following serial steps:
   coating one surface of a substrate with a first material which is soluble in a first solvent without being exposed to actinic light,
   selectively applying a second material in a desired image array on said coating of said first material on said substrate, thereby producing imaged areas and non-imaged areas, said second material adhering to said first material on said imaged areas and being insoluble in said first solvent without being exposed to actinic light, and
   dissolving the first material on said non-imaged areas in said first solvent, thereby removing said first material to expose said surface of said substrate in said non-imaged areas.

5,750,315
COMPRESSIBLE PRINTING PLATES AND MANUFACTURING PROCESS THEREFOR

Joseph F. Rach, Newark, Del., assignor to MacDermid Imaging Technology, Inc., Waterbury, Conn.
Filed Aug. 13, 1996, Ser. No. 669,890
Int. Cl.^{6} G03F *7/095;7/16*
U.S. Cl. 430—306 **20 Claims**

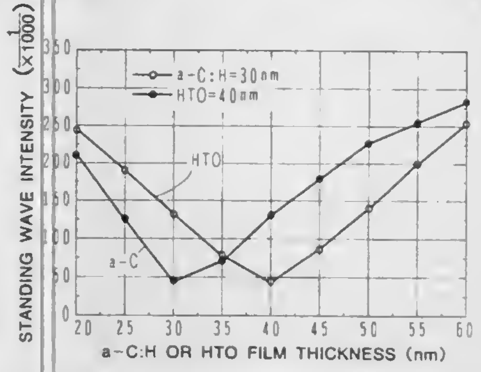
1. A process for forming a laminate bearing a relief image, comprising the steps:



(a) on a surface of a compressible layer wherein said surface is comprised of open cells, directly coating without any intermediate layer, a floor layer comprising at least one layer of a photopolymerizable resin, and exposing said floor layer to first actinic radiation exposure to provide an incompletely cured floor layer;
(b) coating said incompletely cured floor layer with at least one layer of a photopolymerizable resin to provide a relief layer, and exposing said incompletely cured floor layer and said relief layer to second actinic radiation exposure passed through an image-bearing transparency to provide a substantially cured floor layer and partially cured relief layer; and
(c) developing said partially cured relief layer to provide a laminate bearing a relief image.

5,750,316
MANUFACTURE OF SEMICONDUCTOR DEVICE USING A-C ANTI-REFLECTION COATING

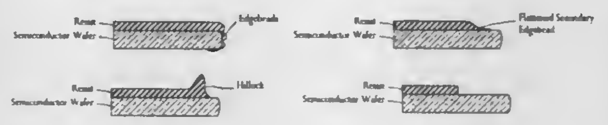
Eiichi Kawamura; Teruyoshi Yao; Nobuhisa Naori; Koichi Hashimoto; Masaharu Kobayashi, and Tadasi Oshima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 15, 1995, Ser. No. 404,550
Claims priority, application Japan, Mar. 18, 1994, 6-049548
Int. Cl.^{6} G03C *5/00*
U.S. Cl. 430—311 **6 Claims**



1. A method of manufacturing a semiconductor device, said method comprising the steps of:
   forming a transparent film on a light reflecting surface, said transparent film having an absolute value 0 2 or smaller of an imaginary part of a complex refractive index;
   forming an anti-reflective film on a surface of said transparent film, said anti-reflective film having an absolute value 0.3 or larger of an imaginary part of a complex refractive index; and
   coating a photoresist film on a surface of said anti-reflective film and patterning said photoresist film by applying incident light to an area of said photoresist film,
   wherein thicknesses of said anti-reflective film and said transparent film are so selected as to provide a standing wave generated by a superposition of the incident light and reflected light reflected from said anti-reflective film, said transparent film, and said light reflecting surface, wherein an intensity of the standing wave $I_{sw}=I\delta/I_{ave}$ to 0.2 or smaller, where I_{ave} is an average value of light intensity in said photoresist film, and wherein Iδ is an amplitude of a change in light intensity.

5,750,317
PROCESS AND SYSTEM FOR FLATTENING SECONDARY EDGEBEADS ON RESIST COATED WAFERS

Jonathan Alan Orth, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Sep. 16, 1994, Ser. No. 306,920
Int. Cl.^{6} G03F *7/16*
U.S. Cl. 430—327 **7 Claims**



1. A method of depositing resist material onto a semiconductor wafer having an edge, comprising the steps of:
   (a) depositing the resist material onto the semiconductor wafer;
   (b) performing a wet edgebead operation to remove edgebeads formed at the edge of the semiconductor wafer during said depositing step (a); and
   (c) performing a secondary edgebead removal operation to remove secondary edgebeads formed during step (b),
   wherein step (c) comprises the steps of:
      (c1) introducing solvent to the semiconductor wafer at an area containing resist mounds to soften the resist mounds, and
      (c2) spinning the semiconductor wafer at approximately 3000 revolutions per minute or higher simultaneously while the solvent is introduced to the semiconductor wafer in step (c1) at a rate sufficient to flatten the resist mounds.

5,750,318
LASER IMAGING ELEMENT

Patrick M. Lambert; David P. Trauernicht, and Joseph F. Bringley, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 16, 1996, Ser. No. 767,054
Int. Cl.^{6} G03C *1/494;1/705;1/67;1/64*
U.S. Cl. 430—346 **18 Claims**

10. A process of forming a single color image comprising imagewise-exposing, by means of a laser, in the absence of a separate receiving element, a thermal recording element comprising a support having thereon a pigment layer comprising a pigment dispersed in a polymeric binder, said pigment absorbing at the wavelength of a laser used to expose said element, wherein said pigment comprises the formula:

$$Cu_{2-x}M_x(OH)_yR_z:M'_w$$

wherein:
   M is at least one metal atom,
   M' is at least one alkali metal,
   R is a carboxylic acid salt, an amino acid salt, an infrared-absorbing dye or iodate,
   w is between 0 and 2,
   x is between 0 and 1.5,
   y and z are selected to maintain charge neutrality, with the proviso that w, x and z cannot all be 0;
thereby providing said single color image.

5,750,319

SUBSTANTIALLY NON-PHOTOSENSITIVE THERMOGRAPHIC RECORDING MATERIAL WITH IMPROVED STABILITY AND IMAGE-TONE

Bartholomeus Horsten, Rumst; Johan Loccufier, Zwijnaarde; Geert Defieuw, Bonheiden, and Luc Leenders, Herentals, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed May 14, 1997, Ser. No. 856,098

Claims priority, application European Pat. Off., May 21, 1996, 96201375

Int. Cl.^{6} G03C *1/49;1/494;1/34*

U.S. Cl. 430—346 **6 Claims**

5. A thermal image recording process comprising the steps of: (i) providing a substantially non-photosensitive recording material comprising a substantially light-insensitive organic silver salt, an organic reducing agent therefor in thermal working relationship therewith, a 1,2,4-triazole compound with at least one of the nitrogen atoms having a hydrogen atom and none of the carbon atoms being part of a thione-group, said compound not being annulated with an aromatic ring system, in reactive association with said substantially light-insensitive organic silver salt and said organic reducing agent and a binder, on a support; (ii) bringing an outermost layer of said recording material into proximity with a heat source; (iii) applying heat from a heat source image-wise to said recording material while maintaining proximity to said heat source to produce an image; and (iv) removing said recording material from said heat source.

5,750,320

COLOR MOTION PICTURE PRINT FILMS FOR TELECINE TRANSFER APPLICATIONS

Mitchell Joseph Bogdanowicz, Spencerport; Charles Peter Hagmaier, and Leslie Gutierrez, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1996, Ser. No. 602,434

Int. Cl.^{6} G03C *7/46*

U.S. Cl. 430—383 **23 Claims**

1. A negative working silver halide light sensitive photographic print element for use in forming a color positive print image through exposure to a color negative film image and processing to form a developed positive image, the print element comprising a support bearing on one side thereof: a blue color sensitive record comprising at least one blue-sensitive silver halide emulsion yellow-image forming layer, a red color sensitive record comprising at least one red-sensitive silver halide emulsion cyan-image forming layer, and a green color sensitive record comprising at least one green-sensitive silver halide emulsion magenta-image forming layer; wherein at least one of the color records has a fixed best fit contrast less than or equal to 2.2, wherein the fixed best fit contrast for a color record is defined as the slope of a straight line connecting a point B and a point C on the characteristic curve of Status A density versus log Exposure for the color record, where points B and C are located by defining a point A on the characteristic curve at the log Exposure required to attain a density level of 1.0, and points B and C are located on the characteristic curve at exposure values −0.40 log Exposure and +0.65 log Exposure with respect to point A, respectively.

5,750,321

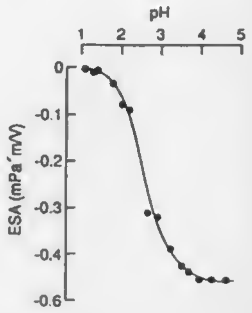
PROCESS FOR BUFFERING CONCENTRATED AQUEOUS SLURRIES

John Texter, Rochester; Ravi Sharma, Fairport, and David Alan Czekai, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 417,876, Apr. 6, 1995, Pat. No. 5,609,998, which is a continuation-in-part of Ser. No. 366,088, Dec. 29, 1994, abandoned. This application Jan. 21, 1997, Ser. No. 786,069

Int. Cl.^{6} G03C *1/38*

U.S. Cl. 430—449 **15 Claims**



1. A process for buffering concentrated aqueous slurries comprising the steps of:

providing a particulate solid substance comprising a weak acid functional group, having effective $pK_{a1}>1$ and less than 1% by weight aqueous solubility at $pH=pK_{a1}$;

providing an aqueous solution consisting essentially of water or a mixture of water with water-miscible solvent, at pH less than the greater of 7 and $pK_{a1}+2$;

providing a buffering salt of a weak acid, where the weak acid associated with this buffering salt has pK_{a2} and where

$$pK_{a1}-2\leqq pK_{a2}; \text{ and}$$

combining said aqueous solution, said particulate solid substance, and said buffering salt to form a slurry;

wherein said process is essentially devoid of any step comprising the addition of any weak acid, other than that arising from reaction between said buffering salt and said particulate solid substance, having greater than 2% by weight aqueous solubility at $pH=pK_{a1}$.

5,750,322

PROCESSING SILVER HALIDE FILMS WITH AN AQUEOUS PHOSPHOLIPID RINSE SOLUTION

Hugh G. McGuckin; John S. Badger, both of Rochester, and Edward A. Kurz, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 632,985, Apr. 16, 1996, Pat. No. 5,667,948. This application Apr. 4, 1997, Ser. No. 825,851

Int. Cl.^{6} G03C *5/39*

U.S. Cl. 430—463 **16 Claims**

1. A photographic processing method comprising washing an already photographically processed silver halide photographic film with a wash solution comprising at least about 50 ppm of a phospholipid.

5,750,323

SOLID PARTICLE DISPERSIONS FOR IMAGING ELEMENTS

Raymond Peter Scaringe; David Darrell Miller, both of Rochester; Mary Christine Brick; Leslie Shuttleworth, both of Webster; Margaret Jones Helber, and Steven Evans, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1996, Ser. No. 698,378

Int. Cl.^{6} G03C *1/06;1/10;1/38;7/388*

U.S. Cl. 430—512 **30 Claims**

30. A photographic element comprising a support bearing at least one silver halide emulsion layer, and at least one layer, which may be the same as or different from the silver halide emulsion layer, which comprises a stable solid particle dispersion comprising solid particles of a first compound useful in imaging elements and from 0.05 to 50 wt %, based on the weight of the first compound, of a structurally similar distinct additive dispersed together in an aqueous medium, such additive and first compound each comprising an identical structural section thereof which makes up at least 75% of the total molecular weight of the first compound, and the additive having at least one substituent bonded to the identical structural section which has a molecular weight higher than the corresponding substituent of the first compound, where dispersed solid particles of said first compound are subject to undesirable particle growth in aqueous mediums when said first compound is dispersed in the absence of any other distinct compound structurally similar to said first compound.

5,750,324

HIGH CHLORIDE EMULSIONS WITH IMPROVED RECIPROCITY

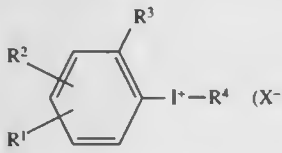
Jerzy Z. Mydlarz, Fairport; Roger L. Klaus, Rochester, and Franklin D. Saeva, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1997, Ser. No. 779,539

Int. Cl.^{6} G03C *1/035;1/08;1/09*

U.S. Cl. 430—567 **23 Claims**

1. A silver halide photographic element for digital exposure comprising a cubical silver chloride emulsion precipitated and/or chemically sensitized in the presence of an aryliodonium compound represented by the formula:



wherein R^1 and R^2 and R^3 are independently H, or aliphatic, aromatic or heterocyclic groups, alkoxy groups, hydroxy groups, halogen atoms, aryloxy groups, alkylthio groups, arylthio groups, acyl groups, sulfonyl groups, acyloxy groups, carboxyl groups, cyano groups, nitro groups, sulfo groups, alkylsulfoxide or trifluoralkyl groups, or any two of R^1, R^2 and R^3 together represent the atoms necessary to form a five or six-membered ring or a multiple ring system;

R^4 is a carboxylate salt or O^-; w is 0 or 1; and X^- is an anionic counter ion; with the proviso that when R^3 is a carboxyl or sulfo group, w is 0 and R^4 is O^-.

5,750,325

PHOTOGRAPHIC ELEMENT CONTAINING HIGH CHLORIDE TABULAR GRAIN SILVER HALIDE EMULSIONS WITH {111} CRYSTALLOGRAPHIC FACES

Richard Peter Szajewski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 583,577, Jan. 5, 1996. This application Feb. 24, 1997, Ser. No. 804,770

Int. Cl.^{6} G03C *1/035*

U.S. Cl. 430—567 **9 Claims**

1. A light sensitive color photographic element comprising a support having thereon

a red light-sensitive color record comprised of a red sensitized silver halide emulsion, a green light-sensitive color record comprised of a green sensitized silver halide emulsion, and a blue light-sensitive color record comprised of a blue sensitized silver halide emulsion, each of said color records having a chemically and spectrally sensitized emulsion (A), wherein:

emulsion (A) comprises a tabular silver halide emulsion population comprised of at least 50 mol % chloride, based on silver, wherein at least 50% of the grain population projected area is accounted for by tabular grains bounded by {111} major faces, each tabular grain having an aspect ratio of at least 2 and each being comprised of a core and a surrounding band containing a higher level of iodide ion than is present in said core, said band containing up to about 30% of the silver in the tabular grain, and said tabular grains having a thickness of less than about 0.3 micrometers;

wherein said emulsion (A) has been precipitated in the presence of an organic grain growth modifier or surface stabilizer, and wherein at least 95% of said organic grain growth modifier or stabilizer has been removed from said emulsion (A) after the formation of said band,

wherein the total iodide content of all of the silver halide emulsions is no more than about 5 mol % based on total silver,

wherein said element comprises from about 1 to about 10 grams of silver/m^2, and

wherein said element has a light sensitivity of at least ISO-25.

5,750,326

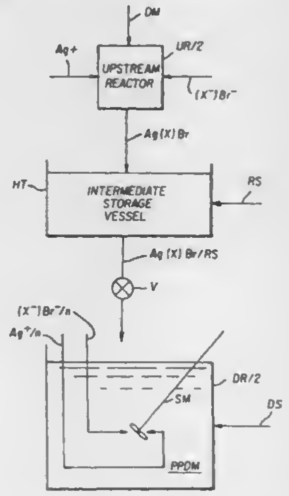
PROCESS FOR THE PREPARATION OF HIGH BROMIDE TABULAR GRAIN EMULSIONS

Michael George Antoniades; Xin Wen, both of Rochester, and Mark Jay Herman, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1996, Ser. No. 695,385

Int. Cl.^{6} G03C *1/015;1/035;1/07*

U.S. Cl. 430—568 **7 Claims**



1. A process of preparing a high bromide tabular grain emulsion comprising in a grain nucleation step creating in a dispersing medium tabular grain nuclei containing parallel twin planes and

in a grain growth step subsequently growing the grain nuclei into tabular grains by running into the dispersing medium high bromide silver halide grains having a maximum equivalent circular diameter of less than 40 nm,

WHEREIN

the high bromide grains are formed prior to the grain nucleation step and then held in the presence of a grain growth restrainer adsorbed to the grain surfaces to inhibit grain ripening, the grain growth restrainer containing a trivalent nitrogen atom and

during the growth step the restrainer is released from the high bromide grains by protonation of the nitrogen atom and silver and halide ions forming the high bromide grains are released by ripening into the dispersing medium in the growth step.

5,750,327

MIXED RIPENERS FOR SILVER HALIDE EMULSION FORMATION

Yun Chea Chang; James Rodgers, both of Rochester, and Joseph Philip Pepe, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1996, Ser. No. 667,159

Int. Cl.^{6} G03C *1/09;1/07;1/015*

U.S. Cl. 430—569 **6 Claims**

1. A method of forming a silver halide emulsion comprising nucleating silver bromide nuclei while in reactive contact with ammonia, digesting said nuclei, bringing a thioether into reactive contact with said nuclei, and growing the nuclei by addition of silver ion, iodide and bromide, wherein during a period that extends for 1 to 95 percent of the growth of the grain, the pH is maintained at between 9 and 10, wherein the grains of said silver halide emulsion have an iodide content of between 5 and 20% iodide, and wherein the grains of said emulsion have a size of between 0.5 and 2.5 μm.

5,750,328

THERMALLY PROCESSABLE IMAGING ELEMENT COMPRISING POLYMERIC MATTE PARTICLES

Sharon Marilyn Melpolder, Hilton; Dennis Edward Smith, Rochester; Christopher Edwin Wheeler, Fairport, and John Leonard Muehlbauer, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 421,178, Apr. 13, 1995, abandoned. This application Apr. 16, 1996, Ser. No. 631,878

Int. Cl.^{6} G03C *1/498*

U.S. Cl. 430—619 **23 Claims**

1. A thermally processable imaging element, said element comprising:

(1) a support;

(2) a thermographic or photothermographic imaging layer on one side of said support;

(3) a protective overcoat layer which is an outermost layer on the same side of said support as said imaging layer; and

(4) a backing layer which is an outermost layer located on the side of said support opposite to said imaging layer;

wherein said thermally processable imaging element comprises polymeric matte particles in at least one layer thereof; said polymeric matte particles comprising a polymeric core surrounded by a layer of colloidal inorganic particles.

5,750,329

METHODS AND COMPOSITIONS FOR AN ARTIFICIAL LUNG ORGAN CULTURE SYSTEM

Frederick D. Quinn, Decatur, and Kristin A. Birkness, Atlanta, both of Ga., assignors to Centers for Disease Control and Prevention, Atlanta, Ga.

Continuation-in-part of Ser. No. 311,762, Sep. 23, 1994. This application Jul. 12, 1996, Ser. No. 679,081

Int. Cl.^{6} C12N *5/00;5/02;5/08;5/12*

U.S. Cl. 435—1.1 **24 Claims**

1. An artificial lung system comprising an endothelial cell layer, an alveolar epithelial cell layer and an artificial microporous membrane, having pores therein, disposed between and in direct contact with the endothelial cell layer and the alveolar epithelial cell layer such that the membrane has an endothelial side and an epithelial side.

5,750,330

METHOD AND COMPOSITION FOR LYOPHILIZING RED BLOOD CELLS

Andrew M. Tometsko, deceased, late of Rochester, by Carol R. Tometsko, executrix; Stephen Dertinger, Webster; Dorothea Torous, and Kenneth Tometsko, both of Rochester, all of N.Y., assignors to Litron Laboratories, Rochester, N.Y.

Filed Jun. 19, 1996, Ser. No. 666,134

Int. Cl.^{6} A01N *1/02*

U.S. Cl. 435—2 **19 Claims**

1. A composition for lyophilizing mammalian red blood cells comprising in a solution:

a hydrophilic polymer having a molecular mass of from about 1,450 to about 20,000 daltons in a concentration of from about 5% to about 50% w/v;

a carbohydrate selected from the group consisting of at least one monosaccharide, a disaccharide, and a combination thereof, said carbohydrate is present in the solution in a concentration of from about 0.01M to about 0.2M; and

an organic solvent selected from the group consisting of a primary alcohol, a secondary alcohol, dimethyl sulfoxide, and a combination thereof, wherein the organic solvent is in a concentration range of from about 0.5% to about 20% v/v.

5,750,331

DIAGNOSTIC REAGENT FOR HEPATITUS C

Tatsuo Miyamura; Izumu Saito; Shizuko Harada, all of Tokyo-to, and Yoshikazu Honda, Kamakura, all of Japan, assignors to Japan as represented by Director General of Agency of National Institute of Health, Tokyo-to, Japan

Continuation of Ser. No. 956,993, Oct. 6, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 325,630

Claims priority, application Japan, Oct. 8, 1991, 3-260824

Int. Cl.^{6} G01N *33/576*

U.S. Cl. 435—5 **12 Claims**

1. A method for detecting an anti-hepatitis C virus antibody, comprising the steps of:

contacting a sample with an animal cell expressing a second envelope/first non-structural protein, E2/NS1, of a hepatitis C virus under conditions which form an immunological complex between said protein and said anti-hepatitis C virus antibody, wherein said protein consists of an amino acid sequence selected from the group consisting of SEQUENCE ID Nos. 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21 and 22; and

detecting said immunological complex to confirm the presence of said anti-hepatitis C virus antibody in said sample.

5,750,332

PEPTOMERS WITH ENHANCED IMMUNOGENICITY

Frank A. Robey, Bethesda; Tracy A. Harris-Kelson, Mitchellville, and Marjorie Robert-Guroff, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Rockville, Md.

Continuation-in-part of Ser. No. 184,330, Jan. 19, 1994, abandoned. This application Jan. 19, 1995, Ser. No. 375,100

Int. Cl.^{6} C12Q *1/70;* **A61K** *38/10*

U.S. Cl. 435—5 **9 Claims**

1. A composition comprising a peptomer comprising a plurality of peptide monomers arranged head-to-tail, each peptide monomer comprising a sequence from a CD4 binding region of gp120 from HIV wherein the secondary structure of the peptomer is at least about 20 percent α-helix and wherein antibodies raised against said peptomer are capable of binding to native gp120.

5,750,333

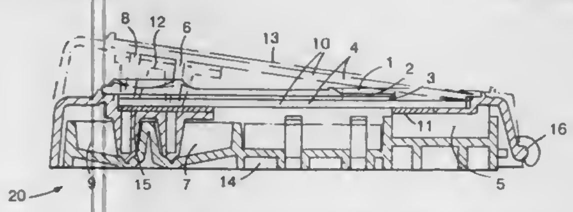
REVERSIBLE FLOW CHROMATOGRAPHIC BINDING ASSAY

Scott M. Clark, Cape Elizabeth, Me., assignor to IDEXX Laboratories, Inc., Westbrook, Me.

Continuation of Ser. No. 738,321, Jul. 31, 1991. This application Jun. 7, 1995, Ser. No. 476,805

Int. Cl.^{6} G01N *33/569;33/543;33/558*

U.S. Cl. 435—5 **24 Claims**



1. A device for performing an assay which determines the presence or quantity of an analyte in a fluid sample suspected of containing the analyte by capturing analyte with an analyte capturing reagent immobilized at a detection region, and detecting captured analyte in the detection region with an analyte binding disclosure reagent conjugate which, when bound to captured analyte provides a detectable reaction in the presence of a detecting reagent, the assay comprising washing unbound analyte binding disclosure reagent from the detection region, the device comprising:

(a) an elongated solid phase flow matrix capable of driving fluid movement by capillary force, the flow matrix furtber comprising,

(i) a first matrix region for receipt of analyte-containing fluid,

(ii) a second matrix region at which the analyte capture reagent is immobilized, the second matrix region being positioned in between the first matrix region (i) and a matrix third region (iii),

(iii) the third matrix region being for receipt of the detecting reagent,

(b) an absorbent reservoir of excess absorbing capacity, positioned for contact with an absorbent contacting area of the matrix, the absorbent contacting area being between the first matrix region and the second matrix region,

(c) at least one sealed container containing the detecting reagent,

(d) means for releasing and transporting the detecting reagent from the sealed container such that detecting reagent is transported by capillary flow to said third matrix region,

(e) a supply of the analyte binding disclosure reagent conjugate,

whereby said flow matrix and said regions thereof are sized and positioned to cause said analyte-containing fluid to flow initially along said flow matrix in one direction toward and through said second region, and subsequently, upon introduction of detecting reagent into the third region of said flow matrix, detecting reagent flows along said elongated flow matrix in a second direction opposite said first direction, through said second region and into said absorbent reservoir.

5,750,334

DETECTION OF HUMAN PAPILLOMAVIRUS MRNA IN CERVICAL SMEARS

Peter Cerutti, Pully; Jeannette Whitcomb, Epalinges; Jacob Zijlstra, Coppet, all of Switzerland, and Ethel-Michelle de Villiers, Hirschberg, Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Continuation of Ser. No. 191,705, Feb. 4, 1994, abandoned, which is a continuation of Ser. No. 929,506, Aug. 18, 1992, abandoned, which is a continuation of Ser. No. 433,899, Nov. 9, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 479,567

Claims priority, applicatinn Germany, Nov. 11, 1988, 38 38 269.5

Int. Cl.^{6} C12Q *1/70;1/68;* **C12P** *19/34*

U.S. Cl. 435—5 **4 Claims**

1. A method for the direct detection of spliced human papillomavirus (HPV) mRNA in a cervical smear sample which comprises:

(a) combining the sample with reverse transcriptase in a reaction mixture and sonicating to release mRNA;

(b) synthesizing a cDNA by means of reverse transcription to establish the presence of E6 spliced MRNA;

(c) amplifying said cDNA in a polymerase chain reaction (PCR) by using:

i) deoxynucleotide triphosphate concentrations above 0.2 mM,

ii) amplimer concentrations above 0.5 μM, wherein said amplimers span the E6 splice sequence of the spliced MRNA to be detected, and

iii) cycle times of 1 to 2 minutes at two temperatures of 70° C.–95° C. and 50° C.–70° C., wherein the PCR is started above the melting temperature; and

(d) detecting said amplified cDNA, wherein said correspondent cDNA is distinguished from other amplified fragments by its size.

5,750,335

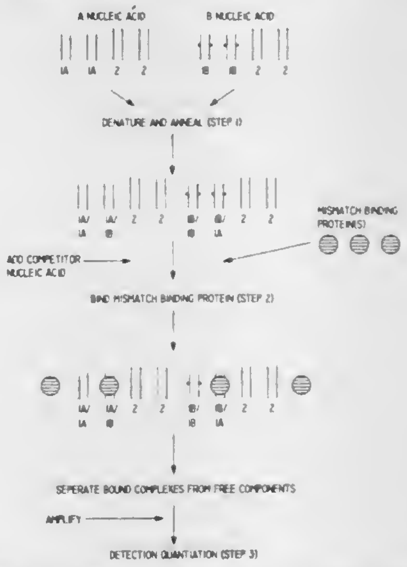
SCREENING FOR GENETIC VARIATION

David K. Gifford, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 874,192, Apr. 24, 1992, abandoned. This application Apr. 22, 1993, Ser. No. 52,157

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07K** *14/195;17/00*

U.S. Cl. 435—6 **70 Claims**


A NUCLEIC ACID
B NUCLEIC ACID
1A
1A
2
2
1B
1B
2
2
DENATURE AND ANNEAL (STEP 1)
1A/1A
1A/1B
2
2
1B/1B
1B/1A
2
2
MISMATCH BINDING PROTEIN(S)
ADD COMPETITOR NUCLEIC ACID
BIND MISMATCH BINDING PROTEIN (STEP 2)
1A/1A
1A/1B
2
2
1B/1B
1B/1A
2
2
SEPERATE BOUND COMPLEXES FROM FREE COMPONENTS
AMPLIFY
DETECTION QUANTIATION (STEP 3)

1. A method of genetic screening for a nucleotide variation, said method comprising:

(A) providing a test nucleic acid suspected to contain a nucleotide variation and a reference nucleic acid;

(B) annealing said test and reference nucleic acids under conditions sufficient to produce a mixture comprising a first concentration of heteroduplex and excess homoduplex nucleic acid, wherein said nucleotide variation comprises one member of a mismatched pair in said heteroduplex, wherein said excess homoduplex nucleic acids are generated by reannealing of a first test or reference nucleic acid strand with a fully complementary second test or reference nucleic acid strand;

(C) fractionating said heteroduplex from said mixture by affinity purification in which a mismatch repair protein immobilized on a solid support binds said mismatched pair in said heteroduplex;

(D) recovering heteroduplex from said affinity purification to produce a heteroduplex sample which contains a second, higher concentration of said heteroduplex; and

(E) detecting, as an indication of a genetic variation between said test and reference nucleic acids, the presence of a mismatched nucleotide pair in said sample.

5,750,336

ASSAYS FOR THE IDENTIFICATION OF COMPOUNDS WHICH INHIBIT ACTIVATION OF CAMP AND MITOGEN RESPONSIVE GENES

Marc R. Montminy, Encinitas, Calif., assignor to The Salk Institute for Biological Studies, La Jolla, Calif.

Filed Feb. 10, 1994, Ser. No. 194,468

Int. Cl.⁶ C12Q *1/68;* G01N *33/567;* C12N *15/85*

U.S. Cl. 435—6 **20 Claims**

1. A method for identifying a compound which inhibits transcription activation of cAMP and/or mitogen responsive genes, said method comprising:

exposing cells to a test compound in the presence of a stimulant capable of activating transcription of cAMP and/or mitogen responsive genes, wherein said cells contain
  (i) a signal dependent transcription factor,
  (ii) a non-endogenous CREB-binding-protein (CBP) polypeptide that cooperates with said signal dependent transcription factor to activate transcription, wherein said polypeptide comprises at least amino acid residues 461–661 of the protein set forth in SEQ ID NO:2, and
  (iii) a reporter construct comprising DNA encoding a reporter gene, wherein said DNA is operatively linked to an inducible promoter, and wherein expression of said reporter gene is under the cooperative control of said signal dependent transcription factor and said CBP polypeptide; and thereafter

comparing the level of expression of said reporter gene in the presence of said test compound, relative to the level of expression of said reporter gene in the absence of said test compound, wherein a reduced level of expression in the presence of said test compound indicates a compound which inhibits transcription activation of cAMP and/or mitogen responsive genes.

5,750,337

METHODS FOR DETECTING NUCLEIC ACID SEQUENCES USING EVANESCENT WAVE DETECTION

David J. Squirrell, Salisbury, Great Britain, assignor to The Secretary Of State For Defence In Her Britannic Majesty's Government Of The United Kingdom Of Great Britain And Northern Ireland, London, England

PCT No. PCT/GB92/01698, § 371 Date Feb. 23, 1994, § 102(e) Date Feb. 23, 1994, PCT Pub. No. WO93/06241, PCT Pub. Date Apr. 1, 1993

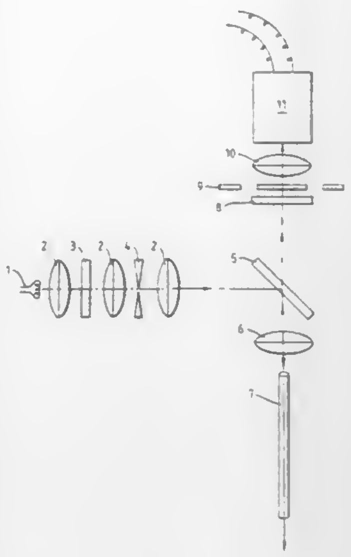
PCT Filed Sep. 16, 1992, Ser. No. 196,185

Claims priority, application United Kingdom, Sep. 16, 1991, 9119735

Int. Cl.⁶ C12Q *1/68*

U.S. Cl. 435—6 **19 Claims**

1. A method for the detection, identification or quantification of a material selected from plant or animal tissue, microorganisms or cell free RNA or DNA, said method comprising the steps of:



(i) immobilizing an oligonucleotide, which specifically binds to all or part of a nucleotide sequence characteristic of the RNA or DNA of the material, on the surface of an evanescent wave detector apparatus waveguide;

(ii) subjecting a sample of said material or RNA or DNA derived therefrom in solution to a sequence specific amplification in which a sequence comprising said sequence characteristic of the RNA or DNA of the material is amplified, the amplification being effected in contact with the immobilized oligonucleotide of step (i);

(iii) during and/or on completion of the sequence specific amplification, subjecting the reaction mixture of step (ii) to conditions whereby DNA or RNA having the characteristic nucleotide sequence will hybridize with said immobilized nucleotide of step (i);

(iv) during or on completion of the hybridization reaction in step (iii) associating any hybrid produced with a fluorescently detectable agent such that the fluorescently labeled agent becomes specifically bound to said hybrid but not to unhybridized immobilized oligonucleotide; and

(v) measuring the fluorescently detectable agent bound by step (iv) using the evanescent wave detector apparatus and relating the amount of that to the presence, identity and/or amount of the material.

5,750,338

TARGET AND BACKGROUND CAPTURE METHODS WITH AMPLIFICATION FOR AFFINITY ASSAYS

Mark L. Collins, Holden; Donald N. Halbert, Milford; Walter King, Maynard, and Jonathan M. Lawrie, Milford, all of Mass., assignors to Amoco Corporation, Chicago, Ill.

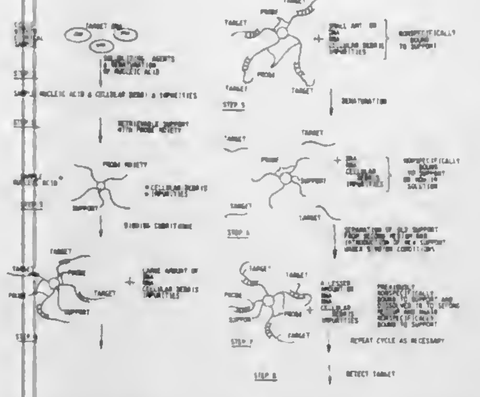
Division of Ser. No. 400,657, Mar. 8, 1995, which is a continuation of Ser. No. 257,469, Jun. 8, 1994, abandoned, which is a continuation of Ser. No. 124,826, Sep. 21, 1993, abandoned, which is a continuation of Ser. No. 946,749, Sep. 17, 1992, abandoned, which is a continuation of Ser. No. 648,468, Jan. 31, 1991, abandoned, which is a continuation-in-part of Ser. No. 922,155, Oct. 23, 1986, abandoned, and Ser. No. 136,920, Dec. 21, 1987, abandoned. This application May 3, 1994, Ser. No. 238,080

Int. Cl.⁶ C07H *21/04;* C12Q *1/68;1/70;* C12P *19/34*

U.S. Cl. 435—6 **40 Claims**

1. A method for amplifying a target polynucleotide contained in a sample comprising the steps of:

(a) contacting the sample with a first support which binds to the target polynucleotide;



(b) substantially separating the support and bound target polynucleotide from the sample; and

(c) amplifying the target polynucleotide.

5,750,339

METHODS FOR IDENTIFYING FETAL CELLS

J. Bruce Smith, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Nov. 30, 1994, Ser. No. 347,506

Int. Cl.⁶ C12Q *1/68;* G01N *33/53*

U.S. Cl. 435—6 **17 Claims**

1. A method of distinguishing nucleated fetal cells from maternal cells in a sample comprising maternal blood containing nucleated fetal cells and maternal cells, said method comprising:

(a) contacting a sample comprising maternal blood containing nucleated fetal cells and maternal cells with a probe; said probe being a nucleic acid molecule comprising a nucleotide sequence complementary to the nucleotide sequence of HLA-G mRNA; and

(b) identifying cells in which said probe hybridizes to mRNA in said cells; wherein the absence of hybridization of said probe to mRNA in said cells is an indication that said cells are maternal cells and the presence of hybridization of said probe to mRNA in said cells is an indication that said cells are nucleated fetal cells.

5,750,340

IN SITU HYBRIDIZATION SOLUTION AND PROCESS

In C. Kim; Donald M. Thompson, and Gloria E. Sarto, all of Albuquerque, N. Mex., assignors to University of New Mexico, Alburquerque, N. Mex.

Filed Apr. 7, 1995, Ser. No. 418,704

Int. Cl.⁶ C12Q *1/68;* A61K *9/44;* G01N *1/30*

U.S. Cl. 435—6 **23 Claims**

1. A hybridization solution for performing an in situ hybridization procedure, said solution consisting essentially of:

between about 8 and 12 percent by weight dextran sulfate;
between about 10 and 30 percent by volume formamide: and
a salt.

5,750,341

DNA SEQUENCING BY PARALLEL OLIGONUCLEOTIDE EXTENSIONS

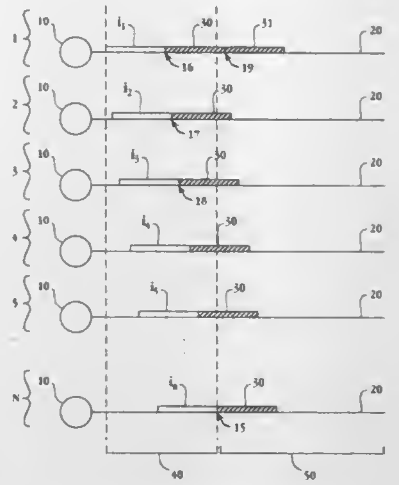
Stephen C. Macevicz, Cupertino, Calif., assignor to Lynx Therapeutics, Inc., Hayward, Calif.

Filed Apr. 17, 1995, Ser. No. 424,663

Int. Cl.⁶ C12Q *1/68;* C07H *21/02;21/04;* C12P *19/34*

U.S. Cl. 435—6 **19 Claims**

1. A method for determining a sequence of nucleotides in a target polynucleotide, the method comprising the steps of:



(a) providing a probe-target duplex comprising an initializing oligonucleotide probe hybridized to a target polynucleotide, said probe having an extendable probe terminus;

(b) ligating an extension oligonucleotide probe to said extendable probe terminus, to form an extended duplex containing an extended oligonucleotide probe;

(c) identifying, in the extended duplex, at least one nucleotide in the target polynucleotide that is either (1) complementary to the just-ligated extension probe or (2) a nucleotide residue in the target polynucleotide which is immediately downstream of the extended oligonucleotide probe;

(d) generating an extendable probe terminus on the extended probe, if an extendable probe terminus is not already present, such that the terminus generated is different from the terminus to which the last extension probe was ligated; and

(e) repeating steps (b), (c) and (d) until a sequence of nucleotides in the target polynucleotide is determined.

5,750,342

NUCLEIC ACID LIGANDS OF TISSUE TARGET

Andrew Stephens, Denver; Dan Schneider; Larry Gold, both of Boulder, all of Colo., and Ulrich Speck, Berlin, Germany, assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo., and Schering Akiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, which is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned, and Ser. No. 964,624, Oct. 21, 1992, Pat. No. 5,496,938. This application May 3, 1995, Ser. No. 433,124

Int. Cl.⁶ C12Q *19/34;1/68;* C07H *21/02;21/04*

U.S. Cl. 435—6 **7 Claims**

1. A method for identifying nucleic acid ligands to a target selected from the group consisting of peripheral blood mononuclear cells, fibrin clots, and carotid arteries comprising:

a) preparing a candidate mixture of nucleic acids;

b) contacting said candidate mixture of nucleic acids with said target, wherein nucleic acids having an increased affinity to the target relative to the candidate mixture may be partitioned from the remainder of the candidate mixture;

c) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture; and

d) amplifying the increased affinity nucleic acids to yield a mixture of nucleic acids enriched for nucleic acids with relatively higher affinity and specificity for binding to said target than the remainder of the candidate mixture, whereby nucleic acid ligands of said target may be identified.

5,750,343

METHODS OF DETECTING NUCLEIC ACIDS WITH NUCLEOTIDE PROBES CONTAINING 4'-SUBSTITUTED NUCLEOTIDES AND KITS THEREFOR

Hans Maag, Menlo Park; Samuel J. Rose, Mountain View, both of Calif., and Beat Schmidt, Baltschieder, Switzerland, assignors to Syntex Inc., Palo Alto, Calif.

Division of Ser. No. 164,893, Dec. 9, 1993, Pat. No. 5,446,137. This application May 2, 1995, Ser. No. 433,855

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68*

U.S. Cl. 435—6 **23 Claims**

1. An improved method of detecting the presence or amount of a target nucleic acid in a sample suspected of containing said target nucleic acid, said method comprising the steps of:

(a) providing in combination a medium suspected of containing said target nucleic acid and at least one nucleotide probe capable of binding to a region of said target nucleic acid; and

(b) determining whether said nucleotide probe has become bound to said target nucleic acid thereby indicating the presence or amount of said target nucleic acid, the improvement comprising said nucleotide probe having at least one nucleotide that has a substituent other than hydrogen at the 4'-position of the sugar moiety, said substituent being capable of facilitating the detection of said nucleotide probe.

5,750,344

METHOD FOR SELECTION OF BIOLOGICALLY ACTIVE PEPTIDE SEQUENCES

Michael V. Doyle, 4560 Horton St., Emeryville, Calif. 94608

Continuation of Ser. No. 69,352, May 28, 1993, abandoned. This application Oct. 4, 1995, Ser. No. 538,911

Int. Cl.^{6} G12Q *1/64;* **G01N** *33/53*

U.S. Cl. 435—6 **13 Claims**

1. A method for selecting a desired compound having a binding affinity for a selected target, wherein said desired compound is present within a biological peptide library, said method comprising:

(a) contacting said library with a first substrate, wherein said first substrate comprises said target;

(b) separating peptides which bind to said first substrate from peptides which do not bind to said first substrate, and amplifying said peptides which bind to said first substrate;

(c) contacting said amplified peptides with a second substrate, wherein said second substrate differs from said first substrate and comprises said target, wherein one of said first and second substrates comprises a cell;

(d) separating compounds which bind to said second substrate from similar compounds which do not bind to said second substrate, and amplifying said peptides which bind to said second substrate.

5,750,345

DETECTION OF HUMAN α-THALASSEMIA MUTATIONS AND THEIR USE AS PREDICTORS OF BLOOD-RELATED DISORDERS

Lemuel J. Bowie, Evanston, Ill., assignor to Evanston Hospital Corporation, Evanston, Ill.

Filed Oct. 31, 1995, Ser. No. 550,715

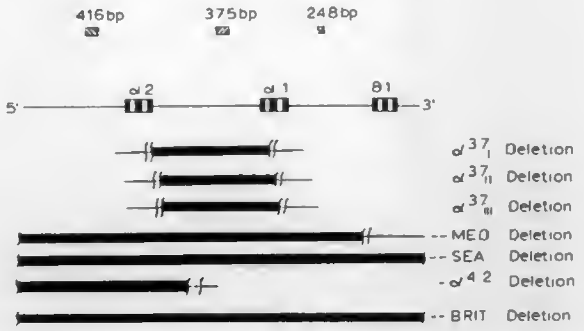
Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **39 Claims**

1. A method of screening a human subject for an increased risk of developing a blood-related disorder, comprising the steps of:

(a) assaying genomic DNA of a human subject to determine a presence or an absence of an α-globin deletion mutation; and

(b) screening for an increased risk of developing a blood-related disorder from the presence or absence of an α-globin deletion mutation in said genomic DNA, wherein the presence of an α-globin deletion mutation in the genomic DNA correlates with an increased risk of developing a blood-related disorder, and wherein said blood-related disorder is selected from the group consisting of hypertension, myocardial infarction, and diabetes.



5,750,346

HOST ORGANISM CAPTURE

John A. Bridgham, Hillsborough; John Brandis, Hercules; John Leong, San Francisco; Paul D. Hoeprich, Jr., Danville; Charles L. Sloan, Fremont; Roger A. O'Neill, San Carlos, and Charles Andre, Foster City, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Continuation-in-part of Ser. No. 585,552, Jan. 11, 1996, which is a continuation-in-part of Ser. No. 511,846, Aug. 7, 1995. This application Aug. 7, 1996, Ser. No. 695,834

Int. Cl.^{6} C12Q *1/68;* **G01N** *33/483;33/53;* **C07N** *21/04*

U.S. Cl. 435—6 **38 Claims**

1. A host organism capture system comprising:

a solid support; and

a plurality of binding moieties attached to the solid support, the binding moieties being members of binding pairs, the complementary member of the binding pairs being expressed on the surface of a host organism, wherein the binding moieties are located in a plurality of discrete anchor sites, each anchor site having dimensions, such that only a single host organism can bind to a single anchor site.

5,750,347

IN SITU POLYMERASE CHAIN REACTION

Omar Bagasra, Laurel Springs, N.J., and Roger J. Pomerantz, Chalfont, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 225,491, Apr. 11, 1994, Pat. No. 5,589,333, which is a continuation of Ser. No. 829,912, Feb. 3, 1992, abandoned. This application Dec. 12, 1996, Ser. No. 764,538

Int. Cl.^{6} C12Q *1/68;1/70;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **16 Claims**

1. A method for identifying a cell containing at least one copy of a selected nucleic acid sequence comprising:

(a) exposing said cell to dry heat thereby fixing said cell to a solid support to produce a heat fixed immobilized cell;

(b) contacting said heat fixed immobilized cell with paraformaldehyde to produce a paraformaldehyde treated, heat fixed immobilized cell;

(c) contacting said paraformaldehyde treated, heat fixed immobilized cell containing selected nucleic acid sequence or nucleic acid sequences with oligonucleotide primers complementary to regions of selected nucleic acid sequence or sequences to form a nucleic acid hybrid and generating an extension product by amplification in said cell;

(d) separating into single stranded nucleic acid molecules, the extension product generated in step (c) to provide single-stranded nucleic acid molecules of the selected nucleic acid sequence or sequences in said cell;

(e) repeating steps (c) and (d) to amplify said selected nucleic acid sequence or sequences;

(f) hybridizing a labeled nucleic acid probe to said amplified selected nucleic acid sequence or sequences provided in step (e); and

(g) observing a labeled cell produced in step (f), wherein a labeled cell indicates a cell containing at least one copy of a selected nucleic acid sequence.

5,750,348

METHOD FOR DETECTING INSULIN RESISTANCE

Joseph Larner, Charlottesville, Va., assignor to The University of Virginia Patents Foundation, Charlottesville, Va.

Continuation-in-part of Ser. No. 953,708, Sep. 30, 1992, Pat. No. 5,427,956, which is a continuation of Ser. No. 870,771, Apr. 21, 1992, Pat. No. 5,183,764, which is a continuation of Ser. No. 476,953, Feb. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 320,485, Mar. 8, 1989, abandoned. This application Jul. 8, 1994, Ser. No. 273,099

Int. Cl.^{6} G01N *30/72;33/48;33/53*

U.S. Cl. 435—7.1 **2 Claims**

1. A method for screening non-diabetic persons for insulin resistance, comprising the steps of

(a) measuring the concentration of D-chiroinositol in a urine sample;

(b) measuring the concentration of myoinositol in a urine sample;

(c) calculating a ratio of myoinositol to D-chiroinositol; and

(d) comparing the calculated ratio to a ratio that is characteristic of insulin resistance,

wherein the non-diabetic person is determined to be likely to be insulin resistant if the calculated ratio exceeds the ratio that is characteristic of insulin resistance.

5,750,349

ANTIBODIES TO β-AMYLOIDS OR THEIR DERIVATIVES AND USE THEREOF

Nobuhiro Suzuki; Asano Odaka, both of Ibaraki, and Chieko Kitada, Osaka, all of Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan

PCT No. PCT/JP94/00089, § 371 Date Sep. 15, 1994, § 102(e) Date Sep. 15, 1994, PCT Pub. No. WO94/17197, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 24, 1994, Ser. No. 302,808

Claims priority, application Japan, Jan. 25, 1993, 5-010132; Feb. 5, 1993, 5-019035; Nov. 16, 1993, 5-286985; Dec. 28, 1993, 5-334773

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.1 **9 Claims**

1. An antibody specifically reactive to a peptide on the C-terminal side of a β-amyloid comprising the amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5 or SEQ ID NO:6 or a derivative thereof which is a peptide lacking 1 to 17 amino acid residues from the N-terminal portion of the said β-amyloid, a peptide in which L-aspartic acid of the said β-amyloid is isomerized to L-isoaspartic acid, D-isoaspartic acid or D-aspartic acid, and a peptide in which the N-terminal portion of the said β-amyloid has pyroglutamic acid, and, in which said antibody does not recognize a peptide comprising the amino acid sequence of SEQ ID NO:7.

5,750,350

HEPATITIS δ DIAGNOSTICS

Michael Houghton, Danville; Kang-Sheng Wang, Oakland; Qui-Lim Choo, El Cerrito; Amy Joan Weiner, Berkeley, and Lacy Rasco Overby, Alamo, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 262,667, Jun. 20, 1994, abandoned, which is a continuation of Ser. No. 97,519, Jul. 27, 1993, Pat. No. 5,389,528, which is a continuation of Ser. No. 932,920, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 765,917, Sep. 25, 1991, abandoned, which is a division of Ser. No. 53,991, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 875,337, Jun. 17, 1986, abandoned. This application May 24, 1995, Ser. No. 449,429

Int. Cl.^{6} G01N *33/53;* **C12Q** *1/70;* **A61K** *39/21;39/29*

U.S. Cl. 435—7.1 **3 Claims**

1. A kit useful in analyzing biological samples for the presence of anti-HDV antibodies which comprises a peptide encoded by ORF 5 of the HDV genome as shown in FIG. 3, said peptide selected from the group consisting of p24^6 and p27^6, and the remaining reagents and materials needed to perform an immunoassay.

5,750,351

TREATMENT FOR ATHEROSCLEROSIS AND OTHER CARDIOVASCULAR AND INFLAMMATORY DISEASES

Russell M. Medford; R. Wayne Alexander; Sampath Parthasarathy, all of Atlanta, and Bobby V. Khan, Dunwoody, all of Ga., assignors to Emory University, Atlanta, Ga.

Continuation of Ser. No. 317,399, Oct. 4, 1994, which is a continuation-in-part of Ser. No. 240,858, May 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 969,934, Oct. 30, 1992, Pat. No. 5,380,747. This application Jun. 7, 1995, Ser. No. 474,530

Int. Cl.^{6} G01N *33/53;* **A61K** *31/40;31/54;31/265*

U.S. Cl. 435—7.21 **11 Claims**

1. A method to assess a test compound for its ability to treat a disorder mediated by VCAM-1 comprising evaluating the ability of the compound to inhibit the oxidation of a polyunsaturated fatty acid by the steps of:

(i) challenging a host to a high level of a polyunsaturated fatty acid and;

(ii) determining the therapeutic efficacy of the test compound based on its ability to decrease the concentration of circulating or cell surface VCAM-1 concentration.

5,750,352

MONO-ALLELIC MUTATION ANALYSIS FOR IDENTIFYING GERMLINE MUTATIONS

Bert Vogelstein, Baltimore; Kenneth W. Kinzler, BelAir, and Nickolas Papadopoulos, Baltimore, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 23, 1995, Ser. No. 519,059

Int. Cl.^{6} G01N *33/567;* **C12Q** *1/68*

U.S. Cl. 435—7.21 **19 Claims**

1. A method of detecting mutations in a first gene of a human, wherein the first gene has been previously mapped to a human chromosome, comprising the steps of:

obtaining cells of the human;

fusing said cells to rodent cell recipients which carry a mutation which can be complemented by a second gene which has been mapped to said chromosome, to form human-rodent cell hybrids;

testing said human-rodent cell hybrids to confirm the presence of said chromosome of the human in said hybrid;

testing said hybrids which contains said chromosome to detect a protein product of said first gene, absence of said protein product or diminished amounts of said protein product indicating the presence of a mutation in the first gene of the human.

5,750,353

ASSAY FOR NON-PEPTIDE AGONISTS TO PEPTIDE HORMONE RECEPTORS

Alan S. Kopin, Wellesley, and Martin Beinborn, Brookline, both of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Filed Dec. 11, 1995, Ser. No. 570,157

Int. Cl.^{6} G01N *33/566;* **C12Q** *1/22*

U.S. Cl. 435—7.21 **12 Claims**

1. A method for determining whether a candidate compound is a non-peptide agonist or an antagonist of a peptide hormone receptor, said method comprising the steps of:

(a) exposing said candidate compound to a form of said peptide hormone receptor that has the ability to amplify the activity of a non-peptide agonist as compared to the corresponding wild-type receptor; and

(b) measuring the activity of said form in the presence of said candidate compound relative to the activity of said form in the absence of said compound, a change in said activity indicating whether said candidate compound is an agonist or an antagonist.

5,750,354

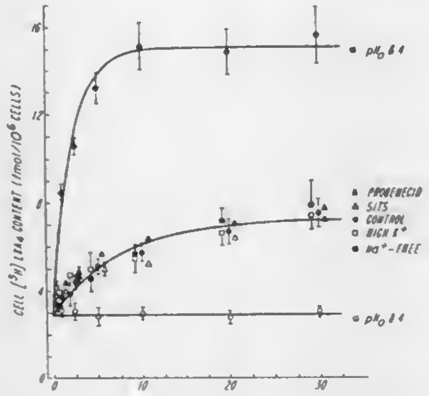
LIPOXIN TRANSPORT SYSTEM AND USES THEREFOR

Louis Simchowitz, St. Louis, Mo., and Charles N. Serhan, Boston, Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Filed Mar. 11, 1994, Ser. No. 212,171

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.24 **19 Claims**



1. An in vitro method for inhibiting uptake of lipoxin A_4 by a cell which has a lipoxin transport system, comprising contacting the cell with a molecule which is an inhibitor of the lipoxin transport system.

5,750,355

METHODS FOR SELECTIVELY DETECTING PERINUCLEAR ANTI-NEUTROPHIL CYTOPLASMIC ANTIBODY OF ULCERATIVE COLITIS OR PRIMARY SCLEROSING CHOLANGITIS

Stephan R. Targan, Los Angeles, and Alda Vidrich, Pacific Palisades, both of Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Continuation of Ser. No. 28,784, Mar. 10, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,163

Int. Cl.^{6} G01N *33/53;33/555;33/567*

U.S. Cl. 435—7.24 **44 Claims**

1. A method of measuring the presence or absence of perinuclear anti-neutrophil cytoplasmic antibodies (p-ANCA) of ulcerative colitis or primary sclerosing cholangitis in a sample, said method comprising:

(a) contacting the sample and a detectable secondary antibody with alcohol-fixed neutrophils under conditions suitable to form a detetable complex of neutrophils, p-ANCA and detectable secondary antibody,

wherein said fixed neutrophils are subjected to DNAase under conditions sufficient to cause substantially complete digestion of cellular DNA without significant loss of nuclear or cellular morphology prior to said contacting step, and

wherein said secondary antibody has specificity for p-ANCA or the class determining portion of p-ANCA;

(b) separating unbound secondary antibody from the complex;

(c) assaying for the presence, absence or pattern of detectable p-ANCA containing complex by measuring the presence, absence or pattern of complexed secondary antibody, compared to a control, wherein said control is the result of repeating the present method on a sample from the same source, except that the neutrophils of step (a) are not subjected to DNAase.

5,750,356

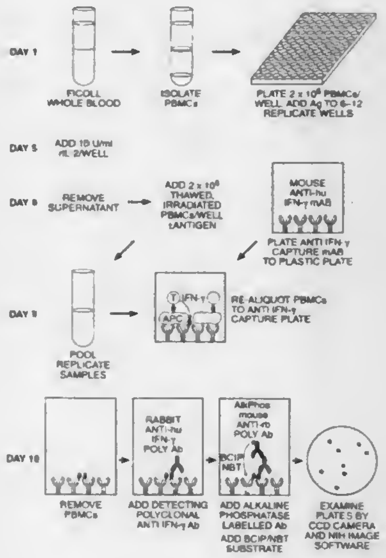
METHOD FOR MONITORING T CELL REACTIVITY

Edward G. Spack, Mountain View; Nancy G. Wehner, Fremont, and Michael A. McCutcheon, Stanford, all of Calif., assignors to Anergen, Inc., Redwood City, Calif.

Filed May 31, 1996, Ser. No. 657,939

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.24 **23 Claims**


DAY 1
FICOLL WHOLE BLOOD
ISOLATE PBMCs
PLATE 2 x 10^6 PBMCs/WELL. ADD Ag TO 6–12 REPLICATE WELLS
DAY 5
ADD 10 U/ml rIL 2/WELL
DAY 8
REMOVE SUPERNATANT
ADD 2 x 10^6 THAWED, IRRADIATED PBMCs/WELL ±ANTIGEN
MOUSE ANTI-hu IFN-γ mAB
PLATE ANTI IFN-γ CAPTURE mAB TO PLASTIC PLATE
DAY 9
T
IFN-γ
APC
POOL REPLICATE SAMPLES
RE-ALIQUOT PBMCs TO ANTI IFN-γ CAPTURE PLATE
DAY 10
RABBIT ANTI-hu IFN-γ POLY Ab
AlkPhos mouse ANTI-rb POLY Ab
BCIP NBT
REMOVE PBMCs
ADD DETECTING POLYCLONAL ANTI IFN-γ Ab
ADD ALKALINE PHOSPHATASE LABELLED Ab
ADD BCIP/NBT SUBSTRATE
EXAMINE PLATES BY CCD CAMERA AND NIH IMAGE SOFTWARE

1. A method for detecting an antigen reactive T-cell in a biological sample suspected of containing said T-cells, the method comprising:

(a) stimulating the T-cells in the biological sample with said antigen for a first time period sufficient to permit T-cell expansion:

(b) restimulating the T-cells with an effective amount of a combination of the antigen and antigen presenting cells for a second time period effective to induce secretion of a soluble factor;

(c) detecting the presence of the soluble factor by capturing the soluble factor on a solid support; and

(d) relating the presence of the soluble factor on the solid support to the presence of the antigen reactive T-cell.

5,750,357

METHOD OF RAPID ANALYTE DETECTION

Alan D. Olstein, Mendota Heights, and Richard Albert, Eden Prairie, both of Minn., assignors to MicroQuest Diagnostics, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 245,374, May 18, 1994, abandoned. This application Jan. 30, 1995, Ser. No. 380,643

Int. Cl.^{6} G01N *33/569;33/53*

U.S. Cl. 435—7.32 **32 Claims**

11. A method for detecting the presence of microorganisms in a test sample comprising:

(a) immobilizing microorganisms from said test sample;

(b) contacting said microorganisms with an amount of a detectable synthetic copolymer which comprises repeating monomeric units, wherein a first population of the monomeric units each comprises a binding agent which binds to said microorganisms at multiple binding site for said binding agent on each microorganism, and wherein a second population of the monomeric units each comprises a detectable label or a binding site for a detectable label, so as to form microorganism-copolymer complexes; and

(c) detecting said microorganism-copolymer complexes.

14. The method of claim 11 wherein the binding agent is an antibiotic or a fragment thereof, which binds to binding sites on a pathogenic microorganism.

5,750,358

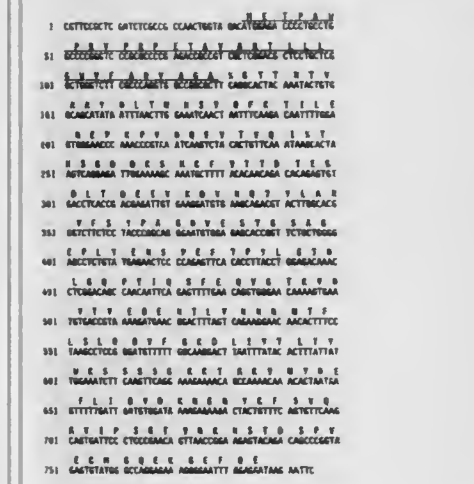
QUANTITATIVE CLOTTING ASSAY FOR ACTIVATED FACTOR VII

James H. Morrissey, Oklahoma City, Okla., assignor to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation of Ser. No. 683,682, Apr. 10, 1991, Pat. No. 5,472,850. This application Jun. 5, 1995, Ser. No. 464,237

Int. Cl.^{6} C21Q *1/56;1/00;* **A01N** *37/18;* **A61K** *35/14*

U.S. Cl. 435—13 **18 Claims**



1. A method for measuring the concentration of coagulation factor VIIa in a patient's plasma sample, comprising the steps of:

(a) mixing a quantity of a plasma sample with a soluble truncated tissue factor, said soluble truncated tissue factor characterized by its inability to bind to phospholipids and its inability to support conversion of factor VII to factor VIIa, to form a first mixture;

(b) thereafter, adding an effective amount of calcium ions to said first mixture to form a second mixture and to initiate clotting of said second mixture;

(c) determining a plasma sample clotting time for said second mixture measured from a time of addition of said calcium ions to a time of clot formation; and

(d) comparing said plasma sample clotting time to a standards clotting time determined for factor VIIa of a known concentration.

5,750,359

COMPOSITION FOR DETECTING LEUCOCYTE AND PROTEINASE IN URINE AND ITS MEASURING DEVICE

Nam Won Huh; Yong Ae Park, and Yong Ho Kim, all of Pusan, Rep. of Korea, assignors to Chung-Do Pharmaceutical Co., Ltd., Kyungsangnam-do, Rep. of Korea

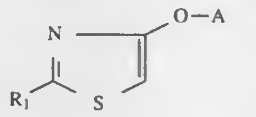
Filed Oct. 25, 1996, Ser. No. 756,370

Claims priority, application Rep. of Korea, Jul. 30, 1996, 96-31386

Int. Cl.^{6} C12Q *1/44;1/37*

U.S. Cl. 435—19 **7 Claims**

1. Composition for detecting leucocytes and proteinase in urine, which contains a compound having the following formula (1) or pharmaceutically acceptable salts and solvated salts



(1)

wherein;

A is a N-blocked-amino acid residue,

R1 is substituted or non-substituted benzene ring.

5,750,360

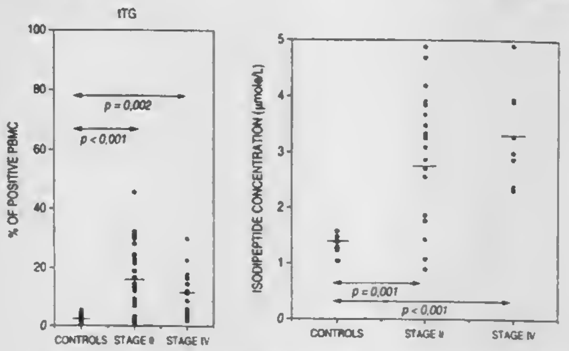
METHOD FOR QUANTITATIVELY MEASURING APOPTOSIS

Laszlo Fesus, Debrecen Nagyerdei, Hungary, and Mauro Piacentini, Rome, Italy, assignors to LXR Biotechnology Inc., Richmond, Calif.

Filed Jun. 7, 1995, Ser. No. 484,339

Int. Cl.^{6} C12Q *1/37;1/48;* **C12P** *21/06;* **G01N** *33/00*

U.S. Cl. 435—23 **15 Claims**



1. A method of measuring the amount of protein-derived isodipeptide in a sample comprising the steps of:

a) obtaining the sample;

b) removing free lysine from the sample to form an isolate;

c) hydrolyzing the isolate to release free lysine and

d) measuring the free lysine,

wherein the concentration of free lysine obtained from step c) is directly related to the amount of isodipeptide in the sample and further wherein the method is capable of detecting an amount of isodipeptide of about 25 pmoles.

5,750,361

FORMATION AND USE OF PRION PROTEIN (PRP) COMPLEXES

Stanley B. Prusiner; Kivotoshi Kaneko, and Fred E. Cohen, all of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 2, 1995, Ser. No. 556,823

Int. Cl.^{6} C12Q *1/37;* **G01N** *31/00;21/00;1/22*

U.S. Cl. 435—23 **27 Claims**

1. A method of screening for compounds which inhibits the binding of PrP^C to a PrP peptide, comprising the steps of:

(a) contacting in vitro a test compound with a purified naturally occurring first component PrP^C in the presence of a purified

second component PrP peptide, wherein said PrP peptide has a random coil or α helical confirmation, and wherein the first and second components form a prion protein complex with a PrP^{SC} characteristic selected from the group consisting of (1) increased β-sheet content, (2) diminished aqueous solubility, and (3) resistance to poroteolytic digestion, relative to PrP^{C};
- (b) detecting formation of a prion protein complex; by determining (1) increased β-sheet, (2) diminished aqueous solubility, or (3) resistance to proteolytic digestion, relative to PrPc and and
- (c) comparing levels of prion protein complex in the presence of said test compound with levels in the absence of the test compound, wherein reduced levels of said prion protein complex in the presence of said test compound is indicative that said test compound inhibits said binding of PrP^{C} to a PrP peptide.

5,750,362
METHODS FOR IDENTIFYING SUBSTANCES WITH A POTENTIAL HERBICIDAL OR GROWTH-REGULATING ACTION BY MEANS OF PLANT TRANSPORTER PROTEINS, THE USE OF THE TRANSPORTER PROTEINS, AND SUBSTANCES WITH A HERBICIDAL AND GROWTH-REGULATING ACTION

Wolf-Bernd Frommer; Olaf Ninnemann; Wolfgang Streber; Jörg Riesmeier, and Marion Kwart, all of Berlin, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/04174, § 371 Date Aug. 5, 1996, § 102(e) Date Aug. 5, 1996, PCT Pub. No. WO95/16913, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 15, 1994, Ser. No. 663,222

Claims priority, application Germany, Dec. 16, 1993, 43 43 527.0

Int. Cl.^{6} G12Q *1/02*

U.S. Cl. 435—29 9 Claims

1. A method for identifying substances which have a potential herbicidal or growth-regulating action which arises due to inhibition or inactivation of a plant transport process, which comprises.
- a) initially preparing a transporter protein by heterologous expression of a DNA sequence which codes for said transporter protein in a transgenic plant fungus, yeast or eukaryotic cell, subsequently
- b) employing said transgenic plant, fungus, yeast or eukaryotic cell for assaying a chemical compound for its inhibitory effect on said transporter protein, and
- c) additionally assaying the chemical compound for activity on plant, fungus, yeast or eukaryotic cell which do not produce the corresponding transporter protein, in order to preclude the possibility that the chemical compound also has an inhibitory effect on other mechanisms in said plant, fungus, yeast or eukaryotic cell, and finally
- d) testing the chemical compound which is active against the transporter protein for its herbicidal or growth-regulating activity on plants.

5,750,363
METHOD FOR DETERMINING THE ANTIMICROBIAL AGENT SENSITIVITY OF A NONPARAFFINOPHILIC MICROORGANISM AND AN ASSOCIATED APPARATUS

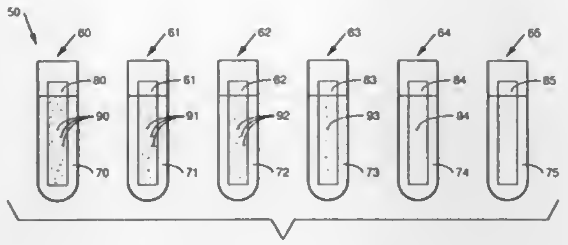
Robert-A. Ollar, Milford, and Mitchell S. Felder, Hermitage, both of Pa., assignors to Infectech, Inc., Sharon, Pa.

Continuation-in-part of Ser. No. 528,192, Sep. 14, 1995, Pat. No. 5,663,056. This application May 19, 1997, Ser. No. 858,131

Int. Cl.^{6} C12Q *1/02;1/24;1/18;1/14*

U.S. Cl. 435—29 36 Claims

1. A method for determining the antibiotic sensitivity of a nonparaffinophilic microorganism from a specimen obtained from a patient to an antimicrobial agent, said method comprising:



providing a receptacle containing an aqueous solution that does not contain a carbon source;

inoculating said solution with said specimen;

placing into said receptacle (i) a slide having bound thereto a carbon source and (ii) a predetermined quantity of an antimicrobial agent; and

observing nonparaffinophilic microorganism growth or lack thereof on said slide to determine whether said predetermined quantity of said antimicrobial agent is effective in inhibiting growth of said nonparaffinophilic microorganism on said slide.

5,750,364
BIODEGRADATION OF ETHERS USING AN ISOLATED MIXED BACTERIAL CULTURE

Joseph Patrick Salanitro, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 6, 1995, Ser. No. 465,996

Int. Cl.^{6} C12P *39/00;* **C12S** *00/00*

U.S. Cl. 435—42 9 Claims

1. An isolated mixed bacterial culture having all the identifying characteristics of BC-1, ATCC No. 202057.

5,750,365
ISOLATED NUCLEIC ACID ENCODING A NEWT ACIDIC FIBROBLAST GROWTH FACTOR (AFGF)

Ing Ming Chiu, Dublin, and Matthew L. Poulin, Columbus, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed May 28, 1993, Ser. No. 70,165

Int. Cl.^{6} C17K *15/19*

U.S. Cl. 435—691 20 Claims

4. A recombinant host microorganism containing a DNA expression vector comprising a DNA sequence encoding *Notophthalmus viridescens* acidic fibroblast growth factor, wherein the microorganism is capable of expressing said factor.

5,750,366
CLONING AND EXPRESSION OF GONADOTROPIN-RELEASING HORMONE RECEPTOR

Stuart C. Sealfon, Brooklyn Heights, N.Y., assignor to Mount Sinai School Of Medicine Of The City University Of New York, New York, N.Y.

Continuation-in-part of Ser. No. 904,072, Jun. 23, 1992, abandoned. This application Jun. 21, 1993, Ser. No. 80,386

Int. Cl.^{6} C07K *14/72;* **C12N** *15/12;15/63;* **C07H** *21/04*

U.S. Cl. 435—69.1 14 Claims

1. An isolated nucleic acid molecule comprising a nucleotide sequence that encodes (a) a polypeptide having the amino acid sequence SEQ ID No: 2; or (b) the complement of the nucleotide sequence of (a).

2. An isolated nucleic acid molecule comprising a nucleotide sequence that hybridizes to the nucleic acid molecule of claim 1, and encodes a naturally occurring GnRH-R.

5,750,367
HUMAN AND MOUSE VERY LOW DENSITY LIPOPROTEIN RECEPTORS AND METHODS FOR USE OF SUCH RECEPTORS

Lawrence C. B. Chan, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Filed Nov. 8, 1993, Ser. No. 149,103

Int. Cl.^{6} C07H *21/02;* **C12N** *5/00;15/12;* **C12P** *21/06*

U.S. Cl. 435—69.1 16 Claims

1. An isolated nucleic acid molecule encoding a human or mouse Very Low Density Lipoprotein (VLDL) receptor wherein said nucleic acid molecule comprises SEQ ID No. 1 or SEQ ID No. 2.

5,750,368
PROCESS FOR PRODUCING A SUBSTANCE

Hideki Oda; Satoshi Nakagawa, both of Machida, and Hideharu Anazawa, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,297, Sep. 30, 1994, abandoned. This application Sep. 19, 1996, Ser. No. 715,249

Claims priority, application Japan, Oct. 1, 1993, 5-246478

Int. Cl.^{6} C12P *21/02;19/30;19/34;* **C12N** *1/21*

U.S. Cl. 435—69.1 5 Claims

1. A process for producing a substance, which comprises culturing a microorganism in a medium until the substance is accumulated in a culture, and recovering the substance therefrom, wherein said microorganism is a transformant constructed by transformation of an acetic acid-resistant mutant belonging to the genus Escherichia with a recombinant plasmid carrying a gene involved in the production of the substance.

5,750,369
DNA ENCODING A PROSTAGLANDIN F28 RECEPTOR, A HOST CELL TRANSFORMED THEREWITH AND AN EXPRESSION PRODUCT THEREOF

Staffan Lake, Lidingö , and Johan Stjernschantz, Uppsala, both of Sweden, assignors to Pharmacia & Upjohn Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE93/00789, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO94/07920, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 1, 1993, Ser. No. 416,756

Claims priority, application Sweden, Oct. 2, 1992, 9202892

Int. Cl.^{6} C12N *15/09;* **C07K** *14/705*

U.S. Cl. 435—69.1 15 Claims

1. A purified prostaglandin F2α receptor comprising amino acids 1 to 366 of SEQ ID NO:2.

2. A purified nucleic acid comprising a nucleotide sequence encoding a prostaglandin F2α receptor, wherein said sequence comprises nucleotides encoding the amino acid sequence of amino acids 1 to 366 of SEQ ID NO:2.

5,750,370
NUCLEIC ACID ENCODING HUMAN ENDOTHLEIN-BOMBESIN RECEPTOR AND METHOD OF PRODUCING THE RECEPTOR

Yi Li, Gaithersburg; Craig A. Rosen, Laytonsville, both of Md., and Chandrika Kumar, West Windsor, N.J., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Jun. 6, 1995, Ser. No. 465,687

Int. Cl.^{6} C12N *15/12;* **C07H** *21/00*

U.S. Cl. 435—69.1 21 Claims

1. An isolated polynucleotide comprising a polynucleotide sequence having at least a 95% sequence identity to a member selected from the group consisting of:
- (a) a polynucleotide encoding a polypeptide comprising amino acids 1 to 587 of SEQ ID NO:2; and
- (b) the complement of (a).

5,750,371
WATER-SOLUBLE MUTEIN OF FGF RECEPTOR, DNA AND PRODUCTION THEREOF

Masaharu Senoo, B-212, 744-1, Nishi-izumigaoka 2-chome, Toyonaka-shi, Osaka, Japan, 560; Tatsuya Watanabe, 50-1, Yamadaminami, Suita-shi, Osaka, Japan, 565, and Koichi Igarashi, 66-3, Shimogamo-miyazakicho, Sakyo-ku, Kyoto-shi, Kyoto, Japan, 606

Continuation of Ser. No. 149,664, Nov. 9, 1993, abandoned, which is a continuation of Ser. No. 743,369, Aug. 16, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 471,570

Int. Cl.^{6} C07K *14/71;* **C07H** *21/00;* **C12N** *15/12;15/63*

U.S. Cl. 435—69.1 7 Claims

1. A water soluble mutein of fibroblast growth factor (FGF) receptor which consists of the amino acid sequence shown in SEQ ID No. 12 or SEQ ID No. 14.

5,750,372
VECTOR HAVING PROMOTER THAT IS INDUCIBLE BY METHANOL AND/OR GLYCEROL

Yasuyoshi Sakai, Shiga-ken; Yoshiki Tani, Kyoto; Yuji Shibano, Osaka; Hiroto Kondo, and Haruyo Hatanaka, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

Continuation of Ser. No. 25,416, Mar. 1, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 485,284

Claims priority, application Japan, Feb. 28, 1992, 4-043361

Int. Cl.^{6} C12P *21/06;* **C12N** *1/19;15/81;15/11*

U.S. Cl. 435—69.1 9 Claims

1. A methanol and/or glycerol inducible expression cassette which comprises a promoter having the nucleotide sequence represented by SEQ. I.D. No. 1; a heterologous gene downstream of said promoter; and a terminator having the nucleotide sequence represented by SEQ. I.D. No. 2 downstream of said heterologous gene.

5,750,373
ENRICHMENT METHOD FOR VARIANT PROTEINS HAVING ALTERED BINDING PROPERTIES, M13 PHAGEMIDS, AND GROWTH HORMONE VARIANTS

Lisa J. Garrard, Burlingame; Dennis J. Henner, Pacifica; Steven Bass, Redwood City, all of Calif.; Ronald Greene, Durham, N.C.; Henry B. Lowman, Hercules, Calif.; James A. Wells, Burlingame, Calif., and David J. Matthews, San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

PCT No. PCT/US91/09133, § 371 Date Apr. 30, 1993, § 102(e) Date Apr. 30, 1993

PCT Filed Dec. 3, 1991, Ser. No. 50,058

Int. Cl.^{6} C12P *21/06;* **C12N** *15/63;* **C07K** *14/61*

U.S. Cl. 435—69.4 50 Claims

1. A method for selecting novel binding polypeptides comprising:
- (a) constructing a replicable expression vector comprising
  - a transcription regulatory element operably linked to a gene fusion encoding a fusion protein wherein the gene fusion comprises
    - a first gene encoding a polypeptide, and
    - a second gene encoding at least a portion of a wild-type M13 phage gene III coat protein;
- (b) mutating the vector at one or more selected positions within the first gene thereby forming a family of related plasmids;
- (c) transforming suitable *E. coli* host cells with the plasmids;
- (d) infecting the transformed host cells with a M13K07 helper phage having a gene encoding the wild-type M13 phage gene III coat protein;

(e) culturing the transformed infected *E. coli* host cells under conditions suitable for forming recombinant phagemid particles containing at least a portion of the plasmid and capable of infecting the *E. coli* host, the phagemid particles displaying a mixture of the wild-type M13 phage gene III coat protein and the fusion protein;

(f) contacting the phagemid particles with a target molcecule so that at least a portion of the phagemid particles bind to the target molecule; and

(g) separating the phagemid particles that bind from those that do not.

5,750,374

PROCESS FOR PRODUCING HYDROPHOBIC POLYPEPTIDES AND PROTEINS, AND FUSION PROTEINS FOR USE IN PRODUCING SAME

Heinz Döbeli, Ziefen; Nicholas Draeger, Basel; Gerda Huber Trottman, Grindel; Peter Jakob, Reinach, all of Switzerland, and Dietrich Stüber, Grenzach-Wyhlen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 29, 1994, Ser. No. 268,348

Claims priority, application European Pat. Off., Jul. 6, 1993, 93110755

Int. Cl.^{6} C07K *1/00;* **C12P** *21/00;* **C10P** *21/06*

U.S. Cl. 435—69.7 **8 Claims**

1. A process for production and purification of a desired hydrophobic polypeptide, protein or peptide, which comprises:

a) passing an aqueous solution containing a fusion protein of the formula:

A—B—C

wherein A is a hydrophilic peptide comprising $(NANP)_X$, X is from 10 to 40, B is a selective cleavage site, and C is a desired hydrophobic polypeptide, protein or peptide

through a hydrophobic matrix column,

b) flushing the column with a solution containing a cleavage reagent or an enzyme; and

c) removing the resulting desired hydrophobic polypeptide, protein or peptide with an aqueous water miscible solvent.

5,750,375

METHODS OF PRODUCING SECRETED RECEPTOR ANALOGS AND BIOLOGICALLY ACTIVE DIMERIZED POLYPEPTIDE FUSIONS

Andrzej Z. Sledziewski; Lillian Anne Bell, and Wayne R. Kindsvogel, all of Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 180,175, Jan. 11, 1994, Pat. No. 5,567,584, which is a continuation of Ser. No. 634,510, Dec. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 347,291, May 2, 1989, Pat. No. 5,155,027, which is a continuation-in-part of Ser. No. 146,877, Jan. 22, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 477,329

Claims priority, application European Pat. Off., Jan. 18, 1989, 89100787.4

Int. Cl.^{6} C12N *15/10;* **C07K** *16/47;14/71*

U.S. Cl. 435—69.7 **9 Claims**

1. A platelet derived growth factor (PDGF) receptor analog comprising a first polypeptide fusion comprising a ligand-binding domain of a PDGF receptor joined to an immunoglobulin light chain constant region, said first polypeptide fusion dimerized with a second polypeptide fusion comprising a ligand-binding domain of a PDGF receptor joined to an immunoglobulin heavy chain constant region selected from the group consisting of C_H1, C_H2, C_H3 and C_H4, wherein said analog binds PDGF.

5,750,376

IN VITRO GROWTH AND PROLIFERATION OF GENETICALLY MODIFIED MULTIPOTENT NEURAL STEM CELLS AND THEIR PROGENY

Samuel Weiss; Brent Reynolds, both of Alberta, Canada; Joseph P. Hammang, and E. Edward Baetge, both of Barrington, R.I., assignors to NeuroSpheres Holdings Ltd., Calgary, Canada

Continuatinn-in-part of Ser. No. 270,412, Jul. 5, 1994, abandoned, Ser. No. 385,404, Feb. 7, 1995, abandoned, Ser. No. 359,945, Dec. 20, 1994, abandoned, Ser. No. 376,062, Jan. 20, 1995, abandoned, Ser. No. 149,508, Nov. 9, 1993, abandoned, Ser. No. 311,099, Sep. 23, 1994, abandoned, and Ser. No. 338,730, Nov. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned, said Ser. No. 385,404 is a continuation of Ser. No. 961,813, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned, said Ser. No. 359,345 is a continuation of Ser. No. 221,655, Apr. 1, 1994, abandoned, which is a continuation of Ser. No. 967,622, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned, said Ser. No. 376,062 is a continuation of Ser. No. 10,829, Jan. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned, said Ser. No. 270,412 Ser. No. 149,508, Nov. 9, 1993, abandoned, and Ser. No. 311,099, Sep. 23, 1994, abandoned, each is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,122

Int. Cl.^{6} C12N *5/00;5/08;5/10;* **C12P** *1/00*

U.S. Cl. 435—69.52 **40 Claims**

1. A method of producing genetically modified neural cells comprising:

(a) obtaining cells derived from mammalian neural tissue containing at least one multipotent neural stem cell capable of producing progeny that are capable of differentiating into neurons, astrocytes, and oligodendrocytes, wherein said obtained cells have not been cultured in a serum-containing medium;

(b) preparing a substantially serum-free culture medium containing one or more predetermined growth factors capable of inducing multipotent neural stem cell proliferation, and

(c) preparing a cell culture by combining the cells obtained in (a) with the culture medium prepared in (b) to induce proliferation of said multipotent neural stem cell to produce proliferating multipotent neural stem cells and proliferating multipotent neural stem cell progeny which includes daughter multipotent neural stem cells and introducing exogenous DNA that does not contain oncogenes to genetically modify said proliferating multipotent neural stem cells and/or said multipotent neural stem cell progeny to produce genetically modified neural stem cell progeny.

8. The method of claim 1 wherein said multipotent neural stem cell progeny are genetically modified to produce a growth factor product.

9. The method of claim 8 wherein said growth factor product is selected from the group consisting of nerve growth factor, brain-derived neurotrophic factor, neurotrophins, ciliary neuroatrophic factor, amphiregulin, basic fibroblast growth factor, acidic fibroblast growth factor, epidermal growth factor, transforming growth factor-alpha, transforming growth factor-beta, platelet-derived growth factor, insulin-like growth factors, and interleukins.

5,750,377

PROCESS FOR PREPARING MAMMALIAN T CELL GROWTH FACTOR P40

Jacques Van Snick, Brussels; Catherine Uyttenhove, Chaumont-Gistoux, both of Belgium, and Richard J. Simpson, Melbourne, Australia, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 462,158, Jan. 8, 1990, Pat. No. 5,587,302, which is a continuation-in-part of Ser. No. 408,155, Sep. 15, 1989, Pat. No. 5,157,112, which is a continuation-in-part of Ser. No. 246,482, Sep. 19, 1988, Pat. No. 5,208,218. This application May 23, 1995, Ser. No. 447,805

Int. Cl.^{6} C07K *14/54;1/18;1/20*

U.S. Cl. 435—70.3 **8 Claims**

1. A method of preparing mammalian T cell growth factor P40, which supports interleukin 2- and interleukin 4-independent growth of T cells, comprising contacting a helper T cell or peripheral blood mononuclear cell culture with a T cell specific mitogen for a period of time and under conditions sufficient to induce production of said P40, and recovering said P40.

5,750,378

METHOD FOR PREPARING CELLULAR FIBRONECTIN

Clyde R. Goodheart, Lincolnshire, and Ralph H. Silverman, Morton Grove, both of Ill., assignors to Fibrogenex, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 302,180, Sep. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 811,269, Dec. 20, 1991, Pat. No. 5,354,269. This application Jan. 7, 1997, Ser. No. 779,383

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—70.3 **5 Claims**

1. A method for producing cellular fibronectin, said method comprising incubating fibronectin-producing cells in a fibronectin production medium comprising:

(a) 1.0–3.5 g/L bicarbonate salt;

(b) 1.0–5.0 g/L glucose;

(c) 10–30 μg/L dexamethasone;

(d) 1–10 g/L hydrolyzed protein; and

(e) 5–15 μg/L insulin.

5,750,379

PROCESS FOR THE PRODUCTION OF CARTHAMIN

Junichi Onodera; Shingo Sato, both of Yonezawa; Toshio Kashiwagi, and Isobe Tetsuhiro, both of Tokyo, all of Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1996, Ser. No. 711,741

Claims priority, application Japan, Mar. 18, 1989, 8-060482; Sep. 11, 1995, 7-232422; Mar. 18, 1996, 8-060483

Int. Cl.^{6} C12P *19/00;* **A61K** *35/78*

U.S. Cl. 435—72 **18 Claims**

1. A process for the production of carthamin, which comprises reacting an aqueous solution of a safflower yellow B dyestuff with an oxido-reductase and an aldehyde other than saccharide for a suitable time and under suitable conditions to obtain a carthamin, the reaction proceeding through the formation of a hydrolyzate of the safflower yellow B dyestuff, and then isolating the carthamin with an immobilizing adsorbent.

5,750,380

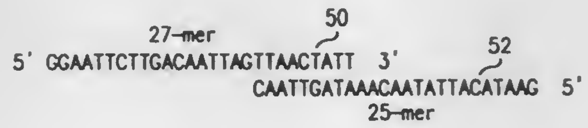
DNA POLYMERASE MEDIATED SYNTHESIS OF DOUBLE STRANDED NUCLEIC ACIDS

Keiichi Itakura, Arcadia, and John J. Rossi, Azusa, both of Calif., assignors to City of Hope Research Institute, Duarte, Calif.

Continuation of Ser. No. 135,066, Dec. 18, 1987, abandoned, which is a division of Ser. No. 943,890, Dec. 18, 1986, abandoned, which is a continuation of Ser. No. 558,905, Dec. 7, 1983, abandoned, which is a continuation of Ser. No. 279,166, Jun. 30, 1981, abandoned. This application Apr. 18, 1995, Ser. No. 425,215

Int. Cl.^{6} C12P *19/34*

U.S. Cl. 435—91.1 **2 Claims**


50
27–mer
5' GGAATTCTTGACAATTAGTTAACTATT 3'
52
CAATTGATAAACAATATTACATAAG 5'
25–mer

1. A DNA polymerase mediated method for synthesizing a double stranded nucleic acid sequence which comprises

(i) providing a first and second polynucleotide strands
  said first and second strands being initially unhybirdized to each other and each each initially having a 3' terminal sequence and an a adjoining 5"terminal sequence
    the 3' terminal sequences of said first and second strands being complementary to each other and having fewer nucleotides in length than either of the respective 5' terminal sequences each of said first and second strands
    said 3' terminal initial sequence of said first strand being a primer for a DNA polymerase mediated synthesis of an extension product complementary to the 5' terminal sequence of said second strand
    said initial 3' terminal sequence of said second strand being a primer for a DNA polymerase mediated synthesis of an extension product complementary to the 5' sequence of said first strand

(ii) hybridizing the complementary 3' terminal portions of said initially unhybridized first and second strands and thereafter;

(iii) extending each of said hybridized 3' terminal end sequences to produce by in-vitro DNA polymerase mediated reaction an extension of said initial 3' terminal sequence of said first strand which is complementary to 5' portion of said second strand and extension of said 3' terminal sequence of said second strand which is complementary to cine 5' portion of said first strand.

5,750,381

ENZYMATIC PROCESS FORMAKING MORPHINE-6-GLUCURONIDE OR SUBSTITUTED MORPHINE-6-GLUCURONIDE

Feodor Scheinmann, Sale; Nicholas John Turner, Devon; Neil Edward Carter, Manchester, and Richard Talbot Brown, Preston, all of United Kingdom, assignors to Salford Ultrafine Chemicals and Research Limited, Manchester, England

Filed Jun. 3, 1996, Ser. No. 659,047

Claims priority, application United Kingdom, Dec. 7, 1993, 9325065

Int. Cl.^{6} C12P *13/00;* **C12N** *9/24*

U.S. Cl. 435—128 **2 Claims**

1. A method of making morphine-6-glucuronide comprising the selective enzymatic cleavage of the 3-glucuronide moiety in morphine-3, 6 -diglucuronide or substituted morphine-3, 6-glucuronide using at least one β -glucuronidase, wherein the β-glucuronidase is obtained from any of the following: abalone molluse; the limpet patella vulgata; or helix aspersa.

5,750,382

PROCESS FOR PRODUCING OPTICALLY ACTIVE 2-ALKOXYCYCLOHEXANOL DERIVATIVES

Naoaki Taoka; Mizuho Honda, both of Kobe; Kenji Inoue, Kakogawa, and Kazunori Kan, Nishinomiya, all of Japan, assignors to Kaneka Corporation, Osaka, Japan

PCT No. PCT/JP96/02174, § 371 Date Jun. 13, 1997, § 102(e) Date Jun. 13, 1997, PCT Pub. No. WO97/06275, PCT Pub. Date Feb. 20, 1997

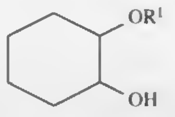
PCT Filed Aug. 2, 1996, Ser. No. 809,431

Claims priority, application Japan, Aug. 4, 1995, 7-219728

Int. Cl.^{6} C12P *7/62;41/00;* **C12N** *9/14*

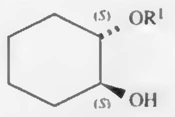
U.S. Cl. 435—135 **11 Claims**

1. A process for producing an optically active 2-alkoxycyclohexanol derivative which comprises treating a (±)-trans-2-alkoxycyclohexanol which is expressed by the general formula (1);



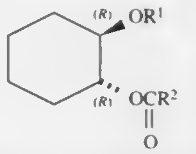
(1)

(wherein R^1 represents a lower alkyl, an alkenyl, a cycloalkyl, a substituted or unsubstituted aryl, or a substituted or unsubstituted aralkyl group) with a hydrolase originating in a microorganism which is capable of esterifying the R-isomer stereospecifically, in the presence of an acyl donor under a condition that no hydrolysis occurs substantially, to thereby give an (S,S)-2-alkoxycyclohexanol which is expressed by the general formula (2);



(2)

(wherein R^1 is the same as previously defined), and a carboxylic ester of an (R,R)-2-alkoxycyclohexanol which is expressed by the general formula (3);



(3)

(wherein R^1 is the same as previously defined and R^2 represents a hydrogen, straight-chain or branched alkyl having 1 to 17 carbon atoms, or straight-chain or branched alkenyl group having 1 to 17 carbon atoms), and then taking up said (S,S)-2-alkoxycyclohexanol.

5,750,383

BACULOVIRUS CLONING SYSTEM

Gary W. Blissard, and Scott C. Monsma, both of Ithaca, N.Y., assignors to Boyce Thompson Institute for Plant Research, Inc., Ithaca, N.Y.

Filed May 14, 1996, Ser. No. 645,863

Int. Cl.^{6} C12N *15/10;15/86;5/10*

U.S. Cl. 435—172.3 **13 Claims**

1. A method of cloning DNA into a nuclear polyhedrosis virus comprising the following steps:

a) obtaining and propagating in modified and stably transfected host cells, infectious nuclear polyhedrosis virus particles that include a null mutation such that the genome of said infectious nuclear polyhedrosis virus particles lack a functional essential gene for production or propagation of infectious virus particles in wild type host cells, but can be propagated in said modified and stably transfected host cells expressing a gene that allows production of infectious null-nuclear polyhedrosis virus particles;

b) obtaining a rescue transfection vector that includes within its genetic material said DNA to be cloned and a rescue DNA that restores function of said functional essential gene lacking in said null-nuclear polyhedrosis virus;

c) infecting host cells with said infectious null-nuclear polyhedrosis virus particles and transfecting with said rescue transfection vector;

d) culturing said transfected and infected host cells to select for recombinant nuclear polyhedrosis virus particles that express said rescue DNA; and

e) harvesting said recombinant nuclear polyhedrosis virus particles that express said rescue DNA.

5,750,384

L5 SHUTTLE PHASMIDS

William R. Jacobs, City Island, N.Y.; Graham F. Hatfull, Pittsburgh, Pa.; Stoyan Bardarov, Bronx, N.Y., and Ruth McAdam, Utrecht, Netherlands, assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y., and University of Pittsburgh, Pa.

Continuation-in-part of Ser. No. 57,531, Apr. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 833,431, Feb. 7, 1992, abandoned. This application May 23, 1994, Ser. No. 247,901

Int. Cl.^{6} C12N *15/64;15/74*

U.S. Cl. 435—172.3 **20 Claims**

15. A method of producing an L5 shuttle phasmid comprising inserting an *E. coli*-bacteriophage lambda cosmid inserted in a non-essential region of ab L5 mycobacteriophage between the PvuII restriction site at nucleotide 42,986 and the SacII restriction site at nucleotide 52,191 of the mycobacteriophage L5 genome as shown in FIG. 3.

5,750,385

METHODS AND COMPOSITIONS FOR REGULATED TRANSCRIPTION AND EXPRESSION OF HETEROLOGOUS GENES

Christine K. Shewmaker, Woodland, and Daniel Facciotti, Davis, both of Calif., assignors to Calgene, Inc., Davis, Calif.

Continuation of Ser. No. 105,852, Aug. 10, 1993, which is a continuation-in-part of Ser. No. 526,123, May 21, 1990, which is a continuation of Ser. No. 267,865, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 692,605, Jan. 17, 1985, abandoned, said Ser. No. 105,852 is a continuation-in-part of Ser. No. 582,241, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 188,361, Apr. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 168,190, Mar. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 54,369, May 26, 1987, Pat. No. 4,943,674, said Ser. No. 105,852 is a continuation-in-part of Ser. No. 742,834, Aug. 8, 1991, Pat. No. 5,420,034, which is a continuation-in-part of Ser. No. 550,804, Jul. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 147,781, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 78,538, Jul. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 891,529, Jul. 31, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 484,941

Int. Cl.^{6} C12N *15/29;15/82;15/84;* **A01H** *5/00*

U.S. Cl. 435—172.3 **8 Claims**

1. A method for obtaining a plant having a modified phenotype, said method comprising;

transforming a host plant cell with a DNA construct under genomic integration conditions, wherein said construct comprises as operably linked components in the direction of transcription, a promoter region obtainable from a gene, wherein transcription of said gene is light-inducible in a plant chloroplast containing tissue, a DNA sequence of interest other than the native coding sequence of said gene, and a transcription termination region, wherein said components are functional in a plant cell,

whereby said DNA construct becomes integrated into a genome of said plant cell;

regenerating a plant from said transformed plant cell, and growing said plant under conditions whereby said DNA sequence of interest is expressed and a plant having said modified phenotype is obtained.

5,750,386

PATHOGEN-RESISTANT TRANSGENIC PLANTS

Mark A. Conkling, Fuquay-Varina; Charles H. Opperman, and Christopher G. Taylor, both of Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 236,678, May 2, 1994, abandoned, which is a continuation of Ser. No. 770,082, Oct. 4, 1991, abandoned. This application Nov. 15, 1995, Ser. No. 558,865

Int. Cl.^{6} C12N *15/00;15/63;15/82;* **A01H** *5/00*

U.S. Cl. 435—172.3 **46 Claims**

1. A recombinant nematode-resistant plant comprising transformed plant cells, said transformed plant cells containing a heterologous DNA construct comprising an expression cassette, which construct comprises, in the 5' to 3' direction, a promoter, a structural gene positioned downstream from said promoter and operatively associated therewith, and a termination sequence positioned downstream from said structural gene and operatively associated therewith, wherein said structural gene encodes a product toxic to said plant cells and wherein said promoter is a plant nematode-inducible promoter comprising a nucleotide sequence selected from:

(a) SEQ ID NO:10; and

(b) DNA sequences which have at least 60% sequences similarly to SEQ ID NO:10 and which are plant nematode-inductible promoters.

5,750,387

DNA ENCOING LEUCYL TRNA SYNTHETASE FROM STAPHYLOCOCCUS AUREUS

John Edward Hodgson, and Elizabeth Jane Lawlor, both of Malvern, Pa., assignors to SmithKline Beecham p.l.c., Brentford, United Kingdom

Filed Jan. 17, 1997, Ser. No. 785,428

Claims priority, application United Kingdom, Jan. 19, 1996, 9601096; Oct. 30, 1996, 9622617

Int. Cl.^{6} C12N *9/00;15/00;1/20;* **C07H** *21/04*

U.S. Cl. 435—183 **24 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

(a) a polynucleotide having at least a 95% identity to a polynucleotide encoding a polypeptide comprising amino acids 1 to 804 of SEQ ID NO:2; and

(b) a polynucleotide which is complementary to the polynucleotide of (a).

5,750,388

PURIFIED SCYTALIDIUM LACCASES AND NUCLEIC ACIDS ENCODING SAME

Randy Michael Berka; Sheryl Ann Thompson, both of Davis, and Feng Xu, Woodland, all of Calif., assignors to Novo Nordish Bio Tech, Inc, Davis, Calif.

Continuation of Ser. No. 253,784, Jun. 3, 1994, abandoned. This application Nov. 15, 1996, Ser. No. 749,882

Int. Cl.^{6} C12N *9/02*

U.S. Cl. 435—189 **23 Claims**

1. A DNA construct comprising a nucleic acid sequence encoding a laccase having at least 95% homology with the amino acid sequence of SEQ ID NO:2.

5,750,389

PURIFIED SACCHAROSE-SYNTHASE, PROCESS FOR ITS PRODUCTION AND ITS USE

Lothar Elling, Aachen, and Maria-Regina Kula, Niederzier, both of Germany, assignors to Forschungszentrum Julich GmbH, Julich, Germany

PCT No. PCT/DE93/00562, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01540, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 26, 1993, Ser. No. 367,178

Claims priority, application Germany, Jul. 1, 1992, 42 21 595.1; Feb. 16, 1993, 43 04 558.8

Int. Cl.^{6} C12N *9/10*

U.S. Cl. 435—193 **7 Claims**

1. A process for producing sucrose synthase with a nucleotide phosphatase content which is less than or equal to 0.1%, which comprises the steps of:

(a) swelling rice, corn or wheat grains in a solution;

(b) mechanically disintegrating the swollen rice, corn or wheat grains in said solution;

(c) treating the disintegrated swollen rice, corn or wheat grains to separate a liquid containing enzyme from solids;

(d) charging a liquid containing the enzyme on a Sepharose-Q-column at a pH of 8, subjecting said phase to linear gradient elution with 50 to 500 mM of KCl and collecting a fraction containing the enzyme; and

(e) chromatographing the collected enzyme fraction in a gel filtration column to obtain the sucrose synthase.

5,750,390

METHOD AND REAGENT FOR TREATMENT OF DISEASES CAUSED BY EXPRESSION OF THE BCL-2 GENE

James D. Thompson, and Kenneth G. Draper, both of Boulder, Colo., assignors to Ribozyme Pharmaceuticals, Inc., Boulder, Colo.

Filed Aug. 26, 1992, Ser. No. 936,421

Int. Cl.^{6} C12N *15/10*

U.S. Cl. 435—195 **13 Claims**

1. The enzymatic RNA molecule which specifically cleaves bcl-2 RNA.

5,750,391

FILARIID NEMATODE CYSTEINE PROTEASE PROTEINS

Cynthia Ann Tripp; Glenn R. Frank, both of Ft. Collins, and Robert B. Grieve, Windsor, all of Colo., assignors to Heska Corporation, Ft. Collins, Colo.

Continuation of Ser. No. 249,552, May 26, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,989

Int. Cl.^{6} C12N *9/48;9/50*

U.S. Cl. 435—212 **9 Claims**

1. An isolated protein comprising an adult filariid nematode cathepsin L cysteine protease protein.

5,750,392

COMPOSITION FOR REDUCING THE AMOUNT OF AND PREVENTING THE FORMATION OF HYDROGEN SULFIDE IN AN AQUEOUS SYSTEM, PARTICULARLY IN AN AQUEOUS SYSTEM USED IN OIL FIELD APPLICATIONS

Donald O. Hitzman; George T. Sperl, and Kenneth A. Sandbeck, all of Bartlesville, Okla., assignors to Geo-Microbial Technologies, Inc., Ochelata, Okla.

Division of Ser. No. 18,288, Feb. 16, 1993, Pat. No. 5,045,531. This application Sep. 15, 1994, Ser. No. 306,324

Int. Cl.^{6} C12N *1/00;1/12;1/20*

U.S. Cl. 435—243 **17 Claims**

1. A composition useful for synergistically reducing the amount of hydrogen sulfide which may be present in an aqueous system and preventing the formation of hydrogen sulfide in the aqueous system, comprising

(a) nitrite ions or compounds which yield these ions, and

(b) nitrate ions or compounds which yield these ions,

wherein the ions are present in a concentration sufficient to support and enhance the growth of denitrifying bacteria when added to the aqueous systems and in a concentration sufficient to inhibit the growth of sulfate reducing bacteria when added to the aqueous system

and wherein the ratio of nitrite to nitrate ions is between about 50:1 to 1:50. and wherein the nitrite and nitrate ions are present in an amount to synergistically reduce the amount of the hydrogen sulfide which may be present in the acrueous system and prevent the formation of hydrogen sulfide in the acrueous system.

5,750,393

PROCESS FOR PREPARING BIOMASS TO IMPROVE THE KINETICS OF SOLID-STATE OXIDATIVE BIOTRANSFORMATIONS

Alberto Torini, Milan, Italy, assignor to Italtraco S.r.l., Milan, Italy

PCT No. PCT/EP94/00004, § 371 Date Jun. 24, 1996, § 102(e) Date Jun. 24, 1996, PCT Pub. No. WO95/18778, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 3, 1994, Ser. No. 666,397

Int. Cl.^{6} C12N *1/00;* **A23C** *9/12*

U.S. Cl. 435—243 **8 Claims**

1. A process for preparing a biomass comprising a solid culture substrate so as to improve kinetics of a solid-state oxidative biotransformation of the biomass, comprising the steps:

(a) pulverizing a biomass comprising a solid culture substrate that is to be subjected to solid-state oxidative biotransformation;

(b) mixing at ambient temperature the pulverized biomass with an inoculum containing microorganisms suitable for solid-state oxidative biotransformation of the pulverized biomass;

(c) adjusting the moisture content of the mixed biomass to not less than 25% (w/w);

(d) saturating the biomass with air or oxygen during steps (a) or (b) or between step (a) and step (b); and

(e) agglomerating the pulverized, mixed and saturated biomass into granules having a volume of less than $10\ cm^3$.

5,750,394

IDENTIFICATION AND USE OF ANTIVIRAL COMPOUNDS THAT INHIBIT INTERACTION OF HOST CELL PROTEINS AND VIRAL PROTEINS REQUIRED FOR VIRAL REPLICATION

Peter Palese, Leonia, N.J., and Robert O'Neill, New York, N.Y., assignors to The Mount Sinai Medical Center, New York, N.Y.

Filed May 20, 1994, Ser. No. 246,583

Int. Cl.^{6} C12N *1/21;15/63;5/10;* **C07H** *21/04*

U.S. Cl. 435—252.3 **11 Claims**

1. An isolated nucleic acid molecule comprising a nucleotide sequence that (a) encodes a nucleoprotein interactor-1 protein having the amino acid sequence SEQ ID NO: 2; or (b) is the complement of the nucleotide sequence of (a).

5,750,395

DNA ENCODING MAGE-1 C-TERMINAL CYTOTOXIC T LYMPHOCYTE IMMUNOGENIC PEPTIDES

John D. Fikes; Brian D. Livingston, both of San Diego; Alessandro D. Sette, and John C. Sidney, both of La Jolla, all of Calif., assignors to Cytel Corporation, San Diego, Calif.

Division of Ser. No. 103,623, Aug. 6, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 465,167

Int. Cl.^{6} C12N *15/63;15/12*

U.S. Cl. 435—325 **3 Claims**

2. A vector comprising cDNA encoding cytotoxic T lymphocyte immunogenic peptide of at least nine contiguous amino acids selected from the 58 amino acids of Sequence I.D. No. 1.

5,750,396

STABLE VIRUS PACKAGING CELL LINES

Yanping Yang; Elio F. Vanin; Gerard C. Grosveld, and Arthur W. Nienhuis, all of Memphis, Tenn., assignors to St. Judes Children's Research Hospital, Memphis, Tenn., and Genetic Therapy, Inc., Gaithersburg, Md.

Filed May 8, 1995, Ser. No. 437,188

Int. Cl.^{6} C12N *5/10;5/08*

U.S. Cl. 435—357 **27 Claims**

1. A retrovirus packaging cell containing:

(a) a first nucleic acid sequence, said sequence comprising a toxic viral envelope protein coding sequence operably linked to a minimal promoter, said minimal promoter being operably linked to at least one copy of the tetracycline operator, said sequence also comprising a sequence that stops transcriptional readthrough of the gene encoding said toxic viral envelope protein;

(b) a second nucleic acid sequence, said sequence comprising a sequence encoding a chimeric protein, said chimeric protein comprising a tetracycline-modulated repressor and a transactivator protein, said chimeric protein coding sequence being operably linked to a promoter; and

(c) a third nucleic acid sequence, said sequence comprising a sequence encoding retrovirus nucleocapsid protein.

5,750,397

HUMAN HEMATOPOIETIC STEM CELL

Ann Tsukamoto, Palo Alto; Charles M. Baum, Mountain View, both of Calif.; Yukoh Aihara, Yokohama, Japan, and Irving Weissman, Palo Alto, Calif., assignors to Systemix, Inc., Palo Alto, Calif.

Division of Ser. No. 720,883, Jun. 25, 1991, which is a continuation-in-part of Ser. No. 502,616, Mar. 30, 1990, Pat. No. 5,061,620. This application Jun. 6, 1995, Ser. No. 469,453

Int. Cl.^{6} C12N *5/00;5/02*

U.S. Cl. 435—372 **7 Claims**

1. A culture comprising:

human hematopoietic stem cells having fewer than 5% lineage committed cells, wherein said human stem cells are Thy-1^{+}, CD34^{+}, capable of self regeneration, and capable of differentiation to members of the lymphoid, erythroid and myelomonocytic lineages; and

a medium capable of supporting the growth of said stem cells.

5,750,398

VECTOR, ELEMENT AND METHOD FOR INHIBITING IMMUNE RECOGNITION

David C. Johnson, 107 Traymore, Hamilton, Ontario, Canada, L8S 1R8, and Ian A. York, Apt. 1207 644 Main Street, Hamilton, Ontario, Canada, L8S 1A1, assignors to David C. Johnson, Portland, Oreg., and Ian A. York, Worcester, Mass.

Filed Nov. 30, 1993, Ser. No. 159,890

Int. Cl.^{6} C12N *5/10;15/85;15/86;* **A61K** *48/00*

U.S. Cl. 435—375 **9 Claims**

1. A method for inhibiting cell recognition by cytotoxic T lymphocytes, comprising introducing into a mammalian cell an isolated nucleotide sequence encoding a herpes simplex virus protein which inhibits the ability of said cell to present antigens associated with MHC class I proteins to T lymphocytes.

5,750,399

ISOFLAVONE REDUCTASE PROMOTER

Richard A. Dixon; Nancy L. Paiva, both of Ardmore, Okla., and Abraham Oommen, Lincoln, Nebr., assignors to The Samuel Roberts Noble Foundation, Inc., Ardmore, Okla.

Filed Nov. 14, 1994, Ser. No. 339,129

Int. Cl.^{6} C12N *5/04;15/29;15/82;* **A01H** *5/00*

U.S. Cl. 435—419 **39 Claims**

21. A plant cell transformed with a recombinant nucleic acid molecule comprising an isolated DNA segment comprising a portion of the isoflavone reductase promoter region capable of directing the developmental or elicitor/infection-induced expression of an operably linked structural gene, wherein said structural gene is a gene other than an isoflavone reductase gene and said structural gene is operably linked to said promoter portion, wherein the portion of the isoflavone reductase promoter region is selected from the group consisting of about nucleotide 1 to about nucleotide 845 of the sequence depicted in SEQ ID NO: 1, about nucleotide 1 to about nucleotide 765 of the sequence depicted in SEQ ID NO: 1, about nucleotide 1 to about nucleotide 330 in SEQ ID NO: 1, about nucleotide 330 to about nucleotide 845 of the sequence depicted in SEQ ID NO: 1, and about nucleotide 330 to about nucleotide 765 of the sequence depicted in SEQ ID NO: 1.

5,750,400

CODING SEQUENCES OF THE HUMAN BRCA1 GENE

Patricia D. Murphy, Slingerlands, N.Y.; Antonette C. Allen, Severn, Md.; Christopher P. Alvares, Potomac, Md.; Brenda S. Critz, Frederick, Md.; Sheri J. Olson, Arlington, Va.; Denise B. Schelter, Silver Spring, and Bin Zeng, Rockville, both of Md., assignors to OncorMed, Inc., Gaithersburg, Md.

Division of Ser. No. 598,591, Feb. 12, 1996, Pat. No. 5,654,155. This application Feb. 12, 1997, Ser. No. 798,691

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04;21/02*

U.S. Cl. 435—6 **8 Claims**

1. An isolated coding sequence of the BRCA1 gene as set forth in SEQ. ID. NO.: 5.

5,750,401

CULTURAL MEDIUM FOR BAMBOO SHOOT SPROUTING AND MULTIPLICATION AND A METHOD FOR SPROUTING AND MULTIPLICATION OF BAMBOO PLANTLETS

Chandrashekhar Hari Phadke; Nazifa Najmuddin Nagarqala; Varsha Anil Parasharami; Rajani Satish Nadgauda, and Anthony Francis Mascarenhas, all of Pune, India, assignors to C.S.I.R., New Delhi, India

Filed Aug. 3, 1995, Ser. No. 511,074

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—430 **11 Claims**

1. A method for propagating a plant of a bamboo species, said method consisting essentially of:

a) cleaning and sterilizing a nodal bud of the plant;

b) maintaining said nodal bud in a first culture medium for sprouting of buds under conditions and for a time suitable for promoting sprouting of the nodal bud to form a sprouted bud;

c) transferring the sprouted bud to a second culture medium for growth and clonal multiplication of shoots from the sprouted bud; said second medium comprising i) a plurality of salts that collectively comprise elements selected from the group consisting of aluminum, boron, calcium, chlorine, chromium, cobalt, copper, iodine, iron, lead, magnesium, manganese, molybdenum, nitrogen, potassium, phosphorous, silicon, sodium, sulphur, titanium, vandium and zinc, and ii) a plurality of organic components selected from the group consisting of sucrose, glucose, fructose, myoinositol, thiamine hydrochloride, pyridoxine hydrochloride, nicotinic acid, glycine, kinetin, benzyl adenine, malt extract, yeast extract, coconut milk, indolebutyric acid, indoleacetic acid, indolpropionic acid, naphthalene acetic acid and agar;

d) excising the shoots and culturing the excised shoots under conditions and for a time suitable for initiating and promoting development of roots from the shoots whereby to form plantlets therefrom, the culturing of the excised shoots comprising initially placing the excised shoots on a culture medium for root initiation comprising a hormone or hormones which include an auxin and thereafter transferring the excised shoots to a hormone-free medium and maintaining the excised shoots thereon for a time sufficient for the development of the roots; and

e) transferring the plantlet or plantlets to soil for growth thereon.

5,750,402

COMPOSITIONS AND METHODS TO PREVENT MICROBIAL CONTAMINATION OF PLANT TISSUE CULTURE MEDIA

Assaf Z. Guri, Cherry Hill, N.J., and Kishor N. Patel, Dobbs Ferry, N.Y., assignors to Plant Cell Technology, Inc., Washington, D.C.

Filed Jun. 2, 1995, Ser. No. 460,703

Int. Cl.^{6} C12N *5/00;5/02*

U.S. Cl. 435—431 **19 Claims**

1. A plant tissue culture medium comprising a chemical agent, which chemical agent comprises: methylchloroisothiazolinone in a concentration range of about 2.0 to about 2.6 g/l; methylisothiazolinone in a concentration range of about 0.6 to about 0.8 g/l; magnesium chloride in a concentration range of about 15.0 to about 30 g/l; and magnesium nitrate in a concentration range of about 15.0 to about 30 g/l; wherein the chemical agent is present in the plant tissue culture medium at a concentration that reduces or prevents microbial contamination of the plant tissue culture medium and allows for substantially normal germination of seeds or substantially normal growth or development of plants, plant organs, plant tissues or plant cells.

5,750,403
METHOD OF FORMING MULTI-LAYER WIRING UTILIZING HYDROGEN SILSESQUIOXANE RESIN

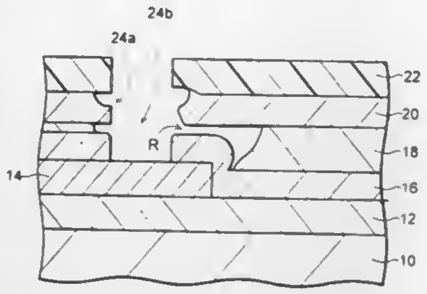
Yushi Inoue, and Takahisa Yamaha, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Jul. 12, 1996, Ser. No. 678,568

Claims priority, application Japan, Jul. 14, 1995, 7-201590

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 438—787 **22 Claims**



1. A wiring forming method comprising the steps of:

forming a first wiring layer on a first insulating film covering the surface of a substrate;

forming a hydrogen silsesquioxane resin film having a surface over said first insulating film and said first wiring layer;

subjecting said hydrogen silsesquioxane resin film to a first heat treatment in an inert gas atmosphere to convert said resin film into a silicon oxide film of a preceramic phase;

forming a second insulating film on said silicon oxide film;

subjecting said silicon oxide film covered with said second insulating film to a second heat treatment in an oxidizing atmosphere to convert said preceramic silicon oxide film into a silicon oxide film of a ceramic phase; and

forming a second wiring layer on said second insulating film after said silicon oxide film of a ceramic phase is formed.

5,750,404
REAGENT FOR THE DETERMINATION OF WATER AMD ENE-DIOLS OR THIOLS

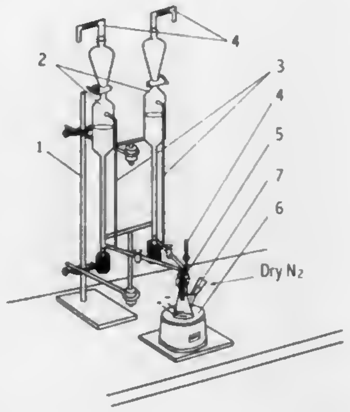
Felix Sherman, 34/5 Yizhak Tuniq Street, Jerusalem 97795; Ilya Kuselman, 29/5 Haim Pazner Street, Jerusalem 97552, and Avinoam Shenbar, 4 Tiltan Street, Jerusalem 96920, all of Israel

Filed Aug. 12, 1996, Ser. No. 695,900

Claims priority, application Israel, Aug. 15, 1995, 114938

Int. Cl.^{6} G01N *33/18*

U.S. Cl. 436—42 **6 Claims**



1. A reagent for a quantitative determination of water and one of ene-diols and thiols in a test sample, comprising iodine and an organic or an inorganic iodide, and a base, in a non-aqueous solvent.

5,750,405
METHOD FOR THE DETECTION FOR PROTEIN

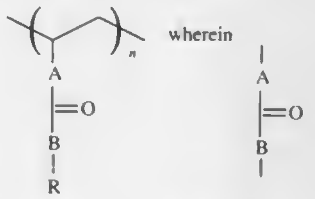
James P. Albarella, Granger, Ind.; Sally E. Cahill, Union, Mich.; Gary M. Johnson, Elkhart, and Michael J. Pugia, Granger, both of Ind., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1996, Ser. No. 609,674

Int. Cl.^{6} G01N *33/96*

U.S. Cl. 436—88 **18 Claims**

1. In the semi-quantitative analysis of an aqueous test sample for human serum albumin which test sample is suspected of containing human serum albumin as well as other proteins and which analysis is carried out by contacting the fluid suspected of containing the proteins with a test reagent comprising a protein error indicator dye and buffer which dye undergoes a detectable color change when contacted with the proteins, the improvement which comprises adding to the test reagent a competitive inhibitor which is a polymer characterized by the formula:



is a linking group in which A and B can either be a single bond or oxygen so that when A is oxygen and B is a bond the polymer is a poly(vinyl alkyl ester), when A is a bond and B is oxygen the polymer is a poly(alkyl acrylate), when A is oxygen and B is oxygen the polymer is a poly(vinyl alkyl carbonate) and when A is a bond and B is a bond the polymer is a poly(vinyl alkyl ketone) and R is a straight, branched or cyclic alkyl groups of 1 to 20 carbon atoms in which 0 to 10 hydrogens are replaced by hydroxyl groups and the polymer backbone comprises repeating alkyl or carbohydrate sub-units which can be copolymerized with unreactive blocking units and the number of alkyl groups attached to repeating polymer sub-units through the linking groups ranges from 10% to 90% of the theoretical maximum to thereby inhibit the protein error indicator response to the human serum albumin to a lesser degree than the response to the other proteins.

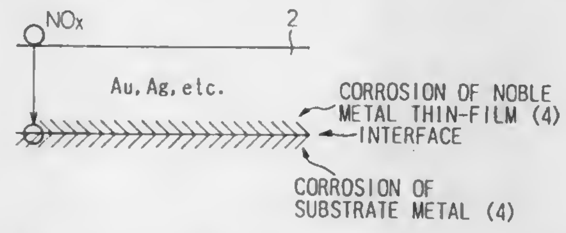
5,750,406
ENVIRONMENT MONITORING TEST PIECE AND TEST METHOD

Eiichi Nakajima; Yasuo Udoh; Tsutomu Iikawa; Toshisuke Kitakohji; Teruo Motoyoshi; Takashi Furusawa; Shiori Yamazaki; Masao Nakayama; Michiko Satoh; Shigeru Fukushima, and Mayumi Itabashi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 178,357, Jan. 4, 1994, which is a continuation-in-part of Ser. No. 140,153, Nov. 4, 1993, abandoned. This application May 1, 1995, Ser. No. 432,259

Int. Cl.^{6} G01N *17/04*

U.S. Cl. 436—116 **18 Claims**


NOx
2
Au, Ag, etc.
CORROSION OF NOBLE METAL THIN-FILM (4)
INTERFACE
CORROSION OF SUBSTRATE METAL (4)

14. A method of testing a gaseous environment for selectively identifying a presence therein of at least one specific harmful gas, of a class of harmful gases, comprising the steps of:

placing a test piece in the environment, the test piece corresponding to the at least one specific harmful gas to be selectively identified and comprising a multi-layer structure of a substrate comprising a selected base material and a thin-film of a selected noble metal different from the base material and forming an interface with the substrate, the base material being selected from the class of metals and metal alloys acting as a cathode, and the noble metal being selected from the class of noble metals acting as an anode together with the base material, in an electrochemical reaction wherein the corresponding at least one specific harmful gas, mixed with water, acts as an electrolyte and, together, produce at least one corresponding corrosion product of a characteristic color respectively identifying the at least one specific harmful gas, of the class of harmful gases, present in the tested environment; and

analyzing the change in color at the interface of the test piece from an original color thereof, prior to being placed in the environment, to the characteristic color, for selectively determining the identity of the at least one specific harmful gas.

5,750,407
TEST METHOD FOR HYDRAULIC FLUIDS BASED ON GLYCOLS AND GLYCOL BORATES WITH RESPECT TO PRECIPITATION TENDENCY

Wilfried Becker, Neuötting, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 12, 1996, Ser. No. 766,401

Claims priority, application Germany, Dec. 15, 1995, 195 46 856.2

Int. Cl.^{6} G01N *33/00;31/02*

U.S. Cl. 436—131 **5 Claims**

1. A method for testing precipitation tendency of hydraulic fluids based on glycols and glycol borates and containing amine compounds as additives, comprising the steps of adding water to a hydraulic fluid sample to form a water-containing fluid having a water content of from 3 to 20 weight percent, mixing the water-containing fluid with at least one part by volume of tetrahydrofuran or monoethylene glycol dimethyl ether per volume of water-containing fluid, and determining if a precipitate forms.

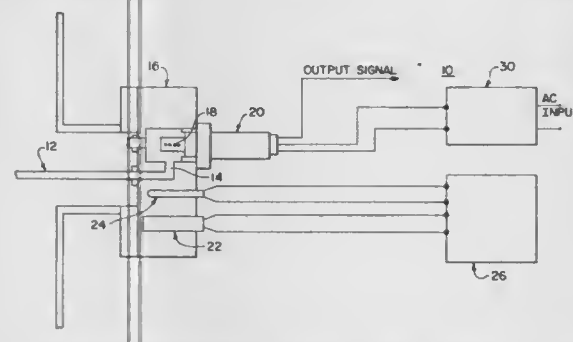
5,750,408
METHOD OF MODIFYING AN AUTOMOTIVE TYPE OXYGEN SENSOR FOR USE IN AN INDUSTRIAL PROCESS ANALYZER

George R. Hall, Geneva; Daniel C. Barnett, Concord; Robert A. Smith, Mentor, and Scotty Y. Jewett, Lyndhurst, all of Ohio, assignors to Elsag International B. V., Netherlands

Continuation of Ser. No. 604,193, Feb. 21, 1996, abandoned, which is a continuation of Ser. No. 906,713, Jun. 30, 1992, abandoned. This application Apr. 14, 1997, Ser. No. 840,261

Int. Cl.^{6} A01N *25/00*

U.S. Cl. 436—137 **5 Claims**



1. A method of modifying a shielded automotive sensor assembly having an integral heater to heat the sensor to a range of 1300° F. to 1400° F. in response to a predetermined elevated voltage applied to the heater to have the automotive sensor act as an industrial process oxygen sensor comprising the steps of:

replacing the automotive oxygen sensor shielding with a thin wall shield;

packing a space between said thin wall shield and the sensor with an insulating material;

lowering the voltage to the automotive sensor heater below the predetermined elevated voltage to approximately 17 VDC; and

providing predetermined perforations in the thin wall shield to allow a predetermined free flow of gas through said packing and to the sensor which will raise and maintain the sensor temperature above 1450° F. while lowering the operating temperature of said heater below its usual operating temperature without said predetermined perforations at said lower voltage thus minimizing combustion by-product errors and calibration shifts while increasing the life of the sensor.

5,750,409
PENTACYCLIC COMPOUNDS AND THEIR USE AS ABSORPTION OR FLUORESCENT DYES

Rupert Herrmann; Hans-Peter Josel, both of Weilheim; Karl-Heinz Drexhage, and Jutta Arden-Jacob, both of Siegen, all of Germany, assignors to Boehringer Mannheim Gmbh, Mannheim, Germany

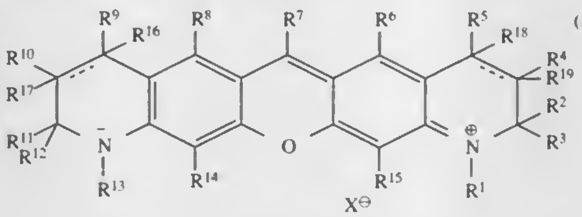
Continuation-in-part of Ser. No. 94,015, Sep. 7, 1993, abandoned. This application May 30, 1995, Ser. No. 454,440

Claims priority, application Germany, Nov. 18, 1991, 41 37 934.9

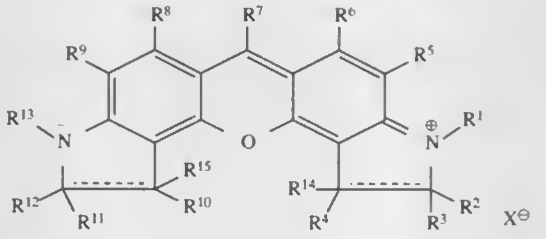
Int. Cl.^{6} G01N *33/557;33/536;* **C07D** *221/18;491/00*

U.S. Cl. 436—517 **20 Claims**

1. A compound of the formula

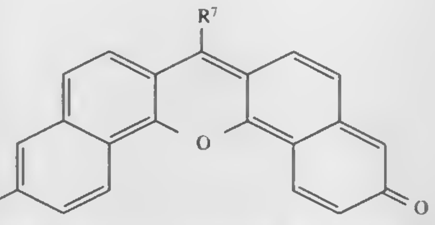


(Ia)



(Ib)

and



(Ic)

wherein R^1 and R^{13} independently of each other represent a hydrogen, an alkyl residue having 1 to 20 carbon atoms, a polyoxyhydrocarbyl, a phenyl group, or a phenylalkyl residue having 1 to 3 atoms in the alkyl chain;

R^7 is (i) an alkyl group of 1 to 20 carbon atoms, substituted by at least one halogen,

(ii) a phenyl group, substituted by a carboxy or an alkoxycarbonyl group having 1 to 4 carbon atoms, wherein said carboxy or alkoxycarbonyl group is located in the ortho position of the carbon atom bound to a pentacyclic ring system of said compound and by at least one halogen,

(iii) a carboxy group,

(iv) a carboxyalkyl group having 1 to 10 carbon atoms in the alkylene chain, or

(v) a carboxymethylene-oxy-alkyloxy group;

$X^{\ominus}$ is a counterion;

R^2, R^3, R^4, R^5, R^6, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}, $R^{15}R^{16}$, R^{17}, R^{18}, and R^{19} independently of each other represent a hydrogen, an alkyl or a substituted alkyl having 1 to 20 carbons and two of R^2, R^3, R^4, R^5, R^6, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, and R^{19} are optionally linked together;

----- represents a single or double bond; wherein said compound can be activated at at least one of R^1, R^7 and R^{13}.

19. A method for determining a first immunologically bindable substance in a sample, comprising:

contacting a conjugate of a compound of claim **1** and a second immunologically bindable substance which is bindable with said first immunologically bindable substance, with said sample containing said first immunologically bindable substance, and

determining the change in absorption or fluorescence of the compound caused by immunological binding which is specific for the first immunologically bindable substance as a measure of the amount of said first immunologically bindable substance in said sample.

5,750,410

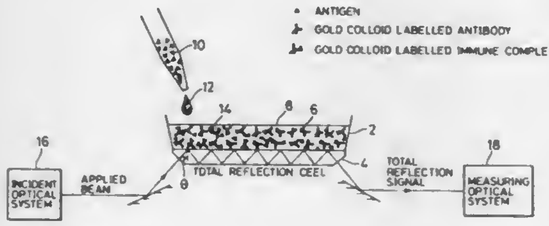
METHOD OF AND APPARATUS FOR IMMUNE ANALYSIS

Xiaoming Dou; Yoshinori Yamaguchi, and Harumi Uenoyama, all of Kyoto, Japan, assignors to Kyoto Dai-ichi Kagaku Co., Ltd., Kyoto, Japan

Filed Jan. 26, 1996, Ser. No. 592,522

Int. Cl.⁶ G01N *33/553*

U.S. Cl. 436—525 **5 Claims**



1. A method for quantitatively determining a target antigen or a target antibody in a liquid sample in an immunoassay, comprising:

(a) reacting said liquid sample with a solution comprising an antibody or antigen labelled with a colloidal noble metal particle, wherein said antibody or antigen specifically binds to said target antigen or said target antibody, respectively, to form a liquid sample/solution mixture containing a labelled immune complex;

(b) contacting said liquid sample/solution mixture with a total reflection cell having a surface comprising a total reflection prism;

(c) illuminating said total reflection prism with a measuring beam of light having a wavelength in a range of visible to infrared light at an angle of incidence which causes total reflection at an interface between said total reflection prism and said liquid sample/solution mixture in said total reflection cell;

(d) measuring absorption of said measuring beam at the interface; and

(e) comparing said measured absorption to a standard absorption obtained from a known concentration of said target antigen or said target antibody processed according to steps (a)–(d) to determine the amount of said target antigen or said target antibody in said liquid sample.

5,750,411

SOL PARTICLE DECAY PROTECTION IMMUNOASSAY

Ronald G. Sommer, Elkhart, Ind., assignor to Bayer Corporation, Elkhart, Ind.

Filed Jun. 3, 1996, Ser. No. 656,904

Int. Cl.⁶ G01N *33/543;33/544;33/553*

U.S. Cl. 436—525 **25 Claims**

1. A method for determining the concentration of an analyte in a fluid test sample which method comprises the steps of:

a) combining the fluid test sample containing the analyte in a buffered aqueous system suitable for the binding of the analyte with a specific binding partner thereto, which aqueous system contains colloidal sized metal particles having a specific binding partner for the analyte or analyte analog bound to their surface and a polymer bearing a plurality of analyte moieties or analogs thereof covalently attached along the polymer chain which will bind to the specific binding partner bound to the metal particles to thereby form an association between the polymer and the metal particles in which the metal particles are protected by the polymer;

b) adding a destabilizer material to the aqueous system which is capable of causing aggregation of the colloidal metal particles with the specific binding partner bound to their surface to destabilize the colloidal metal particles which are not protected by the polymer from the specific binding partner attached thereto to cause the metal particles which are not associated with the polymer to aggregate;

c) measuring the spectral properties exhibited by the colloidal metal particles at a wavelength at which the aggregated colloidal particles are known to absorb; and

d) comparing the spectral properties with spectral properties obtained using fluid samples having known concentrations of analyte to thereby determine the concentration of analyte in the fluid test sample.

5,750,412

PARAMAGNETIC SCINTILLATION PARTICLES AND ASSAY

Irving Sucholeiki, Watertown, Mass., assignor to Solid Phase Sciences Corporation, Watertown, Mass.

Filed Aug. 19, 1996, Ser. No. 699,796

Int. Cl.⁶ G01N *33/553;33/543;33/546;33/542*

U.S. Cl. 436—525 **26 Claims**

1. An immunoscintillation composition comprising:

(a) at least one magnetically responsive composite particle comprising

(i) a resin matrix that defines a composite particle outer surface region defining a plurality of pores therethrough, said pores being limited in their diameter such that said resin matrix is capable of retaining a plurality of inner particles therein,

(ii) a plurality of inner particles retained in said resin matrix, each of said inner particles comprising a resin shell such that said inner particle resin shell is capable of retaining a solid, non-resin core, and

(iii) a like plurality of solid, non-resin cores comprising a magnetically responsive material, each of said solid, non-resin cores being retained in said inner particle resin shell,

(b) a photon-emitting substance that is attached to said at least one magnetically responsive composite particle; and

(c) an immunoadsorbent capable of binding labeled and unlabeled antigens, said immunoadsorbent being provided on said composite particle outer surface region.

5,750,413

IMMUNOASSAY REAGENTS AND METHOD FOR DETERMINING CYCLOSPORINE

Marjorie A. Morrison, Grayslake; Steven E. Lunetta, Waukegan; Victoria P. Meucci; Mariola B. Zajac, both of Chicago, and Elizabeth A. Simpson, Skokie, all of Ill., assignors to Abbott Laboratories

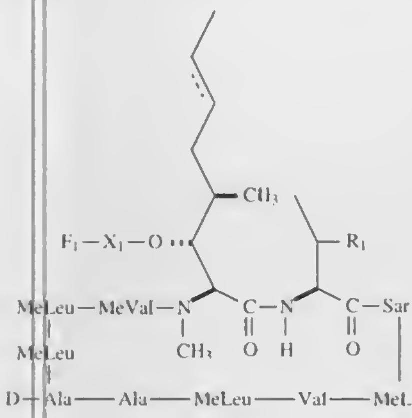
Division of Ser. No. 148,164, Nov. 4, 1993, Pat. No. 5,489,668, which is a continuation of Ser. No. 952,488, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 567,842, Aug. 15, 1990, abandoned. This application May 4, 1995, Ser. No. 433,104

Int. Cl.⁶ G01N *33/536*

U.S. Cl. 436—537 **18 Claims**

1. A method for determining cyclosporine, or cyclosporine and metabolites of cyclosporine, in a test sample, said method comprising the steps of:

(a) contacting said test sample with a cyclosporine derivative corresponding to the formula:



wherein

╲╲

represents a single or double bond;

Fl is a detectable moiety from a luminescent molecule selected from the group consisting of fluoresceinamines and carboxyfluoresceins;

X1 is a linking group of 1–15 atoms excluding hydrogen;

R1 is hydrogen, OH or OCOR6; and

R6 is an alkyl group of from 1–6 atoms or X1-Fl; and an antibody capable of binding to (i) cyclosporine, or cyclosporine and metabolites of cyclosporine, and (ii) said cyclosporine derivative, to form a reaction solution therewith, said cyclosporine derivative capable of producing a detectable fluorescence polarization response to the presence of said antibody;

(b) passing a plane of polarized light through the said reaction solution to obtain a fluorescence polarization response; and

(c) detecting said fluorescent polarization response to said reaction solution as a function of the amount of cyclosporine, or cyclosporine and metabolites of cyclosporine, present in said test sample.

5,750,414

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

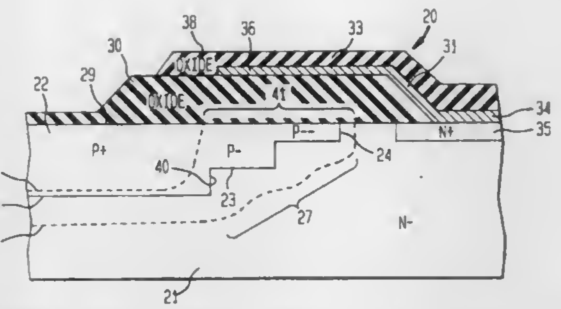
David Whitney, San Jose, Calif., assignor to Siemens Components, inc., Iselin, N.J.

Continuation of Ser. No. 128,423, Sep. 29, 1993, abandoned. This application Oct. 26, 1994, Ser. No. 329,796

Int. Cl.⁶ H01R *21/22*

U.S. Cl. 437—154 **2 Claims**

1. A method of fabricating a semiconductor device comprising:



diffusing a layer of doped impurities into a surface of a semiconductor substrate and forming a semiconductor junction and a graded junction termination structure;

forming an insulating layer on said surface to cover said graded junction termination structure; and

forming a conductive field plate including depositing a first portion of said field plate on said substrate at a location spaced from said layer of doped impurities and a second portion of said field plate on said insulating layer adjacent said graded junction termination structure, whereby the plate potential provided by said field plate during operation is superimposed on said graded junction termination structure,

wherein said graded junction termination structure includes at least one heavily doped P+ region which forms said pn junction, at least one lightly doped P— region and a lightly doped P– region located between said P+ region and said P— region, each said P+, P– and P— region having different depths from one another.

5,750,415

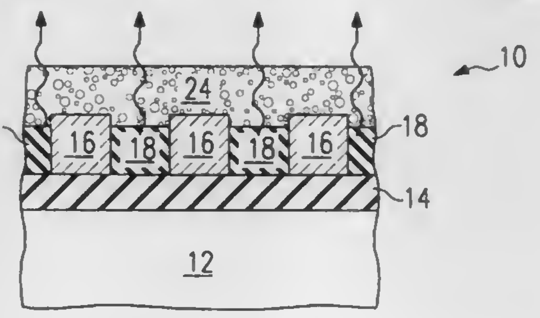
LOW DIELECTRIC CONSTANT LAYERS VIA IMMISCIBLE SOL-GEL PROCESSING

Bruce E. Gnade, Dallas; Chih-Chen Cho, Richardson, both of Tex., and Douglas M. Smith, Albuquerque, N. Mex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 27, 1994, Ser. No. 250,747

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 437—195 **15 Claims**



1. A method for forming air gaps between metal leads of a semiconductor device, comprising the steps of:

depositing a metal layer on a substrate;

etching said metal layer in a pattern to form metal leads, said metal leads having tops, wherein portions of said substrate remain exposed;

depositing a disposable liquid on said metal leads and said exposed portions of substrate;

removing a top portion of said disposable liquid to lower said disposable liquid to a level at least as low as said tops of said metal leads;

depositing a porous silica precursor film on said disposable liquid and at least said tops of said leads, said porous silica precursor film comprising a first solvent;

gelling said porous silica precursor film to form a low-porosity silica film;

removing said disposable liquid through said low-porosity silica film to form air gaps between said metal leads beneath said low-porosity silica film.

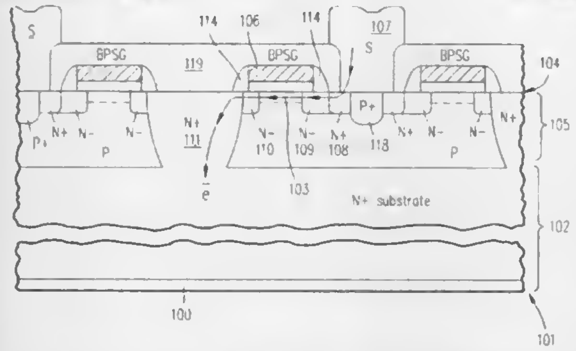
5,750,416
METHOD OF FORMING A LATERAL FIELD EFFECT TRANSISTOR HAVING REDUCED DRAIN-TO-SOURCE ON-RESISTANCE

Fwu-Iuan Hshieh, Saratoga; Mike F. Chang, Cupertino; Jan Van der Linde, Saratoga, and Yueh-Se Ho, Sunnyvale, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Division of Ser. No. 418,397, Apr. 7, 1995. This application Jun. 7, 1995, Ser. No. 479,308

Int. Cl.^{6} H01L ***21/265***

U.S. Cl. 437—40 AS **6 Claims**



1. A method of forming a transistor, comprising the steps of:
- forming a P type epitaxial silicon layer over an N type substrate layer;
- forming a gate over an upper surface of said epitaxial silicon layer;
- forming an N type sinker region from said upper surface of said epitaxial silicon layer downward to said substrate layer;
- implanting and diffusing, in only one diffusion step, a lightly-doped N type source region and a lightly-doped N type drain region into said epitaxial silicon layer to a depth and width less than that of said epitaxial silicon layer, wherein said lightly-doped N type source region is laterally spaced apart from said lightly-doped N type drain region; and
- forming a drain electrode on a bottom surface of said substrate layer, thereby forming part of a conductive path from said source region to said drain electrode when said transistor is turned on.

5,750,417
METHOD OF MANUFACTURING A DEVICE HAVING A SUPPORT BAR WITH CONDUCTOR TRACKS FOR ELECTRICALLY CONTACTING A SEMICONDUCTOR ELEMENT

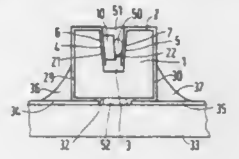
Antonius J. M. Nellissen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

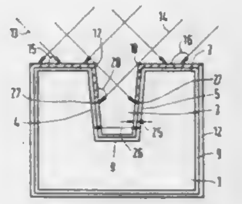
Filed Apr. 13, 1995, Ser. No. 423,247

Claims priority, application European Pat. Off., Apr. 15, 1994, 94201027

Int. Cl.^{6} H01L ***21/52;21/58;21/60***

U.S. Cl. 437—209 **20 Claims**





1. A method of manufacturing a device which is based on a support bar having a first main surface provided with a groove suitable for accommodating at least one semiconductor element, which groove comprises walls on which conductor tracks are provided which continue over the first main surface, wherein the conductor tracks are provided through patterning of a conductive material by means of a patterned photoresist, which photoresist is provided on the support bar and is illuminated from two directions at such an angle to the first main surface and to the groove that a bottom of the groove is not and portions of the walls and of the first main surface are illuminated, after which the photoresist and a layer of conductive material provided are patterned.

5,750,418

Patent Not Issued For This Number

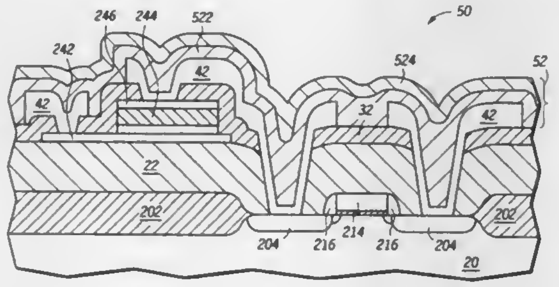
5,750,419
PROCESS FOR FORMING A SEMICONDUCTOR DEVICE HAVING A FERROELECTRIC CAPACITOR

Sufi Zafar, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 24, 1997, Ser. No. 803,789

Int. Cl.^{6} H01G ***7/06;*** **H01L** ***21/8239***

U.S. Cl. 438—3 **23 Claims**



1. A process for forming a semiconductor device comprising the steps of
- forming a ferroelectric capacitor over a substrate, wherein the ferroelectric capacitor is part of a memory cell; and
- forming a first dielectric layer after the step of forming a ferroelectric capacitor,
- wherein the semiconductor device has a characteristic selected from a group consisting of:
  - the first dielectric layer has a first dielectric layer tension no greater than 2×10^4 dynes per centimeter; and
  - in a substantially completed semiconductor device, a nonvolatile polarization has decreased to no less than 75 percent of an initial nonvolatile polarization.

5,750,420
METHOD FOR MANUFACTURING A STRUCTURE WITH A USEFUL LAYER HELD AT A DISTANCE FROM A SUBSTRATE BY ABUTMENTS, AND FOR DETACHING SUCH A LAYER

Hubert Bono, Jauie; France Michel, Sassenage, and Patrice Rey, Jean de Moirans, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

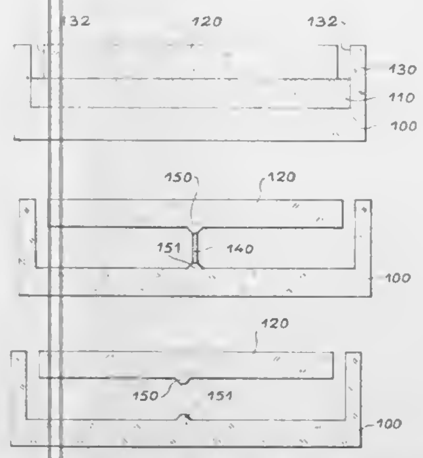
Filed Jul. 10, 1996, Ser. No. 676,629

Claims priority, application France, Jul. 21, 1995, 95 08882

Int. Cl.^{6} H01L ***21/00***

U.S. Cl. 438—52 **9 Claims**

1. A method of detaching a useful layer, initially connected to a substrate by a sacrificial layer, comprising:



- a first partial and selective etching of the sacrificial layer leaving at least one paving to survive forming a spacer between the substrate and the useful layer;
- a second selective etching of at least one of the useful layer and the substrate using the spacer as a mask so as to form at least one abutment in said at least one of the useful layer and the substrate etched by the second selective etching; and
- removal of said spacer.

5,750,421
SEMICONDUCTOR DEVICE, CARRIER FOR CARRYING SEMICONDUCTOR DEVICE, AND METHOD OF TESTING AND PRODUCING SEMICONDUCTOR DEVICE

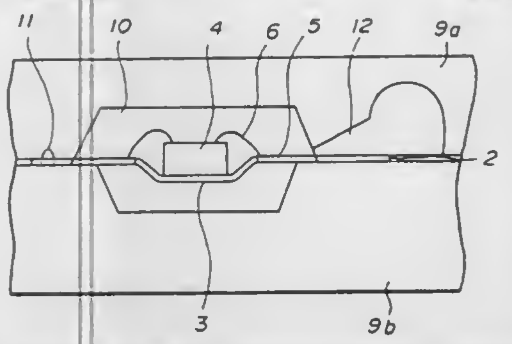
Junichi Kasai; Kazuto Tsuji; Norio Taniguchi; Takashi Mashiko; Masao Sakuma, all of Kawasaki; Yukio Saigo, Satsuma-gun; Yoshiyuki Yoneda, and Masashi Takenaka, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki; Kyushu Fujitsu Electronics Limited, Satsuma-gun, and Fujitsu Automation Limited, Kawasaki, all of Japan

Division of Ser. No. 441,462, May 15, 1995, Pat. No. 5,666,064, which is a division of Ser. No. 961,161, Oct. 16, 1992, Pat. No. 5,475,259. This application Jan. 27, 1997, Ser. No. 789,625

Claims priority, application Japan, Oct. 17, 1991, 3-269645; Feb. 12, 1992, 4-25399; May 22, 1992, 4-130900; Jun. 12, 1992, 4-153842

Int. Cl.^{6} H01L ***21/60***

U.S. Cl. 438—106 **4 Claims**



1. A method of producing a semiconductor device comprising the steps of:
- (a) placing a semi-completed device having leads in a molding position within a cavity which is formed by first and second dies which connect via a palette, said cavity being formed by a recess of the first die and an opening of the palette, said first die having a first gate which communicates to the recess, said palette having a second gate which communicates to the opening, at least one of the first die and the palette having a runner which communicates with the first and second gates; and
- (b) injecting a resin into the cavity via the runner and the first and second gates to mold a resin package which encapsulates the semi-completed device so that the leads extend outwardly from the resin package, said recess being larger than the opening so that a portion of the package above the leads is larger than the remaining portion of the package below the leads and the leads are exposed at a stepped part which is formed by a difference between the sizes of the two portions forming the package.

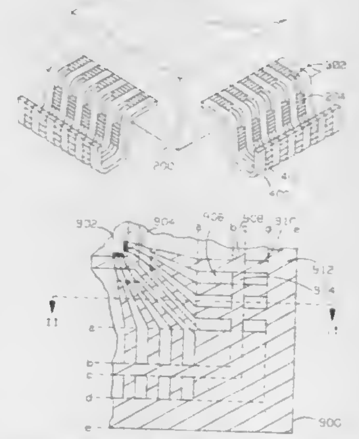
5,750,422
METHOD FOR MAKING INTEGRATED CIRCUIT PACKAGING WITH REINFORCED LEADS

Louis Thomas Mills, Loveland; Richard M. Butler, and Havyn Eugene Bradley, both of Fort Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 114,947, Sep. 1, 1993, abandoned, which is a division of Ser. No. 955,622, Oct. 2, 1992, Pat. No. 5,281,851. This application Feb. 24, 1995, Ser. No. 394,043

Int. Cl.^{6} H01L ***21/44***

U.S. Cl. 438—112 **2 Claims**



1. A method of packaging an integrated circuit device, the method comprising the following steps:
- (a) placing a metal lead frame and an integrated circuit electrically connected to the metal lead frame into a body cavity in a plastic mold;
- (b) injecting a nonconductive plastic material into the body cavity to form a plastic integrated circuit body;
- (c) allowing the plastic material forming the integrated circuit body to flow beyond the body cavity, between adjacent metal leads in the metal lead frame, beyond areas in which the metal leads are to be formed into curves; and
- (d) stopping the flow of plastic between adjacent metal leads at an area on the metal leads where the metal leads are to be soldered.

5,750,423
METHOD FOR ENCAPSULATION OF SEMICONDUCTOR DEVICES WITH RESIN AND LEADFRAME THEREFOR

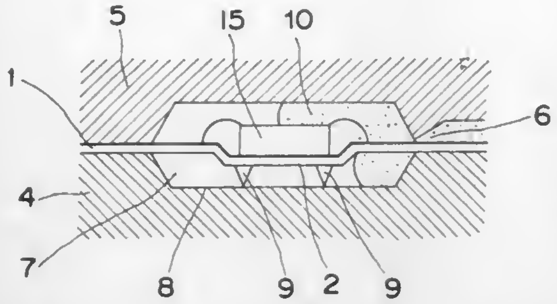
Masaaki Ishii, Fukuoka, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Japan

Filed Aug. 25, 1995, Ser. No. 519,588

Int. Cl.^{6} H01L ***21/60***

U.S. Cl. 438—112 **3 Claims**

1. A method for encapsulating semiconductor chips with a resin, comprising the steps of loading leadframes with semiconductor chips into a mold so as to place semiconductor chips in cavities of the mold, said semiconductor chips being mounted on islands of said leadframes and wire-bonded to leads of said leadframes, and encapsulating said semiconductor chips on rhe leadframe with a molten resin, characterized in that each of said leadframes is



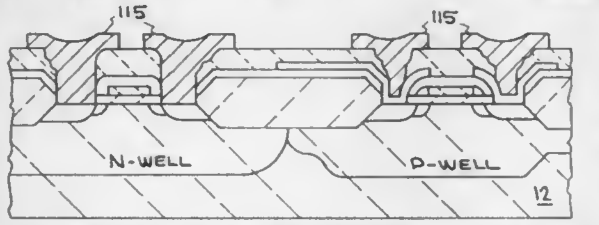
provided with at least one supporting portion extending from the island thereof in the direction opposite to a chip-mounted surface so that said at least one supporting portion comes into contact with a bottom surface of the cavity of said mold when said mold is closed, said at least one supporting portion being formed, by bending a part of said island, into a configuration such tht it comes into point-contact with the bottom surface of the mold when the mold is closed to minimize a surface area of the leadframe exposed out of the molded resin.

5,750,424
METHOD FOR FABRICATING A CMOS DEVICE

Jeong Yeol Choi, Fremont; Chung-Jen Chien, Saratoga; Chung-Chyung Han, San Jose, and Chuen-Der Lien, Los Altos, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Continuation of Ser. No. 538,533, Oct. 3, 1995, Pat. No. 5,654,213. This application Dec. 10, 1996, Ser. No. 764,662
Int. Cl.^{6} H01L ***21/8238***

U.S. Cl. 438—199 17 Claims



1. A method for fabricating source and drain regions in a CMOS structure in a semiconductor substrate having two contiguous wells of opposite conductivity type comprising the steps of:

a) blanket implanting a dopant of a first conductivity type to form source and drain regions in each of said wells;
b) selectively introducing a dopant of a second conductivity type into a portion of said source and drain regions in a selected one of said wells, thereby converting a portion of said source and drain regions in said selected well to said second conductivity type.

5,750,425

Patent Not Issued For This Number

5,750,426
METHOD OF MAKING MOS PRECISION CAPACITOR WITH LOW VOLTAGE COEFFICIENT

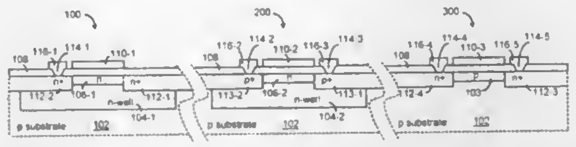
Kamal Rajkanan, Fremont, and Bruno Kranzen, San Jose, both of Calif., assignors to Zilog, Inc., Campbell, Calif.

Continuation of Ser. No. 407,486, Mar. 16, 1995, Pat. No. 5,608,258. This application Nov. 24, 1996, Ser. No. 738,984
Int. Cl.^{6} H01L ***21/8242***

U.S. Cl. 438—210 11 Claims

1. A method of forming a precision capacitor in an integrated circuit including a p-mos transistor and a complementary n-mos transistor, wherein said precision capacitor, said p-mos transistor, and said n-mos transistor are respectively formed in first, second, and third regions of a semiconductor wafer including said integrated circuit, comprising:

forming, in a same mask step, a n-well in said first region where said precision capacitor is to be formed, and a n-well in said second region where said p-mos transistor is to be formed,
forming a gate oxide layer covering said first, second, and third regions of said semiconductor wafer,
forming a first electrode of said precision capacitor over the gate oxide layer formed over said n-well formed in said first region of said semiconductor wafer, and forming a gate electrode of said n-mos transistor over the gate oxide layer formed over said third region of said semiconductor wafer,
forming, in a same mask step, a first n-type region self aligned to said first electrode of said precision capacitor in said n-well formed in said first region of said semiconductor wafer such that said first n-type region has a dopant concentration greater than said n-well formed in said first region, and a second n-type region self aligned to said gate electrode of said n-mos transistor in said third region of said semiconductor wafer such that said second n-type region has a dopant concentration greater than said n-well formed in said third region, and
forming a second electrode of said precision capacitor by connecting said second electrode to said first n-type region self aligned to said first electrode of said precision capacitor.

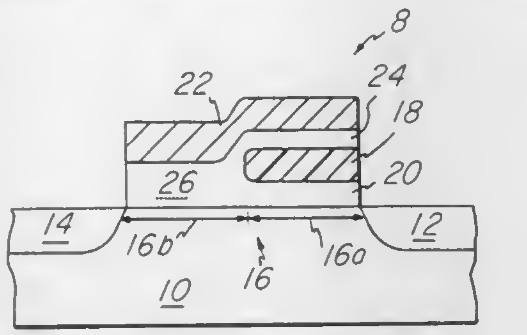


5,750,427
NON-VOLATILE MEMORY CELL STRUCTURE AND PROCESS FOR FORMING SAME

Cetin Kaya, Dallas, and Howard Tigelaar, Allen, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 93,517, Sep. 19, 1993, which is a continuation of Ser. No. 641,952, Jan. 17, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 485,259
Int. Cl.^{6} H01L ***21/8247***

U.S. Cl. 438—264 2 Claims



1. A process for fabricating a programmable non-volatile memory cell comprising the steps of:

forming a first gate oxide over a channel region in a semiconductor surface;
forming a conductive layer over said first gate oxide;
etching said first conductive layer to form a floating gate over a first portion of said channel region;
forming a pass gate oxide over a second portion of said channel region in said surface and a dielectric layer adjacent said floating gate where said dielectric layer is thicker than said first gate oxide and said pass gate oxide is thicker than said dielectric layer;
forming a second condutive layer over said dielectric layer and said pass gate oxide and said floating gate;

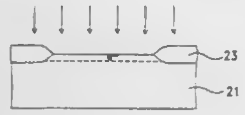
etching said second conductive layer to form a control gate and align an edge of said control gate with an edge of said floating gate; and
forming source and drain regions at the ends of said channel region in said surface, said source and drain aligned to said control gate.

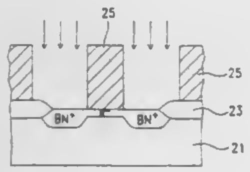
5,750,428
SELF-ALIGNED NON-VOLATILE PROCESS WITH DIFFERENTIALLY GROWN GATE OXIDE THICKNESS

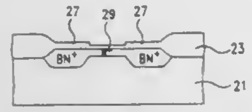
Kuang-Yeh Chang, Taipei, Taiwan, assignor to United Microelectronics Corp.

Filed Sep. 27, 1996, Ser. No. 722,799
Int. Cl.^{6} H01L ***21/336***

U.S. Cl. 438—264 19 Claims







1. A method of fabricating an electrically erasable programmable read only memory (EEPROM) on a semiconductor substrate, said method comprising the steps of:

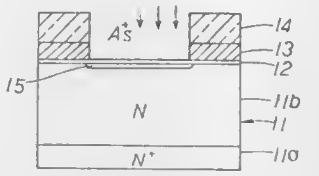
forming a plurality of isolation regions on said substrate to serve as isolations for an active region;
performing a first ion implant to form a lightly-doped region in said active region, wherein said first ion implantation is a blanket ion implantation and is performed without a photo mask;
patterning a photoresist on a portion of said active region;
performing a second ion implant to form a plurality of highly-doped regions in said substrate by using said photoresist as a doping mask;
removing said photoresist;
oxidizing said substrate to form a gate oxide over said substrate and a tunnel oxide layer over the portion of said active region with differential thickness, simultaneously, wherein said gate oxide is thicker than said tunnel oxide; and
forming a first polysilicon layer on said gate oxide and said tunnel oxide.

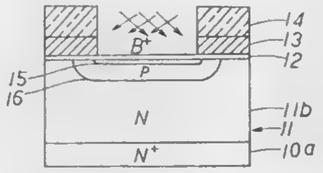
5,750,429
SEMICONDUCTOR DEVICE AND MANUFACTURE METHOD OF THE SAME

Tomnyoshi Kushida, Seto, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 23, 1996, Ser. No. 735,455
Claims priority, application Japan, Oct. 23, 1995, 7-274389
Int. Cl.^{6} H01L ***21/8236***

U.S. Cl. 438—268 3 Claims





1. A manufacturing method of a semiconductor device comprising the steps of:

forming a semiconductor substrate of a first conductivity type at a main surface side and a second conductivity type at a back surface side;
forming a first insulating layer on the main surface of said semiconductor substrate;
forming a first electrode on said first insulating layer at a predetermined position;
forming a second insulating layer to cover the surface of said first electrode;
implanting impurities of the second conductivity type in said semiconductor substrate from the main surface side to form a first conductive region spreading beneath said first electrode;
implanting impurities of the first conductivity type in said first conductive region to form a second conductive region spreading beneath said first electrode in a depth shallower than that of said first conductive region and having a concentration higher than the surface concentration of said first conductive region;
forming a third insulating layer at the main surface side of said semiconductor substrate;
eliminating a portion of said third insulating layer by anisotropic etching in such a manner as to expose a portion of said second conductive region and to form a side wall insulating layer on each side wall of said first electrode and said second insulating layer;
implanting impurities of the second conductivity type into said second conductive region to form a third conductive region having a concentration higher than that or said second conductive region;
eliminating a portion of each of said side wall insulating layer and said second insulating layer by isotropy etching to expose a portion of said second conductive region:
forming a second electrode commonly in contact with said second and third conductive regions at the main surface side of said semiconductor substrate; and
forming a third electrode on the back surface of said semiconductor substrate or in a position spaced from said first and second electrodes at the main surface side of said semiconductor substrate.

5,750,430
METHOD FOR MAKING METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (MOSFET)

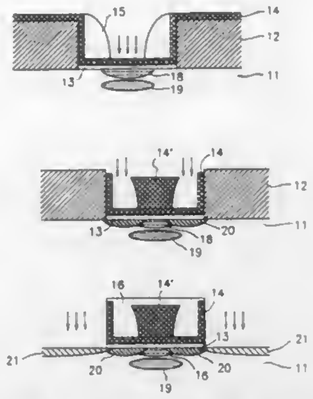
Jeong-Hwan Son, Daejon, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-Do, Rep. of Korea

Filed Aug. 23, 1996, Ser. No. 701,898
Claims priority, application Rep. of Korea, Dec. 28, 1995, 62053/1995
Int. Cl.^{6} H01L ***21/336***

U.S. Cl. 438—303 12 Claims

1. A fabrication method of making a field effect transistor, comprising the steps of:

forming a disposable film on a substrate having an opening to expose a portion of a surface of said substrate therethrough;
forming a gate insulation film on the exposed surface of the substrate;
forming a first conductive film on said disposable film and said gate insulation film;



- forming side wall spacers on side walls of the first conductive film on each side surface portion of the first conductive film;
- forming a second conductive film on the first conductive film so as to fill a space between the side wall spacers entirely, and then etching-back said second conductive film;
- removing the side wall spacers and forming a low density ion-implantation region in the substrate by ion-implanting impurities through the exposed surface of the first conductive film from which the side wall spacers were removed;
- forming an insulation film having approximately the same height as the disposable film on the first and second conductive films;
- removing the disposable film; and
- forming source-drain regions in the substrate by ion-implanting impurities through the substrate surface from which the disposable film was removed.

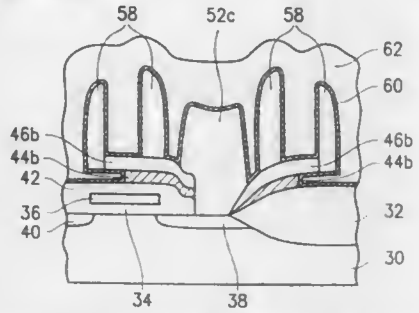
5,750,431
METHOD FOR FABRICATING A STACKED CAPACITOR

Shye-Lin Wu, Hsinchu Hsien, Taiwan, assignor to Powerchip Semiconductor Corp., Hsin-Chu, China

Filed Jun. 24, 1997, Ser. No. 881,774

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—396 **13 Claims**



1. A method for fabricating a capacitor on a semiconductor substrate, comprising the steps of:

- forming a first dielectric layer over the semiconductor substrate;
- forming a first polysilicon layer over the first dielectric layer;
- forming an insulation layer over the polysilicon layer;
- forming a window region through the insulation layer, the first polysilicon layer and the dielectric layer to expose a portion of the substrate;
- forming a second polysilicon layer over the insulation layer and filling in the window region to thereby form a polysilicon plug which makes contact with the semiconductor substrate;
- patterning the second polysilicon layer and the insulation layer to form an island which includes the polysilicon plug;
- forming a dielectric spacer adjacent the island;
- removing the second polysilicon layer over the insulation layer and exposed portions of the first polysilicon;
- removing the insulation layer in the island to thereby expose the polysilicon plug;
- forming polysilicon spacers adjacent the polysilicon plug and the dielectric spacer;
- removing the dielectric spacer, thereby forming a lower electrode including the polysilicon plug, the polysilicon spacers and a portion of the first polysilicon layer;
- forming a second dielectric layer over the exposed surface of the lower electrode; and
- forming an upper electrode over the second dielectric layer.

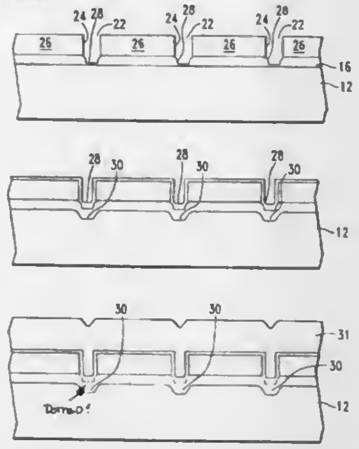
5,750,432
DEFECT CONTROL IN FORMATION OF DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICE REGIONS

Craig J. McLachlan, Valkaria, Fla., assignor to Harris Corporation, Palm Bay, Fla.

Filed Jun. 7, 1995, Ser. No. 481,115

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—404 **11 Claims**



1. A method of forming a silicon-on-insulator (SOI) structure comprising the steps of:

- providing a semiconductor structure having a first support layer, a semiconductor layer having an upper portion suitable for device formation and a dielectric layer formed between the support layer and the semiconductor layer;
- forming the semiconductor layer into a plurality of spaced apart island regions by patterning and etching a trench structure through the upper portions to expose a portion of the dielectric layer, said trench structure defined by sidewalls spaced apart a uniform distance over a major portion of the depth of the trench;
- anisotropically etching the dielectric layer to remove only some of the dielectric layer to form notches in the exposed portion of the dielectric layer for translating stress-relieving lattice slip to the dielectric layer;
- tapering the notches to reduce their cross sectional notch width as the notches penetrate the dielectric layer; and
- forming at least one micron of thick thermal oxide along the trench structure, the resulting structure having portions of dielectric material protruding into the support layer and thus forming an SOI structure characterized by a relatively low oxidation-induced defect density in the island regions and a relatively high oxidation-induced defect density in the support layer.

11. A method of forming a silicon-on-insulator integrated circuit structure comprising the steps of:

- providing a semiconductor structure having a first crystalline support layer, a semiconductor layer having an upper portion suitable for device formation and a dielectric layer formed between the support layer and the semiconductor layer;
- forming the semiconductor layer into a plurality of spaced apart regions of device islands by patterning and etching a matrix of trenches through the upper portion to expose the dielectric layer;
- removing only a portion of the exposed dielectric layer; and
- thermally oxidizing the dielectric layer to create a stress point protruding from the dielectric layer into the substrate, said stress point causing lattice slip in a region other than a device island to reduce lattice slip in the island regions when lattice stress is induced by growth of oxide at the interface of the dielectric layer and the island region.

5,750,433
METHODS OF FORMING ELECTRICALLY ISOLATED ACTIVE REGION PEDESTALS USING TRENCH-BASED ISOLATION TECHNIQUES

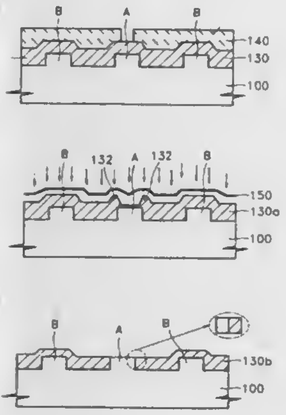
Sang-youn Jo, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 14, 1996, Ser. No. 748,865

Claims priority, application Rep. of Korea, Jun. 25, 1996, 96-23681

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—424 **9 Claims**



1. A method of forming an electrically isolated active region at a face of a semiconductor substrate, comprising the steps of:

- forming a plurality of trenches in a face of a semiconductor substrate to define an active region pedestal between first and second dummy region pedestals;
- forming an electrically insulating layer on the active region and dummy region pedestals and in the trenches disposed therebetween;
- patterning a mask to expose a portion of the electrically insulating layer on the active region pedestal;
- etching the exposed portion of the electrically insulating layer so that a thickness of the electrically insulating layer on the active region pedestal is less than a thickness of the electrically insulating layer on the first and second dummy region pedestals; and
- planarizing the electrically insulating layer to selectively expose the active region pedestal but not the first and second dummy region pedestals.

5,750,434
SURFACE POLISHING OF SILICON CARBIDE ELECTRONIC DEVICE SUBSTRATE USING CEO_2

Tatsuo Urushidani, Yokosuka, and Shinji Ogino, Kamakura, both of Japan, assignors to Fuji Electric Co. Ltd., Japan

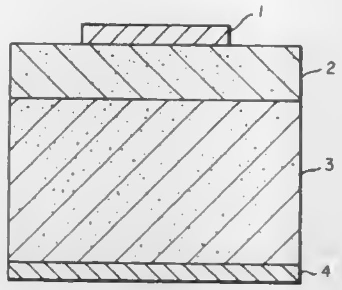
Division of Ser. No. 214,637, Mar. 18, 1994, abandoned. This application Apr. 18, 1995, Ser. No. 423,841

Claims priority, application Japan, Mar. 22, 1993, 5-86681; May 20, 1993, 5-141343

Int. Cl.^{6} H01L *21/306*

U.S. Cl. 438—478 **6 Claims**

1. A method of forming an electronic device comprising the steps of: dry-polishing a surface of a silicon carbide substrate with a polishing means consisting essentially of cerium oxide CeO_2; and forming a silicon carbide epitaxial film on a front surface of the silicon carbide substrate.



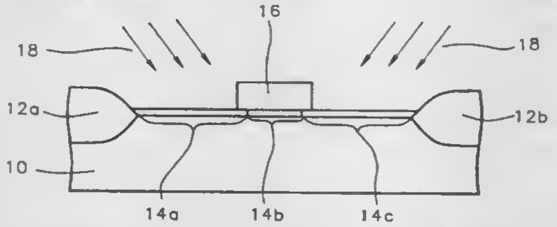
5,750,435
METHOD FOR MINIMIZING THE HOT CARRIER EFFECT IN N-MOSFET DEVICES

Yang Pan, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Company Ltd., Singapore, Singapore

Continuation of Ser. No. 507,144, Jul. 26, 1995, abandoned. This application Jul. 14, 1997, Ser. No. 892,336

Int. Cl.^{6} H01L *21/425*

U.S. Cl. 438—525 **7 Claims**



1. A method for minimizing the Hot Carrier Effect (HCE) within N-Channel Metal Oxide Semiconductor Field Effect Transistors (N-MOSFETs) comprising:

- forming upon a semiconductor substrate a field effect transistor structure comprising a gate oxide, a gate electrode formed upon the gate oxide and a pair of N+ source/drain regions formed within the semiconductor substrate;
- implanting into the gate oxide regions beneath the gate electrode edges a dose of a hardening ion, the hardening ion comprising fluorine only, the dose of the hardening ion being implanted at a tilt angle non-orthogonal to the plane of the semiconductor substrate, the dose of the hardening ion being implanted through means of a large tilt angle ion implant process, the dose of the hardening ion being sufficient to provide an increased threshold for formation of interface states due to charge carriers injected from the semiconductor substrate into the gate oxide; and
- annealing the semiconductor substrate.

5,750,436
THERMAL PROCESSING METHOD AND APPARATUS THEREFOR

Kenichi Yamaga, Sagamihara; Yuichi Mikata, Kawasaki, and Akihito Yamamoto, Kanagawa, all of Japan, assignors to Tokyo Electron Kabushiki Kaisha; Tokyo Electron Tohoku Kabushiki Kaisha, and Kabushiki Kaisha Toshiba, all of Japan

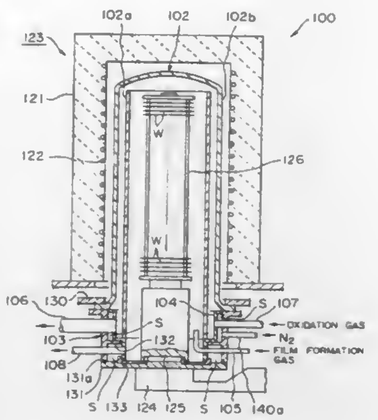
Division of Ser. No. 269,039, Jun. 30, 1994, Pat. No. 5,484,484. This application Jun. 7, 1995, Ser. No. 485,506

Claims priority, application Japan, Jul. 3, 1993, 5-190862; Jul. 8, 1993, 5-194256; Jul. 14, 1993, 5-196851; Dec. 22, 1993, 5-346436; Dec. 24, 1993, 5-347784; Dec. 24, 1993, 5-347785

Int. Cl.^{6} H01L *21/31;21/316*

U.S. Cl. 438—558 **6 Claims**

1. A method of thermally processing an object to be processed, using a vertical thermal processing apparatus provided with a reaction tube of a double-wall structure having an inner tube and an outer tube, wherein a first gas supply pipe and a second exhaust



pipe are provided so as to open into an inner side of said inner tube and a second gas supply pipe and a first exhaust pipe are provided so as to open into a space between said inner tube and said outer tube, said thermal processing method comprising the following steps in order:

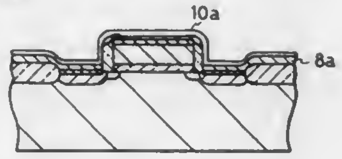
(A) a first step of using said first gas supply pipe and said first exhaust pipe to make a processing gas flow from said inner side of said inner tube to an outer side thereof, to form a film on a surface of said object to be processed in a heated, reduced-pressure environment; and

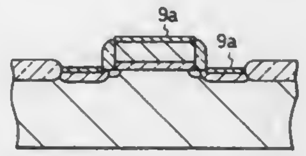
(B) a second step of using said second gas supply pipe and said second exhaust pipe to make a processing gas flow from said outer side of said inner tube to said inner side thereof, to perform oxidation or diffusion processing on said surface of said object to be processed in a heated, normal-pressure environment.

5,750,437
METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Noriaki Oda, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 21, 1997, Ser. No. 786,525
Claims priority, application Japan, Jan. 23, 1996, 8-009126
Int. Cl.^{6} H01L *21/3205;21/4763*
U.S. Cl. 438—592 **6 Claims**





1. A method of fabricating a semiconductor device, comprising the steps of:

(a) forming impurity-diffused layers at a surface of a silicon semiconductor substrate in selected regions;

(b) forming a refractory metal film over said impurity-diffused layers;

(c) carrying out first thermal annealing to convert said refractory metal film into a refractory metal silicide layer;

(d) causing damage to a denaturated layer having been formed over said refractory metal film due to said first thermal annealing;

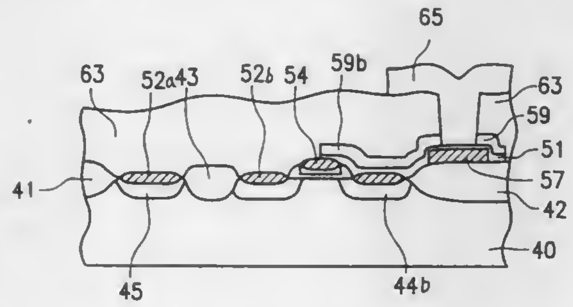
(e) etching both said denaturated layer and non-reacted portions of said refractory metal film; and

(f) carrying out second thermal annealing to reduce a resistance of said refractory metal silicide layer.

5,750,438
METHOD FOR FABRICATING A LOCAL INTERCONNECTION STRUCTURE

Chen-Chiu Hsue, and Sun-Chieh Chien, both of Hsinchu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Jun. 4, 1996, Ser. No. 658,032
Int. Cl.^{6} H01L *21/283;21/306*
U.S. Cl. 438—627 **9 Claims**



1. A method for fabricating a local interconnection structure on a silicon substrate which has a plurality of diffusion regions and a polysilicon gate, said method comprising:

forming a metal layer over said silicon substrate;

heating said metal layer and said silicon substrate in a nitrogen-containing atmosphere to form silicide layers over said polysilicon gates and said diffusion regions and to form a metal nitride layer over said silicon substrate;

forming a dielectric layer over said metal nitride layer; and

patterning said dielectric layer and said metal nitride layer to form said local interconnection structure by covering with a mask said local interconnection structure to be formed and etching away portions of both said dielectric layer and said metal nitride layer not covered by said mask and removing said mask after said etching.

5,750,439
METHOD OF MAKING ALUMINUM ALLOY WIRING WITH LESS SILICON NODULE

Masaru Naito, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka, Japan

Filed Mar. 27, 1996, Ser. No. 624,873
Claims priority, application Japan, Mar. 29, 1995, 7-096121
Int. Cl.^{6} H01L *21/28*
U.S. Cl. 438—648 **29 Claims**

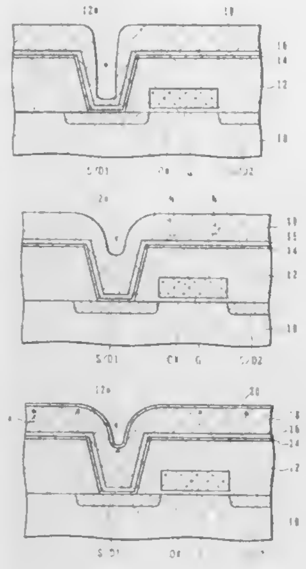
1. A method of manufacturing a semiconductor device comprising the steps of:

(a) forming an Al alloy layer containing Si on a surface of a semiconductor substrate having a step;

(b) heating and reflowing said Si containing Al alloy layer;

(c) forming a Ti layer on said reflow Si containing Al alloy layer;

(d) after step (c), annealing said semiconductor substrate at a temperature sufficient to consume any Si precipitates which may have been generated during said heating and reflowing step in said Si containing Al alloy layer; and

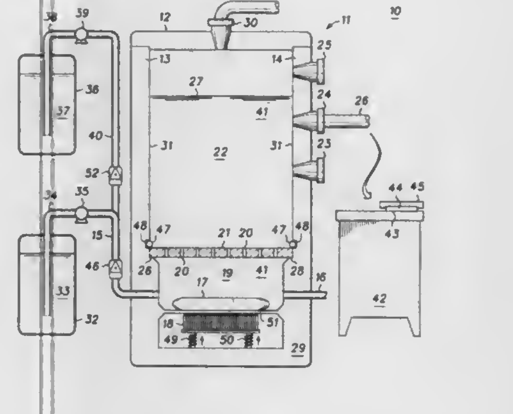


(e) after the annealing step, patterning said Si containing Al alloy layer in which Si precipitates are consumed, and said Ti layer.

5,750,440
APPARATUS AND METHOD FOR DYNAMICALLY MIXING SLURRY FOR CHEMICAL MECHANICAL POLISHING

James F. Vanell, Tempe; Steven D. Ward, Phoenix, both of Ariz., and James M. Mullins, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1995, Ser. No. 559,669
Int. Cl.^{6} B24B *57/04;1/00*
U.S. Cl. 438—692 **23 Claims**



1. A method of dynamically mixing slurry for chemical mechanical polishing, the method comprising the steps of:

providing an oxidizer, an abrasive, and a slurry mixer;

dispensing the oxidizer and the abrasive into the slurry mixer;

dynamically blending the oxidizer and the abrasive together to form the slurry in the slurry mixer;

retaining the slurry in the slurry mixer for a time period of less than approximately thirty minutes;

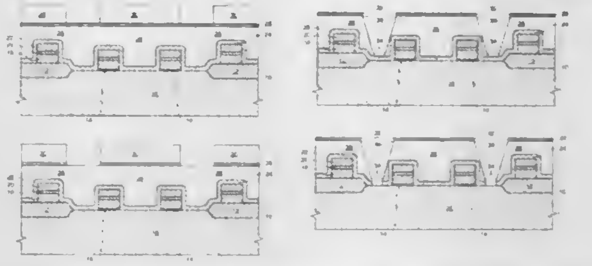
subsequently, removing the slurry from the slurry mixer; and

dispensing the slurry onto a polishing surface.

5,750,441
MASK HAVING A TAPERED PROFILE USED DURING THE FORMATION OF A SEMICONDUCTOR DEVICE

Thomas A. Figura, and Bradley J. Howard, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed May 20, 1996, Ser. No. 650,723
Int. Cl.^{6} H01L *21/02*
U.S. Cl. 438—751 **20 Claims**



1. A method for forming a semiconductor device comprising the following steps:

providing a first substrate assembly layer and a second substrate assembly layer overlying said first substrate assembly layer;

forming a first mask layer over said second substrate assembly layer;

forming a patterned second mask layer over said first mask layer;

etching said first mask layer using said second mask layer as a pattern thereby exposing said second substrate assembly layer, said first mask layer having a tapered profile;

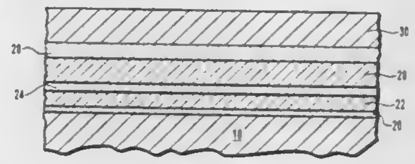
etching said second substrate assembly layer using said first mask layer as a pattern, thereby exposing said first substrate assembly layer; and

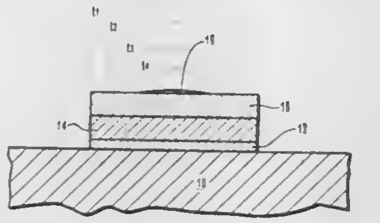
removing said first and second mask layers.

5,750,442
GERMANIUM AS AN ANTIREFLECTIVE COATING AND METHOD OF USE

Werner Juengling, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 25, 1995, Ser. No. 533,184
Int. Cl.^{6} H01L *21/31*
U.S. Cl. 438—761 **32 Claims**





1. A method for improved line width control during photolithography patterning of stack layers on a semiconductor wafer, the process comprising the steps of:

(a) depositing a plurality of stack layers upon a silicon substrate;

(b) depositing over said plurality of active area stack layers an antireflective layer of a material substantially composed of germanium;

(c) forming a layer of photoresist upon said antireflective layer;

(d) exposing said layer of photoresist;

(e) developing said layer of photoresist;

(f) etching said plurality of stack layers;

(g) ashing said layer of photoresist, leaving a residue of photoresist; and

(h) removing said antireflective layer.

5,750,443

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Kazuhisa Sakamoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

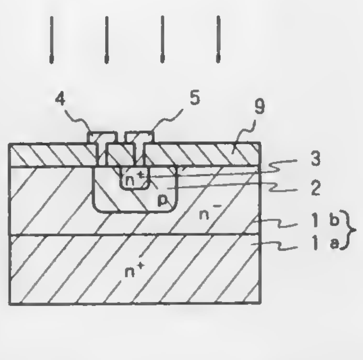
PCT No. PCT/JP96/01906, § 371 Date Mar. 3, 1997, § 102(e) Date Mar. 3, 1997, PCT Pub. No. WO97/03458, PCT Pub. Date Jan. 30, 1997

PCT Filed Jul. 9, 1996, Ser. No. 793,593

Claims priority, application Japan, Jul. 10, 1995, 7-173643

Int. Cl.⁶ H01L *21/324*

U.S. Cl. 438—795 **8 Claims**



1. A method of manufacturing a semiconductor device wherein a corpuscular beam is radiated to a semiconductor substrate to create crystal defects therein, comprising the steps of:

subjecting said semiconductor substrate to a heat treatment wherein rapid heating-up is done; and

rapidly cooling down said semiconductor substrate in a process prior to the step of carrying out the radiation with the corpuscular beam.

5,750,444

BREATHABLE FABRIC LAMINATION, APPARATUS AND METHODS

Curt Jarrell, Duluth, Ga.; Manfred Kubo, Embsen, Germany; Hans-Jurgen Meissner, Luneburg, Germany; Gustav Rieckmann, Wittorf, Germany, and Jurgen Benecke, Luneburg, Germany, assignors to Nordson Corporation, Westlake, Ohio

Division of Ser. No. 865,308, Apr. 8, 1992, Pat. No. 5,294,258. This application Oct. 4, 1993, Ser. No. 131,483

Int. Cl.⁶ B32B *3/10;5/24;5/26;33/00*

U.S. Cl. 442—62 **13 Claims**

1. A breathable, multiple layer, laminated article comprising:

a first layer of porous textile material;

a second layer of foam; and

a porous adhesive pattern disposed intermediate said textile material and said foam;

said adhesive pattern comprising a fine, random fibrous web of hot melt adhesive extruded from a slot die and contact coated onto one of said layers.

2. A breathable, non-skid fabric comprising:

a porous textile web and a non-skid component disposed on one side of said web;

said non-skid component comprising a matrix of cured adhesive extruded from a slot die and contact coated onto said web;

said matrix being porous and said fabric being breathable and flexible, and said matrix being deposited in part in the interstices of said textile web.

5,750,445

TREATMENT OF POLYAMIDE MATERIALS WITH PARTIAL FLUOROESTERS OR FLUOROTHIOESTERS OF MALEIC ACID POLYMERS AND SULFONATED AROMATIC CONDENSATES

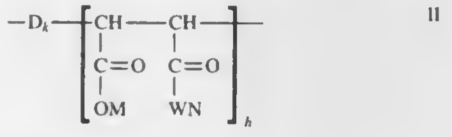
Engelbert Pechhold, Chadds Ford, Pa., and Peter Michael Murphy, Ooltewah, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 532,294, Sep. 22, 1995, Pat. No. 5,670,246. This application May 9, 1997, Ser. No. 854,234

Int. Cl.⁶ B32B *7/00*

U.S. Cl. 442—168 **11 Claims**

1. A fiber or textile treated according to a process for providing soil resistance and resistance to staining by acid dyes comprising application of an effective amount of a composition comprising a mixture of 1) a sulfonated phenol-formaldehyde condensation product which is useful as a dye-resist agent, a dye-fixing agent, a dye-reserving agent, or an agent which improves the wet-fastness of dyeings on polyamide fibers, and 2) a copolymer having units of formula II



$$-D_k-\left[\begin{array}{ll} CH- & CH- \\ | & | \\ C=O & C=O \\ | & | \\ OM & WN \end{array}\right]_h- \qquad II$$

wherein

D is a vinyl monomer selected from the group consisting of styrene, vinyl ether, and alpha olefin;

M is H, alkali metal or ammonium cation;

W is O, S, or a mixture thereof;

N is a mixture of R' and R" in a molar ratio of M:R':R" of :e:g;

R' is R_f—A_d—B—;

R_f is a fully fluorinated straight or branched aliphatic radical which can be interrupted by at least one oxygen atom; A is a divalent radical selected from the group consisting of —$SO_2N(R)$—, —CON(R)—, —S—, and —SO_2— wherein R is H or a C_1 to C_6 alkyl radical;

d is 0 or 1;

B is a divalent linear hydrocarbon radical —C_nH_{2n}— optionally endcapped by —(O—CH_2—$CH_2)_z$—, —(O—CH2—$CH(CH_3))_z$ or —(O—CH_2—$CH(CH_2Cl))_z$— wherein n is 2 to 12 and z is 0 to 50;

R" is either a C_1 to C_{30} alkyl group or a polysiloxane group of formula III

$$(CH_3)_3Si-O-[Si(CH_3)_2O]_j-CH_2- \qquad III$$

wherein j is 5 to 20;

e is 0.1 to 1.0;

g is 0 to 0.5;

h is 3 to 1000; and

k is 3 to 1000.

5,750,446

ABSORBENT BODY

Hien Nguyen, East Windsor, N.J.; Nicolas Martens, Wuppertal, Germany, and Glenn Garbolino, Edison, N.J., assignors to McNeil-PPC, Inc., Skillman, N.J.

Filed Dec. 22, 1995, Ser. No. 577,570

Int. Cl.⁶ A61F *13/22;* **A61L** *15/16;* **D04H** *1/44*

U.S. Cl. 442—337 **14 Claims**

1. An absorbent body having improved absorption capacity comprising a mixture of about 40 to about 99 wt-% of regenerated cellulosic fibers having a multi-limbed cross-section having at least three limbs and about 60 to about 1 wt-% of non-limbed, cellulosic fibers, the absorption capacity of said body being greater than that of a body formed of regenerated cellulosic fibers having multi-limbed cross-section not in admixture with non-limbed cellulosic fibers.

5,750,447

Patent Not Issued For This Number

5,750,448

COPPER(II) OXIDE-CONTAINING ALUMINOPHOSPHATE GLASSES

Danuta Grabowski, Taunusstein; Uwe Kolberg, Mainz; Alwin Weitzel, Mainz, and Magdalena Winkler-Trudewig, Mainz, all of Germany, assignors to Schott Glaswerke, Mainz, Germany

Filed Dec. 11, 1996, Ser. No. 764,009

Claims priority, application Germany, Dec. 12, 1995, 195 46 313.7

Int. Cl.⁶ C03C *3/19;3/066;4/08*

U.S. Cl. 501—47 **3 Claims**

1. Copper (II) oxide-containing aluminophosphate glass comprising (in % by weight, based on oxide):

Al_2O_3	4–9
P_2O_5	67–75
BaO	0.5–6
CaO	0.1–1
MgO	0–4
SrO	0–1
ZnO	0.2–1
EBaO + CaO + MgO + SrO + ZnO	3.5–7
Na_2O	1.5–5
K_2O	2.5–3.5
Li_2O	0.5–5
$ENa_2O + K_2O + Li_2O$	5–13
SiO_2	0–1
B_2O_3	1–2.5
As_2O_3	0.1–0.5
Cl^-	0–0.3
F^-	0–1.3
CeO_2	0.2–0.4
CuO	1–6
with $K_G = EAl_2O_3 + SiO_2 + CeO_2/EP_2O_5 + B_2O_3$	0.06–0.125
and having a refractive index, n_d, of from 1.52 to 1.54.	

5,750,449

CERAMIC POROUS BODIES AND METHOD OF PRODUCING THE SAME

Koichi Niihara, Suita, and Akira Yamakawa, Itami, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 381,966, Feb. 14, 1995, abandoned. This application Dec. 20, 1996, Ser. No. 771,431

Claims priority, application Japan, Jun. 14, 1993, 5-167506; Jun. 2, 1994, 6-145425

Int. Cl.⁶ C04B *38/00;35/56;35/58*

U.S. Cl. 501—80 **2 Claims**

1. A homogeneous ceramic porous body comprising of silicon carbide or silicon nitride, wherein the ceramic porous body has a mean pore diameter of not more than 1 μm and a porosity of not less than 35%, and has a flexural strength of not less than 100 MPa.

5,750,450

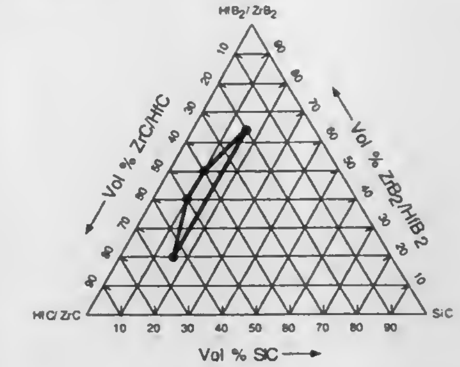
ABLATION RESISTANT ZIRCONIUM AND HAFNIUM CERAMICS

Jeffrey Bull, San Jose, Calif.; Michael J. White, Cumberland, R.I., and Larry Kaufman, Brookline, Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1996, Ser. No. 723,484

Int. Cl.⁶ C04B *35/577;35/58*

U.S. Cl. 501—91 **17 Claims**



1. A ceramic composite having a composition selected from the group consisting of (i) zirconium diboride, zirconium carbide and silicon carbide, (ii) hafnium diboride, hafnium carbide and silicon carbide and (iii) silicon carbide, at least one of zirconium diboride, hafnium diboride and mixture thereof, and at least one of zirconium carbide, hafnium carbide and mixture thereof, and wherein said silicon carbide is present in said composite in an amount of less than 20 volume %.

5,750,451

Patent Not Issued For This Number

5,750,452

DIELECTRIC CERAMIC COMPOSITION FOR MICROWAVE

Jung-Rae Park; Tae-Hong Kim; Suk-Jin Lee, and Tae-Goo Choy, all of Daejeon, Rep. of Korea, assignors to Korea Telecommunication Authority, Seoul, and Electronics And Telecommunications Research Institute, Daejeon, both of Rep. of Korea

Continuation of Ser. No. 531,642, Sep. 21, 1995, abandoned. This application Mar. 3, 1997, Ser. No. 804,280

Claims priority, application Rep. of Korea, Sep. 22, 1994, 94-23883; Nov. 16, 1994, 94-30097; Dec. 13, 1994, 94-33907

Int. Cl.⁶ C04B *35/468;35/472*

U.S. Cl. 501—138 **10 Claims**

4. A dielectric ceramic composition for microwave applications characterized in that said dielectric ceramic composition includes BaO, Sm_2O_3, TiO_2 and PbO as chief ingredients and further includes SrO, ZrO_2, MnO_2, MgO, ZnO, Bi_2O_3, La_2O_3, CeO_2, or a compound of them as accessory ingredients to selectively add one or more of said accessory ingredients into said chief ingredients, and thereby provide a following compositional formula;

$$x[(BaO)_{1-\alpha-\beta}(PbO)_\alpha(MO)_\beta]-y[(Sm_2O_3)_{1-\gamma-\delta}(La_2O_3)_\gamma(CeO_2)_\delta]-zTiO_2$$

wherein, $(MO)_\beta$ is SrO, ZrO_2, MnO_2, MgO, ZnO or Bi_2O_3, 6 mol %≦x≦20 mol %, 6 mol %≦y≦20 mol %, 60 mol %≦z≦75 mol %, 0.01 mol %≦α≦0.2 mol %, 0 mol %≦β≦0.3 mol %, 0 mol %≦γ≦0.3 mol %, 0 mol %≦δ≦0.3 mol %, and x+y+z=100 mol %.

5,750,453
HIGH SURFACE AREA MEIXNERITE FROM HYDROTALCITES INFILTRATED WITH METAL SALTS

Michael A. Easley, Arnold, and William E. Horn, Jr., Gibsonia, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1996, Ser. No. 771,461

Int. Cl.^{6} B01J *21/02*

U.S. Cl. 502—84 **34 Claims**

1. In a process of making a synthetic mixed metal oxide wherein a magnesium aluminum layered double hydroxide material is activated and hydrated in a substantially carbon dioxide-free solution to form a meixnerite, said meixnerite then activated to form a mixed metal oxide having a BET surface area of 290 m^2/g or greater, the improvement wherein said carbon dioxide-free solution contains a metal salt.

5,750,454
CATALYST COMPOSITION AND PROCESS FOR THE PRODUCTION OF OLEFINIC POLYMERS

Hiroyuki Shimizu; Akira Sano, and Kazuo Matsuura, all of Kawasaki, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed May 30, 1996, Ser. No. 655,513

Claims priority, application Japan, May 31, 1995, 7-157100

Int. Cl.^{6} C08F *4/64*

U.S. Cl. 502—114 **17 Claims**

1. A catalyst useful for the polymerization of olefinic polymers which comprises a composition resulting from mutual contact of the following Components (A), (B), (C) and (D):

said Component (A) being a reaction product resulting from mutual contact of components (a), (b) and (c):

said component (a) being represented by the formula

$$Me^1R^1_p(OR^2)_qX^1_{4-p-q} \quad I$$

wherein R^1 and R^2 each are a C_1–C_{24} hydrocarbon moieties, X^1 is a hydrogen atom or a halogen atom, Me^1 is titanium, zirconium or hafnium, p and q are $0 \leqq p \leqq 4$, $0 \leqq q \leqq 4$ and $0 \leqq p+q \leqq 4$,

said component (b) being represented by the formula

$$Me^2R^3_m(OR^4)_nX^2_{z-m-n} \quad II$$

wherein R^3 and R^4 each are a C_1–C_{24} hydrocarbon moieties, X^2 is a hydrogen atom or a halogen atom, Me^2 is an element of Groups I to III in the Periodic Table, z is a valence of Me^2, and m and n are $0 \leqq m \leqq z$, $0 \leqq n \leqq z$ and $0 < m+n \leqq z$, and

said component (c) being an organocyclic compound having two or more conjugated double bonds;

said Component (B) being a modified organoaluminum compound having Al—O— Al bonds;

said Component (C) being an organocyclic compound having two or more conjugated double bonds which is different from component (c); and

said Component (D) being an inorganic carrier or particulate polymer carrier.

5,750,455
CATALYTIC COMPOSITION AND PROCESS FOR THE ALKYLATION OF ALIPHATIC HYDROCARBONS

Yves Chauvin, Le Peco; André Hirschauer, Montesson, and Hélène Olivler, Rueil Malmaison, all of France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France

Filed Oct. 24, 1995, Ser. No. 547,205

Claims priority, application France, Oct. 24, 1994, 94 12778

Int. Cl.^{6} B01J *31/00;27/122;23/70;* **C07C** *2/58*

U.S. Cl. 502—164 **21 Claims**

1. A catalytic composition suitable for alkylation comprising at least one aluminium halide, at least one quaternary ammonium halide and/or at least one amine halohydrate, and at least one cuprous compound.

5,750,456
CATALYST COMPOSITION FOR PREPARING POLYKETONES

Stephen John Dossett, Aldershot, England, assignor to BP Chemicals Limited, London, England

Filed Mar. 26, 1996, Ser. No. 622,586

Claims priority, application United Kingdom, Mar. 29, 1995, 9506378

Int. Cl.^{6} B01J *31/00;* **C07F** *15/00;17/02;15/02*

U.S. Cl. 502—155 **8 Claims**

1. A catalyst composition suitable for use in a process for the preparation of polyketones comprising a Group VIII metal complex of a phosphinite of formula (I):

$$R^1R^2E(OPR^3_2)_2\ ^1 \quad (I)$$

where R^1 and R^2 are independently a halide or a hydrocarbyl;

R^3 is a hydrocarbyl group optionally substituted with a polar group; and E is boron, aluminum or gallium.

5,750,457
SOLID ACID CATALYST FOR PARAFFIN CONVERSION AND PROCESS FOR PARAFFIN CONVERSION USING THE SAME

Kyutae Na, Mitaka; Toshio Okuhara, Chiba, and Makoto Misono, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 215,947, Mar. 22, 1994, abandoned. This application Jul. 31, 1995, Ser. No. 509,299

Claims priority, application Japan, Mar. 26, 1994, 5-092125

Int. Cl.^{6} C07D *401/00;* **C01B** *25/00;* **C07C** *5/13;* **B01J** *27/188*

U.S. Cl. 502—211 **3 Claims**

1. A solid acid catalyst for paraffin conversion which consists of an acid salt of a heteropoly acid being represented by the following general formula (1):

$$A_xH_{(3-x)}PY_{12}O_{40} \quad (1)$$

wherein A represents one ion selected from the group consisting of alkali metal ion and ammonium ion : Y represents at least one atom selected from the group consisting of W and Mo; x represents a number of 2.2 to 2.8, and a metal Group VIII, wherein the acid salt of heteropoly acid has been impregnated in the metal of Group VIII.

5,750,458
COMBUSTION CATALYSTS CONTAINING BINARY OXIDES AND PROCESSES USING THE SAME

Teresa Kennelly, 31 Strawberry La., Belle Mead, N.J. 08502; John K. Hochmuth, 1706 Oak Ct., Monmouth Junction, N.J. 08852; Ting C. Chou, 1411 Oak Knoll Dr., San Jose, Calif. 95129, and Robert J. Farrauto, 227 Seneca Pl., Westfield, N.J. 07090

Division of Ser. No. 684,409, Apr. 12, 1991, Pat. No. 5,378,142. This application Jul. 7, 1994, Ser. No. 271,687

Int. Cl.^{6} B01J *23/10;* **C01F** *17/00*

U.S. Cl. 502—304 **13 Claims**

1. A catalyst composition comprising a refractory carrier on which is disposed a catalytic material comprising a mixture of a refractory inorganic binder, and a binary oxide of palladium and a rare earth metal.

5,750,459
SOL-GEL PROCESS FOR OBTAINING PURE AND MIXED OXIDE ZIRCONIA SPHERES, MICROSPHERES AND WASHCOATS, USEFUL AS CATALYSTS OR CATALYST SUPPORTS

Marcello Marella; Letizia Meregalli, and Michele Tomaselli, all of Venice, Italy, assignors to Enirisorse S.p.A., Italy

Filed Dec. 11, 1995, Ser. No. 570,684

Claims priority, application Italy, Dec. 21, 1994, MI94A2588

Int. Cl.^{6} B01J *13/00;23/63;35/08;101/50*

U.S. Cl. 502—304 **11 Claims**

1. A process for obtaining pure or mixed oxide zirconia spheres, microspheres or washcoats consisting of:

preparing a zirconium solution in water at a concentration, expressed as ZrO_2, or equal to or lower than 400 g/l, starting from a basic zirconium carbonate dissolved in concentrated nitric acid up to a molar ratio $(NO_3^-)/(Zr_4^+)$ of about 0.8, and optionally preparing at least one solution of other oxides;

preparing of a sol of zirconium, mixed with other metals, by a thickening agent and, optionally for spheres and microspheres, a surface active agent;

dripping the sol into an alkaline gelation bath for obtaining gel spheres or microspheres, or sucking the sol into honeycomb channels to obtain washcoats, with subsequent gelation with gaseous ammonia;

ageing the so obtained gel;

rinsing with water down to pH= 9–10, only for gel spheres or microspheres; and

drying and calcining.

7. A process according to claim 1) wherein the sol composition in terms of oxides is:

ZrO_2;

ZrO_2—Y_2O_3, with Y_2O_3 in the range 1–15% wt.;

ZrO_2—Al_2O_3, with Al_2O_3 in the range 1–30% wt.;

ZrO_2—Al_2O_3—CuO, with Al_2O_3 in the range 1–30% wt. and CuO in the range 1–20% wt.;

ZrO_2—Al_2O_3—CeO_2, with Al_2O_3 in the range 1–30% wt. and CeO_2 in the range 5–30% wt and containing a catalytically effective amount of rhodium and/or platinum and/or palladium.

5,750,460
CATALYST AND PROCESS FOR ITS PRODUCTION

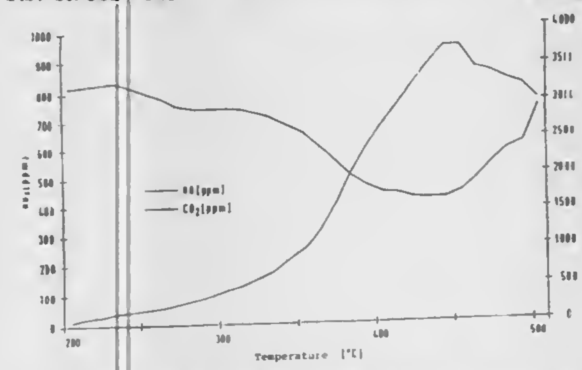
Martin Hartweg, Erbach; Martina Heinau, Ulm; Andrea Seibold, Blaustein-Arnegg; Leonhard Walz, Neu-Ulm; Thomas Fetzer, Speyer; Bernd Morsbach, and Wolfgang Buechele, both of Ludwigshafen, all of Germany, assignors to Daimler-Benz AG, Stuttgart, and BASF Aktiengesellschaft, Ludwigshafen, both of Germany

Filed Jun. 16, 1995, Ser. No. 490,933

Claims priority, application Germany, Jun. 16, 1994, 44 20 932.0

Int. Cl.^{6} B01J *23/06;21/04;23/72*

U.S. Cl. 502—342 **4 Claims**



1. A catalyst for at least one of the catalytic reduction of NO_x and the oxidation of hydrocarbons in waste gases comprising a spinel, wherein the spinel is a copper oxide-cobalt oxide-zinc oxide-aluminum oxide spinel having the chemical formula

$$Cu_{(0.5-B)}Co_BZn_{0.5}Al_2O_4,$$

where: O<B<0.5.

5,750,461
IODINE ADSORPTION AGENT

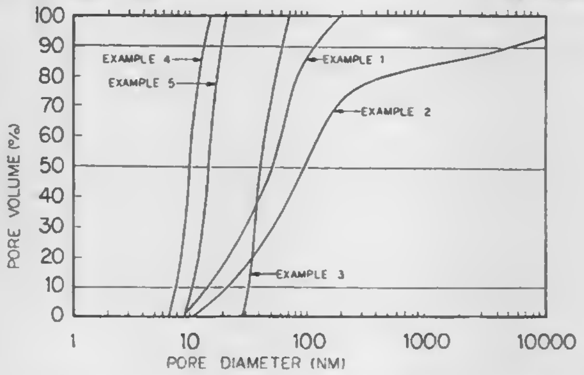
Thomas Engelhardt, Atle Poststrasse 13, 85356 Freising, and Reinhard Hähn, Birkenweg 12, 84186 Vilsheim, both of Germany

Filed Jul. 31, 1995, Ser. No. 509,186

Claims priority, application Germany, Aug. 20, 1994, 44 29 644.4

Int. Cl.^{6} B01J *23/50*

U.S. Cl. 502—347 **10 Claims**



1. An iodine adsorption agent comprising silver or a silver salt on a porous, temperature-resistant and acid-resistant inorganic carrier, wherein the carrier has an average pore diameter, d**50**, in the range from about 6 to 200 nm, and a pore diameter distribution in which about 80% of the pore volume is contained in pores whose diameters, comprising from 10% to 90% of the pore diameter distribution, d**10** through d**90**, lie within the range of 50% around the average pore diameter.

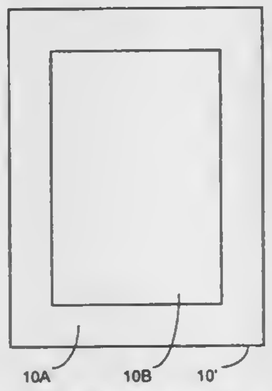
5,750,462
LATENT IMAGE PRINTING PROCESS AND APPARATUS AND SUBSTRATE THEREFOR

Arshavir Gundjian, Montreal, Canada, assignor to Nocopi Technologies, Inc., Wayne, Pa.

Division of Ser. No. 996,550, Dec. 24, 1992, Pat. No. 5,424,266, which is a continuation-in-part of Ser. No. 808,331, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 685,575, Apr. 15, 1991, abandoned. This application Dec. 21, 1994, Ser. No. 360,860

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—201 **6 Claims**



1. A printing process comprising the steps of:

providing a toner including a resin and only one of a pair of a color developer and color former dye, wherein the color developer and color former dye react when mixed to produce a first spectral response;

applying the toner to at least one first selected area of a substrate to obtain a developed image on the substrate in the at least one first selected area;

thereafter applying the other of the pair to the toner of the developed image when desired in the at least one first selected area to produce the first spectral response when applied.

5,750,463

THERMOGRAPHIC RECORDING FILMS

Edward J. Dombrowski, Jr., Bellingham; Rnbert L. Jones, Dracut; John C. Warner, Norwood, all of Mass., and Jiyue Yang, Warwick, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 22, 1997, Ser. No. 837,701

Int. Cl.^{6} B41M *5/32*

U.S. Cl. 503—204 **20 Claims**

1. A thermographic recording film comprising a support carrying an image-forming system comprising at least one layer and including a Lewis acid material, a di- or triarylmethane thiolactone dye precursor, an acidic organic material, a light insensitive organic silver salt, a reducing agent for the light insensitive organic silver salt and a binder.

5,750,464

THERMOGRAPHIC RECORDING

Edward J. Dombrowski, Jr., Bellingham, Mass.; Donna J. Guarrera, Addlestone, England; Robert L. Jones, Dracut, Mass.; Mark R. Mischke, Arlington, Mass.; John C. Warner, Norwood, Mass., and Jiyue Yang, Warwick, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 22, 1997, Ser. No. 837,775

Int. Cl.^{6} B41M *5/32*

U.S. Cl. 503—204 **21 Claims**

1. A thermographic recording film comprising a support carrying an image-forming system comprising at least one layer including a Lewis acid material, a di- or triarylmethane thiolactone dye precursor, an acidic organic material, a first binder and bis[1,2,2,6,6-pentamethyl-4-piperidinyl]sebacate, wherein said image-forming system comprises from about 0.30 about 0.70 parts by weight of bis[1,2,2,6,6-pentamethyl-4-piperidinyl]sebacate per part by weight of acidic organic material.

5,750,465

PLASTICIZERS FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Kin Kwong Lum, Webster; Christine J. T. Landry, Fairport, and Teh-Ming Kung, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

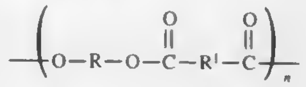
Filed Jun. 27, 1996, Ser. No. 670,312

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **15 Claims**

6. A process of forming a dye transfer image comprising:
   a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a binder, and
   b) transferring a dye image to a dye-receiving element to form said dye transfer image,

wherein said dye layer also contains a polymeric plasticizer having a Tg less than about 25° C., said plasticizer comprising



$$\left(O-R-O-\overset{\overset{O}{\|}}{C}-R^1-\overset{\overset{O}{\|}}{C} \right)_n$$

wherein:

R and R^1 each independently represent a substituted or unsubstituted linear or branched alkylene, phenylene or cycloalkylene group of from 1 to about 12 carbon atoms; and

n is an integer selected so that the plasticizer has a polystyrene equivalent weight average molecular weight of from about 18,000 to about 300,000.

5,750,466

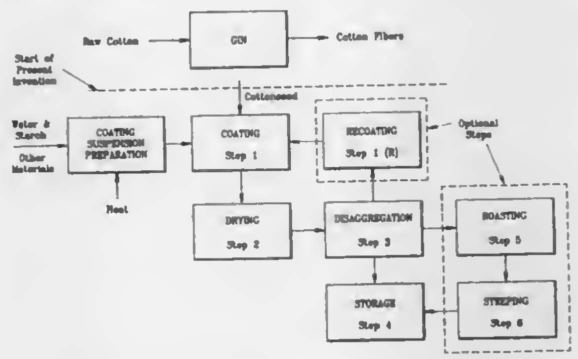
COATED COTTONSEED AND A PROCESS FOR ITS MANUFACTURE

Thomas C. Wedegaertner; Thomas D. Valco, and William F. Lalor, all of Raleigh, N.C., assignors to Cotton Incorporated, New York, N.Y.

Filed Aug. 2, 1996, Ser. No. 691,578

Int. Cl.^{6} A01N *25/26;* **A23K** *1/14;1/16;* **A01C** *1/06*

U.S. Cl. 504—100 **13 Claims**



1. A process for preparing starch coated cottonseed consisting essentially of the following steps:
   a) spraying linter-bearing cottonseed with a coating consisting essentially of a hot, aqueous, gelatinized starch suspension, optionally containing one or more biologically related materials selected from vitamins, feed supplements, oils, fats, urea, anti-fungal agents, rodent repellants, insect repellants, medications, anti-germination agents, and preservatives, while agitating said linter-bearing cottonseed to yield starch suspension coated cottonseed;
   b) drying said starch suspension coated cottonseed to yield starch coated cottonseed;
   c) disaggregating said starch coated cottonseed; and
   d) cooling and storing said starch coated cottonseed.

5,750,467

LIGNIN-BASED PEST CONTROL FORMULATIONS

Baruch S. Shasha, Peoria; Michael R. McGuire, Metamora, both of Ill., and Robert W. Behle, Columbia, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and Biotechnnology Research & Development Corporation, Peoria, Ill.

Filed Dec. 6, 1995, Ser. No. 568,159

Int. Cl.^{6} A01N *25/04;25/10;25/24*

U.S. Cl. 504—116 **38 Claims**

1. A pest control formulation prepared by the process comprising the steps of:
   (a) mixing water, lignin, and a pH adjuster to form a solubilized lignin solution having a pH of between about 7 and about 12;
   (b) mixing a multivalent salt in an amount sufficient to crosslink said lignin and within the range of about 0.05 to about 0.5 mol per 100 grams of lignin and a pesticidally effective amount of a pest control agent with the solubilized lignin solution;
   (c) drying the mixture of (b) to form a dispersible formulation;
   (d) adding water to the dispersible formulation to form the pest control formulation.

5,750,468

GLYPHOSATE FORMULATIONS CONTAINING ETHERAMINE SURFACTANTS

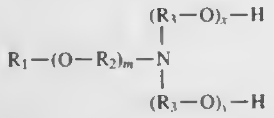
Daniel R. Wright, St. Louis; Ronald J. Brinker, Ellisville; Joseph J. Sandbrink, St. Louis, and Al S. Wideman, St. Louis County, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 419,299, Apr. 10, 1995, abandoned. This application Mar. 15, 1996, Ser. No. 599,363

Int. Cl.^{6} A01N *25/30;57/02*

U.S. Cl. 504—206 **61 Claims**

1. A herbicidal composition comprising
   (a) a herbicidally effective amount of glyphosate or a salt thereof; and
   (b) an effective herbicidal activity enhancing amount of a surfactant having the chemical structure



wherein R$_1$ is a straight or branched chain C$_6$ to about C$_{22}$ alkyl, aryl or alkylaryl group, m is an average number from 1 to about 10, R$_2$ in each of the m (O—R$_2$) groups is independently C$_1$–C$_4$ alkylene, R$_3$ groups are independently C$_1$–C$_4$ alkylene, and x and y are average numbers such that x+y is in the range from 2 to about 60.

5,750,469

SUBTITUTED LACTIC ACID DERIVATIVES HAVING AN N-ORGANIC RADICAL IN THE β-POSITION

Ernst Baumann, Dudenhofen; Joachim Rheinheimer; Uwe Josef Vogelbacher, both of Ludwigshafen; Matthias Gerber; Wilhelm Rademacher, both of Limburgerhof; Helmut Walter, Obrigheim, and Karl-Otto Westphalen, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/02825, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO95/07266, PCT Pub. Date Mar. 16, 1995

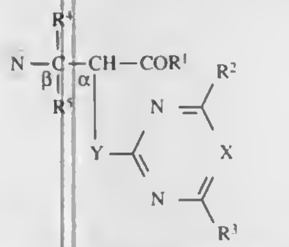
PCT Filed Sep. 25, 1994, Ser. No. 605,141

Claims priority, application Germany, Sep. 4, 1993, 43 29 911.3

Int. Cl.^{6} C07D *239/60;* **A01N** *43/54*

U.S. Cl. 504—243 **9 Claims**

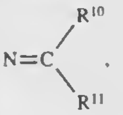
1. A lactic acid, having an N-organic radical in the β-position, of the formula I



(I)

where the substituents have the following meanings:

R^1 is a radical OR^9, where R^9 is
   i) hydrogen, an alkali metal cation, the equivalent of an alkaline earth metal cation, the ammonium cation or an organic ammonium ion;
   ii) a C$_3$–C$_8$-cycloalkyl group which can carry one to three C$_1$–C$_4$-alkyl radicals;
   iii) a C$_1$–C$_8$-alkyl group which can carry one to five halogen atoms and one of the following radicals: C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-alkylthio, cyano, C$_1$–C$_4$-alkylcarbonyl, C$_3$–C$_8$-cycloalkyl, C$_1$–C$_4$-alkoxycarbonyl, phenyl, or phenyl or phenoxy, which is mono- or polysubstituted by halogen, nitro, cyano, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-haloalkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-haloalkoxy and C$_1$–C$_4$-alkylthio;
   iv) a C$_1$–C$_8$-alkyl group which can carry one to five halogen atoms and carries one of the following radicals: pyrazolyl, imidazolyl, benzimidazolyl, triazolyl, benzotriazolyl, isoxazolyl, oxazolyl and thiazolyl, bonded via a C atom or, if possible, N atom, where the heteroaromatic can carry one to four halogen atoms and one or two of the following radicals: nitro, cyano, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-haloalkyl, C$_1$–C$_4$-alkoxy, phenyl, C$_1$–C$_4$-haloalkoxy and C$_1$–C$_4$-alkylthio;
   v) a C$_2$–C$_6$-alkyl group which in the 2-position carries a radical selected from the group consisting of C$_1$–C$_4$-alkoxyimino, C$_3$–C$_6$-alkenyloxyimino, C$_3$–C$_6$-haloalkenyloxyimino and benzyloxyimino;
   vi) a C$_3$–C$_6$-alkenyl or C$_3$–C$_6$-alkynyl group, where these groups for their part can carry one to five halogen atoms;
   vii) a phenyl radical which can carry one to five halogen atoms and one to three of the following radicals: nitro, cyano, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-haloalkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$ -haloalkoxy and C$_1$–C$_4$-alkyithio;
   Viii) a pyrazolyl, imidazolyl, benzimidazolyl, triazolyl, benzotriazolyl, preferably bonded via the 1-position, where the heteroaromatic can carry one or two of the radicals selected from the group consisting of halogen, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-haloalkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-haloalkoxy, C$_1$–C$_4$-alkylthio and phenyl;
   ix) a group



where
   R^{10} and R^{11}, which can be identical or different, are selected from the group consisting of C$_1$–C$_8$-alkyl, C$_3$–C$_6$-alkenyl, C$_3$–C$_6$-alkynyl, C$_3$–C$_8$-cycloalkyl, where these radicals can carry a C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-alkylthio and a substituted or unsubstituted phenyl radical;
   phenyl, which can be substituted by one or more of the radicals selected from the group consisting of halogen, nitro, cyano, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-haloalkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-haloalkoxy and C$_1$–C$_4$-alkylthio; or
   R^{10} and R^{11} together form a C$_3$–C$_{12}$-alkylene chain which can carry one to three C$_1$–C$_4$-alkyl groups and can contain a heteroatom from the group consisting of oxygen, sulfur and nitrogen;

R^2 is methoxy;

X is CH;

R^3 is methoxy;

R^4 is C$_1$–C$_8$-alkyl, which can carry one to five halogen atoms and one of the following radicals: C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-alkylthio, cyano, hydroxyl, C$_1$–C$_4$-alkylcarbonyl, C$_1$–C$_4$-alkoxycarbonyl, phenyl, phenoxy and phenylcarbonyl;
   C$_1$–C$_8$-alkyl, which can carry one to five halogen atoms and carries a pyrrolyl, pyrazolyl, imidazolyl, or triazolyl;
   C$_3$–C$_8$-cycloalkyl or C$_3$–C$_8$-cycloalkenyl, where a methylene group in the saturated or unsaturated ring can be replaced by an oxygen or sulfur atom, where the cycloalkyl or cycloalkenyl radicals can be substituted by one to five halogen atoms and one of the following radicals: C$_1$–C$_4$-alkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-alkylthio, cyano, C$_1$–C$_4$-alkylcarbonyl, C$_1$–C$_4$-alkoxycarbonyl and phenyl:
   C$_3$–C$_6$-alkenyl or C$_3$–C$_6$-alkynyl, which can carry one to five halogen atoms and one of the following radicals: C$_1$–C$_4$-alkyl, C$_1$–C$_4$-alkoxy, C$_1$–C$_4$-alkylthio, cyano, C$_1$–C$_4$-alkylcarbonyl, C$_1$–C$_4$-alkoxycarbonyl and phenyl;
   furyl, thienyl, pyrryl, pyrazolyl, imidazolyl, triazolyl, isoxazolyl, oxazolyl, isothiazolyl, thiazolyl, thiadiazolyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl, oxa-2,4-diazolyl, oxa-3,4-diazolyl, where the heteroaryl rings can carry one to five halogen atoms and one of the following radicals: nitro, cyano, hydroxyl, mercapto, amino,

C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4 -alkylcarbonyl, C_1–C_4-alkoxycarbonyl and phenyl;

phenyl or naphthyl, which can be substituted by one or more of the radicals selected from the group consisting of halogen, nitro, cyano, hydroxyl, mercapto, amino, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4-alkylcarbonyl and C_1–C_4-alkoxycarbonyl;

R^5 is hydrogen, C_1–C_4-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl, C_1– C_4-alkylcarbonyl, C_3–C_8-cycloalkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxyalkyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylthioalkyl or phenyl, or

R^4 and R^5, together with the adjacent carbon atom, forms a 3- to 8-membered ring which can contain an oxygen or sulfur atom, and is unsubstituted or, depending on ring size, carries one to three of the radicals selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio;

Y is sulfur or oxygen; and

Ⓝ is a radical N_3.

5,750,470
HERBICIDAL 2,6-DISUBSTITUTED PYRIDINE COMPOUNDS AND COMPOSITIONS

Katsushi Morimoto, Sodegaura; Masatoshi Ohnari; Hiroyuki Furusawa, both of Narashino; Takumi Terachi, Funabashi; Tsutomu Nawamaki, Tokyo; Kimihiro Ishikawa, Yono; Kunimitsu Nakahira, Minamisaitama-gun, and Chiaki Kawaguchi, Urawa, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

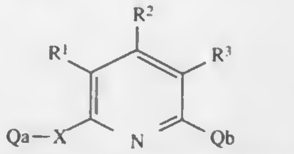
Filed Feb. 24, 1997, Ser. No. 804,916

Claims priority, application Japan, Aug. 23, 1994, 6-198429; Jul. 14, 1995, 7-178740

Int. Cl.⁶ C07D *413/04;413/14*

U.S. Cl. 504—253 **13 Claims**

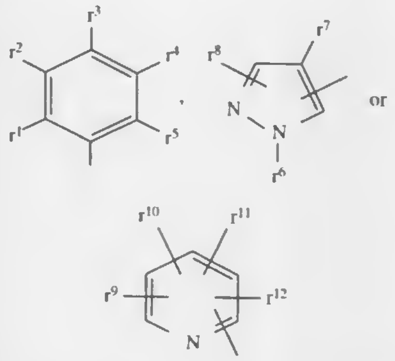
1. A pyridine derivative represented by the formula (1):



(1)

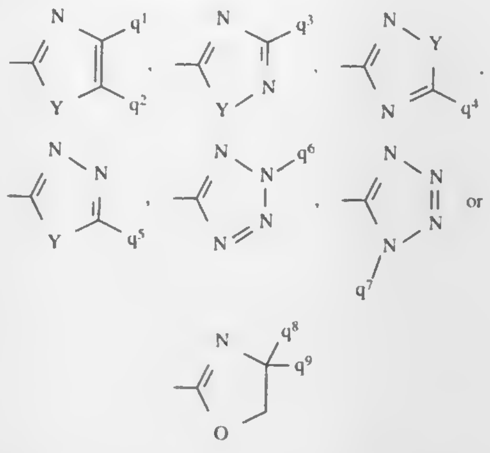
wherein R^1, R^2 and R^3 each independently represent a hydrogen atom, a C_{1-6} alkyl group, a C_{1-4} haloalkyl group, a C_{1-4} alkoxy group, a cyano group, a nitro group or a halogen atom,

Qa represents



wherein r^1, r^2, r^3, r^4 and r^5 each independently represent a hydrogen atom, a C_{1-4} alkyl group, a C_{1-4} haloalkyl group, a C_{1-4} alkoxy group, a cyano group, a nitro group or a halogen atom, r^6 represents a hydrogen atom, a C_{1-6} alkyl group, a C_{3-6} cycloalkyl group which may be substituted by a C_{1-4} alkyl group, a C_{2-4} alkenyl group, a C_{2-4} alkynyl group or a C_{1-4} haloalkyl group, r^7 and r^8 each independently represent a hydrogen atom, a C_{1-6} alkyl group, a C_{3-6} cycloalkyl group, a C_{2-4} alkenyl group, a C_{2-4} alkynyl group, a C_{1-4} haloalkyl group, a C_{1-4} alkoxycarbonyl group, a cyano group, a halogen atom or a nitro group, and r^9, r^{10}, r^{11} and r^{12} each independently represent a hydrogen atom, a C_{1-4} alkyl group, a C_{1-4} haloalkyl group, a C_{1-4} alkoxy group, a cyano group, a nitro group or a halogen atom,

Qb represents



wherein q^1, q^2, q^3, q^4 and q^5 each independently represent a hydrogen atom, a C_{1-6} alkyl group, a C_{3-6} cycloalkyl group which may be substituted by a C_{1-4} alkyl group or a halogen atom, a C_{1-4} haloalkyl group, a C_{1-4} alkoxy group, a cyano group, a nitro group, a halogen atom, a C_{1-4} alkoxy C_{1-4} alkyl group, a C_{1-4} haloalkoxy C_{1-4} alkyl group, a phenyl group, a benzyl group, a 3-pyridyl group, a C_{1-4} alkoxycarbonyl group, a C_{2-4} alkenyl group which may be substituted by a halogen atom, a C_{1-4} haloalkoxy group, a C_{1-4} alkylthio group, a C_{1-4} alkylsulfinyl group, a C_{1-4} alkylsulfonyl group, a C_{2-4} alkenyloxy group, a C_{3-4} alkynyloxy group, a C_{1-4} haloalkylthio group, a C_{2-4} alkenylthio group, a C_{3-4} alkynylthio group, a C_{1-4} alkylamino group, a C_{2-4} haloalkylamino group, a di-C_{1-4} alkylamino group, a carbamoyl group, a N-cyclopropylcarbamoyl group, a hydroxyl group, an epoxy group which may be substituted by a C_{1-4} alkyl group, or a di-C_{2-4} haloalkylamino group, q^6, q^7, q^8 and q^9 each independently represent a hydrogen atom or a C_{1-6} alkyl group, Y represents an oxygen atom, a sulfur atom or N-q^{10}, and q^{10} represents a hydrogen atom or a C_{1-4} alkyl group,

X represents an oxygen atom, a sulfur atom or N-R^4, and R^4 represents a hydrogen atom or a C_{1-4} alkyl group.

5,750,471
CYCLIC SULFONAMIDE HERBICIDES

Balreddy Kamireddy, Hockessin, and William Mark Murray, Bear, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

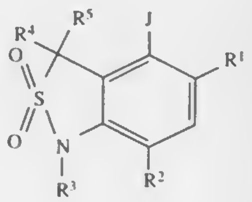
PCT No. PCT/US95/06706, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1996, PCT Pub. No. WO95/33746, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 2, 1995, Ser. No. 737,649

Int. Cl.⁶ A01N *43/80;* **C07D** *417/04*

U.S. Cl. 504—269 **8 Claims**

1. A compound of Formula 1, or an agriculturally-suitable salt thereof,



1

wherein

R^1 is H; F; Cl, or Br;

R^2 is H; F; Cl; Br; CF_3; nitro; or cyano;

R^3 is H; C_1–C_8 alkyl; C_3–C_8 cycloalkyl; C_3–C_8 alkenyl; C_3–C_8 alkynyl; C_1–C_8 haloalkyl; C_2–C_8 alkoxyalkyl; C_3–C_8 alkoxyalkoxyalkyl; C_3–C_8 haloalkynyl; C_3–C_8 haloalkenyl; C_1–C_8 alkylsulfonyl; C_1–C_8 haloalkylsulfonyl; C_3–C_8 alkoxycarbonylalkyl; $S(O)_2NH(C_1$–C_8 alkyl); $C(O)R^6$; or benzyl optionally substituted on the phenyl ring with R^7;

R^4 is H; C_1–C_3 alkyl; or halogen;

R^5 is H; C_1–C_6 alkyl; C_1–C_6 haloalkyl; halogen; $S(O)_2(C_1$–C_6 alkyl); or $C(=O)R^8$; or

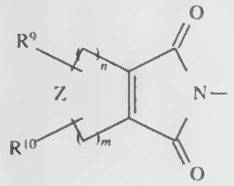
R^4 and R^5 are taken together along with the carbon to which they are attached to form a spiro-cyclopropane ring;

R^6 is C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_1–C_6 alkoxy; $NH(C_1$–C_6 alkyl); phenyl optionally substituted with R^7; benzyl; or C_2–C_8 dialkylamino;

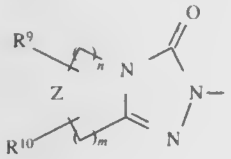
R^7 is C_1–C_6 alkyl; 1–2 halogen; C_1–C_6 alkoxy; or CF_3;

R^8 is H; C_1–C_6 alkyl; C_1–C_6 alkoxy; or $NH(C_1$–C_6 alkyl);

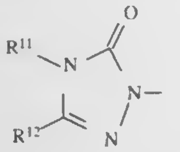
J is



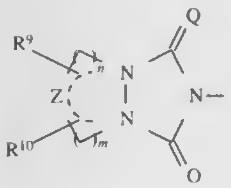
J-1



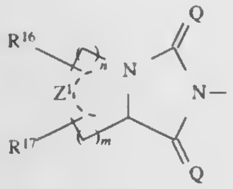
J-2



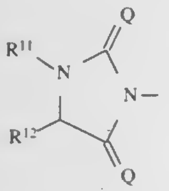
J-3



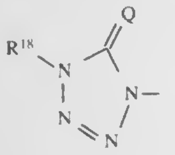
J-5



J-6

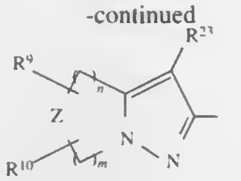


J-7

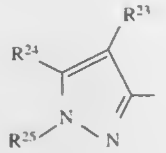


J-9

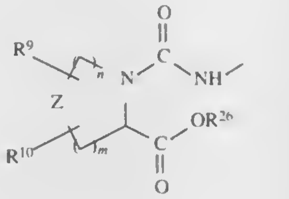
-continued



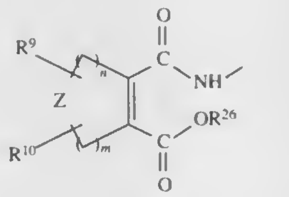
J-15



J-16



J-17



J-18

wherein the dashed line in J-5 and J-6 indicates that the left-hand ring contains only single bonds or one bond in the ring is a carbon-carbon double bond;

n and m are each independently 0; 1; or 2; provided that m+n is 2;

Z is CR^9R^{10}; O; S; S(O); $S(O)_2$; or $N(C_1$–C_4 alkyl); provided that when J is other than J-1, then Z is CR^9R^{10} or $N(C_1$–C_4 alkyl);

each R^9 is independently H; C_1–C_3 alkyl; halogen; hydroxy; C_1–C_6 alkoxy; C_1–C_6 haloalkyl; C_1–C_6 haloalkoxy; C_2–C_6 alkylcarbonyloxy; or C_2–C_6 haloalkylcarbonyloxy;

each R^{10} is independently H; C_1–C_3 alkyl; hydroxy; or halogen;

R^{11} and R^{12} are each independently H; halogen; C_1–C_6 alkyl; C_3–C_6 alkenyl; or C_1–C_6 haloalkyl;

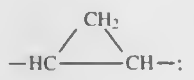
each Q is independently O or S;

Z^1 is $CR^{16}R^{17}$; O; S; S(O); $S(O)_2$; or $N(C_1$–C_4 alkyl);

each R^{16} is independently H; halogen; hydroxy; C_1–C_6 alkoxy; C_1–C_6 haloalkyl; C_1–C_6 haloalkoxy; C_2–C_6 alkylcarbonyloxy; or C_2–C_6 haloalkylcarbonyloxy;

each R^{17} is independently H; hydroxy; or halogen; or

when R^{16} and R^{17} are bonded to adjacent atoms they can be taken together with the carbons to which they are attached to form



R^{18} is C_1–C_6 alkyl; halogen; or C_1–C_6 haloalkyl;

R^{23} is halogen or cyano;

R^{24} is C_1–C_6 alkylsulfonyl; C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_3–C_6 alkenyl; C_3–C_6 alkynyl; C_1–C_6 alkoxy; C_1–C_6 haloalkoxy; or halogen;

R^{25} is C_1–C_6 alkyl; C_1–C_6 haloalkyl; C_3–C_6 alkenyl; or C_3–C_6 alkynyl; and

R^{26} is C_1–C_6 alkyl; C_1–C_6 haloalkyl; or phenyl optionally substituted with C_1–C_6 alkyl, 1–2 halogen, 1–2 nitro, C_1–C_6 alkoxy, or CF_3.

5,750,472

LAMINARIN AS A SEED GERMINATION AND PLANT GROWTH ACCELERATOR

Jean-Claude Yvin; Florence Levasseur, both of Saint Malo; Cyrille Amin-Gendy, Argenteuil; Kiem-Ngoe Tran Thanh, Gif sur Yvette; Pascale Patier, Tassin-la-Deth-Lune; Cyrille Rochas, La Combe de Lancey; Yvette Janine Lienart, St Nizier d'Uriage, and Bernard Cloarec, Saint Pol de Leon, all of France, assignors to Laboratoires Goemar S.A., Saint Malo, France

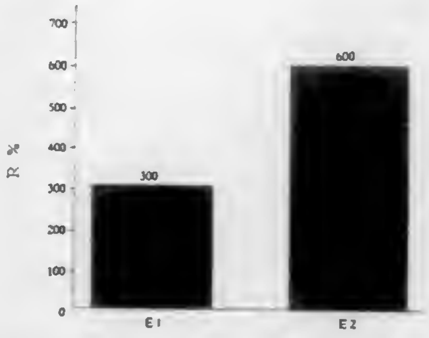
PCT No. PCT/FR93/00698, § 371 Date Mar. 14, 1995, § 102(e) Date Mar. 14, 1995, PCT Pub. No. WO94/00993, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 6, 1993, Ser. No. 367,130

Claims priority, application France, Jul. 7, 1992, 92 08387

Int. Cl.^{6} A01N *43/16*

U.S. Cl. 504—292 **19 Claims**



1. A method for accelerating a plant's growth comprising a step of applying a composition containing an effective amount of laminarin to the leaves of said plant.

5,750,473

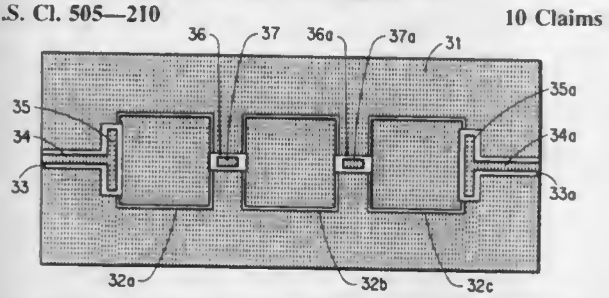
PLANAR HIGH TEMPERATURE SUPERCONDUCTOR FILTERS WITH BACKSIDE COUPLING

Zhi-Yuan Shen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 11, 1995, Ser. No. 438,827

Int. Cl.^{6} H01P *1/203;* **H01B** *12/02*

U.S. Cl. 505—210 **10 Claims**



1. A high temperature superconducting planar filter comprising:

a) a single planar substrate having a front side and a back side,

b) at least two planar resonators disposed in spaced-apart, coplanar relation to one another on the front side of the substrate, each resonator comprising a respective high temperature superconducting film pattern,

c) a planar ground plane comprising a high temperature superconducting film disposed of the back side of the substrate, and

d) a coupling circuit comprising a coplanar waveguide input line electrically isolated from the ground plane and electromagnetically coupled to one of the at least two resonators, a coplanar waveguide output line electrically isolated from the ground plane and electromagnetically coupled to another one of the at least two resonators, and coplanar waveguide interconnecting lines electrically isolated from the ground plane and respectively electromagnetically coupled between adjacent ones of the at least two resonators; wherein at least a portion of the coupling circuit is disposed on the back side of the substrate and coplanar with the ground plane.

5,750,474

METHOD FOR MANUFACTURING A SUPERCONDUCTOR-INSULATOR-SUPERCONDUCTOR JOSEPHSON TUNNEL JUNCTION

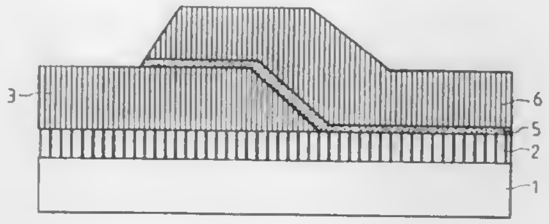
Gun-Yong Sung, and Jeong-Dae Suh, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Sep. 5, 1996, Ser. No. 708,499

Claims priority, application Rep. of Korea, Dec. 15, 1995, 1995-50515

Int. Cl.^{6} H01L *39/24*

U.S. Cl. 505—329 **18 Claims**



1. A method for manufacturing a superconductor-insulator-superconductor Josephson tunnel junction, said method comprising the steps of:

(a) fixing an oxide single crystalline substrate on which a high temperature superconducting thin film is to be grown, to a substrate heating plate of a pulse laser depositor by use of a silver adhesive;

(b) depositing a $PrBa_2\ Cu_3O_{7x}$(PBCO) template layer on said substrate by a pulse laser deposition process;

(c) depositing an a-axis oriented $YBa_2Cu_3O_{7x}$ (YBCO) lower electrode on said PBCO template layer by a laser deposition process;

(d) dry-etching said a-axis oriented YBCO lower electrode while illuminating argon ion beams at an incident angle of 20° to 80° thereby forming the lower electrode with an oblique edge at an angle of 20° to 80°;

(e) depositing a barrier layer over the etched YBCO lower electrode by a pulse laser deposition process;

(f) depositing an a-axis oriented YBCO upper electrode over said barrier layer; and

(g) subjecting said barrier layer and said YBCO upper electrode both to dry etch thereby forming the barrier layer and the YBCO upper electrode with an oblique edge at an angle of 20° to 80°.

5,750,475

ADDITIVE COMBINATION TO REDUCE DEPOSIT FORMING TENDENCIES AND IMPROVE ANTIOXIDANCY OF AVIATION TURBINE OILS

Paul Joseph Berlowitz, East Windsor, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 678,912, Jul. 12, 1996, abandoned. This application May 20, 1997, Ser. No. 859,312

Int. Cl.^{6} C10M *141/06;135/32*

U.S. Cl. 508—258 **12 Claims**

1. A method for enhancing the resistance to deposit formation and improve the oxidative stability of a turbo oil composition comprising a major portion of a synthetic ester based base stock by adding to said turbo oil base stock a minor portion of deposit resisting and oxidation resisting additive comprising a mixture of a non-sulfur containing substituted triazine derivative and 2,5-dimercapto-1,3,4-thiadizole (DMTD), its derivatives or mixtures thereof.

5,750,476

POWER TRANSMITTING FLUIDS WITH IMPROVED ANTI-SHUDDER DURABILITY

Roger Keith Nibert, Hampton; Ricardo Alfredo Bloch, Scotch Plains; Maryann Devine, Lincroft; Manoj Tandon, Princeton, and Raymond Frederick Watts, Long Valley, all of N.J., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Oct. 18, 1995, Ser. No. 544,955

Int. Cl.^{6} C10M *133/16*

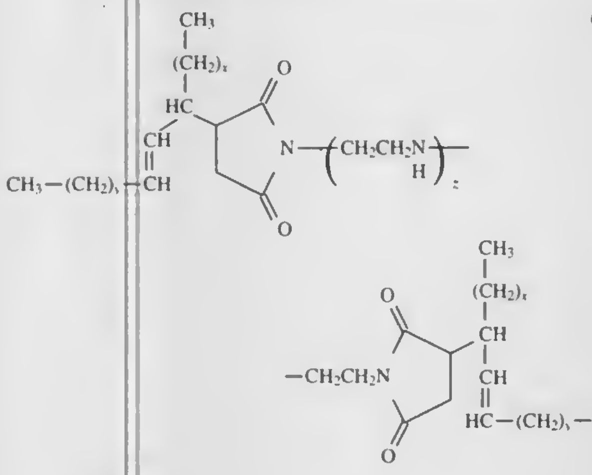
U.S. Cl. 508—291 **13 Claims**

1. A power transmitting fluid comprising:

(1) a major amount of a lubricating oil, and

(2) an anti-shudder improving effective amount of an additive combination comprising:

(a) a reaction product of an isomerized alkenyl substituted succinic anhydride and a polyamine characterized by structure (I), where structure (I) is:



(I)

where

x and y are independent integers whose sum is from 1 to 30, and

z is an integer from 1 to 10;

(b) an oil-soluble phosphorus-containing compound; and

(c) optionally, an additive selected from the group consisting of a metallic detergent, a polyol ester friction modifier, and mixtures thereof.

5,750,477

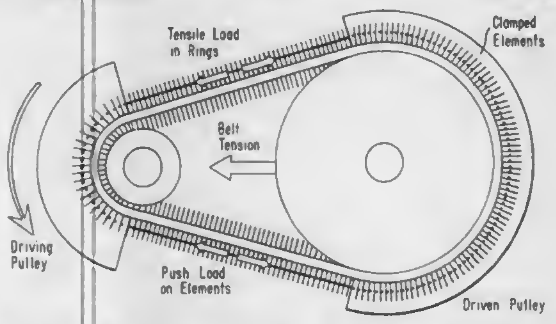
LUBRICANT COMPOSITIONS TO REDUCE NOISE IN A PUSH BELT CONTINUOUS VARIABLE TRANSMISSION

James L. Sumiejski, Mentor, Ohio; Roy Fewkes, Derbyshire, United Kingdom, and Craig Daniel Tipton, Perry, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jul. 10, 1995, Ser. No. 500,810

Int. Cl.^{6} C10M *135/02;143/00*

U.S. Cl. 508—331 **61 Claims**



34. A shear stable composition for use as a lubricant and function fluid, said composition comprising:

A. A majority of an oil of lubricating viscosity said oil having a viscosity of 1–10 centistoke (cSt) at 100° C.;

B. 1–15% by weight of a metal salt of an organic acid;

C. 0.5–10% by weight of a metal dialkyl dithiophosphate;

D. 0.5–10% by weight of a sulfurized mixture of olefins, fats and fatty acids;

E. 0.05–3% by weight of a fatty amide;

F. 0.5–10% by weight of dialkyl phosphite; and

G. 1–25% by weight of a shear stable viscosity modifier;

wherein said composition has a Brookfield Viscosity of less than 20,000 cP at −40° C. and a viscosity loss of less than 20% at 100° C. where determined after a 20 hour Tapered Bearing Shear Test.

5,750,478

HIGH LOAD-CARRYING TURBO OILS CONTAINING AMINE PHOSPHATE AND SULFURIZED FATTY ACID

Jeenok T. Kim, Holmdel; Paul Joseph Berlowitz, East Windsor; Manuel A. Francisco, Washington, and Morton Beltzer, Westfield, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 577,784, Dec. 22, 1995, abandoned. This application Feb. 28, 1997, Ser. No. 808,101

Int. Cl.^{6} C10M *141/06;141/08*

U.S. Cl. 508—331 **11 Claims**

1. A method for enhancing the load carrying capacity of a turbo oil comprising a major amount of a base stock of a synthetic base oil selected from diesters and polyol ester base oil suitable for use as a turbo oil base stock by adding to said turbo oil base stock a minor amount of load carrying additive comprising a mixture of sulfurized linear C_{14}–C_{18} fatty acid, SFA, and an amine phosphate wherein the amine phosphate is monobasic hydrocarbyl amine salt of a diacid phosphate or of mixed mono and diacid phosphates and the sulfurized fatty acid is present in an amount by weight in the range 100 to 1000 ppm and the amine phosphate is present in an amount in the range 50 to 300 ppm based on basestock.

5,750,479

ENCLOSED FLUID SYSTEM CONDITIONER AND PROCESS THEREFOR

Ronald A. Kramer, Dublin, Ohio, assignor to Bandon Corp., Dublin, Ohio

Filed Feb. 14, 1997, Ser. No. 800,851

Int. Cl.^{6} C10M *129/70*

U.S. Cl. 508—463 **20 Claims**

1. A process for treating an interior seal of an enclosed fluid system, comprising;

adding to the fluid system a composition including one or more esters of an aliphatic monocarboxylic acid having 2 carbon atoms reacted with an aliphatic monohydric alcohol having from 2 to 17 carbon atoms.

5,750,480

ALKYLATED ANISOLE LUBRICANT BASESTOCK

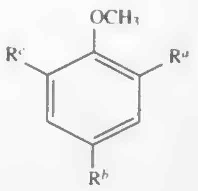
Yusheng Xiong, Newtown, Pa.; Margaret M. Wu; L. Brewster Young, both of Skillman, N.J., and Alice S. Chu, Spotswood, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 18, 1996, Ser. No. 619,867

Int. Cl.^{6} C10M *105/18*

U.S. Cl. 508—580 **17 Claims**

1. A hydrolytically stable lubricant base oil exhibiting superior antiwear properties, dispersancy, thermal stability, low pour point and oxidative stability, said base oil consisting essentially of a mixture of mono, di and tri alkylated anisole having the following structure:



wherein R_a, R_b and R_c are hydrogen with at least one of said R_a, R_b and R_c comprising a secondary alkyl radical containing 8 to 24 carbon atoms, produced by contacting anisole and an olefinic alkylating agent feedstream comprising C_8–C_{24} monoolefins in an alkylation zone with acidic alkylation catalyst under alkylation conditions which minimize the formation of olefin oligomers whereby a lubricant consisting esentially of alkylated anisole free of olefin oligomers is produced and separating and recovering said alkylated anisole lubricant having a pour point below −20° C.

5,750,481
SOAPS PRODUCED FROM HIGH LAURATE CANOLA OIL-BASED FATTY ACIDS

Anthony J. Del Vecchio, Davis, Calif.; Eric Jungermann, Phoenix, Ariz., and Hemendra N. Basu, Bartlett, Ill., assignors to Calgene, Inc., Davis, Calif.

Filed Jan. 17, 1996, Ser. No. 587,981

Int. Cl.⁶ A61K *7/50*

U.S. Cl. 510—152 **20 Claims**

1. A soap comprising saponified products of a laurate canola oil.

15. A soap obtained by a process, comprising the steps of:

producing C12:0 fatty acids in a plant seed cell by growing a plant having integrated into its genome a DNA construct, the construct comprising in the 5' to 3' direction of transcription, a transcriptional regulatory region functional in the plant seed cell, a translational regulatory region functional in the plant seed cell, a plant transit peptide encoding sequence, a DNA sequence encoding C12:0 preferring acyl-ACP thioesterase functional in the plant seed cell and a transcription termination region functional in the plant seed cell:

recovering the fatty acid containing oil of the seed cell and saponifying said oil or the fatty acids obtained from said oils.

5,750,482
GLASS CLEANING COMPOSITION

Gerald Cummings, West Chester, Ohio, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 63,347, May 18, 1993, abandoned, which is a continuation of Ser. No. 743,060, Aug. 9, 1991, abandoned. This application Dec. 7, 1995, Ser. No. 568,527

Int. Cl.⁶ C11D *7/50*

U.S. Cl. 510—182 **27 Claims**

1. A non-streaking glass cleaning composition formulated for direct application to glass surfaces, in use, the composition consisting essentially of, by percent weight of the entire composition:

from about 0.01 to about 0.5%, in total, of at least one surfactant selected from the group consisting of sodium dodecyl benzene sulfonate, sodium lauryl sulfate, and nonoxynol -5:

from about 0.001 to about 0.1% of a fluorosurfactant selected from the group consisting of (a) anionic salts of perfluoroaliphaticoxybenzenesulfonic acids, (b) anionic salts of linear perfluoroalkyloxybenzoic acids, (c) fluorosurfactants having the formula $R_fCH_2CH_2SCH_2CO_2M$, where R_f is $F(CF_2CF_2)_n$, and n is about 3 to about 8 and M is one of an alkali metal and ammonium, (d) fluorosurfactants having the formula $C_nF_{2n+1}CO_2M$, where C_nF_{2n+1} is a straight chain fluorocarbon radical, n is from about 8 to about 12, and M is one of an alkali metal and ammonium, (e) fluorosurfactants having the formula $C_nF_{2n+1}SO_3M$, where C_nF_{2n+1} is a straight chain fluorocarbon radical, n is from about 8 to about 12, and M is an alkali metal cation, (f) fluorosurfactants having the formula $R_fCH_2CH_2O(CH_2CH_2O)_nH$, where R_f is a straight chain $F(CF_2CF_2)_n$ radical and n is from about 3 to about 8, (g) fluorosurfactants having the formula $R_f(OCH_2CH_2)_nOR_f$, where R_f is a branched chain radical selected from the group consisting of C_8F_{15}, $C_{10}F_{19}$, and $C_{12}F_{23}$, and n is from about 10 to about 30, (h) fluorosurfactants having the formula $R_f(OCH_2CH_2)_mOR$, where R_f is a branched chain radical selected from the group consisting of C_8F_{15}, $C_{10}F_{19}$, and $C_{12}F_{23}$, m is from about 2 to about 20, and R is a C_1 to C_3 alkyl, (i) FLUORAD FC-129, $R_fSO_2N(C_2H_5)CH_2CO_2^-K^+$, where R_f is C_nF_{2n+1} and n is about 8, and (j) FLUORAD FC-171, $R_fSO_2N(C_2H_5)(CH_2CH_2O)_xCH_3$, where R_f is C_nF_{2n+1}, n is about 8, and the average value of x is about 7:

from about 0.1 to about 1% ethylene glycol monohexyl ether;

from about 1 to about 5% of a low boiling solvent having a boiling point of less than about 115° C. selected from the group consisting of methyl alcohol, ethyl alcohol, isopropyl alcohol, n-butyl alcohol, and sec-butyl alcohol:

from about 1 to about 3% of a high boiling solvent having a boiling point of from 120° to about 230° C. selected from the group consisting of ethylene glycol, propylene glycol, trimethylene glycol, tetramethylene glycol, 1,2-butanediol, 1,2-pentanediol, 1,4-pentanediol, 2,3-hexanediol, ethylene glycol monoethyl ether, ethylene glycol monopropyl ether, ethylene glycol monobutyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, propylene glycol monopropyl ether, propylene glycol monobutyl ether, and dipropylene glycol monomethyl ether; and

water; and

a pH modifying agent selected from (i) an acidic pH modifying agent to provide a pH of from about 3.5 to about 6.5 and (ii) a basic pH modifying agent to provide a pH from about 7.5 to about 11.5.

5,750,483
NON-PHOSPHATE MACHINE DISHWASHING COMPOSITIONS CONTAINING POLYCARBOXYLATE POLYMERS AND NONIONIC GRAFT COPOLYMERS OF VINYL ACETATE AND POLYALKYLENE OXIDE

Michael C. Welch, Woodhaven, and Kenneth L. Zack, Wyandotte, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.

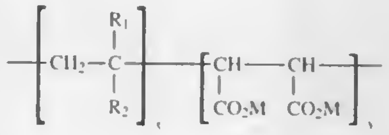
Filed Dec. 6, 1995, Ser. No. 568,032

Int. Cl.⁶ C11D *3/37;3/39;3/395*

U.S. Cl. 510—230 **18 Claims**

1. A nonphosphate, peroxygen based machine dishwashing composition consisting of by weight:

(a) 0.1–10% nonionic surfactants,
(b) 2–40% non-phosphate builders selected from the group consisting of alkali metal salts of carbonate, bicarbonate and silicate and citrate,
(c) 5–15% non-chlorine bleach,
(d) 1–5% bleach precursors,
(e) 0.1–10% polycarboxylate polymer wherein said polycarboxylate polymer has a molecular weight of 500–250,000 and the structural formula:



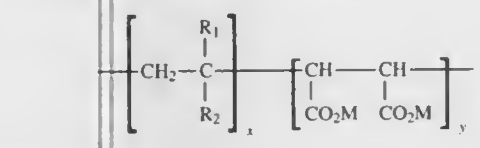
$$-\left[CH_2-\overset{R_1}{\underset{R_2}{C}}\right]_x-\left[\underset{CO_2M}{CH}-\underset{CO_2M}{CH}\right]_y-$$

wherein R_1=H or CH_3; R_2 is CO_2M; M=H or an alkali metal: x=7–1,500; y=0–1,000;

(f) 0.1–10% nonionic graft copolymer of vinyl acetate and polyalkylene oxides wherein said nonionic graft copolymer of vinyl acetate and polyalkyleneoxide is obtained by grafting (a) a polyalkylene oxide having a number average molecular weight of from 300–100,000 and based on ethylene oxide, propylene oxide and/or butylene oxide with (b) vinyl acetate in a weight ratio (a)(b) of from 1:0.2–1:10; and (g) balance, filler.

2. A non-phosphate, peroxygen based machine dishwashing composition consisting of by weight:

(a) 0.1–10% nonionic surfactants,
(b) 2–40% non-phosphate builders selected from the group consisting of alkali metal salts of carbonate, bicarbonate and silicate and citrate,
(c) 5–15% non-chlorine bleach,
(d) 1–5% bleach precursors,
(e) 0.5–8% enzymes,
(f) 0.1–10% polycarboxylate polymers wherein said polycarboxylate polymer has a molecular weight of 500–250,000 and the structural formula:



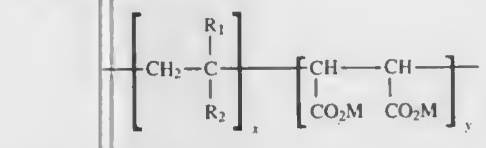
$$-\left[CH_2-\overset{R_1}{\underset{R_2}{C}}\right]_x-\left[\underset{CO_2M}{CH}-\underset{CO_2M}{CH}\right]_y-$$

wherein R_1=H or CH_3; R_2 is CO_2M; M=H or an alkali metal; x=7–1,500; y=0–1,000;

(g) 0.1–10% nonionic graft copolymers of vinyl acetate and polyalkylene oxides wherein said nonionic graft copolymer of vinyl acetate and polyalkyleneoxide is obtained by grafting (a) a polyalkylene oxide having a number average molecular weight of from 300–100,000 and based on ethylene oxide, propylene oxide and/or butylene oxide with (b) vinyl acetate in a weight ratio (a):(b) of from 1:0.2–1:10; and (h) balance, filler.

3. A method of reducing the spotting and filming of dishware comprising contacting said dishware with a non-phosphate, peroxygen based machine dishwashing composition comprising by weight:

(a) 0.1–10% nonionic surfactants,
(b) 2–40% non-phosphate builders,
(c) 5–15% non-chlorine bleach,
(d) 1–5% bleach precursors,
(e) 0.1–10% polycarboxylate polymer wherein said polycarboxylate polymer has a molecular weight of 500–250,000 and the structural formula:



$$-\left[CH_2-\overset{R_1}{\underset{R_2}{C}}\right]_x-\left[\underset{CO_2M}{CH}-\underset{CO_2M}{CH}\right]_y-$$

wherein R_1=H or CH_3; R_2 is CO_2M; M=H or an alkali metal; x=7–1,500; y=0–1,000;

(f) 0.1–10% nonionic graft copolymer of vinyl acetate and polyalkylene oxides wherein said nonionic graft copolymer of vinyl acetate and polyalkyleneoxide is obtained by grafting (a) a polyalkylene oxide having a number average molecular weight of from 300–100,000 and based on ethylene oxide, propylene oxide and/or butylene oxide with (b) vinyl acetate in a weight ratio (a):(b) of from 1:0.2–1:10.

5,750,484
COMPOSITION AND IMPROVED PH DRIVEN METHOD FOR WASTEWATER SEPARATION USING AND AMPHOTERIC CARBOXYLATE AND A CATIONIC DESTABILIZER COMPOSITION

David J. Falbaum, St. Paul; Robert D. Hei, Cottage Grove; Helmut K. Maier, Golden Valley, and Paul J. Mattia, Prior Lake, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

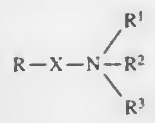
Continuation of Ser. No. 429,896, Apr. 27, 1995, abandoned, which is a continuation-in-part of Ser. No. 267,664, Jun. 29, 1994, Pat. No. 5,523,000. This application Feb. 19, 1997, Ser. No. 802,219

Int. Cl.⁶ C11D *14/02;3/02*

U.S. Cl. 510—276 **15 Claims**

1. An alkaline cleaning concentrate composition comprising in powder form;

(a) an effective detergent amount comprising 5 to 95 wt-% of a source of alkalinity;
(b) an effective detergent and pH phase separation amount comprising about 1–20 wt-% of an amphoteric carboxylate surfactant of the formula:



$$R-X-N\begin{matrix}R^1\\-R^2\\R^3\end{matrix}$$

wherein

X s a linear or branched alkylene, hydroxyalkylene or alkoxyalkylene group having 1–4 carbon atoms;

R is R^4—CO—NH in which R^4 is a saturated or unsaturated, branched or linear alkyl group having 11–22 carbon atoms, or R^4;

R^1 is hydrogen, A or $(A)_n$—X—$CO_2^-Z^+$ in which A is a linear or branched alkyl, hydroxyalkyl or alkoxyalkyl having 1–4 carbon atoms, n is an integer from Q to 6, and Z is an alkali metal cation, a hydrogen ion or an ammonium cation;

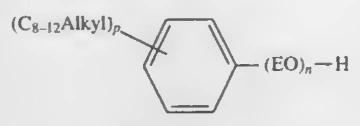
R^2 is $(A)_n$—X—$CO_2^-Z^+$; and

R^3 is absent or A;

(c) an effective detergent amount comprising about 1 to 25 wt-% of a nonionic surfactant composition comprising a $C_{8\text{-}12}$ alcohol ethoxylate of the formula:

$C_{8\text{-}18}$ Alkyl-O-$(EO)_m$—H

or a mono- or di-$C_{8\text{-}12}$ alkyl phenol ethoxylate surfactant of the formula:



each having from 3–15 moles of ethylene oxide per mole of surfactant and p is 1 or 2;

wherein when fabric soiled with greasy or oil soils is cleaned in an aqueous cleaning composition containing an effective cleaning amount of the concentrate resulting in an alkaline effluent containing substantial quantities of organic hydrophobic soil which may be separated from the aqueous effluent by contacting the effluent, at a pH less than 7, with an effective amount of cationic emulsion destabilizing composition.

5,750,485
LAUNDRY DETERGENT CONTAINING A POLYHYDROXY FATTY AMIDE AND INSOLUBLE ETHOXYLATED ALCOHOL

Gerard Marcel Baillely, and Suzanne Powell, both of Newcastle upon Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 162,162, Apr. 29, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 468,236

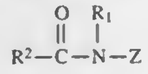
Claims priority, application United Kingdom, Jun. 18, 1991, 9113139

Int. Cl.⁶ C11D *7/18*

U.S. Cl. 510—315 **4 Claims**

1. A laundry detergent composition useful for cleaning fabrics in automatic washing machines, said composition comprising one or more water soluble anionic, cationic, ampholytic or zwitterionic detersive surfactants or mixtures thereof, and detergent builder compounds, said composition comprising:

(a) from 1% to 10% by weight of the composition of a polyhydroxy fatty acid amide having the formula



$$R^2-\overset{\overset{O}{\|}}{C}-\overset{\overset{R_1}{|}}{N}-Z$$

where R_1 is H, C_1–C_4 hydrocarbyl, 2-hydroxyethyl, 2-hydroxypropyl or a mixture thereof, R_2 is C_3–C_{31} hydrocarbyl, and Z is a polyhydroxyhydrocarbyl having a linear hydrocarbon chain with at least hydroxy groups directly connected to said chain, or an alkoxylated derivative thereof;

(b) from 1% to 6% by weight of the composition of a substantially water-insoluble ethoxylated C_{12}–C_{15} primary aliphatic alcohol containing an average of three ethylene oxide groups per mole;

(c) from 5% to 10% by weight of anionic surfactant mixture comprising, by weight of said mixture, a major proportion of C_{14}–C_{15} alkyl sulfate and a minor proportion of C_{12}–C_{15} alkyl ethoxyl sulfate containing an average of three ethoxyl groups per mole; and

(d) from 15% to 50% by weight of a non-phosphate detergent builder;

wherein the weight ratio of said mixture to the combined weight of said exthoxylated aliphatic alcohol and said polyhydroxy fatty acid amide is in a range from 1:3 to 3:1.

5,750,486

LOW-FOAMING CLEANING FORMULATIONS

Pilar Ibanez, Barcelona; Jaume Josa, Terrassa, and Miguel Osset, Barcelona, all of Spain, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/03255, § 371 Date Jul. 5, 1996, § 102(e) Date Jul. 5, 1996, PCT Pub. No. WO95/10586, PCT Pub. Date Apr. 20, 1995

PCT Filed Sep. 29, 1994, Ser. No. 624,588

Claims priority, application Germany, Oct. 8, 1993, 43 34 368.6

Int. Cl.^{6} C11D *1/835*

U.S. Cl. 510—356 **6 Claims**

1. A low-foaming cleaning composition free of polymers consisting essentially of 1% to 5% by weight of cationic surfactants and 5% to 10% by weight of a viscosity-increasing nonionic surfactant mixture consisting essentially of

a) fatty alcohol polyethylene glycol ethers corresponding to formula (I):

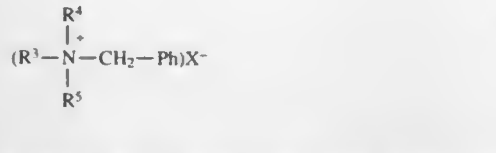
$$R^1O—(CH_2CH_2O)_mH \qquad (I)$$

in which R^1 is a linear alkyl or alkenyl radical containing 12 to 18 carbon atoms and m is a number of 1 to 10, and

b) oxoalcohol polyethylene glycol ethers corresponding to formula (II):

$$R^2O—(CH_2CH_2O)_nH \qquad (II)$$

in which R^2 is a linear and branched alkyl radical containing 11 to 15 carbon atoms and n is a number of 1 to 10, wherein said polyethylene glycol ethers corresponding to formulae (I) and (II) are present in a ratio by weight of 1:3 to 3:1, all weights being based on the weight of said composition, said cationic surfactants comprising quartenary benzylammonium compounds corresponding to formula (III):



$$\left(R^3-\overset{\overset{\displaystyle R^4}{|+}}{\underset{\underset{\displaystyle R^5}{|}}{N}}-CH_2-Ph\right)X^- \qquad (III)$$

in which R^3 and R^4 independently of one another represent an optionally hydroxy-substituted alkyl radical containing 1 to 4 carbon atoms, R^5 is an alkyl or alkenyl radical containing 12 to 22 carbon atoms, Ph is a phenyl radical and X is halide.

5,750,487

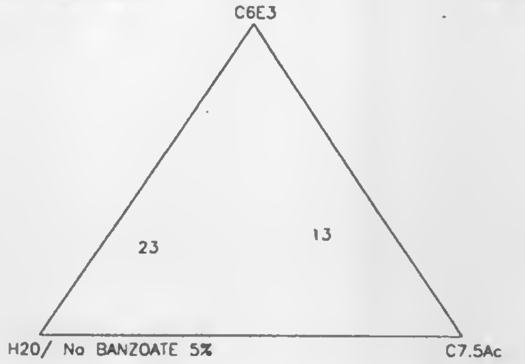
TRICRITICAL POINT COMPOSITIONS

Louis Oldenhove, Heks, and Guy Broze, Grace-Hollgne, both of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 296,805, Aug. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 45,071, Apr. 12, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 388,114

Int. Cl.^{6} C11D *7/50*

U.S. Cl. 510—365 **16 Claims**



1. A liquid cleaning composition having a surface tension at 25° C. of about 10 to 35 mN/m and incorporating at least a polar solvent, a water soluble or water dispersible low molecular weight amphiphile and a non-polar or weakly polar solvent and deriving from three co-existing liquid phases which are capable of being converted into one single phase according to a reversible equilibrium, wherein the first phase is the most abounding with the polar solvent, the second phase is the most abounding with the water soluble or water dispersible low molecular weight amphiphile and the third phase is the most abounding with the non-polar solvent or weakly polar solvent, and the interfacial tension between said first phase and said second phase is 0 to about 1×10^{-3} mN/m, and the interfacial tension between second phase and third phase is a 0 to about 1×10^{-3} mN/m, and the interfacial tension between first phase and third phase is 0 to about 1×10^{-3} mN/m, wherein the polar solvent is water at a concentration of about 15 to about 85 wt %, the amphiphile being an organic compound having a water insoluble hydrophobic portion which has a partial polar parameter and hydrogen bonding parameter, both of which are less than about 5 $(MPa)^{1/2}$, and a water soluble hydrophilic portion which has a partial hydrogen bonding solubility parameter greater than about 10 $(MPa)^{1/2}$; said amphiphile being present at a concentration of about 5 to about 60 wt %; and said non-polar solvent or weakly polar solvent having a dispersion solubility parameter greater than about 10 $(MPa)^{1/2}$and a hydrogen bonding solubility parameter of less than about 15 $(MPa)^{1/2}$, said non-polar solvent or weakly polar solvent being present at a concentration of about 15 to about 55 wt %, said composition being surfactant face.

5,750,488

FLUORINATED CLEANING SOLVENTS

Malcolm W. Haskell, Delran, N.J.; Richard Miller, Doylestown, and Suzanne Zefferi, Morrisville, both of Pa., assignors to CRC Industries, Inc., Warminster, Pa.

Filed Jan. 4, 1996, Ser. No. 582,820

Int. Cl.^{6} C11D *7/30;7/50*

U.S. Cl. 510—412 **21 Claims**

1. A solvent composition comprising

(a) at least one fluorinated chemical of the formula $C_aF_bH_cN_dO_e$ wherein $2\leqq a\leqq 8$, $5\leqq b\leqq 18$, $0\leqq c\leqq 13$, $0\leqq d\leqq 2$ and $0\leqq e\leqq 2$, and

(b) at least one acetal of the formula $R^1—O—CHR^2—O—R^3$ wherein R^1 and R^3 are independently of the formula C_fH_g in which $1\leqq f \leqq 6$ and $3\leqq g\leqq 16$ and R^2 is hydrogen or has said formula C_fH_g wherein said acetal is present in an amount of from about 5% to about 20% by weight, based on the weight of the solvent composition and, further,

wherein said solvent composition passes a Flame Projection Test.

5,750,489

LIQUID DETERGENT COMPOSTIONS CONTAINING STRUCTURING POLYMERS FOR ENHANCED SUSPENDING POWER AND GOOD POURABILITY

Rigoberto Felipe Garcia, Nutley; Tirucherai Varahan Vasudevan, West Orange; Albert Joseph Post, Teaneck, and Feng-Lung Gordon Hsu, Tenafly, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 402,675, Mar. 15, 1995, abandoned, which is a continuation-in-part of Ser. No. 242,224, May 13, 1994, abandoned. This application Jan. 18, 1996, Ser. No. 591,247

Int. Cl.^{6} C11D *17/00;3/37*

U.S. Cl. 510—417 **18 Claims**

1. A liquid detergent composition comprising

(a) 31% to about 80% by wt. of one or more surfactants predominantly present as lamellar drops dispersed in an aqueous medium containing at least 1% by wt. electrolyte;

wherein said surfactant is selected from the group consisting of anionic surfactants, nonionic surfactants, cationic surfactants, amphoteric surfactants, zwitterionic surfactants and mixtures thereof; and wherein unsaturated fatty acids and salts thereof comprise no more than 2% by weight of the total composition;

(b) 0.1% to 20% by wt. deflocculating polymer;

(c) a substantially linear, water soluble, highly salt-tolerant, non-adsorbing, structuring ionic polymer having a molecular weight (MW) of 10,000 to 1,000,000 Daltons, the concentration of said structuring polymer ranging from a minimum of $a(MW)^{-0.75}$ wt. % to a maximum of 20% by weight, wherein a is equal to 770; and

wherein the composition has a Sisko index of 0.35 or less as measured by the Sisko rheological model;

wherein said structuring polymer does not decrease the viscosity of the composition, as measured at 21 sec^{-1}, relative to the viscosity prior to addition of said polymer;

wherein said structuring polymer does not increase the viscosity, as measured at 21 sec^{-1}, above 5000 mpas; and

wherein said composition results in no more than 5% bottom clear layer separation by volume upon storage at 37° C. for 30 days.

15. A liquid detergent pH jump system composition comprising

(a) 31% to about 80% by wt. of one or more surfactants predominantly present as lamellar drops dispersed in an aqueous medium containing 1% to 60% by wt. electrolyte;

wherein said surfactant is selected from the group consisting of anionic surfactants, nonionic surfactants, cationic surfactants, amphoteric surfactants, zwitterionic surfactants and mixtures thereof; and wherein unsaturated fatty acids and salts thereof comprise no more than 2% by weight of the total composition;

(b) a pH jump system comprising 1.0% to 25.0% by wt., based on the weight of the composition, sorbitol; and 0.5% to 10.0% by wt., based on the weight of the composition, boron containing compound

(c) 0.1% to 15% by wt. deflocculating polymer;

(d) 0.1 to 20% by wt. of a substantially linear water soluble, highly salt-tolerant, non-adsorbing structuring ionic polymer having a MW of 10,000 to 1,000.000 Daltons, the concentration of said structuring polymer ranging from a minimum of $a(MW)^{-0.75}$ wt. % to a maximum of 20% by weight, wherein a is equal to 770;

wherein the composition has a Sisko index of about 0.35 or less as measured by the Sisko rheological model;

wherein said structuring polymer does not decrease the viscosity of the composition, as measured at 21 sec^{-1}, relative to the viscosity prior to addition of said polymer;

wherein said polymer does not increase the viscosity, as measured at 21 sec^{-1} above 5000 mPas; and

where said composition results in no more than 5% bottom clear layer separation by volume upon storage at 37° C. for 30 days.

5,750,490

DETERGENT MIXTURES

Anneliese Wilsch-Irrgang, Sprockhoevel; Fred Schambil, Monheim; Theodor Voelkel, Erkrath, all of Germany; Miguel Osset, Barcelona, and Rafael Pi, Granollers, both of Spain, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/00230, § 371 Date Jul. 31, 1996, § 102(e) Date Jul. 31, 1996, PCT Pub. No. WO95/20640, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 23, 1995, Ser. No. 687,587

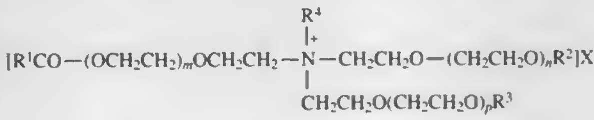
Claims priority, application Germany, Jan. 31, 1994, 44 02 852.0

Int. Cl.^{6} C11D *1/62*

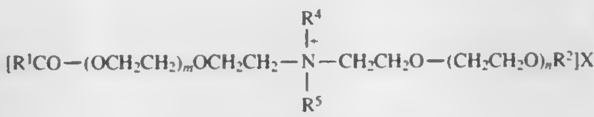
U.S. Cl. 510—504 **3 Claims**

1. Detergent mixtures comprising

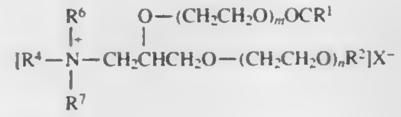
(a) esterquats corresponding to formulae (I), (II) or (III):



$$[R^1CO-(OCH_2CH_2)_mOCH_2CH_2-\overset{\overset{\displaystyle R^4}{|+}}{\underset{\underset{\displaystyle CH_2CH_2O(CH_2CH_2O)_pR^3}{|}}{N}}-CH_2CH_2O-(CH_2CH_2O)_nR^2]X^- \qquad (I)$$



$$[R^1CO-(OCH_2CH_2)_mOCH_2CH_2-\overset{\overset{\displaystyle R^4}{|+}}{\underset{\underset{\displaystyle R^5}{|}}{N}}-CH_2CH_2O-(CH_2CH_2O)_nR^2]X^- \qquad (II)$$



$$[R^4-\overset{\overset{\displaystyle R^6}{|+}}{\underset{\underset{\displaystyle R^7}{|}}{N}}-CH_2\overset{\overset{\displaystyle O-(CH_2CH_2O)_mOCR^1}{|}}{CH}CH_2O-(CH_2CH_2O)_nR^2]X^- \qquad (III)$$

in which R^1CO is an acyl radical containing 6 to 22 carbon atoms, R^2 and R^3 independently of one another represent hydrogen or have the same meaning as R^1CO, R^4, R^5, R^6 and R^7 independently of one another represent an alkyl group containing 1 to 4 carbon atoms or a $(CH_2CH_2O)_qH$ group, m, n and p together are 0 or numbers of 1 to 12, q is a number of 1 to 12 and X stands for halide, alkyl sulfate or alkyl phosphate,

(b) soil-repelling polymers containing ethylene terephthalate or polyethylene glycol terephthalate groups, wherein said esterquats and said soil-repelling polymers are present in a ratio by weight of 70:30 to 99.5;0.5, and

(c) from 1% to 50% by weight of alkyl or alkenyl sulfates, based on the weight of said esterquats.

5,750,491

SUPER CONCENTRATE EMULSIONS WITH FABRIC ACTIVES

Frans DeBlock, Merchtem, and Jean-Francois Bodet, Brussels, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/08593, § 371 Date Jun. 14, 1996, § 102(e) Date Jun. 14, 1996, PCT Pub. No. WO95/04184, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 29, 1994, Ser. No. 592,385

Claims priority, application European Pat. Off., Aug. 2, 1993, 93202276

Int. Cl.^{6} D06M *13/46;13/184*

U.S. Cl. 510—521 **8 Claims**

1. Concentrated, non gelling, easily dispersible fabric treatment composition comprising:

a) a fabric softening compound having the formula:

$$(R)_{4-m}—N+—[(CH2)_n—Y—R^2] \qquad X^-$$

wherein

each Y=—O—(O)C—, or —C(O)—O—; m=1, 2 or 3; each n=1 to 4; each R substituent is a short chain C_1–C_6 alkyl or hydroxyalkyl group, benzyl or mixtures thereof: each R^2 is a long chain C_{12}–C_{22} hydrocarbyl, or substituted hydrocarbyl substituent; and the counterion, X^-, is any softener-compatible anion; and

b) an aromatic acid mixture comprising benzoic acid and a substituted aromatic acid selected from the group consisting of salicylic acid, para hydroxy benzoic acid and mixtures thereof, said fabric treatment composition comprising at least 30% by weight in total of cationic fabric softening compounds, including a).

5,750,492
SURFACTANTS BASED ON QUATERNARY AMMONIUM COMPOUNDS PREPARATION PROCESSES SOFTENING BASES AND COMPOSITIONS DERIVED

Jean-Pierre Contet, Saint Jean De Moirans; Stéphane Courdavault Duprat, Meylan; Yvan Storet, Veurey-Voroize, and Jean-Francois Vindret, Saint Laurent Du Pont, all of France, assignors to Stepan Europe, France

Continuation of Ser. No. 447,219, May 22, 1995, Pat. No. 5,637,743, which is a continuation of Ser. No. 998,566, Dec. 30, 1992, abandoned. This application Jun. 10, 1997, Ser. No. 872,357

Claims priority, application France, Dec. 31, 1991, 9116479; Mar. 12, 1992, 9203199; Jul. 17, 1992, 9209087

Int. Cl.^{6} C07C *211/13;233/36:233/38;* **C11D** *1/00*

U.S. Cl. 510—527 **10 Claims**

1. A softening composition comprising at least one quaternary ammonium salt prepared by quaternizing the product of the condensation reaction between a fatty acid fraction containing at least one saturated or unsaturated, linear or branched fatty acid, or derivative thereof,

said fatty acids or derivatives having a hydrocarbon chain in which the number of atoms is between 5 and 23, and

at least one functionalized tertiary amine, the sum of the carbon atoms in the alkyl chains of said tertiary amine being from 4–12, and the alkyl chains including from one to four

functional groups selected from the group consisting of hydroxyl and amino,

wherein the molar ratio of the fatty acid fraction to tertiary amine is from about 1.85:1 and 1.40:1 dissolved in a solvent.

5,750,493
METHOD TO IMPROVE THE BIOLOGICAL AND ANTIVIRAL ACTIVITY OF PROTEASE INHIBITORS

Jean-Pierre Sommadossi, Birmingham, Ala., and Raymond F. Schinazi, 1524 Regency Walk Dr., Decatur, Ga. 30033, assignors to Raymond F. Schinazi, Decatur, Ga., and University of Alabama at Birmingham, Birmingham, Ala.

Filed Aug. 30, 1995, Ser. No. 521,474

Int. Cl.^{6} A61K *38/55*

U.S. Cl. 514—1 **39 Claims**

1. A method for improving cellular uptake of a protease inhibitor that binds alpha-1-acid glycoprotein during protease inhibitor-based therapy, comprising administering, to a subject in need thereof, an effective amount of one or more alpha-1-acid glycoprotein (AAG) binding compounds.

5,750,494

Patent Not Issued For This Number

5,750,495
TREATMENT OF CYSTIC DISEASE WITH TNF-α

David D. L. Woo, Los Angeles, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Mar. 26, 1996, Ser. No. 621,629

Int. Cl.^{6} A61K *38/00;* **A01N** *37/18*

U.S. Cl. 514—2 **6 Claims**

1. A method for treating a mammal having a cystic disease, comprising the step of administering to said mammal a pharmacologically effective anti-cystic amount of TNF-α in a pharmacologically acceptable carrier, excipient or diluent.

5,750,496
METHOD OF CONTROLLING CRYPTOSPORIDIUM INFECTONS USING PROTEASE INHIBITORS

John R. Forney; Shiguang Yang, and Mark C. Healey, all of Logan, Utah, assignors to Utah State University, Logan, Utah

Filed Aug. 12, 1996, Ser. No. 695,411

Int. Cl.^{6} A01N *37/18;45/00;* **A61K** *38/00;31/56*

U.S. Cl. 514—2 **20 Claims**

1. A method of treating cryptosporidiosis in a mammal which comprises administering to said mammal a serine protease inhibitor in an amount sufficient to interfere with the reproduction and infectivity of *Cryptosporidium parvum.*

5,750,497
ACYLATED INSULIN

Svend Havelund, Bagsværd; John Halstrøm, Hundested; Ib Jonassen, Valby; Asser Sloth Andersen, Frederiksberg C, and Jan Markussen, Herlev, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

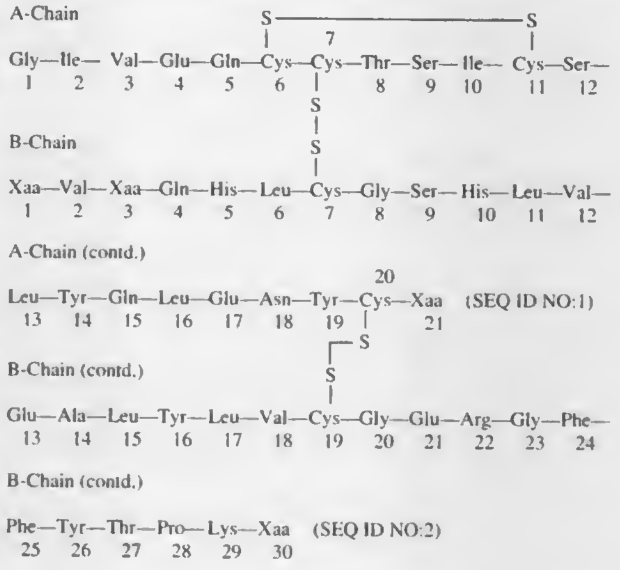
Continuation-in-part of Ser. No. 190,829, Feb. 2, 1994, abandoned. This application Mar. 8, 1995, Ser. No. 400,256

Claims priority, application Denmark, Sep. 17, 1993, 1044/93

Int. Cl.^{6} C07K *14/62;* **A61K** *38/28*

U.S. Cl. 514—3 **95 Claims**

1. An insulin derivative having the following sequence:


A-Chain
S
S
7
Gly—Ile— Val—Glu—Gln—Cys—Cys—Thr—Ser—Ile— Cys—Ser—
1 2 3 4 5 6 8 9 10 11 12
S
B-Chain
S
Xaa—Val—Xaa—Gln—His—Leu—Cys—Gly—Ser—His—Leu—Val—
1 2 3 4 5 6 7 8 9 10 11 12
A-Chain (contd.)
20
Leu—Tyr—Gln—Leu—Glu—Asn—Tyr—Cys—Xaa (SEQ ID NO:1)
13 14 15 16 17 18 19 21
S
B-Chain (contd.)
S
Glu—Ala—Leu—Tyr—Leu—Val—Cys—Gly—Glu—Arg—Gly—Phe—
13 14 15 16 17 18 19 20 21 22 23 24
B-Chain (contd.)
Phe—Tyr—Thr—Pro—Lys—Xaa (SEQ ID NO:2)
25 26 27 28 29 30

wherein

(a) Xaa at positions A21 and B3 are, independently, any amino acid residue which can be coded for by the genetic code except Lys, Arg and Cys;

(b) Xaa at position B1 is Phe or is deleted;

(c) Xaa at position B30 is any amino acid residue which can be coded for by the genetic code except Lys, Arg and Cys; and

(d) the ε-amino group of Lys^{B29} is substituted with an acyl group having at least 10 carbon atoms;

wherein insulin derivative is a Zn^2+ complex and the Zn^2+ complex of the insulin derivative is more water soluble than the insulin derivative without Zn^2+.

5,750,498
TRANSPARENT GELATIN GEL TYPE AIR FRESHENER

Takahiko Soeda, Kawasaki; Masahiko Shinohara, Tokyo; Taro Hozumi, Tokyo, and Seisuke Sato, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc.; Nihon Firmenich K.K., and Systems Bio-Industries Co., Ltd., all of Tokyo, Japan

Filed Aug. 26, 1996, Ser. No. 703,125

Claims priority, application Japan, Sep. 6, 1995, 7-229081

Int. Cl.^{6} A61K *7/46;* **B01J** *13/00*

U.S. Cl. 512—4 **6 Claims**

1. A transparent gelatin gel type air freshener composition consisting essentially of gelatin, a transglutaminase gelatin cross-linking agent, water, a perfume and a surface active agent.

5,750,499
RECEPTOR-SELECTIVE SOMATOSTATIN ANALOGS

Carl A. Hoeger, San Marcos, and Jean E. F. Rivier, La Jolla, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Oct. 18, 1995, Ser. No. 544,805

Int. Cl.^{6} A61K *38/12;38/31;* **C07K** *14/655*

U.S. Cl. 514—9 **21 Claims**

1. A cyclic somatostatin (SRIF) analog peptide having specific affinity for the SRIF receptor SSTR1, which peptide has the amino acid sequence (cyclo 3 -14)Xaa_1-Xaa_2-Cys-Lys-Xaa_5-Phe-Phe-D-Xaa_8-Xaa_9 -Thr-Phe-Thr-Xaa_{13}-Cys wherein Xaa_1 is des-Xaa or Ala; Xaa_2 is Tyr, D-Tyr or des-Xaa or Gly: Xaa_5 is des-Xaa or Asn; D-Xaa_8 is an aromatic D-amino acid: Xaa_9 is (C)aminomethyl Phe with C being H or lower alkyl; and Xaa_{13} is Ser or D-Ser.

5,750,500
PROCESS FOR INHIBITING ACTIVITY OF ENDOTOXIN

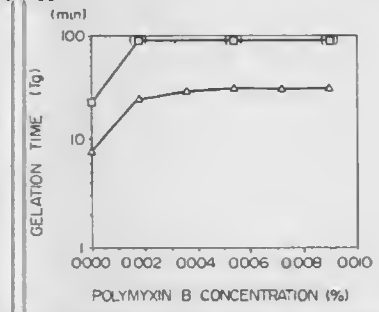
Masakazu Tsuchiya, and Kazuaki Harada, both of Amagasaki, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 183,436, Jan. 19, 1994, abandoned. This application May 31, 1995, Ser. No. 455,563

Claims priority, application Japan, Jan. 21, 1993, 5-026159

Int. Cl.^{6} A61K *7/08;7/62;14/435;* **G01N** *33/579*

U.S. Cl. 514—11 **8 Claims**



5. An aqueous diluting solution for an endotoxin-containing sample, said solution serving to inhibit selectively the activity of the endotoxin in the sample, but not to inhibit the activity of an endotoxin analogous substance in the sample, to make only the latter responsive to horseshoe crab hemocyte lysate, said solution consisting of water, an endotoxin-inhibiting peptide selected from the group consisting of polymyxins A, B, C, D, E, K, M and P, salts of those polymyxins, tachyplesin, polyphemusin and anti-LPS factor, and at least one surfactant, said solution being unreactive with the horseshoe crab hemocyte lysate and not serving to inhibit or to enhance the reaction of the horseshoe crab hemocyte lysate with an endotoxin analogous substance, whereby after dilution with said solution, but before the addition of the horseshoe crab hemocyte lysate, the endotoxin activity in the endotoxin-containing sample is completely inhibited.

5,750,501
METHOD AND COMPOSITION FOR TREATMENT OF PATIENTS HAVING DECOMPENSATED LIVER DISEASE

Paul B. Chretien, Rockville, Md., and Milton G. Mutchnick, West Bloomfield, Mich., assignors to Alpha 1 Biomedicals, Inc., Bethesda, Md., and The Board of Governors of Wayne State Univ., Detroit, Mich.

PCT No. PCT/US93/10619, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/12405, PCT Pub. Date May 11, 1995

PCT Filed Nov. 5, 1993, Ser. No. 313,160

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—12 **8 Claims**

1. A method of treating a Hepatitis B patient having hepatic decompensation, comprising administering Hepatitis B virus-reducing amounts of $T\alpha_1$ to a patient having decompensated liver disease so as to render said patient seronegative for Hepatitis B virus DNA.

5,750,502
CLONING, EXPRESSION AND USES OF A SECRETED PROTEIN, F-SPONDIN

Thomas M. Jessell, New York, N.Y., and Avihu Klar, Jerusalem, Israel, assignors to The Trustees of Columbia University in City of New York, New York, N.Y.

PCT No. PCT/US93/03164, § 371 Date Jan. 5, 1995, § 102(e) Date Jan. 5, 1995, PCT Pub. No. WO93/20196, PCT Pub. Date Oct. 14, 1993

Continuation-in-part of Ser. No. 862,021, Apr. 2, 1992, Pat. No. 5,279,966. This PCT application Apr. 2, 1993, Ser. No. 313,288

Int. Cl.^{6} A61K *38/16*

U.S. Cl. 514—12 **6 Claims**

3. Purified, vertebrate F-spondin polypeptide.

5,750,503
COMPOSITIONS OF G-CSF AND TNF-BP FOR PROPHYLAXIS AND TREATMENT OF SEPTIC SHOCK

Gottfried Alber, Grenzach-Wyhlen, Germany, and Peter Angehrn, Böckten, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 376,267, Jan. 23, 1995. This application May 5, 1995, Ser. No. 435,926

Claims priority, application European Pat. Off., Feb. 4, 1994, 94810059

Int. Cl.^{6} C07K *14/715;14/53;* **A61K** *38/16:38/19*

U.S. Cl. 514—12 **2 Claims**

1. A method of preventing or treating septic shock which comprises administering to a host requiring such treatment an effective amount of G-CSF or a pharmaceutically acceptable salt thereof and an effective amount of a TNF binding protein which is a chimaeric polypeptide which comprises the soluble part of the p55 TNF receptor and all domains except the first domain of the constant region of the heavy chain of human immunoglobulin IgG1 or IgG3 or a pharmaceutically acceptable salt thereof.

5,750,504
ANTIMICROBIAL PROTEINS

Willem Frans Broekaert, Dilbeek; Bruno Philippe Angelo Cammue, Alsemberg, both of Belgium; Rupert William Osborn, Twickenham, and Sarah Bronwen Rees, Forest Park, both of United Kingdom, assignors to Zeneca Agrochemicals, England

PCT No. PCT/GB94/02766, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO95/18229, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 19, 1994, Ser. No. 656,318

Int. Cl.^{6} A61K *38/00;* **C12N** *13/00*

U.S. Cl. 514—12 **5 Claims**

1. An isolated protein which has the amino acid sequence shown in SEQ ID NO 1.

5,750,505

Patent Not Issued For This Number

5,750,506
BRADYKININ ANTAGONISTS WITH EXTENDED HYDROPHOBIC SIDE CHAINS

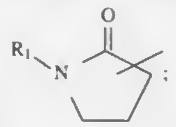
Val S. Goodfellow; Heather B. Kroona, both of Westminster; Eric T. Whalley, Golden; Francine E. Wincott, Longmont, and Dana A. Zummach, Westminster, all of Colo., assignors to Cortech, Inc., Denver, Colo.

Continuation of Ser. No. 077,998, Jun. 18, 1993, abandoned. This application May 13, 1996, Ser. No. 647,281

Int. Cl.^{6} A61K *38/08;* **C07K** *7/18*

U.S. Cl. 514—15 **24 Claims**

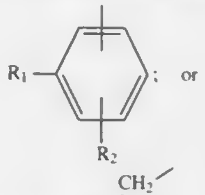
1. A compound comprising a bradykinin antagonist peptide and a hydrophobic side chain; linked through the amino acid residue in the 0, 1, 2, 3, 5 or 6 position of said side chain comprising



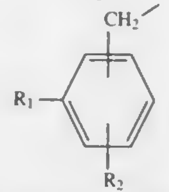
(I)

(ii) a prenyl group;

(iii)(C_1–C_{20}) alkyl optionally comprising 1 to 4 double bonds, or 1 to 4 alcohol or ether oxygen atoms;



(iv)



(v)

where R_1 is (C_1–C_{20})alkyl optionally comprising 1 to 4 double bonds, or 1 to 4 alcohol or ether oxygen atoms; and

R_2 is (C_1–C_6)alkyl or (C_1–C_6)alkoxyalkyl;

said compound having bradykinin antagonist activity.

5,750,507
METHOD FOR PREVENTING OR TREATING ARRHYTHMIA

Takayuki Ozawa; Satoru Sugiyama, both of Nagoya; Shigehisa Kitahara, Hino, and Katsuhiko Fujii, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

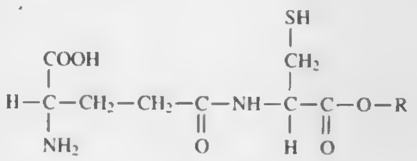
Division of Ser. No. 487,634, Jun. 7, 1995, Pat. No. 5,631,234, which is a continuation of Ser. No. 225,914, Apr. 11, 1994, abandoned, which is a continuation of Ser. No. 955,713, Dec. 15, 1992, abandoned. This application Jan. 9, 1997, Ser. No. 780,367

Claims priority, application Japan, Apr. 15, 1991, 3-108163

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—19 **5 Claims**

1. A method for preventing or treating arrhythmia, comprising administering to a mammal in need thereof an arrhythmia preventing or treating effective amount of: a γ-L-glutamyl-L-cysteine ester compound of formula (1):



$$H-\underset{NH_2}{\overset{COOH}{\overset{|}{\underset{|}{C}}}}-CH_2-CH_2-\underset{O}{\underset{\|}{C}}-NH-\underset{H}{\underset{|}{\overset{\overset{SH}{|}}{\overset{CH_2}{\overset{|}{C}}}}}-\underset{O}{\underset{\|}{C}}-O-R$$

wherein R is a straight chain, branched or cyclic hydrocarbon group having 1–10 carbon atoms, or a straight chain or branched hydrocarbon group having 1–5 carbon atoms substituted with an aromatic group; or an oxidized dimer obtained by dehydrogenation between two γ-L-glutamyl-L-cysteine esters having formula (1).

5,750,508
SIALIC ACID/FUCOSE BASED MEDICAMENTS

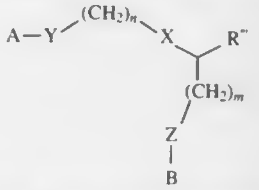
Falguni Dasgupta, Alameda, and John Henry Musser, San Carlos, both of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Filed Jun. 16, 1993, Ser. No. 78,949

Int. Cl.^{6} A61K *31/70;* **C07H** *15/00*

U.S. Cl. 514—25 **20 Claims**

1. A compound having the following structural formula I:



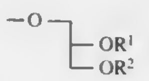
(I)

wherein m and n are independently an integer of from 1 to 5, Y and Z are independently a connecting moiety selected from the group consisting of —CH_2—, —O—, —S—, —NR'— and —NR'R"— (wherein R' and R" are independently H or an alkyl containing 1 to 5 carbon atoms); X is a connecting moiety that is selected from the group consisting of —O—, —S—, —NR'—, and a covalent bond; and wherein R'" is selected from the group consisting of

1) hydrogen;

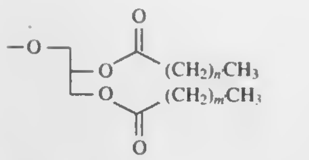
2) an alkyl containing 1 to 4 carbon atoms:

3)



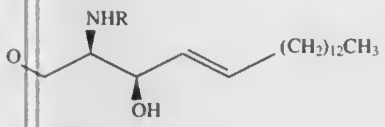
wherein R^1 and R^2 are independently an alkyl or an alkenyl group of 1–5 or 13–15 carbon atoms;

4)



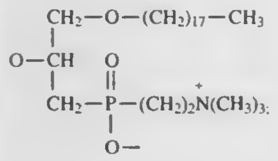
wherein $(CH_2)_n$' and $(CH_2)_m$' are independently a saturated or unsaturated alkyl group of 15 to 24 carbon atoms;

5)



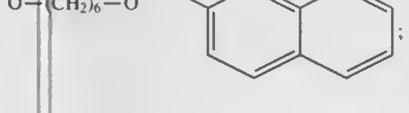
wherein R is —$CO(CH_2)_{14}CH_3$;

6)

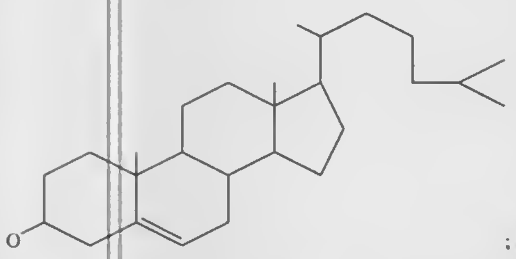


$$\begin{array}{l} CH_2-O-(CH_2)_{17}-CH_3 \\ | \\ O-CH \quad \overset{O}{\|} \\ | \quad\quad\;\; | \\ CH_2-\underset{\underset{O-}{|}}{P}-(CH_2)_2\overset{+}{N}(CH_3)_3; \end{array}$$

7)



8)

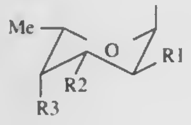


; and

9) —OR", SR", —I, —N_3, and NR'R";

wherein A is selected from the group consisting of α and β forms of sialic acid, Kemp's acid, Quinic acid, Glyceric acid, Lactic acid, acetic acid, —SO_3, —PO_3, and esters thereof; and

wherein B is selected from the group consisting of α and β forms of L-fucose, carboxylic acid analogues of fucose, inositol, substituted inositol, benzimidazole, substituted benzimidazole, quanidine, substituted butane, pentaerythritol, and substituted pentaerythritol, wherein the substituents are selected from the group consisting of —CH_3, —CH_2OH, —CH_2F, and —$CH_2NR_2^3$ wherein each R^3 is independently an alkyl of 1 to 5 carbon atoms, and



wherein Me is a methyl group, R1, R2, and R3 are each independently —OH, —F, and —NR"R" wherein each R" is independently hydrogen or an alkyl of 1 to 5 carbon atoms.

5,750,509
AMIDE DERIVATIVES OF ANTIBIOTIC A 40926

Adriano Malabarba, Via Roma; Romeo Ciabatti, Via Brodolini; Gianbattista Panzone, Via Vanzago, and Alessandra Maria Marazzi, Via Piave, all of Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy

Continuation of Ser. No. 450,037, May 25, 1995, abandoned, which is a continuation of Ser. No. 370,333, Jan. 9, 1995, abandoned, which is a continuation of Ser. No. 167,809, Dec. 16, 1993, abandoned. This application Apr. 30, 1996, Ser. No. 640,681

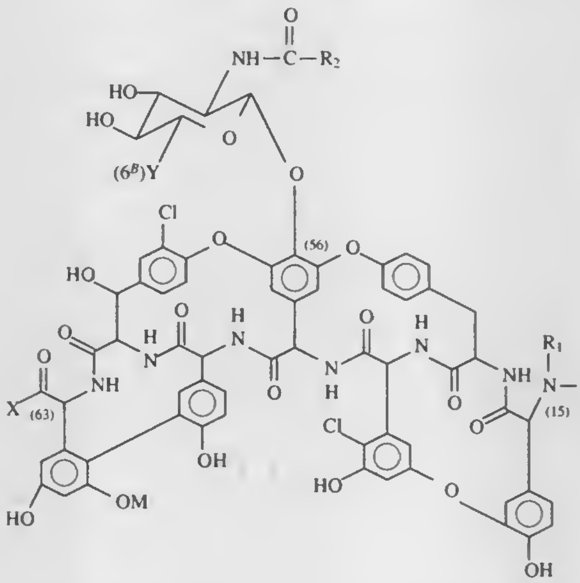
Claims priority, application European Pat. Off., Jul. 29, 1991, 91112685; Jun. 12, 1992, 92109906

Int. Cl.^{6} A61K *38/14;* **C07K** *7/50*

U.S. Cl. 514—11 **5 Claims**

1. A derivative of antibiotic A 40926 of formula (I)

(I)



wherein

- R_1 represents hydrogen or a protecting group of the amino function;
- R_2 represents (C_{10}–C_{11})alkyl;
- M represents hydrogen, a-mannopyranosyl or 6-O-acetyl-α-D-mannopyranosyl;
- Y represents (C_1–C_4)alkoxycarbonyl or hydroxymethyl;
- X represents a compound of formula —NR_3—alk_1—(NR_4—$alk_2)_p$-(NR_5—$alk_3)_q$—W

wherein:

- R_3 represents hydrogen or (C_1–C_4)alkyl;
- alk_1,alk_2
- and alk_3 each independently represent a linear or branched alkylene of 2 to 10 carbon atoms;
- p and q are integers which independently represent zero or 1;
- R_4 and R_5 independently represent hydrogen atoms (C_1–C_4)alkyl or
- R_3 and R_4 taken together represent a (C_2–C_4)alkylene moiety connecting the two nitrogen atoms with the proviso that p is 1; or
- R_4 and R_5 taken together represent a (C_2–C_4)alkylene moiety connecting the two nitrogen atoms with the proviso that both p and q are 1;
- W represents hydrogen, (C_1–C_4)alkyl, amino, (C_1–C_4)alkylamino, di(C_1–C_4)alkylamino, amino substituted with one or two amino(C_2–C_4)alkyl moieties or with one or two (C_1–C_4)alkylamino-(C_2–C_4)alkyl moieties or with one or two di(C_1–C_4)alkylamino-(C_2–C_4)alkyl moieties,

and the pharmaceutically acceptable addition salts thereof.

5. A method for the treatment of bacterial infections comprising administering a compound according to claim 1 to patient in need thereof.

5,750,510

3-DESCLADINOSE-2,3-ANHYDROERYTHROMYCIN DERIVATIVES

Richard L. Elliott, Grayslake; Yat Sun Or, Libertyville, both of Ill.; Daniel T. Chu, Santa Clara, Calif.; George W. Griesgraber; Jacob J. Plattner, both of Libertyville, Ill., and Daisy Pireh, Lincolnshire, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

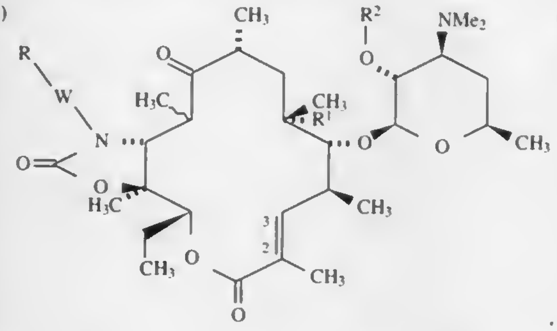
Filed Apr. 4, 1997, Ser. No. 832,741

Int. Cl.^{6} A01N *43/04;* **C07H** *17/08*

U.S. Cl. 514—29 **44 Claims**

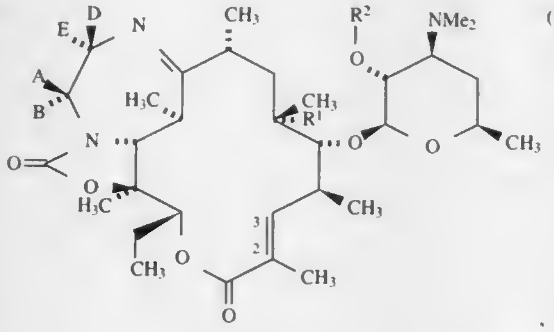
1. A compound, or a pharmaceutically acceptable salt or ester thereof, selected from the group consisting of:

(a)



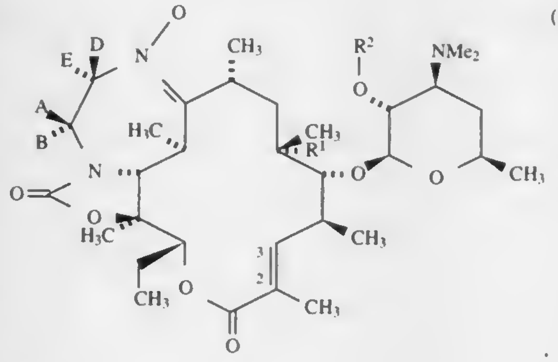
(I)

(b)



(II)

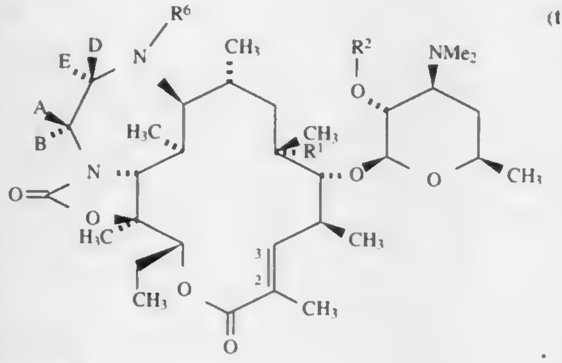
(c)



(III)

and

(d)



(IV)

wherein,

R^1 is selected from the group consisting of:
- (a) hydrogen;
- (b) hydroxy;
- (c) O-C_1–C_{12}-alkyl;
- (d) O-CO-C_1–C_6-alkyl;
- (e) O-CO-NH_2;
- (f) O-CO-NH-CO-C_1–C_{12}-alkyl; and
- (g) O-CO-NH-SO_2-C_1–C_{12}-alkyl;

R^2 is hydrogen or a hydroxy protecting group;

R^6 is hydrogen or C_1–C_6-alkyl;

R is selected from the group consisting of:
- (a) hydrogen;
- (b) C_1–C_6-alkyl optionally substituted with one or more substituents selected from the group consisting of:
  - (i) aryl;
  - (ii) substituted-aryl;
  - (iii) heteroaryl;
  - (iv) substituted-heteroaryl;
  - (v) hydroxy;
  - (vi) C_1–C_6alkoxy;
  - (vii) NR^3R^4, where R^3 and R^4 are independently selected from hydrogen and C_1–C_6-alkyl, or R^3 and R^4 are taken with the nitrogen atom to which they are connected to form a 3- to 7- membered ring which, when the ring is a 5- to 7-membered ring, may optionally contain a hetero consisting of —O—, —NH—, —N(C_1–C_6alkyl—)-, —N(aryl)—, —N(aryl-C_1–C_6-alkyl-), —N(substituted-aryl-C_1–C_6-alkyl—), —N(heteroaryl)—, —N(heteroaryl-C_1–C_6-alkyl—)-, —N(substituted heteroaryl-C_1–C_6-alkyl)-, S- or —$S(O)_n$—, wherein n is 1 or 2;
  - (viii) —CH_2-M-R^5,

wherein M is selected from the group consisting of:
- (aa) —C(O)—NH—;
- (bb) —NH—C(O)—;
- (cc) —NH—
- (dd) —N═;
- (ee) —N(CH_3)—
- (ff) —O—
- (gg) —$S(O)_n$—, wherein n is 0, 1 or 2;
- (hh) —CO—O—
- (ii) —O—CO—
- (jj) —CO—; and

R^5 is selected from the group consisting of:
- (aaa) C_1–C_6-alkyl, optionally substituted with a substituent selected from the group consisting of:
  - (i) aryl;
  - (ii) substituted-aryl;
  - (iii) heteroaryl;and
  - (iv) substituted-heteroaryl;
- (bbb) aryl;
- (ccc) substituted-aryl;
- (ddd) heteroaryl;
- (eee) substituted-heteroaryl; and
- (fff) heterocycloalkyl; and
- (c) C_3–C_7-cycloalkyl;
- (d) aryl;
- (e) substituted-aryl;
- (f) heteroaryl;
- (g) substituted-heteroaryl;

W is absent or selected from the group consisting of —O—, —NH—CO—, —N═CH—, —NH— and —N(C_1–C_6-alkyl)—;

A, B, d and E are independently selected from the group consisting of:
- (a) hydrogen;
- (b) C_1–C_6-alkyl, optionally substituted with one or more substituents selected from the group consisting of:
  - (i) aryl;
  - (ii) substituted-aryl;
  - (iii) heteroaryl;
  - (iv) substituted-heteroaryl;
  - (v) heterocycloalkyl;
  - (vi) hydroxy;
  - (vii) C_1–C_6-alkoxy;
  - (viii) halogen consisting of Br, Cl, F or I; and
  - (ix) NR^3R^4, where R^3 and R^4 are independently selected from hydrogen and C_1–C_6-alkyl, or R^3 and R^4 are taken with the nitrogen atom to which they are connected to form a 3- to 7-membered ring optionally containing a hetero function consisting of —O—, —NH—, —N(C_1–C_6-alkyl-)—, —N(aryl-C_1–C_6-alkyl—)—, —N(substituted-aryl-C_1–C_6-alkyl—)—, —N(heteroaryl-C_1–C_6-alkyl—), —N(substituted-heteroaryl-C_1–C_6-alkyl—)—, —S— or —$S(O)_n$—, wherein n is 1 or 2;
- (c) C_3–C_7-cycloalkyl;
- (d) aryl;
- (e) substituted-aryl;
- (f) heteroaryl;
- (g) substiuted-heteroaryl;
- (h) heterocycloalkyl; and
- (i) a group selected from option (b) above further substituted with —M—R^5, wherein M and R^5 are as defined above; or

any one pair of substituents of AB, AD, AE, BD, BE or DE, is taken together with the atom or atoms to which they are attached to form a 3- to 7-membered ring optionally containing a hetero function consisting of:

—O—,
—NH—,
—N(C_1–C_6-alkyl—)—,
—N(aryl-C_1–C_6-alkyl—)—,
—N(substituted-aryl-C_1–C_6-alkyl—)—,
—N(heteroaryl-C_1–C_6-alkyl—)—,
—N(substituted-heteroaryl-C_1–C_6-alkyl—)—,
—S— or or —$S(O)_n$—, wherein n is 1 or 2;
—C(O)—NH—;
—NR^5-C(O)—, wherein R^5 is as defined above; and
—C(═NH)—NH—.

44. A method for treating bacterial infections administering to a mammal to need of such treatment of a pharmaceutical composition containing a therapeutically effective amount of a compound of claim 1.

5,750,511

Patent Not Issued For This Number

5,750,512

NADH AND NADPH THERAPEUTIC AGENTS FOR NASAL, SUBLINGUAL, RECTAL AND DERMAL ADMINISTRATION

Joerg G. D. Birkmayer, Vienna, Austria, assignor to Birkmayer Pharmaceuticals, Inc., New York, N.Y.

Continuation of Ser. No. 373,147, Jan. 17, 1995, abandoned. This application Jul. 11, 1996, Ser. No. 673,407

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—52 **7 Claims**

1. A method of treating Parkinson's disease, Alzheimer's disease or mental depression comprising the step of administering NADH or NADPH, or a physiologically acceptable salt thereof, to the rectum of a person afflicted with Parkinson's disease, Alzheimer's disease or mental depression.

5,750,513

HYDROCARBYL POLYSACCHARIDE COMPOSITIONS

Dirk Hoorne, Mechlin, and Mahroussa Auda, Sint-Denijs-Westrem, both of Belgium, assignors to Imperial Chemical Industries PLC, Great Britain

Filed Jun. 7, 1995, Ser. No. 475,311

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—54 **26 Claims**

1. A composition which is a homogenous solution which comprises
- a) a hydrocarbyl polysaccharide;
- b) an antifoam component comprising a siloxane antifoam agent;
- c) at least one other non-ionic surfactant; and
- d) a solvent for the hydrocarbyl polysaccharide,

such that the antifoam component forms a separate phase on dilution with water;

components (a) and (c) being present in a weight ratio within the range 20:1 to 1:3;

the amount of component (b) being from 0.1 to 10% by weight of the combined weight of components (a) and (b); and the amount of component (d) being from 25 to 100% by weight of the combined weight of components (a), (b) and (c).

12. A composition as claimed in claim **1** which additionally includes e) an agrochemical.

22. A method of treating vegetation which comprises applying to plants and/or soil a composition as claimed in claim **12**.

5,750,514
METHOD FOR CONTROLLING ECTOPARASITES

Jeffery A. Meyer, 1209 Hampton La., Mundelein, Ill. 60060

Filed May 11, 1995, Ser. No. 439,419

Int. Cl.^{6} A01N *65/00*

U.S. Cl. 514—63 **13 Claims**

1. In a method for controlling infestations of flies on an animal by applying a dose of a composition comprising about 0.5% to about 1.5% of an ectoparasiticide and a carrier onto the skin or coat of an animal, the improvement which comprises:

increasing the concentration of the about 0.5% to about 1.5% ectoparasiticide to about 3% to about 90% by weight of the composition and proportionately reducing the volume of the composition administered to the animal such that the animal receives the same amount of the ectoparasiticide as it would have received prior to the concentration of the ectoparasiticide.

5,750,515
CANCER METASTASIS INHIBITOR

Jiro Shibata, Iruma; Konstanty Wierzba, Sayama; Koji Murakami; Yuji Yamada, both of Tokorozawa, and Koichi Shudo, Tokyo, all of Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00980, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO96/32101, PCT Pub. Date Oct. 17, 1996

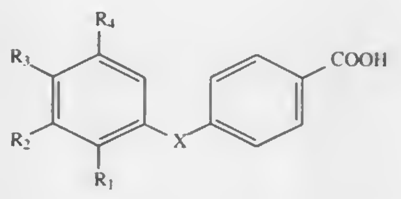
PCT Filed Apr. 10, 1996, Ser. No. 737,799

Claims priority, application Japan, Apr. 10, 1995, 7-083803

Int. Cl.^{6} A61K *31/695;31/20;31/19*

U.S. Cl. 514—63 **4 Claims**

1. A method for inhibiting metastasis of cancer of the liver, lung or lymph node, which cancer metastasis is sensitive to treatment with compounds of formula (I), without substantially inhibiting tumor growth, comprising administering to a mammalian animal in need of such inhibition a metastasis inhibiting effective amount of a benzoic acid derivative of formula (I).



(I)

wherein R_1, R_2, R_3 and R_4 are the same or different and each represents a hydrogen atom, hydroxyl group or trimethylsilyl group, or R_3 and R_4 are bonded to each other to form a tetramethylene group substituted with a lower alkyl group, wherein X represents the group —COCH=C(OH)—, the group —NHCO— or the group —CONH—, provided that when R_3 and R_4 are bonded to each other to form a tetramethylene group substituted with a lower alkyl group, X is the group —COCH=C(OH)—, or the group —CONH—.

5,750,516
PHOSPHORIC DIESTER

Masayuki Nakamura, Himeji; Kazumi Ogata, Toyonaka; Takahiro Sakaue, Itami; Noriko Saito, Minoo, and Masahito Iemura, Kyoto, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

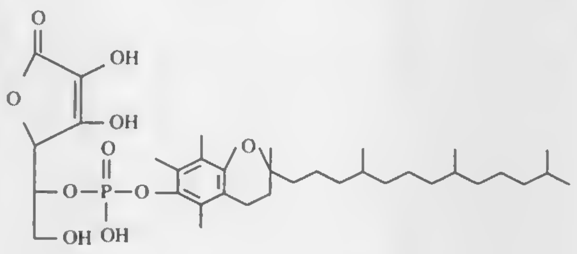
Filed Sep. 30, 1996, Ser. No. 724,509

Claims priority, application Japan, Oct. 13, 1995, 7-265615

Int. Cl.^{6} A61K *31/665;31/355;* **C07F** *9/06;9/28*

U.S. Cl. 514—100 **6 Claims**

1. A phosphoric diester of formula (I) which is available on di-esterification of phosphoric acid with L-ascorbic acid involving its 5-hydroxyl group and tocopherol involving its hydroxyl group or a pharmacologically acceptable salt thereof.



(I)

5,750,517
METHOD OF TREATING SEBACEOUS GLAND DISEASES WITH VITAMIN D_3FLUORINATED ANALOGS

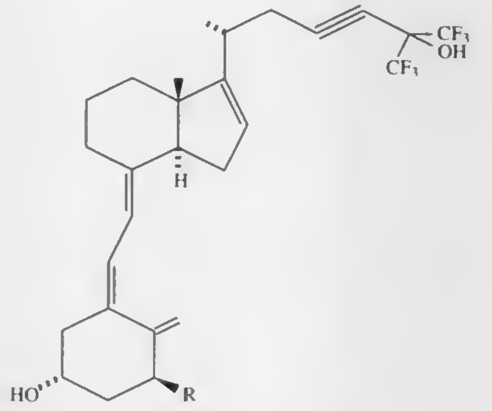
Enrico Giuseppe Baggiolini, deceased, late of North Caldwell, by Barbara Judith Baggiolini, Executrix; Shian-Jan Shiuey, Nutley, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 417,338, Apr. 5, 1995, abandoned, which is a division of Ser. No. 957,500, Oct. 19, 1992, abandoned. This application Mar. 1, 1996, Ser. No. 609,804

Int. Cl.^{6} A01N *45/00*

U.S. Cl. 514—167 **13 Claims**

1. A method for the treatment of sebaceous gland diseases which comprises administering to a host in need of such treatment an effective amount of a compound of formula



1

wherein R is hydrogen, hydroxy or fluorine.

5,750,518
HETEROCYCLIC COMPOUNDS

Tine Krogh Jørgensen, Herlev; Knud Erik Andersen, Smørum; Henrik Sune Andersen, København; Rolf Hohlweg, Kvistgaard; Peter Madsen, Bagsværd, and Uffe Bang Olsen, Vallensbæk, all of Denmark, assignors to Novo Nordisk A/S, Bagsværd, Denmark

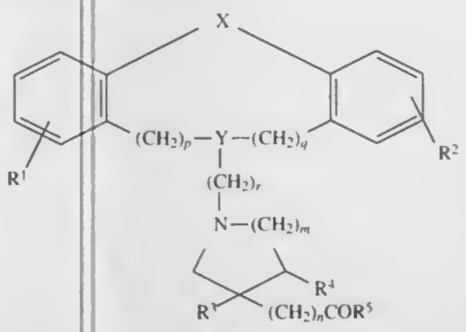
Division of Ser. No. 623,807, Mar. 29, 1996. This application May 27, 1997, Ser. No. 863,751

Claims priority, application Denmark, Apr. 7, 1995, 0403/95; Sep. 11, 1995, 1006/95

Int. Cl.^{6} A61K *31/40;31/445;* **C07D** *207/12;211/60*

U.S. Cl. 514—183 **25 Claims**

1. A compound of formula 1



(I)

wherein

R^1 and R^2 independently are hydrogen, halogen, trifluoromethyl, hydroxy, C_{1-6}-alkyl or C_{1-6}-alkoxy;

Y is —CH_2—N—CH_2—, —CH_2—N—CH_2—, —(C=O)—N—CH_2—, or —CH_2—N—(C=O)—, wherein only the underscored atoms participate in the ring system;

X is —C(R^6R^7)—, —CH_2CH_2—, —CH=CH—CH_2—, —CH_2—CH=CH—, —CH_2—(C=O)—, —(C=O)—CH_2—, —$CH_2CH_2CH_2$—, —CH=CH—, —N(R^8)—(C=O)—, —(C=O)—N(R^8)—, —(C=O)—, or —N(R^9)— wherein R^6, R^7, R^8 and R^9 independently are hydrogen or C_{1-6}-alkyl, provided that the ring containing X and Y contains at least 8 members;

p is 0 or 1;

q is 0 or 1;

r is 1, 2 or 3;

m is 1 or 2;

n is 1 when m is 1 and n is 0 when m is 2;

R^3 and R^4 each represents hydrogen or may—when m is 2—together represent a bond;

and

R^5 is —OH or C_{1-6}-alkoxy; or

a pharmaceutically acceptable salt thereof.

5,750,519
PROCESS FOR THE LONG TERM REDUCTION OF BODY FAT STORES, INSULIN RESISTANCE, HYPERINSULINEMIA AND HYPERGLYCEMIA IN VERTEBRATES

Anthony H. Cincotta, Andover, Mass., and Albert H. Meier, Baton Rouge, La., assignors to The Board of Supervisors of Louisiana University and Agricultural and Mechanical College, Baton Rouge, La., and Ergo Research Corporation, Wakefield, R.I.

Continuation of Ser. No. 468,528, Jun. 6, 1995, which is a continuation of Ser. No. 249,808, May 26, 1994, Pat. No. 5,554,623, which is a continuation of Ser. No. 719,745, Jun. 24, 1991, Pat. No. 5,344,832, which is a continuation-in-part of Ser. No. 463,327, Jan. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 192,332, May 10, 1988, abandoned. This application Oct. 31, 1995, Ser. No. 550,775

Int. Cl.^{6} A61K *31/545;31/55;31/495;31/44*

U.S. Cl. 514—200 **19 Claims**

1. A method for modifying and regulating lipid metabolism in a vertebrate animal or human subject in need of such treatment comprising:

administering a dopamine agonist to said subject on a timed daily basis at a first predetermined time of day in a first dosage amount sufficient to reduce the hormonal prolactin level in the blood of said subject; and additionally

administering a prolactin stimulator to said subject on a timed daily basis at a second predetermined time of day in a second dosage amount sufficient to increase hormonal prolactin levels in the blood of said subject, thereby achieving in said subject at least one of the following modifications in lipid metabolism: decrease in hypercholesterolemia or hypertriglyceridemia.

5,750,520
ANTITHROMBOTIC AMIDINOPHENYLALANINE AND AMIDINOPYRIDYLALANINE DERIVATIVES

John Christopher Danilewicz; David Ellis, and Ryszard Jurek Kobylecki, all of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP94/03509, § 371 Date Apr. 19, 1996, § 102(e) Date Apr. 19, 1996, PCT Pub. No. WO95/13274, PCT Pub. Date May 18, 1995

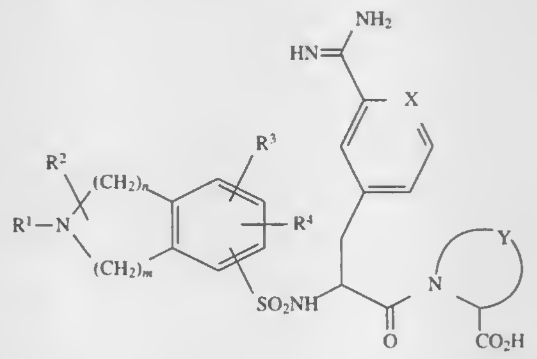
PCT Filed Oct. 24, 1994, Ser. No. 628,642

Claims priority, application United Kingdom, Nov. 8, 1993, 9322976

Int. Cl.^{6} C07D *401/12;217/00;217/16;* **A61K** *31/55*

U.S. Cl. 514—212 **18 Claims**

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of either said compound or said salt, wherein

X is CH or N;

Y is optionally monounsaturated C_3-C_5 alkylene optionally substituted with C_1-C_4 alkyl or methylene;

R^1 is H; C_1-C_4 alkyl optionally substituted with C_1-C_4 alkoxy. OH, NR^5R^6,

$CONR^5R^6$, C_3- C_6 cycloalkyl or aryl; or C_3-C_6 alkenyl;

R^2 is H: C_1-C_4 alkyl optionally substituted with C_1-C_4 alkoxy. OH, NR^5R^6,

$CONR^5R^6$, C_3-C_6 cycloalkyl or aryl; or $CONR^5R^6$;

R^3 and R^4 are each independently selected from H; C_1-C_4 alkyl optionally substituted with NR^5R^6; C_1-C_4 alkoxy; halo; $CONR^5R^6$ and aryl;

R^5 and R^6 are each independently selected from H and C_1-C_4 alkyl;

m is 1:

n is 2.

5,750,521

MERCAPTOACETYLAMIDE DISULFIDE DERIVATIVES USEFUL AS INHIBITORS OF ENKEPHALINASE AND ACE

Gary A. Flynn; Douglas W. Beight, both of Cincinnati; Shujaath Mehdi, West Chester; Alan M. Warshawsky, Cincinnati, all of Ohio; John F. French, Kobe, Japan, and John H. Kehne, Westbrook, Conn., assignors to Hoechst Marion Roussel Inc., Cincinnati, Ohio

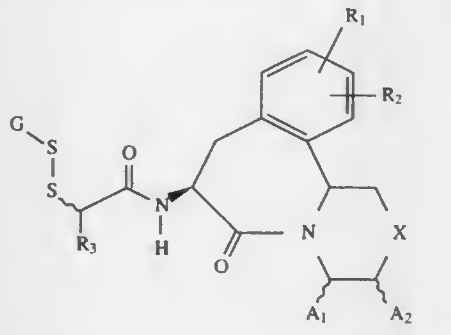
PCT No. PCT/US94/14235, § 371 Date Nov. 4, 1996, § 102(e) Date Nov. 4, 1996, PCT Pub. No. WO95/21839, PCT Pub. Date Aug. 17, 1995

Continuation-in-part of Ser. No. 195,423, Feb. 14, 1994, abandoned. This PCT application Dec. 13, 1994, Ser. No. 669,521

Int. Cl.⁶ C07D *471/04;* **A61K** *31/55*

U.S. Cl. 514—214 **29 Claims**

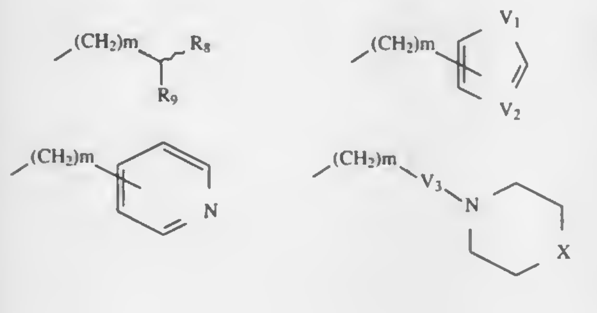
1. A compound of the formula



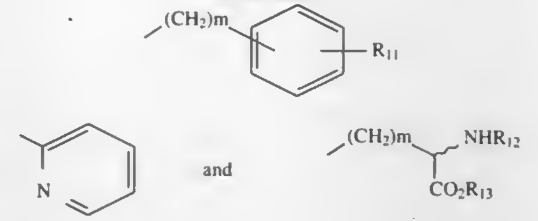
Formula (I)

wherein

- R_1 and R_2 are each independently hydrogen, hydroxy, $—OR_4$ wherein R_4 is a $C_1–C_4$ alkyl or an Ar—Y— group wherein Ar is a phenyl or naphthyl group unsubstituted or substituted with from one to three substituents selected from the group consisting of methylenedioxy, hydroxy, $C_1–C_4$ alkoxy, fluoro and chloro and Y is a $C_0–C_4$ alkyl; or, where R_1 and R_2 are attached to adjacent carbon atoms, R_1 and R_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;
- X is $—(CH_2)_n—$, O,S,NR_5, or $NC(O)R_6$ wherein n is an integer 0 or 1, R_5 is hydrogen, a $C_1–C_4$ alkyl, or an Ar—Y— group, and R_6 is $—CF_3$, $C_1–C_{10}$ alkyl, or an Ar—Y— group;
- A_1 and A_2 are each independently hydrogen or $—COOR_7$ wherein R_7 is hydrogen, $—CH_2O—C(O)C(CH_3)_3$, a $C_1–C_4$ alkyl, an Ar—Y— group, or diphenylmethyl; with the proviso that where X is $—(CH_2)_n—$ and A_1 is hydrogen then A_2 is $—COOR_7$, and where X is $—(CH_2)_n—$ and A_1 is $—COOR_7$ then A_2 is hydrogen; and with the further proviso that where X is O,S,NR_5, or $NC(O)R_6$ then A_2 is hydrogen;
- R_3 is hydrogen, $C_1–C_8$ alkyl, $—CH_2OCH_2CH_2OCH_3$ or an Ar—Y—group;
- G is a radical chosen from the group consisting of



-continued



wherein

- m is an integer from 1 to 3;
- R_8 is hydrogen, $C_1–C_6$ alkyl, $—CH_2CH_2S(O)_pCH_3$, phenyl, naphthyl, naphthylmethyl, phenylmethyl, p-methoxybenzyl, 3,4-methylenedioxybenzyl, p-fluorobenzyl or p-chlorobenzyl; wherein p is an integer from 0 to 2;
- R_9 is hydrogen, hydroxy, amino, $C_1–C_6$ alkyl, N-methylamino, N,N-dimethylamino, $—CO_2R_7$, or $—OC(O)R_{10}$ wherein R_{10} is hydrogen, $C_1–C_6$ alkyl, or phenyl;
- R_{11} is 1 or 2 substituents independently chosen from the group consisting of hydrogen, $C_1–C_4$ alkyl, $C_1–C_4$ alkoxy, and halogen;
- R_{12} is hydrogen, $C_1–C_6$ alkyl, or Ar—Y— group;
- R_{13} is hydrogen or $C_1–C_4$ alkyl;
- V_1 is O, S, or NH;
- V_2 is N or CH;
- V_3 is a direct bond or —C(O)—;

or stereoisomers or pharmaceutically acceptable salts thereof.

5,750,522

PYRROLO[1,2-D] [1,2,4]TRIAZINE DERIVATIVES

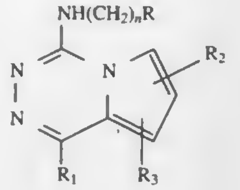
Annmarie Louise Sabb, Pennington, N.J., and William A. Kinney, Churchville, Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Jul. 12, 1996, Ser. No. 678,851

Int. Cl.⁶ C07D *253/10;* **A61K** *31/53*

U.S. Cl. 514—243 **15 Claims**

1. A compound having the formula



wherein

- R is a saturated heterocycle having one nitrogen and 3–6 carbon atoms or a saturated bridged bicycloheterocycle of 5–8 carbon atoms having one nitrogen;
- R_1 is alkyl of 1–6 carbon atoms;
- R_2 and R_3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, or thioalkyl of 1–6 carbon atoms;
- n is 0–5;

or a pharmaceutically acceptable salt thereof.

5,750,523

PYRIDAZINONE DERIVATIVES

Keizo Tanikawa; Takashi Matsumoto; Hiroo Matsumoto, all of Funabashi; Nobutomo Tsuruzoe, and Hitoshi Nakabeppu, both of Shiraoka-machi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP95/00069, § 371 Date Jul. 23, 1996, § 102(e) Date Jul. 23, 1996, PCT Pub. No. WO95/19969, PCT Pub. Date Jul. 27, 1995

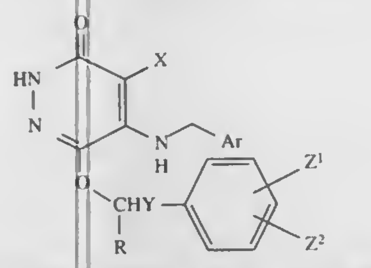
PCT Filed Jan. 24, 1995, Ser. No. 676,227

Claims priority, application Japan, Jan. 25, 1994, 6-006541

Int. Cl.⁶ A61K *31/50*

U.S. Cl. 514—247 **9 Claims**

1. A 3(2H)-pyridazinone of the formula (I):



(I)

wherein R is a hydrogen atom or a $C_1–C_4$ alkyl group,

- X is a hydrogen atom, a chlorine atom or a bromine atom,
- Ar is a phenyl group substituted with OR^1, wherein R^1 is a hydrogen atom or a $C_1–C_4$ alkyl group, and A, wherein A is a hydrogen atom, a halogen atom, a $C_1–C_4$ alkyl group or OR^2, wherein R^2 is a hydrogen atom or a $C_1–C_4$ alkyl group,
- Y is $C_1–C_8$ alkylene wherein one carbon atom on the straight chain is substituted with one OR^1 group, wherein R^1 is the same as defined above, and
- Z^1 and Z^2 are independently a hydrogen atom, a halogen atom, a C_1-C_4 alkyl group or a OR^1 group, wherein R^1 is the same as defined above, or

a pharmaceutically acceptable salt thereof.

5,750,524

REMEDY FOR HYPERLIPIDEMIA

Yukinori Mera; Naoki Nishi; Tadashi Kurimoto, and Hiroki Sato, all of Konan-machi, Japan, assignors to Zeria Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/01486, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO96/05820, PCT Pub. Date Feb. 29, 1996

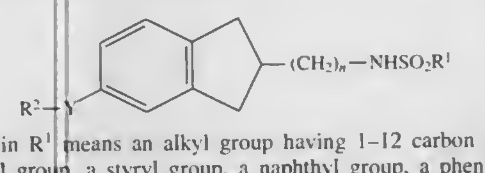
PCT Filed Jul. 26, 1995, Ser. No. 793,102

Claims priority, application Japan, Aug. 25, 1994, 6-222736

Int. Cl.⁶ A61K *31/50;31/495;31/415;31/38;31/16*

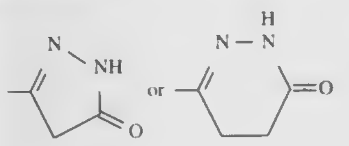
U.S. Cl. 514—247 **5 Claims**

1. A method for treating hyperlipidemia, which comprises administering an effective amount of an indane derivative represented by the general formula (1):



(1)

wherein R^1 means an alkyl group having 1–12 carbon atoms, a benzyl group, a styryl group, a naphthyl group, a phenyl group which may be substituted, or a thienyl group which may be substituted, R^2 denotes a carboxyl group, an alkoxycarbonyl group having 1–4 carbon atoms,



Y is a group represented by $—(CH_2)_p—$ (p stands for an integer of 0–5), a group represented by $—CO—(CH_2)_q\sim$ or $—CH(OH)—(CH_2)_q\sim$ (q stands for an integer of 1–4, and ~ means bonding to R^2), an oxymethylene group, or a vinylene group, and n stands for an integer of 1–4 or the pharmaceutically acceptable salt thereof to a patient having hyperlipidemia.

5,750,525

QUINOXALINEDIONE DERIVATIVES, THEIR PRODUCTION AND USE IN PHARMACEUTICAL AGENTS

Andreas Huth, and Lechoslaw Turski, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE94/00493, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO94/25469, PCT Pub. Date Nov. 10, 1994

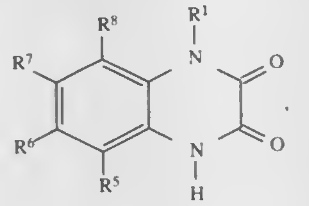
PCT Filed Apr. 28, 1994, Ser. No. 537,839

Claims priority, application Germany, Apr. 28, 1993, 43 14 591.4; Dec. 21, 1993, 43 44 486.5

Int. Cl.⁶ A61K *31/495;* **C07D** *413/00;417/00;241/36*

U.S. Cl. 514—249 **24 Claims**

1. A compound of formula I



(I)

in which

- R^1 means $—(CH_2)_n—CR^2H—(CH_2)_m—Z$,
- R^5, R^6, R^7 and R^8 are the same or different and mean hydrogen, C_{1-6} alkyl, CF_3, nitro, halogen, NR^9R^{10}, cyano, SO_pR^{11}, $SO_2NR^{12}R^{13}$, SO_3H, SO_3C_{1-6} alkyl or OR^{14},
- R^2 means hydrogen or $—(CH_2)_q—R^3$,
- R^3 means hydrogen, hydroxy, C_{1-6} alkoxy or $NR^{15}R^{16}$,
- n, m and q each mean 0, 1, 2 or 3,
- Z means POXY, OPOXY, $NH—COR^{20}$, $NH—SO_2R^{21}$ or SO_2R^{22},
- R^{11} means H, C_{1-6} alkyl or phenyl,
- p means 0, 1 or 2,
- R^{12} and R^{13} mean hydrogen or C_{1-4} alkyl,
- R^{14} means H or C_{1-6} alkyl optionally substituted one to three times with halogen,
- R^{20} and R^{21} mean C_{1-6} alkyl, phenyl or a six-membered ring heteroaromatic group optionally substituted with halogen,
- R^{22} means hydroxy, C_{1-6} alkoxy or $NR^{24}R^{25}$,
- X and Y are the same or different and mean hydroxy, C_{1-6} alkoxy, C_{1-4} alkyl or $NR^{18}R^{19}$,
- R^9 and R^{10} are the same or different and mean hydrogen, $CO—C_{1-6}$ alkyl, phenyl or C_{1-6} alkyl that can optionally be substituted with C_{1-4} alkoxy or an amino group optionally mono- or disubstituted with C_{1-4} alkyl, or together with the nitrogen atom forms a 5- to 7-membered saturated heterocycle, optionally having another N, S or O ring atom and optionally substituted one to three times by C_{1-4}-alkyl or phenyl, or forms an unsaturated 5-membered heterocycle containing 1–3 ring N atoms and optionally substituted once or twice by cyano, C_{1-4} alkyl, phenyl or $—CO_2C_{1-6}$ alkyl,
- R^{15} and R^{16}, R^{18} and R^{19} are the same or different and mean hydrogen, C_{1-4} alkyl, phenyl or together with the nitrogen atom forms a 5- to 7 -membered saturated heterocycle, optionally having another oxygen, sulfur or nitrogen ring atom and optionally substituted one to three times by C_{1-4} alkyl or phenyl, or forms an unsaturated 5-membered heterocycle containing 1–3 N ring atoms and optionally substituted once or twice by cyano, C_{1-4} alkyl, phenyl or $—CO_2C_{1-6}$ alkyl,
- R^{24} and R^{25} are the same or different and mean hydrogen, C_{1-4} alkyl or together with the nitrogen atom forms a saturated 5- to 7-membered heterocycle optionally having another oxygen,

sulfur or nitrogen ring atom and optionally substituted one to three times by C_{1-4} alkyl or phenyl, as well as their isomers or salts,

provided that:

if R^2 is hydrogen and Z is POXY, R^5–R^8 do not mean hydrogen;

if R^2 means hydrogen, Z means POXY, and R^5, R^6, R^7 or R^8 mean only CF_3, NO_2, halogen, NH_2 or methyl, at least two of R^5–R^8 are not hydrogen;

if R^1 is methanephosphonic acid, is R^6 cyano or substituted imidazole, R^5, R^7 and R^8 cannot be hydrogen at the same time; and

if R^1 is methanephosphonic acid, R^6 is CF_3 or NO_2 and R^7 is imidazole, R^5 and R^8 cannot be hydrogen at the same time.

5,750,526

PYRIDO [1,2,3-DE]QUINOXALINE DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND THEIR USE IN PHARMACEUTICAL AGENTS

Martin Krüger; Werner Seelen, and Lechoslaw Turski, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE94/00494, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO94/25472, PCT Pub. Date Nov. 10, 1994

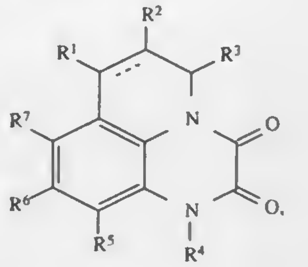
PCT Filed Apr. 28, 1994, Ser. No. 535,250

Claims priority, application Germany, Apr. 28, 1993, 43 14 593.0

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—250 **4 Claims**

1. Compounds of formula I



(I)

in which

R^1, R^2 and R^3 each mean hydrogen, -POXY, or halogen but are not simultaneously hydrogen,

R^4 means hydrogen or OH,

R^5, and R^6 and R^7 are the same or different and mean hydrogen, halogen, nitro, $NR^{12}R^{13}$, cyano, CF_3, CF_{1-6} alkyl, C_{1-4} alkoxy or

R^5 and R^6 or R^6 and R^7 represent a fused benzene ring or a single or double bond, and

X and Y are the same or different and mean hydroxy, C_{1-6} alkoxy, $—O—(CH_2)_n—O—$, C_{1-4} alkyl or NR^9R^{10} and n is 1, 2 or 3 and

R means hydroxy, C_{1-6} alkoxy or NR^9R^{10} and

R^9 and R^{10}, R^{12} and R^{13} are the same or different and mean hydrogen, $—CO—C_{1-6}$ alkyl, phenyl or C_{1-6} alkyl, which optionally can be substituted with C_{1-4} alkoxy or an amino group that is optionally mono- or disubstituted with C_{1-4} alkyl, or together with the nitrogen atom can form a saturated 5- to 7-membered heterocycle, which can contain another oxygen, sulfur or nitrogen atom and can optionally be substituted, or form an unsaturated 5-membered heterocycle, which contains 1–3 N atoms and can be substituted, as well as their isomers or salts.

2. A compound selected from 8-(1-Imidazolyl)-9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

8-iodo-9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

8-(1-pyrrolyl)-9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

8-morpholino-9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

8-amino-9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-6-phosphonic acid

9-chloro-2,3-1,2,3,5,6,7-hexahydro-pyridoquinoxaline5-phosphonic acid

9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid

9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-7-phosphonic acid

9-trifluoromethyl-2,3-dioxo-1,2,3,5,6,7-hexahydro-pyridoquinoxaline-5-phosphonic acid diethyl ester and mixtures thereof.

5,750,527

THIADIAZOLES AND THEIR USE AS ANTIPICORNAVIRAL AGENTS

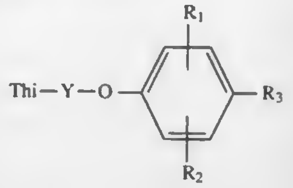
David J. Aldous, Glenmore; Thomas R. Bailey, Phoenixville; Guy Dominic Diana, and Theodore J. Nitz, both of Pottstown, all of Pa., assignors to Sanofi, Paris, France

Division of Ser. No. 706,108, Aug. 30, 1996, Pat. No. 5,650,419, which is a division of Ser. No. 477,040, Jun. 7, 1995, Pat. No. 5,567,719, which is a division of Ser. No. 242,529, May 13, 1994, Pat. No. 5,453,433. This application May 27, 1997, Ser. No. 863,388

Int. Cl.^{6} A61K *31/495;31/50;31/505*

U.S. Cl. 514—252 **5 Claims**

1. A compound of formula;



Formula I

wherein:

Thi is thiadiazolyl or thiadiazolyl substituted with alkoxy, fluoromethyl, difluoromethyl, trifluoromethyl, 1,1-difluoroethyl, halo, alkyl, cycloalkyl, hydroxyalkyl, or alkoxyalkyl;

Y is an alkylene bridge of 3–9 carbon atoms;

R_1 and R_2 are each independently chosen from hydrogen, halo, alkyl, alkenyl, amino, alkylthio, hydroxy, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkylsulfinyl alkyl, alkylsulfonylalkyl, alkoxy, nitro, carboxy, alkoxycarbonyl, dialkylaminoalkyl, alkylaminoalkyl, aminoalkyl, difluoromethyl, trifluoromethyl, or cyano;

R_3 is heterocycle chosen from pyrimidinyl, pyrazinyl, or pyridazinyl, or a pharmaceutically acceptable salt thereof.

5,750,528

BLOCKADE OF NEURONAL M-CHANNELS AS A THERAPEUTIC APPROACH TO THE TREATMENT OF NEUROLOGICAL DISEASE

Barry Stephen Brown, Wilmington; Simon Piers Aiken, Greenville, both of Del.; Robert Zaczek, Avondale, Pa.; Paul Richard Hartig, Princeton, N.J.; Christopher Allan Teleha; Wendell Wilkie Wilkerson, both of New Castle, Del., and Richard Alan Earl, Wilmington, Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Filed Feb. 1, 1995, Ser. No. 384,289

Int. Cl.^{6} A61K *31/50;31/505;31/445;31/38*

U.S. Cl. 514—253 **7 Claims**

1. A method of evaluating a compound for utility in treating neurological diseases involving neurotransmitter deficiencies or traumatic brain injury or the depressive phase of bipolar disorder which comprises:

(a) perfusing hippocampal neurons with a physiological perfusion solution containing K+ and a substance to block Na+ current and measuring the amplitude of the M-current through the neurons when the voltage is changed from one in the range of −30 to −40 mV to one in the range of −60 to −70 mV:

(b) adding a candidate compound for blocking neuronal M-channels to said solution and again measuring the amplitude of the M-current through the neurons over the same voltage change as in step 1: and

(c) comparing the difference in amplitude of the M-current between that measured in step 1 and in step 2.

5,750,529

APOPTOSIS REGULATING COMPOSTION

Satoru Nakai; Koutoku Aihara, both of Tokushima-ken; Hitomi Mori, Tokushima; Michiaki Tominaga, Tokushima; Masakazu Adachi, Takasaki; Hiroyuki Ichikawa, Tokushima; Seiji Akamatsu, Naruto, and Fumio Saito, Takasaki, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

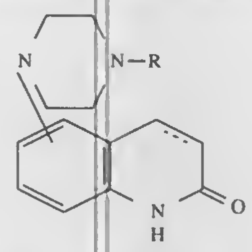
Division of Ser. No. 989,028, Apr. 30, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,505

Claims priority, application Japan, Jul. 3, 1991, 3-162587; Feb. 20, 1992, 4-33469; Mar. 3, 1992, 4-45718; Mar. 25, 1992, 4-100585

Int. Cl.^{6} A61K *31/495;31/50*

U.S. Cl. 514—254 **2 Claims**

1. A method for treatment of retroviral disease which comprises administering to a host afflicted with retroviral disease an anti-retroviral effective amount of at least one carbostyril derivative represented by general formula (1) or a salt thereof



wherein R is a benzoyl group which may optionally be substituted with a lower alkoxy group on the phenyl ring and the carbon-carbon bond in the 3 and 4 positions of the carbostyril skeleton is a single or a double bond.

5,750,530

PHARMACEUTICAL DIKETOPIPERAZINE COMPOUNDS

Justin Stephen Bryans; Adrian John Folkes, and Christopher John Latham, all of Slough, United Kingdom, assignors to Xenova Limited, Berkshire, United Kingdom

PCT No. PCT/GB95/01180, § 371 Date Dec. 17, 1996, § 102(e) Date Dec. 17, 1996, PCT Pub. No. WO95/32190, PCT Pub. Date Nov. 30, 1995

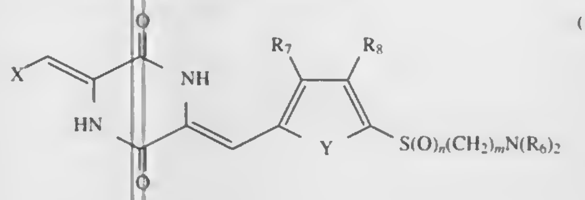
PCT Filed May 24, 1995, Ser. No. 750,020

Claims priority, application United Kingdom, May 24, 1994, 9410387

Int. Cl.^{6} A61K *31/495;* **C07D** *401/00;403/00*

U.S. Cl. 514—255 **9 Claims**

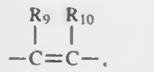
1. A diketopiperazine of formula (I):



(I)

wherein each of R_7 and R_8 which may be the same or different, is hydrogen or a nitro group;

Y is



$$-\overset{R_9}{\overset{|}{C}}=\overset{R_{10}}{\overset{|}{C}}-,$$

—O— or —S—, wherein each of R_9 and R_{10}, which may be the same or different, is hydrogen or a nitro group;

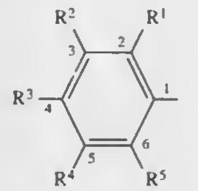
n is 0, 1 or 2;

m is an integer of 1 to 6;

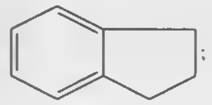
each R_6, which may be the same or different, is a C_1–C_6 alkyl group; and

X is selected from

(i) a phenyl group of the following formula



wherein each of R^1 to R^5, which may be the same or different, is independently selected from hydrogen, C_1–C_6 alkyl unsubstituted or substituted by one or more halogen atoms, C_1– C_6 alkoxy, C_1–C_6 alkythio, halogen, hydroxy, nitro, substituted phenyl, nitrobenzyl, benzyloxy, cyano, $—CH_2OH$, $—CH_2COOH$, $—CO_2R^{11}$, $—NHCOR^{14}$, $—NHSO_2R^{13}$, $—SO_2R^{13}$, $—CON(R^{11}R^{12})$, $—(CH_2)_xN(R^{11}R^{12})$, $—SOR^{13}$, $—SO_2N(R^{11}R^{12})$, $—N(R^{11}R^{12})$, $—O(CH_2)_xN(R^{11}R^{12}$), $—O(CH_2)_xCO_2R^{11}$, $—OCOR^{11}$, $—CH_2OCOR^{11}$, $—CH_2NHCOR^{11}$, $—CH_2NHCOOR^{13}$, $—CH_2SR^{11}$, $—CH_2SCOR^{11}$, $—CH_2S(O)_yR^{13}$, $—CH_2NHCO(CH_2)_xCO_2R^{11}$, $—N(R^{11})COR^{12}$, $—NHCOCF_3$, $—NHCO(CH_2)_xCO_2R^{11}$, $—NHCO(CH_2)_xOCOR^{11}$ and $—NHCO(CH_2)_xOR^{11}$ wherein x is 0 or is an integer of from 1 to 6, y is 1 or 2, each of R^{11} and R^{12}, is independently, H or C_1–C_6 alkyl, R^{13} is C_1–C_6 alkyl and R^{14} is H, C_1–C_6 alkyl or a thiophene group; and/or any of R_1 and R_2, R_2 and R_3, R_3 and R_4 or R_4 and R_5, form together with the carbon atoms to which they are attached a furan group, a benzene ring or the cyclopentyl moiety of the group



;

(ii) a heterocyclic ring selected from furan, thiophene, pyridine, quinoline and indole, the last of which is unsubstituted or N-substituted by C_1–C_6 alkyl;

(iii) a C_1–C_6 alkyl group, a 2,3-methylenedioxyphenyl group or a 3,4-methylenedioxyphenyl group; and

(iv) a group $—(CH_2)_p—Z$ wherein p is 0 or an integer of 1 to 4 and Z is a cyclohexyl group which optionally includes an unsaturated bond and/or a one or two carbon atom bridge, and is optionally substituted by one or more C_1–C_6 alkyl groups; or a pharmaceutically acceptable salt or ester thereof.

5,750,531

PYRIMIDINE DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Jong Wook Lee, Kwacheon-Si; Jeong Seok Chae, Seoul; Chang Seop Kim, Ansan-Si; Jae Kyu Kim, Kwacheon-Si; Dae Sung Lim, Seoul; Moon Kyu Shon, Anyang-Si; Yeon Shik Choi, Suwon-Si, and Sang Ho Lee, Masan-Si, all of Rep. of Korea, assignors to Yuhan Corporation, Seoul, Rep. of Korea

PCT No. PCT/KR95/00105, § 371 Date Jan. 23, 1997, § 102(e) Date Jan. 23, 1997, PCT Pub. No. WO96/05177, PCT Pub. Date Feb. 22, 1996

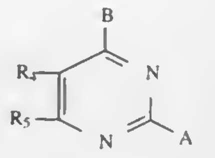
PCT Filed Aug. 10, 1995, Ser. No. 776,220

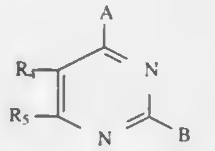
Claims priority, application Rep. of Korea, Aug. 13, 1994, 94-19997; Aug. 13, 1994, 94-19998

Int. Cl.^{6} A61K *31/505;* **C07D** *239/02;239/70*

U.S. Cl. 514—256 **13 Claims**

1. Pyrimidine derivative compounds of formulae (I-1) and (I-2) inclusive of pharmaceutically acceptable salts thereof:

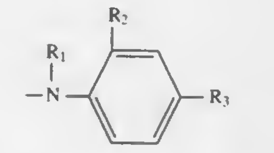

(I-1)


(I-2)

wherein:

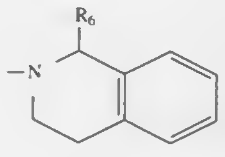
R$_4$ and R$_5$, which may be the same or different, are independently hydrogen or a C$_1$–C$_3$ alkyl group, or jointly form a cyclopentyl or cyclohexyl ring:

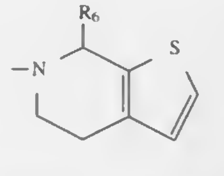
A is a group of formula(II):


(II)

wherein R$_1$ and R$_2$ are, independently of each other, hydrogen or a C$_1$–C$_3$ alkyl group, and R$_3$ is hydrogen, a C$_1$–C$_3$ alkyl group or a halogen; and

B is 1-(substituted)-1,2,3,4-tetrahydroisoquinolin-2-yl of formula (III-1) or 7-(substituted)-4,5,6,7-tetrahydrothieno[2,3-c]pyridin-6-yl of formula (III-2)


(III-1)


(III-2)

wherein R$_6$ is hydrogen or a C$_1$–C$_3$ alkyl group.

5,750,532

PHARMACEUTICALLY ACTIVE COMPOUNDS

Viyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Patrick A. Pinto, Mine Hill, and Richard W. Versace, Wanaque, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 169,809, Dec. 17, 1993, Pat. No. 5,459,144, which is a continuation-in-part of Ser. No. 376,476, Jul. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 940,125, Dec. 10, 1986, Pat. No. 4,851,423. This application May 30, 1995, Ser. No. 453,723

Int. Cl.^{6} C07D *233/60;239/54;* **A61K** *31/505;31/52*

U.S. Cl. 514—274 **3 Claims**

1. A compound represented by formula II

$$Z-X-Q-Y-W'-Y-Q-X-Z \qquad \text{II}$$

wherein each Z is independently, substituted phenyl, wherein the substituents are one or more halogen or lower alkoxy;

X and Y are each independently a bond or —O—;

each Q is independently a divalent straight or branched chain lower alkanediyl group; and

W' is 1,2,3,4-tetrahydropyrimidine-2,4-dione.

5,750,533

14-SUBSTITUTED MARCFORTINES AND DERIVATIVES USEFUL AS ANTIPARASITIC AGENTS

Byung H. Lee, Kalamazoo, Mich., assignor to Pharmacia & Upjohn Company, Kalamazoo, Mich.

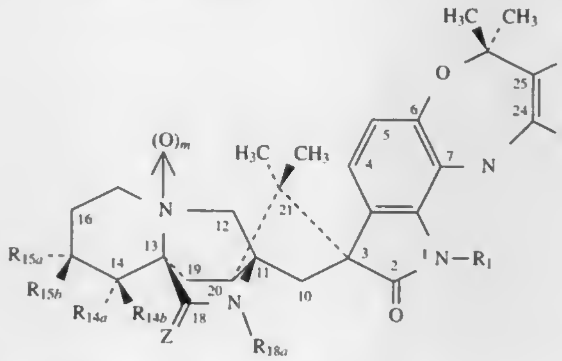
PCT No. PCT/US94/06037, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO94/29319, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 7, 1994, Ser. No. 557,033

Int. Cl.^{6} C07D *453/06;491/20;* **A61K** *31/435*

U.S. Cl. 514—278 **17 Claims**

1. A compound of Formula I



or a pharmaceutically acceptable salt, or 12α-N-oxide thereof; wherein:

m is 0 or 1;

Z is 0 or S;

R$_1$ is hydrogen, C$_1$–C$_7$ alkyl, cyclo C$_3$–C$_8$alkyl, benzyl, C$_2$–C$_7$ alkanoyl (—C(O)C$_2$—C$_7$alkyl) {optionally substituted with carboxy (—COOH), C$_1$–C$_7$ alkanoyl, carboC$_1$–C$_7$alkoxy (—C(O)OC$_1$–C$_7$alkyl), —NR$_4$R$_5$, aminocarbonyl (—C(O)NR$_4$R$_5$)}, C$_{10}$–C$_{24}$alkanoyl (—C(O)C$_{10}$–C$_{24}$alkyl, cyclo C$_3$–C$_8$alkanoyl {optionally substituted with carboxy, C$_1$—C$_7$ alkanoyl, carboC$_1$–C$_7$alkoxy, —NR$_4$R$_5$, aminocarbonyl}, alkanoyloxymethylene (—CH$_2$OC(O)-C$_{2-C7}$alkyl), benzoyloxymethlene (—CH$_2$OC(O)phenyl) {optionally substituted with 1 or 2 groups selected from halogen, C$_1$–C$_4$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$–C$_7$alkoxy }, C$_{10}$–C$_{24}$alkenoyl (—C(O)C$_9$–C$_{23}$alkenyl), benzenesulfonyl (—SO$_2$CH$_2$phenyl) {optionally substituted with 1 or 2 groups selected from halogen, C$_1$–C$_4$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$–C$_7$alkoxy}, C$_1$–C$_4$alkylaminocarbonyl (—C(O)N(C$_1$–C$_4$alkyl)$_2$), C$_1$–C$_4$alkylaminothiocarbonyl (—C(S)N(C$_1$–C$_4$alkyl)$_2$), C$_1$–C$_7$ alkoxycarbonyl, phenoxycarbonyl {optionally substituted with 1 or 2 groups selected from halogen, C$_1$–C$_4$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$–C$_7$alkoxy}, —C(O)NR'$_4$R'$_5$, —P(=X)(R$_2$)(R$_3$), —SR$_6$, —SO$_2$NR$_4$R5, benzoyl substituted at the 3 or 4 position with —CH$_2$NR$_4$R$_5$ or bicycloC$_8$–C$_{12}$alkanoyl;

R$_4$ and R$_5$, being the same or different, are selected from hydrogen, C$_1$–C$_7$ alkyl, phenyl {optionally substituted with 1 or 2 groups selected from halogen, C$_{1-4}$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$–C$_7$alkoxy};

R'$_4$ and R'$_5$, being the same or different, are selected from C$_1$–C$_7$ alkyl, cyclo(C$_3$–C$_8$)alkyl, phenyl {optionally substituted with 1 or 2 groups selected from halogen, C$_{1-4}$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$–C$_7$alkoxy};

X is O or S;

R$_2$ and R$_3$, being the same or different, are selected from C$_1$–C$_7$ alkyl, phenyl {optionally substituted with 1 or 2 groups selected from halogen, C$_{1-4}$ alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano and C$_1$– C$_7$alkoxy}, C$_1$–C$_7$ alkoxy, thio(C$_1$–C$_7$)alkoxy, phenoxy, thiophenoxy, —NR$_7$R$_8$ {where R$_7$ and R$_8$, being the same or different, are selected from H or C$_1$–C$_7$ alkyl;

R$_6$ is C$_1$–C$_7$ alkyl, haloC$_1$–C$_7$alkyl, carboC$_1$–C$_7$alkoxy, —NR$_9$R$_{10}$ o where R$_9$ and R$_{10}$, being the same or different, are C$_1$–C$_7$ alkyl or phenyl (optionally substituted with 1 or 2 groups selected from halo, lower alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano, C$_1$–C$_7$ alkoxy);

R$_{24}$ is hydrogen, halogen or C$_1$–C$_7$ alkoxy;

R$_{25}$ is hydrogen or halogen;

R18a is hydrogen, C$_1$–C$_7$ alkyl, C$_2$–C$_8$ alkoxyalkyl, C$_2$–C$_8$ alkenyl, C$_2$–C$_8$ alkynyl or benzyl;

R14a is hydroxyl, hydrogen, C$_1$–C$_7$ alkyl, C$_2$–C$_8$ alkoxyalkyl, cyclo(C$_3$–C$_8$)alkyl or benzyl (optionally substituted with 1 or 2 groups selected from halo, lower alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano, C$_1$–C$_7$ alkoxy);

R$_{14b}$is hydroxyl, hydrogen, C$_1$–C$_7$ alkoxy, cyclo(C$_3$–C$_8$)alkyl or benzoxyl (optionally substituted with 1 or 2 groups selected from halo, lower alkyl, haloC$_1$–C$_7$alkyl, nitro, cyano, C$_1$–C$_7$ alkoxy);

R$_{15}$a and R$_{15b}$ are both hydrogen, with the provisio that when one of R$_{14a}$ or R$_{14b}$ is hydroxyl and the other is hydrogen or methyl, R$_{15a}$ and R$_{15b}$ can be hydrogen or methyl; and with the overall proviso that R$_{14a}$ and R$_{14b}$ are not both hydrogen.

5,750,534

NALBUPHINE ESTERS HAVING LONG ACTING ANALGESIC ACTION AND METHOD OF USE

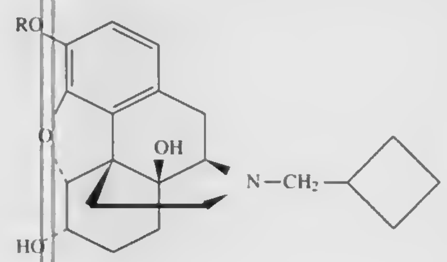
Hu Oliver Yoa-Pu; Jhi-Joung Wang, and Ho Shung-Tai, all of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Continuation-in-part of Ser. No. 161,257, Mar. 16, 1994, abandoned. This application Jul. 26, 1996, Ser. No. 690,361

Int. Cl.^{6} A61K *31/44;31/485*

U.S. Cl. 514—282 **15 Claims**

1. A method of treating severe, acute, long lasting pain with a duration of relief of at least 10 hours up to 30 times the duration of action of nalbuphine hydrochloride in a living subject in need thereof, consisting of orally, intramuscularly, transdermally, or subcutaneously administering to said living subject a pharmaceutical composition which comprises an effective amount of an ester of nalbuphine of the formula



as the free base, or a salt thereof, wherein R is R^{1}CO— and R^1 is a straight or branched alkyl group of 2–36 carbon atoms or a phenyl group, together with a pharmaceutically acceptable oil carrier.

5,750,535

PHARMACEUTICAL AGENTS FOR THE TREATMENT OF DISORDERS CAUSED BY HELICOBACTER PYLORI OR OTHER SPIRAL UREASE-POSITIVE GRAM-NEGATIVE BACTERIA

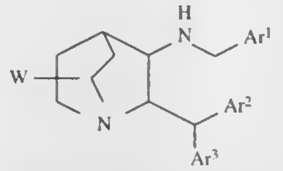
Joanna Clancy, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 159,157, Nov. 30, 1993, abandoned. This application Aug. 29, 1995, Ser. No. 520,522

Int. Cl.^{6} A61K *31/44*

U.S. Cl. 514—294 **4 Claims**

1. A method of treating or preventing a disorder caused by *Helicobacter pylori* or another spiral urease-positive gram-negative bacterium in a mammal, comprising administering to said mammal a compound having the formula



(X)

wherein W is Y or X(CH$_2$)$_n$;

Y is optionally substituted (C$_1$–C$_6$)alkyl, optionally substituted (C$_2$–C$_6$)alkenyl or optionally substituted (C$_3$–C$_8$)cycloalkyl;

X is optionally substituted (C$_1$–C$_6$)alkoxy, hydroxy, CONR^{1}R^2, CO$_2$R^1, CHR^{1}OR^2, CHR^{1}NR^{2}R^3, COR^1, CONR^{1}OR^2 or optionally substituted aryl, wherein said aryl is selected from phenyl, naphthyl, pyridyl, quinolyl, thienyl, furyl, phenoxyphenyl, oxazolyl, tetrazolyl, thiazolyl, imidazolyl and pyrazolyl; and n is an integer from zero to six;

Ar^1, Ar^2 and Ar^3 are each, independently, optionally substituted aryl, wherein said aryl is selected from phenyl, naphthyl, pyridyl, quinolyl, thienyl, furyl, phenoxyphenyl, oxazolyl, tetrazolyl, thiazolyl, imidazolyl and pyrazolyl;

and R^1, R^2 and R^3 are independently selected from hydrogen, optionally substituted (C$_1$–C$_6$)alkyl, optionally substituted (C$_1$–C$_6$)alkoxy, optionally substituted (C$_3$–C$_8$)cycloalkyl, optionally substituted aryl, wherein said aryl is selected from phenyl, naphthyl, pyridyl, quinolyl, thienyl, furyl, phenoxyphenyl, oxazolyl, tetrazolyl, thiazolyl, imidazolyl and pyrazolyl; and optionally substituted (C$_1$–C$_5$)heterocyclic groups, wherein said heterocyclic groups are selected from pyrrolidino, piperidino, morpholino, piperazinyl and thiamorpholino;

and wherein the substituents on the foregoing substituted alkyl, alkenyl, cycloalkyl and alkoxy groups are independently selected from halo, nitro, amino, (C$_1$–C$_4$)alkyl, (C$_1$–C$_4$) alkoxy, trifluoromethyl and trifluoromethoxy;

and wherein the substituents on the foregoing substituted (C$_1$–C$_5$) heterocyclic groups are attached to a sulfur or nitrogen atom on the ring and are independently selected from oxygen, di-oxygen and (C$_1$–C$_4$)alkyl when attached to a ring sulfur atom, and are independently selected from oxygen and (C$_1$–C$_4$)alkyl when attached to a ring nitrogen atom;

and wherein the substituents on said substituted Ar^1 groups are independently selected from (C$_1$–C$_6$)alkyl optionally substituted with from one to three halo groups, (C$_1$–C$_6$)alkoxy optionally substituted with from one to three halo groups, (C$_1$–C$_6$)alkylsulfinyl, (C$_2$–C$_6$)alkenyl, (C$_1$–C$_6$)alkylthio, (C$_1$–C$_6$) alkylsulfonyl, (C$_1$–C$_6$) alkylsulfonylamino, and di-(C$_1$–C$_6$)alkylamino wherein one or both of the alkyl groups may be optionally substituted with a (C$_1$–C$_6$)alkylsulfonyl, or (C$_1$–C$_6$) alkylsulfinyl group;

and wherein the substituents on said substituted Ar^2 and Ar^3 groups are independently selected from (C$_1$–C$_4$)alkyl, (C$_1$–C$_4$) alkoxy, (C$_1$–C$_4$) alkylthio, (C$_1$–C$_4$)alkylsulfinyl, di-(C$_1$–C$_4$)alkylamino, trifluoromethyl and trifluoromethoxy; with the proviso that when Y is unsubstituted or is substituted with (C$_1$–C$_4$)alkyl, it is attached to the 4- or 6-position of the quinuclidine ring;

or a pharmaceutically acceptable salt of such compound.

5,750,536

TROPYL 7-AZAINDOL-3-YLCARBOXYAMIDES AS ANTITUSSIVE AGENT

Marco Mantovanini; Gabriella Melillo, and Luisa Daffonchio, all of Milan, Italy, assignors to DOMPE ' SpA, L'Aquila, Italy

PCT No. PCT/IB94/00234, § 371 Date Apr. 2, 1996, § 102(e) Date Apr. 2, 1996, PCT Pub. No. WO95/04742, PCT Pub. Date Feb. 16, 1995

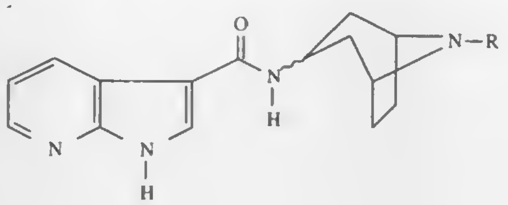
PCT Filed Aug. 4, 1994, Ser. No. 615,173

Claims priority, application Italy, Aug. 5, 1993, MI93A1780

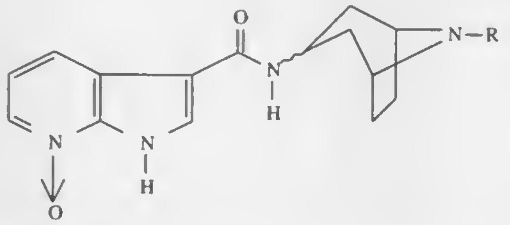
Int. Cl.^{6} A01N *43/42;* **C07D** *471/02;209/02*

U.S. Cl. 514—300 **5 Claims**

1. Tropyl 7-azaindol-3-ylcarboxyamide compound of the formula



or



wherein the symbol ~~~ indicates that the compounds may have an exo or an endo configuration; and R represents hydrogen, a saturated linear or branched C_1–C_4 alkyl, C_7–C_9 arylalkyl or $(CH_2)n$—$(C_3$–$C_7)$ cycloalkyl group wherein n is an number between 0 and 4, or a C_1–C_{12} acyl group;

or non-toxic pharmaceutically acceptable acid addition salts thereof.

5,750,537

USE OF 5HT$_3$ ANTAGONIST TO TREAT IMPOTENCE

Kazuhiko Nomura, Tsukuba, and Isamu Yamaguchi, Kawanishi, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP95/01745, § 371 Date Mar. 17, 1997, § 102(e) Date Mar. 17, 1997, PCT Pub. No. WO96/09069, PCT Pub. Date Mar. 28, 1996

PCT Filed Aug. 31, 1995, Ser. No. 793,798

Claims priority, application Japan, Sep. 19, 1994, 6-251521

Int. Cl.^{6} A61K *31/44;31/415*

U.S. Cl. 514—304 **1 Claim**

1. A method for treating impotence which comprises administering an effective amount of a 5HT$_3$ antagonist.

5,750,538

METHOD OF TREATING HYPERCHOLESTEROLEMIA AND RELATED DISORDERS

Per Sauerberg, Farum, and Kristian Tage Hansen, Frederiksberg, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

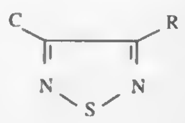
Filed Jan. 3, 1997, Ser. No. 778,646

Claims priority, application Denmark, Jan. 4, 1996, 0002/96

Int. Cl.^{6} A61K *31/44;31/41*

U.S. Cl. 514—305 **34 Claims**

1. A method of inhibiting squalene synthetase or treating hypercholesterolemia in a subject in need thereof comprising administering to the subject an effective amount of a compound of formula I

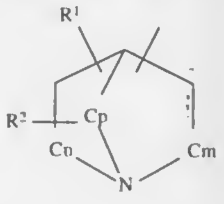


(I)

wherein

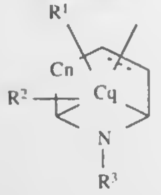
R is —Z^1—R^4, —Z^1—R^6—Z^2—R^5, —Z^1—R^6—Z^2—R^7—Z^3—R^5, —Z^1—R^6—CO—R^5, —Z^1—R^6—CO$_2$—R^5, —Z^1—R^6—O$_2$C—R^5, —Z^1—R^6—CONH—R^5, —Z^1—R^6—NHCO—R^5, —Z^1—R^6—Y, —Z^1—R^6—Z^2—Z or —Z^1—R^6—Z^2—R^7—Y, wherein Z^1, Z^2 and Z^3 independently are —O—, —S— or —NH—; R^4 is C_{3-15}-alkyl, C_{2-15}-alkenyl, or C_{2-15}-alkynyl, each of which is optionally substituted with one or more halogen(s), C_{1-6}-alkoxy, —CF$_3$, —CN, —COOH, —OH, —SH, —NR^{8}R^9, C_{1-6}-alkyl ester, C_{3-10}-cycloalkyl, C_{4-10}-cycloalkenyl, phenyl, benzyloxycarbonyl, phenoxy, benzoyl, tetrahydronaphthyl, naphtyl, indanyl or indenyl, wherein each aromatic ring is optionally substituted with halogen, —NO$_2$, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF$_3$, —CF$_3$, —CONH$_2$, —CSNH$_2$, —NH$_2$, phenoxy or phenyl, or R^4 is C_{1-2}-alkyl substituted with one or more halogen(s), C_{1-6}-alkoxy, —CF$_3$, —CN, —COOH, —OH, —SH, —NR^{8}R^9, C_{1-6}-alkyl ester, C_{3-10}-cycloalkyl, C_{4-10}-cycloalkenyl, phenyl, benzyloxycarbonyl, phenoxy, benzoyl, tetrahydronaphtyl, naphtyl, indanyl or indenyl, wherein each aromatic ring is optionally substituted with halogen, —NO$_2$, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF$_3$, —CF$_3$, —CONH$_2$, —CSNH$_2$, —NH$_2$, phenoxy or phenyl; R^5 is C_{1-15}-alkyl, C_{2-15}-alkenyl, C_{2-15}-alkynyl, each of which is optionally substituted with one or more halogen(s), C_{1-6}-alkoxy, —CF$_3$, —CN, —COOH, —OH, —SH, —NR^{8}R^9, C_{1-6}-alkyl ester, C_{3-10}-cycloalkyl, C_{4-10}-cycloalkenyl, phenyl, benzyloxycarbonyl, phenoxy, benzoyl, tetrahydronaphtyl, naphtyl, indanyl or indenyl, wherein each aromatic ring is optionally substituted with halogen, —NO$_2$, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF$_3$, —CF$_3$, —CONH$_2$, —CSNH$_2$, —NH$_2$, phenoxy or phenyl; R^6 and R^7 independently are C_{1-10}-alkylene, C_{2-10}-alkenylene, C_{2-10}-alkynylene, each of which is optionally substituted with one or more halogen(s), C_{1-6}-alkoxy, —CF$_3$, —CN, —COOH, —OH, —SH, —NR^{8}R^9, C_{1-6}-alkyl ester, C_{3-10}-cycloalkyl, C_{4-10}-cycloalkenyl, phenyl, benzyloxycarbonyl, phenoxy, benzoyl, tetrahydronaphtyl, naphtyl, indanyl or indenyl, wherein each aromatic ring is optionally substituted with halogen, —NO$_2$, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF$_3$, —CF$_3$, —CONH$_2$, —CSNH$_2$, —NH$_2$, phenoxy or phenyl; R^8 and R^9 independently are hydrogen or C_{1-6}-alkyl; and Y is a 5 or 6 membered heterocyclic group containing one to four N, O or S atom(s) or a combination thereof, which heterocyclic group is optionally substituted at carbon and/or nitrogen atom(s) with straight or branched C_{1-6}-alkyl, phenyl or benzyl, or a carbon atom in the heterocyclic group together with an oxygen atom form a carbonyl group, or which heterocyclic group is optionally fused with a phenyl group; and

G is an azabicyclic ring of the formula:



or

-continued



wherein the thiadiazole ring can be attached at any carbon atom of the azabicyclic ring; R^1 and R^2 may be present at any appropriate position and independently are hydrogen, C_{1-5}-alkyl, C_{2-5}-alkenyl, C_{2-5}-alkynyl, C_{1-10}-alkoxy, C_{1-5}-alkyl substituted with —OH, —OH, halogen, —NH$_2$ or —COOH; R^3 is hydrogen, C_{1-5}-alkyl, C_{2-5}-alkenyl or C_{2-5}-alkynyl; n is 0, 1 or 2; m is 0, 1 or 2; p is 0, 1 or 2; q is 1 or 2; and ..... is a single or double bond; or a pharmaceutically acceptable salt thereof.

5,750,539

HETEROARYL DIOL ACIDS AS LEUKOTRIENE ANTAGONISTS

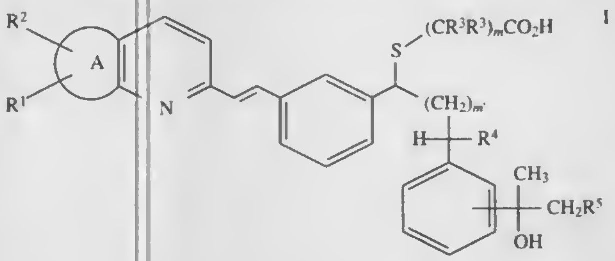
Yves Gareau, N.D. Ile-Perrot; Claude Dufresne, Dollard Des Ormeaux; Marc Labelle, Ile-Perrot; James Yergey, St. Lazare, all of Canada; Xin Xu, North Wales, Pa.; Deborah Nicoll-Griffith, Baie d' Urfe, Canada; Nathalie Chauret, Dollard des Ormeaux, Canada, and Laird Trimble, Pierrefonds, Canada, assignors to Merck Frosst Canada,' Kirkland, Canada

Filed Jun. 7, 1995, Ser. No. 475,139

Int. Cl.^{6} A61K *31/47;* **C07D** *215/12*

U.S. Cl. 514—311 **8 Claims**

1. A compound having the Formula I:



I

wherein

A and the pyridine ring to which it is fused together represent quinolinyl or thienopyridinyl;

R^1 and R^2 are independently hydrogen or halogen;

R^3 is H, lower alkyl, CF$_3$ or two R^3 groups joined to the same carbon form a 3- to 5-membered carbocyclic ring

one of R^4 and R^5 is H and the other is OH;

m is 1 to 5;

m' is 1 or 2;

or a pharmaceutically acceptable salt thereof.

5,750,540

1,4-DI-SUBSTITUTED PIPERIDINE DERIVATIVES

Yoshimi Tsuchiya; Takashi Nomoto; Hirokazu Ohsawa; Kumiko Kawakami; Kenji Ohwaki, and Masaru Nishikibe, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/01128, § 371 Date Jul. 31, 1996, § 102(e) Date Jul. 31, 1996, PCT Pub. No. WO96/33973, PCT Pub. Date Oct. 31, 1996

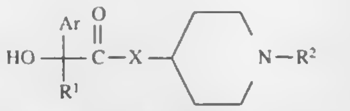
PCT Filed Apr. 25, 1996, Ser. No. 682,785

Claims priority, application Japan, Apr. 28, 1995, 7-129827

Int. Cl.^{6} A61K *31/445;31/505;* **C07D** *401/12;211/46*

U.S. Cl. 514—318 **18 Claims**

1. A 1,4-di-substituted piperidine the formula [I]



[I]

or a pharmaceutically acceptable salt thereof, wherein:

Ar represents a phenyl group or a five- or six-membered heteroaromatic group having one or two hetero atoms selected from the group consisting of an oxygen atom, a sulfur atom and a nitrogen atom in which one or two optional hydrogen atoms on the ring may be replaced by substituent groups selected from the group consisting of a halogen atom and a lower alkyl group;

R^1 represents a cycloalkyl group of 3 to 6 carbon atoms or a cycloalkenyl group of 3 to 6 carbon atoms;

R^2 represents a saturated or unsaturated aliphatic hydrocarbon radical of 5 to 15 carbon atoms; and

X represents O or NH.

5,750,541

METHOD OF TREATING SCHIZOPHRENIA

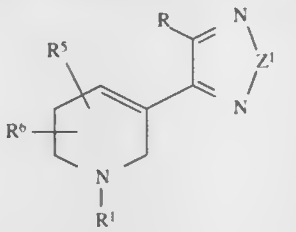
Franklin Porter Bymaster, Brownsburg, and Harlan E. Shannon, Carmel, both of Ind., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 468,273, Jun. 6, 1995, abandoned, which is a division of Ser. No. 292,117, Aug. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 109,300, Aug. 19, 1993, abandoned. This application Aug. 2, 1996, Ser. No. 691,438

Int. Cl.^{6} A61K *31/445;31/44;31/535*

U.S. Cl. 514—318 **11 Claims**

1. A method of treating schizophrenia or a schizophreniform disease in a subject in need thereof comprising administering to said subject an effective amount of a compound of formula I



(I)

wherein

Z^1 is oxygen or sulphur;

R is X, —Z^2—R^2—X, or —Z^2—R^2—Z^3—X, wherein Z^2 and Z^3 independently are oxygen or sulphur, R^2 is straight or branched C_{1-5}-alkyl, straight or branched C_{1-5}-alkenyl, straight or branched C_{2-15}-alkynyl, each of which is optionally substituted with halogen(s), —OH, —CN, —CF$_3$, —SH, —COOH, —NH—R^2, —NR^{2}R^3, C_{1-6}-alkyl ester, and one or two aromatic groups selected from the group consisting of phenyl, phenoxy, benzoyl and benzyloxycarbonyl wherein each aromatic group is optionally substituted with one or two halogens, —CN, C_{1-4}-alkyl or C_{1-4}-alkoxy, and X is a heterocyclic group selected from the group consisting of 1,3-dioxolanyl, pyridyl, thienyl, pyrrolidonyl, oxazolidonyl, thiazolidonyl, pyrrolidinyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, tetrazolyl, thiazolyl, oxazolyl, pyrrolidyl, piperidino, morpholino, and thiazolinyl wherein the heterocyclic group is optionally substituted at carbon or nitrogen atom(s) with straight or branched C_{1-6}-alkyl, phenyl, benzyl or pyridine, or at a carbon atom in the heterocyclic group together with an oxygen atom form a carbonyl group, or wherein the heterocyclic group is optionally fused with a phenyl group; and

R^5 and R^6 may be present at the 2,4,5, or 6 position of the pyridine ring and independently are hydrogen, straight or branched C_{1-5}-alkyl, straight or branched C_{25}-alkenyl, straight or branched C_{2-5}-alkynyl, straight or branched C_{1-10}-alkoxy, —OH, halogen, —NH$_2$, carboxy, or straight or branched C_{1-5}-alkyl substituted with —OH;

R_1 is hydrogen, straight or branched $C_{1\text{-}5}$-alkyl, straight or branched $C_{2\text{-}5}$-alkenyl or straight or branched $C_{2\text{-}5}$-alkynyl; or a pharmaceutically acceptable salt thereof.

5,750,542

BENZISOXAZOLE AND BENZISOTHIZOLE DERIVATIVES AS CHOLINESTERASE INHIBITORS

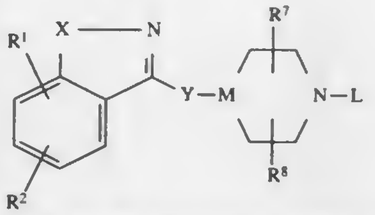
Anabella Villalobos, Niantic; Arthur A. Nagel, Gales Ferry, and Yuhpyng L. Chen, Waterford, all of Conn., assignors to Pfizer, New York, N.Y.

Filed Sep. 28, 1993, Ser. No. 127,847

Int. Cl.^{6} C07D *413/12;413/06;* **A61K** *31/445*

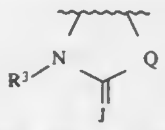
U.S. Cl. 514—322 **6 Claims**

1. A compound of the formula



(I)

wherein R^1 and R^2 are attached to adjacent carbon atoms and form, together with the carbon atoms to which they are attached, a group of the formula



A

wherein J is oxygen, sulfur or NR^4, R^4 is hydrogen or $(C_1\text{–}C_4)$alkyl, R^3 is hydrogen or $(C_1\text{–}C_6)$alkyl and Q is $(CH_2)_l$ wherein l is 1;

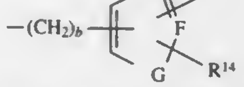
X is oxygen or sulfur;

Y is $—(CH_2)_m—$, $—CH{=}CH(CH_2)_n—$, $—NR^4(CH_2)_m—$, or $—O(CH_2)_m—$ wherein R^4 is hydrogen or $(C_1\text{–}C_4)$ alkyl, n is an integer from 0 to 3 and m is 1 or 2;

R^5 and R^6 are each independently selected from hydrogen, $(C_1\text{–}C_6)$alkyl, phenyl or benzyl, wherein the phenyl moieties of said phenyl and benzyl may optionally be substituted with 1 or 2 substituents independently selected from fluoro, chloro, bromo, iodo, $(C_1\text{–}C_4)$ alkyl, trifluoromethyl, $(C_1\text{–}C_4)$ alkoxy, cyano, nitro and hydroxy, or NR^5R^6 together form a 4 to 5 membered ring wherein one atom of the ring is nitrogen and the others are carbon, oxygen or nitrogen, or NR^5COR^6 together form a 4 to 5 membered cyclic lactam ring;

M is $—CH—$;

L is phenyl, phenyl-$(C_1\text{–}C_6)$alkyl, cinnamyl or pyridylmethyl, wherein the phenyl moieties of said phenyl and phenyl-$(C_1\text{–}C_6)$alkyl may optionally be substituted with 1–3 substituents independently selected from $(C_1\text{–}C_6)$alkyl, $(C_1\text{–}C_6)$alkoxy, $(C_1\text{–}C_4)$alkoxycarbonyl, $(C_1\text{–}C_4)$alkylcarbonyl, $—OCONR^5R^6$, $—NHCOOR^5$ or halo; or L is a group of the formula



(K)

wherein b is an integer from 1 to 4, R^{13} and R^{14} are independently selected from hydrogen, $(C_1\text{–}C_4)$ alkyl, halo and phenyl, E and F are independently selected from —CH— and nitrogen, and G is oxygen, sulfur or NR^4 wherein R^4 is hydrogen or $(C_1\text{–}C_4)$alkyl, with the proviso that when E and F are both nitrogen, one of R^{13} and R^{14} is absent; and

R^7 and R^8 are independently selected from hydrogen, $(C_1\text{–}C_6)$alkyl, $(C_1\text{–}C_6)$alkoxycarbonyl, $(C_1\text{–}C_6)$alkylcarbonyl and $(C_1\text{–}C_6)$alkoxy, with the proviso that said $(C_1\text{–}C_6)$alkoxy is not attached to a carbon that is adjacent to a nitrogen;

or pharmaceutically acceptable salt of such compound.

5,750,543

DIHYDROBENZOFURAN AND RELATED COMPOUNDS USEFUL AS ANTI-INFLAMMATORY AGENTS

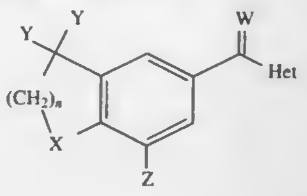
Laurence Ichih Wu, and John Michael Janusz, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 1, 1996, Ser. No. 595,113

Int. Cl.^{6} A61K *31/44;31/34;* **C07D** *401/06;407/06*

U.S. Cl. 514—337 **13 Claims**

1. A compound having the structure:



wherein

(a) n is 1;

(b) X is selected from the group consisting of O, S, SO, or SO_2;

(c) Y is independently hydrogen or straight, branched or cyclic alkyl having from 1 to about 4 carbon atoms, or the Y's are bonded together to form an alkanyl ring having from about 3 to about 7 atom , with the proviso that when one Y is hydrogen the other Y must also be hydrogen;

(d) Z is hydrogen or straight, branched or cyclic alkyl having from 3 to about 10 atoms other than hydrogen;

(e) W is O or S; and

(f) Het is a heteroaryl group comprising one or more rings each ring containing from about 5 to about 6 atoms other than hydrogen and wherein the group contains at least one heteroatom selected from O, N, or S except when Het is pyridyl, Y and Z are not hydrogen.

5,750,544

FUSED PHENOL DERIVATIVES

Shuichi Ohuchida; Fumio Nambu, and Masaaki Toda, all of Osaka, Japan, assignors to Ono Pharmaceuticals Co., Ltd., Osaka, Japan

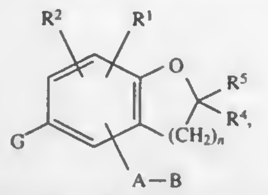
Division of Ser. No. 294,015, Aug. 23, 1994, Pat. No. 5,534,536. This application Apr. 19, 1996, Ser. No. 635,318

Claims priority, application Japan, Aug. 24, 1993, 5-231004

Int. Cl.^{6} C07D *405/06;* **A61K** *31/44*

U.S. Cl. 514—337 **14 Claims**

1. A fused phenol derivative of the formula (I):



(I)

wherein R^1 and R^2 each, independently, is

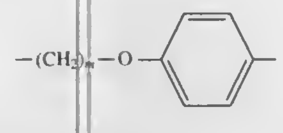
1) hydrogen atom,
2) halogen atom,
3) trifluoromethyl,
4) cyano,
5) C1–10 alkyl,
6) C1–4 alkoxy,
7) C3–7 cycloalkyl,
8) C7–10 phenylalkyl,
9) C1–10 alkyl substituted by C1–4 alkoxy,
10) C1–4 alkyl substituted by C3–7 cycloalkyl,
11) C1–6 alkyl substituted by phenylthio,

12) C1–6 alkyl substituted by phenoxy,
13) —COOH
14) $—COOR^6$ (in which R^6 is C1–6 alkyl),
15) C2–10 alkenyl or R^1 and R^2, taken together, represent $—CH{=}CH—CH{=}CH—$,

when R^1 and R^2 are attached ortho to each other;

A is

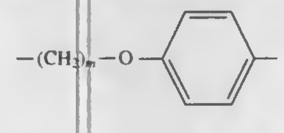
1) C1–8 alkylene,
2) C2–8 alkenylene,
3) C1–6 oxyalkylene or
4)



in which m is 1–6,

B is 2-, 3- or 4-pyridyl;

with the proviso that B can be bonded to an oxygen in the C1–6 oxyalkylene and to phenylene in the



G is $—OR^{3A}$ or $—NR^{3B}R^{3C}$ in which R^{3A}, R^{3B} and R^{3C} each, independently, is hydrogen atom, C1–4 alkyl, C7–10 phenylalkyl, C2–5 acyl, phenylcarbonyl, carbonyl substituted by C7–10 phenylalkyl or C2–4 alkoxyalkyl;

R^4 and R^5 each, independently, is a hydrogen atom, C1–8 alkyl, C7–10 phenylalkyl or R^4 and R^5 together with the carbon atom to which they are attached represent C4–7 cycloalkyl; and

n is 1–3 with the proviso that when R^4 is a hydrogen atom, R^5 is a group other than a hydrogen atom;

a non-toxic salt thereof or non-toxic acid addition salt thereof or hydrate thereof.

5,750,545

TRIAZOLE DERIVATIVE AND PHARMACEUTICAL USE THEREOF

Fumihiko Akahoshi; Takehiro Okada; Shinji Takeda; Youichiro Naito; Chikara Fukaya; Shigeki Kuwahara; Masahiko Kajii; Hiroko Nishimura, and Masanori Sugiura, all of Osaka, Japan, assignors to The Green Cross Corporation, Osaka, Japan

PCT No. PCT/JP94/01215, § 371 Date Jan. 23, 1996, § 102(e) Date Jan. 23, 1996, PCT Pub. No. WO95/03286, PCT Pub. Date Feb. 2, 1995

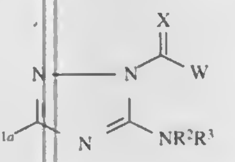
PCT Filed Jul. 22, 1994, Ser. No. 586,787

Claims priority, application Japan, Jul. 23, 1993, 5-182522; Jul. 23, 1993, 5-182544; Aug. 4, 1993, 5-193460

Int. Cl.^{6} C07D *249/14;487/04;* **A61K** *31/41;31/53*

U.S. Cl. 514—340 **17 Claims**

1. A triazole derivative of the formula (I')



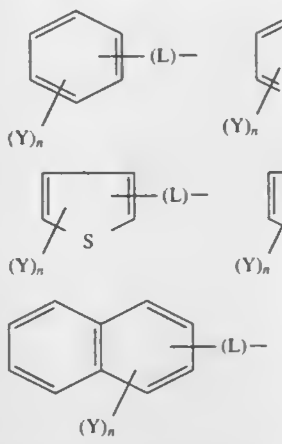
(I')

wherein

X is an oxygen atom or a sulfur atom;

W is $—NR^{4a}R^{5a}$;

R^{1a} is $—NR^{10}R^{11}$, $—N{=}R^{13}$ or a group of the formula (II)



(II)

wherein Y is a hydrogen atom, a lower alkyl, a lower alkoxy, a halogen, a cyano, a nitro, a lower alkyl substituted by halogen, $—NR^{14}R^{15}$, a tetrazolyl, an optionally substituted phenyl, a hydroxy or a carboxyl,

L is a direct bond, an oxygen atom, a sulfur atom, an alkylene, a vinylene or an ethynylene, and n is an integer of 1 to 3,

provided that when n is 2 or 3, Y may be the same or different; and

R^2 and R^3 are the same or different and each is a hydrogen atom or a lower alkyl,

wherein R^{4a} and R^{5a} are the same or different and each is a hydrogen atom, or a lower alkyl, provided that R^{4a} and R^{5a} are not hydrogen atom at the same time, R^{10} and R^{11} are the same or different and each is a hydrogen atom, an optionally substituted benzoyl, an optionally substituted phenyl, a lower alkylcarbonyl or $—COCOOR^{17}$, R^{17} is a lower alkyl, provided that when all of R^2, R^3 and R^{4a} are hydrogen atom and R^{5a} is a lower alkyl, R^{10} and R^{11} are not hydrogen atom at the same time, R^{13} is an optionally substituted methylene, R^{14} and R^{15} are the same or different and each is a hydrogen atom, a lower alkyl, $—COCOOR^{17}$ or $—CSNHR^{18}$ and R^{18} is a lower alkyl,

or a pharmaceutically acceptable salt thereof.

5,750,546

2-(2, 3, 5, 6-TETRAFLUORO-4-PYRIDYL)1, 2, 5-THIADIAZOLIDIN-3-ONE 1, 1-DIOXIDES AND COMPOSITIONS AND METHOD OF USE THEREOF

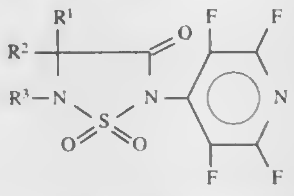
Ranjit Chimanlal Desai, Towamencin Township, Pa., assignor to Sanofi Winthrop, Inc., New York, N.Y.

Filed Dec. 2, 1994, Ser. No. 348,439

Int. Cl.^{6} A61K *31/44;* **C07D** *417/04*

U.S. Cl. 514—342 **9 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen, lower-alkyl, or phenyl-lower-alkyl;
R^2 is hydrogen, lower-alkyl, or phenyl-lower-alkyl; and
R^3 is hydrogen, or lower-alkyl; or
a pharmaceutically acceptable acid-addition salt thereof; or
where applicable, an enantiomer or a racemic mixture thereof.

5,750,547

CERTAIN CARBANATE ANTI-CANCER AGENTS

René C. Gaudreault, Bernières, and Patrick Poyet, Saint-Rédempteur, both of Canada, assignors to Universite Laval, Quebec, Canada

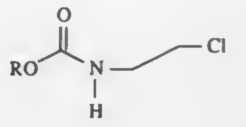
Division of Ser. No. 369,584, Jan. 6, 1995, Pat. No. 5,530,026.

This application Jun. 7, 1996, Ser. No. 664,233

Int. Cl.^{6} A61K *31/44;* **C07D** *231/56;209/40;* **C07C** *271/26*

U.S. Cl. 514—346 **7 Claims**

1. A compound of the formula I:



(I)

wherein:

R is an aryl group selected from the group consisting of phenyl, indane, fluorene,

the aryl group being substituted with at least one substituent selected from the group consisting of azido, carboxy, hydrogen, C_{1-16} alkyl optionally substituted with one or more OH or SH, lower alkoxy, C_{3-8} cycloalkyl, lower alkylthio, nitro, cyano, lower alkyne, lower alkene, OH, SH, carboxy lower alkyl, carboxy lower alkyl esters, amino, N-lower alkyl, N,N-dilower alkyl, and halogen; or a prodrug thereof, with the proviso that the compound is not:

2-, 3- and 4-nitrophenyl N-(2-chloroethyl)carbamate and

2-, 3- and 4-methoxyphenyl N-(2-chloroethyl)carbamate.

5,750,548

1-IN-(HALO-3-PYRIDYLMETHYL)[-N-METHYLAMINO-1-ALKLAMINO-2-NITROETHY-LENE DERIVATIVES FOR CONTROLLING FLEAS IN DOMESTIC ANIMALS

Thomas Friedel, East Blaxland, Australia; Eric William Moyses, Basel, Switzerland; Olivier Tinembart, Delémont, Switzerland; Peter Maienfisch, Rodersdorf, Switzerland, and Laurenz Gsell, Basel, .Switzerland, assignors to Novartis Corp., Summit, N.J.

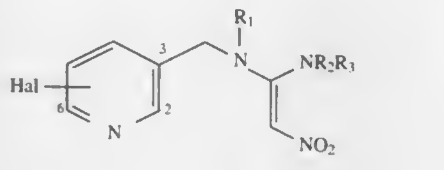
Continuation of Ser. No. 443,943, May 18, 1995, abandoned.

This application Apr. 29, 1996, Ser. No. 639,375

Int. Cl.^{6} C07D *213/36;* **A01N** *43/40*

U.S. Cl. 514—357 **22 Claims**

4. A method for systemic control of fleas in a domestic animal, which comprises administering to the said domestic animal orally, parenterally, or in the form of an implant, in an amount effective against fleas, a compound of formula I



(I)

wherein

Hal is halogen;

R_1 is hydrogen, C_1–C_6alkyl, or C_3–C_7cycloalkyl;

R_2 is hydrogen, C_1–C_6alkyl, or C_3–C_7cycloalkyl; and

R_3 is hydrogen or C_1–C_6alkyl.

5,750,549

CYCLOALKYL TACHYKININ RECEPTOR ANTAGONISTS

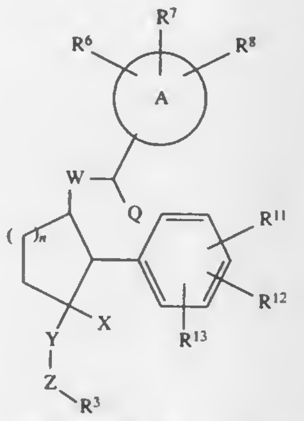
Charles G. Caldwell, Scotch Plains; Ping Chen, Old Bridge; Philippe L. Durette, New Providence; Paul Finke, Milltown; Jeffrey Hale, Westfield, all of N.J.; Edward Holson, New York, N.Y.; Ihor Kopka, Millburn, N.J.; Malcolm MacCoss, Freehold, N.J.; Laura Meurer, Scotch Plains, N.J.; Sander G. Mills, Woodbridge, N.J., and Albert Robichaud, Stirling, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1996, Ser. No. 730,277

Int. Cl.^{6} A61K *31/41;* **C07D** *257/04;271/10*

U.S. Cl. 514—364 **30 Claims**

1. A compound of the formula:



I

or a pharmaceutically acceptable salt thereof, wherein:
the circle A:

is selected from the group consisting of:
(A) phenyl,
(B) benzofuranyl,
(C) benzothiophenyl,
(D) benzothiazoyl,
(E) indolyl,
(F) imidazolyl,
(G) oxadiazolyl,
(H) pyridyl,
(I) pyrimidyl,
(J) quinolinyl,
(K) thiazolyl,
(L) thienyl,
(M) thiophenyl, and
(N) dihydrobenzofuranyl;

Q is selected from the group consisting of:
(1) hydrogen, and
(2) C_{1-6} alkyl;

W is selected from the group consisting of:
(1) —O—,
(2) —NH—,
(3) —N(C_{1-6} alkyl)—,
(4) —NH—CO—, and
(3) —N(C_{1-6} alkyl)—CO—,
wherein if W is —NHCO— or —N(C_{1-6} alkyl)—CO—, then optionally Q and the carbon atom to which it is attached are absent;

X is selected from the group consisting of:
(1) hydrogen, and
(2) C_{1-6} alkyl;

Y is selected from the group consisting of:
(1) a single bond,
(2) C_{1-6} alkyl, unsubstituted or substituted with one or more of the substituents selected from:
(a) hydroxy,

(b) oxo,
(c) C_{1-6} alkoxy,
(d) phenyl-C_{1-3} alkoxy,
(e) phenyl,
(f) —CN,
(g) halo, wherein halo is fluoro, chloro, bromo or iodo,
(h) —NR^{9}R^{10}, wherein R^9 and R^{10} are independently selected from:
(I) hydrogen,
(II) C_{1-6} alkyl,
(III) phenyl,
(IV) (C_{1-6} alkyl)-phenyl,
(V) (C_{1-6} alkyl)-hydroxy, and
(VI) (C_{1-6} alkyl)-(C_{1-4} alkoxy),
(i) —NR^9—COR^{10}, wherein R^9 and R^{10} are as defined above,
(j) —NR^9—CO$_2$R^{10}, wherein R^9 and R^{10} are as defined above,
(k) —CO—NR^{9}R^{10}, wherein R^9 and R^{10} are as defined above,
(l) —COR^9, wherein R^9 is as defined above, and
(m) —CO$_2$R^9, wherein R^9 is as defined above;

Z is selected from the group consisting of:
(1) —NR^{15}—, wherein R^{15} is selected from the group consisting of:
(a) hydrogen;
(b) C_{1-6} alkyl, unsubstituted or substituted with one or more of the substituents selected from:
(i) hydroxy,
(ii) oxo,
(iii) C_{1-6} alkoxy,
(iv) phenyl-C_{1-3} alkoxy,
(v) phenyl,
(vi) —CN,
(vii) halo,
(viii) —NR^{9}R^{10},
(ix) —NR^9—COR^{10},
(x) —NR^9—CO$_2$R^{10},
(xi) —CO—NR^{9}R^{10},
(xii) —COR^9,
(xiii) —CO$_2$R^9;
(c) phenyl, unsubstituted or substituted with one or more of the substituents selected from:
(i) hydroxy,
(ii) C_{1-6} alkoxy,
(iii) C_{1-6} alkyl,
(iv) C_{2-5} alkenyl,
(v) halo,
(vi) —CN,
(vii) —NO$_2$,
(viii) —CF$_3$,
(ix) —(CH$_2$)$_m$—NR^{9}R^{10}, wherein m is 0, 1 or 2,
(x) —NR^9—COR^{10},
(xi) —NR^9—CO$_2$R^{10},
(xii) —CO—NR^{9}R^{10},
(xiii) —CO$_2$—NR^{9}R^{10},
(xiv) —COR^9,
(xv) —CO$_2$R^9,
(2) —CO—NR^{15}—,
(3) —NR^{15}—CO—,
(4) —SO$_2$—NR^{15}—,
(5) —NR^{15}—SO$_2$—,
(6) —SO$_2$—,
(7) —CO—O—R^{15},
(8) —O—CO—R^{15},
(9) —CO—R^{15},
(10) —CH$_2$—OR^{15};
or if R^3 is other than hydrogen, then Z is optionally absent;
or if X is other than hydrogen, then R^{15} and X may be joined together to form a 3- to 7-membered heterocyclic ring containing a group selected from: —NR^3—, —CO—NR^3—, —NR^3—CO—, —SO$_2$—NR^3—, —NR^3—SO$_2$—, —SO$_2$—, —CO—O—, —O—CO—, —O—, and —CO—, and wherein the heterocyclic ring is optionally substituted with one or more of the substitutents selected from:
(i) hydroxy,
(ii) oxo,
(iii) C_{1-6} alkoxy,
(iv) phenyl-C_{1-3} alkoxy,
(v) phenyl,
(vi) —CN,
(vii) halo,
(viii) —NR^{9}R^{10},
(ix) —NR^9—COR^{10},
(x) —NR^9—CO$_2$R^{10},
(xi) —CO—NR^{9}R^{10},
(xii) —COR^9,
(xiii) —CO$_2$R^9;

R^3 is selected from the group consisting of:
(1) hydrogen,
(2) —R^5, and
(3) C_{1-6} alkyl substituted with —R^5, and if Z is —CO—O—R^{15}, —O—CO-R^{15}, —CO—R^{15}, or —CH$_2$—OR^{15}, then R^3 is absent;

R^5 is selected from the group consisting of:
(1) hydroxy,
(2) C_{1-6} alkoxy,
(3) phenyl-C_{1-3} alkoxy,
(4) phenyl,
(5) —CN,
(6) halo,
(7) —NR^{9}R^{10},
(8) —NR^9—COR^{10},
(9) —NR^9—CO$_2$R^{10},
(10) —CO—NR^{9}R^{10},
(11) —COR^9,
(12) —CO$_2$R^9;
(13) heterocycle, wherein the heterocycle is selected from the group consisting of:
(A) benzimidazolyl,
(B) benzofuranyl,
(C) benzothiophenyl,
(D) benzoxazolyl,
(E) furanyl,
(F) imidazolyl,
(G) indolyl,
(H) isooxazolyl,
(I) isothiazolyl,
(J) oxadiazolyl,
(K) oxazolyl,
(L) pyrazinyl,
(M) pyrazolyl,
(N) pyridyl,
(O) pyrimidyl,
(P) pyrrolyl,
(Q) quinolyl,
(R) tetrazolyl,
(S) thiadiazolyl,
(T) thiazolyl,
(U) thienyl,
(V) triazolyl,
(W) azetidinyl,
(X) 1,4-dioxanyl,
(Y) hexahydroazepinyl,
(Z) piperazinyl,
(AA) piperidinyl,
(AB) pyrrolidinyl,
(AC) morpholinyl,
(AD) thiomorpholinyl,
(AE) dihydrobenzimidazolyl,
(AF) dihydrobenzofuranyl,
(AG) dihydrobenzothiophenyl,
(AH) dihydrobenzoxazolyl,
(AI) dihydrofuranyl
(AJ) dihydroimidazolyl,
(AK) dihydroindolyl,
(AL) dihydroisooxazolyl,
(AM) dihydroisothiazolyl,
(AN) dihydrooxadiazolyl,
(AO) dihydrooxazolyl,

(AP) dihydropyrazinyl,
(AQ) dihydropyrazolyl,
(AR) dihydropyridinyl,
(AS) dihydropyrimidinyl,
(AT) dihydropyrrolyl,
(AU) dihydroquinolinyl,
(AV) dihydrotetrazolyl,
(AW) dihydrothiadiazolyl,
(AX) dihydrothiazolyl,
(AY) dihydrothienyl,
(AZ) dihydrotriazolyl,
(BA) dihydroazetidinyl,
(BB) dihydro-1,4-dioxanyl,
(BC) tetrahydrofuranyl, and
(BD) tetrahydrothienyl,
and wherein the heterocycle is unsubstituted or substituted with one or more substituent(s) selected from:
(i) C_{1-6} alkyl, unsubstituted or substituted with halo, —CF_3, —OCH_3, or phenyl,
(ii) C_{1-6} alkoxy,
(iii) oxo,
(iv) hydroxy,
(v) thioxo,
(vi) —SR^9,
(vii) halo,
(viii) cyano,
(ix) phenyl,
(x) trifluoromethyl,
(xi) —$(CH_2)_m$—NR^9R^{10},
(xii) —NR^9COR^{10},
(xiii) —$CONR^9R^{10}$,
(xiv) —CO_2R^9, and
(xv) —$(CH_2)_m$—OR^9,
(14) —CO-heterocycle, wherein heterocycle is as defined above;
R^6, R^7 and R^8 are independently selected from the group consisting of:
(1) hydrogen,
(2) C_{1-6} alkoxy,
(3) halo,
(4) C_{1-6} alkyl, unsubstituted or substituted with one or more of the substituents selected from:
(a) hydroxy,
(b) oxo,
(c) C_{1-6} alkoxy,
(d) phenyl-C_{1-3} alkoxy,
(e) phenyl,
(f) —CN,
(g) halo,
(h) —NR^9R^{10},
(i) —NR^9—COR^{10},
(j) —NR^9—CO_2R^{10},
(k) —CO—NR^9R^{10},
(l) —COR^9,
(m) —CO_2R^9,
(n) heterocycle, wherein heterocycle is as defined above,
(5) hydroxy,
(6) —CN,
(7) —CF_3,
(8) —NO_2,
(9) —SR^{14}, wherein R^{14} is hydrogen or C_{1-6}alkyl,
(10) —SOR^{14},
(11) —SO_2R^{14},
(12) —NR^9—COR^{10},
(13) —CO—NR^9—COR^{10},
(14) —NR^9R^{10},
(15) —NR^9—CO_2R^{10},
(16) —COR^9,
(17) —CO_2R^9,
(18) heterocycle, wherein heterocycle is as defined above,
(19) —(C_{1-6}alkyl)-heterocycle, wherein heterocycle is as defined above,
(20) —N(heterocycle)—SO_2R^{14}, wherein heterocycle is as defined above;
R^{11}, R^{12} and R^{13} are independently selected from:
(1) hydrogen,
(2) C_{1-6} alkyl, unsubstituted or substituted with one or more of the substituents selected from:
(a) hydroxy,
(b) oxo,
(c) C_{1-6} alkoxy,
(d) phenyl-C_{1-3} alkoxy,
(e) phenyl,
(f) —CN,
(g) halo,
(h) —NR^9R^{10},
(i) —NR^9—COR^{10},
(j) —NR^9—CO_2R^{10},
(k) —CO—NR^9R^{10},
(l) —COR^9,
(m) —CO_2R^9;
(3) halo,
(4) —CN,
(5) —CF_3,
(6) —NO_2,
(7) hydroxy,
(8) C_{1-6}alkoxy,
(9) —COR^9,
(10) —CO_2R^9; and
n is an integer selected from 1, 2 or 3;
with the proviso that if A is phenyl and W is —O—, —NH— or —N(C_{1-6} alkyl)—, then at least one of the following four conditions must be met:
(1) Q is other than hydrogen
(2) Y is a single bond,
(3) X is other than hydrogen, or
(4) at least one of R^6, R^7 and R^8 is heterocycle —(C_{1-6}alkyl)-heterocycle or —N(heterocycle)—SO_2R^{14} wherein heterocycle and R^{14} are as defined above.

5,750,550

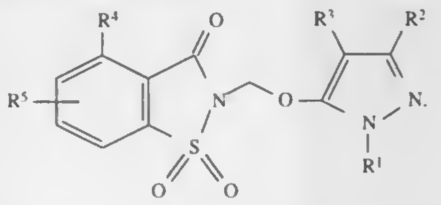
2-(PYRAZOL-5-YL-OXYMETHYL)-1,2-BENZISOTHIAZOL-3 (2H)-ONE 1, 1-DIOXIDES AND COMPOSITIONS AND METHOD OF USE THEREOF

Michael A. Eissenstat, Frederick, Md.; Gee-Hong Kuo, Scotch Plains Township, Union County; Ranjit C. Desai, Kendall Park, both of N.J.; Dennis J. Hlasta, Lower Salford Township, Montgomery County, Pa., and John J. Court, Littleton, Mass., assignors to Sanofi, Paris, France

Filed Sep. 15, 1995, Ser. No. 529,121
Int. Cl.^{6} A61K *31/425;* C07D *275/04*

U.S. Cl. 514—373 **29 Claims**

1. A compound of the formula:



wherein:

R^1 is lower-alkyl, phenyl or phenyl substituted by from one to three, the same or different, substituents selected from the group consisting of nitro, halogen, lower-alkoxy, hydroxy, trifluoromethyl and lower-alkyl; a 5- or 6-membered monocyclic aromatic heterocycle which contains from one to two nitrogen atoms or said 5- or 6-membered monocyclic aromatic heterocycle substituted on any available carbon atom thereof by nitro, halogen, lower-alkoxy, trifluoromethyl, hydroxy or lower-alkyl; a 9- or 10-membered bicyclic aromatic heterocycle which contains from one to two nitrogen atoms or said 9- or 10-membered bicyclic aromatic heterocycle substituted on any available carbon atom thereof by nitro, halogen, lower-alkoxy, trifluoromethyl, hydroxy or lower-alkyl; phenyl-lower-alkyl, or cycloalkyl;

R^2 is hydrogen, lower-alkyl, lower-alkoxy, phenyl or phenyl substituted by from one to five, the same or different, substituents selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, nitro, hydroxy and trifluoromethyl; trihalomethyl, lower-alkoxycarbonyl, pyridyl, carboxy, —C(O)N(R)(alkylene)—NB wherein R is hydrogen or lower-alkyl and NB is 1-pyrrolidinyl or dilower-alkylamino; halogen, or cyano;
R^3 is hydrogen, halogen, or lower-alkyl;
R^4 is lower-alkyl, lower-alkoxy, or cycloalkyl; and
R^5 is hydrogen, or from one to two substituents in any of the 5-, 6-, or 7-positions selected from the group consisting of lower-alkoxy, —O—$(CH_2)_n$-[5-($(CH_2)_n$—N$(\text{lower-alkyl})_2$)-2-furanyl], benzyloxycarbonyl-lower-alkoxy, lower-alkoxycarbonyl-lower-alkoxy, carboxylower-alkoxy, hydroxy, —O—(lower-alkyl)—C(O)N(R') (alkylene)N$(\text{lower-alkyl})_2$, —O—$(CH_2)_n$-[5-(C(O)OCH_2-phenyl-R")-2-furanyl], —O—$(CH_2)_n$-(5-carboxy-2-furanyl), and —O—$(CH_2)_n$-[5-(C(O)N(R' ")(alkylene)-N-$(\text{lower-alkyl})_2$)-2-furanyl]; wherein n is an integer from one to four; R' is hydrogen or lower-alkyl; R" is hydrogen, lower-alkyl, or lower-alkoxy; and R'" is hydrogen or lower-alkyl; or a pharmaceutically acceptable acid-addition salt of basic members thereof, or a pharmaceutically acceptable base-addition salt of acidic members thereof.

5,750,551

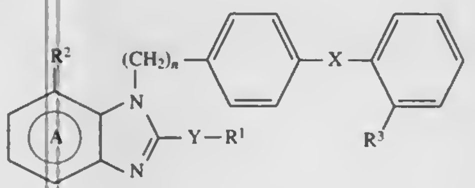
TREATMENT FOR VIRAL DISEASES

Akira Matsumori, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 200,686, Feb. 23, 1994, Pat. No. 5,605,919. This application Dec. 24, 1996, Ser. No. 736,593
Claims priority, application Japan, Feb. 23, 1993, 5-038234
Int. Cl.^{6} A61K *31/41*

U.S. Cl. 514—381 **14 Claims**

1. A method for treating diseases caused by virus-associated cell injury in an animal, which comprises administering to said animal an effective amount of an angiotensin II antagonist compound as an active ingredient and a pharmaceutically acceptable carrier, wherein said angiotensin II antagonist compound is a compound of the formula:



wherein the ring A represents a benzene ring optionally having at least one substituent in addition to R^2; R^1 represents a hydrogen atom or a hydrocarbon residue which may be substituted; R^3 represents a group capable of forming or transformable to an anion; X signifies that the phenylene group and phenyl group are joined to each other either directly or through a spacer comprising a chain of not more than 2 spacer atoms; R^2 represents a carboxyl group which may be esterified; Y represents a bond, —O—, —$S(O)_m$- where m represents 0, 1 or 2, or —N(R^4)— where R^4 represents a hydrogen atom or an alkyl group which may be substituted; and n represents a whole number of 1 or 2.

5,750,552

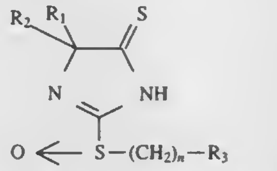
IMIDAZOLINE DERIVATIVE, POSSIBLE TAUTOMER THEREOF, AND VULNERARY INCLUDING SUCH DERIVATIVE OR TAUTOMER

Eitaro Arakawa; Tetsuo Kato, both of Nagoya; Tsukasa Takamura, Toyota; Keiji Imai, Aichi-ken; Tetsuya Segami, and Yukitaka Nakamura, both of Nagoya, all of Japan, assignors to Arax Co., Ltd., Japan

Filed Mar. 25, 1996, Ser. No. 622,469
Claims priority, application Japan, Mar. 27, 1995, 7-067798
Int. Cl.^{6} A61K *31/415;* C07D *233/84*

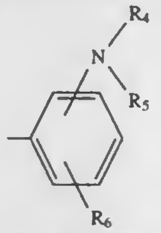
U.S. Cl. 514—386 **12 Claims**

1. An imidazoline derivative or tautomer thereof, which is represented by the following formula (1),



(1)

wherein n represents an integer from 1 to 4, and R_1 and R_2 represent a same one or respective different ones of a hydrogen atom, a lower alkyl group, a phenyl group, and a benzyl group, or in combination represent one of an alkylene group having 2–6 carbon atoms, an alkylidene group having 2–5 carbon atoms and a benzylidene or cinnamylidene group, while R_3 represents a phenyl group represented by the following formula (2),



(2)

wherein R_4 and R_5 represent a same one or respective different ones of a hydrogen atom, a lower alkyl group, a lower alkyl group substituted with at least one halogen atom or at least one hydroxyl group, a cycloalkylalkyl group, a lower alkenyl group, a lower alkanoyl group, a lower alkanoyl group substituted with at least one halogen atom, a lower alkoxyalkyl group, a lower alkoxycarbonyl group, a benzoyl group, a benzyloxycarbonyl group, a lower alkylaminocarbonyl group, a lower alkylsulfonyl group, a benzenesulfonyl group and a toluenesulfonyl group, while R_6 represents one of a hydrogen atom, a hydroxyl group, a halogen atom, a lower alkyl group, a lower alkoxy group and a nitro group.

5,750,553

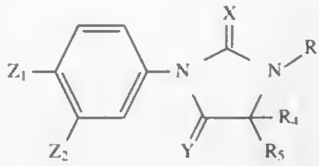
OPTIONALLY SUBSTITUTED PHENYLIMIDAZOLIDINES, THEIR PREPARATION PROCESS AND INTERMEDIATES, THEIR USE AS MEDICAMENTS AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Andre Claussner, Villemomble; Francois Goubet, Paris, and Jean Teutsch, Pantin, all of France, assignors to Roussel Uclaf, France

PCT No. PCT/FR95/00004, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO95/18794, PCT Pub. Date Jul. 13, 1995
PCT Filed Jan. 4, 1995, Ser. No. 669,419
Claims priority, application France, Jan. 5, 1994, 94 00042; Sep. 6, 1994, 94 10660
Int. Cl.^{6} A01N *43/50;* C07D *233/40*

U.S. Cl. 514—392 **6 Claims**

1. A compound in all possible racemic, enantiomeric and diastereoisomer forms of the formula



wherein Y is —O—, Z_2 is —CF_3, Z_1 is —CN or —NO_2, X is —O— or —S—,R_3 is hydrogen or alkyl of 1 to 4 carbon atoms optionally substituted by at least one halogen or —CN and R_4 and R_5 are individually alkyl of 1 to 4 carbon atoms optionally substituted with a member of the group consisting of halogen, —OH, esterified or esterified or protected hydroxy and phenylthio optionally substituted by halogen or —OH, and wherein at least one of R_4 and R_5 is substituted.

5,750,554

6 HETEROCYCLIC-4-AMINO-1,3,4,5-TETRAHYDROBENZ[CD]INDOLES

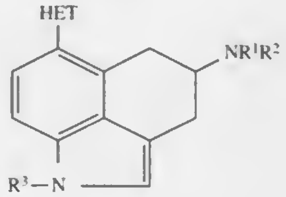
Richard N. Booher, Indianapolis; David E. Lawhorn, Greenfield; Charles J. Paget, Jr., Indianapolis, and John M. Schaus, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 299,175, Aug. 31, 1994, Pat. No. 5,594,019, which is a division of Ser. No. 954,105, Sep. 30, 1992, Pat. No. 5,364,856, which is a continuation-in-part of Ser. No. 677,016, Mar. 28, 1991, Pat. No. 5,244,912. This application May 31, 1995, Ser. No. 454,798

Int. Cl.^{6} A61K *31/40*

U.S. Cl. 514—397 **9 Claims**

1. A compound of the formula



wherein:

R^1 is hydrogen, C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopropylmethyl, phenyl(C_1–C_4 alkyl), nauhthyl(C_1–C_4 alkyl), phenyl(C_1–C_4 alkyl) substituted with one or two substituents selected from the grouo consisting of C_1–C_3 alkoxy, halo, hydroxy, C_1–C_3 thioalkyl, nitro, C_1–C_3 alkyl or trifluoromethyl, naphthyl(C_1–C_4) substituted with one or two substituents selected from the qroup consisting of C_1–C_3 alkoxy, halo, hydroxy, C_1–C_3 thioalkyl, nitro, C_1–C_3 alkyl or trifluoromethyl, —(CH2)nS(C_1–C_4 alkyl), —C(O)R^4, or —(CH_2)nC(O)N$R^5R^{6;}$

R^2 is hydrogen, C_1–C_4 alkyl, cyclopropylmethyl or C_3–C_4 alkenyl;

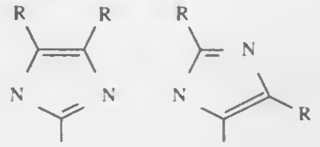
R^3 is hydrogen, C_1–C_4 alkyl or an amino blocking group;

n is 1–4;

R^4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, Cl-C4 alkoxy or phenyl;

R^5 and R^6 are independently hydrogen, C_1–C_4 alkyl, or C_5–C_8 C8 cycloalkyl with the proviso that when one of R^5 or R^6 is a cycloalkyl the other is hydrogen;

HET is a heterocyclic ring selected from the group consisting of



where R is hydrogen, C_1–C_3 alkyl, halocfen, hydroxy, C_1–C_3 alkoxy, C_1–C_3 thioalkyl, NH_2, CN or phenyl; or pharmaceutically acceptable salts thereof.

5,750,555

BIS-INDOLYL MALEINIMIDE OR INDOLOPYRROLO CARBAZOLE CONTAINING AN AMINO ACID AS PKC INHIBITORS

Uwe Trostmann, March-Hugstetten; Christoph Schachtele, Freiburg; Johannes Hartenstein, Stegen-Wittental; Claus Rudolph, Vorstetten; Hubert Barth, Emmendingen; Reinhard Reck, Sexau, and Walter Kolch, Munich, all of Germany, assignors to Goedecke Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP93/03611, § 371 Date Nov. 15, 1996, § 102(e) Date Nov. 15, 1996, PCT Pub. No. WO94/14798, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 20, 1993, Ser. No. 464,666

Claims priority, application Germany, Dec. 21, 1992, 42 43 321.5

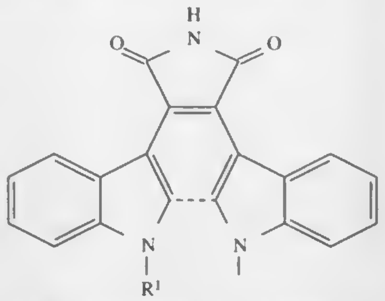
Int. Cl.^{6} A61K *31/40;* **C07D** *487/14;487/22*

U.S. Cl. 514—410 **17 Claims**

1. A compound of formula

$$A—X—Y—E_n—R^5 \qquad (I)$$

in which A is a radical of formula (III)



Formula III

wherein R^1 is a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms and (---) is open or is a valency bond, such that A is bis-indolylmaleinimide or indolopyrrolocarbazole or Formula III,

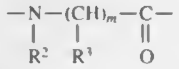
X is a single bond or an alkylene radical containing up to 16 carbon atoms,

Y is a single bond or a group such as N—R^2, CO, CS, CH═CH, PO (OH)O, SO_2, wherein

R^2 is a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms,

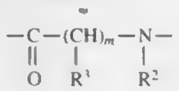
n is 1 to 20,

E are either the same or different radicals of the formula IV:



$$-\underset{R^2}{\underset{|}{N}}-\underset{R^3}{\underset{|}{(CH)_m}}-\underset{O}{\underset{\|}{C}}-$$

or of the Formula V:



$$-\underset{O}{\underset{\|}{C}}-\underset{R^3}{\underset{|}{(CH)_m}}-\underset{R^2}{\underset{|}{N}}-$$

in which,

when m is 1, R^3 is either a hydrogen atom or the side group of one of the natural α-aminocarboxylic acids and, when m is 2 to 6, R^3 is a hydrogen atoms, and

when E is a radical of Formula IV, R^5 is an amino group or the radical —OR^4, in which R^4 is an alkyl radical containing 1 to 4 carbon atoms or a hydrogen atom, and

when E is a radical of formula V, R^5 is a hydrogen atom;

or the pharmacologically compatible salts thereof.

5. A method of inhibiting protein kinase C which comprises administering to a patient in need of such treatment a compound according to claim 1 in unit dosage form.

5,750,556

2-(AMINOMETHYL)-3,4,7,9-TETRAHYDRO-2H-PYRANO-[2,3-E]INDOL-8-ONES AND DERIVATIVES

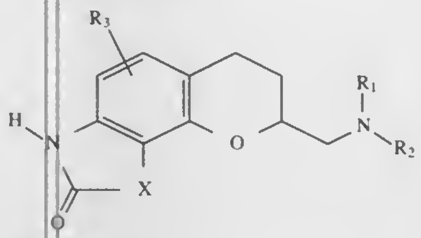
Richard E. Mewshaw, Princeton, N.J., and Gary P. Stack, Ambler, Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Oct. 30, 1996, Ser. No. 739,917

Int. Cl.^{6} A61K *31/40;31/44;* **C07D** *491/052;491/00*

U.S. Cl. 514—411 **13 Claims**

1. A compound of formula I



in which:

X is —$(CH_2)_n$—;

n is 1–3

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, cycloalkylmethyl of 4 to 9 carbon atoms, bicyclo-alkylmethyl of 7 to 9 carbon atoms or —$(CH_2)_m$YAr; where m is 0–4, Y is —CH_2—, and Ar is phenyl, halophenyl, alkylphenyl where the alkyl substituent has 1 to 6 carbon atoms, dialkylphenyl where each alkyl substituent, independently, has 1 to 6 carbon atoms or alkoxyphenyl where the alkoxy substituent has 1 to 6 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R_3 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms or hydroxy;

or a pharmaceutically acceptable salt thereof.

5,750,557

METHOD AND PHARMACEUTICAL FORMULATION FOR TREATING BENIGN PROSTATIC HYPERPLASIA

Nava Zisapel, Tel Aviv, Israel, assignor to Neurim Pharmaceuticals Ltd., Tel Aviv, Israel

Continuation-in-part of Ser. No. 864,684, Apr. 7, 1992, abandoned. This application Aug. 24, 1993, Ser. No. 111,014

Int. Cl.^{6} A61K *31/405*

U.S. Cl. 514—415 **2 Claims**

1. A method for treating benign prostatic hyperplasia (BPH) in male humans, which comprises administering to a male patient in which such condition has been diagnosed, an effective BPH treating amount within the range of from 1 ng to 80 mg of melatonin.

5,750,558

OXIME DERIVATIVES OF INDOLE AND IDENE COMPOUNDS AS INHIBITORS OF PROSTAGLANDIN BIOSYNTHESIS

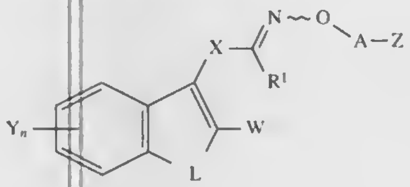
Clint D. W. Brooks, Libertyville; Teodozyj Kolasa, Lake Villa, both of Ill.; Wendy Lee, Hamden, Conn., and Andrew O. Stewart, Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 6, 1996, Ser. No. 660,048

Int. Cl.^{6} A61K *31/40;* **C07D** *209/14*

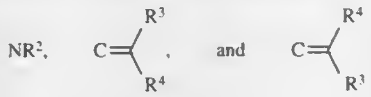
U.S. Cl. 514—415 **16 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein

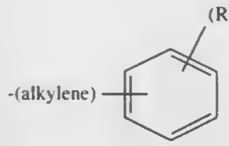
L is selected from the group consisting of



wherein

R^2 is selected from the group consisting of

(a)



wherein the alkylene portion is of one to six carbon atoms, n is 0, 1, 2, or 3, and R^5, which may be the same or different at each occurrence, is selected from the group consisting of

—OR^6,

—SR^6,

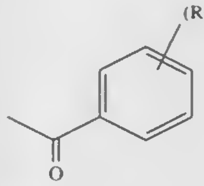
halogen,

alkyl of one to six carbon atoms,

haloalkyl of one to six carbon atoms, and

alkoxy of one to six carbon atoms, and

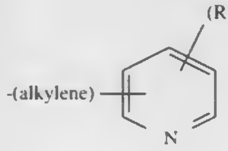
(b)



wherein

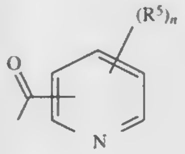
R5 and n are defined above,

(c)



wherein the alkylene portion is of one to six carbon atoms, and R^5 and n are defined above, and

(d)



wherein R^5 and n are defined above;

R^3 is selected from the group consisting of

(a) phenyl,

(h) phenyl substituted with 1, 2, or 3 groups independently selected from

—OR^7,

—SR^7,

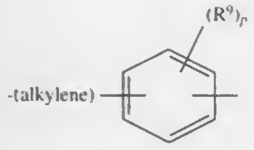
halogen,

alkyl of one to six carbon atoms,

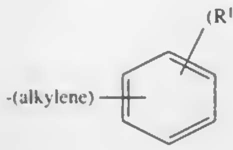
haloalkyl of one to six carbon atoms, and

alkoxy of one to six carbon atoms,

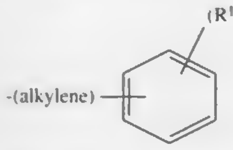
(c) pyridyl, and
(d) pyridyl substituted with 1, 2, or 3 groups independently selected from
—OR7,
—SR^7,
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms;
Y is selected from the group consisting of
(a) halogen,
(b) alkyl of one to six carbon atoms,
(c) haloalkyl of one to six carbon atoms,
(d) alkoxy of one to six carbon atoms,
(e) pyridylmethoxy,
(f) thiazolylmethoxy,
(g) benzothiazolylmethoxy,
(h) quinolylmethoxy, and
(i) quinolylmethoxy substituted with one or two substitutents selected from
halogen and
haloalkyl of one to six carbon atoms, and
n is 0, 1, 2, or 3;
W is selected from the group consisting of
(a) hydrogen,
(b) alkyl of one to six carbon atoms,
(c) hydroxyalkyl of one to six carbon atoms, and
(d) hydroxy;
A is absent or is selected from the group consisting of
(a) alkylene of one to six carbon atoms,
(b) alkylene of one to six carbon atoms substituted with one or two substituents selected from the group consisting of
—OR^8, and
—$COOR^8$,
(c) cycloalkylene of three to eight carbon atoms,
(d) cycloalkylene of three to eight carbon atoms substituted with one or two substituents independently selected from the group consisting of
alkyl of one to six carbon atoms,
—OR^8, and
—$COOR^8$,
(e) heterocycle defined by a cycloalkylene of three to eight carbon atoms wherein one or two of the carbon atoms is replaced with one or two heteroatoms independently selected from O, S, and N,
(f) heterocycle defined by a cycloalkylene of three to eight carbon atoms wherein one or two of the carbon atoms is replaced with one or two heteroatoms independently selected from O, S, and N, and the ring contains one or two substituents independently selected from
alkyl of one to six carbon atoms, —OR^8, and —$COOR^8$, and
(h)



wherein the alkylene portion is of one to six carbon atoms, p is 0, 1, 2, or 3, and R^9, which may be the same or different at each occurrence, is selected from the group consisting of
—OR^8,
—$COOR^8$,
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms;
X is absent or is alkylene of one to six carbon atoms; and
Z is selected from the group consisting of
(a) hydrogen,
(b) COM wherein M is selected from the group consisting of
a pharmaceutically acceptable metabolically cleavable group,
—OR^{10} wherein R^{10} is selected from the group consisting of
a pharmaceutically acceptable cation,
hydrogen,
alkyl of one to six carbon atoms,
phenyl,
phenyl substituted one, two or three substituents selected from the group consisting of
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms,
alkoxy of one to six carbon atoms, and

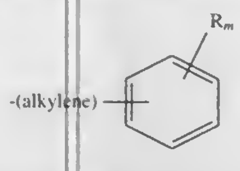


wherein the alkylene portion is of one to six carbon atoms, r is 0, 1, 2, or 3, and R^{11}, which may be the same or different at each occurrence, is selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms,
—$O(CH_2)_w$—$CH(OR^{12})$—CH_2OR^{13} wherein w is 1, 2, or 3, R^{12} and R^{13} are independently selected from the group consisting of
hydrogen,
alkyl of one to six carbon atoms,
phenyl,
phenyl substituted one, two or three substituents selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms,
alkoxy of one to six carbon atoms, and



wherein the alkylene portion is of one to six carbon atoms, s is 0, 1, 2, or 3, and R^{14}, which may be the same or different at each occurrence, is selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms,
or R^{12} and R^{13} together with the oxygen atoms to which they are attached define a 5- or 6-membered heterocyclic ring which may be optionally substituted with one or two substituents selected from
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms,
—$NR^{15}R^{16}$ wherein R^{15} and R^{16} are independently selected from
hydrogen,
alkyl of one to six carbon atoms,
hydroxyalkyl of one to six carbon atoms, and
hydroxy;
(c) —OR^{17},
(d) tetrazolyl
(e) —$CH(OR^{17})$—CH_2OR^{18},
(f) —$CH(OR^{17})$—CH_2—CH_2OR^{18},
(g) —$CH(OR^{17})$—$CH(OR^{18})$—CH_2OR^{19}, and
(h) =N—OR^{17}; and
R^1, R^4, R^6, R^7, R^8, R^{17}, R^{18}, and R^{19} are independently selected at each from
(a) hydrogen,
(b) alkyl of one to six carbon atoms,

(c) phenyl,
(d) phenyl substituted one, two or three substituents selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms,
alkoxy of one to six carbon atoms, and



wherein the alkylene portion is of one to six carbon atoms, m is 0, 1, 2, or 3, and R, which may be the same or different at each occurrence, is selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms.

5,750,559

POTENTIATION OF THE ANTIREACTIVE-ANTIASTHMATIC EFFECT OF INHALED LOOP DIURETICS BY INHALED NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Sebastiano Bianco, Via W. Tobagi 17, I-20143 Milan, Italy, assignor to Sebastiano Bianco, Milan, Italy

Division of Ser. No. 65,450, May 21, 1993, Pat. No. 5,366,967, which is a continuation of Ser. No. 832,165, Feb. 6, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 286,445

Claims priority, application European Pat. Off., Feb. 9, 1991, 91101817

Int. Cl.^{6} A61K *31/60*

U.S. Cl. 514—428 **7 Claims**

1. A method for potentiating the effects of loop diuretics in treating asthma, comprising administering by inhalation to a host in need thereof a combination of a loop diuretic and a non-steroidal anti-inflammatory drug in an amount effective to potentiate the loop diuretic's effect in treating asthma, provided that said loop diuretic is not furosemide when said non-steroidal anti-inflammatory drug is acetylsalicylic acid or lysine acetylsalicylate.

5,750,560

THERAPEUTIC COMPOSITIONS BASED ON 1,2-DITHIOLE-3-THIONE DERIVATIVES

Marie-Odile Christen, Paris, and Jean-Louis Burgot, Rennes, both of France, assignors to Laboratoires De Therapeutique Moderne, Suresnes Cedex, France

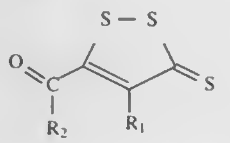
Division of Ser. No. 140,132, Dec. 27, 1993, Pat. No. 5,470,871. This application Nov. 27, 1995, Ser. No. 563,034

Claims priority, application France, May 2, 1991, 91 05411

Int. Cl.^{6} A61K *31/385*

U.S. Cl. 514—441 **7 Claims**

1. Pharmaceutical composition comprising, as active principle, a compound of formula



(VI)

in which

R_1 is chosen, from hydrogen, a halogen, a nitro group, a nitroso group, a thiocyano group, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, an aryl group, an aryl (C_1–C_6 alkyl) group, an aryl (C_2–C_6 alkenyl) group, a carboxyl group, a (C_1–C_6 alkyl) carbonyl group, an arylcarbonyl group, a (C_1–C_6 alkoxy)carbonyl group, a (C_1–C_6 alkoxy) carbonyl (C_1–C_6 alkyl) group, a C_1–C_6 alkoxy group, a trifluoromethyl group, an amino group, a di (C_1–C_6 alkyl) amino (C_1–C_6 alkyl) group, an acylamino group of formula —$NHCOC_nH_{2n+1}$ with n from 0 to 6, a group —NH—CSC_nH_{2n+1} with n from 0 to 6, a terpenyl group, a cyano group, a C_2–C_6 alkynyl group, a C_2–C_6 alkynyl group substituted with a C_1–C_6 alkyl or an aryl group, a hydroxy (C_1–C_6 alkyl) group, a (C_1–C_6 acyl)-oxy(C_1–C_6 alkyl) group, a (C_1–C_6 alkyl)thio group and an arylthio group,

R_2 is chosen from a nitro group, a nitroso group, a thiocyano group, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, an aryl group, an aryl (C_1–C_6 alkyl) group, an aryl (C_1–C_6 alkenyl) group, a carboxyl group, a (C_1–C_6 alkyl)carbonyl group, an arylcarbonyl group, a (C_1–C_6 alkoxy)carbonyl group, a (C_1–C_6 alkoxy)carbonyl(C_1–C_6 alkyl) group, a trifluoromethyl group, a di(C_1–C_6 alkyl)amino(C_1–C_6 alkyl) group, an acylamino group of formula —$NHCOC_nH_{2n+1}$ with n from 0 to 6, a group —NH—CSC_nH_{2n+1} with n from 0 to 6, a terpenyl group, a cyano group, a C_2–C_6 alkynyl group, a C_2–C_6 alkynyl group substituted with a C_1–C_6 alkyl or an aryl group, a hydroxy (C_1–C_6 alkyl) group, a (C_1–C_6 acyl)-oxy(C_1–C_6 alkyl) group, a (C_1–C_6 alkyl)thio group and an arylthio group,

or alternatively R_1 and R_2 together form a mono- or polycyclic C_2–C_{20} alkylene group optionally comprising one or more hetero atoms, with the exception of the 2,2-dimethyltrimethylene group, or a C_3–C_{12} cycloalkylene group.

5,750,561

NEW COMPOSITIONS CONTAINING TAXANE DERIVATIVES

Jean-Pierre Bastart, Lesigny; Thierry Dupechez, Villemoisson Sur Orge, and Jean-Louis Fabre, Paris, all of France, assignors to Rhone-Poulenc Rorer, S.A., Antony Cedex, France

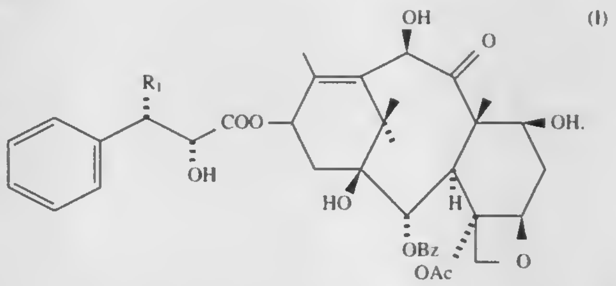
Continuation of Ser. No. 930,393, Aug. 4, 1993, abandoned. This application Apr. 12, 1995, Ser. No. 422,672

Claims priority, application France, Jul. 8, 1991, 9108527

Int. Cl.^{6} A61K *31/335;31/34;9/50*

U.S. Cl. 514—449 **11 Claims**

1. A composition consisting essentially of a compound of formula:



(I)

in which R represents a hydrogen atom or an acetyl radical and R_1 represents a tert-butoxycarbonylamino or benzoylamino radical, dissolved in a mixture of ethanol and a polysorbate whereby said composition is used to form an injectable solution which contains up to about 1 mg/ml of the compound of formula 1, said injectable solution being capable of being injected without anaphylactic or alcohol intoxication manifestations being associated therewith.

5,750,562

10-DEACETYLBACCATINE III AND 10-DEACETYL 14β-HYDROXYBACCATINE III DERIVATIVES, A PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Ezio Bombardelli; Paolo De Bellis, and Bruno Gabetta, all of Milan, Italy, assignors to Indena S.p.A., Milan, Italy

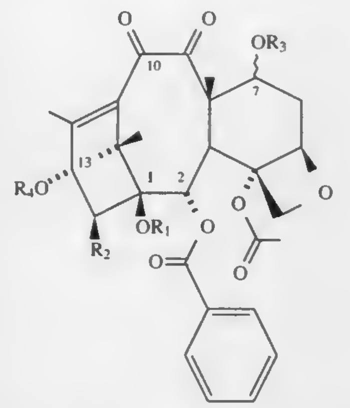
Filed Jun. 6, 1995, Ser. No. 471,137

Claims priority, application Italy, Mar. 17, 1995, MI95A0533

Int. Cl.^{6} A61K *31/335;* **C07D** *305/14*

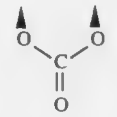
U.S. Cl. 514—449 **11 Claims**

1. 10-Deacetylbaccatine III and 10-deacetyl-14β-hydroxybaccatine III derivatives of formula (1)

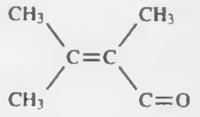


I

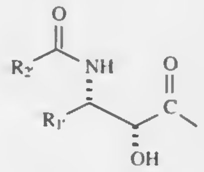
wherein R_1 and R_2 are hydrogen atoms, or R_1 is a hydrogen atom and R_2 is a hydroxyl or an acetyloxy group, or OR_1 and R_2 together form a cyclic carbonate group of formula:



R_3, which can be α- or β-oriented, is a hydrogen atom or an alkylsilyl group having 1 to 5 carbon atoms, R_4 is hydrogen, or the residue



or an isoserine residue of formula A:



(A)

wherein R_1, is a straight or branched alkyl or alkenyl group, containing one to five carbon atoms, or an aryl residue; R_2, is a straight or branched alkyl or alkenyl group, containing one to five carbon atoms, or an aryl residue, or a tert-butoxy group, provided that when R_1, is an aryl group and $R_2$is a tert-butoxy group, R_1, R_2 and R_3 are not all hydrogen atoms.

5,750,563

PREPARATION FOR EPIDERMIS

Shinsuke Honda, Onojo, Japan, assignor to Sansho Seiyaku Co., Ltd., Onojo, Japan

Continuation of Ser. No. 238,628, May 5, 1994, abandoned. This application Oct. 3, 1995, Ser. No. 538,380

Claims priority, application Japan, Oct. 28, 1993, 5-270972

Int. Cl.^{6} A61K *31/35*

U.S. Cl. 514—460 **1 Claim**

1. A method of preventing separation of the ultraviolet light absorbent from a preparation for epidermis containing kojic acid or a derivative thereof, a nonionic surfactant and an ultraviolet light absorbent, and discoloration or decomposition of kojic acid or its derivative in the preparation,

which comprises adding to the preparation:

a catechin selected from the group consisting of pyrogallol, phrologlycine, catechin, epicatechin, gallocatechin, catechin gallate, gallocatechin gallate, epicatechin gallate, epigallocatechin gallate, and epigallocatechin; or

a flavone selected from the group consisting of glucogallin, proanthocyanidin, gallic acid, propyl gallate, isoamyloctyl gallate, dodecyl gallate, rutin, quercetin, quercetagin and gossypetin; or

a polyphenol selected from the group consisting of penta-O-galloyl glucose, tannic acid, gallotannin, ellagitannin and condensed tannins extracted from astringent Japanese persimmon or tea.

5,750,564

ANTI-OXIDANT ESTERS OF NON-STEROIDAL ANTI-INFLAMMATORY AGENTS

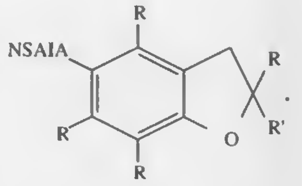
Mark Hellberg, 52211 Overridge Dr., Arlington, Tex. 76017; Pete Delgado, 4315 N. Segura Ct., Fort Worth, Tex. 76132, and Jon C. Nixon, 1616 Hastings Dr., Mansfield, Tex. 76132

Filed Sep. 12, 1995, Ser. No. 526,913

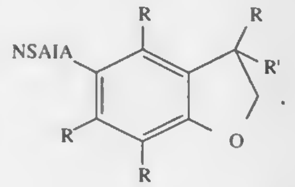
Int. Cl.^{6} A61K *31/34;31/35*

U.S. Cl. 514—469 **30 Claims**

1. A compound of formula (I) or (II):



(I)



(II)

wherein:

NSAIA is a non-steroidal anti-inflammatory agent originally having a carboxylic acid, and is attached through the acid to from a phenolic ester;

R is C_1–C_3 alkyl;

R' is $(CH_2)_mX'$;

m is 1 to 6; and

X' is OH, OR, NH_2, NHR or H;

or a pharmaceutically acceptable salt thereof.

5,750,565

COMPOUNDS AND METHODS FOR THE TREATMENT OF CARDIOVASCULAR, INFLAMMATORY AND IMMUNE DISORDERS

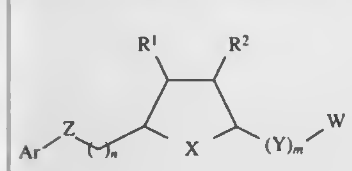
Xiong Cai, Framingham; Aberra Fura, Cambridge, and Changgeng Qian, Wayland, all of Mass., assignors to Cytomed, Inc., Cambridge, Mass.

Filed May 31, 1995, Ser. No. 454,600

Int. Cl.^{6} A61K *31/34;31/38;31/17;31/165*

U.S. Cl. 514—473 **29 Claims**

1. A method for the treatment of inflammatory disorders in a host comprising administering an effective amount of a compound of formula:



wherein:

Ar is an aryl or heteroaryl group that is optionally substituted with halo, lower alkoxy, lower aryloxy, W, cyano, or R^3;

m is 0 or 1;

n is 1–6;

W is independently —$AN(OM)C(O)N(R^3)R^4$, —$N(OM)C(O)N(R^3)R^4$, —$AN(R^3)C(O)N(OM)R^4$, —$N(R^3)C(O)N(OM)R^4$, —$AN(OM)C(O)R^4$, —$N(OM)C(O)R^4$ —$AC(O)N(OM)R^4$, —$C(O)N(OM)R^4$, —C(O)NHA;

A is lower alkylene, lower alkenylene, lower alkynylene, alklarylene or aryl alkylene, or a hetero derivative thereof, wherein one or more carbons optionally can be replaced by O, N, or S; (with valence completed with hydrogen or oxygen as necessary), however, —Y—A—, —A—, and —AW— should not include two adjacent heteroatoms;

M is hydrogen, a pharmaceutically acceptable cation, or a metabolically cleavable leaving group;

X is O, S, S(O), $S(O)_2$, NR^3, or CHR^5;

Y is O, S, S(O), $S(O)_2$, NR^3, or CHR^5;

Z is O, S, S(O), $S(O)_2$, NR^3;

R^1 and R^2 are independently hydrogen, lower alkyl, cyclopropylmethyl, ethyl, isopropyl, butyl, pentyl hexyl, and C_{3-8} cycloalkyl, for example, cyclopentyl; halo lower alkyl, halo; or —COOH;

R^3 and R^4 are independently hydrogen or alkyl, alkenyl, alkynyl, aryl, aralkyl, alkaryl, C_{1-6} alkoxy-C_{1-10} alkyl, C_{1-6} alkylthio-C_{1-10} alkyl, heteroaryl, or heteroarylalkyl-;

R^5 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, arylalkyl, alkylaryl, —$AN(OM)C(O)N(R^3)R^4$, —$AN(R^3)C(O)N(OM)R^4$, —$AN(OM)C(O)R^4$, —$AC(O)N(OM)R^4$, —$AS(O)xR^3$, or —$AC(O)NHR^3$, wherein x is 0–2.

5,750,566

SYNTHETIC EXCITATORY AMINO ACIDS

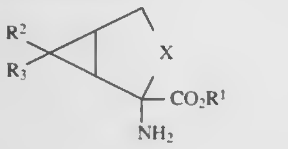
James A. Monn, and Darryle D. Schoepp, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 337,349, Nov. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 289,957, Aug. 12, 1994, abandoned. This application Jun. 29, 1995, Ser. No. 496,643

Int. Cl.^{6} A61K *31/21*

U.S. Cl. 514—510 **13 Claims**

1. A compound of the formula



I

wherein:

X is $(CH_2)_n$;

R^2 is CO_2R^4 and R^3 is hydrogen, or R^2 is hydrogen and R^3 is CO_2R^4;

R^1 and R^4 are independently hydrogen, C_1–C_{10} alkyl, C_2–C_{10} alkenyl, aryl, or arylalkyl; and

n is 1;

or a pharmaceutically-acceptable salt thereof.

5,750,567

FARNESYL TRANSFERASE INHIBITORS, PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Bernard Baudoin, Chaville, France; Christopher Burns, Rosemont, Pa.; Alain Commercon, Vitry-Sur-Seine, and Alain Le Brun, Vigneux, both of France, assignors to Phone-Poulenc Rorer SA., Antony Cedex, France

PCT No. PCT/FR96/00067, § 371 Date Jul. 15, 1997, § 102(e) Date Jul. 15, 1997, PCT Pub. No. WO96/22278, PCT Pub. Date Jul. 25, 1996

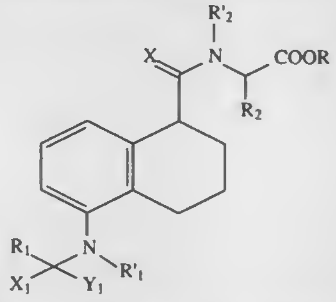
PCT Filed Jan. 16, 1996, Ser. No. 875,005

Claims priority, application France, Jan. 18, 1995, 95 00494

Int. Cl.^{6} A61K *31/21*

U.S. Cl. 514—510 **5 Claims**

1. A compound therefor of general formula:



(I)

in which:

R_1 represents a radical of general formula Y—S—A_1— in which Y represents a hydrogen atom or an amino acid residue or a fatty acid residue or an alkyl or alkoxycarbonyl radical, and A_1 represents a straight or branched alkylene radical containing 1 to 4 carbon atoms, optionally substituted at the position α to the $>C(X_1)(Y_1)$ group by an amino, alkylamino, alkanoylamino or alkoxycarbonylamino radical, the straight or branched alkyl or alkanoyl part of which contains 1 to 6 carbon atoms,

X_1 and Y_1 each represent a hydrogen atom or form, together with the carbon atom to which they are bonded, a $>C{=}O$ group,

R'_1 represents a hydrogen atom or a straight or branched alkyl radical containing 1 to 6 carbon atoms,

X represents an oxygen or sulphur atom,

R_2 represents a straight or branched alkyl, alkenyl or alkynyl radical containing 1 to 6 carbon atoms, optionally substituted by a hydroxyl radical, an alkoxy radical containing 1 to 4 carbon atoms, a mercapto radical, an alkylthio radical containing 1 to 4 carbon atoms, an alkylsulphinyl radical containing 1 to 4 carbon atoms or an alkylsulphonyl radical containing 1 to 4 carbon atoms, it being understood that, when R_2 represents an alkyl radical substituted by a hydroxyl radical, R_2 can form a lactone with the carboxyl radical at the α position,

R'_2 represents a hydrogen atom or a straight or branched alkyl radical containing 1 to 6 carbon atoms, and R represents a hydrogen atom or an alkyl radical containing 1 to 6 carbon atoms, optionally substituted by an alkoxy radical containing 1 to 4 carbon atoms, an alkylthio radical containing 1 to 4 carbon atoms, an alkylsulphinyl radical containing 1 to 4 carbon atoms, an alkylsulphonyl radical containing 1 to 4 carbon atoms, a phenyl radical, a phenoxy radical, a phenylthio radical, a phenylsulphinyl radical, a phenylsulphonyl radical, an alkylamino radical containing 1 to 4 carbon atoms or a dialkylamino radical in which each alkyl part contains 1 to 4 carbon atoms, or a phenyl radical, optionally substituted by one or a number of atoms or radicals chosen from halogen atoms and alkyl, alkyloxy, alkylthio or alkanoyl radicals.

5,750,568

PROTEIN KINASE C MODULATORS. I

Paul E. Driedger, Boston, and James Quick, Lexington, both of Mass., assignors to Procyon Pharmaceuticals, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 120,643, Sep. 13, 1993, which is a continuation-in-part of Ser. No. 664,397, Mar. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 537,885, Jun. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 61,299, Jun. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,812, Jun. 11, 1986, abandoned, and Ser. No. 559,296, Jul. 30, 1990, abandoned, which is a division of Ser. No. 322,881, Mar. 13, 1989, abandoned, and a continuation-in-part of Ser. No. 559,701, Jul. 30, 1990, Pat. No. 5,145,842, which is a continuation-in-part of Ser. No. 322,881, Mar. 13, 1989, abandoned, which is a division of Ser. No. 61,299, Jun. 10, 1987, abandoned, and a continuation-in-part of Ser. No. 980,907, Nov. 24, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,699

Int. Cl.^{6} A61K *31/235*

U.S. Cl. 514—533 15 Claims

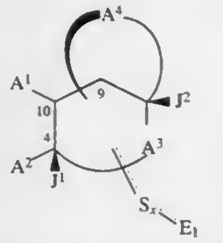
1. A method for treatment of a mammal infected with any Human Immunodeficiency Virus which comprises administering to a mammal in need of such treatment an antivirally effective quantity of a composition, comprising:

a physiologically acceptable pharmaceutical carrier; and

a compound, in a quantity of between about 0.0001–1000 mg per unit dosage, of the formula:

$P_1—S_1—E_1$

wherein P_1 is a radical of the formula:



P_1

in the form of an individual isomer, an isomer mixture, a racemate or optical antipode, or a pharmaceutically acceptable salt thereof,

wherein A^1 and A^2 may be independently selected from hydrogen, halogen and a straight chain or branched chain, cyclic or acyclic, saturated, unsaturated and/or aromatic carbon- and/or heteroatom-containing substituent having not more than 34 carbon atoms, not more than 24 halogen atoms and not more than 9 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur, or A^1 and A^2 taken together may complete a 5- or 6-membered, saturated or unsaturated, carbocyclic or heterocyclic ring, optionally substituted by halogen(s) and/or by 1–8 straight chain or branched chain, cyclic or acyclic, saturated, unsaturated, and/or aromatic carbon- and/or heteroatom-containing groups, which halogens and groups taken together contain a total of not more than 30 carbon atoms, not more than 24 halogen atoms and not more than 9 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur;

A^3 is a three atom chain which carries S_1E_1 and completes a 7-membered saturated or unsaturated carbocyclic ring optionally substituted by 1–6 substituents independently selected from halogen(s) and straight chain or branched chain, cyclic or acyclic, saturated, unsaturated, and/or aromatic carbon- and/or heteroatom-containing groups, which halogens and groups taken together, excluding S_1E_1, contain not more than 12 carbon atoms, not more than 8 halogen atoms, and not more than 5 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur; provided that, including S_1E_1, the middle carbon atom of A^3 is not substituted by hydroxymethyl or hydroxyethyl;

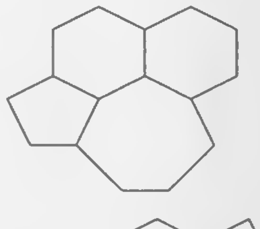
A^4 completes a 6- or 7-membered carbocyclic or heterocyclic ring connected in the β configuration to either carbon atom 9 or 10, optionally substituted by halogen(s) and/or by 1–10 straight chain or branched chain, cyclic or acyclic, saturated, unsaturated and/or aromatic carbon- and/or heteroatom-containing groups, the group or groups optionally completing 1–3 additional rings through bonds among themselves and/or 1–5 additional rings when taken together with A^1, A^2, a ring formed by A^1 and A^2 together, and/or a bond to carbon atom 9, which halogens and groups taken together, include not more than 50 carbon atoms, not more than 24 halogen atoms, and not more than 15 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur;

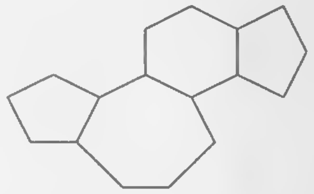
carbon atom 9 may be optionally substituted by halogen(s) and/or by 1–10 straight chain or branched chain, cyclic or acyclic, saturated, unsaturated and/or aromatic carbon- and/or heteroatom-containing groups, which groups may be bound to carbon atom 9 by a single or double bond and which halogens and groups taken together, include not more than 12 carbon atoms, not more than 8 halogen atoms, and not more than 5 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur;

J^1 is selected from hydrogen, fluoro, chloro, hydroxy, amino, mono- or di(lower-alkyl)amino, methyl, ethyl, vinyl, ethynyl, propargyl, cyano, methoxy, ethoxy, trifluoromethyl, 2-hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, acetoxy, propanoyloxy, acetyl, propanoyl, hydroxyacetyl, 2-hydroxypropanoyloxy, 3-hydroxypropanoyl, acetamido, propanamido, hydroxyacetamido, 2-hydroxypropanamido, or 3-hydroxypropanamido (each of which must be situated in the β configuration), or J^1 taken together with A^1, A^2, A^3 or a ring formed by A^1 together with A^2 completes a 3- to 7-membered substituted or unsubstituted carbocyclic or heterocyclic ring, the substituents of which contain not more than 15 carbon atoms, not more than 10 halogens, and not more than 8 heteroatoms selected from oxygen, nitrogen, silicon, phosphorus and sulfur;

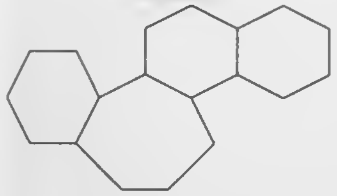
J^2 is selected from hydrogen, methyl, ethyl, hydroxymethyl, hydroxyethyl, vinyl, ethynyl, allyl, propargyl, n-propyl and isopropyl;

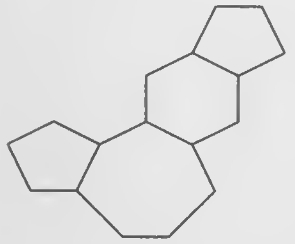
provided that, if A^1 and A^2 are not linked to form a ring, A^4 must carry a cyclopropyl at positions 13 and 14; and the total P_1 ring skeleton may not comprise any of the following six minimum frameworks, which are derived from various homo-, nor- and homo-nor-steroids, with or without additional ring(s) appended:

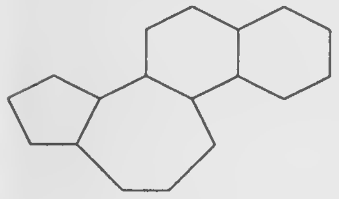


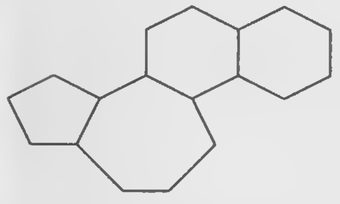


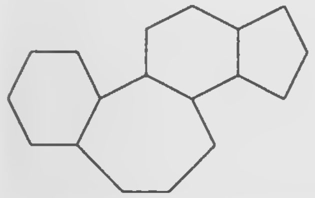
-continued



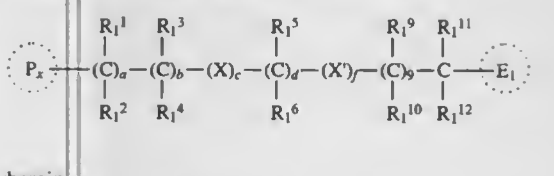








wherein S_1 is a chain of atoms of the formula:



$$P_x - \underset{R_1^2}{\overset{R_1^1}{(C)_a}} - \underset{R_1^4}{\overset{R_1^3}{(C)_b}} - (X)_c - \underset{R_1^6}{\overset{R_1^5}{(C)_d}} - (X')_f - \underset{R_1^{10}}{\overset{R_1^9}{(C)_g}} - \underset{R_1^{12}}{\overset{R_1^{11}}{C}} - E_1$$

wherein

a, b, d, e, and g may independently be from 0 to 3;

c and f may independently be 0 or 1;

the sum of(a+b+c+d+e+f+g) is at least 1 but not more than 12; and

if c and f are both 1, then the sum of (d+e) must be at least 1;

R_1^1 through R_1^{12} may be the same or different and each may be hydrogen, halogen or an acyclic substituent containing not more than 20 carbon atoms, not more than 16 halogen atoms, and not more than 6 heteroatoms selected from oxygen, nitrogen, sulfur, silicon, boron, arsenic, phosphorus and selenium;

R_1^1 or R_1^2 may optionally comprise an additional bond completing an unsaturated linkage to P_1;

one or two of the substituents R_1^1–R_1^{12} may optionally comprise the same or different values of G^1, as defined below;

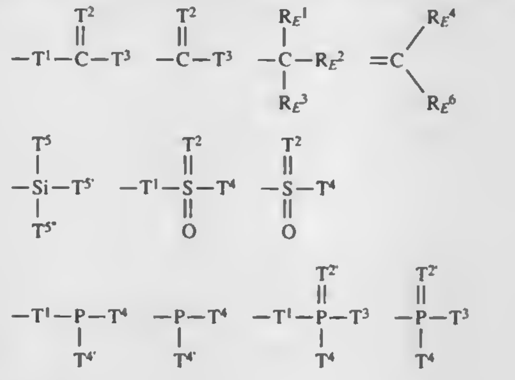
R_1^{11} or R_1^{12} may optionally comprise an additional bond to E_1, thereby completing an unsaturated linkage;

one of the substituents R_1^1–R_1^{12} may be linked to either the atom in P_1 that carries the S_1 chain or to an atom in P_1 adjacent thereto, to form a 4–8 membered ring optionally containing 1–4 identical or different ring hetero members selected from O, S, SO, SO_2, CO, =N— and NH, the ring being optionally substituted on any carbon and/or NH members, by 1–8 identical or different substituents selected from halogen, hydroxy, methoxy, ethoxy, methyl, ethyl, cyano, azide, nitro, hydroxymethyl, 1-hydroxyethyl, 2-hydroxy-2-propyl, CF_3, OCF_3, SH, SCH_3, $SOCH_3$, SCF_3, COOH, $COOCH_3$, $COCH_3$, CH=O, acetoxy, amino, mono- or dialkylamino totaling 1–4 carbon atoms inclusive, acetamido, N-methylacetamido, carboxamido, N-alkylated carboxamido containing 1–4 carbon atoms inclusive, hydroxyacetyl and hydroxyacetoxy;

X and X' are as defined below;

provided that, for all substituents R_1^1 through R_1^{12} and all constituents X and X', taken together, but excluding P_x and E_1: the total of carbon atoms is 25 or less; the total of halogen atoms is 16 or less; the total of oxygen atoms is 6 or less; the total of nitrogen atoms is 4 or less; the sulfur, silicon, boron and phosphorus atoms each total 3 or less; the arsenic and selenium atoms each total 1 or less; the total of oxygen, nitrogen, silicon, boron, arsenic, phosphorus, selenium and sulfur atoms together is 8 or less; the total of —OH groups is 3 or less; the total of —NH_2 groups is 2 or less; the total of —SH groups is 2 or less; and the total of —OH, —SH and —NH_2 groups together is 4 or less;

X and X' may be the same or different and are selected from:



$$-T^1-\overset{T^2}{\overset{\|}{C}}-T^3 \quad -\overset{T^2}{\overset{\|}{C}}-T^3 \quad -\underset{R_E^3}{\overset{R_E^1}{C}}-R_E^2 \quad =C\begin{matrix} / R_E^4 \\ \backslash R_E^6 \end{matrix}$$

$$-\underset{T^{5''}}{\overset{T^5}{Si}}-T^{5'} \quad -T^1-\underset{\underset{O}{\|}}{\overset{T^2}{\overset{\|}{S}}}-T^4 \quad -\underset{\underset{O}{\|}}{\overset{T^2}{\overset{\|}{S}}}-T^4$$

$$-T^1-\underset{T^{4'}}{P}-T^4 \quad -\underset{T^{4'}}{P}-T^4 \quad -T^1-\underset{T^4}{\overset{T^{2'}}{\overset{\|}{P}}}-T^3 \quad -\underset{T^4}{\overset{T^{2'}}{\overset{\|}{P}}}-T^3$$

wherein

R_X^1, R_X^2, R_X^{11} and R_X^{12} may independently be hydrogen;

R_X^1 through R_X^{12} may be the same or different and each may be an acyclic substituent containing 1–20 carbon atoms, not more than 16 halogen atoms, and not more than 6 heteroatoms selected from oxygen, nitrogen, and sulfur, such that for any substituent the oxygen atoms total 4 or less, the nitrogen atoms total 4 or less, and the sulfur atoms total 2 or less,

R_X^4, R_X^5, R_X^{11} and R_X^{12} may independently be hydroxy;

Q and Q' are as defined below;

R_X^1 may optionally represent an additional bond to P_1, thus completing an unsaturated linkage;

one or two of the substituents R_X^1–R_X^{12} may optionally comprise the same or different values of G^1, as defined below;

one of the substituents R_X^1–R_X^{12} may be linked to either the atom in P_1 that carries the chain containing X, X', and/or X" or to an atom in P_1 adjacent thereto, to form a 4–8 membered ring optionally containing 1–4 other identical or different hetero ring members selected from O, S, SO, SO_2, CO, =N— and NH, the ring being optionally substituted on its carbon and/or NH members by 1–8 identical or different substituents selected from halogen, hydroxy, methoxy, ethoxy, methyl, ethyl, cyano, azide, nitro, hydroxymethyl, 1-hydroxyethyl, 2-hydroxy-2-propyl, CF_3, OCF_3, SH, SCH_3, $SOCH_3$, SCF_3, COOH, $COOCH_3$, $COCH_3$, CH=O, acetoxy, amino, mono- or dialkylamino totaling 1–4 carbon atoms inclusive, acetamido, N-methylacetamido, carboxamido, N-alkylated carboxamido containing 1–4 carbon atoms inclusive, hydroxyacetyl and hydroxyacetoxy;

Q and Q' independently may be:

$=O \; =S \; =N—R_Q^1$ or $=N—O—R_Q^2$

wherein $R_Q{}^1$ and $R_Q{}^2$ may be the same or different and each may be hydrogen or a saturated or singly or multiply unsaturated, straight or branched, acyclic substituent containing 1–20 carbon atoms, not more than 16 halogen atoms, and not more than 6 heteroatoms selected from oxygen, nitrogen and sulfur, in which the oxygen atoms total 4 or less, the nitrogen atoms total 4 or less, and the sulfur atoms total 2 or less, the heteroatoms being preferably situated in functional groups selected from hydroxy, amino, thiol, nitro, azide, ether, thioether, aldehyde, keto, carboxy, ester, amide, cyano, nitroguanidine and cyanoguanidine;

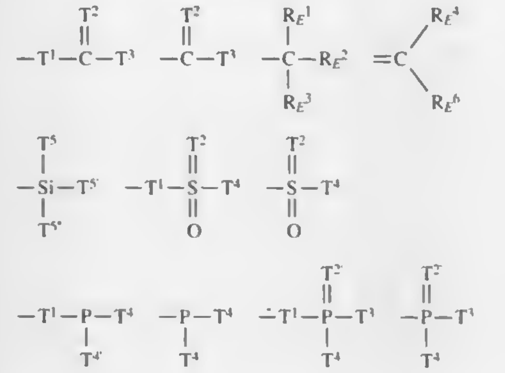
$R_Q{}^1$ and/or $R_Q{}^2$ may optionally comprise the same or different values of G^1, as defined below:

$R_Q{}^1$ may be linked to either the atom in P_1 that carries the chain containing Q and/or Q' or to an atom in P_1 adjacent thereto, to form a 4–8 membered ring defined as for $R_1{}^1R_1{}^{12}$-containing ring above:

G' comprises a group containing 1–3 fused or separate, saturated, unsaturated or aromatic carbocyclic or heterocyclic 4–8 membered rings, each ring optionally containing 1–4 identical or different hetero ring members selected from O, S, SO_2, CO, =N— and NH, each ring being optionally substituted on its carbon and/or NH members by 1–8 identical or different substituents, selected from halogen, hydroxy, methoxy, ethoxy, methyl, ethyl, cyano, azide, nitro, hydroxymethyl, 1-hydroxyethyl, 2-hydroxyethyl, 2-hydroxy-2-propyl, CF_3, OCF_3, SH, SCH_3, $SOCH_3$, SCF_3, COOH, $COOCH_3$, $COCH_3$, CH=O, acetoxy, amino, mono- or dialkylamino totaling 1–4 carbon atoms inclusive, acetamido, N-methylacetamido, carboxamido, N-alkylated carboxamido containing 1–4 carbon atoms inclusive, hydroxyacetyl and hydroxyacetoxy;

and wherein for G^1 the optional second and third rings may be fused to the first ring and/or to one another or may be separate rings connected to one another and/or to the atom bearing G^1 by a single or double bond or by an intervening substituted or unsubstituted, linear or branched, saturated or unsaturated chain containing not more than 8 carbon atoms, not more than 8 halogens, and not more than 4 heteroatoms selected from oxygen, nitrogen, silicon, boron, arsenic, phosphorus, selenium and sulfur,

wherein E_1 is selected from =O, =S, =NH, $=NOR_E{}^8$ wherein $R_E{}^8$ is hydrogen or a C_1–C_8 normal or branched alkyl radical, $=N—NH_2$, hydrogen, halogen, —OH, —SH, $—NH_2$, $—NH—NH_2$, $—N_3$, —CN, —NO, $—NO_2$, —NHOH, $—ONH_2$, or is selected from:



wherein T^1 is selected from —O—, —S—, and —NH—;

T^2 is selected from =O, =S, and $=N—R_E{}^6$, in which $R_E{}^6$ may be hydrogen, hydroxy, cyano, or nitro;

$T^{2'}$ is selected from =O and =S;

T^3, T^4 and $T^{4'}$ are independently selected from —OH, $—NH_2$, —SH, $—N_3$, $—NH—NH_2$, and $—NH—OR_E{}^7$, in which $R_E{}^7$ may be hydrogen, C_{1-3} alkyl or C_{1-3} acyl;

T^3 may also be hydrogen or halogen;

T^5—$T^{5''}$ are independently selected from hydrogen and hydroxy;

T^5 may also be halogen;

$R_E{}^1$ is selected from hydrogen, halogen, hydroxy, nitro, nitroso, cyano, azide, $—NH_2$, —NH—OH, —SH, $—O—NH_2$, $—NH—NH_2$, $—T^1—C(=T^2)—T^3$, $—C(=T^2)—T^3$, $—SiT^5T^{5'}T^{5''}$, $—T^1—S(=O)(=T^2)—T^4$, $—S(=O)(=T^2)—T^4$, $—T^1—P(—T^4)—T^{4'}$, $—P(—T^4)—T^{4'}$, $—T^1—P(=T^{2'})(—T^3)—T^4$, and $—P(=T^{2'})(—T^3)—T^4$;

$R_E{}^2$ and $R_E{}^3$ are individually selected from hydrogen, $—C(=T^2)—T^3$, cyano, nitro, azide, halogen and a C_1–C_{15} straight or branched chain, saturated, unsaturated and/or aromatic-containing alkyl moiety optionally containing not more than 10 halogen atoms and not more than 4 heteroatoms selected from oxygen, nitrogen and sulfur; and

if $R_E{}^1$ is cyano or $—C(=T^2)—T^3$, then $R_E{}^2$ or $R_E{}^3$ may optionally be selected from $—SiT^5T^{5'}T^{5''}$, $—T^1—P(=T^{2'})(—T^3)—T^4$, and $—P(=T^{2'})(—T^3)—T^4$; and $R_E{}^4$ and $R_E{}^4$ are individually selected from hydrogen, halogen, cyano, nitro, $—C(=T^2)—T^3$, $—T^1—C(=T^2)—T^3$, $—CR_E{}^1R_E{}^2R_E{}^3$, $—SiT^5T^{5'}T^{5''}$, $—S(=O)(=T^2)—T^4$, and $—P(=T^{2'})(—T^3)—T^4$.

5,750,569

CARBOXYALKYLETHERS, FORMULATIONS, AND TREATMENT OF VASCULAR DISEASES

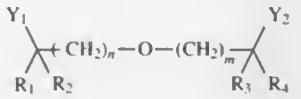
Charles Larry Bisgaier; Paul Leroy Creger; Alan Robert Saltiel, all of Ann Arbor, and Sherrie Rae Tafuri, Dexter, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 409,780, Mar. 24, 1995, Pat. No. 5,648,387. This application Feb. 25, 1997, Ser. No. 805,533

Int. Cl.⁶ A61K *31/225*

U.S. Cl. 514—547 **8 Claims**

1. A method for lowering plasma Lp(a) comprising administering to a mammal an Lp(a) lowering amount of a compound of the formula



I

wherein

n and m independently are integers fom 2 to 9;

R_1, R_2, R_3, and R_4 independently are C_1–C_6 alklyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, and R_1 and R_2 together with the carbon to which they are attached, and R_3 and R_4 together with the carbon to which they are attached, independently can complete a carbocyclic ring having from 3 to 6 carbons;

Y_1 and Y_2 independently are COOH, CHO, tetrazole and $COOR_5$ where R_5 is C_1–C_6 alky, C_2–C_6 alkenyl, C_2–C_6 alkynyl; and where the alkyl, alkenyl, and alkynyl groups may be substituted with one or two groups selected from halo, hydroxy, C_1–C_6 alkoxy, and phenyl, and the pharmaceutically acceptable salts theref.

5,750,570

METHOD OF TREATMENT OF HYPERPIGMENTATION IN BLACK SKIN WITH RETINOIC ACID AND METHOD OF LIGHTENING BLACK SKIN WITH RETINOIC ACID

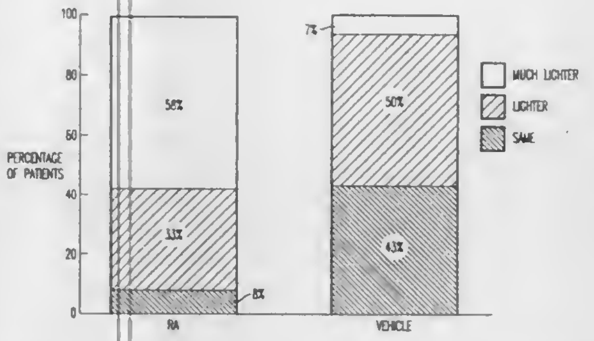
John J. Voorhees; Charles N. Ellis, and Christopher E. M. Griffiths, all of Ann Harbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Mar. 31, 1992, Ser. No. 861,133

Int. Cl.⁶ A61K *31/19;31/07;7/44*

U.S. Cl. 514—557 **11 Claims**

1. A method for treating hyperpigmentation of black skin, comprising administering to a patient in need thereof an effective amount of a pharmaceutical composition consisting essentially of retinoic acid.



5,750,571

METHODS AND THERAPEUTIC COMPOSITIONS FOR TREATING CYSTIC FIBROSIS

Seng Hing Cheng, Wellesley; Shaona Lee Fang, Sudbury; Henry Hoppe, IV, Acton, and Alan Edward Smith, Dover, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Continuation of Ser. No. 72,708, Jun. 7, 1993, which is a continuation-in-part of Ser. No. 935,603, Aug. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 613,592, Nov. 15, 1990, abandoned, which is a division of Ser. No. 589,295, Sep. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 488,307, Mar. 5, 1990, abandoned. This application Dec. 23, 1996, Ser. No. 774,127

Int. Cl.⁶ C07K *53/26;53/125;53/122;* **A61K** *31/19*

U.S. Cl. 514—557 **24 Claims**

1. A method for treating defective chloride ion transport in a subject having cystic fibrosis said method comprising:

administering to said subject an agent selected from the group consisting of differentiating agents, protein enhancing agents and carboxy-compounds in an amount effective to transport mutant cystic fibrosis transmembrane regulator (CFTR) protein to the plasma membrane of a cystic fibrosis (CF)-associated cell of said subject; and

mediating mutant CFTR chloride ion transport in the CF-associated cell of said subject.

5,750,572

SALTS OF A POLYUNSATURATED FATTY ACID AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

Tiberio Bruzzese, Milan, Italy, assignor to Prospa B.V., Hoofdorp, Netherlands

PCT No. PCT/EP94/03943, § 371 Date Jul. 5, 1996, § 102(e) Date Jul. 5, 1996, PCT Pub. No. WO95/16661, PCT Pub. Date Jun. 22, 1995

PCT Filed Nov. 28, 1994, Ser. No. 649,707

Claims priority, application Italy, Dec. 14, 1993, MI93A2612

Int. Cl.⁶ A61K *31/20;* **C07C** *229/00;57/02*

U.S. Cl. 514—560 **4 Claims**

1. An arginine salt of 4,7,10,13,16,19 -cis-docosahexanoic acid (DHA) endowed with anti-platelet aggregating activity in which the acid is greater than 90% pure.

5,750,573

GUANYLHYDRAZONES AND THEIR USE TO TREAT INFLAMMATORY CONDITIONS

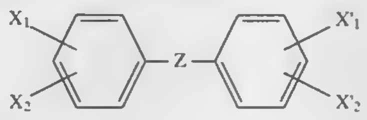
Marina Bianchi, Milan, Italy; Anthony Cerami, Shelter Island, N.Y.; Kevin J. Tracey, Old Greenwich, Conn., and Peter Ulrich, Old Tappan, N.J., assignors to The Picower Institute for Medical Research, Manhasset, N.Y.

Continuation-in-part of Ser. No. 315,170, Sep. 29, 1994, Pat. No. 5,599,984, which is a continuation-in-part of Ser. No. 184,540, Jan. 21, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,568

Int. Cl.⁶ A61K *31/17;* **C07C** *275/28*

U.S. Cl. 514—597 **4 Claims**

1. A compound having the formula:



wherein:

X_2=GhyCH—, $GhyCCH_3$— or H—;

X_1, X'_1 and X'_2, independently=GhyCH— or $GhyCCH_3$—; and

Z=—NH(CO)NH—.

5,750,574

FLUORINATED N-ARYLMETHYLAMINO DERIVATIVES OF CYCLOBUTENE-3,4-DIONES

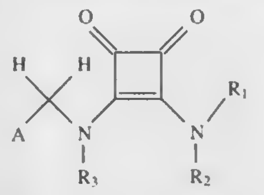
Adam M. Gilbert, Valley Cottage, N.Y., assignor to American Home Products Corporation, Madison, N.J.

Filed Jul. 7, 1997, Ser. No. 889,163

Int. Cl.⁶ A61K *31/135;31/165;* **C07C** *225/20;235/82*

U.S. Cl. 514—604 **23 Claims**

1. A compound of the general formula (I)



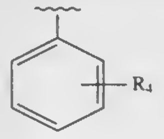
(I)

wherein:

R_1 is straight chain alkyl of 1 to 10 carbon atoms, branched chain alkyl of 3 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, hydroxyalkyl of 2 to 10 carbon atoms, fluoroalkyl of 1 to 10 carbon atoms or polyfluoroalkyl of 1 to 10 carbon atoms;

R_2 and R_3 are, independently, hydrogen or an acyl substituent selected from the group consisting of formyl, alkanoyl of 2 to 7 carbon atoms, alkenoyl of 3 to 7 carbon atoms, alkylsulfonyl of 1 to 7 carbon atoms, aroyl of 7 to 12 carbon atoms, arylalkenoyl of 9 to 20 carbon atoms, arylsulfonyl of 6 to 12 carbon atoms, arylalkanoyl of 8 to 12 carbon atoms or arylalkylsulfonyl of 7 to 12 carbon atoms;

A is a substituted phenyl group of the following formula:



wherein:

R_4 is F, perfluoroalkyl group of 1 to 10 carbon atoms or perfluoroalkoxy of 1 to 10 carbon atoms;

or a pharmaceutically acceptable salt thereof.

5,750,575

SUBSTITUTED AMINO ALCOHOL COMPOUNDS

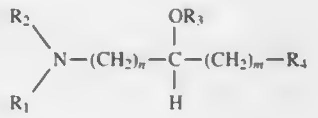
J. Peter Klein, Vashon; Gail E. Underiner, Brier, and Anil M. Kumar, Seattle, all of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

Division of Ser. No. 303,842, Sep. 8, 1994, Pat. No. 5,641,783, which is a continuation-in-part of Ser. No. 152,650, Nov. 12, 1993, and a continuation-in-part of Ser. No. 164,081, Dec. 8, 1993, Pat. No. 5,470,878, which is a continuation-in-part of Ser. No. 040,820, Mar. 31, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,721

Int. Cl.⁶ A61K *31/165;31/135;* **C07C** *233/35;215/20*

U.S. Cl. 514—617 **18 Claims**

1. A compound, including resolved enantiomers and/or diastereomers, hydrates, salts, solvates or mixtures thereof, the compound having a straight or branched aliphatic hydrocarbon structure of formula I:



$$\underset{R_1}{\overset{R_2}{N}}-(CH_2)_n-\underset{H}{\overset{OR_3}{C}}-(CH_2)_m-R_4$$

1

wherein:

n is an integer from one to four;

m is an integer from six to twenty;

independently, R_1 and R_2 are hydrogen, a straight or branched chain alkyl, alkenyl or alkynyl of up to twenty carbon atoms in length or $—(CH_2)_wR_5$, w being an integer from one to twenty and R_5 being an hydroxyl, halo, C_{1-8} alkoxyl group or a substituted or unsubstituted carbocycle or heterocycle; or

jointly R_1 and R_2 form a substituted or unsubstituted, saturated or unsaturated heterocycle having from four to eight carbon atoms, N being a hetero atom;

R_3 is hydrogen or C_{1-3}; or

jointly one of R_1 or R_2 and R_3 form a substituted or unsubstituted linking carbon chain, having from one to four carbon atoms, joining the O and N in a cyclic structure, an integer sum equal to n+a number of carbon atoms in the linking carbon chain being less than six;

a total sum of carbon atoms comprising R_1 or R_2, $(CH_2)_n$ and $(CH_2)_m$ does not exceed forty; and

R_4 is a substituted or unsubstituted carbocycle having one ring or two-fused rings, each ring having five or six ring atoms wherein a ring atom of the carbocycle is attached to a terminal carbon atom of $(CH_2)_m$.

5,750,576

TRIPHENYLETHYLENES FOR THE PREVENTION AND TREATMENT OF OSTEOPOROSIS

Michael DeGregorio; Valerie Wiebe, both of Granite Bay, Calif.; Lauri Kangas, Raisio, Finland; Pirkko Härkönen, Turku, Finland; Kalervo Väänänen, Oulu, Finland, and Aire Laine, Turku, Finland, assignors to Orion-Yhtymä Oy, Espoo, Finland

PCT No. PCT/FI95/00475, § 371 Date Apr. 1, 1997, § 102(e) Date Apr. 1, 1997, PCT Pub. No. WO96/07402, PCT Pub. Date Mar. 14, 1996

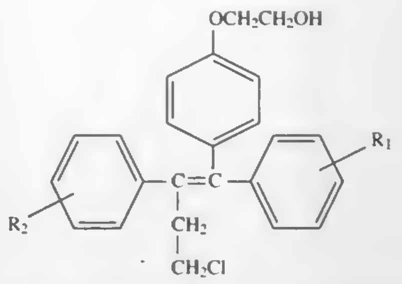
PCT Filed Sep. 6, 1995, Ser. No. 793,938

Claims priority, application United Kingdom, Sep. 7, 1994, 9418067

Int. Cl.⁶ A61K *31/075*

U.S. Cl. 514—720 **6 Claims**

1. A method of using a compound of formula (1)



(1)

wherein R_1 and R_2 are independently H or OH, for the treatment or prevention of osteoporosis, comprising administering to a subject in need of such treatment a prophylactically or therapeutically effective amount of a compound of formula (1) as defined above.

5,750,577

CHROMOTROPIC ACID-FORMALDEHYDE AND 1-NAPHTHOL-FORMALDEHYDE POLYMERIC COMPOUNDS

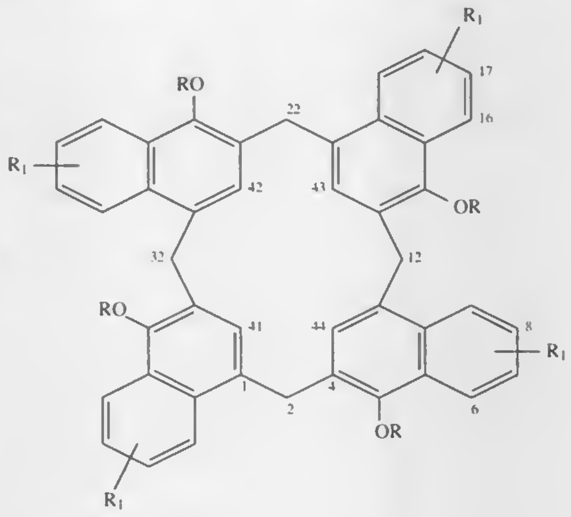
Paris Georghiou, Newfoundland, Canada, assignor to Seabright Corporation Limited, Canada

Continuation of Ser. No. 234,816, Apr. 28, 1994, abandoned. This application Dec. 5, 1996, Ser. No. 760,847

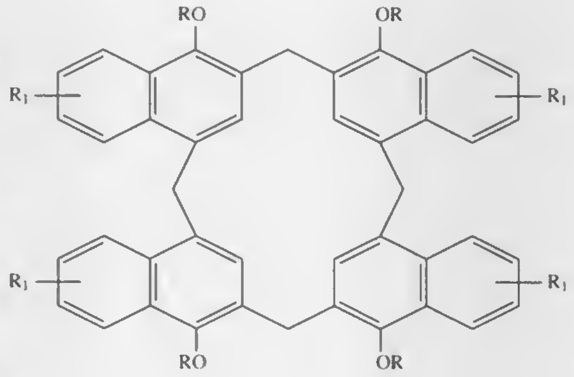
Int. Cl.⁶ A61K *31/05;31/255;31/22;31/235*

U.S. Cl. 514—232 **12 Claims**

1. A cyclic tetramer of formaldehyde and 1-naphthol, and the derivatives or analogues of said cyclic tetramer, which comprises the general structure represented by the following formulas 2–5:

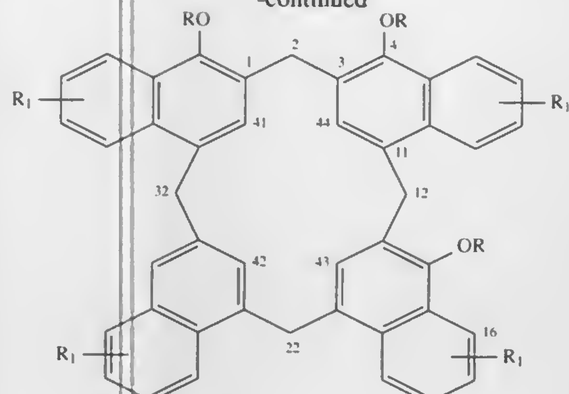


2

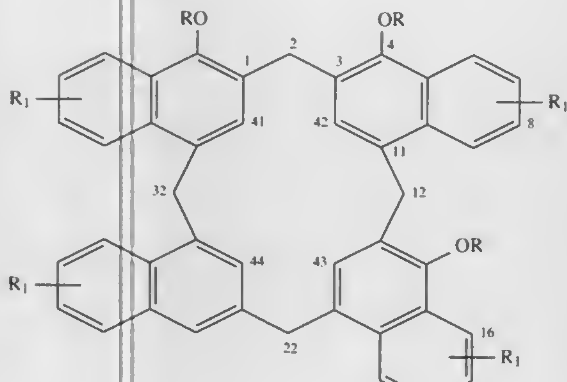


3

-continued



4



5

wherein:

R=H, alkyl, aromatic, CO-alkyl, and CO-aromatic; and

R_1=H, alkyl, aromatic, CO-alkyl, CO-aromatic, SO_2R or SO_3R.

5,750,578

USE OF BETULIN AND ANALOGS THEREOF TO TREAT HERPESVIRUS INFECTION

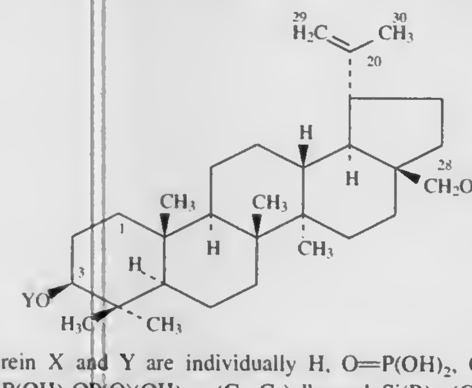
Robert M. Carlson; Pavel A. Krasutsky, and M. Reza-Ul Karim, all of Duluth, Minn., assignors to Regents of The University of Minnesota, Minneapolis, Minn.

Filed Feb. 11, 1997, Ser. No. 798,900

Int. Cl.⁶ A01N *27/00;31/00;* **A61K** *39/245*

U.S. Cl. 514—766 **11 Claims**

1. A therapeutic method for treatment of a human afflicted with a herpesvirus infection comprising administering to said human an effective antiviral amount of a compound of formula (1):



(1)

wherein X and Y are individually H, $O{=}P(OH)_2$, $O{=}P(OH)_2$, $O{=}P(OH)_2OP(O)(OH)—$, $(C_1–C_5)$alkanoyl, $Si(R)_3$, $(C{=}O)N(R)_2$, wherein each R is H, phenyl or $(C_1–C_6)$alkyl, benzyl, benzoyl, tetrahydropyran-2-yl, 1-[$(C_1–C_4)$alkoxy]$(C_1–C_4)$alkyl, a glycoside or a pharmaceutically acceptable salt thereof.

5,750,579

QUICK-DRYING GEL-TYPE DISINFECTANT FOR HANDS AND FINGERS

Takuzo Kamishita, Takatsuki, and Takashi Miyazaki, Nakaniikawa-gun, both of Japan, assignors to Toko Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 169,643, Dec. 20, 1993, abandoned. This application Apr. 29, 1996, Ser. No. 638,860

Claims priority, application Japan, Dec. 28, 1992, 4-348566

Int. Cl.⁶ A61K *47/32;47/36;* **A61L** *2/18*

U.S. Cl. 514—772.6 **19 Claims**

1. In a method for controlling the viscosity of a composition comprising a solution of a disinfectious medicament selected from the group consisting of invert soaps, biguanide compounds, phenol compounds, iodine compounds, pigment compounds, and a mixture of two or more thereof in an alcohol, by a thickening agent,

which comprises using as the only thickening agent a thickening agent consisting of a combination of a carboxyvinyl polymer and hydroxypropylmethyl cellulose.

5,750,580

POLYURETHANE ELASTOMERS PREPARED FROM ALIPHATIC POLYISOCYANATES AND POLYESTERETHER POLYOLS

Eduard Mayer, Dormagen, and Jürgen Grönen, Overath, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 10, 1996, Ser. No. 661,280

Claims priority, application Germany, Jun. 16, 1995, 195 21 798.5

Int. Cl.⁶ C08J *9/04;* **C08G** *18/42;18/48*

U.S. Cl. 521—51 **4 Claims**

1. A polyurethane elastomer which optionally contains urea groups and comprises the reaction product of:

a) at least one liquid polyisocyanate component selected from the group consisting of aliphatic polyisocyanates, alicyclic polyisocyanates and mixtures thereof,

b) optionally, one or more isocyanate-reactive compounds having an average molecular weight of about 1000 to 6000 and an average functionality of at least two,

c) from about 10 to about 42% by weight, based on 100% by weight of the reaction mixture without fillers, of at least one isocyanate-reactive compound comprising a polyesterether polyol having a molecular weight of less than 500 and a functionality of at least two, wherein said polyesterether polyol contains from 3 to 7 mol of ester groups/kg of polyesterether polyol, and an ethylene oxide content of from 40 to 60% by weight, and said polyesterether polyol consists of the reaction product of aromatic carboxylic acid anhydrides with (oligo)ethylene glycols, and subsequent ethoxylation, and

d) 1 to 30% by weight, based on the total weight of all the components, of fillers,

wherein components a) through d) are reacted via the reaction injection molding process.

5,750,581

COMPRESSIBLE SILICON RUBBER

Werner Brennenstuhl, Burgkirchen; Manfred Mittermeier, Mehring, both of Germany, and Wilhelm Huber, Ostermiething, Austria, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 1, 1996, Ser. No. 724,387

Claims priority, application Germany, Nov. 2, 1995, 195 40 886.1

Int. Cl.⁶ C08J *9/32*

U.S. Cl. 521—54 **8 Claims**

1. A composition which crosslinks to give an elastomer, comprising;

(A) expanded, hollow, organo-polymeric plastic bodies and

(B) an addition crosslinkable organosilicon compound, wherein the composition has a viscosity of 1,000 to 100,000 mPa·s.

5,750,582
LIQUID ABSORBABLE MATERIAL AND METHOD FOR PRODUCTION THEREOF

Nobuyuki Harada, Osaka; Katsuyuki Wada, Hyogo; Hisanori Obara, Hyogo, and Toru Inaoka, Hyogo, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Division of Ser. No. 234,416, Apr. 28, 1994. This application Jun. 4, 1996, Ser. No. 658,251

Claims priority, application Japan, Apr. 28, 1993, 5-102138; Jul. 30, 1993, 5-190205

Int. Cl.^{6} C08J *9/28*

U.S. Cl. 521—64 **8 Claims**

1. A method for the production of a liquid absorbable material made of a porous formed article, comprising mixing 1 to 20% by weight of a monomer ingredient, said monomer ingredient comprising a monomer possessing one polymerizable unsaturated group in the molecular unit thereof and a cross-linking monomer possessing at least two polymerizable unsaturated groups in the molecular unit thereof with 99 to 80% by weight of water in the presence of 1 to 40% by weight, based on 100 parts by weight of said monomer ingredient, of an oil-soluble surfactant thereby preparing a water-in-oil type emulsion containing a large volume of water in the form of an inner discontinuous phase, thermally polymerizing said emulsion in the presence of a polymerizing initiator at a temperature in the range of 25° to 90° C. thereby giving rise to a porous cross-linked polymer, and compression molding said porous cross-linked polymer at a temperature of not less than the softening point of the cross-linked polymer.

5,750,583
PROCESS FOR THE PRODUCTION OF MOLDED POLYURETHANE PRODUCTS

Peter Gansen, Pittsburgh, and James R. Gricar, Washington, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed May 28, 1997, Ser. No. 864,169

Int. Cl.^{6} C08G *18/48;* **C08J** *9/00*

U.S. Cl. 521—78 **16 Claims**

1. In a process for the preparation of a molded semi-rigid formed polyurethane product comprising:

a) positioning a plastic film or sheet in a mold,

b) spraying or pouring a polyurethane forming reaction mixture over said film or sheet in an amount sufficient to fill the mold,

c) closing the mold,

d) allowing said reaction mixture to fully react, and

e) removing the resultant product from the mold,

the improvement wherein said reaction mixture comprises

A) an isocyanate reactive mixture comprising:

i) from 70 to 95% by weight of at least one long chain polyether polyol,

ii) from 1.5 to 4.0% by weight of water, and

iii) from 0.5 to 15% by weight of at least one crosslinker, wherein said %s by weight are based upon the total weight of component A),

and

B) a polyisocyanate prepolymer having a functionality of less than about 2.8, an isocyanate group content of about 20 to about 30% by weight, and a urethane group content of from about 0.1 to about 3.2% by weight, and which comprises polymethylene poly(phenylisocyanate), from about 26 to about 52% of 4,4'-methylene bis(phenylisocyanate), and from about 8 to about 27% by weight of 2,2'- and 2,4' -methylene bis(phenylisocyanate),

with the amounts of components A) and B) being such that the isocyanate index of the reaction is from 80 to 100.

5,750,584
STABILITY CONTROL AGENT COMPOSITION FOR POLYOLEFIN FOAM

Dennis A. Knaus, 1 Andrews Rd., Malvern, Pa. 19355

Filed Jan. 31, 1997, Ser. No. 792,126

Int. Cl.^{6} C08J *9/00*

U.S. Cl. 521—97 **40 Claims**

1. An expandable polyolefin composition comprising:

a. an olefin polymer resin;

b. a stability control agent combination comprising

i) at least one compound that is a partial ester of a fatty acid with polyol, and

ii) at least one compound selected from the group consisting of higher alkyl amines, fatty acid amides and/or complete esters of higher fatty acids; and

c. a blowing agent.

5,750,585
SUPER ABSORBENT HYDROGEL FOAMS

Kinam Park, and Haesun Park, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 4, 1995, Ser. No. 416,269

Int. Cl.^{6} C08F *110/00;* **A61F** *13/00*

U.S. Cl. 521—143 **12 Claims**

1. An absorbent hydrogel foam comprising

a solid phase comprising a surfactant and a polymer or copolymer of a free radical polymerizable hydrophilic olefin monomer crosslinked with about 0.1 to about 10% by weight of a crosslinking agent having at least two alkenyl groups; and

a gas phase, wherein the ratio of the volume of the gas phase to the volume of the solid phase is at least one.

5,750,586
PRODUCTION OF CFC-FREE POLYURETHANE RIGID FOAMS HAVING A REDUCED THERMAL CONDUCTIVITY AND THEIR USE

Stefan Adams, Ludwigshafen, and Holger Seifert, Freital, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 563,470, Nov. 28, 1995, Pat. No. 5,670,554. This application May 2, 1997, Ser. No. 850,354

Claims priority, application Germany, Jan. 10, 1995, 195 00 466.3

Int. Cl.^{6} C08G *18/10*

U.S. Cl. 521—159 **10 Claims**

1. A CFC-free polyurethane rigid foam having improved thermal conductivity, said foam comprising the reaction product of

a) an organic polyisocyanate mixture modified with urethane groups,

b) a relatively high molecular weight compound containing at least two reactive hydrogen atoms and, optionally,

c) a low molecular weight chain extender and/or a crosslinker

in the presence of

d) a blowing agent,

e) a catalyst and, optionally,

f) additives,

wherein the polyisocyanate mixture comprises a polyester isocyanate semiprepolymer containing from 31 to 20% by weight of NCO and is obtained by reacting an excess amount of an aromatic polyisocyanate with a polyester-polyol having a hydroxyl number of from 22 to 400 prepared from aromatic and/or aliphatic dicarboxylic acids and/or dicarboxylic acid derivatives, and wherein the blowing agent is selected from the group consisting of cyclopentane and mixtures comprising cyclopentane, cyclohexane or mixtures thereof and low boiling compounds homogeneously miscible with cyclopentane and/or cyclohexane.

5,750,587
RADIATION CURABLE SILICONE RELEASE COATING COMPOSITIONS

Ryuko Manzouji, and Tadashi Okawa, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1996, Ser. No. 637,147

Claims priority, application Japan, Apr. 28, 1995, 7-128882

Int. Cl.^{6} C08F *2/50;* **C08L** *43/04*

U.S. Cl. 522—15 **24 Claims**

1. A radiation curable silicone release coating composition comprising:

(A) 100 weight parts of an alicyclic epoxy-functional silicone graft copolymer prepared by a method comprising:

(I) reacting a mixture comprising:

(a) a silicone macromonomer which is free of epoxy groups and having a vinyl polymerizable group at only one molecular chain terminal;

(b) a compound having at least 1 alicyclic epoxy group and at least 1 vinyl polymerizable group; and

(c) an organic vinyl-polymerizable monomer selected from the group consisting of esters of acrylic acid, esters of methacrylic acid, styrene, derivatives of styrene, acrylic acid, methacrylic acid, vinyl acetate, vinylidene chloride, or polyalkylene glycol monomethacrylates with the proviso that the proportions for (a):(b):(c) are 1 to 80 weight percent: 5 to 90 weight percent: 0 to 94 weight percent, and also with the proviso that the sum of a+b+c is 100 weight percent;

(B) 1 to 10,000 weight parts of an organic compound having at least 2 alicyclic epoxy groups; and

(C) 0.1 to 20 weight parts of an onium salt photocuring catalyst per 100 weight parts of the total of components (A) and (B).

5,750,588
RADIATION-CURABLE SILICONE COMPOSITION

Toru Takeoka, Cincinnati; Stephen J. Clarson, Loveland, and Barry Goldslager, Cincinnati, all of Ohio, assignors to Three Bond Co., Ltd., Japan

Filed Sep. 27, 1996, Ser. No. 720,325

Int. Cl.^{6} C08L *83/05;83/07;* **C08F** *2/50*

U.S. Cl. 522—66 **4 Claims**

1. A radiation-curable silicone composition comprising a polyorganosiloxane which includes an alkenyl group; a polysilane in which at least two silicon atoms are bonded to each other and which has at least one polyorganosiloxane group in a side chain thereof; and a catalytically effective amount of an addition polymerization catalyst.

5,750,589
HYDROPHILATED DENTAL IMPRESSION COMPOUNDS

Joachim Zech, Hechendorf; Erich Wanek, Kaufering; Günther Lechner, Wörthsee, and Peter Bissinger, Köngisbrunn, all of Germany, assignors to Thera Patent GmbH & Co. KG Gesellschaft fur, Seefeld, Germany

PCT No. PCT/EP95/03638, § 371 Date May 16, 1996, § 102(e) Date May 16, 1996, PCT Pub. No. WO96/08230, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 15, 1995, Ser. No. 646,272

Claims priority, application Germany, Sep. 16, 1994, 44 33 139.8

Int. Cl.^{6} A61K *6/10;* **C07F** *7/08*

U.S. Cl. 523—109 **8 Claims**

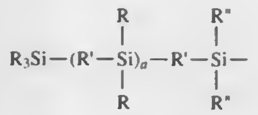
1. A dental impression compound on the basis of addition-crosslinking silicones, condensation-crosslinking silicones, polyether silicones or polyethers, containing 0.1 to 10 wt.-%, relative to the total weight of the compound, of a polyether carbosilane as hydrophilation agent, the polyether carbosilane having the general formulae:

$$Q—P—(OC_nH_{2n})_x—OT \tag{I}$$

in which:

Q stands for $R_3Si—$

or



$$R_3Si-(R'-\underset{R}{\overset{R}{Si}})_a-R'-\underset{R''}{\overset{R''}{Si}}-$$

where every R in the molecule can be the same or different and stands for an aliphatic C_1–C_{18}, a cycloaliphatic C_6–C_{12} or an aromatic C_6–C_{12} hydrocarbon radical, which can optionally be substituted by halogen atoms,

R' is a C_1–C_{14} alkylene group,

R" is R in the case of a≠0 or is R or R_3SiR' in the case of a=0, and a=0–2;

P stands for a C_2–C_{18} alkylene group, or A—R"', where A represents a C_2–C_{18} alkylene group and R"' a functional group from the following list:

—NHC(O)—, —NHC(O) $(CH_2)_{n-1}$—, —NHC(O)C(O)—,

—NHC(O) $(CH_2)_v$C(O)—, —OC(O)—,

—OC(O) $(CH_2)_{n-1}$—, —OC(O)C(O)—, —OC(O) $(CH_2)_v$C(O)—,

—$OCH_2CH(OH)CH_2OC(O)$ $(CH_2)_{n-1}$—,

—$OCH_2CH(OH)CH_2OC(O)$ $(CH_2)_v$C(O)—

with v=1–12;

T is H, a C_1–C_4 alkyl radical or a C_1–C_4 acyl radical;

x is a number from 1 to 200; and

n is an average number from 1 to 6;

$$Q'—(P—(OC_nH_{2n})_x—OT)_2 \tag{II}$$

in which:

Q' is $—SiR_2—X—SiR_2—$;

X is a divalent hydrocarbon radical, a C_1–C_{18} alkylene, a C_6–C_{20} arylene, a C_5–C_{15} cycloalkylene or a C_5–C_{15} polycycloalkylene radical, which radical can optionally bear oxygen-containing groups, and where all other symbols have the above meaning;

$$Q—P—(OC_nH_{2n})_x—OP—Q \tag{III}$$

in which all symbols have the above meaning; or

$$Q''(—P—(OC_nH_{2n})_xOT)_{o'} \tag{V}$$

in which:

Q" stands for an oligomeric or polymeric carbosilane, where at least one silicon atom, are substituted by the radical (—P—$(OC_nH_{2n})_x$OT) and thus o' is ≧1; and where

all other symbols have the above meaning.

5,750,590
POLYMERIZABLE MATERIAL

Roland Schaefer, Friedrichsdorf; Detlef Heindl, Weinbach; Dieter Schödel, Wiesbaden; Oskar Nuyken, München; Ralf Böhner, Martinsried, and Christoph Erdmann, Dachau, all of Germany, assignors to Heraeus Kulzer GmbH, Hanau, Germany

Continuation-in-part of Ser. No. 604,906, Feb. 22, 1996, abandoned. This application Jul. 3, 1996, Ser. No. 675,612

Claims priority, application Germany, Feb. 22, 1995, 195 06 222.1

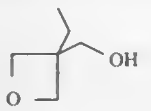
Int. Cl.^{6} C08F *2/46;* **C08L** *33/10*

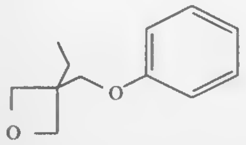
U.S. Cl. 523—115 **11 Claims**

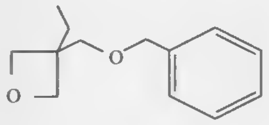
1. A polymerizable material consisting essentially of a mixture of (a) 50 to 90% by weight of one or more cationically polymerizable compounds and an onium compound as a cationic polymerization initiator therefor, and (b) 10 to 50% by weight of one or more free-radically polymerizable methacrylates and a camphorquinone-amine system as a free-radical polymerization

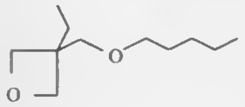
initiator therefor, and wherein the content of the cationic polymerization initiator is 0.3 to 4% by weight and that of the free-radical polymerization initiator is 0.1 to 5% by weight; and, optionally, (c) a fine-particle organic filler, a fine-particle inorganic filler, or a combination thereof

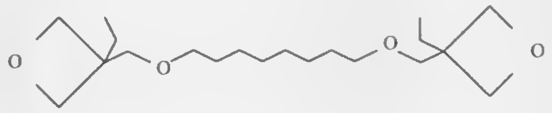
wherein the cationically polymerizable compounds are one or more of the compounds

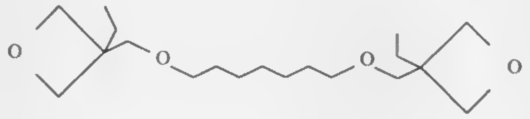


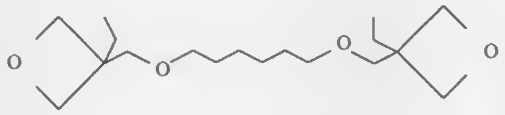


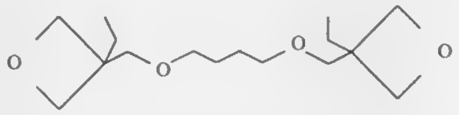


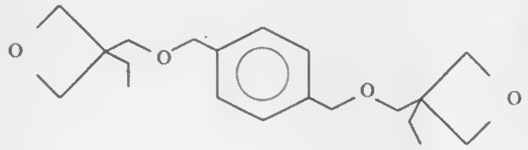


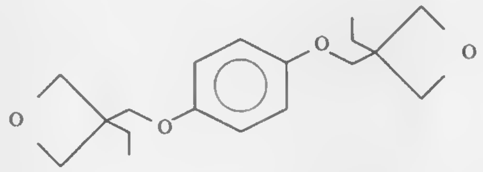


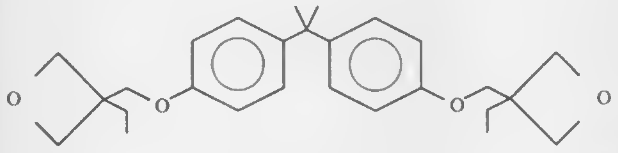




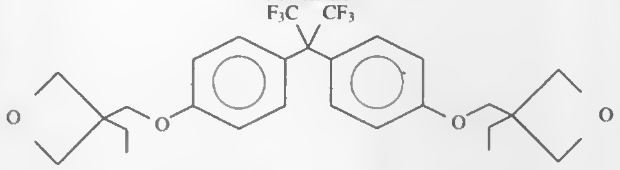


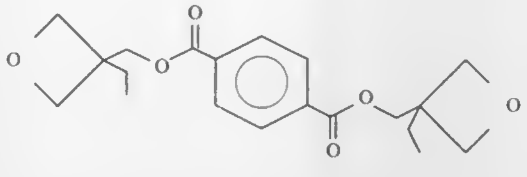


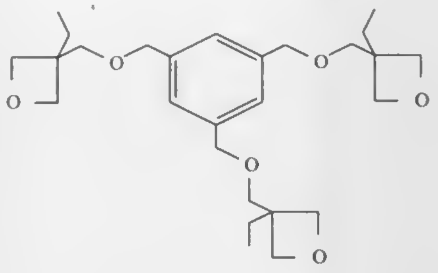


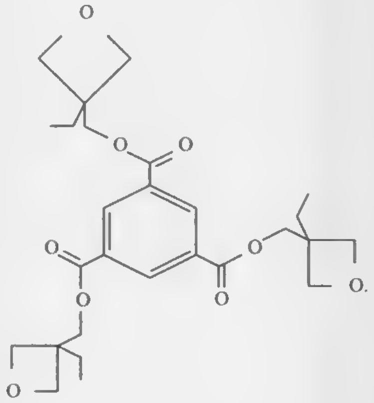


-continued









5,750,591

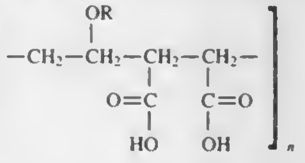
DENTURE ADHESIVE CONTAINING PARTIAL ZIRCONIUM, CALCIUM, SODIUM GANTREZ SALT

Hal C. Clarke, Elmont, N.Y.; Hyung-Kook Ahn, East Brunswick, N.J.; Eddie Wong, New Providence, N.J.; Robert C. Gasman, Montville, N.J.; Alfred J. Smetana, Wayne, N.J.; Joseph Synodis, Summit, N.J., and Tiang Shing Chang, Westfield, N.J., assignors to The Block Drug Company, Jersey City, N.J.

Continuation of Ser. No. 607,975, Feb. 29, 1996, abandoned.
This application Mar. 3, 1997, Ser. No. 808,030
Int. Cl.^{6} A61C *13/23;* **C08F** *8/42*

U.S. Cl. 523—120 **13 Claims**

1. A mixed partial salt of a lower alkyl vinyl ether maleic acid copolymer comprising the repeating structural unit:



$$\left[-CH_2-\overset{\displaystyle OR}{\overset{|}{CH_2}}-\underset{\underset{\displaystyle HO}{|}}{\underset{\displaystyle O=C}{\underset{|}{CH_2}}}-\underset{\underset{\displaystyle OH}{|}}{\underset{\displaystyle C=O}{\underset{|}{CH_2}}}-\right]_n$$

where R represents a C_1-C_5 alkyl radical and n is an integer greater than 1.0 representing the number of repeat occurrences of this structural unit in a molecule of this copolymer and wherein n is a value such that the specific viscosity of this copolymer is greater than 1.2, the specific viscosity being measured in MEK (methyl ethyl ketone) at 25° C., said partial salts containing at least one cation consisting of zirconium and a second cation selected from the group consisting of calcium, magnesium, zinc, strontium, iron and mixtures thereof.

5,750,592

INK COMPOSITION FOR INK JET RECORDING

Masakazu Shinozuka; Yoshinori Miyazawa; Makoto Fujino; Tatsuya Ito, and Osamu Ishibashi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-To, Japan

Filed Aug. 3, 1993, Ser. No. 101,412

Claims priority, application Japan, Aug. 4, 1992, 4-208193; Oct. 7, 1992, 4-268835; Apr. 21, 1993, 5-094528; Apr. 21, 1993, 5-094535

Int. Cl.^{6} C09D *11/10*

U.S. Cl. 523—161 **13 Claims**

1. An ink composition for use in intermediate transfer ink jet recording wherein the ink composition is ejected onto an intermediate transfer medium to form an ink image, wherein the ink image is concentrated on the intermediate transfer medium, and wherein the concentrated ink image is then transferred to a recording medium, the composition, comprising:

water which is present as a major solvent;

a colorant consisting essentially of a dispersed pigment present in an amount of about 0.5 to 15% by weight, said pigment having a particle diameter of 25 μm or less;

a colloidal dispersion resin present in an amount of about 0.2 to 20% by weight;

a volatile alkali component present in an amount of about 0.5 to 15% by weight and sufficient for stabilizing the colloidal dispersion resin;

a water-soluble organic solvent, present in an amount of about 0.5 to 30% by weight and sufficient to facilitate transfer of the ink image from the intermediate transfer medium to the recording medium, and

a surfactant present in an amount of about 0.01 to 5% by weight and sufficient to lower the surface tension of the ink composition.

5,750,593

STABILIZED ELECTROCOAGULATION PRINTING INK

Adrien Castegnier, Outremont, and Normand Lepine, Pointe-aux-Trembles, both of Canada, assignors to Elcorsy Technology Inc., Saint-Laurent, Canada

Filed Jan. 23, 1995, Ser. No. 376,245
Int. Cl.^{6} C09D *11/02*

U.S. Cl. 523—161 **53 Claims**

1. A stabilized electrocoagulation printing ink consisting essentially of a liquid colloidal dispersion containing an electrolytically coagulable colloid, a dispersing medium, a soluble electrolyte, a coloring agent and a sequestering agent for complexing trivalent metal ions generated during electrocoagulation printing, said sequestering agent being present in an amount such that no more than about 20 ppm of trivalent metal ions cause said colloid to crosslink thereby preventing undesired crosslinking of the colloid without adversely affecting electrocoagulation of said colloid.

5,750,594

INK SET AND PROCESS FOR ALLEVIATING BLEED IN PRINTED ELEMENTS

Loretta Ann Grezzo Page, Newark, and Kathryn Amy Pearlstine, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 500,723, Jul. 11, 1995, abandoned.
This application Mar. 19, 1997, Ser. No. 820,917
The portion of the term of this patent subsequent to Aug. 4, 2015, has been disclaimed.
Int. Cl.^{6} C09D *11/10*

U.S. Cl. 523—161 **19 Claims**

1. An ink set comprising, in combination:

a) a first cationic ink comprising:
  1) an aqueous carrier medium,
  2) a pigment, and
  3) a polymeric dispersant having at least one quaternized amine group; and
b) a second cationic ink comprising:
  1) an aqueous carrier medium, and
  2) a colorant comprising a dye selected from the group consisting of dyes containing sulfonate groups, dyes containing phosphonate groups, and mixtures thereof;

wherein said dye is present in an amount sufficient to destabilize the polymeric dispersant of the first cationic ink when the first and second cationic inks are placed in contact with one another on a substrate.

5,750,595

SELF-DISPERSING CURABLE EPOXY RESIN DISPERSIONS AND COATING COMPOSITIONS MADE THEREFROM

Kartar S. Arora, Chalfont, and Michael S. Wiggins, Landsdale, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 366,189, Dec. 29, 1994, Pat. No. 5,643,976. This application Jun. 1, 1995, Ser. No. 457,932
The portion of the term of this patent subsequent to Dec. 29, 2014, has been disclaimed.
Int. Cl.^{6} C08K *3/20;* **C08L** *63/00*

U.S. Cl. 523—404 **27 Claims**

1. A self-dispersing curable epoxy resin composition comprising the addition product of reactants comprising (a) 1.0 reactive equivalent of an epoxy resin, (b) from about 0.01 to 1.0 reactive equivalents of a polyhydric phenol, and (c) from about 0.005 to 0.5 reactive equivalents of an amine-epoxy adduct comprising the addition product of reactants comprising 1.0 reactive equivalent of a polyepoxide and from about 0.3 to 0.9 reactive equivalents of a compound of the formula:

$$[R_1—O—]_{2-m}—R_2—[—CH_2\,CH(R_3)—X—R_4—NH_2]_m \qquad (I)$$

wherein:

R_1 designates a monovalent organic group selected from the group consisting of C_1 to C_{12} aliphatic, alicyclic or aromatic hydrocarbons, and

R_2 represents a polyoxyalkylene chain of the formula:

$$(CH_2—CH_2—O)_a—(CH_2—CH(R_5)—O)_b$$

wherein:

R_5 is a monovalent organic group selected from the group consisting of C_1, to C_4 aliphatic hydrocarbons,

'a' designates a number of ethoxy groups ($CH_2—CH_2—O$),

'b' designates a number of monosubstituted ethoxy groups ($CH_2—CH(R_5)O$) where the substitution of one monosubstituted ethoxy group is independent from the substitution of any other monosubstituted ethoxy group in the polyoxyalkylene chain, the sum of 'a' and 'b' is equal to or greater than 10 but less than or equal to 200, and where the sequence of ethoxy and monosubstituted ethoxy groups within a polyoxyalkylene chain may be completely random and/or there may be blocks of ethoxy and/or monosubstituted ethoxy groups, and where the ratio of a:b is greater than 1:1.

R_3 designates H or a monovalent group selected from the group consisting of C_1, to C_4 aliphatic hydrocarbons.
R_4 designates an aliphatic, cycloaliphatic or aromatic group containing 6 to 18 carbon atoms and X is OC(O)NH.
and m is equal to 1 or 2.

5,750,596
CATHODIC ELECTROCOATING COMPOSITIONS CONTAINING AN ANTICRATER AGENT

Allisa Gam, Troy, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1996, Ser. No. 772,613

Int. Cl.^{6} C08G *59/50;* C08L *63/02*

U.S. Cl. 523—404 9 Claims

1. An improved cathodic electrocoating composition, comprising an aqueous carrier having dispersed therein a film forming binder comprising an epoxy-amine adduct and a blocked polyisocyanate crosslinking agent; wherein the improvement consists essentially of an anticrater agent which consists of a silane terminated reaction product of reactants consisting of a polyoxy alkylene diamine and an isocyanato alkyl alkoxy silane said agent being hyrolyzed and having a number average molecular weight of about 2,000–5,000 determined by Gel Permeation Chromatography (GPC) using polystyrene as the standard; wherein the anticrater agent is used in an amount sufficient to reduce craters in a coating formed from the electrocoating composition.

5,750,597
THERMOSETTING RESIN COMPOSITIONS

Phillip A. Waitkus, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Filed Jun. 20, 1996, Ser. No. 667,271

Int. Cl.^{6} C08L *1/00;* C08J *3/20*

U.S. Cl. 524—35 6 Claims

1. A liquid thermosetting composition for use in a pultrusion process, said composition comprising about 60 to about 95% by weight of an uncured, liquid phenolic resin containing greater than 70% solids by weight and about 5 to about 40% by weight of particles of a molding compound having an average size of about 1 to about 500 microns, said molding compound comprising a blend of an uncured, solid phenolic resin and a filler.

5,750,598
BITUMEN/POLYMER COMPOSITION VULCANIZABLE AT TEMPERATURES BELOW 100°C

Dennis Krivohlavek, Claremore, Okla.; Gayle King, Terre Haute, Ind., and Jean-Pascal Planche, Lyons, France, assignors to Eli France, Courbevoie, France

Continuation of Ser. No. 93,987, Jul. 19, 1993, abandoned, which is a continuation of Ser. No. 872,496, Apr. 23, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 400,180

Int. Cl.^{6} C08L *95/00*

U.S. Cl. 524—71 33 Claims

1. A fluidified and reactive bitumen/polymer composition fluid and vulcanizable at a temperature below 100° C. comprising:
a bitumen;
a sulfur-vulcanizable elastomeric polymer being present in an amount of 0.5 to 20% by weight of the bitumen, remaining in a substantially non-vulcanized state after formation of said composition, and being selected from the group consisting of polyisoprene, polynorbornene, polybutadiene, butyl rubber, and ethylene/propylene/diene terpolymer and a copolymer of styrene and a conjugated diene;
a sulfur-donating vulcanization agent in an amount to provide 0.2 to 20% by weight of sulfur, relative to the elastomeric polymer;
a vulcanization accelerator comprising at least one vulcanization accelerator active at a temperature below 100° C. and present in an amount between 0.05% and 15% by weight of the elastomeric polymer; and
a viscosity-reducing agent selected from the group consisting of water hydrocarbon oils with a distillation range at atmospheric pressure, determined in accordance with ASTM Standard D86-87, between 100° C. and 500° C., said viscosity-reducing agent present in an amount suitable to render the composition fluid at a temperature below 100° C.

5,750,599
QUINOPHTHALONE COMPOUNDS AND POLARIZING FILMS USING SAME

Akira Ogiso, Ohmuta; Rihoko Imai, Tokyo; Tsutami Misawa, Yokohama; Ryu Oi, Yokohama; Yoriaki Matsuzaki, Ohmuta, and Hisato Itoh, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 393,426, Feb. 23, 1995, Pat. No. 5,659,039. This application Mar. 19, 1997, Ser. No. 821,194

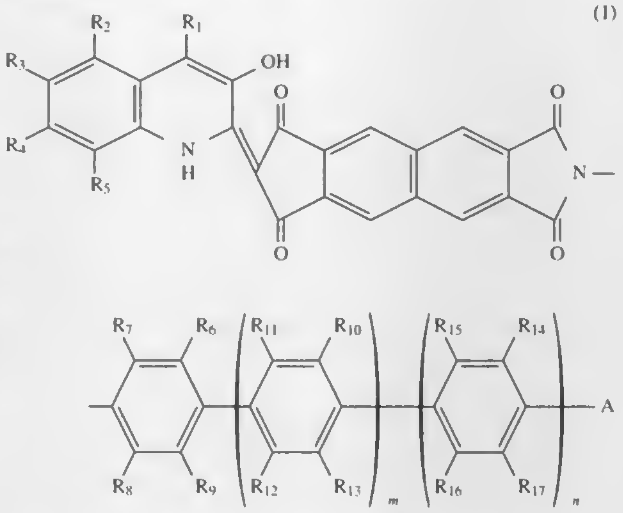
Claims priority, application Japan, Feb. 25, 1994, 6-027731

Int. Cl.^{6} C08L *5/34;* C07D *715/20*

U.S. Cl. 524—90 4 Claims

1. A polarizing film comprising a hydrophobic resin and at least one quinophthalone-base dichroic dyestuff, said dyestuff comprising a quinophthalone compound represented by the following formula (1):

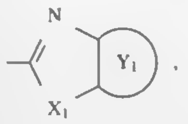
(1)



wherein R_1–R_5 each independently represents a hydrogen or halogen atom or a hydroxy, linear or branched alkyl, unsubstituted cycloalkyl, cycloalkyl substituted by one or more halogen atoms and/or alkyl groups, halogenated alkyl, alkoxyalkyl, alkoxy, nitro, amino, alkylamino, carboxyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, alkylcarbonylamino, alkylcarbonyloxy or cyano group; R_6–R_{17} each independently represents a hydrogen or halogen atom or a hydroxyl, alkyl, halogenated alkyl, alkoxy, nitro, amino, alkylamino, carboxyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, alkylcarbonyloxy or cyano group; m and n each stands for 0 or 1; and A represents a hydrogen or halogen atom or a hydroxy, linear or branched alkyl, cycloalkyl, halogenated alkyl, alkoxyalkyl, nitro, amino, alkylamino, cyano, $—OQ_2$, $—NHQ_3$, $—COOQ_4$, $—NHCOQ_5$, $—OCOQ_6$, $—CH=CH—Q_7$, $—C\equiv C—Q_8$, or $—N=N—Q_9$ group or a group represented by one of the following formulas (2a)–(2d):

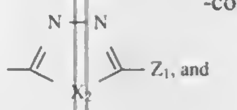
$$-CONHQ_1, \qquad (2a)$$

(2b)

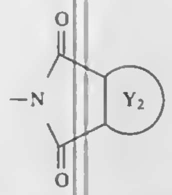


-continued

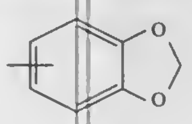
(2c)

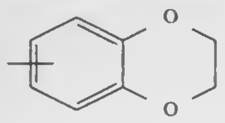


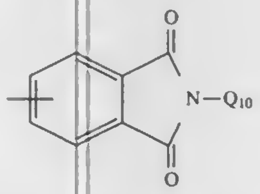
(2d)



wherein Q_1 to Q_9 represent a hydrogen atom or a linear or branched alkyl, unsubstituted cycloalkyl, cycloalkyl group substituted by one or more halogen atoms, hydroxy groups, linear or branched alkyl groups, halogenated alkyl groups, or alkoxy groups, unsubstituted aryl, or aryl group substituted by one or more halogen atoms, hydroxy groups, linear or branched alkyl groups, halogenated alkyl groups, alkoxyalkyl groups, cycloalkyl groups, said substituted cycloalkyl groups, alkoxy groups, aryloxy groups, alkylaminocarbonyl groups, arylaminocarbonyl groups or arylazo groups; X_1 and X_2 represent an —O—, —S— or —NH— group; Y_1 and Y_2 represent an unsubstituted aromatic, alicyclic or heterocyclic ring, or an aromatic, alicyclic or heterocyclic ring substituted by halogen atoms and hydroxy, alkyl, halogenated alkyl, alkoxy, carboxy, alkoxycarbonyl, aryloxycarbonyl, alkylaminocarbonyl, arylaminocarbonyl, phenyl, biphenyl and cyclohexyl groups, where said heterocyclic ring is selected from the group consisting of pyridyl, pyrazinyl, pyrimidinyl, indolyl, isoindolyl, quinolyl, isoquinolyl, purinyl, acridinyl, pyrrolyl, thienyl, furyl, benzopyrrolyl, benzothienyl, benzofuranyl, benzoxazolyl, benzothiazolyl, benzimidazolyl, benzotriazolyl, piperidyl, piperazinyl, and groups represented by the following formulas:







wherein Q_{10} represents a hydrogen atom or a linear or branched alkyl, unsubstituted cycloalkyl, cycloalkyl substituted by one or more halogen atoms or hydroxy, linear or branched alkyl, halogenated alkyl or alkoxy groups, unsubstituted aryl group or aryl group substituted by one or more halogen atoms or hydroxy, linear or branched alkyl, unsubstitlted cycloalkyl, said substituted cycloalkyl groups, alkoxy groups, aryl groups, aryloxy groups, alkylaminocarbonyl groups, arylaminocarbonyl groups or arylazo groups; and Z_1 represents a hydrogen atom or a linear or branched alkyl, unsubstituted cycloalkyl, cycloalkyl group substituted by one or more halogen atoms, hydroxy groups, linear or branched alkyl groups, halogenated alkyl groups, or alkoxy groups, unsubstituted aryl, or aryl group substituted by one or more halogen atoms, hydroxy groups, linear or branched alkyl groups, halogenated alkyl groups, alkoxyalkyl groups, cycloalkyl groups, said substituted cycloalkyl groups, alkoxy groups, aryloxy groups, alkylaminocarbonyl groups, arylaminocarbonyl groups or arylazo groups; wherein said dyestuff is oriented in the hydrophobic resin.

5,750,600
NONFLAMMABLE OLEFIN THERMOPLASTIC ELASTOMER COMPOSITION FOR USE IN SKINS OF INTERIOR AUTOMOTIVE TRIM AND LAMINATE SHEET MADE THEREFROM

Yutaka Nozokido; Shinichi Akitaya, both of Ichihara; Akinori Arai, and Toyokazu Nakauchi, both of Tsuchiura, all of Japan, assignors to Chisso Corporation, Osaka, and Lonseal Corporation, Tokyo, both of Japan

Filed Nov. 15, 1996, Ser. No. 748,905

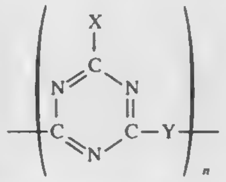
Claims priority, application Japan, Nov. 17, 1995, 7-323868

Int. Cl.^{6} C08K *5/3492*

U.S. Cl. 524—100 20 Claims

1. A nonflammable olefin thermoplastic elastomer composition for use in skins of interior automotive trim, which comprises:
an oil-extended olefin thermoplastic elastomer composition (G) comprising 100 parts by weight of an olefin thermoplastic elastomer composition (D) which comprises 50 to 70% by weight of an ethylene/α-olefin copolymer elastomer (A) having a Mooney viscosity (ML1+4(100° C.)) of 40 to 100, 21 to 35% by weight of a polypropylene resin (B) having a crystal melting point of 140° to 165° C. and an ethylene unit content of 1 to 2% by weight, and 9 to 15% by weight of a low-density polyethylene resin (C) having a density of 0.90 to 0.93 g/cm^3 and a crystal melting point of 102°–118° C., and 10 to 30 parts by weight of a mineral oil (e); and,
relative to 100 parts by weight of the oil-extended olefin thermoplastic elastomer composition (G), 25 to 50 parts by weight of melamine-coated ammonium polyphosphate (h), 8 to 17 parts by weight of a 1,3,5-triazine derivative (j) having a chemical structure represented by the general formula:

(I)



wherein X represents a morpholino or piperidino group, Y represents a divalent group derived from piperazine and n is equal to or greater than 1, and 0.1 to 3 parts by weight of a lubricant (f).

5,750,601
FLAME RETARDANT POLYMERIC COMPOSITIONS

Horst Staendeke, Lohmar, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

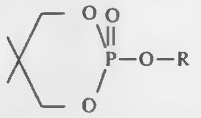
Filed Dec. 4, 1996, Ser. No. 760,051

Claims priority, application Germany, Dec. 15, 1995, 195 46 834.1

Int. Cl.^{6} C08K *5/5357*

U.S. Cl. 524—117 2 Claims

1. A flame-retardant composition comprising polyurethane and a halogen-free cyclic phosphoric acid ester of the formula (I)



where R represents phenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 2,3-dimethylphenyl, 2,4-dimethylphenyl, 2,5-dimethylphenyl, 2,6-dimethylphenyl, 3,4-dimethylphenyl or 3,5dimethylphenyl.

5,750,602

FLAMEPROOFED POLYCARBONATE/ABS BLENDS RESISTANT TO STRESS CRACKING

Burkhard Köhler; Jürgen Kirsch; Richard Weider; Dieter Wittmann, all of Leverkusen, and Horst Beicher, Tönisvorst, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Oct. 9, 1996, Ser. No. 731,082

Claims priority, application Germany, Oct. 19, 1995, 195 38 892.5

The portion of the term of this patent subsequent to Jun. 14, 2016, has been disclaimed.

Int. Cl.^{6} C08K *5/523;* **C08L** *69/00;55/02*

U.S. Cl. 524—127 **12 Claims**

1. Thermoplastic moulding compositions containing

- A) from 5 to 90 parts by weight of block copolycarbonates of polycarbonate blocks and from 0.5 to 30 wt. %, based on the weight of the block copolycarbonate, of polyisobutylene alpha-haloketocarboxylic acid blocks, wherein the polyisobutylene alpha-haloketocarboxylic acid blocks have average molecular weights $\bar{M}_n$ (number average) of between 500 and 50,000, halogen contents prior to incorporation of between 0.1 and 15 wt. % based on the weight of the PIB blocks, and acid numbers of between 2 and 250 mg KOH/g, and further wherein said halogen is chlorine or bromine,
- B) from 5 to 95 parts by weight of graft polymer of a mixture of
  - B.1.1 from 50 to 95 parts by weight of styrene, α-methylstyrene, styrene ring-substituted by halogen or methyl, C_1–C_8 alkyl acrylate or mixtures of these compounds and
  - B.1.2 from 5 to 50 parts by weight of acrylonitrile, methacrylonitrile, C_1–C_8 alkyl methacrylates, maleic anhydride, C_1–C_4 alkyl- or phenyl-N-substituted maleimide or mixtures of these compounds on
  - B.2 from 5 to 95 parts by weight of polymer based on diene and/or alkyl acrylate, having a glass transition temperature of below −10° C.,
- C) from 0 to 20 parts by weight of rubber different from B),
- D) from 0 to 70 parts by weight of a copolymer of
  - D.1) from 50 to 98 parts by weight of styrene, α-methylstyrene, ring-substituted styrenes, C_1–C_8 alkyl methacrylates, C_1–C_8 alkyl acrylates or mixtures thereof and
  - D.2) from 50 to 2 parts by weight of acrylonitrile, methacrylonitrile, maleic anhydride, N-substituted maleimides and mixtures thereof,
- E) from 0 to 80 parts by weight of aromatic polycarbonate,
- F) from 1 to 20 parts by weight of monomeric or oligomeric phosphate esters or phosphonate esters having molar masses of from 250 to 10,000 g/mol,
- G) from 0.05 to 5 parts by weight of fluorinated polyolefin, wherein the sum of the components A+B+C+D+E+F+G totals 100.

5,750,603

POLYMER-BOUND NON-HALOGEN FIRE RESISTANT COMPOSITIONS

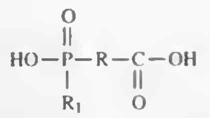
Jawed Asrar, Chesterfield, Mo., assignor to Solutia Inc., St. Louis, Mich.

Filed May 23, 1997, Ser. No. 862,355

Int. Cl.^{6} C08G *79/04;* **C08K** *5/5313*

U.S. Cl. 524—139 **33 Claims**

1. A flame-retardant polyamide which is the polycondensation product of at least one dicarboxylic acid, at least one diamine and a flame-retarding carboxy-phosphinic acid, said carboxy-phosphinic acid being a source of flame-retardant phosphorus and having the formula:



$$HO-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle R_1}{|}}{P}}-R-\underset{\underset{\displaystyle O}{\|}}{C}-OH$$

wherein R is saturated or unsaturated, straight chain, branched or cyclic C_1 to C_{15} alkylene, or a C_5 to C_{15} arylene or aralkylene, wherein the alkylene portion is saturated or unsaturated, straight chain branched or cyclic, and R_1 is lower alkyl, lower alkoxy, allyl, aryl alkylaryl or alkoxyaryl, wherein the alkyl portion is saturated or unsaturated, straight chain branched or cyclic, and wherein R and R_1 may contain one or more O or S atoms; such that the polyamide comprises between about 0.10% and about 1.0% by weight of phosphorous.

5,750,604

PHASE CHANGE INK FORMULATION USING A URETHANE ISOCYANATE-DERIVED RESIN

Jeffery H. Banning, Hillsboro; Clifford R. King, Salem, both of Oreg.; Loc V. Bui, Valencia, Calif., and Donald R. Titterington, Tualatin, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Jun. 28, 1996, Ser. No. 672,609

Int. Cl.^{6} C08J *3/00;* **C08K** *5/16;* **C08L** *75/00;* **C09D** *11/00*

U.S. Cl. 524—187 **22 Claims**

1. A phase change ink carrier composition comprising in combination:

- (a) a urethane resin that is a reaction product of at least octylphenol ethoxylate and an isocyanate;
- (b) a tackifier; and
- (c) a mono-amide.

5,750,605

HOT MELT ADHESIVES BASED ON SULFONATED POLYESTERS

Mitchell J. Blumenthal, Belle Mead; Matthew L. Sharak, Franklin Park, and Charles W. Paul, Madison, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 522,190, Aug. 31, 1995, abandoned. This application May 23, 1996, Ser. No. 652,072

Int. Cl.^{6} C08K *5/20;5/01;* **C08L** *93/04;* **C08J** *167/00*

U.S. Cl. 524—230 **28 Claims**

1. A hot melt adhesive composition comprising (i) 10 to 90% by weight of a sulfonated polyester; condensation polymer comprising the reaction product of

- a) at least one difunctional dicarboxylic acid or the corresponding methyl esters which is not a sulphomonomer;
- b) 2 to 25 mole percent of at least one sulfomonomer containing at least one metallic sulfonate group or nitrogen-containing non-metallic sulfonate group attached to an aromatic or cycloaliphatic nucleus and at least one functional group selected from the group consisting of hydroxyl, carboxyl, and amino;
- c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —C(R^1), —OH groups wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms, and R^1 in the reactant is a hydrogen atom, en alkyl of 1 to 5 carbon atoms, or an aryl group of 6 to 10 carbons atoms:
- d) 0 to 40 mole percent of a difunctional reactant selected from hydroxycarboxylic acids having one —C$(R)_2$—OH group, aminocarboxylic acids having one —NRH group, amino-alcohols having one —C$(R)_2$—OH group and one —NRH group, or mixtures of said difunctional reactants wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms; and

- e) 0 to 40 mole percent of a multifunctional reactant containing at least three functional groups selected from hydroxyl, carboxyl, and mixtures thereof wherein at least a portion of the multifunctional reactant contains at least three hydroxyl groups,

wherein all stated mole percentages are based on the total of all acid, hydroxyl and amino group containing reactants being equal to 200 mole percent, and wherein the polymer contains proportions of acid-group containing reactants (100 mole percent acid) to hydroxy- and amino-group containing reactants (100 mole percent base) such that the value of the equivalents of base divided by the equivalents of acid is between 0.5 and 2;

- (ii) 0 to 80% by weight of a compatible tackifier;
- (iii) 0 to 40% by weight of a compatible plasticizer;
- (iv) at least one crystalline material selected from the group consisting of:
  - (I) 5 to 40% by weight of a compatible wax diluent, with a molecular weight below 500 g/mole containing at least one polar functional group, said group being present at a concentration greater than 3×10^{-3} equivalents per gram and
  - (II) 0 to 60% by weight of a crystalline thermoplastic polymer; and
- (v) 0 to 3% by weight of a stabilizer;

the total of (i)+(v) to equal 100% by weight.

5,750,606

AQUEOUS FLUORINE-CONTAINING POLYMER DISPERSION

Toshiro Miura; Yoshihiro Soda, and Tadao Hayashi, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP95/01520, § 371 Date Feb. 3, 1997, § 102(e) Date Feb. 3, 1997, PCT Pub. No. WO96/04343, PCT Pub. Date Feb. 15, 1996

PCT Filed Jul. 31, 1995, Ser. No. 776,521

Claims priority, application Japan, Aug. 4, 1994, 6-183444

Int. Cl.^{6} C08K *3/20*

U.S. Cl. 524—244 **8 Claims**

1. An aqueous polytetrafluoroethylene dispersion comprising polytetrafluoroethylene, a nonionic surfactant and a preservative selected from the group consisting of 2-iodoacetamide, 1,2-dibromo-2,4-dicyanobutane, 2-(hydroxymethylamino)-2 -methyl-1-propanol and N,N',N"-trishydroxyethylhexahydro-S-triazine.

5,750,607

ADHESIVE COMPOSITIONS COMPRISING BLOCK COPOLYMERS OF A MONOVINYLAROMATIC COMPOUND AND BUTADIENE

Eric-Jack Gerard, Amsterdam, Netherlands; Noel Raymond Maurice De Keyzer, Louvain-La-Neuve, Belgium, and Birgitte Maria Ludovica Christine Van De Vliet, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 6, 1997, Ser. No. 812,226

Int. Cl.^{6} C08L *93/04;53/02;* **C08K** *5/01*

U.S. Cl. 524—271 **9 Claims**

1. A hot melt adhesive composition comprising:

- (a) a radial multiarmed block copolymer $(AB)_nX$, wherein A is a block predominantly derived from a monovinylaromatic compound, B is a block predominantly derived from butadiene, wherein X is the residue of a multifunctional coupling agent and n is in the range of from 3 to 6,
- (b) a linear block copolymer AB, wherein the components (a)+(b) are present in an amount of 100 parts by weight,
- (c) a tackifying resin, which is compatible with the blocks B, in an amount of from 100 to 500 parts by weight,
- (d) a plasticizer in an amount of from 100 to 300 parts by weight,
- (e) an antioxidant-UV stabiliser in an amount from 0.1 to 5 parts by weight, characterised in that the content of bound monovinylaromatic monomer in the block copolymers is at least 20 wt %, the vinyl content in the polymerised butadiene is at least 25 wt %, the diblock content, relative to the weight of components (a) and (b), is in the range of from 6 to 25 wt %, the diblock has an apparent molecular weight in the range of from 70,000 to 100,000, and the radial multiarmed block copolymer has an overall apparent molecular weight in the range of from 200,000 to 500,000.

5,750,608

EXTERNAL LUBRICANT COMPOSITIONS FOR RIGID VINYL POLYMERS

Robert Lindner, N. Wales, Pa.; Eric Alan Dudek, Clarksburg, Mass., and Bernard Daniel Louies, Brussels, Belgium, assignors to AlliedSignal Inc., Morristownship, N.J.

Continuation of Ser. No. 282,393, Jul. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 105,826, Aug. 11, 1993, Pat. No. 5,426,144. This application Aug. 7, 1996, Ser. No. 689,327

Int. Cl.^{6} C08K *5/01*

U.S. Cl. 524—399 **12 Claims**

1. A method of lubricating a lead stabilized, metallic stearate-containing vinyl polymer composition comprising adding to said composition a polyethylene having a Brookfield viscosity at a temperature of 150° C. of between about 1000 and about 100000 centipoise and an acid number as determined by standardized titration of KOH of between about 1 and about 40.

5,750,609

ULTRAVIOLET PROTECTIVE AGENT

Tsutomu Nosu; Wataru Hiraishi, both of Takamatsu, and Yoshiharu Sawa, Sakaide, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Takamatsu, Japan

Filed Apr. 10, 1996, Ser. No. 630,324

Int. Cl.^{6} C08K *3/22;* **C01G** *49/00;51/00*

U.S. Cl. 524—413 **14 Claims**

1. An ultraviolet protective agent which comprises fine particles of

- (1) a zinc compound represented by the following general formula (I):

$$(Zn_xM^{2+}_y)_{1-z}M^{3+}_zO_{1+z/2} \qquad (I)$$

  wherein M^{2+} is at least one metal selected from the group consisting of Mg, Ca, Ni and Cu; M^{3+} is at least one metal selected from the group consisting of Al and Fe; and x, y and z each satisfy $0.2\leqq x\leqq 0.4$, $(y+z)=1$ and $0\leqq z\leqq 0.75$,
- (2) the fine particle having a major diameter of 0.1 to 2 μm, a thickness of 0.01 to 0.3 μm, an aspect ratio of 2 to 200, and an average secondary particle diameter, measured by a laser diffraction method, of not more than 5 μm.

5,750,610

HYDROPHOBIC ORGANOSILICATE-MODIFIED SILICA GELS

Gary Thomas Burns; James Richard Hahn, and Clifford Carlton Reese, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 24, 1997, Ser. No. 805,102

Int. Cl.^{6} C08K *3/10;* **C08G** *77/06*

U.S. Cl. 524—434 **23 Claims**

1. A method for preparing a hydrophobic organosilicate-modified silica gel comprising:

- (A) heating an organosilicate-modified silica hydrosol comprising (i) about 2 to 50 weight percent of SiO_2 per milliliter and (ii) 1 to 50 weight percent of an organosilicate described by formula $R^1SiO_{3/2}$, where R^1 is a monovalent hydrocarbon radical comprising about 1 to 6 carbon atoms, in the presence of a strong mineral acid at a pH less than about pH 1 and a temperature within a range of about 20° C. to 250° C. to form an organosilicate-modified silica hydrogel, and

(B) contacting the organosilicate-modified silica hydrogel with (1) a catalytic amount of a strong acid and (2) an organosilicon compound selected from the group consisting of organosilanes described by formula

$$R^2{}_aH_bSiX_{4-a-b}$$

and organosiloxanes described by formula

$$R^2{}_nSiO_{(4-n)}/2$$

where each R^2 is independently selected from a group consisting of hydrocarbon radicals comprising about 1 to 12 carbon atoms and organofunctional hydrocarbon radicals comprising about 1 to 12 carbon atoms, each X is independently selected from a group consisting of halogen and alkoxy radicals comprising 1 to 12 carbon atoms, a=0, 1, 2, or 3, b=0 or 1, a+b=1, 2, or 3 with the proviso that when b=1 then a+b=2 or 3, n is an integer of from 2 to 3 inclusive to form a hydrophobic organosilicate-modified silica hydrogel having a surface area within a range of about 100 m²/g to 750 m²/g as measured in the dry state.

5,750,611

THERMOPLASTIC COMPOSITION HAVING ABSORPTION AGENT TO REDUCE OFFENSIVE ODORS AND FLAVORS

Yves Trouilhet, Geneva, Switzerland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US95/00207, § 371 Date Jul. 17, 1996, § 102(e) Date Jul. 17, 1996, PCT Pub. No. WO95/20624, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 17, 1995, Ser. No. 676,237

Claims priority, application European Pat. Off., Jan. 19, 1994, 94200102

Int. Cl.⁶ C08J *5/10;* **C08K** *3/34;* **C08L** *23/04*

U.S. Cl. 524—450 **9 Claims**

1. A thermoplastic composition comprising (a) a thermoplastic selected from the group consisting of ethylene/acid copolymers and copolymer/s of ethylene and 2 to 50% by weight acrylic or methacrylic acid neutralized upto about 90% with an alkali metal ion or a divalent or a trivalent metal ion; and ethylene/acid/acrylate terpolymers and copolymer/s of ethylene and 2 to 50% by weight acrylic or methacrylic acid neutralized upto about 90% with an alkali metal ion or a divalent or a trivalent ion; and (b) an adsorption agent which is a crystalline siliceous molecular sieve, having a framework of tetrahedral oxide units, in which at least 90% of the tetrahedral oxide units are SiO tetrahedra, a pore diameter greater than 5.5 Angstroms and a sorption capacity for water of less than 10% by weight at 25° C. and 4.6 torr.

5,750,612

POLYPROPYLENE RESIN COMPOSITION FOR CAR INTERIOR FITTINGS

Yasutoshi Zyagawa; Takeyoshi Nishio; Takao Nomura, all of Aichi-ken; Tomohiko Akagawa, Oosaka-fu; Ikunori Sakai, Oosaka-fu, and Saburou Hinenoya, Oosaka-fu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, and Ube Industries, Ltd., Yamaguchi-ken, both of Japan

Continuation of Ser. No. 498,405, Jul. 5, 1995, abandoned. This application Feb. 18, 1997, Ser. No. 801,416

Claims priority, application Japan, Jul. 7, 1994, 6-156161

Int. Cl.⁶ C08L *23/06;25/10*

U.S. Cl. 524—451 **5 Claims**

1. A polypropylene resin composition for car interior fittings comprising:

(a) from 62 to 85% by weight of a crystalline polypropylene having a melt flow rate (at 230° C. under 2160 g) of from 10 to 45 q/10 minutes,

(b) from 2 to 16% a by weight of hydrogenated block copolymer(s) obtained by hydrogenating block copolymer(s) of formula(e) A—(—B—A)n and/or A—B (where A represents a polymer block of a monovinyl-substituted aromatic hydrocarbon; B represents a polymer block of a conjugated diene elastomer; n represents an integer of from 1 to 5), and which has/have a melt flow rate (at 200° C. under 5 kg) of 5 g/10 minutes or more and in which the block A content is 22% by weight or less, at a degree of hydrogenation of 90 mol % or more,

(c) from 2 to 16% by weight of hydrogenated block copolymer(s) obtained by hydrogenating block copolymer(s) of formula(e) A—(—B—A)n and/or A—B (where A represents a polymer block of a monovinyl-substituted aromatic hydrocarbon; B represents a polymer block of a conjugated diene elastomer; n represents an integer of from 1 to 5), and which has/have a melt flow rate (at 200° C. under 5 kg) of 2 g/10 minutes or less and in which the block A content is 27% by weight or more, at a degree of hydrogenation of 90 mol % or more,

a weight ratio of the hydrogenated block copolymer(s) (b) to the hydrogenated block copolymer(s) (c), being from 0.25 to 4.0; and

(d) from 7 to 25% by weight of talc having a mean particle size of from 3 to 5 μm measured by laser diffraction, a BET specific surface area of from 5 to 13 m²/g and a top-cut particle size of less than 20 μm.

5,750,613

AQUEOUS, CROSSLINKABLE BINDER DISPERSIONS HAVING A LOW SOLVENT CONTENT

Harald Blum, Wachtendonk; Armin Sickert, and Wieland Hovestadt, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 30, 1996, Ser. No. 685,424

Claims priority, application Germany, Aug. 7, 1995, 195 28 939.0

Int. Cl.⁶ C08J *3/02*

U.S. Cl. 524—457 **14 Claims**

1. An aqueous, crosslinkable binder dispersion A) having a low solvent content and comprising, based on resin solids,

A1) 6.5 to 25 wt. % of at least one hydroxy-functional polyether having a functionality of 1.8 to 6.0, a viscosity at 25° C. of ≦4000 mPa.s, a number average molecular weight of 152 to 4000 and an OH number of 50 to 700 mg of KOH/g of resin solids,

A2) 35 to 90 wt. % of a hydroxy-functional copolymer having an OH number of 20 to 220 mg KOH/g of resin solids and an acid number of 0 to 50 mg of KOH/g of resin solids and

A3) 5 to 60 wt. % of a hydroxy- and carboxy-functional copolymer having an OH number of 30 to 220 mg of KOH/g of resin solids and an acid number of 25 to 200 mg of KOH/g of resin solids

wherein the sum of the percentages of A1), A2) and A3) is 100, wherein the acid number is greater in A3) than in A2) and wherein the acid number of dispersion A) is 8 to 45 mg of KOH/g of resin solids, the OH number is 25 to 200 mg of KOH/g of resin solids and the solids content is greater than 35 wt.%.

5,750,614

PROCESS FOR PREPARING STABLE EMULSIONS OF POLYELECTROLYTES OF HIGH MOLECULAR WEIGHT AS REVERSE EMULSION

René Hund, Villars, and Sébastien Georges, Villeurbanne, both of France, assignors to S.N.F., France

Filed Dec. 1, 1995, Ser. No. 566,179

Claims priority, application France, Jan. 10, 1995, 95 00383

Int. Cl.⁶ C08F *2/16*

U.S. Cl. 524—460 **10 Claims**

1. A process for preparing a stable emulsion of a high molecular weight polyelectrolyte by reverse emulsion wherein the formation of gel is prevented, said process comprising:

preparing an organic phase containing a surface active agent;

dissolving the monomer or monomers that will polymerize to form said high molecular weight polyelectrolyte in an aqueous phase;

then, adding to said aqueous phase a low molecular weight, water-soluble polymer of the same chemical nature and of the same ionic nature as the high molecular weight polyelectrolyte to be formed;

then, mixing said organic phase and said aqueous phase to obtain a water-in-oil emulsion;

polymerizing said monomer or monomers in said emulsion; and

adding a reversing agent to said emulsion to obtain a water-in-oil emulsion to make the formed polyelectrolyte water-soluble.

5,750,615

USE OF FULLERENE CARBON IN CURABLE RUBBER COMPOUNDS

Lewis Timothy Lukich; Thomas Edwin Duncan, and Colleen Marie Lansinger, all of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 26, 1996, Ser. No. 757,713

Int. Cl.⁶ C08K *3/04*

U.S. Cl. 524—495 **61 Claims**

1. A tire is provided having a component composed of a rubber composition comprised of, based on 100 parts by weight rubber (A) 100 parts by weight (phr) of at least one diene-based elastomer and (B) about 30 to about 100 phr of elastomer reinforcement composed of about 5 to about 100 weight percent of at least one fullerene carbon and from zero to about 95 weight percent of at least one of carbon black or precipitated silica; wherein said fullerene carbon is characterized by having the formula C_{2n}; where n is an integer of at least 30.

5,750,616

FIBER-REINFORCED THERMOPLASTIC RESIN COMPOSITE MATERIAL

Takashi Shimpuku, and Nobukazu Atsumi, both of Ichihara, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 27, 1996, Ser. No. 624,743

Claims priority, application Japan, Mar. 30, 1995, 7-097771

Int. Cl.⁶ C08J *5/10;* **C08K** *3/04;* **C08L** *23/14*

U.S. Cl. 524—496 **12 Claims**

1. A fiber-reinforced thermoplastic resin composite material formed from:

a thermoplastic resin;

a fiber reinforcing material; and

carbon black, wherein the fiber reinforcing material has an average diameter ranging from 3 to 21 μm and an average length ranging from 0.3 to 30 mm and is included in the composite material in an amount ranging from 5 to 80% by weight on the basis of the weight of the composite material, the carbon black has an aggregate size upon primary cohesion of not more than 60 nm and is included in the composite material in an amount ranging from 0.01 to 5% by weight on the basis of the weight of the composite material, and the fiber-reinforced thermoplastic resin composition material is prepared by kneading the thermoplastic resin, the fiber reinforcing material, and the carbon black.

5,750,617

PROCESS FOR THE PREPARATION OF BIOLOGICALLY DEGRADABLE AQUEOUS DISPERSIONS

Herbert Eck; Gerald Fleischmann, both of Burghausen, and Konrad Wierer, Mehring, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Division of Ser. No. 164,252, Dec. 7, 1993, abandoned. This application Aug. 5, 1996, Ser. No. 689,092

Claims priority, application Germany, Dec. 17, 1992, 42 42 781.9

Int. Cl.⁶ C08K *5/34*

U.S. Cl. 524—718 **12 Claims**

1. A process for the production of a biologically degradable aqueous dispersion of a vinyl ester polymer having a solids content of 20 to 70% by weight, based on the total weight of the dispersion, by free radical polymerization with the emulsion polymerization process of a monomer phase comprising:

a) 50 to 100 parts by weight of at least one ester comprising vinyl esters of branched and unbranched or alkylcarboxylic acids having 1 to 15 C atoms,

b) 0 to 30 parts by weight of ethylene and/or ester of (meth-)acrylic acid or ethylenically unsaturated dicarboxylic acids from alcohols having 1 to 10 atoms and

c) 0 to 20 parts by weight of other mono- or poly-ethylenically unsaturated compounds, wherein the polymerization is carried out at 0° to 100° C. in the presence of a redox catalyst system and in the presence of

10 to 50% by weight, based on the monomer phase, of biologically degradable plasticizer and

0.5 to 15.0% by weight, based on the monomer phase, of biologically degradable emulsifier and/or biologically degradable protective colloid, and wherein

5 to 30% by weight of the vinyl esters a) employed and the other comonomers, apart from comonomer c), are initially introduced into the reaction vessel, and the remainder is metered in and the emulsifier and/or protective colloids are initially introduced into the reaction vessel or are metered in completely or in part.

5,750,618

PROCESS FOR THE PRODUCTION OF LATICES BASED ON CONJUGATED DIENES BY EMULSION POLYMERISATION

Hans-Günter Vogt, Dormagen; Heinrich Grave, Bergisch Gladbach; Hermann-Josef Bross, Leverkusen, and Martin Matner, Odenthal, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Feb. 25, 1997, Ser. No. 804,639

Claims priority, application Germany, Feb. 29, 1996, 196 07 631.5

Int. Cl.⁶ C08L *9/10;9/04;11/02*

U.S. Cl. 524—836 **7 Claims**

1. A process for the production of latices based on conjugated dienes selected from butadiene, isoprene, chloroprene and mixtures thereof, and optionally vinyl compounds which are copolymerizable with the conjugated dienes, by emulsion polymerization, wherein the monomers to be polymerized are metered into an initially-introduced seed latex having a particle size of 10 to 80 nm, which seed latex is based on the monomers used in the process or is based on inorganic pigments, in the presence of a free-radical forming activator and an emulsifier, such that the ratio of the monomer polymerization rate to the monomer feed rate is 0.05 to 0.7:1, and wherein polymerization is performed up to a monomer conversion of ≧95% at temperatures of 10° to 85° C., the introduction of the emulsifier is controlled in such a manner that the final particle size (TG_L) of the latex to be produced is governed by the following equation:

$$TG_L=TG_S\times(m_L/D_L)^{1/3}/(m_S/D_S)^{1/3}$$

in which

D_L=density of latex particles in the latex to be produced
D_s=density of the particles of the seed used
m_L=mass of the latex particles in the latex to be produced
m_s=mass of the particles of the seed used
TG_L=particle size of the latex to be produced
TG_s=particle size of the seed used,

and wherein the quantity of emulsifier is 0.1 to 10 wt. %, based on the total weight of monomers used, the content of the above-mentioned conjugated dienes in the copolymers is ≧15 wt. %, the content of the vinyl-group-containing comonomers constitutes ≦85 wt. % and the quantity of initially introduced seed is 0.01 to 15 wt. %, based on the total quantity of the monomers used.

5,750,619

COATING COMPOSITION OF NON-CYCLIC ANHYDRIDE RESIN, POLYEPOXY OLIGOMER AND STABILIZED ACRYLIC RESIN

Robert John Barsotti, Franklinville, N.J., and Christopher Scopazzi, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US95/07124, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO96/01880, PCT Pub. Date Jan. 25, 1996

Continuation of Ser. No. 272,364, Jul. 8, 1994, abandoned. This PCT application Jun. 16, 1995, Ser. No. 765,706

Int. Cl.⁶ C08L *51/00;63/00;67/02*

U.S. Cl. 525—65 **6 Claims**

1. A curable coating composition comprising organic solvent and binder, the binder comprising

- (a) anhydride resin having a molecular weight of less than about 3000 that contains (1) a central organic moiety, and (2) on average, more than one pendant, non-cyclic anhydride moiety bonded to each central moiety;
- (b) oligomer having epoxy functionality of at least 2 and having a weight average molecular weight of less than about 1500;
- (c) about 3 to 40%, by weight of the binder, of stabilized acrylic resin having
  - (i) a crosslinked core of acrylic polymer polymerized from a hydroxy-functional acrylic monomer and other acrylic monomers and crosslinked by polymerization with a diunsaturated monomer followed by reaction of the hydroxy groups with a diisocyanate or triisocyanate which is non-soluble in organic solvent and, grafted thereto,
  - (ii) a plurality of substantially linear stabilizer components having an acrylic backbone and at least about 3% of ethylenically unsaturated monomers containing epoxy functionality, each of which is soluble in organic solvent and has one end grafted to the core, the stabilized acrylic resin being substantially free from non-polymerizable linear polymer; and
- (d) a functional amount of at least one active catalyst, wherein the ratio of equivalents of epoxy to anhydride is about 0.5:1 to 1.8:1.

5,750,620

TOUGHENED POLYMERIC COMPOSITIONS AND METHODS OF IMPROVING FRICTION AND WEAR PROPERTIES OF TRIBOLOGICAL SYSTEMS

Mark Davies, Middlesbrough, United Kingdom, and Anne E. Bolvari, West Chester, Pa., assignors to Kawasaki Chemical Holding Co., Inc., Wilmington, Del.

Continuation of Ser. No. 561,681, Nov. 22, 1995, abandoned, which is a division of Ser. No. 266,996, Jun. 28, 1994, Pat. No. 5,504,139, which is a continuation of Ser. No. 910,400, Jul. 8, 1992, abandoned. This application May 13, 1997, Ser. No. 855,070

Int. Cl.⁶ C08L *69/00;55/02;23/02*

U.S. Cl. 525—67 **5 Claims**

1. A method of improving the adhesive wear properties of a polymeric composite in a dry, smooth contact sliding tribological wear system wherein a surface of said polymeric composite bears against another surface causing friction and adhesive wear of said polymeric composite, the method comprising the steps of:

- (a) providing a polycarbonate and a polymer selected from the group consisting of polyolefin, polyacrylonitrile-butadiene-styrene, and polyacetal;
- (b) providing at least one elastomer for toughening said polycarbonate and said polymer, said at least one elastomer being functionalized to compatibilize said polycarbonate sand said polymer and said at least one elastomer being selected from the group consisting of maleic anhydride-modified ethylene-propylene rubber, ethylene-propylene rubber grafted with styrene-acrylonitrile, and terpolymers of ethylene, ethyl acrylate and maleic anhdyride; and
- (c) melt mixing said polycarbonate, said polymer and said at least one elastomer, such that said at least one elastomer bonds with at least one of said polycarbonate and said polymer to form said composite, said composite comprising said polycarbonate, said polymer and said at least one elastomer, and wherein the composite has an increased wear resistance and a wear factor lower than the wear factor of a polycarbonate composite without said polymer and said at least one elastomer in the tribological system.

5,750,621

MULTIPHASE POLYMER BLENDS

Axel Gottschalk, Neustadt; Raimund Stadler, Mommenheim, and Udo Krappe, Mainz, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/01668, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1996, PCT Pub. No. WO95/31503, PCT Pub. Date Nov. 23, 1995

PCT Filed May 3, 1995, Ser. No. 737,482

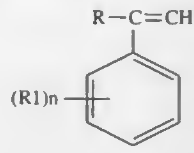
Claims priority, application Germany, May 13, 1994, 44 16 854.3

Int. Cl.⁶ C08L *71/12;53/02;53/00*

U.S. Cl. 525—68 **13 Claims**

1. A multiphase 'polymer blend containing

- a) as a polymer (A) a polyphenylene ether or a mixture of a polyphenylene ether and up to 50% by weight, based on (A), of a vinylaromatic polymer, and
- b) an A—B block copolymer (B) composed of a block A and a resilient block B, and
- c) a B—C block copolymer (C) composed of a resilient block B and a block C, and
- d) at least one further polymer (D) which differs from (A), (B), and (C), and is incompatible with the polymer (A), said polymer (D) being selected from a group consisting of ASA-, and ABS-, and SAN-polymers, and polymers of C_1–C_{18}-alkyl esters of (meth)acrylic acid, where the SAN-polymer in turn comprises from 50 to 90% by weight of styrene or substituted styrenes of the formula I



(I)

where R is alkyl of 1 to 8 carbon atoms, hydrogen or halogen, R^1 is alkyl of 1 to 8 carbon atoms or halogen, and n is 0, 1, 2, or 3, or a mixture thereof,

wherein the blocks A, B, and C are different from one another,

the polymer (A) is compatible with the block A and incompatible with the block C,

the polymer (D) is compatible with the block C and incompatible with the block A,

the resilient block B has a glass transition temperature below +20° C., and

the blocks A, B, and C are incompatible with one another.

5,750,622

HIGH TEMPERATURE LOW VISCOSITY THERMOPLASTIC ELASTOMER BLOCK COPOLYMER COMPOSITIONS

Glenn Roy Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 20, 1997, Ser. No. 821,138

Int. Cl.⁶ C09J *153/02;171/12;* **C08L** *53/02*

U.S. Cl. 525—92 D **6 Claims**

1. A high service temperature, low viscosity thermoplastic elastomer composition which comprises:

- (a) from 2.0 to 30.0% by weight of a polyphenylene ether resin having an intrinsic viscosity of 0.07 to 0.25 deciliters per gram, and
- (b) from 70.0 to 98.0% by weight of an asymmetric radial elastomeric vinyl aromatic hydrocarbon/conjugated diene block copolymer having one of the following formulae:

$$(A—HD)_x—Y—(UD)_z \qquad (I)$$

or

$$(UD—A—HD)_x—Y \qquad (II)$$

or

$$(UD—A—HD)_x—Y—(UD)_z \qquad (III)$$

wherein A is a vinyl aromatic hydrocarbon block having a weight average molecular weight of from 4000 to 16,000, HD is a hydrogenated conjugated diene block having a weight average molecular weight of from 10,000 to 50,000, Y is a multifunctional coupling agent, UD is a partially hydrogenated conjugated diene block having a weight average molecular weight of from 1000 to 45,000, x is an integer from 2 to 30, z is an integer from 1 to 20, and x+z ranges from 3 to 31.

5,750,623

HOT-MELT ADHESIVES FOR DISPOSABLE ITEMS AND ARTICLES MADE THEREFROM

Charles F. Diehl, and Jean M. Tancrede, both of Baton Rouge, La., assignors to The Dow Chemical Co., and Exxon Chemical Patents, Inc., both of Del.

Filed May 20, 1996, Ser. No. 650,734

Int. Cl.⁶ C08L *9/06;53/02*

U.S. Cl. 525—98 **15 Claims**

1. A hot-melt adhesive composition suitable for disposable goods and wherein the hot melt construction adhesive is applied to a polyolefin or nonwoven substrate by extrusion, spray or multi-line type techniques to be operable to bind at least one elastic, polyolefin, foam, polyethylene, polypropylene, or nonwoven layer to the substrate, the hot melt construction adhesive comprising:

- a) about 5 percent to about 15 percent based on the weight of the hot melt adhesive composition, of a linear A—B—A block copolymer wherein the B component is polyisoprene, the A component is polystyrene, the average peak molecular weight corrected for the composition and the polymer, of a polystyrene block is a minimum of 18,000, the overall average peak molecular weight corrected for the composition of the polymer, of the linear block copolymer ranges from about 120,000 to about 200,000, the A component is present in an amount of about 25 parts to about 35 parts per 100 parts by weight of the block copolymer;
- b) from about 45 percent to about 85 percent of a compatible solid tackifying resin, based on the weight of the hot melt composition;
- c) from about 0 percent to about 35 percent of a plasticizing oil or liquid tackifying resin, based upon the weight of the hot melt adhesive; and

wherein the A—B—A block copolymer contains less than 5% residual A—B diblock.

5,750,624

CURABLE RESIN COMPOSITION, COATING COMPOSITION, COATING METHOD AND COATED ARTICLE

Seigo Miyazoe, Takatsuki; Akira Fushimi, Ikoma, and Masanobu Inoue, Nishinomiya, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

PCT No. PCT/JP95/00621, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO95/27011, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 31, 1995, Ser. No. 718,394

Claims priority, application Japan, Apr. 1, 1994, 6-87524

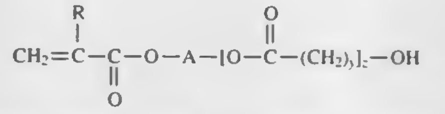
Int. Cl.⁶ C08F *8/00*

U.S. Cl. 525—100 **9 Claims**

1. A curable resin composition comprising

5 to 80 weight % of a polymer containing free and esterified carboxyl groups and having an acid value of 50 to 300 (mg KOH/g) (1e) as obtainable by reacting an acid anhydride group-containing polymer (1c), which is obtainable by copolymerizing 10 to 40 weight % ol an acid anhydride group-containing ethylenically unsaturated monomer (1a) with 90 to 60 weight % of a copolymerizable other ethylenically unsaturated monomer (1b), with a monohydric alcohol of 1 to 12 carbon atoms (1d) in the ratio (the number of mols of acid aihydride group in acid anhydride-containing polymer (1c))/(the number of mols of hydroxyl group in monohydric alcohol (1d)) of 1/10 to 1/1,

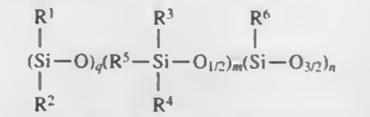
1 to 80 weight % of a hydroxyl group- and epoxy group-containing polymer having an epoxy equivalent of 200 to 1000 and a hydroxyl equivalent of 250 to 1500 (2d) as obtainable by copolymerizing 5 to 60 weight % of a hydroxylalkyl (meth) acrylate monomer (2a) of the general formula (I):



$$CH_2{=}\overset{\overset{\displaystyle R}{|}}{C}-\underset{\underset{\displaystyle O}{\|}}{C}-O-A-[O-\overset{\overset{\displaystyle O}{\|}}{C}-(CH_2)_y]_z-OH \qquad (I)$$

wherein R represents hydrogen or methyl; A represents a straight-chain or branched alkylene group of 2 to 8 carbon atoms; y represents a whole number of 3 to 7; z represents a whole number of 0 to 4; with 10 to 60 weight % of an epoxy group-containing ethylenically unsaturated monomer (2b) and 0 to 85 weight % of an ethylenically unsaturated monomer (2c) copolymerizable therewith,

1 to 50 weight % of an alkoxyl group-containing silicone polymer having an alkoxyl equivalent of 50 to 1500 (3a) of the general formula (II):



$$(\underset{\underset{\displaystyle R^2}{|}}{\overset{\overset{\displaystyle R^1}{|}}{Si}}-O)_q(R^5-\underset{\underset{\displaystyle R^4}{|}}{\overset{\overset{\displaystyle R^3}{|}}{Si}}-O_{1/2})_m(\overset{\overset{\displaystyle R^6}{|}}{Si}-O_{3/2})_n \qquad (II)$$

wherein R^1, R^2, R^3, R^4, R^5, and R^6 are the same of different and each represents alkyl of 1 to 10 carbon atoms, phenyl, phenethyl, alkoxyl of 1 to 5 carbon atoms, $R'—Si(OR')_3$, $R^7—Si(OR')_2CH_3$, $R^7—Si(OR^8)(CH_3)_2$, or $R^7—Y$; R^7 represents a straight-chain or branched alkylene group which may have an ether bond and/or an ester bond; R^8 represents alkyl of 1 to 5 carbon atoms; Y represents an epoxy group-containing acyclic or cyclic hydrogen group; q represents a whole number of 1 to 20, m represents a whole number of 0 to 4, n represents a whole number of 0 to 2; the q, m and n repetitions are a random arrangement coupled with the unit structures which are separate from each other;

0.1 to 5.0 weight % of a quaternary ammonium salt catalyst (4a), and

0.1 to 5.0 weight % of a monoalkyltin compound (5a).

5,750,625
PHENOLIC RESIN CURATIVES WHICH FORM NONSTAINING THERMOPLASTIC ELASTOMERS

Robert Eugene Medsker, Hartville; Raman Patel, and Sabet-Abdou Sabet, both of Akron, all of Ohio, assignors to Advanced Elastomer Systems, L.P., Akron, Ohio

Filed Jun. 9, 1997, Ser. No. 871,264

Int. Cl.^{6} C08L *9/00;19/00;23/02*

U.S. Cl. 525—133 **21 Claims**

1. A process for preparing a thermoplastic vulcanizate, comprising;

a) heating a crystalline polyolefin to above its softening or melting temperature

b) mixing an unsaturated rubber with said crystalline polyolefin and forming a blend thereof, and

c) crosslinking said rubber with a phenolic resin curative wherein some of the hydroxyl groups of said phenolic resin curative have been esterified.

5,750,626
THERMOPLASTIC RESIN COMPOSITION

Tetsuo Shimizu; Yoshihisa Yamamoto; Seitaro Yamaguchi; Nobuhiko Tsuda; Noriyasu Yamane; Takafumi Yamato; Masahiro Kumegawa, and Takayuki Araki, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/01784, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO94/13738, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 8, 1993, Ser. No. 284,548

Claims priority, application Japan, Dec. 10, 1992, 4-353104; Jun. 4, 1993, 5-160329

Int. Cl.^{6} C08L *27/12;67/03*

U.S. Cl. 525—151 **3 Claims**

1. A thermoplastic resin composition which comprises a blend obtained by blending 0.1 to 99% by weight of (a) a fluorine-containing polymer having a functional group and a number-average molecular weight of 2000 to 1000000 and 1 to 99% by weight of (b) a heat resisting thermoplastic aromatic polyester having a crystalline melting point or glass transition temperature of not less than 150° C.; said fluorine-containing polymer (a) having the functional group is at least one selected from fluorine-containing polymers having functional groups, in which a concentration of the functional groups at a main chain end portion and side chain portion is 2 to 2000μ mol/g per the total weight of the fluorine-containing polymer, and represented by the formula (I),

$$A^1—(X)—(Y)—A^2 \qquad (I)$$

wherein

X is a structural unit of the formula $—(CH_2CX^1X^2)—$ (wherein X^1 and X^2 are the same or different, and each is hydrogen atom, fluorine atom, $—(CH_2)_p—(O)_q—R—B^1$ (R is a dihydric hydrocarbon group having carbon atoms of 1 to 20 or dihydric fluorine-substituted organic group having carbon atoms of 1 to 20, B^1 is hydrogen atom, fluorine atom, hydroxy group or epoxy group, p is 0 or 1 and q is 0 or 1), $—OCO—R—B^1$ (R and B^1 are the same as above) or $—COO—R—B^1$ (R and B^1 are the same as above));

Y is a structural unit of the formula $—(CF_2CY^1Y^2)—$ (wherein Y^1 and Y^2 are the same or different, and each is hydrogen atom, fluorine atom, chlorine atom, $—(CF_2)_r—(O)_s—(R_f)_t—CH_2)_u—B^2$ (R_f is a dihydric fluorine-substituted organic group having carbon atoms of 1 to 14, B^2 is hydrogen atom, halogen atom, hydroxy group, epoxy group or glycidyloxy group, r is 0 or 1, s is 0 or 1, t is 0 or 1, and u is an integer of 1 to 3) or $—(CF_2)_v—B^3$(B^3 is hydrogen atom, fluorine atom or chlorine atom, and v is an integer of 1 to 10));

both A^1 and A^2 are end portions of a main chain;

provided that each of X and Y may comprise two or more structural units;

Y may not be present when X has the structural unit derived from $CH_2=CHF$, $CH_2=CF_2$ or fluoroalkyl-α-substituted acrylate (substituent is hydrogen atom, fluorine atom or methyl);

X may not be present when Y has the structural unit derived from $CH_2=CF_2$ or $CH_2=CHCl$;

at least one of A^1 and A^2 contains hydroxy group, epoxy group or glycidyl group when both of X and Y do not contain hydroxy group, epoxy group or glycidyl group; said resin composition contains only the fluorine-containing polymer represented by the formula (I) as the fluorine-containing polymer having functional group.

5,750,627
CROSSLINKABLE HYDROXY TERMINATED POLYDIENE POLYMER COATING COMPOSITIONS FOR USE ON SUBSTRATES AND A PROCESS FOR PREPARING THEM

David John St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1996, Ser. No. 748,291

Int. Cl.^{6} C08F *8/32*

U.S. Cl. 525—162 **13 Claims**

1. A crosslinkable composition comprising from 10 to 80 percent by weight of a hydroxy functional polydiene polymer having a functionality of at least 1.3, from 8 to 60 percent by weight of an amino resin crosslinking agent, and from 2 to 40 percent by weight of a reinforcing agent which has at least two functional groups which will react with the amino resin crosslinking agent, said functional groups selected from the group consisting of hydroxyl, carboxylic acid or anhydride, or amide functionality, wherein the reinforcing agent has an equivalent weight from 30 to 150 grams per functional group.

5,750,628
METAL-NITROGEN POLYMER COMPOSITIONS COMPRISING ORGANIC ELECTROPHILES

Kurt Joseph Becker, Newark; James Allen Jensen, Hockessin, and Alexander Lukacs, III, Wilmingtön, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 223,294, Apr. 5, 1994, Pat. No. 5,616,650, which is a continuation-in-part of Ser. No. 148,044, Nov. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,757

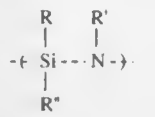
Int. Cl.^{6} C08G *77/06*

U.S. Cl. 528—25 **40 Claims**

1. A composition comprising the reaction mixture of

(1) at least one organic electrophile comprising at least one organic monomer comprising a multiplicity of organic electrophilic substituents, wherein said electrophilic substituents comprise at least one electrophilic reactive group selected from the group consisting of epoxides and carbonyl-containing groups other than a multifunctional isocyanate and a multifunctional amide, and

(2) at least one metal-containing polymer comprising the repeat unit



$$-\!\!\left(\underset{R''}{\overset{R}{Si}}-\overset{R'}{N}\right)\!\!-$$

where R, R' and R"=hydrogen, alkyl, alkenyl, alkynyl or aryl.

5,750,629
URETDIONE DIISOCYANATES AND A PROCESS FOR THEIR PRODUCTION

Hans-Josef Laas, Köln; Reinhard Halpaap, Odenthal; Josef Pedain, Köln, and Klaus König, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

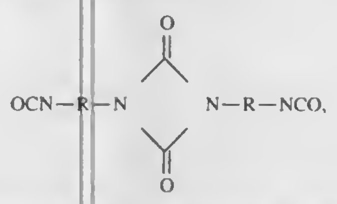
Filed Jan. 23, 1997, Ser. No. 788,726

Claims priority, application Germany, Jan. 30, 1996, 196 03 245.8

Int. Cl.^{6} C08G *18/79;18/80;* **C07D** *229/00*

U.S. Cl. 528—45 **20 Claims**

1. A process for preparing bis(isocyanatoalkyl)-monouretdiones corresponding to formula (I)



(I)

wherein R represents identical or different, linear or branched alkyl groups having 4 to 9 carbon atoms,

which comprises oligomerizing at least a portion of the isocyanate groups of a diisocyanate corresponding to formula (II)

$$OCN—R—NCO, \qquad (II)$$

in the presence of a catalyst which accelerates the dimerization of isocyanate groups, terminating the reaction at the desired degree of oligomerization, removing unreacted excess diisocyanate by extraction or thin film distillation to obtain a distillation residue, subjecting the distillation residue to thin film distillation at a temperature of 160° to 220° C. and a pressure of 0.01 to 1.0 mbar and obtaining bis(isocyanatoalll)-monouretdiones corresponding to formula (1) as the distillate.

5,750,630
WATER-BASED POLYURETHANE POLYMER, RELEASE COATING, ADHESIVE TAPE AND PROCESS OF PREPARATION

Ashok Sengupta, London, Canada, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US95/00528, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO95/21206, PCT Pub. Date Aug. 10, 1995

PCT Filed Jan. 13, 1995, Ser. No. 676,334

Claims priority, application Canada, Feb. 4, 1994, 2115002

Int. Cl.^{6} C08G *18/12;18/61*

U.S. Cl. 528—59 **27 Claims**

1. A water-soluble or water-dispersible polyurethane polymer whose polymer chain includes silicone-containing segments and whose polymer chain is end-capped with a single isocyanate-reactive silane group.

5,750,631
HALOGENATED EPOXY RESIN, PRODUCTION OF SAID RESIN, FLAME RETARDANT, AND FLAME-RETARDED EPOXY RESIN COMPOSITION

Yasuyuki Murata, and Yoshinori Nakanishi, both of Yokkaichi, Japan, assignors to Shell Oil Company, Houston, Tex.

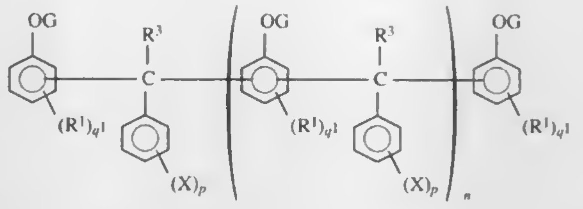
Filed Jun. 28, 1996, Ser. No. 672,433

Claims priority, application Japan, Jun. 29, 1995, 7-184984

Int. Cl.^{6} C08G *8/28*

U.S. Cl. 528—98 **13 Claims**

1. A halogenated epoxy composition represented by the formula



wherein G is a glycidyl group; each X independently is a chlorine or bromine atom; each R^1 independently is a hydroxyl group, C_{1-10} alkyl group, phenyl group, aralkyl group, alkoxy group, or halogen atom; each R^3 independently is a hydrogen atom, C_{1-10} alkyl group, phenyl group, or aralkyl group; each p independently is an integer of 1 to 5; each q^1 independently is an integer of 0 to 4; and n is a number of 0 to 5 on average.

5,750,632
ISOLATION OF NOVOLAK RESIN BY LOW TEMPERATURE SUB SURFACE FORCED STEAM DISTILLATION

M. Dalil Rahman, Flemington, and Daniel Aubin, Oxford, both of N.J., assignors to Clariant Finance (BVI) Limited, Virgin Islands (Br.)

Filed Dec. 30, 1994, Ser. No. 366,634

Int. Cl.^{6} C08G *8/04;14/04*

U.S. Cl. 528—129 **10 Claims**

1. A process for producing a water insoluble, aqueous alkali soluble novolak resin comprising condensing one or more methyl phenols and an aldehyde, in the presence of an acid catalyst, in a suitable organic reaction solvent, distilling said novolak resin utilizing forced steam distillation, at a temperature of 100° C. to 160° C. and thereby isolating said novolak resin.

5,750,633
DOPE FOR CAST FORMATION AND METHOD OF MANUFACTURING THE SAME

Tomomi Ohara, and Hisao Hachisuka, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Oct. 24, 1995, Ser. No. 547,439

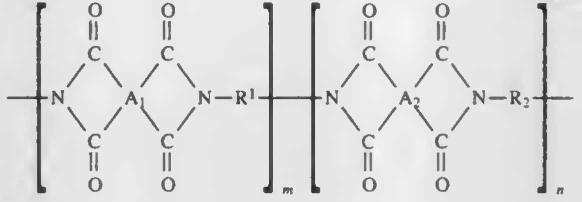
Claims priority, application Japan, Oct. 26, 1994, 6-262782

Int. Cl.^{6} C08G *73/10*

U.S. Cl. 528—174 **27 Claims**

1. A dope for cast formation, comprising a fluorine containing polyimide resin and a polar organic solvent (P), the polar organic solvent comprising diethylene glycol dimethyl ether, the organic solvent (P) being present during resin polymerization of said polyimide resin, said fluorine containing polyimide resin comprising at least three fluorine atoms in a repeating molecular unit and having a repeating unit which is expressed as the following Formula 1;

Formula 1



where A_1 and A_2 are tetravalent organic groups comprising aromatic, alicyclic, or aliphatic hydrocarbon groups; R_1 and R_2 are divalent aromatic, alicyclic, aliphatic hydrocarbon groups, or divalent organic groups in which aromatic, alicyclic or aliphatic hydrocarbon groups are bonded by divalent organic bond groups; and at least one organic group selected from the group consisting of A_1, A_2, R_1 and R_2 has at least three fluorine atoms; and $0 \leqq m \leqq 1$, $0 \leqq n \leqq 1$, and $m+n=1$.

5,750,634

WATER-SOLUBLE POLYCONDENSATION PRODUCTS BASED ON AMINO-S-TRIAZINES AND THE USE THEREOF

Gerhard Albrecht, Trostberg; Josef Weichmann, Pleiskirchen; Ludwig Eibl, Truchtlaching; Christian Huber, Garching, and Alfred Kern, Kirchweidach, all of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

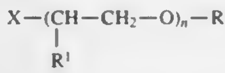
Filed Mar. 18, 1996, Ser. No. 617,108

Claims priority, application Germany, Mar. 17, 1995, 195 09 759.9

Int. Cl.^{6} G08G *12/30*

U.S. Cl. 528—254 **26 Claims**

1. A water-soluble condensation product comprising: amino-s-triazine, formaldehyde and sulphite in a mole ratio of 1:0.5 to 5.0:0.1 to 1.5, containing per mole of amino-s-triazine, a least one organic component selected from the group consisting of a) 0.01 to 1.0 mole of a polyoxyalkylene derivative of the formula:



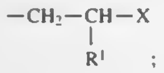
$$X-(\underset{\displaystyle R^1}{\underset{|}{CH}}-CH_2-O)_n-R^2 \qquad (I)$$

wherein

X is $—NH_2$, $—NH—CO—NH_2$ or $—O—CO—NH—R^3—NH—CO—Z$;

R^1 is a hydrogen atom or an aliphatic hydrocarbon radical with up to 4 carbon atoms;

R^2 is a hydrogen atom, an aliphatic hydrocarbon radical with up to 20 carbon atoms, a cycloaliphatic radical with 5 to 8 carbon atoms, an optionally substituted aromatic hydrocarbon radical with 6 to 10 carbon atoms, or



$$-CH_2-\underset{\displaystyle R^1}{\underset{|}{CH}}-X \quad ;$$

R^3 is an aliphatic hydrocarbon radical with 2 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical with 4 to 15 carbon atoms, an aromatic hydrocarbon radical with 6 to 15 carbon atoms or an araliphatic hydrocarbon radical with 8 to 15 carbon atoms;

Z is $—NH_2$, $—NH—CO—NH_2$; and

n is a number from 1 to 100; and

b) 0.01 to 1.5 mole of an aldehyde acid derivative of the formula:

$$—H—CO—R^4 \qquad (II)$$

wherein R^4 is COOH or a phenyl radical with —COOH, $—SO_3H$ or $—PO_3H_2$ or the mono- or divalent salts thereof condensed in;

wherein an aqueous solution having a solids content of 20% by weight of the condensation product has a viscosity of 2 to 10 cSt at 20° C.

5,750,635

THERMALLY STABLE POLYESTERS FORMED UTILIZING ANTIMONY COMPOUNDS AS CATALYSTS

Andrew Edwin Brink, 1401 University Blvd., F10, Kingsport, Tenn. 37660; Wayne Payton Pruett, 101 Walton Ct.; Clinton Cherry, 500 White Oak La., both of Kingsport, Tenn. 37663, and Kay Hunt Shackelford, 206 Brandonwood Dr., Johnson City, Tenn. 37604

Division of Ser. No. 760,830, Dec. 5, 1996, which is a continuation of Ser. No. 557,758, Nov. 13, 1995. This application Dec. 6, 1996, Ser. No. 761,153

Int. Cl.^{6} C08G *63/78*

U.S. Cl. 528—285 **66 Claims**

1. A thermally stable polyester, comprising:

a) a polyester resin prepared by adding a dicarboxylic acid to a glycol compound, said dicarboxylic acid selected from the group consisting of aliphatic dicarboxylic acids having a total of from 3 to 16 carbon atoms, alicyclic dicarboxylic acids having 7 to 12 carbon atoms, aromatic dicarboxylic acids containing a total of from 8 to 16 carbon atoms, and combinations thereof, and wherein said glycol is selected from the group consisting of glycols having from 2 to 12 carbon atoms, glycol ethers having from 4 to 12 carbon atoms, and combinations thereof,

the polyester resin having been prepared in the presence of a catalyst system consisting essentially of one or more antimony compounds which is not reacted with α -hydroxy carboxylic acids, α,β-dicarboxylic acids or derivatives thereof, and

b) an organic dye.

5,750,636

PROCESS FOR THE PREPARATION OF A HIGH-MOLECULAR-WEIGHT POLYCARBODIIMIDE SOLUTION

Yasuyoshi Komoto; Yasuyuki Takiguchi; Ken Yahata; Akira Hayashida, and Minoru Takamizawa, all of Kanagawa-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1996, Ser. No. 658,165

Claims priority, application Japan, Jun. 7, 1995, 7-140145

Int. Cl.^{6} C08G *73/10;18/02*

U.S. Cl. 528—310 **7 Claims**

1. A process for the preparation of a solution of a polycarbodiimide having a molecular average weight of greater than about 5,000 which comprises polymerizing an organic diisocyanate in the presence of a carbodiimidation catalyst by using a chlorinated aromatic compound as solvent.

5,750,637

PROCESS FOR THE PREPARATION OF A POLYCARBODIIMIDE SOLUTION

Yasuyuki Takiguchi; Ken Yahata; Yasuyoshi Komoto; Akira Hayashida, and Minoru Takamizawa, all of Kanagawa-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1996, Ser. No. 658,166

Claims priority, application Japan, Jun. 7, 1995, 7-140144

Int. Cl.^{6} C08G *73/10;18/02*

U.S. Cl. 528—310 **7 Claims**

1. A process for the preparation of a polycarbodiimide solution wherein polycarbodiimide is synthesized by heating an organic diisocyanate in the presence of a carbodiimidation catalyst, characterized in that a non-chlorinated aromatic hydrocarbon is used as solvent and the resulting polycarbodiimide has a number-average molecular weight from about 3,000 to about 10,000.

5,750,638

METHOD FOR THE PRODUCTION OF POLY-O-HYDROXYAMIDES

Recai Sezi; Hellmut Ahne, both of Roettenbach, and Roland Gestigkeit, Nuernberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 19, 1996, Ser. No. 666,177

Claims priority, application Germany, Jun. 19, 1995, 195 22 158.3

Int. Cl.^{6} C08G *69/08;73/10*

U.S. Cl. 528—310 **8 Claims**

1. A method for producing poly-o-hydroxyamides comprising:

(a) heating a dicarboxylic acid to a temperature ≧80° C., together with a sulfonic acid chloride and a tertiary amine in a solvent, to form a reaction mixture, and

(b) reacting the mixture with a solution of bis-o-aminophenol, at a temperature < 80° C.

5,750,639

POLYAMIDE RESIN COMPOSITION AND MOLDING THEREOF

Ryuichi Hayashi, Tokyo, Japan, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US95/00936, § 371 Date Jul. 24, 1996, § 102(e) Date Jul. 24, 1996, PCT Pub. No. WO95/20630, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 25, 1995, Ser. No. 682,575

Claims priority, application Japan, Jan. 26, 1994, 6-006937

Int. Cl.^{6} C08G *69/08;73/10*

U.S. Cl. 528—310 **6 Claims**

1. A polyamide resin composition comprising:

(A) 30–90 weight percent, based on components (A) and (B), of a polyamide resin containing

(i) 10–99 weight percent, based on components (i) and (ii) of an aromatic polyamide containing a carboxylic acid component derived from terephthalic acid or a mixture of terephthalic and isophthalic acid in which the isophthalic acid constitutes 40 mole percent or less of the mixture, and an aliphatic diamine component derived from a mixture of hexamethylene diamine and 2 -methylpentamethylene diamine; and

(ii) 1–90 weight percent, based on components (i) and (ii), of at least one polyamide selected from the group consisting of polyamides containing repeat units derived from aliphatic dicarboxylic acids and aliphatic diamines and polyamides containing repeat units derived from aliphatic aminocarboxylic acids; and

(B) 10–70 weight percent, based on components (A) and (B), of an inorganic filler.

5,750,640

OIL-SOLUBLE REACTION PRODUCTS OF POLYENES

Richard Mark Scott, and Robert William Shaw, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 1, 1995, Ser. No. 522,648

Claims priority, application European Pat. Off., Aug. 24, 1994, 94306237

Int. Cl.^{6} C08G *69/26;* **C08F** *265/00;* **C10M** *105/08*

U.S. Cl. 528—332 **8 Claims**

1. A reaction product for use in fuels prepared by reacting:

(a) the pre-formed product of a polyalkenyl derivative of an ethylenically unsaturated carboxylic reagent and a polyamine containing at least two $—NH_2$ and/or —NH groups; and

(b) the reaction product prepared by reacting a C_4–C_{20} polyene or oligomer prepared therefrom with an ethylenically unsaturated carboxylic reagent in the presence of a solvent at a temperature from about 25° C. to about 200° C., and at a pressure from about 2 to about 100×10^5 Pa.

5,750,641

POLYIMIDE ANGULARITY ENHANCEMENT LAYER

Stephen A. Ezzell, Woodbury; Hassan Sahouani, Hastings, and Ernest L. Thurber, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 23, 1996, Ser. No. 652,886

Int. Cl.^{6} C08G *73/10;* **B32B** *27/00*

U.S. Cl. 528—353 **9 Claims**

1. A negatively birefringent angularity enhancement layer in a liquid crystal display, which display comprises a liquid crystal cell, wherein the negatively, birefringent angularity enhancement layer includes a polyimide comprising a plurality of structural units having pendant fluorene groups.

5,750,642

PROCESS FOR THE PREPARATION OF COPOLYMERS

Frank Baardman, and Jayne Juhb, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 19, 1997, Ser. No. 801,976

Claims priority, application European Pat. Off., Feb. 29, 1996, 96200529

Int. Cl.^{6} C08G *67/02;* **C08K** *5/49*

U.S. Cl. 528—392 **20 Claims**

1. A process for the preparation of copolymers of carbon monoxide and olefinically unsaturated compounds comprising copolymerizing the monomers in the presence of a catalyst composition comprising:

(a) a salt of a Group VIII metal, and

(b) a cation which is selected from cationic oxidants and cations of the formulae $R_nH_{4-n}N^+$, $R_mH_{3-m}C^+$ and $R_mH_{3-m}O^+$, wherein n is 0, 1, 2, 3 or 4, m is 2 or 3, and R represents a hydrocarbyl group.

5,750,643

DEHYDROCOUPLING TREATMENT AND HYDROSILYLATION OF SILICON-CONTAINING POLYMERS, AND COMPOUNDS AND ARTICLES PRODUCED THEREBY

Yigal Blum, San Jose, and Gregory A. McDermott, San Francisco, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed May 18, 1993, Ser. No. 63,617

Int. Cl.^{6} C08F *6/00*

U.S. Cl. 528—481 **3 Claims**

1. A method for producing a ceramic material, comprising:

reacting a polymer in the form of a polysilane, polysilazane, or polycarbosilane, and containing at least two Si—H groups, with a reactant having the structural formula R—O—H wherein R is selected from the group consisting of hydrogen, organic, siloxyl, silazanyl and carbosilyl, and may contain at least one additional O—H group, and wherein reaction is conducted in the presence of a transition metal catalyst effective to activate Si—H bonds, O—H bonds, or both, such that a modified polymer is produced containing at least one Si—O bond and at least one Si—H bond, and H_2 is released; and

pyrolyzing the modified polymer.

5,750,644

PROCESS FOR THE CRYSTALLIZATION OF POLYETHYLENE NAPHTHALATE PREPOLYMERS AND THE SOLID STATING OF THOSE CRYSTALLIZED PREPOLYMERS

Ben Duh, Tallmadge, Ohio, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 30, 1996, Ser. No. 740,547

Int. Cl.^{6} C08F *6/00;* **C08J** *3/00*

U.S. Cl. 528—481 **24 Claims**

1. A process for the crystallization of an amorphous polyethylene naphthalate prepolymer containing volatile components which comprises heating said prepolymer at a temperature within the range of about 200° C. above the Tg and about 10° C. below the Tm of the prepolymer under agitation and, at a pressure at least as high as the vapor pressure of said volatile components within said prepolymer, to produce a crystallized polyethylene naphthalate polymer.

5,750,645

PROCESS FOR THE PRODUCTION OF CALENDERED FILM OF POLYPROPYLENE RESIN

Hwang-Wen Huang, Taipei, Taiwan, assignor to Inteplast Corporation, Livingston, N.J.

Filed May 10, 1996, Ser. No. 644,746

Int. Cl.^{6} B29C *43/24*

U.S. Cl. 528—502 B **7 Claims**

1. A process for manufacturing of polypropylene films which have cavities inside and on the surfaces of the film and have substantially the same surface qualities on both surfaces of the film, comprising the steps of:

- (a) formulating a composition having at least the following constituents:
  - (1) 100 parts by weight of polypropylene of melt flow rate which is measured at 230° C. and 2.16 Kg ranging between about 0.1 and about 10 g/10 min;
  - (2) from 0 to about 70 parts by weight of polyethylene;
  - (3) from about 20 to about 200 parts by weight of inorganic fillers; and,
  - (4) from 0.5 to about 10 parts by weight of antistatic agent;
- (b) mixing said composition through a sequence of steps as follows:
  - (1) shear mixing with a high intensity/high shear mixer having at least one rotor;
  - (2) kneading with a kneader maintained at a temperature between 170° C. and 210° C.;
  - (3) extruding with an extruder so as to mix and to filter out contaminants; and,
  - (4) milling with a two-roll mill to be used as a buffer and to enhance mixing;
- (c) calendering said composition into a film using a calendering unit having a plurality of rolls;
- (d) heating said film by passing said film from said calendering unit by a set of at least five heating rolls;
- (e) stretching said film in both its longitudinal and lateral directions, in a drawing ratio of at least 1 to about 6;
- (f) cooling said film to ambient temperature; and,
- (g) treating the surfaces of said film with coating and corona treatment,

wherein the last calendering roll and said at least five heating rolls have temperatures, which are T_r, TK_1, TK_2, TK_3, TK_4 and TK_5 for said last calendering roll and the first five heating rolls, respectively, satisfy the following two expressions:

$$0.3(T_r-TK_2)>(TK_1-TK_2)>O.1(T_r-TK_2) \qquad (I)$$

and

$$TK_2=TK_3>TK_4=TK_{5>}100° \text{ C.} \qquad (II)$$

5,750,646

BRADYKININ ANALOGS WITH NON-PEPTIDE BOND

David H. Coy, New Orleans, La.; Jacques-Pierre Moreau; John E. Taylor, both of Upton, Mass., and Sun Hyuk Kim, Chestnut Hill, Mass., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La., and Biomeasure, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 880,179, May 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 282,328, Dec. 9, 1988, Pat. No. 5,162,497, which is a continuation-in-part of Ser. No. 257,998, Oct. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 248,771, Sep. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 207,759, Jun. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 204,171, Jun. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 173,311, Mar. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 100,571, Sep. 24, 1987. This application Mar. 22, 1995, Ser. No. 408,197

Int. Cl.^{6} A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 530—314 **3 Claims**

1. A bradykinin antagonist of the following amino acid formula:

$$Q^0\text{-}A^1\text{-}A^2\text{-}A^3\text{-Gly-}A^5\text{-}A^6\text{-}A^7\text{-}A^8\text{-}A^9\text{-}Z^{10}$$

wherein

Q^0 is H;

A^1 is L-Arg, D-Arg, L-homo-Arg, or D-homo-Arg;

A^2 is Pro, or Hyp;

A^3 is Pro, or Hyp;

A^5 is Phe, or thienylalanine;

A^6 is Ser, or Thr;

A^7 is Pro, or Hyp;

A^8 is Phe, p-X-Phe in which X is F, Cl, Br, OH, or CH_3, or thienylalanine;

A^9 is Arg, or homo-Arg;

Z^{10} is OH; and

for each of the residues A^5, A^6, A^7, and A^8, independently, the carbon atom participating in the amide bond between that residue and the nitrogen atom of the α-amino group of the adjacent amino acid residue is either a carbonyl carbon or is reduced to a methylene carbon, provided that at least one such carbon atom must be reduced to a methylene carbon; or a pharmaceutically acceptable salt thereof.

5,750,647

SYNTHETIC PEPTIDE ANALOGS OF NTX

David R. Eyre, Mercer Island; J. Daniel Clemens, Issaquah, and Vincent W. Ochs, Seattle, all of Wash., assignors to Washington Research Foundation, and Ostex International, Inc., both of Seattle, Wash.

Filed May 19, 1995, Ser. No. 446,206

Int. Cl.^{6} C07K *7/00;7/06;* **G01N** *33/53;33/531*

U.S. Cl. 530—328 **14 Claims**

1. A peptide that binds to mAb 1H11, comprising:

Y-Tyr-Asp-Gly-X-Gly-Val-Gly (SEQ ID NO:14)

wherein Y is glutamine or pyrrolidone carboxylic acid, and X is an α-amino acid residue with either a negatively charged R group, or a polar but uncharged R group, or a nonpolar R group.

5,750,648

RETROVIRAL PROTEASE INHIBITORS AND COMBINATIONS THEREOF

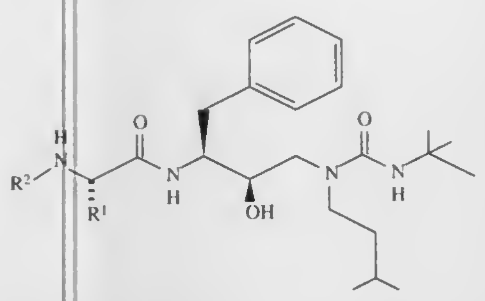
Min S. Chang, Glenview, Ill.; Daniel P. Getman, Chesterfield, Mo.; Richard A. Mueller, Glencoe, Ill.; James C. Ottinger, Lindenhurst, Ill.; James C. Stolzenbach, Buffalo Grove, Ill.; John J. Talley, Brentwood, Mo.; Michael L. Vazquez, Gurnee, Ill., and Gary A. Decrescenzo, St. Peters, Mo., assignors to G.D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 109,787, Aug. 20, 1993, abandoned. This application Jun. 3, 1994, Ser. No. 253,531

Int. Cl.^{6} A61K *38/06*

U.S. Cl. 530—331 **17 Claims**

1. A compound of the formula (I)



(I)

or a pharmaceutically acceptable salt or ester thereof, wherein R^1 is iso-propyl, sec-butyl, tert-butyl, $—C(CH_3)_2(SCH_3)$, $—C(CH_3)_2(S\{O\}CH_3)$ or $—C(CH_3)_2(S\{O_2\}CH_3)$; and R^2 is N-methyl-L-alaninyl, N-methyl-D-alaninyl, glycinyl, N-methylglycinyl, L-prolyl, D-prolyl or L-isoleucinyl, each of which is optionally substituted on the nitrogen atom with benzyloxycarbonyl or tert-butoxycarbonyl.

5,750,649

PROCESS FOR PRODUCING AMIDES USING CATALYTIC AMOUNTS OF AN N-HYDROXY COMPOUND

Markus Hohler, Möhlin, and Peter Vogt, Aesch, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 196,750, Feb. 15, 1994, Pat. No. 5,536,816. This application Feb. 23, 1996, Ser. No. 606,104

Claims priority, application Switzerland, Feb. 19, 1993, 518/93

Int. Cl.^{6} C07K *1/08*

U.S. Cl. 530—338 **22 Claims**

1. A process for producing an amide comprising the steps of:

- a) forming a reaction mixture of a carboxylic acid and a primary or secondary amine; and
- b) reacting the mixture of step (a) in the presence of a carbodiimide dehydrating agent and an N-hydroxy compound selected from the group consisting of N-hydroxy succinimide, 1-hydroxybenzotriazole, 3-hydroxy-4-oxo-3,4-dihydro- 1,2,3-benzotriazine, 1-hydroxy-2-oxoindoline, 3-hydroxy-4-oxo-3,4-dihydroquinazoline and 1-hydroxy-2(1H)-pyridone wherein the molar ratio of the N-hydroxy compound to the carboxylic acid is in the range of 0.02 to 0.10;

whereby said amide is produced.

5,750,650

FIBRINOLYTIC PROTEIN AND PRODUCTION METHOD THEREOF

Koichiro Nakanishi, 19-20, Karibadai 2-chome, Nishi-ku, Kobe, Hyogo 673; Keiichi Nomura, 18-6, Toyoura-cho, Higashiosaka, Osaka 579; Kyoko Tajima, Parumezon-Imadera 307, 4-1, Imadera, Nishi-ku, Kobe, Hyogo 673; Hajime Hiratani, 705-3, Tottori, Hannan-cho, Sennan-gun, Osaka 599-02, and Kazuo Kato, Howaito Rejidensu 202, 8-15, Minamigoyo 3-chome, Kita-ku, Kobe, Hyogo 651-11, all of Japan

Continuation-in-part of Ser. No. 618,494, Nov. 27, 1990, abandoned. This application May 24, 1993, Ser. No. 67,180

Claims priority, application Japan, Nov. 27, 1989, 1-308191

Int. Cl.^{6} C07K *14/32;1/20*

U.S. Cl. 530—350 **4 Claims**

1. A method for producing a biologically pure fibrinolytic protein comprised of the polypeptide having the following amino acid sequence (SEQ ID NO:1):

```
Ala Gln Ser Val Pro Tyr Gly Ile Ser Gln Ile Lys Ala Pro Ala
 1               5                  10                  15
Leu His Ser Gln Gly Tyr Thr Gly Ser Asn Val Lys Val Ala Val
                20                  25                  30
Ile Asp Ser Gly Ile Asp Ser Ser His Pro Asp Leu Asn Val Arg
                35                  40                  45
Gly Gly Ala Ser Phe Val Pro Ser Glu Thr Asn Pro Tyr Gly Asp
                50                  55                  60
Gly Ser Ser His Gly Thr His Val Ala Gly Thr Ile Ala Ala Leu
                65                  70                  75
Asn Asn Ser Ile Gly Val Leu Gly Val Ala Pro Ser Ala Ser Leu
                80                  85                  90
Tyr Ala Val Lys Val Leu Asp Ser Thr Gly Ser Gly Gln Tyr Ser
                95                 100                 105
Trp Ile Ile Asn Gly Ile Glu Trp Ala Ile Ser Asn Asn Met Asp
               110                 115                 120
Val Ile Asn Met Ser Leu Gly Gly Pro Thr Gly Ser Thr Ala Leu
               125                 130                 135
Lys Thr Val Val Asp Lys Ala Val Ser Ser Gly Ile Val Val Ala
               140                 145                 150
Ala Ala Ala Gly Asn Glu Gly Ser Ser Gly Ser Thr Ser Thr Val
               155                 160                 165
Gly Tyr Pro Ala Lys Tyr Pro Ser Thr Ile Ala Val Gly Ala Val
               170                 175                 180
Asn Ser Ser Asn Gly Arg Ala Ser Phe Ser Ser Val Gly Ser Glu
               185                 190                 195
Leu Asp Val Met Ala Pro Gly Val Ser Ile Gln Ser Thr Leu Pro
               200                 205                 210
Gly Gly Thr Tyr Gly Ala Tyr Asn Gly Thr Ser Met Ala Thr Pro
               215                 220                 225
His Val Ala Gly Ala Ala Ala Leu Ile Leu Ser Lys His Pro Thr
               230                 235                 240
Trp Thr Asn Ala Gln Val Arg Asp Arg Leu Glu Ser Thr Ala Thr
               245                 250                 255
Tyr Leu Gly Asn Ser Phe Tyr Tyr Gly Lys Gly Leu Ile Asn Val
               260                 265                 270
Gln Ala Ala Ala Gln
               275
```

said method consisting sequentially the steps of:

(1) adding an alcohol or ammonium sulfate to an aqueous extract of Natto or *Bacillus natto* to precipitate a crude fraction, (2) applying the crude fraction on a hydrophobic carrier equilibrated with a neutral or weakly basic buffer to adsorb the fraction onto a column and eluting the absorbed fraction with water or neutral or weakly basic buffer from the column, (3) passing the eluate through an anion exchanger equilibrated with a neutral or weakly basic buffer to adsorb the impurities onto the exchanger and obtaining a purified fraction as the effluent, or applying the eluate on a cation exchanger equilibrated with a neutral or weakly basic buffer to adsorb the fraction onto the exchanger and eluting a purified fraction with a neutral or weakly basic buffer containing a salt, (4) applying the purified fraction on a gel filtration carrier equilibrated with a neutral or weakly basic buffer containing a salt, and (5) recovering a purified fibrinolytic protein.

5,750,651
CARTILAGE AND BONE-INDUCING PROTEINS

Hermann Oppermann; Thangavel Kuberasampath, both of Medway; David C. Rueger, West Roxbury, and Engin Ozkaynak, Milford, all of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.

Division of Ser. No. 995,345, Dec. 22, 1992, Pat. No. 5,258,494, which is a division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590. This application Nov. 1, 1993, Ser. No. 145,812

Int. Cl.^{6} C07K *14/435;14/51;* **C12N** *15/12*

U.S. Cl. 530—350 **18 Claims**

1. A protein, produced by expression of recombinant DNA in a host cell, comprising a pair of polypeptide chains disulfide bonded to form a dimeric species, each of said polypeptide chains having less than about 200 amino acids and a sequence comprising

1 10 20 30 40
Vg1 CKKRHLYVEFKDVGWQNWVIAPQGYMANYCYGECPYPLTE

50 60 70
ILNGSNHAILQTLVHSIEPEDIPLPCCVPTKMSP

80 90 100
ISMLFYDNNDNVVLRHYENMAVDECGCR

or a naturally occurring mammalian variant thereof comprising at least 96 amino acids and having a molecular weight of approximately 14–16 kDa in an unglycosylated form or a molecular weight of approximately 16–18 kDa in a glycosylated form as determined by polyacrylamide gel electrophoresis under reducing conditions, said dimeric protein having a conformation sufficient to induce cartilage and bone formation when combined with a matrix and implanted in a mammal.

5,750,652
DELTEX PROTEINS

Spyridon Artavanis-Tsakonas, Hamden, Conn.; Isabelle Busseau, Bures-Sur-Yvette, France; Robert J. Diederich, New Haven, Conn.; Tian Xu, Guilford, Conn., and Kenji Matsuno, New Haven, Conn., assignors to Yale University, New Haven, Conn.

Filed Jan. 21, 1994, Ser. No. 185,432

Int. Cl.^{6} C07K *14/705*

U.S. Cl. 530—350 **27 Claims**

1. A substantially purified deltex protein having the amino acid sequence depicted in FIG. 12 (SEQ ID NO:4).

5,750,653
PROTEIN, FAF1, WHICH POTENTIATES FAS-MEDIATED APOPTOSIS AND USES THEREOF

Keting Chu, Burlingame, and Lewis T. Williams, Tiburon, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 7, 1995, Ser. No. 477,476

Int. Cl.^{6} C07K *14/705;* **G01N** *33/53;* **A61K** *38/17*

U.S. Cl. 530—350 **11 Claims**

1. An isolated polypeptide comprising a domain of a Fas-associated factor 1 (FAF1) polypeptide, said polypeptide capable of associating with a cytoplasmic domain of Fas, wherein said FAF1 domain is encoded by a nucleic acid sequence that comprises at least 18 nucleotides and hybridizes under stringent conditions to the complementary nucleic acid sequence shown in SEQ ID NO: 1 or to a degenerate form thereof.

5,750,654
LEUKAEMIA INHIBITORY FACTOR

David Paul Gearing; Nicholas Martin Gough; Douglas James Hilton; Julie Ann King; Donald Metcalf; Edouard Collins Nice; Nicos Anthony Nicola; Richard John Simpson, and Tracy Ann Willson, all of Victoria, Australia, assignors to Amrad Corporation Limited, Victoria, Australia

Division of Ser. No. 58,979, May 6, 1993, Pat. No. 5,427,925, which is a continuation of Ser. No. 948,614, Sep. 22, 1992, Pat. No. 5,443,825, which is a continuation of Ser. No. 667,159, Mar. 11, 1991, abandoned, which is a division of Ser. No. 294,514, Dec. 9, 1988, Pat. No. 5,187,077. This application Mar. 29, 1995, Ser. No. 412,769

Claims priority, application Australia, Apr. 2, 1987, PI2109/87; Jul. 24, 1987, PI3317/87; Oct. 15, 1987, PI4903/87; Dec. 21, 1987, PI6005/87

Int. Cl.^{6} C07K *14/52;1/16*

U.S. Cl. 530—351 **6 Claims**

1. Purified and isolated murine Leukemia Inhibitory Factor (LIF) having the amino acid sequence set forth in FIGS. 15A and 15B.

5,750,655

Patent Not Issued For This Number

5,750,656
PROCESS FOR SULFONATING OR SULFATING POLYMERS

Michael O. Myers, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1996, Ser. No. 656,141

Int. Cl.^{6} C08G *75/00*

U.S. Cl. 528—373 **20 Claims**

1. A process for the preparation of a sulfur-containing polymer, comprising:

A. contacting, in the presence of an inert solvent, sulfuric acid with one or more of (i) a fatty acid, (ii) a fat of a vegetable, animal or fish, (iii) an oil of a vegetable, animal or fish, (iv) a synthetic triglyceride that has from 1 to 3 fatty acid units or (v) a sulfated derivative thereof, that disperses the sulfuric acid in the inert solvent and;

B. contacting the mixture from Part A with a polymer which contains olefenic, aromatic unsaturation or combination thereof under conditions such that a homogeneous sulfated or sulfonated polymer is formed.

5,750,657
METHODS AND COMPOSITIONS USING FIBRIN MONOMER TO MAKE A FIBRIN SEALANT

Peter A. D. Edwardson, Chester; John E. Fairbrother; Ronald S. Gardner, both of Clwyd; Derek A. Hollingsbee, South Wirral, and Stewart A. Cederholm-Williams, Oxford, all of United Kingdom, assignors to Bristol-Myers Squibb Company, Skillman, N.J.

Continuation-in-part of Ser. No. 958,212, Oct. 8, 1992, abandoned. This application Oct. 18, 1993, Ser. No. 138,674

Int. Cl.^{6} A61K *35/14;38/36*

U.S. Cl. 530—382 **48 Claims**

1. A method of making a fibrin sealant, which sealant comprises a fibrin polymer, comprising the steps of:

(a) contacting a desired site with a composition which contains nondynamic fibrin monomer; and

(b) converting said nondynamic fibrin monomer to a fibrin polymer concurrently with said contacting step, thereby forming a fibrin sealant.

5,750,658
FIBRINOGEN PROCESSING APPARATUS, METHOD AND CONTAINER

Philip H. Coelho, and Terry Wolf, both of Rancho Cordova, Calif., assignors to ThermoGenesis Corp., Rancho Cordova, Calif.

Division of Ser. No. 5,989, Jan. 19, 1993, Pat. No. 5,520,885. This application May 24, 1996, Ser. No. 653,641

Int. Cl.^{6} A61K *35/14;* **C07K** *1/00;* **B01L** *3/00*

U.S. Cl. 530—382 **25 Claims**

1. A method for precipitating a fluid, the steps comprising;

placing said fluid in a self-contained, covered container so that said container is only partially filled with said fluid,

coating an interior wall of said container with a film of said fluid by coating the container using repetitive motion, and

exposing a corresponding exterior wall of said container to a first heat transfer medium such that heat transfer proceeds through said wall of said container affecting said film of said fluid by causing precipitation of said film.

5,750,659
MAMMALIAN GROWTH FACTOR

Claudio Basilico, New York, N.Y., and Pasquale Delli Bovi, Portici, Italy, assignors to New York University, New York, N.Y.

Continuation of Ser. No. 806,771, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 177,506, Apr. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 62,925, Jun. 16, 1987, abandoned. This application May 3, 1993, Ser. No. 56,482

Int. Cl.^{6} C07K *14/475;14/50*

U.S. Cl. 530—399 **2 Claims**

1. A purified, isolated recombinant polypeptide chain comprising the amino acid sequence:

Met Ser Gly Pro Gly Thr Ala Ala Val Ala Leu Leu Pro Ala

Val Leu Leu Ala Leu Leu Ala Pro Trp Ala Gly Arg Gly Gly

Ala Ala Ala Pro Thr Ala Pro Asn Gly Thr Leu Glu Ala Glu

Leu Glu Arg Arg Trp Glu Ser Leu Val Ala Leu Ser Leu Ala

Arg Leu Pro Val Ala Ala Gln Pro Lys Glu Ala Ala Val Gln

Ser Gly Ala Gly Asp Tyr Leu Leu Gly Ile Lys Arg Leu Arg

Arg Leu Tyr Cys Asn Val Gly Ile Gly Phe His Leu Gln Ala

Leu Pro Asp Gly Arg Ile Gly Gly Ala His Ala Asp Thr Arg

Asp Ser Leu Leu Glu Leu Ser Pro Val Glu Arg Gly Val Val

Ser Ile Phe Gly Val Ala Ser Arg Phe Phe Val Ala Met Ser

Ser Lys Gly Lys Leu Tyr Gly Ser Pro Phe Phe Thr Asp Glu

Cys Thr Phe Lys Glu Ile Leu Leu Pro Asn Asn Tyr Asn Ala

Tyr Glu Ser Tyr Lys Tyr Pro Gly Met Phe Ile Ala Leu Ser

Lys Asn Gly Lys Thr Lys Lys Gly Asn Arg Val Ser Pro Thr

Met Lys Val Thr His Phe Leu Pro Arg Leu.

5,750,660
BICYCLOPOLYAZAMACROCYCLOPHOSPHONIC ACID HALF ESTERS

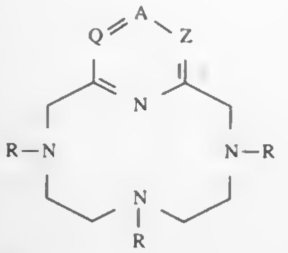
Garry E. Kiefer; Jaime Simon, and Joseph R. Garlich, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 58,101, May 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 805,551, Dec. 10, 1991, abandoned. This application Jul. 15, 1996, Ser. No. 683,653

Int. Cl.^{6} C07F *13/00*

U.S. Cl. 534—10 **11 Claims**

1. Bicyclopolyazamacrocyclophosphonic acid compounds of the formula



(I)

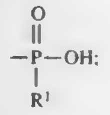
wherein:

R=—$(CH_2)_n$—T

where:

n is an integer of 1, 2 or 3;

T is H, C_1–C_{18} alkyl, COOH, OH or



$$-\overset{\overset{O}{\|}}{\underset{\underset{R^1}{|}}{P}}-OH;$$

where:

R^1 is —OH, C_1–C_5 alkyl or —O—(C_1–C_5 alkyl);

with the proviso that at least one T must be $P(O)R^1OH$, wherein R^1 is —O—(C_1–C_5 alkyl);

A, Q and Z independently are CH; or

pharmaceutically-acceptable salts thereof.

5,750,661

BASIC DYES BASED ON AMIDES OF J-ACID (1-HYDROXY-6-AMINONAPHTHALENE-3-SULFONIC ACID) AND AMIDES OF J-ACID

Ulrike Schloesser, Ludwigshafen, and Udo Mayer, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

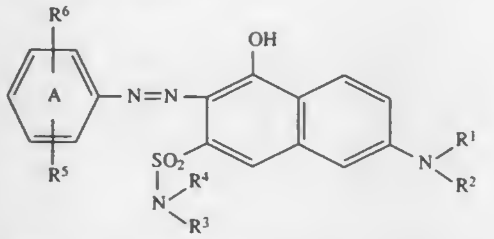
Continuation of Ser. No. 500,565, Jul. 11, 1995, Pat. No. 5,571,898, which is a continuation of Ser. No. 215,647, Mar. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 136,034, Oct. 14, 1993, abandoned. This application Aug. 30, 1996, Ser. No. 705,646

Claims priority, application Germany, Oct. 19, 1992, 42 35 154.5

Int. Cl.⁶ C09B *29/15;31/068;* **D06P** *1/41;* **D21H** *21/28*

U.S. Cl. 534—604 **6 Claims**

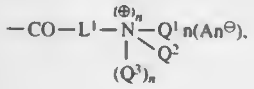
1. A dye of the formula I



(I)

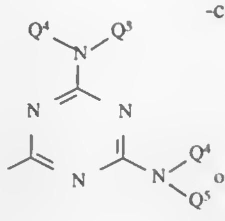
where the ring A may be benzofused,

R^1 is C_1–C_{13}-alkyl, benzyl, 2-chloroethyl, substituted or unsubstituted phenyl, C_1–C_8 -alkanoyl, substituted or unsubstituted benzoyl or a radical of the formula

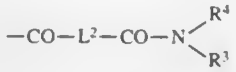


$$-CO-L^1-\overset{(\oplus)_n}{\underset{\underset{(Q^3)_n}{|}}{N}}\genfrac{}{}{0pt}{}{-Q^1}{\diagdown Q^2}\,n(An^{\ominus}),$$

-continued



or



$$-CO-L^2-CO-N\genfrac{}{}{0pt}{}{\diagup R^4}{\diagdown R^3}$$

where L^1 is C_1–C_3-alkylene,

L^2 is C_2–C_3-alkylene, which may be chlorine-substituted, vinylene or phenylene,

n is 0 or 1,

Q^1, Q^2 and Q^3 are identical or different and each is independently of the others hydrogen or unsubstituted or hydroxyl-substituted C_1–C_8-alkyl, which may be interrupted by from 1 to 3 ether oxygen atoms or by from 1 to 3 imino groups which imino groups may be substituted by C_1–C_4-alkyl or ω-hydroxy-C_1–C_8-alkyl, which may be interrupted by from 1 to 3 ether oxygen atoms, or Q^1 and Q^2, together with the nitrogen atom joining them together, are a 5- or 6-membered saturated or unsaturated heterocyclic radical which may contain a further hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, and

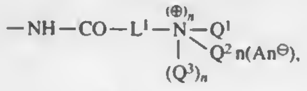
$An^{\ominus}$ is the equivalent of an anion, and

Q^4 and Q^5 are identical or different and each is independently of the other (1) C_1–C_{13}-alkyl, which may be interrupted by from 1 to 4 ether oxygen atoms, by imino or by C_1–C_4-alkyl-imino groups and which C_1–C_{13} -alkyl, interrupted or not interrupted, may be substituted by amino, by a 5- or 6 -membered saturated or unsaturated heterocyclic radical which contains a nitrogen atom and may contain a further hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, or by substituted or unsubstituted C_5–C_7-cycloalkyl, (2) substituted or unsubstituted phenyl, (3) substituted or unsubstituted C_5–C_7-cycloalkyl or (4) unsubstituted or C_1–C_4-alkyl-substituted piperidinyl, and Q^4 may also be hydrogen,

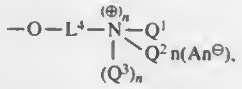
R^2 is hydrogen or C_1–C_4-alkyl or R^1 and R^2 together are a radical of the formula CO—L^3, where L^3 is C_3–C_4-alkylene,

R^3 and R^4 are identical or different and each is independently of the other (1) C_1–C_{13} -alkyl, which may be interrupted by from 1 to 4 ether oxygen atoms or by from 1 to 4 imino groups which imino groups may be substituted by C_1–C_4-alkyl or ω-hydroxy-C_1–C_8-alkyl, which may be interrupted by from 1 to 3 ether oxygen atoms, and which C_1–C_{13}-alkyl, interrupted or not interrupted, may be substituted by hydroxyl, by amino, by a 5- or 6-membered saturated or unsaturated heterocyclic radical which contains a nitrogen atom and may contain a further hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, or by substituted or unsubstituted C_5–C_7-cycloalkyl, (2) substituted or unsubstituted phenyl, (3) substituted or unsubstituted C_5–C_7-cycloalkyl or (4) unsubstituted or C_1–C_4-alkyl substituted piperidinyl, and R^3 may also be hydrogen, and R^3 and R^4, together with the nitrogen atom joining them together, or a 5- or 6-membered saturated heterocyclic radical which may contain a further hetero atom selected from the group consisting of oxygen and sulfur,

R^5 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_5 -alkanoylamino, halogen, nitro, cyano, unsubstituted or C_1–C_4-alkyl-substituted phenylazo or a radical of the formula



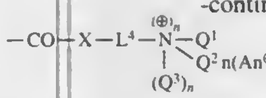
$$-NH-CO-L^1-\overset{(\oplus)_n}{\underset{\underset{(Q^3)_n}{|}}{N}}\genfrac{}{}{0pt}{}{-Q^1}{\diagdown Q^2}\,n(An^{\ominus}),$$



$$-O-L^4-\overset{(\oplus)_n}{\underset{\underset{(Q^3)_n}{|}}{N}}\genfrac{}{}{0pt}{}{-Q^1}{\diagdown Q^2}\,n(An^{\ominus}),$$

or

-continued

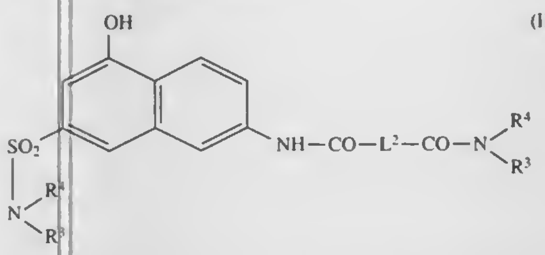


$$-CO-X-L^4-\overset{(\oplus)_n}{\underset{\underset{(Q^3)_n}{|}}{N}}\genfrac{}{}{0pt}{}{-Q^1}{\diagdown Q^2}\,n(An^{\ominus}),$$

where X is oxygen or imino, and L^4 is C_2–C_4-alkylene, and Q^1, Q^2, Q^3, n and $An^{\ominus}$ are each as defined above, and

R^6 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro, or cyano, with the proviso that at least one quaternizable or quaternary nitrogen group is present in the molecule.

6. A sulfonamide of the formula IIIa



(IIIa)

where

L^2 is C_2–C_3-alkylene, which may be chlorine-substituted, vinylene or phenylene and

R^3 and R^4 are identical or different and each is independently of the other (1) C_1–C_{13}-alkyl, which may be interrupted by from 1 to 4 ether oxygen atoms or by from 1 to 4 imino groups which imino groups may be substituted by C_1–C_4-alkyl or ω-hydroxy-C_1–C_8-alkyl, which may be interrupted by from 1 to 3 ether oxygen atoms, and which C_1–C_{13}-alkyl, interrupted or not interrupted, may be substituted by hydroxyl, by amino, by a 5- or 6-membered saturated or unsaturated heterocyclic radical which contains a nitrogen atom and may contain a further hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, or by substituted or unsubstituted C_5–C_7-cycloalkyl, (2) substituted or unsubstituted phenyl, (3) substituted or unsubstituted C_5–C_7-cycloalkyl or (4) unsubstituted or C_1–C_4-alkyl-substituted piperidinyl, and R^3 may also be hydrogen, and R^3 and R^4, together with the nitrogen atom joining them together, or a 5- or 6-membered saturated heterocyclic radical which may contain a further hetero atom selected from the group consisting of oxygen and sulfur,

with the proviso that at least one quaternizable nitrogen group is present in the molecule.

5,750,662

DISAZO DYES CONTAINING HALOACRYLOYLAMINO OR DIHALOPROPIONYLAMINO AND SUBSTITUTED TRIAZINYL REACTIVE GROUPS

Hans Reichert, Rheinfelden; Bernhard Müller, Efringen-Kirchen, both of Germany, and Athanassios Tzikas, Pratteln, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

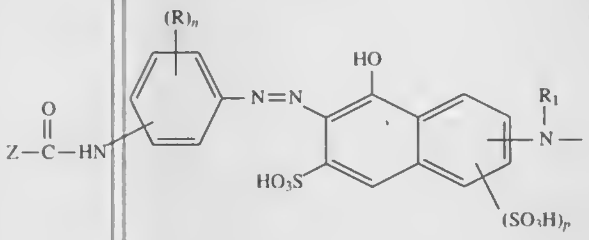
Filed Apr. 16, 1997, Ser. No. 834,403

Claims priority, application Switzerland, Apr. 24, 1996, 1035/96

Int. Cl.⁶ C09B *62/475;* **D06P** *1/38*

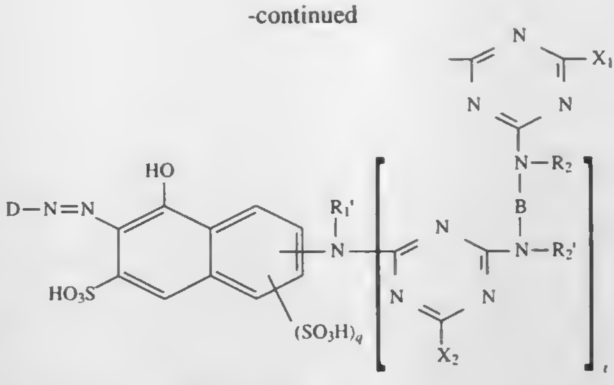
U.S. Cl. 534—612 **17 Claims**

1. A compound of the formula



(I)

-continued



in which B is an aliphatic bridge member,

$(R)_n$ is n identical or different radicals from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen and sulfo,

n is the number 0, 1 or 2,

R_1, R_1', R_2 and R_2' independently of one another are each hydrogen or substituted or unsubstituted C_1–C_4alkyl,

X_1 and X_2 independently of one another are each halogen, 3-carboxypyridin-1-yl or 3-carbamoylpyridin-1-yl,

Z is a radical —CHX—CH_2—X or —CX═CH_2 and X is halogen,

D is the radical of a diazo component of the benzene or naphthalene series and p, q and t independently of one another are each the number 0 or 1.

5,750,663

SOLID SOAP/SYNDET COMPOSITION

Stephen F. Gross, Souderton, and John F. Hessel, Doylestown, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Oct. 4, 1996, Ser. No. 726,184

Int. Cl.⁶ C07G *3/00;* **C07H** *1/00;* **C08B** *37/00*

U.S. Cl. 536—4.1 **26 Claims**

1. A solid, hard surface cleaning composition comprising:

(a) from about 20 to about 40% by weight of a fatty acid component;

(b) from about 10 to about 25% by weight of a polyol component;

(c) from about 2 to about 6% by weight of a base component;

(d) from about 2 to about 15% by weight of a foaming agent; and

(e) remainder, water, all weights being based on the total weight of the composition.

5,750,664

SUBSTITUTED LIPOSACCHARIDES USEFUL IN THE TREATMENT AND PREVENTION OF ENDOTOXEMIA

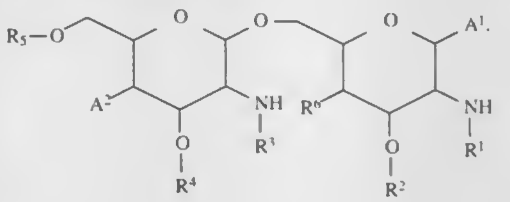
William J. Christ; Daniel P. Rossignol, both of Andover, Mass.; Seiichi Kobayashi, Tsuchiurashi, Japan, and Tsutomu Kawata, Andover, Mass., assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 461,675

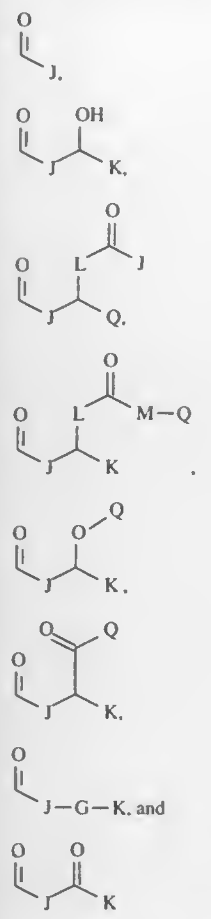
Int. Cl.⁶ C07H *5/00*

U.S. Cl. 536—17.2 **21 Claims**

1. A compound of the formula:



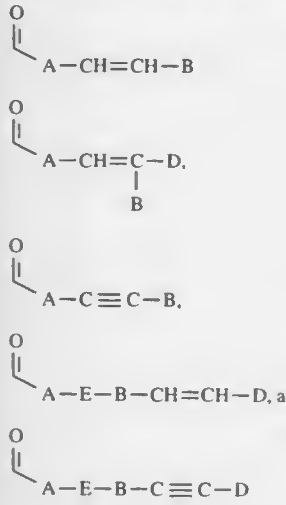
where R^1 is selected from the group consisting of



where each J, K and Q, independently, is straight or branched C1 to C15 alkyl; L is O, NH, or CH_2; M is O or NH; and G is NH, O, S, SO, or SO_2;

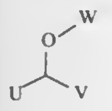
R^2 is straight or branched C5 to C15 alkyl;

R^3 is selected from the group consisting of



where E is NH, O, S, SO, or SO_2; each A, B and D, independently, is straight or branched C1 to C15 alkyl;

R^4 is selected from the group consisting of straight or branched C4 to C 20 alkyl, and



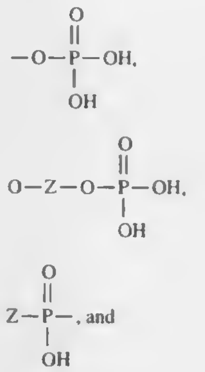
where each U and V, independently, is straight or branched C2 to C15 alkyl and W is hydrogen or straight or branched C1 to C5 alkyl;

R^5 is selected from the group consisting of hydrogen, J',—J'—OH, —J'—O—K',—J'—O—K'— OH, and —J'—O—$PO(OH)_2$, where each J' and K', independently, is straight or branched C1 to C5 alkyl;

R^6 is selected from the group consisting of hydroxy, halogen, C1 to C5 alkoxy and C1 to C5 acyloxy;

A^1 and A^2, independently, are selected from the group consisting of

OH,



$$-O-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OH}{|}}{P}}-OH,$$

$$O-Z-O-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OH}{|}}{P}}-OH,$$

$$Z-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OH}{|}}{P}}-\text{, and}$$

$O-Z-CO_2H$

where Z is straight or branched C1 to C10 alkyl; or a pharmaceutically acceptable salt thereof.

5,750,665

PREPARATION OF GLUCOSAMINYL MURAMIC ACID DERIVATIVES

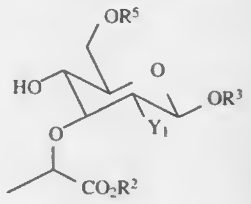
Gerald J. Vosika, 3505 S. Riverview Cir., and Fanfeng Ma, 2930 Village Green Dr., both of Moorhead, Minn. 56560

Filed Oct. 4, 1995, Ser. No. 539,292

Int. Cl.⁶ C07H ***5/00***

U.S. Cl. 536—17.2 **10 Claims**

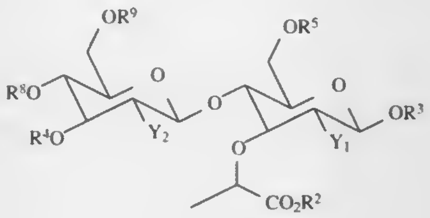
1. A muramic acid ester derivative having the formula:



wherein R^2 is benzyl or substituted benzyl; R^3 and R^5 are independently C(1–6)alkyl, substituted C(1–6)alkyl, benzyl, substituted benzyl, or —C(O)R^6; and Y_1 is NHC(O)R^{15}, NHC(O)OR^7, phthalimido, maleimido or succinimido;

wherein R^6 and R^{15} are independently C(1– 6)alkyl, substituted C(1–6)alkyl, benzyl, substituted benzyl, phenyl or substituted phenyl; and R^7 is C(1–6)alkyl, substituted C(1–6)alkyl, benzyl, or substituted benzyl.

2. A glucosaminyl muramic acid ester derivative having the formula:



wherein R^2 is benzyl or substituted benzyl; R^3, R^4, R^5, R^8 and R^9 are independently C(1– 6)alkyl, substituted C(1–6)alkyl, benzyl, substituted benzyl, or —C(O)R^6; Y_1 and Y_2 are independently NHC(O)R^{15}, NHC(O)OR^7, phthalimido, maleimido or succinimido;

wherein R^6 and R^{15} are independently C(1– 6)alkyl, substituted C(1–6)alkyl, benzyl, substituted benzyl, phenyl or substituted phenyl; and R^7 is C(1–6)alkyl, substituted C(1–6)alkyl, benzyl, or substituted benzyl.

5,750,666

POLYNUCLEOTIDE PHOSPHORODITHIOATE COMPOUNDS

Marvin H. Caruthers, Boulder, Colo.; Wolfgang K.-D Brill, Schopfheim, Germany; Eric Yau, Mercer Island, Wash.; Michael Ma, New York, N.Y., and John Nielsen, Horsholm, Denmark, assignors to Competitve Technologies, Inc., Fairfield, Conn.

Continuation-in-part of Ser. No. 12,532, Feb. 2, 1993, abandoned, which is a division of Ser. No. 643,381, Jan. 22, 1991, Pat. No. 5,218,103, which is a continuation-in-part of Ser. No. 488,805, Mar. 5, 1990, abandoned, which is a continuation of Ser. No. 367,645, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 198,886, May 26, 1899, abandoned, and a continuation of Ser. No. 417,387, Oct. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 314,011, Feb. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 198,886, May 26, 1988, abandoned. This application Oct. 31, 1994, Ser. No. 332,829

Int. Cl.⁶ C07H ***21/00;*** **C12Q** ***1/68;*** **C12N** ***9/99;5/10***

U.S. Cl. 536—23.1 **8 Claims**

1. A polynucleotide wherein all internucleotide linkages between individual nucleotide moieties in the polynucleotide are phosphorodithioate internucleotide linkages.

5,750,667

SYSTEM TO DETECT PROTEIN-RNA INTERACTIONS

Marvin P. Wickens, Madison, Wis., and Stanley Fields, Setauket, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 409,561, Mar. 23, 1995, Pat. No. 5,610,015. This application Nov. 12, 1996, Ser. No. 747,183

Int. Cl.⁶ C07H ***21/02;*** **C12Q** ***1/68***

U.S. Cl. 536—23.1 **1 Claim**

1. A hybrid RNA molecule selected by detecting an interaction between an RNA-binding domain and a test RNA molecule, the method comprising:

(1) introducing into a host cell:
  (a) a detectable gene wherein the detectable gene expresses a detectable protein when the detectable gene is activated by an amino acid sequence including a transcriptional activation domain when the transcriptional activation domain is in sufficient proximity to the detectable gene;
  (b) a first chimeric gene that encodes a first hybrid protein comprising:
    (i) a DNA-binding domain that recognizes a binding site on the detectable gene in the host cell; and
    (ii) a first RNA binding domain;
  (c) a second chimeric gene that encodes a second hybrid protein comprising:
    (i) a transcriptional activation domain; and
    (ii) a second RNA-binding domain;
  (d) a third chimeric gene that encodes said hybrid RNA comprising:
    (i) a first RNA sequence that binds one of the first or second RNA-binding domains; and
    (ii) a second RNA sequence to be tested for interaction with the RNA-binding domain not bound to the first RNA sequence;
  wherein interaction between both the first RNA-binding domain and the hybrid RNA and the second RNA-binding domain and the hybrid RNA in the host cell causes the transcriptional activation domain to activate transcription of the detectable gene;
(2) subjecting the host cell to conditions under which the first hybrid protein, the second hybrid protein, and said hybrid RNA are expressed in sufficient quantity for the detectable gene to be activated;
(3) determining whether the detectable gene has been expressed to a degree greater than expression of the detectable gene in the absence of interactions between both the first RNA-binding domain and said hybrid RNA and the second RNA-binding domain and said hybrid RNA; and
(4) selecting said hybrid RNA.

5,750,668

Patent Not Issued For This Number

5,750,669

OLIGONUCLEOTIDE ANALOGS WITH TERMINAL 3'-3' OR 5'-5' INTERNUCLEOTIDE LINKAGES

Hannelore Rösch, Ulm; Anja Fröhlich, Illerkirchberg; Jose Flavio Ramalho-Ortigao, Ulm; Matthias Montenarh, Senden-Ay, and Hartmut Seliger, Elchingen-Thalfingen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

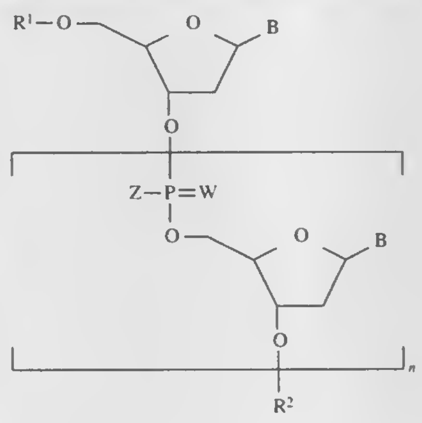
Continuation of Ser. No. 723,440, Jun. 28, 1991, abandoned. This application Aug. 1, 1994, Ser. No. 282,503

Claims priority, application Germany, Jul. 2, 1990, 40 21 019.7

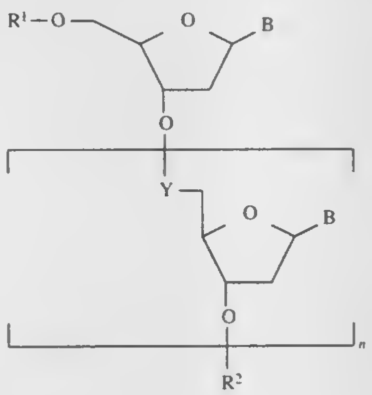
Int. Cl.⁶ C07H ***21/04***

U.S. Cl. 536—24.3 **10 Claims**

1. An oligodeoxynucleotide of the formula I or II



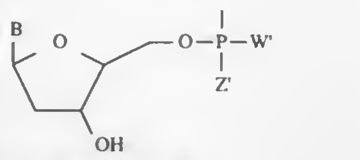
(I)



(II)

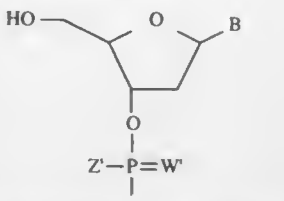
in which

R^1 is hydrogen or a radical of formula III



(III)

R^2 is a radical of the formula IV



(IV)

B is a base selected from adenine, thymine, cytosine, guanine, purine, 2,6-diaminopurine, 7-deazaadenine, 7-deazaguanine and N^4,N^4-ethenocytosine;
W and W' are independently of one another, oxygen or sulfur;
Z and Z' are, independently of one another, O^-; S^-; C_1–C_{18}-alkoxy; C_1–C_{18}-alkyl; NHR^3 with R^3=C_1–C_{18}-alkyl, or C_1–C_4-alkoxy-C_1–C_6-alkyl; NR^3R^4 in which R^3 is as defined above and R^4 is C_1–C_{18}-alkyl, or in which R^3 and R^4 form, together with the nitrogen atom carrying them, a 5–6-membered heterocyclic ring which can additionally contain another hetero atom from the series comprising O, S, N;
Y is a radical from the series comprising O—Si(R)$_2$, OCH_2, C(O)NR or O—CH_2—C(O) in which R is C_1–C_6-alkyl, aryl or C_5- or C_6-cycloalkyl; and
n is an integer from 10–40;
or a physiologically tolerated salt thereof.

5,750,670

Patent Not Issued For This Number

5,750,671

METHOD FOR ISOLATING DNA FROM BIOLOGICAL CELLS

Trinh Cam Khon, 1739 Aprilsong Ct., San Jose, Calif. 95131
Filed Nov. 13, 1996, Ser. No. 748,706
Int. Cl.⁶ C07H *21/04;1/08*
U.S. Cl. 536—25.4 **6 Claims**

1. A method for isolating deoxyribonucleic acid from protamine-containing biological cells that are first washed and/or degreased and/or dried, comprising:
   (a) adding to the biological cells a salt with low molecular weight above a critical ionic strength to cleave all ionic bonds between DNA and protamines;
   (b) subsequently reacting polystryene sulfonic acid and/or its derivatives with the protamines released from the biological cells at temperatures from 0° C. to 100° C., and at a pH value ranging from 7.5 to 8.5, such that the deoxyribonucleic acid is released, wherein the ratio of the weight of the polystyrene sulfonic acid and/or its derivatives to the dry weight of the biological cells is 0.1 to 0.8; and
   (c) separating and purifying the released deoxyribonucleic acid.

5,750,672

ANHYDROUS AMINE CLEAVAGE OF OLIGONUCLEOTIDES

Tomas Kempe, Bowie, Md., assignor to Barrskogen, Inc., Bowie, Md.
Filed Nov. 22, 1996, Ser. No. 755,398
Int. Cl.⁶ C07H *1/02;21/00*
U.S. Cl. 536—25.31 **19 Claims**

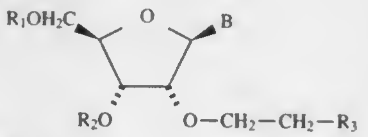
1. A method for recovering synthesized oligonucleotides from a solid support, the method comprising the steps of; (1) providing a solid synthetic support having synthesized oligonucleotides bound thereto, and (2) incubating the solid support with an anhydrous amine reagent in an organic solvent solution under conditions suitable to cleave and deprotect the oligonucleotide, and (3) removing the solution phase reagent in a manner that substantially removes free residues of cleaved protecting groups and permits the cleaved and deprotected oligonucleotide to be preferentially retained on the support.

5,750,673

NUCLEOSIDES WITH 2'-O-MODIFICATIONS

Pierre Martin, Rheinfelden, Switzerland, assignor to Novartis Corporation, Summit, N.J.
Filed Apr. 20, 1995, Ser. No. 426,807
Claims priority, application Switzerland, Apr. 27, 1994, 1307/94
Int. Cl.⁶ C07H *19/10;19/20;21/02*
U.S. Cl. 536—26.1 **9 Claims**

1. A compound of formula I



(I)

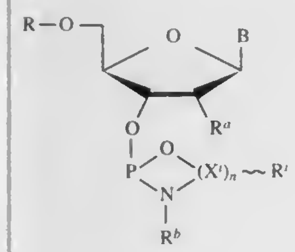
wherein
  R_1 and R_2 are each independently of the other hydrogen or a protecting group, or
  R_1 has those definitions and
  R_2 is a radical forming a phosphorus-containing nucleotide bridge group;
  B is a purine or pyrimidine radical or an analogue thereof; and
  R_3 is OH or F,
said compound when incorporated into an oligonucleotide being capable of base pairing with a complementary nucleic acid strand.

5,750,674

METHODS AND COMPOUNDS FOR THE STEREOSELECTIVE ENRICHMENT OF OLIGONUCLEOTIDE DIASTEREOMERS AND OLIGONUCLEOTIDES THEREBY PRODUCED

Radhakrishnan P. Iyer; Dong Yu; Sudhir Agrawal, all of Shrewsbury, and Weitian Tan, Framingham, all of Mass., assignors to Hybridon, Inc., Cambridge, Mass.
Filed May 23, 1995, Ser. No. 448,131
Int. Cl.⁶ C07H *19/20*
U.S. Cl. 536—26.7 **24 Claims**

1. A mononucleotide synthon having the structure:



XIII

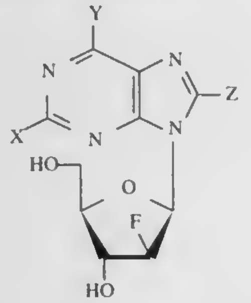
wherein
  R^1, R^b and each R' are independently H, C_1–C_{20} alkyl, aryl, heterocyclic, or C_1–C_{20} alkoxy,
  R is a protecting group,
  n is 1, 2, or 3,
  i is 1 to 3,
  each X' is C, O, S, or N provided that if n is 3 then (a) X^2 is optionally O, S or N, (b) X^1 and X^3 are C, and (c) there is no R^2 when X^2 is O or S,
  each R' is covalently bound to the corresponding X^i,
  the X^i are arranged consecutively such that the first of the X', X^1, is bound to the N and the last of the X', X'', is bound to the ring O to form an n+3 membered ring and each chiral X^1 is predominantly in a single stereoconfiguration, and
  B is any protected, modified or unmodified, purine or pyrimidine base, provided that not all R^i are H.

5,750,675

2'-"UP" FLUORINATED 2'-DEOXY-ARABINOFURANOSYLPURINES

Kyoichi A. Watanabe, Rye Brook; Krzysztof W. Pankiewicz; Jacek Krzeminski, both of Bronxville, all of N.Y., and Barbara Nawrot, Zgierz, Poland, assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.
Division of Ser. No. 273,771, Jul. 12, 1994, abandoned, which is a continuation of Ser. No. 102,544, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 997,103, Dec. 24, 1992, abandoned, which is a continuation of Ser. No. 630,275, Dec. 18, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 470,749
Int. Cl.⁶ C07H *19/16;19/19;19/167;19/173*
U.S. Cl. 536—27.21 **4 Claims**

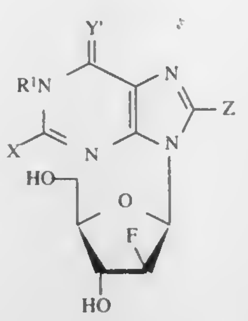
1. A compound having the structure:



I

or

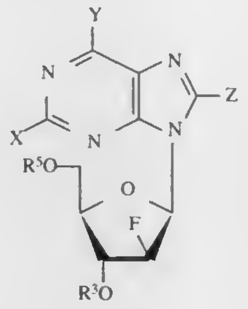
-continued



II

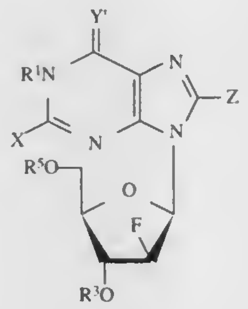
wherein in I, X is an amido or substituted amido group; and Z is hydrogen, or a hydroxyl, methoxy, or halogen group;
wherein in II, X is a fluoro group; and Z is hydrogen or a hydroxyl, methoxy, halogen, amino or substituted amino group;
R^1 is a benzyl or substituted benzyl group;
Y is hydrogen or a methylthio, benzylthio, isopropyl, amino, substituted amino or chloro group; and
Y^1 is an oxo or thio group.

3. A compound having the structure:



III

or



IV

wherein in III, X is hydrogen, an amino or substituted amino group;
wherein in IV, X is hydrogen, a fluoro, amino or substituted amino group;
R^5 is triphenylmethyl, diphenyl(4-methoxyphenyl)methyl, or phenyldi(4-methoxyphenyl)methyl;
R^3 is hydrogen, triflyl, triphenylmethyl, diphenyl(4-methoxyphenyl)methyl, phenyldi(4-methoxyphenyl)methyl, tetrahydropyranyl, propanoyl, anisoyl, toluoyl, nitrobenzoyl, benzyl, toluyl, methoxybenzyl, or nitrobenzyl;
R^1 is hydrogen, or a benzyl or substituted benzyl group;
Y is hydrogen, or a methoxy, methylthio, benzylthio, isopropyl, chloro, amino or substituted amino group;
Y^1 is an oxo or thio group; and
Z is hydrogen, or a hydroxyl, methoxy, halogen, amino or substituted amino group.

5,750,676

PROCESS FOR PREPARING NUCLEOSIDES WITH UNPROTECTED SUGARS

Helmut Vorbrüggen; Konrad Krolikiewicz, and Bärbel Bennua-Skalmowski, all of Berlin, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP96/01472, § 371 Date Apr. 4, 1997, § 102(e) Date Apr. 4, 1997, PCT Pub. No. WO96/31520, PCT Pub. Date Oct. 10, 1996

PCT Filed Apr. 3, 1996, Ser. No. 817,802

Claims priority, application Germany, Apr. 3, 1995, 195 13 330.7

Int. Cl.⁶ C07H *1/00;1/06;19/067;19/167*

U.S. Cl. 536—55.3 **11 Claims**

1. A process for preparing nucleosides, which comprises reacting free sugars with hetero-cyclic bases in the presence of at least one silylating agent in an inert solvent containing a Lewis acid.

5,750,677

DIRECT PROCESS FOR THE PRODUCTION OF CELLULOSE ESTERS

Kevin J. Edgar, and Richard T. Bogan, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 30, 1994, Ser. No. 367,025

Int. Cl.⁶ C08B *1/00;3/06;3/02*

U.S. Cl. 536—63 **57 Claims**

1. A process for preparing cellulose esters having a total DS/AGU of 0.1 to 3.0, said process comprising contacting the following:

(i) a cellulose material,

(ii) a solubilizing amount of a solvent system for said resultant cellulose esters comprising either a carboxamide diluent or a urea-based diluent,

wherein the carboxamide portion of said carboxamide diluent comprises the structure: $R^4R^5NCOCR^6R^7R^8$, wherein R^4, R^5, R^6, R^7, and R^8 are independently selected from the group consisting of hydrogen, alkyl having from about 1 to about 20 carbon atoms, branched alkyl having from about 1 to about 20 carbon atoms, phenyl, naphthyl, alkenyl having from about 1 to about 20 carbon atoms, and branched alkenyl having from about 1 to about 20 carbon atoms, and

wherein said urea portion of said urea-based diluent comprises the structure: $R^9R^{10}NCONR^{11}R^{12}$, wherein R^9, R^{10}, R^{11}, and R^{12} are independently selected from the group consisting of hydrogen, alkyl having from about 1 to about 20 carbon atoms, branched alkyl having from about 1 to about 20 carbon atoms, phenyl, naphthyl, alkenyl having from about 1 to about 20 carbon atoms, and branched alkenyl having from about 1 to about 20 carbon atoms,

(iii) an acylating reagent selected from the group consisting of

(a) an acid chloride, and optionally, an acid acceptor,

(b) a carboxylic acid anhydride,

(c) any one of diketene, ketene, 2,2,6-trimethyl-4H-1,3-dioxin-4-one, and an ester of acetoacetic acid,

(d) an ester of a carboxylic acid, and combinations of one or more of (a)–(d), and

(iv) a titanium-containing compound;

wherein said components (i) and (ii) are contacted first and components (iii) and (iv) are contacted with the product of said contacting of components (i) and (ii), in any order.

5,750,678

WATER-SOLUBLE DEXTRAN FATTY ACID ESTERS AND THEIR USE AS SOLUBILIZERS

Kurt H. Bauer, Im Finkeler 4, D-79112 Freiburg, and Thomas Reinhart, Gundelfingen, both of Germany, assignors to Kurt H. Bauer, Freiburg, Germany

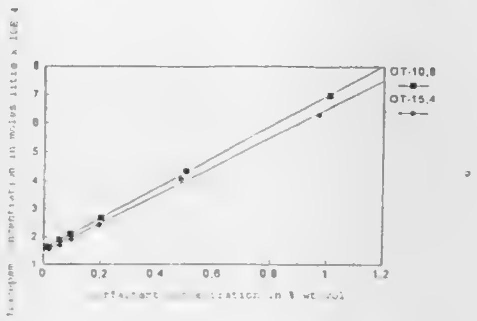
PCT No. PCT/EP95/03625, § 371 Date Aug. 30, 1996, § 102(e) Date Aug. 30, 1996, PCT Pub. No. WO96/08517, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 14, 1995, Ser. No. 648,038

Claims priority, application Germany, Sep. 16, 1994, 44 33 101.0

Int. Cl.⁶ C08B *37/16;37/02;* **C07G** *17/00;* **C12P** *7/40*

U.S. Cl. 536—103 **12 Claims**



Solubilisation of diazepam by lauroyl dextraneS

1. A water-soluble, hemolytically inactive dextran fatty carboxylate with amphiphilic properties made from a dextran with an average molecular weight of 5,000 to 100,000 and a C_{10} to C_{14} fatty acid, wherein the average degree of substitution is between 0.005 and 0.15 and is adjusted, depending on the average molecular weight of the dextran fatty carboxylate and the chain-length of the fatty acid used, in such a way that the dextran fatty carboxylate is soluble in water at room temperature.

5,750,679

PROCESS FOR OBTAINING PHARMACOLOGICALLY ACTIVE COMPOUNDS FROM COMPLEX MIXTURES OF SUBSTANCES

Peter Haas; Heinz Engelhardt, both of Saarbrücken, and Stefan Müllner, Hochheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 25, 1994, Ser. No. 294,803

Int. Cl.⁶ C07H *1/00;* **B01D** *11/04;* **C07D** *305/06;* **C07C** *27/10*

U.S. Cl. 536—127 **7 Claims**

1. A process for obtaining at least one free organic acid, hydroxy acid, fatty alcohol, sugar, hydroxy-substituted steroid, an ester of said free organic acid, an ester of said hydroxy acid, an ester of said fatty alcohol, an ester of said sugar, or an ester of said hydroxy-substituted steroid from a complex mixture comprising at least one of said compounds, which process comprises the steps of:

A) mixing the complex mixture with a polar solvent or a mixture of polar solvents, and concentrating the resulting mixture to dryness;

B) silylating, esterifying or acylating the material obtained from A); and

C) extracting the at least one compound from the material obtained from B) with a supercritical fluid under a pressure of more than 200 bar.

5,750,680

N-VINYLLACTAM DERIVATIVES AND POLYMER THEREOF

Jin Baek Kim; Min Ho Jung, and Kyeong Ho Chang, all of Seoul, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., and Korea Advanced Institute of Science & Technology, both of Rep. of Korea

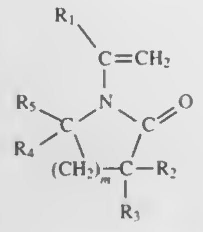
Filed Sep. 12, 1996, Ser. No. 713,085

Claims priority, application Rep. of Korea, Sep. 14, 1995, 95 30063

Int. Cl.⁶ C07F *7/10;* **C08F** *30/08;* **G03C** *1/60*

U.S. Cl. 540—200 **2 Claims**

1. N-vinyllactam derivatives, represented by the following general formula (I):



(I)

wherein,

R_1 is hydrogen, an alkyl group containing 1 to 10 carbon atoms or a trialkylsilyl group containing 3 to 9 carbon atoms;

R_2 represents —OR', —SO_3R', —CO_2R', —PO_3R', —SO_2R' or —PO_2R', wherein R' is an alkyl group containing 1 to 10 carbon atoms, cycloalkyl group containing 3 to 9 carbon atoms, a cyclo group containing a ring heteroatom such as N, O, P and S, or an aryl group containing 6 to 12 carbon atoms;

R_3 is hydrogen, an alkyl group containing 1 to 10 carbon atoms, an aryl group containing 6 to 12 carbon atoms, a trialkylsilyl group containing 3 to 9 carbon atoms, or R_3 is the same as R_2;

R_4 and R_5 is —OH, —OR, wherein R is an alkyl group containing 1 to 10 carbon atoms or an aryl group containing 6 to 12 carbon atoms, or R is the same as R_1; and

m is an integer of 0 to 10.

5,750,681

BICYCLIC BETA-LACTAMS AND PROCESS THEREFOR

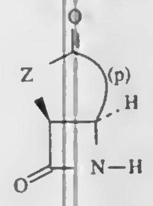
Min Teng, Aliso Viego, Calif., and Marvin J. Miller, South Bend, Ind., assignors to University of Notre Dame Du Lac, Notre Dame, Ind.

Filed Jun. 19, 1995, Ser. No. 491,821

Int. Cl.⁶ C07D *207/00*

U.S. Cl. 540—203 **7 Claims**

1. A compound of the formula



wherein Z is =N—J, wherein J is —OC(O)R, —P(O)(OR_1)(OR_1') or —SO_2R_2, wherein R is C_1–C_4 alkyl, R_1 and R_1' independently are C_1–C_4 alkyl, phenyl or substituted phenyl; R_2 is C_1–C_4 alkyl, phenyl, substituted phenyl, naphthyl or substituted naphthyl; and p is —CH_2—, —CH_2CH_2—, cis-CH=CH—, —CH(alk)—, —CH_2—CH(alk), or —CH(alk)CH_2—, wherein alk is methyl or ethyl.

5,750,682

GLUTARYL 7-ACA DERIVATIVES AND PROCESSES FOR OBTAINING THEM

Loris Sogli, Novara; Davide Longoni, Gorgonzola; Giovanni Pozzi, Besana Brianza; Enrico Siviero, Pavia; Daniele Mario Terrassan, Concorezzo; Ermanno Bernasconi, Caronno Varesino, all of Italy, and Francisco Salto, Madrid, Spain, assignors to Antibioticos S.p.A., Milan, Italy

PCT No. PCT/EP95/02802, § 371 Date Mar. 13, 1996, § 102(e) Date Mar. 13, 1996, PCT Pub. No. WO95/35020, PCT Pub. Date Dec. 28, 1995

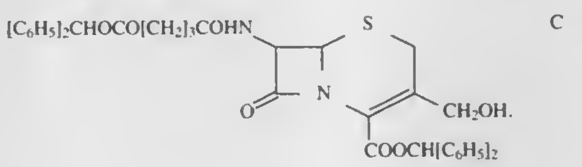
PCT Filed Jul. 17, 1995, Ser. No. 605,135

Claims priority, application Italy, Apr. 21, 1995, MI95 A 000823; Jul. 22, 1997, MI94A1562

Int. Cl.⁶ C07D *501/60*

U.S. Cl. 540—215 **5 Claims**

1. The compound of formula:



5,750,683

PROCESS FOR THE STEREOSPECIFIC SNYTHESIS OF KETO-ENOL TAUTOMERIC MIXTURE OF P-NITROBENZYL (1R,6R,7R)-7-PHENOXYACTAMIDO-3-OXO-CEPHAM-4-(R/S)-CARBOXYLATE-1-OXIDE AND P-NITROBENZYL (1R,6R,7R-7-PHENOXYACETAMIDO-3-HYDROXY-3-CEPHEM-4-CARBOXYLATE-1-OXIDE

Niranjan Lal Gupta; Ramanathan Sankaran; Sugata Chattejee, and Tumma Hari Krishna, all of Mandideep, India, assignors to Lupin Laboratories, Ltd., Bombay, India

Filed Mar. 19, 1996, Ser. No. 618,533

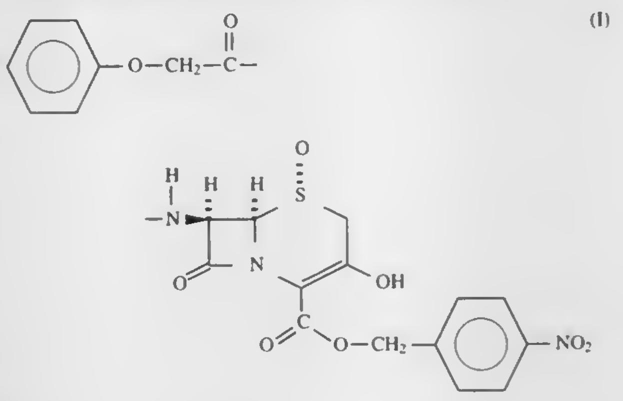
Claims priority, application India, Jan. 19, 1996, 39/BOM/96

Int. Cl.⁶ C07D *501/14;501/20;501/59*

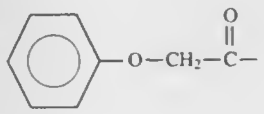
U.S. Cl. 540—214 **2 Claims**

1. A keto-enol tautomeric mixture of p-nitrobenzyl(1 R,6R,7R)-7-phenoxyacetamido-3-hydroxy-3-cephem-4 -carboxylate-1-oxide of formula I and p-nitrobenzyl(1 R,6R,7R)-7-phenoxyacetamido-3-oxo-3-cepham-4 -carboxylate-1-oxide of formula II,

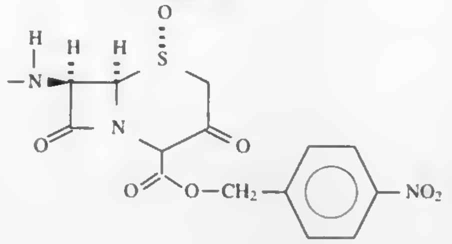
(I)



(II)



-continued



5,750,684
PROCESS FOR THE PREPARATIN OF β-LACTAM COMPOUNDS

Hervé Geerlandt, Bruxelles, and Claudine Grand'Henry, Ohain, both of Belgium, assignors to Beecham Group plc., Middlesex, England

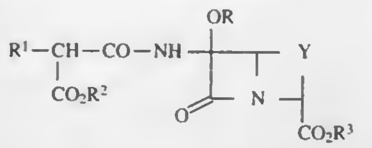
Continuation of Ser. No. 622,329, Nov. 27, 1990, abandoned, which is a continuation of Ser. No. 422,121, Oct. 16, 1989, abandoned, which is a continuation of Ser. No. 134,216, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 560,444, Dec. 12, 1983, abandoned. This application Aug. 30, 1991, Ser. No. 758,433

Claims priority, application United Kingdom, Dec. 14, 1982, 8235568

Int. Cl.^{6} C07D *499/04*

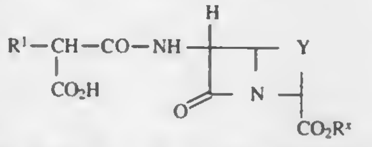
U.S. Cl. 540—319 **10 Claims**

1. A process for the preparation of an antibacterially active β-lactam compound of the formula (III):



(III)

a salt thereof, or an ester thereof wherein R is alkyl of 1 to 6 carbon atoms, R^1 is a hydrocarbon or heterocyclyl group; R^2 is hydrogen or a pharmaceutically acceptable salt or ester, R^3 is hydrogen or a pharmaceutically acceptable salt or in vivo hydrolysable ester, and Y is —S—C(CH$_3$)$_2$—, —S—CH$_2$, or —Y^1—CH$_2$—C(Z)=, wherein Y^1 is oxygen, sulphur or —CH$_2$— and Z is hydrogen, halo, alkoxy of 1 to 6 carbon atoms, —CH$_2$Q or —CH=CH—Q wherein Q is hydrogen, halo, hydroxy, mercapto, cyano, pyridinium, carboxy or an ester thereof, alkoxy of 1 to 6 carbon atoms, acyloxy, aryl, heterocyclyl or heterocyclylthio which process comprises reacting a compound of formula (IV):



(IV)

where R^1, and Y are as above defined and R^x is hydrogen or a carboxyl blocking group, with a halogenating agent in the presence of an alkali metal alkoxide having an alkoxide group of formula —OR where R is alkyl of 1 to 6 carbon atoms whereby said alkali metal alkoxide acts both,

(a) as a strong base to facilitate the action of said halogenating agent to produce an intermediate acylimine derivative of the compound of formula IV, and

(b) as a source of the ion RO$^-$ where R is alkyl of 1 to 6 carbon atoms for in situ reaction with said intermediate, thereby to form said compound of formula III, and optionally thereafter converting the β-lactam produced to a salt or ester thereof.

5,750,685
PROCESS FOR PREPARING POTASSIUM CLAVULANATE IN ROSSETTE FORM

Dennis Edward Clark; Shaukat Hussain Malik; Paul Gerard Butterly, all of Piscataway, N.J.; Clive Elton Badman, and Jeffrey David Hasceler, both of Worthing, England, assignors to SmithKline Beecham, p.l.c., Brentford, United Kingdom

Continuation of Ser. No. 151,548, Nov. 12, 1993, abandoned, which is a division of Ser. No. 978,196, Nov. 18, 1992, Pat. No. 5,288,861, which is a continuation of Ser. No. 867,275, Apr. 9, 1992, abandoned, whlch is a continuation of Ser. No. 668,795, Mar. 6, 1991, abandoned, which is a continuation of Ser. No. 440,909, Nov. 22, 1989, abandoned, which is a continuation of Ser. No. 148,576, Jan. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 74,944, Jul. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 8,781, Jan. 29, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 481,213

Int. Cl.^{6} C07D *503/18;* **C07B** *63/02*

U.S. Cl. 540—349 **8 Claims**

1. A process for the preparation of potassium clavulanate in the form of crystalline rosettes, each rosette comprising a plurality of needle crystals radiating out from a common nucleation point and characterized by their microscopic appearance under 100 fold magnification as having a clearly discernable rosette-form, which comprises adding a solution of clavulanate ions to a solution of potassium ions in a non-solvent for potassium clavulanate so as to cause precipitation of potassium clavulanate in the form of crystalline rosettes, in the presence of potassium ions.

6. A process for the preparation of crystalline potassium clavulanate in the form of crystalline rosettes which comprises dissolving t-butylamine clavulanate in an aqueous solvent selected from isopropanol, methanol and mixtures thereof and adding the resulting solution to a solution of potassium ions in a solvent selected from isopropanol and isopropanol/ acetone so as to cause precipitation of potassium clavulanate in the form of crystalline rosettes.

5,750,686
CARBAPENEM COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Makoto Sunagawa, Itami; Hiroshi Yamaga, Osaka, and Yoshihiro Sumita, Nara-ken, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka-fu, Japan

PCT No. PCT/JP94/00958, § 371 Date Dec. 14, 1995, § 102(e) Date Dec. 14, 1995, PCT Pub. No. WO94/29313, PCT Pub. Date Dec. 22, 1994

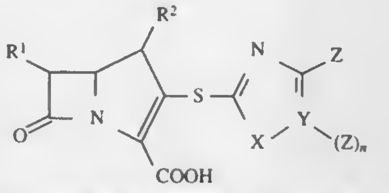
PCT Filed Jun. 14, 1994, Ser. No. 564,032

Claims priority, application Japan, Jun. 16, 1993, 5-171073

Int. Cl.^{6} C07D *487/04;* **A61K** *31/40*

U.S. Cl. 540—350 **7 Claims**

1. A compound of the formula [1]:



[1]

wherein R^1 is a lower alkyl group or a lower alkyl group substituted by a hydroxy group,

R^2 is a hydrogen atom or a lower alkyl group,

X is an oxygen atom, a sulfur atom or NH,

Y is a nitrogen atom or a carbon atom,

n is 0 when Y is a nitrogen atom, or n is 1 when Y is a carbon atom,

Zs are each independently a) a hydrogen atom; b) R^a (R^a is a lower alkyl group, a substituted lower alkyl group or a substituted lower alkenyl group); c) A (A is an aryl group, a substituted aryl group or a 5- to 6-membered cyclic amino group); d) —OH or —OP^a (P^a is a protecting group for hydroxy group); e) —OR^a (R^a is the same as defined above); f) —OA (A is the same as defined above); g) —SR^a (R^a is the same as defined above); h) —SA (A is the same as defined above); i) —NH$_2$ or —NHP^b (P^b is a protecting group for amino group); j) —NHR^a, —N(R^b)R^c or —N(R^a)P^b (R^a and P^b are the same as defined above, R^b and R^c are a lower alkyl group or a substituted lower alkyl group, or R^b and R^c may combine together with the nitrogen atom to form a 5- to 6-membered heterocyclic group, said heterocyclic group optionally containing other 1 or 2 heteroatoms selected from an oxygen atom, a sulfur atom and a nitrogen atom, and having optionally a substituent); k) —NHA or —N(A)P^b (A and P^b are the same as defined above); l) —N(R^a)A (A and R^a are the same as defined above); m) —CONH$_2$; n) —CONHRa, —CON(R^b)R^c(R^a,R^b and R^c are the same as defined above); o) —CONHA (A is the same as defined above); p) —CON(R^a)A (A and R^a are the same as defined above); q) —CONHC(NH)NH$_2$ or —CONHC(NP^b)NHP^b (P^b is the same as defined above); r) —COOH or —COOP^c (P^c is a protecting group for carboxyl group); s) —COOR^a (R^a is the same as defined above); t) —COOA (A is the same as defined above); u) —COR^a (R^a is the same as defined above); v) —COA (A is the same as defined above); w) a halogen atom; or x) a cyano group, or a pharmaceutically acceptable salt thereof or a non-toxic ester thereof.

5,750,687
AZEPINONE COMPOUNDS USEFUL IN THE INHIBITION OF ACE AND NEP

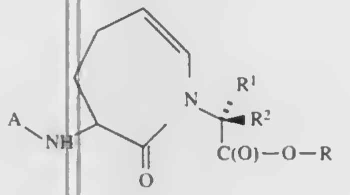
Jeffrey A. Robl, Newtown, Pa., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Division of Ser. No. 390,717, Feb. 17, 1995, Pat. No. 5,587,375. This application Aug. 20, 1996, Ser. No. 700,251

Int, Cl.^{6} C07C *223/12;405/06;* **A61K** *31/55*

U.S. Cl. 540—527 **14 Claims**

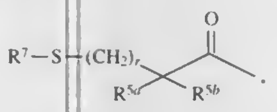
1. A compound of the following formula I, or a pharmaceutically acceptable salt thereof:

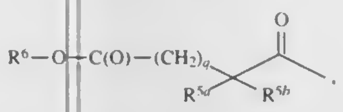


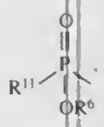
(I)

wherein:

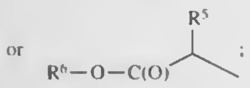
A is





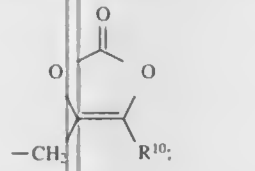


or



;

R and R^6 are each independently hydrogen, alkyl, substituted alkyl, aryl—(CH$_2$)$_p$—, substituted aryl—(CH$_2$)$_p$—, heteroaryl—(CH$_2$)$_p$—, —CH(R^8)—O—C(O)—R^9, or



R^1 and R^2 are each independently hydrogen, alkyl, substituted alkyl, cycloalkyl—(CH$_2$)$_p$—, aryl—(CH$_2$)$_p$—, substituted aryl—(CH$_2$)$_p$—, heteroaryl—(CH$_2$)$_p$—, or R^1 and R^2 may form, together with the carbon to which they are bonded, a 3 to 7 membered carbocyclic ring, where said ring is optionally substituted by alkyl, or by aryl which is fused or bonded by a single bond to said ring;

R^5, R^{5a}, and R^{5b} are each independently hydrogen, alkyl, alkenyl, cycloalkyl, substituted alkyl, substituted alkenyl, aryl, substituted aryl, heteroaryl, cycloalkyl—alkylene—, aryl—alkylene—, substituted aryl—alkylene—, and heteroaryl—alkylene—, or R^{5a} and R^{5b} may form, together with the carbon to which they are bonded, a 3 to 7 membered carbocyclic ring, where said ring is optionally substituted by alkyl, or by aryl which is fused or bonded by a single bond to said ring;

R^7 is hydrogen, R^8—C(O)—, or R^{12}—S—;

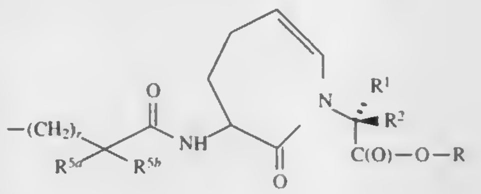
R^8 is hydrogen, alkyl, substituted alkyl, cycloalkyl—(CH$_2$)$_p$—, substituted aryl—(CH$_2$)$_p$—, or heteroaryl—(CH$_2$)$_p$—;

R^9 is hydrogen, alkyl, alkoxy, or aryl;

R^{10} is alkyl or aryl—(CH$_2$)$_p$—,

R^{11} is alkyl, substituted alkyl, cycloalkyl—(CH$_2$)$_p$—, aryl—(CH$_2$)$_p$—, substituted aryl—(CH$_2$)$_p$—, or heteroaryl—(CH$_2$)$_p$—;

R^{12} is hydrogen, alkyl, substituted alkyl, cycloalkyl—(CH$_2$)$_p$—, aryl—(CH$_2$)$_p$—, substituted aryl—(CH$_2$)$_p$—, or heteroaryl—(CH$_2$)$_p$—, or —S—R^{12} completes a symmetrical disulfide wherein R^{12} is



p is zero or an integer from 1 to 6;

q is zero or an integer from 1 to 3; and

r is zero or one.

5,750,688
PROCESS FOR PREPARING BENZOIC ACID DERIVATIVE INTERMEDIATES AND BENZOTHIOPHENE PHARMACEUTICAL AGENTS

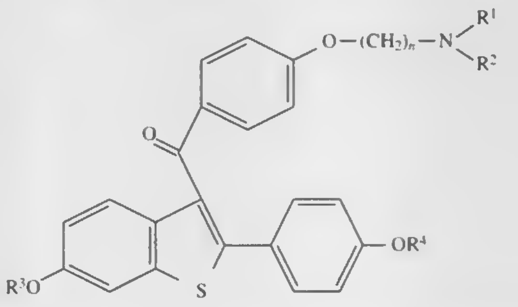
Douglas P. Kjell, and Fred M. Perry, both of West Lafayette, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 298,636, Aug. 31, 1994, Pat. No. 5,631,369. This application Apr. 9, 1996, Ser. No. 629,862

Int. Cl.^{6} C07D *407/12;333/72*

U.S. Cl. 540—596 **15 Claims**

1. A process for preparing a compound of formula II



II

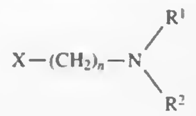
wherein

R^1 and R^2 each are independently C$_1$–C$_4$ alkyl, or combine to form piperidinyl, pyrrolidinyl methylpyrrolidinyl, dimethylpyrrolidinyl, morpholino, dimethylamino, diethylamino, or 1-hexamethyleneimino;

R^3 and R^4 each are H or a hydroxy protecting group; and p1 n is 2 or 3;

or a pharmaceutically acceptable salt thereof, comprising

a) reacting a haloalkyl amine of formula III

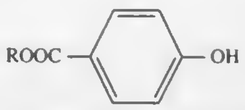


$X-(CH_2)_n-N(R^1)(R^2)$ III

wherein

X is a halogen; and

R^1, R^2, and n are as defined above, with a compound of formula IV

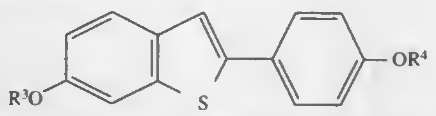

IV

wherein R is C_1–C_6 alkyl, in the presence of an alkyl acetate solvent and a base;

b) extracting the reaction product from step a) with an aqueous acid;

c) cleaving the ester of the reaction product from step b) to form an acid;

d) reacting the extracted product from step c) with a compound of formula V


V

wherein R^3 and R^4 are as defined above, or a pharmaceutically acceptable salt thereof;

e) optionally removing the R^3 and R^4 hydroxy protecting groups of the reaction product form step d); and

f) optionally forming a salt of the reaction product from either steps d) or step e).

5,750,689
TRIPHENDIOXAZINE COMPOUNDS

Gordon Alexander Thomson, Bolton, and Duncan Adrian Sidney Phillips, Bury, both of United Kingdom, assignors to Zeneca Limited, London, England

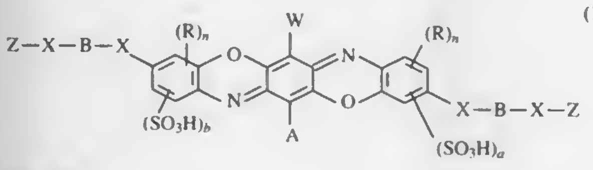
PCT No. PCT/GB94/02348, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/14060, PCT Pub. Date May 26, 1995

PCT Filed Oct. 26, 1994, Ser. No. 640,822

Int. Cl.^{6} C07D *265/38*

U.S. Cl. 544—75 **10 Claims**

1. A compound of Formula (1) and salts thereof:


(1)

wherein:

W is Cl or Br;

A is optionally substituted alkyl;

each R independently is halogen, alkyl, alkoxy or carboxy;

n is 0 or 1;

a+b is 0 to 4;

each X independently is O, S or NR^1 wherein R^1 is H or optionally substituted alkyl;

B is a divalent organic linker group; and

Z is an aromatic nitrogen ring heterocycle devoid of cellulose-reactive groups.

5,750,690
ASYMMETRIC HYDROGENATION PROCESS USING RUTHENIUM-DIPHOSPHINE COMPLEXE

Emil Albin Broger, Magden; Yvo Crameri, Oberwil; Marquard Imfeld, Binningen; François Montavon, Delémont, and Erich Widmer, Münchenstein, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

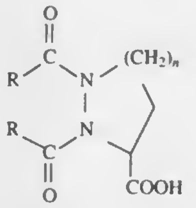
Continuation of Ser. No. 330,404, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 57,231, May 4, 1993, abandoned. This application Jul. 26, 1996, Ser. No. 690,215

Claims priority, application Switzerland, May 18, 1992, 1582/92; Mar. 11, 1993, 729/93

Int. Cl.^{6} C07D *237/26;237/04;231/04*

U.S. Cl. 544—234 **10 Claims**

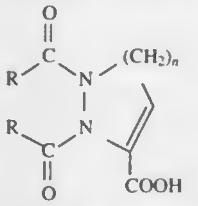
1. A process for the preparation of a compound of the formula:


I

wherein

each R, independently, is alkyl, arylmethyl, aryl, alkoxy, arylmethoxy or aryloxy, or both R's together are 1,2-phenylene and n is 1 or 2, in the (S)- or (R)-form,

which process comprises asymmetrically hydrogenating the corresponding 3-carboxy-3-pyrazoline or 3-carboxy-1,2,5,6-tetrahydropyridazine derivative of the formula


II

where R and n have the significance's given above, or a salt thereof, in the presence of an optically active ruthenium-diphosphine complex of the formula:

$Ru(X^1)_2L$ III

or

$[Ru(X^2)_{2-m}X^3L](X^4)_m$ IV

wherein

X^1 is a halide, an anion $A—COO^\ominus$ or an anion $A—SO_2O^\ominus$,

X^2 is a halide,

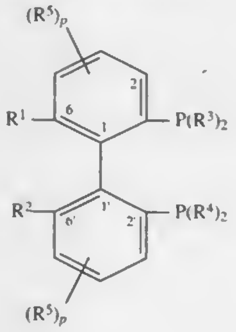
X^3 is benzene, hexamethylbenzene or p-cymene,

X^4 is a halide, $BF_4^\ominus$, $ClO_4^\ominus$ or $B(phenyl)_4^\ominus$,

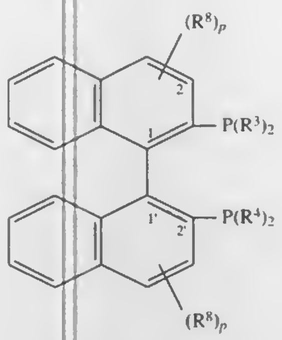
m is the number 1 or 2,

A is lower alkyl halogenated lower alkyl or aryl and

L is an optically active atropisomeric diphosphine ligand selected from a group of compounds consisting of a compound of the formula:


V

and a compound of the formula


VI

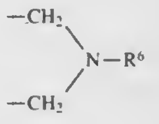
wherein

R^1 and R^2, independently, are lower alkyl, lower alkoxy, di(lower alkyl)amino, hydroxy, protected hydroxy, hydroxymethyl or protected hydroxymethyl

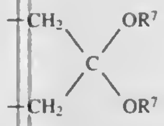
or

R^1 and R^2 taken together are a divalent group:

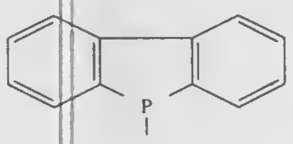
$-(CH_2)_q-$, $-CH_2-O-CH_2-$,



or



R^3 and R^4, independently, are lower alkyl, C_{3-7}-cycloalkyl, optionally substituted phenyl, a five-membered heteroaromatic or a group of the formula



R^5 is lower alkyl or lower alkoxy,

R^6 is lower alkyl, optionally substituted phenyl or optionally substituted benzyl,

R^7 is lower alkyl or both R^7's taken together are di-or trimethylene

R^8 is halogen, hydroxy, methyl, ethyl, amino, acetamido, nitro or sulfo,

p is zero or the number 1, 2 or 3

and q is the number 3,4 or 5.

5,750,691
ACCESS TO TAXOL ANALOGS

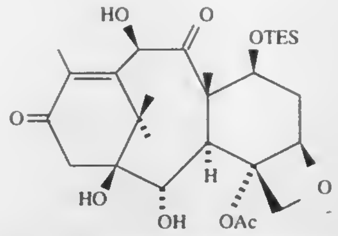
K. C. Nicolaou, La Jolla; Philippe G. Nantermet, San Diego; Rodney K. Guy, San Diego, and Hiroaki Ueno, San Diego, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 110,095, Aug. 20, 1993, Pat. No. 5,440,057. This application Aug. 7, 1995, Ser. No. 512,229

Int. Cl.^{6} C07D *239/10;217/24;411/06;333/18*

U.S. Cl. 544—238 **2 Claims**

1. An improved method for producing key intermediate 4


4

starting from a taxoid natural product, the improvement comprising the following steps:

Step A: providing the taxoid natural product; then

Step B: catalytically oxidating the taxoid natural product using Ley's ruthenium system to give a C13 ketone; and then

Step C: hydrolyzing the product of said Step B under basic conditions to provide key intermediate 4.

5,750,692
SYNTHESIS OF 3-DEAZAPURINES

P. Dan Cook, Carlsbad; Oscar L. Acevedo, San Diego, and Robert S. Andrews, San Juan Capistrano, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Division of Ser. No. 514,762, Aug. 14, 1995, Pat. No. 5,587,470, which is a division of Ser. No. 27,011, Mar. 5, 1993, Pat. No. 5,457,191. This application Dec. 10, 1996, Ser. No. 762,588

Int. Cl.^{6} C07D *239/00*

U.S. Cl. 544—253 **8 Claims**

1. A method for preparing a 3-deazapurine nucleoside comprising the steps of:

a. alkylating a cyano-1-(3,5-di-O-p-toluoyl-β-D-pentose) imidazole in the presence of a base, said alkylating agent having the formula RX, wherein R is alkyl having up to about 12 carbon atoms, alkenyl having up to about 12 carbon atoms, or aralkyl having from about 6 to about 30 carbon atoms; and X is a leaving group;

b. ammonolyating the alkylated cyanoimidazole; and

c. cyclizing the ammonylated cyanoimidazole through basic catalysis at a temperature of greater than 90° C.

5,750,693
DISUBSTITUTED ACETYLENES BEARING HETEROBICYCLIC GROUPS AND HETEROAROMATIC OR PHENYL GROUPS HAVING RETINOID LIKE ACTIVITY

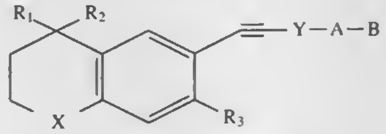
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Irvine, Calif.

Division of Ser. No. 466,005, Jun. 6, 1995, Pat. No. 5,663,347, which is a division of Ser. No. 126,933, Sep. 19, 1993, Pat. No. 5,468,879, which is a division of Ser. No. 836,635, Feb. 14, 1992, Pat. No. 5,264,578, which is a continuation-in-part of Ser. No. 326,191, Mar. 20, 1989, Pat. No. 5,089,509, which is a continuation-in-part of Ser. No. 246,037, Sep. 15, 1988, abandoned, which is a continuation of Ser. No. 28,279, Mar. 20, 1987, abandoned. This application Mar. 19, 1997, Ser. No. 820,791

Int. Cl.^{6} C07D *239/00;487/00*

U.S. Cl. 544—253 **9 Claims**

1. A compound of the formula



wherein R_1 and R_2, independently are n-alkyl groups having 2 to 8 carbons, or cyclo or branch-chained alkyl groups of 3 to 8 carbons;

R_3 is hydrogen or lower alkyl;
X is S, O or;
Y is or a heteroaryl group selected from a group consisting of pyridazinyl, pyrimidinyl, and pyrazinyl;
A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3 to 6 carbons, cycloalkyl having 3 to 6 carbons, alkenyl having 2 to 6 carbons and 1 or 2 double bonds, alkynyl having 2 to 6 carbons and 1 or 2 triple bonds;
B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_5$, $CONR_6R_7$, —CH_2OH, CH_2OR_8, CH_2OCOR_8, CHO, $CH(OR_9)_2$, $CHOR_{10}O$, —COR_{11}, $CR_{11}(OR_9)_2$, or $CR_{11}OR_{10}O$, where R_5 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_5 is phenyl or lower alkylphenyl, R_6 and R_7 independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, R_8 is alkyl of 1 to 10 carbons, phenyl or lower alkylphenyl, R_9 is lower alkyl, R_{10} is divalent alkyl radical of 2–5 carbons and R_{11} is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons.

5,750,694

PROCESS FOR THE PREPARATION OF 4,6-DICHLOROPYRIMIDINE

John David Jones, Bury; Martin Charles Bowden, Rastrick, and Stephen Martin Brown, Upper Cumberworth, all of United Kingdom, assignors to Zeneca Limited, London, England

PCT No. PCT/GB95/00676, § 371 Date Aug. 21, 1996, § 102(e) Date Aug. 21, 1996, PCT Pub. No. WO95/29166, PCT Pub. Date Nov. 2, 1995

PCT Filed Mar. 27, 1995, Ser. No. 669,568

Claims priority, application United Kingdom, Apr. 26, 1994, 9408270

Int. Cl.^{6} C07D *239/30*

U.S. Cl. 544—334 **8 Claims**

1. A process for preparing 4,6-dichloropyrimidine comprising treating 4,6-dihydroxypyrimidine with phosgene in the presence of a base selected from the group consisting of: a tertiary amine of formula $R^1R^2R^3N$ wherein R^1, R^2 and R^3 are, independently, C_{1-10} alkyl, phenyl, an aromatic 3–7 membered carbon nitrogen ring or phenyl(C_{1-4})alkyl: or a saturated or unsaturated 3–7 membered carbon nitrogen ring optionally substituted by C_{1-10} alkyl.

5,750,695

ANTIPARASITIC PARAHERQUAMIDES

Byung H. Lee, and Michael F. Clothier, both of Kalamazoo, Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 670,306, Jun. 27, 1996. This application Mar. 21, 1997, Ser. No. 822,419

Int. Cl.^{6} C07D *241/36*

U.S. Cl. 544—341 **9 Claims**

1. 14,15-Dehydro-16-oxoparaherquamide B.

5,750,696

DIOXACYCLOALKANE COMPOUND HAVING RENIN-INHIBITORY ACTIVITY

Saizo Shibata; Yasuki Yamada; Koji Ando; Kiyoshi Fukui, all of Takatsuki; Ikuro Nakamura, Iruma, and Itsuo Uchida, Takatsuki, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP93/01156, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/04523, PCT Pub. Date Mar. 3, 1994

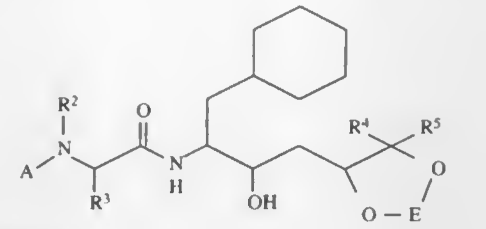
PCT Filed Aug. 19, 1993, Ser. No. 387,808

Claims priority, application Japan, Aug. 21, 1992, 4-244037

Int. Cl.^{6} C07D *317/28;233/64;* **A61K** *31/335;* **C07C** *215/26*

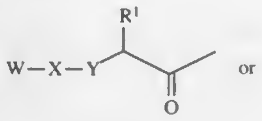
U.S. Cl. 544—374 **17 Claims**

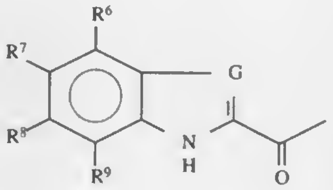
1. A dioxacycloalkane compound of the formula [1]



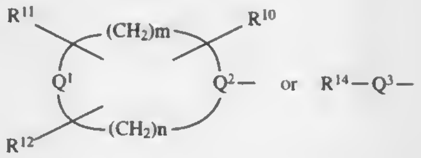
[1]

wherein A is



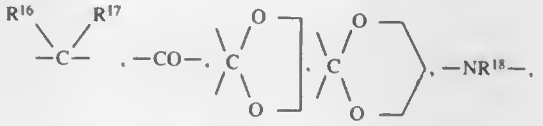


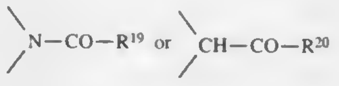
wherein W is



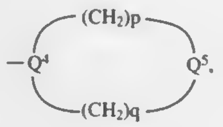
wherein R^{10}, R^{11} and R^{12} are the same or different and each is a hydrogen atom, a lower-alkyl, a halogen atom, amino, a lower alkylamino, a lower dialkylamino or —O—R^{15} wherein R^{15} is a hydrogen atom, a lower alkyl, a lower alkanoyl or an acyl group of amino acid, m and n are each independently an integer of 0–5, the total of which is 1 to 5, Q^1 is

$-CH_2-$, $-O-$, $-S-$, $-SO-$, $-SO_2-$,

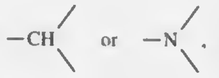




wherein R^{16} and R^{17} are the same or different and each is a lower alkyl or a halogen atom, R^{18} is a hydrogen atom or a lower alkyl, R^{19} and R^{20} are each a lower alkyl or



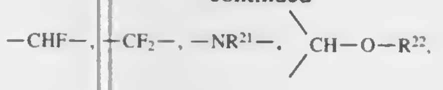
wherein Q^4 is

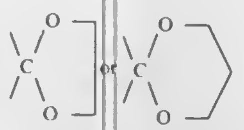


and

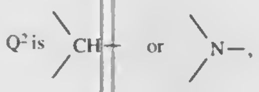
Q^5 is $-CH_2-$, $-O-$, $-S-$, $-SO-$, $-SO_2-$, $-CO-$,

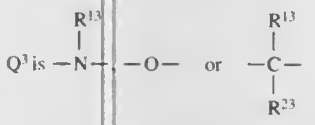
-continued



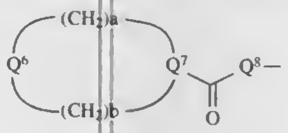


wherein R^{21} and R^{22} are each a hydrogen atom or a lower alkyl, p and q are each independently an integer of 1–4, the total of which does not exceed 5,



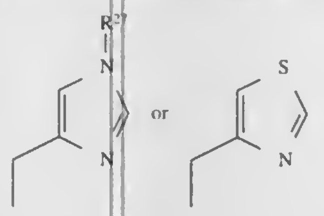


wherein R^{13} is a hydrogen atom or a lower alkyl, R^{23} is a hydrogen atom or a lower alkyl, and R^{14} is a hydrogen atom, amino, a lower alkylamino, a lower dialkylamino, hydroxy, a lower alkoxy, methoxymethoxy, methoxyethoxymethoxy, a lower alkyl optionally substituted by a group of the formula



wherein Q^6 is the same as the above-mentioned Q^5, Q^7 is the same as the above-mentioned Q^4, Q^8 is —CH_2— or —NR^{24}— wherein R^{24} is a hydrogen atom or a lower alkyl, and a and b are each independently an integer of 1–4, the total of which does not exceed 5, or a benzyl optionally substituted by a lower alkoxy.

X is —CO— or —SO_2—,
Y is —CH_2—, —O— or —NR^{25}— wherein R^{25} is a hydrogen atom or a lower alkyl,
R^1 is an aralkyl optionally substituted by a lower alkoxy,
R^6, R^7, R^8 and R^9 are the same or different and each is a hydrogen atom, a halogen atom, hydroxy or a lower alkoxy, and
G is —N= or —CH=;
R^2 is a hydrogen atom or a lower alkyl;
R^3 is —$(CH_2)d$—SR^{26} wherein d is an integer of 1–5 and R^{26} is a hydrogen atom or a lower alkyl, a lower alkyl,



wherein R^{27} is a hydrogen atom, a lower alkyl or —CH_2O—CO—R^{28}
wherein R^{28} is a lower alkyl or a lower alkoxy;
R^4 and R^5 are the same or different and each is a hydrogen atom or a lower alkyl; and
E is —$C(R^{29})(R^{30})$ or —CH_2CH_2— wherein R^{29} and R^{30} are the same or different and each is a hydrogen atom, a lower alkyl or a phenyl, or R^{29} and R^{30} may combinedly form a ring having 5 to 7 carbon atoms,
or a pharmaceutically acceptable salt thereof.

5,750,697

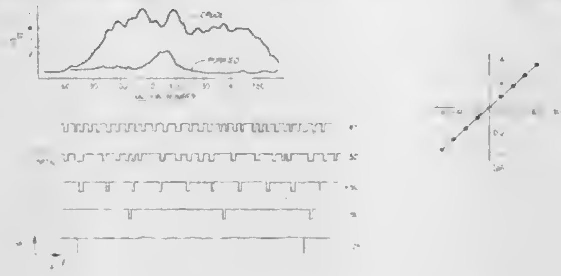
MEMBRANE NA$^+$ CHANNEL PROTEIN AND RELATED THERAPEUTIC COMPOUNDS

Bruce D. Cherksey, 608 Garden St., Hoboken, N.J. 07030

Division of Ser. No. 516,626, Apr. 30, 1990, Pat. No. 5,132,296, which is a division of Ser. No. 85,462, Aug. 14, 1987, Pat. No. 4,950,591. This application Jul. 20, 1992, Ser. No. 916,912

Int. Cl.^{6} C07D *241/02*

U.S. Cl. 544—409 **8 Claims**



1. A glycol adduct of amiloride produced by the reaction of covalently bonding amiloride with an alkanediol of the formula HO—$(CH_2)_n$—OH or HO—C_nH_{2n}—OH, wherein n is an integer of from 2 to 11.

5,750,698

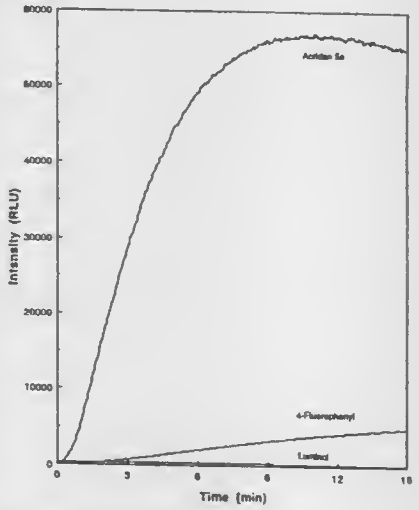
ARYL N-ALKYLACRIDANCARBOXYLATE DERIVATIVES USEFUL FOR CHEMILUMINESCENT DETECTION

Hashem Akhavan-Tafti, Sterling Heights; Renuka DeSilva, Northville; Zahra Arghavani, Sterling Heights, and Barry A. Schoenfelner, Livonia, all of Mich., assignors to Lumigen, Inc., Southfield, Mich.

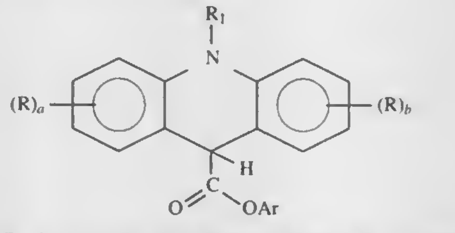
Division of Ser. No. 205,093, Mar. 2, 1994, Pat. No. 5,593,845, which is a continuation-in-part of Ser. No. 61,810, May 17, 1993, Pat. No. 5,491,072. This application Feb. 16, 1996, Ser. No. 602,464

Int. Cl.^{6} C07D *219/06;219/02*

U.S. Cl. 546—102 **10 Claims**



1. An acridan of the formula:



(II)

wherein R_1 is a lower alkyl group, wherein R is selected from lower alkyl and lower alkoxy groups and a and b are integers between 0 and 4 and wherein O—Ar is of the formula $OC_6H_{5-m}X_m$ wherein X is a halogen atom selected from F and Cl, and m is 3 to 5 which allows production of chemiluminescence from the acridan by reaction with a peroxide and a peroxidase.

5,750,699
METHOD OF PREPARING CERTAIN 3-HALO-IMIDAZOPYRIDINES

Teruo Oku; Hiroshi Kayakiri; Shigeki Satoh, all of Tsukuba; Yoshito Abe, Ibaraki; Yuki Sawada, Tsukuba, and Hirokazu Tanaka, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

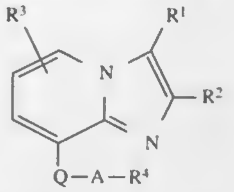
Division of Ser. No. 441,786, May 16, 1995, Pat. No. 5,574,042, which is a continuation of Ser. No. 235,632, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 142,967, Oct. 29, 1993, abandoned. This application Jun. 12, 1996, Ser. No. 662,198

Claims priority, application United Kingdom, Nov. 2, 1992, 9222947; Mar. 3, 1993, 9304249

Int. Cl.^{6} C07D *471/02*

U.S. Cl. 546—121 **1 Claim**

1. A process for preparing a compound of the formula:



wherein R^1 is halogen,

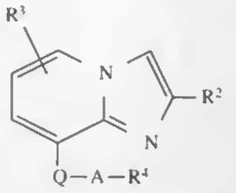
R^2 and R^3 are each hydrogen, lower alkyl, halo(lower)alkyl or acyl,

R^4 is aryl substituted with at least two substituents selected from the group consisting of:
- halogen;
- halo(lower)alkyl;
- acyl;
- aryl;
- aryl substituted with halogen or cyano;
- ar(lower)alkyl substituted with hydroxy;
- lower alkoxy;
- nitro;
- amino;
- amino substituted with substituents selected from the group consisting of lower alkyl, acyl, ar(lower)alkyl, heterocyclic(lower)alkyl, carboxy(lower)alkyl, lower alkylaminomethylene and N-methylpyrrolidinylidene;
- a heterocyclic group and
- a heterocyclic group substituted with oxo; or

R^4 is a heterocyclic group substituted with at least two substituents selected from the group consisting of:
- halogen;
- lower alkyl;
- halo(lower)alkyl;
- acyl;
- aryl;
- aryl substituted with halogen or cyano; ar(lower)alkyl substituted with hydroxy;
- lower alkoxy;
- oxo;
- nitro;
- amino;
- amino substituted with substituent(s) selected from the group consisting of lower alkyl, acyl, ar(lower)alkyl, heterocyclic(lower)alkyl, carboxy(lower)alkyl, lower alkylaminomethylene and N-methylpyrrolidinylidene;
- a heterocyclic group and
- a heterocyclic group substituted with oxo;

Q is O or N—R^{11},
in which R^{11} is hydrogen or acyl, and A is lower alkylene, or salt thereof, which comprises:

halogenating a compound of the formula:



wherein R^2, R^3, R^4, Q and A are each as defined above, or salt thereof thereof.

5,750,700
CERTAIN 1-SUBSTITUTED AMINOMETHYL IMIDAZOLE AND PYRROLE DERIVATIVES: NOVEL DOPAMINE RECEPTOR SUBTYPE SPECIFIC LIGANDS

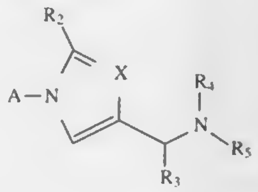
Jun Yuan, Clinton, and Jan W. F. Wasley, Essex, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Continuation of Ser. No. 344,498, Nov. 23, 1994, Pat. No. 5,478,934. This application Jun. 2, 1995, Ser. No. 459,093

Int. Cl.^{6} C07D *401/06*

U.S. Cl. 546—148 **2 Claims**

1. A compound of the formula



or the pharmaceutically acceptable salts thereof wherein:

A is arylalkyl, aryl, or heteroaryl optionally substituted with up to 3 groups selected from the group consisting of halogen, trifluoromethyl, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms;

X is CR_1 where R_1 is hydrogen, halogen, straight or branched chain lower alkyl having 1–6 carbon atoms or phenyl;

R_2 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms or phenyl;

R_3 is hydrogen or straight or branched chain lower alkyl having 1–6 carbon atoms; and

NR_4R_5 together represent 2-(1,2,3,4-tetrahydroisoquinolinyl), optionally mono- or disubstituted with halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms.

5,750,701
HETEROCYCLIC ETHANOLAMINE DERIVATIVES WITH β-ADRENORECEPTOR AGONISTIC ACTIVITY

Lee James Beeley, and David Kenneth Dean, both of Dorking, United Kingdom, assignors to SmithKline Beecham plc, Brentford, Middlesex, United Kingdom

PCT No. PCT/EP95/00794, § 371 Date Sep. 16, 1996, § 102(e) Date Sep. 16, 1996, PCT Pub. No. WO95/25104, PCT Pub. Date Sep. 21, 1995

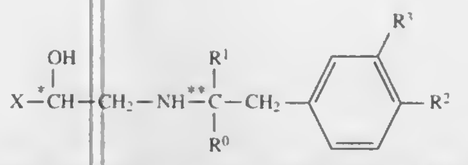
PCT Filed Mar. 3, 1995, Ser. No. 704,699

Claims priority, application United Kingdom, Mar. 15, 1994, 9405019

Int. Cl.^{6} C07D *215/227;215/36;* **A61K** *31/47*

U.S. Cl. 546—157 **13 Claims**

1. A compound of formula (I):

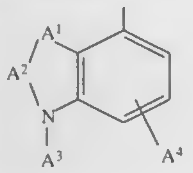


(I)

or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate thereof,

wherein,

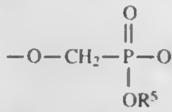
X represents a moiety of formula (a):



in which A^1 represents —CH=CH=; A^2 represents an oxo or a thioxo group; A^3 represents H or an alkylcarbonyl group; and A^4 represents hydroxy or NR^sR^t wherein R^s and R^t each independently represents H or alkyl;

R^0 and R^1 each independently represents hydrogen or an alkyl group;

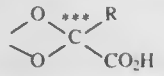
R^2 represents OCH_2CO_2H, or an ester or amide thereof, or R^2 represents a moiety of formula (b):



$$-O-CH_2-\overset{\overset{\large O}{\|}}{\underset{\underset{\large OR^5}{|}}{P}}-OR^4 \qquad (b)$$

wherein R^4 and R^5 each independently represent hydrogen, alkyl, hydroxyalkyl, cycloalkyl or R^4 together with R^5 represents $(CH_2)_m$ wherein m is 2, 3 or 4; and

R^3 represents hydrogen, halogen, alkyl or alkoxy or R^3 together with R^2 represents a moiety of formula (c):



(c)

or an ester or amide thereof, wherein R represents hydrogen, alkyl, hydroxymethyl or a moiety of formula $(CH_2)_nCO_2H$, wherein n is zero or an integer 1, 2 or 3, or an ester or amide thereof.

5,750,702
CERTAIN PYRROLO PYRIDINE-3-CARBOXAMIDES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS

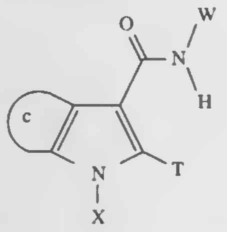
Pamela Albaugh, Clinton, and Alan Hutchison, Madison, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Continuation-in-part of Ser. No. 473,509, Jun. 7, 1995, Pat. No. 5,608,079, which is a continuation of Ser. No. 144,138, Oct. 27, 1993, Pat. No. 5,484,944. This application Jul. 16, 1996, Ser. No. 683,066

Int. Cl.^{6} C07D *401/04;209/52*

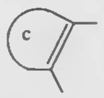
U.S. Cl. 546—183 **12 Claims**

1. A compound of the formula:

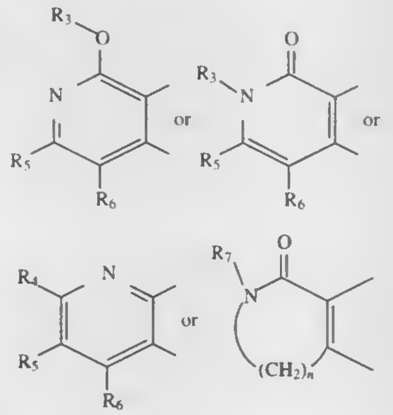


or the pharmaceutically acceptable non-toxic salts thereof wherein:

T is halogen, hydrogen, hydroxy, nitro, amino or lower alkoxy;
X is hydrogen, hydroxyl or lower alkyl;
W is
- phenyl optionally substituted with up to 5 groups independently selected from
  - (i) halogen, hydroxy, lower alkyl, lower alkoxy, (C_3– C_7) cycloalkyl (C_1–C_6) alkoxy, alkylenedioxy or (C_3–C_7) cycloalkyl;
  - (ii) amino, or mono- or dialkylamino where each alkyl attached to the nitrogen atom is independently lower alkyl or cycloalkyl having 3–7 carbon atoms; or
  - (iii) NR_1COR_2, COR_2, or $CONR_1R_2$ where R_1 and R_2 are the same or different and represent hydrogen, lower alkyl or cycloalkyl having 3–7 carbon atoms; or
- phenylalkyl where the phenyl is optionally substituted with up to 5 groups independently selected from
  - (i) halogen, hydroxy, lower alkyl, lower alkoxy, (C_3– C_7) cycloalkyl (C_1–C_6) alkoxy, alkylenedioxy or (C_3–C_7) cycloalkyl;
  - (ii) amino, or mono- or dialkylamino where each alkyl attached to the nitrogen atom is independently lower alkyl or cycloalkyl having 3–7 carbon atoms; or
  - (iii) NR_1COR_2, COR_2, or $CONR_1R_2$ where R_1 and R_2 are the same or different and represent hydrogen, lower alkyl or cycloalkyl having 3–7 carbon atoms; and



represents



where
- n is 1, 2, 3, or 4;
- R_3 is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-, 3-, or 4-pyridylalkyl where each alkyl is lower alkyl;
- R_4 is halogen or trifluoromethyl; or
  - —OR_{10}, —COR_{10}, —CO_2R_{10}, —$OCOR_{10}$, or —R_{10}, where R_{10} is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-, 3-, or 4-pyridylalkyl where each alkyl is lower alkyl; or
  - —$CONR_{11}R_{12}$ or —$(CH_2)_mNR_{11}R_{12}$, where m is 0, 1, or 2; R_{11}represents hydrogen, lower alkyl; and R_{12} is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-, 3-, or 4-pyridylalkyl where each alkyl is lower alkyl; or $NR_{11}R_{12}$ forms a heterocyclic group which is morpholinyl, piperidinyl, pyrrolidinyl, or N-alkyl piperazinyl;
- R_5 and R_6 are the same or different and represent hydrogen, halogen, lower alkyl, or lower alkoxy;
- R_7 is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-, 3-, or 4-pyridylalkyl where each alkyl is lower alkyl;
- R_8 is hydrogen or lower alkyl; and
- R_9 is —COR_{13}, —CO_2R_{13} or —R_{13}, where R_{13} is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-, 3-, or 4-pyridylalkyl where each alkyl is lower alkyl; or
- R_9 is —$CONR_{14}R_{15}$ or —$(CH_2)_kNR_{14}R_{15}$, where k is 0, 1, or 2; R_{14} represents hydrogen, lower alkyl; and R_{15} is hydrogen, phenyl, 2-, 3-, or 4-pyridyl, lower alkyl, or phenylalkyl or 2-,

3-, or 4-pyridylalkyl where each alkyl is lower alkyl; or $NR_{14}R_{15}$ forms a heterocyclic group which is morpholinyl, piperidinyl, pyrrolidinyl, or N-alkyl piperazinyl.

5,750,703

PIPERIDINE DERIVATIVES AND PROCESS FOR THEIR PRODUCTION

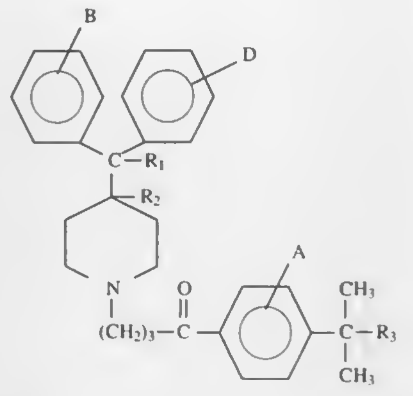
Thomas E. D'Ambra, Wynantskill, N.Y., assignor to Albany Molecular Research, Inc., Albany, N.Y.

Continuation of Ser. No. 83,102, Jun. 24, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 382,649

Int. Cl.^{6} C07D *211/22;211/40*

U.S. Cl. 546—240 12 Claims

1. A process of preparing a piperidine derivative compound of the formula:



wherein

R_1 is hydrogen or hydroxy;

R_2 is hydrogen;

or R_1 and R_2 taken together form a second bond between the carbon atoms bearing R_1 and R_2;

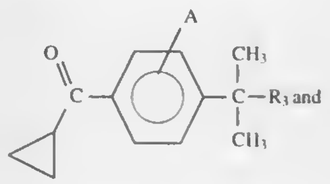
R_3 is —COOH or —$COOR_4$;

R_4 has 1 to 6 carbon atoms;

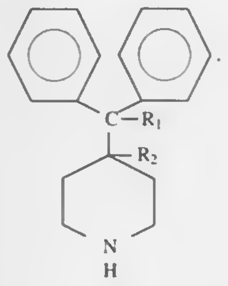
A, B, and D are the substituents of their aromatic rings, each of which may be different or the same, and are selected from the group consisting of hydrogen, halogens, alkyl, hydroxy, alkoxy, or other substituents,

said process comprising:

providing a substantially pure regioisomer of the following formula:



converting the substantially pure regioisomer to the piperidine derivative compound with a piperidine compound of the formula:



5,750,704

1-HETEROCYCLYMETHYL-2-HALONITROMETHYL-IMIDAZOLINES AND-TETRAHYDROPYRIMIDINES

Kozo Shiokawa, Kanagawa-ken; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

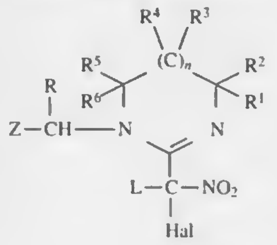
Division of Ser. No. 404,849, Mar. 15, 1995, which is a division of Ser. No. 169,902, Dec. 20, 1993, Pat. No. 5,428,032, which is a division of Ser. No. 67,642, May 25, 1993, Pat. No. 5,461,167, which is a division of Ser. No. 832,174, Feb. 6, 1992, Pat. No. 5,298,507, which is a division of Ser. No. 557,292, Jul. 24, 1990, Pat. No. 5,204,360, which is a division of Ser. No. 347,836, May 4, 1989, Pat. No. 5,001,138, which is a division of Ser. No. 68,991, Jul. 1, 1987, Pat. No. 4,845,106, which is a division of Ser. No. 821,621, Jan. 21, 1986, Pat. No. 4,742,060. This application Jun. 12, 1996, Ser. No. 662,096

Claims priority, application Japan, Feb. 4, 1985, 60-18627; Feb. 4, 1985, 60-18628; Feb. 12, 1985, 60-23683; May 21, 1985, 60-106853; May 21, 1985, 60-106854; Oct. 3, 1985, 60-219082

Int. Cl.^{6} C07D *401/06*

U.S. Cl. 546—275.1 5 Claims

1. A compound of the formula



in which

n is 0 or 1

R^1, R^2, R^5 and R^6 independently are a hydrogen atom or C_1–C_4 alkyl group

R^3 and R^4 independently are hydrogen, hydroxy or a C_1–C_4 alkyl group,

R is hydrogen,

L is halogen, phenylthio or an alkoxy carbonyl group

Hal is halogen, and

Z is a 5 to 6 membered heterocyclic group, containing one to three hetero atoms selected from the group consisting of an oxygen atom, a sulfur atom and a nitrogen atom, at least one of which is a nitrogen atom, which is optionally substituted by at least one member selected from the group consisting of a fluorine atom, a chlorine atom, a bromine atom, alkyl groups having 1 to 4 carbon atoms which is optionally substituted by a fluorine atom and/or a chlorine atom, a nitro group, a cyano group, alkylsulfinyl groups having 1 to 4 carbon atoms, alkylsulfonyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms which is optionally substituted by a fluorine atom and/or a chlorine atom, alkylthio groups having 1 to 4 carbon atoms which is optionally substituted by a fluorine atom and/or a chlorine atom, alkenyl groups having 2 to 3 carbon atoms which is optionally substituted by a chlorine atom, an acetamide group which may be substituted by a fluorine atom and/or a chlorine atom, alkoxycarbonyl groups having an alkyl with 1 to 4 carbon atoms, a thiocyanato group, alkynyl groups having 2 to 4 carbon atoms, an amino group, a methylamino group, a dimethylamino group, an acetyl group, a formyl group, a carboxy group, a hydroxy group, a mercapto group, cycloalkyl groups having 3 to 7 carbon atoms, an oxo group, a thioxo group, alkenylthio groups substituted by a fluorine atom, a chlorine atom and/or a bromine atom, alkoxyalkyl groups having 2 to 4 carbon atoms in total, alkylaminocarbonyl groups having an alkyl with 1 to 2 carbon atoms, dialkylaminocarbonyl groups having an alkyl with 1 to 2 carbon atoms, a phenyl group, a phenoxy group and a benzyl group.

5,750,705

SUBSTITUTED TRIFLUOROMETHYLPYRIDLINES

Gerhard Hamprecht, Weinheim; Elisabeth Heistracher, Mannheim; Ralf Klintz, Grünstadt; Peter Schäfer, Ottersheim, and Cyrill Zagar, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

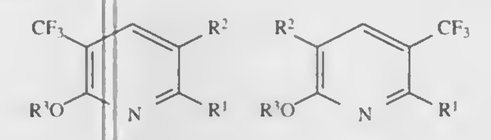
Filed Aug. 12, 1996, Ser. No. 695,475

Claims priority, application Germany, Aug. 21, 1995, 195 30 605.8

Int. Cl.^{6} C07D *213/77;* **A61K** *31/44;* **A01N** *43/40*

U.S. Cl. 546—297 12 Claims

1. A substituted trifluoromethylpyridine of the general formula Ia or Ib



Ia Ib

where the substituents have the following meanings:

R^1 is amino or hydrazino,

R^2 is halogen; and

R^3 is C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl, it being possible for these groups to have attached to them up to 6 halogen atoms,

C_3–C_6-cycloalkyl which can have attached to it up to 3 C_1–C_3-alkyl radicals,

C_1–C_6-cyanoalkyl, C_1–C_4-alkoxy-C_2–C_6-alkyl, 3-oxetanyl, carboxyl-C_1–C_6-alkyl, C_1–C_6-alkoxycarbonyl-C_1–C_6-alkyl, C_1–C_4-alkoxy-C_2–C_4-alkoxycarbonyl-C_1–C_6-alkyl, aminocarbonyl-C_1–C_6-alkyl, C_1–C_4-alkylaminocarbonyl-C_1–C_6-alkyl, C_1–C_4-dialkylaminocarbonyl-C_1–C_6-alkyl, C_2–C_4-alkenylaminocarbonyl-C_1–C_6-alkyl, C_3–C_4-alkynylaminocarbonyl-C_1–C_6-alkyl, C_1–C_4-alkyl-C_3–C_4-alkenylaminocarbonyl-C_1–C_6-alkyl, C_1–C_4-alkyl-C_3–C_4-alkynylaminocarbonyl-C_1–C_6-alkyl, C_3–C_6-(α-alkylalkylidene)iminoxy-C_2–C_6-alkyl, cyclopropylmethyl, C_1–C_6-alkylamino, C_1–C_6-dialkylamino, C_1–C_6-alkylideneimino- or α-(C_1–C_4-alkyl)-C_2–C_6-alkylideneimino; and

halogen is fluorine, chlorine, bromine or iodine.

5,750,706

AZEPANES AND THEIR RING HOMOLOGUES HAVING PROTEIN KINASE INHIBITING ACTIVITY

Pierre Barbier, Rixheim, France; Isabelle Huber, Geneva, Switzerland; Fernand Schneider; Josef Stadlwieser, both of Basel, Switzerland, and Sven Taylor, Riedisheim, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

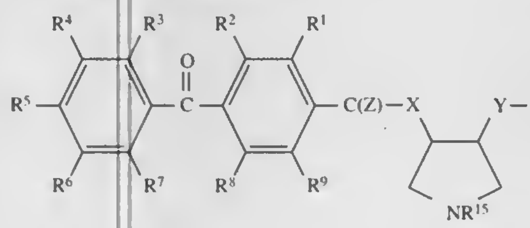
Division of Ser. No. 368,690, Jan. 4, 1995, Pat. No. 5,583,222. This application Sep. 3, 1996, Ser. No. 706,896

Claims priority, application France, Jan. 12, 1994, 94 088

Int. Cl.^{6} C07D *207/12;401/12*

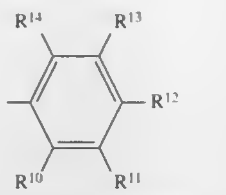
U.S. Cl. 546—279.1 20 Claims

1. A compound of the formula:



wherein

A is a residue



A¹

2-, 3- or 4-pyridyl or 2- or 3-piperazinyl, or 2-, 3- or 4-pyridyl or 2- or 3 -piperazinyl substituted by one or more lower-alkyl, lower-alkoxy and hydroxy groups;

X and Y each independently are oxygen or NH, but are not both NH;

Z is oxygen or, where X is oxygen, oxygen or H,H;

R^1 is hydrogen;

R^2 is hydrogen or fluorine;

R^3 is hydrogen, hydroxy, lower-alkoxy, fluorine, trifluoromethyl, lower-alkoxycarbonyl, tetrazolyl or tetrazolyl substituted by lower-alkyl, benzyl, cyanomethyl or carbamoyl-methyl;

R^4 is hydrogen, hydroxy, lower-alkoxy, lower-alkyl, chlorine, fluorine, trifluoromethyl, acetyl, di-lower-akylamino, or lower-alkoxy-lower-alkyl, lower-alkylthio, lower-alkylsulphonyl, phenyl, pyrrolidinyl or piperidinyl;

R^5 is hydrogen, lower-alkoxy, fluorine or trifluoromethyl;

R^6 is hydrogen, hydroxy, lower-alkoxy, fluorine, 2,4-difluorophenyl, lower-alkoxy-lower-alkyl, lower-alkanoyl, benzoyl, nitrilo, trifluoromethyl, cyclo-lower-alkyl, 2- or 4-thiazolyl, 2-thiazolidinyl, 2-oxazolyl, 2-oxazolidinyl, or 2- or 4-imidazolyl;

R^7 is hydrogen, hydroxy, lower-alkoxy, amino or fluorine;

R^6 and R^7 together are a residue —N=CH—CH=N— or —$N(CH_3)CH_2CH_2N(CH_3)$—;

R^8 is hydrogen or fluorine;

R^9 is hydrogen;

R^{10} is hydrogen, hydroxy, lower-alkoxy or lower-alkyl;

R^{11} is hydrogen, lower-alkoxy, lower-alkyl, fluorine or bromine;

R^{12} is hydrogen, hydroxy, lower-alkoxy, carboxy, lower-alkoxycarbonyl or amino;

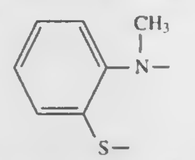
R^{13} is hydrogen, hydroxy, lower-alkoxy, lower-alkyl, acetyl or fluorine;

R^{14} is hydrogen, lower-alkyl or fluorine;

R^{15} is hydrogen or amidino;

R^3 and R^4 together are a residue —CH=CH—CH=CH— or ethylenedioxy;

R^4 and R^5 together are a residue —CH=CH—CH=CH—, tetra-methylene, methylenedioxy, ethylenedioxy or a residue —N=CH—CH=CH— or a residue (a)



(a)

in which the sulfur atom is bonded at the R^5 position; and

R^{12} and R^{13} together are a residue —CH=CH—CH=CH— or —C(OH)=CH—CH=CH— in which the carbon atom carrying the hydroxy group is bonded at the R^{12} position;

and pharmaceutically acceptable salts thereof.

5,750,707

SEPARATION OF THE ENANTIOMERS OF AMLODIPINE VIA THEIR DIASTEREOMERIC TARTRATES

Peter Lionel Spargo, Sandwich, United Kingdom, assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP95/00847, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO95/25722, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 6, 1995, Ser. No. 704,612

Claims priority, application United Kingdom, Mar. 24, 1994, 9405833

Int. Cl.^{6} C07D *213/80;213/803*

U.S. Cl. 546—321 4 Claims

1. (S)-(−)-Amlodipine-hemi-D-tartrate-mono-DMSO-solvate.
2. (R)-(+)-Amlodipine-hemi-L-tartrate-mono-DMSO-solvate.

5,750,708

PYRIDINE COMPOUNDS INTERMEDIATES PROCESSES COMPOSITIONS AND METHODS

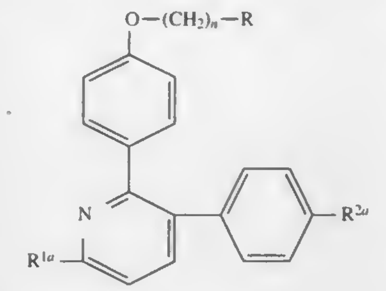
Henry Uhlman Bryant, Indianapolis; Don Richard Finley, Greenwood, and Ken Matsumoto, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 683,326, Jul. 18, 1996, Pat. No. 5,672,609. This application Apr. 15, 1997, Ser. No. 838,098

Int. Cl.^{6} C07D *213/02*

U.S. Cl. 546—334 **4 Claims**

1. A process for preparing a compound of Formula Ia:



Ia

wherein:

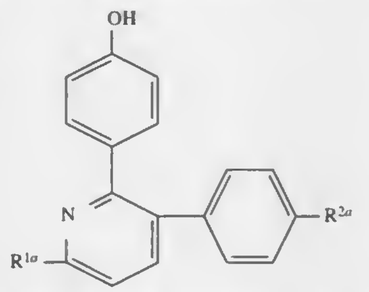
n is 2 or 3;

R is dimethylamino, diethylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, or 1-hexamethyleneimino;

R^{1a} is hydrogen, loweralkyl of C_1–C_4, phenyl, or mono- or disubstituted phenyl wherein each substituent is independently halo, methyl, C_1–C_6-alkoxy, benzyloxy, C_1–C_6-alkanoyloxy, benzoyloxy, substituted benzoyloxy bearing 1 to 3 substituents each of which is independently halo, C_1–C_4-loweralkyl, or C_1–C_4-loweralkoxy, C_1–C_5-alkoxycarbonyloxy, or C_4–C_6-alkylsulfonyloxy;

R^{2a} is hydrogen, C_1–C_6-alkoxy, benzyloxy, C_1–C_6 alkanoyloxy, benzoyloxy, substituted benzoyloxy bearing 1 to 3 substituents each of which is independently halo, C_1–C_4-loweralkyl, or C_1–C_4-loweralkoxy, C_1–C_5-alkoxycarbonyloxy, or C_4–C_6-alkysulfonyloxy,

which comprises reacting a compound of Formula II:



II

with an alkyl chloride of the formula Cl—$(CH_2)_n$—R, in an inert solvent, in the presence of base, and at a temperature of from 0° to 100° C.

5,750,709

METHOD AND APPARATUS FOR ISOLATING THERAPEUTIC COMPOSITIONS FROM SOURCE MATERIALS

Trevor P. Castor, Arlington, Mass., assignor to Alphios Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 30,696, Mar. 12, 1993, Pat. No. 5,440,055. This application Jan. 31, 1995, Ser. No. 381,456

Int. Cl.^{6} C07D *211/70;207/06;409/00*

U.S. Cl. 546—348 **21 Claims**

1. A method of extracting natural therapeutic compositions from source materials comprising the steps:

a) dewaxing, defatting or deoiling the source material by subjecting said source material to first fluid, which first fluid is comprised of a supercritical, critical or near critical fluid, said waxes, fats and oils dissolving in the first fluid to form a wax, fat or oil laden extractant and a dewaxed, defatted or deoiled source material;

b) subjecting said dewaxed, defatted or deoiled source material to a second fluid said second fluid comprising a critical or near critical fluid and a polar cosolvent, to form an extractant containing said natural therapeutic composition and waste material;

c) separating said natural therapeutic composition from impurities in said extractant through chromatography means to produce a natural therapeutic composition and an eluant.

5,750,710

NITRONES WHICH ARE USABLE FOR THE SCAVENGING OF FREE RADICALS

Claudine Marie Clemence Barbe Frejaville, Aix En Provence; Hakim Karoui; Francois Le Moigne, both of Marseille; Marcel Culcasi; Sylvia Pietri, both of Montpellier, and Paul Tordo, Marseille, all of France, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France

PCT No. PCT/FR94/00909, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO95/03314, PCT Pub. Date Feb. 2, 1995

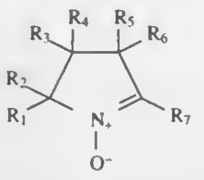
PCT Filed Jul. 20, 1994, Ser. No. 403,783

Claims priority, application France, Jul. 20, 1993, 93/08906

Int. Cl.^{6} C07F *9/141*

U.S. Cl. 548—111 **4 Claims**

1. A compound of general formula I:

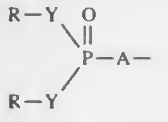


I

in which:

R_1 represents a phenyl or alternatively a C_1–C_{18} alkyl,

R_2 represents a hydrogen or deuterium atom, a phenyl or $(C_1$–$C_{18})$ alkyl group or a radical Z of formula



Z

in which

A is a single bond, a methylene group of an oxamethylene group (in which the oxeygen atom is linked to the phosphorus atom of the radical Z), Y represents an oxygen atom and R represents a hydrogen atom, a $(C_1$–$C_{18})$ alkyl or a $(C_6$–$C_{18})$ aryl, or alternatively Y represents a methylene group and R represents a hydorgen atom, a $(C_1$–$C_{17})$ alkyl or a $(C_6$–$C_{18})$ aryl,

R_3, R_4 and R_5 represent, independently of one another, a hydorgen or deuterium atom of a phenyl or $(C_1$–$C_{18})$ alkyl group, and

R_6 represent a hydrogen or deuterium atom, a phenyl or $(C_1$–$C_{18})$ alkyl group of said radical Z

R_7 representing a hydrogen or deuterium atom or a methyl group, with the proviso the one of the groups R_2 and R_6 must represent said radical Z, whereas the other of the groups R_2 and R_6 cannot represent said radical Z; as well as their corresponding physiologically acceptable salts obtained by the action of an inorganic or organic base.

5,750,711

DICARBOXYLIC ACID DERIVATIVES

Racai Sezi; Hellmut Ahne, both of Röttenbach, and Eberhard Kuehn, Hemhofen, all of Germany, assignors to Siemens Aktiengesellschaft, Müchen, Germany

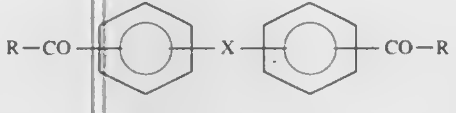
Filed Aug. 28, 1996, Ser. No. 704,213

Claims priority, application Germany, Aug. 31, 1995, 195 32 138.3

Int. Cl.^{6} C07C *231/10;381/10;67/08;* C08G *63/16*

U.S. Cl. 548—165 **3 Claims**

1. A process for making a dicarboxylic acid compound having the structure:

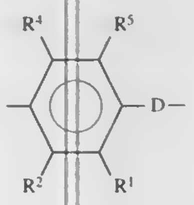


wherein

X=O,S, $(CF_2)_m$, $C(CF_3)_2$ or CF_2—$CF(CF_3)$, and

m=1 to 10;

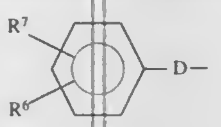
R is



wherein

D is O, S or NH, and

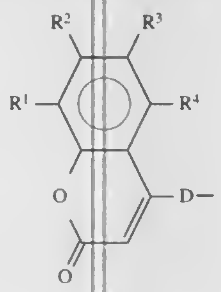
R^1, R^2, R^3, R^4, R^5 are independently H, F, CH_3 or CF_3 with the proviso that at least one of groups R^1 to R^5 is F or CF_3 and at the most two of groups R^1 to R^5 are CH_3 or CF_3;



where

D is O, S or NH, and

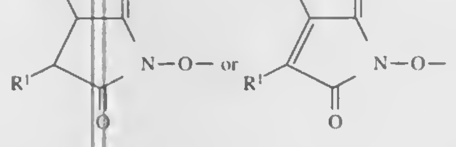
R^6, R^7 are independently H, F, CH_3, CF_3, CN or NO_2 with the proviso that at least one of groups R^6 and R^7 is CN or NO_2;



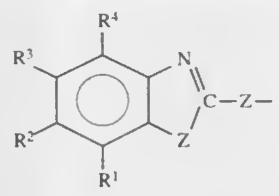
wherein

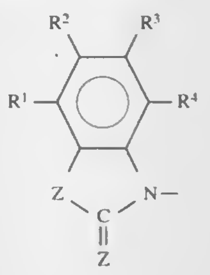
D is O, S or NH, and

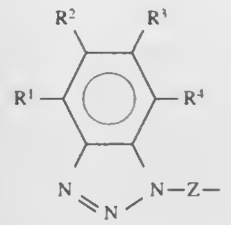
R^1, R^2, R^3, R^4 are independently H, F, CH_3 or CF_3, with the proviso that at the most two of groups R^1 to R^4 are CH_3 or CF_3;



wherein R^1 and R^2 are independently H, F, CH_3 or CF_3;



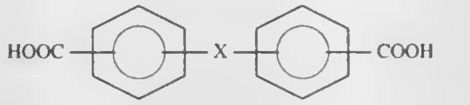




wherein

Z=O or S, and

R^1, R^2, R^3, R^4 are independently H, F, CH_3 or CF_3 with the proviso that at the most two of groups R^1 to R^4 are CH_3 or CF_3, comprising reacting a dicarboxylic acid having the structure



with a compound having the structure

R—H

in the presence of a carbodiimide.

5,750,712

2-(N-CYANOIMINO)-THIAZOLIDIN-4-ONE DERIVATIVES

Fumio Yoneda; Mayumi Watanabe; Masatoshi Sakae; Masanori Katsurada, and Takaaki Sabato, all of c/o Fujimoto Pharmaceutical Co., Ltd., 3-40, Nishiotuka 1-chome, Matsubara-shi, Osaka 580, Japan

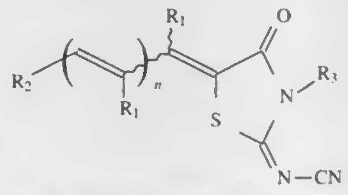
Filed Jun. 21, 1995, Ser. No. 493,152

Claims priority, application Japan, Jul. 29, 1994, 6-209067

Int. Cl.^{6} C07D *277/34*

U.S. Cl. 548—186 **9 Claims**

1. 2-(N-cyanoimino)-thiazolidin-4-one compounds of the formula(1):



(1)

wherein R_1s are the same or different and each represents hydrogen or alkyl having 1 to 4 carbon atoms; R_2 is phenyl, naphthyl or either phenyl or naphthyl substituted with at least one hydroxyl. alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms; R_3 is hydrogen alkyl having 1 to 4 carbon atoms or CH_2COOR_4 in which R_4 is hydrogen or alkyl having 1 to 12 carbon atoms; n is 0 or 1 and the configuration of 5-methylene group includes both E-isomer and Z-isomer, excepting the case wherein R_1 is hydrogen or methyl, R_2 is 3.5-di-t-butyl-4-hydroxyphenyl, R_3 is hydrogen and n is 0 or pharmacologically acceptable salts of the acidic form of said compounds when R_3 or R_4 is hydrogen.

5,750,713
STEREOSELECTIVE METHOD FOR SYNTHESIZING DOLAPHENINE

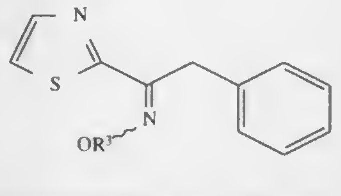
Xiaoyong Sun, Acton; Yesh P. Sachdeva, Concord; Donna Kaye Wilson, Billerica; Richard L. Gabriel, Swampscott, and Siya Ram, Winchester, all of Mass., assignors to Pharm-Eco Laboratories, Inc., Lexington, Mass.

Continuation of Ser. No. 467,013, Jun. 6, 1995, abandoned.
This application Aug. 18, 1997, Ser. No. 916,721
Int. Cl.^{6} C07D *277/28*

U.S. Cl. 548—202 **6 Claims**

2. A method of stereoselectively forming S-dolaphenine or R-dolaphenine, comprising the steps of:

a) reacting benzyl 2-thiazole ketone with R^3ONH_2 or a salt thereof, wherein R^3 is an alkyl or aryl radical, to form syn and anti isomers of an oxime represented by the following structural formula:



b) separating the syn and anti isomers of the oxime formed in step a); and

c) reacting the syn isomer of the oxime with a reducing solution formed by mixing (−)-norephedrine with borane complexed with an aprotic solvent, or reacting the anti isomer of the oxime with a reducing solution formed by mixing (+)-norephedrine with borane complexed to stereoselectively form S-dolaphenine; or

d) reacting the anti isomer of the oxime with a reducing solution formed by mixing (−)-norephedrine with borane complexed with an aprotic solvent, or reacting the syn isomer of the oxime with a reducing solution formed by mixing (+)-norephedrine with borane complexed to stereoselectively form R-dolaphenine.

5,750,714
PROCESS FOR THE MANUFACTURE OF RELATED INTERMEDIATES INCLUDING CISTOFUR

K.S. Keshava Murthy; Gamini Weeratunga; Bruno Konrad Radatus, and Kanwar Pal Singh Sidhu, all of Brantford, Canada, assignors to Brantford Chemicals Inc., Brantford, Canada

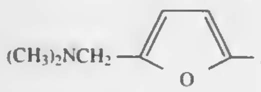
Filed Dec. 13, 1995, Ser. No. 571,653
Int. Cl.^{6} C07D *277/28*

U.S. Cl. 548—205 **18 Claims**

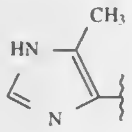
1. A process of manufacture of

$R—CH_2—S—CH_2—CH_2—NH_2.2HCl$

wherein R is selected from the group consisting of



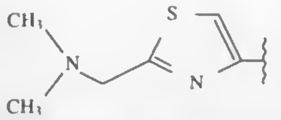
(a)



(b)

-continued

and



(c)

is provided, the said process comprising reacting $R—CH_2OH.HCL$ with $HSCH_2CH_2NH_2HCl$ in a suitable solvent selected from the group consisting of an alkanol in the presence of an effective amount of Hydrochloric acid.

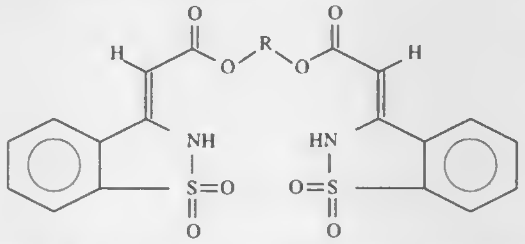
5,750,715
BIS[(1,2-BENZISOTHIAZOL-3(2H)-YLIDENE 1,1-DIOXIDE)ACETATES] CHARGE-CONTROL AGENTS

John C. Wilson, and Robert D. Fields, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1997, Ser. No. 818,668
Int. Cl.^{6} C07D *417/12*

U.S. Cl. 548—209 **4 Claims**

1. A bis[(1,2-benzisothiazol-3(2H)-ylidene 1,1-dioxide)acetate] having the general structure (I):



(I)

wherein R represents C_2 to C_{18} alkylene; arylenedialkylene; alkylenediarylene; bis(alkyleneoxyaryl)alkane; diphenylene; bis(alkyleneoxyaryl); and arylene.

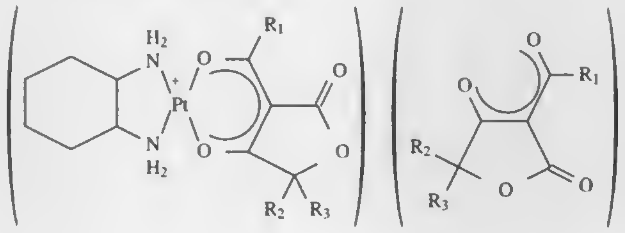
5,750,716
METHOD OF PRODUCING PLATINUM (II) COMPLEX

Kawai Hideki; Imaoka Takayuki, and Hata Go, all of Kanagawa, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP96/01142, § 371 Date Jan. 31, 1997, § 102(e) Date Jan. 31, 1997, PCT Pub. No. WO96/34000, PCT Pub. Date Oct. 31, 1996
PCT Filed Apr. 25, 1996, Ser. No. 750,987
Claims priority, application Japan, Apr. 25, 1995, 7/101226; May 9, 1995, 7/110854
Int. Cl.^{6} C07D *205/00;* **C07F** *15/00*

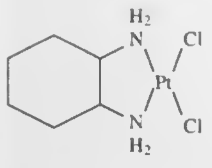
U.S. Cl. 549—210 **6 Claims**

1. A method of producing a platinum (II) complex represented by the following formula (A):



(A)

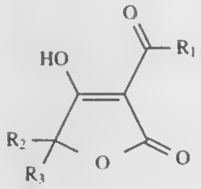
which comprises reacting dichloroplatinum (II) complex represented by the following formula (B):



(B)

(B)

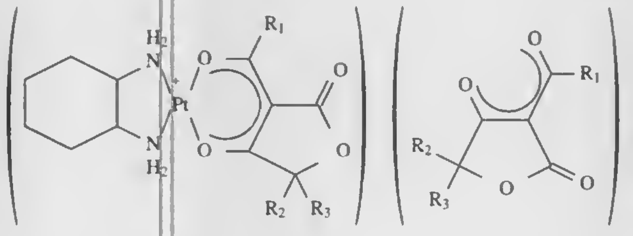
and a tetronic acid derivative represented by the following formula (C):



(C)

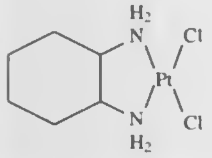
wherein R_1 represents a lower hydrocarbon group having 1 to 3 carbon atoms, and R_2 and R_3 each represents a hydrocarbon atom or a lower hydrocarbon group having 1 to 3 carbon atoms in the presence of a silver salt and a barium salt.

6. A method of producing a platinum complex represented by the following formula (A):



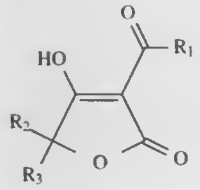
(A)

which comprises reacting an optically active 1-trans-1,2-diaminocyclohexane with potassium chloroplatinate to produce a dichloroplatinum (II) complex represented by the following formula (B):



(B)

and reacting with a tetronic acid derivative represented by the following formula (C):



(C)

in the presence of a silver salt and a barium salt.

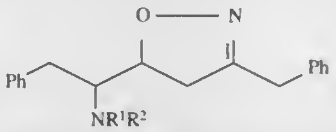
5,750,717
2-ISOXAZOLINE DERIVATIVE AND PROCESS FOR PRODUCING THE SAME, AND PROCESS FOR PRODUCING RELATED DERIVATIVES FROM THE SAME

Yoshiyuki Murai, Tsukuba; Masahiro Nishikawa; Yoichiro Ueda, both of Tsuba; Osamu Onomura, Tsukuba, and Ichiro Takase, Arai, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP95/00331, § 371 Date Sep. 3, 1996, § 102(e) Date Sep. 3, 1996, PCT Pub. No. WO95/23793, PCT Pub. Date Sep. 8, 1995
PCT Filed Mar. 2, 1995, Ser. No. 702,582
Claims priority, application Japan, Mar. 2, 1994, 6-056639; Jul. 13, 1994, 6-183973
Int. Cl.^{6} C07D *261/04*

U.S. Cl. 548—240 **31 Claims**

1. A 2-isoxazoline compound represented by the following formula [1] or an acid addition salt thereof:



[1]

wherein Ph represents phenyl; and each of R^1 and R^2 independently represents hydrogen, acyl, alkyloxycarbonyl, arylalkyloxycarbonyl, aryloxycarbonyl, alkylaminocarbonyl, arylalkylaminocarbonyl, arylaminocarbonyl, alkyl, arylalkyl, aryl, alkylsulfonyl, arylalkylsulfonyl, or arylsulfonyl, or R^1 and R^2 are linked to each other to represent divalent acyl.

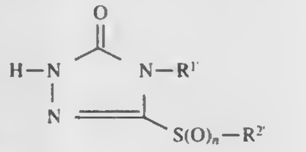
5,750,718
INTERMEDIATES FOR HERBICIDAL SULPHONYLAMINOCARBONLYLTRIAZOLINONES HAVING SUBSTITUENTS WHICH ARE BONDED VIA SULPHUR

Klaus-Helmut Müller, Düsseldorf; Peter Babczinski, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach; Kurt Findeisen, Leverkusen; Markus Lindig, Langenfeld; Klaus Lürssen, Bergisch-Gladbach, and Harry Strang, Düsseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 295,446, Aug. 24, 1994, Pat. No. 5,599,944, which is a continuation-in-part of Ser. No. 125,975, Sep. 23, 1993, Pat. No. 5,523,409, and a continuation-in-part of Ser. No. 136,429, Oct. 13, 1993, Pat. No. 5,380,863, said Ser. No. 125,975 is a division of Ser. No. 868,065, Apr. 13, 1992, Pat. No. 5,262,389, which is a division of Ser. No. 741,702, Aug. 6, 1991, Pat. No. 5,166,356, which is a division of Ser. No. 168,823, Mar. 16, 1988, Pat. No. 5,061,311, said Ser. No. 136,429 is a division of Ser. No. 870,867, Apr. 20, 1992, Pat. No. 5,276,162, which is a division of Ser. No. 777,824, Oct. 15, 1991, Pat. No. 5,149,356, which is a division of Ser. No. 596,845, Oct. 12, 1990, Pat. No. 5,085,684. This application Oct. 11, 1996, Ser. No. 729,126
Claims priority, application Germany, Mar. 24, 1987, 37 09 574.9; Sep. 5, 1988, 38 15 765.9; Oct. 12, 1989, 39 34 081.3; Nov. 3, 1989, 39 36 623.5; Nov. 3, 1989, 39 36 622.7
Int. Cl.^{6} C07D *249/12*

U.S. Cl. 548—263.6 **6 Claims**

1. A triazolinone of the formula



(IIa)

in which

n is 0 (zero),
$R^{1'}$ is $NH—CH_3$, and
$R^{2'}$ is CH_3, C_2H_5, C_3H_7, $CH(CH_3)_2$ or $CH_2—CH{=}CH_2$.

5,750,719

COMMERCIAL PROCESS FOR THE MANUFACTURE OF FLUCONAZOLE AND INTERMEDIATES USEFUL IN THE MANUFACTURE THEREOF

Keshava K.S. Murthy; Gamini Weeratunga, both of Brantford; Derek John Norris, Oakville; Stephen Edward Horne, Burlington, and Derrick L.J. Clive, Edmonton, all of Canada, assignors to Brantford Chemicals Inc., Brantford, Canada

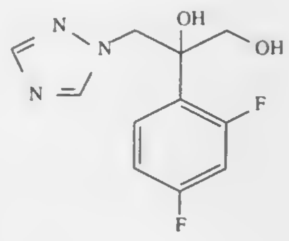
Filed Jun. 6, 1995, Ser. No. 465,710

Claims priority, application Canada, Dec. 23, 1994, 2139079

Int. Cl.^{6} C07D *249/08*

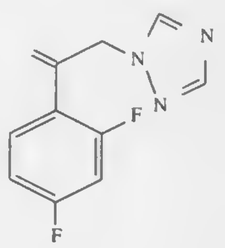
U.S. Cl. 548—268.6 **2 Claims**

1. A process of producing a compound of the formula:



6

by reacting a compound of the formula:



5

with potassium permanganate.

5,750,720

4-[(THIEN-3-YL)METHYL]-IMIDAZOLE ANALGESICS

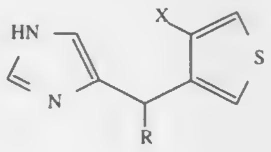
Robert E. Boyd, Horsham; Chris Royce Rasmussen, Lansdale, both of Pa., and Jeffrey B. Press, Brewster, N.Y., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 28, 1996, Ser. No. 625,442

Int. Cl.^{6} C07D *411/06*

U.S. Cl. 548—315.1 **4 Claims**

1. A compound of the formulae:



wherein

R is hydrogen or methyl, and

X is C_{1-4}alkyl, bromine or chlorine.

5,750,721

1,3-DIMETHYL-5-FLUORO-PYRAZOLE-4-CARBONYL FLUORIDE

Bernd Gallenkamp; Lothar Rohe, both of Wuppertal, and Albrecht Marhold, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

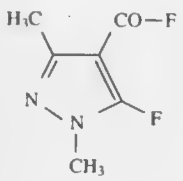
Division of Ser. No. 755,678, Nov. 25, 1996, Pat. No. 5,675,016. This application Apr. 9, 1997, Ser. No. 838,660

Claims priority, application Germany, Dec. 1, 1995, 195 44 800.6

Int. Cl.^{6} C07D *231/16*

U.S. Cl. 548—374.1 **1 Claim**

1. 1,3-Dimethyl-5-fluoro-pyrazole-4-carbonyl fluoride of the formula



5,750,722

METHOD FOR THE PREPARATION OF HIGH PURITY SUBSTITUTED BENZ [E] INDOLES AND THE ALKALINE SALTS THEREOF

Anh Hoa Huynh, Paris; Joanne Tran, Argenteuil; François Scherninski, and Jean-Paul Guette, both of Paris, all of France, assignors to Societe D'etudes et de Recherches Biologiques, Paris, France

PCT No. PCT/FR94/01077, § 371 Date Jun. 11, 1996, § 102(e) Date Jun. 11, 1996, PCT Pub. No. WO95/07888, PCT Pub. Date Mar. 23, 1995

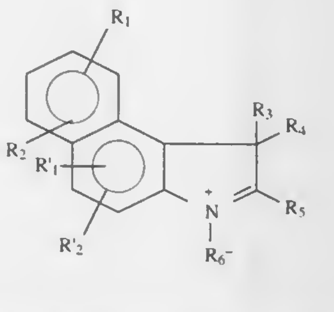
PCT Filed Sep. 14, 1994, Ser. No. 617,897

Claims priority, application France, Sep. 17, 1993, 93 11121

Int. Cl.^{6} C07D *209/56;* **A61K** *49/00;31/40*

U.S. Cl. 548—427 **9 Claims**

1. Method for preparing a substituted benz[e]indole containing less than 0.5% of residual impurities and corresponding to the formula:



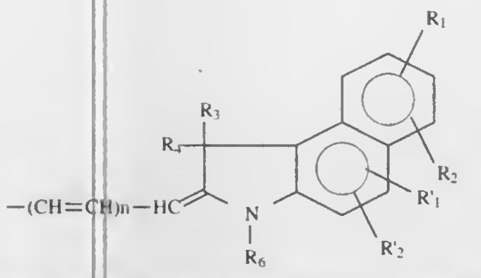
(I)

in which

R_1, R_2, R'_1, R'_2, R_3 and R_4, which are identical to or different from each other, represent a hydrogen atom, a C_1 to C_{12} alkyl group, a C_1 to C_4 sulphoalkyl, cycloalkyl or alkoxyl group, an aryl or aroxyl group, or a halogen atom, and

R_6 represents a C_1 to C_7 sulphoalkyl, haloalkyl or hydroxycarbonylalkyl group,

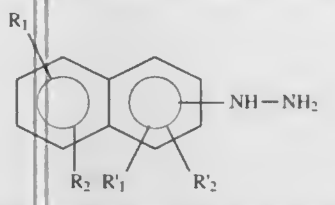
R_5 represents a hydrogen atom, a C_1 to C_{12} alkyl group, a C_1 to C_4 sulphoalkyl, cycloalkyl or alkoxyl group, an aryl or aroxyl group, a halogen atom or a group of formula:



(I')

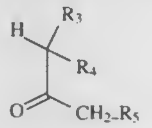
in which n represents an integer from 1 to 7, the said method successively comprising:

preparing an arylhydrazine of the following formula:



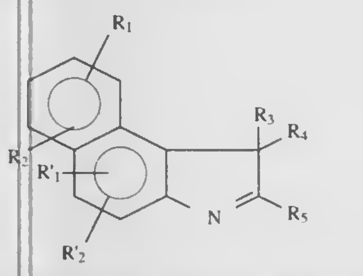
(III)

by reacting hydrazine with the corresponding aryl hydroxyl, carrying out a Fischer indole synthesis between the arylhydrazine of formula (III) and a ketone of formula:



(IV)

to obtain a benz[e]indole of formula:

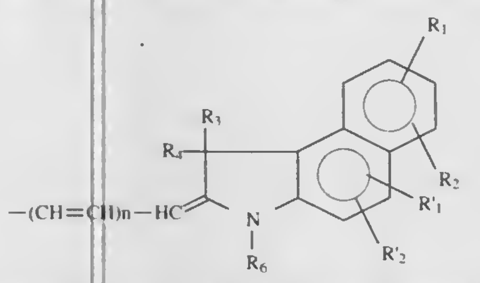


(V)

forming the sulphonic derivative of the benz[e]indole of formula (I) by reacting the benz[e]indole of formula (V) with a molecule comprising the radical R_6,

converting the thus prepared benz[e]indole of formula (I) into a soluble alkaline salt by reaction with an alkaline alkoxide or an alkaline salt of an organic acid, the alkaline salt thus obtained being freed of its residual impurities by extraction using acetone or an apolar solvent whose boiling point is close to that of acetone,

with the proviso that when R_5 represents the group of formula:



(I')

the sulphonic derivative of the benz[e]indole of formula (I) is first reacted with glutaconic aldehyde dianilide hydrochloride, and the product thus obtained is reached with a second molecule of the above-mentioned sulphonic derivative of the benz[e]indole of formula (I).

9. Indocyanine Green free of iodide ions, of traces of carcinogenic amines and of toxic solvents, containing less than 0.5% of residual impurities.

5,750,723

POLYMERIZABLE DIKETOPYRROLOPYRROLES AND POLYMERS PREPARED THEREWITH

Sameer Hosam Eldin, Courtepin; Abul Iqbal, Arconciel; Zhimin Hao, and Bernd Lamatsch, both of Marly, all of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

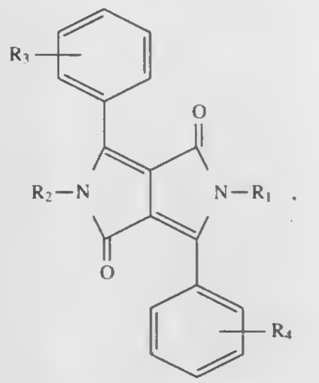
Filed Jan. 29, 1997, Ser. No. 789,895

Claims priority, application Switzerland, Jan. 30, 1996, 228/96

Int. Cl.^{6} C07D *487/04*

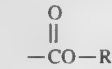
U.S. Cl. 548—453 **7 Claims**

1. A 1,4-diketopyrrolopyrrole of the formula



(I)

in which R_1 and R_2 independently of one another are hydrogen, C_{12}–C_{24}alkyl, C_6–C_{24}alkyl which is interrupted one or more times by O or S, or are a group of the formula



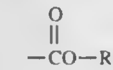
$$-\overset{\overset{\displaystyle O}{\|}}{C}O-R_5,$$

in which R_5 is C_4–C_{18}alkyl or C_5–C_{10}cycloalkyl,

R_3 is a polymerizable reactive group,

R_4, if R_1 and R_2 are hydrogen, is C_6–C_{24}alkyl which is attached directly or by way of O or S to the benzene ring and is uninterrupted or is interrupted one or more times by O or S, and

R_4, if R_1 and/or R_2 are C_{12}–C_{24}alkyl, is C_6–C_{24}alkyl which is interrupted one or more times by O or S or is a group



$$-\overset{\overset{\displaystyle O}{\|}}{C}O-R_5,$$

hydrogen, halogen, methyl, methoxy, CN or phenyl, or is the same as R_3.

5,750,724

INDOLEALKYL DERIVATIVES OF BENZODIOXANMETHYLAMINE

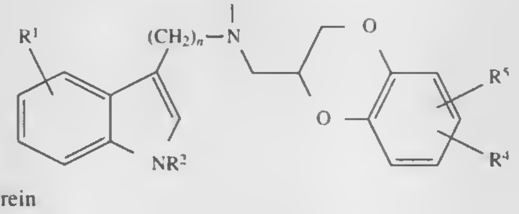
Young H. Kang, Robbinsville, N.J., and Gary P. Stack, Ambler, Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Oct. 30, 1996, Ser. No. 739,912

Int. Cl.^{6} C07D *405/00*

U.S. Cl. 548—454 **27 Claims**

1. A compound of formula I:



I

wherein

R^1, R^4 and R^5 are, independently, hydrogen, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, aralkoxy of 7 to 12 carbon atoms, alkanoyloxy of 2 to 6 carbon atoms, hydroxy, halo, trifluoromethyl, amino, mono- or di-alkylamino in which each alkyl group has 1 to 6 carbon atoms, alkanamido of 2 to 6 carbon atoms, or alkanesulfonamido of 1 to 6 carbon atoms; or,

R^1 is defined as above and R^4 and R^5, taken together, are ortho substituted methylenedioxy, ethylenedioxy, or propylenedioxy;

R^2 and R^3 are, independently, hydrogen or alkyl of 1 to 6 carbon atoms;

n is 3 or 4;

or a pharmaceutically acceptable salt thereof.

5,750,725

HEMOGLOBIN CROSSLINKERS

A. Seetharama Acharya; Belur N. Manjula, both of Cresskill, N.J., and Paul K. Smith, Roscoe, Ill., assignors to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva, Bronx, N.Y.

Division of Ser. No. 425,137, Apr. 19, 1995, Pat. No. 5,585,484. This application Sep. 26, 1996, Ser. No. 720,250

Int. Cl.^{6} C07D *403/12;* **A61K** *31/40*

U.S. Cl. 548—545 9 Claims

1. A compound having the formula:

$$Y—R—CH_2—CH_2—[O—CH_2—CH_2]_n—R'—Y'$$

wherein n is an integer from about 5 to about 200; R is carbamate, urea, or amide; R' is carbamate, urea, amide, or oxygen; Y is 4-phenylmalemimido or 3-phenylmaleimido; and Y' is 4-phenylmalemimido, 3-phenylmaleimido, methyl or hydrogen.

5,750,726

PROCESS FOR THE MANUFACTURE OF 2-ARYL-5-PERFLUOROALKYLPYRROLE DERIVATIVES AND INTERMEDIATES USEFUL THEREFOR

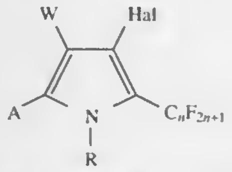
Venkataraman Kameswaran, Princeton Junction, N.J., assignor to American Cyanamid Company, Madison, N.J.

Filed Jun. 27, 1997, Ser. No. 883,768

Int. Cl.^{6} C07D *207/34;255/40*

U.S. Cl. 548—561 11 Claims

1. A process for making a compound of formula IV



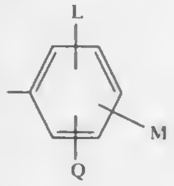
(IV)

wherein R is hydrogen or C_1–C_6alkyl optionally substituted with one C_1–C_4alkoxy or phenyl group;

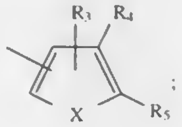
n is an integer of 1, 2, 3, 4, 5, 6, 7 or 8;

W is CN, NO_2, $COOR_1$, or COR_2;

A is



or



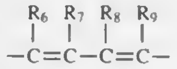
;

L is hydrogen or halogen;

M and Q are each independently hydrogen, halogen, CN, NO_2, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl or when M and Q are on adjacent positions they may be taken together with the carbon atoms to which they are attached to form a ring in which MQ represents the structure $—OCH_2O—$, $—OCF_2O—$ or $—CH{=}CH—CH{=}CH—$;

R_1 and R_2 are each independently C_1–C_4alkyl;

R_3, R_4, and R_5 are each independently hydrogen, halogen, NO_2, CHO or R_4 and R_5 may be taken together with the atoms to which they are attached to form a ring in which R_4R_5 is represented by the structure

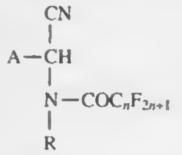


$$-\overset{R_6}{\overset{|}{C}}=\overset{R_7}{\overset{|}{C}}-\overset{R_8}{\overset{|}{C}}=\overset{R_9}{\overset{|}{C}}-$$

R_6, R_7, R_8 and R_9 are each independently hydrogen, halogen, CN or NO_2;

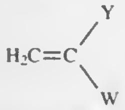
X is O or S; and

Hal is a halogen atom; which comprises reacting an amide nitrile of formula II



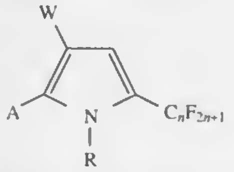
(II)

wherein A, R and n are as described hereinabove for formula I with at least one molar equivalent of a dieneophile of formula III



(III)

wherein W is as described hereinabove for formula I and Y is hydrogen, Br or Cl with the proviso that when R is hydrogen, then Y must be Br or Cl, in the presence of an acid and a solvent and essentially in the absence of water to form a formula I compound



(I)

and halogenating said formula I compound to form said formula IV compound.

5,750,727

POLYISOCYANATES CONTAINING URETDIONE GROUPS

Rainer Gras, Bochum, Germany, assignor to Huels Aktiengesellschaft, Marl, Germany

Filed Feb. 12, 1996, Ser. No. 600,030

Claims priority, application Germany, Feb. 18, 1995, 195 05 566.7

Int. Cl.^{6} C07D *229/00*

U.S. Cl. 548—951 8 Claims

1. A process or preparing polyisocyanates containing uretdione groups and having a molecular weight of from 1000 to 10,000, comprising: i) partially reacting from 55 to 87% by weight a uretdione (component A) with from 10 to 30% by weight of blocking agent (component B) to block at least one but less than all the isocyanate groups of the uretdione; and ii) subsequently, reacting all or some of the remaining NCO groups, with from 3 to 30% by weight a polyol having more than two hydroxyl groups or a polyester or polycaprolactone chain extender having more than two hydroxyl groups (component C).

5,750,728

PROCESS FOR THE PREPARATION OF AROMATIC BROMOMETHYL COMPOUNDS

Adalbert Wagner, Hattersheim/Main; Heinz-Werner Kleemann, Bad Homburg; Dieter Regnat, Frankfurt am Main, and Hans-Jerg Kleiner, Kronberg/Taunus, all of Germany, assignors to Clariant GmbH, Frankfurt, Germany

Continuation of Ser. No. 142,022, Oct. 28, 1993, abandoned. This application Dec. 11, 1996, Ser. No. 763,877

Claims priority, application Germany, Oct. 29, 1992, 42 36 476.0; Mar. 18, 1993, 43 08 562.8

Int. Cl.^{6} C07D *333/56;333/52;* **C07C** *22/04*

U.S. Cl. 549—57 5 Claims

1. A process for the preparation of 2,2'-bis-(bromomethyl)-1,1'-binaphthyl which comprises treating 2,2-dimethyl-1,1-binaphthyl dissolved in chlorobenzene with N-bromosuccinimide and obtaining 2,2'-bis-(bromomethyl)-1,1 '-binaphthyl.

5,750,729

COMPOUNDS AND METHODS FOR MAKING AND USING SAME

Petr Alexander, San Mateo, and Ernest J. Prisbe, Los Altos, both of Calif., assignors to Gilead Sciences,Inc., Foster City, Calif.

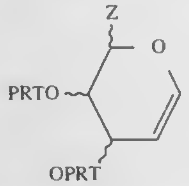
Division of Ser. No. 615,669, Mar. 13, 1996, which is a division of Ser. No. 384,504, Feb. 1, 1995, Pat. No. 5,659,023. This application Feb. 25, 1997, Ser. No. 806,575

Int. Cl.^{6} C07F *9/28;327/00;333/32;* **C07G** *3/00*

U.S. Cl. 549—216 1 Claim

1. A method comprising

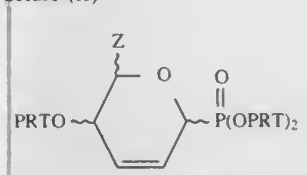
(a) providing a compound having structure (I)



(I)

(b) reacting the compound of structure (I) with $P(OPRT)_3$ in the presence of a Lewis Acid; and

(c) recovering from the reaction mixture of step (b) a compound having structure (II)



(II)

wherein PRT is a protecting group and Z is CH_2OPRT, halo substituted C_1–C_2 alkyl, $CH{=}CH_2$, $C{\equiv}CH$, $—CH_2N_3$, CH_3, or H.

5,750,730

FLUORINE-CONTAINING DIOXOLANE COMPOUND, ELECTROLYTIC SOLUTION COMPOSITION, BATTERY AND CAPACITOR

Tomoharu Nakano, and Katsuji Shiono, both of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

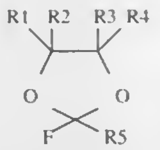
Filed Dec. 31, 1996, Ser. No. 777,867

Claims priority, application Japan, Jan. 10, 1996, 8-020452; Jan. 10, 1996, 8-020453; Feb. 19, 1996, 8-056720; Feb. 19, 1996, 8-056721

Int. Cl.^{6} C07D *317/16;317/38;317/42*

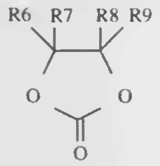
U.S. Cl. 549—229 6 Claims

1. A fluorine-containing dioxolane compound (a1), said compound improving the electroconductivity of an electrolyte solution and represented by the following formula (1);



wherein R1, R2, R3 and R4 each represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and R5 represents a hydrogen atom, a fluorine atom or a —CFXY group wherein X and Y each represents a hydrogen atom, a fluorine atom or an alkyl group having 1 to 4 carbon atoms.

4. A fluorine-containing dioxolane compound (a2) represented by the following formula (2):



wherein at least one of R6, R7, R8 and R9 represents a —CHF—X group wherein X represents an alkyl group having 1 to 4 carbon atoms, and the remaining R groups each represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

5,750,731

PERFLUORINATED AROMATIC COMPOUNDS

Shinji Ando, Tokyo; Toru Matsuura, Yokohama; Shigekuni Sasaki, Iruma, and Fumio Yamamoto, Katsuta, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

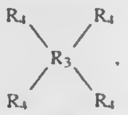
Continuation of Ser. No. 451,465, May 26, 1995, which is a division of Ser. No. 140,982, Oct. 25, 1993, Pat. No. 5,449,741, which is a continuation-in-part of Ser. No. 54,973, Apr. 30, 1993, abandoned, which is a division of Ser. No. 765,672, Sep. 26, 1991, Pat. No. 5,233,018. This application Sep. 20, 1996, Ser. No. 718,208

Claims priority, application Japan, Sep. 28, 1990, 2-256843; Apr. 12, 1991, 3-106552; Apr. 12, 1991, 3-106554; Apr. 12, 1991, 3-106557

Int. Cl.^{6} C07C *255/51;65/28;407/10;307/83*

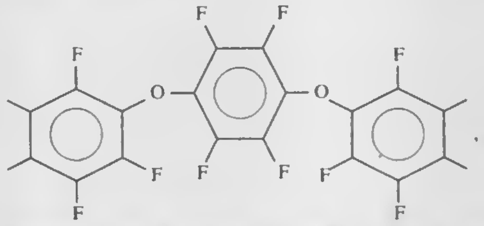
U.S. Cl. 549—241 4 Claims

1. A perfluorinated aromatic compound represented by general formula (7)



(7)

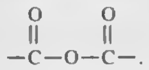
wherein R_3 is a tetravalent perfluorinated aromatic group represented by formula (9):



(9)

, and

wherein (R_4)s are the same, each being a carboxyl group or a cyano group, or two adjacent (R_4)s combine to form a divalent group represented by formula (10).



$$-\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}-.$$

(10)

5,750,732

METHOD TO PRODUCE CYCLIC ESTERS

Dan W. Verser, Golden; Alex Cheung, Fort Collins; Timothy J. Eggeman, Lakewood; William A. Evanko, Golden; Kevin H. Schilling, Arvada; Manfred Meiser, Arvada; Anthony E. Allen, Denver, all of Colo.; Melville E. D. Hillman, Hilliard, Ohio; George E. Cremeans, Groveport, Ohio, and Edward S. Lipinsky, Worthington, Ohio, assignors to Chronopol, Inc., Golden, Colo.

Continuation of Ser. No. 128,797, Sep. 29, 1993, Pat. No. 5,420,304, which is a continuation-in-part of Ser. No. 854,559, Mar. 19, 1992, Pat. No. 5,319,107. This application May 19, 1995, Ser. No. 444,954

Int. Cl.^{6} C07D *321/00;321/10*

U.S. Cl. 549—274 **16 Claims**

1. A process for the recovery of cyclic ester from a cyclic ester production mixture, wherein said cyclic ester production mixture comprises cyclic esters, a compound selected from the group consisting of a single hydroxycarboxylic acid or its ester, salt or amide (X_1A) and oligomers of X_1A, said process comprising:
   (a) providing a recovery solvent for said cyclic ester production mixture;
   (b) separating at least a portion of said cyclic esters and recovery solvent from X_1A and oligomers of X_1A by liquid-liquid equilibrium separation; and
   (c) recovering cyclic esters from said cyclic ester and recovery solvent.

5,750,733

HYDROXY CONTAINING ALKYL GLYCAMIDES, LOW FOAMING DETERGENT COMPOSITIONS COMPRISING SUCH AND A PROCESS FOR THEIR MANUFACTURE

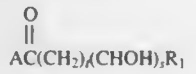
Robert Vermeer, Nutley, and Bijan Harichian, South Orange, both of N.J., assignors to Lever Brothers Company Division of Conopco, Inc., New York, N.Y.

Filed Aug. 6, 1996, Ser. No. 689,178

Int. Cl.^{6} C07D *321/00;* **C07C** *233/00;* **C11D** *3/38;* **D06M** *9/00*

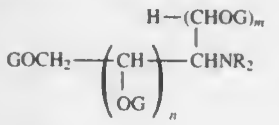
U.S. Cl. 549—346 **9 Claims**

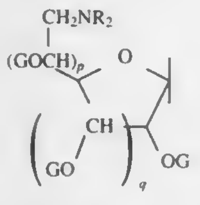
1. A hydroxy-containing alkyl glycamide surfactant having the following formula:



$$A\overset{O}{\overset{\|}{C}}(CH_2)_t(CHOH)_sR_1$$

wherein A is one of the following structures attached to the carboxyl C═O groups via the nitrogen atom:





G is hydrogen (H), a SO_3M, PO_3M_2, $(CH_2CH_2O)_aH$ or $(CH_2CHCH_3O)_bH$ group, a mono-, di-, oligo- or polysaccharide or mixtures thereof;

M is hydrogen (H), an alkali metal, alkaline earth metal, ammonium, alkyl substituted ammonium or mono-, di-, trialkanolammonium group having about 1 to about 5 carbon atoms;

a=0–35
b=0–35
m=0–8
n=2 to 6
p=0–4
q=0–3
s=1–6
t=1 to 18

R_1 is a straight or branched chain alkyl or alkenyl group which may be unsubstituted or substituted with an aromatic, cycloaliphatic or mixed aromatic group having about 1 to about 31 carbon atoms or hydrogen; and

R_2 is hydrogen (H), a hydroxylalkyl group having about 1 to about 6 carbon atoms, a straight or branched chain, alkyl or alkenyl group which may be unsubstituted or substituted with an aromatic, cycloaliphatic or mixed aromatic aliphatic group having about 1 to about 28 carbon atoms.

5,750,734

PROCESS FOR THE PREPARATION OF STEROID DERIVATIVES

Nigel Christopher Parkinson, and Andrew Paul Van Sickle, both of Dagenham, United Kingdom, assignors to Rhone-Poulenc Rorer Limited, West Malling, England

PCT No. PCT/GB95/02568, § 371 Date May 23, 1997, § 102(e) Date May 23, 1997, PCT Pub. No. WO96/16978, PCT Pub. Date Jun. 6, 1996

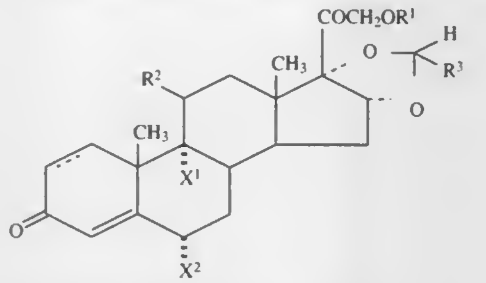
PCT Filed Nov. 2, 1995, Ser. No. 849,015

Claims priority, application United Kingdom, Nov. 26, 1994, 9423919

Int. Cl.^{6} C07J *71/00*

U.S. Cl. 549—432 **27 Claims**

1. A process for the preparation of a compound of formula I



(I)

or a stereoisomer thereof, wherein:

the 1,2-position is saturated or is a double bond;

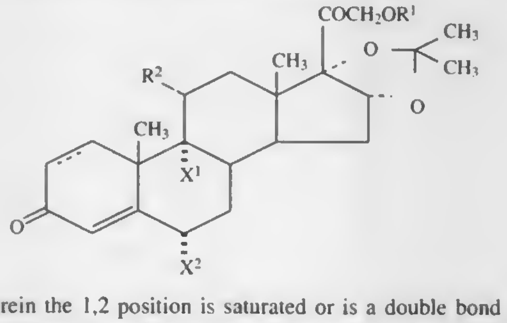
X^1 and X^2 are each independently hydrogen or halogen;

R^1 is hydrogen or acyl;

R^2 is hydroxyl, acyloxy or oxo; and

R^3 is alkyl, comprising

reacting a compound of formula (II)



(II)

wherein the 1,2 position is saturated or is a double bond and X^1, X^2, R^1 and R^2 are as defined above, with an aldehyde R^3CHO, wherein R^3 is as defined above, in phosphoric acid or about 60% to about 75% w/w sulphuric acid.

5,750,735

2-THIOSUBSTITUTED CARBAPENEMS

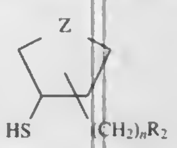
Yang-I Lin, Tappan; Panayota Bitha, Nanuet; Subas Sakya, Pomona, all of N.Y.; Timothy W. Strohmeyer, Demarest; Karen Bush, Princeton, both of N.J.; Carl Bernard Ziegler, Pearl River, and Gregg Brian Feigelson, Airmont, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 182,781, Jan. 26, 1994, Pat. No. 5,602,112, which is a continuation-in-part of Ser. No. 33,684, Mar. 16, 1993, abandoned. This application May 19, 1995, Ser. No. 445,388

Int. Cl.^{6} C07D *307/02*

U.S. Cl. 549—475 **29 Claims**

1. A compound of the formula:



wherein:

Z is oxygen;

n is an integer from 0–4;

R_2 is selected from:

(i) fluorine, chlorine, bromine, iodine, $—OCOCH_3$, $—OCOCF_3$, $—OSO_2CH_3$, $—OSO_2$Phenyl, and azido;

(ii) a moiety of the formula:

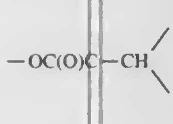
$—S(O)_{n'}\text{-}R''$

wherein n" is an integer from 0–2; and R'' is

(a) hydrogen or an

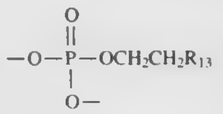
(b) organic group bonded via a carbon atom selected from substituted or unsubstituted $(C_1–C_4)$alkyl, substituted or unsubstituted $(C_3–C_6)$cycloalkyl, substituted or unsubstituted $(C_2–C_4)$alkenyl, substituted or unsubstituted $(C_2–C_4)$alkynyl, substituted or unsubstituted aryl, and substituted or unsubstituted aryl $(C_1–C_6)$alkyl wherein said substitution is selected from $(C_1–C_4)$alkyl, hydroxy, $(C_1–C_4)$alkoxy, phenyl, amino, amidino, guanidino, carboxamido, carbamoyl, and quaternary ammonio associated with a physiologically acceptable anion;

(iii) hydroxy, —OR'', —OC(O)R'', —OC(O)OR'', —OC(O)NR''R'',



$$—OC(O)C—CH\begin{smallmatrix}R^a\\NH_2\end{smallmatrix}$$

and

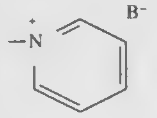


$$—O—\overset{O}{\overset{\|}{\underset{O—}{\underset{|}{P}}}}—OCH_2CH_2R_{13}$$

wherein R'' is independently selected and is as hereinabove defined, and

wherein R_{13} is selected from a moiety of the formula:

$\overset{B^-}{\overset{+}{—NH_3}}$, $\overset{B^-}{\overset{+}{—N(CH_3)_3}}$ and



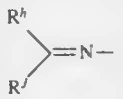
where B^- is a physiologically acceptable anion:

(iv) an organic residue bonded via a nitrogen atom, selected from:

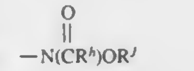
(a) NO, NO_2, NO_3, NC, NCO, NHCN and NR^hR^J wherein R^h and R^J are independently selected from hydrogen, amino, substituted or unsubstituted amino, substituted or unsubstituted $(C_1–C_4)$alkyl, $(C_3–C_6)$cycloalkyl$(C_1–C_4)$alkyl, aryl, and aralkyl wherein the substituents for the aforementioned substituted alkyl and amino moieties are selected from amino, mono-, di- and tri$(C_1–C_4)$alkylamino, hydroxyl, oxo, carboxyl, alkoxyl, chloro, fluoro, bromo, nitro, $—SO_2NH_2$, phenyl, benzyl, acyloxy, alkoxylcarbonyl, alkoxycarbonyloxy, cycloalkoxycarbonyloxy and carboxamido;

(b) hydroxylamino, hydazinyl, iminyl and a hydroxamic acid derivative selected from:

$—N(R^h)OR^J$, $—N(R^h)NR^hR^J$,



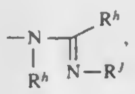
and



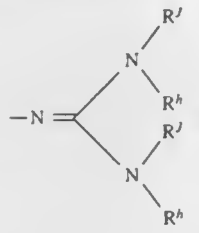
$$—N(\overset{O}{\overset{\|}{C}}R^h)OR^J$$

wherein R^h and R^J are as hereinbefore defined;

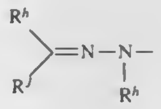
(c) moieties of the formulae:



,

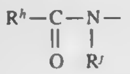


and



wherein R^h and R^J are as hereinabove defined;

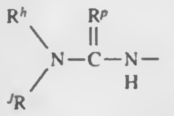
(d) acylamino moieties of the formulae:



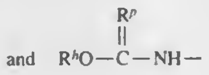
$$R^h—\underset{O}{\underset{\|}{C}}—\underset{R^J}{\underset{|}{N}}—$$

wherein R^h and R^J are as hereinabove defined;

(e) moieties of the formulae:



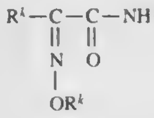
and



$$R^hO—\overset{R^p}{\overset{\|}{C}}—NH—$$

wherein R^h and R^J are as hereinabove defined and R^P is selected from oxygen and sulfur;

(f) moieties of the formula:



$$R^k—\underset{\underset{OR^k}{|}}{\underset{N}{\underset{\|}{C}}}—\underset{O}{\underset{\|}{C}}—NH—$$

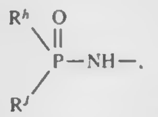
wherein R^k is hydrogen, substituted or unsubstituted $(C_1–C_3)$alkyl, $(C_2–C_4)$alkenyl, $(C_2–C_4)$alkynyl, heterocyclyl and heteroaryl wherein said substituents consist of amino, mono-, di- and tri$(C_1–C_4)$alkylamino, hydroxyl, oxo, carboxyl, alkoxyl, chloro, fluoro, bromo, nitro, $—SO_2NH_2$, phenyl, benzyl, acyloxy, alkoxylcarbonyl, alkoxycarbonyloxy, cycloalkoxycarbonyloxy and carboxamido; and wherein the heteroatom and heteroatoms are selected from 1–4 oxygen, nitrogen or sulfur atoms and the cyclic portion has 5 or 6 ring atoms;

(g) moieties of the formula:

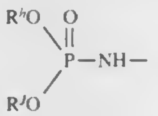
$R''S(O)_{n'}\text{-}NH—$

wherein n' and R'' are as hereinabove defined;

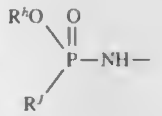
(h) moieties of the formulae:



,

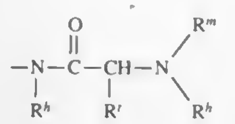


and



wherein R^h and R^J are as hereinabove defined;

(i) an amino moiety which is an acyl residue of an amino acid or peptide represented by the formula:



$$-N(R^h)-C(=O)-CH(R^l)-N(R^m)(R^h)$$

wherein R^h is as hereinabove defined; R^m is hydrogen or an acyl residue of an amino add or peptide said amino acid selected from the group consisting of alanine, glycine, arginine, cysteine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, aminopimelic acid and threonine; and R^l is hydrogen, benzyl, and straight or branched $(C_1–C_6)$alkyl optionally substituted with halo, hydroxy, amino, guanidinyl, carboxy, phenyl, aminocarbonyl, alkylthic, hydroxyphenyl or heterocyclyl as defined hereabove;

(j) an acyclic quaternary ammonio moiety of the formula:

$$B^- \quad -\overset{+}{N}R_7R_8R_9$$

wherein R_7, R_8 and R^9 are the same or different and are selected from hydrogen, a straight or branched $(C_1–C_4)$alkyl, $(C_2–C_4)$alkenyl and substituted $(C_1–C_4)$alkyl, wherein the substitution is selected from hydroxy, $(C_1–C_4)$alkyl, $(C_1–C_4)$ alkoxy, azido, amino, $(C_1–C_4)$alkylamino, di$(C_1–C_4)$alkylamino, guanidino, nitrile, carboxy, formimidoyl and phenyl; alternatively, R_7 and R_8 taken together are $—(CH_2)_2X(CH_2)_2—$, wherein X is $(CH_2)_w$ oxygen, sulfur, NH, NR^h, NOH or NOR^h where W is an integer from 0 to 2, R^h is hereinbefore defined and B^- is a physiologically acceptable anion;

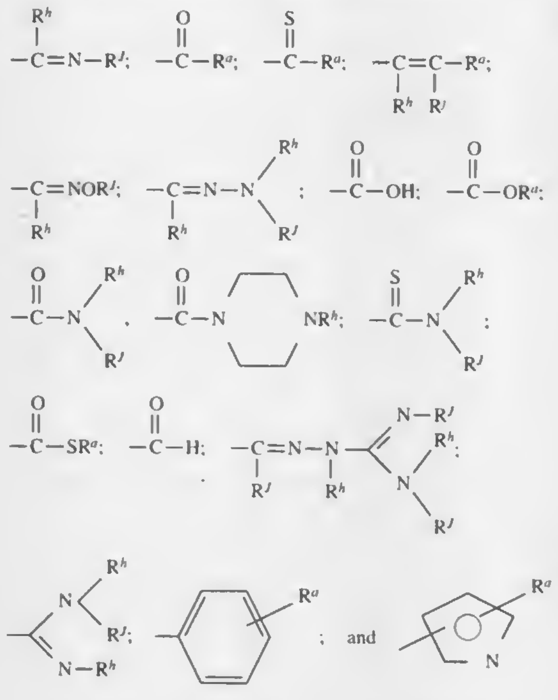
(v) a moiety bonded via a carbon atom selected from the following groups;

(a) a nitrile moiety, an acetylenic group, or a moiety of the formulae:

$$—C{\equiv}C—R^a$$

wherein R^a is as hereinabove defined;

(b) a moiety selected from those of the formulae:



wherein R^a, R^h and R^l are as hereinabove defined; and

(c) a moiety selected from $—CHF_2$, CF_3, $—CF_2CF_3$, $—CH(OCH_3)_2$, and $—CHCl_2$, provided that when R^2 is hydroxy, then n cannot be 0.

5,750,736

METHOD FOR ACYLATING 10-DEACETYLBACCATIN III SELECTIVELY AT THE C-10 POSITION

Nicholas J. Sisti, Jeffersonville, Pa., assignor to NaPro Bio-Therapeutics, Inc., Boulder, Colo.

Filed Jul. 11, 1996, Ser. No. 678,759

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **24 Claims**

1. A method of acylating 10-deacetylbaccatin III at a C-10 position over a C-7 hydroxy position thereof, comprising the steps of:

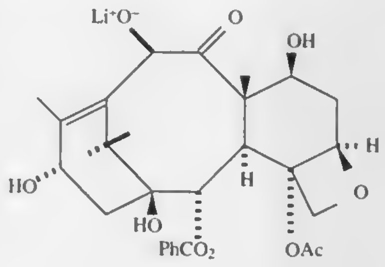
(a) dissolving a selected quantity of 10-deacetylbaccatin III in an acceptable ether solvent therefor to form a first solution at a first temperature;

(b) mixing at least one equivalent of a lithium base into the first solution to form a second solution;

(c) adding at least an equivalent of an acylating agent to the second solution at a second temperature to form a third solution; and

(d) quenching the third solution with a suitable quenching compound that is effective to eliminate excess of the lithium base and said acylating agent therefrom to produce a fourth solution containing baccatin III.

24. An intermediate for the production of baccatin III having the formula:



5,750,737

METHOD FOR PACLITAXEL SYNTHESIS

Nicholas J. Sisti, 450 Forest Ave., Apt. S204, Jeffersonville, Pa. 19401, and Charles S. Swindell, 613 Schiller Ave., Merion, Pa. 19066

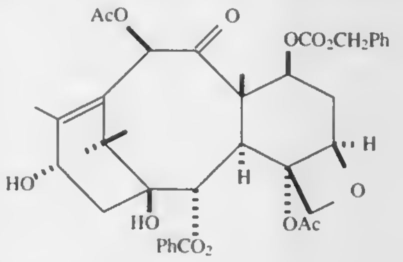
Filed Sep. 25, 1996, Ser. No. 719,488

Int. Cl.^{6} C07D *305/14*

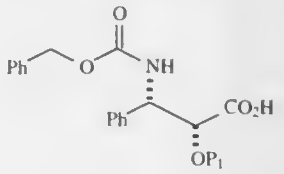
U.S. Cl. 549—510 **15 Claims**

1. A method of producing paclitaxel, comprising the steps of:

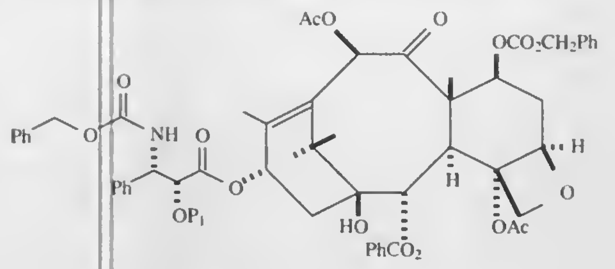
(a) esterifying C7-CBZ baccatin III of the formula:



with C3' N-CBZ-C2'-O-protected (2R,3S)-3 -phenylisoserine side chain of the formula:

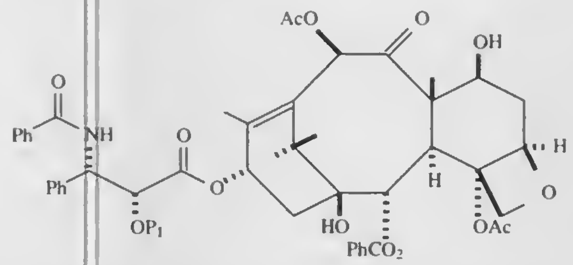


to form a first intermediate compound of the formula:



wherein P_1 is a hydrogenable benzyl-type protecting group;

(b) replacing the C7 carbobenzyloxy group with hydrogen and replacing the carbobenzyloxy group at the C3' nitrogen site with PhCO to produce a second intermediate compound of the formula:



wherein P_1 is the hydrogenable benzyl-type protecting group and

(c) deprotecting the second intermediate compound by replacing P_1 with hydrogen to produce paclitaxel.

5,750,738

PROCESS FOR THE PREPARATION OF 7-HYDROXYTAXANES

Jean-Pierre Bastart, Lesigny; Jean-Dominique Boursat, Vincennes; Alain Commercon, Vitry-Sur-Seine, and Jean-Pierre Leconte, Brunoy, all of France, assignors to Rhone-Poulenc Rorer S.A., France

PCT No. PCT/FR95/00420, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO95/26961, PCT Pub. Date Oct. 12, 1995

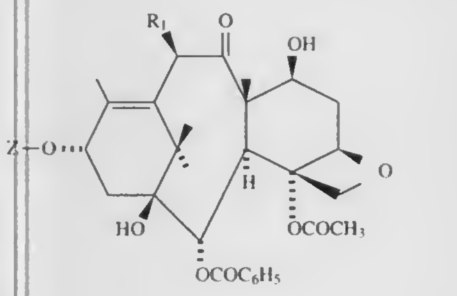
PCT Filed Apr. 3, 1995, Ser. No. 722,106

Claims priority, application France, Apr. 5, 1994, 9403980

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **5 Claims**

1. Process for the preparation of 7 -hydroxytaxanes of general formula:

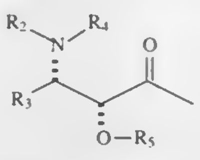


(I)

in which

R_1 represents a hydrogen atom or an alkoxy radical containing 1 to 4 carbon atoms, an alkoxyacetoxy radical in which the alkyl part contains 1 to 4 carbon atoms or an alkanoyloxy radical containing 1 to 4 carbon atoms, and

Z represents a hydrogen atom or a radical of general formula:



(III)

in which:

R_2 represents a benzoyl radical which is optionally substituted with one or more atoms or radicals, which may be identical or different, chosen from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms and trifluoromethyl radicals, or a radical R'_2—O—CO— in which R'_2 represents represents

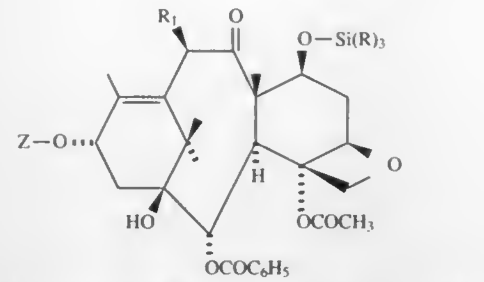
an alkyl radical containing 1 to 8 carbon atoms, an alkenyl radical containing 2 t o 8 carbon atoms, an alkynyl radical containing 3 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms, or a bicycloalkyl radical containing 7 to 10 carbon atoms, these radicals optionally being substituted with one or more substituents chosen from halogen atoms and hydroxyl radicals, alkoxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl part contains 1 to 4 carbon atoms, piperidino or morpholino radicals, 1-piperazinyl radicals (optionally substituted at –4 with an alkyl radical containing 1 to 4 carbon atoms or with a phenylalkyl radical in which the alkyl part contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, phenyl radicals (optionally substituted with one or more atoms or radicals chosen from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms or alkoxy radicals containing 1 to 4 carbon atoms, cyano or carboxyl radicals or alkoxycarbonyl radicals in which the alkyl part contains 1 to 4 carbon atoms,

a phenyl or α- or β-naphthyl radical which is optionally substituted with one or more atoms or radicals chosen from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms or alkoxy radicals containing 1 to 4 carbon atoms or a 5-membered aromatic heterocyclic radical preferably chosen from furyl and thienyl radicals,

or a saturated nitrogen-containing heterocyclic radical containing 4 to 6 carbon atoms which is optionally substituted with one or more alkyl radicals containing 1 to 4 carbon atoms, and

R_3 represents a straight or branched alkyl radical containing 1 to 8 carbon atoms, a straight or branched alkenyl radical containing 2 to 8 carbon atoms, a straight or branched alkynyl radical containing 2 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a phenyl or α- or β -naphthyl radical which is optionally substituted with one or more atoms or radicals chosen from halogen atoms and alkyl, alkenyl, alkynyl, aryl, aralkyl, alkoxy, alkylthio, aryloxy, arylthio, hydroxyl, hydroxyalkyl, mercapto, formyl, acyl, acylamino, aroylamino, alkoxycarbonylamino, amino, alkylamino, dialkylamino, carboxyl, alkoxycarbonyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, cyano, nitro and trifluoromethyl radicals, or a 5-membered aromatic heterocycle containing one or more hetero atoms, which may be identical or different, chosen from nitrogen, oxygen or sulphur atoms and optionally substituted with one or more substituents, which may be identical or different, chosen from halogen atoms and alkyl, aryl, amino, alkylamino, dialkylamino, alkoxycarbonylamino, acyl, arylcarbonyl, cyano, carboxyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or alkoxycarbonyl radicals, it being understood that, in the substituents for the phenyl, α- or β-naphthyl radicals and aromatic heterocyclic radicals, the alkyl radicals and the alkyl portions of the other radicals contain 1 to 4 carbon atoms and that the alkenyl and alkynyl radicals contain 2 to 8 carbon atoms and that the aryl radicals are phenyl or α- or β-naphthyl radicals, and

either R_4 represents a hydrogen atom and R_5 represents a hydrogen atom or a protecting group for the hydroxyl function, or R_4 and R_5 together form a 5- or 6-membered saturated heterocycle, characterized in that a a product of general formula:



(II)

in which R_1 and Z are as defined above and the symbols R, which may be identical or different, each represent a straight or branched alkyl radical containing 1 to 4 carbon atoms which is optionally substituted with a phenyl radical, in converted to the formula (I) compound.

5,750,739

PROCESS FOR PRODUCING GLYCIDYL ESTER OF ACRYLIC ACID OR METHACRYLIC ACID

Tsuyoshi Isozaki; Masahiro Kurokawa, and Akihiro Honma, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 7, 1996, Ser. No. 687,053

Claims priority, application Japan, Aug. 25, 1995, 7-217559

Int. Cl.⁶ C07D *301/27*

U.S. Cl. 549—515 **20 Claims**

1. A process for producing a glycidyl ester of acrylic acid or methacrylic acid which comprises:

(a) neutralizing acrylic acid or methacrylic acid with at least one member selected from the group consisting of a carbonate of an alkali metal and a bicarbonate of an alkali metal in an excess amount of epichlorohydrin, while an oxygen-containing gas is blown into the liquid reaction system;

(b) carrying out an azeotropic distillation to discharge water formed by the neutralizing and epichlorohydrin, outside the liquid reaction system and forming an alkali metal salt of the acrylic acid or the methacrylic acid;

(c) adding a quaternary ammonium salt as a catalyst to the liquid reaction system to react said alkali metal salt of said acid with the epichlorohydrin and thus synthesize the glycidyl ester of said acid in an esterification reaction;

(d) after the esterification reaction, cooling the liquid reaction product while recovering a part of the excess epichlorohydrin under reduced pressure;

(e) adding an aqueous solution of an alkali hydroxide to the liquid reaction product to separate out an aqueous layer and an organic layer;

(f) adding a catalyst deactivator to the organic layer; and

(g) distilling the organic layer to separate out the glycidyl ester of said acid, while blowing an oxygen-containing gas into the organic layer.

5,750,740

PROCESS FOR PREPARING EPOXIDES FROM CARBONYL COMPOUNDS USING SULPHONIUM OR SULPHOXONIUM YLIDES AND INTERMEDIATES USEFUL THEREIN

Raymond Vincent Heavon Jones, West Lothian, and Elizabeth Shearer Currie Simpson, Lanarkshire, both of Scotland, assignors to Zeneca Limited, London, England

Division of Ser. No. 98,379, Aug. 10, 1993, Pat. No. 5,637,727. This application May 25, 1995, Ser. No. 451,936

Claims priority, application United Kingdom, Feb. 15, 1991, 9103260

Int. Cl.⁶ C07D *301/02;* **C07C** *381/00;381/12*

U.S. Cl. 549—519 **8 Claims**

1. A process for transforming an aldehyde or ketone into its corresponding epoxide, which comprises a first step selected from the group of processes consisting of:

(a) reacting together dimethyl sulphide, methanol and concentrated sulphuric acid at a temperature of from −20° C. to +100° C. (in a sealed system) or from −20° C. to +40° C. (at atmospheric pressure); and

(b) reacting together a trimethylsulphonium halide, sulphuric acid and hydrogen peroxide at a temperature of from 0° C. to 100° C.;

and then reacting the aldehyde or ketone with the product obtained from said first step in the presence of a base.

5,750,741

PREPARATION OF OXIRANE COMPOUNDS WITH TITANASILSESQUIOXANE CATALYSTS

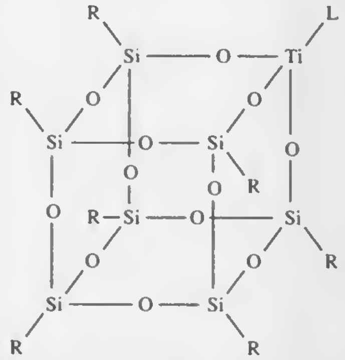
Mark Crocker, and Rudolf Henri Max Herold, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1997, Ser. No. 783,965

Int. Cl.⁶ C07D *301/14*

U.S. Cl. 549—525 **11 Claims**

1. A process for the preparation of an oxirane compound by reacting an olefinically unsaturated hydrocarbon with an organic hydroperoxide, in the presence of a catalyst comprising a titanasilsesquioxane of the general formula $TiLR_7Si_7O_{12}$ and the structural formula



wherein R is chosen from the group of cyclopentyl, cyclohexyl and cycloheptyl and L is chosen from the group of alkyl, cycloalkyl, alkylaryl, alkoxy, aryloxy, siloxy, amido and OH.

5,750,742

OLIGOMERIC TRIARYLMETHANE DYES

Gunter-Rudolf Schröder, Mannheim; Udo Mayer, Frankenthal; Ulf Baus, Dossenheim, and Johannes Peter Dix, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/03111, § 371 Date Feb. 19, 1997, § 102(e) Date Feb. 19, 1997, PCT Pub. No. WO96/06139, PCT Pub. Date Feb. 29, 1996

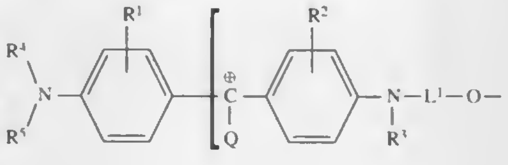
PCT Filed Aug. 4, 1995, Ser. No. 776,605

Claims priority, application Germany, Aug. 19, 1994, 44 29 549.9

Int. Cl.⁶ C07C *217/42*

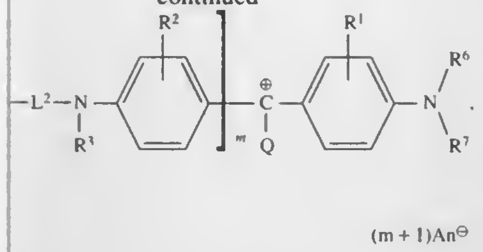
U.S. Cl. 552—109 **10 Claims**

1. Triarylmethanes of the formula I



(I)

-continued



where

m is from 1 to 100,

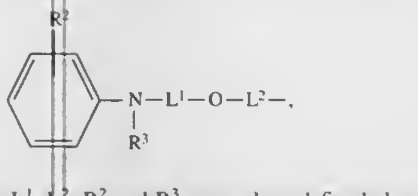
L^1 and L^2 are independently of each other C_2–C_4-alkylene,

R^1 and R^2 are independently of each other hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R^3 is in each case hydrogen or C_1–C_4-alkyl, which may be substituted by hydroxyl, C_1–C_4-alkoxy, halogen or cyano,

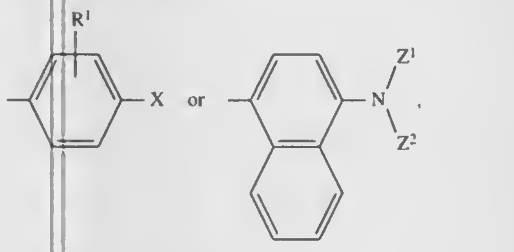
R^4, R^5,

R^6 and R^7 are independently of each other hydrogen, C_1–C_4-alkyl, which may be hydroxyl-, C_1–C_4-alkoxy-, halogen- or cyano-substituted, substituted or unsubstituted phenyl or a radical of the formula



where L^1, L^2, R^2 and R^3 are each as defined above,

Q is a radical of the formula



where

R^1 is as defined above,

x is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or a radical of the formula $—NZ^1Z^2$, and

Z^1 and Z^2 are independently of each other hydrogen or C_1–C_4-alkyl, which may be hydroxyl-, C_1–C_4-alkoxy-, halogen- or cyano-substituted, or substituted or unsubstituted phenyl, and

$An^{\ominus}$ is the equivalent of an anion.

5,750,743

METHOD FOR PREPARING A SOLUTION OF AN ALKALI SALT OF ANTHRAHYDROQUINONE

Hiroyuki Suganuma, Kawasaki, Japan, assignor to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Dec. 12, 1996, Ser. No. 766,469

Claims priority, application Japan, Dec. 21, 1995, 7-333818

Int. Cl.⁶ C07C *37/86*

U.S. Cl. 552—271 **7 Claims**

1. A method for preparing a solution of an alkali salt of anthrahydroquinone, which comprises reacting a solution of a dialkali salt of 1,4-dihydro- 9,10-dihydroxyanthracene with anthraquinone in the presence of at least 2 mols per mol of said anthraquinone of an alkali.

6. A method for preparing a solution of an alkali salt of anthrahydroquinone, which comprises reacting 1,4,4a,9a-tetrahydroanthraquinone with anthraquinone in a solution containing at least 4 mols per mol of said 1,4,4a,9a-tetrahydroanthraquinone of an alkali.

5,750,744

PROCESS FOR THE PREPARATION OF 4-AMINO- 4-3-KETOSTEROIDS VIA 4-NITRO- 4-3-KETOSTEROIDS

Philip M. Weintraub, Cincinnati; Cynthia A. Gates, Fairfield; Michael R. Angelastro, Mason, all of Ohio; Gary Alan Flynn, Tucson, Ark.; Chi-Hsin Richard King, Taipei, Taiwan, and Timothy Thomas Curran, Chester, N.Y., assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

PCT No. PCT/US95/04399, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO95/29932, PCT Pub. Date Nov. 9, 1995

PCT Filed Apr. 11, 1995, Ser. No. 737,031

Int. Cl.⁶ C07J *1/00*

U.S. Cl. 552—515 **2 Claims**

1. The compound (20S)-20-hydroxymethyl-4-nitropregn-4-en-3-one, or a pharmaceutically acceptable salt thereof.

2. The compound 17β-cyclopropyloxy-4-nitroandrost-4-en-3-one, or a pharmaceutically acceptable salt thereof.

5,750,745

PROCESS FOR PREPARING DELTA 9, 11 AND 21-CHLOROCORTICOSTEROIDS

Xiaoyong Fu; Tiruvettipuram K. Thiruvengadam, both of Edison; Chou-Hong Tann, Berkeley Heights; Junning Lee, Gillette, and Cesar Colon, Rahway, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

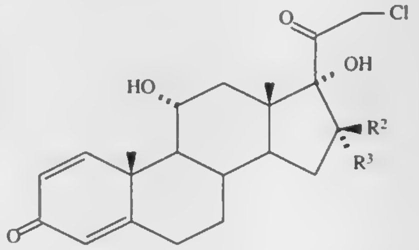
PCT No. PCT/US95/06600, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO95/32989, PCT Pub. Date Dec. 7, 1995

Continuation of Ser. No. 252,302, Jun. 1, 1994, Pat. No. 5,502,222. This PCT application May 30, 1995, Ser. No. 737,690

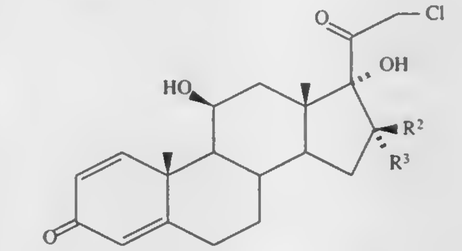
Int. Cl.⁶ C07J *75/00*

U.S. Cl. 552—581 **2 Claims**

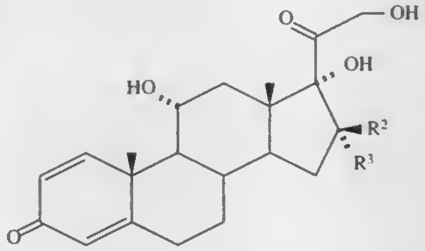
1. A process for regioselectively preparing a 21-chloro steroid of the formula



or

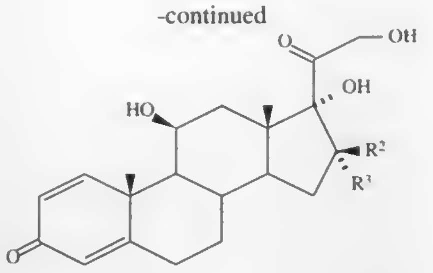


wherein one of R^2 or R^3 is CH_3 and the other is H, comprising treating a triol of the formula



or

-continued



wherein R^2 and R^3 are as defined above, with triphenylphosphine and CCl_4 at a temperature of −20° to +40° C.

5,750,746

HOMOLOGATED VITAMIN D2 COMPOUNDS AND THE CORRESPONDING 1α-HYDROXYLATED DERIVATIVES

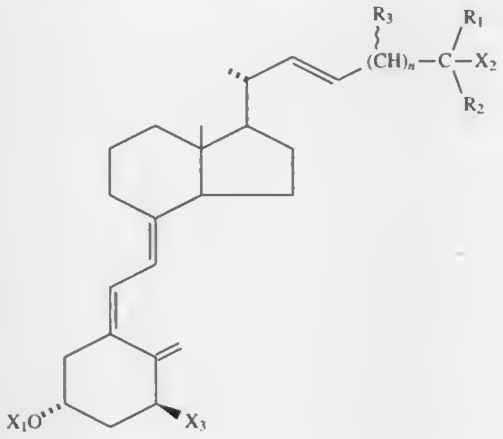
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Kato L. Perlman, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 394,850, Feb. 27, 1995, abandoned, which is a division of Ser. No. 985,432, Dec. 3, 1992, Pat. No. 5,414,098, which is a continuation of Ser. No. 732,008, Jul. 22, 1991, which is a division of Ser. No. 654,746, Feb. 13, 1991, Pat. No. 5,260,290, which is a continuation-in-part of Ser. No. 481,990, Feb. 14, 1990, Pat. No. 5,030,772. This application Mar. 26, 1997, Ser. No. 824,257

Int. Cl.^{6} C07C *401/00*

U.S. Cl. 552—653 **5 Claims**

1. A vitamin D compound having the formula:



where the configuration about carbon 24 may be R or S and wherein n is an integer having a value of 2, X_1 is selected from hydrogen or a hydroxy protecting group. X_2 is selected from hydrogen, hydroxy, and protected hydroxy, X_3 is selected from hydrogen, hydroxy and protected hydroxy, each R_3 is independently selected from alkyl, hydroxy, protected hydroxy, hydrogen or fluorine, with the proviso that at least one R_3 must be alkyl, and wherein R_1 and R_2, which may be the same or different, are each selected from an alkyl or aryl group.

5,750,747

ORGANIC TRIBLOCK COMPOUND SOLID LUBRICANT COMPRISING THE SAME AND MAGNETIC RECORDING MEDIUM

Takahiro Furutani, Otokuni-gun; Hideo Daimon, Ibaraki; Sayaka Shinomoto, Kyoto; Kazushi Miyata, Mishima-gun, and Tetsuo Mizumura, Ibaraki-ken, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka-fu, Japan

Filed Dec. 14, 1995, Ser. No. 572,742

Claims priority, application Japan, Dec. 14, 1994, 6-333269; Dec. 27, 1994, 6-337926

Int. Cl.^{6} C07C *233/90;* **G11B** *5/00*

U.S. Cl. 554—36 **4 Claims**

1. An organic compound of the formula (1):

$$R_1—Z_1—R_3—Z_2—R_2 \quad (1)$$

wherein R_1 and R_2 are the same or different and represent a linear, branched or cyclic saturated or unsaturated hydrocarbon group which has 4 to 34 carbon atoms; Z_1 and Z_2 are the same or different and represent an amine salt bond formed by a reaction between an acid and an amine; and R_3 is a group of the formula:

$$—(CH_2)_x—(CF_2)_y—(CH_2)_z—$$

in which x and z are the same or different and an integer of 1 to 4, and y is an integer of 4 to 34.

5,750,748

N-ALKYL POLYHYDROXY FATTY ACID AMIDE COMPOSITIONS AND THEIR METHOD OF SYNTHESIS

Jean-Pol Boutique, Ernage, and Patrick Firmin A. Delplancke, Zwevegem, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/13022, § 371 Date Apr. 19, 1996, § 102(e) Date Apr. 19, 1996, PCT Pub. No. WO95/14754, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 14, 1994, Ser. No. 633,745

Claims priority, application European Pat. Off., Nov. 26, 1993, 93203307

Int. Cl.^{6} C07C *231/02;* **C11C** *3/00;* **C11D** *3/32*

U.S. Cl. 554—66 **7 Claims**

1. A process for the preparation of a surfactant composition comprising N-methyl polyhydroxy fatty acid amide and N-alkyl (C3–C8) polyhydroxy fatty acid amide comprising the steps of:

(i) mixing N-methyl polyhydroxy fatty acid amine and N-alkyl (C3–C8) polyhydroxy fatty acid amine to form a mixture,

(ii) reacting said mixture with a fatty acid ester reactant in the presence of a base catalyst and, optionally, in the presence of a reaction solvent, and

(iii) acylating unreacted N-alkoxyamino polyol with an acid anhydride at a temperature in the range of from 50° C. to 85° C.;

wherein the weight ratio of N-methyl polyhydroxy fatty acid amide to N-alkyl (C3–C8) polyhydroxy fatty acid amide is from 25:1 to 1:1.

5,750,749

POLYHYDROXY-FATTY AMIDE SURFACTANT COMPOSITION AND METHOD OF PREPARING SAME

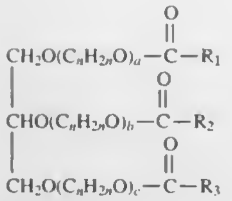
Upali Weerasooriya, Austin, and John Lin, Cedar Park, both of Tex., assignors to CONDEA Vista Company, Houston, Tex.

Filed Feb. 9, 1996, Ser. No. 599,300

Int. Cl.^{6} C07C *231/02;235/02*

U.S. Cl. 554—69 **12 Claims**

1. A process for preparing a surfactant composition comprising: reacting an N-alkylpolyhydroxyamine and an alkoxylated triglyceride of a fatty acid having the general formula:



$$\begin{array}{l} CH_2O(C_nH_{2n}O)_a—\overset{O}{\overset{\|}{C}}—R_1 \\ | \\ CHO(C_nH_{2n}O)_b—\overset{O}{\overset{\|}{C}}—R_2 \\ | \\ CH_2O(C_nH_{2n}O)_c—\overset{O}{\overset{\|}{C}}—R_3 \end{array}$$

wherein n is 2 to 4; a, b, and c can be the same or different and are integers of from 1 to 300; and R_1, R_2, and R_3 can be the same or different and are hydrocarbyl groups having from 4 to 40 carbon atoms under reaction conditions to produce a mixture of a polyhydroxy- fatty amide, an alkoxylated monoglyceride of a fatty acid, and an alkoxylated diglyceride of a fatty acid under reaction conditions to produce a mixture of a polyhydroxy-fatty amide, an alkoxylated monoglyceride of a fatty acid, and an alkoxylated diglyceride of a fatty acid.

5,750,750

HIGH VISCOSITY COMPLEX ALCOHOL ESTERS

Carolyn Boggus Duncan; Paul R. Geissler; David Wayne Turner, all of Baton Rouge, La.; William Joseph Munley, Jr., Houston, Tex., and Martin A. Krevalis, Baton Rouge, La., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Filed Feb. 7, 1997, Ser. No. 799,011

Int. Cl.^{6} C07C *59/47*

U.S. Cl. 554—117 **25 Claims**

1. A complex alcohol ester which comprises the reaction product of an add mixture of the following:

a polyhydroxyl compound represented by the general formula:

$$R(OH)_n$$

wherein R is any aliphatic or cyclo-aliphatic hydrocarbyl group and n is at least 2, provided that said hydrocarbyl group contains from about 2 to 20 carbon atoms;

a polybasic acid or an anhydride of a polybasic acid, provided that the ratio of equivalents of said polybasic acid to equivalents of alcohol from said polyhydroxyl compound is in the range between about 1.6:1 to 2:1; and

a monohydric alcohol, provided that the ratio of equivalents of said monohydric alcohol to equivalents of said polybasic acid is in the range between about 0.84:1 to 1.2:1;

wherein said complex alcohol ester exhibits a pour point of less than or equal to −20° C., a viscosity in the range between about 100–700 cSt at 40° C. and having a polybasic acid ester concentration of less than or equal to 70 wt. %, based on said complex alcohol ester.

5,750,751

GLYCOL CO-ESTERS OF DRYING-OIL FATTY ACIDS AND VINYL CARBOXYLIC ACIDS MADE VIA BIPHASIC CATALYSIS AND RESULTING PRODUCTS

John C. Saam, Midland, Mich., assignor to Michigan Molecular Institute, Midland, Mich.

Filed Nov. 1, 1996, Ser. No. 740,700

Int. Cl.^{6} C07C *67/00;69/58*

U.S. Cl. 554—165 **35 Claims**

1. A method for preparing co-esters of polymerizable vinylic carboxylic acids and unsaturated fatty carboxylic acids, comprising:

forming a hydrophobic phase containing a polymerizable vinylic carboxylic acid and a partial ester of a polyol and an unsaturated fatty carboxylic acid;

forming a hydrophilic phase containing an acidic catalyst;

contacting the hydrophobic phase and the hydrophilic phase under conditions sufficient to form a biphasic system in which the hydrophobic phase is continuous and the hydrophilic phase is dispersed within the continuous hydrophobic phase and under conditions sufficient to cause an acid catalyzed esterification reaction between the polymerizable vinylic carboxylic acid and the partial ester of a polyol and an unsaturated fatty carboxylic acid.

5,750,752

TRANSITION METAL COMPOUND

Michael Riedel, Frankfurt; Frank Küber, Oberursel; Michael Aulbach, Hofheim; Gerhard Erker, and Martin Könemann, both of Münster, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 21, 1996, Ser. No. 668,790

Claims priority, application Germany, Jun. 21, 1995, 195 22 013.7

Int. Cl.^{6} C07F *17/00;* **B01J** *31/00*

U.S. Cl. 556—1 **10 Claims**

1. A stereorigid transition metal compound having as ligands a cyclopentadienyl group and a substituted or unsubstituted heteroatom which are connected to one another via a monocyclic or polycyclic ring system, with the cyclopentadienyl group being fused onto the monocyclic or polycyclic ring system.

5,750,753

METHOD FOR MANUFACTURING ACRYLOXYPROPYSILANE

Yoichi Kimae; Shunji Yoshimatsu; Norio Itoda; Takashi Matsuo, all of Kumamoto, and Naoki Noda, Chiba, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 31, 1996, Ser. No. 777,595

Claims priority, application Japan, Jan. 24, 1996, 8-031449

Int. Cl.^{6} C07F *7/08*

U.S. Cl. 556—440 **2 Claims**

1. A process of manufacturing acryloxypropylsilane expressed by Formula (I),

$$CH_2{=}CR^1COOCH_2CH_2CH_2SiR^2{}_nR^3{}_{3-n} \quad \text{(Formula I)}$$

wherein R^1 represents hydrogen or methyl, R^2 represents a hydrolyzable group, R^3 represents an alkyl, alkenyl or aryl group of carbon number 1–12. and n is 0, 1, 2 or 3, which process comprises hydrosilating allyl acrylate or allyl methacrylate with a hydrosilane compound, with the use of a platinum-containing compound as catalyst, and an organic phosphorus compound as promoter selected from the group consisting of triphenylphosphine and an organic phosphorus compound expressed by Formula (III).

$$R^7R^8P(X)_mPR^9R^{10} \quad \text{(Formula III)}$$

wherein R^7, R^8, R^9 and R^{10} represent an alkyl group of carbon number 1–10 or an aryl group of carbon number 6–10. X represents CH_2 and m is 1, 2, 3 or 4.

5,750,754

HETEROCYCLIC COMPOUNDS

Stuart D. Mills, Cheshire, England, assignor to Zeneca Limited, London, United Kingdom

Filed Jun. 4, 1996, Ser. No. 658,097

Claims priority, application United Kingdom, Mar. 29, 1993, 9306451; Mar. 29, 1993, 9306453; Dec. 15, 1993, 9325605; Dec. 15, 1993, 9325610; Sep. 7, 1995, 9518188

Int. Cl.^{6} C07C *309/07*

U.S. Cl. 558—52 **2 Claims**

1.The optically active compound tert-butyl(3R)-3-methyl-4-hydroxybutyrate, or a derivative thereof reactive in the formation of an ether linkage by nucleophilic substitution with a phenolic compound, substantially free of the (3S) stereoisomer.

2. A compound according to claim 1, wherein the reactive derivative is tert-butyl (3 R)-3-methyl-4-(p-toluenesulphonyloxy)butyrate.

5,750,755

SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL

Takashi Nakamura; Hiroshi Fukuzawa, and Michio Ono, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

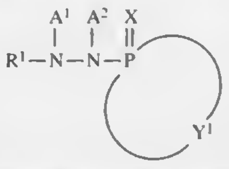
Division of Ser. No. 544,935, Oct. 18, 1995, Pat. No. 5,622,810. This application Aug. 12, 1996, Ser. No. 695,636

Claims priority, application Japan, Oct. 18, 1994, 6-252420; Jan. 20, 1995, 7-7343; Jan. 23, 1995, 7-8093

Int. Cl.^{6} C07F *9/6574;9/6584;9/6578;9/6568*

U.S. Cl. 558—84 **2 Claims**

1. A compound represented by the following formula (I-1):



(I-1)

wherein R' represents an aryl group or a heterocyclic group; A^1 and A^2 each represent a hydrogen atom or a hydrolyzable group; X represents an oxygen atom; and Y^1 represents atoms completing a 5- to 10-membered phosphorus atom-containing heterocyclic ring.

5,750,756

PROCESS FOR THE FORMATION OF HYDROCARBYL BIS(HYDROCARBYL PHOSPHATE)

Danielle A. Bright, New City, and Ronald L. Pirrelli, Mahopac, both of N.Y., assignors to Akzo Nobel nv, Arnhem, Netherlands

Continuation-in-part of Ser. No. 332,671, Nov. 1, 1994. This application Jul. 29, 1996, Ser. No. 681,735

Int. Cl.^{6} C07F *9/12*

U.S. Cl. 558—162 **11 Claims**

1. A process for forming a composition comprising an alkylene-arylene bridging group-containing bis (diaryl phosphate) compound, normally prone to monophosphate by-product formation, with the formation of more bisphosphate and less of such monophosphate by-product, which process comprises the reaction of a composition comprising diaryl halophosphate and alkylene-arylene bridging group-containing diol, in the presence of a catalytic amount of a Lewis acid catalyst, utilizing a means, substantially concurrent with the course of the reaction, for the removal of hydrohalide by-product.

5,750,757

PESTICIDAL ESTER PREPARATION

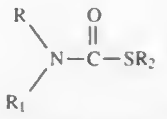
Abdul Rakeeb Abdul Subhan Deshmukh; Rajan Hiralal Naik; Sagun Kashinath Tandel, and Srinivasachari Rajappa, all of Maharashtra, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Division of Ser. No. 511,411, Aug. 4, 1995, Pat. No. 5,621,132, which is a division of Ser. No. 962,774, Oct. 19, 1992, abandoned. This application Oct. 29, 1996, Ser. No. 739,298

Int. Cl.^{6} C07C *333/04*

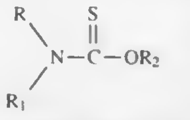
U.S. Cl. 558—232 **5 Claims**

1. A process for the preparation of an S-alkyl ester of an N-alkyl carbamothioic acid having the formula:



III

wherein R and R_2 are each an alkyl group and R_1 is hydrogen or alkyl, which comprises refluxing the corresponding alkyl ester of N-alkyl thiocarbamic acid having the formula I



I

wherein R and R_2 are each alkyl and R_1 is hydrogen or alkyl, in the presence of an acid catalyst selected from the group consisting of iodine and sulfuric acid.

5,750,758

PYROCARBONIC ACID DIESTERS AND THE PREPARATION AND USE THEREOF

John Zambounis, Basel, and Véronique Hall-Goulle, Bern, both of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

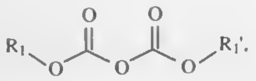
Filed Jul. 22, 1996, Ser. No. 681,205

Claims priority, application Switzerland, Jul. 28, 1995, 02 222/95

Int. Cl.^{6} C07C *68/06*

U.S. Cl. 558—276 **11 Claims**

1. A process for the preparation of a pyrocarbunic acid diester of formula (I)

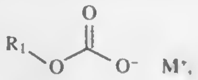


(I)

wherein

R_1 and R_1' are each independently of the other branched or straight-chain C_1–C_{24}alkyl, C_3–C_{24}alkenyl, C_3–C_{24}alkynyl, C_4–C_{12}cycloalkyl, C_4– C_{12}cycloalkenyl or C_7–C_{24}aralkyl, each of which is unsubstituted or substituted by one or more than one substituent which is inert under the reaction conditions,

by reacting at least one ester carbonate of formula (II)

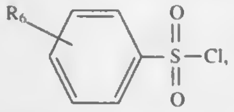


(II)

wherein

M^+ is Na^+, Li^+, K^+ or $NR_2R_3R_4R_5^+$, and R_2 to R_5 are each independently of one another hydrogen, C_1–C_{18}alkyl, C_5–C_{10}cycloalkyl or C_7–C_{18}aralkyl,

with 40–50 mol % of a sulfochloride of formula (IV)

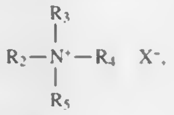


(IV)

wherein

R_6 is —H, $—CH_3$, $—CH_2CH_3$, —Cl, —Br, $—OCH_3$ or $—NO_2$,

in the presence of 0.8–5 mol % of a catalyst of formula (V)



$$R_2-\overset{\displaystyle R_3}{\underset{\displaystyle R_5}{\overset{|}{\underset{|}{N^+}}}}-R_4 \quad X^-,$$

(V)

wherein

R_2 to R_5 have the meaning cited above, and

X^- is a non-nucleophilic anion,

and with minor amounts of a heterocyclic aromatic amine in a nonpolar inert solvent,

in which process the amount of heterocyclic aromatic amine is 1–5 mol % and the reaction is carried out in the temperature range from −10° C. to +25° C.,

all molar amounts being based on 100 mol % of ester carbonate of formula (II).

5,750,759

CONTINUOUS CATALYTIC PROCESS FOR PREPARATION OF ORGANIC CARBONATES

Gary P. Hagen, West Chicago, and Michael J. Spangler, Sandwich, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 7, 1997, Ser. No. 834,986

Int. Cl.^{6} C07C *68/00*

U.S. Cl. 558—277 **9 Claims**

1. A processes for catalytic production of organic carbonates which process comprises contacting a feedstream containing dioxygen, carbon monoxide, ether, and alkanol which can be vaporized under conditions of reaction, with a blend of catalysts, which are heterogeneous to the feedstream, under conditions of reaction sufficient to form a mixture containing at least one higher molecular weight organic carbonate.

5,750,760

METHOD FOR PRODUCING A NITRILE

Takashi Ushikubo; Yukio Koyasu, and Hiroya Nakamura, all of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Sep. 20, 1996, Ser. No. 717,194

Claims priority, application Japan, Oct. 5, 1995, 7-258607

Int. Cl.^{6} C07C *253/26*

U.S. Cl. 558—319 **9 Claims**

1. A method for producing a nitrile, which comprises a gas phase catalytic oxidation reaction of an alkane with ammonia in the presence of an oxide catalyst of the empirical formula (1):

$$Mo_aV_bSb_cX_xO_n \qquad (1)$$

wherein X is at least one element selected from the group consisting of Nb, Ta, W, Ti, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, B. In, Ce, an alkali metal and an alkaline earth metal; when a=1, $0.1 \leqq b < 0.99$, $0.01 \leqq c < 0.9$, $0 \leqq x < 0.89$, and $0.11 \leqq (b+c+x) < 1$; and n is a number determined by the oxidized states of other elements.

5,750,761

CYANATION OF DOUBLE BOND SYSTEMS

Rainer Hamprecht, Odenthal, and Claudia Müller, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

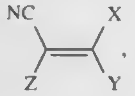
Filed Feb. 28, 1996, Ser. No. 608,455

Claims priority, application Germany, Mar. 3, 1995, 19 507 415.7; Mar. 14, 1995, 19 509 043.8

Int. Cl.^{6} C07C *255/03*

U.S. Cl. 558—423 **15 Claims**

1. Process for the preparation of compounds of the formula



(I)

in which

X and Y independently of one another represent an electron-attracting radical,

or

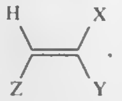
X and Y, together with the carbon atom to which they are bonded, form an optionally substituted, heterocyclic or carbocyclic ring.

Z represents unsubstituted or substituted, optionally fused aryl or represents an unsubstituted or substituted, optionally fused heterocyclic radical,

or

Y and Z, together with the carbon atoms to which they are bonded and including the double bond, form an unsubstituted or substituted heterocyclic radical,

wherein compounds of the formula



(II)

wherein

X, Y and Z have the abovementioned meaning,

are reacted with a cyanide or a cyanide-donating compound and then with an oxidizing agent other than Br_2 in the presence of halides.

5,750,762

CYCLOPENTADIENE DERIVATIVE COMPOUNDS AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING ONE CYCLOPENTADIENE DERIVATIVE COMPOUND

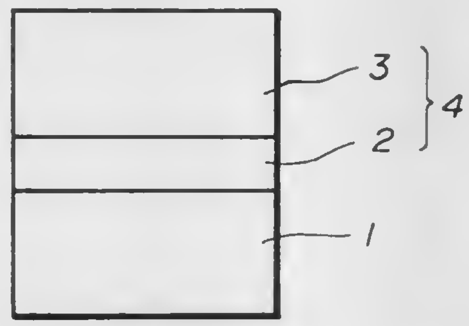
Megumi Kawahara, Yokohama; Ikuko Yamada, Kawasaki; Masayuki Shoshi, Yokohama, and Akio Kojima, Mitaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 398,944, Mar. 2, 1995, Pat. No. 5,700,614. This application Mar. 13, 1996, Ser. No. 615,063

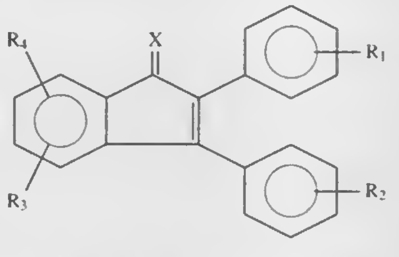
Claims priority, application Japan, Mar. 3, 1994, 6-033617; Mar. 10, 1994, 6-039934

Int. Cl.^{6} C07C *255/07*

U.S. Cl. 558—423 **6 Claims**



1. A cyclopentadiene derivative compound represented by a formula:



wherein R_1, R_2, R_3, R_4 independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, or an alkyl group which may have a substituent;

wherein X represents:

s substitution group (1) of the formula =C(A)(B) wherein A and B independently represent a halogen atom, a cyano group, an aromatic group which may have a substituent, or a group $—COOR_6$ wherein R_6 represents an alkyl group which may have a substituent, or an aromatic group which may have a substituent; or a substitution group (2) of the formula =N—R_5 where R_5 represents a cyano group, an alkyl group which may have a substituent, or an aromatic group which may have a substituent.

5,750,763

PROCESS FOR PRODUCTION OF THIOARYL COMPOUND

Tatsuo Sugiyama, Shizuoka-ken, and Tadashi Nakayama, Tokyo, both of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/00455, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO95/25089, PCT Pub. Date Sep. 21, 1995

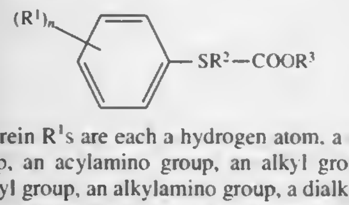
PCT Filed Mar. 17, 1995, Ser. No. 532,801

Claims priority, application Japan, Mar. 17, 1994, 6-072524

Int. Cl.^{6} C07C *321/28*

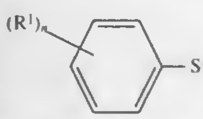
U.S. Cl. 560—17 **8 Claims**

5. A process for producing an alkoxycarbonylalkylthioaryl compound represented by general formula (5):



(5)

(wherein R^1s are each a hydrogen atom, a halogen atom, an amino group, an acylamino group, an alkyl group, an alkoxy group, a phenyl group, an alkylamino group, a dialkylamino group, a benzyl group or an acyl group; n is an integer of 1–5; when n is 2 or more; R^1s may be the same or different; R^2 is an alkylene group; R^3 is an alkyl group), which process comprises reacting an alkali metal salt of an arylmercaptan compound, represented by general formula (3):



(3)

(wherein R^1s and n have the same definitions as given above, and M1 is an alkali metal) with a halogenofatty acid ester compound represented by general formula (4):

$$X^1R^2COOR^3 \qquad (4)$$

(wherein R^2 and R^3 have the same definitions as given above, and X^1 is a halogen atom) at pH 7–10, wherein the reaction of an alkali metal salt of an arylmercaptan compound with a halogenofatty acid ester compound is conducted in a heterogeneous solvent consisting of water and an organic solvent which is substantially inert to said reaction and which has substantially no compatibility with water.

5,750,764

SYNTHESIS AND RESOLUTION OF PROPIONIC ACID DERIVATIVES

Stephanus Francois Marais, Garsfontein; Thebeeapelo John Khaile, Erasmuskloof; Owen Lungile Njamela, Kempton Park; Dana Helen Braithwaite, Johannesburg; Deborah Nicole Davidson, Hurlyvale; Christa Maria Jungmann, Edenvale; Christopher John Parkinson, Modderfontein; Neil Stockenstrom Gardiner, Noordwyk; Lucia Hendrina Steenkamp, Boksburg, and Etienne Van Eeden Skein, Randburg, all of South Africa, assignors to AECI Limited, Johannesburg, South Africa

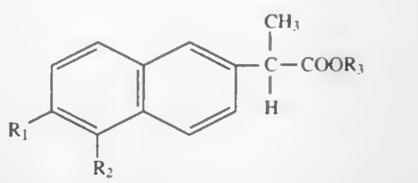
Filed Nov. 5, 1996, Ser. No. 744,187

Claims priority, application South Africa, Nov. 17, 1995, 95/9792; Apr. 30, 1996, 96/3420

Int. Cl.^{6} C07C *69/76*

U.S. Cl. 560—56 **15 Claims**

1. A process for the production of a compound of formula V



V

wherein

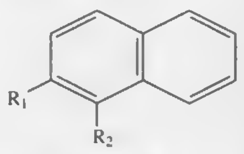
R_1 represents a group OR_6, wherein R_6 represents H or a C_1–C_3 alkyl group;

R_2 represents H or X_1, wherein X_1 represents I, Br, Cl, F or SO_3H; and

R_3 represents a C_1–C_{18} alkyl group;

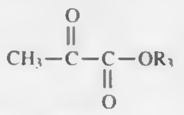
which comprises the steps of:

(i) reacting a compound of formula I



I

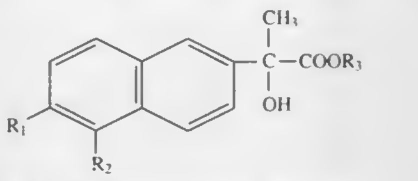
wherein R_1 and R_2 are as defined above,
with an alkylating agent of formula II



$$CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle O}{\|}}{C}-OR_3$$

II

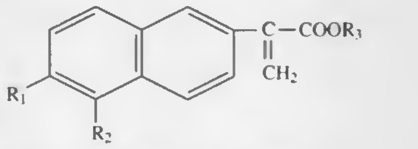
wherein R_3 is as defined above,
in the presence of a catalyst to give a compound of formula III



III

wherein R_1 to R_3 are as defined above; and either

(ii)(a) dehydrating a compound of formula III to give a compound of formula IV



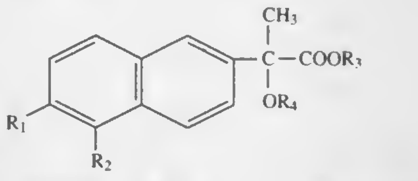
IV

wherein R_1 to R_3 are as defined above; and

(ii)(b) treating a compound of formula IV with hydrogen in the presence of a catalyst to give a compound of the formula V; or

(iii) hydrogenolysing a compound of formula III directly to give a compound of formula V; or

(iv)(a) derivatising a compound of formula III to give a compound of formula VI



VI

wherein R_4 represents COR_5 or a C_1–C_5 alkyl group, and R_5 represents H or a C_1–C_6 alkyl group; and

(iv)(b) hydrogenolysing a compound of formula VI to give a compound of formula V; or

(iv)(c) eliminating the group —OR_4 to give a compound of the formula IV;

and after step (iv)(c)

(iv)(d) treating a compound of formula IV with hydrogen in the presence of a catalyst to give a compound of the formula V.

5,750,765

7-SUBSTITUTED QUINONE METHIDES AS INHIBITORS FOR UNSATURATED MONOMERS

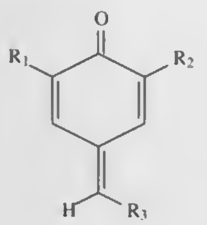
Peter Nesvadba; Samuel Evans, both of Marly, Switzerland; Matthew E. Gande, Danbury, Conn.; Volker H. von Ahn, Mahopac, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of Ser. No. 422,285, Apr. 14, 1995, Pat. No. 5,583,247. This application Aug. 27, 1996, Ser. No. 703,763

Int. Cl.^{6} C07C *69/74*

U.S. Cl. 560—126 **1 Claim**

1. A compound of formula I



(I)

wherein

R_1 and R_2 are independently alkyl of 4 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms or phenylalkyl of 7 to 15 carbon atoms, and

R_3 is —CN, —COOH, —$COOR_4$, —COR_5, —$OCOR_6$, —$CONR_7R_8$ or —$PO(OR_9)_2$ where

R_4 is alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenyl or benzyl,

R_5 is alkyl of 1 to 18 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by 1 or 2 alkyl of 1 to 4 carbon atoms or by hydroxyl,

R_6 is alkyl of 1 to 18 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by 1 or 2 alkyl of 1 to 4 carbon atoms or by hydroxyl,

R_7 and R_8 are independently hydrogen, alkyl of 1 to 18 carbon atoms or said alkyl substituted by alkylamino of 1 to 4 carbon atoms, by dialkylamino of 2 to 8 carbon atoms or by hydroxyl; benzyl, aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl of 1 to 4 carbon atoms, by alkylamino of 1 to 4 carbon atoms, by dialkylamino of 2 to 8 carbon atoms, by phenylamino or by hydroxyl, or

—NR_7R_8 is morpholino, piperidino or pyrrolidino, and

R_9 is hydrogen or alkyl of 1 to 18 carbon atoms, but excluding

a. (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)acetonitrile;

b. (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)acetic acid;

c. methyl (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)acetate;

d. diethyl (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)methanephosphonate;

e. (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)methyl acetate;

f. (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)methyl pivalate;

g. (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)methyl benzoate;

h. 2,6-di-tert-butyl-4-(2-oxophenylethylidene)-cyclohexa-2,5-dienone; and

i. diisopropyl (3,5-di-tert-butyl-4-oxocyclohexa-2,5-dienylidene)methane-phosphonate.

5,750,766

PROCESS FOR THE PREPARATION OF ARYLMALONATES

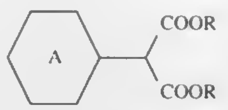
Guenter Krummel, Vendersheim, and Marcus Knell, Ingelheim, both of Germany, assignors to American Cyanamid Company, Madison, N.J.

Filed Mar. 18, 1997, Ser. No. 820,277

Int. Cl.^{6} C07C *69/76*

U.S. Cl. 560—82 **12 Claims**

1. In an improved process for the preparation of dialkyl arylmalonates of formula I,



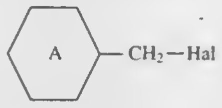
(I)

wherein

ring A is an optionally substituted, optionally benzo-condensed phenyl group or an optionally substituted nitrogen containing 6-membered heteroaromatic group, and

R represents alkyl,

from an arylmethylhalide of formula II



(II)

wherein

ring A has the meaning given for formula I, and

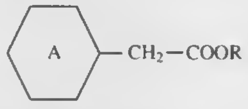
Hal represents halogen,

the improvement wherein is that

(a) the arylmethylhalide of formula II is treated with magnesium in an inert solvent,

(b) the resulting Grignard reagent is treated with more than 2 moles of a dialkyl carbonate or an alkyl chloroformiate related to 1 mole of arylmethylhalide of formula II, and

(c) the resulting reaction mixture comprising an arylacetate of formula III,



(III)

wherein the ring A and R have the meaning given, and the dialkyl carbonate or the alkyl chloroformiate is treated with a base.

5,750,767

SYNTHESIS AND USE OF AMINO ACID FLUORIDES AS PEPTIDE COUPLING REAGENTS

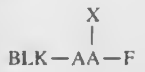
Louis A. Carpino, and Ayman Ahmed El-Faham, both of Amherst, Mass., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 284,964, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 426,121, Oct. 23, 1989, Pat. No. 5,360,928. This application Jun. 6, 1995, Ser. No. 466,319

Int. Cl.^{6} C07C *257/14;257/18;* **C07D** *233/02;207/02*

U.S. Cl. 560—161 **18 Claims**

1. A process for preparing a protected amino acid fluoride of the formula:



$$BLK-\overset{\overset{\displaystyle X}{|}}{AA}-F$$

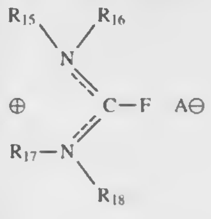
or the hydrogen fluoride salts thereof wherein

BLK is an N-amino protecting group;

AA is an amino acid residue; and

X is a—or a protecting group,

comprising reacting a protected amino acid with a fluoroformamidinium salt of the formula



wherein

R_{15}, R_{16}, R_{17} and R_{18} are independently lower alkyl, aryl, aryl lower alkyl, cycloalkyl, cycloalkyl lower alkyl or
R_{15} and R_{16}, taken together with the nitrogen atom to which they are attached form a 5- or 6- membered ring containing a nitrogen ring atom and 4 or 5 carbon ring atoms and up to a total of 10 carbon atoms, or
R_{17} and R_{18}, taken together with the nitrogen atom to which they are attached form a 5- or 6- membered ring containing a nitrogen ring atom and 4–5 ring carbon atoms and up to a total of 10 carbon atoms or
R_{16} and R_{17} and taken together with the nitrogen atoms to which they are attached and the carbon atom attached to said nitrogen atoms form a 5- or 6- membered ring containing 2 nitrogen ring atoms and 3–4 ring carbon atoms and up to a total of 10 carbon atoms and A is a counterion.

5,750,768

METHOD OF MANUFACTURING α-OXOCARBOXYLATE AND CATALYST ADOPTED IN THE METHOD

Yoshitaka Arita; Akihiko Ohta; Ren Hasebe, all of Suita, and Noboru Saito, Takatsuki, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Aug. 6, 1996, Ser. No. 689,274

Claims priority, application Japan, Aug. 24, 1995, 7-216379; Jul. 5, 1996, 8-176810

Int. Cl.^{6} C07C *69/66*

U.S. Cl. 560—177 **35 Claims**

1. A method of manufacturing α-oxocarboxylate, comprising the step of:
carrying out a vapor phase oxidation of α-oxoaldehyde and/or α-hydroxyaldehyde and alcohol or olefin in the presence of oxygen and a catalyst.

5,750,769

HALOGENATED ESTERS USEFUL AS INTERMEDIATES FOR INSECTICIDES

Martin Charles Bowden, Brighouse, United Kingdom, assignor to Zeneca Limited, London, England

Filed Nov. 8, 1995, Ser. No. 554,648

Claims priority, application United Kingdom, Nov. 25, 1994, 9423800; Jul. 18, 1995, 9514652

Int. Cl.^{6} C07C *69/66*

U.S. Cl. 560—184 **10 Claims**

1. A compound of formula:

$$CF_3—CXCl—CH(OH)CH_2—C(CH_3)_2—CH_2—CO_2R \qquad (I)$$

where X represents chloro or bromo and R represents hydrogen or alkyl of up to 4 carbon atoms.

5,750,770

UNSATURATED MONO-ESTERS AND THEIR USE IN COATING COMPOSITIONS

Edward E. McEntire, Hampton Township, Allegheny County, and Lyle L. Foringer, West Franklin Township, Armstrong County, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1995, Ser. No. 541,748

Int. Cl.^{6} C07C *67/26*

U.S. Cl. 560—200 **8 Claims**

1. A hydroxy functional, unsaturated maleate diester comprising the esterification reaction product of an unsaturated anhydride with a secondary alcohol component comprising cylohexanol to form a maleate monoester, followed by oxyalkylation of the maleate monoester with an epoxy compound whereby a maleate diester is formed with hydroxy functionality.

5,750,771

PROCESS FOR THE MANUFACTURE OF SEC-BUTYL ACRYLATE BY REACTION OF ACRYLIC ACID AND BUTENE ISOMERS

Jean Michel Paul, Metz; Yves Samuel, Saint-Avold, and Marc Esch, Freyming-Merlebach, all of France, assignors to ELF Atochem S.A., Puteaux, France

Filed Jun. 3, 1996, Ser. No. 657,270

Claims priority, application France, Jun. 2, 1995, 95 06594

Int. Cl.^{6} C07C *69/52*

U.S. Cl. 560—205 **20 Claims**

1. A process for the manufacture of sec-butyl acrylate by reaction of acrylic acid and at least one butene in the presence of a macroporous cationic resin containing sulphonic acid groups, characterized in that the reaction is carried out using a molar ratio of the acrylic acid to the butene(s) used which is greater than 1, the crude reaction product comprising residual acrylic acid, dissolved butene isomers, the desired sec-butyl acrylate, octenes, 2-butanol and heavy addition products, and in that the desired sec-butyl acrylate is separated from the crude reaction product by azeotropic distillation in the presence of water.

5,750,772

DECOLORIZATION OF HYDROXY-CONTAINING METHACRYLATE HOMOPOLYMERS AND COPOLYMERS

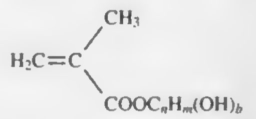
Alexei Alexeyevich Gridnev, Greenville, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1997, Ser. No. 791,373

Int. Cl.^{6} C07C *67/48*

U.S. Cl. 560—218 **15 Claims**

1. A process for decolorizing homo- and co-polymers of hydroxy-containing methacrylates of the formula



$$H_2C{=}C(CH_3)COOC_nH_m(OH)_b$$

wherein n>2,m>4 and b>1;
wherein said homo- and co-polymers are prepared in the presence of a chain transfer catalyst;
comprising the steps of exposing the polymers to:
(a) an acid having a pKa less than about 2;
(b) a chelating bidentate nitrogen ligand containing a fragment of the formula alkylidene$(NR_2)_x$(imidazolyl)$_y$
wherein y>1 and (y+ x)>2;
said alkylidene is C_2 to C_{10};
each R is independently H or C_1 to C_{10} alkyl;
and
(c) a polar absorbent medium.

5,750,773

PROCESS FOR PREPARING 4,4,4-TRICHLOROBUTYL ACETATE

Martin Charles Bowden, Huddersfield, United Kingdom, assignor to Zeneca Limited, London, England

Filed Jul. 11, 1996, Ser. No. 678,273

Claims priority, application United Kingdom, Jul. 17, 1995, 9514564

Int. Cl.^{6} C07C *69/63*

U.S. Cl. 560—226 **9 Claims**

1. A process for the preparation of 4,4,4-trichlorobutyl acetate comprising reacting allyl acetate with chloroform in the presence of a radical initiator, characterized by the incremental addition of the allyl acetate to the chloroform.

5,750,774

METHOD FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Hideo Miyata, Kanagawa; Toru Sasaki, Fukushima, and Kohei Morikawa, Kanagawa, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Mar. 11, 1997, Ser. No. 814,827

Int. Cl.^{6} C07F *9/38*

U.S. Cl. 562—17 **10 Claims**

1. A method for producing N-phosphonomethylglycine which comprises reacting an aminomethylphosphonic acid with glycolonitrile, or formaldehyde and hydrogen cyanide in situ, under an alkaline condition to obtain a product comprising an N-phosphonomethylglycinonitrile salt or a mixture of an N-phosphonomethylglycinonitrile salt and N-phosphonomethylglycinonitrile, and adding an acid to hydrolyze the product under an acidic condition.

5,750,775

SODIUM ORTHOHYDROXYMANDELATE/PHENOL/WATER COMPLEX, PREPARATION PROCESS AND USE FOR ISOLATION OF SODIUM ORTHOHYDROXYMANDELATE

Christian Sidot, Compiegne, and Michel Tarlier, Verberie, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Sep. 18, 1996, Ser. No. 715,634

Claims priority, application France, Oct. 4, 1995, 95 11658

Int. Cl.^{6} C07C *59/48*

U.S. Cl. 562—470 **21 Claims**

1. A crystallized sodium orthohydroxymandelate-phenol-water complex.

5,750,776

PRODUCTION OF DICARBOXYLIC ACIDS OR ESTERS THEREOF

James Lumsden Harvie, Cleveland, United Kingdom, assignor to Imperial Chemical Industries PLC, Great Britain

PCT No. PCT/GB94/01411, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO95/01954, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 29, 1994, Ser. No. 564,227

Claims priority, application United Kingdom, Jul. 5, 1993, 9313892; Jul. 5, 1993, 9313896

Int. Cl.^{6} C07C *51/487*

U.S. Cl. 562—483 **21 Claims**

1. A process for effecting depolymerisation of solid phase polyesters in order to recover dicarboxylic acids and alkylene diols therefrom, comprising:
(a) in a first zone reacting the solid phase polyester with a diol at a reaction temperature which is in excess of 10° C. above the boiling point of the diol to produce a liquid phase medium containing lower molecular weight depolymerisation products;
b) transferring the liquid phase medium from said first zone to a second zone in which elevated pressure conditions prevail; and
c) in said second zone reacting the lower molecular weight depolymerisation products from step a) with a medium comprising water to effect further depolymerisation of said low molecular weight depolymerisation products into dicarboxylic acid, in such a way that, under the prevailing reaction conditions, at least a major part of the dicarboxylic acid is produced in the solid phase.

5,750,777

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS BY CONTROLLED OXIDATION OF THE CORRESPONDING ALKANES

Alain Aubry, Joinville Le Pont; Michel Gubelmann, and Anne-Marie Le Govic, both of Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Dec. 27, 1995, Ser. No. 579,191

Claims priority, application France, Dec. 29, 1994, 94 15932

Int. Cl.^{6} C07C *51/18;27/10*

U.S. Cl. 562—549 **26 Claims**

1. A process for the preparation of carboxylic acids comprising a gas phase reaction of the corresponding alkane with a source of oxygen, wherein said reaction is performed in the presence of an effective oxidation catalytic amount of a catalyst in which the active phase comprises vanadium, titanium, molybdenum, phosphorus and oxygen.

5,750,778

FUNGICIDE INTERMEDIATES

Patrick Jelf Crowley, Crowthorne; Kevin Robert Lawson, High Wycombe; Douglas John Smith, Bracknell, and Donn Warwick Moseley, Reading, all of England, assignors to Zeneca Limited, London, England

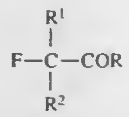
Continuation of Ser. No. 736,347, Jul. 26, 1991, abandoned. This application Aug. 10, 1993, Ser. No. 105,650

Claims priority, application United Kingdom, Jul. 27, 1990, 9016577; Apr. 17, 1991, 9108216

Int. Cl.^{6} C07C *53/21*

U.S. Cl. 562—605 **7 Claims**

1. A compound of the formula (I):



$$F—C(R^1)(R^2)—COR \qquad (I)$$

wherein R is OH, Cl, C_{1-8} alkoxy or optionally substituted benzyloxy; R^1 is methyl, ethyl, CH_2F or CF_3; and, when R^1 is methyl, ethyl or CH_2F, R^2 is ethyl, n- or iso-propyl, optionally substituted benzyl or $CHFR^3$ wherein R^3 is H, methyl or ethyl, and, when R^1 is CF_3, R^2 is the group $C(R^4)(R^5)R^6$ wherein R^4 is H, methyl or ethyl, R^5 is H, F, Br, methyl or ethyl and R^6 is H or F, or R^1 and R^2 are both methyl and R is Cl, C_{3-8} alkoxy or OH, the compounds in which R is OH or Cl having a purity of 80% or more; provided that when R^1 is methyl and R^2 is ethyl or benzyl, R is not methoxy or ethoxy, that when R^1 is methyl and R^2 is CH_2F, R is not methoxy, that when R^1 and R^2 are both ethyl, R is not OH, methoxy or ethoxy and that when R^1 is CF_3 and R^2 is methyl, R is not methoxy.

5,750,779

PREPARATION PROCESS OF ACYL HALIDE OR SULFONYL HALIDE

Teruyuki Nagata; Hidetoshi Hayashi, and Hideki Mizuta, all of Fukuoka-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

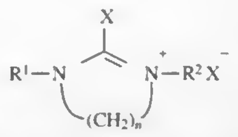
Filed May 31, 1996, Ser. No. 655,929

Claims priority, application Japan, Jun. 20, 1995, 7-152826

Int. Cl.^{6} C07C *51/60;53/42*

U.S. Cl. 562—828 **20 Claims**

1. A preparation process of acyl halide or sulfonyl halide which comprises reacting corresponding carboxylic acid or sulfonic acid with a haloiminium salt represented by the general formula (1):



(I)

wherein R^1 and R^2 are same or different lower alkyl groups, X is a halogen atom, and n is an integer of 2 or 3.

5,750,780

PROCESS FOR THE SYNTHESIS OF UREA COMPRISING TWO SEPARATE REACTION ZONES

Carlo Rescalli, S. Donato Milanese, Italy, assignor to Snamprogetti S.p.A., S. Donato Milanese, Italy

Filed Dec. 22, 1995, Ser. No. 577,182

Claims priority, application Italy, Jun. 30, 1995, MI95A1402

Int. Cl.⁶ C07C *273/04*

U.S. Cl. 564—67 **54 Claims**

1. In a process for the synthesis of urea from ammonia and carbon dioxide with the formation of ammonium carbamate as intermediate, comprising:

(a) reacting, in a reaction step, ammonia and carbon dioxide at a total pressure of between 90 and 250 ata, with a molar ratio NH_3/CO_2 as such or in the form of ammonium carbamate, of between 2.1 and 10, with the formation of a first liquid mixture containing urea, ammonium carbamate, water and ammonia;

(b) transferring said first liquid mixture to at least one decomposition-stripping step;

(c) heating said first liquid mixture in said decomposition-stripping step, operating essentially at the same pressure used in the previous step (a), to obtain the decomposition of at least a part of the ammonium carbamate into ammonia and carbon dioxide, and simultaneously subjecting said liquid mixture to a stripping with the formation of a first gaseous mixture containing ammonia and carbon dioxide, and a second liquid mixture containing urea, water, ammonia and the non-decomposed part of the ammonium carbamate;

(d) transferring at least a part of said first gaseous mixture to at least one condensation step operating essentially at the same pressure as step (a) and condensing the transferred mixture with the formation of a third liquid mixture containing ammonium carbamate, water and ammonia;

(e) transferring said third liquid mixture and the remaining part of the first gaseous mixture to the reaction step (a);

(f) recovering the urea contained in the second liquid mixture in one or more subsequent decomposition, condensation and separation steps to obtain essentially pure urea and recycling to the synthesis the non-converted ammonia and carbon dioxide or in the form of ammonium carbamate; the improvement wherein:

the above reaction step (a) is carried out in two distinct zones, communicating with each other and maintained essentially at the same pressure, of which the first operates at temperature of between 170° and 230° C. with the formation of the first liquid mixture and a second prevalently gaseous mixture containing ammonia, water, carbon dioxide and optionally inert gases, and the second zone operates at a lower temperature than the first, so that at least 5% by weight of the second prevalently gaseous mixture, with respect to the weight of the above first liquid mixture is transferred from the first to the second zone, with the subsequent formation, in the latter, of a further liquid mixture containing, ammonia, ammonium carbamate and, optionally, also urea, which is again transferred from the second to the first reaction zone.

5,750,781

PROCESS FOR PREPARING AN AQUEOUS COPOLYMER SOLUTION

Yoshifumi Yoshida, Hyogo; Akira Tanigawa, and Satoshi Yamamoto, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 7, 1995, Ser. No. 485,143

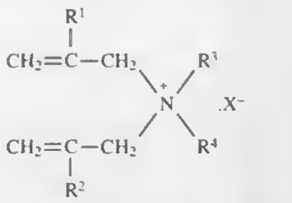
Claims priority, application Japan, Jun. 20, 1994, 6-137047

Int. Cl.⁶ C07C *231/12*

U.S. Cl. 564—153 **5 Claims**

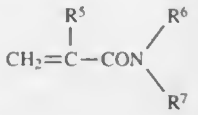
1. A process for preparing an aqueous solution of an ionic copolymer having a copolymer concentration of 20% by weight or less and a viscosity of 20 ps or more at 25° C., which comprises:

conducting copolymerization of a diallylamine compound (A) represented by the following formula (I):



(I)

wherein R^1 and R^2 each independently represents hydrogen or a methyl group, R^3 and R^4 each independently represents hydrogen or an alkyl group having 1–6 carbon atoms, and X^- is an acid anion, and an acrylamide compound (B) represented by the following formula (II):



(II)

wherein R^5 represents hydrogen or a methyl group, and R^6 and R^7 each independently represents hydrogen or an alkyl group having 1–4 carbon atoms, by continuously adding an aqueous solution of the acrylamide compound (B) having a concentration of the acrylamide compound (B) of 30% by weight or less to an aqueous solution of diallylamine compound (A) having a concentration of the diallylamine compound (A) of 5% by weight or more and less than 10% by weight.

5,750,782

NITROANILINE DERIVATIVES AND THEIR USE AS ANTI-TUMOUR AGENTS

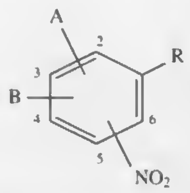
William Alexander Denny; Brian Desmond Palmer, and William Robert Wilson, all of Auckland, New Zealand, assignors to Cancer Research Campaign Technology Limited, London, England

Division of Ser. No. 244,449, May 26, 1994, Pat. No. 5,571,845. This application Jul. 23, 1996, Ser. No. 685,079

Int. Cl.⁶ C07C *233/65*

U.S. Cl. 564—166 **4 Claims**

1. A compound represented by the formula (I).



(I)

where NO_2 is in the 2-position. R represents $CONHCH_2CH_2NMe_2$. A represents 4-NO_2 and B represents 5-$N(CH_2CH_2Cl)_2$.

5,750,783

BENZYLOXY-SUBSTITUTED PHENYLGLYCINOLAMIDES

Siegfried Goldmann; Ulrich Müller, both of Wuppertal, Germany; Richard Connell, Trumbull, Conn.; Hilmar Bischoff; Dirk Denzer, both of Wuppertal, Germany; Rudi Grützmann, Solingen, Germany, and Martin Beuck, Erkrath, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

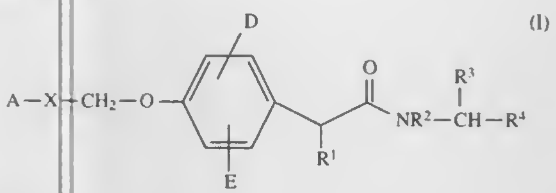
Filed Apr. 10, 1997, Ser. No. 833,824

Claims priority, application Germany, Apr. 18, 1996, 196 15 263.1

Int. Cl.⁶ C07C *233/16;233/25;* **A61K** *31/24;31/16*

U.S. Cl. 564—166 **10 Claims**

1. Benzyloxy-substituted phenylglycinolamides of the general formula (I)



(I)

in which

A represents a 4- to 8-membered, saturated or partially unsaturated carbocycle, or represents phenyl, or represents a 5- to 6-membered aromatic heterocycle having up to 3 heteroatoms from the series S, N and/or O,

the abovementioned ring systems optionally being substituted up to 5 times identically or differently by phenyl, pyridyl, carboxyl, cyano, carboxyl, halogen, nitro, hydroxyl, by straight-chain or branched alkyl, alkoxy, alkoxycarbonyl, polyfluoroalkyl or polyfluoroalkoxy each having up to 6 carbon atoms or by a group of the formula —SO_2R^5, —NR^6R^7 or —CO—NR^8R^9,

in which

R^5 denotes phenyl or straight-chain or branched alkyl having up to 3 carbon atoms,

R^6, R^7, R^8 and R^9 are identical or different and denote hydrogen or straight-chain or branched alkyl having up to 10 carbon atoms,

or

R^8 and R^9 denote cycloalkyl having 3 to 6 carbon atoms, or denote benzyl or phenyl, each of which is optionally substituted by halogen, nitro, hydroxyl or by straight-chain or branched alkyl or alkoxy each having up to 4 carbon atoms,

or

R^8 and R^9, together with the nitrogen atom, form a 5- to 7-membered, saturated or unsaturated heterocycle which can optionally contain a further heteroatom from the series S, N and/or O,

X represents a bond or the >C=O group,

D and E are identical or different and represent hydrogen, cycloalkyl having 3 to 8 carbon atoms, azido, hydroxyl, halogen, straight-chain or branched alkyl, alkoxy or alkenyl each having up to 6 carbon atoms,

R^1 represents cycloalkyl having 3 to 8 carbon atoms, or represents straight-chain or branched alkyl having up to 10 carbon atoms,

R^2 represents hydrogen or represents straight-chain or branched alkyl having up to 4 carbon atoms,

R^3 represents hydrogen or the —CH_2—OH group,

R^4 represents phenyl which is optionally substituted up to 3 times identically or differently by hydroxyl, halogen or straight-chain or branched alkyl having up to 5 carbon atoms,

and their salts.

5,750,784

METHOD FOR EFFECTING VASODILATION WITH (1,5-INTER) ARYL PROSTAGLANDIN DERIVATIVES

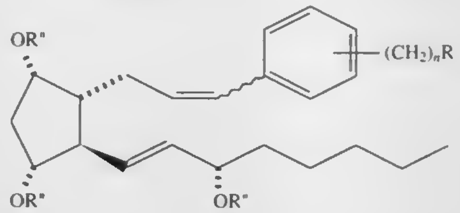
June Chen, San Juan Capistrano; Robert M. Burk, Laguna Beach, and David F. Woodward, Lake Forest, all of Calif., assignors to Allergan, Waco, Tex.

Continuation of Ser. No. 522,775, Sep. 1, 1995, Pat. No. 5,661,178. This application Feb. 18, 1997, Ser. No. 801,445

Int. Cl.⁶ C07C *233/00*

U.S. Cl. 564—171 **8 Claims**

1. A compound comprising a (1,5-inter) aryl prostaglandin derivative of Formula I



wherein n is 0 or an integer of from 1 to 6; R is selected from the group of radicals represented by the formulae:

$CONR'_2$, CH_2OR' and $SO_2NR'_2$'

wherein R' is hydrogen or a lower alkyl radical having from one to six carbon atoms, provided that when R is $CONR'_2$, R' is not hydrogen R" is hydrogen or an acyl radical having the formula (CO)R'" wherein R'" is a saturated or unsaturated acyclic hydrocarbon radical having from 1 to about 10 carbon atoms, or —$(CH_2)_m$R"" wherein m is 0 or an integer of from 1 to 6 and R"" is an aliphatic ring having from 3 to 7 carbon atoms or an aryl group or a heteroaryl group; the hatched triangular segments represent alpha oriented bonds; the solid triangular segments represent beta oriented bonds and the wavy segments represent bonds that may be in either the cis or trans orientation.

5,750,785

1,4-BIS(2', 2' -DIPHENYLVINYL)BENZENE DERIVATIVE AND CHARGE TRANSPORTING MATERIAL AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING THE SAME

Yoshimasa Matsushima; Hiroshi Sugiyama, and Toshimitsu Hagiwara, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

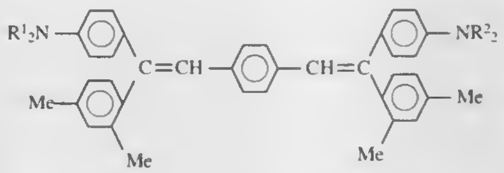
Division of Ser. No. 233,433, Apr. 28, 1994, Pat. No. 5,521,042. This application Feb. 7, 1996, Ser. No. 597,806

Claims priority, application Japan, Apr. 28, 1993, 5-123106

Int. Cl.⁶ C07C *211/54*

U.S. Cl. 564—315 **12 Claims**

1. A 1,4-bis(2',2'-diphenylvinyl)benzene derivative represented by formula (I):



(I)

wherein R^1 and R^2 each represents a different lower alkyl group and Me represents a methyl group.

5,750,786
PROCESS FOR THE PREPARATION OF UNSUBSTITUTED AND SUBSTITUTED DIARYL PHENYLENEDIAMINES

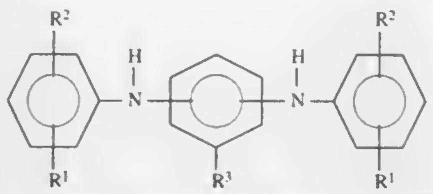
Budd Harvey Sturm, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 20, 1997, Ser. No. 802,744

Int. Cl.^{6} C07C ***209/18***

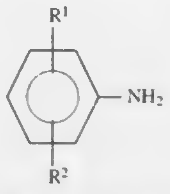
U.S. Cl. 564—403 **14 Claims**

1. A process for the preparation of aromatic diamines of the formula



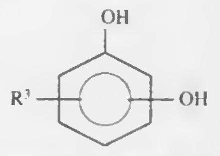
I

comprising reacting (1) from two to four mols of a primary amine having the following structural formula



II

wherein each R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 20 carbon atoms with (2) one mole of a dihydroxy aromatic compound of the formula



III

wherein R^3 is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 10 carbon atoms, at a temperature of from 175° C. to 350°C. in the presence of a catalytic mixture of (a) from 0.01 to 0.1 mol of a transitional metal halide selected from the group consisting of $TiCl_4$, $AlCl_3$ and mixtures thereof and (b) from 0.001 to 0.1 mol of an iron oxide.

5,750,787
LIQUID ALKYLATED DIPHENYLAMINE ANTIOXIDANT

John T. Lai, Broadview Heights, and Deborah S. Filla, Twinsburg, both of Ohio, assignors to B. F. Goodrich Company, Richfield, Ohio

Continuation-in-part of Ser. No. 527,475, Sep. 13, 1995, Pat. No. 5,672,752. This application May 30, 1996, Ser. No. 655,511

Int. Cl.^{6} C07C ***209/02***

U.S. Cl. 564—409 **11 Claims**

1. A process for alkylating diphenylamine, comprising:

reacting unsubstituted diphenylamine with diisobutylene in the presence of a clay catalyst at a reaction temperature from about 105° C. to about 200° C., wherein said unsubstituted diphenylamine contains less than 20 wt. % of mono, di, and polysubstituted diphenylamines and the mole ratio of diisobutylence:unsubstituted diphenylamine is from about 1:0.5 to about 1:1.6.

forming a mixture of diphenylamine and alkylated diphenylamines having less than 25 wt. % dioctyldiphenylamine, at least 50 wt. % monooctyldiphenylamine, and less than 25 wt. % unsubstituted diphenylamine with the proviso that the total amount of unsubstituted diphenylamine and dioctyldiphenylamine is less than 45 wt. %, and

wherein said weight percents are based upon the total weight of said mixture of diphenylamine and alkylated diphenylamines.

5,750,788
PREPARATION OF AMINES FROM COMPOUNDS HAVING AT LEAST 3 CYANO GROUPS

Lukas Häussling, Bad Dürkheim; Horst Neuhauser, Dudenhofen, and Wolfgang Paulus, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/04408, § 371 Date May 12, 1997, § 102(e) Date May 12, 1997, PCT Pub. No. WO96/15097, PCT Pub. Date May 23, 1996

PCT Filed Nov. 9, 1995, Ser. No. 849,102

Claims priority, application Germany, Nov. 12, 1994, 44 40 551.0

Int. Cl.^{6} C07C ***209/48***

U.S. Cl. 564—415 **10 Claims**

1. A process for preparing amines by hydrogenation of compounds having at least 3 cyano groups, prepared by addition of acrylonitrile onto ammonia or primary amines, at from 80° to 200° C. under from 5 to 500 bar, which comprises carrying out the hydrogenation continuously on a catalyst which contains from 80 to 98% by weight of cobalt oxide, from 1 to 10% by weight of manganese oxide, from 1 to 10% by weight of phosphorus pentoxide and from 0 to 5% by weight of alkali metal oxide.

5,750,789
UNSATURATED IMIDE COMPOUNDS CONTAINING ALICYCLIC STRUCTURE, PROCESS FOR PRODUCING THE SAME AND INTERMEDIATE THEREFOR

Yasuhiro Hirano; Yasuhiro Endo; Kazuo Takebe; Mitsuhiro Shibata, all of Tsukuba; Shuichi Kanagawa, Tsuchiura; Yutaka Shiomi, Tsukuba; Masatsugu Akiba, Tsukuba, and Shinichiro Kitayama, Tsukuba, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

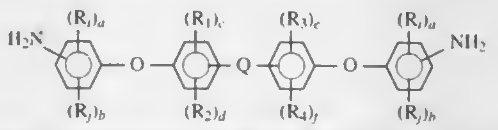
Division of Ser. No. 411,880, Mar. 28, 1995, Pat. No. 5,498,687, which is a division of Ser. No. 202,068, Feb. 25, 1994, Pat. No. 5,444,165, which is a division of Ser. No. 142,578, Oct. 28, 1993, Pat. No. 5,326,881. This application Sep. 29, 1995, Ser. No. 536,281

Claims priority, application Japan, Oct. 28, 1992, 4-290036; Nov. 13, 1992, 4-303616; Nov. 19, 1992, 4-310247; May 24, 1993, 5-121136; May 27, 1993, 5-125888

Int. Cl.^{6} C07C ***211/54***

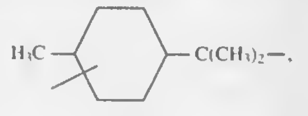
U.S. Cl. 564—428 **14 Claims**

1. A diamino compound represented by formula (2):

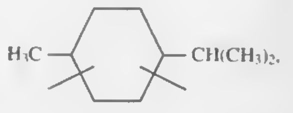


(2)

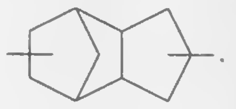
wherein Q represents an alicyclic structure-containing hydrocarbon having 4 to 20 carbon atoms selected from the group consisting of:



(a)

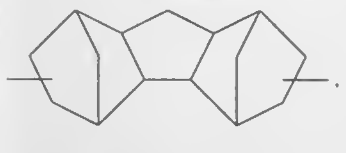


(b)

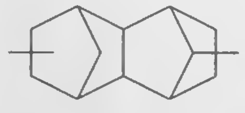


(c)

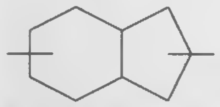
-continued



(d)



, and (e)



, wherein (f)

each of R_1, R_2, R_3, R_4, R_i and R_j represents a hydrogen atom, a halogen atom, a hydrocarbon group having 1–6 carbon atoms or a halogen-containing hydrocarbon group having 1–6 carbon atoms; and each of a, b, c, d, e and f represents an integer of 0–4 satisfying $a+b \leqq 4$, $c+d \leqq 4$ and $e+f \leqq 4$.

5,750,790
REDUCTIVE AMINATION CATALYSTS

Stephen Wayne King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 171,823, Dec. 22, 1993, abandoned. This application Dec. 6, 1995, Ser. No. 567,832

Int. Cl.^{6} C07C ***209/70***

U.S. Cl. 564—469 **8 Claims**

1. A method for reductive amination of MEA comprising contacting MEA and ammonia with a solid reductive amination catalyst comprising at least one catalytically effective reduction amination metal incorporated with a transitional alumina carrier selected from the group consisting of delta, theta, gamma/theta, delta/theta, and theta/alpha alumina phases, and mixtures thereof, under reductive amination conditions sufficient to provide a higher ratio of acyclic to cyclic products when compared to a similar catalyst not containing said transitional aluminas.

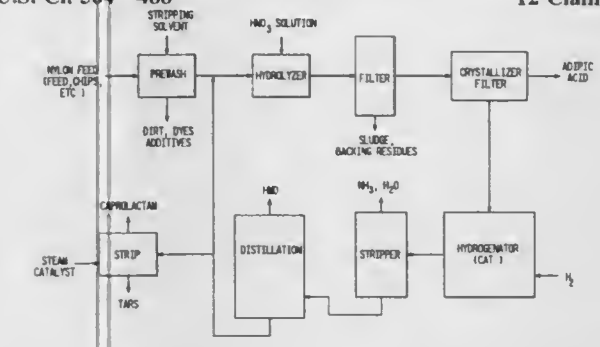
5,750,791
NITRIC ACID HYDROLYSIS OF POLYAMIDES

Darwin Darrell Davis, and Eugene Dennis Wilhoit, both of Victoria, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 493,836, Jun. 22, 1995, abandoned. This application Aug. 20, 1996, Ser. No. 697,116

Int. Cl.^{6} C07C ***209/62***

U.S. Cl. 564—488 **12 Claims**



1. A process for the recovery of diamine and dicarboxylic acid from a polyamide condensation product of the diamine and the dicarboxylic acid which comprises:

a) forming a reaction mixture containing the polyamide condensation product in 10 to 35 wt % nitric acid where the amount of nitric acid is, on a molar basis, stoichiometrically in excess of the diamine content;

b) hydrolyzing the polyamide condensation product at a temperature in the range of about 70°–110° C.; thus forming a reaction product containing diamine and dicarboxylic acid;

c) separating dicarboxylic acid from the reaction product;

d) catalytically hydrogenating nitric acid in the portion of the reaction product remaining after step c) to form ammonia;

e) and recovering diamine from the product of step d).

5,750,792
HIGHLY PURIFIED 1-AMINOPROPANEDIOL-2,3

Hiroshi Koyama, and Etsuo Takemoto, both of Hiroshima, Japan, assignors to Daicel Chemical Industrial, Ltd., Osaka, Japan

Continuation of Ser. No. 479,444, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 20,437, Feb. 22, 1993, abandoned, which is a continuation of Ser. No. 739,068, Aug. 1, 1991, abandoned. This application Dec. 6, 1996, Ser. No. 761,815

Claims priority, application Japan, Aug. 1, 1990, 1-204395; Jul. 8, 1991, 2-166603

Int. Cl.^{6} C07C ***211/03***

U.S. Cl. 564—507 **9 Claims**

1. A highly purified 1-aminopropanediol-2,3 which contains less than 0.3% by weight of 2-aminopropanediol-1,3.

5,750,793
PROCESS FOR THE SYNTHESIS OF NABUMETONE

Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi; Amilcare Bertoni, Tarcento, and Stefano Bianchi, Como, all of Italy, assignors to Alfa Chemicals Italiana S.p.A., Bergamo, Italy

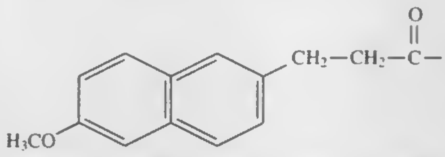
Filed Jan. 23, 1997, Ser. No. 788,054

Claims priority, application Italy, Feb. 21, 1996, BO96A0078

Int. Cl.^{6} C07C ***45/65***

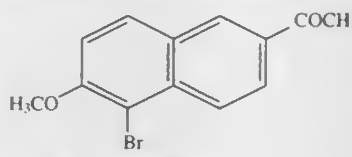
U.S. Cl. 568—315 **7 Claims**

1. A process for the synthesis of 4-(6-methoxy-2-naphthyl)butan-2-one of formula I



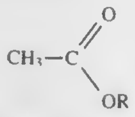
I

which comprises the steps of: a) reacting a molar equivalent of 2-acetyl-5-bromo-6-methoxynaphthalene of formula II



II

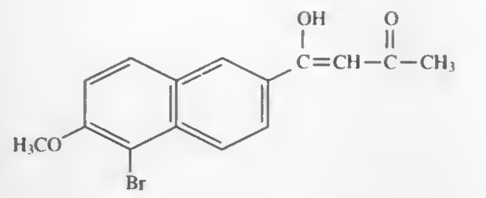
with an alkyl acetate of formula III



$$CH_3-C(=O)-OR$$

III

wherein R is an alkyl group containing from 1 to 6 carbon atoms, in a solvent, said solvent being a member selected from the group consisting of said alkyl acetate of formula III and mixtures of said alkyl acetate of formula III with toluene, acetonitrile or N,N-demethylformamide in presence of 1–3 molar equivalents of an alkaline alcoholate for a period of time from 0.5 to 6 hours at a temperature of 10° C.–90° C. whereby 4-(5-bromo-6-methoxy-2-naphthyl)-4-hydroxybut-3-en-2-one of formula IV is obtained



IV

after acidifying the reaction mixture at a pH value of 3–5 by means of an aqueous solution of an organic or inorganic acid; b) submitting to catalytic hydrogenation a molar equivalent of said compound of formula IV with hydrogen at a pressure of 1–10 atmospheres, for a period of time of 2–24 hours, at a temperature from room temperature to 90° C., in presence of from 0.005 to 0.05 molar equivalents of a hydrogenation catalyst and 0.30 to 0.99 molar equivalents of a base; c) filtering the mixture from step b) and concentrating it under vacuum whereby an oily product is formed; d) purifying said oily product from step c) to obtain the pure compound of formula I.

5,750,794

PROCESS FOR PREPARING CHIRAL TETRALONE

George J. Quallich, North Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

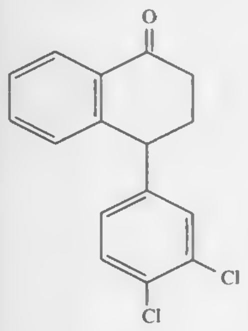
PCT No. PCT/IB94/00263, § 371 Date May 29, 1996, § 102(e) Date May 29, 1996, PCT Pub. No. WO95/15299, PCT Pub. Date Jun. 8, 1995

Continuation of Ser. No. 159,156, Nov. 30, 1993, abandoned. This PCT application Sep. 2, 1994, Ser. No. 652,485

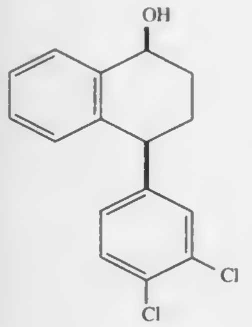
Int. Cl.^{6} C07C ***45/39***

U.S. Cl. 568—322 **18 Claims**

1. A process for asymmetrically reducing racemic 4-(3,4-dichlorophenyl)-3,4-dihydro-1-(2H)-naphthalenone of Formula (A) below to yield any two or four enantiomeric cis and trans alcohols of Formulas (I) through (IV) below:

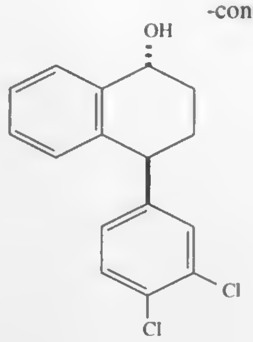


A

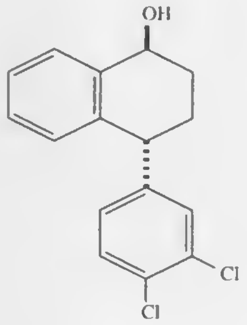


I

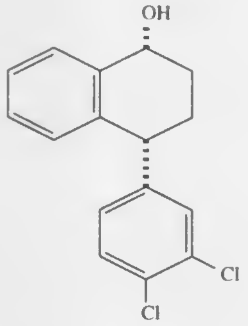
-continued



II



III

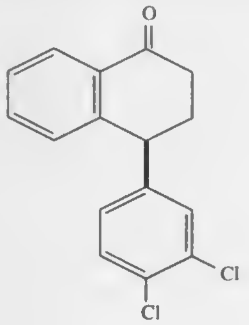


IV

comprising reacting said racemic 4-(3,4 -dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone with one or more asymmetric ketone reducing agents comprising enantioselective organoborane reagents.

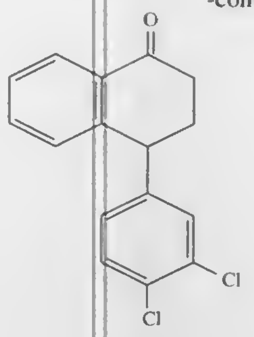
14. A process for preparing chiral (4S)-(3,4 -dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone of Formula (B) below comprising:

A. asymmetrically reducing racemic 4-(3,4 -dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone of Formula (A) below to yield any two or four enantiomeric cis and trans alcohols of Formulas (I) through (IV) below:

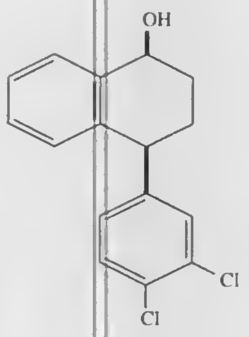


B

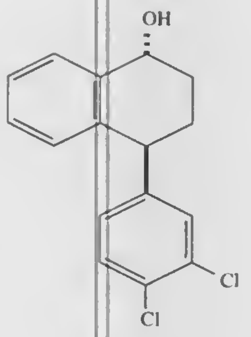
-continued



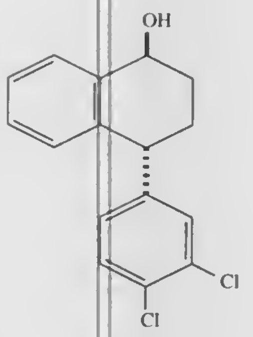
A



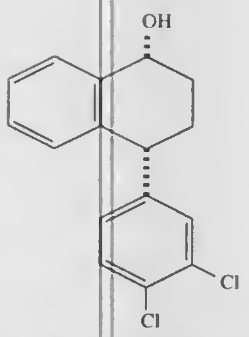
I



II



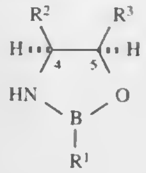
III



IV

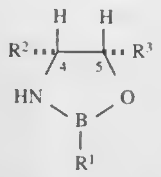
by reacting said racemic 4-(3,4-dichlorophenyl)-3,4 -dihydro-1(2H)-naphthalenone with one or more asymmetric ketone reducing agents comprising enantioselective organoborane reagents independently selected from the group consisting essentially of:

(1) a chiral oxazaborolidine of Formula (V) or (Va) below:



(V)

or



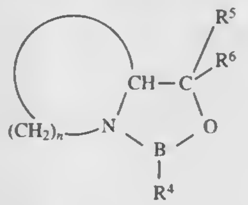
(Va)

wherein:

R^1 is hydrogen, (C_1–C_8) alkyl, benzyl, phenyl or phenyl substituted with up to three substituents independently selected from the group consisting essentially of (C_1–C_8) alkyl, (C_1–C_8) alkoxy and halo; and

R^2 and R^3 are syn and the same and are each phenyl or phenyl substituted with up to three substituents independently selected from the group consisting essentially of (C_1–C_8) alkyl, (C_1–C_8) alkoxy and halo; and a source of borane is additionally present;

(2) a chiral oxazaborolidine of Formula (VI) below:



(VI)

wherein:

R^4 is hydrogen, (C_1–C_8) alkyl, or aryl (C_1–C_8) alkyl;

n is 2, 3, or 4, such that the group $(CH_2)_n$ forms, together with the oxazaborolidine nitrogen and adjacent carbon, a 4-, 5-, or 6-membered ring; and a source of borane is additionally present; and

R^5 and R^6 are phenyl; and

(3) either enantiomer of a compound of Formula (D) below:

Ipc_2BX (D)

wherein:

Ipc is isopinocampheyl;

B is boron; and

X is halo;

B. separating cis alcohol of Formula (I) from trans alcohol of Formula (III) and oxidizing said cis alcohol of Formula (I) to yield said chiral (4S)-(3,4-dichlorophenyl)- 3,4-dihydro-1(2H)-naphthalenone of Formula (B); and

C. separating cis alcohol of Formula (IV) from trans alcohol of Formula (II) and oxidizing said trans alcohol of Formula (II) to yield said chiral (4S)-(3,4-dichlorophenyl)- 3,4-dihydro-1(2H)-naphthalenone of Formula (B).

5,750,795

PROCESS FOR PRODUCTION OF KETONE

Noboru Saito, Takatsuki, Japan, assignor to Nippon Shokubai, Ltd., Osaka, Japan

Filed Jan. 26, 1996, Ser. No. 592,684

Claims priority, application Japan, Jan. 27, 1995, 7-0315595

Int. Cl.^{6} C07C ***45/00***

U.S. Cl. 568—397 **7 Claims**

3. A process for producing a ketone represented by general formula RCOR' wherein

R is a C_9–C_{17} alkyl group or a C_5–C_8 cycloalkyl group;

R' is a C_1–C_{17} alkyl group, a C_6–C_{12} aryl group or a C_5–C_8 cycloalkyl group; and R and R' may be the same or different;

which process comprises,

reacting a carboxylic acid represented by general formula RCOOH, wherein R has the same definition as given above, with a carboxylic acid represented by general formula R'COOH, wherein R' has the same definition as given above, in a gas phase in the presence of a catalyst containing MgO and CaO.

5,750,796
METHOD OF PRODUCING AN ALKYLENE OXIDE ADDUCT OF A COMPOUND HAVING ONE OR MORE ACTIVE HYDROGEN

Itsuo Hama, Chiba; Takahiro Okamoto, Saitama; Hisashi Sasamoto, and Hirofumi Nakamura, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Aug. 23, 1996, Ser. No. 702,037

Int. Cl.^{6} C07C *41/03*

U.S. Cl. 568—618 10 Claims

1. A method of producing an alkylene oxide adduct comprising reacting at least one organic compound having at least one active hydrogen with alkylene oxide in the presence of an Al.Mg composite oxide catalyst obtained by calcining and activating an aluminum magnesium hydroxide having the following general formula (1):

$$nMgO.Al_2O_3.mH_2O \qquad (1)$$

wherein n and m are positive numbers.

5,750,797
PROCESS FOR THE PRODUCTION OF HYDROFLUOROETHERS

Daniel R. Vitcak, Cottage Grove, and Richard M. Flynn, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1996, Ser. No. 632,697

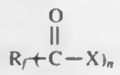
Int. Cl.^{6} C07C *41/00*

U.S. Cl. 568—683 44 Claims

1. An alkylation process for the preparation of hydrofluoroether compounds, said process comprising:

(1) combining in a polar, aprotic solvent:

a) a fluorinated carbonyl-containing compound of the formula:



$$R_f\left(\overset{O}{\overset{\|}{C}}-X\right)_n$$

wherein n is 1 to 3; and

when n is 1, R_f is a fluorinated alkyl group having from 1 to about 15 carbon atoms that may be substituted or unsubstituted, cyclic or acyclic, linear or branched and may contain one or more catenary heteroatoms;

when n is 2, R_f is a fluorinated alkylene group having from 1 to about 15 carbon atoms that may be substituted or unsubstituted, cyclic or acyclic, linear or branched and may contain one or more catenary heteroatoms;

when n is 3, R_f is a fluorinated alkylidene group having from 1 to about 15 carbon atoms that may be substituted or unsubstituted, cyclic or acyclic, linear or branched and may contain one or more catenary heteroatoms; and

wherein each X is independently a halogen atom or is of the formula R'_f or $OOCR'_f$ where R'_f is a fluorinated alkyl group having from 1 to about 10 carbon atoms that may be substituted or unsubstituted, cyclic or acyclic, linear or branched and may contain one or more catenary heteroatoms; where X is an R'_f group, that R'_f group may form a ring with said R_f group;

b) an anhydrous source of fluoride ion; and

c) an amount of a tertiary or aromatic amine sufficient to neutralize substantially all acid contaminants present in the reactant mixture;

(2) contacting the resulting mixture with an alkylating agent of the general formula:

Y—R

wherein:

R is a substituted or unsubstituted, cyclic or acyclic, linear or branched, non-fluorinated or partially fluorinated alkyl group having from 1 to about 10 carbon atoms that may contain one or more catenary heteroatoms; and

Y is a chlorine, bromine, or iodine atom or is a group of the formula $R'—SO_2—O—$ where R' is a phenyl or toluyl group or is a non-fluorinated or fully fluorinated alkyl group or an alkoxy group either of which may contain from 1 to about 10 carbon atoms; and

(3) recovering hydrofluoroether from the resulting product mixture.

5,750,798
METHOD FOR MAKING ETHER FROM A PARAFFIN FEEDSTOCK

Mark D. Scharre; Warren M. Ewert, and Harold R. Hunt, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1995, Ser. No. 573,219

Int. Cl.^{6} C07C *41/06*

U.S. Cl. 568—697 10 Claims

1. A process comprising the steps of:

charging a mixed butane stream to a dehydrogenation system for dehydrogenating paraffin compounds of said mixed butane stream to provide olefins, said dehydrogenation system producing a dehydrogenate stream containing butene and diolefin;

passing said dehydrogenate stream to an extractive distillation system whereby said dehydrogenate stream undergoes an extractive distillation utilizing a suitable extraction solvent to separate paraffins and olefins by providing a first overhead stream containing at least one paraffin compound and a second overhead stream containing at least one olefin compound and at least one diolefin compound;

passing said second overhead stream to a hydroisomerization system whereby at least a portion of the diolefin concentration of said second overhead stream is hydrogenated to produce a hydroisomerate stream having a concentration of diolefin less than the concentration of diolefin in said second overhead stream;

passing said hydroisomerate stream to an etherification system for reacting isoolefin with a primary alcohol to form ether to thereby produce an ether product containing ether and a raffinate stream containing linear butenes; and

charging said raffinate stream to an isomerization system to isomerize at least a portion of the linear butene of said raffinate stream to isobutene and to produce an isomerate stream containing isobutene.

5,750,799
DIMETHYL ETHER PRODUCTION AND RECOVERY FROM METHANOL

Christiaan P. van Dijk, Houston, Tex., assignor to Starchem, Inc., Houston, Tex.

Filed Mar. 15, 1995, Ser. No. 404,256

Int. Cl.^{6} C07C *41/09;41/01*

U.S. Cl. 568—698 17 Claims

1. A process for producing dimethyl ether (DME), comprising the steps of:

(1) contacting a feed of methanol (MeOH) comprising a fresh portion of MeOH and a recycled stream composed of MeOH and water (H_2O) with a dehydration catalyst to form a product gas composition composed of DME, MeOH and H_2O;

(2) distilling the product gas composition to separate and recover its DME content from its MeOH and H_2O content;

(3) feeding the MeOH and H_2O content from the distilling of the product gas composition to a distillation vessel to produce,

(a) a bottom stream comprising a sum of H_2O equal to that water content of the fresh portion of MeOH and that content of water produced by forming the DME content of the product gas, said bottom stream having a content of MeOH less than 0.5 weight % of the bottom stream, and

(b) an overhead stream composed of at least 99 weight % of the MeOH content of the feed to the distillation vessel and having a mole ratio of H_2O:MeOH of at least 0.25, and

(4) recycling the overhead stream from the distillation vessel into combination with a fresh portion of MeOH to form a feed of methanol for contact with the dehydration catalyst.

5,750,800
PROCESS FOR PRODUCING DIISOPROPYL ETHER FROM PROPANE

Terry L. Marker, Warrenville; Brian S. Muldoon, Willowbrook; Bryan K. Glover, Algonquin, and Bipin V. Vora, Darien, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 9, 1995, Ser. No. 556,117

Int. Cl.^{6} C07C *41/00*

U.S. Cl. 568—678 11 Claims

1. A process for producing diisopropyl ether from propane in a feedstock containing at least 95 mass % propane and substantially depleted of hydrocarbons containing more than three carbon atoms, said process comprising:

a) catalytically dehydrogenating the propane in a first reaction zone to produce propylene in a first reaction zone effluent;

b) separating the propylene from the first reaction zone effluent in a first separation zone and catalytically reacting in a second reaction zone the separated propylene with water to produce isopropyl alcohol and diisopropyl ether in a second reaction zone effluent;

c) separating, in a second separation zone, a propane and propylene mixture and a water, diisopropyl ether, and isopropyl alcohol mixture from the second reaction zone effluent;

d) recycling the propane and propylene mixture to the first separation zone; and

e) collecting the water, diisopropyl ether, and isopropyl alcohol mixture.

5,750,801
PROCESS FOR THE CONTINUOUS PREPARATION OF BENZYL ALCOHOL

Hans-Josef Buysch; Ursula Jansen; Pieter Ooms, all of Krefeld; Erhard-Günther Hoffmann, Ratingen, and Bernd-Ulrich Schenke, Bottrop, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 16, 1996, Ser. No. 767,729

Claims priority, application Germany, Dec. 27, 1995, 195 48 876.8

Int. Cl.^{6} C07C *33/18*

U.S. Cl. 568—715 1 Claim

1. Process for the preparation of benzyl alcohol by hydrolysis of benzyl chloride with water at elevated temperature characterized in that

a) benzyl chloride and water are continuously fed into a reactor containing dispersion devices in a molar ratio of 1:(10 to 70), in which reactor a temperature of 80° to 180° C. prevails, and are reacted therein up to a benzyl chloride conversion rate of 30 to 90%,

b) the reaction product, after exiting the reactor, is separated in a separator into an aqueous and organic phase,

c) the organic phase is separated in a first distillation apparatus into benzyl chloride and crude benzyl alcohol,

d) this benzyl chloride is recycled to the reactor,

e) the crude benzyl alcohol is refined in a second distillation unit to give high-purity benzyl alcohol, a bottom phase containing the by-products (particularly dibenzyl ether) being produced,

f) the aqueous phase from the separator of step b), containing dilute hydrochloric acids is treated in an extraction apparatus with a solvent to extract organic constituents, particularly benzyl alcohol, which are still dissolved in the dilute hydrochloric acid,

g) in a third distillation apparatus, this extract is freed of solvent which returns to the extractor,

h) the bottom phase from the third distillation is passed to the first, in order to recover the benzyl alcohol therefrom and

i) the dilute aqueous hydrochloric acid from the extraction, after taking off residual organics, is passed into an HCl absorption unit in order to recover and concentrate HCl to make high-purity HCl.

5,750,802
(1R*, 2S)-1-PHENYL-2-NITROALCOHOLS AND METHOD FOR PRODUCING SAME

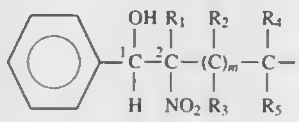
C. Edward Baxter, Jr., Fountain Valley, Calif., assignor to Amvac Chemical Corporation, Los Angeles, Calif.

Continuation of Ser. No. 472,343, Jun. 7, 1995, abandoned. This application Jul. 31, 1997, Ser. No. 904,242

Int. Cl.^{6} C07C *27/00*

U.S. Cl. 568—814 20 Claims

1. A method of producing a 1-phenyl-2-nitroalcohol of the formula



I

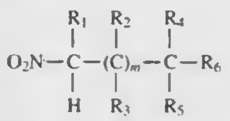
wherein

m is an integer from 0 to 3, and

each R independently is selected from the group consisting of H, $—CH_3$ and $—CH_2CH_3$, such that carbon-1 and carbon-2 are asymmetric,

said 1-phenyl-2-nitroalcohol having a (1R*,2S*) stereoisomer and a (1R*,2R*) stereoisomer,

said method comprising the step of reacting a sufficient amount of benzaldehyde with a sufficient amount of nitroalkane having the formula II



$$O_2N-\underset{H}{\overset{R_1}{C}}-\underset{R_3}{\overset{R_2}{(C)_m}}-\underset{R_5}{\overset{R_4}{C}}-R_6 \qquad II$$

wherein

m is as defined above, and

each R is as defined above,

in the presence of a catalyst, which consists essentially of an amine catalyst, at a temperature in a range of about −15° C. to about 30° C. such that the yield of said 1 -phenyl-2-nitroalcohol is greater than about 50%, and

wherein said 1-phenyl-2-nitroalcohol includes greater than about 50% of said (1R*,2S*) stereoisomer.

5,750,803

PROCESS FOR THE PREPARATION OF D,L-MENTHOL

Gerhard Darsow, Krefeld, and Gerd-Michael Petruck, Erkrath, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1996, Ser. No. 644,783

Claims priority, application Germany, May 17, 1995, 195 18 024.0

Int. Cl.^{6} C07C *35/12;27/00*

U.S. Cl. 568—830 9 Claims

1. Continuous process for the preparation of D,L-menthol by catalytic hydrogenation of compounds which have the carbon skeleton of menthane containing at least one C=C double bond and are 3-substituted by oxygen using hydrogen and/or by catalytic rearrangement of menthol stereoisomers in the presence of hydrogen, characterized in that an unsupported shaped catalyst obtainable by reduction of shaped bodies made of pressed powders of cobalt (hydr)oxide, manganese (hydr)oxide and alkaline earth metal (hydr)oxides with or without one or more (hydr)oxides of metals of subgroup V and/or VI of the Periodic Table of the Elements is used.

5,750,804

PROCESS FOR PRODUCING TRANS-3-ISOCAMPHYLCYCLOHEXANOL

Makoto Emura; Takaaki Toyoda; Nobuo Seido; Makoto Harada, all of Kanagawa; Ryoji Noyori, Aichi; Takao Ikariya, Aichi, and Takashi Ohkuma, Aichi, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

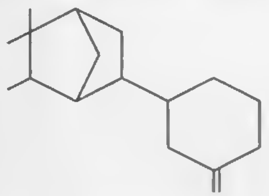
Filed Mar. 7, 1997, Ser. No. 813,238

Claims priority, application Japan, Mar. 7, 1996, 8-050309

Int. Cl.^{6} C07C *35/08*

U.S. Cl. 568—834 11 Claims

1. A process for producing trans-3 -isocamphylcyclohexanol which comprises hydrogenating 3 -isocamphylcyclohexanone represented by the following formula (I):



(I)

by using a ruthenium/phosphine complex as a catalyst in the presence of a base containing an alkali metal or an alkaline earth metal and an amine.

5,750,805

REARRANGEMENT OF EPOXIDES

David Michael Hodgson, Reading, and Jason Witherington, Harlow, both of United Kingdom, assignors to The University of Reading, Reading, Great Britain

PCT No. PCT/GB95/00553, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/25079, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 15, 1995, Ser. No. 704,558

Claims priority, application United Kingdom, Mar. 15, 1994, 9405036

Int. Cl.^{6} C07C *35/06*

U.S. Cl. 568—838 14 Claims

1. A process for the base-catalysed rearrangement of an epoxide to an unsaturated alcohol, wherein the epoxide is an epoxide of a cyclic olefin which has a free hydroxy group and wherein the rearrangement produces a pair of enantiomers and the base is chiral, the relative proportions of the pair of products being dependent on the chiral form of the base.

5,750,806

PREPARATION OF ALKENES BY PARTIAL HYDROGENATION OF ALKYNES OVER FIXED-BED PALLADIUM CATALYSTS

Franz Josef Bröcker, Ludwigshafen; Manfred Stroezel, Ilvesheim, and Udo Rheude, Otterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 12, 1996, Ser. No. 679,118

Claims priority, application Germany, Jul. 20, 1995, 195 26 473.8

Int. Cl.^{6} C07C *29/17*

U.S. Cl. 568—909.5 16 Claims

1. A process for the preparation of an alkene comprising:

hydrogenating an alkyne in the liquid phase over a palladium catalyst at 20°–250° C. and a hydrogen partial pressures of 0.3 to 200 bar,

wherein said catalyst is a fixed bed supported catalyst which is obtained by heating a carrier in air, cooling, coating under reduced pressure with metallic palladium, molding and processing to monolithic catalyst elements; and

wherein 10–80 ppm of carbon monoxide is added to hydrogen used for said hydrogenation.

5,750,807

PRODUCTION OF HYROFLUOROCARBONS

Leslie Burgess; Jane Lesley Butcher, both of Runcorn; Thomas Anthony Ryan, Cheshire, and Peter Paul Clayton, Runcorn, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 93,861, Jul. 20, 1993, abandoned, which is a division of Ser. No. 988,679, Dec. 10, 1992, abandoned. This application May 19, 1995, Ser. No. 446,524

Claims priority, application United Kingdom, Dec. 11, 1991, 9126355

Int. Cl.^{6} C07C *21/18;43/00*

U.S. Cl. 570—142 6 Claims

1. A process for the production of a hydrofluorocarbon which comprises reacting a non-enolisable aldehyde with hydrogen fluoride to form a fluorinated intermediate and reacting the fluorinated intermediate with an alcohol or a fluorinating agent to form an α-fluoroether selected from the group consisting of a fluoromethyl ether and a 1,2,2,2-tetrafluoroethyl ether and heating said α-fluoroether in the vapor phase to convert the α-fluoroether to said hydrofluorocarbon, the α-fluoroether being treated to reduce its water content before its conversion to said hydrofluorocarbon.

5,750,808

DEHYDROHALOGENATION PROCESSES

Wendell Richard Cassel, Newark, Del.; David Richard Corbin, West Chester, Pa., and V.N. Mallikarjuna Rao, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 9, 1996, Ser. No. 677,063

Int. Cl.^{6} C07C *17/00*

U.S. Cl. 570—157 11 Claims

1. A process for the purification of one isomer from a mixture of two isomers of partially halogenated ethanes of the formula $C_2H_aCl_bF_c$ where a is an integer from 1 to 4, b is an integer from 0 to 3 and c is an integer from 1 to 5 , comprising:

contacting the mixture of $C_2H_aCl_bF_c$ isomers with a zeolite selected from the group consisting of NaX and CsY to selectively react the second isomer to produce an olefin selected from the group consisting of $C_2H_{a-1}Cl_{b-1}F_c$ and $C_2H_{a-1}Cl_bF_{c-1}$ by dehydrohalogenation.

5,750,809

METHODS OF PRODUCING 1,1,1,2,2-PENTAFLUOROETHANE

Takashi Shibanuma; Yukio Homoto; Satoshi Komatsu, and Toshikazu Yoshimura, all of Settsu, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP94/00348, § 371 Date Sep. 5, 1995, § 102(e) Date Sep. 5, 1995, PCT Pub. No. WO94/20441, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 3, 1994, Ser. No. 513,755

Claims priority, application Japan, Mar. 5, 1993, 5-070849; Mar. 9, 1993, 5-075336

Int. Cl.^{6} C07C *17/08*

U.S. Cl. 570—169 18 Claims

1. A method of producing 1,1,1,2,2-pentafluoroethane in which reactions are conducted in regions comprising the first reaction region wherein mainly perchloroethylene reacts with hydrogen fluoride in a vapor phase in the presence of a catalyst, and the second reaction region wherein mainly 2,2-dichloro-1,1,1-trifluoroethane and/or 2chloro-11,1,1,2-tetrafluoroethane reacts with hydrogen fluoride in a vapor phase in the presence of a catalyst, said first reaction region being kept at a higher pressure than said second reaction region, the pressure in the first reaction region with higher pressure being between 3 kg/cm^{2}G and 30 kg/cm^{2}G, and the pressure in the second reaction region with lower pressure being not more than 5 kg/cm^{2}G, and the temperature in the first reaction region with high pressure being between 200° and 450° C. and the temperature in the second reaction region with low pressure being between 250° and 500° C.

5,750,810

METHOD FOR COPRODUCING DIFLUOROMETHANE AND 1,1,1,2-TETRAFLUOROETHANE

Jean-Pierre Schirmann, Paris; Serge Hub, Villeurbanne, and Andre Lantz, Vernaison, all of France, assignors to Elf Atochem S.A., France

PCT No. PCT/FR96/00070, § 371 Date Jul. 30, 1997, § 102(e) Date Jul. 30, 1997, PCT Pub. No. WO96/25377, PCT Pub. Date Aug. 22, 1996

PCT Filed Jan. 16, 1996, Ser. No. 875,656

Claims priority, application France, Feb. 17, 1995, 95 01859

Int. Cl.^{6} C07C *17/26*

U.S. Cl. 570—171 11 Claims

1. Process for the co-production of difluoromethane and 1,1,1,2-tetrafluoroethane, comprising pyrolysing chlorodifluoromethane in the presence of hydrogen at a temperature of above 500° C., in the absence of any catalyst or metal surface.

5,750,811

METHOD OF MAKING M-CHLOROBENZOTRIFLUORIDE

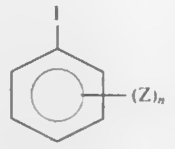
Robert A. Buchanan, Grand Island; Ramesh Krishnamurti, Williamsville; Habib Hichri, Snyder, and David C. Johnson, Cheektowaga, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 7, 1997, Ser. No. 835,183

Int. Cl.^{6} C07C *17/04*

U.S. Cl. 570—208 20 Claims

1. A method of making m-chlorobenzotrifluoride comprising reacting benzotrifluoride with chlorine gas in the presence of about 0.1 to about 5 mole % (based on benzotrifluoride) of a metal chloride selected from the group consisting of $FeCl_3$, $SbCl_3$, $AlCl_3$, and mixtures thereof and about 0.025 to about 5.0 mole % (based on benzotrifluoride) of a cocatalyst having the formula



where Z is halogen, alkyl from C_1 to C_6, alkoxy from C_1 to C_6, or fluoroalkyl from C_1 to C_6, n is 0 to 5, and the molar ratio of metal chloride to cocatalyst is about 0.5 to about 4.

5,750,812

METHOD FOR REDUCING FORMATION OF POLYCHLORINATED AROMATIC COMPOUNDS DURING AIR OXYCHLORINATION OF C_1–C_3 HYDROCARBONS

Joseph Allen Cowfer, Avon Lake; Victor James Johnston, Silver Lake, both of Ohio, and Lawrence Popiel, Houston, Tex., assignors to The Geon Company, Avon Lake, Ohio

Filed Dec. 28, 1995, Ser. No. 581,238

Int. Cl.^{6} C07C *17/154;17/156*

U.S. Cl. 570—245 6 Claims

1. An improved process for manufacturing chlorinated hydrocarbon with reduced formation of chlorobenzenes, polychlorinated biphenyls (PCBs), polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), said process starting with C_1 to C_3 hydrocarbon reactant selected from the group consisting of methane, ethane, ethylene, acetylene, propane, propylene, methylacetylene, and halogen substituted versions thereof, said process comprising: contacting said reactant with air or oxygen enriched air and hydrogen chloride, said contacting is conducted in the presence of a copper (II) oxychlorination catalyst in a heated reaction zone operating at from 150° C. to 600° C. wherein chlorinated hydrocarbon is recovered from the effluents of the reaction zone, the process is characterized by the fact that the air is pretreated with a means for removal of aromatic hydrocarbons.

5,750,813

PROCESS FOR THE PREPARATION OF POLYOLEFIN WAXES

Reiner Hess, Gersthofen; Hartmut Voigt, Königstein/Taunus; Hans-Friedrich Herrmann, Darmstadt; Ludwig Böhm, Hattersheim/Main; Walter Spaleck, Liederbach, and Gerd Hohner, Gersthofen, all of Germany, assignors to Clarian & GmbH, Frankfurt, Germany

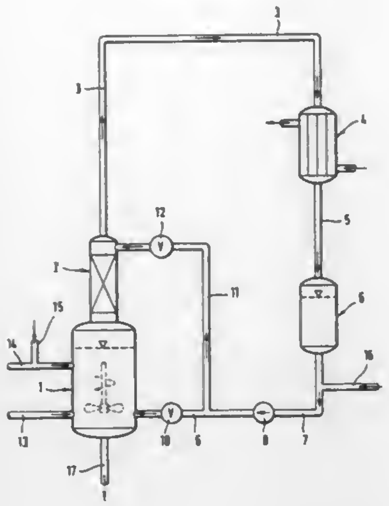
Continuation-in-part of Ser. No. 478,359, Jun. 7, 1995, which is a continuation of Ser. No. 66,578, May 26, 1993, abandoned, which is a continuation of Ser. No. 166,296, Dec. 13, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 353,144

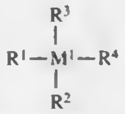
Claims priority, application Germany, Dec. 15, 1992, 4242203

Int. Cl.^{6} C10L *1/16*

U.S. Cl. 585—12 22 Claims

1. A process for the preparation of a polyolefin wax by polymerization or copolymerization of olefins or diolefins at a temperature in the range of –40° to 95° C., at a pressure in the range of 0.5 to 120 bar, in a suspension in the presence of a catalyst comprising a metallocene and a cocatalyst selected from the group consisting of an organoaluminum compound, $R^{19}{}_xNH_{4-x}BR^{20}{}_4$, $R^{19}{}_xPH_{4-x}BR^{20}{}_4$, $R^{19}{}_3CBR^{20}{}_4$ or $BR^{20}{}_3$ where x is a number from 1 to 4, the radicals R^{19} are identical or different, and are C_1–C_{10}-alkyl or C_6–C_{18} -aryl, or two radicals R^{19}, together with the atom linking them, form a ring, and the radicals R^{20} are identical or different, and are an unsubstituted or substituted C_6–C_{18} -aryl wherein the substituents are selected from the group consisting of alkyl, haloalkyl and fluorine, and wherein the metallocene is a compound of the formula I





$$R^1-\overset{\displaystyle R^3}{\underset{\displaystyle R^2}{M^1}}-R^4$$

(I)

in which M^1 is a metal of group IVb, Vb or VIb of the Periodic Table of Elements, R^1 and R^2 are identical or different and are a hydrogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-alkoxy group, C_8–C_{10}-aryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group or a halogen atom and

R^3 and R^4 are identical or different and are a mononuclear or polynuclear hydrocarbon radical, and wherein hydrocarbons having 3 carbon atoms or a halogenated hydrocarbon which boils at a temperature not higher than 95° C. are used as suspending agents.

5,750,814

PROCESS FOR THE ALKYLATION OF AROMATICS

Jacques F. Grootjans, Leefdaal; Pierre-Frederic J. Belloir, Braine-Le-Comte, and Eric J.G.M. Romers, Kraainem, all of Belgium, assignors to Fina Research, S.A., Feluy, Belgium

Continuation of Ser. No. 65,090, May 20, 1993, abandoned.

This application Jun. 6, 1995, Ser. No. 472,018

Claims priority, application European Pat. Off., May 20, 1992, 92870074

Int. Cl.⁶ C07C *2/66*

U.S. Cl. 585—323 **13 Claims**

1. In a process for at least partial liquid phase alkylation and/or transalkylation of aromatic compounds, the steps comprising:

(a) Subjecting a hydrocarbon feedstock comprising aromatics and C_5–C_7 olefins to a selective hydrogenation of the C_5–C_7 olefins, said feedstock diluted with at least 30 mole percent non-aromatic hydrocarbons;

(b) supplying the feedstock resulting from step (a) to a reaction zone containing a zeolite-type aromatic alkylation/transalkylation catalyst;

(c) supplying an alkylation agent comprising olefins to said reaction zone, said alkylation agent diluted with non-aromatic hydrocarbons;

(d) operating said reaction zone at an average temperature and pressure sufficient to maintain said hydrocarbon feedstock comprising aromatics and said alkylation agent comprising olefins in at least partial liquid phase, said temperature and pressure conditions being effective to cause alkylation of said aromatic compounds by said alkylation agent in the presence of said catalyst; and

(e) recovering alkylated aromatic compounds from said reaction zone.

5,750,815

OLEFIN METATHESIS COUPLING USING RUTHENIUM AND OSMIUM CARBENE COMPLEXES

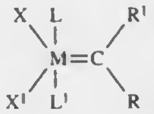
Robert H. Grubbs, South Pasadena; SonBinh T. Nguyen; Marc A. Hillmyer, both of Pasadena, all of Calif.; Gregory C. Fu, Cambridge, Mass., and Lynda K. Johnson, Carrboro, N.C., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 548,446, Oct. 26, 1995, abandoned, which is a division of Ser. No. 282,827, Jul. 29, 1994, which is a continuation-in-part of Ser. No. 106,292, Aug. 13, 1993, Pat. No. 5,342,909, which is a division of Ser. No. 863,606, Apr. 3, 1992, Pat. No. 5,312,940. This application Aug. 29, 1996, Ser. No. 705,064

Int. Cl.⁶ C07C *6/04*

U.S. Cl. 585—511 **50 Claims**

1. A process for olefin coupling by cross-metathesis, comprising the step of contacting a first olefin or functionalized olefin with a compound of the formula



in the presence of a second olefin or functionalized olefin, wherein the first olefin is acyclic and:

M is selected from the group consisting of Os and Ru;

R and R^1 are the same or different and are selected from the group consisting of hydrogen, unsubstituted substituent, and substituted substituent wherein the substituent is selected from the group consisting of C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_2–C_{20} alkoxycarbonyl, aryl, C_1–C_{20} carboxylate, C_1–C_{20} alkoxy, C_2–C_{20} alkenyloxy, C_2–C_{20} alkynyloxy, and aryloxy;

X and X^1 are the same or different and are selected from any anionic ligand; and

L and L^1 are the same or different and are selected from any phosphine of the formula $PR^3R^4R^5$, wherein R^3 is selected from the group consisting of secondary alkyl and cycloalkyl, and wherein R^4 and R^5 are the same or different and are selected from the group consisting of aryl, C_1–C_{10} primary alkyl, secondary alkyl, and cycloalkyl.

5,750,816

PROCESS FOR THE PREPARATION OF α-OLEFIN OLIGOMERS

Yoshitaka Araki; Takashi Ishikawa; Hirofumi Nakamura; Akio Tsuboi; Yoshiaki Nanba; Takeshi Okano, all of Kurashiki; Takayuki Aoshima, Yokohama, and Shinji Iwade, Kurashiki, all of Japan, assignors to Mitsubishi Chemical Corporation, Japan

Filed Mar. 1, 1996, Ser. No. 609,431

Claims priority, application Japan, Mar. 2, 1995, 7-068603; Mar. 2, 1995, 7-068604; Apr. 18, 1995, 7-092603; Dec. 21, 1995, 7-349702; Dec. 26, 1995, 7-351578

Int. Cl.⁶ C07C *2/30*

U.S. Cl. 585—512 **29 Claims**

1. A process for producing an α-olefin oligomer using a chromium-based catalyst system comprising at least(a) a chromium compound, (b) at least one nitrogen-containing compound selected from the group consisting of amines, amides and imides, and (c) an alkylaluminum compound, which process comprises carrying out an oligomerization reaction of an α-olefin in a solvent, and recovering the produced α-olefin oligomer, catalyst components and by-product polymer from the reaction solution, wherein the catalyst components and the by-product polymer are recovered at the same time.

5,750,817

PROCESS FOR PRODUCING α-OLEFIN OLIGOMERS AND α-OLEFIN OLIGOMER COMPOSITIONS

Eiji Tanaka, Kurashiki; Hisao Urata, Sagamihara; Toshiyuki Oshiki; Takayuki Aoshima, both of Yokohama; Riichirou Kawashima, Kurashiki; Shinji Iwade, Kurashiki; Hirofumi Nakamura, Kurashiki; Syunji Katsuki, Kurashiki, and Takeshi Okano, Kurashiki, all of Japan, assignors to Mitsubishi Chemical Corporation, Japan

Continuation of Ser. No. 194,447, Feb. 9, 1994, abandoned.

This application Mar. 13, 1996, Ser. No. 614,905

Claims priority, application Japan, Feb. 17, 1993, 5-028007; Apr. 28, 1993, 5-103084; Oct. 20, 1993, 5-286068

Int. Cl.⁶ C07C *2/02*

U.S. Cl. 585—520 **42 Claims**

1. A process for preparing α-olefin oligomers, which comprises oligomerizing an α-olefin in a hydrocarbon solvent by reacting said α-olefin at a temperature of 0° to 250° C. under atmospheric pressure to 250 kg/cm² in a chromium-based catalyst system composed of a combination of at least a chromium compound, an amine or metal amide, and alkylaluminum compound,

provided that before the α-olefin, the chromium compound, the amine or metal amide and the alkylaluminum compound come into contact with each other, the chromium compound and the alkylaluminum compound do not previously contact each other, and

further provided that when any of the chromium compound, the amine or metal amide and the alkylaluminum compound is made into a solution, the solution is prepared using a hydrocarbon solvent.

5,750,818

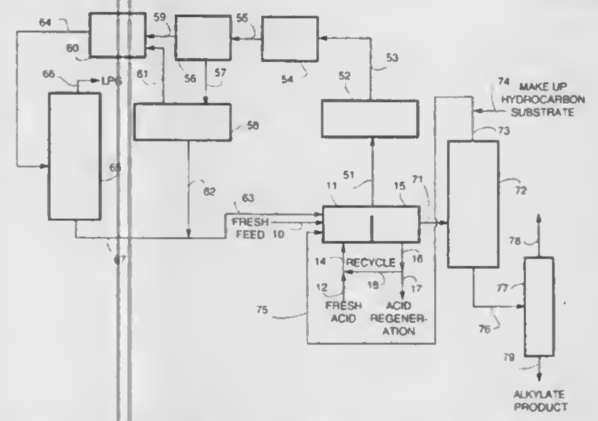
ALKYLATION PROCESS

Robert L. Mehlberg, Wheaton, and James B. Young, Crest Hill, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 20, 1996, Ser. No. 667,841

Int. Cl.⁶ C07C *2/56;2/64;2/66*

U.S. Cl. 585—709 **11 Claims**



1. In a process for the liquid phase alkylation in an alkylation reactor of a hydrocarbon substrate with an olefinic alkylating agent in the presence of an acid alkylation catalyst and a hydrocarbon having a lower boiling point than the hydrocarbon substrate and with a substantial stoichiometric excess of the hydrocarbon substrate over the alkylating agent, to form a liquid product mixture comprising alkylation product, aforesaid at least one lower boiling hydrocarbon and unreacted hydrocarbon substrate, the improvement comprising:

(a) generating from at least a portion of the liquid product mixture a vapor phase comprising unreacted hydrocarbon substrate and lower boiling hydrocarbon;

(b) compressing and at least partially condensing the aforesaid vapor phase to form a relatively cooler liquid condensate, wherein when partial condensation takes place, there is produced a liquid condensate which is depleted in the lower boiling hydrocarbon and a vapor phase which is enriched in the lower boiling hydrocarbon;

(c) when total condensation takes place in step (b), and optionally if partial condensation takes place in step (b), flashing the liquid condensate from step (b) to form a vapor phase which is enriched in the lower boiling hydrocarbon and a further cooled liquid phase which is depleted in the lower boiling hydrocarbon which is recycled to the reactor;

(d) recycling to the alkylation reactor the liquid phase formed from partial condensation in step (b) or from flashing in step (c) or both; and

(e) separating the lower boiling hydrocarbon from unreacted hydrocarbon substrate (i) in at least a portion of the vapor phase formed from flashing in step (c) or from partial condensation in step (b) or both, optionally after such vapor phase is compressed or after compression and partial condensation of such vapor phase and removal of the resulting liquid phase, or (ii) in at least a portion of the liquid phase formed by total condensation of such vapor phase.

5,750,819

PROCESS FOR HYDROCONVERSION OF PARAFFIN CONTAINING FEEDS

Robert J. Wittenbrink; Daniel F. Ryan; William C. Baird, Jr.; Kenneth L. Riley, all of Baton Rouge, La., and Jack W. Johnson, Clinton, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 5, 1996, Ser. No. 740,972

Int. Cl.⁶ C07C *5/13;* B01J *23/00*

U.S. Cl. 585—734 **13 Claims**

1. A process for isomerizing a feed containing C_5+ paraffins comprising passing the feed, at effective isomerization conditions of temperatures and pressures over a non-noble metal, supported catalyst in the presence of hydrogen, the catalyst comprising a Group VIII metal, a Group VI metal, and an effective amount of a Group IB metal as a hydrogenolysis suppressant and wherein the Group IB metal is fixed on the support prior to incorporation of the Group VI metal on the support.

5,750,820

MULTIPLE GRADE FLUSH ADSORPTION SEPARATION PROCESS

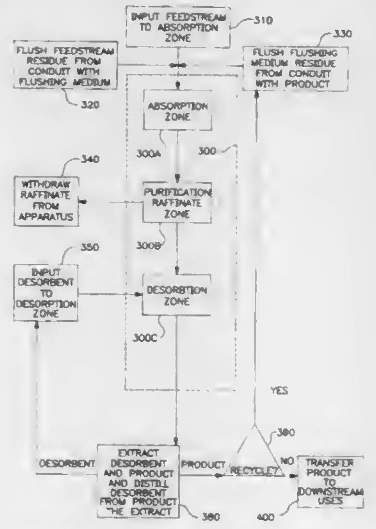
Chiu N. Wei, 15707 Crestbrook, Houston, Tex. 77059

Continuation of Ser. No. 121,680, Sep. 15, 1995, abandoned.

This application Jan. 11, 1996, Ser. No. 584,163

Int. Cl.⁶ C07C *7/12*

U.S. Cl. 585—826 **49 Claims**



INPUT FEEDSTREAM TO ABSORPTION ZONE
310
330
FLUSH FEEDSTREAM RESIDUE FROM CONDUIT WITH FLUSHING MEDIUM
FLUSH FLUSHING MEDIUM RESIDUE FROM CONDUIT WITH PRODUCT
320
ABSORPTION ZONE
300A
300
340
WITHDRAW RAFFINATE FROM APPARATUS
PURIFICATION RAFFINATE ZONE
300B
350
INPUT DESORBENT TO DESORPTION ZONE
DESORBTION ZONE
300C
YES
390
DESORBENT
EXTRACT DESORBENT AND PRODUCT AND DISTILL DESORBENT FROM PRODUCT THE EXTRACT
PRODUCT
RECYCLE?
NO
TRANSFER PRODUCT TO DOWNSTREAM USES
380
400

1. A process for the separation of a product from a multicomponent feedstream to an adsorption apparatus, said product comprising at least one desired component, and said process comprising:

introducing said feedstream through at least one fluid communication conduit into said apparatus;

flushing said at least one conduit with a sufficient quantity of at least one initial flushing medium drawn from a first source and comprising said at least one desired component in an initial concentration, such that feedstream residue is flushed from said at least one conduit into said apparatus by said at least one initial medium;

flushing said at least one conduit with a sufficient quantity of a final flushing medium drawn from a second source and comprising said at least one desired component in a final concentration, such that said final concentration is greater than said initial concentration and such that initial medium residue from said at least one initial medium is flushed from said conduit into said conduit into said apparatus by said final medium; and

withdrawing said product from said apparatus, wherein said first source is separate from said second source and at least one of said first source and said second source is separate from said apparatus.

27. A process for the separation of a product from a multicomponent feedstream, said product comprising at least one desired component, and said process comprising:

introducing said feedstream through at least one fluid communication conduit into a system comprising adsorbent material;

flushing said at least one conduit with a sufficient quantity of at least one initial flushing medium drawn from a first source and comprising said at least one desired component in an initial concentration, such that feedstream residue is flushed from said at least one conduit into said system by said at least one initial medium;

flushing said at least one conduit with a sufficient quantity of a final flushing medium drawn from a second source and comprising said at least one desired component in a final concentration, such that said final concentration is greater than said initial concentration, and such that initial medium residue from said at least one initial medium is flushed from said conduit into said system by said final medium;

withdrawing a raffinate stream from said system;

introducing a desorbent stream to said system;

withdrawing a combination comprised of said product and said desorbent from said system; and

removing said product from said combination, wherein said first source is separate from said second source and at least one of said first source and said second source is separate from said system.

47. A process for the separation of a product from a multicomponent feedstream to an adsorption apparatus, said product comprising at least one desired component, and said process comprising:

introducing said feedstream through at least one fluid communication conduit into said apparatus,

flushing said at least one conduit with a sufficient quantity of at least one initial flushing medium comprising said at least one desired component in an initial concentration, such that feedstream residue is flushed from said at least one conduit into said apparatus by said at least one initial medium;

flushing said at least one conduit with a sufficient quantity of a final flushing medium comprising a desorbent such that initial medium residue from said at least one initial medium is flushed from said conduit into said conduit into said apparatus by said final flushing medium; and

withdrawing said product from said apparatus.

5,750,821

METHOD FOR OXIDATIVE COUPLING OF METHANE COMPRISING CATALYTIC CRACKING

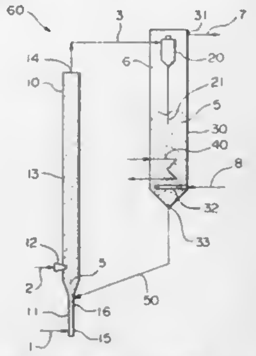
Makoto Inomata; Tsutomu Katagiri, both of Yokohama; Kozo Imura, Handa, and Erli Sun, Yokohama, all of Japan, assignors to Japan National Oil Corporation; Sekiyushigen Kaihatsu Kabushiki Kaisha, and Cosmo Research Institue, all of Tokyo, Japan

Filed Nov. 21, 1995, Ser. No. 564,556

Claims priority, application Japan, Dec. 5, 1994, 6-301216

Int. Cl.⁶ C07C *1/00;2/00*

U.S. Cl. 585—943 **11 Claims**



1. A method for oxidative coupling of methane in which a coupling feed gas containing methane and a gas containing oxygen are allowed to react in the presence of a catalyst, and a coupling product gas containing an unsaturated hydrocarbon is produced, said method for oxidative coupling of methane comprising:

a coupling step, in which a coupling feed gas containing methane and a gas containing oxygen are supplied to a conveying catalyst bed which is formed by an ascending stream which contains a catalyst, and then methane and oxygen are allowed to react so as to produce a coupling product gas accompanied by the catalyst;

a catalyst separation step for separating said catalyst from said coupling product gas;

a catalyst cooling step for cooling the separated catalyst to produce a cooled catalyst; and

a catalyst feedback step for feeding back said catalyst which is separated in said catalyst separation step and cooled, to said coupling step; wherein said conveying catalyst bed is formed by at least a part of said coupling feed gas and said catalyst;

the catalyst amount being in a range between 0.5% and 5% by volume with respect to the volume of the entirety of the gas supplied to the coupling step in the conveying catalyst bed; and

the residence time in the coupling reaction zone being between 0.1 to 10 second; and

wherein said method for oxidative coupling of methane further comprises, between said catalyst separation step and said catalyst feedback step, a cracking step in which said catalyst which is separated in said catalyst separation step is brought into contact with a cracking feed gas which contains a saturated hydrocarbon having a carbon number of at least 2, and then a cracking reaction is allowed to occur so as to produce a cracking product gas which contains an unsaturated hydrocarbon.

5,750,822

PROCESSING OF SOLID MIXED WASTE CONTAINING RADIOACTIVE AND HAZARDOUS MATERIALS

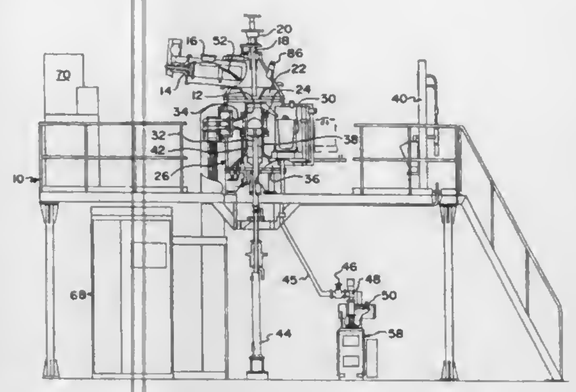
Vitaly T. Gotovchikov; Alexander V. Ivanov, and Eugene A. Filippov, all of Moscow, Russian Federation, assignors to Institute of Chemical Technology (PlasTech), Moscow, Russian Federation

Filed Nov. 13, 1995, Ser. No. 557,961

Int. Cl.⁶ G21F *9/00*

U.S. Cl. 588—11 **7 Claims**

1. A method for the continuous processing of solid mixed waste including metals, ceramics and organics containing radioactive and hazardous materials for disposal, said method comprising the steps of:



depositing the solid mixed waste into a water cooled copper crucible, wherein said crucible is transparent to electromagnetic fields;

heating and melting the ceramics and organics in the solid mixed waste by directing a hot plasma into said crucible so as to form a glasslike slag containing radioactive materials;

heating and melting the metals in the solid mixed waste by directing an induction field into said crucible;

removing excess melted metal from a lower portion of said crucible and allowing the thus removed metal to crystallize in the form of a first compact ingot; and

removing excess glasslike slag from an upper portion of said crucible and pouring said excess glasslike slag into a mold for forming a second compact ingot.

5,750,823

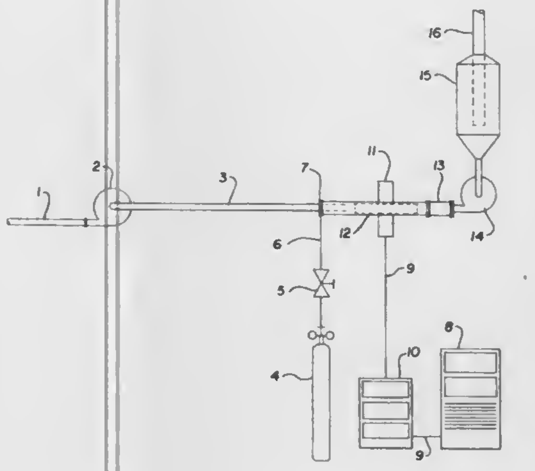
PROCESS AND DEVICE FOR DESTRUCTION OF HALOHYDROCARBONS

Bill Wofford, Little Rock, Ark.; Marc Jackson, Seabrook, and John Bevan, College Station, both of Tex., assignors to R.F. Environmental Systems, Inc., Seabrook, Tex.

Filed Jul. 10, 1995, Ser. No. 499,973

Int. Cl.⁶ A62D *3/00*

U.S. Cl. 588—210 **12 Claims**



1. A method of destroying a halohydrocarbon comprising:

(a) capturing a gaseous waste stream containing halohydrocarbons; and

(b) destroying said stream by exposing said waste stream to a surface wave discharge to create a surface wave plasma whereby said halohydrocarbon is substantially converted to alternate chemical species.

5,750,824

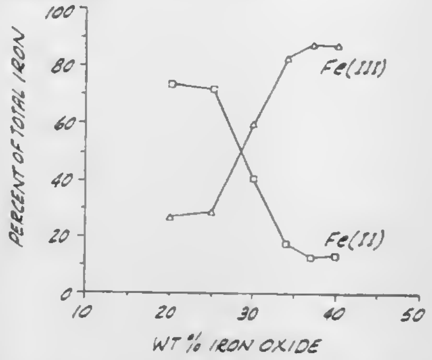
IRON PHOSPHATE COMPOSITIONS FOR CONTAINMENT OF HAZARDOUS METAL WASTE

Delbert E. Day, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Feb. 23, 1996, Ser. No. 606,539

Int. Cl.⁶ A62D *3/00;* **G21F** *9/16*

U.S. Cl. 588—256 **22 Claims**



1. A waste form for containment of hazardous metal waste, said waste form comprising a rigid iron phosphate matrix resulting from the cooling of a melt formed by heating a batch mixture comprising said metal waste and a matrix-forming component, said waste form comprising from about 30 to about 70 weight percent P_2O_5 and from about 22 to about 50 weight percent iron oxide and having metals present in said metal waste chemically dissolved therein.

5. A method for containment of hazardous metal waste in a rigid waste form comprising:

heating a batch mixture comprising said metal waste and a matrix-forming component at a temperature not in excess of about 1250° C. to form a melt; and

cooling said melt to form said rigid waste form having metals present in said metal waste chemically dissolved therein, said batch mixture having a composition such that said waste form comprises from about 30 to about 70 weight percent P_2O_5 and from about 22 to about 50 weight percent iron oxide.

5,750,825

MOUSE WITH DEFECTIVE ENDOTHELINE-1 GENE FUNCTION

Yoshio Yazaki; Hiroki Kuribara; Yukiko Kurihara, all of Tokyo; Hiroshi Suzuki, Shizuoka, and Tatsuhiko Kodama, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP93/01522, § 371 Date Apr. 24, 1995, § 102(e) Date Apr. 24, 1995, PCT Pub. No. WO94/09621, PCT Pub. Date May 11, 1994

PCT Filed Oct. 21, 1993, Ser. No. 325,181

Claims priority, application Japan, Oct. 23, 1992, 4-286131

Int. Cl.⁶ C12N *5/00;15/00;15/09*

U.S. Cl. 800—2 **5 Claims**

1. A process for producing a genetically engineered mouse having a disrupted endotheline-1 gene, said process comprising the steps of

(a) preparing a DNA fragment comprising a disrupted endotheline-1 gene, wherein said endotheline-1 gene is disrupted by the insertion of a selectable marker sequence into exon No. 2 of the endotheline-1 gene;

(b) preparing embryonic stem cells from a mouse;

(c) rendering the endotheline-1 gene contained in the genome of the embryonic stem cells defective by transforming the embryonic stem cells with the DNA fragment of step (a), wherein the endotheline-1 gene in the embryonic stem cell genome is rendered defective by homologous recombination with the DNA fragment of step (a);

(d) culturing the cells of step (c);

(e) subjecting the cells of step (d) to a procedure selected from the group consisting of (I) karyotype analysis, (ii) assay of differentiation potency and (iii) karyotype analysis and assay of differentiation potency;

(f) selecting the cells of step (e) that have characteristics selected from the group consisting of (I) normal karyotype, (ii) normal differentiation potency and (iii) normal karyotype and normal differentiation potency;

(g) generating chimeric mice from the cells of step (f) by injecting said cells into mouse blastocysts and transferring said blastocysts into pseudopregnant mice; and

(h) breeding said chimeric mice to produce a genetically engineered mouse having a disrupted endothelin-1 gene, wherein said disrupted endothelin-1 gene results in said mouse exhibiting altered hemodynamics as compared to a wild-type mouse.

5. A genetically engineered mouse having a disrupted endothelin-1 gene, wherein said endothelin-1 gene is disrupted by the insertion of a selectable marker sequence into exon No. 2 of the endogenous endothelin-1 gene of said mouse, wherein said selectable marker sequence is introduced into said mouse or an ancestor of said mouse at an embryonic stage, and wherein said disrupted endothelin-1 gene results in said mouse exhibiting altered hemodynamics as compared to a wild-type mouse.

5,750,826

BRADYKININ B2 RECEPTOR MIDIFIED TRANSGENIC NON-HUMAN ANIMALS

Joseph A. Borkowski; Howard Y. Chen; John W. Hess, all of Westfield; Catherine D. Strader, Verona, all of N.J., and Myrna E. Trumbauer, Yardley, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 281,393, Jul. 27, 1994, abandoned. This application Dec. 2, 1996, Ser. No. 759,848

Int. Cl.^{6} A61K *49/00;* **C12N** *15/00;15/09*

U.S. Cl. 800—2 **6 Claims**

1. A transgenic mouse harboring a homozygous null mutation in its endogenous bradykinin B2 receptor gene wherein said null mutation has been introduced into said mouse or an ancestor of said mouse via homologous recombination in embryonic stem cells, and further wherein said mouse does not express a functional mouse bradykinin B2 receptor.

5,750,827

CANOLA VARIETY PRODUCING A SEED WITH REDUCED GLUCOSINOLATES AND LINOLENIC ACID YIELDING AN OIL WITH LOW SULFUR, IMPROVED SENSORY CHARACTERISTICS AND INCREASED OXIDATIVE STABILITY

Lorin R. Debonte, Delran, N.J.; Willie H.-T. Loh, Philadelphia, Pa., and Fan Zhegong, Delran, N.J., assignors to Cargill Incorporated, Wayzata, Minn.

Continuation-in-part of Ser. No. 140,205, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 767,748, Sep. 30, 1991, abandoned. This application Aug. 15, 1994, Ser. No. 290,660

Int. Cl.^{6} A01H *5/00;5/10;1/04;* **C12P** *7/64*

U.S. Cl. 800—200 **9 Claims**

1. A canola plant line designated IMC 01, seeds of which have been deposited as ATCC accession number 40579.

5,750,828

METHOD AND MATERIALS FOR CONFERRING TRIPSACUM GENES IN MAIZE

Mary Wilkes Eubanks, 4110 Hulon Dr., Durham, N.C. 27705

Continuation of Ser. No. 248,333, May 24, 1994, abandoned, which is a continuation of Ser. No. 944,389, Sep. 14, 1992, Pat. No. 5,330,547, which is a continuation-in-part of Ser. No. 613,269, Nov. 13, 1990, Pat. No. Plant 7,977, and Ser. No. 117,096, Nov. 4, 1987, Pat. No. Plant 6,906. This application Aug. 22, 1995, Ser. No. 524,113

Int. Cl.^{6} A01H *1/02;5/00;5/10*

U.S. Cl. 800—200 **11 Claims**

1. A method of producing hybrid plant seed comprising the steps of:

(a) crossing a *Tripsacum dactyloides* female parent with a *Zea diploperennis* male parent, or a *Zea diploperennis* female parent with a *Tripsacum dactyloides* male parent to produce seed; and

(b) harvesting said seed produced in (a).

6. A method of producing hybrid maize seed comprising the steps of:

(a) crossing a *Tripsacum dactyloides* female parent with a *Zea diploperennis* male parent to produce (*Tripsacum dactyloides* × *Zea diploperennis*) hybrid seed or crossing a *Zea diploperennis* female parent with a *Tripsacum dactyloides* male parent to produce (*Zea diploperennis* × *Tripsacum dactyloides*) hybrid seed;

(b) growing a hybrid plant from said hybrid seed to maturity;

(c) crossing said hybrid plant with *Zea mays* to produce seed; and

(d) harvesting the seed produced in (c), wherein said seed germinate into plants having resistance to corn rootworm (*Diabrotica virgifera*).

5,750,829

INBRED MAIZE LINE PHOAA

Michael Allen Chapman, Madison Lake, Minn., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Feb. 23, 1996, Ser. No. 605,967

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH0AA having been deposited under ATCC Accession No. 209266.

5,750,830

INBRED MAIZE LINE PH15A

Charles Thomas Cunnyngham, 105 Plumlee Dr., Tipton, Ind. 46072

Filed Feb. 26, 1996, Ser. No. 606,980

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH15A having been deposited under ATCC Accession No. 209410.

5,750,831

INBRED MAIZE LINE PH25A

Theron Eugene Roundy, North Platte, Nebr., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Feb. 28, 1996, Ser. No. 608,421

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH25A having been deposited under ATCC Accession No 209270.

5,750,832

INBRED MAIZE LINE PH44G

Robert Alvin Mohror, Greenville, N.C., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Feb. 28, 1996, Ser. No. 608,583

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH44G having been deposited under ATCC Accession No. 209414.

5,750,833

Patent Not Issued For This Number

5,750,834

INBRED MAIZE LINE PH80B

Robert Lee Segebart, Champaign, Ill., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 1, 1996, Ser. No. 609,370

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH80B having been deposited under ATCC Accession No. 209515.

5,750,835

INBRED MAIZE LINE PH47A

Roy Luedtke, Jr., Thompson, N. Dak., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 5, 1996, Ser. No. 611,269

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12M** *5/04*

U.S. Cl. 800—200 **19 Claims**

1. Seed of maize inbred line designated PH47A, having been deposited under ATCC Accession No. 209516.

5,750,836

Patent Not Issued For This Number

5,750,837

HYBRID MAIZE PLANT & SEED (3496)

David Scott Stucker, RR 5 Box 64, Princeton, Ill. 61356

Filed Mar. 13, 1996, Ser. No. 614,716

Int. Cl.^{6} A01H *5/00;4/00;* **C12N** *5/04*

U.S. Cl. 800—200 **8 Claims**

1. Hybrid maize seed designated 3496, representative seed of said hybrid 3496 having been deposited under ATCC accession number 97481.

2. A maize plant, or its parts, produced by the seed of claim 1.

5,750,838

HYBRID MAIZE PLANT & SEED (3941)

Vladimir Puskaric, Woodstock, Canada, and Roy Luedtke, Jr., Thompson, N. Dak., assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 14, 1996, Ser. No. 615,373

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **7 Claims**

1. Hybrid maize seed designated 3941, representative seed of said hybrid 3941 having been deposited under ATCC accession number 1209499.

5,750,839

HYBRID MAIZE PLANT AND SEED (3341)

Peter Donald Coaldrake, Urbana, and Steven Wayne Tollakson, Mahomet, both of Ill., assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 15, 1996, Ser. No. 615,475

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **7 Claims**

1. Hybrid maize seed designated 3341, representative seed of said hybrid 3341 having been deposited under ATCC accession number 1209333.

5,750,840

Patent Not Issued For This Number

5,750,841

HYBRID MAIZE PLANT AND SEEDS (3237)

Donald Lee Morrow, Garden City, Kans., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 13, 1996, Ser. No. 615,755

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **7 Claims**

1. Hybrid maize seed designated 3237, representative seed of said hybrid 3237 having been deposited under ATCC accession number 209500.

5,750,842

HYBRID MAIZE PLANT & SEED (3914)

Roy Luedtke, Jr., Thompson, N. Dak., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 14, 1996, Ser. No. 616,013

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **7 Claims**

1. Hybrid maize seed designated 3914, representative seed of said hybrid 3914 having been deposited under ATCC accession number 209498.

5,750,843

HYBRID MAIZE PLANT & SEED (3940)

Roy Luedtke, Jr., Thompson, N. Dak., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 14, 1996, Ser. No. 616,129

Int. Cl.^{6} A01H *5/00;4/00;* **C12N** *5/04*

U.S. Cl. 800—200 **7 Claims**

1. Hybrid maize seed designated 3940, representative seed of said hybrid 3940 having been deposited under ATCC accession number 209294.

2. A maize plant, or its parts, produced by the seed of claim 1.

5,750,844

SOYBEANS CAPABLE OF FORMING A VEGETABLE OIL HAVING SPECIFIED CONCENTRATIONS OF PALMITIC AND STEARIC ACIDS

Walter R. Fehr, and Earl G. Hammond, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 376,470, Jan. 20, 1995, Pat. No. 5,585,535, which is a continuation of Ser. No. 180,112, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 839,329, Feb. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 461,361, Jan. 5, 1990, abandoned. This application Mar. 27, 1996, Ser. No. 622,402

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **13 Claims**

1. A soybean seed designated AX5152-105 having ATCC Accession No. 209249 and its descendants capable of yielding an endogenously formed vegetable oil exhibiting a palmitic acid content of less than about 6.0% by weight and a stearic acid content of no more than about 3.2% by weight, both percentages being on the basis of the total fatty acid composition and said fatty acid contents being determined by gas chromatography.

8. A soybean plant produced by the seed of claim 1.

5,750,845

SOYBEANS CAPABLE OF FORMING A VEGETABLE OIL HAVING A LOW SATURATED FATTY ACID CONTENT

Walter R. Fehr, and Earl G. Hammond, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 376,470, Jan. 20, 1995, Pat. No. 5,585,535, which is a continuation of Ser. No. 180,112, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 839,329, Feb. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 461,361, Jan. 5, 1990, abandoned. This application Mar. 28, 1996, Ser. No. 623,198

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **17 Claims**

1. A soybean seed designated AX5152-105 having ATCC Accession No. 209249 and its descendants capable of yielding an endogenously formed vegetable oil exhibiting a saturated fatty acid content based upon the total weight of palmitic and stearic acids of no more than about 7.3% by weight based on the total fatty acid content with said fatty acid contents being determined by gas chromatography.

5,750,846

ELEVATED PALMITIC ACID PRODUCTION IN SOYBEANS

Walter R. Fehr, and Earl G. Hammond, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 30, 1996, Ser. No. 689,106

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

6. A soybean plant capable of forming seeds upon self-pollination possessing an elevated palmitic acid content in the endogenously formed vegetable oil of said seeds wherein said palmitic acid content is enhanced by the combined presence of the homogeneous recessive gene pairs (1) fap2fap2 or fap2-bfap2-b, (2) fap4fap4, and (3) fap5fap5, and wherein said recessive gene pair fap2fap2 is obtainable from soybean C1727 available as PI532834 and said recessive gene pairs fap2-bfap2-b, fap4fap4 and fap5fap5 are obtainable from soybean A28 having ATCC Accession No. 97672 and wherein said palmitic acid content exceeds as a percentage of the total fatty acid content that formed in a typical soybean seed which lacks said combined presence of said recessive gene pairs.

5,750,847

INBRED MAIZE LINE PH38D

Michael Allen Chapman, Madison Lake, Minn., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 522,669, Sep. 1, 1995, abandoned. This application Aug. 15, 1996, Ser. No. 698,358

Int. Cl.^{6} A01H *5/00;4/00;* **C12N** *5/04*

U.S. Cl. 800—200 **19 Claims**

2. A maize plant, or parts thereof, of inbred line PH38D, seed of said line having been deposited under ATCC accession No. 209362.

5,750,848

DNA SEQUENCE USEFUL FOR THE PRODUCTION OF POLYHYDROXYALKANOATES

Niels Krüger, Billerbeck, and Alèxander Steinbüchel, Münster, both of Germany, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 13, 1996, Ser. No. 700,576

Int. Cl.^{6} A01H *5/00;* **C12N** *1/20;1/21;5/14*

U.S. Cl. 800—205 **26 Claims**

1. An isolated DNA molecule comprising a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence of the coding strand shown in SEQ ID NO: 1, positions 911 through 1795, or the complement thereof;

(b) a nucleotide sequence that hybridizes to said nucleotide sequence of (a) under a wash stringency equivalent to 0.5X SSC to 2X SSC, 0.1% SDS, at 55°–65° C., and which encodes a PHA synthase protein;

(c) a *Pseudomonas putida* nucleotide sequence having at least 40% identity with the nucleotide sequence of (a) and which encodes a PHA synthase protein;

(d) a nucleotide sequence encoding the same amino acid sequence as said nucleotide sequence of (a); and

(e) a nucleotide sequence encoding the same amino acid sequence as said nucleotide sequence of (b).

18. A method of producing a genetically transformed plant which expresses PhaG comprising the steps of:

inserting into the genome of a host plant cell a recombinant, double-stranded DNA molecule comprising:

(i) a promoter which functions in plant cells to enhance transcription of an adjacent DNA coding sequence;

(ii) a DNA molecule of claim 1 operatively linked to the promoter; and

regenerating a genetically transformed plant from said host plant cell.

5,750,849

INBRED MAIZE LINE PH05W

Stephen William Noble, Jr., Johnston, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 522,872, Sep. 1, 1995, abandoned. This application Nov. 14, 1996, Ser. No. 749,322

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. Seed of maize inbred line designated PH05W, representative samples having been deposited under ATCC Accession No. 209518.

5,750,850

INBRED CORN LINE LH242

Terry J. Foley, Williamsburg, Iowa, assignor to Holden's Foundation Seeds, Inc., Williamsburg, Iowa

Filed Dec. 5, 1996, Ser. No. 759,594

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. Inbred corn seed designated LH242 having ATCC accession No. 97818.

5,750,851

INBRED CORN LINE QH101

Jon L. Geadelmann, Roseville, Minn., and Kenneth Leto, West Des Moines, Iowa, assignors to Holden's Foundation Seeds, Inc., Williamsburg, Iowa, and E I Dupont de Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1996, Ser. No. 759,735

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. Inbred corn seed designated QH101 having ATCC accession No. 97821.

5,750,852

INBRED CORN LINE NR 109

Michael A. Koopman, Forest City, Iowa, assignor to J.C.Robinson Seed Company, Waterloo, Nebr.

Filed Dec. 9, 1996, Ser. No. 762,108

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12H** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. Inbred corn seed designated NR109 having ATCC accession No. 97814.

5,750,853

SOYBEAN VARIETY 93B41

Peter Armstrong Fuller, 8008 Maple Dr., Urbandale, Iowa 50322; Herbert Schmidt, 510 24th Ave. South, Fargo, N. Dak. 58103; Debra Kay Steiger, 744 Fairway Dr., #21, Wauseon, Ohio 43567, and Dorman John Grace, III, 4120 79th St., Urbandale, Iowa 50322

Filed Jan. 14, 1997, Ser. No. 783,114

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **12 Claims**

1. A soybean seed designated 93B41 having been deposited under ATCC Accession No. 209519.

2. A soybean plant, and parts thereof, produced from the seed of claim 1.

5,750,854

SOYBEAN CULTIVAR 9311779400012

Janet Nykaza, Portage, and Michael Lewis, Vicksburg, both of Mich., assignors to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 12, 1997, Ser. No. 797,919

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. A soybean seed designated 9311779400012 deposited as ATCC Accession Number 209354.

2. A plant or plants of the soybean cultivar designated 9311779400012 produced by growing the seed of claim 1.

5,750,855

SOYBEAN CULTIVAR 92417111

Beth Annice Holmes, Attica, Ind., assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 11, 1997, Ser. No. 798,268

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 92417111 deposited as ATCC Accession Number 209209.

2. A plant or plants of the soybean cultivar designated 92417111 produced by growing the seed of claim 1.

5,750,856

SOYBEAN CULTIVAR 9314919423034

Andrew D. Nickell, Milton, Wis., assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 11, 1997, Ser. No. 799,392

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. A soybean seed designated 9314919423034 deposited as ATCC Accession Number 209546.

2. A plant or plants of the soybean cultivar designated 9314919423034 produced by growing the seed of claim 1.

5,750,857

SOYBEAN CULTIVAR 9390369478967

William K. Rhodes, Queenstown, Md., assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 13, 1997, Ser. No. 800,144

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **10 Claims**

1. A soybean seed designated 9390369478967 deposited as ATCC Accession Number 209547.

2. A plant or plants of the soybean cultivar designated 9390369478967 produced by growing the seed of claim 1.

5,750,858

SOYBEAN CULTIVAR 90139820837

William K. Rhodes, Queenstown, Md., assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 14, 1997, Ser. No. 800,740

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 90139820837 deposited as ATCC accessing Number 209210.

2. A plant or plants of the soybean cultivar designated 90139820837 produced by growing the seed of claim 1.

5,750,859

SOYBEAN CULTIVAR 16502II2

William H. Eby, Adel, and Elmer F. Schechinger, Harlan, both of Iowa, assignors to Stine Seed Farm, Inc, Adel, Iowa

Filed Feb. 25, 1997, Ser. No. 804,980

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 16502II2 deposited as ATCC Accession Number 209204.

2. A plant or plants of the soybean cultivar designated 16502II2 produced by growing the seed of claim 1.

5,750,860
SOYBEAN CULTIVAR 01136F

William H. Eby, Adel, and Elmer F. Schechinger, Harlan, both of Iowa, assignors to Stine Seed Farm, Inc., Adel, Iowa

Filed Feb. 25, 1997, Ser. No. 804,981

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 01136F deposited as ATCC Accession Number 209203.

2. A plant or plants of the soybean cultivar designated 01136F produced by growing the seed of claim 1.

5,750,861
SOYBEAN CULTIVAR 922144460593

Jennifer Hicks, Ames, Iowa, assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Feb. 26, 1997, Ser. No. 806,291

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 922144460593 deposited as ATCC Accession Number 209214.

2. A plant or plants of the soybean cultivar designated 922144460593 produced by growing the seed of claim 1.

5,750,862
CONTROL OF PLANT CELL PROLIFERATION AND GROWTH

Peter Crook Lloyd John, Farrer, Australia, assignor to The Australian National University, Acton, Australia

PCT No. PCT/AU91/00556, § 371 Date Jun. 1, 1993, § 102(e) Date Jun. 1, 1993, PCT Pub. No. WO92/09685, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 29, 1991, Ser. No. 66,092

Claims priority, application Australia, Nov. 29, 1990, PK 3584

Int. Cl.^{6} C12N *15/82;15/29;* **A01H** *4/00;5/00*

U.S. Cl. 800—205 **4 Claims**

1. A transgenic plant transformed with at least one of a coding sequence for $p_{34}{}^{cdc2}$, a coding sequence for a $p34^{cdc2}$-like protein having a cyclin related kinase function, or a regulatory element which interacts with and modulates the level (of $p34^{cdc2}$or $p34^{cdc}$ 2-like molecule wherein said regulatory element is selected from the group consisting of $p13^{suc1}$, cyclin, cdc25 or products of nim-1, wee-1 and mik-1 genes and wherein said transgenic plant expresses enhanced levels of $p34^{cdc2}$ or $p34^{cdc2}$-like protein.

5,750,863

Patent Not Issued For This Number

5,750,864
REGULATED EXPRESSION OF HETEROLOGOUS GENES IN PLANTS

Richard Keith Bestwick, Portland, and Adolph J. Ferro, Lake Oswego, both of Oreg., assignors to Epitope, Inc., Beaverton, Oreg.

Filed Jun. 17, 1994, Ser. No. 261,677

Int. Cl.^{6} A01H *5/08;* **A01G** *7/00;* **C12N** *15/82;15/55*

U.S. Cl. 800—205 **10 Claims**

5. A delayed-ripening fruit, containing

(i) a heterologous S-adenosylmethionine hydrolase gene, and

(ii) a promoter of a tomato E4 gene operably linked to said heterologous gene, wherein said tomato E4 gene is composed of a series of nucleotides which is at least 60% identical to that presented in SEQ ID NO:8, and where said promoter is effective to produce transient expression of the gene when the fruit is picked.

5,750,865
PROCESS FOR MODIFYING THE PRODUCTION OF CAROTENOIDS IN PLANTS, AND DNA, CONSTRUCTS AND CELLS THEREFOR

Colin Roger Bird, Berkshire, United Kingdom; Donald Grierson, Loughbrough, United Kingdom, and Wolfgang Walter Schuch, Berkshire, United Kingdom, assignors to Zeneca Limited, London, England

Continuation of Ser. No. 859,523, Aug. 12, 1992, abandoned, which is a continuation of Ser. No. 625,664, Dec. 13, 1990, abandoned. This application Sep. 2, 1994, Ser. No. 300,582

Claims priority, application United Kingdom, Dec. 13, 1989, 8928179

Int. Cl.^{6} A01H *5/00;* **C12N** *15/11;15/63;15/82*

U.S. Cl. 800—205 **15 Claims**

1. A process for modifying the production of carotenoids in plants which comprises transforming said plants with a DNA construct that modifies carotenoid biosynthesis, growing said transformed plants or their descendants and selecting plants having modified carotenoid content, said construct comprising a DNA sequence encoding a plant enzyme which catalyzes the formation of phytoene from geranylgeranyl pyrophosphate, preceded by a transcriptional initiation region operative in plants so that the construct can generate mRNA in plant cells, said DNA sequence being one which hybridizes to the plant gene of pTOM5.

5,750,866
AHAS PROMOTER USEFUL FOR EXPRESSION OF INTRODUCED GENES IN PLANTS

Gabriele Dietrich, At Bussum, Netherlands; Jane Smith, Bellevue, Wash., and Jianying Peng, Lawrenceville, N.J., assignors to American Cyanamid Company, Madison, N.J.

Filed Sep. 8, 1994, Ser. No. 303,266

Int. Cl.^{6} C12N *15/05;15/29;15/82;* **A01H** *5/00*

U.S. Cl. 800—205 **22 Claims**

1. An isolated nucleotide sequence comprising a maize AHAS promoter capable of constitutive expression.

5,750,867
MAINTENANCE OF MALE-STERILE PLANTS

Mark Williams, and Jan Leemans, both of Ghent, Belgium, assignors to Plant Genetic Systems, N.V., Brussels, Belgium

Continuation of Ser. No. 970,849, Nov. 3, 1992, abandoned, which is a continuation of Ser. No. 899,072, Jun. 12, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 351,413

Int. Cl.^{6} A01H *5/00;1/02;* **C12N** *15/29;15/55;15/82*

U.S. Cl. 800—205 **33 Claims**

1. A process for maintaining a male-sterile line of a plant species, said process comprising:

1) crossing:

a) a male-sterile line to be maintained comprising male-sterile parent plants which comprise at a first genetic locus a males-sterility gene comprising a sterility DNA encoding a ribonuclease under the control of sterility promoter which directs expression selectively in specific stamen cells of said plants, wherein said male-sterility gene is homozygous at said first genetic locus; with

b) a maintainer line comprising male-fertile parent plants which comprise said homozygous male-sterility gene at said first genetic locus, and which further comprise, at a second genetic locus which segregates independently from said first genetic locus, a foreign DNA comprising:

(i) a restorer gene comprising a restorer DNA encoding a protein that inhibits or prevents the activity of said ribonuclease under the control of a restorer promoter which directs expression at least in said specific stamen cells; and,

(ii) a pollen-lethality gene comprising, under the control of a first promoter that directs expression selectively in microspores and/or pollen cells of said male-fertile parent plants, a first DNA encoding a first protein or polypeptide which, when produced in a microspore or pollen cell of said male-fertile parent plant, significantly disrupts the metabolism, functioning or development of said microspore or pollen cell;

wherein said foreign DNA is heterozygous at said second genetic locus; and

2) harvesting seeds from said male-sterile parent plants, said seeds being capable of growing into a new generation of male-sterile parent plants.

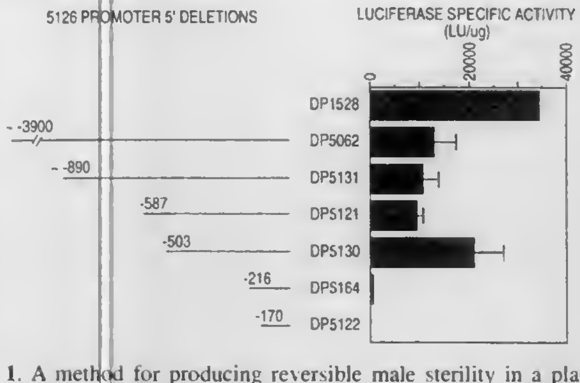
5,750,868
REVERSIBLE NUCLEAR GENETIC SYSTEM FOR MALE STERILITY IN TRANSGENIC PLANTS

Andrew M. Cigan, and Marc C. Albertsen, both of Des Moines, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Dec. 8, 1994, Ser. No. 351,899

Int. Cl.^{6} C12H *15/00;15/05;* **A01H** *1/06;4/00*

U.S. Cl. 800—205 **19 Claims**



1. A method for producing reversible male sterility in a plant, comprising the steps of:

(a) providing a first plant which is male sterile, said plant having a first genetic construct, said first genetic construct comprising (i) an operator that is capable of controlling expression of a dominant negative gene, (ii) a dominant negative gene that, when expressed in a plant, disrupts pollen formation or function, (iii) a gene encoding a DNA-binding protein which binds to the operator and activates transcription, (iv) 5126 promoter or variants, mutants, or derivatives thereof that drive transcription of said gene encoding a DNA-binding protein in cells or tissues critical to pollen formation or function, (v) a DNA sequence encoding a DNA binding region and an activating domain;

(b) providing a second plant which is male fertile, said plant having a second genetic construct comprising a suitable promoter controlling a gene encoding a DNA-binding protein, said protein interacting with the operator of the first genetic construct; and

(c) crossing said first plant with said second plant to form a hybrid plant which is male fertile.

8. A plant cell transformed with the first genetic construct of claim 1.

9. A plant regenerated from plant callus derived from a cell of claim 8, said plant comprising the first genetic construct of claim 1.

5,750,869
SOLUBLE SOLIDS MODIFICATION USING SUCROSE PHOSPHATE SYNTHASE ENCODING SEQUENCES

Christine K. Shewmaker, Woodland, Calif., assignor to Calgene, Inc., Davis, Calif.

Filed Jan. 12, 1995, Ser. No. 372,200

Int. Cl.^{6} A01H *5/00;* **C12N** *15/11;15/85*

U.S. Cl. 800—205 **15 Claims**

1. A method of modifying the soluble solids ratios in a cell of plant sink tissue, as compared to that measured in control plant cells, to a different ratio of soluble solids, wherein said method comprises:

growing a plant having acid invertase in cells of said sink tissue, said plant having integrated into its genome an expression construct comprising, as operably linked components a transcription initiation region which is functional in a plant cell and a DNA encoding a sucrose phosphate synthase derived from corn which is functional in said plant cell, wherein said DNA encoding a sucrose phosphate synthase is not naturally linked to said transcription initiation region, and wherein said cell is grown under conditions which permit said transcription initiation region to function,

whereby an increased level of sucrose is made available to said sink tissue where it is acted on by said acid invertase to modify the soluble solids in said sink tissue as compared to a sink tissue of said control plant cells.

5,750,870
PLANT GENETIC TRANSFORMATION METHODS AND TRANSGENIC PLANTS

Helena V. Mathews; Richard Keith Bestwick, both of Portland, and Adolph J. Ferro, Lake Oswego, all of Oreg., assignors to Agritope, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 263,900, Jun. 17, 1994, abandoned. This application Feb. 3, 1995, Ser. No. 384,556

Int. Cl.^{6} A01H *5/00;5/08;* **C12N** *15/82*

U.S. Cl. 800—205 **20 Claims**

1. A method for producing a stably transformed raspberry or strawberry plant, comprising:

(i) introducing into cells of explant tissue from a target raspberry or strawberry plant to be transformed, an expression vector containing a selectable marker gene operably linked to a plant compatible-promoter,

(ii) culturing said tissues from (i) in selection media having a threshold concentration of selective agent effective to discriminate between plant cells transformed with the vector and non-transformed cells, based on their ability to grow in the media,

(iii) selecting tissues based on their growth characteristics in the selection media,

(iv) regenerating the selected tissues in the presence of a selective agent whose concentration is effective to discriminate between transformed and non-transformed plant cells, based on the cells's ability to produce regenerated tissue.

(v) selecting transformed regenerated tissue generated in (iv),

(vi) obtaining an explant from the selected, transformed regenerated tissue, and

(vii) repeating steps (iv) and (v) at least one time, until stably transformed regenerated tissue is obtained, where step (vi) precedes each repeat cycle.

5,750,871

TRANSFORMATION AND FOREIGN GENE EXPRESSION IN *BRASSICA* SPECIES

Maurice M. Moloney, Alberta, Ireland, and Sharon Radke, Davis, Calif., assignors to Calgene, Inc., Davis, Calif.

Continuation of Ser. No. 943,815, Sep. 11, 1992, Pat. No. 5,463,174, which is a continuation of Ser. No. 395,131, Aug. 14, 1989, Pat. No. 5,188,958, which is a continuation of Ser. No. 054,187, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 898,640, May 29, 1986, abandoned. This application Mar. 30, 1995, Ser. No. 415,351

Int. Cl.^{6} A01H *5/00;* **C12N** *5/04;15/82;15/84*

U.S. Cl. 800—205 **20 Claims**

1. Transgenic Brassica species cells and progeny thereof comprising an expression cassette, wherein said cells are characterized as oncogene-free and capable of regeneration to morphologically normal whole plants, and wherein said expression cassette comprises, in the 5'-3' direction of transcription:

(1) a transcription initiation region functional in Brassica species cells;

(2) a DNA sequence comprising an open reading frame having an initiation codon at its 5' terminus or a nucleic acid sequence complementary to an endogenous transcription product; and

(3) a transcription termination region functional in Brassica species cells;

wherein at least one of said transcription initiation region and transcription termination region is not naturally associated with said DNA sequence or said nucleic acid sequence; and

wherein said expression cassette is integrated into the genome of said Brassica species cells and imparts a detectable trait when said Brassica species cells are grown under conditions whereby said DNA sequence or said nucleic acid sequence is expressed.

5,750,872

NUCLEIC ACIDS ENCODING ASCORBATE FREE RADIAL REDUCTASE AND THEIR USES

Alan B. Bennett; David A. Brummell, and Alexander A. Grantz, all of Davis, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Apr. 5, 1995, Ser. No. 417,492

Int. Cl.^{6} A01H *5/00;* **C12N** *15/29;15/84;15/82;15/53*

U.S. Cl. 800—205 **21 Claims**

8. A transgenic plant comprising a recombinant expression cassette comprising a plant promoter operably linked to a tomato AFR reductase polynucleotide sequence.

5,750,873

NUCLEIC ACID MOLECULES THAT ENCODE TASSEL SEED 2(TS2), A PROTEIN INVOLVED IN THE CONTROL OF FLOWER DEVELOPMENT IN PLANTS

Stephen L. Dellaporta, New Haven, Conn., assignor to Yale University, New Haven, Conn.

Continuation of Ser. No. 110,690, Aug. 23, 1993, abandoned. This application May 15, 1995, Ser. No. 440,856

Int. Cl.^{6} A01H *5/00;* **C12N** *15/29;15/82;15/63*

U.S. Cl. 800—205 **25 Claims**

17. An isolated nucleic acid molecule from an angiosperm that hybridizes to a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and SEQ ID NO:9, under high stringency so as to produce a selective and detectable signal and said nucleic acid molecule encodes a protein that has the biological activity of the TS2 protein from maize or rice.

20. A plant or microbial cell that has been transformed to contain the nucleic acid molecule of claim **17**.

22. The cell of claim **20** wherein said recombinant host cell is a plant cell.

24. A plant regenerated from the cell of claim **22**.

5,750,874

FUNGUS-RESPONSIVE CHIMAERIC GENE

Günter Strittmatter, and Norbert Martini, both of Köln, Germany, assignors to Max-Planck-Gesellschaft Zur Forderung, Munich, Germany

Division of Ser. No. 302,891, Jan. 30, 1995. This application Jun. 5, 1995, Ser. No. 463,229

Claims priority, application European Pat. Off., Mar. 20, 1992, 92400770

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *15/29;15/82*

U.S. Cl. 800—205 **19 Claims**

1. A plant comprising in its genome:

a) a fungus-responsive chimaeric gene comprising the following operably linked DNA sequences:

a fungus responsive promoter region, whose action in controlling transcription of a DNA sequence is stimulated by fungal infection in plant cells immediately surrounding a site of fungal infection, and is not stimulated by mechanical injury,

a first foreign DNA encoding a barnase protein;

3' transcription termination signals for expressing said first foreign DNA in the cells of said plant; and

b) a second chimaeric gene comprising operably linked DNA sequences as follows:

a constitutive plant promoter;

a second foreign DNA encoding a barstar protein;

suitable 3' transcription termination signals for expressing said first foreign DNA in the cells of said plant wherein production of said barnase induces an artificial cell death of said plant cells immediately surrounding the site of fungal infection, to inhibit sporulation and spread of infection of a fungus infecting said plant.

5,750,875

GLYCOGEN BIOSYNTHETIC ENZYMES IN PLANTS

David M. Stalker, 2736 Cumberland Pl., Davis, Calif. 95616; Christine K. Shewmaker, 1409 Spring Creek, Woodland, Calif. 95695, and Janette V. Oakes, 2408 Amapola Dr., Davis, Calif. 95616

Continuation-in-part of Ser. No. 536,392, Jun. 11, 1990, abandoned, and a continuation of Ser. No. 16,881, Feb. 11, 1993, which is a continuation-in-part of Ser. No. 735,065, Jul. 24, 1991, Pat. No. 5,349,123, which is a continuation-in-part of Ser. No. 632,383, Dec. 21, 1990, abandoned, and Ser. No. 731,226, Jul. 16, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 469,202

Int. Cl.^{6} A01H *5/00;* **C12N** *15/82;15/84;15/31;* **C12P** *19/04*

U.S. Cl. 800—205 **42 Claims**

1. A nucleic acid construct comprising a chimeric gene which is expressed in plant cells said chimeric gene comprising a nucleotide sequence encoding a cyclodextrin glycosyltransferase enzyme operably linked with a promoter which is operable in a plant cell.

29. A transformed plant comprising the nucleic acid construct of claim **1** wherein said plant is capable of producing at least one cyclodextrin as a starch degradation product.

5,750,876

ISOAMYLASE GENE, COMPOSITIONS CONTAINING IT, AND METHODS OF USING ISOAMYLASES

Gerard Francis Barry, St. Louis; Ganesh Murthy Kishore, Chesterfield, and Bradley Martin Krohn, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 281,902, Jul. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 476,519

Int. Cl.^{6} A01H *5/00;* **C12N** *15/31;15/54;15/82;* **C12P** *19/04*

U.S. Cl. 800—205 **28 Claims**

10. A transformed plant cell comprising a DNA construct comprising operatively linked in the 5' to 3' direction:

a) a promoter which functions in selected starch-producing plant cells to cause the production of an RNA sequence;

b) a structural coding sequence that encodes for an isoamylase, wherein

i) said isoamylase has a pH optimum of 5–8; and

ii) said structural coding sequence hybridizes to the nucleic acid sequence of SEQ ID NO:4, or the complement thereof, under stringent hybridization conditions; and

c) a 3' non-translated region which functions in said plant cells to cause the addition of polyadenylate nucleotides to the 3' end of the RNA sequence;

wherein said promoter is heterologous with respect to the structural coding sequence.

24. A plant comprising transformed plant cells of claim **10** and containing structurally modified starch.

5,750,877

DEVICE FOR AND METHOD OF CALIBRATING THE MEASUREMENTS OF A PRODUCT STREAM

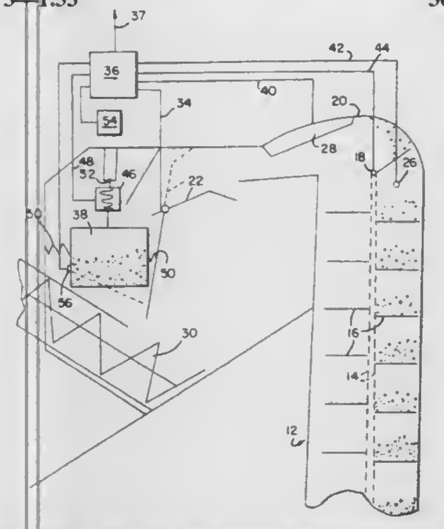
Willi Behnke, Steinhagen, and Burkhard Sagemüller, Gütersloh, both of Germany, assignors to Claas KGaA, Harsewinkel, Germany

Filed Oct. 28, 1996, Ser. No. 740,420

Claims priority, application Germany, Nov. 4, 1995, 195 41 167.6

Int. Cl.⁶ G01F *25/00;* A01D *75/18*

U.S. Cl. 73—1.33 **30 Claims**



1. A device for calibrating the measurements of a product stream on an agricultural machine, comprising measuring means for measuring a product stream and producing a first measured weight value; calibrating means; deviating means arranged so that the whole product stream after passing said measuring means is directed by said deviating means to said calibrating means and is weighed in said calibrating means to produce a second weight value; and evaluating means for comparing said first measured weight value with said second weighed weight value.

5,750,878

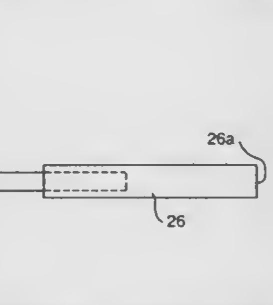
REMOVABLE REFERENCE PLATE

Brian Joseph Bliss, Ypsilanti, Mich., assignor to Harbison-Walker Refractories Company, Pittsburgh, Pa.

Filed Feb. 5, 1996, Ser. No. 597,052

Int. Cl.⁶ G01N *3/62*

U.S. Cl. 73—1.79 **9 Claims**



1. A removable laser target reference assembly for temporary mounting on an exterior shell of a high temperature refractory lined steel making vessel wherein said vessel includes on an exterior surface thereof a pair of flange/ribs, said assembly comprising, in combination:

(a) a laser target having a mounting slot therein for mounting engagement with one of said flange/ribs; and

(b) mounting means including a locator rod mounted on said laser target for engaging another of said flanges/ribs to accurately position said laser target.

5,750,879

STICK-SLIP DETECTION METHOD AND APPARATUS

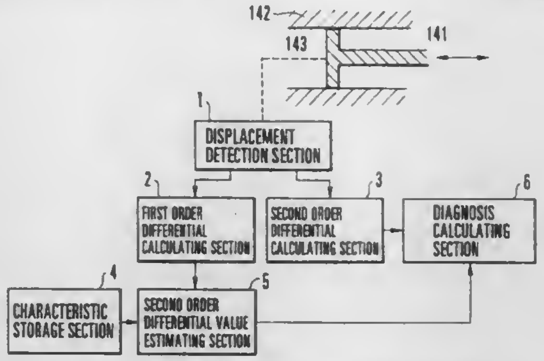
Akira Ohtsuka, and Chosei Kaseda, both of Tokyo, Japan, assignors to Yamatake-Honeywell Co., Ltd., Japan

Filed May 28, 1997, Ser. No. 864,242

Claims priority, application Japan, May 31, 1996, 8-138258; Feb. 27, 1997, 9-043347

Int. Cl.⁶ G01N *19/04*

U.S. Cl. 73—9 **14 Claims**


142
143
141
1
DISPLACEMENT DETECTION SECTION
2
FIRST ORDER DIFFERENTIAL CALCULATING SECTION
3
SECOND ORDER DIFFERENTIAL CALCULATING SECTION
6
DIAGNOSIS CALCULATING SECTION
4
CHARACTERISTIC STORAGE SECTION
5
SECOND ORDER DIFFERENTIAL VALUE ESTIMATING SECTION

1. A stick-slip detection method comprising the steps of:

detecting a displacement of a movable member having a slidable contact portion;

calculating a first quantity of state on the basis of the detected displacement of the movable member;

calculating a second quantity of state, which can be estimated from the first quantity of state, on the basis of the detected displacement of the movable member;

calculating an estimated quantity of state by estimating a second quantity of state from the calculated first quantity of state by using a relationship between first and second predetermined quantities of state which are obtained from a displacement of the movable member in a normal sliding state; and

comparing the calculated second quantity of state with the estimated quantity of state, and determining an abnormal sliding operation of the movable member on the basis of the comparison result.

5,750,880

VEHICLE HARMFUL GAS DETECTION APPARATUS

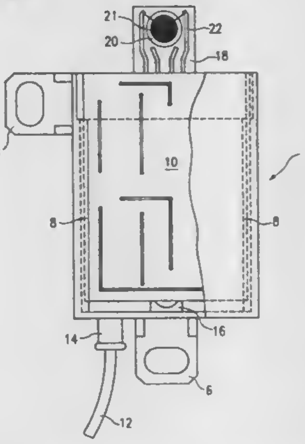
Klaus Dieter Frers, Delbruck, Germany, assignor to Auto Electronics Corporation, Seoul, Rep. of Korea

Filed Dec. 13, 1996, Ser. No. 766,911

Claims priority, application Germany, Dec. 15, 1995, 295 19 940.7

Int. Cl.⁶ G01N *37/00*

U.S. Cl. 73—31.02 **12 Claims**



1. An apparatus, for use in vehicles, for detecting a harmful gas material surrounding the same to then adequately ventilate a surrounding air, said apparatus comprises a case which is equipped with a sensor utilizing an electric measuring device, wherein the sensor is in contact with the surrounding air through an air passage and is mounted on a connection portion of an electric circuit board

and is protruded from the case to a chamber, wherein the chamber has a set of holes and is formed on a case cover, wherein the set of holes of the chamber is provided with a set of filters corresponding thereto, wherein the chamber is covered with a case cap which is provided with an outer wall and an inner wall, the air passage being formed between said inner and said outer walls.

5,750,881

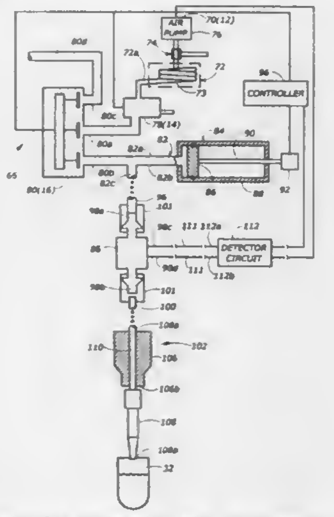
METHOD AND APPARATUS FOR ASPIRATING AND DISPENSING SAMPLE FLUIDS

Jeffrey S. Dorenkott, North Olmsted; Steven E. Wilder, Ashland, both of Ohio; Dinh Nyugen, Liverpool, N.Y., and Kurukundi Ramesh Murthy, Fairview Park, Ohio, assignors to Chiron Diagnostics Corporation, E. Walpole, Mass.

Filed Jul. 13, 1995, Ser. No. 501,806

Int. Cl.⁶ G01M *3/02;* **B01L** *3/02;* **G01N** *1/14*

U.S. Cl. 73—37 **13 Claims**



1. An apparatus for aspirating and dispensing a sample fluid comprises:

- a constant air source having an output port;
- a pump valve having a first port coupled to the output port of said constant air source, a sample probe port and a vent port;
- a connecting member having a first port coupled to the sample probe port of said pump valve, a second port and a third port;
- a diluter having an output port coupled to the second port of said connecting member;
- a flow through pressure transducer having a first port coupled to the third port of said connecting member, a second port to provide a first pressure signal and a third port;
- a sample probe having a first port coupled to the third port of said flow through pressure transducer; a detector having a first port coupled to said second port of said transducer, said detector providing a second pressure signal; and
- a controller for said air source, pump valve, diluter and sample probe operating as a function of said second pressure signal.

5,750,882

GAS PERMEABILITY MEASUREMENTS FOR FILM ENVELOPE MATERIALS

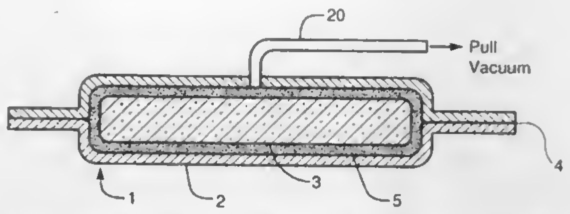
Gerard M. Ludtka; Thomas G. Kollie, both of Oak Ridge; David C. Watkin, Clinton, and David G. Walton, Knoxville, all of Tenn., assignors to Lockheed Martin Energy Research Corporation, Oak Ridge, Tenn.

Filed Apr. 4, 1997, Ser. No. 832,824

Int. Cl.⁶ G01N *15/08*

U.S. Cl. 73—38 **16 Claims**

1. A method for determining the permeability of an envelope material of a given composition and thickness comprising the steps of:



a providing an envelope comprising an envelope material, said envelope material having a material composition and a thickness, said envelope having an envelope volume;

b providing a body, said body having a total body volume and further having means for establishing a specific initial free volume, said means for establishing a specific initial free volume selected from at least one of the group of means consisting of pores and precision-machined holes, the free volume being from 0% to about 25% of the total volume and being interconnected with the surface of said body, said body comprising a solid, non-outgassing material, said body suitably sized and shaped to be contained within said envelope;

c sealing said body within said envelope while maintaining a partial vacuum within said envelope to provide a body-filled panel;

d disposing said body-filled panel within a sealable test enclosure;

e disposing a gas environment within said test enclosure, surrounding said body-filled panel, while maintaining a constant temperature and pressure within said gas environment for a specified period of time;

f measuring the pressure within said body-filled panel during the specified period of time;

g determining the relationship between pressure within said body-filled panel and elapsed time during the exposure of said body-filled panel to said gas environment; and

h calculating, from the relationship between said free volume of said body-filled panel, said pressure within said body-filled panel, and elapsed time during the exposure of said body-filled panel to said gas environment, the permeability of the envelope material to the gas.

5,750,883

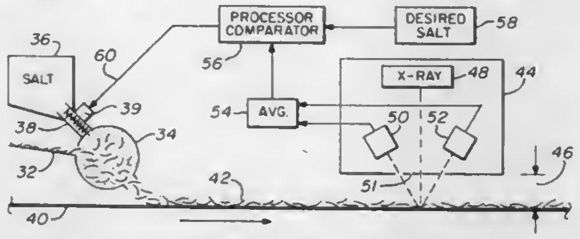
METHOD AND APPARATUS FOR DETERMINING THE SALT CONTENT OF SNACK FOODS

Vincent A. Elder, Carrollton, Tex., assignor to Recot, Inc., Pleasanton, Calif.

Filed Nov. 12, 1996, Ser. No. 747,367

Int. Cl.⁶ G01N *33/06;15/00*

U.S. Cl. 73—53.01 **19 Claims**



1. A non-destructive method for determining the salt content of snack foods exposed to ambient air on a support base by measuring backscatter X-rays including the steps of:

- irradiating the snack foods with X-ray radiation in the range of from about 4 keV to about 12 keV;
- placing a detector of X-ray backscatter energy level radiation above the snack food a distance ranging from 2 inches up to about 8 inches to prevent physical contact with the snack food;
- detecting the X-ray backscatter radiation energy level intensity from said snack food at an energy level intensity above the energy level of chlorine X-rays, said detected X-ray backscatter radiation intensity being representative of the snack food salt content; and

- determining said snack food salt content solely from said backscatter radiation.

5,750,884

COMPLEX VISCOSITY AND COMPLEX MODULUS MEASUREMENT DEVICE AND METHOD

John S. Field, Berowra Heights, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

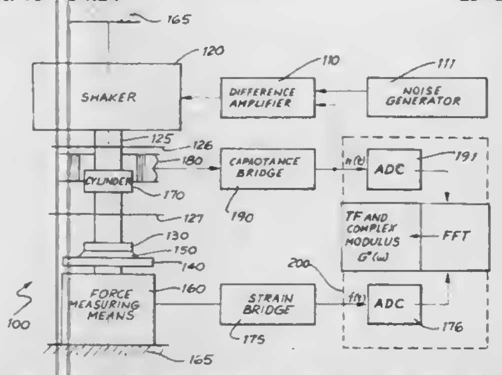
PCT No. PCT/AU95/00232, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/28629, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 19, 1995, Ser. No. 727,539

Claims priority, application Australia, Apr. 19, 1994, PM 5178

Int. Cl.⁶ G01N *11/00;9/24*

U.S. Cl. 73—54.24 **23 Claims**



1. A viscometer for determining a complex viscosity of a fluid, the viscometer comprising: vibrating means for imparting an alternating movement to a surface of the fluid without generating a magnetic field to cause a corresponding alternating flow of the fluid, the flow leading the fluid to exert on the vibrating means an alternating reaction force related to the viscosity of the fluid; force measuring means for providing a force signal related to the alternating reaction force; displacement measuring means for providing a movement signal related to the alternating movement of the surface; and processing means for using the force signal and the movement signal to compute the complex viscosity of the fluid, wherein the processor is configured to compute the Fourier transform F(ω) of the force signal, the Fourier transform H(ω) of the movement signal, and the ratio F(ω)/H(ω) of the Fourier transform of the force signal to the Fourier transform of the movement signal.

5,750,885

Patent Not Issued For This Number

5,750,886

ENGINE EMISSIONS ANALYZER WITH DIAGNOSTIC

David Kay Lambert, Sterling Heights, and Peter John Groblicki, Shelby Township, Macomb County, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

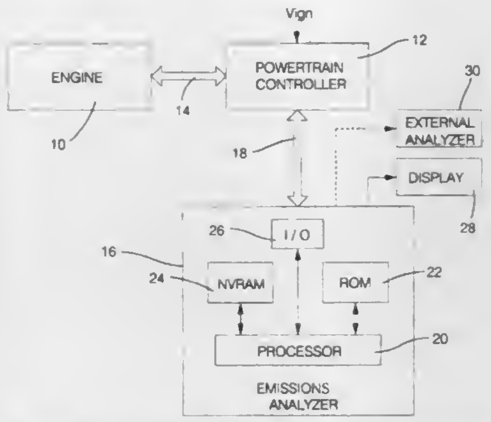
Filed Jun. 27, 1996, Ser. No. 672,159

Int. Cl.⁶ G01M *15/00*

U.S. Cl. 73—117.3 **13 Claims**

1. A vehicle emissions estimating method for indicating emissions of an automotive vehicle having a plurality of emissions control systems, comprising the steps of:

- storing a model representing a relationship between emissions control system fault conditions and corresponding variation in vehicle emissions away from a base level of vehicle emissions;
- diagnosing an emissions control system fault condition;



- referencing the vehicle emissions variation corresponding to the diagnosed emissions control system fault condition from the stored model;
- periodically during a test period, determining an occurrence of any of a predetermined set of engine events;
- estimating a level of vehicle emissions as a predetermined function of the determined occurrences;
- applying the referenced vehicle emissions variation to the estimated level of vehicle emissions to form a corrected vehicle emissions estimate; and
- indicating the corrected vehicle emissions estimate.

5,750,887

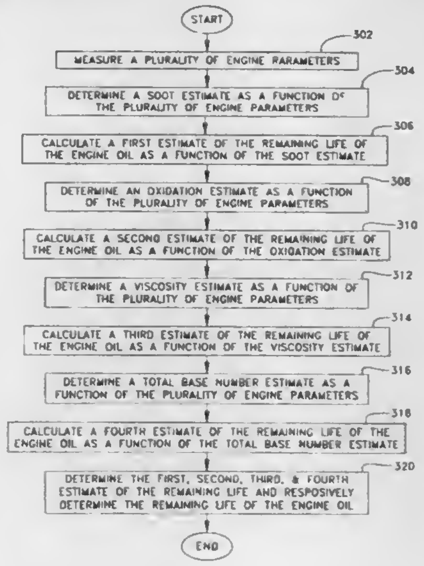
METHOD FOR DETERMINING A REMAINING LIFE OF ENGINE OIL

David R. Schricker, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 18, 1996, Ser. No. 749,603

Int. Cl.⁶ B60Q *1/00;* **G01M** *15/00;* **G01D** *21/00*

U.S. Cl. 73—117.3 **30 Claims**


START
302
MEASURE A PLURALITY OF ENGINE PARAMETERS
304
DETERMINE A SOOT ESTIMATE AS A FUNCTION OF THE PLURALITY OF ENGINE PARAMETERS
306
CALCULATE A FIRST ESTIMATE OF THE REMAINING LIFE OF THE ENGINE OIL AS A FUNCTION OF THE SOOT ESTIMATE
308
DETERMINE AN OXIDATION ESTIMATE AS A FUNCTION OF THE PLURALITY OF ENGINE PARAMETERS
310
CALCULATE A SECOND ESTIMATE OF THE REMAINING LIFE OF THE ENGINE OIL AS A FUNCTION OF THE OXIDATION ESTIMATE
312
DETERMINE A VISCOSITY ESTIMATE AS A FUNCTION OF THE PLURALITY OF ENGINE PARAMETERS
314
CALCULATE A THIRD ESTIMATE OF THE REMAINING LIFE OF THE ENGINE OIL AS A FUNCTION OF THE VISCOSITY ESTIMATE
316
DETERMINE A TOTAL BASE NUMBER ESTIMATE AS A FUNCTION OF THE PLURALITY OF ENGINE PARAMETERS
318
CALCULATE A FOURTH ESTIMATE OF THE REMAINING LIFE OF THE ENGINE OIL AS A FUNCTION OF THE TOTAL BASE NUMBER ESTIMATE
320
DETERMINE THE FIRST, SECOND, THIRD, & FOURTH ESTIMATE OF THE REMAINING LIFE AND RESPOSIVELY DETERMINE THE REMAINING LIFE OF THE ENGINE OIL
END

1. A method for determining the remaining life of engine oil in an engine, comprising:

- measuring a plurality of engine parameters;
- determining an estimate of a characteristic of the engine oil as a function of said plurality of engine parameters; and,
- trending said estimate and responsively determining the remaining life of the engine oil.

5,750,888

FAULT DIAGNOSTIC METHOD AND APPARATUS FOR FUEL EVAPORATIVE EMISSION CONTROL SYSTEM

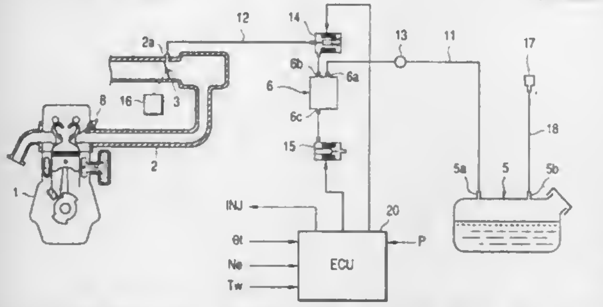
Takuya Matsumoto; Toru Hashimoto; Mitsuhiro Miyake; Hitoshi Kamura, all of Kyoto, and Toshiro Nomura, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushi Kaisha, Tokyo, Japan

Filed Jul. 18, 1996, Ser. No. 683,415

Claims priority, application Japan, Jul. 21, 1995, 7-185975

Int. Cl.⁶ F02M *25/08;* **G01M** *15/00*

U.S. Cl. 73—118.1 **27 Claims**



1. A fault diagnostic apparatus for detecting faults of a fuel evaporative emission control system for inhibiting a fuel evaporative emission from exhausting, the control system including a fuel evaporative emission flow path for drawing the fuel evaporative emission in a fuel tank into a suction passage of an engine, comprising:

- path closure means for closing the flow path such that a vacuum is held in said fuel tank, said path closure means being provided in said fuel evaporative emission slow path;
- internal pressure detecting means for detecting a level of internal pressure in said fuel tank;
- leak detecting means for detecting a leak in said fuel evaporative emission flow path;
- average calculating means for calculating an average value of a plurality of detected levels of the internal pressure obtained by said internal pressure detecting means within a predetermined period of time;
- comparing means for calculating a deviation between each of said detected levels obtained by said internal pressure detecting means and said average value and for comparing the calculated deviation to a predetermined threshold; and
- detection interrupting means for interrupting leak detection by said leak detecting means based upon said comparison by said comparing means.

5,750,889

AIR FLOW RATE MEASURING APPARATUS AND AIR FLOW RATE MEASURING METHOD

Takehiko Kowatari, Ibaraki; Nobukatsu Arai, Ushiku, and Chihiro Kobayashi, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP95/01178, § 371 Date Feb. 13, 1996, § 102(e) Date Feb. 13, 1996, PCT Pub. No. WO95/34753, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 13, 1995, Ser. No. 605,157

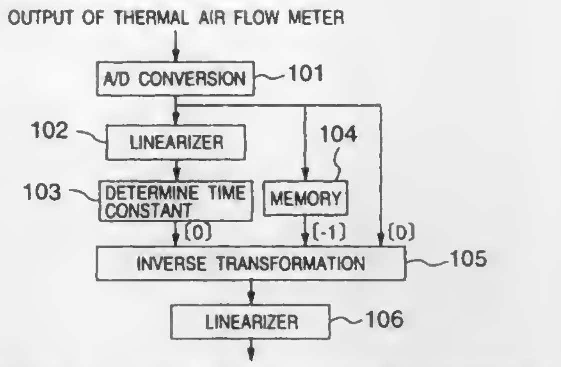
Claims priority, application Japan, Jun. 13, 1994, 6-130112

Int. Cl.⁶ F02D *41/18;45/00;* **G01F** *1/68;1/72*

U.S. Cl. 73—118.2 **15 Claims**

1. An air flow rate measuring apparatus for measuring an intake air amount of an internal combustion engine by use of a thermal air flow meter, comprising:

- means inputted with an output of said thermal air flow meter for correcting a response delay of said output and outputting a corrected output; and
- means inputted with the output of said correcting means for transforming it to a value corresponding to an air flow rate on the basis of a characteristic of said thermal air flow meter stored beforehand.



5,750,890

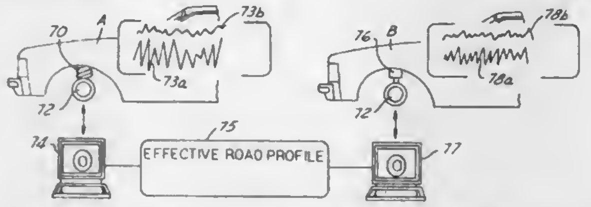
METHOD AND APPARATUS FOR MODELLING A TIRE FOR USE WITH A VEHICLE SPINDLE-COUPLED SIMULATOR

David M. Fricke, Howell; Mark D. Hansen, and Rakan C. Chabaan, both of Farmington Hills, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Apr. 15, 1996, Ser. No. 585,675

Int. Cl.⁶ G01M *17/04*

U.S. Cl. 73—146 **9 Claims**



1. A method for modeling a tire for use with an effective road profile in testing an automotive vehicle on a spindle-coupled road simulator, the method comprising the steps of:

- (a) defining a flat surface road plane in a three coordinate reference system having three coordinates to represent said effective road profile, said three coordinates comprising:
  - a plane vertical deflection;
  - a plane radial contact angle; and
  - a plane lateral contact angle;
- (b) mounting a test tire in a tire test stand against a contact plane movable in each of said three coordinates, with said tire, said contact plane, and said test stand comprising a tire test system;
- (c) exciting said contact plane with said tire in contact therewith over a predetermined excitation range with respect to each of said three coordinates;
- (d) collecting a set of excitation input data and a set of response output data from said tire test system, said data referenced to said three coordinates;
- (d) matching said input data with said output data;
- (e) estimating a spring stiffness constant of said tire system from said input data and said output data based on a linear model of said tire system;
- (f) estimating a tire system mass and a tire system damping constant from said input data and said output data using a system identification technique based upon a second order model of said tire system and a spring constant of approximately twice said spring stiffness constant estimated in step (e) so that a tire model is developed,
- (g) exciting said tire test system with a predetermined input signal to generate an actual spindle force from said tire;
- (h) estimating a simulated spindle force from said tire model based upon said predetermined input signal; and
- (i) comparing said actual spindle force with said simulated spindle force to verify said tire model with respect to said effective road profile.

5,750,891

METHOD AND APPARATUS FOR DETERMINING THE AIRSPEED OF ROTARY WING AIRCRAFT

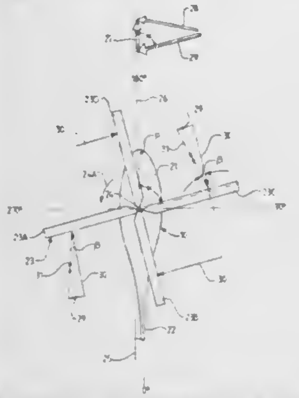
Alan Brocklehurst, Bradford Abbas, United Kingdom, assignor to GKN Westland Helicopters Limited, Yeovil, United Kingdom

Filed Sep. 11, 1996, Ser. No. 711,927

Claims priority, application United Kingdom, Sep. 14, 1995, 9518800

Int. Cl.⁶ G01C *21/00*

U.S. Cl. 73—178 H **19 Claims**



1. A method of detecting the airspeed of a rotary wing aircraft having a sustaining rotor with a plurality of radially extending rotor blades for rotation about a substantially vertical axis, comprising the steps of measuring on at least one of the rotor blades of the sustaining rotor, an airflow sideslip angle of an airflow over the surface of the rotor blade as the blade rotates, producing a signal representative of said sideslip angle, comparing said signal in processing means containing information on a known relationship between said sideslip angle and airspeed, and providing an output signal representative of the airspeed and wind direction to a display means.

5,750,892

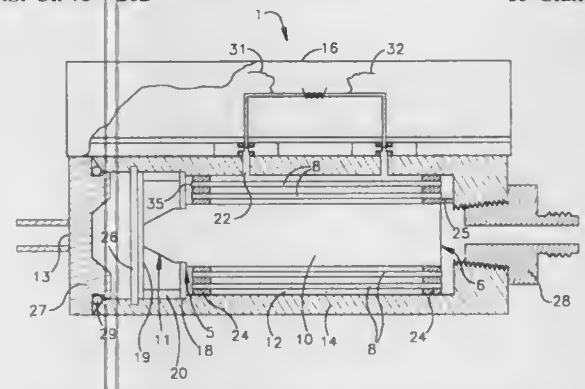
LAMINAR FLOW ELEMENT WITH INBOARD SENSOR TAPS AND COAXIAL LAMINAR FLOW GUIDES

Yufeng Huang, Chesapeake; William J. Alvesteffer, and Ronald A. Outlaw, both of Newport News, all of Va., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 27, 1996, Ser. No. 720,025

Int. Cl.⁶ G01F *5/00*

U.S. Cl. 73—202 **13 Claims**



1. A laminar flow element for use with a flow metering device which has an upstream sensor tap and a downstream sensor tap, the laminar flow element comprising:

- an LFE plug configured for positioning within a base cavity of a base attached to a fluid flow line, the LFE plug having an upstream end for orientation toward an inlet end of the base cavity, and a downstream end for orientation toward an outlet of the base cavity, the LFE plug having a constant cross-sectional area between the upstream end and the downstream end, a fixture for holding the LFE plug within the base cavity with the upstream end oriented toward a flow direction and to provide a laminar flow passage between the LFE plug and interior walls of the base cavity between the upstream end and the downstream end of the LFE plug, and
- an upstream sensor tap through a wall of the base into the base cavity, the upstream sensor tap positioned inboard of the LFE plug, and a downstream sensor tap through a wall of the base into the base cavity, the downstream sensor tap positioned inboard of the LFE plug and downstream of the upstream sensor tap, wherein the cross-sectional area of the flow passage between the upstream sensor tap and the downstream sensor tap is constant.

5,750,893

THERMALLY SENSING TYPE FLOWING VELOCITY MEASURING APPARATUS

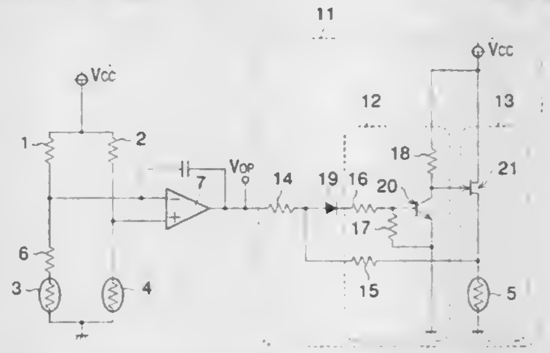
Norihiko Murata, Yokohama, and Tatsuo Miyachi, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 492,714

Claims priority, application Japan, Jun. 21, 1994, 6-138816

Int. Cl.⁶ G01F *1/68*

U.S. Cl. 73—204.11 **31 Claims**



1. A thermally sensing type flowing velocity measuring apparatus which comprises:

- a substrate,
- a moat formed by etching said substrate,
- a thermally sensing type flowing velocity sensor comprising a bridge suspended over said moat, said bridge comprising an electrically insulative film formed on said substrate, a heater mounted on the bridge, a heater temperature measuring body mounted on the bridge, and a fluid temperature measuring body mounted on a part of said electrically insulative film,
- a flowing velocity measuring circuit for keeping a temperature difference between a temperature of said fluid temperature measuring body and a temperature of said heater temperature measuring body constant,
- wherein said flowing velocity measuring circuit comprises:
  - a bridge circuit comprising said fluid temperature measuring body, a first reference resistor connected in series with said fluid temperature measuring body, said heater temperature measuring body, a second reference resistor connected in series with said heater temperature measuring body, and a temperature setting resistor for setting said temperature difference between the temperature of said heater temperature measuring body and the temperature of said fluid temperature measuring body,
  - a differential amplifier having an output terminal, said differential amplifier connected in series with said bridge circuit, and
  - a buffer circuit connected to the output terminal of said differential amplifier and connected in series with the differential amplifier,
  - wherein said buffer circuit comprises a first emitter-grounded amplifying circuit and a source follower.

5,750,894

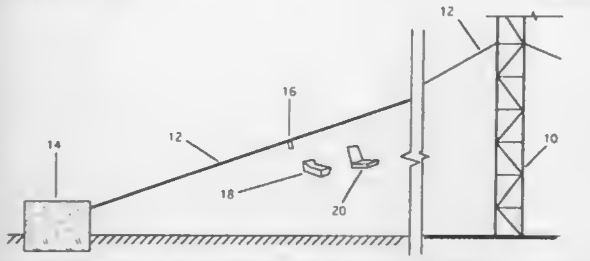
MEASUREMENT OF TENSION USING NATURAL FREQUENCY OF VIBRATION

Jonathan C. Russell, South Glastonbury, Conn., and Thomas J. Lardner, Amherst, Mass., assignors to The Government of the United States as represented by the Secretary of Transportation, Washington, D.C.

Filed Oct. 31, 1996, Ser. No. 778,024

Int. Cl.^{6} G01N *29/12*

U.S. Cl. 73—581 **5 Claims**



1. The method of determining the tension in a flexible member which comprises calculating the natural frequency of the member when subjected to its design tension; calculating the natural frequency of the member at increments above and below its design tension; determining the actual natural frequency in said member; and comparing the measured natural frequency with the calculated natural frequencies.

5,750,895

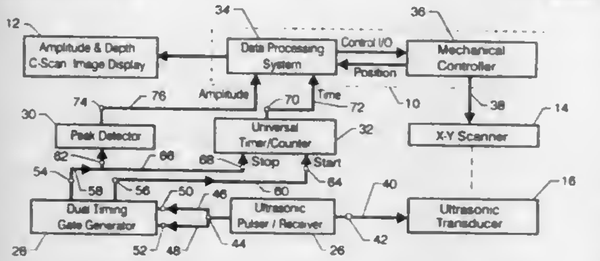
METHOD AND APPARATUS FOR DUAL AMPLITUDE DUAL TIME-OF-FLIGHT ULTRASONIC IMAGING

Engmin James Chern, Columbia, and David W. Butler, Linthicum, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 501,637, Jul. 12, 1995, abandoned. This application Jul. 3, 1996, Ser. No. 675,509

Int. Cl.^{6} G01N *29/06*

U.S. Cl. 73—614 **19 Claims**



1. A method of ultrasonic imaging, comprising the steps of:

scanning a test specimen in a predetermined scan pattern;

propagating and receiving reflected pulses of ultrasonic energy directed to a surface of said test specimen;

detecting and generating data of both the amplitude and depth of a defect in said test specimen from the pulses received from said test specimen wherein the step of generating said data includes the step of generating a first timing gate having a start trigger for a timing unit at a front surface of said test specimen and a second timing gate having a stop trigger within a body of said test specimen;

merging said data of said amplitude and said data of said depth of said defect into composite data; and

displaying said composite data in three dimensional image whereby a mesh of both amplitude and depth data of said defect is displayed in a single image of said defect.

5,750,896

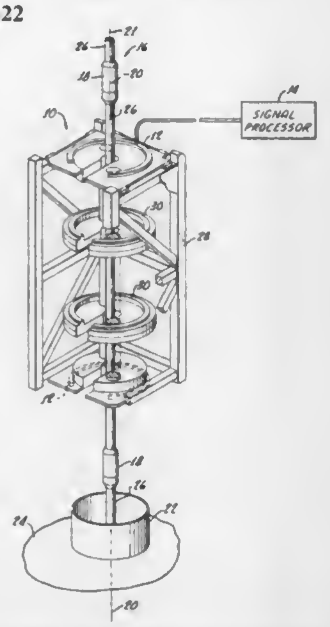
TOOL JOINT SENSOR

Felix E. Morgan; Randall S. Page, and Sam D. Monaco, all of Albuquerque, N. Mex., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 22, 1994, Ser. No. 279,368

Int. Cl.^{6} G01N *29/24*

U.S. Cl. 73—622 **25 Claims**



1. A method of detecting a joint in an elongated rotational and axially movable tool having a nominal axis, wherein the joint has a diameter different from the diameter of the tool at portions of the tool other than the joint, said method comprising the steps of:

employing at least one divergent ultrasonic energy beam to measure at least first and second distances between circumferentially spaced points on the exterior of the tool and at least one point positioned at a fixed radial distance from said nominal axis, wherein said circumferentially spaced points lie in a common plane; and

employing said at least first and second measured distances to determine diameter of said tool in said plane; and

using the diameter difference between the joint and the portions of the tool other than the joint to detect when the joint passes into said common plane.

5,750,897

ACTIVE ANTI-VIBRATION APPARATUS AND METHOD OF MANUFACTURING THE SAME

Hiroaki Kato, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1996, Ser. No. 660,961

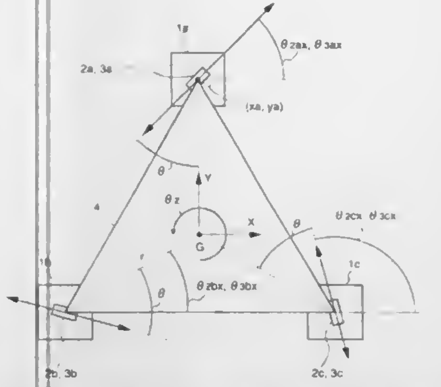
Claims priority, application Japan, Jun. 14, 1995, 7-147412; Jan. 26, 1996, 8-031163

Int. Cl.^{6} G01M *7/00*

U.S. Cl. 73—663 **38 Claims**

1. An active anti-vibration apparatus having a plurality of sensors and actuators, which detects motion of an anti-vibration table for supporting an equipment with said plurality of sensors and controls said actuators on the basis of output signals from said sensors to drive said anti-vibration table, thereby performing an anti-vibration operation for said anti-vibration table,

wherein said plurality of sensors are arranged such that, when a motion parameter of said anti-vibration table is represented by a vector P, and an output signal group from said plurality of sensors is represented by a vector S, a condition number of a matrix A defined by an equation S=AP established between the vector P and the vector S in accordance with a geometrical arrangement of said plurality of sensors is minimized.



5,750,898

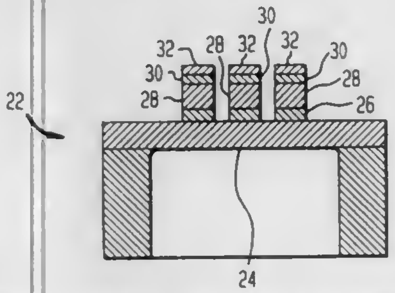
PASSIVATION/PATTERNING OF PZR DIAMOND FILMS FOR HIGH TEMPERATURE TRANSDUCER OPERABILITY

Anthony D. Kurtz, Teaneck; Alexander A. Ned, and Timoteo I. Vergel de Dios, both of Bloomingdale, all of N.J., assignors to Kulite Semiconductor Products, Inc., Leonia, N.J.

Division of Ser. No. 615,458, Mar. 14, 1996, Pat. No. 5,622,902. This application Oct. 9, 1996, Ser. No. 727,882

Int. Cl.^{6} G01L *9/06*

U.S. Cl. 73—727 **3 Claims**



1. A transducer capable of withstanding temperatures up to 800° C. in an oxygen atmosphere, comprising:

a substrate of semiconductive material;

an i-diamond film disposed on said substrate;

a p-diamond film disposed on said i-diamond film;

at least one sensor fabricated from said p-diamond film; and

at least one passivation layer disposed on said at least one sensor, said at least one passivation layer being fabricated from a material which substantially prevents said at least one sensor from oxidizing at temperatures above 800° C. in an oxygen atmosphere.

5,750,899

CAPACITIVE PRESSURE SENSOR WITH SENSING ELEMENT MECHANICALLY ISOLATED FROM THE CASING

Frank Hegner, Lörrach; Elke Maria Schmidt, Schopheim; Ulfert Drewes, Heitersheim, and Rainer Martin, Efringen-Kirchen, all of Germany, assignors to ENVEC Mess- und Regeltechnik GmbH + Co., Weil am Rhein, Germany

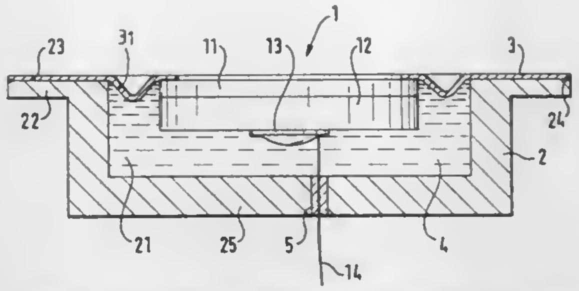
Continuation of Ser. No. 696,483, Aug. 14, 1996, abandoned. This application Sep. 15, 1997, Ser. No. 929,030

Claims priority, application European Pat. Off., Aug. 19, 1995, 95113064; Jun. 14, 1996, 96810394

Int. Cl.^{6} G01L *7/00;7/08*

U.S. Cl. 73—756 **11 Claims**

1. A capacitive pressure sensor for measuring the pressure of a medium to be measured, comprising:



a sensing element including a sensor diaphragm having an area exposed to a medium to be measured;

a casing for receiving the sensing element and having an interior space;

an annular flexible connecting element connecting the casing with an edge of the sensing element, the connecting element and the sensing element closing the interior space toward the medium to be measured; and

a liquid filling the enclosed interior space and surrounding the sensing element except for the area of the sensor diaphragm exposed to the medium to be measured.

5,750,900

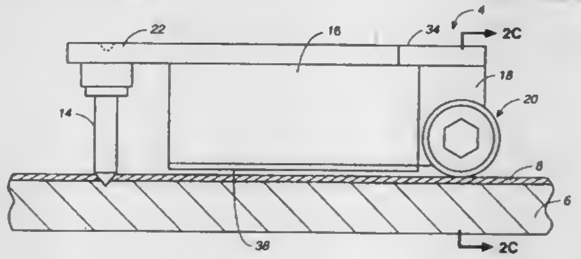
ACOUSTIC STRAIN GAUGE AND ASSEMBLY AND METHOD FOR MEASURING STRAIN

Monte K. Hugentobler, Novato, and Efrain Anthony Mandrachia, San Francisco, both of Calif., assignors to SonicForce, L.L.C., Burlingame, Calif.

Continuation-in-part of Ser. No. 707,922, Sep. 9, 1996. This application Jan. 29, 1997, Ser. No. 792,695

Int. Cl.^{6} G01N *29/24*

U.S. Cl. 73—779 **32 Claims**



1. An improved acoustic strain gauge for transmitting and receiving acoustic waves through a workpiece comprising:

a pair of Electromagnetic Acoustic Transducers ("EMATs") for respectively transmitting and receiving acoustic waves through said workpiece and for determining the applied strain in the workpiece by measuring the change in time of flight between the workpiece in the stressed and unstressed condition for determining applied strain;

a body for housing each of said EMATs, each of said bodies having an outer plane and a longitudinal axis;

a pin fixed relative to each of said bodies' longitudinal axis, said pin extending a first predetermined distance beyond said outer plane for engaging the workpiece to fix the position of said outer plane with respect thereto and to maintain the coplanar registry between each EMAT and the workpiece at a second predetermined distance, said pin having an upper end for striking and a lower end for engaging the workpiece;

holddown means for preventing said body from moving with respect to the workpiece; and

a friction reducing means affixed to each of said bodies for engaging the workpiece and supporting said EMAT thereon such that when said pin is struck thereby indenting the workpiece and locating said outer plane in substantially coplanar registry therewith, surface deformations occurring in the workpiece have negligible effect on the position of the body thereon and for allowing deformation of the workpiece under each EMAT without compromising the registry between the pair of EMAT's.

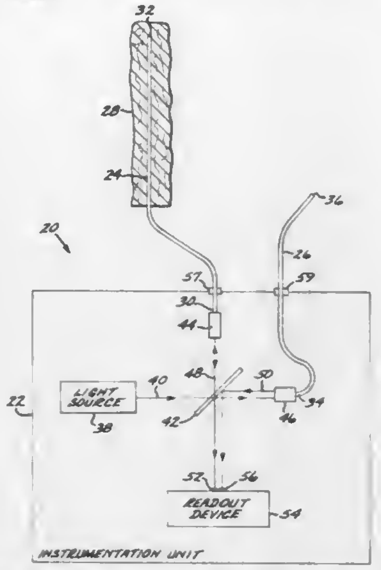
5,750,901
OPTICAL FIBER APPARATUS AND METHOD FOR MEASURING GEOLOGICAL STRAINS

Victor Vali, Laguna Hills; I-Fu Shih, Los Alamitos, and Kenn S. Bates, Long Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 7, 1995, Ser. No. 483,006

Int. Cl.^{6} G01L ***1/24***

U.S. Cl. 73—800 **19 Claims**



1. An apparatus for performing differential strain measurements of a geological structure, comprising:

interferometric readout device having a measurement input

a multiplicity of measurement optical fibers having varying lengths and first ends and having reflective second ends thereof, the multiplicity of measurement optical fibers being in contact with a geological structure along at least a portion of the length of the multiplicity of measurement optical fibers;

a multiplcity of reference optical fibers having varying lengths having first ends and having reflective second ends thereof;

a light source of an input beam of light; and

a beam director including means for directing the input beam of light from the light source into both the first ends of the measurement optical fibers and the first ends of the reference optical fibers, for directing a reflected measurement beam of light from the first ends of the measurement optical fibers into the measurement input, and for directing a reflected reference beam of light from the first ends of the reference optical fibers into the reference input.

5,750,902
MAGNETOINDUCTIVE FLOW METER

Hans W. Schwiderski, Hardenberg, Germany, assignor to Elsag International N.V., Amsterdam, Netherlands

Filed Feb. 3, 1997, Ser. No. 794,145

Claims priority, application Germany, Feb. 5, 1996, 196 04 004.3

Int. Cl.^{6} G02F ***1/58***

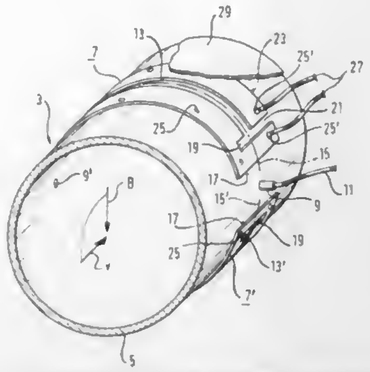
U.S. Cl. 73—861.12 **21 Claims**

1. A magnetoinductive flow meter comprising:

a measuring tube having a body;

an electromagnet device with at least one electric conductor loop arrangement for generating a magnetic field penetrating said measuring tube at right angles to the longitudinal axis thereof; and

at least two measuring electrodes, which are arranged opposite one another at right angles to the longitudinal axis of said measuring tube in such a way that they can be used to tap a measuring voltage induced owing to the flow, proceeding at right angles to the magnetic field, of a liquid flowing through said measuring tube;



said electric conductor loop arrangement comprising an electrically conductive sheet-metal part for providing a loop current path said sheet-metal part arranged on the inner side or on the outer side of said measuring tube body and having at least one cutout which is perpendicular to the longitudinal axis of said measuring tube, said cutout acting as inner boundary of said sheet-metal part loop current path and dividing said sheet-metal part loop current path into two contrarotating current path parts which are perpendicular to said measuring tube longitudinal axis.

5,750,903
METHOD OF LINEARIZING A FLOW VELOCITY SENSOR, A LINEARIZED FLOW VELOCITY MEASUREMENT APPARATUS AND SYSTEM

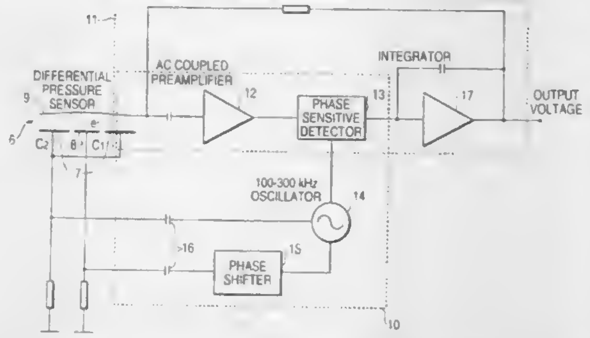
Tapani Ryhänen, Helsinki, Finland, assignor to Vaisala, Oy, Helsinki, Finland

Filed Dec. 21, 1995, Ser. No. 576,313

Claims priority, application Finland, Dec. 22, 1994, 946049

Int. Cl.^{6} G01F ***1/38***

U.S. Cl. 73—861.48 **17 Claims**



5. A linearized flow velocity measurement apparatus, comprising:

a flow velocity sensor disposed in the flow under measurement, said flow velocity sensor having two pressure outlet ports such that the pressure difference between the two pressure outlet ports is proportional to the square of the flow velocity;

a symmetrical capacitive differential pressure sensor coupled to said flow velocity sensor to receive the outputs of the two pressure outlet ports, said differential pressure sensor including a sensing diaphragm disposed between two stationary electrodes for converting the pressure difference between the pressure outlet ports into an electrical measurement signal by sensing a deviation of the sensing diaphragm from a force balance state, said differential pressure sensor receiving a feedback control signal proportional to the square root of the pressure difference between said two pressure outlet ports; and

feedback control voltage generating circuitry including limiter circuits for selectively applying the feedback control voltage to the stationary electrodes of said differential pressure sensor so that the feedback control signal is applied to only one electrode at a time.

5,750,904
FORCE A DISPLACEMENT SENSOR WITH A CAPACITIVE TRANSDUCER

Günter Doemens, Holzkirchen, and Markus Gilch, Mauern, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

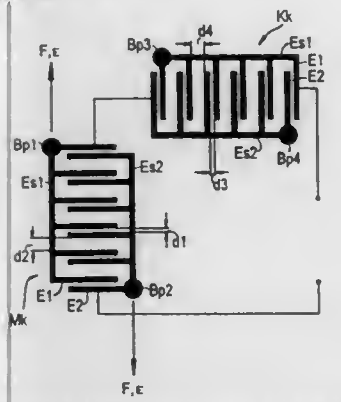
PCT No. PCT/DE95/01053, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO96/05492, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 9, 1995, Ser. No. 793,159

Claims priority, application Germany, Aug. 16, 1994, 44 29 050.0

Int. Cl.^{6} G01L ***1/04***

U.S. Cl. 73—862.623 **3 Claims**



1. A force or displacement sensor with a capacitive transducer, comprising:

a measuring capacitor having electrode structures that are electrically insulated from one another, that have a comb configuration and interengage, that are parallel to one another via two securing points thereof as a function of a force to be measured or of an extension to be measured, each electrode structure having electrode pairs;

a total capacitance of the measuring capacitor by parallel connection of individual electrode pairs each pair being formed by one electrode of a first electrode structure of the electrode structures and an associated adjacent electrode of a second electrode structure of the electrode structures;

within a total measuring range, electrode separation of the electrode pairs, which varies according to the force to be measured or the displacement to be measured, being small compared to a distance between adjacent electrodes, not assigned to each other, of the electrode structures;

the force to be measured, or the displacement to be measured, determined from a change in a resulting capacitance of an electrical series circuit having measuring capacitor and a substantial compensating capacitor arranged orthogonally to the measuring capacitor;

the securing points of the compensating capacitor being selected such that thermally induced variations in electrode separation of the measuring capacitor and of the compensating capacitor have opposite signs.

5,750,905
BEVERAGE DISPENSER TAP COVER WITH POSITION SENSING SWITCH

Michael G. Weimer, Oconomowoc; David K. Wetzel, and Larry D. Powers, both of Watertown, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

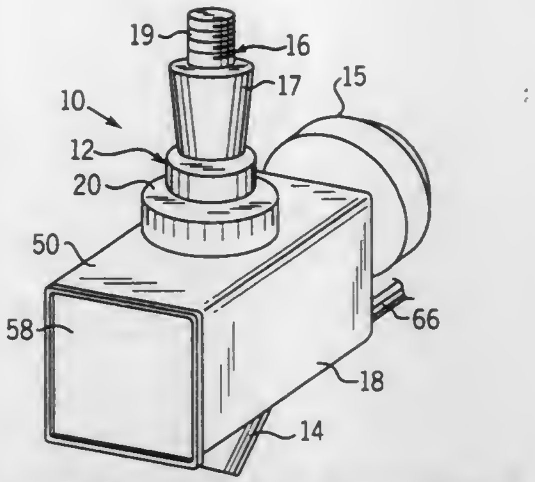
Filed Mar. 6, 1997, Ser. No. 812,461

Int. Cl.^{6} G01N ***1/00***

U.S. Cl. 73—863 **12 Claims**

1. A mechanism for sensing an operational state of a beverage tap which has a spout and a valve operated by a lever that extends through a threaded collar, the mechanism comprising:

a housing for placement over the beverage tap and having an aperture through which the threaded collar projects and an



open bottom through which the spout projects when the housing is placed over the beverage tap;

a compression bonnet which engages the housing and which has a threaded aperture to engage the threaded collar; and

a switch assembly within the housing for operation by a component of the beverage tap and providing an electrical signal indicative of whether the beverage tap is open or closed.

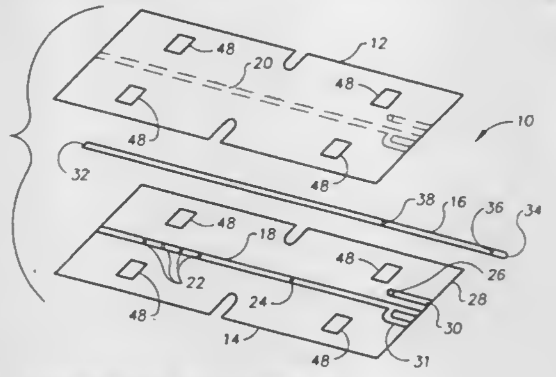
5,750,906
MULTIFUNCTION VALVE

Norman K. Parker, Northfield; James E. Rasmussen, Plainville; Richard L. Schulkind, Sharon; Kevin J. Sullivan, Medfield, and Robert B. Green, Hopkinton, all of Mass., assignors to Chiron Diagnostics Corporation, E. Walpole, Mass.

Filed Oct. 29, 1996, Ser. No. 739,249

Int. Cl.^{6} G01N ***1/10***

U.S. Cl. 73—863.73 **17 Claims**



1. A multifunction valve, comprising:

a lower valve body, comprising

a first end, a second end, a top face, and a bottom face;

an upper valve body, comprising

a first end, a second end, a top face, and a bottom face, said upper valve body attached to said lower valve body to form a seal; and

a groove positioned on said top face and between said first end and said second end of at least one of said valve bodies;

a plurality of inlet ports positioned on at least one of said bottom faces, said plurality of inlet ports having corresponding apertures communicating with said groove;

a sample probe movably positionable in said groove, and comprising

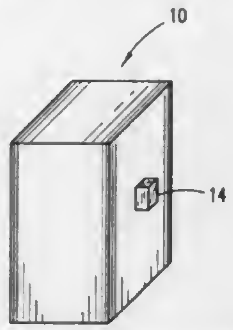
a sealed end and an open end adapted to receive a conduit of a fluid test system; and

a first aperture located adjacent said sealed end, and a second aperture located between said first aperture and said open end;

said seal sealing said sample probe in said groove;

wherein when said second aperture of said sample probe aligns with one of said plurality of inlet ports to expose an inlet port to said open end, said first aperture of said sample probe is sealed by upper valve body and said lower valve body, and when said first aperture of said sample probe is positioned beyond said first end of said lower valve body said second aperture of said sample probe is sealed by said upper valve body and said lower valve body.

5,750,907
PROCESS AND ARTICLE FOR DETERMINING THE RESIDENCE TIME OF A FOOD PARTICLE
Matthew J. Botos, Naperville; Charles E. Sizer, Hawthorn, and Sevugan Palanipian, Grayslake, all of Ill., assignors to Tetra Laval Holdings & Finance, S.A., Pully, Switzerland
Filed Jun. 20, 1996, Ser. No. 667,124
Int. Cl.^{6} A23L *3/18*
U.S. Cl. 73—865.8 **15 Claims**

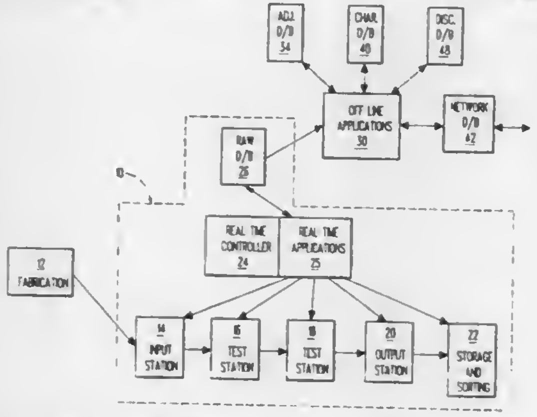


1. An article for determining the residence time of food particles undergoing aseptic processing wherein the food particles are constituents of a heterogeneous fluid, the article comprising:

a magnet capable of generating a magnetic field through a tubing composed of stainless steel; and

an analog of the food particle encompassing the magnet, the analog having substantially the shape, size, density and rotational inertia of the food particle with the magnet encompassed therein.

5,750,908
TESTING SYSTEM WITH REAL TIME/OFF LINE FUNCTIONALITY ALLOCATION
William Drohan, Bedford, Mass., assignor to ADE Corproation, Westwood, Mass.
Filed Feb. 25, 1997, Ser. No. 805,269
Int. Cl.^{6} G01M *19/00*
U.S. Cl. 73—865.9 **21 Claims**



1. A testing system comprising:

a plurality of real time applications controlling a plurality of real time functions;

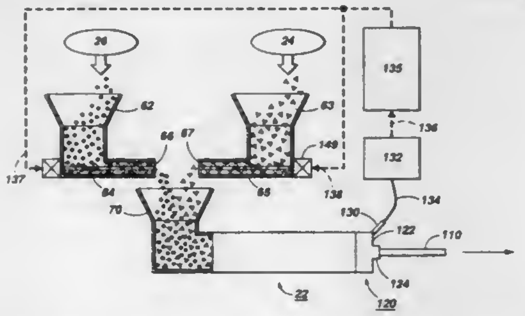
a real time controller operative with said plurality of real time applications;

a plurality of off line applications controlling a plurality of off line functions independently of said real time functions;

a first test station in communication with said plurality of real time applications; and

a first database in communication with said plurality of real time applications and said plurality of off line applications, wherein said real time applications are selected from the group consisting of movement of objects being tested to or from said first test station, operation of said first test station for objects being tested, and storage within said first database of data obtained by testing objects on said first test station.

5,750,909
FEEDBACK CONTROL SYSTEM FOR POLYMER MODIFICATION OF TONER RESINS AND TONERS
Michael G. Hawkins, Rochester; Hui Chang, Pittsford, both of N.Y.; Joo T. Chung, Cupertino, Calif.; Jennifer E. Dewan, Rochester, N.Y.; John J. Ianni, Medina, N.Y.; J. Stephen Kittelberger, Rochester, N.Y.; Joseph L. Leonardo, Penfield, N.Y.; Timothy L. Lincoln, Rochester, N.Y., and Yvonne M. Kenney, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 501,528, Jul. 12, 1995, Pat. No. 5,650,484. This application Feb. 6, 1997, Ser. No. 796,823
Int. Cl.^{6} B29C *47/76*
U.S. Cl. 73—866 **15 Claims**



1. An apparatus for the preparation of a mixture of resin and initiator, to form a modified resin including cross-linked microgel particles, comprising:

an extruder having the resin being conveyed therethrough;

means for adding the initiator to the resin in said extruder to form the modified resin

means for measuring the cross-linked microgel particles in the modified resin substantially immediately after mixing in said extruder and transmitting a signal indicative of the quantity of cross-linked microgel particles in the modified resin; and

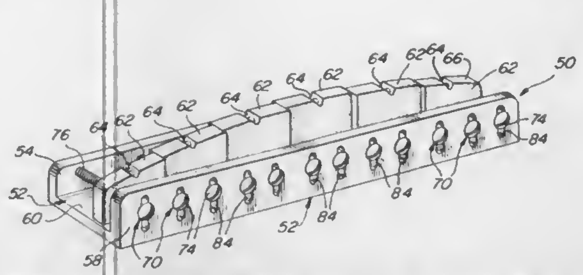
means, responsive to the signal indicative of the quantity of cross-linked microgel particles for controlling addition rate of the initiator to said extruder.

5,750,910
APPARATUS AND METHOD FOR TUNING GUITARS
Richard J. LoJacono, Paso Robles, Calif., assignor to Francis X. LoJacono, Sr., Laguna Niguel, Calif.
Continuation-in-part of Ser. No. 206,395, Mar. 7, 1994, Pat. No. 5,481,956. This application Dec. 8, 1995, Ser. No. 569,574
Int. Cl.^{6} G10D *3/06*
U.S. Cl. 84—314 N **6 Claims**

1. An adjustable nut apparatus for tuning a guitar comprising:

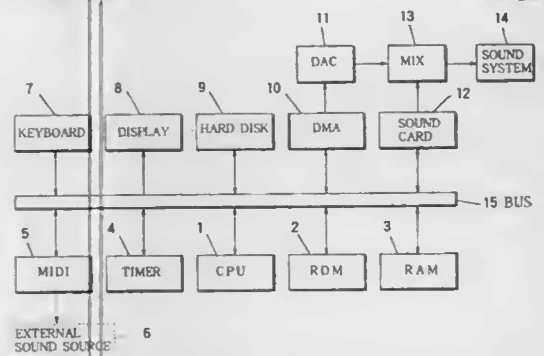
an elongated nut carriage formed to be positioned transverse the terminating end of a fret board of the guitar, wherein said nut carriage is formed having a front and rear wall and an integral base member;

a plurality of adjustable saddle nut members longitudinally juxtaposed between said front and rear walls; and



means for individually adjusting each of said saddle nut members transversely between said front and rear walls, whereby said saddle nut members are selectively positioned for proper tuning of the guitar strings, wherein said means for individually adjusting each of said saddle nut members comprises a pair of adjusting screws rotatably mounted in said rear wall of said nut carriage and threadably mounted to said saddle nut, whereby said saddle nut is selectively positioned between said front and rear walls of said nut carriage.

5,750,911
SOUND GENERATION METHOD USING HARDWARE AND SOFTWARE SOUND SOURCES
Motoichi Tamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Oct. 17, 1996, Ser. No. 732,929
Claims priority, application Japan, Oct. 23, 1995, 7-297272
Int. Cl.^{6} G09B *15/04;* **G10H** *1/06;7/00*
U.S. Cl. 84—602 **21 Claims**



8. A method for generating a musical tone using a computer having an application program, a software sound source and a hardware sound source, the method comprising the steps of:

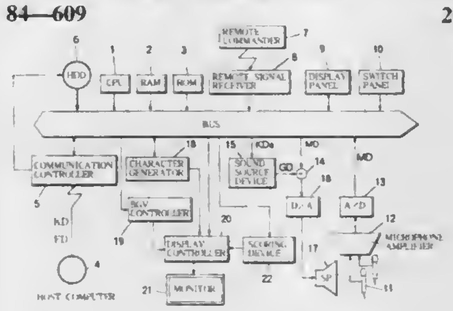
executing the application program to produce an audio message;

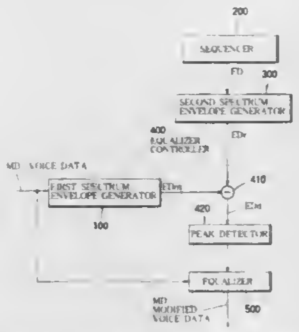
selecting at least one of the software sound source and the hardware sound source to distribute the audio message to the selected one of the software sound source and the hardware sound source;

selectively operating the software sound source composed of a tone generation program, when the software sound source is selected, by executing the tone generation program so as to generate the musical tone corresponding to the distributed message; and

selectively operating the hardware sound source having a tone generation circuit physically coupled to the computer, when the hardware sound source is selected, so as to generate the musical tone corresponding to the distributed audio message.

5,750,912
FORMANT CONVERTING APPARATUS MODIFYING SINGING VOICE TO EMULATE MODEL VOICE
Shuichi Matsumoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Jan. 16, 1997, Ser. No. 784,815
Claims priority, application Japan, Jan. 18, 1996, 8-6850
Int. Cl.^{6} A63H *5/00*
U.S. Cl. 84—609 **20 Claims**





1. A voice modifying apparatus for modifying a singing voice to emulate a model voice, comprising:

an input section that collects the singing voice created by a singer;

an analyzing section that sequentially analyzes the collected singing voice to extract therefrom actual formant data representing resonance characteristics of a singer's own vocal organ which is physically activated to create the singing voice;

a sequencer section that operates in synchronization with progression of the singing voice for sequentially providing reference formant data which indicates a vocal quality of the model voice and which is arranged to match with the progression of the singing voice;

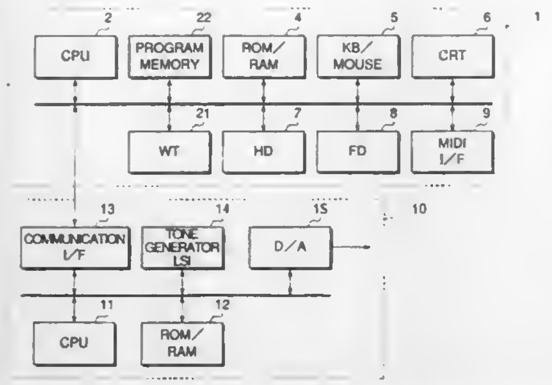
a comparing section that sequentially compares the actual formant data and the reference formant data with each other to detect a difference therebetween during the progression of the singing voice; and

a modifying section that modifies frequency characteristics of the collected singing voice according to the detected difference so as to emulate the vocal quality of the model voice.

5,750,913
MUSIC SYSTEM AND ELECTRONIC MUSICAL INSTRUMENT
Ryo Kamiya, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed May 22, 1996, Ser. No. 653,939
Claims priority, application Japan, May 23, 1995, 7-124055
Int. Cl.^{6} G10H *7/00*
U.S. Cl. 84—625 **14 Claims**

1. A music system comprising:

a first system that is used exclusively for synthesizing musical tones, including a first musical tone-synthesizing device that synthesizes musical tones, based on performance data externally supplied thereto, and a mixing device that mixes together said musical tones synthesized by said first musical tone-synthesizing device and external musical tones externally generated and supplied thereto; and



- a second system having a central processing unit that can synthesize musical tones by executing processing in parallel with other processing, said central processing unit including a performance data-processing device that controls performance data indicative of musical tones to be performed and transmits said performance data to said first system at predetermined timing, and a second musical tone-synthesizing device that synthesizes musical tones, based on said performance data, when said first musical tone-synthesizing device is in a predetermined state;

wherein said second system transmits said musical tones synthesized by said second musical tone-synthesizing device to said first system, as said external musical tones.

5,750,914
ELECTRONIC MUSICAL INSTRUMENT HAVING AN EFFECT DATA CONVERTING FUNCTION

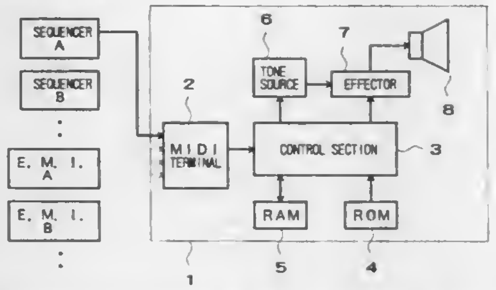
Makoto Takahashi, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Jun. 6, 1995, Ser. No. 471,423

Claims priority, application Japan, Jul. 18, 1994, 6-186828; Nov. 18, 1994, 6-308361

Int. Cl.⁶ G10H *1/02;1/06;* **H03G** *3/00*

U.S. Cl. 84—626 **24 Claims**



22. A method of imparting an effect to a sound signal by use of an effect imparting device which receives the sound signal and effect data and imparts to the sound signal an effect designated by the effect data, said method comprising the steps of:

introducing, from outside, effect data designating a desired sound effect;

when the effect data introduced by said step of introducing designates a sound effect not impartable by said effect imparting device, converting said introduced effect data into another effect data designating another sound effect impartable by said effect imparting device and supplying said introduced effect data or said other effect data to said effect imparting device, wherein if said effect data is converted by said step of converting, said other effect data is supplied to said effect imparting device in place of said introduced effect data, so as to cause said effect imparting device to impart to said sound signal the other sound effect designated by said other effect data.

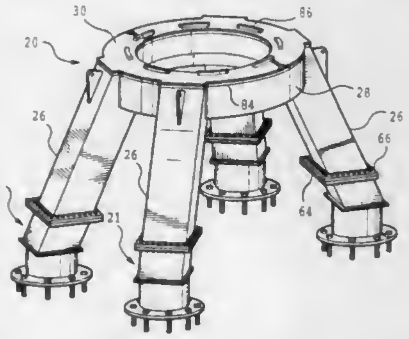
5,750,915
LAUNCH MOUNT PEDESTAL AND UMBILICAL MAST

Ernest R. Bedegrew, Santa Cruz; Robert J. MacDonald, San Jose; Louis E. Rustenburg, Sunnyvale; Russell E. Godfrey, San Jose; Daniel H. Hada; Raymond L. Fredrickson, both of Cupertino; Larry V. Digdigan, Union City; David A. Niemann, Santa Clara, and Russell K. Chun, San Francisco, all of Calif., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Dec. 1, 1995, Ser. No. 565,753

Int. Cl.⁶ F41F *3/04;* **B64G** *1/00;* **F16M** *13/00*

U.S. Cl. 89—1.8 **19 Claims**



1. A launch mount pedestal for use in an existing launch pad having a plurality of launch vehicle support posts, said launch mount pedestal comprising:

a launch vehicle support base having an exhaust opening;

four legs extending downwardly from the support base;

pedestal connecting means secured to lower ends of each of the legs; and

four pedestal adapters for securing the legs to the launch vehicle support posts, the pedestal adapters having adapter connecting means complimentarily engagable with the pedestal connecting means.

5,750,916
TRANSMISSION DEVICE HAVING A CENTRAL ROTATING WHEEL AND A LAYING MECHANISM WITH SUCH A DEVICE

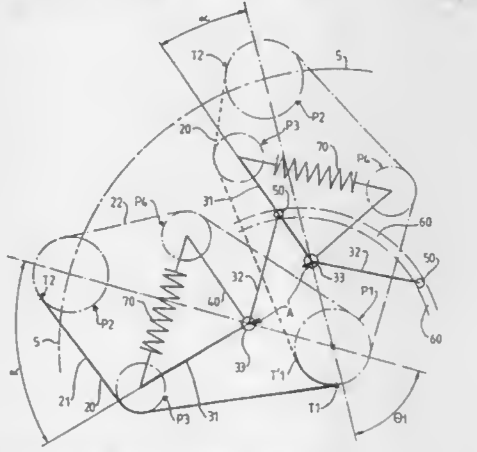
Emmanuel Mornay, Bourges, and Georges Simon, Saint Germain du Puy, both of France, assignors to CTA International, Versailles, France

Filed Jun. 15, 1995, Ser. No. 490,719

Claims priority, application France, Jun. 16, 1994, 94 07354

Int. Cl.⁶ F41A *9/02*

U.S. Cl. 89—33.17 **20 Claims**



1. A transmission device, comprising:

a central wheel disposed to rotate about a central wheel axle, said central wheel axle being fixed in a first position;

a satellite wheel having a satellite wheel axle, said satellite wheel and said satellite wheel axle being revolvable around said first position wherein said satellite wheel does not rotate about said satellite wheel axle;

a drive element connecting said central wheel and said satellite wheel, said drive element having a first portion and a second portion, wherein revolving said satellite wheel in a first direction around said central wheel induces said central wheel to rotate in a second direction opposite said first direction; and

a tension controller connected to said drive element that controls a tension of said drive element to at least partially compensate for rotation of said central wheel induced by said satellite wheel.

5,750,917
WARHEAD

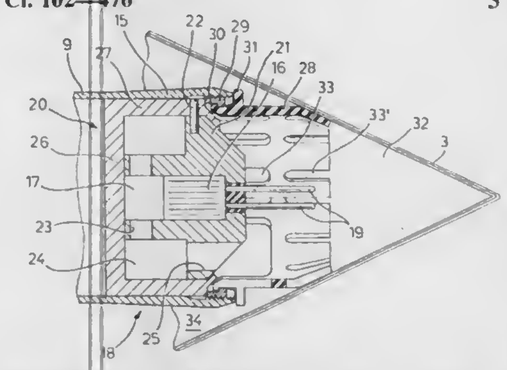
Joachim Seckler, Augsburg, and Klaus-Peter Geiss, Egenhofen, both of Germany, assignors to Daimler-Benz Aerospace AG, Ottobrunn, Germany

Filed Feb. 26, 1990, Ser. No. 489,921

Claims priority, application Germany, Mar. 1, 1989, 39 06 449.2

Int. Cl.⁶ F42B *12/18*

U.S. Cl. 102—476 **3 Claims**



1. Warhead having a flight direction and comprising a warhead jacket (**11**) having a first end leading in the flight direction, a preliminary structure (**13**) extending in the flight direction from the first end of said warhead jacket (**11**), a main shaped charge (**1**) within said warhead jacket (**11**) and a preliminary shaped charge (**5**) arranged ahead of the main shaped charge in the flight direction and located in a first position within said preliminary structure (**13**), said main shaped charge (**1**) having a first end leading in the flight direction, said preliminary shaped charge (**5**) has a first end leading in the flight direction and a second end trailing in the flight direction, a tubular spacer (**9**) extending in the flight direction within said warhead and having a first position therein with a second end thereof in the first position located within said warhead jacket (**11**) and a first end located within a guide (**12**) at a end of said preliminary structure (**13**), said spacer (**9**) being displaceable through said guide (**12**) from the first position to a second position with the second end of said spacer located adjacent said guide (**12**), a pyrotechnical element (**16**) located in a housing (**18**) in the second end of said spacer (**9**), said main shaped charge (**1**) having a lining at the first end thereof, said housing (**18**) including a pot-shaped part (**20**), an annular element (**28**) secured to the second end of said spacer (**9**) and in the first position of said spacer being in contacting engagement with the lining (**3**) of said main shaped charge (**1**), said annular element (**28**) defining an interior open space and in combination with said lining (**3**) and said spacer (**9**) forming a pressure space (**32**) at the first end of said main shaped charge (**1**), in the first position of said spacer (**9**) said spacer being spaced inwardly from said lining (**3**) and forming in combination therewith a hollow space (**34**), said annular element having first openings (**33**) therethrough communicating between said hollow space (**34**) and the interior open space in said annular element and second openings (**33'**) spaced opposite to the flight direction from said first openings (**33**) and facilitating contact between said annular element (**28**) and lining (**3**), an insert (**21**) in said pot-shaped part (**20**) and forming therewith an expansion chamber (**24**) for receiving propellant gases from said pyrotechnical element (**16**), said insert (**21**) forming at least one nozzle (**25**) for flowing propellant gases from the expansion chamber (**24**) into the pressure space (**32**).

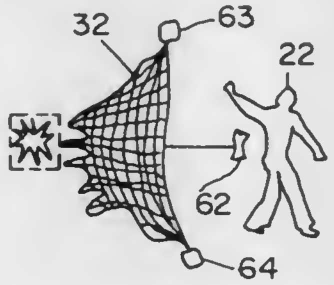
5,750,918
BALLISTICALLY DEPLOYED RESTRAINING NET

Arnie Mangolds, Stow; Michael David Farinella, Mansfield; Daniel Rene Deguire, Blackstone, and Robert Lee Cardenas, Framingham, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Oct. 17, 1995, Ser. No. 544,012

Int. Cl.⁶ F42B *12/00*

U.S. Cl. 102—502 **24 Claims**



1. A ballistically deployed restraining net system comprising:

- a projectile for being fired from a hand held launcher, said projectile including:
  - a packaged restraining net,
  - net deployment means for unfurling the net in flight,
  - means for triggering said net deployment means upon the occurrence of a preestablished criteria after the launch of said projectile from the hand held launcher,
  - a power source,
  - an open electrical circuit attached to said net and connected to said power source for disabling a target captured in said net, and
  - means for starting the operation of the power source after the net is unfurled.

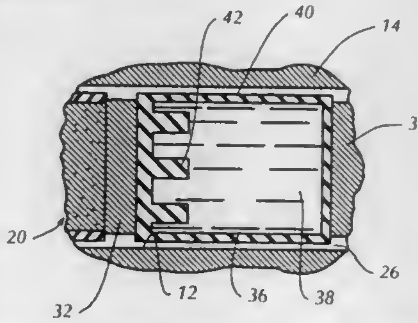
5,750,919
SELF-ADJUSTING OBTURATOR FOR PROJECTILE LAUNCHING

Robert E. Jehle, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 16, 1993, Ser. No. 18,125

Int. Cl.⁶ F42B *14/00*

U.S. Cl. 102—532 **5 Claims**



1. In combination with a launcher having a barrel bore through which a projectile is displaced propellant forces, obturator means disposed within the barrel bore for sealing gas passages between the barrel bore and the projectile during launch, said obturator means including interfacing means for transmitting the propellant forces to the projectile, a body of shock-absorbing fluid and flexible barrier means for isolating the body of shock-absorbing fluid within the barrel bore during gas sealing deformation into contact therewith in response to transfer of the propellant forces exerted on said interfacing means during said launch, said interfacing means comprising at least one relatively rigid pusher plate in abutment with the flexible barrier means, said flexible barrier means being made of a material that is non-porous with respect to the shock-absorbing fluid and said shock-absorbing fluid being a mixture of viscous liquid and gas.

5,750,920

GRANULATED, STABILIZED α-AND β-OCTOGEN

Klaus Redecker: Gunter Schreiner, both of Nuremberg, and Wolfgang Spranger, Furth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 294,899, Jan. 5, 1989, abandoned, which is a continuation of Ser. No. 50,158, Apr. 27, 1987, abandoned. This application Mar. 16, 1990, Ser. No. 496,056

Claims priority, application Germany, Apr. 26, 1986, 36 14 173.9

Int. Cl.⁶ C06B *45/22*

U.S. Cl. 149—11 **4 Claims**

1. Granulated fine-grain stable α-octogen exhibiting reduced impact sensitivity, which comprises crystals of α-octogen covered with a coating of thermoplastic polymer; said crystals of α-octogen containing less than 0.3% by weight of β-octogen.

5,750,921

WASTE-FREE METHOD OF MAKING MOLDING POWDER

May L. Chan, 1209 S. Norma, and Alan D. Turner, 919 Upjohn, both of Ridgecrest, Calif. 93555

Filed Jul. 7, 1997, Ser. No. 888,890

Int. Cl.⁶ C06B *21/00*

U.S. Cl. 149—19.92 **10 Claims**

1. A process for making high explosive molding (HE) powder comprising the steps of:

adding an inert oil to a receptacle surrounding a vessel which will contain the molding powder;

heating said inert oil;

dissolving a polymeric binder in an organic solvent to form a lacquer;

adding a high explosive (HE) to said inert oil (hereinafter, mixture 1) with continuous mixing during the addition;

increasing mixing speed to the highest possible shear agitation rate without spilling sample;

adding said lacquer to said mixture 1 (hereinafter, mixture 2) with continuous mixing during the addition;

purging said mixture 2 with nitrogen and continually stirring and heating said mixture 2 during and after the addition to accelerate the evaporation of the solvent; and

filtering and drying said mixture 2 to obtain HE molding powder.

5,750,922

AUTOIGNITION SYSTEM FOR AIRBAG INFLATOR

Donald Edwin Seeger, Lakeland, Fla., assignor to Breed Automotive Technology, Inc., Lakeland, Fla.

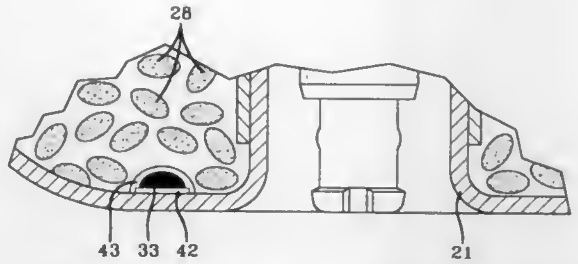
Filed Oct. 30, 1996, Ser. No. 739,582

Int. Cl.⁶ C06B *41/02;45/00*

U.S. Cl. 149—24 **17 Claims**

1. An autoignition system for use in an inflator of a vehicle occupant restraint system comprising:

(a) a globule of an autoignition composition adhering to the interior surface of said inflator, wherein said composition autoignites at about 190° C. to about 220° C.; and



(b) a coating over said globule that resists abrasion and absorption of water by the globule.

5,750,923

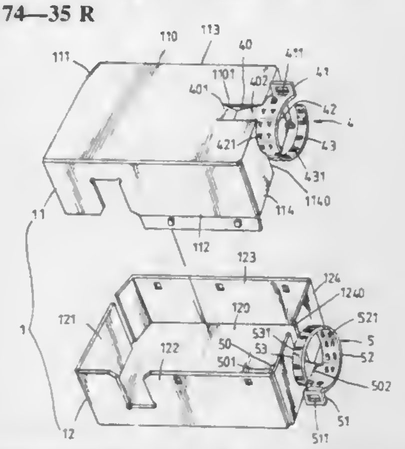
ELECTRIC SHIELDING METAL SHELL RECEPTACLE HAVING MOVABLE BINDING STRIPS

Peter Wu, Taipei, Taiwan, assignor to Hsing Chau Industrial Co., Ltd., Taipei, Taiwan

Filed Feb. 4, 1997, Ser. No. 792,756

Int. Cl.⁶ H05K *9/00*

U.S. Cl. 174—35 R **1 Claim**



1. An electric shielding metal shell comprising first and second symmetrical and rectangular-shaped metal half shells connected together to form a container for holding a receptacle and an electric wire covered with a braided earthed tube, said first half shell having a first wire hole and a first binding strip arranged around said first wire hole, said second half shell having a second wire hole and a second binding strip arranged around said second wire hole, said electric wire extending out of said container through said holes and held in place by said first and second binding strips,

said first and second metal half shells respectively having first and second punch holes adjacent said first and second wire holes, first and second projection strips are respectively arranged in said first and second punch holes and respectively extend from the bottom of said first and second metal half shells to said first and second binding strips, said first and second projection strips having a structure adapted for permitting movement of said first and second binding strips relative to said first and second metal half shells and for permitting said electric wire to be bent relative to said first and second metal half shells, said structure including each of said first and second projection strips having front and rear half sections joined together by a bent middle, said front half sections and said bent middles respectively located within said first and second punched holes and inside said first and second metal half shells, and said rear half sections respectively projecting out of said first and second punch holes,

said first and second binding strips each having a flat front end with a locating hole, an elongated tail with a series of retaining holes, and an arched middle portion arranged between said flat front end and said elongated tail; said arched middle portions each having a locating slot, a hook and a plurality of barbs on an inner side thereof,

wherein said first and second binding strips are fastened together by inserting said elongated tail of said first binding strip into said locating hole of said second binding strip and by inserting said tail of said second binding strip into said locating hole of said first binding strip, so that said hook of said first binding strip is received in one of said series of retaining holes of said second binding strip, said hook of said second binding strip is received in one of said series of retaining holes of said first binding strip, and said barbs of said first and second binding strips pierce said braided earthed tube.

5,750,924

ELECTRONICS AND INSTRUMENTATION ENCLOSURE

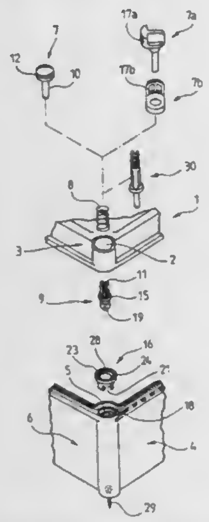
John-Erik Sonntag, Tammisaari, and Matti Ropponen, Espoo, both of Finland, assignors to Fibox Oy AB, Jorvas, Finland

Filed Sep. 26, 1995, Ser. No. 533,720

Claims priority, application Finland, Nov. 25, 1994, 945563

Int. Cl.⁶ H02G *3/08*

U.S. Cl. 174—50 **18 Claims**



1. An electronics and instrumentation enclosure for electronic, electric and instrument installations, the enclosure comprising:

a lower portion having a plurality of corner turrets each provided with a through opening;

a cover having a plurality of corner turrets each provided with a through opening;

a lock for locking the cover to the lower portion, said lock comprising upper locking means arranged in the through opening of one of the corner turrets of the cover and lower locking means arranged in the through opening of one of the corner turrets of the lower portion of the enclosure, said upper and lower locking means being in communication with each other to provide said lock, the upper locking means comprising a locking member having a projecting locking element and the lower locking means comprising a locking slot formed in one of the corner turrets of the lower portion, the locking element of the locking member being arranged between a locked position and an open position in such a way that, in the locked position, the locking element is locked in the locking slot, where the locking element is kept by a spring element for locking the cover to the lower portion, and in the open position, the locking element is removed from the locking slot, when the locking element is lifted apart from the lower locking means for releasing the cover from the lower portion; and

wherein the locking slot is formed in a locking ring mounted in one of the corner turrets of the lower portion of the enclosure and provided with a through opening.

5,750,925

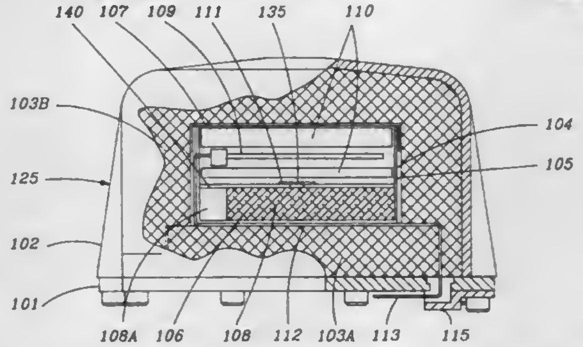
FLIGHT CRASH SURVIVABLE STORAGE UNIT WITH BOILER FOR FLIGHT RECORDER MEMORY

Gregory W. Purdom, Sarasota, Fla., assignor to Loral Fairchild Corp.

Filed Oct. 5, 1994, Ser. No. 317,687

Int. Cl.⁶ H05K *5/00*

U.S. Cl. 174—52.1 **55 Claims**



1. An enclosure for protecting at least one heat sensitive item from high temperature, shock and moisture, said enclosure comprising:

(a) an outer housing including an inner cavity for containing at least one heat sensitive item;

(b) a cover for said outer housing;

(c) a thermal insulator located within said inner cavity defining at least a portion of a second interior cavity, with said at least one heat sensitive item being located within said second inner cavity;

(d) a boiler located within said second interior cavity including at least one containment compartment for containing a thermal mass, at least one protective compartment within which said at least one heat sensitive item is located and means for interconnecting said at least one containment compartment and said at least one protective compartment, wherein said means for interconnecting, when open, provides a passageway between said at least one containment compartment and said at least one protective compartment; and

(e) at least one vent tube which exits said at least one protective compartment via at least one passageway formed in said thermal insulator, said at least one passageway extending to and thru the cover for said outer housing.

5,750,926

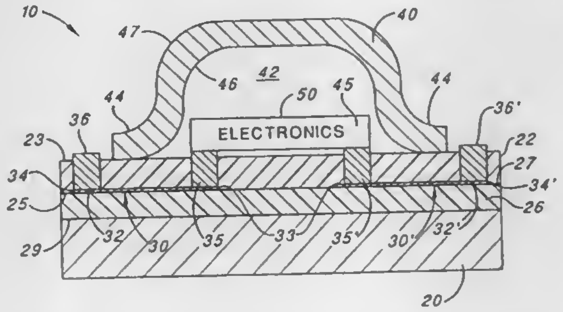
HERMETICALLY SEALED ELECTRICAL FEEDTHROUGH FOR USE WITH IMPLANTABLE ELECTRONIC DEVICES

Joseph H. Schulman, Santa Clarita, and Lyle Dean Canfield, Lake Hughes, both of Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Filed Aug. 16, 1995, Ser. No. 515,559

Int. Cl.⁶ H05K *5/06*

U.S. Cl. 174—52.3 **29 Claims**



1. An electrical feedthrough suitable for implantation within living tissue comprising:

a metal trace encapsulated within an insulating material so as to form a hermetic seal between the metal trace and the insulating material, the insulating material and metal trace being made from materials that are compatible with living tissue, and the hermetic seal being hermetic in a living tissue environment; and

first and second conductive vias that pass through the insulating material from an outer surface thereof to make electrical contact with the metal trace at respective spaced-apart locations along the metal trace, said first and second conductive vias including conductive material that is also compatible with living tissue.

5,750,927

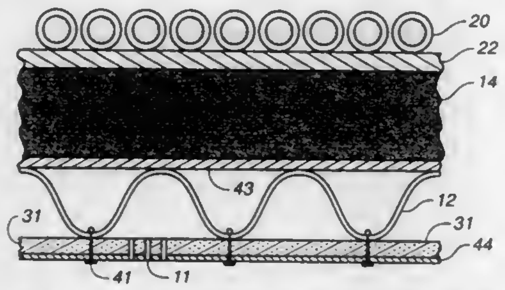
FIRE PROTECTION ARRANGEMENT FOR TEMPERATURE-SENSITIVE, HEAT-PRODUCING ARTICLE

Osni Baltazar, 1038 Liberty St., El Cerrito, Calif. 94530

Filed Aug. 12, 1994, Ser. No. 289,896

Int. Cl.^{6} H02G *3/04*

U.S. Cl. 174—68.3 **35 Claims**



1. A fire-protection arrangement having a temperature-sensitive, heat-producing article, comprising:

(a) an inner layer of an active endothermic material heat barrier for enclosing and contacting said temperature-sensitive, heat-producing article,

(b) a multi-layered, vented, flexible, low-temperature heat-dissipating, high-temperature heat-blocking fire shield enclosing said inner layer, said fire shield comprising:

- (1) a vented heat screen of sheet materials forming an external surface constituting a fire side of said heat screen and an opposite surface constituting an internal side of said heat screen,
- (2) a spacer producing a vented gap between said screen and said inner layer, said spacer comprising a three-dimensional lattice layer, said spacer being located between said heat screen and said inner layer at said internal side of said heat screen, and,
- (3) heat-conductive means for dissipating low-temperature internal heat through said gap and said heat screen to surroundings, said heat conductive means having a plurality of heat-conducting materials forming a heat conducting path for said internal heat between said inner layer and said external surface of said heat screen,
- (4) heat-convective means for dissipating low temperature internal heat through said gap and said heat screen to said surroundings, said heat-convective means comprising venting means for said heat screen for allowing air to circulate, by natural convection, from said surroundings to a surface of said inner layer, through said fire shield and back to said surroundings, and
- (5) heat-emissive means for dissipating low temperature internal heat to said surroundings, said heat emissive means comprising a heat-emissive material forming said external surface of said heat screen.

5,750,928

METHOD OF FABRICATION OF ELECTRICAL CABLE CONNECTOR, ELECTRICAL CABLE, AND HIGH-VOLTAGE TRANSFORMER EQUIPPED WITH SUCH CABLES

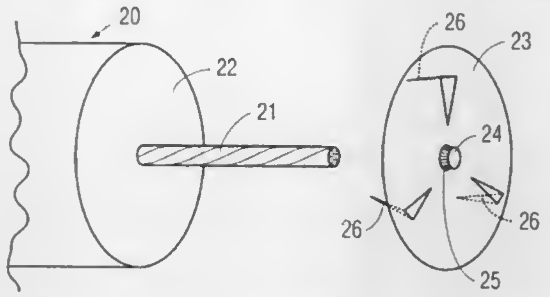
Bernard Escallier, 18b rue Majnoni d'Intignano, F-21121 Fontaine-les-Dijon, France

Filed Dec. 14, 1995, Ser. No. 572,327

Claims priority, application France, Jan. 5, 1995, 95 00070

Int. Cl.^{6} H01R *4/00;* **H01F** *15/10;27/04*

U.S. Cl. 174—84 R **9 Claims**



1. Method of fabrication of a connector on a flexible-core electrical cable comprising the following steps:

stripping one end of the cable by removing the protective plastic sheathing around the flexible core,

fitting on this stripped end of the cable a metal disk that is pressed against the sheathing of the cable, this disk having a diameter not exceeding that of the cable sheathing, and a central hole through which the flexible core of the cable passes,

depositing conducting solder on the flexible core to rigidify it and attach it to the metal disk.

5,750,929

TERMINAL ASSEMBLY FOR A CATV

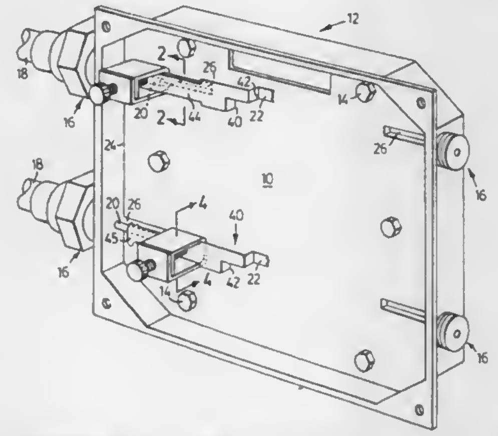
Robert L. Romerein; David B. Crowhurst, and Christopher A. Allinson, all of Lindsay, Canada, assignors to J. E. Thomas Specialties Limited, Lindsay, Canada

Filed Oct. 16, 1996, Ser. No. 731,483

Claims priority, application Canada, Oct. 18, 1995, 2160851

Int. Cl.^{6} H01R *7/14*

U.S. Cl. 174—88 C **3 Claims**



1. A terminal for electrical connection to a central pin of a coaxial cable comprising:

a blade extending to a blade free end,

a board of insulating material having said blade mounted thereon and spaced thereabove to admit the pin between said blade and said board,

said pin extending to a pin free end,

a slot extending to an edge of said board arranged to be generally aligned with and underlie said pin,

means for positioning said blade to overlie said pin in an overlap position and in a generally parallel relationship thereto with said blade and pin free ends oppositely directed,

a yoke defining an opening, said yoke being shaped to surround said blade and said pin in overlap position,

said yoke being moveable between an extended position where it surrounds said pin as well as said blade and a retracted position where it surrounds only said blade,

clamping means on said yoke operable to clamp said blade to said pin in said extended position,

wherein a lower part of said yoke is slidable in said slot,

wherein keying tabs on said yoke extend through said slot and include sub tabs which extend on each side of the keying tabs to underlie the board when said keying tabs extend through said slot.

5,750,930

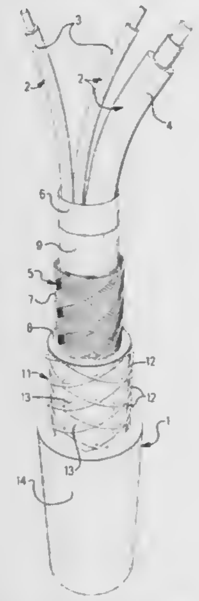
ELECTRICAL CABLE FOR USE IN A MEDICAL SURGERY ENVIRONMENT

Arthur Glen Buck, Sherwood; Doris Arlene Beck, Beaverton, and Sokha Chy, Tualtin, all of Oreg., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 701,366, Aug. 22, 1996, abandoned, which is a continuation of Ser. No. 362,396, Dec. 22, 1994, abandoned. This application Sep. 10, 1997, Ser. No. 926,912

Int. Cl.^{6} H01B *7/04;7/18*

U.S. Cl. 174—102 R **5 Claims**



1. An electrical cable comprising: multiple elongated electrical conductors being linked between a patient monitoring transducer and a medical instrument, said conductors being in a core of the cable, a hollow conducting electrical shield encircling the conductors, a flexible and limp sealant sheath encircling the shield and sealing the core against infectious contaminants, a flexible and limp armor enclosing the sheath in the form of an open braid of wire strands, and a flexible and limp sealant coating covering the armor and entering interstices between the wire strands to bond to the sealant sheath, the armor isolating the sealant sheath from a cut in the cable caused by a sharp surgical tool so that the sealant sheath remains capable of sterilization in an autoclave, and the cable having flexibility and limpness and being linked between said patient monitoring transducer and said medical instrument.

5,750,931

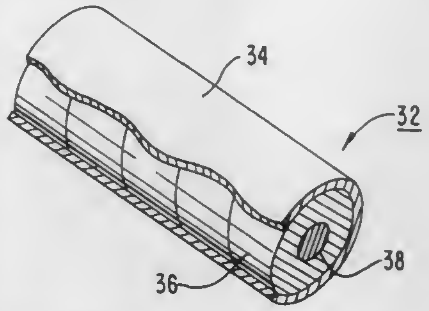
ELECTRICAL CABLE WITH IMPROVED INSULATION AND PROCESS FOR MAKING SAME

Gordon L. McGregor, Landenberg, Pa.; Raymond B. Minor, Elkton, Md.; William Hardie, Landenberg, Pa., and Michael Kennedy, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 166,118, Dec. 13, 1993, Pat. No. 5,468,314, which is a continuation-in-part of Ser. No. 23,642, Feb. 26, 1993, Pat. No. 5,429,869. This application Jun. 1, 1995, Ser. No. 457,439

Int. Cl.^{6} H01B *7/00*

U.S. Cl. 174—110 PM **13 Claims**



1. An energy conductive cable which comprises

a conductor;

a layer of expanded insulation surrounding the conductor, the layer of insulation comprising a composite of polymer expanded to form a lattice of nodes interconnected by fibrils, and expanded expandable microspheres intermixed within the nodes and fibrils;

a sheath surrounding the insulation, the sheath being less elastic than the insulation layer;

wherein the insulation layer comprises an expanded layer with a snug fit between the sheath and the conductor.

5,750,932

MULTI-CORE CABLE FOR ELECTRICALLY COMMUNICATING A HAND HELD POWER NUTRUNNER WITH A POWER SUPPLY AND CONTROL UNIT

Gunnar Christer Hansson, Stockholm, Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden

PCT No. PCT/SE93/00944, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO94/11887, PCT Pub. Date May 26, 1995

PCT Filed Nov. 9, 1993, Ser. No. 433,477

Claims priority, application Sweden, Nov. 9, 1992, 9203340

Int. Cl.^{6} H01B *7/00*

U.S. Cl. 174—113 R **13 Claims**

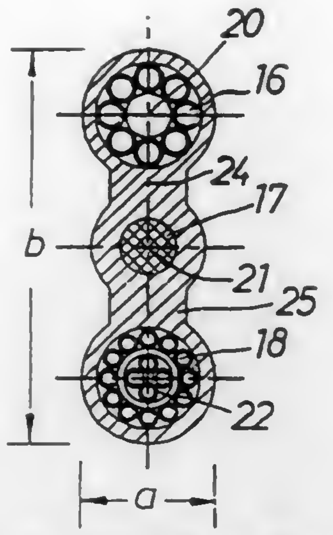
1. A multi-core flat type cable (**15**) for communicating electric power and electric signals between a hand held power tool (**10**) and a power supply and control unit (**14**), said multi-core flat type cable (**15**) comprising at least three parallel longitudinally extending sections (**16–18**) each having a geometric center (**20–22**), wherein:

said longitudinally extending sections (**16–18**) are arranged such that in any cross section of said multi-core flat type cable (**15**) said geometric centers (**20–22**) are disposed on a straight line (**24**),

a first one (**16**) of said longitudinally extending sections (**16–18**) contains a plurality of signal communicating cores only,

a second one (**18**) of said longitudinally extending sections (**16–18**) contains a plurality of power supply cores only,

a third one (**17**) of said longitudinally extending sections (**16–18**) is formed without any conductors and is located between said first one (**16**) and said second one (**18**) of said longitudinally extending sections (**16–18**), said third one (**17**) of said longitudinally extending sections (**16–18**) thereby forming a spacing member for physically separating said



plurality of signal communicating cores from said plurality of power supply cores by a predetermined distance,

said multi-core flat type cable (**15**) comprises a first longitudinally extending portion (A) extending from the power tool (**10**), said first longitudinally extending portion (A) being preformed in a longitudinally twisted shape to form a flex zone for providing a universal easy bending of said multi-core flat type cable (**15**), and

said longitudinally twisted shape comprises a twisting of at least 180°.

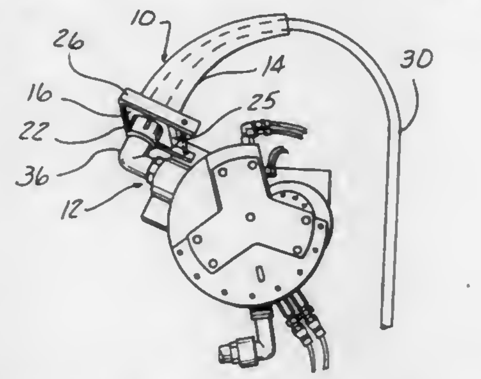
5,750,933
WELD CABLE END

Charles P. Brady, Roseville, Mich., assignor to Progressive Tool & Industries Company, Southfield, Mich.

Filed Sep. 10, 1996, Ser. No. 711,605

Int. Cl.⁶ H01R *4/00*

U.S. Cl. 174—135 **8 Claims**



1. A cable support grip for receiving at least one cable end which connects to a junction box, said cable support grip having a first end for placement spaced from the junction box and a second end for placement proximate to the junction box, said cable support grip comprising:

a generally cone shaped body;

a base portion attached and integral to the cone shaped body, said cone shaped body and said base portion having a through aperture having a constant diameter throughout a full length of said cone shaped body for receiving said at least one cable end; and attachment means at the second end for attaching said cable support grip to said junction box, wherein said attachment means includes a rotatable member and a stationary member.

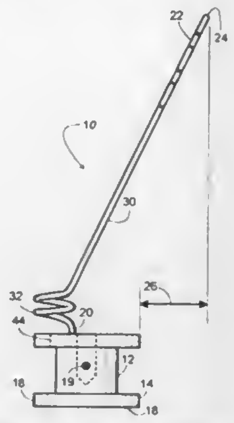
5,750,934
COMPUTER MOUSE HOOK

Zoran R. Kuljis, 8 Farmview La., Granby, Conn. 06035

Filed Mar. 6, 1997, Ser. No. 811,767

Int. Cl.⁶ H01B *7/00*

U.S. Cl. 174—135 **12 Claims**



1. A computer mouse system, comprising:

a computer;

a computer mouse;

a mouse cable connecting said computer to said computer mouse;

a spool having a weight and a center of gravity;

a mast attached to said spool and extending a length from said spool, with said mouse cable extending along said length, said mouse cable having a portion coiled a plurality of turns about a vertical line passing through said center of gravity, said mast having a lower end and an upper end with said lower end being attached to said spool and said upper end overhanging laterally beyond said spool toward said computer mouse; and

a gripper having a serpentine wire through which said mouse cable is woven, said gripper being integrally disposed on said upper end of said mast, said gripper inhibiting said mouse cable from pulling through said gripper in a direction lengthwise along said mouse cable.

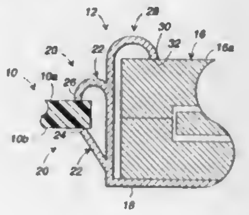
5,750,935
MOUNTING DEVICE FOR ATTACHING A COMPONENT THROUGH AN APERTURE IN A CIRCUIT BOARD

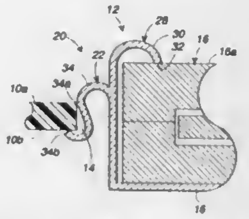
David L. Stevens, Mesquite, Tex., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 16, 1996, Ser. No. 648,549

Int. Cl.⁶ H01B *17/00*

U.S. Cl. 174—138 G **20 Claims**





1. For use with a circuit board having an aperture for receiving an electrical component therethrough, an electrical component assembling device, comprising:

a body member configured to receive said electrical component and at least partially extend through said aperture, said body member having a base and a side wall extending from said base;

a first clip coupled to said body member and extending from said side wall, said first clip including a first pressure bearing member configured to exert a force against said circuit board to thereby secure said body member to said circuit board; and

a second clip coupled to said body member and extending from said side wall, said second clip including a second pressure bearing member configured to exert a force in a direction of said base against said electrical component to thereby secure said electrical component to said body member.

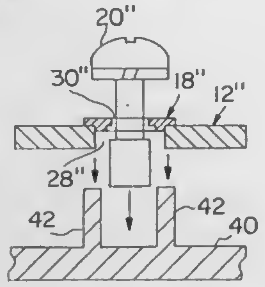
5,750,936
PRINTED WIRING BOARD HARDWARE CAPTIVATION METHOD

William E. Wheatley, Rochester, and Robert James Wilson, Jr., Macedon, both of N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 29, 1996, Ser. No. 739,221

Int. Cl.⁶ F16B *13/06*

U.S. Cl. 174—138 G **14 Claims**



1. Hardware for mounting a printed wiring board (PWB) on a holder, said hardware comprising:

a washer having a first annular surface with a first external diameter, a second annular surface with a second external diameter larger than said first external diameter, an annular shoulder on an exterior side of said washer that extends between said first and second external diameters for attaching said washer to a PWB, and a resilient flange on an interior annular surface of said washer; and

a mounting device for insertion through the interior annular surface of said washer, said mounting device having a first end with an external diameter larger than a diameter of the interior annular surface of said washer and a second end with an external diameter smaller than the diameter of the interior annular surface of said washer and larger than an internal diameter of said flange,

whereby said mounting device is held by said washer between said first and second ends of said mounting device when said second end is forcibly inserted through the interior annular surface of said washer.

5,750,937
MULTI-LOAD CELL FORCE SENSING APPARATUS

Thomas H. Johnson, Winnebago; Gene L. Justice, and Michael W. Lundgreen, both of Fairmont, all of Minn., assignors to Weigh-Tronix, Inc., Fairmont, Minn.

Filed Mar. 7, 1996, Ser. No. 612,143

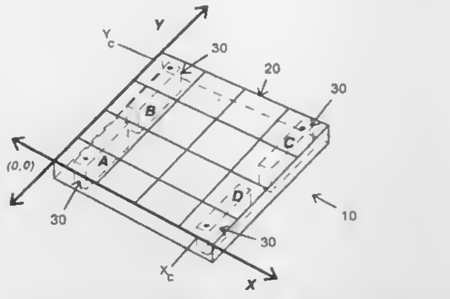
Int. Cl.⁶ G01G *19/22;* **G06F** *3/00*

U.S. Cl. 177—25.11 **34 Claims**

28. A method of operating a multi-load cell scale having a platter supported by a plurality of load cells, the method comprising the steps of:

(a) sensing the weight of an object placed on the platter;

(b) determining the position of a user impulse applied to the platter; and



(c) performing a predetermined function in response to a user impulse received in a predetermined area of the platter.

5,750,938
METHOD OF WEIGHING DRUGS AND RELATIVE DRUG METERING MACHINE

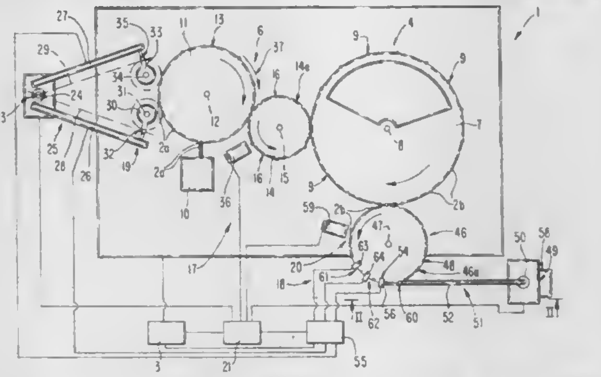
Sandro De Caris, Pianoro, and Angelo Ansaloni, Crespellano, both of Italy, assignors to MG2 S.p.A., Italy

Filed Oct. 21, 1994, Ser. No. 326,929

Claims priority, application Italy, Oct. 22, 1993, B093 A 000418

Int. Cl.⁶ G01G *19/52;* **G01D** *18/00;* **B07C** *5/344*

U.S. Cl. 177—50 **16 Claims**



1. A method of weighing capsules fed successively along a path to at least two sensors which, for each capsule, emits signals correlated to the weight of the capsule, the method comprising a first step for determining the weight of a number of capsules and drug metered therein by means of said at least two sensors; and a second step performed by a control device for controlling said at least two sensors and for calibrating said at least two sensors as a function of the weights of said capsules as determined by a weighing means other than the at least two sensors.

5,750,939
DATA PROCESSING SYSTEM COMPRISING A GRAPHIC TABLET AND A STYLUS, AND STYLUS FOR USE IN SUCH A SYSTEM

Kofi A.A. Makinwa, and Paul Mateman, both of Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Dec. 6, 1995, Ser. No. 568,086

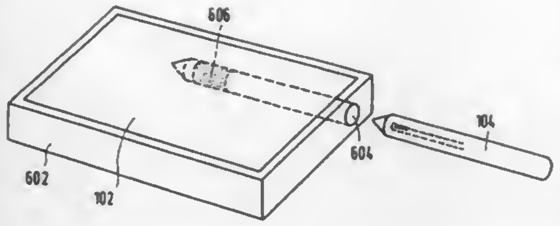
Claims priority, application European Pat. Off., Dec. 7, 1994, 94203558

Int. Cl.⁶ G08C *21/00;* **G09G** *3/02*

U.S. Cl. 178—18 **20 Claims**

1. A data processing system, comprising a graphic tablet and a stylus, the stylus including a transmitter for transmitting an electromagnetic field to be received by the tablet and a power supply for powering the stylus, characterized in that:

the stylus comprises a detector for detecting a value of an operating characteristic of the transmitter and a switch coupled to said detector and said power supply for switching



the stylus to a standby mode in dependence on said value in order to limit the power supplied by the power supply, and

the system comprises a specially proportioned influencing means externally of the stylus for modifying the electromagnetic field in a direct vicinity of the stylus and modifying the value of said operating characteristic of the transmitter to operate said switch.

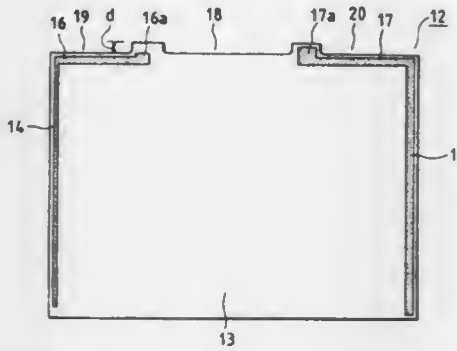
5,750,940
COORDINATE INPUT TABLET WITH NOTCHED FILM SUBSTRATE
Takayuki Ito; Hideto Sasagawa, and Takeshi Watanabe, all of Fukushima-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 744,963

Claims priority, application Japan, Nov. 17, 1995, 7-299913

Int. Cl.^{6} G08C *21/00;* **G09G** *3/02*

U.S. Cl. 178—18 **4 Claims**



1. A tablet comprising:

a film substrate generally rectangular in shape provided on all of one side thereof with a transparent resistor, a pair of electrodes along two parallel sides of said film substrate, said pair of electrodes coming in contact with said transparent resistor, and conductive patterns led from each of said pair of electrodes to the vicinity of another side of said film substrate, said conductive patterns ending in transfer forming sections; and

a glass substrate rectangular in shape provided on one side thereof with a resistor and a pair of electrodes, said film substrate being stacked on said glass substrate, such that the transparent resistor of the film substrate and the resistor of the glass substrate are opposed to each other, the electrodes of both the substrates are arranged orthogonal to each other, and a connection land group provided on the edge of the one side of said glass substrate is connected with a connector,

wherein said film substrate is provided on the edge of the one side to said conductive patterns with a first notch for inserting said connector and second notches located on both sides of said first notch and having a depth generally the same as that of said first notch.

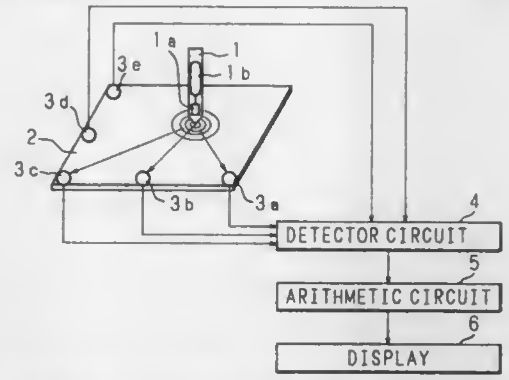
5,750,941
ULTRASONIC COORDINATES INPUT DEVICE
Hiroshi Ishikawa; Nobuyasu Yamaguchi; Yasuhide Iwamoto, and Atsuo Iida, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 29, 1995, Ser. No. 520,669

Claims priority, application Japan, Dec. 15, 1994, 6-312100

Int. Cl.^{6} G08C *21/00*

U.S. Cl. 178—19 **25 Claims**



1. An ultrasonic coordinates input device comprising:

a propagator for allowing ultrasonic wave to propagate therethrough;

input means for inputting ultrasonic waves to the propagator;

a plurality of groups of receivers each receiving the ultrasonic waves propagated through the propagator; and

arithmetic means for calculating the coordinates of the ultrasonic wave inputted positions on the propagator on the basis of the signals received at the receivers in the respective groups;

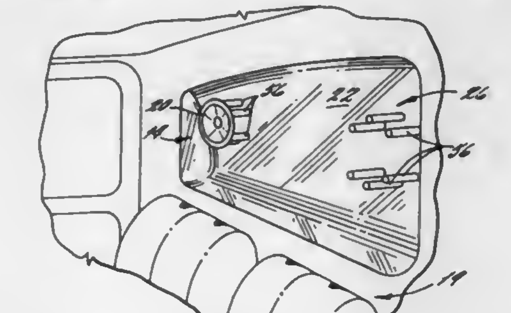
wherein each group of receivers includes at least three receivers which are substantially aligned.

5,750,942
VEHICLE WINDOW SPEAKER MOUNTING ACCESSORY AND RELATED METHODS
Kenneth E. Flick, 5236 Presley Pl., Douglasville, Ga. 30135

Filed Jul. 9, 1996, Ser. No. 677,240

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 181—141 **28 Claims**



1. A window accessory for mounting one or more audio speakers within a rear window space of a vehicle, the window accessory comprising:

an interior panel for installation within the rear window space of the vehicle, the interior panel having one or more speaker openings for admitting sound therethrough;

an exterior panel for installation within the rear window space and for defining an acoustic chamber with the interior panel, the exterior panel having a front surface opposing the interior panel; and

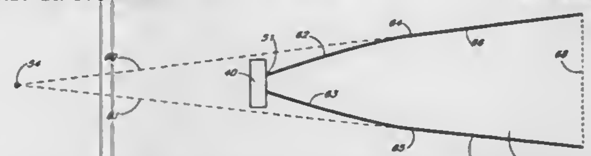
audio speaker mounting means carried by the exterior panel and extending from the front surface of the exterior panel toward the interior panel for mounting one or more audio speakers to be positioned adjacent respective speaker openings in the interior panel.

5,750,943
SPEAKER ARRAY WITH IMPROVED PHASE CHARACTERISTICS
Ralph D. Heinz, Corona, Calif., assignor to Renkus-Heinz, Inc., Irvine, Calif.

Filed Oct. 2, 1996, Ser. No. 720,623

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 181—152 **6 Claims**



1. A loudspeaker for uniformly transmitting sound waves over a wide area in both the vertical and horizontal directions, comprising:

an acoustic source; and

a loudspeaker horn having a proximal portion and a distal portion, the proximal portion defining a proximal end connected to the acoustic source, the proximal portion comprising opposing first and second proximal walls, and opposing third and forth proximal walls, the proximal walls extending curvilinearly from the proximal end of the loudspeaker horn to said distal portion, the distal portion defining a distal end of the horn and comprising opposing first and second distal walls, and opposing third and forth distal walls, the distal walls extending along substantially straight lines from the corresponding first, second, third, and forth proximal walls, and an axis passing through said source and said horn, whereby sound waves emanate from the acoustic source into the proximal end of the loudspeaker horn and out the distal end of the loudspeaker horn, the sound waves having as their perceived source an apparent point of origin behind the acoustic source and lying along said axis.

5,750,944
FOIL SOUND ABSORBERS
Helmut Fuchs, Weil, Germany, assignor to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V., Munich, Germany

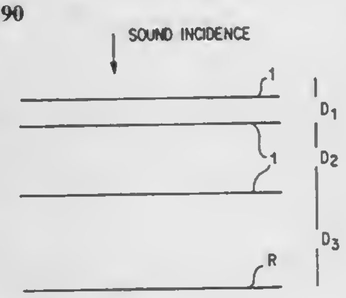
PCT No. PCT/DE95/00341, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO95/25325, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 13, 1995, Ser. No. 704,715

Claims priority, application Germany, Mar. 15, 1994, 44 08 782.9

Int. Cl.^{6} E04B *1/82*

U.S. Cl. 181—290 **10 Claims**



1. A foil sound absorber, comprising:

a reverberant rear wall; and

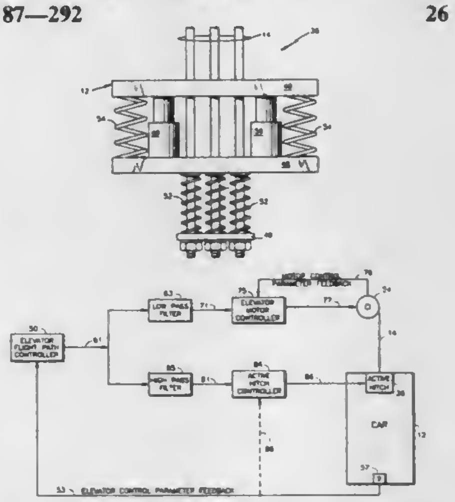
at least two smooth, planar air impermeable foils having respective surface weights m" of approximately 0.05–1 kg/m^2, said foils being disposed in series with said rear wall at a varying distance D from each other as well as a varying distance from said reverberant rear wall R, said varying distance D between said at least two foils being approximately 5–100 mm.

5,750,945
ACTIVE ELEVATOR HITCH
James W. Fuller, and Randall K. Roberts, both of Amston, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jun. 3, 1996, Ser. No. 659,065

Int. Cl.^{6} B66B *1/34;7/08*

U.S. Cl. 187—292 **26 Claims**


36
14
12
34
32
40
LOW PASS FILTER
HIGH PASS FILTER
ELEVATOR MOTOR CONTROLLER
ACTIVE HITCH CONTROLLER
ELEVATOR FLIGHT PATH CONTROLLER
ACTIVE HITCH
CAR
ELEVATOR CONTROL PARAMETER FEEDBACK

1. A system for active damping of oscillations during vertical motion of an elevator car position along an elevator flight path, the elevator car being connected by a rope to a sheave mounted to an elevator motor, the system comprising:

means for providing a dictated flight path signal indicative of a desired vertical motion of the elevator car along the elevator flight path;

motion command means responsive to said dictated flight path signal for providing a motion command signal;

a high pass filter responsive to said motion command signal for providing a force command signal indicative of the high frequency portion of said motion command signal; and

force actuator means responsive to said force command signal, said force actuator means having a variable extension which is controlled by said force command signal for varying the vertical position of the elevator car along the elevator flight path by said variable extension.

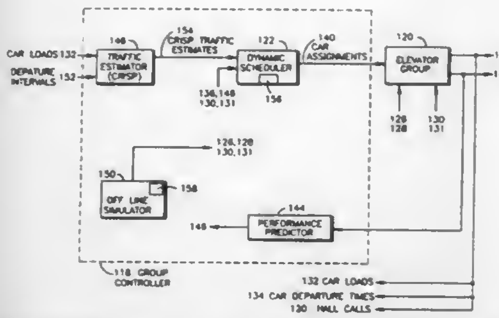
5,750,946
ESTIMATION OF LOBBY TRAFFIC AND TRAFFIC RATE USING FUZZY LOGIC TO CONTROL ELEVATOR DISPATCHING FOR SINGLE SOURCE TRAFFIC
Kandasamy Thangavelu, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Nov. 30, 1995, Ser. No. 564,527

Int. Cl.^{6} B66B *1/18;1/34*

U.S. Cl. 187—392 **20 Claims**

1. A system for controlling elevator cars in a building having a plurality of floors, said system comprising a group controller for controlling operation of the elevator cars during single source traffic conditions, said group controller providing crisp estimates of lobby traffic and traffic rate in response to car loads of elevator cars leaving a lobby and a departure interval between successive cars leaving the lobby, wherein said group controller selects a value for a control parameter of said system in response to the crisp estimates of lobby traffic and traffic rate from a look-up table generated from simulation results using collected traffic data and



selected values of control parameters corresponding to said crisp estimates of lobby traffic and traffic rate.

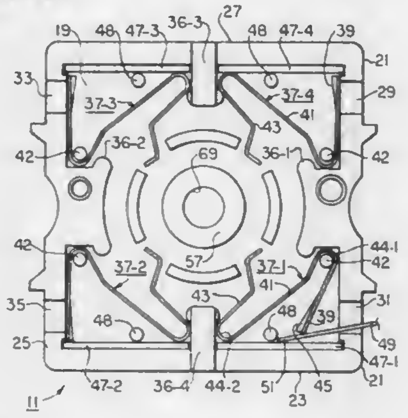
5,750,947
ROTARY ELECTRIC SWITCH WITH CONDUCTIVE PLATES

Chepur P. Rao, North Kingstown, and Bryan A. Thurston, Johnston, both of R.I., assignors to Tower Manufacturing Corporation, Providence, R.I.

Filed Dec. 27, 1995, Ser. No. 579,560

Int. Cl.⁶ H01H *19/00;* **H01R** *4/24*

U.S. Cl. 200—6 R **9 Claims**



1. A rotary electric switch comprising:

a. a hollow housing, said hollow housing having a recessed base and a cover, said base having a plurality of wire receiving openings;

b. a plurality of stationary contacts seated on the base, each stationary contact being generally Z-shaped and comprising a locking tongue at one end, an intermediate arm, and a spring finger at the opposite end from the locking tongue, each stationary contact being positioned in said base with its locking tongue overlying a wire receiving opening in said housing;

c. a rotatable contactor mounted in the base between the spring fingers of said fixed contacts; and

d. a plurality of conductive plates seated in said base, one conductive plate associated with each stationary contact and contacting said fixed contact at a location on said intermediate arm;

e. wherein a wire may be inserted through a wire receiving opening in the base and will contact its associated fixed contact at its locking tongue and will also contact its associated conductive plate.

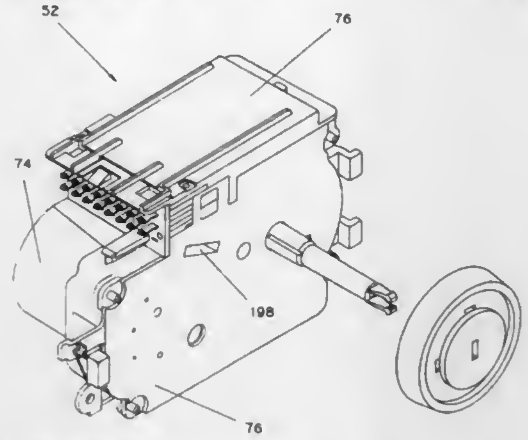
5,750,948
CAM-OPERATED TIMER

Daniel Keith Amonett, Indianapolis; Robert Francis Weaver, Brownsburg, and Henry Earl Burgin, Indianapolis, all of Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 28, 1996, Ser. No. 654,160

Int. Cl.⁶ H01H *7/08*

U.S. Cl. 200—38 R **11 Claims**



1. A cam-operated timer, comprising:

(a) a housing having a base with a base platform, a first open side, a second open side, and base details carried on the base platform pointing toward the first open side to accept timer components;

(b) the timer components installed in the housing base on an axis substantially perpendicular to the base platform that comprise:
  (1) a camstack drive received by the base details,
  (2) a motor connected to the camstack drive through a gear train received by the base details, and
  (3) a camstack having at least three program blades carried on a shaft, driven for rotation by the camstack drive, received by the base details;

(c) a first side cover received by the base on an axis substantially perpendicular to the base platform having first side cover details pointing toward the base details to accept timer components and enclose the first open side; and,

(d) a second side cover containing blade switches received by the base on an axis substantially parallel to the base platform to place the blade switches in working relationship to the camstack and enclose the second open side.

5,750,949
METAL-ENCAPSULATED, GAS-INSULATED HIGH-VOLTAGE CIRCUIT-BREAKER

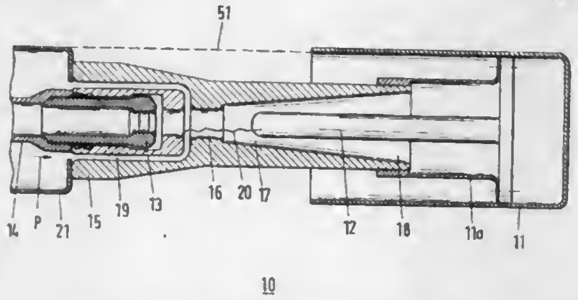
Volker Rees, Darmstadt; Martin Schumacher, Rodenbach, and Horst Plettner, Hanau, all of Germany, assignors to ABB Patent GmbH, Mannheim, Germany

Filed Sep. 13, 1996, Ser. No. 712,105

Claims priority, application Germany, Sep. 13, 1995, 195 33 794.8

Int. Cl.⁶ H01H *33/88*

U.S. Cl. 218—43 **18 Claims**



1. A metal-encapsulated, gas-insulated high-voltage circuit-breaker, comprising:

a fixed contact housing;

a fixed contact configuration in said fixed contact housing;

an other contact housing;

a moving contact piece configuration in said other contact housing;

a drive for driving said moving contact piece configuration; and

a device for producing a gas flow including a dielectric nozzle in which an arc burns and is blown, said dielectric nozzle being sealingly guided in said fixed contact housing throughout an entire switching operation;

said fixed contact housing with said fixed contact piece configuration and said other contact housing with said moving contact configuration being moved away from one another during or after completion of a disconnection operation, for releasing said dielectric nozzle from guidance and achieving an isolating path between said fixed contact housing and said other contact housing along with said dielectric nozzle to produce a disconnecter function; and

another drive for driving said fixed contact housing counter to the disconnection direction of said moving contact piece configuration and for driving said other contact housing in the disconnection direction of said moving contact piece configuration.

5,750,950
HYDRAULIC DRIVE DEVICE FOR CIRCUIT BREAKER AND CIRCUIT BREAKER USING THE SAME

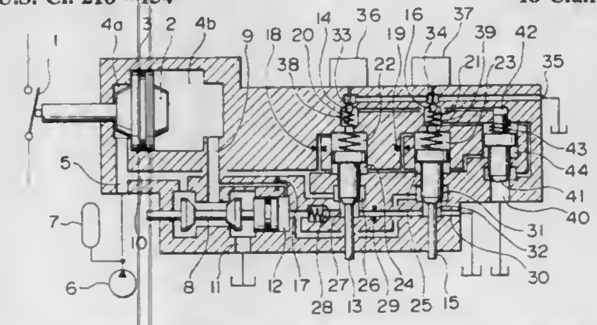
Tadahiko Nogami, Mito; Goro Daimon, Hitachi; Yasuhide Takeda, Hitachi; Hideo Kawamoto, Hitachi; Kouichi Sadou, Hitachi; Hiroshi Maeda, Hitachi, and Hiroyoshi Sadamura, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1996, Ser. No. 713,117

Claims priority, application Japan, Sep. 20, 1995, 7-241247

Int. Cl.⁶ H01H *33/02;33/34;33/68*

U.S. Cl. 218—154 **18 Claims**



1. A hydraulic drive device for a circuit breaker, comprising a hydraulic cylinder for opening and closing a contact, a hydraulic power source for pressurizing and feeding working fluid, control valves for controlling the flow of the working fluid fed from the fluid supply source so as to drive said hydraulic cylinder, characterized in that said control valves include at least one circuit closing system valve for causing the contact to fall into a circuit closing condition, and at least one circuit opening system valve for causing the contact to fall into a circuit opening condition, and means for holding the circuit opening condition of said at least one circuit opening system valve so as to disable the circuit closing operation for said at least one circuit closing system valve after the circuit opening operation in such a case that said at least one circuit opening system valve executes circuit opening operation when said at least one circuit closing system valve is in a circuit closing operation.

5,750,951
POWER SUPPLY SYSTEM FOR AN ELECTRIC DISCHARGE MACHINE

Yuji Kaneko, Yokohama; Tadao Ueda, Sakai; Yoshihiro Watanabe, and Tatsuo Toyonaga, both of Yokohama, all of Japan, assignors to Sodick Co., Ltd., Japan

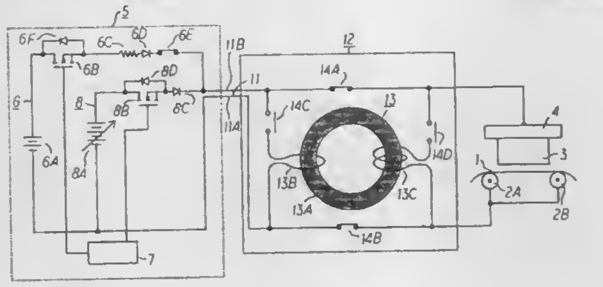
PCT No. PCT/JP95/00232, § 371 Date Aug. 4, 1995, § 102(e) Date Aug. 4, 1995, PCT Pub. No. WO95/22426, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 17, 1995, Ser. No. 495,627

Claims priority, application Japan, Feb. 18, 1994, 6-59777

Int. Cl.⁶ B23H *1/02;7/04*

U.S. Cl. 219—69.18 **19 Claims**



15. A method of electric discharge machining a workpiece positioned across a machining gap from an electrode generating a direct current;

generating a direct current;

generating a control signal having a controllable ON time and OFF time;

using said control signal to generate a direct current pulse train having a first period from said direct current;

converting said direct current pulse train into an alternating current pulse train having multiple pulses in said period;

selectively applying either said alternating current pulse train or said direct current pulse train to said machining gap.

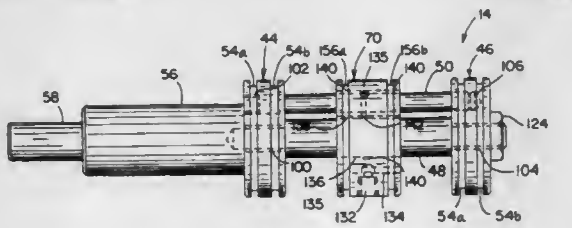
5,750,952
WELDING GUN WITH ANTI-ROTATION CYLINDER AND INTERNAL PROXIMITY SWITCH

Bruce R. Johnson, Muskegon, Mich., assignor to Weld Technology Industries, L.L.C., Muskegon, Mich.

Continuation-in-part of Ser. No. 568,736, Dec. 5, 1995. This application Feb. 14, 1996, Ser. No. 601,228

Int. Cl.⁶ B23K *11/11;11/36;* **F15B** *15/14*

U.S. Cl. 219—89 **17 Claims**



1. A welding gun comprising:

a cylinder defining an internal bore having an axis;

a partition rigidly secured within said internal bore of said cylinder, said partition defining a piston rod guide hole aligned with said axis and an anti-rotation rod guide hole offset from said axis;

a piston assembly reciprocable within said internal bore of said cylinder, said piston assembly including a piston rod extending through said piston rod guide hole, said piston assembly further including first and second pistons secured to said piston rod on opposite sides of said partition, said pistons entirely contained within said internal bore;

a welding tip carried by said piston assembly; and

an anti-rotation rod secured to and extending between said pistons through said anti-rotation guide hole, said anti-rotation rod entirely contained within said internal bore and adapted to reciprocate along with said piston assembly.

5,750,953
MOTOR-DRIVEN X-TYPE RESISTANCE SPOT WELDING GUN

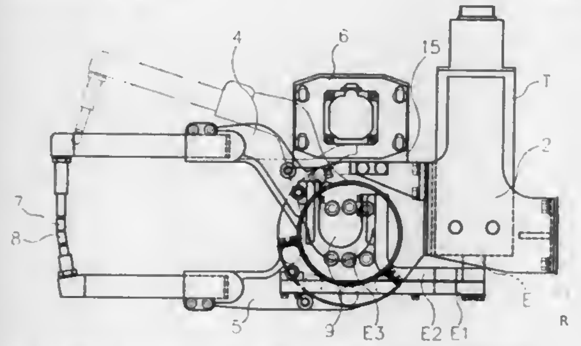
Yoshio Sato, and Keiji Kameta, both of Kanagawa, Japan, assignors to Dengensha Manufacturing Company Limited, Kanagawa, Japan

Filed Aug. 23, 1996, Ser. No. 701,953

Claims priority, application Japan, Aug. 25, 1995, 7-240858

Int. Cl.^{6} B23K *11/00*

U.S. Cl. 219—90 **7 Claims**



1. A motor-driven X-type spot welding gun, comprising:

a first driving unit including:
- a first reduction gear rotatably coupling two gun arms around a center of an output shaft of said first reduction gear;
- a motor to generate a torque for electrode force, said first reduction gear transmitting the torque to electrodes of said gun arms; and
- a common base on which said motor is mounted, said common base being removably set to a casing or the output shaft of said first reduction gear.

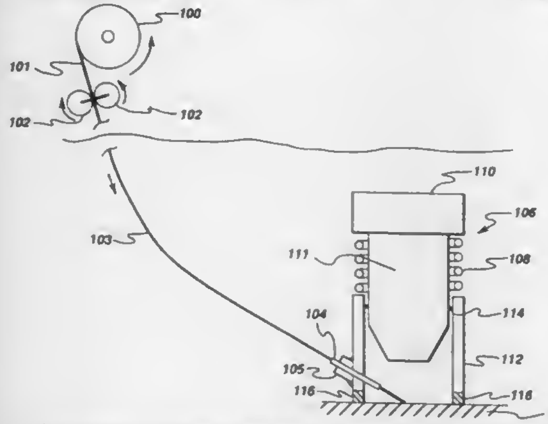
5,750,954
WATER EXCLUSION DEVICE FOR UNDERWATER WELDING

Raymond Alan White, Schenectady, and Harvey Donald Solomon, Niskayuna, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1996, Ser. No. 724,592

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.45 **11 Claims**



1. Underwater welding apparatus comprising a welding torch having a nozzle adapted to deliver heat to a workpiece to form a weld pool, said nozzle having a water exclusion device mounted on the nozzle, the water exclusion device comprising a lower end and a gas permeable skirt on the lower end in contact with the workpiece, at least one spring for biasing the water exclusion device toward the workpiece, and means for providing gas under pressure to the water exclusion device from the nozzle of the torch.

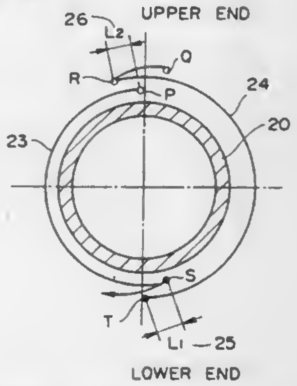
5,750,955
HIGH EFFICIENCY, VARIABLE POSITION PLASMA WELDING PROCESS

Fumito Yoshino, Fujisawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 266,660, Jun. 28, 1994, Pat. No. 5,599,469. This application Oct. 25, 1996, Ser. No. 738,071

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.46 **10 Claims**



1. A plasma welding process for an initial layer welding in a circumferential direction for stationary pipes mating in alignment in a horizontal or a tilted orientation through a process, in which a voltage is applied between an electrode and an object for welding by injecting a plasma gas to generate a plasma, and welding is performed by using the plasma as a heat source, wherein said tilted orientation is any angle greater than horizontal and less than vertical, comprising the steps of:
- performing welding either on an internal surface of a lower half of said stationary pipes or on the internal surface of the lower half as well as a small portion of an internal surface of an upper half of said stationary pipes; and
- performing welding either on the external surface of the upper half of said stationary pipes or on the external surface of the upper half of said stationary pipes as well as a small portion of the external surface of the lower half of said stationary pipes.

5,750,956
METHODS OF MANUFACTURING PERFORATED FOILS

Clive Barnes, Oxford, and Trevor John Crichton, Chesham, both of Great Britain, assignors to Braun Aktiengesellschaft, Kronberg, Germany

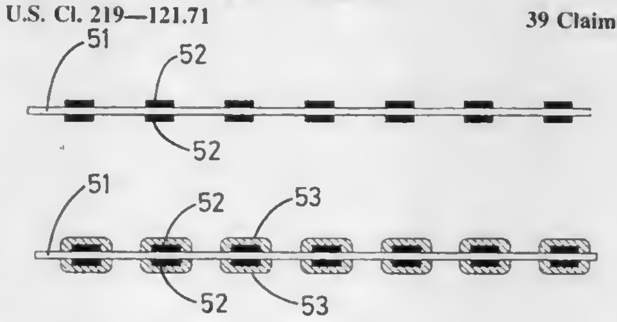
PCT No. PCT/EP93/00772, § 371 Date Jan. 10, 1995, § 102(e) Date Jan. 10, 1995, PCT Pub. No. WO93/19887, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 30, 1993, Ser. No. 307,815

Claims priority, application United Kingdom, Mar. 31, 1992, 9207054

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.71 **39 Claims**



1. A method of manufacturing a perforated foil comprising the steps of:
- providing an electrically conductive film supported on a substrate, using a laser to create a pattern of holes in said film by removing material from said film but not from said substrate in a process that includes photochemical ablation; and
- thickening said patterned film.

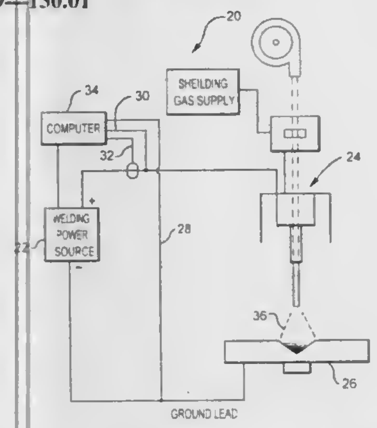
5,750,957
METHOD FOR ARC WELDING FAULT DETECTION

Alan L. Kilty, Peoria; Howard W. Ludewig, Groveland, and Brian L. Wallace, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 263,328, Jun. 21, 1994, Pat. No. 5,521,354. This application May 24, 1996, Ser. No. 653,041

Int. Cl.^{6} B23K *9/095*

U.S. Cl. 219—130.01 **18 Claims**



1. A method for determining in real time the quality of a weld during a weld process, the weld process including a power source, a weld electrode and a base plate defining an electrical circuit, the method comprising the steps of:
- sampling an electrical signal from the electrical circuit;
- determining the standard deviation of the electrical signal for a predetermined time period;
- comparing the standard deviation of the electrical signal to a first predetermined limit and assigning a first value to an array variable if the first predetermined limit exceeds the standard deviation of the electrical signal and assigning a second value to the array variable if the standard deviation of the electrical signal exceeds the first predetermined limit;
- updating an array with the array variable;
- summing values in the array so as to obtain a quality parameter; and
- comparing the quality parameter with a second predetermined limit and terminating the weld process if the quality parameter exceeds the second predetermined limit and continuing the weld process if the second predetermined limit exceeds the quality parameter.

5,750,958
CERAMIC GLOW PLUG

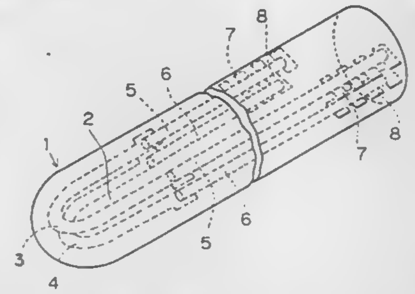
Norio Okuda; Hiroyuki Arima; Kyouji Uchiyama; Michio Ohno; Hiroaki Ohyama; Jun Fukuda, and Makoto Niina, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Sep. 13, 1994, Ser. No. 305,085

Claims priority, application Japan, Sep. 20, 1993, 5-233075; Sep. 30, 1993, 5-244401; Nov. 22, 1993, 5-291789; Nov. 29, 1993, 5-297825; Jan. 31, 1994, 6-009346; Feb. 28, 1994, 6-029863; Mar. 30, 1994, 6-061031; May 31, 1994, 6-118418; Jul. 13, 1994, 6-160884

Int. Cl.^{6} F23Q *7/22;* **H05B** *3/44;* **F02P** *19/00*

U.S. Cl. 219—267 **10 Claims**



1. A ceramic heater for a DC power source, comprising:
- an insulating ceramic sintered body having a surface,
- a heating resistor embedded in the sintered body, and
- at least two leads connected to the heating resistor, the at least two leads comprising at least two electrodes exposed on the surface of the ceramic sintered body,
- the heating resistor comprising at least two printed layers of inorganic conductive material,
- the at least two electrodes comprising at least a printed layer of inorganic conductive material, and
- the at least two leads comprising at least a high melting point metal wire,
- wherein the ceramic sintered body comprises a substantially rod-shaped body having a substantially spherical tip, the heating resistor, the at least two leads and at least a portion of the at least two electrodes are disposed in the ceramic sintered body, the heating resistor comprises at least two substantially U-shaped, mutually parallel layers, and each of the at least two electrodes comprises a separate layer and each separate layer comprises a plurality of pieces.

5,750,959
ELECTRIC HEATER

David Aubrey Plumptre, Droitwich, United Kingdom, assignor to Ceramaspeed Limited, United Kingdom

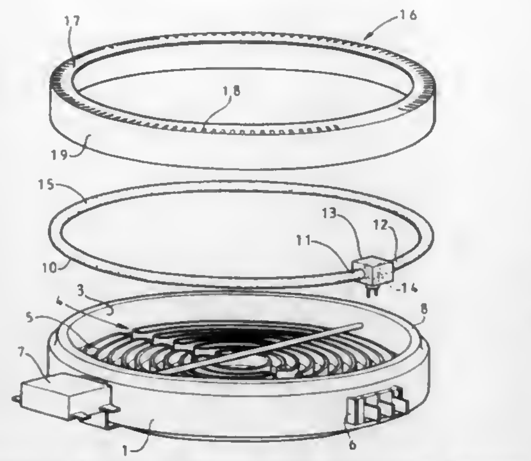
Filed May 8, 1996, Ser. No. 646,947

Claims priority, application United Kingdom, Jun. 1, 1995, 9511071

Int. Cl.^{6} H05B *3/68*

U.S. Cl. 269—465 **22 Claims**

1. An electric heater for arranging beneath a translucent cooking plate, the heater comprising: at least one electrical heating means in a housing comprising a base and a peripheral wall; light indicator means supported peripherally on the heater and visible, in operation, through the cooking plate, the light indicator means comprising an elongate light-emitting device at least partially surrounding the heater and arranged to emit light towards the underside of the cooking plate; and mask means overlying the device and integral with the heater, the mask means being of a material substantially opaque to light from the device and having one or more apertures therein, different in configuration to the



configuration of the device, through which one or more apertures light from the device is visible, viewed through the cooking plate.

5,750,960

DEVICE FOR HEATING AND MAINTAINING A CONSTANT TEMPERATURE IN A LIQUID, IN PARTICULAR THE WATER OF AQUARIUMS

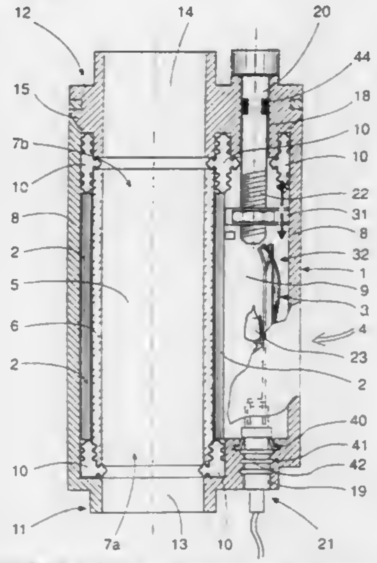
Valerio Bresolin, 9, Via Cornon, Pove Del Grappa, Italy

Filed Jul. 26, 1996, Ser. No. 700,666

Claims priority, application European Pat. Off., Aug. 3, 1995, 95830356

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—494 **15 Claims**



1. A device for heating and maintaining a constant temperature within a liquid, particularly in aquariums, comprising;

at least one heater element comprising a foil resistance screen printed or a dielectric support,

a thermostat,

an electrical circuit connecting said at least one heater element in series with said thermostat to an external electrical power supply,

regulating means for said at least one heater element, connected to said thermostat,

luminous means indicating an operating status of said at least one heater element, and

a casing housing said at least one heater element, said thermostat, said electrical circuit, and said luminous means, said regulating means being disposed externally of said casing,

wherein an interior of said casing has at least one tubular through cavity surrounded by a first wall, said at least one heater element is wrapped externally of said first wall with an interposed insulating film, and wherein opposite ends of said cavity are open so that said liquid to be warmed can pass through.

5,750,961

METHOD FOR CONTROLLING THE ACTUAL TEMPERATURE OF AN INTERMITTENTLY OPERATED HEATING MEANS, PARTICULARLY OF AN ELECTRIC HEATING MEANS

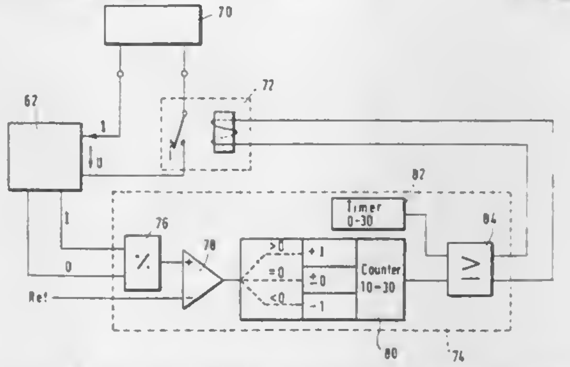
Heinrich Schug; Reiner Schlickhoff, and Reinhold Pieper, all of North-Rhine Westphalia, Germany, assignors to Imation Corp., Oakdale, Minn.

Filed Aug. 15, 1995, Ser. No. 515,121

Claims priority, application Germany, Oct. 19, 1994, 44 37 373.2

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—497 **9 Claims**



1. A method for controlling the actual temperature of a heating means comprising the steps of:

activating a heating means for a switch-on interval having a duration of a first number of time units;

measuring at least one operating parameter for a predetermined measuring time period;

comparing the actual temperature of the heating means to a desired temperature using the measured operating parameter;

increasing the first number of time units if the actual temperature of the heating means is below the desired temperature, thereby lengthening the switch-on interval;

decreasing the first number of time units if the actual temperature of the heating means is above the desired temperature, thereby shortening the switch-on interval; and

deactivating the heating means for a switch-off interval having a duration of a second number of time units.

5,750,962

THERMAL RETENTION DEVICE

Gary F. Hyatt, Randleman, N.C., assignor to Vesture Corporation, Randleman, N.C.

Continuation of Ser. No. 394,491, Feb. 27, 1995, abandoned. This application Jul. 28, 1997, Ser. No. 901,826

Int. Cl.^{6} H05B *3/34*

U.S. Cl. 219—528 **26 Claims**

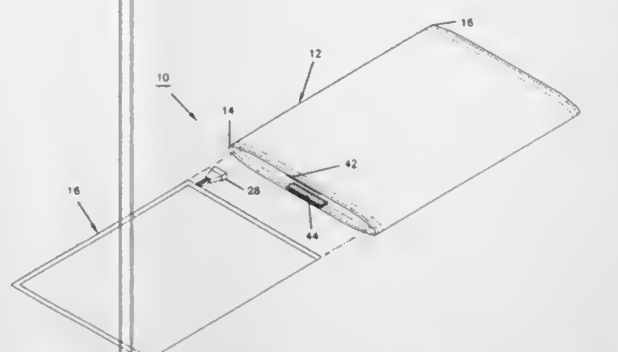
1. A thermal heating and heat storage device comprising:

(a) a paraffin based phase change material;

(i) said paraffin based phase change material having a phase change temperature;

(b) an electrically resistive heating element positioned in thermally conductive contact with said paraffin based phase change material;

(i) said heating element being selectively controllable, upon direction of electric current therethrough, to heat said paraffin based phase change material to a temperature of at least said phase change temperature;



(c) a thermal switch arrangement constructed and arranged to control heating of said electrically resistive heating element in response to a sensed temperature of said phase change material; and,

(d) a covering defining an internal volume;

(i) said paraffin based phase change material and said electrically resistive heating element being positioned within said internal volume of said covering; and,

(ii) said covering having at least one end which is selectively openable for selected access to said interior volume.

5,750,963

APPARATUS FOR CONTROLLING THE HEATING OF FOODSTUFFS

Keld Christensen, Fredericia, and Torben Jensen, Valby, both of Denmark, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

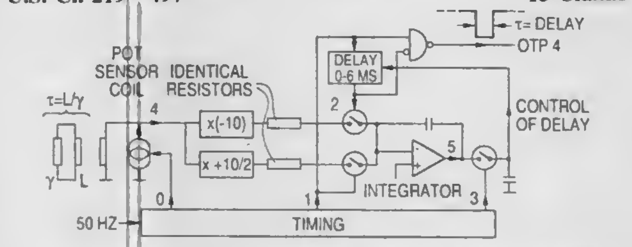
PCT No. PCT/DK94/00217, § 371 Date Dec. 21, 1995, § 102(e) Date Dec. 21, 1995, PCT Pub. No. WO94/29779, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 6, 1994, Ser. No. 553,650

Claims priority, application Denmark, Jun. 4, 1993, 0655/93

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—497 **13 Claims**



1. An apparatus for controlling an electrical heating element to control a cooking temperature of a cooking pot and contents therein comprising:

a source of electrical current;

a control for controlling application of electrical heating current from the source of the electrical current to the heating element to control the cooking temperature of the cooking pot and the contents which are thermally coupled to the heating element;

a source of DC electrical current;

a coil for producing a DC magnetic field, in response to DC electrical current applied thereto from the source of DC electrical current, which is magnetically coupled to the cooking pot and the contents therein;

a switch, coupled between the source of DC electrical current and the coil, for controlling the application of DC electrical current to the coil to cause the buildup of the DC magnetic field and thereafter the decay of the DC magnetic field therein;

a resonant circuit, magnetically coupled to the decay of the DC magnetic field, which electrically resonates in response to the decay of the DC magnetic field in the coil;

a field sensor, magnetically coupled to the resonant circuit, for detecting decay of electrical oscillation in the resonant circuit, the sensor producing a control voltage which is a function of the temperature of the pot and the contents therein; and wherein

the control is responsive to the control voltage and controls the application of the electrical heating current to the heating element as a function of a set cooking temperature inputted from a temperature control and the control voltage to cause the temperature of cooking to track the set temperature.

5,750,964

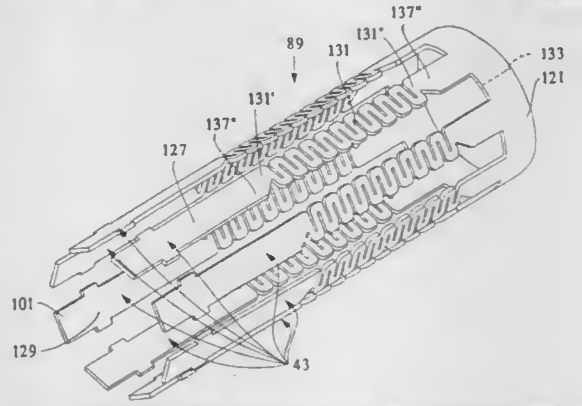
ELECTRICAL HEATER OF AN ELECTRICAL SMOKING SYSTEM

Mary E. Counts, Richmond; Seetharama Deevi, Midlothian; Grier S. Fleischhauer, Midlothian; Mohammad R. Hajaligol, Richmond; Patrick H. Hayes, Chester; Charles T. Higgins, Richmond; Willie G. Houck, Jr., Richmond; Billy J. Keen, Jr., Chesterfield; Bernard C. Laroy, Richmond; Peter J. Lipowicz, Midlothian; Donald E. Miser, Midlothian; Constance H. Nichols, Chesterfield; William H. Stevens, Midlothian; Mantharam Subbiah, Midlothian; Michael L. Watkins, Chester, and Susan E. Wrenn, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 451,081, May 25, 1995, abandoned, which is a division of Ser. No. 380,718, Jan. 30, 1995, Pat. No. 5,666,978, which is a continuation of Ser. No. 118,665, Sep. 10, 1993, Pat. No. 5,388,594, which is a continuation-in-part of Ser. No. 943,504, Sep. 11, 1992, Pat. No. 5,505,214, which is a continuation-in-part of Ser. No. 666,926, Mar. 11, 1991, abandoned. This application Jan. 29, 1997, Ser. No. 790,179

Int. Cl.^{6} H05B *3/58*

U.S. Cl. 219—535 **20 Claims**



1. An electrical heater unit for use in an electrical smoking system for delivering a flavored tobacco response to a smoker, said electrical heater unit comprising:

a plurality of heater elements disposed about a cylindrical, cigarette receiving space, said heater elements being mutually parallel and extending longitudinally along said cigarette receiving space:

said heater element comprising a first end portion, a second end portion, and an electrically resistive, serpentine portion disposed between said first and second end portions, said first and second end portions adapted to establish electrical connections operatively across said serpentine portion;

said serpentine portion being configured to establish a region along the heater element of increased electrical resistance.

5,750,965

Patent Not Issued For This Number

5,750,966

PLANT FOR PASTEURIZING OR STERILISING SOLID OR LIQUID FOOD PRODUCTS USING MICROWAVES

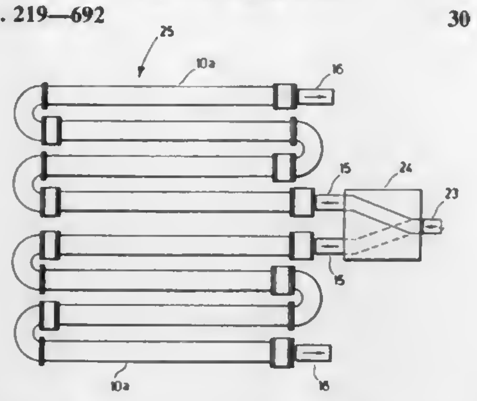
Giuseppe Ruozi, Reggio Emilia, Italy, assignor to O.M.A.C. Societa per Azioni, Reggio Emilia, Italy

Continuation of Ser. No. 353,174, Dec. 8, 1994, abandoned. This application Nov. 25, 1996, Ser. No. 756,188

Claims priority, application Italy, Dec. 9, 1993, MO93A0155

Int. Cl.⁶ H05B *6/78*

U.S. Cl. 219—692 **30 Claims**



1. A plant for treating food products within respective sealed packages comprising:

a plurality of processing elements being each separately operable under different temperature and pressure conditions, said processing elements being arranged in succession to communicate with each other along an operational path for providing a continuously processing system between an entrance section of a first processing element and an exit section of a last processing element, the product packages being fed at said entrance section of the first processing element, transferred for treatment along said operational path between successive processing elements and extracted after treatment at said exit section of the last processing element;

pressure sealing devices provided at said entrance and exit sections of the first and final processing elements and between every two communicating processing elements, said pressure sealing devices being selectively operable in any of an opened and closed position for allowing product package feeding, transferring and extraction, respectively into, between and from said processing elements;

conveyor means disposed with respect to said processing elements for feeding into, transferring between and extracting from said processing elements said product packages;

temperature and pressure varying devices coupled to said processing elements for varying internal temperature independently in each of said processing elements, and for varying the ambient pressure processing in each element as a function of temperatures reached by products therein under treatment, said temperature and pressure varying devices comprising microwave generators arranged in staggered longitudinal or circumferential rows and coupled to the inside of at least one of said processing elements, and comprising pressurized fluid devices for controlling introduction into, and discharge of pressurized fluid from each of said processing elements, and

said temperature and pressure varying devices being operable to balance pressure and temperature values between two successive processing elements for transfer of the products under treatment from a processing element to a successive one along said operational path.

5,750,967

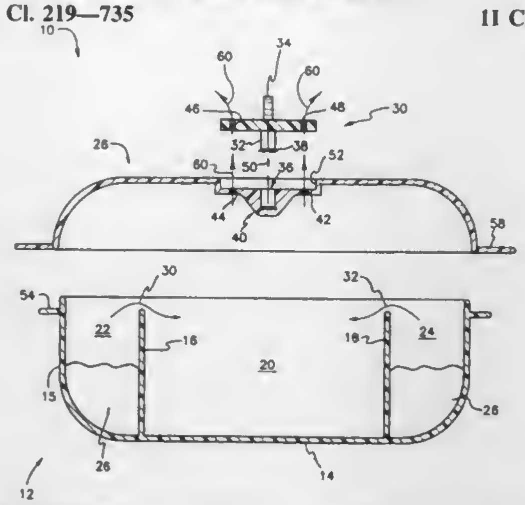
MICROWAVABLE CONTAINER WITH STEAM VENT VALVE

Joseph E. Sprauer, Jr., 99 Brooklyn Heights Rd., Rhinebeck, N.Y. 12572

Filed Jun. 19, 1996, Ser. No. 668,623

Int. Cl.⁶ H05B *6/80;* **B65D** *81/34*

U.S. Cl. 219—735 **11 Claims**



1. A nonmetallic microwavable container for storing and heating foodstuffs, comprising:

a housing having a lateral wall, a bottom wall, and an interior partition wall dividing the interior of said housing into a food storage chamber and a first chilling chamber;

a lid sealing said food storage chamber and said first chilling chamber; and

a valve for venting steam, disposed in fluid communication between said food storage chamber and the exterior of said microwavable container, said valve comprising a valve body and a first valve opening communicating between the interior of said container and the exterior of said container, said valve body disposed to open and to close said first valve opening,

said container comprising a second valve opening formed in said container, said valve body rotatably disposed upon said container and rotatably movable to an open position and to a closed position, wherein said first valve opening is moved into alignment with said second valve opening in said open position and out of alignment with said second valve opening in said closed position.

said valve comprising a stem projecting downwardly from said valve body, said stem having a distal end, and a small flange projecting outwardly from said distal end of said stem, and

said container having a cylindrical bore disposed to receive said stem and a groove disposed to receive said flange of said stem.

5,750,968

SYSTEM AND APPARATUS FOR REDUCING ARCING AND LOCALIZED HEATING DURING MICROWAVE PROCESSING

Zakaryae Fathi, Cary; Richard S. Gerard, Chapel Hill, and Jianghua Wei, Raleigh, all of N.C., assignors to Lambda Technologies, Inc., Raleigh, N.C.

Filed Jun. 30, 1995, Ser. No. 497,603

Int. Cl.⁶ H05B *6/80*

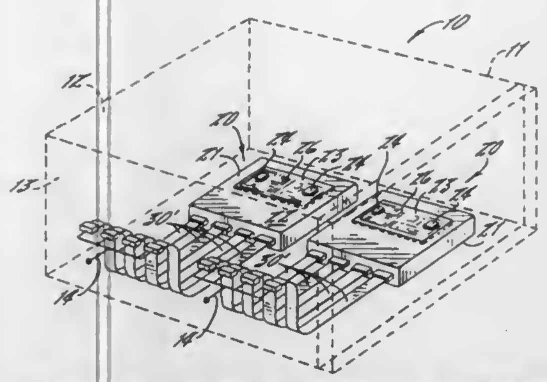
U.S. Cl. 219—736 **14 Claims**

1. A system for reducing arcing and localized heating during microwave processing of a microelectronic substrate, said system comprising:

a chamber including means for generating microwave energy;

a substantially microwave-transparent base for removably securing the microelectronic substrate thereto, said base including at least one internal bore sized and configured to receive an electrical conductor, said bore having a substrate end located to provide the electrical conductor to the microelectronic substrate, and a ground end opposite the substrate end for providing the electrical conductor to ground; and

an electrical conductor having a substrate end configured to electrically interconnect the microelectronic substrate and a ground end configured to electrically interconnect with a ground connected to said chamber.



5,750,969

MICROWAVE CHOKE APPARATUS FOR MICROWAVE OVEN

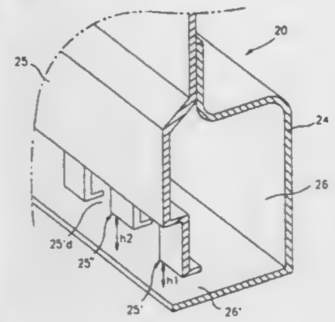
Ho Kyeong Lee, Kyungki-Do, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

Filed Dec. 27, 1996, Ser. No. 777,403

Claims priority, application Rep. of Korea, Dec. 29, 1995, 67370/1995

Int. Cl.⁶ H05B *6/76*

U.S. Cl. 219—742 **3 Claims**



1. A microwave choke apparatus for a microwave oven, comprising:

an inner door panel having a plurality of teeth extending outwardly therefrom,

an outer door panel spaced from the inner door panel and bent at an outer peripheral portion thereof toward a choke channel formed between the outer door panel and the inner door panel;

said teeth having respective length dimensions and each of said teeth being spaced away from the outer peripheral portion of said outer door panel defining an opening, a first plurality of said teeth having a length different from a length of a second plurality of said teeth and including slots formed between the teeth; and

a choke cover closing the choke channel and having an opening portion formed between an inner side of the bent portion of the outer panel and respective outer flat end portions of the teeth of the inner door panel.

5,750,970

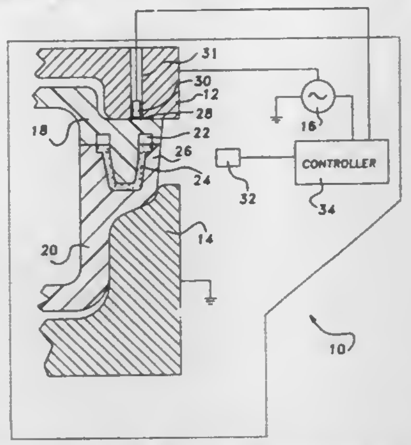
METHOD FOR DIELECTRICALLY HEATING AN ADHESIVE

Kimberly Ann Chaffin, Plymouth, Minn., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 3, 1996, Ser. No. 676,601

Int. Cl.⁶ H05B *6/50*

U.S. Cl. 219—765 **9 Claims**



1. A method of heating an adhesive comprising the steps of:

placing a dielectrically heatable adhesive between a first and second members;

applying a high frequency electric filed between said first and second members sufficient to dielectrically heat said adhesive;

directly measuring the top surface temperature of said first member which is not in contact with said adhesive; and

removing said electric field after said measured temperature reaches a predefined amount.

5,750,971

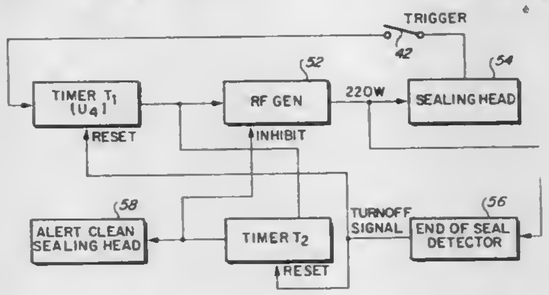
APPARATUS FOR CONTROLLING RF GENERATORS TO WELD PLASTIC MATERIALS

Junius E. Taylor, Phoenix, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Continuation of Ser. No. 306,991, Sep. 16, 1994, Pat. No. 5,543,604, which is a continuation of Ser. No. 785,405, Oct. 31, 1991, Pat. No. 5,349,166. This application Jul. 25, 1996, Ser. No. 687,252

Int. Cl.⁶ H05B *6/54;9/04;* **B32B** *19/02*

U.S. Cl. 219—769 **10 Claims**



1. Apparatus for melting and sealing tubing, said apparatus comprising in combination:

a) a pair of electrically conducting jaws for compressing the tubing, at least one jaw of said pair of jaws being movable to compress the tubing placed intermediate said pair of jaws;

b) means for generating a radio frequency signal in response to compression of the tubing by said pair of jaws;

c) means for amplifying the radio frequency signal to a predetermined power level;

d) means for applying the amplified radio frequency signal across said pair of jaws;

e) means for regulating said generating means to selectively apply a predeterminable level of power across said pair of jaws;

f) means for timing and controlling said regulating means as a function of the melting of the tubing; and
g) means for preempting said timing and controlling means in the event of a fault.

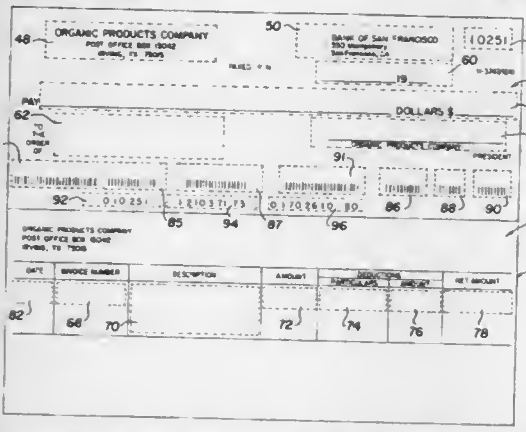
5,750,972
DOCUMENT FOR CONDUCTING ELECTRONIC FINANCIAL TRANSACTIONS

Arthur D. Botvin, 5200 Keller Springs Rd. —Unit 533, Dallas, Tex. 75247

Division of Ser. No. 476,655, Jun. 7, 1995, Pat. No. 5,594,225. This application Sep. 6, 1996, Ser. No. 708,979

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 235—379 **6 Claims**



1. A commercial paper document for conducting a financial transaction having a drawer party, a drawee party and a payee party comprising:
a) user input fields for all written information necessary to qualify as a negotiable instrument adapted for completion by the drawer party to create a commercial paper document;
b) computer-readable code fields for all information necessary to process the negotiable instrument by the drawee party; and
c) an encrypted code field, whereby an image of the commercial paper document with the encrypted code field may be transmitted to the payee party and the drawee party so that when the payee party presents its image of the commercial paper document to the drawee party, the drawee party may use the encrypted code field to verify the authenticity of the payee's image of the commercial paper.

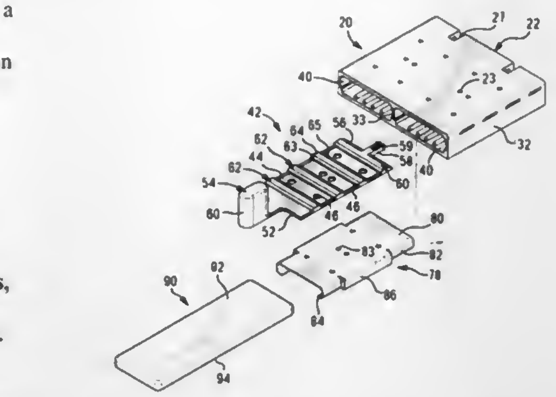
5,750,973
CARD READER

John Wilson Kaufman, Hershey; John Edward Knaub, Etters, and Adam Douglas Cunningham, Middletown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 31, 1996, Ser. No. 739,400

Int. Cl.^{6} G06K *19/06*

U.S. Cl. 235—441 **11 Claims**



1. A card reader comprising:
a dielectric housing having opposed top and bottom walls, opposed side walls, a front face having at least one card-receiving slot therein, and a rear wall;
a plurality of resilient connector elements disposed along said bottom wall and adapted to establish electrical connection between contact pads of a circuit board and contact pads of a card inserted into said at least one card-receiving slot of said reader;
said housing defining a camming surface with said card receiving slot at least adjacent said top wall;
a horizontal plate, slidably mounted within said housing proximate the top surface thereof and movable between first and second positions therein upon actuation, said plate including a cooperating camming surface adjacent and engageable with said housing camming surface whereby said plate is adapted to be moved from a first position adjacent said top wall to said second position lower than said first position upon actuation thereof moving said plate at least toward a card inserted into said card receiving slot beneath said plate to exert pressure on a top of said card and moving said card toward said bottom wall to assure contact pads thereof adjacent said bottom wall are brought into electrical engagement with associated ones of said resilient contact elements that, in turn, are electrically engaged with contact pads on said board; and
an actuator section at least exposed for actuation from outside said housing for moving said late between said first and second positions.

5,750,974
LIGHTING APPARATUS HAVING LIGHT EMITTING DIODES ARRANGED IN A PLURALITY OF PLANES ON A PRINTED CIRCUIT BOARD

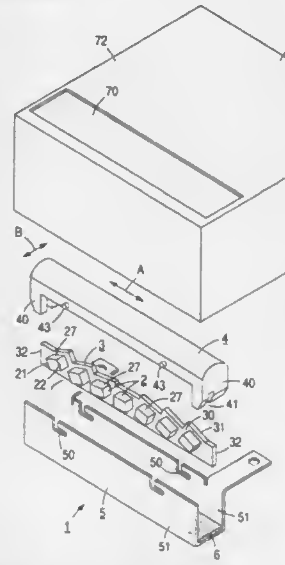
Ryoichi Sasaki; Naoki Tanai, and Masaaki Suhara, all of Osaka, Japan, assignors to Keyence Corporation, Osaka, Japan

Filed Apr. 12, 1996, Ser. No. 635,257

Claims priority, application Japan, Apr. 13, 1995, 7-113854; Apr. 13, 1995, 7-125529

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—454 **22 Claims**



1. A lighting apparatus comprising:
a plurality of light emitting diodes;
a printed circuit board on which said light emitting diodes are arranged in one row; and
a rod-shaped projection lens disposed in front of said light emitting diodes along a light emitting direction, for irradiating an object with light in a strip manner,
wherein each of said light emitting diodes is a chip light emitting diode which has a substantially parallelpiped shape and which comprises a light-emitting face and a pair of electrode faces,
said light-emitting faces are in a plurality of planes which are perpendicular to one common plane, respectively, and
wherein a surface of said printed circuit board is positioned in said one common plane.

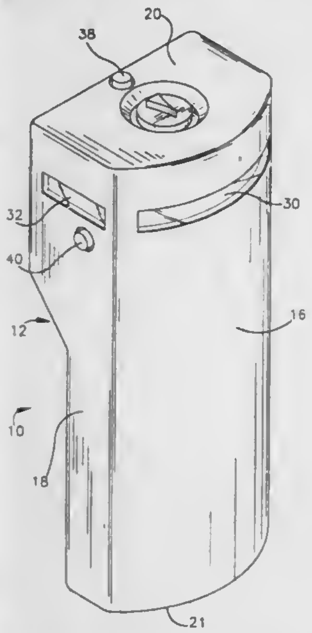
5,750,975
HAND HELD BAR CODE DATAFORM READER HAVING A ROTATABLE READING ASSEMBLY

Robert F. Myerson, Captiva Island, Fla.; Daniel G. Wall, Uniontown, Ohio, and Timothy P. O'Hagan, Fort Myers, Fla., assignors to Teletransactions, Inc., Akron, Ohio

Filed Aug. 25, 1995, Ser. No. 519,849

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **20 Claims**



1. A bar code dataform reader comprising:
a) a housing defining an interior region and including an exit window;
b) a rotatable support mounted in the housing interior region, the support being rotatable to a selected one of a plurality of support positions;
c) a bar code dataform reading assembly mounted on the support, the reading assembly being selectively actuatable to read a bar code dataform by emitting a beam of light; and
d) for each of the plurality of support positions, the beam of light emitted by the reading assembly exiting the housing through a different portion of the exit window along a different path of travel with respect to the housing and for at least two positions of the plurality of support positions, the beam of light exits the housing through spaced apart portions of the exit window.

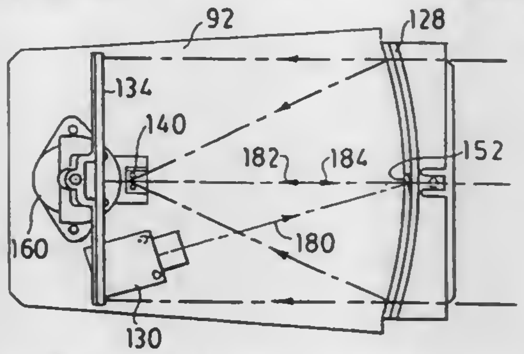
5,750,976
OPTICAL SYSTEM FOR SCANNING AND READING BAR CODES WHICH IS ADAPTED TO BE CONFIGURED IN A HAND HELD UNIT

Jay M. Eastman, Pittsford, and Anna Marie Quinn, Rochester, both of N.Y., assignors to PSC Inc., Webster, N.Y.

Continuation of Ser. No. 966,624, Oct. 26, 1992, abandoned, which is a division of Ser. No. 652,158, Feb. 7, 1991, Pat. No. 5,200,597. This application Sep. 29, 1995, Ser. No. 536,787

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **18 Claims**



1. An optical system for scanning a light beam across a symbol and detecting return light from the symbol to provide electrical signals representing the symbol, said system comprising:
a light source projecting said light beam along a first path,
a photodetector generating said signals in accordance with the return light,
a fixed mirror deflecting said light beam projected along the first path into a second path, and
an oscillatory mirror deflecting said light beam deflected along the second path into a third path, such that oscillations of said oscillating mirror cause said light beam to be deflected into a plurality of third paths to define a scan having end points, an intermediate third path which is positioned intermediate the end points of the scan, and a plane containing said plurality of third paths,
wherein said second path and said intermediate third path define a first plane which is generally perpendicular to said plane containing said plurality of third paths,
wherein said first path forms an acute angle with respect to said first plane, and
wherein the return light is deflected by the oscillatory mirror to said fixed mirror which deflects the return light along a fourth path to be incident upon said photodetector.

5,750,977
OPTICAL CODE READER HAVING PLURAL SPOT BEAMS WHICH INTERSECT ONE ANOTHER A PRESET DISTANCE AWAY FROM A READING WINDOW OF THE OPTICAL CODE READER

Masashi Suzuki, Mishima, Japan, assignor to Kabushiki Kaisha Tec, Shizuoka, Japan

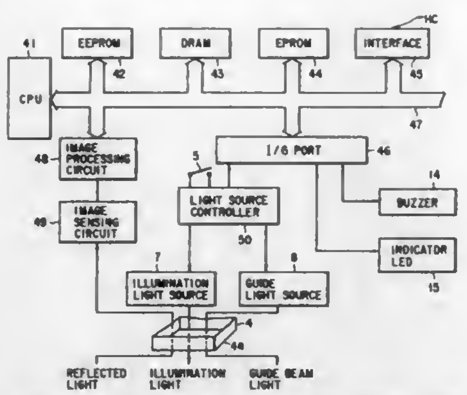
Continuation of Ser. No. 313,333, Sep. 27, 1994, abandoned. This application Jan. 22, 1997, Ser. No. 787,211

Claims priority, application Japan, Sep. 27, 1993, 5-239932

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **5 Claims**

1. An optical code reader comprising:
a reading window;
a reading device which reads an image of a 2-dimensional code via said reading window in a state where said reading window is set within a preset distance from the 2-dimensional code, and said reading device converting the sensed image into image data;
said reading device including:
an illumination light source for applying an illumination light to said 2-dimensional code via said reading window;



- a trigger switch operated in a state where said reading window is set within said preset distance from the 2-dimensional code; and
- an illumination light source controller which turns on said illumination light source upon operation of said trigger switch;

a guide light source for applying guide light beams which indicate a center of a reading range of said reading device to guide the 2-dimensional code within the reading range of said reading device; and

a guide light source controller which (i) turns on said guide light source before turn-on of said illumination light source and which (ii) turns off said guide light source only after turn-on of said illumination light source so as to extinguish the guide light beams while the illumination light source remains on, such that both said guide light source and said illumination light source are simultaneously on for a period of time;

a portable frame having an opening used as said reading window, for accommodating said reading device and said guide light source; and

wherein said guide light source includes a plurality of light emitting elements for emitting respective spot beams which serve as said guide light beams, said spot beams intersecting one another at a position located the preset distance away from said reading window along a central axis of the reading range of said reading device.

5,750,978

METHOD AND APPARATUS FOR TEMPERATURE COMPENSATED OPTICAL SENSOR MOUNTING

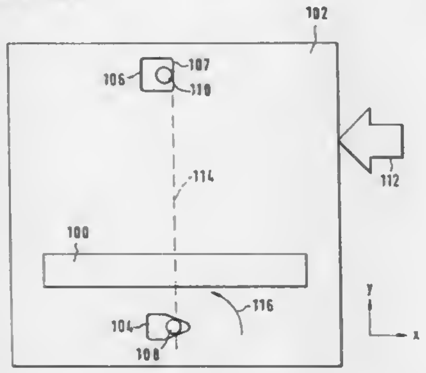
Karsten G. Kraiczek, Karlsbad, and Uwe Effelsberg, Waldbronn, both of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 8, 1996, Ser. No. 598,718

Claims priority, application European Pat. Off., Feb. 17, 1995, 95102210

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—216 **2 Claims**



1. A method for aligning an optical sensor, the method comprising the steps of:

forming a first and second locator hole in a substrate, the first locator hole having a corner;

mounting the optical sensor on the substrate between the first and second locator holes:

mounting the substrate on a first and second locator pin, the first locator pin inserting into the first locator hole and the second locator pin inserting into the second locator hole; forcing the corner of the first locator hole against the first locator pin thereby aligning the first locator hole in two orthogonal directions; and forcing the second locator hole against the second locator pin aligning the second locator hole in one of two orthogonal directions while permitting the second locator hole to move along of the orthogonal directions.

5,750,979

SIDE FACE EXAMINATION APPARATUS FOR PRESSED ARTICLES, CONVEYOR FOR PRESSED ARTICLES AND EXTERNAL APPEARANCE EXAMINATION APPARATUS FOR PRESSED ARTICLES

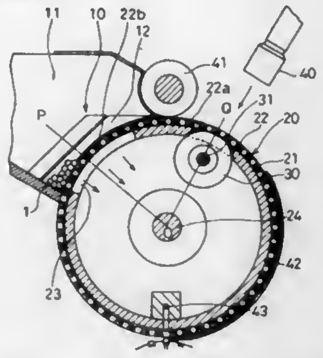
Taizo Yamamoto, Osaka; Motohiro Yagyu, Nara; Yosihisa Kawaguchi, Kashihara, and Akira Nagao, Tenri, all of Japan, assignors to Japan Elanco Company Limited, Osaka, Japan

Filed Aug. 21, 1995, Ser. No. 517,212

Claims priority, application Japan, Nov. 29, 1994, 6-294176

Int. Cl.^{6} B07C *5/342;* **G01N** *21/84*

U.S. Cl. 250—223 R **28 Claims**



1. A side face examination apparatus for pressed articles comprising:

- an arranging apparatus for arranging pressed articles, which are supplied at random, in a manner so that a cross-section of one of said pressed articles having a largest area is substantially vertical, and having a plurality of guide grooves which have a width wider by a predetermined tolerance than a width of said pressed articles in a direction perpendicular to said cross-section;
- a conveying drum intermittently rotated around a horizontal axis, and having pockets arranged for facing said guide grooves and holding said pressed articles, which are arranged by said arranging apparatus, in a manner so that said cross-section is substantially vertical;
- a pressed article rotating roller disposed at a predetermined position in the inside of said conveying drum, and rotating said pressed articles in said pockets stopped at said predetermined position more than one turn around their horizontal axes; and
- an image pickup apparatus disposed for facing an outer surface of said conveying drum at said predetermined position, and picking up picture images of side faces of said pressed articles in said pockets.

5,750,980

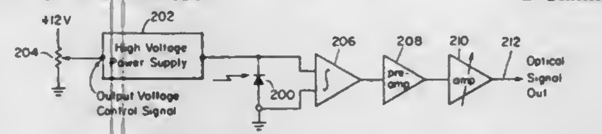
HIGH-SPEED, HIGH-RESOLUTION OPTICAL SCANNER SYSTEM

David Jonathan Swithers, North Attleboro, Mass., and Alex A. Rysin, Pawtucket, R.I., assignors to Computer Identics, Inc., Canton, Mass.

Filed Jun. 7, 1995, Ser. No. 475,868

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 AG **2 Claims**



1. A high-speed, high-resolution, optical scanner system comprising:

- a flying spot scanner for scanning a beam across an object bearing information to be read; and
- a high-bandwidth, high-sensitivity optical receiver including an avalanche photodiode for sensing the variation in light intensity in the beam reflected from the object being scanned; a charge collector circuit, responsive to said avalanche photodiode, for producing a voltage proportional to the light incident on said avalanche photodiode; and a power source for biasing said avalanche photodiode proximate its reverse breakdown voltage to produce high current gain in response to incident light, said power source including a voltage control circuit for sensing, during quiescent non-avalanche conditions, the current through said avalanche photodiode and adjusting the power supplied to said avalanche photodiode to maintain said avalanche photodiode proximate its reverse breakdown voltage.

5,750,981

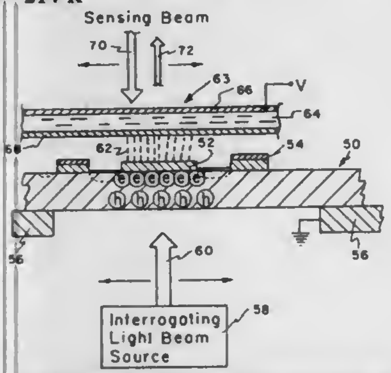
NON-CONTACT ELECTRO-OPTIC DETECTION OF PHOTOVOLTAGES CREATED IN A SEMICONDUCTOR BY A PROBE BEAM

Stephen J. Fonash, State College, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Sep. 23, 1996, Ser. No. 710,798

Int. Cl.^{6} G01R *31/308*

U.S. Cl. 250—214 R **9 Claims**



1. An electro-optic detector for detecting induced photovoltages in a semiconductor structure, said detector comprising:

- interrogating beam means for directing an optical interrogating beam at said semiconductor structure so as to induce a photovoltage at a surface thereof;
- electro-optic layer means juxtaposed to said surface so as to be locally affected by an electric field change which occurs as a result of an induced photovoltage in said semiconductor structure;
- sensing beam means for directing a sensing beam at said electro-optic layer means; and
- detector means for detecting reflections of said sensing beam from said electro-optic layer means, both in regions thereof affected by a local field change and in regions not affected by a local field change, whereby characteristics of said semiconductor structure can be deduced from said reflections.

5,750,982

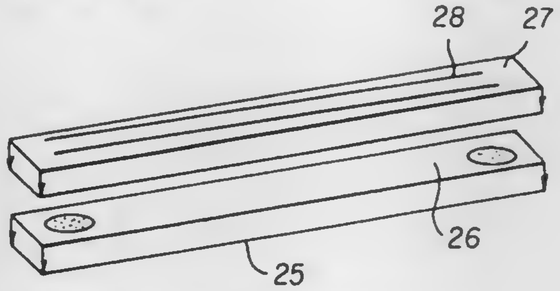
METHOD OF MOUNTING FILTERS ON IMAGE SENSORS

Emmanuel K. Dokyi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1996, Ser. No. 632,970

Int. Cl.^{6} G01J *3/50*

U.S. Cl. 250—226 **17 Claims**



7. An image sensing device sandwich comprising:

- an image sensor;
- a light filter; and
- a plurality of spherical beads functioning having uniform diameters resting within a mixture comprising curable resin that has been cured sandwiched between the image sensor and the light filter.

5,750,983

METER SENSOR LIGHT TAMPER DETECTOR

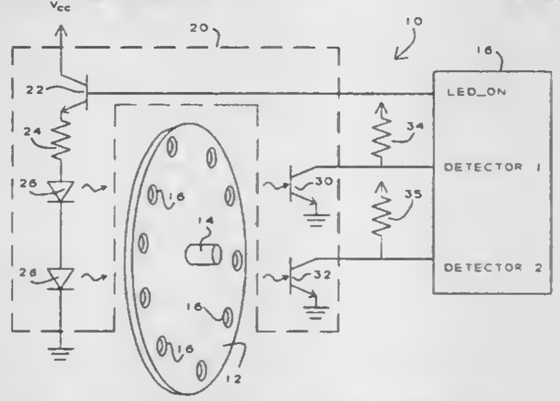
Scott C. Swanson, Roswell, Ga., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Continuation of Ser. No. 407,143, Mar. 20, 1995, abandoned.

This application Jan. 6, 1997, Ser. No. 779,330

Int. Cl.^{6} G01D *5/30*

U.S. Cl. 250—231.13 **19 Claims**



1. A meter sensor light tamper detector, comprising:

- a first and a second light sensor, each being in a first operating state in the presence of an amount of light and in a second operating state in the absence of said amount of light;
- a first light emitter operable to illuminate at least said first light sensor with said amount of light; and
- a microprocessor determining said first and second operating states of said first and said second sensors and controlling emission of said first light emitter, wherein said microprocessor recognizes said meter sensor is subject to tampering whenever it determines said first and second light sensors are both in said first operating state at a time when said first light emitter is emitting said amount of light.

5,750,984
OPTICAL ENCODER USED FOR POSITION DETECTION BASED UPON A PLURALITY OF SIGNALS

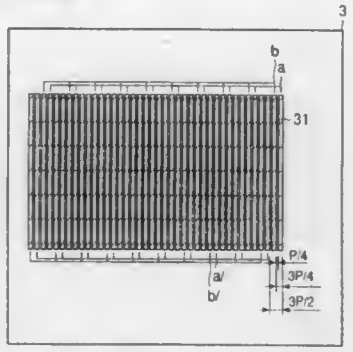
Atsushi Ieki, Kani, Japan, assignor to Okuma Corporation, Gifu, Japan

Filed Jan. 22, 1996, Ser. No. 589,343

Claims priority, application Japan, Jan. 23, 1995, 7-025773

Int. Cl.^{6} H01J *40/14;* G01D *5/36*

U.S. Cl. 250—231.16 **7 Claims**



1. An optical encoder for determining a relative position based on a plurality of signals having a predetermined phase difference therebetween, said optical encoder comprising:
- a first scale having a pattern formed thereon in a lengthwise direction, the pattern having a pattern width;
- a second scale moveable in the lengthwise direction relative to said first scale, said second scale comprising a plurality of groups wherein each of said plurality of groups comprises a plurality of photo sensitive elements arranged in predetermined patterns, wherein each of said plurality of groups corresponds to one of the plurality of signals, wherein said plurality of photo sensitive elements from different groups are arranged side-by-side in a mixed fashion along the lengthwise direction of said second scale, wherein each of said plurality of photo sensitive elements has a width corresponding to the pattern width of the pattern of said first scale, and wherein said groups of photo sensitive elements are arranged such that the plurality of signals have the predetermined phase difference therebetween.

5,750,985
HIGH SPEED AND HIGH PRECISIOIN IMAGE SCANNING APPARATUS

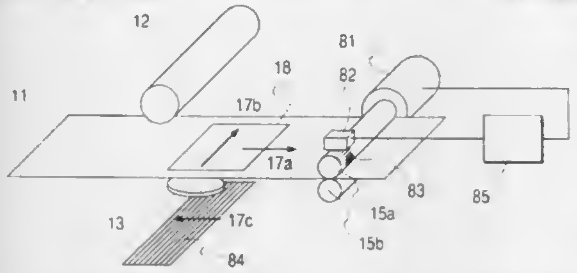
Kenji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1996, Ser. No. 684,963

Claims priority, application Japan, Jul. 24, 1995, 7-187193

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—234 **19 Claims**



1. An image scanning apparatus having an imaging optical system for forming at least part of imaging light of an object into an image, an image sensor for performing photoelectric conversion of an optical image formed by said imaging optical system, and moving means for moving the optical image and said image sensor relative to each other,
- wherein said image sensor comprises a plurality of photoelectric conversion means arranged adjacent to each other, charge transfer means for transferring charges generated by said plurality of photoelectric conversion means, and charge adding means for adding the charges transferred by said charge transfer means, and
- said image scanning apparatus further comprises control means for performing control such that said charge transfer means transfers the charges substantially in synchronism with optical image movement by said moving means, and said charge adding means adds the charges from said plurality of different photoelectric conversion means in accordance with a transfer operation of said charge transfer means.

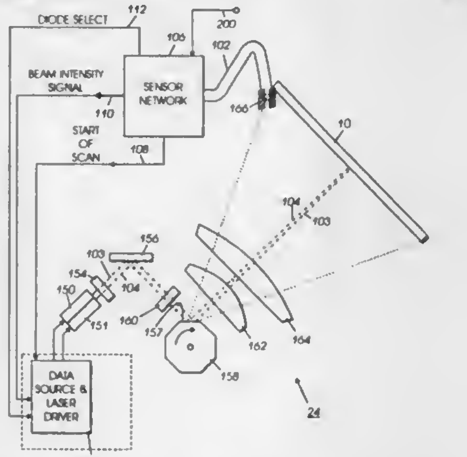
5,750,986
MULTIPLE LASER BEAM DIFFERENTIAL INTENSITY AND START OF SCAN SENSING

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1997, Ser. No. 786,612

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—235 **9 Claims**



1. A raster output scanner, comprising:
- a laser source for generating a first laser beam and a second laser beam;
- a rotating polygon having at least a first facet, said rotating polygon for sweeping said first laser beam and second laser beam along scan paths;
- a photodetector for receiving fluxes from said swept first laser beam and from said swept second laser beam, said photodetector further for converting said fluxes into electrical signals that depend upon the intensity of said fluxes;
- an amplifier for amplifying said electrical signals from said photodetector;
- a scan detection circuit for producing a start-of-scan signal from said amplified electrical signals; and
- a beam intensity difference detecting network for producing a difference signal from said amplified electrical signals, wherein said difference signal represents the difference in intensities of said first laser beam and said second laser beam.

5,750,987
ION BEAM PROCESSING APPARATUS

Satoshi Ichimura, Hitachi; Tadashi Sato, Mito; Kenzo Kobayashi; Shotaro Ohishi, both of Hitachi, and Hisao Oonuki, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

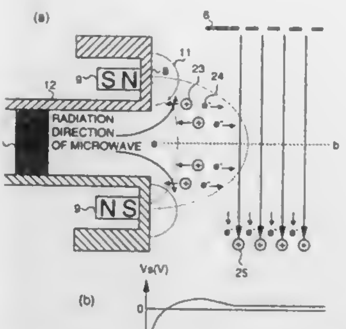
Filed Apr. 24, 1996, Ser. No. 636,974

Claims priority, application Japan, Apr. 28, 1995, 7-105884

Int. Cl.^{6} H05H *3/00*

U.S. Cl. 250—251 **16 Claims**

1. An ion beam processing apparatus including an ion source having an ion pulling-out electrode for generating a plasma and for pulling out ions from said plasma, and a processing chamber connected to said ion source for receiving an ion beam of said pulled-out ions and for processing an object to be processed by said ion beam, said ion beam processing apparatus comprising:
- neutralization means installed between said ion source and said processing chamber, for electrically neutralizing said ion beam supplied to said processing chamber;
- a cylindrical electrode defining a space chamber therein, in which said ion beam pulled out by said ion pulling-out electrode passes;
- generation means for generating a microwave plasma in the space chamber in said cylindrical electrode; and
- means for applying a potential to said cylindrical electrode that is negative with respect to said processing chamber.



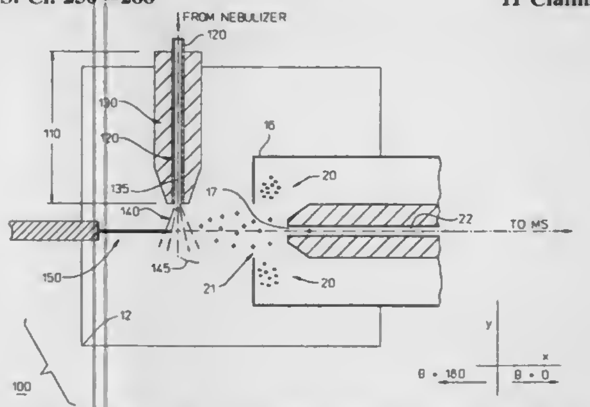
5,750,988
ORTHOGONAL ION SAMPLING FOR APCI MASS SPECTROMETRY

James A. Apffel, Palo Alto; Mark H. Werlich, Santa Clara; James L. Bertsch, Palo Alto, and Paul C. Goodley, Cupertino, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 555,250, Nov. 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 273,250, Jul. 11, 1994, Pat. No. 5,495,108. This application Feb. 3, 1997, Ser. No. 794,248

Int. Cl.^{6} H01J *49/26*

U.S. Cl. 250—288 **11 Claims**



1. An apparatus for converting a liquid solute sample into vaporized and ionized molecules comprising:
- a first passageway having a center axis, an orifice for accepting a liquid solute sample, an interior chamber within which the liquid solute sample is converted into vaporized molecules, and an exit for dischargin molecules;
- a point charge voltage source having the point arranged adjacent to the first passageway exit which ionizes the vaporized molecules into ionized molecules;
- an electrically conductive housing connected to a second voltage source and having an opening arranged adjacent to the first passageway exit wherein the ionized molecules formed by the point charge voltage source are interposed between the point charge voltage source and the housing; and
- a second passageway arranged within the housing adjacent to the opening and connected to a third voltage source, the second passageway having a center axis, an orifice for receiving ionized molecules and an exit, wherein the center axis of the second passageway is arranged in transverse relation to the center axis of the first passageway such that the ionized molecules move laterally through the opening in the housing and thereafter pass into the second passageway under the influence of electrostatic attraction forces generated by the second and third voltage sources; wherein an angle formed between the center axis of the first passageway and the center axis of the second passageway is between about 75 degrees and 105 degrees.

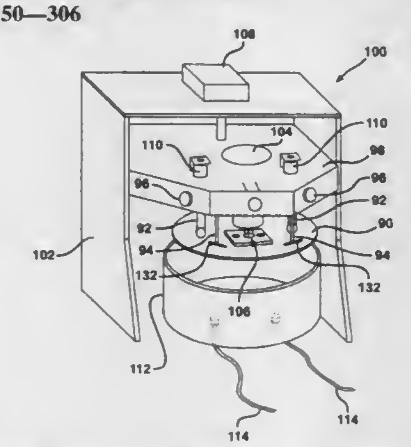
5,750,989
SCANNING PROBE MICROSCOPE FOR USE IN FLUIDS

Stuart M. Lindsay, and Tianwei Jing, both of Tempe, Ariz., assignors to Molecular Imaging Corporation, Tempe, Ariz.

Filed Feb. 10, 1995, Ser. No. 388,068

Int. Cl.^{6} H01J *37/252*

U.S. Cl. 250—306 **49 Claims**



1. An atomic force probe microscope for examining the surface properties of a sample surface, said microscope comprising:
- a frame;
- at least three adjustable support mounts extending downwardly from said frame;
- each of said three adjustable support mounts including a rounded magnetic portion at a distal end thereof;
- a sample stage formed of a material attracted to magnets, said sample stage suspended from said rounded magnetic portions of said support mounts;
- a piezoelectric scanner having a first end and a second end, and attached to said frame at said first end;
- an extender tube coupled to said second end and coupled to an atomic force sensing probe tip; and
- an at least partially optically transparent disk surrounding said extender tube and coupled to said extender tube with a flexible seal.

5,750,990
METHOD FOR MEASURING CRITICAL DIMENSION OF PATTERN ON SAMPLE

Fumio Mizuno, Tokorozawa, and Osamu Satoh, Hitachinaka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

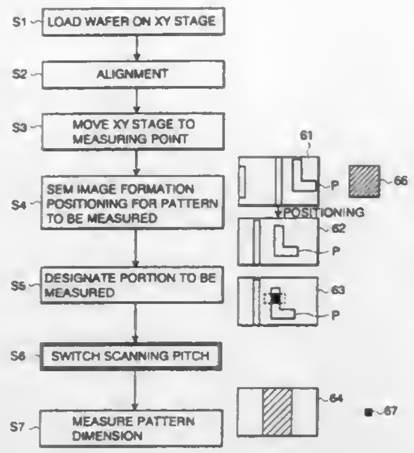
Filed Dec. 20, 1996, Ser. No. 771,325

Claims priority, application Japan, Dec. 28, 1995, 7-342932

Int. Cl.^{6} H01J *37/28*

U.S. Cl. 250—307 **10 Claims**

1. A pattern dimension measuring method comprising the steps of scanning a sample at a predetermined scanning pitch by a probe, forming a sample image using a scanning signal obtained from the sample, scanning a predetermined portion of a pattern to be measured in a sample image by said probe, and measuring a dimension


S1
LOAD WAFER ON XY STAGE
S2
ALIGNMENT
S3
MOVE XY STAGE TO MEASURING POINT
S4
SEM IMAGE FORMATION POSITIONING FOR PATTERN TO BE MEASURED
S5
DESIGNATE PORTION TO BE MEASURED
S6
SWITCH SCANNING PITCH
S7
MEASURE PATTERN DIMENSION
61
66
P
POSITIONING
62
63
64
67

of said predetermined portion by processing obtained scanning signal according to a predetermined algorithm,

wherein said scanning pitch is varied between upon formation of sample image and upon measurement of pattern dimension.

5,750,991

METHOD AND APPARATUS FOR FORMING MULTIDIMENSTIONAL ATTENUATION CORRECTION DATA IN TOMOGRAPHY APPLICATIONS

J. Clifton Moyers, Oak Ridge; Ronald Nutt, and William F. Jones, both of Knoxville, all of Tenn., assignors to CTI Pet Systems, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 210,960, Mar. 21, 1994, Pat. No. 5,471,061, which is a continuation-in-part of Ser. No. 37,303, Mar. 26, 1993, Pat. No. 5,296,708. This application Nov. 27, 1995, Ser. No. 563,268

Int. Cl.⁶ G01T *1/161*

U.S. Cl. 250—363.03 **21 Claims**

1. A method for forming at least one of a multi-dimensional attenuation data set and an image of radiation transmission through an object positioned in a tomograph device, said tomograph device being at least one of a positron emission tomography (PET) device and a single photon emission computed tomography (SPECT) device, said tomograph device having radiation detectors defining a plurality of faces of said radiation detectors, said method comprising:

positioning a selected point source of radioactive radiation proximate each of said radiation detectors in a selected sequence, said radioactive radiation being directed through the object and received by said radiation detectors of said tomograph device; and

processing signals received from outputs of said detectors of said tomograph device to determine transmission data of radiation from said source of radiation during passage of said radiation through the object for forming said at least one of an attenuation data set and an image.

5,750,992

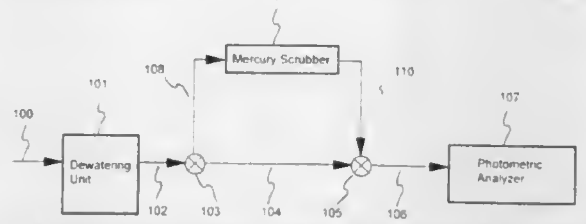
METHOD TO COMPENSATE FOR INTERFERENCES TO MERCURY MEASUREMENT IN GASES

Vince Van Pelt, Tuscumbia; Sandra J. Meischen, Florence, both of Ala., and Clifford J. Timpson, Tiverton, R.I., assignors to Tennessee Valley Authority

Filed Sep. 18, 1996, Ser. No. 715,531

Int. Cl.⁶ G01N *21/17;21/33*

U.S. Cl. 250—372 **6 Claims**



1. An improved photometric measurement system for accurately determining levels of elemental mercury in sampled gases, said sampled gases comprising, in addition to said mercury, other impurities effected through the oxidation of carbonaceous materials, wherein at least one of said other impurities absorbs ultraviolet radiation at radiation wavelengths selected from the group consisting of about 254 nm, 313 mn, and mixtures thereof, said improved system comprising:

means for obtaining a first gas sample to be analyzed;

means for removing substantially all water vapor from said first gas sample;

means comprising gold coated substrate material for removing substantially all elemental mercury from said first gas sample;

means for obtaining a second gas sample to be analyzed;

photometric measurement means comprising an ultraviolet spectrophotometer for determining intensities of radiation absorbed at about 254 nm or 313 nm or both by components in said first gas sample and for determining intensities of radiation absorbed at about 254 nm or 313 min or both in said second gas sample, said second gas sample containing elemental mercury; and

means for determining the concentration of mercury in said second gas sample through utilization of the ratio of the transmitted radiation at wavelengths selected from the group consisting of about 254 nm, 313 nm, and mixtures thereof of said second gas sample with respect to the transmitted radiation, at said selected wavelengths, of said first gas sample.

5,750,993

METHOD OF REDUCING NOISE IN AN ION TRAP MASS SPECTROMETER COUPLED TO AN ATMOSPHERIC PRESSURE IONIZATION SOURCE

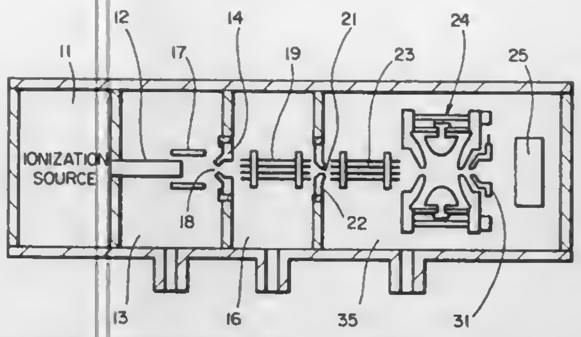
Mark E. Bier, Menlo Park, Calif., assignor to Finnigan Corporation, San Jose, Calif.

Filed May 9, 1996, Ser. No. 647,297

Int. Cl.⁶ H01J *49/42*

U.S. Cl. 250—282 **3 Claims**

1. A method of operating and reducing noise in the output of an ion trap mass spectrometer including an output lens and a detector for providing said output, said mass spectrometer coupled to an atmospheric pressure ionization source by a capillary tube which transfer ions from the atmospheric pressure ionization source to a lower pressure chamber, a skimmer separating said lower pressure chamber from a low pressure chamber, a tube lens surrounding such capillary tube and focusing the ion beam leaving said capillary through said skimmer, an aperture lens spaced from said skimmer to define a low pressure chamber, a multipole ion guide in said low pressure chamber for guiding said ion beam from said skimmer to said aperture lens, a low pressure chamber housing said ion trap mass spectrometer and a multipole ion guide for guiding the beam from said aperture into said ion trap, the method comprising:



applying a DC voltage to said tube lens to block ions until a transmitting voltage of predetermined duration is applied to gate a predetermined number of ions into the ion trap;

applying a ramped RF voltage to said ion trap to eject ions from said ion trap into said detector provide a mass spectrum; and,

blocking the passage of particles into said detector during the analysis phase by applying a blocking or filter voltage to any one of said multipole ion guides, inter-multipole lens or output lens.

5,750,994

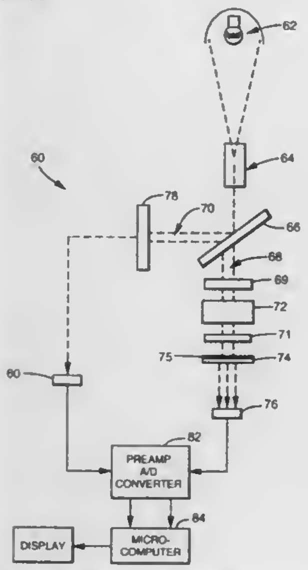
POSITIVE CORRELATION FILTER SYSTEMS AND METHODS OF USE THEREOF

Kenneth J. Schlager, Elm Grove, Wis., assignor to Instrumentation Metrics, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 509,696, Jul. 31, 1995, abandoned. This application Oct. 24, 1995, Ser. No. 547,145

Int. Cl.⁶ G01N *21/35;33/49*

U.S. Cl. 250—339.11 **8 Claims**



1. An apparatus for measurement of analyte concentration in a sample, comprising:

(a) a source of near infrared radiation;

(b) means for dividing radiation emerging from the source into first and second beam paths;

(c) optical filtering means disposed in the second beam path and having absorption characteristics sufficient to attenuate the intensity of the radiation in said second beam path;

(d) means for receiving attenuated radiation from the optical filtering means and for converting the same into signals representative of the intensity thereof;

(e) means for irradiating the sample with the first beam path of radiation and obtaining reflected radiation emerging from the sample;

(f) means for collecting the reflected radiation and directing said reflected radiation to an optically active element that comprises a positive correlation filter having a plurality of filter layers each capable of accepting the reflected radiation and selectively passing a wavelength therefrom, wherein each selectively passed wavelength has high correlation with the analyte concentration;

(g) means for receiving radiation at selectively passed wavelengths from the optically active element and for converting the same into signals representative of the intensity thereof; and

(h) means for calculating the concentration of the analyte in the sample using the signals generated by parts (d) and (g).

5,750,995

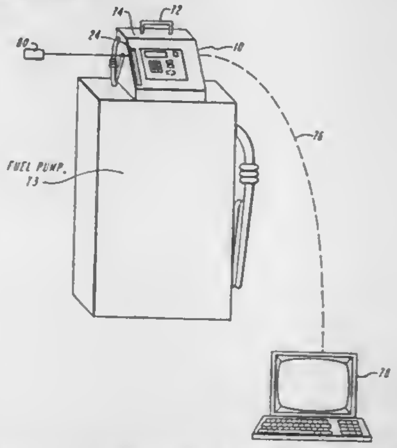
METHODS AND DEVICES FOR FUEL CHARACTERIZATION AND OPTIMAL FUEL IDENTIFICATION ON-SITE AT A FUEL DELIVERY DISPENSER

Richard H. Clarke, Big Sky, Mont., assignor to Boston Advanced Technologies, Inc., Marlborough, Mass.

Filed Feb. 16, 1996, Ser. No. 601,337

Int. Cl.⁶ G01N *21/35;33/22*

U.S. Cl. 250—339.12 **27 Claims**



1. A method for determining at least one pre-selected fuel property of a fuel sample comprising the steps of:

measuring on-site at a fuel delivery dispenser a value for the fuel property associated with the sample through mid-infrared analysis;

comparing the measured value with a pre-determined preferred value range for the fuel property; and

displaying a result of the comparison step.

5,750,996

APPARATUS FOR NONDESTRUCTIVELY INSPECTING A COATED ARTICLE AND ASSOCIATED METHOD

James K. Drennen, III, Mars, and John D. Kirsch, Pittsburgh, both of Pa., assignors to Duquesne University of the Holy Ghost, Pittsburgh, Pa.

Continuation of Ser. No. 721,263, Sep. 26, 1996, abandoned. This application Sep. 22, 1997, Ser. No. 934,928

Int. Cl.⁶ G01N *21/35*

U.S. Cl. 250—341.2 **42 Claims**

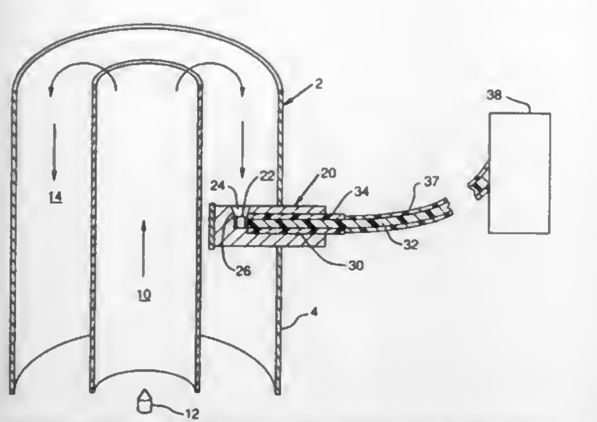
1. Apparatus for nondestructively inspecting a coated article to determine the extent of coating comprising

a housing for containing and transporting said coated article,

an elongated coated article receiving probe which is receivable within said housing,

said probe having a recess in communication with the exterior of said probe for receiving said coated article,

a passageway for receiving fiberoptic means in communication with said coated article receiving recess,



spectrometer means for analyzing coating thickness information received from said fiberoptic means, and

fiberoptic means in optical communication with said article receiving recess for delivering light to a coated article disposed therein and receiving reflected light therefrom and delivering said reflected light to said spectrometer means.

5,750,997
METHOD AND APPARATUS FOR OBSERVING WIRING PATTERNS OF PRINTED CIRCUIT BOARD

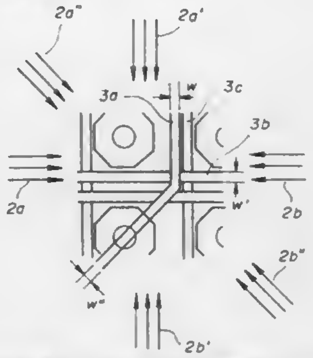
Shinji Matsuda, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 6, 1996, Ser. No. 597,247

Claims priority, application Japan, Feb. 14, 1995, 7-025110

Int. Cl.^{6} H05K *10/00*

U.S. Cl. 250—341.8 **12 Claims**



1. A method for observing wiring patterns of a printed circuit board, said method comprising the steps of:

(a) projecting light having a wave length within an infrared range on the printed circuit board, the light is projected on a wiring line included in the wiring patterns in a direction parallel to a width direction of the wiring line;

(b) detecting reflected light from the printed circuit board; and

(c) forming an image based on the reflected light detected in said step (b), so that the wiring patterns of the printed circuit board are observed based upon the image of the reflected light.

5,750,998
APPARATUS AND METHOD FOR NON INVASIVELY IDENTIFYING COMPONENTS OF LIQUID MEDIUM WITHIN A BAG

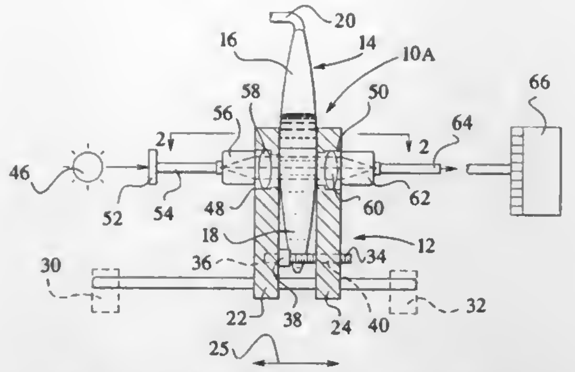
Don S. Goldman, Folsom, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Continuation of Ser. No. 317,114, Oct. 3, 1994, Pat. No. 5,510,621. This application Feb. 16, 1996, Ser. No. 602,620

Int. Cl.^{6} G01J *3/02*

U.S. Cl. 250—343 **12 Claims**

1. An apparatus for non-invasively identifying components of an unknown liquid medium within an interior of a bag, the apparatus comprising:



a source of electromagnetic radiation capable of directing electromagnetic radiation into the interior of the bag, the electromagnetic radiation capable of interaction with the components in the bag chamber and the bag;

detector means located outside the bag receiving the electromagnetic radiation after interaction with the components in the bag chamber and the wall portion of the bag and providing a signal indicative thereof; and

means for analyzing the signal to identify the components and the liquid medium in the bag.

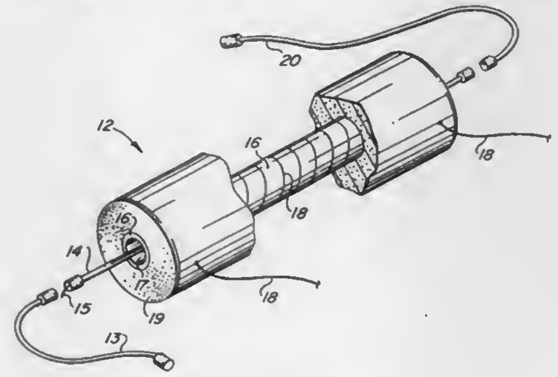
5,750,999
AIR CONTAMINATION MONITOR

Richard Fox, Mesa, Ariz., assignor to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 622,775, Mar. 27, 1996, abandoned. This application Sep. 19, 1997, Ser. No. 933,565

Int. Cl.^{6} G01N *21/35;1/44*

U.S. Cl. 250—343 **15 Claims**



1. An air contaminant monitor comprising:

a sample tube for receiving a sample of air;

a heating element for sufficiently heating said air while in said sample tube so that any contaminant therein decomposes into carbon dioxide and water;

means for detecting said carbon dioxide; and

a pump for drawing the air from the sample tube to the detecting means.

5,751,000
PREFILTER COLLIMATOR FOR PET GAMMA CAMERA

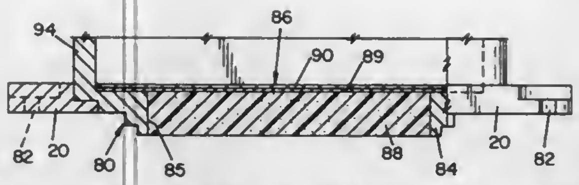
William K. McCroskey, Solon, and David S. Vickers, Independence, both of Ohio, assignors to SMV America, Inc., Twinsburg, Ohio

Filed Jan. 8, 1997, Ser. No. 780,642

Int. Cl.^{6} G01T *1/161;1/164*

U.S. Cl. 250—363.03 **14 Claims**

1. A gamma camera for performing PET studies in which a patient has ingested or been injected with a radiopharmaceutical emits positrons, each positron undergoing an annihilation which



produces a pair of photons, each photon traveling in a linear opposite direction to the other and each having a photopeak energy of about 511 Kev, some photon pairs having a photon striking a first detector head of said camera while the opposite traveling photon strikes a second detector head of said camera, said patient positioned between said first and second detector heads, said camera comprising:

a) each detector head having a scintillation crystal and a plurality of photomultipliers adjacent one another on one side of said crystal producing pulse signals indicative of the intensity of scintillations produced by said crystal when struck by said photons;

b) signal triggering means for determining when said pulse signal of any given photomultiplier becomes a triggering signal having at least a set photopeak energy;

c) coincidence detecting means for determining when any given triggering signal from one detector head occurs within a preset time of any given triggering signal from the other detector head to establish a matched pair of triggering signals indicative of a positron annihilation event;

d) processing means for correcting and refining each matched pair of triggering signals so that tomographic images can be produced therefrom; and

e) each crystal having on its side opposite that adjacent said photomultipliers, a filter extending over the area of said crystal, said filter having an atomic number Z and thickness sufficient to reduce the photopeak energy of photons resulting from positron annihilations which have experienced attenuation attributed to Compton scattering to a value not detected by said signal triggering means whereby photons having photopeak energies of about 511 Kev which experience attenuation attributed to the Compton effect within said crystal actuate said signal triggering means to increase the count of the positron annihilation events.

5,751,001
CASSETTE FOR PHOTO-STIMULABLE RADIOGRAPHY

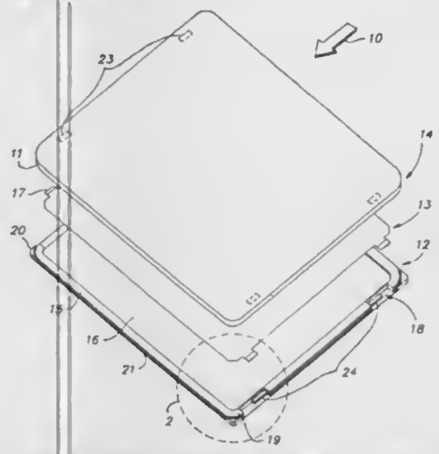
Gentil Verbeke, Edegem, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Apr. 10, 1997, Ser. No. 827,640

Claims priority, application European Pat. Off., Apr. 22, 1996, 96201073

Int. Cl.^{6} G03B *42/04*

U.S. Cl. 250—484.4 **11 Claims**



1. A cassette for photo-stimulable ("PSL") radiography, comprising a flat rigid base (12) and a cap (14) for the base which is releasably securable thereto so as lighttightly to cover a layer of PSL material applied on a surface of the base, characterised in that said cassette comprises at least one rigid removable PSL plate (13) which can freely rest on said base within said cap, and which is arranged for absorbing a portion of an X-ray radiation image which will expose the PSL layer on the base, said cap (14) and said at least one removable plate (13) being arranged in such a way that both the cap alone, and the cap together with said at least one removable PSL plate can be lifted from the base, in order to allow the separate reading-out of the images of the base and of the at least one removable PSL plate.

5,751,002
ION IMPLANTATION APPARATUS

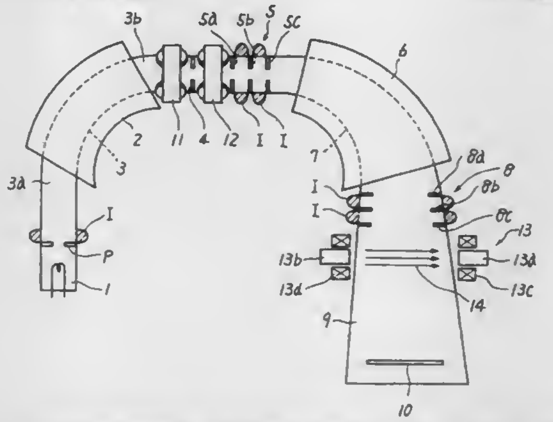
Seiji Ogata; Yuzo Sakurada; Nakaya Chida, and Takeshi Hisamune, all of Chigasaki, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Jan. 30, 1996, Ser. No. 594,320

Claims priority, application Japan, Jan. 31, 1995, 7-034675

Int. Cl.^{6} H01J *37/147*

U.S. Cl. 250—492.21 **15 Claims**



1. An ion implantation apparatus including: an ion source and a mass analyzer having an analyzer magnet for extracting ions having a predetermined kinetic energy and mass from the ion source, and a scanner for scanning an ion beam of the extracted ions and irradiating the ion beam onto a substrate, the improvements comprising; said scanner including a deflection electromagnet disposed downstream of said mass analyzer for deflecting said ion beam in a predetermined plane with respect to a reference axis, a second vacuum chamber portion containing said deflecting electro-magnet through which said ion beam passes, a first vacuum chamber portion electrically independent of said second vacuum chamber portion and containing said mass analyzer through which said ion beam pass, and a third vacuum chamber portion through which said ion beam passes and in which said substrate is arranged, said second vacuum chamber portion is applied by a potential for modulating potential of said ion beam, and said deflection electro-magnet deflects said modulated ion beam so that the deflection angle of said modulated ion beam is modulated and said modulated ion beam is scanned and irradiated onto said substrate.

5,751,003
LOADLOCK ASSEMBLY FOR AN ION IMPLANTATION SYSTEM

Peter H. Rose, N. Conway, N.H., and Adam A. Brailove, Gloucester, Mass., assignors to Eaton Corporation, Beverly, Mass.

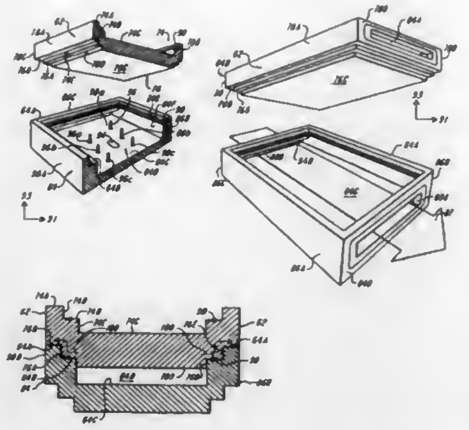
Continuation of Ser. No. 756,372, Nov. 26, 1996, which is a continuation-in-part of Ser. No. 601,983, Feb. 16, 1996, abandoned. This application Jan. 7, 1997, Ser. No. 779,901

Int. Cl.^{6} H01J *37/20*

U.S. Cl. 250—492.21 **24 Claims**

1. A loadlock assembly for an ion implantation system, comprising

a plurality of loadlock stacking elements each having a top surface and a bottom surface, the loadlock stacking elements



being axially positioned relative to each other to form a stacked array wherein the loadlock stacking elements are configured to facilitate nested stacking by a geometrically shaped surface on one loadlock stacking element coupling with a complementary geometrically shaped surface on an adjacent loadlock stacking element for forming a loadlock chamber.

5,751,004

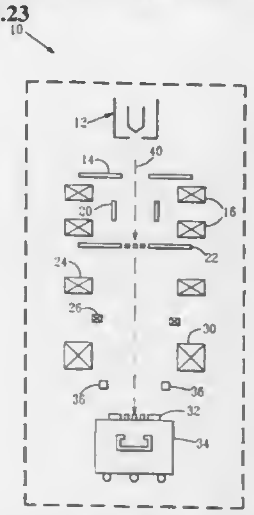
PROJECTION RETICLE TRANSMISSION CONTROL FOR COULOMB INTERACTION ANALYSIS

Christopher Frederick Robinson, Hyde Park, N.Y., and Werner Stickel, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1997, Ser. No. 789,675

Int. Cl.^{6} H01J *37/09*

U.S. Cl. 250—492.23 **18 Claims**



1. A method for studying the effect of electron-electron interaction in an electron beam writing system, comprising the steps of:

providing first and second test reticles, each of the test reticles having a pattern of openings, the openings of the first test reticle having a first total area, and the openings of the second test reticle having a second total area;

generating an electron beam;

directing the electron beam through the first test reticle and onto a test surface means to form a first pattern thereon, and directing the electron beam through the second test reticle and onto the test surface means to form a second pattern thereon, each of said formed patterns having a resolution, and wherein the electron beam forms a first current when directed through the first test reticle and a different, second current when directed through the second test reticle; and

comparing the resolution of the first formed pattern with the resolution of the second formed patter to assess the effect of the currents of the electron beam on the resolutions of the formed patterns.

5,751,005

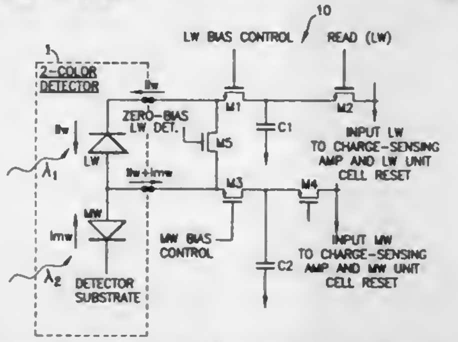
LOW-CROSSTALK COLUMN DIFFERENCING CIRCUIT ARCHITECTURE FOR INTEGRATED TWO-COLOR FOCAL PLANE ARRAYS

Richard H. Wyles, Carpinteria, and William H. Frye, Goleta, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1996, Ser. No. 770,311

Int. Cl.^{6} H01L *27/146;31/101*

U.S. Cl. 250—370.06 **16 Claims**



1. A method of operating a simultaneously active two-color detector of a type that has a first photodiode connected to a second photodiode at a common node, a second node of the first photodiode being coupled to a first capacitance and the common node being coupled to a second capacitance, comprising the steps of:

during a first portion of an integration period, turning off and zero-biasing the first photodiode while integrating on the second capacitance a photocurrent generated only by the second photodiode; and

during a second portion of the integration period, turning on and removing the zero-bias from the first photodetector and integrating on the second capacitance a photocurrent generated by the first photodiode and the photocurrent generated by the second photodiode, while simultaneously integrating on the first capacitance the photocurrent generated only by the first photodiode.

5,751,006

WATER HEATED PANELS FOR SIMULATING THE INFRARED SIGNATURE OF A TARGET

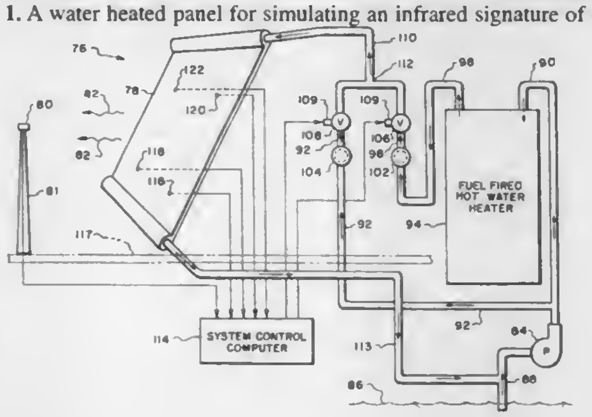
Guy F. Cooper, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1997, Ser. No. 851,390

Int. Cl.^{6} H05B *3/26*

U.S. Cl. 250—495.1 **17 Claims**

1. A water heated panel for simulating an infrared signature of a heat generating structure on a target vessel, said water heated panel comprising:



a generally rectangular shaped support structure;

a fluid inlet passageway positioned at a top portion of said rectangular shaped support structure;

a fluid outlet passageway positioned at a bottom portion of said rectangular shaped support structure;

a plurality of equally spaced substantially parallel fluid transport tubes positioned within said rectangular shaped support structure which run the length of said rectangular shaped support structure;

each of said plurality of fluid transport tubes having one end thereof connected to said fluid inlet passageway and an opposite end thereof connected to said fluid outlet passageway; and

a radiating surface positioned adjacent said fluid transport tubes of said rectangular shaped support structure;

said radiating surface communicating with said fluid transport tubes to transfer heat provided by heated water flowing through said fluid transport tubes to said radiating surface without substantial heat loss.

5,751,007

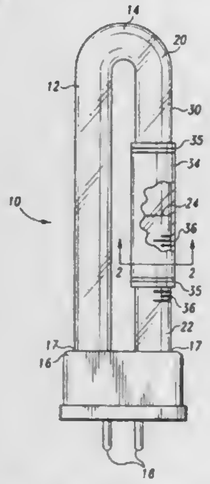
METHOD AND APPARATUS FOR GENERATING A PREDETERMINED AMOUNT OF OZONE USING ULTRAVIOLET LIGHT

William C. Weaver, 1714 Wood Valley Dr., Carmel, Ind. 46032

Filed Sep. 5, 1996, Ser. No. 707,619

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 250—504 R **25 Claims**



1. An ultraviolet light attenuating device for a lamp having a tube including a first section emitting ultraviolet light excluding wavelengths below about 200 nm and a second section emitting ultraviolet light including wavelengths below about 200 nm, comprising:

a generally tubular sleeve attenuating ultraviolet light at wavelengths below about 200 nm; and

mounting means for mounting the sleeve to the tube so that the sleeve is disposed to at least partially surround a portion of the tube and is slidable along a portion of the tube, and covers a selected portion of the second section and attenuates a predetermined amount of ultraviolet light at wavelengths below about 200 nm emitted from the second section.

5,751,008

ULTRAVIOLET EMITTER

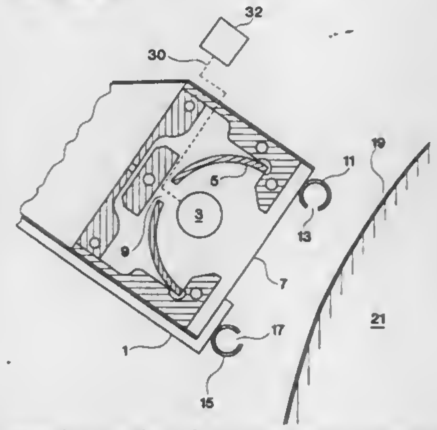
Joachim Jung, and Bernd Schwarz, both of Nurtingen, Germany, assignors to IST Strahlentechnik Metz GmbH, Nurtingen, Germany

Filed May 1, 1996, Ser. No. 640,630

Claims priority, application Germany, May 4, 1995, 195 16 053.3

Int. Cl.^{6} H05B *31/04*

U.S. Cl. 250—504 R **21 Claims**



1. An ultraviolet emitter for drying surface-treated substrates, comprising:

a housing with an opening;

a radiation source arranged within said housing for emitting radiation in an emitting direction through said opening and against a substrate aligned with said opening; and

a first air outlet means, mounted adjacent said opening, for passing a first air current over said opening and across said emitting direction.

5,751,009

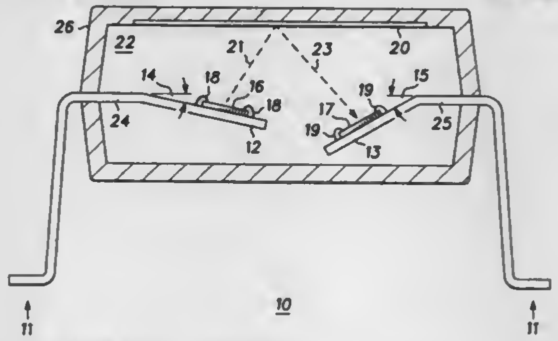
OPTICAL ISOLATOR HAVING LEADFRAME WITH NON-PLANAR MOUNTING PORTIONS

Samuel J. Anderson, Tempe, Ariz.; Austin V. Harton, Oak Park; Jang-Hun Yeh, Streamwood, both of Ill.; John Bliss, Tempe, Ariz., and Karl W. Wyatt, Cary, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1996, Ser. No. 637,516

Int. Cl.^{6} G02B *27/00*

U.S. Cl. 250—551 **20 Claims**



1. An optical isolator comprising:

a leadframe having a first portion and a second portion, wherein the first and second portions are uneven and are electrically isolated from each other;

an optical detector disposed over the first portion of the leadframe;

an optical emitter disposed over the second portion of the leadframe;

a holographic element located above the optical detector and the optical emitter; and

an optically transmissive material encapsulating the first portion of the leadframe, the second portion of the leadframe, the optical detector, and the optical emitter.

5,751,010

Patent Not Issued For This Number

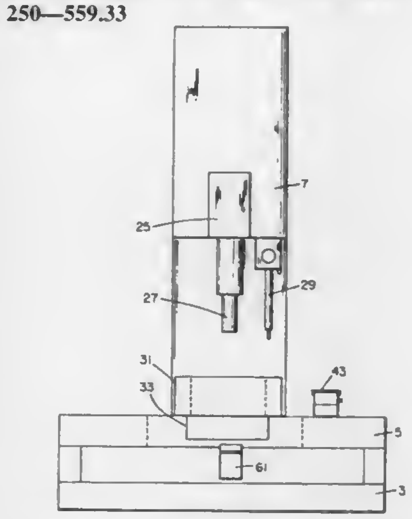
5,751,011
SYSTEM FOR PUNCHING HOLES IN A SPINNERETTE

Michael Ray McLaughlin; Timothy Martin Pinto; Ernest Edward Jessee, all of Kingsport, Tenn.; Leland Manfred Savage, Simi Valley, and Vijay Somabhai Patel, Reseda, both of Calif., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Jun. 20, 1995, Ser. No. 492,551

Int. Cl.⁶ G01N *21/86;* **G01C** *3/08;* **H04N** *7/18*

U.S. Cl. 250—559.33 **3 Claims**



1. A system for accurately and precisely determining the relative location of countersinks formed in a predetermined pattern in a spinnerette blank having an exit side, accurately positioning hole punching and forming tools, in turn, over each countersink, and, in turn, punching and forming accurately positioned holes in the spinnerette blank, said system comprising:

a computer controlled optical coordinate measuring machine having staging, comprising an x-stage, y-stage, and Θ stage, movable in the X, Y, and Θ axes, respectively;

a fixture mounted on said Y-staging adapted to receive the spinnerette blank and mounting the spinnerette blank having a predetermined home row radius of countersinks in the fixture for movement in the X, Y, and Θ axes, the home row radius of countersinks having the innermost countersink hole nearest the center of the predetermined pattern of countersink holes and its outermost hole at the opposite end of the home row radius of countersink holes;

a stage movable in the Z axis having a television camera and lens system mounted for movement with the stage and having tools mounted thereon for movement therewith, the tools being offset a predetermined distance from the television camera and lens system;

means to determine the location of and to store the location of the Z stage; and

means to return each stage to any previously stored location.; and

said machine moving the spinnerette blank via movement of the fixture to bring the innermost countersink hole, and, in turn, the outermost hole on home row radius under the lens system, determining the centroids of the countersinks and storing the locations in the computer, generating via the computer of said machine a two-point line passing through the centroids of the innermost and outermost countersinks located on home row radius, generating a local part coordinate system, aligning the X-axis of the local part coordinate system with its origin at the center of the countersink pattern with the two point line, locating, in turn, each of the remaining countersinks, determining the location of their centroids and storing the locations in the computer, moving, in turn, the staging to position each countersink under the tool and lowering the tool a predetermined distance to punch the hole in the spinnerette.

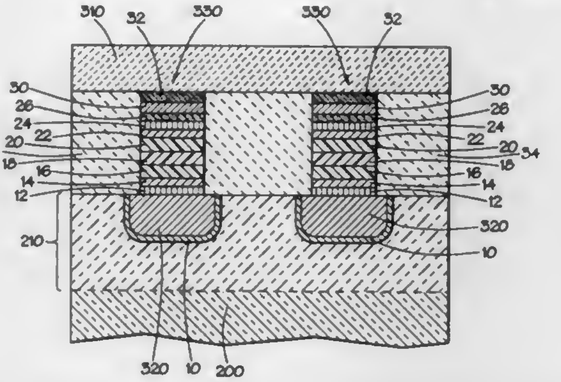
5,751,012
POLYSILICON PILLAR DIODE FOR USE IN A NON-VOLATILE MEMORY CELL

Graham R. Wolstenholme, Boise, and Philip J. Ireland, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 7, 1995, Ser. No. 474,028

Int. Cl.⁶ H01L *47/00;29/06;27/10;29/00*

U.S. Cl. 257—5 **24 Claims**



1. A memory cell having a first and second nodes, said cell comprising:

a memory element having a layer of programmable resistive material bounded by a first electrode and a second electrode, said memory element electrically coupled to said first node; and

a diode formed by depositing at least three silicon layers on a substrate and by selectively etching through said silicon layers to form a distinct pillar of silicon layers, said diode being electrically coupled to said memory element and to said second node, and said silicon layers comprising an N− layer, an N+ layer, and a P+ layer.

5,751,013
SEMICONDUCTOR LIGHT-EMITTING DEVICE AND PRODUCTION METHOD THEREOF

Isao Kidoguchi; Hideto Adachi, both of Mino; Akihiko Ishibashi, Sakai; Kiyoshi Ohnaka, Moriguchi; Yuzaburo Ban, Osaka, and Minoru Kubo, Nabari, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

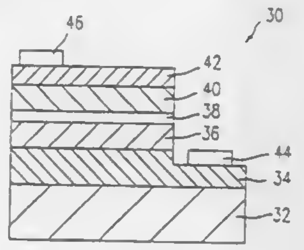
PCT No. PCT/JP95/01447, § 371 Date Mar. 21, 1996, § 102(e) Date Mar. 21, 1996, PCT Pub. No. WO96/03776, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 20, 1995, Ser. No. 619,483

Claims priority, application Japan, Jul. 21, 1994, 6/169394

Int. Cl.⁶ H01L *33/00;* **H01S** *3/19*

U.S. Cl. 257—13 **11 Claims**



1. A semiconductor light-emitting device with a double hetero structure, comprising: an active layer made of $Ga_{1-x}In_xN$ ($0 \leqq x \leqq 0.3$) doped with a p-type impurity and an n-type impurity; and first and second cladding layers provided so as to sandwich the active layer.

5,751,014
SEMICONDUCTOR LIGHT EMITTING DEVICE

Hiroshi Nakatsu, and Jun-ichi Nakamura, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

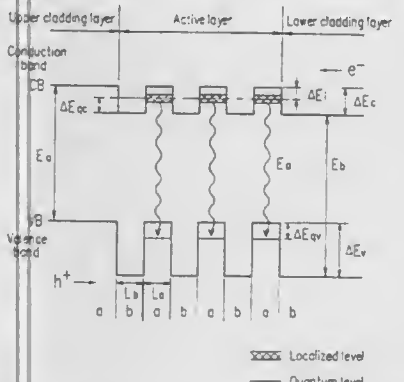
Continuation of Ser. No. 496,225, Jun. 28, 1995, abandoned.

This application May 22, 1997, Ser. No. 861,763

Claims priority, application Japan, Jun. 30, 1994, 6-149842

Int. Cl.⁶ H01L *33/00*

U.S. Cl. 257—25 **14 Claims**



1. A semiconductor light emitting device, comprising:

a superlattice structure including a quantum well layer and a barrier layer to form a staggered-type band line-up, the quantum well layer being doped with an impurity to provide a localized level,

wherein the localized level in the quantum well layer and a quantum level in the barrier layer are substantially equal,

wherein a wave function of one of electrons and holes existing at a quantum level in the barrier layer overlaps a wave function of one of electrons and holes existing at the localized level in the quantum well layer, and

wherein the barrier layer is sufficiently thin to allow one of the electrons and the holes confined in the barrier layer to transfer to the quantum well layer by a resonance tunneling effect and an effective recombination of the one of the electrons and the holes transferred to the quantum well layer occurs in the well layer.

5,751,015
SEMICONDUCTOR RELIABILITY TEST CHIP

Tim J. Corbett; Raymond P. Scholer, and Fernando Gonzalez, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

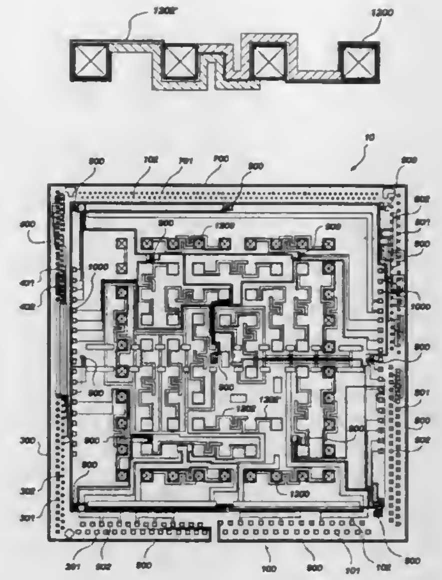
Filed Nov. 17, 1995, Ser. No. 560,544

Int. Cl.⁶ H01L *23/50;27/04;27/18;* **G01R** *31/02*

U.S. Cl. 257—48 **52 Claims**

1. A semiconductor test chip having a scribe area around the periphery thereof for simulating various conditions as a result of the manufacture, packaging, and use of a semiconductor chip, said test chip comprising:

a chip including a periphery formed by at least four sides and a plurality of contact pads located substantially adjacent a portion of the periphery of the chip, a portion of the plurality of contact pads being located in a first row and a second row located substantially behind the first row on a portion of at least one side of the chip; and a plurality of thin gate and thick gate transistor devices for the measurement of the temperature of the chip.



5,751,016
DEVICE HAVING A SWITCH COMPRISING A CHROMIUM LAYER

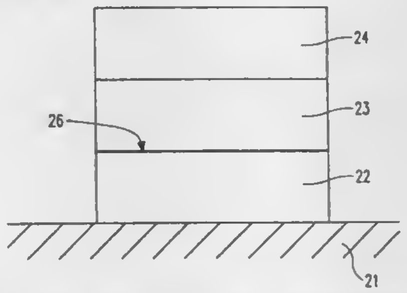
Teunis J. Vink, and Willem Walrave, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1996, Ser. No. 601,407

Claims priority, application European Pat. Off., Feb. 16, 1995, 95200372

Int. Cl.⁶ H01L *29/04*

U.S. Cl. 257—50 **7 Claims**



1. A device having a switch comprising a chromium layer and an adjacent semiconductor layer, the chromium layer having a fraction of voids of less than 10%.

5,751,017
THIN FILM TRANSISTOR HAVING DOUBLE GATE INSULATING LAYER

Jin Jang; Hong Joo Lim, and Bong Yool Ryu, all of Seoul, Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

Continuation of Ser. No. 552,546, Nov. 3, 1995, abandoned.

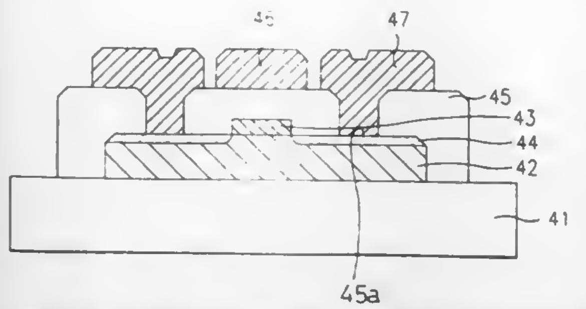
This application Apr. 14, 1997, Ser. No. 833,205

Claims priority, application Rep. of Korea, Nov. 3, 1994, 28726/1994

Int. Cl.⁶ H01L *29/04*

U.S. Cl. 257—57 **20 Claims**

1. A thin film transistor comprising:
a substrate;
a first semiconductor layer on the substrate;
a first insulating layer on the first semiconductor layer;



a doped semiconductor layer on only an upper portion of the first semiconductor layer at first and second sides of the first insulating layer;

a second insulating layer on the first insulating layer and the doped semiconductor layer, the second insulating layer having contact holes and a portion contacting the substrate;

a gate electrode on a portion of the second insulating layer; and

source and drain electrodes on portions of the second insulating layer, the source and drain electrodes contacting the doped semiconductor layer through the contact holes, respectively.

5,751,018

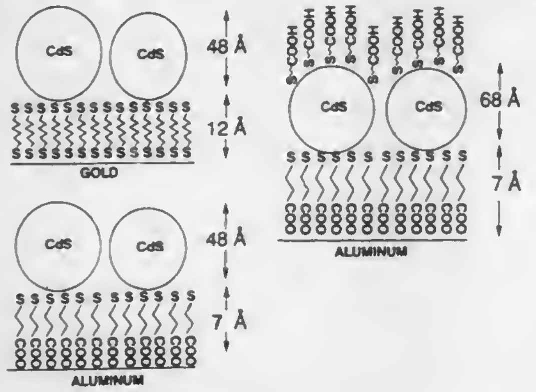
SEMICONDUCTOR NANOCRYSTALS COVALENTLY BOUND TO SOLID INORGANIC SURFACES USING SELF-ASSEMBLED MONOLAYERS

A. Paul Alivisatos, and Vicki L. Colvin, both of Berkeley, Calif., assignors to The Regents of the University of CAlifornia, Oakland, Calif.

Continuation of Ser. No. 796,245, Nov. 22, 1991, abandoned. This application Apr. 29, 1994, Ser. No. 235,265

Int. Cl.^{6} H01L *29/04*

U.S. Cl. 257—64 **41 Claims**



1. A semiconductor assembly comprising:

a) a solid inorganic substrate surface;

b) a self-assembled monolayer of heterobifunctional bridging moieties covalently bonded thereto, each of said bridging moieties having two functional groups, with one of said functional groups covalently bonded to said substrate surface; and

c) semiconductor nanocrystals covalently bonded to said bridging moieties through a second of said two functional groups on each of said bridging moieties.

5,751,019

METHOD AND STRUCTURE FOR REDUCING SHORT CIRCUITS BETWEEN OVERLAPPING CONDUCTORS

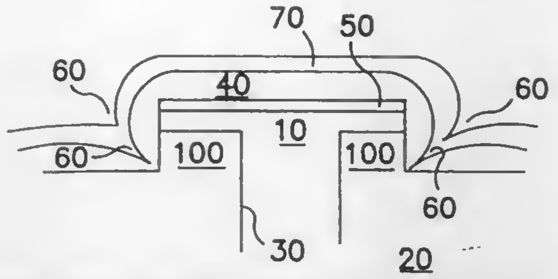
James A. Fair, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 6, 1994, Ser. No. 350,763

Int. Cl.^{6} H01L *27/108;29/04;29/76;31/112*

U.S. Cl. 257—68 **7 Claims**

1. An integrated circuit device, preferably a thin film capacitor, having overlapping conductive structures comprising at least:



a first electrode formed by a first conductor selectively deposited onto a raised surface of a first dielectric layer, said raised surface formed by predetermined step-like erosion of an otherwise substantially planar surface of the first dielectric layer, spacing said first electrode above the respective inside corners necessarily formed by said step-like erosion to produce a structure with no dielectric to conductor interface at the inside corners;

a second dielectric layer deposited onto said first electrode structure; and

a second electrode formed by a second conductor deposited onto said second dielectric layer, said raised surface of said first dielectric layer providing sufficient spacing of said first electrode above said inside corners to reduce unwanted electrode current leakage.

5,751,020

STRUCTURE OF A LIQUID CRYSTAL DISPLAY UNIT HAVING EXPOSED CHANNEL REGION

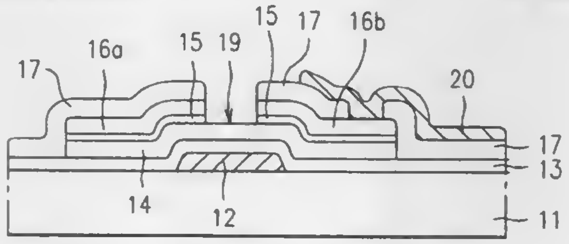
Ki Hyun Lyu, Kyungki-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 3, 1996, Ser. No. 760,143

Claims priority, application Rep. of Korea, Mar. 26, 1996, 1996/8389

Int. Cl.^{6} H01C *29/04;31/036*

U.S. Cl. 257—72 **8 Claims**



1. A liquid crystal display unit comprising:

a substrate;

a gate electrode formed on the substrate;

a gate insulating layer formed on the exposed surface of the substrate including the gate electrode;

an intrinsic semiconductor layer and an impurity layer formed on the gate insulating layer;

source and drain electrodes separately formed on the impurity semiconductor layer;

an insulating layer formed on the source and drain electrodes, the insulating layer having a contact hole for exposing a channel region; and

a pixel electrode formed on the insulating layer and connected to the drain electrode.

5,751,021

SEMICONDUCTOR LIGHT-EMITTING DEVICE

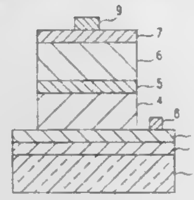
Nobuaki Teraguchi, 277-1, Mitsuyoshi, Koryo-cho, Kitakatsuragi-gun, Nara-ken, Japan

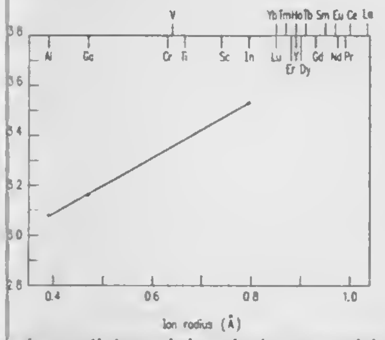
Filed Apr. 22, 1996, Ser. No. 635,637

Claims priority, application Japan, Apr. 24, 1995, 7-098824

Int. Cl.^{6} H01L *33/00;* **H01S** *3/19*

U.S. Cl. 257—103 **5 Claims**





1. A semiconductor light-emitting device comprising a nitride type alloy semiconductor layer,

wherein the nitride type alloy semiconductor layer is made of $(AlGaIn)_{1-y}X_yN(0\leqq y\leqq 1)$ where X is at least one selected from the group consisting of Sc, Ti, V, Cr, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu to have a decreased bandgap as compared to that obtained without the addition of X.

5,751,022

THYRISTOR

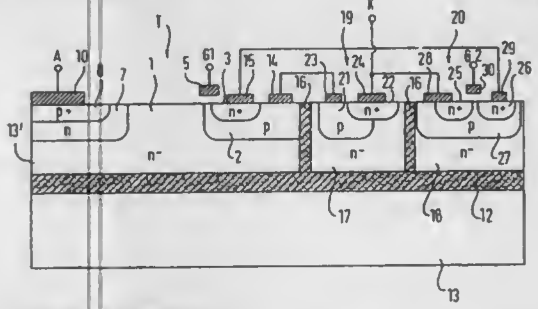
Norio Yasuhara; Akio Nakagawa, both of Kanagawa-ken; Tomoko Matsudai, and Hideyuki Funaki, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 400,980, Mar. 8, 1995, abandoned. This application Feb. 25, 1997, Ser. No. 806,153

Claims priority, application Japan, Mar. 9, 1994, 6-038196; Sep. 30, 1994, 6-259596

Int. Cl.^{6} H01L *29/74;31/111*

U.S. Cl. 257—133 **22 Claims**



1. A thyristor comprising:

a thyristor region including a first base semiconductor region of a first conductivity type, a second base semiconductor region of a second conductivity type in the first base semiconductor region, a first emitter semiconductor region of the first conductivity type in the second base semiconductor region, and a second emitter semiconductor layer of the second conductivity type in the first base semiconductor region;

an first insulated gate electrode provided on the second base semiconductor region between the first emitter semiconductor region and the first base semiconductor region;

a first electrode connected to the second emitter semiconductor region and having a potential applied thereto;

a second electrode;

a semiconductor switch coupled between said first emitter semiconductor region and said second electrode, thereby providing a first plurality of carriers to said first emitter semiconductor region from said second electrode; and a

semiconductor rectifier coupled between said second electrode and said second base semiconductor region, thereby draining a second plurality of carriers.

5,751,023

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

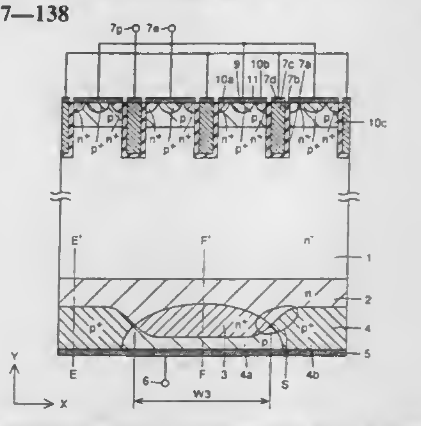
Shinji Aono, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1996, Ser. No. 745,643

Claims priority, application Japan, May 16, 1996, 8-121652

Int. Cl.^{6} H01L *29/74*

U.S. Cl. 257—138 **1 Claim**



1. A semiconductor device operable to flow a main current between first and second main surfaces of a semiconductor substrate of an intrinsic or first conductivity type, comprising:

a first semiconductor layer of the first conductivity type formed at a second main surface side and having an impurity concentration higher than that of said semiconductor substrate;

a second semiconductor layer of the first conductivity type formed at a partial region of said first semiconductor layer and having an impurity concentration higher than that of said first semiconductor layer; and

a third semiconductor layer of a second conductivity type opposite to said first conductivity type covering said first and second semiconductor layers, wherein

for suppressing introduction of holes from said third semiconductor layer into said second semiconductor layer without suppressing introduction of holes from said third semiconductor layer into said first semiconductor layer, a diffusion depth of impurity diffused in said third semiconductor layer toward said first main surface is determined such that the diffusion depth at a first region opposed to said second semiconductor layer is smaller than that at a second region opposed to said first semiconductor layer, wherein the said first region in said third semiconductor layer has a lower impurity concentration than said second region.

5,751,024

INSULATED GATE SEMICONDUCTOR DEVICE

Hideki Takahashi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

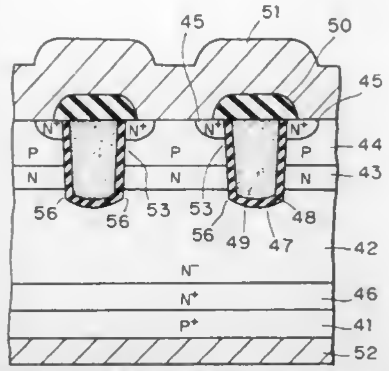
Filed Nov. 28, 1995, Ser. No. 566,572

Claims priority, application Japan, Mar. 14, 1995, 7-054564

Int. Cl.^{6} H01L *29/74;31/111;29/76;29/94*

U.S. Cl. 257—139 **11 Claims**

1. An insulated gate semiconductor device, comprising:



a first semiconductor layer of a first conductivity type having first and second main surfaces;

a second semiconductor layer of a second conductivity type with a low impurity concentration provided on the first main surface of said first semiconductor layer;

a third semiconductor layer of the second conductivity type with an impurity concentration higher than the impurity concentration of said second semiconductor layer and provided in close contact on a surface of said second semiconductor layer;

a fourth semiconductor layer of the first conductivity type provided in close contact on a surface of said third semiconductor layer;

a fifth semiconductor layer of the second type selectively provided in a surface of said fourth semiconductor layer;

a trench having an opening in a surface of said fifth semiconductor layer and having a depth extending through at least said fourth semiconductor layer from the surface of said fifth semiconductor layer;

an insulating film provided on an entire inner wall of said trench;

a control electrode provided in said trench, facing said fourth semiconductor layer through said insulating film;

a first main electrode provided on the surface of said fourth and fifth semiconductor layers; and

a second main electrode provided on the second main surface of said first semiconductor layer wherein said second semiconductor layer is thicker than said third semiconductor layer.

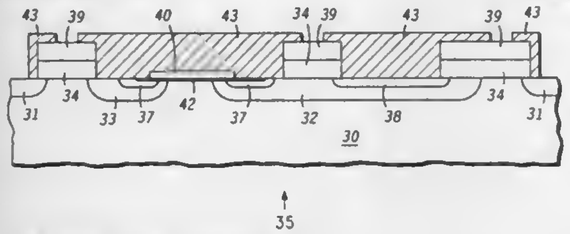
5,751,025
HIGH VOLTAGE CURRENT LIMITER AND METHOD FOR MAKING

David M. Heminger, Mesa, and Joseph H. Slaughter, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 560,774, Nov. 21, 1995, Pat. No. 5,629,536. This application Jan. 2, 1997, Ser. No. 778,432

Int. Cl.^{6} H01L *29/41*

U.S. Cl. 257—173 **22 Claims**



1. A current limiter comprising:

a body of semiconductor material of a first conductivity having a surface and serving as a collector terminal;

a first doped region of a second conductivity having an edge and formed in the body of semiconductor material contiguous with the surface;

a second doped region of the first conductivity having an edge and formed in the first doped region such that the second doped region is contiguous with the surface and the edge of the second doped region is offset from the edge of the first doped region by a first distance;

a third doped region of the second conductivity having an edge and formed in the body of semiconductor material.

5,751,026
EPITAXIAL WAFER OF GALLIUM ARSENIDE PHOSPHIDE

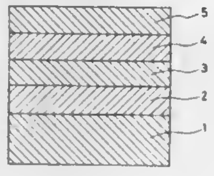
Tadashige Sato; Megumi Imai, and Tsuneteru Takahashi, all of Ushiku, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

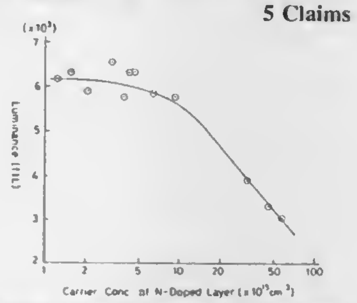
Continuation of Ser. No. 573,885, Dec. 18, 1995, abandoned, which is a continuation of Ser. No. 97,237, Jul. 27, 1993, abandoned. This application Feb. 18, 1997, Ser. No. 801,295

Claims priority, application Japan, Jul. 28, 1992, 4-201368

Int. Cl.^{6} H01L *33/00*

U.S. Cl. 257—190 **5 Claims**





1. An epitaxial wafer of gallium arsenide phosphide comprising a single crystal substrate, having a gallium arsenide phosphide layer with a varying mixed crystal ratio, a gallium arsenide phosphide layer with a constant mixed crystal ratio and a nitrogen-doped gallium arsenide phosphide layer with a constant mixed crystal ratio provided thereon,

wherein a carrier concentration of said gallium arsenide phosphide with a varying mixed crystal layer and said gallium arsenide phosphide with a constant mixed crystal ratio lies in the range of 5×10^{16} cm^{-3} to 5×10^{7} cm^{-3}, and said nitrogen-doped gallium arsenide phosphide layer with a constant mixed crystal ratio having a carrier concentration of 3×10^{15} cm^{-3} or less.

5,751,027
FIELD EFFECT SEMICONDUCTOR DEVICE WITH A LOW-NOISE DRIFT LAYER AND A HIGH-POWER DRIFT LAYER

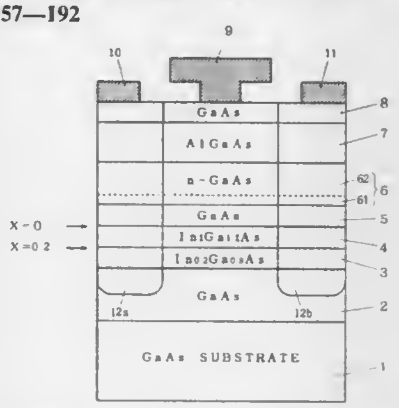
Minoru Sawada, Yawata, and Yasoo Harada, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Nov. 10, 1995, Ser. No. 555,846

Claims priority, application Japan, Nov. 10, 1994, 6-276151

Int. Cl.^{6} H01L *31/0328;31/0336*

U.S. Cl. 257—192 **19 Claims**



1. A field effect semiconductor device, comprising:

a low-noise drift layer including an undoped semiconductor in which electrons mainly drift in a low-noise operation mode and a high-power drift layer including a semiconductor of one conductivity type in which electrons mainly drift in a high-power operation mode.

wherein said high-power drift layer comprises a dual layer of a first doped layer doped with a carrier of said one conductivity type at a predetermined high concentration and a second doped layer doped with a carrier of said one conductivity type at a predetermined concentration lower than said predetermined high concentration, and

said first doped layer and said second doped layer are formed of the same semiconductor material and having a homojunction with each other, and in said high-power drift layer the layer closest to said low-noise drift layer is formed of said first doped layer.

5,751,028
SEMICONDUCTOR DEVICE FORMED ON A SUBSTRATE HAVING AN OFF-ANGLE SURFACE

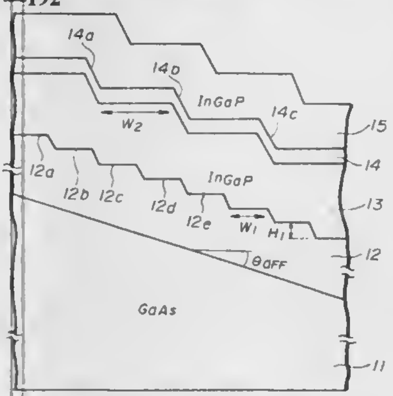
Toshihide Kikkawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 3, 1996, Ser. No. 625,704

Claims priority, application Japan, Apr. 28, 1995, 7-104916

Int. Cl.^{6} H01L *31/0328*

U.S. Cl. 257—192 **6 Claims**



1. A high electron mobility transistor, comprising:

a substrate of semi-insulating GaAs having an inclined upper major surface;

a channel layer of undoped InGaAs provided on said substrate;

an electron supplying layer of n-type InGaP provided on said channel layer;

a cap layer of n-type GaAs provided on said electron supplying layer;

a gate electrode provided on said electron supplying layer with a Schottky contact therewith;

a source electrode provided on said cap layer at a first side of said gate electrode with an ohmic contact to said cap layer; and

a drain electrode provided on said cap layer at a second, opposite side of said gate electrode with an ohmic contact to said cap layer;

said channel layer having a multi-step structure on an upper major surface thereof,

wherein said multi-step structure includes a number of steps each having a step height of five or more atomic layers and a step width of 300 nm or more.

5,751,029
FIELD-EFFECT SEMICONDUCTOR DEVICE HAVING HETEROJUNCTION

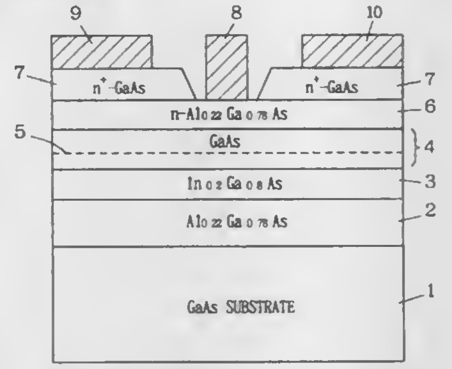
Shigeharu Matsushita, Katano; Daijirou Inoue, Kyoto; Kohji Matsumura, Hirakata; Minoru Sawada, Yawata, and Yasoo Harada, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed May 17, 1996, Ser. No. 651,340

Claims priority, application Japan, May 18, 1995, 7-120280

Int. Cl.^{6} H01L *31/0328;31/0336;31/072;31/109*

U.S. Cl. 257—194 **15 Claims**



1. A field-effect semiconductor device, comprising:

a first semiconductor layer, a fifth semiconductor layer, a second semiconductor layer which is undoped, a third semiconductor layer and a fourth semiconductor layer in this order.

wherein said third semiconductor layer has a forbidden band gap smaller than that of said fourth semiconductor layer,

said second semiconductor layer has a forbidden band gap smaller than those of said first semiconductor layer and said third semiconductor layer,

said fifth semiconductor layer has a forbidden band gap smaller than that of said first semiconductor layer and larger than that of said second semiconductor layer, and having an electron velocity larger than that of said first semiconductor layer,

said third semiconductor layer has a property of having a maximum carrier concentration higher than that of said fourth semiconductor layer and has an electron velocity larger than that of said fourth semiconductor layer,

said second semiconductor layer has an electron velocity larger than that of said third semiconductor layer,

a quantum well formed between said first and fourth semiconductor layers, said second semiconductor layer serves as an electron-drifting layer said third semiconductor layer serves as an electron-supplying layer, and said electron-drifting layer and said electron-supplying layer are formed in the quantum well, and

an impurity-doped layer doped with impurity elements of one conductivity type is provided in part or over the entirety of a thickness direction of said third semiconductor layer.

5,751,030
FIELD EFFECT TRANSISTOR

Kazuhisa Fujimoto, Kyoto; Toshinobu Matsuno, Osaka, and Kaoru Inoue, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1997, Ser. No. 806,798

Claims priority, application Japan, Feb. 27, 1996, 8-039447; Aug. 29, 1996, 8-228087

Int. Cl.^{6} H01L *31/0328*

U.S. Cl. 257—194 **13 Claims**

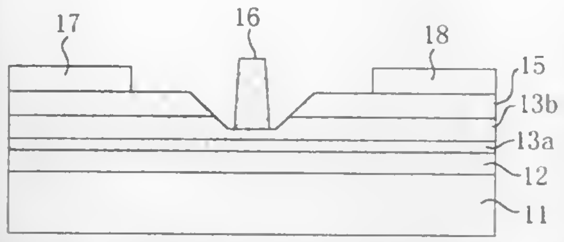
1. A field effect transistor, comprising:

a substrate;

a buffer layer formed on the substrate by epitaxial growth;

an active layer formed on the buffer layer, in which an operating current is to flow;

a gate electrode formed on or above the active layer; and



source-drain formed in regions located at both sides of the gate electrode above the substrate and connected to both ends of the active layer,

the active layer including:

an n-$In_aGa_{1-a}As$ layer formed on the buffer layer and having an In composition ratio a (0<a<1); and

an n-$In_bGa_{1-b}As$ layer formed on the n-$In_aGa_{1-a}As$ layer and having an In composition ratio b (0<b<a).

5,751,031

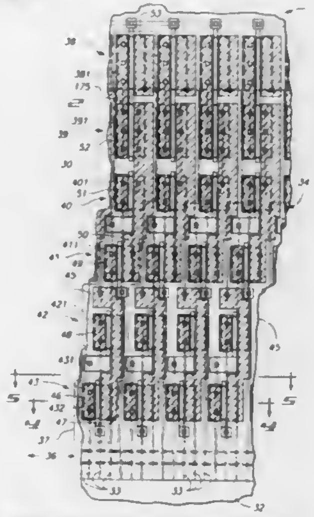
MEMORY AND OTHER INTEGRATED CIRCUITRY HAVING A CONDUCTIVE INTERCONNECT LINE PITCH OF LESS THAN 0.6 MICRON

J. Wayne Thompson, and Troy A. Manning, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 431,900, May 1, 1995, abandoned. This application Apr. 28, 1997, Ser. No. 848,529

Int. Cl.^{6} H01L *27/10;29/76;31/062;31/113*

U.S. Cl. 257—208 **22 Claims**



1. Memory integrated circuitry comprising:

a memory array having a plurality of memory cells, the memory cells comprising a series of conductive interconnect runners extending outwardly of the memory array, adjacent interconnect runners being laterally spaced from one another and having a pitch of no greater than 0.6 micron;

an array of pitch cells peripheral to the memory array, the pitch cells comprising the memory array series of conductive interconnect runners and correspondingly being on pitch with the array of memory cells, the array of pitch cells comprising individual pitch cells respectively having a plurality of field effect transistors having associated source/drain diffusion regions;

within a respective pitch cell, at least some separate and adjacent field effect transistors having separated and non-continuous source/drain diffusion regions;

an insulating dielectric layer overlying the respective pitch cell; and

an electrically conductive plug provided within the insulating dielectric layer in the array of pitch cells, the conductive plug extending between and electrically interconnecting a pair of separated and non-continuous source/drain diffusion regions of different transistors.

5,751,032

COLOR LINEAR CHARGE COUPLED DEVICE AND METHOD FOR DRIVING THE SAME

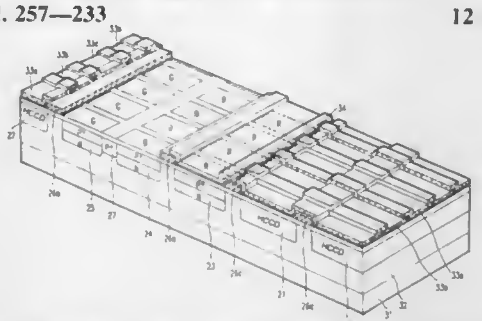
Young J. Yu, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Jun. 25, 1996, Ser. No. 670,099

Claims priority, application Rep. of Korea, Dec. 11, 1995, 1995/48245

Int. Cl.^{6} H01L *27/148;29/768;31/00*

U.S. Cl. 257—233 **12 Claims**



10. A color linear charge coupled device (CCD) comprising:

a first detecting photo diode array for generating first signal charges by photoelectric conversion;

a first transfer gate for moving the first signal charges, the first transfer gate positioned adjacent to the first detecting photo diode array;

a second detecting photo diode array for generating second signal charges by photoelectric conversion, the second detection photo diode array positioned adjacent to the first transfer gate and on the side of the first transfer gate opposite the first detecting photo diode array;

a second transfer gate for moving the first and second signal charges, the second transfer gate positioned adjacent to the second detecting photo diode and on the side of the second detecting photo diode opposite the first transfer gate, the second transfer gate being operated so that the signal charges from the second detecting photo diode are moved through the second transfer gate, and subsequently, the signal charges from the first detecting photo diode are moved through the second transfer gate; and

a storage gate provided on said second detecting photo diode array for controlling the movement of the signal charges by holding a potential of the second detecting photo diode array below a potential of the first detecting photo diode array throughout the operation of the second transfer gate.

5,751,033

FREQUENCY CONVERTER CIRCUIT STRUCTURE HAVING TWO SOURCES

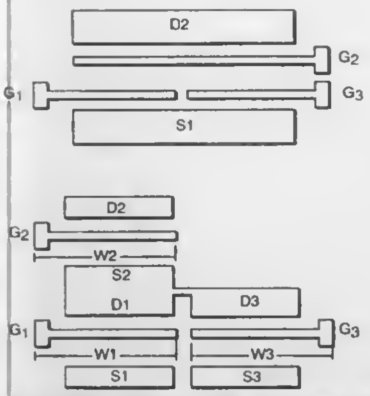
Tatsuya Miya, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 394,885, Feb. 27, 1995, abandoned. This application Jul. 8, 1996, Ser. No. 676,914

Claims priority, application Japan, Mar. 15, 1994, 6-043421

Int. Cl.^{6} H01L *29/80*

U.S. Cl. 257—270 **4 Claims**



1. A frequency converting circuit for high conversion gain comprising as a frequency mixing element, a first FET provided with a first, a second, and a third gate,

said first FET having first and second sources which are aligned with each other and also having a drain, the first and second sources of said first FET being formed in parallel to said drain; and first and third gates being aligned with each other, the second gate being formed along one straight line and the first and third gates being formed along another straight line, said straight lines being located between and parallel to said drain and said sources, said one straight line being on the drain side of said straight lines and extending over a whole width of said drain, and said other line being on the source side of said straight lines so that said first gate controls a drain current which flows between said drain and said first source and also so that said third gate controls a drain current which flows between said drain and said second source; and

said first FET also having a diffusion region formed between said second gate, and said first and third gates, so that said diffusion region acts as a source of a second FET which comprises the drain of said first FET, the second gate and the diffusion region acting as drains of both said first FET and a third FET which comprises the diffusion region, the first and third gates, and the first and second sources of the first FET, respectively;

wherein said first gate is biased to be substantially equal to a pinch-off voltage and said third gate is biased so that a major part of a drain current of the first FET passes through the third FET.

5,751,034

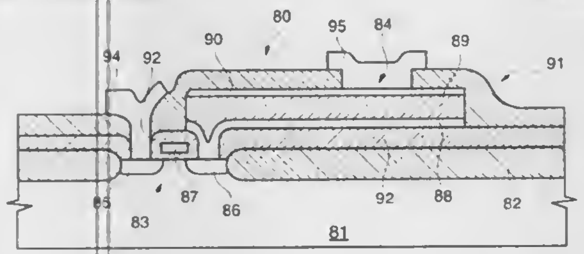
HIGH DIELECTRIC CONSTANT BARIUM-STRONTIUM-NIOBIUM OXIDES FOR INTEGRATED CIRCUIT APPLICATIONS

Joseph D. Cuchiaro; Vikram Joshi; Claudia P. DaCruz; John M. McNelis, and Carlos A. Paz de Araujo, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 597,425, Feb. 8, 1996, abandoned. This application Jun. 12, 1997, Ser. No. 873,827

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—295 **9 Claims**



1. An integrated circuit dielectric memory comprising a plurality of thin film layers, said memory including a memory cell in which the dielectric layer comprises a high dielectric constant metal oxide including the metals barium, strontium, and niobium and wherein said metal-oxide has the formula $Ba_xSr_yNb_zO_{3O}$, where x=1.3 to 3.5, y=1.5 to 3.7.

5,751,035

SEMICONDUCTOR DEVICE PROVIDED WITH LDD TRANSISTORS

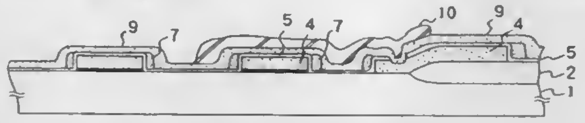
Yasushi Kameda, Yokosuka, and Makoto Segawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Sep. 23, 1996, Ser. No. 718,657

Claims priority, application Japan, Sep. 27, 1995, 7-249164

Int. Cl.^{6} H01L *27/108;29/76;29/94;31/119*

U.S. Cl. 257—300 **7 Claims**



1. A semiconductor device comprising:

at least one transistor formed on a semiconductor substrate, the transistor having a gate and a conductive sidewall spacer adjacent the gate;

a first conductive film formed on the semiconductor substrate:

an insulative film formed on the first conductive film: and

a second conductive film formed on the insulative film, the second conductive film covering the gate of the transistor and connecting the conductive sidewall spacer and the first conductive film;

wherein the conductive sidewall spacer and the second conductive film define a capacitor electrode when a voltage different from a voltage supplied to the gate of the transistor is supplied to the capacitor electrode.

5,751,036

FLOATING GATE TYPE NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

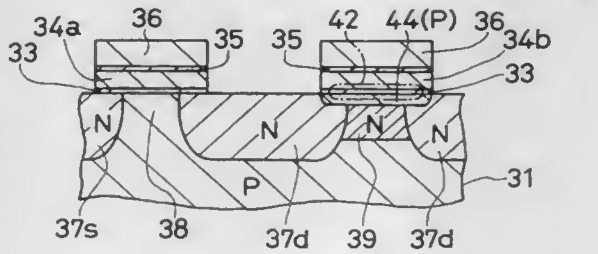
Akira Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed May 24, 1996, Ser. No. 651,784

Claims priority, application Japan, Jun. 2, 1995, 7-159988

Int. Cl.^{6} H01L *29/76;29/788*

U.S. Cl. 257—315 **8 Claims**



1. A floating gate type non-volatile semiconductor memory device comprising:

a Si substrate having a first conduction type and defining an active region and an isolation region;

a first SiO_2 film formed on a surface of the isolation region of the Si substrate;

a second SiO_2 film formed as a gate oxide film on a surface of the active region surrounded by the first film formed on the surface of the isolation region of the Si substrate:

a first polysilicon film forming a floating gate which is isolated for each memory cell and formed on the first and second SiO_2 films, the first polysilicon film having a predetermined shape, end portions of which cross the active region, a coupling portion for the end portions arranged only on the first SiO_2 film;

a third SiO_2 film on the polysilicon film forming a capacitor coupling insulating film;

a second polysilicon film on the first and third SiO_2 films forming a control gate for memory cells of said memory device;

source and drain diffusion layers of a second conductivity type formed in the active region on both sides of the first and second polysilicon films, the active region below one of the end portions serving as a channel region;

an impurity diffusion layer having a second conductivity type buried in the active region below the other end portion of the first polysilicon film, the overlapping portion of the other end portion with the drain diffusion layer and the impurity diffusion layer serving as a tunnel region;

whereupon a parasitic inversion layer having a first conductivity type is formed below the other end portion of the first polysilicon film, so that electrons are to be extracted from the first polysilicon film to the drain diffusion layer to rewrite data, the parasitic inversion layer does not contact the Si substrate below the parasitic inversion layer because of the presence of the impurity diffusion layer of the second conductivity type formed below the parasitic inversion layer.

5,751,037

NON-VOLATILE MEMORY CELL HAVING DUAL GATE ELECTRODES

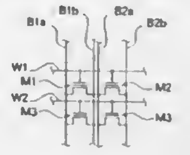
Hiroshi Aozasa, and Yutaka Hayashi, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

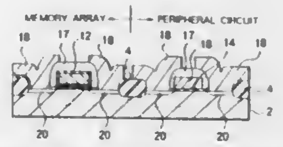
Filed Jul. 26, 1996, Ser. No. 686,561

Claims priority, application Japan, Jul. 27, 1995, 7-192118; Feb. 16, 1996, 8-029718

Int. Cl.^{6} H01L *29/76;29/788*

U.S. Cl. 257—315 **17 Claims**





1. A non-volatile semiconductor memory device with reduced read disturb comprising:

a semiconductor layer having a first surface and a second surface;

a first insulating layer formed on said first surface and a second insulating layer formed on said second surface; and

a first gate electrode formed on said first insulating layer and a second gate electrode formed on said second insulating layer;

a charge storing means located in said first insulating layer; and

a channel region formed in said semiconductor layer between said first gate electrode and said second gate electrode;

wherein a thickness of said semiconductor layer at said channel region is such that a first electric field of said first surface of said semiconductor layer exerts an influence on a second electric field of said second surface of said semiconductor layer such that both a first gate threshold voltage measured with respect to said first gate electrode and a second gate threshold voltage measured with respect to said second gate electrode are changed by a charge stored in said charge storing means; and

said thickness of said semiconductor layer "d" being determined by the following equation:

$$d \leqq (4\epsilon\phi_F/qN_B^{1/2}$$

where:

$$\phi_F=(kT/q)(1n(N_B n_i);$$

ϵ is the dielectric constant of said semiconductor layer;

q is the amount of the charge of an electron;

N_B is the concentration of impurities in said channel region;

k is Boltzmann's constant;

T is absolute temperature; and

n_i is the intrinsic carrier concentration of said semiconductor layer.

5,751,038

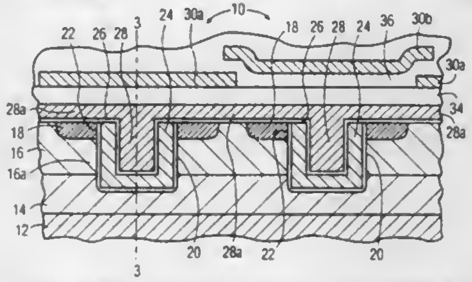
ELECTRICALLY ERASABLE AND PROGRAMMABLE READ ONLY MEMORY (EEPROM) HAVING MULTIPLE OVERLAPPING METALLIZATION LAYERS

Satyendranath Mukherjee, Yorkstown Heights, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Nov. 26, 1996, Ser. No. 753,554

Int. Cl.^{6} H01L *29/788;* **G11C** *11/40*

U.S. Cl. 257—316 **8 Claims**



1. An Electrically Erasable and Programmable Read Only Memory (EEPROM) having an array of memory cells, each memory cell having a trench configuration and a semiconductor drain region adjacent a surface-adjoining portion of said trench, characterized in that said EEPROM is provided with at least two overlapping metallization layers overlying said memory cells separated from each other and from said trenches and said drain regions by regions of insulating material, and in that each of said overlapping metallization layers contact the drain region of at least one underlying memory cell through said insulating material.

5,751,039

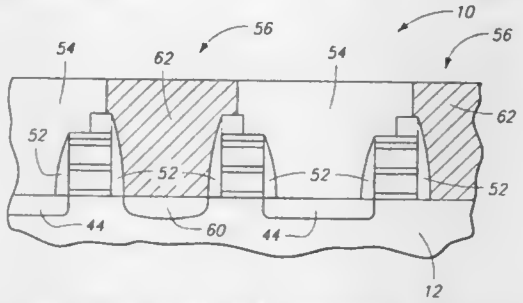
PROGRAMMABLE NON-VOLATILE MEMORY CELL AND METHOD OF FORMING A NON-VOLATILE MEMORY CELL

Ralph Kauffman, and Roger Lee, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 702,736, Aug. 23, 1996, abandoned, which is a division of Ser. No. 444,859, May 19, 1995, Pat. No. 5,661,054. This application Sep. 19, 1997, Ser. No. 934,439

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—316 **21 Claims**



1. A non-volatile memory array comprising:

first and second word lines having respective conductive floating gates atop a semiconductor substrate, the first and second word lines being adjacent one another and defining a substrate transistor drain region therebetween, the first and second word lines having inwardly opposing and facing drain sidewall edges defined in part by respective conductive portions of the respective conductive floating gates, the first and second word lines having outwardly opposing source sidewall edges defined in part by different respective conductive portions of the respective conductive floating gates, the word lines further comprising individual respective nitride blocks having respective inner drain sidewall edges which align with the respective word line drain sidewall edge, the nitride blocks having a respective outer source sidewall edge positioned intermediate the respective word line drain sidewall edge and the respective word line source sidewall edge;

a sidewall spacer over each first and second word line drain sidewall edge, the inner drain sidewall edges of the nitride blocks joining with the sidewall spacers to cover the first and second word line drain sidewall edges; and

a conductive plug extending upwardly from the substrate drain region.

5,751,040

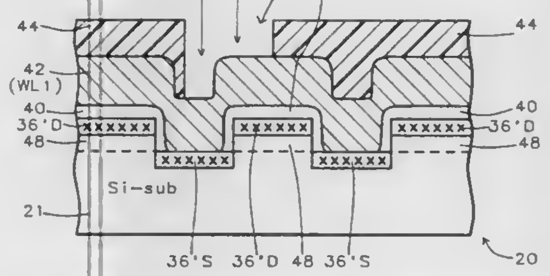
SELF-ALIGNED SOURCE/DRAIN MASK ROM MEMORY CELL USING TRENCH ETCHED CHANNEL

Ling Chen, Sunnyvale, Calif.; Hung-Cheng Sung, Kaohsinng, and Chi-Shiung Lo, Hsinchu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Sep. 16, 1996, Ser. No. 716,809

Int. Cl.^{6} H01L *27/02;27/10*

U.S. Cl. 257—332 **20 Claims**



1. A plurality of semiconductor memory devices on a silicon semiconductor substrate said devices having vertical channels comprising:

a plurality of trenches in the surface of said silicon semiconductor substrate, said trenches having sidewalls in which channel regions are located,

ion implanted source and drain regions in said substrate doped with an N type dopant self-aligned with said trenches with said source regions and said drain regions formed in said substrate, said source regions located below said trenches and said drain regions juxtaposed with and located between said trenches, said channel regions formed in said substrate between said trenches below said drain regions,

a dielectric layer over said source/drain regions,

a conductive word-line over said dielectric layer extending continuously across a said drain region down into a said trench extending across said source regions and across a next one of said drain regions and extending down into a next one of said said trenches and crossing a following one of said source regions, and

a ROM code program implant region in one of said channels in the sidewall between one of said source regions and one of said drain regions adjacent thereto, said ROM code program implant region having been ion implanted with a dose of boron through said conductive word-line into one of said channel regions in said device in a selected region of said device.

5,751,041

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

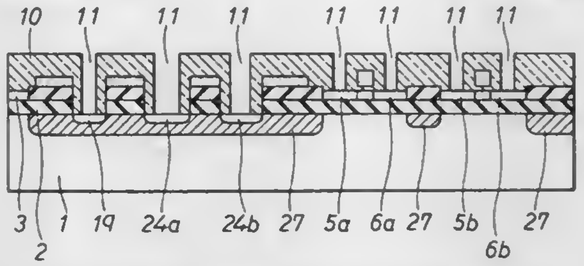
Megumi Suzuki; Akiyoshi Asai, and Jun Sakakibara, all of Kariya, Japan, assignors to Denso Corporataion, Kariya, Japan

Filed Oct. 16, 1996, Ser. No. 732,995

Claims priority, application Japan, Oct. 23, 1995, 7-274433

Int. Cl.^{6} H01L *27/01;23/62*

U.S. Cl. 257—357 **24 Claims**



1. A semiconductor integrated circuit device comprising:

a first conductivity type semiconductor substrate:

an insulating layer formed on the semiconductor substrate:

a semiconductor layer formed on the insulating layer;

a first semiconductor circuit element formed on the semiconductor layer; and

a second semiconductor circuit element formed within the semiconductor substrate to have a second conductivity type first diffusion layer, the first diffusion layer being formed at the surface of the semiconductor substrate where the semiconductor substrate faces the insulating layer;

wherein the second conductivity type first diffusion layer has its periphery surrounded completely on a planar basis by a first conductivity type second diffusion layer whose concentration is higher than that of the semiconductor substrate, the second diffusion layer being formed at the surface of the semiconductor substrate where the semiconductor substrate faces the insulating layer.

5,751,042

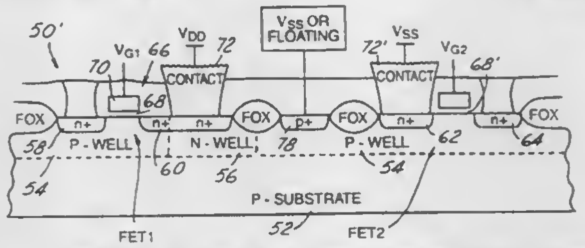
INTERNAL ESD PROTECTION CIRCUIT FOR SEMICONDUCTOR DEVICES

Ta-Lee Yu, Hsin Chu, Taiwan, assignor to Winbond Electronics Corporation, Hsinchu, Taiwan

Filed Feb. 15, 1996, Ser. No. 602,007

Int. Cl.^{6} H01L *23/62;29/76;29/94*

U.S. Cl. 257—360 **9 Claims**



1. A structure for use in a semiconductor device having improved resistance to failure from electrostatic discharge (ESD) events, comprising:

a first n-channel device formed in a p-type semiconductor substrate having first and second n+ regions:

a second n-channel device adjacent said first n-channel device formed in said substrate having third and fourth n+ regions;

said second n+ region being adjacent to said third n+ region, said second n+ region being coupled to one of a positive power supply terminal (V_{DD}) and a negative power supply terminal (V_{SS}), said third n+ region being coupled to the other one of said positive and negative power supply terminals; and

means proximate said first and second n-channel devices for protecting said semiconductor device from damage from ESD events that occur with reference to at least one of said positive and negative power supply terminals, said protecting means comprises a region of N-conductivity type formed in said substrate to define an N-well region, said N-well region substantially overlapping said second n+ region and extending laterally towards said third n+ region wherein said N-well region is doped to a concentration lower than the concentration of said third n+ region to thereby increase a junction breakdown voltage threshold.

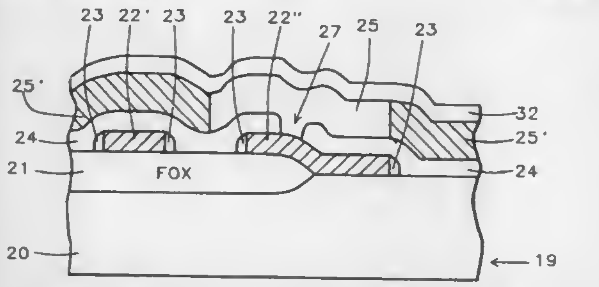
5,751,043
SRAM WITH SIPOS RESISTOR

Chue-San You, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Continuation of Ser. No. 518,704, Aug. 24, 1995, abandoned, which is a division of Ser. No. 280,219, Jul. 25, 1994, Pat. No. 5,470,779. This application Mar. 25, 1997, Ser. No. 823,572

Int. Cl.^{6} H01L *27/11*

U.S. Cl. 257—380 **12 Claims**



1. A semiconductor device on a semiconductor substrate including an SRAM cell with a resistor comprising:

a patterned and etched first polysilicon layer on said semiconductor substrate,

an undoped interpolysilicon layer formed over said first polysilicon layer patterned with an opening through said undoped interpolysilicon layer to a contact area on the surface of said first polysilicon layer,

a Semi-Insulating POlycrystalline Silicon, referred to hereinafter as SIPOS, layer formed over the top surface of said undoped interpolysilicon layer,

said SIPOS layer comprising a main undoped SIPOS load resistor region and a doped remainder SIPOS region, said undoped load resistor region extending down through said opening through said undoped interpolysilicon layer to said contact area on the surface of said first polysilicon layer in contact with said first polysilicon layer through said opening, and said undoped load resistor region extending over said undoped interpolysilicon layer to said doped SIPOS region of said SIPOS layer,

said doped remainder of said SIPOS layer comprising said doped SIPOS region comprising an interconnect conductor structure integral with said load resistor region, said doped SIPOS having been doped with ions providing a lower resistance of said remainder of said SIPOS layer than said load resistor region, said conductor structure overlying said undoped interpolysilicon layer, and

a dielectric layer formed over said SIPOS layer.

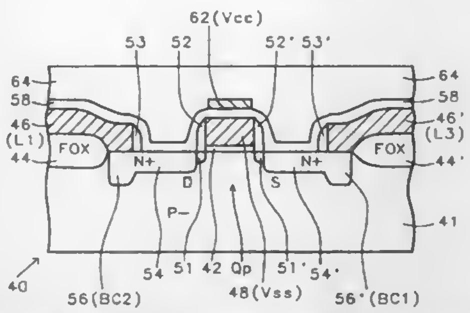
5,751,044
MANUFACTURE DEVICE OF FOUR TRANSISTOR SRAM CELL LAYOUT AND DEVICE

Jin-Yuan Lee, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Division of Ser. No. 507,139, Jul. 26, 1995, Pat. No. 5,686,336. This application Jul. 24, 1997, Ser. No. 899,737

Int. Cl.^{6} H01L *21/8244*

U.S. Cl. 257—380 **9 Claims**



1. An SRAM silicon device comprising a set of cross-coupled inverters forming a bistable flip flop formed on a semiconductor substrate with a pair of FOX regions formed defining an area on the surface of a substrate comprising,

said substrate composed of a semiconductor material,

a pair of buried contact regions in said silicon substrate juxtaposed with said FOX regions,

a control gate electrode of a parasitic FET device formed on a gate oxide layer on the surface of said substrate,

a source region and drain region formed in said substrate juxtaposed with said control gate electrode and reaching to said buried contact regions,

an interpolysilicon dielectric above said control gate electrode covering said device, and

a polysilicon conductor formed over said gate.

5,751,045
NAND TYPE NON-VOLATILE MEMORY DEVICE

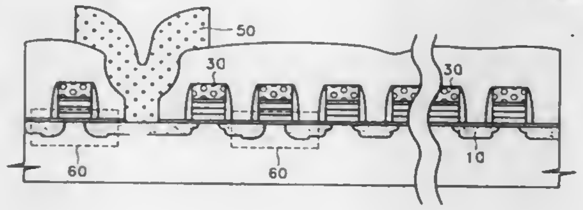
Jung-dal Choi; Sung-bu Jun, and Byeung-chul Kim, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Feb. 21, 1996, Ser. No. 604,301

Claims priority, application Rep. of Korea, Apr. 11, 1995, 95-8400

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—392 **4 Claims**



1. A NAND type non-volatile memory comprising:

a series circuit including:

a plurality of data memory cells comprised of serially connected transistors; and

a plurality of serially connected depletion-type and enhancement-type transistors for string selection in order to select a specific cell among said plurality of data memory cells;

wherein an ion-implanting region is formed in source and drain regions of the depletion-type transistor for string selection, and a junction depth of the source and drain regions of the depletion type transistor for string selection is greater than those of the sources and drains of said enhancement-type transistors and said transistors of said data memory cells.

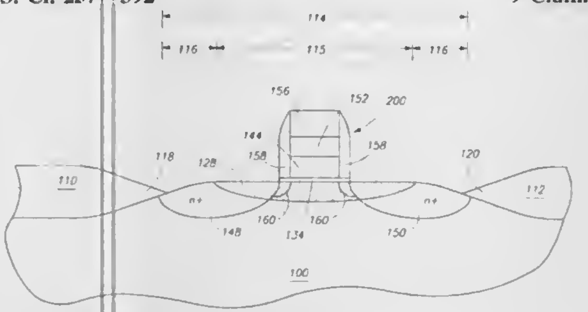
5,751,046
SEMICONDUCTOR DEVICE WITH V_T IMPLANT

Charles H. Dennison, Meridian, and Ken Marr, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 661,824, Jun. 11, 1996, abandoned, which is a division of Ser. No. 514,106, Aug. 11, 1995, Pat. No. 5,650,350. This application May 5, 1997, Ser. No. 850,950

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—392 **9 Claims**



1. A semiconductor device comprising:

a substrate;

a static random access memory cell on the substrate, the static random access memory cell including an n-type access transistor; and

field oxide surrounding the access transistor, the access transistor having a central region, a bird's beak area surrounding the central region, a field oxide area connected to and extending from the bird's beak area, and an area below the bird's beak, the central region having a p-type V_T ion implant concentration, the area below the bird's beak being substantially void of said V_T implant.

5,751,047
SEMICONDUCTOR CIRCUIT WITH REDUCED P-N JUNCTION CAPACITANCE

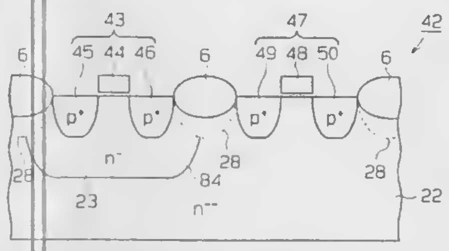
Kiyonori Ogura, Kasugai, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 11, 1996, Ser. No. 630,851

Claims priority, application Japan, Sep. 14, 1995, 7-237241

Int. Cl.^{6} H01L *29/68*

U.S. Cl. 257—394 **5 Claims**



1. A semiconductor circuit device comprising:

a semiconductor substrate of a first conductivity type;

a well area formed on said substrate; said well area being of said first conductivity type as said substrate and having higher concentration of impurity than that of said substrate;

a first element formed in said well area; said first element being of a second conductivity type different from said first conductivity type;

a second element of said second conductivity type formed in said substrate; and

a field oxide located between said first element from said second element,

wherein a channel cut diffusion area is formed below said field oxide between said first element and said second element, and wherein a substantially vertical boundary of said well area and said substrate is located below said field oxide at about the midpoint position between said first element and said second element.

5,751,048
SEMICONDUCTOR DEVICE HAVING A CONTACT WINDOW STRUCTURE

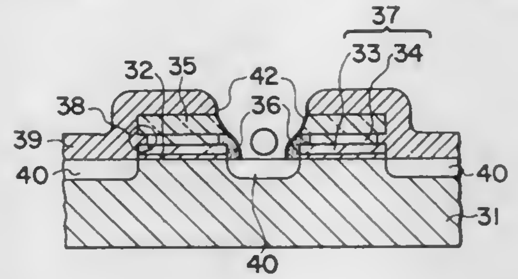
Yong Hee Lee, Seoul, and Young Woo Seo, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 155,745, Nov. 23, 1993, Pat. No. 5,491,100. This application Nov. 3, 1995, Ser. No. 553,038

Claims priority, application Rep. of Korea, Nov. 23, 1992, 92-22040

Int. Cl.^{6} H01L *29/76;29/94*

U.S. Cl. 257—412 **4 Claims**



1. A semiconductor device with a gate structure, said semiconductor device comprising:

a gate insulating layer formed on a semiconductor substrate;

a gate structure having a first conductive layer of polycrystalline silicon and a second conductive layer of refractory metal silicide, said first conductive layer being formed on said gate insulating layer and said second conductive layer being formed on said first conductive layer, said second conductive layer having a recessed edge portion with respect to an edge portion of said first conductive layer; and

a first insulating layer formed on a top surface of said second conductive layer and having a protrusion portion with respect to an edge of said second conductive layer.

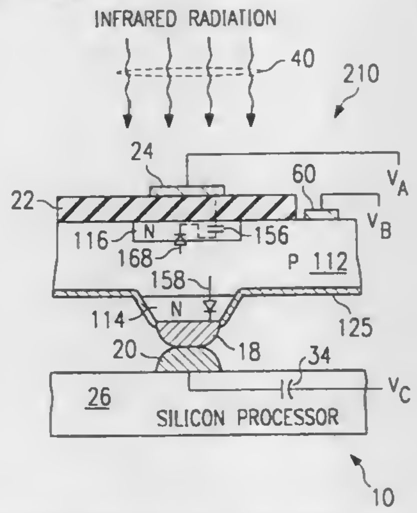
5,751,049
TWO-COLOR INFRARED DETECTOR

Michael W. Goodwin, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 128,977, Sep. 29, 1993, and Ser. No. 108,200, Aug. 16, 1993. This application Sep. 14, 1994, Ser. No. 305,639

Int. Cl.^{6} H01L *27/14;31/00*

U.S. Cl. 257—440 **28 Claims**



1. A two-color infrared detector comprising:

(a) a diode having first, second and third semiconductor regions, said second semiconductor region disposed between said first and third semiconductor regions and said first and third regions spaced from each other;

(b) said first semiconductor region composed of material of a first conductivity type and operable to generate electron-hole pairs when struck by infrared radiation having a first wavelength; said second semiconductor region composed of material of said first conductivity type and operable to generate electron-hole pairs when struck by infrared radiation having a second wavelength different from said first wavelength; said third semiconductor region composed of material of conductivity type opposite said first type and operable to generate electron-hole pairs when struck by infrared radiation having said second wavelength;

(c) an electrical insulator layer disposed on said first semiconductor region and remote from said second semiconductor region;

(d) a metal gate disposed on said electrical insulator layer and remote from said second semiconductor region for creating a potential well in said first semiconductor region;

(e) an electrically conductive layer disposed on said first semiconductor region, adjacent to said electrical insulator layer, spaced from said metal gate and remote from said second semiconductor region; and

(f) an electrical conductor disposed on said third semiconductor region remote from said first and second semiconductor regions.

5,751,050

SEMICONDUCTOR DEVICE HAVING A POLYSILICON RESISTOR ELEMENT WITH INCREASED STABILITY AND METHOD OF FABRICATING SAME

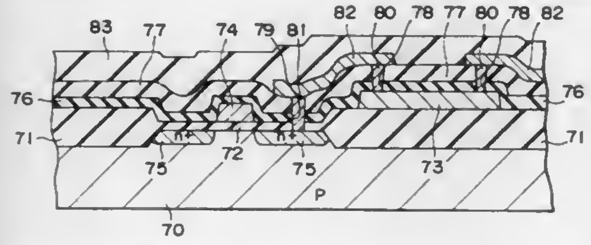
Hiraku Ishikawa, and Tatsuya Usami, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1996, Ser. No. 736,506

Claims priority, application Japan, Oct. 25, 1995, 7-302125

Int. Cl.^{6} H01L *31/0368*

U.S. Cl. 257—538 **14 Claims**



1. A semiconductor device having a resistor element comprising:

a substrate;

a resistor layer formed of polysilicon on said substrate; and

a first interlayer insulator film formed on said resistor layer, said first interlayer insulator film being comprised of a silicon oxide film formed by chemical vapor deposition which applies a high-frequency electric field so that hydrogen atomic concentration of said resistor layer is increased to be equal to or greater than $6 \times 10^{18}/cm^3$ and the resistance of said resistor layer is stabilized against diffusion of lower concentrations of incidental hydrogen atoms.

5,751,051

SEMICONDUCTOR DEVICE EQUIPPED WITH ELECTROSTATIC BREAKDOWN PROTECTION CIRCUIT

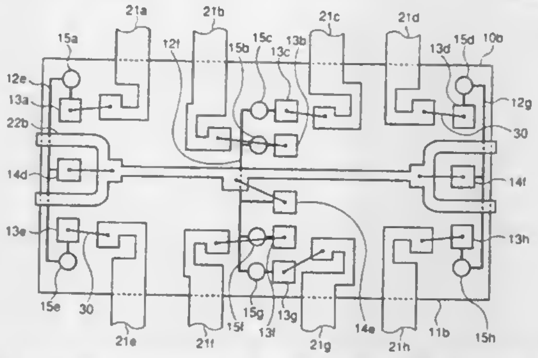
Kiminori Hayano, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 680,291, Jul. 12, 1996, abandoned. This application Oct. 16, 1997, Ser. No. 951,412

Claims priority, application Japan, Jul. 18, 1995, 7-181348

Int. Cl.^{6} H01L *29/00;* **H02H** *9/00*

U.S. Cl. 257—546 **7 Claims**



1. A semiconductor device with a semiconductor chip having an internal circuit for outputting a predetermined signal after having been processed in response to an input signal, said semiconductor device comprising:

first and second separate regions which are formed by dividing said semiconductor chip;

first and second common discharge lines, said first common discharge line being provided only in said first separate region and said second common discharge line being provided only in said second separate region, said common discharge lines being independent from one another;

a plurality of bonding pads including at least one first bonding pad which is connected directly to said first common discharge line;

at least one second bonding pad which is connected directly to said second common discharge line;

first protective elements which are connected between bonding pads other than said first and second bonding pads and said first common discharge line;

second protective elements which are connected between other bonding pads other than said first and second bonding pads, and said second common discharge line;

an inner lead for discharging which is directly connected to said first and second bonding pads and is bonded to a surface of said semiconductor chip, said inner lead also being for holding the semiconductor chip in a lead-on-chip arrangement; and

bonding wires for bonding said inner lead and said first and second bonding pads.

5,751,052

INDUCTIVE DRIVER CIRCUIT AND METHOD THEREFOR

David M. Heminger, Mesa; Vincent L. Mirtich, Scottsdale, and William H. Grant, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1996, Ser. No. 617,722

Int. Cl.^{6} H01L *27/082*

U.S. Cl. 257—577 **19 Claims**

1. A method of forming an inductive driver circuit comprising:

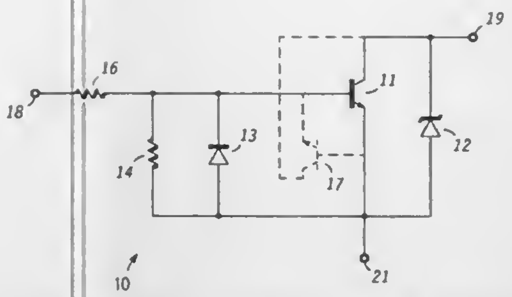
providing a substrate;

forming a driver transistor on the substrate, the driver transistor having a collector, a base, and an emitter;

forming an input protection device on the substrate;

forming a voltage suppression device on the substrate, the voltage suppression device having an anode formed within the collector wherein a cathode of the voltage suppression device has a higher doping concentration than an anode of the voltage suppression device; and

forming a shunt resistor on the substrate wherein the shunt resistor is coupled between the base and the emitter of the driver transistor.



5,751,053

SEMICONDUCTOR DEVICE HAVING A BIPOLAR TRANSISTOR AND METHOD OF MANUFACTURING THE SAME

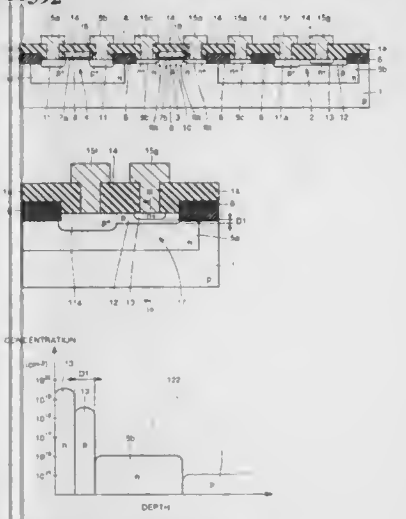
Hiroki Honda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 397,517, Mar. 2, 1995, abandoned. This application Jun. 9, 1997, Ser. No. 870,267

Claims priority, application Japan, Jun. 21, 1994, 6-138513

Int. Cl.^{6} H01L *27/082*

U.S. Cl. 257—592 **13 Claims**



1. A bipolar transistor comprising:

a semiconductor substrate of a first conductivity type having a main surface;

a collector layer of a second conductivity type formed at the main surface of said semiconductor substrate;

a base layer of the first conductivity type formed at the surface of said collector layer; and

an emitter layer of the second conductivity type formed at the surface of said base layer, wherein

a concentration of an impurity of the second conductivity type contained in said collector layer between said base layer and the substrate in the depth direction of the substrate is not more than 5×10^{18} cm^{-3}, and said base layer located immediately under said emitter layer has a diffusion depth not more than 0.3 μm.

5,751,054

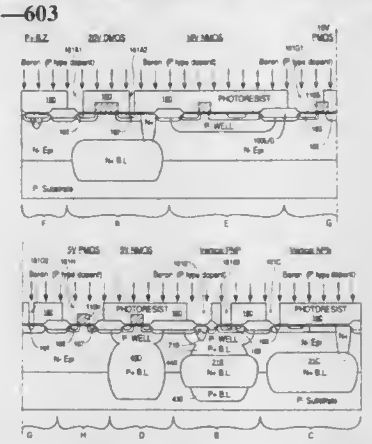
ZENER DIODES ON THE SAME WAFER WITH BICDMOS STRUCTURES

Hamza Yilmaz, Saratoga; Richard K. Williams, Cupertino; Michael E. Cornell, Campbell, and Jun Wei Chen, Saratoga, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Continuation of Ser. No. 335,526, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 26,932, Mar. 5, 1993, Pat. No. 5,374,569, which is a division of Ser. No. 948,276, Sep. 21, 1992, abandoned. This application Aug. 29, 1996, Ser. No. 705,910

Int. Cl.^{6} H01L *29/861;29/76;29/94;23/62*

U.S. Cl. 257—603 **9 Claims**



1. A semiconductor structure comprising, an MOS transistor and a plurality of zener diodes on a single wafer, said single wafer comprising a semiconductor layer having an upper surface, said semiconductor layer having a first conductivity type, wherein said MOS transistor comprises a source, a drain and a drain contact region, each having said first conductivity type, and wherein said plurality of zener diodes comprises

a plurality of laterally separated first zener regions formed into said upper surface of said semiconductor layer, each of said first zener regions having a second conductivity type opposite said first conductivity type;

at least one second zener region, said at least one second zener region having said first conductivity type, wherein said at least one second zener region surrounds in a laterally oriented plane at least one of said plurality of first zener regions, said at least one of said plurality of first zener regions having a portion which extends completely through said at least one second zener region; and

a plurality of third zener regions, said third zener regions having said first conductivity type, wherein each of said third zener regions corresponds with and makes contact with one of said first zener regions to form one of said plurality of zener diodes, wherein the semiconductor layer has a first dopant concentration, said at least one second zener regions has a second dopant côncentration and said third zener regions have a third dopant concentration, wherein the first dopant concentration is less than the second dopant concentration, and the second dopant concentration is less than the third dopant concentration.

5,751,055

SEMICONDUCTOR SINGLE CRYSTALLINE SUBSTRATE AND METHOD FOR PRODUCTION THEREOF

Tamotsu Maruyama, Annaka, and Shigeyuki Sato, Niigataken, both of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

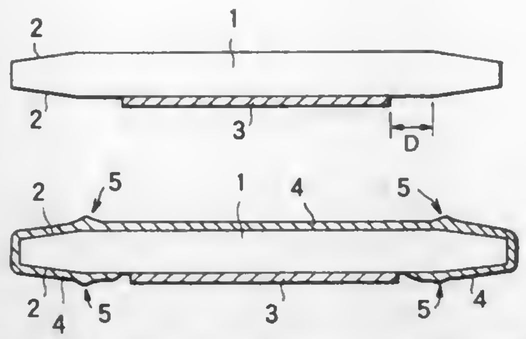
Filed Feb. 8, 1995, Ser. No. 385,544

Claims priority, application Japan, Feb. 12, 1994, 6-037681

Int. Cl.^{6} H01L *21/304;21/20;29/06*

U.S. Cl. 257—618 **3 Claims**

1. A silicon semiconductor single crystalline substrate comprising a main surface for growing a silicon epitaxial layer, a reverse



surface with a protecting film for preventing autodoping and a chamfer having a beveled surface formed at a periphery of the substrate, the chamfer having a width defined by a distance between an outermost part of the substrate and in an innermost part of the chamfer, said substrate being characterized in that the width of the chamfer is determined in order to locate an edge-crown formed by a vapor-phase epitaxial growth on the beveled surface of the chamfer, wherein a gap between a periphery of the protecting film and an innermost part of the chamfer is formed in a size of not less than 0.5 mm and not more than 2 mm, and wherein said protective film does not extend over said chamfer.

5,751,056

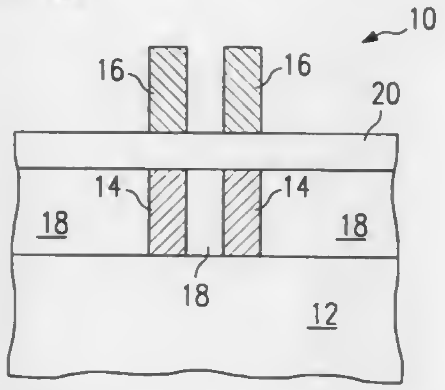
RELIABLE METAL LEADS IN HIGH SPEED LSI SEMICONDUCTORS USING DUMMY LEADS

Ken Numata, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 250,983, May 31, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,316

Int. Cl.^{6} H01L *23/495*

U.S. Cl. 257—666 13 Claims



1. A semiconductor device having metal leads with improved reliability, comprising:

a substrate;

at least two functional metal leads on said substrate;

a low-dielectric constant insulating material at least between said functional metal leads; and

dummy leads proximate said functional metal leads, wherein dummy leads are in such proximity to said functional metal leads as to dissipate Joule's heat from said functional metal leads, and wherein said low-dielectric constant insulating material has a dielectric constant of less than 3.5.

5,751,057

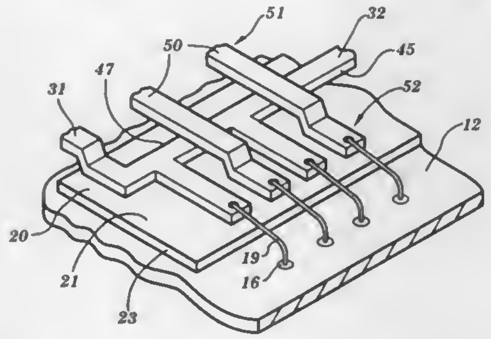
LEAD ON CHIP LEAD FRAME DESIGN WITHOUT JUMPOVER WIRING

Anthony Michael Palagonia, Underhill, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 526,254, Sep. 11, 1995, abandoned. This application Oct. 9, 1996, Ser. No. 728,534

Int. Cl.^{6} H01L *23/52;23/495*

U.S. Cl. 257—691 20 Claims



1. Apparatus comprising:

a plurality of chip pads;

a leadframe; and

a plurality of bond wires electrically coupling the chip pads to the leadframe, wherein the leadframe has at least one bus bar, each bus bar including: a primary distribution line having a terminal end extending from a first side thereof and a distribution finger extending from a second side thereof, wherein the primary distribution line and the distribution finger are coplanar, and wherein the distribution finger is adapted for electrically connecting bond wires with the primary distribution line.

5,751,058

SEMICONDUCTOR DEVICE HAVING PARALLEL OVERLAPPING MAIN CURRENT TERMINALS

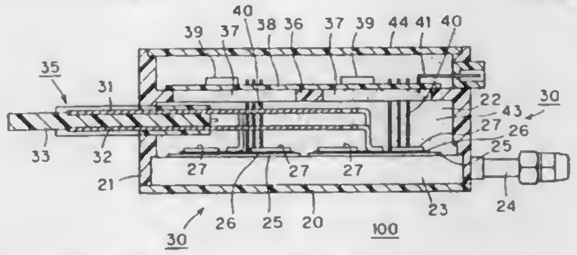
Masatoshi Matsuki, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1996, Ser. No. 635,767

Claims priority, application Japan, Oct. 25, 1995, 7-277587

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—692 15 Claims



1. A semiconductor device comprising:

a circuit substrate including wiring patterns along a major substrate surface and supporting a switching element having a pair of main electrodes coupled to the wiring patterns;

a case holding said circuit substrate;

a pair of electrically conductive main current terminals having a pair of first end portions inside the case adjacent to and electrically coupled with respective first and second ones of said pair of main electrodes and further having a pair of closely spaced parallel principal parts extending from respective ones of the first end portions, said closely spaced principal parts including a pair of respective closely spaced parallel second end portions projecting outside of said case, at least the pair of said closely spaced parallel principal parts of said pair of electrically conductive main current terminals having identical overlapping segments with plane contours;

an electrically insulating material filling in spaces at least between and around said closely spaced parallel principal parts inside said case;

an electrically insulating member having at least a supporting and separating flat plate segment located between said pair of closely spaced parallel second end portions maintaining electrical insulation therebetween, said flat plate segment extending from between said pair of closely spaced parallel second end portions all around the periphery thereof to improve the withstand voltage of the closely spaced parallel second end portions.

5,751,059

PYROELECTRIC SENSOR

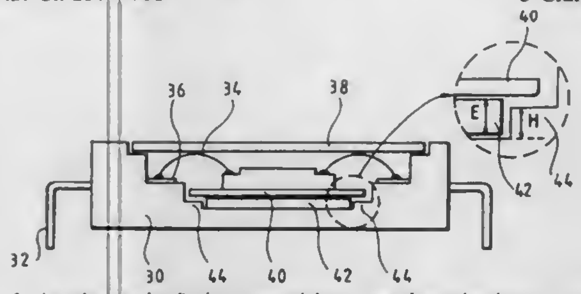
Roger Prost, St. Egreve, France, assignor to Thomson-CSF Semiconducteurs Specifiques, Paris, France

Continuation of Ser. No. 185,968, Feb. 9, 1994, abandoned. This application Apr. 12, 1996, Ser. No. 631,816

Claims priority, application France, Jun. 19, 1992, 92 07482

Int. Cl.^{6} H01L *23/053;23/06;23/34*

U.S. Cl. 257—701 5 Claims



1. An electronic device comprising: a package having a cavity therein, said cavity having a bottom;

a monolithic integrated circuit chip in said cavity, said chip having contact pads;

an elastically deformable layer between said chip and the bottom of said cavity;

conducting areas formed in said package for connection of the chip to external connections;

wires which electrically connect said monolithic integrated circuit chip to said conducting areas, each of said wires bonded to a respective conducting area of the package and to a corresponding contact pad of the chip;

wherein said elastically deformable layer absorbs vibrations imparted to said package, and wherein said chip is not mechanically connected to the package through any rigid part likely to transmit said vibrations to said monolithic integrated chip, wherein said chip is fixed to a rigid plate, and said elastically deformable layer is located between said rigid plate and the bottom of the cavity.

5,751,060

ELECTRONIC PACKAGE

Eric Herman Laine, Binghamton, and James Warren Wilson, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 378,347, Jan. 25, 1995, Pat. No. 5,616,958. This application Feb. 4, 1997, Ser. No. 795,181

Int. Cl.^{6} H01L *23/34;23/495;23/48*

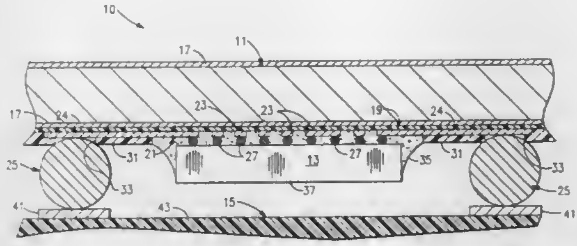
U.S. Cl. 257—702 17 Claims

1. An electronic package adapted for being electrically coupled to an electronic structure, said electronic package comprising:

a thermally conductive member;

at least one thin dielectric layer of organic material positioned directly on said thermally conductive member;

at least one layer of electrical circuitry formed on said at least one thin dielectric layer and including a first portion having a first circuit density and a second portion including a second circuit density less than said first density, said first and second portions being electrically coupled;



a semiconductor device positioned relative to said first portion of said electrical circuitry and electrically coupled to said first portion; and

a plurality of electrically conductive solder conductive members positioned in a predetermined pattern relative to said second portion of said electrical circuitry and electrically coupled to said second portion, said electrically conductive solder members adapted for being electrically coupled to said electronic structure when said electronic package is positioned on said structure.

5,751,061

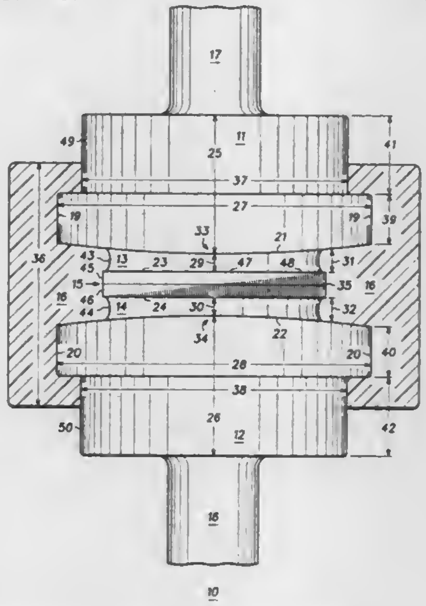
SEMICONDUCTOR DIODE DEVICE WITH NON-PLANAR HEATSINK AND METHOD OF MANUFACTURE

Lonne L. Mays, Gilbert, Ariz.; Jean-Baptiste Martin, Toulouse, France; Hiep M. Le, and James G. Lippmann, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1995, Ser. No. 573,844

Int. Cl.^{6} H01L *23/34*

U.S. Cl. 257—707 20 Claims



1. A semiconductor diode device comprising:

a p-n junction having a first region and a second region;

a first heatsink coupled to the first region of the p-n junction, the first heatsink having a first dome-shaped surface facing towards the p-n junction; and

a second heatsink coupled to the second region of the p-n junction, the second heatsink having a second dome-shaped surface and facing towards the p-n junction.

5,751,062
COOLING DEVICE OF MULTI-CHIP MODULE

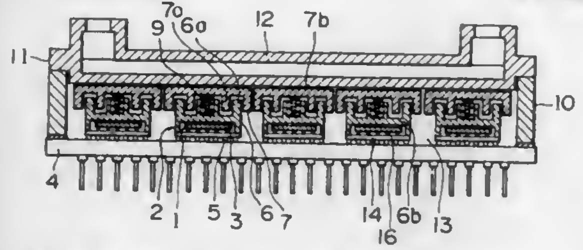
Takahiro Daikoku, Ushiku; Fumiyuki Kobayashi, Sagamihara; Noriyuki Ashiwake, Tsuchiura; Kenichi Kasai, Ushiku; Keizou Kawamura, Ibaraki-ken, and Akio Idei, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 571,711

Claims priority, application Japan, Dec. 15, 1994, 6-333389

Int. Cl.^{6} H01L *23/367*

U.S. Cl. 257—722 **14 Claims**



1. A cooling device of a multi-chip module, comprising:
a plurality of micropackages, each having an LSI chip hermetically sealed therein;
a first substrate having said micropackages mounted thereon;
a housing covering said first substrate;
heat conduction members provided respectively between said micropackages and said housing for conducting heat generated by said LSI chips to said housing;
wherein each of said micropackages includes a first heat conduction member, having a cap portion for receiving said LSI chip and a first fin that is integral with said cap portion and formed of the same material as that of said cap portion, and a second substrate fixed to said cap portion of said first heat conduction member;
wherein each of said LSI chips is mounted on said second substrate and fixed at a back surface thereof to an inner surface of said cap portion;
a cooler for finally releasing the heat generated by said LSI chips, wherein said cooler is formed integrally with the housing of the multi-chip module so as to be a constituent part of said housing; and
second heat conduction members, each having a second fin and being movable with respect to a respective associated first heat conduction member and said cooler to form a flexible heat conduction path, disposed in contact with said cooler, said second heat conduction members being respectively engaged in a heat transfer relationship with said respective associated first heat conduction member through said first and second fins.

5,751,063
MULTI-CHIP MODULE

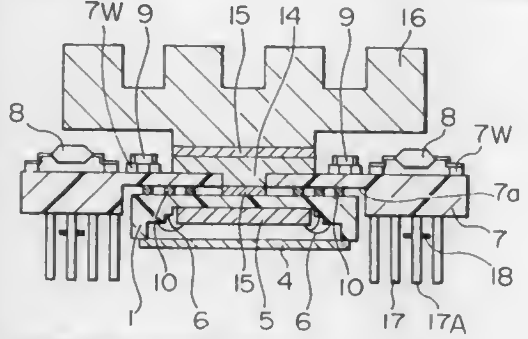
Mikio Baba, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 16, 1996, Ser. No. 714,675

Claims priority, application Japan, Sep. 18, 1995, 7-238015

Int. Cl.^{6} H01L *23/34;23/02;23/10*

U.S. Cl. 257—723 **5 Claims**



1. A multi-chip module comprising:
a first insulating board having a first surface and a second surface that is positioned opposite to said first surface;
at least one semiconductor chip mounted on said first surface of said first insulating board;
a plurality of metal connection members arranged on said second surface of said first insulating board;
a second insulating board that is connected to said plurality of metal connection members;
a metal plate that is securely attached to one part of said second surface of said first insulating board through an opening in said second insulating board; and
electric components mounted on a surface of said second insulating board.

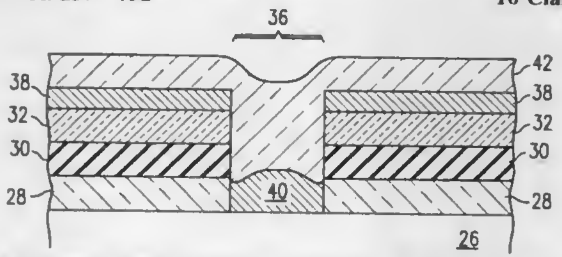
5,751,064
INTERMEDIATE STRUCTURE FOR INTEGRATED CIRCUIT DEVICES

Frank Randolph Bryant, Denton, and Loi Ngoc Nguyen, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 110,486, Aug. 23, 1993, Pat. No. 5,423,939, which is a continuation of Ser. No. 809,937, Dec. 18, 1991, abandoned. This application Mar. 3, 1995, Ser. No. 398,110

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—752 **16 Claims**



6. An intermediate structure useful during fabrication of a semiconductor device, comprising:
a first insulating layer on a substrate;
a barrier layer on the insulating layer;
a second insulating layer on the barrier layer;
an opening through the second insulating layer, the barrier layer, and the first insulating layer to expose a portion of the substrate;
a conductive plug filling the opening to a first thickness equal to a thickness of the first insulating layer; and
a third insulating layer within the opening and having an upper surface below an upper surface of the second insulating layer.

5,751,065
INTEGRATED CIRCUIT WITH ACTIVE DEVICES UNDER BOND PADS

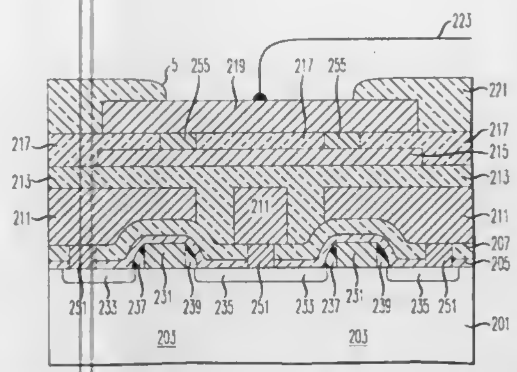
Sailesh Chittipeddi, Austin, Tex.; William Thomas Cochran, Clermont, Fla., and Yehuda Smooha, South Whitehall Township, Lehigh County, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 102,434, Aug. 5, 1993, abandoned. This application Oct. 30, 1995, Ser. No. 549,990

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—758 **11 Claims**

1. An integrated circuit comprising:
a substrate;
active devices formed on the surface of said substrate;
a bond pad formed substantially over a portion of said active devices, said bond pad having a footprint;
a patterned metal layer having a footprint and located between said bond pad and said substrate, said metal layer being substantially over said active devices, said footprint of said bond pad substantially overlying said footprint of said patterned metal layer;
a first dielectric layer separating said patterned metal layer from said bond pad, said patterned metal layer being electrically isolated from said active devices by a second dielectric layer; and
electrical connections from said bond pad to said active device and from said patterned metal layer to said bond pad or said active devices.



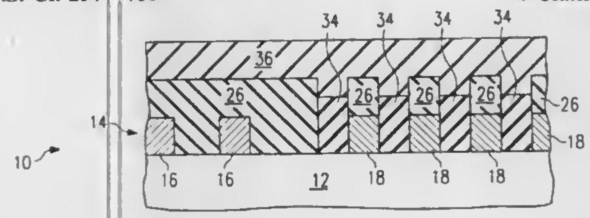
5,751,066
STRUCTURE WITH SELECTIVE GAP FILL OF SUBMICRON INTERCONNECTS

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 250,142, May 27, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 481,720

Int. Cl.^{6} H01L *21/312;23/522*

U.S. Cl. 257—759 **6 Claims**



1. A semiconductor device comprising:
a substrate, said substrate having a first portion and a second portion;
widely-spaced leads formed on said first portion of said substrate, said widely-spaced leads spaced apart by more than one and one-half a minimum lead spacing;
a first structural dielectric layer between said widely-spaced leads;
closely-spaced leads formed on said second portion of said substrate, said closely-spaced leads having a height and having leads spaced apart less than or equal to one and one-half a minimum lead spacing;
a low-permittivity material between at least portions of said closely-spaced leads of which portions are less than one and one-half the minimum lead spacing from another lead, said low-permittivity material providing a relative dielectric constant of less than 3 in a region between at least two of said metal leads, wherein said low-permittivity material extends said entire height of said closely-spaced leads, wherein said low-permittivity material extends the entire distance between said closely-spaced leads; and
a second structural dielectric layer over at least said low-permittivity material and said closely-spaced leads.

5,751,067
COMPACT SEMICONDUCTOR DEVICE HAVING EXCELLENT ELECTRICAL CHARACTERISTICS AND LONG TIME RELIABILITY

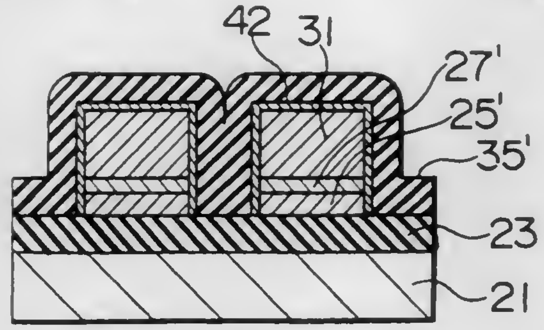
Kaoru Mikagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 43,372, Apr. 2, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,654

Claims priority, application Japan, Apr. 2, 1992, 4-080170

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—764 **2 Claims**



1. A semiconductor device comprising:
a semiconductor substrate having a principal surface;
an insulator layer which is formed on said principal surface;
a first conductor layer which is formed on said insulator layer with a partial area of said insulator layer exposed around said first conductor layer;
a second conductor layer which is stacked on said first conductor layer;
a third conductor layer which is deposited on said second conductor layer and which has an upper portion and a side portion;
a fourth conductor layer which is formed on said third conductor layer; and
a reacted layer which is overlaid on at least said upper and side portions of said third conductor layer and is formed by reaction between said third and said fourth conductor layers;
wherein said fourth conductor layer is formed by nitrogen compounds including a metal selected from a group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Co, and Ni.

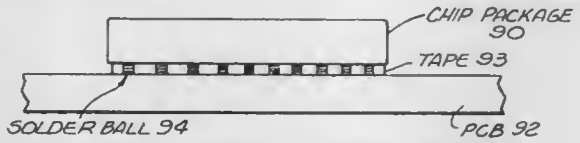
5,751,068
TAPE WITH SOLDER FORMS FOR SEMICONDUCTOR DEVICES

Jack McMahon, Phoenix, Ariz., and George Chiu, Palo Alto, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 648,308, May 13, 1996, abandoned, which is a continuation of Ser. No. 412,132, Mar. 28, 1995, abandoned, which is a division of Ser. No. 299,520, Sep. 1, 1994, Pat. No. 5,497,938. This application Apr. 23, 1997, Ser. No. 847,320

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—774 **4 Claims**



1. An integrated circuit package assembly, comprising:
an integrated circuit package that has a surface pads;
a tape;
a solder pre-form located on said tape; and,
an adhesive that is located between said tape and said solder pre-form, and attaches said solder pre-form to said tape and allows said solder pre-form to be attached to said surface pad of said integrated circuit package.

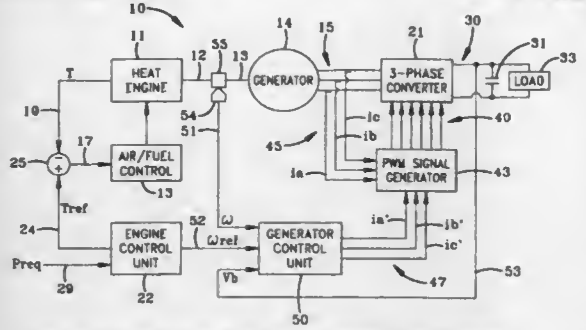
5,751,069
HEAT ENGINE GENERATOR CONTROL SYSTEM

Kaushik Rajashekara, Carmel, Ind.; Bhanuprasad Venkata Gorti, Towson, Md.; Steven Robert McMullen, Anderson, and Robert Joseph Raibert, Fishers, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1996, Ser. No. 674,057

Int. Cl.⁶ H02P *9/04*

U.S. Cl. 290—40 C **10 Claims**



1. An electrical power generation system comprising:
a heat engine for imparting torque to an output member, including a working gas, an input heat source, and a temperature control for maintaining the working gas at a substantially constant predetermined temperature;
a dynamoelectric machine for producing an electrical output power having a rotor operatively coupled to the output member, said machine imposing a load torque upon the output member in accordance with at least one controllable electrical parameter;
speed sensing means for detecting the speed of the output member;
a power request signal indicative of a desired level of electrical output power; and,
means for adjusting said at least one electrical parameter in response to the power request signal to control the output member to a predetermined speed consistent with said desired level of electrical output power.

5,751,070
COMBINED STARTER AND GENERATOR APPARATUS

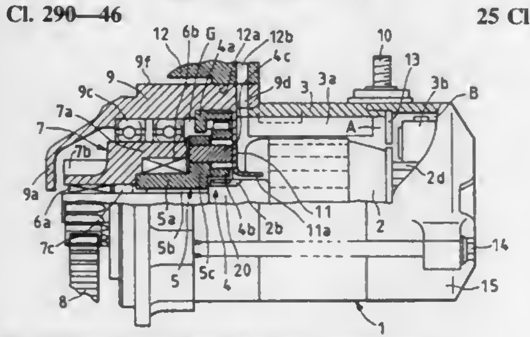
Yasuhiro Nagao, Okazaki; Tsutomu Shiga, Aichi-ken, and Nobuyuki Hayashi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 26, 1996, Ser. No. 638,332

Claims priority, application Japan, Apr. 26, 1995, 7-102189; Mar. 4, 1996, 8-046030

Int. Cl.⁶ F02N *11/04*

U.S. Cl. 290—46 **25 Claims**



1. A combined starter and generator comprising:
a rotor having a rotary shaft;
a drive shaft provided around an outer periphery of said rotary shaft and rotatably supported on a housing, said drive shaft having substantially the same axial center as said rotary shaft and having a pinion gear meshing with a ring gear of an engine;
a speed-reduction mechanism including a sun gear provided on said rotary shaft, a planetary gear meshing with said sun gear, and an internal gear meshing with said planetary gear;
a reduction shaft receiving a rotational torque transmitted from said rotor through said speed-reduction mechanism;
a first one-way clutch interposed between said reduction shaft and said drive shaft for connecting said reduction shaft to said drive shaft only when any rotational torque is transmitted from said reduction shaft to said drive shaft;
a second one-way clutch interposed between said drive shaft and said rotary shaft for connecting said drive shaft to said rotary shaft only when any rotational torque is transmitted from said drive shaft to said rotary shaft, said second one-way clutch being radially positioned inside said pinion gear of said drive shaft,
whereby, in a start-up operation of said engine, rotation of said rotor is reduced through said speed-reduction mechanism, and transmitted through said reduction shaft, said first one-way clutch and said drive shaft to said ring gear to drive said engine, while, after succeeding said start-up operation, rotation of said ring gear of said engine is transmitted through said drive shaft and said second one-way clutch to said rotary shaft of said rotor to generate electric power.

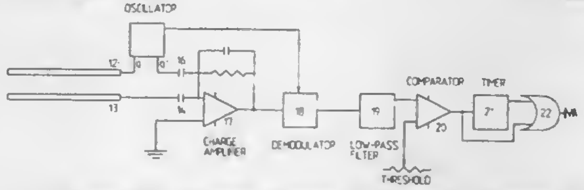
5,751,071
WINDOW CAPACITIVE MOISTURE SENSOR

Yishay Netzer, Yuvalim, Doar Na Misgav, Israel

Filed Mar. 29, 1996, Ser. No. 625,473

Int. Cl.⁶ H05B *1/02*

U.S. Cl. 307—10.1 **11 Claims**



1. An capacitive moisture sensor for sensing moisture on a surface of a dielectric, which capacitive moisture sensor is insensitive to the presence of moisture on the other unsensed side of the dielectric, the capacitive moisture sensor comprising
(a) at least one pair of capacitive electrode plates coated on the surface of the dielectric on which moisture is to be sensed, said at least one pair of capacitive electrode plates including at least one excitation and one signal capacitive electrode plates;
(b) electronic circuitry for substantially ignoring a resistive component of impedance between said electrode plates.

5,751,072
VEHICLE SECURITY SYSTEM USING AN EXISTING SWITCH DEVICE, IGNITION KEY MANIPULATION, AND REMOTE CONTROL TRANSMITTER TO DISARM THE SYSTEM AND PROGRAM SECURITY CODES

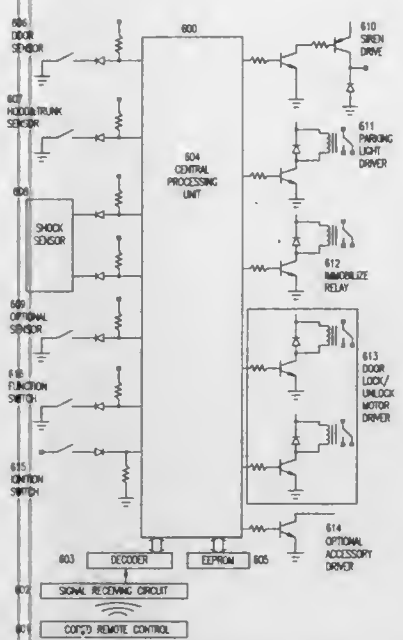
Shih Ming Hwang, 17811 Sky Park Cir., Suite D & E, Irvine, Calif. 92714

Filed Jan. 2, 1996, Ser. No. 582,159

Int. Cl.⁶ B60R *25/04*

U.S. Cl. 307—10.4 **7 Claims**

1. A method of entering security codes into a vehicle security system for a vehicle having an ignition switch and at least one other switch, comprising the steps of:
turning on the ignition switch;
actuating the other switch a number of times corresponding to a first digit;
turning off the ignition switch to signify an end of the first digit;
actuating the other switch a number of time corresponding to each additional digit to be entered; and



turning on the ignition switch to signify the beginning of each of the additional digits and turning off the ignition switch to signify the end of each of the additional digits.

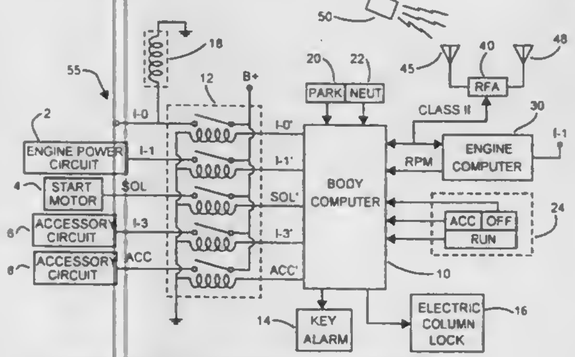
5,751,073
VEHICLE PASSIVE KEYLESS ENTRY AND PASSIVE ENGINE STARTING SYSTEM

Christian Eric Ross, Freeland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1996, Ser. No. 755,327

Int. Cl.⁶ B60R *25/04*

U.S. Cl. 307—10.5 **8 Claims**



1. A motor vehicle comprising, in combination:
an engine;
an electric engine power circuit;
a start motor;
a vehicle body having a seating space therein associated with a driver seat;
detector means for detecting the presence of a valid radio frequency transmitter only within the seating space by receiving a coded radio frequency signal therefrom, deriving a code from the radio frequency signal and validating the derived code in a predetermined validation process;
a RUN signal generator;
a steering column lock;
an engine speed signal generator; and
start control means responsive to activation of the RUN signal generator, provided that the detector means has detected the presence of a valid radio frequency transmitter within the seating space, to (1) unlock the steering column lock, (2) activate the engine electric power circuit and the start motor, (3) repeatedly receive an engine speed signal from the engine speed signal generator and compare the received engine speed signal to a predetermined speed reference indicating engine starting, (4) deactivate the start motor when the engine speed signal exceeds the speed reference or alternatively deactivate the engine electric power circuit and the start motor and lock the column lock if the engine speed signal does not exceed the speed reference within a first predetermined time.

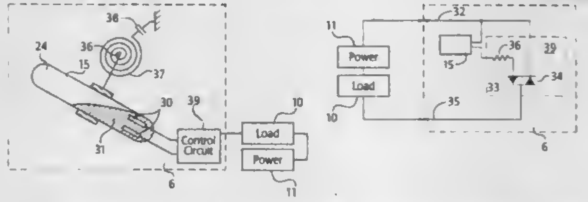
5,751,074
NON-METALLIC LIQUID TILT SWITCH AND CIRCUITRY

Edward B. Prior, Princeton, Ind.; Anthony J. Caristi, Waldwick; Luis A. Lazo, Passaic, both of N.J., and John E. Prior, Princeton, Ind., assignors to Edward B. Prior & Associates, Princeton, Ind.

Filed Sep. 8, 1995, Ser. No. 525,958

Int. Cl.⁶ H01H *35/02*

U.S. Cl. 307—118 **22 Claims**



17. An electrical switch circuit sensitive to an externally applied inertial and gravitational force, comprising:
a liquid switch having an enclosed space, a dielectric fluid having a first dielectric property filling a first portion of said space and a medium having a dielectric property different from said dielectric fluid filling a second portion of said space, said dielectric fluid and said medium having differing densities, and at least two probes in communication with said space;
an solid state electrical circuit coupled to at least two of said probes, said electrical circuit having an electrical connection for connection with a power source and a load in series, and being responsive to a change in capacitance between said probes due to a change in position of said dielectric fluid with respect to said medium to selectively control a current flowing at an output of said electrical circuit, said current flowing at said output being substantially greater than a current through said probes, said current flowing through said probes being derived from said current flowing through said output.

5,751,075
MAGNET ASSEMBLY FOR LINEAR MOTOR

Byoung Ha Kwon, Seoul, and Hyeong Kook Lee, Kyungki-do, both of Rep. of Korea, assignors to L.G. Electronics Inc., Seoul, Rep. of Korea

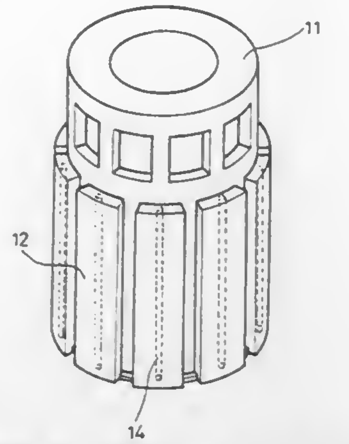
Filed Nov. 5, 1996, Ser. No. 744,175

Claims priority, application Rep. of Korea, Nov. 14, 1995, 41153/1995

Int. Cl.⁶ H02K *41/00*

U.S. Cl. 310—12 **8 Claims**

1. A magnet assembly for a linear motor, comprising:
a cylindrical magnet shell;
a plurality of magnets attached by bonding on a peripheral surface of the magnet shell, wherein said magnets are attached on a plurality of through-slits formed in the peripheral surface of said magnet shell, and said through-slits are formed in



portions along the peripheral surface of the magnet shell where the plurality of magnets are attached.

5,751,076
DRIVE SYSTEM FOR LIFTS

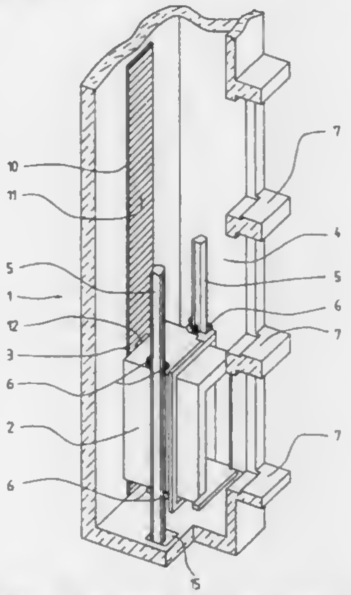
Tian Zhou, Littau, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Jan. 6, 1997, Ser. No. 779,224

Claims priority, application Switzerland, Dec. 19, 1996, 00143/96

Int. Cl.^{6} H02K *41/00;* B66B *11/04*

U.S. Cl. 310—12 **8 Claims**



1. A linear motor drive system for a lift installation, for which a cage is guided by guide rails in a shaft and driven directly by the linear motor, characterized in that the linear motor is constructed as a single-sided flat linear synchronous motor with permanent magnets and that bearing means are provided to insure a constant air gap between a primary and a secondary element of the linear motor.

5,751,077
FLUID-COOLED LINEAR MOTOR ARMATURE

Cesar Gonzalez, Troy, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

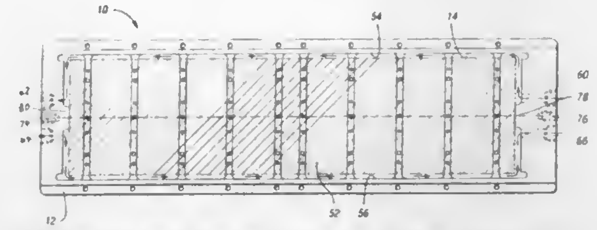
Filed Mar. 27, 1997, Ser. No. 827,131

Int. Cl.^{6} H02K *41/00*

U.S. Cl. 310—12 **12 Claims**

1. A linear motor armature, comprising:

a sealed metal case having a central chamber formed therein;



a lamination stack disposed within the central chamber; and

a coil assembly disposed within the lamination stack;

wherein the central chamber is flooded with an electrically nonconductive fluid for directly cooling said lamination stack and coil assembly.

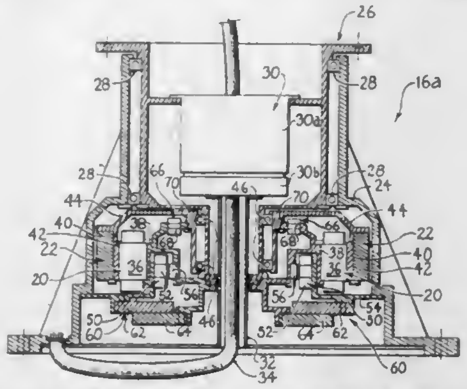
5,751,078
REACTIONLESS, MOMENTUM COMPENSATED PAYLOAD POSITIONER

Stuart H. Loewenthal, San Jose, Calif., assignor to Lockheed Martin Corp. Missiles & Space, Sunnyvale, Calif.

Filed Oct. 3, 1996, Ser. No. 724,777

Int. Cl.^{6} H02K *33/00;35/00*

U.S. Cl. 310—36 **34 Claims**



1. A reactionless momentum compensated payload positioner adapted to be mounted on a supporting body for providing momentum compensation of an oscillatory and scanning payload and for suppressing reactions in the supporting body to the torques that occur as an aiming angle of the payload is changed, said payload positioner comprising:

- a) gimbal means for pointing a payload and having at least two axis of rotation including an elevation axis and an azimuth axis;
- b) first reactionless drive module means for rotating said payload about said elevation axis;
- c) second reactionless drive module means for rotating said payload about said azimuth axis;
- d) each of said first and second reactionless drive module means includes:
  - i) a stationary housing;
  - ii) a main drive shaft for driving said payload, said main drive shaft being freely rotatably suspended within said stationary housing by main bearings;
  - iii) DC electric motor means for rotating said main drive shaft;
  - iv) flywheel means freely rotatably mounted to said main drive shaft and operative to rotate in a direction counter to the rotation of said main drive shaft responsive to actuation of said DC electric motor means, said flywheel means automatically and independently adjusts its speed to counter any changes in payload inertia due to operational variations in said aiming angle of said payload, said flywheel means also effective to provide momentum compensation to said payload and thereby substantially eliminate gyroscopic effects that occur due to rotational movement about either one of said at least two axis of said gimbal means;

  - v) first position transducer means for determining and controlling payload pointing position and speed;
  - vi) second position transducer means for determining speed of said flywheel means;
  - vii) trim motor means for eliminating parasitic drag; and
- e) wherein said payload positioner in combination with said payload having a center of gravity located at the intersection of said elevation and azimuth axis such that disturbance torques to the supporting body are substantially eliminated.

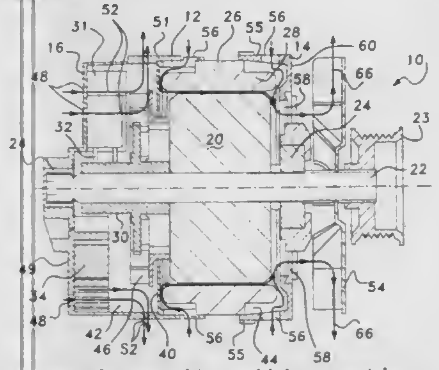
5,751,079
ALTERNATOR WITH INTERNAL AND EXTERNAL FANS

Bo Bagherpour, Ypsilanti; Ralph Kurt Hesse, Howell, and Kenneth Ross Brooks, Dexter, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1996, Ser. No. 733,355

Int. Cl.^{6} H02N *9/06*

U.S. Cl. 310—59 **11 Claims**



1. An alternator for use with a vehicle comprising:

a housing, said housing having front and rear housing portions;

a shaft, said shaft extending through and journaled within said housing;

a stator assembly connected within said housing;

a rotor connected to said shaft;

an external fan connected to said shaft adjacent said front housing;

an internal fan connected to said shaft, said internal fan disposed between said rotor and said rear housing; and

a separator plate, said separator plate connected to said housing between said internal fan and said rotor and extending radially inward to define, on opposite sides thereof front and rear air control volumes within said housing, said internal fan moving air along a predetermined path through said rear control volume and said external fan moving air along a predetermined path through said front control volume.

5,751,080
SPINDLE MOTOR HAVING HYDRODYNAMIC BEARING

Weon Ki Hong, Kyunggi-do, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 6, 1996, Ser. No. 692,531

Claims priority, application Rep. of Korea, May 29, 1996, P96-18438

Int. Cl.^{6} H02K *7/00;5/24*

U.S. Cl. 310—67 R **1 Claim**

1. A spindle motor comprising:

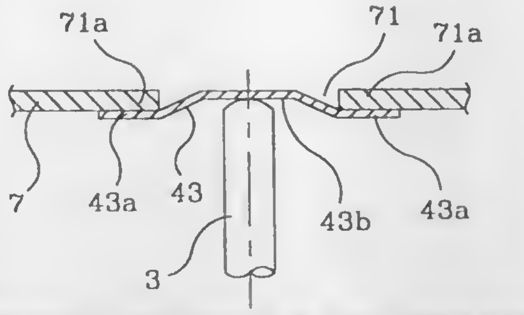
a cover,

a housing assembly arranged below said cover and having an inner cylindrical portion;

a stator secured to a circumferential outer surface of the inner cylindrical portion of the housing assembly;

a spindle hub provided above the housing assembly and having an outer cylindrical portion;

a rotor magnet secured to a circumferential inner surface of the outer cylindrical portion of the spindle hub;



a hydrodynamic bearing formed in the inner cylindrical portion of the housing assembly;

a rotatable shaft having an upper end portion secured to the spindle hub to cause the shaft to rotate with the spindle hub, said shaft extending downwardly from said upper end portion into the hydrodynamic bearing and having a lower end rotatably supported by said housing assembly, said upper end portion of the shaft having a free upper end spaced from said cover, and

restraining means disposed between the cover and said free, upper end of the shaft to restrain axial movement of the shaft upwardly relative to said cover both when the shaft is rotating and not rotating,

said restraining means comprising a plate member which is provided in an opening formed in the cover above said free, upper end of the shaft, a radial outward portion of the plate member being fastened to the cover and a radial inward portion of the plate member being formed with a concave portion for engaging said free, upper end of the shaft to force the shaft to move downward.

5,751,081
REDUCTION GEAR DEVICE WITH DIFFERENTIAL GEAR MECHANISM FOR ELECTRIC VEHICLE

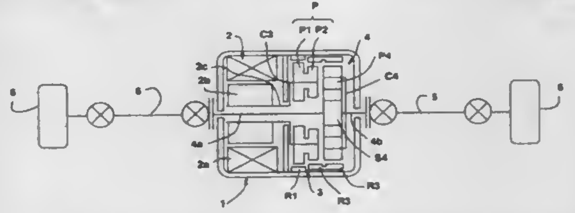
Kunihiko Morikawa, Hiratsuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 2, 1995, Ser. No. 459,609

Claims priority, application Japan, Jun. 2, 1994, 6-121083

Int. Cl.^{6} H02K *7/06;* B60K *17/35;* F16H *3/44*

U.S. Cl. 310—83 **5 Claims**



1. A reduction gear device for a vehicle having an electric motor, including a differential gear mechanism and a planetary gear type reduction gear mechanism, the differential gear mechanism being connected to a right wheel and a left wheel of the vehicle respectively through two output shafts, said reduction gear mechanism being contained in a casing mounted on the vehicle and transmitting power from the electric motor to the right and left wheels through the differential gear mechanism, an output shaft of the electric motor being penetrated by one of the output shafts of the differential gear mechanism, wherein said reduction gear mechanism comprises:

- a plurality of complex pinion assemblies each including a first pinion having a first number of teeth and a second pinion having a second number of teeth, said second number of teeth being less than said first number of teeth, said first and second pinions being integrated with each other;
- a planetary carrier connected to said output shaft of said electric motor and rotatably supporting said complex pinion assemblies at positions spaced radially from a rotating axis of said planetary carrier by an equal amount and spaced from each other by a predetermined angle;

a first ring gear fixed to said casing and engaged with said first pinion of each of said complex pinion assemblies; and

a second ring gear engaged with said second pinion of each of said complex pinion assemblies and serving to transmit power from said electric motor to said differential gear mechanism.

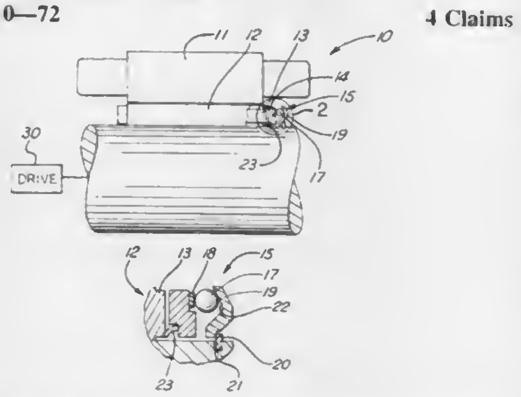
5,751,082
HIGH STARTING TORQUE INDUCTION MOTOR

Umesh C. Gupta, Clinton, Miss., assignor to Vickers, Incorporated, Maumee, Ohio

Filed Sep. 8, 1995, Ser. No. 525,084

Int. Cl.⁶ H02K *17/18;17/16*

U.S. Cl. 310—72 **4 Claims**



1. A high starting torque electric motor adapted to be associated with a drive having a high torque load on starting comprising:

a stator.

a rotor disposed for rotation about an axis within said stator and having a first end ring affixed to said rotor with a flat end face facing axially outwardly from said rotor.

a second end ring carried by said rotor axially adjacent to said first end ring and having a flat end face axially opposed to said flat end face on said first end ring.

said first end ring having a higher electrical resistance than said second end ring.

means axially resiliently spacing said second end ring from said first end ring such that said flat end ring faces are axially spaced from each other. and

a centrifugal device associated with said second ring and operable upon rotation of the rotor at a predetermined speed such that, when the motor is electrically energized, the higher resistance of said first ring produces a high starting torque and reduces starting current, and when the motor achieves said predetermined speed said second ring is moved into engagement with the first ring at said flat end faces and reduces the effective rotor resistance and permits normal operation of the electric motor.

said centrifugal device comprising a third ring axially affixed to said rotor on a side of said second end ring opposed to said first end ring, one of said second and third rings having a circumferentially continuous surface inclined toward the other of said second and third rings. and an annular array of balls disposed between said second and third rings. and captured between said rings by said inclined surface, said balls being urged radially outwardly along said inclined surface by centrifugal force of rotation of said rotor to urge said second ring into facing abutment with said first ring.

5,751,083
MAGNETIC SCREW CONVEYING APPARATUS

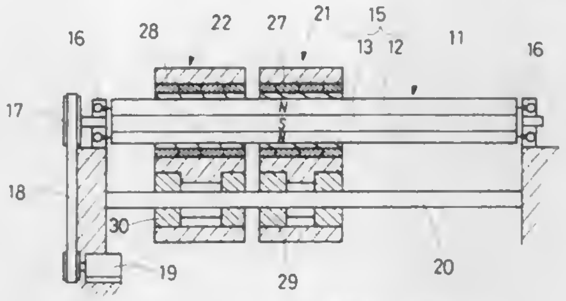
Akira Tamura; Osamichi Yamada; Tadashi Endo, and Eiji Uematsu, all of Komaki, Japan, assignors to CKD Corporation, Japan

Filed Jan. 10, 1997, Ser. No. 781,844

Claims priority, application Japan, Jan. 15, 1996, 8-021764; Jul. 26, 1996, 8-197891

Int. Cl.⁶ H02K *7/06*

U.S. Cl. 310—80 **8 Claims**



1. A magnetic screw conveying apparatus comprising:

a rotary shaft rotatable supported;

driving means for driving said rotary shaft to rotate;

a double male magnetic screw having first spiral magnetized bands with a south pole S and a north pole N alternately magnetized at a first inclination angle on said rotary shaft and second magnetized bands with a south pole S and a north pole N alternately magnetized at a second inclination angle on the same rotary shaft;

a first slide table slidably mounted on said rotary shaft;

a first female magnetic screw having magnetized bands with a south pole S and a north pole N alternately magnetized in a spiral form at a first inclination angle on an inner periphery surface of said first slide table, opposite to said male magnetic screw;

a second slide table slidably mounted on said rotary shaft: and

a second female magnetic screw having magnetized bands with a south pole S and a north pole N alternately magnetized in a spiral form at a second inclination angle on an inner periphery surface of said second slide table, opposite to said male magnetic screw;

wherein, with the rotation of said rotary shaft by said driving means, said first and second female magnetic screws receive magnetic force from said male magnetic screw respectively, thereby allowing said first and second slide tables to move at different speeds.

5,751,084
AIR DISCHARGE GUIDING ARRANGEMENT FOR PREVENTING THE SCATTERING OF FOREIGN MATTER OF A SPINDLE MOTOR

Il Oung Park, Seoul, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Rep. of Korea

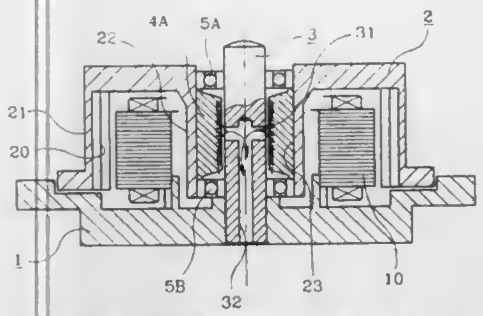
Filed Oct. 21, 1996, Ser. No. 734,300

Claims priority, application Rep. of Korea, May 29, 1996, 1996-18434

Int. Cl.⁶ H02K *15/00;7/14;* **F16C** *33/72*

U.S. Cl. 310—90 **4 Claims**

1. Air discharge guiding arrangement for preventing the scattering of foreign matter in a spindle motor, wherein the spindle motor comprises a fixed shaft vertically fitted through a center portion of a housing assembly, a pair of upper and lower bearings respectively mounted on upper and lower ends of the fixed shaft, and a hub having an internal barrel and receiving the bearings within upper and lower portions of the internal barrel, so that the hub is rotatable via the upper and lower bearings, the hub having an external barrel for supporting a disc medium for rotation within a clean space, said guiding arrangement comprising an air discharge guiding member having internal and external circumferential surfaces fitted within the internal circumferential surface of the internal barrel between the upper and lower bearings, said air discharge guiding member being provided with spiral grooves on the internal circumferential surface thereof, the internal circumferential surface being located close to the outer circumferential surface of the fixed shaft, a horizontal bore being formed transversely through a longitudinal intermediate portion of the shaft and a vertical bore being formed in said shaft and extending longitudinally from a lower end of the fixed shaft into communication with the horizontal bore, so that upon rotation of said hub air flows are self-generated by the spiral grooves and the air flows travel from between the bearings in a direction away from said space containing the disc medium for discharge to the outside through the horizontal and vertical bores.



5,751,085
AXIAL GAP TYPE ELECTRIC MOTOR WITH DYNAMIC PRESSURE AIR BEARING

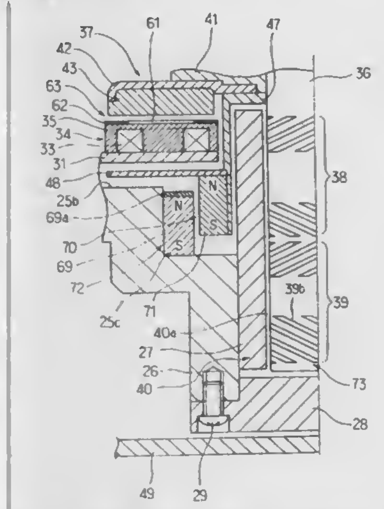
Kunio Hayashi, Konan, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 19, 1995, Ser. No. 504,190

Claims priority, application Japan, Jul. 19, 1994, 6-166819

Int. Cl.⁶ H02K *5/16;1/04;7/09;7/00*

U.S. Cl. 310—90 **4 Claims**



1. An axial gap type electric motor comprising:

a stator assembly including a base having a bearing cylinder, an electric circuit board fixed to the base, and a plurality of stator coils annularly disposed on the circuit board;

a rotor assembly including a shaft rotatably inserted in and held by the bearing cylinder, a rotor magnet provided on the shaft so as to be opposite to the stator coils with an axial gap therebetween, and a magnetic focusing rotatable yoke provided so as to rotate with the shaft, the yoke being disposed so as to be opposite to the rotor magnet with the circuit board with the stator coils being located therebetween;

a dynamic pressure gas bearing arrangement provided between an outer circumferential face of the shaft and an inner circumferential face of the bearing cylinder;

a thrust bearing arrangement for receiving thrust load of the rotor assembly; and

a magnetically levitating arrangement comprising an annular, stator side magnetically levitating magnet provided on the stator assembly and an annular, rotor side magnetically levitating magnet which is provided on the rotor assembly so as to be opposed to an inner or outer circumference of the stator side magnetically levitating magnet with a predetermined gap therebetween, the magnetically levitating arrangement axially levitating the rotor assembly by a magnetic force between the stator and rotor side magnetically levitating magnets;

wherein the annularly disposed stator coils are enclosed in a nonmagnetic molding material so that a single annular block conforming in configuration to the annularly disposed stator coils is formed, the annular block having a surface which is opposite to the rotor magnet and which is rendered flat substantially over an entire area thereof such that the surface is prevented from being circumferentially rugged, the annular block being fixed to the circuit board so as to project from a surface thereof;

wherein the dynamic pressure gas bearing arrangement includes two herringbone grooves formed in an outer circumferential face of the shaft; and

wherein one of the herringbone grooves has an axial dimension larger than the other herringbone groove so that during rotation of the rotor assembly, a force is generated which descends the rotor assembly toward the side of the stator assembly.

5,751,086
MULTIPOLAR MOTOR WITH TWO ROTORS

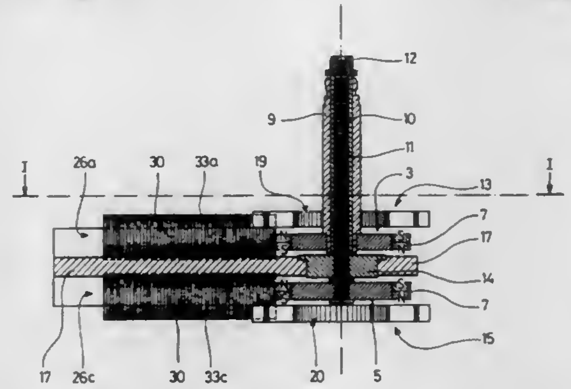
Daho Taghezout, Morges, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Granges, Switzerland

Filed May 15, 1996, Ser. No. 647,787

Claims priority, application France, May 29, 1995, 95 06309

Int. Cl.⁶ H02K *1/12*

U.S. Cl. 310—112 **11 Claims**



1. A multipolar motor comprising:

first and second multipolar coaxial independently rotatable rotors each comprising a plurality of magnetic dipoles which are oriented substantially parallel to the axis of rotation of the two rotors and which are arranged in a ring around said axis, said dipoles being also oriented alternatively in a first direction and in an opposite direction relative to said first direction;

first and second stator parts;

an intermediate stator part arranged between said first and second stator parts;

each of said stator parts comprising a stator opening, the stator openings being aligned along an identical axis to said axis of rotation of said rotors, said first and second stator parts each further comprising first and second polar expansions situated on either side of a respective stator opening, said first and second polar expansions defining respectively first and second serrations formed of a regular succession of teeth and slots on the edges of said respective stator openings each of said polar expansions being connected to said intermediate stator part by a magnetic flux guiding leg on which a winding is mounted, the windings being also electrically connected to means provided for controlling and energizing said motor, said first rotor being rotatably mounted between said first stator part and said intermediate stator part, said dipoles of said first rotor being situated, on one side, facing said first and second serrations of said first stator part and, on the other side, facing a polar expansion of the intermediate stator part, said second rotor being rotatably mounted between said second stator part and said intermediate stator part, said dipoles of the second rotor being situated, on one side, facing said first and second serrations of said second stator part and, on the other side, facing said intermediate stator part polar expansion.

5,751,087

ARMATURE WINDING OFFSET ANGLE EXCITED AND SPEED CONTROLLED RECTIFIER TYPE ELECTRIC MACHINE

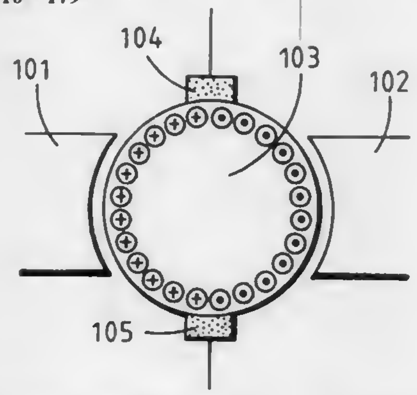
Tai-Her Yang, No.32 Lane 29, Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation of Ser. No. 291,681, Aug. 16, 1994, abandoned.

This application Oct. 3, 1996, Ser. No. 726,406

Int. Cl.^{6} H02K ***1/12***

U.S. Cl. 310—179 **2 Claims**



1. An armature winding offset angle excited and speed controlled rectifier type of electric motor comprising:
- a) a rotatable armature having an armature winding, an armature winding axis and a commutator;
- b) non-permanent magnet field poles located adjacent to the rotatable armature on diametrically opposite sides thereof, the field poles being comprised of a magnetic inductive material having hysteresis characteristics without a field winding, wherein a field flux axis is displaced substantially 90° from the armature winding axis such that the armature has no torque output;
- c) at least one pair of brushes in electrical communication with the commutator wherein the at least one pair of brushes are movable in a circumferential direction relative to the armature from a neutral position located at 90° from the field flux axis to establish an offset angle between the armature winding and a field flux axis wherein movement of the at least one pair of brushes in a first direction from the neutral position varies the speed of the armature in a first rotational direction and movement of the at least one pair of brushes in a second direction from the neutral position varies the speed of the armature in a second rotational direction; and,
- d) an electrical power source electrically connected to the at least one pair of brushes such that magnetic flux of the field poles is excited by the current passing through the armature winding as the at least one pair of brushes are moved away from the neutral position.

5,751,088

ALTERNATOR FOR VEHICLE

Takuzou Mukai, Handa, and Hiroshi Ishida, Anjyo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

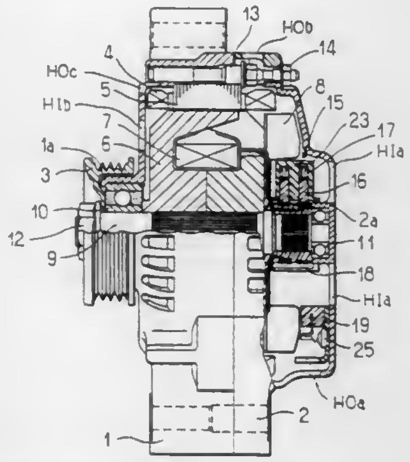
Continuation of Ser. No. 399,888, Mar. 7, 1995, abandoned.

This application Jun. 26, 1997, Ser. No. 883,166

Claims priority, application Japan, Mar. 11, 1994, 6-067894; Feb. 3, 1995, 7-017241

Int. Cl.^{6} H02K ***9/04;*** **H01R** ***39/38***

U.S. Cl. 310—239 **23 Claims**



1. An alternator for a vehicle, comprising:
- a front housing, having a front bearing;
- a rear housing, having an air intake window and a rear bearing;
- a stator having an armature coil;
- a rotor having a plurality of claw poles, a field coil, a cylindrical slip ring member connected to said field coil and a shaft press-fitted into said claw poles and said slip ring member, said shaft being carried by said front and rear bearings;
- a pulley carried by said shaft and driven by an engine;
- a cooling fan having a plurality of fan blades and secured to said rotor at a side opposite said pulley;
- a brush member secured to said rear housing and having a brush holder and a pair of radially extending front and rear brushes, said pair of radially extending front and rear brushes being held in said brush holder and abutting perpendicularly said slip ring member, at least one of said radially extending front and rear brushes and a corresponding portion of the brush holder being positioned within an inner periphery of said fan blades to overlap with said fan blades in the axial direction and so as to face said air intake window, said brush holder having a radially extending surface, at least a portion of said radially extending surface intersecting an axial flow of cooling air, whereby cooling air is introduced through said air intake window to flow around said brush holder and brushes.

5,751,089

BRUSHLESS DC MOTORS/GENERATORS

Lennart Stridsberg, Enskede, Sweden, assignor to Stridsberg Innovation AB, Enskede, Sweden

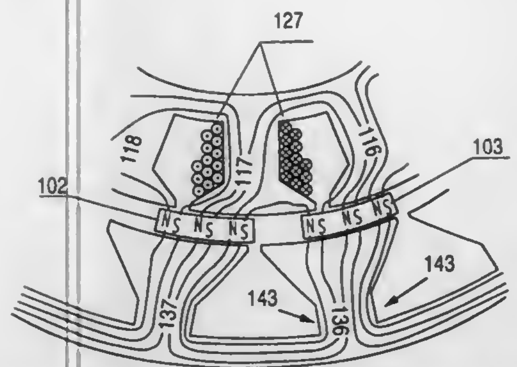
PCT No. PCT/SE93/00070, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO93/15547, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 29, 1993, Ser. No. 256,984

Claims priority, application Sweden, Jan. 29, 1992, 9200241; Sep. 11, 1992, 9202622; Dec. 30, 1992, 9203937

Int. Cl.^{6} H02K ***1/22***

U.S. Cl. 310—266 **16 Claims**



1. A brushless, electric motor or generator comprising
- a first part comprising permanent magnet poles having equally spaced north and south poles and with no or little soft iron parts,
- at least one pair of second parts, all being rigidly attached to each other, and comprising electrical windings and having poles of a magnetically highly permeable material, the poles of one member of a second part pair facing one side of the first part and the poles of the other member of said second part pair facing another side of the first part, an air gap separating the magnetically highly permeable material poles of the second parts from the corresponding side of the first part,
- the first part being movable in relation to the second parts, wherein
- the magnetic orientation of the permanent magnet poles of the first part is substantially perpendicular to the two sides of the first part which face the second parts,
- the shape and distances of the first and second parts are such that, for all positions of the first part in relation to the second parts, most of the permanent magnet poles of the first part are in a position where each permanent magnet pole can drive a magnetic flux loop through a first one of said airgaps, into a facing pole of a magnetically highly permeable material of a first member of a second part pair, through this first member of a second part pair, back through the same first airgap, through one adjacent permanent magnet pole of the first part, through a second one of said airgaps, into a pole of magnetically highly permeable material of the second member of the same second part pair, through this second member of the same second part pair and back through the same second airgap to the original permanent magnet pole of the first part,
- for all positions of the first part, most of the permanent magnet poles of the first part are in a position where said flux loops of two adjacent permanent magnet poles of the first part will pass windings of at least one or both of the two members of a second part pair,
- the winding or windings of one second part belong to only one electrical phase,
- the emf of the phase of one part in each second part pair is substantially 90 electrical degrees apart from the emf of the phase of the other part in the same second part pair,
- each second part has at least two poles facing the first part,
- the pitch of the poles of each second part is substantially the same as the pitch of the permanent magnet poles of the first part facing that second part,
- the area of the gaps between two adjacent poles of a second part and facing a side of the first part is less than the area of the poles of said second part facing the same side of the first part,
- the poles of the second parts are shaped in such a way that the distance between two adjacent poles in the same second part and close to the surface of said poles facing a side of the first part increases with the distance from the surface of said poles facing a side of the first part, so that the distance in not magnetically highly permeable material that must be passed by leakage flux is relatively long except very close to the surface of the second part facing a side of the first part.

5,751,090

PERISTALTIC DRIVER APPARATUS

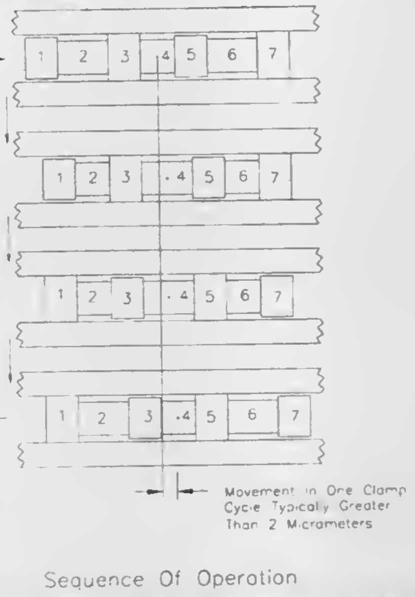
David A. Henderson, Farmington, N.Y., assignor to Burleigh Instruments Inc, Victor, N.Y.

Continuation of Ser. No. 442,738, May 17, 1995, abandoned.

This application Nov. 19, 1996, Ser. No. 752,730

Int. Cl.^{6} H01L ***41/08***

U.S. Cl. 310—328 **17 Claims**



1. Peristaltic apparatus for driving an object which comprises:
- a) a pair of members having surfaces facing each other and defining a path; and
- b) an actuator between said surfaces and movable along said path, said actuator having a first plurality of clamping sections and a second plurality of pusher sections disposed alternately in successive and linear relationship along said path, the number of said clamping sections being greater by one than the number of said pusher sections and the first and last of said sections in said actuator being clamping sections connectable in driving relationship with said object, said clamping sections being alternately actuated in interleaved pairs, means to simultaneously actuate said interleaved pairs to extend into and release from clamping relationship with said surfaces, two of said pusher sections and a clamping section being disposed between the members of each of said interleaved pairs of said clamping sections.

5,751,091

PIEZOELECTRIC POWER GENERATOR FOR A PORTABLE POWER SUPPLY UNIT AND PORTABLE ELECTRONIC DEVICE EQUIPPED WITH SAME

Osamu Takahashi; Yasuharu Hashimoto; Eiichi Nagasaka; Hajime Miyazaki, and Tsukasa Funasaka, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

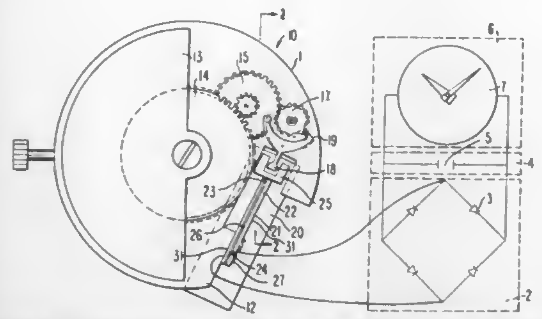
Filed Jan. 31, 1996, Ser. No. 594,566

Claims priority, application Japan, Feb. 1, 1995, 7-015117; Nov. 24, 1995, 7-306188; Jan. 12, 1996, 8-004362

Int. Cl.^{6} H01L ***41/08***

U.S. Cl. 310—339 **4 Claims**

1. A portable power supply unit having a piezoelectric power generator, comprising: two vibrating arms each having a free end being able to freely vibrate and a support end for supporting said free end, coupling member for coupling said support ends of said two vibrating arms, at least two piezoelectric portions disposed on each of said vibrating arms with a support layer disposed therebetween, each vibrating arm including at least one electrode covering at least parts of each of said piezoelectric portions or a respective vibrating arm, each of said vibrating arms including a power generating, section capable of outputting an alternating current through said electrodes; a vibration applying mechanism for



imparting displacements to said vibrating arms to cause a first of said two vibrating arms to move in a direction opposite to the other, said vibration applying mechanism comprising a hitting portion for striking said one free end of said two vibrating arms in a direction toward the other vibrating arm and a wall portion against which said other free end of the vibrating arm strikes when a hit is applied to said one vibrating arm so that said two vibrating arms are vibrated by being sandwiched between said hitting portion and said wall portion; rectifying device coupled to said power generator, for rectifying the alternating current output from said power generator; and an electric condensing device, coupled to said rectifying device, for accumulating a rectified current.

5,751,092
PIEZOELECTRIC TRANSFORMER AND POWER CONVERTING APPARATUS EMPLOYING THE SAME

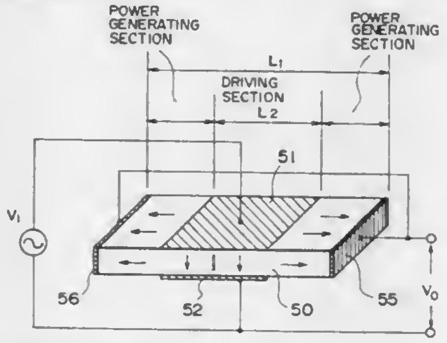
Tooru Abe, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jul. 5, 1996, Ser. No. 675,880

Claims priority, application Japan, Jul. 6, 1995, 7-170662; Mar. 27, 1996, 8-071838

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—359 **5 Claims**



1. A piezoelectric transformer comprising:

a long-plate-shaped piezoelectric element;

input electrodes coupled to the long-plate-shaped piezoelectric element;

output electrodes coupled to the long-plate-shaped piezoelectric element;

a driving section area of the long-plate-shaped piezoelectric element being polarized in the direction of thickness and including the input electrodes positioned at the central part of the piezoelectric element;

first and second power generating section areas including the output electrodes provided on end surfaces of said piezoelectric element in the direction of the length thereof, the first and second power generating sections being polarized in opposite directions from each other and disposed on opposite sides of said driving section area;

wherein said piezoelectric element is excited in a half wavelength mode to obtain an output between said output electrodes and said input electrodes and a ratio L2/L1 of a length L2 of said driving section area to an overall length L1 in the direction of the length of said piezoelectric element ranges from 0.3 to 0.6 and

wherein a ratio L1/W of the overall length L1 to a width W of said piezoelectric element ranges from 4.10 to 4.77.

5,751,093
VIBRATING GYROSCOPE

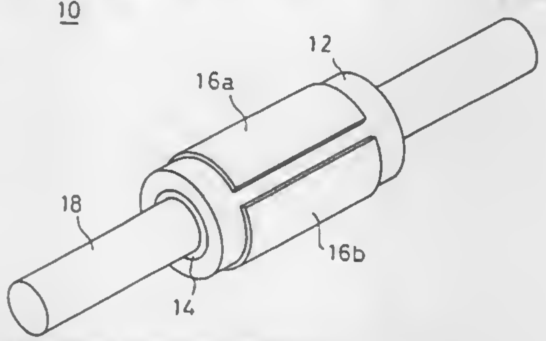
Takeshi Nakamura, Nagaokakyo, Japan, assignor to Murat Manufacturing Co., Ltd., Japan

Filed Mar. 14, 1996, Ser. No. 615,835

Claims priority, application Japan, Mar. 14, 1995, 7-083293

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—369 **16 Claims**



1. A vibrating gyroscope comprising:

a tubular member made of a piezoelectric material;

a vibrating member passing through the tubular member;

a common electrode provided between and in contact with an inner surface of the tubular member and the vibrating member; and

a plurality of outer electrodes provided in the circumferential direction on an outer surface of the tubular member.

5,751,094
CATHODE RAY TUBE CONSTRUCTION FOR BIG SCREEN DISPLAY USING A PLURALITY OF ELECTRON GUNS

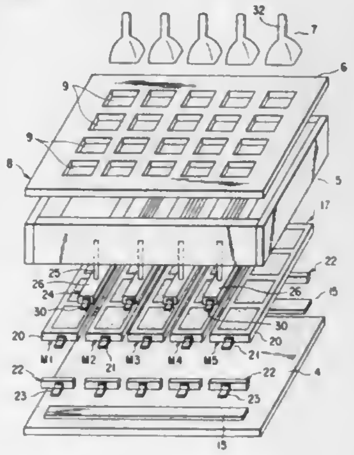
Takashi Nishimura, and Toru Takahashi, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1996, Ser. No. 686,681

Claims priority, application Japan, Jul. 27, 1995, 7-191963

Int. Cl.^{6} H01J *31/20*

U.S. Cl. 313—2.1 **12 Claims**



1. A cathode ray tube comprising:

a vacuum envelope including a substantially rectangular flat faceplate and a substantially rectangular flat rear plate opposed to the faceplate;

a phosphor screen formed on an inner surface of the faceplate;

support means located between the faceplate and the rear plate and supporting the faceplate and the rear plate under atmospheric pressure; and

a plurality of electron guns for emitting electron beams to the phosphor screen so that a plurality of regions of the phosphor screen are scanned by respective electron beams;

the support means including a plurality of support members, each having one end abutting against the faceplate and the other end abutting against the rear plate, and a plurality of connecting members each connecting a predetermined number of support members and fixed to the faceplate.

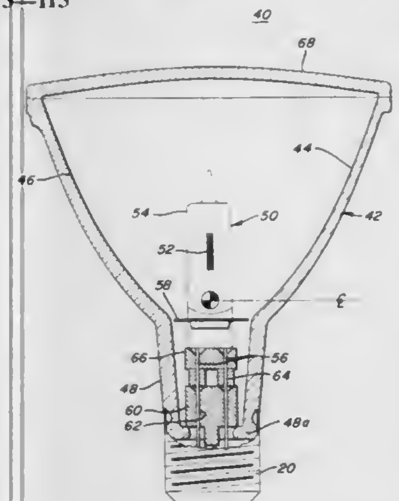
5,751,095
SIMULATED REFLECTOR LAMP USING PAR LAMP COMPONENTS

Frank E. Zalar, Willoughby Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 134,038, Oct. 8, 1993, abandoned. This application Aug. 3, 1995, Ser. No. 510,756

Int. Cl.^{6} H01J *5/48;5/16*

U.S. Cl. 313—113 **15 Claims**



1. A reflector lamp unit comprising:

a light source contained within a pressurized lamp envelope, said light source having lead members extending therefrom;

a reflector member configured so as to have a curved upper portion terminating at an open end, and a longitudinally extending lower portion, said reflector member having a reflective coating disposed thereon and having an optical focal point associated with the curved portion thereof;

an electrically conductive screw base disposed on said lower portion of said reflective member, said light source being electrically coupled to said screw base so as to enable energization of said light source;

a light transmissive cover member disposed over said open end of said reflector member;

wherein said pressurized lamp envelope is mounted along the longitudinal axis of said reflector member such that said light source is at a position between said optical focal point and said open end of said reflector member effective for providing a controlled divergence beam pattern light output which is wide and unfocused in relation to a narrow, focused beam pattern light output as occurs when said light source is positioned at said optical focal point; and,

a spacer member disposed within said lower portion of said reflector member, said spacer member having throughbores formed therein through which said lead members extend.

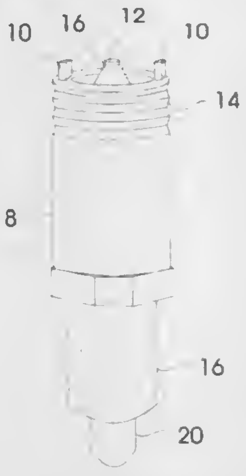
5,751,096
SPARK PLUG HAVING A PLURALITY OF VERTICAL GROUND ELECTRODES AND A VERTICAL CYLINDRICAL SHAPED CENTER ELECTRODE IN PARALLEL FORMATION FOR USE IN A INTERNAL COMBUSTION ENGINE

Albert Lahens, 200-37th St., Union City, N.J. 07087

Continuation of Ser. No. 549,922, Oct. 27, 1995, abandoned. This application Sep. 4, 1997, Ser. No. 923,710

Int. Cl.^{6} H01T *13/46*

U.S. Cl. 313—141 **6 Claims**



4. In a spark plug comprising an insulated single center electrode and a plurality of vertical ground electrodes characterized in that said center electrode with free end exposed is of a cylindrical design extending in a lineal manner, such that, a round edge forms around entire circumference of said free end of said center electrode tip, such that, top of said center electrode forms a right angle with the cylindrical side of said center electrode, wherein, said top of said center electrode points in a parallel manner, in the same longitudinal direction of said ground electrode tip face, such that, said free end being free of any prongs.

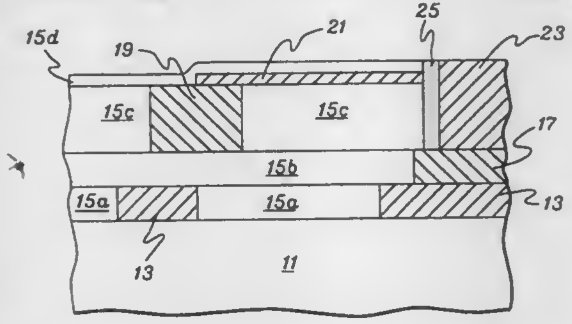
5,751,097
LATERAL FIELD EMISSION DEVICES FOR DISPLAY ELEMENTS AND METHODS OF FABRICATION

Jack Allan Mandelman, Stormville, N.Y., and Micheal David Potter, Grand Isle, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 641,252, Apr. 30, 1996, which is a continuation of Ser. No. 331,307, Oct. 28, 1994, Pat. No. 5,629,580. This application Jan. 24, 1997, Ser. No. 789,175

Int. Cl.^{6} H01J *1/16;* **B05D** *5/12*

U.S. Cl. 313—310 **11 Claims**



1. A method for forming a field emission device ("FED"), said FED being capable of emitting electromagnetic energy, said method comprising the steps of:

(a) providing a substrate having a main surface;
(b) forming an emitter above said main surface of said substrate, said emitter having a tip;
(c) forming a phosphor layer in spaced opposing relation to said tip of said emitter such that said tip of said emitter points towards, and is spaced a distance less than a mean free path distance of an electron in air away from, said phosphor layer; and
(d) forming an anode above said main surface of said substrate, said anode including a first surface oriented substantially perpendicular to said main surface of said substrate, said first surface having said phosphor layer adjacent thereto such that said phosphor layer is disposed between said tip of said emitter and said first surface of said anode, wherein a voltage potential applied between said anode and said emitter causes electrons to be emitted from said tip of said emitter into said phosphor layer causing said phosphor layer to emit electromagnetic energy.

7. A method for producing electromagnetic energy using a field emission device ("FED") comprising the steps of:
(a) providing a FED comprising: a substrate having a main surface; an anode disposed above said main surface of said substrate, said anode having a first surface disposed substantially perpendicular to the main surface of the substrate; a phosphor layer disposed adjacent to said first surface of said anode; and an emitter in spaced opposing relation to said first surface of said anode such that said emitter has a tip pointing towards, and spaced a distance less than a mean free path distance of an electron in air away from, said phosphor layer, wherein a voltage potential applied between said anode and said emitter causes electrons to be emitted from said tip of said emitter into said phosphor layer causing said phosphor layer to emit electromagnetic energy; and
(b) applying a voltage potential between said anode and said emitter such that said phosphor layer emits electromagnetic energy.

5,751,098

STRUCTURE OF COLOR SELECTING ELECTRODE ASSEMBLY FOR COLOR CATHODE RAY TUBES

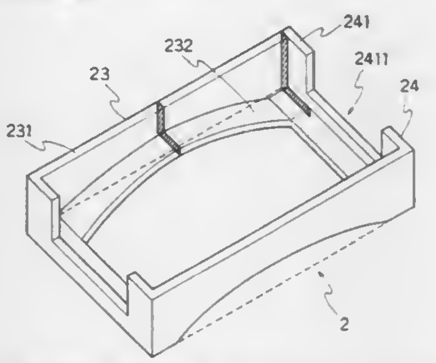
Hideya Ito; Shoji Morimoto; Akira Ichikawa; Junko Itoh; Kenji Kawaguchi, all of Amagasaki; Akira Yamada, Nagasaki; Atsushi Hattori, and Hiroyuki Sakaiya, both of Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1995, Ser. No. 543,585

Claims priority, application Japan, Oct. 25, 1994, 6-260299

Int. Cl.^{6} H01J *29/07*

U.S. Cl. 313—402 **7 Claims**



1. A color selecting electrode assembly for color cathode ray tubes comprising:
an apertured grill having a plurality of grids;
a frame over which the aperture grill is stretched and which applies a pretensioning force to the apertured grill; and
a supporting member which is mounted at a first one end thereof to the frame and is engageable at a second end thereof with a panel side wall of a color cathode ray tube so as to support the frame, wherein the thickness of said apertured grill is at most 0.032 mm and wherein said frame has an arched skirt portion and an L-shaped member, said skirt portion and said L-shaped member together being L-shaped when viewed in cross section and wherein the height dimension of the skirt portion is shorter at a central part of a side of the frame than at an end thereof.

5,751,099

DISPLAY DEVICE AND COLOUR CATHODE RAY TUBE FOR USE IN A DISPLAY DEVICE

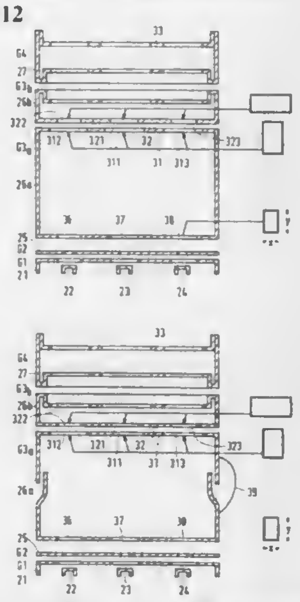
Willibrordus A. J. A. Van der Poel, and Tjerk G. Spanjer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1996, Ser. No. 673,977

Claims priority, application European Pat. Off., Jul. 3, 1995, 95201802

Int. Cl.^{6} H01J *29/50;29/62*

U.S. Cl. 313—412 **7 Claims**



1. Display device comprising a colour cathode ray tube comprising in an evacuated envelope an in-line electron gun for generating three electron beams situated in one plane, said electron beams being directed to a display screen on an interior portion of the evacuated envelope, and a deflection unit for deflecting the electron beams over the screen, said electron gun comprising:
a pre-focusing part for forming a pre-focusing electric field,
a first, a second and a third focusing electrode,
each of said electrodes having apertures for passing the electron beams, wherein the display device comprises means for supplying in operation a first static voltage to the first focusing electrode, a dynamic voltage to the second focusing electrode, and a second static voltage to the third focusing electrode, whereby a dynamic quadrupolar electric field is formed between the first and second focusing electrode and a dynamic main lens is formed between the second and third focusing electrode, characterized in that the part of the first focusing electrode adjacent the prefocusing part has three apertures for passing the electron beams, which apertures are elongated in a direction perpendicular to the plane of the electron beams for forming a qauadrupolar prefocusing electric field lens.

5,751,100

ELECTRON GUN FOR A COLOR CATHODE RAY TUBE

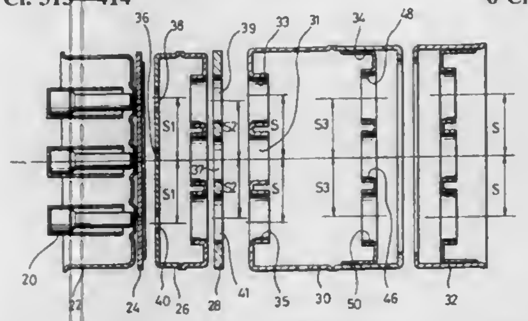
Changhoe Kim, Seoul, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 10, 1996, Ser. No. 659,710

Claims priority, application Rep. of Korea, Dec. 30, 1995, 95-68202

Int. Cl.^{6} H01J *29/56*

U.S. Cl. 313—414 **6 Claims**



1. An electron gun for a color cathode ray tube comprising:
a focusing electrode having apertures; and
a pre-focusing electrode having apertures, wherein the distances between the centers of the apertures of the pre-focusing electrode are smaller than the distances between the centers of the corresponding apertures of the focusing electrode.

5,751,101

CATHODE RAY TUBE HAVING A CONTACT SPRING FIXED TO AN END OF THE SHIELD CUP WITH A MICRO VICKERS HARDNESS OF 250-400

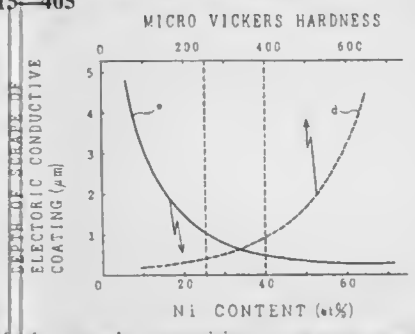
Hiroshi Takanobu, Mobara, and Akimasa Ishikawa, Nagaramachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Electronic Devices Co., Ltd., Chiba-ken, both of Japan

Filed Jan. 28, 1997, Ser. No. 789,777

Claims priority, application Japan, Mar. 4, 1996, 8-046311

Int. Cl.^{6} H01J *28/80*

U.S. Cl. 313—405 **6 Claims**



1. A cathode ray tube comprising: a vacuum vessel provided with a face panel portion, a neck portion, and a funnel portion which interconnects said face panel portion and said neck portion; a phosphor screen formed on an inner surface of said face panel portion; an electron gun assembly accommodated in said neck portion for projecting an electron beam toward said phosphor screen; and a contact spring fixed at one end to a shield cup of said electron gun assembly and pressed at the other end against an electrically conductive coating on an inner wall of said funnel portion,
wherein said contact spring is made of an alloy material which is composed of 30–35 wt % nickel (Ni), 19–23 wt % chromium (Cr) and the balance of which is substantially iron (Fe), and has a micro Vickers hardness of 250–400.

5,751,102

MONOCHROMATIC CATHODE RAY TUBE HAVING . SCATTERED ELECTRON SUPPRESSING LAYER

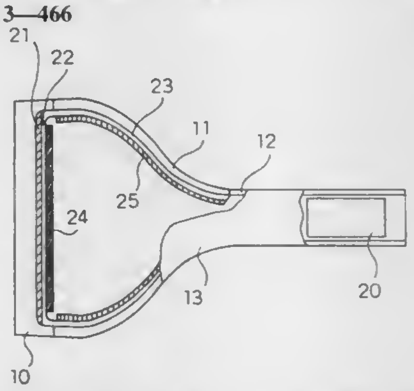
Takaaki Tanaka, Katano; Masahide Yamauchi, Suita; Yasuhisa Ishikura, Katano, and Masaki Aoki, Mino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 429,872, Apr. 27, 1995, abandoned. This application Jun. 30, 1997, Ser. No. 885,838

Claims priority, application Japan, May 2, 1994, 6-093169; Feb. 23, 1995, 7-034882

Int. Cl.^{6} H01J *29/18*

U.S. Cl. 313—466 **6 Claims**



1. A monochromatic cathode ray display tube using an electron beam acceleration voltage which is equal to or greater than 25 kV, said cathode ray display tube being used for a projection display system, comprising:
a neck part accommodating an electron gun;
a funnel part connected to this neck part;
a face panel part connected to this funnel part;
a phosphor layer formed in the inner surface side of this face panel part;
a metal back layer formed with a metal thin film which is provided over the surface of the phosphor layer opposed to the electron gun; and
a scattered electrons suppressing material layer provided on at least both the surface of the metal back layer over the phosphor layer and the inner surface of the funnel part formed on the inner surface of a display tube envelope, wherein the scattered electrons suppressing material layer provided on the surface of the metal back layer over the phosphor layer is formed with an element of atoms or a compound composed of atoms with atomic numbers not less than 3 and not more than 10, and the amount per unit area m (μg/cm^2) of the scattered electrons suppressing material layer is within a range expressed by $0.05 \times V_a^2 \leqq m \leqq 0.35 \times V_a^2$, where V_a represents the electron beam acceleration voltage (kV).

5,751,103

COLOR PICTURE TUBE HAVING IMPROVED FUNNEL

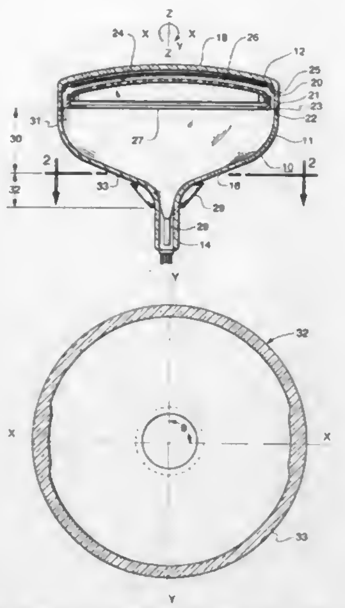
Stephen Thomas Opresko, and Richard Wayne Hutzler, both of Lancaster, Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 13, 1996, Ser. No. 696,078

Int. Cl.^{6} H01J *29/52*

U.S. Cl. 313—477 R **4 Claims**

1. In a color picture tube having a glass envelope comprising a substantially rectangular faceplate panel, a funnel and a neck, said glass envelope having three orthogonal axes, a major axis substantially parallel to a wider dimension of said faceplate panel, a minor axis substantially parallel to a narrower dimension of said faceplate panel, and a longitudinal axis extending through the center of said neck and the center of said faceplate panel, said funnel having a main body portion and a yoke region which is sealed to said neck, said main body portion extending from a seal land to said yoke region, wherein the improvement comprises
said main body portion of said funnel having a first sidewall of varying thickness, wherein said thickness along said major axis, adjacent to said seal land, is less than said thickness



along said minor axis, adjacent to said seal land, and said thickness adjacent to said yoke region along said major and minor axes is less than said thickness' adjacent to said seal land along said major and minor axes, and

said yoke region having a second sidewall of varying thickness, wherein the greatest thickness occurs in proximity to said major axis.

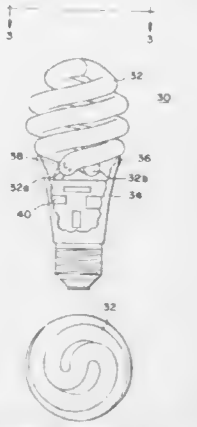
5,751,104
COMPACT FLUORESCENT LAMP HAVING A HELICAL LAMP ENVELOPE

Thomas F. Soules, Richmond Heights, Ohio; Marton Hrabovszki, Budapest, Hungary, and John R. Lahl, Parma, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 414,077, Mar. 31, 1995, abandoned. This application Nov. 15, 1996, Ser. No. 751,031

Int. Cl.⁶ H01J *17/16;61/30*

U.S. Cl. 313—493 **13 Claims**



1. A low pressure discharge lamp comprising:

a lamp envelope having an interior surface with a phosphor coating disposed thereon, and containing a gas fill energizeable to a discharge state;

a housing member on which said lamp envelope is mounted; and

wherein said lamp envelope is formed of tubular material and is shaped essentially in the form of a double helix, said double helix having an apex and having a widest portion defining a perimeter boundary, said double helix having a top crossover segment from which depend a first downwardly spiraling segment and a second downwardly spiraling segment, in a top view of said lamp envelope said top crossover segment having a substantially straight portion at the apex defining a neutral axis, each of said first and second downwardly spiraling segments rotating more than 180° from said neutral axis before reaching said perimeter boundary.

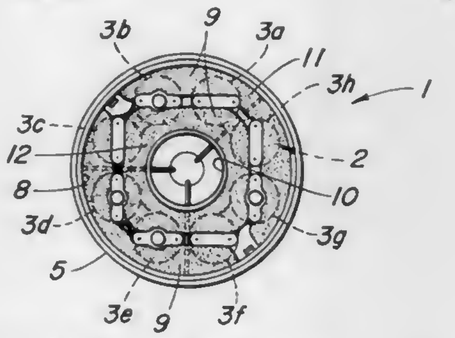
5,751,105
ASSEMBLY ARRANGEMENT FOR A COMPACT FLUORESCENT LAMP

Istvanne Cserteg; Jozsef Tokes; Istvan Wursching, and Jozsef Fulop, all of Budapest, Hungary, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1995, Ser. No. 573,313

Int. Cl.⁶ H01J *1/62;63/04;5/48;5/50*

U.S. Cl. 313—493 **4 Claims**



1. A single-ended discharge lamp comprising:

a lamp envelope having at least two tube legs having inner surfaces that face one another and outside surfaces;

a housing providing mechanical and electrical connection to the lamp envelope;

a tube supporting part of the housing including an outer member and an upper surface having at least two holes into which the tube legs are received;

a rib extending from the upper surface of the tube supporting part in a center portion of the tube supporting part between the holes; and

a bonding material applied between the rib and inside surfaces of the tube legs, and between the outer member and outside surfaces of the tube legs for securing the lamp envelope in place.

5,751,106
FLUORESCENT DISPLAY TUBE

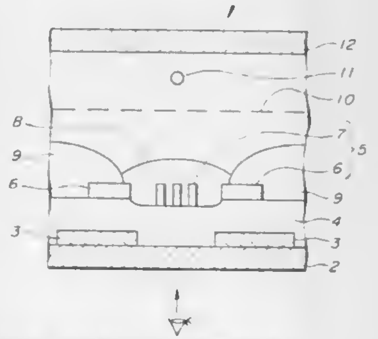
Akihiro Mihira, and Tadashi Mizohata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Dec. 18, 1996, Ser. No. 768,628

Claims priority, application Japan, Dec. 22, 1995, 7-335005

Int. Cl.⁶ H01J *19/00*

U.S. Cl. 313—495 **3 Claims**



1. A fluorescent display tube comprising:

a transparent glass substrate;

a black metal oxide thin film having thickness of within the range of 1000 Å–2000 Å formed on a portion other than a display area of an inner surface of said substrate, said black metal oxide thin film being formed by applying a film forming solution containing an organic metal compound on said substrate and subjecting said solution to a heat treatment;

an alkali-shielding film formed on the entire inner surface of said glass substrate covering said black metal oxide thin film;

anode conductors made of Al for delineating said display area, said anode conductors being formed on said alkali-shielding film at the positions corresponding to said black metal oxide thin film so as to be shielded by said black metal oxide thin film and permit said display area to be observed from a gap between said black metal oxide thin films through said glass substrate and alkali-shielding film when viewed said display area from outside of said substrate; and

a phosphor layer formed on said display area.

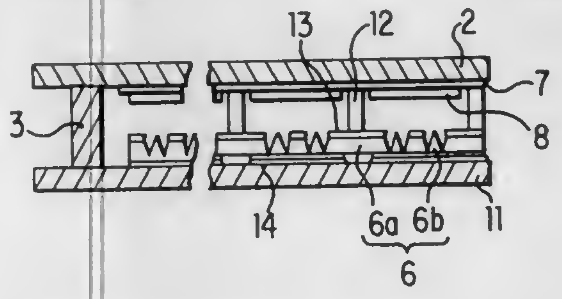
5,751,107
FIELD-DISCHARGE FLUORESCENT-DISPLAY WITH FLUORESCENT LAYER INCLUDING GLASS

Hiroshi Komatsu, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 129,206, Nov. 3, 1993, abandoned. This application Nov. 17, 1995, Ser. No. 560,519

Int. Cl.⁶ H01J *1/62*

U.S. Cl. 313—496 **22 Claims**



1. A fluorescent display apparatus, comprising:

a first substrate having at least one cathode formed on a surface thereof, each cathode having a plurality of electric-field electron discharge devices for discharging low-speed electrons;

a second substrate opposed to said first substrate, said second substrate having at least one anode formed thereon and a fluorescent layer comprising a fluorescent substance and a low-fusing-point glass formed on said anode, said cathode and said anode being located at a distance such that an electrostatic attractive force between said electric-field electron discharge devices and said fluorescent layer is greater than the Van der Waals force between said anode and said fluorescent substance, said fluorescent layer having a sufficient quantity of low-fusing-point glass such that said fluorescent layer is prevented from separating from said second substrate in response to the electrostatic attractive force between said electric-field electron discharge devices and said fluorescent layer when a voltage is applied between said cathode and said anode; and

at least one spacer member interposed between said first and second substrates to define and maintain a space therebetween, whereby,

low-speed electrons discharged from said cathode are absorbed by said fluorescent layer and cause said fluorescent layer to emit light.

5,751,108
ELECTROLUMINESCENT DEVICE AND METHOD FOR PRODUCING SAME

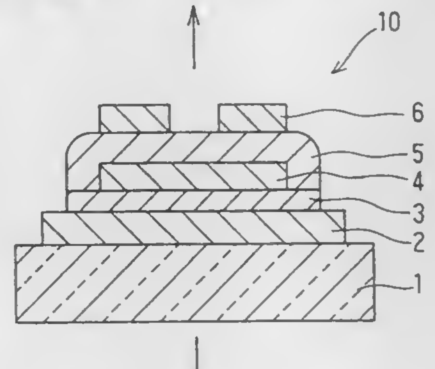
Takashi Kanemura, Nagoya; Masayuki Suzuki, Chiryu; Yutaka Hattori, Okazaki; Nobuei Ito, Chiryu; Tadashi Hattori, Okazaki, and Shigeo Kanazawa, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 26, 1996, Ser. No. 703,043

Claims priority, application Japan, Aug. 25, 1995, 7-217781; Jun. 4, 1996, 8-141926

Int. Cl.⁶ H05B *33/14;33/20*

U.S. Cl. 313—503 **12 Claims**



1. An electroluminescent device comprising:

first and second electrodes;

a luminescent layer disposed between said first and second electrodes; and

first and second insulating layers respectively disposed between said luminescent layer and said first electrode, and between said luminescent layer and said second electrode;

wherein said luminescent layer is made of zinc sulfide as a host material doped with a rare earth element and a plurality of halogen elements including chlorine, and wherein an atomic ratio of said chlorine to said rare earth element is in a range of not less than 0.002 to not more than 0.2.

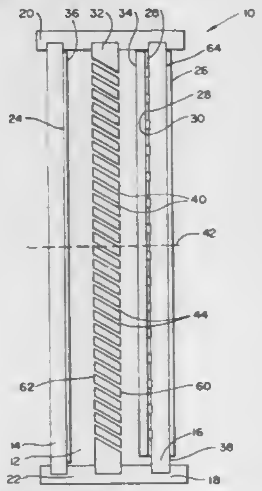
5,751,109
SEGMENTED COLD CATHODE DISPLAY PANEL

Leslie Payne, Annapolis, Md., assignor to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 8, 1996, Ser. No. 687,068

Int. Cl.⁶ H01J *40/18*

U.S. Cl. 313—542 **11 Claims**



1. A display tube, comprising:

an evacuated envelope having a substantially flat output faceplate;

a rear wall substantially parallel to said output faceplate;

a plurality of electron emitters comprising a plurality of segmented photocathodes wherein said plurality of electron emitters are substantially parallel and interior to said rear wall;

at least one channel plate having a plurality of pores for multiplying said electrons;

at least one phosphor plate substantially parallel and interior to said output faceplate;

a plurality of control grids disposed in a plane parallel to said front and said rear walls and oriented in a direction orthogonal to said electron emitters; and an electronic control means for setting component voltages to create a display image in response to a video signal.

5,751,110
ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

Antonius J. Spaapen, Roosendaal; Johannes T.J. Van Haastrecht, and Theodorus J.M.J. Van Gennip, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

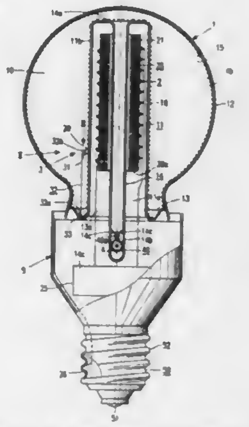
PCT No. PCT/IB96/00480, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO96/37909, PCT Pub. Date Nov. 28, 1996

PCT Filed May 21, 1996, Ser. No. 776,449

Claims priority, application European Pat. Off., May 24, 1995, 95201371

Int. Cl.^{6} H01J *65/04*

U.S. Cl. 313—550 **11 Claims**



1. An electrodeless low-pressure discharge lamp which comprises

a lamp vessel which is closed in a gastight manner, which surrounds a discharge space, which contains a filling of mercury and a rare gas, and which has a cavity and a collar where said cavity is open towards the exterior;

an electric coil being accommodated in said cavity; and

a support with an amalgam positioned in the discharge space,

characterized in that: the collar is made of metal and the support of the amalgam is fastened to the collar.

5,751,111
HIGH-PRESSURE METAL HALIDE LAMP

Jan A.J. Stoffels; Denise K.L. Vandeperre, and Jan M. Peeraer, all of Turnhout, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1995, Ser. No. 420,253

Claims priority, application European Pat. Off., Apr. 13, 1994, 94201009

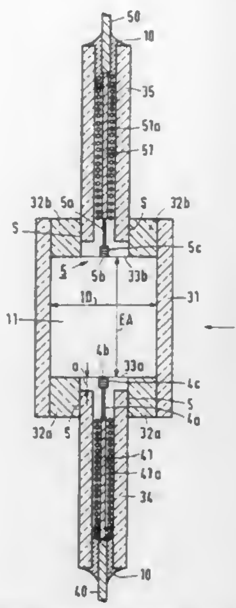
Int. Cl.^{6} H01J *17/00;61/00;61/04;17/04*

U.S. Cl. 313—606 **16 Claims**

1. A high-pressure metal halide lamp provided with a discharge vessel which encloses a discharge space, which has a ceramic wall and a filling which comprises besides Hg and a rare gas at least one metal halide, and which is formed from a cylindrical portion with an internal diameter ID closed off at either end by end wall portions, each end wall portion forming an end face of the discharge space while at least one end wall portion is provided with an opening in which a ceramic closing plug is fastened which narrowly encloses over a length 1 a lead-through of a respective electrode provided with an electrode tip and is connected thereto in a gastight manner at the side facing away from the discharge space by means of a ceramic glazing joint, the discharge vessel containing at least two electrodes whose respective tips are situated at a mutual interspacing EA such that the following relation is satisfied

$$\frac{ID}{EA} > 0.4$$

wherein the lamp has a rated power of at most 100 W, in that at least one electrode tip is situated substantially in the adjacent end face, and in that the relevant ceramic closing plug is fastened in the end wall portion in a gastight manner at a distance from the end face.



5,751,112
CRT MAGNETIC COMPENSATING CIRCUIT WITH PARALLEL AMORPHOUS WIRES IN THE SENSOR

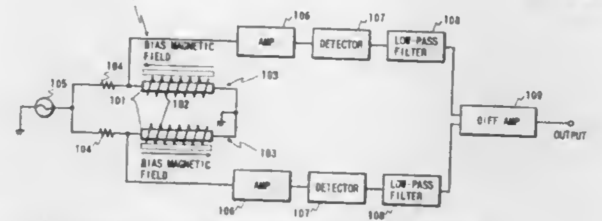
Akio Monma; Yasunori Yamanobe, both of Ichikawa, and Takashi Sato, Inba-gun, all of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1996, Ser. No. 698,389

Claims priority, application Japan, Dec. 22, 1994, 6-319825

Int. Cl.^{6} H04N *9/29*

U.S. Cl. 315—8 **5 Claims**



1. A magnetic compensating circuit comprising:

a magnetic sensor;

a control circuit for generating a signal for magnetic compensation; and

coils for magnetic compensation,

wherein an amount of external magnetism is detected by said magnetic sensor, the signal for magnetic compensation is generated by said control circuit in accordance with the amount of detected external magnetism, the signal is fed to said coils for magnetic compensation to generate a predetermined amount of magnetism in a direction in which said magnetic sensor senses the magnetism, and thereby the external magnetism is compensated,

said magnetic sensor including a pair of amorphous magnetic substance wires arranged in parallel; coils or permanent magnets for providing said pair of amorphous magnetic substance wires with bias magnetic fields in directions opposite to each other; a high-frequency power source for supplying said pair of amorphous magnetic substance wires with high-frequency currents; and circuits for outputting a potential difference derived from an output of said pair of amorphous magnetic substance wires.

5,751,113
CLOSED ELECTRON DRIFT HALL EFFECT PLASMA ACCELERATOR WITH ALL MAGNETIC SOURCES LOCATED TO THE REAR OF THE ANODE

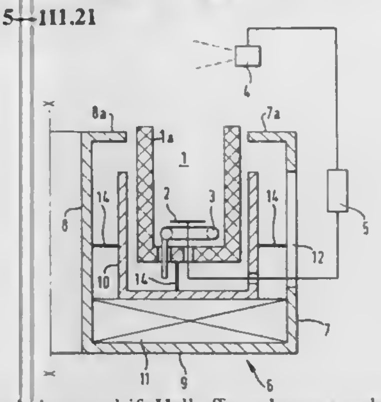
Y. M. Yashnov; V. A. Petrosov; V. I. Baranov; A. I. Vasin, all of Moscow, Russian Federation, and L. Talaalout, Toulouse, France, assignors to Space Power, Inc., San Jose, Calif.

Filed Dec. 9, 1996, Ser. No. 760,952

Claims priority, application Russian Federation, Apr. 1, 1996, 96105557

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 315—111.21 **7 Claims**



1. A closed electron drift Hall effect plasma accelerator comprising:

a substantially annular accelerating channel having closed and open ends where the channel encircles a central vertical axis of the accelerator;

an anode within the channel and located at the closed end of the channel

a first magnetic body spaced apart from the channel and enclosing the outside of the closed end of the channel to form a cavity between the bottom of the closed end of the channel and the first magnetic body and extending upwards on both sides of the channel towards the open end of the channel for defining magnetic poles of opposite polarity on opposite sides of the channel; and

a source of magnetic field located within the cavity for creating a first magnetic circuit with the first magnetic body to form a magnetic field extending radially across the channel.

5,751,114
APPARATUS, METHOD AND ARTICLE OF MANUFACTURE FOR CARRIER FREQUENCY COMPENSATION IN A FM RADIO TRANSMITTER

Andrew Dwight Dingsor, Durham, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1996, Ser. No. 653,307

Int. Cl.^{6} H04B *1/38;* **H04L** *5/16*

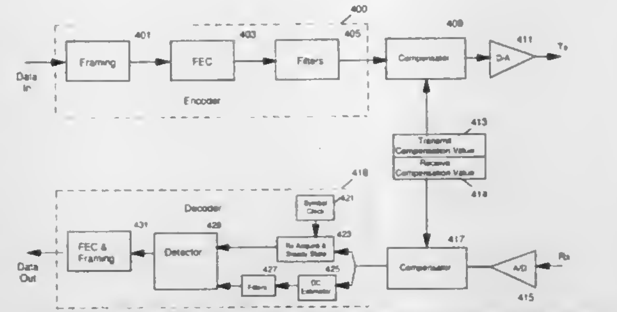
U.S. Cl. 375—222 **15 Claims**

1. A radio data modem comprising:

a digital signal processor inputting a digital input stream, encoding the digital input stream to produce a stream of digital samples, compensating each said digital sample by a transmit compensation value, converting said stream of digital samples to an analog baseband signal;

a local oscillator generating a local oscillator frequency; and

a transmitter for modulating the local oscillator frequency with the analog baseband signal to provide a FM signal wherein the compensation provided by the digital signal processor compensates for a difference between the local oscillator frequency and the carrier frequency.



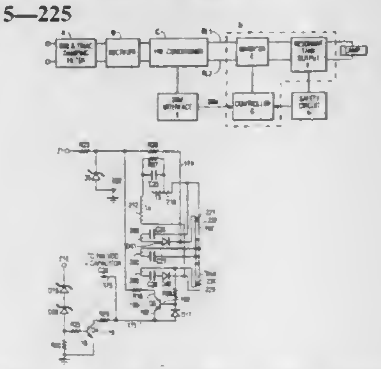
5,751,115
LAMP CONTROLLER WITH LAMP STATUS DETECTION AND SAFETY CIRCUITRY

Raj Jayaraman, Rancho Palos Verdes; Yongping Xia; Sreeraman Venkitasubrahmanian, both of Torrance, all of Calif., and Paul Leyton, Son, Netherlands, assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 415,020, Mar. 31, 1995, Pat. No. 5,650,694. This application Dec. 3, 1996, Ser. No. 759,350

Int. Cl.^{6} H05B *41/14*

U.S. Cl. 315—225 **3 Claims**



1. A ballast for a gas discharge lamp having at least one electrode extending and defining an electrically conductive path between a pair of lamp contacts, said ballast comprising:

a) input means for receiving a source of electrical energy to power said ballast;

b) ballast means, connected to said input means, for controlling the electrical power supplied to said gas discharge lamp, said ballast means including an isolation transformer coupled to and for electrically isolating a pair of output terminals for connection to the pair of lamp contacts of the gas discharge lamp; and

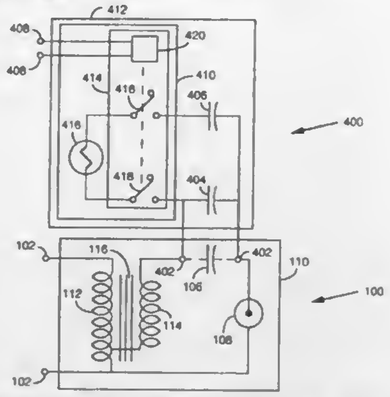
c) safety means including means for detecting the presence of a conductive path between said output terminals, to thereby confirm the presence of the discharge lamp and the continuity of the at least one electrode between the lamp contacts, upon initial application of electrical energy to said input means, said detecting means being coupled to said ballast means such that said ballast means does not energize said gas discharge lamp and provides no electrical potential at said output terminals in the absence of a conductive path between said output terminals upon initial application of electrical energy to said input means.

5,751,116
APPARATUS TO RETROFIT AN HID LIGHT FIXTURE

Larry A. Thomas, 5481 Begonia Dr., San Jose, Calif. 95124, and Kelly B. McMahon, 6690 Mt. Pakron Dr., San Jose, Calif. 95120

Filed Oct. 17, 1995, Ser. No. 544,000
Int. Cl.^{6} H05B *41/42*

U.S. Cl. 315—240 **12 Claims**



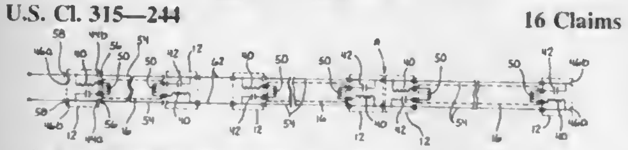
1. An apparatus without a ballast transformer for retrofitting an HID light fixture, the HID light fixture comprising prior to retrofitting a ballast transformer with a primary winding and a secondary winding, an HID lamp, and a light fixture capacitor coupled in series with the secondary winding and the HID lamp, the light fixture capacitor being uncoupled from the secondary winding and the HID lamp during retrofitting, the apparatus comprising:
- a pair of terminals;
- a first retrofit capacitor coupled between the terminals;
- a second retrofit capacitor;
- a switching device coupled in series with the second retrofit capacitor between the terminals to (a) couple the first and second retrofit capacitors in parallel in response to a normal power mode control input, and (b) uncouple the first and second retrofit capacitors from being in parallel in response to a low power mode control input; and;
- an enclosure that encloses the first and second retrofit capacitors and the switching device but does not enclose the terminals and any ballast transformer:
- wherein, when the apparatus is coupled with the terminals in series with the secondary winding and the HID lamp so that the light fixture capacitor is replaced by the apparatus, the HID lamp provides normal intensity lighting at normal power in response to an AC input to the primary winding and the normal power mode control input to the switching device and provides low intensity lighting at low power in response to an AC input to the primary winding and the low power mode control input to the switching device.

5,751,117
MODULAR FLUORESCENT TRACK LIGHTING

Louis Eugene Abbott, Carson City, Nev., assignor to Bruce Industries, Inc., Dayton, Nev.

Filed Jan. 12, 1995, Ser. No. 371,847
Int. Cl.^{6} H05B *41/00*

U.S. Cl. 315—244 **16 Claims**



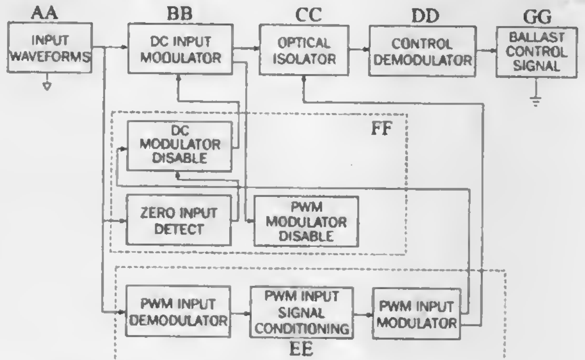
1. A modular ballast system for a fluorescent lamp of the type having a heater filament at each of two opposite lamp ends, said ballast system comprising:
- first and second ballast modules, each of said ballast modules having a module housing, a pair of lamp connectors on said module housing adapted to make electrical contact with opposite ends of a said heater filament, first and second A.C. power connectors on each of said ballast modules, an inductance between one of said pair of lamp connectors and one of said first and second A.C. power connectors, and a capacitance between the other of said pair of lamp connectors and the other of said first and second A.C. power connectors;
- electrically conductive means for connecting said each of said first and second A.C. power connectors on one of said ballast modules to a corresponding one of said first and second A.C. power connectors on the other of said ballast modules thereby to complete a four arm bridge types ballast; and
- a base for supporting both said ballast modules in spaced relationship to each other for holding a fluorescent lamp therebetween.

5,751,118
UNIVERSAL INPUT DIMMER INTERFACE

George W. Mortimer, Fort Wayne, Ind., assignor to Magnetek, Nashville, Tenn.

Filed Jul. 7, 1995, Ser. No. 499,771
Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—291 **12 Claims**



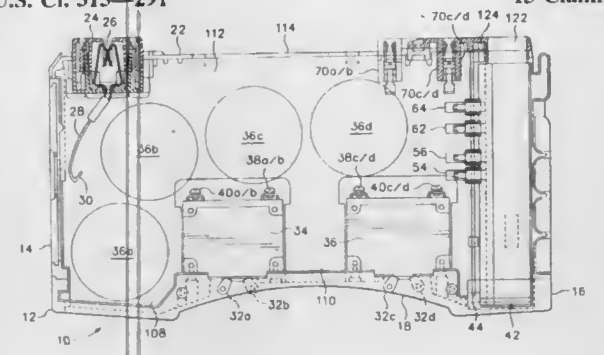
1. A universal input dimmer interface circuit adapted for receiving a plurality of input waveforms comprising:
- direct current modulator means for providing as an output a first pulse train, the first pulse train having pulse widths proportional to the magnitude of a direct current signal;
- a pulse width modulated input demodulator;
- a pulse width modulated input signal conditioner connected to the output of the pulse width modulated input demodulator;
- a pulse width modulated input modulator connected to the output of the pulse width modulated input signal conditioner such that a pulse width modulated signal is inverted, the pulse width modulated input modulator having as an output a second pulse train;
- a zero input detector for providing a zero input signal in response to the input waveforms being absent;
- direct current disabler means for disabling the direct current modulator means in response to a first disabling signal from the pulse width modulated input demodulator;
- pulse width modulated disabler means for disabling the pulse width modulated input demodulator in response to a second disabling signal from the direct current modulator means; and
- demodulator means for converting either the first pulse train or the second pulse train into a control signal, the demodulator means converting the first pulse train into the control signal when the pulse width modulated input demodulator is disabled, the demodulator means converting the second pulse train into the control signal when the direct current modulator means is disabled,
- whereby the control signal is generated from the input waveforms.

5,751,119
HIGH DENSITY PLUG-IN DIMMER MODULE FOR LIGHTING CONTROL SYSTEMS

Craig LeVasseur, Camarillo, Calif., assignor to NSI Corporation, Tualatin, Oreg.

Filed Jan. 16, 1996, Ser. No. 588,393
Int. Cl.^{6} H05B *37/00*

U.S. Cl. 315—291 **13 Claims**



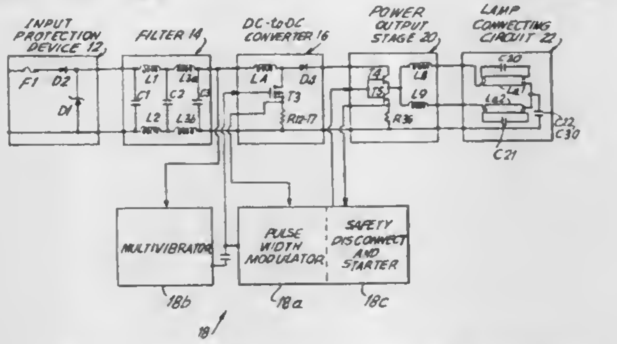
1. A dimmer module capable of providing controlled electrical power to four separate lighting fixtures or groups of fixtures, the dimmer module comprising:
- a chassis having a first side wall, a second side wall opposite the first side wall, and a front face plate, said face plate having a first aperture adjacent the first wall, a second aperture adjacent the second wall, and a central aperture intermediate the first and second apertures;
- an electrical connector for input power attached to the chassis adjacent a rear end of the first wall;
- first and second circuit breakers, attached to the face plate in a first stack intermediate the first and central apertures and third and fourth circuit breakers, attached to the face plate in a second stack intermediate the central and second apertures, said first stack forming cooperatively with the first wall a first airflow channel for cooling air entering the first aperture and the first and second stacks cooperatively forming a second airflow channel for cooling air entering the central aperture, each of said circuit breakers electrically connected to the power connector;
- first, second, third, and fourth toroidal inductors, arranged in an arcuate pattern extending through the first channel into a plenum in the chassis rearward of the first and second circuit breaker stacks, said plenum adjacent a centrally located rear vent in the chassis, each inductor electrically connected to a respective circuit breaker;
- a power device including printed circuit substrates for four silicon controlled rectifier (SCR) circuits and connection lead frames mounted to a heat sink, each of said SCR circuits connected to a respective inductor, and a companion top board carrying control circuitry for the SCR circuits, said power device mounted adjacent the second wall of the chassis and oriented to allow air flow through the second aperture of the face plate across the heat sink to exit the chassis in an exhaust aperture at the rear of the chassis adjacent the second wall; and
- four load connectors for delivering electrical power to four separate lighting devices or groups of lighting devices from a respective SCR circuit, said load connectors mounted intermediate the central vent and the exhaust aperture in the chassis.

5,751,120
DC OPERATED ELECTRONIC BALLAST FOR FLUORESCENT LIGHT

Walter Zeitler, Boynton Beach, Fla., and Ernst Gabriel, Pocking, Germany, assignors to Siemens Stromberg-Carlson, Boca Raton, Fla.

Filed Aug. 18, 1995, Ser. No. 516,782
Int. Cl.^{6} H05B *41/36*

U.S. Cl. 315—307 **22 Claims**



1. A device for operating at least two gaseous discharge lamps, the device comprising:
- a) an input protection circuit
  - i) having first and second input terminals across which an input voltage source is provided, and
  - ii) having a pair of output terminals which are protected from overvoltages and polarity reversals at the first and second input terminals;
- b) a filter having a pair of inputs coupled with the pair of outputs of the input protection circuit and having a first output terminal and a second output terminal across which a filtered DC voltage is provided, wherein the first output terminal of the filter is at a higher potential than the second output terminal of the filter;
- c) a DC to DC converter for performing a DC to DC conversion, the DC to DC converter having a first input coupled with the first output terminal of the filter, a second input for receiving a signal which controls the DC to DC conversion, a first output provided with a stepped-up DC voltage resulting from the DC to DC conversion, and a second output providing a feedback control signal;
- d) a power output stage for providing a high frequency lamp drive output, the power output stage having a first input coupled with the first output of the DC to DC converter, a second input provided with a start control signal, a first output, a second output, and a third output, the third output of the power output stage providing a signal based on a voltage provided at the first output of the DC to DC converter;
- e) a lamp connecting circuit for providing power to the at least two gaseous discharge lamps, the lamp connecting circuit having a first input coupled with the first output of the power output stage and a second input coupled with the second output of the power output stage; and
- f) a control circuit, the control circuit including
  - i) a pulse width modulator having an output providing a fixed frequency pulse train and coupled with the second input of the DC to DC converter, and an input coupled with the second output of the DC to DC converter, wherein a duty cycle of the fixed frequency pulse train provided by the pulse width modulator is varied based on the feedback control signal provided from the second output of the DC to DC converter,
  - ii) a multivibrator capacitively coupled with the second input of the DC to DC converter, and
  - iii) a safety disconnect and starting device having an input coupled with the third output of the power output stage and an output coupled with the second input of the power output stage and providing a start control signal based on the input of the safety disconnect and starting device.

5,751,121
HIGH VOLTAGE DISCHARGE BULB CONTROL

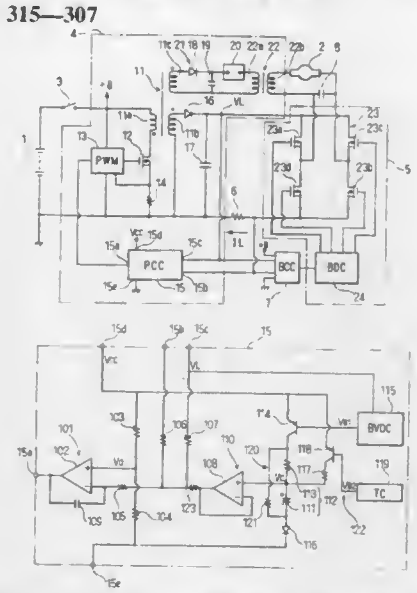
Koichi Toyama, and Noboru Yamamoto, both of Kariya, Japan, assignors to Denso Corporation, Kariya, Japan

Filed Nov. 26, 1996, Ser. No. 756,556

Claims priority, application Japan, Dec. 27, 1995, 7-341507

Int. Cl.⁶ G05F *1/00*

U.S. Cl. 315—307 **8 Claims**



1. A discharge bulb control apparatus comprising:
- a discharge bulb;
- warm-up power setting means including a time constant circuit which has a capacitor and producing a voltage which determines an electric power to be supplied to the discharge bulb and changes toward a first predetermined level in response to a capacitor current flowing to the capacitor during a warm-up period of the discharge bulb; and
- post-warm-up power setting means for causing the capacitor in the time constant circuit to be at a voltage of a second predetermined level different from the first predetermined level after the warm-up period.

5,751,122
DIGITAL CONVERGENCE CORRECTION SYSTEM

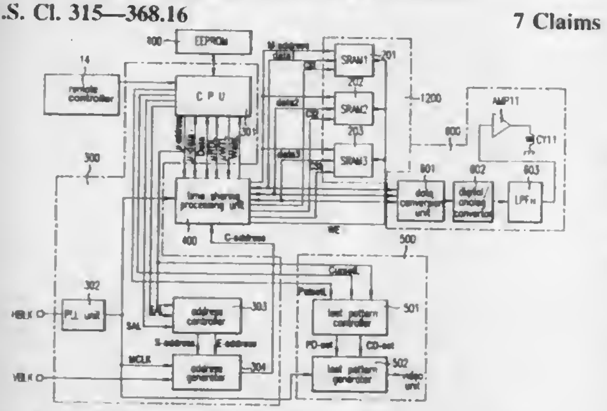
Hanee Park, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Jan. 11, 1996, Ser. No. 583,976

Claims priority, application Rep. of Korea, Jan. 10, 1995, 1995/368

Int. Cl.⁶ H01J *29/62;* **H04N** *3/22;9/28*

U.S. Cl. 315—368.16 **7 Claims**



1. A digital convergence correction system comprising:
- a first memory part for storing adjustment point data for multinodes;
- a second memory part for storing convergence correction data in accordance with the adjustment point data;
- a control part for producing the convergence correction data using the adjustment point data stored in the first memory part for writing the convergence correction data on the second memory part and outputting the convergence correction data in the second memory part; and
- a time sharing processing unit for controlling the control part to share time in producing the convergence correction data and renewing convergence correction data in the second memory part and outputting the convergence correction data stored already in the second memory part for preventing overlap of the producing and storing time and the outputting time,
- wherein the second memory part includes a plurality of static RAMs (SRAMs) connected in parallel.

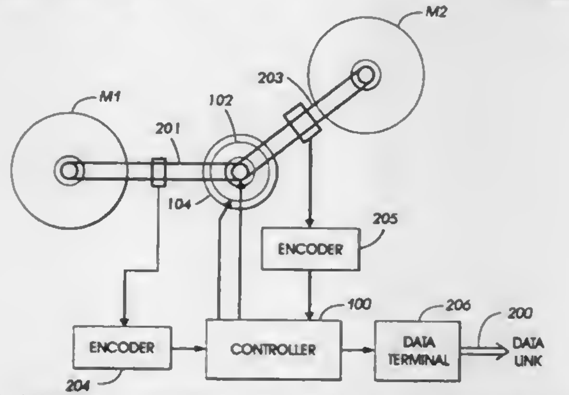
5,751,123
METHOD OF DIAGNOSING A DRIVE TRAIN HAVING MULTIPLE SERVO MOTORS

Gerald L. Coy, Webster, and Neil J. Dempsey, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1997, Ser. No. 786,587

Int. Cl.⁶ H02P *7/67*

U.S. Cl. 318—34 **11 Claims**



1. A method of diagnosing faults in a drive train having electrically operable components that selectively couples sections of said drive train together and that is selectively driven by any servo motor of a plurality of servo motors, that method comprising the steps of:
- (a) determining which of a plurality of servo motors is not operational;
- (b) sending an error signal if any servo motor is not operational;
- (c) if at least one servo motor is operational, selectively engaging drive train components so as to couple an operational servo motor and another servo motor together via the drive train and of determining whether said operational servo motor can rotate said another servo motor.

5,751,124
SAFETY GUARD FOR PEDESTRIAN-OPERATED MACHINES HAVING ROTATABLE BLADES

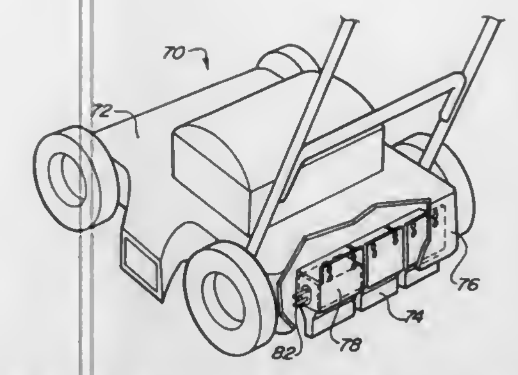
Harold Josephs, 25311 Ronald Ct., Oak Park, Mich. 48237

Division of Ser. No. 666,904, Jun. 19, 1996, which is a continuation-in-part of Ser. No. 514,302, Aug. 19, 1995, Pat. No. 5,653,568, which is a division of Ser. No. 266,726, Jun. 27, 1994, Pat. No. 5,465,807. This application Oct. 18, 1996, Ser. No. 731,936

Int. Cl.⁶ A01D *34/68;75/20*

U.S. Cl. 318—139 **11 Claims**

1. A pedestrian-operated machine comprising:
- a body supported for movement over the ground; and
- a planar guard attached to said body and biased to extend away from the body toward the ground, wherein said planar guard is arranged to slidably retract in a generally vertical direction relative to the ground only when an object makes contact with said guard in a manner which exerts a force on said guard in an upward direction from the ground, thereby preventing lateral relative movement of objects with between said body and the ground.



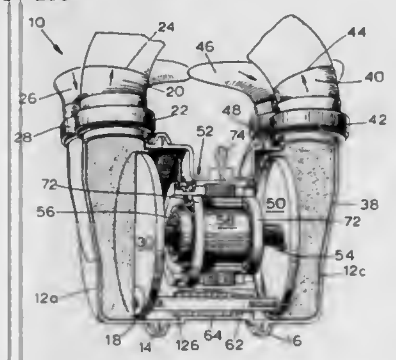
5,751,125
ARTIFICIAL HEART WITH SENSORLESS MOTOR

William J. Weiss, Mechanicsburg, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Nov. 8, 1995, Ser. No. 555,161

Int. Cl.⁶ H02P *1/00*

U.S. Cl. 318—280 **37 Claims**



1. An artificial heart assembly having a sensorless, DC brushless motor, said artificial heart assembly comprising:
- a blood inlet conduit;
- a blood outlet conduit;
- a pumping mechanism for pumping blood from said blood inlet conduit to said blood outlet conduit;
- a sensorless, DC brushless motor operatively connected to said pumping mechanism, said motor being reversibly driven in a first direction and a second direction, said motor changing between said first and second directions at a rate of at least 30 times per minute, said motor comprising:
  - a permanent magnet rotor; and
  - a stator rotatable relative to said permanent magnet rotor, said stator having a plurality of electrically energizable windings and a plurality of motor terminals to which said windings are electrically connected, wherein said rotor may be in Y possible angular position sectors with respect to said stator and wherein Y has a numeric value greater than two;
- means for periodically applying electrical signals to a plurality of said motor terminals while leaving at least one of said motor terminals unenergized to cause said rotor to rotate alternately in said first direction and second directions, said rotor changing between said first and second directions at a rate of at least about 30 times per minute;
- means for detecting a voltage at said unenergized motor terminal; and
- means for determining, based upon said voltage detected by said detecting means, that said rotor is in one of X possible angular position sectors, where X has a numeric value less than said numeric value of Y.

5,751,126
LIFTING APPLIANCE WITH TRAVELING MECHANISM AND LOW PENDULUM OSCILLATION DURING BRAKING

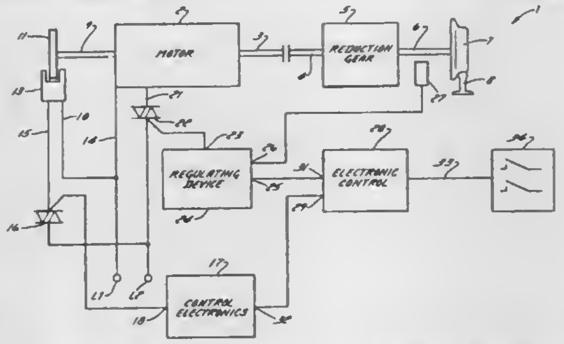
Frank Hellinger, Künzelsau, Germany, and Ari Vaisanen, Hyvinkä , Finland, assignors to R. Stahl Fördertechnik GmbH, Germany

Filed Mar. 21, 1996, Ser. No. 619,422

Claims priority, application Germany, Mar. 24, 1995, 195 10 786.1

Int. Cl.⁶ B66B *1/26;1/32;* **B66C** *13/06;13/30*

U.S. Cl. 318—362 **15 Claims**



1. An electric drive for a vehicle of a lifting appliance, said vehicle having wheels, said electric drive comprising:
- a motor which is operatively coupled to at least one wheel of the vehicle,
- at least one brake which is assigned to one of the wheels and which is switched to and fro via electrical signals between an engaged state and a disengaged state,
- a signal generator arrangement having first, second, and third states, of which the first corresponds to the stopping of the vehicle, the second corresponds to traveling at a low speed, and the third corresponds to traveling at a high speed,
- an electronic control to which the signal generator arrangement is connected and which actuates 1) an electrically controllable switch, located in a current lead to the motor, and 2) a brake actuator, and
- a speed transmitter which supplies the electronic control with information on the speed of the vehicle, wherein the electronic control is automatically operable, upon a change of the state of the signal generator arrangement from the third state to the second state, to 1) switch the current supply to the motor off and 2) to control the brake actuator to initially permit the brake to remain disengaged and to subsequently engage the brake only when the speed of the vehicle becomes lower than a reference speed corresponding to a speed which is higher than the low speed.

5,751,127
MAGNET BRAKE

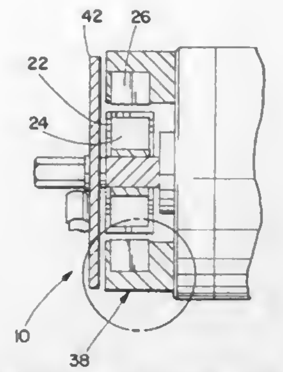
Keith G. Austin, Beavercreek; Jorge G. Erazo, Clayton; Terence D. Kirkpatrick, Urbana; Robert E. Giffen, Columbus, and Michael A. Forhan, Urbana, all of Ohio, assignors to Grimes Aerospace Company, Urbana, Ohio

Continuation-in-part of Ser. No. 498,926, Jul. 6, 1995, abandoned. This application Nov. 12, 1996, Ser. No. 745,725

Int. Cl.⁶ F16D *37/02;* **H02K** *49/10*

U.S. Cl. 318—370 **21 Claims**

1. A magnet brake for attachment to a shaft of a motor, comprising:
- a rotor assembly engaged to said shaft;
- at least one multi-pole magnet contained within said rotor assembly, said at least one multi-pole magnet being rotatable with said shaft;
- a first stationary magnet separated by a fixed distance from said at least one multi-pole magnet so that the magnetic field of said first stationary magnet attracts said at least one multi-pole magnet with opposite-facing polarity, wherein said first stationary magnet and said at least one multi-pole magnet act to



hold said shaft in a stopped position while said motor is not driving said shaft and act to allow said motor to drive said shaft when said motor exerts sufficient force to overcome said magnetic hold on said shaft; and

wherein said first stationary magnet holds said at least one multi-pole magnet against a load torque.

5,751,128

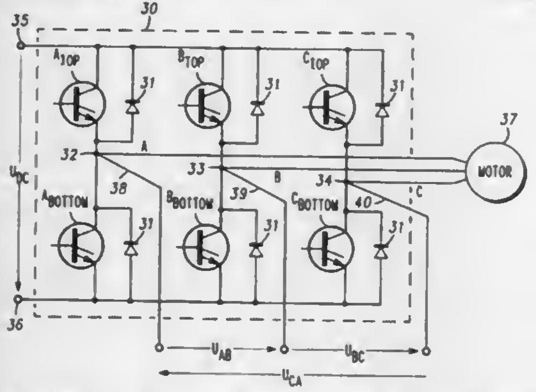
METHOD AND APPARATUS FOR ELECTRONICALLY COMMUTING AN ELECTRIC MOTOR

Leos Chalupa, Jemnice, and Miroslav Patocka, Weissova, both of Czechoslovakia, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 12, 1996, Ser. No. 747,532

Int. Cl.^{6} H01R *39/46*

U.S. Cl. 318—439 **12 Claims**



1. A method of operating an electric motor having a set of windings for producing a rotating magnetic field and a rotor adapted to rotate in response to said magnetic field, said method comprising the steps of

sensing and low pass filtering the differential voltages between said windings;

detecting points of time when said filtered differential voltages become zero; and

commuting the voltages applied to said windings from a power source in accordance with said detected points of time.

5,751,129

MEMORY SEAT MODULE HAVING INTEGRATED SENSORS

William E. Vergin, Sterling Heights, Mich., assignor to Invotronics Manufacturing, Farmington Hills, Mich.

Filed Oct. 4, 1996, Ser. No. 726,878

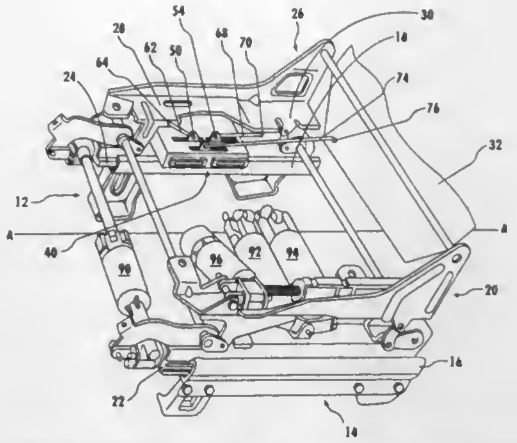
Int. Cl.^{6} B60N *2/04*

U.S. Cl. 318—467 **21 Claims**

1. A power seat assembly comprising:

a base member having a longitudinal axis;

a seat frame mounted on said base member, said seat frame comprising at least one adjustable member arranged to move relative to said base member;



at least one motor, said motor operatively engaged to said adjustable member and arranged to move said adjustable member relative to said base member;

a memory seat module mounted on one of said seat frame and said base member, said memory seat module comprising:

at least one sensor arranged to detect a movement of said adjustable member, from a first position to a second position relative to said memory seat module, and output information reflective of said movement; and

electronic means connected to said at least one sensor and arranged to store said information, said electronic means further arranged to retrieve said information in response to an external signal to return said at least one adjustable member to said second position from said first position; and

a linkage having a first portion connected to said adjustable member and a second portion connected to said sensor, said linkage and said sensor arranged to translate said movement of said adjustable member relative to said memory seat module into said information.

15. A memory seat module adapted to be mounted in a seat assembly, said memory seat module comprising:

at least one sensor arranged to detect a movement of an external member, from a first position to a second position relative to said memory seat module, and output information reflective of said movement; and

electronic means connected to said sensor and arranged to store said information, said electronic means further arranged to retrieve said information in response to a signal received from outside the memory seat module.

5,751,130

TIME CONSTANT SETTING METHOD FOR A TRACK PROGRAM OF A ROBOT

Ryuichi Hara, Fujiyoshida, and Atsuo Nagayama, Oshinomura, both of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

PCT No. PCT/JP95/02276, § 371 Date Jul. 8, 1996, § 102(e) Date Jul. 8, 1996, PCT Pub. No. WO96/15480, PCT Pub. Date May 23, 1996

PCT Filed Nov. 7, 1995, Ser. No. 669,469

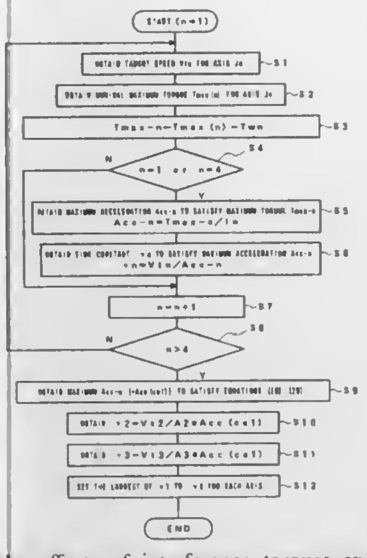
Claims priority, application Japan, Nov. 9, 1994, 6-299108

Int. Cl.^{6} G05B *19/18*

U.S. Cl. 318—575 **4 Claims**

1. A time constant setting method for a track program for a robot having a plurality of axes driven individually by servomotors, comprising steps of:

obtaining time constants for acceleration and deceleration control for at least two axes out of said plurality of axes, the time constants for acceleration and deceleration being obtained to be the shortest time constants as far as torques generated to move the respective axes will not saturate, the time constants being obtained for the start point and end point of a motion where the speed at the respective axes can be regarded as zero, the time constants being obtained by taking into consid-



eration the effects of interference torques exerted between said at least two axes, by on-line software processing of a robot controller which controls said robot; and

setting the time constants obtained for said at least two axes, the time constant being set in the robot controller which controls said robot.

5,751,131

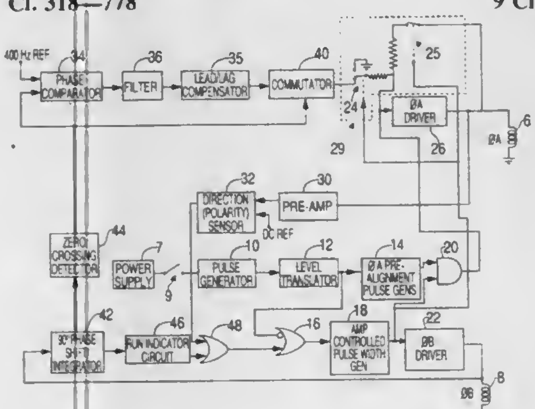
DYNAMIC RATE FEEDBACK PM MOTOR STARTING TECHNIQUE

Jerome Sears, Wyckoff; Walter Parfomak, Wallington; Walter J. Kluss, Kearny, and Michael Germinario, Harrington Park, all of N.J., assignors to AlliedSignal, Inc., Morristown, N.J.

Continuation of Ser. No. 408,804, Mar. 23, 1995, abandoned. This application Aug. 14, 1996, Ser. No. 698,214

Int. Cl.^{6} H02P *1/26*

U.S. Cl. 318—778 **9 Claims**



1. A starting system for a two-phase motor including a permanent magnet rotor and a stator having first and second orthogonally disposed windings, comprising:

means for energizing both orthogonally disposed stator windings so that both of said windings receive a maximum energizing input for a narrow time period for driving the rotor to a position intermediate the windings;

said first winding remaining energized after the end of the narrow time period, for driving the rotor to align said rotor with the magnetic flux of said first winding;

means responsive to the back EMF of the second winding for sensing magnitude and rotor direction;

means for controlling the motor to run when the proper magnitude and rotor direction are sensed and for closing a loop for driving the second winding and de-energizing the first winding; and

means for converting the back EMF of the first winding, as the rotor accelerates toward the second driven winding, from angular rate information to angular rotor position feedback information to determine if the motor is running.

5,751,132

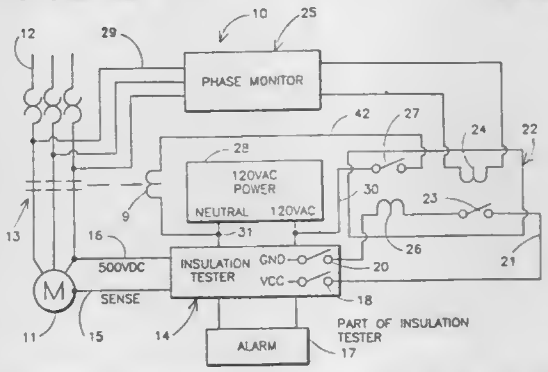
ELECTRIC MOTOR MONITORING CIRCUIT

Joseph G. Horvath, Astatula, and James C. Miller, Tavares, both of Fla., assignors to Automeg, Inc., Astatula, Fla.

Filed Sep. 20, 1996, Ser. No. 717,255

Int. Cl.^{6} H02P *5/28*

U.S. Cl. 318—798 **6 Claims**



1. An electric motor monitoring circuit for an electric motor comprising:

an three phase electric motor having an electric motor starter circuit;

an insulation monitoring circuit coupled to said electric motor for monitoring insulation leakage of said electric motor and to inhibit activation of said electric motor starter circuit when insulation leakage exceeds a preselected threshold, said insulation monitor circuit having a power supply for activating said electric motor starter circuit;

a three phase monitor circuit coupled to said electric motor for monitoring phase sequence and voltage amplitude for said electric motor; and

a relay circuit having an insulation monitoring circuit relay in said starter circuit to inhibit operation of said electric motor in an open position and having a three phase monitoring circuit relay activated by said three phase monitoring circuit to inhibit operation of said electric motor when in an open position, whereby operation of an electric motor is inhibited by detection of insulation leakage current exceeding a preselected threshold and operation of said electric motor ceases upon measuring incorrect phasing or voltage therein.

5,751,133

CHARGE/DISCHARGE CONTROL METHOD, CHARGE/DISCHARGE CONTROLLER, AND POWER GENERATION SYSTEM WITH CHARGE/DISCHARGE CONTROLLER

Hiroshi Sato; Kimitoshi Fukae, both of Nara, and Nobuyoshi Takehara, Soraku-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1996, Ser. No. 622,584

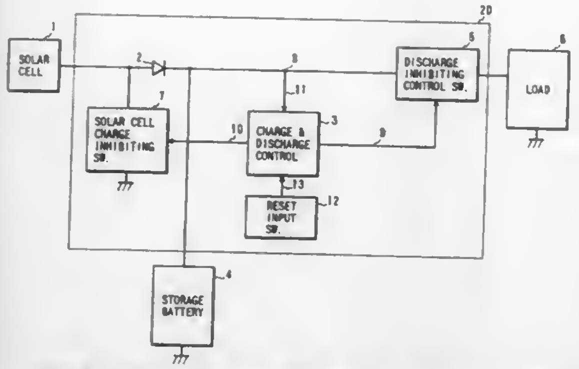
Claims priority, application Japan, Mar. 29, 1995, 7-071623

Int. Cl.^{6} H01M *10/46*

U.S. Cl. 320—13 **2 Claims**

1. A power generation system comprising a solar cell and a load connected through a first wiring, and a storage battery connected through a second wiring to a node on said first wiring between said solar cell and said load, wherein:

a first setting value preliminary set for preventing a state of discharging from said storage battery, and a second setting value preliminary set at a value greater than the first setting


SOLAR CELL
SOLAR CELL CHARGE INHIBITING SW.
CHARGE & DISCHARGE CONTROL
DISCHARGE INHIBITING CONTROL SW.
LOAD
RESET INPUT SW.
STORAGE BATTERY
1
2
3
4
5
6
7
8
9
10
11
12
13
20

value for releasing the prevention of the discharging from the discharging prevention state of said storage battery are designated; and

control means for controlling a connecting state of said first wiring, so that, starting a power supply by the discharging from said storage battery to said load thereby reducing a voltage of said storage battery according to a power consumption of said load, when the voltage of said storage battery reaches the first setting value, said control means sets at a disconnecting state said first wiring between said node and said load thereby preventing the discharging from said storage battery; and

so that, charging said storage battery with an output from said solar cell, when the voltage of said storage battery reaches the second setting value, said control means changes the disconnecting state of said first wiring into the connecting state thereby releasing the state of preventing the discharging from said storage battery to said load to supply the power from said storage battery to said load.

5,751,134

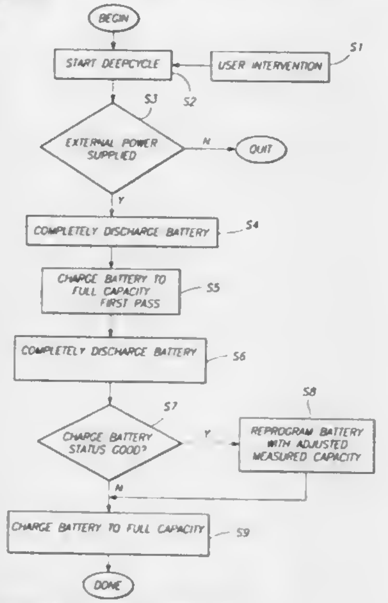
GAS GAUGING SYSTEM AND METHOD FOR MONITORING BATTERY CAPACITY FOR BATTERY POWERED ELECTRONIC DEVICES

Brian Hoerner; Kam Quan, and Frank Smith, all of Spokane, Wash., assignors to Itronix Corporation, Spokane, Wash.

Filed May 16, 1996, Ser. No. 649,316

Int. Cl.^{6} H01M *10/44;10/46;10/48*

U.S. Cl. 320—21 **30 Claims**


BEGIN
START DEEPCYCLE
USER INTERVENTION
S1
S2
S3
EXTERNAL POWER SUPPLIED
N
QUIT
Y
COMPLETELY DISCHARGE BATTERY
S4
CHARGE BATTERY TO FULL CAPACITY FIRST PASS
S5
COMPLETELY DISCHARGE BATTERY
S6
S7
CHARGE BATTERY STATUS GOOD?
Y
S8
REPROGRAM BATTERY WITH ADJUSTED MEASURED CAPACITY
N
CHARGE BATTERY TO FULL CAPACITY
S9
DONE

1. A gas gauging system, comprising:

a battery powered device;

a battery selectively connected to the device for supplying operating power to the device;

an auxiliary power supply configured to connect with the battery for supplying charging power to the battery;

a detector configurable to measure battery capacity;

a processor carried by the device, operatively connected with the detector, and configured to operatively enable the battery and the power supply, respectively, for powering the device, the processor being further configurable during connection of the auxiliary power supply to remove memory effects, then subsequently recalibrate the gas gauging system by completely discharging the battery from a fully charged state to a fully discharged state via a discharge cycle while concurrently measuring battery capacity via the detector; and

an output device for outputting a value based upon the measured battery capacity, the value indicative of battery capacity for the recalibrated gas gauging system.

5,751,135

CHARGING CONNECTOR FOR ELECTRIC VEHICLE

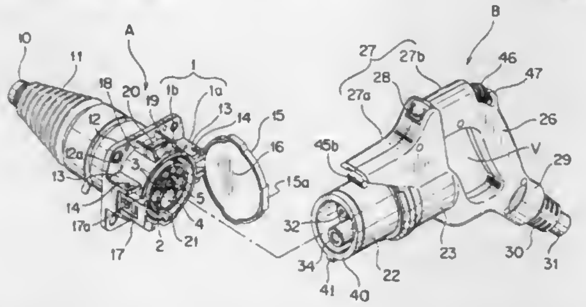
Hirotaka Fukushima, and Toshiaki Hasegawa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 26, 1996, Ser. No. 753,497

Claims priority, application Japan, Nov. 30, 1995, 7-312937

Int. Cl.^{6} H01R *13/62*

U.S. Cl. 320—107 **5 Claims**



1. A charging connector device for an electric vehicle comprising a power supplying connector and a power receiving connector,

said power supplying connector comprising a single indicator lamp set in an illumination chamber which is disposed on said power supplying connector, said indicator lamp including two LEDs which emit two different colors such that a first LED emits one color during standby when said power supplying connector is connected to a charger and a second LED emits another color during charging, respectively,

wherein said power supplying connector further comprises:

a microswitch having a contact with a switch spring so as to allow energization of the connector device;

a locking lever having a securing piece at its first end and a pressing portion at its second end opposite to said first end, and an intermediate portion between said first end and said second end being axially supported, said pressing portion being engageable with said switch spring of said microswitch; and

said power receiving connector including a securing protrusion being engageable with said securing piece when both connectors are completely coupled with each other,

wherein when said power supplying connector and said power receiving connector are completely coupled with each other, said charging connector device is energized.

5,751,136

CHECKING METHOD OF CONNECTION BETWEEN SECONDARY BATTERY AND BATTERY CHARGER AND CHECKING DEVICE

Hiroaki Takechi, and Tomohiro Ono, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

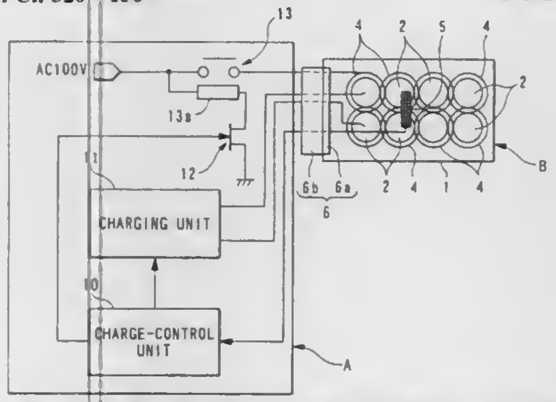
PCT No. PCT/JP95/02649, § 371 Date Nov. 5, 1996, § 102(e) Date Nov. 5, 1996, PCT Pub. No. WO96/20513, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 25, 1995, Ser. No. 702,649

Claims priority, application Japan, Dec. 26, 1994, 6-323084

Int. Cl.^{6} H02J *7/04*

U.S. Cl. 320—150 **6 Claims**



1. A method for checking connection between a secondary battery and a battery charger for charging the secondary battery, said connection being made by a disconnectable connector, said battery charger comprises charging means for supplying electric current to said secondary battery through said connector, charge-control means for controlling said charging means, and a direct current power supply; said secondary battery comprises a temperature sensing element for sensing temperature of said secondary battery, said temperature sensing element having terminals, one of which is connected to said direct current power supply of said battery charger via said connector when said connection is secured, so that said temperature sensing element normally outputs a voltage according to said temperature of said secondary battery within a predetermined range; said method comprising connecting said charge-control means to one of said terminals sensing element when said connection is secured, comparing the output voltage with a preset voltage outside of only one end limit of a standard range of the voltage of the temperature sensing element and deciding that said connection is not secured when the voltage input to said charge-control means is beyond that one end limit.

5,751,137

CONTROL SYSTEM FOR ELECTRIC POWER GENERATING APPARATUS ON VEHICLE

Takeo Kiuchi; Yutaka Tamagawa, and Shigeru Ibaraki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1996, Ser. No. 637,536

Claims priority, application Japan, Apr. 28, 1995, 7-106583

Int. Cl.^{6} H02P *9/04*

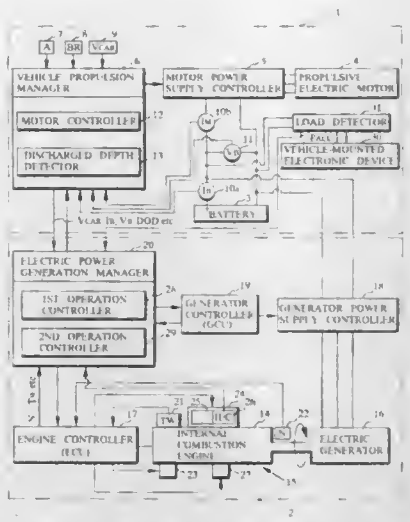
U.S. Cl. 322—14 **7 Claims**

1. A control system for controlling an electric power generating apparatus mounted on a vehicle which has a propulsive electric motor powered by a battery, and having an electric generator and an internal combustion engine for actuating the electric generator to generate an electric power output to charge the battery depending on a charged/discharged state of the battery, comprising:

charged/discharged state detecting means for detecting a charged/discharged state of the battery;

purged-gas adsorbed state detecting means for detecting an adsorbed state of a purged gas in a canister disposed in a fuel supply system of the internal combustion engine;

first operation control means for operating the internal combustion engine to enable the electric generator to charge the battery if said charged/discharged state detecting means


VEHICLE PROPULSION MANAGER
MOTOR POWER SUPPLY CONTROLLER
PROPULSIVE ELECTRIC MOTOR
MOTOR CONTROLLER
LOAD DETECTOR
DISCHARGED DEPTH DETECTOR
VEHICLE-MOUNTED ELECTRONIC DEVICE
BATTERY
ELECTRIC POWER GENERATION MANAGER
1ST OPERATION CONTROLLER
2ND OPERATION CONTROLLER
GENERATOR CONTROLLER (GCU)
GENERATOR POWER SUPPLY CONTROLLER
ENGINE CONTROLLER (ECU)
INTERNAL COMBUSTION ENGINE
ELECTRIC GENERATOR
TW
HC
14
15
16
17
19
20
21
22
23
25
27

detects when an amount of electric energy stored in the battery is smaller than a predetermined value or when a time-dependent rate of increase of an amount of electric energy discharged from the battery is greater than a predetermined level; and

second operation control means for operating the internal combustion engine to purge the canister if the charged/discharged state of the battery detected by said charged/discharged state detecting means fails to satisfy a condition for said first operation control means to operate the internal combustion engine and if said purged-gas adsorbed state detecting means detects when an amount of the purged gas adsorbed in the canister is greater than a predetermined amount;

wherein the first and second operation control means operate the internal combustion engine in modes established respectively for the first and second operation control means such that a load imposed on the internal combustion engine when the internal combustion engine is operated by at least said second operation control means is smaller than a load imposed on the internal combustion engine when the internal combustion engine is operated by said first operation control means.

5,751,138

ACTIVE POWER CONDITIONER FOR REACTIVE AND HARMONIC COMPENSATION HAVING PWM AND STEPPED-WAVE INVERTERS

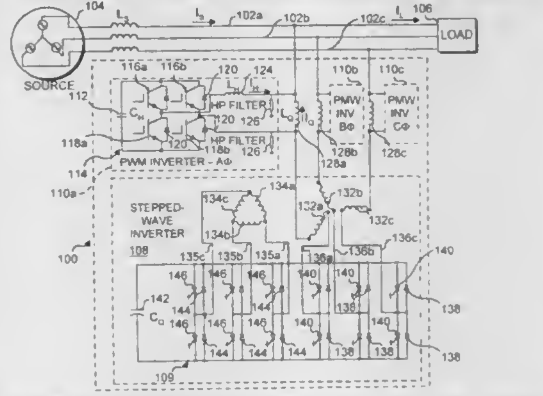
Subrahmanyam S. Venkata, Ames, Iowa; N. Ravisekhar Raju; Raxit A. Kagalwala, both of Seattle, Wash., and Vedula V. Sastry, Madras, India, assignors to University of Washington, Seattle, Wash.

Filed Jun. 20, 1996, Ser. No. 667,924

Int. Cl.^{6} G05F *1/70;* H02M *1/12*

U.S. Cl. 323—207 **29 Claims**

14. A compensator for reactive power and harmonic distortion on an alternating current three-phase power line that supplies power to a load, comprising:



(a) pulse width modulated inverter means coupled to each phase of the three-phase power line, for producing three harmonic distortion compensation signals, each of which compensate for a harmonic distortion caused by the load on a different phase of the three-phase power line;

(b) a stepped-wave inverter that produces a reactive compensation signal to compensate each of the three phases for a reactance of the load coupled to the three-phase power line; and

(c) means for coupling the pulse width modulation inverter means and the stepped-wave inverter to the three-phase power line, while decoupling the pulse width modulator means from the stepped-wave inverter, so that a switching frequency of the pulse width modulation inverter means is substantially greater than a fundamental frequency of an alternating current flowing in the three-phase power line, while a switching frequency of the stepped-wave inverter is substantially equal to the fundamental frequency of the alternating current flowing in the three-phase power line.

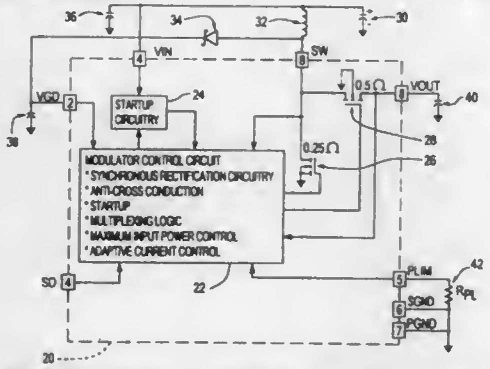
5,751,139
MULTIPLEXING POWER CONVERTER

Mark George Jordan, Goffstown; Francis H. Terry, Windham, and Thomas Peter Hack, Bedford, all of N.H., assignors to Unitrode Corporation, Merrimack, N.H.

Filed Mar. 11, 1997, Ser. No. 814,679

Int. Cl.^{6} G05F ***1/10***

U.S. Cl. 323—222 **45 Claims**



1. A multiplexing power converter for use with a single inductor for providing multiple power outputs, said power converter comprising:

first switching means, said first switching means having an input terminal and an output terminal, said first switching means being switchable between a high resistance state and a low resistance state;

second switching means, said second switching means having an input terminal and an output terminal, said input terminal of said second switching means being electrically connected to said input terminal of said first switching means, said second switching means being switchable between a high resistance state and a low resistance state;

third switching means, said third switching means having an input terminal and an output terminal, said input terminal of said third switching means being electrically connected to said input terminal of said first switching means and said input terminal of said second switching means, said third switching means being switchable between a high resistance state and a low resistance state; and

control means for controlling the switching of said first switching means, said second switching means, and said third switching means, said control means controlling said first switching means to switch between a high resistance state and a low resistance state so that current may flow through said first switching means so as to energize an inductor as needed, said control means controlling said second switching means or said third switching means to switch between a high resistance state and a low resistance state so that current may flow through said second switching means or said third switching means so as to deenergize the inductor and provide multiple power outputs.

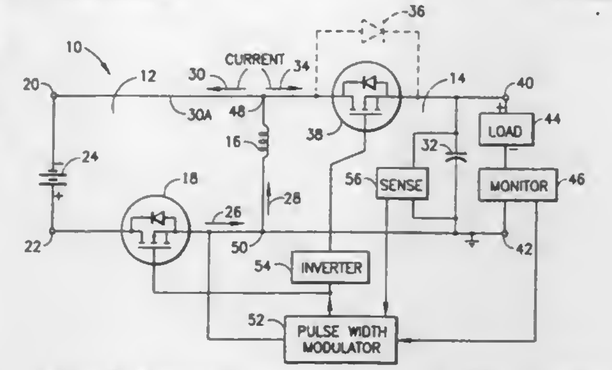
5,751,140
VOLTAGE CONVERTER WITH BATTERY DISCHARGE PROTECTION

Stanley Canter, Phoenix, Ariz., assignor to Space Systems/ Loreal, Inc., Palo Alto, Calif.

Filed Mar. 25, 1997, Ser. No. 823,825

Int. Cl.^{6} G05F ***1/56***

U.S. Cl. 323—282 **11 Claims**



1. A power regulator circuit for discharge of a battery, comprising:

a first circuit loop including input terminals for connection with the battery;

a second circuit loop including output terminals for connection with a load;

an inductor forming a first branch of said first loop and forming a first branch of said second loop;

unidirectional current means in said second loop for constraining electric current to flow in only one direction from said inductor to said output terminals, said first loop including a second branch interconnecting a terminal of said unidirectional current means via one of said input terminals to said battery, wherein said unidirectional current means blocks a flow of current from said battery through said second loop for a protection of said battery from a short circuit in said load; and

means for repetitively gating current from said battery into said inductor.

5,751,141
I_{DDQ}-TESTING OF BIAS GENERATOR CIRCUIT

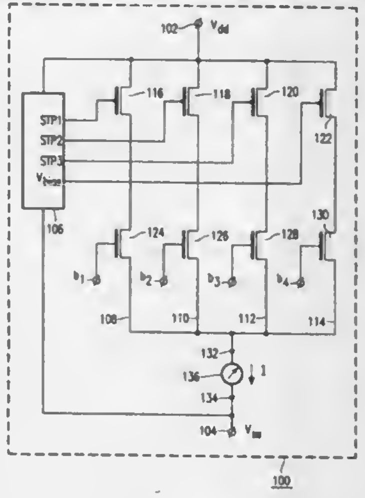
Manoj Sachdev, and Botjo Atzema, both of Eindhoven, Netherlands, assignors to U.S.Philips Corporation, New York, N.Y.

Filed Sep. 21, 1995, Ser. No. 532,338

Claims priority, application European Pat. Off., Jul. 17, 1995, 95201964

Int. Cl.^{6} G05F ***3/04;*** **H01H** ***31/02***

U.S. Cl. 323—312 **6 Claims**



1. An electronic circuit comprising a first supply node for

connection to a first voltage and a second supply node for connection to a second supply voltage, bias generating means for generating at least a first stable bias signal, and a first current path between the first and second supply nodes including a first voltage-to-current converter for converting the first stable bias signal into a first quiescent current under control of the first stable bias signal, and a first switch controllable by a first control signal for enabling or disabling the first path, wherein the first voltage-to-current converter comprises a first transistor and the first switch comprises a second transistor, the first and second transistors having their main conduction channels connected in series.

5,751,142
REFERENCE VOLTAGE SUPPLY CIRCUIT AND VOLTAGE FEEDBACK CIRCUIT

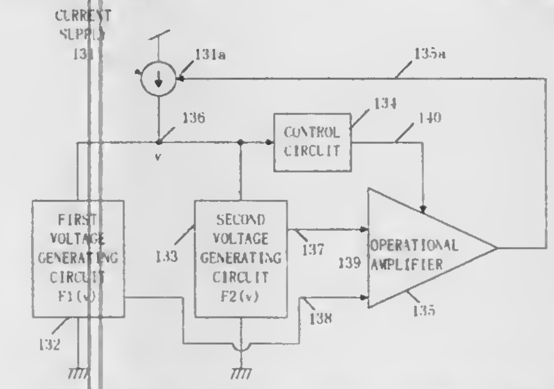
Shiro Dosho; Shiro Sakiyama; Masakatsu Maruyama, all of Osaka; Masatoshi Matsushita, and Koji Mochizuki, both of Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1997, Ser. No. 795,906

Claims priority, application Japan, Mar. 7, 1996, 8-050091

Int. Cl.^{6} G05F ***3/20***

U.S. Cl. 323—316 **24 Claims**



1. A reference voltage supply circuit which operates stably on a normal operation point where a voltage value of a first internal part is coincident with that of a second internal part and on a stabilization point other than the normal operation point, comprising:

a current supply provided with a control terminal for causing a current to flow, the current having a value corresponding to a control signal input to the control terminal;

first and second reference voltage generating circuits which share a reference voltage output terminal and receive the current from the current supply to generate a reference voltage on the reference voltage output terminal, and have the first and second internal parts to generate respective voltages thereon;

an operational amplifier for inputting, as differential signals, the voltages of the first and second internal parts to amplify the differential signals, and for outputting one of two signals forming amplified differential signals from an output terminal to send the output signal as the control signal to the control terminal of the current supply; and

a control circuit for monitoring a reference voltage generated on the reference voltage output terminal of the first and second reference voltage generating circuits when an operation of the reference voltage supply circuit starts up, and for generating an offset voltage between two voltages input to the operational amplifier to cause the stabilization point to disappear if the reference voltage is less than a set value.

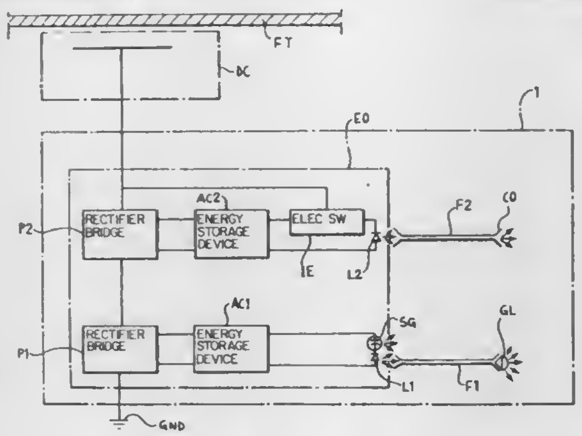
5,751,143
OPTO-ELECTRONIC SYSTEM FOR THE ACQUISITION OF SIGNALS INDICATING THE PRESENCE OF A VOLTAGE AND ITS PHASE

Natale Fava, Corso Antony 11, 1-10093 Collegno (Torino), Italy

Filed Nov. 29, 1995, Ser. No. 564,635

Int. Cl.^{6} G01R ***19/16***

U.S. Cl. 324—96 **18 Claims**



1. A system for the generation and transmission of signals indicative of characteristics of an A.C. voltage on a conductor, the system comprising:

capacitive pick up means operatively coupled to said conductor to produce electrical pulses in response to presence of an A.C. voltage on said conductor, electro-optical convertor means operatively connected to said capacitive pick up means and operable to convert said electrical pulses into light pulses;

said electro-optical convertor means includes rectifier bridge means connected to said capacitive pick up means and operable to rectify said electrical pulses, energy storage means connected to said rectifier bridge means and operable to store energy of several electrical pulses and at least one light emitter connected to said energy storage means; and

optical conductor means coupled to said electro-optical convertor means and operable to convey said light pulses over a distance;

said electro-optical convertor means including detector means operatively connected to said capacitive pick up means and said at least one light emitter operable to emit signals indicative of a phase of the A.C. voltage on said conductor and

said detector means comprising an electronic switch controlled by said electrical pulses generated by the said capacitive pick up means.

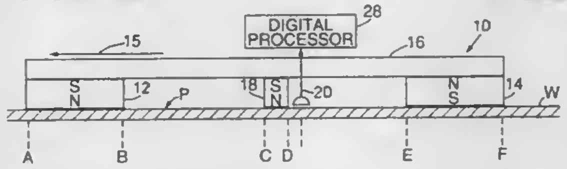
5,751,144
METHOD AND DEVICE INCLUDING PRIMARY AND AUXILIARY MAGNETIC POLES FOR NONDESTRUCTIVE DETECTION OF STRUCTURAL FAULTS

Herbert R. Weischedel, South Windsor, Conn., assignor to NDT Technologies, Incorporated, South Windsor, Conn.

Filed Jul. 23, 1996, Ser. No. 685,414

Int. Cl.^{6} G01N ***27/82;27/90***

U.S. Cl. 324—240 **26 Claims**



9. A magnetic inspection device for nondestructively detecting structural faults in elongated objects comprising:

magnet means including first and second primary magnetic poles oppositely polarized relative to each other and spaced from one another for positioning and movement longitudinally relative to an elongated magnetically permeable object to be tested, the first primary pole being positioned upstream of the second primary pole relative to magnet means movement, the magnet means further including at least one auxiliary magnetic pole provided on the magnet means between the primary poles, the auxiliary pole having the same poling as one of the primary poles, the primary poles inducing a static magnetic flux through a longitudinal section of an object extending between the primary poles to at least a near-saturation level, the auxiliary pole changing the magnitude of the induced static magnetic flux in a portion of the object adjacent to the auxiliary pole, the primary poles and the auxiliary pole inducing circumaxial eddy currents and associated opposing magnetic fluxes in moving portions of the object adjacent to the first primary pole and the auxiliary pole, the auxiliary pole being located downstream of the first primary pole such that at a portion of the object adjacent to the auxiliary pole, the eddy currents generated by the first primary pole have decayed and such portion of the object is at least at a near-saturation level;

at least one eddy current change detecting means positioned downstream of the auxiliary pole such that the detecting means is to be positioned adjacent to a portion of the object where combined static and opposing magnetic fluxes magnetically saturate such portion and where eddy currents induced by the auxiliary pole have not decayed such that eddy current changes representative of structural faults generate at least one detectable signal in the eddy current change detecting means; and

a digital processor responsive to the at least one signal for determining the location and magnitude of a structural fault within the moving portion of the object.

5,751,145

MR IMAGING METHOD AND APPARATUS WITH WATER SIGNAL SUPRESSION

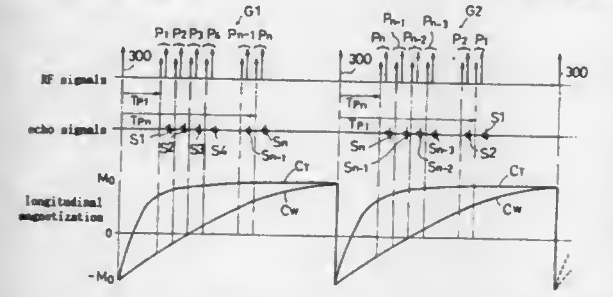
Koji Shimizu, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 13, 1996, Ser. No. 689,786

Claims priority, application Japan, Aug. 21, 1995, 7-236138

Int. Cl.⁶ A01B *5/055*

U.S. Cl. 324—309 **10 Claims**



1. An MR imaging method using NMR phenomenon, comprising the steps of:

(a) emitting a first group of RF pulses including a first inversion RF pulse having a frequency band for inverting proton spins included in a plurality of slices, and first excitation RF pulses emitted at predetermined points of time following said first inversion RF pulse to excite a plurality of slices in a predetermined order;

(b) emitting slice-selecting gradient field pulses based on emission timing of said RF pulses in said first group of RF pulses;

(c) emitting phase-encoding gradient field pulses for phase-encoding echo signals generated by said first excitation RF pulses, respectively;

(d) applying reading gradient field pulses to echo signals generated by said first group of RF pulses to read and collect a first group of echo signals successively;

(e) emitting a second group of RF pulses including a second inversion RF pulse having substantially the same frequency band as said first inversion RF pulse, and second excitation RF pulses emitted at predetermined points of time following said second inversion RF pulse to excite said plurality of slices in an order reverse to said predetermined order;

(f) emitting slice-selecting gradient field pulses based on emission timing of said RF pulses in said second group of RF pulses;

(g) emitting phase-encoding gradient field pulses for phase-encoding echo signals generated by said second excitation RF pulses, respectively;

(h) applying reading gradient field pulses to echo signals generated by said second group of RF pulses to read and collect a second group of echo signals successively;

(i) repeating a pulse sequence from step (a) to step (h), predetermined times, while varying said phase-encoding gradient field pulses emitted at steps (c) and (g);

(j) adding two data corresponding to each slice, which data are included, respectively, in a first group of data acquired from said first group of echo signals and in a second group of data acquired from said second group of echo signals, thereby forming a new group of data; and

(k) reconstructing a plurality of slice images from said new group of data.

5,751,146

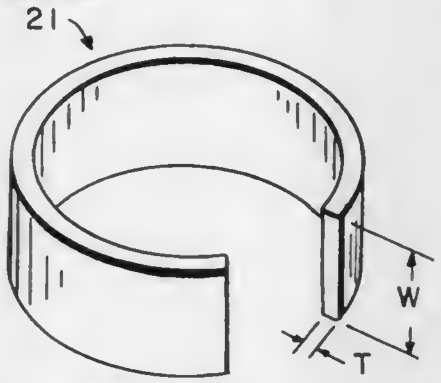
SURFACE COIL FOR HIGH RESOLUTION IMAGING

Mirko I. Hrovat, Brockton, Mass., assignor to Magnetic Vision Technologies, Inc., Cambridge, Mass.

Continuation of Ser. No. 347,799, Dec. 1, 1994, abandoned. This application Nov. 21, 1996, Ser. No. 754,745

Int. Cl.⁶ G01R *33/20*

U.S. Cl. 324—318 **7 Claims**



1. An rf coil for MRI, said coil comprising a trace of a high conductivity material having a length, width and thickness and having a surface defined by the length and the width, the coil having a radius and a longitudinal axis at the center of the coil, wherein the trace is arranged in a loop with one end in proximity to the other end with the surface facing the inside of the loop, wherein the surface is substantially parallel to the longitudinal axis of the coil, wherein the ratio of the width of the coil to the radius of the coil is 0.3 or greater, and wherein the thickness of the trace is sufficient to provide an rf skin effect,

wherein said trace is mounted on a mounting substrate with said surface perpendicular to said mounting substrate.

5,751,147

PREIGNITION DETECTING METHOD

Koichi Nakata; Kazuhisa Mogi, both of Susono, and Youichi Kurebayashi, Toyohashi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

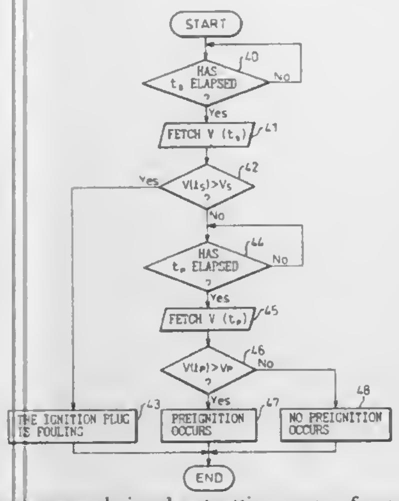
Filed May 28, 1997, Ser. No. 864,627

Claims priority, application Japan, May 30, 1996, 8-136923

Int. Cl.⁶ F02P *17/00*

U.S. Cl. 324—399 **8 Claims**

1. A preignition detecting device comprising:



an ignition command signal outputting means for outputting an ignition command signal;

a fouling detecting means for detecting fouling of an ignition plug in accordance with a current which flows from the ignition plug to a ground during a fouling detecting interval contained in a period when the ignition command signal is being outputted by said ignition command signal outputting means;

a preignition detecting means for detecting a preignition in accordance with a current which flows from the ignition plug to a ground when a preignition detecting interval later than the fouling detecting interval contained in a period during the ignition command signal is being outputted by said ignition command signal outputting means; and

a preignition detecting inhibiting means for inhibiting a preignition from being detected when fouling of the ignition plug is detected by said fouling detecting means.

5,751,148

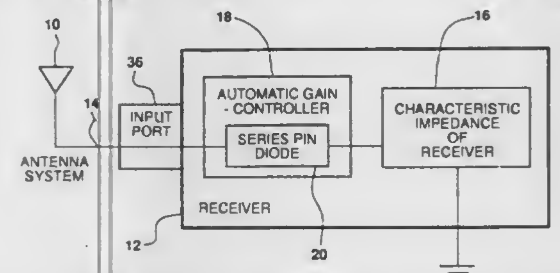
METHOD FOR DETECTING ELECTRICAL CONNECTION BETWEEN ANTENNA AND RECEIVER FOR A MOTOR VEHICLE

John F. Kennedy, Dearborn, and Andrew Adrian, Dexter, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 23, 1996, Ser. No. 717,574

Int. Cl.⁶ H04B *17/00;* **G01R** *31/02*

U.S. Cl. 324—501 **8 Claims**


10
18
16
36
14
INPUT PORT
AUTOMATIC GAIN - CONTROLLER
SERIES PIN DIODE
CHARACTERISTIC IMPEDANCE OF RECEIVER
ANTENNA SYSTEM
RECEIVER
12
20

1. A method for detecting an electrical connection between an antenna system and a receiver for a motor vehicle, the receiver having an automatic gain control with a variable impedance, the method comprising the steps of:

increasing the variable impedance of the automatic gain control;

measuring signal strength of a signal received from the antenna system;

decreasing the variable impedance of the automatic gain control;

measuring the signal strength of the signal received from the antenna system after the impedance of the automatic gain control has been decreased;

correlating the signal strength to the variable impedance to generate a correlation; and

determining whether the antenna system is electrically connected the receiver based on the correlation of the signal strength to the variable impedance.

5,751,149

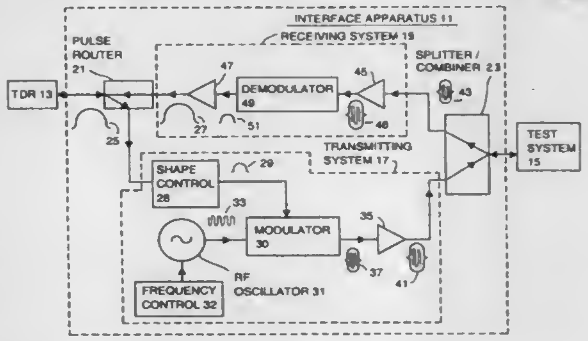
METHOD AND APPARATUS FOR HIGH FREQUENCY TIME DOMAIN REFLECTOMETRY

Arthur E. Oberg, Vista, and Charles H. Wissman, Oceanside, both of Calif., assignors to Tempo Research Corporation, Vista, Calif.

Filed Dec. 8, 1995, Ser. No. 569,503

Int. Cl.⁶ G01R *31/11*

U.S. Cl. 324—533 **23 Claims**



14. An improved time domain reflectometer (TDR) system which permits testing at a selected one of a plurality of frequencies lying within a range of frequencies carried by a system under test with a TDR pulse signal having a comparatively low bandwidth in relation to said range, said system comprising:

a TDR for producing a comparatively low bandwidth TDR pulse signal and for processing a fault reflected signal;

a selectable frequency oscillator, controllable to produce a carrier frequency selected within said frequency range;

a modulator, coupled to receive said TDR pulse signal and said selected carrier frequency, to produce a system test pulse signal at said selected carrier frequency for testing said system under test; and

a demodulator operative to convert a fault reflected signal received from said system under test at said selected carrier frequency to a frequency for processing by said TDR.

5,751,150

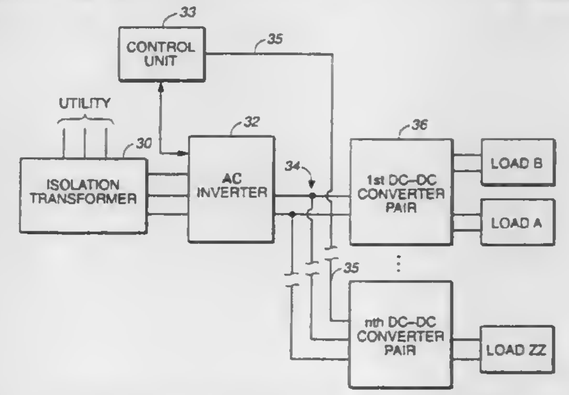
BIDIRECTIONAL LOAD AND SOURCE CYCLER

Wally E. Rippel, Altadena, and Darrell Buchanan, Monrovia, both of Calif., assignors to AeroVironment, Monrovia, Calif.

Filed Aug. 11, 1995, Ser. No. 513,689

Int. Cl.⁶ G01R *31/00;* **H02M** *3/07;7/12*

U.S. Cl. 324—537 **24 Claims**



1. A system for sourcing and sinking electrical power comprising:

a poly-phase utility port for connecting the system with an electrical utility;

a device connected to the poly-phase utility port for interfacing the poly-phase utility port with a DC bus to provide a first DC voltage level thereon;

at least one bi-directional DC-to-DC converter for converting the first DC voltage level to at least one second DC voltage level; and

a controller for coordinating operation of the at least one bidirectional DC to DC converter.

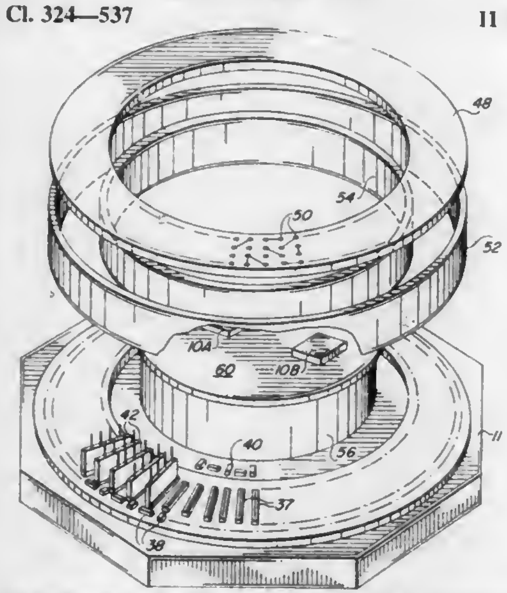
5,751,151
INTEGRATED CIRCUIT TEST APPARATUS

Paul S. Levy, and Ed Chenoweth, both of Chandler, Ariz., assignors to VLSI Technology, San Jose, Calif.

Filed Apr. 12, 1996, Ser. No. 630,685

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—537 **11 Claims**



1. An integrated circuit test system including in combination:

a main test circuit load board having a plurality of relay card mounts thereon;

a plurality of relay circuit cards each having at least one relay mounted thereon, and each having first and second edges, with a plurality of edge connectors on said first edge removably inserted into a corresponding one of said relay card mounts, and a plurality of spring-loaded connector pins on said second edge;

a configuration board having mating connectors on it for releasable electrical connection to the spring-loaded connector pins on said second edges of said relay circuit cards, whereupon removal of said configuration board leaves said relay circuit cards in place on said main test circuit load board and leaves said relay circuit cards exposed for ready access and replacement.

5,751,152
METHOD AND APPARATUS FOR CONCURRENTLY MEASURING NEAR END CROSSTALK AT TWO ENDS OF A CABLE

Richard G. DuBose, Scottsdale, and Martin Teague, New River, both of Ariz., assignors to Microtest, Inc., Phoenix, Ariz.

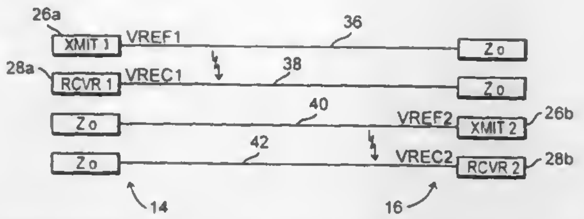
Filed May 14, 1996, Ser. No. 647,572

Int. Cl.⁶ G01R *27/28*

U.S. Cl. 324—628 **20 Claims**

1. A method for measuring near end cross talk (NEXT) between a plurality of conductor pairs in a multiconductor cable, said method comprising the steps of:

(a) transmitting a first test signal on a first one of said conductor pairs, said first test signal being transmitted at a first frequency;



(b) transmitting a second test signal on a second one of said conductor pairs, said second test signal being transmitted at a second frequency;

(c) receiving a first coupled signal in response to said step (a), said first coupled signal having said first frequency and being received over a third one of said conductor pairs; and

(d) receiving a second coupled signal in response to said step (b), said second coupled signal having said second frequency and being received over a fourth one of said conductor pairs; wherein

said steps (a) and (b) occur approximately simultaneously.

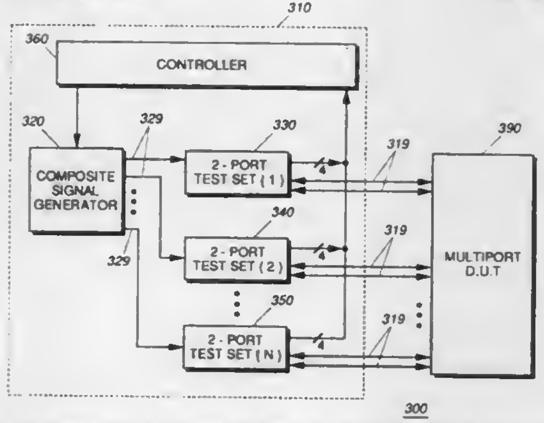
5,751,153
METHOD AND APPARATUS FOR CHARACTERIZING A MULTIPORT CIRCUIT

David E. Bockelman, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 270,359, Jul. 5, 1994, Pat. No. 5,561,378. This application May 2, 1996, Ser. No. 642,236

Int. Cl.⁶ G01R *27/28*

U.S. Cl. 324—638 **20 Claims**



1. An apparatus for characterizing a circuit having at least three ports coupled thereto, comprising:

a signal generator; and

a circuit interface apparatus coupled to the signal generator and having an output of a set of at least three circuit stimulus signals, which set of at least three circuit stimulus signals are linearly independent, and wherein each of the at least three circuit stimulus signals has a plurality of signal components having a one-to-one correspondence with the at least three ports of the circuit, and wherein at least two of the plurality of signal components for each of the at least three circuit stimulus signals are simultaneously non-zero.

5,751,154
CAPACITIVE SENSOR INTERFACE CIRCUIT

Masahiro Tsugai, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

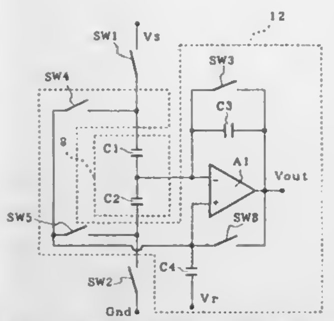
Filed Oct. 28, 1996, Ser. No. 739,049

Claims priority, application Japan, Mar. 19, 1996, 8-076323

Int. Cl.⁶ G01P *15/125*

U.S. Cl. 324—661 **4 Claims**

1. A capacitive sensor interface circuit connected to a capacitive sensor having first and second capacitors, wherein at least one of



said capacitors is a variable capacitor, and the capacitive sensor interface circuit comprising:

a single operational amplifier;

a feedback/sampling capacitor connected between an output terminal and an inverting input terminal of said operational amplifier; and

a holding capacitor connected between a non-inverting input terminal of said operational amplifier and a reference voltage source,

wherein the first and second capacitors and the feedback/sampling capacitor have one, common end connected to the inverting input terminal of the operational amplifier, another, opposite end of the first capacitor being connected to a first power source, another opposite other end of the second capacitor being connected to a second power source, the feedback/sampling capacitor being short-circuited concurrently by a first switching means depending upon predetermined timing, and said opposite ends of the first and second capacitors and the output terminal of the operational amplifier being connected to a non-inverting input terminal of the operational amplifier by a second switching means after the elapse of a predetermined time from the predetermined timing.

5,751,155
ELECTRICAL DISCHARGE MACHINING LEVEL DETECTOR

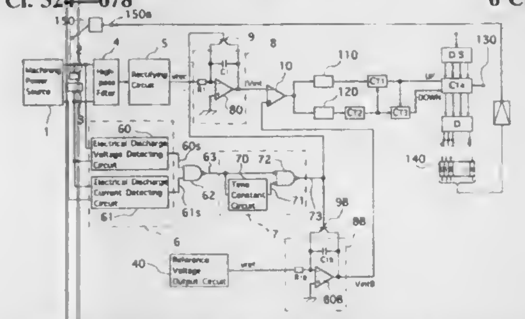
Koji Akamatsu, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1995, Ser. No. 510,849

Claims priority, application Japan, Aug. 9, 1994, 6-187309; Jul. 25, 1995, 7-189351

Int. Cl.⁶ B23H *1/02;7/16*

U.S. Cl. 324—678 **6 Claims**



1. An electrical discharge state detecting device for an electrical discharge machine, comprising:

high-frequency component detecting means for detecting a high-frequency component superimposed on one of an electrical discharge voltage and an electrical discharge current at a machining clearance between an electrode and a workpiece, including a high pass filter and rectifying circuit;

first integrating means for integrating, over time, a magnitude of an amplitude of the high-frequency component detected by said high-frequency component detecting means;

reference voltage output means for outputting a reference voltage;

second integrating means for integrating, over time, said reference voltage output from said reference voltage output means;

control means for controlling a starting and an ending of integrations performed by said first integrating means and said second integrating means; and

comparing means for comparing an integrated value obtained by said first integrating means with an integrated value obtained by said second integrating means, and outputting a signal indicating whether said one of said electrical discharge voltage and said electrical discharge current at the machining clearance between the electrode and the workpiece is normal;

wherein said first integrating means uses a magnitude of an amplitude of a rectified component, obtained by rectifying the high-frequency component, as the magnitude of the amplitude of the high-frequency component to be integrated over time.

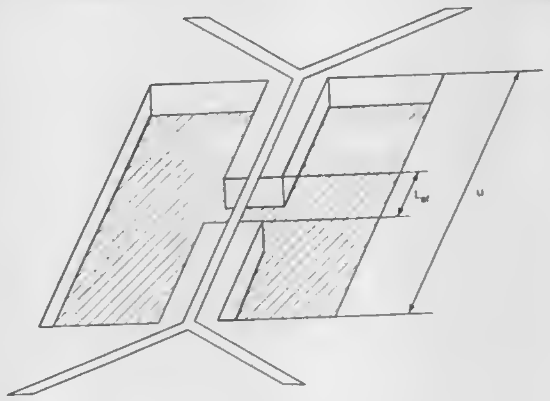
5,751,156
MECHANICALLY CONTROLLABLE BREAK TRANSDUCER

Christiaan Muller; Choog Wu Zhou, both of New Haven, and Mark A. Reed, Southport, all of Conn., assignors to Yale University, New Haven, Conn.

Filed Jun. 7, 1995, Ser. No. 486,960

Int. Cl.⁶ G01R *19/00;27/14*

U.S. Cl. 324—699 **23 Claims**



1. A sensor comprising:

a first conductor and a second conductor positioned to form a gap therebetween which varies dynamically, in response to an external condition being sensed, from a minimum value of at least about zero Ångstroms to a maximum value which is less than about thirty Ångstroms; and

circuitry connected to sense the electrical impedance of said gap by detection of a tunneling current through said gap, wherein said electrical impedance of said gap varies in response to said gap varying.

5,751,157
METHOD AND APPARATUS FOR ALIGNING PROBES

January Kister, Menlo Park, Calif., assignor to Probe Technology, Santa Clara, Calif.

Filed Jul. 22, 1996, Ser. No. 681,226

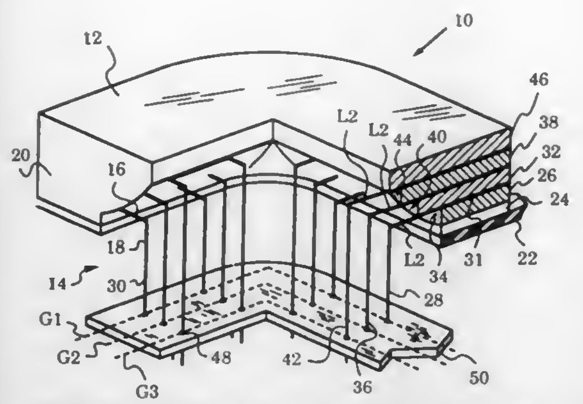
Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—758 **36 Claims**

17. An apparatus for aligning a set of probes of a circuit testing apparatus with a set of pads of a circuit under test, each probe of said set of probes having a tip portion of tip length L1, a beam portion of beam length L2 and a mounting portion, said apparatus comprising:

a) a first group G1 of probes selected from said set of probes, such that each probe of said first group G1 has the same tip length L1 and each probe of said first group G1 has the same beam length L2;

b) a first mounting block having a first through-hole for each probe of said first group G1, such that each probe of said first group G1 has said tip portion in said first through-hole and



said mounting portion attached to said first mounting block, said first mounting block further having a first removable portion comprising said first through-hole, such that when said first removable portion is discarded said beam portion L2 extends unsupported past said first mounting block;

c) a second group G2 of probes selected from said set of probes, such that each probe of said second group G2 has the same tip length L1 and each probe of said second group G2 has the same beam length L2;

d) a second mounting block placed on said first mounting block, said second mounting block having a second through-hole for each probe of said second group G2, such that each probe of said second group G2 has said tip portion in said second though-hole and said mounting portion attached to said second mounting block, said second mounting block further having a second removable portion comprising said second through-hole, such that when said second removable portion is discarded said beam portion L2 extends unsupported past said second mounting block; and

e) an aligning means for aligning said second mounting block with said first mounting block.

5,751,158

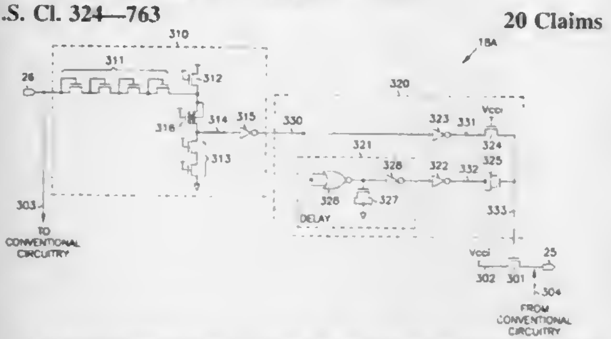
METHOD AND APPARATUS FOR SELECTIVELY DERIVING A BOOSTED VOLTAGE EXCEEDING AN INTERNAL VOLTAGE

Daniel R. Loughmiller, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 7, 1995, Ser. No. 551,825

Int. Cl.⁶ G01R *31/00;31/28*

U.S. Cl. 324—763 **20 Claims**



17. A semiconductor test circuit for testing an internal voltage of an integrated circuit (IC), comprising:

an input pin;

an output pin;

a transistor, having a control gate, the transistor operatively coupling the internal voltage to the output pin in response to a threshold voltage being applied to the control gate;

a supervolt input detect circuit operatively coupled to the input pin to detect a high voltage level test control signal being applied to the input pin and to produce a first voltage transition in response to the test control signal;

a fast path operatively coupled to produce a first voltage at the control gate in response to the first voltage transition; and

a slow path operatively coupled to boost the first voltage at the control gate to a second voltage above the threshold voltage, the slow path including,

a delay circuit operatively coupled to generate a delayed voltage transition in response to the first voltage transition, and

a capacitive element, operatively coupled between the delay circuit and the control gate, the capacitive element operating to increase the voltage at the control gate to the second voltage in response to the delayed voltage transition.

5,751,159

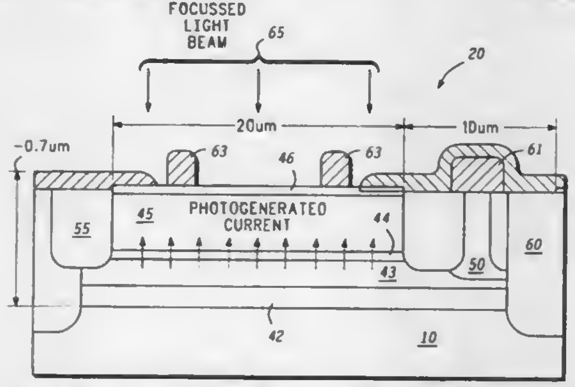
SEMICONDUCTOR ARRAY AND SWITCHES FORMED ON A COMMON SUBSTRATE FOR ARRAY TESTING PURPOSES

Paige M. Holm, Phoenix, and Chris Terwilliger, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1995, Ser. No. 523,327

Int. Cl.⁶ G01R *31/00;31/26*

U.S. Cl. 324—767 **19 Claims**



12. A method of probing high resolution device arrays comprising the steps of:

providing a semiconductor substrate and fabricating an array of semiconductor devices thereon, the semiconductor devices being positioned in rows and columns, and each row and column having an externally available I/O row pad and an externally available I/O column pad, respectively, for the connection of external input/output apparatus;

fabricating a first plurality of externally activated semiconductor switches each having first and second terminals on the semiconductor substrate and connecting one each of the first terminals of the first plurality of semiconductor switches to each of the I/O row pads of the rows and fabricating a second plurality of externally activated semiconductor switches each having first and second terminals on the semiconductor substrate and connecting one each of the first terminals of the second plurality of semiconductor switches to each of the I/O column pads of the columns of semiconductor devices, the second terminals of the first and second pluralities of semiconductor switches having externally available electrical connections and each semiconductor switch having an external energy input positioned to be externally accessible;

connecting the second terminals of the first plurality of externally activated semiconductor switches into a row circuit and connecting the second terminals of the second plurality of externally activated semiconductor switches into a column circuit and connecting the row circuit and the column circuit into a complete probe circuit;

addressing and activating the semiconductor devices in the array by directing an external activating energy source onto the externally activated semiconductor switches in the row and column circuits to determine the existence of inoperative semiconductor devices in the array of semiconductor devices; and

disconnecting the complete probe circuit from the row and column circuits and connecting the I/O pads to external input/output apparatus.

5,751,160

OUTPUT BUFFER WITH IMPROVED OPERATIONAL SPEED AND TRANSITIONAL CURRENT

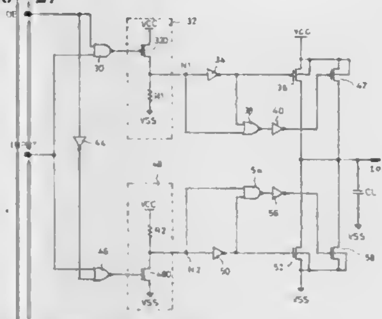
Dae Bong Baek, Kyungki-Do, and Sung Hoon Kwak, Seoul, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Nov. 26, 1996, Ser. No. 756,452

Claims priority, application Rep. of Korea, Dec. 23, 1995, 1995/55618

Int. Cl.⁶ H03K *17/14;17/16*

U.S. Cl. 326—27 **26 Claims**



1. An output buffer comprising:

a first NAND gate for NAND-operating an output enable signal and input data signal;

first inverting means for receiving an output signal of said first NAND gate, and generating a predetermined signal level according to voltage and temperature;

a first inverter for inverting an output signal of said first inverting means;

a first MOS transistor for pulling-up a power level of an output pad according to the output signal of said first inverter;

a first NOR gate for NORing the output signals of said first inverter and first inverting means in response to the output signal of said first inverting means;

a second MOS transistor for pulling-up the power level of the output pad according to an output signal of the first NOR gate;

a second inverter for inverting the output enable signal;

a second NOR gate for NORing said input data signal and said output enable signal input through said second inverter;

second inverting means for receiving an output signal of said second NOR gate, and generating a predetermined signal level according to voltage and temperature;

a third inverter for inverting an output signal of said second inverting means;

a third MOS transistor for pulling-down the power level of said output pad according to an output signal of said third inverter;

a second NAND gate for NANDing the output signals of said third inverter and second inverting means in response to the output signal of said second inverting means; and

a fourth MOS transistor for pulling down the power level of said output pad according to an output signal of said second NAND gate.

5,751,161

UPDATE SCHEME FOR IMPEDANCE CONTROLLED I/O BUFFERS

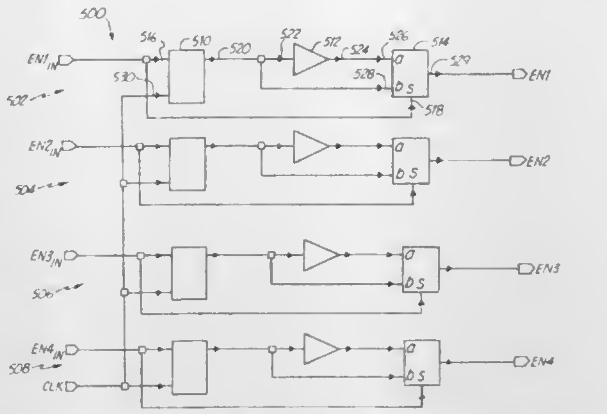
Shuran Wei, St. Paul, and Randall Bach, Stillwater, both of Minn., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 4, 1996, Ser. No. 626,272

Int. Cl.⁶ H03K *17/16*

U.S. Cl. 326—30 **13 Claims**

4. An impedance control apparatus for changing an output impedance of a buffer from an initial output impedance to a final output impedance, the buffer having a plurality of impedance control inputs, with each of the plurality of impedance control inputs adapted for receiving a corresponding one of a plurality of bits of an impedance control signal, wherein the output impedance of the buffer is controlled as a function of a value of the impedance control signal, the impedance control apparatus comprising:



means for changing the value of the impedance control signal from an initial value corresponding to the initial output impedance to an intermediate value corresponding to an intermediate output impedance, wherein the intermediate output impedance is less than the initial output impedance; and

means for changing the value of the impedance control signal from the intermediate value corresponding to the intermediate output impedance to a final value corresponding to the final output impedance.

5,751,162

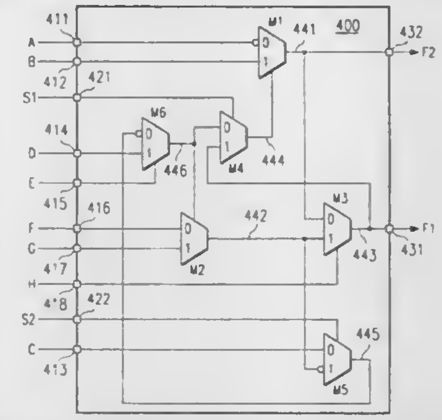
FIELD PROGRAMMABLE GATE ARRAY LOGIC MODULE CONFIGURABLE AS COMBINATIONAL OR SEQUENTIAL CIRCUITS

Mahesh Mehendale, Banaglore, India; Shivaling Mahant-Shetti, Dallas, Tex.; Manisha Agarwala, Richardson, Tex.; Mark G. Harward, Dallas, Tex., and Robert J. Landers, Pla-o, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 417,573, Apr. 6, 1995, abandoned. This application Jun. 7, 1996, Ser. No. 659,990

Int. Cl.⁶ H03K *19/173*

U.S. Cl. 326—37 **17 Claims**



1. A logic module for use in a field programmable gate array integrated circuit comprising:

a plurality of input terminals, a plurality of output terminals, a plurality of logic elements, and an interconnection network interconnecting said input terminals, logic elements and output terminals; the logic elements being configurable to form within a single said logic module preselected types of sequential and combinational logic functions in response to predetermined combinations of control signals placed on certain of said input terminals;

wherein said logic module has no active elements except for said logic elements and wherein each logic element consists of a multiplexer: and

wherein at least one of said preselected types of combinational logic function is a full adder with carry.

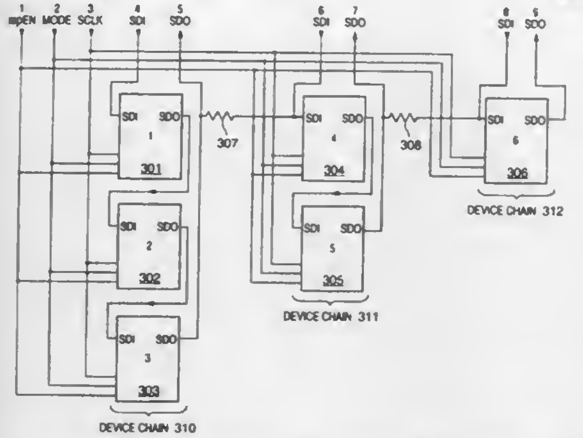
5,751,163

PARALLEL PROGRAMMING OF IN-SYSTEM (ISP) PROGRAMMABLE DEVICES USING AN AUTOMATIC TESTER

Howard Tang, and Daniel V. Parker, both of San Jose, Calif., assignors to Lattice Semiconductor Corporation, Hillsboro, Oreg.

Filed Apr. 16, 1996, Ser. No. 632,811
Int. Cl.^{6} H03K *19/177*

U.S. Cl. 326—38 **7 Claims**



1. A method for programming in parallel programmable logic devices (PLDs), using an automatic tester (ATE) of multiple pins, each programmable logic device including a control pin, an input pin and an output pin, said method comprising the steps of:

providing a first device chain of one or more serially connected PLDs, such that each input pin of said PLDs of said first device chain, except the input pin of the first PLD in said first device chain, is connected to an output pin of another PLD in said first device chain, said control pins of said PLDs in said first device chain being electrically coupled to each other and to a first pin of said ATE, said input pin of said first PLD of said first device chain being electrically coupled to a second pin of said ATE;

providing a second device chain of one or more serially connected PLDs, such that each input pin of said PLDs of said second device chain, except the input pin of the first PLD in said second device chain, is connected to an output pin of another PLD in said second device chain, said control pins of said PLDs in said second device chain being electrically coupled to each other and to said first pin of said ATE, said input pin of said first PLD of said second device chain being electrically coupled to a third pin of said ATE;

shifting programming instructions and data into said PLDs of said first device chain via said second pin of said ATE and said PLDs of said second device chain via said third pin of said ATE; and

simultaneously programming PLDs in said first and second device chains.

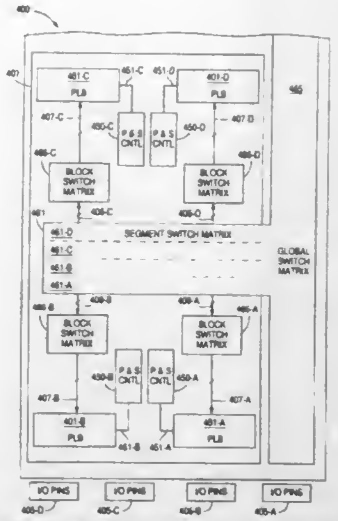
5,751,164

PROGRAMMABLE LOGIC DEVICE WITH MULTI-LEVEL POWER CONTROL

Bradley A. Sharpe-Geisler, San Jose, and Bryon I. Moyer, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 24, 1996, Ser. No. 668,896
Int. Cl.^{6} H03K *17/14*

U.S. Cl. 326—38 **11 Claims**



1. A power-down circuit for a programmable logic device comprising:

a first programmable logic structure including:

a plurality of logic elements; and

a power and speed performance control line coupled to each of said plurality of logic elements wherein a speed performance and a power consumption of said first programmable logic structure are determined by a signal on said power and speed performance control line; and

a first programmable power and speed control circuit connected to said power and speed performance control line wherein said first programmable power and speed control circuit is programmably configurable to provide a signal selected from one of at least three power and speed performance point signals on said power and speed performance control line of said first programmable logic structure.

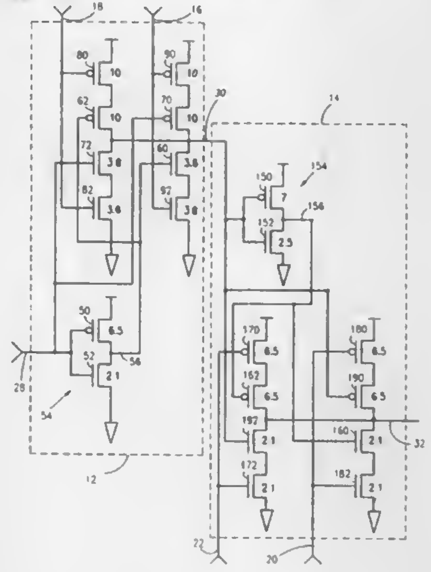
5,751,165

HIGH SPEED CUSTOMIZABLE LOGIC ARRAY DEVICE

Uzi Yoeli; Eran Rotem; Meir Janai, and Zvi Orbach, all of Haifa, Israel, assignors to Chip Express (Israel) Ltd., Haifa, Israel

Filed Aug. 18, 1995, Ser. No. 516,739
Int. Cl.^{6} H03K *19/177*

U.S. Cl. 326—47 **15 Claims**



1. A very high speed customizable logic array device comprising:

a substrate having at least one gate layer and at least one metal layer, said gate layer including a multiplicity of identical unit logic cells,

said customizable logic array device including at least three of the following functionalities:

NAND, NOR, inverter, AND and OR

and further being characterized in that the ratio between the rise time and the fall time of the logic cells embodying each of said at least three functionalities is constant.

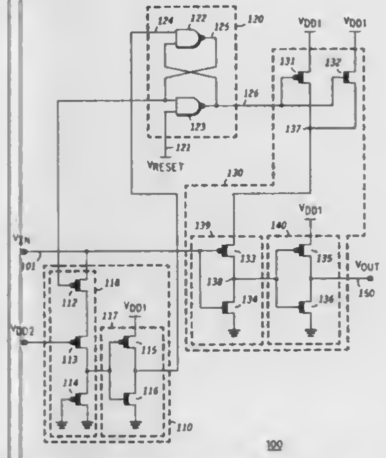
5,751,166

INPUT BUFFER CIRCUIT AND METHOD

Jhy-Jer Shieh, Phoenix, and Dandas K. Tang, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1996, Ser. No. 658,040
Int. Cl.^{6} H03K *19/0185;19/0948*

U.S. Cl. 326—71 **22 Claims**



21. An integrated circuit, comprising:

a threshold detector circuit having a first input coupled for receiving an input signal, a second input coupled for receiving a reference signal, and an output for comparing the input signal with the reference signal to provide a threshold output signal;

a variable threshold stage having an input coupled to the first input of the threshold detector circuit and an output for providing an output signal; and

a variable resistor coupled between a power supply conductor and the variable threshold stage for providing a resistance determined by the threshold output signal to set a switching threshold at the input of the variable threshold stage.

5,751,167

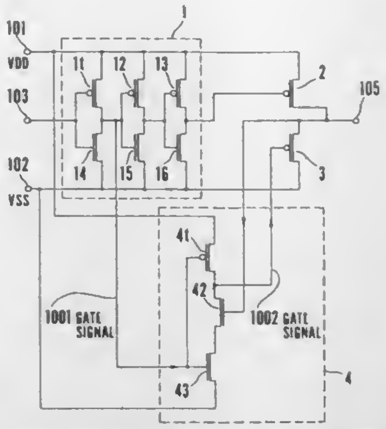
CMOS OUTPUT BUFFER CIRCUIT WHICH CONVERTS CMOS LOGIC SIGNALS TO ECL LOGIC SIGNALS AND WHICH DISCHARGES PARASITIC LOAD CAPACITANCES

Shunichi Karube, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 542,336, Oct. 12, 1995, abandoned, which is a continuation of Ser. No. 290,499, Aug. 15, 1994, abandoned. This application Jun. 20, 1996, Ser. No. 667,870

Claims priority, application Japan, Aug. 16, 1993, 5-202156
Int. Cl.^{6} H03K *19/0175;19/094*

U.S. Cl. 326—73 **2 Claims**



1. A CMOS output buffer circuit comprising:

an amplifier powered by a higher and a lower potential power supply, which amplifier is used for receiving and amplifying CMOS logic signals and for outputting a cascade amplifier output signal and a gate signal;

an outputting MOSFET for receiving, at its gate terminal, the cascade amplifier output signal;

a bypassing MOSFET having a source terminal connected to a drain terminal of the outputting MOSFET, a drain terminal connected to the lower potential power supply, and a gate terminal controlled in such a way that a charge caused by both the outputting MOSFET and a load capacitance parasitically arisen in a load of the outputting MOSFET, is bypassed to the lower potential power supply; and

a bypass control circuit for receiving the first gate signals with the same polarity as the output of the amplifier, and for outputting a second gate signal to control the gate terminal of the bypassing MOSFET to discharge the charge.

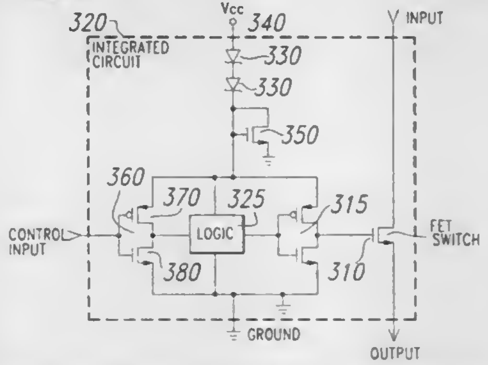
5,751,168

BUS SWITCH INTEGRATED CIRCUIT WITH VOLTAGE TRANSLATION

Harold H. Speed, III, McKinney, and James C. Spurlin, Sherman, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1995, Ser. No. 431,162
Int. Cl.^{6} H03K *19/0175;19/094*

U.S. Cl. 326—83 **17 Claims**



1. A bus switch integrated circuit with voltage translation, comprising on the same integrated circuit:

a circuit output terminal;

a circuit input terminal;

a circuit control input terminal;

a driving transistor coupled between said circuit input terminal and said circuit output terminal to couple said circuit input terminal to said circuit output terminal, responsive to a gate input; and

gate control circuitry coupled to said circuit control input terminal and having an output for driving said gate input, said gate control circuitry being coupled to a voltage supply input and operable for providing a first predetermined voltage at said gate input which is less than said voltage supply input voltage; and said gate control circuitry including:

at least one diode having an anode coupled to said voltage supply input and a cathode coupled to an output;

a first inverter stage coupled to said control input terminal, and having an output, said first inverter stage having a voltage supply input coupled to said at least one diode output;

a second inverter stage having an input coupled to said first inverter stage output and having an output coupled to said gate input, said second inverter stage having a voltage supply input coupled to said diode output; and

a transistor having a gate terminal and a first current conduction terminal coupled together to said diode output to form a first terminal of a bias resistor, and having a second current conduction terminal coupled to a ground reference to form a second terminal of said resistor;

said at least one diode providing said first predetermined voltage level as the supply to said first and second inverter stages and said control logic circuit, and wherein the output of said second inverter stage is approximately equal to said first predetermined voltage;

wherein said bus switch integrated circuit is operable to receive input signals of a first voltage level at said circuit input terminal and provide output signals of a second voltage level which is a second predetermined voltage lower than said first predetermined voltage at said circuit output terminal.

5,751,169

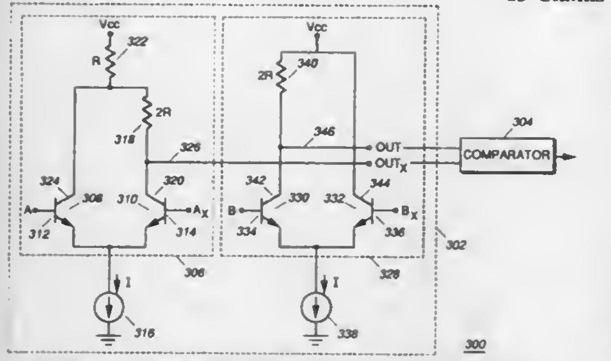
EMITTER COUPLED LOGIC (ECL) GATE WHICH GENERATES INTERMEDIATE SIGNALS OF FOUR DIFFERENT VOLTAGES

Pierce V. Keating, Pompano Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1996, Ser. No. 641,865

Int. Cl.⁶ H03K ***19/086***

U.S. Cl. 326—126 **13 Claims**



1. An emitter coupled logic (ECL) circuit, comprising:

a first differential pair having an amplification factor and a level shifting factor associated therewith, the first differential pair providing an amplified level shifted output in response to a first differential input;

a second differential pair having an amplification factor substantially equivalent to that of the first differential pair, the second differential pair providing an amplified output in response to a second differential input, the level shifting factor of the first differential pair being less than the substantially equivalent amplification factors of the first and second differential pairs; and

the amplified level shifted output of the first differential pair and the amplified output of the second differential pair providing exclusionary differential signals under all combinations of the first and second differential inputs having substantially equivalent voltage swings.

5,751,170

CIRCUIT FOR LOW VOLTAGE SENSE AMPLIFIER

Hong Beom Pyeon, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Dec. 13, 1996, Ser. No. 764,386

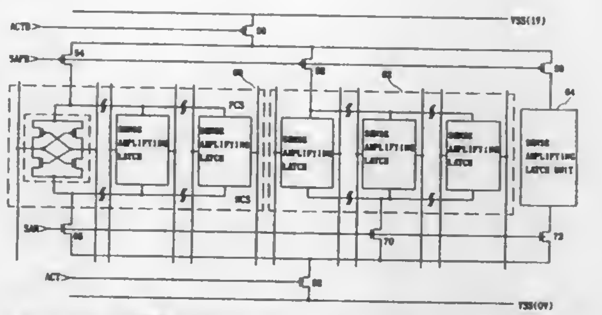
Claims priority, application Rep. of Korea, Dec. 16, 1995, 51093/1995

Int. Cl.⁶ G01R ***19/00***

U.S. Cl. 327—57 **6 Claims**

1. A circuit for a low voltage sense amplifier, comprising:

a PMOS transistor to a gate of which is applied a first switch control signal output from a level shifter, and to a source of which is applied a supply voltage;



a plurality of PMOS transistors to a respective source of which is connected a drain of the PMOS transistor, and to a respective gate of which is applied a first sense amplifier driving control signal;

a plurality of sense amplifiers to a respective terminal of which is connected a corresponding one of the plurality of PMOS transistors, and each of which includes a plurality of sense amplifying latches;

a plurality of NMOS transistors to a respective gate of which is applied a second sense amplifier driving control signal, and to a respective drain of which is connected a corresponding one of the plurality of sense amplifiers; and

an NMOS transistor to a gate of which is applied a second switch control signal output from the level shifter, to a drain of which is connected each of sources of the plurality of NMOS transistors, and to a source of which is connected a ground voltage.

5,751,171

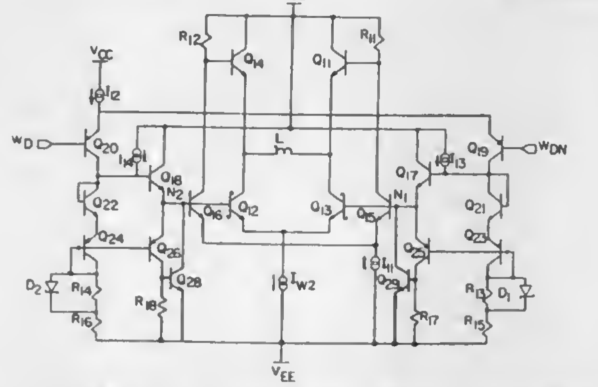
PREDRIVER FOR FAST CURRENT SWITCHING THROUGH A TWO-TERMINAL INDUCTIVE LOAD

Tuan V. Ngo, Eden Prairie, Minn., assignor to VTC Inc., Bloomington, Minn.

Continuation-in-part of Ser. No. 408,219, Mar. 22, 1995. This application Oct. 4, 1996, Ser. No. 725,729

Int. Cl.⁶ H03K ***3/00***

U.S. Cl. 327—110 **21 Claims**



1. An apparatus for driving current through a two-terminal inductive load, the apparatus comprising:

a switching circuit, for coupling to the inductive load and to a first control node, the first control node having a voltage, the switching circuit for driving current through the inductive load; and

a first driver circuit, for coupling to the switching circuit and for altering the voltage at the first control node in response to an input signal, the first driver circuit comprising first charging means for altering the voltage at the first control node toward a first reference voltage, and first discharging means having first and second active discharge paths for altering the voltage at the first control node toward a second reference voltage, the first active discharge path comprising a first active element and the second active discharge path comprising a second active element, the second reference voltage different than the first reference voltage, the first active discharge path for carrying a first active electric current that initially increases when the first active discharge path begins to alter the voltage at the first control node toward the second reference voltage and the second active discharge path for carrying a second active current that increases in response to increases in the first active current.

5,751,172

ELECTRONIC APPARATUS HAVING A COMPUTER

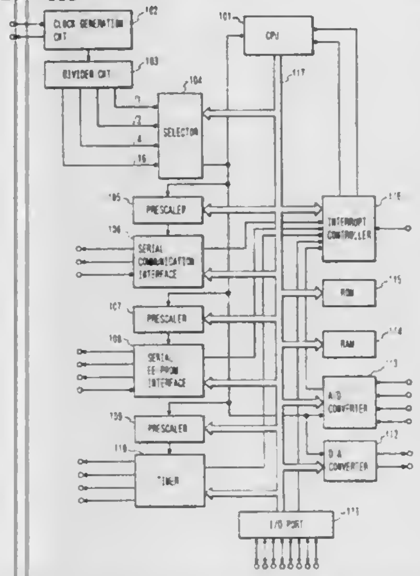
Takao Takano, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1996, Ser. No. 603,891

Claims priority, application Japan, Feb. 24, 1995, 7-036940

Int. Cl.⁶ H03B ***19/00***

U.S. Cl. 327—113 **29 Claims**



1. A computer, which performs serial communication with peripheral circuits, comprising:

(a) a generation circuit for generating a clock;

(b) a first frequency conversion circuit for converting said clock from said generation circuit into a clock having an arbitrary frequency, said computer being operated with said clock converted by said conversion circuit, and

(c) a second frequency conversion circuit for adjusting said frequency of said clock from said second frequency conversion circuit in accordance with said frequency converted by said first frequency conversion circuit, said peripheral circuits performing serial communication at a clock from said second frequency circuit,

wherein the relationship of said frequency of said clock from said second conversion circuit and said frequency of said clock from said first conversion circuit is such that, when said frequency of said clock from said first frequency conversion circuit is 1/N of said frequency of said clock from said generation circuit, said second frequency circuit provides a clock having a frequency that is N times said frequency from said first conversion circuit, N being an integer greater than 1.

5,751,173

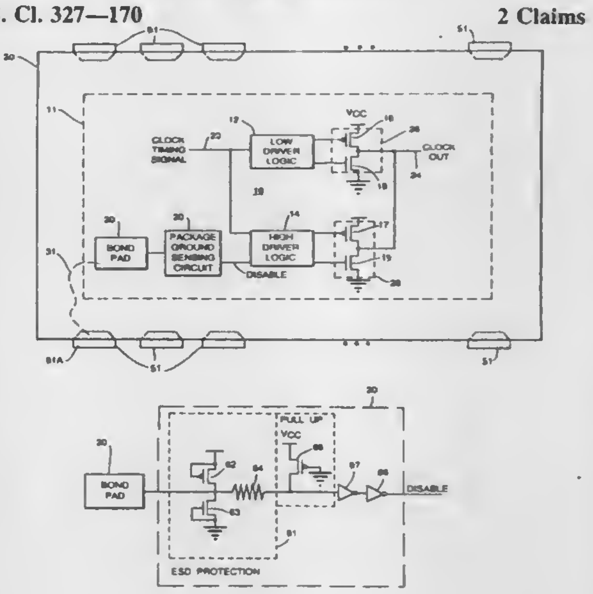
VARIABLE STRENGTH CLOCK SIGNAL DRIVER AND METHOD OF MANUFACTURING THE SAME

Scott H. R. McMahon; James Michael Buchanan, and Stephen C. Horne, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 10,930, Jan. 29, 1993, Pat. No. 5,444,402. This application Aug. 21, 1995, Ser. No. 517,477

Int. Cl.⁶ H03K ***5/12;17/16***

U.S. Cl. 327—170 **2 Claims**



1. A clock signal driver circuit fabricated on an integrated circuit die to be housed within an integrated circuit packages said clock signal driver circuit comprising:

a first transistor output stage including an output line for providing a clock signal;

a low driver unit coupled to drive said first transistor output stage and coupled to receive an input clock timing signal;

a second transistor output stage coupled to said output line;

a high driver unit coupled to drive said second transistor output stage and coupled to receive said input clock timing signal, wherein said high driver unit includes a disable control line for disabling said second transistor output stage in response to a disable signal provided to said disable control line;

a bond pad formed on said integrated circuit die, wherein said disable signal is in a first state when a bond wire is electrically connected from an external connector of said integrated circuit package to said bond pad and wherein said disable signal is in a second state when said bond pad is electrically disconnected from said external connector; and

a reference voltage sensing circuit coupled to said bond pad for driving said disable signal in said second state when said bond pad is electrically disconnected from said external connector, wherein said reference voltage sensing circuit senses an electrical potential at said bond pad and generates said disable signal dependent upon said electrical potential, wherein said reference voltage sensing circuit includes a resistive element between said bond pad and a reference voltage, whereby said electrical potential at said bond pad is substantially equal to said reference voltage when said bond wire is not electrically connected from said external connector of said integrated circuit package to said bond pad.

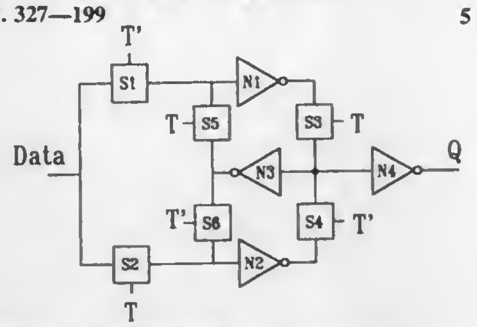
5,751,174
DOUBLE EDGE TRIGGERED FLIP-FLOP

Sy-Yen Kuo; Tzi-Dar Chiueh, and Ke-Horng Chen, all of Taipei, Taiwan, assignors to National Science Council of Republic of China, Taipei, Taiwan

Filed Aug. 2, 1996, Ser. No. 691,679

Int. Cl.⁶ H03K *3/356*

U.S. Cl. 327—199 **5 Claims**



1. A double edge triggered flip-flop, comprising:

six switches;

four inverters; and

means for supplying data to one end each of first and second ones of the six switches, wherein:

- other ends of the first and second switches are separately connected to the inputs of a first and second of the four inverters,
- outputs of the first and second inverters are connected to the input of the third and fourth inverters via the third and fourth switches,
- the third inverter is arranged to serve as a common feedback inverter by connecting the output of the third inverter through the fifth and sixth switches to said other ends of the first and second switches, and
- the output of the fourth inverter forms the output of the double edge triggered flip-flip,

whereby the first, third, and fifth switches thus form an up-loop for the double edge triggered flip-flop and the second, fourth, and sixth switches form a down loop, with the up and down loops sharing the third and fourth inverters such that the second, third, and fifth switches are turned on by a first clock pulse and the first, fourth, and sixth switches are turned on by an inverse of the first clock pulse.

5,751,175
CONTROL OF CLOCK SIGNAL IN SEMICONDUCTOR DEVICE

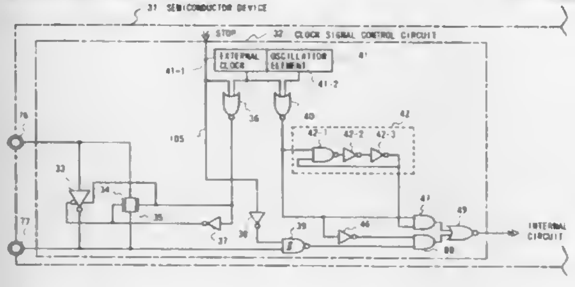
Hirohisa Imamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 593,500

Claims priority, application Japan, Jan. 30, 1995, 7-013146

Int. Cl.⁶ H04B *5/06*

U.S. Cl. 327—291 **5 Claims**



1. A semiconductor device comprising:

first and second terminals, wherein a first clock signal is externally supplied to said second terminal in an external clock signal mode;

- a clocked inverter connected between said first and second terminals, and set to an OFF state in the external clock signal mode:
- a self-biasing resistor including a P-channel MOS transistor and N-channel MOS transistor and set to the OFF state in the external clock signal mode, wherein said clocked inverter and self-biasing resistor generate a second clock signal in a clock signal generation mode using elements externally connected between said first and second terminals;
- a Schmitt trigger type gate for supplying to an internal circuit of said semiconductor device the first clock signal in the external clock signal mode and the second clock signal in the clock signal generation mode; and
- a mode designating section which sets one of the external clock signal mode and the clock signal generation mode in response to a selection signal; and
- a generating section which generates a third clock signal in an internal clock mode, and wherein said mode designating section sets the internal clock mode based on said selection signal indicating that the external clock signal mode and the clock signal generation mode are not set.

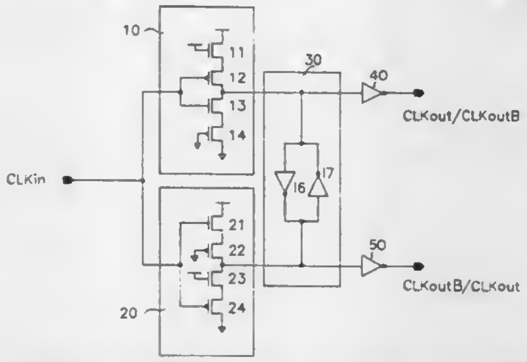
5,751,176
CLOCK GENERATOR FOR GENERATING COMPLEMENTARY CLOCK SIGNALS WITH MINIMAL TIME DIFFERENCES

Jang Sub Sohn, and Yong-Weon Jeon, both of Seoul, Rep. of Korea, assignors to LG Semicon Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Jan. 4, 1996, Ser. No. 579,476

Int. Cl.⁶ H03K *3/00*

U.S. Cl. 327—295 **18 Claims**



1. A clock generator for generating complementary clock signals in response to an input clock signal, comprising:

- a first buffer receiving the input clock signal, said first buffer including a first plurality of transistors coupled in series with a first node at a first serial connection between two of said first plurality of transistors for outputting a first output clock signal, which changes between a first signal level and a second signal level based on the input clock signal;
- an inverting unit receiving the input clock signal, said inverting unit including a second plurality of transistors coupled in series with a second node at a second serial connection between two of said second plurality of transistors for outputting a second output clock signal, which changes between the first signal level and the second signal level based on input the clock signal, the first and second output clock signals being complementary to each other; and
- a latch coupled between said first and second nodes, said latch having first and second inverters, an input of said first inverter and an output of said second inverter being coupled to the first node, and an output of said first inverter and an input of said second inverter being coupled to the second node, wherein said first plurality of transistors comprises first, second, third and fourth transistors, which are respectively coupled in series, each transistor having a control electrode and first and second electrodes, the control electrodes of said first and fourth transistors being commonly coupled for receiving the input clock signal, and the first serial connection of the first node being formed between the first electrodes of said second and third transistors, said control electrodes of said second and third transistors being coupled for receiving first and second signals, respectively, and said first and third transistors are NMOS transistors, and said second and fourth transistors are PMOS transistors.

5,751,177
VARIABLE LEVEL SHIFTER AND MULTIPLIER SUITABLE FOR LOW-VOLTAGE DIFFERENTIAL OPERATION

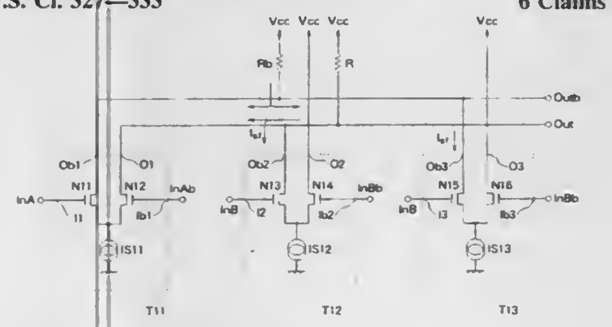
Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1996, Ser. No. 661,922

Claims priority, application Japan, Jul. 3, 1995, 7-167435

Int. Cl.⁶ H03F *3/45*

U.S. Cl. 327—333 **6 Claims**



1. A variable level shifter, comprising:

- a first pair of input terminals for receiving a first pair of voltage signals having a first voltage difference;
- a second pair of input terminals for receiving a second pair of voltage signals having a second voltage difference;
- a first output terminal;
- a second output terminal;
- a first load element having one end and an other end, the one end of the first load element coupled to a supply voltage node supplied with a first potential, the other end of the first load element coupled to the second output terminal;
- a second load element having one end and an other end, the one end of the second load element coupled to a supply voltage node supplied with the first potential, the other end of the second load element coupled to the first output terminal;
- a first transconductor cell having a first transistor and a second transistor, each of which has a first electrode, a second electrode and a control electrode, the control electrode of the first transistor coupled to one of the first pair of input terminals, the control electrode of the second transistor coupled to the other of the first pair of input terminals, the first electrodes of the first and second transistors coupled to a first current source, the second electrode of the first transistor coupled to the other end of the first load element, the second electrode of the second transistor coupled to the other end of the second load element;
- a second transconductor cell having a third transistor and a fourth transistor, each of which has a first electrode, a second electrode and a control electrode, the control electrode of the third transistor coupled to one of the second pair of input terminals, the control electrode of the fourth transistor coupled to the other of the second pair of input terminals, the first electrodes of the third and fourth transistors coupled to a second current source, the second electrode of the third transistor coupled to the other end of the second load element, the second electrode of the fourth transistor coupled to a supply voltage node supplied with the first potential; and
- a third transconductor cell having a fifth transistor and a sixth transistor, each of which has a first electrode, a second electrode and a control electrode, the control electrode of the fifth transistor coupled to the one of the second pair of input terminals, the control electrode of the sixth transistor coupled to the other of the second pair of input terminals, the first electrodes of the fifth and sixth transistors coupled to a third current source, the second electrode of the fifth transistor coupled to the other end of the first load element, the second electrode of the sixth transistor coupled to a supply voltage node supplied with the first potential.

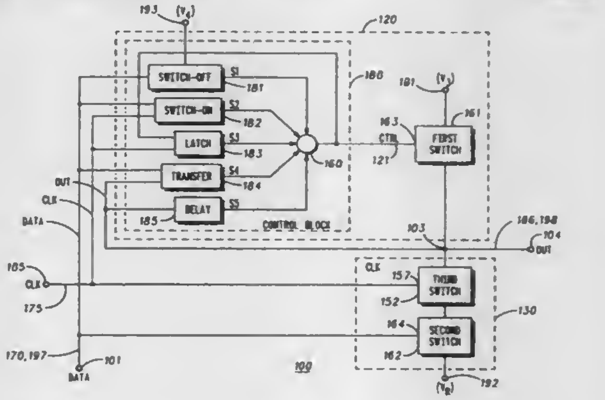
5,751,178
APPARATUS AND METHOD FOR SHIFTING SIGNAL LEVELS

Joseph Shor, Raanana; Eytan Engel, Givat-Tal, and Natan Baron, Oranit, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1996, Ser. No. 767,094

Int. Cl.⁶ H03K *5/153*

U.S. Cl. 327—333 **17 Claims**



1. An apparatus receiving a first signal with a first excursion, said apparatus having a first portion and a second portion for providing a second signal responding to said first signal, said second signal having a second excursion which is greater than said first excursion,

said apparatus CHARACTERIZED IN THAT

said first portion has a control block which receives said first signal and transfers said first excursion into a third excursion for switching said first portion on and off, whereby said first signal toggling in a first direction switches on said first portion, and whereby said control block switches off said first portion after a time delay, said time delay beginning when said second signal has been pulled to a first reference line and ending before said second portion is switched on again, thus bringing said apparatus into a state in which said first portion and said second portion are both switched off and whereby contention is avoided when said first signal toggling in a second direction switches on said second portion.

5,751,179
OUTPUT DRIVER FOR PCI BUS

David Michael Pietruszynski; James Dub Austin, and Brian Kirkland, all of Austin, Tex., assignors to Crystal Semiconductor, Austin, Tex.

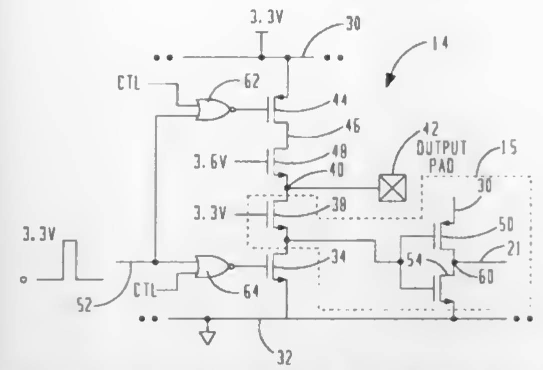
Filed Apr. 26, 1996, Ser. No. 639,369

Int. Cl.⁶ H03K *17/16*

U.S. Cl. 327—379 **15 Claims**

1. A driver circuit for driving an external system from a primary power supply, which external system can have voltages associated therewith at a second and substantially higher voltage than the primary power supply, comprising:

- an output node connectable to the external system;
- a primary power supply rail disposed at the primary power supply voltage level;
- a ground rail disposed at a ground reference voltage level;
- an output pull-up transistor for driving said output node from said primary power supply rail, the gate of said output pull-up transistor connected to a driving signal;



- an output pull-down transistor for sinking current from said output node to said ground rail, the gate of said pull-down transistor connected to said driving signal;
- a first protection transistor disposed between said output pull-up transistor and said output node for preventing current from flowing from said output node to said power supply rail through said output pull-up transistor when a voltage higher than the primary power supply voltage level is disposed on said output node and having the gate thereof connected to a first pre-determined bias voltage; and
- said output pull-down transistor and said first protection transistor fabricated from the same conductivity type material, and said output pull-up transistor fabricated from a second and opposite conductivity type material to said pull-down transistor.

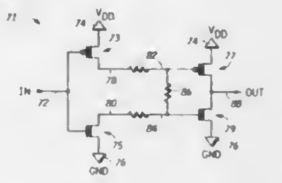
5,751,180
ELECTRICAL DEVICE STRUCTURE HAVING REDUCED CROWBAR CURRENT AND POWER CONSUMPTION

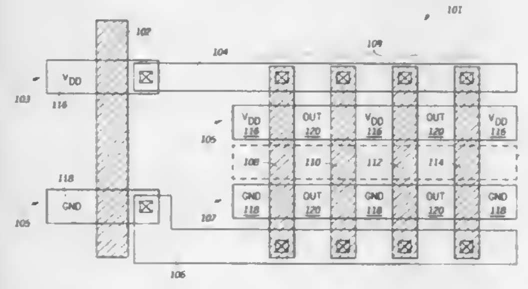
Michael Lee D'Addeo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1996, Ser. No. 706,878

Int. Cl.⁶ H03K ***19/48;17/16***

U.S. Cl. 327—379 **7 Claims**





1. An electrical device comprising:
- a first P channel transistor having a first electrode coupled to a power supply line, a second electrode, and a gate electrode coupled to an input line;
- a first N channel transistor having a first electrode coupled to a ground supply line, a second electrode, and a gate electrode coupled to the input line;
- a second P channel transistor having a first electrode coupled to the power supply line, a second electrode coupled to an output line, and a gate electrode;
- a second N channel transistor having a first electrode coupled to the ground supply line, a second electrode coupled to an output line, and a gate electrode wherein the gate electrode of the second N channel transistor and the gate electrode of the second P channel transistor are form using a contiguous polysilicon member, and wherein a portion of the contiguous polysilicon member has been masked from a doping process to form a resistive region within the contiguous polysilicon member, the resistive region lying between the gate electrode of the second N channel transistor and the gate electrode of the second P channel transistor;
- a first metal interconnect coupling the second electrode of the first P channel transistor to the gate electrode of the second P channel transistor; and
- a second metal interconnect coupling the second electrode of the first N channel transistor to the gate electrode of the second N channel transistor.

5,751,181
POWER AMPLIFIER CIRCUIT

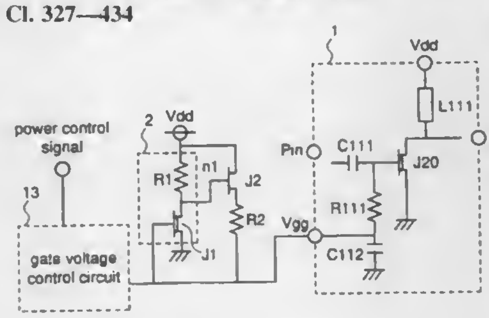
Kousei Maemura, and Kazuya Yamamoto, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1997, Ser. No. 797,265

Claims priority, application Japan, Jul. 16, 1996, 8-185900

Int. Cl.⁶ H03K ***17/687***

U.S. Cl. 327—434 **9 Claims**



1. A power amplifier circuit comprising:
- power amplifying means comprising a first field effect transistor having a gate with a gate length, the first field effect transistor having a threshold voltage;
- gate voltage supply means for supplying a gate voltage to the gate of the first field effect transistor;
- gate voltage control means comprising a second field effect transistor having a threshold voltage that is the same as the threshold voltage of the first field effect transistor, the gate voltage control means receiving, as an input voltage, the gate voltage output from the gate voltage supply means, and increasing the gate voltage when the gate voltage is lower than the threshold voltage of the first field effect transistor for preventing the first field effect transistor from being pinched off.

5,751,182
RAPID START-UP CIRCUIT FOR VOLTAGE REFERENCE AND METHOD OF OPERATION

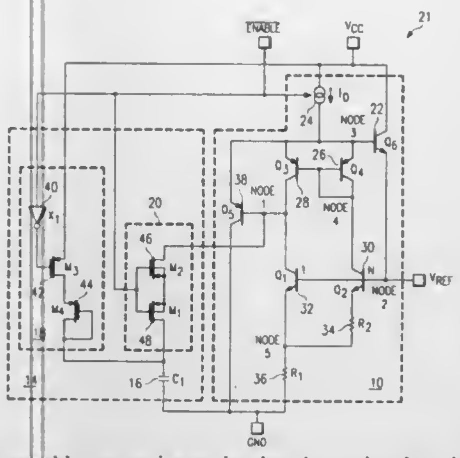
Frank L. Thiel, IV, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 28, 1996, Ser. No. 704,837

Int. Cl.⁶ G05F ***1/10***

U.S. Cl. 327—539 **19 Claims**

1. A rapid start-up voltage reference, comprising:
- a voltage reference circuit operable responsive to a shut-down signal, the shut-down signal having an enable state and a disable state, and the voltage reference circuit comprising a feedback loop having a first node and operable to produce an output reference voltage when the shut-down signal is in the enable state; and
- a rapid start-up circuit coupled to a power supply node and to the first node, the rapid start-up circuit comprising a capacitor and operable responsive to the shut-down signal to charge the capacitor when the shut-down signal is in the disable state and to connect the capacitor to the first node when the shut-down signal is in the enable state.



5,751,183
BIPOLAR TRANSISTOR CIRCUIT HAVING A FREE COLLECTOR

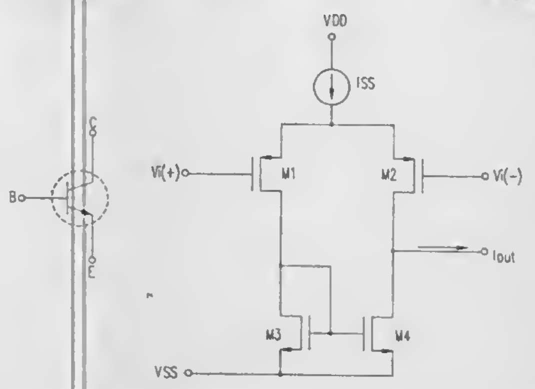
Sang-O Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 17, 1996, Ser. No. 730,879

Claims priority, application Rep. of Korea, Oct. 18, 1995, 95-36001

Int. Cl.⁶ G05F ***1/10;*** **H03K** ***17/60***

U.S. Cl. 327—542 **9 Claims**



1. A bipolar transistor circuit having a free collector comprising:
- first and second bipolar transistors having common collectors and common bases, the common collectors being applied with a first voltage;
- a transconductor, connected to emitters of the first and second bipolar transistors, for detecting and amplifying an error voltage between first and second emitter voltages received respectively from the emitters of the first and second bipolar transistors;
- a first MOS transistor, for generating a drain current corresponding to a gate voltage received from the transconductor, the gate of the first MOS transistor being connected to an output of the transconductor, the drain of the first MOS transistor being connected to the emitter of the second bipolar transistor, and the source of the first MOS transistor being connected to a second voltage; and
- a second MOS transistor for generating a drain current proportional to the drain current of the first MOS transistor, the gate of the second transistor being connected to the output of the transconductor and the source of the second MOS transistor being connected to the second voltage.

5,751,184
LOW ELECTRICAL POWER CONSUMPTION FILTER CIRCUIT

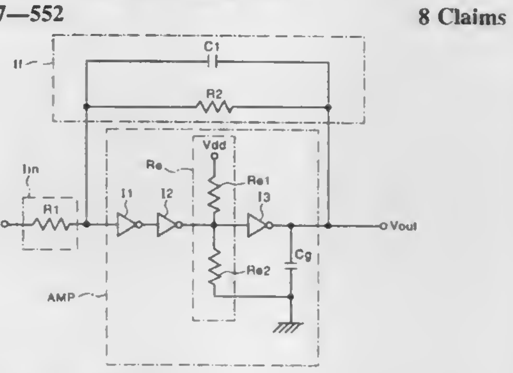
Guoliang Shou; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Oct. 17, 1996, Ser. No. 732,895

Claims priority, application Japan, Oct. 19, 1995, 7-296060

Int. Cl.⁶ H03K ***5/00***

U.S. Cl. 327—552 **8 Claims**



1. A filter circuit comprising:
- i) an amplifying portion including an odd number of serial MOS inverters;
- ii) a grounded capacitance being connected between an output portion of said amplifying portion and the ground;
- iii) balancing resistances including a pair of resistances connecting an input portion of a last MOS inverter of said MOS inverters to a supply voltage and the ground;
- iv) a first feedback impedance connecting said output portion of said amplifying portion to its input portion; and
- v) a first input impedance being connected to said input portion of said amplifying portion for receiving an input signal.

5,751,185
LOW PASS FILTER CIRCUIT UTILIZING TRANSISTORS AS INDUCTIVE ELEMENTS

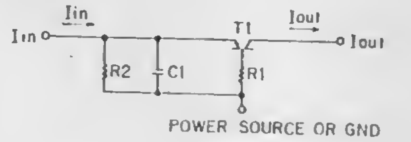
Takuji Yamamoto, and Naoki Kuwata, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

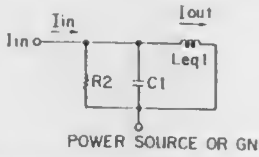
Continuation of Ser. No. 689,386, Aug. 12, 1996, abandoned, which is a continuation of Ser. No. 387,876, Feb. 22, 1995, abandoned. This application Apr. 11, 1997, Ser. No. 827,780

Claims priority, application Japan, Jul. 27, 1993, 5-184256; Feb. 9, 1994, 6-014733

Int. Cl.⁶ H03H ***1/00***

U.S. Cl. 327—558 **2 Claims**





1. A low pass filter circuit having a secondary cut-off frequency characteristic comprising:
- a first transistor T1 having a base or gate connected to a voltage point through a first resistor R1, said voltage point is stable to high-frequency components;
- a second resistor R2 and a capacitor C1 each having one end connected to an emitter or source of said first transistor T1 and the other end connected to said voltage point which is stable to high-frequency components; and

wherein said first resistor R1 and said first transistor T1 function as an inductive element of said circuit having an inductance value Leq1 defined by: $Leq_1=R1/2\pi fT$, where fT is the transition frequency of T1.

5,751,186

OPERATIONAL AMPLIFIER CIRCUIT WITH AN EXTENDED INPUT VOLTAGE RANGE

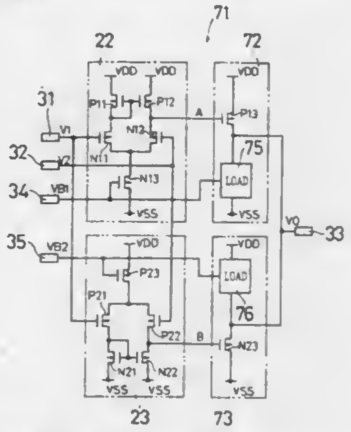
Tomoaki Nakao, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1996, Ser. No. 659,585

Claims priority, application Japan, Nov. 2, 1995, 7-286112

Int. Cl.⁶ H03F *3/45;* H03K *17/687*

U.S. Cl. 327—562 **18 Claims**



1. An operational amplifier comprising:

first and second input terminals for receiving respective input signals;

first differential amplifying means composed of a pair of n-channel type field effect transistors for providing differential amplification, to the gate of one of which the first input terminal is connected, and to the gate of the other of which the second input terminal is connected;

second differential amplifying means composed of a pair of p-channel type field effect transistors for providing differential amplification, to the gate of one of which the first input terminal is connected, and to the gate of the other of which the second input terminal is connected;

output amplifying means including a first p-channel type field effect output transistor, to the gate of which is inputted an output of the first differential amplifying means, to the source of which is supplied a predetermined first potential, and to the drain of which is supplied a predetermined second potential through a first load element so as to be lower than the predetermined first potential, and a second n-channel type field effect output transistor, to the gate of which is inputted an output of the second differential amplifying means, to the source of which is supplied the predetermined second potential, to the drain of which is supplied the predetermined first potential through a second load element;

an output terminal for providing an output signal commonly connected to the drain of the first field effect output transistor and the drain of the second field effect output transistor; and

wherein the first and second load elements comprise loads having a specific resistance value when the respective differential amplifying means of the first and second differential amplifying means are in a conductive state, and which operate to cut off current flow when the respective differential amplifying means is in a non-conductive state.

5,751,187

METHOD AND DEVICE FOR PHASE-MODULATED SIGNALS

Dan Rutger Weinholt, Västra Frölunda, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

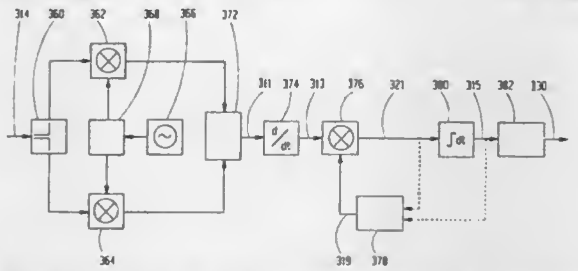
PCT No. PCT/SE96/00664, § 371 Date Jan. 8, 1997, § 102(e) Date Jan. 8, 1997, PCT Pub. No. WO96/37987, PCT Pub. Date Nov. 28, 1996

PCT Filed May 22, 1996, Ser. No. 765,405

Claims priority, application Sweden, May 22, 1995, 9501892

Int. Cl.⁶ H03D *3/00;3/02*

U.S. Cl. 329—304 **19 Claims**



1. In a receiver, a device for correcting errors in a modulated information-carrying signal generated from an information-carrying signal by a transmitter having a voltage-controlled oscillator, wherein the receiver generates a demodulated signal from the modulated information-carrying signal by phase demodulation, the device comprising:

means for differentiating the demodulated signal to generate an instantaneous frequency value;

means for detecting a deviation of the modulated information-carrying signal and generating a correcting signal related to a detected deviation;

means for multiplying the instantaneous frequency value by the correcting signal to generate an amplitude-scaled signal;

means for integrating the amplitude-scaled signal to generate a scaled phase signal; and

means for phase-demodulating the scaled phase signal to generate a copy of the information-carrying signal.

5,751,188

FM DEMODULATOR USING A SWITCHED CAPACITOR PHASE SHIFTER

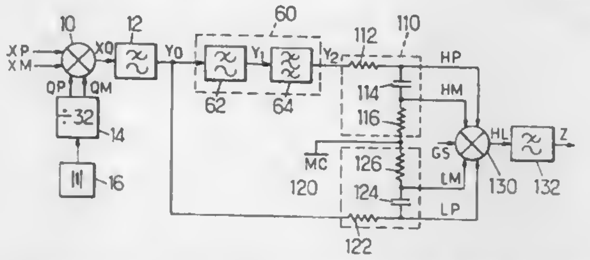
Hervé Guegnaud, Maurepas, and Michel Robbe, Conflans Sainte Honorine, both of France, assignors to Matra Communication, France

Filed Dec. 10, 1996, Ser. No. 763,002

Claims priority, application France, Dec. 12, 1995, 95 14708

Int. Cl.⁶ H03D *3/06*

U.S. Cl. 329—323 **7 Claims**



1. Demodulator circuit for processing an input signal exhibiting a frequency modulation about an intermediate frequency and for producing a baseband output signal representative of said modulation, comprising :

first mixing means for mixing the input signal and at least one wave of predetermined frequency in order to produce a first signal exhibiting said frequency modulation about a transposition frequency equal to a difference between the intermediate frequency and said predetermined frequency;

switched-capacitor phase-shifter means to which the first signal is applied in order to produce a second signal exhibiting, with respect to the first signal, a phase-shift varying in a manner substantially linear with frequency about the transposition frequency;

a first low-pass filter to which the second signal is applied in order to eliminate high-frequency components from the second signal;

a second low-pass filter substantially identical to the first low-pass filter, to which the first signal is applied; and

second mixing means for mixing signals produced by the first and second low-pass filters respectively, in order to deliver the baseband output signal.

5,751,189

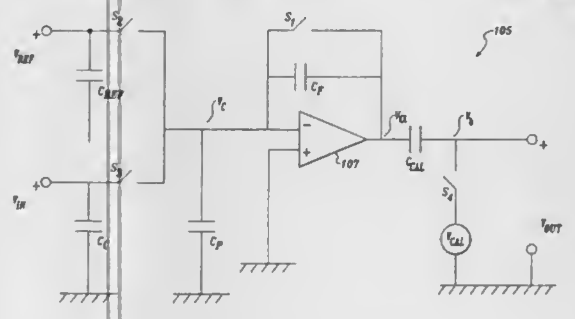
CHARGE AMPLIFIER FOR MOS IMAGING ARRAY AND METHOD OF MAKING SAME

Tai-Ching Shyu, Cupertino; Datong Chen, and Jun Liu, both of Fremont, all of Calif., assignors to OmniVision Technologies, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 538,441, Oct. 3, 1995, Pat. No. 5,724,095. This application Mar. 18, 1996, Ser. No. 617,313

Int. Cl.⁶ H03F *1/02*

U.S. Cl. 330—9 **12 Claims**



1. An improved charge amplifier for amplifying an input signal on an input terminal and providing a final output signal on a final output terminal, said charge amplifier comprising:

an operational amplifier having a negative input, a positive input, and an amplifier output terminal for outputting an amplifier signal;

a feedback capacitor for routing said amplifier signal to said negative input;

a voltage reference selectively connected to said negative input;

a calibration capacitor connected between said amplifier output terminal and said final output terminal;

a first switch between said amplifier output terminal and said negative input;

a second switch between said voltage reference and said negative input;

a third switch placed so that the input signal can be selectively input to said negative input;

a fourth switch between a voltage level and said final output terminal; and

a timing circuit connected to said first switch, said second switch, said third switch, and said fourth switch such that during a first time period, said first and fourth switches are closed and said second and third switches are open, during a second time period, said first and third switches are open and said second and fourth switches are closed, during a third time period, said first switch is closed and said second, third, and fourth switches are open, and during a fourth time period, said third switch is closed and said first, second, and fourth switches are open.

5,751,190

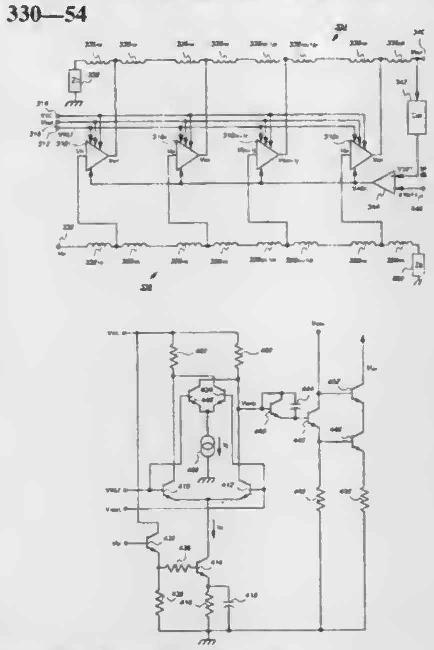
GAIN-CONTROLLED AMPLIFIER AND DISTRIBUTED AMPLIFIER

Thé Linh Nguyen, Ottawa, and Alois Peter Freundorfer, Kingston, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 22, 1996, Ser. No. 701,368

Int. Cl.⁶ H03F *3/60;* H03G *3/30*

U.S. Cl. 330—54 **9 Claims**



1. A distributed amplifier comprising:

an input inductor circuit including a plurality of inductance elements connected in series, the input inductor circuit having first and second terminals;

an output inductor circuit including a plurality of inductance elements connected in series, the output inductor circuit having first and second terminals;

a plurality of gain-controlled amplifier units, each unit including a transistor amplifier and output means dc-coupled to the transistor amplifier, each unit having input and output terminals, the input terminal of each unit being coupled to the respective junction of the inductance elements of the input inductor circuit, the output terminal of each unit being coupled to the respective junction of the inductance elements of the output inductor circuit;

means for providing an amplifier gain control signal to each of the gain-controlled amplifier units;

an input network coupled to the second terminal of the input inductor circuit, the input network providing an input dc bias voltage to the transistor amplifier of each unit via the respective inductance elements of the input inductor circuit and functioning as an input impedance element; and

an output network coupled to the first terminal of the output inductor circuit, the output network providing a dc operating voltage to the output means of each unit via the respective inductance elements of the output inductor circuit and functioning as an output impedance element,

wherein an input signal is fed to the first terminal of the input inductor circuit and an amplified output signal is provided from the second terminal of the output inductor circuit,

the transistor amplifier of each of the gain-controlled amplifier units comprising:

first and second transistors, the emitters of which are coupled to each other;

first and second resistance elements coupled to the collectors of the first and second transistors, respectively;

third and fourth transistors, the emitters of which are coupled to each other, the collectors of the third and fourth transistors being coupled to the collectors of the second and first transistors, respectively, the bases of the third and fourth transistors being coupled to the bases of the first and second transistors, respectively;

first current means for providing a first coupled emitter current flowing in the coupled emitters of the first and second transistors, the first current means including a fifth transistor, the collector of which is coupled to the coupled emitters of the first and second transistors;

second current means for providing a second coupled emitter current flowing in the coupled emitters of the third and fourth transistors; and

input means coupled to the respective junction of the inductor elements of the input inductor circuit, the input means providing a dc bias in response to the input dc bias voltage from the input network and providing an ac signal in response to the input signal, the dc bias and ac signal being applied to the base of the fifth transistor of the input means,

the output means of each of the gain-controlled amplifier units comprising a sixth transistor, the base of which is dc-coupled to the collector of the second transistor, the collector of the sixth transistor being coupled to the respective junction of the inductance elements of the output inductor circuit.

5,751,191
REPRODUCING SIGNAL AMPLIFIER AND CENTRAL VALUE SIGNAL GENERATOR

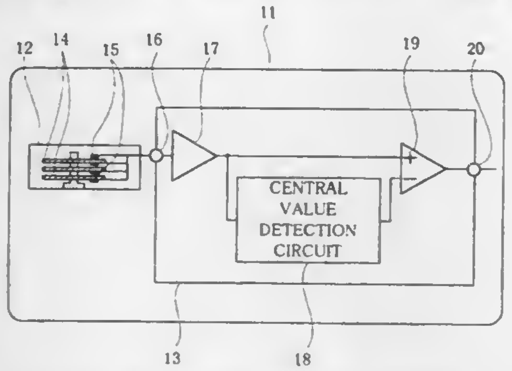
Kenichi Ishida; Michinori Kishimoto; Takashi Yamamoto, and Koji Sushihara, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 12, 1996, Ser. No. 708,064

Claims priority, application Japan, Feb. 1, 1996, 8-016325

Int. Cl.^{6} H03F *3/68;* **G11B** *5/02*

U.S. Cl. 330—125 **16 Claims**



1. A reproducing signal amplifier for a magnetic recording device comprising:

an amplifier for amplifying an input signal and outputting an amplified signal;

a central value signal generator for receiving said amplified signal, and generating and outputting a central value signal corresponding to a central value of said amplified signal by smoothing an AC component of said amplified signal; and

a subtracter for receiving said amplified signal and said central value signal and outputting a reproducing signal obtained as a difference between said amplified signal and said central value signal.

5,751,192
INTEGRATED CIRCUIT AND METHOD FOR GENERATING A TRANSIMPEDANCE FUNCTION

William E. Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

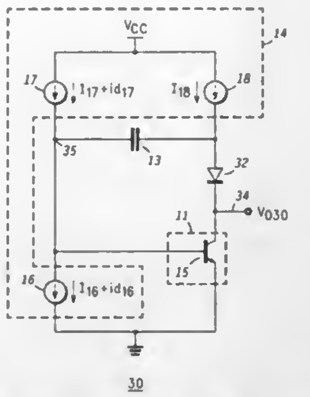
Filed Sep. 3, 1996, Ser. No. 706,886

Int. Cl.^{6} H03F *1/34*

U.S. Cl. 330—293 **20 Claims**

15. An integrated circuit, comprising:

a transconductance amplifier having a control electrode, a first current carrying electrode, and a second current carrying electrode, the first current carrying electrode coupled for receiving a first source of operating potential;



a diode having first and second terminals, the first terminal coupled for receiving a bias current, and the second terminal coupled to the second current carrying electrode of the transconductance amplifier; and

a load impedance having a first terminal and a second terminal, the first terminal coupled to the control electrode of the transconductance amplifier for receiving a differential current and the second terminal coupled to the first terminal of the diode.

5,751,193
RUBIDIUM ATOMIC OSCILLATOR WITH LASER DIODE WAVELENGTH ADJUSTMENT

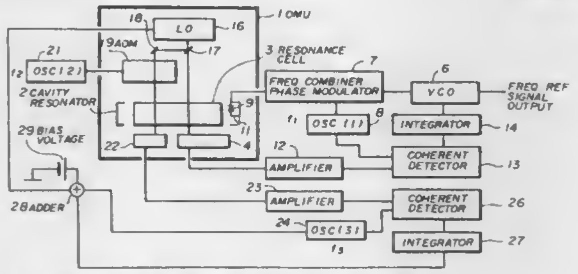
Yoshifumi Nakajima, and Yoshito Koyama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1996, Ser. No. 638,471

Claims priority, application Japan, Jun. 9, 1995, 7-142843

Int. Cl.^{6} H03L *7/26*

U.S. Cl. 331—3 **14 Claims**



1. A rubidium atomic oscillator comprising:

a voltage-controlled oscillator (VCO) producing a first microwave signal for an output;

a light source producing pumping light having a wavelength which is externally controlled;

division means for dividing said pumping light into a first light and a second light;

wavelength shift means for changing a wavelength of said second light to produce a third light, so that said third light has a frequency which said wavelength shift means controls by changing the wavelength of the second light;

a cavity resonator, oscillated by a second microwave signal, which absorbs said first light and said third light, the cavity resonator having a resonance cell filled with a rubidium gas;

an electrical control part which produces said second microwave signal based on said first microwave signal from the VCO, said electrical control part detects a level of the first light passed through said cavity resonator, and controls a frequency of said VCO so that the first light is maximally absorbed in the cavity resonator;

an optical control part which detects a level of said third light passed through said cavity resonator and controls the wavelength of the light source so that said third light is maximally absorbed in the cavity resonator;

wherein said wavelength shift means controls the wavelength of said third light to increase stability of said first microwave signal.

5,751,194
PHASE-LOCKED LOOP HAVING CHARGE PUMP CONTROLLED ACCORDING TO TEMPERATURE AND FREQUENCY

Mika Haapanen, and André Dekker, both of Oulu, Finland, assignors to Nokia Telecommunications OY, Espoo, Finland

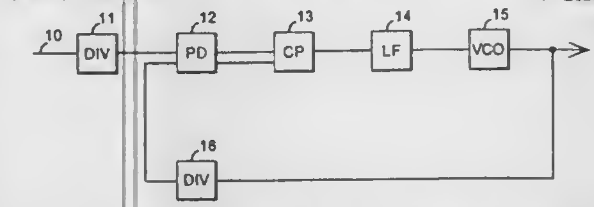
PCT No. PCT/FI95/00320, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO95/34133, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 5, 1995, Ser. No. 750,593

Claims priority, application Finland, Jun. 7, 1994, 942680

Int. Cl.^{6} H03L *1/02;7/085;7/18*

U.S. Cl. 331—17 **7 Claims**



1. A method for controlling a phase-locked loop, which loop comprises a phase comparator (**12**), a charge pump (**13**), a loop filter (**14**) and a voltage-controlled oscillator (**15**), and in which method the loop is provided with information on the measurement result of external temperature, characterized in that the output signal of the charge pump (**13**) is controlled according to the external temperature and a desired frequency.

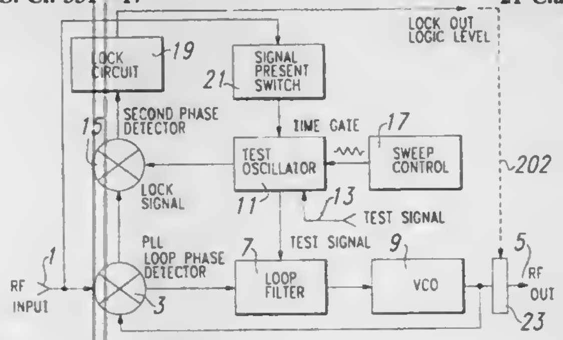
5,751,195
CIRCUIT TO INDICATE PHASE LOCK IN A MULTIMODE PHASE LOCK LOOP WITH ANTI-JAMMING SECURITY

Michael F. Black, Garland, Tex., assignor to Texas Instruments Incopprporated, Dallas, Tex.

Filed Dec. 6, 1996, Ser. No. 760,888

Int. Cl.^{6} H03L *7/095*

U.S. Cl. 331—17 **21 Claims**



1. A lock detection circuit for a phase lock loop circuit which comprises:

(a) a phase lock loop circuit having a signal input terminal and a signal output terminal; and

(b) a test circuit coupled to said phase lock loop circuit including:

(i) signal generating means responsive to the presence of an input signal on said input terminal for injecting a signal into said phase lock loop;

(ii) means for comparing the signal in said phase lock loop with a signal on said signal input terminal to alter the signal in said phase lock loop and provide a replica of the injected signal; and

(iii) means responsive to a substantial match of said replica of the injected signal and said injected signal to provide an indication thereof.

5,751,196
CIRCUIT ARRANGEMENT FOR COMPENSATING FREQUENCY DEVIATIONS OF A VOLTAGE-CONTROLLED OSCILLATOR, USING A SECOND OSCILLATOR

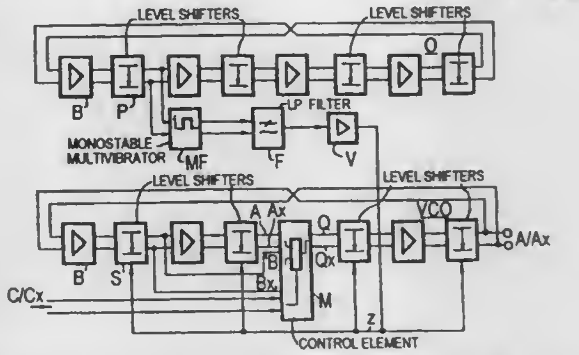
Albrecht Neudecker, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 26, 1996, Ser. No. 621,621

Claims priority, application Germany, Mar. 28, 1995, 195 11 402.7

Int. Cl.^{6} H03B *5/04;* **H03L** *1/00*

U.S. Cl. 331—47 **10 Claims**



6. A method for compensating frequency deviations of a monolithic integrated voltage-controlled oscillator on a semiconductor chip, the method comprising the steps of:

producing frequency deviations of a monolithic integrated non-voltage-controlled oscillator on said semiconductor chip;

producing a control signal, corresponding to the frequency deviations of said monolithic integrated non-voltage-controlled oscillator and opposed to temperature and parameter conditions of the chip, for the voltage-controlled oscillator;

producing an actuating signal corresponding to the control signal to counteract frequency deviations; and

controlling the frequency of the voltage-controlled oscillator with the actuating signal.

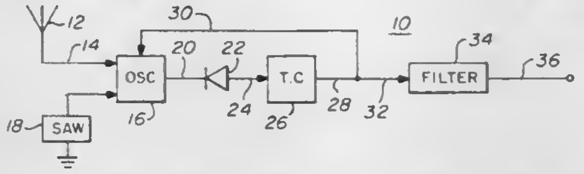
5,751,197
LOW-POWER, SELF-QUENCHING SUPERREGENERATIVE DETECTOR

Harry O. Boling, III, Garland, Tex., assignor to RF Monolithics, Inc., Dallas, Tex.

Filed Jun. 18, 1996, Ser. No. 665,459

Int. Cl.^{6} H04B *1/44;1/16*

U.S. Cl. 331—107 A **10 Claims**



1. A low-power, self-quenching superregenerative detector comprising:

an RF oscillator having a signal input and an oscillation signal output;

a single-port SAW resonator coupled to said RF oscillator to establish the frequency of said output oscillation signal;

a signal detector coupled to the oscillator output for detecting a predetermined amplitude of the oscillator output signal;

a time-constant circuit coupled to said signal detector for generating an oscillator quench signal when said oscillator signal is detected, said oscillator quench signal having a predetermined duration set by said time-constant circuit; and

a feedback circuit coupling the oscillator quench signal to said RF oscillator to cause said RF oscillator to switch to a non-oscillating condition only during said predetermined duration of said RF oscillator quench signal and then switching to the oscillating condition.

5,751,198

ANGULAR MODULATOR WITH A PHASE VARIATION DIVIDED AND INTEGRATED

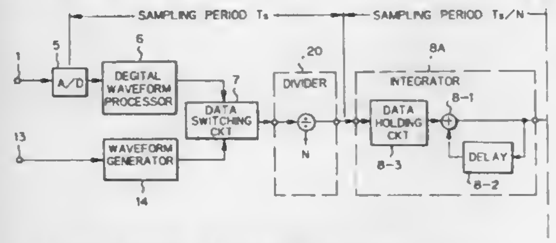
Tatsumasa Yoshida, and Ryoichi Miyamoto, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 755,016

Claims priority, application Japan, Nov. 24, 1995, 7-305444

Int. Cl.^{6} H03C *3/00;* **H04L** *27/12;27/20*

U.S. Cl. 332—100 **15 Claims**



1. A digital angular modulator comprising:

an input terminal for receiving an analog modulation signal;

analog-to-digital (A/D) converting means for converting said analog modulation signal into a digital modulation signal every sampling period Ts;

means for obtaining angle variation ϕ(Ts) per sampling period of the digital modulation signal;

dividing means for dividing the angle variation by N, where N is an integer greater than one, to output a divided angle variation ϕ(Ts)/N every sampling period Ts;

integrating means for integrating the divided angle variation ϕ(Ts)/N for every Ts/N interval;

a carrier generator for generating a carrier signal; and

modulation means for modulating said carrier signal by an output of said integrating means.

5,751,199

COMBLINE MULTIPLEXER WITH PLANAR COMMON JUNCTION INPUT

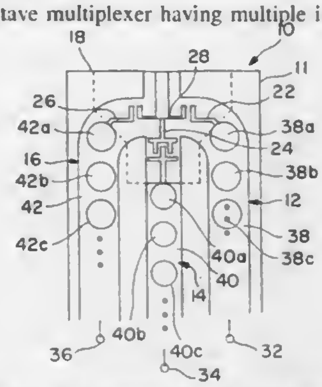
Ming-Jong Shiau, Cerritos, and John C. Tippet, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 16, 1996, Ser. No. 587,081

Int. Cl.^{6} H01P *1/213*

U.S. Cl. 333—134 **11 Claims**

1. A multioctave multiplexer having multiple independent filter channels in which each channel has a first planar circuit and a second combline resonator circuit comprised of N number of resonators;



said first planar circuit including means for concurrently feeding RF signals to said independent channels, and

means within said first planar circuit and second combline resonator circuit of each channel, comprising a predetermined value of N for generating a set of transmission zeros that is 2 at DC, 2N-4 at one-quarter wavelength and 2 at the complex frequency of S=1 and S=−1 in the complex plane.

5,751,200

COMPOSITE LONGITUDINAL VIBRATION MECHANICAL FILTER HAVING UNDESIRED VIBRATION ABSORBER

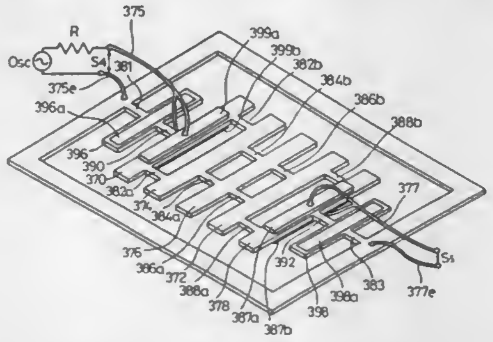
Kazuo Yamashita; Yoshihiko Takeuchi, and Masahiro Watanabe, all of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 276,649, Jul. 19, 1994, Pat. No. 5,528,806, which is a continuation of Ser. No. 971,481, Nov. 4, 1992, abandoned, which is a division of Ser. No. 483,454, Feb. 21, 1990, Pat. No. 5,187,458. This application Jun. 5, 1995, Ser. No. 487,951

Claims priority, application Japan, Sep. 21, 1989, 1-247396; Sep. 21, 1989, 1-247397; Sep. 21, 1989, 1-247398; Sep. 21, 1989, 1-247399; Oct. 16, 1989, 1-269807; Oct. 16, 1989, 1-269808; Oct. 16, 1989, 1-269809; Oct. 16, 1989, 1-269810

Int. Cl.^{6} H03H *9/09*

U.S. Cl. 333—197 **7 Claims**



3. A composite longitudinal vibration mechanical filter for receiving a supplied high-frequency signal at an input thereof and delivering out a high-frequency signal in a predetermined frequency range at an output thereof, comprising:

a plurality of vibratable bodies, each vibratable body having a respective predetermined length and said plurality of vibratable bodies including a high-frequency signal input vibratable body and a high-frequency output vibratable body, said input vibratable body being coupled to said input of the vibration mechanical filter, said plurality of vibratable bodies being positioned between the input and the output of the vibration mechanical filter, each of said vibratable bodies being longitudinally vibratable along said respective predetermined length thereof in a range close to a passband of the vibration mechanical filter, said input vibratable body vibrating when the received high frequency signal is supplied to the input of the vibration mechanical filter, and said output vibratable body being coupled to said output of the vibration mechanical filter;

an input piezoelectric member superposed on said input vibratable body, said input piezoelectric member having an electrode which connects to said input of the vibration mechanical filter;

an output piezoelectric member superposed on said output vibratable body, said output piezoelectric member having an electrode which connects to said output of the vibration mechanical filter;

a plurality of coupling elements for coupling said plurality of vibratable bodies to each other through flexural vibration;

first supporting elements projecting respectively from said input and output vibratable bodies;

at least one vibration absorbing body holder coupled to a respective one of said first supporting elements;

at least one vibration absorbing body fixedly mounted on a respective one of said at least one vibration absorbing body holder; and

a frame linked to said first supporting elements via said at least one vibration absorbing body holder, for holding said plurality of vibratable bodies, said plurality of coupling elements and said first supporting elements; and

wherein said plurality of vibratable bodies, said plurality of coupling elements, said first supporting elements, and said frame are substantially flat.

5,751,201

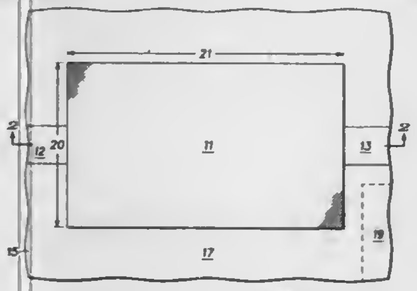
RESONATOR WITH METAL LAYERS DEVOID OF DC CONNECTION AND SEMICONDUCTOR DEVICE IN SUBSTRATE

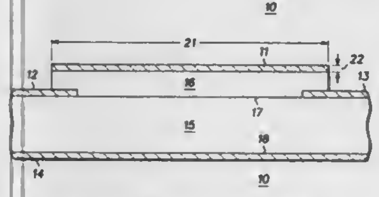
Anthony M. Pavio, Paradise Valley, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 19, 1996, Ser. No. 666,183

Int. Cl.^{6} H01P *7/00*

U.S. Cl. 333—219 **10 Claims**





1. A semiconductor component comprising:

a semiconductor substrate having a first surface and a second surface opposite the first surface;

a semiconductor device in the semiconductor substrate;

a first metal layer electrically coupled to the semiconductor device, the first metal layer adjacent to a first portion of the first surface, the first metal layer having a distal end;

a second metal layer adjacent to a second portion of the first surface, the second metal layer having a distal end;

a polyimide layer adjacent to a third portion of the first surface, the polyimide layer overlying the distal ends of the first and second metal layers;

a third metal layer overlying a portion of the polyimide layer and a portion of the third portion of the first surface, the third metal layer overlying portions of the distal ends of the first and second metal layers, the third metal layer devoid of a d.c. connection to the first and second metal layers; and

a fourth metal layer adjacent to the second surface, the fourth metal layer underlying the third metal layer.

5,751,202

ELECTROMAGNETIC COUPLING DEVICE

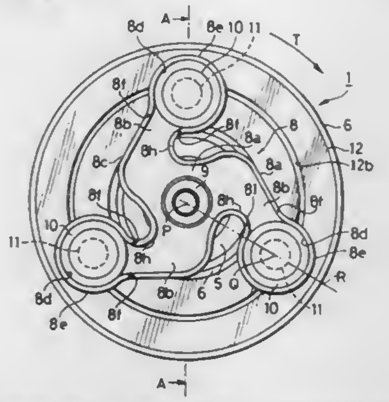
Toshiteru Seino, Kiryu, Japan, assignor to Ogura Clutch Co., Ltd., Japan

Filed Sep. 10, 1996, Ser. No. 709,855

Claims priority, application Japan, Sep. 6, 1995, 7-254655

Int. Cl.^{6} H01F *1/00;* **F16D** *19/00;27/112;65/21*

U.S. Cl. 335—296 **4 Claims**



1. An electromagnetic coupling device comprising an armature hub provided with a boss mountable on a rotational shaft, a plurality of flanges integral with the armature hub with peripheral walls bent in an axial direction on their periphery, and a plurality of damper covers which are internally surrounded by chamber walls constituted by the peripheral walls, are formed at the end of the flanges and are open to the boss in a side of the chamber and peripheral walls that face radially toward an axis of rotation of the boss and the rotational shaft; a plurality of torque transmitting members each having a first end fixed to a rubber damper housed in one of the damper covers and a second free end secured to an armature provided on the side of each of the plurality of flanges opposite one of the plurality of damper covers; a field core provided on its inside with an electromagnetic coil which magnetically attracts the armature against the resilient force of the rubber dampers; and relative to a hypothetical line connecting the center of the rotational shaft and the center of the above-mentioned torque transmitting member, the chamber walls of the damper covers of the armature hub open to the boss on the side in which the rubber dampers will be pulled.

5,751,203

INDUCTOR WITH TERMINAL TABLE

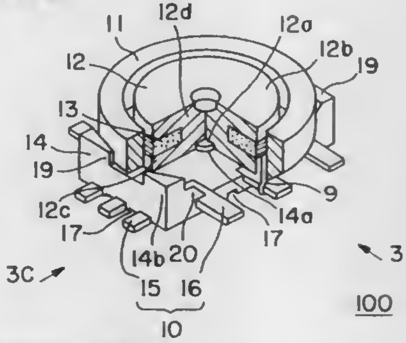
Yutaka Tsutsumi, Neyagawa; Haruhiko Kuwata, Osaka; Makoto Shinada, Yawata; Hiroshi Momoi, Hirakata, and Shinji Nakamura, Matsudo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 20, 1995, Ser. No. 504,888

Claims priority, application Japan, Jul. 20, 1994, 6-167942; May 8, 1995, 7-109246

Int. Cl.^{6} H01F *15/02;15/10;27/26*

U.S. Cl. 336—65 **8 Claims**



1. An inductor, comprising:

a terminal table having a projecting portion at each of four corners of a top surface thereof;

a plurality of L-shaped conductors inserted through the terminal table and each having two ends projecting from a side surface of the terminal table; and

magnetic core located on the top surface of the terminal table, wherein:

the magnetic core includes at least a drum-shaped core having a wire wound around a central part thereof, and

the plurality of L-shaped conductors each have a plurality of stepped portions between the two ends, one of the two ends which is on a higher level than the stepped portions acts as a winding terminal around which the wire is allowed to be wound, and the other end which is on a lower level than the stepped portions acts as a mounting terminal used for mounting of the inductor, the winding terminal projecting from a higher level of the side surface of the terminal table than mounting terminal, and each of the plurality of the L-shaped conductors further including at least one intermediate step which is positioned at a level between the level of the winding terminal and the level of the mounting terminal.

5,751,204

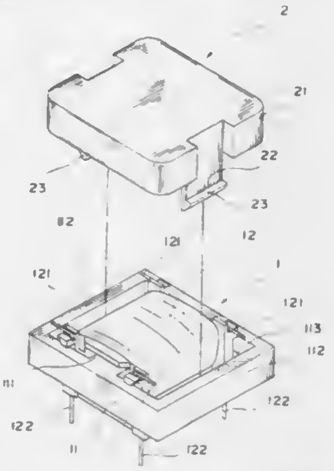
PROTECTIVE CASING FOR NON-SHEATHING TRANSFORMER

James Chen, 3F, No. 15, Lane 50, Nankang Road, Section 3, Taipei, Taiwan

Filed Jul. 26, 1996, Ser. No. 690,397

Int. Cl.⁶ H01F *27/02*

U.S. Cl. 336—98 1 Claim



1. A casing and transformer assembly comprising:

a) a transformer including a steel core frame formed by a plurality of lateral frame portions defining an outer periphery of the frame, a coil means supported within the frame and having a pair of lateral sides, and a pair of spaces, each space being positioned between each lateral side of the coil means and a frame portion;

b) a protective casing including a hollow cover portion, a pair of arms extending downwardly from the cover portion, each arm terminating in an outwardly directed hook portion, the arms being insertable through the spaces into abutting engagement with the frame and the hooks being in engagement with a lower edge of the frame for retaining the casing to the transformer and enclosing the coil means within the hollow cover portion; and

c) the casing being of sufficient size to fully enclose and shield the coil means but not project outwardly beyond the outer periphery of the steel core frame, thereby occupying substantially the same space as that occupied by the transformer without the casing.

5,751,205

HIGH-VOLTAGE TRANSFORMER FOR A TELEVISION RECEIVER

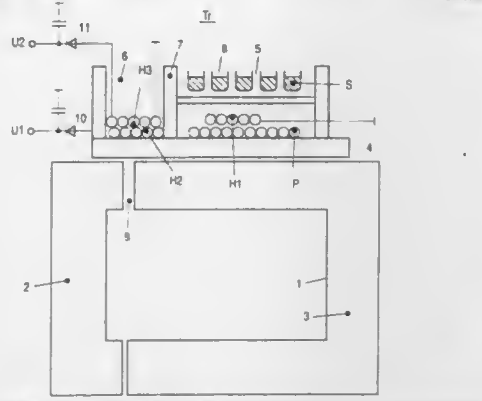
Walter Goseberg, Hanover, Germany, assignor to Deutsche Thomson Brandt GmbH, Villingen-Schwenningen, Germany

Filed Feb. 15, 1996, Ser. No. 602,181

Claims priority, application Germany, Feb. 27, 1995, 195 06 719.3; Nov. 23, 1995, 195 43 673.3

Int. Cl.⁶ H01F *17/06;27/28;21/08*

U.S. Cl. 336—178 7 Claims



1. High-voltage transformer for a television receiver comprising:

a core

a primary winding,

a high-voltage winding,

an auxiliary winding,

the windings being located in a plurality of chambers located side by side in the axial direction of the core the auxiliary winding being split into a plurality of winding elements which are connected in series and which are located in different chambers, one of the chambers being located in the region of the air gap of a U/I core or of a U/U core and having less coupling,

the numbers of turns of said winding elements being chosen and distributed in both chambers so that the required operating voltage is precisely produced.

5,751,206

DEGAUSSING COIL

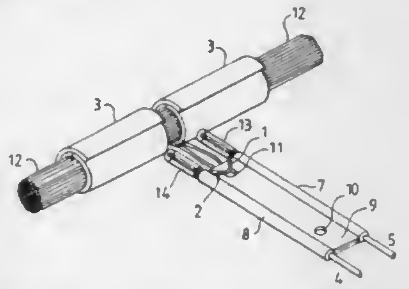
Jean-Claude Sey; Daniel Vittoz, both of Auxonne, and Christophe Lanaud, Dole, all of France, assignors to Thomson Television Components France, Courbevoie, France

Continuation of Ser. No. 206,626, Mar. 7, 1994, abandoned. This application Aug. 29, 1996, Ser. No. 705,065

Claims priority, application France, Mar. 12, 1993, 93 02870

Int. Cl.⁶ H01F *27/29;27/30*

U.S. Cl. 336—192 5 Claims



1. A degaussing coil, which comprises:

a first insulated electrical cable having first and second ends, said first cable being wound so as to form a winding;

a tubular insulating sheath covering substantially an entire portion of said winding excluding an uncovered part of the winding at which the two ends of the first cable are located;

a second electrical cable which includes first and second wires having a conductive core and an electrical insulator, each of said first and second wires having an end connected to one of the ends of the first cable so as to form first and second connections, said second cable comprising a spacer spacing said first and second wires apart, said spacer having an opening formed therein through which each of said first and second ends are passed;

first and second crimped lugs which house, respectively, said first and second ends of said first cable and portions of said first and second wires of said second cable;

a precoating which encapsulates said first and second crimped lugs and an insulating thermoplastic material member completely encasing said precoating, insulating said first and second connections from one another and overlaying said uncovered part of said winding.

5,751,207

ANNULAR CORE FOR A CHOKE, IN PARTICULAR FOR RADIO INTERFERENCE SUPPRESSION OF SEMICONDUCTOR CIRCUITS BY THE PHASE CONTROL METHOD

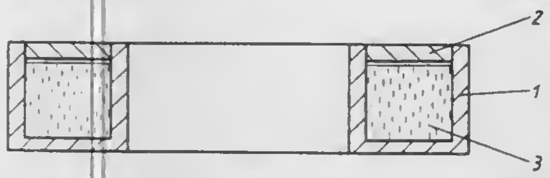
Hans-Joachim Poess, Gelnhausen, Germany, assignor to Vacuumschmelze GmbH, Hanau, Germany

Filed Mar. 7, 1997, Ser. No. 813,370

Claims priority, application Germany, Mar. 7, 1996, 196 08 890.9

Int. Cl.⁶ H01F *27/02;27/24*

U.S. Cl. 336—233 5 Claims



1. An annular core for a choke, in particular for radio interference suppression of semiconductor circuits by the phase control method, comprising:

an annular-core-shaped trough formed of a soft magnetic crystalline material having a given permeability and saturation induction, said trough having an interior; and

at least one of amorphous and nanocrystalline particles in the form of powder or flakes disposed in said interior of said trough, said particles formed of a soft magnetic material having a permeability and saturation induction different from said given permeability and saturation induction.

5,751,208

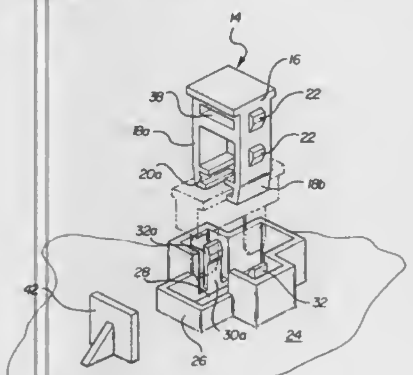
TEMPORARY FUSE DISCONNECT SYSTEM

Ivan V. Martinez, Livonia, Mich., assignor to Alcoa Fujikura Ltd., Brentwood, Tenn.

Filed Aug. 15, 1996, Ser. No. 698,015

Int. Cl.⁶ H01H *85/02;85/22*

U.S. Cl. 337—198 9 Claims



1. A system for selectably establishing and terminating a flow of electrical current through a plug-in fuse of the type which includes a body portion having a pair of contact members projecting therefrom, said system comprising:

a fuse puller including an upper portion and a first and second arm projecting from said upper portion, in a spaced apart relationship along a longitudinal axis of said fuse puller, each arm including a retaining portion configured to engage the body portion of a plug-in fuse so that said fuse is retained by said arms;

a housing having an upstanding wall portion which defines a passageway therethrough which is configured to receive said first and second arms; and

a detent assembly including a projection formed on one of said first and second arms, and a ramp, associated with said housing, which is configured to engage said projection, said detent assembly being operable to selectably retain said fuse puller in said passageway in a first position and in a second position which is displaced along said longitudinal axis relative to said first position, whereby displacement of said fuse puller along said longitudinal axis will correspondingly displace the fuse so that the contact members thereof will correspondingly engage and disengage a terminal socket assembly.

5,751,209

SYSTEM FOR THE EARLY DETECTION OF FIRES

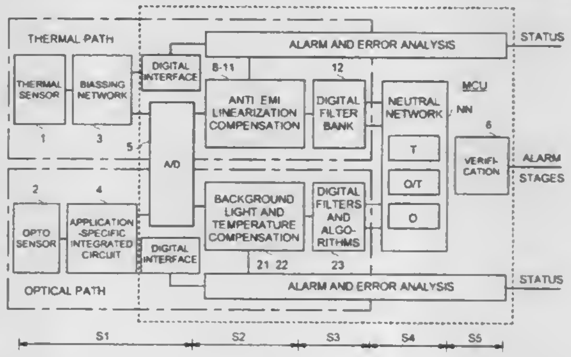
Jürg Werner, Zwillikon, and Max Schlegel, Männedorf, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed Nov. 20, 1994, Ser. No. 345,735

Claims priority, application Switzerland, Nov. 22, 1993, 3 479/93-0

Int. Cl.⁶ G08B *1/00*

U.S. Cl. 340—286.05 25 Claims



1. A system for the early detection of fires, comprising:

a plurality of detectors connected to a control center, wherein each of said detectors includes at least one sensor for monitoring a fire-related parameter; and

a means for processing sensor signals located in each of said detectors to generate alarm signals for transmission to said control center, each of said processing means including a microcontroller for conditioning said sensor signals, signature producing means for receiving a conditioned sensor signal and generating therefrom a plurality of signature signals wherein each of said signature signals includes information regarding a shape of said conditioned sensor signal, and a neural network to which said signature signals are applied to generate said alarm signals.

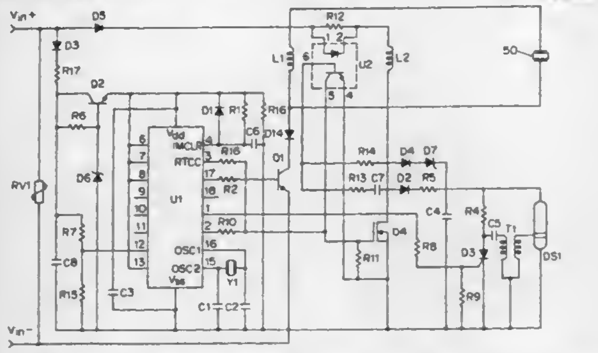
5,751,210
SYNCHRONIZED VIDEO/AUDIO ALARM SYSTEM

Joseph Kosich, South Toms River, N.J., assignor to Wheelock Inc., Long Branch, N.J.

Division of Ser. No. 407,282, Mar. 20, 1995, Pat. No. 5,608,375. This application Feb. 27, 1997, Ser. No. 807,063

Int. Cl.⁶ G08B *25/00*

U.S. Cl. 340—293 **11 Claims**



1. An alarm unit for use in an alarm system having a power source for providing a power signal to the alarm unit over a two-conductor power distribution line and an alarm control circuit for varying the power signal to the alarm unit in one or more predetermined patterns to control alarm unit operation, the alarm unit comprising:

means connectable to said two-conductor power distribution line for receiving said power signal as the sole source of power for said alarm unit;

means for generating an audible alarm signal; and

means for detecting predetermined-pattern variations in said power signal and, in response thereto, for controlling the operation of said audible alarm generating means to generate an audible alarm signal without loss of power to said alarm unit.

5,751,211
OBSTACLE WARNING SYSTEM FOR A VEHICLE

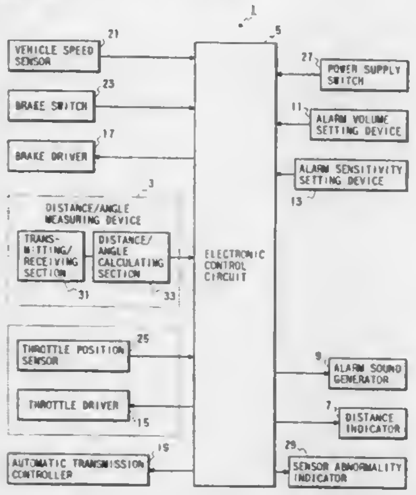
Noriaki Shirai, Oobu; Katsuhiko Hibino, Kariya, and Takao Nishimura, Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 27, 1996, Ser. No. 777,196

Claims priority, application Japan, Dec. 28, 1995, 7-343624

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—435 **8 Claims**


1
5
21
VEHICLE SPEED SENSOR
23
BRAKE SWITCH
17
BRAKE DRIVER
3
DISTANCE/ANGLE MEASURING DEVICE
TRANS-MITTING/ RECEIVING SECTION
DISTANCE/ ANGLE CALCULATING SECTION
31
33
ELECTRONIC CONTROL CIRCUIT
25
THROTTLE POSITION SENSOR
THROTTLE DRIVER
15
19
AUTOMATIC TRANSMISSION CONTROLLER
27
POWER SUPPLY SWITCH
11
ALARM VOLUME SETTING DEVICE
ALARM SENSITIVITY SETTING DEVICE
13
9
ALARM SOUND GENERATOR
7
DISTANCE INDICATOR
29
SENSOR ABNORMALITY INDICATOR

1. An obstacle warning system for a vehicle, comprising:

obstacle detecting means for detecting a distance to an obstacle and an angle of the obstacle within a forward detection zone defined by a given angle in a width direction of the vehicle;

warning means for issuing an alarm when the obstacle detected by said obstacle detecting means satisfies a given warning condition;

guardrail detecting means for detecting a guardrail on the basis of the distance to the obstacle and the angle of the obstacle detected by said obstacle detecting means when the obstacle detected by said obstacle detecting means extends a long distance along a forward direction of the vehicle;

curved state detecting means for detecting a curved state of a road on the basis of a position of the guardrail detected by said guardrail detecting means; and

warning condition correcting means for correcting the warning condition on the basis of the curved state of the road detected by said curved state detecting means.

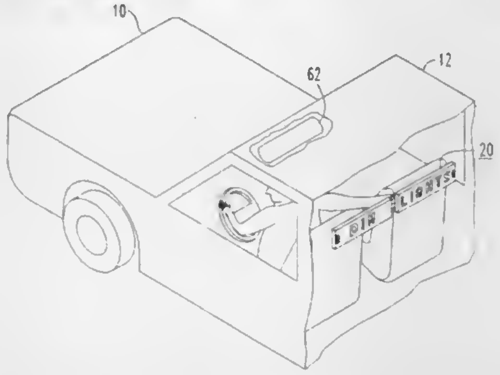
5,751,212
SIGNALING DEVICE

Craig Alan Findley, 20 S. First St., Sharpsville, Pa. 16150

Filed Aug. 18, 1995, Ser. No. 516,605

Int. Cl.⁶ B60Q *7/00*

U.S. Cl. 340—468 **3 Claims**



1. A signaling device for use within a first vehicle for signaling a person positioned in a second, following vehicle having lights, comprising:

a first display member having a portion of a message positioned thereon, said message including letters positioned in an upright position when said first display member is held in a horizontal position;

a second display member positioned separated from said first display member and having a portion of said message positioned thereon, said message including letters positioned in an upright position when said second display member is held in a horizontal position;

said message conveying an expression to the person positioned within said second, following vehicle to adjust the brightness of said lights of said second automobile;

a first attachment member, being separate from said first and second display members, connected to said first display member and connected to said second display member;

a second attachment member, being separate from said first and second display members, positioned in spaced apart relation to said first attachment member and connected to said first display member and connected to said second display member, said first and second attachment members attaching together said first and second display members and foldable for enabling said first and second display members to fold toward each other for storage of said signaling device; and

a handle attached to said first display member and to said second display member, said handle foldable for enabling said first and second display members to fold toward one another for storage of said signaling device.

5,751,213
THEFT DETECTION ALARM ELEMENT FOR AVOIDING FALSE ALARMS

Leif Åsbrink, 01 3265, Jäders Prästgård, S-635 05 Eskilstuna, Sweden

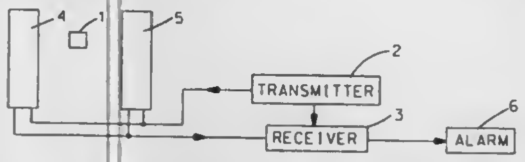
PCT No. PCT/SE95/00100, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO95/21431, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 2, 1995, Ser. No. 676,219

Claims priority, application Sweden, Feb. 7, 1994, 9400396

Int. Cl.⁶ G06B *13/24*

U.S. Cl. 340—572 **9 Claims**



1. An alarm system including an alarm element for receiving a magnetic alternating field having a predetermined frequency and transmitted by a transmitter, wherein the alarm element retransmits a magnetic alternating field without an energy addition, and wherein the retransmitted alternating field is received and detected by a receiver in the alarm system, said alarm system comprising: an alarm element having a circuit which includes a coil, and a diode, wherein the diode is a capacitance diode which is connected in series with the coil and in series with a resistor in a closed circuit, and a capacitor connected in parallel across the resistor; wherein the coil and the capacitance diode define a resonance circuit which has resonance at the predetermined frequency when the voltage across the diode is zero volts; and wherein the resonance circuit provides periodic resonance variations that are detected by the receiver.

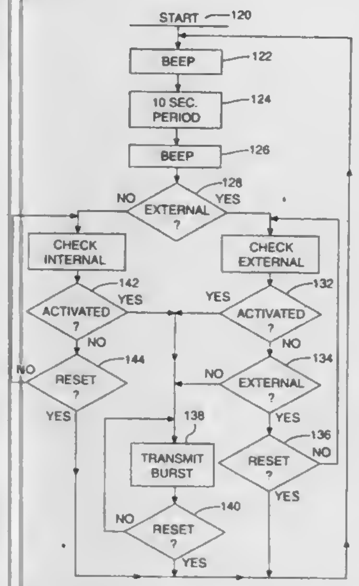
5,751,214
PATIENT ACTIVITY MONITORING DEVICE WITH MULTIPLE SENSORS

Tom J. Cowley, Tiburon; Larry O. Bower, Santa Rosa, and Philip S. Egan, Fairfax, all of Calif., assignors to AlertCare, Inc., Mill Valley, Calif.

Filed Dec. 13, 1995, Ser. No. 571,462

Int. Cl.⁶ G08B *23/00*

U.S. Cl. 340—573 **11 Claims**



1. Apparatus for monitoring movement of a patient in a plurality of ways, comprising:

a connecting device for alternatively connecting to a plurality of different external sensors connectable to the device;

a data processor coupled to the connecting device and responsive to an external sensor connected to the connecting device for determining whether the patient has moved beyond a limit and for determining whether the external sensor has been improperly disconnected from the connecting device;

an alarm responsive to the data processor for indicating that the patient has moved beyond the limit or that the external sensor has been improperly disconnected; and

a handheld, portable housing for containing the device, data processor and alarm,

wherein the data processor is adapted to respond to the plurality of different external sensors.

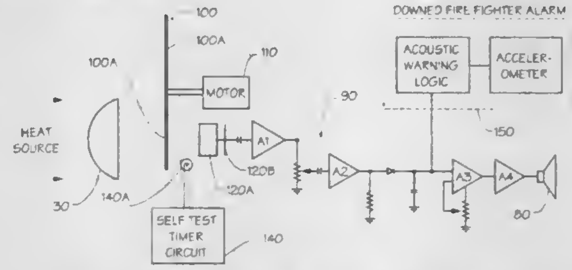
5,751,215
FIRE FINDING APPARATUS

Joseph F. Hall, Jr., 22971 Triton Way Unit B, Laguna Hills, Calif. 92653

Filed Nov. 21, 1996, Ser. No. 752,846

Int. Cl.⁶ G08B *17/00*

U.S. Cl. 340—584 **4 Claims**



1. A device for signaling the intensity of heat in a burning environment, the device comprising:

an optical collection means collecting, focusing and transmitting a received electromagnetic radiation signal sensed within the field of view of the device;

a spectral filter means receiving the transmitted electromagnetic radiation signal and blocking substantially all electromagnetic radiation having wavelengths shorter than about 2.6 microns and longer than about 2.8 microns, the spectral filter means transmitting that part of the electromagnetic radiation signal between about 2.6 microns and 2.8 microns;

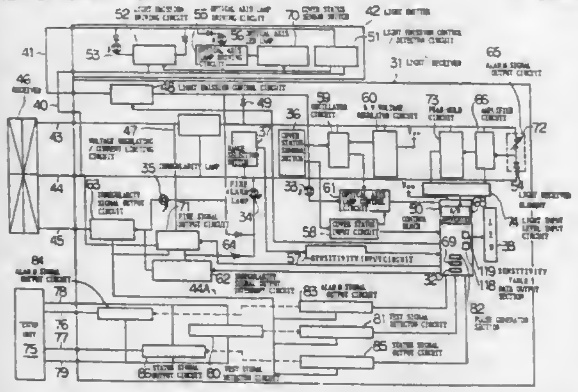
an infrared detector means receiving the electromagnetic radiation signal from the spectral filter means and emitting an electrical detector signal when the filtered electromagnetic radiation signal is received thereon;

an operational electrical circuit means receiving and amplifying the detector signal emitted by the infrared detector means, and further, providing an audible tone, the pitch of the audible tone being proportional to the magnitude of the detector signal; and

a means for interrupting the focused electromagnetic radiation signal emitted by the optical collection means, the interrupting means providing a repetitive interruption to establish a zero base for the focused electromagnetic radiation signal to overcome zero drift in the infrared detector means; and

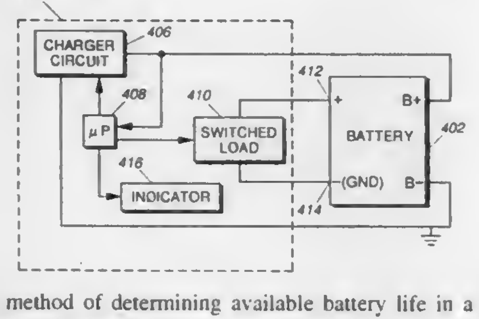
a downed-fire-fighter alarm circuit, the alarm circuit including a means for sensing inertial forces, the alarm circuit structured for enabling the audible tone of the operational electrical circuit means when the device is in an operational mode and is not moving.

5,751,216
PROJECTED BEAM-TYPE SMOKE DETECTOR AND RECEIVING UNIT
Junichi Narumiya, Fujisawa, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 15, 1995, Ser. No. 529,269
Int. Cl.^{6} G08B *17/10*
U.S. Cl. 340—630 **12 Claims**



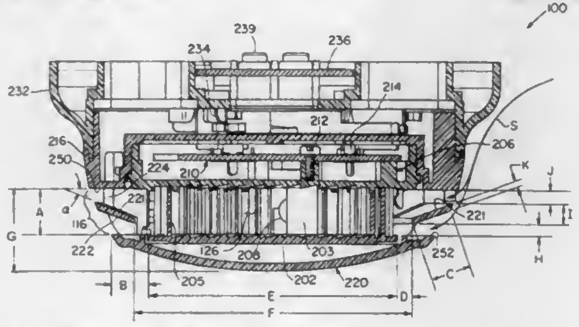
1. A projected beam-type smoke detector that is constructed of a light emitter having a light emitting element and a light receiver having a light receive element separately mounted from the light emitter in order to detect a fire by detecting the light attenuation due to the presence of smoke between the light emitting element and the light receive element, said light receiver sending to a receiving unit a plurality of types of numerical status information including light receive state data and setting state data of a diversity of setting values determined by monitoring the status of the light emitter and the light receiver, said projected beam-type smoke detector comprising: data output means in the light receiver for outputting serially the plurality of types of numerical status information a start data being provided at the head of said plurality of types of numerical status information, said start data being detectable as start position of said status information by said receiving unit; and status signal output means for sending said plurality of types of numerical status information from said data output means to said receiving unit, said plurality of types of numerical status information being sent sequentially in predetermined order and periodically.

5,751,217
METHOD AND APPARATUS FOR ASSESSING AVAILABLE BATTERY LIFE IN A RECHARGEABLE BATTERY
Sokphal Kchao, Fort Lauderdale, and Robert B. Ford, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 1, 1996, Ser. No. 595,154
Int. Cl.^{6} G08B *21/00*
U.S. Cl. 340—636 **12 Claims**



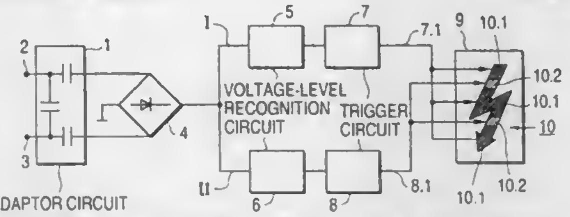
1. A method of determining available battery life in a battery, comprising the steps of:
fully charging the battery by:
applying a rapid charge cycle to the battery, and applying a trickle charge cycle to the battery when the rapid charge cycle is complete;
determining an internal impedance of the fully charged battery once the trickle charge cycle has been applied; and
assessing the available battery life based on the determined internal impedance.

5,751,218
SMOKE DETECTOR HOUSING FOR IMPROVED SMOKE COLLECTION
Charles Winterble, Princeton; Wayne Nelson, Maynard, and Lawrence G. Stanley, Templeton, all of Mass., assignors to Simplex Time Recorder Company, Gardner, Mass.
Filed Jul. 19, 1996, Ser. No. 684,947
Int. Cl.^{6} G08B *23/00*
U.S. Cl. 340—693 **20 Claims**



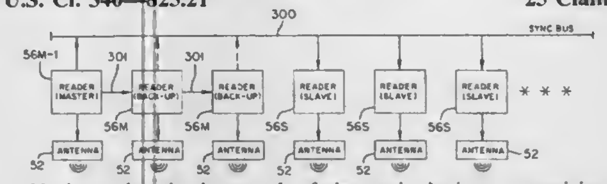
1. A smoke detection unit comprising:
a detection chamber which samples smoke from a surrounding environment;
a housing for the detection chamber, comprising a cover and a base, the cover being supported below and spaced away from the base to define a window though which air from the environment circulates into and out of the detection chamber; and
an inverted frustoconical cage vane positioned in the window, between the cover and base, the cage vane having a downwardly sloping top edge to guide smoke through the window to the detection chamber.

5,751,219
TESTING INSTRUMENT WITH A DISPLAY ELEMENT
Karl Stegmueller, Wiesent, Germany, assignor to AEG Sachsenwerk GmbH, Germany
Filed Oct. 3, 1996, Ser. No. 725,545
Claims priority, application Germany, Oct. 21, 1995, 195 39 227.2
Int. Cl.^{6} G08B *5/00*
U.S. Cl. 340—815.4 **3 Claims**



1. A testing instrument including a display element and two control paths that are separately activated and connected to the display element, each control path including a voltage-level recognition circuit and a trigger circuit connected in series, wherein the voltage-level recognition circuits have different minimum threshold voltages which, if exceed, result in an output signal being fed to the respective trigger circuit, the display element has a display field which includes at least three partial display fields which follow successively in a longitudinal direction of the display element, the partial display fields comprise a first group of non-contiguous partial display fields and a second group of non-contiguous partial display fields, and each trigger circuit has an output connected to a respective one of the groups of partial display fields.

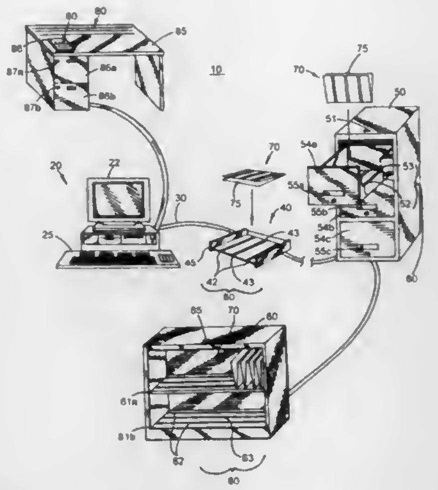
5,751,220
SYNCHRONIZED NETWORK OF ELECTRONIC DEVICES INCLUDING BACK-UP MASTER UNITS
Touraj Ghaffari, Boca Raton, Fla., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.
Filed Jul. 14, 1995, Ser. No. 502,827
Int. Cl.^{6} H04L *7/00*
U.S. Cl. 340—825.21 **25 Claims**



11. A synchronized network of electronic devices, comprising:
a master device including means for generating synchronizing signals at regular intervals and an output terminal for outputting the synchronizing signals;
a second device including an input terminal connected to the output terminal of the master device, means for generating a synchronizing signal in response to receipt of a synchronizing signal at the input terminal, and an output terminal for outputting the synchronizing signal generated by the means for generating of the second device; and
a third device including an input terminal connected to the output terminal of the second device, means for generating a synchronizing signal in response to receipt of a synchronizing signal at the input terminal of the third device, and an output terminal for outputting the synchronizing signal generated by the means for generating of the third device;
said second device further including means for determining whether a synchronizing signal is received at the input terminal of the second device during a predetermined period of time and for generating synchronizing signals at regular intervals if it is determined that no synchronizing signal is received at the input terminal of the second device during the predetermined period of time, each of said synchronizing signals for initiating an operation of a device which receives the respective synchronizing signal.

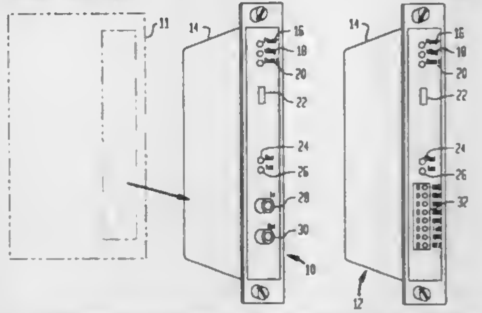
5,751,221
ELECTRONIC SYSTEM, COMPONENTS AND METHOD FOR TRACKING FILES
Joel D. Stanfield, Kentwood; Joseph R. Branc, Grand Rapids; Thomas G. Feldpausch, Hastings, and William L. Miller, Ada, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Jan. 27, 1995, Ser. No. 379,944
Int. Cl.^{6} G06K *19/06*
U.S. Cl. 340—825.35 **20 Claims**

1. A file tracking system comprising:
a database for maintaining file location and unique file addresses for a plurality of files;
a processor for interfacing with said database and issuing control signals;
a bus connected to said processor;
a folder retainer connected to said processor by said bus;
a plurality of file folders, each file folder including an addressable device adapted to be electrically connected to said bus when the file folder is placed in said folder retainer, each addressable device being responsive to a control signal including the unique address associated with the addressable device to transmit a signal back to said processor so that said processor may maintain the file location of each file in said database wherein each of said file folders further include:



a surface;
a first conductor on said surface for providing control signals to said addressable device when the file folder is placed in said folder retainer; and
a second conductor on said surface for providing a ground to said addressable device, wherein said first and second conductors are strips of conductive tape provided on said surface of the file folders.

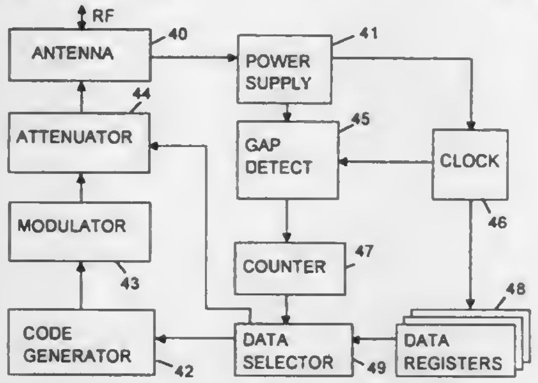
5,751,222
RECONFIGURABLE COMMUNICATIONS MODULE
John J. Trainor, Wake Forest; Carl J. Laplace; Michael A. Kinney, both of Raleigh, and Joseph F. Reilly, Wendell, all of N.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.
Continuation of Ser. No. 414,066, Mar. 31, 1995, abandoned. This application Dec. 26, 1996, Ser. No. 774,003
Int. Cl.^{6} H04Q *1/00*
U.S. Cl. 340—825.05 **20 Claims**



1. A reconfigurable communication module for facilitating communication to or among electric power control apparatus, comprising:
a reconfigurable communication module adaptable to communicate over a plurality of communication media, said reconfigurable communication module connectable to and collocated with said electric power control apparatus;
module communication means contained in said communication module for communicating with said electric power control apparatus and for also communicating with one of a group of replaceable module transceivers;
a plurality of communications protocols embedded in said reconfigurable communications module, wherein the module communication means includes means responsive to said electric power control apparatus for selecting one of the plurality of communications protocols to be used for communicating with said electric power control apparatus;
replaceable module transceiver means contained in said communication module for communicating with said module communication means and for facilitating external communication over a predetermined communications medium, said replaceable module transceiver means consisting of one of a group of replaceable module transceiver means, wherein each of said

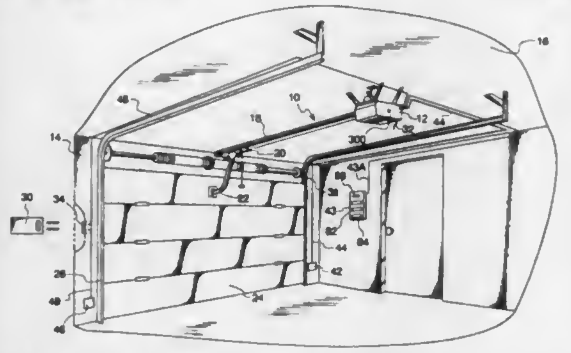
group of replaceable module transceiver means is adapted to communicate over a respectively different one of said communications media.

5,751,223
ELECTRONIC IDENTIFICATION SYSTEM
Edwin Turner, Marlow, England, assignor to International Computers Limited, Putney, England
Filed Mar. 19, 1996, Ser. No. 618,127
Claims priority, application United Kingdom, Mar. 22, 1995, 9505810
Int. Cl.^{6} H04Q *5/22;7/00;* **G08B** *26/00;23/00*
U.S. Cl. 340—825.54 **9 Claims**



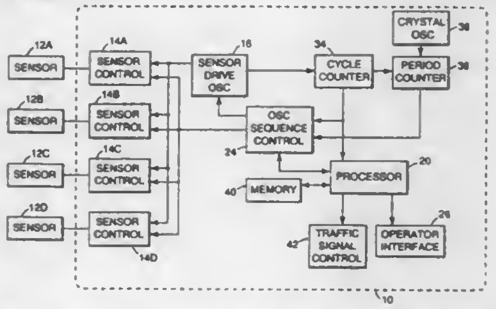
1. An electronic identification system comprising at least one interrogator and a plurality of transponders, wherein each of said transponders includes:
- (a) a plurality of registers stored in non-volatile memory, containing data;
- (b) a counter stored in non-volatile memory;
- (c) means for receiving an interrogation signal transmitted by said interrogator;
- (d) means responsive to said interrogation signal for using said counter to select a data item from one of said registers and for transmitting said data item to the interrogator; and
- (e) control means for incrementing said counter in response to a switching signal from said interrogator.

5,751,224
CODE LEARNING SYSTEM FOR A MOVABLE BARRIER OPERATOR
James J. Fitzgibbon, Streamwood, Ill., assignor to The Chamberlain Group, Inc., Elmhurst, Ill.
Filed May 17, 1995, Ser. No. 442,909
Int. Cl.^{6} G06F *15/20;* **H04B** *7/00;* **H04Q** *9/00*
U.S. Cl. 340—825.22 **12 Claims**



1. A barrier operator for moving a movable barrier, comprising:
an electric motor;
a transmission system connectable to the electric motor for providing mechanical drive to the movable barrier;
a radio frequency receiver;
a decoder coupled to receive a demodulated signal from the radio frequency receiver;
means for recognizing a learn mode code received by the radio frequency receiver and producing a learn code enable signal in response thereto; and
means operative for a predetermined period of time after the reception of a learn mode code for storing a security code received by the radio receiver subsequent to the learn enable code having been received.

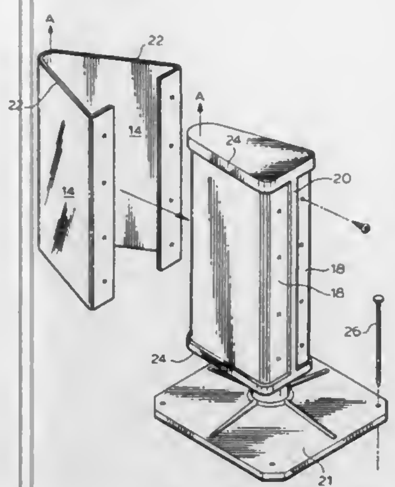
5,751,225
VEHICLE DETECTOR SYSTEM WITH PRESENCE MODE COUNTING
Mickiel P. Fedde, Eagan, and Kevin W. Klimisch, Wyoming Township, Chisago County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 12, 1994, Ser. No. 304,521
Int. Cl.^{6} G08G *1/01*
U.S. Cl. 340—941 **7 Claims**



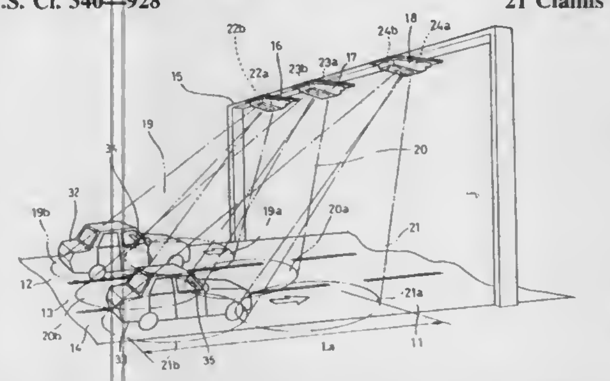
1. In a detector system in which objects are detected in a detection area using an inductive sensor and an oscillator having a oscillator signal that is a function of the inductance of the inductive sensor, a method for detecting subsequent vehicles in the detection area during presence of at least one other vehicle in the detection area, comprising:
- (a) determining presence of a first vehicle in the detection area when a counted number of cycles of the oscillator signal during a first measurement period differ from a first reference value by at least a first threshold amount;
- (b) activating a presence call signal when the first vehicle is determined to be present and maintaining the presence call signal for as long as at least one vehicle is determined to be present;
- (c) setting a current in-call reference when the presence call signal is active wherein the current in-call reference is based on the counted number of cycles during the first measurement period, wherein the in-call reference is in addition to and not substituted for the first reference value;
- (d) setting a current in-call threshold when the presence call signal is active,
- (e) determining presence of a subsequent vehicle in the detection area when a counted number of cycles of the oscillator signal during a subsequent measurement period differ from the in-call reference by an amount at least equal to the in-call threshold wherein the in-call reference is updated during the detection of each subsequent vehicle.

5,751,226
TAXIWAY MARKER
Gary Hretsina, 835 Westney Road South, Unit 12, Ajax, Ontario, Canada, L1S 3M4
Filed Dec. 2, 1996, Ser. No. 753,787
Int. Cl.^{6} G08G *5/00;* **G02B** *5/124*
U.S. Cl. 340—947 **6 Claims**

5. A marker defining an axis, means for mounting said marker with an axis approximately perpendicular to a support surface, a said marker including a pair of approximately planar panel sections with said planar sections approximately parallel to said axis and at an angle of 0°–30° to each other, each of said panels defining a retro-reflective surface on the exterior side of said panels,
a support for said panels,
wherein the material of said panel sections extends to form a hairpin turn between said sections, wherein said retro reflective surface extends over the convex side of said hairpin turn.

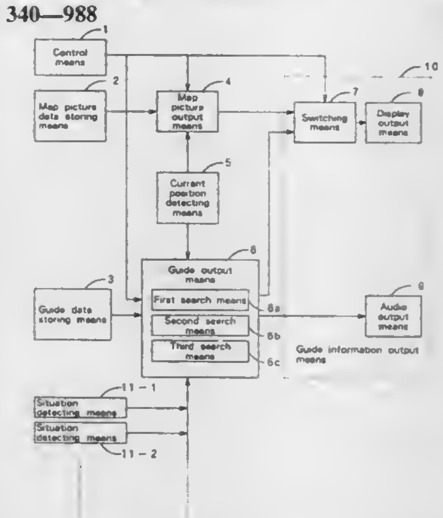


5,751,227
COMMUNICATION SYSTEM FOR VEHICLES
Ichiro Yoshida, Takahama; Taisei Kato, Toyoake; Toshihide Ando, Chita-gun; Manabu Matsumoto; Mutsushi Yamashita, both of Handa, and Yoshiyuki Kago, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 574,635, Dec. 19, 1995, abandoned.
This application Jun. 24, 1997, Ser. No. 881,121
Claims priority, application Japan, Dec. 22, 1994, 6-320208
Int. Cl.^{6} G08G *1/00*
U.S. Cl. 340—928 **21 Claims**



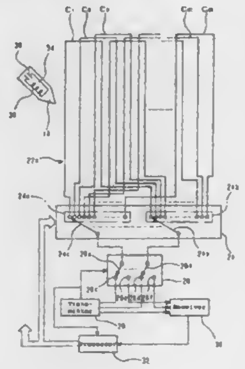
1. A communication system for vehicles, said system comprising:
an antenna unit disposed over a road for setting a communication area by operating at a specified oscillation frequency;
an antenna element provided within the antenna unit, said antenna element including a center patch and an end patch, a transmission line connecting the center patch and the end patch and a power supply terminal connected to the transmission line, an impedance of said end patch as seen from said power supply terminal being higher than an impedance of said center patch as seen from said power supply terminal, for sending an interrogatory signal to a vehicle; and
a communication controlling means provided within the antenna unit for controlling transmission and receipt of signals at the antenna unit.

5,751,228
GUIDE SYSTEM
Kazuo Kamiya, Anjo; Hirofumi Morimoto, Nishio, and Shoji Yokoyama, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., and Equos Research Co., Ltd., both of Japan
Filed Mar. 17, 1995, Ser. No. 405,967
Claims priority, application Japan, May 2, 1904, 6-093467; Mar. 18, 1994, 6-049237; May 2, 1994, 6-093466
Int. Cl.^{6} G08G *1/123*
U.S. Cl. 340—988 **10 Claims**



1. A guide system for a vehicle comprising:
guide data storing means for storing guide information on roads, information on objects located along roads and objects in the local area of roads, in the form of guidance data, said guidance data being classified in storage into plural different classifications;
current position detecting means for detecting and tracing the current position of the vehicle;
guidance selection means including a plurality of guide search means for searching said stored guide information to identify a guide object in the vicinity of the detected current position, said plural guide search means each being dedicated to one of the different classifications, each of said guide search means searching exclusively within the classification to which each guide search means is dedicated wherein said guidance selecting means automatically selects said plurality of guide search means in a predetermined sequence; and
guide information output means for outputting the guide information for the identified guide object.

5,751,229
ANGULAR INFORMATION INPUT SYSTEM
Takahiko Funahashi, Otone-machi, Japan, assignor to WACOM Co., Ltd., Japan
Filed Apr. 13, 1995, Ser. No. 421,270
Claims priority, application Japan, Apr. 28, 1994, 6-111791
Int. Cl.^{6} H01H *19/00*
U.S. Cl. 341—5 **14 Claims**



1. An angular information input system for determining coordinate data and tilt data relating to an inclined angle of a pointing device relative to a coordinate data input device, the angular information input system comprising:

said coordinate data input device, including a plurality of parallel conductors in each of the X and Y axial directions, for inputting coordinate data by detecting electromagnetic signals from said pointing device in each of the X axial direction and the Y axial direction;

said pointing device for indicating location on said coordinate data input device by way of the electromagnetic signals detected via said conductors; and

a calculating means for calculating the incline angle of said pointing device relative to said coordinate data input device in the X axial direction as a function of main peak and auxiliary peak signals detected in each of the X axial direction and the Y axial direction.

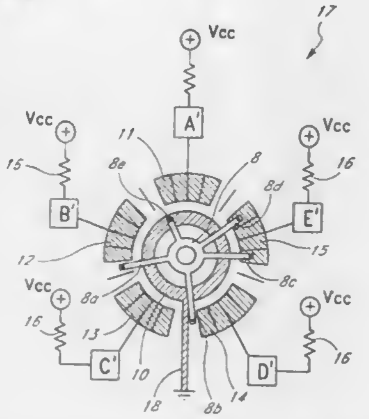
5,751,230
DIGITAL INPUT AND CONTROL DEVICE

Marco Brandestini, Montagnola, Switzerland, assignor to Bourns, Inc., Riverside, Calif.

Division of Ser. No. 359,703, Dec. 20, 1994, which is a continuation-in-part of Ser. No. 201,739, Feb. 25, 1994, Pat. No. 5,519,393, which is a continuation-in-part of Ser. No. 96,047, Jul. 22, 1993, abandoned. This application Jan. 29, 1997, Ser. No. 788,453

Int. Cl.^{6} H03M ***1/22***

U.S. Cl. 341—10 **27 Claims**



1. A single-track absolute digital position encoder, comprising:

a first member having a plurality of conductive pick-up segments positioned along a pick-up track, said pick-up segments electrically insulated from one another, each pick-up segment corresponding to a respective digit of an output code of the encoder;

a second member supported for relative rotational movement with respect to said first member over an operable range which exceeds 90°; and

a plurality of contacts aligned with said pick-up track such that said contacts move into and out of mechanical contact with said pick-up segments to thereby modify said digits of said output code when said first and second members are moved relative to one another;

wherein no more than one digit of said output code changes at-a-time when said second member is rotated relative to said first member over said range, and wherein each value of said output code generated over said range uniquely corresponds to a respective relative position of said first and second members.

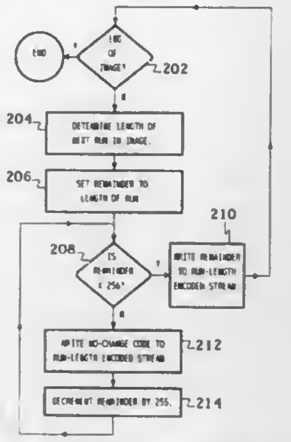
5,751,231
METHOD AND APPARATUS FOR RUN-LENGTH ENCODING USING SPECIAL LONG-RUN CODES

Vaughn Iverson, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 26, 1996, Ser. No. 670,453

Int. Cl.^{6} H03M ***7/00***

U.S. Cl. 341—59 **28 Claims**


END
END OF IMAGE?
202
204
DETERMINE LENGTH OF NEXT RUN IN IMAGE.
206
SET REMAINDER TO LENGTH OF RUN
210
208
IS REMAINDER < 256?
WRITE REMAINDER TO RUN-LENGTH ENCODED STREAM
WRITE NO-CHANGE CODE TO RUN-LENGTH ENCODED STREAM
212
DECREMENT REMAINDER BY 255.
214

1. A method for run-length encoding signals representative of at least one of physical activities and physical objects, comprising the steps of:

(a) determining magnitudes of runs of constant signal value in the signals; and

(b) converting the signals to fixed-length run-length (RL) codes, wherein each long run in the signals that is longer than the largest run length represented by a single RL code is represented by at least one no-change RL code and an RL code representing a remainder value, wherein the no-change RL code represents a portion of the long run and also indicates that the immediately following RL code corresponds to a continuation of the long run.

5,751,232
HIGH-EFFICIENCY ENCODING APPARATUS AND HIGH-EFFICIENCY DECODING APPARATUS

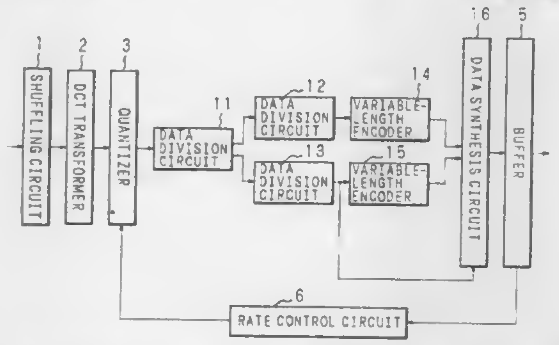
Sadayuki Inoue; Junko Ishimoto, and Ken Onishi, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki, Tokyo, Japan

Division of Ser. No. 282,570, Jul. 29, 1994. This application Aug. 28, 1996, Ser. No. 704,276

Claims priority, application Japan, Jul. 30, 1993, 5-208348; Oct. 18, 1993, 5-284519; Nov. 16, 1993, 5-311141; Jan. 17, 1994, 6-17787; Apr. 28, 1994, 6-92705; Apr. 28, 1994, 6-92706; Jun. 21, 1994, 6-139030

Int. Cl.^{6} H03M ***7/40***

U.S. Cl. 341—63 **10 Claims**



1. A high-efficiency encoding apparatus which applies high-efficiency encoding to digital data organized into blocks, comprising:

data dividing means for dividing the digital data into run length data and coefficient data through 1-dimensional scanning;

first encoding means for run-length encoding the divided run-length data employing data having a high probability of occurrence as a first run; and

second encoding means for run-length encoding the divided coefficient data employing the data having a high probability of occurrence as a second run.

5,751,233
DECODING APPARATUS AND METHOD THEREFOR

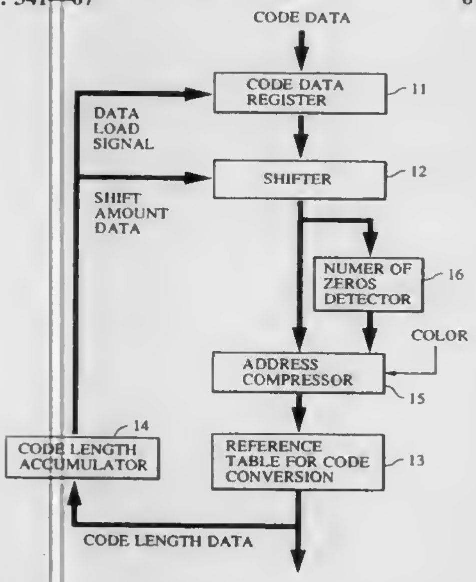
Tetsuya Tateno, Hadano, and Yuji Minami, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1996, Ser. No. 644,246

Claims priority, application Japan, May 19, 1995, 7-121504

Int. Cl.^{6} H03M ***7/40***

U.S. Cl. 341—67 **8 Claims**



1. A decoding apparatus for decoding codes which have been generated by encoding image data in accordance with one of Modified Huffman, Modified READ and Modified Modified READ encoding methods, said decoding apparatus comprising:

detecting means for detecting a number of consecutive leading zero bits of a code to be decoded;

forming means for forming address data by performing a logical operation on data indicating a color represented by the code, on data indicating the number of zero bits detected by said detecting means, and on data for the code excluding the consecutive leading zero bits and a next one bit of the code; and

decoding means comprising a table which is addressed by the address data formed by said forming means and which outputs a decoded result corresponding to the code,

wherein the data length of the address data formed by said forming means is shorter than that of data obtained by concatenating the data indicating the color, the data indicating the number of zero bits, and the data for the code excluding the consecutive leading zero bits and the next one bit of the code.

5,751,234
SURE CHIP

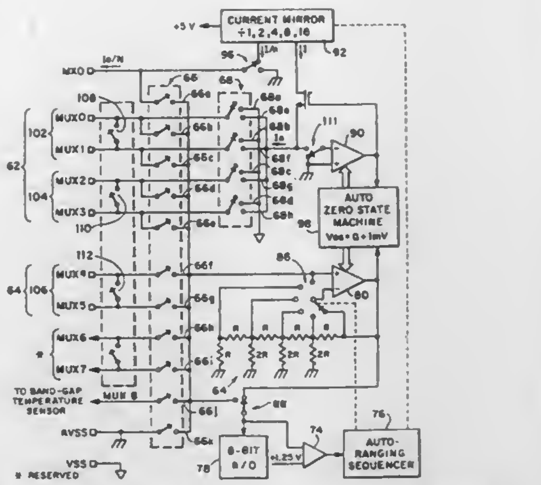
John C. Schlotterer, Murrysville, and Robert T. Elms, Monroeville, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 636,643, Dec. 28, 1990, Pat. No. 5,525,985. This application Sep. 23, 1996, Ser. No. 555,470

Int. Cl.^{6} H03M ***1/18***

U.S. Cl. 341—139 **49 Claims**

1. A CMOS monolithic circuit comprising:



means for receiving analog input signals including analog-to-digital converter means and voltage ranging means for ranging said analog input signals to a predetermined range to improve the resolution of said analog-to-digital converter means; and

means at least for producing digital output signals as a function of said analog input signals.

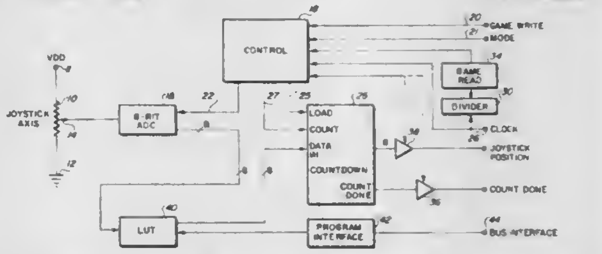
5,751,235
SYSTEM AND METHOD FOR ENHANCING JOYSTICK PERFORMANCE

Gary Hicok, Mesa; Kenneth Potts, Gilbert, and Scott Harrow, Scottsdale, all of Ariz., assignors to VLSI Technology, San Jose, Calif.

Filed May 24, 1996, Ser. No. 653,619

Int. Cl.^{6} H03M ***1/06***

U.S. Cl. 341—140 **6 Claims**



1. A system for modifying a digital representation of the setting of a potentiometer including in combination:

an analog-to-digital converter having an input coupled with a source of analog signals from a potentiometer and having a digital output;

a digital lookup table coupled with the output of said analog-to-digital converter and producing a digital output therefrom representative of translated digital signals from said analog-to-digital converter;

a digital counter with the input thereof coupled to the output of said lookup table and having an output;

a control circuit coupled with said counter to load said counter with the output from said lookup table at a predetermined time;

a clock circuit coupled with said counter for supplying clock signals to cause said counter to count down to an initial value to produce an output signal on the output of said digital counter when said count down to said initial value is attained:

a sample device coupled with the output of said digital counter;

and a circuit coupled with said clock circuit for causing said sample device to sample said output from said digital counter at a predetermined rate which is at a lower frequency than the frequency of said clock signals.

5,751,236
A/D CONVERSION WITH FOLDING AND INTERPOLATION

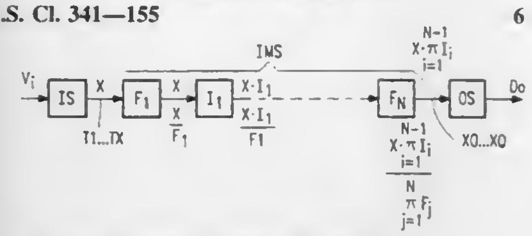
Pieter Vorenkamp; Arnoldus G.W. Venes, and Rudy J. Van De Plassche, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1996, Ser. No. 709,401

Claims priority, application European Pat. Off., Sep. 8, 1995, 95202444; Jul. 16, 1996, 96202014

Int. Cl.^{6} H03M *1/00*

U.S. Cl. 341—155 **6 Claims**



1. An A/D conversion circuit comprising:
an input part (IS) for providing differential transitions associated with different levels of an analog input signal;
an intermediate part (IMS) for carrying out at least one folding operation and at least one interpolation operation on the transitions to obtain a set of bit-determining signals; and
an output part (OS) for deriving a digital output signal (Do) from the bit-determining signals;
wherein the intermediate part (IMS) is arranged to carry out at least one of said folding and interpolation operations more than once in alternation with the other of said operations.

5,751,237
TRIMMING UNIT OF RADIO CONTROL APPARATUS

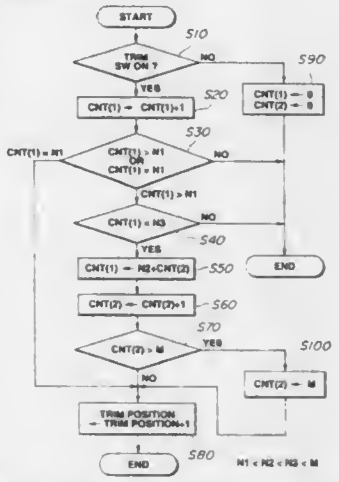
Masahiro Tanaka, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Apr. 4, 1996, Ser. No. 627,456

Claims priority, application Japan, Apr. 4, 1995, 7-101661

Int. Cl.^{6} G08C *19/12*

U.S. Cl. 341—176 **3 Claims**



1. A trimming unit of a radio control apparatus comprising:
a trim switch having only a pair of contacts;
control means for detecting a fact that time in which said trim switch is continuously operated is longer than a predetermined time so as to activate an automatic repeating function and controlling repeating speed of the activated automatic repeating function, wherein
said control means raises the repeating speed as the detected time in which said trim switch is continuously operated is elongated.

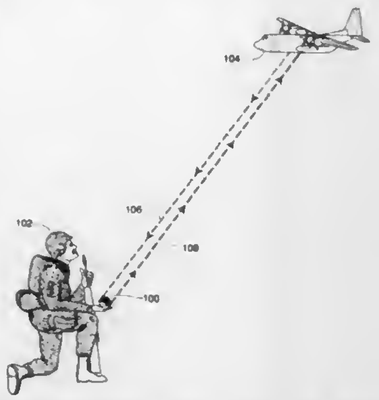
5,751,238
ACTIVE CORNER REFLECTOR

David M. Lin, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1996, Ser. No. 716,701

Int. Cl.^{6} H01Q *15/20*

U.S. Cl. 342—5 **12 Claims**



1. A portable, pocket carried, active, high gain radio frequency corner reflecting apparatus comprising:
a portable and collapsible three-dimensional structure having an assembled uncollapsible state thereof, said three-dimensional structure including a first planar surface, a second planar surface, and a third planar surface, said surfaces intersecting to define a concave vortex point and thereby further defining internal and external sides of each said planar surface;
a plurality of transmitting and receiving antennas disposed on the internal side of one planar surface of said three-dimensional structure;
a plurality of radio frequency signal amplifying electronic circuit chips coupled to each of said antennas; and
a power source connected with each of said electronic circuit chips.

5,751,239
DISTANCE SENSOR FOR PROJECTILE FUZES

Gunter Wichmann, Leiman, Germany, assignor to Eltro GmbH, Heidelberg, Germany

Continuation-in-part of Ser. No. 587,316, Mar. 7, 1984, Pat. No. 4,613,231. This application May 10, 1984, Ser. No. 640,147

Claims priority, application Germany, May 9, 1983, 32 15 845.9

Int. Cl.^{6} F42C *13/04*

U.S. Cl. 342—68 **4 Claims**

1. A distance sensor for projectile fuzes incorporating a first range finder operating on the sampling principle, comprising, means for transmitting a pulse signal, a first receiver system comprising means for generating a sampling signal in the form of pulses which are delayed a fixed period of time with respect to said transmitted pulse signal, gate means for receiving a transmitted pulse which has been reflected from a target and passing a sample portion of the reflected pulse in response to the coincidence of said sample portion with said sampling signal, integrator means for integrating said passed samples to form a low-frequency representation of said reflected pulse, and threshold means responsive to said low-frequency representation to produce an output only in response to said low frequency representation surpassing a predetermined threshold value.

5,751,240
FMCW RADAR SYSTEM FOR DETECTING DISTANCE, RELATIVE VELOCITY AND AZIMUTH OF A TARGET OBSTACLE

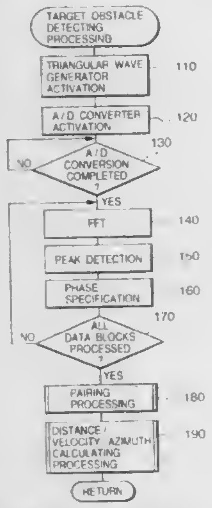
Akihiso Fujita, aichi-ken; Hiroshi Hazumi, Nagoya; Hiroshi Mizuno, Kariya; Hiroto Nakatani, Nagoya, and Hiroshi Naganawa, Kagamigahara, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 11, 1996, Ser. Nn. 764,627

Claims priority, application Japan, Dec. 11, 1995, 7-321675; Jul. 9, 1996, 8-179227

Int. Cl.^{6} G01S *13/93:13/60*

U.S. Cl. 342—70 **4 Claims**


TARGET OBSTACLE DETECTING PROCESSING
TRIANGULAR WAVE GENERATOR ACTIVATION
110
A/D CONVERTER ACTIVATION
120
130
A/D CONVERSION COMPLETED
NO
YES
FFT
140
PEAK DETECTION
150
PHASE SPECIFICATION
160
170
ALL DATA BLOCKS PROCESSED
NO
YES
PAIRING PROCESSING
180
DISTANCE / VELOCITY AZIMUTH CALCULATING PROCESSING
190
RETURN

1. An FMCW radar system comprising:
transmitting means for generating a transmission signal having a modulated frequency variable in accordance with a triangular-wave modulation signal, and sending out radar wave carrying said transmission signal:
a plurality of receiving means for receiving said radar wave when said radar wave is reflected from a target. generating receiving signals, and producing beat signals by mixing said receiving signals with said transmission signal;
analysis means provided for said plurality of receiving means for executing Fourier transformation of said beat signals:
frequency detecting means associated with said plurality of receiving means for detecting peak frequency components having peaks on a frequency spectrum based on analysis result of said beat signals obtained from said analysis means, in both an ascending-section modulation where the frequency of said transmission signal increases and a descending-section modulation where the frequency of said transmission signal decreases;
target detecting means for calculating at least one of distance and relative velocity of said target using predetermined equation defined by a parameter equivalent to a sum or a difference between the peak frequency components detected by said frequency detecting means in respective modulation;
phase calculating means associated with said plurality of receiving means for calculating phases of said peak frequency components detected by said frequency detecting means in respective modulations based on the analysis result obtained from said analysis means;
phase difference calculating means for calculating phase differences of peak frequency components between said plurality of receiving means in respective modulations based on the phases of said peak frequency components calculated by said phase calculating means:
phase difference comparing means for judging a relative relationship between said transmission signal and said receiving signal specified in respective modulations by comparing the phase differences of said peak frequency components calculated by said phase difference calculating means; and
said target detecting means obtaining said parameter from peak frequencies which are given positive or negative sign in accordance with judgement result of said phase difference comparing means.

5,751,241
METHOD AND APPARATUS FOR MEASURING THE SPEED OF A MOVING BODY

Jacques Lewiner, 7, avenue de Suresnes, 92210 Saint-Cloud, and Eric Carreel, 9, rue de Général Gourand, 92190 Meudon, both of France

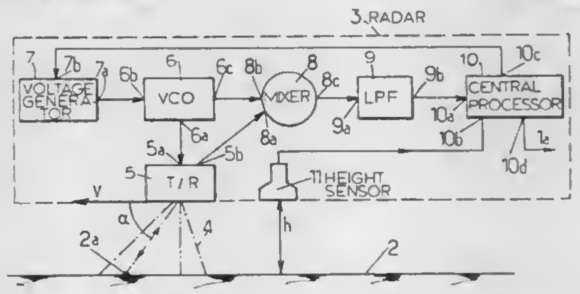
PCT No. PCT/FR95/00879, § 371 Date Mar. 5, 1997, § 102(e) Date Mar. 5, 1997, PCT Pub. No. WO96/01435, PCT Pub. Date Jan. 18, 1996

PCT Filed Jun. 30, 1995, Ser. No. 765,285

Claims priority, application France, Jul. 6, 1994, 94 08346

Int. Cl.^{6} G01S *13/60*

U.S. Cl. 342—104 **14 Claims**



1. A method of measuring the speed v of a body moving in a direction parallel to the ground, said measurement being performed by means of a Doppler radar having a transmitter/receiver fixed to the moving body at a certain height h above the ground and designed to transmit a radar beam towards the ground along a mean axis extending forwards or backwards relative to the direction of movement, said method including the following steps:
a) at a first instant t_1. supplying the radar transmitter/receiver with a first sinusoidal control electrical signal at a first frequency f_1 to cause the transmitter/receiver to transmit a first incident radar wave at the same frequency f_1:
b) receiving a first reflected radar wave generated by the first incident radar wave being reflected on the ground. and generating from said first reflected radar wave a first received electrical signal;
c) multiplying together the first control electrical signal and the first received electrical signal, thereby generating a first multiplied electrical signal having a high frequency component and a low frequency component;
d) filtering the first multiplied electrical signal to generate a first filtered signal proportional to the low frequency component of the first multiplied signal: and
e) during a first measurement time Δt_1 starting at the first instant t_1, determining a first frequency spectrum corresponding to the first filtered signal:
wherein the transmitted radar beam is relatively broad, wherein the first frequency f_1 is time-varying, and wherein said method further includes the following steps:
f) measuring the height h of the radar transmitter/receiver above the ground;
g) at a second instant t_2 very close to the first instant t_1, supplying the transmitter/receiver with a second sinusoidal control electrical signal having a second frequency f_2 to cause the transmitter/receiver to transmit a second incident radar wave at that same frequency f_2;
h) receiving a second reflected radar wave generated by reflection of the second incident radar wave on the ground, and generating a second received electrical signal from said second reflected radar wave;
i) multiplying together the second control electrical signal and the second received electrical signal, thereby generating a second multiplied electrical signal having a high frequency component and a low frequency component;

j) filtering the second multiplied electrical signal to generate a second filtered signal proportional to the low frequency component of the second multiplied signal;

k) during a second measurement time Δt_2 starting from the second instant t_2, determining a second frequency spectrum corresponding to the second filtered signal;

l) identifying a first singular point in the first spectrum and a second singular point in the second spectrum such that the first and second spectra in the vicinity of said two singular points are similar in form but with a certain frequency shift, said two singular points being generated by reflection from the same point on the ground;

m) measuring in the first and second spectra first and second frequencies F_1, F_2 corresponding respectively to the first and second singular points; and

n) computing the speed v of the moving body relative to the ground on the basis of the height h of the radar transmitter/receiver above the ground and of the first and second frequencies F_1, F_2 corresponding to the two singular points.

(h) said optical coupler including a plurality fiber-optic dividers, each of said plurality of fiber-optic dividers having an input and a plurality of outputs each of said inputs being connected to a respective one of said plurality of Mach-Zehnder electro-optical modulators, each of said outputs being coupled to said sink signal converter;

(i) said sink signal converter being operably coupled to said optical coupler for converting said optical signal into a sink electronic signal, said sink signal converter being coupled to a phased array antenna sink for conveying said sink electronic signal thereto said sink signal converter including an optical detector coupled to said optical coupler, said optical detector producing said sink signal electronic signal responsive to said optical signal.

5,751,242

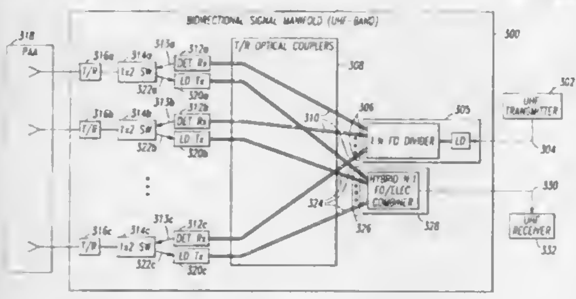
TRANSMIT-RECEIVE FIBER-OPTIC MANIFOLD FOR PHASE ARRAY ANTENNAS

Anastasios P. Goutzoulis, Pittsburgh, and John M. Zomp, North Huntingdon, both of Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Sep. 30, 1995, Ser. No. 521,202

Int. Cl.^{6} G01S *13/00*

U.S. Cl. 342—158 **6 Claims**



1. A transmit signal manifold, comprising:

(a) a source signal converter;

(b) a sink signal converter;

(c) said source signal converter being coupled to an S-band RF transmitter source for converting an S-band source electronic signal from said S-band RF transmitter source into an optical signal;

(d) an optical coupler operably coupled to said source signal converter, said optical coupler having a plurality of optical fibers;

(e) said source signal converter including an optical source and a first fiber-optic divider coupled between said optical source and said optical coupler, said optical source producing said optical signal responsive to said S-band source electronic signal, said divider selectively conveying said optical signal to said plurality of optical fibers;

(f) said source signal converter additionally including an RF divider coupled to said S-band RF transmitter source, said RF divider having a first predetermined RF divider ratio;

(g) said optical source including a laser for producing an optical carrier signal with a preselected carrier wavelength, and a plurality of Mach-Zehnder electro-optical modulators for modulating said S-band source electronic signal onto said carrier signal providing said optical signal thereby;

5,751,243

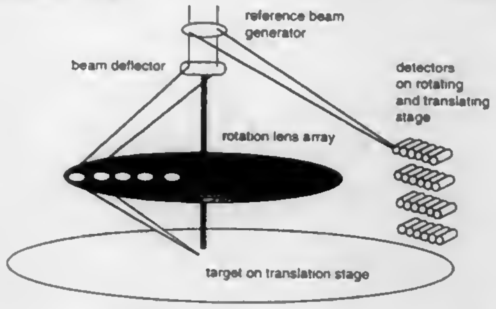
IMAGE SYNTHESIS USING TIME SEQUENTIAL HOLOGRAPHY

Terry M. Turpin, Columbia, Md., assignor to Essex Corporation, Columbia, Md.

Division of Ser. No. 376,415, Jan. 23, 1995, abandoned, which is a continuation-in-part of Ser. No. 32,696, Mar. 17, 1993, Pat. No. 5,384,573, which is a continuation of Ser. No. 811,903, Dec. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 604,255, Oct. 29, 1990, Pat. No. 5,079,555. This application Dec. 20, 1996, Ser. No. 771,023

Int. Cl.^{6} G01S *13/90;* **G01N** *21/47*

U.S. Cl. 342—179 **21 Claims**


reference beam generator
beam deflector
detectors on rotating and translating stage
rotation lens array
target on translation stage

1. A synthetic aperture microscope for imaging an object, the object defining at least one of a transmittance and a reflectance having three-dimensional spatial Fourier transform components including an amplitude and a phase, the synthetic aperture microscope comprising:

sensor means for sequentially measuring the amplitude and the phase of the three-dimensional spatial Fourier transform components of at least one of the transmittance and reflectance of the object, the sensor means comprising transmitter means for directing substantially-single-frequency optical radiation toward the object, receiver means for detecting radiation scattered by the object, and reference means for providing a reference signal for mixing with the radiation scattered by the object,

control means for selecting at least one of the three-dimensional spatial Fourier transform components of the object to measure, and

reconstruction means for reconstructing an image of the object by inversely transforming the three-dimensional Fourier transform components.

5,751,244

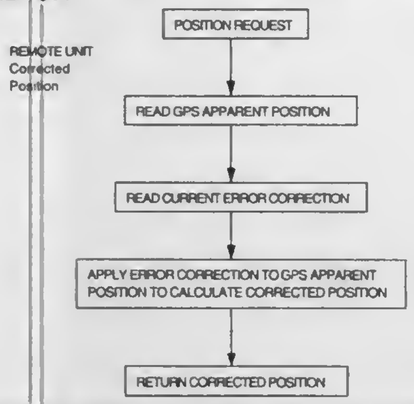
METHOD AND APPARATUS FOR CALIBRATION OF A GPS RECEIVER

Charles D. Huston, 4607 Trail West Dr., Austin, Tex. 78735, and Darryl J. Cornish, 8017 Davis Mountain Pass, Austin, Tex. 78726

Continuation-in-part of Ser. No. 804,368, Dec. 10, 1991, Pat. No. 5,364,093, Ser. No. 313,718, Sep. 22, 1994, abandoned, Ser. No. 334,733, Nov. 4, 1994, abandoned, and Ser. No. 366,994, Dec. 30, 1994. This application Jun. 7, 1995, Ser. No. 486,706

Int. Cl.^{6} G01S *5/02;3/02;* **H04B** *7/185*

U.S. Cl. 342—357 **14 Claims**


REMOTE UNIT Corrected Position
POSITION REQUEST
READ GPS APPARENT POSITION
READ CURRENT ERROR CORRECTION
APPLY ERROR CORRECTION TO GPS APPARENT POSITION TO CALCULATE CORRECTED POSITION
RETURN CORRECTED POSITION

1. A method of calibrating a GPS receiver for accurately determining the position of said GPS receiver as it moves, comprising the steps of:

a) positioning said GPS receiver at a reference location having a known position;

b) determining an apparent position of said GPS receiver at said reference location using a first set of GPS satellites;

c) comparing said reference location known position with the apparent position;

d) determining an error correction based on said comparison between said known position and apparent position;

e) positioning said GPS receiver at a second location having an unknown position;

f) determining a second apparent position of said GPS receiver at said second location using only satellites from said first set of GPS satellites; and

g) determining an estimated position of said GPS receiver at said second location based on said second apparent position and said error correction.

5,751,245

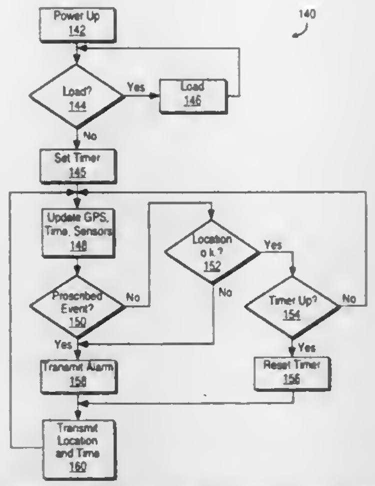
VEHICLE ROUTE AND SCHEDULE EXCEPTION REPORTING SYSTEM

James M. Janky, Los Altos; Eric A. Klein, Mountain View, and John F. Schipper, Palo Alto, all of Calif., assignors to Trimble Navigation Ltd., Sunnyvale, Calif.

Continuation of Ser. No. 218,118, Mar. 25, 1994, abandoned. This application Mar. 7, 1996, Ser. No. 610,590

Int. Cl.^{6} G01S *5/04;* **G08G** *1/123;* **G01C** *21/00;* **G06F** *7/70*

U.S. Cl. 342—357 **18 Claims**



1. In a security system for a mobile vehicle having a defined route and schedule, an apparatus carried on the vehicle for reporting location information to a central station, the apparatus comprising:

locating means for determining a geographical location, Si, of the mobile vehicle;

clock means for providing the local time, Ti, of the mobile vehicle at the location, Si;

storage means for storing a set of predetermined geographical locations Si', and a corresponding set of predetermined schedule times, Ti', along the defined route;

comparator and control means responsive to the locating means for receiving vehicle geographical location Si, from the locating means at time Ti;

means for computing a threshold difference of distance which is a predetermined function of the vehicle's present location, Si;

means for computing the distance, Dp, between the location of the vehicle, Si, and predetermined location, Si' corresponding to time Ti'=Ti;

means for comparing the distance, Dp, to the threshold difference of distance;

communication means for communicating the present location, Si, and time, Ti, to the central station when the distance, Dp, exceeds the threshold difference of distance.

5,751,246

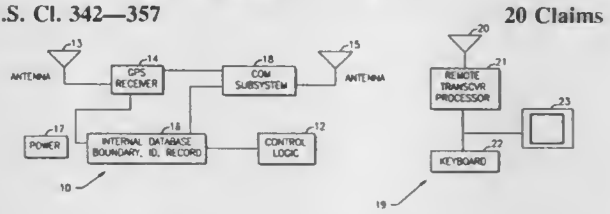
ACCOUNTABILITY AND THEFT PROTECTION VIA THE GLOBAL POSITIONING SYSTEM

Richard J. Hertel, Fort Wayne, Ind., assignor to ITT Industries, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 416,186, Apr. 4, 1995, Pat. No. 5,532,690. This application May 20, 1996, Ser. No. 650,739

Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **20 Claims**



1. A system for monitoring and reporting the location of an object, comprising:

GPS receiver means for receiving radio signals from a Global Positioning System which are indicative of a current spatial position of said GPS receiver means;

database means for storing data indicative of said current spatial position of the GPS receiver means, said database means being responsive to said GPS receiver means;

control logic means coupled to said database means for processing the data in said database means; and

communication means for communicating information related to the data in said database means, to a remote location and receiving a response back from said remote location for said control logic means regarding the data in said database means, said communication means automatically communicating the data to the remote location without receiving a polling message therefrom;

wherein said GPS receiver means, said database means, said control logic means and said communication means are carried as a unit by the object and wherein said current spatial position comprises the object's spatial position.

5,751,247
FIXED EARTH STATION

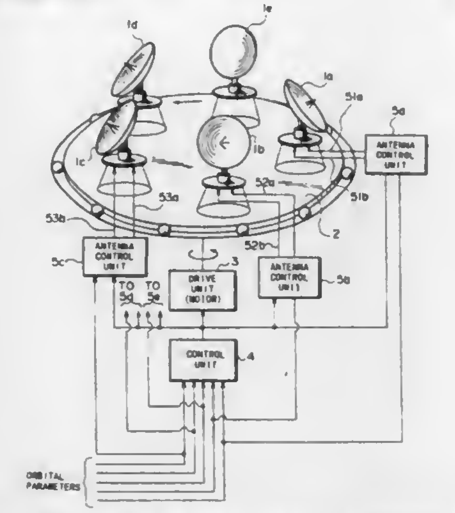
Shinichi Nomoto, Tokyo; Hideo Kobayashi, Saitama; Teruhiko Honda, and Kazuo Hara, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1997, Ser. No. 797,860

Claims priority, application Japan, Mar. 7, 1996, 8-078170

Int. Cl.^{6} H01Q *3/00*

U.S. Cl. 342—359 **15 Claims**



1. A fixed earth station having a plurality of antennas the beam direction of which can be independently changed to allow simultaneous communication with a plurality of non-geostationary communication satellites existing in different directions within the visible range, said fixed earth station comprising:

- a mobile mechanism for mounting part or all of said plurality of antennas;
- a control unit for generating a signal for controlling the operation of said mobile mechanism, on the basis of the orbital parameters of said plurality of communication satellites, so that a beam accessing a satellite of a low elevation angle is not intercepted by other antennas; and
- antenna control units for controlling the direction of the antennas based at least on the orbital parameters of said communication satellites,
- wherein said antennas catch and track a communication satellite having appeared in the sky.

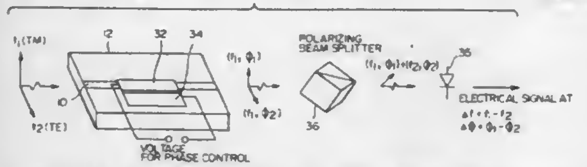
5,751,248
PHASED ARRAY BEAM CONTROLLER USING INTEGRATED ELECTRO-OPTIC CIRCUITS

Suwat Thaniyavarn, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 322,897, Oct. 13, 1994, Pat. No. 5,543,805. This application May 24, 1996, Ser. No. 655,333

Int. Cl.^{6} H01Q *3/22*

U.S. Cl. 342—368 **23 Claims**



1. An apparatus for controlling a phased array antenna which includes a plurality of antenna elements, comprising:

- an electro-optic substrate;
- a plurality of waveguides formed in said substrate, each of said waveguides being capable of simultaneously propagating light signals with orthogonal polarizations;
- an input waveguide for inputting into each one of said plurality of waveguides a pair of co-propagating polarized light signals having orthogonal polarizations and offset frequencies;
- a plurality of electrodes on said substrate configured to phase shift the signals traveling through each of said plurality of waveguides by a different amount in response to applied voltages, thereby creating phase shifted polarized signals; and
- means for combining the phase shifted polarized signals within each one of said plurality of waveguides and propagating said combined signal to one of said plurality of antenna elements.

5,751,249
RADIO TRANSMISSION SYSTEM AND A RADIO APPARATUS FOR USE IN SUCH A SYSTEM

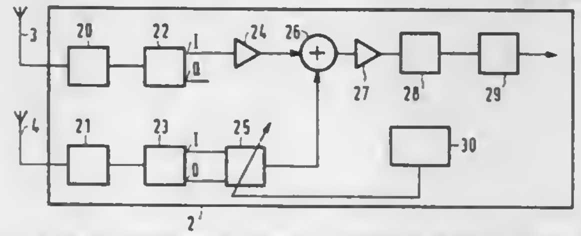
Petrus G. M. Baltus; Lukas Leyten; Jan Van Sinderen; Antoon M. H. Tombeur; Hendrik A. Visser, and Antonius G. Wagemans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1995, Ser. No. 527,738

Claims priority, application European Pat. Off., Sep. 14, 1994, 94202648

Int. Cl.^{6} H01Q *3/24*

U.S. Cl. 342—372 **9 Claims**



1. A radio transmission system comprising at least one radio apparatus which comprises a phased-array receiving arrangement with at least two receiver front-ends coupled to at least two antennas wherein a first receiver front-end is a quadrature receiver having two mixers for forming quadrature signals (I, Q) from a received signal, the two mixers each having an output, and wherein the first receiver front-end further comprises a first phase shifting arrangement coupled to the outputs of the mixers, the first phase shifting arrangement further having an output coupled to an intermediate frequency stage of a second receiver front-end.

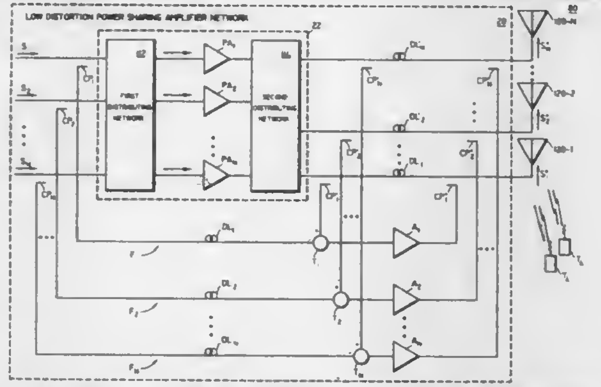
5,751,250
LOW DISTORTION POWER SHARING AMPLIFIER NETWORK

Bernard James Arntz, Morristown, N.J., assignor to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Oct. 13, 1995, Ser. No. 542,480

Int. Cl.^{6} H01Q *3/22;3/24;3/26*

U.S. Cl. 342—373 **19 Claims**


LOW DISTORTION POWER SHARING AMPLIFIER NETWORK
FIRST DISTRIBUTING NETWORK
SECOND DISTRIBUTING NETWORK

1. An apparatus for amplifying a plurality of input signals, comprising:

- a first distributing network for receiving said input signals at respective ones of a plurality of first input ports thereof, said first distribution network splitting each said input signal among a plurality of first output ports thereof, to thereby provide a set of first signals;
- a plurality of amplifiers for amplifying said set of first signals in a power-sharing arrangement to provide a set of amplified signals;
- a second distributing network for receiving said set of amplified signals at respective ones of a plurality of second input ports thereof and generating therefrom a plurality of amplified, reconstructed output signals at respective ones of a plurality of second output ports thereof, each output signal indicative of one of said input signals; and
- a feed-forward loop for generating a correction signal derived from an associated one of said input signals and an associated one of said output signals, and for vectorially combining said correction signal with said one associated output signal to reduce distortion within said output signal.

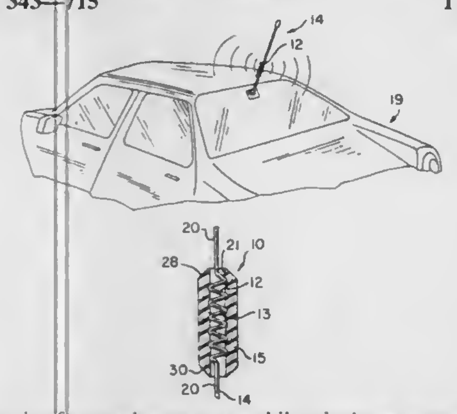
5,751,251
AUTOMOTIVE MOBILE TELEPHONE ANTENNA SILENCER

Ronald M. Hutchinson, 1330 Lexington Ct., Brookfield, Wis. 53045

Filed Mar. 20, 1996, Ser. No. 619,849

Int. Cl.^{6} H01Q *1/32*

U.S. Cl. 343—715 **17 Claims**



1. A device for attachment to a mobile telephone antenna having a straight portion and a helical coil formed of a plurality of coil flights, the device comprising a cylindrical resilient foam body, wherein the foam body insertably engaged with the helical coil of the antenna and is deformed by the coil in a friction fit to fix the body to the helical coil and thereby block air flow through the coil.

5,751,252
METHOD AND ANTENNA FOR PROVIDING AN OMNIDIRECTIONAL PATTERN

James Patrick Phillips, Lake in the Hills, Ill., assignor to Motorola, Inc., Schaumburg

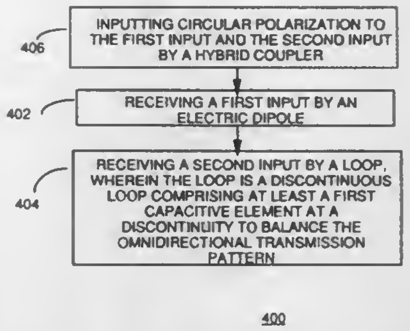
Continuation of Ser. No. 493,039, Jun. 21, 1995, abandoned. This application Oct. 24, 1997, Ser. No. 959,291

Int. Cl.^{6} H01Q *21/00*

U.S. Cl. 343—726 **4 Claims**

2. An antenna for providing an omnidirectional pattern, the antenna comprising:

- a conductive loop oriented in a horizontal plane for receiving a first input to provide a current distribution, the loop contains at least a first discontinuity and is larger than 0.5 wavelengths in circumference; and
- at least a first capacitive element at the discontinuities to modify the current distribution on the conductive loop and thus provide the omnidirectional pattern,
- further comprising an electric dipole, operably coupled to the conductive loop, passing through a center of the conductive loop and perpendicular to the horizontal plane of the conductive loop, for receiving a second input, and


406
INPUTTING CIRCULAR POLARIZATION TO THE FIRST INPUT AND THE SECOND INPUT BY A HYBRID COUPLER
402
RECEIVING A FIRST INPUT BY AN ELECTRIC DIPOLE
404
RECEIVING A SECOND INPUT BY A LOOP, WHEREIN THE LOOP IS A DISCONTINUOUS LOOP COMPRISING AT LEAST A FIRST CAPACITIVE ELEMENT AT A DISCONTINUITY TO BALANCE THE OMNIDIRECTIONAL TRANSMISSION PATTERN
400

- wherein the antenna further comprises a hybrid coupler for inputting circular polarization, wherein the second input is equal in amplitude to the first input and the phase of the second input is in quadrature with the phase of the first input,
- wherein the electric dipole includes two collinear conductive cylinders, one on each side of the horizontal plane of the conductive loop, each conductive cylinder having a length of approximately one quarter of a wavelength of a center frequency of an operating band of frequencies, the conductive cylinders being equal in size and each conductive cylinder having a diameter of substantially one-tenth of the length of the conductive cylinder,
- wherein a diameter of the conductive loop is substantially one-seventh of the wavelength of the center frequency of the operating band of frequencies, and
- wherein uniformity of omnidirectionality is obtained within 0.2 dB.

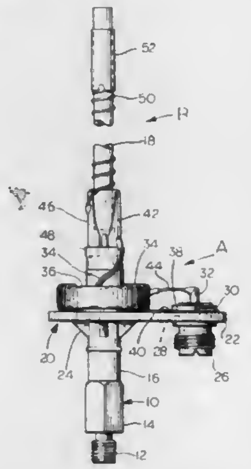
5,751,253
ANTENNA COUPLING SYSTEM

Donald Horace Wells, 1011 Wentworth Ave., Holland, Ohio 43528

Filed Sep. 11, 1995, Ser. No. 526,180

Int. Cl.^{6} H01Q *9/00*

U.S. Cl. 343—749 **20 Claims**



1. An antenna-transmission line coupling system comprising: a wound inductance producing antenna element, a first capacitance element series connected to a first end of said antenna element, a second capacitance element series connected to the opposite end of said antenna element, said antenna element and capacitance elements having an electrical wave length that is approximately one half that having a desired frequency, a third capacitance element capacitively coupled with said first capacitance element, and a transmission line transformer having an input and an output with said output being connected to said third capacitance element.

5,751,254
FEED MOVEMENT MECHANISM AND CONTROL SYSTEM FOR A MULTIBEAM ANTENNA

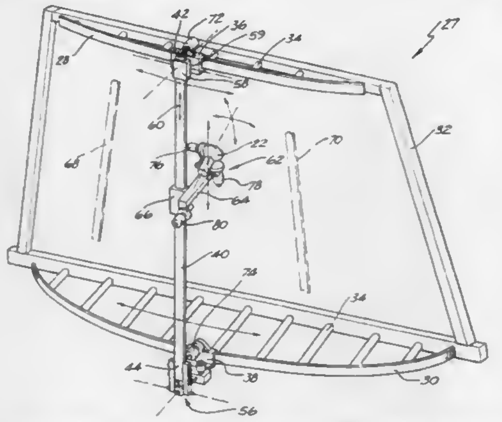
Trevor S. Bird; Mark A. Sprey, both of Sydney; Ian J. McInnes, Melbourne; Warren J. Hancock, Melbourne, and Stephen R. Wilson, Melbourne, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

Filed Jan. 21, 1997, Ser. No. 786,045

Claims priority, application Australia, Jul. 20, 1994, PM6953

Int. Cl.⁶ H01Q *3/12*

U.S. Cl. 343—761 **21 Claims**



1. A feed transport device for moving a feed within a non-planar focal surface defined by a satellite communications antenna, the feed transport device comprising first and second non-linear rails, and a feed transport unit comprising a feed support member for supporting the feed, and first and second slidable members slidably mounted on said first and second rails respectively to permit each slidable member to slide along, the length of its respective rail, wherein one end of the feed support member is pivotally attached, not necessarily about a single pivot axis, to the first slidable member, the other end of the feed support member is both slidably and pivotally, again not necessarily about a single axis, attached to the second slidable member, and the first and second rails are shaped and positioned to maintain the feed in, or near to, said focal surface during movement of the feed support member along the first and second rails.

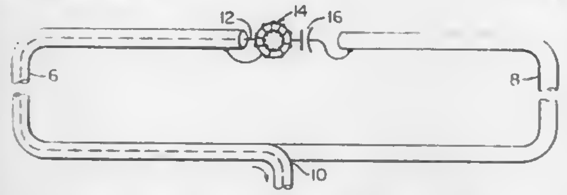
5,751,255
ELECTRICALLY SMALL RECEIVING ANTENNAS

Philip S. Carter, Jr., 221 Iris Way, Palo Alto, Calif. 94303

Filed Jun. 7, 1996, Ser. No. 659,929

Int. Cl.⁶ H01Q *7/00*

U.S. Cl. 343—866 **12 Claims**



1. An electrically small receiving antenna comprising

a C-shaped transmission line having a signal conductor and a ground conductor,

a C-shaped conductive antenna member having two ends and a predetermined inductance,

one end of said antenna member connected to said ground conductor of said transmission line, and

at least two impedance means connected in series between said signal conductor and the other end of said antenna member.

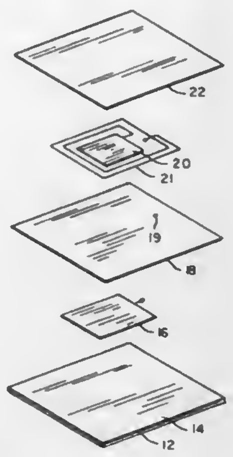
5,751,256
RESONANT TAG LABELS AND METHOD OF MAKING SAME

Neil McDonough, and John R. Pennace, both of Paxton, Mass., assignors to FLEXcon Company Inc., Spencer, Mass.

Continuation-in-part of Ser. No. 206,865, Mar. 4, 1994, abandoned. This application Jan. 31, 1995, Ser. No. 381,086

Int. Cl.⁶ H01Q *01/36;* **G08B** *13/14*

U.S. Cl. 343—873 **13 Claims**



1. A labeling system comprising:

a carrier film;

a first electrically conductive layer formed as a deposit on said carrier film;

a dielectric layer formed as a deposit on and at least partially covering said first electrically conductive layer;

a second electrically conductive layer formed as a deposit on and at least partially covering said dielectric layer, said first and second electrically conductive layers being integrally joined to said dielectric layer to provide a composite label structure, said label structure having oppositely facing sides, with said carrier film being integrally associated with first portions of said label structure and separably associated with second portions of said label structure at one of said sides; and

adhesive means arranged to coact with the other side of said label structure for applying said label structure to a receiving surface, said carrier film being separable from said second portions of the thus applied label structure with said first portions of said label structure remaining with said carrier film, said second portions defining an operable resonant circuit.

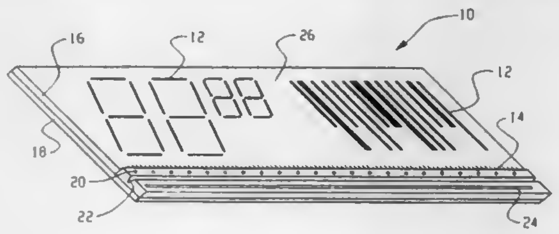
5,751,257
PROGRAMMABLE SHELF TAG AND METHOD FOR CHANGING AND UPDATING SHELF TAG INFORMATION

Jeffrey W. Sutherland, Akron, Ohio, assignor to Teletransactions, Inc., Akron, Ohio

Filed Apr. 28, 1995, Ser. No. 430,350

Int. Cl.⁶ G09G *3/36;3/18*

U.S. Cl. 345—2 **18 Claims**



1. An electronic shelf tag comprising:

a liquid crystal display including a liquid crystal having a first and second optical state which are both stable in the absence of an electric field;

at least one character element formed in said liquid crystal display; and

a plurality of independent electrical conductor members coupled to said at least one character element for applying an electric field to said at least one character element to change the optical state of said liquid crystal, said electrical conductor members positioned in a predetermined configuration to be accessible exterior to the electronic shelf tag and located on the same side of said liquid crystal display to couple electrical signals to the liquid crystal display.

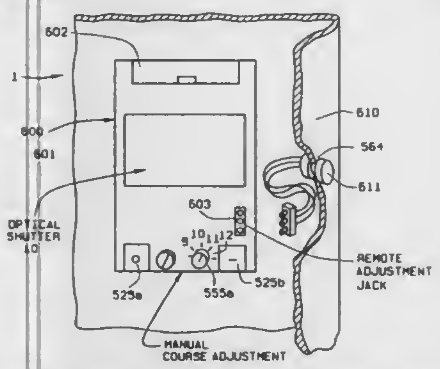
5,751,258
LIQUID CRYSTAL LENS DRIVER ELECTRONICS FOR EYE PROTECTION, HIGH SPEED SHUTTERING WITH CONSISTENT PERFORMANCE

Jeffrey K. Fergason, Menlo Park, and John D. Fergason, Mountainview, both of Calif., assignors to OSD Envizion, Inc., St. Louis, Mo.

Continuation of Ser. No. 27,235, Feb. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 674,850, Mar. 25, 1991, Pat. No. 5,252,817. This application Sep. 4, 1996, Ser. No. 707,269

Int. Cl.⁶ A61F *9/06;* **G02F** *1/133*

U.S. Cl. 345—7 **31 Claims**



1. A portable power supply for a protective optical lens system that has at least relatively greater and lesser light transmission characteristics, comprising

a regulated power supply for supplying substantially regulated power for driving such lens system from an unregulated power source,

said regulated power supply comprising a regulated voltage reference, a DC to DC oscillator, a voltage power input, and inductor and capacitor circuit with diode isolation to develop and to store in said capacitor a voltage of a magnitude greater than the voltage of said voltage power input, a switch for switching a connection between said inductor and capacitor, said oscillator being coupled to operate said switch to open and close state to accumulate charge and voltage in said capacitor, and a comparator circuit for comparing the voltage of said capacitor with said regulated voltage reference to control operation of said oscillator to develop a voltage in said capacitor in proportional relation to a comparison between said regulated voltage reference and the voltage in said capacitor,

output circuit means for coupling power from said regulated power supply to such lens system to cause such lens system to achieve greater and lesser light transmission characteristics.

5,751,259
WIDE VIEW ANGLE DISPLAY APPARATUS

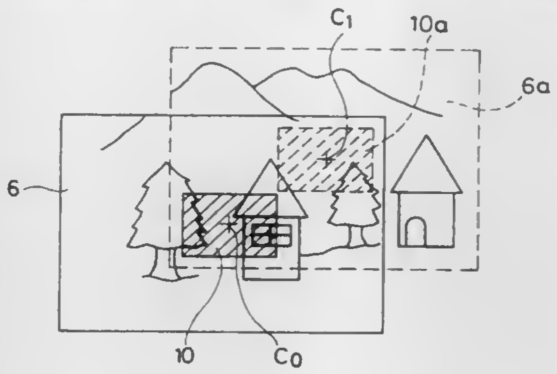
Kazuyo Iwamoto, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry

Filed Mar. 27, 1995, Ser. No. 410,757

Claims priority, application Japan, Apr. 13, 1994, 6-100526

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—8 **4 Claims**



1. A wide view angle display apparatus comprising

a pair of display devices each including a display for displaying an image, a high resolution display for superimposing a high resolution image at a center portion of the displayed image and eye movement detection means for ascertaining a view point,

a support/drive means associated with each display device for supporting the display device and moving the display device in accordance with a signal from the eye movement detection means to keep a center of the displayed image coincident with the view point,

a video signal generating means associated with each display device for sending a view point video signal to the display based on a signal from the eye movement detection means, and

a high resolution video signal generating means associated with each display device for sending a high resolution video signal to the high resolution display.

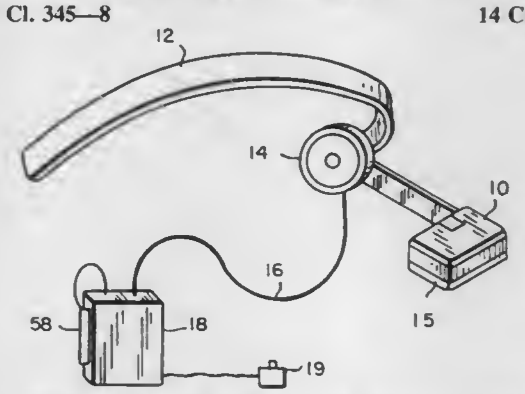
5,751,260
SENSORY INTEGRATED DATA INTERFACE

Bruce Nappi, West Newton; William Schroeder, Wayland, both of Mass., and James E. Miller, Middletown, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 820,284, Jan. 10, 1992, abandoned. This application Apr. 3, 1995, Ser. No. 416,591

Int. Cl.⁶ G09G *5/00;* **G06F** *3/00*

U.S. Cl. 345—8 **14 Claims**



1. A hands free, sensory integrated data interface for interacting with a computer, said interface comprising:

a headset to be worn by a user;

means for interacting with said user attached to said headset, said interacting means communicating with said computer;

said interacting means comprising a microvisual display monitor mounted to said headset and positionable in front of a user's eye;

said microvisual display monitor receiving information to be displayed from said computer;

said interacting means further comprising means for tracking the position of said user's eye and for identifying that portion of said displayed information upon which said user's eye is focused and means for transmitting commands to said computer based upon that portion of said displayed information upon which said user's eye is focused;

said interacting means further comprising first means attached to said headset for receiving an oral command from said user and for transmitting said oral command to said computer via said transmitting means;

said computer being programmed to perform at least one function in response to said oral command;

an earphone attached to said headset; and

said computer having means for generating synthesized voice prompts for said user and for transmitting said voice prompts to said earphone via said transmitting means.

5,751,261

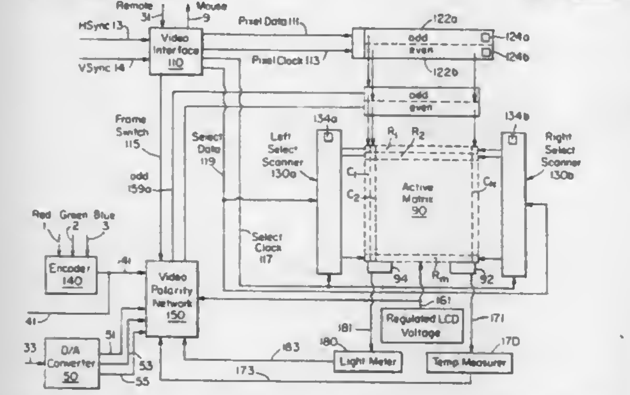
CONTROL SYSTEM FOR DISPLAY PANELS

Matthew Zavracky, North Attleboro; Vic Odryna, Acton, and Barry Mansell, Groton, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Continuation-in-part of Ser. No. 971,399, Nov. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 944,207, Sep. 11, 1992, which is a continuation-in-part of Ser. No. 823,858, Jan. 22, 1992, abandoned, and Ser. No. 872,297, Apr. 22, 1992, which is a continuation-in-part of Ser. No. 839,241, Feb. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,602, Dec. 31, 1990, Pat. No. 5,206,749. This application Aug. 13, 1993, Ser. No. 106,416

Int. Cl.⁶ G09G *3/20*

U.S. Cl. 345—55 **20 Claims**



1. A control apparatus for displaying a video signal from a video source using an active matrix liquid crystal display, the video source generating a select horizontal synchronization frequency from a plurality of selectable horizontal synchronization frequencies and a select vertical synchronization frequency from a plurality of selectable vertical synchronization frequencies, comprising

a Silicon-on-Insulator (SOI) structure having a silicon device layer bonded to a transparent substrate by an adhesive layer, the active matrix liquid crystal display including an active matrix circuit formed in the SOI structure;

a video interface coupled between the video source and the display, the video interface generating a dot clock signal for driving the display at a fixed resolution in response to the select synchronization frequencies;

an active matrix interface circuit formed within the SOI structure and coupled to the video interface for actuating pixels of the active matrix circuit in response to the dot clock signal; and

a user interface coupled between the video source and the video interface for enabling user control of the display.

5,751,262

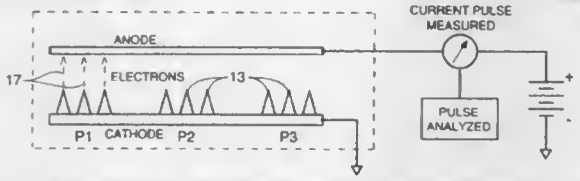
METHOD AND APPARATUS FOR TESTING EMISSIVE CATHODES

Jim Browning; Charles M. Watkins, and David A. Cathey, all of Boise, Id., assignors to Micron Display Technology, Inc., Boise, Id.

Continuation of Ser. No. 383,269, Feb. 3, 1995, abandoned, which is a continuation of Ser. No. 377,320, Jan. 24, 1995, abandoned. This application Aug. 15, 1997, Ser. No. 921,772

Int. Cl.⁶ G09G *3/22*; G01R *31/02*

U.S. Cl. 345—75 **17 Claims**



13. A method of electrically testing pixel functionality in a display, said method comprising the following steps of:

releasably disposing a wafer in a socket, said wafer having at least one baseplate comprised of pixels, each of said pixels comprising at least one emitter, said socket having pads;

contacting said socket pads with test pins;

addressing each of said pixels individually, thereby causing said pixels to emit electrons in a current;

collecting said current from each of said pixels on an anode; and measuring said current.

5,751,263

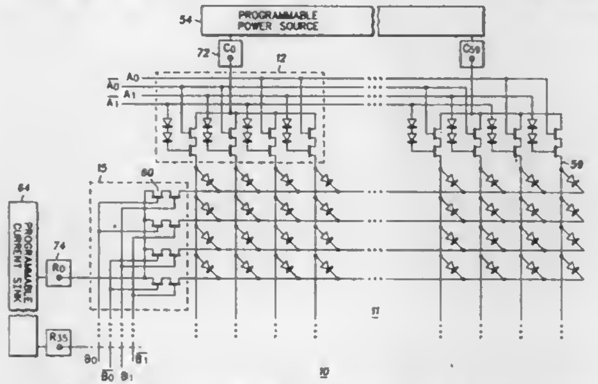
DRIVE DEVICE AND METHOD FOR SCANNING A MONOLITHIC INTEGRATED LED ARRAY

Rong-Ting Huang, Gilbert; Phil Wright, Scottsdale, and Eric D. Joseph, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 23, 1996, Ser. No. 652,075

Int. Cl.⁶ G09G *3/32*

U.S. Cl. 345—82 **20 Claims**



1. A drive device and matrix of light emitting devices comprising:

a matrix including a plurality of light emitting devices with each light emitting device having a first contact and a second contact, the first contacts being organized into a plurality of rows of first contacts and the second contacts being organized into a plurality of columns of second contacts;

a plurality of row decoding switches, each row decoding switch having a current carrying terminal coupled to a number of individual rows of the plurality of rows of first contacts;

a plurality of row address lines, each coupled to each of the plurality of row decoding switches for selecting an addressed one of the number of individual rows coupled to each of the plurality of row decoding switches;

a plurality of row data leads, one each associated row data lead coupled to one each of the row decoding switches for selecting a row decoding switch when an activating signal is supplied to an associated row data lead;

a plurality of column decoding switches, each of the plurality of column decoding switches including a first transistor with current carrying electrodes forming first and second current carrying terminals of the column decoding switch and a control electrode and a second transistor with a first current carrying electrode connected to the second current carrying terminal of the first transistor, a second current carrying terminal, and a control electrode, each column decoding switch having a current carrying terminal coupled to a number of individual columns of the plurality of columns of second contacts;

a plurality of column address lines each coupled to each of the plurality of column decoding switches for selecting an addressed one of the number of individual columns coupled to each of the plurality of column decoding switches; and

a plurality of column data leads, one each associated column data lead coupled to one each of the column decoding switches for selecting a column decoding switch when an activating signal is supplied to an associated column data lead.

5,751,264

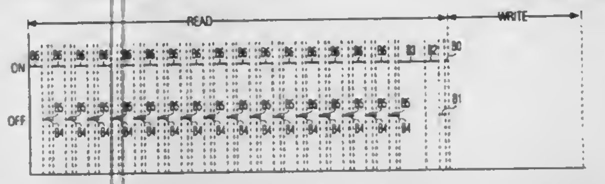
DISTRIBUTED DUTY-CYCLE OPERATION OF DIGITAL LIGHT-MODULATORS

Alan Cavallerano, Ossining, and Claudio Ciacci, White Plains, both of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Jun. 27, 1995, Ser. No. 495,290

Int. Cl.⁶ G09G *3/34*; *3/36*; *5/10*

U.S. Cl. 345—85 **18 Claims**



1. A method of operating a display apparatus comprising a light source, a screen for displaying successive images during respective frame periods, an array of digital light modulating elements interposed in an optical path between the light source and the screen, and means for activating each of the digital light modulating elements into either a first state, in which said element enables the light to illuminate a corresponding pixel of an image area of the display screen, or a second state, in which said element impedes the light from illuminating said pixel, said method comprising, for each of said frame periods:

a. storing, in association with each of the digital light modulating elements, a multi-bit code representing the luminance of the corresponding pixel during said frame period, each bit having a value representing either the first state or the second state and having a respective weight corresponding to a duration equal to a predefined percentage of the frame period during which the associated digital light modulating element is to be in the state represented by said value, a first one of said bits having a weight which is substantially greater than the weight of a second one of said bits; and

b. activating each digital light modulating element, into the states represented by the bits of the associated code, for the respective durations corresponding to the weights of said bits, said activation of said element into the first state represented by the first bit being interrupted at least once while said element is activated into the second state represented by a different one of the bits in the code, wherein the first and second states collectively represent the luminance of the corresponding pixel.

5,751,265

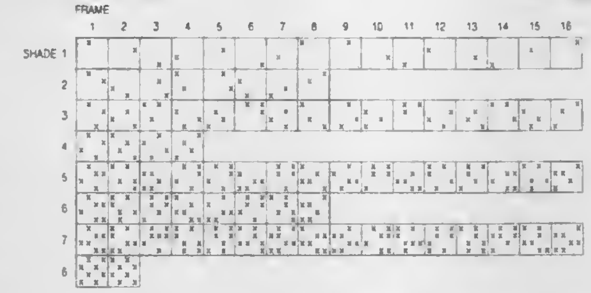
APPARATUS AND METHOD FOR PRODUCING SHADED IMAGES ON DISPLAY SCREENS

Robin Sungsoo Han, Saratoga, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation of Ser. No. 813,036, Dec. 24, 1991, abandoned, and Ser. No. 865,031, Apr. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 813,036. This application May 16, 1995, Ser. No. 442,836

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—88 **30 Claims**



3. A method of displaying, over a number of consecutive frames, an image with one or more shades on a display device that includes an array of pixels, each pixel including an illumination element, the method comprising:

providing a display pattern representing the image in an N×M pixel display neighborhood (where N,M≧4) within the array of pixels;

identifying a first predetermined illumination sequence, the first predetermined illumination sequence being such that

i) only one pixel of the image per frame, in the display neighborhood, has its illumination element illuminated,

ii) pixels of the image, in the display neighborhood, whose illumination is illuminated in consecutive frames are a substantially equal number of pixels apart, and

iii) the pixels of the image, in the display neighborhood, whose illumination element is illuminated in consecutive frames are at least one pixel apart; and

illuminating the illumination element of the pixels of the image in accordance with a second predetermined illumination sequence, the second predetermined illumination sequence being such that

i) the illumination element of only K pixels of the image in the display neighborhood are illuminated in a frame (where K<N×M and not equal to (N×M)/2), and

ii) the K pixels whose illumination element is illuminated in the frame correspond to pixels whose illumination element would be illuminated over K consecutive frames of the first predetermined illumination sequence.

5,751,266

CO-ORDINATE ADDRESSING OF LIQUID CRYSTAL CELLS

William Alden Crossland, Harlow Essex, and Martin John Birch, Middlesex, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

PCT No. PCT/GB91/01537, § 371 Date Feb. 24, 1993, § 102(e) Date Feb. 24, 1993, PCT Pub. No. WO92/04710, PCT Pub. Date Mar. 19, 1992

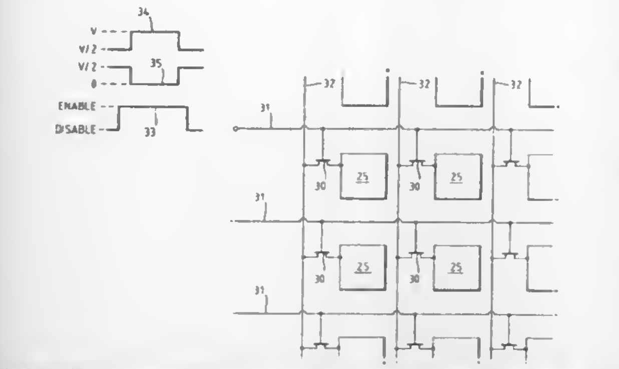
PCT Filed Sep. 10, 1991, Ser. No. 984,427

Claims priority, application United Kingdom, Sep. 11, 1990, 9019868

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—96 **13 Claims**

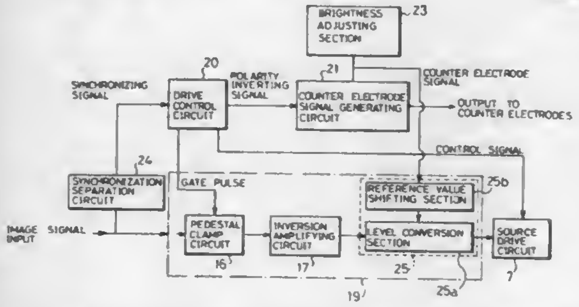
1. A method of addressing a liquid crystal cell having a co-ordinate array of pixels, wherein data for refreshing the cell is compared with the data existing prior to refresh to determine those pixels which require to have their states changed, and wherein those pixels are accessed by developing a positive, or negative, electric potential difference across those pixels, according into which state they are to be changed, for a predetermined period of



time before re-establishing a zero potential difference, whereby no pixel is consecutively accessed twice by the same polarity of potential difference.

5,751,267
LIQUID CRYSTAL DISPLAY DEVICE

Yuji Sato, Tenri, and Manabu Tanaka, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 27, 1996, Ser. No. 607,584
Claims priority, application Japan, Mar. 31, 1995, 7-076776
Int. Cl.^{6} G09G *3/36*
U.S. Cl. 345—96 **7 Claims**


BRIGHTNESS ADJUSTING SECTION
23
20
21
SYNCHRONIZING SIGNAL
DRIVE CONTROL CIRCUIT
POLARITY INVERTING SIGNAL
COUNTER ELECTRODE SIGNAL GENERATING CIRCUIT
COUNTER ELECTRODE SIGNAL
OUTPUT TO COUNTER ELECTRODES
CONTROL SIGNAL
24
SYNCHRONIZATION SEPARATION CIRCUIT
GATE PULSE
REFERENCE VALUE SHIFTING SECTION
25b
IMAGE SIGNAL INPUT
PEDESTAL CLAMP CIRCUIT
INVERSION AMPLIFYING CIRCUIT
LEVEL CONVERSION SECTION
SOURCE DRIVE CIRCUIT
16
17
25
7
19
25a

1. A liquid crystal display device, comprising: display electrodes;

a counter electrode provided opposite to said display electrodes with respect to a liquid crystal layer;

a brightness setting section for setting display brightness;

image signal generating means for generating an image signal whose polarity is inverted at a predetermined frequency;

signal voltage applying means for applying to said display electrodes a signal voltage in accordance with the image signal; and

counter electrode signal generating means for generating a counter electrode signal whose polarity is inverted in synchronism with the polarity inversion frequency of the image signal and for supplying the generated counter electrode signal to said counter electrode,

wherein said counter electrode signal generating means includes an amplitude adjusting section for adjusting peak-to-peak amplitude of the counter electrode signal on the basis of a setting through said brightness setting section, and

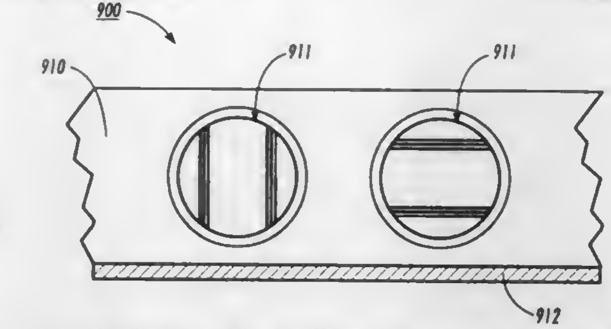
said image signal generating means includes:

a level conversion section for converting level of the image signal in accordance with compensation characteristics which are determined on the basis of a reference value and compensate non-linearity of the transmittance index of liquid crystal to an applied voltage; and

a reference value shifting section for shifting the reference value of the compensation characteristics as much as a variation of the counter electrode signal amplitude which is adjusted on the basis of the setting through said brightness setting section.

5,751,268
PSEUDO-FOUR COLOR TWISTING BALL DISPLAY

Nicholas K. Sheridon, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 15, 1995, Ser. No. 572,912
Int. Cl.^{6} G09G *3/34*
U.S. Cl. 345—107 **27 Claims**



1. A spheroidal ball having a center point and comprising seven (7) segments arrayed substantially parallel to one another, each segment being adjacent to at least one other segment and to no more than two other segments, each segment adjacent to exactly one other segment being an exterior segment, each segment adjacent to exactly two other segments being an interior segment, adjacent segments being adjoined to one another at substantially planar interfaces, the seven segments including:

a central segment including the center point of the ball, the central segment being an interior segment and having a thickness, the central segment being transparent;

a first exterior segment, the first exterior segment being transparent;

a second exterior segment situated opposite the first exterior segment with respect to the central segment, the second exterior segment being transparent;

a first interior segment adjacent to the first exterior segment, the first interior segment having a thickness less than the central segment thickness, the first interior segment having a first color;

a second interior segment adjacent to the first interior segment and to the central segment, the second interior segment having a thickness less than the central segment thickness, the second interior segment having a second color;

a third interior segment situated opposite the second interior segment with respect to the central segment, the third interior segment having a thickness less than the central segment thickness, the third interior segment having a color different from the first color; and

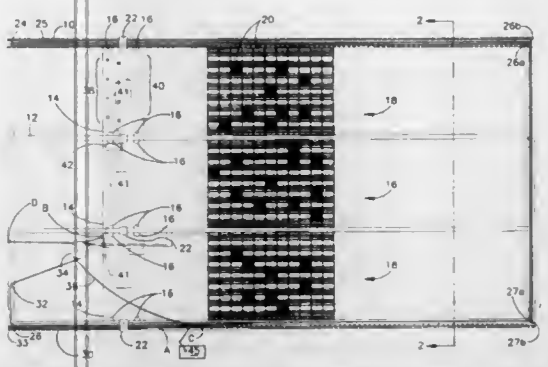
a fourth interior segment adjacent to the third interior segment and situated opposite the first interior segment with respect to the central segment, the fourth interior segment having a thickness less than the central segment thickness, the fourth interior segment having a color different from the second color and different from the color of the third interior segment;

the ball having an anisotropy for providing an electrical dipole moment, the electrical dipole moment rendering the ball electrically responsive such that when the ball is rotatably disposed in an electric field while the electrical dipole moment of the ball is provided, the ball tends to rotate to an orientation in which the electrical dipole moment aligns with the field.

5,751,269
SCANNED FLIP-DISK SIGN IMPROVEMENTS

F. Martin Black, and G. Frank Dye, both of Greensboro, N.C., assignors to Reader Vision, Inc., Greensboro, N.C.
Filed Dec. 6, 1996, Ser. No. 761,125
Int. Cl.^{6} G09G *3/34*
U.S. Cl. 345—108 **32 Claims**

1. A modular display apparatus for displaying indicia at a front thereof, comprising:



an inner frame having horizontal support beams, said inner frame supporting a plurality of grid modules, at least one said grid module being located above another of said grid modules;

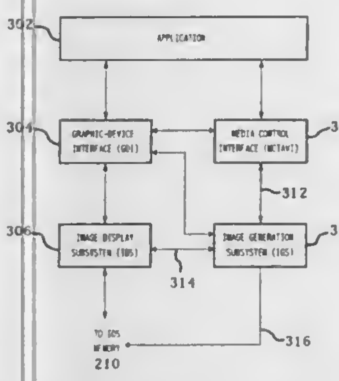
a plurality of pixels rotationally mounted to said grid modules and arranged into a matrix of rows and columns, said pixels each including at least two display faces, only one of which will be displayed at a given time for providing a desired arrangement of said display faces at said front of said display apparatus, wherein a weight is attached to each said pixel, to locate a center of gravity at a point on the second display face opposite to adjacent edges of the first and second display faces and at the rear of said display apparatus when said pixel is in its initial position; and

a triggering mechanism adapted for bidirectional movement behind said pixels and for selective rotation of selected ones of said pixels for changing the desired arrangement of said display faces.

5,751,270
METHOD AND APPARATUS FOR DISPLAYING AN IMAGE USING DIRECT MEMORY ACCESS

Ken Rhodes, Portland; Rohan Coelho, Hillsboro; Blake Bender, and Davis Frank, both of Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Filed Aug. 6, 1993, Ser. No. 103,265
Int. Cl.^{6} G09S *5/00*
U.S. Cl. 345—118 **26 Claims**

200


302
APPLICATION
304
GRAPHIC-DEVICE INTERFACE (GDI)
MEDIA CONTROL INTERFACE (MCTAVI)
308
312
306
IMAGE DISPLAY SUBSYSTEM (IDS)
IMAGE GENERATION SUBSYSTEM (IGS)
310
314
TO IDS MEMORY
210
316

1. A method for displaying an image, comprising the steps of:

(a) providing digital data corresponding to said image in an image generation subsystem of a windowed computer system, wherein:

the computer system comprises the image generation subsystem, a media control interface, a graphic-device interface, and an image display subsystem;

the image generation subsystem is implemented in software on a general-purpose microprocessor of the computer system;

the media control interface is implemented in software on the general-purpose microprocessor;

the graphic-device interface is implemented in software on the general-purpose microprocessor;

the image display subsystem is implemented in software on the general-purpose microprocessor;

the image generation subsystem is directly connected to each of the media control interface, the graphic-device interface, and the image display subsystem;

the media control interface is connected to the graphic-device interface; and

the graphic-device interface is connected to the image display subsystem;

the image generation subsystem is capable of transmitting image signals to the media control interface;

the media control interface is capable of transmitting the image signals to the graphic-device interface;

the graphic-device interface is capable of transmitting the image signals to a memory of the image display subsystem; and

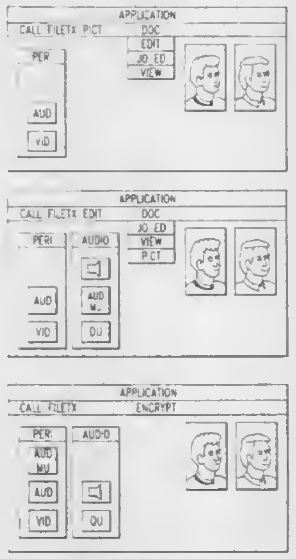
the image display subsystem is capable of displaying the image signals;

(b) writing said digital data directly to a memory of said image display subsystem by said image generation subsystem; and

(c) displaying said digital data by the image display subsystem.

5,751,271
PROCESSOR SYSTEM COMPRISING A PROCESSOR AND A MEMORY FIELD FOR CONTAINING A COMPUTER INTERFACE

Karin Helene Maria Anstötz, Cologne, Germany, and Karel Gerard Coolegem, The Hague, Netherlands, assignors to Koninklijke PTT Nederland N.V., Netherlands
Continuation of Ser. No. 269,049, Jun. 29, 1994, abandoned. This application May 15, 1996, Ser. No. 665,059
Claims priority, application European Pat. Off., Aug. 7, 1993, 93202011
Int. Cl.^{6} G09G *5/08*
U.S. Cl. 345—146 **2 Claims**



1. A processor system comprising a processor and a memory field for implementing a computer interface, the interface having a plurality of display elements, each of the display elements representing a function,

a first display element in the plurality of display elements being directly displayed on a screen in response to a first adjustable element code being allocated to this first display element and having a first value, the first display element being directly displayed on the screen in case the first display element is to be displayed continuously during a length of time and independent of whether or not the first display element has been activated, and

- a second display element in the plurality of display elements being selectively displayed on a screen in response to a second adjustable element code being allocated to this second display element and having a second value, the second display element being selectively displayed on the screen in case the second display element is not to be displayed continuously during the length of time but is to be continuously displayed only after the second display element has been activated,

the processor system being adapted for:

receiving a user code from a user,

generating a plurality of adjustable element codes in response to the user code wherein one of the plurality of adjustable element codes has the first value and is allocated to the first display element and another one of the plurality of adjustable element codes has the second value and is allocated to the second display element,

generating further element codes in response to the user code, each one of the further element codes being allocated to a corresponding one of the plurality of the display elements and having a value representing whether the corresponding one display element is enabled or disabled, and displaying or not displaying individual ones of the plurality of display elements on the screen in response to values of the corresponding individual ones of the further element codes,

generating one of a plurality of additional element codes in response to the user code, the one of the plurality of additional element codes being allocated to a transmission element and setting an attribute of a transmission function to be performed by the processor system, and

storing in a memory location associated with the user code and within a memory associated with the processor system, a new value for one of a group consisting of the adjustable element codes, the further element codes and the additional element for subsequent use in controlling display of an associated one of the display elements or setting the attribute of the transmission function.

5,751,272
DISPLAY PIXEL BALANCING FOR A MULTI COLOR DISCRETE LEVEL DISPLAY

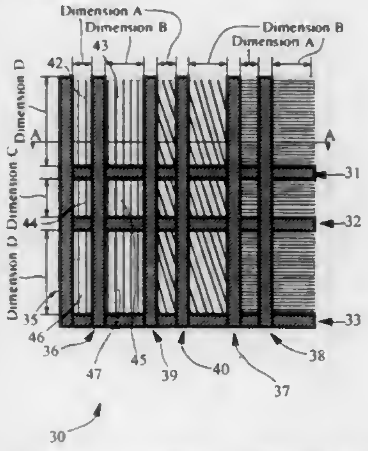
Kia Silverbrook, Leichhardt, Australia, and William Clark Naylor, Jr., Santa Clara, Calif., assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1995, Ser. No. 402,507

Claims priority, application Australia, Mar. 11, 1994, PM4402; Mar. 11, 1994, PM4408

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—149 **23 Claims**



1. A display having a pixel pattern comprising a multiplicity of pixels with each pixel having a multiplicity of primary colour sub-regions of illumination each of which further comprises a multiplicity of illumination areas, the illumination areas being able to be set to an illuminating state or a non-illuminating state wherein:

(a) the primary colour sub-regions extend in a first direction substantially from one side of the pixel to the other, but in a second direction substantially normal to the first direction have only a limited extent in the pixel; and

(b) the colour sub-regions are arranged to be able to be illuminated with changing intensity with a centre of illumination which is substantially stable with respect to movement in the first direction and is substantially constrained to movement in the second direction.

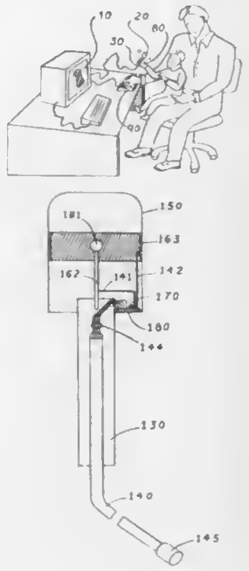
5,751,273
GAME CONTROLLER FOR INFANTS

Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233

Continuation-in-part of Ser. No. 349,686, Dec. 5, 1994, abandoned. This application Apr. 30, 1996, Ser. No. 640,330

Int. Cl.^{6} G09G *5/00;* **A63F** *9/24*

U.S. Cl. 345—156 **20 Claims**



15. A computer input device that enables a baby to interact with software installed on a computer, comprising:

(a) a housing;

(b) an electro-mechanical transducer, omnidirectionally responsive in a two dimensional plane to a mechanical shaking motion of said housing in said two dimensional plane, the transducer output comprising an electrical signal;

(c) a transmitter, activated by said electrical signal, the transmitter output comprising a substantially identical computer control signal each time it is activated by said electrical signal, whereby the baby may interact with the software installed on the computer by holding and shaking said housing.

5,751,274
FOOT-OPERABLE CURSOR CONTROL DEVICE

Michael Davis, 401 E. 74th St., New York, N.Y. 10021

Filed Sep. 14, 1995, Ser. No. 528,100

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—157 **16 Claims**

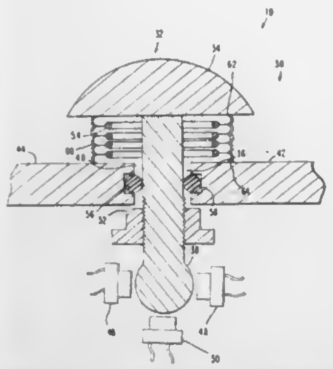
1. A foot-operable device for selective user displacement and control of a cursor on a computer display, comprising:

a housing defining an interior chamber and having a top wall oriented and configured for receiving a user's foot in at least partially-supported relation on said top wall and a bottom wall, said top wall including an opening defined in and through said top wall and communicating with said chamber;

an axially-elongated control stick having a top end and a longitudinally-opposite bottom end and extending through said opening so that said bottom end is disposed in said chamber and said top end projects outwardly from the housing interior through said opening, said control stick being supportedly coupled to said housing for pivotal movement of said control stick relative to said housing so as to move said bottom end in directions substantially transverse to the control stick axis in response to selective user-manipulated axially-transverse movements of the control stick top end and for axial translation of the control stick relative to the housing so as to move the control stick bottom end toward said housing bottom wall in response to selective user-manipulated depression of the control stick top end toward said housing top wall from a first, untranslated position of the control stick to a second, inwardly-depressed position of the control stick, and said control stick top end being disposed for contact with a user's foot so that user-initiated selective movements of a user's foot are transferrable to said top end for selectively transversely moving and axially translating the control stick;

biasing means disposed between said housing top wall and said control stick for resiliently urging said control stick top end in a direction axially away from said top wall so as to return the control stick from said second position to said first position following user-manipulated depression of the control stick top end; and

sensing means in said chamber for detecting pivotal movements and axial translations of said control stick.



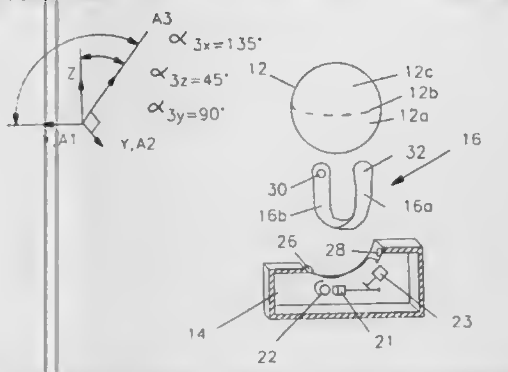
5,751,275
TWO— AND THREE—DIMENSIONAL TRACKBALL WITH COORDINATE TRANSFORMATIONS

Edward T. Bullister, 86 Concord St., Newton, Mass. 02162

Filed Nov. 14, 1994, Ser. No. 337,979

Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—167 **21 Claims**



2. A trackball device for providing coordinate information relative to first, second, and third axes, said trackball device comprising:

a. a ball;

b. a support having a receptacle sized to hold said ball;

c. a first sensor that generates a first signal that corresponds to the rotation of said ball relative to a fourth axis;

d. a second sensor that generates a second signal that corresponds to the rotation of said ball relative to a fifth axis;

e. a third sensor that generates a third signal that corresponds to the rotation of said ball relative to a sixth axis;

f. means for generating a transform signal based on said first, second, and third signals, said transform signal having components that correspond to the rotation of said ball relative to said first, second, and third axes, wherein at least one of said fourth, fifth, and sixth axes differs from said first, second, and third axes such that said at least one of said fourth, fifth, and sixth axes is non-orthogonal with all pairs of axes from the group of said first, second, and third axes,

whereby the transformation of said signals allows for all of said sensors to be positioned below the center of said ball and adjacent to said support and allows a majority of the surface of the top portion of said ball to be accessible for manipulation by a user.

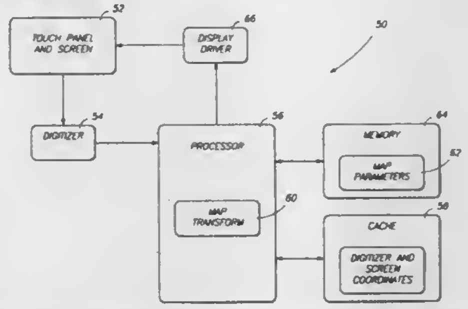
5,751,276
METHOD FOR CALIBRATING TOUCH PANEL DISPLAYS

Yung-Ho Shih, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed May 23, 1996, Ser. No. 652,899

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—178 **13 Claims**



1. A method for calibrating a touch panel display, comprising the following steps:

generating N contact coordinates $(\bar{x}_i, \bar{y}_i, i=1, \ldots, N)$ in response to contact at N touch points on the touch panel display, where $N > 3$;

mapping the contact coordinates $(\bar{x}_i, \bar{y}_i)$ into screen coordinates (x_i, y_i) according to the following mapping transformation:

$$\begin{cases} x_i = a_1\bar{x}_i + b_1\bar{y}_i + c_1 \\ y_i = a_2\bar{x}_i + b_2\bar{y}_i + c_2 \end{cases} \quad \text{where } i = 1, \ldots, N.$$

5,751,277
IMAGE INFORMATION CONTROL APPARATUS AND DISPLAY SYSTEM

Hiroshi Inoue, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 174,070, Dec. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 47,385, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 721,820, Jun. 26, 1991, abandoned. This application Mar. 20, 1995, Ser. No. 406,791

Claims priority, application Japan, Jun. 27, 1990, 2-171101

Int. Cl.^{6} G09G *5/04*

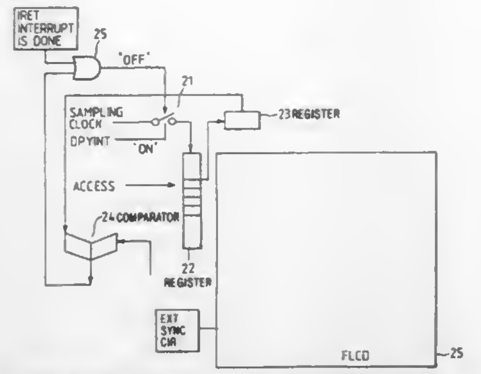
U.S. Cl. 345—200 **18 Claims**

1. An image information control apparatus comprising:

a. first means for recognizing scanning information of a position of image information and storing such information;

b. a first memory unit for, when said first means recognizes the scanning information of a position of the image information, detecting and storing an address accessed to an image information storage memory, the access being started by the recognition in units of lines in a scanning direction;

c. a second memory unit for storing an initial line address detected and stored;



d. second means for comparing contents of said first means for recognizing the scanning information of the position of image information with contents of said second memory unit;
e. third means for interrupting the function of said first means on the basis of the comparison result of said second means; and
f. fourth means for interrupting the function of said first means when drawing processing is ended, with control of drawing processing started by scanning the position of image information.

5,751,278
CLOCKING METHOD AND APPARATUS FOR DISPLAY DEVICE WITH CALCULATION OPERATION

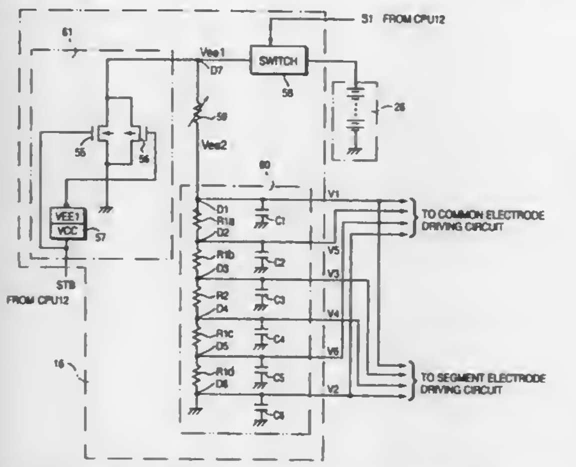
Yoshimitsu Inamori, Nara, and Koichi Oda, Sakai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 194,319, Feb. 10, 1994, Pat. No. 5,610,627, which is a division of Ser. No. 742,898, Aug. 8, 1991, abandoned. This application May 30, 1995, Ser. No. 452,819

Claims priority, application Japan, Aug. 10, 1990, 2-213161; Aug. 10, 1990, 2-213164; Aug. 10, 1990, 2-213166; Aug. 10, 1990, 2-213168; Aug. 10, 1990, 2-213170

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—211 **5 Claims**



1. A driving device for a display device comprising:
a liquid crystal display device having a predetermined display electrode;
a power supply for supplying a display voltage to be applied to the display electrode;
a switch provided between the liquid crystal display device and the power supply and actuatable for supplying the display voltage to the liquid crystal display device or interrupting the supply of the display voltage thereto;
a capacitor, a first terminal of the capacitor being connected between the liquid crystal display device and the switch, and a second terminal of the capacitor being grounded; and
an electrical circuit provided between the first terminal of the capacitor and the liquid crystal display device, for forcibly adjusting a potential at the first terminal of the capacitor to a potential at the second terminal of the capacitor wherein the electrical circuit for forcibly adjusting the potential at the first terminal of the capacitor to the potential at the second terminal of the capacitor comprises:
a first transistor;
a second transistor;
first terminals of both the first transistor and the second transistor being connected to the switch and second terminals of both the first transistor and the second transistor being connected to ground;
the first transistor being operable when a signal of a first level is applied to a third terminal of the first transistor;
the second transistor being operable when a signal of a second level is applied to a third terminal of the second transistor, the second level being greater than the first level;
whereby, when both the first transistor and the second transistor are turned on, a node between (1) the switch and (2) the first transistor and the second transistor is grounded, thereby forcibly discharging the capacitor.

5,751,279
ACTIVE MATRIX TYPE LIQUID CRYSTAL DISPLAY AND METHOD DRIVING THE SAME

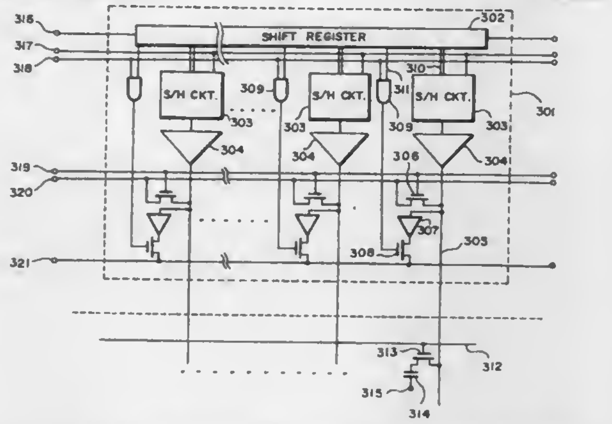
Fujio Okumura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 680,553, Jul. 9, 1996, abandoned, which is a continuation of Ser. No. 452,702, May 30, 1995, abandoned, which is a continuation of Ser. No. 92,062, Jul. 16, 1993, abandoned. This application Jan. 16, 1997, Ser. No. 784,313

Claims priority, application Japan, Jul. 16, 1992, 4-188518

Int. Cl.^{6} G09G *3/30*

U.S. Cl. 345—212 **3 Claims**



1. An offset voltage detection circuit for use in a data line drive integrated circuit for driving an active matrix type liquid crystal display having a data line driver circuit connected to data lines of the active matrix, for outputting video signal to said data lines, said offset voltage detection circuit comprising:
a plurality of voltage detector circuits each connected to a respective one of said data lines for measuring voltage fluctuations on said data lines; and
a plurality of reference voltage supply circuits each supplying a reference voltage to a respective one of said data lines for calibrating said plurality of voltage detector circuits, each of said reference voltage supply circuits including a respective switch connected to its respective data line, wherein each of said voltage detector circuits is serially connected to a signal line by an additional switch operated responsive to a first control signal to transfer output measurements from said respective voltage detector circuit to said signal line, and wherein said each respective switch operates responsive to a second control signal so as to supply said reference voltage to the respective one of said data lines.

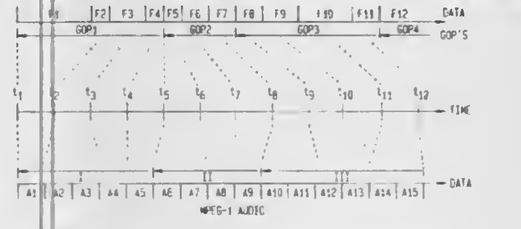
5,751,280
SYSTEM AND METHOD FOR MEDIA STREAM SYNCHRONIZATION WITH A BASE ATOM INDEX FILE AND AN AUXILIARY ATOM INDEX FILE

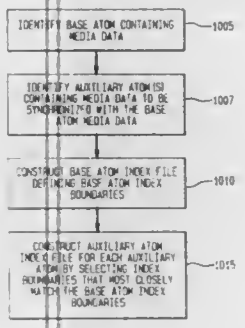
Michael J. Abbott, Sunnyvale; Paul Close, and Kevin P. Smith, both of Mountain View, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Dec. 11, 1995, Ser. No. 570,497

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 345—302 **24 Claims**


MPEG-1 VIDEO
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12
DATA
GOP1 GOP2 GOP3 GOP4
GOP'S
t1 t2 t3 t4 t5 t6 t7 t8 t9 t10 t11 t12
TIME
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15
DATA
MPEG-1 AUDIO


IDENTIFY BASE ATOM CONTAINING MEDIA DATA
1005
IDENTIFY AUXILIARY ATOM(S) CONTAINING MEDIA DATA TO BE SYNCHRONIZED WITH THE BASE ATOM MEDIA DATA
1007
CONSTRUCT BASE ATOM INDEX FILE DEFINING BASE ATOM INDEX BOUNDARIES
1010
CONSTRUCT AUXILIARY ATOM INDEX FILE FOR EACH AUXILIARY ATOM BY SELECTING INDEX BOUNDARIES THAT MOST CLOSELY MATCH THE BASE ATOM INDEX BOUNDARIES
1015

16. A computer program product for use with a computer system, said computer program product comprising:
a computer usable medium having computer readable program code means embodied in said medium for enabling a computer system to synchronize data for delivery to a viewer, said computer readable program code means comprising,
computer readable program code means for identifying a base atom containing media data,
computer readable program code means for identifying at least one auxiliary atom containing media data to be synchronized with media data in said base atom,
computer readable program code means for constructing a base atom index file for said base atom, wherein said base atom index file contains base atom index boundaries, and
computer readable program code means for constructing an auxiliary atom index file for said at least one auxiliary atom, wherein said auxiliary atom index file contains auxiliary atom index boundaries selected to most closely match said base atom index boundaries to thereby synchronize media data in said at least one auxiliary atom with media data in said base atom.

5,751,281
APPARATUS AND METHOD FOR STORING A MOVIE WITHIN A MOVIE

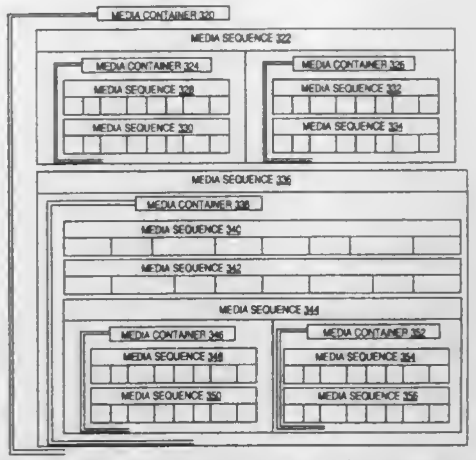
Peter Hoddie, Mountain View; James D. Batson, Sunnyvale, and Sean Michael Callahan, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 11, 1995, Ser. No. 570,542

Int. Cl.^{6} G06T *11/00*

U.S. Cl. 345—302 **24 Claims**

1. A method for use in a computer system for allowing a user to select a parameter value, said computer system including a display device, the method comprising:
determining a current sample from a set of samples wherein a media container includes a media sequence which includes said set of samples each of which is associated with a value;



establishing said value associated with said current sample as a first parameter value;
displaying on said display device a first image represented by said current sample;
controlling the playback of another media sequence in accordance with said first parameter value associated with said current sample;
determining a next sample based on user input, said next sample being a sample of said set of samples that is different from said current sample wherein said next sample and said current sample are part of said media sequence and have an ordered relationship with respect to each other;
establishing said value associated with said next sample as a second parameter value;
displaying on said display device a second image represented by said next sample;
controlling the playback of said another media sequence with said second parameter value associated with said next sample.

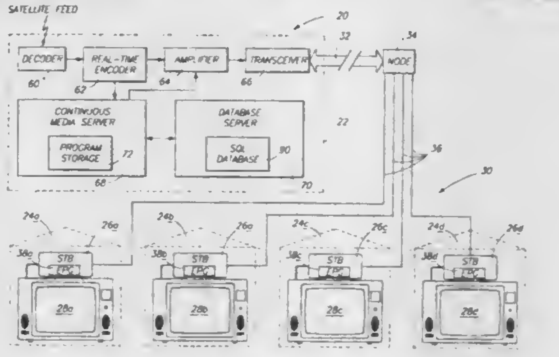
5,751,282
SYSTEM AND METHOD FOR CALLING VIDEO ON DEMAND USING AN ELECTRONIC PROGRAMMING GUIDE

Michel Girard; Keith Rowe, both of Seattle; Joseph H. Matthews, III, Redmond, and Frank Lawler, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 13, 1995, Ser. No. 490,064

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 345—327 **20 Claims**



1. An interactive television system comprising:
a set-top box configured to control which programs are displayed on a television, the set-top box providing an electronic programming guide for display on the television, the electronic programming guide providing an on-screen listing of various program titles correlated to corresponding scheduled viewing times;
a head end server operatively coupled to provide past and current programs to the set-top box for display on the television, the head end server further providing the program titles

and scheduled viewing times of the past, current, and future programs to the electronic programming guide;

the electronic programming guide being manipulable to list titles and scheduled viewing times of the past, current, and future programs;

a program selector to choose a title of a past program, a title of a current program, or a title of a future program from the electronic programming guide; and

the head end providing (1) a reproduced video data stream of the past program if the title of the past program is selected, (2) a real-time video data stream of the current program if the title of the current program is selected, or (3) a video data stream of a preview of the future program if the title of the future program is selected.

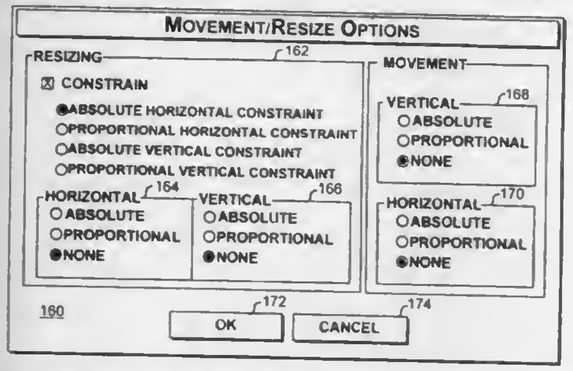
5,751,283
RESIZING A WINDOW AND AN OBJECT ON A DISPLAY SCREEN

Matthew W. Smith, Tulsa, Okla., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jul. 17, 1996, Ser. No. 651,114

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 345—342 **37 Claims**



1. A method for handling an object included in a window that is resized on a display, comprising the steps of:

(a) enabling an author to selectively set a plurality of parameters that determine a position, and a size of the object when the window is resized;

(b) binding the plurality of parameters to the object when it is saved for subsequent display on the display;

(c) displaying the object in a first position and with a first size within an initial window on the display; and

(d) applying the plurality of parameters to determine how the object is resized and repositioned in response to a user resizing the window in which the object appears.

5,751,284
CURRENT SIGNAL CORRECTION PROCESS AND DEVICE

Eric Suptitz, Grenoble; Pierre Blanchard, Voreppe, both of France, and James Collier, Cambridgeshire, United Kingdom, assignors to Schneider Electric, S.A., France

Filed Apr. 4, 1995, Ser. No. 416,361

Claims priority, application France, Apr. 21, 1994, 94 04924

Int. Cl.^{6} G01R *1/02*

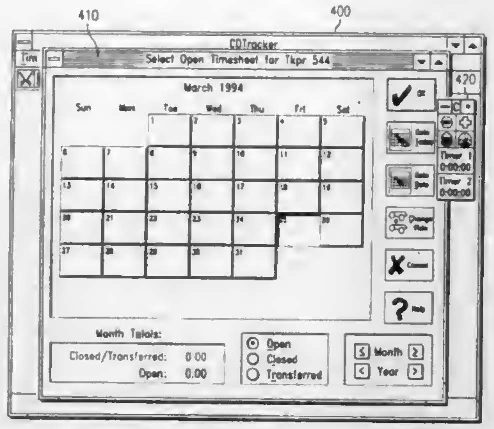
U.S. Cl. 324—127 **12 Claims**

1. A process for correcting a deformed current signal comprising successive correction cycles, each cycle comprising the steps of:

storing an output quantity in memory,

measuring an input quantity representative of the deformed current signal,

calculating the difference between the output quantity stored in memory and the input quantity measured, and



determining a new value of the output quantity lower than the output quantity stored in said storing step by less than or equal to a preset limiting value.

5,751,285
PARAMETER PROCESSING DEVICE FOR SETTING A PARAMETER VALUE USING A MOVABLE SLIDE OPERATOR AND INCLUDING MEANS FOR FINE-ADJUSTING THE PARAMETER VALUE

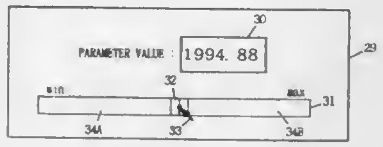
Kouichi Kashiwagi, Tenri; Toshiyuki Masui, Souraku-gun, and George Rome Borden, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

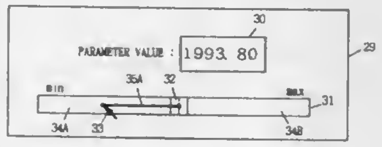
Filed Oct. 17, 1995, Ser. No. 544,129

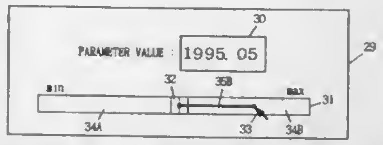
Claims priority, application Japan, Oct. 18, 1994, 6-251809

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 345—349 **8 Claims**







1. A parameter processing device for sequentially entering and providing a parameter value to be adjusted, comprising:

display means for displaying at least a scale of a predetermined length and a slide operator movable on said scale,

designation input means for entering designation of position information of said slide operator on said scale, and fine-adjustment position information for fine-adjusting said parameter value,

detection means for detecting said designated input of said slide operator position information and said fine-adjustment position information,

parameter value conversion means for converting said detected slide operator position information into a corresponding parameter value,

fine-adjustment granularity conversion means for converting distance information of said detected slide operator position information and said fine-adjustment position information into a corresponding fine-adjustment granularity of said parameter value, and

adjustment means for adjusting said parameter value from said parameter value conversion means using said fine-adjustment granularity from said fine-adjustment granularity conversion means, wherein variation in fine-adjustment granularity corresponds to a shifted amount of a cursor according to said distance information of said detected slide operator and said cursor on said scale.

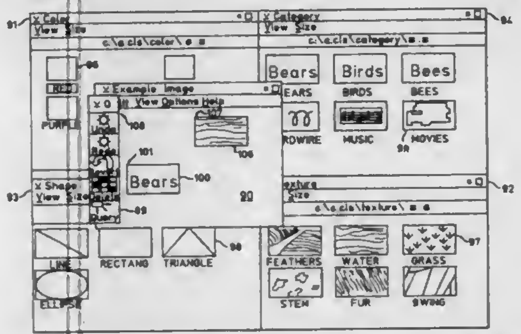
5,751,286
IMAGE QUERY SYSTEM AND METHOD

Ronald Jason Barber, San Jose; Bradley James Beitel, Woodside; William Robinson Equitz, Palo Alto; Myron Dale Flickner; Carlton Wayne Niblack, both of San Jose; Dragutin Petkovic, Los Gatos; Thomas Randolph Work, San Fancisco, and Peter Cornelius Yanker, Mountain View, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 720,993, Oct. 15, 1996, abandoned, which is a continuation of Ser. No. 216,986, Mar. 23, 1994, Pat. No. 5,579,471, which is a continuation-in-part of Ser. No. 973,474, Nov. 9, 1992, abandoned. This application Jan. 24, 1997, Ser. No. 788,150

Int. Cl.^{6} G06F *17/30;3/14*

U.S. Cl. 345—348 **31 Claims**



1. A computer-executed method for visually specifying an image database query using a computer display device and a user interface that provides output on the computer display device, comprising:

displaying an attribute window that contains a control for setting an attribute of an image characteristic;

displaying an image query window; and

receiving in the image query window a specification of an image database query that includes one or more depictive representations of image characteristics, each depictive representation representing an image characteristic having at least one attribute.

5,751,287
SYSTEM FOR ORGANIZING DOCUMENT ICONS WITH SUGGESTIONS, FOLDERS, DRAWERS, AND CABINETS

Samuel S. Hahn, Saratoga; Kenn LeGault, San Francisco; Maxon Wheeler, San Jose, and Jon R. Degenhardt, Mountain View, all of Calif., assignors to Documagix, Inc., San Jose, Calif.

Filed Nov. 6, 1995, Ser. No. 554,052

Int. Cl.^{6} G06F *3/00*

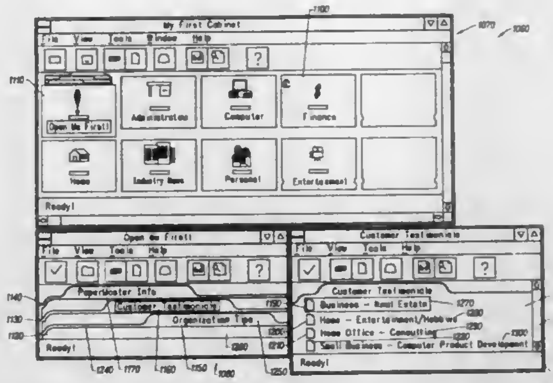
U.S. Cl. 345—351 **16 Claims**

1. A method for managing documents in a computer system, the computer system including a user input device coupled to a processor, a display, and a memory; the method comprising the steps of:

printing a bit-mapped representation of a document created by an application program running on the processor to a location in the memory:

associating the bit-mapped representation with a storage structure in the memory:

displaying a file cabinet image on the display, the file cabinet image including a plurality of file drawer images;



selecting a file drawer image from the plurality of file drawer images in response to a first signal from the user input device;

displaying a plurality of file folder images on the display associated with the file drawer image on the display;

selecting a file folder image from the plurality of the file folder images in response to a second signal from the user input device, the file folder image associated with the storage structure in the memory, and the file folder image having a file folder name:

displaying an icon representing the bit-mapped representation on the display:

selecting the icon in response to a third signal from the user input device: and

displaying the bit-mapped representation of the document.

5,751,288
PROGRAM DISPLAY METHOD AND DEVICE, AND ALSO PROGRAM GENERATION METHOD AND DEVICE

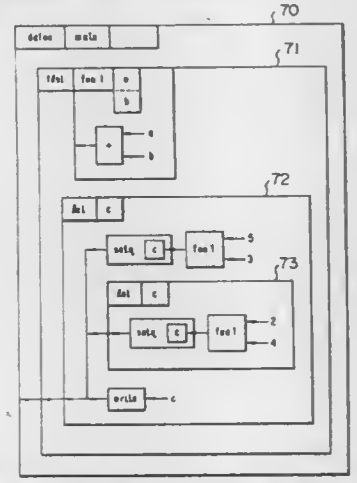
Yoshimitsu Oshima, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 410,580, Mar. 23, 1995, abandoned, which is a continuation of Ser. No. 665,563, Mar. 6, 1991, abandoned. This application Dec. 2, 1996, Ser. No. 759,156

Claims priority, application Japan, Mar. 9, 1990, 2-056360; Oct. 19, 1990, 2-281269

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—357 **27 Claims**



1. A program display method comprising the steps of:

inputting a program expressed by characters;

analyzing said program thereby to detect portions including a block structural portion which defines a sub-structure of said program, with local variables which are effective only within said block structural portion, and a description of data specification designated by a predetermined instruction containing a quote instruction from said program, each of said detected portions defining an environment for said sub-structure different from surrounding portions of said program such that said local variables are not accessible to said surrounding portions;

allocating detected portions to predetermined figures having a spatial boundary; and,

displaying on a display screen said allocated figures at positions corresponding to positions in said program so that an effective range on which the environment of each of said detected portions influences, can be observed from the display screen.

5,751,289

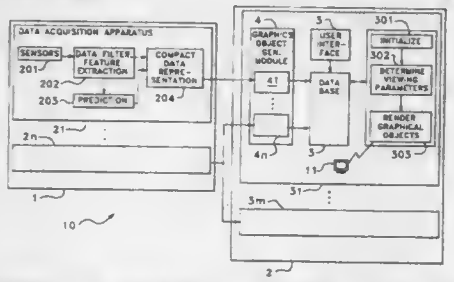
VIRTUAL REALITY IMAGING SYSTEM WITH IMAGE REPLAY

William Loring Myers, Boulder, Colo., assignor to University Corporation for Atmospheric Research, Boulder, Colo.

Continuation-in-part of Ser. No. 302,640, Sep. 8, 1994, Pat. No. 5,490,239, which is a continuation-in-part of Ser. No. 955,309, Oct. 1, 1992, Pat. No. 5,432,895. This application Jan. 16, 1996, Ser. No. 587,222

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—419 **28 Claims**


DATA ACQUISITION APPARATUS
SENSORS
201
DATA FILTER FEATURE EXTRACTION
202
COMPACT DATA REPRE-SENTATION
204
PREDICTION
203
21
2n
1
10
4
GRAPHICS OBJECT GEN. MODULE
41
4n
5
USER INTER-FACE
DATA BASE
3
301
INITIALIZE
302
DETERMINE VIEWING PARAMETERS
RENDER GRAPHICAL OBJECTS
303
11
31
3m
2

1. Apparatus for presenting a user with a virtual image of phenomena located in a predefined multidimensional space, comprising:

means for generating data indicative of at least one phenomena extant in a multidimensional space, which multidimensional space has predefined extent in a plurality of dimensions;

means for converting said generated data to a compact data representation of said at least one phenomena;

means for storing a plurality of said sets of said compact data representations, each set being indicative of an image of a temporally defined state of said at least one phenomena extant in a multidimensional space, said plurality of stored sets being representative of a time ordered sequence of said compact data representations;

means for storing data defining a plurality of characteristics of said phenomena that are to be displayed to a user;

means for extracting data, that satisfies said plurality of characteristics defined by said stored data, from said stored set of compact data representation; and

means, responsive to said extracted data, for producing an image representative of a three dimensional view of at least a portion of said multidimensional space to display said phenomena.

5,751,290

THREE DIMENSIONAL GRAPHICS SYSTEM AND METHOD WITH CORRECTION TO Z BUFFER VALUE ERRORS

Ruen-Rone Lee, Hsinchu, and Chun-Kai Huang, Taichung, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

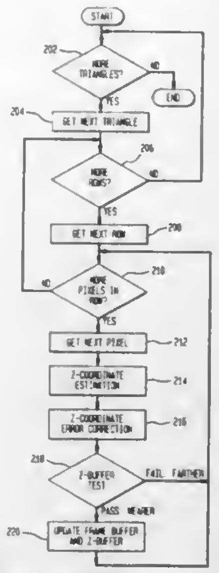
Filed Sep. 20, 1996, Ser. No. 710,652

Int. Cl.^{6} G06T *15/40*

U.S. Cl. 345—421 **21 Claims**

1. In a display system that displays pixellated images of projections of one or more surfaces onto a plane of view, a method for drawing one or more surfaces comprising the steps of:

(a) selecting a first pixel in a first row, which first pixel is near a first point at which a projection onto said plane of view of a first edge of a first one of said surfaces intersects, said first row,



(b) determining a first distance from said first point to a second point on said first surface, wherein said first point is a projection onto said plane of view of said second point,

(c) correcting said first distance by a first value representing a difference in distance between said first distance and a distance from said first pixel to a third point on said first surface, wherein said first pixel overlies a point that is a projection onto said plane of view of said third point, and

(d) assigning said corrected first distance to said first pixel as representing a distance from said first pixel to said first surface.

5,751,291

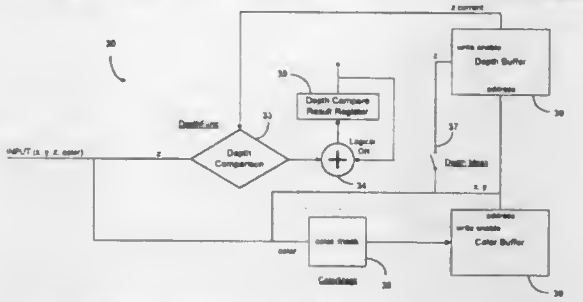
SYSTEM AND METHOD FOR ACCELERATED OCCLUSION CULLING

Daniel M. Olsen; Noel D. Scott, and Robert J. Casey, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 26, 1996, Ser. No. 690,433

Int. Cl.^{6} G06T *15/40*

U.S. Cl. 345—422 **18 Claims**



1. An occlusion culling circuit for use in a graphics computer, comprising:

a central processor;

a depth comparison circuit for receiving a graphics primitive from said central processor and for comparing an incoming depth value for each address in said graphics primitive with a current depth value for a rendered pixel at a corresponding address, said depth comparison circuit generating a result signal having a first logical value when said incoming depth value passes a depth comparison function and a second logical value when said incoming depth value fails said depth comparison function;

a logic circuit for receiving said result signal of said depth comparison circuit and for generating a depth compare signal, said logic circuit latching said depth compare signal at said first logical value upon receipt of said result signal having said first logical value;

a depth buffer for storing depth values of said graphics primitive;

a color buffer for storing color values of said graphics primitive; and

wherein said central processor stores said color values in said color buffer and said depth values in said depth buffer when said logic circuit latches said first logical value for said graphics primitive.

5,751,292

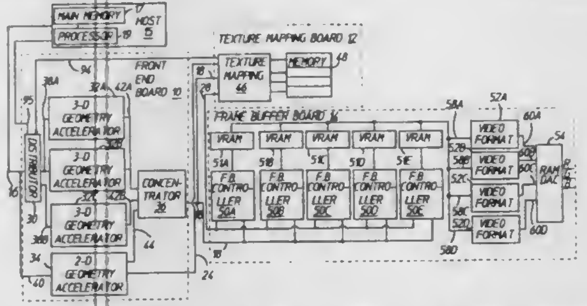
TEXTURE MAPPING METHOD AND SYSTEM

Darel N. Emmot, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 6, 1995, Ser. No. 470,817

Int. Cl.^{6} H04N *1/40*

U.S. Cl. 345—430 **15 Claims**



1. A method for accessing texture data in a texture mapping computer graphics system, the system including a host computer with a main memory that stores texture data including a plurality of texels, the method comprising the steps of:

storing at least a portion of the texture data in a local memory of the system;

temporarily storing within a texel data buffer as many as a limited number of texels most recently accessed from the local memory;

reading texels from predefined locations of the texel data buffer;

accessing texels from the local memory only when such texels are not available to be re-read from the texel data buffer; and

determining, for a current texel, whether to access the texel from the local memory or to re-read the texel from the texel data buffer, wherein the step of determining includes the step of comparing an address of the current texel with an address of a previously accessed texel.

5,751,293

PATTERN GENERATION METHOD AND APPARATUS FOR AUTOMATIC GENERATION OF CONTINUOUS TILE PATTERNS ALONG ANY ARBITRARY SIDE

Akihiko Hashimoto, Yokosuka, and Yasuhiko Watanabe, Yokohama, both of Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

Filed Aug. 22, 1995, Ser. No. 517,929

Claims priority, application Japan, Aug. 24, 1994, 6-199734

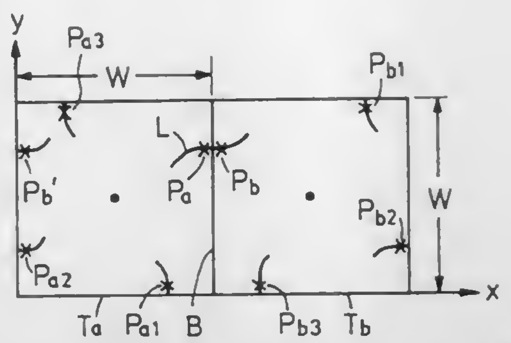
Int. Cl.^{6} G06T *1/00*

U.S. Cl. 345—430 **27 Claims**

20. A method which writes a pixel value of a pattern in an area of a polygonal tile for each pixel so that the pattern may continue across the boundary of the tiles arranged side by side, said method comprising the steps of:

(a) writing a pixel value of a pattern in said tile area for each pixel;

(b) making a check to see if said written pixel of the pattern is adjacent any one of sides of said polygonal area;



(c) when said pixel written in said step (b) is adjacent any one of the sides of said polygonal area, calculating the position of a pixel adjacent said written pixel on the area of an adjacent polygonal area adjacent said polygonal area along said side thereof and calculating, as a shifted position of said adjacent pixel, the position of said adjacent pixel when said adjacent polygonal area is laid on top of said tile area;

(d) rotating the position of said written pixel and said shifted position about the center of said polygonal area at least once through a predetermined angle and calculating the rotated positions; and

(e) writing said pixel value at said shifted position and said rotated positions.

5,751,294

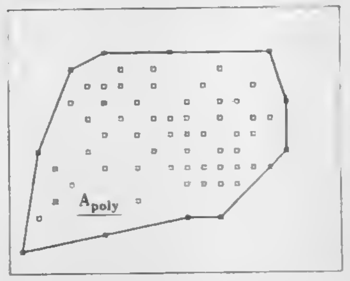
APPROXIMATION METHOD FOR WORKPLACE LAYOUT USING CONVEX POLYGON ENVELOPE

Francis J. O'Brien, Jr., Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1996, Ser. No. 708,002

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—440 **10 Claims**



1. An improved method of determining a population density index which aids in laying out the locations of any number of points representing personnel and equipment in a quadrilateral space using an approximation for the average Euclidean distance between pairs of points, the improved method comprising the steps of:

determining a convex hull area for a selected distribution of the points, the convex hull area being bounded by a boundary line connecting pairs of points such that no line connecting any pair of points crosses the boundary line; and

determining the population density index for the space and the distribution of points by the relationship

$$PDI_{poly}' = \frac{1}{\bar{d}_{act}'} \sqrt{\frac{n}{A_{poly}}}$$

where $\bar{d}_{act}'$ is an approximation for the average Euclidean distance between pairs of points, n is the number of points and A_{poly} is the convex hull area.

5,751,295

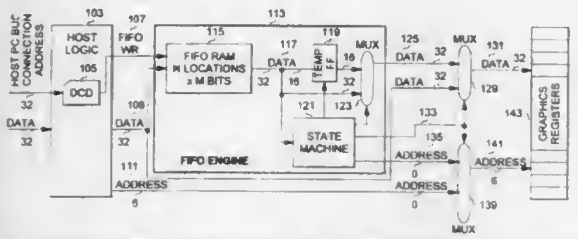
GRAPHICS ACCELERATOR CHIP AND METHOD

Thomas K. Becklund, Edina; Todd C. Houg, Wyoming; Benton H. Jackson, Maplewood; David O. Sluiter, Scandia, and John R. Ukura, Lino Lakes, all of Minn., assignors to Control Systems, Inc., St. Paul, Minn.

Filed Apr. 27, 1995, Ser. No. 429,834

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—501 **29 Claims**



1. A graphics accelerator chip which interprets instructions and data transferred from a microprocessor via an external data bus logically coupled to the microprocessor, the graphics accelerator chip comprising:

(a) a host logic interface logically coupled to the microprocessor via the external data bus for transferring the instructions and data between the graphics accelerator chip and the microprocessor;

(b) a first-in first-out (FIFO) memory logically coupled to the host logic interface for receiving and buffering the instructions and data, wherein the FIFO memory address space is mapped onto a contiguous sequential address space of the microprocessor;

(c) a state machine logically coupled to the FIFO memory for receiving and interpreting the instructions and data, and performing logical state operations based upon the instructions and data;

(d) a temporary memory logically coupled to the state machine for temporarily storing a graphics instruction while the data associated with that graphics instruction is outputted from the FIFO memory; and

(e) a graphics register set logically coupled to the state machine and the temporary memory via a first internal data bus, wherein the graphics register set receives and interprets the graphics instruction and data and performs logical graphics operations based upon the graphics instruction and data.

5,751,296

VIDEO PRESENTATION SYSTEM

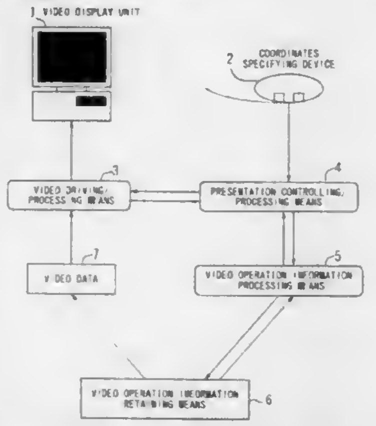
Toyoaki Furusawa; Minehiro Matsumura, and Toshihiro Nishimura, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1996, Ser. No. 655,449

Claims priority, application Japan, Oct. 19, 1995, 7-271562

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—520 **4 Claims**


1 VIDEO DISPLAY UNIT
2 COORDINATES SPECIFYING DEVICE
3
VIDEO DRIVING/PROCESSING MEANS
4
PRESENTATION CONTROLLING/PROCESSING MEANS
7
VIDEO DATA
5
VIDEO OPERATION INFORMATION PROCESSING MEANS
VIDEO OPERATION INFORMATION RETAINING MEANS
6

1. A video presentation system which includes video driving/processing means for carrying out a process for displaying video data at a video display unit, a coordinates specifying device used by a user to specify a subject of operation such as an object in a video image, and presentation controlling/processing means for carrying out processes including a switching to a scene relating to the subject of operation specified by the coordinates specifying device, the video presentation system comprising:

video operation information retaining means for retaining subject-of-operation information defining subjects of operation to be handled by the user on video images corresponding to the video data; and

video operation information processing means for searching the subject-of-operation information for a subject of operation handled by the user, based on a frame position of the video data currently reproduced by the video driving/processing means and screen coordinates of the subject of operation specified by the coordinates specifying device, to thereby detect the subject of operation handled by the user.

5,751,297

CONTROL METHOD FOR PAPER-DRIVEN TYPE AUTOMATIC DRAFTING MACHINE

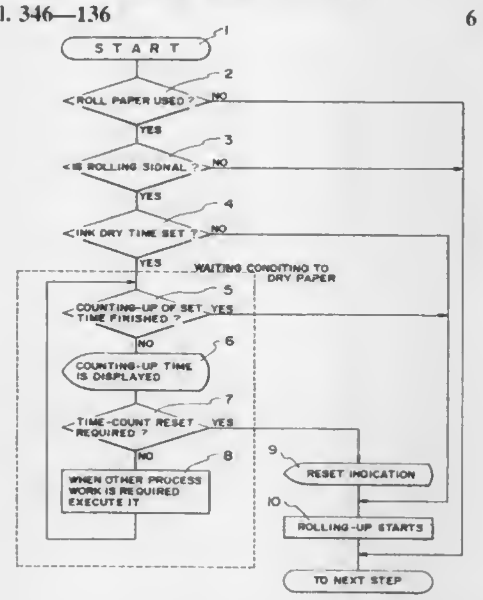
Akimitsu Shirosaki, and Matsushima Toshiaki, both of Tokyo, Japan, assignors to Mutoh Industries Ltd., Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,284

Claims priority, application Japan, Sep. 27, 1989, 1-251565; Feb. 6, 1990, 2-26774

Int. Cl.^{6} G01D *15/24;9/00*

U.S. Cl. 346—136 **6 Claims**


START
1
ROLL PAPER USED ?
2
NO
YES
IS ROLLING SIGNAL ?
3
NO
YES
INK DRY TIME SET ?
4
NO
YES
WAITING CONDITING TO DRY PAPER
COUNTING-UP OF SET TIME FINISHED ?
5
YES
NO
COUNTING-UP TIME IS DISPLAYED
6
TIME-COUNT RESET REQUIRED ?
7
YES
NO
WHEN OTHER PROCESS WORK IS REQUIRED EXECUTE IT
8
9
RESET INDICATION
10
ROLLING-UP STARTS
TO NEXT STEP

1. A control method for controlling a paper-driven automatic drafting machine capable of performing an ink drafting operation and having a frame, an elongated platen mounted to the frame, a paper supply for supplying paper from a roll, a paper winder for rolling-up the paper, a drive roller for driving the paper along the platen in forward and rearward directions, and a pen head for holding an ink writing instrument and moving the writing instrument relative to the paper in directions perpendicular to the forward and rearward directions, said method comprising the steps of:

setting an ink drying time period:

operating the automatic drafting machine to perform the ink drafting operation;

after performance of the ink drafting operation, avoiding rolling-up of the paper by stopping operation of the paper winder during the ink drying time period: and

after expiration of the ink drying time period, allowing the paper to be rolled-up by the paper winder.

5,751,298

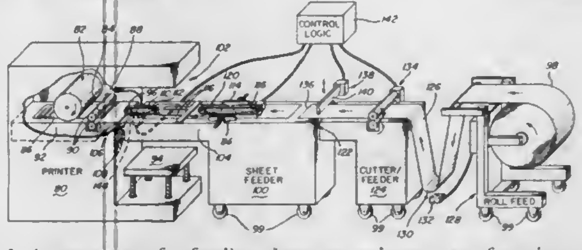
SYSTEM AND METHOD FOR DIRECTLY FEEDING PAPER TO PRINTING DEVICES

H. W. Crowley, Newton, Mass., assignor to Roll Systems, Inc., Burlington, Mass.

Continuation of Ser. No. 773,887, Jun. 24, 1991, which is a continuation-in-part of Ser. No. 536,214, Jun. 11, 1990, Pat. No. 5,130,724. This application Jun. 7, 1995, Ser. No. 481,796

Int. Cl.^{6} G03G *15/21*

U.S. Cl. 346—136 **7 Claims**



1. An apparatus for feeding sheets to an input port of a printer or other utilization device, the sheets being fed along a single predetermined feed path, the apparatus comprising:

a source of sheets;

a support structure having an upstream end and a downstream end and defining the single predetermined feed path;

a drive mechanism that selectively moves the sheets individually on the support structure along the predetermined feed path from the upstream end to the downstream end and toward the input port;

a sensor that generates signals indicating one of the following position states of a sheet at the downstream end relative to the input port:

(i) a GOING state at which the sensor detects movement of the sheet, when the sheet is being drawn at the input port;

(ii) a GONE state in which the sensor detects the absence of the sheet, when the sheet has gone into the input port of the printer or other utilization device; and

(iii) a WAIT state in which a predetermined time is to elapse during which a sheet advances fully downstream to the input port; and

a controller, responsive to the position state signals of the sensor, that controls the drive mechanism to maintain an upstream position sheet in a substantially stationary position in response to a WAIT signal of the sensor indicating movement of a downstream position sheet to the input port, and to drive the upstream position sheet to advance to a predetermined waiting position and readiness for introduction to the input port in response to a GONE signal of the sensor system indicating that the downstream position sheet has reached a more downstream position within the input port.

5,751,299

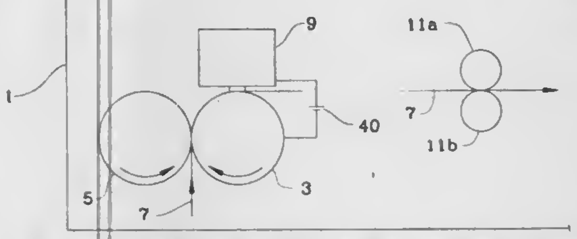
COMBINED ELECTROPHOTOGRAPHIC AND INK JET PRINTING

Gary Allen Denton, Lexington, and David Daniel Dreyfuss, Nicholasville, both of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Mar. 22, 1996, Ser. No. 620,185

Int. Cl.^{6} B41J *3/00*

U.S. Cl. 347—2 **20 Claims**



1. A combined electrophotographic and ink jet printer comprising a photoconductor member and a unitary, movable transfer member forming an electrophotographic transfer station for transferring toner from said photoconductor member to paper or other media supported at a first location on said transfer member, an ink jet printhead forming a printing station for said paper or other media supported on said transfer member at said first location, and a fixing station for fixing toner images on said paper or other media located subsequent to said transfer station.

5,751,300

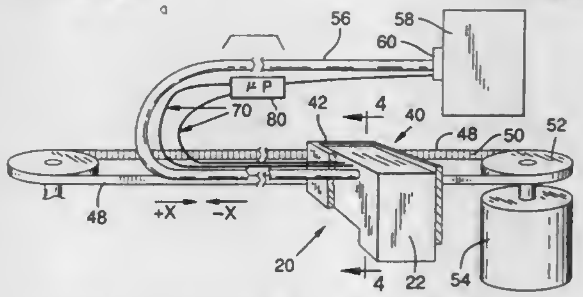
INK DELIVERY SYSTEM FOR A PRINTER

Bruce Cowger; Ronald W. Hall, both of Corvallis, Oreg.; Paul D. Gast, Vancouver, and Alan Shibata, Camas, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 4, 1994, Ser. No. 192,085

Int. Cl.^{6} B41J *29/38;23/00;2/175;2/18*

U.S. Cl. 347—6 **13 Claims**



1. A method for delivering ink to a pen reservoir that is carried on a reciprocating carriage of a printer, wherein the reservoir is connected by a tube to be in fluid communication with an ink supply that is remote from the reservoir, the method comprising the steps of:

accelerating the reservoir and a portion of the tube adjacent to the reservoir thereby to generate inertial flow of ink through the tube;

wherein the accelerating step includes alternately accelerating the reservoir in opposing directions along a path of motion thereby to generate inertial flow of ink within the tube alternately toward and away from the reservoir;

directing the inertial flow of ink in the tube toward the reservoir; and

providing a valve between the tube and the reservoir which can be operated between an open position which allows the flow of ink and a closed position;

moving the valve to the closed position, thereby occluding the tube to retain an amount of the inertial flow of ink in the reservoir as the reservoir moves substantially along an entire path of motion when the inertial flow of ink is away from the reservoir.

5,751,301

INK JET RECORDING APPARATUS HAVING INK JET HEAD MOVING STRUCTURE FOR GAP SPACING AND RECOVERY

Satoshi Saikawa, Inagi; Tetsuo Suzuki, Yokohama; Soichi Hiramatsu, Hachioji; Masahiro Taniguro; Hiroyuki Saito, both of Yokohama; Haruyuki Yanagi, Machida; Takashi Nojima, Tokyo; Hiroyuki Kinoshita, Kawasaki, and Hideaki Kawakami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

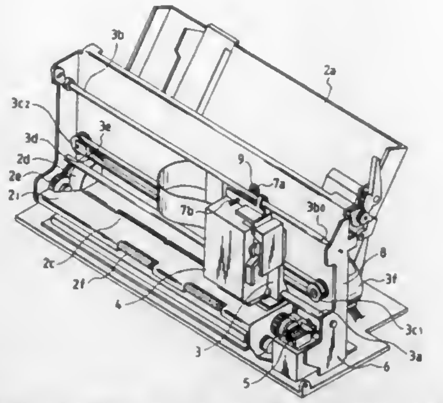
Continuation of Ser. No. 128,096, Sep. 29, 1993, abandoned. This application Oct. 3, 1996, Ser. No. 725,379

Claims priority, application Japan, Oct. 2, 1992, 4-287116

Int. Cl.^{6} B41J *2/165*

U.S. Cl. 347—8 **34 Claims**

1. An ink jet recording apparatus for recording an image on a recording medium disposed above a platen with ink discharged from an ink discharge port of an ink jet recording head, said apparatus comprising:



- a carriage for moving said ink jet recording head in a direction different from a conveyance direction of the recording medium;
- a recovery mechanism having a contacting member for contacting a surface on which said discharge port of said ink jet head is provided;
- a guide shaft for rotatably supporting and guiding said carriage, said guide shaft guiding said carriage to a recording area separate from said recording medium and to a positioning said carriage with respect to said recovery mechanism at a position where said contacting member is capable of contacting the surface on which said discharge port is provided by a rotational movement of said carriage with respect to said guide shaft; and
- a limiting mechanism for limiting the rotational movement of said carriage with respect to said guide shaft, said limiting mechanism having a guide surface and an elastic member for maintaining a position of said carriage with respect to said platen at said recording area by applying an elastic force to said guide surface,
- wherein said carriage is rotated and moved to the position where said contacting member is capable of contacting the surface on which said discharge port is provided by using at least the elastic force of said elastic member.

5,751,302

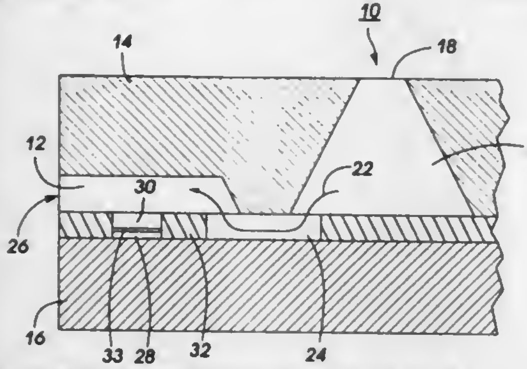
TRANSDUCER POWER DISSIPATION CONTROL IN A THERMAL INK JET PRINTHEAD

Ivan Rezanka, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1996, Ser. No. 624,158

Int. Cl.⁶ B41J *29/38;2/05*

U.S. Cl. 347—9 **13 Claims**



1. A method of controlling the operation of an ink jet printhead including a transducer dissipating power in response to an electrical operating pulse applied thereto for nucleating an ink bubble to cause an ink droplet to be ejected from an ink ejecting orifice, comprising:

- selecting a first value for a burn voltage of the electrical operating pulse;
- selecting a nominal pulse length as a function of the first value of the selected burn voltage;
- determining a second value for a threshold voltage of the electrical operating pulse, having the selected nominal pulse length, sufficient to cause the ink bubble to nucleate; and
- selecting an operating pulse length for the electrical operating pulse as a function of the second value of the determined threshold voltage by selecting the operating pulse length to be approximately equal to the selected nominal pulse length if the first value for the selected burn voltage is approximately 5–15% greater than the second value for the determined threshold voltgage.

5,751,303

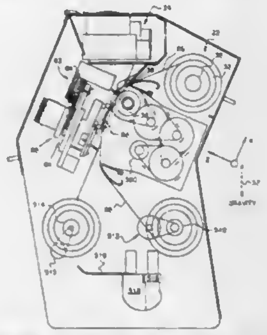
PRINTING MEDIUM MANAGEMENT APPARATUS

Paul R. Erickson, Prior Lake; Brian W. Kleve, Bloomington, both of Minn.; Robert Schaffer, Canaan, N.H.; Steven L. Lidke, Chaska, and Robert L. Skubic, Chanhassen, both of Minn., assignors to Lasermaster Corporation, Eden Prairie, Minn.

Filed Nov. 10, 1994, Ser. No. 337,109

Int. Cl.⁶ B41J *29/38*

U.S. Cl. 347—16 **29 Claims**



1. An apparatus for treating an image previously completely formed from hot melt ink on a roll-type printing medium, the apparatus comprising:

- a support frame having at least two sets of spaced apart opposing hub members:
- an elongate print medium spool member rotatable coupled to the first set of hub members of the support frame so that it rotatably receives a portion of roll-type printing medium containing at least one previously printed image from a image printing apparatus;
- a printing medium take up spool rotatably coupled to the second set of hub members of the support frame and disposed to receive the printing medium from the elongate print medium spool member;
- printing medium advancement/tensioning means coupled to the elongate print medium spool member and the printing medium take up spool for propelling the printing medium while imparting axial web tension to a printing medium attached thereacross;
- an elongate heater means rigidly coupled to the support frame and disposed intermediate a printing medium pathway defined by the elongate print medium spool member and the printing medium take up spool and disposed such that a heated portion of an exterior surface of the heater means controllably manages temperature in response to a control signal, and disposed so that in operation the printing medium momentarily contacts the heated portion of the heater means, for providing a plurality of predetermined printing medium heating profiles, each of the plurality of heating profiles being associated with a respective printing medium type;
- a printing medium engagement means for biasing the printing medium to the heated portion of the exterior surface of the heater means;
- control means for providing a control signal to the heater means which is responsive to the selected printing medium heating profile.

5,751,304

INK JET RECORDING HAVING TEMPERATURE CONTROL FUNCTION

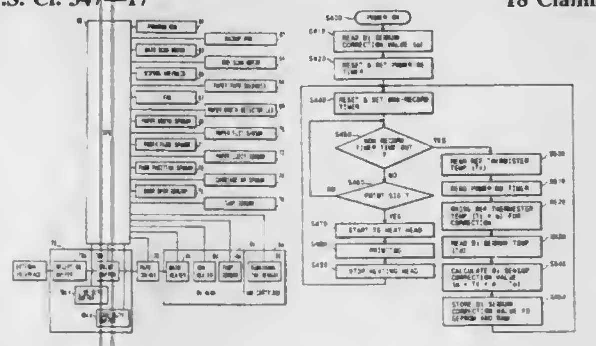
Hiromitsu Hirabayashi, Yokohama; Naoji Otsuka, Kawasaki; Kentaro Yano, Yokohama; Hitoshi Sugimoto, Kawasaki; Miyuki Matsubara, Tokyo; Kiichiro Takahashi, Yokohama, and Osamu Iwasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 921,832, Jul. 30, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,473

Claims priority, application Japan, Aug. 1, 1991, 3-193177; Aug. 1, 1991, 3-193187; Aug. 2, 1991, 3-194139; Dec. 26, 1991, 3-345052; Dec. 26, 1991, 3-345060; Jan. 31, 1992, 4-016526

Int. Cl.⁶ B41J *2/05*

U.S. Cl. 347—17 **18 Claims**



1. An ink jet recording apparatus which executes recording by using a recording head provided for a main body, said apparatus comprising:

- a head temperature detection member provided for the recording head, the recording head ejecting an ink;
- a reference temperature detection member provided for the main body;
- timer means for counting time;
- correction amount determination means for determining a correction amount of a head temperature detected by said head temperature detection member based on a detected value of said head temperature detection member and a detected value of said reference temperature detection member at a predetermined time counted by said timer means; and
- calibration means for calibrating a head temperature detected by said head temperature detection member based on the correction amount.

5,751,305

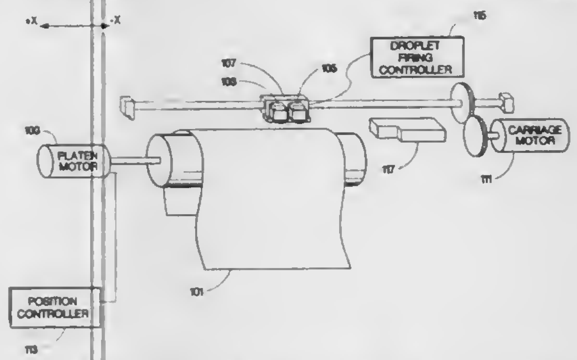
METHOD AND APPARATUS FOR DYNAMICALLY ALIGNING A PRINTER PRINTHEAD

LeMoyne F. Hadley, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1995, Ser. No. 537,223

Int. Cl.⁶ B41S *29/393;23/00*

U.S. Cl. 347—19 **32 Claims**



1. A method for dynamically compensating misalignment of a printhead employing an ink drop ejection apparatus to expel ink in a controlled manner to effect printing in a printer having an alignment mechanism, comprising the steps of:

- determining a need for a first alignment cycle;
- moving the printhead at a known speed and direction past the alignment mechanism which comprises at least two spaced apart reference indicia;
- detecting said passing of a first of said at least two reference indicia with a first detector disposed in the printhead;
- detecting said passing of a second of said at least two reference indicia with said first detector;
- measuring a period of time between said detection of said first reference indicia passage and said detection of said second reference indicia passage;
- creating a delay time related to said measured period of time; and
- delaying energization of at least a portion of the ink drop ejection apparatus for a duration of said created delay time until a second alignment cycle is needed.

5,751,306

STACK OF RECORDING SHEETS WITH CLEANING SHEETS DISPERSED THEREIN AND METHOD OF MAINTAINING RECORDING APPARATUS

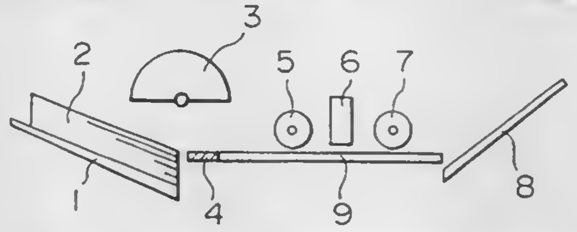
Mamoru Sakaki, Sagamihara, and Yutaka Kurabayashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 218,884, Mar. 28, 1994, Pat. No. 5,560,980, which is a continuation of Ser. No. 942,184, Sep. 9, 1992, abandoned. This application Mar. 25, 1996, Ser. No. 622,293

Claims priority, application Japan, Sep. 13, 1991, 3-234458; Sep. 13, 1991, 3-234459; Sep. 13, 1991, 3-234717

Int. Cl.⁶ B41J *2/165*

U.S. Cl. 347—22 **14 Claims**



1. A method of maintaining a recording apparatus having means for feeding a plurality of recording sheets to a recording unit, each of said recording sheets having a coated layer including pigment formed on a base material, the plurality of recording sheets being fed successively to said recording unit so as to perform a recording operation, said method comprising the step of:

- feeding cleaning paper to said recording unit, said cleaning paper having a Bekk smoothness of less than 40 seconds in accordance with a JIS-P-8119 testing method.

5,751,307

PRINT CARTRIDGE CLEANING APPARATUS AND METHOD USING WATER AND AIR

Paul J. Paroff, E. Amherst; Orrin D. Christy, North Tonawanda; James M. Schweitzer, Lancaster, and Mark A. Matheis, North Tonawanda, all of N.Y., ., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

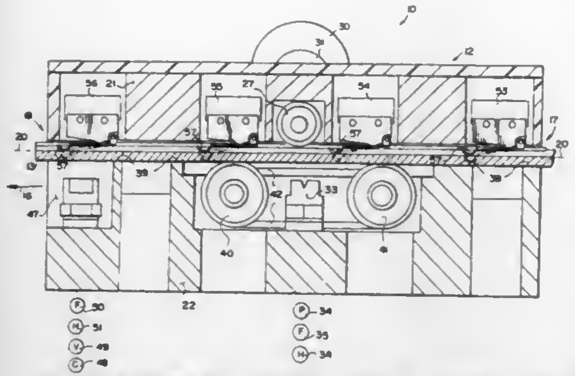
Filed Apr. 12, 1994, Ser. No. 226,685

Int. Cl.⁶ B41J *2/45;2/47;* **B08B** *3/00;* **A47L** *5/00*

U.S. Cl. 347—33 **25 Claims**

1. A cartridge cleaning assembly for cartridges having a first surface and a second surface, opposite to the first, and wherein the first surface has components easily damaged by contact with other solid materials and opposite edges extending beyond the components said assembly comprising:

- a housing having an inlet, outlet, and a straight line cartridge path between the inlet and outlet, said housing having guide



surfaces adjacent the cartridge path and aligned with the opposite edges of the first surface of the cartridge as the cartridge moves alone the cartridge path, and said cartridge path has an open space extending from the inlet to the outlet aligned with the components on the first surface to allow the components to pass through the housing without contacting other solid materials;

drive means for driving the cartridge in said straight line path from the inlet to the outlet, wherein said drive means engages the second surface of the cartridge;

a water spray nozzle located within said housing between said inlet and outlet, and directed toward said straight line cartridge path, and said water spray nozzle directing a water spray onto the first surface of the cartridge moving along the cartridge path;

an air spray nozzle located within said housing adjacent said outlet and directed toward said straight line path, and said air spray nozzle directing air onto the first surface of the cartridge;

sensing means disposed within said housing and automatically operating said drive means, water spray nozzle, and air spray nozzle in response to the position of a cartridge within said housing.

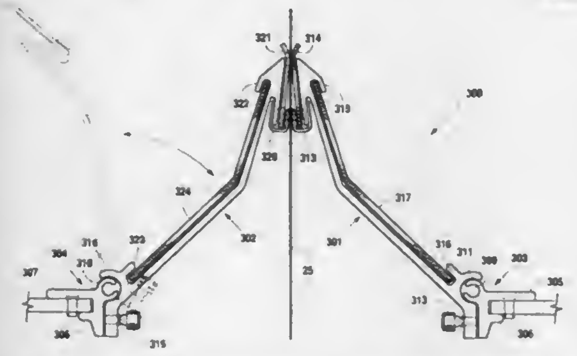
5,751,308
APPARATUS FOR GUIDING AND TENSIONING A SUBSTRATE

James Gandy; Jubayer Ahmed, and Don Ray Janysek, all of San Antonio, Tex., assignors to Signtech USA., Ltd., San Antonio, Tex.

Continuation-in-part of Ser. No. 303,701, Sep. 9, 1994. This application May 3, 1995, Ser. No. 434,023

Int. Cl.^{6} B41J *2/165*

U.S. Cl. 347—33 **12 Claims**



1. An apparatus for guiding and tensioning a substrate, said apparatus utilized in a printing system having a frame supporting at least one printhead for printing an image on the substrate and a substrate support and drive system that supports the substrate and drives the substrate relative to the at least one printhead, said apparatus comprising:

a first wiper arm attached to the frame at a first side of the substrate; and

a second wiper arm attached to the frame at a second side of the substrate wherein said first wiper arm and said second wiper arm guide and tension the substrate to prevent color mismatch during the printing of the image by the at least one printhead.

5,751,309

Patent Not Issued For This Number

5,751,310
INK JET RECORDING APPARATUS CAPABLE OF PREVENTING BLOTTING AT BOUNDARY OF COLORS AND RECORDING METHOD THEREFOR

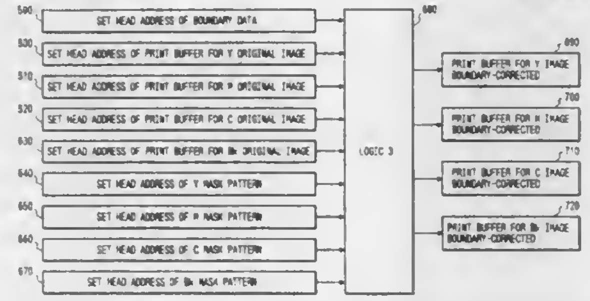
Kentaro Yano; Naoji Otsuka, both of Yokohama; Jiro Moriyama; Nobuyuki Kuwabara, both of Kawasaki; Isao Ebisawa, Yokohama; Atsushi Arai; Hisao Yaegashi, both of Kawasaki; Toshiharu Inui, Yokohama; Kiichiro Takahashi, Kawasaki; Osamu Iwasaki, Tokyo, and Daigoro Kanematsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 329,414

Claims priority, application Japan, Oct. 28, 1993, 5-270582

Int. Cl.^{6} B41J *2/21;2/205*

U.S. Cl. 347—43 **42 Claims**


SET HEAD ADDRESS OF BOUNDARY DATA
SET HEAD ADDRESS OF PRINT BUFFER FOR Y ORIGINAL IMAGE
SET HEAD ADDRESS OF PRINT BUFFER FOR M ORIGINAL IMAGE
SET HEAD ADDRESS OF PRINT BUFFER FOR C ORIGINAL IMAGE
SET HEAD ADDRESS OF PRINT BUFFER FOR Bk ORIGINAL IMAGE
SET HEAD ADDRESS OF Y MASK PATTERN
SET HEAD ADDRESS OF M MASK PATTERN
SET HEAD ADDRESS OF C MASK PATTERN
SET HEAD ADDRESS OF Bk MASK PATTERN
LOGIC 3
PRINT BUFFER FOR Y IMAGE BOUNDARY-CORRECTED
PRINT BUFFER FOR M IMAGE BOUNDARY-CORRECTED
PRINT BUFFER FOR C IMAGE BOUNDARY-CORRECTED
PRINT BUFFER FOR Bk IMAGE BOUNDARY-CORRECTED

1. An ink jet recording apparatus for image recording by discharging a plurality of inks of different characteristics onto a recording medium, comprising:

expansion means for expanding a recording pixel, the recording pixel to be recorded with at least an ink subjected to pixel expansion, in four directions to a peripheral area;

logic product means for calculating a logic product of the pixel expanded by said expansion means and an other recording pixel to be recorded by an ink not subjected to pixel expansion to obtain a result of calculation; and

replacement means for replacing the other recording pixel to be recorded by said ink not subjected to pixel expansion with the pixel to be recorded by said plurality of inks, according to the result of calculation by said logic product means,

wherein said ink subjected to pixel expansion and said ink not subjected to pixel expansion are different in penetration characteristics from each other.

5,751,311
HYBRID INK JET PRINTER WITH ALIGNMENT OF SCANNING PRINTHEADS TO PAGEWIDTH PRINTBAR

Donald J. Drake, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1996, Ser. No. 624,274

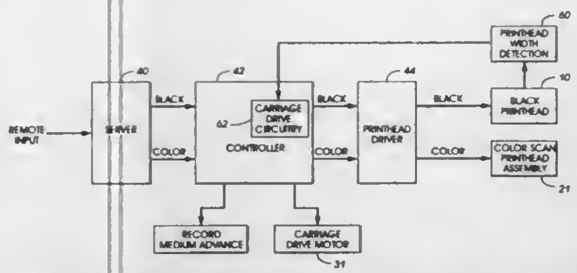
Int. Cl.^{6} B41J *2/21*

U.S. Cl. 347—43 **6 Claims**

1. A hybrid ink jet printer for recording images on a recording medium, during a printing swath, the printer comprising:

a full width printbar for printing along the full width of said printing swath,

a scanning assembly including at least two partial width color printheads,



control means for selectively controlling a print operation to operate the full width printbar or the scanning assembly,

drive means for driving said scanning assembly along said printing swath in a series of steps of a predetermined width,

means for identifying a mismatch, Δ1, between the width of the full width printhead and the summed width of the scanning series of steps, and for generating a signal representing said mismatch and

wherein said control means contains circuitry for changing the average predetermined width of each of said series of steps by Δ1 divided by the number of steps in the series.

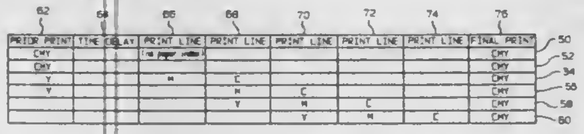
5,751,312
METHOD OF INHIBITING A PRINT ARTIFACT ASSOCIATED WITH A PRINTER PAUSE

Bruce David Gibson, Lexington, Ky., assignor to Lexmark International, Inc., Lexington, Ky.

Filed Sep. 4, 1996, Ser. No. 708,328

Int. Cl.^{6} B41J *2/21;2/205*

U.S. Cl. 347—43 **17 Claims**



9. A method of inhibiting a print artifact on a print medium using an ink jet printer, the ink jet printer including an ink jet cartridge assembly with a plurality of available color inks which are selectively jetted onto the print medium, the ink jet cartridge assembly being scannable in a scan direction and the print medium being movable in an advance direction, said method comprising the sequential steps of:

setting at least one of the available color inks as a determined color ink;

scanning the ink jet cartridge assembly across the print medium and printing on the print medium using the available color inks;

detecting an impending printer pause associated with a time delay during normal printing;

scanning the ink jet cartridge assembly across the print medium in a scan immediately prior to said printer pause and printing on the print medium using the available color inks except the at least one determined color ink;

pausing the printer;

scanning the ink jet cartridge assembly across the print medium in a scan immediately after said printer pause without advancing the print medium in the advance direction; and

printing on the print medium using only the at least one determined color ink during said third scanning step.

5,751,313
HYDROPHILIC INK PASSAGE

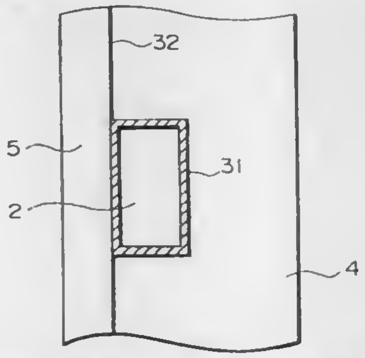
Satoru Miyashita, and Kiyohiko Takemoto, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-to, Japan

Continuation of Ser. No. 941,034, Sep. 30, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 376,304

Claims priority, application Japan, Feb. 4, 1991, 3-13272; Mar. 1, 1991, 3-36049; Apr. 16, 1991, 3-83747; Jun. 18, 1991, 3-145950; Nov. 7, 1991, 3-291659

Int. Cl.^{6} B41J *2/19*

U.S. Cl. 347—45 **16 Claims**



1. A process for coating a base material of an ink passage, said process comprising the steps of:

a) coating the base material with a sol comprising fine particles of an inorganic oxide dispersed therein thereby to form a resultant coating, and

b) drying the resultant coating, said fine particles comprising an inorganic oxide having a hydrophilic group and being present in said coating in a size and an amount that impart sufficient hydrophilicity to the base material to cause rapid discharge of bubbles formed within the ink passage, wherein the base material comprises a resin, silicon, glass, a ceramic, a metal or a composite material, and the drying step (b) is conducted by heating the resultant coating to a heat deformation temperature of the base material.

5,751,314
PRINT HEAD IN POWDER JET IMAGE FORMING APPARATUS HAVING A MATRIX ELECTRODE AND A GRID ELECTRODE

Osamu Takemura; Takahiko Kimura, and Atsushi Fujii, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 7, 1994, Ser. No. 336,218

Claims priority, application Japan, Nov. 11, 1993, 5-307282; Nov. 11, 1993, 5-307283

Int. Cl.^{6} B41J *7/06*

U.S. Cl. 347—55 **10 Claims**

1. A print head for a powder jet image forming apparatus in which the print head is disposable between a developer supply roller and a recording paper feed element of such image forming apparatus, the print head comprising:

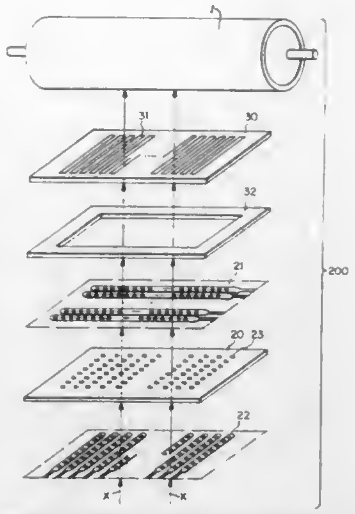
an insulating layer having a first major surface and a second major surface, the insulating layer having a plurality of holes therethrough,

a plurality of first electrodes formed in the first major surface of the insulating layer, the first electrodes each having holes therethrough, and

a plurality of second electrodes formed in the second major surface of the insulating layer, the second electrodes each having holes therethrough,

the first electrodes and the second electrodes being oriented at an angle with respect to each other and, together with the insulating layer, constituting a matrix electrode,

one of the holes of the first electrodes, one of the holes of the insulating layer, and one of the holes of the second electrodes



being aligned to provide a hole through the matrix electrode for passing developer therethrough.

a grid electrode generating a first electric field for controlling developer supply from a developer supply roller of an image forming apparatus and a second electric field for controlling developer supply from the grid electrode to the first electrodes of the matrix electrode, the grid electrode being located spaced apart from the first electrodes of the matrix electrode so that the first electrodes are located between the grid electrode and the insulating layer,

the grid electrode being oriented parallel with the insulating layer, so that the second electric field is an uniform electric field, and

the grid electrode having a plurality of apertures and a plurality of bridge electrodes, and

wherein a plurality of unobstructed paths are provided, each of the paths passing through one of the holes of the insulating layer, one of the holes of the first electrodes, one of the holes of the second electrodes and one of the apertures of the grid electrode.

5,751,315

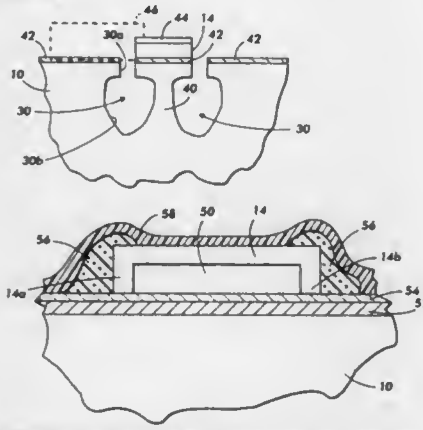
THERMAL INK-JET PRINTHEAD WITH A THERMALLY ISOLATED HEATING ELEMENT IN EACH EJECTOR

Cathie J. Burke; R. Enrique Viturro, both of Rochester; John R. Andrews, Fairport; Narayan V. Deshpande, Penfield, and Sean D. O'Brien, Victor, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 16, 1996, Ser. No. 632,983

Int. Cl.⁶ B41J *2/05*

U.S. Cl. 347—63 **8 Claims**



1. A thermal ink-jet printhead comprising at least one ejector, the ejector comprising:

a structure defining a capillary channel for passage of liquid ink therethrough;

a heater chip defining a main surface and including a heating element disposed on a portion of the main surface thereof, the heating element being exposed within the capillary channel;

a first cavity defined in the heater chip, the cavity extending from a portion of the main surface adjacent the heating element to a portion of the heater chip disposed underneath a portion of the main surface of the heater chip including the heating element;

a second cavity defined in the heater chip, the second cavity extending from a second portion of the main surface adjacent the heating element to a second portion of the heater chip underneath a portion of the main surface of the heater chip including the heating element;

the heater chip defining a pillar disposed between the first cavity and the second cavity, the heating element being disposed on the pillar.

4. A thermal ink-jet printhead comprising at least one ejector, the ejector comprising:

a structure defining a capillary channel for passage of liquid ink therethrough;

a heater chip defining a substantially planar main surface and a heating element disposed on a portion of the main surface thereof, a surface of the heating element being exposed within the capillary channel;

the heating element comprising polysilicon and including at least one polysilicon support for contacting the substantially planar main surface of the heater chip; and

a cavity defined between a portion of the heating element and an area of the main surface of the heater chip.

5,751,316

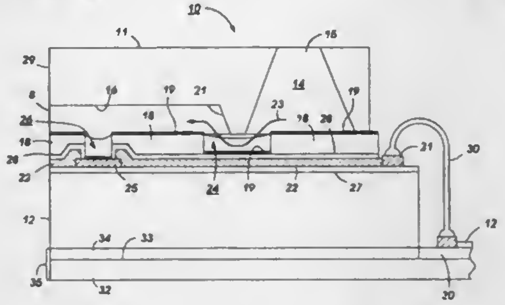
THERMAL INK JET PRINTHEAD WITH INK RESISTANT HEAT SINK COATING

Raymond E. Bailey, Webster; Robert K. McCubbin, Rochester; Manfred H. Goeserich, Churchville, and Robert P. Altavela, Farmington, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1996, Ser. No. 674,493

Int. Cl.⁶ B41J *2/05*

U.S. Cl. 347—63 **17 Claims**



1. A thermal ink jet printer for ejecting ink onto a recording medium including:

a printhead including at least a channel for holding said ink,

at least one nozzle for ejecting said ink onto the recording medium,

a heater for selectively heating the ink in said channel causing ink in said channel to be ejected from said nozzle and

a heat sink having a surface to which said printhead is bonded, said heat sink comprising a metal substrate having a thin copper plated film formed on the substrate surface and a thin chromate film overlying the copper plated film, the printhead bonded to a surface of said chromate film.

5,751,317

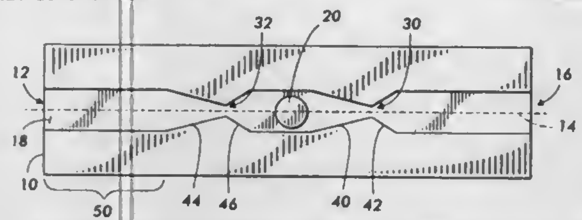
THERMAL INK-JET PRINTHEAD WITH AN OPTIMIZED FLUID FLOW CHANNEL IN EACH EJECTOR

Eric Peeters; R. Enrique Viturro, both of Rochester; Narayan V. Deshpande, Penfield; Joel A. Kubby, and Lisa A. DeLouise, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1996, Ser. No. 632,293

Int. Cl.⁶ B41J *2/05*

U.S. Cl. 347—65 **15 Claims**



1. A thermal ink-jet printhead comprising at least one ejector, the ejector comprising:

a structure defining a fluid flow channel for passage of liquid ink therethrough, the fluid flow channel being defined along an axis extending from an inlet to a nozzle;

a heating element exposed within the fluid flow channel between the inlet and the nozzle;

the fluid flow channel defining a first taper in at least one dimension along the axis, the first taper disposed between the heating element and the inlet and opening toward the nozzle, the first taper defining a first cone angle;

the fluid flow channel defining a second taper in at least one dimension along the axis, the second taper being disposed between the heating element and the nozzle and opening toward the inlet, the second taper defining a second cone angle greater than the first cone angle;

the fluid flow channel defining a third taper in at least one dimension along the axis, the third taper being disposed between the heating element and the inlet and opening toward the inlet;

the fluid flow channel defining a fourth taper in at least one dimension along the axis, the fourth taper being disposed between the heating element and the nozzle and opening toward the nozzle; and

the fluid flow channel defining an extension between the fourth taper and the nozzle, the extension encompassing a volume at least equal to one-half a volume encompassed by the capillary channel between the heating element and the second taper.

5,751,318

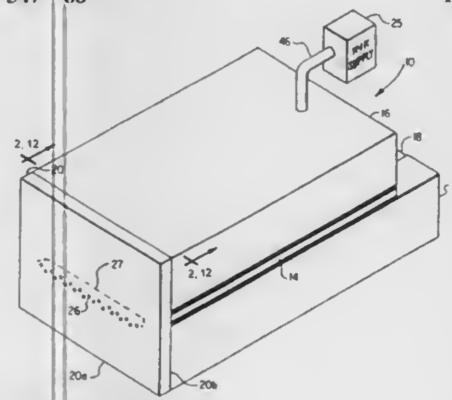
ELONGATED INK JET PRINTHEAD USING JOINED PIEZOELECTRIC ACTUATOR

Daniel B. Granzow, Spring, Tex., assignor to Compag Computer Corporation, Houston, Tex.

Division of Ser. No. 66,908, May 25, 1993, Pat. No. 5,438,739. This application Aug. 3, 1995, Ser. No. 510,711

Int. Cl.⁶ H01L *41/22*

U.S. Cl. 347—68 **15 Claims**



1. A printhead comprising:

a plurality of sheets of polarized piezoelectric material, said sheets having channels formed therein to receive ink;

a joiner disposed between said sheets to hold said sheets together, wherein said joiner comprises a non-conductive glue; and circuitry coupled to said sheets to actuate selected of said channels to eject ink.

5,751,319

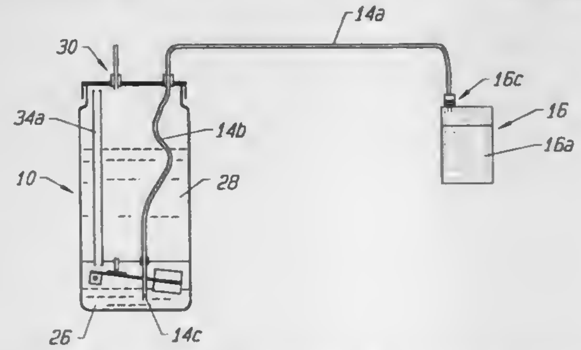
BULK INK DELIVERY SYSTEM AND METHOD

Larry W. Robertson, San Jose, and Mark C. Fitzgerald, Mountain View, both of Calif., assignors to Colossal Graphics Incorporated, Palo Alto, Calif.

Filed Sep. 28, 1995, Ser. No. 535,924

Int. Cl.⁶ B41J *2/175*

U.S. Cl. 347—85 **26 Claims**



1. An ink delivery system for feeding ink to a print ink container of an ink cartridge, ink being contained in said print ink container for delivery to a print head of said ink cartridge, the ink delivery system comprising:

a supply ink reservoir containing ink to be fed to said ink container of said ink cartridge;

a tubing device sealingly interconnected between said supply ink reservoir and said print ink container of said ink cartridge for conveying ink between said supply ink reservoir and said print ink container; and

an ink replenishing device for supplying ink to said supply ink reservoir automatically in response to ink being delivered from said print ink container to the print head of said ink cartridge and without breaking the seal of said tubing device so as to substantially maintain a level of ink contained in said supply ink reservoir.

5,751,320

INK RECHARGER FOR INKJET PRINT CARTRIDGE HAVING SLIDING VALVE CONNECTABLE TO PRINT CARTRIDGE

Joseph E. Scheffelin; David S. Hunt, both of San Diego; Mark E. Young, Escondido; Elizabeth Zapata, San Diego; Alfred Zepeda, San Marcos; Christopher J. Schultz, San Diego, and Jon Fong, Manhattan Beach, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 314,978, Sep. 29, 1994, and a continuation of Ser. No. 332,010, Oct. 31, 1994. This application Mar. 14, 1996, Ser. No. 615,748

Int. Cl.⁶ B41J *2/175*

U.S. Cl. 347—85 **26 Claims**

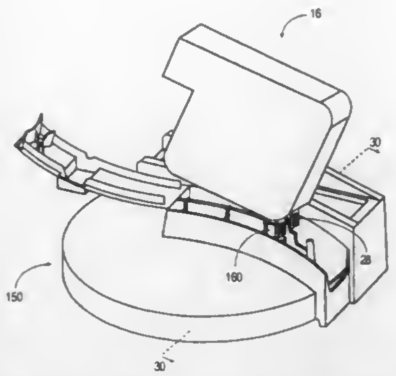
1. An ink recharging system comprising:

an external ink reservoir containing ink; and

a first recharge port connected to said external ink reservoir, said first recharge port comprising:

a sleeve connected to said external ink reservoir;

a recharge valve, slideable within said sleeve, having an elongated hollow body with a first opening proximate to a first end of said hollow body and a second opening proximate to a second end of said hollow body, said first opening being blocked by a seal forming a part of said sleeve when said



recharge valve is slid relative to said sleeve to be in a closed position, said closed position existing when said recharge valve is withdrawn from said sleeve a predetermined distance within a range of movement of said recharge valve, said recharge valve being slid relative to said sleeve to be in an opened position when said first opening is in fluid communication with said external ink reservoir, said opened position existing when said recharge valve is pressed into said sleeve a predetermined distance within said range of movement of said recharge valve,

said recharge valve having an engageable portion formed of a deformable material at said second end, said engageable portion having a first projecting portion for releasably latching onto a second projecting portion at an end of a second recharge port formed on a print cartridge to create an airtight fluid connection between said external ink reservoir and a print cartridge reservoir within said print cartridge,

said first projecting portion being such that, when said first projecting portion is engaged with said second projecting portion and said recharge valve is in said opened position, said first projecting portion pulls said recharge valve into said closed position when said recharge valve and said second recharge pore are pulled away from each other, prior to said first projecting portion becoming disengaged from said second projecting portion.

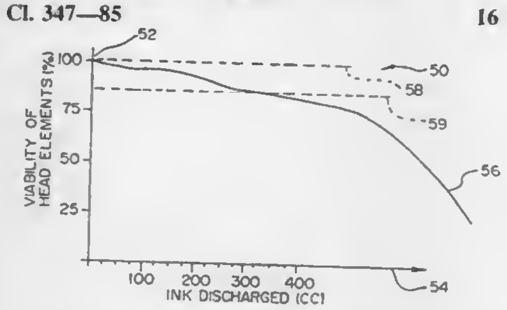
5,751,321
CONTINUOUS INK REFILL SYSTEM FOR DISPOSABLE INK JET CARTRIDGES HAVING A PREDETERMINED INK CAPACITY

Paul E. Erickson, Prior Lake, Minn., assignor to ColorSpan Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 604,401, Feb. 21, 1996, Pat. No. 5,629,727, which is a continuation of Ser. No. 345,510, Nov. 28, 1994, abandoned, which is a continuation of Ser. No. 139,576, Oct. 20, 1993, Pat. No. 5,369,429. This application Dec. 11, 1996, Ser. No. 763,361

Int. Cl.^{6} B41J *2/175;2/195*

U.S. Cl. 347—85 **16 Claims**



1. A continuous ink refill system for an ink jet printer having a print carriage that moves laterally with respect to a print-receiving medium, the refill system comprising:

(a) a disposable ink jet cartridge removably mountable in the print carriage, the disposable ink jet cartridge housing, in a self-contained unit:

(1) an internal ink supply container defining a first volume of liquid ink of at least about 40 cubic centimeters, the internal ink supply container being maintained at a sub-atmospheric pressure and being free of a foam insert; and

(2) a print head coupled directly with the internal ink supply container to receive liquid ink from the internal ink supply container for discharge to the print-receiving medium during a printing operation;

the print head having a known pattern of reliability expressed as a function of the amount of liquid ink discharged through the print head during the printing operation;

the first volume of liquid ink of the internal ink supply container defining an amount of liquid ink that, when discharged through the print head, corresponds to a pattern of reliability above a first predetermined minimum value corresponding to a viability of the print head of about 99%;

(b) an external ink reservoir container, external to the disposable ink jet cartridge, defining a second volume of liquid ink separate from the first volume of liquid ink to supply liquid ink to the internal ink supply container of the disposable ink jet cartridge, the second volume of liquid ink being of at least a multiple of the first volume of liquid ink, the second volume of liquid ink being greater than the first volume of liquid ink;

the sum of the first volume of liquid ink and the second volume of liquid ink defining an extended volume of liquid ink;

the extended volume of liquid ink defining an amount of liquid ink dischargeable through the print head without the corresponding pattern of reliability falling below a second predetermined minimum value corresponding to a viability of the print head of at least about 75%, the second predetermined minimum value being lower than the first predetermined minimum value; and

(c) flexible tubing operably coupled to the internal ink supply container and to the external ink reservoir container to draw liquid ink from the external ink reservoir container to the internal ink supply container due to the sub-atmospheric pressure maintained within the internal ink supply container, freely of moving mechanical ink-transfer components and freely of capillary action, as liquid ink is discharged by the print head from the internal ink supply container;

(d) wherein:

(1) the external ink reservoir container and the flexible tubing are sealed together;

(2) the disposable ink jet cartridge and the flexible tubing are sealed together; and

(3) the operating time during which the reliability pattern of the print head remains above the second predetermined minimum value during use of the ink jet printer corresponds to the operating time needed to exhaust the first and second volumes of liquid ink in the internal ink supply container and the external ink reservoir container.

5,751,322
LIMITED ACCESS NEEDLE/SEPTUM INK-SUPPLY INTERFACE MECHANISM

Gary L. Miller, and Kenneth R. Williams, both of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

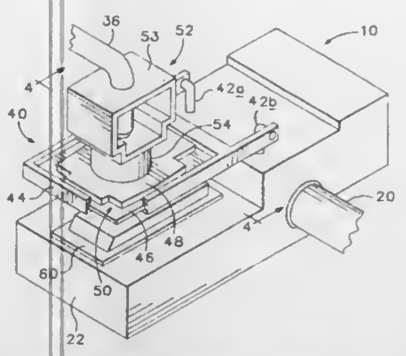
Filed Feb. 13, 1996, Ser. No. 601,166

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—86 **13 Claims**

1. An ink-supply interface mechanism for use in an ink-jet printer to transport ink between ink-delivery loci in an ink-delivery system of the printer, the interface mechanism comprising:

a needle station including a needle-holding structure and a floating-bushing assembly, said needle-holding structure having a cavity therein, and said structure further having an ink needle mounted and fully recessed within said cavity, said needle being operatively connected to an ink-delivery locus,



said floating-bushing assembly retaining said structure in a manner allowing limited movement of said structure, and

a septum tower attached to the printer adjacent said needle station, said tower including an exposed end, with an ink conduit extending through said tower operatively connecting another ink-delivery locus thereto, and a septum covering said exposed end and sealing said conduit, wherein said tower and said cavity are configured so that when they are brought together, said tower fits within said cavity in such a manner that said needle pierces said septum, thereby operatively connecting the ink-delivery loci so that ink may flow therebetween.

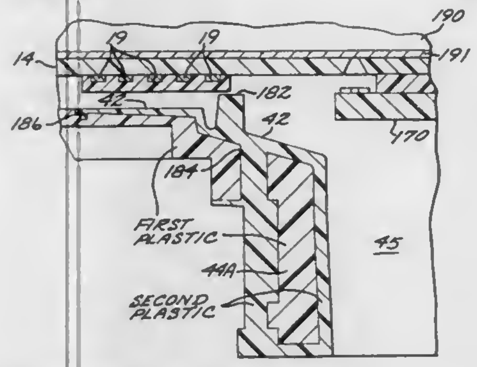
5,751,323
ADHESIVELESS PRINTHEAD ATTACHMENT FOR INK-JET PEN

David W. Swanson; Jaren D. Marler, both of Escondido, and Winthrop D. Childers, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 4, 1994, Ser. No. 317,519

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—87 **14 Claims**



1. An ink-jet printer cartridge, comprising:

a frame structure including a frame member formed of a rigid first plastic material having a relatively high melting temperature, said frame structure defining a headland region;

an ink channel defined in said frame member and leading to said headland region;

a printhead support structure formed on said frame member at said-headland region and circumscribing said ink channel, said support structure defined by a second plastic material having a lower melting temperature than the melting temperature of the first plastic material;

a printhead assembly positioned at said headland region, said assembly including a printhead supplied with ink flowing through said ink channel, said assembly sealed to said headland region by a seal between said headland region and said assembly substantially circumscribing said printhead, said seal defined by a bond formed between said printhead assembly and said second plastic material defining said support structure, said seal free of externally supplied adhesive material.

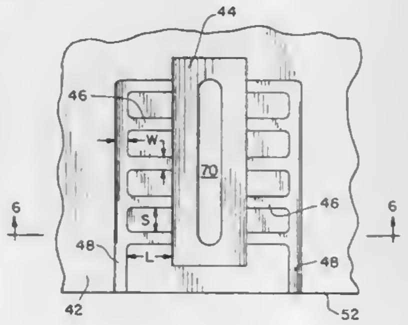
5,751,324
INK JET CARTRIDGE BODY WITH VENTED DIE CAVITY

Fred Young Brandon, Lexington; Charles Leonard DeCoste, Jr., Richmond; Jan Richard DeMeerleer, Lexington; Michael David Lattuca, Lexington, and Jack William Morris, Lexington, all of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Mar. 14, 1996, Ser. No. 615,393

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—87 **30 Claims**



28. An ink jet cartridge assembly, comprising:

a cartridge body including a die cavity, said body further including at least one groove disposed in communication with said die cavity and with an ambient environment;

a print head disposed at least partially within said die cavity; and

an adhesive disposed adjacent to each of said print head and said body;

wherein said at least one groove defines a vent to the ambient atmosphere for a gas which may be produced during curing of said adhesive.

5,751,325
INK JET PRINTING PROCESS

Luc Leenders, Herentals; Leo Oelbrandt, Kruibeke; Jan Van den Bogaert, Schilde, and Guido Desie, Herent, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed May 18, 1995, Ser. No. 444,292

Claims priority, application European Pat. Off., Jul. 11, 1994, 94201994; Jan. 31, 1995, 95200227

Int. Cl.^{6} B41J *2/205;* **B41M** *5/20*

U.S. Cl. 347—96 **23 Claims**

1. An ink jet printing process comprising the steps of image-wise projecting droplets of liquid onto a receiving material thus bringing into working relationship on said receiving material a reducible metal compound (A), a reducing agent (B) for said metal compound and physical development nuclei (C) that catalyze the reduction of said metal compound to metal.

5,751,326
COLOR PRINTING PROCESS AND PRODUCT

Matthew Bernasconi, Balmain, Australia, assignor to Opaltone International Limited, Balmain, Australia

PCT No. PCT/AU95/00192, § 371 Date Oct. 1, 1996, § 102(e) Date Oct. 1, 1996, PCT Pub. No. WO95/27231, PCT Pub. Date Oct. 12, 1995

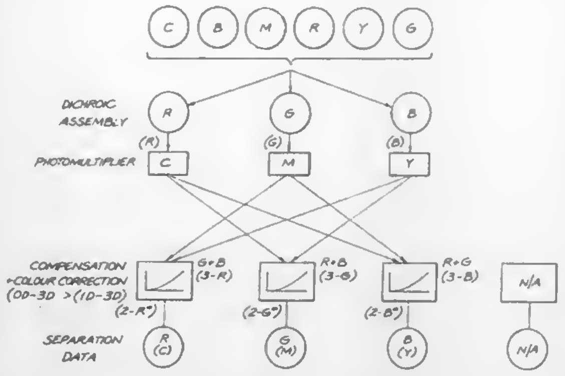
PCT Filed Apr. 5, 1995, Ser. No. 718,496

Claims priority, application Australia, Apr. 5, 1994, PM4814

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—115 **24 Claims**

1. A method of producing colour separations for a print process wherein an image source is scanned one or more times to produce a plurality of data channels each of which provides a representation of one colour separation of the image source, the data provided by each channel being restricted to represent a printable tone density



range, and the channels being separated into two groups, a first providing separation data representing a base image and comprising a compressed representation of the density range of the image source, and the second providing separation data representing a saturation image and substantially comprising a representation of the density range data lost from the first data set as a result of compression to a printable density range.

5,751,327
PRINTER INCLUDING TEMPERATURE CONTROLLED LED RECORDING HEADS

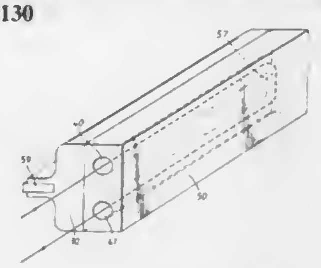
Etienne Marie De Cock; Lucien Amede De Schamphelaere, both of Edegem, and Alfons Jakob Grobben, Heverlee, all of Belgium, assignors to Xeikon N.V., Mortsel, Belgium

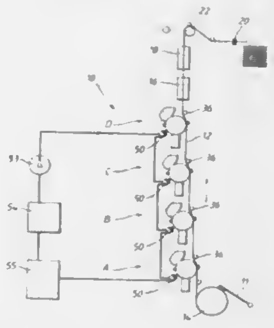
Filed Jun. 8, 1994, Ser. No. 255,609

Claims priority, application European Pat. Off., Jun. 18, 1993, 93304770

Int. Cl.^{6} B41J *2/385;2/435;2/45;* **H05K** *7/20*

U.S. Cl. 347—130 **8 Claims**





1. An electrophotographic printer comprising a plurality of image-producing stations, each of said image-producing stations including a recording head comprising a linear array of light-emitting diodes mounted on a common thermally conductive LED carrier bar having a longitudinal axis, wherein each said recording head is connected in series with each other said recording head in a closed cooling circuit; said carrier bar carrying a series of modules arranged along said longitudinal axis of said carrier bar, each of said modules containing N of said light emitting diodes with associated drivers; said carrier bar being in thermally conductive contact with a cooling means for cooling said carrier bar, said cooling means comprising a U-shaped duct inside a thermally conductive body in thermally conductive contact with said carrier bar, said duct extending between a fluid inlet located at one end of said carrier bar along said longitudinal axis and a fluid outlet location at said one end of said carrier bar for allowing flow of a cooling fluid therethrough, said U-shaped duct having an upper arm portion and a lower arm portion, said upper arm portion and said lower arm portion extending along the longitudinal axis of said carrier bar, said cooling fluid in said upper arm portion and said lower arm portion collectively cooling said carrier bar over the length thereof.

5,751,328
PRINTER HAVING CIRCUIT FOR PROVIDING IMPROVED PRINTING QUALITY

Jiro Tanuma; Katsuyuki Ito; Shinichi Katakura; Nobuo Wakasugi; Kazuhiko Nagaoka, and Toshikazu Ito, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

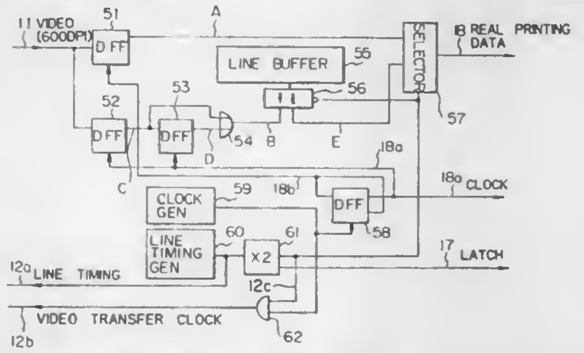
Division of Ser. No. 907,643, Jul. 2, 1992, Pat. No. 5,648,810.

This application May 31, 1995, Ser. No. 455,068

Claims priority, application Japan, Jul. 5, 1991, 3-165872; Oct. 1, 1991, 3-253967

Int. Cl.^{6} B41J *2/385;2/47;2/435;* **H04N** *1/23*

U.S. Cl. 347—130 **6 Claims**



1. A non-impact printer for use with a controller which emits to the printer a control signal and a video signal which has a predetermined resolution and which includes a series of sets of bit data, the series of sets of bit data including a given set of bit data, the bit data of the given set having a first portion and a second portion which consists of bit data remaining in the given set after removal of the first portion, comprising:

an LED head having a resolution that is smaller than the resolution of the video signal; and

control means for providing sequence control of the printer in response to the control signal and the video signal from the controller, the control means including a print data receiving circuit which comprises

first conversion means, receiving the video signal emitted by the controller, for converting the first portion of the bit data in the given set of bit data into a first signal representative of a data sequence which has a resolution corresponding to the resolution of the LED head;

means, receiving the first signal from the first conversion means, for transmitting the first signal to the LED head as a real printing data signal to be printed on a basic raster line;

second conversion means, receiving the video signal emitted by the controller, for converting the second portion of the bit data in the given set into a second signal representative of another data sequence;

a line buffer which receives the second signal from said second conversion means and stores the second signal; and

means, receiving the second signal from the line buffer, for transmitting the second signal to the LED head as a real printing data signal to be printed on an additional raster line that follows said basic raster line,

wherein said control means further includes means for generating printing drive signals which are supplied to the LED head to set a first LED head drive energy with which the basic raster line is printed and a second LED head drive energy with which the additional raster line is printed.

5,751,329
IONOGRAPHIC COLOR PRINTER WITH PLURAL PRINT HEADS REMOVABLE TONER CARTRIDGE AND ONE-TIME USABLE POLYMERIC WEB

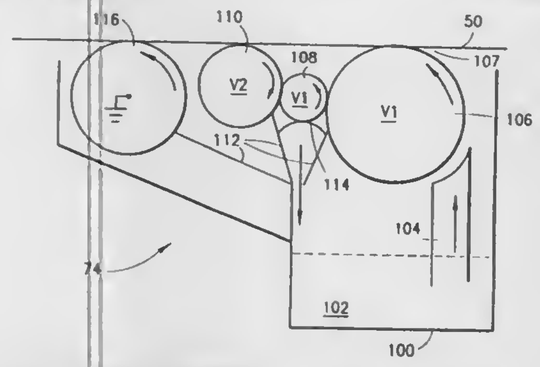
James G. Bearss, and Thomas Camis, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 206,478, Mar. 4, 1994, abandoned.

This application Jun. 20, 1996, Ser. No. 667,339

Int. Cl.^{6} B41J *2/385;* **G03G** *9/08;15/01;* **G01D** *15/06*

U.S. Cl. 347—156 **11 Claims**



1. A color printer comprising:

a movable dielectric surface for manifesting a charge state;

plural color developer modules arranged to engage said dielectric surface, each color developer module including an ion imaging module and an associated toner module, said ion imaging module for projecting an image-wise ion stream at said movable dielectric surface to cause a charge state to be emplaced on said movable dielectric surface in response to single color imaging signals applied to said ion imaging module, said associated toner module for applying a single color toner to said movable dielectric surface in accordance with a charge state created by an associated ion imaging module, said associated toner module including a heated conductive squeegee roller in direct contact with said movable dielectric surface for both fixing said toned image and for discharging any residual charge on said dielectric surface;

processor means for applying single color image signals to said ion imaging module and for controlling said associated toner module to apply toner to said movable dielectric surface;

means for moving said dielectric surface past said plural color developer modules to enable toner of multiple colors to be applied to said movable dielectric surface in registration and under control of said processor means; and

transfer means for transferring a toned multicolor image from said movable dielectric surface to a sheet after said image has passed a last one of said plural developer modules, whereby said toned multicolor image is produced during a single pass of said movable dielectric surface past said plural color developer modules.

5,751,330
PRINTER FOR PRINTING ON MEDIA ROLL

Pixie Ann Austin, Marysville; Christopher A. Wiklof, and Cathy L. Aragon, both of Everett, all of Wash., assignors to Intermec Corporation

Filed May 30, 1995, Ser. No. 454,503

Int. Cl.^{6} B41J *2/32*

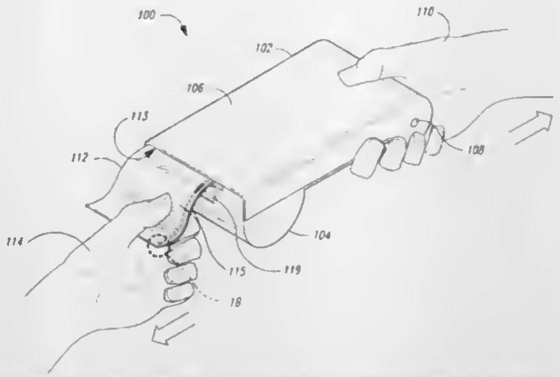
U.S. Cl. 347—171 **22 Claims**

14. A method of printing directly on an outer layer of a print medium on a print medium roll carried by a printer, the print medium roll including a plurality of wraps of the print medium, comprising the steps of:

rotatably mounting the print medium roll on a roll support with the outer layer exposed;

positioning a printhead in a printing position, adjacent to the outer layer and radially outward of the print medium roll;

grasping an end portion of the print medium;



pulling the end portion to cause the print medium roll to rotate on the roll support and dispense the outer layer;

monitoring movement of the outer layer to determine a portion of the outer layer aligned with the printhead;

selecting an image portion corresponding to the determined portion of the print medium; and

activating the printhead when the determined portion is located adjacent the printhead to print the selected image portion on the determined portion of the print medium.

5,751,331
INK SHEET TRANSFER CONTROL APPARATUS FOR GIVING A SPECIFIED VALUE OF TENSION TO INK SHEET TO IMPLEMENT STABLE TRANSFER

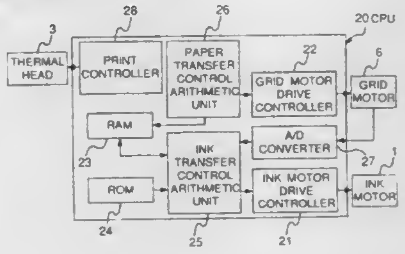
Kaoru Higuchi, Tenri; Hiroshi Ishii, Kashihara, and Hiroyuki Hanato, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

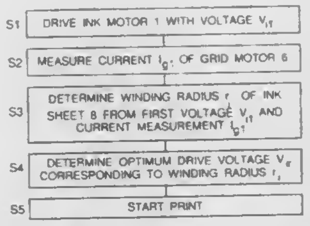
Filed Jun. 5, 1995, Ser. No. 463,770

Claims priority, application Japan, Jul. 4, 1994, 6-152290

Int. Cl.^{6} B41J *17/28;17/30;2/325;33/14*

U.S. Cl. 347—217 **21 Claims**


3
THERMAL HEAD
28
PRINT CONTROLLER
26
PAPER TRANSFER CONTROL ARITHMETIC UNIT
20 CPU
22
GRID MOTOR DRIVE CONTROLLER
6
GRID MOTOR
RAM
23
A/D CONVERTER
27
1
INK TRANSFER CONTROL ARITHMETIC UNIT
ROM
INK MOTOR DRIVE CONTROLLER
INK MOTOR
24
25
21


S1 DRIVE INK MOTOR 1 WITH VOLTAGE V11
S2 MEASURE CURRENT Ig1 OF GRID MOTOR 6
S3 DETERMINE WINDING RADIUS r OF INK SHEET 8 FROM FIRST VOLTAGE V11 AND CURRENT MEASUREMENT Ig1
S4 DETERMINE OPTIMUM DRIVE VOLTAGE Vr CORRESPONDING TO WINDING RADIUS r1
S5 START PRINT

1. An ink sheet transfer control apparatus having a print head for transferring ink applied to an ink sheet onto recording paper, a platen opposing the print head for sandwiching the ink sheet and the recording paper between the platen and the print head, an ink sheet transfer means for transferring the ink sheet, and a recording paper transfer means for transferring the recording paper, the ink sheet transfer means including an ink sheet transfer DC motor, and the recording paper transfer means including a recording paper transfer DC motor, the ink sheet transfer control apparatus comprising:

first control means for controlling the recording paper transfer means so that the recording paper is transferred at a constant speed, with the ink sheet and the recording paper pinched by the print head and the platen into pressing contact with each other;

measuring means for measuring a recording paper drive voltage with which the first control means is driving and controlling the recording paper transfer DC motor, when the ink sheet transfer DC motor is driven with a specified ink sheet drive voltage;

relational expression determining means for determining such a relational expression between the ink sheet drive voltage and the recording paper drive voltage that a specified tension is developed to the ink sheet, from the specified ink sheet drive voltage with which the ink sheet transfer DC motor is driven, and the recording paper drive voltage with which the recording paper transfer DC motor is driven; and

second control means for substituting a predetermined target recording paper drive voltage into the relational expression, to thereby calculate such an ink sheet drive voltage that the recording paper transfer DC motor is driven with the target recording paper drive voltage, whereby the ink sheet transfer DC motor is driven with the calculated ink sheet drive voltage.

5,751,332

CIRCUIT FOR GENERATING STROBE SIGNALS TO LED PRINT HEAD

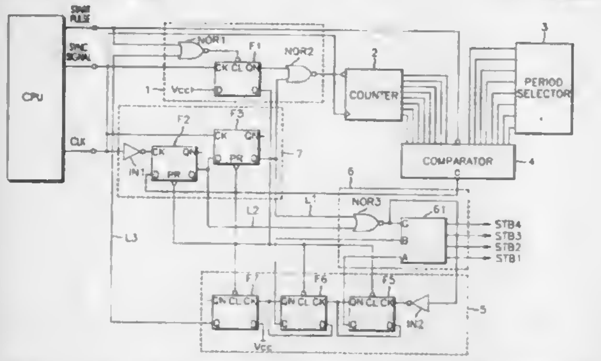
Kyung-Young Lee, Suwon, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 23, 1993, Ser. No. 110,228

Claims priority, application Rep. of Korea, Aug. 22, 1992, 1992-15139

Int. Cl.⁶ B41J *2/47;* **H04N** *1/23*

U.S. Cl. 347—240 **23 Claims**



20. A circuit for generating a plurality of strobe signals for controlling a light emitting diode print head, said circuit comprising:

counter means for generating a counter signal by counting clock pulses in response to start signals;

strobe period selector means for generating a plurality of strobe period selection signals each representing a selected period of said strobe signals for controlling the length of said strobe signals;

comparator means for generating a comparator signal by comparing said counter signal and said strobe period selection signals;

clock controller means for generating a gating clock signal for controlling the length of said strobe signals by latching said comparator signal in dependence upon said start signals;

output means for successively generating individual ones of said strobe signals in response to strobe control signals to control operation of said light emitting diode print head, said individual ones of said strobe signals having respective lengths determined by said gating clock signal; and

strobe controller means for generating said strobe control signals by latching said gating clock signal in dependence upon said start signals to control successive generation of said strobe signals.

5,751,333

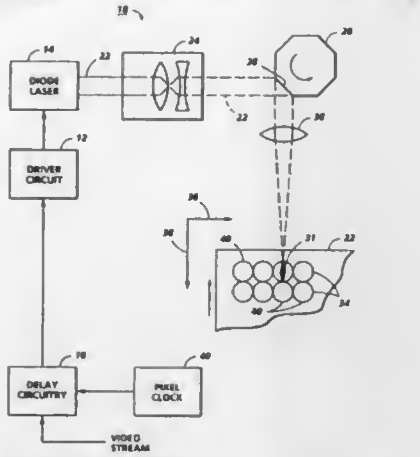
DYNAMIC CONTROL OF A ROS DIODE LASER TO IMPROVE OUTPUT IMAGING

Robert H. Melino, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 247,192, May 20, 1994. This application Nov. 14, 1995, Ser. No. 558,618

Int. Cl.⁶ B41J *2/47;4/435;* **H01S** *3/00;* **G01D** *15/14*

U.S. Cl. 347—247 **8 Claims**



1. A laser diode circuit, comprising:

a laser diode for emitting laser light in response to laser drive current;

a pixel clock for creating pixel time periods;

video data comprised of a serial stream of first logic levels and of second logic levels, wherein the video data is a binary representation of pixels of an image, wherein the first logic levels are each associated with turning the laser diode ON during a pixel time period, and wherein the second logic levels are each associated with turning a diode laser OFF for a pixel time period; and

a laser drive circuit for applying laser drive current to said diode laser in response to occurrences of the first logic levels such that laser light is emitted for a fixed portion of the pixel time period, wherein that fixed portion is less than a pixel time period.

5,751,334

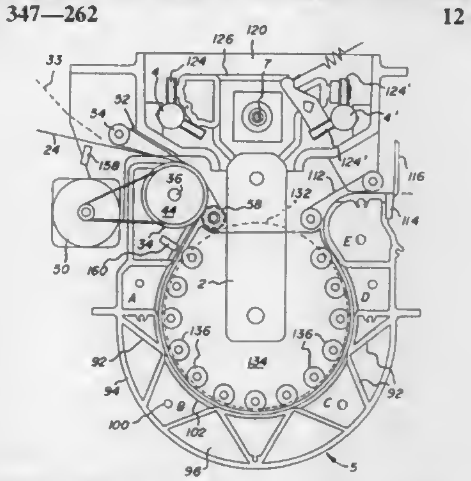
PRINTER WITH SUPPORT SHOE AND MEDIA METERING THEREIN

Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1995, Ser. No. 371,346

Int. Cl.⁶ B41J *2/435;* **G01D** *15/24;* **H01S** *1/131;* **G11B** *7/00*

U.S. Cl. 347—262 **12 Claims**



1. A printer comprising:

a stationary support shoe with an inlet side, an outlet side, and an at-least-partially cylindrical inner surface for receiving a web of light-sensitive recording media;

a metering roller at the inlet side of the stationary support shoe around which a received media web is wrapped;

a pressure roller opposed to the metering roller; and

at least one media guide belt mounted about a set of pulleys to guide media toward a nip between the pressure roller and the metering roller through which the media is driven into the stationary support shoe.

5,751,335

VIEWING RESTRICTING METHOD AND VIEWING RESTRICTING APPARATUS

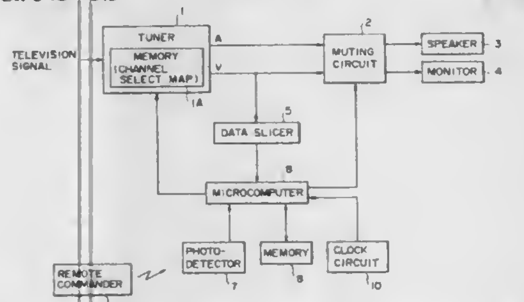
Peter Shintani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1996, Ser. No. 604,792

Claims priority, application Japan, Mar. 10, 1995, 7-050244

Int. Cl.⁶ H04N *7/16;7/167*

U.S. Cl. 348—5.5 **8 Claims**



1. A method for restricting viewing of a program which is transmitted with rating data corresponding to a rating of said program, program length data corresponding to a broadcast length time, and a start time of said program, comprising steps of:

determining whether said rating satisfies a predetermined condition;

calculating an end time of said program from said broadcast length time and said start time; and

muting said program corresponding to said rating until said end time of said program when said rating satisfies said predetermined condition.

5,751,336

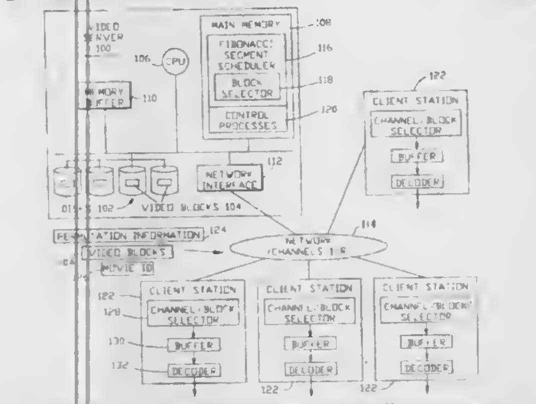
PERMUTATION BASED PYRAMID BLOCK TRANSMISSION SCHEME FOR BROADCASTING IN VIDEO-ON-DEMAND STORAGE SYSTEMS

Charu Chandra Aggarwal, Cambridge, Mass.; Joel Leonard Wolf, Katonah, and Philip Shl-Lung Yu, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1995, Ser. No. 542,002

Int. Cl.⁶ H04N *7/173*

U.S. Cl. 348—7 **11 Claims**



1. A method of broadcasting any of audio programs, video programs, audio-visual programs and other programs, for use in a system wherein the programs are broadcast to receiving stations, comprising the steps of:

repetitively broadcasting to the receiving stations a given portion of a particular program; and,

repetitively broadcasting to the receiving stations, less frequently than the given portion, a subsequent portion of the particular program;

wherein data blocks of at least one of the given portion and the subsequent portion are broadcast in varying permutations from one repetition to a next repetition.

5,751,337

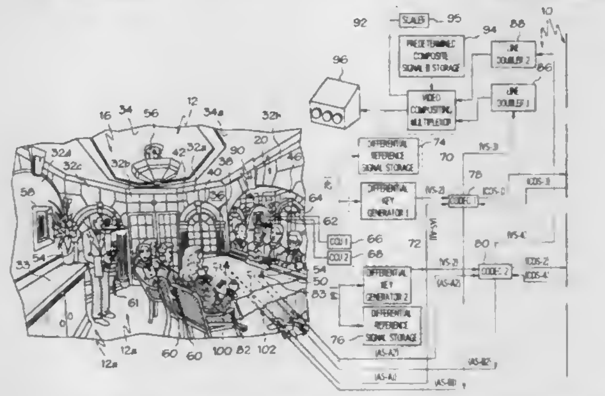
TELECONFERENCING METHOD AND SYSTEM FOR PROVIDING FACE-TO-FACE, NON-ANIMATED TELECONFERENCE ENVIRONMENT

David Lee Allen, Arcanum, and Herold Williams, Huber Heights, both of Ohio, assignors to TeleSuite Corporation, Englewood, Ohio

Continuation of Ser. No. 308,603, Sep. 19, 1994, Pat. No. 5,572,248. This application Nov. 4, 1996, Ser. No. 740,839

Int. Cl.⁶ H04M *11/00;* **H04N** *7/10*

U.S. Cl. 348—15 **85 Claims**


92
SCALER
95
94
88
10
PRESTE TERMINAL COMPOSITE SIGNAL B STORAGE
LINE DOUBLER 2
86
96
VIDEO COMPOSITING MULTIPLEXER
LINE DOUBLER 1
16
34
56
12
34a
32
20
74
DIFFERENTIAL REFERENCE SIGNAL STORAGE
70
78
DIFFERENTIAL KEY GENERATOR
72
64
62
66
68
80
50
58
60
60
100
82
102
12a
76
DIFFERENTIAL KEY GENERATOR
DIFFERENTIAL REFERENCE SIGNAL STORAGE

1. A video mirror system for use in a video conference, comprising a plurality of stations comprising:

a display; and

an imager coupled to said display for generating a superimposed image which is not a cartoon animation, said superimposed image comprising at least a portion of one of said plurality of stations combined with an image of at least one participant from said one of said plurality of stations and also for causing said display to display said superimposed image such that when said superimposed image is displayed at a non-remote station having a predetermined motif during the video conference the at least one participant appears life-size and face-to-face in the presence of a participant at the non-remote station.

5,751,338

METHODS AND SYSTEMS FOR MULTIMEDIA COMMUNICATIONS VIA PUBLIC TELEPHONE NETWORKS

Lester Frank Ludwig, Jr., Foster City, Calif., assignor to Visionary Corporate Technologies, Incline Village, Nev.

Filed Dec. 30, 1994, Ser. No. 367,976

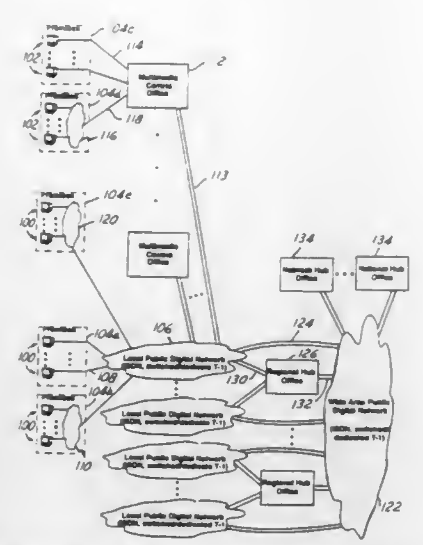
Int. Cl.⁶ H04N *7/10:7/14;* **H04M** *11/00;3/42*

U.S. Cl. 348—17 **42 Claims**

1. A system for providing a plurality of multimedia telecommunication services to a plurality of multimedia workstations at least two of which are distributed among a first premise and a second premise, the system comprising:

a multimedia central office located at a third premise, the multimedia central office including:

a digital switch complex coupled to at least one of the plurality of workstations via a public digital telephone network:



at least one twisted pair transceiver coupled to a second one of the plurality of workstations via at least one twisted pair link in a telephone loop plant; and

at least one switch complex operatively associated with the digital switch complex and the at least one twisted pair transceiver;

wherein the multimedia central office transceives signals with one of the multimedia workstations interfaced to the public digital telephone network, transceives signals with one of the multimedia workstations interfaced to the twisted pair link in the telephone loop plant, and the signals include audio signals, video signals, and digital data signals; and

wherein an analog video signal is communicated between the multimedia central office and at least one of the multimedia workstations using a plurality of space division video signals, each of the space division video signals being transmitted over a corresponding one of a plurality of twisted pair links.

5,751,339

TELEVISION CONVERSATION/MONITORING SYSTEM CHANGING TRANSMISSION CAPACITY RESPONSIVE TO STATE CHANGE IN REMOTE LOCATION

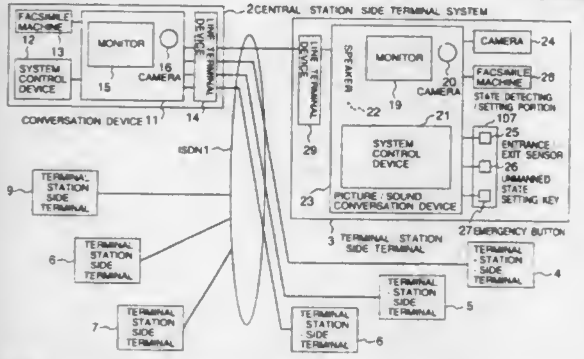
Toru Aramaki; Kiyoshi Ishida, both of Yokohama, and Toshio Watanabe, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1995, Ser. No. 542,031

Claims priority, application Japan, Oct. 12, 1994, 6-245881

Int. Cl.⁶ H04N *7/12;* H04M *11/00*

U.S. Cl. 348—17 **12 Claims**


2 CENTRAL STATION SIDE TERMINAL SYSTEM
FACSIMILE MACHINE
12
13
SYSTEM CONTROL DEVICE
MONITOR
15
16
CAMERA
LINE TERMINAL DEVICE
CONVERSATION DEVICE 11
14
ISDN 1
LINE TERMINAL DEVICE
SPEAKER
MONITOR
19
22
20
CAMERA
CAMERA 24
FACSIMILE MACHINE 28
STATE DETECTING /SETTING PORTION
107
21
SYSTEM CONTROL DEVICE
25
ENTRANCE EXIT SENSOR
26
UNMANNED STATE SETTING KEY
29
23
PICTURE / SOUND CONVERSATION DEVICE
27 EMERGENCY BUTTON
3 TERMINAL STATION SIDE TERMINAL
9 TERMINAL STATION SIDE TERMINAL
6 TERMINAL STATION SIDE TERMINAL
7 TERMINAL STATION SIDE TERMINAL
TERMINAL STATION SIDE TERMINAL 4
TERMINAL STATION SIDE TERMINAL 5
TERMINAL STATION SIDE TERMINAL 6

10. A method for changing transmission capacity in a television conversation/monitoring system for transmitting and receiving pictures and sounds between a plurality of terminal-station-side terminal systems and a central-station-side terminal system, which are connected to each other through an integrated service digital communication network, comprising:

the step of conducting simultaneous communications between at least a sub-plurality of said terminal-station-side terminal systems and said central-station-side terminal system;

the step in which each of said terminal-station-side terminal systems transmits state change information when the state of the terminal station is changed; and

the step in which said central-station-side terminal system changes during communications the transmission capacity for transmissions with respect to at least one selected terminal-station-side terminal system in accordance with said received state change information.

5,751,340

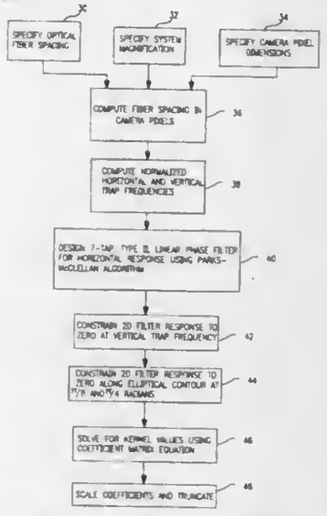
METHOD AND APPARATUS FOR REDUCING THE INHERENTLY DARK GRID PATTERN FROM THE VIDEO DISPLAY OF IMAGES FROM FIBER OPTIC BUNDLES

Karlheinz Strobl, Fiskdale, Mass.; Bryan D. Kennedy; David Chatenever, both of Santa Barbara, Calif., and Klaus Irion, Tuttlingen, Germany, assignors to Karl Storz GmbH & Co., Tuttlingen, Germany

Filed Aug. 21, 1996, Ser. No. 701,131

Int. Cl.⁶ A61B *1/04;* H04N *5/21;5/235*

U.S. Cl. 348—65 **27 Claims**


30
SPECIFY OPTICAL FIBER SPACING
32
SPECIFY SYSTEM MAGNIFICATION
34
SPECIFY CAMERA PIXEL DIMENSIONS
COMPUTE FIBER SPACING IN CAMERA PIXELS
36
COMPUTE NORMALIZED HORIZONTAL AND VERTICAL TRAP FREQUENCIES
38
DESIGN 7-TAP TYPE II LINEAR PHASE FILTER FOR HORIZONTAL RESPONSE USING PARKS-McCLELLAN ALGORITHM
40
CONSTRAIN 2D FILTER RESPONSE TO ZERO AT VERTICAL TRAP FREQUENCY
42
CONSTRAIN 2D FILTER RESPONSE TO ZERO ALONG ELLIPTICAL CONTOUR AT π/8 AND π/4 RADIANS
44
SOLVE FOR KERNEL VALUES USING COEFFICIENT MATRIX EQUATION
46
SCALE COEFFICIENTS AND TRUNCATE
48

1. In combination with an endoscope and a video display, said video display having an array of pixels for displaying purposes, said endoscope including an objective lens at its distal end and a fiber optic bundle for transmitting an image to a CCD camera at its proximal end;

said fiber optic bundle comprising a substantial number of optical fibers each with distal and proximal ends, the ends of said fibers forming an array which is identical at both of said ends of said bundle, whereby to forward an image from said lens to said camera, each said fiber consisting of a central light-transmitting core and a peripheral cladding, said fibers being clustered so as to form voids between groups of contacting fibers, said claddings and said voids being non-transmissive of light so as to form a visible dark grid encompassing said light-transmissive cores;

said camera having arrays of pixels at photo sites on said camera respective to pixels on said display, the improvement comprising;

grid reduction means receiving pixel signals from said camera and generating respective enhanced signals for said display, said grid reduction means comprising circuitry which adjusts the color and intensity of the signal generated by the CCD respective to pixels in said grid, thereby to reduce the prominence of said grid.

5,751,341

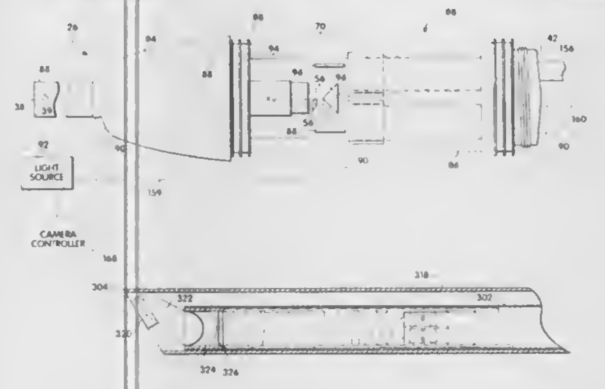
STEREOSCOPIC ENDOSCOPE SYSTEM

Christopher R. Chaleki, Haydenville; Wayne P. Griffin, Dracut; E. Arthur Woodbury, Boxford; Arthur C. McKinley, Bradford, and Harry R. McKinley, Southampton, all of Mass., assignors to Vista Medical Technologies, Inc., Carlsbad, Calif.

Continuation of Ser. No. 227,675, Apr. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 76,944, Jun. 14, 1993, abandoned, and Ser. No. 664, Jan. 5, 1993, abandoned. This application Oct. 2, 1996, Ser. No. 720,816

Int. Cl.⁶ H04N *7/18*

U.S. Cl. 348—65 **31 Claims**



1. A medical video endoscope system comprising:

(a) a stereoscopic endoscope comprising a handle portion (**68**), a tubular barrel portion (**66**), and a light-sensing system, said tubular barrel portion containing an objective lens system (**36**) for generating left and right optical images of an object viewed by said medical video endoscope system, and said light-sensing system including means for alternately sensing said left and right optical images and converting said sensed left and right optical images to left and right video image signals respectively; and

(b) a tubular sheath assembly (**300**) having a longitudinal axis and surrounding and extending lengthwise of and parallel to said barrel portion of said endoscope, said tubular sheath assembly (i) being rotatable relative to said barrel portion, (ii) including a distal tip portion (**310**) having a front face (**304**) that extends at an acute angle to said longitudinal axis, and (iii) containing optical means (**320**, **322**. **324**. **326**) for directing optical images from the direction in which said front face of the angled distal tip portion is pointed to said objective lens system, whereby rotation of said sheath assembly relative to said barrel portion causes changes in the direction in which said front face of said distal tip portion is pointed and thus allows viewing direction changes in the stereoscopic endoscope viewing of said object in response to rotation of said sheath assembly relative to said barrel portion.

5,751,342

VISUAL INSPECTION SYSTEM FOR A PRODUCT

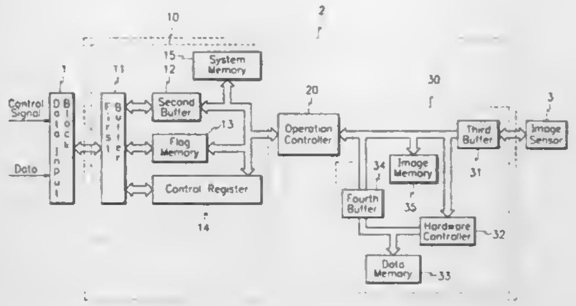
Man-Tae Kim, Gumgoc-dong; Min-Sik Kim, Kyungki-do, and Jin-Hong Park, Unyang-eup, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 1, 1996, Ser. No. 743,128

Claims priority, application Rep. of Korea, Nov. 22, 1995, 95-42937

Int. Cl.⁶ H04N *7/18*

U.S. Cl. 348—92 **4 Claims**



3. A visual inspection system for a product, comprising:

a data input block for inputting a control signal and data;

an image sensor for inputting a video image of a product to be tested; and

a signal processor for testing the product, said signal processor comprising:

a control signal processor having a first buffer for temporarily storing the control signal and the data inputted through the data input block, a control register connected to the first buffer for storing the control signal, and a second buffer for outputting the data from the first buffer,

a video signal controller for receiving the video image of the product from the image sensor, processing the video image data into an image signal, and storing the image signal in memory, and

an operation controller for storing the data from the second buffer, and for generating a test result in response to the control signal according to the stored data and the image signal,

wherein the control signal processor further comprises a flag memory connected to the first buffer for storing the test result, and a system memory connected to the second buffer, the flag memory and the control register for controlling input and output operations of the control signal processor.

5,751,343

FILM IMAGE REPRODUCTION SIGNAL OUTPUT APPARATUS

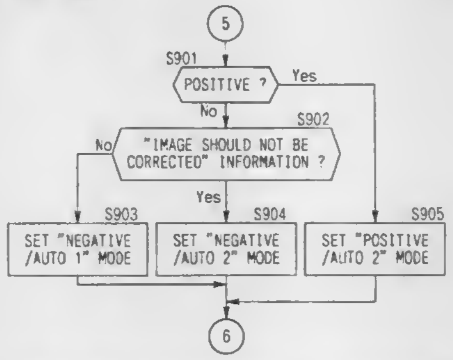
Hideo Hibino, Kawasaki; Kazuyuki Kazami; Norikazu Yokonuma, both of Tokyo, and Hisashi Okutsu, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 7, 1997, Ser. No. 795,131

Claims priority, application Japan, Feb. 9, 1996, 8-024275

Int. Cl.⁶ H04N *7/18*

U.S. Cl. 348—96 **11 Claims**


5
S901
POSITIVE ?
Yes
No
S902
No
"IMAGE SHOULD NOT BE CORRECTED" INFORMATION ?
Yes
S903
S904
S905
SET "NEGATIVE /AUTO 1" MODE
SET "NEGATIVE /AUTO 2" MODE
SET "POSITIVE /AUTO 2" MODE
6

1. A film image reproduction signal output apparatus comprising:

an image pickup device that picks up an image on a film that has been developed;

an image reproduction circuit that produces an image reproduction signal based on an image signal received from said image pickup device;

a film type detector that determines whether said film is a negative film or a positive film; and

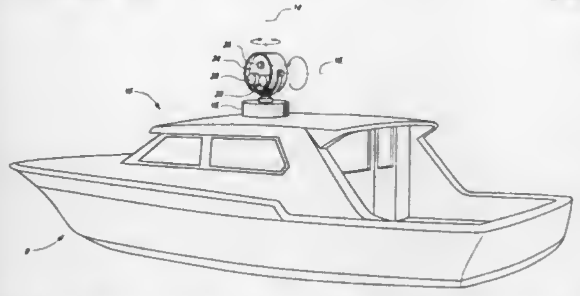
a control circuit that controls said image reproduction circuit so as to produce said image reproduction signal by reversing said image signal from said image pickup device when said film type detector determines that said film is a negative film.

5,751,344

NAVIGATION SYSTEM FOR A MARINE VESSEL IN LOW LIGHT CONDITIONS

Robert Alan Schnee, 2905 Pacific Ct., Irving, Tex. 75062
Continuation of Ser. No. 498,167, Jul. 5, 1995, abandoned. This application Jul. 2, 1997, Ser. No. 886,660
Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—113 **1 Claim**



1. A marine navigation system for use in conjunction with vessels having a helm and a separate captain's cabin, including:

a camera housing;

a low-light video camera mounted in the housing and having a predetermined aiming direction; ", the low-light video camera including a lens for focusing an image on a light amplifier for light amplification and an image sensor coupled to the light amplifier".

a conventional video camera mounted in the housing and having the same aiming direction as the low-light video camera;

the low-light video camera and the conventional video camera each for generating video output signals;

photo responsive means mounted in the housing for sensing ambient light conditions;

first motor driven means for selectively pivoting the housing and therefore the low-light camera, the conventional video camera, and the photo responsive means about a nominally vertical axis through an arc of about 360 degrees;

second motor driven means for selectively pivoting the housing and therefore the low-light camera, the conventional video camera, and the photo responsive means about a nominally horizontal axis through an arc of about 60 degrees;

means for generating an azimuth signal indicative of the positioning of the housing and therefore the low-light and conventional video cameras relative to the nominally vertical axis;

means for generating an elevation signal indicative of the positioning of the housing and therefore the low-light and conventional video cameras relative to the nominally horizontal axis;

means responsive to the output of the photo responsive means for automatically selecting either the low-light video camera or the conventional video camera depending on ambient light conditions;

selector switch means for selectively actuating either the low-light video camera or the conventional video camera notwithstanding the ambient light conditions as determined by the photo responsive means;

first control means mounted at the helm of the vessel for selective actuation to cause the first and second motor driven means to pivot the housing about the nominally vertical axis and about the nominally horizontal axis and thereby aiming the low-light video camera and the conventional video camera at a pre-determined target;

first television receiver means mounted at the helm of the vessel for receiving a video signal either from the low-light video camera or from the conventional video camera and for displaying the received signal;

means responsive to the azimuth signal generating means and to the elevation signal generating means for overlying azimuth and elevation data on the image displayed on the first television receiver means;

second control means mounted in the captain's cabin of the vessel for selective actuation to operate the first and second motor driven means to position the housing about the nominally vertical axis and about the nominally horizontal axis and thereby aiming the low-light video camera and the conventional video camera at a pre-determined target;

second television receiver means mounted in the captain's cabin for receiving video signals either from the low-light video camera or from the conventional video camera and for displaying the received signal;

means responsive to the azimuth and elevation signal generating means for overlying data indicative of the azimuth and elevation of the housing on the image displayed on the second television receiver means;

conventional television signal receiving means mounted on the vessel;

means for selectively displaying signals received by the conventional television signal receiving means on either the first television receiver means, or on the second television receiver means, or both; means for determining vessel speed and direction; means for overlying visual representations of the vessel speed and direction on the image displayed on either of the first or second television receiver means;

a global positioning satellite system mounted on the vessel for generating output signals indicative of the longitude and latitude of the vessel; and

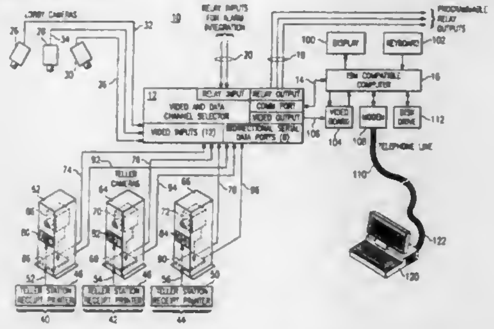
means for displaying the output of the global positioning satellite system on either the first television receiver means, or the second television receiver means, or both.

5,751,345

IMAGE RETENTION AND INFORMATION SECURITY SYSTEM

Charles Wayne Dozier, Garland, and Thomas William Mitchell, Plano, both of Tex., assignors to Dozier Financial Corporation, Dallas, Tex.
Division of Ser. No. 386,888, Feb. 10, 1995, abandoned. This application Jan. 8, 1997, Ser. No. 781,032
Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—153 **9 Claims**


LOBBY CAMERAS
RELAY INPUTS FOR ALARM INTEGRATION
PROGRAMMABLE RELAY OUTPUTS
DISPLAY
KEYBOARD
IBM COMPATIBLE COMPUTER
RELAY INPUT
RELAY OUTPUT
VIDEO AND DATA CHANNEL SELECTOR
COMM PORT
VIDEO OUTPUT
VIDEO INPUTS (12)
BIDIRECTIONAL SERIAL DATA PORTS (8)
VIDEO BOARD
MODEM
DISK DRIVE
TELEPHONE LINE
TELLER CAMERAS
TELLER STATION RECEIPT PRINTER
TELLER STATION RECEIPT PRINTER
TELLER STATION RECEIPT PRINTER

6. A method for acquiring and storing video images and related data, comprising the steps of:

monitoring the outputs from a plurality of transaction machines to detect the generation of selected data by any one of said transaction machines,

in response to detecting the generation of selected data by a one of said transaction machines, connecting the output of a video camera, which corresponds to said one transaction machine, to an input of an image digitizer,

activating said image digitizer to produce a video digital frame image when said video camera has ben connected to said image digitizer,

producing a digital image file for said digital image,

producing an identification for said digital image file,

producing a digital data record after the generation of said selected data by said one transaction machine, said digital data record including at least said selected data and said identification for said digital image file, wherein said identification is a unique identifier for associating said digital image file with its corresponding digital data record, and

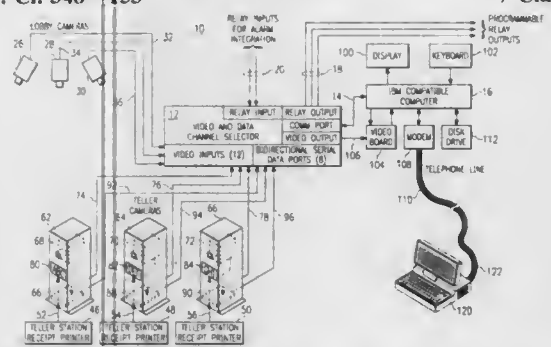
storing said digital image file and said digital data record on a digital storage, wherein said digital data record references said digital image file by said identification.

5,751,346

IMAGE RETENTION AND INFORMATION SECURITY SYSTEM

Charles Wayne Dozier, Garland, and Thomas William Mitchell, Plano, both of Tex., assignors to Dozier Financial Corporation, Dallas, Tex.
Continuation of Ser. No. 386,888, Feb. 10, 1995, abandoned. This application Jan. 8, 1997, Ser. No. 780,529
Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—153 **7 Claims**


LOBBY CAMERAS
RELAY INPUTS FOR ALARM INTEGRATION
PROGRAMMABLE RELAY OUTPUTS
DISPLAY
KEYBOARD
IBM COMPATIBLE COMPUTER
RELAY INPUT
RELAY OUTPUT
VIDEO AND DATA CHANNEL SELECTOR
COMM PORT
VIDEO OUTPUT
VIDEO INPUTS (12)
BIDIRECTIONAL SERIAL DATA PORTS (8)
VIDEO BOARD
MODEM
DISK DRIVE
TELEPHONE LINE
TELLER CAMERAS
TELLER STATION RECEIPT PRINTER
TELLER STATION RECEIPT PRINTER
TELLER STATION RECEIPT PRINTER

7. A method of operation for a video security system, comprising the steps of:

transferring an output signal from a video security camera to an image digitizer,

digitizing first and second time spaced images from said video camera when said camera is connected to said image digitizer.

comparing said first and second images to measure the extent of change from said first image to said second image,

comparing said extent of change to a reference value to determine if said extent of change is greater than said reference value,

storing said second image in a digital storage only when said extent of change is greater than said reference value, wherein said second images can be read from said digital storage,

accumulating a group of said second images which are stored concurrently in said digital storage, and

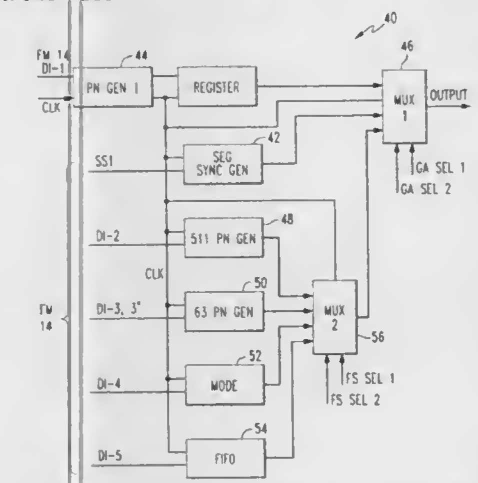
retrieving for examination from said digital storage at least one of said second images in said group of said second images stored in said digital storage.

5,751,347

VESTIGIAL SIDEBAND TEST SIGNAL GENERATOR AND METHOD

Joseph Lee Seccia, and Edwin Ray Twitchell, both of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.
Filed Mar. 26, 1996, Ser. No. 622,672
Int. Cl.^{6} H04N *17/00*

U.S. Cl. 348—181 **21 Claims**



1. A test signal generator for providing a test signal in a format which simulates a real signal of M symbols which has certain of the symbols which are sync symbols and other of the symbols which are data symbols, the test signal generator comprising:

counter means for providing a symbol count at a rate which simulates the real signal;

logic means for generating instructions upon receipt of predetermined ones of the symbol count;

symbol generator means for generating the sync symbols upon receipt of predetermined ones of the instructions and for generating pseudorandom symbols upon receipt of other predetermined ones of the instructions; and

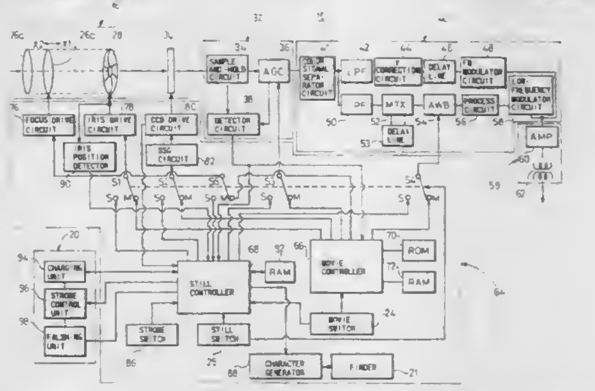
means for combining the sync symbols and the pseudorandom symbols to provide an output which simulates the real signal.

5,751,348

MOVIE CAMERA FOR STORING MOVIE AND STILL IMAGES IN PROPER CHRONOLOGY ON A COMMON RECORDING MEDIUM

Masafumi Inuiya, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Company, Ltd., Kanagawa-ken, Japan
Division of Ser. No. 300,230, Sep. 6, 1994, Pat. No. 5,559,552, which is a continuation of Ser. No. 188,117, Jan. 28, 1994, abandoned, which is a continuation of Ser. No. 873,104, Apr. 24, 1992, abandoned. This application Jun. 6, 1996, Ser. No. 659,513
Claims priority, application Japan, Apr. 26, 1991, 3-097388
Int. Cl.^{6} H04N *5/220*

U.S. Cl. 348—220 **11 Claims**



1. A movie camera for shooting a movie and for shooting a still image during a temporary interruption of the movie shooting, said movie camera comprising:

(a) a photoelectric device for producing an image signal of color signals corresponding to light received from a subject;

(b) a shutter associated with said photoelectric device;

(c) optical means for receiving said light from a subject and controlling the passage of said light to said photoelectric device;

(d) a light source for emitting an electronic flash, to illuminate the subject;

(e) shutter speed and light source controlling means, responsive to the temporary interruption, for setting the speed of said shutter higher than when shooting the movie, and for controlling said light source so that said electronic flash is synchronized with the opening of said shutter and is terminated before the closing of said shutter;

(f) an amplifier for amplifying said image signal;

(g) switcher means for manually temporarily interrupting a movie shooting operation to perform said still image shooting during emission of said electronic flash, and automatically returning to the movie shooting operation upon completion of said still shooting operation;

(h) amplification controlling means for automatically controlling the amplification of said amplifier, wherein the image signal corresponding to the still image is recorded on the same recording medium as the image signal corresponding to the movie shooting, such that said still image is recorded on said same recording medium between successive movie image signals in proper chronology and during a period in which said movie image signals are not recorded; and

(i) white balancing means for adjusting the white balance of the color signals of the image signal corresponding to the still image shot during the temporary interruption, for color temperature of the electronic flash.

5,751,349

WHITE BALANCE CONTROL DEVICE AND METHOD USING A VARIABLE REGION TO REDUCE DETERIORATION OF REPRODUCED COLOR WHEN A USER MANUALLY SELECTS A LIGHT SOURCE

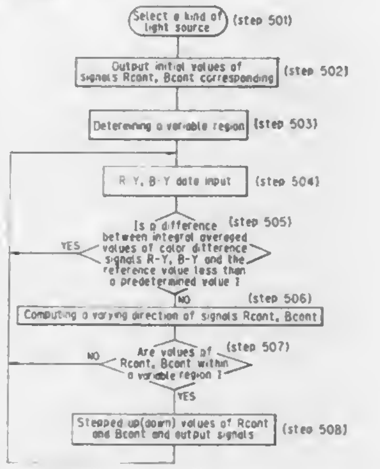
Seiichi Matsui; Yoshio Nakane, and Kenji Saito, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 447,730, May 23, 1995, Pat. No. 5,565,913, which is a division of Ser. No. 922,488, Jul. 31, 1992, Pat. No. 5,329,361, which is a division of Ser. No. 245,689, May 18, 1994, Pat. No. 5,488,292. This application Aug. 15, 1996, Ser. No. 698,423

Claims priority, application Japan, Sep. 4, 1991, 3-224435; Sep. 4, 1991, 3-224439

Int. Cl.^{6} H04N *9/73*

U.S. Cl. 348—228 **14 Claims**


Select a kind of light source (step 501)
Output initial values of signals Rcont, Bcont corresponding (step 502)
Determining a variable region (step 503)
R-Y, B-Y data input (step 504)
Is a difference between integral averaged values of color difference signals R-Y, B-Y and the reference value less than a predetermined value I (step 505)
YES
NO
Computing a varying direction of signals Rcont, Bcont (step 506)
Are values of Rcont, Bcont within a variable region I (step 507)
NO
YES
Stepped up(down) values of Rcont and Bcont and output signals (step 508)

1. A method for controlling white balance control signals, comprising the step of:

(a) manually selecting light sources;

(b) controlling white balance by controlling an amplification degree of a red elementary color signal and a blue elementary color signal out of red-, green-, and blue-elementary color signals;

(c) outputting first and second color difference signals by processing elementary color signals white balance controlled by said step (b);

(d) transmitting white balance control signals to said step (b), wherein said step (b) is actuated for equalizing integral averaged values of said first and second color difference signals, and reference values and predetermined integral averaged values for each first and second color difference signal are set as said reference values when an averaged color of all colors in a picture becomes an achromatic color at a reference color temperature;

said step (d) further includes determining initial values of white balance control signals for outputting and a variable region in order to control said values of said white balance control signals within said variable region; and

(e) determining if said first and second color difference signals are within said variable region.

5,751,350

DUAL MODE ELECTRONIC CAMERA HAVING A LARGE RECORDING CAPACITY

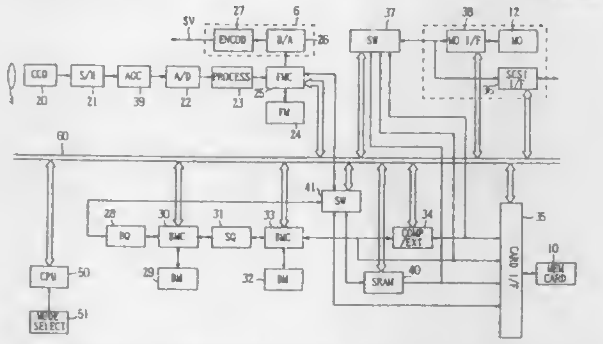
Satomi Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Japan

Continuation of Ser. No. 536,117, Sep. 29, 1995, abandoned, which is a continuation of Ser. No. 307,007, Sep. 16, 1994, Pat. No. 5,525,957. This application Jan. 15, 1997, Ser. No. 783,322

Claims priority, application Japan, Sep. 20, 1993, 5-257610

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 348—231 **15 Claims**



1. An electronic still camera having a first operational mode for creating a single image of a light image from an object, and a second operational mode for continuously imaging said light image, said camera comprising:

an imaging device for at converting said light image to an output image signal;

image data processing means for processing said image signal into digital image data;

a first memory means for temporarily storing said image data from said image data processing means;

a second memory means for temporarily storing image data read out from said first memory means, said second memory means having a memory access time;

recording means for recording image data read out from said first memory means on a recording medium, said recording means having a recording access time which is longer than said memory access time;

compression means for compressing the image data from said first memory means;

switching means for selectively supplying said image data from said first memory means to said compression means and to said second memory means;

means for transmitting said image data from said second memory means to said recording means; and

control means for supplying the image data from said first memory means directly to at least one of said recording means and compression means in said first operational mode, and for supplying the image data from said first memory means to said second memory means in said second operational mode.

5,751,351

VIDEO CAMERA APPARATUS WITH INHIBITION OF IMAGE DISPLAY DURING INITIALIZATION

Hirokazu Mogi, Saitama-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

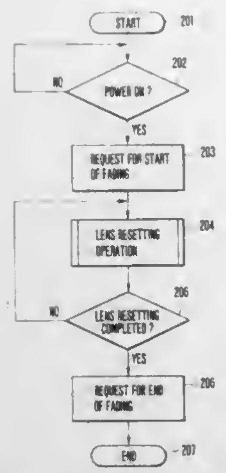
Continuation of Ser. No. 415,141, Mar. 28, 1995, abandoned, which is a continuation of Ser. No. 156,381, Nov. 22, 1993, abandoned, which is a continuation of Ser. No. 63,366, May 17, 1993, abandoned, which is a continuation of Ser. No. 713,705, Jun. 11, 1991, abandoned. This application Jun. 17, 1997, Ser. No. 877,419

Claims priority, application Japan, Jun. 14, 1990, 2-156705

Int. Cl.^{6} H04N *5/262;5/225*

U.S. Cl. 348—239 **17 Claims**

1. A video camera apparatus comprising:


START
201
POWER ON ?
202
NO
YES
REQUEST FOR START OF FADING
203
LENS RESETTING OPERATION
204
LENS RESETTING COMPLETED ?
205
NO
YES
REQUEST FOR END OF FADING
206
END
207

(A) an optical system, including a zooming lens and a focusing lens for compensating a variation of a focal position due to a movement of said zooming lens, for forming an image;

(B) a camera part for converting the image formed by said optical system into an image signal and outputting the image signal;

(C) initializing means, in response to POWER-ON, for performing an initialization operation of said optical system by moving said zooming lens to a first resetting position and moving said focusing lens to a second resetting position;

(C') generating means for generating a predetermined signal for displaying on the initializing operation;

(C") detecting means for detecting a completion of the initializing operation; and

(D) controlling means, in response to POWER-ON, for controlling an output signal of said camera part to inhibit outputting of the image signal corresponding to said image and to place the output signal in the predetermined signal output from said generating means, and in response to an output of said detecting means to permit said camera part to output the image signal.

5,751,352

EXPOSURE CONTROL DEVICE

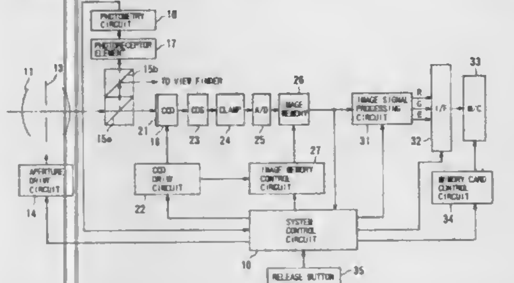
Kimiaki Ogawa, Itabashi-ku, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,715, Jun. 19, 1995, abandoned. This application Apr. 7, 1997, Ser. No. 833,523

Claims priority, application Japan, Jun. 20, 1994, 6-160553

Int. Cl.^{6} H04N *5/235*

U.S. Cl. 348—364 **21 Claims**



1. An exposure control device provided in a still-video camera, said exposure control device comprising:

an imaging device for forming an object image;

photometry measuring means for performing photometry measurements to obtain a first photometry value corresponding to a first object and a second photometry value corresponding to a second object;

provisional exposing means for performing a provisional exposure in which said imaging device is provisionally exposed, said provisional exposure being performed in accordance with a first aperture value and a first electric charge accumulating time which are obtained based on said second photometry value, so that a provisional exposure value is obtained in accordance with an output signal of said imaging device;

means for obtaining a proper exposure value in accordance with characteristics of components of said still-video camera;

means for calculating a ratio of said proper exposure value and said provisional exposure value; and

normal exposing means for performing a normal exposure in which said imaging device is normally exposed, said normal exposure being performed in accordance with a second aperture value and a normal electric charge accumulating time, said normal electric charge accumulating time being obtained based on said ratio of said proper exposure value and said provisional exposure value and said first photometry value.

5,751,353

SWITCHING APPARATUS FOR TV LENS UNIT SWITCHING

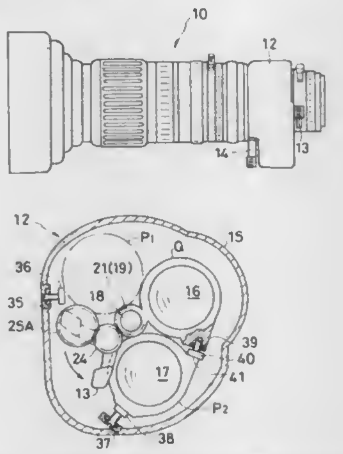
Minoru Tanaka; Shigeru Yamamoto, and Yoshitaka Mori, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 11, 1995, Ser. No. 570,607

Claims priority, application Japan, Dec. 16, 1994, 6-334326; Dec. 16, 1994, 6-334327

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—335 **7 Claims**



1. A Switching Apparatus for TV magnification Lens Switching comprising:

at least two lens units having different magnifications which are supported so as to be rotatable independently of each other and selectively movable from respective resting positions outside of an imaging optical path to a working position in said imaging optical path; and

operating levers for respectively rotating said lens units via gears.

5,751,354

IMAGE SENSING APPARATUS AND METHOD WITH EXPOSURE PERFORMED BASED ON FOCUS EVALUATION VALUES

Masao Suzuki, Tokyo, and Saburo Nakazato, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1995, Ser. No. 423,732

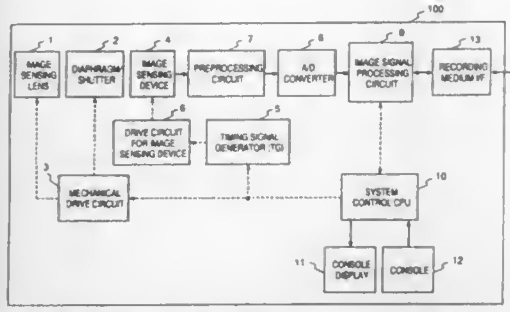
Claims priority, application Japan, Apr. 28, 1994, 6-114171; Apr. 28, 1994, 6-114173

Int. Cl.^{6} H04N *5/232;5/235;5/238*

U.S. Cl. 348—349 **3 Claims**

1. An image sensing apparatus comprising:

an image sensing device for converting an optical image to an electric signal;



focus evaluation-value detecting means for detecting a focus evaluation value, which indicates decree of focusing of the optical image by using said image sensing device;
focus adjusting means for performing focus adjustment, which is for focusing the optical image on said image sensing device, based upon the detected focus evaluation value;
exposure-amount detecting means for detecting a proper amount of exposure by using said image sensing device;
exposure adjusting means for performing exposure adjustment in accordance with the detected Proper amount of exposure;
a first release switch for designating start of the focus adjustment and start of the exposure adjustment;
main-exposure image sensing means for performing main exposure after the adjustments of focus and exposure;
a second release switch for designating start of the main exposure;
a diaphragm for limiting amount of exposing light impinging upon said image sensing device;
wherein said focus evaluation-value detecting means,
detects a first focus evaluation value upon placing said diaphragm in an opened state in response to a command from said first release switch;
detects a second focus evaluation value upon making aperture diameter of said diaphragm approximately the same as that at main exposure after the focus adjustment is performed by said focus adjusting means in accordance with the detected first focus evaluation value; and
detects a third focus evaluation value upon establishing a diaphragm state approximately the same as that at main exposure in response to a command from said second release switch; and
said main-exposure image sensing means compares said second and third focus evaluation values and performs main exposure when the difference between these values is less than a predetermined value.

5,751,355
CAMERA PRESENTATION SUPPORTING SYSTEM

Nobutsune Bito; Tomio Tuzuki; Nobuyuki Oda, and Akio Mizuno, all of Nagoya, Japan, assignors to Elmo Company Limited, Japan

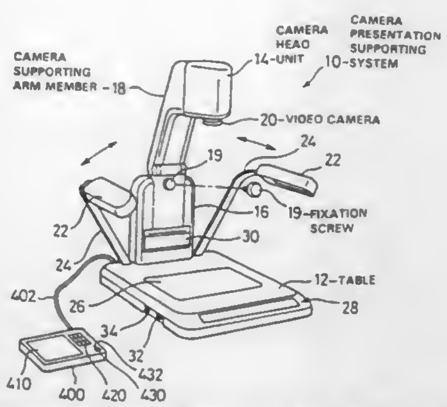
Filed Jan. 18, 1994, Ser. No. 183,051

Claims priority, application Japan, Jan. 20, 1993, 5-026140; Jan. 20, 1993, 5-026141; Feb. 24, 1993, 5-061004

Int. Cl.⁶ H04N *5/225*

U.S. Cl. 348—375 **2 Claims**

1. A camera presentation supporting system comprising:
a) a video camera for taking a visual image of an object placed on a table and converting the visual image to an image signal to be transmitted to an external display unit to show a reproduction image of the object; and
b) a retention member for supporting said video camera at a predetermined camera position for taking a visual image of said object placed on said table, said retention member including:
1) a camera supporting base member fixed to said table;
2) a camera supporting arm member on which said video camera is mounted;
3) an arm joint member for joining said camera supporting arm member with said camera supporting base member and for



positioning said camera supporting arm member to be either at said predetermined camera position or at a predetermined center position directly above said table by said camera support arm member folding towards said table at a predetermined joint of said camera supporting arm member so as to move said video camera from said predetermined camera position to said center position;
4) a camera position retainer for retaining said video camera at said predetermined camera position for taking a visual image of said object; and
5) a center position retainer for retaining said video camera at said predetermined center position directly above said table; wherein
said camera position retainer and said center position retainer securely fix said camera supporting arm member and said camera supporting base member of said retention member with a common fixation member;
wherein said camera supporting arm member has a fixation piece with a tapped hole extending therein,
said camera supporting base member including:
a first contact member with a first screw insertion opening adapted to contact said fixation piece so that said first screw insertion opening and said tapped hole align with each other when said video camera is retained at said predetermined camera position for taking a visual image of said object; and
a second contact member with a second screw insertion opening adapted to contact said fixation piece so that said second screw insertion opening and said tapped hole align with each other when said video camera is retained at said center position directly above said table, and
said common fixation member being a fixation screw adapted to be received in said tapped hole of said fixation piece, said fixation screw being insertable in said first screw insertion opening of said first contact member when said video camera is retained at said predetermined camera position for taking a visual image of said object, and said fixation screw being insertable in said second screw insertion opening of said second contact member when said video camera is retained at said center position directly above said table.

5,751,356
VIDEO/AUDIO SIGNAL CODING SYSTEM AND METHOD

Hiroshi Suzuki, Musashino, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

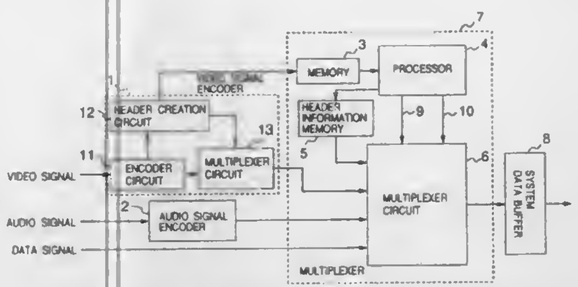
Filed Aug. 6, 1996, Ser. No. 689,268

Claims priority, application Japan, Aug. 15, 1995, 7-229704

Int. Cl.⁶ H04N *7/12;11/02;11/04*

U.S. Cl. 348—390 **9 Claims**

1. A video/audio signal coding system comprising:
video encoding means for encoding a video signal into video data, attaching encoding information to said video data to generate encoded video data, and generating data number information indicative of a number of the encoded video data corresponding to a predetermined video data unit, said encoding information including header information indicative of a head of said encoded video data corresponding to the predetermined video data unit;
audio encoding means for encoding an audio signal into audio data to generate encoded audio data;
a first memory for temporarily storing at least the header information and the data number information generated by said video encoding means;
system header generating means for generating system headers on the basis of the header information and the data number information stored in said first memory;
a second memory for temporarily storing the system headers generated by said system header generating means;
multiplexing means for multiplexing the encoded video data generated by said video encoding means, the encoded audio data generated by said audio encoding means and the system headers stored in said second memory; and
control means for judging a boundary corresponding to said predetermined video data unit in the encoded video data input from said video encoding means to said multiplexing means on the basis of the header information and the data number information stored in said first memory to thereby control multiplexing operation of said multiplexing means.



5,751,357
METHOD AND ARRANGEMENT FOR CODING AND DECODING A VIDEO DATA STREAM FOR ALL PICTURE ELEMENTS OF THE VIDEO DATA STREAM

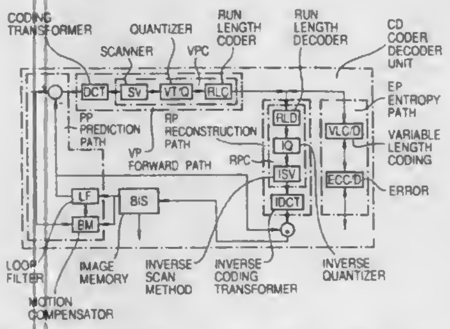
Heribert Geib, Grafing, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 8, 1996, Ser. No. 677,041

Claims priority, application Germany, Jul. 7, 1995, 195 24 872.4

Int. Cl.⁶ H04N *7/50*

U.S. Cl. 348—400 **16 Claims**



1. A method for coding a video data stream for all picture elements of the video data stream, comprising the steps of:
forming coding transformation coefficients in a forward path by applying a coding transformation;
applying a scan method to the coding transformation coefficients in a coder/decoder unit in the forward path;
quantizing the scanned coding transformation coefficients in a quantization unit in the forward path of the coder/decoder unit;
implementing a run length coding in the forward path of the coder/decoder unit;
implementing a run length decoding at a beginning of reconstruction in an internal reconstruction of the video data stream in a reconstruction path;
subjecting data obtained from the run length decoding to an inverse quantizing;
subjecting the inversely quantized data to a scan method inverse relative to the scan method;
subjecting data obtained from the inverse scan method to a coding transformation that is inverse relative to an employed coding transformation; and
subtracting a reconstructed video data stream from the video data stream, so that only a difference between the video data stream and the reconstructed video data stream is respectively processed.

5,751,358
VIDEO ENCODER WITH QUANTIZATION CONTROLLED BY INTER-PICTURE CORRELATION

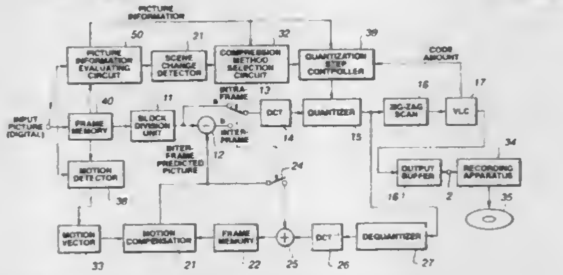
Kazuhiro Suzuki, Kanagawa; Satoshi Mitsuhashi, Tokyo, and Yuji Ando, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,857

Claims priority, application Japan, Sep. 29, 1994, 6-235103

Int. Cl.⁶ H04N *7/32*

U.S. Cl. 348—405 **4 Claims**



1. Apparatus for encoding a picture comprising:
picture data storage means for storing picture data of a plurality of input pictures to provide stored picture data;
picture information evaluating means for evaluating the information quantity of said stored picture data to generate an evaluated value of information quantity;
inter-picture correlation detection means for detecting the correlation between pictures of said stored picture data to generate inter-picture correlation information;
orthogonal transform means for orthogonally transforming said stored picture data to generate orthogonal transform coefficients;
quantization means for quantizing said orthogonal transform coefficients at a pre-set quantization step;
compression method selection means for adaptively selecting compression methods for said stored picture data as a function of said evaluated value of information quantity and said inter-picture correlation information to provide selected compression methods; and
quantization step control means for learning the relation between a quantization step employed for compression, a post-compression data quantity and said evaluated value of information quantity to generate learning parameters and predicting a basic quantization step for said quantization means as a function of said learning parameter; wherein said quantization step control means sums said evaluated value of information quantity for each macro-block obtained from dividing said picture and said evaluated value of information quantity for a full picture during a time interval corresponding to a period of intra-frame coding to allocate bits for quantization; wherein the quantity of picture-based bit allocation for quantization and the sum of evaluated values are related in a pre-set manner for each of said selected compression methods to generate summed evaluated value; wherein said quantization step control means previously determines said learning parameters by least square error method from average value of the macro-block-based quantization step over a full picture.

post-compression data quantity of said full picture and said evaluated value of information quantity for said full picture to generate said previously determined learning parameters and calculates said basic quantization step of said full picture from said previously determined learning parameters and said preset relation.

5,751,359

METHOD FOR QUANTIZING COMPRESSED VIDEO SIGNALS

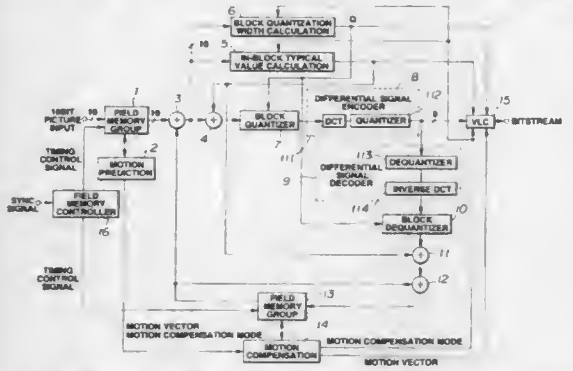
Teruhiko Suzuki, Chiba, and Yoichi Yagasaki, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 615,422

Claims priority, application Japan, Mar. 17, 1995, 7-058944

Int. Cl.^{6} H04N *07/30*

U.S. Cl. 348—405 **10 Claims**



1. A picture signal encoding method for converting m-bit picture data into n-bit data, where m and n are integers, with m>n, comprising the steps of:

determining representative value data and quantization width of picture data for each pre-set block of m-bit input picture data;

calculating m-bit difference data between said picture data and said representative value data;

quantizing the m-bit difference data on the basis of said quantization width to n bits, where m and n are integers, with m>n, for generating first quantized data by a first quantization operation, using rounding which will produce an error not larger than one step between the quantization width in the neighborhood of 0 quantization level and that in other quantization levels;

transforming said first quantized data for generating transform coefficients;

quantizing said transform coefficients for generating second quantized data by a second quantization operation; and

encoding said representative value data, said quantization width and the second quantized data.

5,751,360

CODE AMOUNT CONTROLLING METHOD FOR CODED PICTURES

Mitsumasa Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

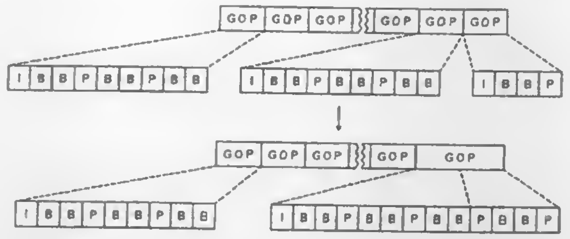
Filed Jul. 16, 1996, Ser. No. 680,842

Claims priority, application Japan, Jul. 18, 1995, 7-181666

Int. Cl.^{6} H04N *7/12*

U.S. Cl. 348—409 **6 Claims**

4. A coding apparatus for providing coded picture signals in accordance with a predetermined format, comprised of Groups of Pictures ("GOP") wherein each GOP is composed of various frames, comprising:



a buffer, and

a means for examining a frame structure of each of the GOPs to detect whether or not the frame structure of the last GOP is different from the frame structure of the preceding GOPs.

5,751,361

METHOD AND APPARATUS FOR CORRECTING ERRORS IN A TRANSMITTED VIDEO SIGNAL

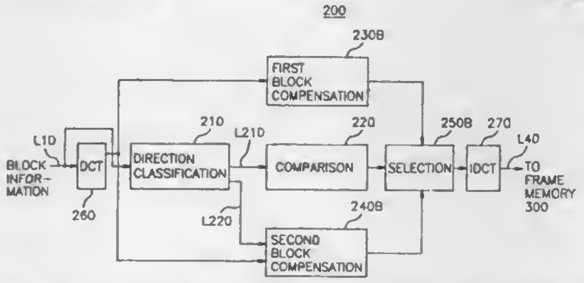
Jin-Hun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 769,831

Claims priority, application Rep. of Korea, Dec. 23, 1995, 95-55647

Int. Cl.^{6} H04N *7/68*

U.S. Cl. 348—409 **25 Claims**



1. A method, for use in a video signal decoding system, for concealing errors in a video signal transmitted in a compressed form, wherein the video signal is divided into a plurality of blocks each of which has N×M pixel values with N and M being positive integers, the method comprising the steps of:

(a) detecting a lost block containing errors;

(b) providing pixel values of blocks neighboring the lost block in the video signal;

(c) calculating an edge gradient at each of neighboring pixels included in a predetermined range of pixels surrounding the lost block based on the pixel values of the neighboring blocks and computing a magnitude and an angle of each of the edge gradients;

(d) generating a spatially interpolated block based on the edge gradients and the pixel values of the neighboring blocks; and

(e) providing the spatially interpolated block as a substitution block for compensating the lost block,

wherein the step (d) includes the steps of:

(d1) classifying the angle of the edge gradient at each of the neighboring pixels along with one of predetermined directional indicators with which the angle of the edge gradient is most closely aligned;

(d2) if a line drawn through a neighboring pixel location along the direction determined by the angle of the gradient at the neighboring pixel passes through the lost block, determining that particular pixel as a voting pixel;

(d3) summing up the magnitudes of the gradients aligned with each directional indicator in order to mutually exclusively accumulate the directional indicators of the voting pixels;

(d4) selecting the directional indicator exhibiting a largest accumulated sum as a pixel interpolation direction by comparing the sum of the magnitudes for each of the directional indicators with one another;

(d5) comparing the largest accumulated sum with a predetermined threshold value; and

(d6) if the largest accumulated sum is larger than or equal to the predetermined threshold value, producing the spatially interpolated block through the use of a directional interpolation based on pixel values of the neighboring blocks along the pixel interpolation direction.

5,751,362

APPARATUS FOR ENCODING A VIDEO SIGNAL USING FEATURE POINT BASED MOTION ESTIMATION

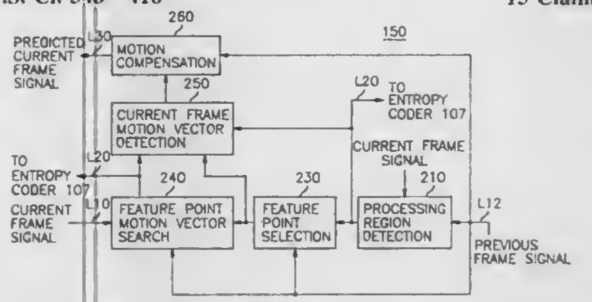
Min-Sup Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 17, 1995, Ser. No. 544,355

Claims priority, application Rep. of Korea, Apr. 29, 1995, 95-10584

Int. Cl.^{6} H04N *7/32;7/30*

U.S. Cl. 348—416 **15 Claims**



1. An apparatus, for use in a motion-compensated video signal encoder, for determining a predicted current frame based on a current frame and a previous frame of a digital video signal, comprising:

region detection means for calculating a difference between the current frame and the previous frame and for detecting a processing region encompassing a moving object from the previous frame based on the calculated difference to generate region information representing the detected processing region, wherein the processing region has a plurality of image blocks contained in the previous frame and the image blocks are determined by using the calculated difference, wherein said region detection means includes:

means for calculating the difference between the current and the previous frames on a pixel-by-pixel basis to generate a frame difference signal wherein the frame difference signal includes N×M blocks, each block having P×Q pixel difference values and N, M, P and Q are positive integers;

means for absolutizing the frame difference signal to generate an absolutized frame difference signal;

means for comparing the absolutized frame difference signal with a predetermined value to convert the absolutized frame difference signal into a converted frame difference signal, wherein, when a pixel difference value of the absolutized frame difference signal is smaller than the predetermined value, "0" is assigned as the pixel difference value and, otherwise, "1" is assigned as the pixel difference value;

means for counting the number of "1"'s contained in each block of the converted frame difference signal; and

means for comparing the counted number for each block with a predetermined number to generate the region information having sequentially arranged N×M block representative values, wherein, when the counted number for a block is smaller than the predetermined value, "0" is assigned as a block representative value of the region information and, otherwise, "1" is assigned as the block representative value;

feature point selection means for selecting a number of pixels from the pixels contained in the detected processing region as feature points based on the region information;

first motion vector detection means for detecting a first set of motion vectors between the current and the previous frames, each of the first set of motion vectors representing a motion for each of the feature points;

second motion vector detection means for producing a second set of motion vectors for all of the pixels contained in the current frame by using the first set of motion vectors; and

motion compensation means for assigning the value of each of the pixels in the previous frame, said each of the pixels corresponding to one of the pixels in the current frame through one of the second set of motion vectors, as the value of said one of the pixels in the current frame, to thereby determine the predicted current frame.

5,751,363

SYSTEM AND METHOD FOR CODING AND/OR DECODING IMAGE-ADAPTIVE SPLIT REGION OF MOTION PICTURE

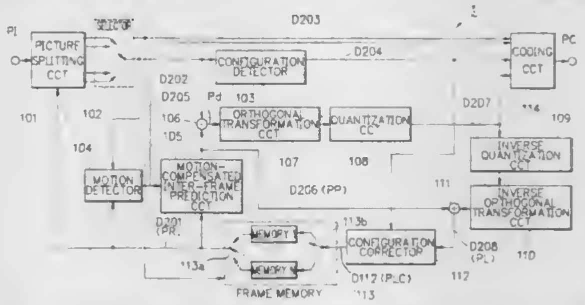
Yoshihiro Miyamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 14, 1996, Ser. No. 601,565

Claims priority, application Japan, Feb. 15, 1995, 7-026377

Int. Cl.^{6} H04N *7/32;7/30*

U.S. Cl. 348—416 **12 Claims**



1. A motion picture coding system for coding a motion picture system, the system comprising:

a first means for generating a concerned region of a current image having a set of pixel data addressed pixels thereon, and an identifying data set for identifying the concerned region in an entire region of the motion picture;

a second means responsible for receiving the identifying data set and generating a reference image representative of a previous image of the current image in a current frame;

a third means for detecting a motion between the reference image and the current image and generating detected motion data corresponding thereto;

a fourth means for receiving the detected motion data and motion-compensating the reference image to generate a prediction image of the current image;

a fifth means for generating a difference image between the current image and the prediction image;

a sixth means for detecting a configuration of the concerned region and generating detected configuration data corresponding thereto;

a seventh means for coding the detected configuration data, the detected motion data, the difference image and the identifying data set, in a compressing manner to output a symbol sequence, said seventh means including conversion means for converting the difference image into a set of compressed data;

an eighth means for inverse-converting the set of compressed data to provide a local decoded image of the difference image;

a ninth means for adding the local decoded image of the difference image to the prediction image to provide a local decoded image of the current image;

a tenth means for correcting a configuration of the local decoded image of the current image in accordance with the detected configuration of the concerned region to provide a corrected image of the local decoded image of the current image; and

an eleventh means for storing the corrected image in an identifiable manner to be read as the reference image in a subsequent frame of the current frame.

5,751,364

METHOD OF AND APPARATUS FOR DETECTING A MOTION OF IMAGE INFORMATION, METHOD OF AND APPARATUS FOR ENCODING IMAGE INFORMATION, IMAGE INFORMATION TRANSMITTING SYSTEM, IMAGE INFORMATION RECORDING SYSTEM AND RECORDING MEDIUM

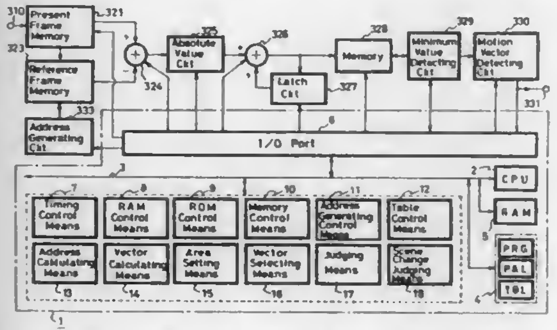
Kazunori Yasuda, and Kouichi Uchide, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 2, 1996, Ser. No. 675,105

Claims priority, application Japan, Jul. 4, 1995, 7-169017

Int. Cl.⁶ H04N *7/32*

U.S. Cl. 348—416 **29 Claims**



1. A method of detecting a motion in image information, comprising the steps of:

(a) establishing a first search area to search for a reference block in agreement with the contents of a block in question, corresponding to the position of the block in question in a present frame, in a reference frame whose position precedes or follows, in time, the position of the present frame;

(b) detecting agreement between the contents of the block in question in the present frame and the contents of the reference block in said first search area in said reference frame for thereby determining first motion vector data;

(c) predicting a position, in a following frame, of the block in question in said present frame based on second motion vector data which are of the same size as and in the opposite direction to the first motion vector data determined in said step (b);

(d) detecting positional information of the block in question in an inclusive region which includes the block in the position predicted in said step (c);

(e) registering, in a table, the first motion vector data determined in said step (b) as registered motion vector data of the block in question in the present frame, and also registering, in the table, the positional information of the block in question detected in said step (d) as related to the block in question which is to be processed in said step (b);

(f) deciding whether the process of determining the first motion vector data with respect to all blocks in question in the present frame is finished or not;

(g) updating the contents of the present frame with contents whose position precedes or follows, in time, the position of the contents of the present frame, and updating the contents of said reference frame with at least the contents of the present frame, if the process of determining the first motion vector data with respect to all blocks in question in the present frame is decided as being finished in said step (f);

(h) reading the registered motion vector data, updated in said step (g), related to the block in question which is to be processed in said step (b) in the present frame as candidate motion vector data from said table, and selecting optimum motion vector data from said candidate motion vector data;

(i) establishing a second search area smaller in size than said first search area in said reference frame updated in said step (g) based on the optimum motion vector data selected in said step (h), and detecting agreement between the block in question in the present frame and a reference block in said second search area in said reference frame for thereby determining third motion vector data; and

(j) determining positional information of the block in question in said inclusive region used in establishing said second search area in said step (i) based on the third motion vector data detected in said step (i), and registering said positional information in said table for thereby updating the contents of the table.

5,751,365

MOTION COMPENSATED INTER-FRAME PREDICTION METHOD AND APPARATUS USING MOTION VECTOR INTERPOLATION WITH ADAPTIVE REPRESENTATION POINT ADDITION

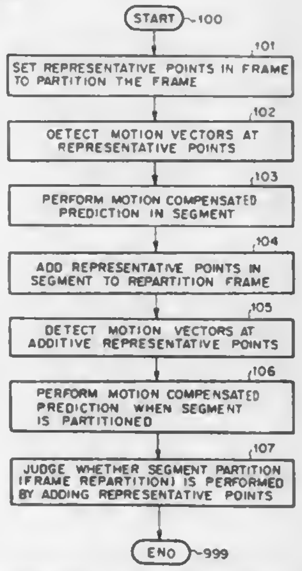
Yutaka Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 1, 1996, Ser. No. 691,919

Claims priority, application Japan, Aug. 4, 1995, 7-200085

Int. Cl.⁶ H04N *7/133;7/137*

U.S. Cl. 348—416 **7 Claims**


START
100
101
SET REPRESENTATIVE POINTS IN FRAME TO PARTITION THE FRAME
102
DETECT MOTION VECTORS AT REPRESENTATIVE POINTS
103
PERFORM MOTION COMPENSATED PREDICTION IN SEGMENT
104
ADD REPRESENTATIVE POINTS IN SEGMENT TO REPARTITION FRAME
105
DETECT MOTION VECTORS AT ADDITIVE REPRESENTATIVE POINTS
106
PERFORM MOTION COMPENSATED PREDICTION WHEN SEGMENT IS PARTITIONED
107
JUDGE WHETHER SEGMENT PARTITION (FRAME REPARTITION) IS PERFORMED BY ADDING REPRESENTATIVE POINTS
END
999

1. A motion compensated inter-frame prediction method comprising:

first step of setting plural representative points in a frame represented by moving picture signals and linking the representative points to one another to form plural segments in the frame;

second step of detecting motion vectors at the plural representative points as representative point motion vectors;

third step of interpolating the motion vectors at all picture element positions within the respective segments on the basis of the representative point motion vectors to perform the motion compensated prediction within each segment;

fourth step of adaptively and additionally setting into the respective segments additive representative points, which do not include the boundary lines between neighboring segments and for processing without effect on other segments with respect to a detected motion vector, and linking each of the additive representative points to the representative points surrounding the additive representative point to form subsegments;

fifth step of detecting the motion vector at the additive representative point as an additive representative point motion vector; and

sixth step of interpolating the motion vectors at all the picture element positions in each subsegment on the basis of the additive representative point motion vectors to perform motion compensated prediction within each subsegment.

5,751,366

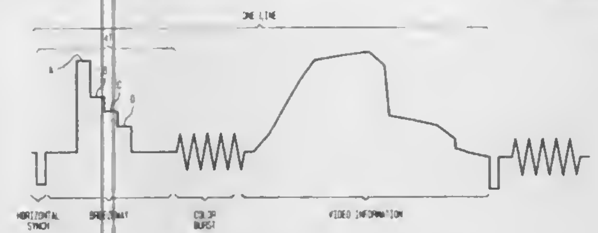
INCLUSION OF AUDIO SIGNAL WITHIN VIDEO SIGNAL

Gary Lamont Hobbs, Indianapolis, Ind., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 31, 1995, Ser. No. 522,625

Int. Cl.⁶ H04N *7/084*

U.S. Cl. 348—480 **5 Claims**



1. In the generation of a video signal for transmission, the improvement comprising the steps of:

a) obtaining fragments from an audio signal;

b) digitizing the fragments;

c) dividing the digitized fragments into sub-fragments;

d) assigning to each sub-fragment one of N analog voltages, which analog voltages have values which are separated by threshold voltages;

e) inserting the analog voltages assigned to the sub-fragments into the video signal; and

f) inserting signals indicating the threshold voltages into the video signal.

5,751,367

VIDEO SIGNAL DETECTING APPARATUS

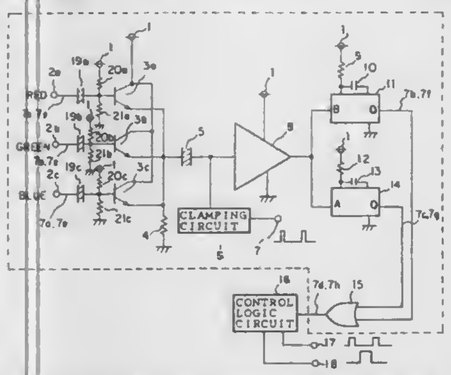
Toshitsugu Wakabayashi, and Masaki Kobayashi, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1995, Ser. No. 383,924

Claims priority, application Japan, Aug. 30, 1994, 6-205564

Int. Cl.⁶ H04N *5/04*

U.S. Cl. 348—511 **14 Claims**



1. A video signal detecting apparatus for detecting an input video signal, said video signal detecting apparatus comprising:

an input circuit which receives said input video signal and produces an output signal including image data;

a first latch circuit arranged to receive said output signal to latch in response to a rise of said output signal;

a second latch circuit arranged to receive said output signal to latch in response to a fall of said output signal; and

an OR circuit arranged to receive an output of said first latch circuit and an output of said second latch circuit in which said output of said first latch circuit and said output of said second latch circuit are ORed to output the OR output as a video detecting signal.

5,751,368

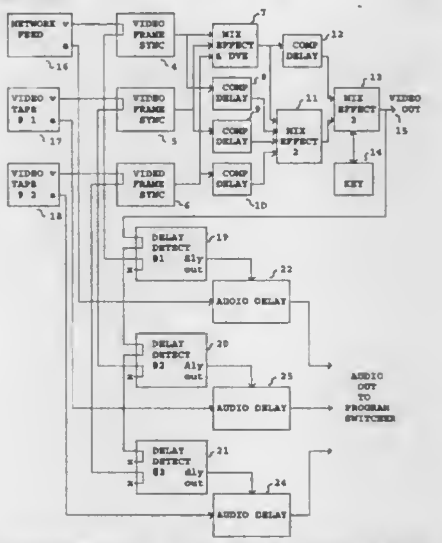
DELAY DETECTOR APPARATUS AND METHOD FOR MULTIPLE VIDEO SOURCES

J. Carl Cooper, Monte Sereno, Calif., assignor to Pixel Instruments Corp., Los Gatos, Calif.

Continuation-in-part of Ser. No. 321,280, Oct. 11, 1994, Pat. No. 5,530,483. This application May 17, 1996, Ser. No. 651,191

Int. Cl.⁶ H04N *9/475*

U.S. Cl. 348—512 **31 Claims**



13. In a system where an image which is derived from one of a plurality of sources is selected to be output, a method for determining if an output image is derived from a given source, said method including the steps of:

a) providing at least a first set of samples from at least one image from said given source,

b) providing at least a second set of samples from at least one image from a second of said sources,

c) providing at least a third set of samples from at least one image from said output,

d) determining if said third set of samples corresponds to said first set of samples.

5,751,369

INFORMATION RETRIEVAL AND PRESENTATION SYSTEMS WITH DIRECT ACCESS TO RETRIEVABLE ITEMS OF INFORMATION

Robert G. Harrison, 2120 8th Ave. N., #102, Seattle, Wash. 98109, and Robert D. Lamson, 2611 Eastlake Ave. E., #405, Seattle, Wash. 98102

Filed May 2, 1996, Ser. No. 641,911

Int. Cl.⁶ H04N *7/00*

U.S. Cl. 348—552 **21 Claims**

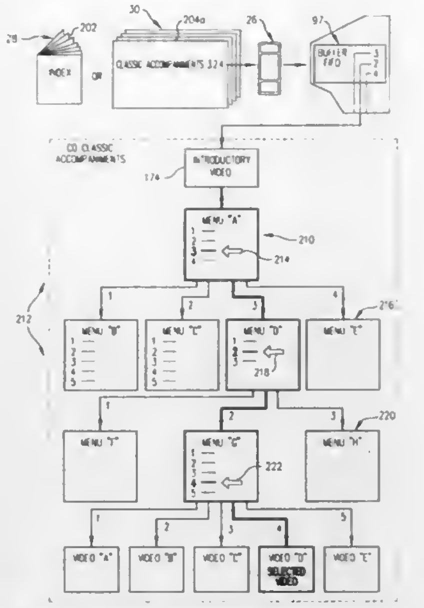
1. An information retrieval and display system which can be employed in a learn-then-perform mode of operation, said system comprising a module which has: (a) a data reader for reading data from an encoded data storage device, and (b) a screen for displaying information generated from data read from said data storage device;

said data storage device having means for storing in digital form data corresponding to: (a) a multiple choice menu, and (b) an item of information which can be retrieved from the data storage device by making a choice from said menu; and

said system further comprising:

a directory means for providing direct access to said item of information, said directory means being separate from and physically independent of said module and including an identifying code and a descriptor for each menu choice corresponding to an item of retrievable information; and

control means having means for so controlling the operation of the data reader as to cause data representing a selected item of information to be retrieved from said data storage



means and the item of information generated from said data presented on said screen when said data reader is activated by the identifying code for the menu choice to which the selected item of information corresponds, said control means also having control elements which are activatable by a system user to generate said identifier code.

5,751,370

HORIZONTAL SIZE ADJUSTING APPARATUS OF A MONITOR

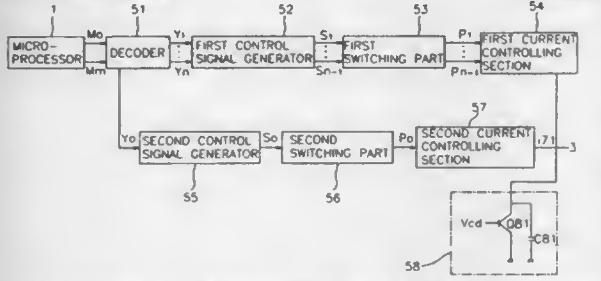
Moon-Keol Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 27, 1995, Ser. No. 549,648

Claims priority, application Rep. of Korea, Oct. 28, 1994, 94-27891

Int. Cl.^{6} H04N *5/46*

U.S. Cl. 348—556 **12 Claims**


MICRO-PROCESSOR
DECODER
FIRST CONTROL SIGNAL GENERATOR
FIRST SWITCHING PART
FIRST CURRENT CONTROLLING SECTION
SECOND CONTROL SIGNAL GENERATOR
SECOND SWITCHING PART
SECOND CURRENT CONTROLLING SECTION
Mo
Mm
Y1
Yn
S1
Sn-1
P1
Pn-1
Yo
So
Po
Vcd
Q81
C81
1
3
51
52
53
54
55
56
57
58
71

1. A horizontal size adjusting apparatus of a monitor comprising;

a microprocessor for setting a mode of said monitor in accordance with a received horizontal frequency, and outputting a pulsewidth modulation signal varied in accordance with said received horizontal frequency;

means for decoding said varied pulsewidth modulation signal from said microprocessor, and for outputting a first plurality of output signals and a second output signal;

first current controlling means for generating a first plurality of control signals to select a first plurality of capacitors according to said first plurality of output signals to thereby correct size and linearity of a deflection signal in accordance with an output current obtained from said first plurality of capacitors when said horizontal frequency exceeds a predetermined frequency;

second current controlling means for generating a second control signal to operate another capacitor in accordance with said second output signal to thereby correct said size and linearity of said deflection signal in accordance with an output current of said another capacitor, when said horizontal frequency is lower than said predetermined frequency; and

current output means for supplying said output current of said first plurality of capacitors or said another capacitor to said deflection circuit.

5,751,371

PICTURE RECEIVING APPARATUS

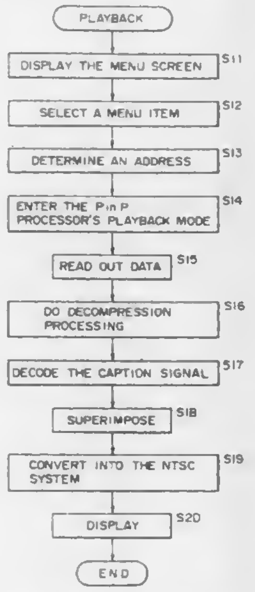
Peter Shintani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1995, Ser. No. 570,515

Claims priority, application Japan, Dec. 22, 1994, 6-319585

Int. Cl.^{6} H04N *5/445;5/262*

U.S. Cl. 348—564 **16 Claims**



1. A picture receiving apparatus for receiving a signal comprising a video signal and text information corresponding to pictures conveyed in said video signal and for displaying said pictures along with said text information, wherein said text information is superimposed on said video signal, comprising:

extraction means for extracting text data corresponding to said text information superimposed on said video signal;

conversion means for converting said video signal into a digital video signal;

compression means for compressing said digital video signal into compressed video data;

storage means for storing said text data extracted by said extraction means and said compressed video data resulting from compression carried out by said compression means;

text reading means for reading out said text data stored in said storage means at a first predetermined speed and converting said text data into a corresponding video text signal;

picture reading means for reading out said compressed video data stored in said storage means at a second predetermined speed and converting said compressed video data into a corresponding video picture signal; and

display means for displaying said video text signal from said text reading means and said video picture signal from said picture reading means.

5,751,372

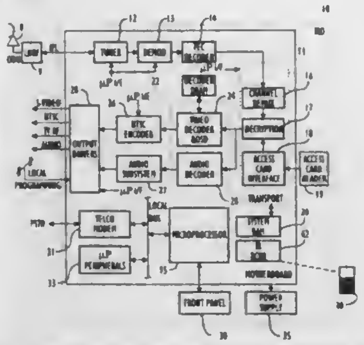
METHOD AND APPARATUS FOR NAVIGATING AN ON-SCREEN PROGRAM GUIDE

Henry Forson, Annandale, Va., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Feb. 19, 1996, Ser. No. 604,120

Int. Cl.^{6} H04N *5/50*

U.S. Cl. 348—569 **16 Claims**



1. A method of navigating an on-screen program guide comprising current and future scheduling information for a plurality of different program sources, said method comprising the steps of:

entering a date and a time, said date and a time defining a reference time for said on-screen program guide, and

generating said on-screen program guide containing scheduling information for a subset of said plurality of different program sources including said reference time.

5,751,373

TELEVISION FUNCTION SELECTION METHOD, TELEVISION RECEIVER AND REMOTE COMMANDER FOR TELEVISION RECEIVER

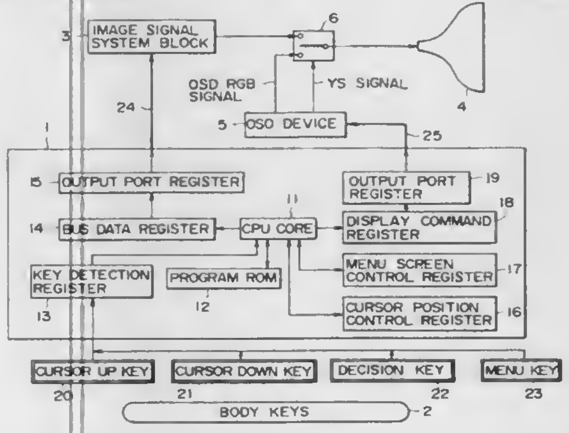
Tomoko Ohyama, Kanagawa; Yukiko Ohkura, Tokyo; Masaharu Fukumoto; Shigeyuki Sano, both of Kanagawa; Yasuko Rokukawa, Tokyo; Shiro Endo, Chiba; Kyosuke Oda; Yumiko Minakawa, both of Kanagawa, and Chifumi Matsuura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 28, 1996, Ser. No. 623,112

Claims priority, application Japan, Mar. 31, 1995, 7-074892

Int. Cl.^{6} H04N *5/445*

U.S. Cl. 348—569 **13 Claims**



1. A function selection method for a television receiver comprising the steps of:

displaying a first level of a hierarchical menu in a first region of a screen of said television receiver, wherein a plurality of selection items corresponding to functions of said television receiver are displayed;

designating one of said plurality of selection items from said first level of said hierarchical menu displayed on said screen of said television receiver;

displaying a subordinate level of said hierarchical menu in a second region of said screen, wherein a plurality of control items corresponding to said designated selection item are displayed;

selecting said designated selection item of said first level of said hierarchical menu;

selecting one of said plurality of control items from said subordinate level of said hierarchical menu; and

modifying said selected control item, whereby said functions of said television receiver corresponding to said designated selection item is controlled by modifying said selected control item.

5,751,374

PROCESSING OF PIXEL DATA ACCORDING TO DIFFERENT BROADCASTING SYSTEMS

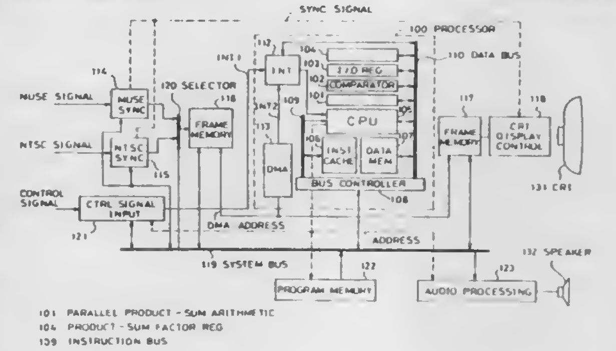
Kazuki Ninomiya; Shirou Yoshioka, and Tamotsu Nishiyama, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 226,663, Apr. 11, 1994, Pat. No. 5,555,197. This application Mar. 20, 1996, Ser. No. 618,610

Claims priority, application Japan, Apr. 12, 1993, 5-084712

Int. Cl.^{6} H04N *5/14;9/64*

U.S. Cl. 348—571 **32 Claims**



1. A video signal processor for processing video information comprising:

(a) control signal input means for holding an external control signal,

(b) output means for outputting processed video information,

(c) a plurality of synchronous means for outputting target broadcasting signals in synchronism with individual input video signals of different broadcasting systems,

(d) selection means for selectively outputting a particular one of said target broadcasting signals output from said plurality of synchronous means,

(e) first storage means for storing pixel data based on said selectively output broadcasting signal from said selection means,

(f) data processing means for controlling the operations of said plurality of synchronous means and the operation of said selection means according to said control signal held by said control signal input means, and performing a sum-of-products arithmetic operation to compute an inner product, denoted by $p.a=a_0*P_0+a_1P_1+\ .\ .\ .\ +a_n*P_n$, where n is an integer, of a sum-of-products factor vector $a=(a_0,\ a_1,\ .\ .\ .\ .\ a_n)$ and a data vector $p=(P_0,P_1,\ .\ .\ .\ ,\ P_n)$ that is made up of said pixel data read out of said first storage means,

(g) program storage means for storing a program with a description of the contents of an operation to be carried out by said data processing means,

(h) second storage means for storing a result of said sum-of-products arithmetic operation performed by said data processing means in the form of pixel data, and

(i) output control means for controlling said output means to output said processed video information on the basis of said pixel data read out of said second storage means.

5,751,375

PROCESSING OF PIXEL DATA AT AN OPERATING FREQUENCY HIGHER THAN THE SAMPLING RATE OF THE INPUT SIGNAL

Kazuki Ninomiya; Tamotsu Nishiyama; Jiro Miyake, all of Osaka, Japan, and Katsuya Hasegawa, Palo Alto, Calif., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

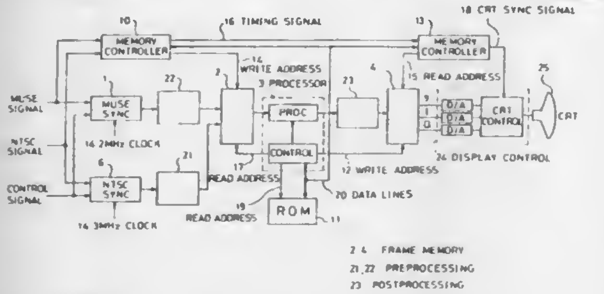
Continuation of Ser. No. 618,610, Mar. 20, 1996, which is a division of Ser. No. 226,663, Apr. 11, 1994, Pat. No. 5,555,197.

This application Feb. 12, 1997, Ser. No. 798,824

Claims priority, application Japan, Apr. 12, 1993, 5-084712; Jul. 26, 1993, 5-183836; Aug. 3, 1993, 5-192195

Int. Cl.^{6} H04N *5/14;9/64*

U.S. Cl. 348—571 **17 Claims**



1. A signal processor comprising:
- (a) first and second storage means for storing plural items of pixel data,
- (b) first control means for writing the pixel data obtained by sampling an input signal including at least one video signal into said first storage means, a write location of said first storage means being determined in accordance with a first signal,
- (c) second control means for reading the pixel data from said second storage means, a read location of said second storage means being determined in accordance with a second signal, and
- (d) processing means for processing said pixel data read from said first storage means at an operating frequency higher than a sampling rate of said input signal.

5,751,376

IMAGE FORMING APPARATUS AND METHOD FOR CREATING MOTION BLUR

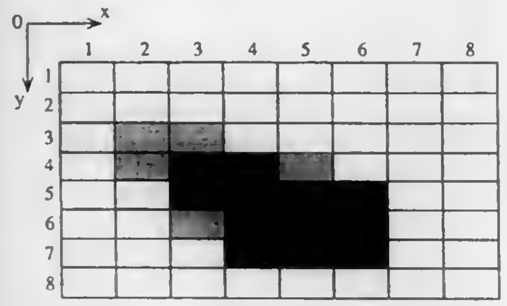
Makoto Hirai, Suita, Japan, assignor to Matsushita Electric Ind., Osaka-fu, Japan

Filed Nov. 13, 1995, Ser. No. 558,031

Claims priority, application Japan, Nov. 15, 1994, 6-306784

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—579 **39 Claims**



1. An image forming apparatus for creating an image of a motion blur of an object by sequentially creating each pixel of the motion blur from pixel values of an original image, the motion blur being a trail of a rapidly moving object, comprising:
- an image memory for storing pixel values of a motion-blur image;
- a pixel position specifying means for sequentially specifying a pixel position for all the pixels in the image memory adverse to a direction of the movement of the object;
- an original image data storage means for storing data of the original image which includes an image of the object;
- an original image pixel value generating means for generating an original image pixel value corresponding to the pixel position specified by the pixel position specifying means based on the data stored in the original image data storage means;
- a pixel value calculating means for dividing by a certain value a result of the original image pixel value generated by the original image pixel value generating means subtracted by a pixel value in the image memory whose pixel position is adjacent to the pixel position specified by the pixel position specifying means in the direction of the movement of the object and adding a quotient of the division to the pixel value to obtain a pixel value each time the original image pixel value generating means generates an original image pixel value; and
- a pixel value writing means for writing the pixel value obtained by the pixel value calculating means as the pixel value of the pixel position specified by the pixel position specifying means.

5,751,377

PICTURE CODING APPARATUS AND DECODING APPARATUS

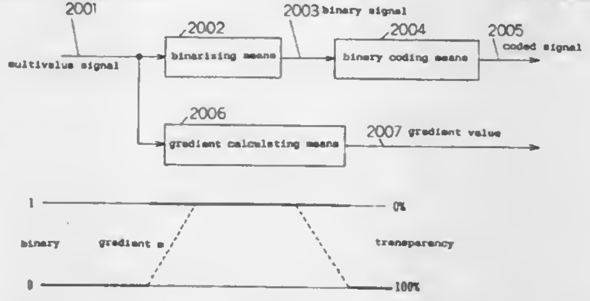
Shinya Kadono, Kobe, and Kenjiro Tsuda, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1995, Ser. No. 552,617

Claims priority, application Japan, Nov. 4, 1994, 6-271542; Nov. 4, 1994, 6-271543; Dec. 21, 1994, 6-318270

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—586 **10 Claims**



1. A coding apparatus for coding transparency information of a picture including pixels, each of the pixels having the transparency information, the coding apparatus comprising:
- binarizing means for judging whether each pixel of the pixels is transparent or not based on the transparency information, indicating the judged result with a binary value, and producing an output;
- binary coding means for coding the output of the binarizing means, and
- multivalue coding means for specifying an area where a transparent status is changing using the transparency information, indicating the transparent status of the area with a multivalue, and coding the multivalue.

5,751,378

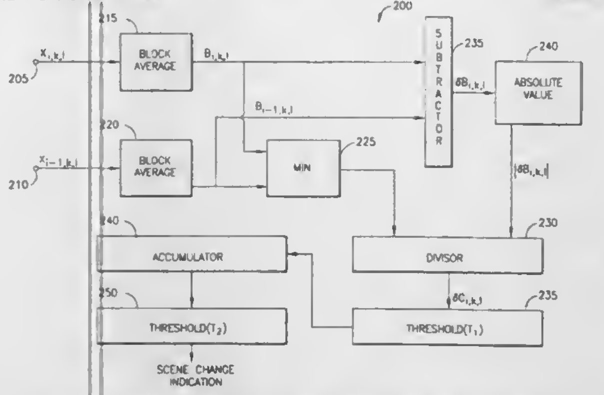
SCENE CHANGE DETECTOR FOR DIGITAL VIDEO

Xuemin Chen, and Vincent Liu, both of San Diego, Calif., assignors to General Instrument Corporation, Horsham, Pa.

Filed Sep. 27, 1996, Ser. No. 722,468

Int. Cl.^{6} H04N *9/77*

U.S. Cl. 348—700 **19 Claims**



1. A method for detecting a scene change between a prior video picture and a current video picture, comprising the steps of:
- determining average luminance values of a block pair of said prior and current video pictures;
- determining an incremental visual sensation value using a difference between said average luminance values;
- determining a minimum of said average luminance values of said current and prior picture blocks, wherein:
  - if said minimum exceeds a dark scene threshold, said incremental visual sensation value is determined using the ratio of (a) the absolute value of said difference, and (b) said minimum;
  - if said minimum does not exceed a dark scene threshold, said incremental visual sensation value is determined using the ratio of (a) the absolute value of said difference, and (b) said dark scene threshold; and
  - if said incremental visual sensation value exceeds a block contrast threshold level, a scene change is indicated.

5,751,379

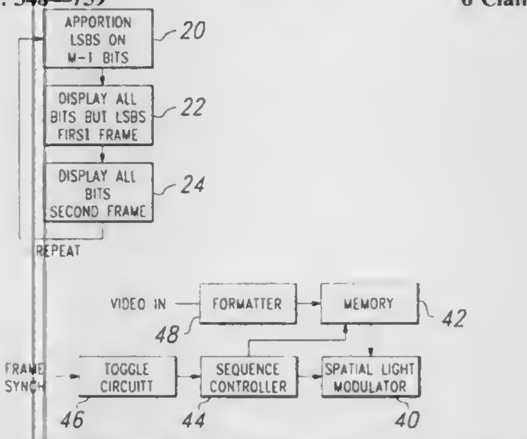
METHOD TO REDUCE PERCEPTUAL CONTOURING IN DISPLAY SYSTEMS

Vishal Markandey, Dallas; Donald B. Doherty, Richardson, both of Tex., and Robert J. Gove, Los Gatos, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 4, 1996, Ser. No. 725,719

Int. Cl.^{6} H04N *5/74*

U.S. Cl. 348—759 **6 Claims**



1. A method of displaying digital video data using pulse width modulation, comprising:
- apportioning least significant bit times within a video frame time using pulse width modulation based upon a pulse width modulation scheme having fewer bits than that actually used for digital sampling;
- displaying a first frame of said video data within said frame time wherein said frame has a predetermined number of least significant bit times, such that all bits of any sample within said first frame are displayed except the least significant bits;
- displaying a second frame of said video data within said frame time wherein said frame has as predetermined number of least significant bit times plus one least significant bit time, such that more bits of any sample than were displayed in said first frame are displayed.

5,751,380

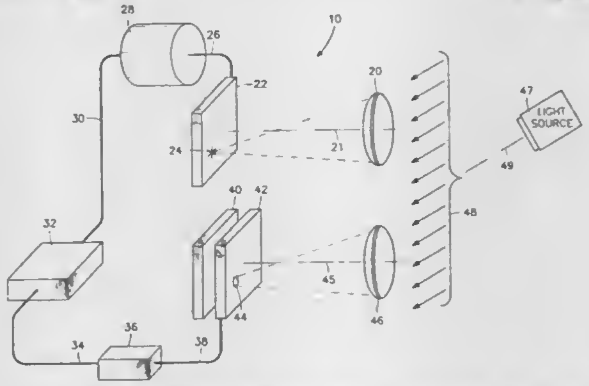
OPTICAL PROTECTION APPARATUS FOR USE WITH NIGHT VISION DEVICES

Jeffrey Scott Hanssen, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1995, Ser. No. 537,344

Int. Cl.^{6} G02F *1/13*

U.S. Cl. 349—1 **9 Claims**



1. An optical protection apparatus for protecting an optical image sensing element of a night vision device from a light source, said optical protection apparatus comprising:
- first and second lens means spatially disposed from said light source along an optical path from said light source, said first and second lens means collecting and focusing light energy from said light source;
- a sensing array spatially disposed from said first lens means at a focal plane of said first lens means along a first optical axis;
- said first lens means collecting and focusing said light energy from said light source onto said sensing array means forming a spot of light energy on said sensing array means;
- said sensing array generating a first stream of digital data representative of the spot of light energy formed on said sensing array means;
- image inverting means coupled to said sensing array for receiving said first stream of digital data, said image inverting means processing said first stream of digital data to form a negative image of said spot of light energy, said image inverting means generating a second stream of digital data representative of the negative image of said first light spot;
- an optical display spatially disposed from said second lens means at a focal plane of said second lens means along a second optical axis, said optical display being positioned directly in front of said optical image sensing element;
- said second lens means collecting and focusing said light energy from said light source onto said optical display;
- control circuit means coupled to said image inverting means and said optical display for receiving said second stream of digital data from said image inverting means, said control circuit means, responsive to said second stream of digital data, providing electrical drive signals to said optical display to form an opaque image on said optical display;
- said opaque image being formed on said optical display at a location on said optical display to prevent said light energy from passing through said optical display to said optical image sensing element of said night vision device.

5,751,381

ACTIVE MATRIX LCD DEVICE WITH IMAGE SIGNAL LINES HAVING A MULTILAYERED STRUCTURE

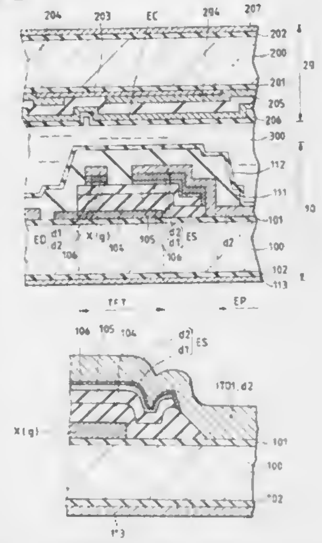
Kikuo Ono, Naka-machi; Kazuhiro Ogawa, Hitachi; Takashi Suzuki, Hitachi; Kouichi Anno, Hitachi; Hiroki Sakuta, Hitachi; Makoto Tsumura, Hitachi; Masaaki Kitajima, Hitachioota, and Genshiro Kawachi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 361,363

Claims priority, application Japan, Dec. 21, 1993, 5-321555

Int. Cl.^{6} G02F *1/136;1/1343;* **H01L** *29/04;31/036*

U.S. Cl. 349—42 **17 Claims**



1. A liquid crystal display device comprising:
- a substrate;
- a plurality of scanning signal bus-lines formed on the substrate and extending in a first direction,
- a plurality of image signal bus-lines formed on the substrate and extending in a second direction intersecting with the scanning signal bus-lines,
- thin film transistors located adjacent intersecting points of the scanning signal bus-lines and the image signal bus-lines, wherein gate electrodes of the thin film transistors are connected to the scanning bus-lines, drain electrodes of the thin film transistors are connected to the image signal bus-lines, and source electrodes of the thin film transistors are connected to pixel electrodes to drive a liquid crystal provided in said display, wherein:
  - patterns of a semiconductor layer are formed over said substrate along said image signal bus-lines,
  - said image signal bus-lines are formed of a transparent conductive film, a first conductive film, and an impurity containing semiconductor layer,
  - patterns of said transparent conductive film, said first conductive film, and said impurity containing layer of said image signal bus-lines extend up to said drain electrodes, and
  - patterns of said semiconductor layer along said image signal bus-lines extend up to said source electrodes.

11. A method of manufacturing a liquid crystal display device comprising a thin film transistor substrate, wherein the method of manufacturing the thin film transistor substrate comprises:
- patterning a conductive film to form scanning signal bus-lines and gate electrodes on the substrate by means of a first photo-treatment process;
- successively forming a gate insulating layer, a semiconductor layer, and an impurity containing semiconductor layer on the substrate, the scanning signal bus-lines and the gate electrodes;
- successively patterning the impurity containing semiconductor layer, the semiconductor layer, and the gate insulating layer by means of a second photo-treatment process, wherein patterns of the impurity containing semiconductor layer, the semiconductor layer, and the gate insulating layer have substantially an identical pattern;
- forming a first metal layer, forming a silicide film by heat-reacting the first metal layer with semiconductor material, and then etching a non-reacted portion of the first metal layer without a mask;
- forming a transparent conductive film;
- patterning the transparent conductive film to form image signal bus-lines, pixel electrodes, the drain electrodes and the source electrodes by means of a third photo-treatment process, wherein patterns of the transparent conductive film extend from the image signal bus-lines to the drain electrodes, and from the pixel electrodes to the source electrodes, respectively; and
- etching the silicide film and the impurity containing semiconductor layer with the patterns of the transparent conductive film as a mask wherein the outer edges of the patterns of the silicide film, the impurity containing semiconductor layer, and the transparent conductive layer in the thin film transistors have substantially an identical pattern.

5,751,382

LIQUID CRYSTAL DISPLAY INPUT/OUTPUT DEVICE

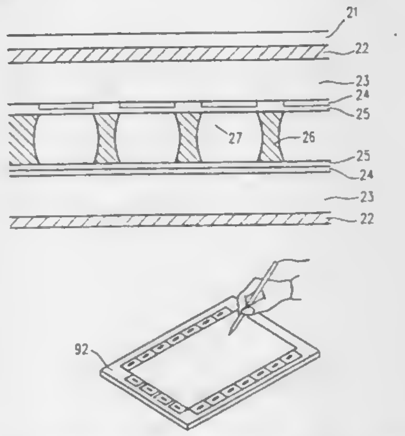
Nobuaki Yamada, Higashiosaka; Masahiko Kondo, Kitakatsuragi; Masayuki Okamoto, Tenri, and Shuichi Kozaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 324,976, Oct. 18, 1994, which is a continuation-in-part of Ser. No. 054,454, Apr. 21, 1993, Pat. No. 5,473,450. This application May 25, 1995, Ser. No. 450,185

Claims priority, application Japan, Oct. 19, 1993, 5-261356; Oct. 27, 1993, 5-268612; Jul. 25, 1994, 6-172740

Int. Cl.^{6} G02F *1/133;1/1339;1/1343;* **G09G** *3/36*

U.S. Cl. 349—12 **7 Claims**



1. A liquid crystal display input/output device comprising:
- a liquid crystal display device including a plurality of pixels and polymeric walls formed in a pattern between a pair of electrode substrates and liquid crystal regions at each pixel being surrounded by the polymeric walls and
- input means for detecting a position of a desired point by touching the desired point.

5,751,383

IMAGE DISPLAY DEVICE HAVING A PIXEL MULTIPLYING MEANS

Atsushi Yamanaka, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

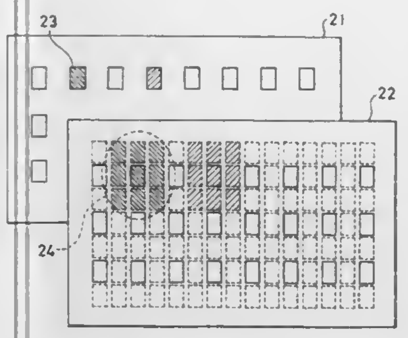
Filed Jun. 1, 1994, Ser. No. 252,659

Claims priority, application Japan, Jun. 1, 1993, 5-130565; Jun. 1, 1993, 5-130566; Jun. 4, 1993, 5-134597; Dec. 7, 1993, 5-306754; Feb. 10, 1994, 6-015633

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 349—13 **11 Claims**

1. An image device comprising:



- a display unit having a plurality of pixels having first and second pitches in two dimensions; and
- a pixel multiplying means located on a surface of said display unit at the display side for visually multiplying the number of pixels displayed on said display unit, wherein the pitches in said two dimensions of the multiplied images are less than said first and second pitches.

5,751,384

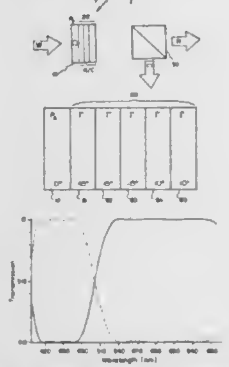
COLOR POLARIZERS FOR POLARIZING AN ADDITIVE COLOR SPECTRUM ALONG A FIRST AXIS AND IT'S COMPLIMENT ALONG A SECOND AXIS

Gary D. Sharp, Boulder, Colo., assignor to The Board of Regents of the University of Colorado, Boulder, Colo.

Filed May 23, 1995, Ser. No. 447,522

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 349—18 **131 Claims**



1. A complementary color polarizer comprising:
- a first linear polarizer; and
- a first retarder stack comprising two or more retarders, said first retarder stack positioned in series with said polarizer, wherein the number, N, of said retarders and the retardances and orientations of said retarders are such that a first additive primary color spectrum is transmitted along a first polarization axis and the complementary first subtractive primary color spectrum is transmitted along a second, orthogonal, polarization axis.

5,751,385

SUBTRACTIVE COLOR LCD UTILIZING CIRCULAR NOTCH POLARIZERS AND INCLUDING A TRIBAND OR BROADBAND FILTER TUNED LIGHT SOURCE OR DICHROIC SHEET COLOR POLARIZERS

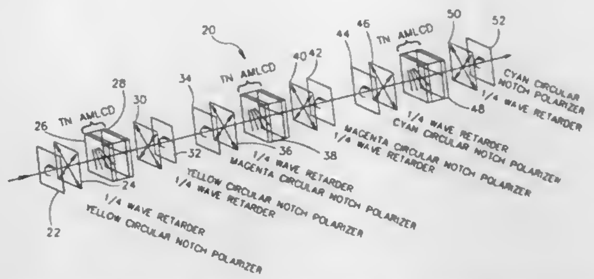
William C. Heinze, Glendale, Ariz., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jun. 7, 1994, Ser. No. 255,031

Int. Cl.^{6} G02F *1/1335;1/1347*

U.S. Cl. 349—61 **20 Claims**

1. A subtractive color liquid crystal display comprising:


20
26
TN AMLCD
28
30
34
TN AMLCD
40
42
44
46
TN AMLCD
50
52
CYAN CIRCULAR NOTCH POLARIZER
1/4 WAVE RETARDER
48
1/4 WAVE RETARDER
CYAN CIRCULAR NOTCH POLARIZER
MAGENTA CIRCULAR NOTCH POLARIZER
1/4 WAVE RETARDER
36
38
32
1/4 WAVE RETARDER
MAGENTA CIRCULAR NOTCH POLARIZER
YELLOW CIRCULAR NOTCH POLARIZER
1/4 WAVE RETARDER
24
1/4 WAVE RETARDER
YELLOW CIRCULAR NOTCH POLARIZER
22

- tuned illumination means comprising a triband tuned light source; and
  - a plurality of picture elements, each of said picture elements comprising:
  - first, second, and third active switching elements aligned relative to said illumination means, which selectively rotate polarization of incident light from said illumination means;
  - a first entrance notch polarizer adjacent to the first switching element which polarizes a narrow band of light of the first primary color (red, green, and blue);
  - a first exit notch polarizer adjacent to the first switching element which blocks or passes light of the first primary color depending on the rotation imparted on the light by the first switching element;
  - a second entrance notch polarizer adjacent to the second switching element which polarizes a narrow band of light of a second primary color;
  - a second exit notch polarizer adjacent to the second switching element which blocks or passes light of the second primary color depending on the rotation imparted on the light by the second switching element;
  - a third entrance notch polarizer adjacent to the third switching element which polarizes a narrow band of light of the third primary color; and
  - a third exit notch polarizer adjacent to the third switching element which blocks or passes light of the third primary color depending on the rotation imparted on the light by the third switching element;

and wherein the entrance and exit notch polarizers are comprised of a circular notch polarizer and a quarter wave retarder plate, said circular notch polarizer being constructed of tuned crosslinked cholesteric liquid crystal silicons.

5,751,386

ILLUMINATION DEVICE WITH LUMINANCE DISTRIBUTION ADJUSTING REFLECTION PLATE AND LIQUID CRYSTAL DISPLAY APPARATUS INCLUDING SAME

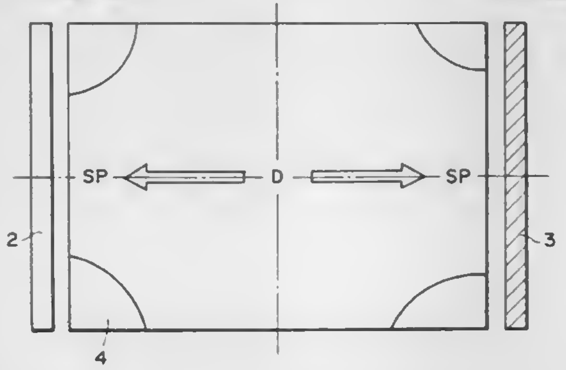
Toshiyuki Kanda, Chigasaki; Hiroshi Takabayashi, Atsugi, and Yoshihiro Onitsuka, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 571,783, Dec. 13, 1995, abandoned. This application Aug. 5, 1997, Ser. No. 906,157

Claims priority, application Japan, Dec. 16, 1994, 6-313694

Int. Cl.^{6} G02F *1/1335;* **G01D** *11/28;* **F21V** *7/04*

U.S. Cl. 349—65 **25 Claims**



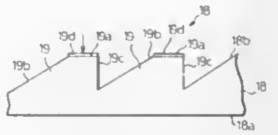
1. An illumination device, comprising:
a linear light source,
a first reflection means disposed opposite to and spaced from the linear light source;
a light guide means disposed between the linear light source and the first reflection means;
a second reflection means disposed behind the light guide means so that light issued from the linear light source is transmitted through the light guide means and reflected by the first and second reflection means to be emitted from the light guide means in a forward direction; and
a luminance distribution-adjusting means for reflecting light transmitted through the light guide means and disposed along the light guide means with a distribution density which varies at a changing rate free from discontinuity so as to adjust the luminance distribution of the light emitted from the light guide means in the forward direction;
said luminance distribution-adjusting means being disposed between the light guide means and the second reflection means with varying distribution densities so that the amount of light reflected by the luminance distribution-adjusting means and emitted from the light guide means in a forward direction is larger in a region of a higher distribution density and smaller in a region of a lower distribution density, respectively, of the luminance distribution-adjusting means for an uniform intensity of light incident thereto; and the distribution density of the luminance distribution adjusting means is increased at corners of the light guide means, whereby the light emitted from the light guide means is made uniform.

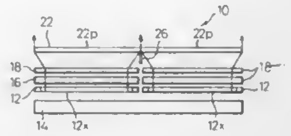
9. An illumination device, comprising:
a linear light source;
a first reflection means disposed opposite to and spaced from the linear light source;
a light guide means disposed between the linear light source and the first reflection means;
a second reflection means disposed behind the light guide means so that light issued form the linear light source is transmitted through the light guide means and reflected by the first and second reflection means to be emitted from the light guide means in a forward direction; and
a luminance distribution-adjusting means for reflecting light transmitted through the light guide means and disposed along the light guide means with a distribution density which varies at a changing rate free from discontinuity so as to adjust the luminance distribution of the light emitted from the light guide means in the forward direction;
said luminance distribution-adjusting means being disposed on a front side of the light guide means and opposite the second reflection means with varying distribution densities so that the amount of light emitted from the light guide means in a forward direction is larger in a region of a higher distribution density and smaller in a region of a lower distribution density, respectively, of the luminance distribution adjusting means for an uniform intensity of light incident thereto; and the distribution density of the luminance distribution adjusting means is lowered at corners of the light guide means, whereby the light emitted through the luminance distribution-adjusting means is made uniform.

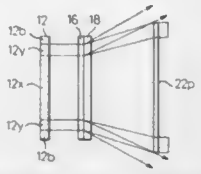
5,751,387
FRESNEL LENS AND LIQUID CRYSTAL DISPLAY DEVICE

Yukio Iigahama, and Motohiko Fukuhara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jul. 28, 1995, Ser. No. 508,632
Int. Cl.^{6} G02F *00/00*
U.S. Cl. 349—95 **30 Claims**

4. A display device comprising:
at least one image modulator;
an array of convergently transmissive elements receiving light from said at least one image modulator for forming an erect and real image







a fresnel lens including a body having a flat surface and a configured surface with periodic ridges, the fresnel lens being arranged so that light is made incident from the array of convergently transmissive elements to the configured surface of the fresnel lens;
a screen receiving light from said at least one image modulator via the array of convergently transmissive elements and the fresnel lens; and
wherein an angle (AEP) of light emerging from an outermost portion of the fresnel lens relative to a line normal to the fresnel lens is in a range of between approximately 13 and 40 degrees.

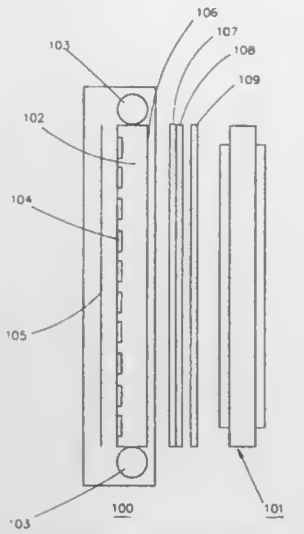
18. A display device comprising:
at least one image modulator;
optical lens for magnifying an image output by said at least one image modulator;
a screen for receiving an image from said at least one image modulator via said optical lens; and
the screen has a predetermined display area, and said at least one image modulator has a main display area and a peripheral compensating area arranged such that the main display area forms an image on the predetermined display area via said optical lens and the peripheral compensating area forms an image just outside the predetermined display area via said optical lens.

20. A display device comprising:
at least one image modulator;
an array of convergently transmissive elements receiving light from said at least one image modulator for forming an erect and real image;
a fresnel lens including a body having a flat surface and a configured surface with periodic ridges, wherein each of the ridges includes a flat crest extending generally parallel to the flat surface and at least one inclined surface extending from the flat crest toward the crest of each of the ridges, and the fresnel lens being arranged so that light is made incident from the array of convergently transmissive elements to the configured surface of the fresnel lens, further wherein the flat crests have varying widths depending on the positions of the ridges; and
a screen receiving light from said at least one image modulator via the array of convergently transmissive elements and the fresnel lens.

5,751,388
HIGH EFFICIENCY POLARIZED DISPLAY

Brent D. Larson, Cave Creek, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 7, 1995, Ser. No. 418,981
Int. Cl.^{6} G02F *1/1335*
U.S. Cl. 349—96 **52 Claims**

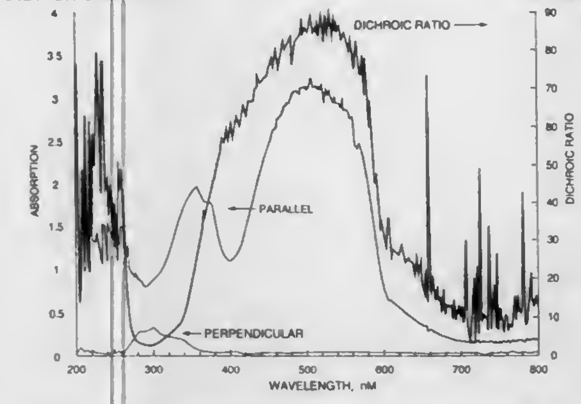
1. An image display apparatus comprising:
a source of light rays;



a polarization-sensitive scattering element (PSSE) located proximate to said source of light rays, where said PSSE is a microstructural composite of material domains having differing birefringence, having a first scattering distribution which is randomly diffuse for light rays of a first polarization and a second scattering distribution for light rays of a second polarization; and
a light modulating means in the path of said light rays which selectively passes light in order to display a desired image.

5,751,389
FILM CONTAINING ORIENTED DYE, METHOD OF MANUFACTURING THE SAME, AND POLARIZER AND LIQUID CRYSTAL DISPLAY UNIT UTILIZING THE SAME

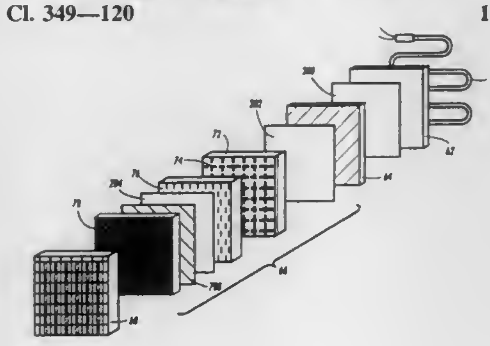
Alejandro Andreatta, Santa Barbara, Calif., and Shuji Doi, Ibaraki, Japan, assignors to Sumitomo Chemical Company, Osaka, Japan
Continuation-in-part of Ser. No. 303,351, Sep. 8, 1994, abandoned. This application Feb. 13, 1995, Ser. No. 387,589
Int. Cl.^{6} G02F *1/1335;* **G02B** *5/30;27/28*
U.S. Cl. 349—97 **30 Claims**

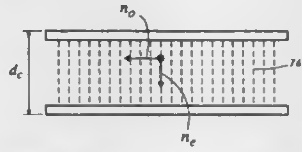


1. A uniaxially oriented film of a film-forming material comprising at least 1% by weight dichroic dye, said dye having a wavelength of peak absorbance of from 400 to 800 nanometers, the film having a thickness of from 1 nanometer to 5 micrometers, having a dichroic ratio of not less than 25 at the wavelength of peak absorbance and having been formed by deposit of the film-forming material upon a fluororesin alignment layer.

5,751,390
ENHANCED OFF-AXIS VIEWING PERFORMANCE OF LIQUID CRYSTAL DISPLAY EMPLOYING A FIBEROPTIC FACEPLATE IN CONJUNCTION WITH DUAL NEGATIVE RETARDERS AND A BRIGHTNESS ENHANCING FILM ON THE ILLUMINATION SOURCE

Gregory P. Crawford, Providence, R.I.; Thomas G. Fiske, Campbell, Calif., and Louis D. Silverstein, Scottsdale, Ariz., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 12, 1996, Ser. No. 764,542
Int. Cl.^{6} G06F *1/1335;1/1333*
U.S. Cl. 349—120 **11 Claims**





1. A direct-view, rear-illuminated liquid crystal display device, comprising in sequential order:
A) a backlight source;
B) a rear diffuser layer;
C) a light shaping film,
D) a rear linear polarizer;
E) a liquid crystal cell including
  i) a rear glass layer with addressing elements and pixel ITO electrodes,
  ii a liquid crystal layer,
  iii) a common ITO electrode,
  iv) a front polarizer, and
  v) a front fiber-optic faceplate as a front containing element substantially adjacent to said front polarizer, said front fiber-optic faceplate including optical fibers and cladding material, said front fiber-optic faceplate having a plurality of fibers, and
F) wherein said liquid crystal cell is constructed to produce a highly anisotropic light distribution possessing extremely high contrast around a narrow meridian of the display viewing volume and is comprised of:
  i) a first negative retardation film located between the front polarizer and the liquid crystal layer,
  ii) a second negative retardation film located between the rear polarizer and the liquid crystal layer,
  iii) said first negative retardation film has indices of refraction n_{x1} and n_{y1}, on the plane of the first retardation film and an index of refraction n_{z1} in a thickness direction, a distance dri which is the thickness of the first retardation film, the indices of refraction of the first retardation film are described by the equation $nz_1<n_{x1}=n_{y1}$, and an optical path length of the first retardation film is approximately described by the equation $\Delta nd=(n_{z1}-n_{x1})d_{r1}$,
  iv) said second negative retardation film has indices of refraction n_{x2} and n_{y2} on the plane of the second retardation film and an index of refraction n_{z2} in a thickness direction, a distance d, which is the thickness of the second retardation film, the indices of refraction of the second retardation film are described by the equation $n_{z2}<n_{x2}=n_{y2}$, and an optical path length of the second retardation film is approximately described by the equation $\Delta nd=(n_{z2}-n_{x2})d_{r2}$,
  v) said liquid crystal layer, in an homeotropically aligned state, has indices of refraction n_e and n_o where index of

refraction n_e extends in a thickness direction of the liquid crystal layer and the index of refraction n_o is perpendicular to the index of refraction n_e and extends in the direction in the plane of the liquid crystal layer, the index of refraction n_e is always greater than the index of refraction n_o, for a positive optically anisotropic liquid crystal material, said liquid crystal layer has a distance d_c which is the thickness of the liquid crystal layer, and an optical path length of the liquid crystal layer is approximately described by the equation $\Delta nd=(n_e-n_o)d_c$, and

vi) a sum of the optical path lengths of the two retardation films must be substantially equal to an absolute value of the optical path length of the liquid crystal layer and is opposite in sign to the value of the optical path length of the liquid crystal layer.

5,751,391

LIQUID CRYSTAL DEVICE WITH ELONGATED PROJECTION HEIGHT SMALLER THAN LIQUID CRYSTAL THICKNESS AND PROCESS FOR PRODUCING SAME

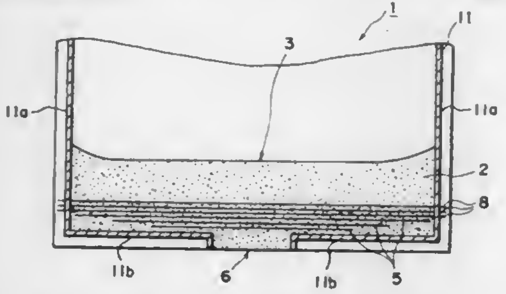
Yuko Yokoyama, Yokohama, and Masayuki Shimamune, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1996, Ser. No. 638,193

Claims priority, application Japan, Apr. 27, 1995, 7-125645

Int. Cl.^{6} G02F *01/1339;01/1341;01/1343*

U.S. Cl. 349—153 **14 Claims**



1. A liquid crystal device, comprising: a pair of oppositely disposed substrates each provide with electrodes in the form of stripes, and a liquid crystal layer having a prescribed thickness and comprising liquid crystal disposed in a region which is enclosed by the pair of substrates and a sealing agent disposed so as to form a peripheral wall having an injection port, the device having an effective optical modulation region, and a peripheral region other than the effective optical modulation region and including the injection port; wherein

on at least one substrate, at least one elongated projection having a height smaller than the thickness of the liquid crystal layer is formed in the peripheral region including the injection port and in a direction parallel to the striped electrodes on the same substrate and perpendicular to a liquid crystal injection direction.

5,751,392

PROCESS FOR FILLING LIQUID CRYSTAL BY GRADUALLY EASING THE LEVEL OF NEGATIVE PRESSURE

Gyo Shimotoyodome, and Isao Sugiura, both of Tokyo, Japan, assignors to Beldex Corporation, Tokyo, Japan

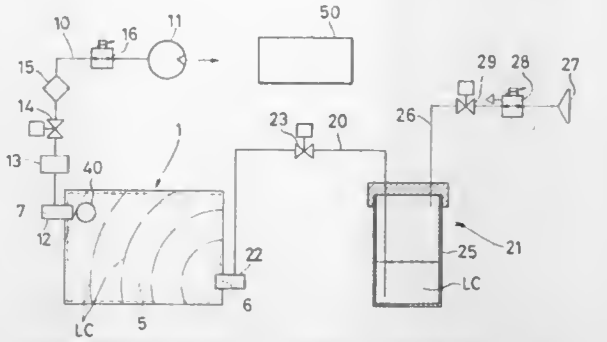
Filed Mar. 8, 1996, Ser. No. 613,116

Claims priority, application Japan, Mar. 23, 1995, 7-090183

Int. Cl.^{6} G02F *1/13;1/1341;* **B65B** *31/00;* **B67C** *3/00*

U.S. Cl. 349—187 **4 Claims**

1. A process for filling a liquid crystal cell comprising the steps to be performed in the following order of:



(a) connecting one end of a vacuum evacuation passage to a suction port of the cell and connecting one end of a liquid crystal supply passage to an introduction port of said cell;

(b) evacuating an internal space of said cell by vacuum evacuation means connected to the other end of said vacuum evacuation passage through said suction port;

(c) supplying a pressurized liquid crystal to the internal space of said cell by a pressurized-liquid crystal supply passage through said introduction port of said cell while evacuating the internal space of said cell by said vacuum evacuation means;

(d) stopping a supply of the pressurized liquid crystal after the completion of a liquid crystal filling operation into the internal space of said cell; and

(e) after stopping the supply of the pressurized liquid crystal, gradually easing the level of negative pressure in said vacuum evacuation passage to that of an atmospheric pressure by a negative pressure adjusting means which is disposed in said vacuum evacuation passage while maintaining the state of connection of said vacuum evacuation passage with said suction port of said cell and the state of connection of said liquid crystal supply passage with said introduction port of said cell.

5,751,393

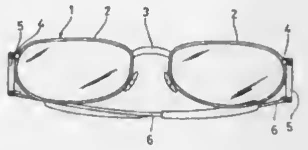
SPECTACLES FRAME HAVING BIASED AUXILIARY TEMPLES

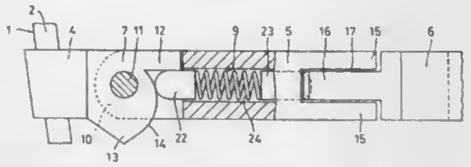
Kiyoshi Yamazaki, Fukui, Japan, assignor to Yugen Kaisha Yamasei Gankyo, Sabae, Japan

Continuation-in-part of Ser. No. 638,185, Apr. 26, 1996, abandoned. This application Jan. 8, 1997, Ser. No. 780,321

Int. Cl.^{6} G02C *5/08;5/14*

U.S. Cl. 351—63 **11 Claims**





1. A frame for spectacles comprising:

a pair of lens frames;

mounting pieces fixed to said lens frames, respectively;

auxiliary temples connected to rear ends of said mounting pieces, respectively, so as to permit said auxiliary temples to be folded downwardly from a position in which they extend rearwardly and to resiliently maintain said auxiliary temples in the rearwardly extending position; and

main temples connected to rear ends of said auxiliary temples, respectively, so as to permit said main temples to be folded inwardly from a position in which they extend rearwardly and to resiliently maintain said main temples both in the rearwardly extending position and an inwardly folded position,

wherein each of said auxiliary temples is provided with a means for permitting said auxiliary temple to be bent downward from a position in which it extends rearwardly from said respective mounting piece and for resiliently maintaining said auxiliary temple in the rearwardly extending position, and for resiliently holding said corresponding main temple in the position in which it is bent inwardly from the position in which it extends rearwardly from the corresponding auxiliary temple.

5,751,394

ADJUSTABLE TEMPLE FRAME MOUNTING STRUCTURE IN SPECTACLES

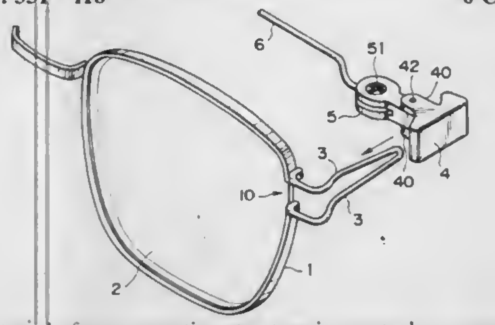
Satoru Masunaga, Fukui, Japan, assignor to Masunaga Optical Mfg. Co., Ltd., Japan

Filed Dec. 24, 1996, Ser. No. 774,862

Claims priority, application Japan, Sep. 26, 1996, 8-009689 U

Int. Cl.^{6} G02C *5/20;5/16*

U.S. Cl. 351—118 **6 Claims**



1. A temple frame mounting structure in spectacles, comprising

a lens frame with a notch portion provided in a part of an annular side;

a pair of clamped pieces fixed at positions of said lens frame between which said notch portion is positioned, and having distal ends extending apart from said lens frame in a direction of eyes;

a clamp pedestal with a pair of bearing portions formed on both sides, having a groove-like portion into which said pair of clamped pieces are guided while an interval therebetween becoming narrower;

a cam piece horizontally movably and pivotally mounted to the bearing portions of said clamp pedestal, and including a base end having a cam portion to press said pair of clamped pieces guided to the clamp pedestal to the side of an inner bottom portion of said clamp pedestal when the cam piece is closed to extend along said clamp pedestal; and

a temple frame horizontally movably and pivotally mounted to a distal end of said cam piece or a part of said clamp pedestal in a state in which the temple frame is capable of being closed on the side of eyes.

5,751,395

RETINAL DIAGNOSTIC DEVICE

Edmond H. Thall, 7208 Dukes Pl., Amarillo, Tex. 79109

Filed Jan. 10, 1997, Ser. No. 781,667

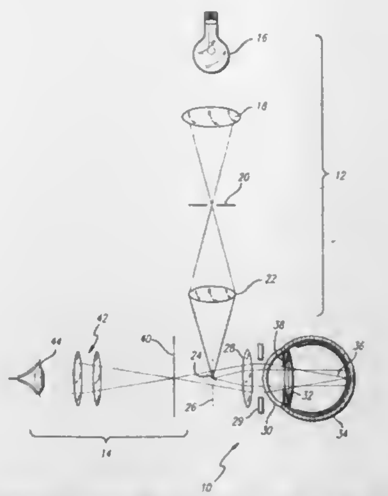
Int. Cl.^{6} A61B *3/10;3/14;3/00*

U.S. Cl. 351—221 **28 Claims**

1. A diagnostic device for examining the internal anatomy of the eye, comprising:

illumination means for illuminating internal ocular structures with a beam of light, the beam of light being directed into the eye along a first optical path onto the internal ocular structures, wherein the light is scattered out of the eye along a second optical path by the internal ocular structures along;

a means, disposed along the second optical path for producing an optical transform from the light scattered out of the eye;



a means, disposed along the second optical path for modifying the optical transform; and

image forming means for receiving the modified optical transform and for forming an image of the internal ocular structures from the modified optical transform.

5,751,396

OPHTHALMIC APPARATUS INCLUDING OCULAR FUNDUS ILLUMINATING SYSTEM FOR ILLUMINATING THE FUNDUS OF THE EYE TO BE EXAMINED THROUGH THE PUPIL THEREOF

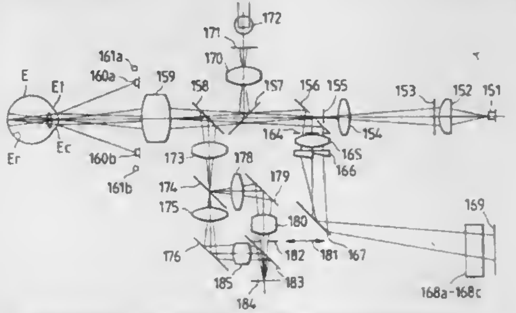
Takashi Masuda, Yamato; Kyoji Sekiguchi; Toshiaki Okumura, both of Yokohama; Hiroshi Aoki, Kawasaki, and Osamu Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 149,922, Nov. 10, 1993, abandoned. This application Apr. 2, 1997, Ser. No. 826,536

Claims priority, application Japan, Nov. 10, 1992, 4-324949

Int. Cl.^{6} A61B *3/10*

U.S. Cl. 351—221 **37 Claims**



1. An ophthalmic measuring apparatus comprising:

an eye measuring system for projecting a measuring light beam onto the ocular fundus of an eye to be examined, including a detector for detecting the reflected light of the measuring light beam reflected from the ocular fundus of the eye, wherein predetermined information of the eye to be examined is measured on the basis of the detection of said reflected light beam by said detector;

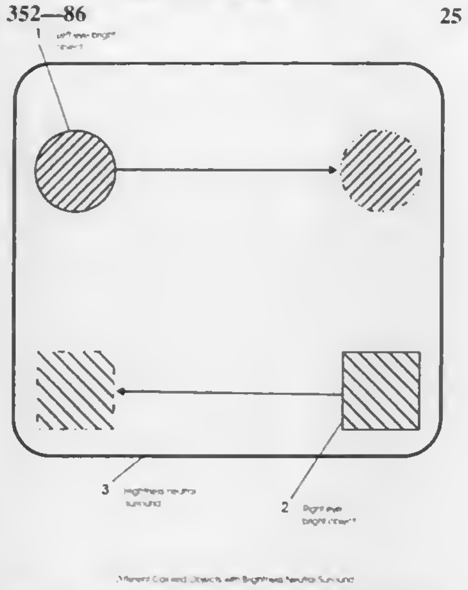
an observing system for enabling observation of the eye to be examined by an examiner;

an anterior segment illuminating system for illuminating the anterior segment of the eye for observation of the anterior segment of the eye by said observing system;

an ocular fundus illuminating system for illuminating the ocular fundus of the eye to be examined through the pupil thereof, and enabling observation, by said observing system of the pupil area of the eye to be examined, wherein the pupil area is illuminated by the reflected light from the ocular fundus of the eye illuminated by said ocular fundus illuminating system; and

a control system for rendering variable the illumination intensity of said anterior segment illuminating system when the illumination by said ocular fundus illuminating system is conducted during the observation by said observing system.

5,751,397
COLOR MOTION DEPTH EFFECT SYSTEM
Alan G. Osgood, 16725 NE. 98th Pl., Redmond, Wash. 98052
Filed Jun. 6, 1995, Ser. No. 483,564
Int. Cl.⁶ G03B *21/32*
U.S. Cl. 352—86 **25 Claims**

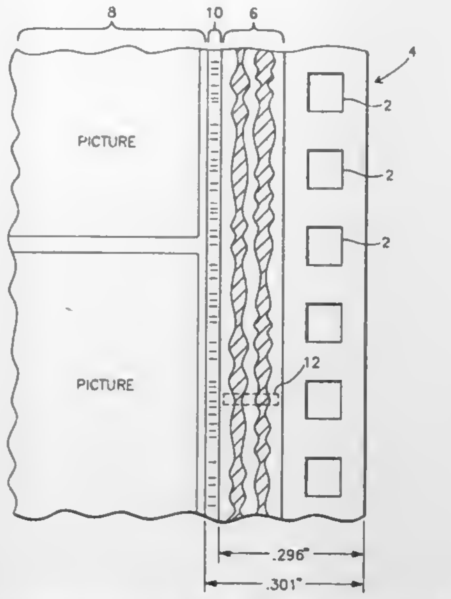

1 left eye bright object
3 brightness neutral surround
2 Right eye bright object
Different Colored Objects with Brightness Neutral Surround

1. A method of using colored backgrounds or surrounds of a first group of colors and a second group of colors as part of movie, video or other imagery which when observed through viewer glasses provides visual depth effects for laterally moving objects of brightness neutral colors, the method comprising:

- selecting a first group of colors and a second group of colors;
- selecting as part of the movie or video imagery surrounds of the first group of colors that cause objects of brightness neutral colors which move from the observer's perspective from left to right to appear to be closer to the observer, and cause objects of brightness neutral colors which move from right to left to appear to be farther from the observer;
- selecting as part of the movie and video imagery surrounds of the second group of colors that cause objects of brightness neutral colors which move from right to left to appear to be closer to the observer, and cause objects of brightness neutral colors which move from left to right to appear to be farther from the observer;
- selecting as part of the movie and video imagery objects of brightness neutral colors which move laterally; and
- using viewer glasses comprising a left lens and a right lens wherein the left lens passes from 4 to 20 times as much light of the first group of colors as the right lens, the right lens passes from 4 to 20 times as much light of the second group of colors as the left lens, and the left and right lens of the viewer glasses pass an equivalent amount of light for brightness neutral colors.

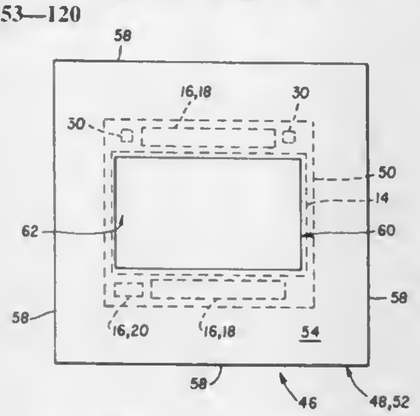
5,751,398
MOTION PICTURE DIGITAL SOUND SYSTEM AND METHOD
Terry D. Beard, Westlake Village, Calif., assignor to Digital Theater System, Inc., Westlake Village, Calif.
Continuation-in-part of Ser. No. 590,294, Sep. 28, 1990, abandoned. This application Nov. 29, 1990, Ser. No. 620,825
Int. Cl.⁶ G03B *31/00*
U.S. Cl. 352—236 **7 Claims**

1. A motion picture sound film, comprising:



- a motion picture color film having a series of picture frames on a developed portion of the film that is substantially transparent to infrared radiation, an analog sound track generally parallel to said picture frames on a redeveloped portion of the film that is readable by infrared radiation, and a buffer area between said picture frames and sound track having a portion that is developed and a portion that is redeveloped, the redeveloped portion of the buffer area extending only partially across said buffer area from said sound track towards said picture frames, and
- a digital time code on the film proximate to said picture frames for providing a digital identification of locations on the film, said digital time code comprising exposed portions of said buffer area that are readable by visible light that is absorbed by the color dyes of said film, at least a portion of said time code being unreadable by infrared radiation.

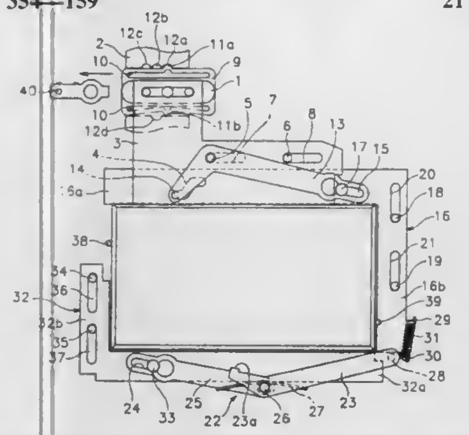
5,751,399
FILM SLIDES HAVING DATA WINDOWS
Dale F. McIntyre; Daniel M. Pagano, both of Honeoye Falls; David L. Patton, Webster, and Edward Weissberger, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 31, 1996, Ser. No. 775,814
Int. Cl.⁶ G03B *21/14*
U.S. Cl. 353—120 **7 Claims**



1. A film slide comprising

- a transparency having an image section bearing a visual image and a data section bearing encoded data relating to said visual image; and
- a mount having front and back panels, said panels each defining an image window overlapping said image section, at least one of said panels defining a data window overlapping said data section.

5,751,400
CONVERSION SYSTEM FOR A CAMERA
Myeong-kyu Kim, and Seong-doo Hong, both of Changwon-si, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Changwon-si, Rep. of Korea
Filed Apr. 13, 1994, Ser. No. 226,947
Claims priority, application Rep. of Korea, Apr. 16, 1993, 93-6448; Apr. 26, 1993, 93-7007
Int. Cl.⁶ G03B *17/02;37/00*
U.S. Cl. 354—159 **21 Claims**



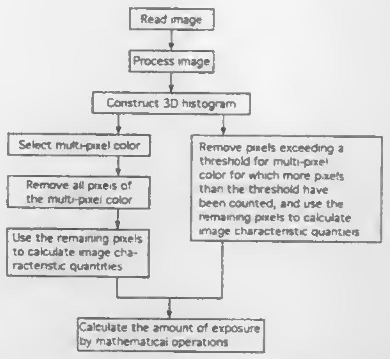
1. A photographic mode conversion system for a camera comprising

- a conversion knob movably mounted in a camera body and extended outwardly of the camera body;
- a cam plate movably mounted in the camera body for a linear movement and connected to said conversion knob;
- A first operating lever rotatably mounted about a first fixed pivot pin and connected to said cam plate for rotation in response to the movement of said cam plate;
- a first panorama curtain connected to said first operating lever for a vertical movement in response to rotation of said first operating lever;
- a second operating lever rotatably mounted about a second fixed pivot pin and contacted to said first panorama curtain for rotation in response to the vertical movement of said first panorama curtain;
- a second panorama curtain connected to said second operating lever for movement in response to rotation of said second operating lever, whereby upon linear movement of said conversion knob and said cam plate, said first and second panorama curtains are moved in opposite directions to each other and a photographic mode is changed; and
- a conversion plate secured between said conversion knob and said cam plate for selectively engaging with the camera body, said conversion plate having a first projection on an upper end for resiliently engaging in one of three grooves in the camera body corresponding to said mode positions of said cam plate and a second projection on a lower end for resiliently engaging in a fourth groove in the camera body.

5,751,401
METHOD OF DETERMINING AMOUNT OF EXPOSURE
Naoki Takaoka, and Atsushi Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 2, 1995, Ser. No. 552,204
Claims priority, application Japan, Nov. 4, 1994, 6-271393
Int. Cl.⁶ G03B *27/32;27/52;27/72;27/80*
U.S. Cl. 355—32 **6 Claims**

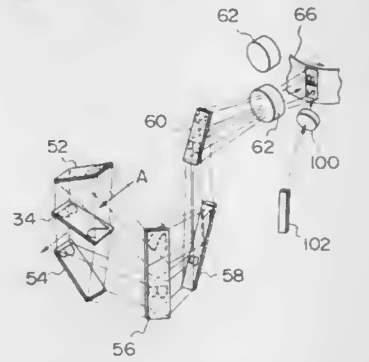
1. A method of determining an amount of exposure for use with an image forming apparatus that reads red, green and blue densities of an original image on a pixel basis and that determines the amount of exposure of a light-sensitive material in accordance with a result of the reading step, comprising the steps of:

- adding those pixels of the same color which have been found to have red, green and blue densities within respective predetermined ranges as a result of the reading of said original image;


Read image
Process image
Construct 3D histogram
Select multi-pixel color
Remove all pixels of the multi-pixel color
Use the remaining pixels to calculate image characteristic quantities
Remove pixels exceeding a threshold for multi-pixel color for which more pixels than the threshold have been counted, and use the remaining pixels to calculate image characteristic quantiers
Calculate the amount of exposure by mathematical operations

- removing at least part of the pixels that represent a color having a greater number of pixels than a predetermined value; and
- performing mathematical operations for determining the amount of exposure with the remaining pixels.

5,751,402
MICROFILM CASSETTE AND MICROFILM CAMERA
Kiyoji Nakamura; Hiroyuki Okabayashi; Mutsumi Ashizawa, all of Kanagawa, Japan; Shinichi Shidara, and Hajime Tachibana, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 10, 1996, Ser. No. 679,630
Claims priority, application Japan, Jul. 10, 1995, 7-195726
Int. Cl.⁶ G03B *27/58;27/62;23/02*
U.S. Cl. 355—40 **6 Claims**



1. A microfilm cassette with a roll film mounted therein for photographing images of document papers on the roll film by a slit exposure system, comprising:

- a case having a substantially rectangular shape as viewed from the top;
- a supply reel and a take-up reel mounted inside said case and arranged adjacent to each other horizontally in the length side direction of said case, where the roll film is wound round the reels from both ends of the roll film;
- a photographic opening formed around the center of one short side wall of said case;
- a photographic roller for being wrapped with the roll film around the outer surface thereof, the photographic roller being arranged in a position opposite to said photographic opening; and
- a shutter for opening and closing said photographic opening.

5,751,403

PROJECTION EXPOSURE APPARATUS AND METHOD

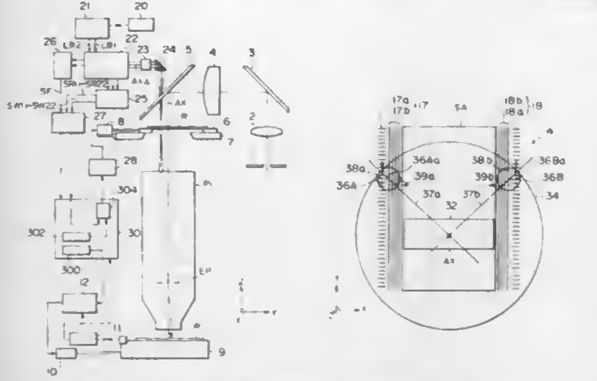
Hideo Mizutani, Yokohama, and Tohru Kawaguchi, Kawasaki, both of Japan, assignors to Nikon Corporation, Japan

Filed Jun. 6, 1995, Ser. No. 471,928

Claims priority, application Japan, Jun. 9, 1994, 6-127481; Feb. 9, 1995, 7-021454

Int. Cl.^{6} G03B *27/42;* G01B *11/26*

U.S. Cl. 355—53 **51 Claims**



1. A projection exposure apparatus comprising:

an illumination optical system for irradiating exposure light of a predetermined wavelength to a photomask pattern formed on a reticle;

a projection optical system for projecting said exposure light having passed through the whole of said photomask pattern at a predetermined magnification to a photosensitive film formed on a surface of a wafer;

a reticle stage for holding said reticle and moving a surface of said reticle within a first reference plane substantially perpendicular to an optical axis of said projection optical system;

a wafer stage for holding said wafer and moving the surface of said wafer within a second reference plane substantially perpendicular to the optical axis of said projection optical system and different from said first reference plane;

a driving mechanism comprising reticle driving means for driving said reticle stage and wafer driving means for driving said wafer stage;

an alignment mechanism for measuring an amount of relative positional deviation between said reticle and said wafer; and

a controlling mechanism comprising reticle controlling means for controlling said reticle driving means, wafer controlling means for controlling said wafer driving means, and servo controlling means for controlling at least one of said reticle controlling means and said wafer controlling means, based on the amount of relative positional deviation between said reticle and said wafer, measured by said alignment mechanism;

wherein said wafer comprises a wafer mark formed as diffraction gratings having two types of pitches in at least one region adjacent to a shot area to which an image of said photomask pattern is transferred, and said reticle comprises a reticle mark formed as diffraction gratings having two types of pitches in at least one region adjacent to a pattern area in which said photomask pattern is located, and

wherein said alignment mechanism comprises:

a first light-sending system for setting a first scan straight line and a second scan straight line being respectively parallel to two directions along which the diffraction gratings having two types of pitches are arranged in said wafer mark, in axis symmetry with respect to a reference straight line passing an intersecting point between said first and second scan straight lines and an intersecting point between the surface of said wafer and the optical axis of said projection optical system, for sending a first light beam and a second light beam different from said first light beam through said projection optical system to said wafer, and for scanning said first and second light beams along said first and second scan straight lines, respectively;

a second light-sending system for sending a third light beam different from said first and second light beams, and a fourth light beam different from said first to third light beams to said reticle, and for scanning said third and fourth light beams along a third scan straight line and a fourth scan straight line being respectively parallel to two directions along which the diffraction gratings having two types of pitches are arranged in said reticle mark, respectively;

a first light-receiving system for detecting reflected light of said first light beam emergent from said wafer mark and detecting reflected light of said third light beam emergent from said reticle mark; and

a second light-receiving system for detecting reflected light of said second light beam emergent from said wafer mark and detecting reflected light of said fourth light beam emergent from said reticle mark.

5,751,404

EXPOSURE APPARATUS AND METHOD WHEREIN ALIGNMENT IS CARRIED OUT BY COMPARING MARKS WHICH ARE INCIDENT ON BOTH RETICLE STAGE AND WAFER STAGE REFERENCE PLATES

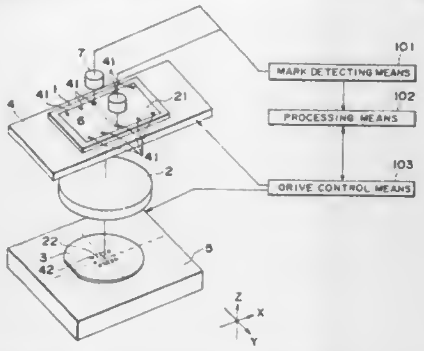
Eiichi Murakami; Fumlo Sakai, both of Utsunomiya; Shigeyuki Uzawa, Nakamachi; Shigeki Ogawa, Minaminasumachi, and Tetsuya Mori, Utsunimiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1996, Ser. No. 684,100

Claims priority, application Japan, Jul. 24, 1995, 7-187171; May 8, 1996, 8-113542; Jul. 9, 1996, 8-179083

Int. Cl.^{6} G03B *27/42;27/52;27/32;* G02B *11/00*

U.S. Cl. 355—53 **29 Claims**



1. A scanning exposure apparatus, comprising:

a first movable stage being movable while carrying a first object thereon;

a second movable stage being movable while carrying a second object thereon;

a projection optical system for projecting a pattern;

control means serviceable to scan said first and second movable stages in a timed relation and relative to said projection optical system and to project a pattern of the first object onto the second object through said projection optical system;

a first reference plate fixedly mounted on said first movable stage;

a second reference plate fixedly mounted on said second movable stage; and

detecting means serviceable to scan at least one of said first and second movable stages to detect a relative positional relationship between alignment marks of said first and second reference plates to thereby determine a scan direction of one of said first and second movable stages.

5,751,405

IMAGE FORMING APPARATUS

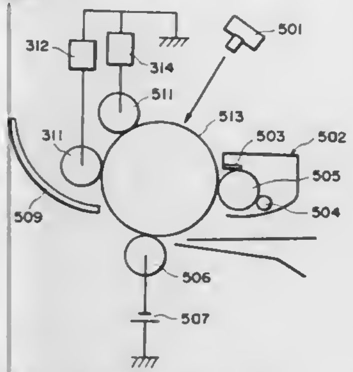
Shuichi Aita; Tsutomu Kukimoto, both of Yokohama; Satoshi Yoshida, Tokyo, and Yoshifumi Hano, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1995, Ser. No. 559,094

Claims priority, application Japan, Nov. 18, 1994, 6-285270; Nov. 1, 1995, 7-284993

Int. Cl.^{6} G03G *15/06;15/24*

U.S. Cl. 355—269 **16 Claims**



1. An image forming apparatus comprising:

an image bearing member;

developing-cleaning means for cleaning said image bearing member by removing residual toner from said image bearing member simultaneously with formation of a toner image by developing an electrostatic latent image formed on said image bearing member with toner having a charging polarity opposite from a charge polarity of the electrostatic latent image;

transfer means for transferring the toner image from said image bearing member to a transfer material; and

charging means for charging the toner remaining on said image bearing member after image transfer by said transfer means and before development by said developing-cleaning means to a polarity which is the same as the charging polarity of the toner image, and for charging said image bearing member to a polarity which is opposite from the charging polarity of the toner image.

5,751,406

RANGE FINDING APPARATUS

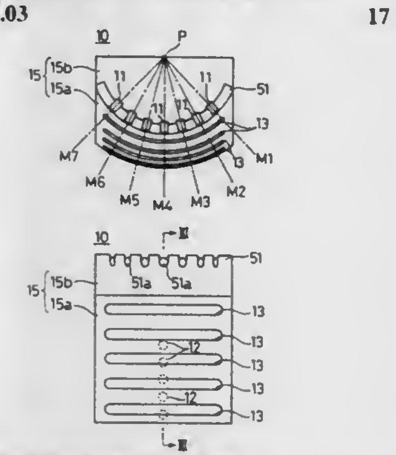
Fumihiko Nakazawa; Hitoshi Okumura; Satosbi Sano, and Fumitaka Abe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 20, 1995, Ser. No. 560,987

Claims priority, application Japan, Nov. 22, 1994, 6-287691; Apr. 26, 1995, 7-102275; Sep. 14, 1995, 7-236398

Int. Cl.^{6} G01C *3/00;* G03B *13/00*

U.S. Cl. 356—3.03 **17 Claims**



1. A range finding apparatus comprising:

a plurality of photoprojectors, provided in one-to-one correspondence with range finding axes radially extending at different angles from each other within a virtual plane for forwardly projecting detector right along the range finding axes;

a one-dimensional light detecting device spaced apart from the virtual plane and having light detecting portions, said device serving as a common photoelectric conversion means for the photoprojectors;

light directing means for directing the detection light from the plurality of the photoprojectors reflected from an object to the one-dimensional light detecting device;

range finding axis switching means for selectively allowing the photoprojectors to emit the detection light; and

distance determination means for determining a distance to an object based on which specific photoprojector is currently emitting the detection light and based on which specific light detecting portion is receiving the detection light reflected from the object.

5,751,407

OPTICAL RADAR DEVICE

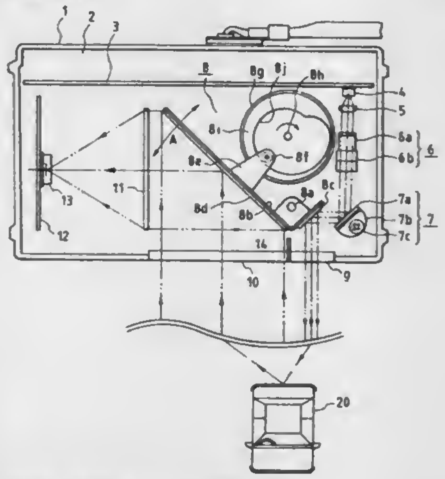
Hiroshi Yamabuchl, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1996, Ser. No. 678,056

Claims priority, application Japan, Mar. 25, 1996, 8-068644

Int. Cl.^{6} G01C *3/00*

U.S. Cl. 356—3.05 **5 Claims**



1. An optical radar device comprising:

light emitting means for producing an optical beam;

scanning, means for scanning the optical beam on an object to be detected in a horizontal direction;

light receiving means for receiving a reflection light from the object;

calculation means for calculating a distance to the object in accordance with tile reflection light detected by the light receiving means: and

vertical deflecting means for vertically deflecting said optical beam by a predetermined angle only during a predetermined time of a scanning period wherein:

said vertical deflecting means comprises:

a cylindrical mirror having an axis orthogonal to the optical axis of the optical beam, and

a driving mechanism for shifting the cylindrical mirror to first and second vertical positions;

when said cylindrical mirror is located at the first position said cylindrical mirror is located outside an optical path of the optical beam; and

when said cylindrical mirror is located at the second position said cylindrical mirror is located within the optical path of the optical beam so as to reflect a part of the optical beam in a predetermined direction.

5,751,408

SURVEYING APPARATUS

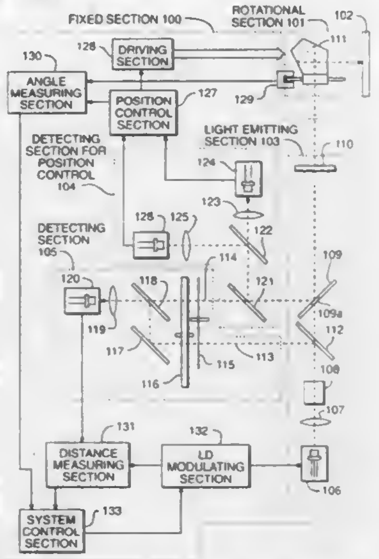
Fumio Ohtomo, and Yoshikatsu Tokuda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 492,584

Claims priority, application Japan, Jun. 21, 1994, 6-138620

Int. Cl.^{6} G01C *3/08*

U.S. Cl. 356—5.14 **12 Claims**



1. A surveying apparatus for detecting an object reflector and measuring a distance from the object reflector based on luminous flux reflected by the object reflector, by irradiating luminous flux toward the object reflector as incident rays of light, the object reflector varying direction of polarization of reflected rays of light relative to that of the incident rays of light, the surveying apparatus comprising:

- a light source section for radiating luminous flux having a predetermined direction of polarization;
- an irradiating optical system for directing the luminous flux radiated by the light source section toward the object reflector;
- a polarizing optical element for isolating polarized luminous flux reflected by the object reflector and having a direction of polarization varied by the object reflector;
- a first light-receiving section for receiving the polarized luminous flux isolated by the polarizing optical element;
- a second light-receiving section for receiving luminous flux reflected by the object reflector;
- a detecting section for detecting the object reflector based on an output signal from the first light-receiving section; and
- a distance measuring section for measuring a distance from the object reflector based on an output signal from the second light-receiving section.

5,751,409

MULTI-POINT DISTANCE MEASURING APPARATUS

Takeshi Koyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,647

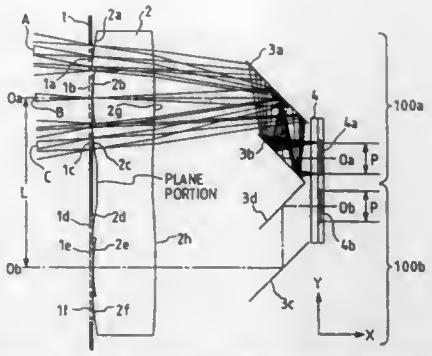
Claims priority, application Japan, Sep. 29, 1994, 6-259412

Int. Cl.^{6} G01C *3/00*

U.S. Cl. 356—3.14 **13 Claims**

1. A multi-point distance measuring apparatus for measuring a distance to an object using a triangulation method and light received from the object, comprising:

- first and second light-receiving systems each constituted by a multi-eye lens in which a plurality of elementary lenses are disposed adjacent to each other in a base line direction; and
- a photoelectric conversion element,
- wherein said first and second light-receiving systems respectively form images of plural regions of the object, which correspond to the elementary lenses constituting the multi-eye lenses and are separated from each other, on the photoelectric conversion elements.



5,751,410

METHOD FOR MEASURING FLOW VECTORS IN GAS FLOWS

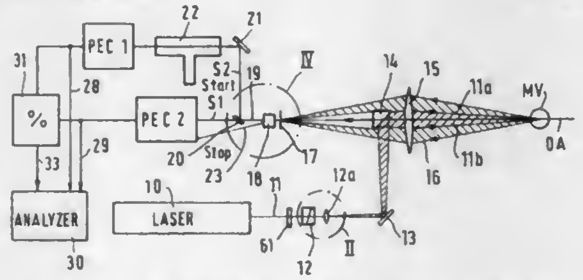
Ingo Roehle, Bonn, and Richard Schodl, Troisdorf, both of Germany, assignors to Deutsche Forschungsanstalt fur Luftund Raumfahrt e.V., Bonn, Germany

Filed Nov. 29, 1995, Ser. No. 564,790

Claims priority, application Germany, Dec. 3, 1994, 44 43 069.8

Int. Cl.^{6} G01P *3/36*

U.S. Cl. 356—28 **9 Claims**



1. A method for measuring a flow vector in a gas flow by detecting two components and an angle of a velocity vector of an optically detectable particle contained in the flow, the method comprising:

- providing a first beam and a second beam, the first beam and the second beam being substantially parallel and defining a beam direction,
- focusing the first beam at a first spot and focusing the second beam at a second spot, the first spot and the second spot being substantially adjacent,
- supplying light scattered by a particle passing through the first spot to a first photoelectric converter and generating a start pulse in response thereto,
- supplying light scattered by a particle passing through the second spot to a second photoelectric converter and generating a stop pulse in response thereto,
- dividing light scattered by a particle passing through one of the spots into a first component beam and a second component beam,
- supplying the first component beam directly to the photoelectric converter assigned to the one of the spots,
- supplying the second component beam to the photoelectric converter assigned to the other spot via an optical frequency/amplitude converter, and
- obtaining a measuring value from output signals of the photoelectric converters caused by the first and second component beam corresponding to the velocity component of the particle in the beam direction.

5,751,411

Patent Not Issued For This Number

5,751,412

DIFFRACTION VIEWING DEVICE TO AID IN AUTHENTICATING AN OPTICAL SURFACE

Graham Duell; Graeme Bullock; Daphne Flynn; Steven Martinuzzo; Belinda Stening, all of Mount Waverley, and Peter Samuel Atherton, North Sydney, all of Australia, assignors to Mikoh Technology Limited, Chatswood, Australia

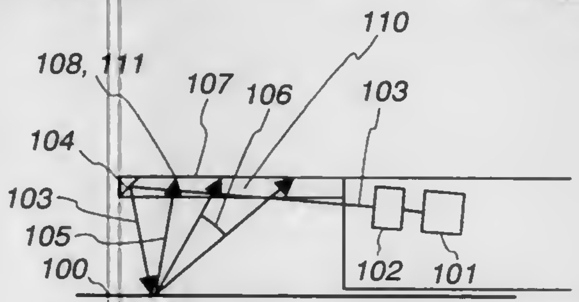
PCT No. PCT/AU94/00674, § 371 Date Aug. 17, 1995, § 102(e) Date Aug. 17, 1995, PCT Pub. No. WO95/12860, PCT Pub. Date May 11, 1995

PCT Filed Nov. 1, 1994, Ser. No. 481,278

Claims priority, application Australia, Nov. 5, 1993, PM2200; Dec. 6, 1993, PM2784; Dec. 6, 1993, PM2785; Jul. 5, 1994, PM6630; Sep. 15, 1994, PM8124

Int. Cl.^{6} G06K *9/74;7/10;* G03H *1/00;* B42D *15/00*

U.S. Cl. 356—71 **19 Claims**



1. A viewing device to aid in authenticating an optical surface, which surface is adapted to produce a projected image from an incident light beam, said device comprising:

- a base;
- a laser light source mounted on the base to provide a light beam and to project the light beam along a predetermined path, said laser light source being provided to illuminate said optical surface to produce a diffracted beam;
- a viewing screen mounted on said base to receive said diffracted beam from said optical surface so that the projected image is produced on said viewing screen and may be viewed by an observer, said viewing screen having an alignment portion which is to be illuminated to aid in aligning the viewing device; and
- an optical lens system positioned along said path and configured so as to focus said diffracted beam on said viewing screen.

5,751,413

BEAT FREQUENCY STABILIZING APPARATUS OF PULSE LIGHT AND PROBE LIGHT FOR MEASURING STRAIN DISTRIBUTION OF OPTICAL FIBER

Min Ho Chung; Tomohiro Murakami; Suk Young Song; Ki Yeul Kim; Ho Bum Lee; Jin Ki Cho, and Young Ki Cho, all of Taejeon, Rep. of Korea, assignors to Korea Telecommunication Authority, Seoul, Rep. of Korea

Filed Oct. 10, 1996, Ser. No. 728,441

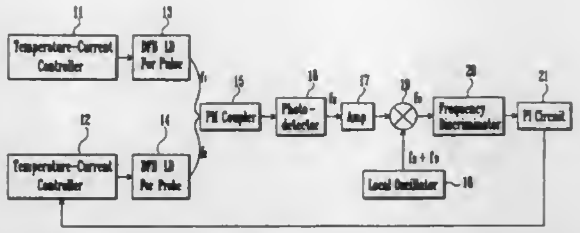
Claims priority, application Rep. of Korea, Oct. 10, 1995, 95-34675

Int. Cl.^{6} G01B *11/16*

U.S. Cl. 356—73.1 **7 Claims**

1. A beat frequency stabilizing apparatus of pulse light and probe light for measuring the distribution of strain for an optical fiber, comprising:

- a laser source for outputting predetermined optical frequencies;
- a temperature-current controller for controlling driving current and temperature in said laser source;
- a polarization maintaining (PM) coupler for receiving the optical frequencies output by said laser source to produce a mixed light signal;
- a photodetector for converting said mixed light signal output from said PM coupler into an electrical signal;
- an amplifier for amplifying said electrical signal of said photodetector;
- a local oscillator for generating an oscillating signal having a predetermined frequency;
- a mixer for mixing an amplification signal of said amplifier and said oscillation signal and generating a mixed electrical signal having a difference frequency of said amplification signal and oscillation signal;
- a frequency discriminator for comparing said mixed electrical signal with a central frequency and controlling an output voltage according to the comparison result;
- a proportional integrator for integrating said output voltage of said frequency discriminator and negatively feeding back a proportional output signal to said temperature-current controller.



5,751,414

LAMINATED HEAT EXCHANGER

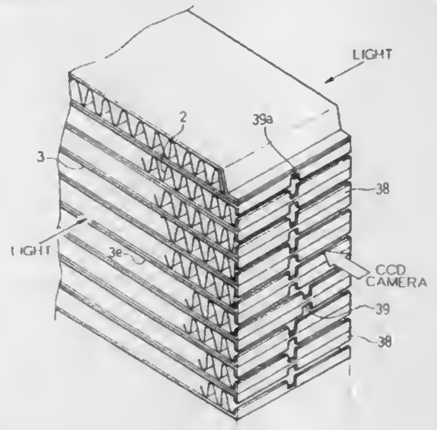
Kunihiko Nishishita, Konan, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Nov. 26, 1996, Ser. No. 755,830

Claims priority, application Japan, Nov. 30, 1995, 7-335948

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—237 **18 Claims**



1. A laminated heat exchanger comprising:

- a core main body comprising a plurality of tube elements laminated over a plurality of levels with fins provided between said tube elements;
- wherein each of said tube elements comprises two formed plates bonded face-to-face;
- wherein each of said tube elements has tanks provided at a first end thereof, and a U-turn passage having two end portions respectively communicating with said tanks;
- wherein, at a second end of each of said tube elements, flange portions project outwardly toward respective ones of said fins, said flange portions of adjacent tube elements facing opposite each other and being separated from each other by a gap;
- wherein each of said flange portions has one, and only one, notch formed in a center portion thereof; and

wherein said tube elements comprise a plurality of different types of tube elements, and said notches are located in different positions in said center portions of said flange portions, along a widthwise direction of said core main body perpendicular to a lamination direction thereof, for said different types of said tube elements, respectively.

5,751,415

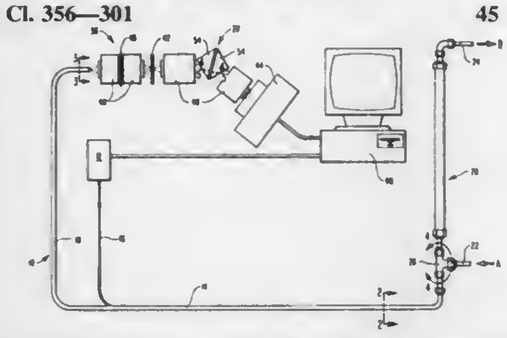
RAMAN SPECTROSCOPY APPARATUS AND METHOD FOR CONTINUOUS CHEMICAL ANALYSIS OF FLUID STREAMS

Lee M. Smith, Salt Lake City; Robert E. Benner, Holladay; Douglas A. Christensen; Joel M. Harris, both of Salt Lake City; Carl W. Johnson, Midvale, and Richard D. Rallison, Paradise, all of Utah, assignors to Process Instruments, Inc., Salt Lake City, Utah

Filed May 13, 1996, Ser. No. 647,586

Int. Cl.^{6} G01J *3/44*

U.S. Cl. 356—301 **45 Claims**



1. A method for continuously analyzing the composition of a fluid stream using Raman spectroscopy comprising the steps of:
- (a) introducing the fluid stream into a tubular Raman enhancement cell comprising:
  - a fluid stream inlet and a fluid stream outlet located adjacent the ends of the enhancement cell for continuous fluid flow through the enhancement cell;
  - an optical connector located at one end of the enhancement cell for connecting a bundle of optical fibers to the enhancement cell, wherein said bundle of optical fibers includes at least one excitation optical fiber and one or more collection optical fibers; and
  - a transparent fluid barrier located between the bundle of optical fibers and the enhancement cell;
- (b) introducing light having an excitation wavelength into the Raman enhancement cell through the excitation optical fiber;
- (c) collecting backscattered Raman light from the enhancement cell with the one or more collection optical fibers;
- (d) measuring the backscattered light with a Raman spectrometer comprising:
  - a linear array of the one or more collection optical fibers for generating an optical signal of the scattered light from the enhancement cell;
  - a filter for rejecting portions of the optical signal having the excitation wavelength;
  - a volume holographic transmission grating to disperse the light;
  - a transmissive aberration correction element for correcting optical aberrations introduced into optical signal by the volume holographic transmission grating, said aberration correction element comprising at least one optically transparent wedge or prism; and
  - a charge coupled device array for converting the optical signal into a corresponding electronic signal; and
- (e) converting the electronic signal into a representation of the chemical analysis of the fluid stream.

5,751,416

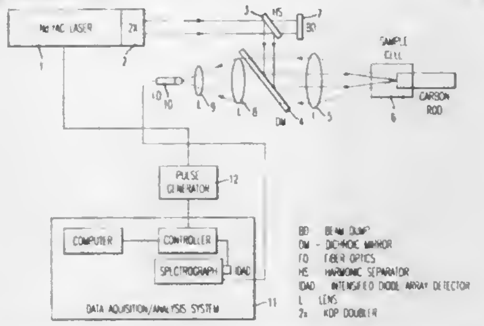
ANALYTICAL METHOD USING LASER-INDUCED BREAKDOWN SPECTROSCOPY

Jagdish P. Singh; Fang-Yu Yueh; Robert L. Cook, and Hansheng Zhang, all of Starkville, Miss., assignors to Mississippi State University, Mississippi, Miss.

Filed Aug. 29, 1996, Ser. No. 705,267

Int. Cl.^{6} E01J *3/30*

U.S. Cl. 356—311 **14 Claims**



1. A laser-induced breakdown spectroscopy apparatus comprising:
- means for providing laser light;
- a mirror harmonic separator;
- a coated dichroic mirror;
- a focusing lens system; and
- a detector,

wherein laser light is directed via said mirror harmonic separator, said dichroic mirror and said focusing lens system onto a sample to be analyzed; and

an emission spectrum of said sample is directed via said focusing lens system through said dichroic mirror to said detector.

5,751,417

ARRANGEMENT FOR CONFOCAL FLUORESCENCE MICROSCOPY

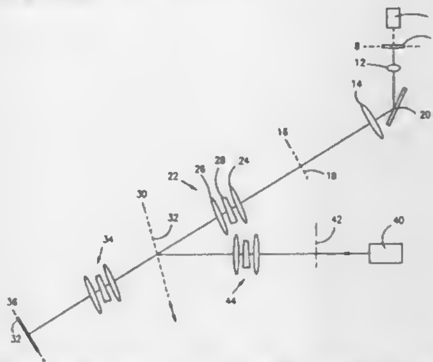
Rainer Uhl, Bahnhofstrasse 89, Grifelfing, Germany

Filed Mar. 20, 1996, Ser. No. 619,922

Claims priority, application Germany, Mar. 20, 1995, 195 10 102.2

Int. Cl.^{6} G01N *21/64*

U.S. Cl. 356—318 **22 Claims**



1. An arrangement for confocal and quasifocal fluorescence microscopy in which the following are arranged in succession in an image beam path:
- (a) an objective arrangement for acquiring an image of a specimen to be examined;
- (b) at least one scanner mirror located below said objective arrangement;
- (c) a tube lens for producing an image of said specimen in an image plane;
- (d) a first confocal diaphragm located in said image plane of said tube lens;
- (e) a first spectrometer arrangement with
  - (i) a first lens for imaging an opening of said diaphragm at infinity,
  - (ii) a dispersion prism for spectral decomposition of light emerging from said first lens, and
  - (iii) a second lens for producing an image in an exit slit plane of said first spectrometer arrangement which represents an intermediate image plane;
- (f) a wavelength selection diaphragm located in said exit slit plane with a host of parallel slits with a slit width or spacing which corresponds to a desired bandwidth and which can be shifted perpendicularly to a longitudinal direction of the slits for purposes of selection of an emission wavelength;
- (g) a second spectrometer arrangement which is analogous to said first spectrometer arrangement and which forms a subtractive dispersion means to spectrally re-combine the light of said wavelength selection diaphragm which has been spectrally fanned out and to image it in a second image plane; and
- (h) a detector for acquiring a brightness distribution in said second image plane;

wherein said wavelength selection diaphragm constitutes a means for coupling of excitation light by an excitation beam path travelling back along an arrangement comprised of said first spectrometer arrangement, said first confocal diaphragm, said tube lens, said scanner mirror and said objective arrangement; wherein the excitation beam path leads from a source of monochromatic excitation light by way of a second confocal diaphragm, which corresponds to said first confocal diaphragm, and a third spectrometer arrangement, analogous to said first spectrometer arrangement, to said wavelength selection diaphragm; wherein the image beam path and the excitation beam path are constituted and matched to one another in a manner causing the light emitted from said specimen to reach said detector by way of said wavelength selection diaphragm, and conversely, preventing excitation light from said wavelength selection diaphragm from hitting said detector and causing the excitation light to traverse said first confocal diaphragm and reach said specimen.

5,751,418

SPECTROMETRY AND OPTICAL METHOD AND APPARATUS FOR OBTAINING A STABLE SPECTRUM WITH USE OF AN INFORMATIONLESS SPECTRUM CONTAINED THEREIN

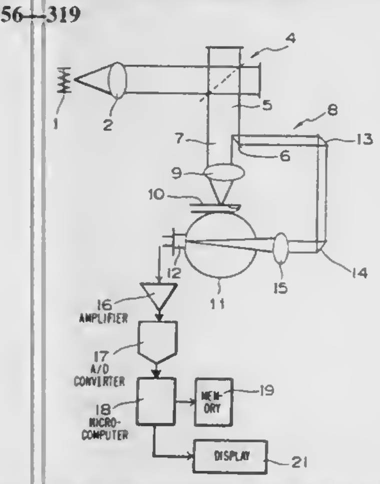
Eiichi Kimura; Naoki Yanai; Motonobu Shiomi, all of Neyagawa; Emi Ashibe, Kyoto; Yutaka Yamasaki, Kyoto, and Harumi Uenoyama, Kyoto, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama-ken, and Kyoto Daiichi Kagaku Co., Ltd., Kyoto, both of Japan

Filed May 10, 1996, Ser. No. 644,202

Claims priority, application Japan, May 11, 1995, 7-113020

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—319 **20 Claims**



1. An optical measuring method that irradiates a measured object with light from a light source and measures a spectrum of light transmitted through or reflected by the measured object, wherein the light source generates measuring light of wavelengths including wavelengths in a compensation wavelength domain at which the measured object almost completely absorbs the measuring light, said method comprising the steps of:
- measuring the spectrum of the light generated by the light source;
- irradiating the measured object with the light from the light source and measuring the spectrum of the light transmitted through or reflected by the measured object;
- calculating a ratio of an intensity of the light transmitted through or reflected by the measured object to an intensity of the light generated by the light source in the compensation wavelength domain;
- multiplying the intensity of the light generated by the light source at each wavelength by the ratio to obtain an informationless spectrum; and
- obtaining, as a compensated sample spectrum, a first difference spectrum by subtracting the informationless spectrum from the spectrum of the light transmitted through or reflected by the measured object.

5,751,419

OPTICAL DELAY APPARATUS

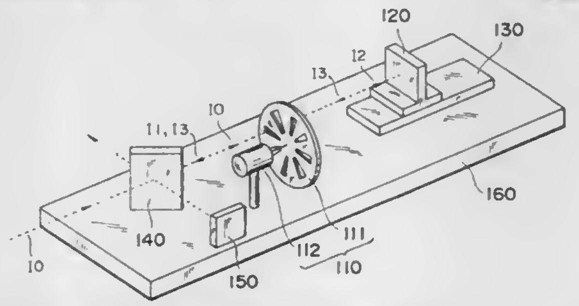
Hironori Takahashi, and Shinichiro Aoshima, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jan. 7, 1997, Ser. No. 779,605

Claims priority, application Japan, Jan. 8, 1996, 8-000869

Int. Cl.^{6} G02F *1/00*

U.S. Cl. 356—321 **7 Claims**



1. An optical delay apparatus comprising:
- beam splitting/coupling means for, with incidence of an incident beam, generating a first beam traveling in an opposite direction to said incident beam and a second beam traveling in a same direction as said incident beam and for, with incidence of a third beam traveling in the opposite direction to said second beam, outputting said first beam when said first beam is generated and the third beam when said first beam is not generated, alternately in a same direction and on a same optical axis;
- reflecting means for outputting said third beam, based on said second beam; and
- moving means for moving at least said reflecting means in a direction along an optical axis of said second beam.

5,751,420

SPECTROPOTOMETER WITH A FIELD RESTRICTOR AND ITS APPLICATION TO A COLORIMETER

Atsuhiro Iida, Nagaokakyo; Kazumi Yokota, Neyagawa; Eiji Ikeda, Nagaokakyo, and Tomoki Sasayama, Ukyo, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

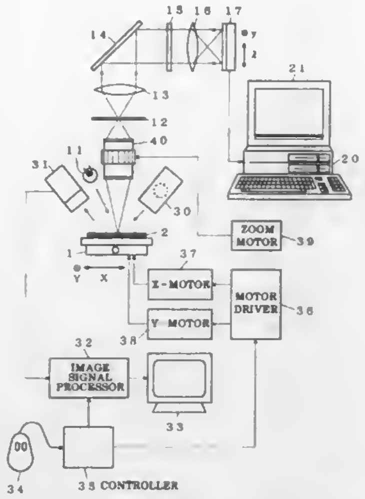
Filed Dec. 18, 1996, Ser. No. 769,269

Claims priority, application Japan, Dec. 21, 1995, 7-350320

Int. Cl.^{6} G01J *3/04;* G01N *21/27*

U.S. Cl. 356—328 **9 Claims**

1. A spectrophotometer, comprising:
- a light source for casting a light on a sample;
- a focusing element having a variable focal length for focusing the light from the sample on a focal plane;



- a restrictor placed on the focal plane for restricting an area of the light focused on the focal plane;
- a spectral element for separating the light coming from the restrictor with respect to wavelength;
- a photo-detector including a plurality of elementary photo-sensors for measuring the light separated by the spectral element;
- a camera for taking a picture of the sample;
- an input device for an operator to input a command;
- a window generator for generating an image of a window having a size that corresponds to the command from the input device;
- a superimposer for superimposing the image of the window on the picture of the sample; and
- a measurement size controller for changing the focal length of the focusing element according to the size of the window.

5,751,421

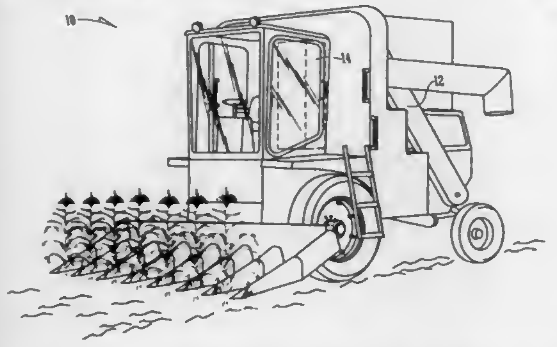
NEAR INFRARED SPECTROMETER USED IN COMBINATION WITH A COMBINE FOR REAL TIME GRAIN ANALYSIS

Steven L. Wright, and C. Fred Hood, both of Johnston, Iowa, assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Feb. 27, 1997, Ser. No. 807,661

Int. Cl.^{6} G01J *3/28;* **A01F** *12/00*

U.S. Cl. 356—328 **24 Claims**



1. An apparatus for measuring constituents of harvested agricultural product on a combine comprising:
- monochromator mounted to the combine, the monochromator having no moving optical components;
- a device coupled to the combine for forming a flow of the harvested product past a sensing location;
- a radiation source coupled to the combine and disposed near the flow of harvested product for irradiating the product as the product flows past the sensing location;
- a fiber optic cable connected to the monochromator for transmitting radiation reflected off the agricultural product to the monochromator; and
- a data processor connected to the monochromator for identifying and determining the amount of constituents in the agricultural product.

5,751,422

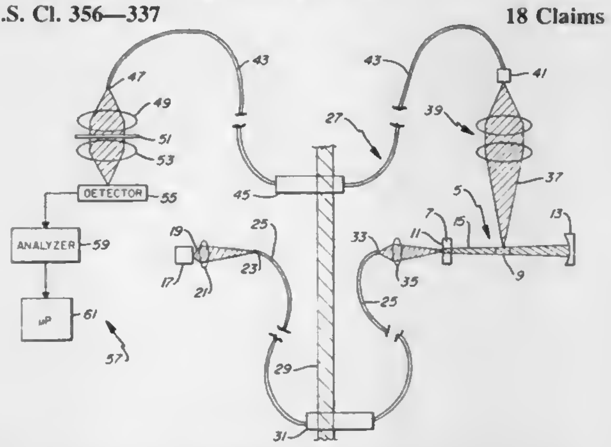
IN-SITU PARTICLE DETECTION UTILIZING OPTICAL COUPLING

John R. Mitchell, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Feb. 26, 1996, Ser. No. 606,891

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—337 **18 Claims**



1. A device for in-situ detection of particles in a specific environment, said device comprising:
- a light provider positioned outside the specific environment;
- an optical coupler for coupling light from the light provider into the specific environment;
- a light source within the specific environment and responsive to said light provider for providing light received from the optical coupler;
- a sensing region within the specific environment, said sensing region being capable of having particles therein and receiving light from said light source whereby light is affected by particles at said sensing region;
- a resonant optical cavity wherein said light source is a laser medium within said resonant optical cavity, said resonant optical cavity also having said sensing region therein;
- a light collector within the specific environment for collecting light affected by particles at said sensing region;
- a second optical coupler for coupling affected light collected by said light collector from the specific environment; and
- a processor positioned outside the specific environment for receiving said affected light from said second optical coupler and, responsive thereto, providing an output indicative of particles detected at said sensing region causing said light to be affected.

5,751,423

OPACITY AND FORWARD SCATTERING MONITOR USING BEAM-STEERED SOLID-STATE LIGHT SOURCE

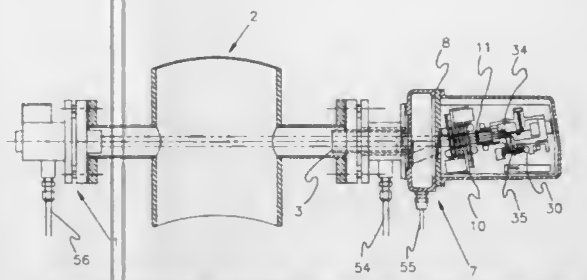
John E. Traina, Glenshaw; Richard Myers, Gibsonia, and Edward A. Smierciak, Pittsburgh, all of Pa., assignors to United Sciences, Inc., Gibsonia, Pa.

Filed Dec. 6, 1996, Ser. No. 761,127

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—338 **19 Claims**

1. A monitor comprised of:
- a. a housing sized and configured for attachment to a conduit and having a window through which light may pass;
- b. a solid state light source within the housing;



- c. a beam steering unit within the housing and having a pair of colinear rotatable wedge prisms positioned to direct a light beam from the light source through the window and across the conduit; and
- d. at least one detector positioned to receive the light beam from the solid state light source after that light beam has passed through the conduit and to receive light which has been forward scattered after striking particles in the conduit which detector produces a signal corresponding to intensity of light received by the detector the signal being useful for measuring at least one of opacity of a medium passing through the conduit and light scattered by particulates in the conduit.

5,751,424

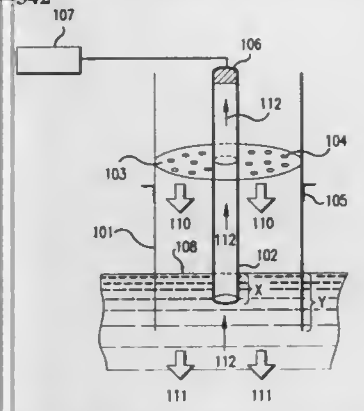
SCALABLE NON-CONTACT OPTICAL BACKSCATTER INSERTION PROBE

Charles R. Bostater, Jr., Indian Harbour Beach, Fla., assignor to KB Science, Beaufort, S.C.

Filed Nov. 5, 1996, Ser. No. 743,789

Int. Cl.^{6} G01N *21/00;21/55*

U.S. Cl. 356—342 **14 Claims**



1. A scalable optical backscatter probe, comprising:
- an outer optical chamber:
- an electromagnetic energy source positioned within said outer optical chamber for emitting photons towards a medium to be analyzed, wherein said photons emitted by said electromagnetic energy source are scattered within said outer optical chamber to enter said medium at a plurality of angles;
- an inner optical chamber having a reflective outer surface and an absorbing inner surface, said inner optical chamber collecting a portion of backscattered photons emitted from said medium;
- a sensor positioned within said inner optical chamber for receiving said backscattered photons collected by said inner optical chamber; and
- a link for providing signals output by said sensor to a processor for processing said signals.

5,751,425

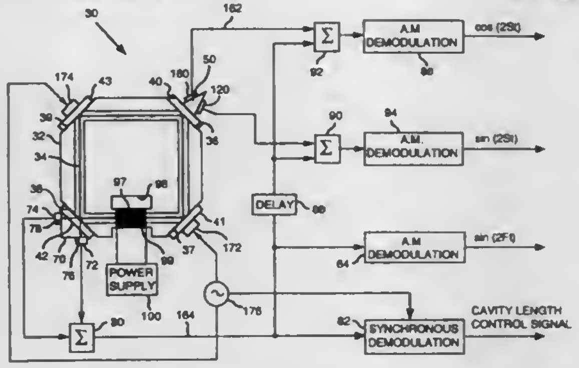
APPARATUS AND METHOD FOR DETECTING ROTATION RATE, FARADAY BIAS AND CAVITY LENGTH IN A RING LASER GYROSCOPE

Donald A. Frederick, Woodland Hills; John G. Mark, Pasadena; Daniel A. Tazartes, West Hills; David B. Hall, La Crescenta, and Tae W. Hahn, Chatsworth, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Dec. 30, 1996, Ser. No. 777,498

Int. Cl.^{6} G01C *19/64*

U.S. Cl. 356—350 **30 Claims**



1. A ring laser gyroscope including a frame having a cavity therein and a sensing axis about which rotations may be measured using the Sagnac effect, the cavity guiding right circularly polarized clockwise and anticlockwise modes and left circularly polarized clockwise and anticlockwise modes in a closed non-planar optical path that causes a geometrical bias between counterpropagating modes, comprising:
- a Faraday rotator in the ray path that provides a Faraday bias for splitting the frequencies of the right circularly polarized clockwise and anticlockwise beams and the left circularly polarized clockwise and anticlockwise beams to provide four different mode frequencies in the cavity;
- mode combining apparatus arranged to cause interference between the modes that propagate within the cavity, thereby producing an interference pattern;
- apparatus arranged to produce a first combined intensity signal that is indicative of the light intensity in the interference pattern;
- apparatus for separating a rotation signal from the first combined intensity signal that includes:
  - apparatus for producing a second combined intensity signal, the first and second combined intensity signals having a 180° phase difference in corresponding components that are dependent upon the geometric bias; and
  - apparatus for processing the first and second combined intensity signals to produce the rotation signal that is independent of the spatially uniform interference fringes caused by the geometric bias; and
- signal processing apparatus for processing the rotation signal to measure rotation of the ring laser gyroscope about the sensing axis.

5,751,426
POSITIONAL DEVIATION MEASURING DEVICE AND METHOD FOR MEASURING THE POSITIONAL DEVIATION BETWEEN A PLURALITY OF DIFFRACTION GRATINGS FORMED ON THE SAME OBJECT

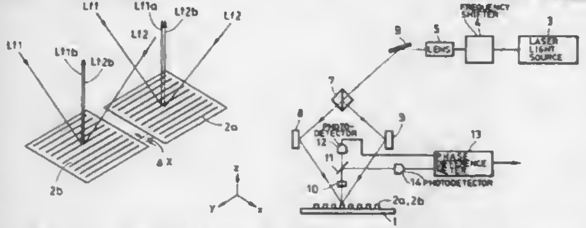
Noriyuki Nose, Atsugi; Minoru Yoshii, Higashinakano; Kenji Saitoh; Hiroshi Osawa, both of Yokohama; Koichi Sentoku, Atsugi; Toshihiko Tsuji, Atsugi, and Takahiro Matsumoto, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 947,802, Sep. 21, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,708

Claims priority, application Japan, Sep. 27, 1991, 3-276952

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—356 **14 Claims**



1. A device for measuring the positional deviation between a plurality of diffraction gratings formed on the same object, said device comprising:

an illumination optical system for illuminating the plurality of diffraction gratings with a light beam, the illumination by said illumination optical system generating a plurality of diffracted light beams from the plurality of diffraction gratings;

an interference optical system for forming at least one interference light beam from the plurality of diffracted light beams;

a detector for detecting the at least one interference light beam, wherein the result of the detecting by said detector serves as the basis for measuring the positional deviation between the plurality of diffraction gratings;

a signal processing system configured to measure the relative positional relation between said illumination optical system and the plurality of diffraction gratings, in a rotation direction about the z-axis in accordance with light reflected by the diffraction gratings incident on the signal processing system; and

a control driving circuit connected to a stage supporting the object and configured to align said illumination optical system with the object on the basis of the measuring by said signal processing system so as to obtain the one color condition between the diffracted light beams.

5,751,427
OPTICAL GAP MEASURING APPARATUS AND METHOD

Peter de Groot, Middletown, Conn., assignor to ZYGO Corporation, Middlefield, Conn.

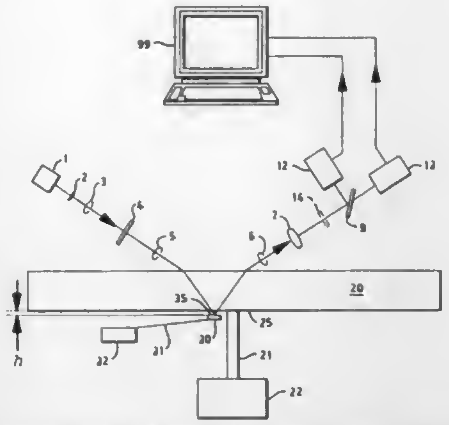
Continuation of Ser. No. 522,570, Sep. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 408,907, Mar. 22, 1995, Pat. No. 5,557,399. This application Jan. 21, 1997, Ser. No. 784,603

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—358 **32 Claims**

1. A method for measuring the distance of a surface of an object under test with respect to a surface of a substantially transparent element, said surface of said object under test having boundaries and being in close proximity to said transparent element surface, said method comprising the steps of:

directing a polarized light beam toward said transparent element surface at an oblique angle to a predetermined measurement spot, said polarized light beam having a plane of incidence defining a polarization basis vector p having an associated orthogonal basis vector s, said polarized light beam being incident on said transparent element surface and having a polarization such that both said s and p type polarizations are present;



flood illuminating the surface of the object under test for enabling accurate placement of said predetermined measurement spot relative to the boundaries of said surface of said object under test.

reflecting said polarized light beam back through said substantially transparent element from said transparent element surface for providing a reflected beam comprising said s and p polarization components, said reflected beam resulting from a combined reflection from said substantially transparent element surface and said surface of the object under test, said reflected s and p polarization components having a relative phase with respect to each other and associated amplitudes;

interfering said reflected s and p polarization components in said reflected beam with each other for providing information about said relative phase and said associated amplitudes of said s and p polarization components; and

determining said distance based upon said relative phase and associated amplitudes information of said reflected s and p polarization components.

5,751,428
EXPOSURE METHOD AND EXPOSURE APPARATUS USING THE SAME

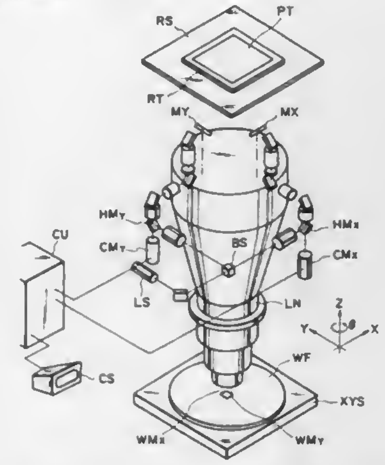
Yoshiharu Kataoka; Haruna Kawashima, and Yuichi Yamada, all of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 474,325

Claims priority, application Japan, Jun. 14, 1994, 6-131819; Sep. 21, 1994, 6-226426

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—401 **13 Claims**



1. An exposure method for use with an exposure apparatus which includes a projection optical system for projecting a pattern of a first object onto a second object, a mark position detecting optical system having a detection zone at a predetermined position with respect to the projection optical system, for detecting a position of a mark formed on the second object with respect to a

direction perpendicular to the axis of the projection optical system, and a plurality of surface position detecting devices having different detection zones at different positions predetermined with respect to the projection optical system, for detecting a surface position of the second object with respect to a direction of the axis of the projection optical system, said method comprising the steps of:

placing the mark within the direction zone of the mark position detecting optical system;

detecting the surface position of the second object by using the surface position of the detecting devices, wherein plural detection results are produced by the surface position detecting devices, respectively;

determining a deviation between the mark and a focal plane of the mark position detecting optical system on the basis of (i) the results of the detection of the surface position and (ii) the positional relationship among the detection zone of the mark position detecting optical system and the detection zones of the surface position detecting devices;

adjusting the surface position of the second object on the basis of the determined deviation; and

detecting, after the adjustment in said adjusting step, the position of the mark through the mark position detecting optical system.

5,751,429
COLOR CLASSIFICATION SYSTEM AND METHOD CAPABLE OF AUTOMATICALLY EXCHANGING OPTICAL BAND-PASS FILTERS ACCORDING TO THE OBJECT

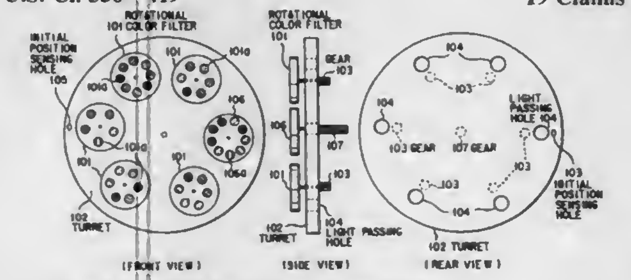
Tohru Wada, Niiza, and Yasushi Hibi, Kokubunji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1996, Ser. No. 701,123

Claims priority, application Japan, Aug. 29, 1995, 7-220525

Int. Cl.^{6} G01N *21/25*

U.S. Cl. 356—419 **19 Claims**



1. A color classification system comprising:

an optical system for utilizing light from an object to form an image on an imaging device;

a plurality of optical band-pass filters each having a different pass band provided between the object and said imaging device; said plurality of optical band-pass filters including a plurality of measurement filters for use in measuring a color of the object and attest filter for use in judging which one of said plurality of measurement filters should be applied to the object;

a changeover section for changing between said plurality of optical band-pass filters;

a computing circuit for performing at least one of a color classification and a color judgment based on a spectral characteristic of the imaged object through a statistical approach; and

a control section for causing said changeover section to select an effective one of said plurality of measurement filters based on a judgment by said computing circuit of a result sensed by said test filter,

wherein said plurality of optical band-pass filters are arranged in a plurality of filter sets, each of said sets including at least one filter, and

wherein said changeover section includes a filter changeover mechanism for changing between the optical band-pass filters in one of said filter sets, and a filter-set changeover mechanism for changing between said plurality of filter sets.

5,751,430
OUTPUT APPARATUS AND METHOD CAPABLE OF EMULATING A MODE OF RECEIVED DATA

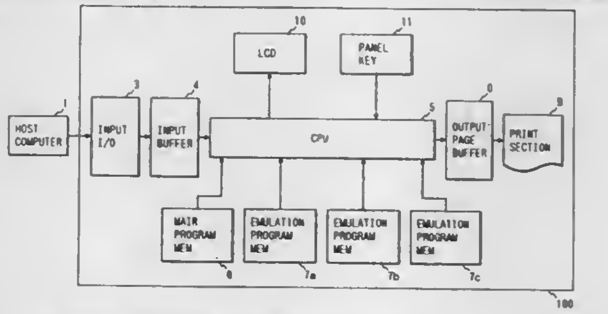
Hisashi Koike, Sakura, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 38,489, Mar. 29, 1993, abandoned. This application Dec. 27, 1995, Ser. No. 580,275

Claims priority, application Japan, Mar. 30, 1992, 4-074598

Int. Cl.^{6} H04N *1/00;* **G06F** *15/00;* **B41J** *11/44*

U.S. Cl. 358—296 **32 Claims**



1. An output apparatus comprising:

storing means for storing data received from an external apparatus;

selecting means for analyzing a predetermined amount of data included in the data stored in said storing means and for selecting an optimum emulation mode from a plurality of emulation modes;

control means for controlling said selecting means to change the predetermined amount of data to another amount of data and to analyze the another amount of data included in the stored data, in a case where said selecting means cannot specify one emulation mode, to thereby select an emulation mode; and said predetermined region analyzed by said selecting means is

output means for generating pattern data from the data stored in said storing means in the emulation mode selected by said selecting means and for outputting the generated pattern data.

5,751,431
DIGITAL IMAGE FORMING APPARATUS CAPABLE OF EASILY INSTALLING AND REMOVING OPTICAL SCANNER UNIT

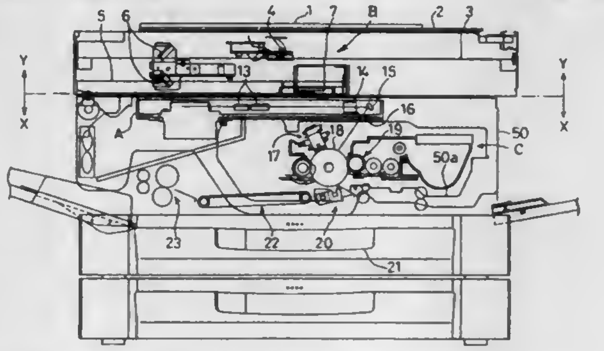
Kyosuke Taka, Nara; Keiji Masuda, Tenri, and Kan Mukai, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1996, Ser. No. 607,484

Claims priority, application Japan, Mar. 16, 1995, 7-057538

Int. Cl.^{6} H04N *1/29;1/04;* **G03G** *21/00*

U.S. Cl. 358—296 **13 Claims**



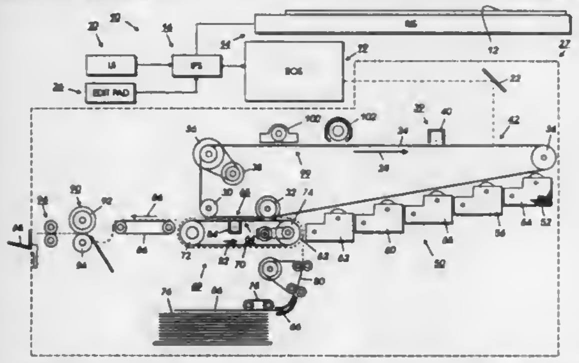
1. A digital image forming apparatus, comprising:

an image reading section for outputting image information by scanning an image;

an image holding member;
an image forming section, provided under said image reading section, for forming an image on said image holding member;
an optical scanner unit provided between said image reading section and said image forming section, for exposing said image holding member by an optical signal converted from the image information to form an electrostatic latent image; and
an installation and removal unit provided in a main body, for installing and removing said optical scanner unit in a vertical direction,
wherein said installation and removal unit has an opening for removing therethrough said image forming section from the apparatus, the opening being formed in such a shape that said optical scanner unit can pass therethrough.

5,751,432
HIGHLIGHT GLOSS FOR XEROGRAPHIC ENGINE

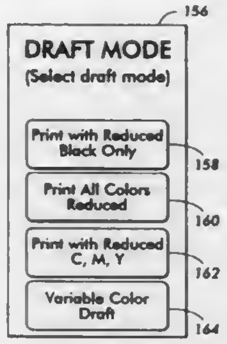
Mark A. Gwaltney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 31, 1996, Ser. No. 656,516
Int. Cl.⁶ H04N *1/00;* **G03G** *21/00;13/01;13/20*
U.S. Cl. 358—296 **20 Claims**



1. Apparatus for creating highlight toner images, said apparatus comprising:
means for forming toner images on an image receiver;
means for effecting combining of clear polymer material with some of said toner images on said image receiver; and
means for fusing said toner images and said clear polymer to a final substrate for creating toner images with different degrees of gloss on said final substrate.

5,751,433
DRAFT PRINTING SYSTEM

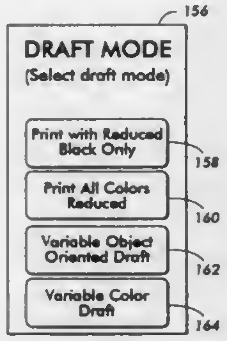
Nagesh H. Narendranath, and Fritz F. Ebner, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 27, 1997, Ser. No. 884,392
Int. Cl.⁶ H04N *1/40;1/46*
U.S. Cl. 358—298 **12 Claims**



1. A method for reducing toner consumption in a printing system while rendering a image area on an output sheet according to a set of digitized pixels, said method comprising:
providing a draft mode for invoking a first reduced slope draft mode tone reproduction curve;
employing said reduced slope draft mode tone reproduction curve to render at least one separation of an image, said tone reproduction curve having less than a maxium density for a standard tone reproduction curve; and
producing an output image with the reduced tone reproduction curve.

5,751,434
AREA DEPENDENT DRAFT PRINTING SYSTEM

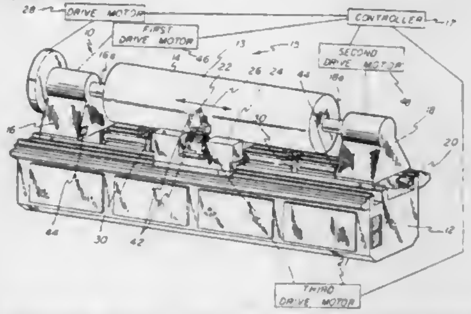
Nagesh H. Narendranath, and Fritz F. Ebner, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 27, 1997, Ser. No. 884,399
Int. Cl.⁶ H04N *1/40;1/46*
U.S. Cl. 358—298 **18 Claims**



1. A printing system for differentially printing image areas on an output sheet, comprising:
a memory including at least one lookup table having a draft mode for processing digital images at less than a maximum density;
a controller for invoking the use of the draft mode lookup table according to at least one of a plurality of object image types and
a print engine for rendering an output image with the at least one draft mode lookup table.

5,751,435
METHOD AND APPARATUS FOR ALIGNING A CYLINDER IN AN ENGRAVER

Kenneth F. Bornhorst, Jr., Centerville; Robert Dean Likins, Wilmington; Thomas J. Eichhorn, Dayton; David R. Seitz, Vandalia, and Curtis Woods, Centerville, all of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio
Continuation of Ser. No. 057,327, May 7, 1993, Pat. No. 5,424,846. This application Jun. 7, 1995, Ser. No. 480,919
Int. Cl.⁶ B41C *1/02*
U.S. Cl. 358—299 **35 Claims**

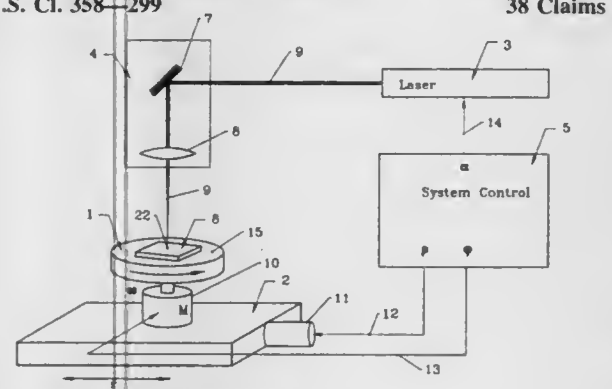


1. An engraver support system for use in an engraver having an engraving head which is driven substantially parallel to an axis of a cylinder when the cylinder is engraved, comprising:
a bed;
a headstock and a tailstock slidably mounted on said bed;
at least one driver coupled to said headstock and said tailstock;

a controller coupled to said at least one driver;
said controller energizing said at least one driver in response to at least one input parameter to drive said headstock and said tailstock to rotatably support the cylinder at an engraving station in the engraver.

5,751,436
METHOD AND APPARATUS FOR CYLINDRICAL COORDINATE LASER ENGRAVING

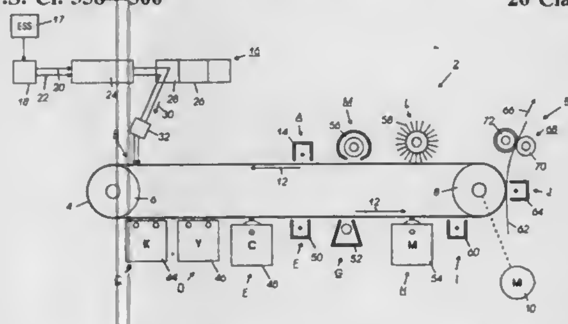
Young Key Kwon, Longmont, Colo.; Ashot Mesropian, Yerevan, Argentina; Kwang Min Lee, Broomfield, and Sergey Soboley, Aurora, both of Colo., assignors to Rocky Mountain Instrument Company, Longmont, Colo.
Filed Dec. 23, 1996, Ser. No. 772,382
Int. Cl.⁶ B41C *1/04*
U.S. Cl. 358—299 **38 Claims**



1. A laser engraver comprising:
a laser having a controllable beam;
a rotating workpiece table mounted on a translation stage which functions to controllably move said rotating workpiece table in a single axis normal to said beam;
a controller which moves said translation stage a predetermined distance upon completion of a revolution of said rotating workpiece table in accordance with a location of a known point; and
said controller further comprising a laser beam command to fire at a predetermined time corresponding to the known point on said rotating workpiece table, thereby forming an engraving on a workpiece similar to an image in the controller.

5,751,437
DEVELOPMENT COMBINATION EXPOSURE AND RECHARGE SCHEME TO ELIMINATE DEVELOPMENT DEFECTS IN TWO PASS PROCESS COLOR XEROCOLOGRAPHY

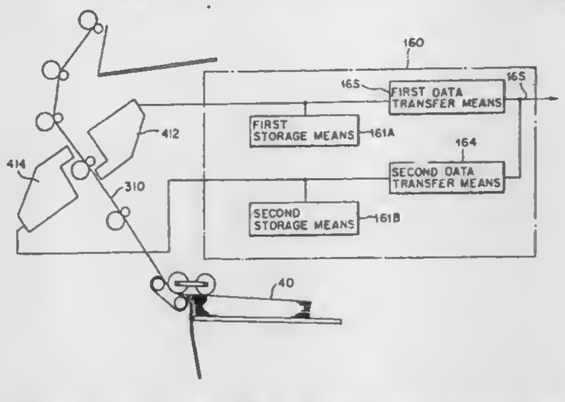
Delmer G. Parker, Rochester, N.Y., and Gregory J. Kovacs, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 21, 1997, Ser. No. 786,544
Int. Cl.⁶ H04N *1/29;* **G03G** *15/01*
U.S. Cl. 358—300 **20 Claims**



1. A method of creating full color images using IOI development on a charge retentive structure, said method including the steps of:
a. uniformly charging said charge retentive structure to a predetermined voltage level;
b. using an exposure device, creating tri-level latent electrostatic images comprising developable CAD images at a first voltage level, developable DAD images at a second voltage level, non-developable DAD images and background areas at a third voltage level;
c. rendering said CAD and DAD images visible with marking particles to thereby form areas of first and second color images on said charge retentive structure,
d. voltage leveling said CAD and DAD images to said background voltage level;
e. conditioning said non-developable DAD image to produce another developable DAD image;
f. developing said another developable DAD image;
g. flood illuminating said charge retentive structure with white light;
h. recharging said charge retentive surface to a predetermined voltage level;
i. reducing the voltage levels associated with said developed CAD and DAD images and un-developed areas of said charge retentive structure to thereby form immediately developable DAD images and yet another non developable DAD image;
j. reducing the remainder of the voltages associated with said developed CAD and DAD images to the voltage level of said background areas;
k. rendering visible said immediately developable DAD images formed by reducing the voltage levels associated with said CAD and DAD images and undeveloped image areas;
l. voltage leveling said DAD images rendered visible in step k;
m. conditioning said charge retentive structure for converting said yet another non-developable DAD image to still another developable DAD image;
n. developing said still another non-developable DAD image
o. pretransfer charging said charge retentive structure; and
p. transferring said images to a final substrate.

5,751,438
DATA TRANSFER METHOD AND DATA TRANSFER APPARATUS FOR IMAGE READING APPARATUS AND IMAGE READING APPARATUS WITH DATA TRANSFER APPARATUS

Yukako Murai; Akio Suzuki; Yoshio Tabata; Keiichi Saito, and Tamio Amagai, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 407,471, Mar. 20, 1995, abandoned. This application Mar. 18, 1997, Ser. No. 819,802
Claims priority, application Japan, Apr. 7, 1994, 6-069311
Int. Cl.⁶ H04N *1/00;1/04;* **G03G** *15/00*
U.S. Cl. 358—403 **11 Claims**



1. A data transfer method for an image reading apparatus which includes a first optical image reading unit located at a location along a paper transport path for optically reading front face image information from a paper sheet transported along said paper transport path, and a second optical image reading unit located at another location along said paper transport path for optically

reading rear face image information from the paper sheet transported along said paper transport path, comprising the steps of:
- successively transferring, by way of a data transfer line, data from a first operating image reading unit from one of said first optical image reading unit and said second optical image reading unit from which paper image information is to be read out first;
- temporarily storing data from a later operating image reading unit from one of said first optical image reading unit and said second optical image reading unit from which paper image information is to be read out later; and
- successively transferring, after the data from said first operating image reading unit have been transferred, the stored data from said later operating image reading unit at a rate higher than the transfer rate at which the data from said first operating image reading unit have been transferred.

5,751,439

Patent Not Issued For This Number

5,751,440

TRANSMISSION SPEED CONTROL SYSTEM FOR FACSIMILE PICTURE SIGNALS IN MOBILE RADIO COMMUNICATION

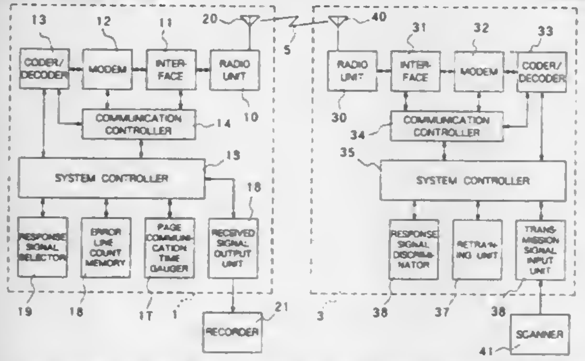
Yoshio Nitta, and Akemi Kakizaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 345,763, Nov. 22, 1994, abandoned. This application Dec. 27, 1996, Ser. No. 777,187

Claims priority, application Japan, Nov. 26, 1993, 5-297114

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 358—434 **7 Claims**



1. A picture signal transmission speed control system in a mobile radio communication system having radio terminals that perform a facsimile communication over a radio communications link, comprising:
- speed estimating means, on a picture signal receiving side, for finding an estimated transmission speed in the radio communications link based only on an actual picture signal received over the radio communications link;
- counting means for counting a number of error lines in a received picture signal sent over the radio communications link; and
- control means for controlling the transmission speed of the transmitted picture signal in the facsimile communication depending on the estimated transmission speed and the number of error lines,
- wherein said control means comprises:
  - response signal output means provided in a first station on the picture signal receiving side for outputting response signals in accordance with the estimated transmission speed and the number of error lines;
  - transmitting means for transmitting said response signals to a second station on a picture signal sending side; and
  - retraining means provided in said second station on the picture signal sending side for executing a retraining procedure by changing the transmission speed based on said response signals received,
- wherein said response signal output means generates said response signals in accordance with a result of comparison of the number of error lines with a first value and a result of comparison of the estimated transmission speed with a second value, and
- wherein a first signal is generated by said response signal output means when the estimated transmission speed is equal to or greater than said second value and the number of error lines is zero, a second signal is generated by said response signal output means when the estimated transmission speed is equal to or greater than said second value and the number of error lines is one or more but less than said first value, and a third signal is generated by said response signal output means when the number of error lines is equal to or greater than said first value or the estimated transmission speed is less than said second value.

5,751,441

COMMUNICATION METHOD AND COMMUNICATION TERMINAL APPARATUS CAPABLE OF FULL-DUPLEX OR HALF-DUPLEX COMMUNICATION

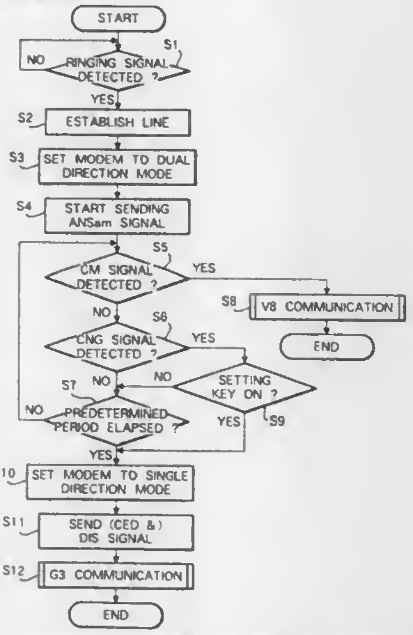
Eiichi Morimoto, Moriyama, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 13, 1996, Ser. No. 600,631

Claims priority, application Japan, Feb. 27, 1995, 7-038726; May 18, 1995, 7-120137

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 358—435 **7 Claims**



7. A communication terminal apparatus for communicating with a second communication terminal apparatus in accordance with ITU-T recommendation V.8 or G3 mode depending upon a function of the caller, comprising:
- signal transmission means for transmitting a modified answer tone (ANSam) to the second terminal apparatus after a line has been established between the two terminal apparatuses,
- means for detecting a call menu signal (CM) from the second terminal apparatus when a modified answer tone (ANSam) is transmitted to the second terminal apparatus,
- control means for causing the signal transmission means to transmit a digital identification signal (DIS) to the second terminal apparatus after a modified answer tone (ANSam) is transmitted to the second terminal apparatus when the call menu signal (CM) is not detected within a predetermined time period after the start of transmission of the modified answer tone (ANSam), and
- means for transmitting a joint menu signal (JM) to the second terminal apparatus after a modified answer tone (ANSam) is transmitted to the caller when a call menu signal (CM) is detected during transmission of a modified answer tone (ANSam) to the caller.

5,751,442

COMMUNICATION CONNECTION APPARATUS FOR USE IN DIRECT CONNECTION BETWEEN FACSIMILE MODEM APPARATUS AND FACSIMILE APPARATUS

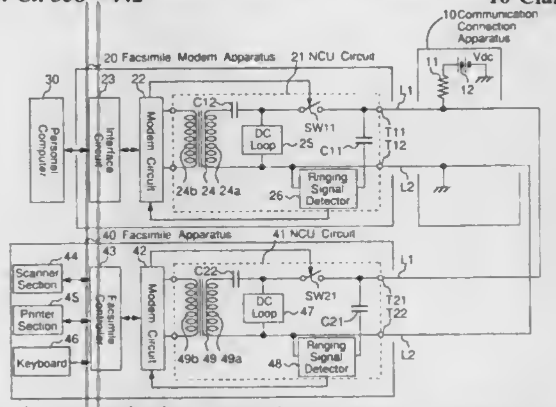
Kiyoshi Hamada, and Shin-ichi Ishimoto, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1996, Ser. No. 641,549

Claims priority, application Japan, Oct. 18, 1995, 7-270129

Int. Cl.^{6} H04M *11/00;1/40;1/32;* **G06F** *13/40*

U.S. Cl. 358—442 **10 Claims**



3. A communication connection apparatus, operatively connected between a facsimile modem apparatus and a facsimile apparatus, for connecting said facsimile modem apparatus with said facsimile apparatus by way of a pair of transmission lines so as to execute communication between said facsimile modem apparatus and said facsimile apparatus, comprising:
- DC power source means for applying to said pair of transmission lines through a resistor, a predetermined DC voltage for transmitting an analog facsimile signal transmitted from either one of said facsimile modem apparatus and said facsimile apparatus so as to superimpose the analog facsimile signal on the DC voltage by way of said pair of transmission lines;
- switch means having either one of an ON-state and an OFF-state, operatively connected between one transmission line of said pair of transmission lines, and said resistor, said switch means being normally or previously put in an ON-state thereof; and
- voltage detecting means for detecting a voltage generated across said pair of transmission lines and controlling said switch means to be switched over from the ON-state to an OFF-state thereof when the detected voltage is higher than a predetermined threshold voltage higher than said predetermined DC voltage.

5,751,443

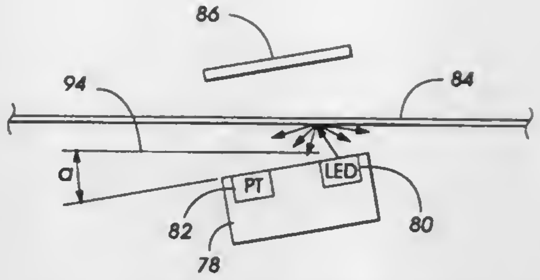
ADAPTIVE SENSOR AND INTERFACE

Michael D. Borton, Ontario; Kevin M. Carolan, Webster, and Fred F. Hubble, III, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1996, Ser. No. 728,018

Int. Cl.^{6} G01N *21/47*

U.S. Cl. 356—446 **14 Claims**



1. A sensor for detecting the presence of copy sheets and transparencies in a copy substrate transporting path comprising:
- a light source disposed near the transporting path for projecting light toward the transporting path,
- a light detector located relative to the light source to receive light reflected from copy substrates within the transporting path and provide an output signal proportional to the light received from the copy substrate, the operating range of the light detector having a linear portion and a saturated portion, and
- a control, electrically connected to the sensor, to adjust the light source to maintain the current of the light detector in the linear portion of the operating range, the sensor being tilted at an angle with respect to the horizontal of a copy substrate.

5,751,444

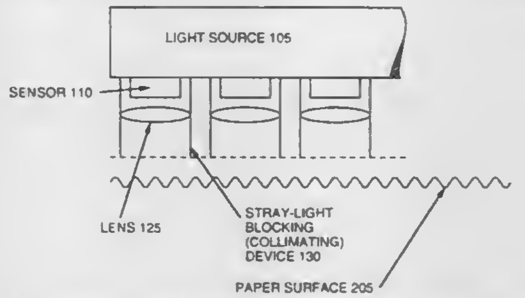
IMAGING APPARATUS FOR COPYING BOUND DOCUMENTS

Michael J. Ward, San Jose, Calif., assignor to Adobe Systems Incorporated, San Jose, Calif.

Filed Dec. 18, 1995, Ser. No. 573,732

Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—471 **9 Claims**



1. A portable reproduction apparatus for duplicating bound documents, comprising:
- a light source to illuminate an image to be reproduced;
- a sensor configured to cover only a portion of the image to be reproduced;
- an input-output device for transferring data received by the sensor; and
- a carriage containing the sensor and the input-output device, wherein the carriage is configured to be inserted into a bound document with minimal opening of the bound document and minimal pressure on the binding of the bound document and the sensor is configured to traverse within the carriage across the entire image to be reproduced.

5,751,445

IMAGE TRANSMISSION SYSTEM AND TERMINAL DEVICE

Makoto Masunaga, c/o Canon Kabushiki Kaisha 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

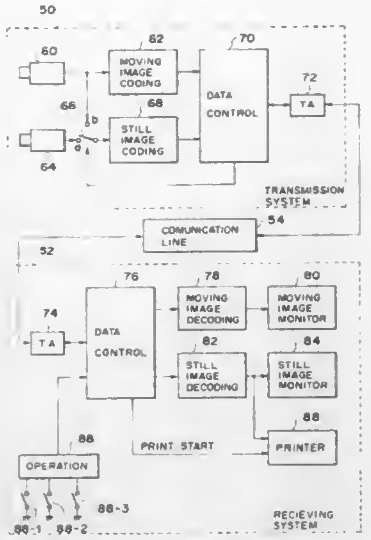
Continuation of Ser. No. 973,668, Nov. 9, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 334,369

Claims priority, application Japan, Nov. 11, 1991, 3-294201

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 358—426 **17 Claims**

1. An image processing apparatus comprising:
- image pickup means for generating a moving image;
- first compression processing means for executing compression for the moving image;



second compression processing means for executing compression for a still image;
receiving means for receiving an instruction signal for instructing said second compression processing means via a communication line from an external image processing apparatus;
control means for changing a compression process for the moving image generated by said image pickup means from said first compression processing means to said second compression processing means in response to the instruction signal received by said receiving means; and
transmission means for transmitting the image compressed by said second compression processing means to said external image processing means,
wherein the instruction signal is transmitted via communication line in response to a manual instruction in said external image processing apparatus.

5,751,446
IMAGE READING DEVICE FOR ACCURATELY READING SPREAD PAGES OF A BOOK DOCUMENT

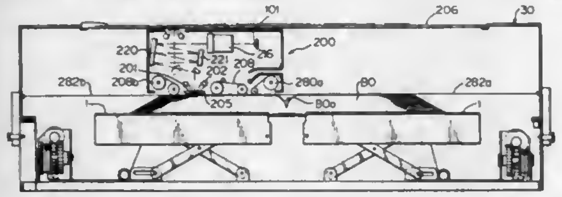
Tetsuya Fujioka, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1995, Ser. No. 437,372

Claims priority, application Japan, May 12, 1994, 6-124506; May 16, 1994, 6-101418; Nov. 17, 1994, 6-283374

Int. Cl.^{6} H04N *1/04;1/40;* **G03B** *27/32*

U.S. Cl. 358—474 **11 Claims**



1. An image reading device comprising:
a table for loading a book document in a spread position;
reading means for reading images from spread pages of the book document by sequentially scanning said spread pages;
storing means for storing image data output from said reading means;
detecting means for detecting an overall length of the book document in a direction perpendicular to a bound portion of said book document by detecting an edge of a first page of the book document and an edge of a second page of the book document;
selecting means for selecting an optimal regular read paper size on the basis of the detected overall length;
determining means for determining a difference between the detected overall length and a dimension of the optimal regular read paper size corresponding to said detected overall length, and for determining a position of the bound portion of the book document from the detected overall length; and
control means for controlling a reading range of said reading means and the image data in response to an output of one of said detecting means, said selecting means, and said determining means.

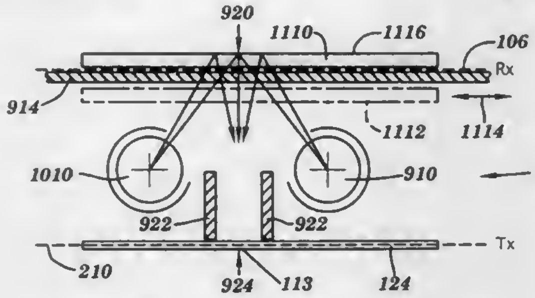
5,751,447
SCANNING SYSTEM

Mark G. Brook, Londonberry, N.H.; Mark E. Tellam, Charlestown, Mass.; John F. Omvik, North Andover, Mass.; Marc L. Cresens, Bedford, Mass.; Christopher R. Duval, Charlestown, Mass., and David M. Leclerc, Peabody, Mass., assignors to Agfa Division, Bayer Corporation, Wilmington, Mass.

Continuation of Ser. No. 605,484, Feb. 26, 1996, Pat. No. 5,621,563, which is a continuation of Ser. No. 496,713, Jun. 29, 1995, Pat. No. 5,532,846. This application Sep. 11, 1996, Ser. No. 712,012

Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—487 **40 Claims**



1. A flat-bed scanner for scanning an original document to obtain a digitized representation of said original document, said flat-bed scanner comprising:
a stationary reflective object focal plane;
a stationary transmissive object focal plane disposed substantially coplanar with and at a vertical distance below said reflective object focal plane;
means for selecting between said reflective object focal plane and said transmissive object focal plane, said selecting means including at least one movably disposed diffuser and reflector element, and means for selectively displacing each diffuser and reflector element between said reflective object focal plane and said transmissive object focal plane;
a scan carriage movably disposed for linear motion along a scanning axis, said scan carriage including an illumination source disposed between said reflective object focal plane and said transmissive object focal plane for illuminating a scan line of said original document located in said selected object focal plane, said scan carriage further including optical imaging and sensor means for obtaining a digitized representation of said scan line; and
means for moving said scan carriage along said scanning axis to obtain digitized representations of successive scan lines of said original document in said selected object focal plane, said digitized representations of said successive scan lines together comprising said digital representation of said original document.

5,751,448
METHODS OF OPERATING AN IMAGE FORMING APPARATUS HAVING A SHARED PAPER TRANSMISSION PATH

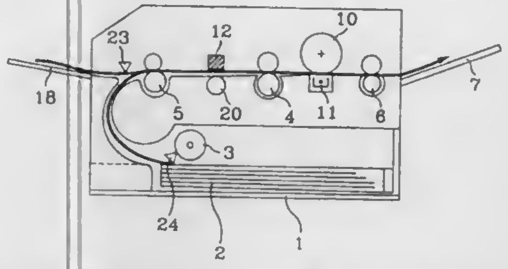
Yong-Geun Kim, and Seong-Woo Kim, both of Suwon, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 5, 1996, Ser. No. 583,592

Claims priority, application Rep. of Korea, Jan. 7, 1995, 231/1995

Int. Cl.^{6} H04N *1/04;1/23*

U.S. Cl. 358—498 **7 Claims**



1. A method for operating an image forming apparatus having a common paper transmission path in one of a facsimile transmitting operation, a facsimile receiving operation and a copy operation, said method comprising the steps of:
feeding a paper through said paper transmission path;
reading an image on said paper fed through said paper transmission path during said facsimile transmitting operation;
reading an image on said paper fed through said paper transmission path during a scanning mode of said copy operation;
printing an image on said paper fed through said paper transmission path during said facsimile receiving operation;
printing an image on said paper fed through said paper transmission path during a printing mode of said copy operation;
determining whether a ring signal indicative of said facsimile receiving operation is received over a telephone line;
sensing whether paper is available to be printed on when said ring signal is received;
displaying a message indicating that no paper is available to be printed on when said step of sensing fails to sense any paper being available to be printed on;
performing said step of feeding said paper through said paper transmission path when said step of sensing senses that paper is available to be printed on;
sensing whether paper is available to be read when said ring signal is not received; and determining whether said image forming apparatus is to be operated in said copy operation, discharging said paper from said paper transmission path to an exit tray.

4. A method of operating an image forming apparatus having a common paper transmission path in one of a facsimile transmitting operation, a facsimile receiving operation and a copy operation, said method comprising the steps of:
checking for reception of a ring signal indicative of said facsimile receiving operation;
checking a first paper sensor at a beginning of said paper transmission path to determine whether a document is available to be read when said ring signal is not received;
returning to said step of checking for reception of a ring signal when said first paper sensor indicates that no document is available to be read;
determining whether said image forming apparatus is to perform said copy operation when said first paper sensor indicates that said document is available to be read;
acknowledging and performing said facsimile transmitting operation when said step of determining whether said image forming apparatus is to perform said copy operation determines that said image forming apparatus is not to perform said copy operation;
transmitting said document along said paper transmission path and scanning said document when said step of determining whether said image forming apparatus is to perform said copy operation determines that said image forming apparatus is to perform said copy operation;
storing information obtained during said scanning of said document;
checking a second paper sensor to determine whether print paper is available to be printed on when said ring signal is received or when said step of storing information obtained during said scanning of said document is completed;
transmitting said print paper through said paper transmission path and printing an image on said print paper when said second paper sensor determines that print paper is available;
discharging said print paper from said paper transmission path to an exit tray.

5,751,449
IMAGE COMMUNICATING APPARATUS

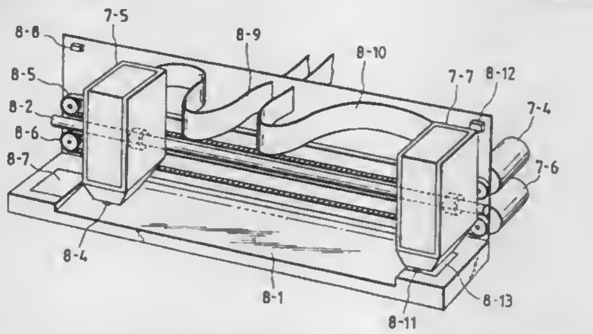
Hiroshi Nobuta, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,655

Claims priority, application Japan, Dec. 20, 1993, 5-344846; Dec. 27, 1993, 5-348672

Int. Cl.^{6} H04N *1/46*

U.S. Cl. 358—501 **28 Claims**



1. An image forming apparatus for recording a received image, comprising:
a) discrimination means for discriminating whether the received image is to be recorded as a color image or as a monochromatic image;
b) recording means for recording said received image, said recording means having plural cartridges respectively for recording on a recording member, said plural cartridges including at least first and second cartridges which are stored in mutually opposite directions with respect to said recording member and are moved to a common position at the start of recording, said first cartridge containing recording agents of plural colors, and said second cartridge containing only a single recording agent; and
c) control means for determining which of said plural cartridges is to be used by said recording means, according to the output of said discrimination means.

5,751,450
METHOD AND SYSTEM FOR MEASURING COLOR DIFFERENCE

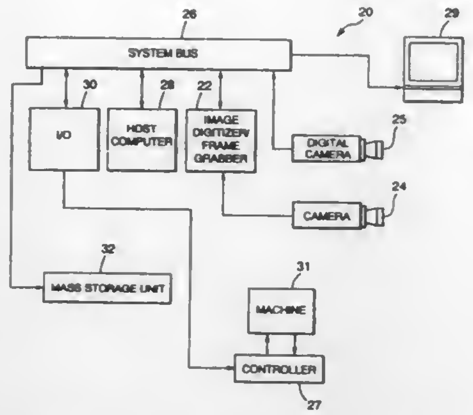
David A. Robinson, Towcester, Great Britain, assignor to MEDAR, Inc., Farmington Hills, Mich.

Filed May 22, 1996, Ser. No. 651,455

Int. Cl.^{6} H04N *1/46*

U.S. Cl. 358—504 **40 Claims**

1. A method for automatically measuring color difference between color distribution of an object and a reference color image of the object in a machine vision system having a memory, the method comprising the steps of:
storing a template in the memory of the machine vision system, the template representing the reference color image of the object and having a first set of pixels;

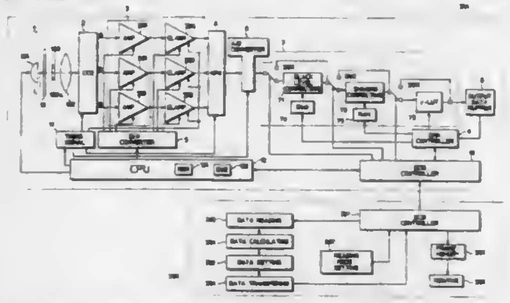


generating a sample color image of the object having the color distribution and having a second set of pixels; and

processing the template and the sample color image together on a pixel-by-pixel basis to obtain a total color distance accumulated over matched pixels in the first and second sets of pixels in an area of the object, the total color distance representing a statistically meaningful color measurement between the color distribution and the reference color image of the object in a color system.

5,751,451
FILM IMAGE READING SYSTEM

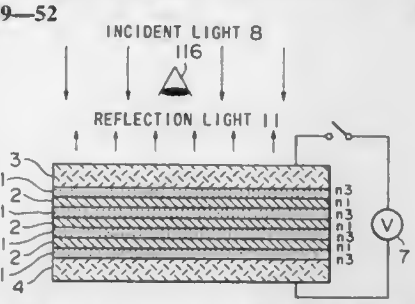
Takeshi Ogoshi, Amagasaki, and Yukari Maeda, Osaka, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed May 23, 1996, Ser. No. 653,700
Claims priority, application Japan, May 26, 1995, 7-128684
Int. Cl.^{6} H04N *1/46*
U.S. Cl. 358—527 **5 Claims**



1. A film image reading system comprising:
- an image pickup device which picks up a light image of an image recorded on a film to produce raw image signals corresponding to three colors of the light image and indicative of magnitudes corresponding to light amounts of the respective three colors;
- a signal processor which processes said raw image signals of three colors in accordance with a reference to produce output image signals corresponding to three colors of the light image, the output image signals being operable to ensure a proper color balance;
- a first calculator which calculates:
  - a ratio between a high magnitude image signal of a first color and a corresponding image signal of a second color of said three colors; and
  - a ratio between the high magnitude image signal of said first color and a corresponding image signal of the third color of said three colors;
- a second calculator which calculates:
  - a ratio between an average magnitude image signal of said first color and an average magnitude image signal of said second color; and
  - a ratio between the average magnitude image signal of said first color and an average magnitude image signal of said third color; and
- a reference changer which changes the reference of the signal processor based on ratios calculated by the first and second calculators.

5,751,452
OPTICAL DEVICES WITH HIGH POLYMER MATERIAL AND METHOD OF FORMING THE SAME

Keiji Tanaka; Kinya Kato, both of Iruma; Shigeru Tsuru, and Shigenobu Sakai, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan
Filed Feb. 18, 1994, Ser. No. 198,811
Claims priority, application Japan, Feb. 22, 1993, 5-031721; Feb. 23, 1993, 5-033221; Apr. 27, 1993, 5-100596; Sep. 20, 1993, 5-233253; Nov. 26, 1993, 5-296287
Int. Cl.^{6} G02F *1/13;1/133;1/137*
U.S. Cl. 359—52 **19 Claims**

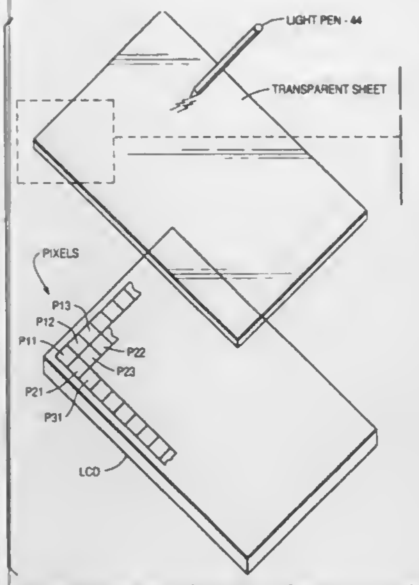


1. An optical device comprising a pair of transparent electrodes, a plurality of optical elements formed as an interference pattern, having a periodicity in inter-element spacings, disposed between said transparent electrodes, wherein:
- each optical element comprises a high polymer material having an electrical field-independent refractive index and a liquid crystal material having an electrical field-dependent refractive index, and wherein each optical element is orientated at a specific angle to an incident surface of said optical device, and reflection, transmission and diffraction of incident light entering said optical device are regulated by the application of an electrical field between said transparent electrodes; and
- said high polymer material is an optically isotropic material and said liquid crystal material is an optically anisotropic material, and said high polymer material comprises a multifunctional carbon/unsaturated carbon compound that can be additionally polymerized, and a light hardenable resin containing at least multifunctional thiol, and wherein the refractive index of the liquid crystal material is controlled by the application of an electric field on said pair of transparent electrodes.

5,751,453
LIQUID CRYSTAL DISPLAY WITH PEN-INPUT CAPABILITY

Peter F. Baur, Augsberg, Germany, assignor to NCR Corporation, Dayton, Ohio
Continuation of Ser. No. 322,969, Oct. 13, 1994, abandoned, which is a continuation of Ser. No. 44,788, Apr. 9, 1993, abandoned, and a continuation-in-part of Ser. No. 805,450, Dec. 6, 1991, Pat. No. 5,243,452. This application Oct. 23, 1995, Ser. No. 553,741
Int. Cl.^{6} G02F *1/1343;1/13*
U.S. Cl. 359—60 **11 Claims**

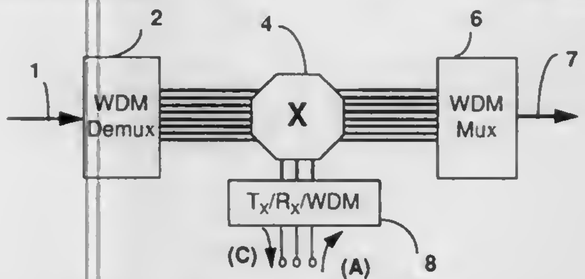
1. In a liquid crystal display having a plurality of pixels, the improvement comprising:
- a) a light pen for producing incoming light:
- b) a plurality of sensors, each
  - i) associated with a respective pixel and
  - ii) capable of producing a signal in response to incoming light; and



- c) means for changing the brightness of each pixel, in response to the signal for that pixel.

5,751,454
WAVELENGTH BYPASSED RING NETWORKS

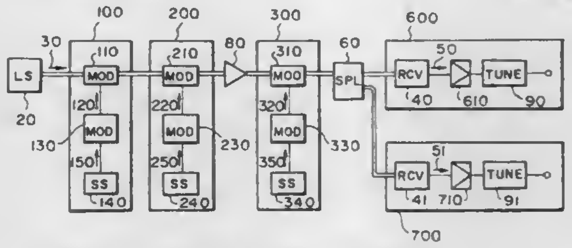
R. Ian MacDonald, Edmonton, and Herman W. Willemsen, Stittsville, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Oct. 10, 1996, Ser. No. 728,427
Int. Cl.^{6} H04B *10/20;* **H04J** *14/00*
U.S. Cl. 359—119 **22 Claims**



1. An optical wavelength bypassed ring network (WBRN) configured with a plurality (N) of traffic nodes and a transmission medium chaining from traffic node to traffic node in a ring configuration, a span S_n of said transmission medium for linking a node (n) with a downstream node (n+1), where n is the sequential position of said node (n) in said ring and n∊[1, N], each said node (n) comprising:
- an input port for receiving a first set of (Q_i) incoming channels;
- an output port for providing a second set of (Q_o) outgoing channels; and
- bypass means for directly connecting an incoming channel of said first set having the carrier wavelength λ_q, where q∊[1, Q], to an outgoing channel of said second set, having same carrier wavelength λ_q, for bypassing said node (n) whenever said node (n) is not the destination node for said incoming channel.

5,751,455
OPTICAL TRANSMISSION SYSTEM AND OPTICAL NETWORK TERMINALS USED THEREIN

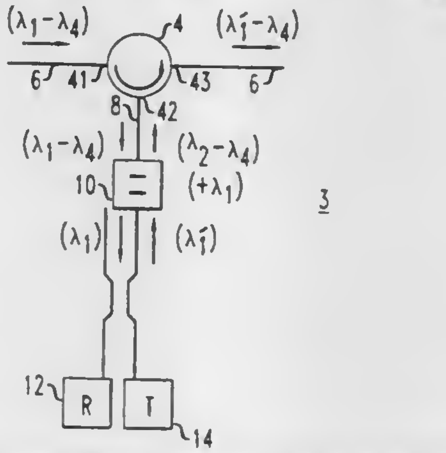
Makoto Shibutani, and Katsumi Emura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Division of Ser. No. 178,803, Jan. 7, 1994, abandoned. This application Oct. 31, 1996, Ser. No. 742,685
Claims priority, application Japan, Jan. 7, 1993, 5-913; Jun. 3, 1993, 5-133046
Int. Cl.^{6} H04J *14/02*
U.S. Cl. 359—126 **8 Claims**



1. An optical transmission system comprising:
- a light source for generating a signal beam;
- a plurality of light receivers;
- an optical fiber transmission path which carries said signal beam and also couples said light source with said plurality of light receivers; and
- a plurality of network terminals, connected in cascade along said optical transmission system, each of said network terminals including cascade-connected modulators: subcarrier waves having frequencies different from one another being applied to one of said cascade-connected modulators inside each of said network terminals.

5,751,456
MULTIWAVELENGTH ADD/DROP MULTIPLEXER

Antonius Marcellus Jozef Koonen, Eemnes, Netherlands, assignor to Lucent Technologies Inc., Murray Hill, N.J.
Filed Feb. 20, 1996, Ser. No. 604,136
Int. Cl.^{6} H04J *14/02*
U.S. Cl. 359—127 **7 Claims**



1. A multiwavelength add/drop multiplexer for use in an optical fiber communication system comprising;
- a main optical fiber,
- a branch optical fiber;
- an optical element arranged to direct substantially all of the light transmitted in a predetermined direction along said main optical fiber into said branch optical fiber, regardless of wavelength;
- a transmission filter coupled to said branch optical fiber and arranged to transmit light of a predetermined wavelength and reflect the non-transmitted light back towards said main optical fiber for continued propagation along said main optical fiber;
- a receiver for receiving the transmitted light; and

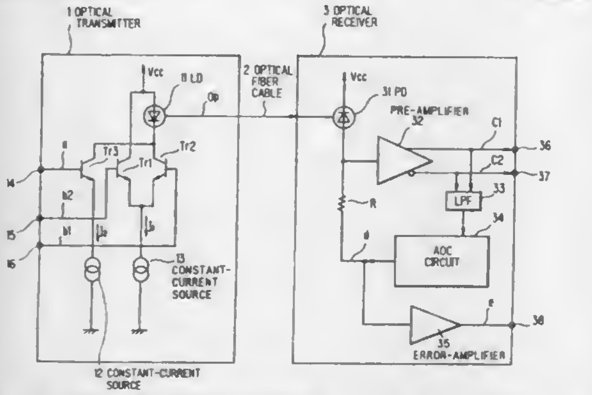
and a transmitter arranged to transmit optical data signals along said branch optical fiber, through said transmission filter and towards said optical element for propagation along said main optical fiber.

5,751,457

Patent Not Issued For This Number

5,751,458
OPTICAL DOUBLE TRANSMISSION SYSTEM

Toshirou Yoshida, and Tetsuya Suzuki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Mar. 15, 1996, Ser. No. 616,595
Claims priority, application Japan, Mar. 15, 1995, 7-054853
Int. Cl.^{6} H04B *10/12*
U.S. Cl. 359—173 **2 Claims**

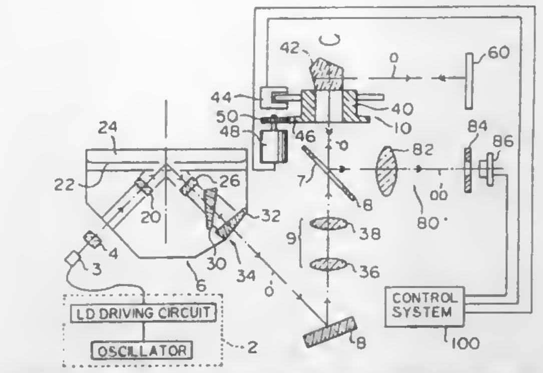


1. An optical double transmission system for transmitting a digital optical signal from an optical transmitter through an optical fiber cable to an optical receiver, wherein:
said optical transmitter transmits a digital multiplexed light intensity signal which is modulated by a main data signal and a sub-data signal, said sub-data signal having a clock rate lower than that of said main data signal; and
said optical receiver comprises a photoelectric conversion circuit for converting said light intensity signal into a first electric signal having a DC component, a low-pass filter for passing a frequency component lower than that of said main data signal of said first electric signal, an offset cancel circuit for controlling a value of the DC component of said first electric signal to be such that a DC component of the output of said low-pass filter is made zero responding to the output of said low-pass filter, and a sub-data signal reproducing circuit for reproducing said sub-data signal from the output of said offset cancel circuit.

5,751,459
MARKING APPARATUS HAVING FEEDBACK-CONTROLLED ROTATIONAL LASER BEAM

Fumio Ohtomo; Hiroyuki Nishizawa; Jun-ichi Kodaira, and Kenichirou Yoshino, all of Tokyo, Japan, assignors to Topcon Corporation, Tokyo, Japan
Division of Ser. No. 511,619, Aug. 7, 1995, Pat. No. 5,583,685, which is a continuation of Ser. No. 141,047, Oct. 26, 1993, Pat. No. 5,517,023. This application Aug. 14, 1996, Ser. No. 696,726
Claims priority, application Japan, Oct. 27, 1992, 4-289042
Int. Cl.^{6} G02B *26/08*
U.S. Cl. 359—197 **7 Claims**

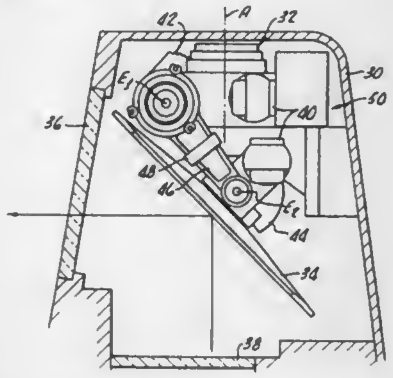
1. A laser beam irradiation apparatus comprising:
a laser source for emitting a laser beam;
laser beam projecting means for projecting the laser beam;



scanning means for moving said laser beam projecting means and scanning the laser beam along a laser scanning path, said scanning means having a first mode and a second mode;
reflecting means for reflecting the laser beam projected by said projecting means, said reflecting means including first and second reflection zones having a space therebetween along said laser scanning path;
laser beam detecting means for detecting a return laser beam reflected from said reflecting means and producing an output based on detection of the return laser beam; and
control means for changing operation of said scanning means from said first mode to said second mode based on the output of said laser beam detecting means when said laser beam detecting means detects a return laser beam from both of said first and second reflection zones.

5,751,460
OPTICAL SYSTEM WITH AN ARTICULATED MIRROR UNIT

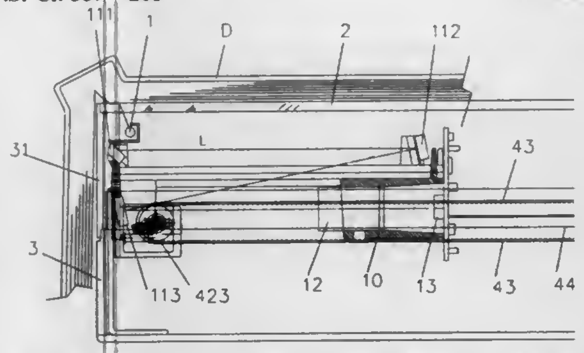
John P. Harrell, Mission Viejo, and Bryce A. Wheeler, Mammoth Lakes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 11, 1995, Ser. No. 540,731
Int. Cl.^{6} G02B *26/08;7/182*
U.S. Cl. 359—198 **18 Claims**



18. An articulated optical system for directing a beam, said optical system comprising:
a head mirror to reflect the beam;
structure pivotally supporting said head mirror, said structure defining a first pivot axis disposed generally centrally of said head mirror and a mutually parallel second pivot axis spaced from said first pivot axis, an arm extending from said first pivot axis to said second pivot axis, first means for independently selectively pivoting said head mirror about said first pivot axis, and second means for selectively pivoting said support arm along with said first pivot axis and said head mirror relative to said second pivot axis.

5,751,461
EDGE-FLAT IMAGE SCANNING SYSTEM

Philip L. Chen, Rolling Hills, Calif., and Thomas Sheng, Hsin-Chu, Taiwan, assignors to Avision, Inc, Hsin-Chu, Taiwan
Filed Sep. 11, 1995, Ser. No. 526,358
Int. Cl.^{6} G02B *26/08*
U.S. Cl. 359—201 **8 Claims**

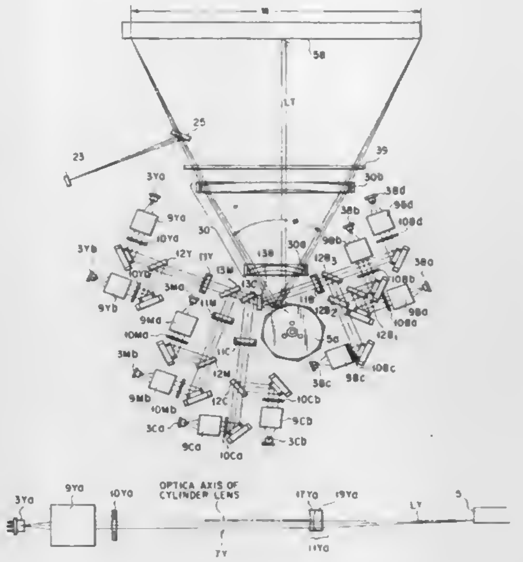


1. A flat-edge image scanning system capable of scanning a document to the binding edge of a page for reducing distortion, comprising:
a frame with vertical supporting walls;
a scanning window lying on top of said frame, transparent up to said vertical supporting walls and capable of supporting said document with said binding edge placed at the corner between said frame and said scanning window;
an image reading head, comprising:
a scanning light source for illuminating said page to obtain optical signals,
a series of reflecting mirrors for reflecting said optical signals of the area scanned by said light source to said image reading head, placed underneath said window and inside the boundary of said window so that the light source can scan to the supporting walls for reducing distortion caused due to protrusion at the binding edge and
a light sensor for further processing said optical signals;
driving mechanism for sliding said image reading head underneath said scanning window along a rail using conventional driving mechanism.

5,751,462
MULTI-BEAM EXPOSURE UNIT

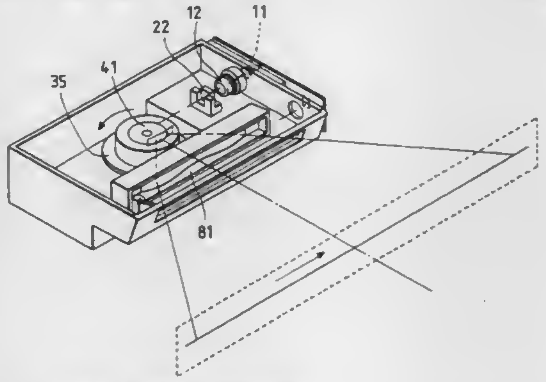
Takashi Shiraishi, Sagamihara; Masao Yamaguchi, Funabashi, and Yasuyuki Fukutome, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 9, 1997, Ser. No. 780,905
Claims priority, application Japan, Jan. 11, 1996, 8-002988
Int. Cl.^{6} G02B *26/08*
U.S. Cl. 359—204 **2 Claims**

1. An optical exposure unit comprising:
light sources which are arranged in correspondence with numbers indicated by N_1 to N_M (M is an integer not less than 3) and emit light beams;
first lens means for converting the light beams emitted by each of the light sources into one of convergent light and collimated light, said first lens means including one of a finite lens and collimate lens in number corresponding to a sum of N_1 to N_M;
second lens means given lens power associated with a first direction to converge the light beams output from each of said first lens means in only the first direction, M sets of said second lens means being provided;
M−1 synthesizing reflection mirrors for reflecting M−1 groups of beams from M−1 sets of said second lens means to be substantially overlaid as M groups of beams from M sets of said second lens means in the first direction;
deflection means for deflecting the light beams output from said second lens means and said reflection mirrors in a second direction perpendicular to the first direction, the deflection means including a reflection surface formed to be rotatable about a rotation axis extending in a direction parallel to the first direction as a center of rotation; and
imaging means, including at least one lens, for imaging each of the light beams deflected at an equal speed by said deflection means at a predetermined position, and
wherein M beam groups are incident on the reflection surface of said deflection means so that an interval between adjacent beam groups in the first direction monotonously increases from one end, and a beam group on one end with a smallest interval to an adjacent beam group in the first direction is incident to cross the beams deflected by said deflection means.



5,751,463
OPTICAL SCANNER

Nozomu Inoue; Takashi Hama; Yujiro Nomura, and Kyu Takada, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Division of Ser. No. 604,901, Feb. 22, 1996, Pat. No. 5,673,136. This application Apr. 22, 1997, Ser. No. 837,750
Claims priority, application Japan, Feb. 23, 1995, 7-59894
Int. Cl.^{6} G02B *26/08*
U.S. Cl. 359—205 **2 Claims**



1. An optical scanner comprising:
a light source for emitting a light beam;
first optics, including a collimator lens, for providing a transformed light beam by transforming said light beam to have specified characteristics;
a deflector for providing a deflected light beam by deflecting said transformed light beams; and
second optics, including a scanning lens, for providing a focused light beam by focusing said deflected light beam to form a focused image on a predetermined surface to be scanned,

wherein a first movement direction of said focused image caused by refractive power variation resulting from thermal change of said collimator lens is opposite to a second movement direction of said focused image caused by refractive power variation resulting from thermal change of said scanning lens.

5,751,464
OPTICAL SCANNER, IMAGE FORMING APPARATUS AND IMAGE READING APPARATUS

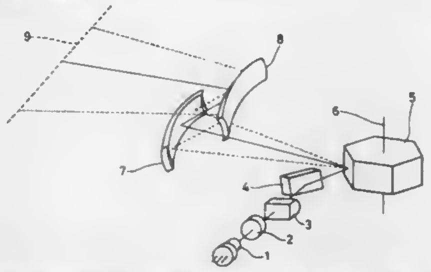
Motonobu Yoshikawa; Yoshiharu Yamamoto, and Kazutake Boku, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 20, 1996, Ser. No. 604,058

Claims priority, application Japan, Feb. 20, 1995, 7-031065

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—208 **33 Claims**



1. An optical scanner comprising a light source unit, an optical deflector to scan a light beam from the light source unit, a first image formation optical system disposed between the light source unit and the optical deflector, and a second image formation optical system disposed between the optical deflector and a surface to be scanned, wherein the second image formation optical system comprises a first curved mirror to reflect the light beam from the optical deflector and a second curved mirror having a toric surface with a convex shape in the main scanning direction, which is the direction a light beam is scanned in, and with a concave shape in the sub scanning direction, which is the direction perpendicular to the main scanning direction, to focus the light beam from the first curved mirror on the surface to be scanned.

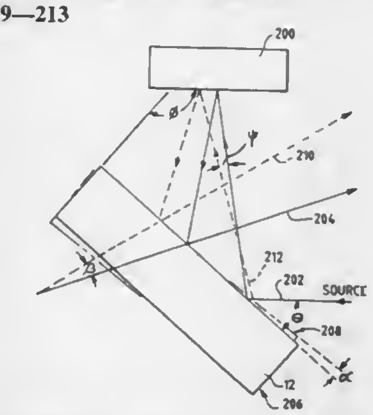
5,751,465
MINIATURE OPTICAL SCANNER FOR A TWO AXIS SCANNING SYSTEM

Charles D. Melville, Issaquah; Thomas A. Furness, III, and Michael R. Tidwell, both of Seattle, all of Wash., assignors to University of Washington, Seattle, Wash.

Division of Ser. No. 329,508, Oct. 26, 1994, Pat. No. 5,557,444. This application Jun. 13, 1996, Ser. No. 664,103

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—213 **7 Claims**



1. An optical scanning system for scanning a light beam from a source of light comprising:

a multiplying mirror for reflecting a light beam;

a first optical scanning mirror for reflecting a light beam from said source, said first optical scanning mirror oscillating about an axis of rotation through a mechanical first scan angle to provide a first optical scan angle and said multiplying mirror being positioned relative to said first optical scanning mirror to reflect the reflected light beam from said first optical scanning mirror back onto said first optical scanning mirror such that the light beam is reflected by said first optical scanning mirror a multiple number of times before being output from the scanning system to cause said first optical scanning mirror to scan said light beam through an output scan angle that is greater than said first optical scan angle by a factor that is equal to said multiple number of times.

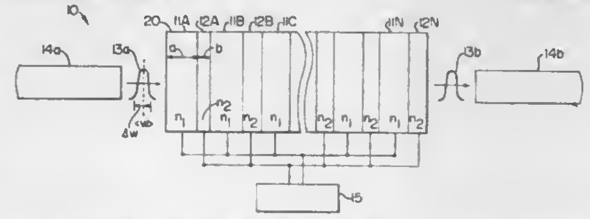
5,751,466
PHOTONIC BANDGAP APPARATUS AND METHOD FOR DELAYING PHOTONIC SIGNALS

Jonathan P. Dowling, Fayetteville, Tenn.; Michael Scalora, Huntsville, Ala.; Mark J. Bloemer, Athens, Ala.; Charles M. Bowden; Rachel J. Flynn, both of Huntsville, Ala.; Richard L. Fork, Madison, Ala.; Senter B. Reinhardt, Jr., and Michael D. Tocci, both of Huntsville, Ala., assignors to University of Alabama at Huntsville, Huntsville, Ala.

Filed Jan. 11, 1996, Ser. No. 584,403

Int. Cl.^{6} G02F *1/03;* G02B *1/10;5/28;6/12*

U.S. Cl. 359—248 **28 Claims**



19. A photonic signal delaying apparatus, which delays photonic signals of a predetermined frequency and a predetermined bandwidth, comprising:

a photonic bandgap structure having a plurality of generally parallel layers including a first layer and a last layer;

means for directing the photonic signals into said first layer such that the photonic signals propagate in a direction generally perpendicular to said plurality of layers,

wherein said photonic bandgap structure has a photonic band edge resonance at the predetermined frequency of the photonic signal, and having a corresponding photonic band edge resonance bandwidth which is at least as wide as the predetermined bandwidth of the photonic signal, to thereby impart a predetermined delay to the photonic signal which propagates therethrough.

5,751,467
VARIABLE REFLECTANCE AUTOMOBILE MIRROR

Harlan J. Byker, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

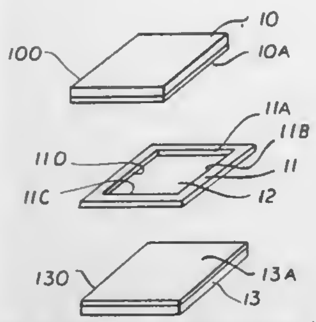
Continuation of Ser. No. 760,877, Sep. 16, 1991, abandoned, which is a division of Ser. No. 422,601, Oct. 17, 1989, abandoned, which is a division of Ser. No. 846,354, Mar. 31, 1986, Pat. No. 4,902,108. This application Apr. 23, 1992, Ser. No. 874,175

The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.

Int. Cl.^{6} G02F *1/153*

U.S. Cl. 359—272 **109 Claims**

104. A variable reflectance rearview mirror for a motor vehicle, wherein the variable reflectance is provided by a component of reversibly variable transmittance, which is a self-erasing electrochromic device, and wherein, in said electrochromic device, there is a medium of reversibly variable transmittance which is between and in contact with two planar parallel, spaced-apart walls, each of which, on the side in contact with said medium, is coated with an electrode layer of electrically conductive material, one of which is transparent and the other of which has as its electrode layer in contact with said medium a reflecting layer of high reflectance material, which layer reflects, through said medium and the transparent wall, light which reaches said layer after entering the medium through the transparent wall and which reflectance material is selected from the group consisting of rhodium and inconel.



5,751,468
VERTICAL MODULATOR WITH DUAL MODE DBR

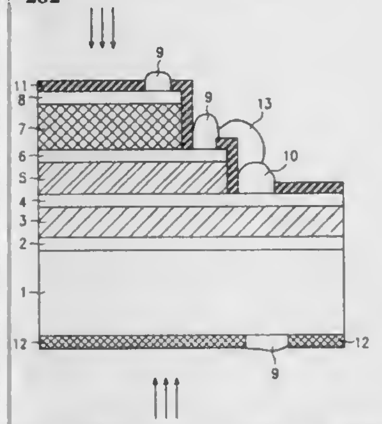
Kyung-Sook Hyun, Yusong-ku; O-Kyun Kwon, Seo-ku; Kwang-Joon Kim, and El-Hang Lee, both of Yusong-ku, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Center, Daejeon, Rep. of Korea

Filed Sep. 20, 1996, Ser. No. 717,127

Claims priority, application Rep. of Korea, Dec. 20, 1995, 95-52644

Int. Cl.^{6} G02F *1/09*

U.S. Cl. 359—282 **4 Claims**



1. A vertical modulator with a dual mode distributed Bragg reflection, comprising:

a first-conduction type semiconductor substrate;

a first optical structure operating at a first wavelength, the first optical structure including a first-conduction type electrode formed over the first-conduction type semiconductor substrate, an optically active layer formed over the first-conduction type electrode and adapted to serve as a multiple quantum well layer, and a second-conduction type electrode formed over the optically active layer;

a mirror structure formed over the first optical structure, the mirror structure exhibiting a high reflection factor at either the first wavelength or a second wavelength different from the first wavelength;

a second optical structure operating at the second wavelength, the second optical structure including a first-conduction type electrode formed over the mirror structure, an optically active layer formed over the first-conduction type electrode and adapted to serve as a multiple quantum well layer, and a second-conduction type semiconductor electrode formed over the optically active layer;

a first ohmic electrode adapted to connect the first-conduction type substrate and the first-conduction type electrode of the second optical structure with each other;

a second ohmic electrode adapted to connect the second-conduction type electrode of the first optical structure and the second-conduction type semiconductor electrode;

an anti-reflection film for the second optical structure;

another anti-reflection film for the first optical structure; and

a metal layer adapted to connect the second-conduction type electrode and the first-conduction type electrode.

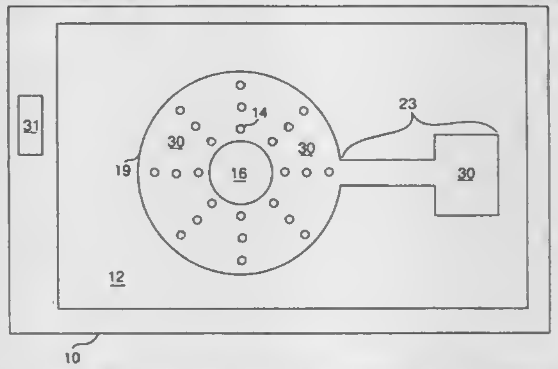
5,751,469
METHOD AND APPARATUS FOR AN IMPROVED MICROMECHANICAL MODULATOR

Susanne C. Arney, Highland Park; Dennis Stanley Greywall, White House Station; James A. Walker, Howell, and Bernard Yurke, Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 1, 1996, Ser. No. 565,453

Int. Cl.^{6} G02B *26/00*

U.S. Cl. 359—291 **12 Claims**



1. A monolithic micromechanical modulator for modulating an optical signal comprising:

a substrate characterized by a first refractive index; and

a membrane for receiving an optical signal, wherein, the membrane has at least a first layer of material having a second refractive index that is approximately equal to the square root of the first refractive index of the substrate; wherein,

the membrane is supported over a first region of the substrate, the first region having a perimeter defining a modulator cavity, wherein the membrane overlaps a substantial portion of the perimeter of the modulator cavity, and further wherein the substrate and membrane are monolithically integrated.

5,751,470
METHOD FOR ENHANCED PRINT QUALITY ON PRINT ENGINES WITH AT LEAST ONE HIGH RESOLUTION DIMENSION

Brian Wesley Damon, Lexington, Ky., assignor to Lexmark International, Inc., Lexington, Ky.

Filed Mar. 12, 1996, Ser. No. 614,086

Int. Cl.^{6} H04N *1/40;* G06F *15/00;* G01D *9/42*

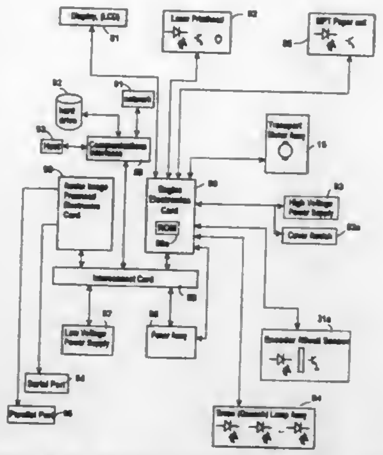
U.S. Cl. 358—298 **1 Claim**

1. A method of enhancing the print quality in a binary printer which converts digital data by addressing a high frequency of dots in at least one dimension on print receiving media, and at a greater resolution in at least one of two print directions than the nominal rating of said binary printer, the method comprising:

supplying a representation of areas to print and a single desired gray intensity value for each one of said areas;

converting each one of said areas to a representation of pixels to be covered, and converting said gray intensity value for each one of said areas to a digital intensity number;

comparing said number for each one of said areas to a predetermined matrix representation of cells arranged in supercells, each cell of each one of said supercells representing a pixel and including a threshold number for each of said cells of said supercells; said threshold numbers when less than or equal to



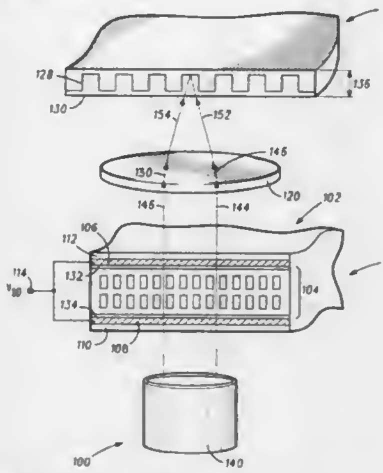
said desired gray intensity number, effecting a cell print, and when greater than said gray intensity number effecting a no cell print;
obtaining for each cell print a single digital value from a second predetermined matrix having one value corresponding to each said representation of cells by said first matrix,
determining for each cell print the arithmatic difference between said intensity number and said threshold number,
employing said each said single digital value as a first address in a table of laser on conditions, said laser on conditions not being linearly related to arithmatic differences of said intensity numbers,
employing said arithmatic differences as a second address in a table, said first said address and said second said address defining a single entry in said table, and
maintaining an on condition of said printer in each cell of said supercells in an amount defined by its value in said table.

5,751,471

SWITCHABLE LENS AND METHOD OF MAKING

Diana Chen, Gilbert; Wenbin Jiang, Phoenix, and Michael S. Lebby, Apache Junction, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1997, Ser. No. 848,848
Int. Cl.⁶ G02F *1/29*
U.S. Cl. 359—319 22 Claims



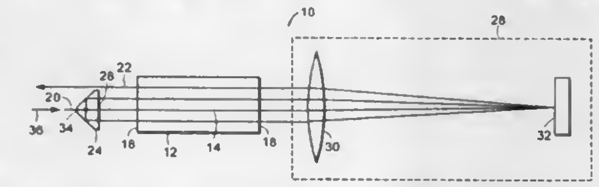
11. A dual focus lens system comprising:
a first transparent substrate having a first surface, the first transparent substrate being made of an insulating material;
a first electrically conductive, transparent contact film disposed on the first surface of the first transparent substrate;
a layer of phase modulating material disposed on the first electrically conductive, transparent contact film, the layer of phase modulating material having a thickness and a memory of a lens pattern with a first optical axis, a first numerical aperture and a first focal length;
a second electrically conductive, transparent contact film disposed on the phase modulating material;
a second transparent substrate having a second surface disposed on the layer of phase modulating material; and
an optical lens having a second optical axis, a second numerical aperture, and a second focal length, wherein the first optical axis and the second optical axis are substantially superimposed.

5,751,472

MULTI-PASS OPTICAL PARAMETRIC GENERATOR

Thomas H. Jeys, Lexington, and Tso Yee Fan, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 8, 1996, Ser. No. 598,662
Int. Cl.⁶ G02F *1/39*
U.S. Cl. 359—330 24 Claims



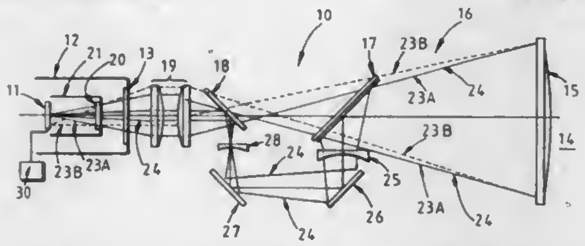
9. A multi-pass optical parametric generator, comprising:
a) a second order nonlinear parametric medium defining a plurality of optical paths through a first and a second end each of the optical paths being substantially distinct and non-overlapping;
b) a first retro-reflector adjacent the first end and positioned within the optical paths of the parametric medium;
c) a second retro-reflector adjacent the second end and positioned within the optical paths of the parametric medium;
d) an input for coupling radiation of a first frequency into the parametric medium;
e) an undesirable radiation removal element for removing undesirable radiation from the optical paths; and
f) an output for transmitting a desired radiation of a second frequency out of the parametric medium.

5,751,473

DUAL WAVEBAND OPTICAL SYSTEM

Herbert Morrison Runciman, Glasgow, United Kingdom, assignor to Barr & Stroud Limited, Scotland, United Kingdom

Filed Apr. 4, 1996, Ser. No. 628,581
Int. Cl.⁶ G02B *13/14*
U.S. Cl. 359—356 6 Claims



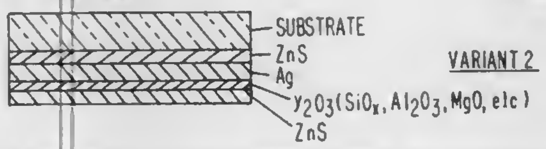
6. An optical system having a focal length that differs in two spectral wavebands, and in which an exit pupil for each waveband is determined by a spectrally-selective aperture, the aperture for each waveband being chosen in such a way that the diameter of an entrance pupil is similar in both bands, said optics comprising a first positively powered optical component, a spectrally selective means of directing the radiation corresponding to one of the wavebands through a second optical component which in combination with said first positively powered optical component comprises a positively powered optical system of focal length which differs from that of said first positively powered optical component, and a means of causing the centre of the image formed by said first positively powered optical component independently and the centre of the image formed by said first positively powered optical component and said second optical component in combination to coincide in focus and position in the focal plane and a means of limiting the radiation in each of the chosen wavebands received by a detector to that which enters said first positively powered optical component, said means comprising re-imaging optics capable of passing radiation in both bands, and a spectral filter having spatial zones each of which transmits radiation only in each of the selected spectral bands.

5,751,474

HIGH-REFLECTION SILVER MIRROR

Karl Hohenegger, Balzers, Liechtenstein, and Peter Wierer, Bludenz, Austria, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Continuation of Ser. No. 228,402, Apr. 15, 1994, Pat. No. 5,548,440. This application Mar. 20, 1996, Ser. No. 618,900
Claims priority, application Switzerland, Apr. 15, 1993, 1139/93
Int. Cl.⁶ G02B *1/10;5/08;5/26*
U.S. Cl. 359—360 5 Claims



1. A high-reflection environmentally stable silver mirror comprising:
a substrate;
at least one optically high-reflective silver layer forming a mirror on said substrate;
a barrier layer configuration on said at least one silver layer, said barrier layer configuration containing at least one layer;
a zinc sulfide layer on said barrier layer configuration;
said at least one silver layer, said barrier layer configuration and said zinc sulfide layer being selected so that with a light angle of incidence of 45° and across a light spectrum of 400 nm to 12,500 nm, the silver mirror always has a reflection value greater than 96% across the entire spectrum for non-polarized light;
the barrier layer configuration comprising at least one layer selected from the group consisting of:
oxides of silicon, aluminum, magnesium, a group IVb element, a group Vb element, a group VIb element, scandium, yttrium, calcium, strontium, zinc, iron, indium, tin, cerium, and holmium; and mixtures of said oxides;
an oxinitride of Ti, Ta, Zr, Si, Hf and Al; and
a fluoride of magnesium, barium, strontium, calcium, a rare earth and lead.

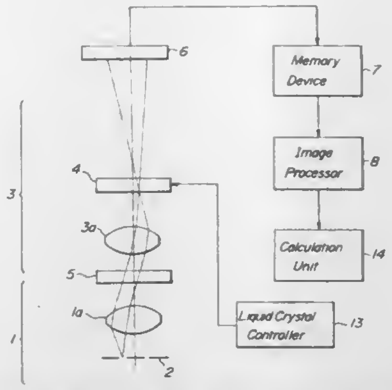
5,751,475

PHASE CONTRAST MICROSCOPE

Hiroshi Ishiwata, Yokosuka, and Chikara Nagano, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,317
Claims priority, application Japan, Dec. 17, 1993, 5-318421; Mar. 16, 1994, 6-045697; Mar. 24, 1994, 6-053819
Int. Cl.⁶ G02B *21/06*
U.S. Cl. 359—387 21 Claims

1. A phase contrast microscope comprising:
an illumination optical system for illuminating a specimen under inspection;
an aperture arranged at a pupil of said illumination optical system;
an imaging optical system for forming an image of the specimen;



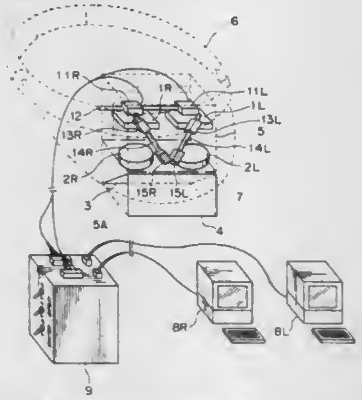
a phase plate arranged near a pupil of said imaging optical system, said pupil of the imaging optical system being arranged at a conjugate position with said aperture with respect to a specimen plane on which said specimen situates;
an image pick-up means provided at a imaging plane on which an image of the specimen is formed by said imaging optical system for picking-up the image to produce an image signal;
a storing means for storing said image signal produced by said image pick-up means; and
a signal processing means for processing the image signal read out of said storing means;
wherein said phase plate is constructed to give phase differences which have substantially a same amount but have opposite signs, two images at said different phase differences are separately picked-up by said image pick-up means and stored in said storing means, an image of a difference between said two images is derived as a phase contrast image, said phase plate comprises a liquid crystal and substantially transparent electrodes arranged on both sides of said liquid crystal, and a voltage applied to the liquid crystal via the electrodes is changed such that said phase differences having substantially the same amount but having said opposite signs are obtained.

5,751,476

DISPLAY DEVICE

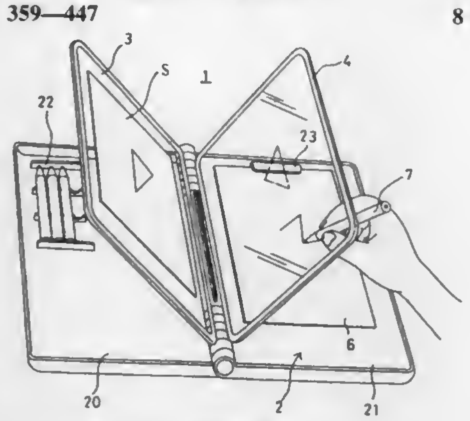
Takeshi Matsui, Tokyo, and Akira Kawamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 20, 1996, Ser. No. 603,718
Claims priority, application Japan, Feb. 28, 1995, 7-040565
Int. Cl.⁶ G02B *23/00*
U.S. Cl. 359—411 6 Claims



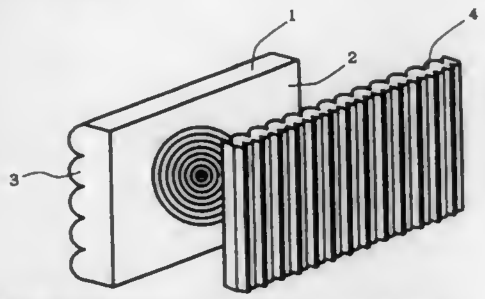
1. A method of adjusting a display device comprising the steps of:
adjusting a horizontal distance between first and second lens members; and
simultaneously adjusting a horizontal distance between first and second image display members in synchronization with the adjustment of the distance between first and second lens members.

5,751,477
TRANSFERRING DEVICE
Mihoko Tomita, and Michihiro Kozuka, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Sep. 14, 1995, Ser. No. 528,262
Claims priority, application Japan, Sep. 16, 1994, 6-012634
Int. Cl.^{6} G03B *21/56*
U.S. Cl. 359—447 **8 Claims**



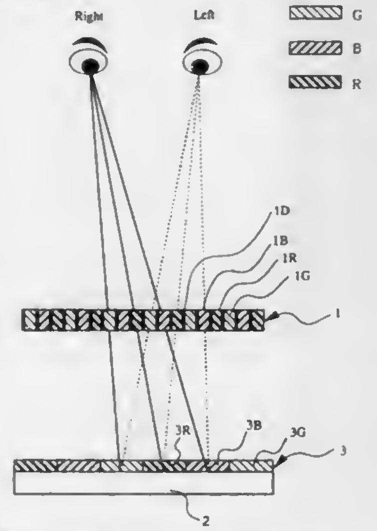
1. A transferring device, comprising:
a base,
a supporting plate,
a transparent window plate,
hinge means operatively connecting the supporting plate, the window plate and the base permitting opening and closing movement therebetween,
first engaging means for erecting the supporting plate at a predetermined angle with respect to the base, and
second engaging means for erecting the window plate at a predetermined angle with respect to the base,
the base being formed of a pair of cover bodies movable between first and second positions such that in the first position, the cover bodies lie in a common plane, with the supporting plate and the window plate on one side of the common plane and in the second position, the cover bodies are folded on top of one another so as to enclose the supporting plate and the window plate.

5,751,478
REAR-PROJECTION SCREEN
Osamu Yoshimura, and Ichiro Matsuzaki, both of Niigata, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Apr. 3, 1996, Ser. No. 626,966
Claims priority, application Japan, Apr. 6, 1995, 7-080944
Int. Cl.^{6} G03B *21/60;* **G02B** *13/20;3/08*
U.S. Cl. 359—453 **7 Claims**



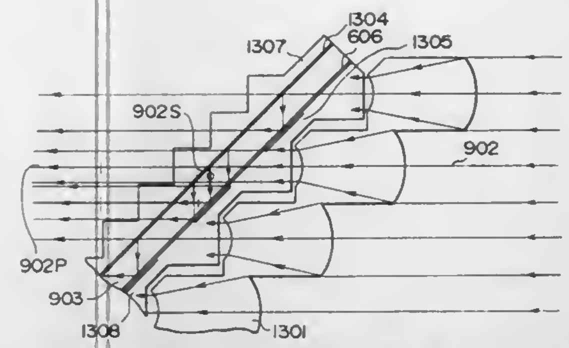
1. A rear projection screen, said screen comprising:
a Fresnel lens structure, a first side of which is a first light-diffusing member, and a second side of which is a circular Fresnel lens surface, and
a second light-diffusing member wherein said second light-diffusing member is spaced apart from the circular Fresnel lens structure and is adjacent to the Fresnel lens surface of said Fresnel lens structure,
wherein said first light-diffusing member has vertical-light diffusion properties greater at its upper and lower end portions than at its middle portion.

5,751,479
THREE-DIMENSIONAL DISPLAY
Goro Hamagishi, Toyonaka; Ken Mashitani, Hirakata; Eiji Nakayama, Osaka, and Susumu Tanase, Hirakata, all of Japan, assignors to Sanyo Electric Co., Osaka-fu, Japan
Filed Nov. 16, 1995, Ser. No. 559,539
Claims priority, application Japan, Nov. 18, 1994, 6-285730; Apr. 28, 1995, 7-105420; May 19, 1995, 7-121409
Int. Cl.^{6} G02B *27/22*
U.S. Cl. 359—464 **21 Claims**



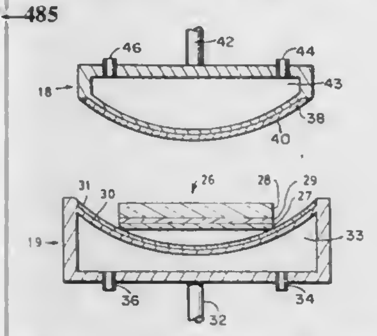
1. A three dimensional display comprising:
a light source which emits light in a flat shape;
a liquid crystal panel for color images which displays left eye images and right eye images respectively with left eye pixels and right eye pixels; and
a color separation means for converting emitted flat light received from the light source into a set of very small luminescence of red, blue and green aligned in a predetermined order which is opposite to that of the pixels of the liquid crystal panel.

5,751,480
PLATE-LIKE POLARIZING ELEMENT, A POLARIZING CONVERSION UNIT PROVIDED WITH THE ELEMENT, AND A PROJECTOR PROVIDED WITH THE UNIT
Nozomu Kitagishi, Hachioji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1992, Ser. No. 865,076
Claims priority, application Japan, Apr. 9, 1991, 3-103317
Int. Cl.^{6} G02B *5/30;27/28*
U.S. Cl. 359—485 **9 Claims**



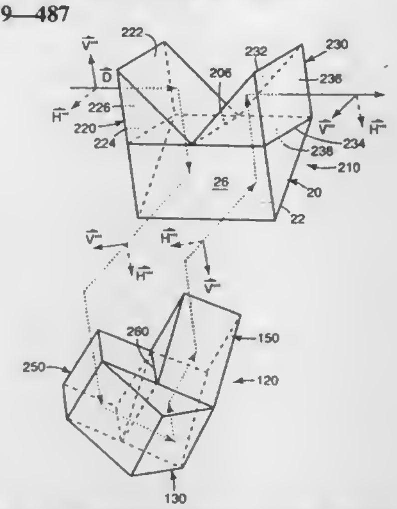
1. A polarizing conversion unit, comprising:
an illuminating system for supplying a lattice-like light pattern; and
a polarizing element for converting said lattice-like light pattern into substantially dense polarized light;
said polarizing element having a polarizing dividing surface disposed on one surface of a plane parallel plate and a reflecting surface disposed on an other surface of the plane parallel plane, said lattice-like light pattern from said illuminating system entering obliquely from said one surface or said other surface, partial lights forming said lattice-like light being divided into first and second polarized lights different in polarized state from each other by said polarizing dividing surface, said first polarized light being directed in a first direction, said second polarized light being reflected by said reflecting surface and directed in said first direction, wherein a quarter wavelength optical phase plate is formed at a predetermined location on said one surface or said other surface of said plane parallel plate to vary the polarized state of at least one of said first and second polarized lights to thereby make the polarized states of said first and second polarized lights coincident with each other.

5,751,481
LAMINAR LIGHT-POLARIZING LENS BLANK FOR PRODUCING PRESCRIPTION LENS
William H. Dalzell, Marshfield, and Igor Loshak, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 5, 1996, Ser. No. 628,780
Int. Cl.^{6} G02B *5/30*
U.S. Cl. 359—485 **18 Claims**



1. A unitary laminar curved composite lens blank for the production of a light-polarizing optical lens, the lens blank being cut and removed from a light-polarizing laminate comprising in order:
a first light-transmissive optically isotropic polymeric layer;
a light-polarizing layer;
and a second light-transmissive polymeric layer;
said first light-transmissive layer defining a convex surface of said lens blank and having a thickness in the range of 0.127 mm. to 1.91 mm.;
said second light-transmissive layer defining a concave surface of the lens blank and having a thickness from 3 to 100 times the thickness of said first light-transmissive polymeric layer sufficient to permit grinding of the concave surface thereof for production of optical properties desired in said light-polarizing optical lens;
said convex surface of said unitary laminar curved composite lens blank providing at least substantially the optical properties desired in said light-polarizing optical lens and said concave surface thereof being grindable to a surface providing said light-polarizing optical lens with said desired optical properties.

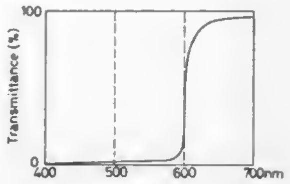
5,751,482
ACHROMATIC POLARIZATION-ROTATING RIGHT-ANGLE PRISM SYSTEM
William A. Challener, IV, Grant Township, Minn., assignor to Imation Corp., Oakdale, Minn.
Filed Apr. 22, 1996, Ser. No. 635,985
Int. Cl.^{6} G02B *5/30;5/04*
U.S. Cl. 359—487 **2 Claims**

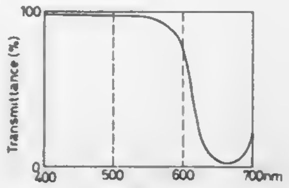


1. A method of rotating the plane of polarization of an electric field, E, of an incident beam by 90° while allowing the beam to continue along undisplaced and in the same direction of travel, comprising the steps of:
providing a beam having a plane of polarization of an electric field, E, having a horizontal component, H, and a vertical component, V, and traveling in a first direction toward and normal to a portion of an optical assembly;
reflecting the beam from the first direction to a second direction which is perpendicular to the first direction and then reflecting the beam from the second direction to a third direction which is normal to a plane defined by the first and second directions, wherein H and V each undergo one s-polarized reflection and one p-polarized reflection;
retroreflecting the beam from the third direction to a fourth direction opposite the third direction, wherein the plane of polarization of E is reflected across a plane which bisects H and V, wherein H and V each undergo two s-polarized reflections and two p-polarized reflections; and
reflecting the beam from the fourth direction to a fifth direction which is opposite the second direction and then reflecting the beam from the fifth direction to the first direction, wherein H and V each undergo one s-polarized reflection and one p-polarized reflection; wherein the number of s-polarized reflections is the same for V and H, and wherein the number of p-polarized reflections is the same for V and H, and whereby the plane of polarization of E is rotated 90° from its original orientation and the beam continues traveling undisplaced from and in the same direction as the first direction of travel.

5,751,483
COLOR FILTER HAVING POLARIZABILITY
Hisato Itoh; Tsutami Misawa; Akira Ogiso, all of Kanagawa-ken, and Rihoko Imai, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Continuation of Ser. No. 170,722, Dec. 21, 1993, abandoned. This application Aug. 1, 1995, Ser. No. 510,007
Claims priority, application Japan, Dec. 25, 1992, 4-346334
Int. Cl.^{6} G02B *5/30;27/28;* **F21V** *9/14*
U.S. Cl. 359—502 **6 Claims**

1. A color filter having polarizability, which comprises
(a) a non-dichroic dye having a dichroic ratio less than 5 and spectral transmissibility at a wavelength range, for use in a color filter,





(b) a dichroic dye having a dichroic ratio more than 6 and an absorption band at the transmissible wavelength range of the non-dichroic dye, and

(c) a base resin, wherein the non-dichroic dye and the dichroic dye are selected from the group consisting of (1) a red non-dichroic dye and a blue dichroic dye, (2) a green non-dichroic dye and a red dichroic dye, and (3) a blue non-dichroic dye and a yellow dichroic dye.

5,751,484

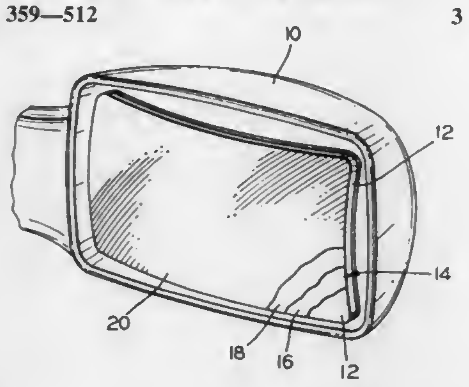
COATINGS ON GLASS

Ronald D. Goodman, Toledo; Michel J. Soubeyrand, Holland, both of Ohio, and Timothy Jenkinson, Wigan, England, assignors to Libbey-Owens-Ford Co., Toeldo, Ohio, and Pilkington PLC, England

Continuation-in-part of Ser. No. 179,157, Jan. 10, 1994, Pat. No. 5,580,364, which is a continuation-in-part of Ser. No. 87,329, Jul. 8, 1993, Pat. No. 5,505,989. This application Dec. 3, 1996, Ser. No. 758,692

Int. Cl.^{6} G02B *5/08;* B32B *17/06*

U.S. Cl. 359—512 **3 Claims**



1. An automotive mirror comprising a float glass substrate carrying a coating including a first layer consisting essentially of silicon having a refractive index of at least 2.8 and a thickness in the range of 100Å to 500Å, a second layer consisting essentially of an oxide of silicon having a refractive index less than 2 and a thickness in the range of 300Å to 700Å, and a third layer of tin oxide including a reactive fluorine dopant and having a refractive index greater than the refractive index of the silicon oxide layer, said tin oxide layer being electrically conductive and having a thickness in the range of 1800Å to 2800Å, said mirror having a visible light reflectance between 35% and 55% and a reflected color defined by the CIELAB color scale system of a* between 0 and −10 and b* between −5 and −20.

5,751,485

LENS CAPABLE OF SHORT DISTANCE PHOTOGRAPHING WITH VIBRATION REDUCTION FUNCTION

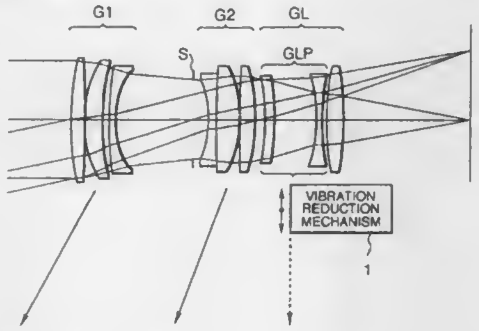
Kenzaburo Suzuki, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 348,841, Nov. 28, 1994, abandoned. This application Aug. 2, 1995, Ser. No. 510,267

Claims priority, application Japan, Nov. 29, 1993, 5-323282; Mar. 18, 1994, 6-074439; Mar. 18, 1994, 6-074440; Jan. 27, 1995, 7-031544; Jan. 27, 1995, 7-031545

Int. Cl.^{6} G02B *27/64;15/14*

U.S. Cl. 359—557 **7 Claims**



1. A lens system capable of a short distance photographing, which satisfies:

$|\beta M|>0.25$ (βM is the photographing magnification at a shortest photographing distance)

said lens system comprising:

a plurality of lens groups respectively having positive or negative refracting powers,

wherein at least two intervals between two neighboring lens groups change for focusing, and at least a partial lens group, located at an image side of a lens group which is movable for focusing, is a vibration reduction lens group which is movable in a direction substantially perpendicular to an optical axis;

wherein said plurality of lens groups include, in turn from an object side, a first lens group having a positive refracting power, a second lens group having a positive refracting power, and a last lens group which is arranged at the most image side and has a negative refracting power, and when focusing is effected from infinity to a short distance object, said first and second lens groups move toward the object side, and a partial lens group constituting said last lens group and having a negative refracting power constitutes said vibration reduction lens group; and

wherein said lens system satisfies:

$$\Delta SLP/|fLP|<0.1$$

$$0.1<fLP/fL<2$$

where fL is the focal length of said last lens group, fLP is the focal length of said partial lens group in said last lens group, and ΔSLP is the maximum displacement amount of said partial lens group in the direction perpendicular to the optical axis upon vibration reduction.

5,751,486

SHAKE-PREVENTING CORRECTION OPTICAL SYSTEM

Junichi Misawa, and Yutaka Suenaga, both of Yokohama, Japan, assignors to Nikon Corporation, Japan

Filed Oct. 19, 1995, Ser. No. 545,418

Claims priority, application Japan, Oct. 20, 1994, 6-281228; Oct. 20, 1994, 6-281229; Oct. 20, 1994, 6-281231; Oct. 20, 1994, 6-281232; Oct. 20, 1994, 6-281233; Oct. 20, 1994, 6-281234

Int. Cl.^{6} G02B *27/64;15/14*

U.S. Cl. 359—557 **8 Claims**

1. A shake-preventing correction optical comprising in order from the object side a lens unit (Gf) fixed in a direction perpendicular to an optical axis and a shake-preventing correction lens unit (Gv) comprising a decentering lens unit arranged as movable in a direction substantially perpendicular to the optical axis,

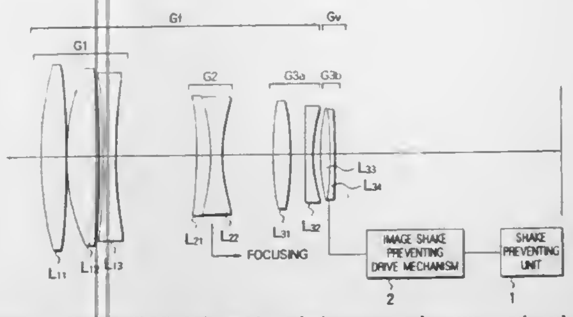
wherein said lens unit (Gf) comprises a first lens unit (G1) having a positive refractive power, a focusing lens unit (G2) having a negative refractive power and arranged to move along the optical axis to effect focusing to a near object, and a lens unit (G3*a*), and

wherein said shake-preventing correction lens unit (Gv) consists of the decentering lens unit (G3*b*) having a positive lens and a negative lens, wherein said lens unit (G3*a*) has at least one positive lens and at least one negative lens, and

which satisfies the following condition:

$$-1.5<\Phi 3an/\Phi 3ap<-0.8$$

where Φ3ap is a composite refractive power of the positive lens in said lens unit (G3*a*) and Φ3an is a composite refractive power of the negative lens in said lens unit (G3*a*).



5,751,487

MULTILAYERED FILTER FILMS AND METHOD FOR MAKING THE SAME

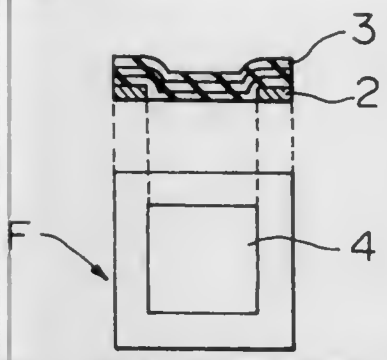
Yoshihiro Someno, Miyagi-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1996, Ser. No. 685,014

Claims priority, application Japan, Aug. 28, 1995, 7-218917

Int. Cl.^{6} G02B *5/28;* B05D *5/06*

U.S. Cl. 359—589 **6 Claims**



1. A method for making a multilayered filter film comprising: a step for forming a filter frame layer having a window on a substrate; a step for forming a multilayered film on the substrate inside said window and on the filter frame layer; and a step for removing said substrate from said filter frame layer and said multilayered film.

5,751,488

MOTORIZED SUNSCREEN FOR MOTOR VEHICLES

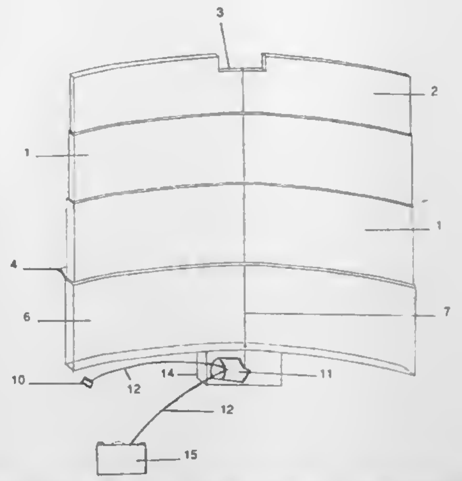
Craig Michael Wade, 816 W. Raynell, Springfield, Mo. 65807

Filed Jul. 24, 1995, Ser. No. 506,112

Int. Cl.^{6} B60J *3/02*

U.S. Cl. 359—601 **2 Claims**

1. A motorized sunscreen for motor vehicles having an electrical system, to be mechanically displaced to block sunlight from entering vehicle which includes: telescoping-type contoured hollowed sections housed within the motor vehicle's dash which are capable of being extended and retracted by the means of a reversible electric motor actuation located under said vehicle's dash; a nylon cord, which is stored coiled when said sunscreen is retracted, internally secured through the center of each section of said sunscreen to the center plane, beneath the area of the rearview mirror, of the top plane of the upper-most contoured hollowed section; a spring-loaded rocker switch mounted on the surface of said motor vehicle's dash to the left of the steering wheel; a flexible conductor connected between said switch, said reversible electric motor, and said vehicle's electrical system, to convert by means of electrical energy into the mechanical operation of said sunscreen; a spring-loaded lid that covers said sunscreen when stored, located on the surface of said vehicle's dash, which is pushed open when sunscreen is displaced to cover the windshield; a motor housing, for mounted reversible electric motor, secured underneath stationary storage compartment where retracted said sunscreen sections are housed.



5,751,489

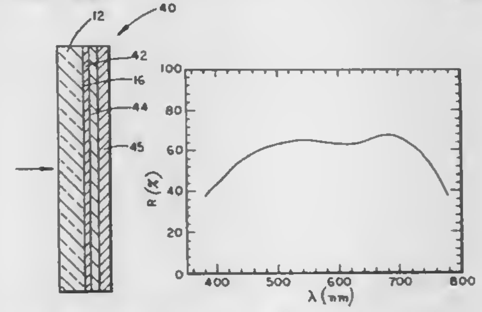
ELEMENTAL SEMICONDUCTOR MIRROR FOR VEHICLES

Gregory T. Caskey; Niall R. Lynam, both of Holland, Mich., and Bryant P. Hichwa, Santa Rosa, Calif., assignors to Donnelly Corporation, Holland, Mich.

Division of Ser. No. 700,760, May 15, 1991, Pat. No. 5,535,056. This application Mar. 23, 1995, Ser. No. 409,279

Int. Cl.^{6} G02B *5/08;5/26;7/182;1/10*

U.S. Cl. 359—603 **103 Claims**



1. A high luminous reflectance mirrored substrate for use on a vehicle comprising:

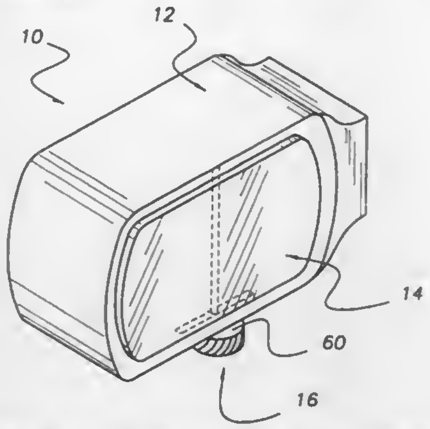
a substrate having a reflector coated upon a surface thereof,

said reflector comprising a first layer of an elemental semiconductor having a refractive index greater than 3.0 and a second layer of an elemental semiconductor having a refractive index greater than 3.0 with a third layer of a dielectric disposed between said first layer and said second layer, said third layer having a refractive index between about 1.3 and 2.7, and

said reflector having a light reflectance of at least about 60% of light incident thereon at the wavelength region of about 550 nanometers and being achromatic.

5,751,490
DUAL REFLECTIVE ELEMENT VEHICLE SIDE VIEW MIRROR ASSEMBLY

Esther T. Johnson, 6550 Logan Rd., Mobile, Ala. 36695
Filed Oct. 29, 1996, Ser. No. 739,520
Int. Cl.⁶ G02B *5/08;7/182;* **B06R** *1/06*
U.S. Cl. 359—605 **11 Claims**

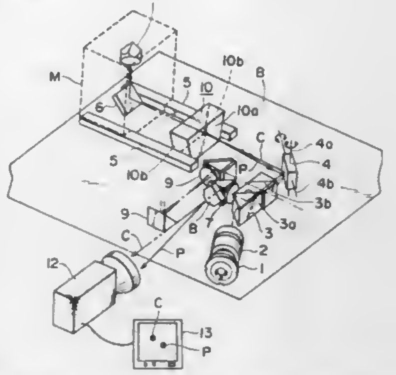


1. A dual reflective element vehicle side view mirror assembly comprising:

- a mirror housing having a rotation cavity formed therein in connection with a mirror opening, said mirror housing further including a rotation pin aperture and a rotation pin seat, said rotation pin aperture being formed entirely through a sidewall of said mirror housing opposite from a mirror housing sidewall into which said rotation pin seat is formed, said rotation pin seat and said rotation pin aperture being concentrically aligned, formed adjacent to a perimeter of said mirror opening, and centered along said mirror opening;
- a dual element mirror having a first surface having a first reflective element thereon and a second surface opposite to and parallel with said first surface having a second reflective element thereon that is covered by a tinted transparent material, said dual element mirror including a central support plate having a centered rotation pin passageway formed therethrough, said first and second reflective elements being attached to said central support plate; and
- a mirror positioning mechanism including an elongated rotation pin in connection with said dual element mirror for rotating said dual element mirror from a first position to a second position, said elongated, rotation pin being positioned through said rotation pin aperture of said mirror housing, through said rotation pin passageway of said central support plate and into said rotation pin seat in a manner such that said dual element mirror is rotatable on said rotation pin;
- said mirror opening being sized to allow said dual element mirror to be placed there across in a manner such that a gap exists between an entire perimeter edge of said housing defining said mirror opening and a perimeter side edges of said dual element mirror, said rotation cavity being sized to allow said dual element mirror to rotate at least one-hundred eighty degrees about an axis positioned across said mirror opening;
- said mirror housing further includes including a pair of spaced registration cavities, one positioned on either side of said rotation pin aperture;
- said mirror positioning mechanism further including a registration plate secured to said central support plate having a rotation pin hole for allowing said rotation pin to be passed therethrough and into said rotation pin passageway and two spaced registration bumps on either side of said rotation pin hole, said registration bumps being spaced such that each registration bump is positioned within one of said registration cavities said mirror housing when said dual element mirror is rotated on said rotation pin to a first position, said registration bumps positioned within said registration cavities holding said dual element mirror in said first position.

5,751,491
METHOD OF ADJUSTING BEAM AXIS OF OPTICAL PICK-UP

Toshiyuki Kase, and Hiroshi Nishikawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 9, 1996, Ser. No. 677,277
Claims priority, application Japan, Jul. 10, 1995, 7-173435
Int. Cl.⁶ G02B *27/10;7/02*
U.S. Cl. 359—618 **11 Claims**

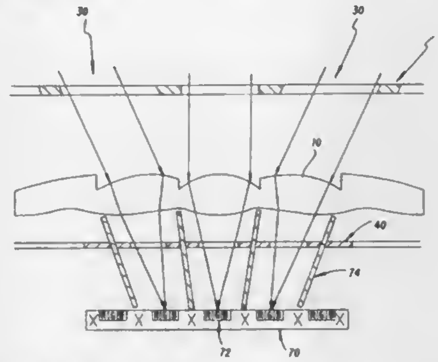


1. A method of adjusting a beam axis of an optical pick-up having a fixed optical system which is positioned on a base, and a moving optical system which reflects a beam emitted by the fixed optical system to an optical disc, while the moving optical system moves along a track formed on the base, comprising the steps of:

- positioning a plane-parallel plate made of a transparent material on the track, with a plane surface of said plane-parallel plate extending in a direction perpendicular to the track, said plane surface reflecting part of the emitted beam;
- positioning an optical system which reflects and emits the beam in a direction of incidence of the beam on an other side of the plane-parallel plate than a side of the fixed optical system;
- separating the beam which is reflected by said plane surface of the plane-parallel plate and the beam which is reflected by the optical system from the optical path of the beam emitted from the fixed optical system;
- projecting the separated beams on a plane; and
- adjusting the direction of the beam emitted from the fixed optical system such that the light points of the respective reflected beams formed on the plane coincide with each other.

5,751,492
DIFFRACTIVE/REFRACTIVE LENSLET ARRAY INCORPORATING A SECOND ASPHERIC SURFACE

Mark Marshall Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 14, 1996, Ser. No. 663,887
Int. Cl.⁶ G02B *24/10*
U.S. Cl. 359—619 **7 Claims**



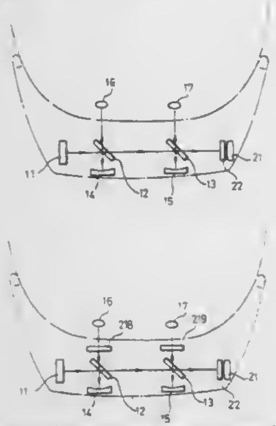
1. An image sensor comprising:

- a color photosensor array comprised of a number of sets of three photosensors with red, green, and blue, filters positioned over respective photosensors in each set;

- a lenslet array having a number of lenslets equal to the number of three sets of photosensors in said color photosensor array, wherein each lenslet is formed with a first convex, spherical surface having diffractive means incorporated thereon and a second surface which is aspheric and opposite said first surface with the size of said lenslet array being greater than the size of said color photosensor array by an amount that allows the mechanical optical axis of each lenslet, at the largest field angle, to image incident light onto a set of three photosensors; and
- an array of aperture stops combined with an array of field stops wherein the number of field stops and the number of aperture stops are equal to the number of lenslets and wherein each field and aperture stop is aligned to the center of the mechanical optical axis of a lenslet.

5,751,493
HEAD-MOUNTED DISPLAY APPARATUS WITH A SINGLE IMAGE DISPLAY DEVICE

Se-Hurn Hur, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea
Filed Feb. 25, 1997, Ser. No. 806,886
Claims priority, application Rep. of Korea, Nov. 15, 1996, 96-54562; Nov. 15, 1996, 96-54563
Int. Cl.⁶ G02B *27/14*
U.S. Cl. 359—630 **16 Claims**



1. A head-mounted display apparatus comprising:

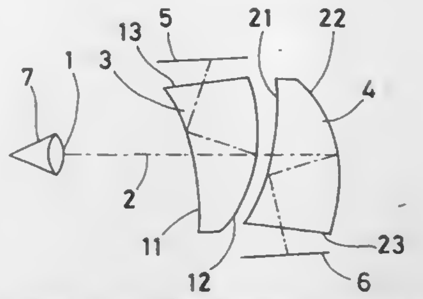
- an image display device for displaying images;
- a first beam splitter for partially transmitting and partially reflecting light from the image display device in proportion of 3:1;
- a second beam splitter for partially transmitting and partially reflecting the light transmitted by the first beam splitter in proportion of 1:1; and
- a first and a second concave reflection mirrors for reflecting the light reflected by the first and the second beam splitters to one eye and the other eye of an observer, respectively.

5,751,494
IMAGE DISPLAY APPARATUS

Koichi Takahashi, Hachioji, Japan, assignor to Olympus Optical., Ltd., Tokyo, Japan
Filed Dec. 18, 1996, Ser. No. 768,583
Claims priority, application Japan, Dec. 18, 1995, 7-329044
Int. Cl.⁶ G02B *27/14*
U.S. Cl. 359—631 **26 Claims**

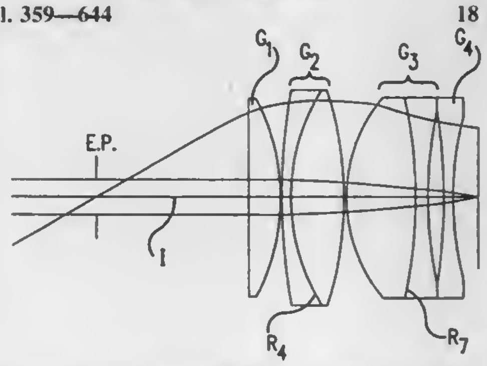
1. An image display apparatus comprising at least two image display devices for displaying images, and at least two ocular optical systems for projecting, respectively, the images formed by said at least two image display devices as enlarged virtual images in front of one common eyeball of an observer and for leading the projected images to said eyeball,

wherein, when said at least two ocular optical systems are defined as a first ocular optical system and a second ocular optical system in order from an observer side, said first ocular optical system and second ocular optical system each have at least one reflecting surface of positive power, said reflecting surface being tilted or decentered with respect to an observer's visual axis, said at least one reflecting surface of positive power in said first ocular optical system being a semitransparent surface which reflects a part of incident light and transmits a part of it, said first ocular optical system being disposed on a side of said second ocular optical system which is closer to said eyeball in a direction of said observer's visual axis, said second ocular optical system being disposed on a side of said first ocular optical system which is remote from said eyeball in the direction of said observer's visual axis.



5,751,495
EYEPIECE LENS

Masami Suzuki, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Aug. 6, 1996, Ser. No. 692,482
Claims priority, application Japan, Aug. 10, 1995, 7-225832
Int. Cl.⁶ G02B *25/00*
U.S. Cl. 359—644 **18 Claims**



1. An eyepiece lens that has an apparent field of no less than 40°, and minimizes eye relief error, the eye relief including a distance between a lens surface closest to an eye point side in the eyepiece lens and an eye point, comprising:

- from the eye point, a first lens means that includes one positive lens component, a second lens means with positive refracting power that includes a cemented lens means having a negative lens component and a positive lens component, a third lens means with positive refracting power that includes a cemented lens having a positive lens component and a negative lens component, and a fourth lens means that includes one negative lens component; and
- means for configuring the eyepiece lens such that $1.4 \leqq |R7/R4|$, wherein R4 is a radius of curvature of a cemented surface of the negative lens component and the positive lens component of the second lens group G2, and R7 is a radius of curvature of a cemented surface of the positive lens component and the negative lens component of the third lens group G3.

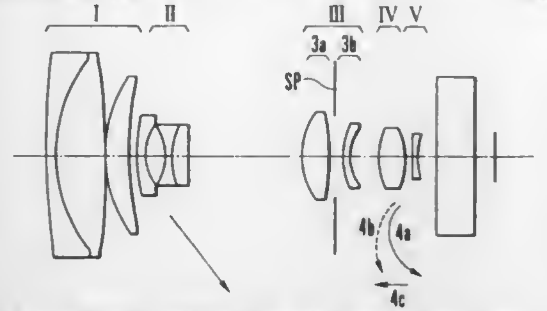
5,751,496
ZOOM LENS OF REAR FOCUS TYPE
Hiroyuki Hamano, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,197

Claims priority, application Japan, May 30, 1995, 7-131813

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—677 **2 Claims**



1. A zoom lens comprising, in order from an object side to an image side, a first lens unit having a positive refractive power, a second lens unit having a negative refractive power, a third lens unit having a positive refractive power, a fourth lens unit having a positive refractive power, and a fifth lens unit having a negative refractive power, wherein said second lens unit and said fourth lens unit are moved to vary magnification and said fourth lens unit is moved to effect focusing, wherein said third lens unit comprises, in order from the object side to the image side, a positive lens and a negative lens having a strong concave surface facing the image side, and wherein said first lens unit, said third lens unit, and said fifth lens unit are stationary during zooming.

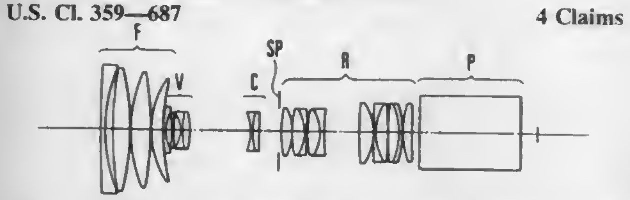
5,751,497
ZOOM LENS
Fumiaki Usui; Kunio Takeshi; Jun Hosoya, and Chiaki Terasawa, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 189,651, Feb. 1, 1994, Pat. No. 5,583,700. This application Oct. 30, 1996, Ser. No. 741,104

Claims priority, application Japan, Mar. 31, 1993, HEI 05-098935

Int. Cl.^{6} G02B *15/14;3/02*

U.S. Cl. 359—687 **4 Claims**



1. A zoom lens system comprising, from front to rear, a first lens unit of positive refractive power stationary during zooming, a second lens unit of negative refractive power movable for zooming, a third lens unit of positive refractive power for compensating for the shift of an image plane with zooming, said third lens unit being monotonously movable toward an object side when zooming from a wide-angle to a telephoto end, and a fixed fourth lens unit of positive refractive power, wherein letting the shortest and longest focal lengths of the entire system be denoted by fw and ft, respectively, the zoom ratio by Z, the F-numbers for wide-angle and telephoto ends of the entire system by $F_{NO.w}$ and $F_{NO.t}$, respectively, and the focal length and F-number of said first lens unit by f1 and $F_{NO.1}$, respectively, the magnification for said second lens unit varying in a range including unity magnification, the range of variation of a lateral magnification of said second lens unit being denoted by Z2, and the magnification for said third lens unit varying in a range including unity magnification, letting the maximum incident height of an axial light beam on said third lens unit during zooming and the maximum incident height of an axial light beam in the telephoto end be denoted by h3m and h3T, respectively, said third lens unit including at least one cemented surface between a front-side medium and a rear-side medium, and letting the refractive index difference between the front-side medium and the rear-side medium be denoted by $\Delta n3$ and the focal length and F-number of said third lens unit by f3 and $F_{NO.3}$, respectively, the following conditions are satisfied:

$$1.25<F_{NO.1}<1.6$$

where

$F_{NO.1}=f1/(ft/F_{NO.t})$

$$5<Z2$$

$$0.2<Z2/Z<0.3$$

$$0.8<F_{NO.3}<1.2,$$

where

$F_{NO.3}=f3/(2\times h3m)$

$$0.17<\Delta n3$$

and wherein an aspheric surface is applied to at least one lens surface in said third lens unit, said aspheric surface satisfying the following condition:

$$1.15<h3m/h3T.$$

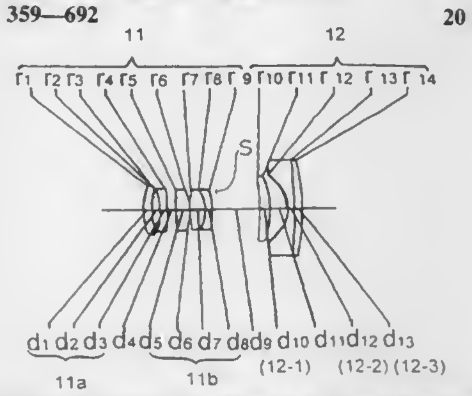
5,751,498
ZOOM LENS SYSTEM
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1995, Ser. No. 575,772

Claims priority, application Japan, Dec. 22, 1994, 6-320988; Aug. 7, 1995, 7-200703

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—692 **20 Claims**


11
12
r1 r2 r3 r4 r5 r6 r7 r8 r9 r10 r11 r12 r13 r14
S
d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13
(12-1) (12-2) (12-3)
11a
11b

1. A zoom lens system comprising a first lens group having a positive focal length and a second lens group having a negative focal length, arranged in this order from an object side, whereby zooming is carried out by varying a distance between said first and second lens groups;

said first lens group comprising a first sub-group and a second sub-group, in this order from the object side, said first sub-group and said second sub-group each comprising at least one negative lens element, wherein said zoom lens system satisfies the following relationships:

$3.5<f_L/f_1<5.0$

$1.77<N_{1aN}$

$35<\upsilon_{1aN}<50$

$1.77<N_{1bN}$

$35<\upsilon_{1bN}<50$

wherein,

"f_L" represents the focal length of said zoom lens system at a telephoto extremity;

"f_1" represents the focal length of said first lens group;

"N_{1aN}" represents the refractive index of the negative lens element of said first sub-group at the d-line;

"υ_{1aN}" represents the Abbe number of the negative lens element of said first sub-group;

"N_{1bN}" represents the refractive index of the negative lens element of said second sub-group at the d-line; and

"υ_{1bN}" represents the Abbe number of the negative lens element of said second sub-group;

said second lens group comprising a positive first lens element having a convex surface located on an image side, a negative second lens element having a concave surface located on the object side, and a positive third lens element having a convex surface located on the image side, said positive first lens element, said negative second lens element and said positive third lens element being arranged in this order from the object side, wherein said second lens group satisfies the following relationships:

$\upsilon_{2-1}<35$

$\upsilon_{2-3}<35$

wherein,

"υ_{2-1}" represents the Abbe number of the positive first lens element of said second lens group at the d-line; and,

"υ_{2-3}" represents the Abbe number of the positive third lens element of said second lens group, that is located on the image side, at the d-line.

5,751,499
ZOOM LENS SYSTEM
Kiyotaka Inadome, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

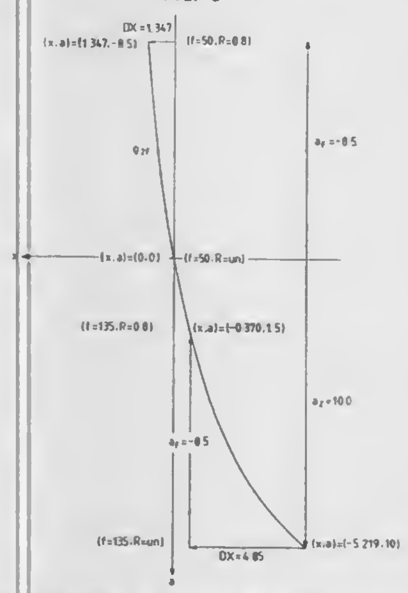
Continuation-in-part of Ser. No. 513,141, Aug. 9, 1995, abandoned. This application Sep. 18, 1996, Ser. No. 715,517

Claims priority, application Japan, Aug. 24, 1994, 6-199873; Nov. 29, 1994, 6-294725; Dec. 26, 1994, 6-321087; Nov. 28, 1995, 7-309041

Int. Cl.^{6} G02B *15/14;7/02;* **G03B** *3/00*

U.S. Cl. 359—699 **11 Claims**

FIG. 8



1. A zoom lens system in which a movement locus of a focusing lens unit is defined by synthesizing a focus cam and a zoom compensation cam upon expression of a predetermined movement locus for zooming by an amount of movement, in a direction of an optical axis, of lens units, and an angle of rotation of a rotatable lens barrel, wherein a ratio (dBf/dx) of an amount dBf of infinitesimal movement of an imaging plane to an amount dx of infinitesimal movement, in the direction of the optical axis, of said focusing lens unit, and a ratio (dBf/da) of the amount dBf of infinitesimal movement of the imaging plane to an amount da of infinitesimal movement, in a direction of rotation, of said focusing lens unit on said focus cam are respectively represented by γ_{xO} and γ_{aO} at an infinity in-focus point, and are respectively represented by γ_{xR} and γ_{aR} at a closest in-focus point, wherein said zoom lens satisfies the following conditional formula at least at a telephoto end:

$$1.0<\gamma_{xR}/\gamma_{xO}$$

wherein a ratio of an amount a_F of rotation of said focusing lens unit on said focus cam, which amount corresponds to focusing from an infinity in-focus state to a closest in-focus state to an amount a_Z of rotation corresponding to zooming from a wide-angle end to the telephoto end is set to satisfy:

$$-1.0<a_F/a_Z<-0.7$$

and wherein said zoom lens satisfies the following conditional formula at least at the wide-angle end and the telephoto end:

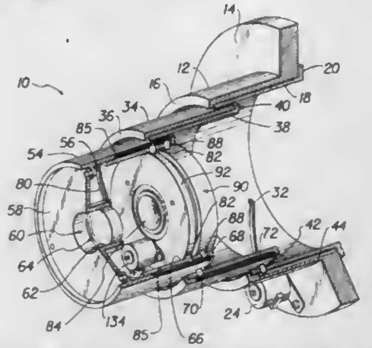
$$0.3<\gamma_{aR}/\gamma_{aO}<0.7.$$

5,751,500
ZOOM LENS MECHANISM WITH FOCUS CAMMING MECHANISM
Mark David Bedzyk, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 30, 1996, Ser. No. 688,600

Int. Cl.^{6} G02B *9/00*

U.S. Cl. 359—740 **33 Claims**



1. A zoom lens includes a plurality of lens groups arranged along an optical axis and means for moving the lens groups relative to one another to change the overall focal length of the lens and is characterized by:

a frame for one of the lens groups, the frame having a first aperture centered on the optical axis;

a lens support ring having a second aperture centered on the optical axis for receiving the one lens group, the lens support ring having an outer diameter less than an inner diameter of the first aperture and the lens support ring being rotatably extended at least partially into the first aperture;

at least one circumferentially and axially extended cam surface on the support ring;

at least one radially extended stop on the support ring for engaging the frame to limit axial movement of the support ring along the optical axis into the first aperture;

at least one radially extended cam follower on the one lens group, the cam follower being engaged with the at least one cam surface;

the second aperture having an inner diameter greater than an outer diameter of the one lens group and the one lens group being extended at least partially into the second aperture;

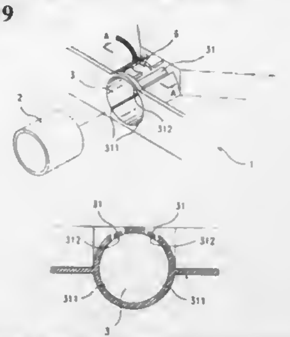
a flexure supported on the frame for holding the cam follower against the cam surface;

a gear sector on the support ring; and

a drive motor supported on the frame, the motor having an output pinion engaged with the gear sector,

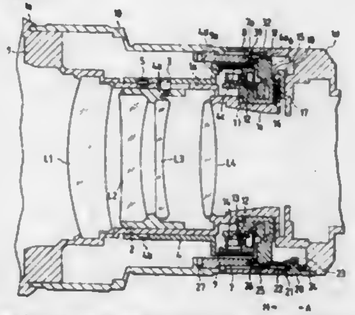
whereby rotation of the pinion rotates the gear sector and support ring relative to the frame, causing movement of the cam follower along the cam surface and movement of the one lens group along the optical axis toward or away from the second aperture and the frame.

5,751,501
LENS MOUNTING STRUCTURE OF A SCANNER
Steve Li, Pa-Der, Taiwan, assignor to SPOT Technology, Inc., Hsinchu Hsien, Taiwan
Filed Jan. 17, 1997, Ser. No. 784,535
Int. Cl.^{6} G02B *07/02*
U.S. Cl. 359—819 **1 Claim**



1. A lens mounting structure comprising a cylindrical lens, and a lens holder formed in a part of a casing of a scanning mechanism of a scanner to hold said cylindrical lens, wherein said lens holder comprises a cylindrical receiving hole, which receives said cylindrical lens, two integral longitudinal springy strips cut from the periphery of said cylindrical receiving hole and disposed at two opposite sides of said glue filling hole, two first longitudinal ribs respectively raised from said longitudinal springy strips at an inner side along the length thereof and pressed against the periphery of said cylindrical lens, and two second longitudinal ribs respectively raised from the periphery of said cylindrical receiving hole at an inner side symmetrical to said first longitudinal ribs and pressed against the periphery of said cylindrical lens, and a glue filling hole through the periphery of said cylindrical receiving hole in a middle through which a glue is filled into said cylindrical hole to fix said cylindrical lens in place, after the focal length has been accurately adjusted.

5,751,502
LENS BARREL WITH BUILT-IN ULTRASONIC MOTOR
Tsuneo Watanabe, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Jan. 14, 1997, Ser. No. 783,040
Claims priority, application Japan, Jan. 30, 1996, 8-013550
Int. Cl.^{6} G02B *7/02*
U.S. Cl. 359—823 **7 Claims**



1. An ultrasonic motor built-in lens barrel comprising:

a photographing optical system;

a fixed barrel;

an ultrasonic motor having a stator so fitted to said fixed barrel as to be rotatable about an optical axis and capable of generating ultrasonic vibrations therein, and a rotor in a frictional contact with said stator and rotating about the optical axis with the ultrasonic vibrations to thereby move said photographing optical system;

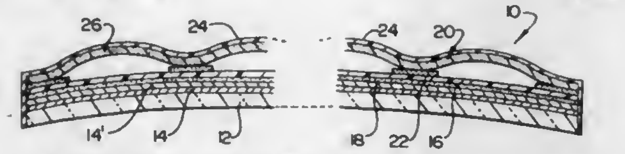
a manual operating portion for moving said photographing optical system by a manual operation from outside;

a mode selecting portion for selectively switching over an autofocusing mode for moving said photographing optical system by said ultrasonic motor, under which said stator is fixed to said fixed barrel and only said rotor is driven by a driving force of the ultrasonic motor so as to move said photographing optical system, and a manual focusing mode for moving said photographing optical system by the operation of said manual operating portion, under which said rotor and said stator get integral, and said rotor rotates interlocked with the operation of said manual operating portion to thereby move said photographing optical system;

an angle-of-rotation reduction mechanism for transmitting a rotation of said manual operating portion at a reduced angle of rotation to said stator of said ultrasonic motor when the manual focusing mode is selected, said angle-of-rotation reduction mechanism including a plurality of small rotatable members provided rotatably on said stator, which roll on a side surface of said fixed barrel with the rotation of said manual operating portion, and a biasing member for causing frictional contacts between said manual operating portion and the plurality of small rotatable members and said manual operating portion and between said small rotatable members and said fixed barrel by pushing said manual operating portion against the side surface of said fixed barrel through said small rotatable members; and

a frictional member provided on a contact portion of said manual operating portion and/or said fixed barrel.

5,751,503
LIGHT-WEIGHT REFLECTOR FACET
James B. Blackmon, Brownsboro, Ala.; Kenneth W. Stone, Huntington Beach, Calif., and Stephen M. Kusek, Huntsville, Ala., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.
Continuation of Ser. No. 273,786, Jul. 12, 1994, abandoned. This application Jan. 21, 1997, Ser. No. 786,146
Int. Cl.^{6} G02B *5/08;7/182;7/188;5/26*
U.S. Cl. 359—846 **11 Claims**



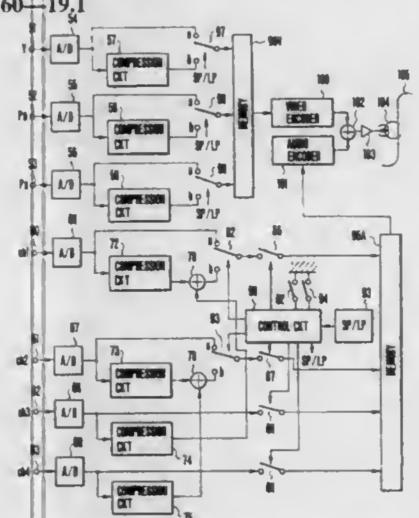
1. A light weight arcuate reflector facet for a solar concentrator which comprises:

a flexible microsheet glass having a reflective mirrored layer on the back side and a highly reflective and non-wavy specular front surface and also having a thickness in the range of 0.002 to 0.0101 inch,

a backing sheet, said backing sheet bonded to the back side of said glass sheet and providing a smooth surface to said glass sheet and providing no pattern print through thereby avoiding undesirable light scattering, and

a support member in the form of a moderately rigid sheet having a rib structure, said rib structure having a central section and a plurality of outwardly radially extending ribs extending from said central section with a complete radial symmetry and an absence of any intersecting laterally arranged ribs, said backing sheet bonded to the rib structure of said support member so that any portion of the glass sheet if unsupported is only unsupported for a very small distance so that there are no excessive stress points in the glass sheet, said support member also maintaining said mirrored glass sheet curved at a small radius of curvature and conforming to the curvature of the glass sheet at a desired relatively small radius of curvature for relatively short focal distances.

5,751,504
DIGITAL VIDEO AND AUDIO SIGNAL RECORDING APPARATUS
Mitsugu Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 541,981, Oct. 10, 1995, Pat. No. 5,541,739, which is a continuation of Ser. No. 201,071, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 713,407, Jun. 11, 1991, abandoned. This application Apr. 29, 1996, Ser. No. 638,846
Claims priority, application Japan, Jun. 15, 1990, 02-157328
Int. Cl.^{6} G11B *5/02*
U.S. Cl. 360—19.1 **13 Claims**



1. A digital signal recording apparatus, comprising:

a) compressing means for compressing a number of bits of each sample of N channel digital audio signals N being an integer 2 or more; and

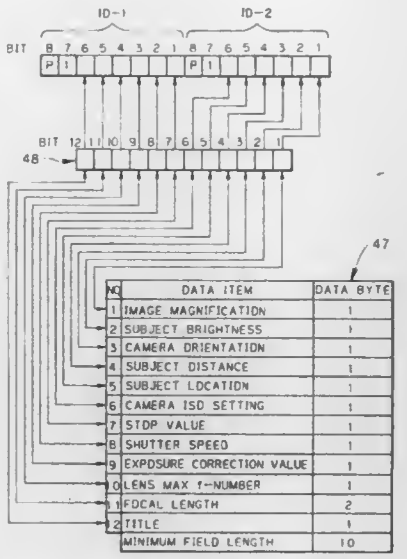
b) recording means for recording a digital video signal and one of a first digital audio signal which has N channels and is processed through said compressing means and a second digital audio signal which has N/M channels and is obtained without passing through said compressing means, M being an integer 2 or more, an amount of information of the digital video signal are determined irrespective of whether the first audio signal or the second audio signal is recorded.

5,751,505
MAGNETIC RECORDING LAYER FORMED ON A PHOTOGRAPHIC FILM AND HAVING AN IDENTIFICATION CODE WHICH IDENTIFIES INFORMATION SEGMENTS, AND METHOD FOR RECORDING THE SAME
Yutaka Yoshida, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 360,954, Dec. 21, 1994, abandoned. This application Jun. 17, 1996, Ser. No. 665,767
Claims priority, application Japan, Dec. 21, 1993, 5-322393
Int. Cl.^{6} G11B *5/09;5/00*
U.S. Cl. 360—48 **29 Claims**

1. A magnetic recording layer formed on a photographic filmstrip, comprising:

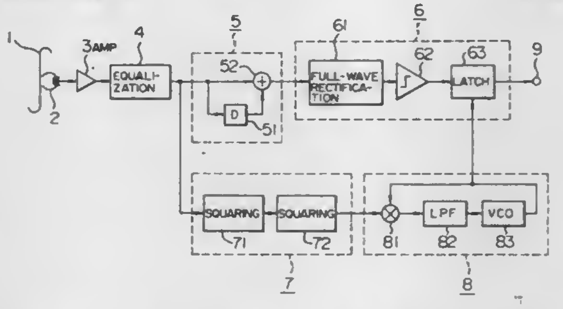
a block recorded on a longitudinal track, said block comprising a block start code at a leading end thereof, a block end code at a trailing end thereof, and at least one field between said block start code and said block end code; and

said at least one field comprising a field start code at a leading end thereof, a series of information segments relating to a plurality of information items and being arranged in a predetermined order, and an identification code disposed between said field start code and said information segments, said identification code representing binary code data having a predetermined plural number of bits, each position of said bits of said binary code data being assigned to a corresponding one of said plurality of information items, a first value of each of said bits indicating that the content of said corresponding one of said information items is recorded as one of said information segments and a second value of each of said bits indicating that the content of said corresponding one of said information items is not recorded as one of said information segments.



NO	DATA ITEM	DATA BYTE
1	IMAGE MAGNIFICATION	1
2	SUBJECT BRIGHTNESS	1
3	CAMERA ORIENTATION	1
4	SUBJECT DISTANCE	1
5	SUBJECT LOCATION	1
6	CAMERA ISO SETTING	1
7	STOP VALUE	1
8	SHUTTER SPEED	1
9	EXPOSURE CORRECTION VALUE	1
10	LENS MAX f-NUMBER	1
11	FOCAL LENGTH	2
12	TITLE	1
	MINIMUM FIELD LENGTH	10

5,751,506
DIGITAL INFORMATION REPRODUCING APPARATUS USING PARTIAL RESPONSE DETECTION METHOD INCLUDING QUADRUPLE PROCESSING
Nobutaka Amada, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 427,624, Apr. 21, 1995, abandoned, which is a continuation of Ser. No. 164,436, Dec. 9, 1993, abandoned. This application Apr. 5, 1996, Ser. No. 628,812
Claims priority, application Japan, Dec. 10, 1992, 4-330541
Int. Cl.^{6} G11B *5/09*
U.S. Cl. 360—51 **2 Claims**



1. A digital information reproducing apparatus for detecting digital information signals recorded on a recording medium by utilizing a partial response detection method, comprising:

a read means for reading a digital information signal from said recording medium;

an equalizer means for equalizing an output signal of said read means into a partial response PR (1, −1) signal, said output signal of said equalizer means being a ternary base band signal;

an operation means for performing a (1+D) operation by adding the output signal of said equalizer means and a signal obtained by one bit delaying said output signal of said equalizer means;

a discriminator means for discriminating an output signal of said operation means to provide an original digital information signal and decoding said original digital information signal; and

- a clock recovering means for recovering, from said output signal of said equalizer means, a clock signal necessary to provide said original digital information signal through said discrimination and to decode said original digital information signal and for supplying said clock signal to said discriminator means,
- said clock recovering means including:
  - a clock component extractor means for extracting a bit frequency component of said digital information signal by raising said output signal of said equalizer means to the fourth power, wherein said clock component extractor means consists of two squaring circuits connected directly in cascade; and
  - a phase-locked loop circuit for phase-locking its output signal to said bit frequency component of said digital information signal contained in an output signal of said clock component extractor means and for producing a phase-locked signal as said clock signal.

5,751,507

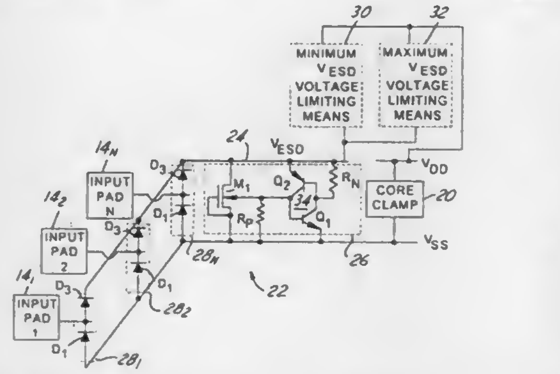
KSD PROTECTION APPARATUS HAVING FLOATING EDS BUS AND SEMICONDUCTOR STRUCTURE

Jeffrey Watt, Mountain View, and Andrew Walker, Palo Alto, both of Calif., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Aug. 15, 1995, Ser. No. 515,433

Int. Cl.⁶ H02H *9/00*

U.S. Cl. 361—56 **13 Claims**



1. An apparatus for protecting a semiconductor device from electrostatic discharge (ESD) events wherein the device includes a plurality of interface pads, a positive power supply bus (V_{DD}), and a negative power supply bus (V_sS), comprising:

- one or more first diodes coupled between the negative power supply bus and said plurality of interface pads;
- an ESD bus isolated from said positive power supply bus;
- one or more second diodes coupled between said interface pads and said ESD bus, said one or more second diodes being operative to transfer charge from said interface pads to said ESD bus;
- an ESD protection circuit including an SCR circuit and a first field effect transistor (FET) for controlling said SCR circuit, said SCR circuit being coupled between said ESD bus and said negative power supply bus, said SCR circuit having a high-impedance off state for isolating said ESD bus from said negative power supply bus to thereby reduce externally-sourced leakage currents into said interface pads, said first FET being responsive to a voltage potential of said ESD bus for placing said SCR circuit in a low-impedance on state when said voltage potential reaches a predetermined threshold level wherein said predetermined threshold level is higher than a voltage potential of said positive power supply bus and further higher than voltage levels normally encountered on said interface pads whereby input leakage currents are reduced when voltage potentials higher than said positive power supply bus level are applied to said interface pads.

5,751,508

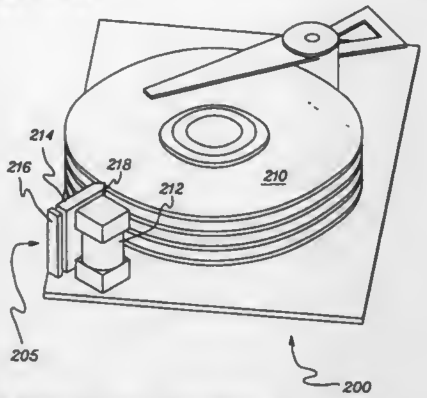
DISK DRIVE WITH ACTUATOR TO OVERCOME STICTION

John Peter Karidis, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1996, Ser. No. 690,705

Int. Cl.⁶ G11B *33/14*

U.S. Cl. 360—97.01 **5 Claims**



1. A data storage system, comprising:

- a circular data storage device; and
- an actuator mounted at a perimeter of said circular data storage device and having a moving armature, the moving armature being mounted to:
  - move into contact with the perimeter of said circular data storage device thereby initiating movement thereof and overcoming any force inhibiting the movement thereof, and
  - move out of contact with the perimeter of said storage device to allow for subsequent rotation thereof.

5,751,509

DRUM SERVO SYSTEM USING A PLL WITH FREQUENCY DIVIDED REFERENCE CLOCK SIGNALS AS AN INPUT

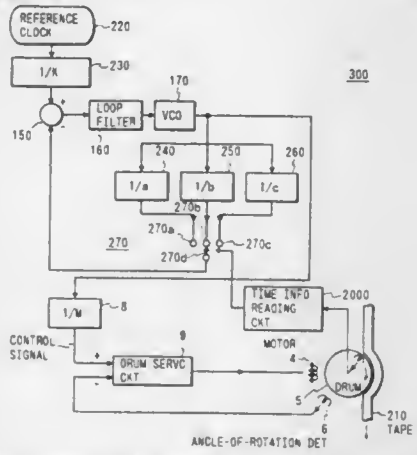
Jin Ogasawara, Yokohama; Seiji Higurashi, Tokyo; Tomoyuki Shindo, and Tetsuya Suwa, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 189,277, Jan. 31, 1994, abandoned, which is a continuation of Ser. No. 799,789, Nov. 29, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 470,727

Claims priority, application Japan, Nov. 30, 1990, 2-336126; Mar. 29, 1991, 3-121966

Int. Cl.⁶ G11B *5/588*

U.S. Cl. 360—70 **10 Claims**



1. A control system for a rotatable drum with a reproducing head for scanning a recording medium, the recording medium storing a sequence of divided samples of a digital audio signal, the samples relating to a common fixed sampling frequency, the sequence of the samples being separated into blocks including at least first-type blocks and second-type blocks, the first-type blocks each having a first predetermined number of samples therein, the second-type blocks each having a second predetermined number of samples therein, the second predetermined number differing from he first predetermined number, the control system comprising:

- first means for detecting whether a block currently scanned by the reproducing head is a first-type block or a second-type block, and generating a detection signal representative thereof;
- second means for generating a control signal having a controllable frequency;
- third means for controlling the frequency of the control signal in response to the detection signal; and
- fourth means for controlling rotation of the drum in response to the control signal.

5,751,510

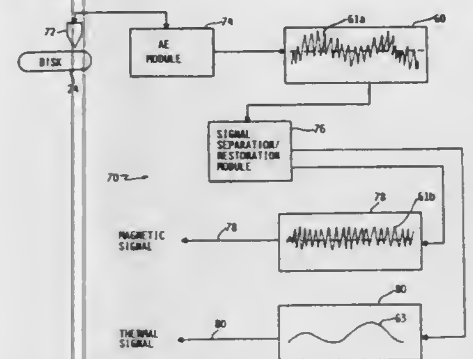
METHOD AND APPARATUS FOR RESTORING A THERMAL RESPONSE SIGNAL OF A MAGNETORESISTIVE HEAD

Gordon J. Smith, and Hal Hjalmar Ottesen, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1996, Ser. No. 581,906

Int. Cl.⁶ G11B *5/02*

U.S. Cl. 360—67 **20 Claims**



1. A method for processing a signal obtained from a storage medium using a magnetoresistive (MR) element, the method comprising the steps of:

- reading the signal from the storage medium using the MR element, the signal comprising a thermal component representing a thermal response of the MR element;
- highpass filtering the signal so as to pass content of the signal above a first range of frequencies associated with the thermal component of the signal and to degrade the thermal component of the signal; and
- passing the highpass filtered signal through an inverse filter having a response substantially inverse to a response associated with the highpass filtering step to produce a restored thermal signal substantially representative of the thermal component of the signal read from the storage medium.

5,751,511

CAPSTAN PHASE CONTROL METHOD FOR VIDEO CASSETTE TAPE RECORDER

Yong-Hoo Sheen, Kyungki-Do; Gwl-Tae Park, Seoul; Ji-Yoon Yoo, Seoul, and Sang-Lak Lee, Seoul, all of Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

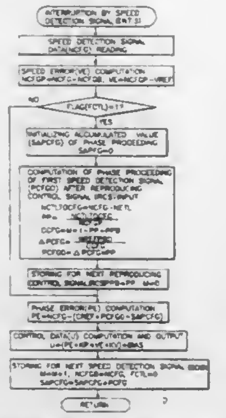
Filed Jan. 26, 1996, Ser. No. 592,172

Claims priority, application Rep. of Korea, Jan. 28, 1995, 1746/1995

Int. Cl.⁶ G11B *15/52*

U.S. Cl. 360—73.11 **7 Claims**

1. A capstan phase control method for a video cassette tape recorder, comprising the steps of:


SPEED DETECTION SIGNAL DATA(NCFG) READING
SPEED ERROR(VE) COMPUTATION
NO
YES
INITIALIZING ACCUMULATED VALUE (SAPCFG) OF PHASE PROCEEDING
SAPCFG=0
COMPUTATION OF PHASE PROCEEDING OF FIRST SPEED DETECTION SIGNAL (PCFGD) AFTER REPRODUCING CONTROL SIGNAL (RCS) INPUT
STORING FOR NEXT REPRODUCING CONTROL SIGNAL
PHASE ERROR(PE) COMPUTATION
CONTROL DATA(U) COMPUTATION AND OUTPUT
STORING FOR NEXT SPEED DETECTION SIGNAL
RETURN

- a phase reference signal processing step which reads a current phase reference signal data outputted from a counter and latch unit whenever an interruption occurs in accordance with the phase reference signal, computes and stores a cycle and reference data of the phase reference signal in accordance with the read current phase reference signal data of the previously stored phase reference signal data, and updates said previous phase reference signal data;
- a reproducing control signal processing step which reads and stores the reproducing control signal data outputted from said counter and latch unit whenever an interruption occurs in accordance with the reproducing control signal, sets a reference data of the reproducing control signal, and sets a value of a flag;
- a speed and phase error processing step which reads a speed detection signal data outputted from the counter and latch unit whenever an interruption occurs in accordance with a speed detection signal and updates a speed error and phase error in accordance with each speed detection signal inputted thereto for each cycle of the reproducing control signal; and
- a control data output step which computes a new control data whenever the speed detection signal is inputted thereto using the speed and the phase error obtained by said speed and phase error processing step and outputs the thusly computed control signal to a D/A converter.

5,751,512

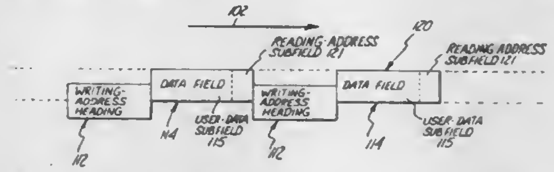
DATA STORAGE FORMAT FOR DATA STORAGE DEVICES HAVING A RADIAL OFFSET BETWEEN READ AND WRITE ELEMENTS

David Bruce Anderson, Minnetonka, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 188,565, Jan. 28, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 730,564

Int. Cl.⁶ G11B *5/02*

U.S. Cl. 360—78.04 **13 Claims**



1. A disc drive comprising:

- a storage disc having a plurality of data-carrying tracks;
- a slider;
- a transducer carried by the slider, the transducer including a write element for writing data to the storage disc and a read element for reading data from the storage disc, wherein the read and write elements are separated by a gap;
- a radial actuator for positioning the slider adjacent the data-carrying tracks along an arcuate path that establishes a skew angle between the write and read elements based on a radial position of the data-carrying track, wherein an offset exists between the read and write elements at each data-carrying track based on the skew angle and the gap;

a plurality of data fields distributed among the data-carrying tracks of the storage disc, each data field comprising common overhead information, a user-data subfield for storing user data, and an embedded reading-address subfield containing an address identifying the respective data field, the (common overhead information being shared by the user-data subfield and the embedded reading-address subfield during a read operation, the common overhead information being positioned to be read before reading the user-data subfield, and the embedded reading-address subfield being positioned to be read after reading the user-data subfield, each data field being formatted such that the reading-address subfield is rewritten each time the user-data subfield is rewritten; and

a plurality of writing-address headers distributed among the data-carrying tracks of the storage disc, each writing-address header corresponding to a data field and identifying the corresponding data field during a write operation, each writing-address header being radially offset from the corresponding data field by the offset of the data-carrying track at which the corresponding data field is located.

5,751,513

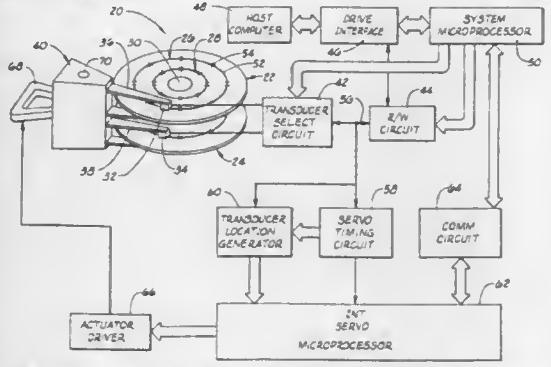
METHOD FOR CARRYING OUT SEEKS IN A HARD DISC DRIVE TO LIMIT THE GENERATION OF ACOUSTIC NOISE

Duc T. Phan, Saratoga, and Mark A. Pajdowski, Los Gatos, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 218,607, Mar. 28, 1994. This application May 31, 1996, Ser. No. 657,689

Int. Cl.^{6} G11B *5/55*

U.S. Cl. 360—78.07 **5 Claims**



1. A method for carrying out a seek phase in the movement of a disc drive transducer from an initial track on a rotating disc to a target track on the disc so as to reduce noise generated during the seek phase, wherein the transducer is initially accelerated away from the initial track and subsequently decelerated toward the target track and wherein the transducer is supported adjacent the surface of the disc by a pivotable actuator for radial movement of the transducer via pivotation of the actuator, the method comprising the steps of:

determining the distance between the initial and target tracks;

multiplying the distance between the initial and target tracks by a preselected factor that is less than one to determine a deceleration distance for the movement of the transducer during the seek phase; and

thereafter, during the acceleration and subsequent deceleration of the transducer by means of which the seek phase is effected, repetitively executing the steps of estimating the distance between the transducer and the target track;

selecting a profile distance as the lesser of the deceleration distance and the estimated distance between the transducer and the target track;

evaluating a preselected velocity profile relation at the profile distance to determine a profile velocity;

estimating the radial velocity of the transducer across said disc;

generating a control signal comprising at least a component proportional to the difference between the estimated radial velocity of the transducer and the profile velocity;

at such times that the control signal exceeds the control signal generated for the previous repetition by a preselected slew rate limit, adjusting the control signal to the sum of control signal for the previous repetition and the slew rate limit;

averaging the control signal with the control signal generated for the previous repetition;

exerting a force on the actuator in proportion to said average control signal for a selected time period; and

subsequently exerting a force on the actuator in proportion to said current control signal;

wherein said preselected factor is selected so that the forces exerted on the transducer in said repetitively executed steps will accelerate the transducer to a velocity equal to the value of the profile velocity at the deceleration distance before the transducer reaches a distance from the target track equal to the deceleration distance.

5,751,514

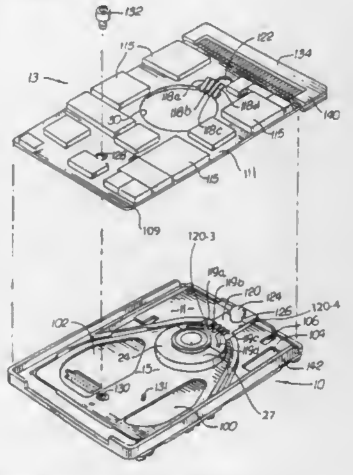
INTELLIGENT DISK DRIVE HAVING SPRING CONTACTS ON A BOARD ASSEMBLY FOR CONNECTING TO EXTERIOR-FACING ELECTRICAL CONTACTS COUPLED TO A SPINDLE MOTOR

Darryl L. Hyde, San Jose, and John R. Edwards, Mountain View, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 119,023, Sep. 9, 1993, abandoned. This application Jun. 28, 1996, Ser. No. 671,901

Int. Cl.^{6} G11B *5/012*

U.S. Cl. 360—97.01 **5 Claims**



1. An intelligent disk drive comprising:

a head disk assembly defining a substantially sealed interior and having an exterior which is outside of the substantially sealed interior, the head disk assembly including:

a base having a motor mounting hole;

a spindle motor having a generally cylindrical, axially extending portion and a generally planar surface portion, with the generally cylindrical portion terminating at the generally planar surface to define a step;

the spindle motor being mounted to the base such that an axially extending portion of the generally cylindrical portion is surrounded by the hole in the base, and the generally planar surface defines a generally circular portion of the exterior of the head disk assembly;

a magnetic disk mounted to be rotated by the spindle motor;

conductive lead means having a first, second, and third strip portions, the first strip portion lying flat against the generally planar surface of the spindle motor; the second strip portion lying against the step; and the third strip portion having a plurality of exterior-facing electrical contacts, the conductive lead means provided on the exterior of the head disk assembly and;

a board assembly including:

a printed circuit board and control circuitry for the spindle motor;

the printed circuit board having a planar surface and an opening;

the control circuitry being attached to the printed circuit board; the board assembly being mounted to the head disk assembly such that the opening is aligned with the exterior-facing electrical contacts and such that the planar surface of the board faces away from the exterior-facing electrical contacts; and

a plurality of spring contacts for electrically connecting the exterior-facing electrical contacts to the control circuitry; each spring contact having:

a tab portion inserted into the planar surface of the printed circuit board, and

a spring portion extending from the tab portion through the opening to contact a respective one of the plurality of exterior-facing electrical contacts.

5,751,515

RECORDING AND REPRODUCING HEAD SLIDER HAVING MULTIPLE SLIDER RAILS AND A PROJECTION PORTION

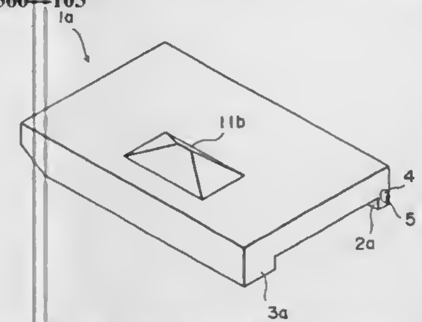
Akihiro Kasahara, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1996, Ser. No. 591,002

Claims priority, application Japan, Jan. 24, 1995, 7-027226

Int. Cl.^{6} G11B *5/48;5/60*

U.S. Cl. 360—103 **20 Claims**



1. A recording and reproducing head slider having a recording and reproducing head for recording and reproducing data in and from a data recording medium, an air flow being generated therebetween in a direction substantially parallel to the longitudinal axis of the recording and reproducing head slider, comprising:

a first slider rail having a surface facing the data recording medium, the surface having an air flow outgoing end, wherein the recording and reproducing head is attached to said first slider rail at the air flow outgoing end of the first slider rail;

a second slider rail having a surface facing the data recording medium, the surface of the second slider rail being larger than the surface of the first slider rail facing the medium, wherein the first and second slider rails are arranged so that the recording and reproducing head slider floats over the data recording medium by a hydrodynamic force generated by the air flow, wherein at least one of the length or the width of the first slider rail surface facing the medium is one half or less the length or the width of the second slider rail surface facing the recording medium, whereby the surface area of the first slider rail surface facing the medium is one half or less the surface area of the second slider rail surface facing the recording medium;

a push force application point portion, for application of a push force in a direction substantially perpendicular to the data recording medium, the push force application point portion being located at a position on the opposite side of the recording and reproducing head slider from the first and second slider rail surfaces and being closer to the second slider rail than the first slider rail in a direction substantially perpendicular to the longitudinal axis of the recording and reproducing head slider.

5,751,516

NON-MAGNETIC SUBSTRATE MATERIAL AND SLIDER ASSEMBLY FOR USE IN FLYING-TYPE MAGNETIC HEAD

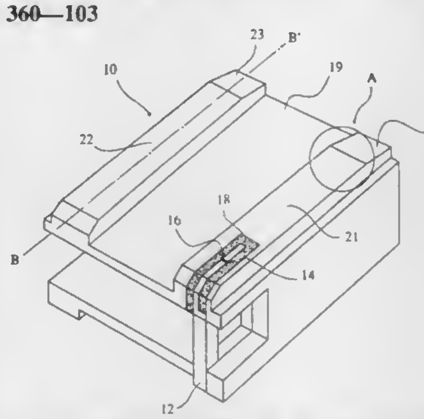
Nitta Hideo; Soutome Tomoki, both of Mooka, and Shimizu Yoshiro, Utsunomiya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 25, 1996, Ser. No. 670,340

Claims priority, application Japan, Jun. 28, 1995, 7-184705

Int. Cl.^{6} G11B *5/60*

U.S. Cl. 360—103 **16 Claims**



1. A non-magnetic material for use in a flying type magnetic head, comprising:

non-magnetic Fe_2O_3 as the principal component; and

0.1–5 weight %, based on the total weight of the non-magnetic material, of at least one of Nd_2O_3 and Gd_2O_3.

the non-magnetic material having a maximum grain size of 5 μm.

5,751,517

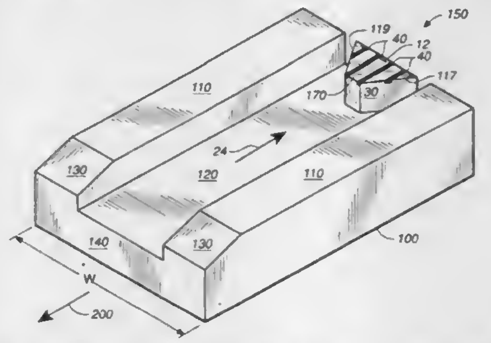
AIR BEARING SLIDER HAVING DEBRIS REMOVING CHANNELS

Shashi B. Agarwal, Santa Clara, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Filed Apr. 11, 1997, Ser. No. 826,986

Int. Cl.^{6} G11B *5/60*

U.S. Cl. 360—103 **21 Claims**



1. An air bearing slider for use in a disk drive, the slider comprising:

a leading side and a trailing side;

first and second main rails each having an air bearing surface;

a center pad having an air bearing surface and disposed adjacent to the trailing side of the slider and between the first and second main rails, the center pad having a leading side, a trailing side, first and second side walls and a width between the first side wall and the second side wall;

a transducer disposed within the center pad;

at least one longitudinal channel disposed within the center pad between the transducer and one of the first and second side walls. the longitudinal channel extending across the air bearing surface of the center pad from the leading side of the center pad to the trailing side of the center pad in a direction substantially parallel to the main rails, the longitudinal channel for reducing contaminant buildup on the center pad by attracting contaminants and passing at least some of the contaminants through to the trailing side of the center pad; and

wherein the longitudinal channel comprises a width that is relatively small compared to the width of the center pad, such that the longitudinal channel has an insubstantial effect on air bearing flight characteristics of the slider.

5,751,518
HEAD FEEDING MECHANISM IN MAGNETIC RECORDING AND REPRODUCING DEVICE

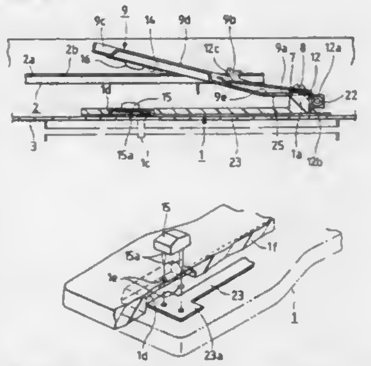
Makoto Konno; Akira Shibata; Takashi Watanabe, and Hisateru Komatsu, all of Yamagata, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 457,737, Jun. 1, 1995, abandoned, which is a continuation of Ser. No. 275,719, Jul. 19, 1994, abandoned. This application May 15, 1996, Ser. No. 647,648

Claims priority, application Japan, Sep. 30, 1993, 5-057930

Int. Cl.⁶ G11B *5/48;21/16*

U.S. Cl. 360—104 **22 Claims**



1. A head feeding mechanism in a magnetic recording and reproducing device, said magnetic recording and reproducing device including a device frame, guide means provided on the device frame, and a magnetic disk holder having a slot for receiving a magnetic disk loaded therein, said head feeding mechanism comprising:

- a first side carriage for feeding in a direction of length of the slot formed in the magnetic disk holder by the guide means provided on the device frame, the first side carriage including:
  - a base supported on said device frame, said base including a groove and a recess at an end of said groove, said recess forming an unbroken, continuous flexible portion of said base of said first side carriage;
  - a first side magnetic head mounted directly on said flexible portion; and
  - means for connecting said first side magnetic head to said flexible portion and allowing said head movement relative to said base,
  - wherein said flexible portion is unitarily formed with said base of said first side carriage such that said flexible portion comprises a first surface of said recess and a portion of a second surface of said base of said first side carriage,
  - wherein said second surface is continuous from a first end of said base of said first side carriage to a second end of said base of said first side carriage;
- said head feeding mechanism further comprising a second side carriage, said second side carriage including:
  - a second side magnetic head mounted on a surface of said second side carriage such that said second side magnetic head is confronted with the first side magnetic head; and
  - a base flexibly supported on the base of the first side carriage.

5,751,519
BEARING UNIT, CARRIAGE ASSEMBLY WITH THE BEARING UNIT, AND MAGNETIC DISK APPARATUS

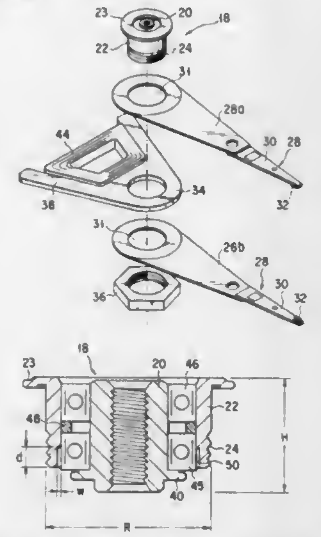
Tetsuya Hata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

Filed Sep. 25, 1996, Ser. No. 719,794

Claims priority, application Japan, Mar. 18, 1996, 8-061455

Int. Cl.⁶ G11B *5/55*

U.S. Cl. 360—106 **14 Claims**



1. A bearing unit of an information recording for rotatably supporting a member to be supported, comprising:

- a support shaft;
- a cylindrical sleeve arranged to coaxially surround the support shaft and having a first end portion on which a flange is formed, and a second end portion having an outer circumferential surface on which a threaded portion is formed;
- a plurality of bearings arranged between the support shaft and the sleeve to be spaced apart from each other in an axial direction of the support shaft, for rotatably supporting the sleeve on the support shaft; and
- a nut threadably engaged with the threaded portion to hold the member on the outer circumferential surface of the sleeve between the flange and the nut;
- the plurality of bearings including a lower bearing which is aligned with the threaded portion in a radial direction of the sleeve, and
- the sleeve having a groove which is located between the threaded portion and the lower bearing, for reducing a tightening force of the nut which acts on the lower bearing.

5,751,520
HEAD DRUM ASSEMBLY OF A VIDEO CASSETTE RECORDER

Keum-Mo Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 12, 1996, Ser. No. 766,209

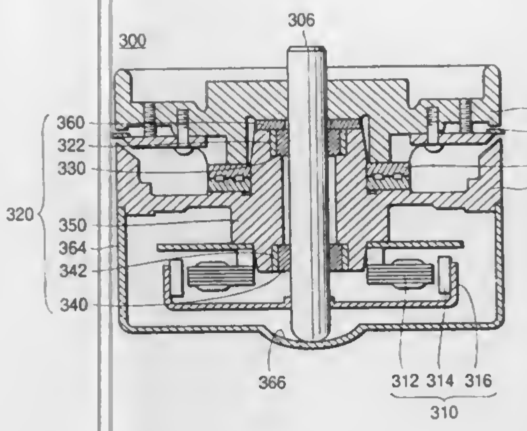
Claims priority, application Rep. of Korea, Dec. 13, 1995, 95-49274

Int. Cl.⁶ G11B *15/61*

U.S. Cl. 360—107 **9 Claims**

1. A head drum assembly of a video cassette recorder comprising:

- a lower drum;



- a motor for generating a rotational force, said motor being installed in said lower drum;
- an upper drum including magnetic heads for recording video information onto a magnetic tape and for reproducing the video information from the magnetic tape during the rotation of the upper drum, said upper drum being disposed above said lower drum;
- a transformer for electrically connecting the magnetic heads to an external apparatus while said upper drum is being rotated, said transformer being installed between a lower surface of said upper drum and an upper surface of said lower drum;
- a shaft installed in said motor so as to transfer the rotational force of said motor to said upper drum;
- a bearing housing formed at an upper inner portion thereof with a pair of first lubricant containing grooves and formed at a lower inner portion thereof with a pair of second lubricant containing grooves, each pair of the first and second lubricant containing grooves being disposed in a longitudinal direction of said bearing housing in opposition to each other, each of the first and second lubricant containing grooves having a cylindrical shape, said bearing housing being disposed at an inner portion of the lower drum;
- first and second bearings for rotatably supporting said shaft, said first and second bearings being fixed and being located in upper and lower inner portions of said bearing housing respectively;
- first and second lubricating pads for supplying a lubricant between said first and second bearings and said shaft, said first and second lubricating pads being inserted into the first and second lubricant containing grooves, said first and second lubricating pads being in contact with said first and second bearings; and
- a shielding means for preventing evaporation of the lubricant which is supplied to said first bearing, said shielding means being disposed between said first bearing and said upper drum, said shaft being inserted into said shielding means, and said shielding means being fixed on a lower surface of said upper drum.

5,751,521
DIFFERENTIAL SPIN VALVE SENSOR STRUCTURE

Hardayal Singh Gill, Portola Valley, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

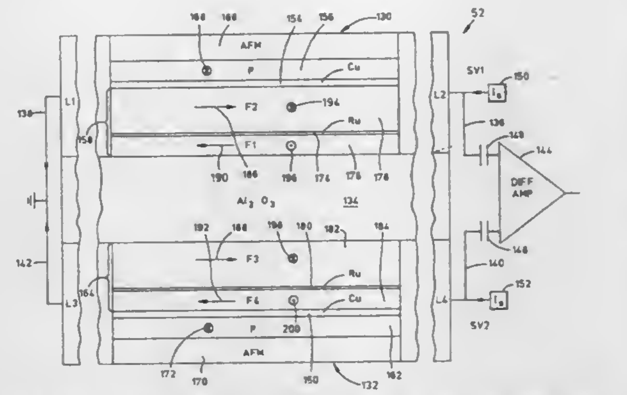
Filed Sep. 23, 1996, Ser. No. 710,804

Int. Cl.⁶ G11B *5/39*

U.S. Cl. 360—113 **16 Claims**

1. An MR read head with an air bearing surface (ABS), comprising:

- first and second spin valve sensors for producing response signals with opposite polarities in reaction to a magnetic field;
- a gap layer sandwiched between the first and second spin valve sensors;



- first and second leads connected in series to the first spin valve sensor and third and fourth leads connected in series to the second spin valve sensor;
- the first and third leads being electrically interconnected;
- the first spin valve sensor including a first pinned layer and a first antiferromagnetic layer interfacing one another to form an exchange coupling therebetween and the second spin valve sensor including a second pinned layer and a second antiferromagnetic layer interfacing one another to form an exchange coupling therebetween;
- the first and second antiferromagnetic layers pinning magnetic moments of the first and second pinned layers in the same direction;
- the first spin valve sensor having a first non-magnetic conductive spacer layer and a first laminated free layer and the second spin valve sensor having a second non-magnetic conductive spacer layer and a second laminated free layer;
- the first spacer layer being sandwiched between the first laminated free layer and the first pinned layer and the second spacer layer being sandwiched between the second laminated free layer and the second pinned layer;
- the first laminated free layer having a first ruthenium layer sandwiched between first and second ferromagnetic free layers and the second laminated free layer having a second ruthenium layer sandwiched between third and fourth ferromagnetic free layers wherein the first and second ruthenium layers are sufficiently thin so that the first and second ferromagnetic free layers are antiferromagnetically coupled and the third and fourth ferromagnetic free layers are antiferromagnetically coupled;
- the second ferromagnetic free layer being thicker and having a greater magnetization than the first ferromagnetic free layer and the third ferromagnetic free layer being thicker and having a greater magnetization than the fourth ferromagnetic free layer so that the first ferromagnetic free layer follows magnetic rotation of the second ferromagnetic free layer and the fourth ferromagnetic free layer follows magnetic rotation of the third ferromagnetic free layer; and
- the first spacer layer being sandwiched between the first pinned layer and the second ferromagnetic free layer and the second spacer layer is sandwiched between the second pinned layer and the fourth ferromagnetic free layer.

5,751,522
COMBINED-TYPE THIN FILM MAGNETIC HEAD WITH INDUCTIVE MAGNETIC HEAD HAVING LOW-INDUCTIVE CORE

Minoru Yamada, Sakae-machi; Hideyuki Hashimoto, Nagaoka; Yasuhiro Yabe, Nagaoka, and Kenji Honda, Nagaoka, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

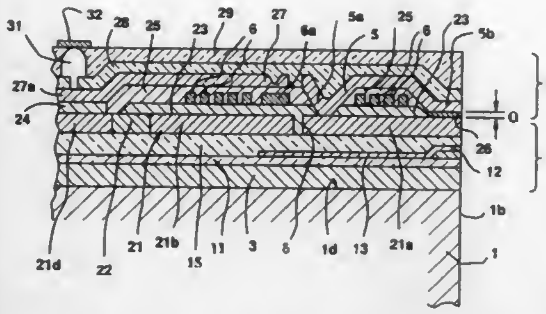
Continuation of Ser. No. 324,429, Oct. 17, 1994, abandoned. This application Sep. 13, 1996, Ser. No. 712,662

Claims priority, application Japan, Oct. 21, 1993, 5-285513

Int. Cl.⁶ G11B *5/39*

U.S. Cl. 360—113 **1 Claim**

1. A combined-type thin film magnetic head comprising:



a reproducing head portion including a magnetoresistive device and an insulating layer formed over the magnetoresistive device; and

an inductive magnetic head formed over said reproducing head portion, wherein said inductive magnetic head includes:

a magnetic material layer formed on an upper surface of said insulating layer, the magnetic material layer having an upper surface;

an insulating material formed on the upper surface of the magnetic material layer, the insulating material defining an opening;

a coil formed on an upper surface of the insulating material;

an upper core layer connected to the upper surface of said magnetic material layer through said opening and extending over said coil; and

a magnetic gap formed between said magnetic material layer and said upper core layer;

wherein the magnetic material layer includes a lower core portion located under the upper core layer and a first portion of the coil, and a coil support portion located under a second portion of the coil,

wherein the lower core and the coil support portion are separated by a gap,

wherein said insulating material is injected into the gap located between said coil support portion and said lower core portion, and

wherein the upper surfaces of the coil support portion and the lower core portion are co-planar.

5,751,523

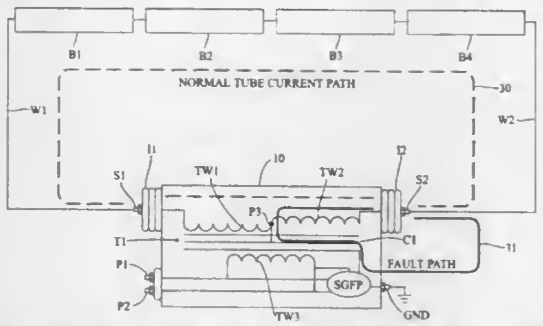
SECONDARY GROUND FAULT PROTECTED LUMINOUS TUBE TRANSFORMER FOR MID-POINT CONNECTED LUMINOUS TUBES

Gerald L. Ballard, and William L. Brosius, both of Brandon, Miss., assignors to Magnetek Corporation, Nashville, Tenn.

Filed Sep. 19, 1996, Ser. No. 715,873

Int. Cl.⁶ H02H *3/00*

U.S. Cl. 361—42 **10 Claims**



1. A transformer assembly for powering a load, the assembly having a plurality of output terminals connectable to the load, the output terminals providing a high voltage to the load, the assembly comprising:

a transformer, the transformer having a primary winding and at least one secondary winding, the secondary winding connected to the output terminals, the secondary winding further having a midpoint terminal;

a housing, the housing containing the transformer;

input terminal means connected to the primary winding and operable to receive a source of power;

a ground terminal connected to an earth ground and to the housing;

a return terminal connected to the mid-point terminal and to the load and operable to provide a return path which is separate from the earth ground;

a ground fault protection circuit, the protection circuit connected between the ground terminal and the return terminal, the protection circuit operable to detect a fault current flowing between the output terminals and the earth ground, the protection circuit disconnecting the source of power from the primary winding in response to detecting the fault current.

5,751,524

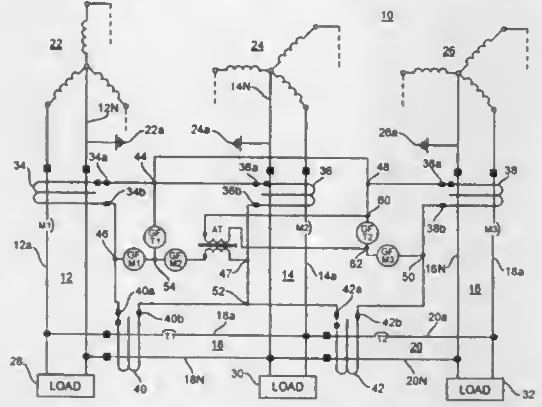
GROUND FAULT PROTECTION CIRCUIT FOR A MULTIPLE SOURCE SYSTEM

David L. Swindler, Murfreesboro, Tenn., assignor to Square D Company, Palatine, Ill.

Filed Mar. 10, 1997, Ser. No. 814,302

Int. Cl.⁶ H02H *3/00*

U.S. Cl. 361—42 **11 Claims**



1. A ground fault protection circuit for an electrical power distribution system having i) a plurality of polyphase power sources, each including a plurality of phase conductors and a neutral conductor, ii) a polyphase main bus connected to each one of the power sources and including a plurality of phase conductors and a neutral conductor, iii) a main circuit breaker electrically connected in each of the main buses for interrupting power flowing therethrough, iv) a polyphase tie bus connected between each of the main buses and including a plurality of phase conductors and a neutral conductor, iv) a tie circuit breaker electrically connected in each of the tie buses for interrupting power flowing therethrough, the ground fault protection circuit comprising:

a current sensor associated with each one of the main and tie buses having a pair of output terminals and located adjacent to each one of the main and tie buses for generating a trip current through the output terminals that varies directly with the vector sum of currents flowing through the phase conductors and the neutral conductor at the location of the current sensor;

a trip function associated with each one of the main and tie circuit breakers, wherein current flowing through the trip function causes its associated circuit breaker to trip; and

an auxiliary transformer for sending the trip current to a portion of the ground fault protection circuit so that the appropriate tripping faction receives the trip current and causes its associated circuit breaker to trip when a ground fault occurs in the power distribution system.

5,751,525

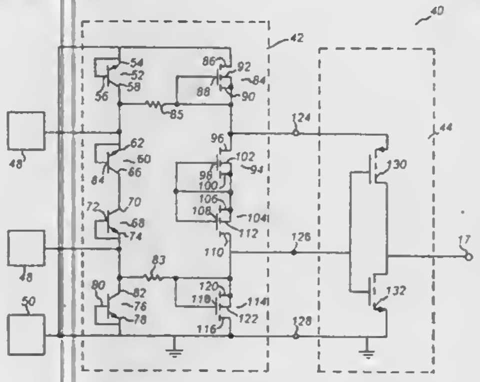
EOS/ESD PROTECTION CIRCUIT FOR AN INTEGRATED CIRCUIT WITH OPERATING/TEST VOLTAGES EXCEEDING POWER SUPPLY RAIL VOLTAGES

Andrew H. Olney, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 5, 1996, Ser. No. 583,612

Int. Cl.⁶ H02H *9/00*

U.S. Cl. 361—56 **36 Claims**



1. An electrical overstress protection circuit for protecting an active circuit from electrical overstress, the electrical overstress protection circuit having first and second inputs for respectively receiving first and second reference voltages, first and second outputs for respectively providing the first and second reference voltages to the active circuit, first and second signal pads for respectively connecting to an external circuit and the active circuit, the electrical overstress protection circuit comprising:

first and second clamping circuits series connected between the first input and the first signal pad of the electrical overstress protection circuit, the first clamping circuit including a breakdown device that is constructed and arranged to conduct current in a first direction when a voltage across the breakdown device exceeds a forward conduction threshold, the second clamping circuit including a breakdown device constructed and arranged such that in a first direction of current through the breakdown device, the breakdown device has an active mode of operation and a breakdown mode of operation, the breakdown mode of operation occurring when a voltage across the breakdown device exceeds a reverse breakdown threshold, the breakdown device switching from breakdown mode to active mode when a magnitude of current through the breakdown device in the first direction exceeds a current threshold level; and

third and fourth clamping circuits series connected between the first output and the second signal pad of the electrical overstress protection circuit.

5,751,526

FLUX ENHANCED WRITE TRANSDUCER AND PROCESS FOR PRODUCING THE SAME IN CONJUNCTION WITH SHARED SHIELDS ON MAGNETORESISTIVE READ HEADS

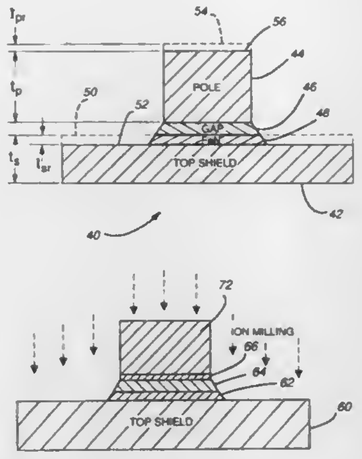
Terence D. Schemmel, Longmont, Colo., assignor to MKE-Quantum Components Colorado LLC, Louisville, Colo.

Continuation of Ser. No. 461,411, Jun. 5, 1995, abandoned. This application Feb. 24, 1997, Ser. No. 804,954

Int. Cl.⁶ G11B *5/33;5/147*

U.S. Cl. 360—113 **15 Claims**

14. A magnetic data transducer incorporating a read head that is interposed between an upper magnetic shield layer having a magnetic moment, and a lower magnetic shield layer having a magnetic moment, and incorporating a write head that utilizes said upper magnetic shield layer as a bottom magnetic pole member, said upper magnetic shield layer having a width, and said write head comprising:



a flux enhancement layer having a width that is smaller than said width of said upper magnetic shield layer directly on and overlying a mid portion of said width of said upper magnetic shield layer, said flux enhancement layer having a magnetic moment that is higher than said magnetic moment of said upper magnetic shield layer;

a gap layer having a width that is generally equal to said smaller width of said flux enhancement layer directly overlying said flux enhancement layer;

an upper magnetic pole member having a width that is generally equal to said width of said gap layer directly on and overlying said gap layer, said upper magnetic pole member having a magnetic moment; and

a seed layer having a magnetic moment generally equal to said magnetic moment of said upper magnetic pole member, said seed layer having a width that is generally equal to said width of said upper magnetic pole member, said seed layer being located directly on said upper magnetic pole member and between said upper magnetic pole member and said gap layer, said seed layer underlying said upper magnetic pole member and being substantially coextensive therewith.

5,751,527

MAGNETIC TAPE HEAD CONTOUR WITH LAND WIDTHS TO OPTIMIZE FLYING HEIGHT AND A SUFFICIENT NUMBER OF BLEED SLOTS TO UNIFORMLY MAINTAIN THE FLYING HEIGHT OF THE TAPE

Ramesh Sundaram, and Terry J. Barber, both of Louisville, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 15,583, Feb. 10, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 291,052

Int. Cl.⁶ G11B *5/265*

U.S. Cl. 360—122 **19 Claims**

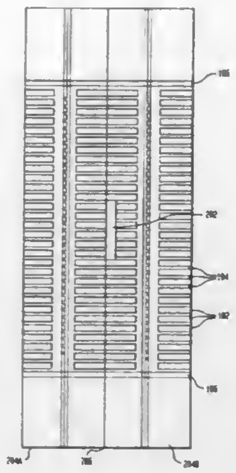
14. A magnetic tape head comprising:

a plurality of magnetic elements; and

a tape head contour having

a longitudinal gap formed in said contour, and

a plurality of bleed slots formed in said contour, said bleeds slots formed such that a land between two longitudinally adjacent bleed slots is of a sufficient width to provide an optimum head-to-tape separation of a magnetic tape over said gap, said bleed slots being of a sufficient number that the head-to-tape separation of said magnetic tape moving across said gap is uniform across said magnetic tape, said



plurality of magnetic elements positioned along said gap independently of the position of said bleed slots and said lands.

5,751,528

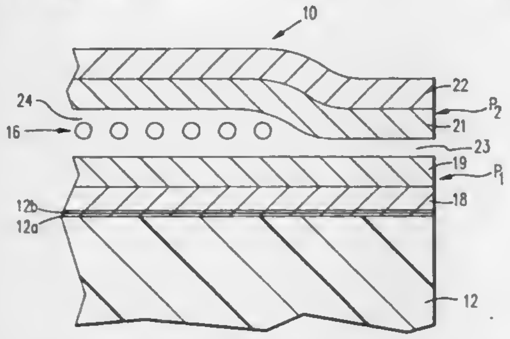
MULTILAYER EXCHANGE COUPLED MAGNETIC POLES WITH APPROXIMATE ZERO MAGNETOSTRICTION

Daniel A. Nepela, San Jose, and Siamak Sarhadi, Fremont, both of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Apr. 15, 1996, Ser. No. 648,538

Int. Cl.^{6} G11B *5/31*

U.S. Cl. 360—126 **8 Claims**



1. An inductive magnetic head used for writing and reading magnetic signals onto and from a magnetic recording medium comprising:

a first magnetic pole P1 and a second pole P2 formed on a substrate and defining a gap therebetween;

said first magnetic pole P1 including an inner magnetic layer formed adjacent to said gap and an outer magnetic layer;

said second magnetic pole P2 including an inner magnetic layer formed adjacent to said gap and an outer magnetic layer;

said inner and outer magnetic layers of said first magnetic pole P1 having saturation magnetostrictions of approximately equal but opposite values, such that said first magnetic pole P1 exhibits a net magnetostriction of approximately zero or is biased within a predefined range;

said inner and outer magnetic layers of said second magnetic pole P2 having saturation magnetostrictions of approximately equal but opposite values, such that said second magnetic pole P2 exhibits a net magnetostriction of approximately zero or is biased within said predefined range;

wherein said inner magnetic layers of said first and second magnetic poles P1 and P2 are formed of a material that has a high saturation magnetization to realize a high write field gradient closer to said gap, and

wherein said predefined range of the magnetostriction of said inner and outer layers of said first and second magnetic poles P1, P2 does not exceed approximately $\pm 20\times10^{-6}$.

5,751,529

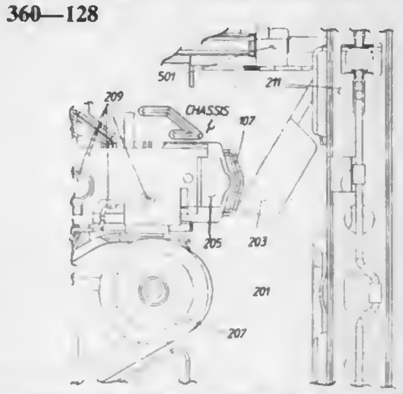
MAGNETIC HEAD PROTECTION FOR A CARTRIDGE TAPE DRIVE

Fred O. Stephens, Loveland, and Jonathan D. Bassett, Fort Collins, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 493,128, Jun. 21, 1995, abandoned. This application Mar. 3, 1997, Ser. No. 810,096

Int. Cl.^{6} G11B *15/00;5/10*

U.S. Cl. 360—128 **5 Claims**



1. A tape drive for a tape cartridge, the tape cartridge having a front surface and two end surfaces, each of the two end surfaces having at least a portion that is perpendicular to the front surface, the front surface having a cartridge opening for access to a magnetic tape and a door covering the cartridge opening, the tape drive comprising:

a drive opening in the tape drive to receive the tape cartridge;

the tape drive normally receiving the tape cartridge with the front surface passing through the drive opening first; a magnetic head contacting the magnetic tape through the cartridge opening;

an opener opening the door during insertion of the tape cartridge into the tape drive;

a physical barrier located near the magnetic head, the physical barrier positioned so that when the opener fails to completely open the door during insertion of the tape cartridge, the door contacts the physical barrier, the physical barrier prevents the door from opening, and the physical barrier prevents the door from making contact with the magnetic head; and the physical barrier positioned so that when the tape cartridge is inserted so that one of the end surfaces passes through the drive opening first, the tape cartridge contacts the physical barrier and the physical barrier prevents the tape cartridge from making contact with the magnetic head.

5,751,530

HIGH POWER DC BLOCKING DEVICE FOR AC AND FAULT CURRENT GROUNDING

Brian R. Pelly, Palos Verdes Estates, Calif., and Henry N. Tachick, Pound, Wis., assignors to Dairyland Electrical Industries, Inc., Oregon, Wis.

Filed Aug. 13, 1996, Ser. No. 696,116

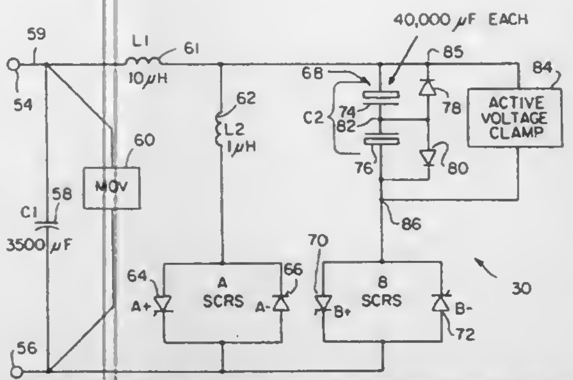
Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—56 **35 Claims**

1. A DC blocking device, comprising:

(a) a DC blocking capacitor connected between two terminals of the blocking device;

(b) a main bypass path connected in parallel with the DC blocking capacitor and including a main switching device which is responsive to main triggering signals to create a low impedance path between the terminals of the blocking device;



(c) an auxiliary bypass path connected in parallel with the main bypass path and including a storage capacitor connected in series with an auxiliary switching device which is responsive to first and second auxiliary triggering signals to electrically connect the storage capacitor in parallel with the main bypass path; and

(d) controller means for providing the first auxiliary triggering signal when a fault condition causes the voltage level across the DC blocking capacitor to exceed a triggering voltage level to allow the storage capacitor to charge to a stored voltage level, for providing the main triggering signal when the storage capacitor is charged to the stored voltage level, and for providing the second auxiliary triggering signal when the fault condition has cleared to apply the stored voltage in the storage capacitor across the main switching devices to commutate them off.

5,751,531

PROTECTION CIRCUIT AGAINST HIGH ENERGY OVERVOLTAGES, HAVING A CONTROLLED CLIPPING VOLTAGE

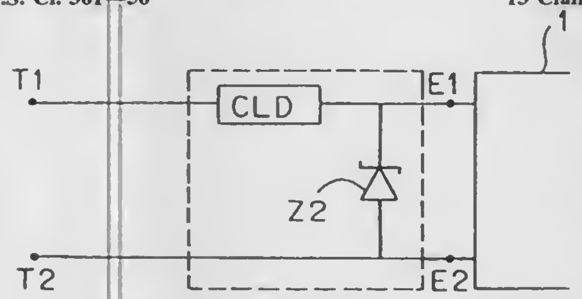
Pierre Rault, Saint Cyr/Loire, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Continuation of Ser. No. 277,406, Jul. 19, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 767,522

Claims priority, application France, Jul. 19, 1993, 93 09139

Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—56 **13 Claims**



1. A method for protecting a circuit to be protected from an overvoltage, comprising the steps of:

providing an avalanche diode between input ports of the circuit to be protected;

providing a device for limiting current to a predetermined value in series with the avalanche diode, between one of the input ports of the circuit and a voltage applying terminal;

selecting a breakdown voltage of the device to be greater than a difference between a maximum predetermined overvoltage against which the circuit is to be protected and a clipping voltage of the avalanche diode; and

operating the device in a constant current operating region only when a voltage at the voltage applying terminal is greater then or equal to the clipping voltage of the avalanche diode.

5,751,532

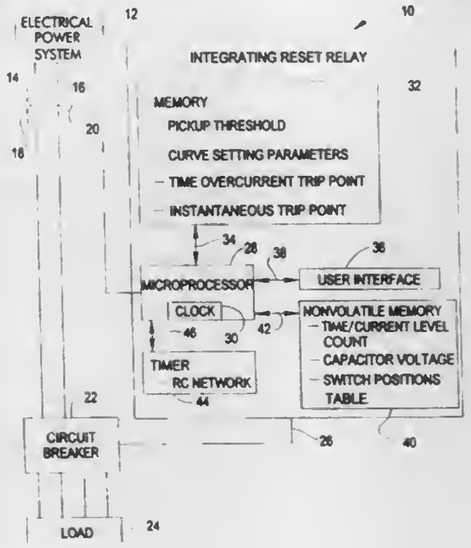
INTERGRATING RESET OVERCURRENT RELAY

John M. Kanuchok, Collinsville; Jeffrey A. Burnworth, Swansea, and James A. Bright, Glen Carbon, all of Ill., assignors to Basler Electric Company, Highland, Ill.

Filed Feb. 28, 1996, Ser. No. 608,306

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—94 **26 Claims**



1. A relay for monitoring an electrical system to protect the electrical system from an overcurrent condition as a time dependent function of an electrical current level in the electrical system, the relay comprising:

a microprocessor for varying a current level count; and

a timer for measuring a period of time that includes a period when the electrical current level is less than a minimum current level required for proper operation of the relay;

wherein the microprocessor is responsive to the timer for varying the current level count as a function of at least the measured period of time.

5,751,533

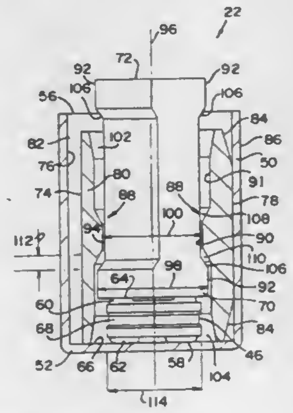
CUP AND DIODE ASSEMBLY FOR OVERVOLTAGE PROTECTORS AND COMMUNICATIONS LINES

Richard T. Kaczmarek, Park Ridge, Ill., assignor to Reltec Corporation, Cleveland, Ohio

Filed Feb. 1, 1996, Ser. No. 595,278

Int. Cl.^{6} H02H *3/22*

U.S. Cl. 361—119 **20 Claims**



1. An arrester assembly comprising:

a cup having a conductive surface;

a sleeve retained in said cup;

an arrester element having a first electrode and a second electrode, said first electrode being positioned in said sleeve in conductive contact with said cup;

an elongated meltable conductive contact having a first end abutting said second electrode of said arrester element;

at least one protrusion extending radially inwardly from an internal surface of said sleeve; and

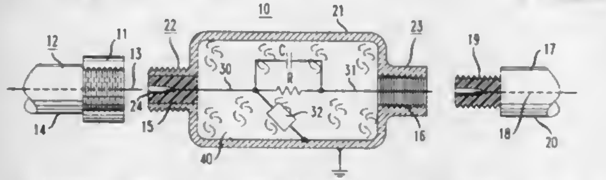
at least one projection on said elongated meltable conductive contact extending outwardly from a central axis thereof, the inward extension of said at least one protrusion and the outward extension of said at least one projection preventing said contact from being removed from said sleeve once positioned therein.

5,751,534
COAXIAL CABLE SURGE PROTECTOR

George Andrew DeBalko, Township of Washington, Morris County, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 29, 1996, Ser. No. 655,069
Int. Cl.^{6} H02H *9/06*

U.S. Cl. 361—119 **8 Claims**



1. A device which is connectable to a coaxial cable having a center conductor and an outer sheath, said device comprising:

a housing;

a conductor surrounded by the housing, said conductor extending to at least one end of the housing so that the conductor is connectable to the center conductor of the cable while the housing is connectable to the outer sheath;

a voltage surge arrestor coupled between the conductor and the housing; and

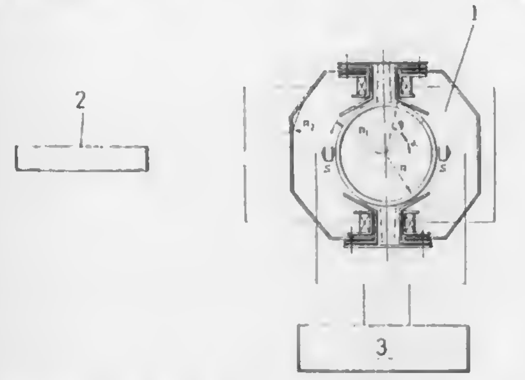
a variable resistor coupled in series with the conductor within the housing such that the conductor and resistor provide an electrical path for dc signals through the device.

5,751,535
CONTROL CIRCUITS FOR AN ELECTROMAGNETIC FLOW METER

Pedro A. Garcia-Gutierrez, and Jesus Fraile-Mora, both of Madrid, Spain, assignors to Qualitas Asesoria Profesional, S.A., Madrid, Spain

Filed Oct. 16, 1995, Ser. No. 543,822
Claims priority, application Spain, Oct. 26, 1994, 9402225
Int. Cl.^{6} G01F *1/58*

U.S. Cl. 361—143 **6 Claims**



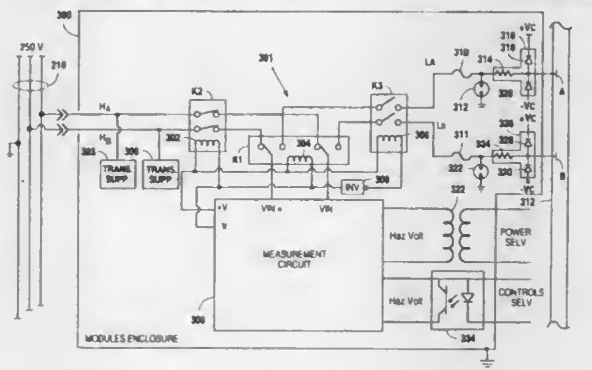
1. Control circuits for an electromagnetic flow meter which include an excitation block (2) and a metering signal processing circuit, said excitation block comprising an excitation control signal generating circuit which generates a base control wave of zero continuous level and a working cycle of 50%, to provide a signal at the input to an integrated circuit (6) which excites coils B1 and B2, the excitation control signal generating circuit consists of a generator (4) followed by a continuous level suppressor and an amplifier (5), while the metering signal processing circuit consists of a capacitive conduction suppressor (7) and an amplifier (8), the output from which runs through high- and low-pass filters (9) and (10) formed by operational amplifiers with adaptation modules inserted between them using the same type of circuitry and thence through an attenuator unit (11) to a true effective value convertor (12).

5,751,536
METHOD AND APPARATUS FOR PROVIDING ISOLATION FROM HAZARDOUS VOLTAGE LEVELS IN A HYBRID INSTRUMENTATION SYSTEM

Michel G. Haddad, and Alvin G. Becker, both of Austin, Tex., assignors to National Instruments Corporation, Austin, Tex.

Filed Feb. 29, 1996, Ser. No. 609,942
Int. Cl.^{6} H02J *1/00*

U.S. Cl. 361—191 **42 Claims**



1. An isolation system, comprising:

a low voltage bus;

a high voltage bus;

a measurement circuit for measuring signals on said high voltage bus and said low voltage bus;

a first relay coupled to the measurement circuit for switching between the low and high voltage buses, said first relay having isolation between coil to contact providing double insulation and isolation between contact to contact meeting basic insulation;

a second relay coupled between said first relay and said high voltage bus for coupling the measurement circuit to at least one high voltage signal line on the high voltage bus, said second relay having isolation between coil to contact providing double insulation and isolation between contact to contact providing basic insulation;

a third relay coupled between said first relay and said low voltage bus for coupling the measurement circuit to at least one low voltage signal line on the low voltage bus, said third relay having isolation between coil to contact providing double insulation and isolation between contact to contact providing basic insulation, said third relay having a state which is opposite of said second relay;

wherein when said first relay is switched to the low voltage bus, and the third relay is closed, the second relay is open, and the open contact of said first relay and the open contact of said second relay provide double insulation; and

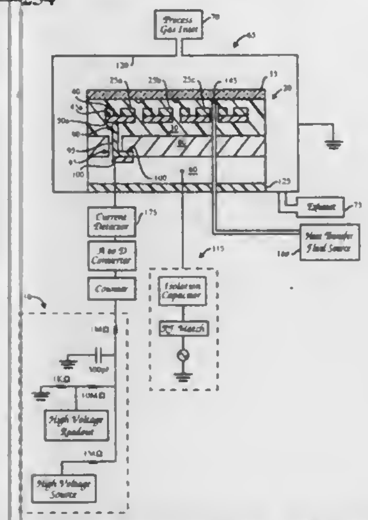
wherein when said first relay is switched to the high voltage bus, and the second relay is closed, the third relay is open, and the open contact of said first relay and the open contact of said third relay provide double insulation.

5,751,537
MULTIELECTRODE ELECTROSTATIC CHUCK WITH FUSES

Ananda H. Kumar, Milpitas, and Shamouil Shamouilian, San Jose, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 2, 1996, Ser. No. 641,938
Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **65 Claims**



1. A failure resistant electrostatic chuck for holding a substrate in a process environment, the chuck comprising:

(a) a plurality of electrodes covered by insulator, the electrodes capable of electrostatically holding a substrate when a voltage is applied thereto;

(b) an electrical power bus having a plurality of output terminals for conducting voltage to the electrodes; and

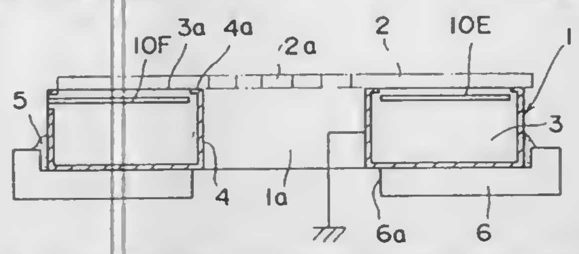
(c) a plurality of fuses in the insulator, each fuse electrically connecting at least one electrode in series to an output terminal from the power bus.

5,751,538
MASK HOLDING DEVICE AND METHOD FOR HOLDING MASK

Mamoru Nakasuji, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Sep. 26, 1996, Ser. No. 721,629
Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **12 Claims**



1. A mask holding device of a charged particle beam projecting apparatus for protecting a pattern of a mask on a radiation sensitive substrate by means of a charged particle beam, comprising:

an electrostatic chuck having an aperture through which said charged particle beam passes after being transmitted through said mask, said electrostatic chuck including at least one electrode for producing an electrostatic force between said mask and said electrostatic chuck so as to attract and hold the mask onto the electrostatic chuck; and

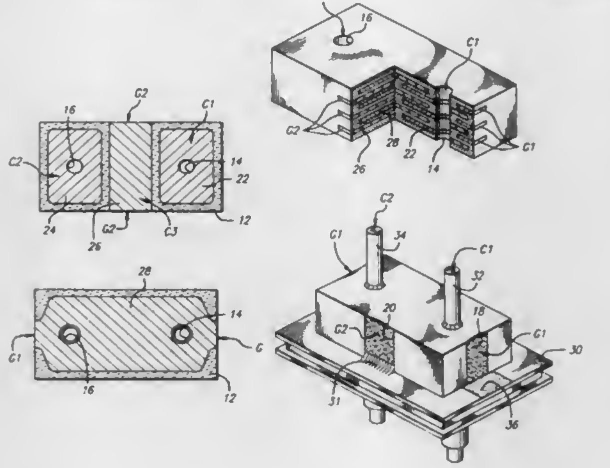
a conductive member that grounds said mask and covers at least a portion of said electrostatic chuck which defines said aperture.

5,751,539
EMI FILTER FOR HUMAN IMPLANTABLE HEART DEFIBRILLATORS AND PACEMAKERS

Robert A. Stevenson, Canyon Country, Calif., and Dick H. Ni, Carson City, Nev., assignors to Maxwell Laboratories, Inc., Carson City, Nev.

Filed Apr. 30, 1996, Ser. No. 640,098
Int. Cl.^{6} H01G *4/35;4/38*

U.S. Cl. 361—302 **18 Claims**



1. A feedthrough capacitor assembly, comprising:

a substantially monolithic casing of dielectric material having a plurality of conductive electrode plates encased therein in an alternating stack of a plurality of first and second layers in spaced parallel relation;

said first layer including at least one active plate corresponding to at least one feedthrough capacitor, and a first ground plate electrically isolated from said active plate; and

said second layer including a second ground plate common to said at least one of active plate of said first layer and cooperating therewith to define said feedthrough capacitor, and further cooperating with said first ground plate to define a coupling capacitor for coupling said feedthrough capacitor to a common ground point.

5,751,540
FERROELECTRIC CAPACITOR WITH RHODIUM ELECTRODES

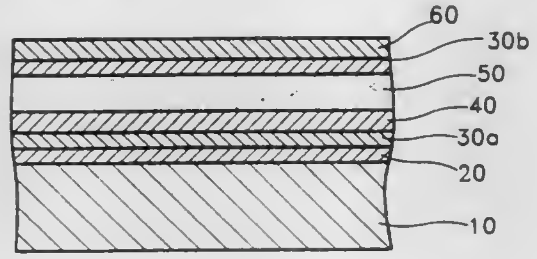
June-key Lee, Suwon; Il-sub Chung, Seoul, both of Rep. of Korea, and Seshu Babu Desu, Blacksberg, Va., assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Mar. 19, 1996, Ser. No. 618,320

Claims priority, application Rep. of Korea, Mar. 20, 1995, 95-5783

Int. Cl.^{6} H01G *4/06*

U.S. Cl. 361—321.4 **16 Claims**



10. A ferroelectric capacitor comprising:

a substrate;

an insulating layer formed on said substrate;

a RH lower electrode provided on said substrate;

- a first rhodium oxide layer between said insulating layer and said Rh lower electrode;
- a ferroelectric layer provided on said Rh lower electrode;
- a second rhodium oxide layer formed on said ferroelectric layer; and a Rh upper layer provided on the second layer.

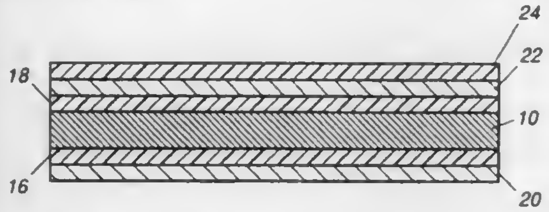
5,751,541
POLYMER ELECTRODES FOR ENERGY STORAGE DEVICES AND METHOD OF MAKING SAME

Changming Li, Vernon Hills, and Richard Hanson Jung, Park Ridge, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1995, Ser. No. 498,450

Int. Cl.^{6} H01G *9/02;9/00*

U.S. Cl. 361—525 **23 Claims**



1. An electrochemical capacitor comprising:
- a current collecting substrate fabricated of a non-noble metal, and having at least a first and second surface;
- a layer of an adhesion enhancing material disposed on at least one surface of said substrate, said adhesion enhancing material comprising a polymeric carrier and an adhesion enhancing agent dispersed in said polymeric carrier;
- a layer of an electrically conducting polymer disposed on said adhesion enhancing material; and
- a layer of a polymer gel or solid electrolyte disposed atop said electrically conducting polymer.

5,751,542
WALL SOCKET

Jörgen Holhammar, Lindome, Sweden, assignor to Vattenfall AB, Stockholm, Sweden

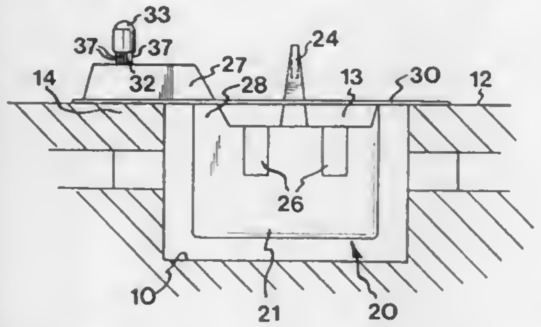
PCT No. PCT/SE95/00596, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/33288, PCT Pub. Date Dec. 7, 1995

PCT Filed May 24, 1995, Ser. No. 737,791

Claims priority, application Sweden, May 26, 1994, 9401802

Int. Cl.^{6} H02B *1/10;1/18*

U.S. Cl. 361—623 **20 Claims**



1. A wall socket which is adapted to be flush-mounted in a wall terminal box (**10**) and which, when mounted, comprises a cover (**40**) located outside the wall terminal box (**10**) and a base (**20**) located inside the wall terminal box (**10**) end supporting at least one pair of connector terminals (**22**) for receiving a plug via openings (**41**) in the cover and for connection to an alternating voltage available in the wall terminal box (**10**), characterised in that
- the base (**20**) comprises a base portion (**21**), which is flush-mounted in the wall terminal box (**10**) and supports the connector terminals (**22**) for the alternating voltage, as well as a surface-mounted base portion (**27**), which is located outside, and is laterally offset in relation to, the opening (**13**) of the wall terminal box (**10**) facing the cover (**40**) and which supports at least one low-voltage socket (**31**) for a direct voltage,
- the surface-mounted cover (**40**) has such an extent as to enclose the opening of the wall terminal box (**10**) as well as the laterally-offset, surface-mounted base portion (**27**), and is formed with one or more openings giving access to the low-voltage socket, and
- the wall socket further comprises a transformer and rectifier element which is disposed in the wall terminal box (**10**) and is connected to the flush-mounted base portion (**21**) and which has an alternating-voltage side for connection to the alternating voltage, as well as a direct-voltage side for emitting a step-down transformed and rectified voltage to the low-voltage socket (**31**).

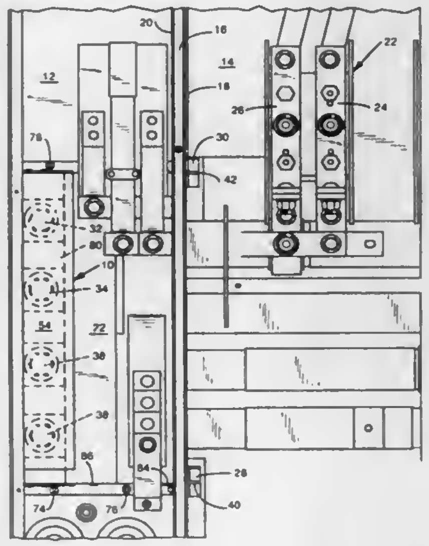
5,751,543
SEALING COVER ASSEMBLY FOR ELECTRICAL BUS CONNECTIONS

Donald F. Gehrs, and Robert E. Craddock, both of Brandon, Miss., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1994, Ser. No. 283,015

Int. Cl.^{6} H02B *1/26*

U.S. Cl. 361—641 **2 Claims**



1. In combination with a panel board arrangement in a utility compartment and electrical bus connection means in a customer compartment adjacent to said utility compartment, and including fixed bus housing means for said electrical bus connection means, a sealing cover assembly for said electrical bus connection means, comprising:
- slidable base means mounted on said fixed bus housing means of said electrical bus connection means and having an end portion extending into said utility compartment;
- cover means fixedly mounted to said slidable base means for slidable movement therewith and for covering said electrical bus connection means when said sealing cover assembly is in a closed positioning in said customer compartment;
- operative means associated with said end portion of said slidable base means extending into said utility compartment for said panel board arrangement for resisting movement of said slidable base means in order to establish said closed positioning of said sealing cover assembly and for allowing movement of said slidable base means for an open positioning of said sealing cover assembly to allow access to said electrical bus connection means;
- wherein said utility compartment has a wall and a door, and wherein said operative means is comprised of slidable latching means mounted to said wall of said utility compartment and engagable with said slidable base means; and
- wherein said slidable latching means includes means for resisting the closing of said door of said utility compartment when said slidable latching means is in disengagement with said slidable base means, and for allowing said closing of said door of said utility compartment when said slidable latching means is in engagement with said slidable base means.

5,751,544
COMPUTER WITH A DETACHABLE HINGED LCD DISPLAY CABLE CONNECTION

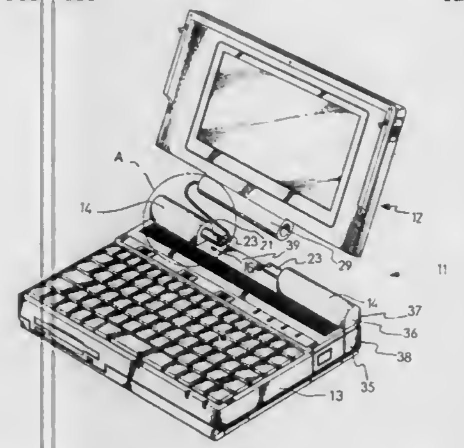
Kwang-Ho Song, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 15, 1996, Ser. No. 679,910

Claims priority, application Rep. of Korea, Oct. 6, 1995, 34296/1995

Int. Cl.^{6} G06F *1/16;* **H05K** *7/16*

U.S. Cl. 361—681 **12 Claims**



12. The process of connecting a video display to a base housing of a notebook computer, comprising:
- providing a plurality of clamps;
- attaching a hinge portion to each clamp;
- inserting an electrical cable through an aperture in one of said hinge portions;
- electrically connecting a first connector to said electrical cable;
- electrically connecting a second connector to said electrical cable;
- attaching each of said clamps to the base housing;
- attaching the video display to said hinge portion; and
- electrically connecting the video display to said second connector.

5,751,545
DESKTOP PERSONAL COMPUTER WITH AN EASY ASSEMBLY STRUCTURE

Hee-Duck Jung, Suwon-si, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

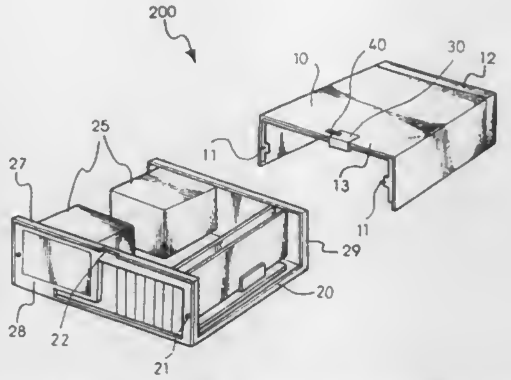
Filed Oct. 18, 1996, Ser. No. 730,901

Claims priority, application Rep. of Korea, Jan. 17, 1996, 819/1996

Int. Cl.^{6} G06F *1/16;* **H05K** *5/03*

U.S. Cl. 361—683 **20 Claims**

1. A desktop personal computer case with an easy assembly structure, comprising:



- a base of a computer case for containing internal circuits and a power source in a computer;
- a cover of the computer case mountable on said base to protect the internal circuits and the power source of the computer;
- a buckle mounted on a rear portion of said cover, for latching said cover to said base;
- a groove positioned in the top rear portion of said base;
- a detent mounted on the rear portion of said cover, for securing the buckle after the buckle latches said cover on to the groove of said base;
- a guide pin attached to and extended outwardly from said cover for aligning said cover with said base unit, when said cover is mounted on said base; and
- said base unit having a guide hole formed in the rear portion to receive said guide pin, when said cover is mounted on said base.

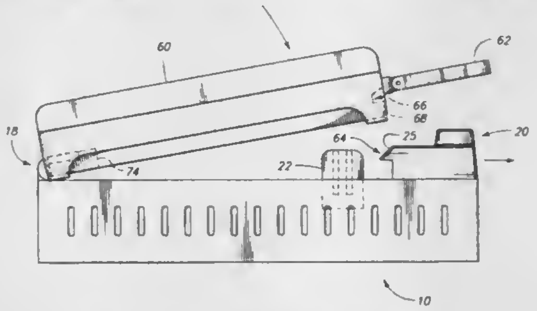
5,751,546
CRADLE ASSEMBLY FOR PORTABLE COMPUTING DEVICES AND METHOD

Jay Clark, Ione; Jonathan LaMarche, and Robert J. Tuttle, Sr., both of Spokane, all of Wash., assignors to Itronix Corporation, Spokane, Wash.

Filed Jun. 21, 1996, Ser. No. 670,723

Int. Cl.^{6} G06F *1/16;* **H05K** *1/16*

U.S. Cl. 361—686 **30 Claims**



1. A cradle for securing a portable electronic device, comprising:
- a base;
- a first mating member carried by the base and configured to removably receive and pivotally support a first end of a portable electronic device on the base;
- a second mating member carried by the base in spaced-apart and urgably movable fore/aft relation with the first mating member including a sloped contact face and a biasing spring, the second mating member configured to secure the portable electronic device to the base by pivotally moving a second end of the portable electronic device about the first mating member for latched engagement with the second mating member, the biasing spring configured to bias the second mating member into a load position toward the first mating member, the sloped contact face configured at the load location to be engaged by the portable electronic device during loading, the second mating member being urged away from the first mating member to receive a second end of the portable electronic device, the portable electronic device

being releasably retained between the first and second mating members upon engagement therebetween.

5,751,547

ELECTRONIC DEVICE SYSTEM INCLUDING A PORTABLE ELECTRONIC DEVICE HAVING A HANDWRITING INPUT DEVICE LOCKED TO AN EXPANSION STATION WHEN THE POWER SWITCH OF THE PORTABLE ELECTRONIC DEVICE IS TURNED ON

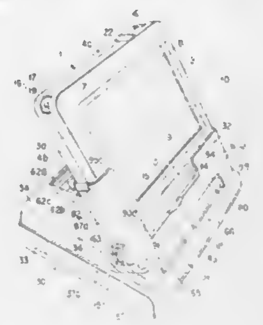
Masami Honda, Tokyo, and Yosuke Miura, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

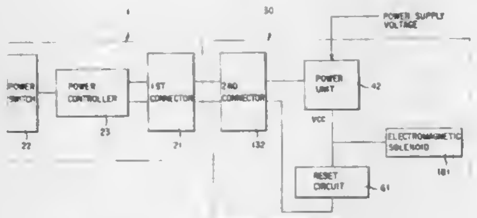
Continuation of Ser. No. 509,617, Jul. 31, 1995, Pat. No. 5,619,397. This application Nov. 22, 1996, Ser. No. 755,261

Claims priority, application Japan, Sep. 29, 1994, 6-235696

Int. Cl.⁶ G06F *1/16;* **H05K** *7/10;* **H01R** *13/639*

U.S. Cl. 361—686 **7 Claims**





1. A computer system comprising:

a portable computer having a power switch manually turned on or off, a controller for outputting a signal when the power switch is turned on, and a first connector to which the signal output from the controller is supplied; and

an expansion station having an expansion device for expanding a function of the computer and an input section connected to a power supply, the expansion station including

a main body containing the expansion device and the input section; a mount portion, arranged on the main body, for removably holding the computer, and a second connector electrically connected to the expansion device and the input section and electrically connected to the first connector when the computer is attached to the mount portion, wherein

the mount portion includes an engaging member movable between a first position, in which the engaging member hooks the computer, and a second position, in which the engaging member is released from the computer, and lock means movable between a lock position, in which the engaging member is inhibited from being moved from the first position to the second position, and a lock release position in which the engaging member is allowed to move from the first position to the second position; and

the lock means is maintained in the lock position when the computer is electrically connected to the input section through the first and second connectors and the lock means receives the signal output from the controller through the first and second connectors.

5,751,548

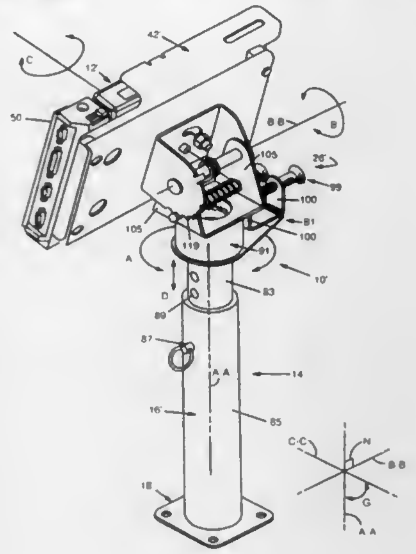
DOCKING STATION FOR A PORTABLE COMPUTER PROVIDING ROTATIONAL MOVEMENT OF THE COMPUTER'S VIEWABLE SCREEN IN THREE DIFFERENT PLANES

Charles William Hall; Julian Dominick Rizzi, both of Endicott, and John Arthur Stubecki, Nichols, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 645,461, May 28, 1996. This application Feb. 28, 1997, Ser. No. 810,226

Int. Cl.⁶ G06F *1/16;* **A47B** *9/00*

U.S. Cl. 361—686 **22 Claims**



1. A docking station for a portable computer having a viewable screen, said docking station comprising:

a base portion; and

a holder portion positioned on said base portion and adapted for holding said portable computer therein, said holder portion being rotationally adjustable in at least three different planes and including a first bracket assembly rotationally adjustable on said base portion in one of said three different planes and a second bracket assembly rotationally adjustable in a second of said three different planes substantially perpendicular to said one of said planes in which said first bracket assembly is rotationally adjustable.

5,751,549

HARD DISK DRIVE ASSEMBLY WHICH HAS A PLENUM CHAMBER AND A FAN ASSEMBLY THAT IS PERPENDICULAR TO A RACK CHAMBER

Anthony N. Eberhardt, Los Gatos; William L. Dailey, Redwood City, and John A. Harada, San Francisco, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jun. 26, 1996, Ser. No. 670,976

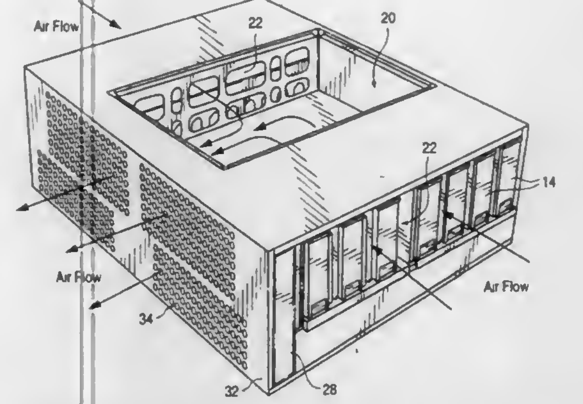
Int. Cl.⁶ G06F *1/20;* **H05K** *7/20*

U.S. Cl. 361—687 **11 Claims**

1. An electrical assembly, comprising:

a housing which has a rack chamber that is separated from a plenum chamber by a backbone wall which has an opening, and a fan side wall which separates a fan chamber from said plenum chamber, said fan side wall has both an opening and is perpendicular to said backbone wall;

an electronic assembly that is located within said rack chamber; and,



a fan that is located within said fan chamber, said fan induces an air flow from said rack chamber to said plenum chamber and from said plenum chamber to said fan chamber.

5,751,550

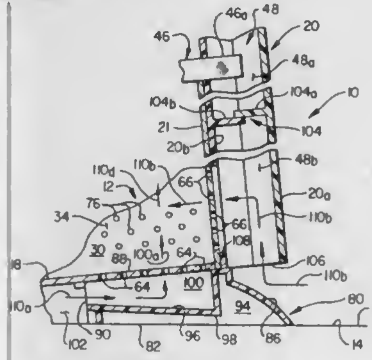
ULTRA-QUIET, THERMALLY EFFICIENT COOLING SYSTEM FOR FORCED AIR COOLED ELECTRONICS

George K. Korinsky, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 16, 1996, Ser. No. 633,134

Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—695 **33 Claims**



1. Electronic apparatus comprising:

a housing within which a heat generating electronic device may be operatively disposed, said housing being restable on a generally horizontal support surface and having front and rear spaced apart vertical exterior wall portions, a bottom exterior wall portion extending between said front and rear vertical exterior wall portions, a ventilation air inlet opening formed in said bottom exterior wall portion adjacent said front vertical exterior wall portion, and ventilation air outlet opening means formed in an exterior wall portion spaced apart from said ventilation air inlet opening;

a hollow foot structure depending from said bottom exterior wall portion adjacent said front vertical exterior wall portion and underlying said first ventilation air inlet opening, said hollow foot structure being configured to engage the support surface in a manner positioning said bottom exterior wall portion in a downwardly and rearwardly sloped relationship with the support surface and creating a vertical gap between the support surface and the underside of said housing; and

cooling means operative to sequentially flow ambient air through the interior of said hollow foot structure, into said housing through said first ventilation air inlet opening, and then outwardly from said housing through said ventilation air outlet opening means.

5,751,551

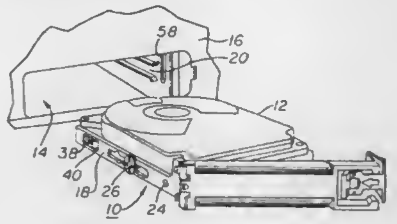
UNIVERSAL HARD DRIVE BRACKET WITH SHOCK AND VIBRATIONAL ISOLATION AND ELECTRICAL GROUNDING

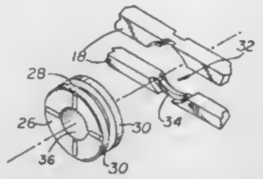
Vince Hileman, San Jose, and Khim H. Foo, Palo Alto, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Nov. 7, 1995, Ser. No. 554,679

Int. Cl.⁶ F16M *13/00;* **H05K** *5/00*

U.S. Cl. 361—753 **20 Claims**





1. An electronic card assembly that is inserted into a chassis, wherein the chassis can be subjected to a shock load that is transferred to the electronic card assembly, comprising:

an electronic card that has a pair of opposing edges;

a pair of guide rails that are attached to said edges of said electronic card, said guide rails each have a lip located within a slot; and,

a pair of damping members that each have an annular groove that receives said lip of said guide rail and is attached to an edge of said electronic card, said damping members are pressed between the chassis and said edges to dampen a shock load that may be transferred to said electronic card from the chassis.

5,751,552

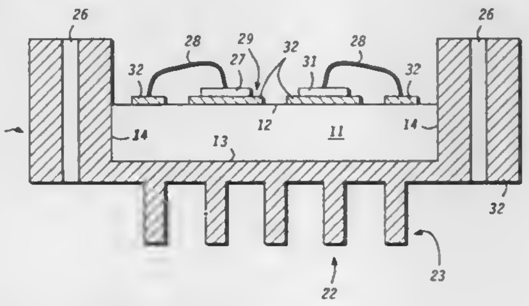
SEMICONDUCTOR DEVICE BALANCING THERMAL EXPANSION COEFFICIENT MISMATCH

Christopher M. Scanlan, and Carl J. Raleigh, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 688,084, Jul. 29, 1996, abandoned, and Ser. No. 452,753, May 30, 1995, abandoned. This application May 6, 1997, Ser. No. 851,811

Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—707 **19 Claims**



1. A semiconductor device comprising:

a semiconductor chip;

a substrate having a thermal expansion coefficient, a first surface, a second surface opposite the first surface, and a side surface coupling the first and second surfaces, the semiconductor chip overlying the first surface; and a material coupled to the substrate, the material having a thermal expansion coefficient different from the thermal expansion coefficient of the substrate, a first portion of the material having a thickness over the first surface of the substrate and located under the semiconductor chip, a second portion of the material having a thickness over the second surface of the substrate, a third portion of the material having a thickness over the side surface of the substrate wherein the thickness of the third portion of the material is greater than the thickness of the first portion of the material and is greater than the thickness of the second portion of the material, wherein the thickness of the first portion of the material is measured in a direction perpendicular to the first surface of the substrate, wherein the thickness of the second portion of the material is measured in a direction perpendicular to the second surface of the substrate, and wherein the thickness of the third portion of the material is measured in a direction perpendicular to the side surface of the substrate.

5,751,553

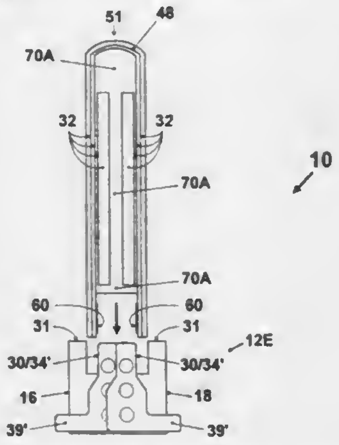
THIN MULTICHIP MODULE INCLUDING A CONNECTOR FRAME SOCKET HAVING FIRST AND SECOND APERTURES

James E. Clayton, 10605 Marbury Ct., Austin, Tex. 78726-1312

Division of Ser. No. 138,829, Oct. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 947,293, Sep. 16, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,532

Int. Cl.^{6} H05K *1/14;* **H01R** *9/09*

U.S. Cl. 361—749 **3 Claims**



1. An apparatus for attaching semiconductor devices to a circuit board, comprising:

a connector frame socket fixedly attached to the circuit board and including first and second apertures for receiving a semiconductor module, wherein said connector frame socket includes a center contact portion and first and second ends extending beyond said center contact portion; and

a semiconductor module adapted to be removably attached to the connector frame socket, wherein the semiconductor module comprises:

- a generally U-shaped composite substrate having first and second members;
- a first plurality of semiconductor devices connected to said first member of said composite substrate;
- a second plurality of semiconductor devices connected to said second member of said composite substrate; and
- means associated with the distal ends of said members operable to electrically connect said first and second members to said first and second apertures, respectively.

5,751,554

TESTABLE CHIP CARRIER

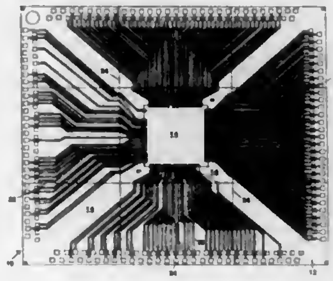
Simon Mark Williams, Ayr, and Michael Lawrence McGeary, Ayrshire, both of Scotland, assignors to Digital Equipment Corporation, Maynard, Mass.

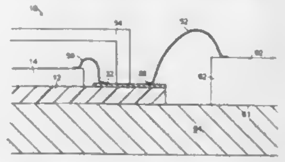
Continuation of Ser. No. 180,600, Jan. 13, 1994, abandoned. This application Mar. 7, 1996, Ser. No. 612,206

Claims priority, application United Kingdom, Jan. 19, 1993, 9300951

Int. Cl.^{6} H05K *7/02;* **H01R** *9/00*

U.S. Cl. 361—760 **18 Claims**





1. A chip carrier comprising a rigid substrate, at least a first surface thereof being electrically insulating, the planar area of the substrate being divided into three portions:

the first portion adapted for the siting of an integrated circuit chip, the chip having a plurality of bonding pads for electrical connections to the chip;

the second portion bounding said first portion and having a first plurality of conductive traces formed on said first surface thereof;

the third portion bounding said second portion and having a second plurality of conductive traces formed on a first surface thereof, the first conductive traces being electrically connected to corresponding traces of the second plurality of traces in the third portion;

the first conductive traces each terminating, at one end thereof, at inner bonding areas, and fanning out from the inner bonding areas to terminate, at the other end thereof, at outer bonding areas at the outer periphery of the second portion;

characterized by

the inner bonding areas being positioned on the substrate within the first portion or at the inner periphery of the second portion, at positions orthogonally projected outward from each bonding pad of the chip in the plane of the substrate thereby resulting in a substantially identical distance from each bonding pad of a chip sited in said first portion to a corresponding inner bonding area.

5,751,555

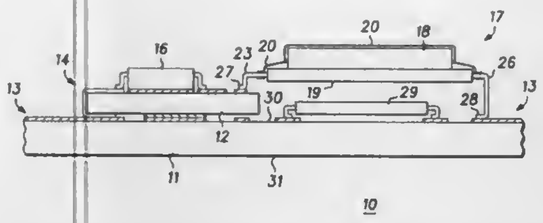
ELECTRONIC COMPONENT HAVING REDUCED CAPACITANCE

Henry L. Pfizenmayer, and Frederick C. Wernett, III, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 19, 1996, Ser. No. 697,095

Int. Cl.^{6} H05K *1/16*

U.S. Cl. 361—763 **20 Claims**



1. An electronic component comprising:

a first substrate having an electrically conductive path;

a second substrate having an electrically conductive path, the first substrate overlying the second substrate;

a first electronic device overlying the first substrate and electrically coupled to the electrically conductive path of the first substrate;

a second electronic device having a first lead and a second lead, the first lead overlying the first substrate and electrically coupled to the electrically conductive path of the first substrate, the second lead overlying the second substrate and electrically coupled to the electrically conductive path of the second substrate; and

a third electronic device electrically coupled to the electrically conductive path of the second substrate, the third electronic device underlying the second electronic device and overlying the second substrate.

5,751,556

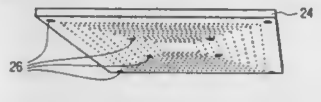
METHOD AND APPARATUS FOR REDUCING WARPAGE OF AN ASSEMBLY SUBSTRATE

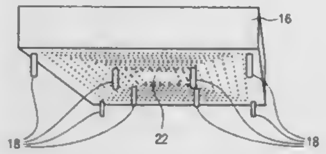
Peter O. Butler, Hillsboro, and Ricardo E. Suarez-Gartner, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

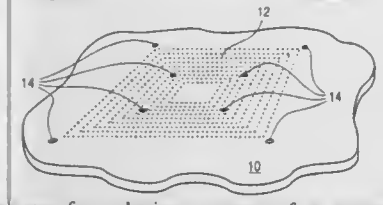
Filed Mar. 29, 1996, Ser. No. 625,794

Int. Cl.^{6} H05K *1/18*

U.S. Cl. 361—773 **18 Claims**







1. An apparatus for reducing warpage of an assembly substrate with respect to a surface mount technology (SMT) component, said assembly substrate including a plurality of apertures therethrough, said apparatus comprising:

a plurality of mounting pins extending from said SMT component, said mounting pins corresponding to and registrable with said apertures in said assembly substrate, said mounting pins adapted to provide an interference fit between said SMT component and said assembly substrate.

5,751,557

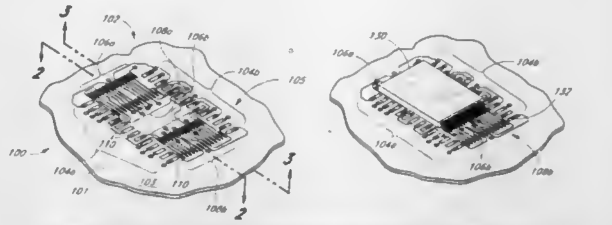
PRINTED CIRCUIT BOARD HAVING A TRIPLE PATTERN FOOTPRINT FOR RECEIVING ONE OF THREE COMPONENT PACKAGES

David J. Silva, Trabuco Canyon, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jun. 21, 1996, Ser. No. 667,617

Int. Cl.^{6} H01R *9/09*

U.S. Cl. 361—777 **18 Claims**



1. A printed circuit board comprising:

a first plurality of pin receptors formed in a first row and in a second row parallel to said first row on a first surface of said board, wherein said first and second rows of said first plurality of pin receptors define a portion of an outer boundary of a first area of said printed circuit board and wherein said first plurality of pin receptors are configured to receive a plurality of pins on a first component so that, when said first component is positioned on said printed circuit board, said first component substantially covers said first area;

a second plurality of pin receptors formed in a third row and in a fourth row parallel to said third row on said first surface of said board, wherein said third and fourth rows of said second plurality of pin receptors are positioned within said first area and wherein said second plurality of pin receptor are configured to receive a plurality of pins on a second component so that, when said second component is positioned on said printed circuit board, said second component covers a first portion of said first area;

a third plurality of pin receptors formed in a fifth row and in a sixth row parallel to said fifth row on said first surface of said board, wherein said fifth and sixth rows of said third plurality of pin receptors are positioned within said first area and wherein said third plurality of pin receptor are configured to receive a plurality of pins on a third component so that, when said third component is positioned on said printed circuit board, said third component covers a second portion of said first area; and

a plurality of conductors interconnecting pin receptors in said first plurality of pin receptors with corresponding pin receptors in said second plurality of pin receptors and with corresponding pin receptors in said third plurality of pin receptors.

5,751,558

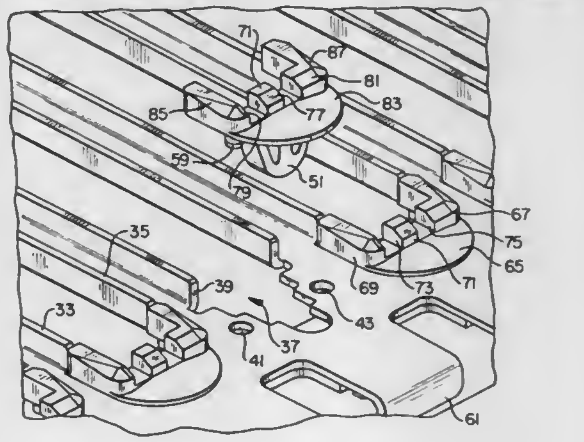
DEVICE FOR IMPROVING COMPUTER CAGE SLOT KEYING

John Theodore Gullicksrud, Rochester; Dale Joseph Lidberg, Wabasha, and Michael David Seyfert, Chatfield, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1996, Ser. No. 610,038

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—801 **10 Claims**



1. An apparatus for use in computer cages of the type having an interior with at least one guide rail for guiding a logic-card book into position within the interior, the guide rail having opposing ends, the computer cage also having at least one cage guide

opening provided at a selected location along the at least one guide rail, the apparatus comprising:

a keyblock mountable within the cage guide opening, the keyblock having an upper surface and a lower surface;

mounting means located on the keyblock lower surface for removably mounting and retaining the keyblock within the cage guide opening;

locating means on the keyblock lower surface for properly positioning the keyblock within the cage guide opening;

at least one contoured region on the keyblock upper surface for engaging and leading-in a complimentary surface located on the logic-card book being received within the cage interior;

and at least one slot provided on the keyblock upper surface for limiting or allowing access to a complimentary feature present on the logic-card book being received within the cage interior to thereby insure that the logic-card book is properly installed within the cage interior.

5,751,559

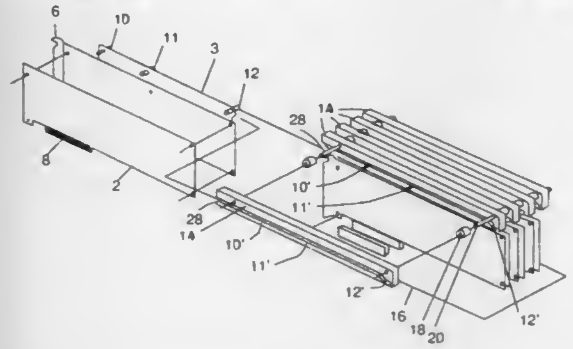
APPARATUS FOR INSERTING PC CARDS HAVING RECESSED GUIDE PATHS WITH MULTIPLE LEVELS IN THE GUIDE PATHS

David John Jensen, Raleigh, and Charles Steven Lingafelt, Durham, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1996, Ser. No. 728,295

Int. Cl.⁶ H05K *1/11*

U.S. Cl. 361—802 **22 Claims**



1. An apparatus capable of housing plug-in packages, each plug-in package having at least a connector and plug-in package guide means, said apparatus comprising:

a housing having an insertion opening for inserting said plug-in package into said housing and housing guide means arranged on said housing for guiding said plug-in package by said plug-in package guide means into said housing;

a circuit board mounted in said housing, said circuit board having a socket for connecting said connector of said plug-in package with said circuit board, wherein said connecting direction between said circuit board and said plug-in package is perpendicular to the inserting direction of said plug-in package wherein:

said plug-in package guide means has at least a pivot guiding pin which is arranged at a significant distance from said connector;

said housing guide means has a continuously recessed guide path for guiding said pivot guiding pin, said guide path has a guiding portion located at a first level and a stop portion defining a moving pivot point located at a second level and the transition of said pivot pin from said guiding portion to said stop portion causes a defined rotation of said plug-in package about said pivot point in the plane defined by said socket and said connector wherein said plug-in package is rotatably arranged at said pivot point.

5,751,560

SWITCHING POWER CIRCUIT WITH CURRENT RESONANCE FOR ZERO CURRENT SWITCHING

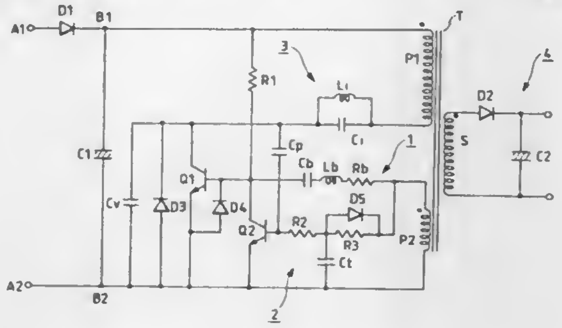
Kenji Yokoyama, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 566,021, Dec. 1, 1995, abandoned. This application Aug. 6, 1997, Ser. No. 914,027

Claims priority, application Japan, Dec. 12, 1994, 6-332083

Int. Cl.⁶ H02M *3/335*

U.S. Cl. 363—18 **21 Claims**



1. A switching power circuit comprising:

first and second input terminals;

a transformer including a primary winding having a first end which connects to said first input terminal;

a switching transistor connected between a second end of the primary winding of said transformer and said second input terminal;

timing control means for controlling an on-off operation of said switching transistor;

rectifying and smoothing means connected on a secondary winding of said transformer for rectifying and smoothing an output from said secondary winding; and

a current resonance circuit connected in series with the primary winding of said transformer and said switching transistor, said current resonance circuit being determined in accordance with a leakage inductance of said transformer.

5,751,561

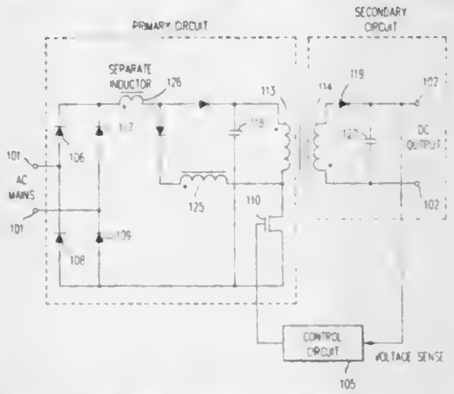
LOW COST AC-TO-DC CONVERTER HAVING INPUT CURRENT WITH REDUCED HARMONICS

Francis Man Shuen Ho, Sheung Shui, and Robert Chun Fung Lee, Causeway Bay, both of Hong Kong, assignors to Computer Products, Inc., Fremont, Calif.

Continuation of Ser. No. 543,561, Oct. 16, 1995, Pat. No. 5,600,546. This application Feb. 3, 1997, Ser. No. 794,755

Int. Cl.⁶ H02M *3/335*

U.S. Cl. 363—21 **14 Claims**



1. An AC-to-DC power converter, comprising:

a rectifier having first and second input terminals and first and second output terminals;

a transformer comprising a first primary winding, a second primary winding and a secondary winding;

a first diode coupled in series with the second primary winding, said series combination of the second primary winding and the first diode being coupled to a second terminal of the first primary winding;

a storage capacitor having a first terminal and a second terminal, the first terminal of the storage capacitor being coupled to a first terminal of the first primary winding;

an inductor having a first terminal and a second terminal, the first terminal of the inductor being coupled to the first output terminal of the rectifier and the second terminal of the inductor being coupled to the series combination of the second primary winding and the first diode;

a second diode having a first terminal and a second terminal, the second terminal of the second diode being coupled to the first terminal of the first primary winding;

a rectifying circuit coupled to the secondary winding, the rectifying circuit having a DC output terminal; and

a power switch having a first terminal and a second terminal, said first terminal being coupled to the series combination of the second primary winding and the first diode, the second terminal of the power switch being coupled to the second output terminal of the rectifier and to the second terminal of the storage capacitor, said power switch configured to be turned on and off multiple times during a period of an AC voltage present between the first and second input terminals of the rectifier.

5,751,562

Patent Not Issued For This Number

5,751,563

HVDC TRANSMISSION

Per-Erik Björklund, Ludvika, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

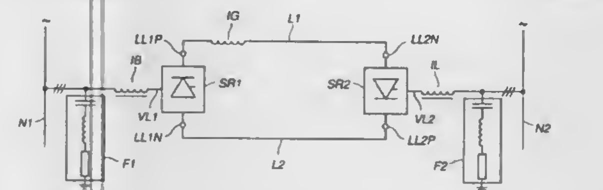
PCT No. PCT/SE95/00782, § 371 Date Oct. 10, 1996, § 102(e) Date Oct. 10, 1996, PCT Pub. No. WO96/01517, PCT Pub. Date Jan. 18, 1996

PCT Filed Jun. 26, 1995, Ser. No. 722,169

Claims priority, application Sweden, Jul. 4, 1994, 9402359

Int. Cl.⁶ H02J *3/36*

U.S. Cl. 363—35 **15 Claims**



1. An HVDC transmission, comprising:

at least two converters, wherein each converter is adapted for connection between a three-phase alternating-voltage network wherein at least a first converter has ac leads for connection of the first converter to the alternating-voltage network without the use of a separate winding transformer;

a dc link common to the converters

a zero-sequence inductor connection arranged in the ac leads of the first converter and designed such that the zero-sequence inductor connection exhibits a high impedance to zero-sequence currents and a low impedance to positive-sequence currents.

5,751,564

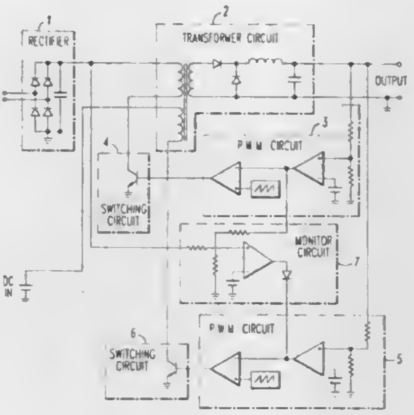
DUAL/MULTIPLE VOLTAGE LEVEL INPUT SWITCHING POWER SUPPLY

Ghing-Hsin Dien, 10F-A, No. 148, Sec. 2, Fu Hsing S. Rd., Taipei, Taiwan

Filed Aug. 10, 1994, Ser. No. 292,815

Int. Cl.⁶ H02M *5/45*; H02J *7/00*

U.S. Cl. 363—37 **4 Claims**



3. A switching power supply system comprising:

(a) a transformer circuit, said transformer circuit comprising a first input for connection to a primary power source and second input for connection to a secondary power source;

(b) a power supply output to be connected to a load;

(c) means for regulating said power supply output;

(d) means for sensing an interruption wherein said interruption is selected from the group comprising: said primary power source falling below a first predetermined voltage, said power supply output falling below a second predetermined voltage, and said primary power source approaching an overload condition; and

(e) means for utilizing said secondary power source when said interruption is sensed and, wherein said means for regulating said power supply output, said means for sensing an interruption, and said means for utilizing said secondary power source when said interruption is sensed comprises:

(i) a first switching circuit controlling a current flow from said primary power source through said first input of said transformer circuit;

(ii) a first pulse width modulator circuit regulating said power supply output by controlling the on and off operation of said first switching circuit;

(iii) a second switching circuit controlling a current flow from said secondary power source through said second input of said transformer circuit;

(iv) a second pulse width modulator circuit regulating said power supply output by controlling the on and off operation of said second switching circuit; and

(v) a monitor circuit monitoring a voltage from said first input and monitoring a voltage from said first pulse width modulator circuit, said monitor circuit comparing both said voltage from said first input and said voltage from said first pulse width modulator circuit to a reference voltage, and said monitor circuit enabling said second pulse width modulator circuit when said voltage from said first input and said voltage from said first pulse width modulator circuit are below said reference voltage.

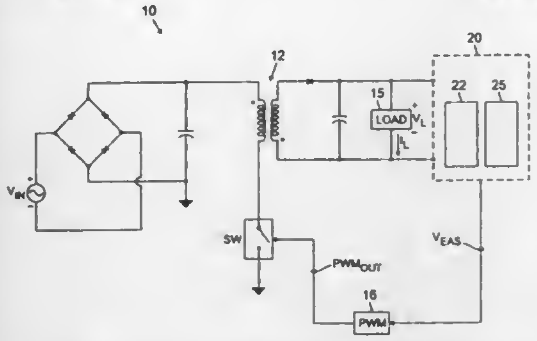
5,751,565
CONTROLLING PULSE SKIP MODULATION IN POWER CONVERSION

Richard A. Faulk, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 4, 1996, Ser. No. 707,697

Int. Cl.⁶ H02M *7/00;3/335*

U.S. Cl. 363—41 **20 Claims**



1. A control circuit for producing a feedback signal to a pulse width modulator that generates switch control pulses for a switching converter that delivers power to a load at a regulated load voltage level, comprising:

circuitry for monitoring directly the level of the load voltage; and

circuitry for generating an interruption feedback signal that, in a low-load mode, causes the pulse width modulator to interrupt the generation of switch control pulses, when the monitored load voltage level has risen to an upper threshold voltage level and until the monitored load voltage level drops to a lower threshold voltage level; and

in a normal mode, allows the pulse width modulator to modulate the width of switch control pulses without interrupting the generation of switch control pulses.

5,751,566
CURRENT STABILIZER WITH STEP-UP TRANSFORMER

Otto Vongehr, Aldersbach/Bundesrepublik, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

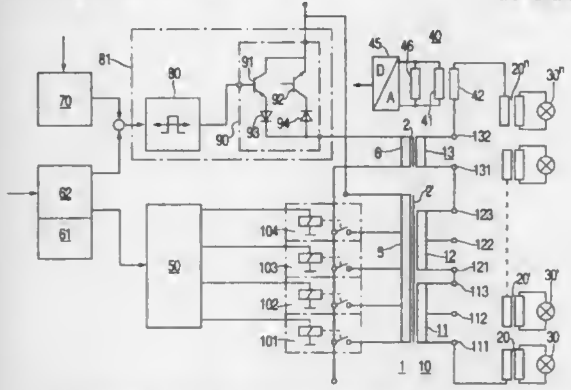
PCT No. PCT/DE94/01529, § 371 Date Jun. 24, 1996, § 102(e) Date Jun. 24, 1996, PCT Pub. No. WO95/17707, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 22, 1994, Ser. No. 666,449

Claims priority, application Germany, Dec. 23, 1993, 43 44 286.2

Int. Cl.⁶ H02M *3/335*

U.S. Cl. 363—71 **10 Claims**



1. In a lighting system a constant-current regulator comprising:

a first unit for selecting a basic voltage;

a step-up transformer including a first primary winding coupled to the first unit, wherein an additional power for supplementing the basic voltage is produced using one of a second primary winding of the step-up transformer and a second transformer which includes the second primary winding and a secondary winding;

a switch-mode regulator module for regulating the additional power, wherein the switch-mode regulator module drives the second primary winding; and

a drive circuit by which the switch-mode regulator module drives the second primary winding.

5,751,567
AC-DC CONVERTER

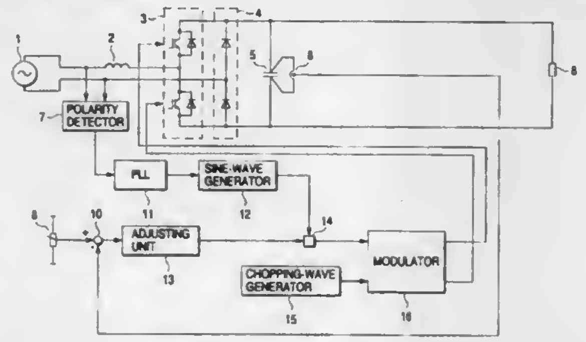
Jiro Toyozaki; Takao Yanase; Shinichi Ishii, and Takashi Aihara, all of Kanagawa, Japan, assignors to Fuji Electric Co., LTD., Kanagawa, Japan

Filed Jan. 10, 1997, Ser. No. 782,485

Claims priority, application Japan, Jan. 12, 1996, 8-020588

Int. Cl.⁶ H02M *5/42*

U.S. Cl. 363—89 **6 Claims**



1. An AC-DC converter, comprising:

DC output voltage instruction setting means for setting a DC output voltage instruction value;

DC output voltage detecting means for detecting a DC output voltage detection value;

adjusting means for adjusting which operates to zero a difference between the DC output voltage instruction value and the DC output voltage detection value to zero;

means for generating a modulating wave;

a modulator for comparing a carrier wave based on an output signal from said adjusting means with the modulating wave to output drive pulses;

a switching element which turns on and off according to the drive pulses to provide a DC output voltage higher than a full-wave rectification voltage of an AC input voltage;

an AC power source for generating an AC input voltage;

means for detecting the polarity of the AC input voltage;

means for generating a sine wave synchronous with the AC input voltage according to a detection value from said polarity detecting means; and

a multiplier for multiplying the sine wave by an output signal of said adjusting means to obtain the carrier wave.

5,751,568
POWER SUPPLY APPARATUS FOR ARC-UTILIZING EQUIPMENT

Kenzo Danjo, Kyoto-fu; Atsushi Kinoshita, Osaka; Shigeru Okamoto, Hirakata; Haruo Moriguchi, Itami, and Takashi Hashimoto, Kobe, all of Japan, assignors to Sansha Electric Manufacturing Company, Limited, Osaka, Japan

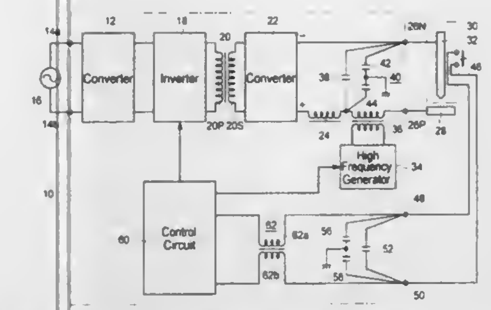
Filed Dec. 3, 1996, Ser. No. 758,691

Int. Cl.⁶ H02M *3/335;* **H23K** *9/095*

U.S. Cl. 363—95 **7 Claims**

1. A power supply apparatus for arc-utilizing equipment, comprising:

first converter means for receiving and converting an AC voltage to a DC voltage;



inverter means for converting said DC voltage from said first converter means to a high-frequency voltage;

a voltage-transformer having primary and secondary windings, said transformer receiving said high frequency voltage from said inverter means and inducing a voltage-transformed high-frequency voltage in said secondary winding;

second converter means for converting said voltage-transformed high-frequency voltage from said voltage-transformer to a DC voltage;

two output terminals between which an output voltage of said second converter means is developed, said two output terminals being adapted for connection to a torch electrode of a torch of said arc-utilizing equipment and a workpiece to be processed by said equipment, respectively;

high-frequency voltage generating means including a coupling coil having its one end connected to one of said two output terminals;

a bypass capacitor connected between the other end of said coupling coil and the other one of said two output terminals; and

control means for controlling said high-frequency voltage generating means and said inverter means;

said bypass capacitor being connected directly between said other output terminal and said other end of said coupling coil.

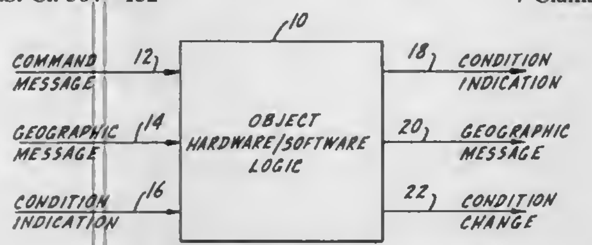
5,751,569
GEOGRAPHIC TRAIN CONTROL

Omer Metel, and Francois Pretorius, both of Rancho Cucamonga, Calif., assignors to Safetran Systems Corporation, Minneapolis, Minn.

Filed Mar. 15, 1996, Ser. No. 617,469

Int. Cl.⁶ B61L *21/00;27/00*

U.S. Cl. 364—132 **7 Claims**



1. A method of controlling railroad train movement over a geographically defined network of geographic control objects which represent a layout of railroad track which includes signals, switches and track blocks, each signal having signal control hardware and software logic, which logic includes an address, representation of signal condition, and means for initiating a change in signal condition (signal object logic), each switch having switch control hardware and software logic, which logic includes an address, representation of switch condition, and means for initiating a change in switch condition (switch object logic), each track block having hardware and software logic, which logic includes an address and representation of track block occupancy condition (track object logic), each object logic including the addresses of only its next adjacent neighboring objects,

the method including the steps of establishing communication between each signal object logic, switch object logic, and track object logic and only its next adjacent object's logic regardless whether it be signal object logic, switch object logic, or track object logic, with such communication being one of a plurality of predetermined messages, which messages either request a response relative to train movement, or provide a response relating to train movement.

5,751,570
METHOD OF AUTOMATICALLY IDENTIFYING AN UNKNOWN NUMBER OF TRANSPONDERS WITH A READER AND IDENTIFICATION SYSTEM FOR EXECUTING THE METHOD

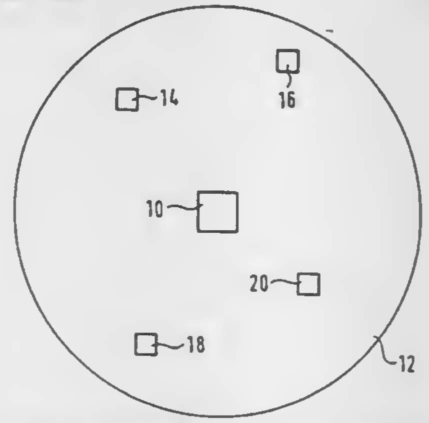
Anatoli Stobbe, Steinradweg 3, D-30890 Barsinghausen, and Holger Merk, Barsinghausen, both of Germany, assignors to Anatoli Stobbe, Barsinghausen, Germany

Filed Jul. 9, 1996, Ser. No. 677,121

Claims priority, application Germany, Jul. 19, 1995, 195 26 353.7

Int. Cl.⁶ H04B *7/00*

U.S. Cl. 364—140 **20 Claims**



1. A method of automatically identifying an unknown number of transponders with a reader, whereby the transponders are activated by an electromagnetic field generated by the reader and transmit their specific transponder data (identification data of the transponder and application-specific characteristic data) to the reader, whereby the transponders can be identified individually and successively by the reader and the transponder data are evaluated, and whereby the method comprises at least the following steps for an initial identification phase:

the transponders which are located within the range of effectiveness of the electromagnetic field and activated are put into a dead state by a collision signal transmitted by the reader in which the transponders cease transmission of transponder data;

each transponder generates a random or pseudo-random dead state for itself after receiving the collision signal;

the transponders resume transmission of their transponder data at the end of their dead states;

the reader transmits an occupied signal after receiving the data from at least one transponder as a result of the deviating dead states;

the other remaining transponders are put into idle states in which they no longer transmit transponder data due to the occupied signal;

after reception of the complete transponder data from the individual transponder, the reader transmits an acknowledge signal;

the transponder which has been identified is put into an idle state by the acknowledge signal in which it ceases transmission of transponder data for the first identification phase; and

the other transponders in idle states are reactivated and the steps described above are repeated until all transponders have been identified individually and successively by the reader.

5,751,571

PROCESS AND APPARATUS FOR DETERMINING OPTIMUM VALUES FOR MANIPULATED VARIABLES OF A TECHNICAL SYSTEM

Volker Tresp, München; Bernd Schürmann, Haimhausen, and Martin Schlang, München, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

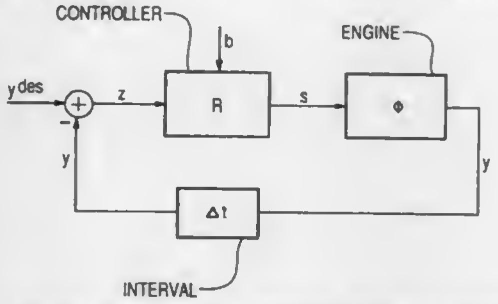
PCT No. PCT/DE94/00762, § 371 Date Jan. 4, 1996, § 102(e) Date Jan. 4, 1996, PCT Pub. No. WO95/02213, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 1, 1994, Ser. No. 578,600

Claims priority, application Germany, Jul. 5, 1993, 43 22 365.6

Int. Cl.^{6} G05B *13/04;* **G06F** *15/18*

U.S. Cl. 364—148 **9 Claims**



1. A process for determining optimum values for manipulated variables of a technical system for prescribed operational variables for optimizing a prescribed target function of system properties, comprising the steps of:

a) using a set of functions whose parameters are set such that the functions of the set of functions model the system such that functions contained in the set of functions approximate system functions of the system properties as functions of variables of the set of functions in terms of an interval of prescribed magnitude, and

b) determining the manipulated variables by optimizing the set of functions at fixed values of the parameters and the operational variables;

c) controlling the technical system via the determined manipulated variable.

5,751,572

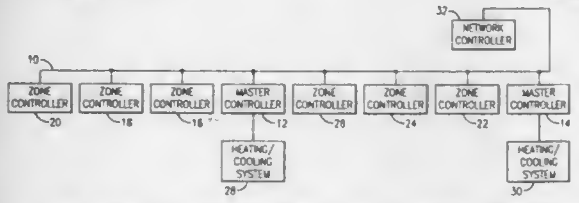
HVAC COMMUNICATION NETWORK

Stephen M. Maciulewicz, Auburn, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 22, 1996, Ser. No. 670,197

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—132 **34 Claims**



1. A process of communicating HVAC control information between a master controller for a heating or cooling system and the zone controllers associated with the master controller wherein the zone controllers control the amount of conditioned air to be provided by such heating or cooling system to particular zones to be heated or cooled and wherein the master controller and the zone controllers are linked together by a communication system carrying the HVAC control information between the master controller and the zone controllers, said process comprising the steps of:

sending a message over the communication system from the master controller to the zone controllers wherein said message includes an identification of the master controller;

reading at least a portion of the message at each zone controller wherein said read portion includes the identification of the master controller;

comparing, within each zone controller, the identification of the master controller with a master controller identification assigned to the particular zone controller; and

accepting the message at a particular zone controller for use in controlling the amount of conditioned air to be provided to a zone associated with the particular zone controller when the read identification of the master controller equals the assigned master controller identification for the particular zone controller.

5,751,573

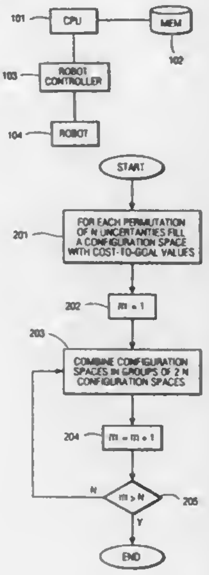
PATH PLANNING IN AN UNCERTAIN ENVIRONMENT

Alexander John Cameron, Tarrytown, and Leendert Dorst, Mt. Kisco, both of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 805,234, Dec. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,303, Nov. 16, 1990, and a continuation-in-part of Ser. No. 508,024, Apr. 11, 1990. This application Jan. 27, 1994, Ser. No. 187,370

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—167.01 **20 Claims**


101
CPU
MEM
102
103
ROBOT CONTROLLER
104
ROBOT
START
201
FOR EACH PERMUTATION OF N UNCERTAINTIES FILL A CONFIGURATION SPACE WITH COST-TO-GOAL VALUES
202
m = 1
203
COMBINE CONFIGURATION SPACES IN GROUPS OF 2 N CONFIGURATION SPACES
204
m = m + 1
N
m > N
205
Y
END

1. A method for controlling an object in an environment having N uncertainties comprising the steps of

a) starting from a plurality of configuration space representations, each configuration space representing cost to goal values for a possible environment of the object;

b) combining the plurality of configuration space representations to yield a result configuration space representation;

c) finding a path based on the result configuration space representation;

d) controlling the object to follow the path.

5,751,574

METHOD FOR LOADING SOFTWARE IN COMMUNICATION SYSTEMS WITH NON-REDUNDANT, DECENTRALIZED EQUIPMENT

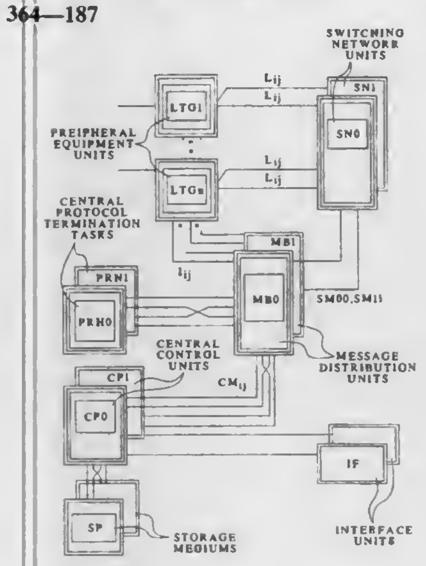
Norbert Loebig, Darmstadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 10, 1996, Ser. No. 711,776

Claims priority, application Germany, Sep. 13, 1995, 195 33 961.4

Int. Cl.^{6} G05B *9/02*

U.S. Cl. 364—187 **13 Claims**



1. A method for loading software into a communication system which is connected to at least one subscriber line network and wherein the communication system is formed of first and second system halves with the second system half being redundant to the first system half, comprising the steps of:

providing each of the first and second system halves with a plurality of non-redundant peripheral equipment units operating in non-redundant manner, the peripheral equipment units each connecting equipment in both of the respective system halves to the at least one subscriber line network via defined interfaces, the defined interfaces providing communication channels for carrying useful data and also being available for changeover to standby;

placing the first system half with its associated peripheral equipment units into a defined initial condition by changing communication channels after they are finished carrying useful data in the first system half over to standby and then rerouting them over to the second system half;

loading software into the first system half which had been placed into the defined initial condition, and including loading the software into the respective peripheral equipment units of the first system half;

after loading of the software into the first system half is completed, placing the communication channels in the second system half in standby and then rerouting them over to the first system half already loaded with the software;

then loading software into the second system half including into the respective peripheral equipment units of the second system half; and

thereafter restoring redundant operation of the first and second system halves.

5,751,575

METHOD AND APPARATUS FOR AIDING CONFIGURATION MANAGEMENT OF A COMPUTER SYSTEM

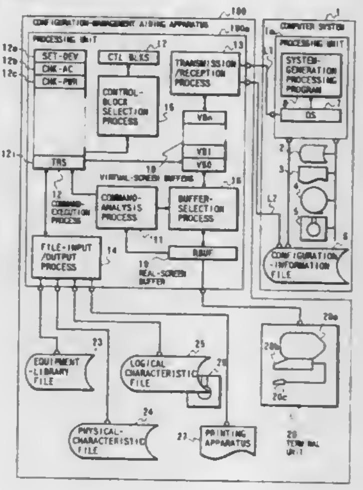
Toshio Hirosawa, Tokyo; Tsutomu Ito, Tsukui-Gun; Motohide Kokunishi; Atsushi Ueoka, both of Tokyo; Seiji Inoue, Hadano, and Yosbio Ukai, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 20, 1995, Ser. No. 504,665

Claims priority, application Japan, Jul. 22, 1994, 6-171153

Int. Cl.^{6} G05B *9/02*

U.S. Cl. 364—188 **44 Claims**



1. A method of generating configuration defining parameters of a computer system for a computer center by an aiding computer before the computer system is configured, the computer system comprising pieces of equipment which include at least one processing unit and other apparatuses, said apparatuses including a plurality of input/output devices to be connected to said at least one processing unit through channels, said plurality of input/output devices including a plurality of storage devices and at least one printer, said aiding computer including a processing unit, an input device and a display unit, said method comprising steps executed by said aiding computer, the steps including:

a first step of determining proper installation locations of said pieces of equipment by displaying a drawing of an installation area and figures of said pieces of equipment on a display screen of said display unit and through interactive operations with a user through said input device;

a second step of inspecting appropriateness of connection by cables between said pieces of equipment, in response to specifying of said connection by the user, after installation locations of said pieces of equipment have been determined at said first step; and

a third step of generating configuration defining parameters of said computer system, based on said connection by cables, after said connection by cables has been inspected as being appropriate at said second step, said configuration defining parameters for said computer system including information which is related to said apparatuses included in said computer system and is required by a system generation program within an operating system controlling said computer system, said system generation program being one which executes system generation processing for enabling said operating system to use said apparatuses included in said computer system, based upon said generated configuration defining parameters for said computer system, when said system generation program is executed on said one processing unit within said computer system after said computer system has been configured.

5,751,576

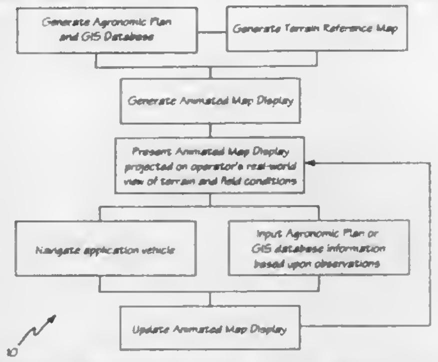
ANIMATED MAP DISPLAY METHOD FOR COMPUTER-CONTROLLED AGRICULTURAL PRODUCT APPLICATION EQUIPMENT

Robert J. Monson, Saint Paul, Minn., assignor to Ag-Chem Equipment Co., Inc., Minnetonka, Minn.

Filed Dec. 18, 1995, Ser. No. 574,268

Int. Cl.^{6} G05B *15/00*

U.S. Cl. 364—188 **45 Claims**


Generate Agronomic Plan and GIS Database
Generate Terrain Reference Map
Generate Animated Map Display
Present Animated Map Display projected on operator's real-world view of terrain and field conditions
Navigate application vehicle
Input Agronomic Plan or GIS database information based upon observations
Update Animated Map Display
10

1. A method for displaying information in a computer-controlled system for distributing a product onto a field using a vehicle driven by an operator, the distribution of said product being controlled at least in part by an map corresponding to regions of said field to receive varying densities of said product, said map being maintained in a processor and containing information relating to an agronomic plan, said field defining a real-world terrain having features, said operator having a field of view through a viewing surface encompassing at least a portion of said real-world terrain which changes over time as said vehicle traverses said field, said method comprising the steps of:

identifying a location and an orientation of the vehicle within the field at a given time;

determining from said location and said orientation the features of the terrain within the field of view of the operator at said given time by reference to the map;

generating an image containing the information to be displayed to the operator; and

presenting said image so that it is visible within the field of view of the operator such that the operator views the information corresponding to the real-world terrain encompassed by the field of view of the operator, said image being displayed on the viewing surface using a heads-up type display such that at least a portion of said image is visually overlaid onto the real world terrain encompassed by the field of view of the operator,

whereby the operator simultaneously views the real-world terrain and the information and selectively compares the information being projected with the features of the real-world terrain of the field.

5,751,577

PRODUCTION DATA PREPARING SYSTEM FOR PRODUCING A METAL MASK PLATE

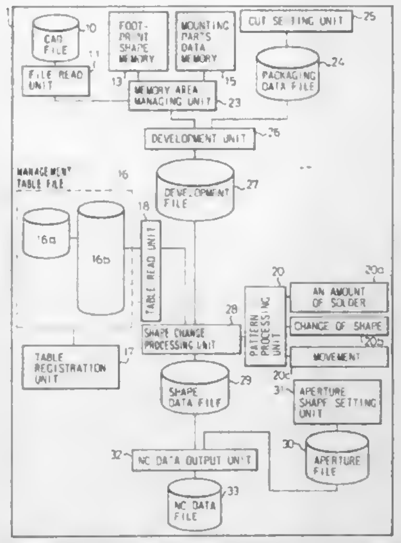
Akira Sakai; Miki Ichikawa, and Selichi Urita, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 288,049, Aug. 10, 1994, abandoned. This application Dec. 9, 1996, Ser. No. 761,863

Claims priority, application Japan, Sep. 27, 1993, 5-239514

Int. Cl.^{6} G05B *19/42;* G06F *19/00;* G06G *7/64;7/66*

U.S. Cl. 364—191 **22 Claims**



10. A production data preparing system for producing a metal mask plate used for soldering surface mounting devices (SMDs) on a printed-circuit board, comprising:

a CAD file storing production data for preparing the printed-circuit board, the production data including substrate data, packaging parts data and remodeling data of the SMDs, and the packaging parts data comprising parts-position data, pin-position data, and foot-print shape data;

a foot-print shape storage unit, operatively connected to the CAD file, storing target foot-print shape data extracted from the CAD file in order to change the foot-print shapes;

a mounting parts data storage unit, operatively connected to the CAD file, storing data of target SMDs extracted from the CAD file;

a management table file storing packaging parts attributes and foot-print shape changing rules and relationships therebetween; and

a preparation unit operatively connected to the foot-print shape storage unit, the mounting parts data storage unit and the management table file, the preparation unit preparing production data used for providing the metal mask plate and further comprising:

  a pattern processing unit determining at least two of:

    i. an amount of solder to be supplied on the metal mask plate,

    ii. a change of the foot-print shape, and

    iii. movement of the foot-print shape,

  a data processing unit preparing production data for the metal mask plate, and

  a controller controlling operation of the pattern processing unit and the data processing unit in order to provide the production data.

5,751,578

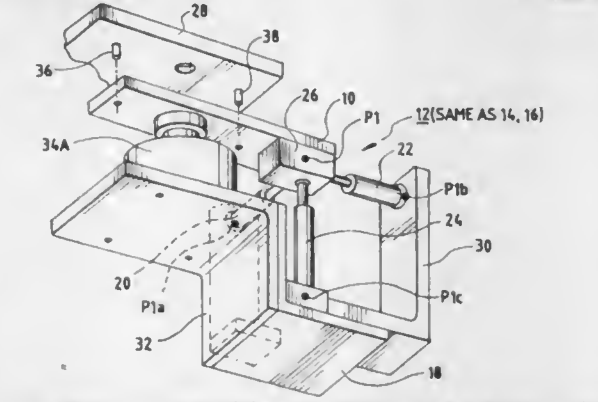
PLATFORM ATTITUDE MEASUREMENT SYSTEM

James P. Quinn, Gurnee, and Lance D. Gedde, McHenry, both of Ill., assignors to Recon/Optical, Inc., Barrington, Ill.

Filed May 16, 1995, Ser. No. 442,011

Int. Cl.^{6} B64C *17/00*

U.S. Cl. 364—453 **18 Claims**



1. A method of determining the attitude of a platform, said platform isolated from an airframe by at least one compliant mount, said platform installed in an aircraft having an inertial navigation system, comprising the steps of:

measuring the movement of said platform relative to the airframe along three axes at three separate locations;

calculating the roll, pitch and yaw angles of said platform relative to said airframe from said measurement of the movement of said platform relative to the airframe;

obtaining from the inertial navigation system current information as to roll, pitch and yaw of the aircraft; and

summing said calculated yaw, pitch and roll angles with said aircraft roll, pitch and yaw information obtained from said inertial navigation system, thereby deriving the attitude of said platform in an inertial reference frame.

5,751,579

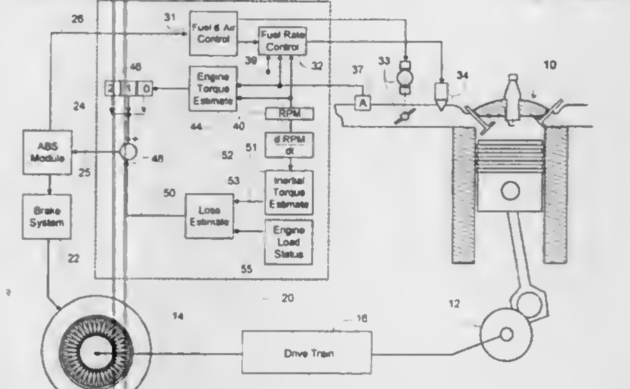
VEHICLE CONTROL SYSTEM EMPLOYING IMPROVED METHODS AND APPARATUS FOR ESTIMATING APPLIED WHEEL TORQUE

Davorin David Hrovat, Dearbrn; Daniel Scott Colvin, Farmington; Michael Alan Weyburne, Northville; Ngoc Minh Tran, Dearborn, and John Loring Yester, Bloomfield, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Sep. 6, 1995, Ser. No. 524,274

Int. Cl.^{6} B60K *41/00*

U.S. Cl. 364—426.015 **10 Claims**



1. A traction control system for a vehicle comprising:

an internal combustion engine equipped with a fuel rate controller responsive to a first control signal for applying a variable amount of drive torque to at least one drive wheel through a drive train,

a brake system for applying braking torques to said drive wheels in response to a second control signal,

an anti-skid control module connected to supply said first signal to said fuel rate controller and further connected to supply said second control signal to said brake system, said antiskid control module being responsive to a third control signal having a value indicating the estimated magnitude of said drive torque,

means coupled to said fuel rate controller for generating a first value indicative of the amount of wheel torque generated by said internal combustion engine,

means coupled to said engine for generating a second value proportional to the rate of change of the operating speed of said engine and indicative of the amount of wheel torque produced by the inertial movement of said engine and said drive train, and

means for summing said first and second values to form said third control signal.

5,751,580

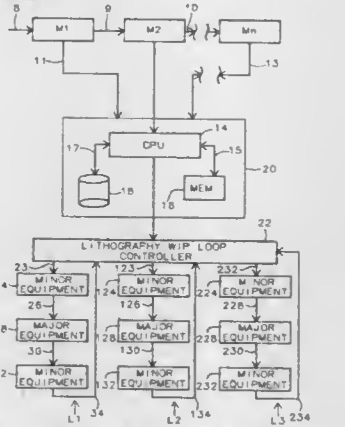
FUZZY LOGIC METHOD AND SYSTEM FOR ADJUSTMENT OF PRIORITY RATING OF WORK IN PROCESS IN A PRODUCTION LINE

Keh-Fei Chris Chi, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing, Ltd., Singapore, Singapore

Filed Jul. 26, 1996, Ser. No. 686,783

Int. Cl.^{6} G06F *19/00;* G06G *7/6466*

U.S. Cl. 364—468.07 **33 Claims**



1. A method of operating a manufacturing control system for computer control of work flow in an automatic manufacturing production line with a plurality of work stations at which the progress of work is monitored, by the steps comprising,

assigning priority ratings (PR) to each lot of WIP materials with said priority ratings (PR) ranging from a low priority rating to a high priority rating,

making fuzzy logic tests of parameters of lots of WIP materials and making adjustments based upon said tests as follows:

  a) measuring the velocity of work flow parameter and adjusting PR rating as a function of said velocity,

  b) testing whether a lot exceeds a maximum time and increasing the PR rating if the lot exceeds said maximum time,

  c) batching when higher priority lots are absent, then upgrading the priority rating (PR) of said lot, and

  d) testing whether a Kanban is below target and if so, then upgrading the PR rating.

5,751,581

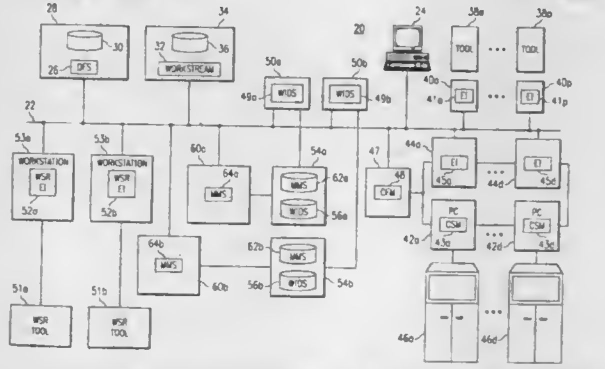
MATERIAL MOVEMENT SERVER

Lok L. Tau, Austin; Michael R. Conboy, Buda, and Thomas P. Jackson, Bastrop, all of Tex., assignors to Advanced Micro Devices, Austin, Tex.

Filed Nov. 13, 1995, Ser. No. 558,962

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—468.22 **19 Claims**



1. A method for tracking products within a sequence of processes, wherein the products are moved in carriers through the sequence, the products are initially arranged in groups, and the products are moved between different carriers and the carriers are moved between stockers during the sequence, comprising the steps of:

assigning a first set of identification codes to the products, a second set of identification codes to the groups, a third set of identification codes to the carriers, a fourth set of identification codes to the processes, and a fifth set of identification codes to the stockers;

associating in a first database codes of groups with codes of processes according to a status of a certain group relative to a certain process;

associating in a second database the codes of the carriers with codes of the stockers according to placement of a certain carrier in a certain stocker;

associating in a third database codes of the groups with codes of the carriers according to placement of a certain group in a certain carrier;

disassociating a code of a carrier from a code of a stocker when the carrier is removed from the stocker;

disassociating a code of a group from a code of a carrier when the group is removed from the carrier;

tracking movement of products through the sequence using the database of associated codes of groups and codes of carriers, associated codes of groups and codes of processes, and associated codes of carriers and stockers.

5,751,582

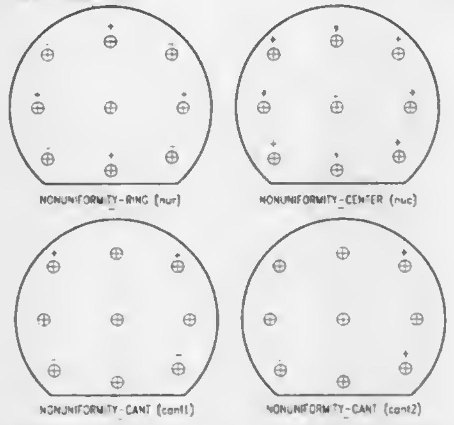
CONTROLLING PROCESS MODULES USING SITE MODELS AND MONITOR WAFER CONTROL

Sbarad Saxena, Dallas; Purnendu K. Mozumder, Plano; Gregory B. Shinn, Dallas, and Kelly J. Taylor, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1996, Ser. No. 719,104

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—468.16 **21 Claims**


NONUNIFORMITY-RING (nur)
NONUNIFORMITY-CENTER (nuc)
NONUNIFORMITY-CANT (cont1)
NONUNIFORMITY-CANT (cont2)

1. A method of simultaneously controlling a plurality of nonuniformity measures in processing discrete products through a module consisting of a plurality individual processes, said method comprising:

a. establishing a process model for a first process of said module by relating a plurality of product quality parameters to a plurality of process control variables to obtain an initial setting for said plurality of process control variables;

b. determining goals for the output of a second process in said module subsequent to said first process which could be better achieved by changing the output of a previous process;

c. changing the goals of said first process of said module to achieve the goals of said second process and establishing a set of process control variables for said first process;

d. processing one or more products and measuring one or more product quality parameters on said products;

e. exercising quality control tests on said products;

f. if quality control tests do not indicate significant difference from said first process model prediction and goals then continuing processing at step g, otherwise continue by:

(1) processing at least one monitor product to obtain observations for tuning using settings determined by local experiment design;

(2) tuning said process models to create tuned process models using said plurality of product quality parameters from said products of step d, wherein said tuning estimates a changed state of said processing with the use of process models;

(3) estimating new values for said plurality of process control variables from said tuned models; and

(4) continuing processing products with said new values of said plurality of process control variables by repeating again at step d, substituting new products for said first plurality of products;

g. continuing to process plurality of products through subsequent process of said process module; and

h. monitoring the output of said second process and continuing processing a step g if said output of said second process is within process goals otherwise continuing with step b if said output of said second process is not within process goal tolerances.

5,751,583

EMBROIDERY DATA PROCESSING METHOD

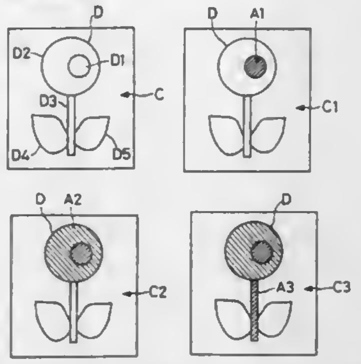
Mitsuyasu Kyuno, Aichi-ken; Masahiro Mizuno, Nagoya; Masao Futamura, Nagoya, and Yukiyoshi Muto, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 21, 1995, Ser. No. 391,168

Claims priority, application Japan, Feb. 25, 1994, 6-027733

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—470.08 **24 Claims**



1. An apparatus for generating sewing data used to form an embroidery on a work sheet, the apparatus comprising:

an image reader operative to read an original image and to produce at least one set of image data representing the original image, the original image including at least one outline and an inside area defined by the at least one outline;

a first device operative in association with the at least one set of image data to produce outline sewing data for making stitches on the work sheet along the at least one outline; and

a second device operative in association with the at least one set of image data to produce area sewing data for making stitches on the work sheet to fill the inside area thereby forming an embroidery of the original image on the work sheet.

5,751,584

METHOD FOR CHECKING INTERFERENCE, METHOD FOR CHECKING PROCESSING PROGRAM, AND METHOD FOR CHECKING PROCESSING PROPRIETY

Akihiko Yuasa; Yutaka Noda; Satoshi Kumamoto; Makoto Kawano, and Toshiyuki Hirose, all of Shizuoka-ken, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

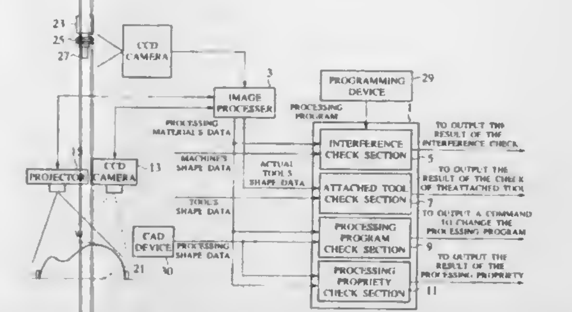
Filed Aug. 14, 1995, Ser. No. 514,666

Claims priority, application Japan, Aug. 15, 1994, 6-191525

Int. Cl.^{6} G06F *19/00;* **G06G** *7/6466*

U.S. Cl. 364—474.2 **10 Claims**

1. A method for checking interference, comprising the steps of:


23
25
27
CCD CAMERA
3
IMAGE PROCESSER
PROGRAMMING DEVICE
29
PROCESSING PROGRAM
1
PROCESSING MATERIAL'S DATA
MACHINE'S SHAPE DATA
ACTUAL TOOL'S SHAPE DATA
TOOL'S SHAPE DATA
PROCESSING SHAPE DATA
15
PROJECTOR
CCD CAMERA
13
CAD DEVICE
21
30
INTERFERENCE CHECK SECTION
5
ATTACHED TOOL CHECK SECTION
7
PROCESSING PROGRAM CHECK SECTION
9
PROCESSING PROPRIETY CHECK SECTION
11
TO OUTPUT THE RESULT OF THE INTERFERENCE CHECK
TO OUTPUT THE RESULT OF THE CHECK OF THE ATTACHED TOOL
TO OUTPUT A COMMAND TO CHANGE THE PROCESSING PROGRAM
TO OUTPUT THE RESULT OF THE PROCESSING PROPRIETY

obtaining a configuration and size of a processing material by sensing a three-dimensional image of the processing material and converting the three-dimensional image to three dimensional coordinates;

obtaining a machine's shape data defining the three-dimensional shape of the machine side including a main shaft head provided with a processing tool and a tool holder attached thereto;

determining whether the three-dimensional coordinates of said processing material is in the space to be occupied by the machine given by the machine's shape data at a relative movement position between the main shaft head of the machine tool and a work table by an arithmetic processing of an arithmetic processing means; and

when the three-dimensional coordinates of the processing material are in the space to be occupied by the machine, determining that the processing material and the machine will interfere with each other.

5,751,585

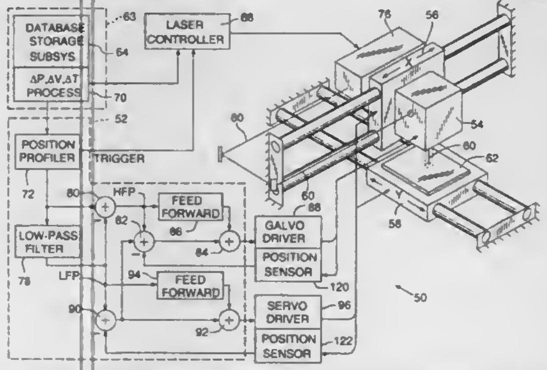
HIGH SPEED, HIGH ACCURACY MULTI-STAGE TOOL POSITIONING SYSTEM

Donald R. Cutler; Robert M. Pailthorp, both of Portland, and Mark A. Unrath, Aloha, all of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 408,558, Mar. 20, 1995, abandoned. This application Mar. 12, 1996, Ser. No. 615,049

Int. Cl.^{6} G06F *19/00;* **G06G** *7/66*

U.S. Cl. 364—474.03 **22 Claims**



1. In a tool positioning system that is implemented as part of a workpiece processing system in which the workpiece is an electronic device or an electronic device package, the tool position system positioning a tool relative to a set of target locations and describing a tool path on a workpiece in response to a set of positioning commands, comprising:

a first positioner stage effecting at a first positioning acceleration a controlled first range of relative movement between the tool and the workpiece;

a second positioner stage effecting at a second positioning acceleration a controlled second range of relative movement between the tool and the workpiece, the second controlled range of relative movement being greater than the first controlled range of relative movement, and the second positioning acceleration being less than the first positioning acceleration;

a signal processor deriving from the set of positioning commands a movement-controlling signal;

a filter receiving the movement-controlling signal and separating it to produce higher bandwidth and lower bandwidth positioning signals that have an inherent delay offset between them;

a delay element introducing a delay to compensate for the inherent delay offset between the higher bandwidth and lower bandwidth positioning signals; and

first and second positioner drivers responsive to the delay compensated higher bandwidth and lower bandwidth positioning signals to drive the respective first and second positioner stages so that they respond by operating within their controlled ranges of relative movement with at least partly uninterrupted concurrent motion in a coordinated fashion to produce accurate tool positioning along the tool path.

5,751,586

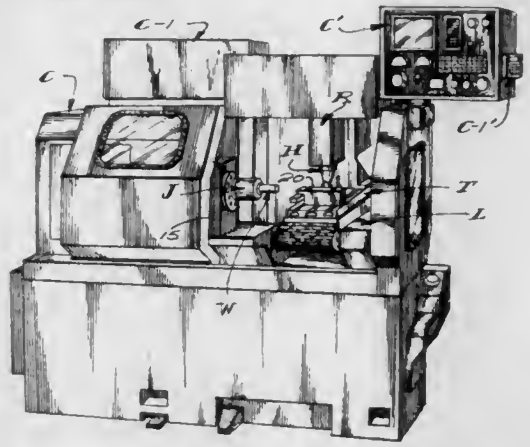
CNC MACHINE TOOL

Bosko Grabovac, 1114 Fairview Ave., Arcadia, Calif. 91748

Filed Dec. 1, 1995, Ser. No. 565,789

Int. Cl.^{6} G06F *19/00;* **B23Q** *3/157*

U.S. Cl. 364—474.11 **5 Claims**



1. In combination; a computer-controlled lathe including an elongate bed with front and rear ends, front and rear sides, and defining a longitudinal axis, an elongate spindle with front and rear ends rotatably supported at the rear end portion of the bed, a work piece-engaging chuck at the front end of the spindle, a first motor drivingly connected with the spindle, and encoder connected with the spindle and reading the rotative position thereof, an elongate carriage carried by the front end portion of the bed, a first drive means including a second motor operating to position and move the carriage longitudinally of the longitudinal axis, an elongate cross-slide carried by the carriage and on a lateral axis that is normal to the longitudinal axis, a tool holder with a cutting tool on the cross-slide, a second drive means including a third motor operating to position and move the cross-slide longitudinally of the lateral axis, a primary computer-numerical-controller connected with the encoder and with the first, second and third motors and operating to power and control the direction and rate of rotation of the first motor and to control the direction and rate of rotation of the second and third motors, a primary programming terminal connected with the primary controller and operating to enter and store in the memory of the primary controller machining numerical data programs for the machining of parts and that cause the primary controller to generate and process command signals that effect programmed operation of the first, second and third motors; and, a rotary cutting tool head carried by the cross-slide in spaced relationship from the tool holder and including a rotary cutting tool holder with at least one cutting tool and drivingly rotated by a fourth motor; an electric-powered secondary computer-numerical-controller connected with the encoder and primary controller and the fourth motor and controlling operation of the fourth motor to control the rotative position and the rotation of the fourth motor and rotary tool holder relative to the spindle in response to programs stored in the secondary controller that include discrete

command signals for operation of the rotary cutting tool head in machining programs stored in the primary controller; and, a manually operable secondary programming terminal connected with the secondary controller and operating to enter into each machining program stored in the secondary controller data which when processed by the secondary controller controls the direction of rotation and the rotative position and rate of rotation of the fourth motor and rotary tool holder relative to the spindle.

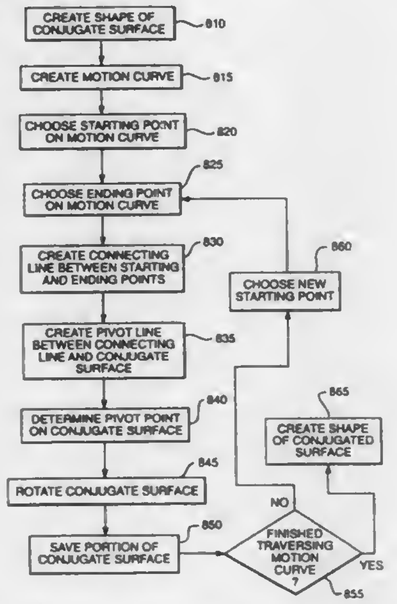
5,751,587
METHOD FOR CREATING A CONJUGATED PROFILE CORRESPONDING TO A CONJUGATE SURFACE IN A MOTION CONVERSION DEVICE

Douglas C. Brackett, 2535 Mason Oaks Dr., Valricho, Fla. 33594, and William R. Wister, III, Runnymede Farm, Rd 3, Coatesville, Pa. 19320

Continuation of Ser. No. 468,426, Jun. 6, 1995, Pat. No. 5,661,655. This application May 16, 1997, Ser. No. 857,486

Int. Cl.^{6} G06F *19/00;* **F16H** *21/18*

U.S. Cl. 364—474.24 **23 Claims**


CREATE SHAPE OF CONJUGATE SURFACE
810
CREATE MOTION CURVE
815
CHOOSE STARTING POINT ON MOTION CURVE
820
825
CHOOSE ENDING POINT ON MOTION CURVE
830
CREATE CONNECTING LINE BETWEEN STARTING AND ENDING POINTS
860
CHOOSE NEW STARTING POINT
CREATE PIVOT LINE BETWEEN CONNECTING LINE AND CONJUGATE SURFACE
835
865
840
DETERMINE PIVOT POINT ON CONJUGATE SURFACE
CREATE SHAPE OF CONJUGATED SURFACE
845
ROTATE CONJUGATE SURFACE
NO
850
SAVE PORTION OF CONJUGATE SURFACE
FINISHED TRAVERSING MOTION CURVE ?
YES
855

6. An automatic method of creating a conjugated curve, corresponding to a shape of a conjugated profile on a conjugate-bearing, from a conjugate surface on a conjugate-driver used in a motion conversion device, the method, performed by a data processor, comprising the steps of:

creating a motion curve corresponding to movement of the conjugate-driver relative to the conjugate-bearing;

choosing motion points along the motion curve corresponding to points of motion of the conjugate-driver, each motion point being a set distance from a previous motion point;

creating a connecting line between two successive ones of the motion points;

creating a pivot line from a midpoint of the connecting line to a pivot point on the conjugate surface;

rotating the conjugate surface with respect to the pivot point to determine a position on the conjugate surface;

repeating the steps of creating a connecting line and a pivot line for successive motion points until the connecting lines have traversed the entire motion curve and a plurality of the positions of the conjugate surface have been determined; and

creating the conjugated curve based on the plurality of conjugate surface positions.

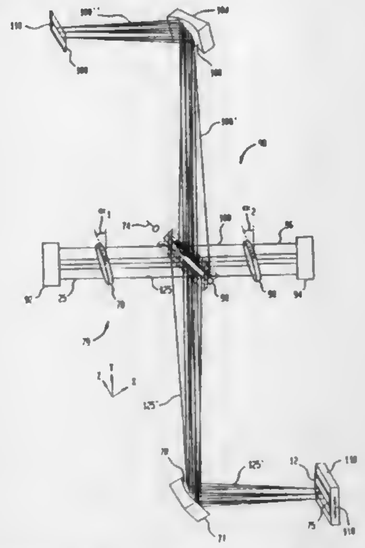
5,751,588
MULTI-WAVELENGTH PROGRAMMABLE LASER PROCESSING MECHANISMS AND APPARATUS UTILIZING VAPORIZATION DETECTION

Candace J. Freedenberg, Poughkeepsie; David C. Long, Wappingers Falls; Joshua M. Cobb, Millbrook; Mark J. LaPlante, Walden; Uldis A. Ziemins, Poughkeepsie; Daniel G. Patterson, Wappingers Falls, and James G. Balz, Maybrook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 430,480, Apr. 28, 1995, Pat. No. 5,620,618. This application Jun. 6, 1995, Ser. No. 465,689

Int. Cl.^{6} G06F *19/00;* **G06G** *7/64;7/66*

U.S. Cl. 364—474.28 **2 Claims**



1. An apparatus for verifying machining operations comprising:

means for generating a machining beam;

means for generating a tracking beam, said tracking beam being separate from said machining beam;

at least two lenses, one lens being positioned to at least partially focus said machining beam, another lens being positioned to at least partially focus said tracking beam;

means for tilting each of said at least two lenses at an angle to said machining and tracking beams to add an amount of astigmatism opposite to astigmatism in the remainder of said apparatus;

means for scanning said machining and tracking beams along an axis after said astigmatism is added by said lenses, said scanning means being movable and having a first surface for reflecting said machining beam and a second surface for reflecting said tracking beam;

at least two concave cylindrical mirrors having curved reflective surfaces, the curvatures of the reflective surfaces being substantially identical, one concave cylindrical mirror being positioned to receive and interrupt said reflected machining beam directly from said scanning means first surface and at least partially focus said machining beam at a workpiece, another concave cylindrical mirror being positioned to interrupt said reflected tracking beam directly from said scanning means second surface and at least partially focus said tracking beam at a detector;

a workpiece holder for securing a workpiece to receive said machining beam after reflection from said scanning means and said one concave cylindrical mirror;

a detector for receiving said tracking beam after reflection from said scanning means and said another concave cylindrical mirror;

feedback control means for determining the position of the reflected tracking beam relative to said detector and controlling the firing rate of said machining beam as said machining beam is being scanned by determining the position of said machining beam relative to said workpiece based upon the position of the reflected tracking beam relative to said detector;

a detector located proximate said workpiece holder for detecting the presence or absence of a plume generated by vaporization of material by said machining beam; and

electronic control means for verifying the end point of the machining process based upon the presence or absence of a plume detected by said detector.

5,751,589
METHOD FOR CREATING A MACHINING CONDITION SERIES

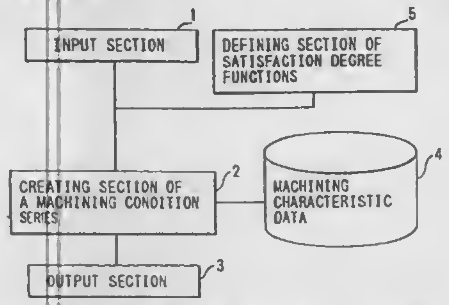
Tatsushi Sato, and Tomoko Sendai, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 792,632, Nov. 15, 1991, abandoned. This application Jun. 7, 1994, Ser. No. 255,819

Claims priority, application Japan, Nov. 20, 1990, 2-314510

Int. Cl.^{6} G06F *17/00;* **G05B** *13/02*

U.S. Cl. 364—474.35 **11 Claims**


1
INPUT SECTION
5
DEFINING SECTION OF SATISFACTION DEGREE FUNCTIONS
2
CREATING SECTION OF A MACHINING CONDITION SERIES
4
MACHINING CHARACTERISTIC DATA
3
OUTPUT SECTION

1. A method of automatically generating machining condition series meeting a plurality of required machining specifications, said machine condition series being used at least as operating parameters for a machine tool, the method comprising the steps of:

designating ranges for the machining specifications including required values of said machining specifications, and satisfaction degree functions indicating satisfaction degrees relating to user desirability of said specifications within said ranges;

constructing a number of machining steps realizing values in said ranges for at least one type of said machining specifications; selecting machining conditions realizing said steps, respectively, from previously stored data of machining conditions;

enumerating all combinations of the selected machining conditions, as machining series, said combinations each being capable of realizing values in said ranges, respectively;

calculating total satisfaction degrees with respect to said machining condition series, respectively, by multiplying said satisfaction degrees by one another relative to specifications which are met by each said machining condition series, in which each said satisfaction degree is obtained from said functions based on the value of each specification as met by each said machining condition series; and

selecting a machining condition series having a high total satisfaction degree.

5,751,590
SYSTEM FOR PRINTING SOCIAL EXPRESSION CARDS

Thomas G. Cannon, Loveland; Daniel L. DeHart, Greeley, and Eric M. Krug, Loveland, all of Colo., assignors to Onkor, Ltd., Loveland, Colo.

Continuation of Ser. No. 949,715, Sep. 23, 1992, Pat. No. 5,600,563. This application Jan. 31, 1997, Ser. No. 791,197

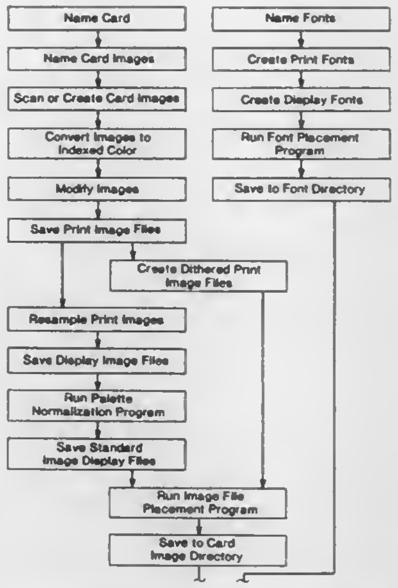
Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—479.03 **18 Claims**

1. A method of processing images to define social expression cards in a computer database system comprising the following steps:

inputting images for each card;

creating a high-resolution print file for each of said images;


Name Card
Name Card Images
Scan or Create Card Images
Convert Images to Indexed Color
Modify Images
Save Print Image Files
Create Dithered Print Image Files
Resample Print Images
Save Display Image Files
Run Palette Normalization Program
Save Standard Image Display Files
Run Image File Placement Program
Save to Card Image Directory
Name Fonts
Create Print Fonts
Create Display Fonts
Run Font Placement Program
Save to Font Directory

creating a lower-resolution display file for each of said images; and

creating a card description database defining the layout of each card in terms of its component images and their locations on the card, to permit retrieval of said print files and said display files for each card.

5,751,591
THREE DIMENSIONAL WIRING INDUCTANCE CALCULATION SYSTEM

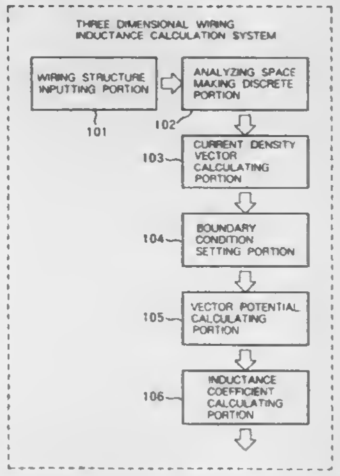
Susumu Asada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 555,804

Claims priority, application Japan, Nov. 9, 1994, 6-274829

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—488 **18 Claims**


THREE DIMENSIONAL WIRING INDUCTANCE CALCULATION SYSTEM
WIRING STRUCTURE INPUTTING PORTION
101
ANALYZING SPACE MAKING DISCRETE PORTION
102
103
CURRENT DENSITY VECTOR CALCULATING PORTION
104
BOUNDARY CONDITION SETTING PORTION
105
VECTOR POTENTIAL CALCULATING PORTION
106
INDUCTANCE COEFFICIENT CALCULATING PORTION

1. A three dimensional wiring inductance calculating system, comprising:

wiring structure inputting means for inputting a three dimensional wiring structure of an object for analysis expressed by a three dimensional configuration;

an analyzing space partitioning means for taking the wiring structure as an analyzing space and partitioning the analyzing space into a finite number of partial elements;

current density deriving means for solving a Poisson's equation with respect to an electrical potential in the partitioned analyzing space and deriving a plurality of current values and a plurality of current density vectors within the partitioned analyzing space;

boundary condition setting means for solving an integral equation of a vector potential including the corresponding current density vector at each of points of partial elements within the partitioned analyzing space by deriving the vector potential as a boundary condition at a boundary of the partitioned analyzing space;

vector potential calculating means for deriving a value for the vector potential by solving a vector potential equation in the partitioned analyzing space and taking the vector potential value at the boundary as the boundary condition; and

inductance calculating means for normalizing a product of the vector potential value and said current density vector per unit current value, deriving an integral sum of said product within the partitioned analyzing spaces, and calculating an inductance of said wiring structure as a result thereof.

5,751,592

APPARATUS AND METHOD OF SUPPORTING FUNCTIONAL DESIGN OF LOGIC CIRCUIT AND APPARATUS AND METHOD OF VERIFYING FUNCTIONAL DESIGN OF LOGIC CIRCUIT

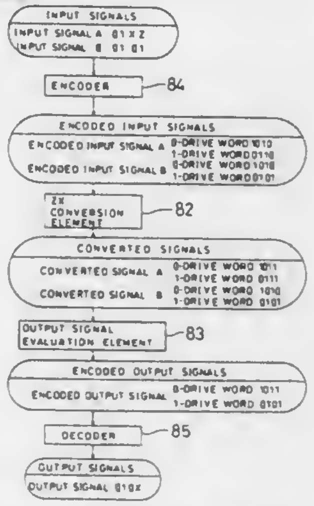
Yuji Takai, Osaka; Kazue Nakatani, Kyoto, and Michihiro Matsumoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 238,745, May 5, 1994, abandoned. This application Dec. 27, 1995, Ser. No. 579,154

Claims priority, application Japan, May 6, 1993, 5-105311; Jul. 21, 1993, 5-180337; Nov. 9, 1993, 5-279302

Int. Cl.⁶ G06F *15/60*

U.S. Cl. 364—488 **6 Claims**



1. A functional design verification apparatus for verifying the functional design of a logic circuit, comprising:

an encode means for accepting an n-bit input signal (n≧2) in which each bit is represented by one of logic signals 0, 1, X, and Z and encoding each bit of said input signal to an encoded bit consisting of a 0-drive bit which indicates whether or not the logic value of said bit can be 0 and a 1-drive bit which indicates whether or not the logic value of said bit can be 1 so as to generate an encoded input signal consisting of a 0-drive word composed of n 0-drive bits and a 1-drive word composed of n 1-drive bits; and

a ZX conversion means for accepting said encoded input signal and converting that encoded bit of the n encoded bits in said encoded input signal, which corresponds to the logic signal Z, to the encoded bit which corresponds to the logic signal X so as to generate a converted signal;

an output signal evaluation means for accepting said converted signal and obtaining, based on the 0-drive word and 1-drive word of said converted signal, the 0-drive word and 1-drive word which correspond to the result of a logic operation to be subjected to functional simulation so as to generate the encoded output signal consisting of the obtained 0-drive word and 1-drive word; and

a decode means for accepting said encoded output signal and restoring a combination of the m-th (1≦m≦n) 0-drive bit in the 0-drive word of said encoded output signal and the mth 1-drive bit in the 1-drive word of the encoded output signal to representation by one of the logic signals 0, 1, X, and Z so as to generate an n-bit output signal.

5,751,593

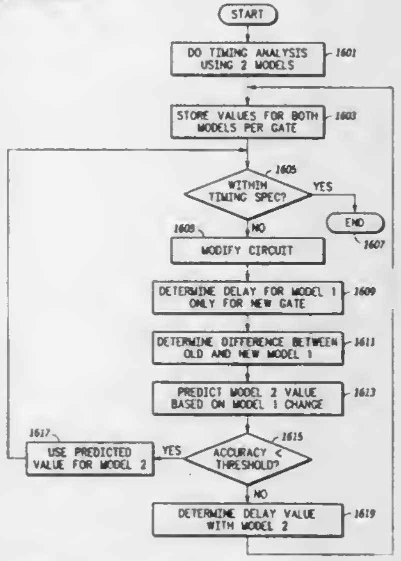
ACCURATE DELAY PREDICTION BASED ON MULTI-MODEL ANALYSIS

Satyamurthy Pullela; Abhijit Dharchoudhury; David T. Blaauw; Tim J. Edwards, and Joseph W. Norton, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1996, Ser. No. 629,487

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—488 **10 Claims**


START
DO TIMING ANALYSIS USING 2 MODELS
1601
STORE VALUES FOR BOTH MODELS PER GATE
1603
1605
WITHIN TIMING SPEC?
YES
END
1607
NO
1608
MODIFY CIRCUIT
DETERMINE DELAY FOR MODEL 1 ONLY FOR NEW GATE
1609
DETERMINE DIFFERENCE BETWEEN OLD AND NEW MODEL 1
1611
PREDICT MODEL 2 VALUE BASED ON MODEL 1 CHANGE
1613
1617
USE PREDICTED VALUE FOR MODEL 2
YES
1615
ACCURACY < THRESHOLD?
NO
DETERMINE DELAY VALUE WITH MODEL 2
1619

1. A method for performing a timing analysis for a circuit being designed, said method comprising:

applying a first circuit model to determine a circuit signal propagation delay;

periodically testing an accuracy characteristic of said circuit signal propagation delay; and

applying a more accurate second circuit model whenever said accuracy characteristic is determined to be outside of a predetermined threshold level.

5,751,594

APERTURE CONTROL SYSTEM FOR PRINTED CIRCUIT BOARD FABRICATION

Rick J. Stanley, Woburn, and Michel M. Raguin, Medford, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Mar. 16, 1993, Ser. No. 33,277

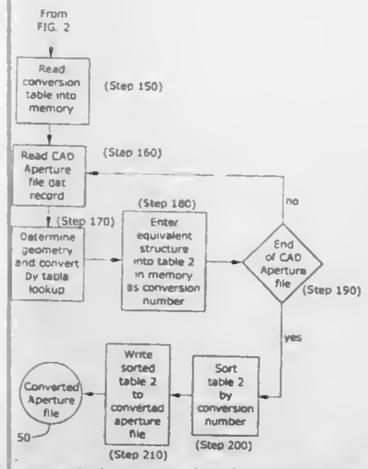
Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—490 **42 Claims**

1. A PCB laser plotter data control system comprising:

a computer aided design workstation for generating CAD aperture data in any one of a plurality of CAD formats for one of at least first and second types of PCB laser plotters;

a data converter that is operative for said first type of PCB laser plotter for reading said CAD aperture data in said any one of a plurality of CAD formats, for comparing said CAD aperture data in said any one of a plurality of CAD formats to entries in a conversion table of allowable conversion values, and for providing converted aperture data in a prespecified one of a plurality of PCB laser plotter formats from corresponding ones of said allowable conversion values;


From FIG. 2
Read conversion table into memory
(Step 150)
Read CAD Aperture file dat record
(Step 160)
no
(Step 170)
Determine geometry and convert by table lookup
(Step 180)
Enter equivalent structure into table 2 in memory as conversion number
End of CAD Aperture file
(Step 190)
yes
Converted Aperture file
50
Write sorted table 2 to converted aperture file
(Step 210)
Sort table 2 by conversion number
(Step 200)

said data converter being operative for said second type of PCB laser plotter for reading said CAD aperture data in said any one of a plurality of CAD formats, for comparing said CAD aperture data in said any one of a plurality of CAD formats to geometric shapes having predefined conversion values, and for providing converted aperture data in a prespecified one of a plurality of PCB laser plotter formats from corresponding ones of said predefined conversion values;

a PCB laser plotter of one of said at least first and second types of PCB laser plotters disposed in a location remote from said data converter, said PCB laser plotter employing said converted aperture data in said prespecified one of said plurality of PCB laser plotter formats to control a laser beam used in the generation of a PCB mask; and

a modem operative to transmit said converted aperture data from said data converter directly to said PCB laser plotter for the generation of said PCB mask by said PCB laser plotter.

5,751,595

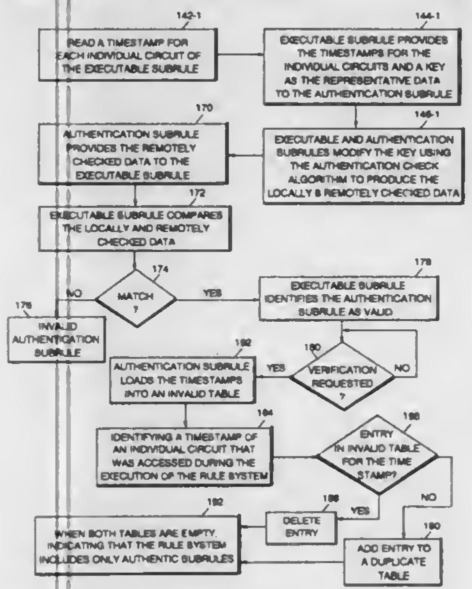
METHOD FOR BUILDING AND VERIFYING AUTHENTICITY OF A RULE SYSTEM

Harry John Beatty, III, Clinton Corners; Peter Claude Elmendorf, Poughkeepsie, both of N.Y.; Jeannie Harrigan Panner, Underhill, Vt.; Bijan Salimi, and Lansing Dunn Pickup, both of Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1996, Ser. No. 616,171

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 364—490 **15 Claims**


142-1
READ A TIMESTAMP FOR EACH INDIVIDUAL CIRCUIT OF THE EXECUTABLE SUBRULE
144-1
EXECUTABLE SUBRULE PROVIDES THE TIMESTAMPS FOR THE INDIVIDUAL CIRCUITS AND A KEY AS THE REPRESENTATIVE DATA TO THE AUTHENTICATION SUBRULE
170
AUTHENTICATION SUBRULE PROVIDES THE REMOTELY CHECKED DATA TO THE EXECUTABLE SUBRULE
146-1
EXECUTABLE AND AUTHENTICATION SUBRULES MODIFY THE KEY USING THE AUTHENTICATION CHECK ALGORITHM TO PRODUCE THE LOCALLY & REMOTELY CHECKED DATA
172
EXECUTABLE SUBRULE COMPARES THE LOCALLY AND REMOTELY CHECKED DATA
174
NO
MATCH ?
YES
178
EXECUTABLE SUBRULE IDENTIFIES THE AUTHENTICATION SUBRULE AS VALID
176
INVALID AUTHENTICATION SUBRULE
182
AUTHENTICATION SUBRULE LOADS THE TIMESTAMPS INTO AN INVALID TABLE
YES
180
VERIFICATION REQUESTED ?
NO
184
IDENTIFYING A TIMESTAMP OF AN INDIVIDUAL CIRCUIT THAT WAS ACCESSED DURING THE EXECUTION OF THE RULE SYSTEM
186
ENTRY IN INVALID TABLE FOR THE TIME STAMP?
192
WHEN BOTH TABLES ARE EMPTY, INDICATING THAT THE RULE SYSTEM INCLUDES ONLY AUTHENTIC SUBRULES
188
DELETE ENTRY
YES
NO
190
ADD ENTRY TO A DUPLICATE TABLE

1. A method for building and verifying authenticity of a rule system for a custom integrated circuit design, the method comprising the steps of:

a) providing a library of executable subrules, each executable subrule including circuit definitions, a key, time stamp information, and a local authentication algorithm, wherein the time stamp information includes a table of time stamps;

b) providing an authentication subrule, the authentication subrule including a remote authentication algorithm;

c) when an executable subrule is to be loaded as part of the rule system, the executable subrule reads its table of time stamps;

d) providing, by the executable subrule, local representative data to the authentication subrule, the local representative data including the table of time stamps and a key;

e) performing, by the authentication subrule, an authentication check algorithm upon the local representative data to produce remotely checked data, wherein the remotely checked data includes a remotely modified key;

f) providing, by the authentication subrule, remote representative data to the executable subrule, the remote representative data including the remotely modified key and a verification key;

g) performing, by the executable subrule, the authentication check algorithm upon the local representative data to produce locally checked data, wherein the locally checked data includes a locally modified key;

h) comparing, by the executable subrule, the remotely modified key with the locally modified key and (aa) when the remotely modified key matches the locally modified key, modifying the verification key of the remote representative data using the local authentication algorithm of the executable subrule for producing a locally modified verification key and (bb) when the remotely modified key does not match the locally modified key, providing an indication that the executable subrule is not dealing with a valid authentication subrule;

j) sending, by the executable subrule, the locally checked data, including the modified verification key, to the authentication subrule;

k) modifying the verification key of the remote representative data using the remote authentication algorithm of the authentication subrule for producing a remotely modified verification key, wherein the remotely checked data includes the remotely modified verification key;

l) comparing, by the authentication subrule, the remotely checked data with the locally checked data, including comparing the remotely modified verification key with the locally modified verification key; and

m) when the locally checked data matches the remotely checked data, loading the executable subrule into the rule system as an authenticated subrule.

5,751,596

AUTOMATED SYSTEM AND METHOD FOR IDENTIFYING CRITICAL TIMING PATHS IN INTEGRATED CIRCUIT LAYOUTS FOR USE WITH AUTOMATED CIRCUIT LAYOUT SYSTEM

Arnold Ginetti, Antibe, France, and Athanasius W. Spyrou, San Jose, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 27, 1995, Ser. No. 495,194

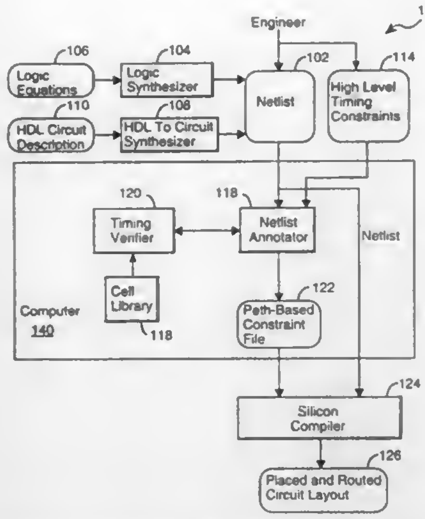
Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—491 **3 Claims**

1. A method of synthesizing an integrated circuit, the steps of the method comprising:

(A) receiving and storing in a computer memory a netlist denoting a list of components in said integrated circuit and a set of nodes interconnecting said components; each said component of said integrated circuit having at least one input port and at least one output port, said set of nodes including a set of circuit input nodes and circuit output nodes for said integrated circuit;

(B) receiving and storing in a computer memory a plurality of system level timing constraints, said system level timing



constraints representing maximum delay times for signals to propagate from input nodes to output nodes of said integrated circuit;

(C) receiving cell delay data representing signal delays associated with said components in said integrated circuit;

(D) for each system timing constraint, storing data for nodes downstream of input nodes associated with said each system timing constraint and for nodes upstream of output nodes associated with said each system timing constraint, said stored data indicative of slack at said nodes with respect to each said system timing constraint;

(E) repeatedly generating successive path-based timing constraints, until all nodes for which slack indicative data has been stored are included in at least one path-based timing constraint, each path-based timing constraint being generated by:

(E1) selecting a node, not included in any previously generated path-based timing constraint, with a worst slack represented in said stored data;

(E2) identifying which system level timing constraint corresponds to a worst slack associated with said selected node; and

(E3) identifying a signal path from a start node associated with said identified system level timing constraint through said selected node to an end node associated with said identified system level timing constraint, determining a path traversal time for said identified signal path-based on said stored data, and outputting said identified signal path and path traversal time as one of said path-based timing constraints; and

(F) passing said netlist and output path-based timing constraints to a silicon compiler and automatically placing/routing a circuit in according with said netlist and path-based timing constraints.

5,751,597

CAD APPARATUS FOR LSI OR PRINTED CIRCUIT BOARD

Mitsunobu Okano, and Yasuhiro Yamashita, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 290,602, Aug. 15, 1994, abandoned. This application Aug. 19, 1996, Ser. No. 699,208

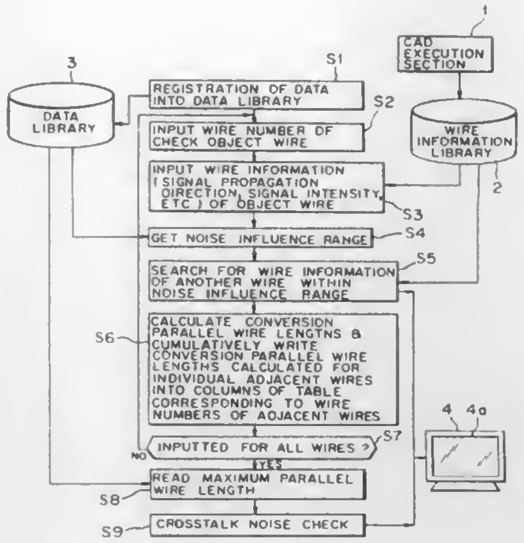
Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—491 **15 Claims**

1. A CAD apparatus for an LSI or a printed circuit board, comprising:

CAD execution means for designing physical layout of first and second wires on an LSI or a printed circuit board, wherein a portion of the first wire is adjacent to the second wire;

conversion calculation means for calculating a conversion wire length of the first wire with respect to the second wire from the length of the portion of the first wire adjacent to the second wire and respective propagation directions of the first and second wires;


1
CAD EXECUTION SECTION
3
DATA LIBRARY
S1
REGISTRATION OF DATA INTO DATA LIBRARY
S2
INPUT WIRE NUMBER OF CHECK OBJECT WIRE
WIRE INFORMATION LIBRARY
2
INPUT WIRE INFORMATION (SIGNAL PROPAGATION DIRECTION, SIGNAL INTENSITY, ETC) OF OBJECT WIRE
S3
GET NOISE INFLUENCE RANGE
S4
SEARCH FOR WIRE INFORMATION OF ANOTHER WIRE WITHIN NOISE INFLUENCE RANGE
S5
S6
CALCULATE CONVERSION PARALLEL WIRE LENGTNS & CUMULATIVELY WRITE CONVERSION PARALLEL WIRE LENGTHS CALCULATED FOR INDIVIDUAL ADJACENT WIRES INTO COLUMNS OF TABLE CORRESPONDING TO WIRE NUMBERS OF ADJACENT WIRES
4
4a
INPUTTED FOR ALL WIRES ?
S7
NO
YES
READ MAXIMUM PARALLEL WIRE LENGTH
S8
CROSSTALK NOISE CHECK
S9

display means for displaying the physical layout of the first and second wires designed by said CAD execution means, including the respective propagation directions of each wire; and

display control means for controlling the display means to display the physical wire layout.

5,751,598

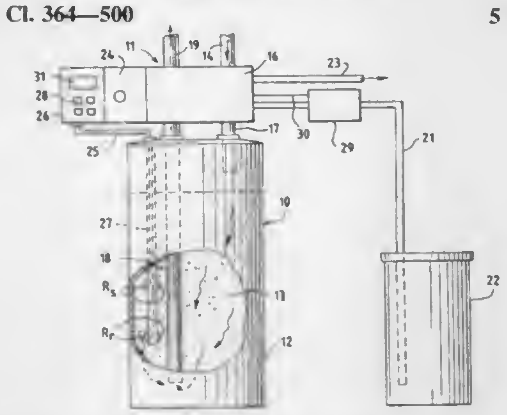
WATER SOFTENING APPARATUS WITH MICROPROCESSOR CONTROL

John E. Zabinski, Naperville, and Roger Rehfeldt, Arlington Heights, both of Ill., assignors to Culligan International Company, Northbrook, Ill.

Filed Feb. 22, 1996, Ser. No. 604,772

Int. Cl.^{6} C02F *5/00*

U.S. Cl. 364—500 **5 Claims**



1. A water softening apparatus, which comprises:

a water tank;

a brine tank;

chlorination electrodes for providing chlorination to water flowing in said water tank;

a circuit for providing electrical energy to said electrodes;

a microprocessor for controlling said circuit, said microprocessor being software controlled to determine when regeneration should commence, when backwash should commence, when backwash should terminate, when brine/slow rinse should commence, when said chlorination electrodes should be energized, when said chlorination electrode energization should terminate, when brine/slow rinse should terminate, when fast rinse should commence, and when fast rinse should terminate;

said circuit including a solid state switch driven by said microprocessor and a relay controlled by said solid state switch, said electrical energy being provided to said chlorination electrodes in response to the operation of said relay.

5,751,599

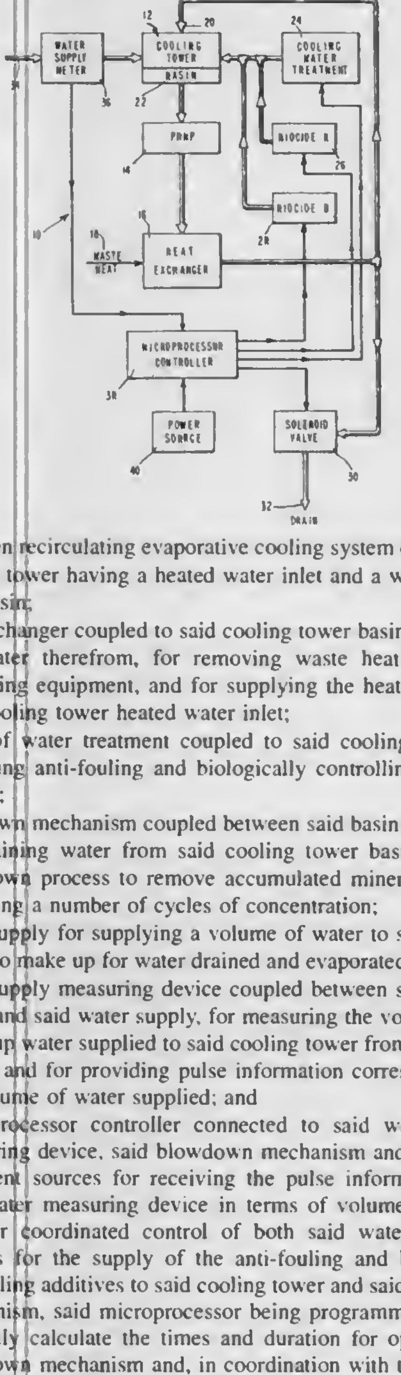
PROBELESS MICROPROCESSOR BASED CONTROLLER FOR OPEN RECIRCULATING EVAPORATIVE COOLING SYSTEMS

Michael Bortnik, 11071/2 18th St., Santa Monica, Calif. 90403, and Vadim A. Sadovsky, 3150 Isberwood Way, Fremont, Calif. 94536

Continuation-in-part of Ser. No. 678,636, Jul. 10, 1996, abandoned. This application Aug. 9, 1996, Ser. No. 694,802

Int. Cl.^{6} F25B *39/04;* **G08B** *21/00*

U.S. Cl. 364—505 **17 Claims**



1. An open recirculating evaporative cooling system comprising:

a cooling tower having a heated water inlet and a water collection basin;

a heat exchanger coupled to said cooling tower basin for receiving water therefrom, for removing waste heat from heat producing equipment, and for supplying the heated water to said cooling tower heated water inlet;

sources of water treatment coupled to said cooling tower for supplying anti-fouling and biologically controlling additives thereto;

a blowdown mechanism coupled between said basin and a drain for draining water from said cooling tower basin during a blowdown process to remove accumulated mineral build up following a number of cycles of concentration;

a water supply for supplying a volume of water to said cooling tower to make up for water drained and evaporated therefrom;

a water supply measuring device coupled between said cooling tower and said water supply, for measuring the volume of the make-up water supplied to said cooling tower from said water supply and for providing pulse information corresponding to the volume of water supplied; and

a microprocessor controller connected to said water supply measuring device, said blowdown mechanism and said water treatment sources for receiving the pulse information from said water measuring device in terms of volume per pulse, and for coordinated control of both said water treatment sources for the supply of the anti-fouling and biologically controlling additives to said cooling tower and said blowdown mechanism, said microprocessor being programmed to automatically calculate the times and duration for opening said blowdown mechanism and, in coordination with the draining of water, for the supply of the anti-fouling and biologically controlling additives.

5,751,600

METHOD AND APPARATUS FOR THE ANALYSIS OF ELECTROMAGNETICS

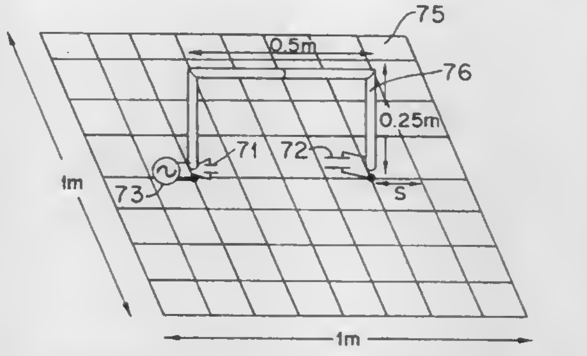
Hisaaki Ochi; Etsuji Yamamoto, both of Tokyo; Kumio Sawaya, and Saburo Adachi, both of Sendai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1996, Ser. No. 671,255

Claims priority, application Japan, Jun. 28, 1995, 7-161742

Int. Cl.^{6} G01R *29/08*

U.S. Cl. 364—524 **14 Claims**



1. In a method of analyzing electromagnetics of an antenna, the method comprising the steps of:

dividing a conductor of an antenna, the conductor having a junction of a linear conductor and a planar conductor, into a plurality of dipole segments, the linear and planar conductors being placed in a different plane,

wherein a current distribution function expressing a current in each of said dipole segments is expressed in a predetermined function, the plurality of dipole segments include a plurality of linear dipole segments divided from the linear conductor, a plurality of planar dipole segments divided from the planar conductor, and a radial dipole segment which includes a linear monopole connected to said junction and a radial monopole connected to said junction, adjacent ones of the linear dipole segments are overlapping, and adjacent ones of the planar dipole segments are overlapping, said linear monopole is the same conductor portion of a monopole of a linear dipole segment connected to said junction, said radial monopole is divided into a plurality of regions, one of the divided regions of said radial monopole is the same conductor portion of a first monopole of a first planar dipole segment connected to said junction;

transforming an integral equation relating to an electric field established on the surface of said conductor into simultaneous equations (1) for obtaining a current distribution of current flowing in said conductor of said antenna;

$$\sum_{i=1}^{N} Z_{ij} I_j = V_i \; (i = 1, 2, \ldots, N) \qquad (1)$$

wherein N is a number of said dipole segments,

$Z_{i,j}$ is a self or mutual impedance between an I-th dipole segment and a j-th dipole segment,

I_j is an unknown electric current coefficient of current flowing in the j-th dipole segment, and

V_i is a voltage applied to the i-th dipole segment; and

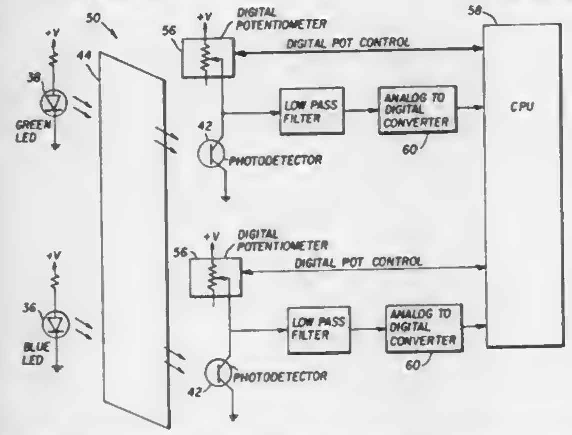
solving the simultaneous equations;

adding a second planar dipole segment to said plurality of dipole segments, wherein said second planar dipole segment includes a part of said one of the divided regions of said radial monopole and a second monopole of said first planar dipole segment, the second monopole is connected to the part of said one of the divided regions; and

calculating a current distribution function expressing a current flowing in said second planar dipole segment from a current distribution function expressing a current flowing in said part of said one of the divided regions of said radial monopole and a current distribution function expressing a current flowing in said second monopole segment of said first planar dipole segment;

wherein the current distribution of current flowing in said conductor of said antenna is obtained using the unknown electric current coefficients of currents flowing in the dipole segments by solving the simultaneous equations.

5,751,601
AUTOCALIBRATION OF OPTICAL SENSORS
Manh Tang, Penfield, and Keith A. Hadley, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 28, 1996, Ser. No. 705,103
Int. Cl.^{6} G02F *3/00*
U.S. Cl. 364—526 **18 Claims**



9. An optical sensor for a thermal printer system including a printer having a dye donor web with a repeating series of spaced yellow, magenta, and cyan dye donor frames, and a receiver which receives dye from said yellow, magenta and cyan dye donor frames to form a colored image, such printer including a print head having a plurality of selectively energizable heating elements, means for moving said dye donor web and said receiver along respective paths so as to sequentially move each dye donor frame of a series and the receiver relative to the print head such that as the heating elements are selectively energized, dye from each dye donor frame of a series is transferred to the receiver and forms a color image on the receiver, means for identifying dye donor frames of such series comprising:

a first LED disposed adjacent to the dye donor web for illuminating a first dye donor frame with a first color light having a first wavelength;

a second LED disposed adjacent to the dye donor web for illuminating said first dye donor frame with a second color light having a second wavelength;

first and second spaced photodetectors disposed adjacent to the dye donor web and respectively responsive to an intensity of said first and second color lights which passes through said first dye donor frame for respectively providing electrical signals, the levels of such signals being proportional to the intensity of light which passes through said first dye donor frame;

a CPU which receives said electrical signals from said first and second photodetectors;

a first potentiometer for setting a gain on said first photodetector wherein said CPU sets:

a(1). said first potentiometer to a initial position P(i), wherein (i) equals a series of integers, and the series begins with the numeral 1;

a(2). initiates illumination of said first dye donor frame with said first color light, wherein said first dye donor frame blocks a substantial portion of said first color light,

a(3). measures said electrical signals produced by said first photodetector proportional to the intensity of light transmitted through said first dye donor frame;

a(4). records said intensity as A(i);

a(5). increases i by 1 and repeating steps a(1)–a(5) n times, wherein n is a predetermined integer;

b(1). resets said first potentiometer to said initial position P(i);

b(2). initiates illumination of a second dye donor frame with said first color light, wherein said second dye donor frame transmits a substantial portion of said first color light;

b(3). measures said electrical signals produced by said first photodetector proportional to the intensity of light transmitted through said second dye donor frame;

b(4). records said intensity as B(i);

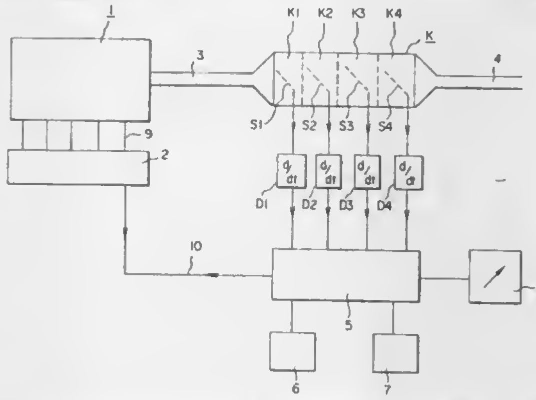
b(5). increases i by 1 and repeats steps b(1)–b(5) n times;

c(1). subtracts A(i) from B(i) and determines an absolute value C(i);

c(2). repeats steps c(1)–c(2) n times; and

d(1). sets said first potentiometer to a position P(i) which corresponds to a largest value of C(i).

5,751,602
METHOD OF MONITORING THE OPERATION OF A CATALYTIC CONVERTER
Wolfgang Maus; Helmut Swars, and Rolf Brück, all of Bergisch Gladbach, Germany, assignors to Emitec Gesellschaft Fuer Emissiontechnologie mbH, Lohmar, Germany
Division of Ser. No. 390,676, Feb. 17, 1995, Pat. No. 5,610,844. This application Jan. 27, 1997, Ser. No. 789,488
Claims priority, application Germany, Aug. 17, 1992, 42 27 207.6; Jun. 16, 1993, 43 19 924.0
Int. Cl.^{6} F01N *3/20*
U.S. Cl. 364—557 **32 Claims**



1. A method for analyzing a condition of a catalytic converter through which a gas mixture flows, which comprises:

defining at least two partial volumes within a catalytic converter, the partial volumes being axially offset from one another at different axial positions in the catalytic converter along a flow direction of a gas mixture through the catalytic converter;

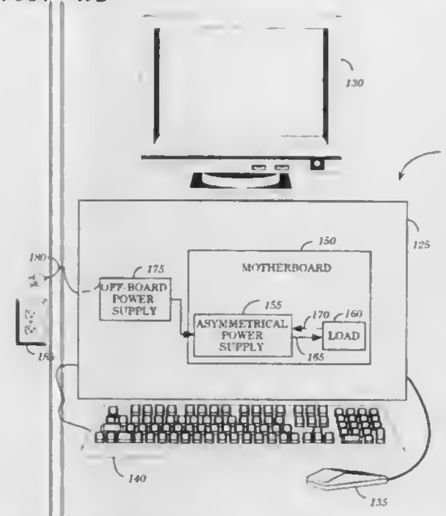
measuring a temperature with a sensor at least at one location or in a region within each of the partial volumes of the catalytic converter during a change of at least one of chemical and physical properties of the gas mixture flowing through the catalytic converter;

selecting the location or the region and a configuration of the sensor for at least approximately representing a reaction of the temperature in each of the partial volumes of the catalytic converter with a reaction of the measured temperature to a change of the properties of the gas mixture;

determining set point values for the respective change in the properties of the gas mixture on the basis of a thermodynamic model while taking physical boundary conditions and properties of each of the partial volumes into account; and

determining and comparing the reaction of the measured temperature with the set point values.

5,751,603
ASYMMETRICAL POWER SUPPLY
David E. Landolf, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.
Filed Dec. 12, 1995, Ser. No. 570,908
Int. Cl.^{6} G06F *01/26*
U.S. Cl. 364—492 **30 Claims**



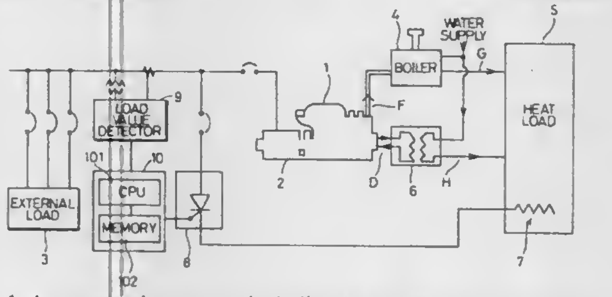
1. An asymmetric power supply providing an operating voltage ranging between a maximum voltage and a minimum voltage, the asymmetric power supply comprising:

a power supply;

a load current sensor to be coupled to said power supply; and

a voltage reference selection circuit to be coupled to said load current sensor and said power supply, said voltage reference selection circuit reducing the operating voltage to a selected, positive voltage upon detecting that a voltage drop across said load current sensor is greater than a first reference trigger voltage being a predetermined voltage less than the maximum voltage.

5,751,604
COGENERATION SYSTEM
Noriyuki Yamauchi, Hyogo-ken, Japan, assignor to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan
Filed Jan. 26, 1993, Ser. No. 9,200
Claims priority, application Japan, Feb. 3, 1992, 4-017605
Int. Cl.^{6} G06F *17/00*
U.S. Cl. 364—494 **8 Claims**



1. A cogeneration system including a generator driven by a heat engine, an external electric power load connected to said generator, and a heat load whose heat source is, waste heat generated from said heat engine, comprising:

detecting means for detecting a load value of said external electric power load;

heat generating means powered by said generator for generating heat and supplying the generated heat to said heat load; and

controlling means for controlling said heat generating means according to the load value of said external electric power load detected by said detecting means,

said controlling means comprising

storing means for storing information indicating a relation between a load value of said generator and a heat quantity recovered by said heat load from said heat engine, and

calculating means for calculating electric power to be consumed by said heat generating means based on the relation stored in said storing means, so that the sum of heat quantities recovered by said heat load from waste heat of said heat engine and from generated heat of said heat generating means is a predetermined value, in response to said external electric power load being a small load value and a heat quantity recovered by said heat load from said heat engine being less than the predetermined value.

5,751,605
MOLECULAR HOLOGRAM QSAR
John Robert Hurst, Wildwood, and Trevor William Heritage, Ballwin, both of Mo., assignors to Tripos, Inc., St. Louis, Mo.
Filed Aug. 15, 1996, Ser. No. 698,040
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—496 **1 Claim**

1. A computer-based method of generating an optimal quantitative structure-activity relationship of a series of molecules comprising the steps of:

(a) defining a list of values for L, m, and n;

(b) selecting a first set of values for L, m, and n from the list;

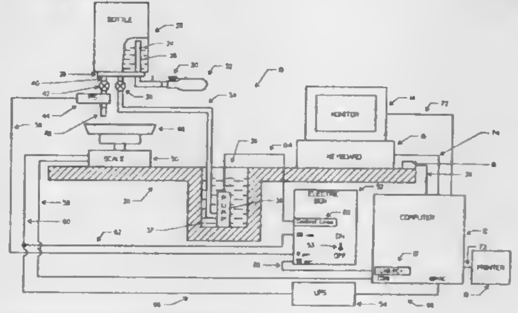
(c) using the selected values of L, m, and n, defining a MOLECULAR HOLOGRAM molecular structural descriptor for each molecule in the series wherein each molecule is associated with an activity value;

(d) correlating the MOLECULAR HOLOGRAM molecular structural descriptor and activity value of each molecule with all the other molecules in said series;

(e) repeating steps (c) and (d) for all values of L, m, and n on the list; and

(c) outputting a table of parameters, including the values of L, m, and n, used for MOLECULAR HOLOGRAM generation along with associated measures of statistical validity.

5,751,606
AUTOMATIC VALVE TEST APPARATUS
Valery Migachyov, San Antonio, and Charles D. Colley, Universal City, both of Tex., assignors to HK Medical Technologies Incorporated, San Antonio, Tex.
Filed May 3, 1996, Ser. No. 642,635
Int. Cl.^{6} G01N *7/00*
U.S. Cl. 364—558 **27 Claims**



1. An apparatus comprising:

a) a device for controlling urinary incontinence; and

b) a tester responsively coupled to said device for determining that said device opens at a first predetermined pressure and remains open above a first predetermined flow rate.

5,751,607

METHOD OF SPUTTER DEPOSITION SIMULATION BY INVERSE TRAJECTORY CALCULATION

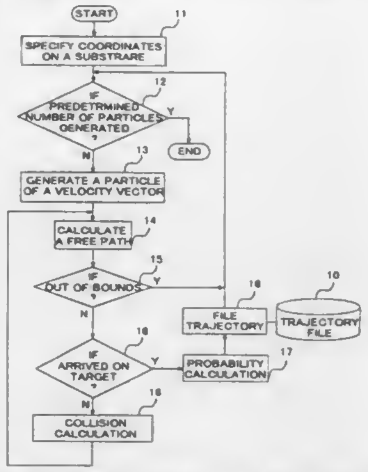
Toshiyuki Ohta, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 25, 1996, Ser. No. 621,507

Claims priority, application Japan, Mar. 30, 1995, 7-072814

Int. Cl.^{6} G06F *9/455;* **C23C** *14/52;* **H01L** *21/203*

U.S. Cl. 364—578 **3 Claims**



1. A method of profile simulation of a thin film deposited by sputtering, comprising the steps of:

determining trajectories of sputtered particles generated according to a generation probability of each of said sputtered particles from a target by a Monte Carlo method which considers equipmental geometry where said trajectories are traced and sputtered particle collisions with background gas, and

determining growth of the thin film at a location according to a proportional number of said trajectories of sputtered particles arriving at said location; and

determining said trajectories arriving at said location by an inverse calculation which considers that each of said trajectories arriving at said location follows one of said trajectories of virtual particles starting from said location and extending to said target assuming said virtual particles travel in the same manner as said sputtered particles.

5,751,608

COATING THICKNESS GAUGE

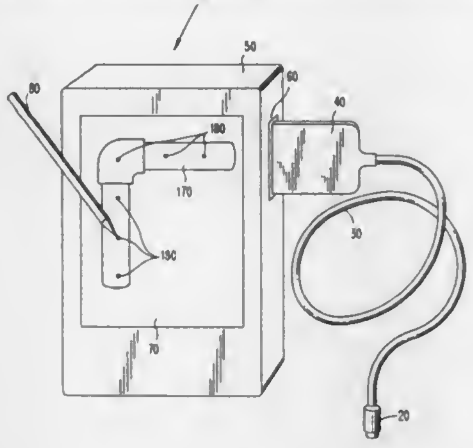
Frank J. Koch, Ogdensburg, N.Y.; Leon C. Vandervalk, and David J. Beamish, both of Brockville, Canada, assignors to DeFelsko Corporation, Ogdensburg, N.Y.

Filed Sep. 15, 1995, Ser. No. 529,137

Int. Cl.^{6} G06F *15/52;* **G01N** *23/203*

U.S. Cl. 364—563 **30 Claims**

1. A method of recording coating thickness measurements, comprising the steps of:



obtaining a plurality of coating thickness values with a probe electrically connected to an electronic memory;

recording in the electronic memory the plurality of coating thickness values; and

recording in the electronic memory a plurality of descriptive data, each descriptive data is associated with a respective one of the coating thickness values and provides information concerning the respective one coating thickness value.

5,751,609

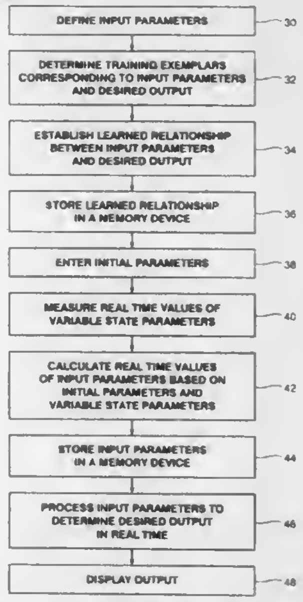
NEURAL NETWORK BASED METHOD FOR ESTIMATING HELICOPTER LOW AIRSPEED

Carl G. Schaefer, Jr., Woodbridge, Va.; Kelly M. McCool, University Park, and David J. Haas, North Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1996, Ser. No. 740,067

Int. Cl.^{6} G01C *21/10*

U.S. Cl. 364—565 **17 Claims**


DEFINE INPUT PARAMETERS
30
DETERMINE TRAINING EXEMPLARS CORRESPONDING TO INPUT PARAMETERS AND DESIRED OUTPUT
32
ESTABLISH LEARNED RELATIONSHIP BETWEEN INPUT PARAMETERS AND DESIRED OUTPUT
34
STORE LEARNED RELATIONSHIP IN A MEMORY DEVICE
36
ENTER INITIAL PARAMETERS
38
MEASURE REAL TIME VALUES OF VARIABLE STATE PARAMETERS
40
CALCULATE REAL TIME VALUES OF INPUT PARAMETERS BASED ON INITIAL PARAMETERS AND VARIABLE STATE PARAMETERS
42
STORE INPUT PARAMETERS IN A MEMORY DEVICE
44
PROCESS INPUT PARAMETERS TO DETERMINE DESIRED OUTPUT IN REAL TIME
46
DISPLAY OUTPUT
48

1. A method for estimating airspeed information of a helicopter operating in a low airspeed flight range of below about 50 knots, said airspeed information estimated in a real time fashion, said method comprising the steps of:

(a) defining input parameters derivable from variable state parameters generated during flight of the helicopter, said variable state parameters measurable in a nonrotating reference frame associated with the helicopter;

(b) determining said input parameters and a coinciding reference speed information at a plurality of flight conditions representing a predetermined low airspeed flight domain of the helicopter;

(c) establishing a learned relationship between said determined input parameters and said coinciding reference speed information, said relationship represented by at least one nonlinear equation;

(d) storing said at least one nonlinear equation in a memory onboard the helicopter;

(e) measuring real time values of said variable state parameters during low airspeed flight of the helicopter;

(f) calculating real time values of said input parameters;

(g) processing said real time values of said input parameters in accordance with said at least one nonlinear equation to determine said airspeed information; and

(h) displaying said airspeed information.

5,751,610

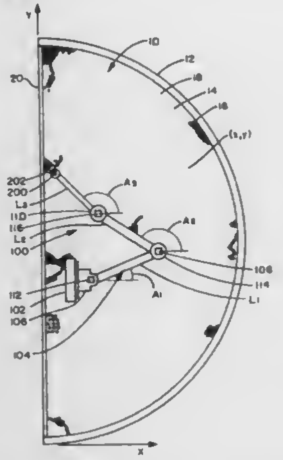
ON-LINE ROBOT WORK-CELL CALIBRATION

Zhongxue Gan, Storrs, Conn.; Lance Terrance Fitzgibbons, Southwick, Mass.; Qing Tang, Wethersfield, and Jeffrey Sherman Katz, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 31, 1996, Ser. No. 741,898

Int. Cl.^{6} G01C *25/00*

U.S. Cl. 364—571.03 **13 Claims**



4. In a heat exchanger while out of service, having a substantially planar tube sheet which defines a multiplicity of laterally spaced tube openings each of which is centered at a coordinate on a tube sheet coordinate system and a robot under the automatic control of a computer and optionally under the remote manual control of an operator, the robot having a base fixed with respect to the tube sheet, an articulated arm for moving parallel to said tube sheet, and an end effector carried by the arm for sequential positioning in a robot coordinate system which is offset from the tube sheet coordinate system, to register sequentially with a plurality of selected tube openings, a method for controlling the movement of the arm comprising:

(a) storing a first database, of the coordinates of all the tube openings in the tube sheet coordinate system;

(b) assigning each coordinate of the first database, to one a plurality of calibration zones;

(c) determining the position of the end effector in the tube sheet coordinate system;

(d) selecting the coordinate in the tube sheet coordinate system, of a first target tube opening, to which the end effector will be repositioned by movement of the arm;

(e) moving the arm automatically to reposition the end effector at the selected tube end according to a robot kinematics equation which quantitatively relates the tube sheet coordinate system to the robot coordinate system;

(f) determining whether the end effector as repositioned in step (e) is deviated from direct registry with the first target tube opening;

(g) if a deviation is determined in step (f), moving the arm differentially to move the end effector until the deviation is reduced within an acceptable tolerance;

(h) measuring the differential movement of the end effector in step (g);

(i) selecting the coordinate of a second target tube opening in the same calibration zone as the first target tube opening;

(j) moving the arm automatically to reposition the end effector at the second selected tube opening according to a recalibrated robot kinematics equation which quantitatively relates the tube sheet coordinate system to the robot coordinate system as further offset by the differential movement measured in step (h).

5,751,611

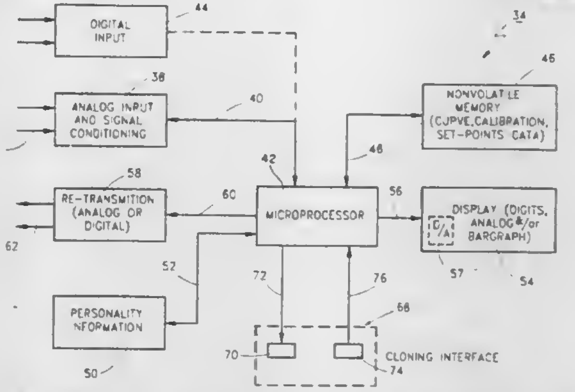
DISPLAY DEVICE FOR LINEARLY DISPLAYING A NON-LINEAR INPUT VARIABLE

Brian Thomas Jamieson, Meriden, Conn., assignor to Prime Technology, Inc., North Branford, Conn.

Filed Oct. 3, 1996, Ser. No. 726,345

Int. Cl.^{6} G06F *15/20*

U.S. Cl. 364—573 **18 Claims**


DIGITAL INPUT
44
34
45
38
ANALOG INPUT AND SIGNAL CONDITIONING
40
NONVOLATILE MEMORY (CURVE,CALIBRATION, SET-POINTS DATA)
36
42
46
58
RE-TRANSMITION (ANALOG OR DIGITAL)
60
MICROPROCESSOR
56
DISPLAY (DIGITS, ANALOG &/or BARGRAPH)
D/A
62
52
72
76
57
54
PERSONALITY NFORMATION
68
70
CLONING INTERFACE
74
50

1. A display device for linearly displaying a non-linear input variable at an infinite number of input points over a finite range, comprising input means for receiving data representative of a non-linear input variable; computer means connected to said input means for receiving the data; a substantially linear display having a display input connected to said computer means for providing an output indication which vary linearly with a signal applied to said display input; non-volatile memory means connected to said computer means for storing a plurality of finite sets of predetermined points n of correlated input/output points (x_n, y_n) each defining a specific conversion function representative of an associated non-linear input variable for converting a given input (x_n) at any given point (x_n, y_n) to an associated output (y_n), each two adjacent points (x_0, y_0) and (x_1, y_1) defining a straight line segment, said computer means being programmed to interpolate for any given x between two inputs (x_0, x_1) to provide an output (y) between associated outputs (y_0, y_1) by making the following computation:

$$y = \frac{(x - y_0)(y_1 - y_0)}{x_1 - x_0} + y_0;$$

and personality means for selecting one of said plurality of sets of points for a given application which linearizes a predetermined specific non-linear input variable.

5,751,612

SYSTEM AND METHOD FOR ACCURATE AND EFFICIENT GEODETIC DATABASE RETRIEVAL

Kenneth B. Donovan, Daytona Beach; Richard A. Ferrell, Chuluota; Arthur J. Heidrich, South Daytona, and Dominick S. Zirpolo, Port Orange, all of Fla., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Aug. 24, 1995, Ser. No. 519,063

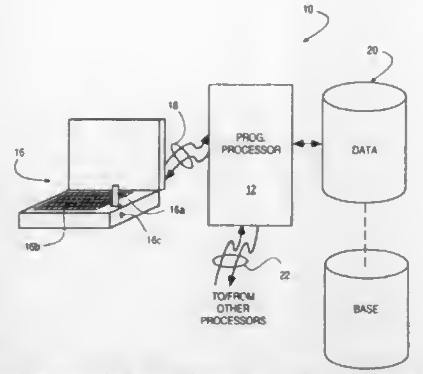
Int. Cl.^{6} G06F *9/455;7/548*

U.S. Cl. 364—578 **43 Claims**

1. A system for retrieving information stored in a first coordinate system corresponding to at least one target location specified relative to a second coordinate system comprising:

a database containing information stored in the first coordinate system;

an input device for providing a reference location defined in the first coordinate system and for providing indicia relative to the reference location, for defining at least one target location relative to the reference location but with respect to said second coordinate system;



processing means for establishing a region adjacent to at least said one target location including means for representing at least first and second points on said region with respect to said first coordinate system;

processing means for translating said representations of said points into representations with respect to said second coordinate system; and wherein said processing means includes means for establishing a representation of said target location in said first coordinate system using said translated representation of said points.

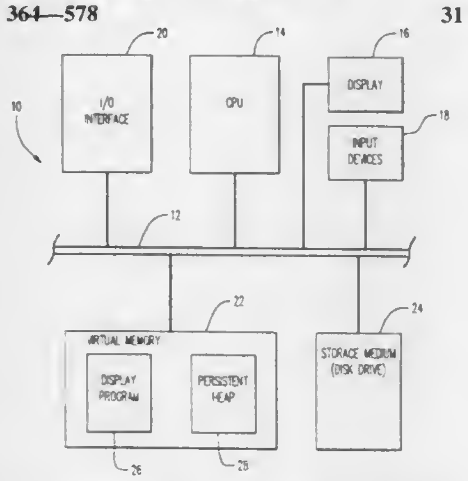
5,751,613
PERSISTENT HEAP FOR DYNAMIC PICTURE OBJECTS

Douglas E. Doty, 5905 E. Cielo Run Ss, Cave Creek, Ariz. 85331; David G. Johnsen, 801 W. Toropah Dr., Phoenix, Ariz. 85027, and Donald W. Moore, 2901 E. Friess Dr., Phoenix, Ariz. 85032

Filed Sep. 3, 1996, Ser. No. 697,919

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 364—578 **31 Claims**



1. A system for displaying objects held in a persistent heap and stored in a heap file which comprises:

a means for forming said persistent heap in a virtual memory portion of said system;

a means for retrieving said heap file from a storage medium of said system;

a means for loading said heap file to said persistent heap, said heap file including at least one object; and

a means for displaying said object on a display of said system.

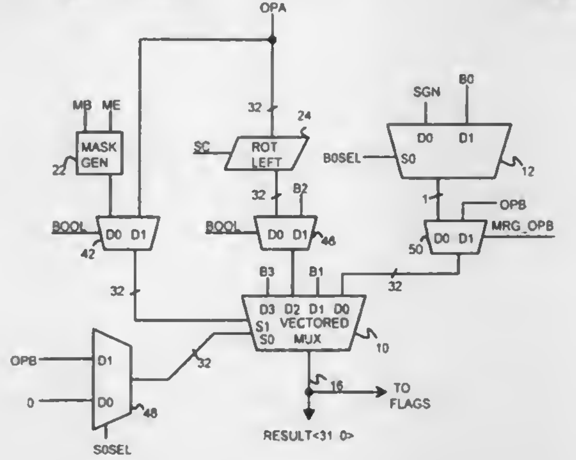
5,751,614
SIGN-EXTENSION MERGE/MASK, ROTATE/SHIFT, AND BOOLEAN OPERATIONS EXECUTED IN A VECTORED MUX ON AN ALU

Earl T. Cohen, Fremont, Calif., assignor to Exponential Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 444,814, May 18, 1995, Pat. No. 5,497,341, which is a continuation of Ser. No. 207,751, Mar. 8, 1994, Pat. No. 5,442,577. This application Feb. 29, 1996, Ser. No. 609,908

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—716.02 **18 Claims**



1. A logic-instruction execution unit for executing Boolean operations and merge operations, the logic-instruction execution unit comprising:

a vectored mux for outputting a result of a Boolean operation or a merge operation, the vectored mux comprising a plurality of individual mux cells, each mux cell having data inputs and select control inputs and an output driving one bit-position of the result, the select control input controlling which data input is coupled to drive the output independently of other data inputs;

a first operand input comprising a plurality of electrical signals representing a first operand;

a second operand input comprising a plurality of electrical signals representing a second operand;

Boolean control means for applying the first operand input and the second operand input to the select control inputs of the vectored mux when a Boolean operation is executed;

truth-table inputs comprising electrical signals representing a truth table for the Boolean operation, the truth-table inputs varying for different Boolean operations;

the Boolean control means including means for applying the truth-table inputs to the data inputs of the vectored mux when a Boolean operation is executed;

merge control means for applying the first operand inputs to a first data input on the vectored mux and for applying the second operand inputs to a second data input on the vectored mux when a merge operation is executed;

a mask generator for generating a mask indicating a first portion of the result from the first operand and a second portion of the result from the second operand, the first portion and the second portion not overlapping;

the merge control means including means for applying the mask to a select control input of the vectored mux when a merge operation is executed, wherein the mask causes the vectored mux to select the first portion of the first operand applied to the first data input and the second portion of the second operand applied to the second data input,

whereby the vectored mux executes both merge operations and Boolean operations, the operands applied to the data inputs for merge operations but applied to the select control inputs for Boolean operations.

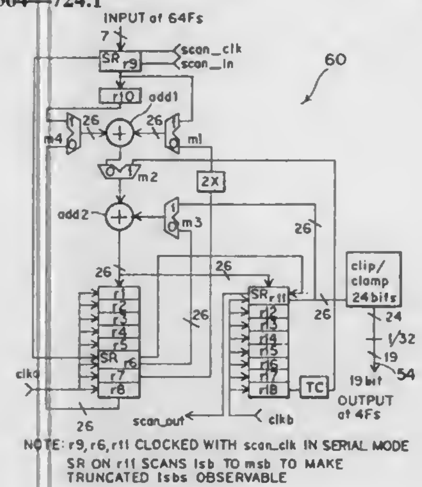
5,751,615
IMPLEMENTATION OF A DIGITAL DECIMATION FILTER AND METHOD

Glen W. Brown, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 14, 1995, Ser. No. 557,511

Int. Cl.^{6} G06F *17/10* .

U.S. Cl. 364—724.1 **10 Claims**



DECIMATOR 1 IMPLEMENTATION

7. A digital decimation filter implementing a nth order sinc filter, comprising:

(a) a multi-bit digital input signal comprised of a plurality of input data values;

(b) a first input signal storage device having an input and an output;

(c) a second input signal storage device having an input and an output;

(d) a first adder having an output and a plurality of inputs;

(e) a second adder having an output and a plurality of inputs;

(f) a first group of data storage registers;

(g) a second group of data storage registers;

(h) a first selection device which selects between said output of said second input signal storage device and an output from said first group of data storage registers, to be input to an input of said first adder;

(i) a second selection device which selects between said output of said first input signal storage device and an output from said first group of data storage registers, to be input to another input of said first adder;

(j) a third selection device which selects between said output of said first adder and an output from said second group of data storage registers, to be input to an input of said second adder; and

(k) a fourth selection device which selects between an output of said first group of data storage registers and an output from said second group of data storage registers, to be input to another input of said second adder;

wherein said output of said second adder is input to an input of said first group of data storage registers and to an input of said second group of data storage registers; and

wherein a filter output is output from said second group of data storage registers.

5,751,616
MEMORY-DISTRIBUTED PARALLEL COMPUTER AND METHOD FOR FAST FOURIER TRANSFORMATION

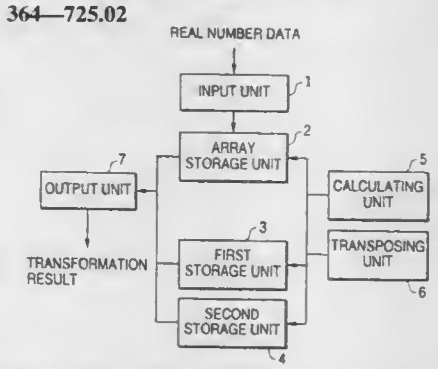
Markus Hegland, O'Connor, Australia, and Makoto Nakanishi, Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan, and The Australian National University, Canberra, Australia

Filed Aug. 21, 1996, Ser. No. 701,165

Claims priority, application Japan, Nov. 29, 1995, 7-311224

Int. Cl.^{6} G06F *17/14;15/00*

U.S. Cl. 364—725.02 **13 Claims**



1. A memory-distributed parallel computer for distributing data to memory of a plurality of processors and performing a fast Fourier transformation while transferring data between processors, comprising:

input means for inputting real number data as a first two-dimensional array consisting of a first dimension and a second dimension;

array storage means for dividing the first dimension of the first two-dimensional array by a number of the processors, generating a plurality of subarrays in which the first dimension is even, and distributing the plurality of subarrays for storage in each of the plurality of processors;

first storage means for storing first data after the first dimension of each of the plurality of subarrays is divided into the first data and second data;

second storage means for storing the second data;

calculating means for moving the first and second data from array storage means to said first storage means and second storage means, performing a complex Fourier transformation in each processor on the second dimension with the first data regarded as a real part and the second data regarded as an imaginary part, and obtaining a second transformation result of the Fourier transformation performed on the real number data based on a first-transformation result of the complex Fourier transformation; and

output means for outputting the second transformation result.

5,751,617
CALCULATING THE AVERAGE OF TWO INTEGER NUMBERS ROUNDED AWAY FROM ZERO IN A SINGLE INSTRUCTION CYCLE

Roney S. Wong, Sunnyvale, Calif., assignor to Samsung Electronics Co., Ltd., Rep. of Korea

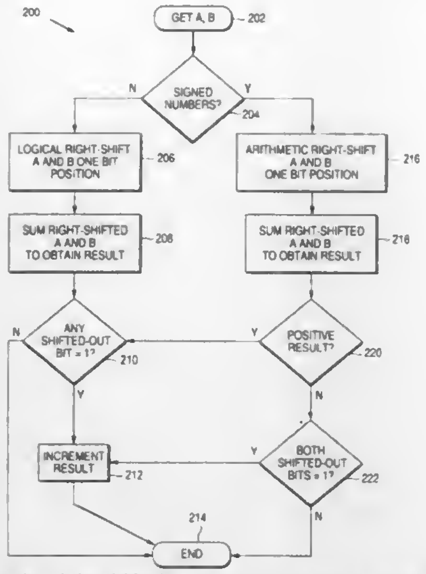
Filed Apr. 22, 1996, Ser. No. 636,047

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—734 **15 Claims**

1. A method of operating a circuit to obtain an average of two unsigned operands such that the average is an integer rounded away from zero in a single instruction cycle, comprising:

logically right-shifting each of the operands by one bit position, wherein bits in a lowest significant bit position of the operands become shifted-out bits;


200
GET A, B
202
SIGNED NUMBERS?
204
N
Y
LOGICAL RIGHT SHIFT A AND B ONE BIT POSITION
206
ARITHMETIC RIGHT-SHIFT A AND B ONE BIT POSITION
216
SUM RIGHT-SHIFTED A AND B TO OBTAIN RESULT
208
SUM RIGHT-SHIFTED A AND B TO OBTAIN RESULT
218
ANY SHIFTED-OUT BIT = 1?
210
POSITIVE RESULT?
220
INCREMENT RESULT
212
BOTH SHIFTED-OUT BITS = 1?
222
214
END

summing the right-shifted operands to obtain a result; and incrementing the result when any of the shifted-out bits is a one.

5,751,618

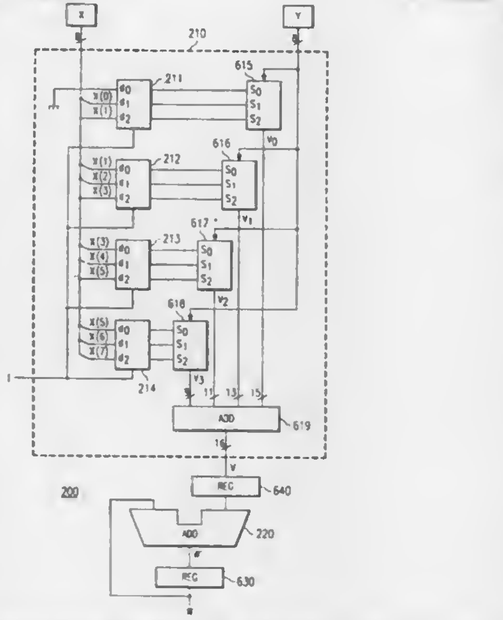
ARITHMETIC CIRCUIT

Shigeshi Abiko, Tokyo; Shintaro Mizushima, Chiba-ken, both of Japan, and Marc Couvrat, Saint Laurent du Var, France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1995, Ser. No. 391,871

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—736.01 **6 Claims**



1. A product sum/product difference arithmetic circuit comprising:

first and second input terminals for respectively receiving multiplier x data and multiplicand y data as numerical values;

a multiplier including

a plurality of multiplier sections, each of said multiplier sections having the same number of plural data bits arranged in cascade so as to overlap one data bit in successive multiplier sections,

a plurality of encoders having plural inputs and outputs and respectively corresponding to the plurality of multiplier sections for receiving the data bits from respective multiplier sections in the plural inputs thereof and producing encoded data bits at the plural outputs thereof, each of said plurality of encoders further having an additional input,

a plurality of partial product preparation units having plural inputs and an output and respectively corresponding to the plurality of encoders for receiving the encoded data bits produced at the plural outputs of said encoders at the plural inputs thereof, each of said plurality of partial product preparation units further having an additional input,

said first input terminal being connected to said plurality of multiplier sections for providing the x data thereto,

said second input terminal being connected to said additional input of each of said plurality of partial product preparation units for providing the y data thereto,

an add/subtract control terminal connected to the said additional input of each of said encoders for providing either an add command signal or a subtract command signal to the respective encoder, and

an adder connected to said plurality of partial product preparation units and having plural inputs and an output for receiving the outputs from said plurality of partial product preparation units at the plural inputs thereof and providing a multiplication result at the output thereof;

whereby said multiplier generates and outputs a value as a result of the multiplication of two input x and y numerical values when an add command signal from said add/subtract control terminal is input to said additional input of each of said encoders, and generates and outputs a value as a result of the multiplication of two input x and y numerical values multiplied by (−1) when a subtract command signal from said add/subtract control terminal is input to said additional input of each of said encoders.

5,751,619

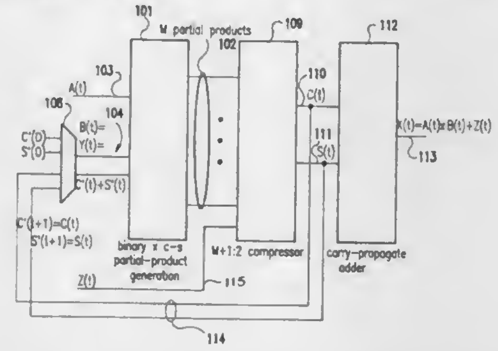
RECURRENT ADRITHMETICAL COMPUTATION USING CARRY-SAVE ARITHMETIC

Ramesh Chandra Agarwal, Yorktown Heights; Bruce Martin Fleischer, Mt. Kisco, and Fred Gehrung Gustavson, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1996, Ser. No. 589,770

Int. Cl.^{6} G06F *7/38;7/52*

U.S. Cl. 364—736.02 **5 Claims**



1. A recurrent calculator using carry-save arithmetic comprising:

a partial product generator for generating a plurality of partial products whose sum is a product A×B, where A is one binary input and B is a sum C'+S' of carry-save inputs C' and S', wherein the partial product generator has a compressor for compressing C' and S' to C" and S", where the sum of compressed values, C"+S", equals the sum of the binary inputs C'+S and C"(i) is non-zero only for odd values of i, i being an integer and $0 \leqq i \leqq n-1$, n being the number of bits in B;

a compressor for compressing the plurality of partial products and an additional input Z to two partial products C and S whose sum C+S equals a sum of the plurality of partial products and Z;

a carry propagate adder for adding the partial products C and S to produce a binary result X equal to A×B+Z;

a feedback path for returning the partial products C and S from the compressor to the inputs C' and S' for a next iteration; and

a selector for selecting whether inputs C' and S' are the partial products C and S from a previous iteration or initializing values C(0) and S(0) on an initial iteration.

5,751,620

METHOD FOR THE PRODUCTION OF AN ERROR CORRECTION PARAMETER ASSOCIATED WITH THE IMPLEMENTATION OF MODULAR OPERATIONS ACCORDING TO THE MONTGOMERY METHOD

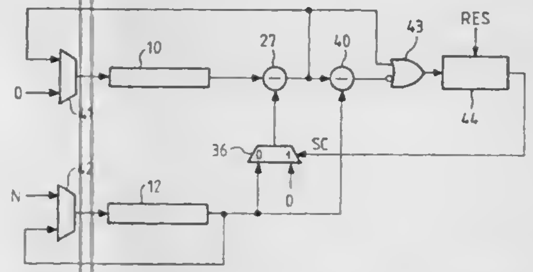
Guy Monier, Rognac, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Nov. 7, 1995, Ser. No. 551,782

Claims priority, application France, Nov. 8, 1994, 94 13593

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 364—746.1 **13 Claims**



1. A method for producing a binary error correction parameter encoded on m words of k bits each, wherein said method comprises the following steps:

(A) loading a modulo N in a first n-bit register with n=m*k and initializing a second n-bit register at zero, the contents of the second register being denoted B(**0**);

(B) producing and storing a data element B(**1**)=2* (B(**0**)–N) encoded on n bits by:

right shifting the first and second registers, bit-by-bit subtracting the contents of the first and second registers, and left shifting by one unit a result, denoted R(**0**), of the bit-by-bit subtraction;

loading the result of the subtraction after shifting, denoted B(**1**), in the second register;

(C) producing a data element $H_{int}=2^{n+v}$ mod N encoded on n bits by repeating, for i iterations where i is an integer ranging from 1 to v=(m*k)/2p and p is an integer, the following operations:

bit-by-bit comparing B(i) and N;

if B(i)<N, loading into the second register B(i+1)=2*B(i) by left shifting B(i) by one unit; and

if B(i)≧N, bit-by-bit subtracting N and B(i), left shifting by one unit a result of the subtraction, and loading the left shifted result B(i+1)=2* (B(i)–N) into the second register;

(D) producing the parameter by performing p P_{field} operations $H_{int}(j)=P(H_{int}(j-1), H_{int}(j-1)_N$, with j being an index ranging from 1 to p and $H_{int}(\mathbf{0})$ equaling B(v+1) when B(v+1)<N and equaling B(v+1)–N when B(v+1)≧N; and

(E) using the parameter to one of encrypt and decrypt a message.

5,751,621

MULTIPLY-ADD UNIT AND DATA PROCESSING APPARATUS USING IT

Fumio Arakawa, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

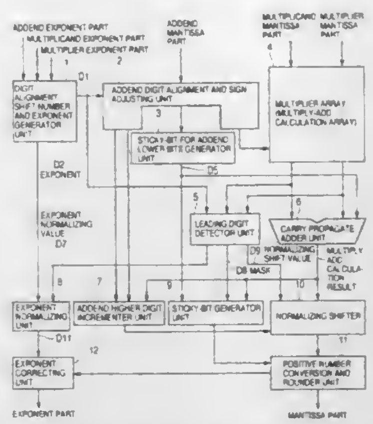
Filed Nov. 13, 1995, Ser. No. 559,160

Claims priority, application Japan, Nov. 17, 1994, 6-308200

Int. Cl.^{6} G06F *7/38;7/00*

U.S. Cl. 364—748.07 **16 Claims**

1. A multiply-add unit for performing a multiply-add calculation of a multiplicand, a multiplier, and an addend, comprising:


ADDEND EXPONENT PART
MULTIPLICAND EXPONENT PART
MULTIPLIER EXPONENT PART
ADDEND MANTISSA PART
MULTIPLICAND MANTISSA PART
MULTIPLIER MANTISSA PART
DIGIT ALIGNMENT SHIFT NUMBER AND EXPONENT GENERATOR UNIT
ADDEND DIGIT ALIGNMENT AND SIGN ADJUSTING UNIT
MULTIPLIER ARRAY (MULTIPLY-ADD CALCULATION ARRAY)
STICKY-BIT FOR ADDEND LOWER BITS GENERATOR UNIT
D2 EXPONENT
EXPONENT NORMALIZING VALUE D7
LEADING DIGIT DETECTOR UNIT
CARRY PROPAGATE ADDER UNIT
NORMALIZING SHIFT VALUE
DB MASK
MULTIPLY-ADD CALCULATION RESULT
EXPONENT NORMALIZING UNIT
ADDEND HIGHER DIGIT INCREMENTER UNIT
STICKY BIT GENERATOR UNIT
NORMALIZING SHIFTER
D11
EXPONENT CORRECTING UNIT
POSITIVE NUMBER CONVERSION AND ROUNDER UNIT
EXPONENT PART
MANTISSA PART

a digit alignment shift number generator unit for obtaining a digit alignment shift number and an exponent of a multiply-add calculation result before normalization, in accordance with an exponent of the multiplicand, an exponent of the multiplier, and an exponent of the addend;

an addend digit alignment unit for shifting and outputting a mantissa of the addend in accordance with the digit alignment shift number;

a multiply-add calculation array for receiving a mantissa of the multiplicand and a mantissa of the multiplier, and a mantissa of the addend supplied from the addend digit alignment unit, performing a multiply-add calculation of these mantissas, and outputting two terms;

a leading digit detector unit for receiving the two terms supplied from the multiply-add calculation array, and in accordance with the two terms, detecting the leading non-zero digit among absolute values of the mantissas of the multiply-add calculation result before normalization. said leading digit detector unit having a determining portion for determining whether a sum of said two terms is positive or negative, a first detection portion for detecting which digit is the leading non-zero digit among the absolute values of the mantissas of the multiply-add calculation result before normalization based on said two terms when it is determined that said sum is positive, and a second detection portion for detecting which digit is the leading non-zero-digit among the absolute values of the mantissas of the multiply-add calculation result before normalization based on said two terms when it is determined that said sum is negative, whereby the leading non-zero digit is finally determined upon the initial detection of a leading non-zero digit by the leading digit detector unit, whether the initial detection is made by the first detection portion or by the second detection portion;

a carry propagate adder unit for receiving the two terms from the multiply-add calculation array; in accordance with the two terms, performing a carry propagate addition operation in parallel with a leading digit detection operation of the leading digit detector unit; and outputting a mantissa of the multiply-add calculation result before noralization;

a normalizing unit for normalizing the mantissa of the multiply-add calculation result before normalization supplied from the carry propagate adder unit in accordance with the leading digit detected by the leading digit detector unit, and obtaining a normalized mantissa of the multiply-add calculation result; and

an exponent normalizing unit for normalizing the exponent of the multiply-add calculation result before normalization supplied from the digit alignment shift number generator unit in accordance with the leading digit detected by the leading digit detector unit, and obtaining a normalized exponent of the multiply-add calculation result.

5,751,622

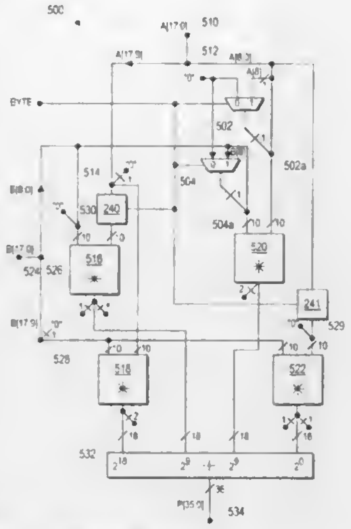
STRUCTURE AND METHOD FOR SIGNED MULTIPLICATION USING LARGE MULTIPLIER HAVING TWO EMBEDDED SIGNED MULTIPLIERS

Stephen C. Purcell, Mountain View, Calif., assignor to Chromatic Research, Inc., Mountain View, Calif.

Filed Oct. 10, 1995, Ser. No. 541,563

Int. Cl.⁶ G06F *7/52*

U.S. Cl. 364—757 **13 Claims**



1. A multiplier circuit comprising:

a first input port for receiving a first word having an upper byte and a lower byte;

a second input port for receiving a second word having an upper byte and a lower byte;

a first gating circuit coupled to receive the most-significant bit of said lower byte of said first word and a byte control signal, said first gating circuit providing a first bit at an output terminal thereof, said first bit being equal to the most significant bit of said lower byte of said first word when said byte control signal is in a first state and being equal to zero when said byte control signal is in a second state;

a first concatenation port coupled to receive said lower byte of said first word and said first bit and providing a sign-extended lower byte of said first word;

a second gating circuit coupled to receive the most-significant bit of said lower byte of said second word and said byte control signal, said second gating circuit providing a second bit at an output terminal thereof, said second bit being equal to the most significant bit of said lower byte of said second word when said byte control signal is in said first state and being equal to zero when said byte control signal is in said second state;

a second concatenation port coupled to receive said lower byte of said second word and said second bit and providing a sign-extended lower byte of said second word;

a first multiplier coupled to receive said sign-extended lower bytes of said first and second words and generating a first product equal to the product of said sign-extended lower bytes;

a third concatenation port coupled to said first input port and concatenating a zero bit with said upper byte of said first word to produce a left-shifted upper byte of said first word;

a fourth concatenation port coupled to said second input port and concatenating a zero bit with said upper byte of said second word to produce a left-shifted upper byte of said second word;

a second multiplier coupled to receive said left-shifted upper bytes of said first and second words and generating a second product equal to the product of said left-shifted upper bytes;

a third gating circuit coupled to receive said left-shifted upper byte of said first word and said byte control signal, said third gating circuit providing a first gated byte, said first gated byte being equal to said left-shifted upper byte of said first word when said byte control signal is in said second state and said first gated byte being equal to zero when said byte control signal is in said first state;

a fourth gating circuit coupled to receive said lower byte of said first word and said byte control signal, said fourth gating circuit providing a second gated byte, said second gated byte being equal to said lower byte of said first word when said byte control signal is in said second state and said second gated byte being equal to zero when said byte control signal is in said first state;

a third multiplier coupled to said second input port and to said third gating circuit, said third multiplier receiving said lower byte of said second word and said first gated byte and generating a third product equal to the product of said lower byte of said second word and said first gated byte; and

a fourth multiplier coupled to said second input port and said fourth gating circuit, said fourth multiplier receiving said upper byte of said second word and said second gated byte and generating a fourth product equal to the product of said upper byte of said second word and said second gated byte.

5,751,623

DIGITAL COMPUTER FOR ADDING AND SUBTRACTING

David E. Ferguson, Fawnskin, Calif., assignor to Amalgamated Software of North America, Inc., San Antonio, Tex.

Filed Nov. 22, 1995, Ser. No. 561,785

Int. Cl.⁶ G06F *7/50*

U.S. Cl. 364—781 **20 Claims**

9. A digital computer comprising:

(a) a storage device;

(b) digital circuitry capable of performing addition and subtraction in a reduced number of operations to produce, for use in subsequent computer operations, the sum or difference of two decimal numbers stored in the storage device in binary form by:

- (1) storing X7B representations of the two decimal numbers in the storage device;
- (2) selectively adding or subtracting the X7B representations of the two numbers to produce, in the storage device, a first operand;
- (3) logically AND'ing the first operand with a second operand having a hexadecimal value of "30" in each byte to produce, in the storage device, a third operand;
- (4) logically shifting the third operand by three bits to the right to produce, in the storage device, a fourth operand;
- (5) subtracting the fourth operand from the first operand to produce, in the storage device, a fifth operand;
- (6) logically AND'ing each byte of the fifth operand with a sixth operand having a hexadecimal value of "0F" in each byte to produce, in the storage device, a binary number representing the sum or difference of the two decimal numbers; and
- (7) delivering the binary number from its location in the storage device for use in subsequent operations of the digital computer.

5,751,624

COMPLEX NUMBER CALCULATION CIRCUIT

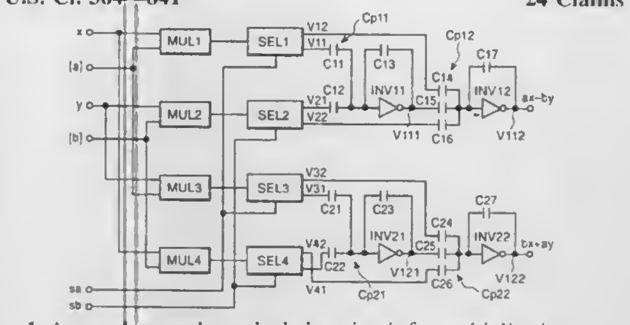
Changming Zhou; Guoliang Shou; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, and Yozan Inc., Tokyo, both of Japan

Filed Sep. 19, 1996, Ser. No. 715,732

Claims priority, application Japan, Sep. 20, 1995, 7-264645; Sep. 28, 1995, 7-274839

Int. Cl.⁶ G06C *15/08*

U.S. Cl. 364—841 **24 Claims**



1. A complex number calculation circuit for multiplication comprising:

i) a first multiplying circuit which comprises:

a) a first capacitive coupling to which an analog voltage is inputted corresponding to a real part of a first complex number and a digital signal is inputted corresponding to an absolute value of a real part of a second complex number,

in which capacitances corresponding to a weight of each bit of said digital signal are connected in parallel,

b) a plurality of first multiplexers for alternatively connecting said analog voltage or a reference voltage to each said capacitance according to a value of each bit of said digital signal in said first capacitive coupling; and

c) a first inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said first capacitive coupling is inputted;

ii) a second multiplying circuit which comprises:

a) a second capacitive coupling to which an analog voltage is inputted corresponding to an imaginary part of said first complex number and a digital signal is inputted corresponding to an absolute value of an imaginary part of said second complex number,

in which capacitances corresponding to a weight of each bit of said digital signal are connected in parallel,

b) a plurality of second multiplexers for alternatively connecting said analog voltage or said reference voltage to each said capacitance according to said value of each bit of said digital signal in said second capacitive coupling; and

c) a second inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said second capacitive coupling is inputted;

iii) a third multiplying circuit which comprises:

a) a third capacitive coupling to which an analog voltage is inputted corresponding to an imaginary part of said first complex number and said digital signal corresponding to said absolute value of said real part of said second complex number,

in which capacitances corresponding to a weight of each bit of said digital signal are connected in parallel,

b) a plurality of third multiplexers for alternatively connecting said analog voltage or said reference voltage to each said capacitance according to said value of each bit of said digital signal in said third capacitive coupling; and

c) a third inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said third capacitive coupling is inputted;

iv) a fourth multiplying circuit which comprises:

a) a fourth capacitive coupling to which an analog voltage is inputted corresponding to said real part of said first complex number and said digital signal is inputted corresponding to said absolute value of said imaginary part of said second complex number,

in which capacitances corresponding to said weight of each bit of said digital signal are connected in parallel,

b) a plurality of fourth multiplexers for alternatively connecting said analog voltage or said reference voltage to each capacitance according to said value of each bit of said digital signal in said first capacitive coupling; and

c) a fourth inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said fourth capacitive coupling is inputted;

v) a first selector connected to an output of said first multiplying circuit; to which a first control signal is inputted for introducing said output of said first multiplying circuit to a first or second output in response to a polarity of said real part of said second complex number,

vi) a second selector connected to an output of said second multiplying circuit, to which a second control signal is inputted for introducing said output of said second multiplying circuit to a first or second output in response to a polarity of said imaginary part of said second complex number,

vii) a third selector connected to an output of said third multiplying circuit, to which a third control signal is inputted for introducing said output of said third multiplying circuit to a first or second output in response to a polarity of said real part of said second complex number,

viii) a fourth selector connected to an output of said fourth multiplying circuit, to which a fourth control signal is inputted for introducing said output of said fourth multiplying circuit to a first or second output in response to a polarity of said imaginary part of said second complex number,

ix) a first addition and subtraction portion which comprises,

a) a fifth capacitive coupling to which said second output of said first selector and said first output of said second selector are inputted,

b) a fifth inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said fifth capacitive coupling is inputted,

c) a sixth capacitive coupling to which an output of said first output of said first selector, said second output of said second selector, and an output of said fifth inverting amplifier are inputted;

d) a sixth inverting amplifier with a linear relationship between an input and output thereof, to which an output of said sixth capacitive coupling is connected;

x) a second addition and subtraction portion which comprises,

a) a seventh capacitive coupling to which said second output of said third selector and said second output of said fourth selector are inputted,

b) a seventh inverting amplifier with a linear relationship between an input and an output thereof, to which an output of said seventh capacitive coupling is inputted,

c) an eighth capacitive coupling to which an output of said first output of said third selector, said first output of said fourth selector, and an output of said seventh inverting amplifier are inputted,

d) an eighth inverting amplifier with a linear relationship between an input and output thereof, to which an output of said eighth capacitive coupling is connected.

5,751,625

FERROELECTRIC MEMORY AND RECORDING DEVICE USING THE SAME

Takashi Mihara, Iruma, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1996, Ser. No. 702,832

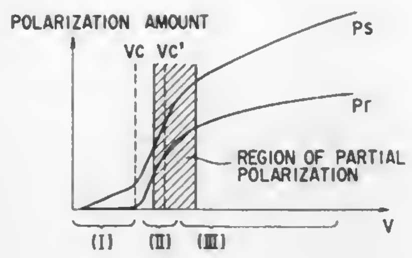
Claims priority, application Japan, Aug. 28, 1995, 7-219185

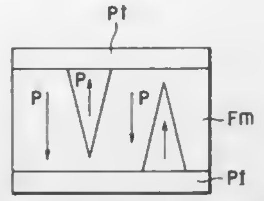
Int. Cl.⁶ G11C *11/22*

U.S. Cl. 365—145 **20 Claims**

1. A ferroelectric memory having a thin ferroelectric film sandwiched between a pair of electrodes as a memory cell, comprising:

first pulse applying means for applying a first pulse having a voltage Ve higher than a coercive voltage Vc of said thin





ferroelectric film to said memory cell, thereby forming a polarized state in a first direction of two states of polarization;

second pulse applying means for applying to said memory cell a second pulse having a voltage Vw whose polarity is opposite to a polarity of the first pulse applied by said first pulse applying means, thereby forming a partially polarized state containing both domains having polarization in the first direction and domains having polarization in a second direction opposite to the first direction; and

analog recording means for performing analog recording by controlling the partially polarized state by using the second pulse applied by said second pulse applying means.

5,751,626

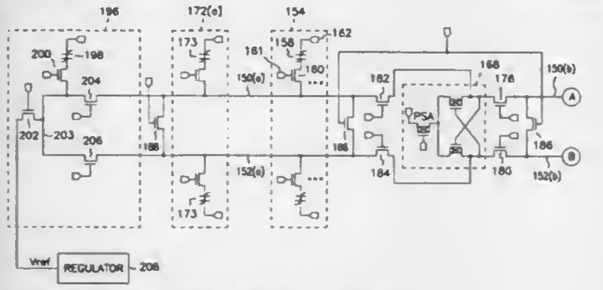
FERROELECTRIC MEMORY USING FERROELECTRIC REFERENCE CELLS

Mirmajid Seyyedy, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 520,256, Sep. 11, 1995, Pat. No. 5,638,318. This application Mar. 27, 1997, Ser. No. 827,400

Int. Cl.^{6} G11C *11/22*

U.S. Cl. 365—145 11 Claims



1. An integrated circuit memory comprising:

an array of ferroelectric memory cells;

a sense amplifier to sense and amplify data stored on the ferroelectric memory cells;

a first pair of bit line sections coupled to the sense amplifier and ferroelectric memory cells;

a second pair of bit line sections coupled to the sense amplifier and ferroelectric memory cells;

a first reference circuit coupled to the first pair of bit line sections and having a plurality of ferroelectric reference cells for providing a first reference voltage;

a second reference circuit coupled to the second pair of bit line sections and having a plurality of ferroelectric reference cells for providing a second reference voltage; and

a third reference circuit coupled to the first pair of bit line sections, the third reference circuit having a non-remnant capacitor circuit for providing a reference voltage.

5,751,627

MEMORY CELL THAT CAN STORE DATA NONVOLATILY USING A FERROELECTRIC CAPACITOR, AND A SEMICONDUCTOR MEMORY DEVICE INCLUDING SUCH A MEMORY CELL

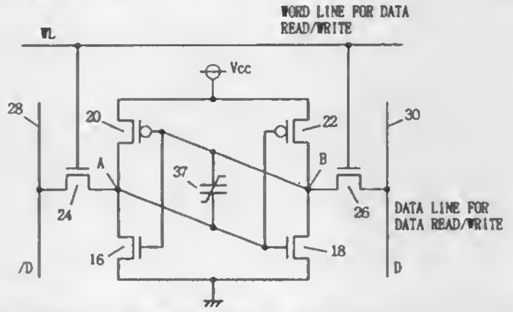
Tsukasa Ooishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 576,353, Dec. 21, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 786,378

Claims priority, application Japan, Dec. 26, 1994, 6-322741

Int. Cl.^{6} G11C *11/22*

U.S. Cl. 365—145 12 Claims



1. A memory cell that can store information in a non-volatile manner, comprising:

a plurality of bit line pairs,

a plurality of word lines crossing said bit line pairs,

a plurality of bistable memory elements arranged in corresponding crossing of said bit line pairs and said word lines,

each of said bistable memory elements including

a first amplifying circuit having an input and an output,

and a second amplifying circuit having an output and an input coupled to said input and said output, respectively, of said first amplifying circuit,

a node to which a fixed potential is supplied, a first data output node coupled to said output of said first amplifying circuit,

a second data output node coupled to said output of said second amplifying circuit,

a first ferroelectric capacitor having one end coupled to said second data output node and the other end coupled to said node to which said fixed potential is supplied,

a second ferroelectric capacitor having one end coupled to said first data output node and the other end coupled to said node to which said fixed potential is supplied,

a first access transistor connected between said first data output node and the first bit line of one of said bit line pairs, and

a second access transistor connected between said data output node and the second bit line pairing with said first bit line, and

each of said first and said second access transistors being controlled to be conductive/nonconductive by a potential of corresponding said word line,

a plurality of first data output lines, each connected to corresponding said first data output node, and

a plurality of second data output lines, each connected to corresponding said second data output node.

5,751,628

FERROELECTRIC MEMORY DEVICES AND METHOD FOR TESTING THEM

Hiroshige Hirano, Nara; Nobuyuki Moriwaki; Tetsuji Nakakuma, both of Kyoto; Toshiyuki Honda, and George Nakane, both of Nara, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Aug. 20, 1996, Ser. No. 700,240

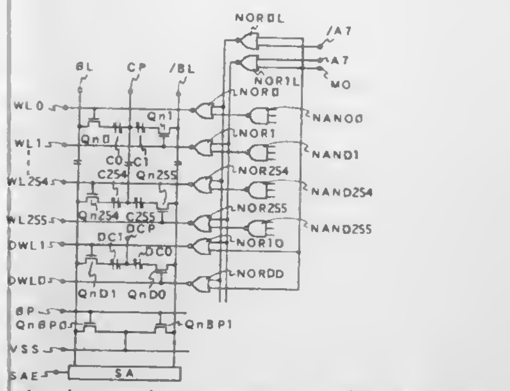
Claims priority, application Japan, Aug. 21, 1995, 7-211943

Int. Cl.^{6} G11C *11/22*

U.S. Cl. 365—145 19 Claims

1. A ferroelectric memory device comprising:

first and second bit lines;



a first ferroelectric capacitor connected to said first bit line through a first memory cell transistor, said first capacitor constituting a main memory cell;

a second ferroelectric capacitor connected to said second bit line through a second memory cell transistor, said second capacitor constituting the main memory cell;

a third ferroelectric capacitor connected to said second bit line through a third memory cell transistor, said third capacitor constituting a first reference memory cell;

a fourth ferroelectric capacitor connected to said first bit line through a fourth memory cell transistor, said fourth capacitor constituting a second reference memory cell;

a first word line connected to a gate of said first memory cell transistor;

a second word line connected to a gate of said second memory cell transistor;

a third word line connected to a gate of said third memory cell transistor;

a fourth word line connected to a gate of said fourth memory cell transistor; and

a control circuit for controlling said first to fourth word lines, said control circuit functioning to control first and second operation modes, by controlling either said first or second word line in said first operation mode, and controlling both said first and second word lines in said second operation mode.

5,751,629

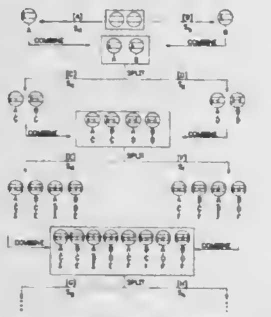
REMOTELY PROGRAMMABLE MATRICES WITH MEMORIES

Michael P. Nova, Rancho Santa Fe, and Andrew E. Senyei, San Juan Capistrano, both of Calif., assignors to IRORI, La Jolla, Calif.

Continuation-in part of Ser. No. 428,662, Apr. 25, 1995. This application Jun. 7, 1995, Ser. No. 484,504

Int. Cl.^{6} G11C *13/02*

U.S. Cl. 365—151 20 Claims



1. A combination of a matrix with memory, comprising:

(A) a recording device, comprising a data storage unit programmed with information that identifies a molecule or biological particle that is proximate to the matrix;

(B) a matrix material, and

(C) the molecule, biological particle, mixture of molecules, mixture of biological particles or a mixture of molecules and biological particles in proximity to the matrix, wherein:

the device is less than about 5 mm^3 in size;

the matrix material is in the form of a container used for chemical syntheses;

the recording device is in contact with the matrix or in a composition that is in contact with the matrix;

the molecules are either linked to the matrix or in a composition that is in contact with the matrix and comprise nucleic acids, oligonucleotides, nucleotides, amino acids, biopolymers, organic molecules, peptides or proteins;

the biological particles are either linked to the matrix or in a composition that is in contact with the matrix and comprise viral capsids with or without packaged nucleic acids, phage, phage capsids with or without encapsulated nucleotide acid, eukaryotic cells, prokaryotic cells or fragments thereof; and

the data storage unit is electromagnetically remotely programmable.

5,751,630

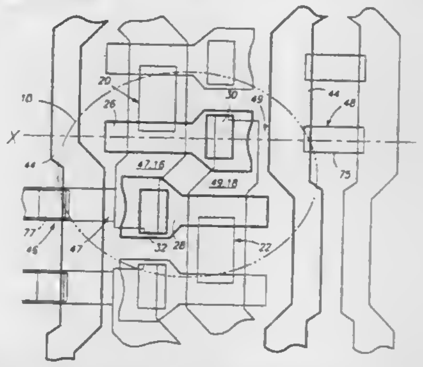
SRAM CELL EMPLOYING SUBSTANTIALLY VERTICALLY ELONGATED PULL-UP RESISTORS

Ceredig Roberts, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 705,589, Aug. 29, 1996, Pat. No. 5,699,292. This application Mar. 11, 1997, Ser. No. 815,413

Int. Cl.^{6} H01L *29/76;27/02*

U.S. Cl. 365—154 8 Claims



1. A dual wordline SRAM cell comprising:

a pair of memory cell wordlines, a pair of pull-down gates, an electrical interconnect line, a Vcc line, and a pair of pull-up resistors;

the wordlines and pull-down gates having associated transistor diffusion regions operatively adjacent thereto; and

the Vcc line and the electrical interconnect line being provided in different respective elevational planes, the pull-up resistors being substantially vertically elongated between Vcc and selected of the respective transistor diffusion regions operatively adjacent the pull-down gates and wordlines.

5,751,631

FLASH MEMORY CELL AND A NEW METHOD FOR SENSING THE CONTENT OF THE NEW MEMORY CELL

David K. Y. Liu, 470 Tumbleweed Ct., Fremont, Calif. 94539, and Wenchi Ting, 4837 Lago Vista Cir., San Jose, Calif. 95129

Filed Oct. 21, 1996, Ser. No. 735,384

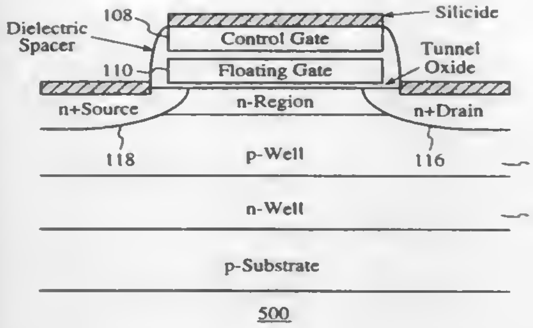
Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—185.01 10 Claims

1. A semiconductor memory cell comprising:

a lightly doped continuous n− channel region;

a first insulating layer overlying said lightly doped continuous n− channel region; wherein a neutral state of the n− channel region is active;



a floating gate overlying said first insulating layer;
a second insulating layer overlying said floating gate; and
a control gate overlying said second insulating layer.

5,751,632

DEVICE FOR AND METHOD OF SENSING DATA OF MULTI-BIT MEMORY CELL

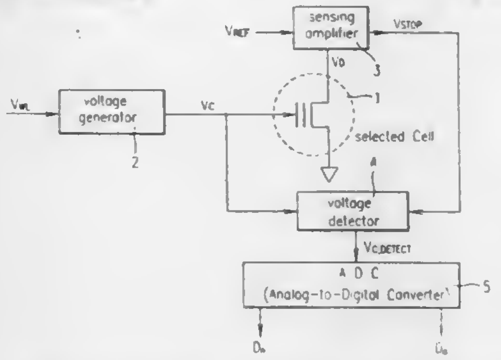
Woong Lim Choi, Kwachon-si; Kyeong Man Ra, Chungcheongbuk-do, and Kyung Myung Hur, Cheongju-si, all of Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-Do, Rep. of Korea

Filed May 7, 1997, Ser. No. 852,497

Claims priority, application Rep. of Korea, Nov. 19, 1996, 55272/1996

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.03 **10 Claims**



1. A data sensing device of a multi-bit memory cell comprising:
a memory cell having a gate, a source and a drain, the memory cell being programmed with at least two voltage levels;
a voltage generator coupled to the memory cell and providing the gate of the memory cell with a voltage, the voltage being increased linearly;
a sensing amplifier coupled to the memory cell and generating a sensing signal when a drain voltage of the memory cell is lower than a reference voltage;
a voltage detector coupled to the sensing amplifier and the voltage generator and detecting synchronously a gate voltage of the memory cell with the sensing signal of the sensing amplifier; and
an A/D converter coupled to the voltage detector and translating the gate voltage detected in the voltage detector into a digital value.

5,751,633

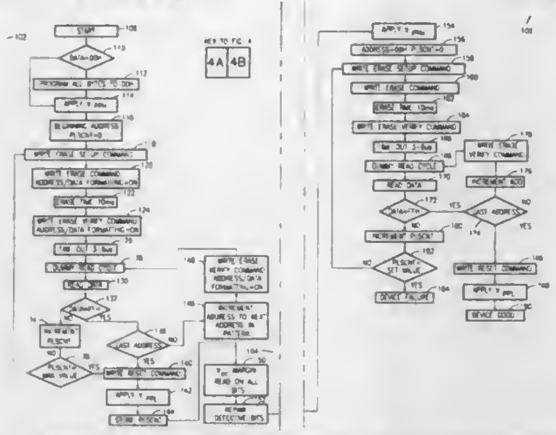
METHOD OF SCREENING HOT TEMPERATURE ERASE REJECTS AT ROOM TEMPERATURE

Edward Hsia, San Jose; Jose H. Hernandez, Milpitas, both of Calif., and Sayan Suanya, Bangkok THX, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 24, 1996, Ser. No. 655,357

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.09 **11 Claims**



1. A method of testing Flash memory devices for erasability at room temperature during wafer sort to screen out those Flash memory devices that would be rejected during elevated temperature testing for erasability during class test thus negating the requirement to test the Flash memory devices for erasability during class test, wherein the Flash memory devices are organized in x number of rows and y number of columns, the method comprising:
selecting a number of memory cells in a Flash memory device including at least one memory cell from each of the x number of rows and at least one memory cell from the y number of columns;
subjecting the selected number of memory cells to a first sequence of erasure pulses at a first voltage until the selected memory cells are verified erased or until a first maximum number of erasure pulses has been reached;
recording a number of erasure pulses at which the selected memory cells are verified erased if the selected memory cells are verified erased before the first maximum number of erasure pulses has been reached;
subjecting all cells to a margin read to determine if any cell has not been successfully erased;
repairing all cells determined to have not been successfully erased;
subjecting all cells to a second sequence of erasure pulses at a second voltage until all the memory cells are verified erased or until a second maximum number of erasure pulses has been reached;
marking the Flash memory device as passed if all memory cells are verified erased before the second maximum number of erasure pulses has been reached; and
marking the Flash memory device as failed if all memory cells are not verified erased before the second maximum number of erasure pulses has been reached.

5,751,634

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE FOR STORING MULTIVALUE DATA AND READOUT/WRITE-IN METHOD THEREFOR

Yasuo Itoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

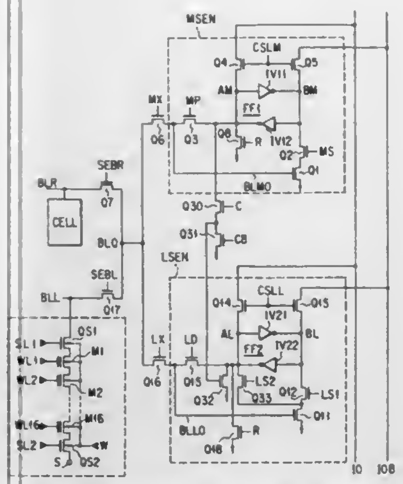
Filed May 15, 1996, Ser. No. 647,629

Claims priority, application Japan, May 16, 1995, 7-116676

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—185.17 **40 Claims**

1. A non-volatile semiconductor memory device comprising:
memory cells connected to bit lines, first and second data being stored in each of said memory cells;



a voltage generating circuit for generating a plurality of reference voltages of different levels and supplying the reference voltages to the gates of said memory cells at the time of data writing and data readout; and
first and second storage circuits coupled to each of said bit lines, for holding first and second data to be written into one of said memory cells at the data writing time and holding first and second data read out from said memory cell according to the plurality of reference voltages at the data readout time.

5,751,635

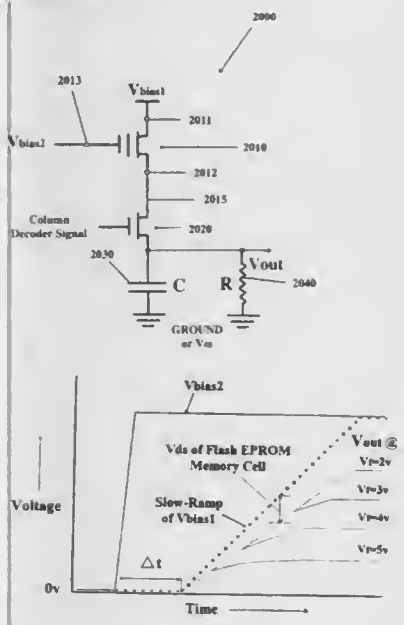
READ CIRCUITS FOR ANALOG MEMORY CELLS

Sau C. Wong, Hillsborough, and Hock C. So, Redwood City, both of Calif., assignors to inVoice Technology, Inc., Santa Clara County, Calif.

Division of Ser. No. 333,381, Nov. 2, 1994. This application Jan. 11, 1996, Ser. No. 585,072

Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—185.19 **3 Claims**



1. A circuit for reading a threshold voltage of a memory cell, comprising:
a ramping circuit coupled to a source/drain of the memory cell;
a high impedance load coupled between a drain/source of the memory cell;
a voltage source; and
a control circuit which connects the voltage source to a control gate of the memory cell during a read of the memory cell and then after a fixed delay, activates the ramping circuit, wherein
a voltage indicating the threshold voltage of the memory cell is provided at the drain/source of the memory cell.

5,751,636

SEMICONDUCTOR MEMORY DEVICE HAVING DATA ERASING MECHANISM

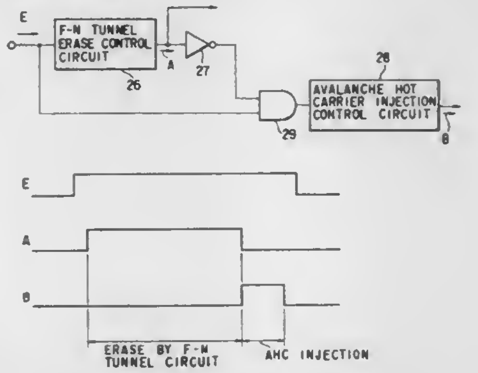
Kiyomi Naruke; Tomoko Suzuki; Seiji Yamada, all of Tokyo; Etsushi Obi, Yokohama, and Masamitsu Oshikiri, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 440,253, May 12, 1995, Pat. No. 5,623,445, which is a continuation of Ser. No. 903,949, Jun. 26, 1992, Pat. No. 5,452,248. This application Jan. 21, 1997, Ser. No. 785,397

Claims priority, application Japan, Jun. 27, 1991, 3-157063

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.29 **7 Claims**


E
F-N TUNNEL ERASE CONTROL CIRCUIT
26
A
27
28
AVALANCHE HOT CARRIER INJECTION CONTROL CIRCUIT
29
B
E
A
B
ERASE BY F-N TUNNEL CIRCUIT
AHC INJECTION

1. A semiconductor memory device, comprising:
a body of semiconductor material of a first conductivity type;
memory cells formed in said semiconductor body, each memory cell comprising:
  source and drain regions of a second conductivity type formed in said semiconductor body to define a channel therebetween;
  a charge storage portion; and
  a control gate;
a discharge circuit for discharging charges from said charge storage portions of said memory cells, said discharge circuit comprising:
  a Fowler-Nordheim (F-N) tunnel control circuit for generating a signal for setting voltages of the control gate, source region, and drain region of at least one of said memory cells such that the charge in said at least one of said memory cells is discharged by F-N tunneling; and
an injection control circuit for setting voltages of the control gate, source region and drain region of said at least one of said memory cells such that avalanche hot electrons are injected into the charge storage portion of said at least one of said memory cells to converge a voltage of the charge storage portion of said at least one of said memory cells to a balanced voltage at which avalanche hot electron injection balances with avalanche hot hole injection, whereby a threshold voltage of said at least one of said memory cells converges to a balanced threshold voltage Vth*.

5,751,637

AUTOMATIC PROGRAMMING ALGORITHM FOR PAGE MODE FLASH MEMORY WITH VARIABLE PROGRAMMING PULSE HEIGHT AND PULSE WIDTH

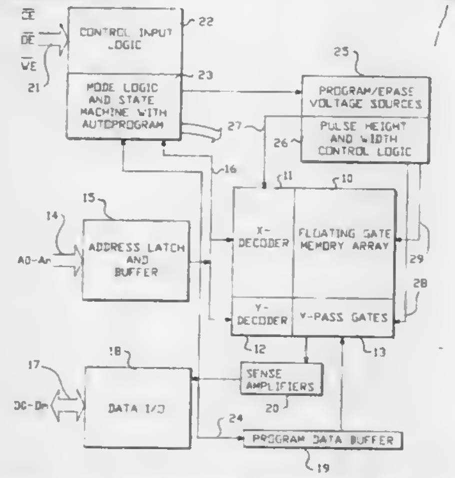
Chia Shing Chen, I-Lan County; Chun-Hsiung Hung, Hsin-Chu, both of Taiwan; Ray-Lin Wan, Milpitas, Calif., and Teruhiko Kamei, Yokohama, Japan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

PCT No. PCT/US95/07376, § 371 Date Mar. 12, 1996, § 102(e) Date Jun. 7, 1995

PCT Filed Mar. 12, 1996, Ser. No. 605,003

Int. Cl.^{6} C11C *13/00*

U.S. Cl. 365—185.33 **24 Claims**



1. A method for programming a floating gate memory cell, comprising:

applying a first program pulse to the cell having a first pulse height and a first pulse width selected so that the cell is unlikely to be over-programmed;

determining whether the cell is programmed in response to the first program pulse; and if not

applying a program retry pulse to the cell;

determining whether the cell is programmed in response to the program retry pulse; and if not

iteratively applying another program retry pulse to the cell and determining whether the cell is programmed, until the cell is determined to be programmed or a maximum number of retries is made;

wherein the program retry pulses have respective pulse widths and pulse heights which vary according to a pattern which includes at least one pulse having pulse width wider than the first pulse width and a pulse height higher than the first pulse height, the pattern selected so that the cell is likely to be programmed within a first phase of the pattern including predetermined number of retries less than the maximum number of retries.

5,751,638

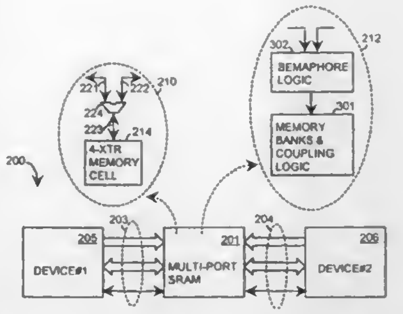
MAIL-BOX DESIGN FOR NON-BLOCKING COMMUNICATION ACROSS PORTS OF A MULTI-PORT DEVICE

John Mick, San Jose; Michael Miller, Saratoga; Jeff Smith, Gilroy, and Mark Baumann, San Jose, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jan. 17, 1997, Ser. No. 786,401

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—189.04 **20 Claims**



1. A shared resource electronic device having first and second ports for communicating respectively with first and second resource sharing electronic devices, comprising:

at least one first mail box register which can be written to only through said first port, and read from at least through said second port; and

at least one second mail box register which can be written to only through said second port, and read from at least through said first port.

5,751,639

DRAM HAVING A POWER SUPPLY VOLTAGE LOWERING CIRCUIT

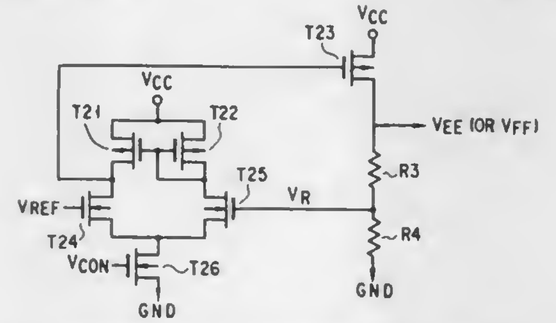
Takashi Ohsawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 19, 1996, Ser. No. 588,930

Claims priority, application Japan, Jan. 20, 1995, 7-007150

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 365—226 **4 Claims**



1. A semiconductor integrated circuit device comprising:

an internal circuit;

a first voltage lowering circuit being of a source follower type and having an N-channel MOS transistor, said first voltage lowering circuit for receiving an external power supply voltage, lowering the external power supply voltage to generate a first lowered voltage, and supplying the first lowered voltage to at least part of said internal circuit as a power supply voltage thereof;

an inverter type input buffer; and

a second voltage lowering circuit being of a feedback type and having at least one P-channel MOS transistor, said second voltage lowering circuit for receiving the external power supply voltage, lowering the external power supply voltage to generate a second lowered voltage, and supplying the second lowered voltage to said inverter type input buffer as a power supply voltage thereof.

5,751,640

SEMICONDUCTOR MEMORY DEVICE AND METHOD THEREOF

Gyoung-Seon Gil, Jeonrabook-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Nov. 15, 1996, Ser. No. 751,022

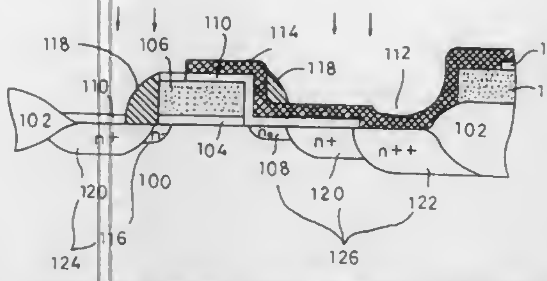
Claims priority, application Rep. of Korea, Dec. 28, 1995, 62054/1995

Int. Cl.^{6} G11C *11/40*

U.S. Cl. 365—156 **15 Claims**

1. A memory device, comprising:

a) a plurality of wordlines and bitlines;



b) a plurality of memory cells, each memory cell being responsive to corresponding wordline and bitline and each cell having

i) a latch coupled between a first node for receiving a first predetermined potential and a second node for receiving a second predetermined potential;

ii) a first transistor coupled to said latch at a third node, and said corresponding wordline and bitline;

iii) a second transistor coupled to said latch at a fourth node, and said corresponding wordline and bitline; and

iv) means for controlling a current flow in at least one of said first and second transistors.

5,751,641

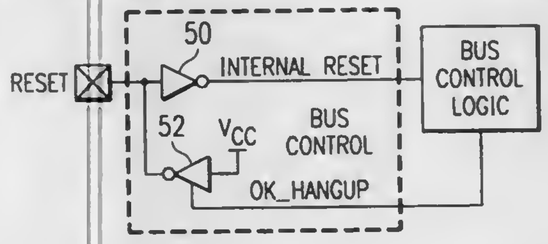
MICROPROCESSOR MEMORY TEST CIRCUIT AND METHOD

Gianluca Petrosino, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 27, 1995, Ser. No. 579,008

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **10 Claims**



1. A microprocessor formed on a semiconductor substrate, comprising:

a reset terminal formed on the semiconductor substrate for receiving an external reset signal which, when active causes the microprocessor to be reset;

a bi-directional reset circuit formed on the semiconductor substrate having an input terminal coupled to the reset terminal, an output terminal, and an enable terminal adapted to receive an enable signal, the bi-directional reset circuit operable to couple the input terminal to the output terminal and, when the enable signal is active, to drive the external reset signal active, wherein the bi-directional reset circuit includes a control unit formed on the semiconductor substrate and coupled to the output terminal and the enable terminal, the control unit operable to drive the enable signal active in response to the external reset signal going active and operable to hold the enable signal active until the the microprocessor has been reset.

5,751,642

VOLTAGE CONTROL CIRCUIT FOR INPUT AND OUTPUT LINES OF SEMICONDUCTOR MEMORY DEVICE

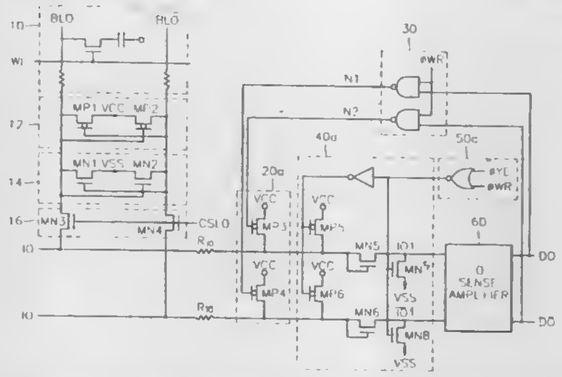
Jei-hwan Yoo, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 23, 1996, Ser. No. 702,356

Claims priority, application Rep. of Korea, Aug. 23, 1995, 1995-26186

Int. Cl.^{6} G11C *11/40*

U.S. Cl. 365—189.06 **11 Claims**



1. A voltage control circuit for a semiconductor memory device having:

a pair of bit lines coupled to a plurality of memory cells for storing data;

a pair of input and output lines coupled to the bit lines;

a pair of data lines coupled to the input and output lines and outputting output data according to the stored memory data; and

a clamping circuit coupled between the input and output lines and the data lines comprising a pair of load transistors maintaining complementary conductive states that toggle back and forth according to the output data on the data lines, the clamping circuit selectively clamping the input and output lines to predetermined voltage levels according to the output data on the data lines.

5,751,643

DYNAMIC MEMORY WORD LINE DRIVER

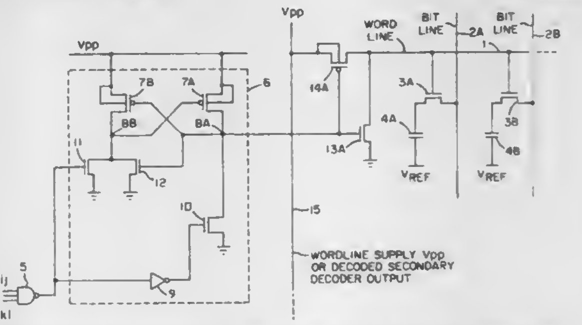
Valerie L. Lines, Ottawa, Canada, assignor to Mosaid Technologies Incorporated, Ontario, Canada

Continuation-in-part of Ser. No. 515,904, Aug. 16, 1995, which is a continuation of Ser. No. 205,776, Mar. 3, 1994, abandoned, which is a continuation of Ser. No. 31,898, Mar. 16, 1993, abandoned, which is a continuation of Ser. No. 680,746, Apr. 5, 1991, Pat. No. 5,214,602. This application Mar. 6, 1996, Ser. No. 611,558

Claims priority, application United Kingdom, Apr. 6, 1990, 9007790; Apr. 5, 1991, 9107165

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.11 **29 Claims**



29. A dynamic random access memory (DRAM) comprising:

bitlines and word lines and memory cells connected to the bitlines and word lines, each memory cell being comprised of an access field effect transistor (FET) having its source-drain circuit connected between a bitline and a high logic level voltage V_{dd} bit charge storage capacitor, the field effect transistor having a gate connected to a corresponding word line;

a high V_{pp} supply voltage source which is in excess of the high logic level voltage V_{dd} plus one transistor threshold voltage but less than a transistor damaging voltage;

means for receiving only V_{dd} level logic inputs for selecting the word line and means having an input driven by the selecting means for applying the V_{pp} supply voltage level directly to the word line through the source-drain circuit of an FET;

the means for applying comprising a level shifter connected to said high supply voltage source and comprising a pair of cross-coupled P-channel FET circuits connected between the high V_{pp} supply voltage source and a pair of control nodes; and

level shifter driving means connected between the level shifter and ground and connected to the output of the selecting means, the level shifter driving means comprising a pair of N-channel FET circuits, each having source-drain circuits connected between a corresponding one of said control nodes and ground.

5,751,644

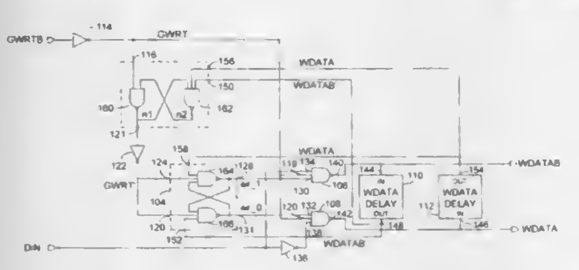
DATA TRANSITION DETECT WRITE CONTROL

George M. Ansel, Starkville; Jeffery Scott Hunt, Ackerman; Ping Wu, Starkville; David A. Lindley, Starkville, and Andrew L. Hawkins, Starkville, all of Miss., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Nov. 26, 1996, Ser. No. 756,634

Int. Cl.^{6} G11C *11/407;* B01F *7/00*

U.S. Cl. 365—194 **20 Claims**



1. A circuit comprising:

a gate circuit configured to present one or more control signals in response to one or more write enable signals, wherein said one or more control signals transition to an inactive state after completion of a write operation without waiting for an end of write signal;

a latch circuit configured to present said one or more write enable signals to said gate circuit in response to (i) an input and (ii) one or more delay signals; and

a delay circuit configured to present said one or more delay signals in response to said one or more control signals.

5,751,645

SEMICONDUCTOR MEMORY DEVICE WITH REDUCED OUTPUT NOISE

Yasuhiko Tsukikawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1997, Ser. No. 781,795

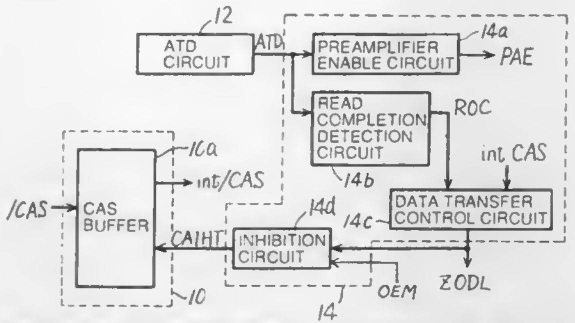
Claims priority, application Japan, May 14, 1996, 8-119022

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—194 **8 Claims**

1. A semiconductor memory device having a plurality of memory cells arranged in rows and columns, comprising:

a control input buffer receiving an external read operation start instruction signal for at least buffering the received signal to generate an internal read operation start instruction signal;



read means for reading data in a memory cell out of said plurality of memory cells addressed in accordance with a column address signal;

read control means responsive to change in said column address signal for activating said read means and for generating a data read completion instruction signal and;

data output means responsive to said internal read operation start instruction signal and said data read completion instruction signal for externally outputting the data read by said read means.

said read control means including inhibition means responsive to external data outputting by said data output means for inhibiting said internal read operation instruction signal from shifting into an active state from an inactive state.

5,751,646

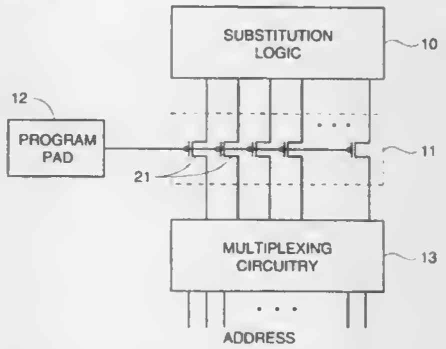
REDUNDANCY ELEMENTS USING THIN FILM TRANSISTORS (TFTS)

Monte Manning, Kuna, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 390,348, Feb. 17, 1995, Pat. No. 5,644,540, which is a continuation of Ser. No. 106,497, Aug. 13, 1993, Pat. No. 5,392,245. This application Dec. 5, 1996, Ser. No. 761,624

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **15 Claims**



1. A programmable redundancy element for a redundancy repair circuit, said programmable redundancy element comprising a field effect transistor (FET) having a single gate element acting as a control gate and a programming pad connecting to said control gate of said FET.

5,751,647

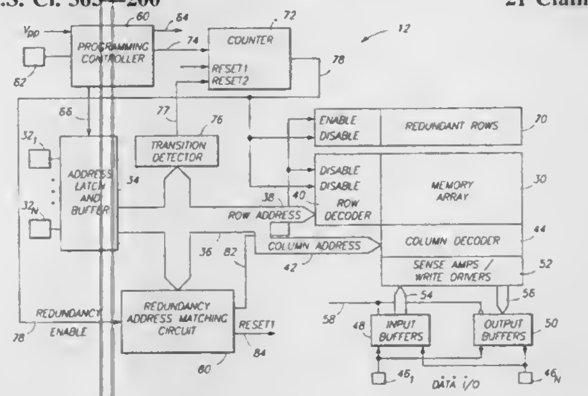
ON-CHIP MEMORY REDUNDANCY CIRCUITRY FOR PROGRAMMABLE NON-VOLATILE MEMORIES, AND METHODS FOR PROGRAMMING SAME

James E. O'Toole, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 596,528, Feb. 5, 1996, Pat. No. 5,648,934, which is a continuation of Ser. No. 387,244, Feb. 13, 1995, Pat. No. 5,513,144. This application Feb. 19, 1997, Ser. No. 802,376

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **21 Claims**



1. A programmable non-volatile memory device comprising:

a memory array of memory cells;

a controller programming one of the memory cells with data, the controller repeatedly attempting to program the one memory cell in the event that the data is not validly written into the one memory cell;

a redundant memory cell;

a counter counting the number of attempts the controller makes to program the one memory cell;

means for generating a redundancy enable signal when the number of attempts counted by the counter reaches a predetermined value; and

means for replacing the one memory cell with the redundant memory cell in response to the redundancy enable signal.

5,751,648

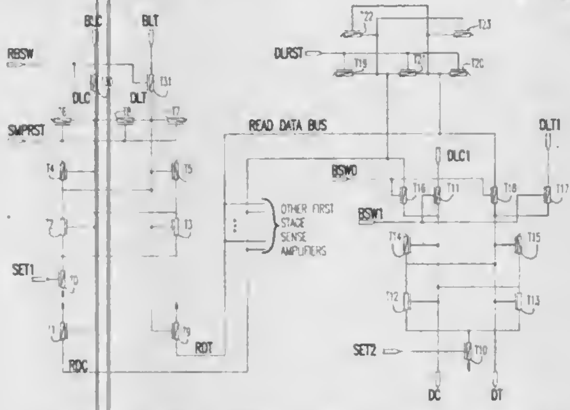
TWO STAGE SENSING FOR LARGE STATIC MEMORY ARRAYS

George M. Braceras, Colchester, and Donald A. Evans, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1997, Ser. No. 792,005

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—205 **4 Claims**



1. A two stage latch sensing circuit for static random access memory (SRAM) devices comprising:

a first stage connected to receive small signals from SRAM array bitlines, said first stage including a first sense latch receiving the small signals through bit-switches:

first and second p-type field effect transistor (PFET) devices responsive to respective first and second outputs of the first sense latch to drive a precharged high, low-signal swing read data bus; and

a second stage connected to the read data bus, said second stage including a second sense latch which amplifies a signal from the read data bus, thereby providing a full level swing to outputs.

5,751,649

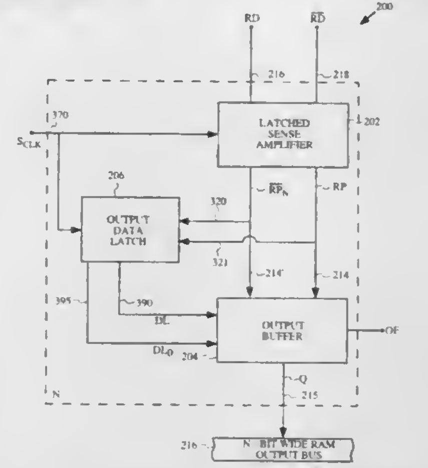
HIGH SPEED MEMORY OUTPUT CIRCUITRY AND METHODS FOR IMPLEMENTING SAME

Steve P. Kornachuk, and Scott T. Becker, both of San Jose, Calif., assignors to Artisan Components, Inc., Sunnyvale, Calif.

Filed Feb. 26, 1997, Ser. No. 806,335

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—205 **28 Claims**



1. A latch sense amplifier output buffer for amplifying a data signal read from a memory device, comprising:

a sense amplifier core including an amplifier circuit, the amplifier circuit providing amplification on the data signal read from the memory device, the sense amplifier core configured to generate an amplified data signal;

an output data latching circuit being configured to substantially simultaneously store the amplified data signal and generate an output data signal; and

an output buffer core that receives the amplified data signal from the sense amplifier core and the output data signal from the output data latching circuit, the output buffer core includes an output driver circuit that has a pull down transistor and a pull up transistor, and the amplified data signal is coupled to a first turn-off transistor and a second turn-off transistor that assist in providing a fast turnoff to one of the pull down and pull up transistors, thereby rapidly generating an output transition that outputs the output data signal at an output node that is coupled between the pull down and pull up transistors.

5,751,650

ELECTRIC SIGNAL SUPPLY CIRCUIT AND SEMICONDUCTOR MEMORY DEVICE

Hiroshige Hirano, Nara, and Tetsuji Nakakuma, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

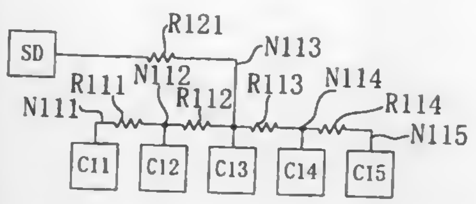
Filed Oct. 1, 1996, Ser. No. 724,664

Int. Cl.^{6} G11C *5/06*

U.S. Cl. 365—210 **18 Claims**

1. An electric signal supply circuit, comprising:

a plurality of circuit cells including at least a first circuit cell and a second circuit cell;



an electric signal generating source for generating a signal which is to be supplied to each one of said circuit cells; and

a wire line which is lead from said electric signal generating source and connected at tip with each one of said circuit cells,

wherein a resistance value in the wire line between said electric signal generating source and said first circuit cell is set approximately the same as a resistance value in said wire line between said electric signal generating source and said second circuit cell.

5,751,651

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A HIERARCHICAL POWER SOURCE CONFIGURATION

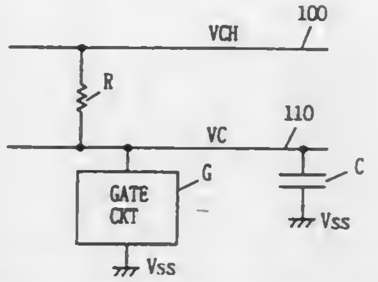
Tsukasa Ooishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 546,747

Claims priority, application Japan, Nov. 7, 1994, 6-272592

Int. Cl.^{6} H03K *19/0948*

U.S. Cl. 365—226 **9 Claims**



1. A semiconductor integrated circuit device comprising:

a first main voltage transmission line for transmitting a voltage of a first logic level;

a plurality of first sub voltage transmission lines;

a plurality of first resistive elements connected between respective ones of said plurality of first sub voltage transmission lines and said first main voltage transmission line;

a second main voltage transmission line for transmitting a voltage of a second logic level;

a plurality of second sub voltage transmission lines respectively disposed corresponding to said plurality of first sub voltage transmission lines;

a plurality of second resistive elements connected between respective ones of said plurality of second sub voltage transmission lines and said second main voltage transmission line; and

a plurality of gate circuits divided into a plurality of groups corresponding to respective pairs of said plurality of first sub voltage transmission lines and said plurality of second sub voltage transmission lines, each of the gate circuits receiving voltages on corresponding first and second sub voltage transmission lines respectively as one operating source voltage and another operating source voltage, each the gate circuit performing a predetermined logic process on a received signal for outputting.

5,751,652

SEMICONDUCTOR APPARATUS HAVING A VOLTAGE UNIT AND A BACKUP UNIT FOR PROVIDING A REDUCED POWER CONSUMPTION

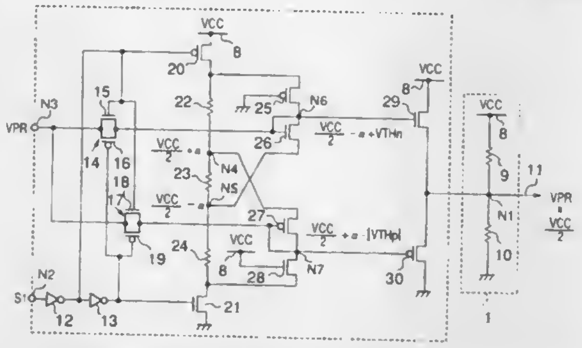
Hiroyoshi Tomita, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 2, 1997, Ser. No. 867,044

Claims priority, application Japan, Dec. 13, 1996, 8-333528

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—226 **10 Claims**



1. A semiconductor apparatus comprising:

a voltage unit for supplying a down voltage produced at a node, said voltage unit having a plurality of resistors connected in series between a power supply line and a grounding line, said node being a connection point between the resistors;

a backup unit for pulling up the node of the voltage unit when a voltage at the node is below a lower limit of the down voltage, so that the voltage at the node increases to the lower limit, and for pulling down the node of the voltage unit when the voltage at the node is above an upper limit of the down voltage, so that the voltage at the node decreases to the upper limit; and

a control unit for setting the backup unit in one of an active state and an inactive state in response to a control signal.

5,751,653

DRAM WITH REDUCED LEAKAGE CURRENT

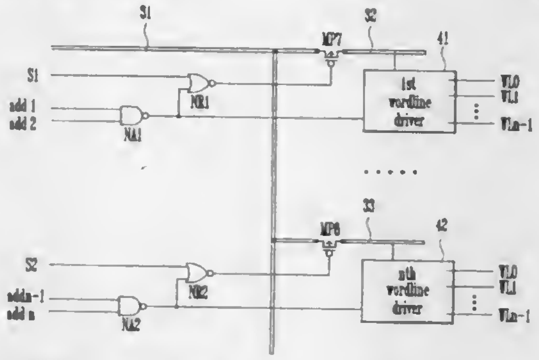
In Sool Chung, and Jae Jin Lee, both of Ichon, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jun. 2, 1997, Ser. No. 867,455

Claims priority, application Rep. of Korea, Jun. 29, 1996, 96-25742

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—230.06 **7 Claims**



1. A DRAM comprising:

at least two line driving means for transmitting high potential to lines selected by address signals;

a main power line for transmitting a power source voltage externally supplied;

secondary power lines for transmitting the power source voltage to the respective line driving means;

switching means respectively connected between the main power line and secondary power lines;

logic means for outputting a signal which is logically combined by a pair addresses to each of the line driving means, in order to select and operate one of the line driving means; and

switching control means for outputting a signal which controls each of the switching means by means of the logical combination of the output signal of the logic means and a refresh operation mode signal.

5,751,654

DRIVER DEVICE FOR SELECTION LINES FOR A MULTIPLEXER, TO BE USED IN A WIDE RANGE OF SUPPLY VOLTAGES, PARTICULARLY FOR NON-VOLATILE MEMORIES

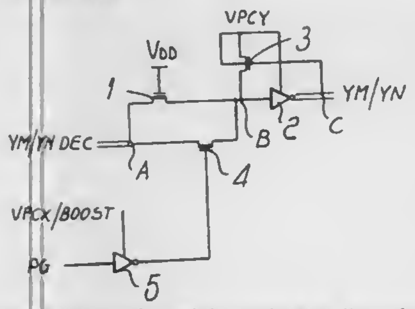
Luigi Pascucci, Sesto San Giovanni, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 27, 1997, Ser. No. 826,223

Claims priority, application European Pat. Off., Mar. 29, 1996, 96830166

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.06 **25 Claims**



21. A driver device for driving selection lines for a memory matrix, comprising:

a first inverter having an input and an output;

a first transistor coupled to the input of the first inverter for driving the first inverter, the first transistor being driven by a supply voltage;

a second transistor coupled between the input and output of the first inverter; and

means, coupled to the input of the first inverter, for driving the first inverter, at a voltage greater than said supply voltage.

5,751,655

SYNCHRONOUS TYPE SEMICONDUCTOR MEMORY DEVICE HAVING INTERNAL OPERATION TIMINGS DETERMINED BY COUNT VALUES OF AN INTERNAL COUNTER

Akira Yamazaki, and Katsumi Dosaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

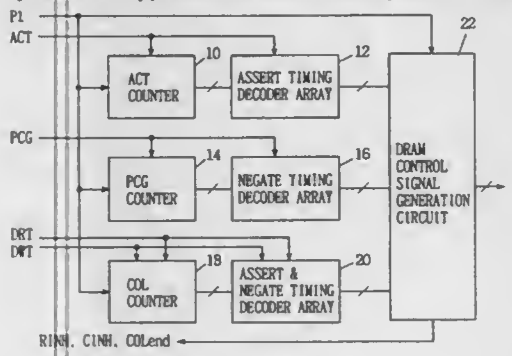
Filed Jan. 23, 1997, Ser. No. 788,803

Claims priority, application Japan, Apr. 22, 1996, 8-100123

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **11 Claims**

1. A synchronous type semiconductor memory device including


P1
ACT
22
10
ACT COUNTER
12
ASSERT TIMING DECODER ARRAY
PCG
14
PCG COUNTER
16
NEGATE TIMING DECODER ARRAY
DRAM CONTROL SIGNAL GENERATION CIRCUIT
DRT
DWT
18
COL COUNTER
20
ASSERT & NEGATE TIMING DECODER ARRAY
RINH, CINH, COLend

a memory array of memory cells arranged in rows and columns and operating in synchronization with a periodically applied clock signal, comprising:

counter means started in response to an operation mode designating signal for counting the clock signal, and

control signal generating means for generating an internal operation control signal controlling at least one of activation and inactivation of an operation associated with a row or column selection and designated by said operation mode designating signal according to a count value from said counter means.

5,751,656

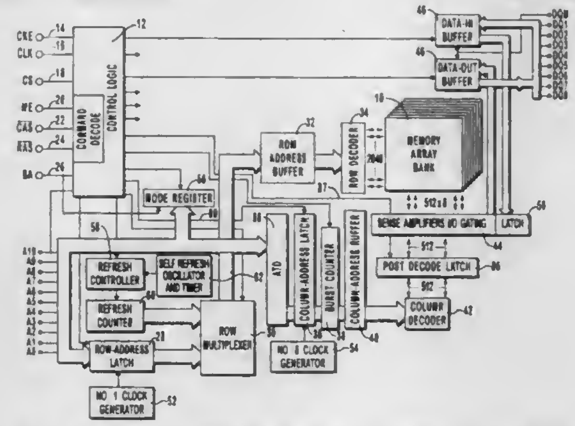
SYNCHRONOUS DRAM MEMORY WITH ASYNCHRONOUS COLUMN DECODE

Scott Schaefer, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 522,869, Sep. 1, 1995, abandoned. This application Dec. 23, 1996, Ser. No. 772,974

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233.5 **20 Claims**



19. A method of addressing an array of memory cells which are arranged in rows and columns and which are addressed by a row-address and a column-address of a selected memory cell to be communicated with by a microprocessor, the row-address and column-address being present at separate times on an address bus, the address bus being in electrical connection with a column-address latch and a row-address batch, the method comprising:

generating an internal signal at predetermined repeating intervals;

issuing a row-address on the address bus;

setting the column-address latch to a transparent state, such that each column-address appearing on the address bus is entered into the column-address latch;

beginning decoding of the row-address in synchronization with the internal signal;

issuing a column-address on the address bus;

detecting the presence of the column-address on the address bus with an address transition detection module;

latching the column-address in the column-address latch in response to the detection of the presence of the column-address on the address bus;

beginning decoding of the column-address upon latching the column-address latch and independently of the internal signal; and

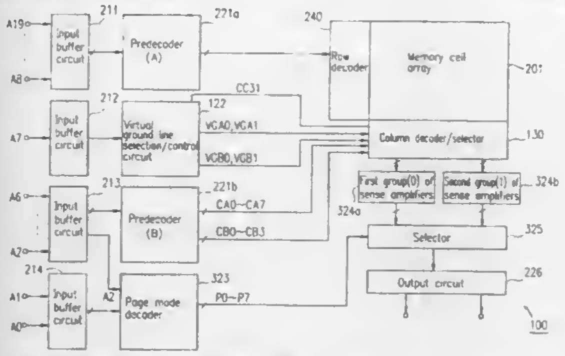
conducting a plurality of sequential operations in burst mode in which contiguous groups of memory cells are addressed successively with a timing that is coordinated with the internal signal.

5,751,657

SEMICONDUCTOR MEMORY DEVICE

Yasuhiro Hotta, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1997, Ser. No. 788,933
Claims priority, application Japan, Jan. 26, 1996, 8-012310
Int. Cl.^{6} G11C *8/00*
U.S. Cl. 365—238.5 **2 Claims**



1. A semiconductor memory device comprising:

a memory cell array including a plurality of virtual ground lines, a plurality of bit lines, and a plurality of memory cells arranged in a matrix shape, the plurality of virtual ground lines and the plurality of bit lines alternately interposing each other, the plurality of memory cells being classified into a plurality of groups, and the memory cell array having a page mode, wherein data stored in one or more of the plurality of memory cells is read to one or more of the plurality of bit lines, the page mode allowing data stored in one of the plurality of classified groups to be read in accordance with an input address;

a selection circuit for, in accordance with the input address, selecting the memory cells in one of the plurality of classified groups corresponding to a column address of the input address and selecting the memory cells in another of the plurality of classified groups corresponding to another column address;

a first amplifier circuit for amplifying data stored in the one of the plurality of classified groups corresponding to the column address of the input address;

a second amplifier circuit for amplifying data stored in the other of the plurality of classified groups corresponding to the other column address; and

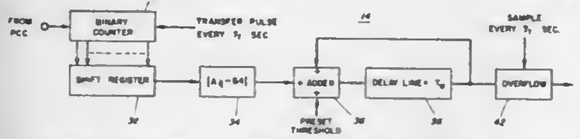
a first control circuit and a second control circuit for selectively charging or discharging those of the plurality of virtual ground lines corresponding to one page in accordance with the input address, the first control circuit and the second control circuit performing the charging or discharging independently of each other.

5,751,658

SIGNAL PROCESSOR FOR NARROW BAND SONAR SIGNALS

Manfred Karl Pruessner, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1970, Ser. No. 78,330
Int. Cl.^{6} G01S *15/00*
U.S. Cl. 367—98 **4 Claims**



1. A digital detector for determining the presence of valid sonar signals in an input bit stream containing correlation information comprising:

means for counting a fixed number of bits in said bit stream to produce a sequence of binary words;

means for digitally rectifying said binary words about their mean value to produce a sequence of average values about said mean;

means for adding selected ones of said average values to produce a sequence of output sums corresponding to basic correlation functions of different portions of said input bit stream; and

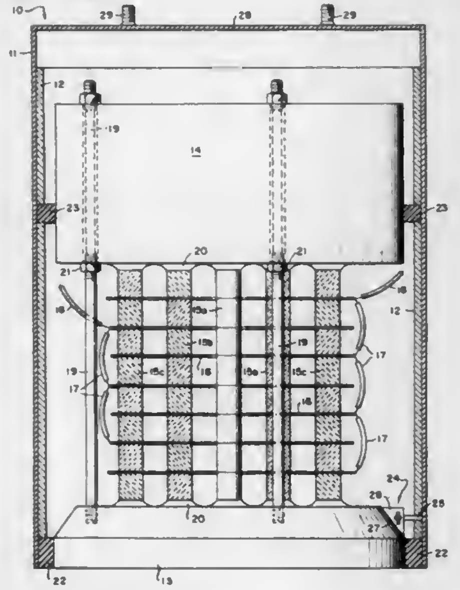
means for determining from the magnitude of each of said sums whether said valid sonar signal is contained in the corresponding portion of said input bit stream.

5,751,659

CERAMIC MASS LOADED LONGITUDINAL VIBRATOR

Matthias M. Glwer, 1201 S. Scott St., Apt. 630, Arlington, Va. 22204

Filed Sep. 29, 1969, Ser. No. 862,647
Int. Cl.^{6} H04R *17/00*
U.S. Cl. 367—158 **7 Claims**



1. In a sonar transducer having:

a gas tight housing; and

an acoustic sensor assembly within said housing;

the combination therewith of gaseous mixture within said housing substantially consisting of 90% argon and 10% methane.

5,751,660

CONTAINER FOR MEDICATION

Martin N. Chappell, 1000 S. Main St., Suite 632, Salinas, Calif. 93901

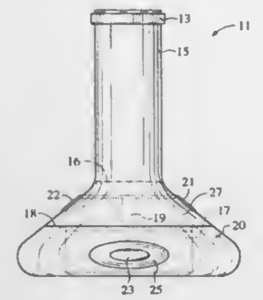
Filed Jan. 26, 1996, Ser. No. 592,758
Int. Cl.^{6} G04B *47/00*
U.S. Cl. 368—10 **12 Claims**

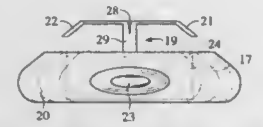
1. A finger held bottle for medication subject to strict compliance comprising,

a cylindrical vial having a removable cap and a circumferential wall having an optically noticeable bulge in the wall, noticeable to a person's touch when the vial is held in the fingers, marking the vial as a container subject to a strict compliance regimen, said vial being formed of upper and lower portions, the upper portion including a closed bottom wall and the lower portion having a skirt flared outwardly in the vicinity of said bottom wall,

a base unit attachable to the skirt in the lower portion of the vial by a spacer unit having a shaft that supports a pair of opposed wings which project into windows defined within said skirt, the shaft having a slot that allows compression of the wings,

a time and date stamp timer mounted in the base of the vial, the timer always running but not displaying the current time and date, having a visible display and having a manually actuated switch for causing a time and date to be displayed on the display as a date and time stamp until the next time the switch is actuated.



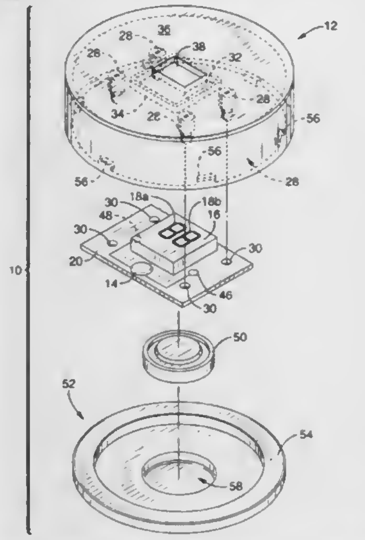


5,751,661

MEDICATION DOSAGE TIMING APPARATUS

Stephen M. Walters, Penn Valley, Calif., assignor to Tri-Continent Scientific, Inc., Grass Valley, Calif.

Filed Aug. 12, 1996, Ser. No. 695,728
Int. Cl.^{6} G04B *47/00;* **G04C** *57/00;* **G07F** *11/00*
U.S. Cl. 368—10 **9 Claims**



1. A medication dosage timing apparatus, comprising:

(a) a container cap;

(b) timer means for measuring elapsed time;

(c) display means for displaying said elapsed time, said display means operatively coupled to said timer means;

(d) coupling means for coupling said timer means and said display means to said container cap; and

(e) battery carrier means slidably coupled to said container cap for automatically moving a battery between a first position when said container cap is coupled to a container and a second position when said container cap is removed from said container;

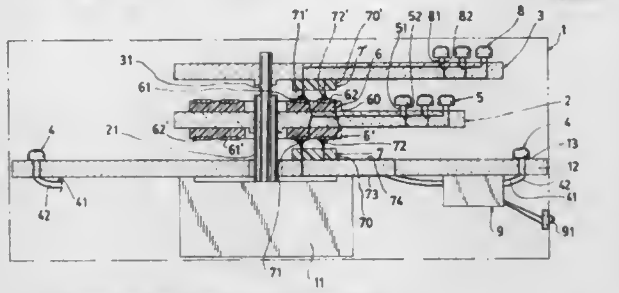
(f) said timer means and said display means responsive to movement of said battery carrier means as a result of removal and replacement of said container cap.

5,751,662

ILLUMINATING TIMEPIECE

Sen-Yen Shaw, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan

Filed Jan. 28, 1997, Ser. No. 789,286
Int. Cl.^{6} G04B *19/30;19/32;19/02*
U.S. Cl. 368—67 **5 Claims**



1. An illuminating timepiece comprising:

a casing (1) having a dial circumferentially formed with a plurality of hour numerals on the dial;

a first pointer (2) for indicating a first time period rotatably mounted on said casing, having at least a first rotor illuminator (5) made of light emitting diode and secured on said first pointer;

a second pointer (3) for indicating a second time period rotatably mounted on said casing, having at least a second rotor illuminator (8) made of light emitting diode and secured on said second pointer;

a plurality of stator illuminators (4) made of light emitting diodes circumferentially disposed on said dial, each said stator illuminator corresponding to and positioned at each said hour numeral on said dial, each said stator illuminator electrically connected to two poles of a power source of an electric control means (9);

a first conducting disk (6) secured on an outer surface of said first pointer (2);

a second conducting disk (6') secured on a bottom of said first pointer (2);

a first brush means (7) secured on said dial (12) under said conducting disks (6', 6), and electrically connected to the electric control means (9) and rotatably electrically contacting said second conducting disk (6') for conducting power from the electric control means (9) to the first rotor illuminator (5) through said first brush means (7) and said second conducting disk (6');

a second brush means (7') secured on a bottom of said second pointer (3) to be electrically connected to said second rotor illuminator (8) and rotatably contacting the first conducting disk (6) for conducting power to the second rotor illuminator (8) through the first brush means (7), the two conducting disks (6', 6) and the second brush means (7'); and

the electric control means (9) secured in said casing (1) for controlling illumination of said illuminators (4, 5, 8), said electric control means (9) including: a power source of battery (92): an electronic controller (90) electrically connected with the power source (92) and pre-recorded with a timing control sequence for subsequently alternatively switching on or off the illuminators (4, 5, 8) in each pre-determined time interval; a trigger switch (91) electrically connected to the electronic controller (90) for switching on a power supplied to the illuminators for lighting up the illuminators for an instant read-out of the time shown on the dial; and a photo-sensitive switch (93) electrically connected in parallel with the trigger switch (91) to the electronic controller (90) for automatically actuating the electronic controller (90) at night time or under darkness for executing the timing control sequence of the electronic controller (90) for alternatively switching on or off the illuminators.

5,751,663

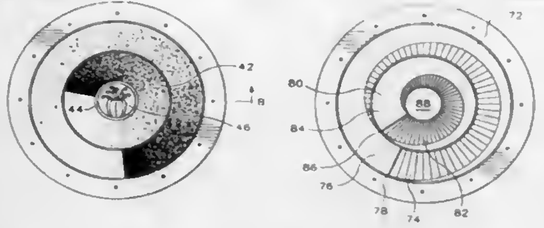
TIMEPIECE HAVING DISKS OF GRADUATED DESIGN DENSITY

Peter R. Johnson, 32219 SW. Boones Bend Rd., Wilsonville, Oreg. 97070

Continuation of Ser. No. 685,206, Jul. 23, 1996. This application Dec. 10, 1996, Ser. No. 762,743

Int. Cl.^{6} G04B *19/20;19/06*

U.S. Cl. 368—77 **2 Claims**



1. A timepiece comprising a frame having time indicator markings and at least a first rotatable disk rotating about an axis, said first rotatable disk having a first band or ring continuously graduated in visual design density from a region of a most dense visual design density to a region of least dense visual design density so as to form a first sharp contrast zone at a juncture between said regions, said disk being rotatably synchronized so as to provide an indicator of time as said first sharp contrast zone aligns with said time indicator markings, wherein said first band or ring includes a spiral decorative pattern continuously narrowing from said region of most dense visual design density to said region of least dense visual design density, and further including at least a second disk concentrically mounted with respect to said first disk, said second disk having a second band or ring including a spiral decorative design continuously narrowing from a second region of most dense visual design density to a second region of least dense visual design density so as to form second sharp contrast zone at a juncture between said regions, said second disk being rotatably synchronized so as to provide an indicator of time different from that provided by first sharp contrast zone as said second sharp contrast zone is aligned with said time indicator markings.

5,751,664

HAND ROTATING MECHANISM FOR ELECTRONIC WATCH

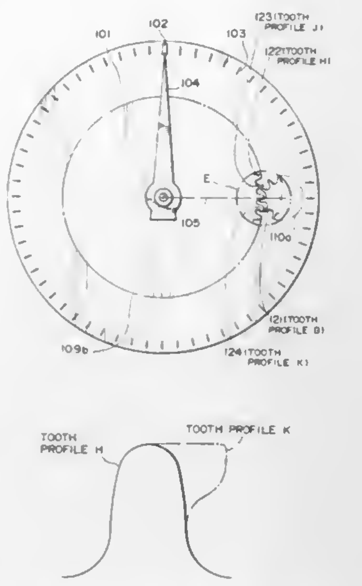
Haruhiko Higuchi, Tokorozawa, and Noritoshi Suzuki, Kawaguchi, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,085

Claims priority, application Japan, Dec. 27, 1994, 6-324371

Int. Cl.^{6} G04B *15/00*

U.S. Cl. 368—112 **22 Claims**



1. A hand rotating mechanism for an electronic watch in which at least a hand is rotated forward and backward by a motor converting an electrical signal from a control circuit into the rotary motion, the hand rotating mechanism comprising:

(a) a backward movement preventing mechanism for preventing only the backward movement of the hand only at a predetermined backward movement preventing position;

(b) a backward movement commanding circuit for commanding the motor to move the hand backward when a position of the hand estimated on the basis of the electrical signal agrees with the backward movement preventing position;

(c) a backward movement detecting circuit for detecting that the hand actually moves backward; and

(d) a hand position determining circuit for determining that an actual position of the hand agrees with the estimated position when the backward movement of the hand is not detected, and determining that the actual position of the hand deviates from the estimated position when the backward movement of the hand is detected.

5,751,665

CLOCK DISTRIBUTING CIRCUIT

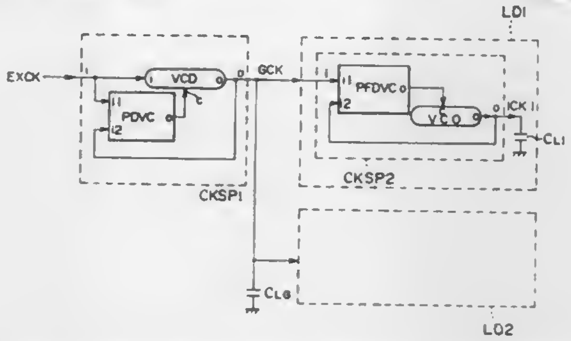
Satoru Tanol, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1996, Ser. No. 678,860

Claims priority, application Japan, Jul. 14, 1995, 7-179081

Int. Cl.^{6} G04F *8/00;* **H03K** *5/13;5/00*

U.S. Cl. 368—120 **7 Claims**



1. A clock distributing circuit, comprising: a clock distribution output circuit having a voltage control type delay circuit and a phase difference-voltage converting circuit, wherein the voltage control type delay circuit is for delaying a first clock in response to a first control voltage and for outputting a second clock obtained by delaying the first clock, and wherein the phase difference-voltage converting circuit is for converting a phase difference between the first clock and the second clock into the first control voltage; and

a plurality of distributed clock input circuits coupled to the voltage control type delay circuit, each of the distributed clock input circuits having a voltage control type oscillator and a phase/frequency difference-voltage converting circuit, wherein the voltage control type oscillator is for varying a frequency and a phase of a third clock output therefrom in response to a second control voltage, and wherein the phase/frequency difference-voltage converting circuit is for converting a phase/frequency difference between the second clock and the third clock into the second control voltage.

5,751,666

ELECTRONIC TIMEPIECE COMPRISING A GENERATOR DRIVEN BY A SPRING BARREL

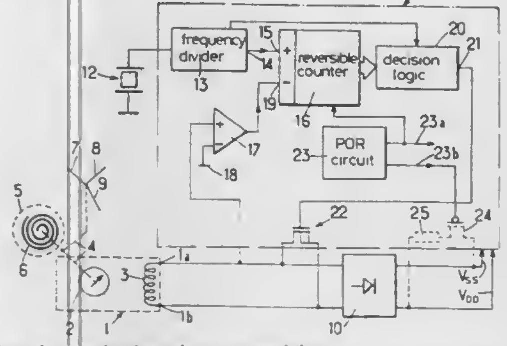
Pierre-André Farinc, Neuchâtel, and Jean-Jacques Born, Morges, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Jul. 31, 1997, Ser. No. 903,788

Claims priority, application France, Aug. 1, 1996, 96 09747

Int. Cl.^{6} G04B *1/00;1/10*

U.S. Cl. 368—140 **7 Claims**



1. An electronic timepiece comprising:

an a.c. voltage generator connected to a rectifier arranged to supply an electronic circuit of the timepiece,

a spring barrel coupled to said generator for the driving thereof,

a set of time indicating hands also driven by said barrel,

said electronic circuit comprising:

a time base arranged to provide a standard frequency signal,

comparing means for comparing the frequency of said time base to the frequency of said a.c. voltage in order to generate an error signal, and

verifying means connected to said comparing means for verifying whether said error signal passes a first predetermined threshold, and

braking means controlled by said verifying means for electrically braking said generator when said error signal passes said first predetermined threshold, wherein

said verifying means are also arranged to verify whether said error signal passes a second predetermined threshold greater than said first predetermined threshold and evidencing a predetermined degree of depletion of the power reserve of said barrel, said braking means being also controlled when said second threshold is passed,

said verifying means being further arranged to verify whether, after said error signal has passed said second predetermined threshold, said error signal becomes at least equal to a third predetermined threshold, during a predetermined period of time to control said braking means at the expiry of said period of time;

in such a way that said hands indicate said state of depletion by a rotation at a higher speed than the speed corresponding to the indication of the correct time, each time that said error signal reaches or passes said third predetermined threshold.

5,751,667

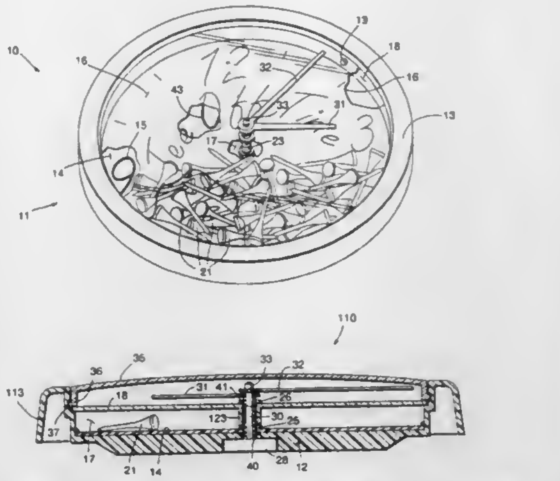
CLOCK WITH OBJECT RECEIVING VOLUME

Brendoo Nunes, 467 Westney Road S., Unit 3, Ajax, Ontario, Canada, L1S 6V7

Filed Jun. 12, 1996, Ser. No. 662,792

Int. Cl.^{6} G04B *19/02*

U.S. Cl. 368—223 **12 Claims**



1. A measuring instrument assembly comprising:

a stationary casing including a base and an upstanding perimeter portion;

an instrument face mounted by said base and having an upper surface facing away from said base;

a substantially transparent cover substantially parallel to said instrument face and supported by said casing, said cover spaced from said face to define, with said casing upstanding perimeter portion, a substantially closed interior volume and wherein said cover is mounted by said upstanding portion of said casing;

at least one discrete object disposed within said interior volume;

a lens covering said instrument face on the opposite side of said face from said base, and having a peripheral portion;

said lens peripheral portion received within an annular groove in said casing upstanding portion; and

means defining a passageway through said interior volume for an instrument shaft extending from said base substantially perpendicular to said face, through said cover, and spaced from said upstanding perimeter portion of said casing

clock movement mounted by said base, at least two clock shafts extending from said clock movement through said passageway, and at least an hour hand and minute hand connected to said shafts on the opposite side of said cover from said face

wherein said means defining said passageway includes an externally threaded metal tube engaging a first nut within said interior volume adjacent said base, and engaging a second nut at said cover on the opposite side of said cover from said interior volume; and an element engaging said cover within said interior volume to prevent significant deflection of said cover toward the interior of said volume at said passageway.

5,751,668

PUSH BUTTON AND METHOD FOR ASSEMBLING SUCH PUSH BUTTON

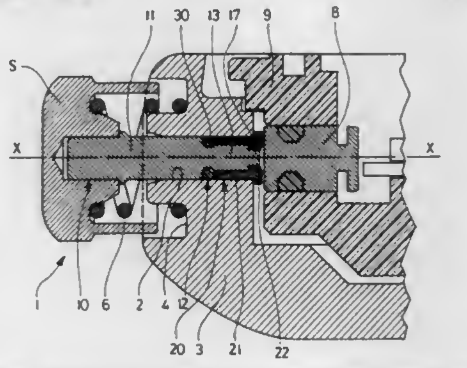
David Eray, Le Noirmont, Switzerland, assignor to Eta sa Fabriques d'Ebauches, Grenchen, Switzerland

Filed Jul. 22, 1997, Ser. No. 898,524

Claims priority, application France, Jul. 23, 1996, 96 09235

Int. Cl.^{6} G04B *3/04;37/10*

U.S. Cl. 368—290 **4 Claims**

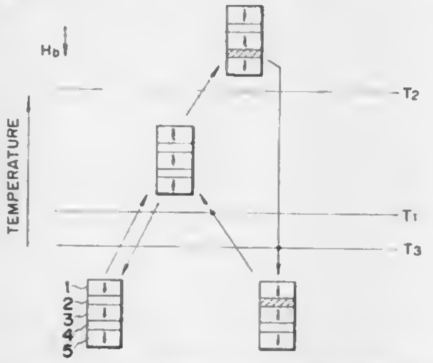


1. A push button for a timepiece comprising a stem, provided with a head able to be manipulated and sliding into a cylindrical opening provided in the middle part of said timepiece, and stopping means preventing the extraction of said stem, wherein the stem comprises, on the head side, a main cylindrical body extended by a shank separated from the latter by a groove intended to receive an O-ring sealing gasket, said shank having at its end an annular recess forming an axial stud ending in an annular rim, and wherein the stopping means comprise a sleeve inserted, between the wall of the opening and the shank, of substantially equal length to the shank, partially blocked by a ring of greater external diameter than that of the opening and of substantially equal aperture to the diameter of the stud, said sleeve compressing the O-ring sealing gasket and being fixed to the shank by riveting of the annular rim against the ring of the sleeve.

5,751,669
OVERWRITABLE MAGNETOOPTICAL RECORDING METHOD IN WHICH THE RECORDING MEDIUM IS COOLED AFTER IRRADIATION

Tsutomu Shiratori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 510,578, Aug. 2, 1995, abandoned, which is a continuation of Ser. No. 134,679, Oct. 13, 1993, abandoned. This application Jun. 19, 1996, Ser. No. 666,918
Claims priority, application Japan, Oct. 16, 1992, 4-279048
Int. Cl.^{6} G11B *13/04*
U.S. Cl. 369—13 **6 Claims**



1. An overwritable magnetooptical information recording method for effecting recording of information by irradiating a magnetooptic recording medium with a light beam while moving the recording medium which includes at least a first magnetic layer and a second magnetic layer and which satisfies the following conditions:

(1) the first and second magnetic layers are mutually exchange-coupled;

(2) in an environmental temperature, the magnetization of the second magnetic layer is oriented to a predetermined direction and the magnetization of the first magnetic layer is oriented to an arbitrary direction independently of the second magnetic layer;

(3) in a heating or cooling process of the recording medium, when a medium temperature is a temperature T_1, which is higher than the environmental temperature, the magnetization of the first magnetic layer is oriented in a direction that the coupling due to the exchange-coupling force to the second magnetic layer assumes a stable state;

(4) in the heating or cooling process of the recording medium, when the medium temperature is a temperature T_2, which is higher than the temperature T_1, the magnetization of the second magnetic layer is oriented in a direction different from the predetermined direction, and

(5) in the cooling process of the recording medium, when the medium temperature is a temperature T_3, which is higher than the environmental temperature but lower than the temperature T_1, the magnetization of the second magnetic layer is oriented in the predetermined direction and the first magnetic layer maintains the most recent magnetizing state independently of the second magnetic layer,

said method comprising:

a first recording step for irradiating the recording medium with a light beam which is adjusted such that the temperature of the first magnetic layer rises to the temperature T_1 or higher so as to cause the condition (3), in accordance with the information;

a second recording step for irradiating the recording medium with a light beam which is adjusted such that the temperature of the second magnetic layer rises to the temperature T_2 or higher so as to cause the condition (4), in accordance with the information; and

a third recording step for irradiating the recording medium with a light beam which is adjusted such that the recording medium is cooled to the temperature T_3 or lower after irradiation of the recording medium with the light beam adjusted such that the temperature of the second magnetic layer rises to the temperature T_2 or higher, during a recording operation of a series of data signals,

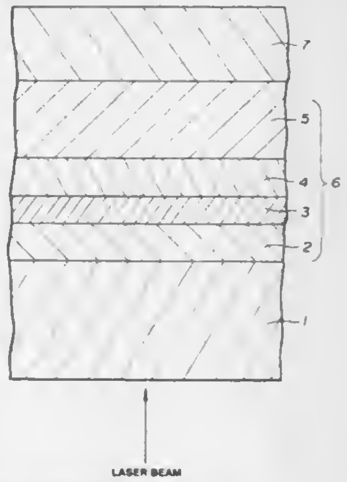
wherein said third recording step is executed at the time of switching to said first recording step from said second recording step, and

wherein a portion of the region rendered to the condition (4) by said second recording step is subjected to said first recording step subsequently executed and after completion of said first recording step, the portion is caused to assume the condition (3).

5,751,670
MAGNETO-OPTICAL DISK HAVING VARIABLE THICKNESS RECORDING LAYER BUT ADEQUATE UNIFORM REFLECTANCE VALUE

Yoshihito Fukushima, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 672,717
Claims priority, application Japan, Jun. 30, 1995, 7-166642
Int. Cl.^{6} G11B *11/00;7/24*
U.S. Cl. 369—13 **3 Claims**



1. A magneto-optical disc, comprising:

a disc shaped substrate; and

a recording layer formed on said substrate,

wherein:

said recording layer extends between inner and outer diameters, said outer diameter falls within 2.5 mm from an outer rim of said magneto-optical disc,

said recording layer comprises a first dielectric layer, a magneto-optical layer, a second dielectric layer and a reflection layer formed sequentially in that order on the substrate,

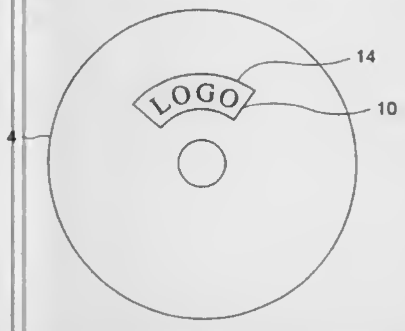
said first dielectric layer has a maximum thickness of $\lambda/4n$ where λ is the wavelength of a playback light beam and n is the refraction index of said first dielectric layer, and

said first dielectric layer and said magneto-optical layer having counter-balancing reflective effects given similar changes in these respective thicknesses so that no significant change in reflectance in said recording layer occurs given a variation in film thickness for the recording layer.

5,751,671
INFORMATION RECORDING MEDIA AND OPTICAL DISK, DISK HAVING SPECIFIC DATA SO THAT A VISIBLE PATTERN OF CHARACTERS OR GRAPHICS APPEAR ON A COPY DISK

Ryuichi Koike, Yokohama; Hiroshi Banno, Koshigaya; Tamotsu Ito, Ayase, and Takashi Takeuchi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1995, Ser. No. 420,656
Claims priority, application Japan, Apr. 26, 1994, 6-088747; Apr. 26, 1994, 6-088748; Apr. 26, 1994, 6-088749
Int. Cl.^{6} G11B *13/00;5/86;* **H04L** *9/00*
U.S. Cl. 369—14 **43 Claims**



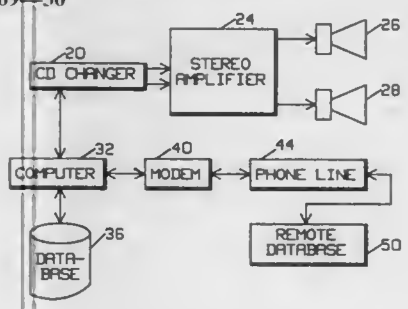
1. An information recording medium comprising a recording surface for recording information according to pits formed on a plurality of tracks, said information recording medium having a pattern recording area for recording specific data at a predetermined first tracking linear velocity for each track on the plurality of tracks, wherein

said pits are disposed to form a pattern having no visibly recognizable character or graphics format on said surface, and said pits are further disposed for forming a visibly recognizable pattern of at least either characters or graphics on a copy medium in the event where said specific data is recorded on said copy medium from said information recording medium at a second tracking linear velocity different from the predetermined first tracking linear velocity, and wherein said visible pattern results from a difference in light reflection factors in said visibly recognizable pattern corresponding to the specific data.

5,751,672
COMPACT DISC CHANGER UTILIZING DISC DATABASE

Carl J. Yankowski, Dover, Mass., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Jul. 26, 1995, Ser. No. 507,544
Int. Cl.^{6} G11B *17/22*
U.S. Cl. 369—30 **38 Claims**



1. A system for playback of music compact discs, comprising in combination:

a disc changer for receiving a compact disc and converting data from said disc to signals representing music;

means for reading an identifying portion of said disc which uniquely identifies said disc;

a memory;

means for comparing said identifying portion of said disc with said memory to determine if said identifying portion and associated identifying information relating to said compact disc is stored in said memory;

a modem;

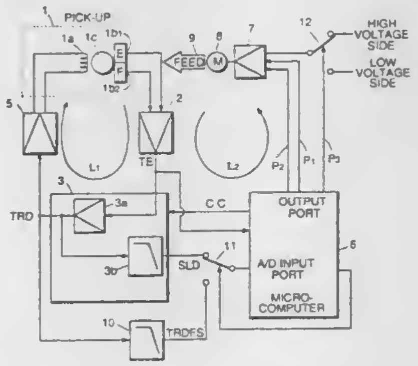
searching means for accessing a remote database via said modem, wherein in the event said comparing means does not detect said identifying portion in said memory, said searching means accesses said remote database via said modem to locate identifying information relating to said disc, said disc being identified in said database by said identifying portion; and

downloading means for downloading said identifying information from said remote database to said memory.

5,751,673
QUICK RESPONSE OPTICAL DISK SYSTEM PROVIDING ACCURATE DISPLACEMENT OF A PICK-UP AND METHOD THEREFOR

Noriaki Yokota, and Kouji Okamura, both of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1996, Ser. No. 587,929
Claims priority, application Japan, Apr. 3, 1995, 7-077718
Int. Cl.^{6} G11B *17/22;7/00*
U.S. Cl. 369—32 **21 Claims**



1. An optical disk system comprising:

a pick-up disposed facing an optical disk having a spiral track with optically reproducible information recorded thereon and used for reproducing the information recorded on the track of the optical disk and detecting information on the track position;

shifting means for moving the pick-up in a radial direction of the optical disk;

error determining means for determining, from the track position information signal, a relative positional error of the pick-up relative to the track;

pick-up drive-signal generating means for generating a pick-up drive signal TRD for driving the pick-up by processing the output of the first determining means;

center determining means for determining a mean center position of the pick-up by processing the pick-up drive signal with a low-pass filter;

actual position determining means for determining an actual position of the pick-up relative to the track by processing said pick-up drive signal while the; and

selecting means for selecting control of the shifting means between an output of said center determining means and said actual position determining means.

5,751,674
APPARATUS FOR CONTROLLING BIAS AMOUNT OF FOCUS ERROR SIGNAL

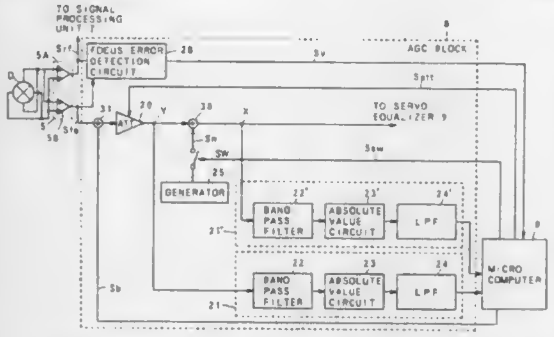
Alex Bradshaw; Takashi Sasaki; Yoshifumi Fujino; Yoshimichi Nishio; Tomoko Miyagawa; Mayumi Takahashi, and Hideaki Yoshimura, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Dec. 23, 1996, Ser. No. 772,265

Claims priority, application Japan, Dec. 26, 1995, 7-339783; Aug. 27, 1996, 8-225282

Int. Cl.^{6} G11B *7/09*

U.S. Cl. 369—44.35 **8 Claims**



1. An apparatus for controlling a bias amount of a focus error signal in a focus servo loop of an optical information reproducing and/or recording system, which comprises an optical system for irradiating a light beam to an information record surface of an information record medium and detecting the light beam reflected from the information record surface to output a light detection signal, an amplifying means for amplifying the light detection signal and generating the focus error signal which indicates an error of a focus point of the light beam with respect to the information record surface on the basis of the light detection signal, and a feed back means for feeding back the focus error signal in the focus servo loop to change the focus point with respect to the information record surface in accordance with a level of the focus error signal, said apparatus comprising:

a superimposing means for superimposing a disturbance signal to flutter the focus point with respect to the information record surface, onto the focus error signal;

an error amount detecting means for detecting a focus error amount of the focus point with respect to the information record surface, on the basis of the light detection signal outputted when the disturbance signal is superimposed;

a parameter calculating means for calculating a gain parameter corresponding to an amplification factor of said amplifying means, and a sensitivity parameter corresponding to a detection sensitivity of the optical system; and

a bias amount calculating means for calculating the bias amount, on the basis of the detected focus error amount and the calculated gain parameter and sensitivity parameter.

5,751,675
RECORDING AND/OR REPRODUCTION APPARATUS AND METHOD FOR OPTICAL RECORD MEDIUM

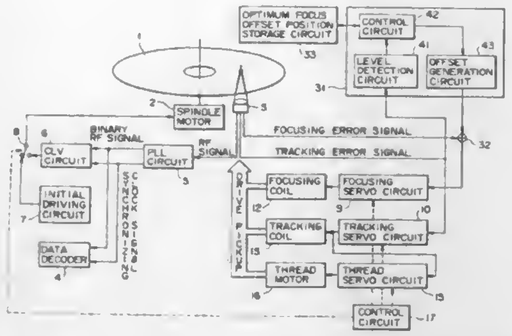
Keiichi Tsutsui, Kanagawa, and Katsuji Igarashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1996, Ser. No. 662,492

Claims priority, application Japan, Jun. 16, 1995, 7-149899

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—44.27 **12 Claims**



1. A recording/reproducing apparatus for an optical storage medium, comprising:

optical means for recording/reproducing data, represented by a signal, on/from said optical storage medium;

generating means for generating a focus offset value by continuously obtaining amplitude values for a first, a second and a third consecutive sample point of said signal, and by comparing the amplitude values to each other until a signal position of the second sample point is determined to be the focus offset value; and

focus control means for controlling focus of said optical means as a function of said focus offset value.

5,751,676
OPTICAL DISK RECORDING AND REPRODUCING METHOD AND APPARATUS THEREFOR

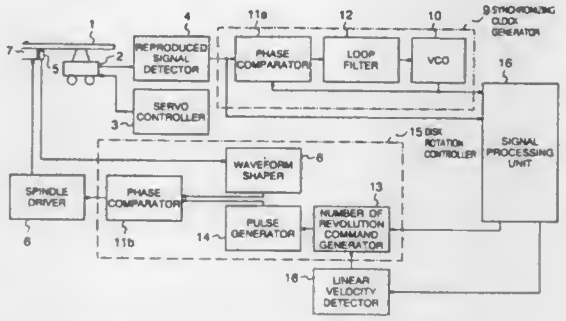
Taizou Kusano, Fukuoka; Yoshiro Kashiwabara; Yasuhiro Wada, both of Kasuga, and Keisuke Umeda, Fukuoka-ken, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1996, Ser. No. 668,770

Claims priority, application Japan, Jun. 26, 1995, 7-158993; Jul. 3, 1995, 7-167217

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 369—50 **7 Claims**



7. An optical disk apparatus comprising:

a pickup unit including an optical unit for applying a laser beam to an optical disk and converting its reflected beam into an electric signal and a drive unit for moving said optical unit in radial direction of said optical disk;

a reproduced signal detecting means for amplifying a signal from said pickup unit and outputting said reproduced signal;

servo control means for driving said optical unit so that said laser beam is focused at a specified position of said optical disk;

optical disk rotating means for driving said optical disk to a specified rotating velocity;

signal processing means for controlling the whole optical disk apparatus;

synchronizing clock signal generating means for generating a synchronizing clock signal for use in reproducing data from a reproduced signal such that a synchronization range of said synchronizing clock signal is in a permissible range of at least ±25% with respect to a basic frequency;

optical disk rotation control means for detecting a number of optical disk revolutions, and in response to a command specifying the number of revolutions from said signal processing means, supplying said optical disk rotating means with a control signal to control said optical disk to a required number of revolutions; and

linear velocity detecting means for detecting a linear velocity of the optical disk rotation and notifies a detection result to said signal processing means;

wherein said signal processing means, on the basis of a detection result from said linear velocity detecting means, calculates a range where said synchronizing clock signal generating means allows a reproduced signal to be subjected into pull-in-synchronization, and wherein said optical disk rotation control means, on the basis of the reproducing position of said optical disk, controls the optical disk rotation so that the angular velocity of the optical disk rotation currently under control of said optical disk rotation control means is constant (CAV control) in said pull-in-synchronization range calculated by said signal processing means, and controls the optical disk rotation so that the linear velocity at the reproducing position of the optical disk heretofore under control of said optical disk rotation control means is constant and the changes of the number of revolutions of the optical disk are minimal in a range exceeding said synchronization-possible range calculated by said signal processing means (CLV control).

5,751,677
MAGNETIO OPTICAL DISK RECORDING DEVICE CAPABLE OF VERIFYING RECORDED STATE DURING RECORDING AND CHECKING ERASED STATE DURING ERASING

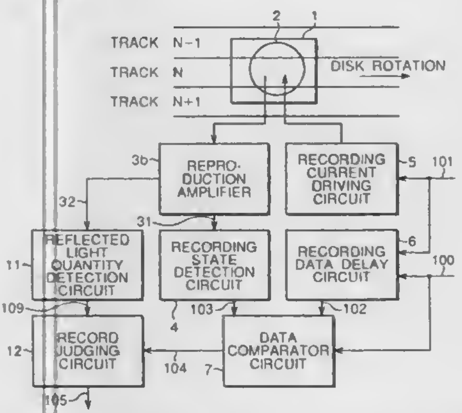
Toshiaki Iwanaga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 602,071, Feb. 15, 1996, Pat. No. 5,708,639. This application Jul. 22, 1997, Ser. No. 898,681

Claims priority, application Japan, Feb. 16, 1995, 7-27817

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—54 **1 Claim**



1. A magneto-optical disk recording device for recording and reproducing by an optical beam in magnetized series of pits in a magneto-optical disk medium, said device comprising:

a magneto-optical head for recording a recording data on and reproducing a recorded data from said magneto-optical disk medium;

a reproduction amplifier for amplifying both a magneto-optical reproduction signal and a reflected light quantity signal read out by said magneto-optical head during the recording;

a recording data delay circuit for delaying said recording data by a predetermined period of time;

a recording state detection circuit for receiving a magnetic data output from said reproduction amplifier and detecting a reproduced signal state during the recording;

a data comparator circuit for outputting a record failure signal derived from an output of said recording data delay circuit and an output of said recording state detection circuit;

a reflected light quantity detection circuit for outputting a reflected light quantity detection signal when a reflected light quantity signal outputted from said reproduction amplifier has become a level lower than a predetermined threshold level; and

a record judging circuit for judging whether to skip a record failure region or to verify a recorded state of said recorded data when at least one of said record failure signal from said data comparator circuit and said reflected light quantity detection signal from said reflected light quantity detection circuit is outputted.

5,751,678
DUBBING SYSTEM

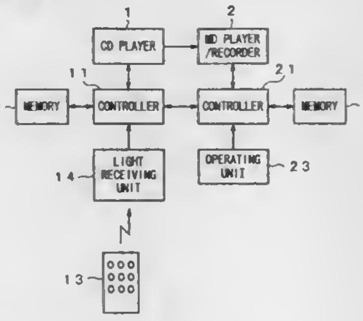
Yozo Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Feb. 19, 1997, Ser. No. 802,385

Claims priority, application Japan, Feb. 28, 1996, 8-067274

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—84 **2 Claims**



1. A dubbing system, comprising:

storing means for storing character information corresponding to at least one program recorded on a first record medium;

reproducing means for reproducing information recorded on the first record medium;

recording means for copying information reproduced from the first record medium to a second record medium;

determining means for determining whether or not all regions of the second record medium are recordable; and

recording means controlling means for causing the recording means to copy character information stored in the storing means to a management region of the second record medium corresponding to a program copied to the second record medium when the determining means has determined that all the regions of the second record medium are recordable.

5,751,679
HOLOGRAM FORMED ON AN OBJECTIVE LENS FOR ONE DEFRACTING LIGHT BEAMS WHICH ARE SEPARATED BY MORE THAN ONE TRACK WIDTH

Akio Yamakawa, Kanagawa, and Masamichi Utsumi, Chiba, both of Japan, assignors to Sony Corporation, Japan

Filed Aug. 8, 1996, Ser. No. 694,262

Claims priority, application Japan, Aug. 11, 1995, 7-226068

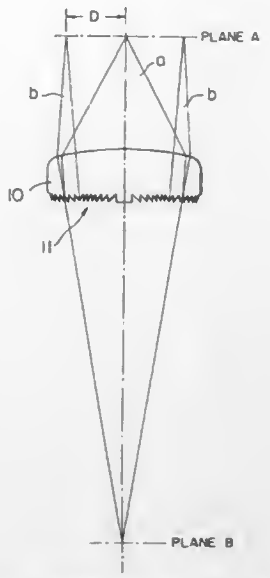
Int. Cl.^{6} G11B *7/12*

U.S. Cl. 369—103 **10 Claims**

1. An optical pickup, comprising:

an objective lens for focusing light generated by a light source onto a reading out member which includes a plurality of adjacent tracks, wherein each track contains data to be read out, and for directing the light reflected by the reading out member;

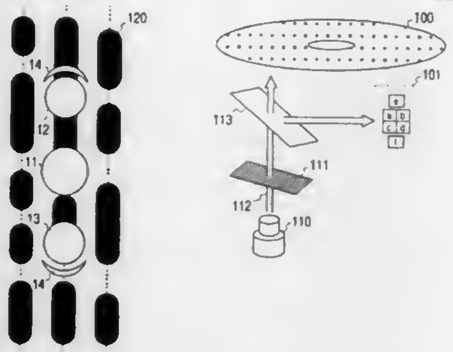
wherein said objective lens includes a hologram lens formed over the entire area of one surface thereof, with a central portion of the hologram lens being formed such that light incident upon the central portion of the hologram lens is focused by said objective lens in such a manner as to illuminate a first one of said tracks of the reading out member, and light reflected by the reading out member is incident upon said objective lens; and with a peripheral portion of the hologram lens being formed such that light incident upon the peripheral portion of the hologram lens illuminates a second



one of said tracks wherein said first and second tracks are separated by at least one intermediate track, and the light reflected by the second track is not incident upon said objective lens.

5,751,680
OPTICAL DISK DRIVE

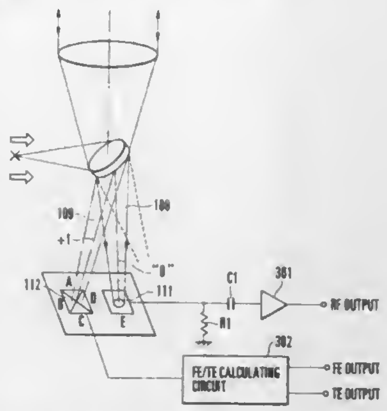
Toshiaki Ishibashi, Yokohama; Kunikazu Ohnishi, Yokosuka; Masayuki Inoue, Yokohamas-hi, and Yoshio Suzuki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 9, 1996, Ser. No. 762,436
Claims priority, application Japan, Dec. 13, 1995, 7-324741
Int. Cl.^{6} H04B ***1/20***
U.S. Cl. 369—109 **11 Claims**



1. An optical disk device, comprising:
a diffraction grating, provided on a path in a signal playback optical system for an optical disk device, on which there has been engraved a grating groove pattern capable of adding a coma aberration component to a + primary diffracted light and a − primary diffracted light to be generated in a pit row direction in a disk respectively;
a first light receiving element and a second light receiving element capable of respectively receiving reflected light of said + primary diffracted light and said − primary diffracted light having said coma aberration component respectively from the surface of said disk; and
a signal processing circuit for calculating a difference in strength between respective output signals from said first and second light-receiving elements, tilt control being effected using said strength difference signal.

5,751,681
TRACKING SIGNAL DETECTION WITH A PHOTODETECTOR RECEIVING ONE OF A ∓1ST-ORDER POLARIZED LIGHT

Tsutomu Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 17, 1997, Ser. No. 819,140
Int. Cl.^{6} G11B ***7/00***
U.S. Cl. 369—112 **7 Claims**

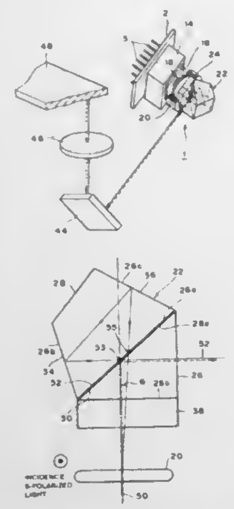


1. An optical head apparatus for a phase change disk, comprising:
a semiconductor laser for outputting a laser beam;
a rectangular prism having an inclined surface formed with a polarizing beam splitter to deflect the laser beam emitted from said semiconductor laser by 90° toward an optical disk, said polarizing beam splitter passing therethrough a return beam of the laser beam which is reflected by the optical disk;
diffracted light component generating means, arranged in contact with or close to said inclined surface of said prism, for generating a 0th-order polarized laser beam and ±1st-order polarized laser beams from the beam returning from the optical disk through said rectangular prism;
a first optical sensor for detecting the 0th-order polarized laser beam output from said diffracted light component generating means, a reproducing signal being obtained from an output from said first optical sensor; and
a second optical sensor for detecting one of the ±1st-order polarized laser beams output from said diffracted light component generating means, a focusing error signal and a tracking error signal being obtained based on an output from said second optical sensor.

5,751,682
COMPACT SIZE MAGNETO-OPTICAL HEAD WITH A HOLOGRAM AND A BEAM SPLITTING MEANS

Shinya Hasegawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 8, 1996, Ser. No. 727,752
Claims priority, application Japan, Mar. 11, 1996, 8-052972
Int. Cl.^{6} G11B ***7/09***
U.S. Cl. 369—112 **11 Claims**

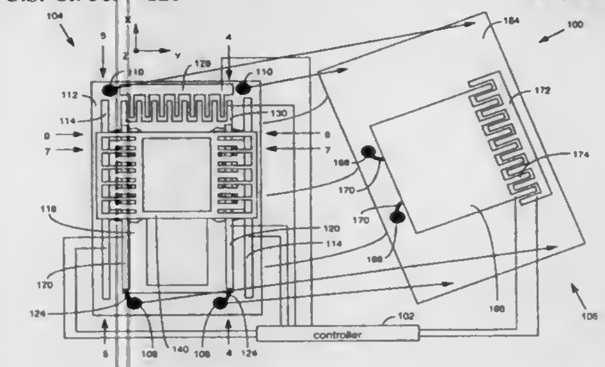
1. An optical head for an optical disk drive, for reading and writing information on an optical disk, comprising:
a laser diode;
a first photodetector for detecting an optical signal from a reflected beam reflected on said optical disk;
a second photodetector for detecting a focusing error signal and a tracking error signal of a laser beam focused on said optical disk, from said reflected beam;
a hologram for diffracting a part of said reflected beam toward said second photodetector; and
a beam splitter unit including a polarization beam splitter, optical rotating means for rotating a polarization plane of a part of said reflected beam by 45 degrees, and beam separating



means for separating the reflected beam into P-polarized light component and S-polarized light component.

5,751,683
NANOMETER SCALE DATA STORAGE DEVICE AND ASSOCIATED POSITIONING SYSTEM

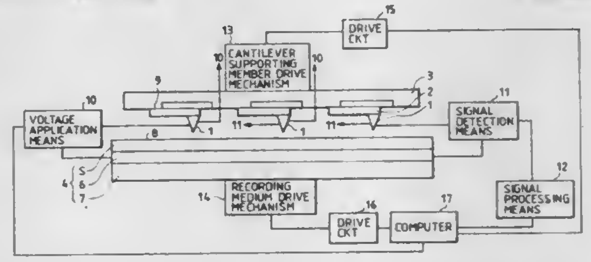
Victor B. Kley, Berkeley, Calif., assignor to General Nanotechnology, L.L.C., Berkeley, Calif.
Filed Jul. 24, 1995, Ser. No. 506,516
Int. Cl.^{6} G11B ***9/00***
U.S. Cl. 369—126 **18 Claims**



1. A positioning system for positioning an object in a predefined direction, the positioning system comprising:
a microfabricated positioning assembly comprising:
a stationary support structure;
a moveable support structure movably coupled to the stationary support structure and moveable within a range of movement in the predefined direction with respect to the support structure;
a positionable support structure positionable in the predefined direction;
a stationary support structure clamp to clamp and unclamp the positionable support structure to and from the stationary support structure;
a moveable support structure clamp to clamp and unclamp the positionable support structure to and from the moveable support structure; and
a controller to control positioning of the positionable support structure in the predefined direction within a range of positioning that is larger than the range of movement of the moveable support structure by controlling (A) the stationary support structure clamp in clamping and unclamping the positionable support structure to and from the stationary support structure, (B) the moveable support structure clamp in clamping and unclamping the positionable support structure to and from the moveable support structure, and (C) the movement of the moveable support structure;
the object being disposed on the positionable support structure so that the object is positionable in the predefined direction within the range of positioning.

5,751,684
RECORDING/REPRODUCING APPARATUS AND METHOD FOR RECORDING/REPRODUCING INFORMATION USING PROBE

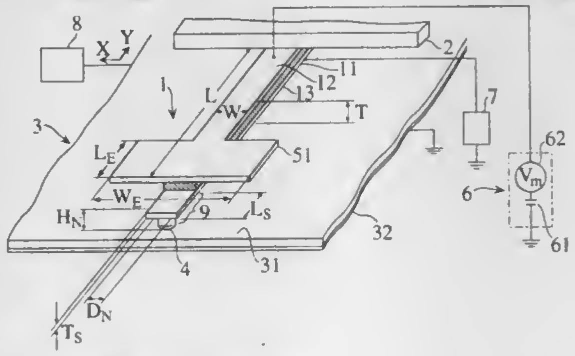
Toshihiko Takeda, Atsugi; Ryo Kuroda, Kawasaki, and Susumu Yasuda, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 10, 1996, Ser. No. 676,684
Claims priority, application Japan, Jul. 10, 1995, 7-198226; Feb. 15, 1996, 8-052363
Int. Cl.^{6} G11B ***7/00***
U.S. Cl. 369—126 **12 Claims**


15
DRIVE CKT
13
CANTILEVER SUPPORTING MEMBER DRIVE MECHANISM
10
9
3
2
1
10
VOLTAGE APPLICATION MEANS
11
SIGNAL DETECTION MEANS
8
5
6
7
14
RECORDING MEDIUM DRIVE MECHANISM
16
DRIVE CKT
17
COMPUTER
12
SIGNAL PROCESSING MEANS

1. A recording/reproducing apparatus in which a recording surface of a recording medium on which a recording bit is formed is scanned using a probe and the recording bit is detected by comparing a signal detected via the probe with a predetermined threshold value, including:
signal processing means for normalizing a signal detected within the recording surface, on the basis of an amplitude value of a signal detected, by the probe, on a portion where no recording bit is present.

5,751,685
PROBE FOR MEMORY DEVICE HAVING MOVABLE MEDIA

You-Wen Yi, Yokohama, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 10, 1996, Ser. No. 644,385
Claims priority, application Japan, May 30, 1995, 7/155222
Int. Cl.^{6} G11B ***7/00***
U.S. Cl. 369—126 **6 Claims**



1. A probing device, comprising:
a probe target having a surface;
a probe substrate,
an elongate probe cantilevered from said probe substrate and terminating in a probe tip, said probe having a first spring constant per unit length in a direction perpendicular to said probe target;
a suspension member extending lengthways from said probe tip and having a second spring constant per unit length in said direction perpendicular to said probe target, said second

spring constant per unit length being less than said first spring constant per unit length;
a micro-needle extending from said suspension member towards said surface of said probe target; and
an electric circuit that applies electrical signals between said micro-needle and said probe target.

5,751,686
SCANNING PROBE TIP COVERED WITH AN ELECTRICAL RESISTANCE TO LIMIT RECORDING/ REPRODUCING CURRENT

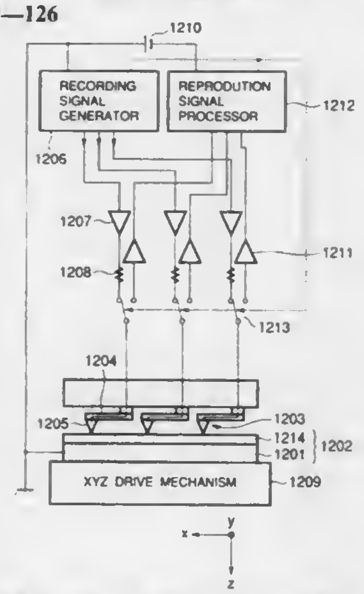
Ryo Kuroda, Kawasaki, and Shunichi Shido, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1996, Ser. No. 665,457

Claims priority, application Japan, Jun. 19, 1995, 7-175490

Int. Cl.^{6} G11B *9/00*

U.S. Cl. 369—126 **11 Claims**



1. A probe for use in an information recording apparatus for recording information on a recording medium by applying a voltage between the recording medium and a tip of said probe, said probe comprising:
a conductive tip;
a wiring provided on said probe for applying a voltage to said tip; and
an electrical resistance provided in said tip or in the wiring on said probe.

5,751,687
DISK LOADING APPARATUS

Yūji Ariyoshi, Toyonaka, and Asayuki Matsumura, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

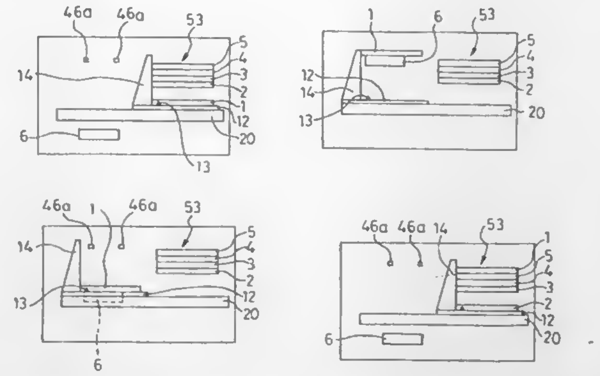
Filed Jul. 17, 1996, Ser. No. 682,205

Claims priority, application Japan, Jul. 21, 1995, 7-185976; Oct. 23, 1995, 7-299074

Int. Cl.^{6} G11B *17/08*

U.S. Cl. 369—202 **15 Claims**

1. A disk loading apparatus comprising:
a plurality of trays on which a disk is to be placed;
a frame having storage means for supporting said trays in a stacked manner;
reproducing means for reproducing disks placed on said trays, at a reproduction position;
tray ejecting means for ejecting said trays outside of said frame; and
tray driving means for, in said frame, moving a tray at a lowest position among said trays which are supported in a stacked manner by said storage means, to said reproduction position and sequentially returning said tray from said reproduction position onto a tray at a highest position among said stacked trays in said storage means, thereby circulating said stacked trays, wherein said tray driving means ejects a tray at the reproduction position to the outside of said frame passing said tray below a tray at the lowest position among said trays stacked by said storage means, said tray driving means moving by means of a circulating operation wherein a tray at a tray storage position is supported by said storage means to the lowest position of said tray storage position, and thereafter said tray is ejected to outside of said frame.



5,751,688
OPTICAL DISC CLAMP MECHANISM FOR USE IN SELECTIVELY CLAMPING A MINI DISC OR A COMPACT DISC IN AN OPTICAL DISC APPARATUS

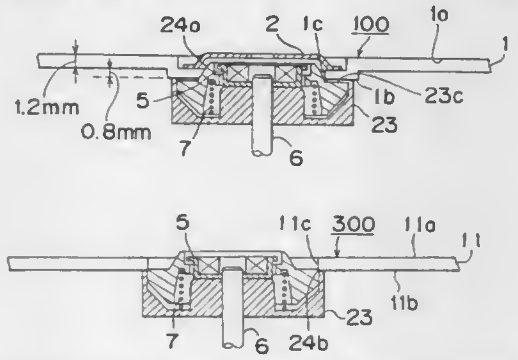
Osamu Mizuno, Osaka; Tohru Nakamura, Katano; Hideki Aikoh, Higashiosaka; Hironori Tomita, Katano, and Masanari Mohri, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 149,724, Nov. 10, 1993, Pat. No. 5,586,105. This application May 30, 1995, Ser. No. 454,566

Claims priority, application Japan, Nov. 12, 1992, 4-301958

Int. Cl.^{6} G11B *17/028*

U.S. Cl. 369—270 **9 Claims**



1. An optical disc clamp mechanism for use in an optical disc apparatus to selectively clamp a compact disc having a center hole or a mini disc having a center hole and a magnetically attractable member, said optical disc clamp mechanism comprising:
an approximately circular disc receiving section for contacting a reference surface of either of the compact disc and the mini disc;
a magnetic clamp unit rigidly fixed to a center portion of said disc receiving section for clamping the mini disc by magnetic attraction of the magnetically attractable member thereof;
a taper cone section including an approximately conical or spherical first taper cone portion mounted to said disc receiving section for receiving the mini disc, and an approximately conical or spherical second taper cone portion mounted to said disc receiving section for receiving the compact disc;

wherein said magnetic clamp unit includes a stopper element for preventing detachment of said first and second taper cone portions from said disc receiving section;
wherein said first taper cone portion is engageable in the center hole of the mini disc and is resiliently movably mounted to said disc receiving section for movement in an axial direction and so as to be located inside an outer periphery of said disc receiving section, and said second taper cone portion is engageable in the center hole of the compact disc and is resiliently movably mounted to said disc receiving section for movement in an axial direction; and
wherein said first taper cone portion is located inwardly of an outer periphery of said second taper cone portion and protrudes from said second taper cone portion in the axial direction.

5,751,689
INFORMATION RECORDING MEDIUM

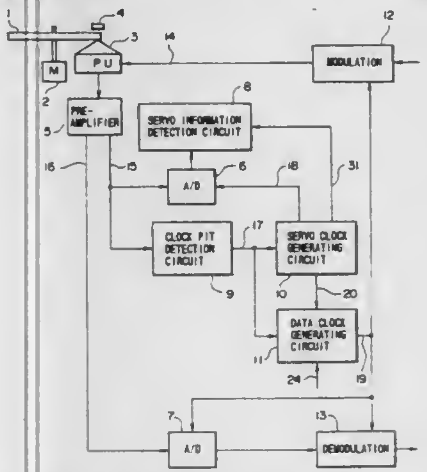
Takashi Hoshino, Yokohama; Tetsuya Ikeda, Chigasaki, and Junichi Ishii, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 337,445, Nov. 8, 1994, Pat. No. 5,459,710, which is a continuation of Ser. No. 911,677, Jul. 9, 1992, Pat. No. 5,388,090. This application Jun. 6, 1995, Ser. No. 470,458

Claims priority, application Japan, Jul. 9, 1991, 3-168025; Mar. 12, 1992, 4-53282

Int. Cl.^{6} G11B *23/00*

U.S. Cl. 369—275.3 **23 Claims**



1
4
3
14
12
M
PU
MODULATION
2
8
PRE-AMPLIFIER
5
SERVO INFORMATION DETECTION CIRCUIT
16
15
6
18
31
A/D
CLOCK PIT DETECTION CIRCUIT
17
SERVO CLOCK GENERATING CIRCUIT
9
10
20
DATA CLOCK GENERATING CIRCUIT
11
24
19
7
13
A/D
DEMODULATION

1. A disk-shaped information recording medium comprising:
a recording and reproducing area including helically or concentrically disposed tracks grouped into a plurality of bands disposed in a radial direction of the disk; and
segments each including a servo section and a data section disposed on the tracks such that servo sections and data sections are alternately disposed on each of the tracks, the segments on each of the tracks being grouped into a plurality of sectors each constituted by an integer number of the segments;
wherein the servo section has prepits recorded therein, the prepits including at least one of (1) wobble pits and (2) a clock pit;
wherein a storage capacity of the data section increases at each transition from one band to an outer adjacent band;
wherein the integer number of segments constituting one sector decreases at each transition from one band to an outer adjacent band; and
wherein in each of the bands, a product of the integer number of the segments constituting one sector and a storage capacity of the data section is greater than or equal to a total amount of data to be recorded in one sector.

5,751,690
OPTICAL DISK HAVING PATTERN DISPLAYED THEREON AND APPARATUS FOR MANUFACTURING SAME

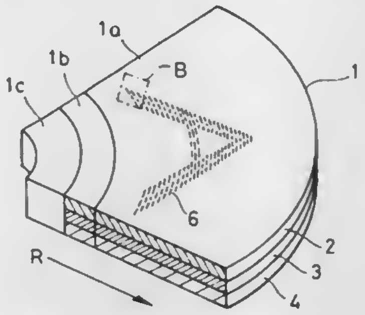
Hiroyuki Ohira; Nobuki Yamaoka, and Yutaka Murakami, all of Yamanashi, Japan, assignors to Pioneer Video Corporation, Yamanashi, and Pioneer Electronic Corporation, Tokyo, both of Japan

Continuation-in-part of Ser. No. 560,985, Nov. 20, 1995, abandoned. This application Jul. 7, 1997, Ser. No. 889,177

Claims priority, application Japan, Dec. 15, 1994, 6-312081

Int. Cl.^{6} G06K *19/06*

U.S. Cl. 369—275.3 **10 Claims**



1. An optical disk having an information recording area in which concentrical or spiral recording tracks constructed by pit trains carrying information signals are formed, wherein
display pits or grooves are formed between and without contacting said recording tracks so as to display a recognizable pattern in said information recording area.

5,751,691
CONNECTION ADMISSION CONTROL SYSTEM

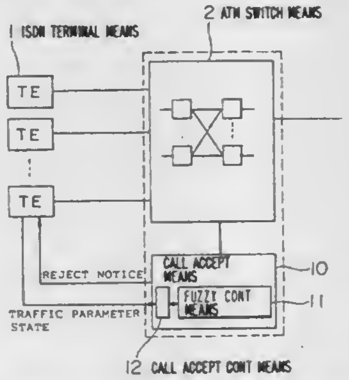
Toshio Soumiya; Shunji Abe; Masafumi Katoh, and Naotoshi Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 32,113, Mar. 17, 1993, Pat. No. 5,341,366. This application Jul. 14, 1994, Ser. No. 274,687

Claims priority, application Japan, Mar. 18, 1992, 4-061673; Mar. 25, 1992, 4-067414; Sep. 18, 1992, 4-249974; Oct. 8, 1992, 4-270184

Int. Cl.^{6} H04L *12/56;29/02*

U.S. Cl. 370—17 **4 Claims**



1. A connection admission control system comprising:
a plurality of terminal means each for transmitting a call connection request and traffic parameters in call origination;
switching means connected to each of said terminal means, for receiving one of said call connection requests from one of said plurality of terminal means;
central control means for controlling an internal line switching of said switching means;
call acceptance control means provided in said central control means, for executing a switch routine and a band allocation in response to a statement of the traffic parameters received from said one of said plurality of said terminal means; and

fuzzy control means provided in said central control means, for analyzing the traffic parameters received by said call acceptance control means, for calculating a necessary band in accordance with fuzzy rules, and for discriminating whether a call setup for the call, based on the call connection request, is acceptable or not.

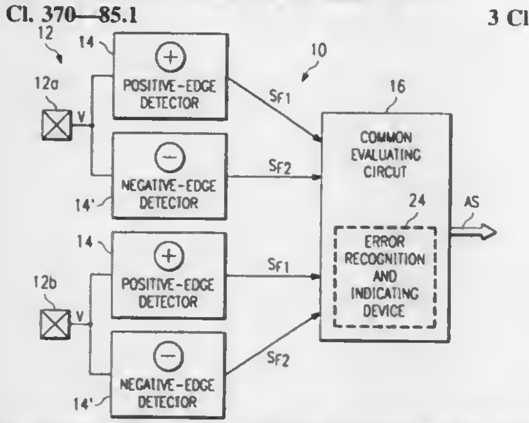
5,751,692
BUS SIGNAL DETECTOR

Helmut Kiml, Tiefenbach, Germany, assignor to Texas Instuments Deutschland GmbH, Germany

Filed Jun. 7, 1995, Ser. No. 485,256

Int. Cl.^{6} H03K *11/00;* **H04L** *25/64*

U.S. Cl. 370—85.1 **3 Claims**



1. A bus signal detector for use with (i) a first bus voltage signal variable between a time-varying first quiescent voltage and a more positive first signal voltage, and (ii) a complementary second bus voltage signal variable between a time-varying second quiescent voltage and a more negative second signal voltage, comprising:

first and second input terminals for respectively receiving the first and second bus voltage signals;

a first detecting pair of positive-edge & negative-edge detectors respectively coupled to the first input terminal, for respectively generating a positive-edge or negative-edge signal according to whether the first bus voltage signal switches by at least a predetermined threshold voltage (i) from the first quiescent voltage to the more positive first signal voltage or (ii) the reverse; and

a second detecting pair of positive-edge & negative-edge detectors respectively coupled to the second input terminal, for respectively generating a negative-edge or positive-edge signal according to whether the second bus voltage signal switches by at least the threshold voltage (i) from the second quiescent voltage to the more negative second signal voltage or (ii) the reverse; and

a common evaluating circuit coupled to the first and second detecting pairs for generating an output signal AS which is normally INACTIVE but becomes ACTIVE in response to positive-edge and negative-edge signals respectively from the first and second detecting pairs for at least a predetermined minimum interval, and returns to INACTIVE in response to negative-edge and positive-edge signals respectively from the first and second detecting pairs for at least a predetermined minimum interval.

5,751,693
CELLULAR DIGITAL SIGNALING

Gilbert M. Dinkins, Herndon, Va., assignor to Eon Corporation, Reston, Va.

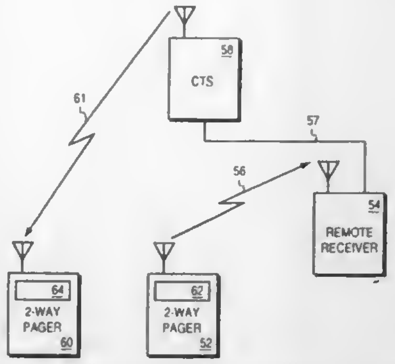
Continuation-in-part of Ser. No. 966,414, Oct. 26, 1992, Pat. No. 5,388,101. This application Feb. 3, 1995, Ser. No. 383,805

Int. Cl.^{6} H04Q *7/14;7/30;7/32*

U.S. Cl. 370—95.1 **35 Claims**

1. A two-way paging apparatus comprising:

a central transmitting station,



at least one remote receiver communicatively coupled to said central transmitting station, said at least one remote receiver disposed within a first geographic area associated with said central transmitting station, said at least one remote receiver adapted to synchronously communicate with said central transmitting station,

at least one pager communicatively coupled to said central transmitting station and said at least one remote receiver, said at least one pager adapted to synchronously communicate with said central transmitting station and said at least one remote receiver, said at least one pager disposed within a second geographic area associated with said at least one remote receiver.

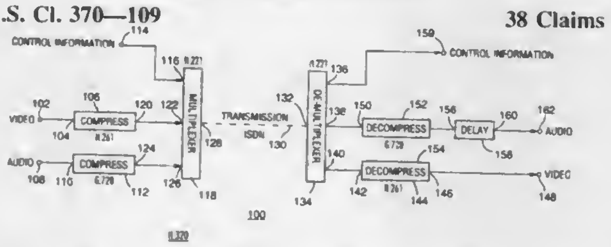
5,751,694
METHODS AND APPARATUS FOR SYNCHRONIZING TEMPORALLY RELATED DATA STREAMS

Rolf Toft, La Jolla, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., N.J.

Filed May 22, 1995, Ser. No. 445,854

Int. Cl.^{6} H04J *3/04;3/06*

U.S. Cl. 370—109 **38 Claims**



1. A system for dynamically synchronizing a plurality of streams of temporally related data, comprising:

a first compressor for compressing a first stream of data to generate a first compressed stream of data and for generating compression time data representative of a first period of time t_1 required to compress the first stream of data;

a second compressor for compressing, within a second period of time t_2, a second stream of data to generate a second compressed stream of data, the second stream of data temporally related to the first stream of data;

transmission means for transmitting the compressed first stream of data, the compressed second stream of data and the compression time data;

a first decompressor for decompressing, within a third period of time t_3, the compressed first stream of data to generate first decompressed signal;

a second decompressor for decompressing, within a fourth period of time t_4, the compressed second stream of data to generate a second decompressed signal; and

a delay circuit for delaying the second decompressed signal by an amount of time substantially equal to $(t_1+t_3)-(t_2+t_4)$.

5,751,695
ATM CELL FLOW CONTROL APPARATUS

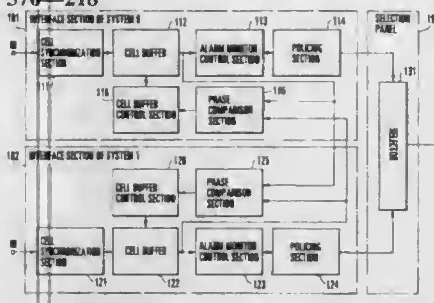
Satoshi Ohashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 12, 1996, Ser. No. 712,837

Claims priority, application Japan, Sep. 13, 1995, 7-234547

Int. Cl.^{6} H04L *1/22;* **H04J** *3/06*

U.S. Cl. 370—218 **6 Claims**


INTERFACE SECTION OF SYSTEM 0
112
113
114
SELECTION PANEL
CELL SYNCHRONIZATION SECTION
CELL BUFFER
ALARM MONITOR CONTROL SECTION
POLICING SECTION
131
CELL BUFFER CONTROL SECTION
PHASE COMPARISON SECTION
SELECTOR
OUT
INTERFACE SECTION OF SYSTEM 1
CELL BUFFER CONTROL SECTION
PHASE COMPARISON SECTION
CELL SYNCHRONIZATION SECTION
CELL BUFFER
ALARM MONITOR CONTROL SECTION
POLICING SECTION
121
122
123
124

1. An ATM cell flow control apparatus comprising interface sections for terminating transmission lines of two systems which constitute a redundant structure and to which identical cell sequences are supplied,

each of said interface sections including:

cell synchronization means for performing cell synchronization control of an input cell sequence and outputting the sequence in units of cells;

delay adjustment means for performing delay adjustment of each cell output from said cell synchronization means;

cell interval detection means for detecting a cell interval between cells output from said delay adjustment means, and discarding cells having a detected cell interval shorter than a predetermined cell interval; and

delay control means for detecting a phase difference between a cell output from said delay adjustment means of a self-system and a cell output from said delay adjustment means of the other system, and controlling said delay adjustment means in accordance with the detected phase difference.

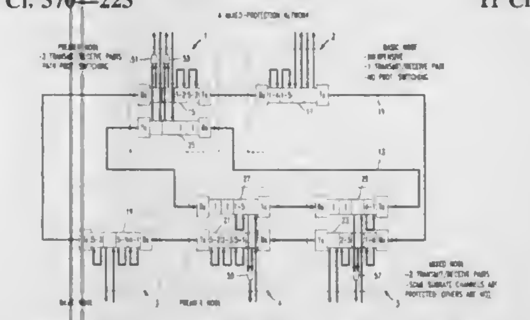
5,751,696
MULTIPLEXED-COMMUNICATIONS NETWORK HAVING MIXED PROTECTION AGAINST FAULTS AND ERRORS

Gordon L. Bechtel, Newburyport, and Curtis J. Newton, Medford, both of Mass., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 2, 1996, Ser. No. 581,792

Int. Cl.^{6} H04L *1/00*

U.S. Cl. 370—223 **11 Claims**



1. A multiplexed-communications network comprising:

(a) a first ring adapted to transport multiplexed subrate channels and integrity-data signals around said first ring in a first direction,

(b) a second ring associated with said first ring and adapted to transport multiplexed subrate channels and integrity-data signals around said second ring in a second direction which is opposite to said first direction, and

(c) a plurality of nodes each of which is connected in series with at least one of said first ring and said second ring, each of said nodes having:

  (1) at least one receiver-transmitter pair for receiving from said ring and transmitting on said ring said multiplexed subrate channels and integrity-data signals,

  (2) means for adding, by multiplexing, subrate channels and integrity-data signals onto said ring,

  (3) means for dropping, by demultiplexing, subrate channels and integrity-data signals from said ring,

  (4) means for passing through the node subrate channels and integrity-data signals from receiver to transmitter on said ring, and

  (5) means for delivering predetermined demultiplexed subrate channels to an interface between said network and utilization equipment,

(d) each of said plurality of nodes being selected from:

  (1) a first set of nodes each of which has one receiver-transmitter pair and is connected in series with only one of said first ring and said second ring, and which adds onto said one ring and drops from said one ring dissociated subrate channels and integrity-data signals,

  (2) a second set of nodes each of which has two receiver-transmitter pairs and is connected in series with each of said first ring and said second ring, and which adds onto both of said first ring and said second ring, and drops from both of said first ring and said second ring, associated pairs of subrate channels with integrity-data signals, and

  (3) a third set of nodes each of which has two receiver-transmitter pairs and is connected in series with each of said first ring and said second ring, and which adds onto both of said first ring and said second ring, and drops from both of said first ring and said second ring, a set of predetermined associated pairs of subrate channels with integrity-data signals, and which adds onto one ring, and drops from said one ring, a set of predetermined dissociated subrate channels and integrity-data signals.

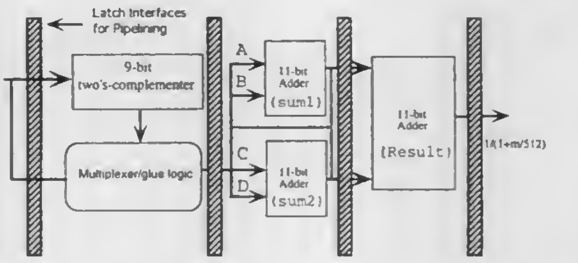
5,751,697
ALLOWED CELL RATE RECIPROCAL APPROXIMATION IN RATE-BASED AVAILABLE BIT RATE SCHEDULERS

Sivakumar Radhakrishnan, Burnaby, and Stephen J. Dabecki, Coquitlam, both of Canada, assignors to PMC-Sierra, Inc., Burnaby, Canada

Filed Dec. 6, 1995, Ser. No. 568,347

Int. Cl.^{6} H04L *12/24;* **G06F** *1/02*

U.S. Cl. 370—229 **5 Claims**



1. A method of scheduling cell transmission over an asynchronous transfer mode communication channel, said channel characterized by a clock frequency f and an allowed cell rate A(R expressed as a floating point number having a mantissa m and an exponent e, where $0 \leqq m \leqq 511$, $0 \leqq e \leqq 31$ and $ACR=(1+m/512)*2^3$, said method requiring determination of the reciprocal ACR^{-1} of said allowed cell rate and comprising the steps of:

(a) if $m \geqq 128$ evaluating the reciprocal of the mantissa portion (1+m/512) by piece-wise linear approximation of the function:

$$\frac{1}{2}\left(1+\frac{512-m}{1024}+1.5\left(\frac{512-m}{1024}\right)^2\right);$$

(b) if m<128 evaluating the reciprocal of said mantissa portion by piece-wise linear approximation of the function:

$$\left(1-\frac{m}{512}+\left(\frac{m}{512}\right)^2\right);\text{ and,}$$

(c) scheduling a selected cell for transmission at a time T relative to the transmission time T_0 of a cell transmitted immediately prior to said selected cell, where

$$T=T_0+(ACR^{-1})*\ f.$$

5,751,698

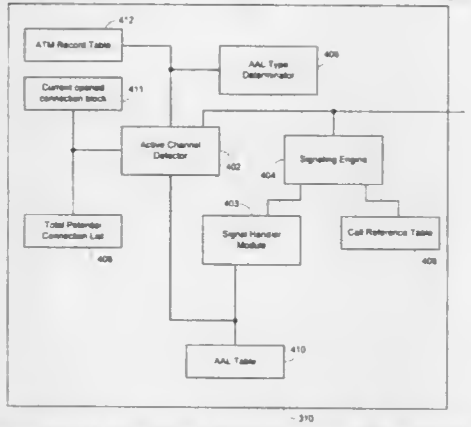
SYSTEM AND METHOD FOR AUTOMATICALLY IDENTIFYING AND ANALYZING ACTIVE CHANNELS IN AN ATM NETWORK

Paul W. Cushman, Montclair, N.J.; King L. Won, San Jose, Calif.; Bakulesh A. Mehta, Sunnyvale, Calif., and Mark Akselrod, San Ramon, Calif., assignors to Network General Technology Corporation, Menlo Park, Calif.

Filed Mar. 15, 1996, Ser. No. 616,465

Int. Cl.^{6} H04J *1/16*

U.S. Cl. 370—252 **59 Claims**



1. A method for identifying active channels in an asynchronous transfer mode (ATM) network, the ATM network having a plurality of channels including a signaling channel, the method comprising the steps of:

(A) automatically monitoring the signaling channel to identify a first signal as a connect message associated with a first channel including the steps of:

identifying said first signal as a signaling message if a first portion of said first signal matches a first protocol;

comparing a second portion of said first signal with a predetermined connect identifier if said first signal is identified as the signaling message; and

identifying said first signal as the connect message if said second portion of said first signal matches said predetermined connect-identifier and if said first signal is identified as the signaling message; and

(B) identifying said first channel as an active channel, if said first signal is identified as said connect message.

5,751,699

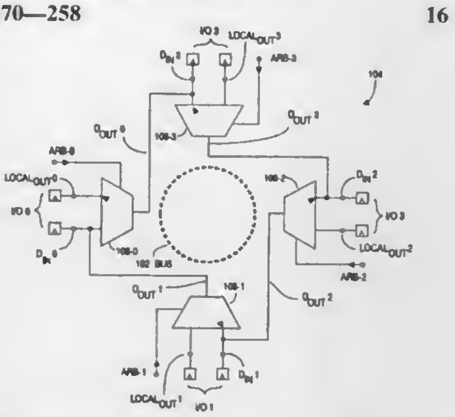
MULTIDIMENSIONAL ASPECTS OF AN ASIC BUS STRUCTURE

William H. Radke, San Jose, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 390,052, Feb. 17, 1995, Pat. No. 5,555,540. This application Jun. 24, 1996, Ser. No. 669,631

Int. Cl.^{6} H04J *3/00*

U.S. Cl. 370—258 **16 Claims**



1. A hierarchial system having at least three dimensions for coupling data between Z nodes, where Z is an integer ≧2, the system comprising:

Z multiplex modules each having a first input coupled to a D_{in} input node, having a second input node coupled to a local output node, having a third input node coupled to a H_{in} input node, having an arbitration node coupled to an arbitration signal, and having an output node D_{out} that is coupled in response to a signal at said arbitration node to a chosen one of said first, second and third input node, said output node being coupled to at least a H_{out} node on at least another one of said modules, and to a V_{out} node on at least another one of said modules, and to a $Local_{in}$ node on at least another one of said modules;

a first horizontal hierarchial level conductive path providing electrical coupling between a first subset of said Z modules;

a second horizontal hierarchial level conductive path providing electrical coupling between a second subset of said Z modules; and

a first vertical hierarchial level conductive path providing electrical coupling between a first said module coupled to said first horizontal hierarchial level conductive path and a second said module coupled to said second horizontal hierarchial level conductive path;

wherein states of arbitration signals coupled to said modules define a signal path between a desired input node on one said module and an output node on another said module, the modules so coupled providing point-to-point coupling.

5,751,700

COMMUNICATION TERMINAL APPARATUS

Eiji Imaeda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Sep. 15, 1995, Ser. No. 529,087

Claims priority, application Japan, Sep. 22, 1994, 6-228316

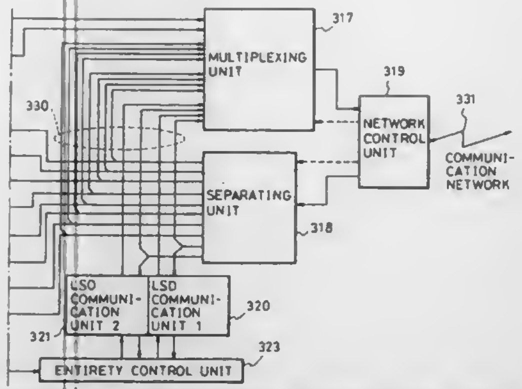
Int. Cl.^{6} H04L *12/18*

U.S. Cl. 370—263 **15 Claims**

6. A communication terminal apparatus for multiplexing a plurality of different types of data and for performing communications of said multiplexed data, comprising:

control means connected to a communication network for controlling communication with the network so as to transmit and receive pluralities of different types of data to and from the network;

multiplexing means for generating transmission data by multiplexing a plurality of different types of data and for outputting the transmission data to said control means;



separation means for separating reception data, received from the network by said control means and then supplied to said separation means, by data type to form separated reception data; and

generating means for generating other data,

wherein multiplexing by said multiplexing means and separation by said separation means are performed on a basis of a common timing signal such that said multiplexing means multiplexes the separated reception data with the other data.

5,751,701

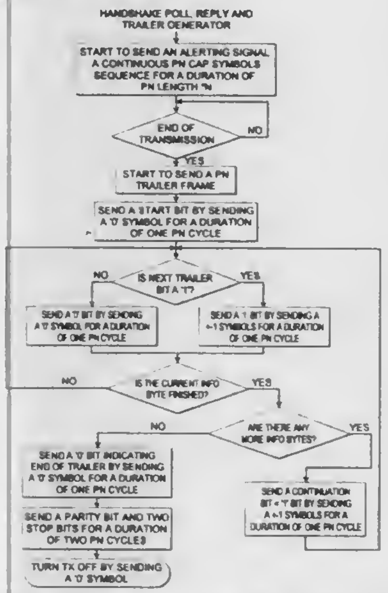
RATE ADAPTIVE DIGITAL SUBSCRIBER LINE ("RADSL") MODEM

Ehud Langberg, Ocean Township, and William Henry Scholtz, Middletown, both of N.J., assignors to Globespan Technologies, Inc., Red Bank, N.J.

Filed Jul. 19, 1996, Ser. No. 690,243

Int. Cl.^{6} H04J *1/00*

U.S. Cl. 370—281 **21 Claims**


HANDSHAKE POLL REPLY AND TRAILER GENERATOR
START TO SEND AN ALERTING SIGNAL A CONTINUOUS PN CAP SYMBOLS SEQUENCE FOR A DURATION OF PN LENGTH *N
END OF TRANSMISSION
NO
YES
START TO SEND A PN TRAILER FRAME
SEND A START BIT BY SENDING A '0' SYMBOL FOR A DURATION OF ONE PN CYCLE
NO
IS NEXT TRAILER BIT A '1'?
YES
SEND A '0' BIT BY SENDING A '0' SYMBOL FOR A DURATION OF ONE PN CYCLE
SEND A '1' BIT BY SENDING A +1 SYMBOLS FOR A DURATION OF ONE PN CYCLE
NO
IS THE CURRENT INFO BYTE FINISHED?
YES
NO
ARE THERE ANY MORE INFO BYTES?
YES
SEND A '0' BIT INDICATING END OF TRAILER BY SENDING A '0' SYMBOL FOR A DURATION OF ONE PN CYCLE
SEND A CONTINUATION BIT = '1' BIT BY SENDING A +1 SYMBOLS FOR A DURATION OF ONE PN CYCLE
SEND A PARITY BIT AND TWO STOP BITS FOR A DURATION OF TWO PN CYCLES
TURN TX OFF BY SENDING A '0' SYMBOL

1. A rate adaptive digital subscriber line ("RADSL") transceiver system for use between a customer location and a central office, comprising:

(a) frequency division multiplexer means for providing frequency division multiplexing, whereby upstream data, from the customer to the central office is all placed within a first frequency range, and downstream data, from the central office to the customer location, is placed into a second frequency range, there being no overlap between said first frequency range and said second frequency range;

(b) rate negotiation means for providing rate negotiation between a customer transceiver, located at the customer location, and a central office transceiver, located at the central office, and

(c) a pseudorandom noise ("PN") generator for generating a PN, said PN being utilized by said rate negotiation means for both correlation and high data rate transmission.

5,751,702

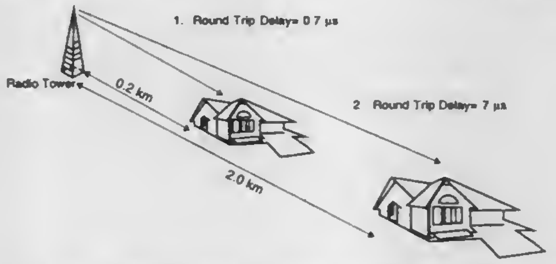
NETWORK PROTOCOL FOR WIRELESS BROADBAND ISDN USING ATM

Allan Evans, Sunnyvale; Charles Van Blaricom, Cupertino, and April Hunter, Altos, all of Calif., assignors to Stanford Telecommunications, Inc., Sunnyvale, Calif.

Filed Dec. 5, 1995, Ser. No. 568,600

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 370—314 **14 Claims**



1. In a RF communication system for controlling communication between a base station and a plurality of stationary user stations, said base station and each said user stations having an RF transceivers and each said stationary users having a high gain directional antenna, the improvement comprising, in combination:

means for effecting time-division multiplexed communications from said base station to said stationary users,

means for providing time division multiple access time slot communications from each said stationary user, respectively, to said base station including means for actively assigning time slots to each said user and means for synchronizing frame timing from each said user transceiver, respectively, with frame timing between said base station to said stationary users,

each said time slot carries one asynchronous transfer mode (ATM) cell and wherein the first of time slots in the communication between said base station and said carries a frame start ATM cell.

5,751,703

ENERGY DISPERSAL METHOD FOR TDMA CARRIER

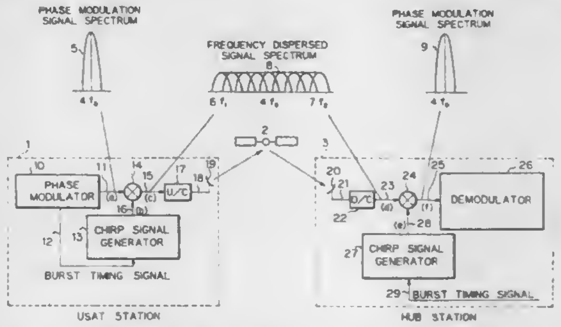
Hideo Kobayashi, Saitama; Takashi Inoue, Tokyo, and Hiroyasu Ishikawa, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 9, 1996, Ser. No. 645,005

Claims priority, application Japan, May 11, 1995, 7-135664

Int. Cl.^{6} H04B *7/212*

U.S. Cl. 370—321 **1 Claim**



1. An energy dispersal method for a TDMA carrier in a radio communication system comprising:

a plurality of slave stations, and

a master station which communicates with said slave stations through a Time Division Multiple Access (TDMA) control system which functions as a link control protocol,

each of said slave stations multiplying a modulation signal, which is sent from said slave station by a first chirp signal, said first chirp signal changes its frequency on a time axis during a TDMA burst period, wherein said modulation signal is dispersed on a frequency axis to a predetermined bandwidth by changing a carrier frequency from said slave station to said master station during said TDMA burst period, therein reducing signal power density of a transmit signal of said slave station,

said master station a) receiving a frequency dispersed signal from said slave station, b) multiplying said frequency dispersed signal by a second chirp signal, which has opposite characteristics to said first chirp signal which changes frequency continuously on said time axis and which is used in said slave station during said TDMA burst period, by using TDMA burst timing information, wherein said modulation signal is reproduced in a frequency dispersed received signal, and c) demodulating said reproduced modulation signal by using a demodulator to provide a demodulated signal.

5,751,704

TECHNIQUE FOR MINIMIZING THE VARIANCE OF INTERFERENCE IN PACKETIZED INTERFERENCE-LIMITED WIRELESS COMMUNICATION SYSTEMS

Zoran Kostic, and Gordana Pavlovic, both of Tinton Falls, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 1, 1996, Ser. No. 609,582

Int. Cl.^{6} H04J *13/04;3/16*

U.S. Cl. 370—335 **16 Claims**

1. A method of switching packets in a wireless communication system, the method comprising the steps of:

separating packets into short packet-slots without overhead;

determining packet slot distribution patterns by a number-theoretic basis, wherein said number theoretic-basis includes properties of unipolar binary sequences;

transmitting said packet-slots at times determined by said packet-slot distribution patterns; and

generating a time domain signal representing data of said slot distribution pattern, said time domain signal being selected in accordance with the following formula:

$$O_i(t) = s(k) \times o_i\left(t - \left(k - \sum_{l=1}^{k} s(l) \right) T_S \right)$$

for $(k-1)\times T_S \leqq t \leqq k\times T_S$, k=1, 2, . . . , L,

where

$O_i(t)$ is the packetized and modulated signal;

s(k) is the packet-slot distribution pattern or unipolar binary code

$s(k) \epsilon \{0, 1\}$;

$o_i(t)$ is the waveform of the time-domain signal for a single packet-slot;

t is time;

$s(k) \epsilon \{C_{QC}, C'_{QC}, C_{QCA}\}$—described in the sequel;

k is the packet-slot index; and

T_S=slot duration.

5,751,705

CODE DIVISION MULTIPLE ACCESS BASE STATION TRANSMITTER

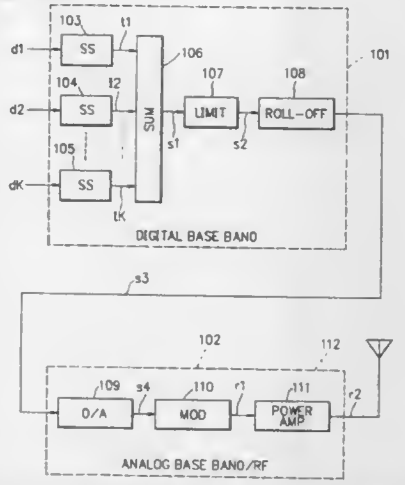
Toshifumi Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 672,599

Claims priority, application Japan, Jun. 30, 1995, 7-188501

Int. Cl.^{6} H04J *13/00*

U.S. Cl. 370—335 **3 Claims**



2. A code division multiple access base station transmitter which is placed in a mobile communication system base station transmitting and receiving a plurality of communication channels by a direct spread code division multiple access system and which ensures suppression of transmission peak power while transmitting, comprising:

a plurality of spread units spreading transmission data of a plurality of communication channels by different spreading codes to output spread signals;

a summing synthesizer summing up the spread signals output from the spread units to output a multiplexed spread signal;

a limiter performing an amplitude limitation of the multiplexed spread signal output from the summing synthesizer, the limiter comprising a read only memory which is addressed by the multiplexed spread signal to read data out of the read only memory to obtain an amplitude limited multiplexed spread signals;

a roll-off filter carrying out a spectrum shaping of the amplitude-limited multiplexed spread signal so that an occupied band width of the amplitude-limited multiplexed spread signal is included within a predetermined value:

a digital-to-analog converter converting a digital base band signal of the spectrum-shaped multiplexed spread signal into an analog base band signal;

a modulator converting the analog base band signal into a radio frequency signal;

a transmission power amplifier amplifying the radio frequency signal output from the modulator; and

a transmission antenna transmitting the amplified radio frequency signal output from the transmission power amplifier.

5,751,706

SYSTEM AND METHOD FOR ESTABLISHING A CALL TELECOMMUNICATIONS PATH

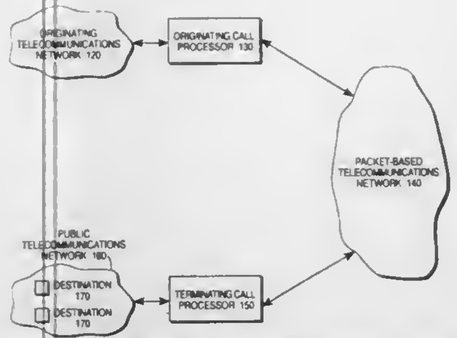
Mark S. Land, Merrick, N.Y.; Steven J. Kruy, Milford, N.H.; Andrew T. Perlman, Newton, Mass., and Edward A. Walvick, Livingston, N.J., assignors to Cignal Global Communications, Inc., Boston, Mass.

Filed Jun. 5, 1996, Ser. No. 659,677

Int. Cl.^{6} H04L *12/66;12/28;* **H04M** *15/00*

U.S. Cl. 370—352 **16 Claims**

1. A system for establishing a call telecommunications path, comprising:


ORIGINATING TELECOMMUNICATIONS NETWORK 120
ORIGINATING CALL PROCESSOR 130
PACKET-BASED TELECOMMUNICATIONS NETWORK 140
PUBLIC TELECOMMUNICATIONS NETWORK 160
DESTINATION 170
DESTINATION 170
TERMINATING CALL PROCESSOR 150

a terminating call processor, in communication with a packet-based telecommunications network and a public telecommunications network, having

means for receiving a destination code from the packet-based telecommunications network, and

means for converting the destination code to a destination address associated with a destination served by the public telecommunications network;

an originating call processor, in communication with an originating telecommunications network and the packet-based telecommunications network, having

means for receiving a predetermined code from the originating telecommunications network,

means, responsive to a preselected portion of the predetermined code, for identifying the terminating call processor,

means, responsive to the predetermined code, for determining the destination code, and

means for transmitting the destination code to the packet-based telecommunications network;

means, responsive to the destination address, for establishing a call telecommunications path, through the originating telecommunications network, the packet-based telecommunications network, and the public telecommunications network, to the destination; and

wherein characteristics of the public telecommunications network determine the format of the destination address.

5,751,707

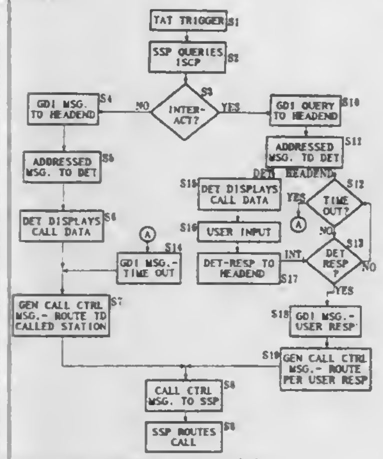
AIN INTERACTION THROUGH WIRELESS DIGITAL VIDEO NETWORK

Eric A. Voit, Silver Spring; Bruce Kostreski, Wheaton; Lance Liptak, Laytonsville, all of Md., and Kenneth DePaul, Wake Forest, N.C., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 563,400, Nov. 30, 1995, which is a continuation-in-part of Ser. No. 491,515, Jun. 19, 1995, Pat. No. 5,729,549. This application Nov. 30, 1995, Ser. No. 564,999

Int. Cl.^{6} H04J *3/12;* **H04N** *7/025*

U.S. Cl. 370—384 **40 Claims**



1. A communication system comprising:

local telephone communication links;

a trunk circuit;

at least two separately located central office switching systems interconnected via the trunk circuit for selectively providing switched call connections between at least two of said local communication links;

a service control point, separate from the central office switching systems, comprising a database storing call processing data associated with a plurality of the local communication links for control of call processing through one or more of the central office switching systems;

an interoffice signaling network, coupled to the central office switching systems and the service control point, said interoffice signaling network providing signaling data communication links separate from the local communication lines and the trunk circuit; and

a wireless network for distribution of broadband information and signaling information through a plurality of terminal devices, said wireless network comprising an interface point for communicating signaling data relating to a telephone call from the service control point through the wireless network to a selected one of the terminal devices.

5,751,708

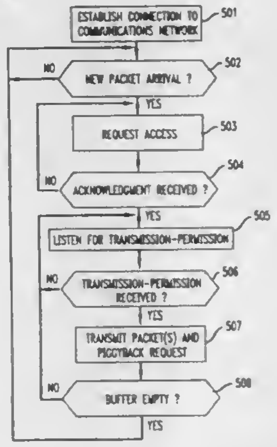
ACCESS METHOD FOR BROADBAND AND NARROWBAND NETWORKS

Kai Yin Eng, Middletown, and Mark John Karol, Fair Haven, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 25, 1995, Ser. No. 547,822

Int. Cl.^{6} H04J *3/24*

U.S. Cl. 370—389 **43 Claims**


ESTABLISH CONNECTION TO COMMUNICATIONS NETWORK
501
NO
NEW PACKET ARRIVAL ?
502
YES
REQUEST ACCESS
503
NO
ACKNOWLEDGMENT RECEIVED ?
504
YES
LISTEN FOR TRANSMISSION-PERMISSION
505
NO
TRANSMISSION-PERMISSION RECEIVED ?
506
YES
TRANSMIT PACKET(S) AND PIGGYBACK REQUEST
507
NO
BUFFER EMPTY ?
508
YES

1. A method for an end-user device to request access to a communications network, said method comprising the steps of:

receiving at an empty buffer of said end-user device at least one information packet;

transmitting from said end-user device to a scheduler of said communication network a stand-alone data symbol to request permission to transmit said at least one information packet; and

in response to said end-user device receiving permission from said scheduler to transmit said at least one information packet, including a piggybacked data symbol in said at least one information packet being transmitted, said piggybacked data symbol communicating to said scheduler a request to transmit one or more information packets remaining in said buffer of said end-user device.

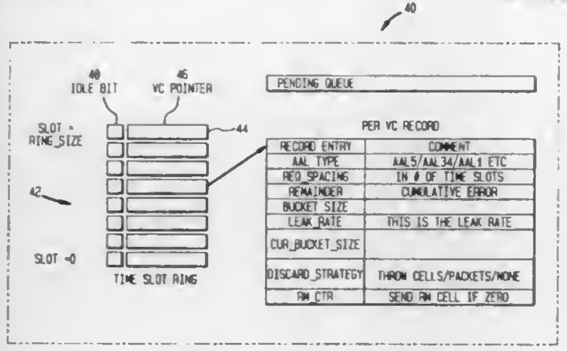
5,751,709
ADAPTIVE TIME SLOT SCHEDULING APPARATUS AND METHOD FOR END-POINTS IN AN ATM NETWORK

Sunder Raj Rathnavelu, Marlboro, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 28, 1995, Ser. No. 580,470

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—395 **26 Claims**



1. An apparatus for scheduling communications traffic from an end-point host over an ATM network, said apparatus comprising:

a time slot ring including an array of time slots, wherein each of said time slots includes a virtual channel identifier (VCID) of a virtual channel (VC) to be serviced;

a VC table including an array of VC descriptors, wherein said VCID stored in said time slot ring points to a VC descriptor in said VC table: and

processing means for scheduling said VCs in said time slots of said time slot ring, wherein said time slots are circularly processed in a continuous fashion enabling scheduled transmission of ATM cells over an output link in said network,

wherein said VC descriptor includes a remainder variable defined as the accumulated difference between required cell-to-cell spacing and actual cell-to-cell spacing for said VC, said remainder variable operable to ensure that said actual cell to cell spacing averages to said required cell-to-cell spacing.

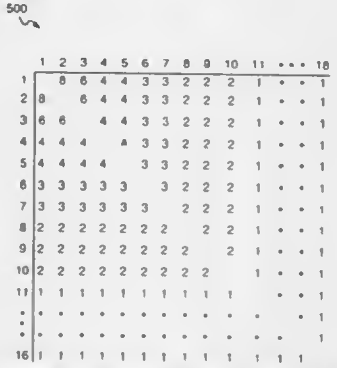
5,751,710
TECHNIQUE FOR CONNECTING CARDS OF A DISTRIBUTED NETWORK SWITCH

William R. Crowther, Lincoln, and William P. Brandt, Groton, both of Mass., assignors to Cisco Technology, Inc., San Jose, Calif.

Filed Jun. 11, 1996, Ser. No. 661,424

Int. Cl.^{6} H04L *12/00*

U.S. Cl. 370—423 **18 Claims**



	1	2	3	4	5	6	7	8	9	10	11	• • •		16
1		8	6	4	4	3	3	2	2	2	1	•	•	1
2	8		6	4	4	3	3	2	2	2	1	•	•	1
3	6	6		4	4	3	3	2	2	2	1	•	•	1
4	4	4	4		4	3	3	2	2	2	1	•	•	1
5	4	4	4	4		3	3	2	2	2	1	•	•	1
6	3	3	3	3	3		3	2	2	2	1	•	•	1
7	3	3	3	3	3	3		2	2	2	1	•	•	1
8	2	2	2	2	2	2	2		2	2	1	•	•	1
9	2	2	2	2	2	2	2	2		2	1	•	•	1
10	2	2	2	2	2	2	2	2	2		1	•	•	1
11	1	1	1	1	1	1	1	1	1	1		•	•	1
:	•	•	•	•	•	•	•	•	•	•	•		•	1
•	•	•	•	•	•	•	•	•	•	•	•	•		1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	

1. A connection arrangement for maximizing the rate at which data are transferred among cards of a distributed switch, the arrangement comprising:

a backplane of the switch; and

a plurality of cards coupled to the backplane, the cards including a source card, a destination card and an intermediate card interconnected in a manner such that the source card is directly and indirectly connected to the destination card, the latter indirect connection utilizing the intermediate card as a relay,

wherein data is transferred from the source card to the destination card over each of the direct and indirect connections to maximize the transfer rate efficiency between the source and destination cards.

5,751,711
DIGITAL INFORMATION PROCESSING DEVICE

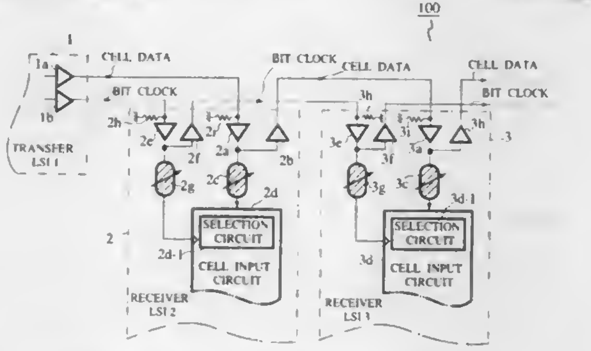
Kenji Sakaue, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1996, Ser. No. 621,579

Claims priority, application Japan, Mar. 27, 1995, 7-067821

Int. Cl.^{6} H04L *12/28*

U.S. Cl. 370—431 **14 Claims**



1. A digital information processing device, comprising:

a data transfer Large Scale Integration (LSI) capable of transferring data; and

a plurality of data receiver LSIs connected in a cascade connection to each other and capable of receiving said data having a same content transferred from said data transfer LSI, each of said plurality of data receiver LSIs comprising:

a data input buffer for receiving said data; and

a data output buffer connected to an output side of said data input buffer,

wherein an output side of said data output buffer in one of said plurality of data receiver LSIs is connected to an input side of said data input buffer in another one of said plurality data receiver LSIs in a following stage in order to form a data transfer path having a cascade connection, and

wherein said data transfer LSI transfers said data to said data input buffer in said data receiver LSI in a first stage in said plurality of data receiver LSIs, each of said plurality of data receiver LSIs further comprising a changeable delay means incorporated between said data input buffer and said data output buffer in each data receiver LSI through which said data is delayed by a time corresponding to its own stage number counted from said data transfer LSI in said data transfer path having said cascade connection, and thereby each of said plurality of receiver LSIs stores said data transferred from said data transfer LSI by delaying a storing operation by the corresponding delay time.

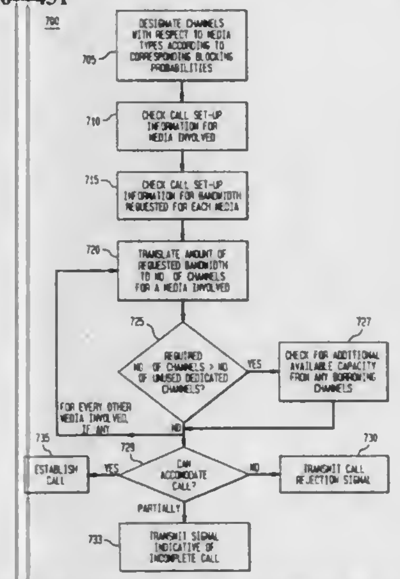
5,751,712
TECHNIQUE FOR EFFICIENTLY ALLOCATING BANDWIDTH TO MULTIMEDIA CALLS IN A COMMUNICATIONS SYSTEM

Charles Yeomans Farwell, Denver; Paul M. Gerhardt, Boulder, both of Colo.; Hassan Hagirahm, Long Branch, N.J.; David Martin Sueper, Brighton, and Terry L. Zrust, Thornton, both of Colo., assignors to Lucent Technologies, Murray Hill, N.J.

Filed Oct. 28, 1996, Ser. No. 736,699

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—431 **24 Claims**


700
705
DESIGNATE CHANNELS WITH RESPECT TO MEDIA TYPES ACCORDING TO CORRESPONDING BLOCKING PROBABILITIES
710
CHECK CALL SET-UP INFORMATION FOR MEDIA INVOLVED
715
CHECK CALL SET-UP INFORMATION FOR BANDWIDTH REQUESTED FOR EACH MEDIA
720
TRANSLATE AMOUNT OF REQUESTED BANDWIDTH TO NO. OF CHANNELS FOR A MEDIA INVOLVED
725
REQUIRED NO. OF CHANNELS > NO. OF UNUSED DEDICATED CHANNELS?
YES
727
CHECK FOR ADDITIONAL AVAILABLE CAPACITY FROM ANY BORROWING CHANNELS
FOR EVERY OTHER MEDIA INVOLVED, IF ANY
NO
735
ESTABLISH CALL
YES
729
CAN ACCOMMODATE CALL?
NO
730
TRANSMIT CALL REJECTION SIGNAL
PARTIALLY
733
TRANSMIT SIGNAL INDICATIVE OF INCOMPLETE CALL

8. A system for communicating information involving at least one of a plurality of media comprising:

means for allocating bandwidth for communications on each of said plurality of media, the amount of bandwidth allocated to a respective media being a function of at least a predetermined blocking probability associated with said respective media;

means for identifying each media which said information involves; and

means for allowing communications when the bandwidth allocated to at least one of the identified media is sufficient for communicating information associated therewith.

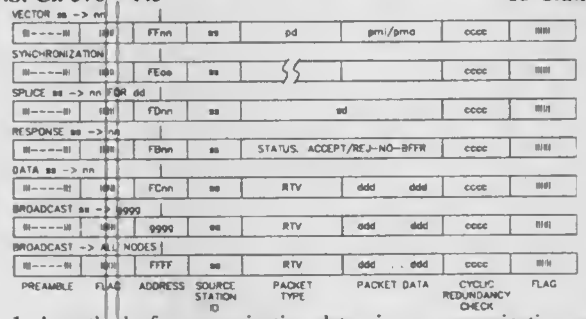
5,751,713
COMMUNICATING SYSTEM

Mark A. Lacas, Redondo Beach, and David J. Warman, Woodland Hills, both of Calif., assignors to MediaLink Technologies Corporation, Seattle, Wash.

Continuation of Ser. No. 810,002, Dec. 18, 1991, Pat. No. 5,245,604, which is a continuation of Ser. No. 488,728, Mar. 5, 1990, abandoned. This application Sep. 13, 1993, Ser. No. 119,384

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 370—445 **13 Claims**



1. A method of communicating data via a communication network to a plurality of stations connected to the communication network, the method comprising:

for each station connected to the communication network,

(a) storing a current identifier identifying the station and a previous identifier identifying a previous station from which the station last received a vector, the received vector indicating that the station is allowed to transmit data;

(b) computing a delay interval upon sensing that a vector has been transmitted to the station, the delay interval being computed as a function of the current identifier and the previous identifier; and

(c) upon expiration of the delay interval, causing the station to transmit a vector to a next station via the network, the transmitted vector indicating that the next station is allowed to transmit data.

5,751,714
TIME DIVISION MULTIPLEX FRAME SLOT ASSIGNMENT SYSTEM AND METHOD FOR INTERCONNECTING TELEPHONE STATIONS ON A TOKEN RING NETWORK

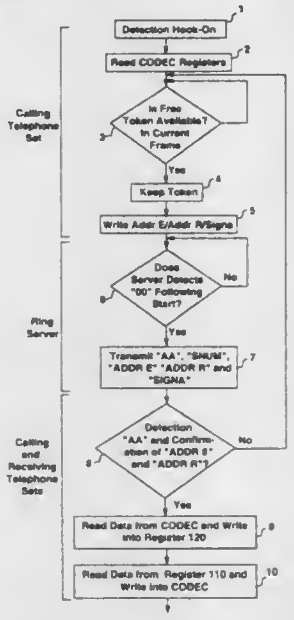
Andre Albano, La Colle Sur Loup; Rene Chuniaud, Cagnes Sur Mer; Jacques Fieschi, Saint Laurent du Var; Patrick Michel, La Gaude, and Jean-Francois Le Pennec, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 455,826, May 31, 1995, Pat. No. 5,592,484. This application Oct. 8, 1996, Ser. No. 727,333

Claims priority, application European Pat. Off., Jul. 28, 1994, 94480068

Int. Cl.^{6} H04J *3/12;* **H04L** *12/433*

U.S. Cl. 370—452 **5 Claims**


1
Detection Hook-On
2
Read CODEC Registers
Calling Telephone Set
3
Is Free Token Available? In Current Frame
Yes
4
Keep Token
5
Write Addr E/Addr R/Signa
Does Server Detects "00" Following Start?
No
6
Yes
Ring Server
7
Transmit "AA", "SNUM", "ADDR E" "ADDR R" and "SIGNA"
Calling and Receiving Telephone Sets
8
Detection "AA" and Confirmation of "ADDR E" and "ADDR R"?
No
Yes
9
Read Data from CODEC and Write into Register 120
10
Read Data from Register 110 and Write into CODEC

1. Telecommunication network having a number of telephone stations connected to a ring server station (**8**) by means of a token ring, characterized in that each of said telephone stations include:

means (**010**) for receiving a periodic Time Division Multiplex (TDM) frame, having a frame header for establishing communications between telephone stations and a plurality of information carrying slots via which pairs of telephone stations can exchange information, from said token ring; means (**60**) for transmitting said frame to said token ring, wherein said frame header comprising:

a first START field;

a second TOKEN field which can carry three distinctive values, a first value (FF) representative of the token being free, a second value (00) representative of the token being busy and a third value (AA) for identifying call establishment communications from said ring server station;

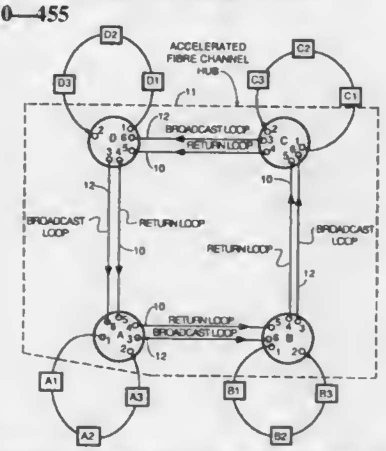
a third SNUM field representative of a slot number;

a fourth ADDR_E field representative of an identification address of a calling station;
a fifth ADDR_R field representative of the address of a called station;
a sixth SIGNA field representative of the signalling message to be transmitted to the server station; and
means (**40**, **260**, **270**, **190**) under control of a processor (**200**) for detecting the presence of said first value in said token field and for replacing said first value (FF) with said second value (00) in order to inform said ring server station (**8**) that a connection to another telephone station is requested.

5,751,715
ACCELERATOR FIBER CHANNEL HUB AND PROTOCOL
Kurt Chan, Roseville, and Alistair D. Black, Los Gatos, both of Calif., assignors to Gadzoox Microsystems, Inc., San Jose, Calif.

Filed Aug. 8, 1996, Ser. No. 695,290
Int. Cl.^{6} H04L *12/42*

U.S. Cl. 370—455 **4 Claims**



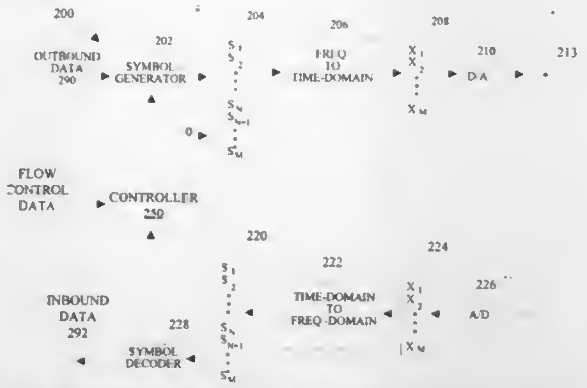
3. An apparatus for carrying out an accelerated Fibre Channel Arbitrated Loop protocol, comprising:
a plurality of subloops, each coupled to one or more computing machines called nodes;
a plurality of hub ports, each coupled to one said subloop and each containing a switching circuit and fill word generator which makes switching connections, generates fill words and manages one or more tokens in accordance with predetermined rules which implement said accelerated Fibre Channel protocol; and
one or more buses coupling said hub ports for carrying one or more tokens and one or more OPN, CLS and RRDY commands and data frames therebetween to implement the handshaking of said accelerated Fibre Channel protocol.

5,751,716
MULTI-CARRIER TRANSMISSION SYSTEM ADAPTED FOR PACKET DATA TRANSFER
Michael Tzannes, Newton, and Marcos Tzannes, Natick, both of Mass., assignors to Aware, Inc., Bedford, Mass.

Filed Jun. 19, 1996, Ser. No. 670,245
Int. Cl.^{6} H04J *3/22*

U.S. Cl. 370—468 **2 Claims**

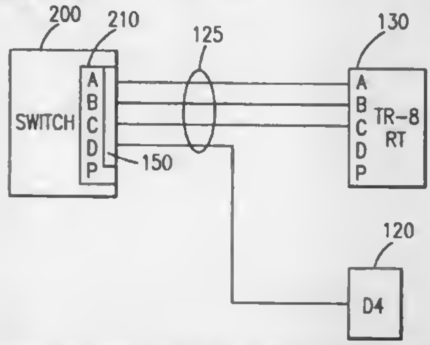
1. In a data communication link between a server site and a client site, said server site transferring data packets to said client site, each data packet causing an acknowledgment packet to be sent from said client site to said server site, the ratio of the average number of bits in said data packets to the average number of bits in said acknowledgment packets being where R is greater than 1, wherein said communication link comprises a multi-channel communication link having a plurality of data channels, each said data channel providing communication in one direction between said server site and said client site, each channel having a data carrying capacity characteristic of that data channel, the improvement comprising assigning data channels from said server to said client site and from said client site to said server site such that the ratio of the combined data carrying capacity of said data channels from said server site to said client site to the combined data carrying capacity of said data channels from said client site to said server site is as close to R as possible given the constraint that each data channel carries data exclusively from one of said sites to the other in only one direction.



5,751,717
SUBSCRIBER LINE INTERFACE IN A TELECOMMUNICATIONS EXCHANGE
Mangalore S. Babu, Garland; Jinen K. Nahar, Richardson; Gregory B. Rogers, Murphy, and Walter S. Downs, III, Plano, all of Tex., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed Mar. 8, 1996, Ser. No. 612,768
Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—466 **21 Claims**

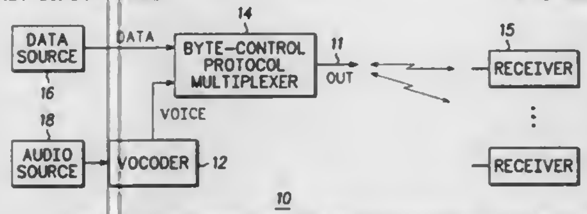


1. A system for connecting a plurality of telecommunications subscriber terminals to a telecommunications exchange, said system comprising:
a channel bank, said channel bank connected to said plurality of telecommunications subscriber terminals and communicating data using a first A–B bit pattern protocol and a D3/D4 time slot assignment scheme;
a TR-8 interface module communicating data using a second A–B bit pattern protocol and a D1D time slot assignment scheme;
a conversion module associated with said TR-8 interface module for:
converting A–B bit patterns for the communicated data between said first A–B bit pattern protocol of said channel bank and said second A–B bit pattern protocol of said TR-8 interface module;
converting time slot assignments for said communicated data between said D3/D4 time slot assignment scheme of said channel bank and said D1D time slot assignment scheme of said TR-8 interface module; and
a T-1 communications link connecting said channel bank with said conversion module.

5,751,718
SIMULTANEOUS TRANSFER OF VOICE AND DATA INFORMATION USING MULTI-RATE VOCODER AND BYTE CONTROL PROTOCOL
William Chunhung Yip, Scottsdale, and David T. Gustafson, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 20, 1996, Ser. No. 603,974
Int. Cl.^{6} H04J *3/22*

U.S. Cl. 370—468 **8 Claims**

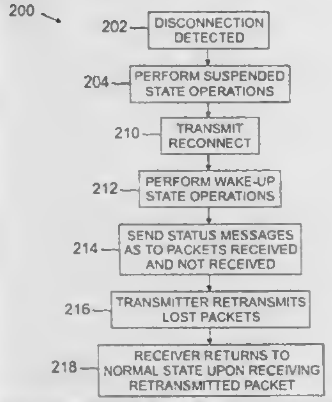


1. A system for simultaneously transferring both voice and data information over a single communications link, comprising:
a data source for providing data information;
a multi-rate vocoder for providing voice information at a plurality of different data rates thereby dynamically adjusting a data rate of said vocoder to meet bandwidth requirements of the system;
a multiplexer, coupled to said data source and to said vocoder, for providing both said voice information and said data information over the single communications link by inserting said voice information into a stream of said data information, said multilexer utilizing a byte-control protocol having the capability of generating a command byte for indicating that said stream of said data information is being interrupted; and
a vocoder identification byte for identifying one of said plurality of different data rates of said multi-rate vocoder.

5,751,719
METHOD AND SYSTEM FOR DATA TRANSFER IN THE PRESENCE OF DISCONNECTS
Kuo-Wei Herman Chen, Scotch Plains; Sanjoy Paul, Atlantic Highlands, and Krishan Kumar Sabnani, Westfield, all nf N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 30, 1995, Ser. No. 565,526
Int. Cl.^{6} H04L *1/16;* **G08C** *25/00*

U.S. Cl. 370—473 **18 Claims**

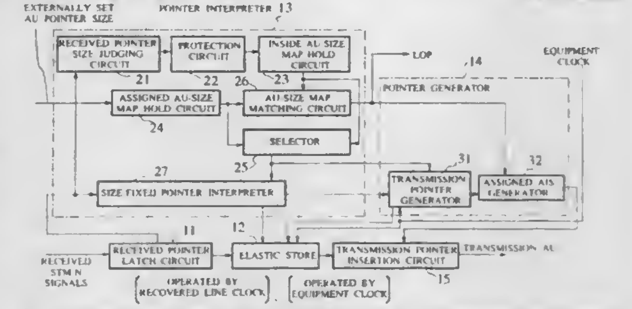

200
202
DISCONNECTION DETECTED
204
PERFORM SUSPENDED STATE OPERATIONS
210
TRANSMIT RECONNECT
212
PERFORM WAKE-UP STATE OPERATIONS
214
SEND STATUS MESSAGES AS TO PACKETS RECEIVED AND NOT RECEIVED
216
TRANSMITTER RETRANSMITS LOST PACKETS
218
RECEIVER RETURNS TO NORMAL STATE UPON RECEIVING RETRANSMITTED PACKET

1. A method for controlling data transfer operations comprising the steps of:
(a) initiating a data file transmission from a first communication device to a second communication device over a communication link, said data file comprising a plurality of sequentially numbered data packets, said transmission involving the sequential transmission of said data packets;
(b) storing data packets correctly received at a memory in said second communication device;
(c) maintaining a record in the second communication device memory of the sequence numbers of those data packets stored in the second communication device memory; and
(d) in response to receiving a signal indicative of a disconnect in the communication link, retaining in the second communication device memory those data packets stored in the second device memory before the disconnect occurred, such that the first communication device need transmit to the second communication device, once the communication link is re-established, only those data packets of the data file not previously stored in the second communication device memory.

5,751,720
POINTER PROCESSOR AND POINTER PROCESSING SCHEME FOR SDH/SONET TRANSMISSION SYSTEM
Yoshihiko Uematsu, Tokyo, and Shinji Matsuoka, Kanagawaken, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 27, 1996, Ser. No. 671,244
Claims priority, application Japan, Jun. 28, 1995, 7-162499
Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—503 **10 Claims**


EXTERNALLY SET AU POINTER SIZE
POINTER INTERPRETER 13
RECEIVED POINTER SIZE JUDGING CIRCUIT
PROTECTION CIRCUIT
INSIDE AU SIZE MAP HOLD CIRCUIT
LOP
14
EQUIPMENT CLOCK
21
22
26
23
POINTER GENERATOR
ASSIGNED AU-SIZE MAP HOLD CIRCUIT
AU-SIZE MAP MATCHING CIRCUIT
24
SELECTOR
25
31
32
27
SIZE FIXED POINTER INTERPRETER
TRANSMISSION POINTER GENERATOR
ASSIGNED AIS GENERATOR
11
12
RECEIVED STM N SIGNALS
RECEIVED POINTER LATCH CIRCUIT
ELASTIC STORE
TRANSMISSION POINTER INSERTION CIRCUIT
TRANSMISSION AU
15
OPERATED BY RECOVERED LINE CLOCK
OPERATED BY EQUIPMENT CLOCK

1. A pointer processor for an SDH/SONET transmission system, comprising:
a pointer latch circuit for detecting AU pointers from 3N pairs of H1 and H2 bytes contained in received STM-N signals;
an elastic store for extracting all VCs contained in the received STM-N signals synchronized with a recovered line clock and synchronizing the extracted VCs to an equipment clock;
a pointer interpreter for judging received pointer indications and values from AU pointers notified from the received pointer latch circuit and generating inside pointers according to the received pointer indications and values;
a pointer generator for generating transmission pointers from the inside pointers and a phase difference between the recovered line clock and the equipment clock; and
a transmission pointer insertion circuit for inserting the transmission pointers into AUs outputted from the elastic store and transmitting resulting transmission AUs,
wherein the pointer interpreter constantly monitors 3X pairs of H1 and H2 bytes to contain a prescribed maximum size pointer AU-4-Xc that can possibly be received by the pointer processor, where X is a natural number equal to or less than N, to obtain and hold an inside AU-size map indicating an occupation state of AU pointers on said 3X pairs of H1 and H2 bytes;
the pointer interpreter generates and holds an assigned AU-size map indicating an assigned state of AU pointers on said 3X pairs of H1 and H2 bytes according to externally set AU pointer sizes;
the pointer interpreter carries out size-fixed pointer interpretations in pointer sizes specified by the assigned AU-size map, for a part of map where the inside AU-size map coincides with the assigned AU-size map;
the pointer generator generates transmission pointers in forms of normal pointers or AISs (Alarm Indication Signals) in the pointer sizes specified by the assigned AU-size map according to the size-fixed pointer interpretations, for a part of map where the inside AU-size map coincides with the assigned AU-size map; and
the pointer generator generates AISs in the pointer sizes specified by the assigned AU-size map as transmission pointers, for

a part of map where the inside AU-size map does not coincide with the assigned AU-size map.

5,751,721

SYSTEM FOR ADJUSTING TIMING OF OUTPUT DATA IN RESPONSE TO POTENTIAL DISCONTINUITIES IN A TIMING SIGNAL

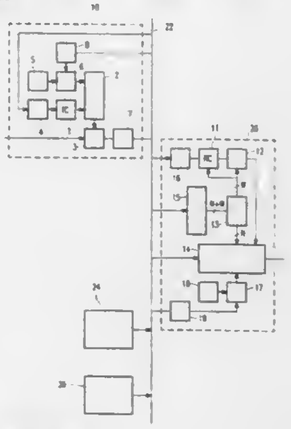
Rudolf H. J. Bloks, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1996, Ser. No. 623,648

Claims priority, application European Pat. Off., Mar. 29, 1995, 95200784

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—509 **12 Claims**



1. A system, comprising:
an input;
an output;
timing means for associating a time-stamp with data inputted at the input and for outputting said data at the output when a time indicated by the timing means is in a predetermined relation with the time-stamp;
potential discontinuity signalling means for signalling a potential discontinuity in a progression of the time indicated by the timing means; and
time correction means for correcting the predetermined relation when a potential discontinuity is signalled.

5,751,722

METHOD OF DISPLAYING A FROZEN IMAGE WHEN TRANSMISSION OF IMAGE INFORMATION IS SUSPENDED IN A MULTIMEDIA SYSTEM

Yoshito Maekawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

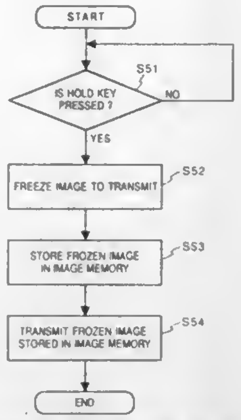
Filed Feb. 8, 1993, Ser. No. 14,818

Claims priority, application Japan, Feb. 10, 1992, 4-057544; May 6, 1992, 4-141012

Int. Cl.^{6} H04J *3/12*

U.S. Cl. 370—522 **7 Claims**

1. A method of suspending communication conducted by a multimedia communication system for communicating multimedia information including image information through a communication line, comprising:
a first step of selecting a communication suspension at a first multimedia communication apparatus when said first multimedia communication apparatus is communicating with a second multimedia communication apparatus;
a second step of suspending transmission of image information at said first multimedia communication apparatus after transmitting a suspension command from said first multimedia communication apparatus to said second multimedia communication apparatus when the communication suspension is selected at said first step; and
a third step in which, in response to the suspension command received from said first multimedia communication apparatus, said second multimedia communication apparatus freezes image information received from said first multimedia communication apparatus, stores the frozen image information into a memory of said second multimedia communication apparatus, and then displays the frozen image information out of the memory as a frozen image on a display of said second multimedia communication apparatus.


START
IS HOLD KEY PRESSED ?
S51
NO
YES
FREEZE IMAGE TO TRANSMIT
S52
STORE FROZEN IMAGE IN IMAGE MEMORY
S53
TRANSMIT FROZEN IMAGE STORED IN IMAGE MEMORY
S54
END

5,751,723

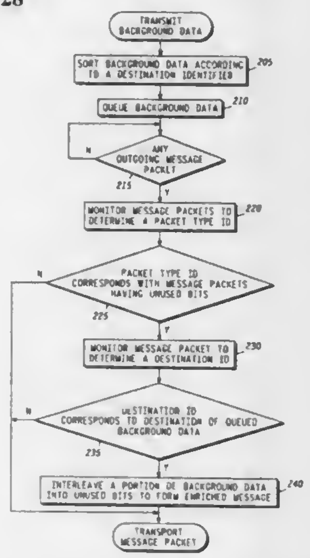
METHOD AND SYSTEM FOR OVERHEAD BANDWIDTH RECOVERY IN A PACKETIZED NETWORK

Dean Paul Vanden Heuvel; Brent Matthew McKay, both of Chandler, and James Morris Tooker, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1996, Ser. No. 673,888

Int. Cl.^{6} H04J *3/08;3/12*

U.S. Cl. 370—528 **20 Claims**


TRANSMIT BACKGROUND DATA
SORT BACKGROUND DATA ACCORDING TO A DESTINATION IDENTIFIER
205
QUEUE BACKGROUND DATA
210
N
ANY OUTGOING MESSAGE PACKET
215
Y
MONITOR MESSAGE PACKETS TO DETERMINE A PACKET TYPE ID
220
N
PACKET TYPE ID CORRESPONDS WITH MESSAGE PACKETS HAVING UNUSED BITS
225
Y
MONITOR MESSAGE PACKET TO DETERMINE A DESTINATION ID
230
N
DESTINATION ID CORRESPONDS TO DESTINATION OF QUEUED BACKGROUND DATA
235
Y
INTERLEAVE A PORTION OF BACKGROUND DATA INTO UNUSED BITS TO FORM ENRICHED MESSAGE
240
TRANSPORT MESSAGE PACKET

1. In a packet network, a method for conveying and recovering background data over said packet network, said packet network transporting a series of message packets wherein each of said message packets has a format denoted by one of a plurality of packet type identifiers, a portion of said packet type identifier denoting each of said message packets having at least one unused bit, said method comprising the steps of:
(a) monitoring, at a sending node, each of said message packets to determine said packet type identifier;
(b) when said packet type identifier corresponds with said message packet having at least one unused bit, interleaving a portion of said background data into said at least one unused bit to form an enriched message packet by retrieving an unused bit mask from a message packet unused bit catalog as indexed by said packet type identifier;
(c) transporting said enriched message packet to a receiving node;
(d) monitoring, at said receiving node, for said enriched message packet to determine said packet type identifier;
(e) when said packet type identifier corresponds with said message packet having at least one unused bit, extracting said portion of said background data from said at least one unused bit of said enriched message packet; and
(f) repeating steps a–e for subsequent portions of said background data.

5,751,724

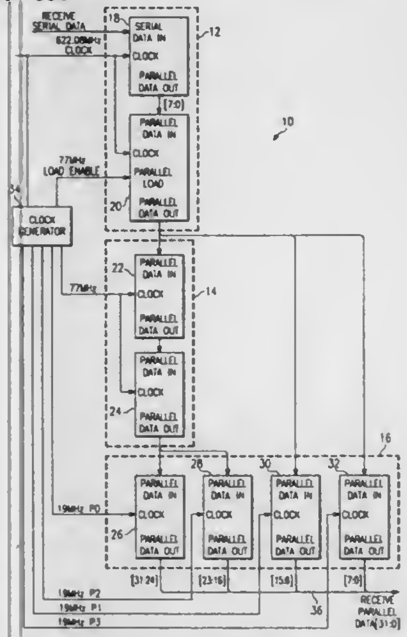
DEMULTIPLEXER FOR A MULTI-BITLINE BUS

Paul M. Elliott, Jenner, Calif., assignor to DSC Communications Corporation, Plano, Tex.

Filed Feb. 23, 1996, Ser. No. 606,054

Int. Cl.^{6} H04J *3/04*

U.S. Cl. 370—536 **16 Claims**



1. A demultiplexer for a multi-bitline bus, comprising:
an input stage operable to receive a serial data stream partitioned into multi-bit sections, each multi-bit section having a first number of bits, the input stage operable to generate a first parallel output having a second number of bitlines less than the first number of bits;
an intermediary stage operable to receive the first parallel output and generate a second parallel output having the second number of bitlines, the second parallel output representing a different portion of the multi-bit section than the first parallel output which was generated by the input stage and is composed of a subsequent portion of the multi-bit section;
an output stage operable to receive the first parallel output from the input stage and the second parallel output from the intermediary stage, the output stage operable to generate an output bus representing an entire multi-bit section and having a same number of bitlines as the first number of bits, the output stage operable to place the first parallel output onto the output bus at an earlier instance in time than when placing the second parallel output onto the output bus.

5,751,725

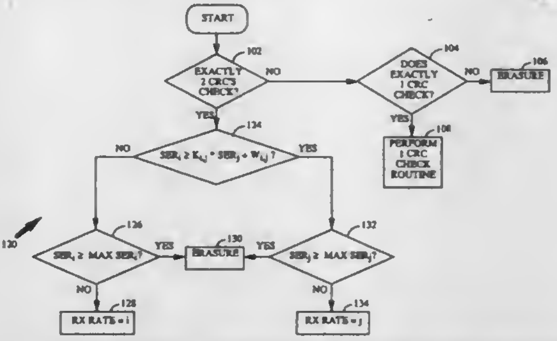
METHOD AND APPARATUS FOR DETERMINING THE RATE OF RECEIVED DATA IN A VARIABLE RATE COMMUNICATION SYSTEM

Tao Chen, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Filed Oct. 18, 1996, Ser. No. 730,863

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—5.5 **52 Claims**



1. In a communication system having a transmitter that transmits to a receiver, said transmitter transmitting each of a plurality of frames at a current rate, wherein said current rate corresponds to one of a plurality of rates, a method at said receiver for determining said current rate of a current frame comprising the steps of:
generating a plurality of error check values each based on whether said current frame has one of said plurality of rates, wherein only a first check value of a selected rate favorably checks, and wherein said selected rate is one of said plurality of rates;
generating a plurality of error rate codes each based on whether said current frame has one of said plurality of rates, wherein a selected error rate code corresponds to said selected rate;
generating a plurality of decoding codes each based on whether said current frame has one of said plurality of rates, wherein a selected decoding code corresponds to said selected rate;
determining if said selected rate of said selected error rate code corresponds to a predetermined rate;
if said selected rate corresponds to said predetermined rate, comparing said selected decoding code to a selected value;
if said selected rate does not correspond to said predetermined rate, comparing said selected error rate code to a first value based on a predetermined operational relationship;
if said selected decoding code corresponds to said selected value, comparing said selected error rate code to a second value based on said predetermined operational relationship;
if said selected decoding code does not correspond to said selected value, comparing said selected error rate code to a third value based on said predetermined operational relationship; and
determining that said current rate of said current frame is said selected rate if said selected error rate code has said predetermined operational relationship to said first, second or third value.

5,751,726

REPRESENTATIVE VALUE SELECTOR AND AN EMBODYING METHOD THEREFOR

You Taeq Kim, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries, Co. Ltd., Kyoungki, Rep. of Korea

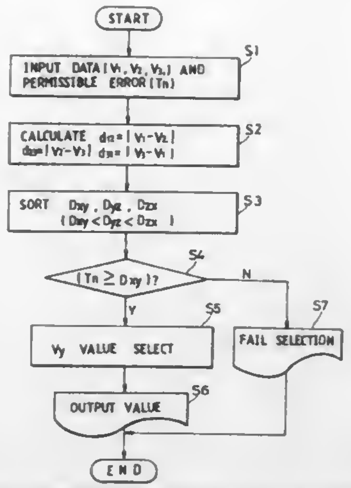
Filed Aug. 9, 1995, Ser. No. 513,060

Claims priority, application Rep. of Korea, Dec. 31, 1994, 94-40426

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—6 **6 Claims**

1. A representative value selector for selecting one representative value among various calculated results based on diverse interpretations with respect to identical events or same information, comprising:



input means for supplying data values by an oscillator, sensor or keyboard;

an operational device programmed for selecting the representative value among said data values received from said input means; wherein said operational device is programmed to receive a permissible error range and said data values from said input means for calculating results of absolute values of differences in said respective input data values, said device further being programmed to sort the results of the calculations in ascending order, and when only one result belongs to said permissible error range among the sorted results, to output the data value corresponding to the second order of the result, and to select no representative value output when no results belong to said permissible error range;

output means for outputting said representative value operated to be selected in said operational device; and

a memory for storing said data values and the result of the operation.

5,/51,727

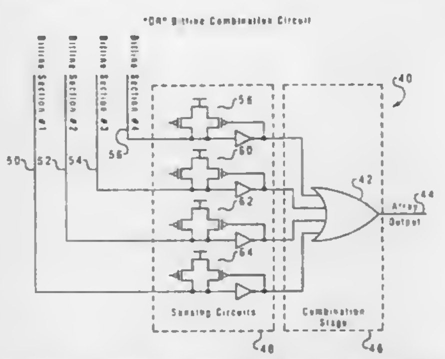
DYNAMIC LATCH CIRCUIT FOR UTILIZATION WITH HIGH-SPEED MEMORY ARRAYS

David James Martens, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1997, Ser. No. 821,155

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 371—21.1 **6 Claims**



1. A dynamic scannable latch circuit for high-speed memory arrays utilized in high-performance integrated circuit devices, wherein said high-speed memory arrays include data-bearing bitlines, comprising:

a plurality of scannable latch circuits for serially reading data from high-speed memory arrays during memory-testing cycles wherein at least one of said plurality of scannable latch circuits provides a scan output to a scan input of a second scannable latch circuit; and

a plurality of sensing and combination circuits for sensing the presence of said data-bearing bitlines and for combining said data-bearing bitlines into a memory array output wherein at least one sensing and combination circuit among said plurality of sensing and combination circuits is coupled to each scannable latch circuit among said plurality of scannable latch circuits.

5,751,728

SEMICONDUCTOR MEMORY IC TESTING DEVICE

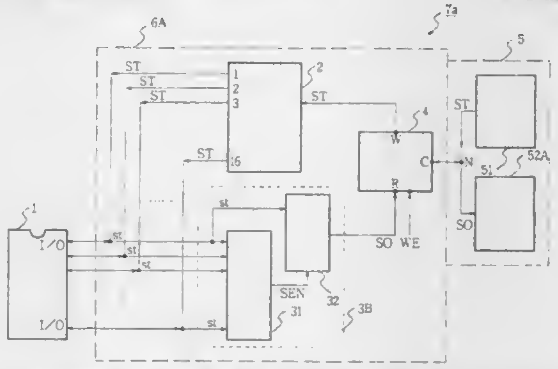
Naoki Katanosaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 517,661, Aug. 22, 1995, abandoned, which is a continuation of Ser. No. 974,520, Nov. 12, 1992, abandoned. This application Apr. 28, 1997, Ser. No. 837,953

Claims priority, application Japan, Nov. 12, 1991, 3-295321

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 371—21.2 **4 Claims**



1. An adapter for coupling a memory testing device and at least one semiconductor memory IC for testing said semiconductor memory IC, said semiconductor memory IC having a plurality of input/output pins through which a plurality of write data and a plurality of read data are transferred, wherein said adapter is external to said semiconductor memory IC and comprises:

an input/output terminal coupled to said memory testing device;

a plurality of test terminals coupled respectively to said input/output pins of said at least one semiconductor memory IC;

a branching circuit having a first input node supplied operatively with a test data and a plurality of output nodes coupled respectively to said test terminals, said branching circuit responding to said test data and outputting a plurality of first data respectively at said first output nodes in parallel to each other, said plurality of first data being thereby written into said at least one semiconductor memory IC through respective ones of said input/output pins as said plurality of write data;

a logical operation circuit having a second output node and a plurality of second input nodes coupled respectively to said test terminals to receive a plurality of second data which are read out from said at least one semiconductor memory IC and appear respectively at said input/output pins in parallel to each other as said plurality of read data, said logical operation circuit performing a logical operation on said plurality of second data and outputting an output data indicative of a result of said logical operation at said second output node; and

a changeover circuit having a write node, a read node and an input/output node, said write node being connected to said first input node of said branch circuit, said read node being connected to said second output node of said logical operation circuit, said input/output node being connected to said input/output terminal, said changeover circuit receiving at said write node a third data from said memory testing device through said input/output terminal to transfer said third data to said first input node of said branching circuit as said test data and receiving at said read node said output data from said logical operation circuit through said second output node to transfer said output data to said input/output terminal through said input/output node.

5,751,729

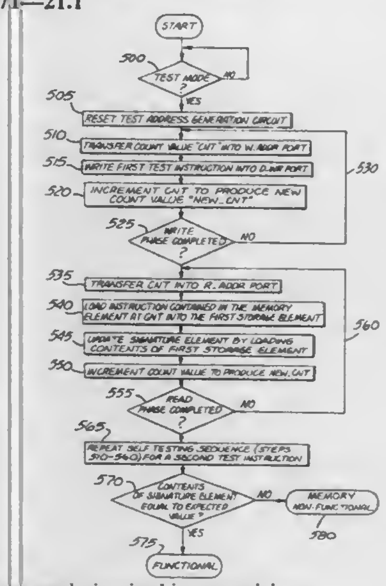
METHOD AND APPARATUS FOR EFFICIENT SELF TESTING OF ON-CHIP MEMORY

Gunes Aybay, Burlingame, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Division of Ser. No. 674,354, Jul. 1, 1996, Pat. No. 5,677,913. This application May 8, 1997, Ser. No. 853,314

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 371—21.1 **7 Claims**


START
500
TEST MODE ?
NO
YES
505
RESET TEST ADDRESS GENERATION CIRCUIT
510
TRANSFER COUNT VALUE "CNT" INTO W. ADDR PORT
515
WRITE FIRST TEST INSTRUCTION INTO D.WR PORT
520
INCREMENT CNT TO PRODUCE NEW COUNT VALUE "NEW_CNT"
530
525
WRITE PHASE COMPLETED ?
NO
535
TRANSFER CNT INTO R. ADDR PORT
540
LOAD INSTRUCTION CONTAINED IN THE MEMORY ELEMENT AT CNT INTO THE FIRST STORAGE ELEMENT
545
UPDATE SIGNATURE ELEMENT BY LOADING CONTENTS OF FIRST STORAGE ELEMENT
560
550
INCREMENT COUNT VALUE TO PRODUCE NEW_CNT
555
READ PHASE COMPLETED ?
NO
565
REPEAT SELF TESTING SEQUENCE (STEPS 510-560) FOR A SECOND TEST INSTRUCTION
570
CONTENTS OF SIGNATURE ELEMENT EQUAL TO EXPECTED VALUE ?
NO
MEMORY NON-FUNCTIONAL
580
YES
575
FUNCTIONAL

1. An integrated circuit chip comprising:

a package; and

an integrated circuit encapsulated within said package, said integrated circuit configured to be controlled by at least one microcode sequencer, each of said at least one microcode sequencer being capable of self-testing its internal memory.

5,751,730

ENCODING/INTERLEAVING METHOD AND CORRESPONDING DEINTERLEAVING/DECODING METHOD

Christophe Mourot, Asnieres, France, assignor to Alcatel N.V., Rijswijk, Netherlands

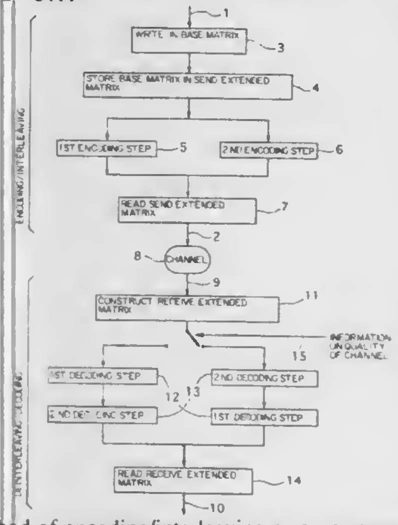
PCT No. PCT/FR95/00283, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/25386, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 10, 1995, Ser. No. 716,151

Claims priority, application France, Mar. 15, 1994, 94 02988

Int. Cl.⁶ H03M *13/22;* H04L *1/20*

U.S. Cl. 371—37.4 **12 Claims**


1
WRITE IN BASE MATRIX
3
STORE BASE MATRIX IN SEND EXTENDED MATRIX
4
1ST ENCODING STEP
5
2ND ENCODING STEP
6
READ SEND EXTENDED MATRIX
7
2
8
CHANNEL
9
CONSTRUCT RECEIVE EXTENDED MATRIX
11
INFORMATION ON QUALITY OF CHANNEL
15
1ST DECODING STEP
2ND DECODING STEP
12
13
2ND DECODING STEP
1ST DECODING STEP
READ RECEIVE EXTENDED MATRIX
14
10

1. A method of encoding/interleaving a source sequence of data symbols to be transmitted to produce at least two bursts to be sent over a transmission channel and made up of said data symbols to be transmitted and redundancy symbols, which method comprises the steps of:

writing data symbols to be transmitted of said source sequence row by row into a base matrix,

storing said base matrix in a first quadrant of a send extended matrix,

in a first encoding step on columns of said base matrix, generating first redundancy symbols which are stored in a second quadrant of said send extended matrix and constitute additional rows of said base matrix,

in a second encoding step on rows of said base matrix, generating second redundancy symbols which are stored in a third quadrant of said send extended matrix and constitute additional columns of said base matrix,

reading said send extended matrix row by row (or column by column), each row or column of said send extended matrix constituting a burst to be sent.

5,751,731

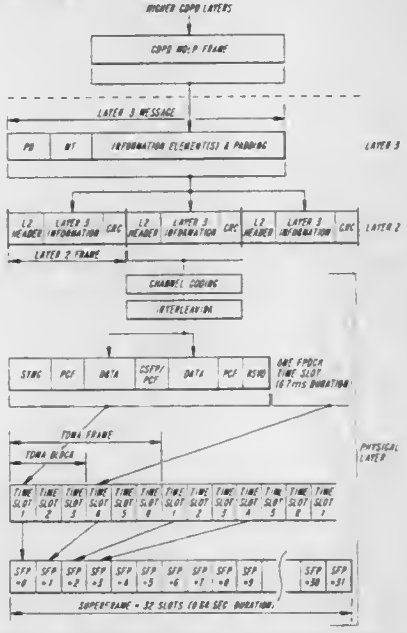
SIMPLIFYING DECODING OF CODEWORDS IN A WIRELESS COMMUNICATION SYSTEM

Alex Krister Raith, Durham, N.C., assignor to Telefonaktiebolaget LM Ericsson, Sweden

Filed Oct. 18, 1995, Ser. No. 544,840

Int. Cl.⁶ H03M *13/00*

U.S. Cl. 371—37.01 **14 Claims**



1. A method for decoding fields of information in a wireless communication system, comprising the steps of:

(a) accessing a codeword of a field of data; and

(b) reducing the length of said codeword to be decoded based on known information in the codeword.

5,751,732

POLYNOMIAL EVALUATOR FOR USE IN A REED-SOLOMON DECODER

Yong-Hee Im, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

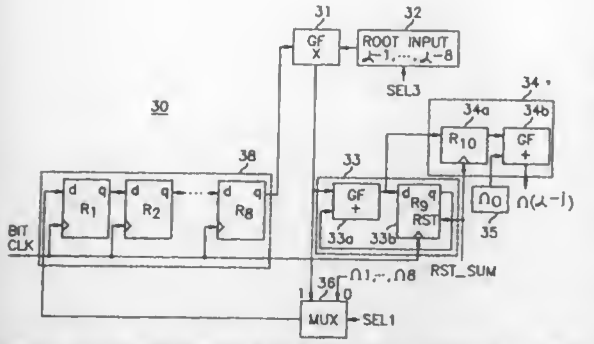
Filed Nov. 25, 1996, Ser. No. 755,581

Claims priority, application Rep. of Korea, Feb. 28, 1996, 95-5129; Feb. 29, 1996, 96-5443; May 9, 1996, 96-15268

Int. Cl.⁶ H03H *13/00*

U.S. Cl. 371—37.11 **10 Claims**

1. An apparatus, for use in a Reed-Solomon decoder, which evaluates a polynomial P(X) iteratively, by substituting α^{-j} for X in a jth iteration, to thereby provide a jth evaluation result $P(\alpha^{-j})$,



wherein j is an integer ranging from 0 to $N-1$, N being a predetermined positive integer, and α is a primitive element in a finite field $GF(2^m)$, said apparatus comprising:

a memory block having T memory means, T being a predefined positive integer;

input means for sequentially providing a group of T elements in the finite field $GF(2^m)$;

means for sequentially multiplying the contents of each memory means with each element of the group provided from the input means, to thereby provide T evaluating terms, wherein the contents of ith memory means are multiplied with an ith element, to thereby provide an ith evaluating term, i being 1 to T;

selection means for providing 1st to Tth coefficients of the polynomial P(X) or the T evaluating terms, to the memory block; and

means for determining a sum of the T evaluating terms.

5,751,733

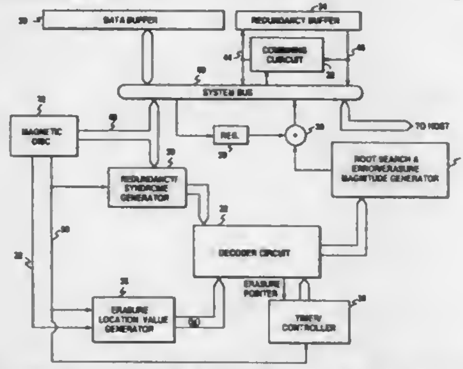
INTERLEAVED REDUNDANCY SECTOR FOR CORRECTING AN UNRECOVERABLE SECTOR IN A DISC STORAGE DEVICE

Neal Glover, Broomfield, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 16, 1996, Ser. No. 710,293

Int. Cl.^{6} G11B *20/18*

U.S. Cl. 371—40.3 **11 Claims**



1. An error correction apparatus for use in a disc storage device, wherein the disc comprises a plurality of data tracks recorded thereon, each track comprises a plurality of data sectors and at least one redundancy sector, and each sector comprises sector data symbols and sector redundancy symbols, the error correction apparatus comprising:

(a) a sector level error correction system for detecting and correcting errors in the sector data using the sector redundancy symbols, wherein:

  (i) a sector is divided into N interleaved codewords, wherein $N>1$; and

  (ii) an erasure pointer is generated corresponding to an uncorrectable interleaved codeword; and

(b) a track level error correction system for correcting an uncorrectable sector using the redundancy sector and the erasure pointer generated by the sector level error correction system.

5,751,734

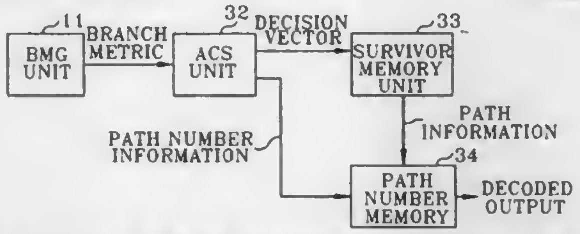
DECODING METHOD AND APPARATUS USING TRACE DELETION FOR VITERBI ALGORITHM

Hyung-Jin Choi; Sung-Bae Cho; Suk-Jin Jung, and Hyung-Kil Lee, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Nov. 4, 1996, Ser. No. 742,663

Int. Cl.^{6} G06F *11/10*

U.S. Cl. 371—43.4 **5 Claims**



4. A decoding apparatus for decoding input data using a Viterbi algorithm and a trellis diagram, said decoding apparatus comprising:

first means for determining, for each state of said trellis diagram at each time unit, a survivor path based on said input data, and for generating decision vectors and path number information when said survivor path is determined, said path number information respectively corresponding to survivor paths which are connected to a state in a next time unit;

second means for storing said decision vectors and for outputting path information representing each survivor path; and

third means for storing said path number information output from said first means and said path information output from said second means, and for deleting path information, from said path information stored in said second means, corresponding to said path number information from said first means when said path number information does not correspond to a branch path which overlaps another survivor path having a branch path connected to another state of said trellis diagram, and for generating decoded data corresponding to said input data based on a final remaining survivor path.

5,751,735

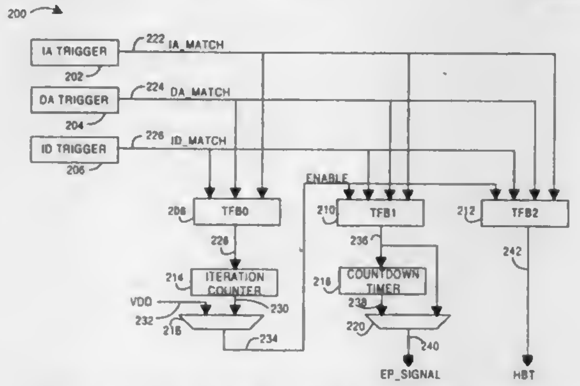
INTEGRATED DEBUG TRIGGER METHOD AND APPARATUS FOR AN INTEGRATED CIRCUIT

Paul G. Tobin, Fort Collins; Hosein Naaseh-Shahry, Windsor, and Stephen R. Undy, Fort Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1996, Ser. No. 749,188

Int. Cl.^{6} G06F *11/27*

U.S. Cl. 371—22.5 **17 Claims**



1. A debug trigger apparatus for use in debugging functional and electrical failures of an integrated circuit, comprising:

a plurality of programmable trigger registers disposed internal and integral to said integrated circuit, each trigger register configured to receive a plurality of integrated circuit signals, to compare each of said plurality of integrated circuit signals of said integrated circuit to a programmed trigger condition, and to produce a trigger match signal when said plurality of integrated circuit signals match said programmed trigger condition;

a plurality of programmable trigger function blocks disposed internal and integral to said integrated circuit, each trigger function block coupled to receive a plurality of said trigger match signals and performing a programmed boolean minterm function on the monitored trigger match signals to produce a trigger capture signal; and

a programmable timer disposed internal and integral to said integrated circuit enabled by said trigger capture signal of a corresponding one of said programmable trigger function blocks to generate a timer enable signai upon completion of a programmed time delay.

5,751,736

TESTABLE ELECTRONIC SYSTEM

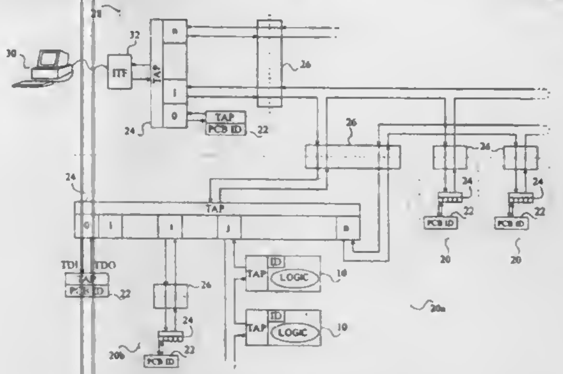
Patrice Deroux-Dauphin, Saint Egreve, and Christian Francois, Civrieux, both of France, assignors to Temento Systems

Filed Aug. 9, 1996, Ser. No. 694,595

Claims priority, application France, Aug. 11, 1995, 95 09894

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—22.31 **8 Claims**



1. A testable electronic system including testable elements having standardized test interfaces for organizing the elements in chains which behave like shift registers to ensure the exchange of test information, each element being either a component (**10**) including an identifier characterizing the behavior of the test of the component and accessible by the test interface of the component, or a switch (**24**) for organizing a chain in sub-chains which can be individually selected through channels of the switch, the system including master switches (**24**) which define respective sub-sets (**20**) of elements, a specific channel of each master switch being reserved to access an identifier (**22**) characterizing the test organization of the associated sub-set.

5,751,737

BOUNDARY SCAN TESTING DEVICE

Joseph M. Lagrotta, Fort Collins; James L. Hutchinson, Boulder; Daniel G. Bihn; Kenneth P. Parker, both of Fort Collins; David J. Rustici, Loveland, all of Colo.; Keisuke Takaura, Ikomashi, Japan; Muneo Kawabata, Akaiwagun, Japan; Hiroyuki Ohki, Okayamaken, Japan, and Takanori Uematsu, Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

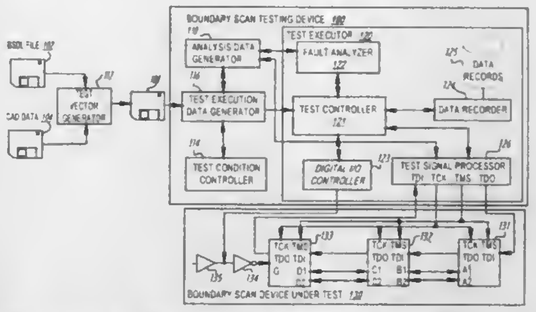
Filed Feb. 26, 1997, Ser. No. 805,553

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—22.32 **3 Claims**

1. A boundary scan testing device comprising:

a test execution data generator which uses boundary scan vectors, which correspond to a boundary scan device under test and which are produced by a boundary scan test vector generator separate from said boundary scan testing device, to produce execution data based on said boundary scan test vectors and on test conditions;



a test condition controller which sets said test conditions;

a test executor which executes a boundary scan test based on said execution data; and

an analysis data generator which produces analysis data comprising circuit information for said boundary scan device under test and expected value data from comment portions of said boundary scan vectors which, while being added to said boundary scan vectors, are not used in the production of said execution data, wherein said analysis data allows said boundary scan testing device to analyze test results of said boundary scan test.

5,751,738

PATTERN GENERATOR CICUIT FOR SEMICONDUCTOR TEST SYSTERM

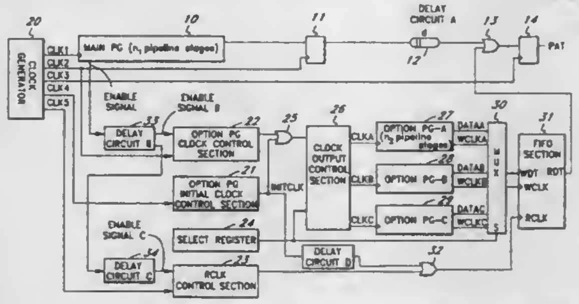
Michio Shimura, Hanyu, Japan, assignor to Advantest Corp., Tokyo, Japan

Filed Jul. 8, 1996, Ser. No. 677,016

Claims priority, application Japan, Jul. 11, 1995, 7-198135

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—27.7 **5 Claims**



1. A pattern generator circuit for a semiconductor test system, comprising:

a clock generator (**20**), which generates a first clock (CLK1), a second clock (CLK2), and a third clock (CLK3);

a main PG (**10**) having n_1 pipeline stages, which is clocked by CLK1;

a first register (**11**), into which an output of said main PG (**10**) is clocked by CLK2;

a delay circuit A (**12**), which delays an output signal of said first register (**11**);

a first logic circuit (**13**), which takes the logical OR of an output of said delay circuit A (**12**) and the output of an option PG;

a second register (**14**), which has an output of said first logic circuit (**13**) clocked into it by CLK3, and generates a PAT signal;

an option PG initial clock control section (**21**) that generates an initial clock signal (INITCLK) that is synchronous with a fourth clock (CLK4) from said clock generator (**20**), and initializes said option PG and a FIFO (first in first out) section (**31**);

an option PG clock control section (**22**) that inputs an enable signal generated by said main PG (**10**), and generates a clock output signal that is synchronous with CLK2;

a read clock (RCLK) control section (**23**) that inputs an enable signal generated by said main PG (**10**) and generates a clock output signal that is synchronous with a fifth clock (CLK5) output from said clock generator (**20**) synchronous with CLK3;

an option PG (**27**) that inputs a signal obtained by taking, in a second logic circuit (**25**), the logical OR of a clock output signal of said option PG clock control section (**22**) and said INITCLK signal of option PG initial clock control section (**21**), and outputs pattern data and clock signals; and

a FIFO section (**31**), that receives outputs of said option PG (**27**) as its write data (WDT) and write clock (WCLK) inputs, and, in a third logic circuit (**32**), takes the logical OR of said INITCLK output signal of said option PG initial clock control section (**21**) that has been delayed in a delay circuit D (**35**) and an output of said RCLK control section (**23**), and inputs the resulting output as its read clock (RCLK), and outputs a signal to said first logic circuit (**13**) as an option PG output signal.

5,751,739

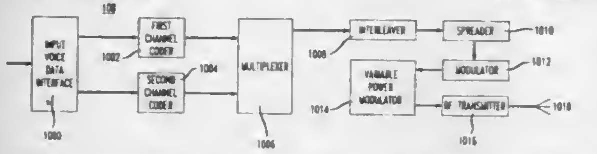
METHODS OF AND DEVICES FOR ENHANCING COMMUNICATIONS THAT USE SPREAD SPECTRUM TECHNOLOGY

Nambirajan Seshadri, and Carl-Erik Wilhelm Sundberg, both of Chatham, N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Apr. 29, 1994, Ser. No. 236,744

Int. Cl.⁶ H03M *13/00*

U.S. Cl. 371—30 **44 Claims**



15. In an apparatus for processing a signal, the apparatus including means for applying a spread spectrum encoding process to the signal, the improvement comprising:

means for applying a first error protection process to at least one more significant portion of the signal and a second error protection process to at least one less significant portion of the signal wherein the first error protection process provides a greater amount of error protection than the second error protection process, the means for applying comprising:

(a) means for applying a variable time modulator; and

(b) means for applying a variable rate coder.

5,751,740

ERROR DETECTION AND CORRECTION SYSTEM FOR USE WITH ADDRESS TRANSLATION MEMORY CONTROLLER

Walter A. Helbig, Sr., Medford Lakes, N.J., assignor to Gorca Memory Systems, Cherry Hill, N.J.

Filed Dec. 14, 1995, Ser. No. 575,922

Int. Cl.⁶ H03M *13/00;* **G06F** *11/10*

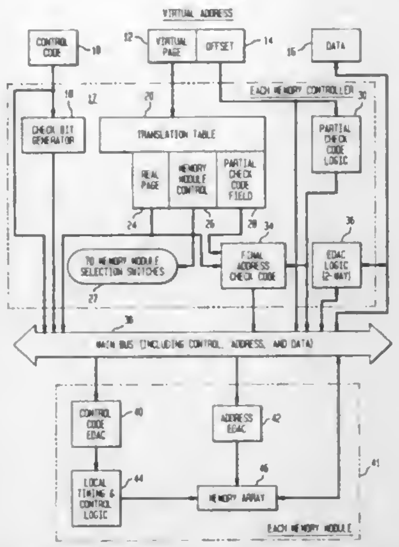
U.S. Cl. 371—37.1 **32 Claims**

1. A method for correcting errors in the transmission of information bit s sa id method comprising;

arranging said information bits into subsets such that each information bit is included in two subsets, to form a pair of subsets, and no two information bits are contained within the same pair of subsets, and wherein the number of subsets is other than a prime number;

generating a check bit for each subset of said information bits wherein the number of check bits is other than a prime number;

transmitting said check bits and said information bits as a plurality of blocks of bits, each of said plurality of blocks consisting of a group of information bits and no more than one check bit which is not associated with any information bit in its block;



receiving said plurality of blocks and generating the exclusive OR of said bits of each of said plurality of blocks to form a syndrome pattern indicative of whether there are one or more errors in only a single block of said plurality of blocks;

producing responsive to said syndrome pattern, a plurality of error indicator outputs indicative of whether there is an error in one or more of said information bits; and

producing responsive to said plurality of error indicator outputs and to said blocks of bits, output information bits which are the same value as the corresponding transmitted information bits.

5,751,741

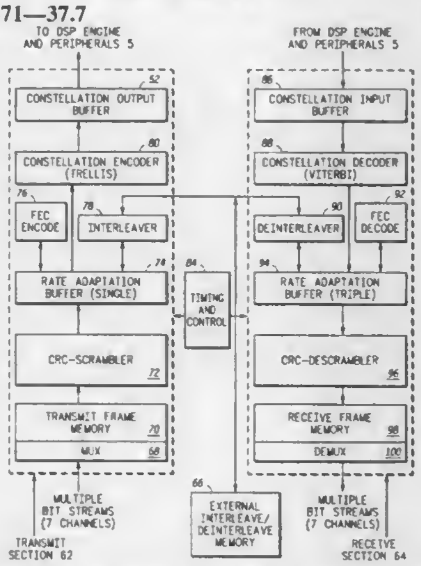
RATE-ADAPTED COMMUNICATION SYSTEM AND METHOD FOR EFFICIENT BUFFER UTILIZATION THEREOF

Raymond Paul Voith; Sujit Sudhaman, and George Hoekstra, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1996, Ser. No. 754,768

Int. Cl.⁶ H03M *13/22*

U.S. Cl. 371—37.7 **18 Claims**


TO DSP ENGINE AND PERIPHERALS 5
FROM DSP ENGINE AND PERIPHERALS 5
CONSTELLATION OUTPUT BUFFER
CONSTELLATION ENCODER (TRELLIS)
FEC ENCODE
INTERLEAVER
RATE ADAPTATION BUFFER (SINGLE)
CRC-SCRAMBLER
TRANSMIT FRAME MEMORY
MUX
TIMING AND CONTROL
CONSTELLATION INPUT BUFFER
CONSTELLATION DECODER (VITERBI)
DEINTERLEAVER
FEC DECODE
RATE ADAPTATION BUFFER (TRIPLE)
CRC-DESCRAMBLER
RECEIVE FRAME MEMORY
DEMUX
MULTIPLE BIT STREAMS (7 CHANNELS)
EXTERNAL INTERLEAVE/ DEINTERLEAVE MEMORY
MULTIPLE BIT STREAMS (7 CHANNELS)
TRANSMIT SECTION 62
RECEIVE SECTION 64
52
80
76
78
74
84
72
70
68
66
86
88
90
92
94
96
98
100

5. A method for transmitting a frame of data in a communication system, the method comprising the steps of:

receiving the frame of data, at a first rate, in a frame memory;

performing at least two operations on the frame of data to produce a modified frame of data, and moving the modified frame of data to a rate adaptation buffer after each of the at least two operations; and

providing the modified frame of data to an output buffer, the output buffer providing a buffered frame of data at a second rate different from the first rate.

5,751,742

SERIALLY ACCESSIBLE MEMORY MEANS WITH HIGH ERROR CORRECTABILITY

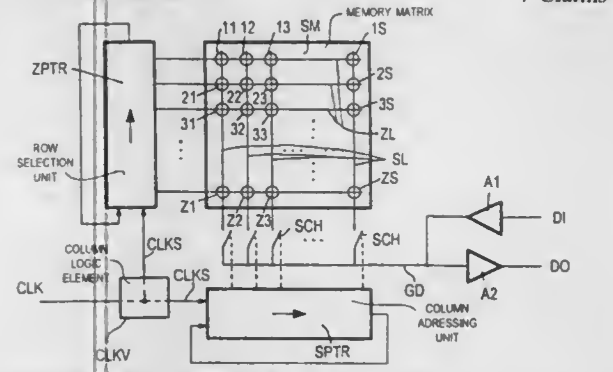
Paul-Werner Von Basse, Wolfratshausen; Michael Bollu, Munich; Roland Thewes, Puchheim, and Doris Schmitt-Landsiedel, Ottobrunn, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1996, Ser. No. 626,512

Claims priority, application Germany, Apr. 5, 1995, 195 12 791.9

Int. Cl.⁶ G11C *8/04*

U.S. Cl. 371—40.18 **7 Claims**



1. A memory unit with serial access, comprising:

a memory matrix whose memory cells are arranged in Z rows and S columns, and wherein the memory cells are connected to row lines and column lines;

a row clock signal and a column clock signal that are formed from an external clock signal in a clock logic unit;

a row selection unit connected to the row lines and indexed cyclically by a predetermined row skip width ZSW for row selection with every row clock signal;

a column selection unit connected to the column lines and indexed cyclically by a predetermined column skip width SSW for column selection with every column clock signal; and

the row selection unit and the column selection unit being designed such that a respectively new row is already selected after n columns have been selected or a respectively new column is selected after m rows have been selected, where n is smaller than S and m is smaller than Z and a higher of the two numbers n and m represents a plurality of bits in a memory word that can still be corrected by a code.

5,751,743

INFORMATION TRANSMISSION METHOD AND APPARATUS

Hiroshi Takizawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1992, Ser. No. 955,035

Claims priority, application Japan, Oct. 4, 1991, 3-257784

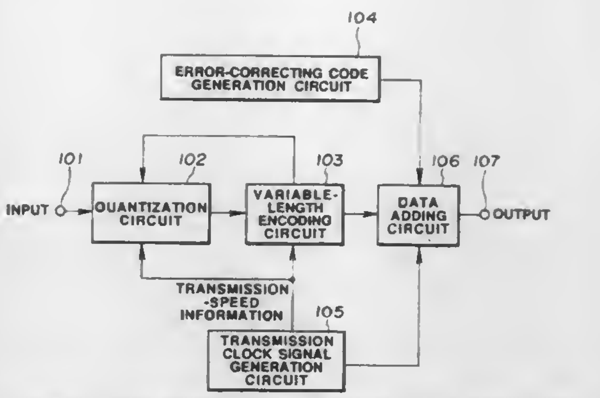
Int. Cl.⁶ H03M *13/00*

U.S. Cl. 371—41 **9 Claims**

1. An image information method for transmitting image information at a plurality of transmission speeds, said method comprising the steps of:

setting a desired transmission speed from the plurality of transmission speeds;

transmitting information in units of a fixed-length block including image information codes and error-correcting check codes for correcting errors of the image information codes, the image information codes being obtained by performing


104
ERROR-CORRECTING CODE GENERATION CIRCUIT
101
102
103
106
107
INPUT
QUANTIZATION CIRCUIT
VARIABLE-LENGTH ENCODING CIRCUIT
DATA ADDING CIRCUIT
OUTPUT
TRANSMISSION -SPEED INFORMATION
105
TRANSMISSION CLOCK SIGNAL GENERATION CIRCUIT

variable-length encoding of image signals in a frame of image data which are encoded to be a predetermined total amount of codes; and

changing a number of blocks to be transmitted per unit time without changing a code amount of the image information codes and a code amount of the error correcting check codes within each block in accordance with the set transmission speed.

5,751,744

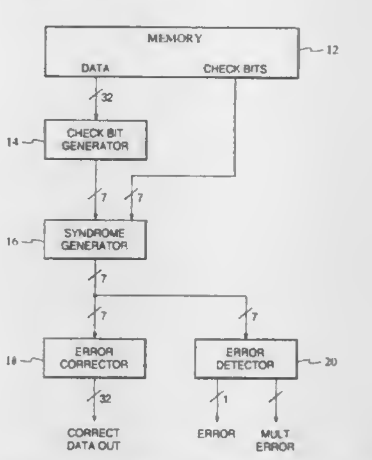
ERROR DETECTION AND CORRECTION CIRCUIT

Brendan J. Babb, Anchorage, Ak., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 11,578, Feb. 1, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 379,107

Int. Cl.⁶ G06F *11/10*

U.S. Cl. 371—49.1 **12 Claims**



1. An improved error detection and correction circuit comprising:

first means for providing a data word and a first set of check bits;

second means for generating a second set of check bits corresponding to the data word in accordance with a nibble protect matrix in which errors that occurred in the data word are located next to each other in the matrix and within a nibble;

third means responsive to the first and second sets of check bits for detecting errors in the data word including multiple errors occurring within a nibble; and

fourth means responsive to the first and second sets of check bits for correcting the data word and outputting a corrected data word.

5,751,745

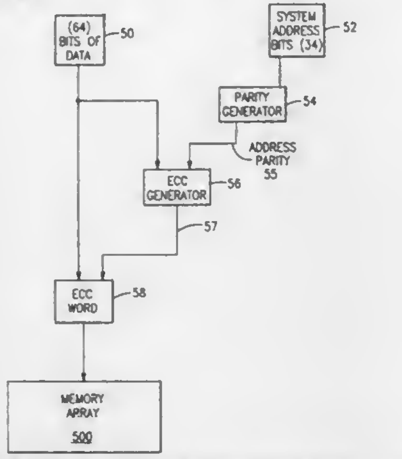
MEMORY IMPLEMENTED ERROR DETECTION AND CORRECTION CODE WITH ADDRESS PARITY BITS

Chin-Long Chen, Fishkill; Mu-Yue Hsiao, Poughkeepsie, both of N.Y.; Walter Heinrich Lipponer, Ammerbuch, Germany, and William Wu Shen, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 570,446, Dec. 11, 1995, Pat. No. 5,691,996. This application Mar. 25, 1997, Ser. No. 824,098

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—51.1 **7 Claims**



7. An apparatus for generating at least two address parity bits in a computer system from a string of received incoming system address bits, said apparatus comprising:

- means for dividing said system address bits into two groups where said first group includes only high bits having a value of "1", and said second group includes only low bits having a value or "0";
- a generator for generating at least one address parity bit from each of said two groups; and
- at least one high address parity bit generated by combining all bits of said first group; and at least one low address parity bit generated by combining all bits all bits of said second group.

5,751,746

METHOD FOR MONITORING SERIAL TRANSMISSION OF DIGITAL DATA MESSAGES ON A SINGLE-WIRE MULTIPLEX CONNECTION BETWEEN INTERCOMMUNICATING SIGNAL-PROCESSING DEVICES

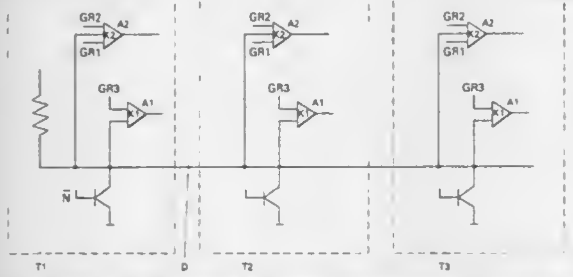
Klaus Dieter Strauss, Brunswick, Germany, assignor to Volkswagen AG, Wolfsburg, Germany

Filed Jun. 14, 1995, Ser. No. 490,496

Claims priority, application Germany, Jun. 16, 1994, 44 21 083.3

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—67.1 **11 Claims**



1. A method for monitoring serial transmission of digital data utilizing a useful signal level range on a single-wire multiplex connection between intercommunicating signal-processing devices for error conditions, comprising providing a single-wire multiplex connection between intercommunicating signal-processing devices, the single wire connection normally being maintained at a selected voltage level, monitoring transmitted data messages in a signal processing device operating as a transmitter by reading back data messages and comparing the data level of the read-back data messages with at least one reference-level limit indicating the presence of a high frequency disturbance and with one reference-level limit indicating the presence of a short circuit and comparing the data level of transmitted data messages in a signal-processing device operating as a receiver with a first reference-level limit located above and a second reference-level limit located below the useful signal level range and generating a status signal concerning the transmitted data messages in the signal-processing devices as a result of the comparison.

5,751,747

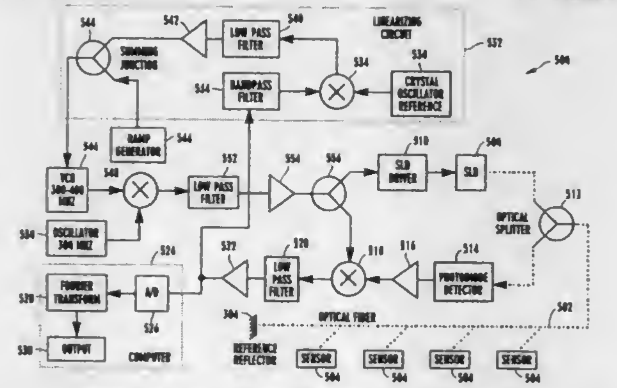
LINEAR SWEPT FREQUENCY GENERATOR

George F. Lutes, Glendale, and Xiaotian Steve Yao, Diamond Bar, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 20, 1995, Ser. No. 575,381

Int. Cl.^{6} H03L *7/24*

U.S. Cl. 372—2 **31 Claims**



15. A sensor querying system comprising:

- an optical fiber;
- at least one sensor positioned along the optical fiber and configured to reflect light at a level corresponding to a value sensed by the at least one sensor;
- a signal generator operable to generate a swept frequency signal having a frequency that varies between a first frequency and a second frequency and configured to provide the swept frequency signal to the optical fiber;
- a mixer configured to receive the swept frequency signal and a signal produced by the optical fiber in response to the swept frequency signal, and operable to combine the swept frequency signal and the signal produced by the optical fiber to produce an output signal; and
- a processor configured to receive the output signal and operable to produce a measure of the value sensed by the at least one sensor in response thereto.

5,751,748

SYSTEM FOR MONITORING AMOUNT OF LIGHT EMITTED FROM SURFACE EMITTING LASER

Atsushi Uejima; Yoshiharu Okino; Yoshinori Morimoto; Toshiyuki Inoue, and Kenichi Kodama, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 4, 1996, Ser. No. 658,084

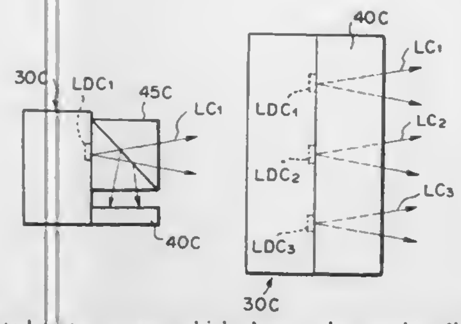
Claims priority, application Japan, Jun. 5, 1995, 7-138181

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—31 **9 Claims**

1. A system for monitoring the amount of light emitted from a surface emitting laser comprising:

- a surface emitting laser in the form of a laser array having a plurality of light emitting points;
- a beam splitter which splits a part of a laser beam emitted from the laser as a monitor light,



- a photodetector means which detects the monitor light, said photodetector means comprises a single photodetector which detects all the monitor lights split from the laser beams emitted from the respective light emitting points, and
- a means for controlling the laser array so that a plurality of laser beams are emitted from the respective light emitting points in sequence.

5,751,749

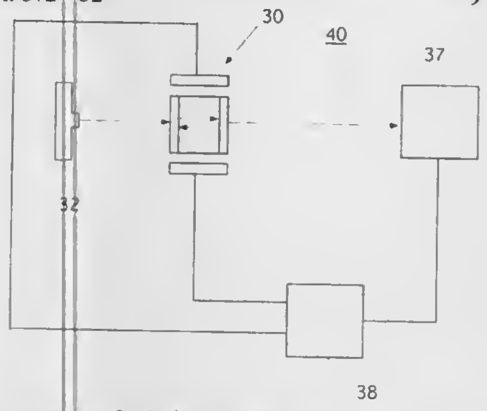
LASER OSCILLATOR AND METHOD FOR CONTROLLING THE SAME

Takeshi Yokozawa, Yokohama; Hiroshi Hara, Funabashi, and Takanobu Yamamoto, Yokohama, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1995, Ser. No. 495,033

Int. Cl.^{6} H01S *3/13*

U.S. Cl. 372—32 **9 Claims**



1. An apparatus for lasing, comprising:

- a laser oscillator comprising (a) a laser medium having two ends and having a dimension variable by one or more of converse piezoelectric and electrostriction effects when an electric field is applied thereto, (b) an optical pumping source for exciting said laser medium to thereby generate a laser beam, (c) a pair of terminals through which a voltage is applied to said laser medium to thereby apply an electric field to the laser medium and vary said dimension, and (d) an optical resonator containing the laser medium and including a total reflection coating attached to one of end of the laser medium and a partial reflection coating attached to the other of end of the laser medium;
- an output/wavelength detector, positioned to receive said laser beam, and for detecting at least one of the output and the wavelength of the laser beam produced from said laser oscillator to produce a signal corresponding to the detected output and/or wavelength; and
- a controller operatively connected to receive said signal from said output/wavelength detector to control the electric field applied by said pair of terminals in accordance with said signal, to thereby vary said dimension and control at least one of the output and the wavelength of the laser beam.

5,751,750

LASER SYSTEM AND METHOD WITH THERMALLY COMPENSATED OPTICS

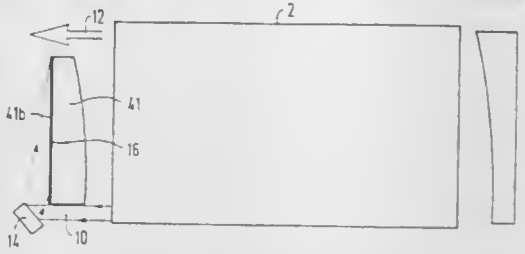
Dirk Friede, Buchholz; Hermann Hage; Karl-Heinz Herzner, both of Hamburg, and Volker Scholz, Luebeck, all of Germany, assignors to Rofin-Sinar Laser GmbH, Hamburg, Germany

Filed Feb. 10, 1997, Ser. No. 798,513

Claims priority, application Germany, Aug. 9, 1994, 44 28 194.3

Int. Cl.^{6} H01S *3/04;* **G02B** *5/08*

U.S. Cl. 372—34 **15 Claims**



1. A laser system with compensated optics, comprising:

- at least one optical element disposed in a laser beam path; and
- a heat source thermally coupled to said at least one optical element to compensate for a laser beam-created deformation of said at least one optical element.

15. A method for reducing the deformation of at least one optical element in a path of a laser beam of a laser system, which comprises:

- providing an optical element in a path of a laser beam and a heating source; and continuously heating the at least one optical element at a substantially constant temperature profile to maintain the at least one optical element in a known deformed shape, the heating source and the laser beam continuously supplying the heat to the at least one optical element, reducing the heat from the heating source when the laser-beam is firing, increasing the heat from the heating source when the heating source is the only heat source.

5,751,751

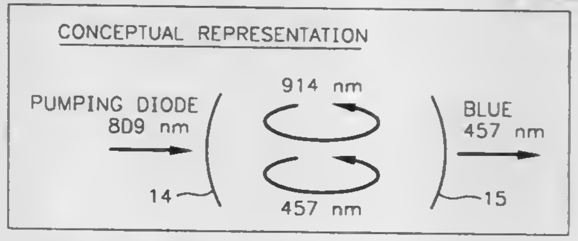
DEEP BLUE MICROLASER

David E. Hargis, La Jolla, and Sven E. Nelte, Carlsbad, both of Calif., assignors to Laser Power Corporation, San Diego, Calif.

Continuation of Ser. No. 295,006, Aug. 23, 1994, Pat. No. 5,574,740, which is a continuation-in-part of Ser. No. 112,558, Aug. 26, 1993, abandoned. This application Oct. 21, 1996, Ser. No. 731,823

Int. Cl.^{6} H01S *3/16*

U.S. Cl. 372—41 **76 Claims**



1. A laser comprising:

- an active gain medium comprising a rare earth doped microlaser crystal which has two opposite faces, said gain medium having a polarized emission at about 900 nm when optically pumped:

a nonlinear frequency doubling crystal oriented to phase match at about 900 nm, said crystal having two opposite faces said gain medium and doubling crystal being bonded together to form a composite cavity; and

optical pumping means in operative relationship with said composite cavity for pumping said composite cavity in which frequency-doubling to the blue of its fundamental frequency occurs, the output of said composite cavity being polarized.

5,751,752

SEMICONDUCTOR LIGHT EMITTING DEVICE AND MANUFACTURING METHOD THEREFOR

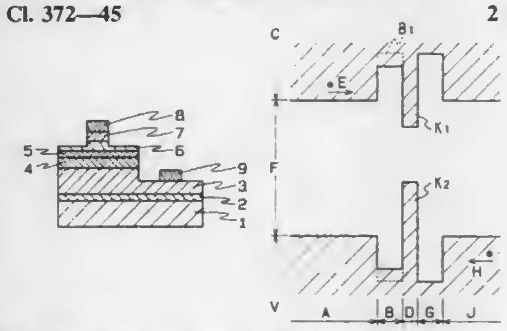
Yukio Shakuda, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Sep. 14, 1995, Ser. No. 528,308

Claims priority, application Japan, Sep. 14, 1994, 6-219892; Sep. 28, 1994, 6-233179; Sep. 28, 1994, 6-233180; Sep. 29, 1994, 6-235013; Sep. 29, 1994, 6-235014

Int. Cl.^{6} H01S *3/19;* **H01L** *33/00*

U.S. Cl. 372—45 **2 Claims**



2. A semiconductor light emitting device of double hetero junction comprising:

a first clad layer of an n-type;

an active layer formed on said first clad layer: and

a second clad layer of a p-type formed on said active layer, said first and second clad layers sandwiching said active layer, a band gap energy of said first and second clad layers being larger than that of said active layer:

wherein said band gap energy of said first clad layer is smaller than that of said second clad layer,

wherein a buffer layer is provided between a substrate and one of said second clad layer and said first clad layer, said buffer layer being made of GaN.

5,751,753

SEMICONDUCTOR LASER WITH LATTICE MISMATCH

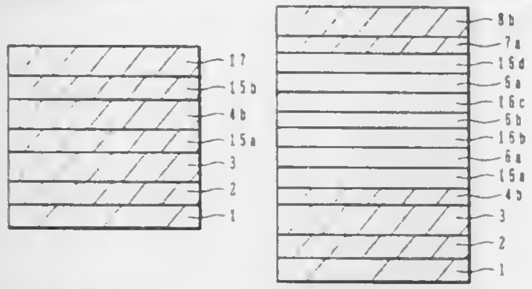
Toru Uchida, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 23, 1996, Ser. No. 681,336

Claims priority, application Japan, Jul. 24, 1995, 7-186735; Dec. 22, 1995, 7-334454

Int. Cl.^{6} H01S *3/19;* **H01L** *31/0328*

U.S. Cl. 372—45 **14 Claims**



1. A group III–V semiconductor device comprising:

a substrate of group III–V semiconductor having a first lattice constant and a primary surface;

a buffer layer, formed of group III–V semiconductor mixed crystal, disposed on said primary surface and having a lattice constant gradually changing from said first lattice constant to a second lattice constant different from said first lattice constant by 0.5% or more; and

a lamination of a plurality of layers disposed on said buffer layer, said lamination including a first layer of group III–V semiconductor containing Al as a group III element, a second layer of group III–V semiconductor containing phosphorous as a group V element, and a GaAs layer directly sandwiched between said first and second layers.

5,751,754

SEMICONDUCTOR LASER INCLUDING TUNNEL DIODE FOR REDUCING CONTACT RESISTANCE

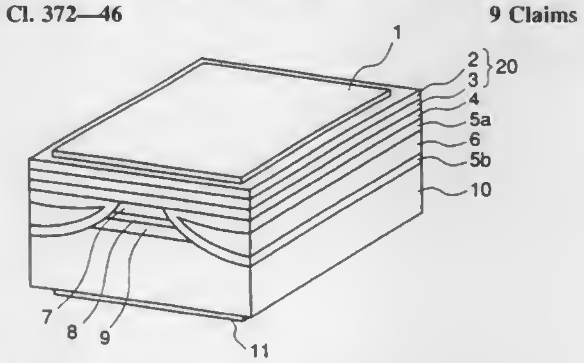
Kazubisa Takagi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1996, Ser. No. 594,467

Claims priority, application Japan, Sep. 7, 1995, 7-230006

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—46 **9 Claims**



1. A semiconductor laser comprising:

an n type semiconductor substrate having opposed front and rear surfaces;

an n type cladding layer disposed on the front surface of the n type semiconductor substrate;

an active layer disposed on the n type cladding layer and having an effective band gap energy;

a p type cladding layer disposed on the active layer;

a tunnel diode structure comprising a high dopant concentration p type semiconductor layer and a high dopant concentration n type semiconductor layer, these semiconductor layers comprising a material having an effective band gap energy larger than the band gap energy of the active layer and being successively disposed on the p type cladding layer;

a p side electrode disposed directly on the tunnel diode structure and comprising a metal; and

an n side electrode disposed on the rear surface of the n type semiconductor substrate.

5,751,755

Patent Not Issued For This Number

5,751,756

SEMICONDUCTOR LASER DEVICE FOR USE AS A LIGHT SOURCE OF AN OPTICAL DISK OR THE LIKE

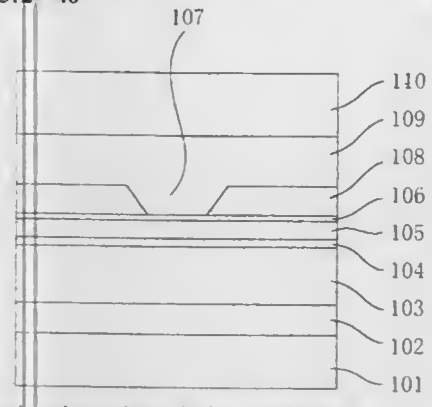
Toru Takayama, Nara; Osamu Imafuji, Osaka; Masaaki Yuri, Kyoto; Masahiro Kume, Shiga, and Akio Yoshikawa, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Sep. 4, 1996, Ser. No. 707,566

Claims priority, application Japan, Sep. 5, 1995, 7-228080

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—46 **28 Claims**



1. A semiconductor laser device comprising:

a first optical guiding layer composed of a semiconductor layer of first conductivity type formed on a semiconductor substrate;

an active layer composed of a semiconductor layer formed on said first optical guiding layer;

a second optical guiding layer composed of a semiconductor layer of second conductivity type formed on said active layer;

a loss varying layer composed of a semiconductor layer of second conductivity type formed on said second optical guiding layer, said loss varying layer absorbing a lasing light from said active layer;

a stripe region composed of a semiconductor layer of second conductivity type formed on the central portion of said loss varying layer;

current blocking layers composed of semiconductor layers of first conductivity type formed on both sides of said stripe region on said loss varying layer and having a refractive index lower than a refractive index of said first optical guiding layer; and

a third optical guiding layer composed of a semiconductor layer of second conductivity type formed over said stripe region and said current blocking layers, wherein

the thickness of said loss varying layer ranges between 5 nm and a thickness obtained by adding 5 nm to one-fifth of the thickness of said active layer and

the total thickness of said second optical guiding layer and said loss varying layer is 0.15 μm or less.

5,751,757

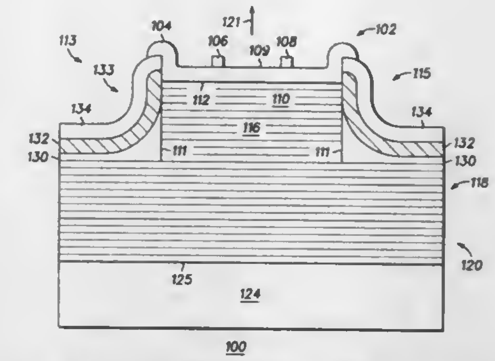
VCSEL WITH INTEGRATED MSM PHOTODETECTOR

Wenbin Jiang, Phoenix; Chan-Long Shieh, Paradise Valley, and Michael S. Lebby, Apache Junction, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1996, Ser. No. 675,307

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—50 **14 Claims**



1. A vertical cavity surface emitting laser with an integrated metal-semiconductor-metal photodetector comprising:

a vertical cavity surface emitting laser having a substrate with a first surface, a first stack of distributed Bragg reflectors disposed on the first surface of the substrate, an active area disposed on the first stack of distributed Bragg reflectors, a second stack of distributed Bragg reflectors disposed on the active area so as to define an optical pathway through which light is generated and passes, the vertical cavity surface emitting laser further including first and second electrical contacts coupled to the first and second stacks respectively for supplying operating power thereto;

a layer of semiconductor material disposed on the second stack of distributed Bragg reflectors so as to intersect the optical pathway; and

first and second spaced apart electrodes disposed on the layer of semiconductor material so as to define a metal-semiconductor-metal photodetector in cooperation with the layer of semiconductor material.

5,751,758

PHASE CONJUGATE WAVE GENERATING DEVICE, WAVELENGTH CONVERTING METHOD, OPTICAL DISPERSION COMPENSATING METHOD AND MULTI-WAVELENGTH LIGHT GENERATING DEVICE

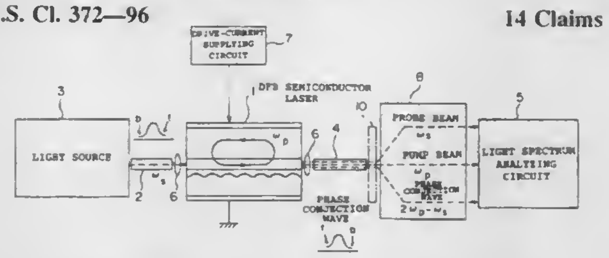
Haruhiko Kuwatsuka, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1996, Ser. No. 746,646

Claims priority, application Japan, Nov. 15, 1995, 7-296524; Sep. 20, 1996, 8-250710

Int. Cl.^{6} H01S *3/08*

U.S. Cl. 372—96 **14 Claims**



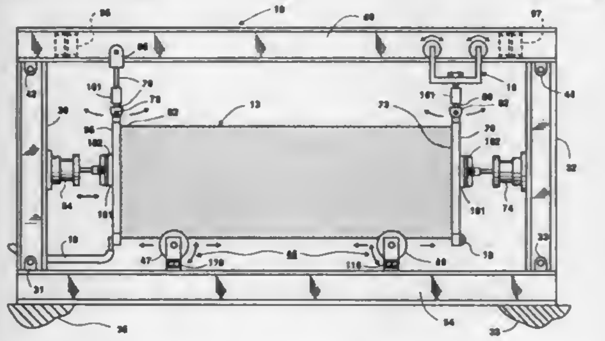
1. A phase conjugate wave generating device comprising:

a distributed feedback semiconductor laser having an optical input end and an optical output end, reflection-free films capable of transmitting phase conjugate waves being formed on respective ends and grating structure enabling single mode oscillation;

a probe beam generating light source for injecting a probe beam into said optical input end of said distributed feedback semiconductor laser;

means for supplying electric current to said distributed feedback semiconductor laser to oscillate a pump beam; and means for detecting said phase conjugate waves output from said optical output end of said distributed feedback semiconductor laser by injecting said probe beam into said distributed feedback semiconductor laser which is oscillating said pump beam.

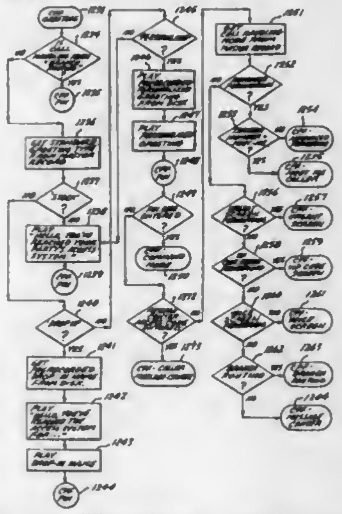
5,751,759
PRE-HEATING FURNACE FOR BAKED AMORPHOUS CARBON BODIES
Allan Webster Intermill, Strongsville, and Charles Chris Nagy, North Olmsted, both of Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.
Filed May 31, 1995, Ser. No. 454,739
Int. Cl.⁶ H05B *3/60*
U.S. Cl. 373—123 **3 Claims**



1. Apparatus for pre-heating a cylindrically shaped amorphous carbon body comprising:
- a) a framework formed of structural steel members including
  - i) a first vertical steel member arranged opposite to and spaced from a second vertical steel member
  - ii) a horizontal steel member spanning the first and second vertical steel members and affixed thereto to provide a rigid structure;
- b) a first stationary roller assembly extending horizontally in-line between the first and second vertical steel members adapted to support an amorphous cylindrically shaped carbon body extending between said first and second steel members and to permit said amorphous carbon body to roll back-and-forth on said roller assembly between said first and second vertical steel members;
- c) a first electrical contact means pivotally supported by and depending downward from said horizontal member adjacent said first vertical support member;
- d) a second electrical contact means rollably supported by and depending downward from said horizontal member adjacent said second vertical support;
- e) a first adjustable pressing assembly fixedly mounted on said first vertical support member for applying a pressing force on said first electrical contact means;
- f) a second adjustable pressing assembly fixedly mounted on said second vertical support member for applying a pressing force on said second electrical contact means;

said apparatus being configured so that a shaped carbon body can be received on said roller assembly between said first and second electrical contact means and be contacted by said first and second contact means through adjustment of the first and second pressing assemblies.

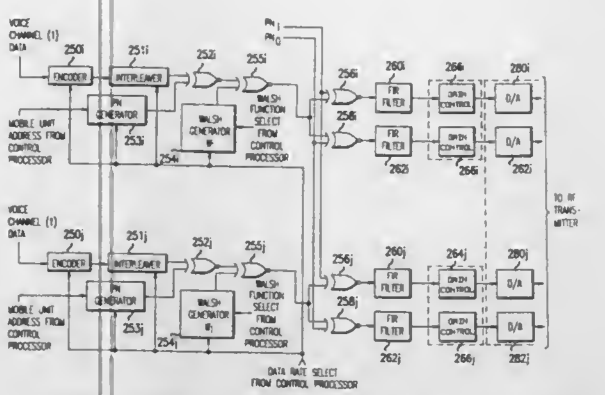
5,751,760
CONTROLLER FOR A TELEPHONE SYSTEM WITH CODE SCREENING OF INCOMING CALLS
Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Aspect Telecommunications Corporation, San Jose, Calif.
Division of Ser. No. 249,453, May 26, 1994, Pat. No. 5,673,299, which is a division of Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application May 31, 1995, Ser. No. 455,083
Int. Cl.⁶ H04M *1/64*
U.S. Cl. 379—210 **49 Claims**



1. A remotely accessible telephone control system comprising:
- a detector for detecting signals received via a communication port;
- memory; and
- a processing unit programmed for monitoring signals detected by said detector and for accessing said memory, said processing unit also:
  - (a) sensing signals provided by said detector indicating the presence of an incoming call to said system from a calling party,
  - (b) causing signals to be generated which to the calling party indicate normal call processing operation but to a knowledgeable caller indicate that the knowledgeable caller can transmit a confidential access code to gain access to a called party,
  - (c) sensing for signals provided by said detector corresponding to the transmission of the confidential access code, and if signals corresponding to the confidential access code are sensed, then issuing instructions connecting the incoming call to said called party.

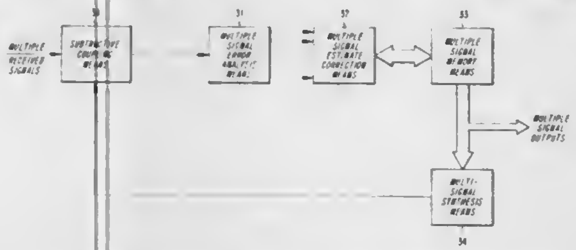
5,751,761
SYSTEM AND METHOD FOR ORTHOGONAL SPREAD SPECTRUM SEQUENCE GENERATION IN VARIABLE DATA RATE SYSTEMS
Klein S. Gilhousen, Bozeman, Mont., assignor to QUALCOMM Incorporated, San Diego, Calif.
Continuation of Ser. No. 94,822, Jul. 20, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 310,204
Int. Cl.⁶ H04B *15/00;* H04K *1/00;* H04L *27/30*
U.S. Cl. 375—200 **25 Claims**

1. A modulation system for use in a spread spectrum communications system, said modulation system being disposed to transmit an information signal, comprising:
- means for selecting a first function from a set of functions in accordance with a selected characteristic of said information signal, said set of functions including a plurality of subsets of functions, wherein a predefined recursive relationship exists among the functions within each of said subsets, said means for selecting including means for preventing selection of more than a single function from each of said subsets, and members of said subsets are orthogonal to members of all other subsets;



- means for generating a function signal representative of said first function;
- means for generating a pseudorandom noise (PN) signal of a predetermined PN code; and
- means for combining said function signal, said PN signal and said information signal, and for providing a resultant first modulation signal.

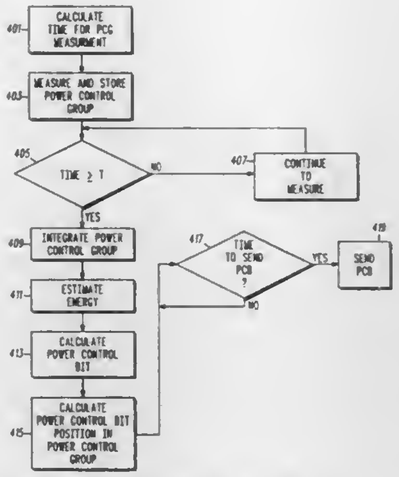
5,751,762
MULTICHANNEL RECEIVER USING ANALYSIS BY SYNTHESIS
Paul W. Dent, Stehags, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.
Filed Feb. 15, 1996, Ser. No. 601,768
Int. Cl.⁶ H04B *15/00;* H04K *1/00;* H04L *27/30*
U.S. Cl. 375—200 **22 Claims**


30
31
32
33
34
MULTIPLE RECEIVED SIGNALS
SUBTRACTIVE COUPLING MEANS
MULTIPLE SIGNAL ERROR ANALYSIS MEANS
MULTIPLE SIGNAL ESTIMATE CORRECTION MEANS
MULTIPLE SIGNAL MEMORY MEANS
MULTIPLE SIGNAL OUTPUTS
MULTI-SIGNAL SYNTHESIS MEANS

1. A receiving system for multiple radio signals, comprising:
- means for receiving said radio signals;
- subtractive coupling means for coupling a feedback signal in opposition to said received signals to produce a residual signal;
- signal analysis means for resolving said residual signal into a number of constituent components;
- signal estimating means for using said resolved constituent components to refine estimates of corresponding constituent components of said radio signals; and
- signal synthesis means for using said estimates to produce said feedback signal.

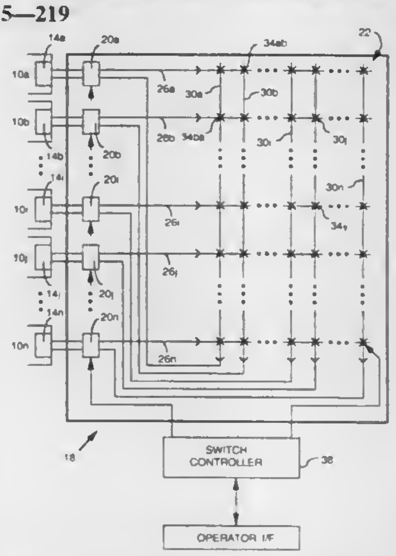
5,751,763
METHOD AND APPARATUS FOR POWER CONTROL IN A COMMUNICATION SYSTEM
Eugene J. Bruckert, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 15, 1996, Ser. No. 616,801
Int. Cl.⁶ H04K *1/00*
U.S. Cl. 375—200 **19 Claims**

1. A method for power control in a communication system, the method comprising the steps of:


401
CALCULATE TIME FOR PCG MEASUREMENT
403
MEASURE AND STORE POWER CONTROL GROUP
405
TIME ≥ T
NO
YES
407
CONTINUE TO MEASURE
409
INTEGRATE POWER CONTROL GROUP
411
ESTIMATE ENERGY
413
CALCULATE POWER CONTROL BIT
415
CALCULATE POWER CONTROL BIT POSITION IN POWER CONTROL GROUP
417
TIME TO SEND PCB ?
YES
NO
419
SEND PCB

- measuring a power-control transmission; and
- producing a discontinued measurement of the power-control transmission by discontinuing, prior to completion, the measuring of the power-control transmission based on a transmission time of a power adjustment command.

5,751,764
SWITCHER FOR FLEXIBLY INTERCONNECTING COMMUNICATION PORTS
Charles S. Meyer, and Neill J. Allen, both of Nevada City, Calif., assignors to Nvision, Inc., Grass Valey, Calif.
Continuation-in-part of Ser. No. 48,733, Apr. 16, 1993, Pat. No. 5,396,512. This application Mar. 6, 1995, Ser. No. 399,819
Int. Cl.⁶ H04L *25/02;12/02;* H04B *1/40*
U.S. Cl. 375—219 **14 Claims**



1. A method of configuring a switch comprising n I/O ports, where n>2, and a switching core having n inputs connected to the n I/O ports respectively and n outputs connected to the n I/O ports respectively and comprising means operable to connect the ith input, where i=1 . . . n, to at least the jth output, where j=1 . . . n excluding i, the method comprising connecting a kth I/O port, where 1≦k≦n, to an lth I/O port, where 1≦l≦n and l≢k, by:
- (a) determining current connection state of the kth I/O port and the lth I/O port,
- (b) if the kth I/O port is currently connected to an I/O port other than the kth I/O port, determining each I/O port to which the kth I/O port is connected and disabling each I/O port to which the kth I/O port is connected,
- (c) if the lth I/O port is currently connected to an I/O port other than the lth I/O Port, determining each I/O port to which the lth I/O port is connected and disabling each I/O port to which the lth I/O port is connected,

(d) configuring the kth I/O port as a source and the lth I/O port as a destination, and

(e) configuring the switching core to provide a forward connection from the kth I/O port to the lth I/O port and a reverse connection from the lth I/O port to the kth I/O port.

5,751,765
NON-CONTACT IC CARD, NON-CONTACT IC CARD SYSTEM, AND NON-CONTACT IC CARD DATA COMMUNICATION METHOD

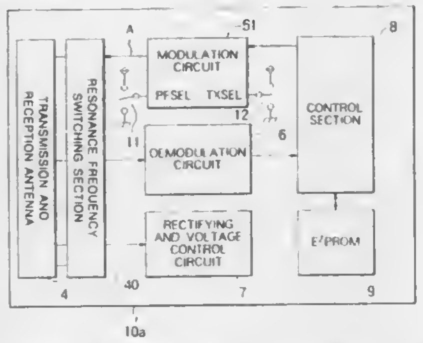
Toshiyuki Matsubara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, both of Japan

Filed Feb. 29, 1996, Ser. No. 609,945

Claims priority, application Japan, Mar. 3, 1995, 7-044315

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 375—219 **14 Claims**


A
51
8
TRANSMISSION AND RECEPTION ANTENNA
RESONANCE FREQUENCY SWITCHING SECTION
MODULATION CIRCUIT
PFSEL
TXSEL
12
11
6
DEMODULATION CIRCUIT
CONTROL SECTION
RECTIFYING AND VOLTAGE CONTROL CIRCUIT
E²PROM
4
40
7
9
10a

1. A non-contact IC card, using electromagnetic waves as a communication medium, comprising:

antenna means for transmitting and receiving data, the antenna means having a resonant frequency;

a modulation circuit for PSK modulation and FSK modulation of data to be transmitted through the antenna means and producing an output signal;

a resonant frequency switching circuit coupled to the antenna means and the modulation circuit for varying the resonant frequency of the antenna means in response to the output signal;

PSK/FSK switching means coupled to the modulation circuit for switching the modulation circuit between a first state for PSK modulation and a second state for FSK modulation;

demodulation means coupled to the resonant frequency switching circuit for demodulating data received through the antenna means; and

control means coupled to the modulation circuit and the demodulation means for controlling the antenna means, the modulation circuit, and the PSK/FSK switching means in response to the data demodulated by the demodulation means.

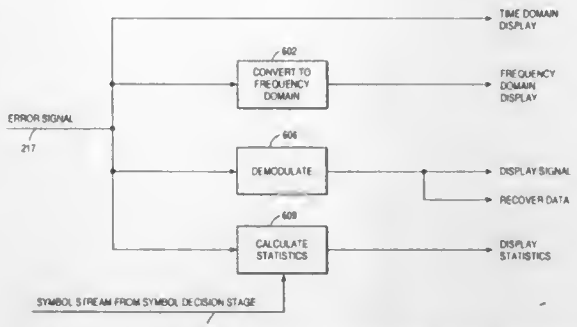
5,751,766
NON-INVASIVE DIGITAL COMMUNICATIONS TEST SYSTEM

Jeffrey Marc Kletsky, San Francisco, and Ernest T. Tsui, Cupertino, both of Calif., assignors to Applied Signal Technology, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 430,909, Apr. 27, 1995, abandoned. This application Sep. 21, 1995, Ser. No. 532,017

Int. Cl.^{6} H04B *3/46*

U.S. Cl. 375—224 **22 Claims**



7. In a digital receiver system comprising:

a demodulator that receives a distorted modulated carrier signal carrying digital data and extracts an estimated modulation signal,

a symbol decoder that translates a representation of said estimated modulation signal output into estimates of said digital data, a method of diagnosing a communication channel to which said distorted modulated carrier signal was subject, said method comprising the steps of:

generating an ideal modulation signal representing said digital data;

generating a difference signal between said ideal modulation signal and said estimated modulation signal as an estimate of an interfering signal, said difference signal being resolved into orthogonal components;

receiving said difference signal into a diagnostic processor; and

calculating statistics of said difference signal using said orthogonal components using said diagnostic processor.

5,751,767
CHANNEL QUALITY MONITORING BY DETECTING, BASED ON A FADING PITCH DETECTED IN AN RSSI, A BER IN AN ACCUMULATED PHASE LIKELIHOOD DATUM

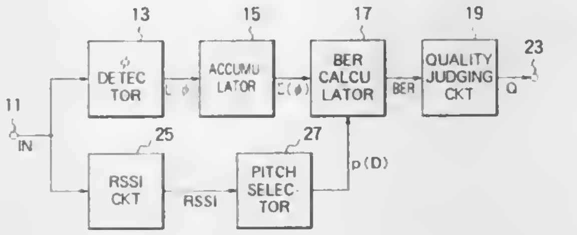
Satoshi Tatsumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 19, 1996, Ser. No. 752,144

Claims priority, application Japan, Nov. 22, 1995, 7-304316

Int. Cl.^{6} H04B *3/46;17/00*

U.S. Cl. 375—224 **18 Claims**



10. A channel quality monitoring device comprising;

a phase detector for detecting phase likelihood data in an input phase shift keying modulated signal,

an accumulating circuit for accumulating said phase likelihood data during a predetermined time interval,

a bit error rate calculator for calculating a bit error rate, and

a judging circuit for judging a channel quality by said bit error rate;

wherein said bit error rate calculator comprises;

a pitch detector for detecting a selected fading pitch in said phase shift keying modulated signal, and

an error rate calculating circuit for calculating said bit error rate based on said selected fading pitch by using accumulated phase likelihood data.

5,751,768
FRACTIONALLY SPACED EQUALIZING CIRCUITS AND METHOD

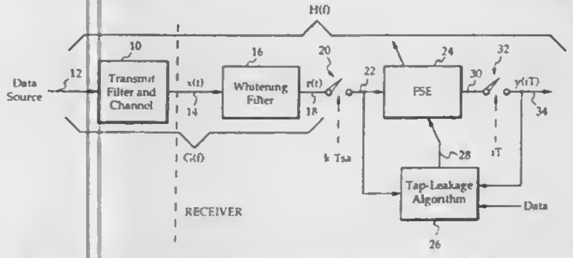
Franco Guglielmi, Milan; Carlo Luschi, S. Maria Hoé , and Arnaldo Spalvieri, Milan, all of Italy, assignors to Alcatel Italia S.p.A., Italy

Filed Jan. 18, 1996, Ser. No. 588,348

Claims priority, application Italy, Feb. 24, 1995, M195A0355

Int. Cl.^{6} H03H *7/30;7/40;* **H03K** *5/159*

U.S. Cl. 375—234 **14 Claims**



1. Method of fractionally spaced adaptive equalization of a real or complex information signal from a generic transmission channel, including a step of conventional fractionally spaced equalization of distortions introduced by the generic transmission channel, characterized in that the method further comprises a step of:

whitening the real or complex information signal, for providing a whitened real or complex information signal having a constant power spectral density, and having a repetition period equal to a reciprocal of a signalling interval of the real or complex information signal.

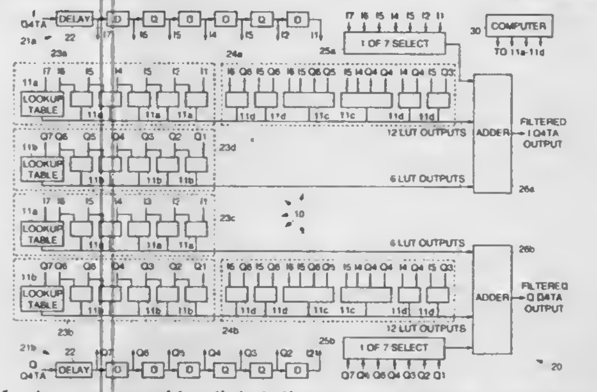
5,751,769
PROGRAMMABLE DIGITAL LINEAR AND NONLINEAR TRANSVERSAL EQUALIZER

James Pressey, San Jose; Richard Koralek, Palo Alto, and Francis J. Smith, Livermore, all of Calif., assignors to Lockheed Martin Aerospace Corp., Bethesda, Md.

Filed Oct. 22, 1996, Ser. No. 734,879

Int. Cl.^{6} H03H *7/30;* **H03K** *5/139*

U.S. Cl. 375—235 **10 Claims**



1. A programmable digital linear and nonlinear transversal equalizer comprising:

in-phase and quadrature delay circuits that each include a predetermined number of delay elements that respectively delay in-phase (I) and quadrature (Q) input data by a predetermined delay time;

an in-phase through dual tap nonlinear lookup table circuit comprising a predeteimined number of first in-phase nonlinear lookup tables coupled to receive the delayed values of the I data inputs;

a quadrature through dual tap nonlinear lookup table circuit comprising a predetermined number of first quadrature nonlinear lookup tables coupled to receive the delayed values of the Q data inputs;

an in-phase to quadrature cross dual tap nonlinear lookup table circuit comprising a predetermined number of first in-phase nonlinear lookup tables coupled to receive the delayed values of the I data inputs;

a quadrature to in-phase cross dual tap nonlinear lookup table circuit comprising a predetermined number of first in-phase nonlinear lookup tables coupled to receive the delayed values of the Q data inputs;

first and second I/Q cross product nonlinear lookup table circuits that are each coupled to receive the delayed values of the I and Q data inputs provided by the in-phase and quadrature delay circuits;

a first adder coupled to receive the outputs of the in-phase through dual tap nonlinear lookup table circuit, the outputs of quadrature to in-phase cross dual tap nonlinear lookup table circuit, and the outputs of the first I/Q cross product nonlinear lookup table circuits;

a first selection circuit coupled to receive respective delayed values of the I data inputs output by the delay circuit that has a select output coupled to the first adder;

a second adder coupled to receive the outputs of the quadrature through dual tap nonlinear lookup table circuit, the outputs of in-phase to quadrature cross dual tap nonlinear lookup table circuit and the outputs of the second I/Q cross product nonlinear lookup table circuit; and

a second selection circuit coupled to receive respective delayed values of the Q data inputs output by the delay circuit that has a select output coupled to the second adder;

and wherein the first and second adders output filtered I and Q data, respectively, from the equalizer.

5,751,770
DATA TRANSMISSION SYSTEM

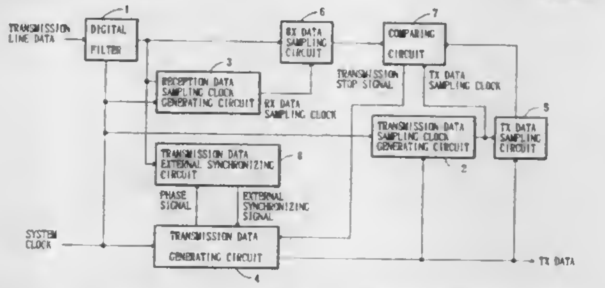
Hirokazu Tatara, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 616,005

Claims priority, application Japan, Mar. 17, 1995, 7-058898

Int. Cl.^{6} H03K *7/08;9/08*

U.S. Cl. 375—238 **3 Claims**


TRANSMISSION LINE DATA
1
DIGITAL FILTER
6
RX DATA SAMPLING CIRCUIT
7
COMPARING CIRCUIT
3
RECEPTION DATA SAMPLING CLOCK GENERATING CIRCUIT
RX DATA SAMPLING CLOCK
TRANSMISSION STOP SIGNAL
TX DATA SAMPLING CLOCK
5
TRANSMISSION DATA SAMPLING CLOCK GENERATING CIRCUIT
2
TX DATA SAMPLING CIRCUIT
TRANSMISSION DATA EXTERNAL SYNCHRONIZING CIRCUIT
8
PHASE SIGNAL
EXTERNAL SYNCHRONIZING SIGNAL
SYSTEM CLOCK
TRANSMISSION DATA GENERATING CIRCUIT
4
TX DATA

1. A data transmission system for communicating one station with other stations using a common data transmission line interconnected thereamong, wherein when more than two stations including the one station simultaneously transmit the data of their own stations by a start-stop PWM (Pulse-Width Modulation) transmission mode, the phases within a bit in the transmission data of the one station and a corresponding bit of the data on the transmission line which has been received through a noise filtering means of said one station are compared, wherein if they coincide with each other, the one station continues transmitting the transmission data of its own, whereas it stops transmitting otherwise, wherein said data transmission system further comprises:

an external synchronizing means which, when a rising edge of the filtered transmission line data is detected during the period in which the last phase of the transmission data of the one station is being transmitted, said external synchronization means forces to start transmitting the next bit of the transmission data in synchronization with the timing of said detection of a rising edge of the filtered transmission line data.

5,751,771

WAVEFORM DATA COMPRESSION APPARATUS AND WAVEFORM DATA EXPANSION APPARATUS

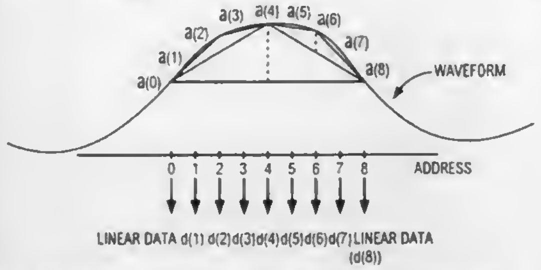
Masaaki Katsumata, and Satoshi Kusakabe, both of Osaka, Japan, assignors to Roland Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1995, Ser. No. 467,573

Claims priority, application Japan, Oct. 7, 1994, 6-270334; Nov. 30, 1994, 6-321721

Int. Cl.^{6} H04B *1/66*

U.S. Cl. 375—240 **20 Claims**



1. A waveform data compression apparatus comprising:

a first conjecture means for determining a first conjecture data based on at least sampled data at a first time and sampled data at a second time, said first conjecture data being the conjecture data of sampled data at a third time existing during a period of time between said first time and said second time;

a first difference means for determining a difference value between said sampled data at the third time and the first conjecture data conjectured by said first conjecture means;

a second conjecture means for determining a second conjecture data based on at least said sampled data at the first time and said sampled data at the third time, said second conjecture data being the conjecture data of sampled data at a fourth time existing during a period of time between said first time and said third time; and

a second difference means for determining a difference value between said sampled data at the fourth time and the second conjecture data conjectured by said second conjecture means;

whereby data indicating a difference value of said sampled data at the third time and data indicating a difference value of said sampled data at the fourth time are produced on the basis of the difference values determined by said first and second difference means, respectively.

5,751,772

METHOD FOR LOCATING A CHANNEL IN A COMMUNICATION SYSTEM

Michael Russell Mannette, Bloomingdale; Camille Louise Dozier, Schaumburg, and Tom Nguyen, Streamwood, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1996, Ser. No. 608,374

Int. Cl.^{6} H04L *27/06;27/14;27/22*

U.S. Cl. 375—316 **15 Claims**

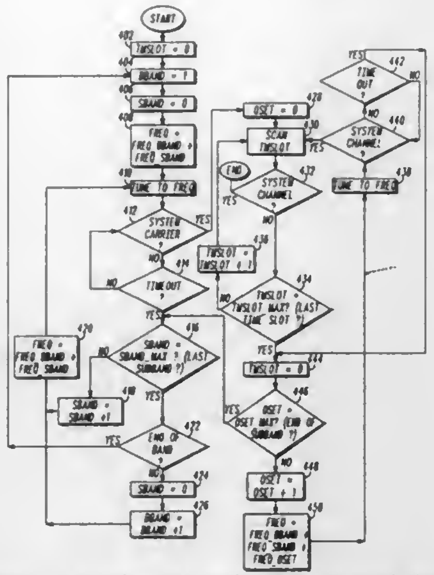
1. A method for locating a carrier in a radio frequency spectrum comprising the steps of:

providing a radio frequency band comprising a plurality of sequential subband divisions sized to be capable of containing a plurality of the carriers, the radio frequency band further including a plurality of anticipated carrier locations;

tuning to a first single anticipated carrier location within a first of the plurality of sequential subband divisions;

attempting to locate the carrier at the first single anticipated carrier location within the first of the plurality of sequential subband divisions;

in response to failing to locate the carrier at the first single anticipated carrier location within the first of the plurality of sequential subband divisions, tuning to a second single anticipated carrier location within a second of the plurality of sequential subband divisions; attempting to locate the carrier at the second single anticipated carrier location within the second of the plurality of sequential subband divisions;



in response to locating the carrier at the second single anticipated carrier location within the second of the plurality of sequential subband divisions, attempting to locate a specific channel on the carrier: and

in response to failing to locate the specific channel, tuning to a third single anticipated carrier location within the second of the plurality of sequential subband divisions.

5,751,773

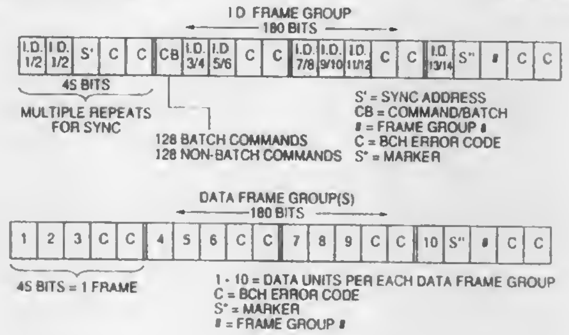
SYSTEM FOR WIRELESS SERIAL TRANSMISSION OF ENCODED INFORMATION

Thomas J. Campana, Jr., Chicago, Ill., assignor to NTP Incorporated, Annandale, Va.

Continuation-in-part of Ser. No. 112,256, Aug. 26, 1993, Pat. No. 5,446,759, which is a continuation-in-part of Ser. No. 850,275, Mar. 12, 1992, abandoned, Ser. No. 850,276, Mar. 12, 1992, abandoned, and Ser. No. 850,487, Mar. 12, 1992, abandoned. This application Feb. 7, 1995, Ser. No. 386,060

Int. Cl.^{6} H03D *1/04;1/06;* **H03K** *5/01;6/04*

U.S. Cl. 375—346 **236 Claims**



65. A process for resynchronizing reception of a plurality of frames of wirelessly transmitted information comprising:

wirelessly transmitting with a radio frequency carrier at least one identification frame group which identifies receiving circuitry to receive the information followed by at least one data frame group, each identification frame group comprising at least one frame containing bits identifying the receiving circuitry to receive the radio frequency carrier, a plurality of bits of error correction code in each frame, and synchronization information for originally synchronizing a clock of the receiving circuitry with each data frame group comprising a plurality of frames each including a plurality of bits of error correction code and a plurality of bits of data, and a synchronization marker comprising a plurality of bits for resynchronizing the clock of the receiving circuitry;

receiving the radio frequency carrier, detecting the bits of the at least one identification frame group and the at least one data frame group, originally synchronizing the clock in response to the synchronization information and storing the detected bits of the at least one frame of the at least one identification frame group and the frames of the at least one data frame group;

processing the stored bits of at least one frame with the error correction code therein to determine if the stored bits of the at least one frame contain at least one erroneous uncorrectable bit which cannot be corrected with the error correction code therein which is representative of the clock of the receiving circuitry requiring resynchronization; and

searching the stored bits transmitted after the stored bits of the at least one processed frame containing the at least one erroneous uncorrectable bit to detect a synchronization marker and using the detected synchronization marker to resynchronize the clock.

5,751,774

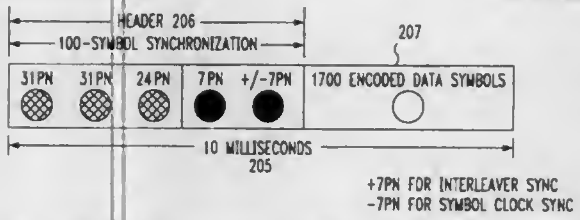
TRANSMISSION SYSTEM FOR DIGITAL AUDIO BROADCASTING

Jin-Der Wang, Ocean, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 4, 1996, Ser. No. 628,119

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—367 **68 Claims**


HEADER 206
100-SYMBOL SYNCHRONIZATION
207
31PN
31PN
24PN
7PN
+/-7PN
1700 ENCODED DATA SYMBOLS
10 MILLISECONDS
205
+7PN FOR INTERLEAVER SYNC
-7PN FOR SYMBOL CLOCK SYNC

19. Apparatus for generating a framed signal that represents a sequence of frames of information, the apparatus comprising: ·

source encoding circuitry for providing an information signal; and

circuitry for developing the framed signal such that each frame comprises an information-bearing portion for representing the information signal and a header portion, wherein the header portion further includes a frame synchronization and channel sounding portion and an interleaver/data synchronization portion in which interleaver synchronization signaling and data synchronization signaling are interleaved over a number of frames.

5,751,775

TRANSMISSION CIRCUIT OF A LINE ENCODED SIGNAL ON A TELEPHONE LINE

Thierry Fensch, Grenoble, France, and Jan Sevenhans, Brasschaat, Belgium, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Apr. 18, 1995, Ser. No. 423,579

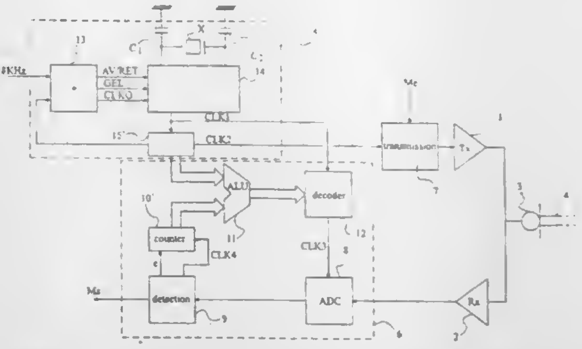
Claims priority, application France, Apr. 29, 1994, 94 05500

Int. Cl.^{6} H04L *7/00;25/36;25/40*

U.S. Cl. 375—371 **40 Claims**

1. A full duplex transmission circuit for correcting a phase jitter of a signal encoded according to lines and frames and having synchronization words alternating with data words, the circuit comprising:

a phase-locked loop including an oscillator that provides an oscillator signal having an oscillator frequency, a frequency synchronizer having a ring oscillator that reproduces the oscillator frequency to produce a sampling clock signal, and a frequency counter/divider, said phase-locked loop having a first output that provides an emission clock signal and a second output that provides the sampling clock signal, the emission clock signal and the sampling clock signal being synchronized with a reference clock signal having a reference frequency;



an analog to digital converter;

means for providing a sampling signal to the analog to digital converter, responsive to the sampling clock signal, the sampling signal having a phase locked to a phase shift between an emitted signal and a received signal, the sampling clock signal having a frequency that determines a duration of a phase skip of the sampling signal; and

means for varying the frequency of the sampling clock signal to vary the duration of the phase skip of the sampling signal.

5,751,776

RECEIVER FOR A DIGITAL COMMUNICATION SYSTEM

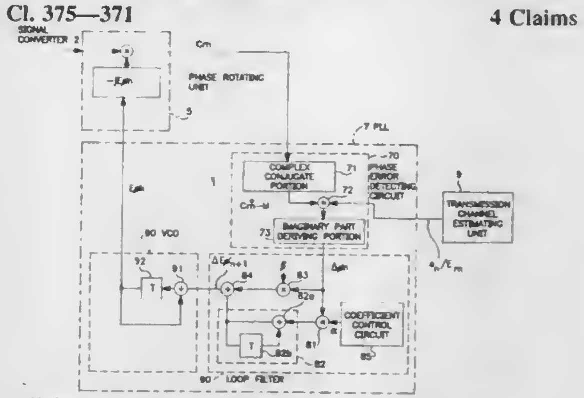
Haruhiro Shiino; Norio Yamaguchi, and Toshimichi Naoi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 167,967, Dec. 21, 1993, Pat. No. 5,602,881. This application Oct. 25, 1996, Ser. No. 736,767

Claims priority, application Japan, Apr. 24, 1992, 4-106501

Int. Cl.^{6} H04L *7/02*

U.S. Cl. 375—371 **4 Claims**


SIGNAL CONVERTER 2
Cm
PHASE ROTATING UNIT
5
7 PLL
70
COMPLEX CONJUGATE PORTION
71
PHASE ERROR DETECTING CIRCUIT
72
1
IMAGINARY PART DERIVING PORTION
73
9
TRANSMISSION CHANNEL ESTIMATING UNIT
90 VCO
92
91
84
83
82a
81
82b
82
85
COEFFICIENT CONTROL CIRCUIT
80 LOOP FILTER

1. A digital phase synchronizing circuit, comprising:

a phase error detecting means for detecting a phase error between first and second signals, the phase error detecting means producing an output indicative of the phase error;

a phase error correcting amount outputting means for producing an output indicative of a phase error correcting amount upon reception of the output of the phase error detecting means; and

a means for correcting the phase of the first signal upon reception of the output of the phase error correcting amount outputting means.

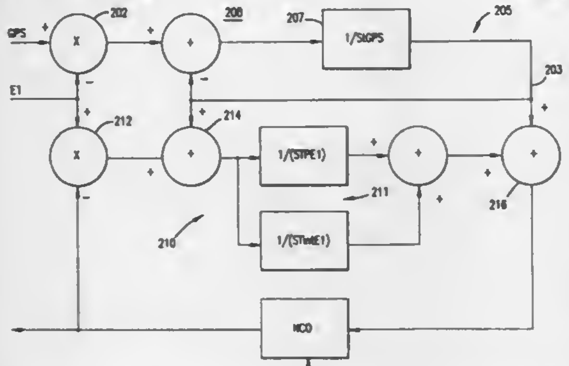
wherein the phase error correcting amount outputting means includes

  a means for receiving a first coefficient to thereby obtain a dc component of the phase error, and

  a means for receiving a second coefficient to thereby obtain the instantaneous value of the phase error, and

wherein an initial value having a predetermined value as a first coefficient and a convergent value having a value which is less than the initial value are set and wherein the first coefficient value is controlled so as to be gradually lessened from the initial value to reach the convergent value after the lapse of a predetermined time.

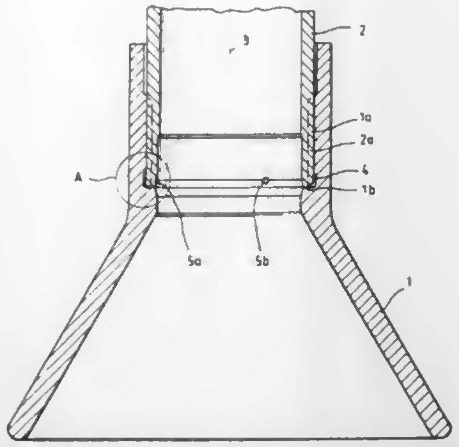
5,751,777
MULTIPLE INPUT FREQUENCY LOCKED LOOP
George Zampetti, Livermore, Calif., assignor to Symmetri-Com, Inc., San Jose, Calif.
Filed May 3, 1996, Ser. No. 642,814
Int. Cl.^{6} H03D *3/24*
U.S. Cl. 375—376 **29 Claims**



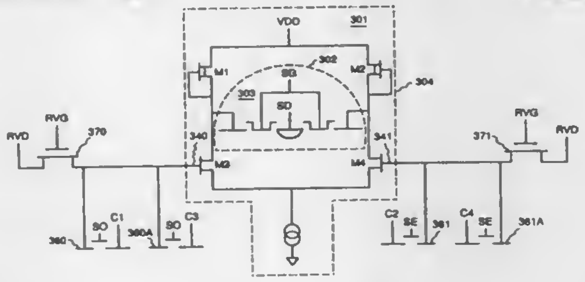
1. A multiple source loop responsive to at least two input signals and a oscillator signal, each of the three signals having a frequency associated therewith, each signal having differing frequency stability characteristics such that one signal nominally has the best long term stability, a second signal nominally has the best intermediate term stability and a local signal having nominally the best short term stability, the dual source loop including:
- first difference detection means for detecting a first difference between the two input signals, the first difference comprising one of a group of frequency and phase differences,
- second difference detection means for detecting a second difference between one of the input signals and the oscillator signal, the second difference comprising one of a group of frequency and phase differences;
- an oscillating means to provide the oscillator signal having short term, intermediate term and long term stability characteristics;
- filtering means responsive to both of the differences to control the oscillating means such that the short term stability of the oscillator signal tracks the short term stability of the first oscillator signal, the intermediate term stability of the first signal and the long term stability of the second signal.

5,751,778
METHOD FOR CAPTIVELY ATTACHING A GUIDE CONE OF TUBULAR SHAPE AND A THERMAL SLEEVE OF AN ADAPTOR PASSING THROUGH THE HEAD OF THE VESSEL OF A NUCLEAR REACTOR
Bernard Magnin, Saint Victor sur Rhins, France, assignor to Framatome, Courbevoie, France
Filed Dec. 19, 1996, Ser. No. 769,355
Claims priority, application France, Dec. 22, 1995, 95 15 416
Int. Cl.^{6} G21C *19/00*
U.S. Cl. 376—260 **9 Claims**

1. A method for captively attaching a tubular guide cone onto a threaded end part of an exterior surface of a thermal sleeve of an adaptor for passing through the head of a vessel of a pressurized water nuclear reactor, said method comprising the steps of providing an annular cavity in an internal part of a tapped bore of said guide cone, screwing the tapped bore of said guide cone onto the threaded end of the thermal sleeve and expanding at least part of the end of the thermal sleeve radially into the cavity of the guide cone from inside the thermal sleeve and the guide cone.



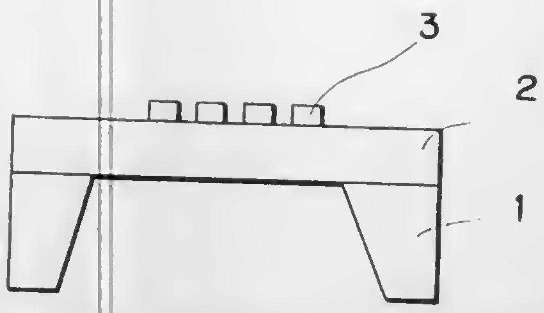
5,751,779
GENERAL ABSOLUTE VALUE CIRCUIT
Michael Paul Weir, Ballston Lake, N.Y., assignor to Lockheed Martin Corporation, Syracuse, N.Y.
Division of Ser. No. 940,261, Sep. 2, 1992, Pat. No. 5,453,783. This application Jun. 27, 1995, Ser. No. 495,188
Int. Cl.^{6} H03K *23/74;* G11C *19/28*
U.S. Cl. 377—60 **9 Claims**



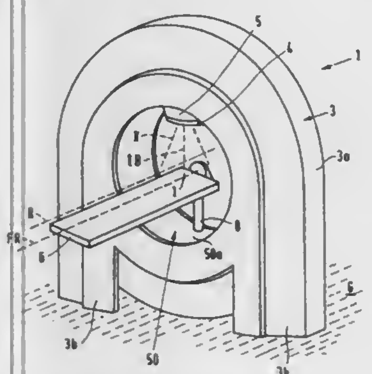
1. A general absolute value circuit for developing a bipolar absolute value output signal from an input charge signal, comprising:
- a merged dual shelf transistor structure; and
- a balanced differential amplifier coupled to said merged dual shelf transistor structure for driving said merged dual shelf transistor structure in response to said input charge signal, said merged dual shelf transistor structure being adapted to generate said bipolar absolute value output signal in response to said input charge signal.

5,751,780
X-RAY MASK STRUCTURE, PREPARATION THEREOF AND X-RAY EXPOSURE METHOD
Yasuaki Fukuda, Hadano, and Shigeyuki Matsumoto, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 122,649, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 727,961, Jul. 10, 1991, abandoned. This application Oct. 27, 1994, Ser. No. 329,787
Claims priority, application Japan, Jul. 12, 1990, 2-186795; Jul. 27, 1990, 2-199746
Int. Cl.^{6} G21K *5/00*
U.S. Cl. 378—35 **16 Claims**

1. An X-ray mask structure comprising an X-ray transmissive film, an X-ray absorptive member held on said X-ray transmissive film and a supporting frame for supporting said X-ray transmissive film, wherein said X-ray absorptive member is constituted of crystalline grains having a grain size of 1 μm or larger, wherein said X-ray absorptive member has a density of 90% or more relative to the density of the bulk material constituting said X-ray absorptive member.

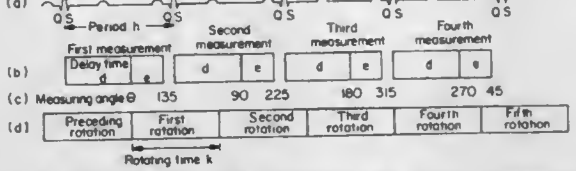


5,751,781
APPARATUS FOR TREATING A PATIENT
Kevin J. Brown, Horsham; William R. Harwood, Hurst Pier Point, and Terence Bates, Horsham, all of England, assignors to Elekta AB, Stockholm, Sweden
Filed Oct. 4, 1996, Ser. No. 726,287
Claims priority, application United Kingdom, Oct. 7, 1995, 9520567; Dec. 1, 1995, 9524564
Int. Cl.^{6} A61N *5/01*
U.S. Cl. 378—65 **20 Claims**



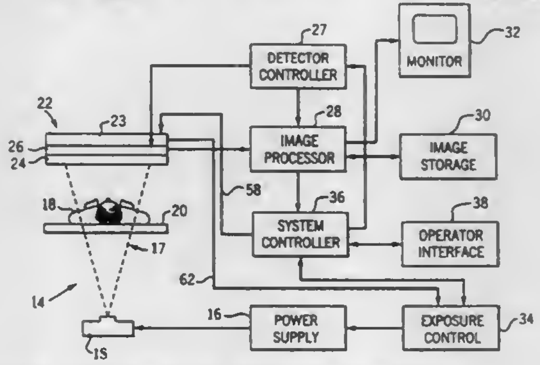
1. Apparatus for treating a patient by exposing a treatment area of the patient to radiation, the apparatus comprising:
- a support;
- a hollow body having a central aperture which defines a passageway extending through the body, the hollow body being mounted to the support so as to be rotatable about a central axis of the hollow body;
- a radiotherapy source mounted to the hollow body so as to be rotatable with the hollow body and for projecting a radiotherapy beam within the passageway which crosses the central axis of the hollow body;
- a beam limiting device for controllably partially limiting the projected area of the beam; and
- a patient support having a generally planar elongated top for receiving the patient and which extends at least partly through the passageway and which is positioned such that an unlimited projection area of the beam substantially covers the treatment area of the patient, said patient support being angularly movable about an axis generally perpendicular to the top of the patient support, thereby allowing the patient support to extend obliquely through the passageway.

5,751,782
X-RAY COMPUTERIZED TOMOGRAPHY APPARATUS AND METHOD FOR CONTROLLING THE SAME
Eiji Yoshitome, Tokyo, Japan, assignor to GE Yokogawa Medical Systems, Limited, Tokyo, Japan
Filed Apr. 22, 1996, Ser. No. 636,797
Claims priority, application Japan, Jul. 10, 1995, 7-173065
Int. Cl.^{6} H05G *1/64*
U.S. Cl. 378—98.5 **6 Claims**



1. A control method for controlling an X-ray computerized tomography apparatus having at least one of an X-ray tube and a detector rotated around an object to be scanned in order to acquire data constituting a complete view necessary for reconstructing an image of said object, said method comprising the steps of:
- continuously rotating at least one of said X-ray tube and said detector over a time which is not an integer multiple of the period of the motion of said object;
- starting to measure data the moment a specific phase of said motion is reached;
- repeatedly measuring data constituting a view corresponding to a rotation angle representing a shorter measuring time than said period of said motion, until the data constituting the complete view necessary for reconstructing said image of said object is acquired; and
- generating a tomographic image of said object on the basis of the data thus acquired.

5,751,783
DETECTOR FOR AUTOMATIC EXPOSURE CONTROL ON AN X-RAY IMAGING SYSTEM
Paul R. Granfors; Jean-Claude Morvan, both of Milwaukee, and Rowland F. Saunders, Hartland, all of Wis., assignors to General Electric Company, Waukesha, Wis.
Filed Dec. 20, 1996, Ser. No. 771,725
Int. Cl.^{6} H05G *1/44*
U.S. Cl. 378—108 **6 Claims**



1. In an x-ray system the improvement comprising:
- a large area solid state image detector;
- an array of photosensors disposed behind the image detector and positioned to detect photons passing through the image detector;
- means for combining currents produced by photosensors in said array;
- an integrator connected to the means for combining for providing an AEC signal; and
- an exposure control connected to receive the AEC signal and employ the same to control x-ray exposure.

5,751,784

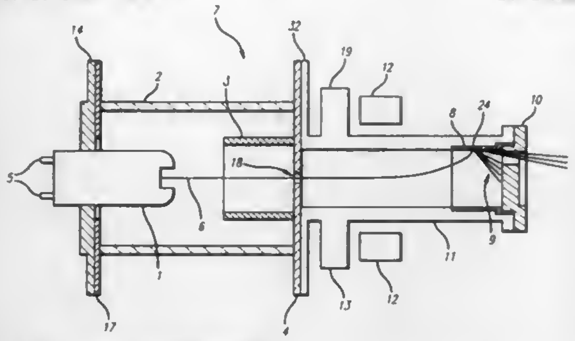
X-RAY TUBE

Richard S. Enck, San Jose, Calif., assignor to Kevex X-Ray, Scotts Valley, Calif.

Filed Sep. 27, 1996, Ser. No. 722,343

Int. Cl.⁶ H01J *5/18*

U.S. Cl. 378—140 **10 Claims**



1. An x-ray rube comprising:

first means for generating a beam of electrons along a first axis;

second means for emitting x-rays in response to said beam of electrons, said second means including an anode mounted off-axis with respect to said first axis;

third means for deflecting said electron beam onto said anode; and

a housing within which said first, second and third means are disposed, said housing including:

a first x-ray permeable window,

barrier means disposed between said anode and said window for protecting said window from electrons scattered by said beam from said anode, said barrier means having an exit aperture formed therein, said exit aperture being mounted relative to said anode such that only x-rays having take-off angles of 0 to 30 degrees relative to a surface of the anode are able to pass through the exit aperture, and

a second x-ray permeable window provided in said exit aperture.

5,751,785

IMAGE RECONSTRUCTION METHODS

Jack W. Moorman, Los Gatos; Brian Skillicorn, Saratoga; Edward G. Solomon, Menlo Park; Peter J. Fiekowsky, Los Altos, all of Calif.; John W. Wilent, deceased, late of Aroja, Calif., by Virginia B. Wilent, administratrix; Abigail A. Moorhouse, San Jose, Calif., and Robert E. Melen, Saratoga, Calif., assignors to Cardiac Mariners, Inc., Los Gatos, Calif.

Continuation of Ser. No. 419,730, Apr. 10, 1995, Pat. No. 5,644,612, which is a continuation of Ser. No. 386,861, Feb. 10, 1995, Pat. No. 5,651,047, which is a continuation-in-part of Ser. No. 375,501, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 42,742, Apr. 5, 1993, abandoned, and Ser. No. 342,641, Nov. 21, 1994, abandoned, which is a continuation of Ser. No. 8,455, Jan. 25, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 753,263

Int. Cl.⁶ G21K *5/10*

U.S. Cl. 378—146 **19 Claims**

1. A method of imaging comprising:

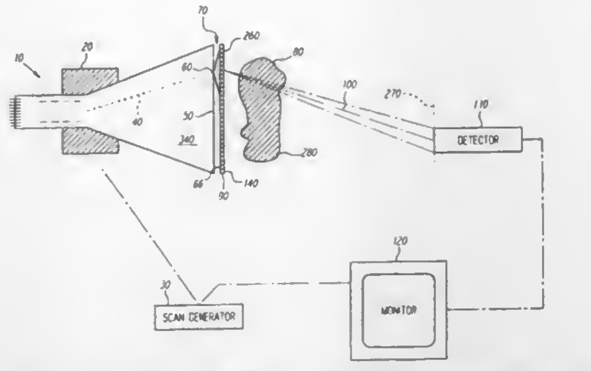
generating a plurality of x-ray beams emanating from different locations on an x-ray source, the locations forming a pattern of rows on the x-ray source;

receiving x-rays that have passed through an object from each of the generated x-ray beams with an arrangement of detectors;

capturing information indicative of an x-ray absorbency of the object to be imaged from each detector for each x-ray beam;

obtaining imaging information about each image pixel in the object to be imaged by combining the information indicative of the x-ray absorbency of the object at each image pixel to be imaged from a plurality of detectors, the plurality of detectors each intersected by a line defined by a different location on the x-ray source and the image pixel for which imaging information is desired;

forming an image from the imaging information wherein the image comprises a plurality of rows of pixels, and wherein a number of pixels in at least one row of the plurality of rows of pixels is greater than the number of locations in at least one row of locations on the x-ray source.



5,751,786

X-RAY EXAMINATION APPARATUS COMPRISING A FILTER

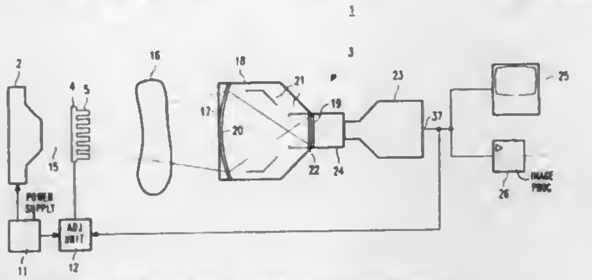
Wilhelmus J. J. Welters, and Jacob Wijdenes, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1996, Ser. No. 679,037

Claims priority, application European Pat. Off., Jul. 13, 1995, 95201925; Mar. 5, 1996, 96200581

Int. Cl.⁶ G21K *3/00*

U.S. Cl. 378—156 **20 Claims**



1. An X-ray examination apparatus, comprising

an X-ray source (2), an X-ray detector (3), and a filter which is arranged therebetween and comprises a plurality of filter elements having an X-ray absorptivity which can be adjusted by controlling a quantity of X-ray absorbing liquid within individual filter elements,

characterized in that individual filter elements comprise a wall provided with an electrically conducting layer, a dielectric layer is deposited on the side of the electrically conducting layer which faces the interior of the relevant filter element, and the dielectric layer is covered by a coating layer.

5,751,787

MATERIALS AND METHODS FOR IMPROVED RADIOGRAPHY

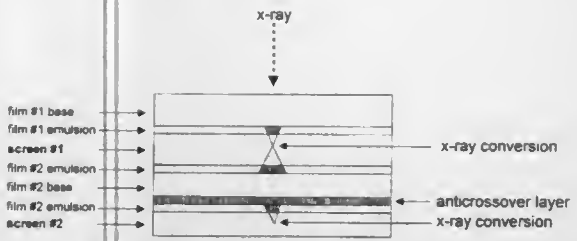
Zhenxue Jing, and James K. Walker, both of Gainesville, Fla., assignors to Nanoptics, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 711,379, Sep. 5, 1996, abandoned. This application Sep. 25, 1996, Ser. No. 719,225

Int. Cl.⁶ G03B *42/02*

U.S. Cl. 378—169 **39 Claims**

1. A method for x-ray imaging of a subject wherein said method comprises irradiating said subject such that radiation passing through said subject strikes a screen, said screen comprising a first side and a second side, wherein said screen then emits light from the first side of said screen which exposes a first film and emits light from the second side of said screen which exposes a second film, wherein said second film is a double emulsion film comprising a first emulsion layer and a second emulsion layer, wherein the light emitted by the second side of said screen exposes said first emulsion layer of said second film, wherein said radiation passing through said subject strikes a second screen, wherein said second screen then emits light which exposes said second emulsion layer of said second film.



5,751,788

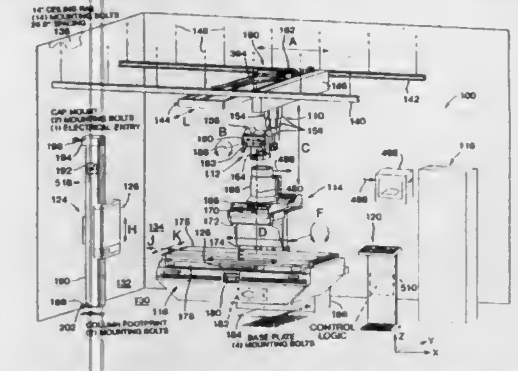
UNIVERSAL RADIOGRAPHIC/FLUOROSCOPIC DIGITAL ROOM

Oscar Khutoryansky; Dennis Bleser; Allan Kojro, all of Glenview; Thomas Simak, Warrenville, and Thomas Rosevear, Forest Park, all of Ill., assignors to Continental X-Ray Corporation, Broadview, Ill.

Continuation of Ser. No. 443,486, May 18, 1995, Pat. No. 5,636,259. This application Oct. 11, 1996, Ser. No. 729,989

Int. Cl.⁶ H05G *1/02*

U.S. Cl. 378—197 **4 Claims**



1. A diagnostic imaging system adapted for selectable operation in at least radiographic, fluoroscopic, and tomographic examination modes responsive to an operator mode selection, comprising:

a movable x-ray source directed at a patient imaging position;

at least one movable x-ray recording medium;

said x-ray source and said x-ray recording medium adapted for coordinated but not mechanically interlocked movement about said patient imaging position; and

means responsive to said operator mode selection for automatically causing movement of said x-ray source and said x-ray recording medium in a manner appropriate for the examination mode corresponding to said operator mode selection.

5,751,789

SNID WITH WIRELESS BACKUP

Robert D. Farris, Sterling, and Richard G. Backus, Manassas, both of Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Nov. 13, 1995, Ser. No. 557,396

Int. Cl.⁶ H04M *1/24;3/08;3/22*

U.S. Cl. 379—34 **21 Claims**

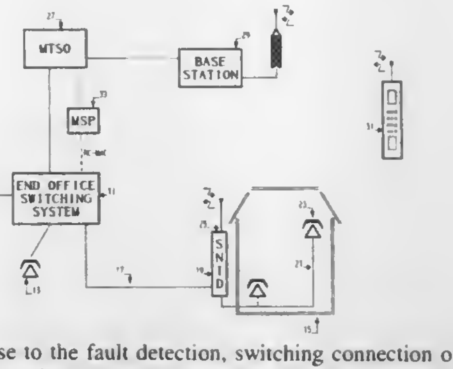
17. A method comprising:

detecting a fault in a telephone line from a public switched telephone network;

in response to the fault detection, switching connection of customer premises telephone wiring from a connection to the line to a coupling to a wireless telephone transceiver located at the customer premises;

registering the wireless telephone transceiver with a public wireless telephone network;

in response to the registration with the public wireless telephone network, activating call forwarding in the public switched telephone network with regard to the line.



5,751,790

VOICE INFORMATION SERVICE DEVICE AND VOICE INFORMATION SERVICE METHOD

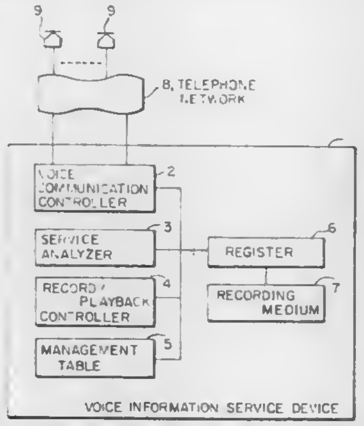
Kazuhisa Makihata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 21, 1996, Ser. No. 621,204

Claims priority, application Japan, Mar. 22, 1995, 7-062611

Int. Cl.⁶ H04M *1/64*

U.S. Cl. 379—71 **4 Claims**


9
9
8, TELEPHONE NETWORK
VOICE COMMUNICATION CONTROLLER
2
SERVICE ANALYZER
3
REGISTER
6
RECORD / PLAYBACK CONTROLLER
4
RECORDING MEDIUM
7
MANAGEMENT TABLE
5
VOICE INFORMATION SERVICE DEVICE

3. A voice information service method utilizing a recording medium made up of a plurality of voice files into which information may be recorded and a management table which secures storage area for every information number assigned to information and, for each of said information numbers, records a voice file number for identifying said voice file and an index number for designating the order of playback of voice files; wherein voice information can be provided from a plurality of information providers using telephones and a plurality of information users can receive provided voice information by telephone, said information providers dividing said information into arbitrary units; and wherein:

call acceptance is performed for telephone calls from information providers or information users and Push-Button (PB) tones are analyzed to produce a PB analysis result, and, based on said PB analysis result, judgment is made to record or playback information;

when judgment is made to record information, said voice file number is designated, said voice file number and an index number designated by one of said plurality of information providers are paired and recorded to said storage area;

and in addition, information for every arbitrary unit designated by said information providers is recorded to a voice file of a designated voice file number;

and when judgment is made to play back information, said voice file numbers are read out in the order of said index numbers from a storage area corresponding to an information number designated by one of said information users; and
information within voice files is registered and played back in the order of read voice file numbers.

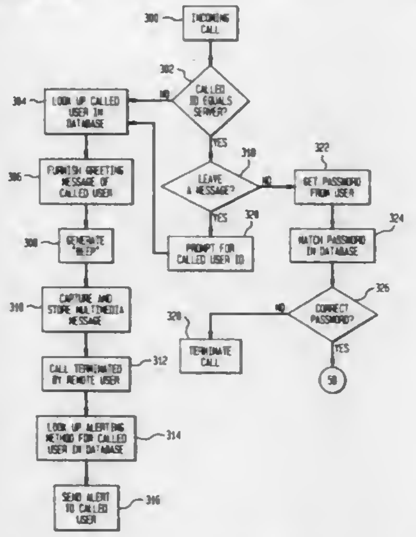
5,751,791

NETWORK BASED MULTIMEDIA MESSAGING METHOD AND SYSTEM

Mon-Mei Chen, Marlboro; Howard Paul Katseff, Manalapan; Ashok K. Kuthyar, Holmdel; Robert Edward Markowitz, Glen Rock; Robert F. Mortenson, Chatham; Ram S. Ramamurthy, Manalapan; Bethany Scott Robinson, Colts Neck, and Peter H. Stuntebeck, Little Silver, all of N.J., assignors to AT&T Corp, Middletown, N.J.

Continuation of Ser. No. 357,473, Dec. 16, 1994, abandoned.
This application Jan. 31, 1997, Ser. No. 792,339
Int. Cl.⁶ H04M *1/64*

U.S. Cl. 379—88 **34 Claims**



300
INCOMING CALL
302
CALLED ID EQUALS SERVER?
NO
YES
304
LOOK UP CALLED USER IN DATABASE
306
FURNISH GREETING MESSAGE OF CALLED USER
308
GENERATE "BEEP"
310
CAPTURE AND STORE MULTIMEDIA MESSAGE
312
CALL TERMINATED BY REMOTE USER
314
LOOK UP ALERTING METHOD FOR CALLED USER IN DATABASE
316
SEND ALERT TO CALLED USER
318
LEAVE A MESSAGE?
NO
YES
320
PROMPT FOR CALLED USER ID
322
GET PASSWORD FROM USER
324
MATCH PASSWORD IN DATABASE
326
CORRECT PASSWORD?
NO
YES
328
TERMINATE CALL
50

1. In a circuit switched telecommunication network supporting at least 56 kilobits per second access, a method of handling a multimedia call from a caller using an H.320 protocol compliant multimedia device, comprising the steps of:
attempting to establish a communication connection in the circuit switched telecommunication network between the caller and a recipient for the multimedia call, the multimedia call comprising a unified combination of video and at least one other media communicated according to an H.320 compliant protocol;
determining at a network switch that said communication connection between the caller and said recipient cannot be completed because the multimedia call is an unanswered call;
following said determining step and as a result thereof, connecting said unanswered call to a network based multimedia server; and
creating a stored multimedia message in real-time from the caller by recording a multimedia message from the H.320 compliant multimedia device using said network based multimedia server.

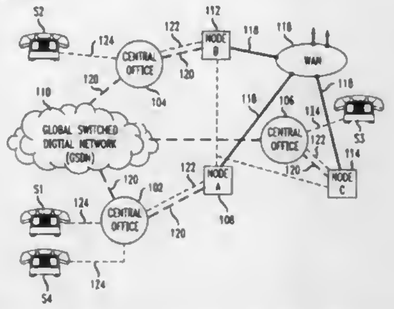
5,751,792

SYSTEM AND METHOD FOR PROVIDING A MESSAGE SYSTEM SUBSCRIBER WITH A ROAMING MAILBOX

Nga V. Chau, Herndon, Va.; Edward D. Eng, South Plainfield, N.J.; Henry H. Shen; Agnes C. Tow, both of Middletown, N.J., and Gang Yang, Holmdel, N.J., assignors to AT&T Corp, Middletown, N.J.

Filed Jul. 15, 1996, Ser. No. 679,842
Int. Cl.⁶ H04M *3/50;15/00*

U.S. Cl. 379—89 **18 Claims**



16. A method for reducing the toll cost associated with leaving a message for a message service subscriber at the subscriber's home mailbox when the calling party and the subscriber are not in the same local exchange, comprising the steps of:
the calling party accessing a message system at a local node; and transferring the message to the home mailbox of the subscriber.

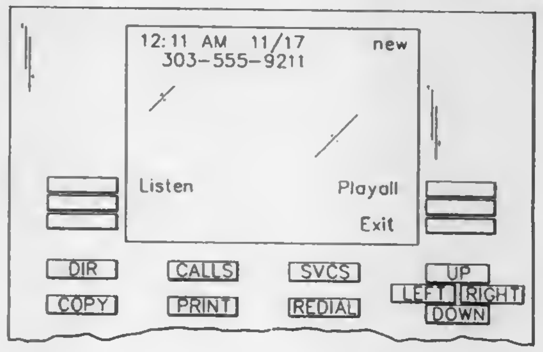
5,751,793

METHOD AND INSTRUCTIONS FOR VISUAL VOICE MESSAGING USER INTERFACE

Susan Davies, Boulder, Colo., and Gloria E. Davy, Phoenix, Ariz., assignors to U S WEST Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 404,010, Mar. 14, 1995, abandoned.
This application Jul. 16, 1996, Ser. No. 680,893
Int. Cl.⁶ H04M *1/64;1/56;15/06;3/42*

U.S. Cl. 379—89 **19 Claims**



1. A customer premises equipment (CPE) used in conjunction with a public switched telephone network visual voice messaging system, said CPE comprising:
a display screen;
a plurality of soft key buttons associated with said display screen;
a plurality of function labels associated with the soft keys;
a DTMF keypad; and
message identification and message status displayed on said display screen, said message identification obtained via the public switched telephone network wherein said function labels are determined as a function of the message status.

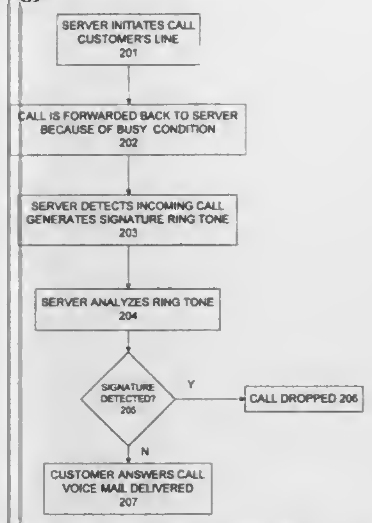
5,751,794

PROACTIVE VOICE MAIL SERVICE

Stanley Kugell, Newton Highlands, and David Friend, Boston, both of Mass., assignors to Faxnet Corp., Boston, Mass.

Filed Sep. 4, 1996, Ser. No. 706,477
Int. Cl.⁶ H04M *1/64*

U.S. Cl. 379—89 **3 Claims**



SERVER INITIATES CALL CUSTOMER'S LINE 201
CALL IS FORWARDED BACK TO SERVER BECAUSE OF BUSY CONDITION 202
SERVER DETECTS INCOMING CALL GENERATES SIGNATURE RING TONE 203
SERVER ANALYZES RING TONE 204
SIGNATURE DETECTED? 205
Y
CALL DROPPED 206
N
CUSTOMER ANSWERS CALL VOICE MAIL DELIVERED 207

1. A method of providing voice mail service, comprising the steps of:
activating a forward on busy or a forward on busy/no-answer service on a customer's telephone line to forward calls to the customer's telephone line to a server;
receiving a call at the server forwarded from the customer's telephone line and storing voice mail at the server;
calling the customer's telephone line according to a retry schedule using a ring-back tone with an imbedded electronic signature that uniquely identifies the server;
analyzing ring-back tones received by the server when calling the customer's telephone line to detect if the electronic signature is present; and
disconnecting a telephone call to the customer's telephone line made according to the retry schedule if the unique signature is detected or transmitting the stored voice mail from the server to the customer's telephone line if the electronic signature is not detected and the customer answers the telephone call made according to the retry schedule.

5,751,795

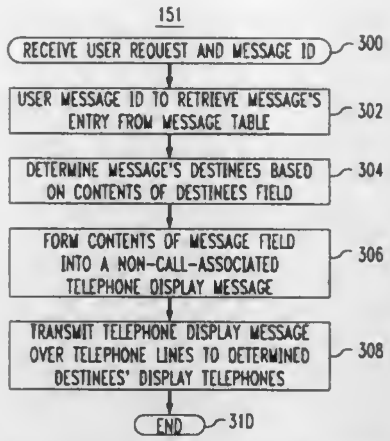
BROADCASTING OF INFORMATION THROUGH TELEPHONE SWITCHING SYSTEM DISPLAY MESSAGES

Kerry Wayne Hassler, and Paul Lawrence Richman, both of Boulder, Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 11, 1995, Ser. No. 514,327
Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—93.17 **13 Claims**

13. A method of broadcasting messages for users in a telecommunications system comprising a plurality of user telecommunications terminals each having a display, a plurality of telephone lines each connected to a different one of the terminals, and a telephone switching system connected to the telephone lines for connecting telephone calls to or from the terminals via the telephone lines, the method comprising the steps of:
a user of one of the terminals making a request accompanied by a message identifier by either inputting a feature access code on the one terminal or actuating a predetermined actuator of the one terminal;
in response to the making, the one terminal sending the request accompanied by the message identifier to the switching system, the request consisting of either the feature access code or notification of the actuation;



151
RECEIVE USER REQUEST AND MESSAGE ID
300
USER MESSAGE ID TO RETRIEVE MESSAGE'S ENTRY FROM MESSAGE TABLE
302
DETERMINE MESSAGE'S DESTINEES BASED ON CONTENTS OF DESTINEES FIELD
304
FORM CONTENTS OF MESSAGE FIELD INTO A NON-CALL-ASSOCIATED TELEPHONE DISPLAY MESSAGE
306
TRANSMIT TELEPHONE DISPLAY MESSAGE OVER TELEPHONE LINES TO DETERMINED DESTINEES' DISPLAY TELEPHONES
308
END
310

receiving the request accompanied by the message identifier from the one of the terminals at the switching system;
in response to the receipt, retrieving a stored predetermined message for users that corresponds to the received message identifier from a plurality of stored predetermined messages for users, wherein each message is identifiable by a corresponding said message identifier and has corresponding predetermined information that indicates destinees of said each message;
forming at the switching system a non-call-associated display message containing the retrieved message for users;
determining the destinees of the retrieved message for users from the stored predetermined information that corresponds to the retrieved message for users; and
in response to the forming, broadcasting the formed message from the switching system over multiple ones of the telephone lines to those multiple ones of the terminals that correspond to the determined destinees to cause the contained message for users to be displayed on the displays of the multiple ones of those terminals.

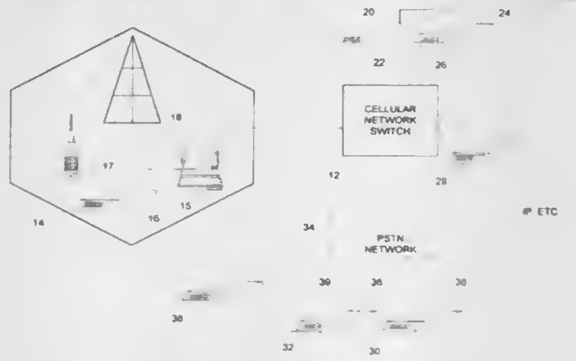
5,751,796

RAPID STARTUP PROTOCOL FOR COMMUNICATION BETWEEN A PLURALITY OF MODEMS

Robert Earl Scott, Indian Rocks Beach, and Edward S. Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Jan. 9, 1997, Ser. No. 781,787
Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—93.31 **12 Claims**



1. In a system having a calling modem and an answer modem for communicating across an established communication link using V.34 modulation protocol for information transfer after startup, an improved startup method comprising the steps of:
transmitting a unique calling signal from the calling modem, the calling signal identifying the configuration of the calling modem;

transmitting a unique answer signal from the answer modem, the answer signal identifying the configuration of the answer modem;

analyzing the configuration of the calling modem and answer modem to determine whether the established link passes through a hybrid converter circuit; and

omitting the line probing and echo training, if the established link does not pass through a hybrid converter circuit.

5,751,797

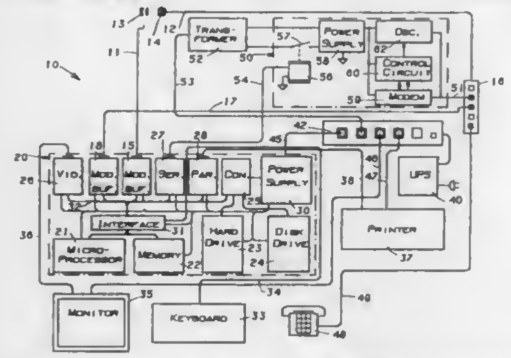
AUTOMATIC METER READING SYSTEM WITH MULTITASKING CONTROL

Theresa Saadeh, West Allis, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Apr. 13, 1990, Ser. No. 509,504

Int. Cl.⁶ H04M *11/00*

U.S. Cl. 379—106.03 **27 Claims**



1. An application program stored in an operational medium and providing a single control center computer with call handling and customer account processing capabilities, the computer having a plurality of modems for connection to telephone lines to receive meter data from automatic meter reader devices, having a microprocessor, having first program memory locations for storing an operating system program, having second program memory locations for storing the application program and having a plurality of data memory locations for storing received meter data, wherein the stored application program comprises:

groups of servicing instructions stored in the operational medium for executing respective servicing activities related to a plurality of customer accounts for customers of utility services which are metered;

communication instructions stored in the operational medium for transfer of received meter data from the modems to the memory locations for storing received meter data; and

means stored in the operational medium and operable with the microprocessor and the operational system program for executing the communications instructions and portions of the groups of servicing instructions in a time-interleaved and time-controlled execution cycle in which the received meter data is transferred from the modems to the data memory locations within the execution cycle of the application program while accomplishing periodic execution of the servicing activities over a plurality of execution cycles of the application program.

5,751,798

PASSIVE INFORMATION ACCESS SYSTEM

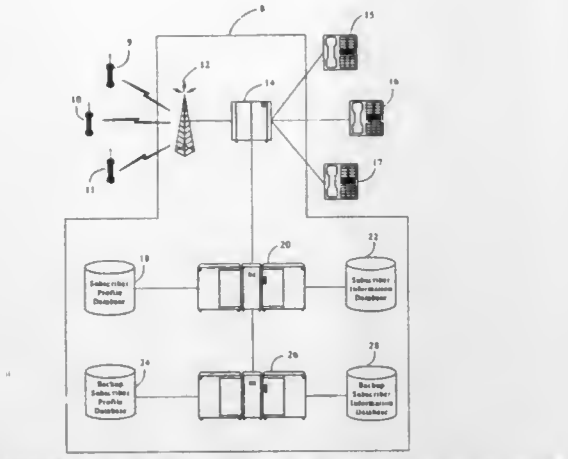
Inderpal Singh Mumick, Berkeley Heights, and Abraham Silberschatz, Summit, both of N.J., assignors to AT&T Corp., Middletown, N.J.

Filed Sep. 12, 1995, Ser. No. 527,241

Int. Cl.⁶ H04M *15/00*

U.S. Cl. 379—112 **20 Claims**

1. A passive information access system for use in a service subscription system having a service provider and at least one subscriber unit, said passive information system comprising:


8
9
10
11
12
14
15
16
17
18
Subscriber Profile Database
20
22
Subscriber Information Database
24
Backup Subscriber Profile Database
26
28
Backup Subscriber Information Database

a database for storing subscriber information specific to said at least one subscriber unit;

detecting means for detecting at least one initialization signal from said at least one subscriber unit when said at least one subscriber unit is activated;

identifying means for identifying said at least one activated subscriber unit from said at least one detected initialization signal;

accessing means for accessing from said database subscriber information specific to said at least one identified activated subscriber unit; and

presenting means for presenting at least a portion of said accessed subscriber information to said at least one identified activated subscriber unit substantially upon activation of said at least one identified subscriber unit.

5,751,799

METHOD AND DEVICE FOR CHARGING DURING DATA COMMUNICATION TIME IN A DATA SWITCHING NETWORK

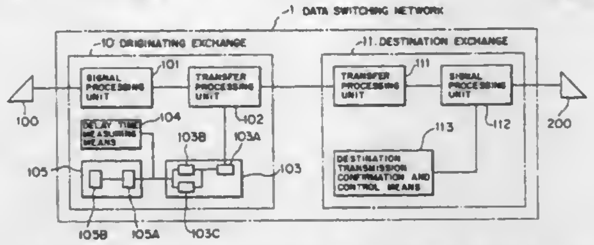
Atuko Mori, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 280,188, Jul. 25, 1994, abandoned. This application May 21, 1996, Ser. No. 651,121

Claims priority, application Japan, Feb. 17, 1994, 6-020630

Int. Cl.⁶ H04M *15/00*

U.S. Cl. 379—114 **37 Claims**



1. A method for charging during data communication in a data switching network, comprising the steps of:

measuring a data communication delay time at an originating node when said originating node receives transmission completion report information from a receiving node, said data communication delay time having elapsed to transmit data from said originating node to said receiving node; and

setting a different charging index in accordance with said data communication delay time to perform a charging operation at said originating node.

5,751,800

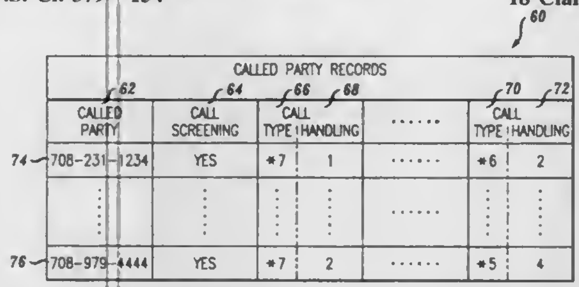
SCREENING OF INCOMING TELEPHONE CALLS PRIOR TO CALL COMPLETION TO THE DESTINATION PARTY

Menachem Tsur Ardon, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 15, 1995, Ser. No. 572,956

Int. Cl.⁶ H04M *15/00;3/00*

U.S. Cl. 379—134 **18 Claims**


60
62
64
66
68
70
72
74
76

CALLED PARTY RECORDS

CALLED PARTY	CALL SCREENING	CALL TYPE	CALL HANDLING	......	CALL TYPE	CALL HANDLING
708-231-1234	YES	*7	1	......	*6	2
⋮	⋮	⋮	⋮	......	⋮	⋮
708-979-4444	YES	*7	2	......	*5	4

1. A method for processing incoming telephone calls comprising the steps of:

receiving at a destination telecommunication switch a request to establish a call to a first customer's line coupled to the switch;

said request including call type data identifying the party originating the request as one of a plurality of predetermined call categories, said call type data not derived from a telephone number associated with the originating party;

reading a first record associated with the first line in a first database, said first record having at least one set of data including first data defining a first call category and second data determinative of processing of the incoming call identified as the first call category;

processing the incoming call at the switch as determined by said second data if the one call category of the incoming call is equal to the first call category.

5,751,801

CHARGING MEMBER WITH SURFACE LAYER COMPRISING POLYMERS, AND IMAGE FORMING APPARATUS USING THE SAME

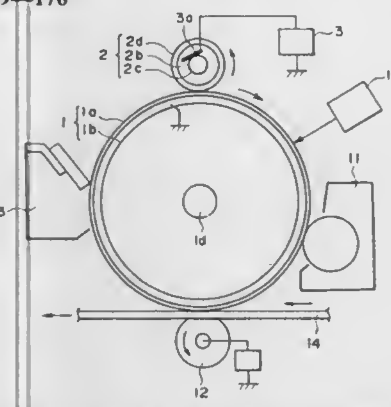
Jun Murata, Kawagoe; Naoki Shirai, Koshigaya; Yoshiaki Nishimura, Tokyo; Yuzi Ishihara; Kiyoshi Mizoe, both of Kawasaki, and Tsunenori Ashibe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 451,765, May 26, 1995, abandoned. This application Jul. 16, 1997, Ser. No. 895,547

Claims priority, application Japan, May 30, 1994, 6-116722

Int. Cl.⁶ G03G *15/02*

U.S. Cl. 399—176 **24 Claims**



1. A charging member, having a surface layer comprising a resin comprising a rigid polymer, and a plasticizing polymer for plasticizing the rigid polymer chemically bonded to the rigid polymer.

5,751,802

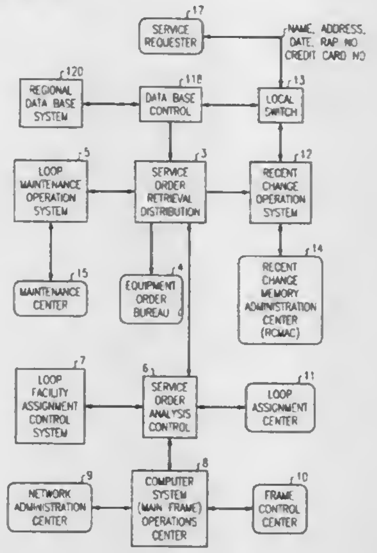
TELECOMMUNICATIONS SERVICE PROVISIONING

Richard Gregory Carr, 38 W. 810 Deer Run Dr., St Charles, Ill. 60175, and Francis Joseph Pope, III, 2509 Braddock Dr., Naperville, Ill. 60565

Continuation of Ser. No. 627,326, Apr. 4, 1996, abandoned, which is a continuation of Ser. No. 364,650, Dec. 27, 1994, abandoned. This application Feb. 3, 1997, Ser. No. 794,129

Int. Cl.⁶ H04M *3/42*

U.S. Cl. 379—201 **5 Claims**


17
SERVICE REQUESTER
NAME, ADDRESS, DATE, RAP NO CREDIT CARD NO
120
REGIONAL DATA BASE SYSTEM
118
DATA BASE CONTROL
13
LOCAL SWITCH
5
LOOP MAINTENANCE OPERATION SYSTEM
3
SERVICE ORDER RETRIEVAL DISTRIBUTION
12
RECENT CHANGE OPERATION SYSTEM
15
MAINTENANCE CENTER
4
EQUIPMENT ORDER BUREAU
14
RECENT CHANGE MEMORY ADMINISTRATION CENTER (RCMAC)
7
LOOP FACILITY ASSIGNMENT CONTROL SYSTEM
6
SERVICE ORDER ANALYSIS CONTROL
11
LOOP ASSIGNMENT CENTER
9
NETWORK ADMINISTRATION CENTER
8
COMPUTER SYSTEM (MAIN FRAME) OPERATIONS CENTER
10
FRAME CONTROL CENTER

1. In a telecommunications system including a switching system serving a plurality of calling stations, a method of provisioning determined set of subscriber-desired telecommunications services, comprising the steps of:

providing, to at least one subscriber wishing to newly activate service for at least one calling station, human-intelligible documentary information descriptive of different sets of available subscriber-desired telecommunications services;

establishing a connection between said one calling station and said switching system, said connection being established by transmitting a telephone number dialed from said one calling station where said telephone number identifies and provides access to a means in said switching system for provisioning said different sets of services, said means accessible to all calling stations having access to said switching system;

transmitting prompts from said switching system to said one calling station to solicit a response from said one subscriber at said one calling station indicative of a desired set of services described in the documentary information provided to said one subscriber;

entering data at said one calling station in response to said prompts specifying said desired set of services to be provisioned, said data comprising an identifying indicator, obtained by the subscriber from the documentary information, specifying said desired set of services;

transmitting said data to a service order provisioning system;

processing said data for generating a service order; and

automatically initiating steps to provide said desired set of services to said one calling station.

5,751,803

TELEPHONE LINE COUPLER

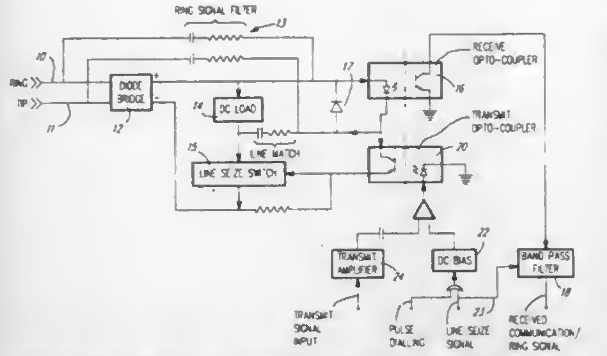
Pinhas Shpater, Quebec, Canada, assignor to Shmuel Hershkovit, Quebec, Canada

Filed Nov. 8, 1995, Ser. No. 555,042

Int. Cl.⁶ H04M *1/00*

U.S. Cl. 379—379 **4 Claims**

1. A telephone line coupler circuit for connecting telephone subscriber equipment to a telephone line, the circuit comprising:



ring and tip connector means for connecting to telephone line ring and tip contacts and providing ring and tip signal outputs;

a high impedance DC load and a gated line switch connected in series between said ring and tip signal outputs for controllably conducting an "off-hook" current between said ring and tip signal outputs;

a transmit opto-coupler means having a transmit signal input and output;

means for connecting said transmit signal output to said tip output and to a gate input of said gated line switch;

means for controllably providing a low level DC bias signal to said transmit signal input and generating sufficient current on said transmit signal output to substantially saturate said gated line switch and seize said telephone line;

means for providing an outgoing AC signal to said transmit signal input; and

AC signal receive means connected to said ring and tip outputs for detecting an incoming AC signal and producing an incoming AC signal output.

5,751,804

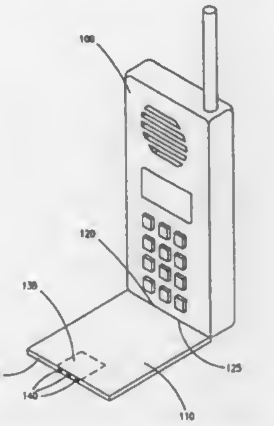
AUDIO INPUT FOR FLIP TYPE TELEPHONES

Gregory S. Mendolia, Forest, Va., assignor to Ericsson, Inc., Research Triangle Park, N.C.

Filed Oct. 30, 1996, Ser. No. 742,817

Int. Cl.⁶ H04M ***1/00***

U.S. Cl. 379—433 **2 Claims**



1. An audio input for a telephone comprising:

a rectangular flip attached to the telephone, the flip having a plurality of openings on an outside edge of the flip to allow sound to enter the flip, wherein the outside edge of the flip is perpendicular to an inside face of the flip; and

a microphone located within the flip to pick up sound entering the flip through the plurality of openings.

5,751,805

DATA-PROTECTING SYSTEM

Kazunori Otsuki, Yokohama, and Shinichirou Watanabe, Tokyo, both of Japan, assignors to Kabushiki Kaisya Advance, Tokyo, Japan

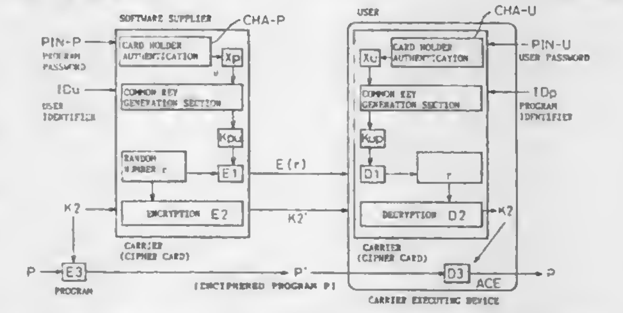
PCT No. PCT/JP95/00796, § 371 Date Dec. 20, 1995, § 102(e) Date Dec. 20, 1995, PCT Pub. No. WO95/29438, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 21, 1995, Ser. No. 564,262

Claims priority, application Japan, Apr. 22, 1994, 6-106316

Int. Cl.⁶ H04L ***9/16***

U.S. Cl. 380—4 **3 Claims**



1. A data-protecting system comprising a center, a program supplier and a user, wherein:

the center produces a special algorithm held secretly only by the center; applies the special algorithm to a user identifier and a program dividable into a plurality of loadable modules to produce a secret algorithm exclusive to the program and the user; and supplies the produced secret algorithm to the user and program supplier;

the program supplier produces a first encryption key using the user identifier and the secret algorithm; encrypts a second encryption key using the first encryption key; encrypts one module of the plurality of loadable modules to form an encrypted program; produces an installation program using a program identifier and the encrypted second encryption key, wherein the installation program produces, only when the encrypted module in the encrypted program is executed, a common key using the program identifier and the secret user algorithm to produce a loader for decrypting the encrypted program; and supplies the user with the program identifier, the encrypted second encryption key, the encrypted program, and the installation program; and

the user causes the supplied installation program to be operated by its own program execution means to cause the installation program to install the encrypted program and produce the loader; operates the loader when the encrypted module of the encrypted program is executed by the program execution means to produce a common key by using the program identifier and the secret user algorithm to decrypt the encrypted second encryption key; and decrypts the program by using the decrypted second encryption key.

5,751,806

AUDIO INFORMATION DISSEMINATION USING VARIOUS TRANSMISSION MODES

John O. Ryan, Cupertino, Calif., assignor to Command Audio Corporation, Redwood City, Calif.

Division of Ser. No. 181,394, Jan. 12, 1994, Pat. No. 5,590,195, which is a continuation-in-part of Ser. No. 31,763, Mar. 15, 1993, Pat. No. 5,406,626. This application Dec. 18, 1996, Ser. No. 769,092

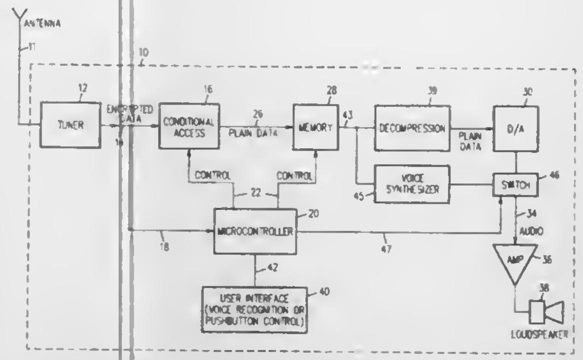
Int. Cl.⁶ H04L ***9/00;*** **H04B** ***1/06***

U.S. Cl. 380—9 **28 Claims**

28. A system for information dissemination to transmit audio data comprising:

a data producing sub-system for converting analog audio information to digital data and producing an associated database with menus;

a data compressor for compressing the encrypted audio data;



an encryptor for encrypting the digital audio data;

an inserter for inserting the compressed encrypted digital audio data into a transmission channel;

a receiver for receiving the transmitted compressed encrypted digital audio data;

a memory for storing the selected data in the database;

means for providing a set of menus to a user describing the database, and means for updating the data in the database;

a controller for selecting data from the database and providing the selected data in the encrypted compressed digital form;

a decryptor for decrypting the encrypted compressed digital audio data;

a decompressor for decompressing the compressed digital audio data; and

a converter for converting the digital audio data to analog audio data representing the analog audio information.

5,751,807

Patent Not Issued For This Number

5,751,808

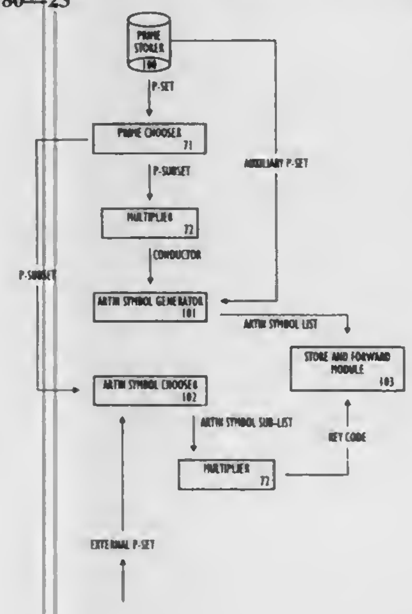
MULTI-PURPOSE HIGH SPEED CRYPTOGRAPHICALLY SECURE SEQUENCE GENERATOR BASED ON ZETA-ONE-WAY FUNCTIONS

Michael M. Anshel, 1140 Fifth Ave. Apt. C, New York, N.Y. 10128, and Dorian Goldfeld, 31 Peter Lynas Ct., Tenafly, N.J. 06760

Continuation of Ser. No. 400,928, Mar. 9, 1995, Pat. No. 5,577,124. This application Nov. 19, 1996, Ser. No. 752,033

Int. Cl.⁶ H04L ***9/32;9/00;*** **G06F** ***7/58;*** **G07C** ***15/00***

U.S. Cl. 380—23 **13 Claims**



2. A real time authentication system comprising:

a zeta one-way pseudorandom number generator responsive to an input key and an input parameter to generate a primary zeta code;

a zeta code transformer responsive to said zeta one-way pseudorandom number generator to generate variety generation parameters;

a variety generator responsive to said zeta code transformer variety generation parameters and connected to a zeta function coefficient generator;

an announcer responsive to an output of said zeta function coefficient generator generating secondary zeta code;

means for transmitting parameters specifying said variety;

means for incrementing said input parameter.

5,751,809

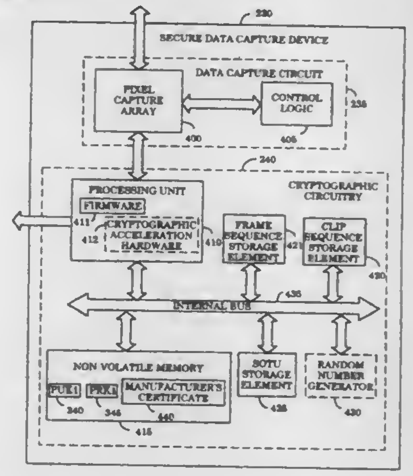
APPARATUS AND METHOD FOR SECURING CAPTURED DATA TRANSMITTED BETWEEN TWO SOURCES

Derek L. Davis, Phoenix, Ariz., and Peter Jones, San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 538,189, Sep. 29, 1995, abandoned. This application Feb. 4, 1997, Ser. No. 795,452

Int. Cl.⁶ H04K ***1/00***

U.S. Cl. 380—23 **46 Claims**



1. A semiconductor device comprising:

sensing means for capturing a data clip; and

cryptographic means, coupled to said sensing means, for preserving integrity of said data clip, said cryptographic means includes

storage means for storing a unique key pair, a running hash value and a State value,

processor means for performing operations on said data clip to establish that said data clip was captured after publication of said State value prior to said running hash value undergoing a time-stamping operation, and

bus means for enabling said processor means to communicate with said storage means, said bus means being coupled to said processor means and said storage means.

5,751,810
BIT AGITATOR

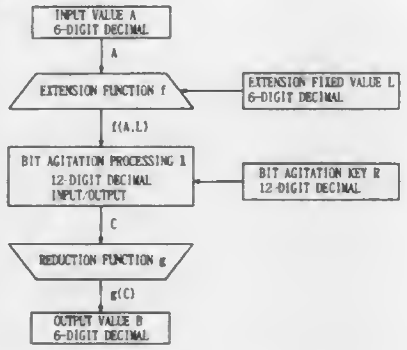
Atsuko Miyaji, Kawachinagano; Motoji Omori, Osaka, and Makoto Tatebayashi, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 7, 1995, Ser. No. 511,851

Claims priority, application Japan, Aug. 8, 1994, 6-185958

Int. Cl.^{6} H04L *9/28;9/00*

U.S. Cl. 380—28 **36 Claims**



1. A bit agitator for bit-agitating an n-digit decimal input value A $(0 \leqq A \leqq 10^n-1)$ thereby obtaining an m-digit decimal output value B $(0<B<10^m-1)$, said bit agitator comprising:

a central processing unit, an input means for inputting said input value A to said central processing unit:

extension means for converting said input value A to an extended value f(A,L) by substituting said input value A and a previously prepared extension fixed value L in an extension function f;

bit agitation means for obtaining a value C by bit-agitating said extended value f(A,L) being obtained by said extension means, with a bit agitation key;

reduction means for obtaining said m-digit decimal output value B by substituting said value C in a reduction function g; and

output means for enabling the transmission of said m-digit decimal output value B to a certification unit for comparison with a certification response value.

5,751,811
32N +D BIT KEY ENCRYPTION-DECRYPTION SYSTEM USING CHAOS

Joseph C. Magnotti, and Larry A. Nelson, both of 1909 S.E. 4th Ave., Fort Lauderdale, Fla. 33316

Continuation-in-part of Ser. No. 521,522, Aug. 30, 1995, abandoned. This application Nov. 26, 1996, Ser. No. 756,047

Int. Cl.^{6} H04L *9/28;9/00*

U.S. Cl. 380—28 **37 Claims**

1. A method of encryption comprising the steps of;

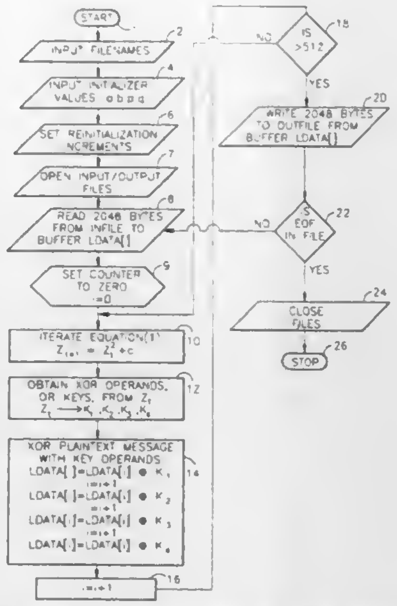
a) selecting four initializer values which are used to generate n chaotic iterates from a chaotic equation, where n is the lifetime of the chaotic equation, and wherein said chaotic equation is $z_{i+1}=z_i^2+c$, where z and c are complex numbers;

b) generating two chaotic iterates from said chaotic equation;

c) converting the two chaotic iterates into a predetermined number of chaotic keys;

d) encrypting a block of plaintext message as a block of ciphertext based on one of said chaotic keys;

e) repeating step d) until a predetermined number of blocks of plaintext message have been encrypted with one each of said chaotic keys;



f) repeating steps b) through e) until the entire plaintext message is encrypted as ciphertext.

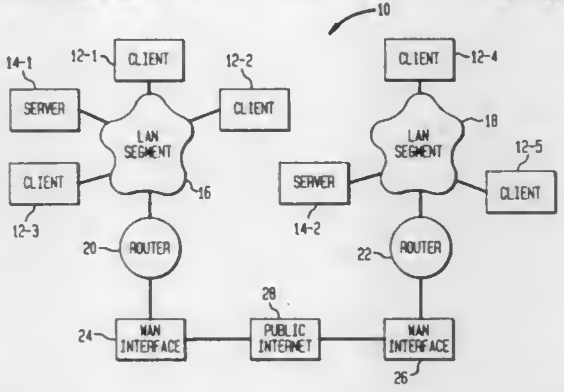
5,751,812
RE-INITIALIZATION OF AN ITERATED HASH FUNCTION SECURE PASSWORD SYSTEM OVER AN INSECURE NETWORK CONNECTION

Milton M. Anderson, Fairhaven, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Filed Aug. 27, 1996, Ser. No. 702,916

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—48 **24 Claims**



1. A method of communicating over a transmission medium using an iterated hash function, the method comprising the steps of:

determining that a first series of communications based on a first password has reached a predetermined minimum number of remaining hash function iterations;

generating an initialization signal relating the first series of communications based on the first password to a second series of communications to be based on a second password, wherein the initialization signal is generated as a function of the results of applying a first number of hash function iterations to the first password and a second number of hash function iterations to the second password; and

transmitting the initialization signal over the medium prior to commencing the second series of communications.

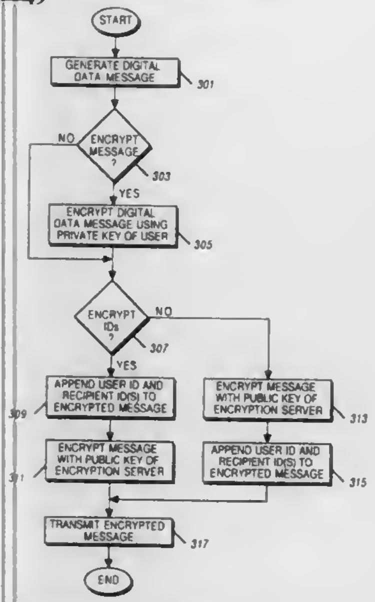
5,751,813
USE OF AN ENCRYPTION SERVER FOR ENCRYPTING MESSAGES

David Dorenbos, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1996, Ser. No. 639,457

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—49 **34 Claims**


START
GENERATE DIGITAL DATA MESSAGE
301
ENCRYPT MESSAGE ?
303
NO
YES
ENCRYPT DIGITAL DATA MESSAGE USING PRIVATE KEY OF USER
305
ENCRYPT IDs ?
307
NO
YES
APPEND USER ID AND RECIPIENT ID(S) TO ENCRYPTED MESSAGE
309
ENCRYPT MESSAGE WITH PUBLIC KEY OF ENCRYPTION SERVER
311
ENCRYPT MESSAGE WITH PUBLIC KEY OF ENCRYPTION SERVER
313
APPEND USER ID AND RECIPIENT ID(S) TO ENCRYPTED MESSAGE
315
TRANSMIT ENCRYPTED MESSAGE
317
END

1. A method comprising the steps of:

at a communication unit operated by a user:

- generating a digital data message;
- encrypting the digital data message using a first key, yielding a first encrypted message;
- appending an identification of the user and an identification of a first recipient to the first encrypted message, yielding an appended first encrypted message;
- encrypting the appended first encrypted message using a second key, yielding a second encrypted message;
- transmitting the second encrypted message to an encryption server;
- at the encryption server:
  - receiving the second encrypted message;
  - decrypting the second encrypted message using a third key, yielding the appended first encrypted message;
  - determining the first encrypted message, the identification of the user, and the identification of the first recipient from the appended first encrypted message;
  - encrypting the first encrypted message and the identification of the user with a fourth key, yielding a third encrypted message;
  - transmitting the third encrypted message to the first recipient.

5,751,814
FILE ENCRYPTION METHOD

Oded Kafri, Beer Sheva, Israel, assignor to Veritas Technology Solutions Ltd., Beer Sheva, Israel

Filed Jun. 25, 1996, Ser. No. 672,324

Claims priority, application Israel, Jun. 27, 1995, 114361

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—49 **9 Claims**

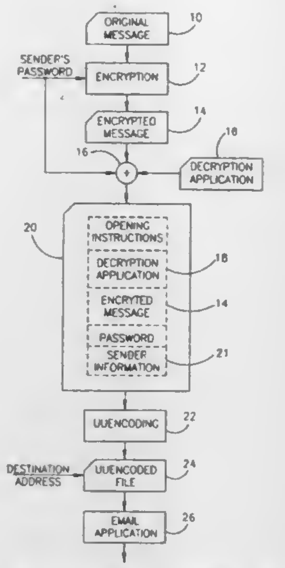
1. A method for transmitting and receiving encrypted messages, the method comprising the steps of:

a. encrypting the text of the message to be sent;

b. concatenating the encrypted text and a password to the end of a decryption application to produce a combined file;

c. converting the combined file to an electronic mail format;

d. transmitting and receiving the converted combined file:



e. reconverting the converted combined file to its previous format; and

f. executing the combined file thereby to operate the decryption application on the encrypted text and thereby to produce the text of the message.

5,751,815
APPARATUS FOR AUDIO SIGNAL STEREOPHONIC ADJUSTMENT

Adam Rupert Philp, Ealing; Alastair Sibbald, Maidenhead; Richard David Clemow, Gerrards Cross, and Fawad Nackvi, Southall, all of England, assignors to Central Research Laboratories Limited, Middlesex, England

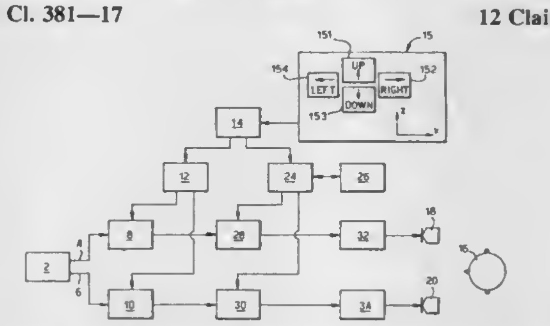
PCT No. PCT/GB94/02756, § 371 Date Jun. 21, 1996, § 102(e) Date Jun. 21, 1996, PCT Pub. No. WO95/17799, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 16, 1994, Ser. No. 663,317

Claims priority, application United Kingdom, Dec. 21, 1993, 9326092

Int. Cl.^{6} H04R *5/00*

U.S. Cl. 381—17 **12 Claims**



1. Audio signal adjustment apparatus including left and right signal channels for connection to respective left and right sound transducers, means within each channel for adjusting signal parameters for varying the stereophonic effect produced by the transducers, such adjusting means including azimuthal adjustment means for adjusting the stereophonic effect in dependence on the azimuthal orientation (θ) of the facing direction (D) of a listener's head in relation to a reference plane containing the listener's head and the sound transducers, the azimuthal adjustment means including a filter means with a transfer function adjustable in dependence on a set of stored items of information relating to binaural head-related transfer functions representing predetermined angles of said azimuthal orientation, and user operable means for selecting a desired item for modification of the filter transfer function,

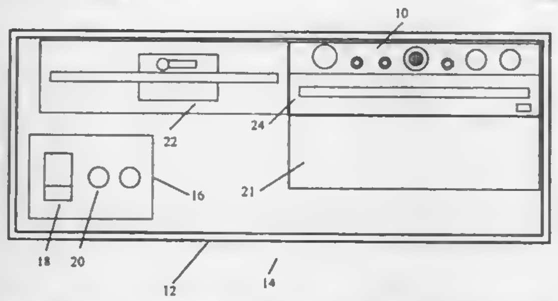
wherein the stored items represent functions at ±12.5°, ±25° from the reference plane.

5,751,816
AUDIO POWER AMPLIFIER DEVICE FOR MICRO-COMPUTERS

Albert R. Howard, 1010 Rockrose Ave., Sunnyvale, Calif. 94086

Filed Oct. 19, 1995, Ser. No. 545,159
Int. Cl.⁶ H04R *5/00*

U.S. Cl. 381—24 **7 Claims**



1. In a micro-computer that includes a central processing unit, a compact disc read only memory drive coupled to the central processing unit, audio signal generating circuitry coupled to the central processing unit, the audio circuitry adapted to provide a line-level audio signal, and an internal power source providing power to the central processing unit, the compact disc drive, and the audio circuitry, an amplification device for amplifying the audio signal from the audio circuitry comprising:

a unitary housing retaining an audio signal power amplification device and said compact disc drive, said housing adapted to be retained in a 5.25 inch drive bay of said micro-computer, said amplification device comprising;

first and second input means coupled to said audio circuitry for receiving the line-level audio signal therefrom,

frequency response contouring means is coupled to said input means for adjusting the frequency response of said line-level audio signal, said contouring means controlling the response of a plurality of frequency bandwidths of said line-level audio signal centered about a plurality of predetermined frequencies of said audio signal passing through said contouring means,

power level adjusting means coupled to said frequency response contouring means for adjusting the power level of a frequency contoured audio signal generated by said frequency response contouring means, and

at least one amplification means coupled to said adjusting means for amplifying the power level of an adjusted audio signal from said adjusting means to provide an amplified audio signal;

audio output means for coupling said amplified audio signal to a plurality of loudspeakers, each of said loudspeakers providing an audible sound level indicative of the level of the amplified audio signal provided by said amplification means and adjusted by said adjusting means;

connecting means for connecting said amplification device to said compact disc drive, said connecting means coupling said amplification device to said power source;

line-input means secured on a front panel of said housing and a line-output means coupled to said line-input means, said line-input and output means providing a facile access location for coupling a remote audio device to said audio circuitry; and

a microphone input on a front panel of said housing and a microphone output coupled to said input, said microphone output coupling to a microphone input of said audio circuitry for providing a facile access location for coupling a remote microphone to said audio circuitry; and

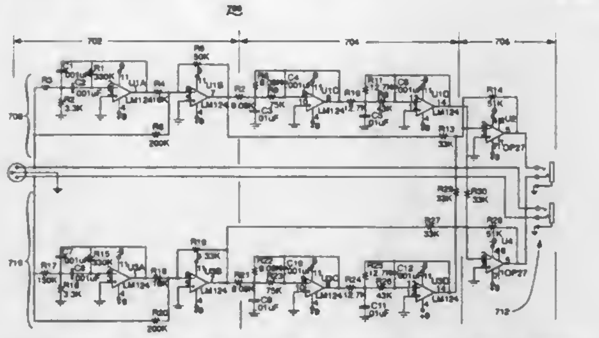
a microphone secured to said front panel and coupled to said microphone output, said microphone provided for capturing audio information necessary for voice driven software running on said computer.

5,751,817
SIMPLIFIED ANALOG VIRTUAL EXTERNALIZATION FOR STEREOPHONIC AUDIO

Douglas S. Brungart, 23 Hampshire St, Apt 5, Salem, N.H. 03079

Filed Dec. 30, 1996, Ser. No. 775,230
Int. Cl.⁶ H04R *5/02*

U.S. Cl. 381—25 **17 Claims**



1. Externalized stereophonic audio virtual signal source apparatus comprising the combination of:

a first audio frequency signal-processing channel having a first analog ear frequency response-simulating pinna related filter element coupled to a first stereophonic signal input node of said apparatus and a first analog Bessel filter signal delay element coupled to an output node of said first ear frequency response simulating analog pinna related filter element; and

a second audio frequency signal-processing channel having a second analog ear frequency response-simulating pinna related filter element coupled to a second stereophonic signal input node of said apparatus and a second analog Bessel filter signal delay element coupled to an output node of said second ear frequency response simulating analog pinna related filter element;

said first audio frequency signal-processing channel further including a first signal summing output signal generator element having one input connected also with an output node of said first analog ear frequency response simulating filter element, another input connected with an output node of said second analog Bessel filter delay element and having an output signal path connected to a first output node of said audio frequency signal-processing channel; and

said second audio frequency signal-processing channel further including a second signal summing output signal generator element having one input connected also with an output node of said second analog ear frequency response simulating filter element, another input connected with an output node of said first analog Bessel filter delay element and having an output signal path connected to a second output node of said audio frequency signal-processing channel.

5,751,818
CIRCUIT SYSTEM FOR SWITCHING LOUDSPEAKERS

Jonathan Gertz, Lexington; Mark S. Butcher, Paris, and James M. Tuomy, Lexington, all of Ky., assignors to Audio Authority Corporation, Lexington, Ky.

Continuation-in-part of Ser. No. 583,328, Jan. 5, 1996, abandoned. This application Sep. 5, 1996, Ser. No. 708,515
Int. Cl.⁶ H03G *3/20;* **H04R** *27/00*

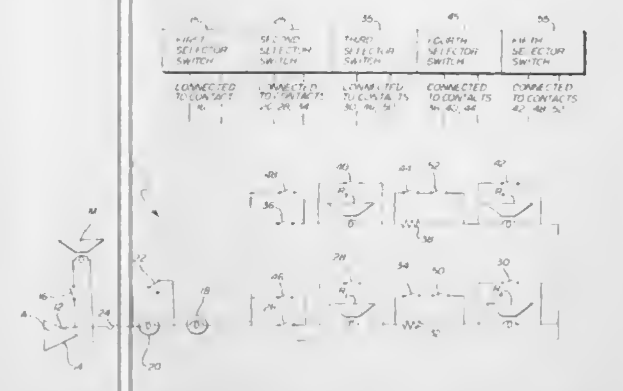
U.S. Cl. 381—55 **13 Claims**

1. A circuit system for selectively switching between main and remote loudspeakers, powered by an amplifier comprising:

a pair of input terminals for applying an input audio signal to said main and remote loudspeakers;

a first switch contact in series with said main loudspeakers for selectively applying said input audio signal to said main loudspeakers;

a second switch contact in series with said remote loudspeakers for selectively applying said input audio signal to said remote loudspeakers; and



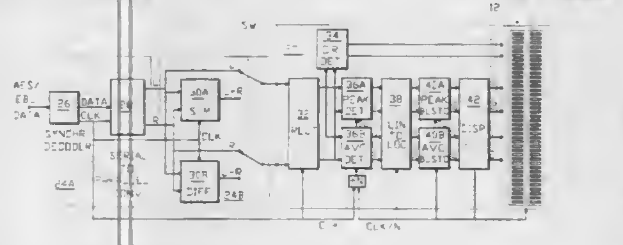
a first current-dependent resistance element between said amplifier and said remote loudspeakers in series only with said remote loudspeakers for automatically compensating for changes in input audio signal load and protecting said remote loudspeakers from overdrive.

5,751,819
LEVEL METER FOR DIGITALLY-ENCODED AUDIO

Michael L. Dorrough, 5221 Collier Pl., Woodland Hills, Calif. 91364

Filed Jul. 24, 1995, Ser. No. 506,391
Int. Cl.⁶ H04R *29/00*

U.S. Cl. 381—56 **18 Claims**



1. An audio level meter instrument comprising:

an input electronic processing circuit, receiving an input digital audio signal in serial format representing data of a stereophonic audio signal sampled at a predetermined sampling rate, constructed and arranged to derive therefrom an L signal representing left channel audio data and an R signal representing right channel audio data;

a sum processing circuit, receiving as input the L signal and the R signal, constructed and arranged to provide as output an L+R signal representing an instantaneous sum of the R and L signals;

a display signal processor, receiving as input a subject signal, selected from a group including the L signal, the R signal and the L+R signal, constructed and arranged to process the subject signal in a manner to provide a logarithmic average display drive signal and a logarithmic peak display drive signal, having respective predetermined different ballistic properties;

rectifier electronic processing circuitry means, in said display signal processor and receiving the subject signal, constructed and arranged to act thereupon to apply full-wave rectification to audio data of the subject signal and to thus provide as output a rectified signal representing the audio data of the subject signal in rectified form;

a display drive electronic processing circuit, in said display signal processor and receiving as input the rectified signal, constructed and arranged to act thereupon in a manner to provide as output, an average logarithmic ballistically-conditioned display driving signal representing guasi-average amplitude values of the rectified signal and a peak logarithmic ballistically-conditioned display driving signal representing peak amplitude values of the rectified signal, the two display driving signals being applied to said electronic display device in a manner to enable simultaneous display of quasi-average and peak levels in a co-related and distinguishable manner along a common meter scale;

a digital average detecting process circuit, in said display drive electronic processing circuit and receiving as input the detected signal, constructed and arranged to monitor successive average groups of data thereof each average group containing a predetermined number of audio data samples and to provide therefrom a digital average signal representing the average amplitude of audio data samples contained in each average group;

linear-to-logarithmic conversion means, in said display drive electronic processing circuit and receiving as input the average signal, constructed and arranged to convert linear data of the average signal to logarithmic average data;

a digital average ballistics process circuit, in said display drive electronic processing circuit and receiving as input the logarithmic average data, constructed and arranged to impose a predetermined rise and fall times upon said logarithmic average data and to thus provide the logarithmic ballistically-conditioned average signal;

an electronic display device, receiving as input the display drive signals, constructed and arranged to visually display independent average and peak representations of audio data of the subject signal; and

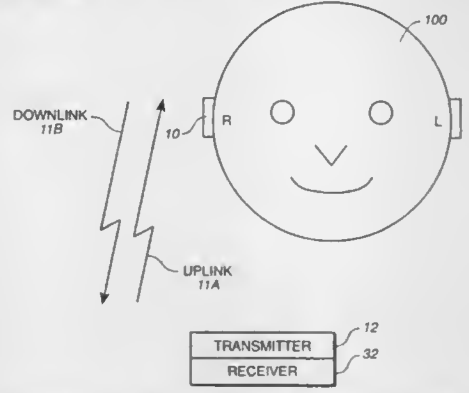
display drive circuit means, in said display drive electronic processing circuit and receiving as input the ballistically-conditioned average signal, constructed and arranged to operate said display device in a manner to provide a visual logarithmic ballistically-conditioned average display of the subject signal.

5,751,820
INTEGRATED CIRCUIT DESIGN FOR A PERSONAL USE WIRELESS COMMUNICATION SYSTEM UTILIZING REFLECTION

Jon C. Taenzer, Los Altos, Calif., assignor to ReSound Corporation, Redwood City, Calif.

Filed Apr. 2, 1997, Ser. No. 832,573
Int. Cl.⁶ H04R *25/00*

U.S. Cl. 381—68 **15 Claims**



1. An integrated circuit chip set for a personal two-way wireless communication system including a transmitter, a receiver, and a transceiver, said communication system having a first non-reflective mode of operation wherein said transmitter transmits a modulated uplink signal representing a first set of digitized signals to said transceiver and having a second reflective mode of operation wherein said transceiver transmits a modulated downlink signal representing a second set of digitized signals to said receiver, said chip set comprising:

at least two integrated circuit chips including:

a transmitter integrated circuit portion for transmitting said modulated uplink signal to said transceiver during said first mode and for transmitting an unmodulated signal to said transceiver during said second mode;

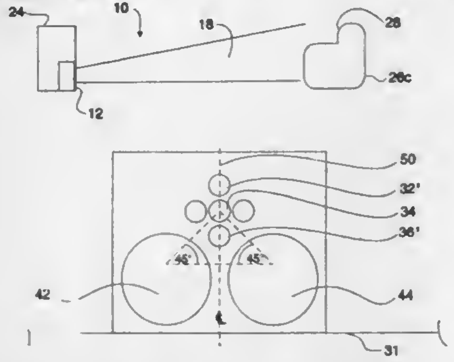
a receiver integrated circuit portion having a receiver non-receive state and a receiver receive state in which said receiver is receiving said modulated downlink signal from said transceiver, wherein said receiver circuit portion switches from said non-receive state to said receive state in a first minimum time interval;

a transceiver integrated circuit portion for, in a transceiver receive state, receiving said uplink signal from said transmitter and in a transceiver transmit state for receiving and simultaneously modulating said unmodulated signal so as to generate and transmit said modulated downlink signal to said receiver, wherein said transceiver circuit portion switches from said transceiver transmit state to said transceiver receive state in a second minimum time interval and switches from said transceiver receive state to said transceiver transmit state in a third minimum time interval;

wherein said first, second, and third minimum time intervals have a duration such that said system operates essentially as a full duplex system as perceived by a system user.

5,751,821
SPEAKER SYSTEM WITH RECONFIGURABLE, HIGH-FREQUENCY DISPERSION PATTERN

David L. Smith, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.
Filed Oct. 28, 1993, Ser. No. 141,369
Int. Cl.^{6} H04R *5/00*
U.S. Cl. 381—90 **22 Claims**



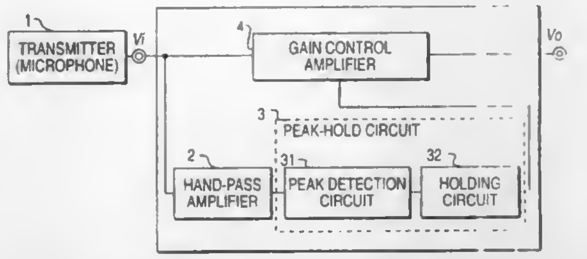
1. An audio frequency sound source comprising:
- a) a low-frequency speaker unit having a plane;
- b) a directional, high-frequency speaker unit, said high-frequency speaker unit having two predetermined, distinct radiation patterns, one in the horizontal plane and one in the vertical plane; and
- c) means operatively connected to said high-frequency speaker unit for reorientation thereof substantially in said low frequency speaker unit lane, with respect to said low-frequency speaker unit.

5,751,822
AMBIENT NOISE SUPPRESSION CIRCUIT

Noboru Yamaguchi, Yokohama, and Masao Konomi, Tokyo, both of Japan, assignors to Pan Communications, Inc., Tokyo, Japan
Filed Apr. 18, 1994, Ser. No. 229,087
Claims priority, application Japan, Jan. 18, 1994, 6-016920
Int. Cl.^{6} H04R *1/00;* H03G *5/00;9/00;3/00*
U.S. Cl. 381—94.1 **7 Claims**

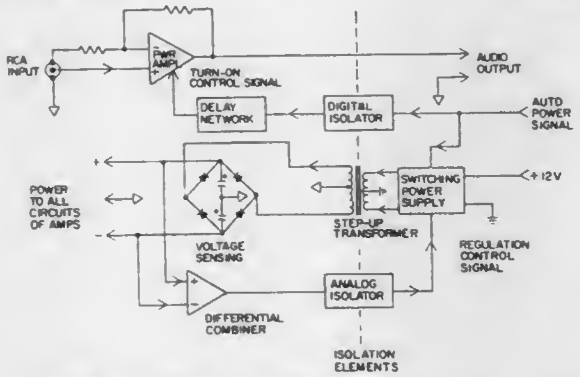
1. An ambient noise suppression circuit for a hands-free voice communication terminal comprising a microphone, means for positioning the microphone for hands-free operation, a gain control amplifier receiving a signal from the microphone, and a peak-hold circuit that comprises:
- (i) a band-pass amplifier that amplifies a specified frequency range of audio output signals of said microphone,
- (ii) a peak detection circuit that produces signals related to the peak amplitude of output signals of the said band-pass amplifier, and
- (iii) a holding circuit that holds the amplitude of the produced signals of said peak detection circuit without significant reduction for a specified period of time and produces a peak-hold output signal; and

wherein the peak-hold output signal is applied solely and directly to control gain of said gain control amplifier in direct relation to the peak-hold output signal.



5,751,823
AUDIO AMPLIFIER SYSTEM WITH IMPROVED ISOLATION BETWEEN PREAMPLIFIER AND POWER AMPLIFIER

James C. Strickland, and Mark D. Albers, both of Mesa, Ariz., assignors to Rockford Corporation, Tempe, Ariz.
Filed Jan. 5, 1996, Ser. No. 582,367
Int. Cl.^{6} H04B *15/00;* H03F *3/04*
U.S. Cl. 381—94.6 **7 Claims**



1. An audio amplifier comprising:

a preamplifier means for amplifying an input signal to provide a preamplified signal, said preamplifier means including a preamplifier ground;

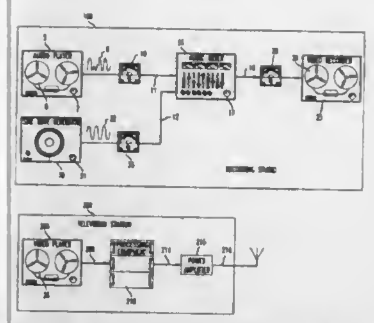
a power amplifier means for amplifying the preamplified signal to provide an output signal, said power amplifier means including a power amplifier ground, said preamplifier ground being isolated from said power amplifier ground;

a voltage regulator means for supplying regulated voltage to said preamplifier means, said voltage regulator means being grounded to said preamplifier ground, said voltage regulator means including an output and a reference port, said output providing unity positive feedback to said reference port.

5,751,824
METHOD OF STABILIZING THE LEVEL OF AN AUDIO SIGNAL IN TELEVISION BROADCASTING

Robert B. Pladek, Middletown, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.
Filed Sep. 23, 1994, Ser. No. 311,648
Int. Cl.^{6} H03G *3/00*
U.S. Cl. 381—104 **8 Claims**

1. A method of controlling the level of an audio signal such that said level remains unchanged after being processed by particular transmission equipment which increases the level of an audio signal when the level is below a predetermined maximum allowable level, said method comprising the steps of



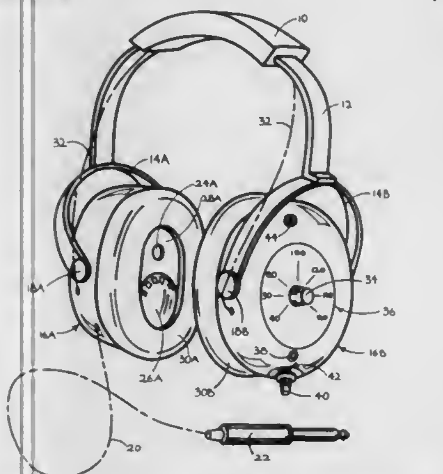
summing the audio signal with a stabilization signal having a predetermined frequency to form a composite audio signal, said stabilization signal having a level corresponding to said allowable level,

supplying the composite audio signal to said transmission equipment for processing such that said transmission equipment operates only on said stabilization signal as a result of said stabilization signal having said corresponding allowable level, and then forwards the processed signal to a band-limiting function to remove the stabilization signal from the composite audio signal, and

outputting the audio signal for reception by particular receiving equipment.

5,751,825
COMBINATION ELECTRONIC METRONOME AND HEADPHONE UNIT

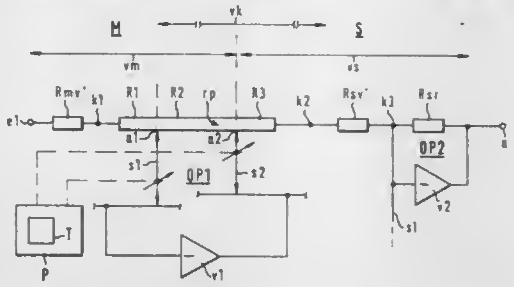
Robert A. Myers, 6034 Vantage Ave., N. Hollywood, Calif. 91606; Lara L. Greenamyer, 5921 Colbath, Van Nuys, Calif. 91407, and Robert J. Kasha, 9246 Geyser Ave., Northridge, Calif. 91324
Filed Aug. 19, 1994, Ser. No. 292,581
Int. Cl.^{6} G01G *7/00*
U.S. Cl. 381—118 **7 Claims**



1. A headphone unit comprising left and right earcups connected by a headband, an electronic metronome housed in said headphone unit, transducer means for providing audible tempo signals produced from said electronic metronome and housed in said headphone unit, transducer means for providing acoustical reproduction of an electronic audio input signal housed in said headphone unit, cord means connected to said headphone unit providing said audio input signal from an independent source, power supply means fully contained in said headphone unit to actuate said electronic metronome, adjustable means mounted to said headphone unit for increasing and decreasing the volume of said audible tempo signals, adjustable means mounted to said headphone unit altering the speed and or rhythm of said audible tempo signals, adjustable on and off means mounted to said headphone unit to activate and deactivate said electronic metronome, and adjustable means mounted to said headphone unit for increasing and decreasing the volume of said audio input signal.

5,751,826
MONOLITHICALLY INTEGRABLE MIXER NETWORK FOR A MIXER CONSOLE

Ulrich Theus, Gundelfingen, Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Germany
Filed May 28, 1996, Ser. No. 654,372
Claims priority, application European Pat. Off., Jun. 1, 1995, 95108370
Int. Cl.^{6} H04B *1/00*
U.S. Cl. 381—119 **20 Claims**



1. A monolithic integrable mixer network for a mixer console controlling different channels, comprising:

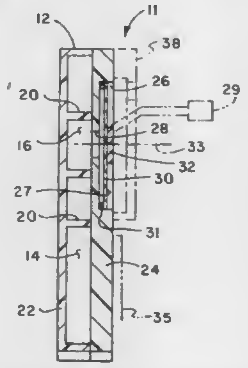
a variable gain preamplifier for each channel;

a summing amplifier, coupled to the output of each variable gain amplifier, having a summing gain adjustable differently for each sound channel; and,

an electronic control unit, coupled to each variable gain preamplifier and the summing amplifier, serving to automatically control an overall gain for each sound channel gain being divided between its variable gain preamplifier and the summing amplifier according to a predetermined ratio dependent on the desired channel gain, the ratio varying in the attenuation range with increasing channel attenuation such that the summing gain is reduced more than the preamplification by the variable gain preamplifier.

5,751,827
PIEZOELECTRIC SPEAKER

Masahiko Takahashi, Tokyo, Japan, assignor to Primo Microphones, Inc., McKinney, Tex.
Filed Mar. 13, 1995, Ser. No. 402,923
Int. Cl.^{6} H04R *25/00*
U.S. Cl. 381—190 **10 Claims**



1. A speaker for generating sound comprising:

a casing;

a cover member;

a diaphragm integrally formed with a selected one of said casing and said cover member;

a speaker driving element supported on said diaphragm; and

means defining a transverse wall between said casing and said cover member and forming a sound transmission channel, said channel having an inlet portion disposed in communication with said diaphragm and an outlet opening to atmosphere, said channel having an increasing cross sectional area between said inlet portion and said outlet opening.

5,751,828

MAGNETIC CIRCUIT UNIT FOR LOUD-SPEAKER AND METHOD OF MANUFACTURING THE SAME

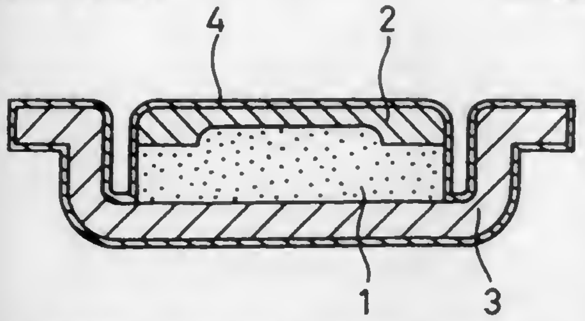
Hiroshi Ueda, Hyogo; Kazuhiro Ohyama; Shizuo Furuyama, both of Osaka; Kiyoshi Kojima, Nara, and Masayuki Wakamiya, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1995, Ser. No. 451,653

Claims priority, application Japan, May 30, 1994, 6-116455; Dec. 27, 1994, 6-324752

Int. Cl.⁶ H04R *25/00*

U.S. Cl. 381—199 **16 Claims**



1. A magnetic circuit unit for a loud-speaker, comprising:

an anisotropic Nd—Fe—B system magnet; and

a top plate, being integrated with the anisotropic Nd—Fe—B system magnet on one side of the top plate, said top plate having a hollow part whose inner surface is bonded to the anisotropic Nd—Fe—B system magnet through Joule heating by passing a current under compression, an anti-corrosive coating being formed on the surface of the magnetic circuit unit.

5,751,829

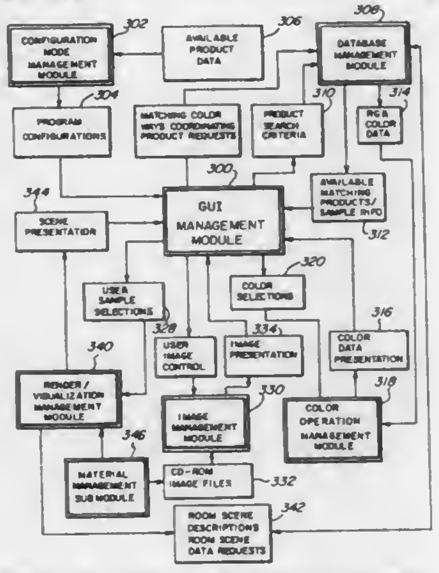
SPECTRALLY COORDINATED PATTERN SEARCH-IMAGING SYSTEM AND METHOD

William K. Ringland, and Jon C. Kubo, both of Walnut, Calif., assignors to Autodesk, Inc., San Rafael, Calif.

Filed Aug. 18, 1994, Ser. No. 292,514

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—100 **41 Claims**



1. A method for viewing and selecting decorative materials comprising the steps of:

generating color image data by scanning a plurality of decorative materials samples with a color sensor;

generating color descriptive data by analyzing selected regions of each sample with a spectrophotometer;

creating a searchable data compilation by coordinating the color image data for each sample with the color descriptive data for the same sample;

storing the searchable data compilation on a mass storage device of a computer;

displaying a palette of available colors to a user on a color monitor in communication with the computer;

obtaining a selection from the user, the selection comprising one or more colors contained in the palette of available colors;

searching through the searchable data compilation to identify a subset of the decorative materials which contain data in common with the selection;

displaying images of the decorative materials of the subset by displaying the color image data of each sample of the subset on the color monitor; and

obtaining a choice representing at least one of the subset of decorative materials, the choice being made by the user from the color image data displayed in juxtaposition on the color monitor.

5,751,830

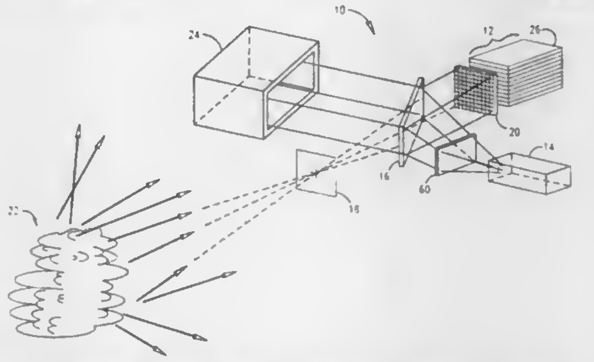
METHOD AND APPARATUS FOR COHERENT IMAGING OF INFRARED ENERGY

Donald P. Hutchinson, Knoxville, Tenn., assignor to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Filed May 24, 1995, Ser. No. 449,715

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—103 **32 Claims**



1. A coherent imaging optical detection system for passively detecting and analyzing the amplitude, frequency, and phase of naturally-occurring target scene infrared energy being emitted from a target scene, the system comprising:

an aperture having an upstream side and a downstream side through which said naturally-occurring target scene infrared energy passes, said target scene infrared energy entering the aperture from the upstream side and exiting the aperture from the downstream side;

a local oscillator laser for generating a local beam of infrared laser energy for heterodyne mixing with the target scene infrared energy, said local beam of infrared laser energy being directed only onto an area downstream from where the target scene infrared energy enters said aperture;

an optical beamsplitter for receiving said target scene infrared energy and said local beam of infrared laser energy, combining said infrared energies, and producing a combination of said infrared energies; and

a coherent imaging camera having a two-dimensional photodetector array for receiving the combination of infrared energies for heterodyne detection of said energies, the target scene infrared energy producing an image on said photodetector array, said photodetector array comprising a plurality of photodetector elements arranged two-dimensionally each producing an intermediate frequency signal having a voltage component and a frequency component representative of a difference between the two infrared energies, said camera amplifying the voltage components and filtering the frequency components of the intermediate frequency signals to produce output signals containing the amplitude, frequency, and phase of said target scene infrared energy.

5,751,831

METHOD FOR EXTRACTING OBJECT IMAGES AND METHOD FOR DETECTING MOVEMENTS THEREOF

Shuji Ono, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 944,850, Sep. 14, 1992, Pat. No. 5,619,593. This application Jun. 5, 1995, Ser. No. 465,353

Claims priority, application Japan, Sep. 12, 1991, 3-233213; Dec. 6, 1991, 3-323342; Dec. 6, 1991, 3-323343; Dec. 6, 1991, 3-323344; Jan. 28, 1992, 4-13092; Jan. 28, 1992, 4-13093; Jan. 28, 1992, 4-13094; Jan. 28, 1992, 4-13095; Jan. 28, 1992, 4-13096; Jan. 28, 1992, 4-130797

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—103 **12 Claims**

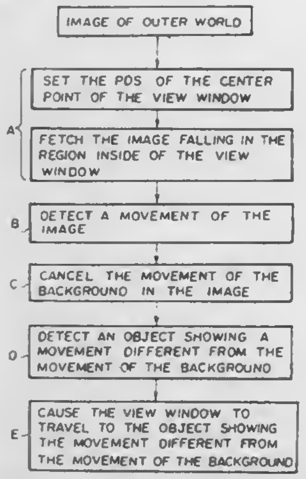


IMAGE OF OUTER WORLD
SET THE POS OF THE CENTER POINT OF THE VIEW WINDOW
A
FETCH THE IMAGE FALLING IN THE REGION INSIDE OF THE VIEW WINDOW
B
DETECT A MOVEMENT OF THE IMAGE
C
CANCEL THE MOVEMENT OF THE BACKGROUND IN THE IMAGE
D
DETECT AN OBJECT SHOWING A MOVEMENT DIFFERENT FROM THE MOVEMENT OF THE BACKGROUND
E
CAUSE THE VIEW WINDOW TO TRAVEL TO THE OBJECT SHOWING THE MOVEMENT DIFFERENT FROM THE MOVEMENT OF THE BACKGROUND

1. A method for detecting a movement of an image, wherein a movement of an image is detected from the image having a background and an object, the method for detecting a movement of an image comprises the steps of:

i) cutting out a first image which falls in a region inside of a view window having a predetermined size which is smaller than the entire image, from the image,

ii) detecting a contour line of the object which is embedded in said cut-out first image,

iii) after a predetermined time has elapsed, cutting out a second image which falls in the region inside of said view window and which includes essentially the same object as said first image, from said image,

iv) detecting a contour line of the object which is embedded in said cut-out second image,

v) calculating a difference between said contour line which has been detected from said cut-out first image, and said contour line which has been detected from said cut-out second image, and

vi) automatically detecting a movement of the background of the image from said calculated difference.

5,751,832

HEADLIGHT AIMING APPARATUS

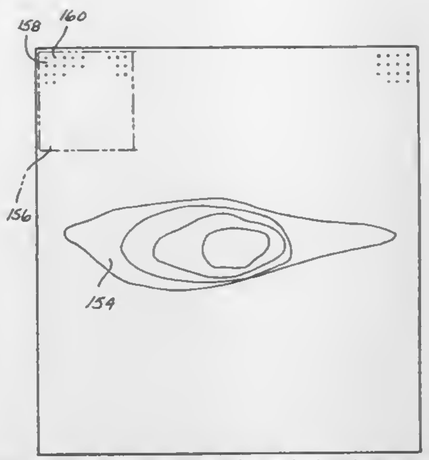
Ronald L. Panter, Flushing, and John J. Taylor, Flint, both of Mich., assignors to Progressive Tool & Industries Co., Southfield, and Panter Master Controls, Inc., Mt. Morris, both of Mich.

Filed Sep. 4, 1996, Ser. No. 699,521

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—104 **28 Claims**

1. An apparatus for aiming a vehicle headlight to a standard aiming image, the apparatus comprising:



means for storing standard headlight aiming image pattern as a standard image matrix;

means for sensing light emitted from a headlight, the sensing means generating an output on a pixel-by-pixel basis proportional to the sensed light intensity of each pixel;

means, responsive to the output from the sensing means, for converting the output to an intensity magnitude value for each pixel in a sensed image matrix;

means for forming a plurality of offset sample matrices, each formed of a portion of the sensed image matrix and a plurality of corresponding standard image sub-matrices each formed of a portion of the standard image matrix;

means for determining the offset sample matrix having the highest correlation to a corresponding standard image sub-matrix;

means for determining the center of the offset sample matrix having the highest correlation;

means, responsive to the means for determining the center of the offset sample matrix, for determining the difference between the center of said offset sample matrix and the center of the corresponding standard image sub-matrix, the difference determining means generating a difference output signal having a magnitude proportional to the difference; and

means, responsive to the difference output, for activating an adjustment means engagable with headlight support to adjust the support to reduce the difference to zero.

5,751,833

APPARATUS AND METHOD FOR INSPECTING ARTICLES SUCH AS AGRICULTURAL PRODUCE

Shmuel Blit, Rehovot; Eyal Bartfeld, Mazkeret Batya; Idan Pais, Tel Aviv; Yair Eilam, Kfar Saba; Efraim Vallach, Jerusalem; Haim Bezdin, Bat Yam; Israel Laron, Rehovot, and Doron Katzin, Hod Hasharon, all of Israel, assignors to Elop Electro-Optics Industries, Ltd., Israel

Division of Ser. No. 49,713, Apr. 16, 1993, Pat. No. 5,526,119. This application May 29, 1996, Ser. No. 654,821

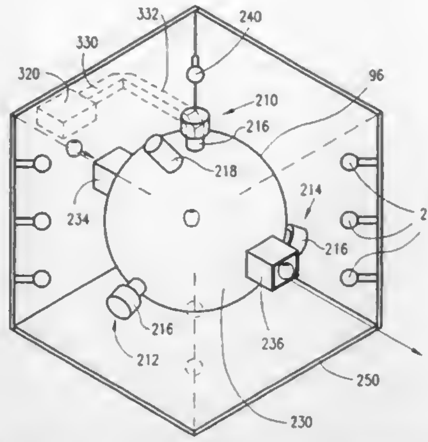
Claims priority, application Israel, Apr. 16, 1992, 101612

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—110 **6 Claims**

1. Apparatus for inspecting articles comprising:

a camera means operative to inspect generally all exposed surfaces of the article simultaneously; and



an image processor for providing a reconstruction of the exposed surfaces of an article in which substantially every point on the exposed surfaces of the article is reconstructed exactly once.

5,751,834

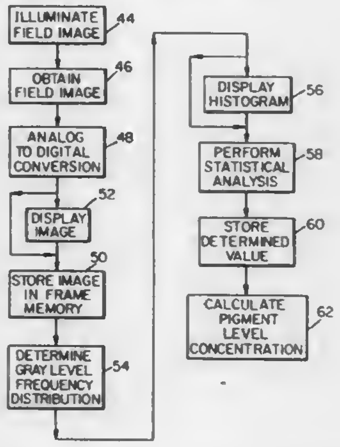
IMAGE ANALYSIS METHOD FOR DETERMINING PIGMENT LEVELS IN FABRIC

James R. Lisk, Jr., Harrisville, Utah, assignor to BASF Corporation, Mt. Olive, N.J.

Filed Feb. 7, 1996, Ser. No. 597,771

Int. Cl.⁶ G06T ***7/00***

U.S. Cl. 382—111 **34 Claims**


ILLUMINATE FIELD IMAGE
44
OBTAIN FIELD IMAGE
46
ANALOG TO DIGITAL CONVERSION
48
DISPLAY IMAGE
52
STORE IMAGE IN FRAME MEMORY
50
DETERMINE GRAY LEVEL FREQUENCY DISTRIBUTION
54
DISPLAY HISTOGRAM
56
PERFORM STATISTICAL ANALYSIS
58
STORE DETERMINED VALUE
60
CALCULATE PIGMENT LEVEL CONCENTRATION
62

1. A method for determining pigment concentration levels in fabric or yarn material comprising:

a. illuminating the material with a light source;

b. recording an image of a selected field area of a surface of the material to create a record having a plurality of discrete segments of varying values;

c. digitally resolving an intensity of each discrete segment into one of a multiple of discrete values;

d. processing frequency of occurrences of the multiples of discrete values of a cross section of the selected field area to obtain a frequency distribution of each discrete value;

e. resolving a coefficient of variation of the frequency distribution; and

f. employing the coefficient of variation as one variable of a multinomial equation.

5,751,835

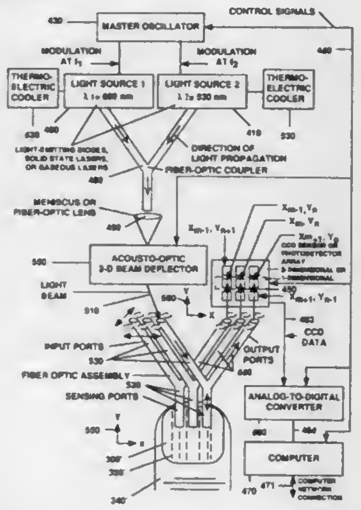
METHOD AND APPARATUS FOR THE AUTOMATED IDENTIFICATION OF INDIVIDUALS BY THE NAIL BEDS OF THEIR FINGERNAILS

Allen Topping, 44 Delmar St., San Francisco, Calif. 94117; Vladimir Kuperschmidt, 3124 Weymouth Ct., Pleasanton, Calif. 94588, and Austin Gormley, 906 20 Ave. N., North Myrtle Beach, S.C. 29582

Filed Oct. 4, 1995, Ser. No. 538,918

Int. Cl.⁶ G06K ***9/00***

U.S. Cl. 382—115 **18 Claims**



1. A system for determining the identity of an individual, comprising:

a. a plurality of light sources providing a corresponding plurality of beams of light,

b. a modulator for modulating the amplitudes of said light sources at a plurality of respective frequencies,

c. lens means for focusing said beams of light,

d. coupling means for coupling said light beams from said sources to said lens means,

e. an input port means,

f. light beam deflection means for deflecting said beams of said light in a grid pattern to illuminate a discrete portion of said input port means,

g. an output port means,

h. sensing port means coupled to said input port means and said output port means for illuminating a discrete portion of said individual with said beams of light and sensing a corresponding plurality of beams of said light reflected from said discrete portion of said individual,

i. photodetector sensing means for sensing the amplitudes of said beams of said reflected light,

j. analog-to-digital converter means for converting the output of said photodetector sensing means to digital representations of said amplitudes, and

k. computer means for storing the results of said digital representations of said amplitudes in a form which uniquely identifies said individual.

5,751,836

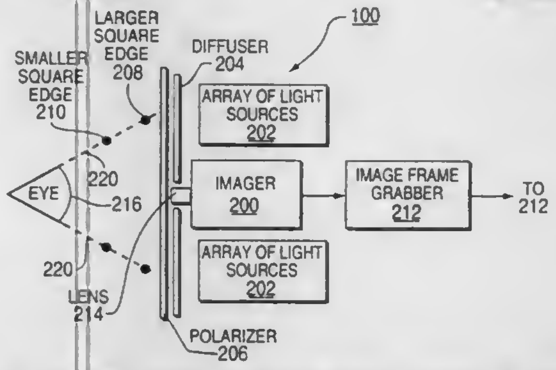
AUTOMATED, NON-INVASIVE IRIS RECOGNITION SYSTEM AND METHOD

Richard Patrick Wildes; Jane Circle Asmuth; Keith James Hanna, all of Princeton; Stephen Charles Hsu, East Windsor; Raymond Joseph Kolczynski, Trenton; James Regis Matey, Mercerville, and Sterling Eduard McBride, Lawrenceville, all of N.J., assignors to David Sarnoff Research Center Inc., Princeton, N.J.

Continuation of Ser. No. 300,678, Sep. 2, 1994, Pat. No. 5,572,596. This application Sep. 27, 1996, Ser. No. 727,366

Int. Cl.⁶ G06K ***9/00***

U.S. Cl. 382—117 **10 Claims**



1. In a system including an imager having a lens for deriving a focused image of an eye of a user of the system to examine the iris of said user's eye; the improvement comprising:

alignment means for permitting said user to self-position his or her eye into said imager's field of view without the need for any physical contact with said system;

a digital frame grabber coupled to said imager for deriving digital data representative of said focused image of said user's eye;

image processing means responsive to the digital data from said frame grabber that manifests said user's eye for localizing the iris of said eye by, in sequential order, (1) locating that data which is within the image of the user's eye that defines the limbic boundary of said iris, (2) locating that data which is within said limbic boundary that defines the pupilary boundary of said iris, (3) locating that data which is within said limbic boundary that defines the boundaries of the upper and lower eyelids of said eye, and (4) then employing that data that is outside of said pupilary boundary, inside said limbic boundary, and below the upper eyelid and above the lower eyelid thereby to delimit said data to that portion thereof which manifests the iris of said eye.

5,751,837

X-RAY CT SCANNER SYSTEM HAVING A PLURALITY OF X-RAY SCANNER APPARATUS

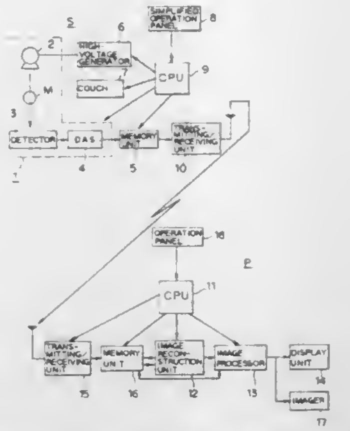
Naofumi Watanabe, Tochigi-Ken, and Shigeru Tanaka, Otawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 216,868, Mar. 24, 1994, abandoned. This application Jul. 19, 1996, Ser. No. 683,910

Claims priority, application Japan, Mar. 25, 1993, 5-065858

Int. Cl.⁶ G06K ***7/00***

U.S. Cl. 382—131 **5 Claims**



1. An X-Ray CT scanner system comprising:

a plurality of image data detecting apparatus, each apparatus having a pre-given, individual identification code to distinguish each image data detecting apparatus from the other image data detecting apparatus; and

an image processor placed separately from and operatively connected to each of the plurality of image data detecting apparatus through a communication medium,

wherein each of the plurality of image data detecting apparatus comprises:

an X-ray generating means for generating X rays toward an object;

an X-ray data acquisition system for detecting the X rays passing through the object and outputting X-ray projection data corresponding to the detected X rays, and

an information transmitting means for transmitting through the communication medium to the image processor the pre-given identification code and information including the X-ray projection data; and wherein

the image processor comprising:

an inputting means for inputting the identification code and the information transmitted through the communication medium, the inputting means including means for verifying the identification code; and

an image reconstruction means for reconstructing a tomography image based on the X-ray projection data.

5,751,838

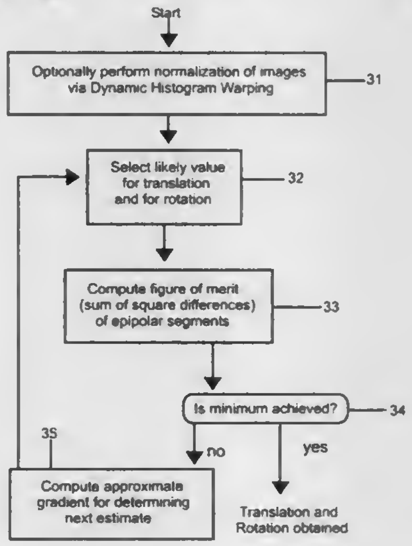
CORRECTION OF CAMERA MOTION BETWEEN TWO IMAGE FRAMES

Ingemar J. Cox, Lawrenceville, and Sebastien Roy, Pennington, both of N.J., assignors to Nec Research Institute, Inc., Princeton, N.J.

Filed Jan. 26, 1996, Ser. No. 592,249

Int. Cl.⁶ G06K ***9/36***

U.S. Cl. 382—107 **8 Claims**


Start
Optionally perform normalization of images via Dynamic Histogram Warping
31
Select likely value for translation and for rotation
32
Compute figure of merit (sum of square differences) of epipolar segments
33
Is minimum achieved?
34
no
yes
35
Compute approximate gradient for determining next estimate
Translation and Rotation obtained

1. A process for determining ego-motion between two image frames of a scene that includes the steps of:

estimating the two parameters of translation and three parameters of rotation involved in camera ego-motion based upon pixels in one frame and corresponding epipolar line segments in the other frames;

computing the cost function of the estimated movement; and revising the estimate and computing the cost function in iterative fashion to find the estimate that results in the cost function with the least figure of merit for use as the desired ego-motion.

5,751,839

APPARATUS AND PROCESS FOR THE DETECTION AND COUNTING OF RARELY OCCURRING MAMMALIAN CELLS

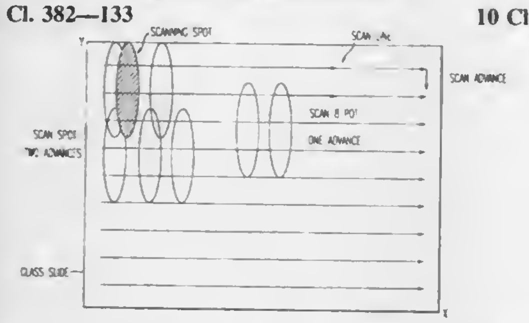
Jean-Louis Drocourt, Yerres; Jean-Gérard Guillet, Vanves, both of France, and Warren Groner, Great-Neck, N.Y., assignors to Chemunex, Maisons-Alfort, France

Filed Jun. 21, 1995, Ser. No. 492,762

Claims priority, application European Pat. Off., Nov. 17, 1994, 94402609.5

Int. Cl.^{6} G06K *9/00;9/46*

U.S. Cl. 382—133 **10 Claims**



1. Method for detecting and counting rarely occurring mammalian cells, comprising the steps of:

scanning a solid support on which a specimen potentially containing fluorescent cells has been deposited, with an incident beam from a laser to thereby form a laser spot on the solid support, said laser spot being substantially greater than the cells to be detected, and said laser spot size being between 15 and 30 μm, wherein the distance between two scanning lines is such that each element of the said support is scanned at least twice, by partial overlapping of adjacent scanning paths; and simultaneously:

detecting the resultant fluorescent light at least at one wavelength, by selecting as samples only detected signals exceeding a given threshold, wherein a set of adjacent samples on a scan-line represents a feature;

establishing a set of correlated-features by a line-to-line correlation of individual features, by comparing features on each pair of adjacent lines in time synchrony, counting the number of lines over which said set of correlated-features occur, each set of correlated-features forming an event, and eliminating any single-uncorrelated-features;

comparing said correlated-features on each pair of adjacent lines in time synchrony, at least at two different wavelengths λ_1 and λ_2, for selecting the correlated-features having an emission intensity ratio at said two wavelengths lower than a predetermined number, being specified that if the emission ratio at said wavelengths generated by any correlated samples is greater than a predefined value, the complete event is eliminated;

making a size discrimination of retained events and selecting those having a size corresponding to the type of cells searched;

determining if for retained events after size discrimination, the events energy profile in three dimensions is within predetermined Gaussian shape criteria and rejecting events not within said predetermined Gaussian shape criteria; and

counting said remaining events to determine and to count exclusively the fluorescent cells present on said solid support.

5,751,840

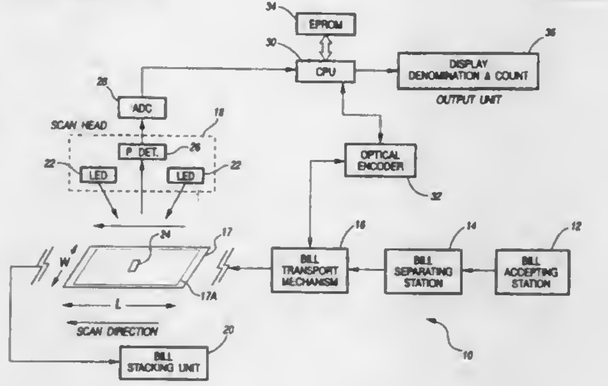
METHOD AND APPARATUS FOR CURRENCY DISCRIMINATION

Donald E. Raterman, Deerfield; Bradford T. Graves; Lars R. Stromme, both of Arlington Heights, all of Ill., and Aaron M. Bauch, Boxboro, Mass., assignors to Cummins-Allison Corp., Mt. Prospect, Ill.

Continuation of Ser. No. 226,660, Apr. 12, 1994, which is a continuation-in-part of Ser. No. 127,334, Sep. 27, 1993, Pat. No. 5,467,405, which is a continuation of Ser. No. 885,648, May 19, 1992, Pat. No. 5,295,196, which is a continuation-in-part of Ser. No. 475,111, Feb. 5, 1990, abandoned. This application Jul. 14, 1995, Ser. No. 502,676

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—135 **9 Claims**



1. A currency evaluation device for receiving a stack of currency bills, rapidly evaluating all the bills in the stack, and then re-stacking the bills, said device comprising:

a feed mechanism for receiving a stack of currency bills and feeding said bills in the direction of the wide dimension of the bills, one at a time, to a feed station;

a bill transport mechanism for transporting bills, in the direction of the wide dimension of the bills, from said feed station to a stacking station, at a rate in excess of about 800 bills per minute;

a stationary optical scanning head located between said feed and stacking stations for scanning a preselected segment of a central portion of each bill transported between said stations by said transport mechanism, said scanning head including at least one light source for illuminating a strip of said preselected segment of a bill, and at least one detector for receiving reflected light from the illuminated strip on the bill and producing an output signal representing variations in the intensity of the reflected light;

means for sampling said output signal at preselected intervals as a bill is moved across said scanning head in the direction of the wide dimension of the bill, each of said output signal samples being proportional to the intensity of the light reflected from a different strip of said preselected segment of a bill;

a memory for storing characteristic signal samples produced by scanning said preselected segments of bills of different denominations with said scanning head and sampling said output signal at said preselected intervals, each of said stored signal samples being proportional to the intensity of the light reflected from a different strip of said preselected segment of a bill; and

signal processing means for receiving said signal samples and determining the denomination of each scanned bill by comparing said stored signal samples with said output signal samples produced by the scanning of each bill with said scanning head.

5,751,841

METHOD AND APPARATUS FOR SCANNING BANK NOTES

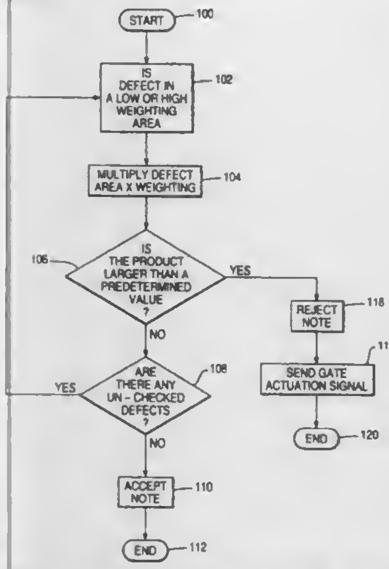
Liem H. Leong, and Brian E. Storey, both of Dundee, Scotland, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 20, 1996, Ser. No. 602,526

Claims priority, application United Kingdom, Sep. 29, 1995, 9519886

Int. Cl.^{6} G06K *9/03*

U.S. Cl. 382—137 **9 Claims**


START
100
IS DEFECT IN A LOW OR HIGH WEIGHTING AREA
102
MULTIPLY DEFECT AREA X WEIGHTING
104
106
IS THE PRODUCT LARGER THAN A PREDETERMINED VALUE ?
YES
NO
REJECT NOTE
118
SEND GATE ACTUATION SIGNAL
118
END
120
ARE THERE ANY UN - CHECKED DEFECTS ?
108
YES
NO
ACCEPT NOTE
110
END
112

6. A method of optically scanning a bank note, the method comprising the steps of:

(a) moving the bank note along a transport path;

(b) illuminating the bank note from one side of the transport path;

(c) obtaining a representation of the boundaries of the bank note based upon illumination of the bank note in step (b);

(d) determining the location of any predetermined type of defect in the bank note relative to the boundaries of the bank note by using the representation of the boundaries of the bank note obtained in step (c);

(e) creating a weighting matrix which provides different weighting factors to different areas of the bank note,

(f) determining whether or not the bank note is acceptable for use in an automated teller machine (ATM) depending upon the location of any defect or defects which have been located in the bank note as determined in step (d) and the weighting factors as determined in step (e).

5,751,842

DOCUMENT TRANSACTION APPARATUS

David J. A. Riach, Edinburgh; Richard J. Longmore, Cairneyhill, and John N. Eccles, Edinburgh, all of Scotland, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 485,854, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 168,290, Dec. 17, 1993, abandoned. This application Nov. 15, 1996, Ser. No. 749,879

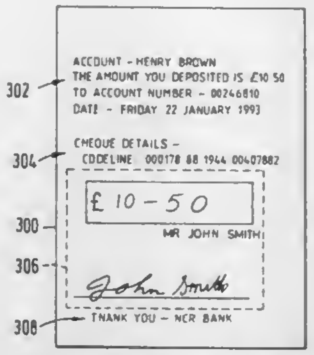
Claims priority, application United Kingdom, Jul. 1, 1993, 9313640

Int. Cl.^{6} G06K *9/00;* **G07F** *19/00*

U.S. Cl. 382—137 **1 Claim**

1. An automated teller machine (ATM) for allowing a bank customer to deposit the entire amount of a check having a MICR codeline field which contains characters identifying the account of the payer of the check and an amount field which contains characters representing the entire amount of the check, the ATM comprising:

a transport for accepting the check to be deposited from the bank customer;


302
304
300
306
308
ACCOUNT - HENRY BROWN
THE AMOUNT YOU DEPOSITED IS £10 50
TO ACCOUNT NUMBER - 00246810
DATE - FRIDAY 22 JANUARY 1993
CHEQUE DETAILS -
CODELINE 000178 88 1944 00407882
£ 10 - 5 0
MR JOHN SMITH
John Smith
THANK YOU - NCR BANK

an image lift device for (i) generating first digitized image data from the characters located in the MICR codeline field of the check, and (ii) generating second digitized image data from the characters located in the amount field of the check;

a printer for printing an image of at least a portion of the check onto a receipt to be dispensed to the bank customer; and

a processing unit for (i) processing the first digitized image data to identify the account of the payer of the check, (ii) causing funds equal to the entire amount of the check to be transferred out of the account of the payer of the check and deposited into the account of the bank customer after the account of the payer of the check has been identified, (iii) processing the second digitized image data to provide an image of the characters located in the amount field of the check, and (iv) controlling the printer to print the image onto the receipt to assure the bank customer that the entire amount of the check has been deposited.

5,751,843

METHOD FOR DETECTING THE SPATIAL POSITION AND ROTATIONAL POSITION OF SUITABLY MARKED OBJECTS IN DIGITAL IMAGE SEQUENCES

Christoph Maggioni, and Brigitte Wirtz, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

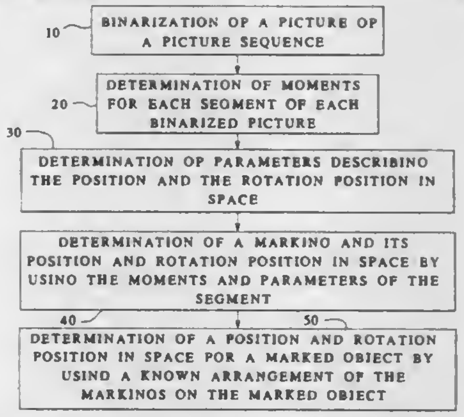
PCT No. PCT/DE94/00893, § 371 Date Feb. 8, 1996, § 102(e) Date Feb. 8, 1996, PCT Pub. No. WO95/04977, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 1, 1994, Ser. No. 596,283

Claims priority, application Germany, Aug. 9, 1993, 93112720.3; Nov. 19, 1993, 43 39 534.1

Int. Cl.^{6} G06T *7/60*

U.S. Cl. 382—154 **8 Claims**


10
BINARIZATION OP A PICTURE OP A PICTURE SEQUENCE
20
DETERMINATION OF MOMENTS FOR EACH SEOMENT OF EACH BINARIZED PICTURE
30
DETERMINATION OP PARAMETERS DESCRIBINO THE POSITION AND THE ROTATION POSITION IN SPACE
DETERMINATION OF A MARKINO AND ITS POSITION AND ROTATION POSITION IN SPACE BY USINO THE MOMENTS AND PARAMETERS OF THE SEGMENT
40
50
DETERMINATION OF A POSITION AND ROTATION POSITION IN SPACE POR A MARKED OBIECT BY USINO A KNOWN ARRANGEMENT OF THE MARKINOS ON THE MARKED OBIECT

1. A method for detecting spatial position and rotational position of marked objects in real time digital image sequences, structures arranged eccentrically relative to one another being used as markings on the objects, comprising the steps of:

a) putting images of a real time image sequence into binary form by applying a threshold value operation, as a result of which a binary image sequence is formed;

b) determining moments of individual segments of each individual binary image of the binary image sequence up to a prescribed order;
c) determining parameters which describe a spatial position and rotational position of the individual segments in space from the moments;
d) determining the markings and their spatial position and rotational position in space with aid of the parameters and the moments;
e) finally, determining the three-dimensional spatial position and rotational position of the marked objects in space using the known arrangement of the markings on the marked objects.

5,751,844

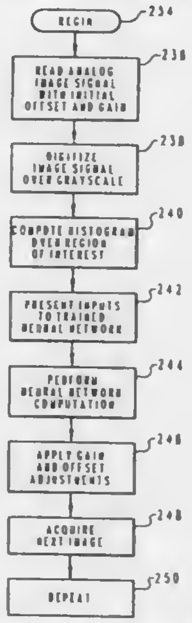
METHOD AND APPARATUS FOR IMAGE ACQUISITION WITH ADAPTIVE COMPENSATION FOR IMAGE EXPOSURE VARIATION

Mark Robert Bolin, Tucson; Gregory Tad Kishi, Oro Valley, and Michael Philip McIntosh, Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 255,299, Jun. 7, 1994, abandoned, which is a continuation of Ser. No. 871,380, Apr. 20, 1992, abandoned. This application Jan. 29, 1996, Ser. No. 593,538

Int. Cl.^{6} G06K *9/62*

U.S. Cl. 382—156 **19 Claims**


BEGIN
234
READ ANALOG IMAGE SIGNAL WITH INITIAL OFFSET AND GAIN
236
DIGITIZE IMAGE SIGNAL OVER GRAYSCALE
238
COMPUTE HISTOGRAM OVER REGION OF INTEREST
240
PRESENT INPUTS TO TRAINED NEURAL NETWORK
242
PERFORM NEURAL NETWORK COMPUTATION
244
APPLY GAIN AND OFFSET ADJUSTMENTS
246
ACQUIRE NEXT IMAGE
248
REPEAT
250

1. In an image acquisition device which produces at least one acquired image, each of which is characterizeable with reference to at least one image quality criterion which is at least in-part established by an exposure parameter value, an apparatus for optimizing said image quality criterion, comprising:

an image acquisition means for obtaining at least one image under selected exposure characteristics as determined by at least one exposure parameter value;

a neural network means for (a) maintaining a learned relationship between said at least one image quality criterion and said at least one exposure parameter value which is developed from training data during a training data acquisition mode of operation from image acquisition over a range of values for said exposure parameter values, and (b) receiving said at least one image quality criterion of said at least one image from said image acquisition means and providing a correction for said at least one exposure parameter value without modification of said learned relationship; and

a feed forward controller member for supplying said correction for said at least one exposure parameter value to said image acquisition means for use in digitizing at least one subsequent image to compensate for changes in illumination of areas that are viewed repetitively.

5,751,845

METHOD FOR GENERATING SMOOTH COLOR CORRECTIONS IN A COLOR SPACE, PARTICULARLY A CIELAB COLOR SPACE

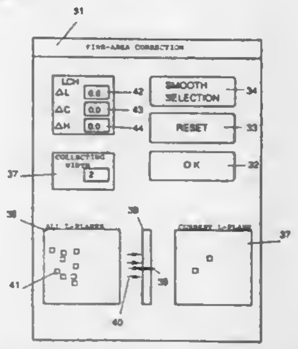
Peter Dorff, Moerfelden-Walldorf; Joern Kowalewski, Preetz; Sigrid Anni Lore Doebler, Karlsruhe, and Uwe-Jens Krabbenhoeft, Landwehr, all of Germany, assignors to Linotype Hell AG, Kiel, Germany

Continuation of Ser. No. 224,587, Apr. 7, 1994, abandoned. This application Oct. 9, 1996, Ser. No. 728,034

Claims priority, application Germany, Apr. 8, 1993, 43 11 612.4; Dec. 18, 1993, 43 43 362.6

Int. Cl.^{6} G06K *9/66*

U.S. Cl. 382—162 **28 Claims**



1. A method for generating smooth color corrections in a stored color image, comprising the steps of:

collecting color samples P having locus coordinates and color values from the stored color image with a coordinate input unit;

providing a color sample memory for storing the color values of these color samples P;

providing a color computer for color correction of color values of the stored color image;

forming an arbitrarily shaped color sample space from the color values of the color samples;

before utilizing the color values of the color sample space for correction, subjecting the color values of the color sample space to a filtering with a convolution function employing a weighting matrix for producing a weighting of the color values of the color sample space so that a smooth transition to non-selected locations in the arbitrarily shaped color space is produced at arbitrarily shaped transitions of the color space in order to avoid undesired color breaks of the color correction; and

employing the weighted color values of the color samples of the color sample space for color correction of pixels of the stored color image.

5,751,846

DOCUMENT IMAGE COMPRESSION SYSTEM AND METHOD

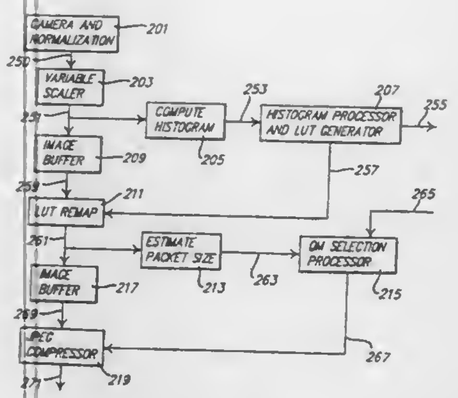
Michael John Higgins-Luthman, Livonia; Robert Charles Kidd, Ann Arbor; Robert Dennis Klein, Farmington; Robert Chihsung Yen, Novi, and Charles Martin Zalinski, Canton, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 796,703, Nov. 21, 1991, Pat. No. 5,339,368. This application Mar. 7, 1994, Ser. No. 207,284

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—169 **15 Claims**

1. Apparatus for pre-processing document image data prior to data compression, said data being arranged as a plurality of pixels, each representing one of a plurality of gray levels, the apparatus comprising:



a means for generating document image data comprising highly visible pixel data and nominally visible background pixel data,

histogram generation means for generating a histogram having a highly visible pixel data portion and a nominally visible background pixel data portion,

histogram processing means for generating a contrast reduction pixel conversion on said highly visible gray level pixel data,

said histogram processing means further performing a stretch pixel conversion function of the converted highly visible gray level pixel data and the nominally visible gray level pixel data in accordance with preselected characteristics of said histogram generating a contrast increase pixel conversion of said pixel data; and

means for combing the contrast reduction and the gray level stretch conversion functions and for applying a combined conversion function to the document image data prior to data compression to minimize loss of said nominally visible background pixel data.

5,751,847

METHOD AND APPARATUS FOR DETERMINING THE COLOR OR COLOUR CODE OF AN OBJECT

Robert Wuyts, Antwerpen, Belgium, assignor to Framatome Connectors International, Courbevoie, France

PCT No. PCT/EP94/03597, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO95/12806, PCT Pub. Date May 11, 1995

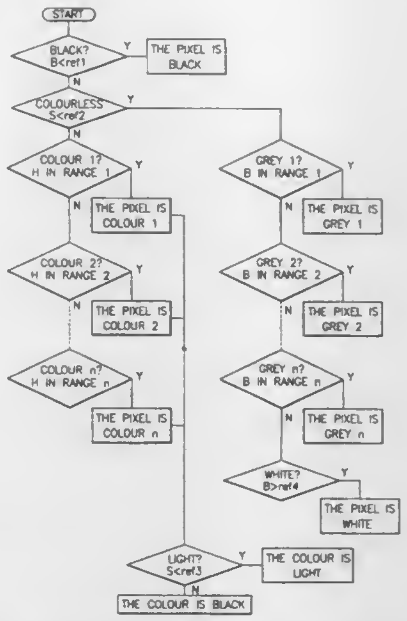
PCT Filed Oct. 31, 1994, Ser. No. 635,893

Claims priority, application Netherlands, Nov. 5, 1993, 9301915; Sep. 15, 1994, 9401496

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—165 **8 Claims**

1. Method for determining a colour or colour code of an object, comprising the steps of illuminating the object at a constant level, making a colour picture of the object and determining the colour of the object by means of colour information in the colour picture, characterized by the steps of determining the saturation (S), hue (h) and brightness (B) values of a plurality of pixels of the colour picture of the object distributed over the surface of the object, wherein each pixel of the plurality of pixels has an S-value, an H-value and a B-value, said steps of determining the colour of the object comprising the steps of first comparing the B-value of each pixel with a first reference value determining whether the pixel is black or not, and, if the pixel is not black, then comparing the S-value of the pixel with a second reference value determining whether the pixel is colourless or not, and, if the pixel is not colourless, then comparing the H-value of the pixel with a plurality of successive reference value ranges, each of said reference value ranges corresponding with a predetermined colour for determining the colour of the pixel.



5,751,848

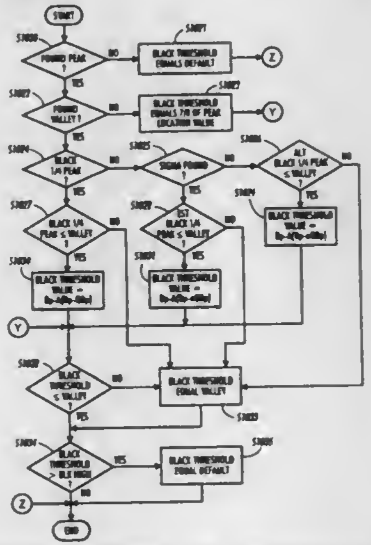
SYSTEM AND METHOD FOR GENERATING AND UTILIZING HISTOGRAM DATA FROM A SCANNED IMAGE

Barbara L. Farrell, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1996, Ser. No. 754,459

Int. Cl.^{6} G06K *9/00;9/38*

U.S. Cl. 382—172 **10 Claims**


START
FOUND PEAK ?
NO
YES
BLACK THRESHOLD EQUALS DEFAULT
Z
FOUND VALLEY ?
BLACK THRESHOLD EQUALS 7/8 OF PEAK LOCATION VALUE
Y
BLACK 1/4 PEAK ?
SIGMA FOUND ?
ALT BLACK 1/4 PEAK ≤ VALLEY ?
BLACK 1/4 PEAK ≤ VALLEY ?
1ST BLACK 1/4 PEAK ≤ VALLEY ?
BLACK THRESHOLD VALUE =
BLACK THRESHOLD VALUE =
BLACK THRESHOLD VALUE =
Y
BLACK THRESHOLD ≤ VALLEY ?
BLACK THRESHOLD EQUAL VALLEY
BLACK THRESHOLD > BLK HIGH ?
BLACK THRESHOLD EQUAL DEFAULT
Z
END

1. A method for determining a black threshold grey value for an image, comprising the steps of:

(a) generating a histogram corresponding to possible grey values of the image;

(b) determining, from the histogram, a first grey value having a peak frequency associated with a black distribution;

(c) determining, from the histogram, a second grey value having a peak frequency equal to one quarter of the peak frequency associated with the first grey value;

(d) determining, from the histogram, a third grey value having a peak frequency equal to ⅝ of the peak frequency associated with the first grey value;

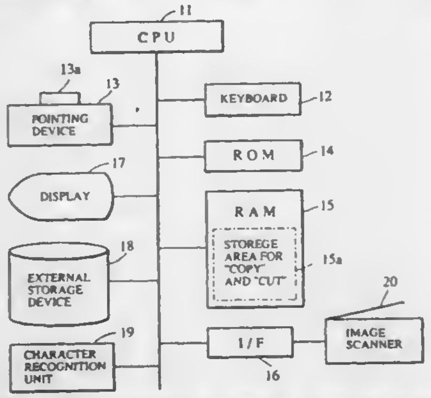
(e) determining, from the histogram, a fourth grey value having a peak frequency equal to one quarter of the peak frequency

associated with the first grey value, the fourth grey value being located on a negative slope-side of the first grey value;
(f) determining, from the histogram, a fifth grey value having a minimum peak frequency associated with the histogram; and
(g) calculating a black threshold grey value for the image from the first, second, third, fourth, and fifth grey values.

5,751,849
METHOD AND APPARATUS FOR PROCESSING A DOCUMENT

Hiroaki Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 248,661, May 25, 1994, abandoned.
This application May 16, 1996, Ser. No. 648,886
Claims priority, application Japan, Jun. 2, 1993, 5-156245
Int. Cl.^{6} G06K *9/34*
U.S. Cl. 382—176 35 Claims



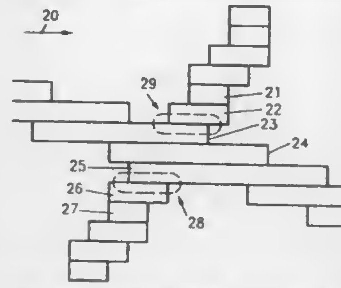
1. A method of processing a document, comprising the steps of:
specifying data as a type of data;
specifying a location in the document into which the specified data are to be written;
judging whether the type of the specified data is text;
determining whether a character recognition of the specified data is to be performed in response to a judgement that the type of specified data is not text, and converting the specified data into character codes; and
writing the character codes which are a result of the recognition into the specified location.

5,751,850
METHOD FOR IMAGE SEGMENTATION AND CLASSIFICATION OF IMAGE ELEMENTS FOR DOCUMENTS PROCESSING

Klaus Rindtorff, Wei im Schoenbuch, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 263,326, Jun. 21, 1994, abandoned.
This application Oct. 4, 1996, Ser. No. 726,887
Claims priority, application European Pat. Off., Jun. 30, 1993, 93110476
Int. Cl.^{6} G06K *9/34;9/62;9/46;9/66*
U.S. Cl. 382—178 14 Claims

1. Method for removing unwanted information, lines or printed characters from documents prior to character recognition of written information, comprising the steps of:

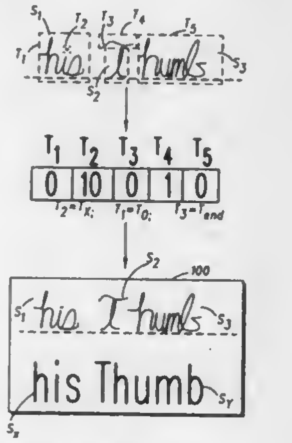


1) segmentation of an image into image elements;
searching each image element to determine if it comprises more than one image element by scanning a pixel array in a horizontal and a vertical direction, and identifying a common border between two parallel pixel runs, said common border having a length below a threshold value;
cutting a connection between said two parallel runs at said common border to break an image element having said common border into several image elements;
2) extraction of feature information from each image element;
3) classification of each of the image elements;
4) removal of those image elements which are classified as unwanted information, lines and printed characters; and
5) processing remaining image elements for writing recognition.

5,751,851
METHOD OF SPLITTING HANDWRITTEN INPUT

Kenneth J. Guzik, Santa Clara, and John L. C. Seybold, Portola Valley, both of Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 340,084, Nov. 14, 1994, abandoned.
This application Jul. 17, 1996, Ser. No. 682,480
Int. Cl.^{6} G06K *9/34;9/00;9/46;9/03*
U.S. Cl. 382—179 22 Clalms

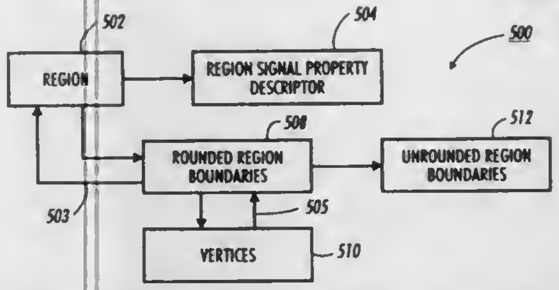


1. A method comprising the steps of:
processing electronic data comprising a series of data points that correspond to an original handwritten input of continuous segments to provide recognized characters that correspond to the original handwritten input;
displaying the recognized words;
upon receiving a split instruction,
parsing the series of data points into a series of strokes
from a given stroke and each subsequently written stroke, generating a first set of gap values for the given stroke of the gap or gaps between the given stroke as compared to each subsequently written stroke,
continuing generating further first sets of one or more gap values of the gap or gaps between each stroke as compared to every other subsequently written stroke:
from the first sets of gap values so generated, generating a second set of smallest gap values comprising a smallest of the gap values for each stroke;
splitting the one or more continuous segments at a split stroke number T_x, said split stroke number having a largest value of the second set of smallest gap values;
generating at least a first discrete continuous segment incorporating each of the series of strokes from a start stroke T_0 to the split stroke number T_x;
generating at least a second discrete continuous segment incorporating each of the series of strokes from a stroke immediately following the split stroke number T_x to a final stroke; and
displaying recognized words that correspond to the first and second discrete continuous segments.

5,751,852
IMAGE STRUCTURE MAP DATA STRUCTURE FOR SPATIALLY INDEXING AN IMGAGE

David H. Marimont, and Leonidas John Guibas, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1996, Ser. No. 639,606
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—180 33 Claims

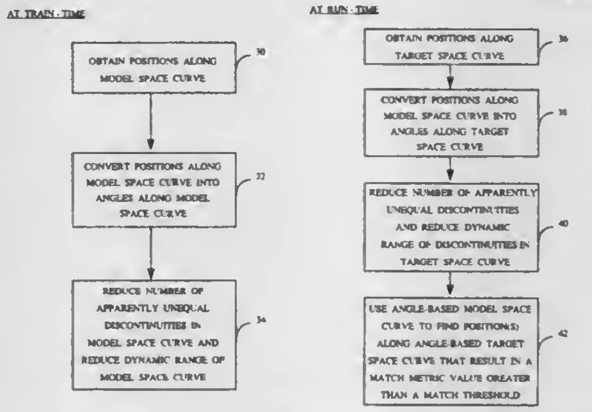

502
504
500
REGION
REGION SIGNAL PROPERTY DESCRIPTOR
508
512
ROUNDED REGION BOUNDARIES
UNROUNDED REGION BOUNDARIES
503
505
VERTICES
510

1. A data structure stored on a storage medium capable of being accessed and read by a processor-controlled machine; the data structure, referred to as an image structure map, representing an original image definition data structure, hereafter referred to as an original image, including image regions each having a topology and a geometry with respect to neighboring image regions; the machine including storage medium access circuitry for accessing and reading the image structure map data structure stored in the storage medium; the machine further including a processor connected for accessing instruction data for operating the machine; the image structure map data structure comprising:
a plurality of region data items; each region data item representing a respective one of a plurality of image regions in the original image; each image region formed by a set of image region boundaries determined to be included in the original image;
a signal property descriptor indicated by each region data item; the signal property descriptor having a value indicating a smoothly varying function of signals indicated by locations in the respective image region of the original image;
a plurality of region boundary data items indicated by each respective region data item indicating all adjacent image region boundaries forming the image region represented by the respective region data item;
a plurality of vertex data items each indicating a vertex location, wherein a vertex location refers to an endpoint location of a respective one of the image region boundaries or an intersection location between two image region boundaries;
each vertex data item indicating all of the region boundary data items representing image region boundaries adjacent to the vertex location represented by the vertex data item;
each vertex data item having a machine representable value computed by applying a rounding operation to an infinite precision value of the vertex location to produce the machine representable value; modifying the vertex location of an image region boundary according to the rounding operation producing a rounded image region boundary to be represented by a region boundary data item;
the region data items, the region boundary data items and the vertex data items collectively representing the original image as a partition of a two-dimensional (2D) plane induced by the image region boundaries into one or more disjoint image regions tiling the 2D plane; the region data items, the region boundary data items and the vertex data items being arranged in the image structure map so as to represent the topology and the geometry of the image regions determined to be included in the original image; and
an unrounded image region boundary data item indicated by each region boundary data item; each unrounded image region boundary data item representing the respective image region boundary in the original image;
the unrounded image region boundary data item being used in place of the rounded image region boundary to determine an unrounded vertex of an intersection location with a second unrounded image region boundary data item; the rounding operation modifying the unrounded vertex to produce the machine representable value of the intersection location according to one or more rounding rules that preserve topological and geometrical consistency between unrounded locations in the original image and rounded locations in the image structure map.

5,751,853
LOCATING SHAPES IN TWO-DIMENSIONAL SPACE CURVES

David Michael, Newton, Mass., assignor to Cognex Corporation, Natick, Mass.

Filed Jan. 2, 1996, Ser. No. 581,955
Int. Cl.^{6} G06K *7/48*
U.S. Cl. 382—203 17 Claims


AT TRAIN-TIME
AT RUN-TIME
OBTAIN POSITIONS ALONG MODEL SPACE CURVE
30
CONVERT POSITIONS ALONG MODEL SPACE CURVE INTO ANGLES ALONG MODEL SPACE CURVE
32
REDUCE NUMBER OF APPARENTLY UNEQUAL DISCONTINUITIES IN MODEL SPACE CURVE AND REDUCE DYNAMIC RANGE OF MODEL SPACE CURVE
34
OBTAIN POSITIONS ALONG TARGET SPACE CURVE
36
CONVERT POSITIONS ALONG MODEL SPACE CURVE INTO ANGLES ALONG TARGET SPACE CURVE
38
REDUCE NUMBER OF APPARENTLY UNEQUAL DISCONTINUITIES AND REDUCE DYNAMIC RANGE OF DISCONTINUITIES IN TARGET SPACE CURVE
40
USE ANGLE-BASED MODEL SPACE CURVE TO FIND POSITION(S) ALONG ANGLE-BASED TARGET SPACE CURVE THAT RESULT IN A MATCH METRIC VALUE GREATER THAN A MATCH THRESHOLD
42

1. A method for finding a feature of an object by finding at least one instance of a model two-dimensional space curve that represents the feature within a target two-dimensional space curve in an image that represents at least a portion of the object, the method comprising the steps of:
at train-time:
acquiring said model two-dimensional space curve, said model two-dimensional space curve including a plurality of points, each point being characterized by a position in two dimensions, said position being a function of distance S along said model two-dimensional space curve;
for each of said plurality of points of said model two-dimensional space curve, converting said position in two dimensions as a function of distance S into an angle as a function of distance S to provide an angle-based model space curve; and
at run-time:
acquiring said target two-dimensional space curve, said target two-dimensional space curve including a plurality of points, each point being characterized by a position in two dimensions, said position being a function of distance S along said target two-dimensional space curve;
for each of said plurality of points of said target two-dimensional space curve, converting said position in two dimensions as a function of distance S into an angle as a function of distance S to provide an angle-based target space curve; and
using said angle-based model space curve to find at least one position along said angle-based target space curve that results in a match metric value that exceeds a match threshold.

5,751,854

ORIGINAL-DISCRIMINATION SYSTEM FOR DISCRIMINATING SPECIAL DOCUMENT, AND IMAGE FORMING APPARATUS, IMAGE PROCESSING APPARATUS AND DUPLICATOR USING THE ORIGINAL-DISCRIMINATION SYSTEM

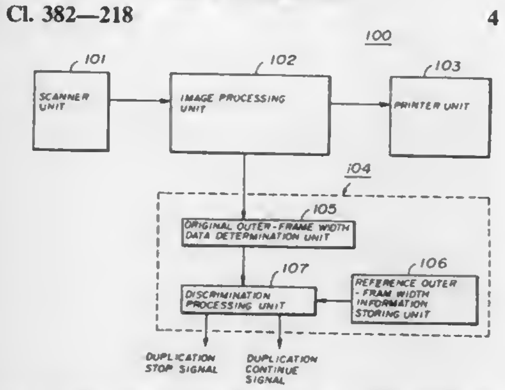
Takashi Saitoh; Takashi Saitoh, both of Yokohama; Hiroshi Takahashi, Kawasaki; Yoshio Kaneko, Tokyo; Shigeo Kurotaka, Sagamihara; Toshiya Hikita, Machida; Kyoji Omi, Kawasaki; Midori Aida, Yokohama; Shinji Yamakawa, Kawasaki; Hiromi Okubo, Yokohama; Kouji Ishigaki, Yokohama; Takeshi Ukai, Yokohama; Kazuo Murai, Tokyo; Haruhiko Fukuda, Kawasaki; Yukio Sakano, Fuchu; Tadato Hashiguchi; Michiyoshi Tachikawa, both of Yokohama, and Hiroyasu Sumida, Ichikawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 211,266, Jul. 11, 1994, abandoned. This application Jun. 7, 1996, Ser. No. 660,464

Claims priority, application Japan, Aug. 3, 1992, 4-226462; Aug. 6, 1992, 4-231436; Aug. 7, 1992, 4-232978; Aug. 11, 1992, 4-235380; Aug. 11, 1992, 4-235381; Aug. 13, 1992, 4-237751; Aug. 16, 1992, 4-239050; Aug. 16, 1992, 4-239052; Aug. 16, 1992, 4-239053; Aug. 16, 1992, 4-239054

Int. Cl.^{6} G06K *9/68*

U.S. Cl. 382—218 **4 Claims**


100
101
SCANNER UNIT
102
IMAGE PROCESSING UNIT
103
PRINTER UNIT
104
105
ORIGINAL OUTER-FRAME WIDTH DATA DETERMINATION UNIT
107
DISCRIMINATION PROCESSING UNIT
106
REFERENCE OUTER - FRAM WIDTH INFORMATION STORING UNIT
DUPLICATION STOP SIGNAL
DUPLICATION CONTINUE SIGNAL

1. An original-discrimination system for determining whether or not an original image is identical to a predetermined reference image in response to data concerning said original image being input comprising:

means for determining whether or not data of each of a plurality of color components is greater than a predetermined value to determine whether the predetermined region of the original image is white

means for measuring at least one hue of a ratio of a kind of colors in a predetermined region of the original image only when the predetermined region of the original image is determined to be not white:

means for counting instances of the at least one measured hue:

means for comparing the counted instances of the at least one measured hue with a reference value: and

determining means for determining if the original image is identical to the predetermined reference image based on an output of the means for counting.

5,751,855

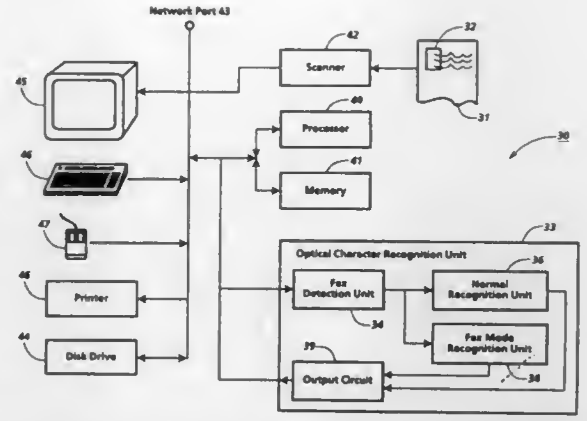
METHOD AND APPARATUS FOR DETECTING WHETHER AN ELECTRONIC IMAGE HAS BEEN FAXED

Eric Saund, San Carlos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1994, Ser. No. 347,928

Int. Cl.^{6} G06K *9/46;9/66;7/62;* **H04N** *1/00*

U.S. Cl. 382—224 **19 Claims**



1. A method of selecting an optical character recognition mode to be applied to a document using a processor coupled to a memory storing instructions for performing the method, the document being represented by raster signals representative of pixels, the document including a sample image including a multiplicity of connected components represented by a multiplicity of pixels of a first color and surrounded by pixels of a second color, midpoints between the pixels of the first color of a connected component and adjacent pixels of the second color defining a contour, optical character recognition modes including a fax mode and a normal mode, the method comprising the processor implemented steps of:

a) measuring the contours of the connected components of the sample image to determine whether the document has undergone coarse pixel quantization; and

b) if the sample image has undergone coarse pixel quantization, selecting the fax mode to generate a multiplicity of character coded signals representing the document from the raster signals.

5,751,856

SYSTEM FOR PROCESSING A QUANTIZED VECTOR USING SPATIAL FREQUENCY CORRELATIONS

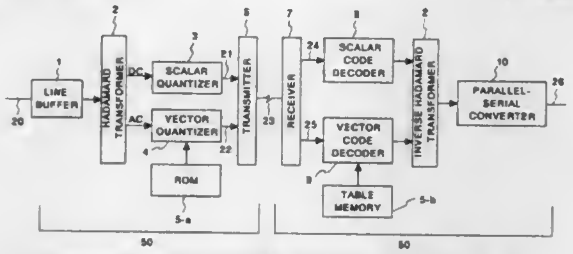
Yasuji Hirabayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 987,241, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 483,794, Feb. 23, 1990, abandoned. This application Oct. 19, 1994, Ser. No. 326,809

Claims priority, application Japan, Feb. 28, 1989, 1-45441

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—232 **20 Claims**



1. A computer-based decoding apparatus comprising:

receiving means for receiving a code obtained by coding a first set of spatial frequency components of image data;

decoding means, coupled to said receiving means, for receiving and decoding said code, for adding a second set of spatial frequency components which includes non-zero values and which was not received by said receiving means, to said first set of spatial frequency components by using a correlation between said first and second sets of spatial frequency components, and for outputting the added first and second sets of spatial frequency components; and

post-processing means for combining the first and second sets of spatial frequency components to form an image to be output,

wherein said decoding means adds the second set of spatial frequency components which comprises non-zero values in a frequency space.

5,751,857

IMAGE PROCESSING METHOD

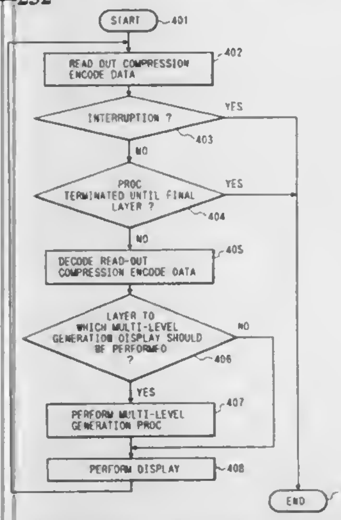
Shigetada Kobayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1995, Ser. No. 576,904

Claims priority, application Japan, Dec. 26, 1994, 6-322411

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—232 **14 Claims**


START
401
READ OUT COMPRESSION ENCODE DATA
402
INTERRUPTION ?
403
YES
NO
PROC TERMINATED UNTIL FINAL LAYER ?
404
YES
NO
DECODE READ-OUT COMPRESSION ENCODE DATA
405
LAYER TO WHICH MULTI-LEVEL GENERATION DISPLAY SHOULD BE PERFORMED ?
406
NO
YES
PERFORM MULTI-LEVEL GENERATION PROC
407
PERFORM DISPLAY
408
END
409

1. An image processing method comprising the steps of:

(a) reading out hierarchically encoded binary image data stored in a storage medium;

(b) sequentially decoding the binary image data read out in said step (a), in the order of a low-resolution image to a high-resolution image;

(c) performing a multilevel generation to the binary image data decoded in said step (b);

(d) causing a display device to display an image, on the basis of the image data decoded in said step (b) or the image data multilevel-generation processed in said step (c);

(e) judging whether or not a resolution of the image data decoded in said step (b) is higher than a resolution of the display device in said step (d) to display the image on the basis of the image data; and

(f) controlling said step (d) to cause the display device to display the image based on the image data multilevel-generation processed in said step (c) if YES in said step (e), and said step (d) to cause the display device to display the image based on the binary image data decoded ins said step (b) if NO in said step (e).

5,751,858

MOVING PICTURE CODING APPARATUS

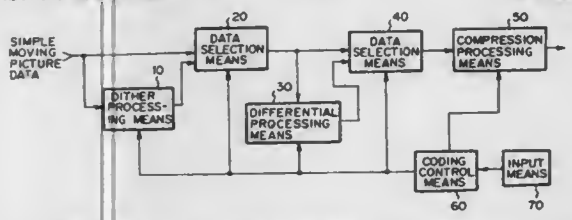
Mikio Sugiyama, and Kaoru Endo, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 673,359

Claims priority, application Japan, Jun. 30, 1995, 7-165535

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—236 **10 Claims**



1. A moving picture coding apparatus for coding simple moving picture data having plural multivalued image data, comprising:

dither processing means for performing dither processing on the simple moving picture data;

differential processing means for performing inter-frame differential processing on dither-processed data of a current frame with dither-processed data of a previous frame; and

compression processing means for compressing the data obtained by said differential processing means.

5,751,859

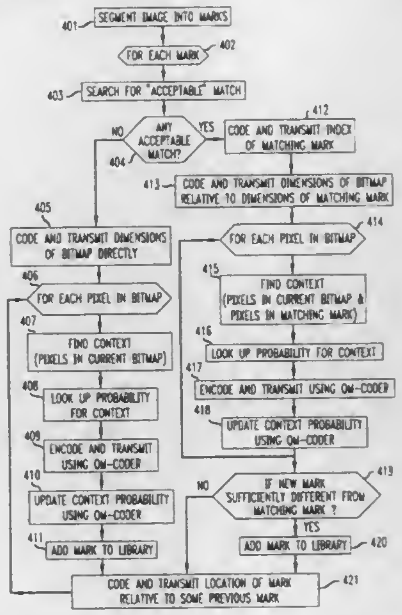
COMPRESSION OF TEXT IMAGES BY SOFT PATTERN MATCHING

Paul Glor Howard, Morganville, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 14, 1995, Ser. No. 490,215

Int. Cl.^{6} G06K *9/36;9/46;* **H03M** *7/00*

U.S. Cl. 382—238 **18 Claims**


401
SEGMENT IMAGE INTO MARKS
402
FOR EACH MARK
403
SEARCH FOR "ACCEPTABLE" MATCH
404
ANY ACCEPTABLE MATCH?
NO
YES
412
CODE AND TRANSMIT INDEX OF MATCHING MARK
413
CODE AND TRANSMIT DIMENSIONS OF BITMAP RELATIVE TO DIMENSIONS OF MATCHING MARK
405
CODE AND TRANSMIT DIMENSIONS OF BITMAP DIRECTLY
406
FOR EACH PIXEL IN BITMAP
407
FIND CONTEXT (PIXELS IN CURRENT BITMAP)
408
LOOK UP PROBABILITY FOR CONTEXT
409
ENCODE AND TRANSMIT USING QM-CODER
410
UPDATE CONTEXT PROBABILITY USING QM-CODER
411
ADD MARK TO LIBRARY
414
FOR EACH PIXEL IN BITMAP
415
FIND CONTEXT (PIXELS IN CURRENT BITMAP & PIXELS IN MATCHING MARK)
416
LOOK UP PROBABILITY FOR CONTEXT
417
ENCODE AND TRANSMIT USING QM-CODER
418
UPDATE CONTEXT PROBABILITY USING QM-CODER
419
IF NEW MARK SUFFICIENTLY DIFFERENT FROM MATCHING MARK ?
NO
YES
420
ADD MARK TO LIBRARY
421
CODE AND TRANSMIT LOCATION OF MARK RELATIVE TO SOME PREVIOUS MARK

6. A method for compressing a bilevel image of textual information, the bilevel image being scanned into black and white pixels, the method comprising the steps of:

segmenting the pixels of the image into marks;

comparing the pixels from a current mark with the pixels in a set of marks in a library of marks;

determining whether the current mark matches one of the marks in the library of marks using a predetermined measure of acceptability;

if the current mark matches one of the marks in the library, coding an index of the matching mark and comparing the pixels in the current mark with the pixels in the matching mark;

for each pixel from the current mark that does not match a corresponding pixel in the matching mark, tentatively flipping the value of the pixel;

for each tentatively flipped pixel from the current mark, determining whether the pixel is isolated from other tentatively flipped pixels from the current mark or part of a small isolated group of pixels that are separated from other tentatively flipped pixels from the current mark;

permanently flipping the value of each tentatively flipped pixel from the current mark that is isolated or part of a small isolated group; and

coding each permanently flipped pixel value from the current mark using a statistical coding method.

5,751,860

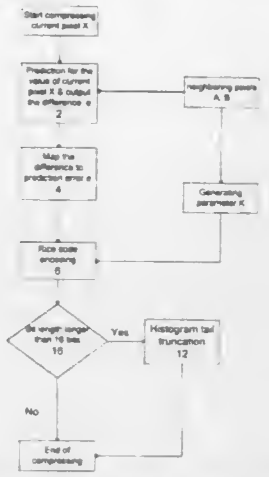
METHOD FOR COMPRESSING AND DECOMPRESSING DIGITAL IMAGE DATA

Yang-Chun Su, Taoyuang, and Yu-Wen Huang, Taoyuan, both of Taiwan, assignors to Acer Peripherals, Inc., Taiwan

Filed Sep. 3, 1996, Ser. No. 708,276

Int. Cl.⁶ H04N *1/41*

U.S. Cl. 382—244 **8 Claims**


Start compressing current pixel X
Prediction for the value of current pixel X & output the difference e
2
Neighboring pixels A, B
Map the difference to prediction error e
4
Generating parameter K
Rice code encoding
6
Bit length longer than 16 bits
16
Yes
Histogram tail truncation
12
No
End of compressing

1. A lossless compression method for a digitized image, the digitized image including a current pixel, which has a value X, and two neighboring pixels adjacent to the current pixel, the two neighboring pixels having values A and B respectively, and Δ being the difference between A and B, comprising the steps:

- using a first algorithm to generate a predicted value P for the current pixel based on the values A and B;
- calculating a prediction error e' based on a one-to-one mapping of the difference e between the predicted value P and the current value X;
- generating a parameter K which is a predetermined non-constant function of the difference Δ;
- encoding the prediction error e' of the current pixel by assigning a Rice code thereto based on the parameter K, to thereby obtain a Rice encoded code; and
- replacing the Rice encoded code by a predetermined code pattern followed by the current value X if the Rice encoded code obtained for the current pixel is longer than a predetermined length.

5,751,861

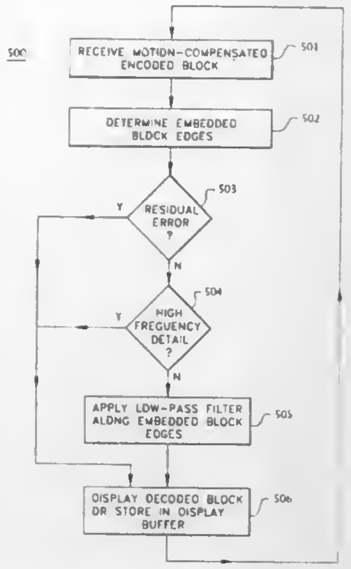
REDUCING RESIDUAL ARTIFACTS IN VIDEO CODING SCHEMES WITH INTEGER MOTION COMPENSATION

Brian Astle, Plainsboro, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1995, Ser. No. 497,150

Int. Cl.⁶ G06K *9/36;9/40;* **H04N** *7/12*

U.S. Cl. 382—250 **21 Claims**


500
RECEIVE MOTION-COMPENSATED ENCODED BLOCK
501
DETERMINE EMBEDDED BLOCK EDGES
502
503
Y
RESIDUAL ERROR ?
N
504
Y
HIGH FREQUENCY DETAIL ?
N
APPLY LOW-PASS FILTER ALONG EMBEDDED BLOCK EDGES
505
DISPLAY DECODED BLOCK OR STORE IN DISPLAY BUFFER
506

1. A computer-implemented method for decoding integer motion-compensated blocks of a picture of a sequence of pictures, comprising the steps of:

- (a) decoding a current block, wherein the current block is an integer motion-compensation encoded block;
- (b) determining embedded block edges within the current block;
- (c) determining whether the current block was encoded with residual error correction in which a difference block is utilized which represents the difference between the current block and a reference block used to reproduce the current block; and
- (d) applying a low-pass filter along the embedded block edges only if the current block was not encoded with residual error correction.

5,751,862

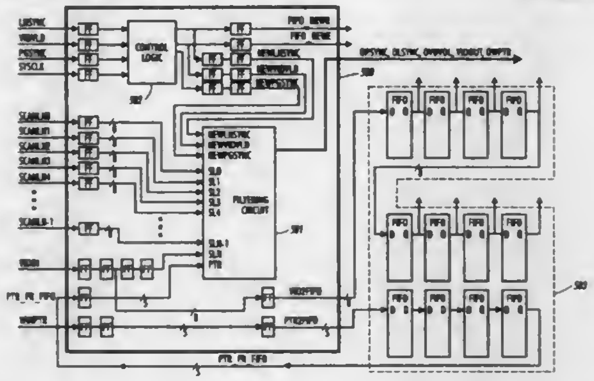
SELF-TIMED TWO-DIMENSIONAL FILTER

Dawn M. Williams, Webster, and Stuart A. Schweid, Henrietta, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 8, 1996, Ser. No. 643,427

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—260 **14 Claims**



1. A self-timed image processing device for filtering digital image data, comprising:

- a timing circuit to convert a received line sync signal and a received page sync signal to a new line sync signal and a new page sync signal; and
- a N×M filter to filter digital data based on said new line sync signal and said new page sync signal; N being a value representing a filter dimension in a slow scan direction, M being a value representing a filter dimension in a fast scan direction;
- said timing circuit causing the self-timed image processing device to output (N−1)/2 scanlines of unfiltered digital image data after the received page sync signal indicates an end of an input page.

5,751,863

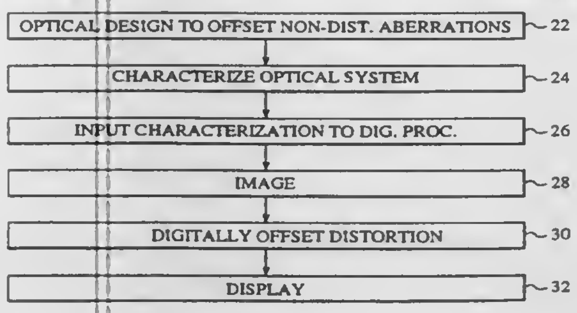
METHOD AND SYSTEM HAVING RELAXED FRONT END DISTORTION REQUIREMENTS

Mina Farr, Palo Alto, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Jun. 18, 1996, Ser. No. 665,437

Int. Cl.⁶ G06F *9/40;* **G06T** *5/00;* **H04N** *1/409*

U.S. Cl. 382—275 **16 Claims**


OPTICAL DESIGN TO OFFSET NON-DIST. ABERRATIONS
22
CHARACTERIZE OPTICAL SYSTEM
24
INPUT CHARACTERIZATION TO DIG. PROC.
26
IMAGE
28
DIGITALLY OFFSET DISTORTION
30
DISPLAY
32

1. In a design of optics for use in a digital image processing system, a method comprising steps of:

- selecting an arrangement of optical elements based upon achieving low levels of aberrations other than distortion, including defining said arrangement such that a distortion level of at least five percent is introduced by sacrificing distortion-free imaging to achieve said low levels of aberrations other than distortion; and
- characterizing distortion of said arrangement of optical elements such that said distortion can be offset in providing digital image processing of images captured via said arrangement.

5,751,864

IMAGE DATA PROCESSING APPARATUS

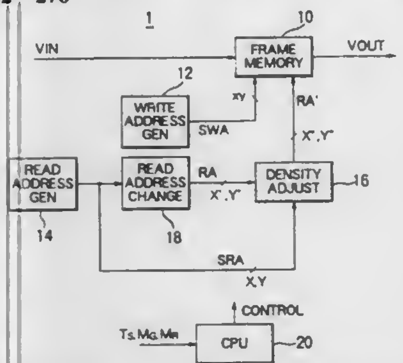
Katsuakira Moriwake, Kanagawa, and Toshihiro Shiraishi, Kangawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 302,370, Sep. 8, 1994, abandoned. This application Aug. 21, 1996, Ser. No. 701,004

Claims priority, application Japan, Sep. 8, 1993, 5-223517

Int. Cl.⁶ G06K *9/36*

U.S. Cl. 382—276 **6 Claims**



2. An image data processing apparatus for adding a special effect to an input image data, comprising:

- storage means for temporarily storing said image data;
- write address generating means for generating sequential write address signals for writing the input image data to said storage means;
- read address generating means for generating sequential read address signals;
- read address changing means for changing the read address signals generated by the read address generating means to produce changed read address signals; and
- density adjustment means for producing adjusted read address signals from said changed read address signals and for reading the input image data from the storage means in accordance with the adjusted read address signals,
- said density adjustment means including:
  - function data generating means for generating respective function data for each read address signal in accordance with a position represented by said read address signal in the image data;
  - random number generating means for generating a respective random number for each read address signal; and
  - determining means for determining, based on said respective function data and said respective random number, if a corresponding changed read address is either valid or invalid, and supplying the same changed read address when it is valid as said adjusted read address signal to said storage means so that only stored image data corresponding to valid changed read addresses are read out.

5,751,865

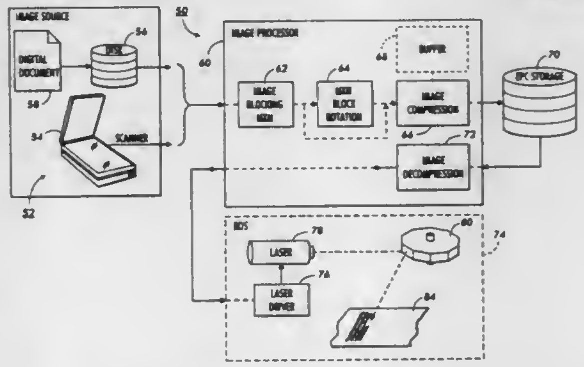
METHOD AND APPARATUS FOR IMAGE ROTATION WITH REDUCED MEMORY USING JPEG COMPRESSION

Felice A. Micco, Webster, and Martin E. Banton, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 721,127

Int. Cl.⁶ G06K *9/32;9/36;* **H04N** *1/41;1/415*

U.S. Cl. 382—296 **13 Claims**



1. A method for rotating a digital image in accordance with a compression operation, the method comprising the steps of:

- dividing the digital image into blocks, each block being represented by digital data;
- rotating the digital data in each block;
- compressing the digital data for each block into a coded unit;
- creating a pointer associated with each of a plurality of coded units after a first coded unit, wherein at least one pointer points to a coded unit other than the coded unit compressed immediately preceding the coded unit with which the pointer is associated;
- storing the coded units and associated pointers in an electronic precollation memory;
- retrieving from the electronic precollation memory the coded units in an order determined by the pointers associated with each coded unit, the order of retrieval being such that no coded unit is decompressed immediately following a block which immediately preceded the coded unit in the compressing step; and
- decompressing the coded units retrieved from the electronic precollation memory so as to produce a rotated image.

5,751,866

IMAGE SCANNING SYSTEM

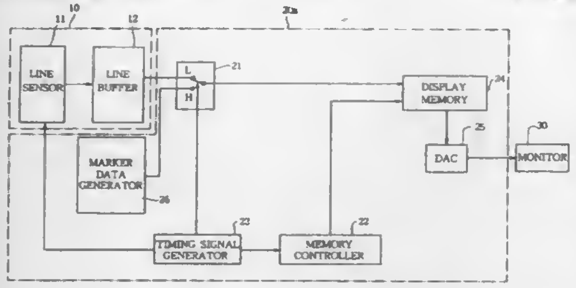
Satoshi Kusano, Saitama-ken, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,363

Claims priority, application Japan, Feb. 28, 1995, 7-040961

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—312 **4 Claims**



1. An image scanning system having a line sensor with a plurality of photoelectric conversion elements for producing image data dependent on an optical image of an object at every scanning line, the number of the photoelectric conversion elements being corresponding to a predetermined number of pixels of one scanning line, the system comprising:

marker data generator means for generating a marker data of a predetermined color for an entire straight line;

a changeover switch for selectively switching the image data applied from the line sensor for an entire straight line and the marker data applied from the marker data generator means for the entire straight line;

display memory means for storing the image data and marker data applied through the changeover switch at predetermined addresses;

memory controller means for producing address data representing said predetermined address, and for producing a first write signal for writing the marker data and a second write signal for writing the image data at every scanning line for the entire straight line;

timing signal generator means for generating a timing signal for deciding timing for producing the first write signal and the second write signal, and for generating a changeover signal for operating the changeover switch in synchronism with the first and second write signals,

monitor means for displaying the predetermined color line for the entire straight line dependent on the stored marker data and a new image for the entire straight line dependent on the stored image data, wherein the predetermined color line and new image data are displayed such that an old image is superposed with the new image and the predetermined color line is disposed therebetween.

5,751,867

POLARIZATION-INSENSITIVE, ELECTRO-OPTIC MODULATOR

James H. Schaffner, Chatsworth, and Daniel Yap, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 26, 1996, Ser. No. 591,997

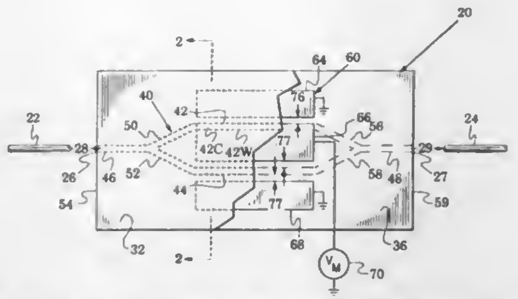
Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—3 **19 Claims**

1. A polarization-insensitive modulator for intensity modulation of an optical signal with a modulating voltage, comprising:

a first electro-optic polymer waveguide having active molecules that are at least partially ordered in a first direction, said first electro-optic polymer waveguide having input and output ends;

a second electro-optic polymer waveguide having active molecules that are at least partially ordered in a second direction which is different from said first direction, said first electro-optic polymer waveguide having input and output ends;



said input ends of said first and second electro-optic polymer waveguides coupled together to form an input port;

said output ends of said first and second electro-optic polymer waveguides coupled together to form an output port; and

an electric-field generation system which includes first, second and third coplanar electrodes, said first and second coplanar electrodes arranged to receive said modulating voltage and generate a first electric field across said first electro-optic polymer waveguide which is substantially parallel with said first direction and said second and third coplanar electrodes arranged to receive said modulating voltage and generate a second electric field across said second electro-optic polymer waveguide which is substantially parallel with said second direction;

said optical signal modulated by said modulating voltage when said modulating voltage is applied to said electric-field generation system and said optical signal is received into said input port and transmitted to said output port.

5,751,868

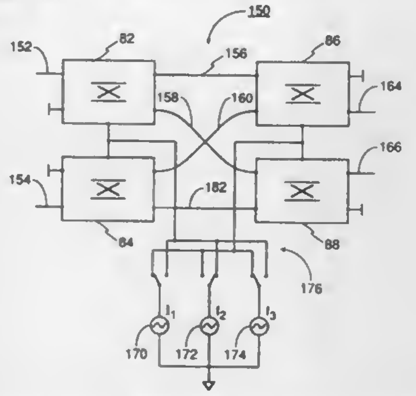
ASYMETRICALLY DILATED OPTICAL CROSS CONNECT SWITCHES

Krishna Bala, Eatontown; Charles Arthur Brackett, Mendham, both of N.J., and Ghie Hugh Song, Kwangju, Rep. of Korea, assignors to Bell Communications Research, Inc., Morristown, N.J.

Continuation of Ser. No. 498,080, Jul. 3, 1995, abandoned. This application Jun. 9, 1997, Ser. No. 871,056

Int. Cl.^{6} G02B *6/26;* **H01J** *14/00*

U.S. Cl. 385—16 **13 Claims**



1. An optical switch comprising a plurality of switching units each having a first switching state and a second switching state and being arranged in a plurality of sequential stages, wherein interconnections and control of said switching units are such that all paths between each of a plurality of inputs and each of a plurality of outputs are arranged to provide. in each of said paths, equal numbers of switching units in each of said first and said second switching states.

5,751,869

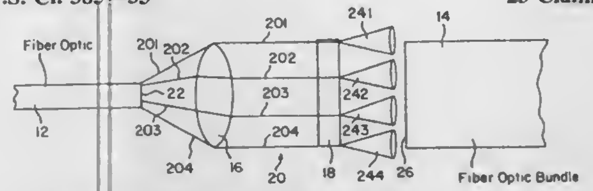
OPTICAL SYSTEM FOR COUPLING LIGHT FROM A SINGLE FIBER OPTIC INTO A FIBER BUNDLE

Kenneth K. Li, Arcadia; Douglas M. Brenner, Los Angeles, and Chingfa Chen, West Covina, all of Calif., assignors to Cogent Light Technologies, Inc., Santa Clarita, Calif.

Filed Aug. 8, 1996, Ser. No. 694,283

Int. Cl.^{6} G02B *6/32*

U.S. Cl. 385—33 **23 Claims**



1. A light guide coupling system, comprising:

a first optical light guide having a first diameter, the first optical light guide having a light-transmitting end;

a collimating device for receiving and collimating light output from the light-transmitting end of the first optical light guide;

a second optical light guide having a second diameter different from said first diameter, the second optical light guide having a light-receiving end; and

a diffuser device positioned between the collimating device and the light-receiving end of the second light guide, for diffusing the collimated light and for directing the light into the light-receiving end of the second light guide such that the collimated light diverges into the second light guide.

5,751,870

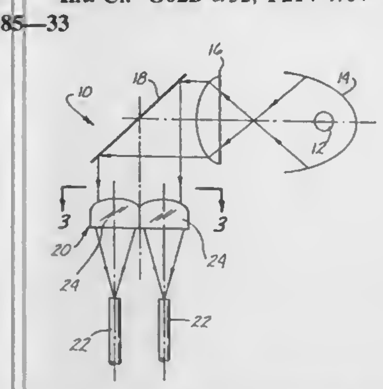
OPTICAL FIBER LENSED ILLUMINATION COUPLER

John F. Forkner, Laguna Beach; Andrew P. Riser, Menifee, both of Calif.; Ronald F. Rykowski, Woodinville, Wash., and Stephen S. Wilson, San Juan Capistrano, Calif., assignors to Remote Source Lighting International, Inc., San Juan Capistrano, Calif.

Continuation of Ser. No. 374,163, Jan. 17, 1995, Pat. No. 5,559,911. This application Sep. 23, 1996, Ser. No. 717,833

Int. Cl.^{6} G02B *6/32;* **F21V** *7/04*

U.S. Cl. 385—33 **24 Claims**



1. An optical fiber manifold for coupling light from an illumination source to a plurality of spaced output optical fibers, each of which has a proximal end for receiving said light, and a core having a diameter of at least about 1 mm for transmitting light from the proximal end to a distal output end, said manifold comprising a lens for converging said light separately on the core of each of the optical fibers, light exiting from the output end of each of said optical fibers to illuminate a space remote from said illumination source, said lens comprising a plurality of segments, each having a first surface receptive of light from said illumination source and also having a second surface, each of said lens segments further being adapted to transmit light from the second surface and focus said light on the proximal end of a corresponding one of said optical fibers.

5,751,871

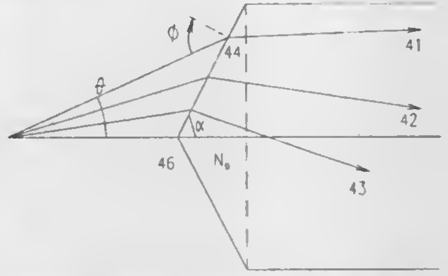
METHOD FOR COUPLING OF SEMICONDUCTOR LASERS INTO OPTICAL FIBERS

Sergej G. Krivoshlykov, Palmer, Mass., and Bolesh J. Skutnik, New Britain, Conn., assignors to Ceram Optec Industries, Inc., East Longmeadow, Mass.

Filed Jan. 3, 1997, Ser. No. 775,947

Int. Cl.^{6} G02B *6/32*

U.S. Cl. 385—33 **15 Claims**



1. A method of coupling a diode laser beam into an optical fiber having a core with a refractive index and a cladding with a lower refractive index, said method comprising the steps of:

modifying said core's refractive index at a fiber end face surface thereby creating an axial variation of said core's refractive index as a function of the distance from said fiber end face surface; and

shaping said fiber end face so as to maximize coupling efficiency of said diode laser beam into said fiber.

5,751,872

WAVELENGTH DEMULTIPLEXER

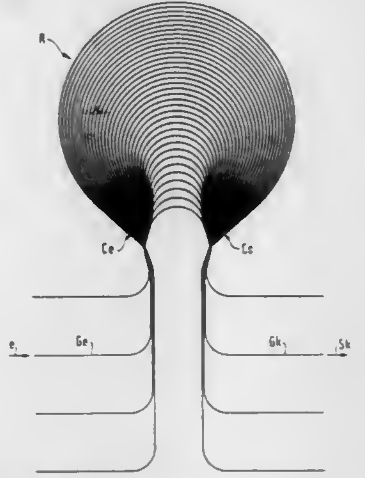
Hans Bissessur; Roland Mestric, both of Paris, and Christian Duchet, Marcoussis, all of France, assignors to Alcatel Alsthom Compagnie Generale d'Electricite, Paris, France

Filed Dec. 24, 1996, Ser. No. 772,527

Claims priority, application France, Dec. 28, 1995, 95 15657

Int. Cl.^{6} G02B *6/34*

U.S. Cl. 385—37 **13 Claims**



1. A wavelength demultiplexer comprising:

a diffraction space including:

at least one input;

an input waveguide, coupled to said at least one input and serving to inject an input optical wave into said diffraction space, and

a reception surface arranged to face said input, said input waveguide and said reception surface being dimensioned so as to form a diffracted wave, from an input optical wave, on said reception surface having amplitude as a function of position on said reception surface and including at least a portion of a plurality of secondary lobes of said diffracted wave;

a focusing surface, and

a grating, coupled to said reception surface, said grating focusing an output wave on said focusing surface at a position that is a function of the wavelength of the input optical wave.

5,751,873
FIBRE OPTIC COUPLERS

Martin Charles Elias, O'Connor; Scott Anthony Johnston, Narrabundah, and Mark Ronald Hesling, Glen Waverley, all of Australia, assignors to AOFR Pty. Limited, Fyshwick, Australia

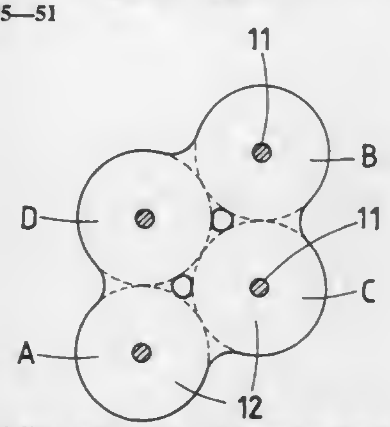
PCT No. PCT/AU94/00693, § 371 Date Jun. 26, 1996, § 102(e) Date Jun. 26, 1996, PCT Pub. No. WO95/13554, PCT Pub. Date May 18, 1995

PCT Filed Nov. 10, 1994, Ser. No. 646,255

Claims priority, application Australia, Nov. 10, 1993, 2330/93

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—51 **31 Claims**



1. A fused fibre optic 1×4 or 2×4 coupler in which four optical fibre segments extend longitudinally beside each other in a coupling region in which the fibre segments are at least partially fused together to form an assembly exhibiting a close packed cross-section in which the fibre cores are centered substantially at the corners of a four-sided polygon having a pair of opposite internal acute angles substantially less than 90°.

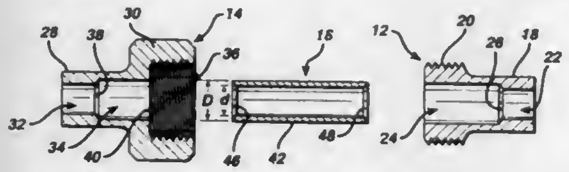
5,751,874
COUPLING DEVICE FOR LINKING OPTICAL FIBER CONNECTORS

Paul Chudoba, Shohola, and Jerome Polizzi, Morrisville, both of Pa., assignors to NuVisions International, Inc., Shohola, Pa.

Filed Sep. 13, 1996, Ser. No. 714,797

Int. Cl.^{6} G02B *6/38*

U.S. Cl. 385—72 **32 Claims**



1. A device for coupling to one another a pair of cylindrical axial ferrules of optical fiber connectors of any of ST, FC, or SC, all of said connectors having cylindrical axial ferrules of equal, predetermined diameter, said device comprising:

a) a main body having first, inner and outer ends and a first, through bore including coaxial, first and second portions adjoining at a first, internal shoulder;

b) an end cap having second, inner and outer ends and a second through bore including coaxial, third and fourth portions adjoining at a second internal shoulder, said first and third bore portions having a diameter at least as large as said predetermined diameter;

c) a generally cylindrical bushing having opposite ends and inside and outside diameters less and greater than, respectively, said predetermined diameter; and

d) means for retaining said main body and end cap in assembled relation with said first and second inner ends in directly opposing relation and said first and second bores coaxial, said bushing being disposed with said opposite ends in said second and fourth bore portions, respectively, between said first and second shoulders, whereby axial ferrules inserted through said first and third bore portions into said bushing are frictionally engaged and releasably retained thereby.

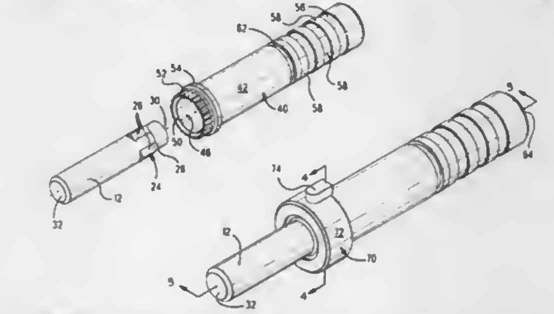
5,751,875
OPTICAL FIBER FERRULE

Bryan Thomas Edwards, Camp Hill; David Donald Erdman, Hummelstown; Robert L. Mansberger, II, Middletown; John Nicholas Skitka, Hummelstown, and Michael Charles Sponsel, New Oxford, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 4, 1996, Ser. No. 727,844

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—84 **27 Claims**



1. A fiber optic connector comprising a front ferrule with a precision bore extending there through, for precisely positioning one end of a fiber optic cable, and a rear housing including an alignment bore for receiving a buffered fiber optic cable, the precision bore and the alignment bore being coaxial, the precision ferrule including a protruding section adjacent a rear face of the precision ferrule, the housing including an enlarged bore section adjacent a front face of the housing, the protruding section of the precision ferrule being received in the enlarged bore section on the housing, the fiber optic connector including a separate retainer engaging the housing and extending into the enlarged bore in front of the protruding section of the precision ferrule to secure the precision ferrule to the housing.

5,751,876
OPTICAL FIBER CABLE CONNECTOR

Hiroshi Ikesugi, Yokohama, and Shigeyuki Hoshikawa, Yamato, both of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 10, 1996, Ser. No. 676,691

Claims priority, application Japan, Aug. 24, 1995, 7-009812

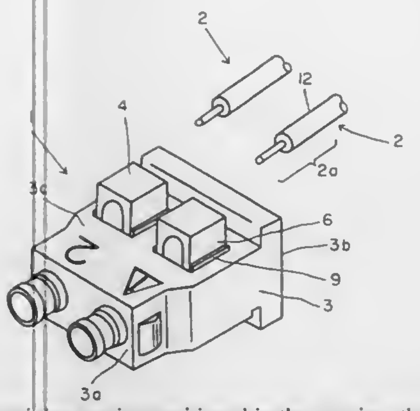
Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—86 **3 Claims**

1. An optical fiber connector comprising,

a housing molded of a dielectric material,

the housing having at least one through hole extending along a first axis to permit insertion of an end of an optical fiber, and at least one opening extending along a second axis generally perpendicular to said first axis to communicate with the through hole, and



a cable retaining portion positioned in the opening, the retaining portion molded with the housing and connected to the housing by at least one frangible portion.

5,751,877
SEMICONDUCTOR LASER MODULE

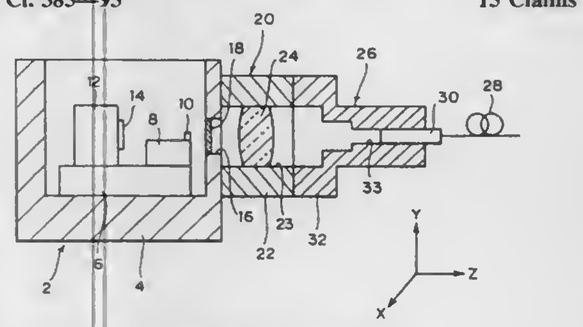
Tetsuo Ishizaka, Sapporo; Toshio Ohya, Kawasaki; Shunichi Satoh, Sapporo; Noboru Sonetsuji, and Manabu Komiyama, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 22, 1996, Ser. No. 621,092

Claims priority, application Japan, Sep. 7, 1995, 7-230238

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—93 **15 Claims**



1. A semiconductor laser module comprising:

a semiconductor laser assembly comprising a package having a transparent window and a first coefficient of linear expansion, a base fixedly mounted on an inside surface of said package and having a second coefficient of linear expansion which is substantially identical to the first coefficient of linear expansion, a carrier fixedly mounted on said base and having a third coefficient of linear expansion which is greater than the first and the second coefficients of linear expansion, and a semiconductor laser mounted on said carrier;

a lens assembly fixed by welding to said package, said lens assembly comprising a lens holder and a lens press-fitted in said lens holder, said lens holder being spot-welded to said package at a plurality of positions all of which are set below an upper surface of said base, said lens holder having a fourth coefficient of linear expansion which is generally identical to the third coefficient of linear expansion; and

a fiber assembly fixed by welding to said lens assembly, said fiber assembly comprising a holder, a ferrule inserted and fixed in said holder, and an optical fiber inserted and fixed in said ferrule.

5,751,878
LIGHT-EMITTING MODULE

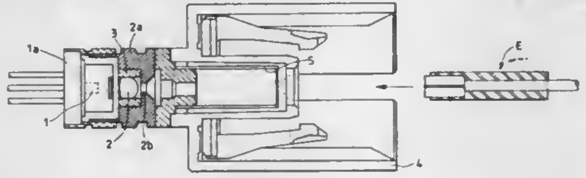
Shouichi Kyoya, Miyagi-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1997, Ser. No. 795,089

Claims priority, application Japan, Feb. 8, 1996, 8-022696

Int. Cl.^{6} G02B *6/30*

U.S. Cl. 385—93 **4 Claims**



1. A light-emitting module comprising: a laser diode; and a lens for gathering light emitted by the laser diode on an optical fiber, wherein the numerical aperture of a side of the lens on the side of the optical fiber is not greater than 0.08.

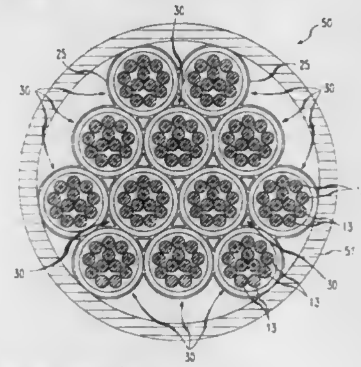
5,751,879
WOUND OPTICAL FIBER CABLE INCLUDING ROBUST COMPONENT CABLE(S) AND A SYSTEM FOR MANUFACTURE OF THE CABLE

Lionell Graham, Norcross; Artis Cornell Jenkins, Lithonia; Terry Don Mathis; Wayne McCall Newton, both of Lilburn, and Montri Viriyayuthakorn, Norcross, all of Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 28, 1995, Ser. No. 580,229

Int. Cl.^{6} G02B *6/44*

U.S. Cl. 385—103 **28 Claims**



1. An apparatus comprising:

at least one component cable including

- an elongated central aramid yarn member;
- a plurality of individually buffered optical fibers arranged about and in contact with the aramid yarn member;
- an aramid yarn layer surrounding and in contact with the buffered optical fibers; and
- a plastic jacket surrounding and in contact with the aramid yarn layer.

5,751,880
OPTICAL UNIT FOR AN OPTICAL FIBER TELECOMMUNICATIONS CABLE, AND AN OPTICAL FIBER CABLE INCLUDING SUCH A UNIT

Pierre Gaillard, Puteaux, France, assignor to Alcatel Cable France, Clichy Cedex, France

Filed Oct. 18, 1996, Ser. No. 733,447

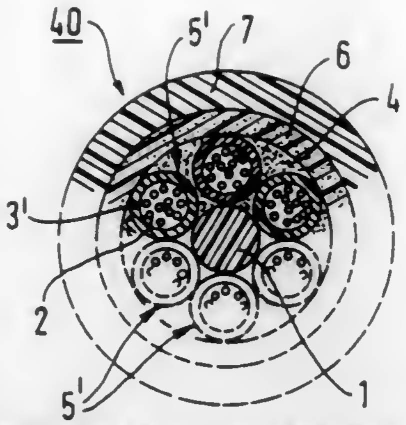
Claims priority, application France, Oct. 20, 1995, 95 12367

Int. Cl.^{6} G02B *6/44*

U.S. Cl. 385—109 **11 Claims**

1. An optical unit for an optical fiber telecommunications cable, the unit comprising a tube of a plastics material in which at least one optical fiber is loosely received,

wherein the thickness of said tube is less than or equal to 0.5 mm, and wherein said material has a modulus of elasticity



less than 1500 MPa at 20° C. and a stress/elongation curve without a yield point.

5,751,881
OPTICAL FIBER CABLE

Eiji Konda; Nobuhisa Ishii, both of Chiba, and Ryuichi Matsuoka, Chiba-ken, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

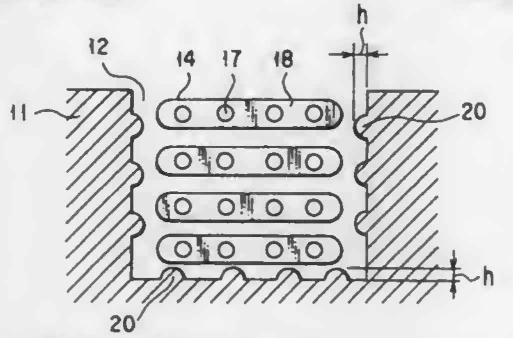
PCT No. PCT/JP96/01548, § 371 Date Jan. 27, 1997, § 102(e) Date Jan. 27, 1997, PCT Pub. No. WO96/42029, PCT Pub. Date Dec. 27, 1996

PCT Filed Jun. 7, 1996, Ser. No. 776,429

Claims priority, application Japan, Jun. 8, 1995, 7-142011

Int. Cl.^{6} G02B *6/44*

U.S. Cl. 385—110 **10 Claims**



1. An optical fiber cable, comprising:

a longitudinally extending core body having a plurality of spiral grooves formed thereon; and

at least one optical fiber ribbon housed in any one of said grooves, said at least one optical fiber ribbon including a plurality of optical fibers embedded in a strip of resin,

wherein projections formed on an inner surface of any one of said spiral grooves measure 30 μm or less in height.

5,751,882
OPTICAL FIBRE ORGANIZER

Daniel Daems, Berchem, and Luk Macken, Kessen-Lo, both of Belgium, assignors to N.V. Raychem S.A., Kessel-Lo, Belgium

PCT No. PCT/GB94/00594, § 371 Date Sep. 28, 1995, § 102(e) Date Sep. 28, 1995, PCT Pub. No. WO94/23324, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 23, 1994, Ser. No. 532,730

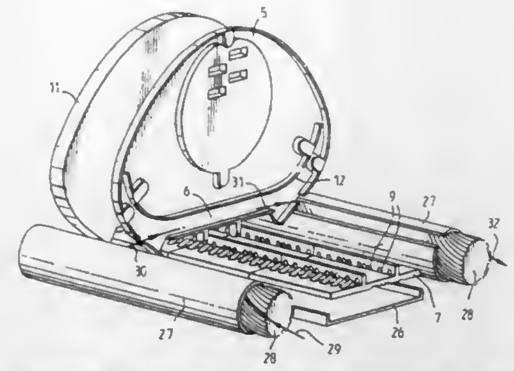
Claims priority, application United Kingdom, Apr. 1, 1993, 9306854

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—135 **15 Claims**

1. An optical fibre organizer which comprises:

(a) a support for a plurality of optical fibre trays;



(b) an input tray and an output tray mounted in series on a surface of the support;

(c) a splitter tray also mounted in series on the surface of said support, the splitter tray including an optical fibre splitter; and

(d) guide means for defining predetermined guiding paths to be taken by optical fibres and for guiding optical fibres from the splitter tray to the input and output trays, the guide means being provided on an opposite surface of the support to that on which the trays are mounted.

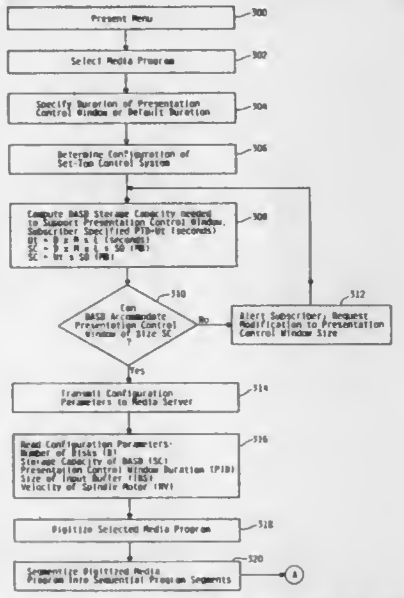
5,751,883
MULTIMEDIA DIRECT ACCESS STORAGE DEVICE AND FORMATTING METHOD

Hal Hjalmar Ottesen; Gordon J. Smith, and George Willard Van Leeuwen, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 478,328, Jun. 7, 1995, abandoned. This application May 30, 1997, Ser. No. 866,377

Int. Cl.^{6} H04N *9/80;5/917;5/911;7/64*

U.S. Cl. 386—27 **28 Claims**


Present Menu
300
Select Media Program
302
Specify Duration of Presentation Control Window or Default Duration
304
Determine Configuration of Set-Top Control System
306
Compute DASD Storage Capacity Needed to Support Presentation Control Window.
308
Can DASD Accommodate Presentation Control Window of Size SC ?
310
No
Alert Subscriber; Request Modification to Presentation Control Window Size
312
Yes
Transmit Configuration Parameters to Media Server
314
Read Configuration Parameters:
316
Digitize Selected Media Program
318
Segmentize Digitized Media Program Into Sequential Program Segments
320
A

1. A direct access storage device for buffering at least a chronological portion of a multimedia program defined by non-chronologically ordered source program segments, each of the source program segments being representative of a unique portion of the chronological multimedia program portion, the direct access storage device comprising:

at least one data storage disk having a plurality of data storing regions disposed on any of a lower disk surface and an upper disk surface, the plurality of data storing regions defining a presentation control window buffer;

a spindle motor for rotating the at least one data storage disk;

an actuator having elongated arms;

a transducer disposed on each of the elongated arms; and

a controller that coordinates writing of the non-chronologically ordered source program segments to the presentation control window buffer and coordinates reading of the non-chronologically ordered source program segments from the presentation control window buffer as chronologically ordered local program segments, the controller coordinating writing of the source program segments to the presentation control window buffer in accordance with the equations:

$$SC=D\times M\times L\times S0;\ \text{and}\ PTD=D\times M\times L\times T0;$$

where:

SC is defined as a nominal storage capacity used for supporting the presentation control window buffer in megabytes;

D is defined as a number of data storage disk surfaces used for supposing the presentation control window buffer,

M is defined as a number of segment blocks per data storage disk surface used for supporting the presentation control window buffer,

L is defined as a length of each segment block as measured by the number of source program segments;

S0 is defined as an average size of each of the source program segments in megabytes;

PTD is defined as a duration of the presentation control window buffer in seconds; and

T0 is defined as a decompressed full-motion program time in seconds corresponding to each of the source program segments.

5,751,884
HIGH-RESOLUTION VIDEO TAPE RECORDER SYSTEMS AND METHODS FOR RECORDING AND RECOVERING VIDEO COMPATIBLY WITH THE NORMAL-VHS FORMAT SYSTEM

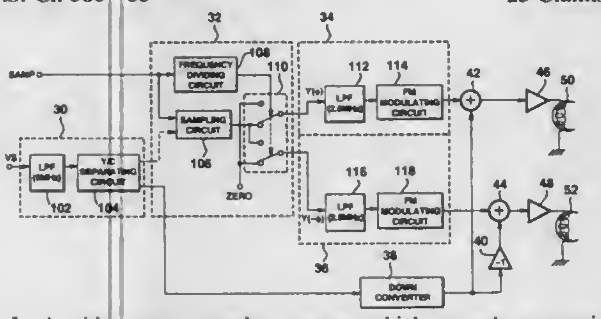
Jung Wan Ko, Lawrenceville, N.J., assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation-in-part of Ser. No. 636,440, Dec. 31, 1990, abandoned. This application Mar. 3, 1993, Ser. No. 25,758

Claims priority, application Rep. of Korea, Dec. 30, 1989, 1989-20595

Int. Cl.^{6} H04N *11/02;9/79*

U.S. Cl. 386—33 **25 Claims**



1. A video tape recorder system, which records magnetic responses to a composite video signal in a recording medium on field tracks with a field track width, and which picks up and recovers from said recording medium electric responses to said composite video signal recorded on said field track, said composite video signal being descriptive of line by line scanning of a television image field at a line scan rate, the successive scanning lines of each television image frame being identified by consecutive ordinal numbers, and successive television image frames being identified by consecutive ordinal numbers, said video tape recorder system comprising:

luma/chroma separating means for separating said composite video signal into a luminance signal and a chrominance signal;

chrominance signal converting means for generating by down-conversion from said chrominance signal, a first color-under signal and a second color-under signal in phasing opposite to that of said first color-under signal;

sampling means for sampling said luminance signal according to a first sampling clock signal supplied at a rate at least the Nyquist rate for said luminance signal, but not as much as twice the Nyquist rate, to obtain an integral number of samples per scanning line which samples are identified by consecutive ordinal numbers beginning with first, and ones of said samples identified by the same ordinal number being arranged within said television image frames in a line transverse to the nominal direction of said scanning lines;

means included within said sampling means, separating odd-numbered samples from odd-numbered scan lines and even-numbered samples from even-numbered scan lines as those samples sequentially occur during scanning of each odd-numbered television image frame and each even-numbered television image frame, respectively, and further separating even-numbered samples from odd-numbered scan lines and odd-numbered samples from even-numbered scan lines as those samples sequentially occur during scanning of each even-numbered television image frame and each odd-numbered television image frame, respectively, for generating a first sub-Nyquist sampled luminance signal and a second sub-Nyquist sampled luminance signal, respectively;

first modulating means for generating a first modulated signal having frequencies above those of said first color-under signal, said first modulated signal being modulated in accordance with said first sub-Nyquist sampled luminance signal;

means for generating a first subtrack video signal by frequency-multiplexing said first modulated signal from said first modulating means together with said first color-under signal from said chrominance signal converting means;

second modulating means for generating a second modulated signal having frequencies above those of said second color-under signal, said second modulated signal being modulated in accordance with said second sub-Nyquist sampled luminance signal;

means for generating a second subtrack video signal by frequency-multiplexing said second modulated signal from said second modulating means together with said second color-under signal from said chrominance signal converting means;

recording and playback means including a headwheel, a first even-numbered plurality of heads mounted along the rim of said headwheel for recording magnetic responses to said first subtrack video signal in first subtracks occupying a first half of the width of said field tracks in said recording medium and playing back a first reproduced subtrack video signal responsive to magnetic responses previously recorded in said first subtracks in said recording medium, and a second even-numbered plurality of heads mounted along the rim of said headwheel for recording magnetic responses to said second subtrack video signal in second subtracks occupying a second half of the width of said field tracks in said recording medium and playing back a second reproduced subtrack video signal responsive to magnetic responses previously recorded in said second subtracks in said recording medium;

first demodulating means responding to said first reproduced subtrack video signal for reproducing said first sub-Nyquist sampled luminance signal as a first reproduced sub-Nyquist sampled luminance signal and for reproducing said chrominance signal in a first phasing as a first reproduced chrominance signal, said first demodulating means being of a type separating a first reproduced color-under signal from said first subtrack video signal, generating said first reproduced chrominance signal from said first reproduced color-under signal by upconversion thereof, separating a first reproduced modulated signal from said first subtrack video signal, and detecting from said first reproduced modulated signal said first reproduced sub-Nyquist sampled luminance signal;

second demodulating means responding to said second reproduced subtrack video signal for reproducing said second sub-Nyquist sampled luminance signal as a second reproduced sub-Nyquist sampled luminance signal and for reproducing said chrominance signal in a second phasing as a second reproduced chrominance signal, said second demodulating means being of a type separating a second reproduced color-under signal from said second subtrack video signal, generating said second reproduced chrominance signal from said second reproduced color-under signal by upconversion thereof, separating a second reproduced modulated signal from said second subtrack video signal, and detecting from said second reproduced modulated signal said second reproduced sub-Nyquist sampled luminance signal;

multiplexing means for reproducing said luminance signal by alternately sampling said first reproduced sub-Nyquist sampled luminance signal and said second reproduced sub-Nyquist sampled luminance signal according to a second sampling clock signal, thereby generating a reproduced luminance signal;

means for generating a combined response to said first reproduced chrominance signal and said second reproduced chrominance signal, in which said combined response respective component responses to said first reproduced chrominance signal and to said second reproduced chrominance signal combine constructively; and

means for reproducing said composite video signal, by combining said combined response to said first reproduced chrominance signal and said second reproduced chrominance signal with said reproduced luminance signal from said multiplexing means.

5,751,885

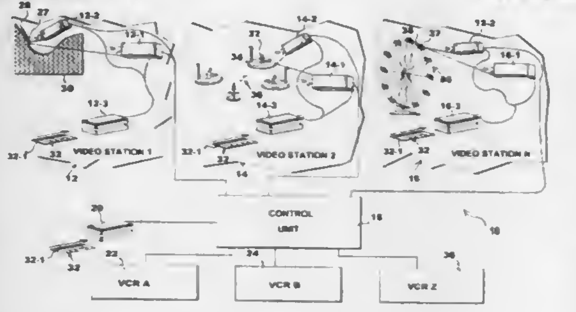
CENTRALIZED VIDEO SYSTEM

Maureen O'Loughlin, and Brian O'Loughlin, both of 200 Charlemont, Griffith Avenue, Dublin 9, Ireland

Filed Dec. 19, 1995, Ser. No. 574,921

Int. Cl.^{6} H04N *5/91;7/00;5/225:5/76*

U.S. Cl. 386—46 **30 Claims**



1. A centralized video system, comprising:

a) at least one remote video recorder each of which recording at least one video clip for at least one customer;

b) imparting means for imparting a different customer identification code for each of said at least one customer on each of said at least one video clip recorded for said at least one customer;

c) an imaging means for inputting/transmitting video clips of said at least one customer to said remote video recorder, wherein said imaging means is triggered by said imparting means;

d) combining means for combining said at least one video clip by said customer identification code;

e) producing means for producing a video of said combined at least one video clip for each said different customer identification number;

f) identifying means for identifying said produced video by said different customer identification code; and

g) dispensing means for dispensing said identified produced video.

5,751,886

VIDEO IMAGE PROCESSING APPARATUS

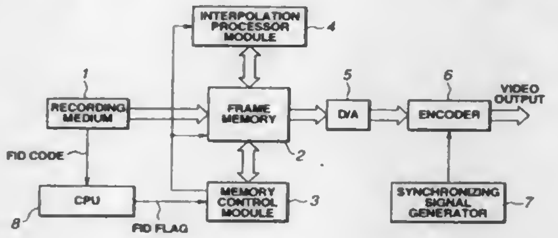
Hitoshi Komine, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1996, Ser. No. 658,406

Claims priority, application Japan, Jun. 7, 1995, 7-140839

Int. Cl.^{6} H04N *5/94*

U.S. Cl. 386—48 **10 Claims**



1. A video image processing apparatus comprising:

a reproducing unit for reproducing field video data from a recording medium that stores the field video data and field attribute information about the field video data,

a video memory for temporarily storing the field video data reproduced by the reproducing unit,

an interpolation unit for interpolating the field video data stored in the video memory and then outputting interpolated video data, and

a memory control unit for controlling writing to and reading from the video memory, whereby the memory control unit comprises an element for modifying a write line position of the field video data to the video memory, to the odd line position or even line position, depending on whether the field attribute information about the reproduced field video data to be interpolated is odd or even to prevent a one-line discrepancy between odd and even fields stored in the video memory.

5,751,887

APPARATUS AND METHOD OF DECODING DATA GROUPS OF PICTURES

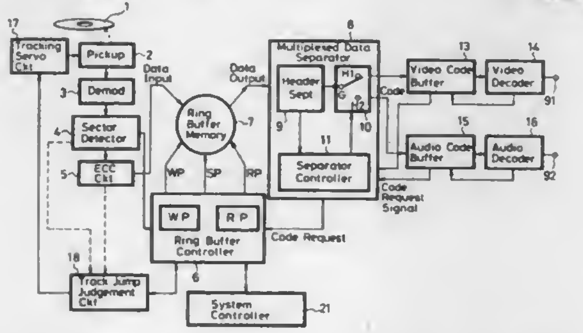
Hajime Nitta, Kanagawa, and Kiyoshi Ota, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 8, 1996, Ser. No. 598,727

Claims priority, application Japan, Feb. 17, 1995, 7-051991

Int. Cl.^{6} H04N *5/783*

U.S. Cl. 386—68 **11 Claims**



1. An apparatus for decoding groups of pictures conforming to the MPEG standard reproduced from a record medium comprising:

memory means logically configured in a continuous loop for storing said groups of pictures reproduced from the record medium;

first control means for causing said data reproduced from the record medium to be written into and read from said memory means,

wherein, said first control means, during forward reproduction, causes frames of each group of pictures to be read around said continuous loop of said memory means;

decoding means for decoding data read from said memory means; and

second control means for inhibiting, during forward reproduction, the first control means from overwriting a respective group of pictures being currently read from said memory means until all frames of said respective group of pictures are read from said memory means, such that all of said frames in said respective group of pictures being currently read are available in said memory means when reverse reproduction is initiated.

5,751,888

MOVING PICTURE SIGNAL DECODER

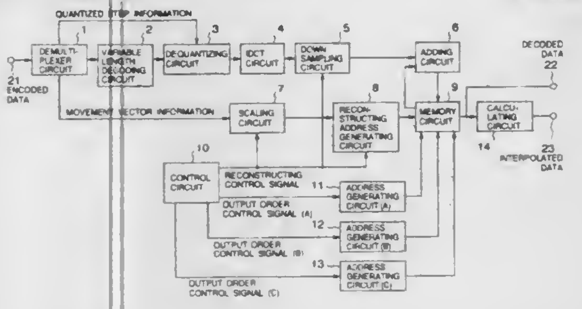
Hiroyuki Fukuchi, and Kinya Osa, both of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 6, 1996, Ser. No. 659,573

Claims priority, application Japan, Jun. 6, 1995, 7-163018

Int. Cl.^{6} H04N *5/783;5/76*

U.S. Cl. 386—68 **6 Claims**



QUANTIZED STEP INFORMATION
1
2
3
4
5
6
DEMULTIPLEXER CIRCUIT
VARIABLE LENGTH DECODING CIRCUIT
DEQUANTIZING CIRCUIT
IDCT CIRCUIT
DOWN SAMPLING CIRCUIT
ADDING CIRCUIT
DECODED DATA
22
21
ENCODED DATA
MOVEMENT VECTOR INFORMATION
7
SCALING CIRCUIT
8
RECONSTRUCTING ADDRESS GENERATING CIRCUIT
9
MEMORY CIRCUIT
CALCULATING CIRCUIT
14
23
INTERPOLATED DATA
10
CONTROL CIRCUIT
RECONSTRUCTING CONTROL SIGNAL
11
ADDRESS GENERATING CIRCUIT (A)
OUTPUT ORDER CONTROL SIGNAL (A)
12
ADDRESS GENERATING CIRCUIT (B)
OUTPUT ORDER CONTROL SIGNAL (B)
13
ADDRESS GENERATING CIRCUIT (C)
OUTPUT ORDER CONTROL SIGNAL (C)

1. A moving picture signal decoder for decoding compressed picture data resulting from compressing original picture data by use of a combination of picture information including picture data of each frame of a moving picture signal and motion vector information including a motion vector between frames, said moving picture signal decoder comprising:

demultiplexer means for demultiplexing the compressed picture data to obtain the picture data and the motion vector;

decoding means for decoding the picture data to obtain decoded picture data;

down-sampling means for (i) down-sampling the decoded picture data so that the decoded picture data has 1/M a number of pixels included in the original picture data, where M is a positive integer, in one of a reverse playback mode and a fast forward/reverse playback mode and (ii) passing the decoded picture data as it is in a normal playback mode;

scaling means for (i) multiplying the motion vector by $1/\sqrt{M}$ in one of the reverse playback mode and the fast forward/reverse playback mode and (ii) passing the motion vector as it is in the normal playback mode;

memory means for storing the decoded picture data output from said down-sampling means; and

memory reading means for reading the sampled picture data from said memory means in a predetermined order by using the motion vector output from said scaling means.

5,751,889

RECORDING AND REPRODUCTION OF A TRICK MODE VIDEO SIGNAL

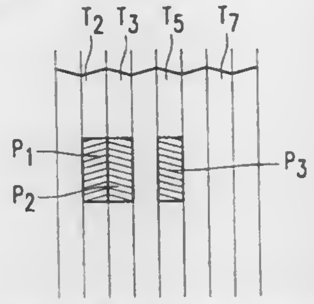
Wilhelmus J. Van Gestel, and Ronald W.J.J. Saeijs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 402,263, Mar. 10, 1995, abandoned. This application Apr. 14, 1997, Ser. No. 839,427

Claims priority, application European Pat. Off., Apr. 12, 1994, 94200943

Int. Cl.^{6} H04N *5/91;* **G11B** *5/09*

U.S. Cl. 386—68 **17 Claims**



1. Recording arrangement for recording a digital video signal in slant tracks on a magnetic record carrier, the recording arrangement comprising

an input terminal for receiving the digital video signal,

channel encoding means for channel encoding the digital video signal so as to obtain a channel signal suitable for recording in a track on said record carrier,

writing means for writing the channel signal in the tracks, the writing means comprising at least a first and a second writing head having head gaps of different azimuth angles and located at the circumference of a rotatable head drum,

wherein the recording arrangement is further provided with trick mode information generation means for deriving a trick mode video signal from the digital video signal, the channel encoding means being adapted to encode the trick mode video signal and the digital video signal so as to obtain a composite channel signal at its output, the writing means being adapted to write the composite channel signal in the tracks, that, for realizing a trick mode reproduction in a reproducing arrangement having reading means for reading the composite channel signal from the tracks, the reading means having at least a first and a second reading head located on a head drum such that the two heads are either located separately from each other at an angle around the circumference of the head drum or form a head pair of two rigidly connected heads located side by side, the first and second heads of the reading means having gaps with an azimuth angle which is substantially equal to the azimuth angle of the first and second write head respectively of the writing means, the transport speed of the record carrier in the said trick mode being n times the nominal transport velocity during normal play reproduction where n is an integer and comprises a divisor number p larger than 1, the channel encoding means are adapted to encode the trick mode video signal in such a way that in a group of 2p tracks the encoded trick mode video signal is recorded in a portion of a first, second and a third track in said group of 2p tracks, the first and second tracks being neighbouring tracks, the encoded trick mode information stored in the portion of the first track being different from the encoded trick mode information stored in the portion of the second track, the encoded trick mode information stored in the portion of the third track being equal to at least part of the encoded trick mode information which is stored in the portion of one of the first and second tracks, and for p being an odd number, in the group of 2p tracks the neighbouring first and second tracks are spaced a number of p−2 tracks from the third track.

5,751,890
MAGNETIC TYPE RECORDING AND REPRODUCING APPARATUS

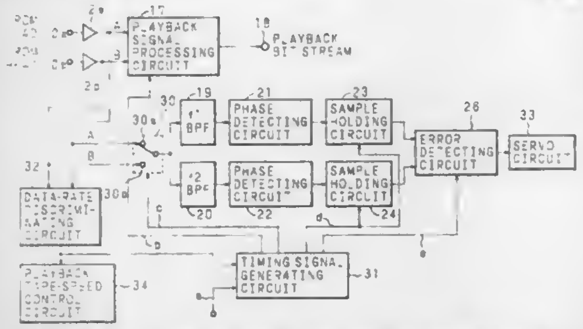
Tatsuo Yamasaki; Masako Asamura; Sadayuki Inoue; Junko Shinohara, and Ken Onishi, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 554,833

Claims priority, application Japan, Nov. 11, 1994, 6-277823; Jan. 25, 1995, 7-009869

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 386—79 **7 Claims**



1. A magnetic type recording and reproducing apparatus for recording signals, having a different data rates from each other, together with pilot signals for use in tracking during playback, to a plurality of tracks formed on a magnetic tape and for reproducing the signals, comprising:

a first head and a second head which have different azimuth angles from each other;

determining means for determining a data rate of playback data obtained by said first head and said second head;

means for extracting a first pilot signal component obtained through playback by said first head;

means for extracting a second pilot signal component obtained through playback by said second head;

detection means for detecting a tracking error on the basis of the first pilot signal component, the second pilot signal component, and the data rate determined by said determining means; and

control means for controlling tracking of said first and second heads in accordance with the tracking error detected by said detection means.

5,751,891

Patent Not Issued For This Number

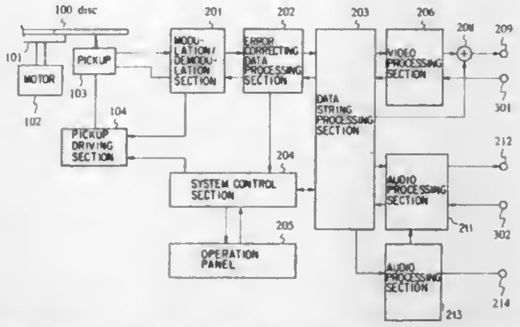
5,751,892
MULTI-SCENE RECORDING MEDIUM AND APPARATUS FOR REPRODUCING DATA THEREFROM

Koichi Hirayama, Yokohama; Masatoshi Nakai, Kawasaki, and Kenji Shimoda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 454,289, Jun. 15, 1995. This application Aug. 8, 1996, Ser. No. 694,339

Int. Cl.^{6} H04N *5/91;7/08;5/781*

U.S. Cl. 386—92 **8 Claims**



1. An apparatus for reproducing information from a multi-scene recording medium including a disk having a management area and a data area, said data area recording a first program information item, a second program information item following said first program information item, a third program information item following said second program information item, and a fourth program information item for replacing said second program information item, wherein said second and fourth program information items include simultaneously proceeding scenes, said management area recording multi-scene configuration information indicating that second and fourth program information items are linked to each other, data units of said second program information item and data units of said fourth program information item being alternatingly and continuously recorded on said recording medium, said apparatus comprising:

pickup means for generating signals based on information recorded on said disk;

demodulation means for generating multi-scene configuration data by demodulating signals generated by said pickup means, said multi-scene configuration data being based on said multi-scene configuration information recorded in said management area of said disk;

management data storage means for storing said multi-scene configuration data generated by said demodulation means;

menu generating means for generating, based on a decoded output, a menu displaying an image relating to said program information item being decoded when said multi-scene configuration data indicates that said second or fourth program information item is being reproduced, said menu being used to switch between reproduction of said second program information item and said fourth program information item, where

when reproduction is to be switched from one of the second and fourth program information items to another of the second and fourth program information items while the one program information item is being reproduced, reproduction of the other program information item starts from a head portion of a data unit of the other program information item.

5,751,893
VARIABLE LENGTH CODE RECORDING/PLAYBACK APPARATUS

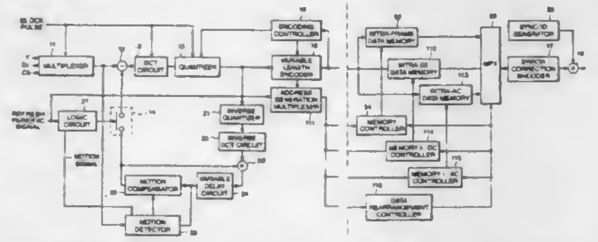
Kenji Shimoda; Shuji Abe, and Kouichi Kurihara, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Mar. 24, 1993, Ser. No. 35,755

Claims priority, application Japan, Mar. 24, 1992, 4-066369; Mar. 24, 1992, 4-066370; Mar. 25, 1992, 4-067609; Mar. 25, 1992, 4-067611

Int. Cl.^{6} H04N *5/917*

U.S. Cl. 386—111 **10 Claims**



1. A variable length code encoding apparatus for encoding video data to be recorded on a recording medium with a plurality of tracks, comprising:

multiplexing means for multiplexing said video data and outputting multiplexed data, said multiplexed data comprising interframe data, AC components of intraframe data, and DC components of intraframe data;

subtracting means for subtracting from said multiplexed data a preceding frame data when said interframe data is being encoded;

encoding means for variable length encoding said multiplexed data and outputting variable length encoded data, said variable length encoded data comprising variable length encoded interframe data, variable length encoded AC components of intraframe data and variable length encoded DC components of intraframe data;

memory means for storing said variable length encoded data, said memory means comprising intraframe AC memory means for storing said variable length encoded AC components of intraframe data, intraframe DC memory means for storing said variable length encoded DC components of intraframe data, and interframe memory means for storing said variable length encoded interframe data; and

data rearrangement means for rearranging said variable length encoded data so that said variable length encoded DC components of intraframe data are to be recorded at prescribed locations on said recording medium.

5,751,894
RECORDING/REPRODUCING SYSTEM OF A DVCR

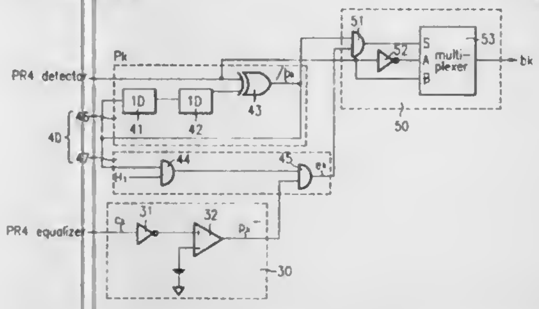
Tae-Kyong Kwon, Kyungki-do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Sep. 25, 1995, Ser. No. 533,067

Claims priority, application Rep. of Korea, Sep. 27, 1994, 1994/24285

Int. Cl.^{6} H04N *5/911;7/64*

U.S. Cl. 386—116 **5 Claims**



1. A recording/reproducing system of a DVCR for converting input digital data into an INRZI signal via a precoder to record said INRZI signal, and restoring it via a PR4 equalizer and a PR4 detector, comprising:

an error detecting part including;

a (–) peak waveform detector for detecting a (–) peak waveform from said PR4 detector,

an approximate signal generator for approximating a position of error occurrence after the (–) peak waveform detected from said PR4 detector is delayed by 2 bits, and

an error pulse generator for generating error pulses when the (–) peak waveform of the (–) peak waveform detector and the approximate signal of the approximate signal generator are received at the same time, and,

an error correcting part including;

a gate part for subjecting the error pulses from the error pulse generator and 2 bits delayed (–) peak waveform from the approximate signal generator to an AND operation,

an invertor for inverting said peak waveform from said PR4 detector, and

a multiplexer for selectively providing the inverted peak waveform from said inverter and said peak waveform from said PR4 detector according to a result of the AND operation.

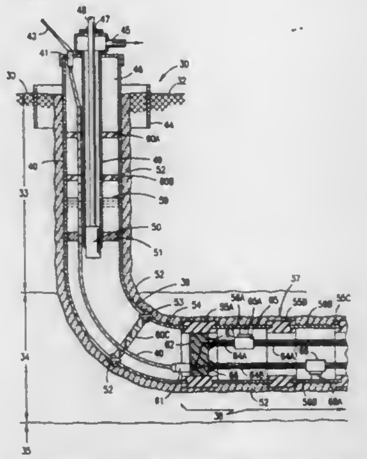
5,751,895
SELECTIVE EXCITATION OF HEATING ELECTRODES FOR OIL WELLS

Jack E. Bridges, Park Ridge, Ill., assignor to EOR International, Inc., Calgary, Canada

Filed Feb. 13, 1996, Ser. No. 600,526

Int. Cl.^{6} E21B *36/04*

U.S. Cl. 392—306 **10 Claims**



1. An electrical control for an iterated heating electrode array for an oil well, the oil well comprising an initial well bore extending downwardly from the surface of the earth through overburden formations and a producing well bore in communication with and extending from the initial well bore into an oil producing formation, the electrode array including sets of two or more electrically isolated conductive heating electrodes spaced longitudinally through the producing well bore, and a plural-conductor energizing cable for electrically energizing the heating electrodes in each set of electrodes with A.C. power at a phase displacement of at least 90°, the electrical control comprising:

a plurality of sensor switches, each sensor switch being connected from the energizing cable to one heating electrode, each sensor switch being actuated only for a predetermined sensing range and being unactuated above that range.

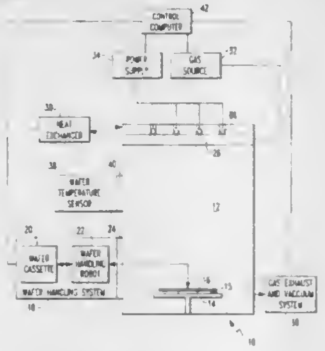
5,751,896
METHOD AND APPARATUS TO COMPENSATE FOR NON-UNIFORM FILM GROWTH DURING CHEMICAL VAPOR DEPOSITION

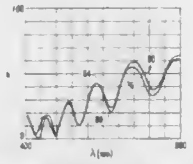
Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Feb. 22, 1996, Ser. No. 605,369

Int. Cl.^{6} H01L *21/20;* **H05B** *3/02;* **F27B** *5/04*

U.S. Cl. 392—416 **12 Claims**





1. An apparatus for heating a surface carrying a film having a thickness, comprising a source of radiant energy having a plurality

of peak energy wavelengths for heating the film so that heating of the film generally increases as the thickness of the film decreases, and being positioned to direct radiant energy toward the surface.

5,751,897

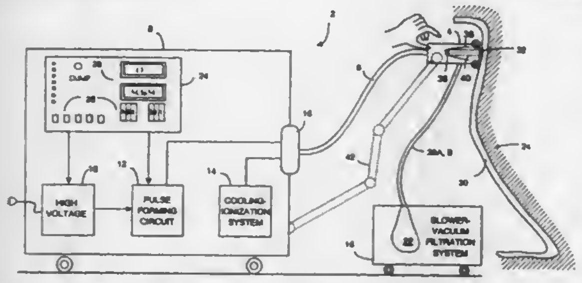
SYSTEM FOR PHOTOPYROLITICALLY REMOVING A CONTAMINANT

David C. Van Alstyne, 2664 Califoria St., Apt. No. 5, San Francisco, Calif. 94115

Division of Ser. No. 378,944, Jan. 26, 1995, which is a continuation of Ser. No. 67,521, May 25, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 748,185

Int. Cl.^{6} F21V *7/12*

U.S. Cl. 392—419 **15 Claims**



1. A system for removing a contaminant from a substrate, comprising:

light energy means for directly heating the contaminant, said light energy means having an output spectrum including an infrared component and a visible component; and

energizing means, coupled to said light energy means, for causing said light energy means to provide to the contaminant at least one pulse of light energy having a desired characteristic;

wherein energy from said light energy means carbonizes the contaminant relatively faster than said energy heats said substrate, thereby removing said contaminate from said substrate.

5,751,898

SPEECH RECOGNITION METHOD AND APPARATUS FOR USE THEREIN

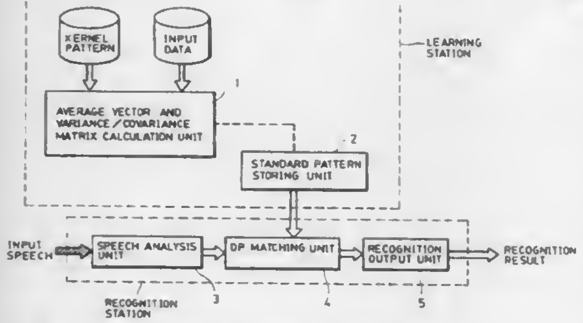
Tetsuo Kosaka; Atsushi Sakurai, both of Yokohama, and Junichi Tamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 48,060, Apr. 19, 1993, abandoned, which is a continuation of Ser. No. 592,304, Oct. 2, 1990, abandoned. This application Feb. 22, 1994, Ser. No. 199,968

Claims priority, application Japan, Oct. 3, 1989, 1-259649

Int. Cl.^{6} G10L *5/06*

U.S. Cl. 395—2.5 **15 Claims**



1. A speech recognition apparatus, comprising:

input means for inputting a speech vector;

memory means for storing data representing a reference pattern of a word composed of an average vector and a matrix including covariance elements obtained by learning some input speech vector of the word;

calculation means for calculating the cumulative distance P(i,j) between the i^{th} frame of an input speech vector and the jth frame of the reference pattern, for calculating the optimal integral path length C(i,j) between the i^{th} frame of the input speech vector and the jth frame of the reference pattern, and for calculating a dynamic programming value D(i) for the i^{th} frame of an input speech vector according to the equation D(i)=P(i,j)/C(i,j);

calculation means for calculating sequentially the Mahalanobis distance between data representing a time series of parameters of the speech vector input by said input means and data representing the reference pattern of the word composed of the average vector and the matrix including covariance elements stored in said memory means by performing a matching operation by means of a connected dynamic programming method;

detection means for detecting the reference pattern representing the minimum Mahalanobis distance calculated by said calculation means; and

recognition means for recognizing when the end of a word has been input by determining that D(i) has fallen below a predetermined threshold and for recognizing whether the input speech vector is the word represented by the reference pattern based on the data representing the minimum Mahalanobis distance calculated by said calculation means and detected by said detection means when D(i) falls below the predetermined threshold.

5,751,899

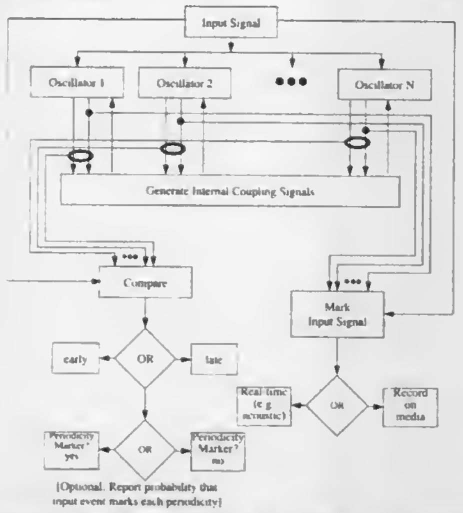
METHOD AND APPARATUS OF ANALYSIS OF SIGNALS FROM NON-STATIONARY PROCESSES POSSESSING TEMPORAL STRUCTURE SUCH AS MUSIC, SPEECH, AND OTHER EVENT SEQUENCES

Edward W. Large, 5283 Brandy Oaks La., Columbus, Ohio 43220, and John F. Kolen, 2822 Indianola Ave., Columbus, Ohio 43202

Filed Jun. 8, 1994, Ser. No. 254,638

Int. Cl.^{6} G01L *3/02*

U.S. Cl. 395—2.16 **43 Claims**



1. A method for the analysis of a stationary or non-stationary input signal provided as a time series susceptible to a frequency and phase analysis, to determine the presence and nature of a pseudo-periodic component in the signal, comprising the steps of:

providing a nonlinear oscillator with time-varying internal state described by a set of state variables and generating a potentially non-stationary reference periodicity;

driving the nonlinear oscillator with the input signal, through linear or non-linear coupling, to do one or more of the group consisting of (1) adjusting the state variables that determine the phase of the nonlinear oscillator in such a way that the nonlinear oscillator becomes entrained to said pseudo-periodic component, (2) adapting the state variables that determine the period of nonlinear oscillator according to systematic changes in the period of said pseudo-periodic component, in order to estimate the local period of said pseudo-periodic component, and (3) adapting the state variables that determine the gain of said nonlinear oscillator according to deviations of said pseudo-periodic component from the reference periodicity generated by said nonlinear oscillator, in order to estimate the local variability of said pseudo-periodic component; and

reading the reference periodicity and/or internal state of said nonlinear oscillator throughout the analysis as the nonlinear oscillator adjusts its state variables.

5,751,900

SPEECH PITCH LAG CODING APPARATUS AND METHOD

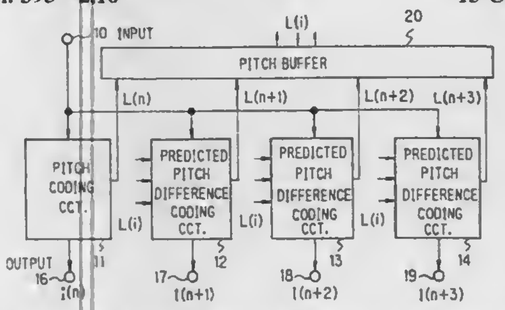
Masahiro Serizawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1995, Ser. No. 579,412

Claims priority, application Japan, Dec. 27, 1994, 6-324562

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 395—2.16 **13 Claims**



12. A method of a speech lag coding in which an input speech signal pitch lag is coded for each sub-frame having a predetermined length, comprising the steps of:

extracting a pitch lag for each of a predetermined number of sub-frames;

calculating a predicted pitch lag for a pertinent sub-frame in the predetermined number of sub-frames on the basis of at least two pitch lags extracted for sub-frames other than the pertinent sub-frame or at least one pitch lag extracted for one sub-frame other than the pertinent sub-frame and an adjacent sub-frame with respect to the one sub-frame, the adjacent sub-frame not corresponding to the pertinent sub-frame; and

coding a difference between the predicted pitch lag and the extracted pitch lag.

5,751,901

METHOD FOR SEARCHING AN EXCITATION CODEBOOK IN A CODE EXCITED LINEAR PREDICTION (CELP) CODER

Andrew P. DeJaco, and Ning Bi, both of San Diego, Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Jul. 31, 1996, Ser. No. 690,709

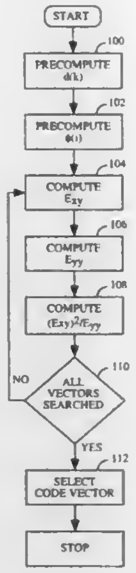
Int. Cl.^{6} G10L *3/02;5/02*

U.S. Cl. 395—2.25 **9 Claims**

1. In a linear prediction coder to provide synthesized speech in which short term and long term redundancies by a filter means having L taps wherein said filter means has an impulse response, h(n), are removed from a frame of N digitized speech samples resulting in a residual waveform of N samples, a method for encoding said residual waveform using k codebook vector, c_k, comprising:

convolving a target signal, x(n), and said impulse response, h(n) to provide a first convolution;

autocorrelating an impulse response matrix wherein said impulse response matrix is a lower triangular toeplitz matrix with diagonal h(0) where h(0) is the zeroth impulse response value and the lower diagonals h(1), . . . ,h(L−1) and wherein said impulse response autcorrelation is computed in accordance with the equation:



$$\Phi(i) = \sum_{n=0}^{L-1} h(n)h(n-i);$$

autocorrelating said synthesized speech in accordance with said autocorrelation of said impulse response matrix and said codebook vectors, c_k to provide a synthesized speech autocorrelation, E_{yy};

cross correlating said synthesized speech and said target speech in accordance with said first convolution and said codebook vectors to provide a cross correlation E_{xy}; and

selecting a codebook vector in accordance with said cross correlation, E_{xy}, and said synthesized speech autocorrelation, E_{yy}.

5,751,902

ADAPTIVE PREDICTION FILTER USING BLOCK FLOATING POINT FORMAT AND MINIMAL RECURSIVE RECOMPUTATIONS

Rudolf Hofmann, Forchheim, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

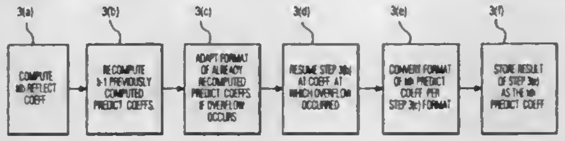
PCT No. PCT/IB94/00086, § 371 Date Jan. 5, 1995, § 102(e) Date Jan. 5, 1995, PCT Pub. No. WO94/25960, PCT Pub. Date Nov. 10, 1994

PCT Filed May 2, 1994, Ser. No. 362,514

Claims priority, application Germany, May 5, 1993, 43 14 921.9

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 395—2.28 **7 Claims**



3(a)
3(b)
3(c)
3(d)
3(e)
3(f)
COMPUTE kth REFLECT COEFF
RECOMPUTE k-1 PREVIOUSLY COMPUTED PREDICT COEFFS.
ADAPT FORMAT OF ALREADY RECOMPUTED PREDICT COEFFS. IF OVERFLOW OCCURS
RESUME STEP 3(b) AT COEFF AT WHICH OVERFLOW OCCURRED
CONVERT FORMAT OF kth PREDICT COEFF PER STEP 3(c) FORMAT
STORE RESULT OF STEP 3(e) AS THE kth PREDICT COEFF

5. An adaptive prediction filter for a sampled audio signal, said filter comprising:

first processing means for computing correlation coefficients from the sampled values of segments of the sampled audio signal;

second processing means for computing reflection coefficients and prediction coefficients from said correlation coefficients in N-bit fixed point arithmetic; and

third processing means which, in cooperation with said second processing means, provides recursive recalculation of the prediction coefficients in block floating point format by the steps of:

(a) computing a kth reflection coefficient;

(b) recomputing the k−1 previously computed prediction coefficients based on the kth reflection coefficient determined in step (a);

(c) adapting the block floating point format of those of the k−1 prediction coefficients already recomputed and not yet again recomputed if an overflow occurs during the recomputations performed in step (b), so that N bits are no longer sufficient to represent a recomputed prediction coefficient;

(d) continuing with recomputation of the k−1 prediction coefficients starting with the coefficient at which overflow occurred in step (c);

(e) converting the kth prediction coefficient derived from the kth reflection coefficient computed in step (a), to a floating point format number having the same exponent as the adapted block floating point format determined in step (c); and

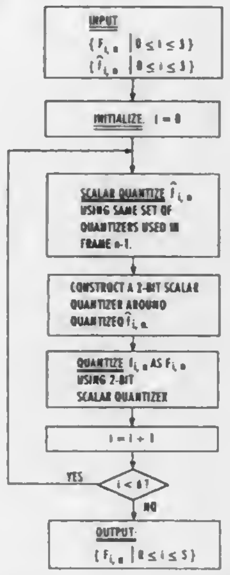
(f) storing the number obtained in step (e) as the kth prediction coefficient;

said sampled audio signal being filtered by said filter in accordance with said prediction coefficients.

5,751,903
LOW RATE MULTI-MODE CELP CODEC THAT ENCODES LINE SPECTRAL FREQUENCIES UTILIZING AN OFFSET

Kumar Swaminathan, Gaithersburg, and Murthy Vemuganti, Germantown, both of Md., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Dec. 19, 1994, Ser. No. 359,116
Int. Cl.^{6} G10L *9/18*
U.S. Cl. 395—2.39 **28 Claims**


INPUT
{F_{i,n} | 0 ≤ i ≤ 5}
{F̂_{i,n} | 0 ≤ i ≤ 5}
INITIALIZE i = 0
SCALAR QUANTIZE F̂_{i,n} USING SAME SET OF QUANTIZERS USED IN FRAME n-1.
CONSTRUCT A 2-BIT SCALAR QUANTIZER AROUND QUANTIZED F̂_{i,n}
QUANTIZE f_{i,n} AS F_{i,n} USING 2-BIT SCALAR QUANTIZER
i = i + 1
YES
i < 6?
NO
OUTPUT
{F_{i,n} | 0 ≤ i ≤ 5}

1. A method of coding a digitized speech signal comprising the steps of:

analyzing the digitized speech signal in discrete segments;

classifying each discrete segment of the digitized speech signal in one of a plurality of predetermined modes comprising a first mode and a second mode;

determining a set of unquantized line spectral frequencies for each discrete segment of the digitized speech signal to represent short term predictor parameters for the digitized speech signal segment;

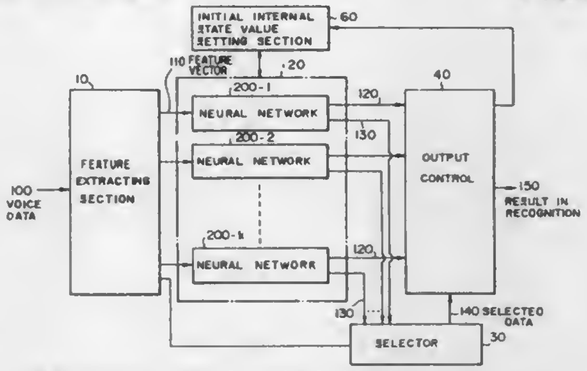
quantizing each unquantized line spectral frequency in each determined set of unquantized line spectral frequencies representing discrete segments of the digitized speech signal classified in the first mode; and

encoding the unquantized line spectral frequencies in each set of unquantized line spectral frequencies representing discrete segments of the digitized speech signal classified in the second mode using at least one offset generated from analysis of a representation of at least one preceding discrete segment of the digitized speech signal.

5,751,904
SPEECH RECOGNITION SYSTEM USING NEURAL NETWORKS

Mitsuhiro Inazumi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 78,027, Jun. 18, 1993, abandoned. This application Apr. 30, 1996, Ser. No. 641,268
Claims priority, application Japan, Jun. 18, 1992, 4-159442; Jun. 19, 1992, 4-161074; Aug. 12, 1992, 4-215266
Int. Cl.^{6} G10L *5/06*
U.S. Cl. 395—2.41 **26 Claims**



1. A speech recognition system comprising:

voice recognizing and processing means including a plurality of speech recognition neural networks that have previously learned different voice patterns to recognize given voice data, each of said speech recognition neural networks including means for judging whether or not a piece of input voice data coincides with one of the voice data to be recognized and outputting a recognition result and having means for outputting adaptation judgment data independent of the recognition result, the adaptation judgement data representing the adaptation in speech recognition;

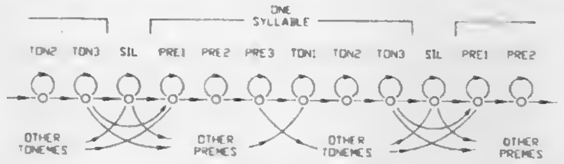
selector means receiving input voice data and data from said neural networks and responsive to the adaptation judgment data from each of said speech recognition neural networks for selecting one of said neural networks that has the highest adaptation in speech recognition; and

output control means for outputting the result of speech recognition from the speech recognition neural network selected by said selector means.

5,751,905
STATISTICAL ACOUSTIC PROCESSING METHOD AND APPARATUS FOR SPEECH RECOGNITION USING A TONED PHONEME SYSTEM

Chengjun Julian Chen, Yorktown Heights; Ramesh Ambat Gopinath, White Plains; Michael Daniel Monkowski, New Windsor, and Michael Alan Picheny, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1995, Ser. No. 404,786
Int. Cl.^{6} G10L *5/06*
U.S. Cl. 395—2.63 **12 Claims**



9. A system for recognizing words of speech comprising at least one syllable having tonal content, comprising:

means for decomposing said at least one syllable into a preme and a toneme, the toneme having a tone value; and

means for recognizing the words of speech based on the preme and toneme of said at least one syllable comprising:

means for converting the words of speech into an electrical signal;

pitch extraction means for extracting a pitch value for the toneme of said at least one syllable if the signal energy is above a threshold;

means for extrapolating the signal wherever the signal energy is below the threshold or the extracted pitch value is not within a pre-determined range to generate an extended pitch signal;

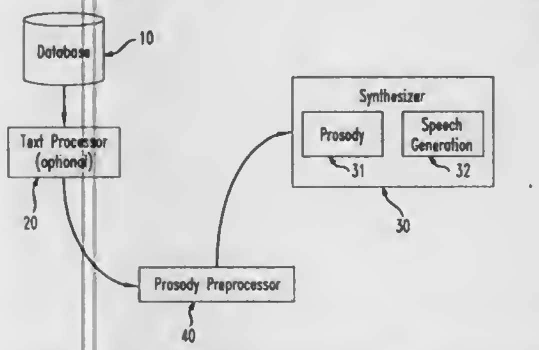
storage means for storing data including the extended pitch signal and at least one derivative of the extended pitch signal; and

means for determining the tone value of the toneme of said at least one syllable using the stored data.

5,751,906
METHOD FOR SYNTHESIZING SPEECH FROM TEXT AND FOR SPELLING ALL OR PORTIONS OF THE TEXT BY ANALOGY

Kim Ernest Alexander Silverman, Danbury, Conn., assignor to Nynex Science & Technology, White Plains, N.Y.

Continuation of Ser. No. 641,480, Mar. 1, 1996, Pat. No. 5,652,828, which is a continuation of Ser. No. 460,030, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 33,528, Mar. 19, 1993, abandoned. This application Jan. 29, 1997, Ser. No. 790,579
Int. Cl.^{6} G10L *5/02;9/00*
U.S. Cl. 395—2.69 **22 Claims**



1. A method of synthesizing human audible speech from a multi-word string of text, the method comprising the steps of:

treating the multi-word string as a single prosodic paragraph by performing the steps of:

assigning a pitch to the beginning of the multi-word string that is higher than at the end of the multi-word string; and

assigning a pitch to a final end point of the string that is lower than the pitch at any point within the string;

including, in the multi-word string, following at least one of the individual words in the multi-word string, the corresponding spelling of the individual word;

treating each individual word in the multi-word string as a single word declarative sentence;

treating the spelling of each individual word included in the multi-word string as a single word declarative sentence;

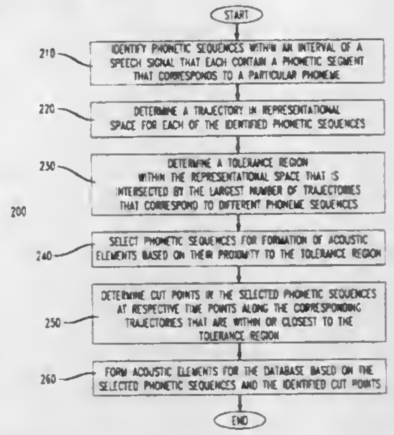
grouping each individual word and the corresponding spelling of the individual word into a prosodic group within the single prosodic paragraph, the prosodic group having a higher pitch at the beginning of the prosodic group than at the end of said prosodic group; and

generating speech from the multi-word string as a function of the prosodic groupings and assigned pitch.

5,751,907
SPEECH SYNTHESIZER HAVING AN ACOUSTIC ELEMENT DATABASE

Bernd Moebius, Chatham; Joseph Philip Olive, Watchung, both of N.J.; Michael Abraham Tanenblatt, New York, and Jan Pieter VanSanten, Brooklyn, both of N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 16, 1995, Ser. No. 515,887
Int. Cl.^{6} G10L *5/04*
U.S. Cl. 395—2.76 **22 Claims**


START
210
IDENTIFY PHONETIC SEQUENCES WITHIN AN INTERVAL OF A SPEECH SIGNAL THAT EACH CONTAIN A PHONETIC SEGMENT THAT CORRESPONDS TO A PARTICULAR PHONEME
220
DETERMINE A TRAJECTORY IN REPRESENTATIONAL SPACE FOR EACH OF THE IDENTIFIED PHONETIC SEQUENCES
230
DETERMINE A TOLERANCE REGION WITHIN THE REPRESENTATIONAL SPACE THAT IS INTERSECTED BY THE LARGEST NUMBER OF TRAJECTORIES THAT CORRESPOND TO DIFFERENT PHONEME SEQUENCES
200
240
SELECT PHONETIC SEQUENCES FOR FORMATION OF ACOUSTIC ELEMENTS BASED ON THEIR PROXIMITY TO THE TOLERANCE REGION
250
DETERMINE CUT POINTS IN THE SELECTED PHONETIC SEQUENCES AT RESPECTIVE TIME POINTS ALONG THE CORRESPONDING TRAJECTORIES THAT ARE WITHIN OR CLOSEST TO THE TOLERANCE REGION
260
FORM ACOUSTIC ELEMENTS FOR THE DATABASE BASED ON THE SELECTED PHONETIC SEQUENCES AND THE IDENTIFIED CUT POINTS
END

1. A method for producing synthesized speech, the method including an acoustic element database containing acoustic elements that are concatenated to produce synthesized speech, the acoustic element database established by the steps comprising:

for at least one phoneme corresponding to particular phonetic segments contained in a plurality of phonetic sequences occurring in an interval of a speech signal,

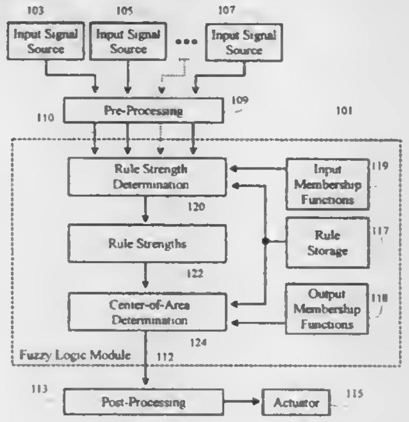
determining a relative positioning of a tolerance region within a representational space based on a concentration of trajectories of the phonetic sequences that correspond to different phoneme sequences which intersect the region, wherein each trajectory represents an acoustic characteristic of at least a part of a respective phonetic sequence that contains the particular phonetic segment; and

forming acoustic elements from the phonetic sequences by identifying cut points in the phonetic sequences at respective time points along the corresponding trajectories based on the proximity of the time points to the tolerance region.

5,751,908
FUZZY LOGIC OUTPUT DEFUZZIFICATION

Dinu Petre Madau, Dearborn, and Lee Albert Feldkamp, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 172,991, Dec. 27, 1993, abandoned. This application Jan. 19, 1996, Ser. No. 599,447
Int. Cl.^{6} G06F *9/44*
U.S. Cl. 395—3 **3 Claims**



1. A fuzzy logic controller adapted to convert a plurality of input signal values, each representing a sensed condition in a physical system, into an output command signal for controlling an actuator, said controller comprising:

memory means for storing a plurality of rules each comprising data representing one or more input membership functions, each of said input membership functions being associated with one of said input signal values,

processing means for comparing each of said input signal values with the associated one of said input membership functions of each of said rules to generate, for each of said rules, a current rule strength value,

memory means for storing, for each of said rules, an output membership function consisting of data which specifies a range of values assumable by said output command signal,

processing means for deriving a center-of-area value for each output membership functions for each of said rules,

processing means for translating said current rule strength value for each given rule as determined by the output membership function for said given rule to generate a positive influence value indicative of an extent to which the current rule strength value for said rule should influence said output command signal,

processing means for identifying rules whose output membership functions currently specify overlapping ranges of values assumable by said output command signal,

processing means for deriving an intersection center-of-area value representative of each of said overlapping ranges of values,

means responsive to the current rule strength value for at least one of said rules whose output membership function currently specifies at least one of said overlapping ranges of values for forming a negative influence value representative of said overlapping range,

processing means for forming a total area value by summing the positive influence value for each of said rules and at least selected ones of said negative influence values,

processing means for forming a total moment arm value by multiplying the positive influence value of each of said rule times the center-of-area value of the output membership function of that rule,

processing means for multiplying each of said negative influence values times the intersection center-of-area value for each of said overlapping ranges to form product values,

processing means for reducing said total moment arm value by the sum of said product values, and

means for forming said output command signal by dividing said total moment arm value by said total area value.

5,751,909
DATABASE SYSTEM WITH METHODS FOR CONTROLLING OBJECT INTERACTION BY ESTABLISHING DATABASE CONTRACTS BETWEEN OBJECTS

Stefan F. Gower, Fremont, Calif., assignor to Sybase, Inc., Emeryville, Calif.

Continuation of Ser. No. 214,375, Mar. 17, 1994, Pat. No. 5,535,383. This application Jul. 8, 1996, Ser. No. 676,739

Int. Cl.^{6} G06F *15/18;17/30*

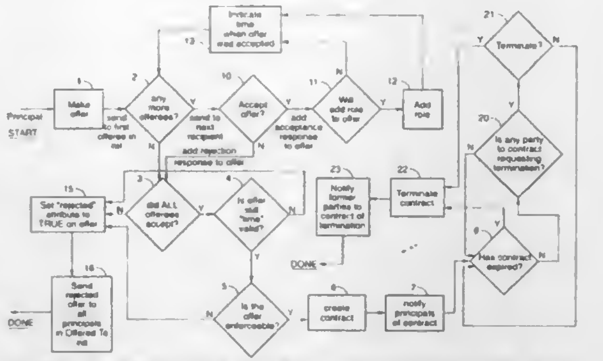
U.S. Cl. 395—11 **10 Claims**

1. In a computer system, a computer-implemented method for controlling interaction between first and second objects, each object having authority independent of the other, the method comprising:

creating at said first object an offer providing a set of constraints dictating how said first and second objects can interact in said computer system;

communicating said offer to said second object;

determining at said second object whether to accept said set of constraints provided by said offer;


Principal START
Make offer
Send to first offeree in list
Any more offerees?
Send to next recipient
add rejection response to offer
Accept offer?
add acceptance response to offer
Indicate time when offer was accepted
Will add rule to offer
Add rule
Set "rejected" attribute to TRUE on offer
Did ALL offerees accept?
Is offer still "time" valid?
Send rejected offer to all principals in Offered To list
DONE
Is the offer enforceable?
create contract
notify principals of contract
Notify former parties to contract of termination
Terminate contract
Terminate?
Is any party to contract requesting termination?
Has contract expired?
Y
N

if said constraints are acceptable, determining whether said set of constraints is enforceable between said first and second objects; and

if set of constraints is enforceable, establishing a binding relationship between said first and second objects, by:

storing information in said computer system information indicating that said set of constraints dictates how said first and second objects can legally interact in said computer system; and

monitoring, in a manner independent of both said first and second objects, interaction between said first and second objects, for ensuring that said set of constraints is not violated.

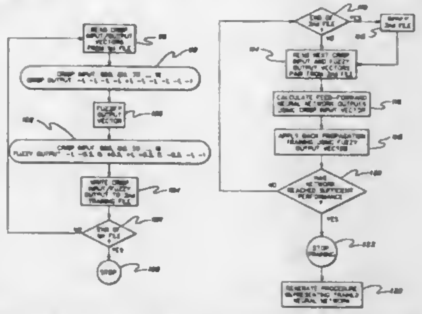
5,751,910
NEURAL NETWORK SOLDER PASTE INSPECTION SYSTEM

Steven M. Bryant, Holley, N.Y., and Kenneth H. Loewenthal, Reston, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1995, Ser. No. 447,282

Int. Cl.^{6} G06K *9/00;* **G06F** *15/18*

U.S. Cl. 395—22 **15 Claims**



1. A training a neural network, comprising the steps of:

providing a first training data base of crisp input and crisp output pairs;

fuzzifying crisp outputs of said first training data base to create a second training data base of crisp input and fuzzified output pairs; and

training the neural network with said crisp input and fuzzified output pairs to solution conversions, wherein: said crisp outputs are fuzzified in accordance with a predetermined nearness relationship between different crisp outputs, the neural network is employed for classification of objects, the crisp output of each crisp input and crisp output pair is representative of an image of a particular object, and the crisp output of each such crisp input and crisp output pair represents a desired classification of the particular object, and the objects comprise solder paste bricks on at least one printed circuit board, the crisp input of each crisp input and crisp output pair represents a machine vision image of a particular solder paste brick, and the crisp output of each such crisp input and crisp output pair represents an operator generated physical quality score for the particular solder paste brick.

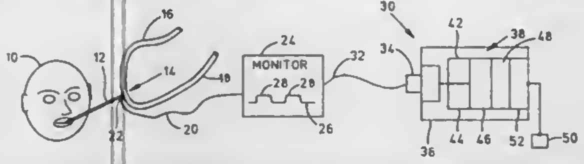
5,751,911
REAL-TIME WAVEFORM ANALYSIS USING ARTIFICIAL NEURAL NETWORKS

Julian M. Goldman, 130 S. Hudson St., Denver, Colo. 80222

Division of Ser. No. 779,219, Oct. 18, 1991, Pat. No. 5,598,508. This application Nov. 12, 1996, Ser. No. 747,460

Int. Cl.^{6} G06F *15/48;15/18*

U.S. Cl. 395—22 **13 Claims**



1. A method of analyzing a waveform in a signal using a neural network having input nodes and output nodes, said method comprising the steps of:

transmitting a first portion of said waveform to said neural network, such that N consecutive samples of said waveform are transmitted to N input nodes of said neural network;

said neural network being trained to recognize the starting point and ending point of said waveform by producing outputs which are a representation of an index number of the portion of the sample of the waveform corresponding to the starting and ending points; and

classifying said waveform as one characteristic waveform type of a plurality of characteristic waveform types, or as an incomplete waveform, in response to the index number.

5,751,912
SCHEMATIC DIAGRAM CREATING SYSTEM

Yasuhito Karouji, Tokorozawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

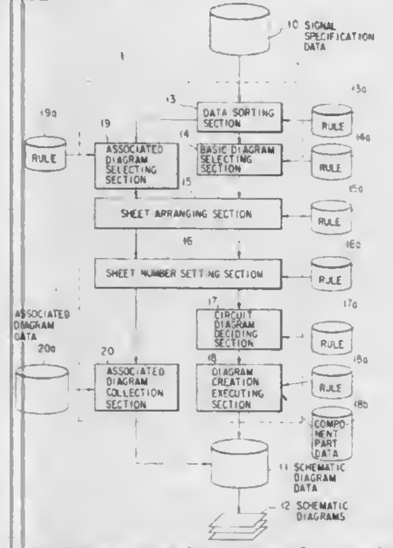
PCT No. PCT/JP96/00332, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996

PCT Filed Feb. 16, 1996, Ser. No. 722,203

Claims priority, application Japan, Feb. 16, 1995, 7-027978

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—62 **8 Claims**


10 SIGNAL SPECIFICATION DATA
13
DATA SORTING SECTION
RULE
14
BASIC DIAGRAM SELECTING SECTION
19
ASSOCIATED DIAGRAM SELECTING SECTION
15
SHEET ARRANGING SECTION
16
SHEET NUMBER SETTING SECTION
17
CIRCUIT DIAGRAM DECIDING SECTION
ASSOCIATED DIAGRAM DATA
20
ASSOCIATED DIAGRAM COLLECTION SECTION
18
DIAGRAM CREATION EXECUTING SECTION
COMPONENT PART DATA
11 SCHEMATIC DIAGRAM DATA
12 SCHEMATIC DIAGRAMS

1. A schematic diagram creating system for creating schematic diagrams associated with a control apparatus on the basis of a plurality of specification data with an input/output relation between each kind of card in the control apparatus and each kind of device in an external or internal apparatus being listed in signal units, the system comprising:

sorting means for sorting, in accordance with a data sorting rule, the specification data in card units;

basic diagram selecting means for selecting, in accordance with a basic diagram selecting rule, basic diagram data corresponding to the specification data for each card sorted by the sorting means;

arranging means for arranging, in accordance with a sheet arranging rule, the specification data for each card sorted by the sorting means;

sheet number setting means for attaching, in accordance with a sheet number setting rule, a sheet number to the corresponding specification data for each card sorted by the sorting, means;

deciding means for deciding, in accordance with a circuit diagram deciding rule, a circuit diagram corresponding to a respective sheet; and

diagram creation executing means for executing diagram creation of the circuit diagram based on the basic diagram data for each card.

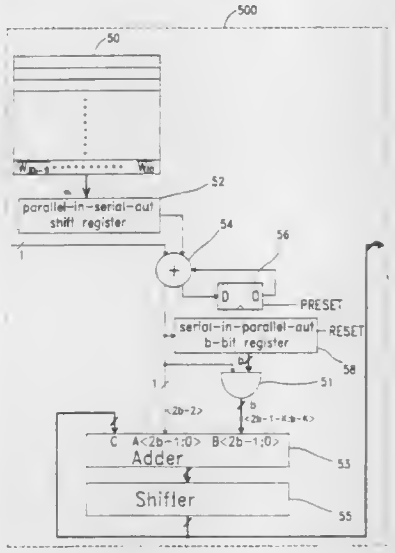
5,751,913
RECONFIGURABLE NEURAL NETWORK AND DIFFERENCE-SQUARE NEURON

Tzi-Dar Chiueh, Taipei; Hwai-Tsu Chang; Fang-Ru Hsu, both of Hsinchu, and Wan-Yu Meng, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Hsien, Taiwan

Filed Jul. 29, 1996, Ser. No. 688,055

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—27 **15 Claims**


500
50
52
parallel-in-serial-out shift register
54
56
D Q
PRESET
serial-in-parallel-out b-bit register
RESET
58
51
Adder
53
Shifter
55

1. A neural network circuit, comprising:

first switching means having a first lead, a second lead and a third lead;

second switching means having a first lead, a second lead and a third lead, said second lead of said second switching means coupled to said second lead of said first switching means;

a first processing element (PE) having a first input lead, a second input lead and an output lead, said first input lead of said first PE coupled to said third lead of said first switching means, said second input lead coupled to said third lead of said second switching means, wherein said first PE outputting at said output lead of said first PE a serial digital output signal dependent on a first serial digital input signal received at said first input lead of said first PE;

third switching means having a first lead, a second lead and a third lead, said first lead of said third switching means coupled to said first input lead of said first PE;

fourth switching means having a first lead, a second lead, and a third lead, said first lead of said fourth switching means coupled to said output lead of said first PE, said second lead of said fourth switching means coupled to said second lead of said third switching means; and

a second PE having a first input lead, a second input lead and an output lead, said first input lead coupled to said third lead of said fourth switching means, said second input lead of said second PE coupled to said third lead of said fourth switching means, wherein said second PE outputting at said output lead of said second PE a serial digital output signal dependent on a serial digital input signal received at said first input lead of said second PE,

wherein:

said first switching means being selectably configured to provide a signal received on said first lead of said first switching means to said first input lead of said first PE or a signal received from said second lead of said second switching means to said first input lead of said first PE,

said second switching means being selectably configured to provide a signal received on said first lead of said second switching means to said second input lead of said first PE or to said second lead of said first switching means,

said third switching means being selectably configured to provide a signal received from said third lead of said first switching means to said first input lead of said second PE or a signal received from said second lead of said fourth switching means to said first input lead of said second PE, and

said fourth switching means being selectably configured to provide a signal received from said output lead of said first PE to said second lead of said fourth switching means or to said second input lead of said second PE.

5,751,914

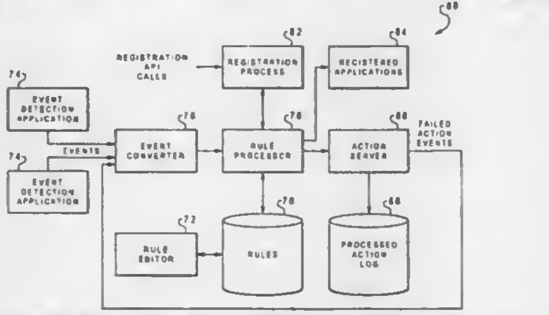
METHOD AND SYSTEM FOR CORRELATING A PLURALITY OF EVENTS WITHIN A DATA PROCESSING SYSTEM

Brett Angus Coley, Raleigh; Vincent G. Chin, Cary; Patrick Francis Downing, Wake Forest, and David M. Wormald, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1995, Ser. No. 541,838

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 395—51 **27 Claims**



18. A system for correlating a plurality of events within a data processing system to determine an action to be performed, said system comprising;

means for providing a plurality of rule networks, each of said plurality of rule networks including a plurality of program objects arranged in a tree structure having at least one parent program object and a plurality of child program objects, wherein said at least one parent program object is logically linked to said plurality of child program objects by passing input events received by said at least one parent program object to said plurality of child program objects, wherein at least one of said plurality of program objects invokes an action in response to receiving a particular input event;

means, responsive to two rule networks among said plurality of rule networks both including identical program objects, for minimizing said plurality of rule networks by sharing one of said identical program objects;

means for registering at least a first application program with a rule processor that passes events within said data processing system to particular rule networks among said plurality of rule networks, wherein said first application program has associated therewith one or more of said plurality of rule networks;

means, responsive to receipt of said series of events at a rule processor, for passing said series of events to each rule network associated with said first registered application program;

means, responsive to receipt of said series of events by one of said one or more associated rule networks, for evaluating said series of events through said tree structure; and

means, responsive to said evaluation, for invoking an action at one of said plurality of program objects, wherein event correlation efficiency is enhanced.

5,751,915

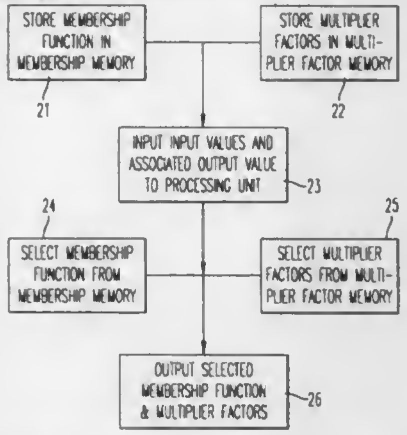
ELASTIC FUZZY LOGIC SYSTEM

Paul J. Werbos, 8411 48th St., College Park, Md. 20740

Continuation-in-part of Ser. No. 91,170, Jul. 13, 1993, abandoned. This application Aug. 31, 1993, Ser. No. 115,198

Int. Cl.^{6} G06F *17/00*; G06G *7/00*

U.S. Cl. 395—61 **25 Claims**


STORE MEMBERSHIP FUNCTION IN MEMBERSHIP MEMORY
STORE MULTIPLIER FACTORS IN MULTIPLIER FACTOR MEMORY
21
22
INPUT INPUT VALUES AND ASSOCIATED OUTPUT VALUE TO PROCESSING UNIT
23
24
25
SELECT MEMBERSHIP FUNCTION FROM MEMBERSHIP MEMORY
SELECT MULTIPLIER FACTORS FROM MULTIPLIER FACTOR MEMORY
OUTPUT SELECTED MEMBERSHIP FUNCTION & MULTIPLIER FACTORS
26

1. An apparatus for fuzzy control, comprising:

a membership memory for storing a plurality of membership functions for fuzzy control using at least one input variable and output variable;

a rule memory for storing a plurality of if-then rules in a form

$$R=f(\gamma_{0},{}^{n}g(\gamma_i,\mu_i)),$$

where each μ_i, is one of the plurality of membership functions, where f and g are differentiable, and for which there exists a γ_0 which causes R to equal zero, and for which there exists a base value for γ_i which causes clause i to effectively be removed from the rule;

an input device for entering data comprising at least one input value;

a processing unit for receiving said at least one input value from said input device, for retrieving at least one membership function of said plurality of membership functions from said membership memory, for retrieving at least one rule of said plurality of if-then rules from said rule memory and for producing an output representing a degree to which the at least one rule applies to said at least one input value using said at least one membership function, said at least one input value, and said at least one rule.

5,751,916

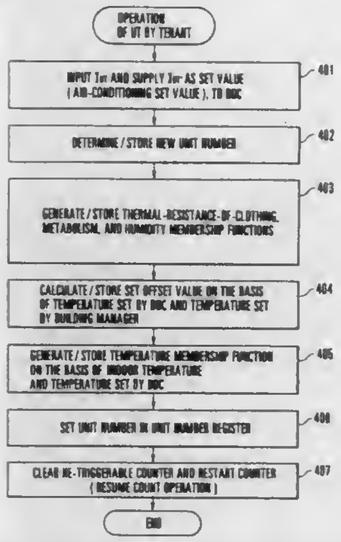
BUILDING MANAGEMENT SYSTEM HAVING SET OFFSET VALUE LEARNING AND SET BIAS VALUE DETERMINING SYSTEM FOR CONTROLLING THERMAL ENVIRONMENT

Akihiko Kon, Tokyo, and Akihiko Naruse, Kanagawa, both of Japan, assignors to Yamatake-Honeywell Co. Ltd., Japan

Continuation of Ser. No. 237,128, May 3, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 622,923

Int. Cl.^{6} F24E *13/00*

U.S. Cl. 395—77 **14 Claims**


OPERATION OF UT BY TENANT
401
INPUT Tor AND SUPPLY Tor AS SET VALUE (AIR-CONDITIONING SET VALUE), TO DDC
402
DETERMINE / STORE NEW UNIT NUMBER
403
GENERATE / STORE THERMAL-RESISTANCE-OF-CLOTHING, METABOLISM, AND HUMIDITY MEMBERSHIP FUNCTIONS
404
CALCULATE / STORE SET OFFSET VALUE ON THE BASIS OF TEMPERATURE SET BY DDC AND TEMPERATURE SET BY BUILDING MANAGER
405
GENERATE / STORE TEMPERATURE MEMBERSHIP FUNCTION ON THE BASIS OF INDOOR TEMPERATURE AND TEMPERATURE SET BY DDC
406
SET UNIT NUMBER IN UNIT NUMBER REGISTER
407
CLEAR RE-TRIGGERABLE COUNTER AND RESTART COUNTER (RESUME COUNT OPERATION)
END

1. A set offset value learning and set bias value determining apparatus comprising:

a set offset value learning apparatus comprising:

a neural network having an input layer, an intermediate layer, and an output layer;

an intermediate layer unit generation means for generating intermediate layer units in said intermediate layer in response to a command of changing an air-conditioning set value, set with respect to an air-conditioning control target, to a tenant set value;

a set offset value storage means for causing said intermediate layer unit generated by said intermediate layer unit generation means to store a difference between a management set value, set with respect to said air-conditioning control target, and said tenant set value as a set offset value;

an intrinsic number storage means for causing said intermediate layer unit generated by said intermediate layer unit generation means to store an intrinsic number indicating an ordinal number in a sequence of generation; and

a membership function storage means for causing said intermediate layer unit generated by said intermediate layer unit generation means to respectively determine and store membership functions on the basis of a measured value of said air-conditioning control target, obtained when said intermediate layer unit is generated, and a measured or preset value of other predetermined parameters; and

a set bias value determining apparatus comprising:

a re-triggerable counter having a count value being cleared to zero in accordance with a command of changing said air-conditioning set value to said tenant set value;

an activation amount determination means for determining an activation amount of each said intermediate layer unit in response to an incrementing operation of said re-triggerable counter by performing a fuzzy operation between each of said membership functions stored in said intermediate layer unit and a corresponding one of said membership functions of said measured value of said air-conditioning control target, obtained at the time of said incrementing operation, and said preset value of said other predetermined parameters;

an information pack output means for outputting an information pack representing said activation amount, said set offset value, and said intrinsic number, said set offset value and said intrinsic number being stored in said intermediate layer unit;

an air-conditioning set value calculation means for selecting said set offset value of said intermediate layer unit having a maximum activation amount which has a maximum intrinsic number based on said information pack, adding said selected set offset value, as a set bias value, to said management set value, and setting a sum as a new air-conditioning set value in place of said tenant set value;

an air-conditioning set value forcible change means for forcibly changing said air-conditioning set value to said tenant set value in accordance with a change command to said tenant set value of said air-conditioning set value; and

a tenant temperature preference setting and learning means for obtaining a temperature setting preferred by a tenant, said temperature setting entered into a tenant user terminal.

5,751,917

METHOD AND APPARATUS FOR CONTROLLING MOVEMENTS OF A CHIP MOUNTING ROBOT

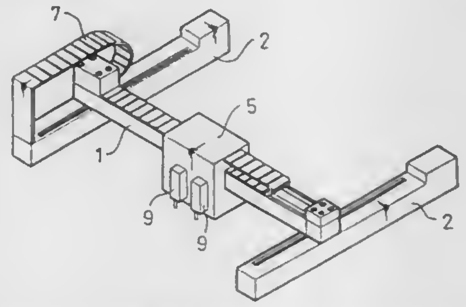
Young Hyeon Kim, and Pil Young Seong, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 9, 1996, Ser. No. 629,735

Claims priority, application Rep. of Korea, Dec. 28, 1995, 95-61664

Int. Cl.^{6} G06F *15/46*

U.S. Cl. 395—89 **4 Claims**



1. A method of controlling a position of a chip-mounting robot, the robot comprising a body, and a head unit mounted on the body and including a chip-mounting nozzle; the body being movable along a forward/backward axis; the head unit being movable longitudinally along the body in a direction transversely of the forward/backward axis for positioning the head unit relative to a leftward/rightward axis oriented perpendicularly to the forward/backward axis; the body being slightly inclined relative to the leftward/rightward axis by an error angle; and a drive mechanism for driving the body along the forward/backward axis and for driving the head unit longitudinally along the body; the method comprising the steps of:

A) determining target coordinates for the head unit on the forward/backward axis and the leftward/rightward axis;

B) determining, as a function of the error angle, a first position of the head unit relative to the body, and a second position of the body relative to the forward/backward axis, for placing the head unit at the target coordinates; and

C) actuating the drive mechanism to move the head unit and body to the first and second positions, respectively.

5,751,918
SAFETY CIRCUIT FOR TEACHING OPERATION OF ROBOT

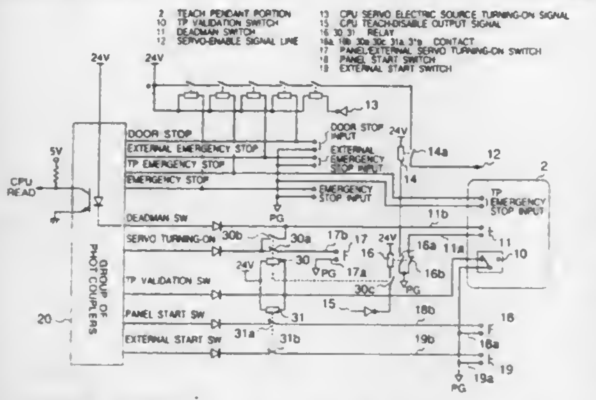
Shigeru Shimogama, Kawanishi; Hiroshi Nakajima, Itami, and Kazunori Matsumoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 21, 1997, Ser. No. 804,264

Claims priority, application Japan, Feb. 29, 1996, 8-042568

Int. Cl.^{6} G05B *15/00;19/00*

U.S. Cl. 395—99 **8 Claims**



7. A robot comprising:

a robot body capable of being taught procedure of a task;

a first switch for making indication by its opened/closed state as to whether or not said procedure is teachable to said robot body;

a second switch for making indication by its opened/closed state as to whether or not said first switch has a valid servo turning-on right;

a third switch for making indication by its opened/closed state as to whether or not an external servo tuning-on request is made;

a control portion supplied with a first signal indicating the opened/closed state of said first switch, a second signal indicating the opened/closed state of said second switch, and a third signal indicating the opened/closed state of said third switch; and

a first changeover mechanism provided between said first switch and said control portion so that said first signal is supplied to said control portion only when said second signal indicates that said first switch has said valid servo turning-on right; and

a second changeover mechanism provided between said third switch and said control portion so that said third signal is prevented from being supplied to said control portion when said second signal indicates that said first switch has said valid servo turning-on right.

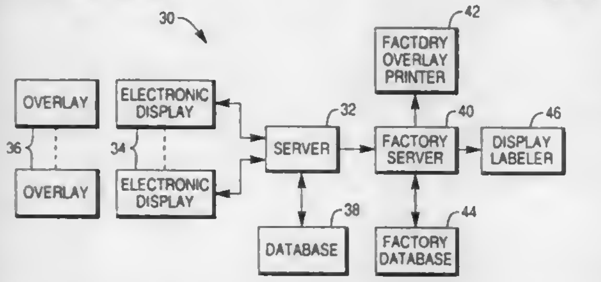
5,751,919
SYSTEM AND METHOD FOR PRINTING OVERLAYS FOR ELECTRONIC DISPLAY DEVICES

John C. Goodwin, III, Lawrenceville, Ga., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 223,259, Apr. 4, 1994, abandoned. This application Nov. 6, 1996, Ser. No. 744,564

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—101 **13 Claims**



1. A system for printing a plurality of overlays containing information for items for attachment to new electronic shelf displays which display price information for the items and which are located at a place where the items are sold comprising:

a database containing the information for the items;

a printer for printing the overlays; and

a computer terminal for adding identification information for the new electronic shelf displays to the database, for matching the information for the items to the electronic shelf display identification information, for initializing the new electronic shelf displays with the price information for the items, for creating a print queue containing overlay information, and for activating the printer to print the overlay information in the print queue.

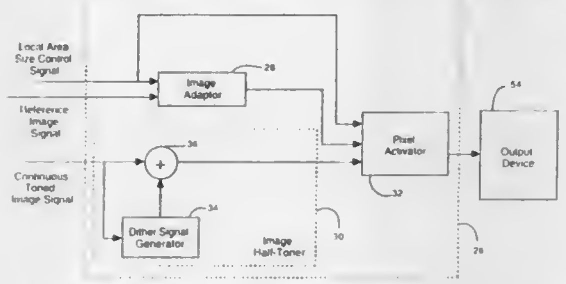
5,751,920
SYSTEM AND METHOD FOR ADAPTING THE THRESHOLDS OF A DITHER MATRIX TO THE AMPLITUDE OF AN INPUT SIGNAL

John Carl Dalton, San Francisco, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 26, 1995, Ser. No. 378,956

Int. Cl.^{6} H04N *1/405*

U.S. Cl. 395—109 **20 Claims**



1. A system for generating a binary image signal for an output device, the system comprising:

an image compensator, having a first input coupled to receive a continuous toned image signal and an output, for generating a reference image signal;

an image adaptor, having an input coupled to the output of the image compensator to receive the reference image signal and an output, for determining an average intensity in a local area of the reference image signal and for generating an adaptive signal;

an image half-toner, having an input coupled to receive the continuous toned image signal and an output, for transforming the continuous toned image signal into a half-toned binary image signal; and

a pixel activator, having a first input coupled to receive the adaptive signal from the image adaptor, and a second input coupled to receive the binary image signal from the image half-toner, for generating a pixel activation signal identifying to the output device the pixels that are to be activated.

5,751,921
DOCUMENT IMAGE PROCESSING DEVICE FOR CONVERTING MONOCHROME IMAGES TO COLOR IMAGES

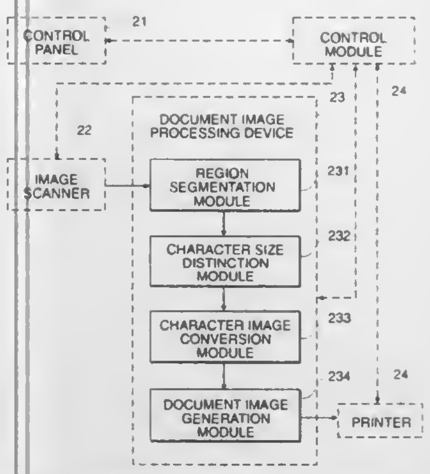
Masakazu Fujimoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 325,935, Oct. 19, 1994, abandoned. This application Jan. 9, 1997, Ser. No. 781,520

Claims priority, application Japan, Oct. 20, 1993, 5-284155

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—109 **7 Claims**


CONTROL PANEL
21
CONTROL MODULE
23
24
22
DOCUMENT IMAGE PROCESSING DEVICE
IMAGE SCANNER
REGION SEGMENTATION MODULE
231
CHARACTER SIZE DISTINCTION MODULE
232
CHARACTER IMAGE CONVERSION MODULE
233
234
24
DOCUMENT IMAGE GENERATION MODULE
PRINTER

1. A document image processing device comprising:

region segmentation means for segmenting a set of pixels in a document into a plurality of regions;

character size distinction means for classifying the sizes of monochrome characters in said regions segmented by said region segmentation means;

character image conversion means for converting characters of one or more sizes classified by said character size distinction means into characters of respective colors based on information indicating correspondence between sizes and colors of the characters; and

document image generation means for composing an image for an output based on the image of said characters converted by said character image conversion means.

5,751,922
OUTPUT CONTROL APPARATUS AND METHOD WITH VARIABLE OUTPUT SETTINGS

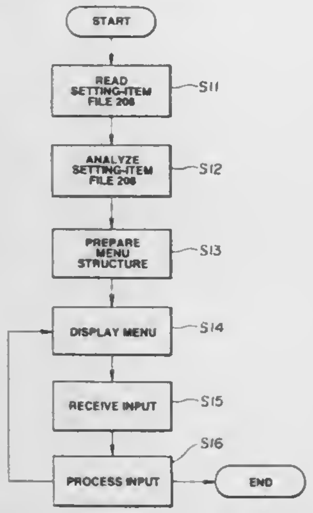
Takuto Harada, Koshigaya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 142,088, Oct. 28, 1993, abandoned. This application Oct. 21, 1996, Ser. No. 734,310

Claims priority, application Japan, Nov. 9, 1992, 4-298471

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—112 **21 Claims**



1. A host computer connected to an output apparatus through an interface, said computer comprising:

file reading means for reading a new setting-item file peculiar to a newly added operation program of the output apparatus

menu construction means for constructing a new setting menu of the setting-item file based on the new setting item file read by said file reading means;

setting means for setting a new setting item of the setting-item file based on information input in response to displaying of the new setting menu constructed by said menu construction means; and

transmitting means for transmitting the set new setting item to the output apparatus for setting up the set new setting item on the output apparatus.

5,751,923
BIDIRECTIONAL PRINTER INTERFACE HAVING FUNCTION OF NOTIFYING PRINT DATA ABNORMALITIES FROM PRINTER TO HOST UNIT

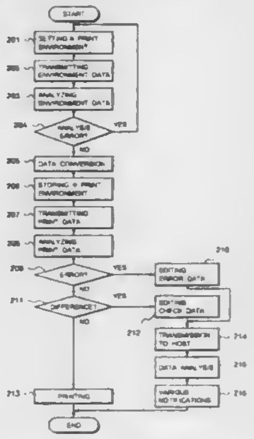
Kunihiko Matsuzawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1995, Ser. No. 578,899

Claims priority, application Japan, Dec. 27, 1994, 6-325344

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—114 **11 Claims**



1. A bidirectional printer interface comprising:

a print monitoring controller means provided for a host unit for controlling a printer connected to the host unit to monitor a print state, for generating environment data for setting a print environment of print data, and for transmitting the environment data to the printer;

an analysis means for analyzing the environment data and the print data;

a storage means for storing the environment data analyzed by the analysis means; and

an edit means for creating a check data for making the host unit check the content for any difference and transmitting the check data to the host unit,

wherein the analysis means compares data in relation to a print environment included in the print data with the environment data stored in the storage means to determine the presence of any difference therebetween, and if the difference between the data in relation to a print environment and the environment data is detected, the analysis means notifies the edit means of the detection of the difference, and if the difference is not detected, the analysis means makes the printer print the print data,

wherein the edit means creates and transmits the check data to the host unit when receiving the detection of the difference from the analysis means, and

wherein the printer monitoring controller means analyzes the check data received from the edit means, and makes the host unit display the result of the analysis as a confirmation message that enables the notification by an interactive mode to a user.

5,751,924

MULTIPLE OVERLAY PRINTING AND OUTPUTTING DEVICE AND MULTIPLE OVERLAY PRINTING SYSTEM

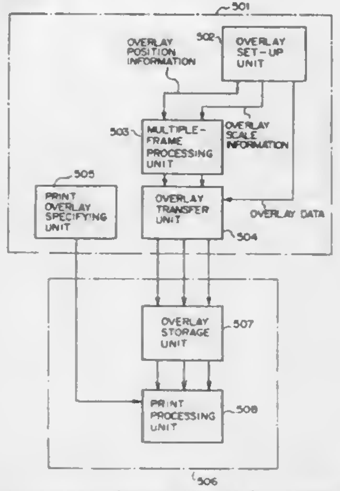
Takao Hamada; Takehiro Matsushita; Tizou Shirakata; Yoshio Shiromoto, and Hiroki Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 293,894, Aug. 22, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 803,919

Claims priority, application Japan, Oct. 14, 1993, 5-257331

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—115 **25 Claims**



1. A multiple-overlay printing device for printing both overlay data and general print data other than said overlay data onto a sheet of paper in accordance with a control by a host device, comprising:

- overlay storage means, located within said multiple-overlay printing device, for storing said overlay data which has been previously produced and stored in an overlay memory in said host device and which indicates printing elements of at least one overlay and overlay position information indicating printing position of said at least one overlay so that said overlay data is transferred from said overlay memory in said host device to said overlay storage means in said printing device only once and is not retransferred to said printing device for each print application to thereby reduce printing time; and
- print processing means for dually functioning to independently expand said general print data and said overlay data which is stored in said overlay storage means and which corresponds to said at least one overlay specified by said host device in accordance with said overlay position information stored in said overlay storage means and to print, onto said sheet of paper, both said expanded overlay data and said general print data so that a printed figure comprises a combination of said at least one overlay and said general print data.

5,751,925

IMAGE PROCESSING APPARATUS

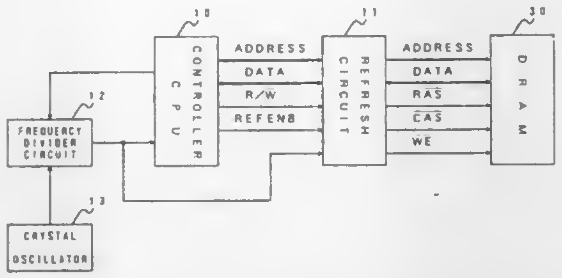
Hiromi Kataoka, Yokohama; Shunichi Masuda, Kawasaki; Tetsuo Saito, Tokyo, and Kazuma Yamamoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 515,053, Aug. 14, 1995, abandoned, which is a division of Ser. No. 91,690, Jul. 15, 1993, Pat. No. 5,602,975. This application Jul. 8, 1997, Ser. No. 889,446

Claims priority, application Japan, Jul. 22, 1992, 4-195111; Mar. 3, 1993, 5-067502

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—115 **14 Claims**



1. An image processing apparatus having a sleep mode and at least one other mode, comprising:

- a dynamic memory for storing image data to be formed into an image;
- an image forming unit including a CPU for forming an image based on the image data stored in said dynamic memory;
- a refreshing circuit for refreshing said dynamic memory; and
- control means for controlling the refreshing operation of said refreshing circuit, said control means inhibiting the refreshing operation during the sleep mode of said image processing apparatus;
- wherein said CPU includes means for receiving a clock signal and is adapted to operate at a speed corresponding to frequency of the clock signa, and wherein in the sleep mode the clock signal has a low frequency.

5,751,926

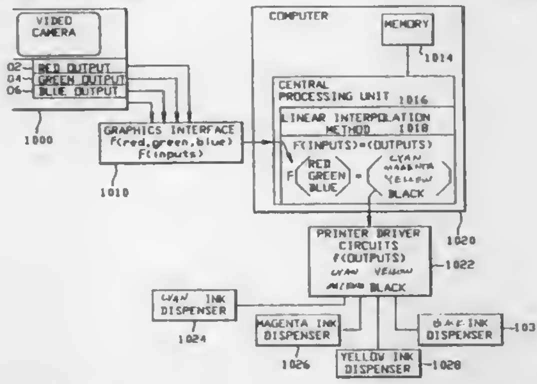
FUNCTION APPROXIMATION USING A CENTERED CUBIC PACKING WITH TETRAGONAL DISPHENOID EXTRACTION

James Matthews Kasson, Menlo Park; Sigfredo Ismael Nin, Morgan Hill; Wilfred Edmund Plouffe, Jr., San Jose, and Dualne Wright Pryor, Jr., Berkeley, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,306

Int. Cl.^{6} G03F *03/08*

U.S. Cl. 395—119 **13 Claims**



1. For a function relating a function domain including a plurality of points in a first color space having three dimensions to a corresponding plurality of function values in an output range in a second color space having m dimensions, each of the three dimensions of the input domain having a corresponding minimum domain value, a method for transforming input pixels having colors in the first color space into output pixels having colors in the second color space by approximating a value of the function corresponding to a target evaluation point selected from the domain input, the method being executable on a combination including a first video image generator including pixels having colors in the first color space, storage means for storing information and processing means for performing calculations, and a second video image generator having colors in the second color space, the method comprising the following steps:

- (a) receiving an input pixel from the first video image generator, said input pixel represented by a color in the first color space that corresponds to a pixel evaluation point situated within the function domain;
- (b) dividing the function domain into a first division including a plurality of rectangular solids formed by a plurality of parallel planes of constant value in each of the three dimensions of the first color space, division of each of the three dimensions commencing at the minimum domain value, and, for each of the three dimensions, the function domain being divided into intervals of equal size, each rectangular solid having twelve edges, eight corners, and one center point situated midway between all parallel planes of constant value forming the rectangular solid, each of the edges having two ends formed by two respective corners;
- (c) dividing the function domain into a second division including a plurality of points such that there is only one point in the interior of each rectangular solid of the first division, the plurality of points of the second division interior to the eight rectangular solids of the first division which share a single common corner from a three-dimensional solid with twelve edges and eight corners;
- (d) determining the function value corresponding to each of the corner points of the rectangular solids formed by each of the first division and the second division;
- (e) extracting a tetrahedral volume containing the pixel evaluation point from the first and the second divisions, the extracted tetrahedral volume being defined by two points from the first subdivision and two points from the second subdivision, the extracting step being performed as follows:
  - (e.1) measuring a distance between the pixel evaluation point and any one of the edges from the first plurality of rectangular solids along a line that passes through both the evaluation point and the edge in a direction perpendicular to the edge;
  - (e.2) repeating step e.1 for a plurality of edges from the first division to identify the edge closest to the pixel evaluation point;
  - (e.3) for the edge closest to the target evaluation point, identifying two ends of the edge, each of the two ends defining a respective vertex of the tetrahedral volume;
  - (e.4) measuring the distance between the pixel evaluation point and any one of the edges from the second plurality of rectangular solids along a line that passes through both the pixel evaluation point and the edge in a direction perpendicular to the edge;
  - (e.5) repeating step e.4 for a plurality of edges from the second division to identify the edge closest to the pixel evaluation point;
  - (e.6) for the edge closest to the pixel evaluation point, identifying two ends of the edge, each of the ends defining a respective vertex of the tetrahedral volume, such that two tetrahedral volume vertices are defined by the first division, and two tetrahedral volume vertices are defined by the second division;
- (f.) deriving an approximation of the function value at the pixel evaluation point from the vertices of the tetrahedral volume identified in step e and the function values corresponding to the vertices, by a volumetric interpolation process; and
- (g.) using the second video image generator to display an output pixel having a color in the second color space that corresponds to the approximation.

5,751,927

METHOD AND APPARATUS FOR PRODUCING THREE DIMENSIONAL DISPLAYS ON A TWO DIMENSIONAL SURFACE

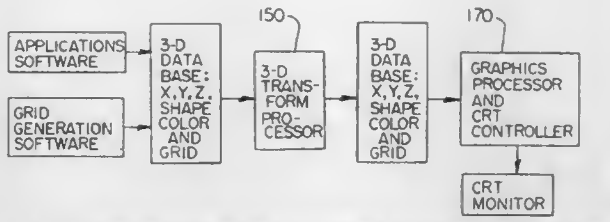
Thomas D. Wason, 715 W. Johnson St., Raleigh, N.C. 27603

Continuation of Ser. No. 675,439, Mar. 26, 1991, abandoned. This application Jun. 19, 1995, Ser. No. 491,280

Int. Cl.^{6} G06F *15/00;* **H04N** *13/00;13/02*

U.S. Cl. 395—119 **71 Claims**

53. An apparatus for displaying a three dimensional view made up of features comprising


APPLICATIONS SOFTWARE
GRID GENERATION SOFTWARE
3-D DATA BASE: X,Y,Z, SHAPE COLOR AND GRID
150
3-D TRANS-FORM PRO-CESSOR
3-D DATA BASE: X,Y,Z, SHAPE COLOR AND GRID
170
GRAPHICS PROCESSOR AND CRT CONTROLLER
CRT MONITOR

- a. a two dimensional surface and means for rendering the view as points thereon and
- b. means for creating a display on said surface of a perceptible three-dimensional coordinate display space in which the displayed view is rendered, including means which modifies the view as rendered including altering and redisplaying points of the surface, at a saccade-like rate, corresponding to at least three positions in accordance with variations in the direction of sight in a pattern of discrete changes that are:
  - i) perceptually unpredictable in order,
  - ii) perceptually unpredictable in length of time displayed for each displayed view,
  - iii) less than d_{max}, where d_{max} is the maximal disparity between successive images which maintain human perceptual correspondence, and
  - iv) synchronous over the entire displayed view;

whereby motion parallaxes are displayed perceptibly to both eyes of the human viewer, which enables the human viewer to achieve a perception of spatial structure in the view, whether movement of the view is occurring or not.

5,751,928

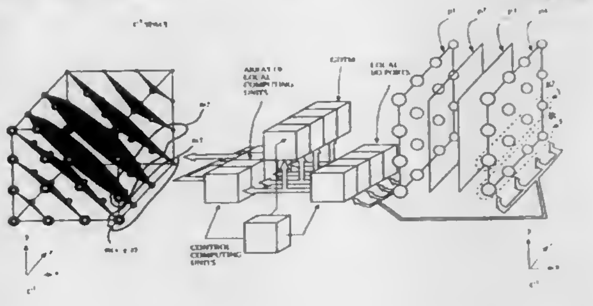
PARALLEL COMPUTING SYSTEM FOR VOLUMETRIC MODELING, DATA PROCESSING AND VISUALIZATION VOLUMETRIC

Reuven Bakalash, 82 Shita St., Omer, Israel, 84965

Continuation of Ser. No. 936,178, Aug. 26, 1992, Pat. No. 5,361,385. This application Oct. 26, 1994, Ser. No. 329,250

Int. Cl.^{6} G06T *17/20*

U.S. Cl. 395—124 **33 Claims**



1. A parallel computing system for generating and processing voxel-based objects within a three-dimensional memory storage array represented in 3-D space, comprising:

- a system bus for transferring coordinate data sets and local programs;
- a plurality of local computing units, each said local computing unit being connected to said system bus and having local program storage means for storing one or more local programs, and local processing means for locally processing one or more coordinate data sets in accordance with one or more of said local programs and producing data elements, including voxel data elements representative of a portion of a 3-D voxel-based object represented in said 3-D space;
- a plurality of local memory storage modules, each said local memory storage module having a set of memory storage elements and each said memory storage element being capable of storing one or more voxel data elements, wherein a plurality of said memory storage elements in said plurality of

local memory storage modules are indexed so as to represent said three-dimensional memory storage array in said 3-D space;

a plurality of local buses, each said local bus being operably connected to one said local computing unit and one said local memory storage module, for transferring voxel data elements therebetween; and

a control computing unit, operably connected to said plurality of local computing units by way of said system bus, for controlling and coordinating said plurality of local computing units during the local production and storage of said voxel data in said three-dimensional memory storage array.

5,751,929
IMAGE PROCESSING APPARATUS

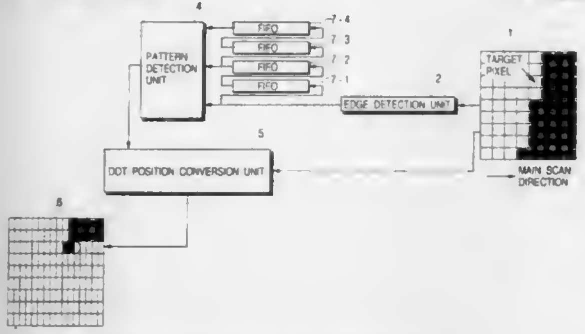
Nobuo Ohnuma, and Takatoshi Ohta, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jan. 31, 1996, Ser. No. 594,439

Claims priority, application Japan, Feb. 1, 1995, 7-015062; Feb. 1, 1995, 7-015064

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—129 **14 Claims**



1. An image processing apparatus comprising:

input means for inputting image data;

edge detecting means for detecting an edge from the image data inputted by said input means;

pattern detecting means for detecting whether the edge data from said edge detecting means coincides with a specific pattern or not; and

recording position converting means for converting a recording position of the image data of a specific pixel inputted by said input means when said pattern detecting means detects that said edge data coincides with said specific pattern.

5,751,930
GRAPHIC PROCESSING SYSTEM

Koyo Katsura, Hitachiota; Shigeru Matsuo, Hitachi; Shigeaki Yoshida, Sayama; Hiroshi Takeda, Kodaira, and Hisashi Kaziwara, Hitachi, all of Japan, assignors to Hitachi, Ltd., and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 890,710, May 29, 1992, which is a continuation of Ser. No. 542,825, Jun. 25, 1990, which is a division of Ser. No. 905,173, Sep. 9, 1986, Pat. No. 4,947,342. This application Mar. 16, 1994, Ser. No. 213,820

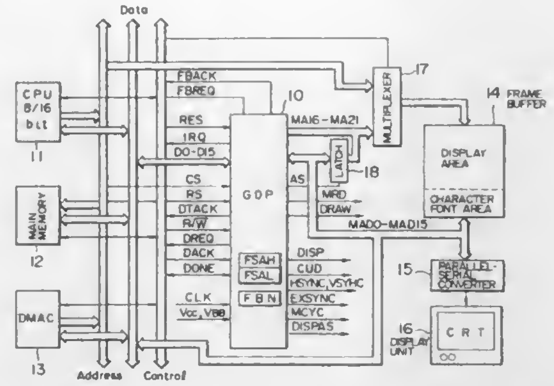
Claims priority, application Japan, Sep. 13, 1985, 60-201549

Int. Cl.^{6} G06T *3/40;3/60*

U.S. Cl. 395—137 **23 Claims**

2. A method of processing images in a graphic processing system comprising a data processing unit including a main memory and a central processing unit (CPU) for creating character code information and a graphic processing unit including a frame buffer and a graphic data processor (GDP) for creating pixel information representing images based on said character code information, said method comprising the steps of:

a) creating character code information in said data processing unit;



b) supplying said character code information from said data processing unit to said GDP;

c) generating addresses of said frame buffer corresponding to said character code information supplied to said GDP;

d) reading out a character font composed of plural pixels of binary information from a second area of the frame buffer using said generated addresses;

e) converting said character font composed of plural pixels of binary information into multi-level information by said GDP;

f) writing said character font converted into the multi-level information by said GDP in a predetermined position of a first area of said frame buffer; and

g) sending display data from said first area of the frame buffer to a display unit.

5,751,931
THREE DIMENSIONAL GRAPHICAL DISPLAY OF INFORMATION

Kenneth Charles Cox, and Stephen Gregory Eick, both of Naperville, Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 18, 1995, Ser. No. 424,762

Int. Cl.^{6} G06T *17/00*

U.S. Cl. 395—140 **31 Claims**

1. An apparatus for representing information in a display in a computer system, said information describing entities and relationships between pairs of entities, said apparatus comprising:

means for displaying a surface representation on said display;

means responsive to said information for displaying a plurality of entity representations on said display, each of said entity representations corresponding to one of said entities; and

means responsive to said information for displaying a plurality of arcs at positions appearing at least in part disposed from said surface representation on said display, each of said arcs connecting the entity representations of a pair of entities, wherein the position of each of said arcs relative to said surface representation is a function of an attribute of the relationship between a pair of entities.

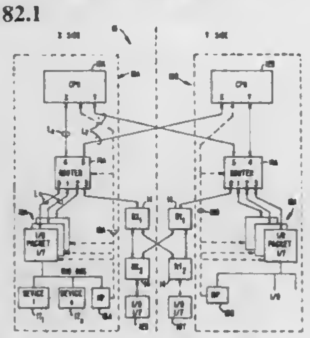
5,751,932
FAIL-FAST, FAIL-FUNCTIONAL, FAULT-TOLERANT MULTIPROCESSOR SYSTEM

Robert W. Horst, Saratoga, Calif.; William Edward Baker, Austin, Tex.; Randall G. Banton, Hopkinton, Mass.; John Michael Brown, Austin, Tex.; William F. Bruckert, Austin, Tex.; William Patterson Bunton, Austin, Tex.; Gary F. Campbell, Palo Alto, Calif.; John Deane Coddington, Cedar Park, Tex.; Richard W. Cutts, Jr., Georgetown, Tex.; Barry Lee Drexler; Harry Frank Elrod, both of Austin, Tex.; Daniel L. Fowler, Georgetown, Tex.; David J. Garcia, Los Gatos, Calif.; Paul N. Hintikka, Austin, Tex.; Geoffrey I. Iswandhi, Sunnyvale, Calif.; Douglas Eugene Jewett, Round Rock, Tex.; Curtis Willard Jones, Jr., Austin, Tex.; James Stevens Klecka, Lexington, Tex.; John C. Krause, Georgetown, Tex.; Stephen G. Low, Austin, Tex.; Susan Stone Meredith, Hillsboro, Oreg.; Steven C. Meyers, Round Rock, Tex.; David P. Sonnier, Austin, Tex.; William Joel Watson, Austin, Tex.; Patricia L. Whiteside, Austin, Tex.; Frank A. Williams, Austin, Tex., and Linda Ellen Zalzala, Austin, Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 992,944, Dec. 17, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 485,217

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.1 **30 Claims**



1. A data processing system, comprising:

at least two sub-processing systems, each sub-processing system including;

a central processing unit, the central processing unit including at least a pair of processor elements operating in lock-step, self-checking configuration, and executing substantially identical instructions at substantially the same time,

a peripheral unit, and

a routing element coupled to the central processing unit of each of the sub-processing systems and to the peripheral unit for communicating data between the central processing units and peripheral unit of the sub-processing systems.

5,751,933
SYSTEM FOR DETERMINING THE STATUS OF AN ENTITY IN A COMPUTER NETWORK

Roger H. Dev, 64 Bagdad Rd., Durham, N.H. 03824, and Mark H. Nelson, 53 Tibbetts Rd., Fremont, N.H. 03044

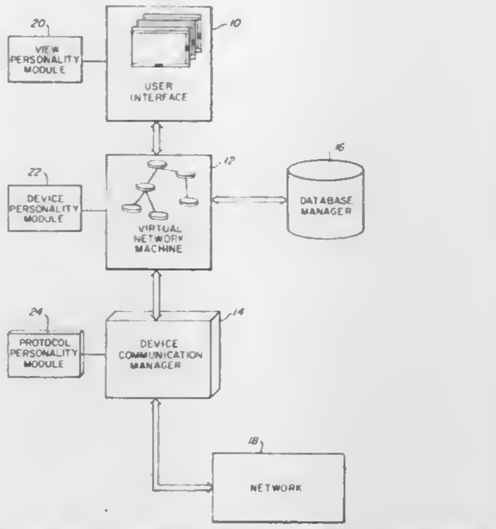
Continuation of Ser. No. 355,436, Dec. 13, 1994, Pat. No. 5,559,955, which is a continuation of Ser. No. 216,696, Mar. 23, 1994, abandoned, which is a continuation of Ser. No. 797,121, Nov. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 583,509, Sep. 17, 1990, abandoned. This application Sep. 12, 1996, Ser. No. 713,152

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—182.02 **10 Claims**

1. In a network comprising interrelated network entities including communicating network entities and at least one non-communicating network entity, a system for monitoring a status of the non-communicating network entity, comprising:

means for providing an electronic network management system;



means for said network management system communicating with said communicating network entities to obtain operational information as to the communicating network entities; and

means for said network management system using the operational information as to the communicating network entities and information as to relations between said non-communicating network entity and said communicating network entities to infer the status of the non-communicating network entity.

5,751,934
NON-BLOCKING FAULT-TOLERANT GAMMA NETWORK FOR MULTI-PROCESSOR SYSTEM

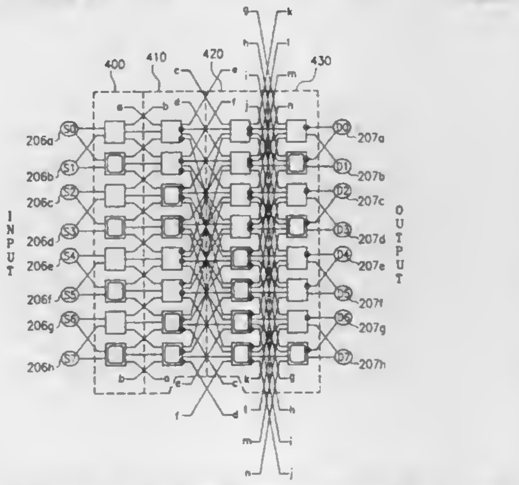
Jong-Seok Han; Woo-Jong Hahn, and Suk-Han Yoon, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Nov. 12, 1996, Ser. No. 747,685

Claims priority, application Rep. of Korea, Dec. 8, 1995, 95-47847

Int. Cl.^{6} G06F *13/00;* H04Q *11/04*

U.S. Cl. 345—182.02 **3 Claims**



1. A non-blocking fault tolerant gamma network for a multi-processor system comprising:

N dual links respectively connected to N source nodes, and for transmitting data input;

a first stage made up with N 2×3 switching devices for outputting data transmitted from said N dual links;

a second stage made up with n 3×4 switching devices for outputting data output from said first stage;

a third stage to (n−1) stage made up with (n−2)×N 4×4 switching devices for receiving data output from said second stage at said third stage and outputting the data to the (n−1) stage;

an n stage made up with N 4×2 switching devices for receiving data output from said n−1 stage and outputting the data; and

N dual links connected to N destination nodes for transmitting data output from said n stage, whereby said links, which connect said N source nodes, switching devices of the interconnection network and N destination nodes, are designed according to the connection formula of the following regulation 1, thus simultaneously set all paths between a plurality of sources and a plurality of destinations, and tolerate a single-switching fault or a single-link fault in said interconnection network;

<REGULATION

1>

$L(k)_{i,i}, L(k)_{i,i-2^k} L(k)_{i,i+2^k}$ if k = 0.

$L(k)_{i,i}, L(k)_{i,i-2^k} L(k)_{i,i+2^k}, L(k)_{i,i+2^{k+1}}$ if $1 \leqq k < n-1$

$L(k)_{i,i}, L(k)_{i,i-2^k} L(k)_{i,i+2^k}, L(k)_{i,adj(i)}$ if k = n − 1.

$L(k)_{i,i}, L(k)_{i,adj(i)}$ if k = n

(Here, n = log2(N), $0 \leqq i \leqq n-1$,
N: the number of input port or output port of the interconnection network,
k: stage number of switches,
L: link,
adj(i) = adjacent switch or node of i).

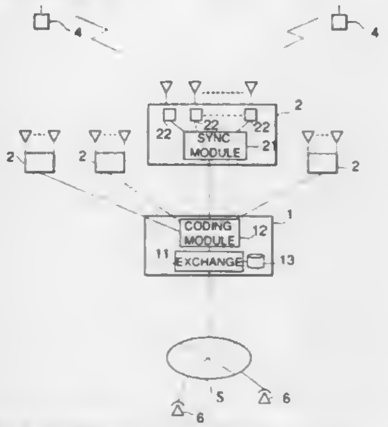
5,751,935

RADIO PAGING SYSTEM

Takafumi Kojima, Yokohama; Sotaro Hiroshima, Chigasaki; Toshiro Suzuki, Tama; Yasuo Kogure, and Akio Yasuda, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1995, Ser. No. 565,135
Claims priority, application Japan, Dec. 2, 1994, 6-299244
Int. Cl.⁶ G08C ***17/00***

U.S. Cl. 395—182.04 **7 Claims**



1. A radio paging system, comprising:

a plurality of receivers which receive messages through radio communications;

a plurality of transmitting stations which transmit the messages to said receivers through the radio communications; and

a central station which is connected to a communication network, and which allocates the messages received from the communications network, to said plurality of transmitting stations,

said central station including means for obtaining error correcting codes which serve to correct transmission errors of said messages received from said communications network, and means for allocating the messages to which the error correcting codes obtained are affixed, to the respective transmitting stations and for transmission of the messages via a plurality of transmission systems;

each of said receivers including means for correcting the transmission error which has developed in relation to the message received through said radio communications, by the use of the error correcting code affixed to said message;

each of said transmitting stations including means for receiving the messages from said central station by using any one of said plurality of transmission systems, and means for detecting if the transmission error has developed in relation to the message received from said central station, by the use of the error correcting code affixed to said message, and failure counterplan means for executing predetermined failure counterplan processing in which the transmission system is switched to one of the other transmission systems for reception of the messages, in a case where the transmission error rate has exceeded a predetermined value.

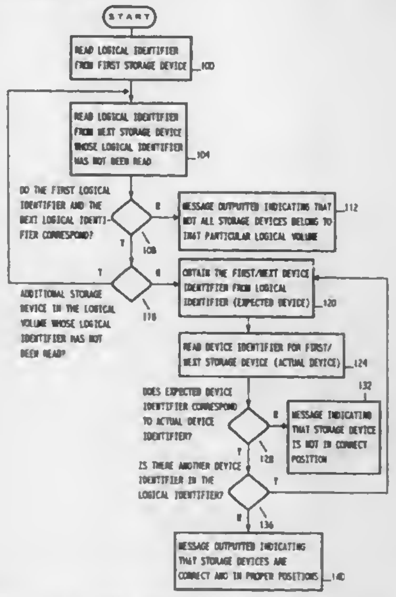
5,751,936

CHECKING FOR PROPER LOCATIONS OF STORAGE DEVICES IN A STORAGE DEVICE ARRAY

David Larson, Broomfield; Robert E. Stubbs, and Gene Edstrom, both of Longmont, all of Colo., assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 325,989, Oct. 19, 1994, Pat. No. 5,598,528, which is a continuation of Ser. No. 794,114, Nov. 15, 1991, Pat. No. 5,369,758. This application May 13, 1996, Ser. No. 645,124
Int. Cl.⁶ G06F ***11/28;11/30***

U.S. Cl. 395—182.05 **20 Claims**


START
READ LOGICAL IDENTIFIER FROM FIRST STORAGE DEVICE
100
READ LOGICAL IDENTIFIER FROM NEXT STORAGE DEVICE WHOSE LOGICAL IDENTIFIER HAS NOT BEEN READ
104
DO THE FIRST LOGICAL IDENTIFIER AND THE NEXT LOGICAL IDENTIFIER CORRESPOND?
N
MESSAGE OUTPUTTED INDICATING THAT NOT ALL STORAGE DEVICES BELONG TO THAT PARTICULAR LOGICAL VOLUME
112
Y
108
Y
N
ADDITIONAL STORAGE DEVICE IN THE LOGICAL VOLUME WHOSE LOGICAL IDENTIFIER HAS NOT BEEN READ?
116
OBTAIN THE FIRST/NEXT DEVICE IDENTIFIER FROM LOGICAL IDENTIFIER (EXPECTED DEVICE)
120
READ DEVICE IDENTIFIER FOR FIRST/NEXT STORAGE DEVICE (ACTUAL DEVICE)
124
132
DOES EXPECTED DEVICE IDENTIFIER CORRESPOND TO ACTUAL DEVICE IDENTIFIER?
N
MESSAGE INDICATING THAT STORAGE DEVICE IS NOT IN CORRECT POSITION
Y
128
IS THERE ANOTHER DEVICE IDENTIFIER IN THE LOGICAL IDENTIFIER?
Y
N
136
MESSAGE OUTPUTTED INDICATING THAT STORAGE DEVICES ARE CORRECT AND IN PROPER POSITIONS
140

1. A method for determining whether each of a plurality of storage devices of a logical volume of storage devices is part of a logical volume, comprising:

providing an identifier on each storage device of said logical volume, each of the identifiers on each of said storage devices being the same in said logical volume;

reading out the identifiers from each of said storage devices;

assuming the identifier read out from one of said storage devices is a reference identifier;

comparing the reference identifier with the identifier read out from the other storage devices;

determining whether or not an incorrect member is present in said logical volume based upon the comparison result in said comparing step; and

updating the identifier on each of said storage devices when an event occurs which may affect data integrity, by generating a new identifier different from that already provided on said storage devices, and writing the new identifier to each of said storage devices.

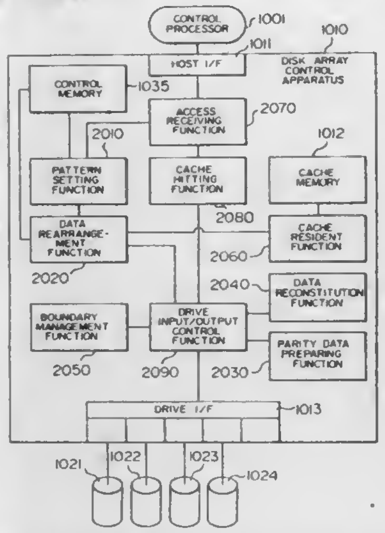
5,751,937

ARRAY TYPE STORAGE UNIT SYSTEM

Kouji Arai, Odawara; Takao Satoh, and Akira Yamamoto, both of Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 341,082, Nov. 17, 1994, Pat. No. 5,564,116. This application Jun. 25, 1996, Ser. No. 670,019
Claims priority, application Japan, Nov. 19, 1993, 5-290538
Int. Cl.⁶ G06F ***11/00***

U.S. Cl. 395—182.05 **4 Claims**



1. An array type storage unit system comprising:

a plurality of storage units for storing parity groups each of which includes a plurality of data blocks and a parity data block; and

a control apparatus connected between a processor and said plurality of storage units, said control apparatus having:

a cache memory;

rearrangement means for deciding an arrangement of data blocks on said plurality of storage units on the basis of redundancy of the storage unit system in response to addition of a new storage unit to said plurality of storage units;

reading means for reading data blocks from said plurality of storage units to said cache memory after addition of the new storage unit;

writing means for writing the data blocks from said cache memory into said plurality of storage units including said new storage unit based on the arrangement of data blocks decided by said rearrangement means;

write position storing means for storing write position information that indicates an extent of data blocks that are being processed by said reading means and said writing means;

means for comparing an access position of a request for data access from said processor with the write position information; and

means for determining a data dispersed pattern for the data access requested by said processor on the basis of a comparison result of said comparing means.

5,751,938

PERIPHERAL MODULE AND MICROPROCESSOR SYSTEM

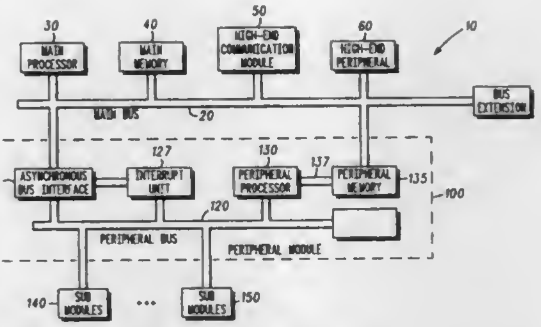
Wilhard C. Wendorff, München, Germany; Roland Schwarz, Geneva, Switzerland, and Guiseppe Amato, Orio Litta, Italy, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1996, Ser. No. 768,765
Claims priority, application United Kingdom, Jan. 4, 1996, 9600118
Int. Cl.⁶ G06F ***11/00***

U.S. Cl. 395—182.08 **3 Claims**

1. A microprocessor system comprising:

a main processor;



a main bus, coupled to the main processor;

at least one submodule; -

a peripheral bus arranged for coupling to the at least one submodule;

an asynchronous interface for coupling between the peripheral bus and the main bus; and,

peripheral processing means coupled to the peripheral bus, and arranged for managing the activities of the at least one submodule,

wherein the peripheral processing means is arranged to be programmed with data for managing the at least one submodule, and further arranged for controlling the microprocessor system should an error occur within the main processor.

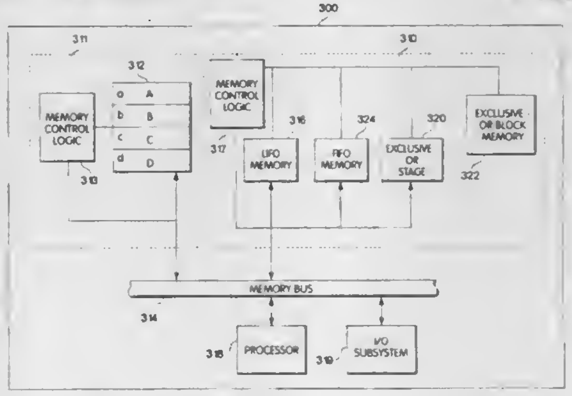
5,751,939

MAIN MEMORY SYSTEM AND CHECKPOINTING PROTOCOL FOR FAULT-TOLERANT COMPUTER SYSTEM USING AN EXCLUSIVE-OR MEMORY

Jack J. Stiffler, Hopkinton, Mass., assignor to Texas Micro, Inc., Houston, Tex.

Filed Nov. 29, 1995, Ser. No. 564,665
Int. Cl.⁶ G06F ***11/00***

U.S. Cl. 395—182.13 **9 Claims**



1. A computer system comprising:

a processor;

a main memory subsystem, coupled to the processor, including:

an exclusive-or memory for storing an exclusive-or checkpoint state;

a buffer that monitors accesses of the main memory subsystem by the processor and stores data related to the accesses; and

means, using the data from the buffer and the exclusive-or memory, for ensuring the existence of a consistent checkpoint state in the main memory subsystem to which processing can resume without loss of data integrity or program continuity following a fault.

5,751,940

MICROPROCESSOR INTEGRATED CIRCUIT WORKING IN INTERNAL ROM AND EXTERNAL RAM MODE

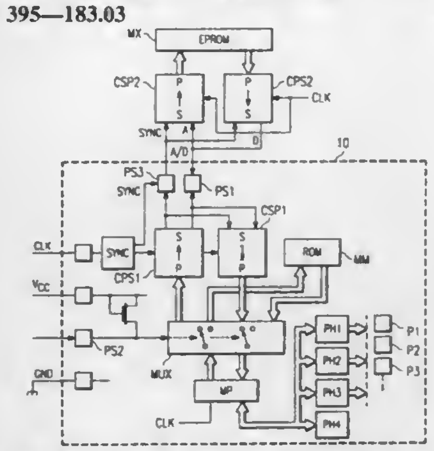
Jean Nicolai, Aix en Provence, France, assignor to SGS Thomson Microelectronics, S.A., Gentilly, France

Filed Jan. 3, 1991, Ser. No. 638,173

Claims priority, application France, Jan. 9, 1990, 9000169

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.03 **26 Claims**



1. An integrated circuit component comprising an integrated circuit chip encapsulated in a package having external pins, said integrated circuit comprising

a microprocessor,

a program read-only memory to contain a program to be carried out by the microprocessor and

pads, capable of being connected to said external pins of said package, including

at least one serial transmission contact pad, connected to said microprocessor for the serial transmission of addresses and data to and from said microprocessor, and

at least one mode selection contact pad for selecting the mode of operation of the microprocessor,

said integrated circuit further comprising a mode selection circuit to select between first and second possible modes of operation of said microprocessor as a function of a signal present at said mode selection contact pad,

said first mode of operation being the execution of a program which is serially interfaced to said microprocessor through said serial transmission pad,

said second mode of operation being the execution of a program contained in said program read-only memory;

and wherein at least one of said transmission contact pad and said mode selection contact pad is not connected to an external pin of the packages;

whereby said first mode of operation is inoperative in said package.

5,751,941

OBJECT ORIENTED FRAMEWORK FOR TESTING SOFTWARE

David Hinds, Wakefield, Mass.; Ana Kapetanakis, Nashua, N.H.; Stephen J. McFarland, Groton, Mass.; Mark C. Campbell, Billerica, Mass.; David S. Levin, Concord, Mass., and David J. Miller, Burlington, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 4, 1996, Ser. No. 627,629

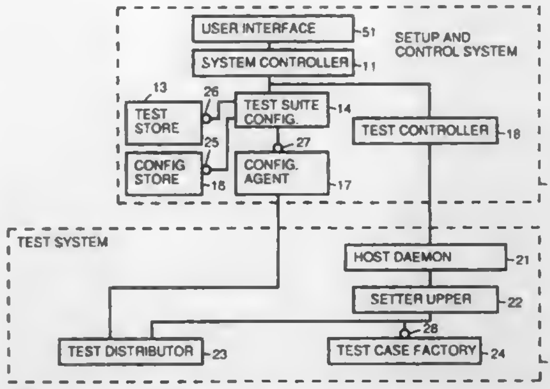
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.14 **22 Claims**

1. A software testing system for testing software, the software operating within a computing system, the software testing system comprising:

a set-up and control system, the set-up and control system including

a user interface for interacting with a user of the software testing system, and



storage means, for storing test data and for storing test configurations; and,

a test system, coupled to the set-up and control system, the test system including:

testing set-up means for setting up test cases from the test data and the test configurations stored in the storage means, each test case inheriting attributes from at least one test object within the test system, the inherited attributes facilitating interaction of the test system with the test cases.

5,751,942

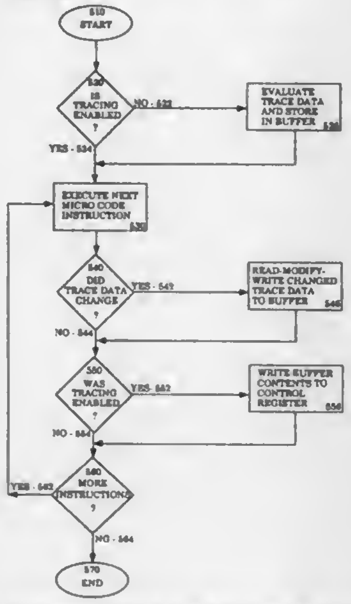
TRACE EVENT DETECTION DURING TRACE ENABLE TRANSITIONS

Reed K. Christensen, and Robert W. Martell, both of Hillsboro, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 85,645, Jun. 30, 1993, abandoned. This application May 9, 1996, Ser. No. 647,387

Int. Cl.^{6} G06F *11/00;9/45*

U.S. Cl. 395—183.14 **14 Claims**


510 START
520 IS TRACING ENABLED ?
NO - 522
EVALUATE TRACE DATA AND STORE IN BUFFER
526
YES - 524
EXECUTE NEXT MICRO CODE INSTRUCTION
530
540 DID TRACE DATA CHANGE ?
YES - 542
READ-MODIFY-WRITE CHANGED TRACE DATA TO BUFFER
546
NO - 544
550 WAS TRACING ENABLED ?
YES - 552
WRITE BUFFER CONTENTS TO CONTROL REGISTER
556
NO - 554
560 MORE INSTRUCTIONS ?
YES - 562
NO - 564
570 END

1. A method for testing one of software and an electronic device, the method comprising the steps of:

monitoring for an occurrence of a trace event during execution of macro code instructions prior to execution of a plurality of micro code instructions;

determining whether or not tracing has been enabled;

storing the trace information in a buffer inaccessible to a trace fault decision handler if tracing has been disabled and the trace event has occurred;

executing the plurality of micro code instructions; and

while the plurality of micro code instructions are executing, if one of the plurality of micro code instructions enabling tracing is executed, writing the trace information stored in the buffer to a data storage area, the data storage area being accessible to the trace fault decision handler.

5,751,943

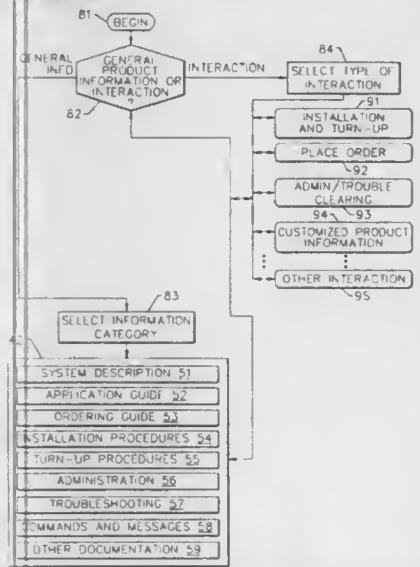
ELECTRONIC WORK ENVIRONMENT FOR A DATA PROCESSING SYSTEM

Craig Kay Benzenberg, Raleigh; Lloyd Steven Mann; Lawrence Carl Oslund, both of Cary, all of N.C., and Colleen Ann Roe, Menlo Park, Calif., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Continuation of Ser. No. 9,927, Jan. 27, 1993, abandoned. This application Jan. 22, 1996, Ser. No. 589,764

Int. Cl.^{6} G06F *11/22*

U.S. Cl. 395—183.16 **4 Claims**



3. A computer program product for execution on a data processing system comprising a plurality of hardware elements, said computer program product comprising:

a computer-readable storage medium having computer-readable program code means embodied in said medium, said computer-readable program code means comprising:

computer-readable program code means which provides a plurality of software elements which cause said hardware elements to perform predetermined application functions upon execution of said software elements on said hardware elements;

computer-readable program code means which provides a plurality of online documentation modules which execute on at least one of said hardware elements, including at least a troubleshooting guide module, and an ordering guide module an installation procedures module;

computer-readable program code means, responsive to execution of said plurality of software elements and said plurality of online documentation modules on at least one of said hardware elements, for exchanging data between at least one of said software elements and at least one of said online documentation modules, to produce interaction between said at least one software element and said at least one online documentation module; and

computer-readable program code means which provides a common user interface module, responsive to said data exchanging means, for displaying on a display, results of the interaction between said at least one software element and said at least one online documentation module;

wherein said data exchanging means comprises computer-readable program code means for generating a customized ordering guide module which reflects said predetermined configuration of said hardware and software elements;

wherein said data exchanging means further comprises computer-readable program code means for generating a customized ordering guide module which reflects said predetermined configuration of said hardware and software elements; and

wherein said computer program product further comprises computer-readable program code means, responsive to an error in said data processing means upon execution of said customized troubleshooting guide module, for executing said customized ordering module and ordering a replacement part.

5,751,944

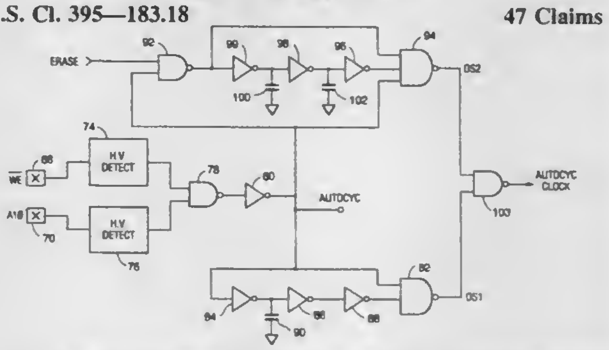
NON-VOLATILE MEMORY SYSTEM HAVING AUTOMATIC CYCLING TEST FUNCTION

Frankie F. Roohparvar, Cupertino, and Christophe J. Chevallier, Palo Alto, both of Calif., assignors to Micron Quantum Devices, Inc., Santa Clara, Calif.

Filed Jul. 28, 1995, Ser. No. 508,797

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 395—183.18 **47 Claims**



1. A non-volatile memory system operable in a normal mode of operation and a test mode of operation where the memory system performs repeated program-erase test cycles, said system comprising:

test mode switching circuitry configured to switch the system between the normal mode of operation and the test mode of operation;

an array of non-volatile memory cells:

a normal operations controller, operably coupled to the array, said normal operations controller being configured to program, read and erase the non-volatile memory cells when the system is in the normal mode of operation: and

a test operations controller operably coupled to the array and configured to carry out successive ones of the test cycles on the array, with each of the test cycles including a programming segment which causes the array to be programmed and an erasing segment which causes the array to be erased, when the system is in the test mode of operation said test operations controller including a retrigger circuit configured to detect when one of the test cycles is completed and to automatically initiate a further one of the test cycles.

5,751,945

METHOD AND SYSTEM FOR PERFORMANCE MONITORING STALLS TO IDENTIFY PIPELINE BOTTLENECKS AND STALLS IN A PROCESSING SYSTEM

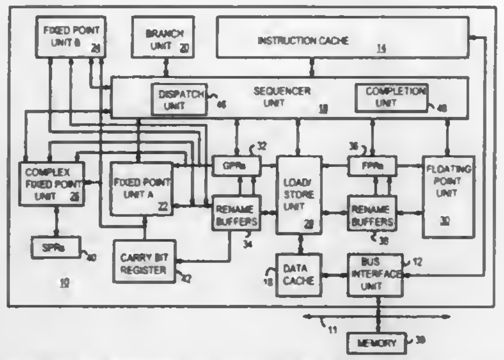
Frank Eliot Levine; Charles Philip Roth, and Edward Hugh Welbon, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1995, Ser. No. 538,102

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—184.01 **25 Claims**

1. A method for identifying bottlenecks within a processing system, the processing system including special purpose registers, a number of the special purpose registers designated as a plurality of performance monitor counters (PMCs) and at least one monitor mode control register (MMCR) to configure the operations of at least one of the PMCs, the method comprising:



(a) counting a number of cycles that a dispatch unit is stalled during a predetermined sampling period;

(b) counting a number of cycles that each of a plurality of execution units is stalled during the predetermined sampling period;

(c) counting a number of cycles that a load/store unit is stalled during the predetermined sampling period; and

(d) counting a number of cycles that a completion unit is stalled during the predetermined sampling period,

wherein the steps of counting are performed with the plurality of PMCs to identify a number of stalls occurring within each unit during processing to produce an overview of system bottleneck conditions.

5,751,946

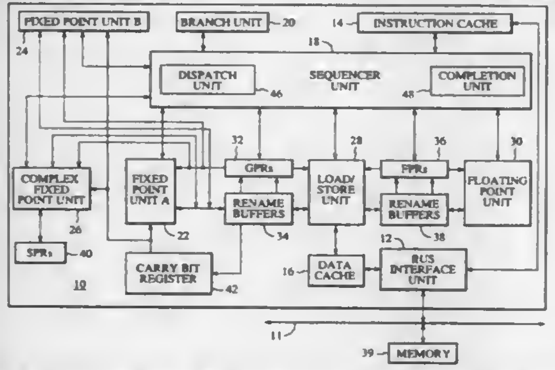
METHOD AND SYSTEM FOR DETECTING BYPASS ERROR CONDITIONS IN A LOAD/STORE UNIT OF A SUPERSCALAR PROCESSOR

Muhammad Afsar, and Christopher Anthony Freymuth, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1996, Ser. No. 588,183

Int. Cl.^{6} G06F *11/28*

U.S. Cl. 395—185.03 **10 Claims**



6. A system for detecting bypass error conditions in a load/store unit of a superscalar processor, the system comprising:

a load queue, the load queue including a real page number buffer for storing a real address to a word boundary for each load instruction in the load queue;

detection logic coupled to the load queue, the detection logic comparing a real address to a word boundary for a load instruction in the load queue against a real address to a word boundary of an executing store instruction and comparing a program order of the load instruction and the executing store instruction when the real addresses to a word boundary match; and

completion logic coupled to the load/store unit, the completion logic receiving the executing store instruction together with a bypass error signal when the load instruction has executed out-of-order with respect to the executing store instruction.

5,751,947

MAGNETIC DISK APPARATUS HAVING INSPECTION FUNCTION OF RECORDING MEDIUM AND METHOD OF INSPECTING RECORDING MEDIUM IN MAGNETIC DISK APPARATUS

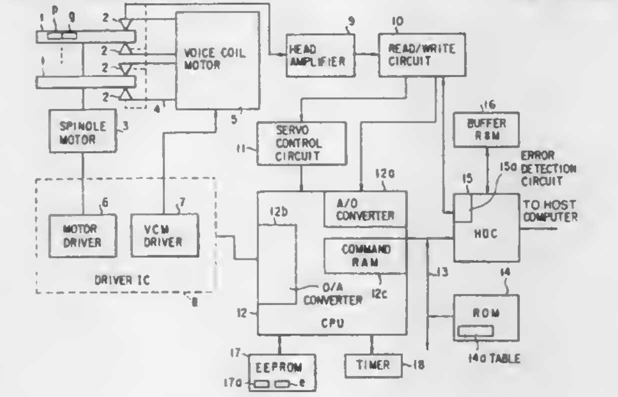
Yutaka Arakawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1995, Ser. No. 530,477

Claims priority, application Japan, Apr. 26, 1995, 7-102200

Int. Cl.^{6} G11B *20/00*

U.S. Cl. 395—185.07 **18 Claims**



1. A magnetic disk apparatus connected to a host system, comprising:

a plurality of magnetic disks;

means for positioning a magnetic head at an arbitrary position on each said magnetic disk to perform write/read processing of data;

idling detection means for detecting an idling state of said magnetic disk apparatus;

a nonvolatile memory;

defect detection means for, when the idling state of said magnetic disk apparatus is detected by said idling detection means, sequentially detecting the presence/absence of defects in said plurality of magnetic disks in units of bits from the addresses stored in said nonvolatile memory;

substitute processing means for performing processing in which, when a defect is detected by said defect detection means and a defect quantity level is calculated, an area corresponding to a detected defect having a level higher than a predetermined level is assigned to a substitute area;

means for, when the defect is detected by said defect detection means, calculating the defect quantity level and storing a location of the detected defect in said nonvolatile memory as a defect location map when the defect quantity level is lower than or equal to the predetermined level;

means for analyzing locations of the defect in units of at least one of disks and heads by using said defect location map;

means for outputting a warning signal to said host system in accordance with a result of said analyzing means;

means for calculating a formation rate of defects detected by said defect detection means, and storing the defect formation rate in said nonvolatile memory;

determination means for checking, on the basis of the defect formation rate stored in said nonvolatile memory, whether the number of defects increases; and

means for outputting a warning signal to said host system when said determination means determines that the number of defects increases.

5,751,948

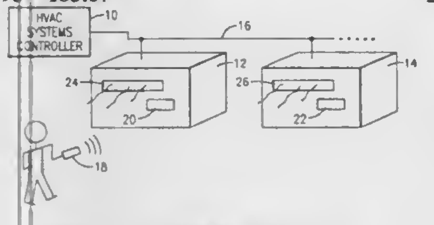
SYSTEM FOR PROCESSING HVAC CONTROL INFORMATION

Robert P. Dolan, Syracuse; Thomas R. Phillips, Cicero; Thomas L. DeWolf, Liverpool, and Mark A. Hill, Lafayette, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 26, 1995, Ser. No. 578,350

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.07 **27 Claims**



MEMORY ADDRESS INDEX "i"	ADDRESSABLE LOCATION	
	PARAMETER STORED IN LOWER BYTE	TYPE OF VERIFICATION IMAGE IN UPPER BYTE
0	HEAT CONTROL	SAME VALUE
⋮	⋮	⋮
5	FAN CONTROL	SAME VALUE
6	HVAC TYPE	ONES COMPLEMENT
7	HVAC TYPE	ONES COMPLEMENT
8	HVAC TYPE	ONES COMPLEMENT
9	NETWORK ID	TWOS COMPLEMENT
10	NETWORK ID	TWOS COMPLEMENT
11	NETWORK ID	TWOS COMPLEMENT

1. A process for writing control parameter information to addressable memory locations of a memory associated with a programmed processor wherein the control parameter information is used by the processor to control a unit that provides conditioned air to a space to be heated or cooled, said process comprising the steps of:

receiving the value of a control parameter that is to be used by the processor to control the unit providing conditioned air;

associating the control parameter that is to be used by the processor to control the unit providing conditioned air with at least one addressable memory location;

writing the value of the control parameter to a first portion of each addressable memory location associated with the control parameter;

transforming the value of the control parameter in accordance with a particular mathematical transformation that is not to be used to transform values received for any other control parameters so as to produce a verification image having a unique mathematical relationship with respect to the value of the control parameter; and

writing the verification image of the value of the particular control parameter to a second portion of each addressable memory location associated with the control parameter.

5,751,949

DATA SECURITY SYSTEM AND METHOD

Robert David Thomson, Colorado Springs, and Roger Geiwitz, Monument, both of Colo., assignors to MCI Corporation, Washington, D.C.

Filed Nov. 7, 1995, Ser. No. 447,650

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—187.01 **13 Claims**

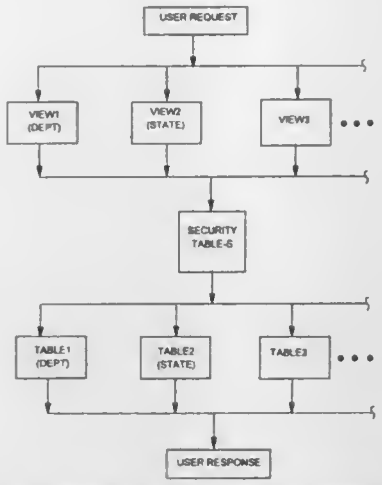
1. A security system for providing user authorized access to a server table having data arranged in rows and columns comprising:

a server computer for storing said server table;

a plurality of user terminals operatively joined to said computer for providing access to said server table;

relational database software stored in said computer and operable by an administrator for creating and maintaining tables, including said server table, and views defining subsets of said tables;

a security table stored in said computer for identifying authorized user access to preselected rows of said server table for pre-identified users; and



an access view stored in said computer for joining said security and server tables to limit user access to said server table to said preselected rows thereof based on said security table.

5,751,950

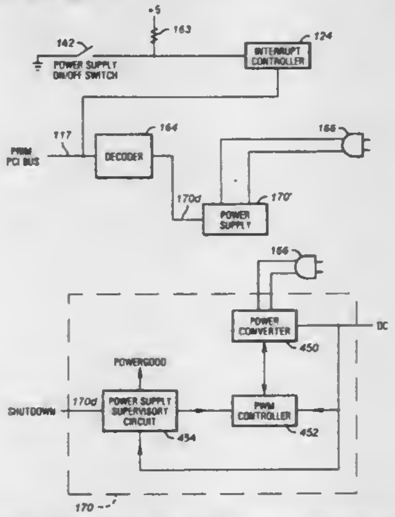
SECURE POWER SUPPLY FOR PROTECTING THE SHUTDOWN OF A COMPUTER SYSTEM

Adrian Crisan, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 16, 1996, Ser. No. 632,892

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—188.01 **24 Claims**



1. A computer system protected against an unauthorized shutdown by a user, said computer system comprising:

a processor;

a memory coupled to said processor;

a keyboard coupled to said processor for receiving data input from the user;

a display coupled to said processor for providing visual feedback to the user;

a data storage drive coupled to said processor for storing data;

a power supply for supplying power to the computer system;

a non-volatile memory to store a shutdown key for authorizing a shutdown of said power supply;

a power supply shutdown circuit coupled to said power supply and said non-volatile memory, said power supply shutdown circuit including:

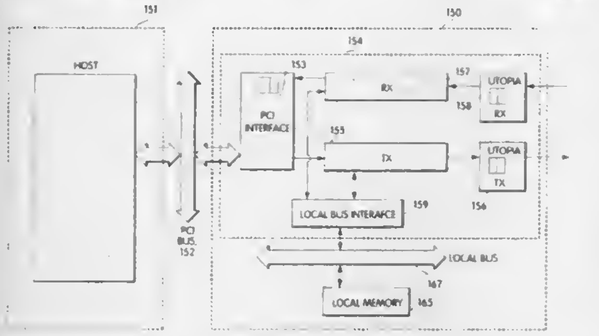
- a switch adapted to receive a power supply shutdown input from the user;
- an input device for receiving a password from a user upon receipt of said power supply shutdown input from the user;
- a comparator for comparing said password with said shutdown key; and

a circuit for shutting down said power supply if said comparator indicates that said key matches said password.

5,751,951
NETWORK INTERFACE

Randy B. Osborne, Newton; John H. Howard, Cambridge, both of Mass.; Ross T. Casley, Palo Alto, and Douglas J. Hahn, El Cerrito, both of Calif., assignors to Mitsubishi Electric Information Technology Center America, Inc., Cambridge, Mass.

Filed Oct. 30, 1995, Ser. No. 549,940
Int. Cl.^{6} G06F *13/38*
U.S. Cl. 395—200.8 **21 Claims**



1. In a connection-based data transmission system a network interface for connecting a host computer to a network over a virtual connection, comprising:

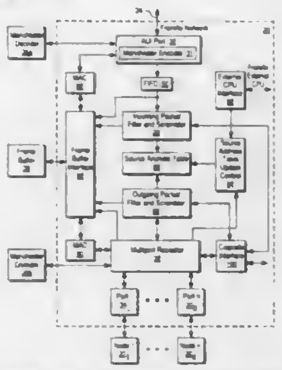
a network interface card having a Peripheral component interconnect interface, a receive block and a transmit block connected thereto, a bus connecting said peripheral component interconnect interface to said computer and means for connecting said transmit block and said receive block to said network, said host computer having TXin and TXdone queues and RXfree and RXdone queues; and,

means within said RX and TX blocks for implementing a multiword frame descriptor format utilized by said queues and said peripheral component interconnect interface a mode description in said frame descriptor specifying one of a plurality of different modes such that said frame descriptor accommodates Mode M, Mode S and Optimized Mode M.

5,751,952
NETWORK INTERFACING APPARATUS AND METHOD USING ATTACHMENT PORT AND REPEATER

Wei William Dai, San Jose, and Yu Kwong Ng, Sunnyvale, both of Calif., assignors to Allied Telesyn Int'l Corp., Sunnyvale, Calif.

Continuation of Ser. No. 278,820, Jul. 21, 1994, Pat. No. 5,615,340. This application Nov. 22, 1996, Ser. No. 755,450
Int. Cl.^{6} G06F *13/00*
U.S. Cl. 395—200.8 **20 Claims**



1. A network interfacing apparatus comprising:

plurality of working ports, not directly connected to each other, coupled to a plurality of nodes;

a repeater for coupling to each working port;

an address table for storing addresses of said working ports;

an attachment port, not directly connected to the repeater, coupled to a network for receiving an incoming information packet therefrom, and sending an outgoing information packet thereto, said incoming packet containing a destination address;

an incoming packet controller coupled to said address table, said attachment port, said repeater, and said working ports through said repeater, said controller determining whether said destination address matches any of the addresses stored in said address table, and in response to a destination address match, said controller sending said incoming packet to said working ports;

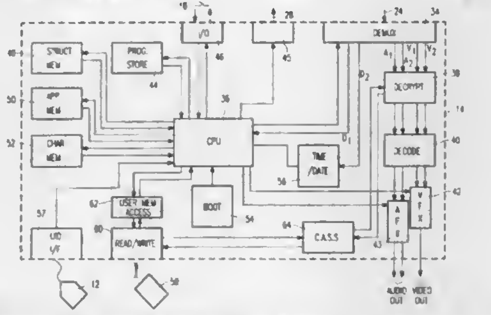
packet scrambler coupled to the incoming packet controller for providing a scrambled information packet so that in response to a destination address match, the corresponding working port receives the incoming information packet and at least one other working port receives the scrambled information packet; and

an outgoing packet controller coupled to said address table, said attachment port, said repeater, and said working ports through said repeater, said outgoing controller receiving said outgoing information packet from one of said working ports, and determining whether an outgoing address contained in said outgoing packet matches any of the addresses stored in said address table, and if no outgoing address match is found, said controller sending said outgoing packet to said network via said attachment port.

5,751,953
INTERACTIVE ENTERTAINMENT PERSONALISATION

Martin A. Shiels, Bristol; Richard S. Cole, Redhill; Paul J. Rankin, Horley, and Rosa Freitag, London, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1996, Ser. No. 705,887
Claims priority, application United Kingdom, Aug. 31, 1995, 9517808
Int. Cl.^{6} G06F *17/00*
U.S. Cl. 395—200.09 **10 Claims**



1. Interactive entertainment apparatus operable to output sequences of image frames comprising a user-influenced path through a branch structured narrative, the apparatus comprising:

a source of image frame data for all branch structure paths of the narrative;

branch storage means for data defining the narrative branch structure;

user operable input means;

branch selection means coupled to the branch storage means and operable to determine when the narrative reaches a branch point and to call one of two or more image frame sequences from the image frame source in dependence on the user input;

an output for the selected image frame sequences; and

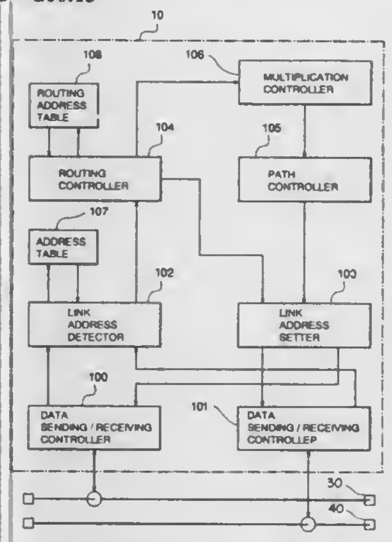
a user memory,

the branch selection means being arranged to record therein data specifying two or more past user inputs, and to refuse or enable access to at least one path from a branch path in dependence on the stored past input data.

5,751,954
ROUTER DEVICE AND DATA COMMUNICATION SYSTEM CAPABLE OF SUPPRESSING TRAFFIC INCREASE IN COMMUNICATIONS AMONG A PLURALITY OF LAN SEGMENTS

Shuichi Saito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 35,268, Mar. 22, 1993, abandoned. This application Dec. 16, 1996, Ser. No. 767,504
Claims priority, application Japan, Mar. 23, 1992, 4-065152
Int. Cl.^{6} G06F *15/56*
U.S. Cl. 395—200.15 **17 Claims**



1. A router device connected between a plurality of LAN segments for mutual communications between processing devices on said LAN segments, comprising:

a plurality of data sending/receiving control means each for receiving data signals from a corresponding one of said LAN segments and for sending data signals to said corresponding one of said LAN segments;

a link address detection means for selecting data signals that are to be received and sent out by the router device among the data signals received at said plurality of data sending/receiving control means;

a routing control means for selecting data signals that are to be routed through another router device from the data signals selected by said link address detection means;

a concatenation control means for concatenating the data signals selected by said routing control means as a single concatenated data signal which is output from the router device as a single frame of data having a single destination address and a single originating address as header information, the single originating address corresponding to an address of the router device, the single, destination address corresponding to an address of the another router device, the concatentation control means concatenating a plurality of text data from a corresponding plurality of frames of data destined for processing devices that can only be communicated with via the another router device, the concatenating text data corresponding to a single text data field of the single concatenated data signal;

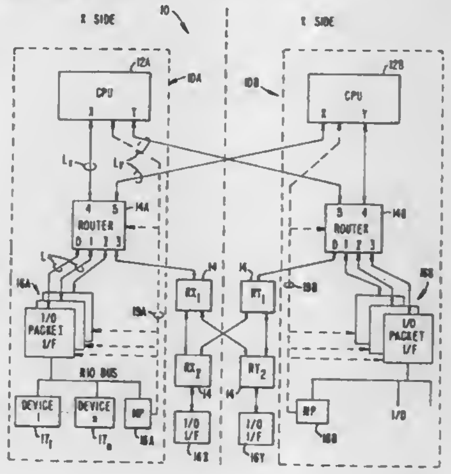
a path control means for setting paths for the data signals concatenated by said concatenation control means and for issuing a request to send out said single concatenated data signal; and

a link address setting means, based on the issued request from said path control means, for setting a destination address to said single concatenated data signal to send said single concatenated data signal to one of said plurality of data sending/receiving control means to be thereby sent to the another router device.

5,751,955
METHOD OF SYNCHRONIZING A PAIR OF CENTRAL PROCESSOR UNITS FOR DUPLEX, LOCK-STEP OPERATION BY COPYING DATA INTO A CORRESPONDING LOCATIONS OF ANOTHER MEMORY

David Paul Sonnier; William Edward Baker; William Patterson Bunton, all of Austin; Daniel L. Fowler, Georgetown; Curtis Willard Jones, Jr., Austin; John C. Krause, Georgetown; Michael P. Simpson, Liberty Hill, and William Joel Watson, Austin, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 992,944, Dec. 17, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 473,541
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 395—200.19 **7 Claims**



1. In a computing system including first and second processor elements of substantially identical construction coupled to one another for communicating data therebetween, each of the first and second processor elements including a memory element for storing instructions and data, the first processor element operating to execute instructions of an instruction stream from the memory element of the first processor element, a method for establishing for synchronized, substantially lock-step operation of the second processor element with the first processor element to have the second processor element executing the same instructions at substantially the same moment in time as the first processor element, the method including the steps of:

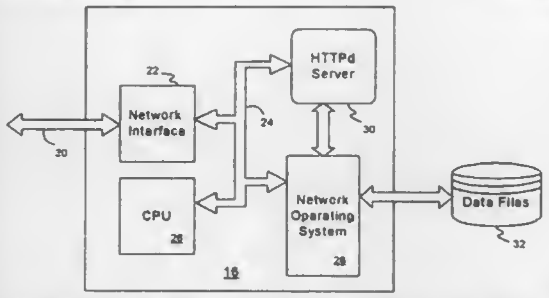
synchronizing the second processor element with the first processor element;

the first processor element accessing the instructions and data of the memory element of the first processor element and communicating the accessed instructions and data to the second processor element with address data indicative of locations in the memory element of the second processor element corresponding to locations at which the instructions and data are stored in the memory element of the first processor element;

storing the received instructions and data in the memory element of the second processor element at the locations indicated by the address data; marking first locations of the memory element of the first processor that are written with new data or new instructions after the instructions and data accessed from the first locations for communication to the second processor element; and

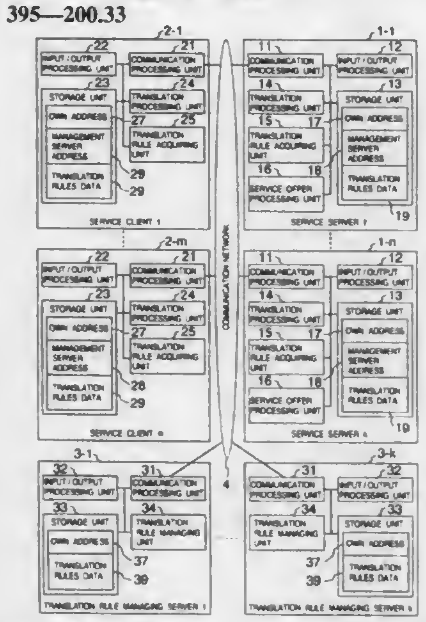
periodically sending selected ones of the instructions and data of the first processor element for storing in the memory element of the second processor element at locations corresponding to location of the first memory element.

5,751,956
METHOD AND APPARATUS FOR REDIRECTION OF SERVER EXTERNAL HYPER-LINK REFERENCES
Steven T. Kirsch, Los Altos, Calif., assignor to Infoseek Corporation, Sunnyvale, Calif.
Filed Feb. 21, 1996, Ser. No. 604,468
Int. Cl.⁶ H04Q *9/00*
U.S. Cl. 395—200.33 **18 Claims**



1. A method of providing for the server based controlled management and tracking of a client reference to a resource locator independently selected by a client computer system and referencing a server external resource, said method comprising the steps of:
- a) providing to a client system a predetermined URL referencing a first server system, said predetermined URL being encoded with predetermined redirection and accounting data including a reference to a second server system;
- b) receiving by said first server system said predetermined URL from said client system;
- c) decoding by said first server system said predetermined redirection and accounting data from said predetermined URL; and
- d) processing by said first server system said predetermined redirection and accounting data including providing said client system with a redirection message including said reference to said second server system.

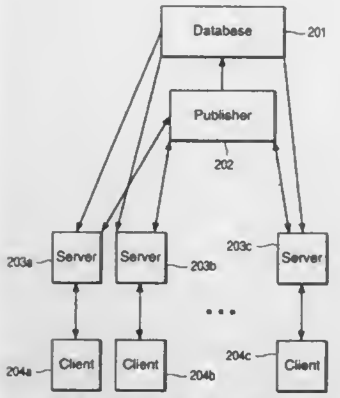
5,751,957
COMMUNICATION SERVICE SYSTEM EMPLOYING TRANSLATION RULES FOR COMMUNICATING DATA IN DIFFERENT LANGUAGES ALONG A NETWORK
Masaaki Hiroya, and Koichi Sano, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 10, 1996, Ser. No. 709,866
Claims priority, application Japan, Sep. 12, 1995, 7-233689
Int. Cl.⁶ G06F *17/28*
U.S. Cl. 395—200.33 **21 Claims**



1. A multi-language compatible service offering/receiving system comprising:
a first information processing apparatus for offering services;
a second information processing apparatus for receiving said services; and
a third information processing apparatus for managing translation rules for translating information expressing forms,
wherein said first, second and third information processing apparatuses are interconnected via a communication network,
wherein said first information processing apparatus and said second information processing apparatus each comprises:
communication means for performing communication with the other information processing apparatus via said communication network,
storage means for storing data,
translation means for effecting translation of the information expressing forms in accordance with said translation rules, and
translation rule acquiring means for acquiring said translation rules from said third information processing apparatus,
wherein said third information processing apparatus comprises:
communication means for performing communication with said first and second information processing apparatuses via said communication network,
storage means for storing said translation rules, and
transfer means for transferring said translation rules in response to a request issued from said first or said second information processing apparatus,
wherein said translation rules include a set of rules stipulating corresponding relationships between words of an intermediate expression having a meaning common to a plurality of languages and words of a specific language, and a set of rules stipulating corresponding relationships between scale units of said intermediate expression and scale units translated into values accompanied by specific scale units, serving as standards for units such as length, weight, or currency and specific scale units, and
wherein, when sending out said data onto said communication network, said translating means translates words of a specific language contained in said data into words of said intermediate expression and translates the values accompanied by the specific scale units into the scale units of said intermediate expression by making use of said translation rules, while upon reception of the data from said communication network, said translating means translates the words of the intermediate expression contained in said data as received into the words of the specific language and translates the scale units of said intermediate expression into values accompanied by the specific scale units.

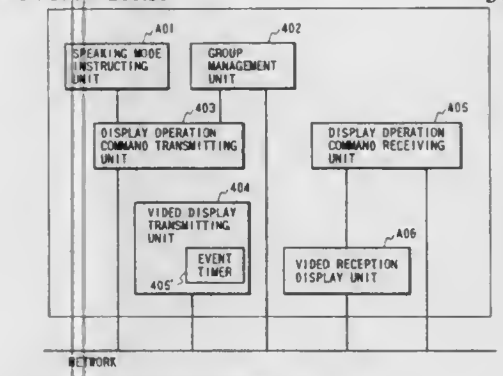
5,751,958
ALLOWING INCONSISTENCY IN A DISTRIBUTED CLIENT-SERVER APPLICATION
Monte Zweben, San Francisco; Michael J. Deale, Sunnyvale; Mark A. Vershel, Palo Alto, and Christophe E. Pettus, San Francisco, all of Calif., assignors to PeopleSoft, Inc., Pleasanton, Calif.
Filed Jun. 30, 1995, Ser. No. 497,506
Int. Cl.⁶ H04L *12/00*
U.S. Cl. 395—200.34 **20 Claims**

1. A system for enabling multiple users to simultaneously access and change the contents of a database, comprising:
means for storing a master copy of the database;
means for storing a plurality of working copies of one or more datasets of the database;



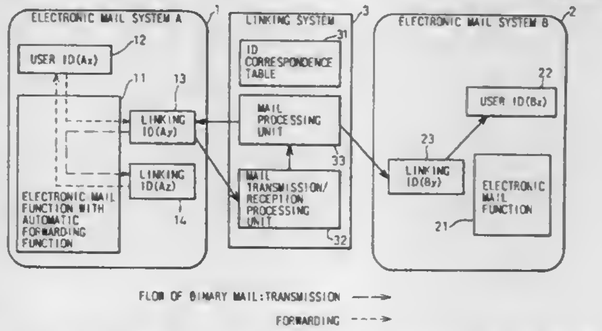
means for allowing a corresponding one of the users to access and manipulate the contents of each of two or more of the working copies so that the contents of the two or more working copies can be revised;
means for enabling at least one user of the two or more working copies to publish revisions made to a working copy by the at least one user;
means for updating the contents of the master copy of the database with the published revisions;
means for presenting to each user of a working copy of a dataset that is affected by the revisions the option to accept or reject the inclusion of the revisions in that working copy;
means for updating the working copy of each dataset with accepted published revisions that affect that dataset; and
means for preventing each user that has rejected the inclusion of revisions in the user's working copy of a dataset from publishing revisions.

5,751,959
COMMUNICATION TERMINAL, SUPERVISORY SYSTEM AND COMMUNICATION METHOD
Hiroaki Sato, Kawasaki, and Hiroshi Okazaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1996, Ser. No. 634,631
Claims priority, application Japan, Apr. 20, 1995, 7-095197
Int. Cl.⁶ G06F *17/00*
U.S. Cl. 395—200.35 **34 Claims**


401
SPEAKING MODE INSTRUCTING UNIT
402
GROUP MANAGEMENT UNIT
403
DISPLAY OPERATION COMMAND TRANSMITTING UNIT
405
DISPLAY OPERATION COMMAND RECEIVING UNIT
404
VIDEO DISPLAY TRANSMITTING UNIT
EVENT TIMER
405'
406
VIDEO RECEPTION DISPLAY UNIT
NETWORK

1. A communication apparatus comprising:
input means for inputting a video signal;
discriminating means for discriminating that a video represented by the video signal is not active for a predetermined time; and
control means for causing an icon to be displayed in place of the video signal input by said input means in accordance with a discrimination by said discriminating means.

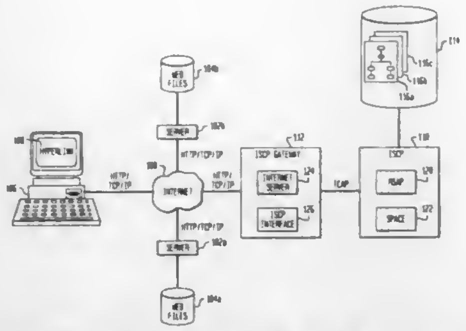
5,751,960
ELECTRONIC MAIL SYSTEM USING DOUBLE FORWARDING SUPPRESSING FUNCTION FOR ADMINISTRATING ELECTRONIC MESSAGE THAT HAVING DATA FORMAT THAT CAN NOT BE HANDLED AT DESTINATION SIDE
Ryotaro Matsunaga, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 8, 1994, Ser. No. 301,399
Claims priority, application Japan, Dec. 3, 1993, 5-339435
Int. Cl.⁶ G06F *13/00*
U.S. Cl. 395—200.36 **13 Claims**



1. A method for administrating electronic messages in linking an electronic mail systems, comprising:
a linking system,
an electronic mail system which is a forwarding side having a double forwarding-suppressing function connected to said linking system,
and an electronic mail system which is the destination to which the mail message to be forwarded, and in which linking ID means controlled by the linking system are set in each of the electronic mail systems, and wherein an electronic mail message forwarded to the linking ID means from the user ID means of the electronic mail system of the forwarding side, is forwarded to a linking ID means of opposite electronic mail system of the destination to which the message to be forwarded, through the linking system, wherein at least two linking ID means are arranged at least in the electronic mail system of the forwarding side and when it is judged that the electronic mail message forwarded from electronic mail system of the forwarded side has a data format that cannot be handled by the electronic mail system of the destination side to which the message to be forwarded, the linking system of the forwarding side transmits the electronic mail message forwarded to a first linking ID means provided in the electronic mail system of the forwarding side to a second linking ID means provided in the same electronic mail system, and transmits again the electronic mail message from the second linking ID means to the user ID means of the same electronic mail system.

5,751,961
INTEGRATED INTERNET SYSTEM FOR TRANSLATING LOGICAL ADDRESSES OF INTERNET DOCUMENTS TO PHYSICAL ADDRESSES USING INTEGRATED SERVICE CONTROL POINT
Darek Andrew Smyk, Piscataway, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.
Filed Jan. 31, 1996, Ser. No. 594,749
Int. Cl.⁶ G06F *13/00*
U.S. Cl. 395—200.47 **9 Claims**

1. An integrated Internet system, comprising:
one or more Internet documents having one or more logical addresses;
means for displaying said one or more Internet documents;



means, responsive to selections of said one or more logical addresses, for sending requests to an Integrated Service Control Point ("ISCP");

said ISCP including means to translate said one or more logical addresses to one or more physical addresses; and

means for returning said one or more physical addresses to said display means.

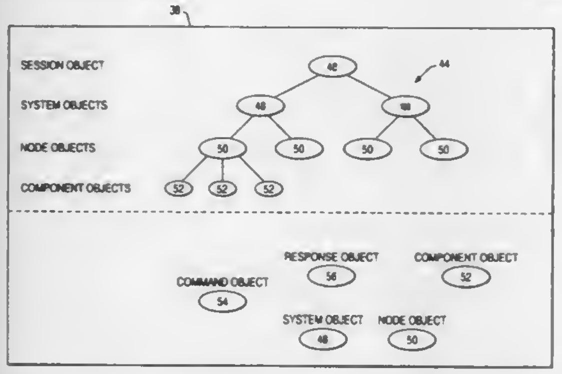
5,751,962
OBJECT-BASED SYSTEMS MANAGEMENT OF COMPUTER NETWORKS

Stephen Reid Fanshier; My Tien Pare, both of San Diego; Anthony Bautista Nacional, Oceanside, and Steven Lynn Klekas, Poway, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 13, 1995, Ser. No. 572,251

Int. Cl.⁶ G06F *15/16*

U.S. Cl. 395—200.53 **51 Claims**



1. A systems administration apparatus for a computer network, comprising:

(a) a computer having a memory, the computer being connected to a network;

(b) an object-based representation of the network stored in the memory of the computer, wherein the object-based representation comprises one or more objects linked together in the memory to form a hierarchy, wherein each of the objects represents the network, one or more nodes within the network, or one or more components executed by each of the nodes within the network, and wherein each of the objects stores systems management information about the network, node, or component; and

(c) systems management means, performed by the computer, for generating command objects that target any of the objects in the hierarchy, wherein the command objects describe a systems administrative request for the associated network, node, and component, and the systems administrative request is transmitted to the associated network, node, and component when the command object is sent to the targeted object.

5,751,963
HIERARCHICAL NETWORK MANAGEMENT SYSTEM OPERATING AS A PROXY AGENT FOR ENHANCING PROCESSING EFFICIENCY

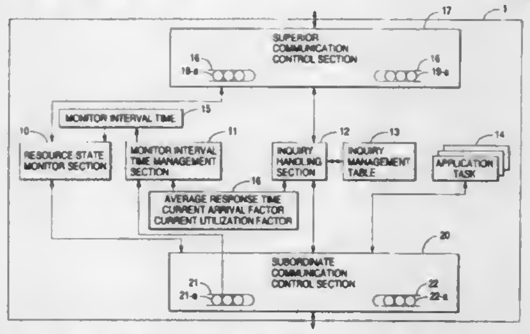
Minoru Umetsu, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1996, Ser. No. 730,795

Claims priority, application Japan, Mar. 29, 1996, 8-076886

Int. Cl.⁶ G06F *11/30*

U.S. Cl. 395—200.53 **6 Claims**


17
1
SUPERIOR COMMUNICATION CONTROL SECTION
16
19-a
15
MONITOR INTERVAL TIME
10
11
12
13
14
RESOURCE STATE MONITOR SECTION
MONITOR INTERVAL TIME MANAGEMENT SECTION
INQUIRY HANDLING SECTION
INQUIRY MANAGEMENT TABLE
APPLICATION TASK
16
AVERAGE RESPONSE TIME
CURRENT ARRIVAL FACTOR
CURRENT UTILIZATION FACTOR
20
SUBORDINATE COMMUNICATION CONTROL SECTION
21
21-a
22
22-a

1. A network management apparatus operating as a proxy agent in a network management system including a plurality of manager nodes and a proxy agent node for managing resources in a plurality of networks, said network management apparatus comprising:

resource state monitor means for accessing network resources periodically in cycles corresponding to a monitor interval time to monitor the network resources for a state of fault or change;

means for determining a current utilization factor based on an arrival factor of accessing the network resources and an average response time to access the network resources;

means for determining a length of a transmission queue for accessing the network resources, and

automatic monitor interval time change means for calculating and automatically adjusting the monitor interval time based on the current utilization factor and the determined length of the transmission queue, wherein the monitor interval time will not cause a reduction in essential application communication performance.

5,751,964
SYSTEM AND METHOD FOR AUTOMATIC DETERMINATION OF THRESHOLDS IN NETWORK MANAGEMENT

Zvonimir Ordanic, Raleigh, and David John Spitz, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1995, Ser. No. 526,829

Int. Cl.⁶ G06F *11/30*

U.S. Cl. 395—200.54 **14 Claims**

1. A method for automatically determining and adaptively updating thresholds without user intervention in a communications network including a network management station running a network management application and having at least one processor, said network containing a plurality of network nodes, said method comprising the steps of:

selecting at least one variable for each of said plurality of network nodes that is to have a threshold value determined automatically and adaptively updated;

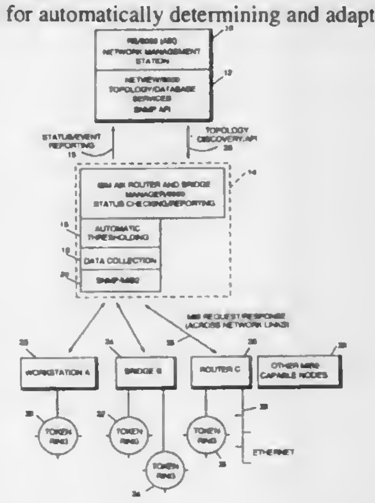
receiving a plurality of data sample values for said at least one variable that is to have said threshold value determined automatically;

accumulating based on each data sample value received, a first sum of each data sample value received and a second sum of the square of each data sample value received and then discarding said each data sample received;

determining a mean value and a standard deviation for said at least one variable based on said first sum, said second sum and a total number of data sample values received;

setting at least one threshold value for said at least one variable by scaling said standard deviation by a threshold factor and adding the result to said mean value; and

graphically displaying a meter depicting said data sample value received and said at least one threshold value.


NETWORK MANAGEMENT STATION
TOPOLOGY/DATABASE SERVICES
SNMP API
STATUS/EVENT REPORTING
TOPOLOGY DISCOVERY/API
IBM AIX ROUTER AND BRIDGE MANAGER/6000
STATUS CHECKING/REPORTING
AUTOMATIC THRESHOLDING
DATA COLLECTION
SNMP MIBS
MIB REQUEST/RESPONSE (ACROSS NETWORK LINKS)
WORKSTATION A
BRIDGE B
ROUTER C
OTHER MIBII CAPABLE NODES
TOKEN RING
ETHERNET

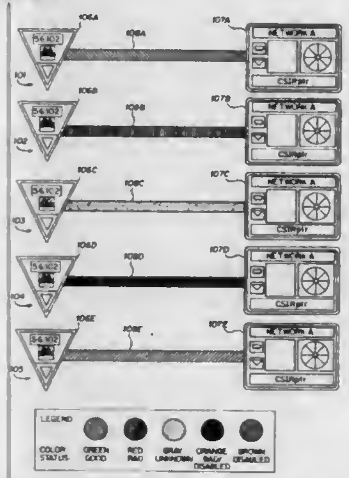
5,751,965
NETWORK CONNECTION STATUS MONITOR AND DISPLAY

Gregory E. Mayo, Salem; Roger G. Desroches, Dover, and David N. Nedde, Durham, all of N.H., assignors to Cabletron System, Inc., Rochester, N.H.

Filed Mar. 21, 1996, Ser. No. 619,012

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—200.54 **28 Claims**



1. A method for resolving a condition of a connection within a communications network to a user, comprising the steps of:

(a) determining a condition of a first interface element of the network;

(b) determining a condition of a second interface element of the network, the first and second interface elements sharing the connection within the network;

(c) combining the conditions of the first and second interface elements to determine the condition of the connection from a predetermined plurality of connection conditions the predetermined plurality of connection conditions including a disabled/bad condition indicative that the connection would not be operable even if a disabled one of the first and second interface elements were to be enabled; and

(d) displaying a representation of the condition of the connection to the user.

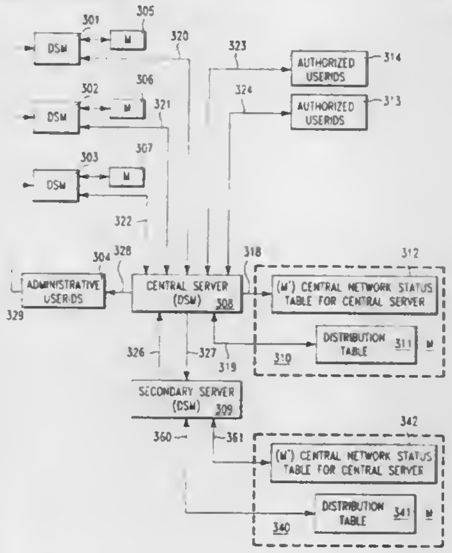
5,751,966
NOTIFICATION OF DISCONNECTED SERVICE MACHINES THAT HAVE STOPPED RUNNING

Norman Joseph Dauerer, Hopewell Junction, and Edward Emile Kelley, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 8,017, Jan. 22, 1993, Pat. No. 5,640,513. This application Mar. 3, 1997, Ser. No. 810,703

Int. Cl.⁶ G06F *11/30*

U.S. Cl. 395—200.54 **14 Claims**



1. A computer system including,

a central service machine connected to a network of disconnected-but-running service machines,

said disconnected-but-running service machines process data after said data have been delivered thereto and process data which is resident therein independently of control by said central service machine said disconnected-but-running service machines provide background data processing functions,

each service machine sending a status message to said central service machine periodically,

means for monitoring of said network of disconnected service machines by said central service machine to determine those background data processing functions that have stopped running but remain disconnected, and

means for providing notification from said central service machine as to which service machines which have a background data processing function which has stopped running in a service machine which remains disconnected.

5,751,967
METHOD AND APPARATUS FOR AUTOMATICALLY CONFIGURING A NETWORK DEVICE TO SUPPORT A VIRTUAL NETWORK

Ilan Raab, Sunnyvale; Ravi Manghirmalani, Fremont; Ofer Doitel, Saratoga, and Lynne Marie Izbicki, Cupertino, all of Calif., assignors to Bay Networks Group, Inc., Santa Clara, Calif.

Continuation of Ser. No. 280,275, Jul. 25, 1994, abandoned. This application Jul. 15, 1996, Ser. No. 680,113

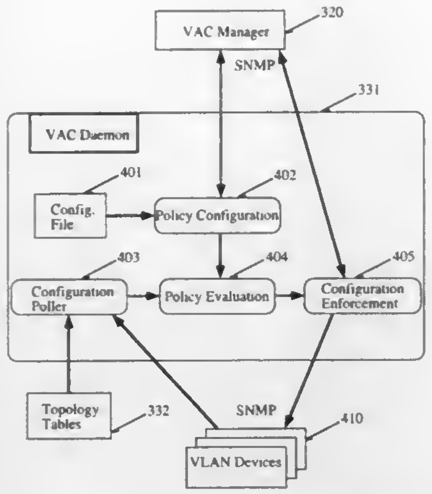
Int. Cl.⁶ G06F *15/177;15/173*

U.S. Cl. 395—200.58 **61 Claims**

1. A physical networking system including a plurality of end-stations said physical networking system comprising:

a. at least one switching device adapted to support a virtual network;

b. at least one end-station interconnected with said at least one switching device, wherein said at least one switching device and said end-station are interconnected in a first topology; and



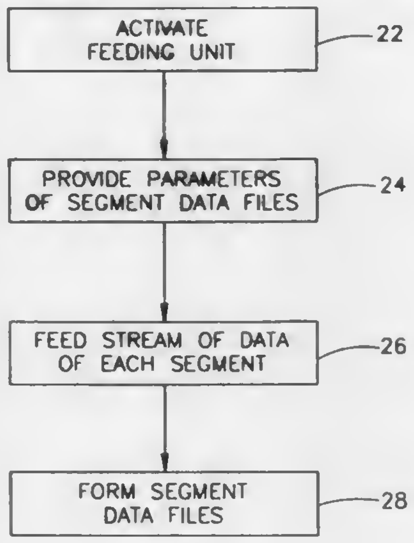
- c. a configuration device, said configuration device including:
  - i. a configuration modification detection circuit to detect the modification of said first topology;
  - ii. a configuration policy maintenance circuit to store a policy defining said virtual network as including a logical subgroup of said plurality of end stations according to a predetermined logical criteria
  - iii. a policy evaluation circuit to determine a manner in which to reconfigure said at least one switching device to implement said virtual network upon said detection of said modification of said first topology, said manner being determined in accordance with said policy; and
  - iv. a reconfiguration circuit automatically to reconfigure said at least one switching device in said manner.

5,751,968

SYSTEM AND METHOD FOR DISTRIBUTING MULTI-MEDIA PRESENTATIONS IN A COMPUTER NETWORK

Alon Cohen, Rishon LeZion, Israel, assignor to VocalTec Ltd., Herzlia, Israel

Filed May 9, 1996, Ser. No. 647,072
Claims priority, application Israel, Sep. 12, 1995, 115263
Int. Cl.^{6} G06F *3/14;13/38;15/16*
U.S. Cl. 395—200.61 **12 Claims**


ACTIVATE FEEDING UNIT
22
PROVIDE PARAMETERS OF SEGMENT DATA FILES
24
FEED STREAM OF DATA OF EACH SEGMENT
26
FORM SEGMENT DATA FILES
28

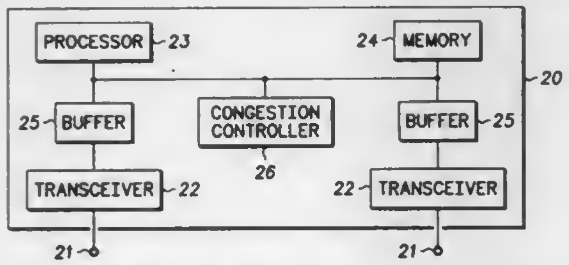
1. A method for distributing a multi-media presentation in a computer network comprising:
- a. feeding at least one site of said computer network with a stream of data of said presentation;
- b. forming, in each site a plurality of data files, each data file including a segment of said multi-media presentation;
- c. distributing said plurality of data files to at least one display;
- d. displaying said distributed data files; and
- e. selecting a time lag between said steps of feeding and forming and said steps of distributing and displaying, said time lag determines whether said displaying is substantially a real time display or a delayed display.

5,751,969

APPARATUS AND METHODS FOR PREDICTING AND MANAGING CONGESTION IN A NETWORK

Vijay Kapoor, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1995, Ser. No. 566,626
Int. Cl.^{6} G06F *13/00;* **H04L** *12/56*
U.S. Cl. 395—200.65 **14 Claims**



1. A method for managing traffic congestion in a network, the network comprising a plurality of nodes including a source node, intermediary nodes and a destination node, the method comprising the steps of:
- a) predicting in each of the nodes whether congestion is imminent; and
- b) determining how many data packets the source node can send to the destination node when congestion is imminent by determining a credit value, determining whether the credit value is less than or equal to available buffer space in the destination node, sending a message to the source node indicating that the source node can send a number of data packets equivalent to the credit value if the credit value is less than or equal to the available buffer space in the destination node, and sending the message to the source node indicating that the source node can send the number of data packets equivalent to the available buffer space in the destination node when the credit value is greater than the available buffer space in the destination node.

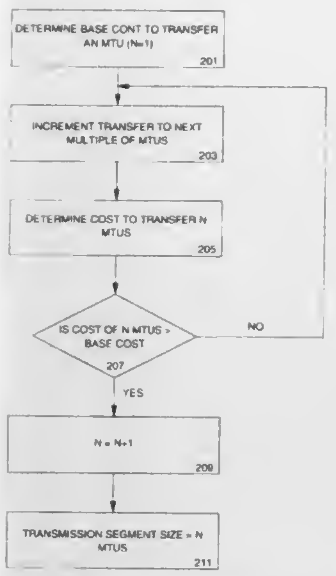
5,751,970

METHOD FOR DETERMINING AN OPTIMAL SEGMENTATION SIZE FOR FILE TRANSMISSION IN A COMMUNICATIONS SYSTEM

Redha Mohammed Bournas, Chapel Hill, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 8, 1996, Ser. No. 689,473
Int. Cl.^{6} G06F *13/42*
U.S. Cl. 395—200.66 **4 Claims**

1. In a host data processing system including a file transfer protocol handler, a transmission control protocol handler, an internetwork protocol handler and a system input/output for connecting the system to a remote user by a communication network having a predetermined Maximum Transmission Unit (MTU) size and a given probability y of a successful MTU transmission, a method for determining and selecting an integer multiple n of the MTU which yields an optimum transmission segment size comprising the steps:
- determining a base cost to transfer transmission segments equal in size to the MTU;
- determining and comparing in sequence the cost to transfer transmission segments equal in size to n.MTU where n is an integer greater than 1 and is incremented by 1 for each sequential comparison to the said base cost;
- discontinuing the said sequential determination and comparison when a comparison indicates that the base cost is exceeded by the current sequential cost; and,
- decreasing the last value of n by 1 and selecting the transmission segment size at the value (n−1).MTU.

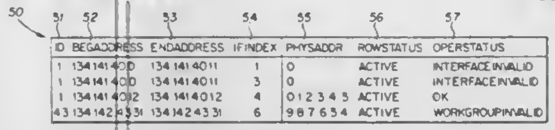

DETERMINE BASE CONT TO TRANSFER AN MTU (N=1)
201
INCREMENT TRANSFER TO NEXT MULTIPLE OF MTUS
203
DETERMINE COST TO TRANSFER N MTUS
205
IS COST OF N MTUS > BASE COST
207
NO
YES
N = N+1
209
TRANSMISSION SEGMENT SIZE = N MTUS
211

5,751,971

INTERNET PROTOCOL (IP) WORK GROUP ROUTING

Kurt A. Dobbins, Bedford; David L. Cullerot, Manchester; Stephen H. Negus, Windham, all of N.H., and William T. Haggerty, Dunstable, Mass., assignors to Cabletron Systems, Inc., Rochester, N.H.

Filed Jul. 12, 1995, Ser. No. 501,324
Int. Cl.^{6} G06F *15/16*
U.S. Cl. 395—200.68 **31 Claims**


50
51
52
53
54
55
56
57

ID	BEGADDRESS	ENDADDRESS	IFINDEX	PHYSADDR	ROWSTATUS	OPERSTATUS
1	134 141 40 0	134 141 40 11	1	0	ACTIVE	INTERFACEINVALID
1	134 141 40 0	134 141 40 11	3	0	ACTIVE	INTERFACEINVALID
1	134 141 40 12	134 141 40 12	4	0 1 2 3 4 5	ACTIVE	OK
43	134 142 43 31	134 142 43 31	6	9 8 7 6 5 4	ACTIVE	WORKGROUPINVALID

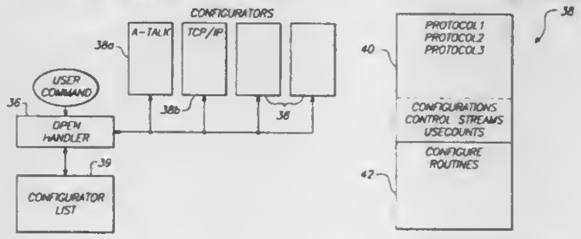
1. A method of routing datagrams from a source to a destination in an IP communications network including routers having multiple router interfaces connecting multiple physical networks, wherein the routers forward IP datagrams based upon IP addresses, the method comprising the steps of:
- defining an IP work group by assigning multiple router interfaces connecting a given router to multiple host networks, a single IP work group address,
- forwarding IP datagrams through the routers based on the IP work group address; and
- assigning a security level to the IP work group by identifying hosts as "free" in order to permit forwarding to/from any interface in the group or "secured" in order to permit forwarding to/from a designated interface in the group
- wherein four levels of security are provided:
  - in a "low" security work group, a host with any physical address is free to reside on any interface in the group as long as its IP address does not lie within a specified host address range, but if it does fall in the rangers then it must reside on a designated interface for that range;
  - in a "medium" security work group, a host's IP address must fall within a specified host address range for a designated interface, but unless a physical address is also specified, the physical address is not constrained;
  - in a "high" security work group, a host must have a specified host IP address for a designated interface and have a designated physical address; and
  - in a "none" security work group, a host are is free.

5,751,972

SYSTEM FOR RUN-TIME CONFIGURATION OF NETWORK DATA TRANSFER PATHS

Michael Quinn, Campbell, and Michael B. Shoemaker, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 28, 1995, Ser. No. 412,154
Int. Cl.^{6} G06F *9/00;13/00*
U.S. Cl. 395—200.1 **18 Claims**



15. A method for constructing network communication data paths, comprising the steps of:
- storing a plurality of configurator code modules, wherein each configurator module contains information pertaining to the configuration of communications protocols that are associated with respective network architectures;
- receiving a command to construct a data path in accordance with a specified protocol;
- identifying a first one of said configurator modules that is associated with the specified protocol;
- configuring a first control stream, containing a first function module, with said first configurator module;
- identifying a second configurator module that is associated with said first function module;
- configuring a second control stream, containing a second function module, with said second configurator module; constructing said second control stream with said second configurator module; and
- constructing said first control stream, which contains the second control stream and said first function module, with said first configurator module.

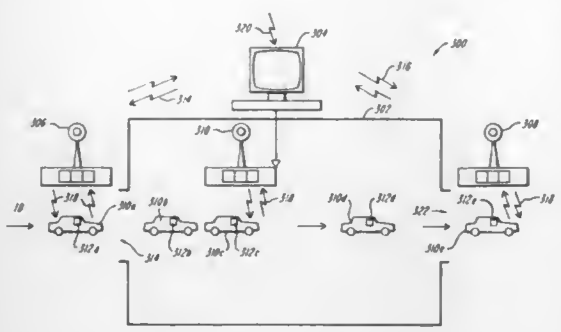
5,751,973

ELECTRONIC PARKING AND DISPATCHING MANAGEMENT METHOD AND APPARATUS

John J. Hassett, Marblehead, Mass., assignor to AT/COMM Incorporated, Marblehead, Mass.

Continuation-in-part of Ser. No. 901,278, Jun. 19, 1992, which is a continuation-in-part of Ser. No. 525,103, May 17, 1990, Pat. No. 5,144,553. This application Sep. 16, 1992, Ser. No. 945,523
Int. Cl.^{6} G06F *13/00*
U.S. Cl. 395—213 **15 Claims**

1. A system for monitoring and managing vehicle access to a restricted access area comprising,
- a base transceiver including means for repeatedly transmitting radio frequency signals toward vehicles utilizing said area, said signals including information signals including a current date and time, and a fee rate schedule,
- a plurality of vehicle transponders, each of said transponders having an associated identification code and being located in a vehicle requiring access to said restricted access area, each of said vehicle transponders including a vehicle data processor, a vehicle memory, a vehicle transceiver, and means for intercoupling said data processor, said memory and said vehicle transceiver so that said information signals transmitted from



said base transceiver can be received, and processed in said vehicle data processor and at least a subset of said information signals can be stored in said vehicle memory in at least one of, received and processed form, said vehicle memory including means for storing a parking credits signal representative of a monetary quantity available for paying any fees associated with entering into and remaining in said restricted access area, and

said vehicle data processor including, means for tracking an elapsed time that said vehicle is within said restricted access area, said time being in relation to said current date and time received from said base transceiver, means for calculating a usage fee based on said fee rate schedule and said elapsed time and for periodically debiting said parking credits signal to reflect said fee,

said vehicle transceiver including means for transmitting an information signal to said base transceiver including a signal representing said transponder identification code, and

independent data processor means coupled to said base transceiver for two-way communication with said base transceiver.

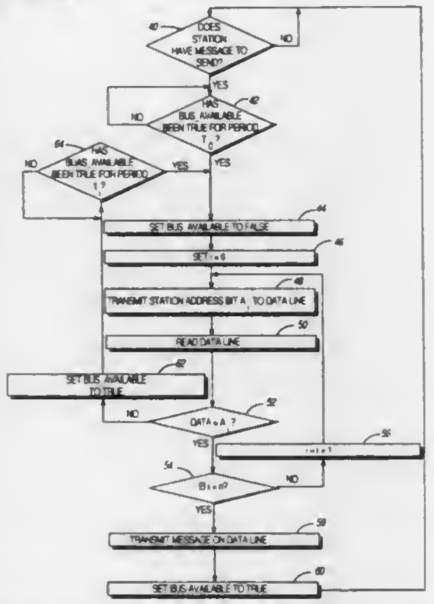
5,751,974
CONTENTION RESOLUTION FOR A SHARED ACCESS BUS

Steven R. Blackwell, Huntsville; Charles E. Polk, Athens, and Jason N. Morgan, Madison, all of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 278,293, Jul. 21, 1994, abandoned. This application Mar. 27, 1997, Ser. No. 827,123

Int. Cl.^{6} H04J *6/00*

U.S. Cl. 395—301 **7 Claims**


DOES STATION HAVE MESSAGE TO SEND?
NO
YES
HAS BUS AVAILABLE BEEN TRUE FOR PERIOD T?
HAS BUS AVAILABLE BEEN TRUE FOR PERIOD T?
SET BUS AVAILABLE TO FALSE
TRANSMIT STATION ADDRESS BIT A TO DATA LINE
READ DATA LINE
SET BUS AVAILABLE TO TRUE
DATA = A ?
TRANSMIT MESSAGE ON DATA LINE
SET BUS AVAILABLE TO TRUE
40
42
44
46
48
50
52
54
56
58
60
62
64

1. In an arrangement of a plurality of stations coupled to a data bus and having access to one or more address lines, each station having a unique station address, a method of resolving contention for access to the data bus between two or more stations desiring access to the data bus, the method comprising:

transmitting on the address line(s) the station addresses of the stations desiring access to the data bus;

reading the address on the address line(s);

comparing the address on the address line(s) with the station addresses of the stations desiring access to the data bus; and

enabling the station with the station address that matches the address on the address line(s) to access the data bus.

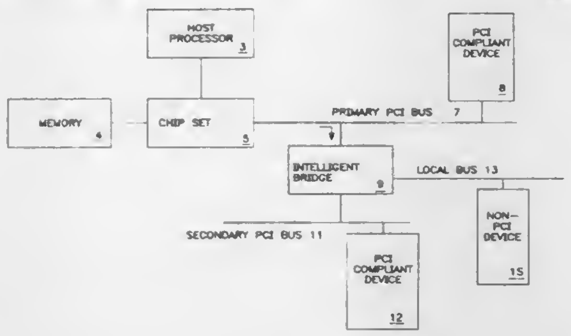
5,751,975
METHOD AND APPARATUS FOR INTERFACING A DEVICE COMPLIANT TO A FIRST BUS PROTOCOL TO AN EXTERNAL BUS HAVING A SECOND BUS PROTOCOL AND FOR PROVIDING VIRTUAL FUNCTIONS THROUGH A MULTI-FUNCTION INTELLIGENT BRIDGE

Byron Gillespie, Phoenix; Marc Goldschmidt, Tempe; Terry Sych, Gilbert, all of Ariz., and Bruce Young, Tigard, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 28, 1995, Ser. No. 580,130

Int. Cl.^{6} G06F *13/00;13/10*

U.S. Cl. 395—306 **11 Claims**



1. An intelligent I/O circuit for interfacing a device adapted to operate with a first bus protocol to an external bus having a second bus protocol, said intelligent I/O circuit having a plurality of configuration registers for storing configuration information, said intelligent I/O circuit comprising:

a) a local processor bus having the first bus protocol;

b) a memory controller, coupled to the local processor bus, for controlling access to a local memory; said local memory including

first program means for translating a second bus protocol configuration cycle into a first bus protocol configuration cycle and, said first bus protocol configuration cycles understandable by the device;

second program means for providing appropriate handshake signals to the external bus;

third program means for verifying that the plurality of configuration registers have been modified by the external agent in accordance with a predetermined hardware map, said map defined by the second bus protocol, and for restoring those registers that have been modified in violation of the hardware map, said predetermined hardware map specifying non-writable bits in the intelligent I/O circuit;

c) a local processor, coupled to the local processor bus, for executing program instructions; and

d) an address translation unit for coupling the external bus to the local processor bus and for providing an interface between the external bus and the local processor bus.

5,751,976
BUS SYSTEM FOR USE WITH INFORMATION PROCESSING APPARATUS

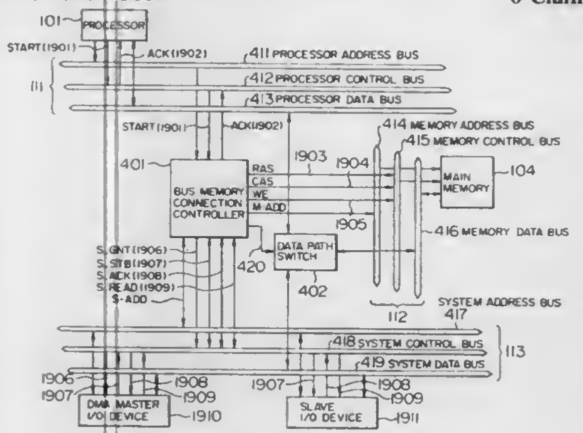
Koichi Okazawa, Tokyo; Koichi Kimura; Hitoshi Kawaguchi, both of Yokohama; Ichiharu Aburano, Hitachi; Kazushi Kobayashi, Ebina, and Tetsuya Mochida, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 449,088, May 24, 1995, Pat. No. 5,668,956, which is a continuation of Ser. No. 311,893, Sep. 26, 1994, Pat. No. 5,483,642, which is a continuation of Ser. No. 705,701, May 23, 1991, abandoned. This application Feb. 15, 1996, Ser. No. 601,993

Claims priority, application Japan, Jun. 4, 1990, 2-144301; May 10, 1991, 3-105536

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—306 **6 Claims**



1. A data processing system comprising:

a processor;

a processor bus coupled to said processor, said processor bus comprising a data bus, an address bus and a control bus;

a main memory;

a memory bus coupled to said main memory, said memory bus comprising a data bus, an address bus and a control bus;

a device;

a system bus coupled to said device, said system bus comprising a data bus, an address bus and a control bus; and

a three-way connection controller coupled to said processor bus, said memory bus and said system bus, said three-way controller controlling data transfer among said processor, said main memory and said device, and for executing arbitration control by outputting a grant signal via a grant line granting said bus mastership of said system bus to said device,

wherein said three-way connection controller controls

said data bus of said system bus to selectively inhibit latching of data on said system bus of first data being latched for transfer on said processor bus and said memory bus during transferring of said first data between said processor and said main memory,

said data bus of said processor bus to selectively inhibit latching of data on said processor bus of second data being latched for transfer on said memory bus and said system bus during transferring of said second data between said memory and said device, and

said data bus of said memory bus to selectively inhibit latching of data on said memory bus of third data being latched for transfer on said processor bus and said system bus during transferring of said third data between said processor and said device.

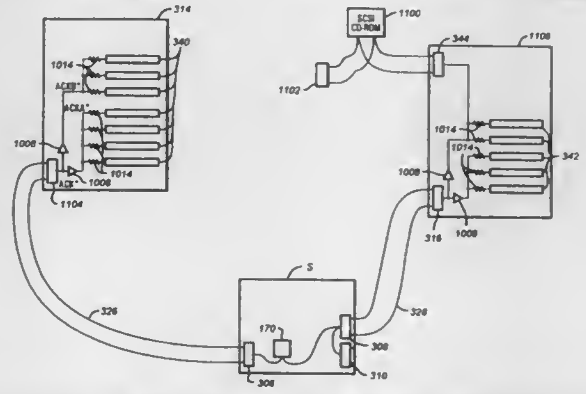
5,751,977
WIDE SCSI BUS CONTROLLER WITH BUFFERED ACKNOWLEDGE SIGNAL

Dennis J. Alexander, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 366,872, Dec. 30, 1994, abandoned. This application Oct. 7, 1996, Ser. No. 726,549

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—306 **32 Claims**



1. SCSI controller circuitry for controlling a wide SCSI device on a wide SCSI bus such as defined by the SCSI-2 specification working draft revision 10 L, the wide SCSI bus including an ACK* line, comprising:

circuitry for providing and receiving signals used on the wide SCSI bus, said circuitry providing a SCSI acknowledge signal; and

a fast buffer with an input and an output, said input receiving said SCSI acknowledge signal from said circuitry, said buffer providing a buffered SCSI ACK* signal to the ACK* line of the wide SCSI bus, and said fast buffer sourcing and sinking more than 55 milliamps into a capacitive load, wherein said fast buffer is of a non-saturating analog design, whereby said buffered SCSI ACK* signal tracks the SCSI acknowledge signal and whereby the slew rate of said buffered SCSI ACK* signal is a close approximation of the slew rate of said SCSI acknowledge signal.

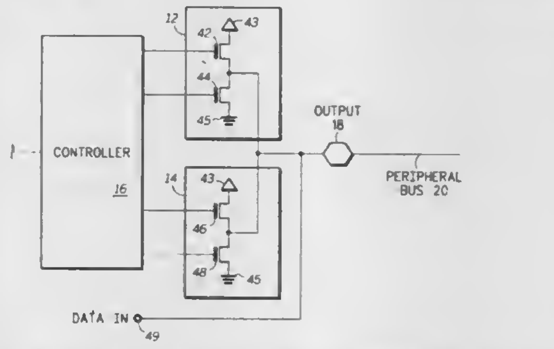
5,751,978
MULTI-PURPOSE PERIPHERAL BUS DRIVER APPARATUS AND METHOD

David R. Tipple, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 13, 1995, Ser. No. 557,401

Int. Cl.^{6} H03K *17/60*

U.S. Cl. 395—309 **21 Claims**



1. An output driver for a bus interface, the output driver comprising:

a first driver circuit, wherein the first driver circuit includes a first transistor operably coupled between a first power supply and an output of the output driver, and wherein the first driver circuit includes a second transistor operably coupled between a second power supply and the output of the output driver, the first driver circuit selectively providing output data to the output of the output driver where the output data has a first current drive;

a second driver circuit, wherein the second driver circuit includes a first transistor operably coupled between the first power supply and the output of the output driver, and wherein the second driver circuit includes a second transistor operably coupled between the second power supply and the output of the output driver the second driver circuit selectively providing output data to the output of the output driver where the output data has a second current drive different from the first current drive; and

a controller operably coupled to the first driver circuit and the second driver circuit, wherein the controller receives control signals and data signals which control the operation of the first driver circuit and the second driver circuit so that one of either the first driver circuit or the second driver circuit is enabled to provide the output data, wherein the controller includes circuitry for mutually exclusively enabling the first driver circuit and the second driver circuit.

5,751,979

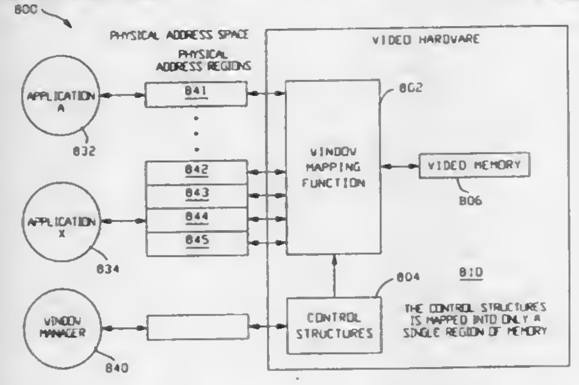
VIDEO HARDWARE FOR PROTECTED, MULTIPROCESSING SYSTEMS

Duane J. McCrory, Malvern, Pa., assignor to Unisys Corporation, Blue Bell, Pa.

Filed May 31, 1995, Ser. No. 454,849

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—343 **19 Claims**



1. A video controller in a protected, multiprocessing system comprising:

a) video memory for storing pixel information representing a plurality of application windows defined by a plurality of application programs to be displayed on a video monitor;

b) a control structure for storing priority, size and position information for a plurality of logical windows;

c) said logical windows corresponding to said application windows stored in said video memory,

d) said plurality of logical windows being defined by addresses in, and not contents of, separate physical address regions; and

e) window mapping hardware logic connected to said control structure for receiving video memory access requests from said plurality of application programs, comprising:

f) means for detecting logical window physical addresses in said video memory access request,

g) means for identifying the logical window to which said logical window physical addresses belong,

h) means for identifying the corresponding application window being accessed,

i) means for completing the allowable portions of said video memory access request that seeks to access pixels contained within by reference to logical window addresses that correspond to a visible portion of said corresponding application window, and

j) means for ignoring any portion of said video memory access request that seeks to access pixels by reference to those logical window addresses that do not correspond to a visible portion of said window stored in said video memory as defined by said priority, size and position information in said control structure.

5,751,980

METHOD AND SYSTEM FOR DISPLACING A DIALOGUE BOX

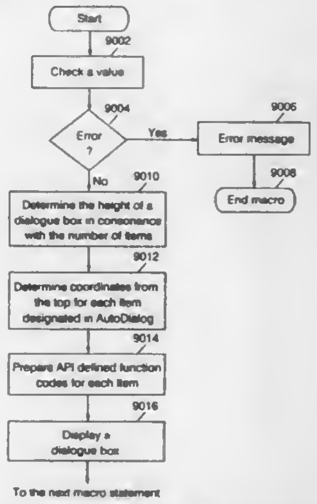
Kazuyuki Musashi, Kanagawa-ken, and Hiroshi Morishima, Yamato, both of Japan, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 24, 1995, Ser. No. 547,638

Claims priority, application Japan, Oct. 25, 1994, 6-258630

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—354 **26 Claims**


Start
9002
Check a value
9004
Error ?
Yes
9006
Error message
9008
End macro
No
9010
Determine the height of a dialogue box in consonance with the number of items
9012
Determine coordinates from the top for each item designated in AutoDialog
9014
Prepare API defined function codes for each item
9016
Display a dialogue box
To the next macro statement

1. A computer implemented dialogue box display method for displaying a dialogue box, which is employed by a user to enter data into a computer, on a screen of a display device that is connected to said computer, comprising the steps of:

(a) designating in order a plurality of items to be displayed in a dialogue box;

(b) offsetting positioning coordinates by a predetermined value in said order in which said plurality of items are designated, and automatically determining position coordinates for each of said plurality of items that are to be displayed in said dialogue box; and, (c) when said positioning coordinates for each of said plurality of items are determined, displaying on said screen a dialogue box in which said plurality of items are positioned at said determined coordinates.

5,751,981

HIGH PERFORMANCE SUPERSCALAR MICROPROCESSOR INCLUDING A SPECULATIVE INSTRUCTION QUEUE FOR BYTE-ALIGNING CISC INSTRUCTIONS STORED IN A VARIABLE BYTE-LENGTH FORMAT

David B. Witt, and William M. Johnson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif. Division of Ser. No. 501,243, Jul. 10, 1995, which is a continuation of Ser. No. 146,382, Oct. 29, 1993, abandoned. This application Feb. 9, 1996, Ser. No. 599,699

Int. Cl.⁶ G06F *9/38*

U.S. Cl. 395—380 **29 Claims**

1. A superscalar complex instruction set computer (CISC) microprocessor having a variable byte length instruction format comprising:

a source of CISC instructions having a variable byte-length instruction format in which the CISC instructions are stored with an inconsistent byte alignment within an instruction memory including CISC instructions that map into reduced instruction set computer (RISC) operations (ROPs), the CISC instructions being integer CISC instructions that map into integer ROPs and floating point instructions that map into floating point ROPs;

a queue coupled to the CISC instruction source for aligning the speculatively fetched CISC instructions into an aligned instruction stream;

an instruction decoder coupled to the speculative instruction queue for mapping aligned CISC instructions into a corresponding sequence of RISC-like operations (ROPs), dispatching a plurality of ROPs per microprocessor cycle and performing a speculative branch prediction operation;

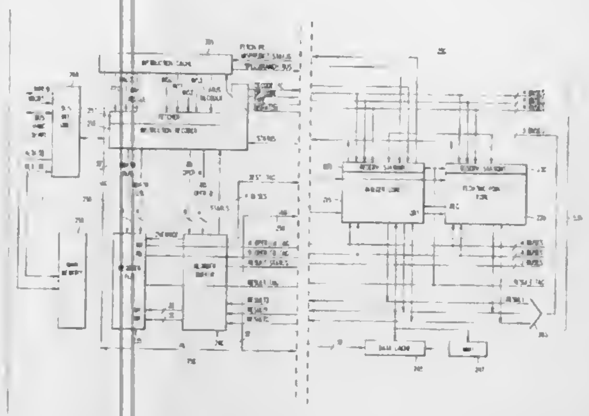
a data processing bus coupled to the instruction decoder for communicating the integer ROPs and floating point ROPs;

an integer functional unit coupled to the data processing bus for receiving the dispatched integer ROPs, executing the integer ROPs and generating speculative results resulting from the integer ROP execution;

an floating point functional unit coupled to the data processing bus for receiving the dispatched floating point ROPs, executing the floating point ROPs and generating speculative results resulting from the floating point ROP execution;

a reorder buffer coupled to the data processing bus for shared use by both the integer functional unit and the floating point functional unit to store speculative results in common storage elements, the common reorder buffer renaming registers, issuing multiple instructions in a single cycle, retiring multiple instructions in a single cycle, and retiring speculative results which become non-speculative results by virtue of being in a correctly predicted branch, the common reorder buffer not retiring speculative results in mispredicted branches; and

a register file, coupled to the reorder buffer and data processing bus, for storing non-speculative results which are retired form the reorder buffer.



5,751,982

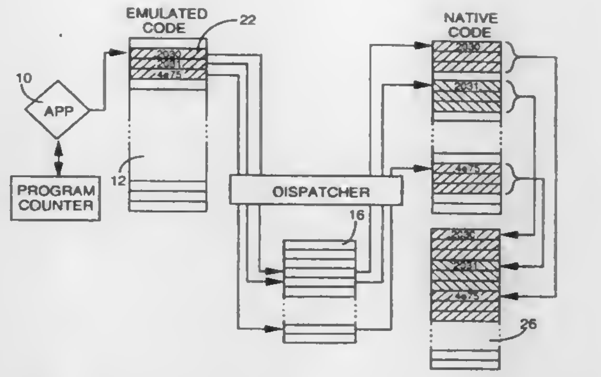
SOFTWARE EMULATION SYSTEM WITH DYNAMIC TRANSLATION OF EMULATED INSTRUCTIONS FOR INCREASED PROCESSING SPEED

John E. Morley, Kapaa, Hi., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 31, 1995, Ser. No. 414,877

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—800 **8 Claims**



1. In a computer having a processor which executes instructions from a first set of instructions, a method for emulating the operation of a different processor which executes a second set of instructions, comprising the steps of:

identifying a sequence of plural instructions in said second set of instructions which are repeatedly called with a predetermined frequency;

translating each of the instructions in said sequence into one or more corresponding instructions in said first set of instructions;

cumulatively storing the corresponding instructions from said translated instructions as a group; and

executing the group of stored instructions when an initial instruction in said sequence is issued during subsequent operation of the computer, wherein each instruction in said second set of instructions has an associated operation code, and further including the steps of assigning an operation code to said group of stored instructions, and substituting said assigned operation code for the operation code associated with said initial instruction.

5,751,983

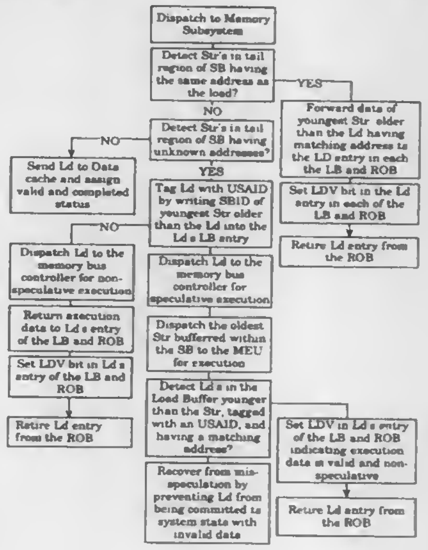
OUT-OF-ORDER PROCESSOR WITH A MEMORY SUBSYSTEM WHICH HANDLES SPECULATIVELY DISPATCHED LOAD OPERATIONS

Jeffrey M. Abramson, 6537 SW. Hoffert Pl., Aloha, Oreg. 97007; David B. Papworth, 20101 SW. Schools Ferry Rd., Beaverton, Oreg. 97007; Haitham H. Akkary, 17840 NW. Anastasia Dr., Portland, Oreg. 97229; Andrew F. Glew, 1038 NE. 21st Ave., No. 24, Hillsboro, Oreg. 97124; Glenn J. Hinton, 6130 NW. 185th Ave.; Kris G. Konigsfeld, 17937 NW. Anastasia Dr., both of Portland, Oreg. 97229, and Paul D. Madland, 7905 SW. Carol Glen Pl., Beaverton, Oreg. 97007

Filed Oct. 3, 1995, Ser. No. 538,594

Int. Cl.⁶ G06F *3/38*

U.S. Cl. 395—392 **26 Claims**


Dispatch to Memory Subsystem
Detect Str's in tail region of SB having the same address as the load?
YES
Forward data of youngest Str older than the Ld having matching address to the LD entry in each the LB and ROB
Set LDV bit in the Ld entry in each of the LB and ROB
Retire Ld entry from the ROB
NO
Detect Str's in tail region of SB having unknown addresses?
NO
Send Ld to Data cache and assign valid and completed status
YES
Tag Ld with USAID by writing SBID of youngest Str older than the Ld into the Ld's LB entry
NO
Dispatch Ld to the memory bus controller for non-speculative execution
Return execution data to Ld's entry of the LB and ROB
Set LDV bit in Ld's entry of the LB and ROB
Retire Ld entry from the ROB
Dispatch Ld to the memory bus controller for speculative execution
Dispatch the oldest Str bufferred within the SB to the MEU for execution
Detect Ld's in the Load Buffer younger than the Str, tagged with an USAID, and having a matching address?
Set LDV in Ld's entry of the LB and ROB indicating execution data as valid and non-speculative
Retire Ld entry from the ROB
Recover from mis-speculation by preventing Ld from being committed to system state with invalid data

1. A method of performing memory operations in a computer system comprising the steps of:

(a) dispatching a load operation having a first address;

(b) identifying a most recent store operation that was dispatched prior to the load operation and which has an unknown address;

(c) dispatching a store operation having a second address;
(d) blocking the load operation in the event that the first address matches the second address of the store operation and the store operation was dispatched earlier than, or at the same time as the most recent store operation; and
(e) executing the store operation.

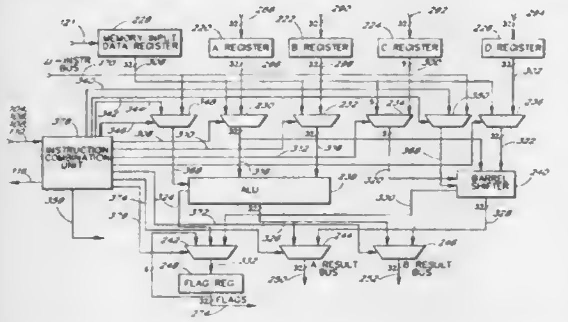
5,751,984
METHOD AND APPARATUS FOR SIMULTANEOUSLY EXECUTING INSTRUCTIONS IN A PIPELINED MICROPROCESSOR

Hsiao-Shih Chang, Orange; James A. Kane, Newport Beach, and Graham B. Whitted, III, Irvine, all of Calif., assignors to United Microelectronics Corporation, Hsin Chu, Taiwan, and Meridian Semiconductor, Inc., Irvine, Calif.

Continuation of Ser. No. 609,051, Feb. 29, 1996, abandoned, which is a continuation of Ser. No. 252,411, Jun. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 193,000, Feb. 8, 1994, abandoned. This application Sep. 3, 1997, Ser. No. 922,741

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—392 **17 Claims**



1. A pipelined microprocessor, said microprocessor executing a first instruction and a second instruction from a computer program, said microprocessor decoding said first instruction to determine a data destination for said first instruction at least one clock cycle before said microprocessor decodes said second instruction to determine a data source for said second instruction, said microprocessor being connected to an external memory, said microprocessor comprising a data register, said data destination of said first instruction requiring that said microprocessor load the contents of a memory location of said external memory into said data register, said data source of said second instruction requiring that said microprocessor perform an operation on the contents of said data register and load the results of said operation back into said data register, said microprocessor comprising:

a memory data register for receiving the contents of said memory location after the contents are read from memory and before the contents are loaded into said data register;

an ALU for performing operations on data, said ALU receiving the contents of said memory data register;

a source/destination compare unit which compares said data destination of said first instruction with said data source of said second instruction, said source/destination compare unit detecting a data access conflict between said data destination of said first instruction and said data source of said second instruction that would cause said microprocessor to read said data register for said second instruction before the contents of said memory location are written into said data register for said first instruction; and

an instruction compare unit responsive to the detection of said data access conflict by said source/destination compare unit, said instruction compare unit determining that said first instruction and said second instruction can be combined for simultaneous completion of execution in said ALU, said instruction compare unit controlling said microprocessor so that said ALU performs said operation required by said second instruction on the contents of said memory location as received directly from said memory data register and loads the result of said operation into said data register.

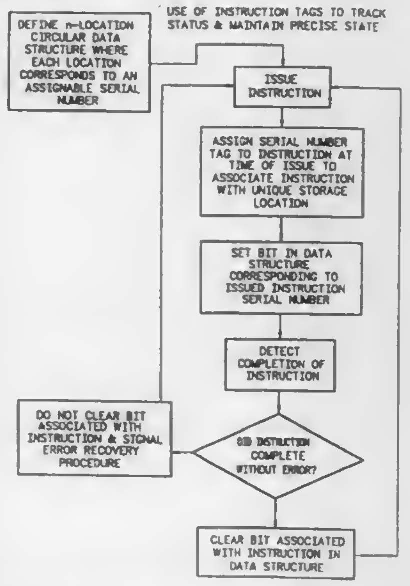
5,751,985
PROCESSOR STRUCTURE AND METHOD FOR TRACKING INSTRUCTION STATUS TO MAINTAIN PRECISE STATE

Gene W. Shen, Mountain View; John Szeto, Oakland; Niteen A. Patkar, Sunnyvale, all of Calif., and Michael C. Shebanow, Plano, Tex., assignors to Hal Computer Systems, Inc., Campbell, Calif.

Continuation of Ser. No. 398,299, Mar. 3, 1995, abandoned, which is a continuation of Ser. No. 390,885, Feb. 14, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 487,801

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—394 **36 Claims**


USE OF INSTRUCTION TAGS TO TRACK STATUS & MAINTAIN PRECISE STATE
DEFINE n-LOCATION CIRCULAR DATA STRUCTURE WHERE EACH LOCATION CORRESPONDS TO AN ASSIGNABLE SERIAL NUMBER
ISSUE INSTRUCTION
ASSIGN SERIAL NUMBER TAG TO INSTRUCTION AT TIME OF ISSUE TO ASSOCIATE INSTRUCTION WITH UNIQUE STORAGE LOCATION
SET BIT IN DATA STRUCTURE CORRESPONDING TO ISSUED INSTRUCTION SERIAL NUMBER
DETECT COMPLETION OF INSTRUCTION
DID INSTRUCTION COMPLETE WITHOUT ERROR?
DO NOT CLEAR BIT ASSOCIATED WITH INSTRUCTION & SIGNAL ERROR RECOVERY PROCEDURE
CLEAR BIT ASSOCIATED WITH INSTRUCTION IN DATA STRUCTURE

1. In a central processing unit for executing instructions issued by an instruction issue unit, said processor having a data store, an instruction issue unit, an instruction execution unit, and an instruction issue and execution scheduler; a method for tracking speculative instruction execution in a processor, said method comprising the steps of:

defining a data structure in the data store, the data structure providing storage for a plurality of instruction identification tags and a plurality of activity bits, each identifying an instruction active or inactive status, uniquely associated with each particular one of the plurality of instruction identification tags;

assigning an identification tag with its associated activity bit to each particular instruction issued by the instruction issue unit;

setting the activity bit stored in the data structure to a first state for a particular associated instruction to identify the particular instruction as an active instruction when the particular instruction becomes currently active in the processing unit; and

clearing the activity bit stored in the data structure to a second state for a particular associated instruction to identify the particular instruction as an inactive instruction when the particular instruction completes execution normally without error.

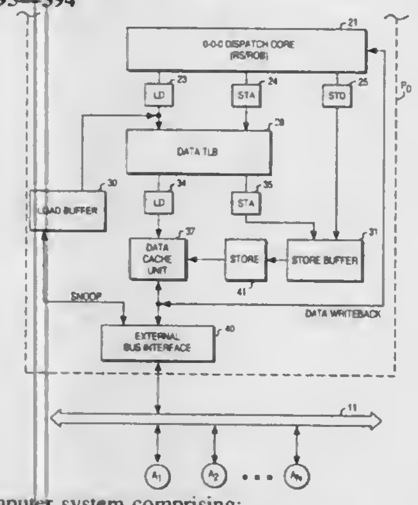
5,751,986
COMPUTER SYSTEM WITH SELF-CONSISTENT ORDERING MECHANISM

Michael A. Fetterman, Hillsboro; Glenn J. Hinton, Portland; David B. Papworth, Beaverton; Andrew F. Glew, Hillsboro, and Robert P. Colwell, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 547,023, Oct. 23, 1995, abandoned, which is a continuation of Ser. No. 205,843, Mar. 1, 1994, abandoned. This application Jan. 3, 1997, Ser. No. 778,515

Int. Cl.^{6} G06F *9/38;15/16*

U.S. Cl. 395—394 **34 Claims**



1. A computer system comprising:

a processor executing a program of instructions, a number of said instructions being executed out-of-order;

a bus coupled to said processor;

at least one agent coupled to said bus for communications thereon;

a common memory coupled to said bus, said processor and said at least one agent sharing said common memory; and

an ordering mechanism for synchronizing variables stored in said common memory by comparing an address of a STORE operation present on said bus from said at least one agent, to addresses of LOAD operations which have been issued, but not yet retired, by said processor, said mechanism aborting a first LOAD operation and speculatively processed operations of said processor following said first LOAD operation in said program responsive to a match between said address of said STORE operation and an address of said first LOAD operation.

5,751,987
DISTRIBUTED PROCESSING MEMORY CHIP WITH EMBEDDED LOGIC HAVING BOTH DATA MEMORY AND BROADCAST MEMORY

Shivaling S. Mahant-Shetti, Richardson; Derek J. Smith; Basavaraj I. Pawate, both of Dallas; George R. Doddington, Richardson; Warren L. Bean, Wylie; Mark G. Harward, and Thomas J. Aton, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 129,012, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 498,235, Mar. 16, 1990, abandoned. This application May 4, 1995, Ser. No. 434,885

Int. Cl.^{6} G06F *12/00*

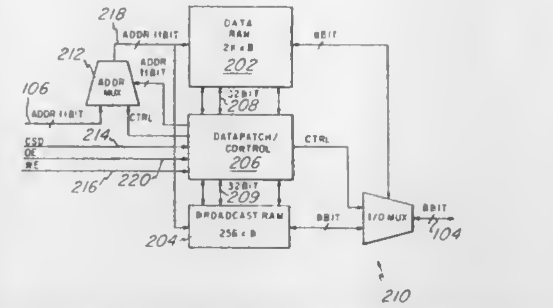
U.S. Cl. 395—405 **12 Claims**

1. An integrated circuit memory chip having logic embedded thereon, comprising:

a data memory, said data memory directly coupled through an input/output multiplexer to a data bus terminal;

a chip select terminal coupled to said data memory;

a broadcast memory, said broadcast memory directly coupled through said input/output multiplexer to said data bus terminal, and said broadcast memory not coupled to said chip select terminal, wherein said broadcast memory responds to a broadcast write by an external CPU;



an address bus directly coupled to both said data memory and said broadcast memory; and

a datapath coupled to both said data memory and said broadcast memory, said data path including circuitry for computation with data from said data memory, and a detector for receiving an external signal for initiating and terminating said computation.

5,751,988
MICROCOMPUTER WITH MEMORY BANK CONFIGURATION AND REGISTER BANK CONFIGURATION

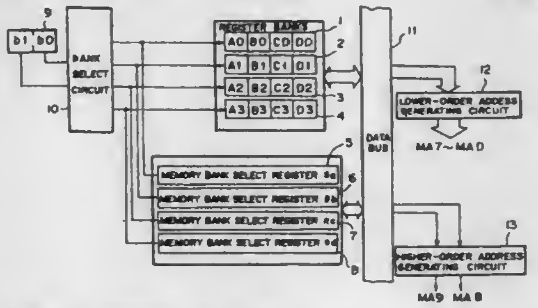
Sayuri Fujimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 720,160, Jun. 25, 1991, abandoned. This application Aug. 29, 1996, Ser. No. 705,017

Claims priority, application Japan, Jun. 25, 1990, 2-165911

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 395—405 **8 Claims**



1. A microcomputer comprising:

a plurality of register banks each having a plurality of addressing registers;

a plurality of memory bank select registers which are same as said plurality of register banks in number;

a register bank select register for temporarily storing memory bank selection information;

a bank select circuit for decoding said memory bank selection information stored in said register bank select register and for selecting both one of said plurality of register banks and one of said plurality of memory bank select registers; and

an address generating circuit for generating, based on contents of said selected one register bank and said selected one memory bank select register, a memory address which has the contents of said selected one register bank as lower-order bit contents and the contents of said selected one memory bank select register as higher-order bit contents, and for accessing a memory based on said memory address, said address generating circuit being such that one of the plurality of addressing registers included in the register bank selected is made a lower bit of the memory address.

5,751,989

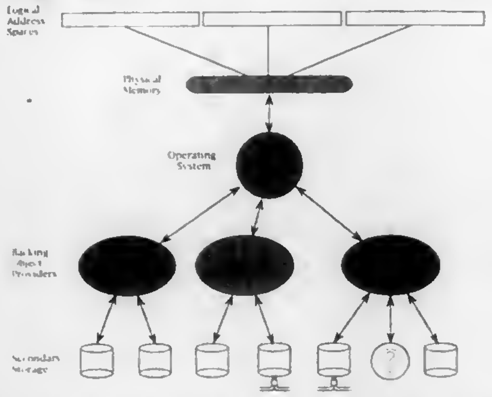
SYSTEM FOR DECENTRALIZING BACKING STORE CONTROL OF VIRTUAL MEMORY IN A COMPUTER

David F. Harrison, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 128,706, Sep. 30, 1993, abandoned. This application Nov. 4, 1996, Ser. No. 743,344

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—413 **21 Claims**



1. A virtual memory management system for a computer having a physical memory and a backing store, where said physical memory and said backing store together function as a virtual memory, comprising:

an operating system for allocating space in said physical memory for the storage of data, for receiving requests for data stored in said physical memory, and for generating requests for data to be stored in said physical memory when said received requests specify data which is not stored in said physical memory; and

a backing store provider for external to said operating system and associated with said backing store, for receiving said requests for data generated by sid operating system and determining the location of the requested data in the backing store, and for retrieving the requested data and causing it to be stored in the physical memory, said backing store provider having an associated memory cache in which data from the backing store can be stored, said backing store provider being responsive to a request for data from said operating system to check the contents of its associated cache and, if the requested data is stored therein, to advise the operating system of the address of the requested data in the cache.

5,751,990

ABRIDGED VIRTUAL ADDRESS CACHE DIRECTORY

David John Krolak, Dodge Center; Lyle Edwin Grosbach, Rochester; Sheldon B. Levenstein, Rochester, and John David Irish, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1994, Ser. No. 233,654

Int. Cl.^{6} G06F *12/08*

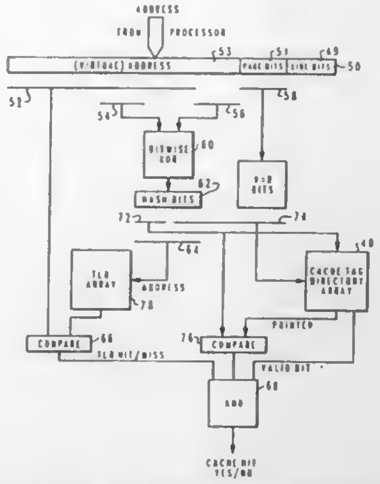
U.S. Cl. 395—417 **18 Claims**

1. A method within a data processing system for accessing a hierarchical memory system utilizing an address, wherein said data processing system includes a processor and said hierarchical memory system includes a cache memory indexed by a cache directory and a main memory indexed by a translation lookaside buffer, said method comprising the steps of:

transmitting an associativity set corresponding to a requested virtual address from said processor to said cache directory in response to an attempted access of said hierarchical memory system;

performing a hashing function on an upper portion of said requested virtual address;

locating a first entry in said translation lookaside buffer corresponding to said hashed upper portion of said requested virtual address;



locating an entry in said cache directory utilizing a lower portion of said requested virtual address, said entry in said cache directory including a congruence class field and having an associated data block in said cache memory;

locating a second entry in said translation lookaside buffer utilizing a pointer wbich includes said congruence class field and said transmitted associativity set; and

comparing said first entry in said translation lookaside buffer and said second entry in said translation lookaside buffer to verify the validity of data within said data block for said requested virtual address.

5,751,991

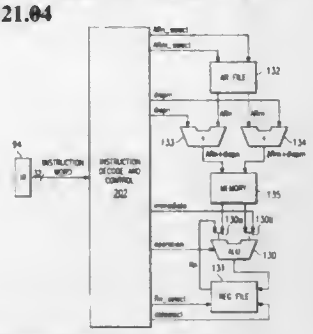
PROCESSING DEVICES WITH IMPROVED ADDRESSING CAPABILITIES, SYSTEMS AND METHODS

Jerald G. Leach, Houston; Laurence R. Simar, Richmond; Alan L. Davis, Houston, and Reid E. Tatge, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 170,609, Dec. 21, 1993, abandoned, which is a division of Ser. No. 589,968, Sep. 28, 1990, Pat. No. 5,305,446. This application Apr. 10, 1995, Ser. No. 420,458

Int. Cl.^{6} G06F *9/34*

U.S. Cl. 395—421.04 **6 Claims**



1. A data processing device, comprising:

a storage circuit accessible by assertion of addresses;

an arithmetic logic unit;

an instruction decode and control unit having an instruction register for holding a program instruction, said program instruction including source operand information indicative of a plurality of source operands to be input to said arithmetic logic unit and also including destination information indicative of a destination where a result operand produced by said arithmetic logic unit is to be stored, said instruction decode and control unit responsive to the source operand information and the destination information to control data transfers to and from said arithmetic logic unit;

an address calculating unit connected to said storage circuit and said instruction decode and control unit;

a plurality of data paths for providing said source operands to said arithmetic logic unit, a first said data path connecting said storage circuit to said arithmetic logic unit, and a second said data path connecting said instruction register to said arithmetic logic unit; and

said instruction decode and control unit operable to select said first data path when said source operand information includes information for said address calculating unit to use in calculating an address at which one of said source operands resides in said storage circuit, and said instruction decode and control unit operable to select said second data path when said source operand information includes one of said source operands.

5,751,992

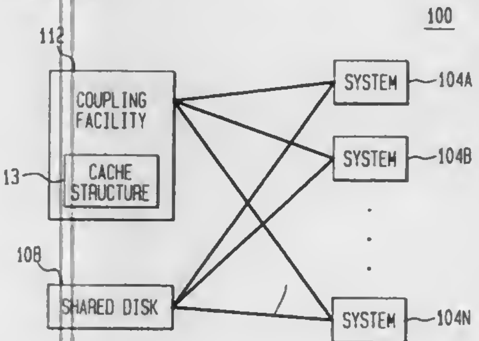
COMPUTER PROGRAM PRODUCT FOR CONTINUOUS DESTAGING OF CHANGED DATA FROM A SHARED CACHE IN A MULTISYSTEM SHARED DISK ENVIRONMENT WHEREIN CASTOUT INTEREST IS ESTABLISHED IN A HIERARCHICAL FASHION

Gautam Bhargava, Cupertino; Inderpal Singh Narang, Saratoga, and James Z. Teng, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 311,755, Sep. 23, 1994. This application May 31, 1995, Ser. No. 454,846

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 395—457 **21 Claims**



2. A computer program product for use with a computer system in a shared data environment, comprising:

a computer usable medium having computer readable program code means embodied in said medium for distributing a castout process for datasets among a plurality of systems in a shared data environment, wherein each system has a processor and a memory, and wherein the plurality of systems share a high-speed electronic storage and a low-speed direct access storage, said computer readable program code means comprising:

computer readable code means for enabling a computer to assign a castout lock for a dataset in a backup state to a first computer system having an update interest in the dataset, wherein said first computer system is tasked with casting out an updated version of the dataset from said high-speed electronic storage to said low-speed direct access storage in the event that a system having a castout lock for the dataset in a primary state fails;

said computer readable code means for enabling a computer to assign a castout lock for the dataset in a primary state to said first computer system if no other of said systems holds castout lock in said primary state, wherein said first computer system is tasked with casting out an updated version of the dataset from said high-speed electronic storage to said low-speed direct access storage, and

wherein a second computer system having castout lock for the dataset in said backup state is given an opportunity to accept or decline castout lock for the dataset in said primary state if said first computer system fails, and

wherein castout lock for the dataset in said primary state is passed to said second computer system if said second computer system accepts castout lock for the dataset in said primary state.

5,751,993

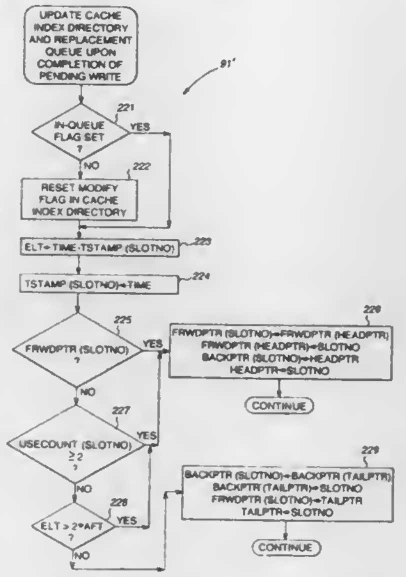
CACHE MANAGEMENT SYSTEM

Yuval Ofek, Hopkinton, and Natan Vishlitzky, Brookline, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Sep. 5, 1995, Ser. No. 523,657

Int. Cl.^{6} G06F *12/12*

U.S. Cl. 395—463 **6 Claims**



1. In a data storage system having a system memory for buffering data element transfers between at least one a host computer and at least one storage device, the system memory having a pending write data structure, the method for inserting a pending write data element into either the head or the tail of a replacement queue comprising the step of

time stamping the data element as it is place in the pending write data structure,

calculating the elapsed time the data element was stored in the pending write data structure prior to the completion of the pending write operation, and

inserting the data element at the head of the replacement queue if the elapsed time that the element is in the pending write data structure was greater than a predetermined threshold based on the average fall through time of the data elements in the replacement queue;

inserting the data element at the tail of the replacement queue if the elapsed time that the data element is in the pending write data structure was less than the predetermined threshold;

comparing the usage count of the data element while resident in the pending write data structure to a fixed number, and

placing the data element from the pending write data structure at the head of the replacement queue if the usage count is greater than or equal to the fixed number.

5,751,994

SYSTEM AND METHOD FOR ENHANCING COMPUTER OPERATION BY PREFETCHING DATA ELEMENTS ON A COMMON BUS WITHOUT DELAYING BUS ACCESS BY MULTIPLE BUS MASTERS

Pirmin L. Weisser, Unterkirnach, Germany; Fulps V. Vermeer, Delft, Netherlands, and Edward C. King, Fremont, Calif., assignors to NCR Corporation, Dayton, Ohio

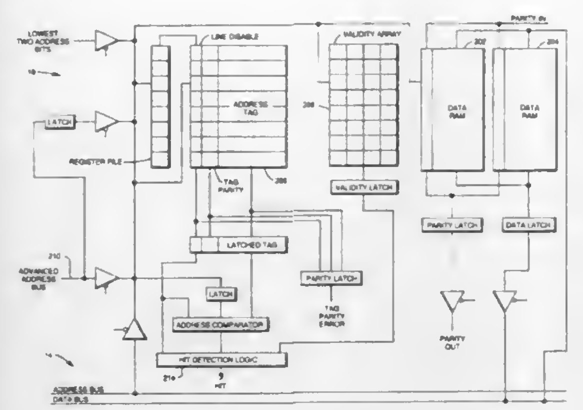
Continuation of Ser. No. 432,326, May 1, 1995, abandoned, which is a continuation of Ser. No. 563,215, Aug. 6, 1990, Pat. No. 5,530,941. This application Feb. 10, 1997, Ser. No. 795,262

Int. Cl.^{6} G06F *13/16*

U.S. Cl. 395—464 **5 Claims**

3. A memory system, connectable by a common bus to a plurality of bus masters, comprising:

a system memory connected to said bus;



a cache connected to said bus, and readable by said plurality of bus masters;

means, connected to said system, for predicting data elements to be read by one of said bus masters, and

means, connected to said system, for transferring said predicted data elements from said memory to said cache during access cycles to said bus by others of said bus masters without delaying memory access requests from said others of said bus masters.

5,751,995

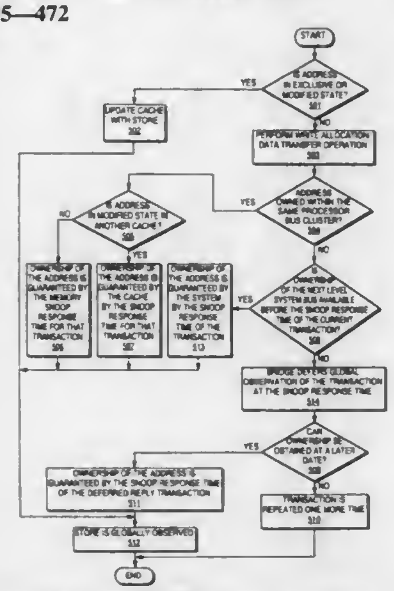
APPARATUS AND METHOD OF MAINTAINING PROCESSOR ORDERING IN A MULTIPROCESSOR SYSTEM WHICH INCLUDES ONE OR MORE PROCESSORS THAT EXECUTE INSTRUCTIONS SPECULATIVELY

Nitin V. Sarangdhar, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 177,259, Jan. 4, 1994, abandoned. This application Jan. 18, 1996, Ser. No. 591,224

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—472 **24 Claims**


START
IS ADDRESS IN EXCLUSIVE OR MODIFIED STATE?
UPDATE CACHE WITH STORE
PERFORM WRITE ALLOCATION DATA TRANSFER OPERATION
IS ADDRESS IN MODIFIED STATE IN ANOTHER CACHE?
ADDRESS OWNED WITHIN THE SAME PROCESSOR BUS CLUSTER?
OWNERSHIP OF THE ADDRESS IS GUARANTEED BY THE SNOOP RESPONSE TIME FOR THAT TRANSACTION
OWNERSHIP OF THE ADDRESS IS GUARANTEED BY THE SNOOP RESPONSE TIME FOR THAT TRANSACTION
OWNERSHIP OF THE ADDRESS IS GUARANTEED BY THE SNOOP RESPONSE TIME OF THE TRANSACTION
OWNERSHIP OF THE NEXT LEVEL SYSTEM BUS AVAILABLE BEFORE THE SNOOP RESPONSE TIME OF THE CURRENT TRANSACTION?
BRIDGE DEFERS GLOBAL OBSERVATION OF THE TRANSACTION AT THE SNOOP RESPONSE TIME
CAN OWNERSHIP BE OBTAINED AT A LATER DATE?
OWNERSHIP OF THE ADDRESS IS GUARANTEED BY THE SNOOP RESPONSE TIME OF THE DEFERRED REPLY TRANSACTION
TRANSACTION IS REPEATED ONE MORE TIME
STORE IS GLOBALLY OBSERVED
END
YES
NO

14. In a multiprocessor (MP) system comprising a plurality of processors, each having an internal data cache operating in accordance with a MESI-based protocol, the processors being organized into clusters comprising one or more processors, each cluster being coupled to a memory via a memory bus which, in turn, is coupled to a system bus, at least a first processor in a first cluster executing instructions speculatively, a method of maintaining processor ordering, said method comprising the steps of:

(a) storing data associated with a first write operation (STORE1) and a second write operation (STORE2) in a buffer in a first processor in retiring STORE1 and STORE2;

(b) issuing STORE1 from said buffer

(c) designating the STORE1 to be globally observed, following any of the steps of:

  (1) determining that the address location of the STORE1 is in the internal data cache of the first processor in the M or E state; or

  (2) (i) determining that the address location of the STORE1 is owned by a local memory within the first cluster in the E, S, or I state; and

  (ii) waiting for a snoop response time of a current transaction to the address location of the STORE1;

  (3) (i) determining that the address location of the STORE1 is owned by a cache in a second processor in said first cluster in the M state; and

  (ii) waiting for a snoop response time of a current transaction to the address location of the STORE1; or

  (4) (i) determining that the address location is not owned within the first cluster; and

  (ii) obtaining ownership of the cache line from a remote memory; and

  (iii) waiting for a snoop response time of a current transaction to the address location of the STORE1; and

(d) issuing STORE2 from said buffer after global observation of STORE1.

5,751,996

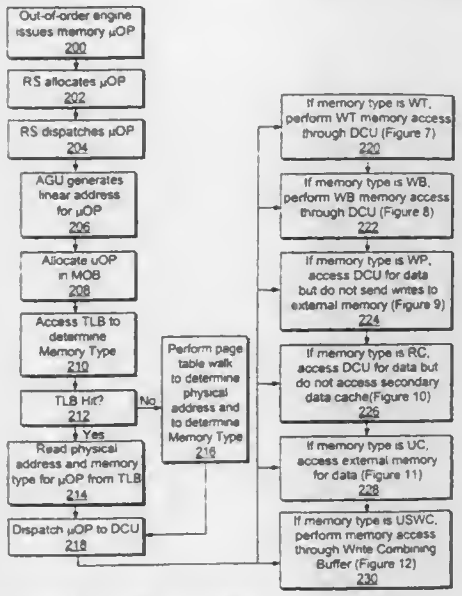
METHOD AND APPARATUS FOR PROCESSING MEMORY-TYPE INFORMATION WITHIN A MICROPROCESSOR

Andrew F. Glew, Hillsboro, and Glenn J. Hinton, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 316,550, Sep. 30, 1994, abandoned. This application Dec. 17, 1996, Ser. No. 767,799

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 711—145 **52 Claims**


Out-of-order engine issues memory µOP 200
RS allocates µOP 202
RS dispatches µOP 204
AGU generates linear address for µOP 206
Allocate uOP in MOB 208
Access TLB to determine Memory Type 210
TLB Hit? 212
No
Yes
Read physical address and memory type for µOP from TLB 214
Dispatch µOP to DCU 218
Perform page table walk to determine physical address and to determine Memory Type 216
If memory type is WT, perform WT memory access through DCU (Figure 7) 220
If memory type is WB, perform WB memory access through DCU (Figure 8) 222
If memory type is WP, access DCU for data but do not send writes to external memory (Figure 9) 224
If memory type is RC, access DCU for data but do not access secondary data cache (Figure 10) 226
If memory type is UC, access external memory for data (Figure 11) 228
If memory type is USWC, perform memory access through Write Combining Buffer (Figure 12) 230

1. A computer system comprising:

an external memory;

a first cache memory;

at least one microprocessor coupled to the external memory;

wherein the at least one microprocessor includes a register to store a memory type value identifying a memory access protocol appropriate for accessing a memory location of the external memory, and a second cache memory to cache the memory type value received from the register, the memory type value indicating a particular memory access protocol from a plurality of memory access protocols to be used by the at least one microprocessor for accessing the memory location; and

wherein the at least one microprocessor is operative to determine the memory access protocol for the memory location by accessing the second cache and further operative to access information stored in the memory location according to the memory access protocol identified by the memory type value.

5,751,997

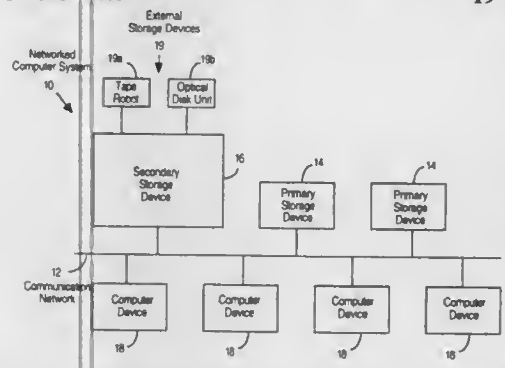
METHOD AND APPARATUS FOR TRANSFERRING ARCHIVAL DATA AMONG AN ARBITRARILY LARGE NUMBER OF COMPUTER DEVICES IN A NETWORKED COMPUTER ENVIRONMENT

Steven E. Kullick, Saratoga; Charles S. Spirakis, Santa Clara, and Diane J. Titus, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 7,159, Jan. 21, 1993, abandoned. This application Jan. 19, 1996, Ser. No. 588,830

Int. Cl.^{6} G06F *12/16;12/08*

U.S. Cl. 395—489 **19 Claims**



1. In a networked computer system having a communication network interconnecting one or more primary storage devices, one or more secondary storage devices and a plurality of computer devices, each computer device having one or more disks, a method for storing data from one or more computer devices, said method comprising the steps of:

indicating when a transfer of data from a primary storage device to a secondary storage device should occur;

transferring data from the primary storage device to the secondary storage device in response to such indicating, the data including for a particular disk a corresponding full index and a backup data file, the data being merged, respectively, with any full index and backup data file for the disk currently stored on the secondary storage device, the merged any full index and backup data file corresponding to the particular disk, the data being merged in such a way so that if an index entry in the full index from a computer indicates that data corresponding to that index entry has been changed or created, the corresponding data in a resulting backup data file is the corresponding data from the backup data file from the primary storage device and if an index entry in the full index from the computer indicates that data corresponding to that index entry has been changed or created, the corresponding data in the resulting backup data file is the corresponding data from a previously-stored backup data file:

checking whether the primary storage device has a full index corresponding to a disk of a computer device and, if the primary storage device has such a corresponding full index, then sending the corresponding full index, or a portion thereof, to the primary storage device and, if the primary storage device does not have such a corresponding full index, then checking to see if the secondary storage device has such a full index corresponding to the disk and, if the secondary storage device does have such a corresponding full index, sending directly or indirectly that corresponding full index to the computer device and if the secondary storage device does not have a copy of such corresponding full index, copying data and corresponding information from the disk to the secondary storage device, storing the data in a backup data file on the secondary storage device or external storage devices connected thereto, creating a corresponding full index for accessing the data in the backup data file on the secondary storage device and storing that corresponding full index on the secondary storage device;

determining which data on the disk of the computer device has been changed or created since the last time the corresponding full index for that disk was modified;

creating an index entry for each file or directory on the disk;

sending index entries and a copy of the determined data to the primary storage device; and

forming on the primary storage device a new corresponding full index and new corresponding backup data file for the disk from the index entries and data received from the computer device and the corresponding full index and backup data file, if any, on the primary storage device.

5,751,998

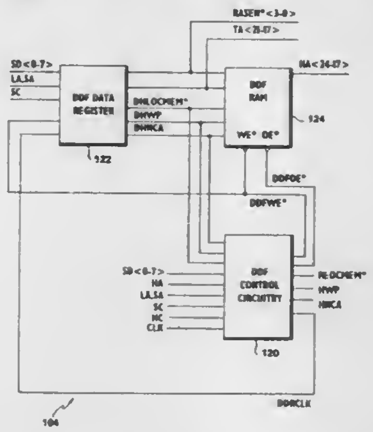
MEMORY ACCESSING SYSTEM WITH PORTIONS OF MEMORY BEING SELECTIVELY WRITE PROTECTABLE AND RELOCATABLE BASED ON PREDEFINED REGISTER BITS AND MEMORY SELECTION RAM OUTPUTS

Russell J. Wunderlich; Mark Taylor, both of Houston; Charles J. Stancil, Tomball; Mikal C. Hunsaker, and Brian V. Belmont, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 878,437, May 4, 1992, abandoned. This application May 25, 1995, Ser. No. 450,548

Int. Cl.^{6} G06F *12/14*

U.S. Cl. 395—490 **24 Claims**



1. A memory accessing system for use in a computer system having an address bus for communication of address values, a data bus for communication of data values, a control bus for communication of status and timing signals, and predefined register locations for storing values indicating write protect and relocation states of specific portions of memory, the memory accessing system comprising:

at least one memory module containing memory having data inputs and outputs coupled to the data bus and having address line and control inputs;

memory control logic for interfacing said address bus and said control bus to each said memory module, said memory control logic having enable signal inputs for selecting a desired memory module; a plurality of address line inputs, a first portion of said plurality of address line inputs are coupled to the address bus; control signal inputs connected to the control bus; a write protect input which is used to disable write operations to each said memory module; address line outputs which are connected to each said memory module address line inputs; and control signal outputs connected to said memory module control inputs;

memory selection random access memory having address inputs which are coupled to the address bus, having data inputs coupled to the data bus and having data outputs, the data outputs having a first portion, a second portion and a write protect data output, said first portion of said data outputs coupled to said memory control logic enable signal inputs, said second portion of said data outputs coupled to a second portion of said memory control logic plurality of address line inputs and said write protect data output for indicating whether said memory module is write protected; and

conversion logic receiving said write protect data output from said memory selection random access memory to selectively modify said write protect data output based on the predefined register location write protect and relocation states and to provide the selectively modified write protect data output to said memory control logic write protect input.

5,751,999
PROCESSOR AND DATA MEMORY FOR OUTPUTTING AND RECEIVING DATA ON DIFFERENT BUSES FOR STORAGE IN THE SAME LOCATION

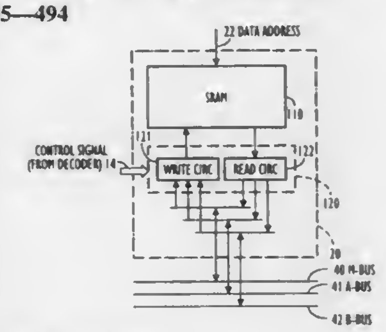
Takao Suzuki, Hyogo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 20, 1995, Ser. No. 492,702

Claims priority, application Japan, Jun. 23, 1994, 6-141650

Int. Cl.^{6} G06F *13/00;13/40*

U.S. Cl. 395—494 **8 Claims**



1. A processor comprising:

a plurality of data buses;

means for generating a data address;

a cycle selecting means for selecting one of a read cycle, a write cycle, and a read/write cycle; and

a data memory for outputting data stored at a location designated by said data address to any one of said plurality of data buses when the read cycle has been selected, receiving data from any one of said plurality of data buses and storing the data thus received at the location designated by said data address when the write cycle has been selected, and outputting the data stored at the location designated by said data address to any one of said plurality of data buses, while receiving data from another one of said plurality of data buses and storing the data thus received at the same location as designated by said data address, when the read/write cycle has been selected.

5,752,000
SYSTEM AND METHOD FOR SIMULATING DISCRETE FUNCTIONS USING ORDERED DECISION ARRAYS

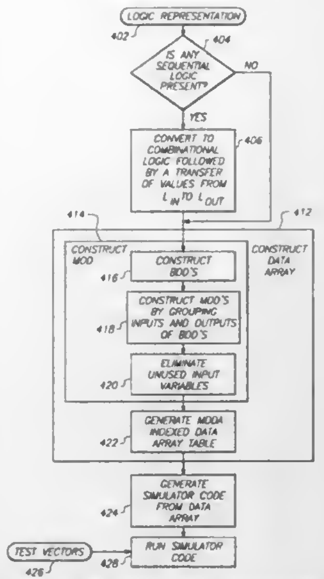
Patrick C. McGeer, Orinda; Alexander Saldanha, El Cerrito, and Alberto Sangiovanni-Vincentelli, Berkeley, all of Calif., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Aug. 2, 1994, Ser. No. 284,157

Int. Cl.^{6} G06G *17/50*

U.S. Cl. 395—500 **39 Claims**

1. A method for simulating a discrete function circuit design, on a digital computer, the discrete function circuit design including two or more discrete function elements, said discrete function circuit design having a plurality of inputs and a plurality of outputs, the method comprising the steps of:


LOGIC REPRESENTATION
402
404
IS ANY SEQUENTIAL LOGIC PRESENT?
NO
YES
CONVERT TO COMBINATIONAL LOGIC FOLLOWED BY A TRANSFER OF VALUES FROM L IN TO L OUT
406
414
412
CONSTRUCT MDD
CONSTRUCT DATA ARRAY
CONSTRUCT BDD'S
416
CONSTRUCT MDD'S BY GROUPING INPUTS AND OUTPUTS OF BDD'S
418
ELIMINATE UNUSED INPUT VARIABLES
420
GENERATE MDDA INDEXED DATA ARRAY TABLE
422
GENERATE SIMULATOR CODE FROM DATA ARRAY
424
TEST VECTORS
426
RUN SIMULATOR CODE
428

generating a multi-valued decision data representation having a plurality of nodes, representing the circuit design, a size of said multi-valued decision data representation is not dependent upon the number of discrete function elements;

generating a first data array, using the digital computer, wherein said first data array represents an effect of the two or more discrete function elements on the plurality of inputs, wherein said first data array includes a plurality of data tables, each of said tables identified with one of said plurality of nodes, said first data array having a size that is not dependent upon the number of discrete function elements; and

traversing said first data array and generating one or more of the plurality of outputs in response to the plurality of inputs to simulate the discrete function circuit design.

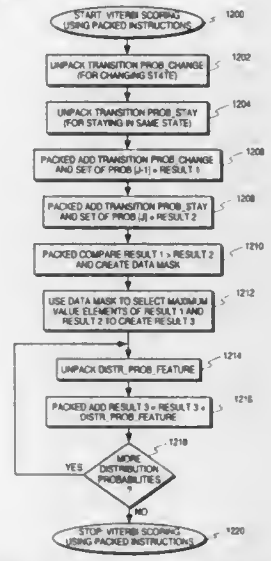
5,752,001
METHOD AND APPARATUS EMPLOYING VITERBI SCORING USING SIMD INSTRUCTIONS FOR DATA RECOGNITION

Carole Dulong, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 1, 1995, Ser. No. 457,102

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—500 **21 Claims**


START VITERBI SCORING USING PACKED INSTRUCTIONS
1200
UNPACK TRANSITION PROB_CHANGE (FOR CHANGING STATE)
1202
UNPACK TRANSITION PROB_STAY (FOR STAYING IN SAME STATE)
1204
PACKED ADD TRANSITION PROB_CHANGE AND SET OF PROB (J-1) = RESULT 1
1206
PACKED ADD TRANSITION PROB_STAY AND SET OF PROB (J) = RESULT 2
1208
PACKED COMPARE RESULT 1 > RESULT 2 AND CREATE DATA MASK
1210
USE DATA MASK TO SELECT MAXIMUM VALUE ELEMENTS OF RESULT 1 AND RESULT 2 TO CREATE RESULT 3
1212
UNPACK DISTR_PROB_FEATURE
1214
PACKED ADD RESULT 3 = RESULT 3 + DISTR_PROB_FEATURE
1216
1218
MORE DISTRIBUTION PROBABILITIES ?
YES
NO
STOP VITERBI SCORING USING PACKED INSTRUCTIONS
1220

1. A method used in determining an output probability that an input set of data matches a stochastic model, the stochastic model including a plurality of states, the method comprising the steps of:

(a) using an SIMD pack instruction to convert a plurality of data elements into a first packed format;

(b) using a first SIMD packed add instruction to determine a first plurality of probabilities for the stochastic model to be in a set of states after transitioning via a first set of transitions, wherein said first plurality of probabilities is represented by a first data set of said plurality of data elements, and said first set of transitions is represented by a second data set of said plurality of data elements;

(c) using a second SIMD packed add instruction to determine a second plurality of probabilities for the stochastic model to be in the set of states after transitioning via a second set of transitions, wherein said second plurality of probabilities is represented by a third data set of said plurality of data elements, and said second set of transitions is represented by a fourth data set of said plurality of data elements;

(d) generating a data mask from comparing the first plurality of probabilities to the second plurality of probabilities responsive to a single compare instruction; and

(e) logically combining the data mask with the first plurality of probabilities and the second plurality of probabilities to generate a third set of probabilities.

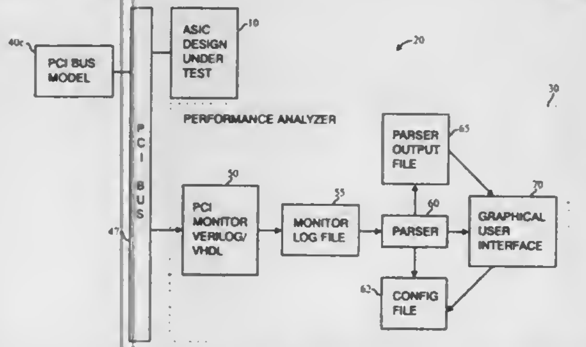
5,752,002
METHOD AND APPARATUS FOR PERFORMANCE OPTIMIZATION OF INTEGRATED CIRCUIT DESIGNS

Anand Naidu; Ajit Deora, both of San Jose, and Venkatesham Arunarthi, Sunnyvale, all of Calif., assignors to Sand Microelectronics, Inc., San Jose, Calif.

Filed Jun. 12, 1995, Ser. No. 489,654

Int. Cl.^{6} G06F *9/455;17/50*

U.S. Cl. 395—500 **16 Claims**



1. A method for optimizing performance of a computer system component design by analyzing simulation of the component design, the method comprising the steps of:

(a) providing the computer system component design to a simulation apparatus;

(b) simulating operation of the component design by performing a plurality of transactions, and generating an operation data set for each transaction;

(c) collecting and storing the operation data set from each transaction;

(d) sequentially parsing the stored operation data sets to produce parsed data by inputting the stored operation data set and a user configuration file, and parsing the operation data set based on the user configuration file to produce the parsed data, the user configuration file capable of being edited by the user to enable or disable user designated data types;

(e) performing a statistical analysis of the parsed data; and

(f) outputting performance information in graphical, text, or tabular form, in response to the statistical analysis,

whereby the performance information can be used to improve performance of the computer system component prior to its fabrication.

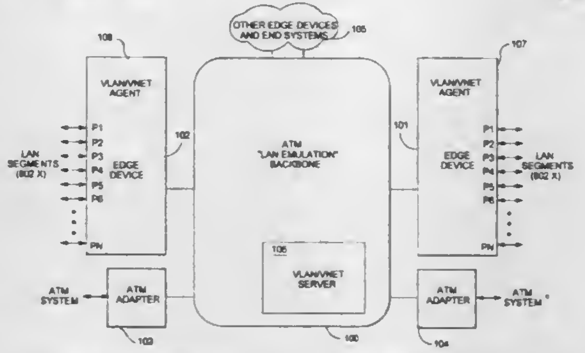
5,752,003
ARCHITECTURE FOR MANAGING TRAFFIC IN A VIRTUAL LAN ENVIRONMENT

John H. Hart, Saratoga, Calif., assignor to 3 Com Corporation, Santa Clara, Calif.

Filed Jul. 14, 1995, Ser. No. 502,835

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **43 Claims**



1. For a network including a set of local area network (LAN) segments interconnected as a virtual LAN, in which nodes in the virtual LAN are members of one or more logical networks, a method for managing traffic in the network, comprising:

detecting a multi-destination packet on a LAN segment within the set;

determining, in response to the multi-destination packet, the logical network for which the detected multi-destination packet is intended; and

delivering information carried by the multi-destination packet to nodes authorized to receive multi-destination packets intended for members of the determined logical network.

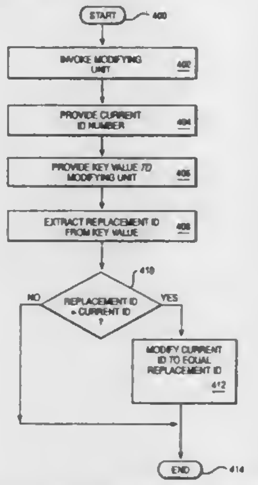
5,752,004
METHOD AND SYSTEM FOR MODIFYING AN INTERNAL DATA PROCESSING SYSTEM IDENTIFICATION

Roger Morton Blood, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1995, Ser. No. 509,257

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—500 **10 Claims**


START
400
INVOKE MODIFYING UNIT
402
PROVIDE CURRENT ID NUMBER
404
PROVIDE KEY VALUE TO MODIFYING UNIT
406
EXTRACT REPLACEMENT ID FROM KEY VALUE
408
410
NO
YES
REPLACEMENT ID = CURRENT ID ?
MODIFY CURRENT ID TO EQUAL REPLACEMENT ID
412
END
414

1. A method of modifying an identification of a computer system, said method comprising the steps of:

detecting a failure of a central processing unit of said computer system, said failed central processing unit having an identification of the entire computer system;

replacing said failed central processing unit with a replacement central processing unit having modifiable memory, said modifiable memory containing a replacement identification for the entire computer system;

creating a key value having a verification identification and said failed identification;

extracting the verification identification and said failed identification from the key value;

comparing said verification identification to said replacement identification to determine if they are equal; and

modifying, in response to determining that the verification identification equals the replacement identification, said replacement identification to equal said failed identification.

5,752,005

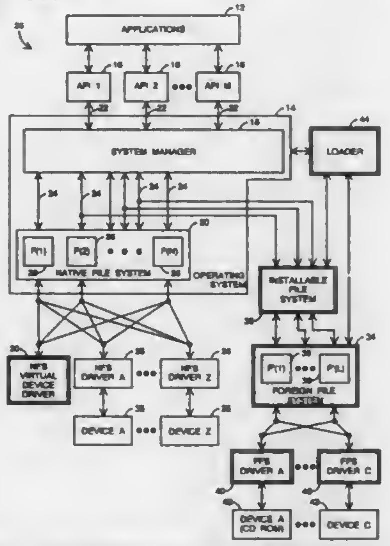
FOREIGN FILE SYSTEM ESTABLISHING METHOD WHICH USES A NATIVE FILE SYSTEM VIRTUAL DEVICE DRIVER

Clay LaMoyne Jones, Mesa, Ariz., assignor to Microtest, Inc., Phoenix, Ariz.

Filed Jan. 22, 1996, Ser. No. 589,628

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **20 Claims**



1. A method of establishing a foreign file system on a computer configured to run an operating system, said operating system being configured to implement a native file system having a multiplicity of function routines, and said method comprising the steps of:

programming said operating system to access a virtual device driver configured in accordance with said native file system;

arranging said virtual device driver to emulate a file storage device having substantially no files stored thereon; and

routing program flow threaded within said operating system toward a selected one of said function routines to an installable file system.

5,752,006

CONFIGURATION EMULATION OF A PROGRAMMABLE LOGIC DEVICE

Glenn A. Baxter, Ben Lomond, Calif., assignor to Xilinx, Inc., San Jose, Calif.

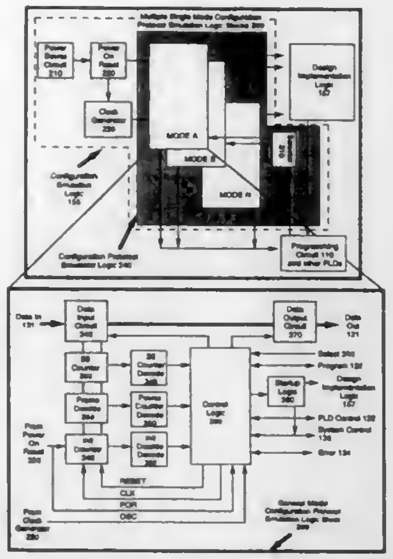
Continuation-in-part of Ser. No. 594,933, Jan. 31, 1996. This application Feb. 29, 1996, Ser. No. 613,785

Int. Cl.^{6} G06G *7/48;* **H03K** *19/173*

U.S. Cl. 395—500 **5 Claims**

1. A circuit for emulating a configuration timing relationship and a configuration protocol relationship between a programmable Logic Device (PLD) and a programming circuit, said programming circuit using a configuration mode signal to said PLD to establish said configuration timing relationship and said configuration protocol relationship, said circuit comprising:

a first circuit to emulate said PLD in said configuration timing relationship; and



a second circuit to emulate said PLD in said configuration protocol relationship, said second circuit being coupled to said first circuit and being coupled to receive said configuration mode signal, and wherein said second circuit is responsive to said configuration mode signal, said second circuit further configured to emulate said PLD in a second configuration protocol relationship responsive to a second configuration mode signal.

5,752,007

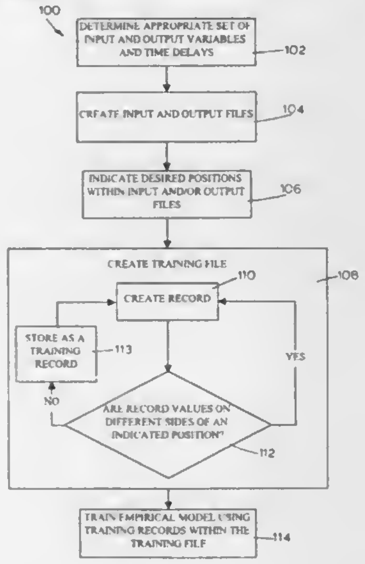
SYSTEM AND METHOD USING SEPARATORS FOR DEVELOPING TRAINING RECORDS FOR USE IN CREATING AN EMPIRICAL MODEL OF A PROCESS

Steven Michael Morrison, Austin, Tex., assignor to Fisher-Rosemount Systems, Inc., Austin, Tex.

Filed Mar. 11, 1996, Ser. No. 613,913

Int. Cl.^{6} G06T *1/40*

U.S. Cl. 395—500 **26 Claims**



100
DETERMINE APPROPRIATE SET OF INPUT AND OUTPUT VARIABLES AND TIME DELAYS
102
CREATE INPUT AND OUTPUT FILES
104
INDICATE DESIRED POSITIONS WITHIN INPUT AND/OR OUTPUT FILES
106
CREATE TRAINING FILE
108
CREATE RECORD
110
STORE AS A TRAINING RECORD
113
YES
NO
ARE RECORD VALUES ON DIFFERENT SIDES OF AN INDICATED POSITION?
112
TRAIN EMPIRICAL MODEL USING TRAINING RECORDS WITHIN THE TRAINING FILE
114

1. A device for developing a training record, capable of being used to create a model of a process, from data pertaining to a plurality of variables associated with the process, comprising:

means for creating a file having multiple values for each of the plurality of variables from the data pertaining to the plurality of variables;

means for indicating a position within the file;

means for selecting first and second of the values within the file to define a record;

means for determining if the first value is associated with a position within the file which is on one side of the indicated position and if the second value is associated with a position within the file which is on another side of the indicated position to thereby determine if the first and second selected values are on different sides of the indicated position; and

means responsive to the determining means for preventing the use of the defined record as a training record when the first and second values are on different sides of the indicated position.

5,752,008

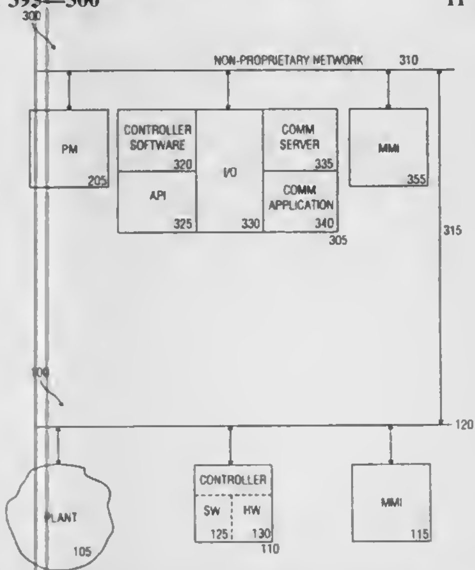
REAL-TIME PROCESS CONTROL SIMULATION METHOD AND APPARATUS

Jonathan S. Bowling, Georgetown, Tex., assignor to Fisher-Rosemount Systems, Inc., Austin, Tex.

Filed May 28, 1996, Ser. No. 654,355

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—500 **11 Claims**



1. An improved process control system comprising:

a first communications network utilizing a first communications protocol;

a real-time device controller coupled to the first communications network, the real-time device controller comprising a digital processor running a first operating system and process control software, the hardware and operating system of the real-time device controller allowing the process control software to run only in a real-time mode;

a second communications network utilizing a second communications protocol, the second communications network being coupled to the first communications network by a communications link; and

a simulation unit coupled to the second communications network, the simulation unit comprising a digital processor running a second operating system and a version of the process control software that has been rehosted to run in conjunction with the second operating system.

5,752,009

RECORDING MEDIUM FOR ELECTRONIC PUBLICATIONS INCLUDING MULTIPLE FORMAT EMULATION

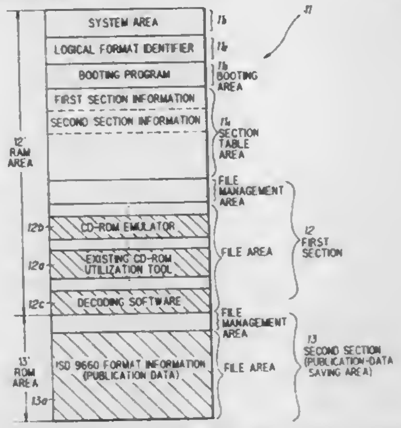
Masaru Nakahara; Kazuo Nakashima, and Kenichi Utsumi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 255,487, Jun. 8, 1994, abandoned. This application Dec. 2, 1996, Ser. No. 757,642

Claims priority, application Japan, Jul. 16, 1993, 5-176613

Int. Cl.^{6} G06F *15/40*

U.S. Cl. 395—500 **42 Claims**



SYSTEM AREA
LOGICAL FORMAT IDENTIFIER
BOOTING PROGRAM
BOOTING AREA
FIRST SECTION INFORMATION
SECOND SECTION INFORMATION
SECTION TABLE AREA
RAM AREA
FILE MANAGEMENT AREA
CD-ROM EMULATOR
EXISTING CD-ROM UTILIZATION TOOL
DECODING SOFTWARE
FILE AREA
FIRST SECTION
FILE MANAGEMENT AREA
ISO 9660 FORMAT INFORMATION (PUBLICATION DATA)
FILE AREA
ROM AREA
SECOND SECTION (PUBLICATION-DATA SAVING AREA)

1. A recording medium for storing data with a predetermined physical format comprising:

a first section for storing software;

a second section for storing publication data converted to the predetermined physical format from an original physical format; and

wherein said first section has an area for storing software for converting a command associated with the original physical format, for reading the publication data in accordance with the original physical format to a command associated with the predetermined physical format, for reading the publication data from said second section.

5,752,010

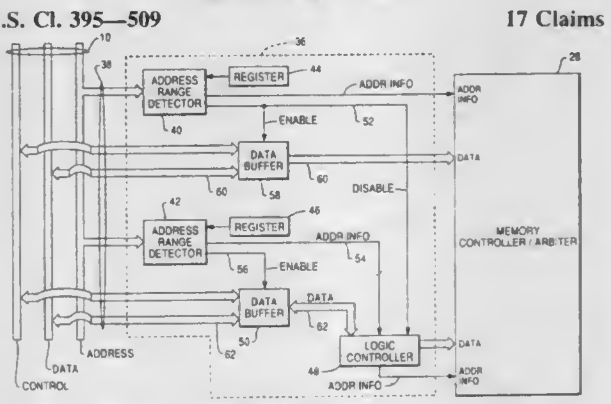
DUAL-MODE GRAPHICS CONTROLLER WITH PREEMPTIVE VIDEO ACCESS

Brian K. Herbert, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed Sep. 10, 1993, Ser. No. 119,295

Int. Cl.^{6} G06T *1/60*

U.S. Cl. 395—509 **17 Claims**



1. In a computer system having:

A) a local bus for transmitting both video and graphics data;

B) a display terminal; and

C) a graphics controller, connected between said local bus and terminal, including a display memory for storing video data and graphics data for said display terminal;

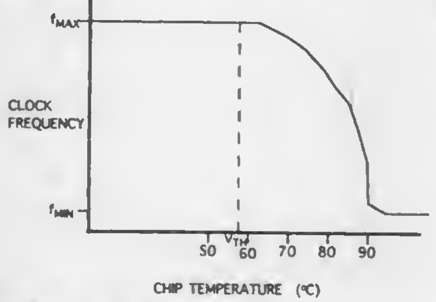
a method of providing new data to said display memory, the method comprising the steps of:
- a) defining an address range for said video data;
- b) commencing a logic operation on existing data stored in said display memory;
- c) transmitting said new data over said local bus to said graphics controller;
- d) checking an address of said new data to determine whether the address falls within said address range; and
- e) interrupting said logic operation when the address falls within said address range, and transferring said new data directly to said display memory.

5,752,011
METHOD AND SYSTEM FOR CONTROLLING A PROCESSOR'S CLOCK FREQUENCY IN ACCORDANCE WITH THE PROCESSOR'S TEMPERATURE

C. Douglas Thomas, 1193 Capri Dr., Campbell, Calif. 95008, and Alan E. Thomas, 424 Atlantic Ave., Ocean City, N.J. 08226

Filed Jun. 20, 1994, Ser. No. 262,754
Int. Cl.^{6} G06F *1/06*

U.S. Cl. 395—556 **32 Claims**



1. A computer, comprising:
a clock module, said clock module produces a clock signal having two or more different frequencies;
a processor operatively connected to said clock module, said processor processes instructions in accordance with the clock signal;
a temperature sensor operatively connected to said clock module, said temperature sensor produces a temperature signal based on the temperature of said processor; and
an activity detector operatively connected to said processor, said activity detector monitors activity of said processor,
wherein the frequency of the clock signal utilized by said processor varies depending on the temperature and the activity of said processor.

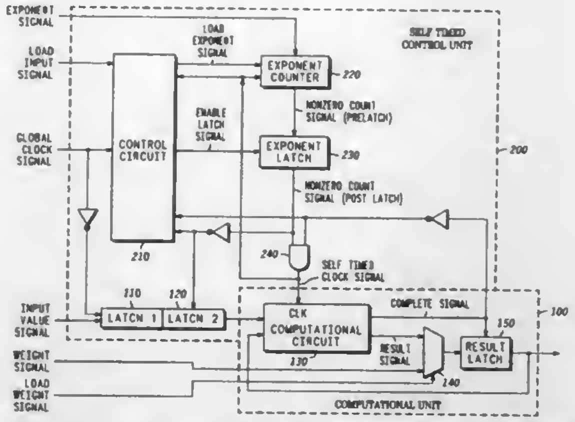
5,752,012
COMPUTATIONAL ARRAY WITH SELF TIMED COMPUTATIONAL ELEMENT AND METHOD OF SELF TIMED CALCULATION

Stephen Lee Smith, Chandler, Ariz., assignor to Motorola, Schaumburg, Ill.

Filed Mar. 4, 1996, Ser. No. 610,775
Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—559 **24 Claims**

1. A computational array having computational elements including at least one self timed computational element comprising:
a computational unit calculating a result value based on an input value and producing a completion signal upon completion of calculating the result value;
a self timed control unit, coupled to the computational unit and receiving the completion signal from the computational unit, the self timed control unit determining whether a new result value is to be calculated based on the completion signal and producing a self timed clock signal, the self timed clock signal having a first self timed clock signal logic state when the new result value is to be calculated and a second self timed clock signal logic state when the new result value is not to be calculated; and
the computational unit calculating the new result value upon receiving the self timed clock signal having the first self timed clock signal logic state from the self timed control unit.

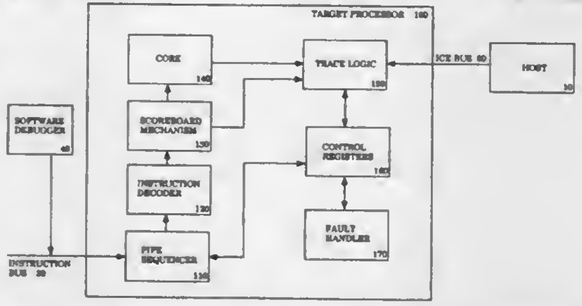


5,752,013
METHOD AND APPARATUS FOR PROVIDING PRECISE FAULT TRACING IN A SUPERSCALAR MICROPROCESSOR

Reed K. Christensen, Hillsboro, and Andre Eberhard Wolper, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1993, Ser. No. 85,508
Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—568 **30 Claims**



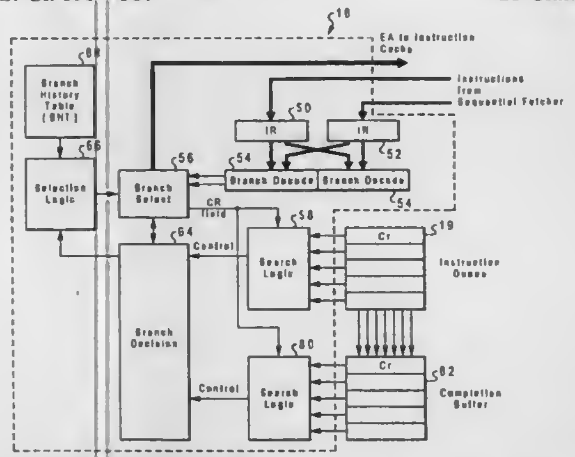
1. A method for providing precise trace faults for testing and debugging a superscalar processor, the method comprising the steps of:
grouping instructions into a cluster of instructions to be executed simultaneously by the superscalar processor;
decoding each instruction of the cluster; determining faulting instructions, if any, of the cluster of instructions, the faulting instructions being instructions having a break point for testing and debugging;
if no faulting instructions were found, simultaneously executing each instruction in the cluster;
if at least one faulting instruction was found,
  determining a break faulting instruction, the break faulting instruction being a first faulting instruction in the cluster of instructions;
  simultaneously executing the break faulting instruction and each instruction of the cluster occurring prior to the break faulting instruction.

5,752,014
AUTOMATIC SELECTION OF BRANCH PREDICTION METHODOLOGY FOR SUBSEQUENT BRANCH INSTRUCTION BASED ON OUTCOME OF PREVIOUS BRANCH PREDICTION

Soummya Mallick, Austin, and Albert John Loper, Cedar Park, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1996, Ser. No. 639,577
Int. Cl.^{6} G06F *9/32*

U.S. Cl. 395—587 **21 Claims**



1. A processor, comprising:
one or more execution units for executing instructions, said one or more execution units including a branch processing unit for executing branch instructions, said branch processing unit including:
  selection logic for selecting one of a plurality of branch prediction methodologies;
  a branch prediction unit for predicting a resolution of a conditional branch instruction utilizing said selected branch prediction methodology; and
  means for speculatively executing said branch instruction according to said prediction;
wherein said selection logic automatically selects a branch prediction methodology from said plurality of branch prediction methodologies for predicting a resolution of a subsequent conditional branch instruction in response to an outcome of said prediction.

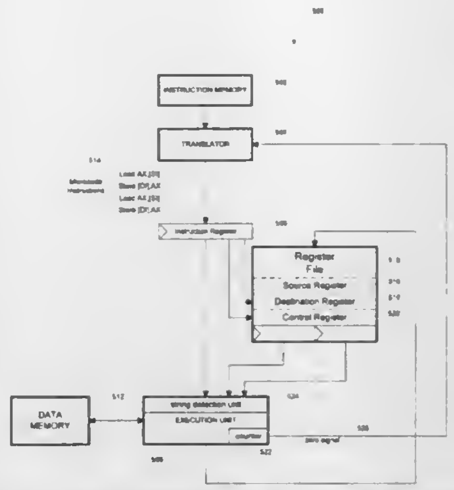
5,752,015
METHOD AND APPARATUS FOR REPETITIVE EXECUTION OF STRING INSTRUCTIONS WITHOUT BRANCH OR LOOP MICROINSTRUCTIONS

Glenn Henry, and Terry Parks, both of Austin, Tex., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Mar. 29, 1996, Ser. No. 623,657
Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—588 **9 Claims**

1. A processing system for executing instructions, including string instructions, within a computing environment, the processing system comprising:
an instruction memory for storing said string instructions;
data memory, for storing data upon which said string instructions operate:
a translator connected to said instruction memory for receiving said string instructions from said instruction memory and for generating a sequence of micro instructions for each of said string instructions,
an execution unit connected to said translator, for receiving said sequence of micro instructions from said translator and for executing said micro instructions; and
a counter, connected to said translator and to said execution unit for storing a count value associated with the number of times said sequence of micro instructions is to be executed for each of said string instructions for counting said number of times said sequence of micro instructions is executed, and for providing a signal indicative that said counted number of times equals said stored number of times,
wherein said sequence of micro instructions generated by said translator contain information indicating that said micro instructions are associated with said string instructions.



5,752,016
METHOD AND APPARATUS FOR DATABASE INTERROGATION USING A USER-DEFINED TABLE

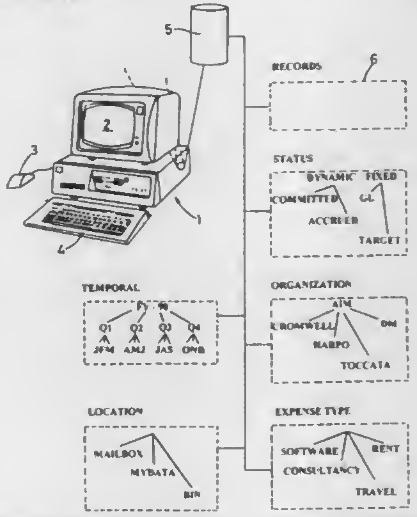
Stephen Whittaker, Bristol; Keith Harrison, Gwent; Philip Stenton, Gloucestershire, all of Great Britain; Derek Proudian, Moss Beach, Calif., and Nicholas Haddock, Bristol, Great Britain, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 761,961, Mar. 30, 1992, abandoned. This application Apr. 25, 1995, Ser. No. 428,397

Claims priority, application United Kingdom, Feb. 8, 1990, 9002874; Feb. 8, 1990, 9002876; Jan. 3, 1991, 9002876

Int. Cl.^{6} G06F *17/30*

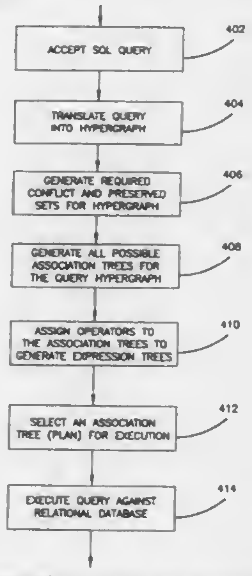
U.S. Cl. 395—600 **25 Claims**



1. A method of interrogation of a computer database, the database having a number of records and a number of dimensions in which each of said records is represented, each dimension comprising a range of possible values, the dimensions including headings denoting value sets in the range of possible values for the respective dimension and the method comprising the steps of:
displaying a blank elementary select table and a plurality of user-selectable row and column headings;
adding a plurality of user-selectable row headings and a plurality of user-selectable column headings for the table from those available in the dimensions so as to specify value sets, thereby defining a plurality of rows and a plurality of columns and empty cells at the crossings of the rows and columns; and

executing a database search program which searches said computer database using the value sets of the row and column headings for each of said empty cells and fills in each respective empty cell with data from said computer database corresponding to an intersection of the value sets of the row and column headings for said respective empty cell.

5,752,017
METHOD AND APPARATUS FOR EXECUTING COMPLEX SQL QUERIES USING PROJECTION OPERATIONS
Gautam Bhargava, Cupertino; Piyush Goel, Monte Sereno, and Balakrishna Ragmavendra Iyer, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 326,461, Oct. 20, 1994, Pat. No. 5,680,603. This application Jun. 5, 1995, Ser. No. 468,647
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—602 **3 Claims**


ACCEPT SQL QUERY
402
TRANSLATE QUERY INTO HYPERGRAPH
404
GENERATE REQUIRED CONFLICT AND PRESERVED SETS FOR HYPERGRAPH
406
GENERATE ALL POSSIBLE ASSOCIATION TREES FOR THE QUERY HYPERGRAPH
408
ASSIGN OPERATORS TO THE ASSOCIATION TREES TO GENERATE EXPRESSION TREES
410
SELECT AN ASSOCIATION TREE (PLAN) FOR EXECUTION
412
EXECUTE QUERY AGAINST RELATIONAL DATABASE
414

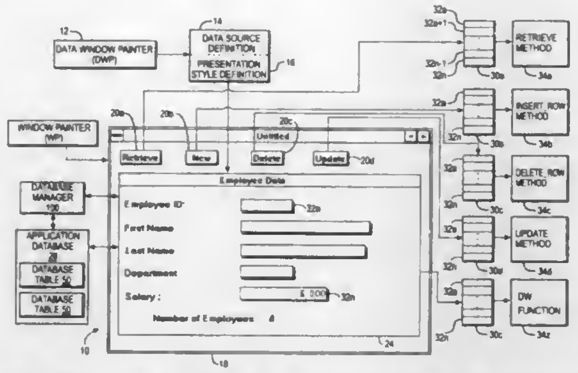
1. A method of executing a query in a computer, comprising the steps of:

(a) accepting a query into the computer; and

(b) performing a projection operation in the query, wherein the projection operation allows a choice in the selection among a plurality of virtual attributes from a source expression of the projection operation.

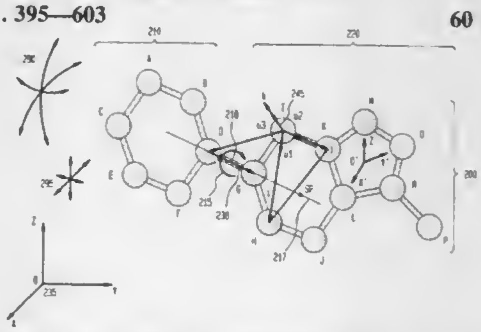
5,752,018
BUFFERED DATABASE TABLE INTERFACE OBJECT SYSTEM
Kim A. Sheffield, Groton, Mass., assignor to Powersoft Corporation, Concord, Mass.
Continuation of Ser. No. 393,049, Feb. 23, 1995, Pat. No. 5,566,330, which is a continuation of Ser. No. 747,858, Aug. 20, 1991, abandoned. This application May 22, 1996, Ser. No. 652,731
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—602 **7 Claims**

1. A database interface to an application database table containing data elements to be presented to a user via said database interface, the interface executable by a computer and comprising:
- a data window object tailored, without access to source code of said data window object to said database table by defining:
- a plurality of visual presentation attributes that determine a display manner of a data window for display of data elements of said database table, and
- data definition attributes that define both type and value validity criteria of said data elements,



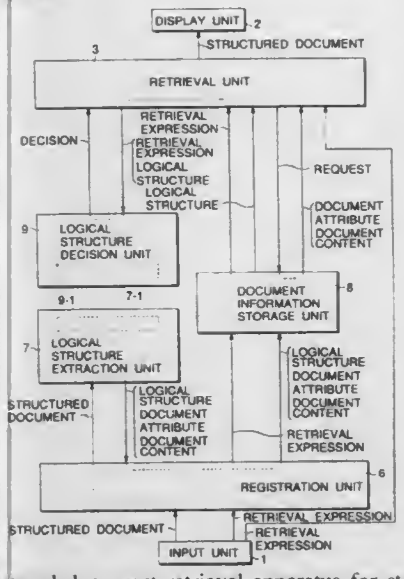
said data window object comprising means for indirectly manipulating said data elements by:
- retrieving said data elements from said application database table into a memory buffer and presenting said data elements in said defined display manner;
- receiving from a user of said interface commands for altering the retrieved data elements in said memory buffer; and
- automatically generating database statements to apply results of said indirect manipulation from said data elements in said memory buffer to said application database table.

5,752,019
SYSTEM AND METHOD FOR CONFIRMATIONALLY-FLEXIBLE MOLECULAR IDENTIFICATION
Isidore Rigoutsos, Long Island City, and Andrea Califano, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1995, Ser. No. 577,759
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—603 **60 Claims**



1. A method for storing a representation of one or more reference molecules in a memory in a computer system, the method executed on a computer system and comprising the steps of:
- a. identifying either one or more rigid substructures of the reference molecule, each of the rigid substructures having one or more atomic sites, each of the atomic sites being connected to zero or more atomic sites in the rigid substructure with a non-rotatable bond, each rigid substructure having a global position and a global orientation in a global coordinate frame;
- b. defining a vector with a magnitude and direction with a fixed position and orientation with respect to the rigid substructure;
- c. selecting a set of three or more sites, the set of sites forming a frame tuple, at least one of the sites being non-colinear with the remaining sites, the sites being in a fixed position with respect to the rigid substructure, and the frame tuple defining a three-dimensional skewed local coordinate frame;
- d. selecting one or more of the frame tuples and generating a frame tuple field with information associated with each of the selected frame tuples; and
- e. storing a record in a data structure, the data structure having a plurality of records, each record containing the frame tuple field and a vector field, the vector field containing vector information relating to the vector as well as information about the identities of the molecule and rigid substructure having the sites forming the frame tuple.

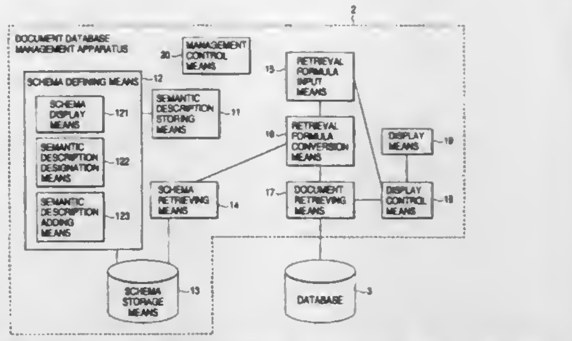
5,752,020
STRUCTURED DOCUMENT RETRIEVAL SYSTEM
Toshiaki Ando, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 295,002, Aug. 24, 1994, abandoned. This application Jan. 23, 1997, Ser. No. 785,282
Claims priority, application Japan, Aug. 25, 1993, 5-232455
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—604 **4 Claims**



1. A structured document retrieval apparatus for storing structured documents and for retrieving the stored documents in accordance with a retrieval expression, each of said structured documents comprising a plurality of components and logical structures therebetween that define a hierarchical relationship between components, said apparatus comprising:
- a registration unit for conducting a preprocess for storing a structured document received from an input unit;
- a logical structure extraction unit for incorporating knowledge of the logical structures of the structured documents, and for extracting a select logical structure, a document attribute, and a document content from the structured documents in accordance with the knowledge of the logical structures;
- a document information storage unit for storing the extracted logical structure, document attribute, and document content while grouping them by kind;
- a logical structure decision unit for incorporating knowledge of logical structures of the structured documents, and for deciding whether or not a logical structure read out from said document information storage unit coincides with a logical structure written in the retrieval expression; and
- a retrieval unit for conducting a retrieval by reading out from said document information storage unit only information which is an ultimate retrieval object of a structured document in which the logical structure coincides with that of the retrieval expression, for rearranging a structured document obtained from the retrieval, and for outputting the rearranged structured document.

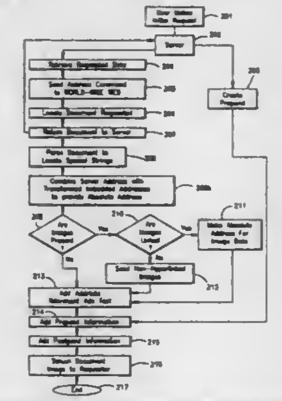
5,752,021
DOCUMENT DATABASE MANAGEMENT APPARATUS CAPABLE OF CONVERSION BETWEEN RETRIEVAL FORMULAE FOR DIFFERENT SCHEMATA
Hisashi Nakatsuyama; Yo Okumura, and Go Uchida, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 18, 1995, Ser. No. 443,751
Claims priority, application Japan, May 24, 1994, 6-132504
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—605 **4 Claims**

1. A document database management apparatus for managing documents of a plurality of document types, each document type


DOCUMENT DATABASE MANAGEMENT APPARATUS
MANAGEMENT CONTROL MEANS
SCHEMA DEFINING MEANS
SCHEMA DISPLAY MEANS
SEMANTIC DESCRIPTION DESIGNATION MEANS
SEMANTIC DESCRIPTION ADDING MEANS
SEMANTIC DESCRIPTION STORING MEANS
RETRIEVAL FORMULA INPUT MEANS
RETRIEVAL FORMULA CONVERSION MEANS
SCHEMA RETRIEVING MEANS
DOCUMENT RETRIEVING MEANS
DISPLAY MEANS
DISPLAY CONTROL MEANS
SCHEMA STORAGE MEANS
DATABASE

comprising a plurality of document components, the database managing apparatus comprising:
- means for storing semantic descriptions that represent meanings of the document components;
- means for associating the semantic descriptions stored in the semantic description storing means to the document components;
- means for storing a schema definition for each of the plurality of document types, each said schema definition including an indication of the document type, the document components of the document type, and the semantic descriptions associated with the document components of the document type; and
- means for accessing a database by using the schema definitions to determine corresponding document components of different document types.

5,752,022
METHOD FOR CREATING A HYPERTEXT LANGUAGE FOR A DISTRIBUTED COMPUTER NETWORK
Suet Mui Chiu, San Jose; Michael Jon Dockter, Hollister; Joel Frank Farber, San Jose; Michael Leon Pauser, Morgan Hill, and Randal James Richardt, San Jose, all of Calif., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Aug. 7, 1995, Ser. No. 512,205
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—610 **18 Claims**



1. A system for processing existing hypertext links in a computerized network comprising:
- a server which intercepts a first document request before it reaches said computerized network and generates a second request;
- a filter which searches for imbedded strings in a document returned to said server pursuant to said second request;
- an address modifying function to operatively connect an address of said server to said imbedded strings;
- an appending function to append data to said document;
- a transferring function which transmits said document with its appended data and modified imbedded strings to complete said first request, and
- wherein said returned document appears to a requester unmodified but retains said appended data.

5,752,023

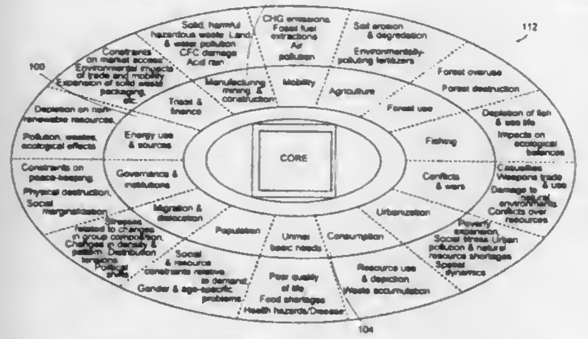
NETWORKED DATABASE SYSTEM FOR GEOGRAPHICALLY DISPERSED GLOBAL SUSTAINABILITY DATA

Nazli Choucri, Chestnut Hill, Mass., and Juliana Kousoum, Chantilly, Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 24, 1996, Ser. No. 637,074

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—610 **12 Claims**



1. A computer implemented method for facilitating the storage of data and the communication of information among a plurality of geographically separated entities working to solve problems related to global sustainability, said method comprising the steps of:

organizing data relating to said global sustainability problems into a plurality of hierarchies of interrelated subproblems of said global sustainability problems stored on media on a plurality of computer systems interconnected by a plurality of communications links, each subproblem of said hierarchies belonging to a category and having at least one topic and one concept;

defining the connectivities between data among and within said hierarchies of interrelated subproblems stored on media on said plurality of computer systems;

providing a mapping between the data related to each of said subproblem and said computer systems of said plurality of computer systems storing said data;

providing access, for each of said plurality of entities, to the data within any of said subproblems stored on media on any of said plurality of computer systems by said plurality of said computer systems in response to said mapping;

providing access to data and information in any of said plurality of hierarchies of interrelated subproblems on any of said computer systems of said plurality of computer systems from any of said subproblems according to said defined connectivities and in response to said mapping;

permitting the exchange of information relating to global sustainability among said plurality of entities

permitting said data and information related to global sustainability stored on media on said plurality of computer systems to be updated by selected ones of said plurality of entities in response to said communication of information relating to global sustainability among said plurality of geographically separated entities.

5,752,024

Patent Not Issued For This Number

5,752,025

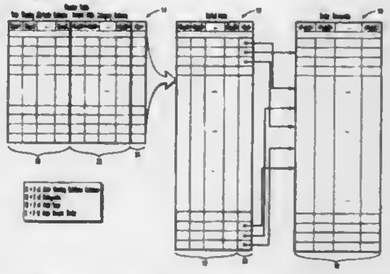
METHOD, COMPUTER PROGRAM PRODUCT, AND SYSTEM FOR CREATING AND DISPLAYING A CATEGORIZATION TABLE

Darren Arthur Shakib, Redmond; William H. Rockenbeck, Woodinville; Max Loell Benson, Redmond, and Milind Madhukar Joshi, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jul. 12, 1996, Ser. No. 679,052

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—613 **26 Claims**



1. In a computer system comprising a CPU, an input/output means connected to the CPU, a storage system accessible to the CPU containing a collection of data records, and a display means, a method for creating and displaying a categorization table having N different levels of categories, the categorization table categorizing a quantity of data records sorted by at least N different data record fields, using values of each category level to form category headings, and listing information representing data records associated with the category level headings according to category value and hierarchy, the method comprising the steps of:

the CPU creating a header table in the storage system having N category columns and a count column, the header table comprising a plurality of header rows, each header row having i) a unique combination of category column values with each category column value corresponding to a data record field value, and ii) a count value indicating the number of data records identified by the unique combination of category column values; and

the CPU traversing the header table to access the desired sorted data records and heading information in the desired order from the storage system and displaying the categorization table on the display means.

5,752,026

EARLY COMMIT LOCKING COMPUTER DATABASE PROTOCOL

Paul J. Fortier, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1994, Ser. No. 238,045

Int. Cl.^{6} G06F *17/30; 17/60*

U.S. Cl. 395—614 **5 Claims**

1. A computer database method comprising the steps of:

organizing data items into atomic data sets;

breaking down each transaction containing a plurality of statements operating on said data items into at least one projection having statements which operate on only one said atomic data set;

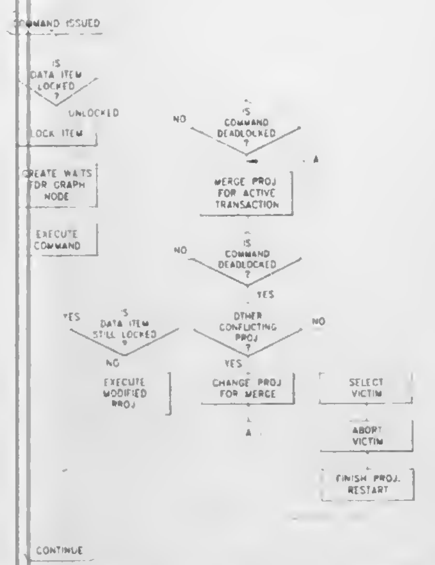
issuing commands by said projections, said commands comprising read commands, write commands, and projection delimiting commands;

allowing multiple transactions to access said atomic data set;

detecting preexisting locking for a data item upon issuance of either a read command or a write command;

locking said data items from said atomic data set upon issuance of either a read command or a write command when no preexisting lock is detected;

unlocking said data items from said atomic data set upon completion of the projection issuing said locking command;



determining the existence of a deadlock and related projections in the current transaction when a preexisting lock on said data item is detected;

delaying execution of said issued command until said preexisting lock is unlocked;

merging said related projections in said current transaction upon determination that said deadlock exists;

executing said transaction with said merged projections in said current transaction;

determining the existence of a deadlock and related projections in the other transactions when a preexisting lock on said data item is detected after merging said related projections in said current transaction;

merging said related projections in said other transaction upon determination that said deadlock exists;

executing said transaction with said merged projections in said current transaction and in said other transactions;

determining the existence of a deadlock when a preexisting lock on said data item is detected after merging said projections in said other transactions;

choosing a victim projection for abort after determining that a deadlock exists after merging said projections in said other transactions; and

aborting execution of said victim projection.

5,752,027

APPARATUS AND PROCESS FOR CREATING AND ACCESSING A DATABASE CENTRIC OBJECT

Robert F. Familiar, Sudbury, Mass., assignor to Dun & Bradstreet Software Services, Inc., Atlanta, Ga.

Filed Nov. 30, 1994, Ser. No. 347,584

Int. Cl.^{6} G06F *17/30*

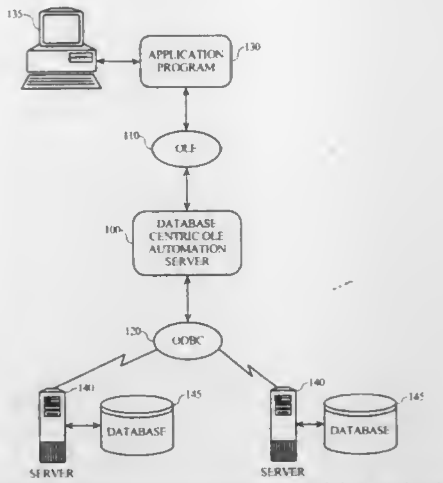
U.S. Cl. 395—614 **52 Claims**

1. In a computer system, an apparatus for interfacing an application program and a relational database including a plurality of tables, the apparatus comprising:

(a) a database centric object including a method, said method performing an operation on data within the tables of the relational database;

(b) means for receiving an object identifying signal from the application program;

(c) means for receiving a method identifying signal from the application program; and



(d) means responsive to said object identifying and said method identifying signals for executing said operation on data within the relational database.

5,752,028

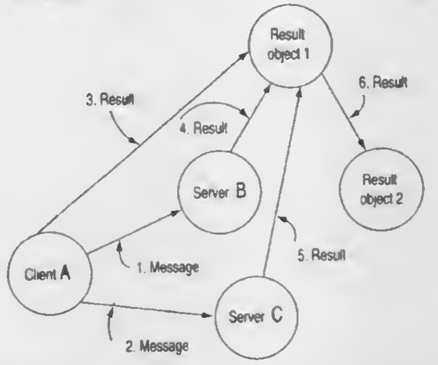
OBJECT-ORIENTED QUERY MECHANISM

Bruce Arthur Ellacott, 51 Waverley Street, Ottawa, Ontario, Canada, K2P 0T7

Filed Apr. 3, 1996, Ser. No. 627,197

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—614 **10 Claims**



1. A method of query processing in a database wherein data is sought to be retrieved and combined using at least two objects, which comprises;

(A) sending at least one message from a first object to at least one second object within the database, said message specifying criteria for a join.

(B) said message being acted upon by the method of the second object to form at least one output from each second object which has some of the data sought or other potentially relevant data, each such output containing some of the data sought or data which is related or potentially related to the data sought or a pointer to such data,

(C) each said output proceeding independently either to another object so said output can be acted upon by the method of such other object to form a further output or to a results object which stores final or intermediate results, and

(D) each object which has sent an output not awaiting replies from other objects to which its output has been sent before finishing its processing.

5,752,029

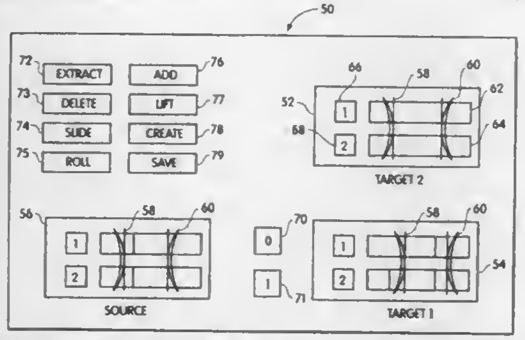
METHOD AND APPARATUS FOR REPRESENTING AND EDITING MULTIMEDIA COMPOSITIONS USING REFERENCES TO TRACKS IN THE COMPOSITION TO DEFINE COMPONENTS OF THE COMPOSITION

Michael J. Wissner, Boston, Mass., assignor to Avid Technology, Inc., Tewksbury, Mass.

Division of Ser. No. 415,091, Mar. 31, 1995, which is a continuation of Ser. No. 236,244, Apr. 21, 1994, abandoned, which is a continuation of Ser. No. 920,260, Jul. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 867,133, Apr. 10, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 465,812

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—615 **7 Claims**



1. A computer-readable medium containing computer-readable logic defining a data structure stored thereon for representing a multimedia composition and for access by an application program being executed on a data processing system, the data structure comprising:

a first track group of a plurality of tracks of the multimedia composition, wherein each track is defined as a sequence of components sequentially related in time, wherein each component is associated with content defined by one or more temporal samples of media data and wherein all tracks are displayed concurrently beginning at a common time; and

wherein content of a selected component of the sequence of components defining one track of the plurality of tracks in the first track group is defined by a track reference, wherein the track reference has a time value with reference to the common time and an indication of another track of the plurality of tracks in the track group and a duration starting from the specified time, wherein the specified time and the duration are used by the application program to identify one or more components in the other track, wherein the content associated with the identified components is used to define the content of the selected component.

5,752,030

PROGRAM EXECUTION CONTROL IN PARALLEL PROCESSOR SYSTEM FOR PARALLEL EXECUTION OF PLURAL JOBS BY SELECTED NUMBER OF PROCESSORS

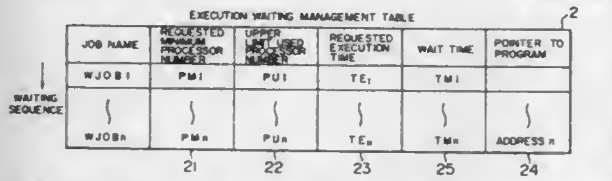
Chisato Konno, Inagi, and Toshio Okochi, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1993, Ser. No. 101,993

Claims priority, application Japan, Aug. 10, 1992, 4-212578

Int. Cl.^{6} G06F *9/40;15/16*

U.S. Cl. 395—672 **6 Claims**


EXECUTION WAITING MANAGEMENT TABLE
2
WAITING SEQUENCE
21
22
23
25
24

JOB NAME	REQUESTED MINIMUM PROCESSOR NUMBER	UPPER LIMIT USED PROCESSOR NUMBER	REQUESTED EXECUTION TIME	WAIT TIME	POINTER TO PROGRAM
WJOB1	PM1	PU1	TE_1	TM1	
⌇	⌇	⌇	⌇	⌇	⌇
WJOBn	PMn	PUn	TE_n	TMn	ADDRESS n

1. A job execution control method in a parallel processor system provided with a plurality of processors, comprising the steps of:

(a) storing, for each of a plurality of jobs waiting for execution thereof in the parallel processor system,
  a requested processor number which is designated with respect to that job and which represents a requested minimum processor number required for executing said each job,
  an upper limit used processor number representative of an upper limit number of processors to be used for each of the execution waiting jobs, and
  a requested execution time which represents a maximum job execution time when that job is executed by processors equal in number to the requested processor number stored for that job;

(b) judging, at a point of time when some idle processors are generated, whether or not the requested processor number stored for an earliest one of the plurality of execution waiting jobs for which a request for execution is issued earliest is not larger than the total number of generated idle processors;

(c) assigning processors not smaller in number than the requested processor number and not larger than the upper limit used processor number stored for the earliest job, to the earliest job to activate the earliest job in the case where said judging in said step (b) is that the requested processor number stored for the earliest job is not larger than the total number of generated idle processors;

(d) predicting an instant of time of completion of each of one or plural jobs under execution on the basis of a requested execution time stored for that job and an instant of time of start of execution of that job, where said judging in said step (b) is that the requested processor number stored for the earliest job is larger than the total number of generated idle processors by determining a corrected requested execution time representative of the maximum execution time of each job under execution when that job is executed by processors equal in number to not the requested processor stored for that job, but a processor number assigned to that job, on the basis of the requested minimum processor number stored for that job, the processor number assigned to that job and the requested execution time stored for that job;

(e) predicting a time of lapse from a present instant of time to a time when a generation of idle processors is not smaller in number than the requested processor number stored for the earliest job on the basis of a predicted completion time instant of each job under execution;

(f) judging, which of the earliest job and one of jobs subsequent to the earliest job should be activated preferentially for improved system throughput, on the basis of at least the predicted lapse time;

(g) waiting for the generation of idle processors not smaller in number than the requested processor number stored for the earliest job where said judging in said step (f) is that the earliest job should be activated preferentially;

(h) performing said steps (b) and (c) for the subsequent job where said judging in said step (f) is that the one subsequent job should be activated preferentially; and

(i) executing the jobs with the processors.

5,752,031

QUEUE OBJECT FOR CONTROLLING CONCURRENCY IN A COMPUTER SYSTEM

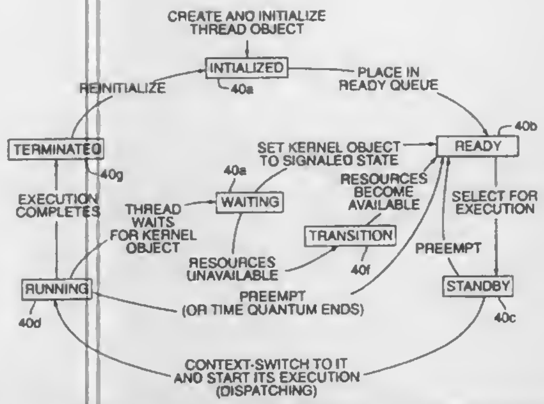
David N. Cutler, Bellevue, and Charles T. Lenzmeier, Woodinville, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 24, 1995, Ser. No. 427,007

Int. Cl.^{6} G06F *9/46*

U.S. Cl. 395—673 **26 Claims**

10. In a computer system including a microprocessor, an operating system running on said computer system, a memory device coupled to said microprocessor and accessible by said operating system, said memory device storing a plurality of queue objects, each queue object including an entry list of work entries, a plurality of waiting threads, a current concurrency level and a target concurrency level, a method of controlling the current concurrency level, comprising the steps of:


CREATE AND INITIALIZE THREAD OBJECT
INTIALIZED
40a
PLACE IN READY QUEUE
REINITIALIZE
TERMINATED
40g
READY
40b
SET KERNEL OBJECT TO SIGNALED STATE
40e
WAITING
RESOURCES BECOME AVAILABLE
SELECT FOR EXECUTION
EXECUTION COMPLETES
THREAD WAITS FOR KERNEL OBJECT
TRANSITION
PREEMPT
40f
RESOURCES UNAVAILABLE
RUNNING
40d
PREEMPT (OR TIME QUANTUM ENDS)
STANDBY
40c
CONTEXT-SWITCH TO IT AND START ITS EXECUTION (DISPATCHING)

(a) detecting a calling thread that has completed executing one of said work entries on said microprocessor and is ready to execute another one of said work entries;

(b) if the current concurrency level is less than the target concurrency level, then determining whether any of said plurality of work entries can be removed from said entry list;
  (b1) if there is not a work entry in the entry list that can be removed, then instructing said calling thread to enter a waiting state;
  (b2) otherwise:
    (i) removing a selected one of the plurality of work entries from the entry list;
    (ii) decrementing the number of work entries in the entry list;
    (iii) incrementing the current concurrency level; and
    (iv) executing said selected work entry on said microprocessor;

(c) if the current concurrency level is not less than the target concurrency level, then instructing said calling thread to enter a waiting state.

5,752,032

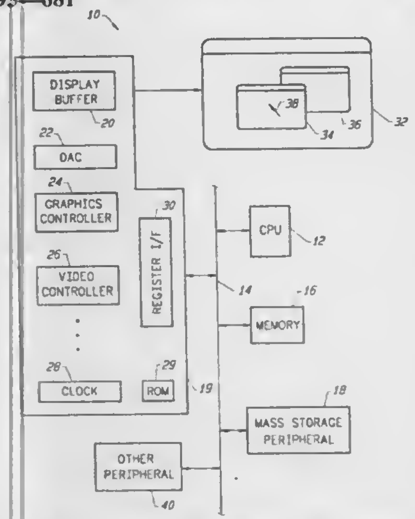
ADAPTIVE DEVICE DRIVER USING CONTROLLER HARDWARE SUB-ELEMENT IDENTIFIER

James A. Keller, Santa Clara, and Kevin J. Flory, Patterson, both of Calif., assignors to Diamond Multimedia Systems, Inc., San Jose, Calif.

Filed Nov. 21, 1995, Ser. No. 560,801

Int. Cl.^{6} G06F *13/10*

U.S. Cl. 395—681 **10 Claims**



1. A controller, operable in conjunction with an adaptively configurable device driver, comprising:

a) a plurality of sub-elements that cooperatively operate in support of a predetermined controller function, said plurality of sub-elements being provided together on a peripheral adapter coupleable to a peripheral bus of a computer system;

b) a hardware identifier provided on said peripheral adapter and readable via said peripheral bus, said hardware identifier encoding predetermined respective specific identifications of said sub-elements, whereby an adaptively configurable device driver can specifically identify each of said sub-elements and dynamically adapt the configuration of said device driver to the specific plurality of said sub-elements.

5,752,033

PROGRAMMING DEVICE FOR PROGRAMMABLE CONTROLLER, FUNCTIONAL UNIT FOR PROGRAMMABLE CONTROLLER, AND METHOD OF INPUTTING MEMORY DISPLAY FOR PROGRAMMING DEVICE

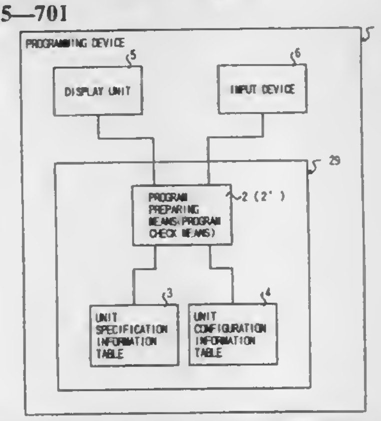
Eiichi Suda; Takayuki Nihei, and Kyoko Tanaka, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1995, Ser. No. 439,765

Claims priority, application Japan, May 26, 1994, 6-101373

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—701 **12 Claims**


1
PROGRAMMING DEVICE
5
DISPLAY UNIT
6
INPUT DEVICE
29
PROGRAM PREPARING MEANS(PROGRAM CHECK MEANS)
2 (2')
3
UNIT SPECIFICATION INFORMATION TABLE
4
UNIT CONFIGURATION INFORMATION TABLE

1. A programming device for a programmable controller comprising:

a CPU unit controlling a program;

functional units having a bidirectional memory accessible from said CPU unit and providing specific controls according to instructions from said CPU unit;

a unit specification information section in which specifications of each of said functional units are set;

a unit configuration information section in which configurations of said functional units are set; and

a program preparing means comprising means responsive to user input to cause a CRT to display a selection menu containing configuration information and specification information, and for decoding a user selection from said menu to obtain a program code corresponding to said selection and to display said program code at a code entry Position on said CRT.

5,752,034

APPARATUS AND METHOD FOR PROVIDING AN EVENT DETECTION NOTIFICATION SERVICE VIA AN IN-LINE WRAPPER SENTRY FOR A PROGRAMMING LANGUAGE

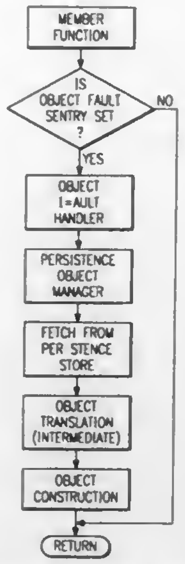
Aditya Srivastava, Dallas; José A. Blakeley; Stephen J. Ford, both of Plano; Moira Mallison, Dallas; Craig W. Thompson, Plano, and David L. Wells, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 6,061, Jan. 15, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 304,980

Int. Cl.^{6} G06F *19/00*

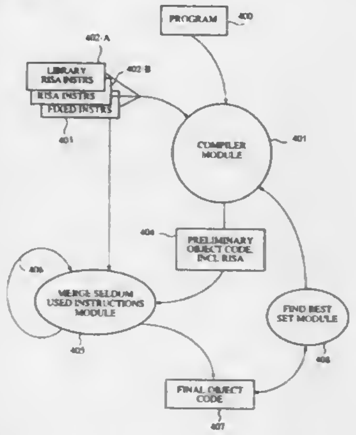
U.S. Cl. 395—704 **34 Claims**

1. A computer implemented method for event detection to detect an event and notification, comprising the steps of:


MEMBER FUNCTION
IS OBJECT FAULT SENTRY SET ?
NO
YES
OBJECT 1=AULT HANDLER
PERSISTENCE OBJECT MANAGER
FETCH FROM PER STENCE STORE
OBJECT TRANSLATION (INTERMEDIATE)
OBJECT CONSTRUCTION
RETURN

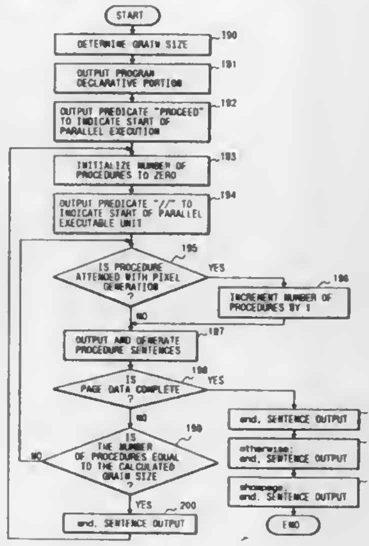
searching a programming language including a function for a section of said function;
inserting a sentry in said function so as to set a trap for said event detection:
compiling said programming language to form executable code;
executing said executable code and said trap to detect said event.

5,752,035
METHOD FOR COMPILING AND EXECUTING PROGRAMS FOR REPROGRAMMABLE INSTRUCTION SET ACCELERATOR
Stephen M. Trimberger, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.
Continuation-in-part of Ser. No. 417,337, Apr. 5, 1995. This application Jun. 7, 1995, Ser. No. 484,251
Int. Cl.^{6} G06F *9/44;15/76*
U.S. Cl. 395—705 **16 Claims**



1. A method for translating a computer program to executable code, comprising:
providing a library including defined instructions executable by a defined execution unit, and including programmed instructions executable by a configurable execution unit configured for execution of the programmed instructions; and
compiling the program using both defined and programmed instructions from the library to produce an executable version of the program.

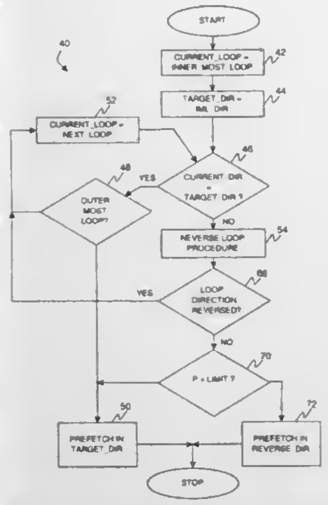
5,752,036
APPARATUS FOR GENERATING A PROGRAM FOR PARALLEL PROCESSING
Eri Nakamura, and Fumio Nagasaka, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 5, 1994, Ser. No. 318,448
Claims priority, application Japan, Oct. 5, 1993, 5-249575; Oct. 5, 1993, 5-249577
Int. Cl.^{6} G06F *9/44*
U.S. Cl. 395—706 **12 Claims**


START
DETERMINE GRAIN SIZE
190
OUTPUT PROGRAM DECLARATIVE PORTION
191
OUTPUT PREDICATE "PROCEED" TO INDICATE START OF PARALLEL EXECUTION
192
INITIALIZE NUMBER OF PROCEDURES TO ZERO
193
OUTPUT PREDICATE "//" TO INDICATE START OF PARALLEL EXECUTABLE UNIT
194
195
IS PROCEDURE ATTENDED WITH PIXEL GENERATION ?
YES
INCREMENT NUMBER OF PROCEDURES BY 1
196
NO
OUTPUT AND GENERATE PROCEDURE SENTENCES
197
198
IS PAGE DATA COMPLETE ?
YES
NO
199
IS THE NUMBER OF PROCEDURES EQUAL TO THE CALCULATED GRAIN SIZE ?
NO
YES
200
end. SENTENCE OUTPUT
201
end. SENTENCE OUTPUT
202
otherwise; end. SENTENCE OUTPUT
203
showpage. end. SENTENCE OUTPUT
END

1. In an apparatus for generating a source code expressing a series of image processing procedures for image formation, a program generating apparatus comprising:
an independent procedure detection means for detecting independently executable image processing procedures from said series of image processing procedures;
a procedure counting means for counting a number of said independently executable image processing procedures detected;
a procedure set extraction means for extracting a set of procedures constituted by a suitable number of said independently executable image processing procedures as a grain size of a parallel processing unit from said series of image processing procedures on the basis of an output of said counting means; and
a parallel sentence structure generation means for generating a sentence structure of a source code which expresses that said extracted set of procedures forms one parallel processing unit.

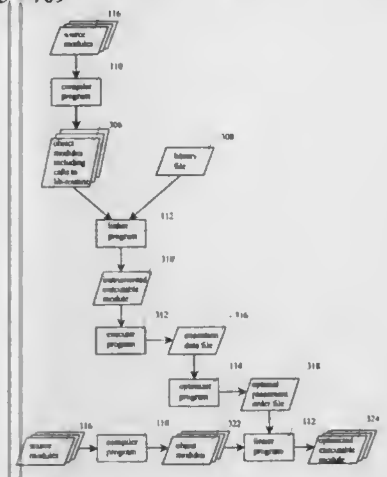
5,752,037
METHOD OF PREFETCHING DATA FOR REFERENCES WITH MULTIPLE STRIDE DIRECTIONS
Edward H. Gornish, Palo Alto; Anne M. Holler, San Jose, and Wei Chung Hsu, Cupertino, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 26, 1996, Ser. No. 639,134
Int. Cl.^{6} G06F *9/45*
U.S. Cl. 395—709 **20 Claims**

1. A method of prefetching data elements having multiple strides for a data reference at an inner loop of a nested loop structure, the method comprising the steps of:
determining a direction of an inner loop;
determining a direction of an outer loop, the inner loop being nested inside the outer loop;
identifying a data reference within the inner loop, the data reference having strides determined by the directions of the inner and outer loop;



reversing the direction of one of the loops so that both loops have the same direction if the direction of the inner loop is different than the direction of the outer loop; and
prefetching a data element in the common direction of the loops.

5,752,038
METHOD AND SYSTEM FOR DETERMINING AN OPTIMAL PLACEMENT ORDER FOR CODE PORTIONS WITHIN A MODULE
Russ Blake, Carnation; M. Reza Baghai, Redmond, and Lee A. Smith, Seattle, all of Wash., assignors to Microsoft Corporation, Redmind, Wash.
Continuation of Ser. No. 214,642, Mar. 16, 1994, abandoned. This application Jul. 17, 1997, Ser. No. 903,323
Int. Cl.^{6} G06F *9/45*
U.S. Cl. 395—709 **23 Claims**



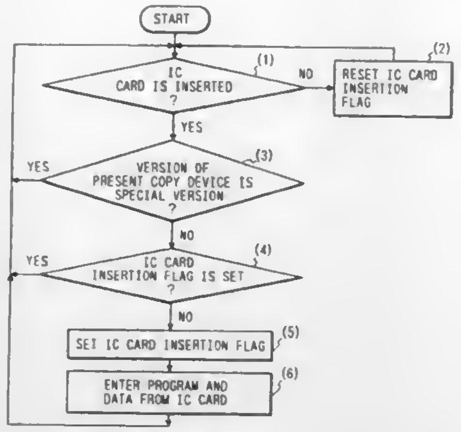
1. In a computer system, a method for ordering code portions that together non-redundantly comprise a single executable module, the method comprising the steps of:
executing the module on the computer system for a period of time;
defining within the period of time during which the module is executed a plurality of time intervals including a first and a second time interval;
during execution of the module, determining which of the code portions are invoked within the first interval and determining which of the code portions are indeed within the second time interval; and
ordering the code portions within the module so that code portions determined to be invoked within the first time interval are placed within the module in close proximity to each other relative to code portions not determined to be invoked within the first time interval and code portions determined to be invoked within the second time interval are placed in close proximity to each other relative to code portions not determined to be invoked during the second time interval.

5,752,039
EXECUTABLE FILE DIFFERENCE EXTRACTION/ UPDATE SYSTEM AND EXECUTABLE FILE DIFFERENCE EXTRACTION METHOD
Morimasa Tanimura, Tokyo, Japan, assignor to NTT Data Communications Systems Corp., Tokyo, Japan
PCT No. PCT/JP94/00454, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO94/22086, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 22, 1994, Ser. No. 343,444
Claims priority, application Japan, Mar. 22, 1993, 5-062181
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—712 **7 Claims**

1. An executable file difference extracting device for extracting an update file for use in updating an old executable file into a new executable file, the update file referring to a difference between the new executable file and the old executable file, comprising:
logic unit area dividing means for dividing each of the old executable file and the new executable file into a plurality of logic unit areas each of which has a predetermined function;
logic unit area associating means for associating each of said logic units area in the old executable file with a corresponding logic unit area in the new executable file;
difference extracting means for extracting difference information between data in the logic unit area in the old executable file and the functionally corresponding logic unit area in the new executable file associated by logic unit area associating means; and
update file generating means for storing in the update file said difference information extracted by said difference extracting means, and extracting and storing in the update file the difference information about an logic unit area in the old executable file or the new executable file not associated by said logic unit area associating means.

5,752,040
IMAGE PROCESSING APPARATUS WHICH CAN UPDATE PROGRAM
Satoshi Kaneko; Hideki Adachi; Shinichi Nakamura, all of Kawasaki; Naoyuki Ohki; Tokuharu Kaneko, both of Yokohama; Satoshi Kuroyanagi; Hiroshi Ozaki, both of Tokyo; Hisatsugu Tahara, Kawasaki; Taisei Fukada, Tokyo; Yukimasa Iseki, Kawasaki; Mitsuhiko Sato, Machida, and Mitsuharu Takizawa, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 953,024, Sep. 29, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 400,112
Claims priority, application Japan, Sep. 30, 1991, 3-276109
Int. Cl.^{6} G06F *9/44;9/445;19/00*
U.S. Cl. 395—712 **8 Claims**

1. An image forming apparatus comprising:
image forming means;
an inserting unit for inserting a storage medium which is freely attachable and detachable and in which programs to control said image forming means and version data indicating versions of the programs have been stored;
a memory to store the program and the version data which are read out from said storage medium;
loading means for loading the program and the version data stored in said storage medium into said memory; and
control means for controlling said image forming means in accordance with the program stored in said memory, wherein said control means includes discrimination means for discriminating whether the program already stored in said memory is a special version program or not on the basis of the version data already stored in said memory, and


START
IC CARD IS INSERTED ?
(1)
NO
RESET IC CARD INSERTION FLAG
(2)
YES
VERSION OF PRESENT COPY DEVICE IS SPECIAL VERSION ?
(3)
YES
NO
IC CARD INSERTION FLAG IS SET ?
(4)
YES
NO
SET IC CARD INSERTION FLAG
(5)
ENTER PROGRAM AND DATA FROM IC CARD
(6)

wherein when a new program is loaded by said loading means, said control means controls said loading means in a manner such that when said discrimination means discriminates that the program already stored in said memory is the special version program, the loading of the new program from the storage medium to said memory by said loading means is inhibited so as not to rewrite the program already stored in said memory, and when said discrimination means discriminates that the program already stored in said memory is other than the special version program, the loading of the new program from the storage medium to said memory by said loading means is permitted so as to rewrite the program already stored in said memory, and

wherein even if the program already stored in said memory is the special version program, said control means permits the loading of the new program when an instruction for erasing the special version program is input in a service mode for a serviceman.

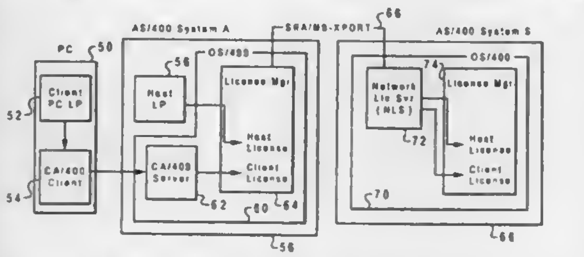
5,752,041
METHOD AND SYSTEM FOR LICENSING PROGRAM MANAGEMENT WITHIN A DISTRIBUTED DATA PROCESSING SYSTEM

Eric L. Fosdick, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1995, Ser. No. 572,816

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 395—712 **12 Claims**



1. A method for licensed program management within a distributed data processing network having a plurality of local systems which requires minimal network communication traffic, said method comprising the data processing system implemented steps of:

initially distributing a plurality of use tokens within said distributed data processing system, each of said plurality of use tokens indicative of a permitted use of a licensed program;

maintaining a local use count at each local system within said distributed data processing system, each local use count specifying the current number of permitted uses of said licensed program at an associated local system within said distributed data processing system;

periodically redistributing at least one of said plurality of use tokens to a particular system within said distributed data processing system in response to a requested usage of said licensed program at said particular system by:

requesting a use token redistribution to said particular local system within said distributed data processing system solely in response to a local use count for said particular local system being greater than or equal to the sum of a usage limit and a use token count for said particular local system;

permitting a use token redistribution from a selected local system within said distributed data processing system solely in response to said local use count for said selected local system being less than the sum of said usage limit and said use token count for said selected local system; and

maintaining said at least one of said plurality of use tokens at said particular system within said distributed data processing system upon completion of said usage of said licensed program at said particular system wherein network communication traffic in response to requests to utilize said licensed program is minimized.

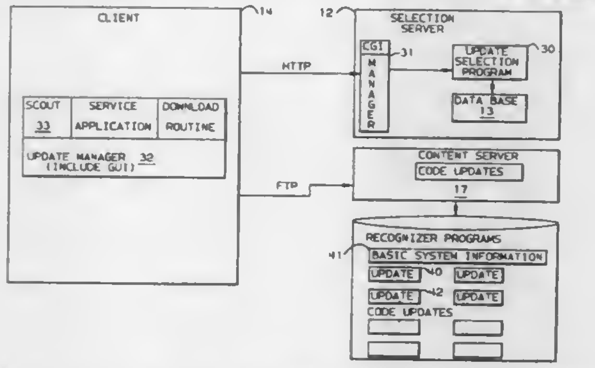
5,752,042
SERVER COMPUTER FOR SELECTING PROGRAM UPDATES FOR A CLIENT COMPUTER BASED ON RESULTS OF RECOGNIZER PROGRAM(S) FURNISHED TO THE CLIENT COMPUTER

Gary Lee Cole, Endicott; Scott Phillip Engleman, Vestal, and Steven Michael Pritko, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1996, Ser. No. 659,841

Int. Cl.^{6} G06F *15/177*

U.S. Cl. 395—712 **30 Claims**



1. A server computer for selecting code updates to download to a client computer, said server computer comprising:

means for identifying code updates which are consistent with basic system characteristics of the client computer;

means for sending to said client computer one or more programs which execute in said client computer to determine whether said client computer has a version other than a current version of the identified code updates;

means for receiving results of said programs, generating a list of code updates which are consistent with said basic system characteristics, represent current versions of code within said client computer and are not currently resident in said client computer, and transmitting said list or information about said list to said client computer; and

means for receiving selection from said client computer of one or more of the listed code updates.

5,752,043
INTERRUPT CONTROL SYSTEM PROVIDED IN A COMPUTER

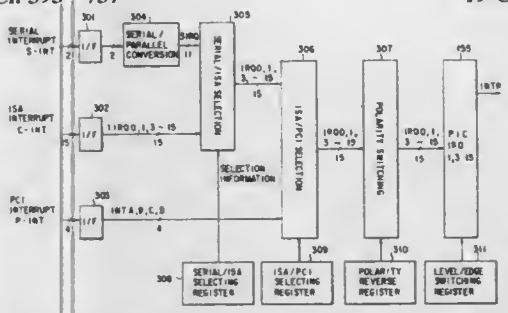
Hirotaka Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 25, 1996, Ser. No. 669,919

Claims priority, application Japan, Jun. 27, 1995, 7-160546

Int. Cl.^{6} G06F *13/32*

U.S. Cl. 395—737 **19 Claims**



1. An interrupt control system provided in a computer having a processor, a first bus each of whose lines is not given a fixed priority level and in which a low-level signal is defined as active, and a second bus each of whose lines is given a fixed priority level and in which a rising edge of a signal is defined as active, said interrupt control system comprising:

means for allocating priority levels to a plurality of interrupt request signals sent via said first bus;

means for selecting ones of said plurality of interrupt request signals allocated priority levels and a plurality of interrupt request signals sent via said second bus, for each of the same priority levels therebetween;

means for reversing polarity of ones of said plurality of interrupt request signals allocated priority levels and said plurality of interrupt request signals sent via said second bus, thereby unifying the polarity of signals; and

an interrupt controller responsive to the plurality of interrupt request signals whose polarity has been unified, for outputting interrupt requests to the processor according to the priority levels of the received signals, said interrupt controller including means for fixing sensing type for the receiving signals to one of a edge sensing type and a level sensing type.

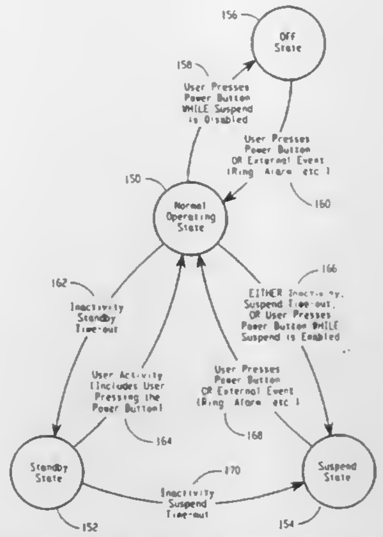
5,752,044
COMPUTER SYSTEM HAVING MULTI-LEVEL SUSPEND TIMERS TO SUSPEND FROM OPERATION IN ATTENDED AND UNATTENDED MODES

Dwayne Thomas Crump, Apex; Duane Edward Norris, and Steven Taylor Pancoast, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,857

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—750 **27 Claims**


156
Off State
158
User Presses Power Button WHILE Suspend is Disabled
User Presses Power Button OR External Event (Ring Alarm etc)
150
Normal Operating State
160
162
Inactivity Standby Time-out
166
EITHER Inactivity Suspend Time-out OR User Presses Power Button WHILE Suspend is Enabled
User Activity (Includes User Pressing the Power Button)
User Presses Power Button OR External Event (Ring Alarm etc)
164
168
Standby State
152
170
Inactivity Suspend Time-out
Suspend State
154

1. A computer system having at least two modes of power management, namely a normal operating mode in which code is executed normally by said computer system, and a suspend mode, said computer system entering said normal operating mode in one of an attended fashion and an unattended fashion, said system comprising:

(a) at least one inactivity suspend timer, said inactivity suspend timer determining the expiration of a first inactivity period of time responsive to said computer system entering said normal operating mode in the attended fashion, said inactivity suspend timer determining the expiration of a second inactivity period of time responsive to said computer system entering said normal operating mode in the unattended fashion, said first inactivity period of time being longer than said second inactivity period of time; and

(b) a control unit for actively controlling transitions of said computer system from said normal operating mode to said suspend mode in response to expiration of one of the first and second inactivity periods of time.

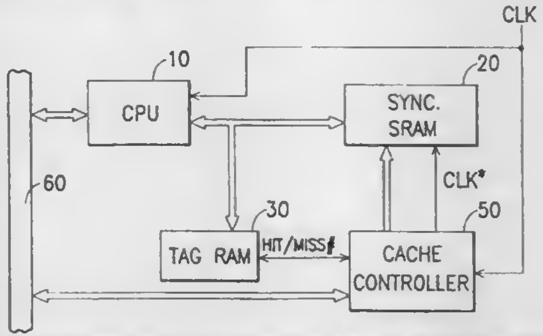
5,752,045
POWER CONSERVATION IN SYNCHRONOUS SRAM CACHE MEMORY BLOCKS OF A COMPUTER SYSTEM

David Yu Chen, Taipei, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Jul. 14, 1995, Ser. No. 502,059

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—750 **5 Claims**



1. A cache memory power conserving apparatus for controlling a plurality of cache SRAM blocks in a computer system, said computer system including a CPU, a first signal bus, said plurality of cache SRAM blocks coupled to said first signal bus, a cache controller coupled to said plurality of cache SRAM blocks, and a second signal bus coupling said CPU and said cache controller, wherein said CPU and said cache controller are driven by a same CPU clock pulse, and said cache memory power conserving apparatus is included in said cache controller and comprises:

synchronization logic coupled to said second signal bus of said CPU to monitor CPU status signals as conveyed on said second signal bus to generate a first selection signal when said CPU is in an idling cycle, and to generate a second selection signal when said CPU is in a cache hit memory access cycle; and

a multiplexer having an output coupled to said plurality of cache SRAM blocks and receiving one of said first selection signal and said second selection signal generated by said synchronization logic, wherein said multiplexer multiplexes said same CPU clock pulse to said plurality of cache SRAM blocks when said second selection signal is received from said synchronization logic, allowing for synchronized CPU access to said plurality of cache SRAM blocks, and said multiplexer multiplexes a static signal to said plurality of cache SRAM blocks when said first selection signal is received from said synchronization logic, allowing said plurality of cache SRAM blocks to remain in an idling power conserving mode.

5,752,046

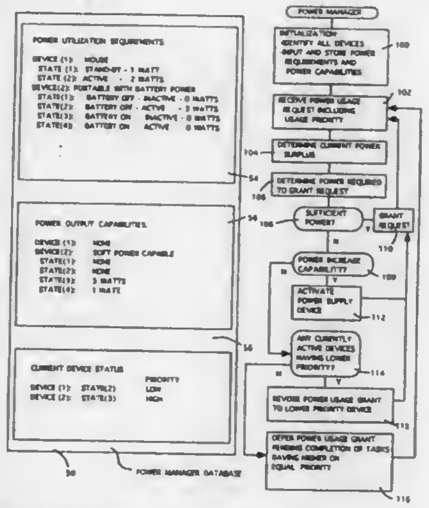
POWER MANAGEMENT SYSTEM FOR COMPUTER DEVICE INTERCONNECTION BUS

Florin Oprescu, Sunnyvale, and Michael D. Teener, Santa Cruz, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 457,044, Jun. 1, 1995, abandoned, which is a continuation of Ser. No. 5,364, Jan. 14, 1993, Pat. No. 5,483,656. This application Dec. 18, 1996, Ser. No. 769,583

Int. Cl.^{6} G06F *1/26;1/32*

U.S. Cl. 395—750.01 **19 Claims**


POWER MANAGER
INITIALIZATION: IDENTIFY ALL DEVICES INPUT AND STORE POWER REQUIREMENTS AND POWER CAPABILITIES
100
RECEIVE POWER USAGE REQUEST INCLUDING USAGE PRIORITY
102
DETERMINE CURRENT POWER SURPLUS
104
DETERMINE POWER REQUIRED TO GRANT REQUEST
106
SUFFICIENT POWER?
108
GRANT REQUEST
110
POWER INCREASE CAPABILITY?
109
ACTIVATE POWER SUPPLY DEVICE
112
ANY CURRENTLY ACTIVE DEVICES HAVING LOWER PRIORITY?
114
REVOKE POWER USAGE GRANT TO LOWER PRIORITY DEVICE
113
DEFER POWER USAGE GRANT PENDING COMPLETION OF TASKS HAVING HIGHER OR EQUAL PRIORITY
116
POWER UTILIZATION REQUIREMENTS
POWER OUTPUT CAPABILITIES
CURRENT DEVICE STATUS
54
56
50
POWER MANAGER DATABASE

1. An electronics system comprising:
an interconnection bus;
a plurality of devices coupled to the interconnection bus, each of the plurality of devices being operative to transmit power requests via the interconnection bus and at least a first device of said plurality of devices being capable of supplying power to said interconnection bus; and
a power manager receiving the power requests from the plurality of devices, said power manager further including:
  a database that contains (i) a priority level corresponding to each of the plurality of devices, (ii) power draw information on different operating states of each of the plurality of devices, and (iii) power output capabilities of at least said first device,
  a processor that grants the power requests based on the power draw information and the priority information.

5,752,047

MODULAR SOLID STATE POWER CONTROLLER WITH MICROCONTROLLER

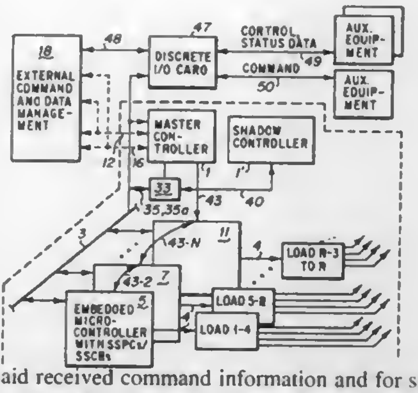
Mark Anthony Darty, Madison; Guy Brent Prickett, Grant, and Charles Raymond Schwarz, Huntsville, all of Ala., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation of Ser. No. 513,714, Aug. 11, 1995, abandoned. This application Jul. 15, 1997, Ser. No. 893,304

Int. Cl.^{6} G06F *1/26*

U.S. Cl. 395—750.01 **28 Claims**

14. In a modular power controller of the type containing a controller card, a plurality of load cards and a backplane card in which each of said controller cards and load cards are interconnected in circuit by means of said backplane card, wherein said modular power controller selectively controls the supply of electrical power to a plurality of separate electrical loads, the improvement therein wherein said controller card issues command information selectively in serial digital form onto said backplane card for each of said load cards; and wherein each said load card includes a plurality of semiconductor power switches and an embedded microprocessor, said embedded microprocessor for receiving command information in serial form transmitted from said controller card via said backplane card, for interpreting and processing said received command information and for selectively controlling the electrical state of said semiconductor power switches associated therewith responsive to said interpreted processed received information, whereby each load card individually controls a plurality of electrical load circuits.



5,752,048

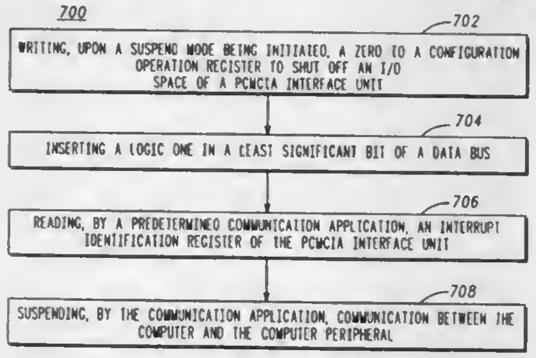
DEVICE AND METHOD FOR PROVIDING A SIMULATION OF AN IDLE UART TO PREVENT COMPUTER LOCKUP

Shawn Richard Antol, Hanover Park, and Raed Mouaffac Hafez, Lake in the Hills, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 12, 1996, Ser. No. 600,390

Int. Cl.^{6} H04M *11/00;* **H04L** *27/10;* **G06F** *1/32*

U.S. Cl. 395—750.05 **6 Claims**


700
702
WRITING, UPON A SUSPEND MODE BEING INITIATED, A ZERO TO A CONFIGURATION OPERATION REGISTER TO SHUT OFF AN I/O SPACE OF A PCMCIA INTERFACE UNIT
704
INSERTING A LOGIC ONE IN A LEAST SIGNIFICANT BIT OF A DATA BUS
706
READING, BY A PREDETERMINED COMMUNICATION APPLICATION, AN INTERRUPT IDENTIFICATION REGISTER OF THE PCMCIA INTERFACE UNIT
708
SUSPENDING, BY THE COMMUNICATION APPLICATION, COMMUNICATION BETWEEN THE COMPUTER AND THE COMPUTER PERIPHERAL

1. A device for preventing "locking up" of a computer by an operating system when a suspend mode is entered, comprising:
  A) an electrical path of a PCMCIA data bus, for carrying a signal representing a least significant data bit; and
  B) a resistor, coupled to the electrical path of the data bus and to a logic one voltage, for forcing the least significant data bit to become a logic one when all elements coupled to the data bus are in a high impedance state such that the device simulates an idle Universal Asynchronous Receiver Transmitter (UART) operably coupled to the computer thereby preventing the computer from "locking up."

5,752,049

INTEGRATED COMPUTER AND PRINTER SYSTEM AND METHOD FOR MANAGING POWER SOURCE THEREFOR

Dong-Ho Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

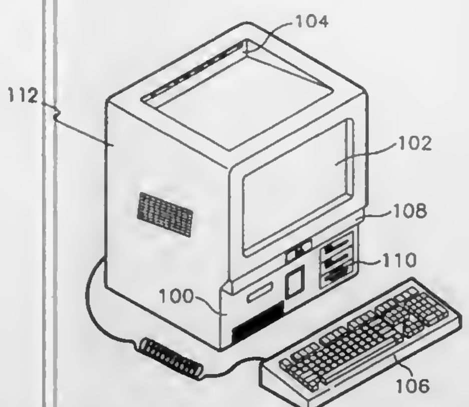
Filed Mar. 21, 1996, Ser. No. 621,183

Claims priority, application Rep. of Korea, Mar. 31, 1995, 7523/1995

Int. Cl.^{6} G06F *15/20;* **B41J** *11/58;* **H05K** *7/16*

U.S. Cl. 395—750.05 **30 Claims**

1. An integrated computer and printer system, comprising:



a unitary housing having a base joined to substantially parallel side walls, front and rear surfaces;
a back cover pivotally connected at one end of the rear surface of said unitary housing, for allowing access to an interior of said unitary housing;
a computer unit contained in, and positioned on the base of said unitary housing;
a display unit contained in, and mounted to the front of said unitary housing, said display unit being electrically connected to, and controlled by said computer unit for providing a visual display of application programs; and
a printer unit contained in, and installed at the rear of said unitary housing, said printer unit being electrically connected to, and controlled by said computer unit for performing a printing operation upon instruction by an operator, said printer unit comprising:
  a process cartridge detachably mounted on the back cover pivotally connected at one end of said unitary housing, and positioned in said unitary housing for forming images on a succession of individual sheets of recording paper upon a print command, when the back cover is closed to cover said unitary housing;
  means coupled to receive individual sheets of recording paper from a paper cassette, for conveying each individual sheet of recording paper to an image forming section in a vertical direction where said process cartridge forms images on each individual sheet of said recording paper upon said print command; and
  means for delivering each individual sheet of recording paper processed by said process cartridge to a paper discharge tray formed on a top surface of said unitary housing.

5,752,050

METHOD AND APPARATUS FOR MANAGING POWER CONSUMPTION OF EXTERNAL DEVICES FOR PERSONAL COMPUTERS USING A POWER MANAGEMENT COORDINATOR

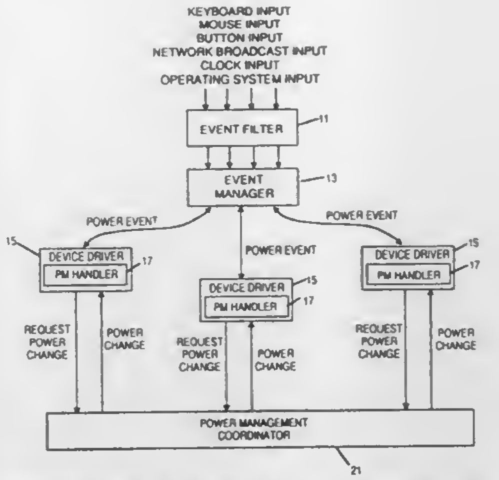
Thomas J. Hernandez, Beaverton, and Richard P. Mangold, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Carla, Calif.

Filed Oct. 4, 1994, Ser. No. 318,051

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—750.07 **31 Claims**

1. In a personal desktop computer having a CPU, on-board system devices, a display and other external devices, a system for the managing and coordinating the power consumption of said external devices comprising:
  a) event manager means for generating power events indicating that power being supplied to external devices and buses may be changed;
  b) a plurality of external devices and buses, each having an associated device driver, each of said device drivers adapted to provide power to and remove power from its associated external device;
  c) a power management handler means coupled to each of said device drivers for receiving power events generated by said event manager and generating requests for change in power requirements for its associated device or bus;
  d) power management coordination means coupled to each of said power management handler means for receiving said requests for change in power requirements from said power management handler means, determining whether each of said requested changes can be undertaken and granting the request for change if it has been determined that the requested change can be undertaken;
wherein said power management coordination means comprises:
  i) means for receiving a device power management change request from said power management handler means associated with said device;
  ii) means for determining power-up sequencing based on a hardware hierarchy of said device;
  iii) means for determining power down sequencing based on said hardware hierarchy of said device;
  iv) means for sending device power management state change grants to said power management handler means associated with said device.



5,752,051

LANGUAGE-INDEPENDENT METHOD OF GENERATING INDEX TERMS

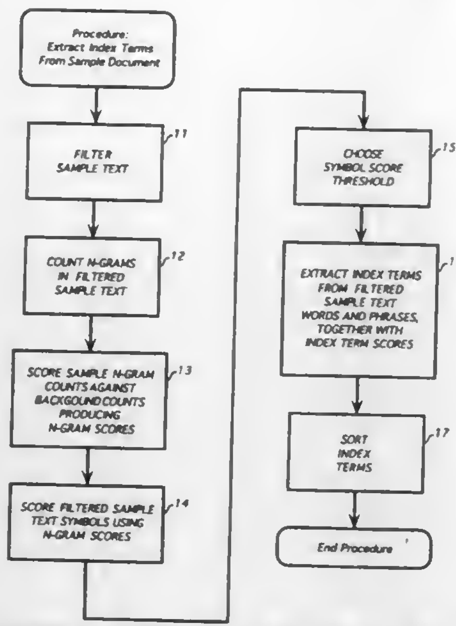
Jonathan Drew Cohen, Hanover, Md., assignor to The United States of America as represented by the Secretary of NSA, Washington, D.C.

Filed Jul. 19, 1994, Ser. No. 277,052

Int. Cl.^{6} G06F *17/21*

U.S. Cl. 395—751 **14 Claims**

1. A method of extracting index terms from sample text relative to background text, comprising the steps of
  (a) filtering the background text to remove undesired symbols, thereby to produce filtered background text;
  (b) counting the n-grams in said filtered background text to produce background n-gram counts;
  (c) filtering the sample text to remove undesired symbols, thereby to produce filtered sample text;
  (d) counting the n-grams in said filtered sample text to produce sample n-gram counts;
  (e) comparing said sample n-gram counts to said background n-gram counts to produce n-gram scores;
  (f) assigning to each symbol of said filtered sample text a symbol score derived from said n-gram scores, said symbol score being derived from the scores of the n-grams containing said symbol;
  (g) determining a symbol score threshold; and


Procedure: Extract Index Terms From Sample Document
FILTER SAMPLE TEXT
11
COUNT N-GRAMS IN FILTERED SAMPLE TEXT
12
SCORE SAMPLE N-GRAM COUNTS AGAINST BACKGOUND COUNTS PRODUCING N-GRAM SCORES
13
SCORE FILTERED SAMPLE TEXT SYMBOLS USING N-GRAM SCORES
14
CHOOSE SYMBOL SCORE THRESHOLD
15
EXTRACT INDEX TERMS FROM FILTERED SAMPLE TEXT WORDS AND PHRASES, TOGETHER WITH INDEX TERM SCORES
16
SORT INDEX TERMS
17
End Procedure

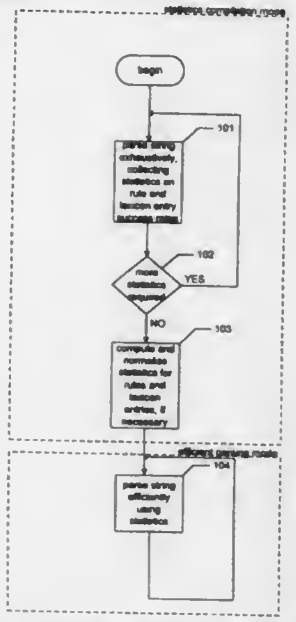
(h) extracting as index terms the words and phrases of said filtered sample text that contain symbols whose symbol scores exceed said symbol score threshold.

5,752,052

METHOD AND SYSTEM FOR BOOTSTRAPPING STATISTICAL PROCESSING INTO A RULE-BASED NATURAL LANGUAGE PARSER

Stephen Darrow Richardson, Redmond, and George E. Heidorn, Bellevue, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 24, 1994, Ser. No. 265,845
Int. Cl.^{6} G06F *17/27*
U.S. Cl. 395—759 **31 Claims**


begin
101
parse string exhaustively, collecting statistics on rule and lexicon entry success rates
102
YES
NO
103
compute and normalize statistics for rules and lexicon entries, if necessary
104
parse string efficiently using statistics

1. A method in a computer system for bootstrapping statistical processing into a rule-based parser for parsing input strings of natural language text using a set of conditioned rules, the method comprising the steps of:

(a) operating the parser such that the parser attempts to apply a subset of every applicable rule of the parser to each input string;

(b) compiling statistics indicating the likelihood of success of each rule of the parser, based on the success of each rule when applied in step (a); and

(c) operating the parser such that the parser applies at least one of the rules of the parser in descending order of the likelihood of success indicated by the statistics compiled in step (b).

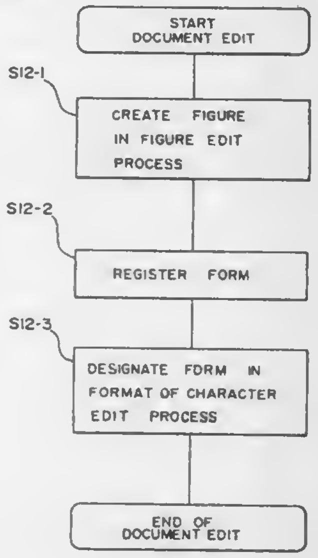
5,752,053

DOCUMENT PROCESSING APPARATUS FOR PROCESSING A DOCUMENT AND ASSOCIATED FORMAT INFORMATION

Hiroshi Takakura, Yokohama; Satoshi Ishihara, Sagamihara, and Keiko Yasuda, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 878, Jan. 5, 1993, abandoned, which is a division of Ser. No. 782,767, Oct. 22, 1991, Pat. No. 5,208,905, which is a continuation of Ser. No. 270,647, Nov. 14, 1988, abandoned. This application May 18, 1995, Ser. No. 444,359

Claims priority, application Japan, Nov. 16, 1987, 62-289141; Nov. 16, 1987, 62-289142; Nov. 16, 1987, 62-289143
Int. Cl.^{6} G06T *1/00*
U.S. Cl. 395—766 **8 Claims**


START DOCUMENT EDIT
S12-1
CREATE FIGURE IN FIGURE EDIT PROCESS
S12-2
REGISTER FORM
S12-3
DESIGNATE FORM IN FORMAT OF CHARACTER EDIT PROCESS
END OF DOCUMENT EDIT

1. A document processing apparatus comprising:

form data memory means for storing form data representing a display pattern in response to an instruction from instruction means for registering generated figure data generated by generating means as a form;

data memory means for storing character data and figure data managed on a page unit basis by managing means based on format information including form designation information which designates the form data stored in said form data memory means;

display control means for controlling a display device to display the character data and the figure data in a format based on the format information and the form data stored in said form data memory means, the form data being determined by the form designation information included in the format information, said display control means controlling the display device to display a common menu for selection of either one of the character data and the figure data;

editing means for editing the character data displayed on the display device in response to selection of one of the instructions included in a character input main menu which is displayed in response to selection of the character data in the common menu; and

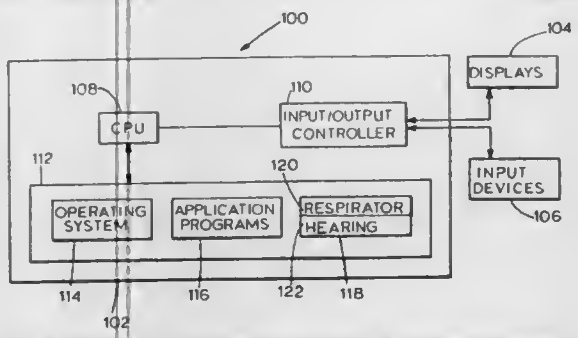
memory control means for controlling said data memory means to update the stored character data in response to the editing of the character data performed by said editing means.

5,752,054

SYSTEM AND METHOD FOR DEVELOPING AND/OR MAINTAINING MULTIPLE WORKPLACE PROTECTION PROGRAMS

Sharon R. Garber, Crystal; Rena H. Glaser, St. Paul, and Carolyn M. Cary, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1995, Ser. No. 471,725
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—767 **71 Claims**



21. A method of developing workplace protection programs, the method comprising the steps, performed by a data processing system, of:

(a) executing first program code to display a first workplace protection program to a user on a computer display;

(b) executing second program code to display a second workplace protection program to the user on a computer display; and,

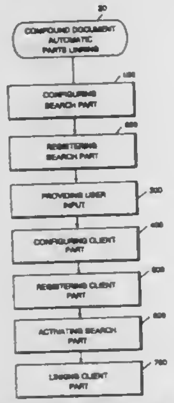
(c) executing third program code to prompt creation by the user of records and to store the records in memory of a computer, wherein the records relate to the first and second workplace protection programs.

5,752,055

SYSTEMS AND METHOD FOR AUTOMATICALLY LINKING PARTS WITHIN COMPOUND DOCUMENTS

Richard J. Redpath, Cary, and Rodney A. Smith, Raleigh, both of N.C., assignors to International Business Machine Corp., Armonk, N.Y.

Continuation of Ser. No. 364,858, Dec. 27, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 730,559
Int. Cl.^{6} G06F *15/00*
U.S. Cl. 395—777 **19 Claims**



1. A system for automatically linking a plurality of parts within a compound document in a computing environment including a computing platform and a message broker executing thereon, said automatic linking system comprising:

means for configuring a compound document including a first part and a second part at corresponding first and second locations, within said compound document;

means, responsive to said configuring means, for automatically registering said first and second parts with said message broker;

means, responsive to user input at said first location, for displaying said user input within said first part at the first location;

means, responsive to user activation of said first part containing said user input, for communicating a first message to said message broker;

means, responsive to receipt of said first message by said message broker for communicating a second message to said second part;

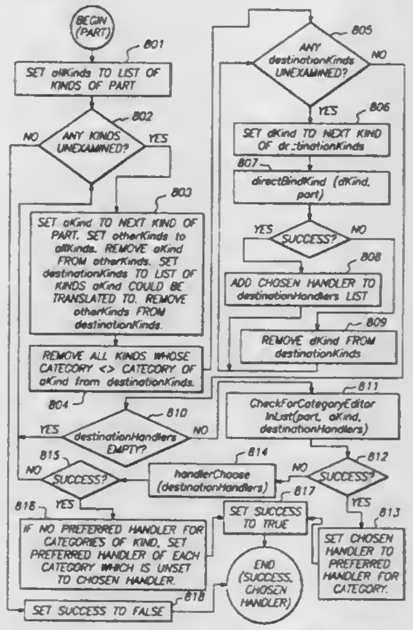
means, responsive to receipt of said second message by said second part for obtaining content data for said second part, based upon the received second message, and for displaying the obtained content data within said second part at said second location.

5,752,056

SYSTEM FOR BINDING DOCUMENT PARTS AND HANDLERS BY FIDELITY OF PARTS OR BY AUTOMATIC TRANSLATION OF PARTS

Tantek Celik, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 2, 1994, Ser. No. 204,520
Int. Cl.^{6} G06F *17/00*
U.S. Cl. 395—778 **28 Claims**


BEGIN (PART)
801
SET allKinds TO LIST OF KINDS OF PART
802
ANY KINDS UNEXAMINED?
NO
YES
803
SET aKind TO NEXT KIND OF PART. SET otherKinds to allKinds. REMOVE aKind FROM otherKinds. SET destinationKinds TO LIST OF KINDS aKind COULD BE TRANSLATED TO. REMOVE otherKinds FROM destinationKinds.
REMOVE ALL KINDS WHOSE CATEGORY <> CATEGORY OF aKind from destinationKinds.
804
805
ANY destinationKinds UNEXAMINED?
NO
YES
806
SET dKind TO NEXT KIND OF destinationKinds
807
directBindKind (dKind, part)
YES
SUCCESS?
NO
808
ADD CHOSEN HANDLER TO destinationHandlers LIST
809
REMOVE dKind FROM destinationKinds
810
YES
destinationHandlers EMPTY?
NO
811
CheckForCategoryEditor InList(part, aKind, destinationHandlers)
812
SUCCESS?
NO
YES
813
SET CHOSEN HANDLER TO PREFERRED HANDLER FOR CATEGORY.
814
handlerChoose (destinationHandlers)
815
NO
SUCCESS?
YES
816
IF NO PREFERRED HANDLER FOR CATEGORIES OF KIND, SET PREFERRED HANDLER OF EACH CATEGORY WHICH IS UNSET TO CHOSEN HANDLER.
817
SET SUCCESS TO TRUE
END (SUCCESS, CHOSEN HANDLER)
818
SET SUCCESS TO FALSE

1. In a computer system having a computer-human interface of the type in which documents are based upon parts, where each part comprises contents and a handler for those contents, and the contents are identified as belonging to at least one of plural different kinds of data, a method for binding a handler to a part, comprising the steps of:

automatically determining whether a handler is available on the computer system which is suitable for handling at least one of the kinds of data contained in the part, and binding the part to such a handler when one is determined to be available;

if no such handler is available, automatically determining other kinds of data to which the part can be translated;

automatically identifying a handler available on the system which is suitable for any of said other kinds of data;

translating the contents of the part into one of said other kinds of data for which the identified handler is suitable; and

binding the translated part to the identified handler.

5,752,057

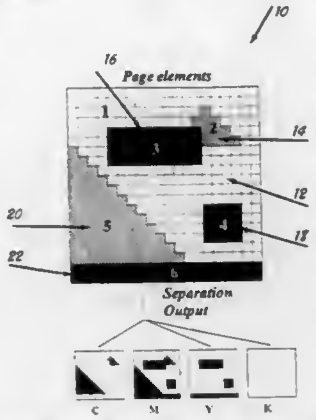
METHOD FOR CONVERSION OF A COLOR ELECTRONIC PRE-PRESS SYSTEM DATA FILE TO A PAGE DESCRIPTION LANGUAGE DATA FILE

Lior Lifshitz, Maoz Zion, and Raphael Wiesenberg, Tel Aviv, both of Israel, assignors to Shira Computers Ltd., Kfar Saba, Israel

Filed Oct. 27, 1994, Ser. No. 330,851

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—785 **8 Claims**



1. A method of converting a Color Electronic Pre-press System (CEPS) LineWork (LW) image data file to a composite Page Description Language (PDL) file, the CEPS LineWork image data file including a LineWork image made up of a multiplicity of LineWork run length encoded (RLE) entries, the LineWork image featuring dimensions and resolution, the method comprising the steps of:

(a) importing a portion of the LineWork image data file into the memory, said portion of the data including parameters associated with the dimensions and resolution of the LineWork image;
(b) reading parameters from the portion of the LineWork image data file associated with the dimensions and resolution of the LineWork image;
(c) preparing the composite PDL file according to the parameters from step (b);
(d) reading a plurality of LineWork RLE entries from the CEPS LineWork image data file;
(e) sorting the plurality of LineWork RLE entries by color into clusters of LineWork RLE entries, such that the cluster of the color having the greatest number of RLE entries is applied as a background color;
(f) translating each cluster of LineWork RLE entries into at least one PDL element realized as a concatenation of horizontal line segments; and
(g) exporting each PDL element to the composite PDL file.

5,752,058

SYSTEM AND METHOD FOR INTER-TOKEN WHITESPACE REPRESENTATION AND TEXTUAL EDITING BEHAVIOR IN A PROGRAM EDITOR

Michael L. Van De Vanter, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 6, 1995, Ser. No. 499,284

Int. Cl.⁶ G06F *17/21*

U.S. Cl. 395—793 **24 Claims**

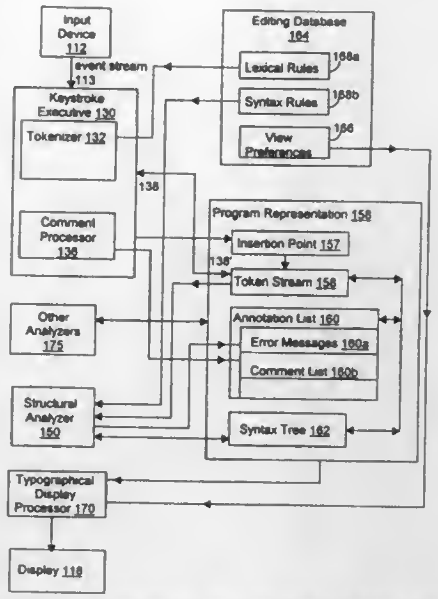
1. A process for visual whitespace representation and cursor behavior in a computer program editor configured to edit a computer program represented as a stream of tokens from a display of said program as if said computer program were represented as a text flow, said process comprising the steps of:

displaying each line of said computer program as it is entered by a user, wherein a displayed line comprises a sequence of tokens and visual whitespace separating adjacent tokens, said visual whitespace being based on lexical types of a first and a second token composing said adjacent tokens and not on spaces entered by said user, said spaces not being recorded in the token stream;

displaying a cursor in said displayed line of said computer program, said cursor providing user interactability with said displayed line, said cursor having a cursor position corresponding to an insertion point in said stream lying between editable elements composing said tokens, between said tokens or at the beginning or end of said stream;

maintaining boundaries between said tokens and updating said insertion position as said user edits said line of said computer program; and

updating said cursor position, as said user edits said line of said computer program, in accordance with a set of cursor display rules as applied to ones of said tokens adjacent said cursor position such that said cursor position is updated as though said user were editing said line of said computer program with a text editor.



5,752,059

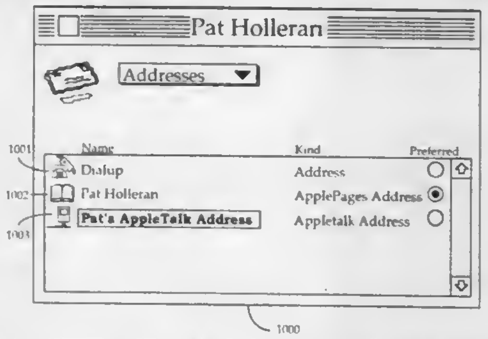
APPARATUS AND METHOD FOR REPRESENTING ELECTRONIC MAIL

Patrick A. Holleran, Santa Cruz, Calif.; Yan Arrouye, Paris, France; Cordell R. Ratzlaff, Palo Alto, Calif.; Stephen Fisher, Menlo Park, Calif., and John S. Evans, Mountain View, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 29, 1992, Ser. No. 997,075

Int. Cl.⁶ G06F *17/28*

U.S. Cl. 395—800 **32 Claims**



Name	Kind	Preferred
Dialup	Address	○
Pat Holleran	ApplePages Address	◉
Pat's AppleTalk Address	Appletalk Address	○

1. In a computer system, a method of representing an electronic mail address in a field format and in a string format, wherein said electronic mail address is specified by a plurality of fields corresponding to components of said electronic mail address in said field format, and wherein said electronic mail address is specified by a character string in said string format, said method comprising the steps of:

selecting a selected electronic mail system from a plurality of electronic mail systems:
selecting either said field format or said string format as a selected format;
if said field format is selected as said selected format, then inputting said electronic mail address by inputting said components in said plurality of fields;
if said string format is selected as said selected format, then inputting said electronic mail address by inputting a series of characters;
determining a protocol of said selected electronic mail system;
determining a syntax of said protocol;
if said electronic mail address is in said field format and said string format is subsequently selected, converting said electronic mail address from said field format by combining said components in said plurality of fields according to said syntax to produce said series of characters; and
if said electronic mail address is in said string format and said field format is subsequently selected, converting said electronic mail address from said string format to said field format by parsing said series of characters into said plurality of fields according to said syntax.

5,752,060

FILE ACCESS SCHEME IN DISTRIBUTED DATA PROCESSING SYSTEM

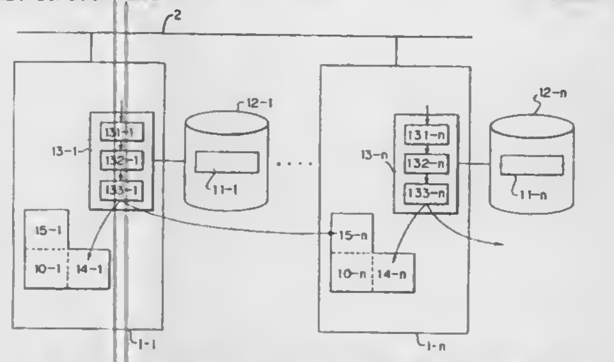
Hiroshi Yoshida, Mishima, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 62,252, May 17, 1993, abandoned, which is a continuation of Ser. No. 707,832, May 30, 1991, abandoned. This application Dec. 23, 1994, Ser. No. 364,385

Claims priority, application Japan, May 30, 1990, 2-140906

Int. Cl.⁶ G06F *13/14*

U.S. Cl. 395—800 **1 Claim**



1. A file access apparatus in a distributed data processing system, said distributed data processing system storing files comprising data, one of said files being accessed, and said data from one of the files being transferred, by an open instruction, said file access apparatus comprising:

a network comprising communication lines;
data modules coupled to the network via the communication lines, at least one of the data modules comprising:
  a disk comprising a data domain and storing a subset of the files in the data domain,
  a file server coupled to the disk and transferring the data via the communication lines, said file server comprising identification means for identifying which of said data modules transmitted the open instruction
  a data processing unit coupled to the file server and generating and transmitting the open instruction, said data processing unit corresponding to the data domain and comprising:
    an input/output processing unit coupled to the file server and transferring the data between the data processing unit and the disk by executing an input/output operation accessing the disk by directly assigning the data domain as a corresponding input/output domain; and
    a data transfer unit transferring the data, via the communication lines and using the open instruction, between the data processing unit of the at least one of the data modules and a file server in another of the data modules, wherein

when the file server receives the open instruction, the file server determines whether the open instruction was transmitted by the data processing unit connected to the file server, determines if the data domain includes the one of the files, and transfers the data through the input/output processing unit if the data domain includes the one of the files and if the data processing unit connected to the file server transmitted the open instruction, and copies the one of the files to the data domain by transferring the data using the open instruction through the data transfer unit to the communication lines and through the file server and an input/output processing unit in the another of the data modules if a data domain storing a subset of the files stored on a disk in the another of the data modules includes the one of the files, and wherein said identification means comprises:
  open instruction receiving means for receiving the open instruction to open the file on said disk;
  processing module discriminator means for determining which of said data modules transmitted the open instruction;
  binding processing means for enabling the data processing unit to call one of the data transfer unit and the input/output processing unit to access the file.

5,752,061

ARRANGEMENT OF DATA PROCESSING SYSTEM HAVING PLURAL ARITHMETIC LOGIC CIRCUITS

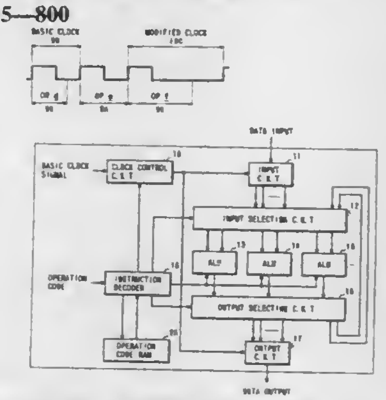
Makoto Michiue, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 9, 1995, Ser. No. 401,609

Claims priority, application Japan, Mar. 10, 1994, 6-040087

Int. Cl.⁶ G06F *7/00*

U.S. Cl. 395—800 **7 Claims**



1. A data processing apparatus comprising:
an instruction decoding circuit receiving operation code signals to provide first, second, and third command signals;
an input circuit receiving input data to provide a plurality of data signals;
a plurality of arithmetic logic circuits receiving the data signals from said input circuit, respectively, said arithmetic logic circuits being responsive to the first command signals from said instruction decoding circuit to perform arithmetic and logic operations on the received data signals and to provide operation output signals indicative of results of the arithmetic and logic operations;
an input selecting circuit selecting the data signals provided by said input circuit to distribute each of the data signals to a corresponding one of said arithmetic logic circuits according

to the second command signal from said instruction decoding circuit;

an output circuit outputting the results of the arithmetic operations executed by said arithmetic logic circuit; and

an output selecting circuit selecting the operation output signals provided from said arithmetic logic circuits according to the third command signal from said instruction decoding circuit to output each of the operation output signals to a given location of said output circuit,

wherein one of said arithmetic logic circuits performs a first arithmetic and logic operation based on the data signal provided by said input circuit in synchronism with a basic clock signal having a given clock cycle, another of said arithmetic logic circuits performing a second arithmetic and logic operation using the results of the first arithmetic and logic operation, said output selecting circuit supplying the results of the first arithmetic and logic operation to said input selecting circuit for use in the second arithmetic and logic operation when there is a sufficient time to complete the second arithmetic and logic operation within the given clock cycle after completion of the first arithmetic and logic operation.

5,752,062

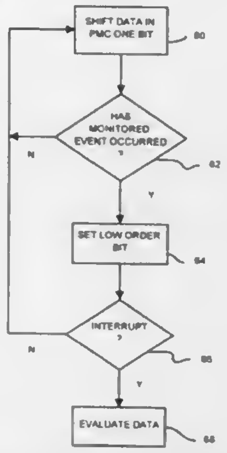
METHOD AND SYSTEM FOR PERFORMANCE MONITORING THROUGH MONITORING AN ORDER OF PROCESSOR EVENTS DURING EXECUTION IN A PROCESSING SYSTEM

Frank Carl Gover, Round Rock; Frank Eliot Levine, and Edward Hugh Welbon, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1995, Ser. No. 537,645

Int. Cl.^{6} G06F *11/72*

U.S. Cl. 355—800 **37 Claims**



1. A method for reconstructing a relationship among events in a processing system, the processing system including at least one performance monitor counter (PMC) and at least one monitor mode control register (MMCR) to configure the operations of the at least one PMC, the method comprising:

(a) controlling a mode of updating the at least one PMC through a bit set within the at least one MMCR;

(b) determining if the bit set is at a first logic level; and

(c) placing the at least one PMC in a history mode if the bit set is at the first logic level.

5,752,063

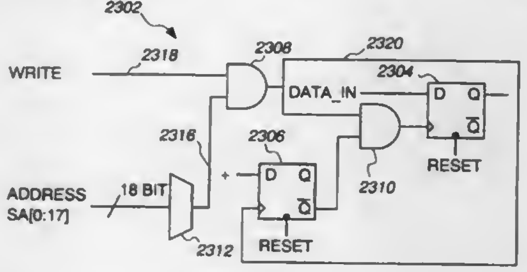
WRITE INHIBITED REGISTERS

David T. DeRoo, St. Joseph; Mark D. Nicol, Stevensville; David J. DeLisle, Berrien Springs; Michael P. Krau, Benton Harbor; Saifuddin Fakhruddin, St. Joseph, all of Mich.; Lloyd W. Gauthier, Austin, Tex., and Robert A. Kohtz, St. Joseph, Mich., assignors to Packard Bell NEC, Sacramento, Calif.

Continuation of Ser. No. 220,961, Mar. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 139,946, Dec. 8, 1993, abandoned. This application Dec. 19, 1995, Ser. No. 575,004

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—800 **2 Claims**



1. A computer system including a data bus, an address bus, a control bus and a central processing unit (CPU) coupled to said address bus, said data bus and said control bus, for generating data signals on said data bus, address signals on said address bus and control signals including read signals and write signals on said control bus, said system comprising:

a first hardware register having a first predetermined address, coupled to the data bus and the address bus, for storing data in response to a predetermined control signal;

a decoder, coupled to the address bus, for generating a predetermined decode signal when said first predetermined address is on the address bus; and

means responsive to the write signal and said predetermined decode signal for generating said predetermined control signal and enabling data to be stored in said first hardware register once anytime after the computer system is powered up, the first time the CPU writes to said first hardware register after the computer system is powered up and subsequently automatically inhibiting in hardware, data from being stored and altered in said first hardware register until the computer system is powered up again, said first hardware register including a data input and a clock input and said qenerating means including a predetermined gate coupled to said clock input, said predetermined gate only enabled for the first write to said first hardware register and subsequently disabled.

5,752,064

COMPUTER ARCHITECTURE CAPABLE OF CONCURRENT ISSUANCE AND EXECUTION OF GENERAL PURPOSE MULTIPLE INSTRUCTIONS

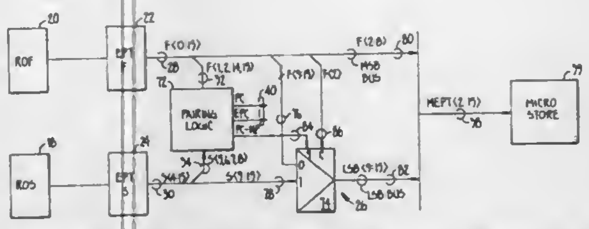
Robert W. Horst, Champaign, Ill., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 483,661, Jun. 7, 1995, Pat. No. 5,628,024, which is a division of Ser. No. 300,815, Sep. 2, 1994, abandoned, which is a continuation of Ser. No. 890,299, May 27, 1992, Pat. No. 5,390,355, which is a continuation of Ser. No. 356,170, May 24, 1989, abandoned. This application Sep. 20, 1996, Ser. No. 710,620

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—800 **5 Claims**

5. A system for concurrently issuing and executing pairs of instructions, comprising first and second instructions included in a subset of instructions of said target instruction set, in parallel and with a sub-group of pairs of instructions, included in said subset, comprising instructions in said target instruction set that cause register and resource conflicts if issued and executed concurrently, said system comprising:



a fetch unit for fetching ordered instructions included in a program and providing a pair of adjacent instructions in the program as a first pair of instructions;

a decoder for decoding said first pair of instructions to generate a first pair of decoded results;

a pairing unit for processing said first pair of decoded results to indicate if said first pair is included in said subset;

a stage, responsive to said pairing unit, for concurrently issuing said first pair of instructions to be concurrently executed by said processor if said first pair of instructions is included in said subset even if said first pair is included in the sub-group of pairs that would cause register and resource conflicts if concurrently issued and executed in said existing processor; and

an architecture that sequentially executes all instructions in said target instruction set and that includes resources for concurrently executing issued pairs included in said subset and for eliminating register and resource conflicts when pairs of instructions included in said sub-group are concurrently issued and executed with the architecture utilizing said decoded results to execute said first pair of instructions when said first pair is concurrently issued.

5,752,065

ONE CYCLE PROCESSOR FOR REAL TIME PROCESSING

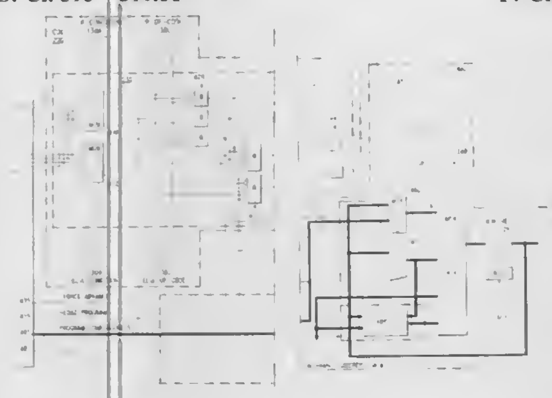
Dieter E. Staiger, Weil im Schoenbuch, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,207

Claims priority, application European Pat. Off., Nov. 29, 1994, 94118741

Int. Cl.^{6} G06F *15/76*

U.S. Cl. 395—800.01 **14 Claims**



1. A real time processing unit having a processor for processing an operation code, the processor comprising:

an operation code control unit for receiving and processing a first operation code in response to a first pulse of a clock and generating a logical result at an output thereof;

a memory addressable by the processor on an address line so that an operation code corresponding to the applied address is loadable by the processor, and

a multiplexing unit having a plurality of input lines selectable in response to said output of said operation code control unit, each of said plurality of input lines receiving signals representing potential next addresses in memory containing second operation codes to be processed by the processor, and the selected next address being outputed by said multiplexing unit; and

said multiplexing unit generating said selected next address before a second pulse of said clock signal is received wherein the multiplexing unit outputs said selected next address when a second pulse of said clock signal is received by the processor.

5,752,066

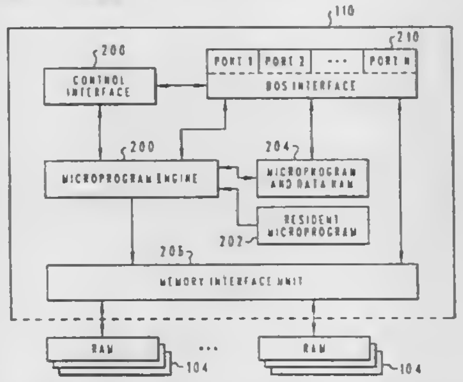
DATA PROCESSING SYSTEM UTILIZING PROGAMMABLE MICROPROGRAM MEMORY CONTROLLER

Richard Bealkowski, Delray Beach, and Brenda M. Ozaki, Deerfield Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 817,239, Jan. 6, 1992, abandoned. This application Aug. 13, 1996, Ser. No. 695,946

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—800.01 **12 Claims**



1. An improved data processing system, said data processing system comprising:

a random access memory subsystem for storing a plurality of programs and data;

a firmware memory subsystem for storing a Basic Input/Output System for controlling hardware operations within said data processing system including basic memory functions;

a processor coupled to said random access memory subsystem and said firmware memory subsystem for processing said plurality of programs; and

a memory controller coupled to said processor for providing a system-level interface between said processor and said random access memory subsystem for controlling enhanced memory functions, said memory controller comprising:

a microprogram engine; and

nonvolatile memory coupled to said microprogram engine having a resident microprogram stored therein wherein said microprogram engine may utilize said resident microprogram to manage said random access memory subsystem.

5,752,067

FULLY SCALABLE PARALLEL PROCESSING SYSTEM HAVING ASYNCHRONOUS SIMD PROCESSING

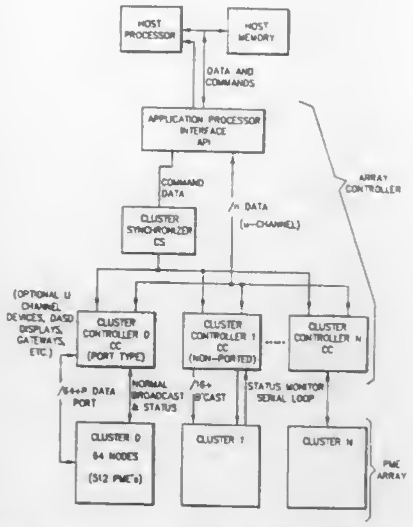
Paul Amba Wilkinson, Apalachin; James Warren Dieffenderfer, Owego; Peter Michael Kogge, Endicott, and Nicholas Jerome Schoonover, Tioga Center, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 233,210, Apr. 26, 1994, which is a continuation-in-part of Ser. No. 798,788, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 611,594, Nov. 13, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 474,268

Int. Cl.^{6} G06F *15/80*

U.S. Cl. 395—800.16 **5 Claims**

5. An array processing system, comprising:


HOST PROCESSOR
HOST MEMORY
DATA AND COMMANDS
APPLICATION PROCESSOR INTERFACE API
ARRAY CONTROLLER
COMMAND DATA
/n DATA
(u-CHANNEL)
CLUSTER SYNCHRONIZER CS
(OPTIONAL U CHANNEL DEVICES, DASD DISPLAYS, GATEWAYS, ETC.)
CLUSTER CONTROLLER 0 CC (PORT TYPE)
CLUSTER CONTROLLER 1 CC (NON-PORTED)
CLUSTER CONTROLLER N CC
/64+P DATA PORT
NORMAL BROADCAST & STATUS
/16+ B'CAST
STATUS MONITOR SERIAL LOOP
CLUSTER 0 64 NODES (512 PME's)
CLUSTER 1
CLUSTER N
PME ARRAY

- a plurality of processing elements interconnected as an array processor, each having a processor and a memory coupled to said processor, and wherein each of the processing elements selectively and autonomously executes an independent instruction stream on an independent multiple data stream, thereby providing for a MIMD mode;
- a control processor that selectively dispatches a single instruction stream including a series of instructions to the plurality of processing elements, each of the series of instructions operative to command the processing elements to execute multiple independent instruction streams stored in respective processing elements on multiple independent data streams located one per processing element; and
- wherein said processing elements are selectively grouped as scalable processing nodes and each of said processing elements provides full scalability of processing, inter-processing element communication, and I/O.

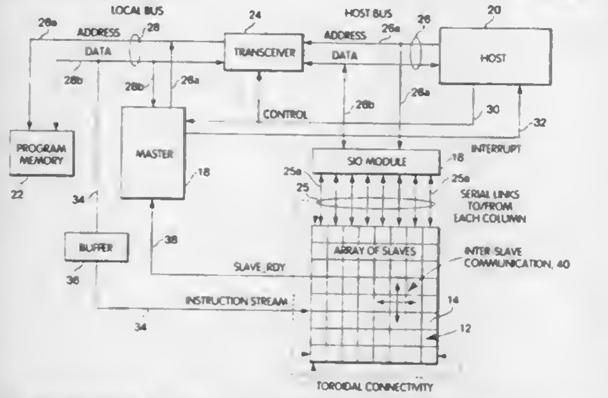
5,752,068
MESH PARALLEL COMPUTER ARCHITECTURE APPARATUS AND ASSOCIATED METHODS

Ira H. Gilbert, Carlisle, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 294,757, Aug. 23, 1994, Pat. No. 5,590,356. This application Dec. 30, 1996, Ser. No. 774,429

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800.16 **20 Claims**



1. Digital data processing apparatus for synchronously processing data from a host computer, comprising:

- program memory means for storing data, and bus means connecting said program memory means to the host computer;
- a master processor element and an array of slave processor elements, said master processor element having means to access said data within said program memory and for broadcasting instructions to said array; and
- input/output module means connected to communicate with said bus means and having a plurality of data links connected to said array, each of said data links providing serial communication with selected slave processor elements;
- wherein each of said slave processor elements comprises
  - (i) an input/output processor section having interprocessor communication links for communicating data to and from selected other processor elements within said array, and further having means for communicating data to and from said input/output module means,
  - (ii) internal memory means having a storage capacity of at least 128 kilobytes for storing executable code, and (iii) a core processor section for processing said executable code and said instructions, each of said processor sections being operable independently from the other of said processor sections;
- said slave processor elements synchronously executing at least one of said instructions and said executable code at a throughput rate of at least 120 MFLOPS.

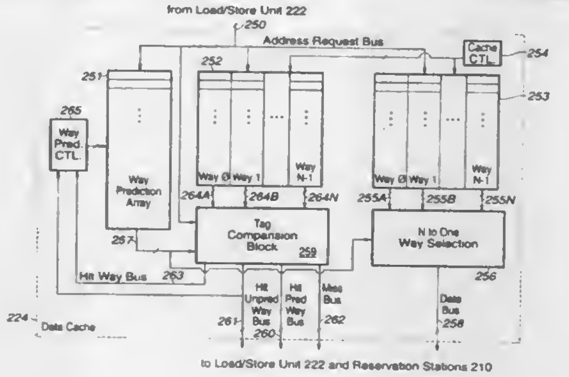
5,752,069
SUPERSCALAR MICROPROCESSOR EMPLOYING AWAY PREDICTION STRUCTURE

James S. Roberts, and James K. Pickett, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 31, 1995, Ser. No. 521,749

Int. Cl.^{6} G06F *12/12;12/10*

U.S. Cl. 395—800.23 **19 Claims**



1. A superscalar microprocessor comprising a data cache including:

- a way prediction array including a plurality of storage locations wherein each one of said plurality of storage locations is configured to store a way value, and wherein said way prediction array is configured to receive at least one request address;
- a way prediction control unit coupled to said way prediction array wherein said way prediction control unit is configured to update said way prediction array;
- a second plurality of storage locations configured to store data bytes and to receive said request address, wherein said second plurality of storage locations is coupled to said way prediction array, and wherein one of said second plurality of storage locations is selected by said way value to convey data bytes upon an output bus;
- a tag comparison block, and wherein said tag comparison block is configured to receive said request address and said way prediction during a first clock cycle, and wherein said tag comparison block is coupled to said way prediction array and to said way prediction control unit, and wherein said tag comparison block is configured to convey a plurality of signals indicative of the correctness of said way prediction, and wherein said tag comparison block is configured to compare said request address to said plurality of tag addresses and to produce a hit unpredicted way signal in response thereto, and wherein said hit unpredicted way signal indicates, when asserted, that said way prediction is incorrect and that said request address hit in a way other than a particular way indicated by said way prediction, and
- a reservation station coupled to receive said hit unpredicted way signal from said tag comparison block, wherein said reservation station is configured to invalidate a first datum forwarded by said cache in response to said way prediction if said hit unpredicted way signal is asserted.

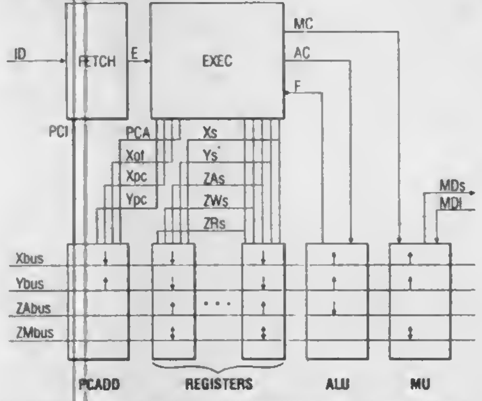
5,752,070
ASYNCHRONOUS PROCESSORS

A. J. Martin, and S. M. Burns, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 495,835, Mar. 19, 1990, abandoned. This application Jul. 8, 1994, Ser. No. 272,856

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800.33 **42 Claims**



2. An asynchronous processing apparatus, comprising:

- a fetching module operating to fetch a instruction to be executed from an instruction memory, and to produce an instruction output indicating an instruction to be executed;
- an execution module, operating based on the instruction output from said fetching module, to decode the instruction produced by the fetching module, to produce parameters indicative of how the instruction decoded by the fetching module should be used;
- a plurality of other processing modules, each module carrying out a processing operation, and each module operating independently and without a common clock, all of said other processing modules commonly connected to at least first and second parameter buses and at least one result bus, said other processing modules including:
  - (A) at least two registers;
  - (B) an arithmetic unit, which operates based on values that are supplied from said first and second registers on said first and second parameter buses to form a result which is communicated to said result bus; and
  - (C) a memory unit, which carries out memory fetch operations using values supplied from and to said first and second registers,
- wherein each of said plurality of modules including components operates asynchronously relative to one another, without a common clock therebetween, said modules each including a first element, operating by evaluating input information to detect whether valid information is present as a beginning of an information cycle, to operate on the valid information during its information cycle and to prepare a confirmation when the operation is complete, lack of valid data being detected as an end of an information cycle.

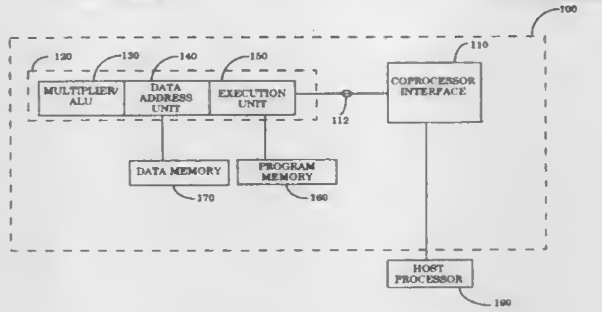
5,752,071
FUNCTION COPROCESSOR

Graham S. Tubbs, Ahwatukee, and James Charles Abel, Phoenix, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 17, 1995, Ser. No. 503,251

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—800.34 **15 Claims**



1. A function coprocessor for a processor having a first type of coprocessor interface, comprising:

- a subprocessor;
- a program memory coupled to the subprocessor;
- a first data memory for storing data from the processor in response to a first control signal, the first data memory having m ports coupled to the subprocessor for providing up to m operands to the subprocessor per clock cycle; and
- a function coprocessor interface compatible with the first type of coprocessor interface for coupling to the processor, the function coprocessor interface generating the first control signal in response to interface signals received from the coprocessor interface of the processor, the function coprocessor interface providing handshake signals to the coprocessor interface of the processor including a busy signal, an error signal, and a processor extension request signal.

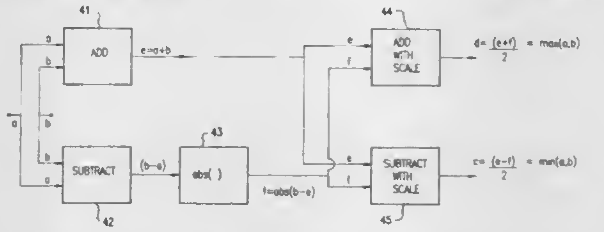
5,752,072
SORTING SCHEME WITHOUT COMPARE AND BRANCH INSTRUCTIONS

Ramesh Chandra Agarwal, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1996, Ser. No. 644,753

Int. Cl.^{6} G06F *7/08;7/42*

U.S. Cl. 395—800.34 **9 Claims**



1. A computer implemented method of sorting without compare and branch instructions in a computer having multiple parallel functional units comprising the steps of:

- in a first functional unit, inputting two numbers, a and b, and computing an output, e, as a sum a+b;
- in a second functional unit, inputting said two numbers, a and b, and computing an output as a difference b−a;
- in said second functional unit, computing an output, f, which is the absolute value of the difference, or abs(b−a); and
- inputting the values e and f to each of said first and second functional units and, in said first functional unit, computing a output, d, as

$$\frac{(e+f)}{2} = \max(a,b),$$

and in said second functional unit, computing a output, c, as

$$\frac{(e-f)}{2} = \min(a,b).$$

5,752,073

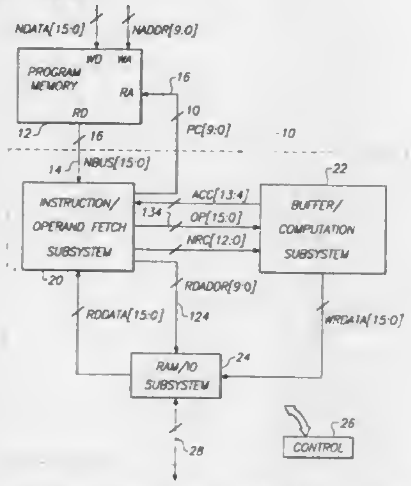
DIGITAL SIGNAL PROCESSOR ARCHITECTURE

Donald M. Gray, III, San Francisco, and David L. Needle, Alameda, both of Calif., assignors to CagEnt Technologies, Inc., Santa Clara, Calif.

Continuation of Ser. No. 1,463, Jan. 6, 1993. This application Jul. 11, 1995, Ser. No. 501,163

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—800.35 **8 Claims**



1. Computer apparatus, for use with a memory having data stored in a plurality of addresses,

means for fetching processing instructions including a first instruction having a control portion and at least one source operand identifier, each source operand identifier in said first instruction having a respective write-back bit;

means for fetching data from a first address in said memory in response to said first instruction, said first address being determined in response to a first one of said source operand identifiers:

means for processing said data,

means for writing said processed data back to said first address in said memory in response to the write-back bit for said first source operand identifier:

an address bus coupled to said memory, said means for fetching data including means for placing said first address on said address bus;

an address storage element coupled to said address bus; and

means for writing said first address from said address bus into said address storage element in conjunction with data being fetched from said first address in said memory if said write-back bit for said first source operand identifier is active,

and wherein said means for writing said processed data includes means for placing said first address from said address storage element onto said address bus without having reloaded said first address into said address storage element.

5,752,074

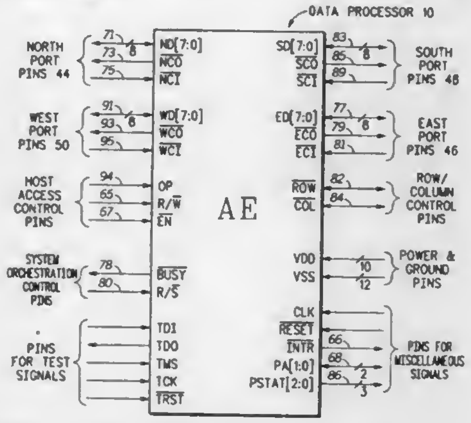
DATA PROCESSING SYSTEM AND METHOD THEREOF

Michael G. Gallup; L. Rodney Goke; Robert W. Seaton, Jr.; Terry G. Lawell; Stephen G. Osborn, and Thomas J. Tomazin, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 40,779, Mar. 31, 1993. This application Feb. 10, 1995, Ser. No. 390,191

Int. Cl.^{6} G06F *15/76;15/80;15/16*

U.S. Cl. 395—800 **47 Claims**



1. A data processor, comprising:

a first port for communicating digital information;

a second port for communicating digital information;

enable means for enabling the data processor to communicate digital information, the enable means being coupled to the first port and the second port to enable communication of digital information;

an internal memory storage circuit, the memory storage circuit storing a plurality of data values wherein each of the plurality of data values has a corresponding address location, the internal memory storage circuit being coupled to both the first port and the second port; and

mode selection means for enabling the data processor to communicate in one of a first mode of operation and a second mode of operation, wherein:

when the data processor is in the first mode of operation, an external processor utilizes the first port and the second port jointly to access one of the plurality of data values in the internal memory storage circuit and the data processor is enabled to communicate information with a host integrated circuit but not with a non-host integrated circuit; and

when the data processor is in the second mode of operation, digital information is communicated independently with the first port and the second port and the data processor is enabled to selectively communicate information with the host integrated circuit and the non-host integrated circuit.

5,752,075

INTEGRATED COMPUTER SCANNER PRINTER IN A SINGLE SYSTEM ENCLOSURE SHARING CONTROL CIRCUITRY AND LIGHT SOURCE WHEREIN A SINGLE CPU PERFORMING ALL OF THE CONTROL TASKS

Dan Kikinis, Saratoga, Calif., assignor to Elonex PLC, Ltd., United Kingdom

Continuation-in-part of Ser. No. 16,122, Feb. 10, 1993, Pat. No. 5,457,785. This application Aug. 7, 1995, Ser. No. 511,749

Int. Cl.^{6} G06F *9/00*

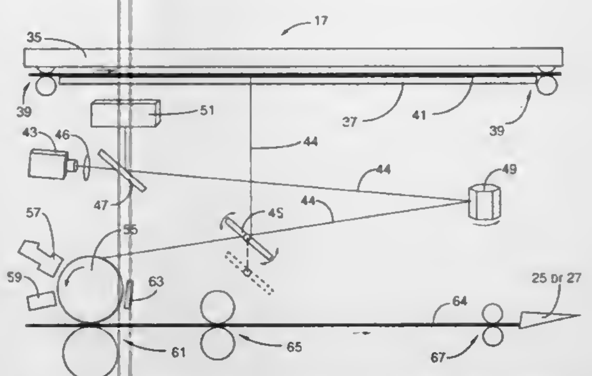
U.S. Cl. 395—821 **14 Claims**

1. An image-enhanced computer system comprising:

a system enclosure;

a fixed point light source;

a first mirror continuously rotatable for laterally scattering a light beam directed along a first light path from the light source, along a second light path within a fixed width;



a modulator connected to the point light source and adapted for modulating the light source on and off according to an input signal;

an electrostatic printer portion within the system enclosure including an organic photoconducting cartridge (OPC), a document handling system, and a fuser;

scanner elements within the system enclosure including a light-intensity detector and a document support surface;

a second mirror adapted to be moved into and out of the second path;

a digital storage system; and

a computer portion within the system enclosure, the computer portion comprising a CPU for operating the overall system, including the modulator and the second mirror, a system memory, a video adapter circuit coupled to an output port for a video monitor, a keyboard controller coupled to a keyboard port, a scanner drive and interface circuit, a printer drive and interface circuit, and a computer bus connecting the digital elements of the computer portion;

wherein stored images are printed by driving the modulator to modulate the light source in an image pattern retrieved from the storage system by the computer portion, and positioning the second mirror outside the second path, such that a modulated, laterally-scanned light beam is directed on the OPC, and wherein scanning is accomplished by modulating the light source in at a fixed frequency, positioning the second mirror in the second light path such that the modulated, laterally-scanned light beam is diverted to the document support surface and the light-intensity detector, the light intensity detector producing a scanned image stored in the digital storage system.

5,752,076

DYNAMIC PROGRAMMING OF BUS MASTER CHANNELS BY INTELLIGENT PERIPHERAL DEVICES USING COMMUNICATION PACKETS

Bill A. Munson, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

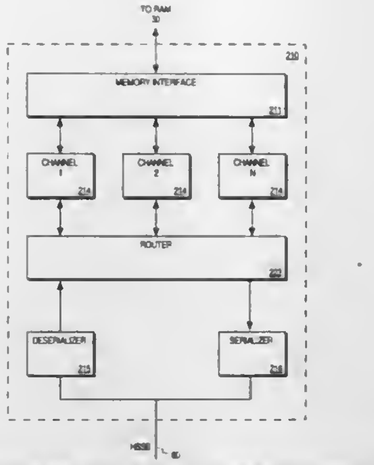
Filed Aug. 31, 1995, Ser. No. 522,177

Int. Cl.^{6} G06F *13/14;* **H04J** *3/02*

U.S. Cl. 395—825 **49 Claims**

1. An apparatus for enabling any of a plurality of peripheral devices to dynamically program read and write operations upon a memory, the apparatus comprising:

means for decoding a memory operation, the means for decoding including means for receiving a plurality of packets of information from one of the plurality of peripheral devices, one of the packets including a read/write bit identifying the memory operation as a read operation or a write operation, each of the packets being one of a plurality of packet types, the packet types including an address type, a data type and a control type, each of the packets including a plurality of packet type bits identifying the packet type of said packet as either the address type, the data type, or the control type, wherein the means for decoding decodes the memory operation based on said at least one packet type bit and the read/write bit; and



means for performing the memory operation based on said at least one packet type bit and the read/write bit.

5,752,077

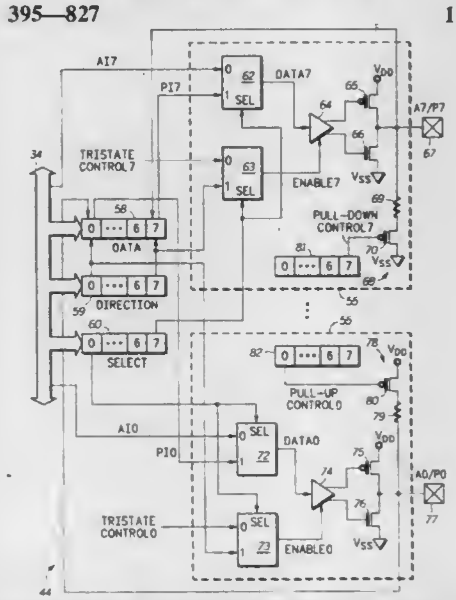
DATA PROCESSING SYSTEM HAVING A MULTI-FUNCTION INPUT/OUTPUT PORT WITH INDIVIDUAL PULL-UP AND PULL-DOWN CONTROL

Hing Leung Yiu, Tsuen Wan, Hong Kong; Jeff Gokinko, and Glen Zoerner, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 15, 1995, Ser. No. 440,948

Int. Cl.^{6} G06F *3/00;15/78;1/24*

U.S. Cl. 395—827 **17 Claims**



1. A data processing system implemented on a single integrated circuit, the data processing system having a multi-function input/output port, the multi-function input/output port comprising a plurality of input/output port circuits, each of the plurality of input/output port circuits comprising:

a multiplexer having a first input terminal for receiving a first data signal, a second input terminal for receiving a second data signal, a control terminal for receiving a select signal, and an output terminal;

a buffer circuit having an input terminal coupled to the output terminal of the multiplexer, a control terminal for receiving an enable signal, and an output terminal, the buffer circuit controlling a pull-up transistor for increasing a voltage at an output terminal of the buffer circuit, and controlling a pull-down transistor for reducing the voltage at output terminal of the buffer circuit;

an input/output terminal coupled to the output terminal of the buffer circuit, for providing the first or second data signals external to the data processing system;

a pull-up circuit, coupled to the input/output terminal, for increasing the voltage at the input/output terminal in response to a pull-up control signal; and

a register bit field having a plurality of programmable bits, a bit of the plurality of programmable bits corresponding to one input/output port circuit of the plurality of input/output port circuits, each of the plurality of programmable bits for selectively providing the pull-up control signal to the corresponding pull-up circuit of each of the plurality of input/output port circuits;

wherein use of the pull-up circuit and register bit field allow the voltage at the output terminal of each, of the plurality of input/output port circuits to be increased without using load resistors that are external to the data processing system.

5,752,078

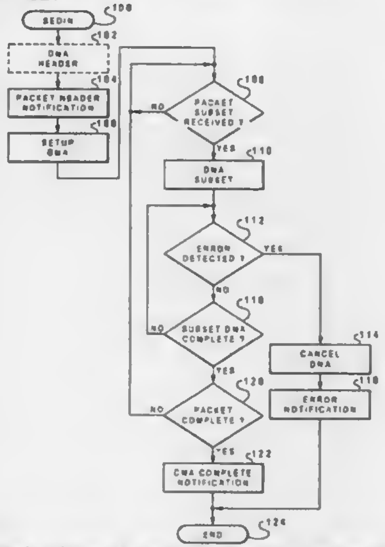
SYSTEM FOR MINIMIZING LATENCY DATA RECEPTION AND HANDLING DATA PACKET ERROR IF DETECTED WHILE TRANSFERRING DATA PACKET FROM ADAPTER MEMORY TO HOST MEMORY

Gary S. Delp; Philip L. Leichty, both of Rochester, and Albert A. Slane, Oronoco, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 10, 1995, Ser. No. 500,491

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—827 **8 Claims**



1. A method within a data processing system for receiving information from a communications network, said data processing system having a communications adapter coupled to said communications network and a host memory, said communications adapter having an adapter memory, wherein said communications network transmits information to said data processing system in packets including a packet header and packet data, said method comprising:

receiving a portion of a packet of information from said communications network at said adapter memory within said communications adapter, said portion of said packet of information including at least a packet header, wherein said packet header specifies a length of said packet of information and a destination address within said host memory;

in response to receipt of said portion of said packet of information, preparing a transfer of said packet of information from said adapter memory to said host memory prior to receipt of a final portion of said packet of information at said adapter memory;

transferring said packet of information from said adapter memory to said host memory, wherein said packet of information is stored in addresses within said host memory beginning with said destination address;

concurrently with said step of transferring said packet of information, detecting whether or not said packet of information includes an error;

in response to a detection of an error within said packet of information, cancelling said transfer of said packet of information from said adapter memory to said host memory; and

in response to a failure to detect an error within said packet of information prior to completion of said transfer of said packet from said adapter memory to said host memory, providing a notification that said packet of information has been received from said communications network.

5,752,079

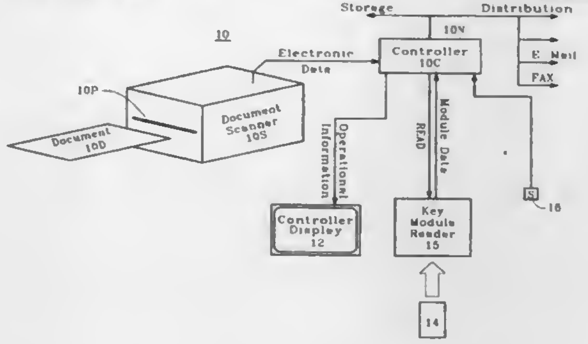
SYSTEM FOR READING PARAMETERS FROM PORTABLE KEY MODULE AND TRANSFERRING THESE PARAMETERS TO CONTROLLER TO EFFECT DISTRIBUTION AND STORAGE OF ELECTRONIC DOCUMENT DATA THROUGHOUT NETWORK

Roger D. Melen, Los Altos Hills, and Boris Krtolica, Milpitas, both of Calif., assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1995, Ser. No. 524,996

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—827 **37 Claims**



1. A document entry system for receiving user documents containing document data and for distributing and storing the document data throughout a user network, comprising:

controller means for controlling the operation of the document entry system:

document scanner means having a document port for receiving the user documents, and responsive to the controller for scanning the document data thereon to provide electronic document data for distribution and storage throughout the user network;

controller display means responsive to the controller for displaying operational information to the user;

portable key module means containing user module data which defines distribution parameters and storage parameters for the electronic document data; and

key module reader means having a module port for reading the module data on the key module means and transferring the module data to the controller to effect the distribution and storage of the electronic document data.

5,752,080

CABLE TERMINAL UNIT USING BIT SET FOR SELECTIVELY ENABLING A PLURALITY OF HARDWARE FUNCTIONS WITH SOME FUNCTIONS HAVING A PLURALITY OF SELECTIVELY ENABLED HARDWARE FUNCTIONS

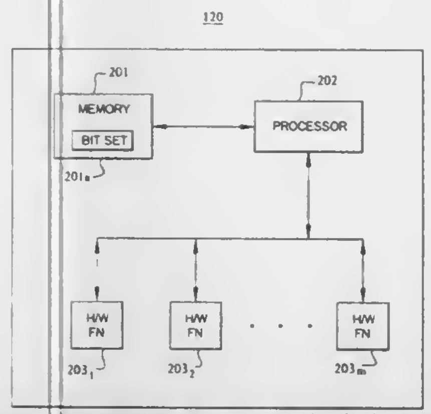
Lawrence D. Ryan, Princeton Junction, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 22, 1994, Ser. No. 361,780

Int. Cl.^{6} G06F *13/362*

U.S. Cl. 395—828 **27 Claims**

1. A terminal unit for use within a digital cable system having a head end control unit, the terminal unit comprising:



(a) processor means and at least one selectively enabled hardware function, wherein the at least one selectively enabled hardware function comprises a plurality of selectively enabled hardware functions, wherein each selectively enabled hardware function of the plurality of selectively enabled hardware functions can be uniquely enabled or disabled;

(b) memory means for storing a bit set representative of the enabled or disabled status of each selectively enabled hardware function of the plurality of selectively enabled hardware functions;

(c) means for setting the bit set to unable or disable each selectively enabled hardware function of the plurality of selectively enabled hardware functions in accordance with a control signal received by the terminal unit from the head end control unit; and

(d) means for enabling or disabling each selectively enabled hardware function in accordance with the bit set.

5,752,081

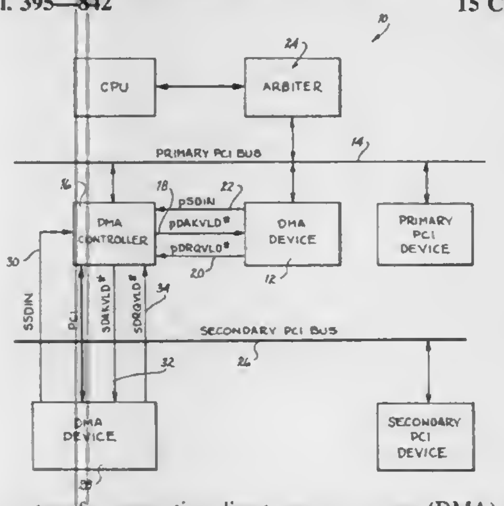
SIGNALLING SYSTEM AND METHOD FOR ALLOWING A DIRECT MEMORY ACCESS (DMA) INPUT/OUTPUT (I/O) DEVICE ON THE PERIPHERAL COMPONENT INTERCONNECT (PCI) BUS TO PERFORM DMA TRANSFERS

James J. Jirgal, Chandler, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 8, 1995, Ser. No. 488,989

Int. Cl.^{6} G06F *15/16;13/00;13/28*

U.S. Cl. 395—842 **15 Claims**



1. A system for supporting direct memory access (DMA) input/output (I/O) devices on a peripheral component interconnect (PCI) bus comprising, in combination:

a PCI bus for transferring data to and from memory;

at least one DMA I/O device means directly coupled to said PCI bus for requesting a DMA transfer to at least one of receive data transferred from said memory and to transfer data to said memory;

DMA controller means coupled to said PCI bus and directly coupled to said at least one DMA I/O device means for receiving a signal from said at least one DMA I/O device means that a DMA transfer is required and for permitting transfer of said data to said at least one DMA I/O device means from said memory and for permitting transfer of said data from said at least one DMA I/O device means to said memory;

serial link signal means coupled to said at least one DMA I/O device means and said DMA controller means for allowing said at least one DMA I/O device means to signal said DMA controller means that a DMA transfer is required;

arbiter means coupled to said DMA controller means for receiving a signal from said DMA controller means that said DMA transfer has been requested and for granting said PCI bus means to said DMA controller means for said DMA transfer;

first signal line means coupled to said at least one DMA I/O device means and to said DMA controller means for signaling said at least one DMA I/O device means when said DMA transfer has been granted and for signaling said at least one DMA I/O device means a code indicating active DMA channels as a subset of PCI address lines;

second signal line means coupled to said at least one DMA I/O device means and to said DMA controller means for signaling said DMA controller means when said at least one DMA I/O device means acknowledges said DMA transfer has been granted, said second signal line means being a realtime representation of said at least one DMA I/O device DMA request and is asserted until said at least one DMA I/O device means requires no more DMA cycles.

5,752,082

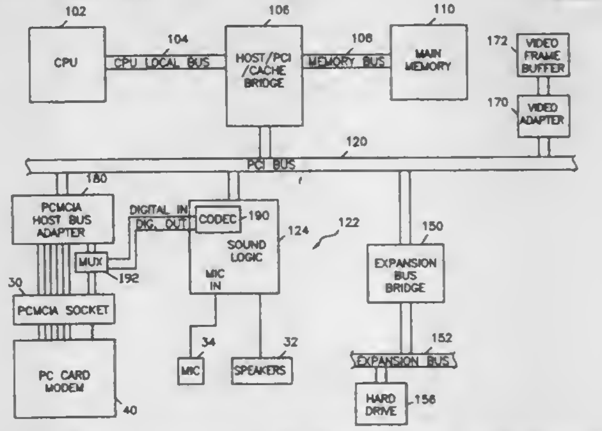
SYSTEM FOR MULTIPLEXING PINS OF A PC CARD SOCKET AND PC CARD BUS ADAPTER FOR PROVIDING AUDIO COMMUNICATION BETWEEN PC CARD AND COMPUTER SOUND SYSTEM

Leven E. Staples, San Antonio, Tex., assignor to Data Race, San Antonio, Tex.

Continuation-in-part of Ser. No. 496,537, Jun. 29, 1995. This application Oct. 17, 1995, Ser. No. 544,054

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—882 **31 Claims**



1. A computer system which has improved audio communication between a sound system comprised in the computer system and a removable PC Card coupled to the computer system, comprising:

a sound system comprised in the computer system, wherein said sound system includes at least one audio input for receiving an audio input signal and at least one audio output for providing an audio output signal;

a bus;

a PC Card bus adapter coupled to said bus;

a PC Card socket coupled to said PC Card bus adapter, wherein said PC Card socket is adapted for receiving one or more PC Cards, wherein said PC Card socket includes a plurality of pins;

a multiplexer coupled between one or more of said pins of said PC Card socket and said PC Card bus adapter, wherein said multiplexer is also coupled to said sound system, wherein said multiplexer selects either a first path between said one or more pins and said PC Card bus adapter or a second path between said one or more pins and said sound system; and

a PC Card adapted for insertion in said PC Card socket, wherein when said PC Card is inserted into said PC Card socket, said multiplexer is operable to select said second path between said one or more pins of said PC Card socket and said sound system to provide digital audio communication between said PC Card and said sound system.

5,752,083

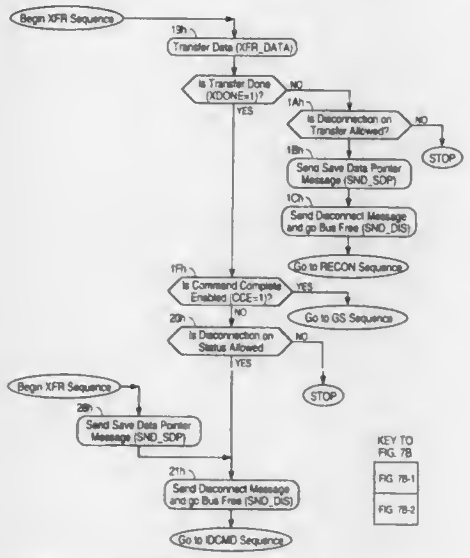
METHOD FOR RECEIVING A FIRST SCSI COMMAND SUBSEQUENT RECEIVING SECOND SCSI COMMAND AND STARTING DATA TRANSFER, RECONNECTING AND PERFORMING DATA TRANSFER FOR FIRST SCSI COMMAND

Shahe H. Krakirian, Milpitas, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

Division of Ser. No. 205,002, Mar. 1, 1994. This application Jun. 5, 1995, Ser. No. 463,617

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—894 **3 Claims**


Begin XFR Sequence
19h
Transfer Data (XFR_DATA)
Is Transfer Done (XDONE=1)?
NO
YES
1Ah
Is Disconnection on Transfer Allowed?
NO
STOP
1Bh
Send Save Data Pointer Message (SND_SDP)
1Ch
Send Disconnect Message and go Bus Free (SND_DIS)
Go to RECON Sequence
1Fh
Is Command Complete Enabled (CCE=1)?
YES
Go to GS Sequence
NO
20h
Is Disconnection on Status Allowed
NO
YES
STOP
Begin XFR Sequence
28h
Send Save Data Pointer Message (SND_SDP)
21h
Send Disconnect Message and go Bus Free (SND_DIS)
Go to IDCMD Sequence
KEY TO FIG. 7B
FIG. 7B-1
FIG. 7B-2

1. A method of transferring data to a SCSI target device comprising:

(a) receiving in the SCSI target device a first SCSI data transfer command from a SCSI bus;

(b) disconnecting the SCSI target device from the SCSI bus before a data transfer for the first SCSI data transfer command has started, without waiting for a communication from a processor in said SCSI target device, upon determining in a disk controller integrated circuit of the SCSI target device that the first SCSI data transfer command is not an autotransfer command;

(c) deciphering in a processor of the SCSI target device the first SCSI data transfer command;

(d) receiving in the SCSI target device subsequent to said disconnecting a second SCSI data transfer command from the SCSI bus;

(e) determining in a disk controller integrated circuit of the SCSI target device whether the second SCSI data transfer command is an autotransfer command and starting data transfer for the second SCSI data transfer command by the disk controller integrated circuit without waiting for a communication from said processor in the SCSI target device upon determining that said second SCSI data transfer command is an autotransfer command; and

(f) reconnecting the SCSI target device to the SCSI bus and performing the data transfer for the first SCSI command following completion of the data transfer for the second SCSI data transfer command by the disk controller integrated circuit.

5,752,084

LENS-FITTED PHOTO FILM UNIT AND ELECTRONIC FLASH DEVICE FOR USE THEREWITH

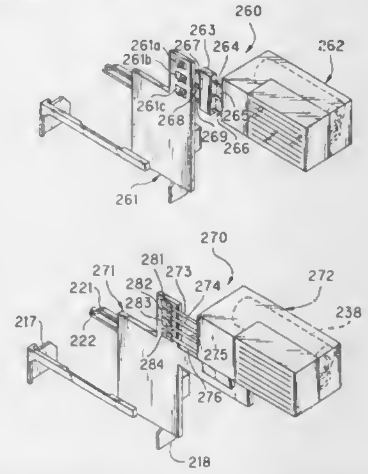
Katsumi Motomura, Saitama; Keiji Uchiyama, Kanagawa; Nobuyuki Kameyama, Kanagawa; Takashi Imamura, Kanagawa; Mitsuyoshi Mochida, Tokyo; Yukitsugu Hata, and Junichi Takagi, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 443,980, May 18, 1995, abandoned. This application May 1, 1996, Ser. No. 641,535

Claims priority, application Japan, May 18, 1994, 6-103532; Aug. 22, 1994, 6-196658; Aug. 24, 1994, 6-199670; Oct. 13, 1994, 6-247465; Oct. 17, 1994, 6-250980; Oct. 17, 1994, 6-250985

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **15 Claims**



1. An electronic flash device for a recyclable lens-fitted photo film unit including a flash-emitting section for emitting flash light toward a photographic field, a main capacitor for storing charge to be discharged in said flash-emitting section, and a flash circuit board having a flash circuit for controlling charging of said main capacitor and flash emission of said flash-emitting section, said flash device comprising:

a flasher/capacitor unit constituted by said flash-emitting section and said main capacitor;

said flash-emitting section including a flash tube for generating flash light, a concave reflector disposed behind said flash tube for condensing said flash light from said flash tube toward a front, and a transparent protector disposed in front of said flash tube for covering said flash tube;

a securing portion disposed for securing said flasher/capacitor unit to said flash circuit board in detachable fashion, comprising a pair of rails disposed on the flasher/capacitor unit, the rails riding along opposite sides of a projecting portion of the flash circuit board; and

a connecting portion disposed for electrically connecting said flasher/capacitor unit to said flash circuit board while secured with said flasher/capacitor unit by said securing portion;

wherein said securing portion and said connecting portion are detachable from at least one of said flasher/capacitor unit and said flash circuit board.

5,752,085

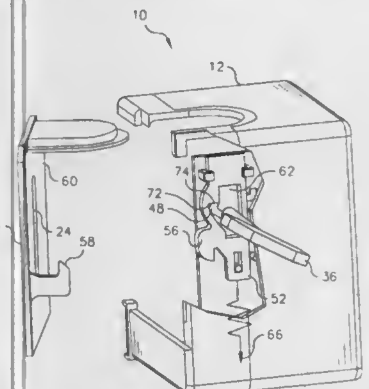
RENTAL CAMERA WITH KEY-OPENING LOCK TO DETER CUSTOMER REUSE AFTER COMPLETED EXPOSURE

Robert P. Cloutier; Ronald H. Kiesow, both of Spencerport, and Stephen G. Malloy Desormeaux, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1997, Ser. No. 802,075

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **5 Claims**



1. A rental camera to be used by a customer for picture-taking, and intended to be returned to a lender to unload exposed film and replace with fresh film, said rental camera comprising:

a camera body having an exterior-to-interior through-hole, and including a door that is to be opened to unload exposed film and replace with fresh film; and

operable means supported within said camera body for movement between a first position for deterring unloading exposed film and replacing with fresh film and a second position for not deterring unloading exposed film and replacing with fresh film, and including a movable latching member which in the first position of said operable means latches said door closed to prevent exposed film from being unloaded and replaced with fresh film and in the second position of said operable means unlatches the door to permit the door to be opened to unload exposed film and replace with fresh film and which has a key-hole for receiving an auxiliary key, and including an engageable portion accessible via said through-hole when said operable means is in said first position and located in said key-hole for the auxiliary key to engage when the operable means is in the first position to move said latching member with said operable means to said second position when the auxiliary key is rotated.

5,752,086

LENS-FITTED PHOTO FILM UNIT WITH SUPPORTED FILM ADVANCE WHEEL

Kenji Negishi; Osamu Noguchl, and Kazuo Okoyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 28, 1997, Ser. No. 808,164

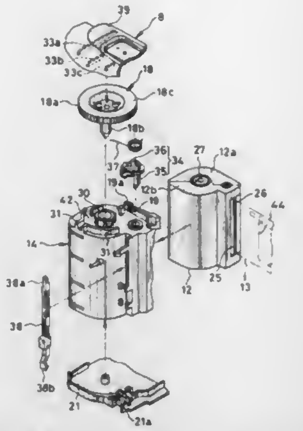
Claims priority, application Japan, Mar. 1, 1996, 8-045019

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **9 Claims**

1. A lens-fitted photo film unit, having a cassette containing chamber, a photo film roll chamber, and an exposure mechanism, said cassette containing chamber containing a cassette, said photo film roll chamber containing a photo film drawn from said cassette, said exposure mechanism creating a frame on said photo film, said cassette having a spool and a cassette shutter, one end of said photo film being secured to said spool, said spool being contained in said cassette in a rotatable manner, said cassette shutter being incorporated in a rotatable manner between a closed position to close a photo film passage port and an open position to open said photo film passage port, said lens-fitted photo film unit comprising:

a rotatable photo film winding device, comprising:



a manually rotatable wheel, disposed above said cassette containing chamber, wherein said manually rotatable wheel is manually rotated after said frame is created on said photo film;

a first rotational shaft, disposed to project downwards from said manually rotatable wheel, and engaged with said spool through a top wall of said cassette containing chamber, to wind said photo film into said cassette when said manually rotatable wheel is rotated;

a rotating member, having a second rotational shaft, connected with said cassette shutter through said top wall of said cassette containing chamber, for rotating said cassette shutter from said open position to said closed position;

a body, in which said cassette containing chamber and said photo film roll chamber are formed, and to which said exposure mechanism is secured;

a front cover, including a front portion and an upper portion, for respectively covering a front and a top of said body; and

at least one upper ridge, integrally formed on an inside of said upper portion of said front cover, wherein said at least one ridge contacts said manually rotatable wheel, preventing said manually rotatable wheel from moving upwards past a lower edge of said at least one upper ridge.

5,752,087

ONE-TIME-USE CAMERA WITH FRONT AND REAR COVER PARTS THAT CAN BE BENT APART TO PERMIT BATTERY TO DROP OUT OF CHAMBER

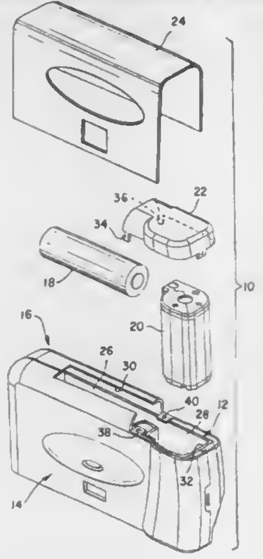
Jude A. Sangregory, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1997, Ser. No. 859,344

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **5 Claims**

1. A one-time-use camera comprising a main body part having



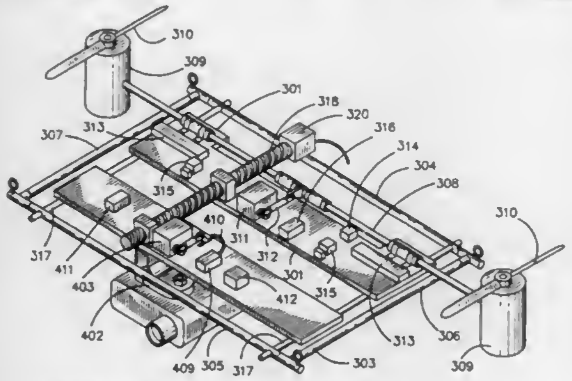
an open chamber for a film source and an open chamber for a battery, and a lid for sealing said open chamber for a film source, is characterized in that:

at least one cover part for said main body part at least partially covers said open chamber for a battery to prevent the battery from being removed from the chamber when said cover part is in place, and is resilient to allow said cover part to be bent away from said open chamber for a battery to permit the battery to be removed from the chamber; and

said lid is connected to said cover part to hold the lid to seal said open chamber for a film source and to prevent the cover part from being bent away from said open chamber for a battery, and can be disconnected from said cover part to allow the cover part to be bent away from said open chamber for a battery, whereby the battery can be removed from the chamber.

5,752,088
AERIAL PHOTOGRAPHY DEVICE

Alex S. Desselle, 33443 Nancy Dr., Walker, La. 70785
Filed Feb. 3, 1997, Ser. No. 794,046
Int. Cl.^{6} G03B *39/00*
U.S. Cl. 396—12 **18 Claims**



1. An aerial photography device comprising:

(1) a buoyancy means for providing sufficient lift to said photography device so that said photography device can maintain altitude;

(2) a servo frame, said servo frame being fixably attached to said buoyancy means;

(3) a servo platform attached to said servo frame, said servo platform comprising:

(a) at least two motors fixably attached to a motor rod, each said motor having a propeller:

(b) a global servo fixably attached to said servo platform and operably attached to said motor rod, said global servo adapted such that said global servo can rotate said motor rod about the long axis of said motor rod;

(c) for each motor, a motor speed controller for independently controlling the speed of each said motor;

(d) a global gyroscope fixably attached to said servo frame; and

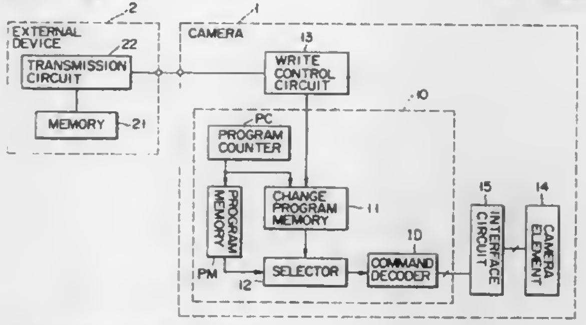
(e) a global controller attached to said servo platform and operably connected to said global gyroscope and said global servo, said global controller and said global gyroscope being adapted such that when said global gyroscope senses a change in orientation from a selected position in at least one dimension, said global controller will cause said global servo to position said motor rod as necessary to maintain said device in said selected position in one dimensions;

(3) a camera platform attached to said servo frame, said camera platform having a camera mount which is pivotable through at least one plane; and

(4) a control means for remotely controlling said servo platform and said camera platform.

5,752,089
SYSTEM OPERABLE WITH A GIVEN APPARATUS AND CAPABLE OF PSEUDO-REWRITING A PROGRAM

Azuma Miyazawa, Mitaka; Satoshi Miyazaki, Tokyo; Tetsuo Miyasaka, Tsukui-machi; Toshiaki Ishimaru, Hino; Kazutada Kobayashi, and Shoji Kawamura, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 742,606, Aug. 8, 1991, abandoned. This application May 6, 1994, Ser. No. 238,985
Claims priority, application Japan, Aug. 13, 1990, 2-214087; May 20, 1991, 3-115070
Int. Cl.^{6} G03B *17/00*
U.S. Cl. 396—48 **49 Claims**



1. A camera system comprising:

a microcomputer provided in a camera body, said microcomputer including

a read-only memory for storing a series of program instructions for operating the camera,

a program counter for designating addresses of the program instructions stored in the read-only memory,

a replacement program memory for storing a change address and a replacement program instruction of a portion to be corrected in said series of program instructions, said replacement program instruction being read out instead of a program instruction stored in the read-only memory only when the change address coincides with a program instruction address designated by the program counter, and an instruction decoder for controlling a camera element via an interface circuit according to the program instruction read out from the read-only memory or the replacement program instruction read out instead of the program instruction; and

a camera accessory connectable to said camera body, said camera accessory including

memory means for storing a change address and a replacement program instruction for making a necessary correction in order to use said series of program instructions stored in the read-only memory in combination with the camera accessory, and

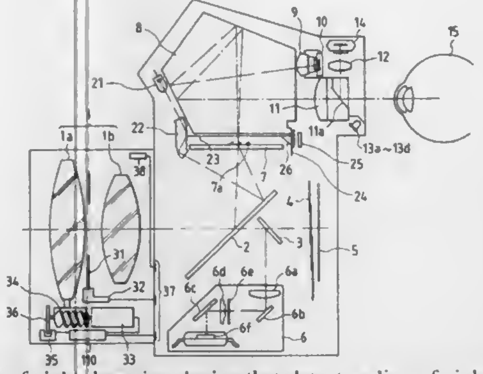
transmission means for transmitting the change address and the replacement program instruction stored in said memory means to the camera body; and

write control means, provided in the camera body, for receiving the change address and the replacement program instruction transmitted by the transmission means and writing the same into the replacement program memory.

5,752,090
OPTICAL DEVICE HAVING A LINE OF SIGHT DETECTION APPARATUS

Akihiko Nagano, Ichihara; Akira Yamada, and Yoshiaki Irie, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 585,576, Jan. 16, 1996, abandoned. This application Aug. 11, 1997, Ser. No. 907,997
Claims priority, application Japan, Jan. 13, 1995, 7-019969
Int. Cl.^{6} G03B *7/08;13/02;13/36*
U.S. Cl. 396—51 **22 Claims**

1. An optical apparatus, comprising:



a line of sight detection device that detects a line of sight of an operator;

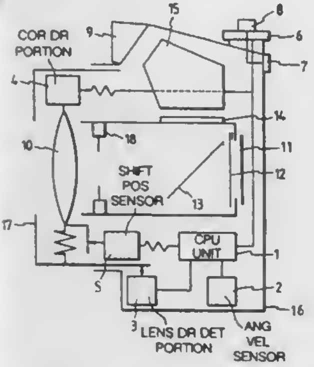
a display device that displays a position of the line of sight detected by said line of sight detection device; and

a control device that controls said apparatus in a first control mode or a second control mode, wherein in each of the first control mode and the second control mode said control device controls said apparatus based on information corresponding to the line of sight detected by said line of sight detection device; and

a selection circuit that selects either the first control mode or the second control mode, wherein said display device varies a state of display of the position of the line of sight in accordance with the control mode of said control device selected by said selection circuit.

5,752,091
CAMERA HAVING ANIMAGE BLUR SUPPRESSION DEVICE

Tadao Kai, Kawasaki, and Akira Katayama, Koganei, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Division of Ser. No. 479,398, Jun. 7, 1995, Pat. No. 5,640,611, which is a division of Ser. No. 305,759, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 83,252, Jun. 29, 1993, abandoned. This application Mar. 3, 1997, Ser. No. 813,942
Claims priority, application Japan, Jul. 28, 1992, 4-200060; Nov. 17, 1992, 4-330975
Int. Cl.^{6} G03B *5/00*
U.S. Cl. 396—52 **2 Claims**



1. An apparatus for calculating a camera shake amount, comprising:

detecting means for detecting camera shakes;

storing means for storing a predetermined storage value;

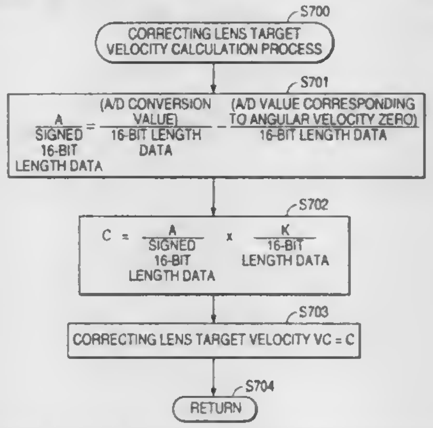
comparing means for comparing said storage value with an output of said detecting means;

calculating means for calculating a calculation value concerning the camera shakes from the output of said detecting means; and

changing means for changing an input value for said calculating means into said calculation value when the output of said detecting means exceeds said storage value.

5,752,092
CONTROL UNIT FOR A VIBRATION COMPENSATION DEVICE FOR USE IN AN OPTICAL IMAGING SYSTEM

Sueyuki Ohishi, Tokyo, and Nobuhiko Terui, Ichikawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jan. 25, 1995, Ser. No. 377,607
Claims priority, application Japan, Apr. 27, 1994, 6-090325
Int. Cl.^{6} G03B *17/00*
U.S. Cl. 396—53 **19 Claims**


S700
CORRECTING LENS TARGET VELOCITY CALCULATION PROCESS
S701
A / SIGNED 16-BIT LENGTH DATA = (A/D CONVERSION VALUE) / 16-BIT LENGTH DATA − (A/D VALUE CORRESPONDING TO ANGULAR VELOCITY ZERO) / 16-BIT LENGTH DATA
S702
C = A / SIGNED 16-BIT LENGTH DATA x K / 16-BIT LENGTH DATA
S703
CORRECTING LENS TARGET VELOCITY VC = C
S704
RETURN

1. A control unit for a vibration compensation device for use in an optical imaging system comprising:

a multiplying unit adapted to multiply 8-bit data by 16-bit data.

5,752,093
BUILT-IN FLASH CAMERA

Minoru Ishiguro, and Hideo Yoshida, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan
Continuation of Ser. No. 652,302, May 23, 1996, abandoned. This application Sep. 16, 1997, Ser. No. 931,240
Claims priority, application Japan, May 26, 1995, 7-128520
Int. Cl.^{6} G03B *7/08*
U.S. Cl. 396—61 **20 Claims**

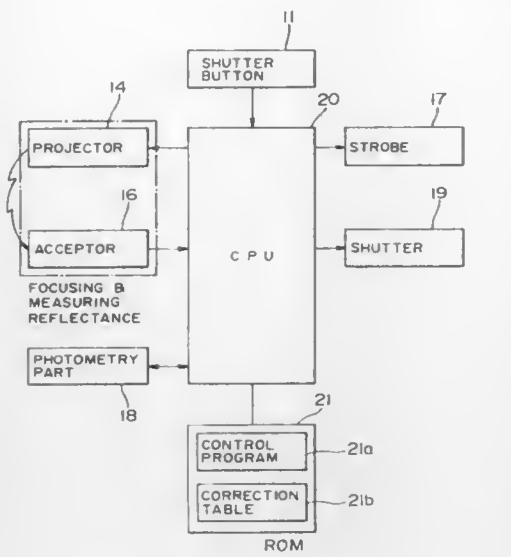
1. A built-in flash camera including a strobe light therein, the built-in flash camera comprising:

a photometry part for measuring external light brightness within a shot visual field;

a focusing part for measuring distance between the camera and a main subject within the shot visual field;

a reflectance measuring part for measuring a reflectance of the main subject;

an automatic exposure mechanism for opening and closing a diaphragm shutter to obtain an exposure exposure under an external light brightness, greater than a predetermined reference external light brightness, the predetermined reference external light brightness being an external light brightness at which an optimum exposure is obtained when the shutter is open for a predetermined time; and



a strobe light control part for controlling the strobe light to flash in connection with the opening and closing of the shutter and for varying the exposure of the strobe light in accordance with the measured distance and the measured reflectance;

wherein a reference reflectance RO is predetermined, R is defined as the measured reflectance, and wherein the strobe light control part sets the exposure of the strobe light based upon the ratio of RO/R;

wherein a strobe changeover brightness of the strobe light is set to a value less than the predetermined reference external light brightness.

5,752,094
AUTOZOON APPARATUS FOR CAMERA

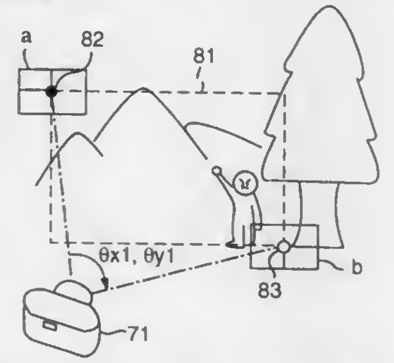
Motoko Tsutsumi; Minoru Hara, both of Hachioji, Japan, and Kenichi Kishida, Kowloon, Hong Kong, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 501,877

Claims priority, application Japan, Jul. 27, 1994, 6-175498

Int. Cl.⁶ G03B *17/00*

U.S. Cl. 396—76 39 Claims



1. An autozoom camera having a zoom lens, comprising:

manual operating means for inputting information on an angle of view to be photographed;

angular displacement detecting means for detecting an amount of angular displacement of the camera when the manual operating means is operated;

focal length determining means for determining a focal length of the zoom lens on the basis of the amount of angular displacement detected by the displacement detecting means; and

driving means for driving the zoom lens on the basis of the focal length determined by the focal length determining means.

5,752,095
MAGNIFICATION CHANGE-OVER DEVICE FOR CAMERA

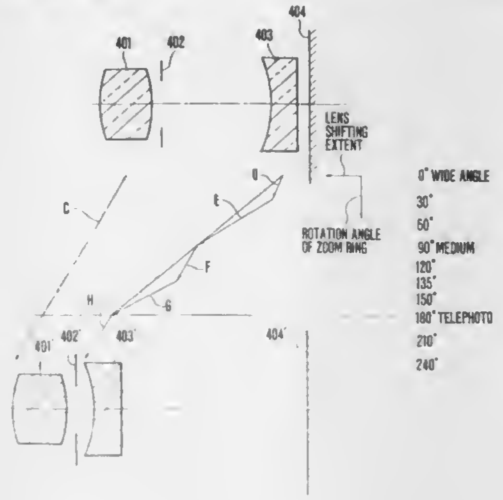
Takayuki Tsuboi, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 383,534, Feb. 1, 1995, abandoned, which is a continuation of Ser. No. 237,952, May 3, 1994, abandoned, which is a continuation of Ser. No. 921,187, Jul. 28, 1992, abandoned, which is a division of Ser. No. 831,074, Feb. 5, 1992, Pat. No. 5,223,873, which is a division of Ser. No. 453,056, Dec. 13, 1989, abandoned, which is a continuation of Ser. No. 296,928, Jan. 11, 1989, abandoned, which is a continuation of Ser. No. 125,734, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 862,798, May 13, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 484,623

Claims priority, application Japan, May 14, 1985, 60-102436; May 14, 1985, 60-102437; Jun. 14, 1985, 60-129339; Jun. 14, 1985, 60-129340

Int. Cl.⁶ G03B *5/00;13/36;* **G02B** *7/09*

U.S. Cl. 396—80 127 Claims



1. An apparatus, comprising:

a first guide part which guides an optical unit for magnification change;

a second guide part which guides said optical unit for focus adjustment, said second guide part being provided on an extension of said first guide part;

a third guide part which guides said optical unit for magnification change, said third guide part being provided on an extension of said second guide part; and

a fourth guide part which guides said optical unit for focus adjustment, said fourth guide part being provided on an extension of said third guide part.

5,752,096
CAMERA FEATURING A SINGLE DRIVE SOURCE AND A PLURALITY OF SELECTABLE DRIVE TRANSMISSION MECHANISMS

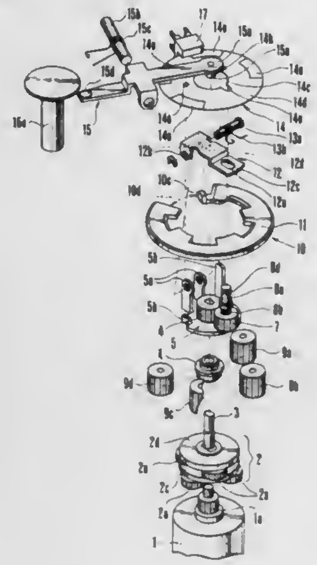
Kazushige Ichino, Tokyo; Ryoichi Suzuki; Takayuki Tsuboi, both of Yokohama; Yoshiaki Hamada; Yuji Fujihara, both of Kawasaki, and Yoshiyuki Kaneko, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 580,276, Dec. 27, 1995, abandoned, which is a continuation of Ser. No. 323,710, Oct. 18, 1994, abandoned, which is a continuation of Ser. No. 834,167, Feb. 11, 1992, abandoned. This application Oct. 22, 1996, Ser. No. 731,920

Claims priority, application Japan, Feb. 14, 1991, 3-040864; Feb. 14, 1991, 3-040865; Feb. 14, 1991, 3-040866; Feb. 14, 1991, 3-040867; Feb. 14, 1991, 3-040868; Feb. 14, 1991, 3-040869; Feb. 14, 1991, 3-040870; Feb. 14, 1991, 3-040871; Feb. 14, 1991, 3-040872; Feb. 14, 1991, 3-040873; Feb. 14, 1991, 3-040875

Int. Cl.⁶ G03B *1/18*

U.S. Cl. 396—85 80 Claims



1. A camera, comprising:

a first rotatable portion that transmits a drive force by rotation;

a second rotatable portion that rotates in association with rotation of the first rotatable portion and revolves around the first rotatable portion;

a transmission portion engagable with the second rotatable portion by revolution of the second rotatable portion, thereby to transmit the drive force from the first rotatable portion to the transmission portion; and

a control device which determines whether or not a rotation direction of the first rotatable portion which causes the second rotatable portion to revolve into engagement with the transmission portion is the same as a rotation direction of the first rotatable portion which transmits the drive force to the transmission portion, and, if not the same, causes the first rotatable portion to rotate in such a manner that the second rotatable portion revolves to a position to transmit the drive force to the transmission portion and passes the position, and then reverses the direction of rotation of the first rotatable portion.

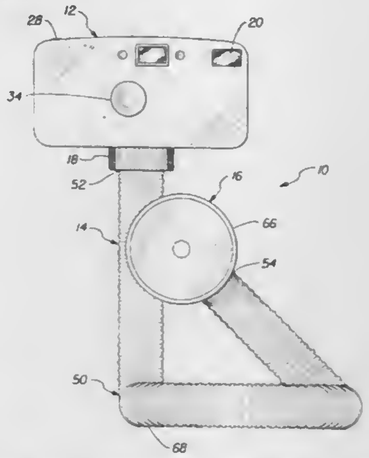
5,752,097
APPARATUS FOR SUPPORTING A CAMERA TO FACE A SUBJECT TO BE PHOTOGRAPHED AND FOR ILLUMINATING THE SUBJECT

Dale Frederick McIntyre, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1996, Ser. No. 697,744

Int. Cl.⁶ G03B *15/03*

U.S. Cl. 396—157 3 Claims



1. A photographic assemblage comprising a camera with an electronic flash unit for providing a flash exposure light pulse, is characterized in that:

a single auxiliary lamp provides a subject-conditioning pre-flash light pulse before said electronic flash unit provides the flash exposure light pulse;

an infrared emitter in said camera emits infrared radiation from a radiation egress opening in the camera;

a phototransistor is capable of receiving the infrared radiation;

a lamp circuit connected to said phototransistor causes said auxiliary lamp to provide the pre-flash light pulse before said electronic flash unit provides the flash exposure light pulse, when said phototransistor receives the infrared radiation;

a filter at said radiation egress opening prevents ambient non-infrared radiation from entering the radiation egress opening but allows infrared radiation to be emitted from the radiation egress opening to said phototransistor; and

a selector has a selection setting for causing said auxiliary lamp to be continuously on to provide continuous illumination, including when said electronic flash unit provides the flash exposure light pulse, instead of providing the pre-flash light pulse.

5,752,098
AUTO FOCUSSING METHOD AND DEVICE

Shigeo Toji; Masanori Yoshida, and Atsushi Misawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 625,812, Apr. 4, 1996, abandoned. This application Aug. 1, 1997, Ser. No. 904,933

Claims priority, application Japan, Apr. 5, 1995, 7-080540

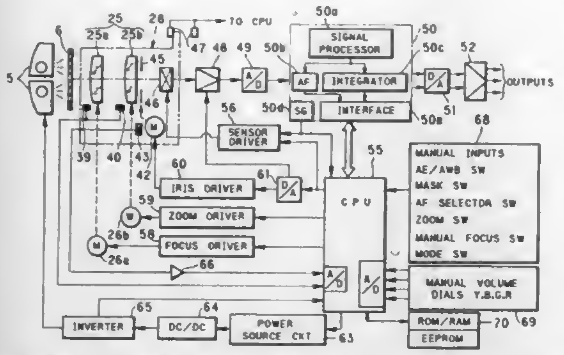
Int. Cl.⁶ G03B *13/36*

U.S. Cl. 396—85 33 Claims

1. An auto focussing method for a zoom optical system, an image sensor being disposed behind said zoom optical system for picking up an object, said zoom optical system being focussed by use of a photoelectric signal from said image sensor, said auto focussing method comprising steps of:

in a setup mode, zooming said zoom optical system from a first magnification to a preset magnification, said zoom optical system having been set at said first magnification, said preset magnification being adapted to focussing;

focussing said zoom optical system in accordance with said photoelectric signal generated while said zoom optical system has said preset magnification; and



zooming said zoom optical system back from said preset magnification to said first magnification, while keeping said zoom optical system in-focus, whereby said zoom optical system becomes in-focus at said first magnification in accordance with said focussing at said preset magnification and with predetermined tracking data.

5,752,099
OPTICAL UNIT FOR DETECTING A FOCUS STATE

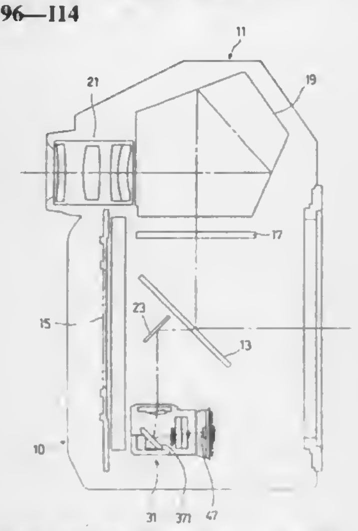
Tatsuhide Takebayashi, and Takayuki Sensui, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1996, Ser. No. 708,947

Claims priority, application Japan, Sep. 11, 1995, 7-233063

Int. Cl.⁶ G03B *13/36*

U.S. Cl. 396—114 **8 Claims**



1. An optical unit for detecting a focus state, comprising:
- a focus detection zone restricting plate having a plurality of openings arranged in a first pattern in a vicinity of a predetermined focal plane on which an object image is formed;
- a sensor unit having a plurality of sensor sections arranged in a second pattern different from said first pattern, in a vicinity of an image reforming surface on which said object image is reformed; and
- a plurality of mirrors which deflect light transmitted through said plurality of openings arranged in said first pattern toward said plurality of sensor sections so said light has an orientation identical to an orientation of said second pattern of said plurality of sensor sections,

wherein said plurality of openings and said plurality of sensor sections are provided on a body of said optical unit, said plurality of mirrors being provided on members distinct from said body of said optical unit, reflecting surfaces of said plurality of mirrors being positioned by bringing said reflecting surfaces into contact with a plurality of reference surfaces formed on said body of said optical unit.

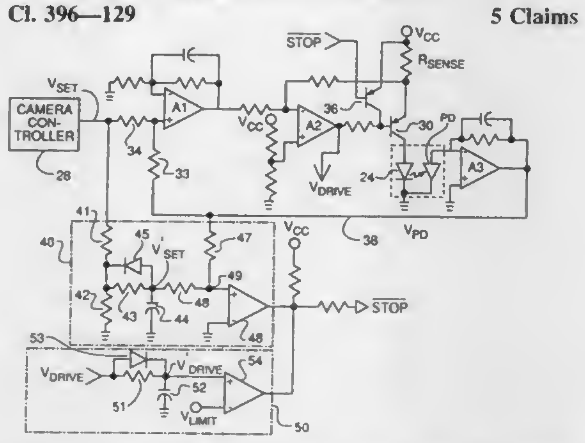
5,752,100
DRIVER CIRCUIT FOR A CAMERA AUTOFOCUS LASER DIODE WITH PROVISION FOR FAULT PROTECTION

Anthony Ward Schrock, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 592,170, Jan. 26, 1996, abandoned. This application Feb. 28, 1997, Ser. No. 808,293

Int. Cl.⁶ G03B *3/00;13/36;* **H02H** *3/00*

U.S. Cl. 396—129 **5 Claims**



1. A control circuit for a laser diode with provision for disablement of the diode in the event of a fault in an operating condition of the diode, comprising:
- means for supplying a switching input signal setting an ON/OFF condition of the laser diode in which the laser diode operates at an integrated power level which is at or below a predetermined integrated operating power level but which may have peak power levels exceeding said predetermined integrated operating power level;
- a laser diode current source including a current switch, said laser diode being coupled to said switch;
- a laser diode drive circuit coupling said input signal to said switch for controlling opening and closing of said switch to effect flow of drive current to said laser diode determined by said switching input signal when said switch is closed in response to an ON condition of the input signal;
- fault sensing feedback control circuit means for sensing operating power level of the laser diode and generating a feedback signal to maintain operation of said laser diode at or below said predetermined integrated operating power level; and
- feedback signal sensing circuit means, separate from said input signal supply means, coupled to said feedback control circuit means and responsive to absence of said feedback signal to open said current switch thereby terminating flow of said drive current from said current source and terminating operation of said laser diode.

5,752,101
FLASH LIGHT AMOUNT CONTROLLING APPARATUS

Norihiko Akamatsu, Suita; Masataka Hamada, Osakasayama; Kazuhiko Yukawa, Wakayama, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

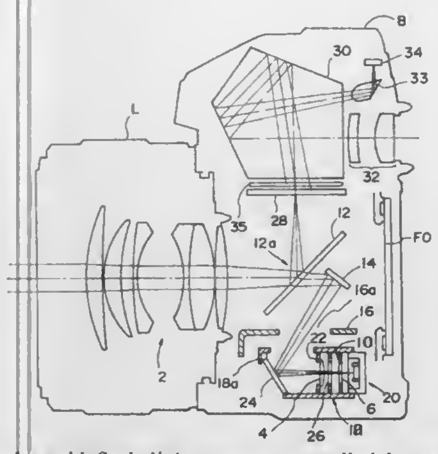
Filed Aug. 4, 1994, Ser. No. 285,963

Claims priority, application Japan, Aug. 5, 1993, 5-214897

Int. Cl.⁶ G03B *13/36*

U.S. Cl. 396—155 **7 Claims**

1. Flash light amount controlling apparatus, comprising:
- a distinction device which distinguishes set auto focus mode; and
- a control device, having first and second flash light amount control devices, which selectively controls either the first or the second flash light amount control device as a function of the auto focus mode distinguished by said distinction device whereby said flash light amount controlled by said control device is based on reflected flash light.



5,752,102
ELECTRONIC FLASHING DEVICE

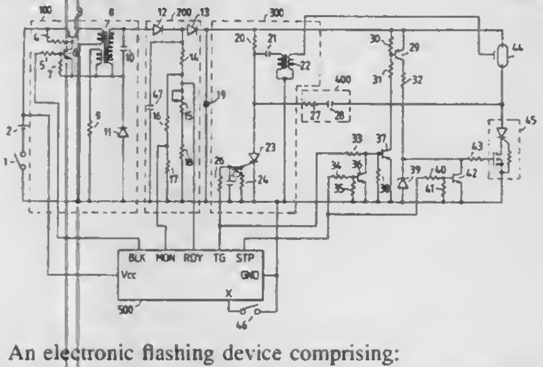
Hideki Matsui, Yokohama; Hiroshi Sakamoto, Kawasaki; Ryotaro Takayanagi, Yokosuka, and Nobuyoshi Hagiuda, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 42,771, Apr. 6, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 488,463

Claims priority, application Japan, Apr. 16, 1992, 4-024357 U; Apr. 16, 1992, 4-096630

Int. Cl.⁶ G03B *15/05*

U.S. Cl. 396—156 **5 Claims**



1. An electronic flashing device comprising:
- a booster circuit for boosting a power supply voltage to a predetermined voltage;
- a main capacitor charged with a charge via said booster circuit;
- a light emission tube for emitting light according to said charge charged on said main capacitor;
- a semiconductor element connected in series with said light emission tube, and including a thyristor element and a MOS-FET which are cascade-connected to each other and are formed on a single chip;
- a trigger circuit for applying a trigger voltage to said light emission tube in response to a light emission start signal;
- a gate voltage applying circuit for applying a first voltage to a gate of said semiconductor element before the light emission start signal is output, in response to a second voltage and independent of the light emission start signal; and
- a gate voltage disappearing circuit for causing the first voltage at the gate of said semiconductor element to disappear in response to a light emission stop signal for causing said light emission tube to stop light emission,

wherein a series circuit of said light emission tube and said semiconductor element is connected in parallel with said main capacitor.

5,752,103
ELECTRONIC FLASH DEVICE

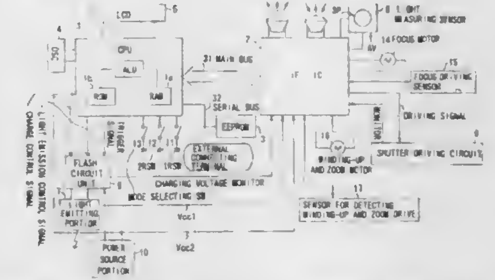
Takao Nishida, Urawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1997, Ser. No. 790,327

Claims priority, application Japan, Feb. 2, 1996, 8-017856

Int. Cl.⁶ G03B *9/70*

U.S. Cl. 396—173 **22 Claims**



1. An electronic flash device for use with a camera having a shutter with an aperture which opens gradually, the electronic flash device comprising:
- a flash tube having a discharge path;
- a switching element arranged in the discharge path; and
- a light emission controller for controlling a light emission of the flash tube while an opening diameter of the shutter varies by repeatedly turning on and off the switching element in accordance with an opening operation of the shutter.

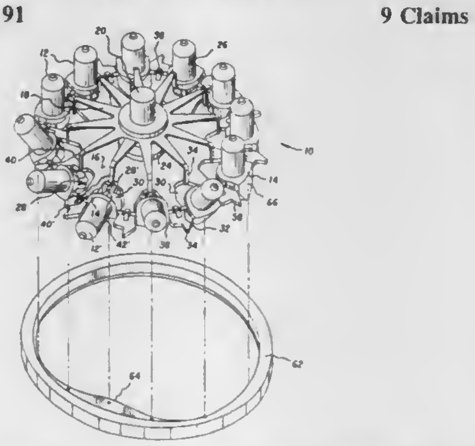
5,752,104
MULTI-LAMP FLASH WHEEL AND CAMERA

Michael Joseph O'Brien, Rochester; Robert Cooper Bryant, Honeoye Falls, and Richard Alexander Colleluori, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1996, Ser. No. 646,644

Int. Cl.⁶ G03B *15/04;* **F21K** *5/00*

U.S. Cl. 396—191 **9 Claims**



1. A multi-lamp flash assemblage comprising a plurality of flash lamps arranged in respective storage orientations, is characterized by:
- support means supporting each one of said flash lamps for movement relative to the other lamps to change the respective lamps from their storage orientations to ignition orientations which are different than the storage orientations; and
- resilient means for biasing each one of said flash lamps for movement relative to the other lamps to return the respective lamps to their storage orientations from their ignition orientations.

5,752,105

OPERATION METHOD OF DEVICE LOADED WITH A FILM UNIT

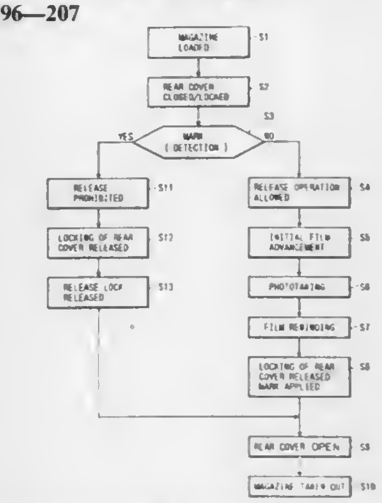
Tsugio Takahashi, Setagaya-ku; Hitoshi Aoki, Nerima-ku; Yoshio Imura, Machida; Hidenori Miyamoto; Daiki Tsukahara, both of Kawasaki; Noriyasu Kotani, Okegawa; Hideya Inoue, Yokohama, and Jun Nagai, Chigasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 451,064, May 25, 1995, Pat. No. 5,649,252, which is a division of Ser. No. 351,145, Nov. 30, 1994, abandoned, which is a continuation of Ser. No. 247,392, May 23, 1994, abandoned, which is a continuation of Ser. No. 141,694, Oct. 26, 1993, abandoned, which is a continuation of Ser. No. 961,345, Oct. 15, 1992, abandoned, which is a division of Ser. No. 747,458, Aug. 12, 1991, Pat. No. 5,159,365, which is a continuation of Ser. No. 465,310, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 321,793, Mar. 10, 1989, abandoned. This application Jan. 15, 1997, Ser. No. 782,681

Claims priority, application Japan, Mar. 15, 1988, 63-60916

Int. Cl.^{6} G03B *7/24*

U.S. Cl. 396—207 **21 Claims**



1. A method of operating a device which is capable of loading a film unit of a type having film and a container for accommodating said film, said device being provided with a transporter capable of electrically feeding and rewinding said film, and said film unit being unloadable from said device after a rewind operation in which film fed outside said container is fed back inside said container by said transporter, said method comprising:

- loading said device with a film unit of the aforesaid type and having a changeable information part;
- detecting whether said information part has a predetermined state; and
- in response to a detection that said information part does not have said predetermined state, setting said information part to said predetermined state.

5,752,106

AUTOMATIC FOCUS CAMERA

Shozo Yamano, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 19, 1995, Ser. No. 492,137

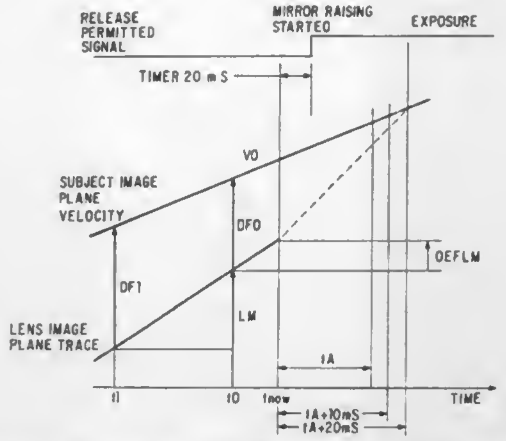
Claims priority, application Japan, Sep. 7, 1994, 6-213404

Int. Cl.^{6} G03B *13/36*

U.S. Cl. 396—263 **20 Claims**

1. An automatic focus camera, comprising:

- a shooting lens;
- a shutter;
- shift amount detection means which detects information relating to a shift amount between a shooting lens position and a focus position with respect to a subject;
- automatic focus adjustment means which automatically controls driving of the shooting lens toward the focus position on the basis of the above information relating to the shift amount;



- algorithm means which computes a required time needed for the shooting lens to reach the focus position on the basis of the information relating to the shift amount; and
- control means which permits driving of the shutter in accordance with the required time, said camera further comprising:
- means for detecting a release operation to determine whether or not a release action is to be conducted; and
- means for controlling the release action so that, if the release operation detection means determines to perform the release action and if the required time is longer than a release time lag of the camera, then the release action starts after a delayed time which corresponds to at least the difference between the required time and the release time lag.

5,752,107

REAL IMAGE FINDER SYSTEM FOR A CAMERA

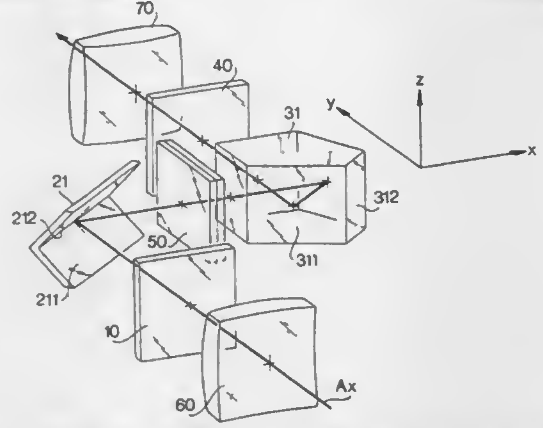
Sachio Hasushita; Masato Noguchi; Kazuhiro Yamada; Ichiro Taguchi, and Masahiro Inazuka, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 587,985, Jan. 17, 1996, abandoned, which is a continuation of Ser. No. 354,093, Dec. 6, 1994, Pat. No. 5,537,184. This application May 16, 1997, Ser. No. 857,564

Claims priority, application Japan, Jan. 25, 1994, 6-000192

Int. Cl.^{6} G03B *13/08*

U.S. Cl. 396—296 **18 Claims**



1. A real image finder system having an objective lens, an eyepiece lens and deflecting system that includes an erecting optical system that is positioned between said objective lens and said eyepiece lens, said finder system comprising:

- an LCD panel located on an image plane of said objective lens, said LCD panel displaying information to be viewed through said eyepiece lens;
- a first polarizer positioned between said objective lens and said LCD panel; and
- a second polarizer positioned between said LCD panel and said eyepiece lens,

- wherein at least one optical component of said deflecting system is located between said first polarizer and said second polarizer.

5,752,108

RECORDING DATA ERECTING APPARATUS

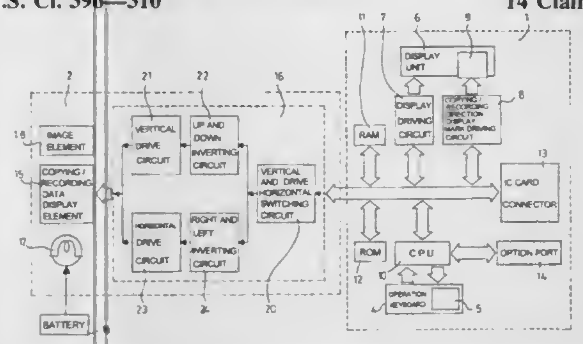
Tadashi Sato, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

Filed Nov. 1, 1995, Ser. No. 548,296

Claims priority, application Japan, Nov. 2, 1994, 6-269987; Oct. 9, 1995, 7-261665

Int. Cl.^{6} G03B *17/24*

U.S. Cl. 396—310 **14 Claims**


11
7
6
9
1
DISPLAY UNIT
2
21
22
16
8
18
IMAGE ELEMENT
VERTICAL DRIVE CIRCUIT
UP AND DOWN INVERTING CIRCUIT
RAM
DISPLAY DRIVING CIRCUIT
COPYING / RECORDING DIRECTION DISPLAY MARK DRIVING CIRCUIT
15
COPYING / RECORDING DATA DISPLAY ELEMENT
VERTICAL AND DRIVE HORIZONTAL SWITCHING CIRCUIT
13
IC CARD CONNECTOR
17
HORIZONTAL DRIVE CIRCUIT
RIGHT AND LEFT INVERTING CIRCUIT
ROM
CPU
OPTION PORT
12
10
14
OPERATION KEYBOARD
4
5
23
24
20
BATTERY

1. A recording data erecting apparatus for a camera arranged to copy and record data, comprising:

- data input means for inputting a recording data;
- data recording means for recording the recording data in a vertical direction of a photosensitive surface of a film or a horizontal direction thereof;
- erection direction input means electrically connected to the data recording means for inputting an erection direction of the recording data; and
- display means included in and electrically connected to the data input means for displaying the erection direction of the recording data.

5,752,109

PHOTOGRAPHIC CAMERA SYSTEM

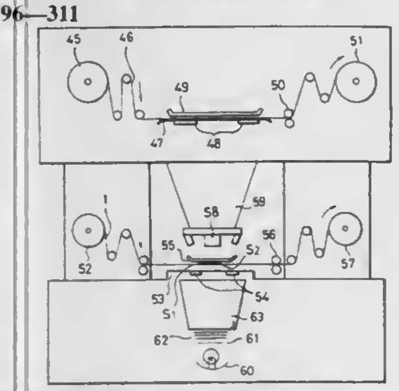
Takahiko Saito, Kanagawa; Akira Nakanishi, Tokyo; Shunzi Obayashi, Tokyo; Kyoji Genda, Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 714,695, Sep. 16, 1996, abandoned, which is a continuation of Ser. No. 333,593, Nov. 2, 1994, Pat. No. 5,625,430, which is a continuation of Ser. No. 26,415, Mar. 4, 1993, abandoned. This application May 5, 1997, Ser. No. 851,412

Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304

Int. Cl.^{6} G03B *17/24*

U.S. Cl. 396—311 **5 Claims**



1. A photographic system comprising:

- a photographic camera, including
  - a camera body,
  - a first housing disposed in the camera body for housing photographic film in a photographic film cartridge,
  - a second housing disposed in the camera body for housing the photographic film drawn from the photographic film cartridge,
  - film drive means disposed in the camera body for driving the photographic film between the first and second housings,
  - exposure means for exposing an image of a subject onto a portion of an effective area of the photographic film located at an exposure opening between the first and second housings,
  - selector switch means for enabling a user to select one of a plurality of aspect ratios for a print picture,
  - sensor means for detecting a hole formed along a first outer longitudinal edge portion of the photographic film and generating a film position detecting signal based upon the detected hole, the first outer longitudinal edge portion having film information pre-recorded thereon,
  - control means disposed in the camera body including a microcomputer electrically connected to the selector switch means for receiving a selection signal from the selector switch means and determining a position of an exposure area of the photographic film available to record the image, and
  - recording means disposed in the camera body and responsive to the micro-computer for recording at least an aspect signal generated based upon the selection signal, the aspect signal recorded on a second outer longitudinal edge portion of the photographic film for indicating an aspect of the photographic film to be printed on photosensitive print paper; and
- a photographic film printer for printing on the photosensitive paper processed photographic film recorded using the photographic camera, including
  - a printer body,
  - a light source and variable width mask for exposing the photosensitive print paper,
  - film feeding means for feeding the photographic film,
  - detecting means disposed on the printer body for non-mechanically detecting the aspect signal recorded between the edge of photographic film and the effective exposure area of the photographic film by the photographic camera,
  - processed photographic film drive control means disposed on the printer body for controlling driving of the photographic film,
  - logic circuit means for determining if the aspect signal corresponds to a first aspect format or a second aspect format and for determining whether the detected aspect signal is correct based on film feed information from the film feeding means, and
  - printing means disposed on the printer body for varying an opening width of the variable width mask used to expose the image of the subject in the exposure area of the photographic film onto the photosensitive print paper based on the format determined by the logic circuit means.

5,752,110

APPARATUS THAT USES A PHOTOGRAPHIC FILM

Shuji Iijima, Yamato, and Akio Nishizawa, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Aug. 29, 1996, Ser. No. 705,126

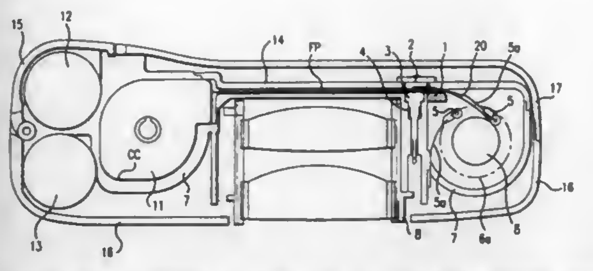
Claims priority, application Japan, Sep. 4, 1995, 7-226528

Int. Cl.^{6} G03B *17/02;17/24*

U.S. Cl. 396—319 **20 Claims**

1. An apparatus that uses a film that is drawn out of a film cartridge, comprising:

- a film cartridge chamber that receives a film cartridge loaded in the apparatus;
- a take-up spool located in a spool chamber that winds up film that has been drawn out of the film cartridge;



a film path extending between the film cartridge chamber and the spool chamber; and

a film guide located at the spool chamber side of the film path and fixedly attached to a body of the apparatus, the film guide having a guide surface that is parallel to the film path and extending into the spool chamber and toward the take-up spool to ensure that film drawn out of the film cartridge is properly wound around the take-up spool.

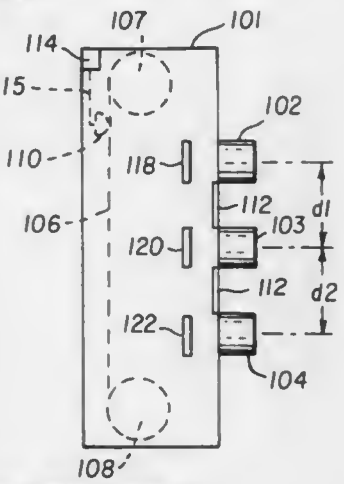
5,752,111
MULTI-LENS CAMERA WHICH RECORDS STATUS ON FILM

Roger Roy A. Morton, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 13, 1996, Ser. No. 600,713

Int. Cl.^{6} G03B *35/00;35/08*

U.S. Cl. 396—324 **8 Claims**



1. A multi-lens camera, comprising:

a housing;

at least two lenses spaced apart on the housing to obtain different views of a single scene for capturing as a set of simultaneously captured separate frames;

a status indicator which provides an indication of the relative positions of the different views based on the distance between the lenses when the set is captured; and

a recorder which can record the indication in association with the set.

5,752,112
MOUNTING SYSTEM FOR BODY MOUNTED CAMERA EQUIPMENT

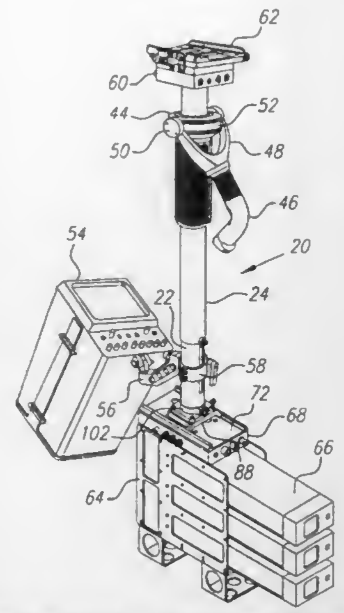
George K. Paddock; Christopher C. Haarhoff, both of Los Angeles, and Mark D. O'Kane, Manhattan Beach, all of Calif., assignors to George Paddock, Inc., Mesa, Ariz.

Filed Nov. 6, 1996, Ser. No. 746,204

Int. Cl.^{6} G03B *17/00;21/00*

U.S. Cl. 396—421 **17 Claims**

1. A mounting system for body mounted camera equipment, comprising



a tube assembly including a tube having a first, upper end and a second, lower end, the second, lower end having flanges extending radially outwardly from the tube;

a first attachment on the first, upper end of the tube assembly;

a second attachment;

a clamp including a mounting fixed to the second attachment, a split clamp ring fixed to the mounting, a bore through the split clamp ring and the mounting, grooves in the split clamp ring and the mounting extending longitudinally about the periphery of the bore and sized to axially receive the flanges, the mounting having a shoulder adjacent the grooves to receive and inter-engage the flanges through placement and rotation of the second, lower end of the tube assembly in the clamp, the split clamp ring being axially compressible against the second, lower end.

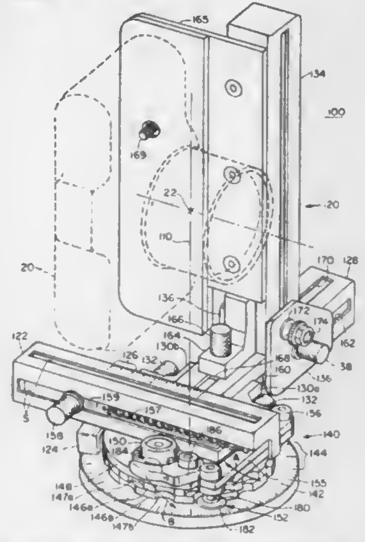
5,752,113
PANORAMIC INDEXING CAMERA MOUNT

John Borden, 6 Williams St., Cambridge, Mass. 02139

Filed Dec. 22, 1995, Ser. No. 577,292

Int. Cl.^{6} G03B *29/00*

U.S. Cl. 396—428 **19 Claims**



1. An image capturing device mount, comprising:

a frame for supporting an image capturing device;

a base adapted for connection to a support device, carrying the frame, and enabling the frame to be rotated through 360°; and

a rotational advance system that indexes the rotation of the frame to discrete angles, and that provides greater resistance to rotation in one direction than the other when rotated between the discrete angles.

5,752,114
PHOTOGRAPHIC AND VIDEO IMAGE SYSTEM

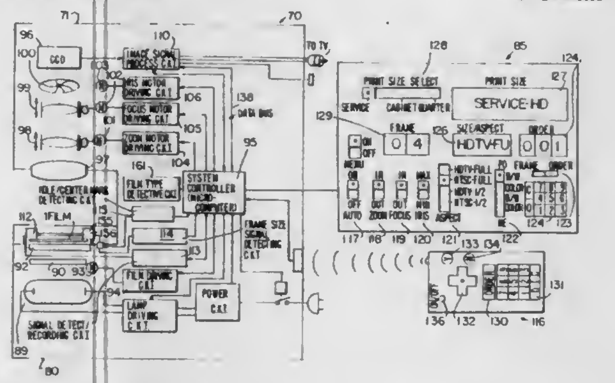
Takahiko Saito, Kanagawa; Akira Nakanishi; Shunzi Obayashi, both of Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 445,772, May 22, 1995, Pat. No. 5,652,643, which is a continuation-in-part of Ser. No. 329,546, Oct. 26, 1994, Pat. No. 5,583,591, which is a continuation-in-part of Ser. No. 26,415, Mar. 4, 1993, abandoned. This application Nov. 14, 1996, Ser. No. 748,802

Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304

Int. Cl.^{6} G03B *29/00*

U.S. Cl. 396—429 **8 Claims**



1. A photographic camera and image storage system comprising:

a photographic camera including:

a body,

a housing disposed in the camera body for housing a photographic film,

exposing means disposed in the camera body for exposing an image onto the photographic film, and

recording means including a selector switch operable by a user for magnetically or optically recording on a marginal edge of the photographic film an aspect signal determined in response to a signal from the selector switch; and

an image storage system for storing an image from a processed photographic film recorded using the photographic camera, the image storage system including:

image transforming means for transforming the image on the processed photographic film into an image signal,

detecting means for detecting the aspect signal magnetically or optically recorded on the processed photographic film,

image compressing means for compressing the image signal to form a compressed image signal, and

data storage means for storing the compressed image signal and the detected aspect signal.

5,752,115
AUTOFOCUS CAMERA WITH POWER CONTROL FOR EMITTED BEAM

Dale F. McIntyre, Honeoye Falls, and Anthony W. Schrock, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 26, 1996, Ser. No. 756,467

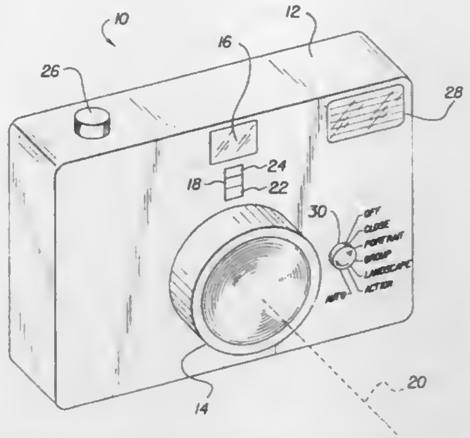
Int. Cl.^{6} G03B *13/00;1/08*

U.S. Cl. 396—431 **27 Claims**

1. A camera, comprising:

a camera body;

an objective lens for receiving light from an object in a scene and focusing the light on a focal plane within said camera body;



a photographic mode selection switch that enables a user of said camera to indicate a type of a scene to be photographed;

an emitter having an output power level for producing a beam oriented generally along an optical axis of said objective lens such that said beam reflects from the object;

a sensor for measuring an intensity level of a portion of said beam, said portion having been reflected back from the object to said sensor, and for producing a first signal; and

a controller responsive to said photographic mode selection switch and to said first signal for adjusting said output power when said intensity level of said portion reflected back differs from a predetermined level.

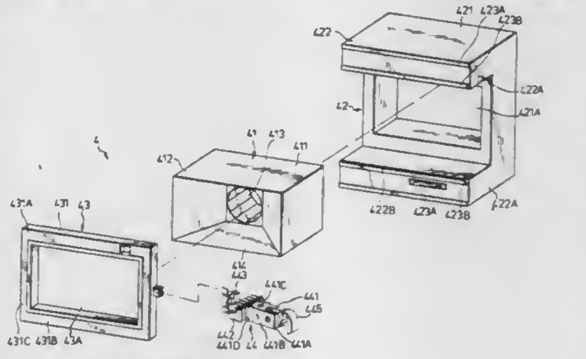
5,752,116
CAMERA HAVING A SCREEN ADJUSTMENT FRAME

Jing-Shiun Lai, Taichung, Taiwan, assignor to Shansun Technology Company, Ltd., Taipei Hsien, Taiwan

Filed Feb. 6, 1997, Ser. No. 796,701

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—435 **8 Claims**



1. A camera comprising:

a cartridge mounting chamber;

a film take-up chamber;

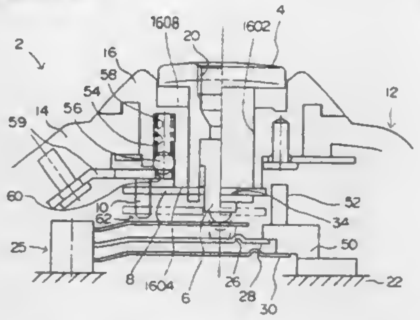
a photographing unit provided between said cartridge mounting chamber and said film take-up chamber, said photographing unit including a lens housing having a front housing portion holding a lens and a rear housing portion defining a diverging light passage;

a lens mounting frame including a front frame portion which receives said front housing portion and a rear frame portion which defines a screen adjustment chamber, said rear housing portion of said lens housing being received into said screen adjustment chamber, and

a screen adjustment frame having a frame part defining an opening, said frame part being mounted inside said screen adjustment chamber and being sleeve movably around said rear housing portion so as to be guided thereby for forward and rearward movement, said frame part being movable rearward and forward between a first position and a second position, said frame part crossing the path of the light passing through said diverging light passage in said first position so as to confine the light to pass through said opening, said frame part moving away from the path of the light in said second position.

5,752,117
RELEASE BUTTON MECHANISM OF CAMERA

Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1997, Ser. No. 859,368
Claims priority, application Japan, May 21, 1996, 8-150249
Int. Cl.⁶ G03B *17/38*
U.S. Cl. 396—504 **15 Claims**



13. A release button mechanism of a camera, comprising:

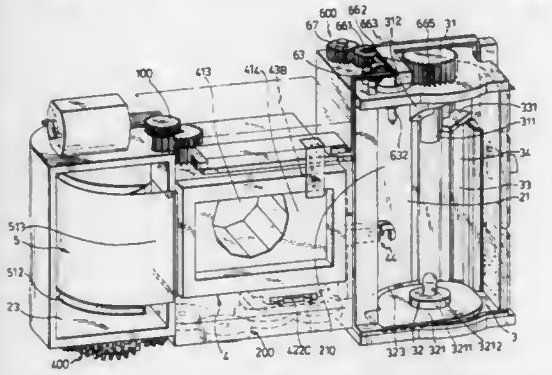
a release button to which an external release cable can be attached;

a release pin supported by said release button; and

a single association member engaged by said release button to prevent the release button from rotating and to prevent the release pin from slipping from the release button.

5,752,118
CAMERA

Jing-Shiun Lai, Taichung, Taiwan, assignor to Shansun Technology Company. Ltd., Taipei Hsien, Taiwan
Filed Feb. 6, 1997, Ser. No. 796,703
Int. Cl.⁶ G03B *1/04;17/02;17/26*
U.S. Cl. 396—513 **8 Claims**



1. A camera capable of accommodating a film cartridge having a cartridge spool, a film exit, and a light-intercepting door openable at the film exit by turning about a door axis, said camera comprising:

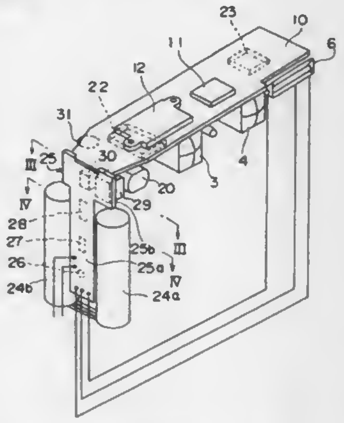
a cartridge mounting chamber which receives the film cartridge and which has a first spindle for holding said cartridge spool;

a drive mechanism for rotating said first spindle in a first direction to feed the film during the photographing operation and in a second direction to wind up the film after completing the photographing operation, said drive mechanism including a sun gear, a first planetary gear and a second planetary gear engaging the sun gear, and a planetary carrier holding said first and second planetary gears and having an axis of rotation coaxial with said sun gear, said sun gear being rotatable in two directions for turning said planetary carrier between a first position, in which said first planetary gear drives said first spindle in said first direction, and a second position in which said second planetary gear drives said first spindle in said second direction; and

a door driving gear mounted on the top of said film mounting chamber and incorporating a second spindle to be connected to said door axis, said door driving gear being engageable with one of said first and second planetary gears before said planetary carrier reaches said first position so as to open said light-intercepting door of said film cartridge before said first spindle is rotated in said first direction.

5,752,119
ARRANGEMENT OF STRUCTURE IN A CAMERA FOR REDUCED THICKNESS

Hidenori Miyamoto, Urayasu, and Isao Soshi, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 412,208, Mar. 27, 1995, abandoned, which is a continuation of Ser. No. 187,312, Jan. 27, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 478,929
Claims priority, application Japan, Jan. 28, 1993, 5-012797
Int. Cl.⁶ G03B *7/00*
U.S. Cl. 396—535 **11 Claims**



1. A camera having a camera body with a thickness in one direction and a film winding direction perpendicular to said one direction, said camera comprising:

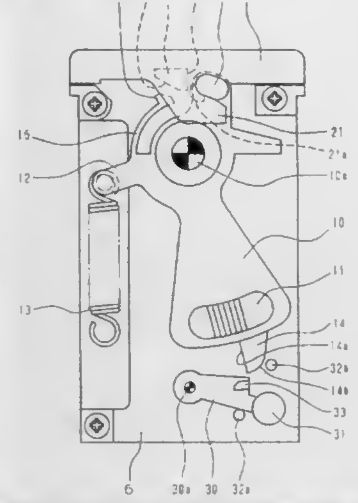
a pair of electric energy storage devices, each of said electric energy storage devices being spaced from each other in said one direction of the thickness so as to extend perpendicular to said film winding direction, the space between said electric energy storage devices being smaller than the diameter of each of said electric energy storage device;

a circuit board disposed between said pair of electric energy storage devices; and

a plurality of electric parts mounted on said circuit board so as to be disposed within an imaginary tube having a length equal to and defined by a resultant length of said electric energy storage devices when the longitudinal axes of both of said electric energy storage devices are overlaid side by side on one another and a substantially elliptical cross-section defined by a smallest loop which circumscribes the diameters of both of said electric energy storage devices.

5,752,120
MECHANISM FOR OPENING AND CLOSING A FILM CHAMBER OF A PHOTOGRAPHIC CAMERA

Yasuhiko Tanaka, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan
Continuation of Ser. No. 544,798, Oct. 18, 1995, abandoned. This application Mar. 24, 1997, Ser. No. 824,067
Claims priority, application Japan, Oct. 20, 1994, 6-279768
Int. Cl.⁶ G03B *17/02*
U.S. Cl. 396—536 **15 Claims**



1. A mechanism for preventing the unintentional opening of a lid on the bottom of a camera body, comprising in combination:

a locking member pivotally coupled at a first end to a wall of the camera body, a latch at said first end releasably engaging the lid, a lug extending from a second and opposite end of said locking member, and a control knob extending from said locking member through said wall of the camera body at a point intermediate said first and second ends for pivotally rotating said locking member and moving said latch with respect to the lid; and

a control lever having first and second ends, said first end pivotally coupled to said wall of the camera body, said second end having a weight spaced from said first end sufficiently so that said control lever pivots under the influence of gravity when the camera body is inverted, and a projection intermediate said first and second ends, said projection configured to engage said lug on said locking member blocking pivotal rotation of said locking member about said first end of said locking member when the camera body is generally in an upright position, and said projection disengaging said lug on said locking member permitting pivotal rotation of said locking member when the camera body is generally in an upside down position.

5,752,121
PHOTOGRAPHIC PROCESSING APPARATUS

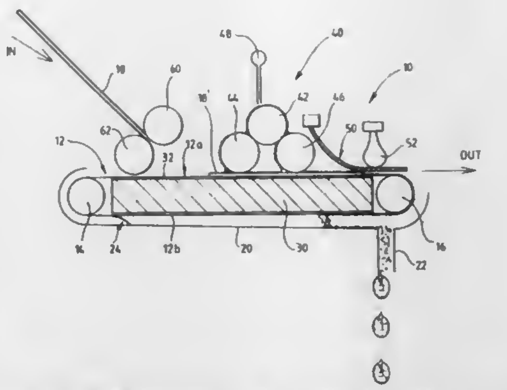
Anthony Earle, Harrow, and Leslie Robert Wells, Brentford, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 13, 1996, Ser. No. 713,305
Claims priority, application United Kingdom, Sep. 27, 1995, 9519709; May 9, 1996, 9609640
Int. Cl.⁶ G03D *5/00*
U.S. Cl. 396—606 **10 Claims**

1. Apparatus for processing photographic material including at least one processing stage which comprises:

a support surface for supporting the material being processed;

transport means for transporting the material through the processing stage; and

application means for applying processing solution to the material while the material is in the processing stage, the application means comprising at least two roller members arranged above the support surface, an upper roller member of said at least two roller members being located above a lower roller member of said at least two roller members and in contact therewith;

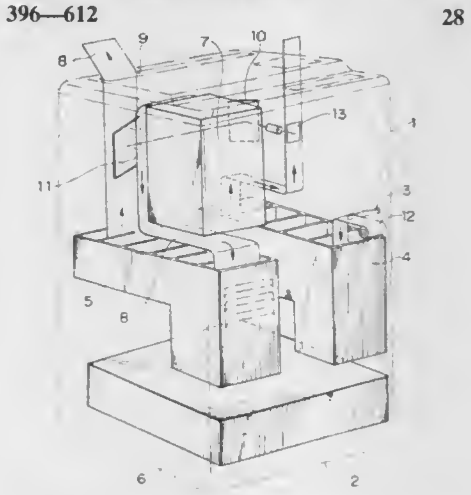


wherein the application means further includes metering means for supplying processing solution in predetermined amounts to at least one roller member of said at least two roller members thereof; and

the at least two roller members are freely mounted for rotation, the lower roller member being in contact with the support surface, at least in the absence of material to be processed, each of the at least two roller members being rotated by contact with the support surface and/or movement of the photographic material through the processing stage.

5,752,122
COLOR PHOTOGRAPHIC PROCESSING METHOD AND APPARATUS

Takatoshi Ishikawa, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 6, 1996, Ser. No. 659,751
Claims priority, application Japan, Jun. 9, 1995, 7-168316
Int. Cl.⁶ G03D *3/08*
U.S. Cl. 396—612 **28 Claims**



1. A color photographic processing apparatus in which a color film processing apparatus, a printer and a color paper processing apparatus are built-in in a casing, characterized in that

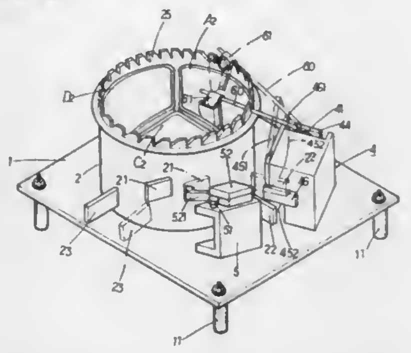
the sum of a length of a path from an entrance of a developing tank to a discharge port of a drying station of the color film processing apparatus and a length of a path from an entrance of a developing tank to a discharge port of a drying station of the color paper processing apparatus is in the range of 950 mm to

a processing time from insertion of an exposed color film into the color film processing apparatus to discharge of the 25th finished print or equivalent thereto through the processing of the color film, the print-exposure onto the color paper and the processing of the color paper is less than 10 minutes.

a ratio NV of the length of the path (mm) to the conveying speed of the color film (mm/second) is from 120–330, and
a ratio PV of the length of the path (mm) to the conveying speed of the color film (mm/second) is from 20–120.

5,752,123
AUTOMATIC X RAY DEVELOPING DEVICE

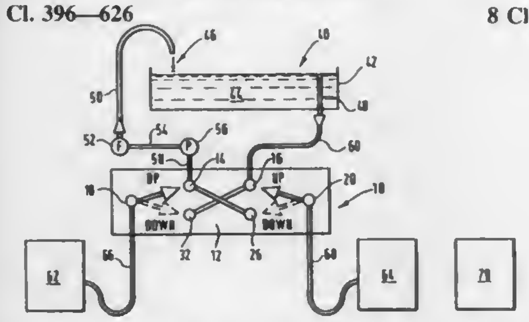
Jeng-Kuo Cheng, 9F, No. 163, Ming Sheng 2nd Road, Kao Shiong, Taiwan
Filed Dec. 2, 1996, Ser. No. 755,897
Int. Cl.⁶ G03D *3/08*
U.S. Cl. 396—621 **17 Claims**



1. An automatic X ray developing device comprising, in combination: a base platform; a cylindrical container rotatably disposed upon the base platform; a first vessel adapted to contain a developing agent; a second vessel adapted to contain a fixing agent; a third vessel adapted to contain water, with the first, second and third vessels disposed in the cylindrical container; a clamp seat disposed on the base platform; a clamp holder having an extended rod and a clamp hanging on the extended rod, with the extended rod being pivotal relative to the clamp seat, with the clamp adapted to hold the X ray; and means for pivoting the clamp holder relative to the clamp seat in response to the rotation of the cylindrical container to move the clamp so that the X ray held in the clamp is dipped into one of the first, second and third vessels.

5,752,124
HANDLING OF SOLUTIONS

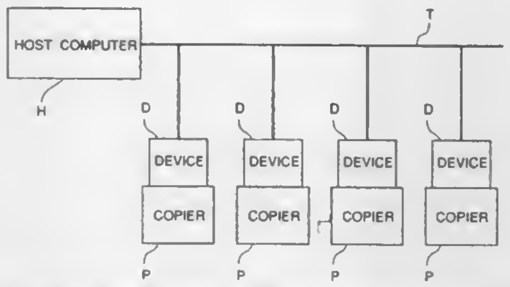
Edward Charles Glover, London, and Anthony Earle, Harrow Weald, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 16, 1996, Ser. No. 632,992
Claims priority, application United Kingdom, Apr. 18, 1995, 9507845
Int. Cl.⁶ G03D *3/02*
U.S. Cl. 396—626 **8 Claims**



1. A method of handling processing solutions for a photographic process using at least one flexible container capable of containing processing solution, the flexible container having a single connector by which it is connected to the process, the process having an inlet side through which fresh processing solution is introduced thereto and an outlet side from which used processing solution is removed therefrom, the method comprising the steps of:
a) providing at least one flexible container connected to the inlet side of the process for supplying processing solution thereto, the supply flexible container being initially substantially full of fresh processing solution;
b) providing at least one waste flexible container connected to the outlet side of the process for collecting used processing solution therefrom, the waste flexible container being initially substantially empty;
c) supplying fresh processing solution to the inlet side of the process;
d) collecting used processing solution from the outlet side of the process;
e) removing each waste flexible container from the outlet side of the process when it is substantially full;
f) switching each substantially emptied supply flexible container from the inlet side of the process to the outlet side of the process to replace a respective one of the removed waste flexible container;
g) providing at least one further supply flexible container; and
h) connecting each further supply flexible container to the inlet side of the process;
characterized in that step f) is carried out by a valve arrangement with no physical movement of each flexible container.

5,752,125
MAINTENANCE MANAGEMENT SYSTEM FOR IMAGE FORMING EQUIPMENT

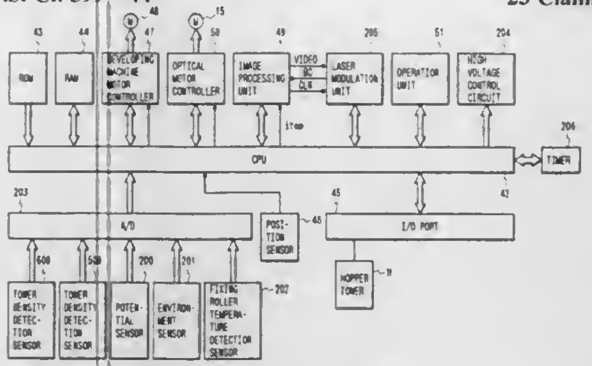
Yuji Yamashita; Jiro Nagira; Yasuhiro Hashimoto, and Hiroshige Utatsu, all of Osaka, Japan, assignors to Mita Industries Co. Ltd, Osaka, Japan
Filed Sep. 20, 1996, Ser. No. 716,888
Claims priority, application Japan, Sep. 28, 1995, 7-251376
Int. Cl.⁶ G03G *15/00*
U.S. Cl. 399—8 **4 Claims**



1. A maintenance management system for image forming equipment for managing items of maintenance work to be performed for each component of the image forming equipment, comprising:
a work item storing means for setting items of maintenance work that need to be performed for each component regularly at every predetermined count of use of the image forming equipment, and for storing different work item setting areas in order of precedence of regular maintenance occasions;
a work item judging means for judging, based on an order of precedence of a work item setting area referred to at a particular moment, to which work item setting area belongs an item of work to be performed on a next occasion; and
a work item determining means for determining, based on how many times maintenance has been performed for the image forming equipment until a particular moment, whether or not an item of work that belongs to a work item setting area having an order of precedence prior to a result given by said work item judgment means needs to be added to an item of work to be performed on a next occasion.

5,752,126
IMAGE FORMING APPARATUS

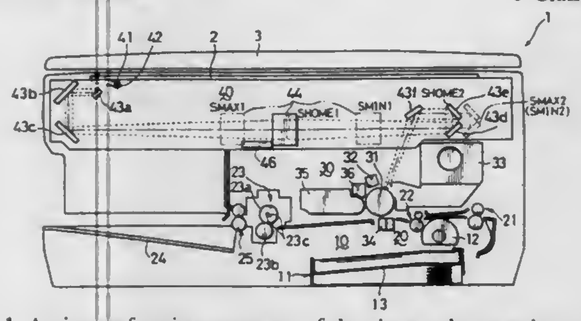
Masanori Muramatsu, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 837,921, Feb. 20, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,687
Claims priority, application Japan, Feb. 22, 1991, 3-028613; Feb. 22, 1991, 3-028634
Int. Cl.⁶ G03G *15/00*
U.S. Cl. 399—44 **23 Claims**



1. An image forming apparatus comprising:
generating means for generating an image signal representing an image of a predetermined density;
image forming means for forming an image on a recording medium on the basis of the image signal generated by said generating means;
measurement means for measuring a density of the image formed on the recording medium; and
control means for determining a condition for image formation on the basis of a measurement result from said measurement means,
wherein said control means selects a density of the image signal to be generated by said generating means for the measurement of the density according to a change of an environment around said image forming means or an elapsed time from a next-preceding measurement.

5,752,127
IMAGE FORMING APPARATUS PROVIDED WITH A MOVEMENT CONTROL MECHANISM FOR OPTICAL SYSTEM

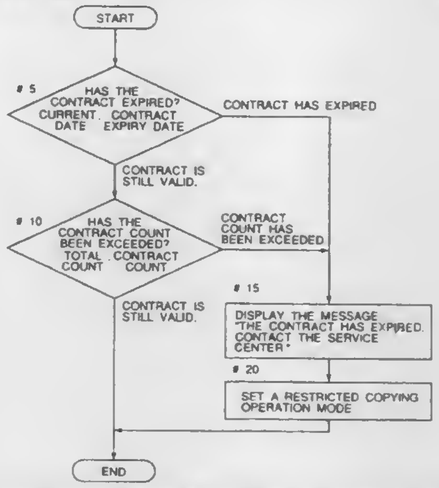
Makoto Okado; Yoshihiro Ueda; Tadashi Kobata, and Masami Taniguchi, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Mar. 11, 1997, Ser. No. 814,847
Claims priority, application Japan, Mar. 13, 1996, 8-056000
Int. Cl.⁶ G03G *15/041*
U.S. Cl. 399—76 **5 Claims**



1. An image forming apparatus of the electro-photography type in which a light image obtained by reflected light from an original document image by projecting light onto the original document image is changed in size at a set magnification rate to form an electrostatic latent image on a photosensitive member, and the electrostatic latent image is developed into a toner image which is to be transferred onto a copy sheet, the image forming apparatus comprising:
a magnification rate setting unit including a lens and a reflective mirror for introducing the reflected light toward the photosensitive member and for determining a magnification rate of the light image relative to the original document image;
lens moving means for moving the lens between a first position and a second position along an optical path for the reflected light;
reflective mirror moving means for moving the reflective mirror between a third position and a fourth position along the optical path for the reflected light in association with the lens moving means;
movement controlling means for controlling the lens moving means to move the lens between the first position and the second position by a first predetermined distance and for controlling the reflective mirror moving means to move the reflective mirror between the third position and the fourth position by a second predetermined distance upon receiving a command signal, the movement controlling means being set to operate upon receiving a power signal, indicative that power is supplied to the image forming apparatus, as the command signal when power is supplied; and
judgment means for judging whether power is supplied to the image forming apparatus for the first time, the movement controlling means being operable if it is judged that power is supplied thereto.

5,752,128
IMAGE FORMING APPARATUS WITH CONTRACT RENEWAL DEVICE

Yuji Yamashita, Osaka, Japan, assignor to Mita Industries Co. Ltd, Osaka, Japan
Filed Sep. 20, 1996, Ser. No. 716,886
Claims priority, application Japan, Sep. 28, 1995, 7-251380
Int. Cl.⁶ G03G *15/00*
U.S. Cl. 399—80 **4 Claims**


START
# 5
HAS THE CONTRACT EXPIRED? CURRENT . CONTRACT DATE EXPIRY DATE
CONTRACT HAS EXPIRED
CONTRACT IS STILL VALID.
# 10
HAS THE CONTRACT COUNT BEEN EXCEEDED? TOTAL . CONTRACT COUNT COUNT
CONTRACT COUNT HAS BEEN EXCEEDED
CONTRACT IS STILL VALID.
# 15
DISPLAY THE MESSAGE "THE CONTRACT HAS EXPIRED. CONTACT THE SERVICE CENTER"
# 20
SET A RESTRICTED COPYING OPERATION MODE
END

1. An image forming apparatus in which conditions for renewal of a maintenance contract are prescribed, comprising:
a contract information managing means for storing conditions for renewal of said maintenance contract;
a contract expiry detecting means for comparing operation records at a particular moment with the conditions for renewal of said maintenance contract in order to detect expiry of the contract;
a code storing means for storing a contract renewal code for the maintenance contract;
a renewal accepting means for executing renewal of the contract only when said contract renewal code is entered; and
a display means for displaying a message requesting renewal of the contract when said contract expiry detecting means has detected expiry of the contract;
wherein contract renewal codes are generated by calculation based on a machine number of the imagine forming apparatus itself according to a predetermined function.

5,752,129
IMAGE FORMING APPARATUS HAVING A SUPPLEMENTAL HEATING SOURCE

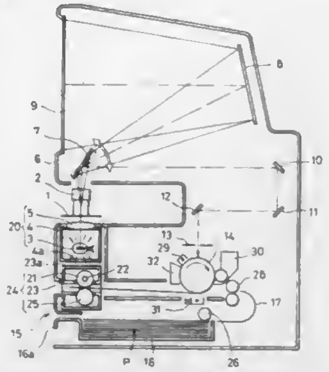
Kazuhide Sugiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1996, Ser. No. 674,735

Claims priority, application Japan, Jul. 5, 1995, 7-191035; Mar. 25, 1996, 8-094842

Int. Cl.⁶ G03G *15/70; 15/00*

U.S. Cl. 399—92 **16 Claims**



1. An image forming apparatus, comprising:
- reading means for projecting an image on a recording medium onto a screen for observation in a reading mode;
- printing means for printing the image on a recording sheet in a printing mode;
- a lamp illuminating the recording medium;
- a fixing section for fixing the image on the recording sheet by heat; and
- heating means for supplementarily heating said fixing section with the heat generated from said lamp in the reading mode, wherein
- said heating means includes a duct for discharging the heat from said lamp out of a main body of the apparatus after guiding the heat to said fixing section.

5,752,130
IMAGE FORMING APPARATUS FOR CLEANING RESIDUAL TONER FROM AN INTERMEDIATE TRANSFER MEMBER

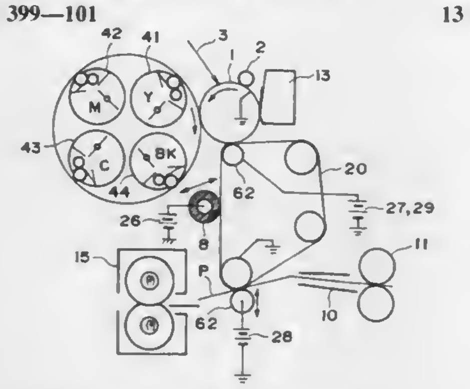
Atsushi Tanaka, Yokohama; Hiroyuki Kobayashi, Fuji; Akihiko Nakazawa, Shiroyamamachi; Tsunenori Ashibe, Yokohama, and Takashi Kusaba, Kodaira, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1996, Ser. No. 674,836

Claims priority, application Japan, Jul. 7, 1995, 7-172307

Int. Cl.⁶ G03G *15/16*

U.S. Cl. 399—101 **13 Claims**



1. An image forming apparatus, comprising:
- a first image-bearing member,
- latent image-forming means for forming an electrostatic latent image on the first image-bearing member,
- developing means for developing the electrostatic latent image with a toner to form a toner image,
- an intermediate transfer member,
- a second image-bearing member, wherein the intermediate transfer member receives the toner image by primary transfer and transfers the toner image onto the second image-bearing member by secondary transfer,
- a charging member for charging a residual toner remaining on the intermediate transfer member after the secondary transfer, and
- recovery means for recovering the charged residual toner at a recovery position, said recovery means including an electroconductive member and voltage application means for applying a voltage to the electroconductive member at the recovery position,
- wherein the intermediate transfer member has a charging characteristic such that it has a surface potential of at most 500 volts as an absolute value at the recovery position.

5,752,131
DEVELOPING APPARATUS WITH A REMOVABLE SEALING FILM AND PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS INCLUDING SUCH A DEVELOPING APPARATUS

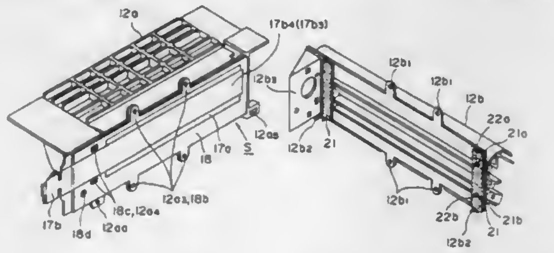
Yasuo Fujiwara, Urawa, and Hiroo Kobayashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 265,936

Claims priority, application Japan, Jun. 25, 1993, 5-155376; Nov. 1, 1993, 5-273580; Jan. 19, 1994, 6-004057

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—106 **156 Claims**



1. A developing apparatus for developing a latent image formed on an electrophotographic photosensitive member, said developing apparatus comprising:
- a first frame having a developer container for containing developer;
- a second frame having a developer carrying member for carrying developer supplied from said developer container to supply the developer to the latent image;
- a sealing member for sealing an opening for supplying the developer from said developer container to said developer carrying member, said sealing member being pullable between said first frame and said second frame along a pulling path in a pulling direction to open the opening;
- an end seal for preventing leakage of the developer through an area between said first frame and said second frame, said end seal being disposed between said first frame and said second frame and downstream of the opening with respect to the pulling direction of said sealing member; and

projections, surrounded by said end seal and disposed adjacent said sealing member at both sides of the pulling path downstream of the opening in the pulling direction, for limiting the pulling direction of said sealing member.

5,752,132
PROCESS UNIT

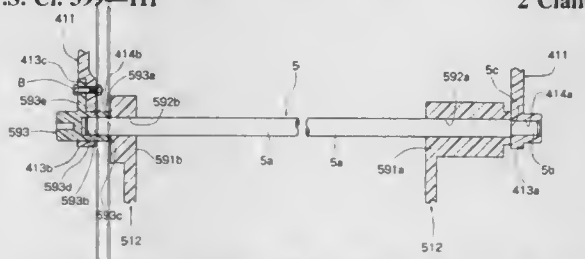
Hiroyuki Hazama; Masaru Gotoh; Takashi Terada; Nobuhiro Nakajima; Hiroyuki Hamakawa, and Nariaki Tanaka, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 16, 1997, Ser. No. 857,306

Claims priority, application Japan, May 31, 1996, 8-137310

Int. Cl.⁶ G03G *21/18*

U.S. Cl. 399—111 **2 Claims**



1. A process unit including a first imaging unit, a second imaging unit, and support shaft means for supporting the first imaging unit and the second imaging unit pivotably relative to each other; wherein
- the first imaging unit and the second imaging unit each have a pair of support side walls arranged with spacing and provided with support holes having a common axis,
- one pair of the support side walls define a pair of inner support side walls having an outside width smaller than the inside width of the other pair of the support side walls, while the other pair of the support side walls define a pair of outer support side walls,
- the support shaft means includes a support shaft composed of a rod member circular in section, and having a larger diameter portion, and having at one end part a smaller diameter portion continued from the larger diameter portion via a stepped portion; and a bearing member having a tubular portion provided with a support hole having an open end and a closed end, said bearing member being detachably mounted on one of the outer support side walls by the fitting of the tubular portion into the support hole of the one of the outer support side walls, and
- with the bearing member being mounted on the one of the outer support side walls, the respective support holes of the inner support side walls are fitted with the larger diameter portion of the support shaft, the support hole of the other of the outer support side walls is fitted with the smaller diameter portion of the support shaft, the support hole of the bearing member is fitted with the other end part of the support shaft, the outside surface of one of the inner support side walls is contacted with the inside surface of the other of the outer support side walls, the outside surface of the other of the inner support side walls is contacted with the open end of the bearing member or the inside surface of the one of the outer support side walls, the stepped portion of the support shaft is contacted with the inside surface of the other of the outer support side walls, and the end face of the other end part of the support shaft is positioned apart from the closed end of the bearing member.

5,752,133
ELECTROPHOTOGRAPHIC COLOR IMAGE FORMING APPARATUS WITH IMAGE EXPOSURE MEANS INSIDE OF PHOTORECEPTOR DRUM

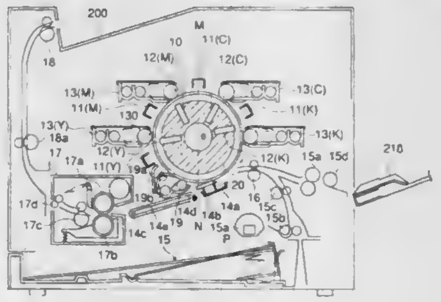
Hisayoshi Nagase; Satoshi Haneda; Hiroyuki Tokimatsu; Shuta Hamada, all of Hachioji; Toshihide Miura, Koganei; Masakazu Fukuchi, and Tadayoshi Ikeda, both of Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

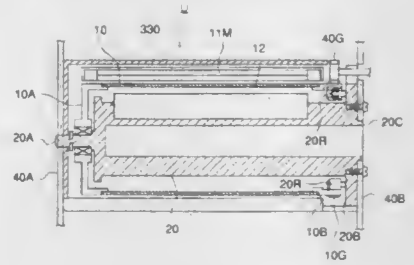
Continuation-in-part of Ser. No. 662,817, Jun. 12, 1996, Pat. No. 5,663,787, which is a continuation of Ser. No. 397,918, Mar. 3, 1995, abandoned. This application Aug. 9, 1996, Ser. No. 695,299

Claims priority, application Japan, Jun. 24, 1994, 6-143360; Sep. 2, 1994, 6-209743; Aug. 17, 1995, 7-209650; Sep. 8, 1995, 7-231438; Sep. 11, 1995, 7-232655; Sep. 11, 1995, 7-232656

Int. Cl.⁶ G03G *15/00; 15/01*

U.S. Cl. 399—112 **41 Claims**





1. A color image forming apparatus, comprising:
- a photoreceptor drum having an outer surface and two ends;
- a plurality of charger devices for charging an outer surface of the photoreceptor drum;
- a plurality of image exposure devices each provided inside the photoreceptor drum for exposing the photoreceptor drum so as to form a latent image thereon;
- plurality of developing devices each for developing the latent image with different colored toner from each other so as to form a toner image on the outer surface of the photoreceptor drum;
- an image exposure device supporting member on which the plurality of image exposure devices are mounted,
- wherein the image exposure device supporting member and the photoreceptor drum are connected through bearing members provided on both ends of the photoreceptor drum, and the image exposure device supporting member has engaging portions at both ends thereof; and
- side plates provided on the image forming apparatus for engaging with the engaging portions to support the image exposure device supporting member, while the photoreceptor drum is rotated around the image exposure devices through the bearing members.

5,752,134
PROCESS UNIT OF IMAGE FORMING MACHINE HAVING PRE-TRANSFER GUIDE

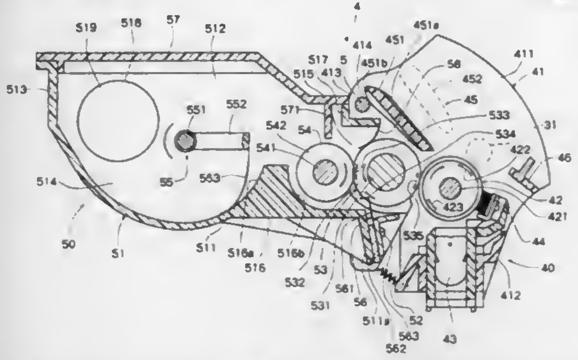
Hiroyuki Hazama; Masaru Watanabe; Yukinori Akiyama; Masanobu Maeshima; Hirotsugu Ogawa, and Takahiko Murata, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 9, 1997, Ser. No. 853,903

Claims priority, application Japan, May 31, 1996, 8-137308

Int. Cl.^{6} G03G ***21/18***

U.S. Cl. 399—113 **5 Claims**



1. A process unit of an image forming machine, said process unit comprising a photoconductor unit including a photoconductor drum having a photosensitive layer, and a developing unit for developing a latent electrostatic image formed on the photosensitive layer of the photoconductor drum to a toner image, said photoconductor unit and said developing unit being connected by a support shaft so as to be pivotable relative to each other, and said process unit being adapted to transfer the toner image to a transfer sheet conveyed to a transfer zone of the photoconductor drum; wherein

said photoconductor unit includes photoconductor support means for supporting the photoconductor drum rotatably,

a pre-transfer guide plate for guiding a transfer sheet to be conveyed to the transfer zone is disposed on the photoconductor support means, and

when a pressing force by a transfer sheet is exerted at least during the guidance of the transfer sheet, the rear surface of the pre-transfer guide plate is brought into contact with the support shaft.

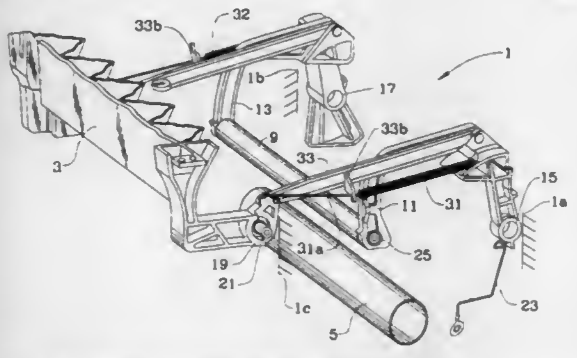
5,752,135
DOOR OPERATED CHARGE MEMBER POSITIONING

Johnnie A. Coffey, Winchester; Larry Steven Foster, Lexington; Paul Douglas Horrall, Lexington, and John Randolph McIntyre, Lexington, all of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed May 9, 1997, Ser. No. 853,994

Int. Cl.^{6} G03G ***21/18***

U.S. Cl. 399—115 **2 Claims**



1. A door controlled mechanism comprising

an imaging machine having a frame and a door rotatable upward for access to the inside of said imaging machine,

a first link carrying a charging device to contact a member to be charged in said imaging machine upon closing of said door, said first link being rotatably connected to said frame within said imaging machine,

a second link connected to said first link at a first end by an elongated slot having a side toward said door,

a pin narrower than the length of said slot extending through said first link and said elongated slot,

said second link having a second end spaced from said first end of said second link,

said door being rotatably connected to said frame and rotatably connected to said second end of said second link, and

a resilient member connected at a first end to said first link at a location spaced from the location at which said first link is rotatably connected to said frame,

said resilient member having a second end opposite said first end of said resilient member connected to said door at a location a distance above said location of said rotatable connection of said door to said frame when said door is closed, to pivot said first link to move said contact member into contact with said member to be charged when said door is closed,

said pin being located in the said elongated slot so as not to apply force to said side of said elongated slot when said door is closed,

said second end of said second link being located above the location at which said door is rotatably connected to said frame when said door is closed so that upward movement which opens said door brings said second end of said second link toward said pin, said elongated slot being of size such that said movement of said second link toward said pin causes said pin to contact said first side of said elongated slot, said contact applying force from said resilient member to move said contact member away from contact with said member to be charged.

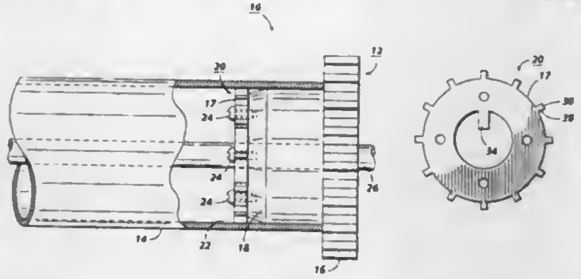
5,752,136
IMAGING MEMBER END FLANGE AND END FLANGE ASSEMBLY

Ismael R. Sanchez; Robert S. Foltz, both of Rochester; Warren F. Brydges, Macedon; William A. Hammond, Rochester; Eugene A. Swain, Webster; John K. Williams, Monroe Fairport; Richard C Petralia, Rochester, and Thong H. Vo, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1995, Ser. No. 536,033

Int. Cl.^{6} G03G ***21/00***

U.S. Cl. 399—117 **18 Claims**



1. A hollow cylindrical electrostatographic imaging member supporting end flange comprising a disk shaped member, a supporting hub extending axially from said disk shaped member and a flat rigid metal disk coaxially secured to said hub, said metal disk comprising a plurality of rectangular tabs extending radially from said metal disk in a direction away from and perpendicular to an imaginary axis of said hub for engagement with said hollow cylindrical electrostatographic imaging member upon insertion of said hub and disk shaped member into one end of said hollow cylindrical electrostatographic imaging member.

5,752,137
MULTI-COLOR IMAGE FORMING APPARATUS HAVING A PLURALITY OF DETACHABLE UNITS

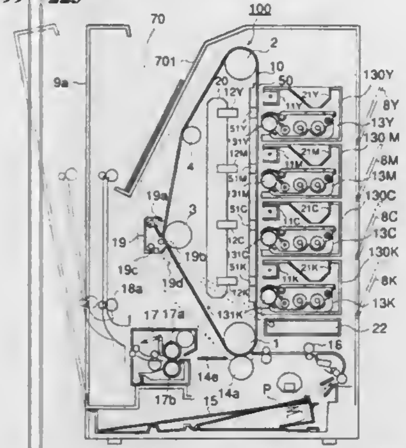
Satoshi Haneda, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jun. 3, 1996, Ser. No. 657,309

Claims priority, application Japan, Jun. 9, 1995, 7-143053; Jun. 12, 1995, 7-144502; Jun. 14, 1995, 7-147735

Int. Cl.^{6} G03G ***15/01; 15/00***

U.S. Cl. 399—223 **17 Claims**



1. An image forming apparatus for forming a multi-color image, comprising:

a rotatable image forming member which is enclosed on itself to form an inner surface and an outer surface;

a plurality of exposure devices each provided inside the image forming member for conducting an exposure operation toward the inner surface of the image forming member; and

a plurality of independently detachable units each including a charger for electrically charging the outer surface of the image forming member and a developing device having one of a plurality of color toners for developing a latent image, each of the plurality of units being disposed near the outer surface of the image forming member so as to be opposite to a respective one of the plurality of exposure devices provided inside the image forming member so that a multi-color toner image may be formed on the outer surface of the image forming member during a single rotation of the image forming member,

wherein each of the plurality of exposure devices comprises a plurality of light emitting elements aligned along a width of the image forming member to face the inner surface of the image forming member, and a transparent member provided between the plurality of exposing elements and the inner surface of the image forming member, and

wherein the transparent member has a length corresponding to the width of the image forming member and comprises protrusions corresponding to positions along the width of the image forming member on which light is not emitted by one of the plurality of light emitting elements.

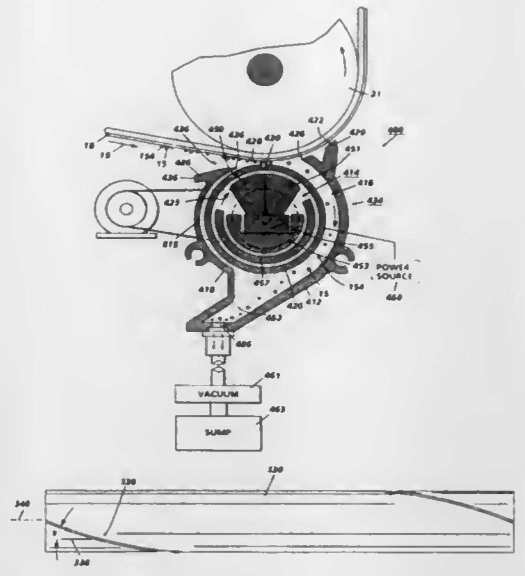
5,752,138
VACUUM ASSISTED BEAD PICK OFF APPARATUS HAVING A SPIRAL PLURAL LEVEL SURFACE

Joseph M. Wing, Ontario; Mark E. Roszkowski, Fairport; Kerry P. Haughan, Pittsford; James F. Lincoln, Hilton, and Robert A. Pictor, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1995, Ser. No. 567,378

Int. Cl.^{6} G03G ***15/095***

U.S. Cl. 399—264 **32 Claims**



1. An apparatus for removing magnetic granules from a moving imaging surface in a region between a developer station and a transfer station, comprising:

a removing member rotatable about a longitudinal axis, interposed between the developer station and the transfer station, defining a groove in an exterior surface thereof having at least a portion of the groove extending in a direction skewed to the longitudinal axis of said removing member, the groove having dimensions and a skewed direction relative to a periphery of the member selected to provide for moving most of the magnetic granules tangentially about the periphery of the member and selected to provide for reducing an accumulation of beads in one axial position on the periphery of the member; and

a magnetic member, operatively associated with said removing member, for generating a magnetic field to attract the magnetic granules from the imaging surface to said removing member, at least a portion of said removing member rotatable about at least a portion of said magnetic member, wherein most of the magnetic granules are propelled tangentially about the periphery of the member and wherein the accumulation of beads in one axial position on the periphery of the member may be somewhat reduced.

5,752,139
DUAL-COMPONENT MAGNETIC BRUSH DEVELOPING DEVICE

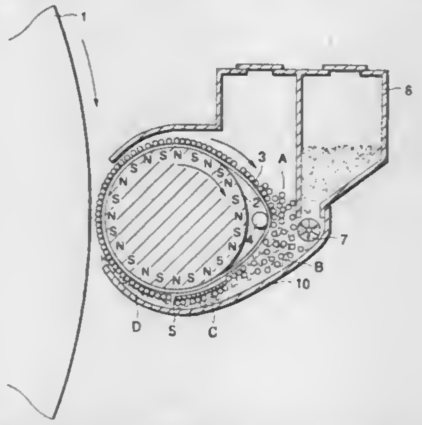
Takeshi Sumikawa, and Isao Ito, both of Ashigarakami-gun, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1996, Ser. No. 754,935

Claims priority, application Japan, Nov. 27, 1995, 7-329414

Int. Cl.^{6} G03G ***15/09; 15/095***

U.S. Cl. 399—264 **13 Claims**



1. A dual-component magnetic brush developing device using a dual-component developer containing magnetic carriers and toner electrically attracted to the magnetic carriers for selectively transferring the toner to an electrostatic latent image formed on an

image carrier for visualizing the latent image, said dual-component magnetic brush developing device comprising:

a magnetic field generation member being formed with a plurality of magnetic poles almost equally spaced from each other on a peripheral surface and being supported so that the peripheral surface makes a circumferential rotation move;

a developer transport member being supported outside said magnetic field generation member for circumferential rotation and moving together with said magnetic field generation member at least in a developing area facing the image carrier in the proximity thereof;

toner supply means for supplying an excess of new toner to the magnetic carriers supported on said developer transport member and passing through the developing area;

magnetic field reduction means for reducing a magnetic field strength in the vicinity of a surface of said developer transport member by an agitation section for agitating the developer to which the excessive toner is supplied; and

a plate-like member disposed downstream from the agitation section in a circumferential rotation direction of said developer transport member and placed in contact with or in the proximity of said developer transport member along said developer transport member where the developer is magnetically attracted to said magnetic field generation member through said plate-like member and charge-failure toner is liberated from the developer as the developer is agitated by a magnetic force on said plate-like member, forming a stable magnetic brush on said developer transport member,

wherein said stable magnetic brush is transported to a developing area for transfer to an electrostatic latent image as said developer transport member makes a circumferential rotation.

5,752,140

DEVELOPING DEVICE USING DEVELOPMENT BIAS HAVING OSCILLATING PART AND A QUIESCENT PART

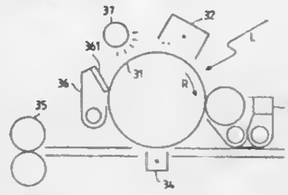
Toshimitsu Danzuka, Tokyo; Yuji Sakemi, Inagi; Hisashi Fukushima, Kawasaki, and Takeshi Menjo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

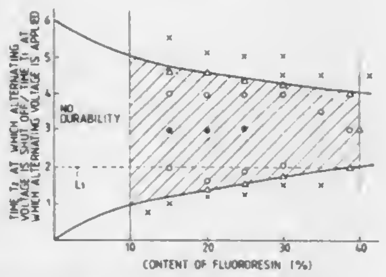
Filed Dec. 19, 1994, Ser. No. 358,730

Claims priority, application Japan, Dec. 27, 1993, 5-348361; Apr. 19, 1994, 6-104754; Apr. 19, 1994, 6-104755

Int. Cl.⁶ G03G *15/09*

U.S. Cl. 399—270 **9 Claims**





1. An image forming apparatus comprising:

an image carrying member for carrying an electrostatic image, said image carrying member having a photosensitive layer and a surface layer containing a fluororesin; and

developing means for developing the electrostatic image on said image carrying member, said developing means having a developer carrying member for carrying a developer, arranged as opposed to said image carrying member, and bias applying means for applying a development bias voltage to said developer carrying member;

wherein a period of a waveform of the bias voltage applied by said bias applying means has an oscillating part and a quiescent part and wherein the following formula is satisfied:

$$|V_{PP}-2V_{cont}|/16V_f^2<d^2/|Q|$$

where

V_{PP}: peak-to-peak value (V) of the development bias voltage;

V_f: a frequency (Hz) of the development bias;

V_{cont}: a image contrast potential (V);

Q: an average triboelectricity (C/kg) of the toner;

d: a distance (m) between the image carrying member and the developer carrying member.

5,752,141

ROTATING TYPE DEVELOPING APPARATUS

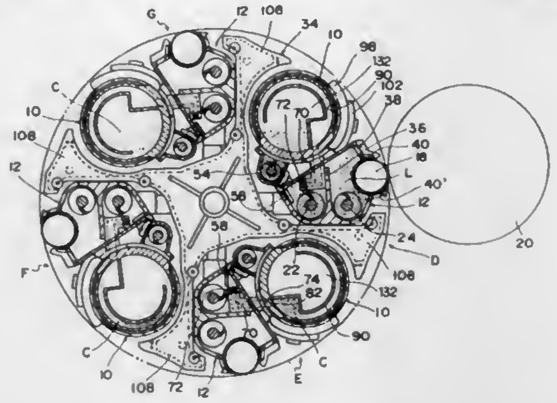
Masayuki Nishimura; Yuusaku Hashimoto; Takeshi Okoshi; Yoshifumi Ozaki; Katsumi Harumoto; Hideo Nagura; Toshio Uchida, all of Iwatsuki; Kei Hirata, Ebina; Atsuyuki Kitamura, Ebina, and Ikutaroh Nagatsuka, Ebina, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1997, Ser. No. 796,401

Claims priority, application Japan, Feb. 9, 1996, 8-024085

Int. Cl.⁶ G03G *15/01*

U.S. Cl. 399—227 **15 Claims**



1. A rotating type developing apparatus, comprising:

a plurality of developing devices which convey developer, which at least includes toner and carrier, to a developing roll while accommodating and circulating the developer; and

a rotating body which holds and rotates said plurality of developing devices,

in a rotating type developing apparatus in which said plurality of developing devices successively oppose a photosensitive drum due to the rotation of said rotating body so as to form a multicolor image, said apparatus comprising:

developer supplying means which supplies the developer to said developing devices; and

collecting means which collects excess developer within said developing devices due to the rotation of said rotating body.

5,752,142

METHOD AND APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES

Phillip Eric Staples, Warradale, and Luis Lima-Marques, Blackwood, both of Australia, assignors to Watermark Imaging Ltd., Royston, England

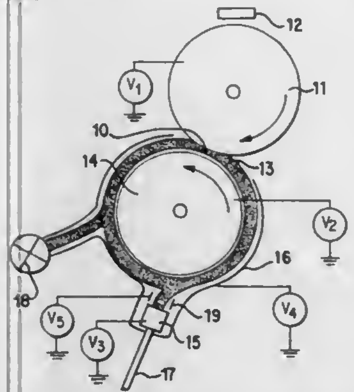
PCT No. PCT/AU94/00623, § 371 Date Apr. 12, 1996, § 102(e) Date Apr. 12, 1996, PCT Pub. No. WO95/10800, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 13, 1994, Ser. No. 628,710

Claims priority, application Australia, Oct. 13, 1993, PM1789

Int. Cl.⁶ G03G *15/10*

U.S. Cl. 399—241 **51 Claims**



1. A method of developing a latent electrostatic image comprising the steps of;

(a) producing a mist from a liquid comprised substantially of water with a colourant incorporated therein such that the colourant is supported in the mist,

(b) transporting the mist to a developer station in an arcuate path,

(c) passing the mist between a development electrode and a recording member incorporating the electrostatic image such that its direction of travel is substantially tangential or parallel to the recording member,

(d) providing an electric field between the development electrode and the recording member, and

(e) attracting the mist by means of the electric field to the electrostatic image to thereby develop the electrostatic image.

5,752,143

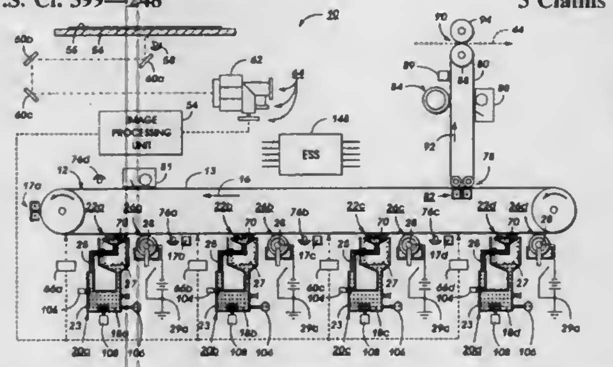
LIQUID IMMERSION DEVELOPMENT APPARATUS HAVING EFFICIENT CHARGE DISSIPATING DEVELOPMENT ELECTRODE

William H. Wayman, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1997, Ser. No. 792,951

Int. Cl.⁶ G03G *15/10*

U.S. Cl. 399—248 **3 Claims**



1. A liquid immersion development (LID) reproduction machine comprising:

(a) a movable image bearing member having an image bearing surface defining a path of movement;

(b) means mounted along said path of movement for forming a latent image onto said image bearing surface;

(c) a development apparatus mounted along said path of movement containing liquid developer material consisting of a liquid carrier and solid charged toner particles for biasing to generate separated counter charges for dissipation, and development charges for developing the latent image to create a toner developed image, said development apparatus including:

(i) a housing defining an opening, a recovery chamber, and a sump containing said liquid developer material;

(ii) a conduit member connected to said sump and having a development opening positioned closely spaced from said image bearing surface;

(iii) means connected to said sump for delivering liquid developer material from said sump through said conduit member towards said image bearing surface for image development;

(iv) a biased conductive development electrode, forming a development nip with said image bearing surface, for efficiently dissipating separated counter charges within said development nip, said development electrode having pores therethrough for enabling flowthrough of liquid developer material delivered into said development nip, thereby preventing undesirable residue build-up on said development electrode, as well as, undesirable residual counter charge build up within the development nip, and said development electrode also having a length corresponding to a width of the image bearing surface, and a width for achieving a desired counter charge dissipation; and

(v) liquid developer material delivery means connected to said sump for delivering liquid developer material through said pores of said development electrode into development contact with a latent image on said image bearing surface.

5,752,144

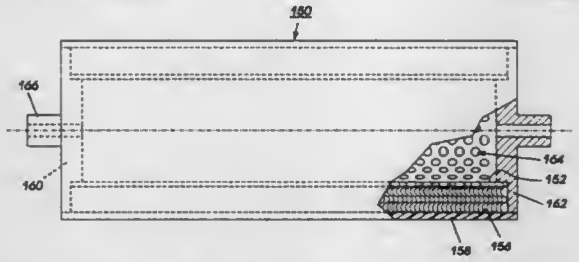
METHOD OF FABRICATING A RECLAIMABLE UNIFORM CONDITIONING BLOTTER ROLL

Joseph C. Mammino, Penfield; William G. Herbert, Williamson; Shu Chang, Webster, and Theodore C. Ludwig, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1996, Ser. No. 625,391

Int. Cl.⁶ G03G *15/11*

U.S. Cl. 399—249 **4 Claims**



1. A method of fabricating a blotter roll for uniformly conditioning liquid images consisting of toner particles and carrier liquid, the method comprising:

(a) electroforming a semi-rigid resilient and perforated metallic substrate for preventing undesirable impressions of substrate outlines and footprints on an image being conditioned, and so that the resilient metallic substrate has a cylindrical hollow interior and first and second open ends;

(b) forming at least a first absorbent foam layer over the semi-rigid resilient substrate for absorbing carrier liquid from the image being conditioned; and

(c) filling the cylindrical hollow interior of the semi-rigid resilient substrate using a porous foam insert for rigidifying the semi-rigid resilient substrate, and for uniformly spreading throughout the hollow interior, vacuum effects of a vacuum source connected to the hollow interior for drawing carrier liquid from the image being conditioned.

5,752,145
APPARATUS FOR FEEDING A DEVELOPING AGENT THROUGH A DEVICE FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE

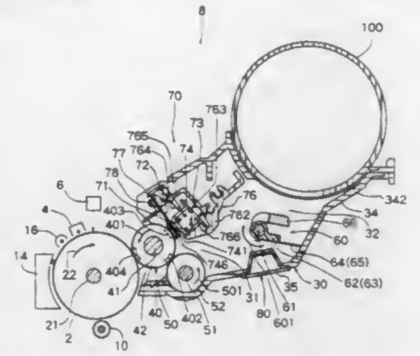
Takahisa Nakaue; Masanobu Maeshima; Akinobu Nakahata; Takeshi Aoki, and Hiroshi Inui, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 23, 1996, Ser. No. 734,845

Claims priority, application Japan, Nov. 10, 1995, 7-317188

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—256 **3 Claims**



1. A device for developing an electrostatic latent image comprising a developing housing having a developing chamber and a stirrer chamber in communication with said developing chamber;
- said developing chamber including
  - a developing roller having a developing agent-holding zone, a developing zone both disposed and spaced apart on a peripheral surface thereof, said developing roller receiving a developing agent in said developing agent-holding zone and conveying the developing agent to said developing zone to apply the developing agent to the electrostatic latent image, and a replenishing means for feeding the developing agent onto said developing roller in said developing agent-holding zone;
- said stirrer chamber including a stirring means to stir the developing agent and send the developing agent to said developing chamber;
- said device further comprising a developing agent detecting sensor having a sensor case disposed in said developing housing and under said stirring means;
- said stirring means having a rotary shaft, a cleaning member mounted on said rotary shaft to clean said sensor case, and two stirrer members mounted on the rotary shaft, said two stirrer members being arranged so that respective inner ends are spaced at a predetermined distance with said cleaning member positioned between said two stirrer members, each of said two stirrer members having a tilted guide portion at said inner end for sending the developing agent toward said sensor case.

5,752,146
ELECTROPHOTOGRAPHIC TYPE IMAGE FORMING DEVICE PROVIDING POSITIVE CHARGE TO TONERS

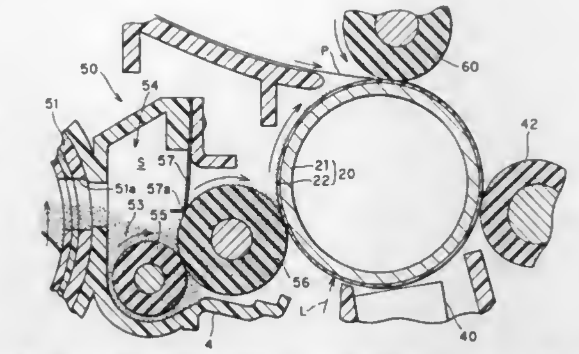
Shougo Sato, Seto, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 5, 1996, Ser. No. 760,982

Claims priority, application Japan, Dec. 8, 1995, 7-320915; Dec. 28, 1995, 7-343716

Int. Cl.⁶ G03G *15/22; 15/08*

U.S. Cl. 399—284 **21 Claims**



1. An image forming device for forming an image on an image recording medium comprising:
- a photosensitive member having a positively chargeable characteristic;
- a charger charging the photosensitive member to a positive polarity;
- an electrostatic latent image forming unit for forming an electrostatic latent image on the photosensitive member charged to the positive polarity;
- a developing roller for developing the electrostatic latent image into a toner image on the photosensitive member, the toner image being formed by a toner layer consisting of toners;
- a thickness regulator for regulating a thickness of the toner layer so that from one to less than two toner particles are deposited in a radial direction of the developing roller, the thickness regulator and the developing roller rubbing the deposited toners positioned therebetween for charging the toners to a positive polarity; and
- a transfer roller for transferring the toner image onto an image recording medium.

5,752,147
ROLLER FUSER ASSEMBLY FOR REPRODUCTION SYSTEMS

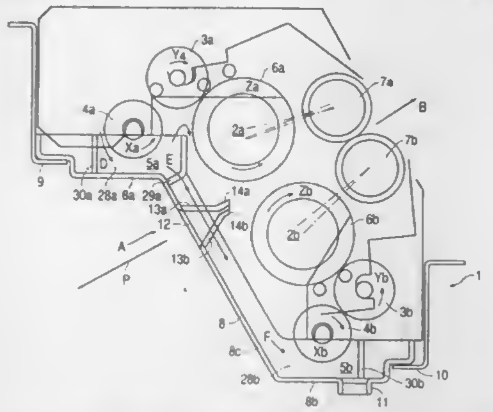
Hubertus W.G. In't Zandt, Venlo, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Mar. 12, 1997, Ser. No. 815,847

Claims priority, application Netherlands, Mar. 12, 1996, 1002579

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—325 **20 Claims**



1. A roller fuser assembly for reproduction systems comprising:
- at least two fuser rollers, each of the fuser rollers having a pressure surface for pressing against a printing sheet fed therealong in order to fix toner images on at least one side of the printing sheet by pressure and heat;
- means for applying a release liquid to the pressure surfaces of the fuser rollers;
- a release liquid container for each fuser roller; and
- a release liquid collecting and discharge plate for interconnecting the at least two release liquid containers, the release liquid collecting and discharge plate discharging release liquid to at least one of the release liquid containers.

5,752,148
ELECTROMAGNETIC INDUCTION HEATING TYPE FIXING DEVICE AND METHOD

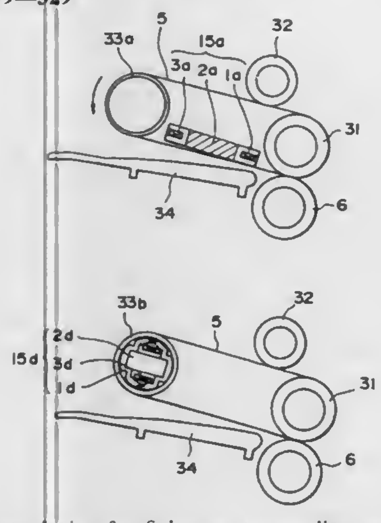
Satoru Yoneda, Toyohashi; Takeshi Kato, Toyokawa; Eiji Okabayashi, Toyokawa; Hiroaki Hinotani, Toyokawa, and Tatsumi Fujishima, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 9, 1995, Ser. No. 556,203

Claims priority, application Japan, Nov. 10, 1994, 6-276685

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—329 **27 Claims**



1. A fixing device for fixing on a recording member a toner image formed on the recording member, said device comprising:
- a drive roller;
- a tension roller;
- a belt arranged in a loop about said drive roller and said tension roller such that said tension roller exerts a tension force on said belt;
- a pressure roller positioned adjacent said drive roller such that said belt and said pressure roller form a nip therebetween as said belt is moved in a first direction about said drive roller and said tension roller;
- a guide positioned exteriorly of said belt for guiding a recording member alongside but spaced from a portion of said belt when said belt is being moved in said first direction, wherein said portion of said belt is upstream of said nip and downstream of said tension roller when said belt is being moved in said first direction; and
- a heater, arranged on an interior side of said tension roller, for heating said belt as said belt passes in contact with said tension roller so that said portion of said belt heats the recording member by radiation from said belt softening said toner image on said recording member as the recording member moves along said guide toward said nip without said recording member contacting said portion of said belt;
- wherein said pressure roller applies pressure to the thus heated recording member for fixing said toner image on the heated recording member as the thus heated recording member enters said nip and passes between said belt and said pressure roller.

5,752,149
IMAGE HEATING APPARATUS USING ENDLESS WEB GUIDED BY A GUIDE HAVING INCLINED SURFACES

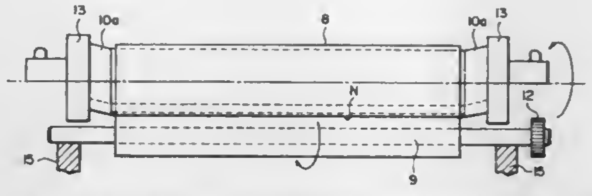
Akira Yuza; Nobukazu Adachi; Akira Kuroda, and Takeshi Sugita, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 77,049, Jun. 16, 1993, abandoned. This application Apr. 10, 1996, Ser. No. 630,271

Claims priority, application Japan, Jun. 16, 1992, 4-156755

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—329 **10 Claims**



1. An image heating apparatus comprising:
- a heater;
- an endless film having a substantially equal diameter along its entire length, said film being in sliding contact with said heater at its inside surface;
- a pressing roller cooperative with said heater to form a nip with said film extending therebetween, said pressing roller being rotatable to move said film;
- regulating means for abutment by an edge of said film to regulate lateral shifting of said film; and
- a guiding member, extending in a direction substantially perpendicular to a movement direction of the film, for guiding an inside surface of said film, said film being loosely extended around said guiding member, said guiding member being provided at an end thereof with a film guiding surface inclined relative to an axis of said pressing roller.

5,752,150
HEATING APPARATUS

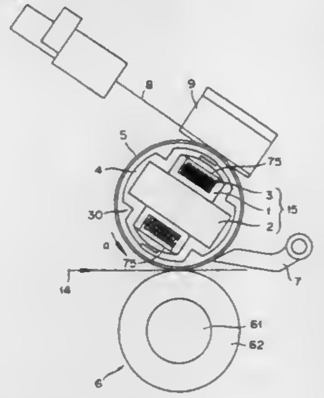
Takeshi Kato; Eiji Okabayashi; Satoru Yoneda; Yuusuke Morigami, all of Toyohashi, and Tetsuro Ito, Anjo, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 4, 1996, Ser. No. 707,685

Claims priority, application Japan, Sep. 4, 1995, 7-226768; Sep. 11, 1995, 7-232957; Oct. 30, 1995, 7-281996; Jan. 12, 1996, 8-004152; Jan. 16, 1996, 8-004849

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—330 **23 Claims**



1. A heating apparatus comprising:
- a power supply;
- a first induction coil which is connected to the power supply;
- a second induction coil which is connected to the power supply in parallel to the first induction coil, wherein said second induction coil is arranged coaxially to the first induction coil; and
- a conductive member which is heated by eddy current, said eddy current being brought by current flowing in the first and second induction coils.

5,752,151

IMAGE FORMING APPARATUS HAVING A CLEANING BLADE WITH A TENSILE STRENGTH FROM 80 TO 120 KG/CM^2

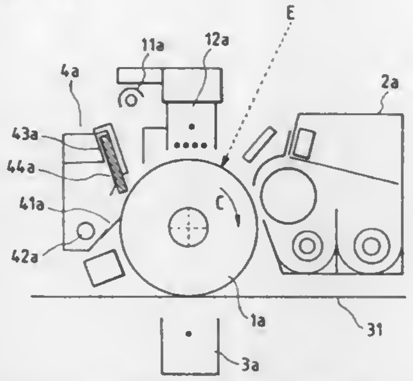
Masahiro Inoue, Yokohama, and Yuji Sakemi, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 578,344

Claims priority, application Japan, Dec. 27, 1994, 6-337037

Int. Cl.^{6} G03G *15/08;21/00*

U.S. Cl. 399—350 **10 Claims**



1. An image forming apparatus comprising an image bearing member holding a toner thereon, and a cleaning blade coming into touch with the image bearing member to remove the toner remaining on the image bearing member, wherein,

the toner has a weight average particle diameter of 6 μm or smaller, and

said cleaning blade has a tensile strength of from 80 to 120 kg/cm^2.

5,752,152

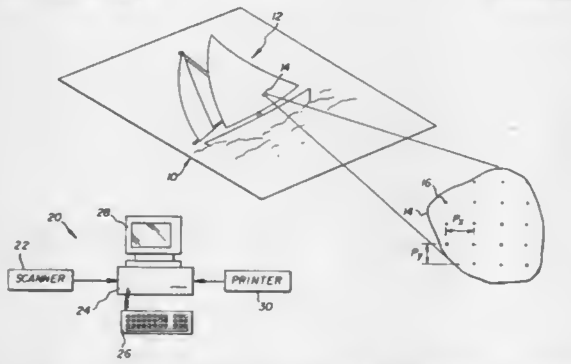
COPY RESTRICTIVE SYSTEM

John Gasper, Hilton, and Jay Stuart Schildkraut, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 8, 1996, Ser. No. 598,778

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—366 **35 Claims**



1. A system for restricting the copying of an image document comprising:

an image of arbitrary and undetermined character formed in or on a document medium having a predetermined pattern of microdots creating an image document of arbitrary and undetermined character;

detecting means for detecting the presence of one or more microdots in said document ; and

controlling means responsive to said detecting me ans for restricting a copy machine from copying the document when a microdot is detected.

5,752,153

METHOD AND APPARATUS FOR AVOIDING SLIP IN TRANSPORTING A RECORDING SUBSTRATE IN A FIXING STATION OF AN ELECTROGRAPHIC PRINTER OR COPIER

Alexander Kreiter, and Vassilis Kremastiotis, both of Bundesrepublik, Germany, assignors to Oce Printing Systems GmbH, Poing, Germany

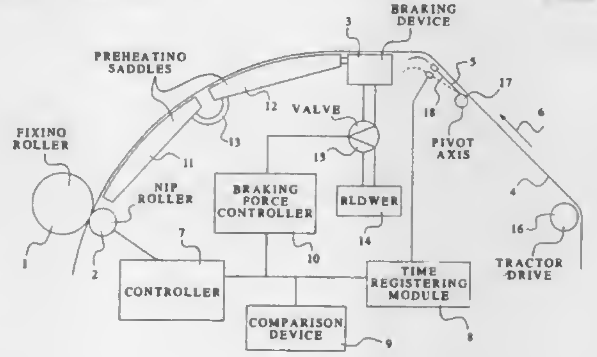
PCT No. PCT/DE95/00490, § 371 Date Oct. 22, 1996, § 102(e) Date Oct. 22, 1996, PCT Pub. No. WO95/29430, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 10, 1995, Ser. No. 732,417

Claims priority, application Germany, Apr. 27, 1994, 44 14 733.3

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—384 **7 Claims**



1. A system for avoiding slip during transport of a recording substrate in a fixing station of an electrographic printer or copier, the recording substrate having a continuous form, comprising:

the recording substrate being transportable by friction in a recording substrate transport direction by two rollers contained in the fixing station;

said rollers being preceded by a braking device for tautening the recording substrate in the recording substrate transport direction;

the braking device being preceded by a loop tensioner which is pivotable about a pivot axis for equalizing the length of the recording substrate transport path to the length of the recording substrate, which is feedable to the fixing station at constant speed;

sensors respectively assigned to the loop tensioner at first and second deflection points thereof;

a roller drive controller controlling a rotational speed of the rollers as a function of reaching said first and second deflection points of the loop tensioner;

a time registering module registering a deflection and dwell time between reaching the first deflection point, at which there is a maximum length of the recording substrate transport path, and reaching the second deflection point of the loop tensioner;

a comparison device comparing the registered deflection and dwell time with a desired deflection and dwell time;

a braking force controller controlling a braking force of the braking device acting on the recording substrate, the control being such that the braking force is reduced if the desired deflection and dwell time is exceeded by the registered deflection and dwell time; and

device for varying a basic setting of braking force and roller rotational speed when a limiting value of the braking force is reached.

5,752,154

SHEET POST-TREATMENT APPARATUS OF LINE-UP FREE TYPE

Hiroyoshi Maruyama, Yokohama; Yuji Takahashi, Tokyo; Yoshikuni Toyama, Yokohama; Shinichi Tanada, Isehara; Toshihiko Kusumoto, and Masahiko Yashiro, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

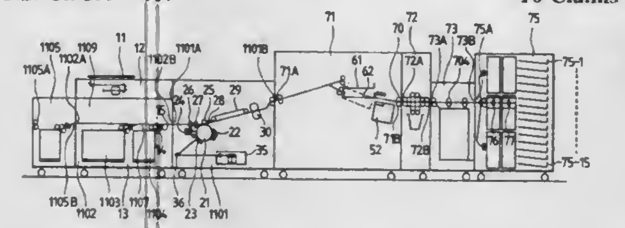
Continuation of Ser. No. 191,261, Feb. 3, 1994, abandoned.

This application Feb. 28, 1996, Ser. No. 608,212

Claims priority, application Japan, Feb. 7, 1993, 5-042011; Feb. 7, 1993, 5-042012; Feb. 7, 1993, 5-042017

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—407 **10 Claims**



1. A sheet treatment apparatus, comprising a first, a second, and a third sheet treatment unit, characterized by that:

each of said first, second, and third sheet treatment units have different kinds of sheet treatment functions, and each of said first, second, and third sheet treatment units has at both sides thereof substantially fixed openings at substantially the same height for discharging or receiving the sheet, so that a sheet is conveyed in one direction from the front most sheet treatment unit to the rearmost sheet treatment unit through the intermediate sheet treatment unit, among the first to third sheet treatment units in arbitrary sequence, or from the front most sheet treatment unit directly to the rearmost sheet treatment unit selected from said first to third sheet treatment units,

wherein one of said first to third sheet treatment units is a sorter comprising (i) a plurality of bin trays separately arranged in a vertical direction between said sheet receiving opening and said sheet discharging opening, (ii) a straight path extending generally straight between and connecting said sheet receiving opening and said sheet discharging opening, and (iii) sheet carry means for carrying the sheet from said sheet receiving opening by a vertical movement along said bin trays and discharging the sheet to said bin trays, said sheet carry means also constituting a portion of the straight path when the sheet is discharged to another sheet treatment unit via the straight path in alignment with a line connecting said sheet receiving opening and said sheet discharging opening.

5,752,155

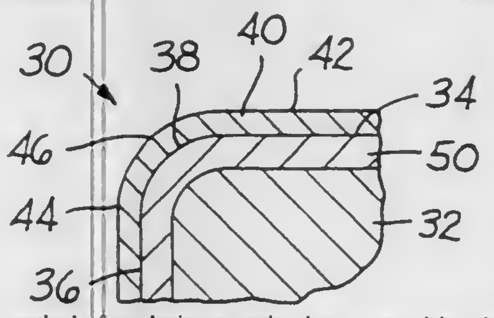
GREEN HONED CUTTING INSERT AND METHOD OF MAKING THE SAME

Alfred S. Gates, Jr.; Bernard North, and William R. Shaffer, all of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Oct. 21, 1996, Ser. No. 734,511

Int. Cl.^{6} B22F *3/12;3/24;7/06;7/08*

U.S. Cl. 419—5 **37 Claims**



1. A method of producing a cutting insert comprising the steps of:

providing a generally homogeneous powder blend of powder components;

forming the powder blend into a green body wherein the green body includes a rake face and a flank face with a cutting edge at the juncture of the rake face and the flank face;

honing the cutting edge of the green body; and

consolidating the green body with the honed cutting edge so as to form a consolidated body with a honed cutting edge.

5,752,156

STABLE FIBER INTERFACES FOR BERYLLIUM MATRIX COMPOSITES

Kuo-Chun Chen; Paul W. Trester, both of Encinitas, and Khodabakhsh S. Mazdiyasni, Alpine, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Mar. 4, 1996, Ser. No. 610,714

Int. Cl.^{6} B22F *3/14;7/04*

U.S. Cl. 419—11 **19 Claims**

1. A process for making fiber-reinforced beryllium metal matrix composites, which process comprises

coating reinforcing fibers of metal oxide, carbon or silicon carbide with thermodynamically stable continuous coatings by,

forming (a) a homogenous alcohol solution of an organoyttrium compound or (b) a mixture of an organoaluminum compound and an organoyttrium compound having a stoichiometric ratio of about 3 atoms of yttrium to each 5 atoms of aluminum,

adding water thereto and causing said solution or said liquid mixture to undergo hydrolytic condensation and polymerization to form a sol-gel,

coating said reinforcing fibers with said sol-gel, and

heating said coated fibers at a temperature to cure and pyrolyze said sol-gel to create thermodynamically stable coatings thereupon,

surrounding said coated fibers with beryllium metal powder, and

heating said coated fibers and surrounding beryllium powder under pressure in the absence of gaseous oxygen to form a thermodynamically stable beryllium metal matrix, fiber-reinforced composite material.

5,752,157

LIQUID FUEL REFORMING APPARATUS

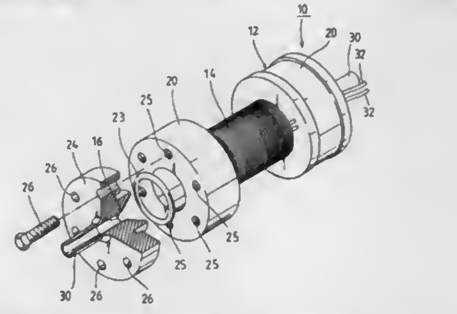
Takeshi Yamashita, Nakatsugawa, and Hiro Yamashita, 4580-59, Naegi, Gifu, both of Japan, assignors to Centerfield Kabushiki Kaisha, Aichi, and Hiro Yamashita, Gifu, both of Japan

Filed Jun. 14, 1996, Ser. No. 662,239

Claims priority, application Japan, May 27, 1996, 8-156135

Int. Cl.^{6} B01J *19/08*

U.S. Cl. 422—186.01 **12 Claims**



1. A liquid fuel reforming apparatus comprising:

a bobbin main body containing a fuel passage through which a liquid fuel such as gasoline and a combustible gas passes;

a coil having a predetermined number of windings formed around the bobbin main body; and

- a multi-faced magnetic metal material sealed in the fuel passage, which permits passage of the liquid fuel being brought into contact therewith; and wherein:
- the liquid fuel is adapted to be reformed by applying a predetermined voltage across the coil to induce a magnetic field and effect magnetization of the multi-faced magnetic metal material contained in the fuel passage and by allowing the liquid fuel to flow through the fuel passage in contact with the magnetized multi-faced magnetic metal material:
- the liquid fuel is supplied to an internal combustion engine to be burned therein; and
- an AC voltage having a frequency synchronous to the revolution of the internal combustion engine is applied across the coil.

5,752,158

THERMAL PROCESS FOR THE CONVERSION OF URANIUM HEXAFLUORIDE

Michael J. Stephenson, Oak Ridge; Waldo R. Golliher, and Paul Haas, both of Knoxville, all of Tenn., assignors to M4 Environmental L.P., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 635,190, Apr. 19, 1996. This application May 30, 1996, Ser. No. 657,937

Int. Cl.^{6} C01G *43/01*

U.S. Cl. 423—261 **24 Claims**

1. A single-step process for producing solid uranium oxide and gaseous HF from UF$_6$ which comprises bringing together two gaseous reactant streams wherein at least one of the streams is preheated to a temperature of 700°–1000° C. prior to bringing together, one of said streams comprising UF$_6$ optionally admixed with oxygen as O_2, and the second reactant stream comprising a mixture of hydrogen as H_2 or as a hydrogen-containing compound and oxygen as an oxygen-containing compound, said gaseous reactant streams being brought together in a reactor at a temperature and composition such that the UF$_6$ is converted rapidly by flame reaction into readily separable solid uranium oxide and a gaseous HF product.

5,752,159

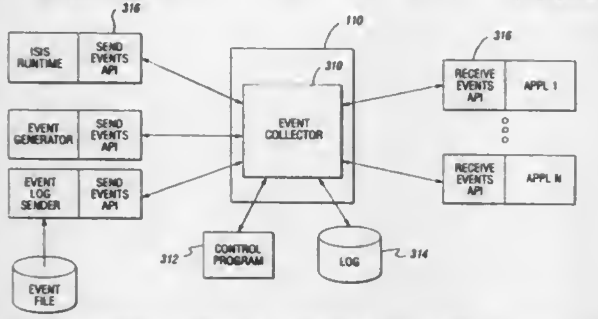
METHOD FOR AUTOMATICALLY COLLECTING AND DELIVERING APPLICATION EVENT DATA IN AN INTERACTIVE NETWORK

John E. Faust, Boulder, and John R. Meier, Longmont, both of Colo., assignors to U S West Technologies, Inc., Boulder, Colo.

Filed Jan. 13, 1995, Ser. No. 372,153

Int. Cl.^{6} H04H *1/00;* **H04N** *7/14;* **H04B** *17/00*

U.S. Cl. 455—5.1 **6 Claims**



1. In an interactive network including a server and a plurality of client stations, the server including a memory and a processor having event processing control logic, a method for automatically collecting event data from a multimedia application at a client station with the server, the method comprising:

- identifying an event of a multimedia application at a first client station;
- transmitting, from the first client station, an event data signal representing the event;
- receiving the event data signal with the server;
- processing the event data signal with the event processing control logic of the server to determine if the event is of interest to the server;
- storing the event data signal in the memory of the server if the event is of interest to the server;
- registering an interest of a second client station in the event with the server;
- processing the event data signal stored in the memory of the server with the event processing control logic of the server to determine if the event is of interest to the second client station;
- transmitting the event data signal from the server if the second client station is interested in the event; and
- receiving the event data signal with the second client station.

5,752,160

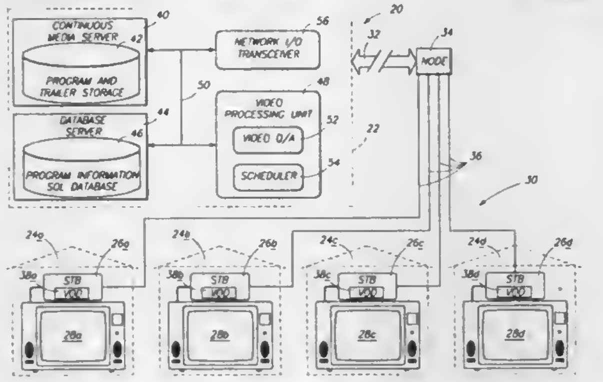
INTERACTIVE ENTERTAINMENT NETWORK SYSTEM AND METHOD WITH ANALOG VIDEO STARTUP LOOP FOR VIDEO-ON-DEMAND

Matthew W. Dunn, 5609 6th Ave. NW., Seattle, Wash. 98107

Filed May 5, 1995, Ser. No. 437,131

Int. Cl.^{6} H04N *7/10*

U.S. Cl. 455—5.1 **22 Claims**



1. In an interactive entertainment network system in which a content provider serves video content programs to one or more user interface units over a distribution network, the content provider having a storage medium to store the video content programs and associated preview video trailers about the video content programs in digital format, a system comprising:

- a video processing unit at the content provider to convert preview video trailers from the digital format to an analog format and thereby form an analog video stream for transmission to the user interface units;
- the video processing unit being configured to determine a schedule of the preview video trailers for transmission to the user interface units, the schedule defining an order that the preview video trailer appear within the analog video stream to be supplied to the user interface units; and
- an on-demand application resident at a user interface unit to display the analog video stream when the user interface unit initially executes the on-demand application and to generate requests for services from the content provider in response to user input; and
- the video processing unit, in response to receiving a request from the on-demand application, outputting the preview video trailers and video content programs as digital video data streams.

5,752,161

METHOD AND APPARATUS FOR REPLACING A FAILED CHANNEL UNIT OF A SECTORED BASE STATION, IN A CELLULAR RADIO SYSTEM, WITH AN ADDITIONAL CHANNEL UNIT

Arto Jäntti, and Keijo Katisko, both of Oulu, Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

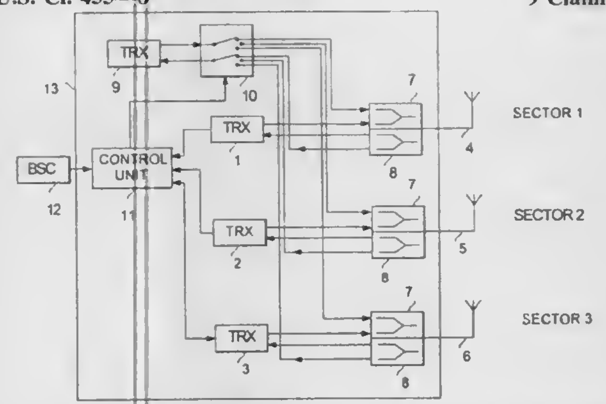
PCT No. PCT/FI94/00424, § 371 Date Mar. 22, 1996, § 102(e) Date Mar. 22, 1996, PCT Pub. No. WO95/08875, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 22, 1994, Ser. No. 619,729

Claims priority, application Finland, Sep. 24, 1993, 934198

Int. Cl.^{6} H04B *3/36;7/14*

U.S. Cl. 455—8 **9 Claims**



1. A method for securing the operation of a base station having a radio coverage area divided into at least two sectors, the base station comprising individually for each said sector an antenna, a combiner arranged for combining signals transmitted by a plurality of channel units to be applied to the antenna, a brancher for branching arranged signals received by the antenna to receivers of a plurality of channel units, and at least one channel unit assigned for each sector, each said assigned channel unit being arranged to be operatively connected by a respective combiner and a respective said brancher to a respective said antenna, collectively for enabling the base station to establish radio connection with active radio transceivers currently located in the respective sectors of the coverage area, wherein the base station is provided with an additional channel unit having a traffic capacity which is selectably switchable to any one or none of the base station sectors, said method comprising:

- monitoring the operation of the assigned channel units of the base station; and
- switching, when one of the assigned channel units fails, the additional channel unit to the combiner and brancher of the failed assigned channel unit by connecting antenna attachments of the additional channel unit thereto without thereby connecting said antenna attachments to an assigned channel unit for another said sector.

5,752,162

METHODS FOR ASSIGNING SUBSCRIBER UNITS TO VISITED GATEWAYS

Steven Paul Sawyer, Fountain Hills; Peter Joseph Armbruster, Tempe, and Steven Harry Moritz, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

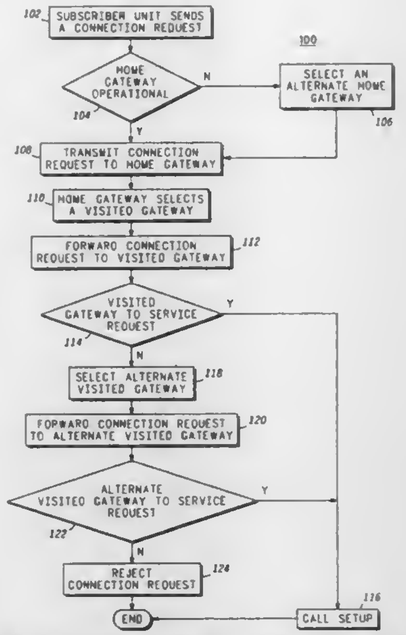
Filed Nov. 3, 1995, Ser. No. 552,424

Int. Cl.^{6} H04B *7/185*

U.S. Cl. 455—13.1 **24 Claims**

1. A method for assigning a subscriber unit to a visited gateway, the method comprising the steps of:

- a) receiving a connection request;
- b) forwarding the connection request to a home gateway and selecting an alternate home gateway if the home gateway is incapable of servicing the connection request;


102
SUBSCRIBER UNIT SENDS A CONNECTION REQUEST
100
HOME GATEWAY OPERATIONAL
104
N
SELECT AN ALTERNATE HOME GATEWAY
106
Y
108
TRANSMIT CONNECTION REQUEST TO HOME GATEWAY
110
HOME GATEWAY SELECTS A VISITED GATEWAY
FORWARD CONNECTION REQUEST TO VISITED GATEWAY
112
VISITED GATEWAY TO SERVICE REQUEST
114
Y
N
SELECT ALTERNATE VISITED GATEWAY
118
FORWARD CONNECTION REQUEST TO ALTERNATE VISITED GATEWAY
120
ALTERNATE VISITED GATEWAY TO SERVICE REQUEST
122
Y
N
REJECT CONNECTION REQUEST
124
END
CALL SETUP
116

- c) selecting the visited gateway from a list of gateways to service the connection request;
- d) forwarding the connection request to the visited gateway; and
- e) setting-up a call.

5,752,163

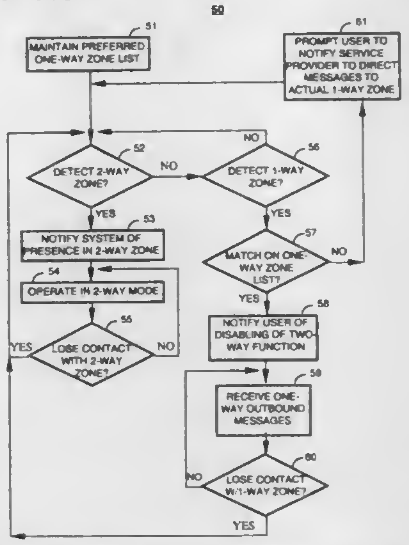
METHOD AND APPARATUS FOR ONE-WAY RECEIVER OPERATION FROM A TWO-WAY COMMUNICATION DEVICE

Edward Herbert Robinson, Fort Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1996, Ser. No. 707,167

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—31.3 **17 Claims**


50
51
MAINTAIN PREFERRED ONE-WAY ZONE LIST
61
PROMPT USER TO NOTIFY SERVICE PROVIDER TO DIRECT MESSAGES TO ACTUAL 1-WAY ZONE
NO
52
DETECT 2-WAY ZONE?
NO
56
DETECT 1-WAY ZONE?
YES
53
NOTIFY SYSTEM OF PRESENCE IN 2-WAY ZONE
54
OPERATE IN 2-WAY MODE
55
YES
LOSE CONTACT WITH 2-WAY ZONE?
NO
YES
57
MATCH ON ONE-WAY ZONE LIST?
NO
YES
58
NOTIFY USER OF DISABLING OF TWO-WAY FUNCTION
59
RECEIVE ONE-WAY OUTBOUND MESSAGES
60
NO
LOSE CONTACT W/1-WAY ZONE?
YES

1. A method of making a selective call transceiver operational as a one-way receiver in a one-way selective call receiver coverage zone, comprises the steps at the selective call transceiver of:

- maintaining a preferred one-way zone list;
- detecting a one-way zone;
- matching the one-way-zone with a one-way zone on the preferred one-way zone list; and

disabling a two-way function of the selective call transceiver if a match exists between the one-way zone and the one-way zone on the preferred one-way zone list.

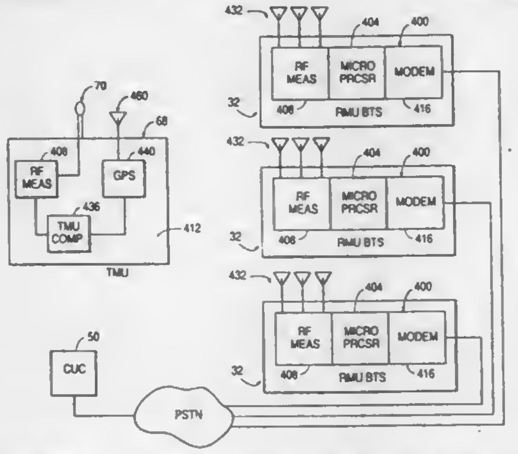
5,752,164
AUTONOMOUS REMOTE MEASUREMENT UNIT FOR A PERSONAL COMMUNICATIONS SERVICE SYSTEM

J. Barclay Jones, Washington, D.C., assignor to American PCS L.P., Bethesda, Md.

Continuation-in-part of Ser. No. 874,370, Apr. 27, 1992, Pat. No. 5,410,737. This application Apr. 25, 1995, Ser. No. 428,730

Int. Cl.^{6} H04Q *7/34*

U.S. Cl. 455—33.1 **10 Claims**



1. An autonomous remote measurement unit in a communications system having a central controller, for autonomously measuring signal strengths in a communications environment with other communications transmissions, the remote measurement unit comprising:

a means for accepting instructions from the central controller, wherein the remote measurement unit is under the control and direction of the central controller;

a means, connected to the accepting means, for autonomously controlling the operation of the remote measurement unit, the control exercised based upon the instructions received from the central controller, wherein the instructions include desired frequency band for measurement and schedule of measurement, at least one of the instructions reformatted by the controlling means as commands to control measurement;

an antenna, operably connected to the controlling means, for receiving communications transmissions;

a means for measuring, connected to the receiving means and the controlling means, the signal strengths of any communications transmissions across the frequency band and according to the schedule of measurement contained in the commands from the controlling means;

a means for storing the signal strengths of the communications transmissions in data files; and

means, connected to the storing means, for uploading the data files containing the signal strengths to the central controller, wherein the signal strengths are used by the central controller to verify theoretical radio frequency analyses with measurements of actual frequency usage the result of which is an available channel list of permissible frequencies for transmission.

5,752,165
METHOD AND APPARATUS FOR COMPARING AVERAGES OF SIGNAL LEVELS OF RECEIVERS OF RECEIVER UNIT FOR AUTOMATICALLY PROVIDING INDICATION OF A DEFECTIVE RECEIVER

Petri Hokkanen, Oulu, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

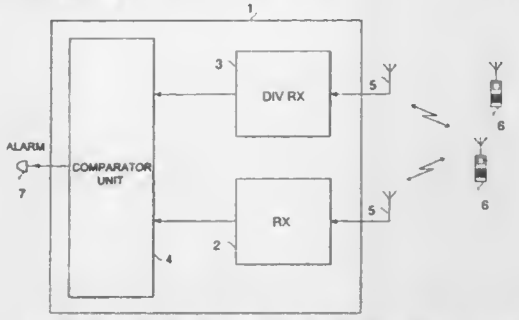
PCT No. PCT/FI94/00403, § 371 Date Jun. 4, 1996, § 102(e) Date Jun. 4, 1996, PCT Pub. No. WO95/08223, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 14, 1994, Ser. No. 615,224

Claims priority, application Finland, Sep. 15, 1993, 934052

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—67.1 **9 Claims**



1. A method for testing the operation of a radio receiver unit during normal traffic, the receiver unit comprising at least two receivers for diversity reception, and respective antennas to allow the receiver unit to receive signals transmitted by at least one radio transmitter, said method comprising the steps of:

measuring the signal levels of the signals received by each receiver to provide respective measurements;

calculating for each receiver an average on the basis of the respective said measurements;

comparing said averages with one another to obtain differences; and

indicating an error when a difference between the averages calculated for a respective at least two of the receivers is greater than a predetermined reference value.

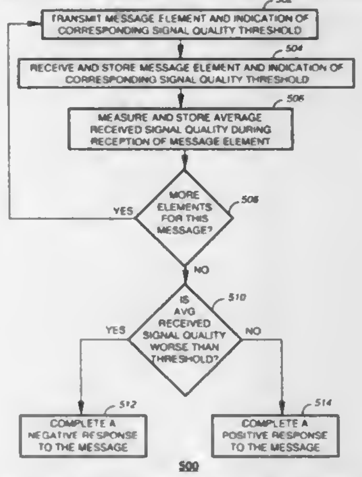
5,752,166
METHOD AND APPARATUS FOR CONTROLLING HOW A RECEIVER RESPONDS TO A MESSAGE

Jheroen Dorenbosch, Paradise, Tex.; Douglas Irvin Ayerst, Delray Beach, Fla., and Gregory Lewis Cannon, Keller, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1996, Ser. No. 707,571

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—67.1 **19 Claims**


502
TRANSMIT MESSAGE ELEMENT AND INDICATION OF CORRESPONDING SIGNAL QUALITY THRESHOLD
504
RECEIVE AND STORE MESSAGE ELEMENT AND INDICATION OF CORRESPONDING SIGNAL QUALITY THRESHOLD
506
MEASURE AND STORE AVERAGE RECEIVED SIGNAL QUALITY DURING RECEPTION OF MESSAGE ELEMENT
508
MORE ELEMENTS FOR THIS MESSAGE?
YES
NO
510
IS AVG RECEIVED SIGNAL QUALITY WORSE THAN THRESHOLD?
YES
NO
512
COMPLETE A NEGATIVE RESPONSE TO THE MESSAGE
514
COMPLETE A POSITIVE RESPONSE TO THE MESSAGE
500

1. A method for controlling how a receiver responds to a message received in a radio communication system, the method comprising in a controller of the radio communication system the step of:

transmitting a message element and an indication of a signal quality threshold corresponding to the message element; and the method further comprising in the receiver the steps of:

receiving the message element and the indication of the signal quality threshold corresponding thereto;

measuring a received signal quality experienced while receiving the message element; and

completing a negative response to the message when the received signal quality is worse than the signal quality threshold, and a positive response to the message when the received signal quality is not worse than the signal quality threshold, wherein the message element is defined as one of (a) the message in its entirety and (b) a portion of the message.

5,752,167
RADIO PROPAGATION SIMULATION METHOD WAVE FIELD STRENGTH INFERENCE METHOD AND THREE-DIMENSIONAL DELAY SPREAD INFERENCE METHOD

Hitoshi Kitayoshi, Sendai, Japan, assignor to Advantest Corporation, Tokyo, Japan

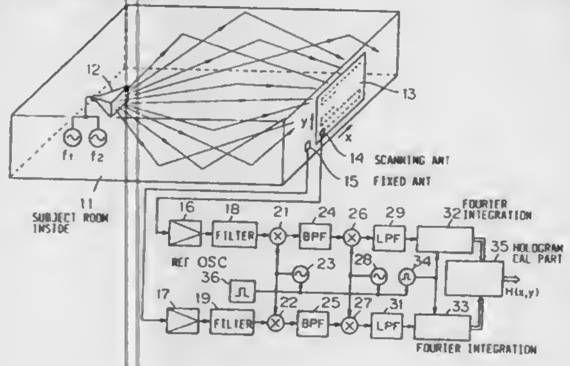
PCT No. PCT/JP96/00110, § 371 Date Dec. 18, 1996, § 102(e) Date Dec. 18, 1996, PCT Pub. No. WO96/23363, PCT Pub. Date Aug. 1, 1996

PCT Filed Jan. 23, 1996, Ser. No. 716,289

Claims priority, application Japan, Jan. 23, 1995, 7-008495; Jan. 23, 1995, 7-008496; Jan. 23, 1995, 7-008497

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—67.1 **12 Claims**



1. A radio propagation simulation method wherein two-dimensional interferogram data of a wave is measured with respect to a plurality of frequencies to simulate the propagation thereof, said method comprising:

a first step for measuring two-dimensional interferogram data of a radio wave with respect to a plurality of frequencies in a subject space;

a second step for reconstructing radio wave source images from said measured two-dimensional interferogram data with respect to the plurality of frequencies;

a third step for generating a time response function of the propagation path of the wave based on the amplitude and delay of each of said reconstructed wave source images as well as the directivity characteristic of the receiving antenna;

a fourth step for convoluting the generated time response function into a modulated carrier wave signal; and

a fifth step for demodulating a received base band signal from the convoluted result in said fourth step.

5,752,168
MULTISENSOR RECEPTION METHOD FOR A FIXED BASE STATION OF A COMMUNICATIONS NETWORK EXCHANGING DATA WITH MOBILE STATIONS AND DEVICE FOR ITS IMPLEMENTATION

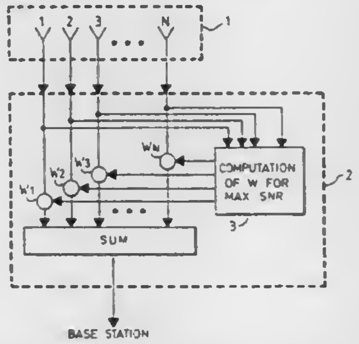
Jean-Jacques Monot, Courdimanche; Francois Pipon, Paris; Gilbert Multedo, Vaureal, and Pascal Chevalier, Courbevoie, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 21, 1996, Ser. No. 620,699

Claims priority, application France, Mar. 28, 1995, 95 03626

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—67.3 **3 Claims**



1. A method enabling the improvement of the multisensor reception of a radiocommunications system exchanging signals between at least one fixed base station providing for multisensor reception by means of a network of sensors and processing of the signals, by computing a channel-formation weighting vector W at reception in a transparent manner seen from the base station, wherein said weighting vector W is an eigen vector corresponding to a maximum eigen value of a matrix R_{xx} of one of the signals received by said network of sensors, said computing the weighting vector W comprising the steps of:

acquiring a vector (X(n)) corresponding to a signal received by the network of sensors, after sampling at a determined frequency;

estimating said weighting vector W according to an algorithm of the gradient made adaptive by the updating, at each new sample, of the pitch μ of the computation of the gradient, the pitch μ being determined to limit the losses as a function of the signal-to-noise ratio;

standardizing the estimated vector W to ensure a modulus equal to 1 according to a criterion of maximazation; and

filtering data elements by means of the weighting vector W.

3. A reception device for the implementation of the method according to any of the claims **1** to **2**, comprising a network of a determined number N of sensors, analog multichannel reception means enabling the selection of a communications channel and the transposition of the signal received in a determined band into an intermediate frequency compatible with a determined sampling, means of digitization and passage into baseband, wherein said device further comprises digital channel-formation means implementing the adaptive algorithm leading to a maximization of the signal-to-noise ratio, a frequency discrimination means performing a frequency demodulation in order to have available a signal whose value corresponds to the modulated data elements and a digital/analog converter converting the digital signal into an analog signal compatible with the input interface of the base station to which the reception device is linked, the reception device being totally transparent with respect to the base station.

5,752,169
INTEGRATED CIRCUIT AND TRANSMITTER/ RECEIVER

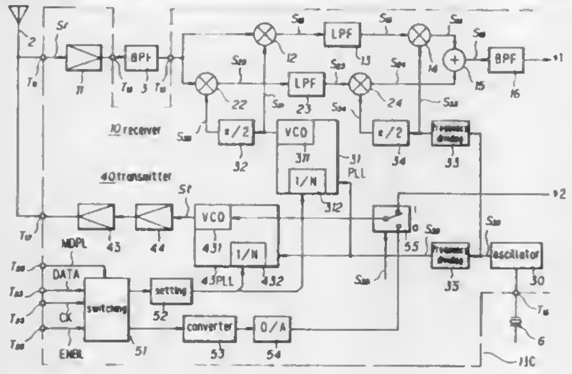
Nobuo Hareyama, and Hiroshi Yokoyama, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 11, 1996, Ser. No. 613,510

Claims priority, application Japan, Mar. 14, 1995, 7-081674

Int. Cl.^{6} H04B *1/50*

U.S. Cl. 455—76 **4 Claims**



1. An integrated circuit comprising

frequency dividing ratio setting means for setting a transmission frequency dividing ratio and a receiving frequency dividing ratio based on externally provided data;

first variable frequency dividing means for producing a signal transmitting frequency in accordance with said transmission frequency dividing ratio set by said frequency dividing ratio setting means;

second variable frequency dividing means for producing a signal receiving frequency in accordance with said receiving frequency dividing ratio set by said frequency dividing ratio setting means;

data converting means for converting said externally-provided data to a signal for transmission; and

switching means for selectively providing said externally-provided data to one of said frequency dividing ratio setting means and said data converting means in response to an externally-provided control signal.

5,752,170
TRANSMITTERS FOR RADIO TELEPHONE BASE STATIONS

Paul Thomas Clifford, Fleet, Great Britain, assignor to Nokia Mobile Phones Limited, Espoo, Finland

PCT No. PCT/GB95/02409, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO96/12343, PCT Pub. Date Apr. 25, 1996

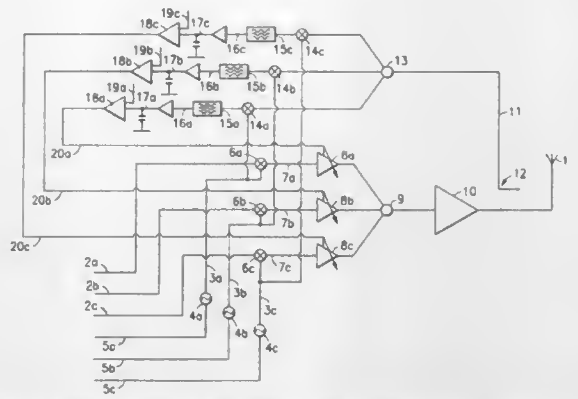
PCT Filed Oct. 12, 1995, Ser. No. 628,630

Claims priority, application United Kingdom, Oct. 15, 1994, 9420843

Int. Cl.^{6} H01Q *11/12*

U.S. Cl. 455—126 **5 Claims**

1. A transmitter for a radio telephone base station, the transmitter being operative to transmit radio signals on at least two channels, the transmitter comprising a variable gain preamplifier for each channel, combining means for combining the outputs of the variable gain preamplifiers, a multichannel power amplifier for amplifying the output of the combining means, coupling means for sampling the output of the multi-channel power amplifier and for obtaining a sampled signal representative of the output power on each channel, and a feedback loop for applying to each variable gain preamplifier a control signal which is derived from the said sampled signal, whereby the gain of each preamplifier is varied in dependence upon the power level of each channel at the output of the multichannel power amplifier.



5,752,171
TRANSMISSION LEVEL CONTROL SYSTEM WITH SELECTIVELY FIXED OR VARIABLE AMPLICATION CONTROL

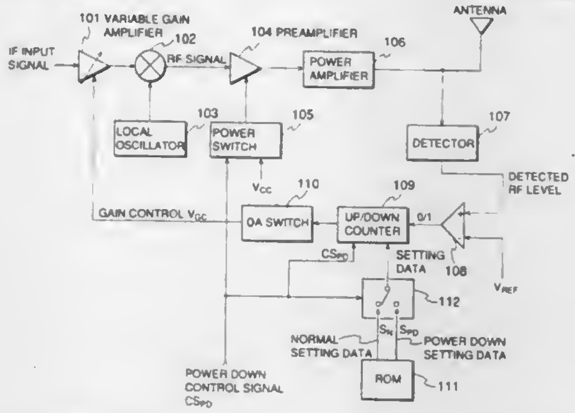
Makoto Akiya, Saitama, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,495

Claims priority, application Japan, May 22, 1995, 7-122181

Int. Cl.^{6} H04B *1/04*

U.S. Cl. 455—126 **43 Claims**



1. A transmitter comprising:

a first amplifier for amplifying an input high-frequency signal to produce a first high-frequency signal;

a frequency converter for converting the first high-frequency signal to a first radio-frequency (RF) signal;

a second amplifier for amplifying the first RF signal to produce a second RF signal, the second amplifier being controlled by a control signal such that the first RF signal is amplified by a fixed factor when the control signal is in a first state and the first RF signal is attenuated by a fixed degree when the control signal is in a second state;

a third amplifier for amplifying the second RF signal to produce an output Rf signal;

a detector for detecting an output level of the output Rf signal; and

a first controller for controlling the first amplifier to amplify variably, the first amplifier being adjusted based on the output level so as to keep the output level at a first predetermined level when the control signal is in the first state; and

a second controller for controlling the first amplifier such that the amplification factor of the first amplifier is set at a predetermined value so as to set the output level at a second predetermined level lower than the first predetermined level when the control signal is in the second state.

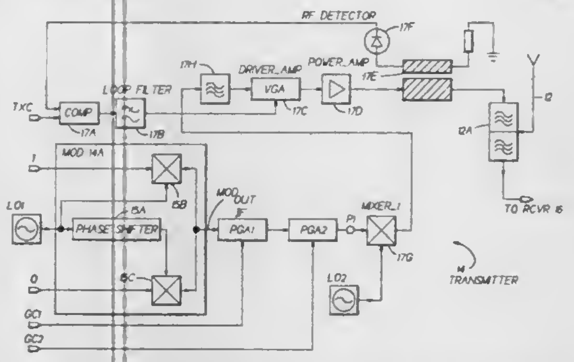
5,752,172
DISTRIBUTED TRANSMITTER OUTPUT POWER CONTROL CIRCUIT AND METHOD FOR A RADIO TELEPHONE

Jorma Matero, Oulu, Finland, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Aug. 16, 1996, Ser. No. 696,582

Int. Cl.^{6} H01Q *11/12*

U.S. Cl. 455—127 **15 Claims**



1. A transmitter circuit for use in a radio telephone, comprising:

a power amplifier having an output coupled to an antenna for transmitting an amplified modulated RF signal;

a variable gain driver amplifier having an output coupled to an input of said power amplifier and an input coupled to an output of a modulator, said variable gain driver amplifier being required to output the modulated RF signal within a predetermined dynamic power range having a maximum value; and

at least one programmable gain amplifier coupled in series between said output of said modulator and said input of said variable gain driver amplifier, wherein said at least one programmable gain amplifier has a dynamic range selected for reducing the dynamic range requirement of said variable gain driver amplifier to be less than the maximum value of the predetermined dynamic power range.

5,752,173
DIVERSITY COMMUNICATION SYSTEM WITH ADAPTABLY ORIENTED MULTIPLE BEAM PATTERNS

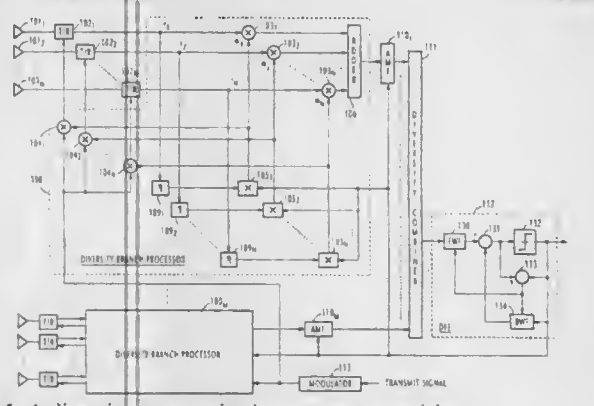
Ichiro Tsujimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 6, 1995, Ser. No. 470,986

Claims prinrity, application Japan, Jun. 7, 1994, 6-148627

Int. Cl.^{6} H04L *1/02*

U.S. Cl. 455—137 **5 Claims**



1. A diversity communication system comprising:

a plurality of arrays of antennas;

a plurality of groups of receive units, said groups corresponding respectively to said antenna arrays, the receive units of each group respectively processing incoming signals from the antennas of the corresponding array;

a plurality of diversity branches corresponding respectively to the groups of receive units:

a diversity combiner for combining output signals of the diversity branches to produce a space-domain diversity-combined signal;

a decision feedback equalizer for adaptively equalizing the diversity-combined signal and producing therefrom a decision signal; and

a plurality of groups of transmit units, said groups corresponding respectively to said antenna arrays, the transmit units of each group processing outgoing signals and applying the processed outgoing signals to the antennas of the corresponding array;

each of the diversity branches including:

- a plurality of complex multipliers for respectively multiplying the processed incoming signals from the corresponding group of received units by weight coefficients;
- a plurality of delay means for respectively providing delays to the processed incoming signals so that the delayed signals are time-coincident with said decision signal;
- a plurality of correlators for determining correlations between the delayed processed incoming signals and the decision signal and deriving therefrom the weight coefficients of the complex multipliers;
- an adder for combining output signals of the complex multipliers to produce a sum signal;
- an adaptive matched filter for converging delay-dispersed components of the sum signal and maximal-ratio combining said components according to said decision signal to produce a time-domain diversity-combined signal as one of the output signals of the diversity branches, and
- a plurality of second complex multipliers for multiplying a transmit signal by the weight coefficients derived by the correlators of the diversity branch to produce multiplied transmit signals and respectively supplying the multiplied transmit signals to said transmit units of the corresponding array as said outgoing signals.

5,752,174
RADIO RECEIVER WITH AUTOMATIC ADJUSTMENT OF OSCILLATION FREQUENCIES

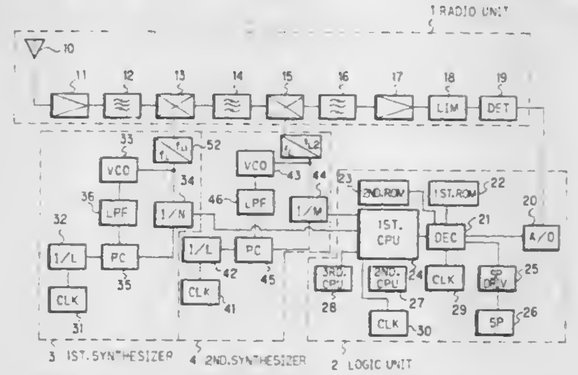
Masahiro Matai, and Kunitoshi Yonekura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1994, Ser. No. 282,238

Claims priority, application Japan, Jul. 31, 1993, 5-208601

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—183.1 **12 Claims**



1. A radio selective calling receiver comprising:

first and second local oscillators constituted by respective synthesizers, and

control means for controlling the oscillation frequencies of the local oscillators, the control means including:

- frequency setting means for setting original and optimum oscillation frequencies of said local oscillators; and
- frequency calculation means for calculating said optimum oscillation frequencies for said local oscillators according

to the received call signal frequency after said frequency setting means sets said original oscillation frequency, the original oscillation frequencies of said local oscillators and the harmonic frequencies of said local oscillators to minimize harmonic distortion between said optimum oscillation frequencies and said received signal frequency, and for verifying that said calculated optimum oscillation frequencies are acceptable according to a predetermined standard, during normal operation of said receiver and before said frequency setting means sets said optimum oscillation frequencies.

5,752,175
FREQUENCY SYNTHESIZER FOR V/UHF WIDEBAND RECEIVER

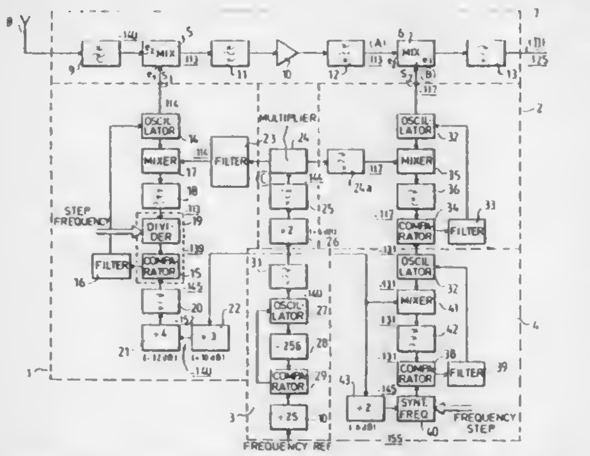
André Roullet, Domont, and Daniel Peris, Colombes, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 14, 1995, Ser. No. 572,627

Claims priority, application France, Dec. 16, 1994, 94 15169

Int. Cl.⁶ H04B *1/18*

U.S. Cl. 455—183.1 **12 Claims**



1. A frequency synthesizer device configured for use in a wideband V/UHF receiver having a first frequency mixing stage configured to transpose a wideband signal applied to an input of the receiver into a first intermediate frequency signal and a second frequency mixing stage coupled to an output of the first frequency mixing stage and configured to transpose the first intermediate frequency signal into a second intermediate frequency signal, comprising;

- a first frequency synthesizer loop with fractional division configured to apply a first frequency band transposition signal to an input of the first mixing stage, said first frequency synthesizer loop, comprising,
- a voltage controlled oscillator having an output configured to output said first frequency band transposition signal,
- a frequency mixing mechanism, and
- a variable rank divider with fractional division coupled to said output of said voltage controlled oscillator via said frequency mixing mechanism;
- a second frequency synthesizer loop configured to apply a second frequency band transposition signal to an input of the second mixing stage; and
- a common frequency source configured to apply a frequency reference to respective inputs of the first frequency synthesizer loop and the second frequency synthesizer loop.

5,752,176
FM RADIO RECEIVER AND SIGNAL PROCESSING DEVICE USED THEREIN

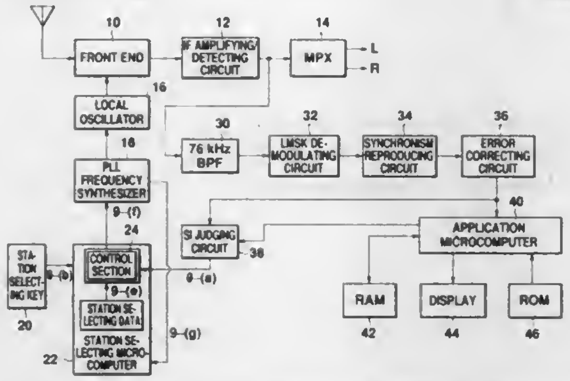
Kazuhiro Kimura, Fukaya; Shigeaki Hayashibe, Gunma-ken; Yutaka Hirakoso, Gyoda; Takahiko Masumoto; Shizuka Ishimura, both of Gunma-ken; Toshiyuki Ozawa, Ota, and Munehiro Suka, Tokyo-to, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 26, 1996, Ser. No. 624,739

Claims priority, application Japan, Mar. 30, 1995, 7-074071

Int. Cl.⁶ H04B *1/18*

U.S. Cl. 455—184.1 **13 Claims**


FRONT END
IF AMPLIFYING/DETECTING CIRCUIT
MPX
L
R
LOCAL OSCILLATOR
PLL FREQUENCY SYNTHESIZER
76 kHz BPF
LMSK DE-MODULATING CIRCUIT
SYNCHRONISM REPRODUCING CIRCUIT
ERROR CORRECTING CIRCUIT
SI JUDGING CIRCUIT
APPLICATION MICROCOMPUTER
STATION SELECTING KEY
CONTROL SECTION
STATION SELECTING DATA
STATION SELECTING MICRO-COMPUTER
RAM
DISPLAY
ROM

1. An FM radio receiver for receiving a multiplex FM broadcast on which data are superimposed, the FM radio receiver comprising:

- a station selecting section for selecting a frequency signal of a requested broadcasting station;
- a service judging section for detecting a service identification code of a block in superimposed FM data included in a multiplex FM broadcast being received, and judging the kind of service included in the block;
- a timing signal generating section for generating a station change timing signal based on the kind of service detected; and
- a station selecting control section for permitting the frequency signal in the station selecting section to change according to the station change timing signal.

5,752,177
RADIO RECEIVER, IN PARTICULAR A VEHICLE RADIO RECEIVER

Gert Siegle, Berlin; Peter Braegas, Hildesheim; Jürgen Kaesser, Diekholzen, and Wadym Suchowerskyj, Hildesheim, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE92/00232, § 371 Date Oct. 15, 1993, § 102(e) Date Oct. 15, 1993, PCT Pub. No. WO92/19093, PCT Pub. Date Oct. 29, 1992

PCT Filed Mar. 19, 1992, Ser. No. 133,145

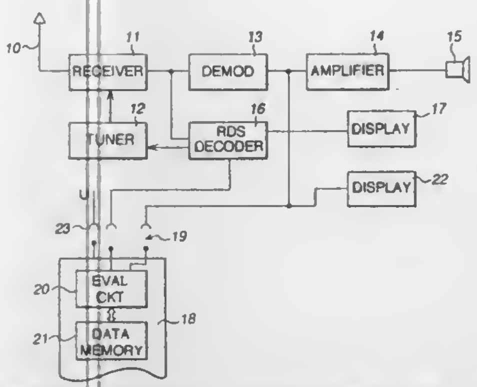
Claims priority, application Germany, Apr. 19, 1991, 41 12 828.1

Int. Cl.⁶ H04B *1/18*

U.S. Cl. 455—186.1 **4 Claims**

4. A solid-state chip card, for engagement with a Radio Data System receiver having a chip card reading means, comprising:

- a data memory (21), said data memory (21) including at least a locality code area (27) having a plurality of geographical data relating to a specific locality and a speech stock area (26) having data relating to speech used for speaking said plurality of geographical data in a desired language, with the desired language of one said chip card being different from the desired language of at least one other said chip card, and
- a traffic bulletin evaluation unit (20) connected with said data memory (21).



5,752,178
WAVEFORM IDENTITY DISCRIMINATING CIRCUIT

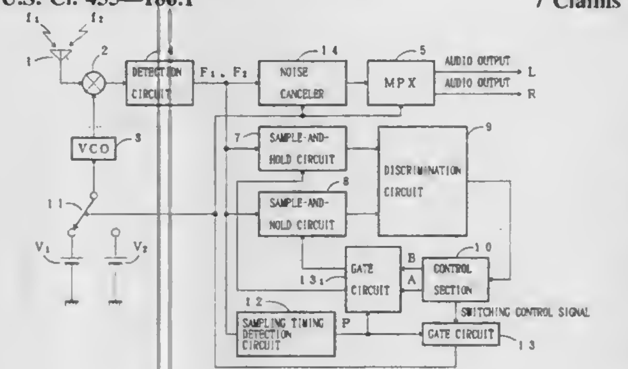
Yuji Yamamoto, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 17, 1996, Ser. No. 730,817

Claims priority, application Japan, Oct. 26, 1995, 7-278713; Nov. 13, 1995, 7-294070

Int. Cl.⁶ H04B *1/18*

U.S. Cl. 455—186.1 **7 Claims**



1. A waveform identity discriminating circuit for receiving a plurality of input signals to be compared being selected by switching, sampling the input signals and comparing the sampled values thereof to discriminate the identity of waveforms of the input signals, said circuit comprising:

- sampling means for directly receiving the selected input signals, sampling each of the input signals according to a sampling command and holding the sampled values;
- discriminating means for discriminating whether or not the waveforms of the input signals are identical by comparing the sampled values of the input signals held by said sampling means; and
- sampling timing detecting means for monitoring the frequency distribution pattern of said input signals and detecting whether or not there are contained frequency components of a predetermined bandwidth by an amount at or above a predetermined value, wherein the sampling timing of said sampling means is controlled by an output of said sampling timing detecting means.

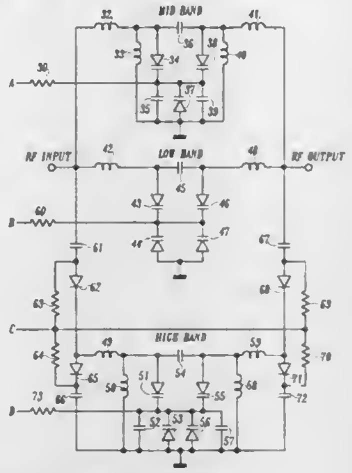
5,752,179
SELECTIVE RF CIRCUIT WITH VARACTOR TUNED AND SWITCHED BANDPASS FILTERS

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 17, 1995, Ser. No. 516,031

Int. Cl.⁶ H04B *1/18;* H03H *7/00;5/12*

U.S. Cl. 455—266 **16 Claims**



6. A selective RF circuit comprising:

- a plurality of double-tuned bandpass filters each including two controllable tuning varactors which in a first mode exhibit a variable capacitance for primarily tuning their associated bandpass filter and which in a second mode are biased into conduction;
- at least one coupling varactor coupling the primary and second side of each said bandpass filter, said coupling varactor when in said first mode primarily varying the bandpass coupling factor and when in said second mode being biased into conduction and cooperating with said tuning varactors to disable their associated bandpass filter.

5,752,180
CONVERTER FOR PROCESSING RF SIGNALS HAVING DIFFERENT POLARIZATIONS

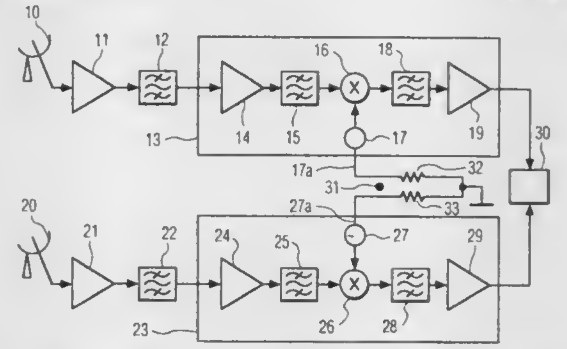
Chaoying Guo, and Jean-Paul Grimm, both of Illkirch, France, assignors to Thomson Consumer Electronics S.A., Courbevoie, France

Continuation of Ser. No. 189,002, Jan. 27, 1994, abandoned. This application Oct. 18, 1995, Ser. No. 544,899

Claims priority, application European Pat. Off., Jan. 30, 1993, 93101481

Int. Cl.⁶ H04B *1/26*

U.S. Cl. 455—319 **6 Claims**



1. A radio frequency (RF) converter apparatus for processing RF signals received from a satellite, including RF signals of the same frequency but with different polarizations comprising:

- a plurality of signal paths for simultaneously receiving and processing respective ones of two of said RF signals in the same frequency band, but with different polarizations, each of said signal paths including a mixer and an oscillator for providing respective ones of two output intermediate frequency signals simultaneously, each of said oscillators having a frequency control line; and

a resonator coupled with said frequency control line of each of said oscillators so that each of said oscillators oscillates at the same frequency.

5,752,181

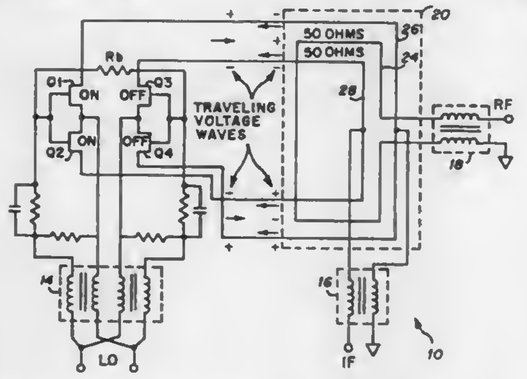
METHOD AND APPARATUS FOR REDUCING INERMODULATION DISTORTION IN A MIXER

Michael W. Vice, El Granada, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Division of Ser. No. 376,126, Jan. 19, 1995, Pat. No. 5,551,074, which is a continuation of Ser. No. 105,292, Aug. 10, 1993, abandoned, which is a division of Ser. No. 4,234, Jan. 14, 1993, Pat. No. 5,361,409, which is a continuation of Ser. No. 668,248, Mar. 12, 1991, abandoned. This application Dec. 18, 1995, Ser. No. 574,071

Int. Cl.^{6} H04B *1/26*

U.S. Cl. 455—326 **20 Claims**



1. In a mixer, an apparatus for reducing intermodulation distortion in art output signal, said apparatus comprising:

a first and a second FET each having a gate and a drain and a source, the first and second FET having their gates tied to one another and their sources tied to one another such that said first and second FETs are connected back-to-back in series and have substantially equal gate-to-source voltages at all times, said first FET drain-to-source voltage being substantially equal in magnitude but opposite in sign to said second FET drain-to-source voltage at all times;

means for applying a control voltage signal between said tied first and second FET gate terminals and said tied first and second FET source terminals, said control voltage signal operable to switch the conduction state of said serially connected FETs between a conducting state and a non-conducting state; and

means for coupling a second signal between the drain terminals of said first and second FETs, said second signal passing through a channel combination defined by said serially connected first and send FET during the time said FETs are conducting and mixing with said control voltage signal to generate said output signal;

said first FET introducing a first component of intermodulation distortion in said output signal related to the change in channel resistance of said first FET during channel conduction, and said second FET introducing a second component of intermodulation distortion in said output signal related to the change in channel resistance of said second FET during channel conduction, said second component being substantially equal in magnitude but opposite in sign to said first component;

said back-to-back serial FET connection providing means for summing said first distortion component and said second distortion component to substantially cancel said first distortion component by said second distortion component at all times so that the overall intermodulation distortion introduced in said mixer output signal is suppressed.

5,752,182

HYBRID IC

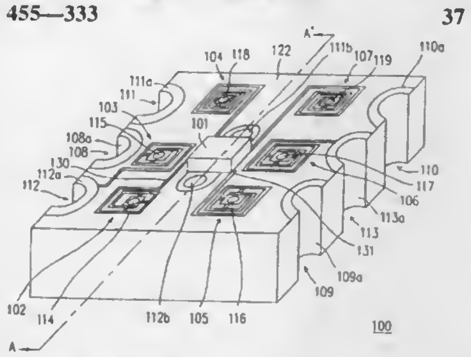
Tadayoshi Nakatsuka, Toyonaka; Junji Itoh; Shinji Yamamoto, both of Hirakata, and Mitsuru Nishitsuji, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 2, 1995, Ser. No. 433,926

Claims priority, application Japan, May 9, 1994, 6-094868

Int. Cl.^{6} H04B *1/28*

U.S. Cl. 455—333 **37 Claims**



1. A hybrid IC comprising:

a substrate including a front face, a back face opposite the front face, and side faces interposed between the front face and the back face which define an outer perimeter of the substrate;

at least one inductor formed on at least one of the front face and the back face of the substrate;

a semiconductor chip mounted on the front face of the substrate by flip-chip bonding;

at least one terminal formed in a predetermined portion of the side faces of the substrate,

wherein the semiconductor chip comprises a plurality of circuit elements provided therein, at least one of the plurality of circuit elements being an MIM capacitor having a metal-insulation film-metal (MIM) structure, the insulation film being composed of a highly dielectric material.

5,752,183

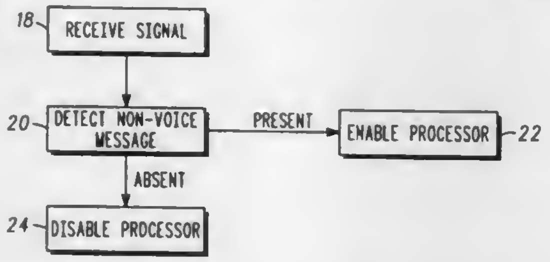
METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN A SUBSCRIBER UNIT OF A COMMUNICATION SYSTEM

Bruce Dale Mueller, Palatine; Michael Russell Mannette, Bloomingdale, and James Robert Kelton, Oak Park, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 19, 1996, Ser. No. 618,546

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—343 **9 Claims**



1. An apparatus for reducing power consumption in a subscriber unit of a communication system, the subscriber unit including a processor for processing non-voice messages received from the communication system; said apparatus comprising: a receiver for receiving a communication signal at the subscriber unit; a message detector for detecting one of a presence and an absence of non-voice messages in the communication signal and responsive to predetermined null message data for producing a null interrupt control signal, and responsive to non-null message data for producing a non-null interrupt control signal; and a controller for disabling the processor in response to detecting the absence of a non-voice message in the communication signal and for enabling the processor in response to detecting the presence of a non-voice message in the communication signal, the message detector comprising a first logic portion for comparing received message data with predetermined null message data and for producing a corresponding first logic output; a second logic portion responsive to mask signal data for selectively enabling and disabling said first logic output at a second logic output; and a third logic portion for receiving said second logic output and said mask data and responsive thereto for producing a corresponding third logic output comprising one of said null interrupt control sianal and said non-null interrupt control signal in a predetermined, systematic fashion.

5,752,184

REMOTE CONTROL SIGNAL RECEIVING CIRCUIT CAPABLE OF PROCESSING A SIGNAL FROM A PLURALITY OF KINDS OF REMOTE CONTROL TRANSMITTER

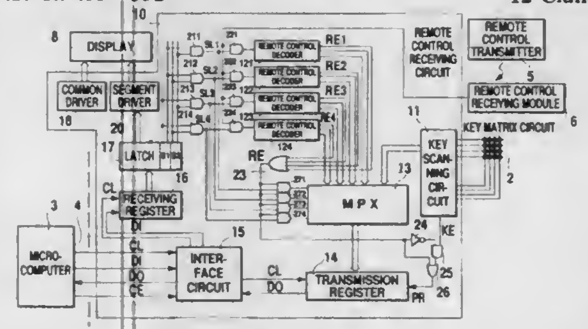
Shizuka Ishimura, Ora-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 13, 1996, Ser. No. 600,830

Claims priority, application Japan, Feb. 17, 1995, 7-029699

Int. Cl.^{6} H04B *1/06;1/18*

U.S. Cl. 455—352 **12 Claims**



1. A remote control signal receiving circuit capable of processing a remote control signal from a remote controller, the remote controller having one of a plurality of data formats that the remote control signal receiving circuit is capable of processing, the remote control signal receiving circuit comprising:

(a) a plurality of remote control decoders for decoding encoded signals based on the plurality of data formats to generate remote control data according to the plurality of data formats, each of the plurality of remote control decoders and each of the encoded signals corresponding to one of the plurality of data formats;

(b) a selection circuit for selecting in advance one of the plurality of remote control decoders corresponding to the data format of the remote controller so that an encoded signal transmitted from the remote controller is supplied to the remote control decoder corresponding to the data format of the remote controller in accordance with selection data, the selection data being supplied by an external source other than the remote controller; and

(c) a transmission register for selectively storing remote control data from the remote control decoder selected by the selection circuit and for transmitting the stored data.

5,752,185

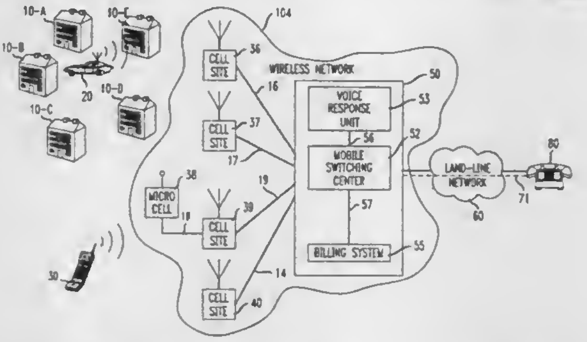
DISCONNECTION MANAGEMENT SYSTEM FOR WIRELESS VOICE COMMUNICATIONS

Sudhir Raman Ahuja, Aberdeen, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 21, 1994, Ser. No. 342,496

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 455—414 **23 Claims**



1. A method of providing voice communications services to users, the method comprising:

establishing an initial end-to-end communications link comprising:

a) an initial first segment which carries wireless communications signals and which connects a wireless network to a wireless end-user apparatus, and

b) a second segment which connects a communications end-user device to said wireless network;

in response to detecting a signal indicating that the initial first segment of the link has been disconnected, inhibiting release of the second segment;

setting up a subsequent first segment extending from said wireless network to said wireless end-user apparatus;

establishing a new end-to-end communications link comprising: of the second segment and said subsequent first segment; and

adjusting an amount of time recorded for usage of the voice communication services to compensate for delays in establishing the new end-to-end communication link.

5,752,186

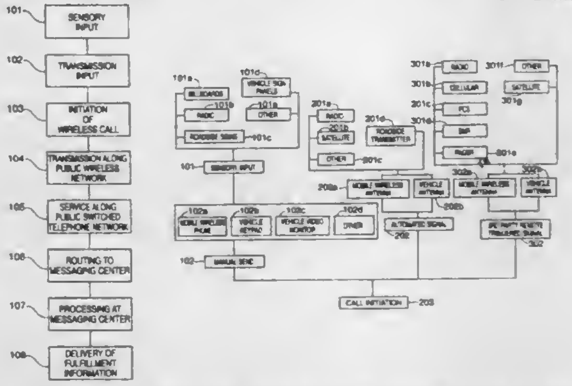
ACCESS FREE WIRELESS TELEPHONY FULFILLMENT SERVICE SYSTEM

James E. Malackowski, and Kristi L. Stathis, both of Chicago, Ill., assignors to Jeman Technologies, Inc., Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 475,800

Int. Cl.^{6} H04M *11/00;* **H04Q** *7/00*

U.S. Cl. 455—414 **31 Claims**


101
SENSORY INPUT
102
TRANSMISSION INPUT
103
INITIATION OF WIRELESS CALL
104
TRANSMISSION ALONG PUBLIC WIRELESS NETWORK
105
SERVICE ALONG PUBLIC SWITCHED TELEPHONE NETWORK
106
ROUTING TO MESSAGING CENTER
107
PROCESSING AT MESSAGING CENTER
108
DELIVERY OF FULFILLMENT INFORMATION
RADIO
OTHER
CELLULAR
SATELLITE
PCS
SMR
PAGER
OTHER
CALL INITIATION

1. A method for providing requested information from an informational fulfillment center to a caller having a wireless telecommunications transmitting and receiving device comprising the steps of:

prompting the caller through advertising media to access the informational fulfillment center by providing a specialized access code to said caller;

initiating a call to the center through dialing of said specialized access code into said wireless telecommunications transmitting and receiving device;

switching said call from said public wireless telecommunications network to a public switch telephone network by translating said specialized access code to a public switch telephone network number to direct said call to said informational fulfillment center; and

delivering said requested information as designated by said specialized access code to said caller from said informational fulfillment center through said wireless telecommunications transmitting and receiving device.

5,752,187

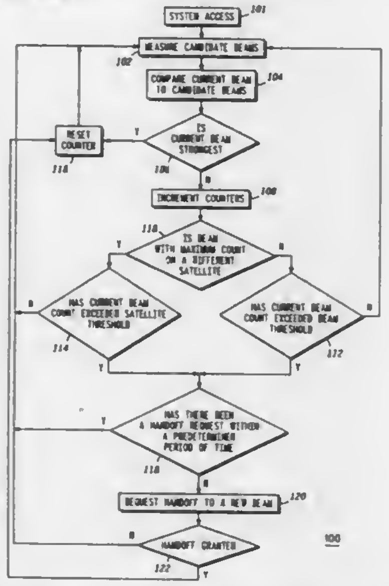
METHOD AND APPARATUS FOR OPTIMAL HAND-OFFS IN A SATELLITE CELLULAR COMMUNICATION SYSTEM

Mark Steven Frank; Daniel Richard Tayloe, both of Phoenix, Ariz., and Dariusz Andrzej Blasiak, Chicago, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 24, 1995, Ser. No. 506,310

Int. Cl.^{6} H04Q *7/00;* **H04H** *1/08*

U.S. Cl. 455—428 **22 Claims**


SYSTEM ACCESS
101
MEASURE CANDIDATE BEAMS
102
COMPARE CURRENT BEAM TO CANDIDATE BEAMS
104
IS CURRENT BEAM STRONGEST
106
Y
N
RESET COUNTER
116
INCREMENT COUNTERS
108
110
IS BEAM WITH MAXIMUM COUNT ON A DIFFERENT SATELLITE
Y
N
HAS CURRENT BEAM COUNT EXCEEDED SATELLITE THRESHOLD
114
HAS CURRENT BEAM COUNT EXCEEDED BEAM THRESHOLD
112
N
Y
HAS THERE BEEN A HANDOFF REQUEST WITHIN A PREDETERMINED PERIOD OF TIME
118
REQUEST HANDOFF TO A NEW BEAM
120
HANDOFF GRANTED
122
100

3. A method of handing-off subscriber unit communications between cells of a cellular communication system comprising the steps of:

comparing a signal level of a current cell with signal levels of candidate hand-off cells:

incrementing a counter when a signal level of at least one of said candidate hand-off cells is greater than said signal level of said current cell:

initiating a hand-off request to one of said candidate hand-off cells when said counter exceeds a predetermined number; and

receiving a cell ID within a broadcast channel provided by a satellite of said communication system, and

wherein the comparing step is performed by a subscriber unit that contains system configuration information stored therein, and wherein the comparing step further comprises the step of evaluating said system configuration information and said cell ID to determine said candidate hand-off cells.

5,752,188

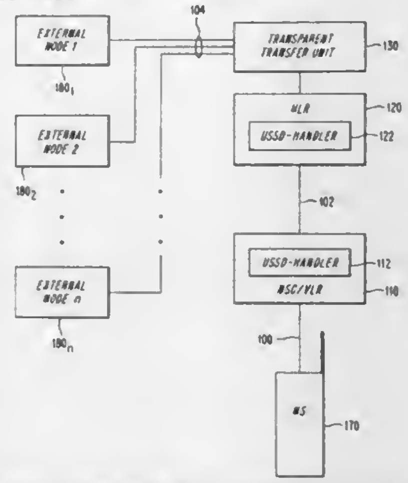
UNSTRUCTURED SUPPLEMENTARY SERVICE DATA FROM A HOME LOCATION REGISTER TO AN EXTERNAL NODE

Bo A. V. Åström, Hägersten, and Björn A. Svennesson, Danderyd, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 23, 1994, Ser. No. 363,027

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—433 **32 Claims**



1. A system for controlling the signalling between external nodes and a mobile station comprising:

an unstructured supplementary service data (USSD) handler for analyzing USSD in a home location register (HLR) to determine whether said USSD corresponds to defined HLR applications; and

a transparent transfer unit for establishing a transparent transfer to external nodes (TTEN) application between one of the external nodes defined by said USSD and the mobile station when said USSD handler determines that said USSD fails to correspond to any of said defined HLR applications.

5,752,189

MOBILE COMMUNICATION SYSTEM WHICH PROHIBITS SERVICE TO A MOBILE STATION HAVING AN ID NUMBER UPON RECEIVING A NON-COINCIDENCE NOTICE FROM THE MOBILE STATION

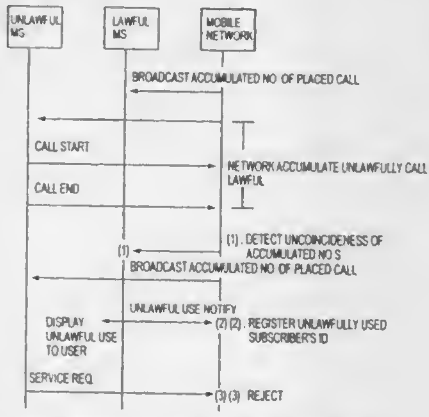
Makoto Ueno; Takeshi Kunugi; Kazuya Ohyama, and Hiroomi Yazaki, all of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 398,217, Mar. 2, 1995. This application Jan. 21, 1997, Ser. No. 785,872

Claims priority, application Japan, Mar. 2, 1994, 6-031696; Feb. 24, 1995, 7-036554

Int. Cl.^{6} H04Q *7/20;7/22*

U.S. Cl. 455—435 **4 Claims**


UNLAWFUL MS
LAWFUL MS
MOBILE NETWORK
BROADCAST ACCUMULATED NO OF PLACED CALL
CALL START
NETWORK ACCUMULATE UNLAWFULLY CALL AS LAWFUL
CALL END
(1)
(1). DETECT UNCOINCIDENESS OF ACCUMULATED NO S
BROADCAST ACCUMULATED NO OF PLACED CALL
UNLAWFUL USE NOTIFY
DISPLAY UNLAWFUL USE TO USER
(2) (2). REGISTER UNLAWFULLY USED SUBSCRIBER'S ID
SERVICE REQ
(3) (3) REJECT

1. A mobile communication system comprising:

a mobile communication network comprising

a mobile service switching center,

a plurality of base control stations, each connected to the mobile service switching center, and

a plurality of base stations controlled by the base control station; and

a mobile station located in a cell of a base station, for communicating control data for placing a call via a control channel and a talk signal via a talk channel to the mobile station's own base station,

wherein the mobile communication network comprises:

a user information storing means for storing user information corresponding to an ID number of the mobile station, said user information changing each time a particular service to the mobile station being provided; and

a user information notifying means for notifying information including said user information to the mobile station each predetermined time; and

a service prohibiting means for prohibiting said service to the mobile station having said ID number upon receiving a non-coincidence notice from the mobile station, and

the mobile station comprises:

a mobile station user information storing means for renewing and storing said user information, said user information changing each time said particular service being requested; and

a non-coincidence notifying means for comparing said user information notified at said predetermined time to the mobile station's own base station from the mobile communication network with said independently stored user information so as to notify the mobile communication network of a non-coincidence when the comparison result is not coincident.

5,752,190

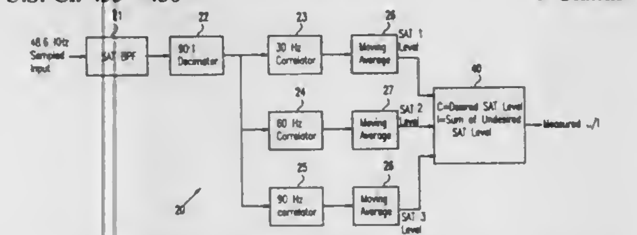
SUPERVISORY AUDIO TONE BASED CARRIER-TO-INTERFERENCE MEASUREMENT IN A MOBILE CELLULAR COMMUNICATION SYSTEM

John D. Kaewell, Jr., Bensalem, and David M. Cooley, Upper Darby, both of Pa., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Jul. 30, 1993, Ser. No. 99,503

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—436 **9 Claims**



1. A Supervisory Audio Tone (SAT) based Carrier-to-Interference (C/I) ratio measurement system for a base station in a digital cellular communication system comprising:

input means for receiving signals from mobile stations in said system, said signals including SATs;

correlation means responsive to said SATs for generating correlated outputs corresponding to each of said SATs; and

processor means responsive to said correlated outputs for assigning a level of a desired SAT as a measure of Carrier (C) and summing said levels of undesired SATs as a measure of Interference (I), said processor means computing the ratio C/I and providing an output as a measure of C/I.

5,752,191

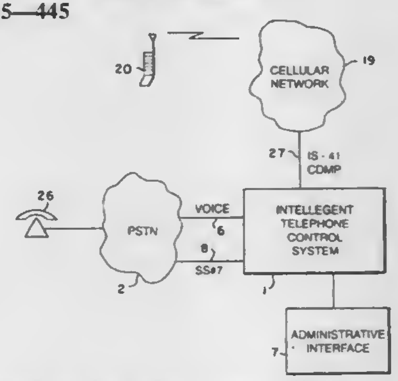
TELEPHONE CONTROL SYSTEM WHICH CONNECTS A CALLER WITH A SUBSCRIBER AT A TELEPHONE ADDRESS

Robert M. Fuller; Frederick A. Epler, both of Issaquah, and Eugene W. Oates, Redmond State, all of Wash., assignors to AccessLine Technologies, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 310,908, Sep. 22, 1994, Ser. No. 210,347, Mar. 18, 1994, and Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Dec. 12, 1994, Ser. No. 354,200

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 455—445 **5 Claims**



1. A communications control system comprising:

(a) a computer including means for storing a schedule for subscribers of said system, said schedule including time and call-handling information for said subscribers which indicate methods and times when said subscribers prefer to have their telephone calls delivered via said system;

(b) a switch controlled by said computer for connecting a call from a caller to an address selected by said computer;

(c) a radio telephone communication system for communicating with radio telephones at addresses selected by said computer, said radio telephone system having a communications capability for receiving commands from said computer and for sending responses thereto;

(d) and computer being programmed to send a command to said radio telephone system to determine whether or not a radio telephone of said subscriber is available to receive a telephone call and storing the response received thereto;

(e) said computer also being programmed to control said switch to connect said caller with said subscriber at a telephone address selected by said computer from said schedule unless it has been determined that said radio telephone of said subscriber is available to receive a telephone call at their radio telephone in which case said caller is connected to a selected telephone address.

5,752,192

CHANNEL REUSE IN CELLULAR MOBILE COMMUNICATION WITH INTERFERENCE SIGNAL LEVELS OF DIFFERENT RADIO CHANNELS MEASURED AT REGULAR AND SHORTER REFRESH INTERVALS

Kojiro Hamabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

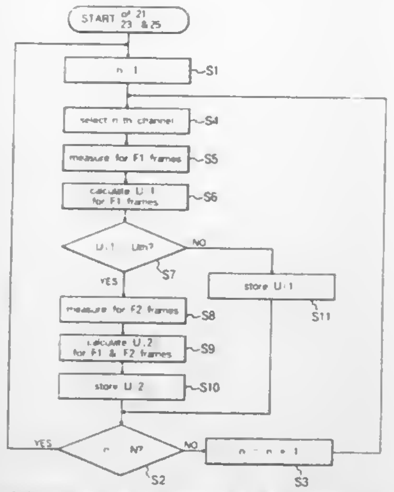
Filed Dec. 5, 1995, Ser. No. 567,773

Claims priority, application Japan, Dec. 5, 1994, 6-300757

Int. Cl.^{6} H04Q *7/26*

U.S. Cl. 455—450 **19 Claims**

1. A mobile communication system comprising a base station in each cell for communication with a mobile station in said cell through an allocated channel of a plurality of radio channels, said base station comprising measuring means for measuring an inter-



ference signal level of each channel as a measured level, storing means for storing said measured level as a stored level, and selecting means for selecting said allocated channel based on said stored level, wherein said measuring means is for measuring the interference signal level of one of said radio channels during a first predetermined interval as said measured level and for further measuring the interference signal level of said one of radio channels during a second predetermined interval when said stored level is lower than a predetermined reference level.

5,752,193

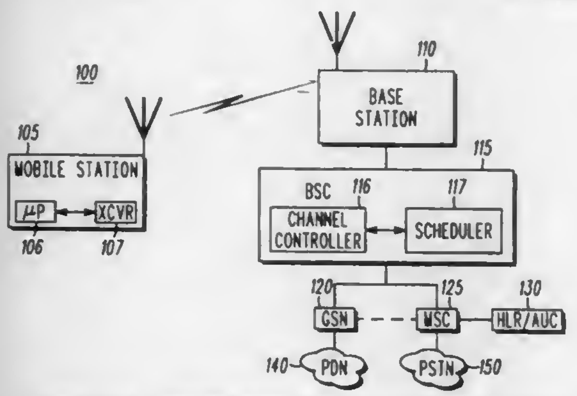
METHOD AND APPARATUS FOR COMMUNICATING IN A WIRELESS COMMUNICATION SYSTEM

Christopher Scholefield, Delta, and Ronald H. Gerhards, Vancouver, both of Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1995, Ser. No. 522,742

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—452 15 Claims



1. A method of communicating data via a wireless communications system, comprising:

receiving a first access request including a priority indicator from a first communication unit during at least a first access period;

determining the priority of the first access request relative to any other pending access requests previously received;

allocating a communications resource during a first traffic period to the first communication unit for communication of a first portion of a data message when the first communication unit has a highest priority;

monitoring in a second access period for a further access request by a further communication unit having a higher priority indicator, and when said further access request is received, allocating the communications resource during a second traffic period to the further communication unit; and

determining in a still further access period that the first communication unit again has the highest priority, and in response thereto allocating the communications resource during a still further traffic period to the first communication unit for communication of a further portion of the data message.

5,752,194

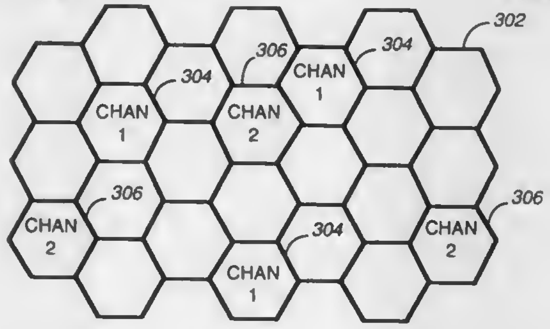
METHOD AND APPARATUS FOR ASSIGNING CHANNELS TO TRANSMITTERS IN A RADIO COMMUNICATION SYSTEM

Jyh-Han Lin, Fort Worth, and Alain Charles Louis Briancon, McKinney, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1996, Ser. No. 691,082

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—452 8 Claims



300

1. A method for assigning a plurality of channels to a plurality of transmitters in a radio communication system, the method comprising the steps of:

defining interference constraints for the plurality of transmitters;

measuring a channel capacity required to handle traffic for each of the plurality of transmitters;

applying a linear programming technique to minimize a total number of channels assigned in the system, consistent with the interference constraints and the channel capacity required, which can result in a fractional solution of channel-to-transmitter assignment values; and

generating an integer solution based upon values of the fractional solution by performing a process selected from a group of processes consisting of process (a), process (b), and process (c),

wherein process (a) comprises the step of time-sharing the channel-to-transmitter assignment values in proportion to values of the fractional solution, and

wherein process (b) comprises the step of randomly rounding the fractional solution periodically, wherein a probability of rounding a channel-to-transmitter assignment value to unity is equal to a fractional solution value corresponding to the channel-to-transmitter assignment value before rounding, and

wherein process (c) comprises the steps of:

- sorting by transmitter the traffic queued for the plurality of transmitters during a predetermined period;
- selecting a transmitter having a highest channel capacity required that is not yet processed;
- sorting the channel-to-transmitter assignment values associated with the transmitter selected;
- choosing a highest non-zero one of the channel-to-transmitter assignment values that has not yet been processed;
- rounding up the highest non-zero one to unity when no interference constraint is violated as a result;
- rounding down the highest non-zero one to zero when an interference constraint would be violated by rounding to unity;
- checking how much accumulated channel capacity has been accumulated for the transmitter by the rounding up and rounding down steps;
- repeating the choosing, rounding up and rounding down steps when the accumulated channel capacity is less than the channel capacity required for the transmitter; and
- otherwise, returning to the selecting step to select another transmitter for processing until all transmitters have been processed.

5,752,195

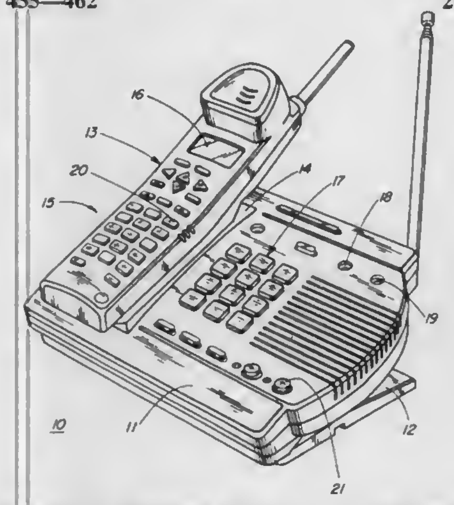
CORDLESS TELEPHONE TERMINAL

Bruce H. Tsuji, Nepean; Susan J. McGarry, Ottawa, and Steven W. Sparksman, Calgary, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 175,534, Dec. 30, 1993, Pat. No. 5,581,599. This application Dec. 2, 1996, Ser. No. 758,887

Int. Cl.^{6} H04R *7/32*

U.S. Cl. 455—462 20 Claims



1. Apparatus for displaying data and processing appearances thereof from an alphanumeric display screen of a cordless handset in user-interactive radio communication with an associated base station of a cordless telephone terminal in onhook communication with a telephone exchange, wherein said base station comprises a memory device, and wherein said memory device comprises first and second submemories, said apparatus comprising in combination:

means for generating predetermined command and alphanumeric data from selected ones of key operations at the handset;

means for enabling first processor means at the handset for displaying keyed alphanumeric data on the screen and concurrently transmitting the alphanumeric data and commands to the base station;

means for enabling second processor means at the base station for receiving the alphanumeric data and commands, retrievably storing the data in a first submemory of the base station and operably responding to the commands;

means for capturing service data from an incoming telephone call received at the base station;

means for testing the service data at the base station to confirm its validity;

means for retrievably storing the valid data in a second submemory of the base station and concurrently transmitting the valid data to the handset for display on the screen;

means for generating a set of user-interactive prompts having predetermined appearances on the display screen; and

means for accessing individual ones of the first and second submemories via key operations at the handset corresponding to the user-interactive prompts for selectively processing and editorially revising the alphanumeric data stored in the submemories while under display screen observation.

5,752,196

MAINTAINING GROUP DATA IN A MOBILE COMMUNICATIONS SYSTEM

Jouko Ahvenainen, and Anna Sillanpää , both of Helsinki, Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

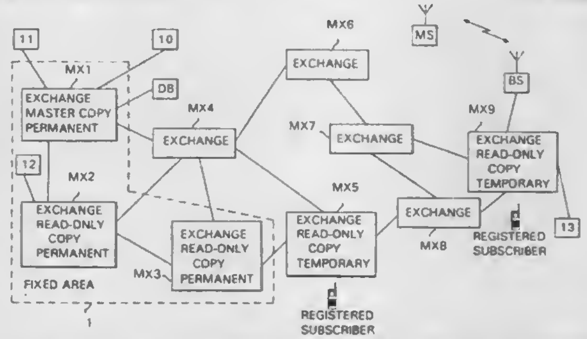
PCT No. PCT/FI95/00640, § 371 Date Jul. 17, 1996, § 102(e) Date Jul. 17, 1996, PCT Pub. No. WO96/16519, PCT Pub. Date May 30, 1996

PCT Filed Nov. 21, 1995, Ser. No. 676,239

Claims priority, application Finland, Nov. 22, 1994, 945495

Int. Cl.^{6} H04B *1/00*

U.S. Cl. 455—518 6 Claims


11
10
MX1
EXCHANGE MASTER COPY PERMANENT
DB
MX4
EXCHANGE
MX6
EXCHANGE
MS
BS
MX9
MX7
EXCHANGE
EXCHANGE READ-ONLY COPY TEMPORARY
12
MX2
EXCHANGE READ-ONLY COPY PERMANENT
MX5
EXCHANGE
EXCHANGE READ-ONLY COPY PERMANENT
EXCHANGE READ-ONLY COPY TEMPORARY
MX8
REGISTERED SUBSCRIBER
13
FIXED AREA
MX3
REGISTERED SUBSCRIBER
1

1. A method for maintaining group data relating to a communication group in a mobile communications system comprising a plurality of exchanges having connection through base stations with subscribers at least some of which belong to said communication group, said exchanges incorporating respective databases, said method comprising the steps of:

selecting one of said exchanges as a main exchange in the database of which a master copy of group data of the communication group is maintained;

maintaining information in the database of said selected main exchange:

- on exchanges of a fixed distribution area, said group data being stored in the databases of these exchanges irrespective of the location of the subscribers,
- on exchanges of an enlarged distribution area, said group data being stored in these exchanges if subscribers belonging to said communication group register under said exchanges, and
- on exchanges of a current enlarged distribution area, subscribers of said communication group being currently registered under these exchanges;

storing said group data in the databases of the exchanges of said fixed distribution area; and

storing said group data in the databases of the exchanges of said current enlarged distribution area.

5,752,197

METHOD FOR ADJUSTING TRANSMISSION POWER IN A RADIO SYSTEM, AND AN EXCHANGE

Markku Rautiola, Tampere, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI94/00390, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO95/07012, PCT Pub. Date Mar. 9, 1995

PCT Filed Sep. 2, 1994, Ser. No. 600,990

Claims priority, application Finland, Sep. 3, 1993, 933865

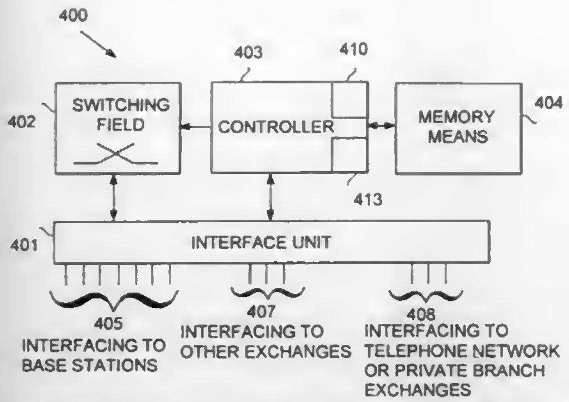
Int. Cl.^{6} H04B *1/00;7/00*

U.S. Cl. 455—522 3 Claims

1. A method for adjusting transmission power in a mobile radio system covering a geographical area which is divided into a plurality of radio cells each comprising a base station, an exchange of the system comprising a database, said method comprising:

listing in a list in said database base stations of said mobile radio system which are subject to interference as a result of the use of a respective specific channel;

a subscriber station of said mobile radio system transmitting a connection establishment request;


400
403
410
402
SWITCHING FIELD
CONTROLLER
MEMORY MEANS
404
413
401
INTERFACE UNIT
405
INTERFACING TO BASE STATIONS
407
INTERFACING TO OTHER EXCHANGES
408
INTERFACING TO TELEPHONE NETWORK OR PRIVATE BRANCH EXCHANGES

a base station of said mobile radio system receiving the connection establishment request transmitted by the subscriber station;

said base station measuring the quality of the transmission from said subscriber station;

said base station sending base station information about the quality of the transmission to said exchange;

said exchange selecting a lowest possible power level for use in radio traffic a specific traffic channel between said subscriber station and said base station on the basis of the quality of said transmission from said subscriber station;

said exchange commanding said base station and said subscriber station to use said selected power level on said specific traffic channel;

said exchange changing as to presence or absence on said list, list of base stations in the database of base stations which are subject to interference, depending on the power level selected for said specific traffic channel;

said exchange changing in said database of base stations the number of said base stations subject to interference, depending on the power level selected for said specific traffic channel; and

said base station and said subscriber station starting to use said selected power level on said specific traffic channel.

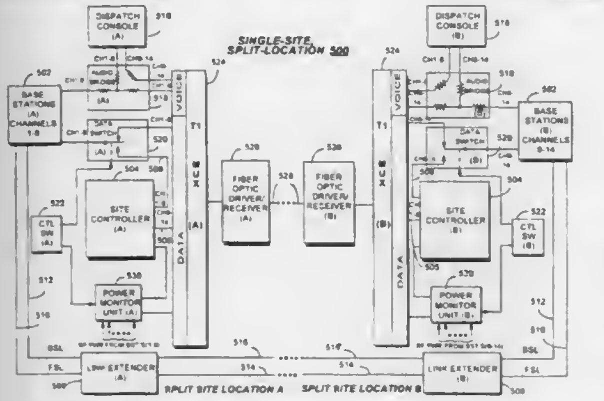
5,752,198
SINGLE SITE, SPLIT LOCATION TRUNKED RADIO COMMUNICATIONS SYSTEM

John S. Frichtel, Lynchburg; Robert O. Canada, III, Bedford, and Kennard N. Gwin, Lynchburg, all of Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Nov. 14, 1994, Ser. No. 340,345

Int. Cl.^{6} H04B *7/00*

U.S. Cl. 455—524 **32 Claims**



1. A trunked radio communications system, comprising:

plural portable radios;

a first trunked RF communications site located in a first split site location including:

plural first base stations, each first base station having a first base station transceiver corresponding to an RF communications channel;

a first site controller, connected to each of the first base station transceivers, for assigning base station transceivers to radios requesting an RF communications channel,

a second trunked RF communications site located in a second split site location remote from the first split site location including:

plural second base station transceivers, each second base station transceiver corresponding to an RF communications channel;

a second site controller, connected to each of the second base station transceivers, for assigning base station transceivers to radios requesting an RF communications channel;

a communications link linking the first and second trunked RF communications sites,

wherein the first and second trunked RF communications sites function as a single site with one of the first and second site controllers assigning both first and second base station transceivers to radios requesting an RF communications channel during which time the other of the first and second site controllers does not assign base station transceivers to radios requesting an RF communications channel.

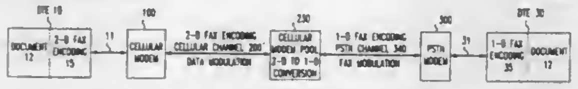
5,752,199
METHOD AND APPARATUS FOR SENDING FAXES OVER ANALOG CELLULAR

Robert Earl Scott, Indian Rocks Beach, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Dec. 18, 1995, Ser. No. 573,739

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—557 **9 Claims**



1. A method for use in data communications equipment operating on the analog cellular network, the method comprising the steps of;

receiving through a data terminal equipment port of the data communications equipment a data signal representing a predefined modem command;

classifying the predefined modem command as a local command or a remote command;

if a local command, operating on the predefined modem command; and

if a remote command, transmitting the predefined modem command, in a data modulation format containing facsimile information to a remote facsimile modem, said remote facsimile modem being a PSTN-side facsimile modem of a back-to-back modem pair at a mobile switching center in the analog cellular network.

5,752,200
MODULAR INTERCONNECT MATRIX FOR MATRIX CONNECTION OF A PLURALITY OF ANTENNAS WITH A PLURALITY OF RADIO CHANNEL UNITS

Sheldon Kent Meredith, and Walter Brian Steele, both of Phoenix, Ariz., assignors to Radio Frequency Systems, Inc., Marlboro, N.J.

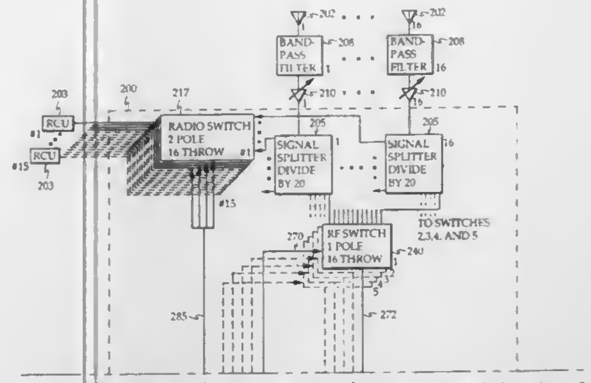
Continuation of Ser. No. 348,045, Dec. 1, 1994, Pat. No. 5,701,596. This application Feb. 13, 1997, Ser. No. 806,132

Int. Cl.^{6} H04B *1/38;* **H04M** *1/00*

U.S. Cl. 455—562 **18 Claims**

1. A modular interconnect matrix for matrix connection of a first plurality of antennas with a second plurality of radio channel units, wherein the antennas and the radio channel units transmit and receive RF signals at assigned operating frequencies, comprising:

a third plurality of first switching modules, each having a housing-with at least one first switching connector and a plurality of second switching connectors mounted thereon,



each first switching module being connected by its first switching connector to a corresponding radio channel unit;

first switching means in the housing of each one of said first switching modules for connecting each one of said first switching connectors with any one of said second switching connectors;

a fourth plurality of antenna interface modules, each having a housing with a first interface connector and a plurality of second interface connectors mounted thereon, each antenna interface module being connected by its first interface connector to a corresponding antenna;

wherein said second switching connectors are dimensioned for interconnection with said second interface connectors; and

wherein said second switching connectors and said second interface connectors are arranged on the respective first switching module housings and antenna interface module housings such that when the antenna interface module housings are arranged in side-by-side relation with respect to one another, each of said second switching connectors on each of said first switching module housings is arranged for direct engagement with at least one of said second interface connectors on each of said antenna interface module housings.

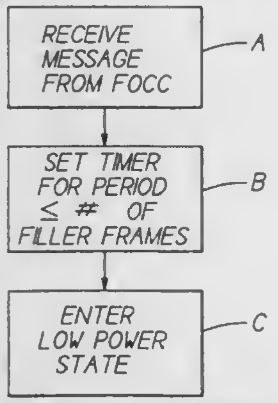
5,752,201
MOBILE TERMINAL HAVING POWER SAVING MODE THAT MONITORS SPECIFIED NUMBERS OF FILLER MESSAGES

Raimo Kivari, Haukipudas, Finland, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Feb. 9, 1996, Ser. No. 599,144

Int. Cl.^{6} H04B *1/38;* **H04M** *1/00*

U.S. Cl. 455—574 **16 Claims**


RECEIVE MESSAGE FROM FOCC
A
SET TIMER FOR PERIOD ≤ # OF FILLER FRAMES
B
ENTER LOW POWER STATE
C

1. A method for operating a user terminal of a type that is bidirectionally coupled to a system through a wireless interface, comprising the steps of:

receiving a message from the system. the message specifying at least in part a number of consecutive filler messages that will be transmitted; and

placing the user terminal in a reduced power state for a period of time that is a function of the number of consecutive filler messages specified in the received message, wherein the message employs certain bits, that are specified as reserved bits, for specifying the number of consecutive filler messages that will be transmitted.

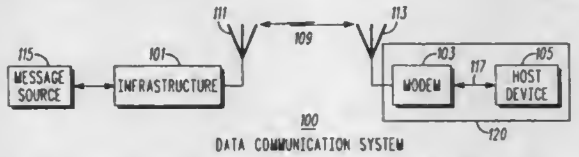
5,752,202
METHOD OF MESSAGE DELIVERY ADAPTED FOR A POWER CONSERVATION SYSTEM

Michael H. Obright, Duvall, Wash., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 476,408, Jun. 7, 1995, abandoned. This application Jan. 30, 1997, Ser. No. 790,810

Int. Cl.^{6} H04B *1/38;* **H04M** *1/00*

U.S. Cl. 455—574 **11 Claims**



1. In a radio data communications system adapted for power conservation, said system having an infrastructure and a subscriber device and a communications channel segmented into windows including root windows and non-root windows, a method of message delivery practiced at said subscriber device, said method comprising the steps of:

scheduling a ping segment at a prearranged time in each window wherein said ping segment has a duration equal to a first predetermined time period substantially shorter than a window and is centered in its respective window;

when said window is a non-root window:

waking from a sleep mode at said prearranged time in said non-root window for said first predetermined time period to receive a ping message;

responding to said infrastructure when said ping message is received during said first predetermined time period; and

remaining awake for a second predetermined time period in said non-root window following said ping segment to receive from said infrastructure a data message;

when said window is a root window:

waking from a sleep mode at a commencement of said root window; and

receiving from said infrastructure any undelivered messages during said root window at least prior to said ping segment.

5,752,203
PORTABLE RADIO APPARATUS HAVING CABLE-INCORPORATED HAND STRAP

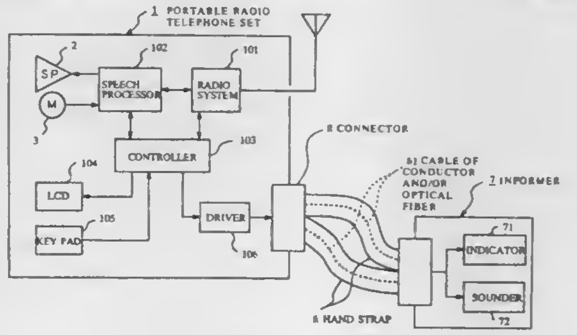
Koji Yamashita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 532,883

Claims priority, application Japan, Sep. 22, 1994, 6-254791

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 455—575 **7 Claims**



1. A portable radio apparatus comprising:

a main body incorporating radio communication circuits, which includes a light generating circuit for generating light so as to inform a user of an incoming call;

a hand strap connected at one end to said main body, said hand strap including a conductor line and an optical fiber, said optical fiber being optically connected to said light generating circuit; and

an informer for informing said user of said incoming call, said informer being mechanically connected to said main body through said hand strap, said informer being electrically connected with said main body through said conductor line of said hand strap, and said informer being optically connected with said main body through said optical fiber of said hand strap.

5,752,204

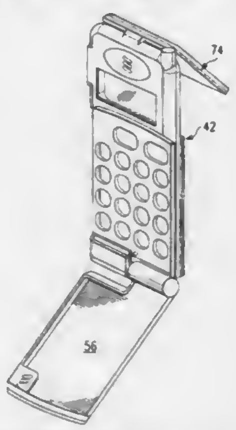
ANTENNA ASSEMBLY FOR RADIOTELEPHONIC DEVICE

Darrell Epperson, Wake Forest; Sandeep Chennakeshu, and Peter Dimitrios Karabinis, both of Cary, all of N.C., assignors to Telefonaktiebolaget L M Ericsson (publ)

Filed Apr. 1, 1996, Ser. No. 625,312

Int. Cl.⁶ H04B *1/38;1/08*

U.S. Cl. 455—575 **13 Claims**



1. In a radiotelephonic device having at least first radio receiver circuitry for receiving first down-link signals transmitted downwardly thereto by a first network station positioned above the radiotelephonic device and first radio transmitter circuitry for transmitting first up-link signals to the first network station, at least portions of the first radio receiver circuitry and of the first radio transmitter circuitry housed at a radiotelephonic housing having a front side and a back side, an improvement of an antenna assembly for detecting the first down-link signals transmitted down to the radiotelephonic device and for transmitting the first uplink signals therefrom, said antenna assembly comprising:

a first antenna support having a rotatable coupling rotatably coupled to a top portion of the radiotelephonic housing at least alternately between a down position whereat said first antenna support is positioned to abut against the radiotelephonic housing and an up position whereat said first antenna support is positioned to extend above the radiotelephonic housing;

a first patch antenna supported at said first antenna support and coupled to the first radio receiver circuitry, said first patch antenna exhibiting cellular polarization characteristics to facilitate reception of the first down-link signals when the first patch antenna is oriented in a position to face at least partially upwardly towards the first network station;

a second antenna support having a rotatable coupling rotatably coupled to a bottom portion of the radiotelephonic housing at least alternately between a closed position whereat said second antenna support is positioned to abut against the radiotelephonic housing and an open position whereat said second antenna support is positioned to extend beneath the radiotelephonic housing; and

a second patch antenna supported at said second antenna support and coupled to the first radio receiver circuitry, said second patch antenna exhibiting circular polarization characteristics to facilitate reception of the first down-link signals when the second patch antenna is oriented in a position to face at least partially towards the first network station.

5,752,205

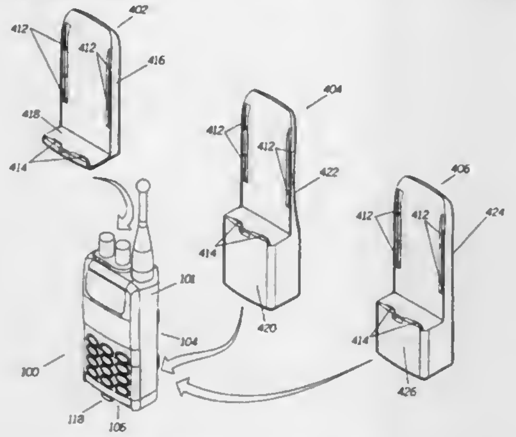
ADAPTABLE PORTABLE RADIO

John C. Dzung, Ft. Worth, Tex.; John F. Murray, Sunrise; Raymond P. Meenen, Boca Raton, both of Fla.; Donald F. Gatto, Coral Springs, Fla.; Faris S. Habbaba, Boca Raton, Fla., and Frank M. Tyneski, Ft. Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 395,131, Feb. 27, 1995, abandoned. This application Jul. 24, 1997, Ser. No. 900,057

Int. Cl.⁶ H04B *1/38*

U.S. Cl. 455—575 **8 Claims**



1. A communication device, comprising:

a portable radio portion including top, bottom, back, and side surfaces;

a first set of conductive contacts coupled to the back surface of the portable radio portion;

a second set of conductive contacts coupled to the bottom surface of the portable radio portion;

and

a battery portion coupled to the back and bottom surfaces of the portable radio portion, the battery portion including battery contacts for mating with both of the first and second set of conductive contacts, the communication device being adaptable in both thickness and length by the battery portion being coupled to the back and bottom surfaces of the portable radio portion.

5,752,206

IN-SITU DECONTAMINATION AND RECOVERY OF METAL FROM PROCESS EQUIPMENT

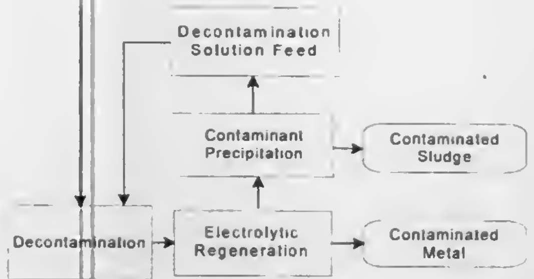
Neal A. Frink, 2524 Halstead St., Cincinnati, Ohio 45214; Daniel D. Burns, 24 Woodland Ave., Florence, Ky. 41042; Paul G. Frink, 151 Vermont Ave., Cincinnati, Ohio 45215, and Amy Ciric, 1107 Wareham Ave., #46, Cincinnati, Ohio 45202

Filed Apr. 4, 1996, Ser. No. 628,135

Int. Cl.⁶ C25C *1/06*

U.S. Cl. 588—20 **36 Claims**

1. A process for in-situ decontamination and recovery of metal from radioactive-contaminated metal contained in process equipment, comprising (a) circulating through the process equipment and in contact with the radioactive-contaminated metal an acid decontamination solution for removing the radioactive contaminants and a first surface portion of the metal from the equipment, and (b) circulating through the process equipment an acid digestion solution for removing at least a second portion of the metal, the second portion of the metal contains less than about 75 Bq/g radioactivity.


Decontamination Solution Feed
Contaminant Precipitation
Contaminated Sludge
Decontamination
Electrolytic Regeneration
Contaminated Metal

5,752,207

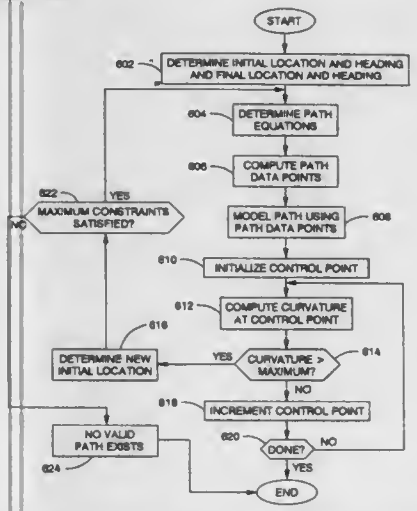
METHOD AND APPARATUS FOR DETERMINING A PATH FOR A MACHINE BETWEEN A PREDETERMINED ROUTE AND A FINAL POSITION

Jagannathan Sarangapani, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 29, 1995, Ser. No. 536,761

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 701—26 **8 Claims**



1. A method for automatically determining and modeling a path between a route and a final position, the final position including a final location and a final heading, comprising:

(a) determining an initial position on the route using a position determining system, said initial position including an initial location and an initial heading;

(b) determining a set of path equations between said initial position and the final position;

(c) computing a set of path data points using said set of path equations;

(d) determining a model of the path as defined by said path data points;

(e) determining the curvature of the path at each of said path data points using said model;

(f) determining an other initial position and repeating steps (b)–(e) if said curvature at any path data point is greater than a predetermined curvature.

5,752,208

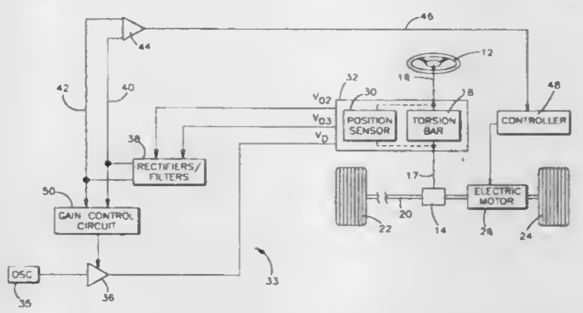
AUTOMATIC GAIN CONTROL OF A TORQUE SENSOR FOR A POWER ASSIST STEERING SYSTEM

Oded Lerner, Torrance, Calif., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 29, 1995, Ser. No. 538,496

Int. Cl.⁶ B62D *5/04*

U.S. Cl. 701—41 **10 Claims**



1. An apparatus for controlling gain of a torque sensor of a type providing two output signals, each output signal having a value functionally related to a value of an input drive signal and torque sensed by said torque sensor, said apparatus comprising:

variable gain amplifier means for providing said input drive signal;

means for monitoring the two output signals of said torque sensor; and

means for adjusting the gain of said drive signal in response to the values of said monitored two output signals of said torque sensor.

5,752,209

ELECTRIC POWER STEERING APPARATUS

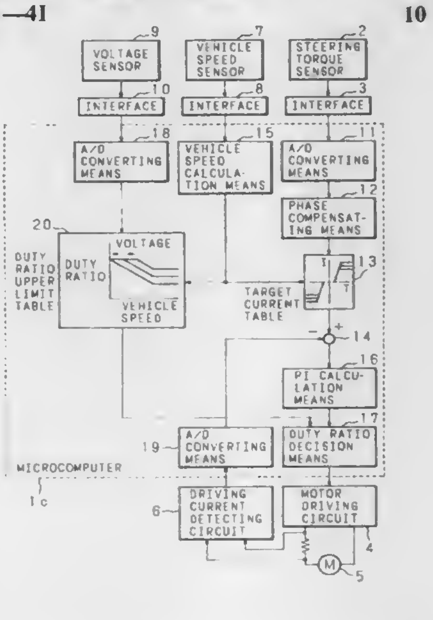
Mitsuhiko Nishimoto, Kashihara, and Makoto Inoue, Hirakata, both of Japan, assignors to Koyo Seiko Co., Ltd., and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Oct. 18, 1995, Ser. No. 544,621

Claims priority, application Japan, Oct. 20, 1994, 6-255595

Int. Cl.⁶ G06F *7/70*

U.S. Cl. 701—41 **10 Claims**



1. An electric power steering apparatus for driving, under PWM control, a motor for assisting a steering power of a vehicle, comprising:

a vehicle speed sensor for detecting a speed of the vehicle;

an upper-limit decision means for determining a duty ratio upper limit value for the PWM control on the basis of the speed detected by the vehicle speed sensor and a voltage supplied to the motor;

a steering torque sensor for detecting a steering torque;

a target current value decision means for determining a target current value for the motor on the basis of the steering torque detected by the steering torque sensor; and

a duty ratio decision means for determining a target duty ratio based on the target current value determined by the target current value decision means, wherein the duty ratio decision means outputs the target duty ratio as a duty ratio of a PWM wave signal used for driving the motor when the target duty ratio is smaller than the duty ratio upper limit value, and outputs the duty ratio upper limit value as the duty ratio of the PWM wave signal when the target duty ratio exceeds the duty ratio upper limit value.

5,752,210
METHOD AND APPARATUS FOR CONTROLLING SPEED-CHANGE TRANSIENT MODE OF AUTOMATIC TRANSMISSIONS

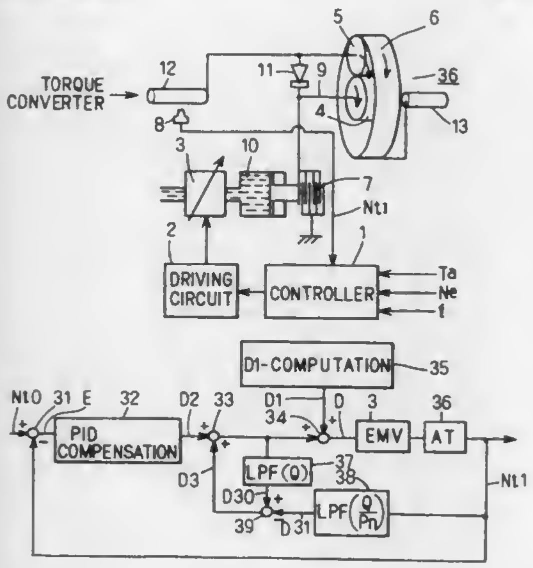
Yoshifumi Kato, Nishikamo-gun; Ichiro Yamauchi; Masami Fujitsuna, both of Kariya, and Tsutomu Tashiro, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 3, 1995, Ser. No. 434,398

Claims priority, application Japan, May 12, 1994, 6-098599

Int. Cl.^{6} F16H *59/42;* **G06F** *17/00*

U.S. Cl. 701—51 **9 Claims**



1. A method of controlling a speed-change transient mode of an automatic transmission having an input shaft at an engine side, an output shaft at a wheel side and a friction element for a speed-change between the shafts by regulating a fluid pressure regulated by a pressure regulating device and applied to the friction element, said method comprising the steps of:

detecting an actual value representative of rotation of the input shaft;

computing a control value based on a difference between said detected value and a target value representative of rotation of the input shaft;

estimating a disturbance from the control value and the detected value, said disturbance corresponding to an error from a predetermined transfer function model which defines a model from an application of the control value to the pressure regulating device to a change in the rotation of the input shaft and is stored; and

correcting the control value to the pressure regulating device using the estimated disturbance.

5,752,211
CONTROL SYSTEM FOR DISTRIBUTING DRIVE TORQUE BETWEEN FRONT AND REAR WHEELS OF VEHICLE

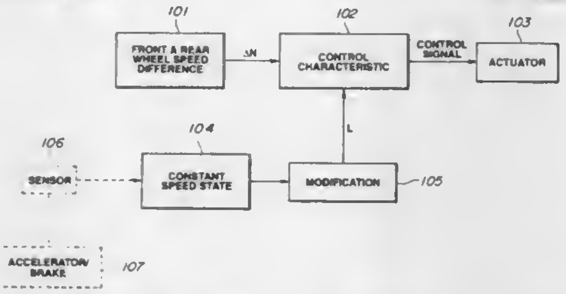
Toshiharu Takasaki, Sagamihara, and Tomoyuki Hara, Hadano, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 320,543, Oct. 11, 1994, abandoned. This application May 17, 1996, Ser. No. 649,475

Claims priority, application Japan, Nov. 24, 1993, 5-293652

Int. Cl.^{6} G06F *7/70;* **G06G** *7/76*

U.S. Cl. 701—69 **28 Claims**



1. A driving torque distribution control system for a vehicle, comprising:

a drive system for distributing a driving torque from a prime mover of the vehicle between a primary drive axle and a secondary drive axle of the vehicle, said drive system comprising an actuator for varying a driving torque distribution ratio between the primary drive axle and the secondary drive axle in response to a control signal;

first sensing means for determining a wheel speed difference between a primary drive wheel speed of the primary drive axle and a secondary drive wheel speed of the secondary drive axle;

second sensing means for detecting a constant speed running state of the vehicle, the second sensing means comprising a vehicle condition sensor for sensing a vehicle operating condition, wherein the second sensing means detects the constant speed running state in accordance with the sensed vehicle operating condition; and

controlling means for receiving the wheel speed difference as an input signal from the first sensing means, for producing the control signal for the actuator in response to the input signal in accordance with one of a normal control characteristic and a modified control characteristic, and for selecting one of the normal and modified control characteristics in response to a condition signal supplied from the second sensing means, wherein in the modified control characteristic a share of the driving torque to the secondary drive axle is decreased, with respect to the normal control characteristic,

wherein said second sensing means includes a means for producing the condition signal which is in a first signal state when the vehicle is accelerated during a straight ahead operation, and in a second signal state when said constant speed running state is detected during straight ahead operation of the vehicle, and said controlling means produces said control signal according to said normal control characteristic when said condition signal is in said first signal state, and according to said modified control characteristic when said condition signal is in said second signal state, and

wherein a magnitude of said control signal is increased to increase the share of the driving torque to the secondary drive axle as the wheel speed difference increases, and a rate of increase of the magnitude of said control signal with respect to said wheel speed difference is smaller in said modified control characteristic than in at least a portion of said normal control characteristic.

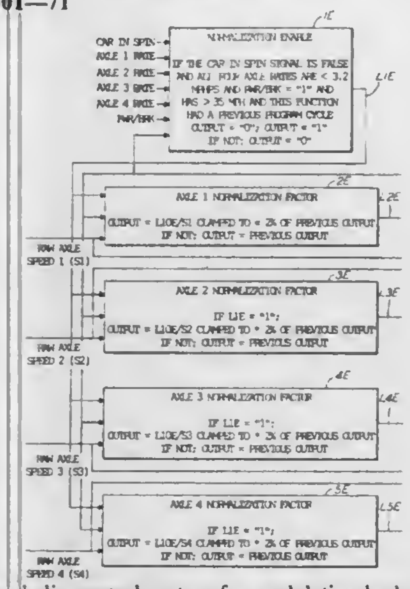
5,752,212
PROPORTIONAL POLARITY SHIFT WHEEL SLIDE PROTECTION

James A. Wood, Spartanburg, and David A. Greer, Simpsonville, both of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 8, 1995, Ser. No. 436,882

Int. Cl.^{6} B60T *8/00;8/32*

U.S. Cl. 701—71 **16 Claims**


1E
CAR IN SPIN
AXLE 1 RATE
AXLE 2 RATE
AXLE 3 RATE
AXLE 4 RATE
PWR/BRK
NORMALIZATION ENABLE
IF THE CAR IN SPIN SIGNAL IS FALSE AND ALL FOUR AXLE RATES ARE < 3.2 MPHPS AND PWR/BRK = "1" AND MPS > 35 MPH AND THIS FUNCTION HAD A PREVIOUS PROGRAM CYCLE OUTPUT = "0"; OUTPUT = "1"
IF NOT: OUTPUT = "0"
L1E
2E
AXLE 1 NORMALIZATION FACTOR
OUTPUT = L10E/S1 CLAMPED TO ± 2% OF PREVIOUS OUTPUT
IF NOT: OUTPUT = PREVIOUS OUTPUT
L2E
RAW AXLE SPEED 1 (S1)
3E
AXLE 2 NORMALIZATION FACTOR
IF L1E = "1";
OUTPUT = L10E/S2 CLAMPED TO ± 2% OF PREVIOUS OUTPUT
IF NOT: OUTPUT = PREVIOUS OUTPUT
L3E
RAW AXLE SPEED 2 (S2)
4E
AXLE 3 NORMALIZATION FACTOR
IF L1E = "1";
OUTPUT = L10E/S3 CLAMPED TO ± 2% OF PREVIOUS OUTPUT
IF NOT: OUTPUT = PREVIOUS OUTPUT
L4E
RAW AXLE SPEED 3 (S3)
5E
AXLE 4 NORMALIZATION FACTOR
IF L1E = "1";
OUTPUT = L10E/S4 CLAMPED TO ± 2% OF PREVIOUS OUTPUT
IF NOT: OUTPUT = PREVIOUS OUTPUT
L5E
RAW AXLE SPEED 4 (S4)

1. A wheel slip control system for modulating brake application forces on a passenger transit type railway vehicle having a plurality of axles on which wheels are mounted, said wheel slip control system comprising:

(a) means for receiving signals indicative of speeds and acceleration rates of each of such axles;

(b) means for processing such signals indicative of speeds and acceleration rates and generating signals indicating, for each of such axles, whether or not such wheels are slipping, said means such axles, whether or not such wheels are slipping, said means including:

  (I) means for identifying a time when wheel slip is not occurring, for any of such plurality of axles,

  (II) means for venerating signals indicative of relative wheel diameter based on relative axle speeds for all of such axles on such railway vehicle during said time when wheel slip is not occurring,

  (III) means for generating signals indicative of normalized axle speeds based on said signals indicative of relative wheel diameters and such axle speeds;

  (IV) means for selecting a highest one of said normalized axle speeds and for generating a signal indicating wheel slip for any axle having a normalized axle speed less than said highest normalized axle speed;

(c) means responsive to said signals indicating wheel slip and such signals indicative of speeds and acceleration rates and generating, for each of such axles, signals indicative of severity of wheel slip;

(d) means responsive to said signals indicative of severity of wheel slip for generating, for each of such axles, a first signal for brake reduction;

(e) timing means, for each of such axles, responsive to said signals indicative of whether or not such wheels are slipping to generate a signal indicative of a duration of time that a wheel slip condition has been in effect;

(f) for each of such axles, means responsive to said signals indicative of a duration of time that a wheel slip condition has been in effect, for generating a second signal for brake reduction, said second signal for brake reduction providing for increasing brake reduction the longer that a wheel slip condition is in effect, up to a maximum predetermined time; and

(g) means responsive to said first signal for brake reduction and said second signal for brake reduction to modulate such application forces of such brakes.

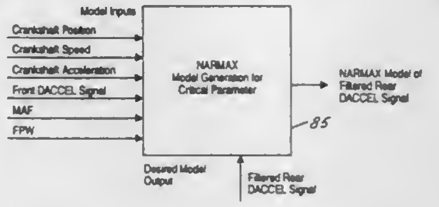
5,752,213
MISFIRE DETECTOR WITH TORSIONAL OSCILLATION FILTERING

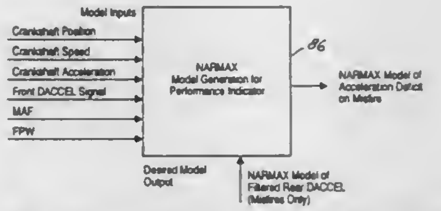
Bruce David Bryant, Royal Oak, Mich.; Vasanth Krishnaswami, Columbus, Ohio, and Kenneth Andrew Marko, Ann Arbor, Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Feb. 29, 1996, Ser. No. 609,028

Int. Cl.^{6} G06G *7/70*

U.S. Cl. 701—111 **6 Claims**




Model Inputs
Crankshaft Position
Crankshaft Speed
Crankshaft Acceleration
Front DACCEL Signal
MAF
FPW
86
NARMAX Model Generation for Performance Indicator
NARMAX Model of Acceleration Deficit on Misfire
Desired Model Output
NARMAX Model of Filtered Rear DACCEL (Misfires Only)

1. A misfire detection system for, an internal combustion engine having a plurality of cylinders coupled to a crankshaft, said crankshaft having a flywheel portion to which a flywheel is mounted, each cylinder producing respective ignition firings and misfires during operation of said engine, said engine including a plurality of devices for measuring engine operating conditions at respective event times, said engine operating conditions including one or more of crankshaft rotation interval, crankshaft speed, crankshaft acceleration, mass air flow, and fuel pulse width, said misfire detection system comprising:

modeling means coupled to said plurality of devices and including a first model interrelating said engine operating conditions and crankshaft acceleration for predicting a crankshaft acceleration value of said crankshaft near said flywheel portion without directly sensing motion of said flywheel portion, and including a second model interrelating said engine operating conditions and an acceleration that would be present near said flywheel portion assuming 1) that respective engine operating conditions are present as determined at a selected event time, and 2) that an individual misfire has occurred in a respective cylinder of said engine at said selected event time for predicting an acceleration deficit; and

a comparator outputting a misfire indication in response to a comparison of said predicted crankshaft acceleration value and said predicted acceleration deficit.

5,752,214
METHOD AND APPARATUS FOR CONTROLLER POWER TRAIN OF MOTOR VEHICLE

Toshimichi Minowa, Mito; Hiroshi Kuroda, Hitachi; Satoru Kuragaki; Kenichirou Kurata, both of Hitachinaka, and Tatsuya Ochi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1996, Ser. No. 654,971

Claims priority, application Japan, May 25, 1995, 7-126204

Int. Cl.^{6} B60K *41/28*

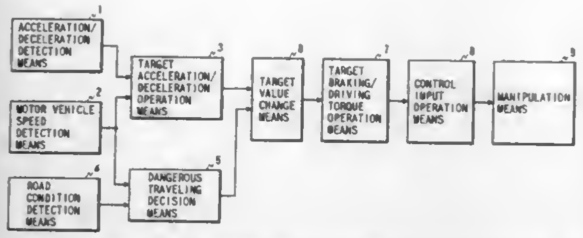
U.S. Cl. 701—111 **17 Claims**

1. An apparatus for controlling a power train of a motor vehicle, comprising:

acceleration/deceleration detection means for detecting a motor vehicle acceleration/deceleration requested by a driver;

motor vehicle speed detection means for detecting a motor vehicle speed;

target acceleration/deceleration determining means for setting a target acceleration/deceleration in accordance with signals


1
ACCELERATION/ DECELERATION DETECTION MEANS
2
MOTOR VEHICLE SPEED DETECTION MEANS
4
ROAD CONDITION DETECTION MEANS
3
TARGET ACCELERATION/ DECELERATION OPERATION MEANS
5
DANGEROUS TRAVELING DECISION MEANS
6
TARGET VALUE CHANGE MEANS
7
TARGET BRAKING/ DRIVING TORQUE OPERATION MEANS
8
CONTROL INPUT OPERATION MEANS
9
MANIPULATION MEANS

output from the acceleration/deceleration detection means and the motor vehicle speed detection means;

road condition detection means for detecting a current road condition, including existence of an obstacle such as an approaching motor vehicle;

dangerous traveling decision means for determining whether a dangerous traveling conditions exists, based on a signal output from the road condition detection means; and

target value change means for changing target values set by the target acceleration/deceleration operation means when dangerous traveling is decided by the dangerous traveling decision means.

5,752,215

APPARATUS AND METHOD FOR CLASSIFYING VEHICLES USING ELECTROMAGNETIC WAVES AND PATTERN RECOGNITION

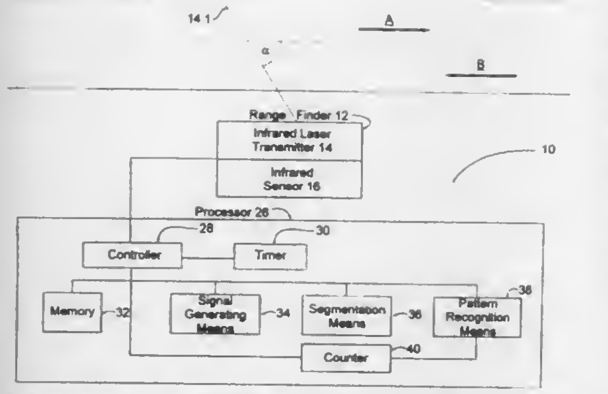
Ben Thomas Zaaiman; Paul-Boer Putter, both of Pretoria, South Africa; Pieter Johannes Erasmus Vermeulen, Hillsboro, Oreg., and Gerrit Jacobus Loubser, Kemtonpark, South Africa, assignors to Livingstone Legend Enterprises (Propiretary) Ltd., Lynnwood, South Africa

Filed Feb. 26, 1996, Ser. No. 606,566

Claims priority, application South Africa, Feb. 28, 1995, 95/1638; Sep. 29, 1995, 95/8220

Int. Cl.^{6} G08G *1/015;1/04*

U.S. Cl. 701—117 **22 Claims**



1. Apparatus for classifying movement of an object moving in a defined range within an operative region, the apparatus comprising:

distance-finding means mountable adjacent said operative region;

the distance finding means comprising transmitter means for transmitting stationary beams of electromagnetic waves along a given stationary field extending through said operative region;

receiver means located adjacent said transmitter means for receiving reflections of said beams from regions on an object moving in said operative region through said field, to determine from said reflections the presence or absence of the object in the range, said moving object being representative of one of a plurality of different classes;

controller means connected to the distance-finding means for causing the distance-finding means over a period of time to illuminate regions on the object with the beams and to determine from reflections of the beams from the regions a sequence of data relating to the presence or absence of the object in the range as the object moves along the operative region, for gathering data relating to the time relation of the sequence of data and for filtering out data regarding objects in the operative region but outside of said range;

the controller means further comprising signal generating means responsive to said reflections for generating a multi-dimensional pattern representing said object moving in the range wherein said multi-dimensional pattern has a first dimension in the time domain; and

pattern recognition means connected to the signal generating means to receive as an input said pattern and for classifying the pattern according to one of said plurality of different classes and for providing a corresponding output signal.

5,752,216

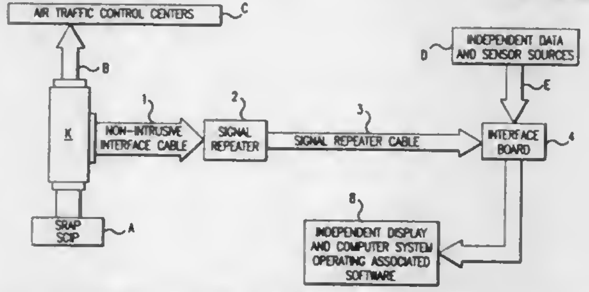
NON-INTRUSIVE DATA INTERFACE SYSTEM FOR AIR TRAFFIC CONTROL

Kenneth Carlson, Linwood, N.J., and Charles Hucks, Bryan, Tex., assignors to Dimensions International, Inc., Alexandria, Va.

Filed Jul. 6, 1994, Ser. No. 268,558

Int. Cl.^{6} G01R *17/02;* **G06F** *3/00*

U.S. Cl. 701—117 **40 Claims**


AIR TRAFFIC CONTROL CENTERS
C
B
K
NON-INTRUSIVE INTERFACE CABLE
1
SIGNAL REPEATER
2
SIGNAL REPEATER CABLE
3
INDEPENDENT DATA AND SENSOR SOURCES
D
E
INTERFACE BOARD
4
SRAP SCIP
A
8
INDEPENDENT DISPLAY AND COMPUTER SYSTEM OPERATING ASSOCIATED SOFTWARE

1. A system for providing data access to air traffic control data comprising a non-intrusive data cable interface permanently connected to receive said air traffic control data, a signal repeater receiving said air traffic control data provided from said non-intrusive data cable interface, said repeater providing said received air traffic control data to an interface board, said interface board being operatively connected to a computer, said computer having an associated software program, a sensor for receiving further data from a source other than said air traffic control data, a communications link from said sensor to said computer, and said computer providing a comparison means for comparing said air traffic control data with said further data, wherein said traffic control data are produced by sensor responses which are non-intrusively tapped for input to said comparison means.

5,752,217

NAVIGATION SYSTEM HAVING OPTIMAL DESTINATION ROUTE SETTING CAPABILITY

Takashi Ishizaki, Kariya, and Hidetoshi Fujimoto, Toyokawa, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1996, Ser. No. 653,268

Claims priority, application Japan, May 30, 1995, 7-131751

Int. Cl.^{6} G01C *21/00*

U.S. Cl. 701—201 **27 Claims**

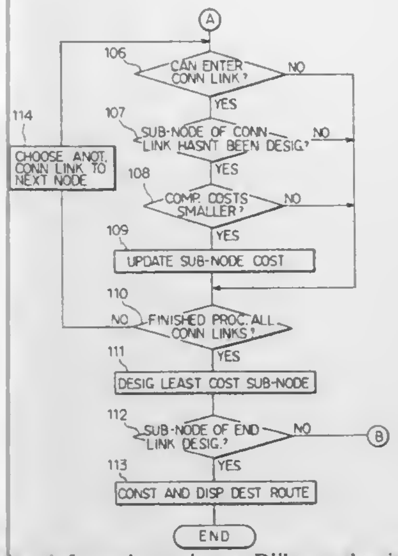
1. A navigation system comprising:

storage means for storing link information of links which connect nodes of a map and have route costs, and link connection information;

destination setting means for setting a destination in said map;

route determination means, which includes route cost storage means for storing said route costs of said links, for determining a destination route from a starting position to said destination set by said destination setting means by computing route costs based on said link information and said link connection information using a Dijkstra algorithm and by selecting links which form said destination route that have a least cost as determined by calculating an individual route cost, for every link connected to nodes in said destination route, of travel from said node to said link, and for individually updating said route costs for links connected to said nodes in said destination route; and

navigation means for performing cruising navigation based on said navigation route.


A
106
CAN ENTER CONN LINK?
NO
YES
107
SUB-NODE OF CONN LINK HASN'T BEEN DESIG?
NO
114
CHOOSE ANOT. CONN LINK TO NEXT NODE
YES
108
COMP. COSTS SMALLER?
NO
YES
109
UPDATE SUB-NODE COST
110
NO
FINISHED PROC. ALL CONN LINKS?
YES
111
DESIG LEAST COST SUB-NODE
112
SUB-NODE OF END LINK DESIG.?
NO
B
YES
113
CONST AND DISP DEST ROUTE
END

5,752,218

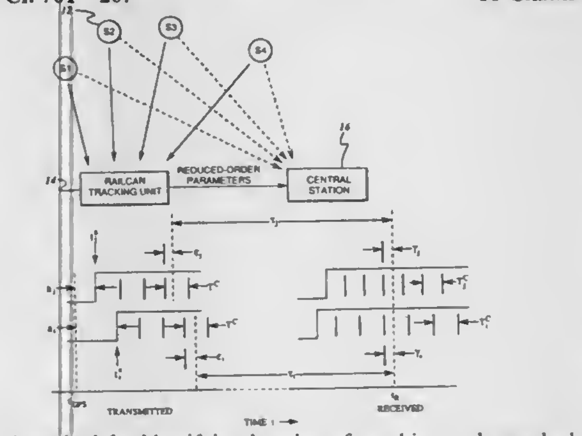
REDUCED-POWER GPS-BASED SYSTEM FOR TRACKING MULTIPLE OBJECTS FROM A CENTRAL LOCATION

Daniel David Harrison, Delanson; Anantha Krishnan Pradeep, Clifton Park; Glen William Brooksby, Glenville, and Stephen Michael Hladik, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 456,229, May 31, 1995, abandoned. This application Aug. 25, 1997, Ser. No. 924,478

Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*

U.S. Cl. 701—207 **18 Claims**



1. A method for identifying location of an object to be tracked, comprising:

measuring data related to propagation time differences between signals transmitted from a plurality of GPS satellites and received at said object to be tracked, said data comprising code word phase measurements μ_i for a satellite at a time t_R, where $\mu_1=\gamma_i/T_i^C$, and defined as time elapsed to time t_R from the beginning of a code word in the signal from satellite i in which t_R falls, T_i^C being defined as the code period for satellite i at time t_R in the signal received from satellite i, said code word phase measurements being simultaneously derived from the signals transmitted from said plurality of satellites and received at the object to be tracked;

transmitting said data to a central station; and

calculating at said central station the location of said object to be tracked based upon the transmitted data and data derived from at least one receiver apart from said object to be tracked receiving said signals from said plurality of satellites.

5,752,219

NAVIGATION APPARATUS FOR VEHICLES

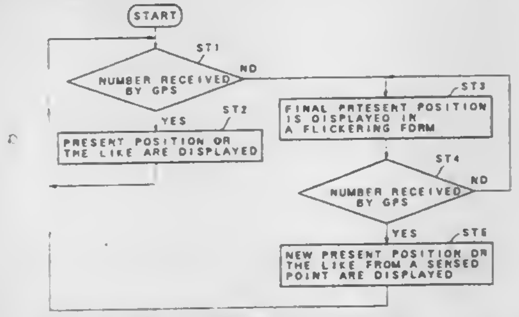
Tohru Yoshihara; Shigeru Tsujimura; Shinichi Takemura; Masashi Shimakata; Masaya Adachi; Hayato Yoshida; Hitoshi Ando, and Tsutomu Honda, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 678,177, Jul. 11, 1996, abandoned, which is a continuation of Ser. No. 352,816, Dec. 1, 1994, Pat. No. 5,598,339, which is a continuation of Ser. No. 662,592, Mar. 1, 1991, abandoned. This application Jan. 21, 1997, Ser. No. 786,442

Claims priority, application Japan, Mar. 6, 1990, 2-52831; Mar. 15, 1990, 2-62630

Int. Cl.^{6} G06F *165/00*

U.S. Cl. 701—213 **15 Claims**


START
ST1
NUMBER RECEIVED BY GPS
NO
YES
ST2
PRESENT POSITION OR THE LIKE ARE DISPLAYED
ST3
FINAL PRTESENT POSITION IS DISPLAYED IN A FLICKERING FORM
ST4
NUMBER RECEIVED BY GPS
NO
YES
ST5
NEW PRESENT POSITION OR THE LIKE FROM A SENSED POINT ARE DISPLAYED

1. A vehicle navigation system, comprising:

a global positioning system (GPS) receiver for receiving signals from satellites;

means for determining whether or not the signals received are sufficient for calculating a present position of a vehicle;

means for calculating the present position of the vehicle;

means for displaying the present position of the vehicle in a first form of display as a most recent correct position displayed solely whenever said determining means determines that the signals received are sufficient for calculating the present position of the vehicle; and

means for changing the most recent correct position displayed into an altered form of display and ceasing to display the present position of the vehicle whenever said determining means determines that the signals received are insufficient for calculating the present position of the vehicle.

5,752,220

METHOD FOR HEADING ERROR SUPPRESSION IN DEAD RECKONING SYSTEMS

George J. Geier, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1995, Ser. No. 578,370

Int. Cl.^{6} G01C *21/00*

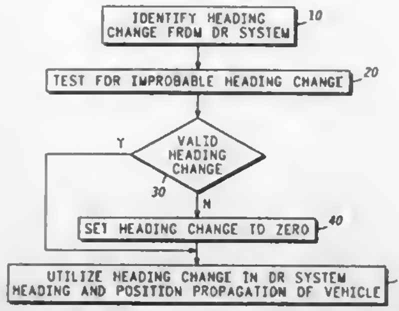
U.S. Cl. 701—217 **16 Claims**

1. A method for suppressing heading error accumulation in a dead reckoning (DR) system, the method comprising the steps of:

identifying a heading change sensed by the dead reckoning system;

determining if the heading change is an improbable heading change including the substep of comparing the heading change to a minimum turn rate;

zeroing the improbable heading change if the heading change is an improbable heading change; and


IDENTIFY HEADING CHANGE FROM DR SYSTEM
10
TEST FOR IMPROBABLE HEADING CHANGE
20
VALID HEADING CHANGE
Y
30
N
SET HEADING CHANGE TO ZERO
40
UTILIZE HEADING CHANGE IN DR SYSTEM HEADING AND POSITION PROPAGATION OF VEHICLE
50

using the heading change to update a DR system heading for a vehicle.

5,752,221

METHOD OF EFFICIENTLY RECORDING AN AUDIO SIGNAL IN SEMICONDUCTOR MEMORY

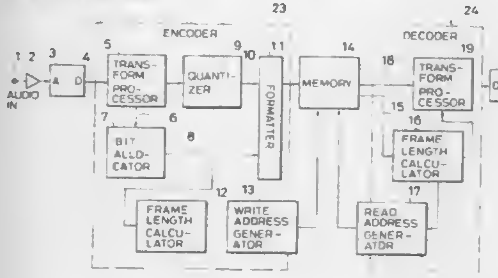
Kazuhiro Sugiyama; Yukari Ono, and Yoshinobu Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 536,356, Sep. 29, 1995, Pat. No. 5,630,010, which is a division of Ser. No. 45,705, Apr. 14, 1993, Pat. No. 5,495,552. This application Sep. 18, 1996, Ser. No. 716,566

Claims priority, application Japan, Apr. 20, 1992, 4-099647; Jul. 24, 1992, 4-198463; Jul. 24, 1992, 4-198464

Int. Cl.^{6} G10L *3/02;9/00*

U.S. Cl. 704—201 **24 Claims**



13. A hierarchical encoder, comprising:

frequency transformation means for transforming an input digital audio signal into transformation coefficients for a plurality of frequency bands; and

hierarchical dividing and quantizing means for extracting audible signal components from the transformation coefficients based on psycho-acoustic characteristics, for dividing the audible signal components into hierarchical levels, and for quantizing the audible signal components to produce encoded data divided into a plurality of hierarchical levels,

a first hierarchical level of encoded data S1 being obtained by selecting, from among the transformation coefficients of said extracted audible signal components, transformation coefficients of frequency bands equal to or less than a first predetermined frequency f_1, with a quantization level from the most significant bit equal to or less than a first predetermined number of bits b_1, and

an n-th hierarchical level of encoded data Sn being obtained as a residual signal obtained by selecting, from among the transformation coefficients of said extracted audible signal components, transformation coefficients of frequency bands equal to or less than an nth predetermined frequency f_n ($f_n \geqq f_{n-1}$), with a quantization level from the most significant bit equal to or less than an nth predetermined number of bits b_n ($b_n \geqq b_{n-1}$), and subtracting out the transformation coefficients of each of the first hierarchical level to the (n−1)-th hierarchical level, wherein n is an integer.

5,752,222

SPEECH DECODING METHOD AND APPARATUS

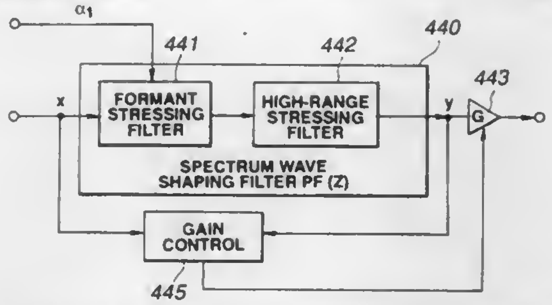
Masayuki Nishiguchi, Kanagawa; Kazuyuki Iijima, Saitama; Jun Matsumoto, and Shiro Omori, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 23, 1996, Ser. No. 736,342

Claims priority, application Japan, Oct. 26, 1995, 7-279489

Int. Cl.^{6} G10L *3/02;9/00*

U.S. Cl. 704—201 **12 Claims**


α1
441
442
440
443
x
FORMANT STRESSING FILTER
HIGH-RANGE STRESSING FILTER
y
G
SPECTRUM WAVE SHAPING FILTER PF (Z)
GAIN CONTROL
445

1. A speech decoding method in which an encoded speech input signal is entered, decoded and subsequently post-filtered, comprising steps of:

performing spectral shaping filtering for spectrally shaping a decoded input signal with a filter coefficient updated within a first period; and

performing gain adjustment for correcting gain changes caused by said step of performing spectral shaping filtering, wherein said gain is updated within a second period different from said first period.

5,752,223

CODE-EXCITED LINEAR PREDICTIVE CODER AND DECODER WITH CONVERSION FILTER FOR CONVERTING STOCHASTIC AND IMPULSIVE EXCITATION SIGNALS

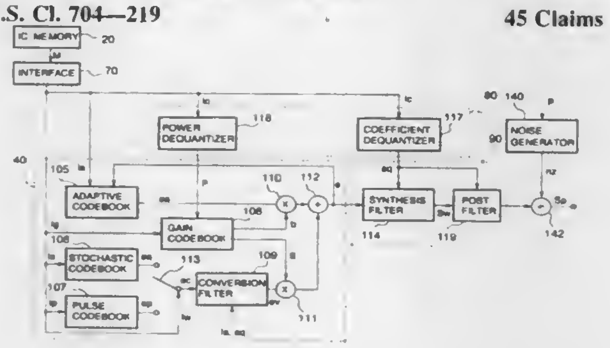
Hiromi Aoyagi; Yoshihiro Ariyama, and Kenichiro Hosoda, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1995, Ser. No. 557,809

Claims priority, application Japan, Nov. 22, 1994, 6-287654

Int. Cl.^{6} G01L *9/14*

U.S. Cl. 704—219 **45 Claims**



29. A method of generating an excitation signal for code-excited linear predictive coding and decoding of an input speech signal, comprising the steps of:

calculating linear predictive coefficients of said input speech signal;

calculating a power value of said input speech signal;

selecting an adaptive excitation signal, corresponding to an adaptive index, from an adaptive codebook;

selecting a stochastic excitation signal from a stochastic codebook;

selecting an impulsive excitation signal from a pulse codebook;

selecting a constant excitation signal by choosing between said stochastic excitation signal and said impulsive excitation signal;

selecting a pair of gain values from a gain codebook;

filtering said constant excitation signal, using filter coefficients derived from said adaptive index and said linear predictive coefficients, to convert said constant excitation signal to a varied excitation signal more closely resembling said input speech signal;

combining said varied excitation signal and said adaptive excitation signal according to said power value and said pair of gain values to produce a final excitation signal; and

using said final excitation signal to update said adaptive codebook.

43. An improved code excited linear predictive decoder of the type having an interface circuit for demultiplexing a coded speech signal generated by a speech coder, to obtain index information and coefficient information, an excitation circuit for creating an excitation signal from the index information, and a filtering circuit for filtering the excitation signal according to the coefficient information to generate a reproduced speech signal, the improvement comprising:

means, including a white noise generator, for masking a pink noise produced by the speech coder and present in the reproduced speech signal.

5,752,224

INFORMATION ENCODING METHOD AND APPARATUS, INFORMATION DECODING METHOD AND APPARATUS INFORMATION TRANSMISSION METHOD AND INFORMATION RECORDING MEDIUM

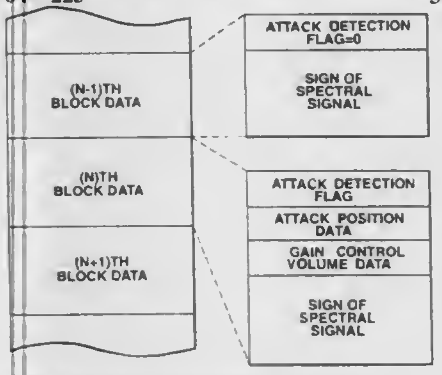
Kyoya Tsutsui, Kanagawa, and Robert Heddle, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 413,391, Mar. 30, 1995, abandoned. This application Jun. 4, 1997, Ser. No. 868,665

Claims priority, application Japan, Apr. 1, 1994, 6-064855

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—225 **30 Claims**



1. An information encoding method comprising

resolving an input signal into frequency components,

gain controlling the input signal to be resolved into frequency components,

encoding the output information resolved into the frequency components and the control information for gain control, and

selecting a gain control quantity at an acutely increased portion of the waveform signal from a plurality of magnitudes, with the maximum value of the gain control quantity being 40 dB or more.

5,752,225

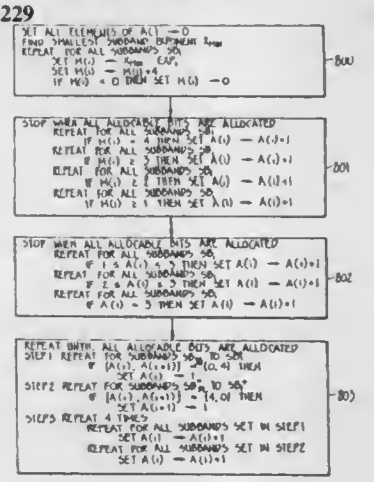
METHOD AND APPARATUS FOR SPLIT-BAND ENCODING AND SPLIT-BAND DECODING OF AUDIO INFORMATION USING ADAPTIVE BIT ALLOCATION TO ADJACENT SUBBANDS

Louis Dunn Fielder, Millbrae, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 79,169, Jun. 18, 1993, Pat. No. 5,479,562, which is a continuation-in-part of Ser. No. 582,956, Sep. 26, 1990, Pat. No. 5,222,189, and Ser. No. 787,665, Nov. 4, 1991, Pat. No. 5,230,038, which is a division of Ser. No. 458,894, Dec. 29, 1989, Pat. No. 5,109,417, which is a continuation-in-part of Ser. No. 439,868, Nov. 20, 1989, abandoned, and Ser. No. 303,714, Jan. 27, 1989, abandoned, said Ser. No. 582,956 is a continuation-in-part of Ser. No. 458,894, and Ser. No. 439,868, which is a continuation-in-part of Ser. No. 303,714. This application Jun. 7, 1995, Ser. No. 481,638

Int. Cl.^{6} G10L *7/02*

U.S. Cl. 704—229 **19 Claims**


SET ALL ELEMENTS OF A() → 0
FIND SMALLEST SUBBAND EXPONENT
REPEAT FOR ALL SUBBANDS SB
SET M(i) → EXP
SET M(i) → M(i)+4
IF M(i) < 0 THEN SET M(i) → 0
800
STOP WHEN ALL ALLOCABLE BITS ARE ALLOCATED
REPEAT FOR ALL SUBBANDS SB
IF M(i) = 4 THEN SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SB
IF M(i) ≥ 3 THEN SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SB
IF M(i) ≥ 2 THEN SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SB
IF M(i) ≥ 1 THEN SET A(i) → A(i)+1
801
STOP WHEN ALL ALLOCABLE BITS ARE ALLOCATED
REPEAT FOR ALL SUBBANDS SB
IF 1 ≤ A(i) ≤ 3 THEN SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SB
IF 2 ≤ A(i) ≤ 3 THEN SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SB
IF A(i) = 3 THEN SET A(i) → A(i)+1
802
REPEAT UNTIL ALL ALLOCABLE BITS ARE ALLOCATED
STEP1 REPEAT FOR SUBBANDS SB TO SB
IF {A(i), A(i+1)} = {0, 4} THEN
SET A(i) → 1
STEP2 REPEAT FOR SUBBANDS SB TO SB*
IF {A(i), A(i+1)} = {4, 0} THEN
SET A(i+1) → 1
STEP3 REPEAT 4 TIMES
REPEAT FOR ALL SUBBANDS SET IN STEP1
SET A(i) → A(i)+1
REPEAT FOR ALL SUBBANDS SET IN STEP2
SET A(i) → A(i)+1
803

* FOR 8ST BLOCKS, THE LOWER LIMIT IS SUBBAND SB2

1. An encoder for the high-quality digital encoding of wideband audio information, comprising

subband means for receiving said wideband audio information and for generating subband information for a plurality of subbands in response thereto,

quantizing means for forming digital words by adaptively allocating bits to and quantizing said subband information, wherein bits are adaptively allocated to digital words representing a respective subband and one or two adjacent subbands on the basis of a spectral level in said respective subband, and

formatting means for assembling digital information including said digital words into a coded signal having a format suitable for transmission or storage.

5,752,226

METHOD AND APPARATUS FOR REDUCING NOISE IN SPEECH SIGNAL

Joseph Chan, Tokyo, and Masayuki Nishiguchi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 12, 1996, Ser. No. 600,226

Claims priority, application Japan, Feb. 17, 1995, 7-029337

Int. Cl.^{6} G10L *5/06*

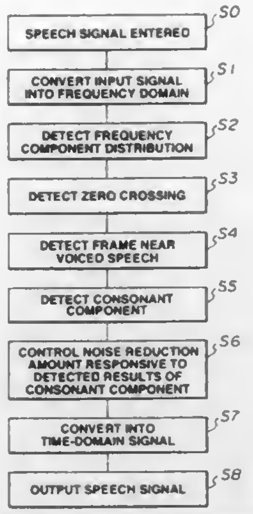
U.S. Cl. 704—233 **8 Claims**

1. A method for reducing noise in an input speech signal comprising steps of:

detecting a consonant portion contained in the input speech signal; and

controlling a reduction of noise in said input speech signal in response to the results of consonant detection from said consonant portion detection step,

wherein the step of detecting a consonant portion includes a step of detecting consonants in the vicinity of a speech signal


SPEECH SIGNAL ENTERED
S0
CONVERT INPUT SIGNAL INTO FREQUENCY DOMAIN
S1
DETECT FREQUENCY COMPONENT DISTRIBUTION
S2
DETECT ZERO CROSSING
S3
DETECT FRAME NEAR VOICED SPEECH
S4
DETECT CONSONANT COMPONENT
S5
CONTROL NOISE REDUCTION AMOUNT RESPONSIVE TO DETECTED RESULTS OF CONSONANT COMPONENT
S6
CONVERT INTO TIME-DOMAIN SIGNAL
S7
OUTPUT SPEECH SIGNAL
S8

portion detected in said input speech signal using at least one of changes in energy in a short domain of the input speech signal, a value indicating a distribution of frequency components in the input speech signal, and a number of zero-crossings in said input speech signal, and

wherein the value indicating the distribution of frequency components in the input speech signal is obtained based on a ratio of a mean level of the input speech signal spectrum in a high range to a mean level of the input speech signal spectrum in a low range.

5,752,227
METHOD AND ARRANGEMENT FOR SPEECH TO TEXT CONVERSION

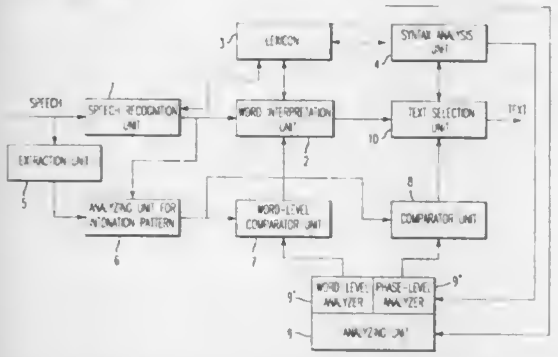
Bertil Lyberg, Vagnhärad, Sweden, assignor to Telia AB, Farsta, Sweden

Filed May 1, 1995, Ser. No. 432,062

Claims priority, application Sweden, May 10, 1994, 9401613

Int. Cl.^{6} G01H *9/04*

U.S. Cl. 704—235 **22 Claims**



1. A method for speech to text conversion including the steps of:

identifying phonemes from a segment of input speech to be converted into text;

interpreting the phonemes as possible word combinations to establish a speech model of the segment of input speech;

determining a first intonation pattern of a first fundamental tone of the speech model including first maximum and minimum values of the first fundamental tone, and respective positions of the first maximum and minimum values;

determining a second fundamental tone of the input speech;

determining a second intonation pattern of the second fundamental tone of the input speech including second maximum and minimum values of the second fundamental tone, and respective positions of the second maximum and minimum values;

comparing the second and first intonation patterns of the input speech and the speech model, respectively, to identify the word combinations in the speech model having intonation patterns which best correspond with the second intonation pattern of the word combinations of the input speech; and

providing a representation of the at least one of corresponding words and word combinations which best correspond with the input speech.

5,752,228
SPEECH SYNTHESIS APPARATUS AND READ OUT TIME CALCULATING APPARATUS TO FINISH READING OUT TEXT

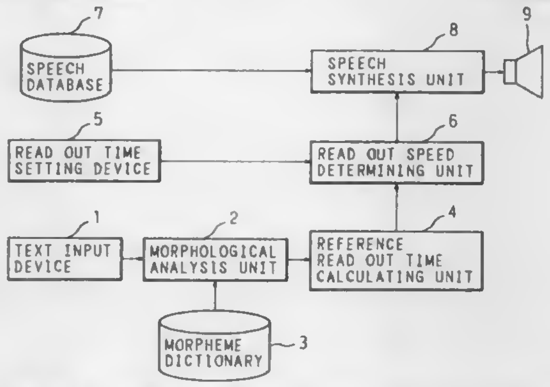
Takeshi Yumura, Neyagawa; Hiroki Ohnishi; Masanori Miyatake, both of Hirakata; Naoyuki Yoden, Toyonaka; Masashi Ochiiwa, Ogaki, and Takashi Izumi, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 29, 1995, Ser. No. 564,594

Claims priority, application Japan, May 31, 1995, 7-133374

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 704—260 **12 Claims**


7
SPEECH DATABASE
8
SPEECH SYNTHESIS UNIT
9
5
READ OUT TIME SETTING DEVICE
6
READ OUT SPEED DETERMINING UNIT
1
TEXT INPUT DEVICE
2
MORPHOLOGICAL ANALYSIS UNIT
4
REFERENCE READ OUT TIME CALCULATING UNIT
MORPHEME DICTIONARY
3

1. A speech synthesis apparatus for reading out a text by synthesizing speech, comprising:

means for inputting text data;

means for setting a time to finish reading out the text;

means for morphologically analyzing the input text data;

means for calculating a time necessary to finish reading out the text data at a prescribed speed based on the morphological analysis result of the text data;

means for determining a read out speed so as to make the calculated read out time agree with the set read out time by comparing the calculated time to the set time;

a database which stores data for the speech synthesis;

means for synthesizing speech by using the data for the speech synthesis in the database at the read out speed determined by said means for determining; and

means for outputting the synthesized speech.

5,752,229
INTELLIGENT NEAR-END SPEECH DETECTION

Donald Lars Duttweiler, Rumson, N.J.; Toshiro Kawahara, Kanagawa, Japan; Cheng Kim, Lincroft, N.J., and Toshio Miki, Yokohama, Japan, assignors to Lucent Technologies Inc., Murray Hill, N.J.

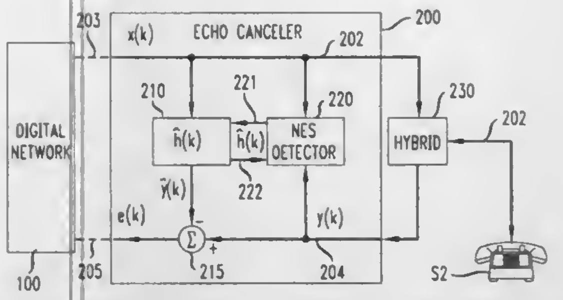
Filed Jun. 28, 1996, Ser. No. 671,746

Int. Cl.^{6} G10L *9/18;* **A04B** *3/23*

U.S. Cl. 704—270 **13 Claims**

1. An echo canceler comprising an adaptive filter operative for accumulating knowledge of an echo path associated with a connection, in which said knowledge is derived as result of processing signals received from a near-end source of said connection and signals received from a far-end of said connection, and

a near-end speech detector, responsive to receipt of said accumulated knowledge from said adaptive filter, for determining, as a function of said accumulated knowledge, if signals received at said near-end of said connection are speech signals or echo.



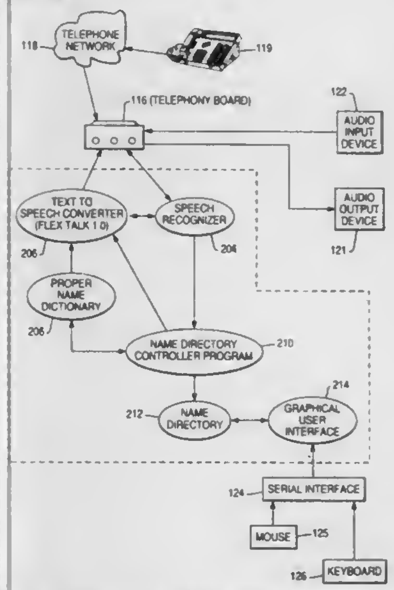
5,752,230
METHOD AND APPARATUS FOR IDENTIFYING NAMES WITH A SPEECH RECOGNITION PROGRAM

Teodoro G. Alonso-Cedo, Aurora, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 20, 1996, Ser. No. 697,182

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—270 **16 Claims**



1. A method for selecting a name based on spelling and pronunciation, comprising the steps of:

(a) receiving a name spelled by a user;

(b) identifying possible names that match said spelled name;

(c) receiving a name pronounced by said user; and

(d) selecting a name from said possible names in reference to said pronounced name.

5,752,231
METHOD AND SYSTEM FOR PERFORMING SPEAKER VERIFICATION ON A SPOKEN UTTERANCE

Michele B. Gammel, Farmers Branch, and Joseph A. Adamo, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

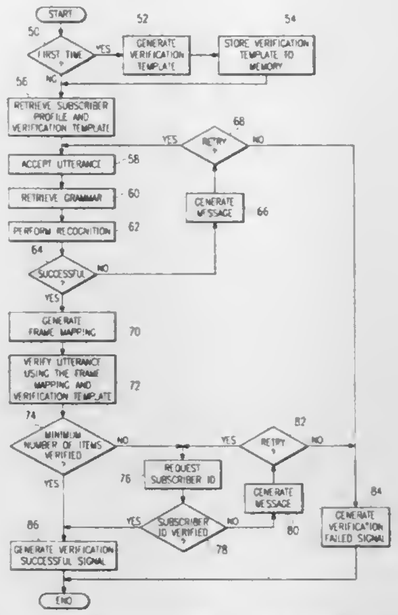
Filed Feb. 12, 1996, Ser. No. 600,387

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—273 **8 Claims**

8. A method of performing speaker verification of a spoken utterance comprising the steps of:

generating speaker-dependent verification templates for each possible spoken item that may be in the spoken utterance at a first time;


START
50
FIRST TIME ?
YES
52
GENERATE VERIFICATION TEMPLATE
54
STORE VERIFICATION TEMPLATE TO MEMORY
56
NO
RETRIEVE SUBSCRIBER PROFILE AND VERIFICATION TEMPLATE
68
RETRY ?
YES
NO
ACCEPT UTTERANCE
58
RETRIEVE GRAMMAR
60
GENERATE MESSAGE
66
PERFORM RECOGNITION
62
64
SUCCESSFUL ?
NO
YES
GENERATE FRAME MAPPING
70
VERIFY UTTERANCE USING THE FRAME MAPPING AND VERIFICATION TEMPLATE
72
74
MINIMUM NUMBER OF ITEMS VERIFIED ?
NO
YES
82
RETRY ?
YES
NO
REQUEST SUBSCRIBER ID
76
GENERATE MESSAGE
84
86
YES
SUBSCRIBER ID VERIFIED ?
NO
80
78
GENERATE VERIFICATION FAILED SIGNAL
GENERATE VERIFICATION SUCCESSFUL SIGNAL
END

storing said speaker-dependent verification templates to memory;

receiving the spoken utterance at a second time;

retrieving said speaker-dependent verification templates from said memory;

performing speech recognition functions on the spoken utterance;

marking starting and ending positions of each recognized spoken item within the spoken utterance;

generating a verification successful signal in response to matching at least a pre-determined number of said spoken items within the spoken utterance with the speaker-dependent verification templates;

requesting an alternate identifier if unable to not match said pre-determined number of spoken items with the speaker-dependent verification templates;

generating said verification successful signal if able to match said alternate identifier with a pre-determined identifier in a stored user profile; and

generating a verification unsuccessful signal if unable to match said alternate identifier with said pre-determined identifier.

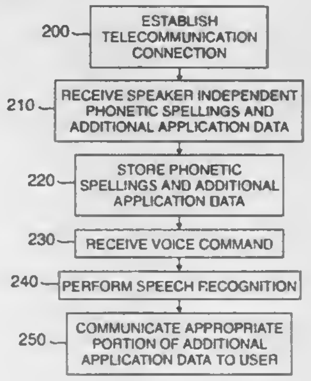
5,752,232
VOICE ACTIVATED DEVICE AND METHOD FOR PROVIDING ACCESS TO REMOTELY RETRIEVED DATA

David Lee Basore, Little Silver, N.J., and William Stuart Meisel, Encino, Calif., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 14, 1994, Ser. No. 338,928

Int. Cl.^{6} G10L *9/06*

U.S. Cl. 704—275 **31 Claims**


200
ESTABLISH TELECOMMUNICATION CONNECTION
210
RECEIVE SPEAKER INDEPENDENT PHONETIC SPELLINGS AND ADDITIONAL APPLICATION DATA
220
STORE PHONETIC SPELLINGS AND ADDITIONAL APPLICATION DATA
230
RECEIVE VOICE COMMAND
240
PERFORM SPEECH RECOGNITION
250
COMMUNICATE APPROPRIATE PORTION OF ADDITIONAL APPLICATION DATA TO USER

26. A method of communicating information comprising the steps of:

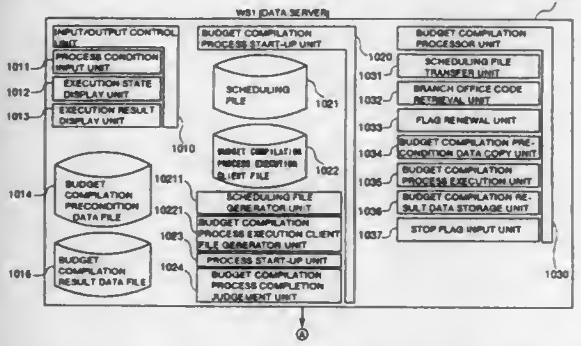
(a) establishing a telecommunication connection to a remote location;
(b) receiving from said remote location a plurality of speaker independent phonetic spellings of words and additional application data;
(c) storing said phonetic spellings and said additional application data;
(d) receiving a voice command;
(e) performing speech recognition processes using said phonetic spellings; and
(f) communicating, in response to said voice command, an appropriate portion of said additional application data.

5,752,233
SYSTEM AND METHOD FOR BUDGET COMPILATION UNDER PARALLEL/DISTRIBUTED PROCESSING

Takao Sekimoto, Kawasaki; Masahiro Sakashita, Yokosuka; Kenji Ando, Yokohama, and Mitsushige Tsukada, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1994, Ser. No. 322,413
Claims priority, application Japan, Oct. 20, 1993, 5-262104
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 705—1 **15 Claims**


WS1 (DATA SERVER)
1
INPUT/OUTPUT CONTROL UNIT
PROCESS CONDITION INPUT UNIT
EXECUTION STATE DISPLAY UNIT
EXECUTION RESULT DISPLAY UNIT
1011
1012
1013
1010
1014
BUDGET COMPILATION PRECONDITION DATA FILE
1016
BUDGET COMPILATION RESULT DATA FILE
BUDGET COMPILATION PROCESS START-UP UNIT
SCHEDULING FILE
1021
BUDGET COMPILATION PROCESS EXECUTION CLIENT FILE
1022
10211
SCHEDULING FILE GENERATOR UNIT
10221
BUDGET COMPILATION PROCESS EXECUTION CLIENT FILE GENERATOR UNIT
1023
PROCESS START-UP UNIT
1024
BUDGET COMPILATION PROCESS COMPLETION JUDGEMENT UNIT
1020
BUDGET COMPILATION PROCESSOR UNIT
1031
SCHEDULING FILE TRANSFER UNIT
1032
BRANCH OFFICE CODE RETRIEVAL UNIT
1033
FLAG RENEWAL UNIT
1034
BUDGET COMPILATION PRE-CONDITION DATA COPY UNIT
1035
BUDGET COMPILATION PROCESS EXECUTION UNIT
1036
BUDGET COMPILATION RE-SULT DATA STORAGE UNIT
1037
STOP FLAG INPUT UNIT
1030
Ⓐ

15. A budget compilation scheduling method for a budget compilation system for performing budget compilation under distributed environments for branch offices, on a network having a server and a plurality of clients connected thereto, said method comprising:

a first step of forming a scheduling file comprising identifiers of said branch offices and status flags corresponding to said identifiers;

a second step of transferring said scheduling file from said server to an activated client;

a third step of determining in said activated client a branch office for which said activated client is to execute a budget compilation process, by referring to said identifiers and said status flags in said scheduling file and picking at least one branch office on the basis of its status flag; and

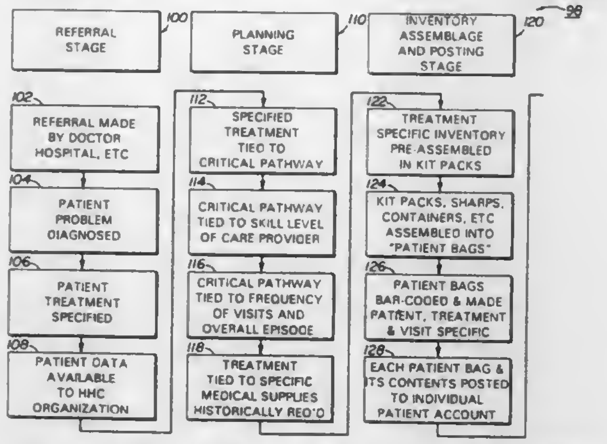
a fourth step of renewing in said scheduling file a status flag corresponding to said branch office determined at said third step, and transferring a renewed scheduling file to said server from said activated client.

5,752,234
METHOD AND APPARATUS FOR MANAGING DISPOSABLE MEDICAL SUPPLIES APPROPRIATE FOR A SINGLE PATIENT VISIT

Andrew Withers, Atlanta, Ga., assignor to Patients Solutions, Ga.

Filed Aug. 18, 1995, Ser. No. 516,873
Int. Cl.^{6} G06F *7/00*

U.S. Cl. 705—2 **33 Claims**


REFERRAL STAGE
100
PLANNING STAGE
110
INVENTORY ASSEMBLAGE AND POSTING STAGE
120
98
102
REFERRAL MADE BY DOCTOR HOSPITAL, ETC
104
PATIENT PROBLEM DIAGNOSED
106
PATIENT TREATMENT SPECIFIED
108
PATIENT DATA AVAILABLE TO HHC ORGANIZATION
112
SPECIFIED TREATMENT TIED TO CRITICAL PATHWAY
114
CRITICAL PATHWAY TIED TO SKILL LEVEL OF CARE PROVIDER
116
CRITICAL PATHWAY TIED TO FREQUENCY OF VISITS AND OVERALL EPISODE
118
TREATMENT TIED TO SPECIFIC MEDICAL SUPPLIES HISTORICALLY REQ'D
122
TREATMENT SPECIFIC INVENTORY PRE-ASSEMBLED IN KIT PACKS
124
KIT PACKS, SHARPS, CONTAINERS, ETC ASSEMBLED INTO "PATIENT BAGS"
126
PATIENT BAGS BAR-CODED & MADE PATIENT, TREATMENT & VISIT SPECIFIC
128
EACH PATIENT BAG & ITS CONTENTS POSTED TO INDIVIDUAL PATIENT ACCOUNT

1. A method of supplying health care workers with disposable supplies appropriate for a single patient visit to a particular patient, comprising the steps of:

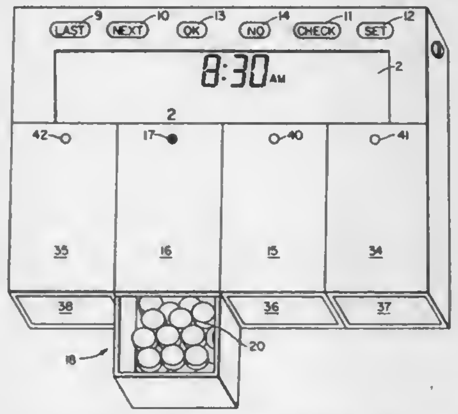
a. determining a requirement for disposable medical supplies for a patient for an associated single visit based on the procedures to be performed on the patient and on specific requirements for the patient;
b. placing said disposable supplies determined to be associated with the visit in a disposable container;
c. delivering said disposable container and said disposable supplies to a first site, whereat a patient is to receive treatment, prior to the associated single visit by the health care worker;
d. delivering said disposable container to a second site for disposal after the visit by the health care worker; and
e. recording movement of said disposable container in a computer database when said disposable container is delivered to the first site and to the second site.

5,752,235
ELECTRONIC MEDICATION MONITORING AND DISPENSING METHOD

Bruce A. Kehr, Potomac, Md.; David Lerner, New York, N.Y.; Richard D. Demenus, New York, N.Y., and Michael J. Edl, New York, N.Y., assignors to InforMedix, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 464,877, Jan. 17, 1990, Pat. No. 5,200,891. This application Jul. 23, 1990, Ser. No. 556,626
Int. Cl.^{6} G06F *15/02*

U.S. Cl. 705—3 **6 Claims**



1. A device for alerting a person when it is time to take medication, comprising,

(a) a casing having at least one face,
(b) a display on said face,
(c) a memory,
(d) timing means,
(e) a plurality of medication compartments that open and close, associated with said casing,
(f) control means for providing a plurality of bits of information relating to the taking of medication, said control means including the timing means, said information including information as to the quantity of medication to be taken and also including other information,
(g) selecting means for selecting at least one of said bits and at least one time of day, for each compartment,
(h) means for entering the selected bits and said selected time or times in said memory,
(i) said control means including means responsive to both said selected time or times and said selected bits stored in said memory, for, a particular one of said compartments, (a) giving a take-medication signal at each of said time or times that was selected for that compartment, and (b) displaying on said display the information that was based on the bit or bits selected for that compartment,
(j) said display having first and second portions the first of which is closer to said compartments than the second portion, said control means including means for displaying said information as to the quantity of medication to be taken on said first portion and said other information on said second portion, and
(k) means operable following a take-medication signal to store a missed medication signal in said memory, if a compartment is not opened or closed,

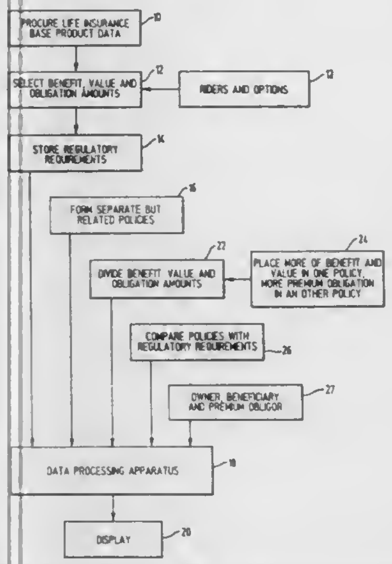
said control means including means for displaying, on said display, the missed medication signal.

5,752,236
LIFE INSURANCE METHOD, AND SYSTEM

Frank M. Sexton, 30 Serendipity Way, and Swinton B. Burkhalter, 10 Wildwood Valley, both of Atlanta, Ga. 30350

Filed Sep. 2, 1994, Ser. No. 301,232
Int. Cl.^{6} G06F *157/00*

U.S. Cl. 705—4 **31 Claims**


PROCURE LIFE INSURANCE BASE PRODUCT DATA
10
SELECT BENEFIT, VALUE AND OBLIGATION AMOUNTS
12
RIDERS AND OPTIONS
12
STORE REGULATORY REQUIREMENTS
14
FORM SEPARATE BUT RELATED POLICIES
16
DIVIDE BENEFIT VALUE AND OBLIGATION AMOUNTS
22
PLACE MORE OF BENEFIT AND VALUE IN ONE POLICY, MORE PREMIUM OBLIGATION IN AN OTHER POLICY
24
COMPARE POLICIES WITH REGULATORY REQUIREMENTS
26
OWNER, BENEFICIARY AND PREMIUM OBLIGOR
27
DATA PROCESSING APPARATUS
18
DISPLAY
20

1. A method for forming a life insurance plan comprising the steps of:

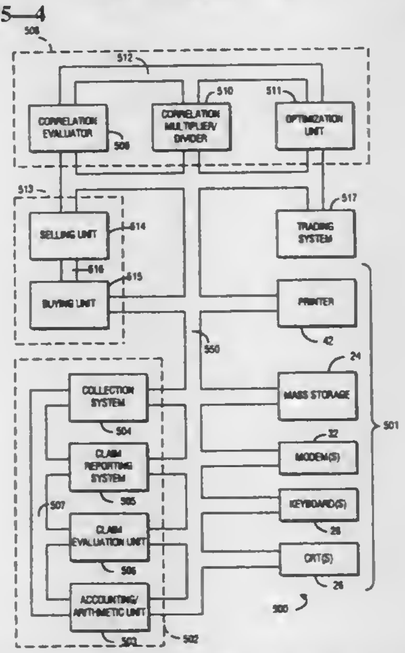
procuring life insurance product data;
selecting death benefit, cash value and premium obligation amounts based upon gender, age and other risk
factors from said data;
storing factors representing regulatory requirements in a data processing apparatus;
forming in said apparatus at least two separate but related insurance contracts, said contracts being related by tying the total death benefit and cash value amounts for all of said contracts to the total premium obligation amount for all of said contracts;
dividing said death benefit, cash value and premium obligation amounts between said contracts;
comparing each of said contracts with the regulatory requirements; and
displaying the resulting contracts.

5,752,237
METHOD AND APPARATUS FOR PROVIDING PROFESSIONAL LIABILITY COVERAGE

Julius Cherny, Monsey, N.Y., assignor to Mottola Cherny & Associates, Inc., New York, N.Y.

Continuatinn-in-part of Ser. No. 420,364, Apr. 11, 1995. This application May 18, 1995, Ser. No. 444,290
Int. Cl.^{6} G06F *155/00*

U.S. Cl. 705—4 **41 Claims**



1. A machine-readable data storage medium encoded with a set of machine-executable instructions for using a data processing system including a printer to perform a method of providing professional liability coverage to a professional, during a coverage period having a starting date and an ending date, said professional having clients including a substantial number of publicly traded corporations each having a respective securities price at a respective starting price on said starting date, and with respect to whom a professional liability triggering event could cause a decline in said respective securities price, said method comprising the steps of:

using said data processing system, determining a respective number of positions in securities of each of said publicly traded corporations needed to provide said professional liability coverage, based on market correlation between prices of securities of said publicly traded corporations, and on at least one of (a) probability that a professional liability triggering event will occur relative to any one or more of said publicly traded corporations, and (b) likely effect of said professional liability triggering event on said price of securities of said one or more publicly traded corporations,

- using said data processing system to buy and/or sell financial instruments for securing at a respective cost a right to deliver at a respective delivery price, at any time at least as late as said ending date, said respective number of positions in securities of each of said publicly traded corporations;
- using said data processing system, determining from said respective costs a payment to be charged to said professional in exchange for said coverage; and
- using said printer of said data processing system, generating a coverage document conferring, in exchange for said payment, a right to sell, at a respective claim price, at any time during said coverage period, up to said respective number of positions in securities of any one of said publicly traded corporations when there is a professional liability triggering event with respect to any of said publicly traded corporations, said coverage document setting forth said payment and evidencing said right to sell.

5,752,238

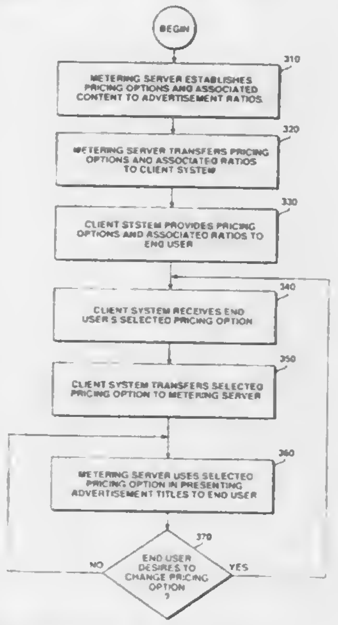
CONSUMER-DRIVEN ELECTRONIC INFORMATION PRICING MECHANISM

Rick Dedrick, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 3, 1994, Ser. No. 333,961

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—14 **19 Claims**


BEGIN
310
METERING SERVER ESTABLISHES PRICING OPTIONS AND ASSOCIATED CONTENT TO ADVERTISEMENT RATIOS
320
METERING SERVER TRANSFERS PRICING OPTIONS AND ASSOCIATED RATIOS TO CLIENT SYSTEM
330
CLIENT STSTEM PROVIDES PRICING OPTIONS AND ASSOCIATED RATIOS TO END USER
340
CLIENT SYSTEM RECEIVES END USER S SELECTED PRICING OPTION
350
CLIENT SYSTEM TRANSFERS SELECTED PRICING OPTION TO METERING SERVER
360
METERING SERVER USES SELECTED PRICING OPTION IN PRESENTING ADVERTISEMENT TITLES TO END USER
370
END USER DESIRES TO CHANGE PRICING OPTION ?
NO
YES

17. A method comprising the steps of:

(a) presenting an end user with a plurality of pricing options and a plurality of content to electronic advertisement ratios associated with the plurality of pricing options;

(b) providing the electronic content and one or more electronic advertisements to the end user in accordance with a first pricing option selected by the end user;

(c) presenting the end user with an option to select a new pricing option of the plurality of pricing options; and

(d) providing the electronic content and one or more electronic advertisements to the end user in accordance with the new pricing option.

5,752,239

SELF-SERVICE DEVICE WITH AN ANIMATED USER INTERFACE TO ASSIST THE OPERATOR TO EFFECT A TRANSACTION

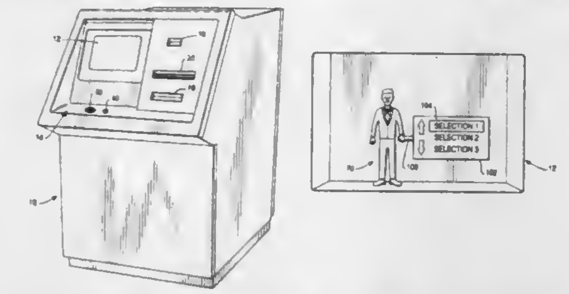
Michael G. Coutts, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 7, 1995, Ser. No. 553,224

Claims priority, application United Kingdom, Jul. 28, 1995, 9515513

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 705—26 **10 Claims**



1. A self-service retail terminal for allowing a customer of a retail establishment to purchase an item from the retail establishment, the self-service retail terminal comprising:

- a display;
- a processor for (i) providing a background image representative of the retail establishment on the display, and (ii) providing an animated sprite representative of the customer on the display and movable between different positions within the background image on the display; and
- a manually operable control device for (i) controlling the processor to control movement of the animated sprite from a first position within the background image on the display to a second position within the background image on the display to select an item for purchase from the retail establishment when the customer manually operates the control device at a first time, and (ii) controlling the processor to complete purchasing the selected item when the animated sprite is at the second position within the background image on the display and the customer manually operates the control device at a second time which is later than the first time.

5,752,240

Patent Not Issued For This Number

5,752,241

METHOD AND APPARATUS FOR ESTIMATING TRANSITIVE CLOSURE AND REACHABILITY

Edith Cohen, Chatham, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

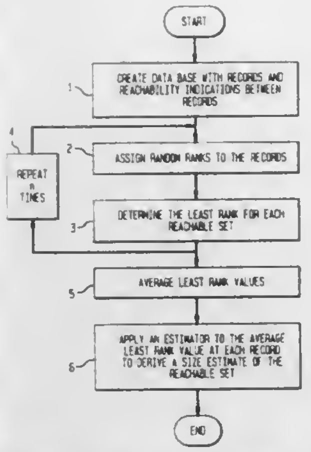
Filed Nov. 14, 1995, Ser. No. 557,223

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—3 **25 Claims**

1. A database query method using estimates of the size of reachability sets in a database including a plurality of elements each including reachability information to other elements comprising the steps:

- assigning random ranks to elements in the database;
- computing the rank of the least ranked element in each of a plurality of reachability sets;
- applying an estimator to the rank of the least ranked element in each of the plurality of reachability sets to provide an estimate of the size of each of the plurality of reachability sets;
- using said estimate of the size of each of the plurality of reachability sets to perform a database query.


START
1
CREATE DATA BASE WITH RECORDS AND REACHABILITY INDICATIONS BETWEEN RECORDS
2
ASSIGN RANDOM RANKS TO THE RECORDS
3
DETERMINE THE LEAST RANK FOR EACH REACHABLE SET
4
REPEAT n TIMES
5
AVERAGE LEAST RANK VALUES
6
APPLY AN ESTIMATOR TO THE AVERAGE LEAST RANK VALUE AT EACH RECORD TO DERIVE A SIZE ESTIMATE OF THE REACHABLE SET
END

5,752,242

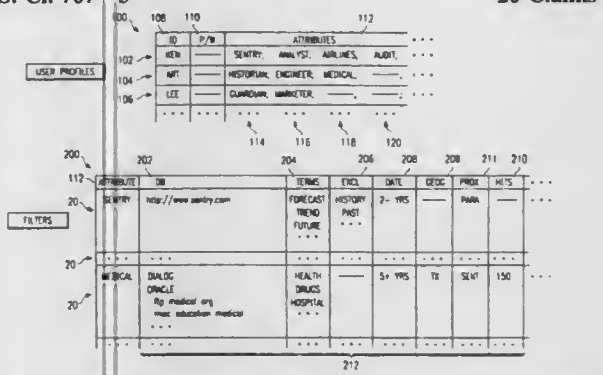
SYSTEM AND METHOD FOR AUTOMATED RETRIEVAL OF INFORMATION

Charnell T. Havens, McKinney, Tex., assignor to Electronic Data Systems Corporation, Plano, Tex.

Filed Apr. 18, 1996, Ser. No. 634,640

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—3 **20 Claims**



1. A system for automated retrieval of information from one or more information sources, comprising:

- at least one attribute that:
- comprises a business role of information describing a particular purpose for which information may be used:
- is associated with a work activity corresponding to a particular usage of information; and
- indicates selected information for which retrieval is likely to be desirable for the usage;
- a library containing a plurality of information filters, each information filter specifying one or more search parameters corresponding to the attribute;
- a translator coupled to the library and operable to select one or more information filters from the library in accordance with the attribute; and
- a searcher coupled to the translator and the information sources, the searcher operable to generate one or more search requests according to the search parameters specified by the selected information filters, the searcher further operable to retrieve information from the information sources using the generated search requests.

5,752,243

COMPUTER METHOD AND STORAGE STRUCTURE FOR STORING AND ACCESSING MULTIDIMENSIONAL DATA

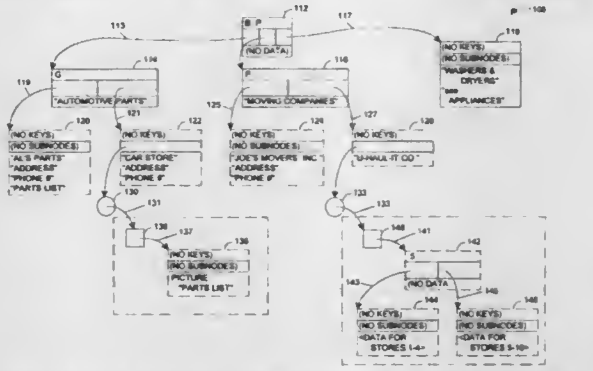
Allen Reiter, Haifa, Israel, and Ian Charles Jose, Bellevue, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 139,916, Oct. 20, 1993, abandoned.

This application Oct. 8, 1996, Ser. No. 727,131

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—3 **24 Claims**



1. A method in a computer system having hierarchically-related data objects for storing a data object on a storage device, the method comprising the steps of:

- providing a first node entry having a first associated node identifier on the storage device as part of a tree data structure that indexes the hierarchically-related data objects, the first node entry comprising a table for storing key values and a table for storage identifying information for subnodes, and a first data area for storing at least one data object;
- receiving a request to store the data object on the storage device;
- determining whether the data object can be stored in the first data area;
- when it is determined that the data object cannot be stored in the first data area,
  - creating a new node entry on the storage device, the new node entry having a new node identifier and comprising a new key value table, a new subnode table, and a new data area,
  - storing the data object in the new data area,
  - creating a pointer node entry on the storage device, the pointer node entry having a pointer node identifier,
  - storing the new node identifier in the pointer node entry, and
  - storing the pointer node identifier in the first subnode table; and
- when it is determined that the data object can be stored in the first data area, storing the data object in the first data area.

5,752,244

COMPUTERIZED MULTIMEDIA ASSET MANAGEMENT SYSTEM

Scott M. Rose, Northbrook, Ill., and Piyush M. Patel, North Weald, United Kingdom, assignors to Andersen Consulting LLP, Chicago, Ill.

Filed Jul. 15, 1996, Ser. No. 679,573

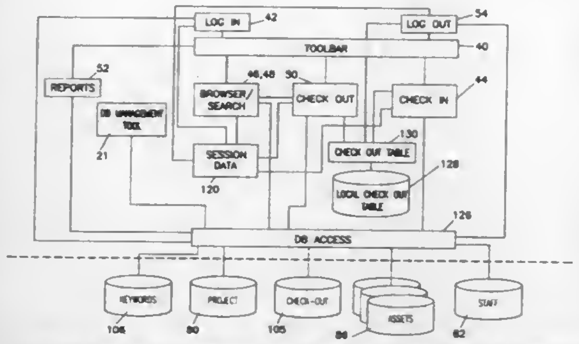
Int. Cl.^{6} G06F *7/00;7/06*

U.S. Cl. 707—5 **54 Claims**

1. A computerized method of managing multimedia assets of one or more of image, video, audio, text, and program code media types, including the steps of:

(a) checking in multimedia assets of one or more of image, video, audio, text, and program code media types, upon a user's request, the checking-in step for each multimedia asset checked in including the steps of:

- i) prompting the user for characteristics and identification information for a multimedia asset to be checked in; and
- ii) storing the multimedia asset to be checked in, along with any specified characteristics and identification information, in a database contained on a storage device;



(b) upon the user's request, searching the database for multimedia assets, including the steps of:
  i) prompting the user for a search strategy based on one or more of asset characteristics and asset identification information;
  ii) searching the database for multimedia assets that satisfy the user-specified search strategy; and
  iii) reporting any multimedia assets found to satisfy the search strategy; and

(c) upon the user's request, selectively checking out a multimedia asset contained in the database, including the steps of:
  i) prompting the user for a multimedia asset to be checked out, and prompting the user for one of multiple check-out types;
  ii) determining if the user-specified check-out is allowed based on predetermined criteria; and
  iii) if the user-specified check-out is allowed, copying the multimedia asset to be checked out, for use by the user, and storing an indication of the check-out and the type of check-out in the database.

5,752,245

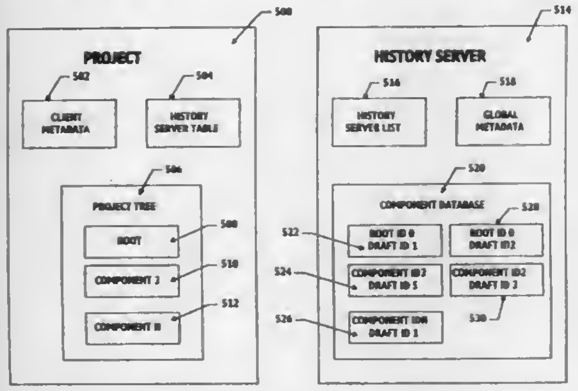
OBJECT-ORIENTED SYSTEM FOR CONFIGURATION HISTORY MANAGEMENT WITH A PROJECT WORKSPACE AND PROJECT HISTORY DATABASE FOR DRAFT IDENTIFICATION

Jeff W. Parrish, Los Altos, and Farzin Maghoul, Hayward, both of Calif., assignors to Object Technology Licensing Corporation, Cupertino, Calif.

Filed Dec. 9, 1994, Ser. No. 353,027

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—10 **24 Claims**



1. A method for assembling in a project workspace, a version of a program configuration comprising a plurality of software program components, each of said software components being stored in a tree structure and containing member properties including at least one draft identifier identifying a draft of said component as belonging to said program configuration version, comprising the steps of:

A. creating a program component database and storing in the program component database a plurality of program component drafts, each of said program component drafts including a draft identifier identifying said program component draft as being associated with a program configuration version;

B. using information in the project workspace to locate said program component database and send a program component request including a component draft identifier for each component belonging to said program configuration version to said program component database; and

C. retrieving program component drafts from the program component database in response to said program component request using said draft identifier to identify said program component drafts belonging to said program configuration version.

5,752,246

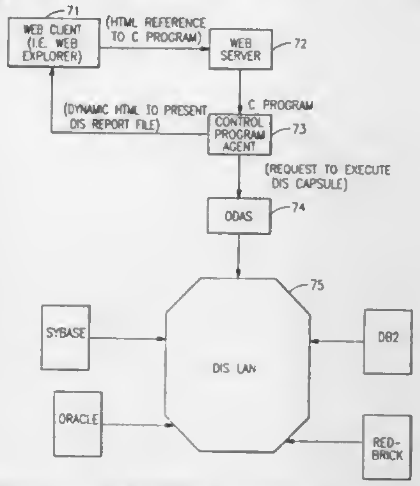
SERVICE AGENT FOR FULFILLING REQUESTS OF A WEB BROWSER

Richard Michael Rogers, Beacon, N.Y., and Konrad Charles Lagarde, Milford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 474,576

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—10 **34 Claims**


71
WEB CLIENT (I.E. WEB EXPLORER)
(HTML REFERENCE TO C PROGRAM)
WEB SERVER
72
C PROGRAM
(DYNAMIC HTML TO PRESENT DIS REPORT FILE)
CONTROL PROGRAM AGENT
73
(REQUEST TO EXECUTE DIS CAPSULE)
ODAS
74
75
SYBASE
DIS LAN
DB2
ORACLE
RED-BRICK

32. A service agent for fulfilling requests of a web browser client coupled to a network; comprising: a control program agent tangibly embodying a program of instructions executable by a supporting machine environment for performing method steps for receiving a request initiated at said web browser client and fulfilling the request by providing a result, said method steps comprising:

displaying an HTML document to said web browser;

invoking a control program agent;

receiving data entered by the user from the HTML document and passing said user entered data to said control program agent upon invocation as input parameters to said control program agent that were returned from said HTML document; and storing said input parameters in a buffer;

retrieving with the control program agent from a store command files and the variable names associated with each command files and loading into memory associated with the control program the command file names available and the variable names associated with each command file;

initiating with the control program agent a connection between said control program agent and an API;

once a command file is loaded into memory for said control program agent, retrieving with said control program agent from its memory the command file variable names associated with a command file name passed to the control program agent once the control program agent is invoked;

subsequently, creating with said control program agent a data array stored in the control program memory containing the command file variable names and the values for them that were passed to the control program agent during initial data retrieval steps in order to match command file variable names with the data that was passed to the control program agent with said environment variables step;

subsequently, in preparation for a command file report, creating with said program command agent a unique filename which may include data originated by the HTML document's variables stored in said buffer to pass to the command file as a command file variable for use in naming the report which will be created by the command file, which as a result the command file will create that file with the unique file name during its process;

subsequently, using the API to set the command file variable values, in anticipation of command file execution, obtaining the values of variables used by the command file from the data array in the control program memory containing the command file variable names and the values for them that were passed to the control program agent as input parameters to said control program agent as query data from the HTML document that referred to said control program agent which contains values selected by the user and/or default values selected by a HTML document designer set in a command file program prior to its execution;

subsequently, using an API to query and determine the size of a queue of jobs being requested, and comparing whether the size has exceeded a predetermined threshold number of jobs being requested, and if so, then entering a wait state loop to wait and reiteratively comparing whether the size still has exceeded said predetermined threshold number of jobs being requested until the queue size is reduced to below said threshold level, and then at that point using said API to submit a command file for execution by a sub-agent to create a resulting file identified by said unique filename;

after the API has submitted said command file for execution by a sub agent, said control program agent enters a state of awaiting execution of said command file by said sub-agent;

and wherein after execution by said sub-agent, thereafter the control program agent reads the resulting file identified by said unique filename and dynamically creates new HTML statements to report results according to a request of the web browser with said unique filename identified.

5,752,247

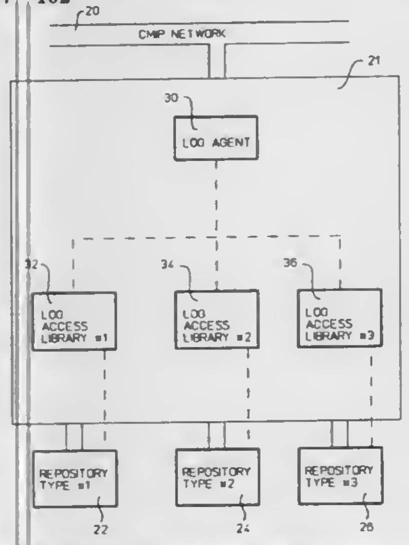
LOG ACCESS INTERFACE BETWEEN A NETWORK AND REPOSITORIES

Eric A. Henderson, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 30, 1996, Ser. No. 688,703

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—102 **9 Claims**



1. A telecommunications log access apparatus comprising:

a CMIP network;

a computer system connected to the CMIP network, the computer system receiving events to be logged and requests for logged events;

a log agent operating on the computer system, the log agent processing the network events to be logged and requests for logged events by executing a set of standardized functions;

a plurality of repository types connected to the computer system for storing the logged events, each repository type having a corresponding application specific interface; and

a plurality of log access libraries operating on the computer system, each log access library controlling a corresponding repository through the corresponding application specific interface based upon the functions executed by the log agent.

5,752,248

Patent Not Issued For This Number

5,752,249

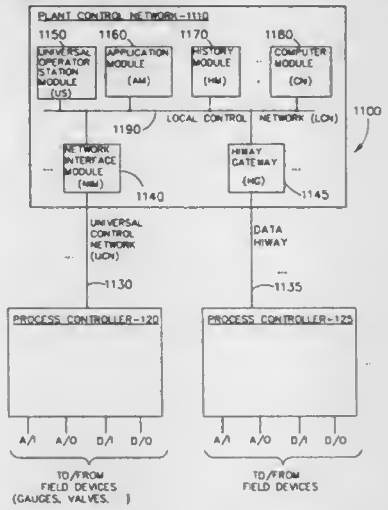
SYSTEM AND METHOD FOR INSTANTIATING A SHARABLE, PRESISTENT PARAMETERIZED COLLECTION CLASS AND REAL TIME PROCESS CONTROL SYSTEM EMBODYING THE SAME

Charles E. Macon, Jr., 24413 N. 40th Dr., Glendale, Ariz. 85310, and William H. Morphew, 17714 N. 64th Dr., Glendale, Ariz. 85308

Filed Nov. 14, 1996, Ser. No. 749,315

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—103 **38 Claims**



1. A computer system, comprising:

a memory containing an operating system capable of operating on one or more parameterized collection classes;

a persistent data store, coupled to said memory, in which a parameterized collection class is memory-mapped; and

a processor, associated with said memory and said persistent data store, that instantiates an occurrence of said parameterized collection class in said memory, said parameterized collection class thereby becoming persistent, and provides direct access by at least one routine executing in said processor to said persistent parameterized collection class, said persistent parameterized collection class surviving termination of said at least one routine.

5,752,250

INSTANCE UPDATING METHOD AND APPARATUS THEREFOR

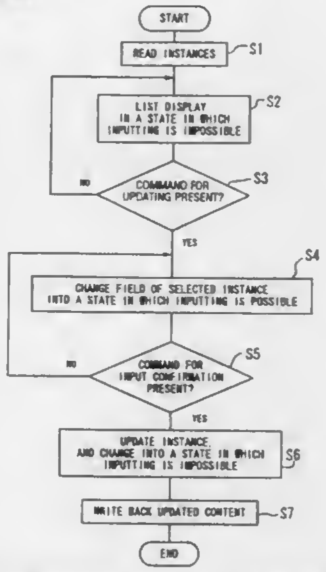
Masamitsu Minatogawa, Yatsuomachi; Maki Sakuta, Kawasaki; Kazuko Ichie, Yatsuomachi; Chikako Momoyama, Yatsuomachi; Takahiro Hayashi, Yatsuomachi; Yuhko Hanada, Yatsuomachi, and Tomonori Suda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 12, 1995, Ser. No. 527,129

Claims priority, application Japan, Dec. 2, 1994, 6-299425; Dec. 28, 1994, 6-326543

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—200 **10 Claims**


START
READ INSTANCES
S1
LIST DISPLAY IN A STATE IN WHICH INPUTTING IS IMPOSSIBLE
S2
COMMAND FOR UPDATING PRESENT?
S3
NO
YES
CHANGE FIELD OF SELECTED INSTANCE INTO A STATE IN WHICH INPUTTING IS POSSIBLE
S4
COMMAND FOR INPUT CONFIRMATION PRESENT?
S5
NO
YES
UPDATE INSTANCE, AND CHANGE INTO A STATE IN WHICH INPUTTING IS IMPOSSIBLE
S6
WRITE BACK UPDATED CONTENT
S7
END

1. An instance updating method of updating instances in a database, comprising the steps of:

reading necessary instances from a storage medium storing an assembly of instances;

displaying the read instances by a list in a state in which inputting is impossible;

selecting an instance to be updated from the displayed instances in the state in which inputting is impossible;

changing a field of the selected instance into a state in which inputting is possible in accordance with a command for updating of the instance;

inputting a new instance and displaying the inputted content as a new instance;

returning said field to the state in which inputting is impossible in accordance with a command for input confirmation; and

writing back and storing the updated content to the assembly of instances in said storage medium.

5,752,251

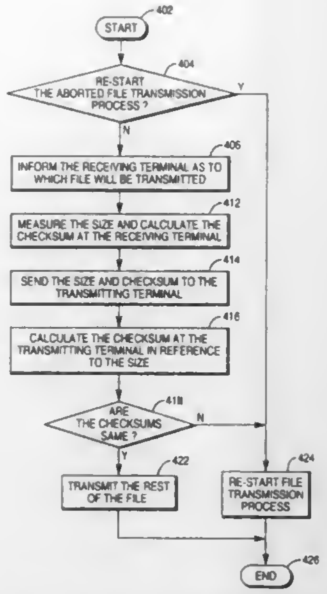
METHOD AND APPARATUS FOR RECOVERING ABORTED FILE (OR DATA) TRANSMISSION

Michael J. Cripps, Lincroft, N.J., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 512,042, Aug. 7, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 912,457

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—202 **12 Claims**


402
START
404
RE-START THE ABORTED FILE TRANSMISSION PROCESS ?
Y
N
405
INFORM THE RECEIVING TERMINAL AS TO WHICH FILE WILL BE TRANSMITTED
412
MEASURE THE SIZE AND CALCULATE THE CHECKSUM AT THE RECEIVING TERMINAL
414
SEND THE SIZE AND CHECKSUM TO THE TRANSMITTING TERMINAL
416
CALCULATE THE CHECKSUM AT THE TRANSMITTING TERMINAL IN REFERENCE TO THE SIZE
418
ARE THE CHECKSUMS SAME ?
N
Y
422
TRANSMIT THE REST OF THE FILE
424
RE-START FILE TRANSMISSION PROCESS
426
END

1. A system for performing a file transmitting process from a transmitting terminal to a receiving terminal, comprising:

the receiving terminal including:

a processor circuitry for generating a first value for a portion of a file received at the receiving terminal, and for generating a size for the portion of the file received at the received terminal, said portion of the file containing a plurality of data blocks, said first value being calculated based on contents of said portion of said received file;

a transmitting circuitry for sending said first value and size from the receiving terminal to the transmitting terminal;

the transmitting terminal including:

a processor circuitry for generating a second value for a corresponding portion of a corresponding file stored at the transmitting terminal, said corresponding portion of said corresponding file at the transmitting terminal containing a plurality of data blocks and being indicated by said size from the receiving terminal, said second value being calculated based on contents of said corresponding portion of said corresponding file;

a processor circuitry for comparing said first value generated at the receiving terminal with said second value generated at the transmitting terminal; and

a transmitting circuitry for transmitting said corresponding file from the transmitting terminal to the receiving terminal if said first value generated at the receiving terminal does not match said second value generated at the transmitting terminal, and transmitting remaining portion of said corresponding file from the transmitting terminal to the receiving terminal if said first value generated at the receiving terminal matches said second value generated at the transmitting terminal.

5,752,252

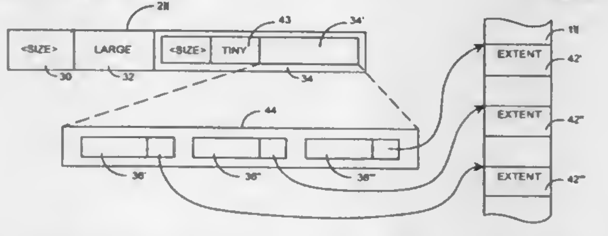
STORAGE OF FILE DATA ON DISK IN MULTIPLE REPRESENTATIONS

Mark Zbikowski, Woodinville, and Robert I. Ferguson, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 85,543, Jun. 30, 1993, abandoned. This application Jul. 31, 1996, Ser. No. 690,014

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 707—205 **21 Claims**



1. In a file system of a data processing system having secondary storage, a method of storing a file in file storage structures provided by the file system on the secondary storage by the file system, comprising the steps of:

(a) storing at least a portion of contents of the file in a first stream file storage structure of a given type on the secondary storage;

(b) storing a first stream descriptor for the first stream file storage structure on the secondary storage, said first stream descriptor having a description field and a type field, and said storing of the first stream descriptor comprising the steps of:

(i) storing a description of the first stream file storage structure in the description field of the first stream descriptor; and

(ii) storing a type identifier that identifies the type of the first stream file storage structure in the type field of the first stream descriptor.

5,752,253

PROCESS AND DEVICE FOR THE AUTOMATIC GENERATION OF SPREADSHEETS

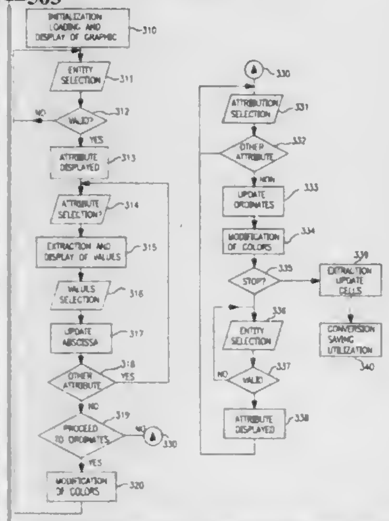
Jean Paul Geymond, Clamart, and Massimo Paltrinieri, Paris, both of France, assignors to Bull, S.A., Paris, France

Filed Jun. 28, 1995, Ser. No. 495,963

Claims priority, application France, Jun. 28, 1994, 94 07909

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—503 **14 Claims**



1. A process implemented on a graphical user interface for the automatic generation of a spreadsheet from a model of an entity-relationship type which serves as a support for a relational data base model, comprising the steps of displaying said data base model of the entity-relationship type on a screen of an information system in the form of a graph composed of a plurality of entities and relationships represented respectively by first and second types of objects and linked by lines, said graph being physically embodied in memory by a set of relational tables, and automatically defining said spreadsheet by selection, from among various types of objects in said graph, of elements which are memorized to enable plotting of abscissa and ordinate data of the graph and compose the contents of cells of the spreadsheet thus formed.

5,752,254

METHOD AND SYSTEM FOR CONTROLLING CLIPBOARDS IN A SHARED APPLICATION PROGAM

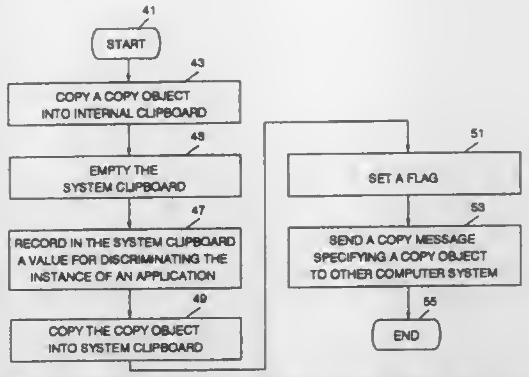
Takashi Sakairi, Yamato, Japan, assignor to International Business Machine Corp., Armonk, N.Y.

Filed Apr. 8, 1996, Ser. No. 630,705

Claims priority, application Japan, May 26, 1995, 6-127940

Int. Cl.^{6} G06F *17/24*

U.S. Cl. 707—530 **8 Claims**


41
START
43
COPY A COPY OBJECT INTO INTERNAL CLIPBOARD
45
EMPTY THE SYSTEM CLIPBOARD
47
RECORD IN THE SYSTEM CLIPBOARD A VALUE FOR DISCRIMINATING THE INSTANCE OF AN APPLICATION
49
COPY THE COPY OBJECT INTO SYSTEM CLIPBOARD
51
SET A FLAG
53
SEND A COPY MESSAGE SPECIFYING A COPY OBJECT TO OTHER COMPUTER SYSTEM
55
END

1. A group editor which operates to share the results of input and editing operations for a computer network system having a plurality of computer systems, each of the computer systems having an internal clipboard associated with the group editor and a system clipboard associated with the computer systems, the group editor comprising:

means for copying a copy object into said internal clipboard in response to a copy instruction with a specification of said copy object;

means for setting a group editor identifier in said system clipboard, and copying said copy object into said system clipboard in response to said copy instruction;

means for sending a copy message specifying said copy object to said plurality of computer systems in response to said copy instruction;

means responsive to an instruction from the group editor to execute a paste operation specifying a paste destination for determining if a group editor identifier set in the system clipboard identifies the group editor;

means for performing a paste operation from the internal clipboard to said specified paste destination if said group identifier set in the system clipboard identifies the group editor;

means for sending a paste message specifying a paste destination to said other computer systems in response to said means for performing a paste operation;

means for pasting data from said system clipboard if said group identifier set in the system clipboard does not identify the group editor;

means for sending data from said system clipboard to said other computer systems with a specification of a paste destination if said group identifier set in the system clipboard does not identify the group editor;

means for copying into said internal clipboard when said copy message is received from any of said other computer systems; and

means for performing a paste operation from said internal clipboard when said paste message is received from any of said other computer systems.

5,752,255

DYNAMIC NON-COHERENT CACHE MEMORY RESIZING MECHANISM

Neil Alasdair James Jarvis, Reading, United Kingdom, assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 130,060, Sep. 30, 1993, abandoned. This application Feb. 3, 1997, Ser. No. 794,565

Claims priority, application United Kingdom, Oct. 1, 1992, 9220702

Int. Cl.^{6} G06F *12/00*

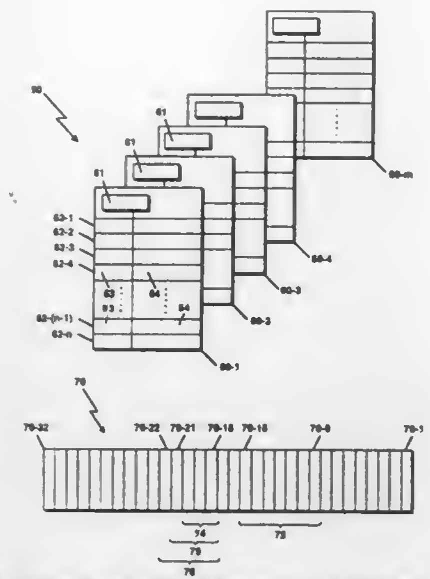
U.S. Cl. 711—3 **8 Claims**

1. A method for resizing a non-coherent cache wherein said cache memory space is sub-divided into a number of pages, each page containing a memory space for a predetermined number of entries, said method including the steps of:

a) setting a cache size of a first number of pages;

b) receiving data items each including a key value and storing said data in said cache at addresses on pages determined by a first selection process operating on said key value;

c) monitoring cache usage to determine whether said first number of cache pages should be increased or decreased;



d) in the event that said first number of cache pages should be increased or decreased, receiving further data items and storing said further data items at addresses on pages in the cache according to a second selection process different to said first selection process, said second selection process operating on said key value such that said key value maps to remaining cache pages in the event of a decrease in cache size and to added cache pages in the event of an increase in cache size.

5,752,256
DISK ARRAY APPARATUS AND METHOD FOR DIVIDING AND READING/WRITING PARTIAL DATA ACROSS A PLURALITY OF DRIVE GROUPS UTILIZING PARALLEL PROCESSING

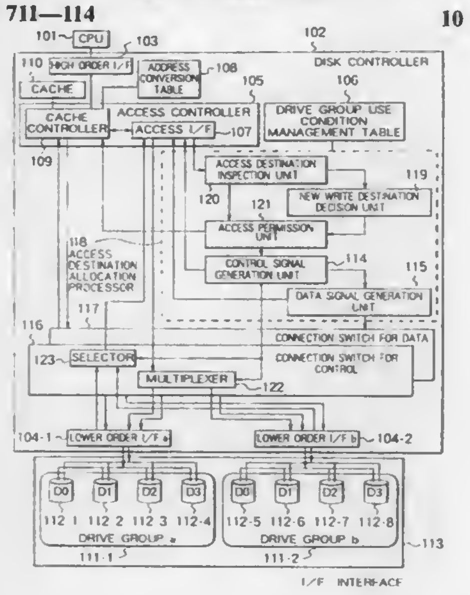
Hiroaki Fujil, Hadano; Hitoshi Kakuta, Tokyo, and Yoshifumi Takamoto, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,446

Claims priority, application Japan, May 27, 1993, 5-125778

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 711—114 **10 Claims**



5. A disk access method in a disk apparatus having a plurality of memory disks and a disk controller connected to said memory disks, said method comprising the steps of:

grouping a plurality of said memory disks into a plurality of drive groups;

dividing a data set into a plurality of partial data each having a data quantity which is capable of being processed at one time by each of said drive groups when data are received from an external apparatus connected to said disk controller;

transferring said plurality of partial data to said drive groups; and

writing said partial data into said memory disks in said drive groups, wherein said transferring step is executed in parallel with said writing step.

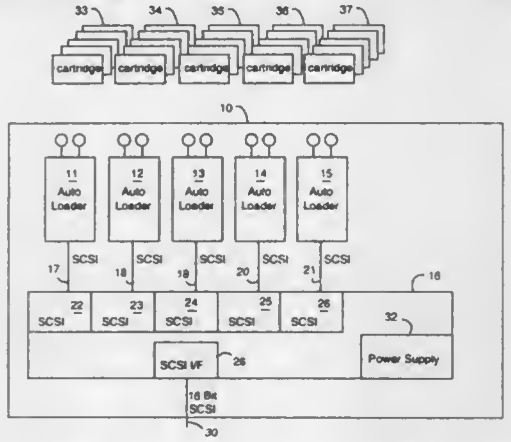
5,752,257
REDUNDANT ARRAY OF REMOVABLE CARTRIDGE DISK DRIVES

Jean-Louis Ripoll; Marc Frouin, both of Avranches, France, and Frederic Janon, Mountain View, Calif., assignors to Nomai SA, Avranches cedex, France

Filed Jul. 29, 1994, Ser. No. 283,094

Int. Cl.^{6} G06F *12/16*

U.S. Cl. 711—114 **3 Claims**



1. A computer data storage memory system (**10**), comprising:

a plurality of removable cartridge disk drives (**33–37**) for reading and writing data on interchangeable hard disk cartridges, wherein one of the plurality of removable cartridge disk drives is limited to reading and writing error correction and detection data;

a peripheral controller connected to each of the removable cartridge disk drives;

a host interface (**28, 66, 70**) having a host data input/output (I/O) port (**30, 80**) and connected to the peripheral controller;

data parsing means (**96, 106**) connected to the peripheral controller and the host interface for accepting data from said host data I/O port and for parsing, distributing and recombining said data amongst the plurality of removable cartridge disk drives according to a signature code recorded on a plurality of interchangeable hard disk cartridges then present in the plurality of removable cartridge disk drives;

a plurality of interchangeable hard disk cartridges (**33–37**) for loading into respective ones of the plurality of removable cartridge disk drives and each having a unique one of said signature codes;

signature assignment means (**10, 28, 96, 106, 114**) connected to the peripheral interface controller for recognizing the absence of a signature code in the plurality of interchangeable hard disk cartridges loaded into respective ones of the plurality of removable cartridge disk drives and for writing a unique one of said signature codes on respective ones of said hard disk cartridges;

first error detection and correction means (**112**) connected to the plurality of removable cartridge disk drives for generating correction codes for data received from said host data I/O port on the plurality of interchangeable hard disk cartridges;

second error detection and correction means (**112**) connected to the plurality of removable cartridge disk drives for reading data and correction codes received from the plurality of

interchangeable hard disk cartridges and for correcting and rebuilding data that is forwarded to said host data I/O port; and

a computer-implemented program (**96**) for verifying which set of the plurality of interchangeable hard disk cartridges are loaded in particular ones of the plurality of removable cartridge disk drives such that the sequence and order of data contained in each interchangeable hard disk cartridge is electronically manipulated and shuffled for reconstruction of the whole data as it had been originally presented to said host data I/O port.

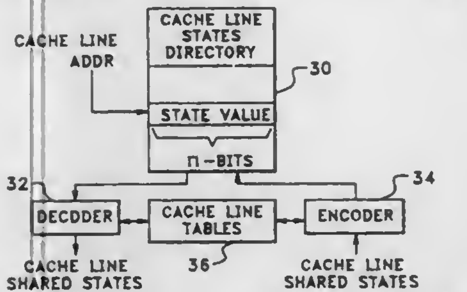
5,752,258
ENCODING METHOD FOR DIRECTORY STATE IN CACHE COHERENT DISTRIBUTED SHARED MEMORY SYSTEM

Aleksandr Guzovskiy, Lowell; Robert C. Zak, Jr., Lexington, and Mark Bromley, Andover, all of Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 1, 1996, Ser. No. 672,946

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 711—120 **10 Claims**



1. Directory system apparatus for directing cache line access requests from processors in a multi-processor system with a shared memory system, each of the processors having a cache, each of the caches storing cache lines, each cache line owned by the processor controlling the cache that the cache line resides in, each cache line available for sharing with all of the processors in the multi-processor system, said directory system apparatus comprising:

a cache line states directory storing a state value that identifies a cache line shared states word;

said cache line shared states word identifying the processor that owns the cache line and the state of access of each processor that shares access to the cache line;

a state value encoder responsive to a cache line shared state word for encoding the cache line shared state word into a state value and loading the state value into the cache line states directory; and

a state value decoder responsive to a state value from said cache line states directory for decoding the state value into a cache line shared state word for use by the cache line directory system in retrieving the cache line.

5,752,259
INSTRUCTION CACHE CONFIGURED TO PROVIDE INSTRUCTIONS TO A MICROPROCESSOR HAVING A CLOCK CYCLE TIME LESS THAN A CACHE ACCESS TIME OF SAID INSTRUCTION CACHE

Thang M. Tran, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

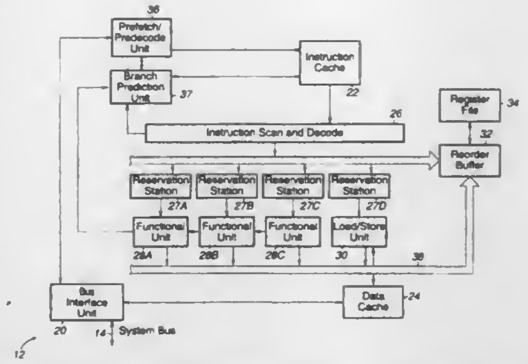
Filed Mar. 26, 1996, Ser. No. 621,960

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 711—125 **20 Claims**

1. An apparatus for providing instruction blocks in a microprocessor, comprising:

an instruction cache having a cache access time greater than a clock cycle time employed by said microprocessor, said instruction cache including a plurality of banks wherein a particular instruction block is stored within one of said plurality of banks; and



a branch prediction unit coupled to said instruction cache, wherein said branch prediction unit is configured to provide said instruction cache with a plurality of fetch addresses during a first clock cycle, said plurality of fetch addresses representing a portion of a predicted instruction stream, and wherein each of said plurality of fetch addresses accesses a different one of said plurality of banks;

wherein said instruction cache is configured to provide a plurality of instruction blocks, and wherein each of said plurality of instruction blocks corresponds to one of said plurality of fetch addresses, and wherein said instruction cache is configured to provide said plurality of instruction blocks during a plurality of consecutive clock cycles.

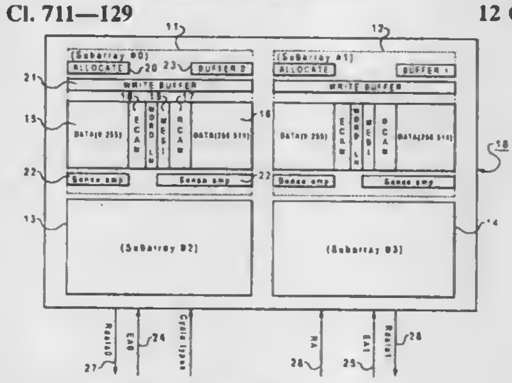
5,752,260
HIGH-SPEED, MULTIPLE-PORT, INTERLEAVED CACHE WITH ARBITRATION OF MULTIPLE ACCESS ADDRESSES

Peichun Peter Liu, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1996, Ser. No. 638,655

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 711—129 **12 Claims**



7. A cache memory comprising:

at least four subarrays of memory cells, each subarray containing a plurality of cache lines;

means for applying at least three addresses to said subarrays during a given cycle,

each subarray containing at least two content-addressable arrays for receiving said at least three addresses at one time for comparison of said addresses with tags stored in said content-addressable arrays,

arbitration means receiving signals associated with said at least three addresses, and producing a selection of one of said at least three addresses if a conflict appears between the addresses.

5,752,261

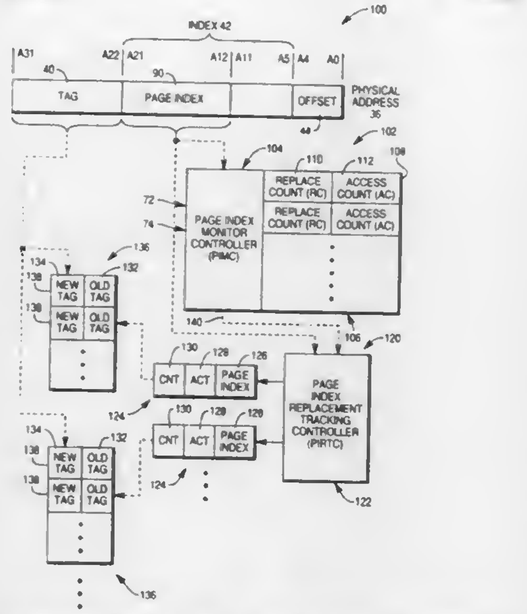
METHOD AND APPARATUS FOR DETECTING THRASHING IN A CACHE MEMORY

Arthur F. Cochcroft, Jr., West Columbia, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 7, 1996, Ser. No. 745,035

Int. Cl.^{6} G06F *12/12*

U.S. Cl. 711—133 **21 Claims**



11. A cache controller for a cache memory having a plurality of cache lines, the cache controller comprising:

a page index monitor configured to update a thrashing value associated with a cache line identified by a first page index;

a page index tracker coupled to said page index monitor, said page index tracker including a tracking controller and a replacement tracking store;

said tracking controller configured to store a first tag and a second tag in said replacement tracking store when a first data stored in said cache line is replaced with a second data; and

wherein said first data is also stored in a first main memory location identified by a first address having said first page index and said first tag, and said second data is stored in a second main memory location identified by a second address having said first page index and said second tag.

5,752,262

SYSTEM AND METHOD FOR ENABLING AND DISABLING WRITEBACK CACHE

David K. Cassetti, Tempe, and Philip Wszolek, Phoenix, both of Ariz., assignors to VLSI Technology, San Jose, Calif.

Filed Jul. 25, 1996, Ser. No. 687,242

Int. Cl.^{6} G06F *12/12*

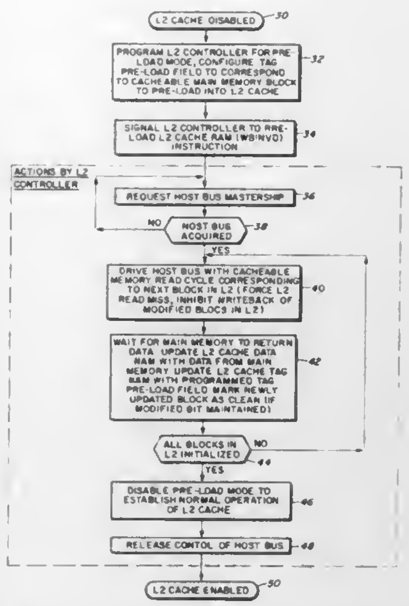
U.S. Cl. 711—135 **4 Claims**

1. A method for controlling a cache memory in a computer system having a central processing unit (CPU), a host bus, a system controller, a main memory and a cache memory having a data portion and a tag portion including the steps of:

disabling said cache memory on power on and system reset to prevent initial values of the tag portion of said cache memory from causing false hits to the data portion of said cache memory;

pre-loading said cache memory data portion and tag portion in response to signals from said CPU which configure said system controller to determine from which block of main memory said cache memory is to be pre-loaded;

relinquishing control of the host bus by the system controller after initializing the cache memory;


L2 CACHE DISABLED
PROGRAM L2 CONTROLLER FOR PRE-LOAD MODE, CONFIGURE TAG PRE-LOAD FIELD TO CORRESPOND TO CACHEABLE MAIN MEMORY BLOCK TO PRE-LOAD INTO L2 CACHE
SIGNAL L2 CONTROLLER TO PRE-LOAD L2 CACHE RAM (WB/INVD) INSTRUCTION
ACTIONS BY L2 CONTROLLER
REQUEST HOST BUS MASTERSHIP
NO
HOST BUS ACQUIRED
YES
DRIVE HOST BUS WITH CACHEABLE MEMORY READ CYCLE CORRESPONDING TO NEXT BLOCK IN L2 (FORCE L2 READ MISS, INHIBIT WRITEBACK OF MODIFIED BLOCS IN L2)
WAIT FOR MAIN MEMORY TO RETURN DATA UPDATE L2 CACHE DATA RAM WITH DATA FROM MAIN MEMORY UPDATE L2 CACHE TAG RAM WITH PROGRAMMED TAG PRE-LOAD FIELD MARK NEWLY UPDATED BLOCK AS CLEAN (IF MODIFIED BIT MAINTAINED)
ALL BLOCKS IN L2 INITIALIZED
DISABLE PRE-LOAD MODE TO ESTABLISH NORMAL OPERATION OF L2 CACHE
RELEASE CONTOL OF HOST BUS
L2 CACHE ENABLED

signaling said system controller from said CPU to flush said cache memory for writing data therefrom back to said main memory;

driving the host bus with cacheable memory read cycles corresponding to the next block in said cache memory; and

writing back blocks to said main memory if the corresponding block in said cache memory is modified until all blocks in said cache memory are accessed; and

releasing control of said host bus by said system controller to said CPU.

5,752,263

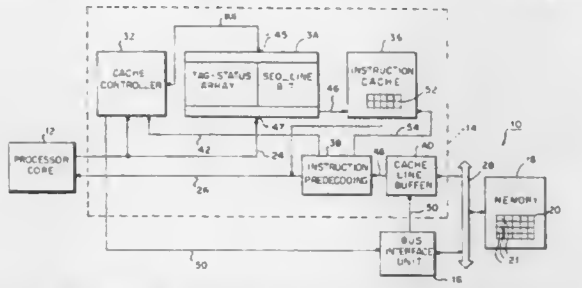
APPARATUS AND METHOD FOR REDUCING READ MISS LATENCY BY PREDICTING SEQUENTIAL INSTRUCTION READ-AHEADS

Uwe Kranich, Munich, Germany, assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 5, 1995, Ser. No. 464,351

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 711—137 **19 Claims**



1. An apparatus for supplying instructions to a processor of an execution unit comprising:

a cache memory;

a controller for fetching from a memory a line of instructions including a first instruction requested by said processor; and

an instruction predecoding unit for determining if all instructions in said line of instructions are sequential and for outputting a sequential instruction signal indicative of whether or not said all instructions in said line of instructions are sequential, wherein, if said sequential instruction signal indicates that said all instructions in said line of instructions are sequential, said controller loads a buffer with a line of instructions beginning at an address of an immediately next line of instructions if said immediately next line of instructions is not stored in said cache memory,

wherein said instruction predecoding unit determines, prior to said execution unit performing execution of any of said instructions in said line of instructions, whether or not said all instructions in said line of instructions are sequential.

5,752,264

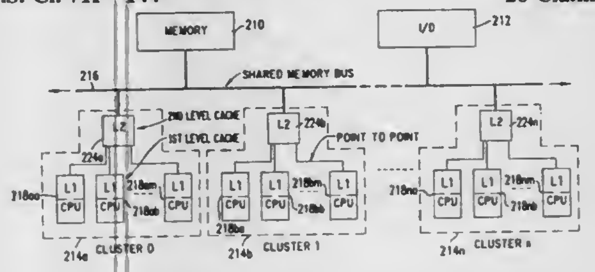
COMPUTER ARCHITECTURE INCORPORATING PROCESSOR CLUSTERS AND HIERARCHICAL CACHE MEMORIES

Michael Andrew Blake, Wappingers Falls; Carl Benjamin Ford, III, and Pak-kin Mak, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 414,670, Mar. 31, 1995, abandoned. This application Aug. 15, 1996, Ser. No. 698,192

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 711—144 **26 Claims**



1. A cache architecture for a computer system having multiple processors comprising:

a plurality of level one caches, each said level one cache being operatively coupled to one of the multiple processors of the computer system to form a plurality of processor-level oNE cache pairs and each said level one cache being a store-through cache;

a plurality of level two caches, each of said level two caches being operatively coupled to two or more of said processor-level one cache pairs to form a cluster, and each of said level two caches having a plurality of level two directory states for the purpose of maintaining coherency among all of said caches; wherein for each said level two cache said level two directory states describe the status of the data stored in said level two cache as being invalid, exclusive to said level two cache, or read only to said level two cache; and wherein for each said level two cache said level two directory states describe the status of the data stored in said level one caches that are operatively coupled to said level two cache as being invalid, exclusive to one of said level once caches that are operatively coupled to said level two cache, or read only to one or more of said level one caches that are operatively coupled to said level two cache;

wherein when a level one cache within a cluster updates the data, the status of the level two directory states is examined and castouts sent only to the level one caches that have exclusive or read only ownership of the data;

a plurality of point to point buses, each said point to point bus coupling one of said processor-level one cache pairs to one of said level two caches;

a shared bus, said shared bus coupling together said level two caches; and

wherein each of said level two caches further comprise a shared bus castout buffer for temporary storage of data in response to one of either a snoop command or a store command.

5,752,265

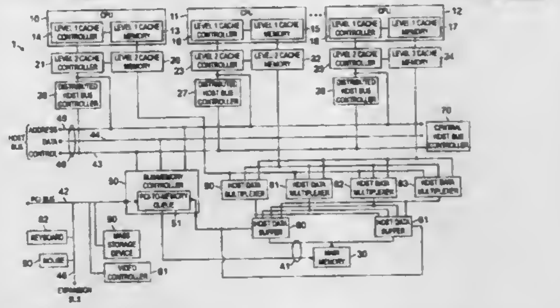
MEMORY ACCESSING IN A MULTI-PROCESSOR SYSTEM USING SNOOPING

Bassam N. Elkhoury, Longmont, Colo.; Scott T. McFarland, Kingwood, and Miguel A. Perez, Tomball, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 13, 1996, Ser. No. 662,479

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 711—146 **24 Claims**



1. A method comprising:

performing a memory access cycle from a first one of the processors of a multi-processor system to a memory address in the multi-processor system including:

initiating the memory access cycle;

initiating a snoop routine with respect to the memory address prior to completion of the memory access cycle; and

continuing the memory access cycle without awaiting responses from another one of the processors of the system if a second one of the processors of the system provides a signal which indicates that immediate completion of the memory access cycle will not disturb the integrity of data stored in the system.

5,752,266

METHOD CONTROLLING MEMORY ACCESS OPERATIONS BY CHANGING RESPECTIVE PRIORITIES THEREOF, BASED ON A SITUATION OF THE MEMORY, AND A SYSTEM AND AN INTEGRATED CIRCUIT IMPLEMENTING THE METHOD

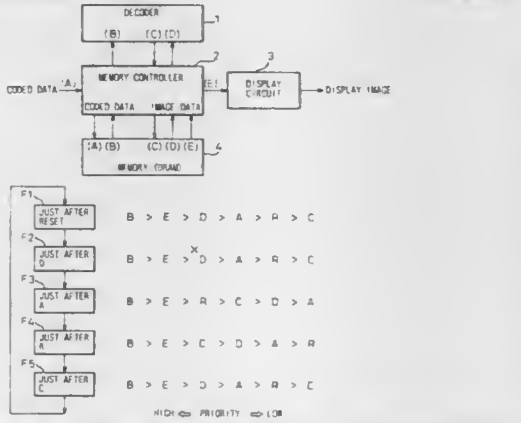
Katsuki Miyawaki; Yukio Otobe; Kimihiko Kazui; Hideki Miyasaka, all of Kawasaki; Yasunori Ueno, Yokohama, and Kouji Maruyama, Fukuoka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1995, Ser. No. 571,493

Claims priority, application Japan, Mar. 13, 1995, 7-052610

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 711—158 **35 Claims**



12. An image decoding apparatus for decoding compressed and coded data comprising:

an image decoding circuit decoding coded data of a compressed image into decoded image data of expanded coded data and providing said decoded image data as an output;

a memory storing said coded data and said decoded image data in a time sharing manner; and a memory control circuit selectively changing respective priorities of memory access operations of writing and reading to and from said memory depending on a situation of said memory, and arbitrating and scheduling the memory access operations according to said respective, changed priorities, thereby avoiding concentration on or rejection of a specific memory access operation and eliminating an ineffective period.

5,752,267

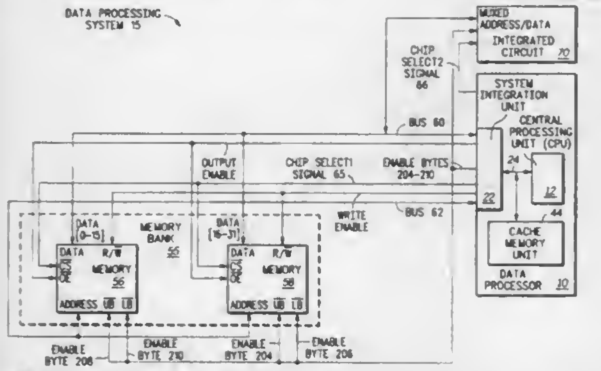
DATA PROCESSING SYSTEM FOR ACCESSING AN EXTERNAL DEVICE DURING A BURST MODE OF OPERATION AND METHOD THEREFOR

William C. Moyer, Dripping Springs; Charles Kirtland, and John H. Arends, both of Austin, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 27, 1995, Ser. No. 534,763

Int. Cl.^{6} G06F ***13/00***

U.S. Cl. 711—167 **32 Claims**



19. A method for accessing at least one of a plurality of external devices in a data processor, comprising the steps of:

communicating a plurality of address values, a plurality of data values, and a plurality of control values with a central processing unit;

coupling a compare circuit to the central processing unit for receiving the plurality of address values;

enabling the compare circuit to provide a first compare signal indicating an address range which includes a first one of the plurality of address values;

coupling a control circuit to the central processing unit for receiving the plurality of control values;

coupling the control circuit to the compare circuit for receiving the compare signal;

enabling the control circuit to provide a first control value corresponding to a first external device in response to the first compare signal and the control circuit providing a plurality of internal control signals;

coupling a control register to the control circuit for receiving the first control value;

enabling the control register to selectively provide a first memory access value to the control circuit in response to the first control value;

enabling the control register to selectively provide a second memory access value to the control circuit in response to the first control value;

enabling the control circuit to provide an external access enable signal having a first timing restriction for providing a memory enable signal which enables the data processor to perform a first memory access operation determined by the first memory access value; and

enabling the control circuit to provide the external access enable signal having a second timing restriction for providing the memory enable signal which enables the data processor to perform a second memory access operation determined by the second memory access value.

5,752,268

MINIMUM-DELAY RECOVERABLE DISK CONTROL SYSTEM USING CHECKPOINTS AND NONVOLATILE MEMORY

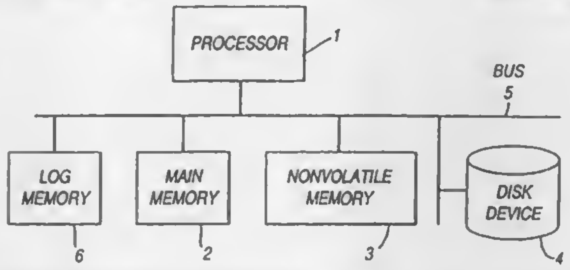
Kuniyasu Shimizu, Tokyo, and Hideaki Hirayama, Kanagawa-ken, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Apr. 15, 1996, Ser. No. 632,113

Claims priority, application Japan, Jun. 19, 1995, 7-151737

Int. Cl.^{6} G06K ***12/16***

U.S. Cl. 711—162 **18 Claims**



1. A computer system executing a checkpoint operation, the system restarting from a last checkpoint status if a fault occurred, the system comprising:

a disk device for reading and storing data;

an operating system for issuing a write or a read request to the disk device;

a nonvolatile memory;

write request storage means for storing write data and an associated write request in the nonvolatile memory;

means for notifying the operating system of a write completion after storing the write request and the associated write data in the nonvolatile memory, when the operating system issues a write request to the disk device; and

disk write means for storing write data, stored in the nonvolatile memory according to the write request generated before a last checkpoint, from the nonvolatile memory to the disk device after passing the last checkpoint.

5,752,269

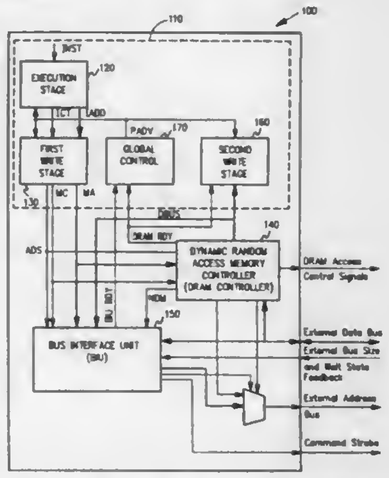
PIPELINED MICROPROCESSOR THAT PIPELINES MEMORY REQUESTS TO AN EXTERNAL MEMORY

Robert J. Divivier, San Jose; Ralph Haines, Atherton; Mario D. Nemirovsky, San Jose, and Alexander Perez, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1995, Ser. No. 451,150

Int. Cl.^{6} G06F ***12/02***

U.S. Cl. 711—169 **18 Claims**



1. A memory access circuit for pipelining memory requests, the circuit comprising:

a pipelined processor having a plurality of stages that simultaneously process a plurality of instructions;

an external memory connected to the pipelined processor; and

a memory controller connected to the pipelined processor and the external memory, the memory controller receiving a memory request from the pipelined processor, controlling the external memory to output information associated with the memory request when the information is held by the external memory, and asserting an early ready signal during a clock period that precedes a clock period where the information output from the external memory is valid, the early ready signal indicating that the information output from the external memory is valid during a next clock period,

the pipelined processor including a global controller connected to the stages and the memory controller that asserts a pipeline advance signal each time all of the instructions in the stages of the processor are to be advanced one step, the global controller asserting the pipeline advance signal during a second clock period when the early ready signal is asserted during a first clock period and a plurality of control signals are set to predefined logic states, the first clock period immediately preceding the second clock period.

5,752,270

METHOD OF EXECUTING READ AND WRITE OPERATIONS IN A SYNCHRONOUS RANDOM ACCESS MEMORY

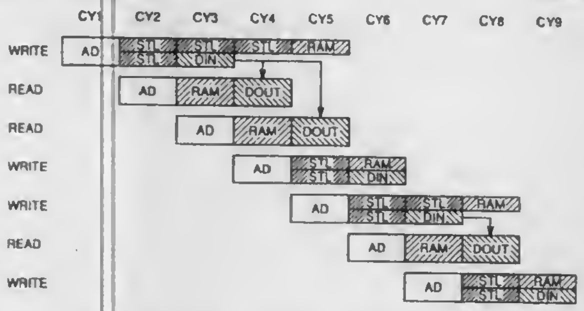
Tomohisa Wada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 605,565, Feb. 22, 1996, abandoned, which is a division of Ser. No. 354,767, Dec. 12, 1994, Pat. No. 5,515,325. This application Apr. 28, 1997, Ser. No. 846,206

Claims priority, application Japan, Dec. 24, 1993, 5-326919

Int. Cl.^{6} G06F ***13/16;12/00***

U.S. Cl. 711—169 **3 Claims**



1. A method of operating a synchronous random access memory having read operations and write operations, each read and write operation executed sequentially,

a read operation comprising a first step of fetching an address, a second step of accessing the random access memory array, and a third step of outputting data, the first through third steps performed in three distinct sequential machine cycles,

a write operation comprising a first step of fetching an address, a second step of accessing the random access memory array and a third step of inputting data, the first through third steps performed in at least three machine cycles with the second and third steps performed in the same machine cycle or a different machine cycle and the first step performed in a machine cycle which is distinct from the machine cycle in which the second and the third steps are performed, the method comprising the step of:

when a write operation is followed by a read operation

in the first machine cycle in which the write operation is, carrying out the first step of the write operation,

in the second machine cycle, carrying out the first step of the read operation,

in the third machine cycle, carrying out the third step of the write operation and the second step of the read operation and delaying the second step of the write operation until the second cycle of the next following write operation, and

in the fourth machine cycle, carrying out the third step of the read operation.

5,752,271

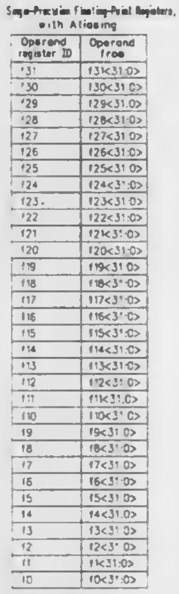
METHOD AND APPARATUS FOR USING DOUBLE PRECISION ADDRESSABLE REGISTERS FOR SINGLE PRECISION DATA

Robert Yung, Fremont, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Apr. 29, 1996, Ser. No. 639,456

Int. Cl.^{6} G06F ***12/00***

U.S. Cl. 711—171 **20 Claims**



Single-Precision Floating-Point Registers, with Aliasing

Operand register ID	Operand from
f31	f31<31:0>
f30	f30<31:0>
f29	f29<31:0>
f28	f28<31:0>
f27	f27<31:0>
f26	f26<31:0>
f25	f25<31:0>
f24	f24<31:0>
f23	f23<31:0>
f22	f22<31:0>
f21	f21<31:0>
f20	f20<31:0>
f19	f19<31:0>
f18	f18<31:0>
f17	f17<31:0>
f16	f16<31:0>
f15	f15<31:0>
f14	f14<31:0>
f13	f13<31:0>
f12	f12<31:0>
f11	f11<31:0>
f10	f10<31:0>
f9	f9<31:0>
f8	f8<31:0>
f7	f7<31:0>
f6	f6<31:0>
f5	f5<31:0>
f4	f4<31:0>
f3	f3<31:0>
f2	f2<31:0>
f1	f1<31:0>
f0	f0<31:0>

1. In a microprocessor having a first register file having a plurality of registers, each register being addressable as at least two single precision registers or as one double precision register, and a second register file having a plurality of registers addressable only as double precision registers and not as single precision registers, a method comprising the steps of:

writing single precision data to at least a first single precision register in said first register file;

storing the contents of a first double precision register containing said first single precision register to a second double precision register in said second register file; and

subsequently storing the contents of said second double precision register file back into said first register file.

5,752,272

MEMORY ACCESS CONTROL DEVICE WITH PREFETCH AND READ OUT BLOCK LENGTH CONTROL FUNCTIONS

Noboru Tanabe, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

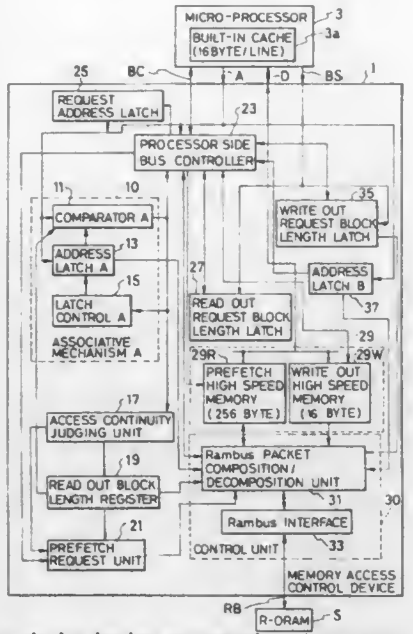
Continuation of Ser. No. 212,121, Mar. 14, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 729,319

Claims priority, application Japan, Mar. 12, 1993, 5-052526

Int. Cl.^{6} G06F ***12/00***

U.S. Cl. 711—171 **18 Claims**

1. A memory access control device for controlling memory accesses from a master device, comprising:


MICRO-PROCESSOR
3
BUILT-IN CACHE (16BYTE/LINE)
3a
25
BC
A
D
BS
1
REQUEST ADDRESS LATCH
23
PROCESSOR SIDE BUS CONTROLLER
11
10
COMPARATOR A
13
ADDRESS LATCH A
15
LATCH CONTROL A
ASSOCIATIVE MECHANISM A
35
WRITE OUT REQUEST BLOCK LENGTH LATCH
ADDRESS LATCH B
37
27
READ OUT REQUEST BLOCK LENGTH LATCH
29
29R
29W
PREFETCH HIGH SPEED MEMORY (256 BYTE)
WRITE OUT HIGH SPEED MEMORY (16 BYTE)
17
ACCESS CONTINUITY JUDGING UNIT
19
READ OUT BLOCK LENGTH REGISTER
21
PREFETCH REQUEST UNIT
Rambus PACKET COMPOSITION / DECOMPOSITION UNIT
31
30
Rambus INTERFACE
33
CONTROL UNIT
MEMORY ACCESS CONTROL DEVICE
RB
R-ORAM
S

a memory device having an operation characteristic of a high transmission bandwidth for continuous accesses;

a high speed memory for storing block data read from the memory device;

an access continuity judging unit for judging an access continuity of memory accesses made by the master device; and

a control unit for receiving an access request from the master device, and returning data requested by the access request from the high speed memory to the master device whenever the data requested by the access request are contained in the block data stored in the high speed memory, and otherwise reading new block data of a variable block length to be stored in the high speed memory from the memory device according to the access request received from the master device and the access continuity judged by the access continuity judging unit, such that the variable block length of the new block data is controlled to maintain an effective transmission bandwidth on a bus for accessing the memory device at a high level.

5,752,273

APPARATUS AND METHOD FOR EFFICIENTLY DETERMINING ADDRESSES FOR MISALIGNED DATA STORED IN MEMORY

Mario Nemirovsky, San Jose; Alexander Perez, Sunnyvale; Robert James Divivier, San Jose, and Narendra Sankar, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 450,154, May 26, 1995, abandoned. This application May 23, 1997, Ser. No. 863,092

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 711—201 **10 Claims**

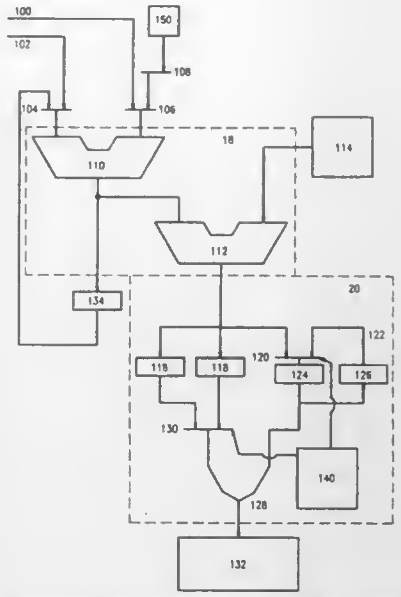
1. An apparatus for generating memory addresses for accessing misaligned data stored in a memory, comprising:

means for generating an offset value for an address, wherein the offset value corresponds to an amount by which a memory location is offset from a base address;

means for generating the base address;

means for adding the offset value and the base address to form a complete memory address;

control means for determining whether a piece of data stored at the complete memory address is misaligned, and if the piece of data is misaligned, for determining if generation of a memory address for the piece of data will produce a carry bit;



means for forming an incremented complete memory address when the control means determines that the piece of a memory added of data is misaligned and that generation of a memory address for the piece of data will produce a carry bit;

means for dividing the complete memory address and the incremented complete memory address into a set of most significant bits and a set of least significant bits;

means for incrementing a value of the set of least significant bits when the control means determines that the data is misaligned; and

means for combining the set of most significant bits and the incremented set of least significant bits to form a new address for memory, when the control means determines that the data is misaligned.

5,752,274

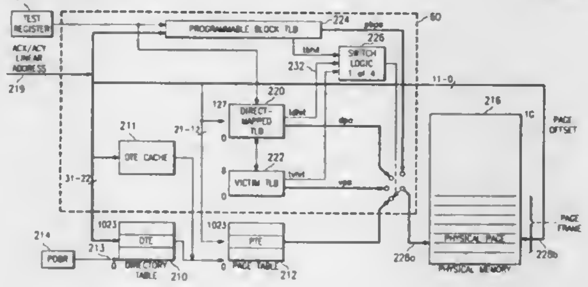
ADDRESS TRANSLATION UNIT EMPLOYING A VICTIM TLB

Raul A. Garibay, Jr., Richardson; Marc A. Quattromani, and Douglas Beard, both of Allen, all of Tex., assignors to Cyrix Corporation, Richardson, Tex.

Filed Nov. 8, 1994, Ser. No. 336,030

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 711—206 **14 Claims**



7. In a system employing direct-mapped and victim translation lookaside buffers, a method of address translation comprising steps of:

(a) receiving physical addresses from the direct-mapped translation lookaside buffer unless a miss occurs; and,

(b) in response to a hit in the victim translation lookaside buffer,

(i) delivering a physical address to a physical address bus, and,

(ii) swapping the physical address and an associated linear address tag from the victim translation lookaside buffer with a physical address and an associated linear address tag from an entry which failed to hit in the direct-mapped translation lookaside buffer.

5,752,275

TRANSLATION LOOK-ASIDE BUFFER INCLUDING A SINGLE PAGE SIZE TRANSLATION UNIT

Gary N. Hammond, Campbell, Calif., assignor to Intel Corporation, Santa Clara, Calif.

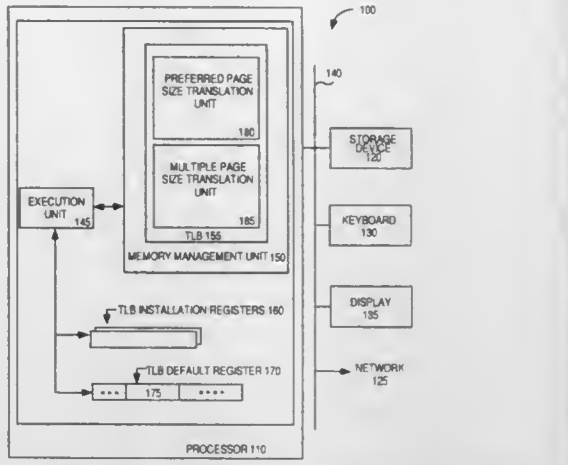
Continuation of Ser. No. 414,206, Mar. 31, 1995, abandoned. This application Jul. 14, 1997, Ser. No. 893,085

Int. Cl.^{6} G06F *12/10*

U.S. Cl. 711—207 **20 Claims**

1. A translation look-aside buffer comprising:

a first storage area to store a dynamic value identifying a single page size;



a first translation unit to simultaneously store virtual to physical address translations for a plurality of page sizes; and

a second translation unit to store virtual to physical address translations for only the single page size identified by said dynamic value.

DESIGNS

MAY 12, 1998

394,135

SHIRT DECORATION

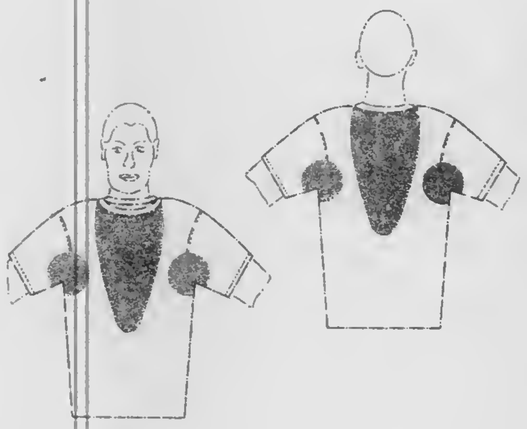
Lane Nathan Gunnerson, RR 1, Box 214, Remer, Minn. 56672-9728

Filed Dec. 24, 1996, Ser. No. 64,235

Term of patent 14 years

LOC (6) Cl. 02 - *01*

U.S. Cl. D2—717



394,136

PIERCED CAP

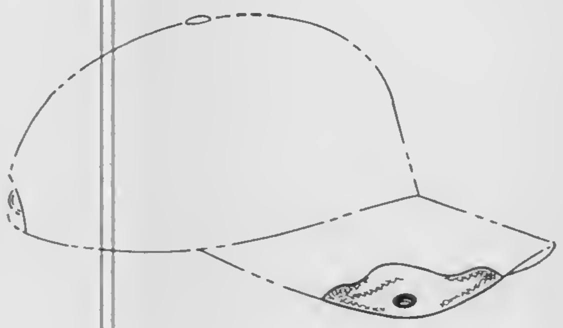
Sidney Richlin, 909 N. Bedford Dr., Beverly Hills, Calif. 90210

Filed Aug. 5, 1996, Ser. No. 57,949

Term of patent 14 years

LOC (6) Cl. 02 - *02*

U.S. Cl. D2—866



394,137

SLIPPER

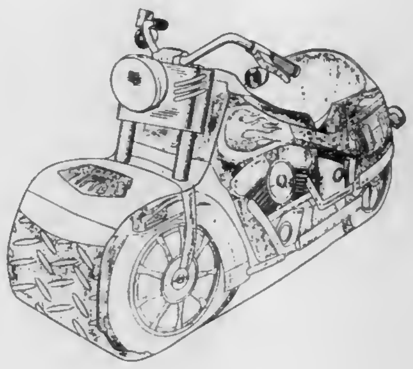
Craig P. Nadel, 20 Tomalyn Hill Rd., Montville, N.J. 07045

Filed Aug. 13, 1996, Ser. No. 58,653

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—898



394,138

BABY BOOTIES

Alan Haddad, 345 E. 86th St., Apt. 9B, New York, N.Y. 10028

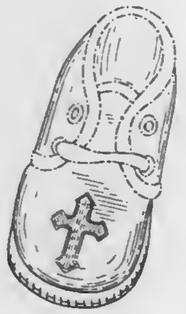
Filed Nov. 18, 1996, Ser. No. 62,500

The portion of the term of this patent subsequent to Nov. 19, 2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—900



394,139

SPLIT TOE SNEAKER

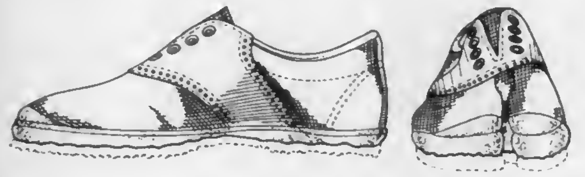
Aki Hirahata, c/o Urban Hide Inc., 220 Old Country Rd., Mineola, N.Y. 11501

Division of Ser. No. 54,770, May 21, 1996, Pat. No. Des. 382,690. This application Dec. 10, 1996, Ser. No. 64,648

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—902



394,140

ELEMENT FOR A SHOE UPPER

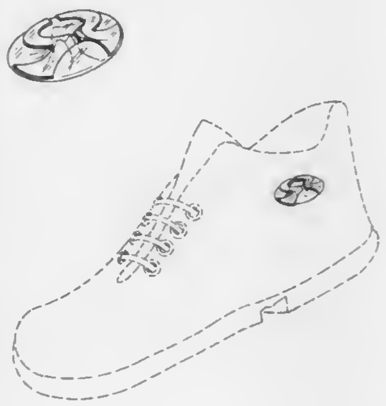
Marc R. Loverin, Arlington, Mass., assignor to SRL, Inc., Wilmington, Del.

Filed Feb. 10, 1997, Ser. No. 66,264

Term of patent 14 years

LOC (6) Cl. 02 - *99*

U.S. Cl. D2—946



394,141

SHOE SOLE

Norio Takaoka, and Kenichi Mitani, both of Kobe, Japan, assignors to Asics Corporation, Japan

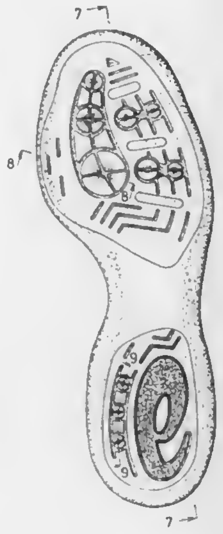
Filed Jul. 3, 1996, Ser. No. 56,606

Claims priority, application Japan, Mar. 13, 1996, 8-6993

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—954



394,142

SHOE SOLE

Jean-Paul Merceron, Monthodon, France, assignor to L'Article Chaussant Europeen, Chateau-Renault, France

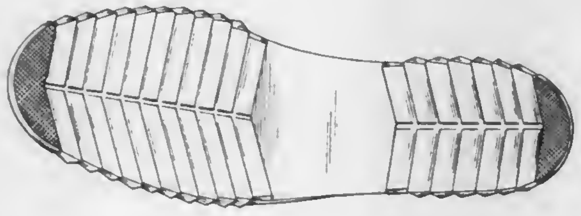
Filed Aug. 2, 1996, Ser. No. 57,905

Claims priority, application France, Feb. 2, 1996, 960657

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—960



394,143

SHOE SOLE

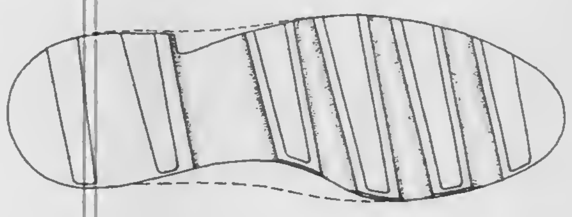
Jeffrey A. Sink, Redwood City, Calif., assignor to The Rockport Company, Inc., Marlboro, Mass.

Filed Mar. 10, 1997, Ser. No. 67,483

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—960



394,144

SHOE UPPER

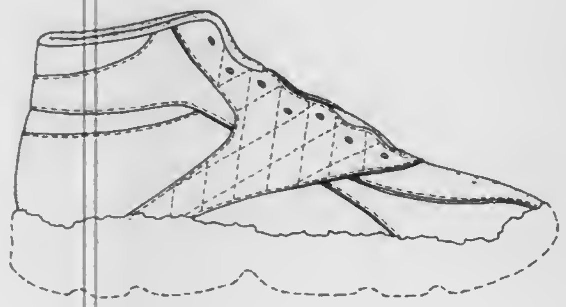
Sunita J. Parmar, Quincy, Mass., assignor to Reebok International Ltd., Stoughton, Mass.

Filed Sep. 11, 1996, Ser. No. 59,429

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



394,145

SHOE UPPER

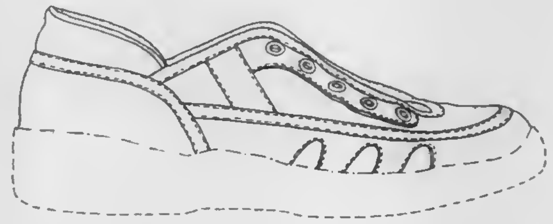
Peter von Conta, Putnum, Conn., assignor to The Rockport Company, Inc., Marlboro, Mass.

Filed Mar. 5, 1997, Ser. No. 67,380

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



394,146

BOOT UPPER

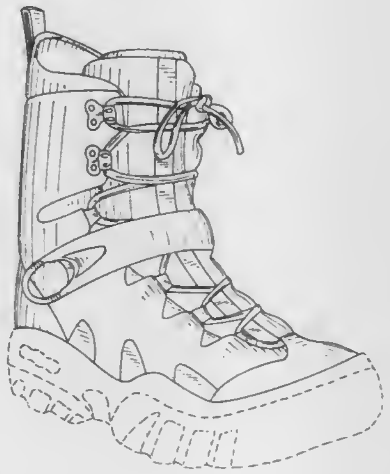
Sinisa Egelja; Amy Egelja, and Matthew Rall, all of State College, Pa., assignors to Items International, Inc., Altoona, Pa.

Filed Dec. 19, 1996, Ser. No. 63,964

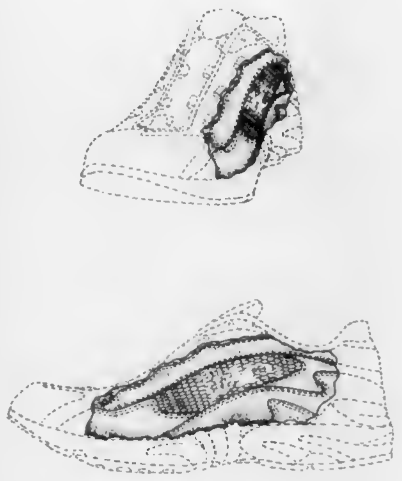
Term of patent 14 years

LOC (6) Cl. 02 - *04*

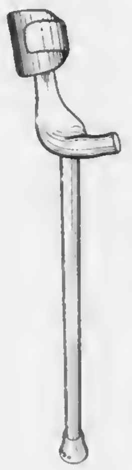
U.S. Cl. D2—970



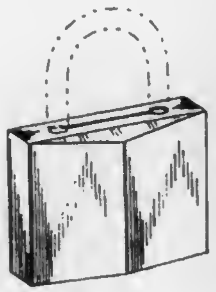
394,147
PORTION OF A SHOE UPPER
David J. Schenone, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Aug. 22, 1997, Ser. No. 75,194
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



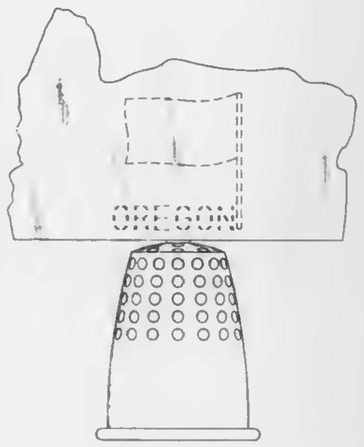
394,148
FOREARM CRUTCH
Frank A. Hosick, P.O. Box H, Vashon, Wash. 98070
Filed Sep. 9, 1996, Ser. No. 59,388
Term of patent 14 years
LOC (6) Cl. 03 - *03*
U.S. Cl. D3—8



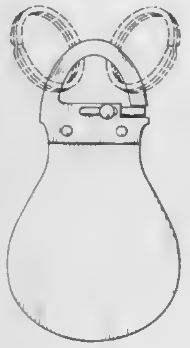
394,149
PROTECTIVE COVER FOR A PADLOCK
Lance Turner, P.O. Box 11073, Marina Del Rey, Calif. 90292
Division of Ser. No. 55,622, Feb. 11, 1997, which is a division of Ser. No. 42,437, Aug. 10, 1995, Pat. No. Des. 379,059. This application Jul. 7, 1997, Ser. No. 73,348
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—346



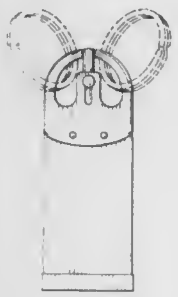
394,150
COLLECTOR'S THIMBLE
Bonnie J. George, and Gerald O. George, both of 2031 S.E. Meadow Ct., Gresham, Oreg. 97080
Filed Jan. 23, 1997, Ser. No. 65,199
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D3—29



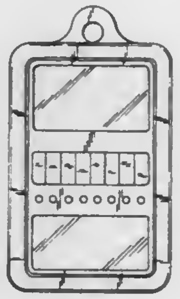
394,151
KEY RING HOLDER
Sumner MacDonald, 44 Ballou Blvd., Bristol, R.I. 02809
Filed May 6, 1997, Ser. No. 70,316
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—207



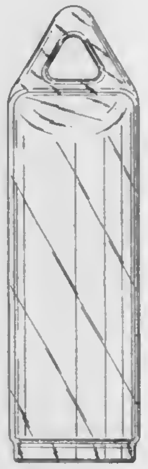
394,152
KEY RING HOLDER
Sumner MacDonald, 44 Ballou Blvd., Bristol, R.I. 02809
Filed May 6, 1997, Ser. No. 70,891
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—207



394,153
OIL CHANGE REMINDER FOR KEY RINGS
John C. Martin, 1131 Lyonhurst, Birmingham, Mich. 48009
Filed Jun. 25, 1996, Ser. No. 56,180
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—208



394,154
BALL HOLDER
David J. Smith, Brecksville, Ohio, assignor to Steere Enterprises, Tallmadge, Ohio
Continuation-in-part of Ser. No. 37,484, Apr. 13, 1995, Pat. No. Des. 375,406. This application Jul. 17, 1996, Ser. No. 57,121
The portion of the term of this patent subsequent to Nov. 12, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—257



394,155
CAMERA CASE

Kazuhiko Miyahara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

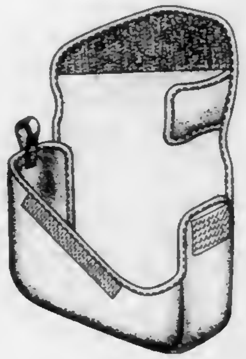
Filed Mar. 12, 1996, Ser. No. 51,512

Claims priority, application Japan, Sep. 14, 1995, 7-27218

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—267



394,156
EMERGENCY ROAD KIT

A. Michael Melanson, Richmond Hill, and Andrew Z. Menceles, Willowdale, both of Canada, assignors to Cosmoda Concept Corporation, Canada

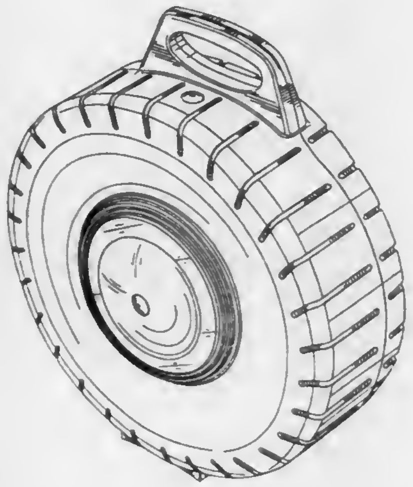
Filed Jan. 9, 1997, Ser. No. 64,722

Claims priority, application Canada, Nov. 28, 1996, 1996-2719

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—271



394,157
STORAGE CONTAINER HANDLE

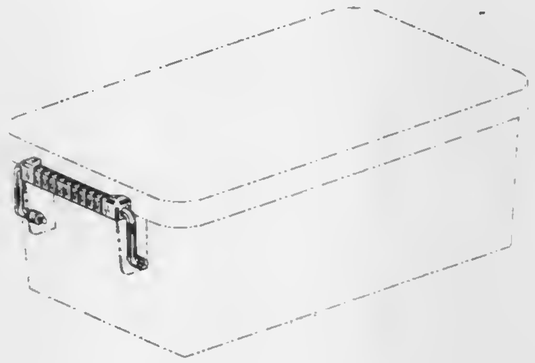
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.

Continuation of Ser. No. 36,590, Mar. 23, 1995, abandoned. This application Jan. 2, 1996, Ser. No. 49,614

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—318



394,158
TRAVEL CAP

Hans Krämer, Bühl-Altschweier, and Hans Halm, Herne, both of Germany, assignors to SmithKline Beecham Consumer Healthcare GmbH, Germany

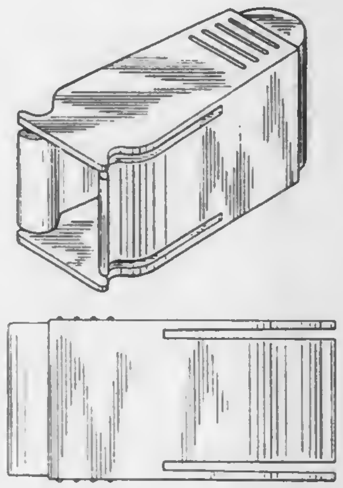
Filed Sep. 20, 1996, Ser. No. 65,714

Claims priority, application United Kingdom, Mar. 23, 1996, 2055061

Term of patent 14 years

LOC (6) Cl. 04 - *02*

U.S. Cl. D4—113



394,159
DESIGN FOR AN OVAL PICTURE FRAME

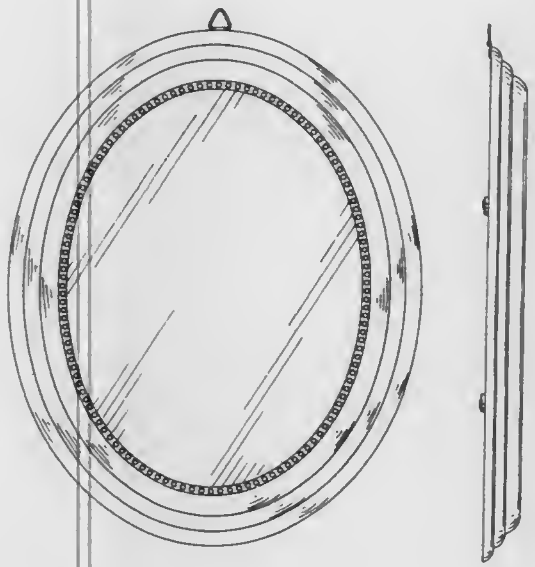
Sin Ming Leung, Hong Kong, China, assignor to Make Wood Industries Limited, Kowloon, Hong Kong

Filed Jul. 30, 1997, Ser. No. 74,242

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—309



394,160
FOLDABLE EASEL

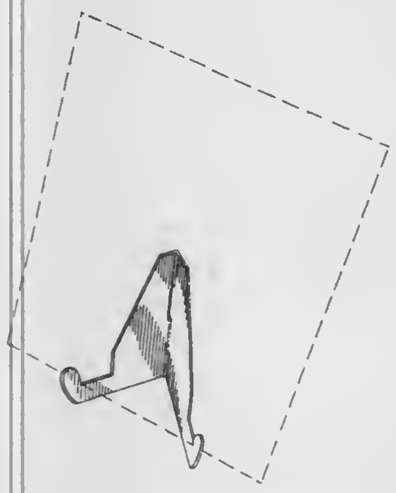
Denada A. Yarbrough, Moore, S.C., assignor to Greenleaf, Inc., Spartanburg, S.C.

Filed Apr. 29, 1996, Ser. No. 53,745

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—310



394,161
PHOTO/PICTURE FRAME

Chi Fai Tsui, Hong Kong, Hong Kong, assignor to Magnum Industries Limited, Hong Kong

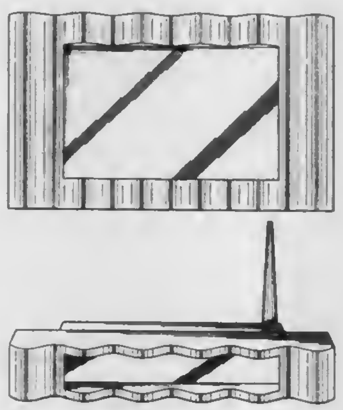
Filed Mar. 17, 1997, Ser. No. 68,143

Claims priority, application United Kingdom, Oct. 3, 1996, 2059824

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—310



394,162
CHILDS CAR SEAT SHELL

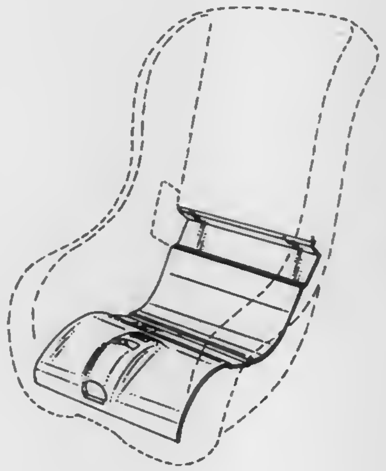
Maryann C. Celestina-Krevh, Euclid, Ohio, assignor to Century Products Company, Macedonia, Ohio

Filed Oct. 25, 1996, Ser. No. 61,518

Term of patent 14 years

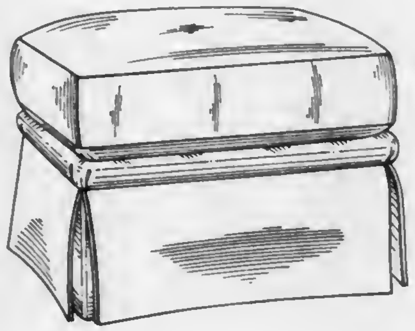
LOC (6) Cl. 06 - *01*

U.S. Cl. D6—333



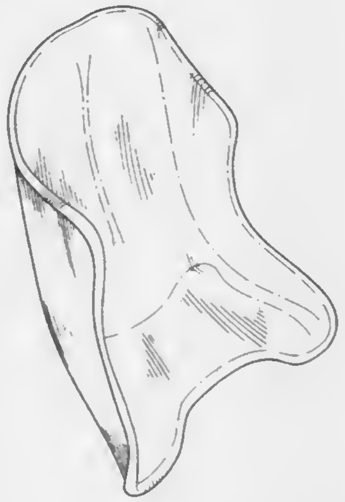
394,163
OTTOMAN

Sally Sirkin Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Division of Ser. No. 49,483, Jan. 26, 1996. This application Feb. 28, 1997, Ser. No. 68,951
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—349



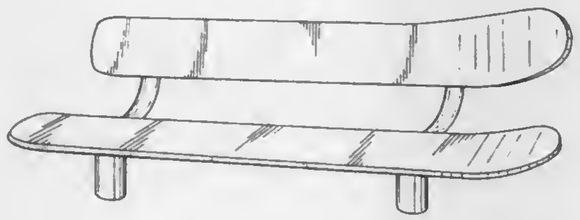
394,164
GO-KART SEAT

Donald E. Safrit, 1145 Shuping Mill Rd., Rockwell, N.C. 28138
Filed Mar. 4, 1997, Ser. No. 67,469
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—356



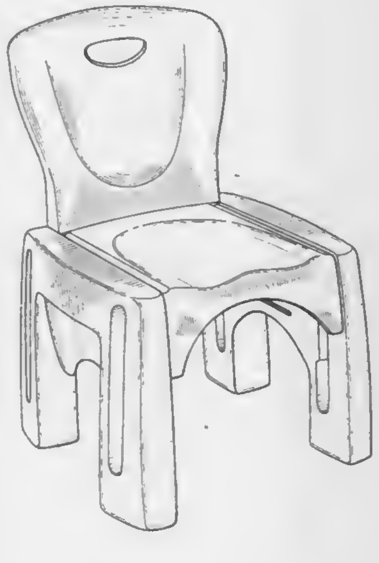
394,165
BENCH

Dennis John Adamovich, Atlanta, Ga., assignor to The Coca-Cola Compay, Atlanta, Ga.
Filed Nov. 20, 1996, Ser. No. 62,642
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—358



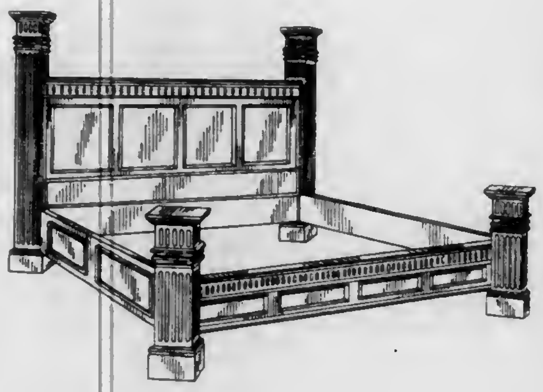
394,166
ADJUSTABLE CHAIR

Jon R. Rossman, Chelmsford, and Bryan R. Hotaling, Arlington, both of Mass., assignors to The First Years Inc., Avon, Mass.
Continuation-in-part of Ser. No. 738,021, Oct. 25, 1996. This application Apr. 25, 1997, Ser. No. 70,049
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—367



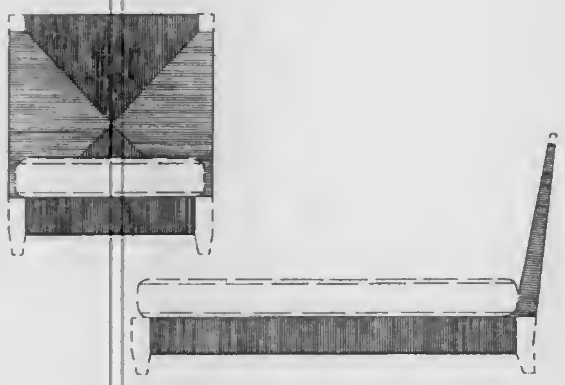
394,167
BED FRAME

Jorge Estapé, and Joyce Estapé, both of 2453 San Pasqual Valley Rd., Escondido, Calif. 92027
Filed Mar. 29, 1996, Ser. No. 53,016
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—393



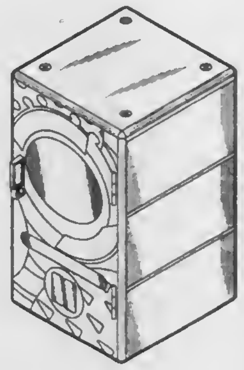
394,168
BED

John Hutton, New York, N.Y., assignor to Donghia Furniture Co., Ltd., New York, N.Y.
Filed Mar. 13, 1997, Ser. No. 67,887
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—393



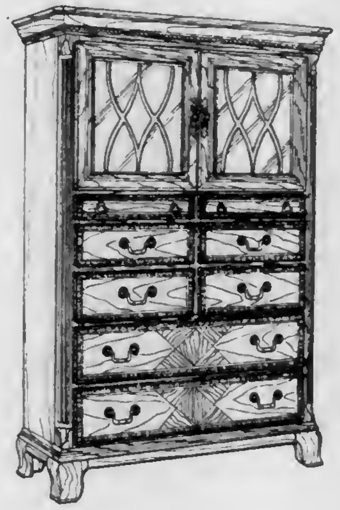
394,169
STORAGE LOCKER

Thomas A. Tisbo, Barrington Hills; Torrence Anderson, and Michael G. Uffner, both of Naperville, all of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Nov. 11, 1996, Ser. No. 64,079
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—434



394,170
CABINET

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Sep. 26, 1996, Ser. No. 60,327
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—436



394,171
TRIPLE DRESSER

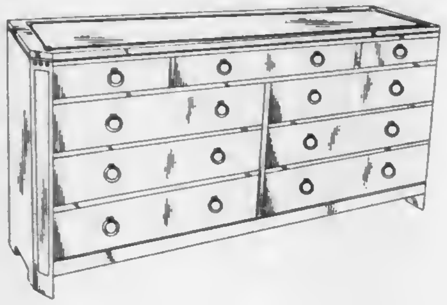
William E. De Blaay, Manlius, N.Y., assignor to L. & J.G. Stickley, Inc., Manlius, N.Y.

Filed Jan. 21, 1997, Ser. No. 65,140

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446



394,172
STAND FOR A MONITOR AND KEYBOARD

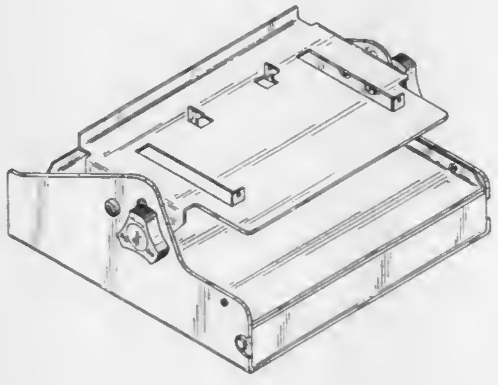
Jiro Kubo, Arling Heights; Yoshikazu Tatsumi, Blooming Dale, both of Ill., and Hideaki Kitamura, Minou, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 3, 1996, Ser. No. 55,832

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—474



394,173
DISPLAY STAND

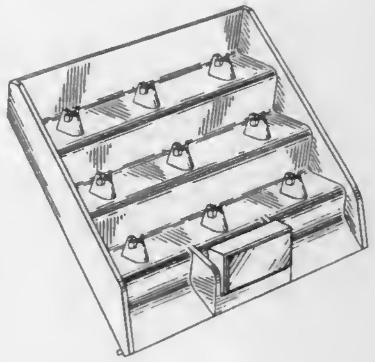
Pierre Habib, Mont-Royal, Canada, assignor to Leader Industries Inc., Boucherville, Canada

Filed Nov. 25, 1996, Ser. No. 63,056

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—474



394,174
STORAGE RACK FOR ELECTRONIC REMOTE CONTROLS

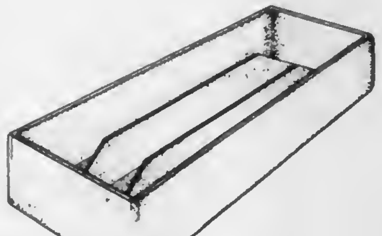
Salvatore Aquino, #56 Forest by the Sea, Carolina Beach, N.C. 28428

Filed Jul. 19, 1996, Ser. No. 57,236

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—476



394,175
DESK

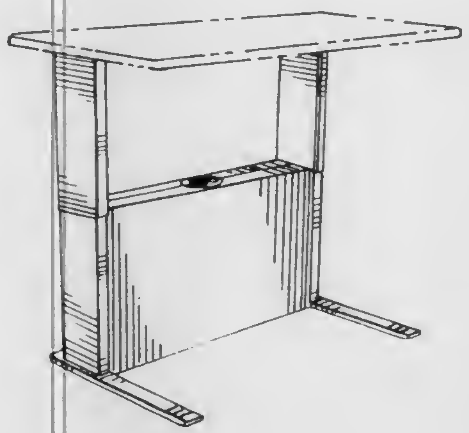
Ogden R. Olson, 2043 Mississippi View Dr., Muscatine, Iowa 52761

Filed Sep. 12, 1996, Ser. No. 59,552

Term of patent 14 years

LOC (6) Cl. 06 - *03*

U.S. Cl. D6—495



394,176
CHAIR

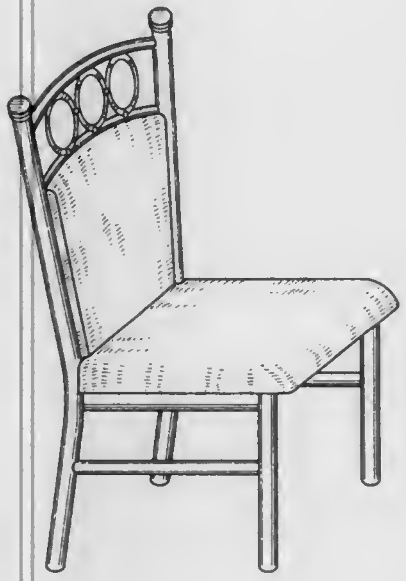
Arsho Diramarian, Pasadena, Calif., assignor to Aleco Furniture Mfg Inc., Vernon, Calif.

Filed Apr. 18, 1997, Ser. No. 69,851

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—334



394,177
TOILET PAPER DISPENSER

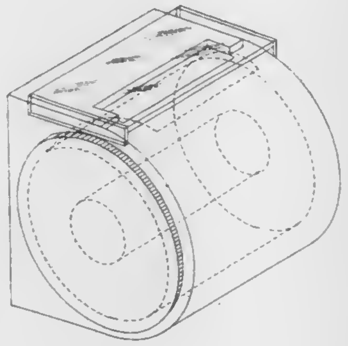
Lynda D. Christopher, P.O. Box 64252, Tucson, Ariz. 85728

Filed Dec. 26, 1996, Ser. No. 64,274

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—523



394,178
TOILET PAPER CONTAINER

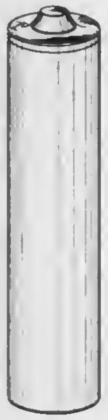
Alan Gremchuck, 2455 Vista Wood Cir., No. 22, Thousand Oaks, Calif. 91362

Filed Apr. 16, 1997, Ser. No. 67,971

Term of patent 14 years

LOC (6) Cl. 06 - *02*

U.S. Cl. D6—524



394,179

SHELF UNIT

Raffy Panossian, 470 Conestoga Blvd., Cambridge, ON, Canada, N1R 7L7

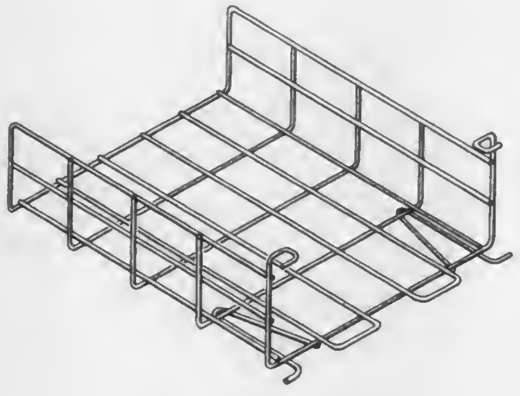
Filed Aug. 27, 1996, Ser. No. 58,870

Claims priority, application Canada, Feb. 28, 1996, 1996-0424

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—566



394,180

CIGARETTE PACK DISPLAY UNIT

Yvon St-Pierre; Andre Dubeau, and Roch Cyr, all of Montreal, Canada, assignors to Imperial Tobacco Limited, Montreal, Canada

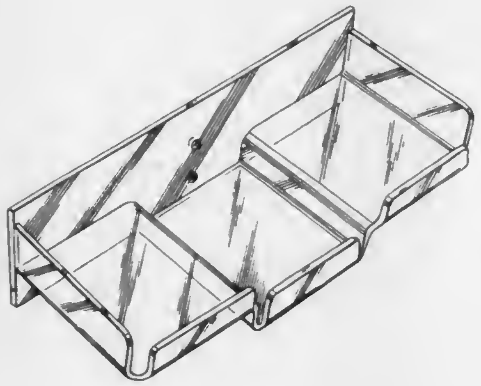
Filed Sep. 17, 1996, Ser. No. 59,875

Claims priority, application Canada, Jun. 20, 1996, 1996-1431

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—571



394,181

COMBINED INFANT BLANKET AND CHANGING PAD

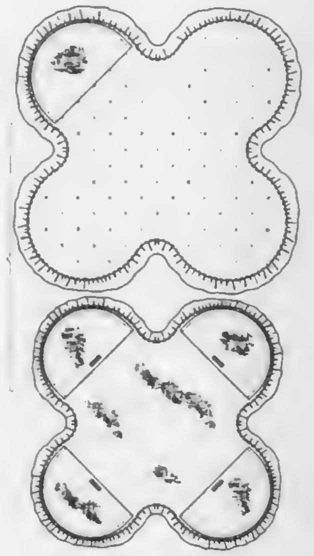
Betty Jane Mitchell, 6601 Bailey Cutoff, Benton, Ark. 72015

Filed Jun. 9, 1997, Ser. No. 72,127

Term of patent 14 years

LOC (6) Cl. 06 - *13*

U.S. Cl. D6—603



394,182

DISC HOLDER

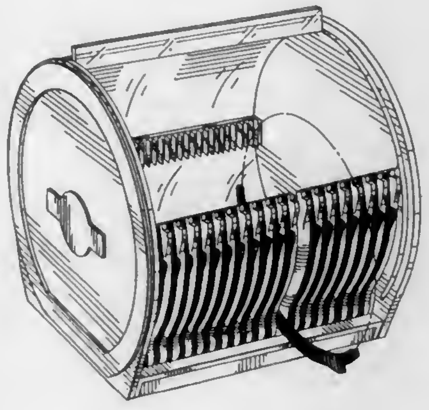
Peter Woolrich, 131 Bloor Street West, Penthouse #3, Toronto, Ontario, Canada, M5S 1R1

Filed May 7, 1996, Ser. No. 54,110

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. 206—308.3



394,183

FOOD PROCESSOR

Toyomi Arita, Osaka; Shigehiro Uemura, Kyoto, and Kazuo Takada, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

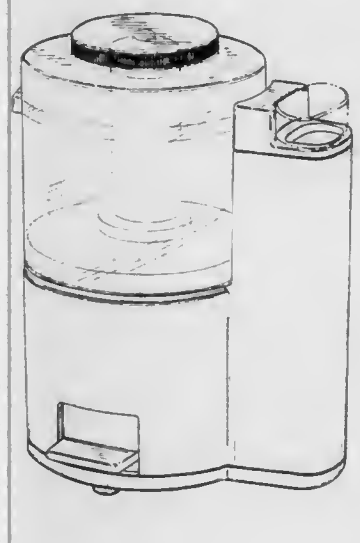
Filed Jul. 8, 1997, Ser. No. 73,952

Claims priority, application Japan, Jan. 8, 1997, 9-272

Term of patent 14 years

LOC (6) Cl. 31 - *00*

U.S. Cl. D7—384



394,184

LID FOR JAR

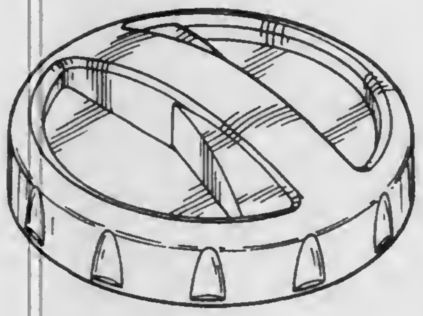
Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 18, 1996, Ser. No. 57,182

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—391



394,185

SHELL AND COVER FOR WATER COOLERS

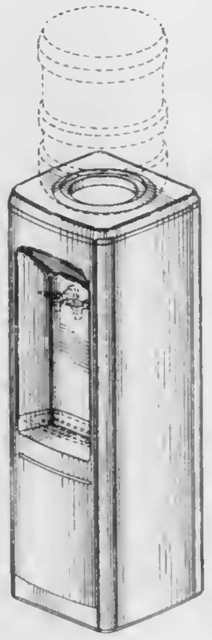
John W. Eddy, Riverside; Kelley S. Needham, Yorba Linda, and Jeffrey L. Harlan, Corona, all of Calif., assignors to Kel-Jac Engineering and Plastic Sales, Inc., Riverside, Calif.

Filed Sep. 30, 1996, Ser. No. 60,551

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—392



394,186

COOKWARE HANDLE

Paul Dodane, B.P. 10, 25490 Fesches-Le-Chatel, France

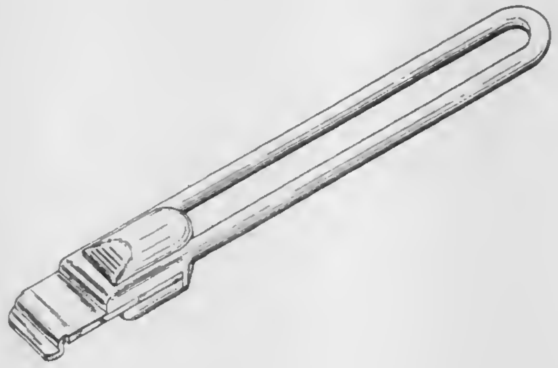
Filed Sep. 4, 1996, Ser. No. 59,175

Claims priority, application France, Mar. 4, 1996, 961459

Term of patent 14 years

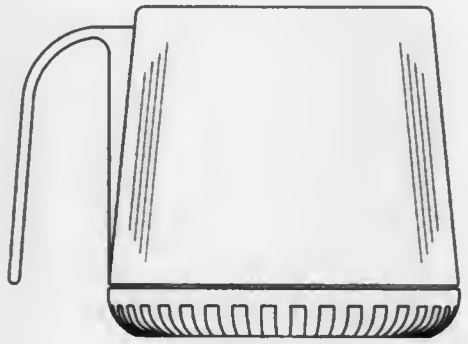
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—395



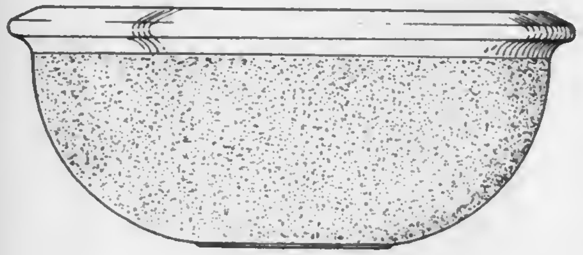
394,187
DEVICE FOR MAKING HEATED BEVERAGES IN A MICROWAVE OVEN

Mario Orrico, 6137 N. Harlem Ave., Chicago, Ill. 60631, and Herb Velazquez, 352 Nayatt Rd., Barrington, R.I. 02806
Filed Mar. 27, 1997, Ser. No. 69,306
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—533



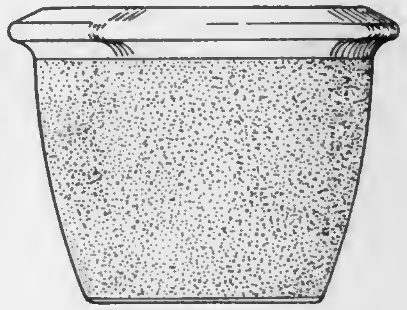
394,188
CONTAINER

Scott M. Reynaert, Dearborn, Mich., and Brian T. Davis, Waterford, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Nov. 27, 1996, Ser. No. 63,127
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—584



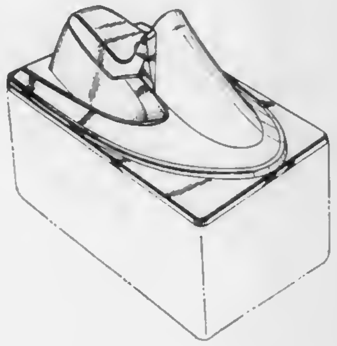
394,189
CONTAINER

Scott M. Reynaert, Dearborn, Mich., and Brian T. Davis, Waterford, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Nov. 27, 1996, Ser. No. 63,147
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—584



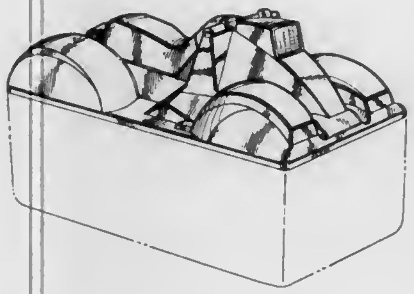
394,190
LID FOR A COOLER

David A. Arnfelt, Waseca, Minn.
Filed Feb. 7, 1997, Ser. No. 66,148
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D7—606



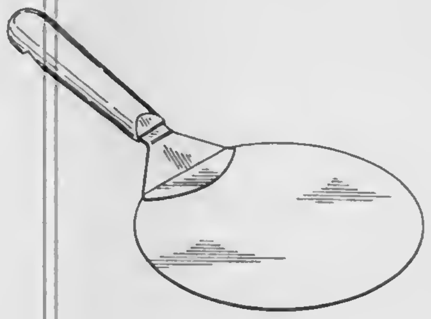
394,191
LID FOR A COOLER

David A. Arnfelt, Waseca, Minn.
Filed Feb. 7, 1997, Ser. No. 66,149
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—606



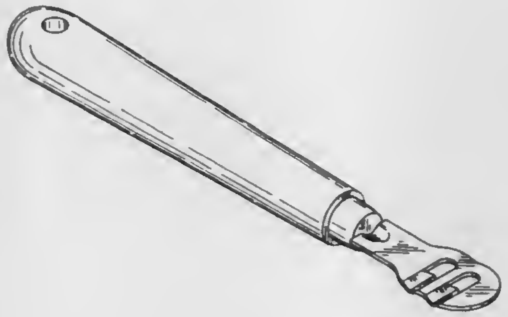
394,192
ROUND CAKE SERVER

Thierry Deglon, Thiers, France, assignor to Ets Jean Deglon, France
Filed Jun. 6, 1997, Ser. No. 71,779
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—688



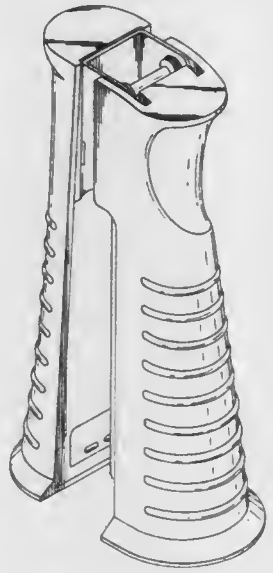
394,193
DOUBLE LEMON DECORATOR

Thierry Deglon, Thiers, France, assignor to Ets Jean Deglon, France
Filed Jun. 6, 1997, Ser. No. 71,777
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—693



394,194
UPRIGHT STAPLER

Robert T. Brunsdon, Millis, and George F. W. Boesel, Brookline, both of Mass., assignors to Hunt Holdings, Inc., Wilmington, Del.
Filed Mar. 29, 1996, Ser. No. 53,021
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D8—50

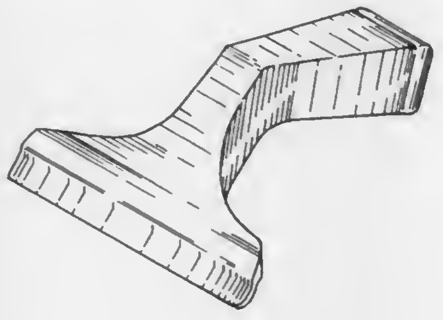


394,195
WINDOW SCREEN REMOVER

Dan Hart Auldridge, 217 Christian Pla., Grand Prairie, Tex. 75051

Filed Jan. 15, 1997, Ser. No. 64,932
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—88

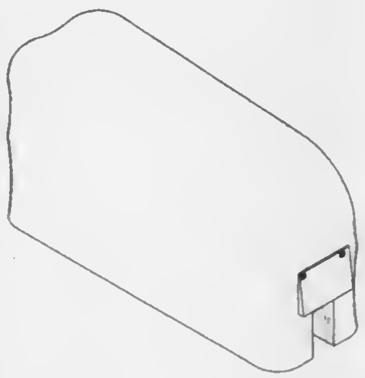


394,196
PORTABLE ICE SKATE BLADE SHARPENER

Phil G. Richardson, Box 2, Site 17, RR 2, Grande Prairie, Alberta, Canada, T8V 2Z9

Filed Jan. 31, 1997, Ser. No. 65,659
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—91

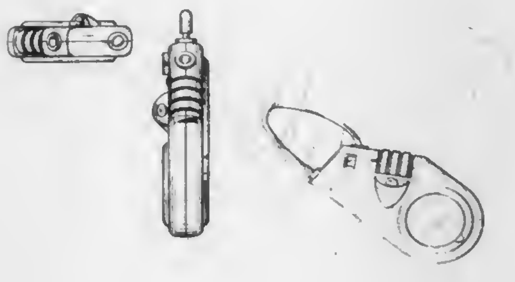


394,197
PORTABLE CABLE LOCK

Noel E. Zeller, c/o Zelco Industries, Inc. 630 S. Columbus Ave., Mount Vernon, N.Y. 10551-4445

Filed May 1, 1997, Ser. No. 71,818
Term of patent 14 years
LOC (6) Cl. 08 - *07*

U.S. Cl. D8—333

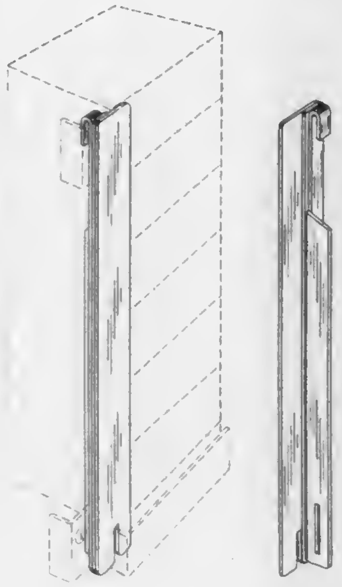


394,198
AUTOMATED TELLER MACHINE CASSETTE LOCK

Buzz Siler, 3328 Lakeview Bl., Lake Oswego, Oreg. 97035

Filed Dec. 20, 1996, Ser. No. 64,031
Term of patent 14 years
LOC (6) Cl. 08 - *07*

U.S. Cl. D8—346

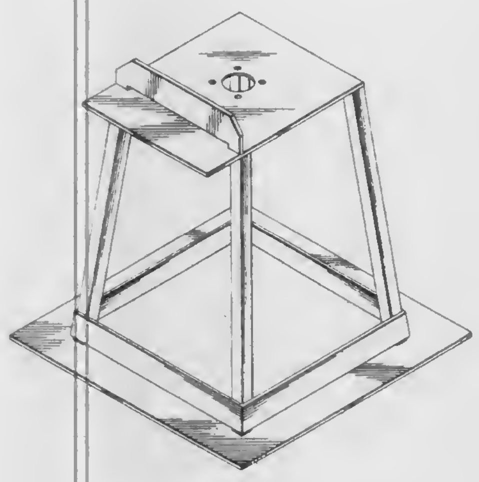


394,199
TRANSMISSION SUPPORT STAND

Douglas Hodges, 672 W. 12th St., Unit 4, San Pedro, Calif. 90731

Filed Feb. 22, 1995, Ser. No. 35,195
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—349

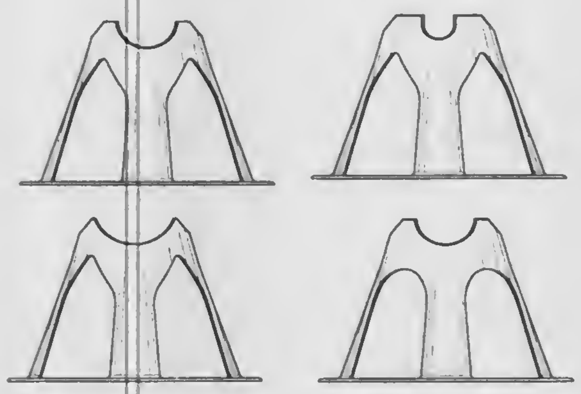


394,200
SLAB ON GRADE CHAIR

G. Douglas Hartzheim, 12390 Cambrin Dr., Yucaipa, Calif. 92399

Filed May 7, 1996, Ser. No. 54,168
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—354

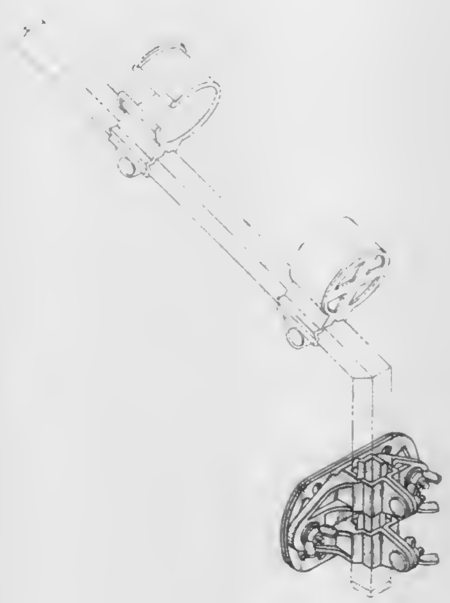


394,201
ROD HOLDER SURFACE MOUNT BRACKET WITH SWIVEL PLATE

Roger Newell, Carmel, and Tommy L. Carter, Seaside, both of Calif., assignors to E-Z Catch and Company, Carmel, Calif.

Filed Sep. 25, 1996, Ser. No. 60,261
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—356

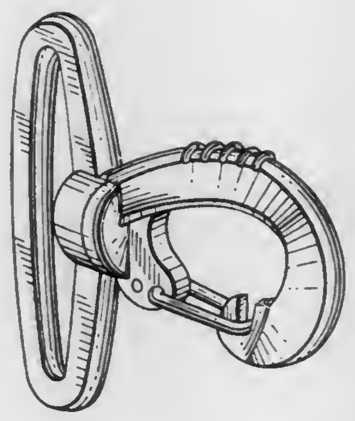


394,202
SWIVEL HOOK

Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corp., Farmingdale, N.Y.

Filed Mar. 28, 1997, Ser. No. 68,238
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—367



394,203

SUPPORT BRACKET

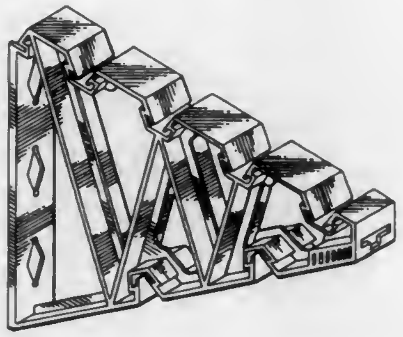
Paul Nadar, Mississauga, Canada, assignor to Royal Plastics Inc., Woodbridge, Canada

Filed Feb. 24, 1997, Ser. No. 66,862

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—381



394,204

MULTIPLE COMPARTMENT DISPENSER

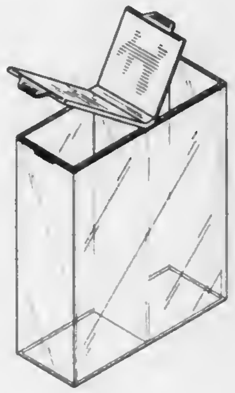
Edward T. Seddon, 119 Executive Dr., Ambler, Pa. 19002

Filed Jul. 10, 1997, Ser. No. 73,449

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—341



394,205

BASKET CARRIER

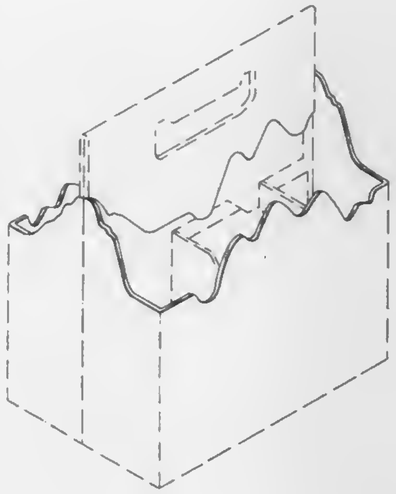
Aaron Bates, Marietta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 18, 1996, Ser. No. 63,897

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—346



394,206

COMBINED DISPENSER PACKAGE WITH FLAT ROLLED PRODUCT

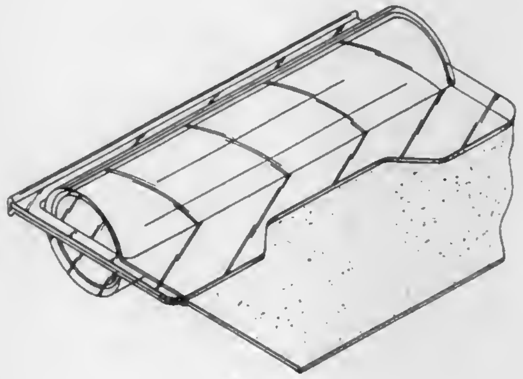
David L. Morrish, San Gabriel, Calif., assignor to Martha L. McGuire, San Gabriel, Calif.

Filed Jun. 9, 1997, Ser. No. 72,098

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—417



394,207

BATTERY PACK

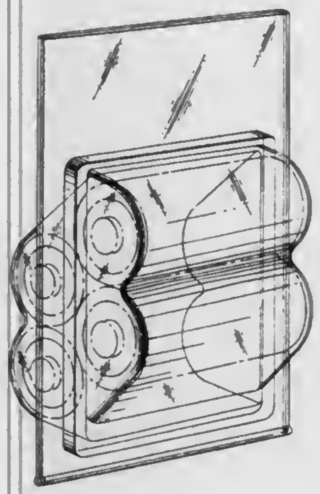
David H. Waterbury, Cranford, N.J.; Stephen Denny, Grosse Pointe, Mich., and Kimberly Distaso, Berkeley Heights, N.J., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Aug. 22, 1997, Ser. No. 75,750

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—415



394,208

COMBINED STORAGE AND DISPENSING CONTAINER

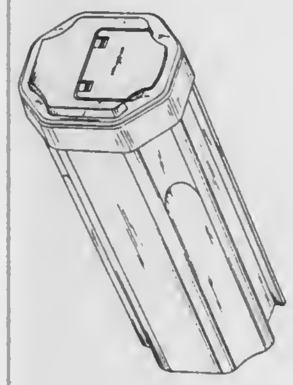
Gary L. Rutledge, Parker, Tex., assignor to John C. Marrelli, Tustin, Calif.

Division of Ser. No. 48,704, Jan. 11, 1996, abandoned. This application Mar. 20, 1997, Ser. No. 69,264

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—430



394,209

WINE BOTTLE HOLDER

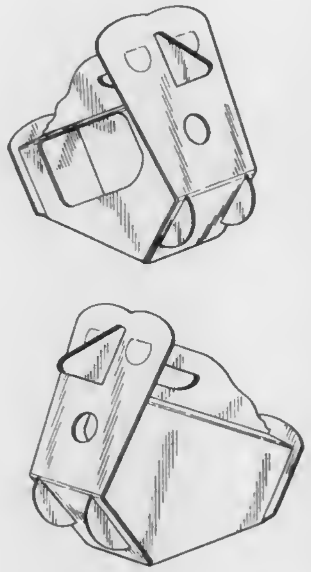
Stéphane Millet, Paris, France, assignor to Garcon! Brands Limited, Ireland

Filed Dec. 20, 1996, Ser. No. 64,057

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—430



394,210

CONTAINER

Trevor Fiore, San Diego, Calif., assignor to Amway Corporation, Ada, Mich.

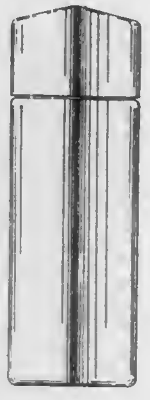
Continuation-in-part of Ser. No. 20,214, Mar. 22, 1994. This application Jun. 18, 1996, Ser. No. 56,235

The portion of the term of this patent subsequent to Mar. 22, 2018, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—529



394,211

COMBINED BOTTLE AND CAP

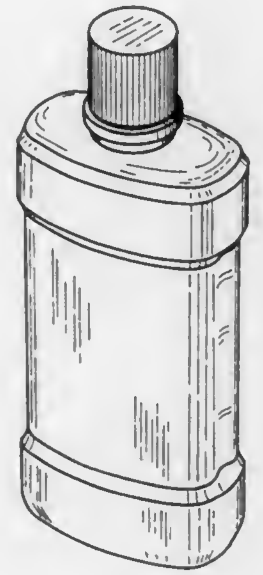
Gene J. Kuzma, and Douglas W. Weaver, both of Columbus, Ohio, assignors to G.K. Packaging, Inc., Columbus, Ohio

Filed Aug. 9, 1996, Ser. No. 58,207

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—542



394,212

BELLOWS CONTAINER

Masayosi Mazda, No. 70, 3 Chome Ohno-Cho Kakamihara, Gifu 504, Japan

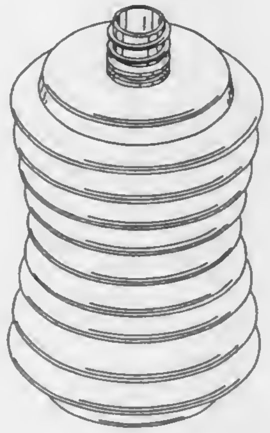
Continuation-in-part of Ser. No. 25,816, Jun. 30, 1994, Pat. No. Des. 372,667. This application Aug. 13, 1996, Ser. No. 58,640

Claims priority, application Japan, Apr. 26, 1994, 6-12316

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—557



394,213

CLOCK

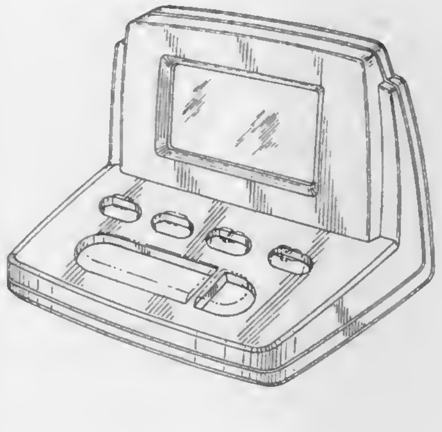
David Plogman, Decatur, Ga., assignor to GTC Properties, Inc., Wilmington, Del.

Filed Sep. 11, 1996, Ser. No. 59,444

Term of patent 14 years

LOC (6) Cl. 10 - *01*

U.S. Cl. D10—15



394,214

CASING FOR A WATCH

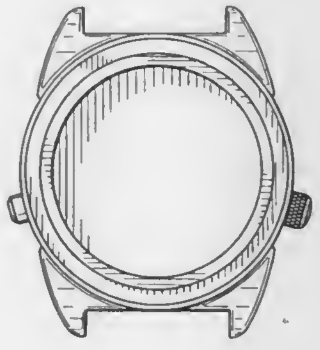
Daniel Lai Kong Sang, Flat, Hong Kong, assignor to Timex Corp, Middlebury, Conn.

Filed Jul. 31, 1996, Ser. No. 57,781

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



394,215

WRISTWATCH CASE

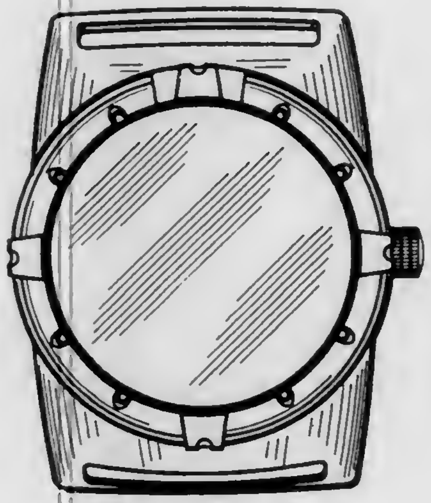
Judith R. Riley, Goshen, and David Quinlan, Marion, both of Conn., assignors to Timex Corporation, Middlebury, Conn.

Filed May 27, 1997, Ser. No. 71,307

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



394,216

WATCH AND BRACELET

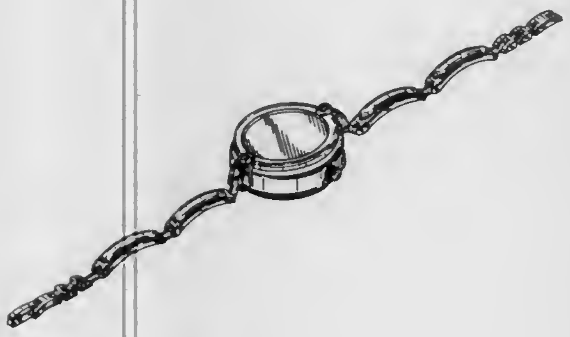
Nimfa Barz Toribio, Mandaue, Philippines, assignor to Timex Corp., Middlebury, Conn.

Filed Feb. 25, 1997, Ser. No. 66,979

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—32



394,217

MEASURING CUP

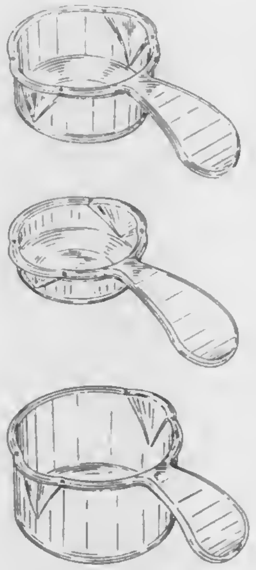
Douglas M. Laib, Orlando, Fla., assignor to Dart Industries Inc., Orlando, Fla.

Filed Jun. 18, 1997, Ser. No. 72,080

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—46.2



394,218

QUANTUM USER INTERFACE MODULE

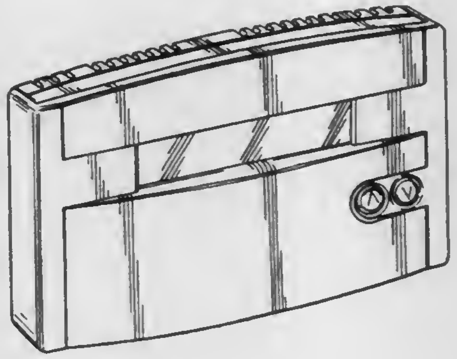
Steven E. Keto, Port Washington; Herbert W. Mueller, Sussex; Thomas J. Lechner, Mequon; Jennifer J. Clark-Keller, Jackson; George Rudich, Jr., Cedarburg, all of Wis., and Robert E. Hillmer, Toronto, Canada, assignors to Johnson Service Company, Milwaukee, Wis.

Filed Oct. 30, 1996, Ser. No. 61,772

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—50



394,219

THERMOSTAT

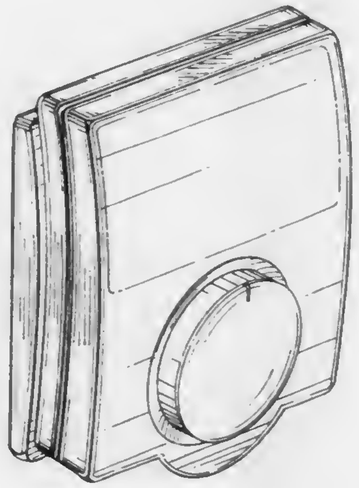
James Morrow, Oak Park; Brian Day, Des Plaines, both of Ill.; David Stearns, Wichita, Kans., and Gary Van Deursen, Evergreen, Colo., assignors to Coleman Safety and Security Products, Inc., Downers Grove, Ill.

Filed Aug. 13, 1997, Ser. No. 74,945

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—50



394,220

THERMOSTAT

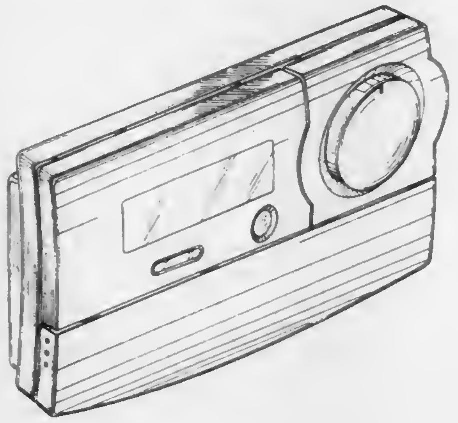
James Morrow, Oak Park; Brian Day, Des Plaines, both of Ill.; David Stearns, Wichita, Kans., and Gary Van Deursen, Evergreen, Colo., assignors to Coleman Safety and Security Products, Inc., Downers Grove, Ill.

Filed Aug. 13, 1997, Ser. No. 75,148

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—50



394,221

SURVEY MARKER

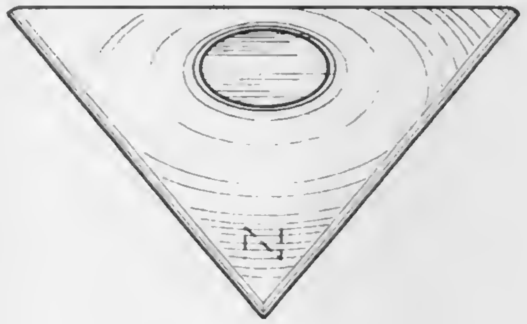
Clarence E. Truax, 520 Fairground Rd.,, Taylorsville, Ky. 40071

Filed Apr. 10, 1997, Ser. No. 68,379

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—66



394,222

BODY FOR COMBINATION INSTRUMENT

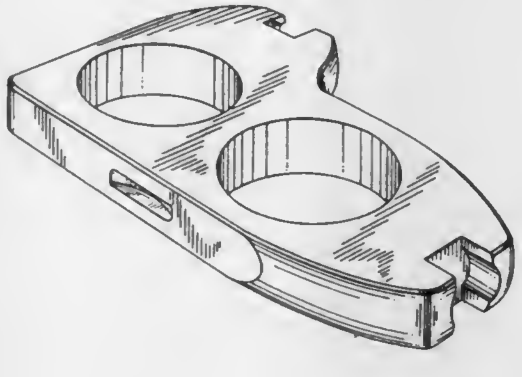
Erkki Vainio, and Heikki Metsa-Ketela, both of Helsinki, Finland, assignors to Suunto Oy, Espoo, Finland

Filed Jan. 16, 1997, Ser. No. 64,993

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—68



394,223

FISH FINDER

Shinichiro Nishimura, Tokyo; Shigeru Namaizawa, Koganei; Toshiro Taki, Hachioji, and Kiyofumi Ishibashi, Mitaka, all of Japan, assignors to Japan Radio Co., Ltd., Tokyo, Japan

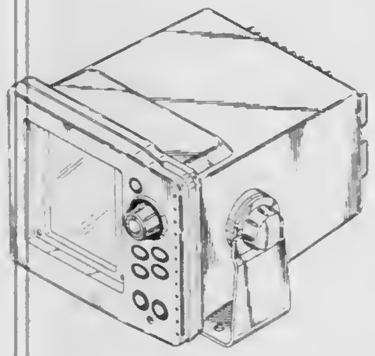
Filed Mar. 14, 1997, Ser. No. 68,004

Claims priority, application Japan, Sep. 25, 1996, 8-28513

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



394,224

JEWELRY CHAIN

David Rozenwasser, Savion, Israel, assignor to Avraham Moshe Rozenwasser, Israel

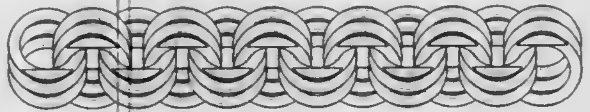
Filed Aug. 15, 1996, Ser. No. 58,482

Claims priority, application Israel, Feb. 1, 1996, 25794

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—13



394,225

RING

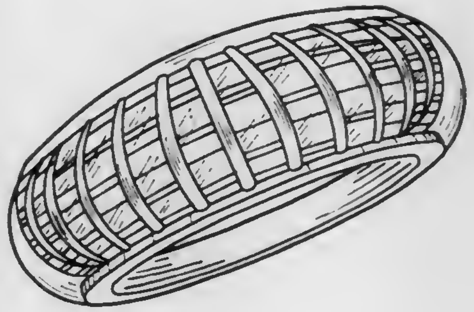
Ritesh B. Mehta, Bombay, India, assignor to Jewelex New York Ltd., New York, N.Y.

Filed May 6, 1996, Ser. No. 54,028

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—26



394,226

PENDANT

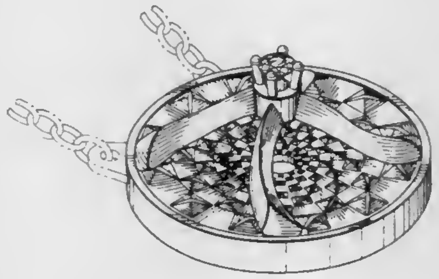
Fred Bell, 891 Santa Ana St., Laguna Beach, Calif. 92651

Filed Jul. 1, 1997, Ser. No. 73,149

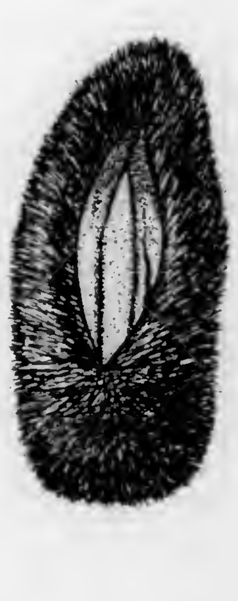
Term of patent 14 years

LOC (6) Cl. 11 - *01*

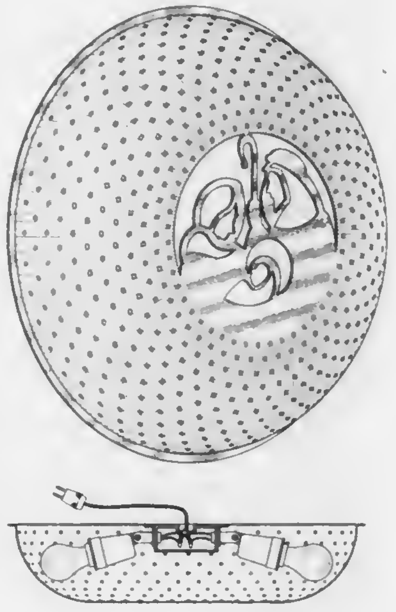
U.S. Cl. D11—79



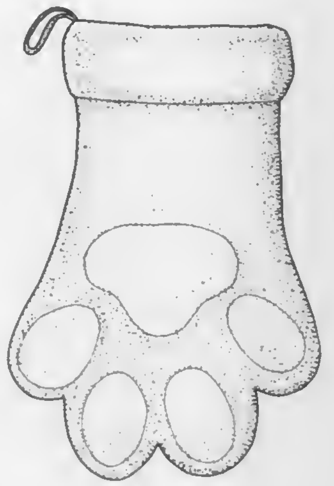
394,227
ANIMAL EAR FOB
Michael Woerly, 4947 Wild Heron Way, Jacksonville, Fla. 32225
Filed Sep. 4, 1996, Ser. No. 59,165
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—81



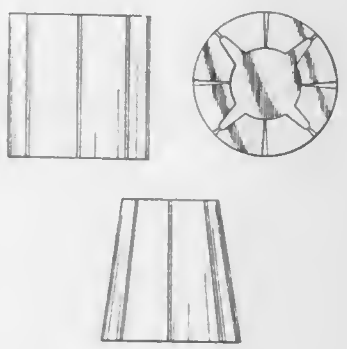
394,228
ILLUMINATED WREATH
Merwan B. Mehta, and Rukshana M. Mehta, both of 1206 Winchester Dr., Rolla, Mo. 65401
Filed Apr. 14, 1997, Ser. No. 69,415
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—120



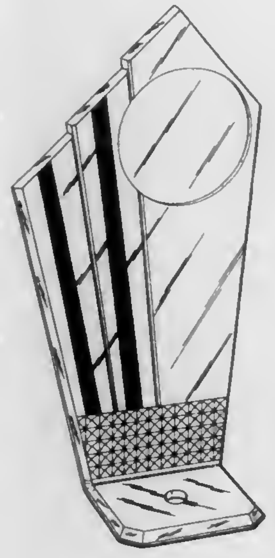
394,229
HOLIDAY PET STOCKING
Jon Kevin Curry, P.O. Box 10601, Prescott, Ariz. 86304, assignor to Jon Kevin Curry, Prescott, Ariz.
Filed Jun. 25, 1997, Ser. No. 72,820
Term of patent 14 years
LOC (6) Cl. 11 - *05*
U.S. Cl. D11—126



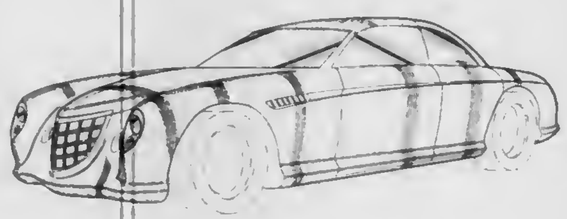
394,230
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc.
Continuation-in-part of Ser. No. 809,078, Dec. 16, 1991, Pat. No. Des. 366,228, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Dec. 23, 1992, Ser. No. 3,064
The portion of the term of this patent subsequent to Nov. 14, 2009, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—164



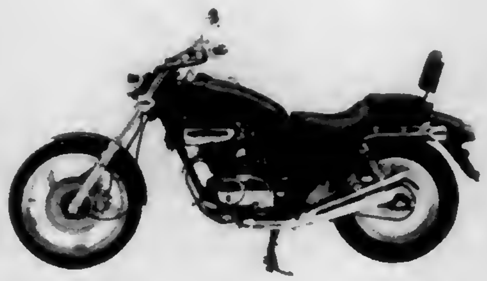
394,231
BACKGROUND PLATE FOR A SPORTS TROPHY
Ian Pierce, Orangeville, Canada, assignor to Tromar Corporation, Canada
Filed Sep. 27, 1996, Ser. No. 60,417
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—164



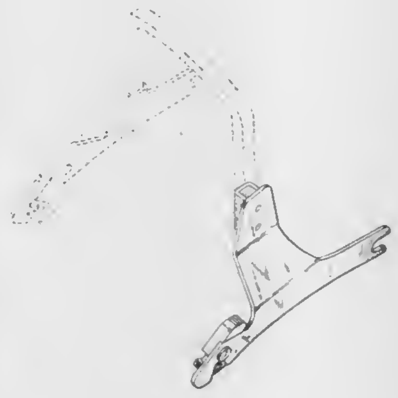
394,232
VEHICLE BODY
Mark Trostle, Royal Oak; William A. Dayton, Northville; Darrel L. Morley, Birmingham, and David M. Miglia, Clarkston, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Sep. 20, 1996, Ser. No. 60,028
Term of patent 14 years
LOC (6) Cl. 12 - *08*
U.S. Cl. D12—91



394,233
MOTORCYCLE
Shoji Yamamoto, and Yumio Shibata, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1997, Ser. No. 65,285
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—110



394,234
MOTORCYCLE SISSY BAR SIDE PLATE
Donald M. Gogan, Brookfield, and Geoffrey T. Williams, Mequon, both of Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.
Filed May 1, 1996, Ser. No. 55,803
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—114



394,235
DISC BRAKE SHIM

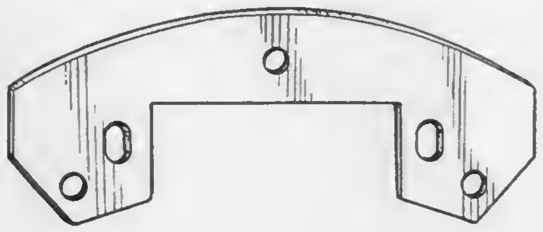
Gustav J. Steinke, and Starla D. Huffer, both of Lima, Ohio, assignors to International Brake Industries, Inc., Lima, Ohio

Filed Dec. 1, 1993, Ser. No. 15,859

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—180



394,236
MUFFLER

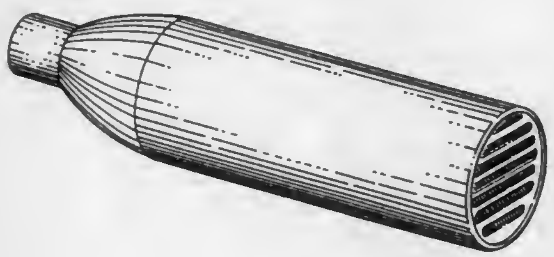
Arthur R. Verlengiere, 2363-A Thompson Way, Santa Maria, Calif. 93455

Continuation-in-part of Ser. No. 30,188, Oct. 24, 1994, abandoned. This application May 31, 1996, Ser. No. 55,216

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—194



394,237
CAP FOR MOTORCYCLE GAS TANK FILL PORT

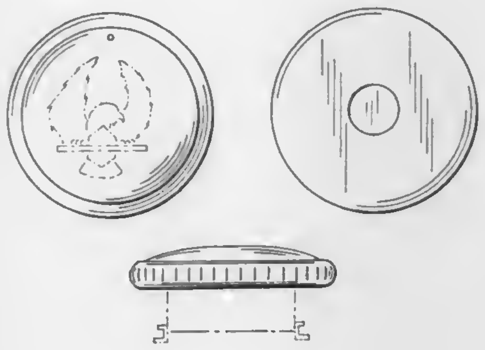
Nicholas J. Mancini, III, 1649 W. Cholla St., Phoenix, Ariz. 85029

Filed Aug. 9, 1995, Ser. No. 42,361

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—197



394,238
FRONT FACE OF A VEHICLE WHEEL

Uwe Haller, Eisingen; Harald Leschke, Sindelfingen, both of Germany; Olivier Pierre Boulay, and Anthony W. K. Lo, both of Tokyo, Japan, assignors to Mercedes-Benz AG, Stuttgart, Germany

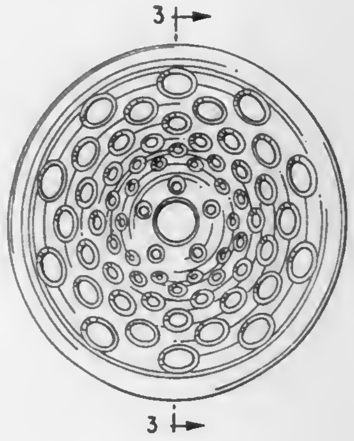
Filed Mar. 31, 1997, Ser. No. 68,758

Claims priority, application Germany, Sep. 30, 1996, 96 08 462.6

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



394,239
FISHING ANCHOR

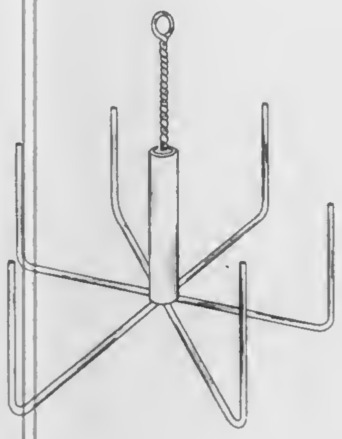
David Lee, R.R. #85, Tabor City, N.C. 28463

Filed Jul. 26, 1996, Ser. No. 57,551

Term of patent 14 years

LOC (6) Cl. 12 - *06*

U.S. Cl. D12—215



394,240
PAIR OF SKI RACKS

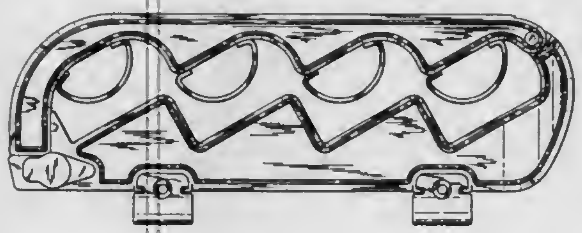
John S. Cucheran, Orion; Jon D. Sparham, Waterford, and Jeffrey M. Aftanas, Sterling Heights, all of Mich., assignors to JAC Products, Inc., Ann Arbor, Mich.

Filed Jan. 24, 1995, Ser. No. 33,956

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—412



394,241
LOW PROFILE TRANSFORMER HOUSING

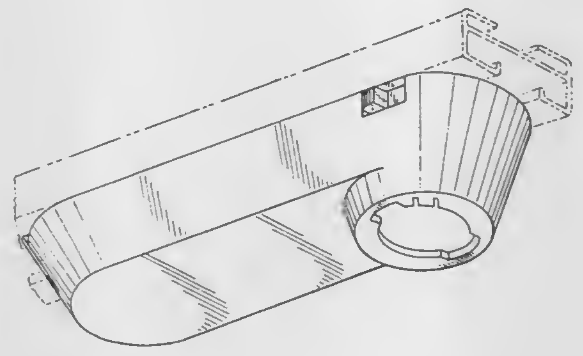
Peter F. Wachter, Northfield, and John J. O'Rourke, Downers Grove, both of Ill., assignors to Juno Lighting, Inc., Des Plaines, Ill.

Filed Sep. 15, 1997, Ser. No. 76,636

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—110



394,242
ELECTRIC CONNECTOR

Chong Hwan Park, 113-207, Sinsigaji Apt., Mok-dong, Yangcheon-ku, Rep. of Korea

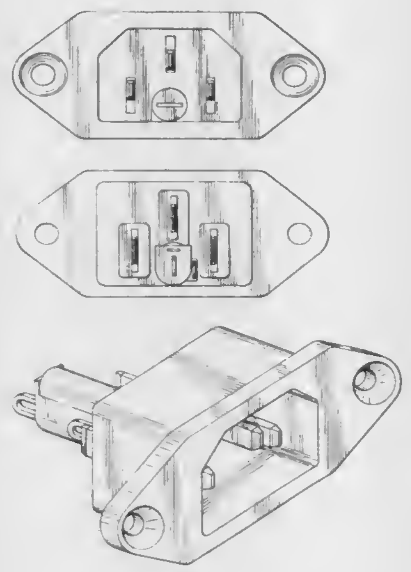
Filed Aug. 23, 1996, Ser. No. 58,793

Claims priority, application Rep. of Korea, Mar. 14, 1996, 96-4435

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—146



394,243
FUSE SWITCH WITH HANDLE

Benoit Siat, Benfeld, France, assignor to Socomec (societe Anonyme), Benfeld, France

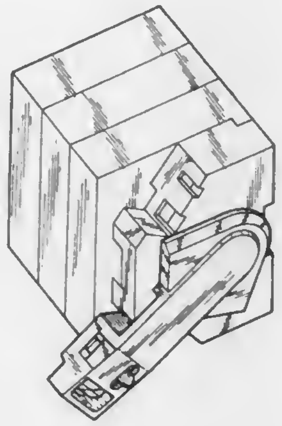
Filed Jan. 26, 1996, Ser. No. 49,475

Claims priority, application France, Jul. 28, 1995, 954245

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—158



394,244
SEMICONDUCTOR DEVICE

Gorab Majumdar; Satoshi Mori; Sukehisa Noda; Tooru Iwagami; Yoshio Takagi, and Hisashi Kawafuji, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

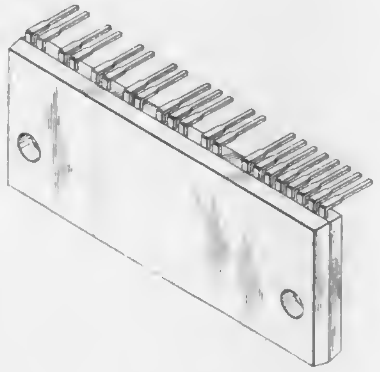
Filed May 24, 1996, Ser. No. 55,963

Claims priority, application Japan, Nov. 27, 1995, 7-35815

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—182



394,245
INTERACTIVE COMMUNICATIONS DEVICE

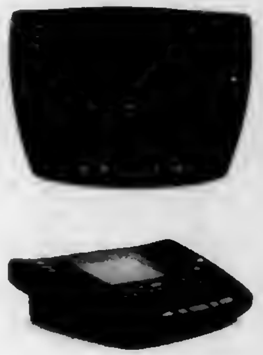
Stefan Brodbeck, Lenggries, Germany, assignor to Tressor TV Produktions GmbH, Germany

Filed Jun. 18, 1996, Ser. No. 56,284

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—150



394,246
COMPUTER HOUSING

Takashi Yamamoto, Kodaira; Toshiyuki Utsuki, Tachikawa; Kenta Kumagai, Tokyo; Tohru Higashihara, Sayama; Yutaka Yonezawa, Hachiohji; Tamotsu Tsukaguchi, Hiratsuka; Kazuyuki Sunaga, Hadano; Shigeru Koizumi, Hadano, and Norifumi Sano, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

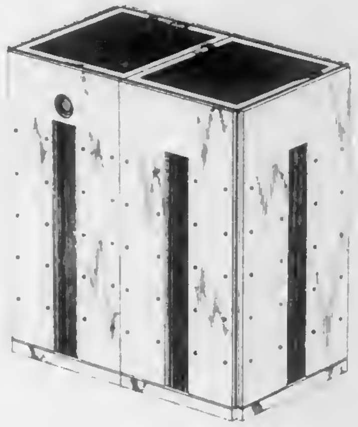
Filed Jul. 17, 1996, Ser. No. 57,157

Claims priority, application Japan, Jan. 17, 1996, 8-594

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—102



394,247
UNIT FOR EXTENTION OF FUNCTIONS OF ELECTRONIC COMPUTERS

Osamu Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

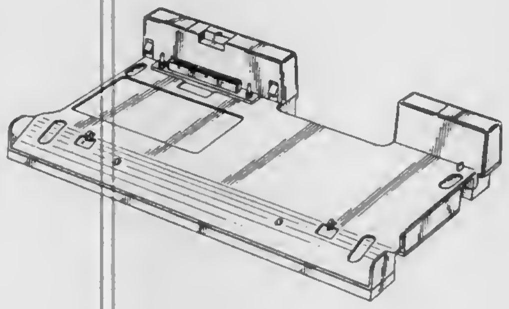
Filed Feb. 6, 1997, Ser. No. 66,185

Claims priority, application Japan, Aug. 6, 1996, 8-23477

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107



394,248
LIQUID CRYSTAL DISPLAY

Alex Duan, Taipei, Taiwan, assignor to Topvision Technologies, Inc., Taipei, Taiwan

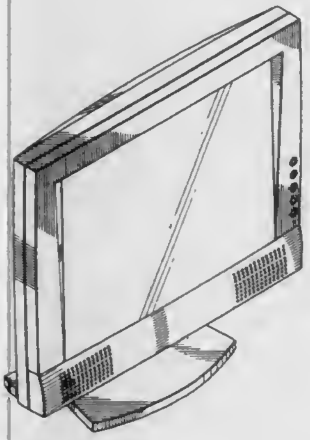
Filed May 29, 1997, Ser. No. 71,439

Claims priority, application Taiwan, May 21, 1997, 86304333

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—113



394,249
MAGNETIC DISC FOR COMPUTER

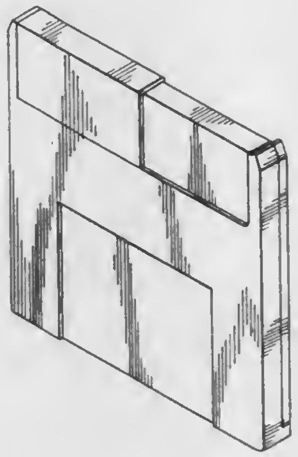
Kazuo Takahashi; Kazuyuki Yamamoto; Minoru Watanabe, and Takashi Yamada, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 26, 1996, Ser. No. 53,695

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114



394,250
ICON FOR A DISPLAY SCREEN

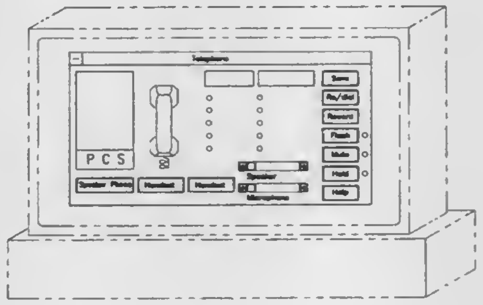
Sidhartha Maitra, Saratoga, Calif., assignor to Multi-Tech Systems, Inc., Mounds View, Minn.

Filed Nov. 12, 1992, Ser. No. 1,397

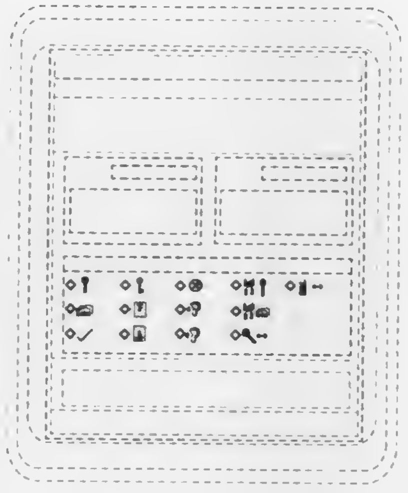
Term of patent 14 years

LOC (6) Cl. 14 - *02*

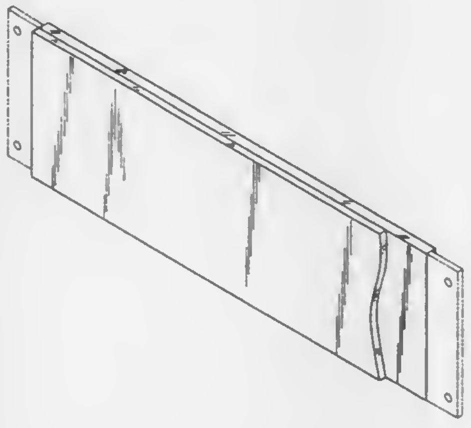
U.S. Cl. D14—114.2



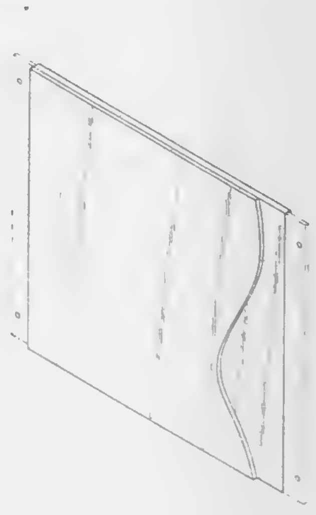
394,251
SET OF ICONS FOR A COMPUTER DISPLAY SCREEN
Paul A. Arnone, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 29, 1993, Ser. No. 10,124
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.5



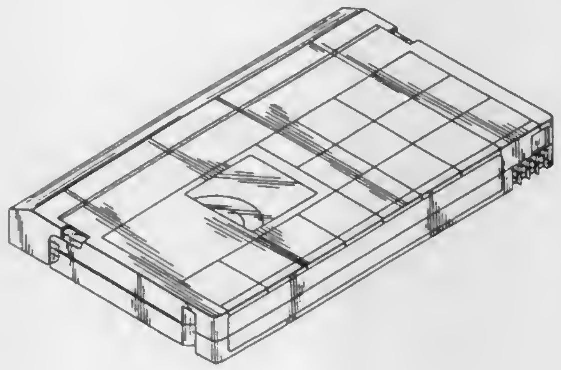
394,252
FRONT PANEL FOR A MODULAR COMPUTER HARDWARE COMPONENT
Gerald A. Dingman, Rancho Cordova; James Dudley, Sacramento; Stephen Andrew Hartford; Daniel A. Kaye, both of Folsom; Joseph Paul Montgomery, Orangevale, and Michael Richard Young Moore, Rancho Cordova, all of Calif., assignors to Play Industries, Inc., Rancho Cordova, Calif.
Filed Nov. 6, 1996, Ser. No. 62,039
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—115



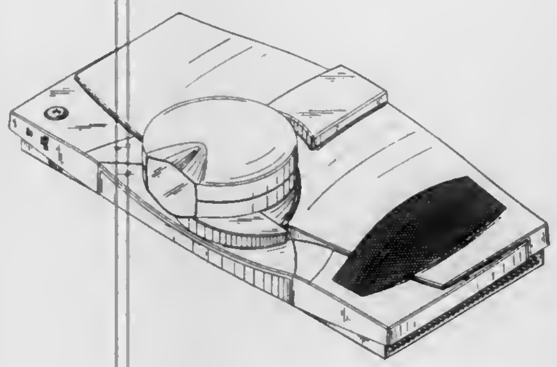
394,253
FRONT PANEL FOR A MODULAR COMPUTER HARDWARE COMPONENT
Gerald A. Dingman, Rancho Cordova; James Dudley, Sacramento; Stephen Andrew Hartford; Daniel A. Kaye, both of Folsom; Joseph Paul Montgomery, Orangevale, and Michael Richard Young Moore, Rancho Cordova, all of Calif., assignors to Play Industries, Inc., Rancho Cordova, Calif.
Filed Nov. 6, 1996, Ser. No. 62,062
The portion of the term of this patent subsequent to Nov. 6, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—115



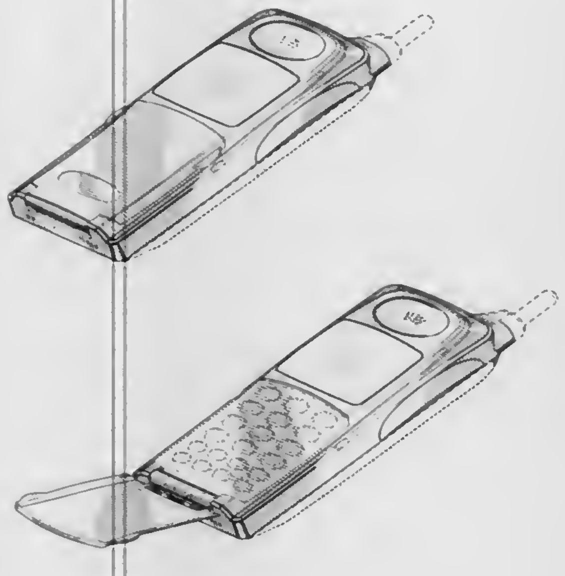
394,254
VIDEO CASSETTE
Kazushi Kirihara, and Michio Akita, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Division of Ser. No. 43,702, Sep. 11, 1995, Pat. No. Des. 377,791. This application Nov. 27, 1996, Ser. No. 63,110
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D14—121



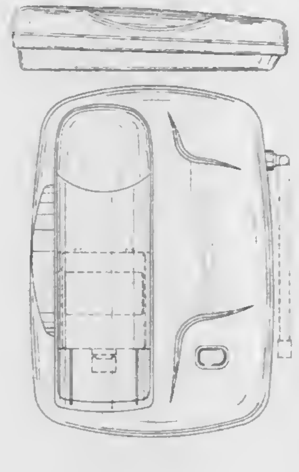
394,255
INTEGRAL VIDEOCONFERENCING SYSTEM
Nunzio Napoleone, South Hamilton; Stephen A. Coleman, Billerica, and Kendra J. DeSimone, Acton, all of Mass., assignors to PictureTel Corporation, Andover, Mass.
Filed Oct. 9, 1996, Ser. No. 60,863
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—124



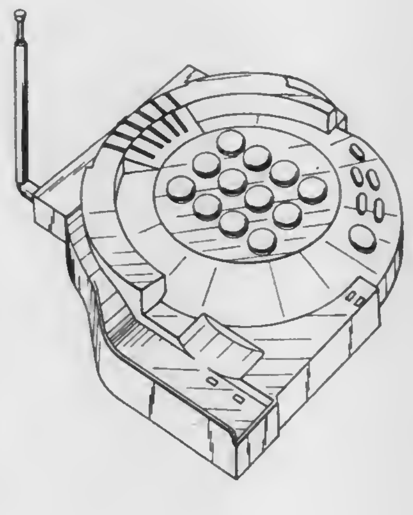
394,256
PORTABLE RADIOTELEPHONE
Bradley K. Lohrding, Gurnee, Ill.; Matthew R. Michieli, Chandler, and Jay R. Mitchell, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 28, 1997, Ser. No. 67,177
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



394,257
TELEPHONE BASE HOUSING
Joseph Chan Ka Hung, Sai Kung, and Pang Chi-Kong, Tsuen Wan, both of Hong Kong, assignors to Vtech Communications Ltd., Hong Kong
Filed Sep. 5, 1996, Ser. No. 59,214
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—149



394,258
BASE FOR A TELEPHONE HEADSET
Robert M. Fitzgerald, 233 Milwaukee, Denver, Colo. 80206
Filed Jun. 17, 1997, Ser. No. 72,518
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—150



394,259
TELEPHONE BASE

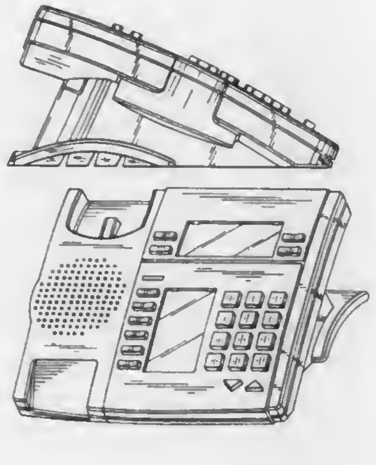
Michael Langlois, Almonte, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Sep. 26, 1996, Ser. No. 60,315

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—151



394,260
COMBINED DIGITAL AUDIO DISC PLAYER AND TAPE RECORDER

Masafumi Ito; Minoru Sube; Hiroyuki Watanabe, and Yukio Iikura, all of Musashino, Japan, assignors to Teac Corporation, Japan

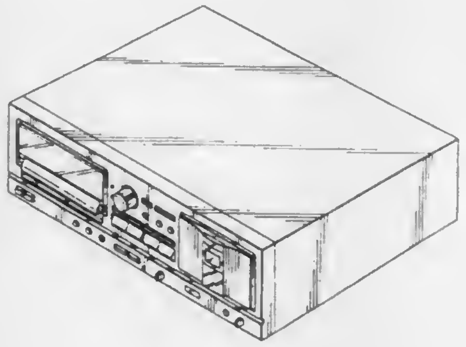
Filed Jan. 6, 1997, Ser. No. 64,552

Claims priority, application Japan, Jul. 10, 1996, 8-20646

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—156



394,261
VOICE MEMO

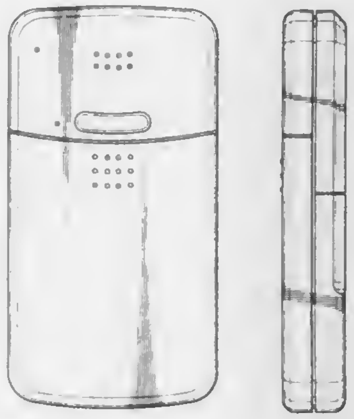
Raymond Chan, Hong Kong, Hong Kong, assignor to IDT International Limited, Hamilton, Bermuda

Filed Aug. 22, 1996, Ser. No. 58,781

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—167



394,262
AUDIO AMPLIFIER

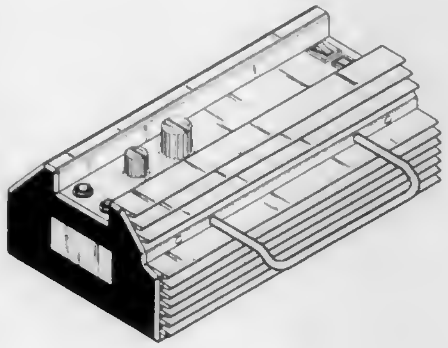
David W. Cross, Johnston, and Gregory M. Farres, West Des Moines, both of Iowa, assignors to Amplitude L.C., Johnston, Iowa

Filed Jul. 11, 1996, Ser. No. 56,895

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—188



394,263
LOUDSPEAKER ENCLOSURE

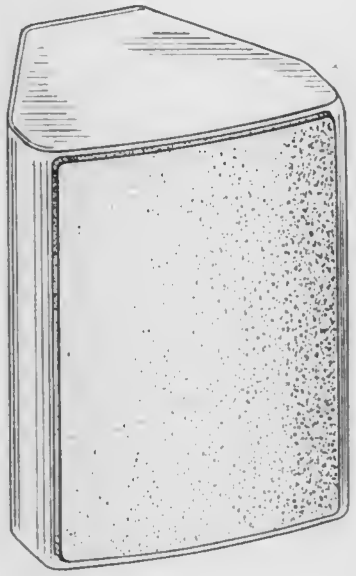
Roy Fischer, Scottsdale, Ariz., assignor to JBL, Incorporated, Northridge, Calif.

Filed Mar. 14, 1997, Ser. No. 68,007

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—214



394,264
REMOTE CONTROLLER FOR VIDEO PROJECTOR

Harumi Sakamoto, Utsunomiya, and Koichi Iida, Yaita, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

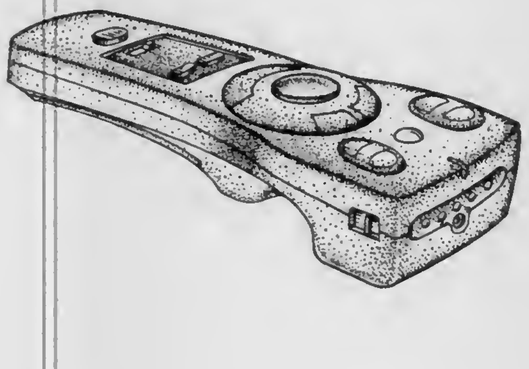
Filed May 8, 1997, Ser. No. 71,006

Claims priority, application Japan, Nov. 8, 1996, 8-33809

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—218



394,265
SPEAKER STAND

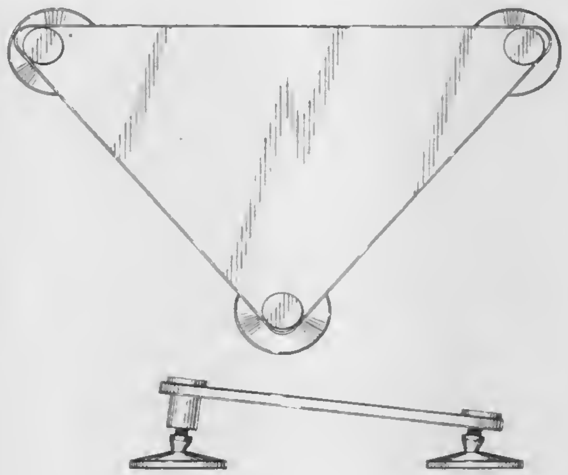
Dennis Loo, 990 E. Oak St., Anaheim, Calif. 92805, and Jerry Axelro, 1604 Wollacott St., Redondo Beach, Calif. 90278

Filed Sep. 24, 1996, Ser. No. 60,201

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—224



394,266
BASE STATION

Harm Willem Hogenbirk, Amsterdam, Netherlands, assignor to Ericsson Business Mobile Networks B.V., Amsterdam, Netherlands

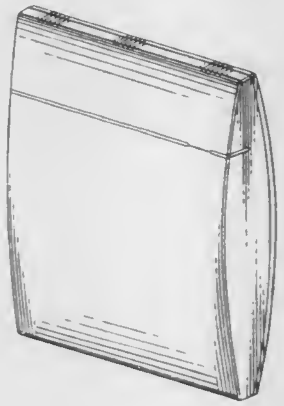
Filed Sep. 6, 1996, Ser. No. 59,260

Claims priority, application WIPO, Mar. 6, 1996, DM/035776

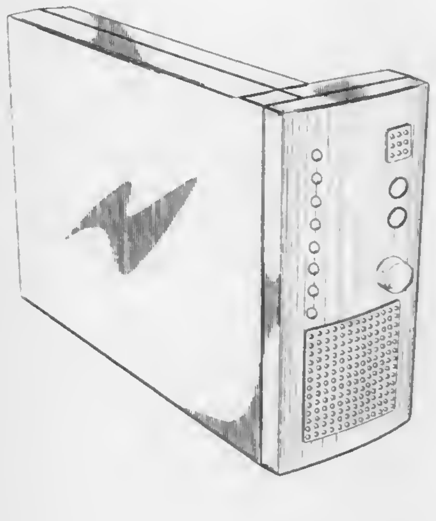
Term of patent 14 years

LOC (6) Cl. 14 - *03*

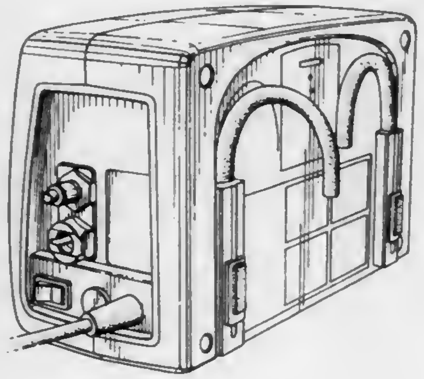
U.S. Cl. D14—240



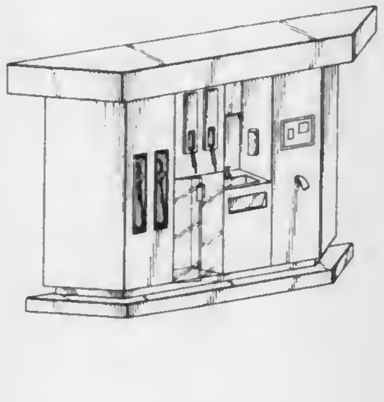
394,267
MODEM
J. Stephen Wells, Buford, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Nov. 18, 1996, Ser. No. 62,497
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—242



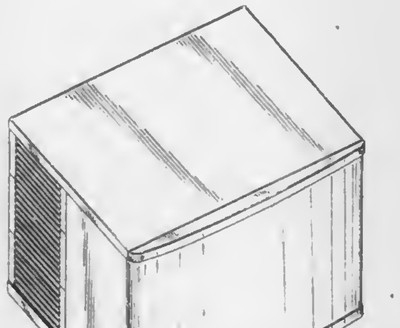
394,268
MINIPUMP
Jarred Evans, Mid Glamorgan, and Rolf Schild, London, both of United Kingdom, assignors to Huntleigh Technology PLC, Luton, England
Filed Nov. 15, 1996, Ser. No. 62,491
Term of patent 14 years
LOC (6) Cl. 15 - *02*
U.S. Cl. D15—7



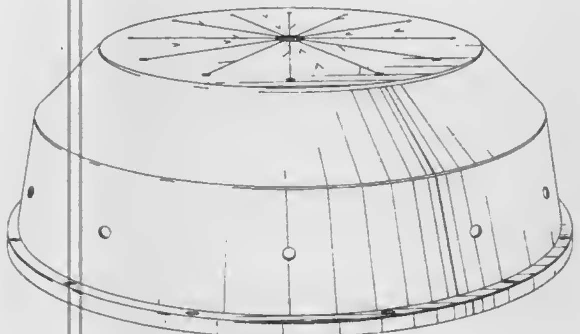
394,269
COMBINED FUEL, AIR, OIL AND WINDSHIELD WASHER FLUID DISPENSING UNIT WITH WASHING FACILITIES
Stein Alvern, Oslo, and Øyvind Alvern, Hjellestad, both of Norway, assignors to Alvern Norway AS, Norway
Filed Oct. 16, 1996, Ser. No. 61,132
Claims priority, application Norway, Apr. 24, 1996, D960270
Term of patent 14 years
LOC (6) Cl. 15 - *02*
U.S. Cl. D15—9.2



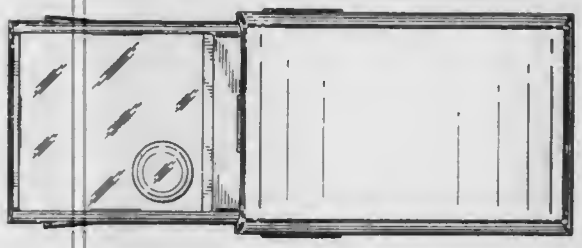
394,270
ICE MACHINE
Timothy B. Strandell, Racine, and Raymond R. Haack, Mishicot, both of Wis., assignors to Manitowoc Foodservice Group, Inc., Sparks, Nev.
Filed Apr. 22, 1997, Ser. No. 69,754
Term of patent 14 years
LOC (6) Cl. 15 - *07*
U.S. Cl. D15—80



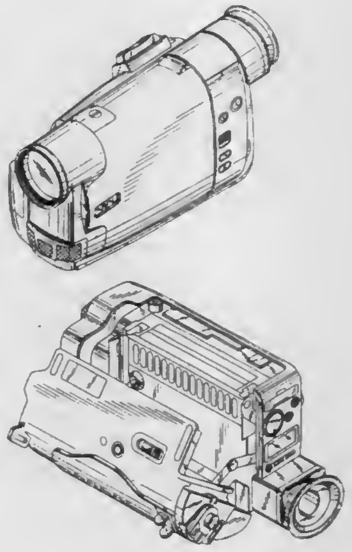
394,271
BASE MOLD FOR CONCRETE POST
Morris T. Croghan, 106 Papineau Road, Fulford, Quebec, Canada, J0E 1S0
Filed Jan. 13, 1997, Ser. No. 64,881
Term of patent 14 years
LOC (6) Cl. 15 - *09*
U.S. Cl. D15—136



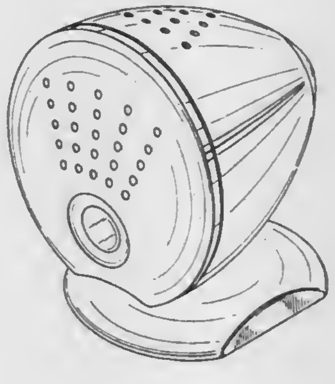
394,272
POP UP MAGNIFIER
Chan Chung Hon, New Territories, Hong Kong, assignor to Sunrich Manufactory Ltd., New Territories, Hong Kong
Filed Jan. 3, 1997, Ser. No. 64,532
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—135



394,273
VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER
Daisuke Ishii, Tokyo, Japan, assignor to Sony Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 26, 1996, Ser. No. 49,476
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



394,274
CAMERA FOR ELECTRONIC COMPUTERS
Shogo Suzuki, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 29, 1997, Ser. No. 74,153
Claims priority, application Japan, Feb. 19, 1997, 9-4428
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



394,275

FRONTPIECE FOR SWIM GOGGLES

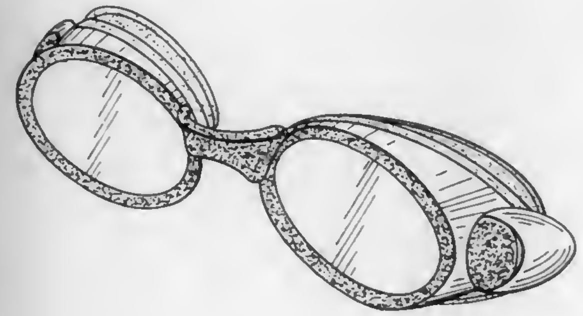
Stephen John Hall, Surrey, Canada; Aidan Petrie, Providence, R.I.; Stephen Lane, Jamestown, R.I., and John Mathews, Providence, R.I., assignors to Authentic Fitness Products, Inc., Van Nuys, Calif.

Filed Oct. 3, 1996, Ser. No. 60,668

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—303



394,276

EYEWEAR LENS FRONT

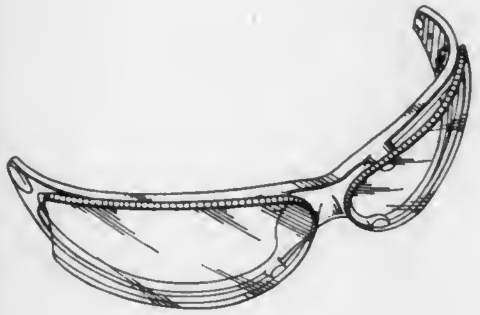
David K. Peschel, San Francisco, Calif., assignor to Nike, Inc., Beaverton, Oreg.

Filed Mar. 25, 1997, Ser. No. 68,272

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—315



394,277

COMBINATION STACKED PAPER, CALCULATOR AND BUSINESS CARD HOLDER

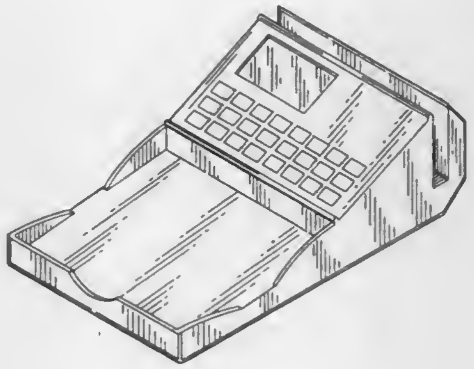
Stephen Lin, 315 Santa Cruz Rd., Arcadia, Calif. 91007

Filed Apr. 25, 1997, Ser. No. 68,994

Term of patent 14 years

LOC (6) Cl. 18 - *01*

U.S. Cl. D18—2



394,278

ANIMAL TYPE FONT

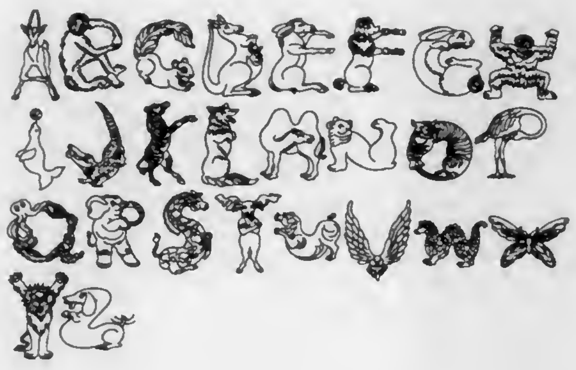
Sandra A. Nowicki, 9035 Fox River Rd., Burlington, Wis. 53105

Filed Jun. 9, 1997, Ser. No. 71,925

Term of patent 14 years

LOC (6) Cl. 18 - *03*

U.S. Cl. D18—27



394,279

EXTERIOR OF A BINDER COVER

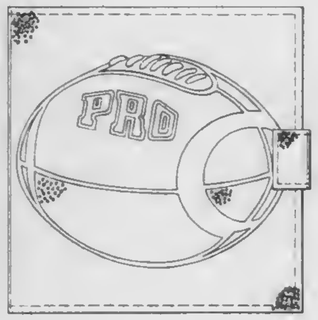
Alan Hodes, Front Royal, Va., assignor to Pen-Tab Industries, Inc., Front Royal, Va.

Filed May 7, 1996, Ser. No. 54,125

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—26



394,280

FILE BOX

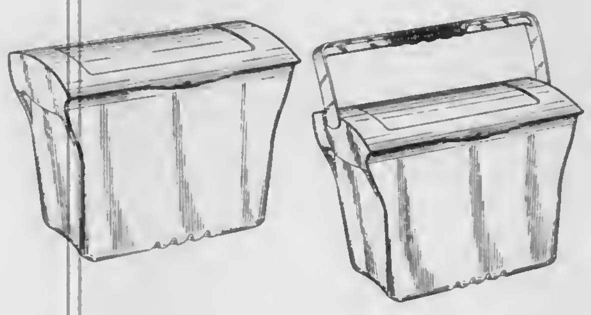
Albert B. Cheris, Highland Park, and Mark Dziersk, Chicago, both of Ill., assignors to Tenex Corporation, Elk Grove Village, Ill.

Filed Apr. 1, 1997, Ser. No. 68,557

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D19—75



394,281

EMERGENCY SIGN FOR VEHICLES

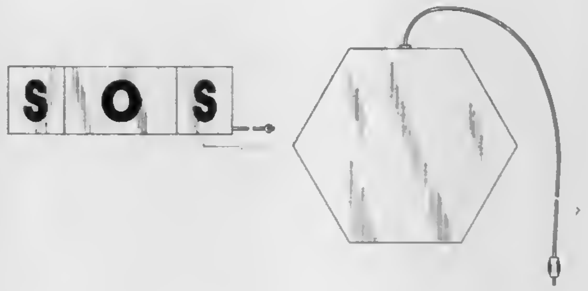
Dougald Miller, 9524-114 Avenue, Apt. #4, Edmonton, Alberta, Canada, T5G 0K7

Filed Jan. 21, 1997, Ser. No. 65,120

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D20—10



394,282

WORKOUT LEVEL DISPLAY INDICATOR

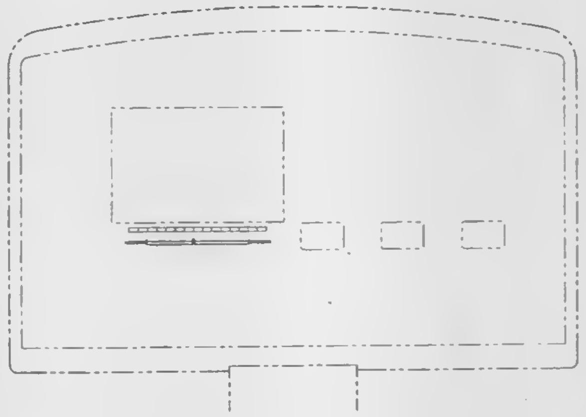
James S. Birrell, Seattle, Wash., assignor to Precor Incorporated, Bothell, Wash.

Continuation-in-part of Ser. No. 494,107, Jun. 23, 1995. This application Sep. 19, 1996, Ser. No. 58,387

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—19



394,283

CRISS CROSS BOARD GAME

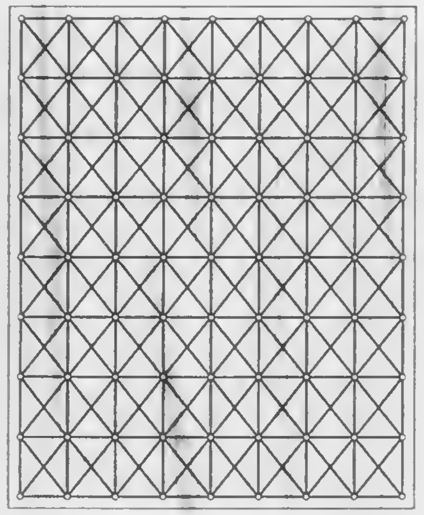
David Dawkins, 7618 Burgundy Dr., Canon, Mich. 48187

Filed Jan. 7, 1997, Ser. No. 64,643

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—34



394,284

LOTTO TOY

Leonhard Augenstein, Ungsteiner Strasse 3, D-81539 Munich, Germany

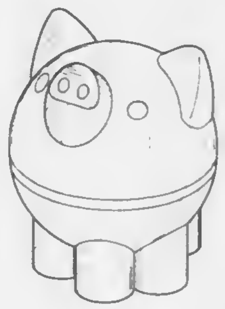
Filed Apr. 18, 1996, Ser. No. 53,260

Claims priority, application Germany, Oct. 19, 1995, M 95 08 442.8

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—37



394,285

KLACKER SET

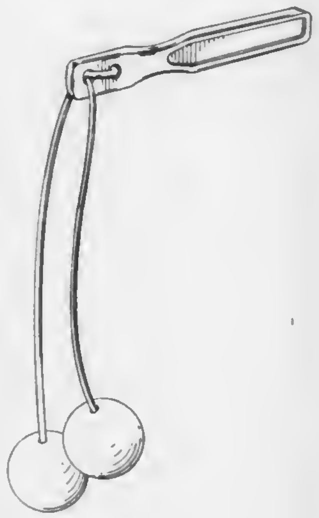
Grant Mann, Chandler, Ariz., assignor to Talent Toy Industries, Inc., Scottsdale, Ariz.

Filed Apr. 7, 1997, Ser. No. 67,914

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—62



394,286

SPRING-DRIVEN MOTOR FOR CONSTRUCTION TOY

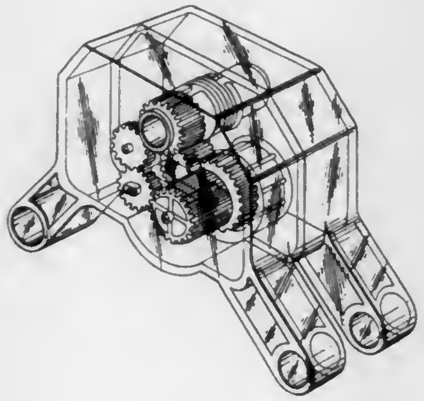
Tomiyuki Hirose, Apt. 402, 7-12-2 Nishiogu, Arakawa-Ku, Tokyo 116, Japan, and Joel Glickman, 1777 Oak Hill Dr., Huntington Valley, Pa. 19006

Filed Jan. 18, 1996, Ser. No. 49,117

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—108



394,287

THREE DIMENSIONAL ORNAMENT FOR TOYS

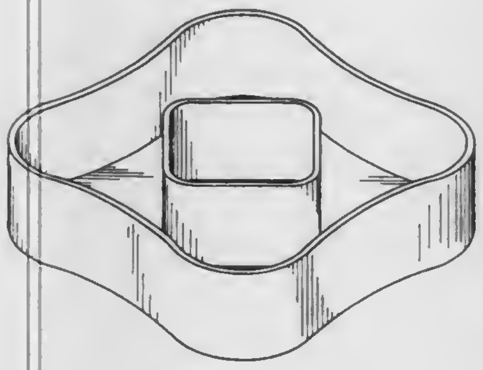
Hanne Davidsen Jensen, Gentofte; Paul Leadbetter, Holbæk, and Arne Egholm Jensen, Gentofte, all of Denmark, assignors to INTERLEGO AG, Baar, Switzerland

Filed Sep. 17, 1996, Ser. No. 59,850

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—108



394,288

ALLIGATOR HEAD HAND PUPPET

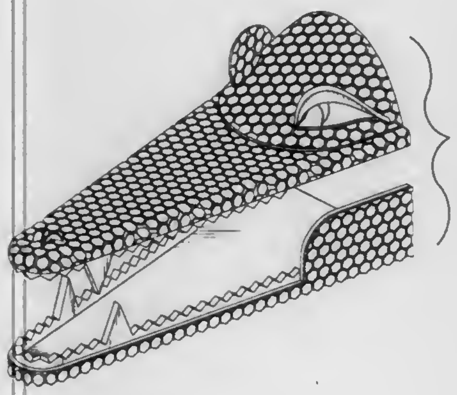
Michael W. Trahan, 6068 Iota Hwy. 91, Iota, La. 70543

Filed Apr. 29, 1997, Ser. No. 69,567

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—153



394,289

DOLL HAVING A BAGEL-SHAPED HEAD WITH BAGEL-SHAPED TRIMMINGS

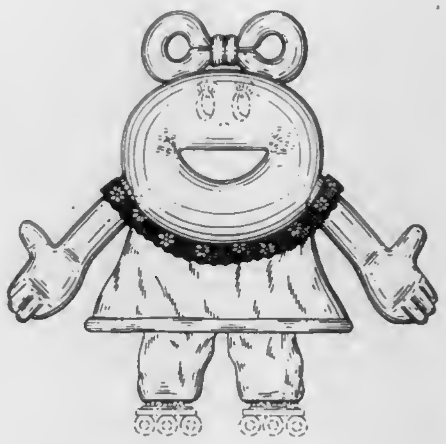
Carol Caldwell, 9 Melody La., Kings Park, N.Y. 11754

Filed Oct. 25, 1996, Ser. No. 61,558

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—155



394,290

GOLF CLUB HEAD

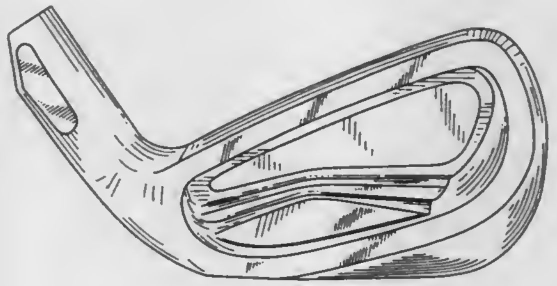
Christopher Brian Best, Encinitas, and William F. Davidson, Costa Mesa, both of Calif., assignors to Cobra Golf, Inc., Carlsbad, Calif.

Filed Jan. 23, 1997, Ser. No. 65,177

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—220



394,291

COMBINATION GOLF PUTTER AND GOLF BALL DISPLAY STAND AND PUTT PRACTICE DEVICE

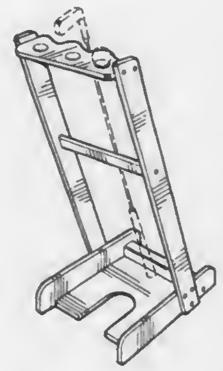
Carlos Machado Beltran, P.O. Box 530010, San Diego, Calif. 92153, and Alejandro Machado Beltran, 3938 Via de la Bandola, San Ysidro, Calif. 92173

Filed Jan. 27, 1997, Ser. No. 65,394

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—223



394,292

CONVERTIBLE GOLF CLUB

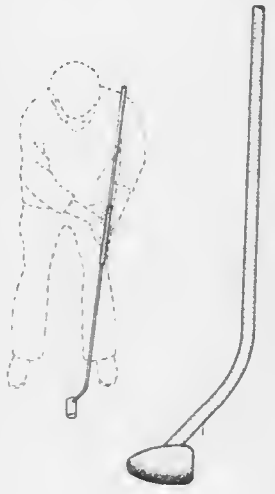
Sam D. Bankhead, West End, N.C., assignor to Bankhead Golf Company, L.L.C., Pinehurst, N.C.

Filed May 30, 1997, Ser. No. 71,521

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—217



394,293

IN LINE SKATE

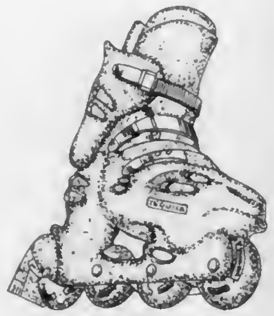
Renzo Maggi, Riva Nazzano, Italy, assignor to Salvas S.p.A., Castelnuovo Scrivia, Italy

Filed Mar. 10, 1997, Ser. No. 67,291

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—226



394,294

WATER FLOATABLE BOARD

Pierre-Louis Parant, Sillery, Canada, assignor to Surfbike Products Inc., Sherbrooke, Canada

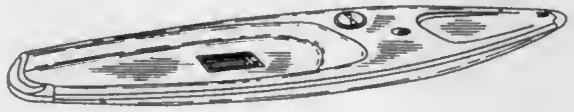
Filed Dec. 9, 1996, Ser. No. 63,483

Claims priority, application Canada, Aug. 1, 1996, 1996-1733

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—228



394,295

GOLF HOLE FLAG PIN

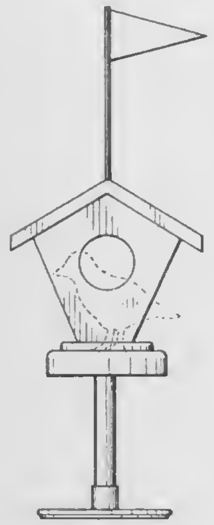
Grant L. Southworth, 3615 N. Wolf Creek Dr., Eden, Utah 84310

Filed Aug. 16, 1996, Ser. No. 58,487

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—234



394,296

FROG PLAYGROUND SCULPTURE

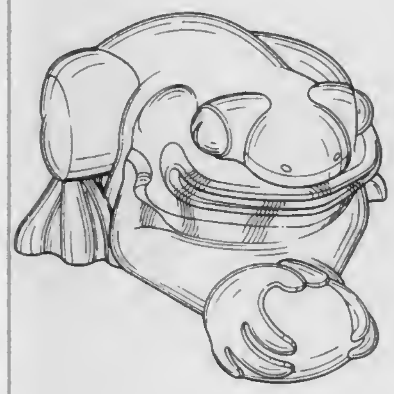
Kyle McLean, Park Hills, Mo., assignor to Little Tikes Commercial Play Systems Inc., Farmington, Mo.

Filed Mar. 31, 1997, Ser. No. 68,773

Term of patent 14 years

LOC (6) Cl. 21 - *03*

U.S. Cl. D21—242



394,297

FIREARM TRIGGER GUARD COVER

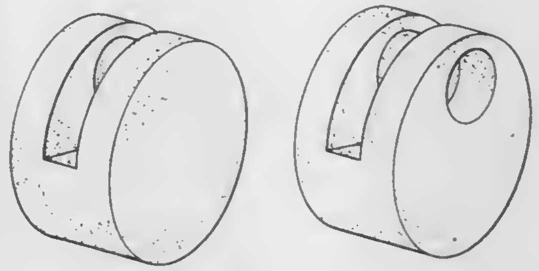
James H. Knuth, 9425 Ravenna Rd., Chardon, Ohio 44024

Filed Jan. 29, 1996, Ser. No. 49,711

Term of patent 14 years

LOC (6) Cl. 22 - *01*

U.S. Cl. D22—108



394,298

INSECT ATTRACTANT COVER

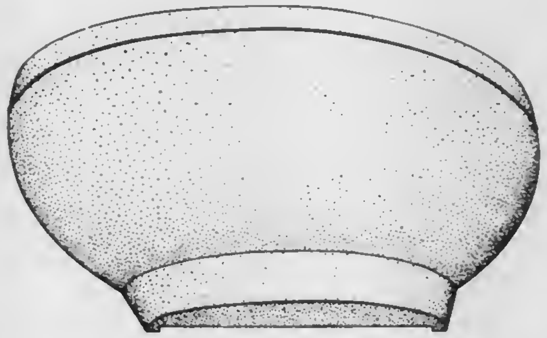
Ross Austin Mackert, St. Louis Park, and Neil Thomas Amundson, Eden Prairie, both of Minn., assignors to Ecolab, Inc., St. Paul, Minn.

Filed Aug. 23, 1996, Ser. No. 58,813

Term of patent 14 years

LOC (6) Cl. 22 - *06*

U.S. Cl. D22—122

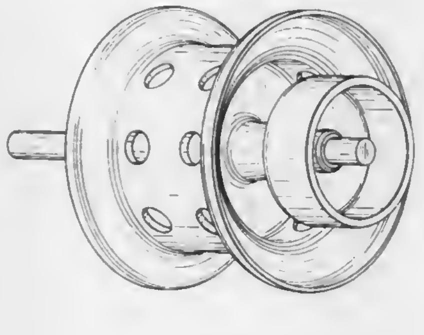


394,299

FISHING REEL SPOOL

Takeo Miyazaki, and Yukio Itoh, both of Higashikurume, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jun. 25, 1996, Ser. No. 56,169
Term of patent 14 years
LOC (6) Cl. 22 - *05*

U.S. Cl. D22—137

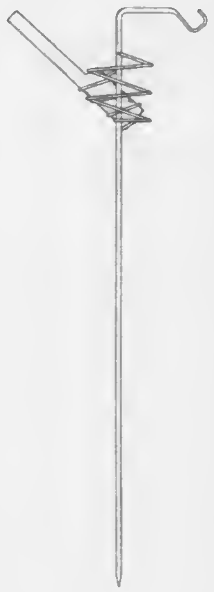


394,300

COMBINATION FISHING ROD HOLDER, UITILITARIAN HOOK AND BEVERAGE HOLDER

Francis D. Samuels, 128 N. River Dr.; Raymond B. Samuels, 137 Dolbow Ave., both of Pennsville, N.J. 08070, and Ralph L. Fisher, 4 Summerill Ave., Penns Grove, N.J. 08069
Filed Mar. 13, 1997, Ser. No. 67,999
Term of patent 14 years
LOC (6) Cl. 22 - *05*

U.S. Cl. D22—148

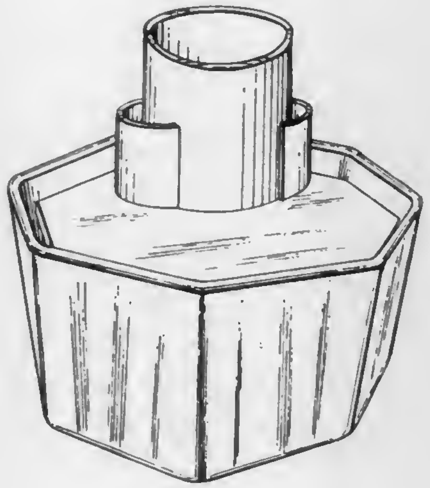


394,301

TABLE TOP WATER FOUNTAIN WITH PLATFORM FOR DECORATIVE OBJECTS

Gary R. Fisher, Los Angeles, Calif., assignor to Armchair World, Los Angeles, Calif.
Filed Jul. 15, 1997, Ser. No. 73,506
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—201

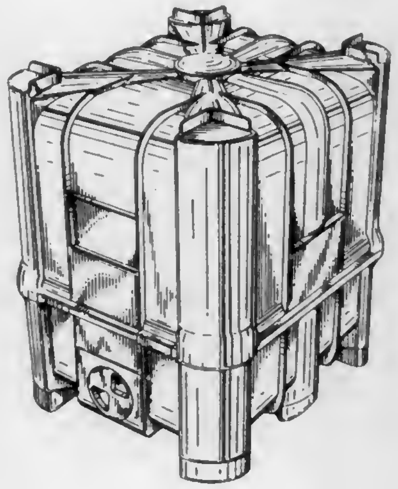


394,302

CONTAINER FOR BULK MATERIALS

Jack E. Harris, Savannah, Ga.; Robert A. Bromwell, Royal Oak, Mich.; Karl L. Sommer, Rochester Hills, Mich., and Gerald L. Blake, Farmington Hills, Mich., assignors to Encon, Inc., Romeo, Mich.
Filed Jun. 1, 1994, Ser. No. 23,749
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—202

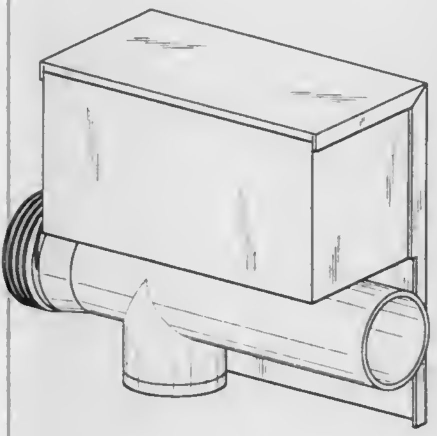


394,303

WATER IONIZER

Joseph Pucci, Hinckley, Ohio, assignor to Hercules Products, Brunswick, Ohio
Filed Mar. 7, 1997, Ser. No. 67,456
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—207

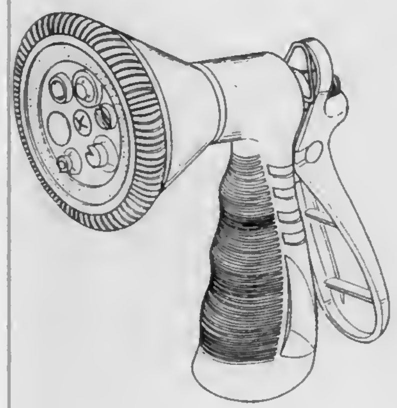


394,304

SPRAY GUN

Yu-Neng Kuo, Chang Hua Hsien, Taiwan, assignor to Le Yuan Industrial Co., Ltd., Chang Hua Hsien, Taiwan
Filed Jul. 3, 1997, Ser. No. 73,220
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—226

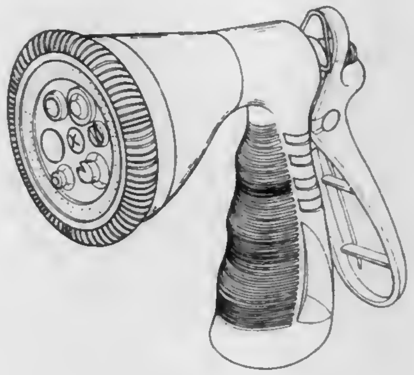


394,305

SPRAY GUN

Yu-Neng Kuo, Chang Hua Hsien, Taiwan, assignor to Le Yuan Industrial Co., Ltd., Chang Hua Hsien, Taiwan
Filed Jul. 3, 1997, Ser. No. 73,221
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—226



394,306

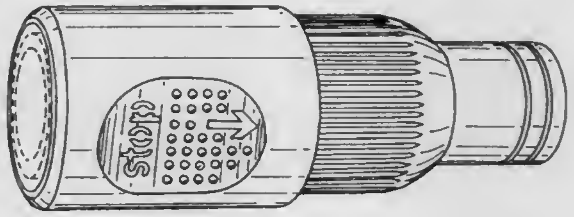
HOSE COUPLING WITH WATER STOP

Franco Clivio, Erlenbach, Switzerland, assignor to Gardena Kress & Kastner GmbH, Ulm, Germany
Filed Feb. 12, 1996, Ser. No. 50,229

Claims priority, application Germany, Aug. 10, 1995, M 95 06 385.4

Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—262



394,307

LAVATORY BOWL

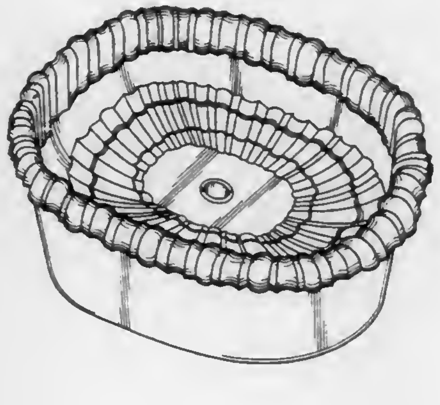
Sherle Wagner, New York, N.Y., assignor to Sherle Wagner International LLC, New York, N.Y.

Filed Sep. 26, 1996, Ser. No. 60,333

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—285



394,308

LAVATORY

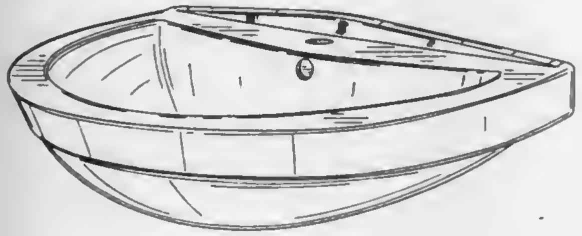
Franco Bertoli, Milan, Italy, assignor to American Standard Inc., Piscataway, N.J.

Filed Apr. 11, 1997, Ser. No. 69,132

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—293.1



394,309

TOILET

Marcelo Garza Laguera Garza, Acambaro No. 459 Col. CD. Industrial, 36541, Irapuato, Guanajuato, Mexico

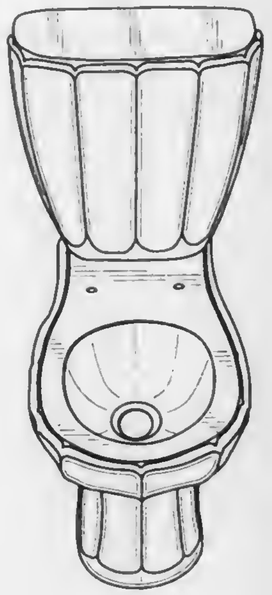
Filed Apr. 25, 1997, Ser. No. 70,008

Claims priority, application Mexico, Oct. 25, 1996, 961071

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—301



394,310

SHOWER HEAD VALVE

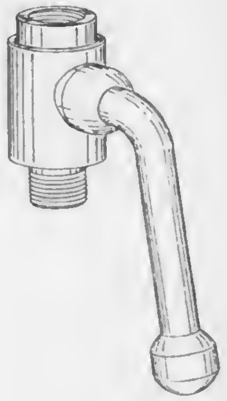
Frederick Rector, 368 Blvd., Elmwood Park, N.J. 07407

Continuation of Ser. No. 54,192, May 8, 1996, abandoned. This application Jan. 13, 1997, Ser. No. 65,409

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—304



394,311

PORTABLE AIR PURIFIER

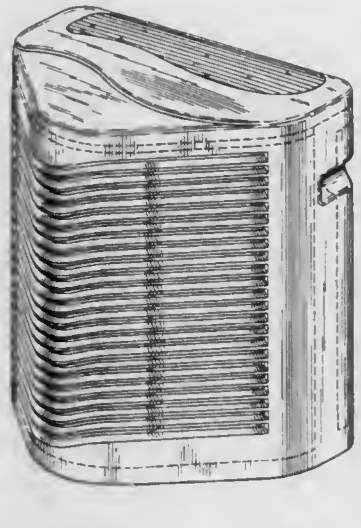
John W. Seaman, Sheboygan Falls; Randy K. Hulsebus, Plymouth, and Daniel DeLay, Waterford, all of Wis., assignors to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Apr. 10, 1997, Ser. No. 69,387

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—364



394,312

BURNER PART

Garry Owen Thompson, Victoria, Australia, assignor to Ausmark International Pty Ltd., Australia

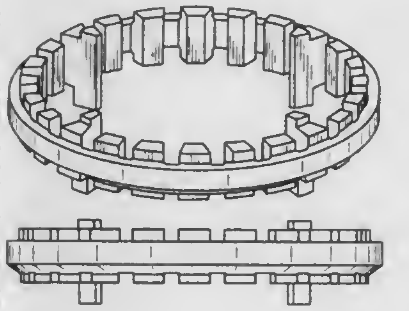
Filed Dec. 22, 1995, Ser. No. 48,223

Claims priority, application Australia, Jun. 29, 1995, 2004/95

Term of patent 14 years

LOC (6) Cl. 23 - *03*

U.S. Cl. D23—418



394,313

SPACER DEVICE FOR DISPENSING INHALANT MEDICATION

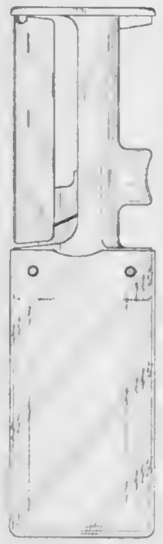
Kevin P. O'Brien, 41 Vermont Ave., Cincinnati, Ohio 45215

Filed Jan. 21, 1997, Ser. No. 65,513

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—110



394,314

DELRIN CARDIOCARE STETHOSCOPE

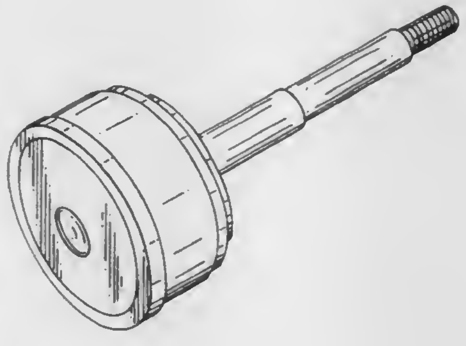
Jerome Moore; Gwendolyn Moore, both of 7387 Waters Edge Dr., Stone Mountain, Ga. 30087, and Shiu Wen Kao, 833 N. Hariston Rd., Stone Mountain, Ga. 30083

Filed Apr. 22, 1996, Ser. No. 55,727

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—134



394,315
SURGICAL SAW BLADE HUB

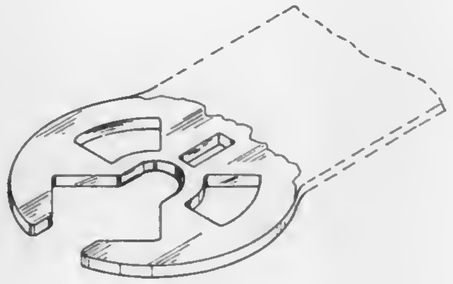
Michael G. Fisher, 1468 Lake Hills Dr., El Dorado Hills, Calif. 95752

Filed Jul. 19, 1996, Ser. No. 57,213

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—146



394,316
RADIATION THERAPY MACHINE

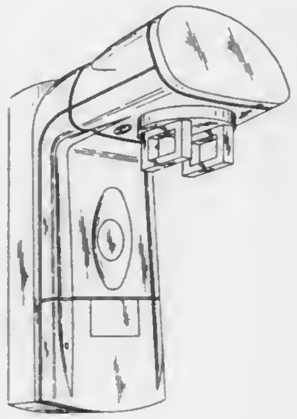
Kelly L. Kodama, Alamo; Erich C. Elkins, San Francisco, and Jeffrey T. Haller, San Mateo, all of Calif., assignors to Siemens Medical Sysems, Inc., Iselin, N.J.

Filed Oct. 28, 1996, Ser. No. 61,642

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—158



394,317
COMBINED HOUSING AND REMOVABLE CAP OF A SAMPLE ANALYZER

Richard Nikolaas Carp, Alton, Great Britain, assignor to Unipath Limited, Hampshire, United Kingdom

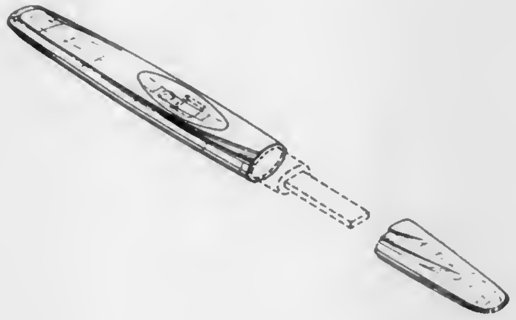
Filed Jun. 10, 1996, Ser. No. 56,155

Claims priority, application United Kingdom, Dec. 8, 1995, 2052554

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—223



394,318
CONDOMINIUM FACADE

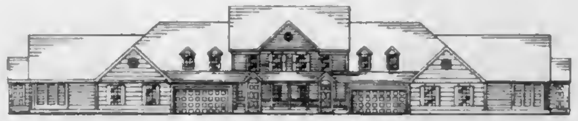
William J. Riat, Dublin, Ohio, assignor to Dominion Homes, Inc., Dublin, Ohio

Filed Jun. 1, 1995, Ser. No. 39,638

Term of patent 14 years

LOC (6) Cl. 25 - *03*

U.S. Cl. D25—17



394,319
FLOORING SURFACE

Gerhard Berger, Weinheim, Germany, assignor to Carl Freudenberg, Weinheim, Germany

Filed Sep. 12, 1996, Ser. No. 59,529

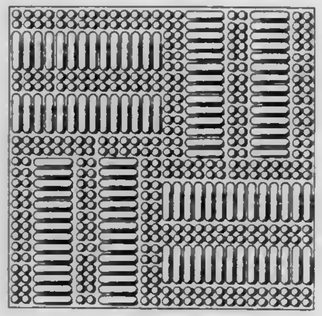
Claims priority, application Germany, Mar. 14, 1996, 96 02 356.2

The portion of the term of this patent subsequent to Nov. 4, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—163



394,320
FLOORING SURFACE

Gerhard Berger, Weinheim, Germany, assignor to Carl Freudenberg, Weinheim, Germany

Filed Sep. 12, 1996, Ser. No. 59,530

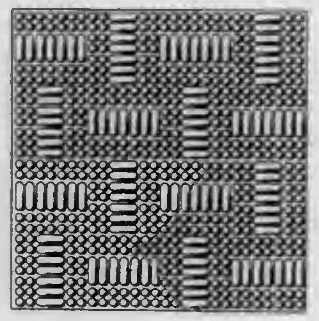
Claims priority, application Germany, Mar. 14, 1996, 96 02 356.2

The portion of the term of this patent subsequent to Nov. 4, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—163



394,321
FLASHLIGHT

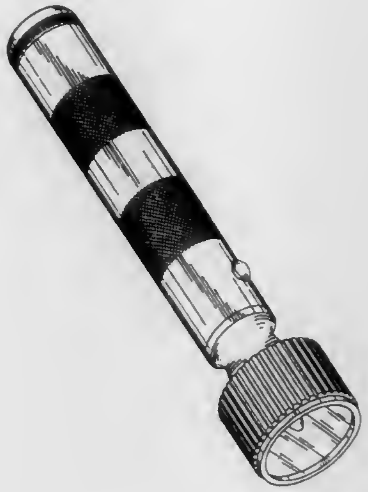
Si Fu Chiu, Unit 10, 19th Floor, Technology Plaza, 29-35 Sha Tsui Road, Tsuen Wan, New Territories, Hong Kong

Filed Sep. 26, 1997, Ser. No. 76,882

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—37



394,322
LANTERN

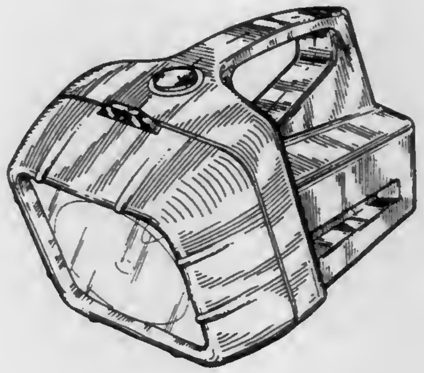
David R. Dalton, Westlake, Ohio, and John R. Brown, New South Wales, Australia, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jan. 6, 1997, Ser. No. 64,595

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—48



394,323

LIGHT FIXTURE FOR MOUNTING ON A WALL

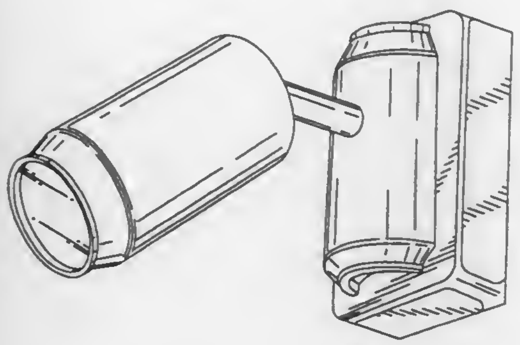
Mark West, 1388 Calle Violeta, Thousand Oaks, Calif. 91360

Filed Feb. 21, 1997, Ser. No. 66,809

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—63



394,324

TABLE LAMP

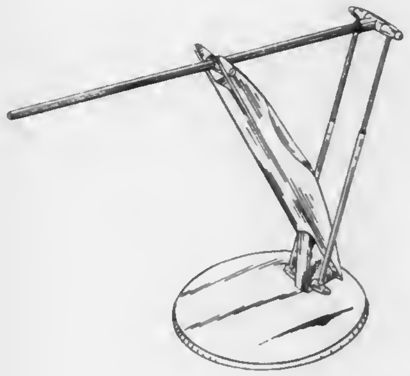
Huo-Tu Huang, No.9, Lane 379, Chung-Hwa Road, Su-Lin, Taipei, Taiwan

Filed Apr. 22, 1997, Ser. No. 69,623

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—65



394,325

WALL LAMP

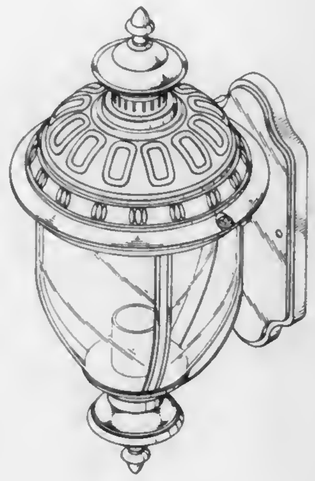
Keen Hsu, Taichung, Taiwan, assignor to Bright Yin Huey Co., Ltd., Taichung, Taiwan

Filed Mar. 5, 1997, Ser. No. 66,997

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—87



394,326

TABLE LAMP

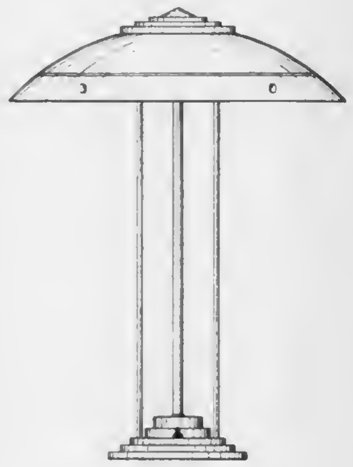
Sandra E. Littman, and Krina S. Kaufman, both of New York, N.Y., assignors to Sandy Littman, Inc., New York, N.Y.

Filed Dec. 26, 1995, Ser. No. 48,305

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—106



394,327

LAMP BODY

John Hutton, New York, N.Y., assignor to Donghia Furniture Co., Ltd., New York, N.Y.

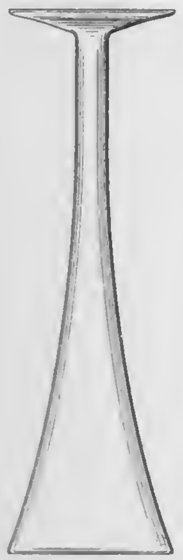
Filed Mar. 13, 1997, Ser. No. 68,630

The portion of the term of this patent subsequent to Mar. 13, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—110



394,328

COMBINED SUNTAN LOTION DISTRIBUTOR AND CAP THEREFOR

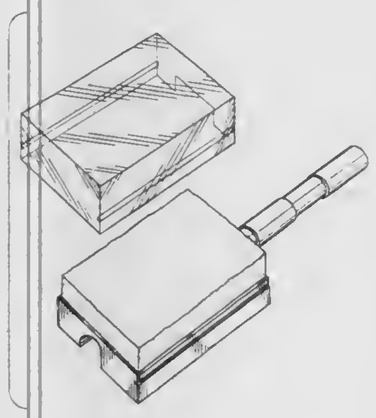
Lisa Mary Palumbo, 58 Park Hill Ave., Massapequa, N.Y. 11758

Filed Mar. 20, 1997, Ser. No. 68,057

Term of patent 14 years

LOC (6) Cl. 28 - *02*

U.S. Cl. D28—7



394,329

DRY SHAVER

Roland Ullmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

Filed Dec. 22, 1995, Ser. No. 48,800

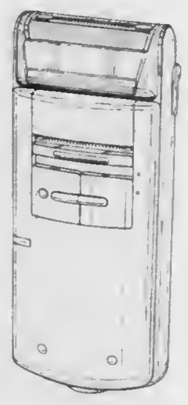
Claims priority, application Germany, Jul. 19, 1995, M 95 05 668.8

The portion of the term of this patent subsequent to Dec. 22, 2009, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—49



394,330

SPONGE MITTEN

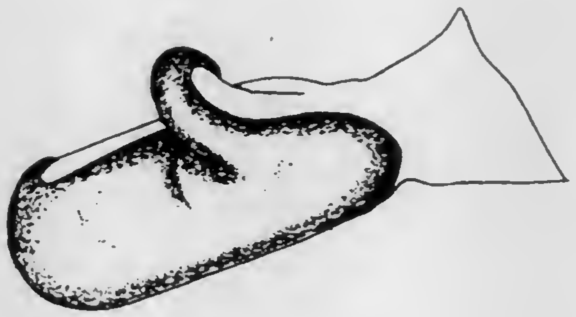
Marty M. Sedighzadeh, 11504 W. Berry Pl., and Mary F. Collins, 11181 W. Powers Pl., both of Littleton, Colo. 80127

Filed Nov. 4, 1996, Ser. No. 62,411

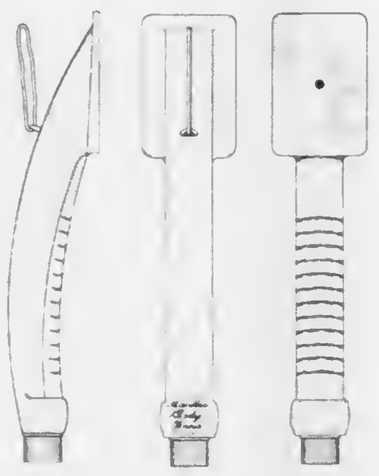
Term of patent 14 years

LOC (6) Cl. 28 - *03*

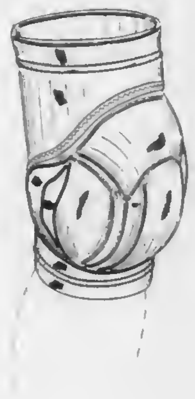
U.S. Cl. D28—63



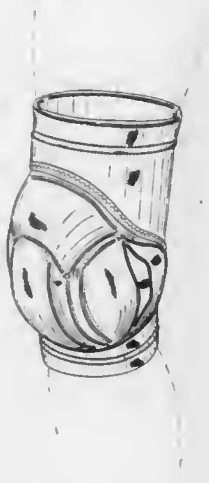
394,331
LIQUID CONTAINER WITH BATH BRUSH
Macille Rose Price, 4825 Columbus Lanscater Rd., Carroll, Ohio 43112
Filed Apr. 10, 1997, Ser. No. 69,159
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—63



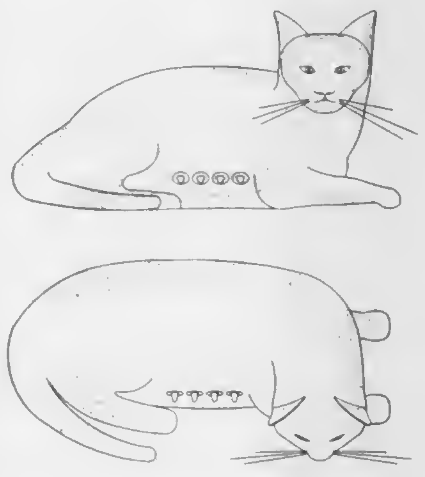
394,332
KNEE PAD
Kanzo Tsujino, Orange, Calif., assignor to Asics Corporation, Japan
Filed May 9, 1997, Ser. No. 70,561
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D29—121



394,333
KNEE PAD
Kanzo Tsujino, Orange, Calif., assignor to Asics Corporation, Japan
Filed May 9, 1997, Ser. No. 70,562
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D29—121



394,334
ANIMAL NURSING FEEDER
Jerry Dorn, and Colleen Dorn, both of 308 John Dorn La., Telford, Pa. 18969
Filed Oct. 15, 1996, Ser. No. 61,051
Term of patent 14 years
LOC (6) Cl. 30 - *07*
U.S. Cl. D30—121



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12th DAY OF MAY, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.J. Sackett and Sons Company: *See—*
Humphries, Robert D.; Dreese, Delbert R.; Taylor, Louis L.; and Parker, Dennis Clay, 5,749,936, Cl. 71-64.050.

A.U. Mines, Inc.: *See—*
Tanner, Noel, 5,749,472, Cl. 209-458.000.

AB Volvo: *See—*
Eklund, Karl-Gunnar; and Mattsson, Tommy, 5,749,992, Cl. 156-212.000.

ABB Henschel AG: *See—*
Tegeler, Ferdinand, 5,749,302, Cl. 105-397.000.

ABB Patent GmbH: *See—*
Rees, Volker; Schumacher, Martin; and Plettner, Horst, 5,750,949, Cl. 218-43.000.

Abbott Laboratories: *See—*
Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., 5,750,558, Cl. 514-415.000.
Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.
Macauley, Richard Peter; Sita, Lewis Henry; and Stokesbury, Elwood Lamar, 5,750,226, Cl. 428-36.400.
Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., 5,750,413, Cl. 436-537.000.
Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.

Abbott, Louis Eugene, to Bruce Industries, Inc. Modular fluorescent track lighting. 5,751,117, Cl. 315-244.000.

Abbott, Michael J.; Close, Paul; and Smith, Kevin P., to Silicon Graphics, Inc. System and method for media stream synchronization with a base atom index file and an auxiliary atom index file. 5,751,280, Cl. 345-302.000.

Abe, Eiichi: *See—*
Tsunematsu, Shuji; Yamada, Hideo; Abe, Eiichi; and Inoue, Kozo, 5,750,038, Cl. 210-777.000.

Abe, Fumitaka: *See—*
Nakazawa, Fumihiko; Okumura, Hitoshi; Sano, Satoshi; and Abe, Fumitaka, 5,751,406, Cl. 356-3.030.

Abe, Katsuhiko: *See—*
Fujikawa, Takuya; and Abe, Katsuhiko, 5,749,527, Cl. 239-585.300.

Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, to Nippon Pillar Packing Co., Ltd. Gasket for sanitary piping and method of manufacturing the same. 5,749,586, Cl. 277-608.000.

Abe, Michiharu, to Ricoh Company, Ltd. Method of recording and reproducing information. 5,750,293, Cl. 430-21.000.

Abe, Shuji: *See—*
Shimoda, Kenji; Abe, Shuji; and Kurihara, Kouichi, 5,751,893, Cl. 386-111.000.

Abe, Shunji: *See—*
Soumiya, Toshio; Abe, Shunji; Katoh, Masafumi; and Watanabe, Naotoshi, 5,751,691, Cl. 370-17.000.

Abe, Tooru, to Hitachi Metals, Ltd. Piezoelectric transformer and power converting apparatus employing the same. 5,751,092, Cl. 310-359.000.

Abe, Yoshito: *See—*
Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl 546-121.000.

Abel, James Charles: *See—*
Tubbs, Graham S.; and Abel, James Charles, 5,752,071, Cl. 395-800.340.

Abelen, Thomas; Arndt, Lutz; and Muller, Peter, to Leybold Aktiengesellschaft. Integrated oil pump rotor and coupling piece for an oil-sealed vacuum pump. 5,749,716, Cl. 417-410.300.

Åberg, Kenneth, to Niblick International AB. Method of affixing a tubular object. 5,749,991, Cl. 156-187.000.

Abidin, Michael R.; and Lehmbeck, Steven P., to Bloom, Leonard. Disposable guarded finger scalpel for inserting a line in a patient and blade therefor. 5,749,886, Cl. 606-182.000.

Abiko, Shigeshi; Mizushima, Shintaro; and Couvrat, Marc, to Texas Instruments Incorporated. Arithmetic circuit. 5,751,618, Cl. 364-736.010.

Abo, Sadayuki: *See—*
Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.

Abrams, Richard Wayne: *See—*
Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.

Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D. Out-of-order processor with a memory subsystem which handles speculatively dispatched load operations. 5,751,983, Cl. 395-392.000.

Abuaf, Nesim; and Goebel, Steven George, to General Electric Company. Thermal spreading combustor liner. 5,749,229, Cl. 60-752.000.

Aburano, Ichiharu: *See—*
Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.

AccessLine Technologies, Inc.: *See—*
Fuller, Robert M.; Epler, Frederick A.; and Oates, Eugene W., 5,752,191, Cl. 455-445.000.

Accu-Sort Systems, Inc.: *See—*
Wurz, Albert; Yeh, Edward P.; and Brobst, Thomas J., 5,750,004, Cl. 156-360.000.

Ace Medical Company: *See—*
Kyle, Richard F.; Clewett, Richard H.; and Wright, Drew D., 5,749,872, Cl. 606-69.000.

Acer Peripherals, Inc.: *See—*
Su, Yang-Chun; and Huang, Yu-Wen, 5,751,860, Cl. 382-244.000.

Acevedo, Oscar L.: *See—*
Cook, P. Dan; Acevedo, Oscar L.; and Andrews, Robert S., 5,750,692, Cl. 544-253.000.

Acharya, A. Seetharama; Manjula, Belur N.; and Smith, Paul K., to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva. Hemoglobin crosslinkers. 5,750,725, Cl. 548-545.000.

Ackerman, Robert S.; and Ozark, L. John, to Chrysler Corporation. Rear lift gate-mounted bicycle mount for passenger van. 5,749,694, Cl. 414-462.000.

ACO Polymer Products, Inc.: *See—*
Bärenwäld, Jörg R., 5,749,315, Cl. 119-52.100.

Acuson Corporation: *See—*
Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., 5,749,364, Cl. 128-662.020.

Adachi, Hideki: *See—*
Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Adachi, Hideto: *See—*
Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.

Adachi, Masakazu: *See—*
Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl 514-254.000.

Adachi, Masaya: *See—*
Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.

Adachi, Nobukazu: *See—*
Yuza, Akira; Adachi, Nobukazu; Kuroda, Akira; and Sugita, Takeshi, 5,752,149, Cl. 399-329.000.

Adachi, Saburo: *See—*
Ochi, Hisaaki; Yamamoto, Etsuji; Sawaya, Kumio; and Adachi, Saburo, 5,751,600, Cl. 364-524.000.

Adachi, Tamio: *See—*
Tamada, Hiroshi; Kashio, Shigetora; and Adachi, Tamio, 5,750,313, Cl. 430-280.100.

Adachi, Tatsuhiko: *See—*
Sakai, Kazuhiko; Adachi, Tatsuhiko; Nakayama, Norihiro; and Fujino, Kenichi, 5,750,258, Cl. 428-405.000.

Adamo, Joseph A.: *See—*
Gammel, Michele B.; and Adamo, Joseph A., 5,752,231, Cl. 704-273.000.

Adams, Curtis E.: *See—*
Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,749,950, Cl. 106-316.000.

Adams, David J., to Armstrong World Industries, Inc. Tiled surface covering. 5,750,227, Cl. 428-42.200.

Adams, Stefan; and Seifert, Holger, to BASF Aktiengesellschaft. Production of CFC-free polyurethane rigid foams having a reduced thermal conductivity and their use. 5,750,586, Cl. 521-159.000.

Adaptec, Inc.: *See—*
Krakirian, Shahe H., 5,752,083, Cl. 395-894.000.

ADE Corproation: *See—*

- Drohan, William, 5,750,908, Cl. 73-865.900.
- Adobe Systems Incorporated: *See—*
  - Ward, Michael J., 5,751,444, Cl. 358-471.000.
- Adolfsson, Bengt, to Post-Mix Equipment AB. Method and device for cooling and carbonating a liquid. 5,749,233, Cl. 62-50.200.
- Adrian, Andrew: *See—*
  - Kennedy, John F.; and Adrian, Andrew, 5,751,148, Cl. 324-501.000.
- Advanced Bionics Corporation: *See—*
  - Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.
- Advanced Cardiovascular Systems, Inc.: *See—*
  - Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., 5,749,370, Cl. 128-772.000.
  - O'Donnell, Joseph A.; and Hamper, Douglas R., 5,749,853, Cl. 604-97.000.
- Advanced Coronary Intervention: *See—*
  - Janssen, Michael, 5,749,914, Cl. 607-116.000.
- Advanced Elastomer Systems, L.P.: *See—*
  - Medsker, Robert Eugene; Patel, Raman; and Sabet, Sabet-Abdou, 5,750,625, Cl. 525-133.000.
- Advanced Micro Devices: *See—*
  - Tau, Lok L.; Conboy, Michael R.; and Jackson, Thomas P., 5,751,581, Cl. 364-468.220.
- Advanced Micro Devices, Inc.: *See—*
  - Babb, Brendan J., 5,751,744, Cl. 371-49.100.
  - Brown, Glen W., 5,751,615, Cl. 364-724.100.
  - Hsia, Edward; Hernandez, Jose H.; and Suanya, Sayan, 5,751,633, Cl. 365-185.090.
  - Kranich, Uwe, 5,752,263, Cl. 711-137.000.
  - McMahon, Scott H. R.; Buchanan, James Michael; and Horne, Stephen C., 5,751,173, Cl. 327-170.000.
  - Orth, Jonathan Alan, 5,750,317, Cl. 430-327.000.
  - Roberts, James S.; and Pickett, James K., 5,752,069, Cl. 395-800.230.
  - Sharpe-Geisler, Bradley A.; and Moyer, Bryon I., 5,751,164, Cl. 326-38.000.
  - Tran, Thang M., 5,752,259, Cl. 711-125.000.
  - Witt, David B.; and Johnson, William M., 5,751,981, Cl. 395-380.000.
- Advantest Corporation: *See—*
  - Kitayoshi, Hitoshi, 5,752,167, Cl. 455-67.100.
  - Shimura, Michio, 5,751,738, Cl. 371-27.700.
- Aebersold, Hans; Gross, Norbert; and Urech, Werner, to Elpatronic AG. Method and apparatus for connecting two workpieces together. 5,749,511, Cl. 228-212.000.
- AECI Limited: *See—*
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- AEG Sachsenwerk GmbH: *See—*
  - Stegmueller, Karl, 5,751,219, Cl. 340-815.400.
- AeroVironment: *See—*
  - Rippel, Wally E.; and Buchanan, Darrell, 5,751,150, Cl. 324-537.000.
- AFA Products, Inc.: *See—*
  - Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 5,749,501, Cl. 222-384.000.
- Afsar, Muhammad; and Freymuth, Christopher Anthony, to International Business Machines Corporation. Method and system for detecting bypass error conditions in a load/store unit of a superscalar processor. 5,751,946, Cl. 395-185.030.
- Ag-Chem Equipment Co., Inc.: *See—*
  - Monson, Robert J., 5,751,576, Cl. 364-188.000.
- Agarwal, Ramesh Chandra; Fleischer, Bruce Martin; and Gustavson, Fred Gehrung, to International Business Machines Corporation. Recurrent adrithmetical computation using carry-save arithmetic. 5,751,619, Cl. 364-736.020.
- Agarwal, Ramesh Chandra, to International Business Machines Corporation. Sorting scheme without compare and branch instructions. 5,752,072, Cl. 395-800.340.
- Agarwal, Shashi B., to Western Digital Corporation. Air bearing slider having debris removing channels. 5,751,517, Cl. 360-103.000.
- Agarwala, Manisha: *See—*
  - Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., 5,751,162, Cl. 326-37.000.
- Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
  - Iwamoto, Kazuyo, 5,751,259, Cl. 345-8.000.
- Agfa Division, Bayer Corporation: *See—*
  - Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., 5,751,447, Cl. 358-487.000.
- Agfa-Gevaert: *See—*
  - Horsten, Bartholomeus; Loccufier, Johan; Defieuw, Geert; and Leenders, Luc, 5,750,319, Cl. 430-346.000.
  - Verbeke, Gentil, 5,751,001, Cl. 250-484.400.
- Agfa-Gevaert AG: *See—*
  - Faust, Raimund Josef; Allen, Danuta Eva; and Lutz, Silvia, 5,750,306, Cl. 430-115.000.
- Agfa-Gevaert, N.V.: *See—*
  - Leenders, Luc; Oelbrandt, Leo; Bogaert, Jan Van den; and Desie, Guido, 5,751,325, Cl. 347-96.000.
- Aggarwal, Charu Chandra; Wolf, Joel Leonard; and Yu, Philip Shi-Lung, to International Business Machines Corporation. Permutation based pyramid block transmission scheme for broadcasting in video-on-demand storage systems. 5,751,336, Cl. 348-7.000.
- Agrawal, Sudhir: *See—*
  - Iyer, Radhakrishnan P.; Yu, Dong; Agrawal, Sudhir; and Tan, Weitian, 5,750,674, Cl. 536-26.700.
- Agritope, Inc.: *See—*
  - Mathews, Helena V.; Bestwick, Richard Keith; and Ferro, Adolph J., 5,750,870, Cl. 800-205.000.
- Aguilar, Iwona M.: *See—*
  - Shaked, Dov; Banin, Amos; Moll, William F.; and Aguilar, Iwona M., 5,749,955, Cl. 106-287.170.
- Ahlert, Richard Henry; Howard, James Kent; Ullah, Muhammad Inayet; and Umphress, Richard Donald, to International Business Machines Corporation. Magnetic disk with boron carbide overcoat layer. 5,750,231, Cl. 428-65.500.
- Ahmadi, Majid R.: *See—*
  - Cherpeck, Richard E.; Morris, Jack E.; and Ahmadi, Majid R., 5,749,929, Cl. 44-387.000.
- Ahmed, Jubayer: *See—*
  - Gandy, James; Ahmed, Jubayer; and Janysek, Don Ray, 5,751,308, Cl. 347-33.000.
- Ahn, Hyung-Kook: *See—*
  - Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.
- Ahne, Hellmut: *See—*
  - Sezi, Racai; Ahne, Hellmut; and Kuehn, Eberhard, 5,750,711, Cl. 548-165.000.
  - Sezi, Recai; Ahne, Hellmut; and Gestigkeit, Roland, 5,750,638, Cl. 528-310.000.
- Ahuja, Sudhir Raman, to Lucent Technologies Inc. Disconnection management system for wireless voice communications. 5,752,185, Cl. 455-414.000.
- Ahvenainen, Jouko; and Sillanpää , Anna, to Nokia Telecommunications Oy. Maintaining group data in a mobile communications system. 5,752,196, Cl. 455-518.000.
- Aida, Midori: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Aihara, Koutoku: *See—*
  - Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.
- Aihara, Takashi: *See—*
  - Toyozaki, Jiro; Yanase, Takao; Ishii, Shinichi; and Aihara, Takashi, 5,751,567, Cl. 363-89.000.
- Aihara, Yukoh: *See—*
  - Tsukamoto, Ann; Baum, Charles M.; Aihara, Yukoh; and Weissman, Irving, 5,750,397, Cl. 435-372.000.
- Aiken, Simon Piers: *See—*
  - Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.
- Aikoh, Hideki: *See—*
  - Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, 5,751,688, Cl. 369-270.000.
- Aimori, Tomio: *See—*
  - Nakayama, Hiroshi; Ogushi, Koichiro; and Aimori, Tomio, 5,749,530, Cl. 241-27.000.
- Air Handling Engineering Ltd.: *See—*
  - Datta, Dipti Kr.; and Richarz, Werner, 5,749,702, Cl. 415-119.000.
- Air Liquide America Corporation: *See—*
  - Sauer, Richard A., 5,749,232, Cl. 62-50.100.
- Air Products and Chemicals, Inc.: *See—*
  - Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.
- Aisin AW Co., Ltd.: *See—*
  - Kamiya, Kazuo; Morimoto, Hirofumi; and Yokoyama, Shoji, 5,751,228, Cl. 340-988.000.
  - Tanahashi, Katsuyuki; Tsutsui, Hiroshi; Yamamoto, Yoshihisa; and Tsukamoto, Kazumasa, 5,749,802, Cl. 475-120.000.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, 5,749,173, Cl. 49-349.000.
- Aita, Shuichi; Kukimoto, Tsutomu; Yoshida, Satoshi; and Hano, Yoshifumi, to Canon Kabushiki Kaisha. Image forming apparatus. 5,751,405, Cl. 355-269.000.
- Ajinomoto Co., Inc.: *See—*
  - Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.
- Akagawa, Tomohiko: *See—*
  - Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.

- Akagi, Kosuke, to Osaka Gas Co., Ltd. Fuel cell system. 5,750,280, Cl. 429-32.000.
- Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, to Green Cross Corporation, The. Triazole derivative and pharmaceutical use thereof. 5,750,545, Cl. 514-340.000.
- Akai, Tetsuya: *See—*
  - Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, 5,749,586, Cl. 277-608.000.
- Akamatsu, Koji, to Mitsubishi Denki Kabushiki Kaisha. Electrical discharge machining level detector. 5,751,155, Cl. 324-678.000.
- Akamatsu, Norihiko; Hamada, Masataka; Yukawa, Kazuhiko; and Ootsuka, Hiroshi, to Minolta Co., Ltd. Flash light amount controlling apparatus. 5,752,101, Cl. 396-155.000.
- Akamatsu, Seiji: *See—*
  - Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.
- Akemann, Nicolaas C.: *See—*
  - Watson, Earl L.; and Akemann, Nicolaas C., 5,749,611, Cl. 292-336.300.
- Akena, Mayumi: *See—*
  - Komura, Akihiko; Onuma, Kenji; and Akena, Mayumi, 5,749,973, Cl. 118-626.000.
- Akeno, Mitsuru: *See—*
  - Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakibara, Keisuke; and Minato, Tsuyoshi, 5,749,129, Cl. 24-452.000.
- Akhavan-Tafti, Hashem; DeSilva, Renuka; Arghavani, Zahra; and Schoenfelner, Barry A., to Lumigen, Inc. Aryl N-alkylacridancarboxylate derivatives useful for chemiluminescent detection. 5,750,698, Cl. 546-102.000.
- Akhtar, Masood, to Wisconsin Alumni Research Foundation. Method of enhancing biopulping efficacy. 5,750,005, Cl. 162-72.000.
- Akiba, Masatsugu: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
- Akitaya, Shinichi: *See—*
  - Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, 5,750,600, Cl. 524-100.000.
- Akiya, Makoto, to NEC Corporation. Transmission level control system with selectively fixed or variable amplication control. 5,752,171, Cl. 455-126.000.
- Akiyama, Koji: *See—*
  - Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, 5,750,304, Cl. 430-110.000.
- Akiyama, Yukinori: *See—*
  - Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanohu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.
- Akkary, Haitham H.: *See—*
  - Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
- Akselrod, Mark: *See—*
  - Cushman, Paul W.; Won, King L.; Mehta, Bakulesh A.; and Akselrod, Mark, 5,751,698, Cl. 370-252.000.
- Aktiebolaget Electrolux: *See—*
  - Christensen, Keld; and Jensen, Torben, 5,750,963, Cl. 219-497.000.
- Akutagawa, Tadamasa; Sano, Shigeru; and Nishino, Aya, to Yuasa Corporation. Life indicator and lead-acid storage battery with life indicator. 5,750,285, Cl. 429-92.000.
- Akzo Nobel N.V.: *See—*
  - Cook, Jane Kathleen Alexandra, 5,750,113, Cl. 424-222.100.
  - Fischer, Timothy J.; Bell, Maria L.; and Bowling, Regina J., 5,749,976, Cl. 134-22.120.
  - Schrier, Carla Christina, 5,750,111, Cl. 424-214.100.
  - Van Den Bosch, Johannes Franciscus, 5,750,115, Cl. 424-241.100.
- Akzo Nobel nv: *See—*
  - Bright, Danielle A.; and Pirrelli, Ronald L., 5,750,756, Cl. 558-162.000.
- Alan Shelton Limited: *See—*
  - Shelton, William Ewart Alan; and Shelton, Mark Alan, 5,749,531, Cl. 242-131.100.
- Albanese, Guido. Multi-purpose strap for pets. 5,749,325, Cl. 119-792.000.
- Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, to International Business Machines Corporation. Time division multiplex frame slot assignment system and method for interconnecting telephone stations on a token ring network. 5,751,714, Cl. 370-452.000.
- Albany Molecular Research, Inc.: *See—*
  - D'Ambra, Thomas E., 5,750,703, Cl. 546-240.000.
- Albarella, James P.; Cahill, Sally E.; Johnson, Gary M.; and Pugia, Michael J., to Bayer Corporation. Method for the detection for protein. 5,750,405, Cl. 436-88.000.
- Albaugh, Pamela; and Hutchison, Alan, to Neurogen Corporation. Certain pyrrolo pyridine-3-carboxamides; a new class of GABA brain receptor ligands. 5,750,702, Cl. 546-183.000.
- Albayrak, Sener: *See—*
  - Nass, Rüdiger; Aslan, Mesut; Albayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, 5,750,193, Cl. 427-213.310.
- Alber, Gottfried; and Angehrn, Peter, to Hoffmann-La Roche Inc. Compositions of G-CSF and TNF-BP for prophylaxis and treatment of septic shock. 5,750,503, Cl. 514-12.000.
- Albers, Mark D.: *See—*
  - Strickland, James C.; and Albers, Mark D., 5,751,823, Cl. 381-94.600.
- Albert Einstein College of Medicine of Yeshiva University: *See—*
  - Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, 5,750,384, Cl. 435-172.300.
- Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva: *See—*
  - Acharya, A. Seetharama; Manjula, Belur N.; and Smith, Paul K., 5,750,725, Cl. 548-545.000.
- Albert, Richard: *See—*
  - Olstein, Alan D.; and Albert, Richard, 5,750,357, Cl. 435-7.320.
- Albertsen, Marc C.: *See—*
  - Cigan, Andrew M.; and Albertsen, Marc C., 5,750,868, Cl. 800-205.000.
- Albertson, Robert Jeffery: *See—*
  - Frey, Normam Walter; and Albertson, Robert Jeffery, 5,749,984, Cl. 152-415.000.
- Albrecht, Donald H., to Composite Structures International, Inc. Height compensating device. 5,749,555, Cl. 248-346.000.
- Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, to SKW Trostberg Aktiengesellschaft. Water-soluble polycondensation products based on amino-s-triazines and the use thereof. 5,750,634, Cl. 528-254.000.
- Alcatel Alsthom Compagnie Generale d'Electricite: *See—*
  - Bissessur, Hans; Mestric, Roland; and Duchet, Christian, 5,751,872, Cl. 385-37.000.
- Alcatel Cable France: *See—*
  - Gaillard, Pierre, 5,751,880, Cl. 385-109.000.
- Alcatel Italia S.p.A.: *See—*
  - Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, 5,751,768, Cl. 375-234.000.
- Alcatel N.V.: *See—*
  - Mourot, Christophe, 5,751,730, Cl. 371-37.400.
- Alcatel Network Systems, Inc.: *See—*
  - Benzenberg, Craig Kay; Mann, Lloyd Steven; Oslund, Lawrence Carl; and Roe, Colleen Ann, 5,751,943, Cl. 395-183.160.
- Alcoa Fujikura Ltd.: *See—*
  - Martinez, Ivan V., 5,751,208, Cl. 337-198.000.
- Aldouby, Yanir: *See—*
  - Friedman, Doron; and Aldouby, Yanir, 5,750,142, Cl. 420-450.000.
- Aldous, David J.; Bailey, Thomas R.; Diana, Guy Dominic; and Nitz, Theodore J., to Sanofi. Thiadiazoles and their use as antipicornaviral agents. 5,750,527, Cl. 514-252.000.
- AlertCare, Inc.: *See—*
  - Cowley, Tom J.; Bower, Larry O.; and Egan, Philip S., 5,751,214, Cl. 340-573.000.
- Alexander, Dennis J., to Compaq Computer Corporation. Wide SCSI bus controller with buffered acknowledge signal. 5,751,977, Cl. 395-306.000.
- Alexander, Petr; and Prisbe, Ernest J., to Gilead Sciences,Inc. Compounds and methods for making and using same. 5,750,729, Cl. 549-216.000.
- Alexander, R. Wayne: *See—*
  - Medford, Russell M.; Alexander, R. Wayne; Parthasarathy, Sampath; and Khan, Bobby V., 5,750,351, Cl. 435-7.210.
- Alfa Chemicals Italiana S.p.A.: *See—*
  - Cannata, Vincenzo; Bertoni, Amilcare; and Bianchi, Stefano, 5,750,793, Cl. 568-315.000.
- Alfred E. Mann Foundation for Scientific Research: *See—*
  - Schulman, Joseph H.; and Canfield, Lyle Dean, 5,750,926, Cl. 174-52.300.
- Alivisatos, A. Paul; and Colvin, Vicki L., to University of CAlifornia, The Regents of the. Semiconductor nanocrystals covalently bound to solid inorganic surfaces using self-assembled monolayers. 5,751,018, Cl. 257-64.000.
- Allegheny Ludlum Corporation: *See—*
  - Polito, Anthony J.; Bailey, Ronald E.; Timmons, William W.; and Bell, Robert H., 5,749,140, Cl. 29-527.100.
- Allen, Anthony E.: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Allen, Antonette C.: *See—*
  - Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.
- Allen, Danuta Eva: *See—*
  - Faust, Raimund Josef; Allen, Danuta Eva; and Lutz, Silvia, 5,750,306, Cl. 430-115.000.
- Allen, David Lee; and Williams, Herold, to TeleSuite Corporation. Teleconferencing method and system for providing face-to-face, non-animated teleconference environment. 5,751,337, Cl. 348-15.000.
- Allen, Joseph, to Bale Built, Inc. Fiber bale composite structural building system. 5,749,199, Cl. 52-729.100.
- Allen, Neill J.: *See—*
  - Meyer, Charles S.; and Allen, Neill J., 5,751,764, Cl. 375-219.000.
- Allen, Richard P.; and Krausman, David T. Method for monitoring activity and providing feedback. 5,749,372, Cl. 128-782.000.
- Allergan: *See—*
  - Chandraratna, Roshantha A. S., 5,750,693, Cl. 544-253.000.
  - Chen, June; Burk, Robert M.; and Woodward, David F., 5,750,784, Cl. 564-171.000.
- Allied Colloids Limited: *See—*

Chamberlain, Peter; and Cole, Richard Everett, 5,749,672, Cl. 405-36.000.
Allied Telesyn Int'l Corp.: *See—*
Dai, Wei William; and Ng, Yu Kwong, 5,751,952, Cl. 395-200.800.
AlliedSignal Europe Services Techniques: *See—*
Ruiz Busquets, Josep, 5,749,445, Cl. 188-73.450.
AlliedSignal Inc.: *See—*
Fox, Richard, 5,750,999, Cl. 250-343.000.
Lindner, Robert; Dudek, Eric Alan; and Louies, Bernard Daniel, 5,750,608, Cl. 524-399.000.
Sears, Jerome; Parfomak, Walter; Kluss, Walter J.; and Germinario, Michael, 5,751,131, Cl. 318-778.000.
Allin, Gaylord; and Gorham, Mark, to Dallas Enviro-Tek International, Inc. Double-faced liner board. 5,750,237, Cl. 428-182.000.
Allington, Robert W.; Walters, Henry LeRoy; Jameson, Daniel Gene; and Tehrani, Yoossef, to Isco, Inc. Apparatus and method for supercritical fluid extraction or supercritical fluid chromatography. 5,750,027, Cl. 210-511.000.
Allinson, Christopher A.: *See—*
Romerein, Robert L.; Crowhurst, David B.; and Allinson, Christopher A., 5,750,929, Cl. 174-88.00C.
Allison Advanced Development Company: *See—*
Henry, Mark S.; and King, Brian P., 5,749,700, Cl. 415-104.000.
Allison Engine Company, Inc.: *See—*
Henry, Mark S.; and King, Brian P., 5,749,700, Cl. 415-104.000.
Allshouse, James R.; and Petrole, Christopher P., to Indian Industries, Inc. Compound archery bow. 5,749,351, Cl. 124-25.600.
Almanza, Jesus: *See—*
Torres, Eric R.; and Almanza, Jesus, 5,749,551, Cl. 248-205.100.
Alonso-Cedo, Teodoro G., to NCR Corporation. Method and apparatus for identifying names with a speech recognition program. 5,752,230, Cl. 704-270.000.
Alpha 1 Biomedicals, Inc.: *See—*
Chretien, Paul B.; and Mutchnick, Milton G., 5,750,501, Cl. 514-12.000.
Alphios Corporation: *See—*
Castor, Trevor P., 5,750,709, Cl. 546-348.000.
Alpins, Noel Ami. Method of analysing astigmatism and apparatus for performing corneal surgery. 5,749,867, Cl. 606-4.000.
Alps Electric Co., Ltd.: *See—*
Ito, Takayuki; Sasagawa, Hideto; and Watanabe, Takeshi, 5,750,940, Cl. 178-18.000.
Kyoya, Shouichi, 5,751,878, Cl. 385-93.000.
Someno, Yoshihiro, 5,751,487, Cl. 359-589.000.
Yamada, Minoru; Hashimoto, Hideyuki; Yabe, Yasuhiro; and Honda, Kenji, 5,751,522, Cl. 360-113.000.
Alschweig, Günther: *See—*
Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.
Altavela, Robert P.: *See—*
Bailey, Raymond E.; McCubbin, Robert K.; Goeserich, Manfred H.; and Altavela, Robert P., 5,751,316, Cl. 347-63.000.
Aluminum Company of America: *See—*
Easley, Michael A.; and Horn, William E., Jr., 5,750,453, Cl. 502-84.000.
McEldowney, Carl, 5,749,257, Cl. 72-354.600.
Alvares, Christopher P.: *See—*
Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.
Alvesteffer, William J.: *See—*
Huang, Yufeng; Alvesteffer, William J.; and Outlaw, Ronald A., 5,750,892, Cl. 73-202.000.
Alwyn Company, Inc.: *See—*
Klinkner, Allen O.; and Hancock, Larry R., 5,749,310, Cl. 111-200.000.
Amada, Nobutaka, to Hitachi, Ltd. Digital information reproducing apparatus using partial response detection method including quadruple processing. 5,751,506, Cl. 360-51.000.
Amagai, Tamio: *See—*
Murai, Yukako; Suzuki, Akio; Tabata, Yoshio; Saito, Keiichi; and Amagai, Tamio, 5,751,438, Cl. 358-403.000.
Amalgamated Software of North America, Inc.: *See—*
Ferguson, David E., 5,751,623, Cl. 364-781.000.
Amano, Tadashi: *See—*
Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, 5,750,079, Cl. 422-138.000.
Amarr Company: *See—*
Brenner, Richard A.; and Romanelli, Dennis, 5,749,407, Cl. 160-229.100.
Amato, Guiseppe: *See—*
Wendorff, Wilhard C.; Schwarz, Roland; and Amato, Guiseppe, 5,751,938, Cl. 395-182.080.
American Cyanamid Company: *See—*
Dietrich, Gabriele; Smith, Jane; and Peng, Jianying, 5,750,866, Cl. 800-205.000.
Kameswaran, Venkataraman, 5,750,726, Cl. 548-561.000.
Krummel, Guenter; and Knell, Marcus, 5,750,766, Cl. 560-82.000.
Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
American Gas Furnace Company: *See—*
Driscoll, Michael E.; Dorio, Michael A.; and Keogh, Frank T., 5,749,722, Cl. 432-118.000.
American Home Products Corporation: *See—*
Gilbert, Adam M., 5,750,574, Cl. 514-604.000.
Kang, Young H.; and Stack, Gary P., 5,750,724, Cl. 548-454.000.
Mewshaw, Richard E.; and Stack, Gary P., 5,750,556, Cl. 514-411.000.
Sabb, Annmarie Louise; and Kinney, William A., 5,750,522, Cl. 514-243.000.
American National Can Company: *See—*
Lazarz, Donald; and De Jong, Jurjen Jan, 5,749,155, Cl. 34-90.000.
American PCS L.P.: *See—*
Jones, J. Barclay, 5,752,164, Cl. 455-33.100.
Amin-Gendy, Cyrille: *See—*
Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
Amoco Corporation: *See—*
Bhattacharyya, Alakananda; Foral, Michael J.; and Reagan, William J., 5,750,020, Cl. 208-113.000.
Collins, Mark L.; Halbert, Donald N.; King, Walter; and Lawrie, Jonathan M., 5,750,338, Cl. 435-6.000.
Hagen, Gary P.; and Spangler, Michael J., 5,750,759, Cl. 558-277.000.
Hecht, Daniel H.; and Schulz, David A., 5,750,058, Cl. 264-29.600.
Mehlberg, Robert L.; and Young, James B., 5,750,818, Cl. 585-709.000.
Amonett, Daniel Keith; Weaver, Robert Francis; and Burgin, Henry Earl, to Emerson Electric Co. Cam-operated timer. 5,750,948, Cl. 200-38.00R.
Amoretti, Luigi, to T.P.A. Impex S.p.A. Control device, particularly for steam-generating appliances for household and/or industrial cleaning. 5,749,120, Cl. 15-339.000.
Amrad Corporation Limited: *See—*
Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.
AMSTED Industries Incorporated: *See—*
Wronkiewicz, Robert D.; Pitchford, Terry L.; Schuller, Daniel J.; and Vennen, Emmanuel Vander, 5,749,301, Cl. 105-199.300.
Amvac Chemical Corporation: *See—*
Baxter, C. Edward, Jr., 5,750,802, Cl. 568-814.000.
Analog Devices, Inc.: *See—*
Olney, Andrew H., 5,751,525, Cl. 361-56.000.
Anazawa, Hideharu: *See—*
Oda, Hideki; Nakagawa, Satoshi; and Anazawa, Hideharu, 5,750,368, Cl. 435-69.100.
Andersen, Asser Sloth: *See—*
Havelund, Svend; Halstrom, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, 5,750,497, Cl. 514-3.000.
Andersen Consulting LLP: *See—*
Rose, Scott M.; and Patel, Piyush M., 5,752,244, Cl. 707-5.000.
Andersen, Henrik Sune: *See—*
Jorgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,750,518, Cl. 514-183.000.
Andersen, Knud Erik: *See—*
Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Ulfe Bang, 5,750,518, Cl. 514-183.000.
Anderson, David Bruce, to Seagate Technology, Inc. Data storage format for data storage devices having a radial offset between read and write elements. 5,751,512, Cl. 360-78.040.
Anderson, Donald R.: *See—*
Laahs, Gary R.; and Anderson, Donald R., 5,749,526, Cl. 239-307.000.
Anderson, J. Dale; and Goossen, LaVern Roy, to Hay & Forage Industries. Tall sleeves for round baler drive rolls. 5,749,289, Cl. 100-88.000.
Anderson, Jeffory B.: *See—*
Grosswald, Ralph R.; Anderson, Jeffory B.; and Andrew, Clair S., 5,750,157, Cl. 425-143.000.
Anderson, Milton M., to Bell Communications Research, Inc. Re-initialization of an iterated hash function secure password system over an insecure network connection. 5,751,812, Cl. 380-48.000.
Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., to Motorola, Inc. Optical isolator having leadframe with non-planar mounting portions. 5,751,009, Cl. 250-551.000.
Andersson, Anders, to Svedala-Arbra AB. Vibrating screen. 5,749,471, Cl. 209-314.000.
Ando, Hitoshi: *See—*
Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.
Ando, Kenji: *See—*
Sekimoto, Takao; Sakashita, Masahiro; Ando, Kenji; and Tsukada, Mitsushige, 5,752,233, Cl. 705-1.000.
Ando, Koji: *See—*
Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.
Ando, Michael E.: *See—*
Meyer, Thomas A.; Ando, Michael E.; and Powell, Jimmy B., 5,750,092, Cl. 424-59.000.
Ando, Nobuo: *See—*

Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.
Ando, Shinji; Matsuura, Toru; Sasaki, Shigekuni; and Yamamoto, Fumio, to Nippon Telegraph & Telephone Corporation. Perfluorinated aromatic compounds. 5,750,731, Cl. 549-241.000.
Ando, Toshiaki, to Fuji Xerox Co., Ltd. Structured document retrieval system. 5,752,020, Cl. 395-604.000.
Ando, Toshihide: *See—*
Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.
Ando, Yuji: *See—*
Suzuki, Kazuhiro; Mitsuhashi, Satoshi; and Ando, Yuji, 5,751,358, Cl. 348-405.000.
Andoh, Masaru: *See—*
Ogawa, Susumu; Senoh, Hideaki; Andoh, Masaru; and Nomura, Hideki, 5,750,200, Cl. 427-361.000.
Andre, Charles: *See—*
Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
Andreatta, Alejandro; and Doi, Shuji, to Sumitomo Chemical Company. Film containing oriented dye, method of manufacturing the same, and polarizer and liquid crystal display unit utilizing the same. 5,751,389, Cl. 349-97.000.
Andres, James J.; and Kline, Ladd M. Service board for mounting services to base material. 5,749,194, Cl. 52-506.060.
Andrew, Clair S.: *See—*
Grosswald, Ralph R.; Anderson, Jeffory B.; and Andrew, Clair S., 5,750,157, Cl. 425-143.000.
Andrews, John R.: *See—*
Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., 5,751,315, Cl. 347-63.000.
Andrews, Robert S.: *See—*
Cook, P. Dan; Acevedo, Oscar L.; and Andrews, Robert S., 5,750,692, Cl. 544-253.000.
Anekawa, Akihiro: *See—*
Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.
Anergen, Inc.: *See—*
Spack, Edward G.; Wehner, Nancy G.; and McCutcheon, Michael A., 5,750,356, Cl. 435-7.240.
Angehrn, Peter: *See—*
Alber, Gottfried; and Angehrn, Peter, 5,750,503, Cl. 514-12.000.
Angeion Corporation: *See—*
Brumwell, Dennis A.; Perttu, Joseph S.; Kroll, Mark W.; and Nelson, Randall S., 5,749,910, Cl. 607-36.000.
Angelastro, Michael R.: *See—*
Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard, and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.
Angers, Christian: *See—*
Rochette, Daniel; Wood, John; and Angers, Christian, 5,749,385, Cl. 134-199.000.
Angus, John C.: *See—*
Schmidt, Paul Herman; and Angus, John C., 5,750,210, Cl. 427-577.000.
Anno, Kouichi: *See—*
Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.
Ansaloni, Angelo: *See—*
De Caris, Sandro; and Ansaloni, Angelo, 5,750,938, Cl. 177-50.000.
Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., to Cypress Semiconductor Corporation. Data transition detect write control. 5,751,644, Cl. 365-194.000.
Anshel, Michael M.; and Goldfeld, Dorian. Multi-purpose high speed cryptographically secure sequence generator based on zeta-one-way functions. 5,751,808, Cl. 380-23.000.
Anstötz, Karin Helene Maria; and Coolegem, Karel Gerard, to Koninklijke PTT Nederland N.V. Processor system comprising a processor and a memory field for containing a computer interface. 5,751,271, Cl. 345-146.000.
Antibioticos S.p.A.: *See—*
Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.
Antol, Shawn Richard; and Hafez, Raed Mouaffac, to Motorola, Inc. Device and method for providing a simulation of an idle UART to prevent computer lockup. 5,752,048, Cl. 395-750.050.
Antoniades, Michael George; Wen, Xin; and Herman, Mark Jay, to Eastman Kodak Company. Process for the preparation of high bromide tabular grain emulsions. 5,750,326, Cl. 430-568.000.
AOFR Pty. Limited: *See—*
Elias, Martin Charles; Johnston, Scott Anthony; and Hesling, Mark Ronald, 5,751,873, Cl. 385-51.000.
Aoki, Hiroshi: *See—*
Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, 5,751,396, Cl. 351-221.000.
Aoki, Hitoshi: *See—*
Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.
Aoki, Masaki: *See—*
Tanaka, Takaaki; Yamauchi, Masahide; Ishikura, Yasuhisa; and Aoki, Masaki, 5,751,102, Cl. 313-466.000.
Aoki, Takeshi: *See—*
Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, 5,752,145, Cl. 399-256.000.
Aono, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and method of manufacturing the same. 5,751,023, Cl. 257-138.000.
Aoshima, Shinichiro: *See—*
Takahashi, Hironori; and Aoshima, Shinichiro, 5,751,419, Cl. 356-321.000.
Aoshima, Takayuki: *See—*
Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.
Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.
Aoyagi, Hiromi; Ariyama, Yoshihiro; and Hosoda, Kenichiro, to Oki Electric Industry Co., Ltd. Code-excited linear predictive coder and decoder with conversion filter for converting stochastic and impulsive excitation signals. 5,752,223, Cl. 704-219.000.
Aozasa, Hiroshi; and Hayashi, Yutaka, to Sony Corporation. Non-volatile memory cell having dual gate electrodes. 5,751,037, Cl. 257-315.000.
Apffel, James A.; Werlich, Mark H.; Bertsch, James L.; and Goodley, Paul C., to Hewlett-Packard Company. Orthogonal ion sampling for APCI mass spectrometry. 5,750,988, Cl. 250-288.000.
Apple Computer, Inc.: *See—*
Celik, Tantek, 5,752,056, Cl. 395-778.000.
Dalton, John Carl, 5,751,920, Cl. 395-109.000.
Harrison, David F., 5,751,989, Cl. 395-413.000.
Hoddie, Peter; Batson, James D.; and Callahan, Sean Michael, 5,751,281, Cl. 345-302.000.
Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., 5,752,059, Cl. 395-800.000.
Kullick, Steven E.; Spirakis, Charles S.; and Titus, Diane J., 5,751,997, Cl. 395-489.000.
Morley, John E., 5,751,982, Cl. 395-800.000.
Oprescu, Florin; and Teener, Michael D., 5,752,046, Cl. 395-750.010.
Quinn, Michael; and Shoemaker, Michael B., 5,751,972, Cl. 395-200.100.
Applied Materials, Inc.: *See—*
Kumar, Ananda H.; and Shamouilian, Shamouil, 5,751,537, Cl. 361-234.000.
Applied Medical Resources: *See—*
Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., 5,749,881, Cl. 606-151.000.
Applied Medical Resources Corporation: *See—*
Hart, Charles C.; Chi Sing, Eduardo; and Ashby, Mark P., 5,749,882, Cl. 606-159.000.
Applied Power Inc.: *See—*
Mentink, Laurentius A. G., 5,749,619, Cl. 296-107.000.
Applied Signal Technology, Inc.: *See—*
Kletsky, Jeffrey Marc; and Tsui, Ernest T., 5,751,766, Cl. 375-224.000.
APV Homogenizer Group, a Division of APV North America, Inc.: *See—*
Kinney, Richard R.; Pandolfe, William D.; and Ferguson, R. Daniel, 5,749,650, Cl. 366-176.200.
Aragon, Cathy L.: *See—*
Austin, Pixie Ann; Wiklof, Christopher A.; and Aragon, Cathy L., 5,751,330, Cl. 347-171.000.
Arai, Akinori: *See—*
Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, 5,750,600, Cl. 524-100.000.
Arai, Atsushi: *See—*
Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.
Arai, Kouji; Satoh, Takao; and Yamamoto, Akira, to Hitachi, Ltd. Array type storage unit system. 5,751,937, Cl. 395-182.050.
Arai, Nobukatsu: *See—*
Kowatari, Takehiko; Arai, Nobukatsu; and Kobayashi, Chihiro, 5,750,889, Cl. 73-118.200.
Arai, Saburo, to Sankei Giken Kogyo Kabushiki Kaisya; and Kabushiki Kaisya VISTA. Bending device for hollow double-structured pipe. 5,749,255, Cl. 72-150.000.
Arai, Yuji: *See—*
Ikeda, Kenichi; Asai, Yuichi; and Arai, Yuji, 5,750,033, Cl. 210-711.000.
Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, to Arax Co., Ltd. Imidazoline derivative, possible tautomer thereof, and vulnerary including such derivative or tautomer. 5,750,552, Cl. 514-386.000.
Arakawa, Fumio, to Hitachi, Ltd. Multiply-add unit and data processing apparatus using it. 5,751,621, Cl. 364-748.070.
Arakawa, Yutaka, to Kabushiki Kaisha Toshiba. Magnetic disk apparatus having inspection function of recording medium and method of inspecting recording medium in magnetic disk apparatus. 5,751,947, Cl. 395-185.070.
Araki, Takayuki: *See—*

Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, to Mitsubishi Chemical Corporation. Process for the preparation of α-olefin oligomers. 5,750,816, Cl. 585-512.000.

Aramaki, Toru; Ishida, Kiyoshi; and Watanabe, Toshio, to Hitachi, Ltd. Television conversation/monitoring system changing transmission capacity responsive to state change in remote location. 5,751,339, Cl. 348-17.000.

Arax Co., Ltd.: *See—*

Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.

Arceo, Kathie Ann. Protective tips for brassiere wires. 5,749,767, Cl. 450-41.000.

Arden-Jacob, Jutta: *See—*

Herrmann, Rupert; Josel, Hans-Peter; Drexhage, Karl-Heinz; and Arden-Jacob, Jutta, 5,750,409, Cl. 436-517.000.

Ardon, Menachem Tsur, to Lucent Technologies Inc. Screening of incoming telephone calls prior to call completion to the destination party. 5,751,800, Cl. 379-134.000.

Arends, John H.: *See—*

Moyer, William C.; Kirtland, Charles; and Arends, John H., 5,752,267, Cl. 711-167.000.

Arghavani, Zahra: *See—*

Akhavan-Tafti, Hashem; DeSilva, Renuka; Arghavani, Zahra; and Schoenfelner, Barry A., 5,750,698, Cl. 546-102.000.

Ariga, Kenji: *See—*

Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.

Arima, Hiroyuki: *See—*

Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.

Arita, Yoshitaka; Ohta, Akihiko; Hasebe, Ren; and Saito, Noboru, to Nippon Shokubai Co., Ltd. Method of manufacturing α-oxocarboxylate and catalyst adopted in the method. 5,750,768, Cl. 560-177.000.

Ariyama, Yoshihiro: *See—*

Aoyagi, Hiromi; Ariyama, Yoshihiro; and Hosoda, Kenichiro, 5,752,223, Cl. 704-219.000.

Ariyoshi, Yūji; and Matsumura, Asayuki, to Matsushita Electric Industrial Co., Ltd. Disk loading apparatus. 5,751,687, Cl. 369-202.000.

Arlton, Paul E. System for controlling and automatically stabilizing the rotational motion of a rotary wing aircraft. 5,749,540, Cl. 244-17.130.

Armbruster, Peter Joseph: *See—*

Sawyer, Steven Paul; Armbruster, Peter Joseph; and Moritz, Steven Harry, 5,752,162, Cl. 455-13.100.

Armco Inc.: *See—*

Kundrat, David M., 5,749,939, Cl. 75-560.000.

Armstrong World Industries, Inc.: *See—*

Adams, David J., 5,750,227, Cl. 428-42.200.

Arnaud, Pascal; and Mellul, Myriam, to L'Oreal. Anhydrous cosmetic or dermatological composition containing the combination of a silicone oil and a wax made from an ethylene homopolymer or copolymer. 5,750,095, Cl. 424-64.000.

Arndt, Lutz: *See—*

Abelen, Thomas; Arndt, Lutz; and Muller, Peter, 5,749,716, Cl. 417-410.300.

Arney, Susanne C.; Greywall, Dennis Stanley; Walker, James A.; and Yurke, Bernard, to Lucent Technologies Inc. Method and apparatus for an improved micromechanical modulator. 5,751,469, Cl. 359-291.000.

Arnold, Norbert; Haug, Willi; and Lind, Stefan, to fischerwerke, Artur Fischer GmbH & Co. KG. Hardenable mortar composition. 5,749,963, Cl. 106-724.000.

Arnott, Robin: *See—*

Schad, Robert; and Arnott, Robin, 5,750,162, Cl. 425-533.000.

Arntz, Bernard James, to Lucent Technologies, Inc. Low distortion power sharing amplifier network. 5,751,250, Cl. 342-373.000.

Arora, Kartar S.; and Wiggins, Michael S., to Henkel Corporation. Self-dispersing curable epoxy resin dispersions and coating compositions made therefrom. 5,750,595, Cl. 523-404.000.

Aros, Carlos Joaquin; and Throndson Aros, Sylvan S., to Royal Truck Bodies, Inc. Apparatus and method for forming compound shaped surfaces. 5,750,236, Cl. 428-178.000.

Arpac, Ertugrul: *See—*

Nass, Rüdiger; Aslan, Mesut; Alhayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, 5,750,193, Cl. 427-213.310.

Arrouye, Yan: *See—*

Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., 5,752,059, Cl. 395-800.000.

Arrowhead Innovations Corporation: *See—*

Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, 5,749,790, Cl. 473-245.000.

Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, to Yale University. Deltex proteins. 5,750,652, Cl. 530-350.000.

Arthrex, Inc.: *See—*

Bracy, Barton W.; and Schmieding, Reinhold, 5,749,878, Cl. 606-104.000.

Puddu, Giancarlo, 5,749,875, Cl. 606-87.000.

Artisan Components, Inc.: *See—*

Kornachuk, Steve P.; and Becker, Scott T., 5,751,649, Cl. 365-205.000.

Arunarthi, Venkatesham: *See—*

Naidu, Anand; Deora, Ajit; and Arunarthi, Venkatesham, 5,752,002, Cl. 395-500.000.

Asada, Susumu, to NEC Corporation. Three dimensional wiring inductance calculation system. 5,751,591, Cl. 364-488.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*

Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, 5,752,107, Cl. 396-296.000.

Hori, Masakatsu, 5,752,117, Cl. 396-504.000.

Ito, Takayuki, 5,751,498, Cl. 359-692.000.

Kase, Toshiyuki; and Nishikawa, Hiroshi, 5,751,491, Cl. 359-618.000.

Ogawa, Kimiaki, 5,751,352, Cl. 348-364.000.

Takehayashi, Tatsuhide; and Sensui, Takayuki, 5,752,099, Cl. 396-114.000.

Asai, Akiyoshi: *See—*

Suzuki, Megumi; Asai, Akiyoshi; and Sakakìhara, Jun, 5,751,041, Cl. 257-357.000.

Asai, Yuichi: *See—*

Ikeda, Kenichi; Asai, Yuichi; and Arai, Yuji, 5,750,033, Cl. 210-711.000.

Asamura, Masako: *See—*

Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, 5,751,890, Cl. 386-79.000.

Asano, Terumichi: *See—*

Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.

Asano, Tetsuya: *See—*

Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, 5,750,304, Cl. 430-110.000.

Asao, Yasufumi: *See—*

Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.

Asaoka, Masanobu: *See—*

Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.

Åsbrink, Leif. Theft detection alarm element for avoiding false alarms. 5;751,213, Cl. 340-572.000.

Ascom Hasler Mailing Systems AG: *See—*

Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, 5,749,291, Cl. 101-91.000.

Asea Brown Boveri AB: *See—*

Björklund, Per-Erik, 5,751,563, Cl. 363-35.000.

Asgrow Seed Company: *See—*

Hicks, Jennifer, 5,750,861, Cl. 800-200.000.

Holmes, Beth Annice, 5,750,855, Cl. 800-200.000.

Nickell, Andrew D., 5,750,856, Cl. 800-200.000.

Nykaza, Janet; and Lewis, Michael, 5,750,854, Cl. 800-200.000.

Rhodes, William K., 5,750,857, Cl. 800-200.000.

Rhodes, William K., 5,750,858, Cl. 800-200.000.

Ashby, Mark P.: *See—*

Hart, Charles C.; Chi Sing, Eduardo; and Ashby, Mark P., 5,749,882, Cl. 606-159.000.

Ashibe, Emi: *See—*

Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.

Ashibe, Tsunenori: *See—*

Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.

Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, 5,752,130, Cl. 399-101.000.

Ashiwake, Noriyuki: *See—*

Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.

Ashizawa, Mutsumi: *See—*

Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, 5,751,402, Cl. 355-40.000.

Ashjaee, Javad, to Javad Positioning, LLC. Satellite positioning system antenna supporting tripod. 5,749,549, Cl. 248-168.000.

Aslan, Mesut: *See—*

Nass, Rüdiger; Aslan, Mesut; Alhayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, 5,750,193, Cl. 427-213.310.

Asmuth, Jane Circle: *See—*

Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.

Asou, Yoshio: *See—*

Hayashi, Bunya; Asou, Yoshio; and Ishikawa, Makoto, 5,749,395, Cl. 137-596.160.

Aspect International AB: *See—*

Stern, Leif Einar, 5,749,495, Cl. 222-134.000.

Aspect Telecommunications Corporation: *See—*

Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., 5,751,760, Cl. 379-210.000.

Asrar, Jawed, to Solutia Inc. Polymer-bound non-halogen fire resistant compositions. 5,750,603, Cl. 524-139.000.

Asset Purchase Co. LLC: *See—*

Jewett, Thomas E.; and Bird, Thomas B., 5,749,180, Cl. 52-154.000.

AST Research, Inc.: *See—*

Silva, David J., 5,751,557, Cl. 361-777.000.

Asta Medica Aktiengesellschaft: *See—*

Wichert, Burkhard; Sauerbier, Dieter; and Rawert, Jurgen, 5,750,131, Cl. 424-422.000.

Astle, Brian, to Intel Corporation. Reducing residual artifacts in video coding schemes with integer motion compensation. 5,751,861, Cl. 382-250.000.

Astor, John J., to Dresser-Rand Company. Method for fastening parts together and resulting structure. 5,749,670, Cl. 403-269.000.

Äström, Bo A. V.; and Svennesson, Björn A., to Telefonaktiebolaget LM Ericsson. Unstructured supplementary service data from a home location register to an external node. 5,752,188, Cl. 455-433.000.

Asulab S.A.: *See—*

Farine, Pierre-André; and Born, Jean-Jacques, 5,751,666, Cl. 368-140.000.

AT&T Corp: *See—*

Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, 5,751,792, Cl. 379-89.000.

Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.

AT&T Corp.: *See—*

Mumick, Inderpal Singh; and Silberschatz, Abraham, 5,751,798, Cl. 379-112.000.

AT&T Global Information Solutions Company: *See—*

Herbert, Brian K., 5,752,010, Cl. 395-509.000.

AT/COMM Incorporated: *See—*

Hassett, John J., 5,751,973, Cl. 395-213.000.

Ata, Masafumi: *See—*

Kurihara, Kenichi; Ata, Masafumi; Matsute, Masataka; and Watanabe, Haruo, 5,750,261, Cl. 428-422.800.

Atherton, Peter Samuel: *See—*

Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.

Atkin, Graham: *See—*

Warburton, Alan; and Atkin, Graham, 5,749,340, Cl. 123-90.160.

Atlantic Richfield Company: *See—*

Mehta, Sudhir; and Caveny, William J., 5,749,418, Cl. 166-292.000.

Wolford, Larry L.; and Prince, Brian K., 5,749,560, Cl. 251-214.000.

Atlas Copco Berema AB: *See—*

Johansson, Ingemar Sven; and Nilsson, Ake Lennart, 5,749,421, Cl. 173-162.200.

Atlas Copco Tools AB: *See—*

Hansson, Gunnar Christer, 5,750,932, Cl. 174-113.00R.

Aton, Thomas J.: *See—*

Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.

Atsumi, Nobukazu: *See—*

Shimpuku, Takashi; and Atsumi, Nobukazu, 5,750,616, Cl. 524-496.000.

Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, to Minolta Camera Kabushiki Kaisha. Document feeding apparatus having improved forwarding means. 5,749,569, Cl. 271-10.110.

Atzema, Botjo: *See—*

Sachdev, Manoj; and Atzema, Botjo, 5,751,141, Cl. 323-312.000.

Auberon, Marcel: *See—*

Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, 5,749,985, Cl. 156-64.000.

Aubin, Daniel: *See—*

Rahman, M. Dalil; and Aubin, Daniel, 5,750,632, Cl. 528-129.000.

Aubin, Daniel P.: *See—*

Rahman, M. Dalil; and Aubin, Daniel P., 5,750,031, Cl. 210-681.000.

Aubry, Alain; Gubelmann, Michel; and Le Govic, Anne-Marie, to Rhone-Poulenc Chimie. Process for the preparation of carboxylic acids by controlled oxidation of the corresponding alkanes. 5,750,777, Cl. 562-549.000.

Auda, Mahroussa: *See—*

Hoorne, Dirk; and Auda, Mahroussa, 5,750,513, Cl. 514-54.000.

Audio Authority Corporation: *See—*

Gertz, Jonathan; Butcher, Mark S.; and Tuomy, James M., 5,751,818, Cl. 381-55.000.

Aulbach, Michael: *See—*

Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, 5,750,752, Cl. 556-1.000.

Auria, Augustin: *See—*

Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.

Austin, James Dub: *See—*

Pietruszynski, David Michael; Austin, James Dub; and Kirkland, Brian, 5,751,179, Cl. 327-379.000.

Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., to Grimes Aerospace Company. Magnet brake. 5,751,127, Cl. 318-370.000.

Austin, Pixie Ann; Wiklof, Christopher A.; and Aragon, Cathy L., to Intermec Corporation. Printer for printing on media roll. 5,751,330, Cl. 347-171.000.

Australian National University, The: *See—*

Hegland, Markus; and Nakanishi, Makoto, 5,751,616, Cl. 364-725.020.

John, Peter Crook Lloyd, 5,750,862, Cl. 800-205.000.

Auto Electronics Corporation: *See—*

Frers, Klaus Dieter, 5,750,880, Cl. 73-31.020.

Auto Splice Systems, Inc.: *See—*

Bianca, Giuseppe; and Bogursky, Robert M., 5,749,458, Cl. 200-541.000.

Autodesk, Inc.: *See—*

Ringland, William K.; and Kubo, Jon C., 5,751,829, Cl. 382-100.000.

Automeg, Inc.: *See—*

Horvath, Joseph G.; and Miller, James C., 5,751,132, Cl. 318-798.000.

Avery Dennison Corporation: *See—*

Johnson, John R.; and Mercier, Diana M., 5,750,234, Cl. 428-141.000.

Avid Technology, Inc.: *See—*

Wissner, Michael J., 5,752,029, Cl. 395-615.000.

Avila, Javier; Obermeyer, James Andrew; Speck, Michael H.; and Dybalski, Ronald Henry, to General Motors Corporation. Tray assembly. 5,749,554, Cl. 248-311.200.

Avision, Inc: *See—*

Chen, Philip L.; and Sheng, Thomas, 5,751,461, Cl. 359-201.000.

Aware, Inc.: *See—*

Tzannes, Michael; and Tzannes, Marcos, 5,751,716, Cl. 370-468.000.

Axiohm IPB Inc: *See—*

Walker, Alan H., 5,749,277, Cl. 83-563.000.

Aybay, Gunes, to Sun Microsystems, Inc. Method and apparatus for efficient self testing of on-chip memory. 5,751,729, Cl. 371-21.100.

Ayerst, Douglas Irvin: *See—*

Dorenbosch, Jheroen; Ayerst, Douglas Irvin; and Cannon, Gregory Lewis, 5,752,166, Cl. 455-67.100.

B. F. Goodrich Company: *See—*

Lai, John T.; and Filla, Deborah S., 5,750,787, Cl. 564-409.000.

Lemma, Solomon, 5,750,047, Cl. 252-70.000.

Baardman, Frank; and Jubb, Jayne, to Shell Oil Company. Process for the preparation of copolymers. 5,750,642, Cl. 528-392.000.

Baba, Mikio, to NEC Corporation. Multi-chip module. 5,751,063, Cl. 257-723.000.

Babb, Brendan J., to Advanced Micro Devices, Inc. Error detection and correction circuit. 5,751,744, Cl. 371-49.100.

Babcock-Hitachi Kabushiki Kaisha: *See—*

Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.

Babezinski, Peter: *See—*

Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.

Babu, Mangalore S.; Nahar, Jinen K.; Rogers, Gregory B.; and Downs, Walter S., III, to Ericsson, Inc. Subscriber line interface in a telecommunications exchange. 5,751,717, Cl. 370-466.000.

Bach, Randall: *See—*

Wei, Shuran; and Bach, Randall, 5,751,161, Cl. 326-30.000.

Bachik, Alan, to U.S. Scientific, L.L.C. Apparatus and process for carbon removal from fly ash. 5,749,308, Cl. 110-344.000.

Bacich, Steven R.; Greelis, John P.; Nguyen, Hien; and Nguyen, Tuoc, to Imagyn Medical, Inc. Method and apparatus for performing biopsy. 5,749,889, Cl. 606-198.000.

Backus, Richard G.: *See—*

Farris, Robert D.; and Backus, Richard G., 5,751,789, Cl. 379-34.000.

Bactex, Inc.: *See—*

Brinton, Charles C., Jr., 5,750,116, Cl. 424-242.100.

Bader, Josef: *See—*

Buri, Gerhard; and Bader, Josef, 5,749,263, Cl. 74-331.000.

Badesha, Santokh S.; Heeks, George J.; and Henry, Arnold W., to Xerox Corporation. Fluoroelastomer surfaces and methods thereof. 5,750,204, Cl. 427-387.000.

Badger, John S.: *See—*

McGuckin, Hugh G.; Badger, John S.; and Kurz, Edward A., 5,750,322, Cl. 430-463.000.

Badger Meter, Inc.: *See—*

Saadeh, Theresa, 5,751,797, Cl. 379-106.030.

Badman, Clive Elton: *See—*

Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, 5,750,685, Cl. 540-349.000.

Baek, Dae Bong; and Kwak, Sung Hoon, to LG Semicon Co., Ltd. Output buffer with improved operational speed and transitional current. 5,751,160, Cl. 326-27.000.

Baetge, E. Edward: *See—*

Weiss, Samuel; Reynolds, Brent; Hammang, Joseph P.; and Baetge, E. Edward, 5,750,376, Cl. 435-69.520.

Bagasra, Omar; and Pomerantz, Roger J., to Thomas Jefferson University. In situ polymerase chain reaction. 5,750,347, Cl. 435-6.000.

Bagepalli, Bharat S.: *See—*

Skinner, David Robert; Bagepalli, Bharat S.; Crumer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.

Baggett, Thomas Doyle: *See—*

Pitman, Richard James; and Baggett, Thomas Doyle, 5,750,056, Cl. 261-37.000.

Baggiolini, Enrico Giuseppe, deceased (by Barbara Judith Baggiolini, Executrix); Shiuey, Shian-Jan; and Usknkovic, Milan Radoje, to Hoffman-La Roche Inc. Method of treating sebaceous gland diseases with vitamin D_3fluorinated analogs. 5,750,517, Cl. 514-167.000.
Baghai, M. Reza: *See—*
Blake, Russ; Baghai, M. Reza; and Smith, Lee A., 5,752,038, Cl. 395-709.000.
Bagherpour, Bo; Hesse, Ralph Kurt; and Brooks, Kenneth Ross, to Ford Motor Company. Alternator with internal and external fans. 5,751,079, Cl. 310-59.000.
Bagwell, Alan C.; and Edwards, Daniel A., to Reynolds Metals Company. Can end with recessed center panel formed downwardly from coin. 5,749,488, Cl. 220-269.000.
Bailey, Bruce R.: *See—*
Bizot, Paul M.; Bailey, Bruce R.; and Hicks, Peter D., 5,750,037, Cl. 210-750.000.
Bailey, Jeffrey L. Amusement system for children. 5,749,764, Cl. 446-27.000.
Bailey, Raymond F.; McCubbin, Robert K.; Goeserich, Manfred H.; and Altavela, Robert P., to Xerox Corporation. Thermal ink jet printhead with ink resistant heat sink coating. 5,751,316, Cl. 347-63.000.
Bailey, Ronald E.: *See—*
Polito, Anthony J.; Bailey, Ronald E.; Timmons, William W.; and Bell, Robert H., 5,749,140, Cl. 29-527.100.
Bailey, Ronald L., to Young Dental Manufacturing Company. Method of assembling a dental prophylaxis angle. 5,749,728, Cl. 433-125.000.
Bailey, Thomas R.: *See—*
Aldous, David J.; Bailey, Thomas R.; Diana, Guy Dominic; and Nitz, Theodore J., 5,750,527, Cl. 514-252.000.
Baillely, Gerard Marcel; and Powell, Suzanne, to Procter & Gamble Company, The. Laundry detergent containing a polyhydroxy fatty amide and insoluble ethoxylated alcohol. 5,750,485, Cl. 510-315.000.
Baird, William C., Jr.: *See—*
Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., 5,750,819, Cl. 585-734.000.
Bakalash, Reuven. Parallel computing system for volumetric modeling, data processing and visualization volumetric. 5,751,928, Cl. 395-124.000.
Baker, Donald A. Fetal cardiac monitoring utilizing umbilical blood flow parameters and heartbeat information. 5,749,831, Cl. 600-301.000.
Baker, Gene G.: *See—*
Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., 5,750,009, Cl. 203-64.000.
Baker Hughes Incorporated: *See—*
Coronado, Martin P.; and Mackenzie, Alan, 5,749,419, Cl. 166-387.000.
Lembcke, Jeffrey J., 5,749,585, Cl. 277-116.200.
Baker, James Allen, Jr.: *See—*
Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., 5,749,846, Cl. 604-22.000.
Baker, Keith Homer: *See—*
Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.
Baker, William Edward: *See—*
Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
Bala, Krishna; Brackett, Charles Arthur; and Song, Ghie Hugh, to Bell Communications Research, Inc. Asymetrically dilated optical cross connect switches. 5,751,868, Cl. 385-16.000.
Balaban, David B.; and Tufano, Anthony, to Leviton Manufacturing Co., Inc. Electrical rocker type switch. 5,749,459, Cl. 200-559.000.
Baldwin-Gegenheimer GmbH: *See—*
Kurz, Hans-Joachim, 5,749,295, Cl. 101-350.100.
Baldwin Hardware Corporation: *See—*
Meck, Leslie A.; and Ellis, Philip C., 5,749,612, Cl. 292-347.000.
Bale Built, Inc.: *See—*
Allen, Joseph, 5,749,199, Cl. 52-729.100.
Ballard, Gerald L.; and Brosius, William L., to Magnetek Corporation. Secondary ground fault protected luminous tube transformer for mid-point connected luminous tubes. 5,751,523, Cl. 361-42.000.
Ballard Power Systems Inc.: *See—*
Buswell, Richard F.; Cohen, Ronald; McNeilly, Leonard; and Watkins, David S., 5,750,076, Cl. 422-115.000.
Washington, Kirk B.; Kenna, John T.; James, Greg A.; and Ramji, Shiraz N., 5,750,281, Cl. 429-39.000.
Baltazar, Osni. Fire protection arrangement for temperature-sensitive, heat-producing article. 5,750,927, Cl. 174-68.300.
Balthazard, Patrick, to Valeo Thermique Moteur. Heat exchanger having a tubular header with a fastening lug. 5,749,412, Cl. 165-67.000.
Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., to U.S. Philips Corporation. Radio transmission system and a radio apparatus for use in such a system. 5,751,249, Cl. 342-372.000.
Balz, James G.: *See—*
Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
Balzers Aktiengesellschaft: *See—*
Hohenegger, Karl; and Wierer, Peter, 5,751,474, Cl. 359-360.000.
Ban, Yuzaburo: *See—*
Kidoguchi, Isao; Adachi, Hideto; Ishihashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.
Banas, Christopher E.; and Edwin, Tarun J., to Impra, Inc. Endoluminal encapsulated stent and methods of manufacture and endoluminal delivery. 5,749,880, Cl. 606-198.000.
Bandoh, Kazuhiko, to Towa Corporation. Method of molding resin to seal electronic parts. 5,750,059, Cl. 264-39.000.
Bandon Corp.: *See—*
Kramer, Ronald A., 5,750,479, Cl. 508-463.000.
Bandurkin, Victor Vladimirovich: *See—*
Shashkovsky, Sergei Gennadievich; Kamrukov, Alexander Semyonovich; Chepegin, Dmitry Vyacheslavovich; and Bandurkin, Victor Vladimirovich, 5,750,205, Cl. 427-535.000.
Bandy, Thomas R.: *See—*
Hampton, John T., III; Trainor, William F.; and Bandy, Thomas R., 5,749,605, Cl. 285-48.000.
Bangma, Pier, to Buro Eco-Home. Building and building element therefor. 5,749,196, Cl. 52-561.000.
Banin, Amos: *See—*
Shaked, Dov; Banin, Amos; Moll, William F.; and Aguilar, Iwona M., 5,749,955, Cl. 106-287.170.
Banning, Jeffery H.; King, Clifford R.; Bui, Loc V.; and Titterington, Donald R., to Tektronix, Inc. Phase change ink formulation using a urethane isocyanate-derived resin. 5,750,604, Cl. 524-187.000.
Banno, Hiroshi: *See—*
Koike, Ryuichi; Banno, Hiroshi; Ito, Tamotsu; and Takeuchi, Takashi, 5,751,671, Cl. 369-14.000.
Banno, Yoshikazu: *See—*
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.
Banton, Martin E.: *See—*
Micco, Felice A.; and Banton, Martin E., 5,751,865, Cl. 382-296.000.
Banton, Randall G.: *See—*
Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
Banyu Pharmaceutical Co., Ltd.: *See—*
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.
Baranov, V. I.: *See—*
Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., 5,751,113, Cl. 315-111.210.
Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, to Centre National de la Recherche Scientifique (C.N.R.S.). Nitrones which are usable for the scavenging of free radicals. 5,750,710, Cl. 548-111.000.
Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, to International Business Machines Corporation. Image query system and method 5,751,286, Cl. 345-348.000.
Barber, Terry J.: *See—*
Sundaram, Ramesh; and Barber, Terry J., 5,751,527, Cl. 360-122.000.
Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, to Hoffmann-La Roche Inc. Azepanes and their ring homologues having protein kinase inhibiting activity. 5,750,706, Cl. 546-279.100.
Barbot, Gérard; Rameau, Cyril; and Sanchez, Patrick F. Self-cleaning litter box for animals. 5,749,318, Cl. 119-166.000.
Bardarov, Stoyan: *See—*
Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, 5,750,384, Cl. 435-172.300.
Bardin, Daniel, to T Deux C. Intraosseous anchoring method and device. 5,749,899, Cl. 606-232.000.
Bärenwäld, Jörg R., to ACO Polymer Products, Inc. Animal feeder. 5,749,315, Cl. 119-52.100.
Barker, Frederick H.: *See—*
Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.
Barker, Richard Steven: *See—*

Wulf, Katherine; and Barker, Richard Steven, 5,749,503, Cl. 224-153.000.
Barker, Roger L.: *See—*
Hamouda, Hechmi; Barker, Roger L.; and Millsaps, Darrin S., 5,749,259, Cl. 73-159.000.
Barkhaus, Joan K.: *See—*
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,134, Cl. 424-434.000.
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,136, Cl. 424-448.000.
Barnes, Clive; and Crichton, Trevor John, to Braun Aktiengesellschaft. Methods of manufacturing perforated foils. 5,750,956, Cl. 219-121.710.
Barnett, Clayton M., to L&P Property Management Co. Spring to metal rail assembly. 5,749,108, Cl. 5-264.100.
Barnett, Daniel C.: *See—*
Hall, George R.; Barnett, Daniel C.; Smith, Robert A.; and Jewett, Scotty Y., 5,750,408, Cl. 436-137.000.
Baron, Natan: *See—*
Shor, Joseph; Engel, Eytan; and Baron, Natan, 5,751,178, Cl. 327-333.000.
Barr & Stroud Limited: *See—*
Runciman, Herbert Morrison, 5,751,473, Cl. 359-356.000.
Barrois, Claus Dieter; Lindner, Georg Johann; and Zelfel, Hans-Jürgen, to Koenig & Bauer-Albert Aktiengesellschaft. Method and apparatus for fastening and clamping printing plates with beveled edges. 5,749,299, Cl. 101-483.000.
Barrskogen, Inc.: *See—*
Kempe, Tomas, 5,750,672, Cl. 536-25.310.
Barry, Gerard Francis; Kishore, Ganesh Murthy; and Krohn, Bradley Martin, to Monsanto Company. Isoamylase gene, compositions containing it, and methods of using isoamylases. 5,750,876, Cl. 800-205.000.
Barsotti, Robert John; and Scopazzi, Christopher, to Du Pont de Nemours, E. I., and Company. Coating composition of non-cyclic anhydride resin, polyepoxy oligomer and stabilized acrylic resin. 5,750,619, Cl. 525-65.000.
Bartfeld, Eyal: *See—*
Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.
Barth, Hubert: *See—*
Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.
Barton, Roger Edgar Charles; and Jordaan, Johannes Clemens Maria, to Shell Oil Company. Fuel tank and a process for producing the fuel tank. 5,750,220, Cl. 428-35.700.
BASF Aktiengesellschaft: *See—*
Adams, Stefan; and Seifert, Holger, 5,750,586, Cl. 521-159.000.
Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.
Bröcker, Franz Josef; Stroezel, Manfred; and Rheude, Udo, 5,750,806, Cl. 568-909.500.
Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, 5,750,362, Cl. 435-29.000.
Gottschalk, Axel; Stadler, Raimund; and Krappe, Udo, 5,750,621, Cl. 525-68.000.
Häussling, Lukas; Neuhauser, Horst; and Paulus, Wolfgang, 5,750,788, Cl. 564-415.000.
Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, 5,750,705, Cl. 546-297.000.
Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
Schloesser, Ulrike; and Mayer, Udo, 5,750,661, Cl. 534-604.000.
Schröder, Gunter-Rudolf; Mayer, Udo; Baus, Ulf; and Dix, Johannes Peter, 5,750,742, Cl. 552-109.000.
BASF Corporation: *See—*
Hoyt, Matthew B., 5,750,063, Cl. 264-172.150.
Lisk, James R., Jr., 5,751,834, Cl. 382-111.000.
Welch, Michael C.; and Zack, Kenneth L., 5,750,483, Cl. 510-230.000.
Basilico, Claudio; and Delli Bovi, Pasquale, to New York University. Mammalian growth factor. 5,750,659, Cl. 530-399.000.
Basler Electric Company: *See—*
Kanuchok, John M.; Burnworth, Jeffrey A.; and Bright, James A., 5,751,532, Cl. 361-94.000.
Basore, David Lee; and Meisel, William Stuart, to Lucent Technologies Inc. Voice activated device and method for providing access to remotely retrieved data. 5,752,232, Cl. 704-275.000.
Bass, Steven: *See—*
Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.
Bassett, Jonathan D.: *See—*
Stephens, Fred O.; and Bassett, Jonathan D., 5,751,529, Cl. 360-128.000.
Bastart, Jean-Pierre; Dupechez, Thierry; and Fabre, Jean-Louis, to Rhone-Poulenc Rorer, S.A. New compositions containing taxane derivatives. 5,750,561, Cl. 514-449.000.
Bastart, Jean-Pierre; Boursat, Jean-Dominique; Commercon, Alain; and Leconte, Jean-Pierre, to Rhone-Poulenc Rorer S.A. Process for the preparation of 7-hydroxytaxanes. 5,750,738, Cl. 549-510.000.
Basu, Hemendra N.: *See—*
Del Vecchio, Anthony J.; Jungermann, Eric; and Basu, Hemendra N., 5,750,481, Cl. 510-152.000.
Batchelor, William Herbert, to Devine Rendezvous. Turbocharged RAM tornado engine with transmission and heat recovery system. 5,749,220, Cl. 60-39.750.
Bates, Kenn S.: *See—*
Vali, Victor; Shih, I-Fu; and Bates, Kenn S., 5,750,901, Cl. 73-800.000.
Bates, Terence: *See—*
Brown, Kevin J.; Harwood, William R.; and Bates, Terence, 5,751,781, Cl. 378-65.000.
Batson, James D.: *See—*
Hoddie, Peter; Batson, James D.; and Callahan, Sean Michael, 5,751,281, Cl. 345-302.000.
Battelle Memorial Institute: *See—*
Lamar, David A.; Chapman, Chris C.; and Elliott, Michael L., 5,749,932, Cl. 65-135.700.
Battenfeld GmbH: *See—*
Eckardt, Helmut; Schröder, Klaus; Ehritt, Jürgen; and Hübel, Uwe, 5,750,155, Cl. 425-130.000.
Bauch, Aaron M.: *See—*
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,751,840, Cl. 382-135.000.
Baudoin, Bernard; Burns, Christopher; Commercon, Alain; and Le Brun, Alain, to Phone-Poulenc Rorer SA. Farnesyl transferase inhibitors, preparation thereof and pharmaceutical compositions containing same. 5,750,567, Cl. 514-510.000.
Bauer, Kurt H.; and Reinhart, Thomas, to Bauer, Kurt H. Water-soluble dextran fatty acid esters and their use as solubilizers. 5,750,678, Cl. 536-103.000.
Bauer, Randall C.: *See—*
Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., 5,749,701, Cl. 415-115.000.
Baughman, Larry G.: *See—*
Quiachon, Dinah B.; Piplani, Alec A.; and Baughman, Larry G., 5,749,920, Cl. 623-1.000.
Baukloh, Horst. Egg cutter. 5,749,145, Cl. 30-114.000.
Baum, Charles M.: *See—*
Tsukamoto, Ann; Baum, Charles M.; Aihara, Yukoh; and Weissman, Irving, 5,750,397, Cl. 435-372.000.
Bauman, Michael James. Underground emergency shelter system. 5,749,181, Cl. 52-169.600.
Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, to BASF Aktiengesellschaft. Subtituted lactic acid derivatives having an N-organic radical in the β-position. 5,750,469, Cl. 504-243.000.
Baumann, Mark: *See—*
Mick, John; Miller, Michael; Smith, Jeff; and Baumann, Mark, 5,751,638, Cl. 365-189.040.
Baumgartner, Ernst Severin, to General Motors Corporation. Brake by wire system. 5,749,633, Cl. 303-113.100.
Baur, Peter F., to NCR Corporation. Liquid crystal display with pen-input capability. 5,751,453, Cl. 359-60.000.
Baus, Ulf: *See—*
Schröder, Gunter-Rudolf; Mayer, Udo; Baus, Ulf; and Dix, Johannes Peter, 5,750,742, Cl. 552-109.000.
Baxter, C. Edward, Jr., to Amvac Chemical Corporation. (1R*, 2S)-1-phenyl-2-nitroalcohols and method for producing same. 5,750,802, Cl. 568-814.000.
Baxter, Glenn A., to Xilinx, Inc. Configuration emulation of a programmable logic device. 5,752,006, Cl. 395-500.000.
Baxter International Inc.: *See—*
Brown, Richard I.; and Min, Kyungyoon, 5,750,039, Cl. 210-782.000.
Goldman, Don S., 5,750,998, Cl. 250-343.000.
Bay Networks Group, Inc.: *See—*
Raab, Ilan; Manghirmalani, Ravi; Doitel, Ofer; and Izbicki, Lynne Marie, 5,751,967, Cl. 395-200.580.
Bayer AG: *See—*
Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, 5,750,602, Cl. 524-127.000.
Vogt, Hans-Günter; Grave, Heinrich; Bross, Hermann-Josef; and Matner, Martin, 5,750,618, Cl. 524-836.000.
Bayer Aktiengesellschaft: *See—*
Böcker, Thomas; Berneth, Horst; and Giera, Henry, 5,749,925, Cl. 8-436.000.
Blum, Harald; Sickert, Armin; and Hovestadt, Wieland, 5,750,613, Cl. 524-457.000.
Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, 5,750,801, Cl. 568-715.000.
Darsow, Gerhard; and Petruck, Gerd-Michael, 5,750,803, Cl. 568-830.000.
Gallenkamp, Bernd; Rohe, Lothar; and Marhold, Albrecht, 5,750,721, Cl. 548-374.100.
Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.
Hamprecht, Rainer; and Müller, Claudia, 5,750,761, Cl. 558-423.000.

- Laas, Hans-Josef; Halpaap, Reinhard; Pedain, Josef; and König, Klaus, 5,750,629, Cl. 528-45.000.
- Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
- Mayer, Eduard; and Grönen, Jürgen, 5,750,580, Cl. 521-51.000.

Bayer Corporation: *See—*
- Albarella, James P.; Cahill, Sally E.; Johnson, Gary M.; and Pugia, Michael J., 5,750,405, Cl. 436-88.000.
- Gansen, Peter; and Gricar, James R., 5,750,583, Cl. 521-78.000.
- Sommer, Ronald G., 5,750,411, Cl. 436-525.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
- Treml, Christian, 5,749,345, Cl. 123-456.000.

Baylor College of Medicine: *See—*
- Chan, Lawrence C. B., 5,750,367, Cl. 435-69.100.

Bayot, Alfredo G.: *See—*
- Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., 5,749,370, Cl. 128-772.000.

Bealkowski, Richard; and Ozaki, Brenda M., to International Business Machines Corporation. Data processing system utilizing progammable microprogram memory controller. 5,752,066, Cl. 395-800.010.

Beamish, David J.: *See—*
- Koch, Frank J.; Vandervalk, Leon C.; and Beamish, David J., 5,751,608, Cl. 364-563.000.

Bean, Warren L.: *See—*
- Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.

Beard, Douglas: *See—*
- Garibay, Raul A., Jr.; Quattromani, Marc A.; and Beard, Douglas, 5,752,274, Cl. 711-206.000.

Beard, Terry D., to Digital Theater System, Inc. Motion picture digital sound system and method. 5,751,398, Cl. 352-236.000.

Bearss, James G.; and Camis, Thomas, to Hewlett-Packard Company. Ionographic color printer with plural print heads removable toner cartridge and one-time usable polymeric web. 5,751,329, Cl. 347-156.000.

Beattie, David Richard: *See—*
- Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.

Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, to International Business Machines Corporation. Method for building and verifying authenticity of a rule system. 5,751,595, Cl. 364-490.000.

Bebensee, Douglas W.; and Stringer, Michael J., to Patriot Sensors & Controls Corporation. Extended range thruster system and method of determining thrust. 5,749,224, Cl. 60-473.000.

Bechtel, Gordon L.; and Newton, Curtis J., to Lucent Technologies Inc. Multiplexed-communications network having mixed protection against faults and errors. 5,751,696, Cl. 370-223.000.

Beck, Doris Arlene: *See—*
- Buck, Arthur Glen; Beck, Doris Arlene; and Chy, Sokha, 5,750,930, Cl. 174-102.00R.

Beck, Earl Joseph. Apparatus for rapidly degassing and decontaminating liquids. 5,749,945, Cl. 95-248.000.

Becker, Alvin G.: *See—*
- Haddad, Michel G.; and Becker, Alvin G., 5,751,536, Cl. 361-191.000.

Becker, Kurt Joseph; Jensen, James Allen; and Lukacs, Alexander, III, to Lanxide Technology Company, LP. Metal-nitrogen polymer compositions comprising organic electrophiles. 5,750,628, Cl. 528-25.000.

Becker, Larry W.: *See—*
- Shepperd, Paul W., III; Becker, Larry W.; and Cundiff, Robert J., 5,750,035, Cl. 210-719.000.

Becker, Scott T.: *See—*
- Kornachuk, Steve P.; and Becker, Scott T., 5,751,649, Cl. 365-205.000.

Becker, Wilfried, to Hoechst Aktiengesellschaft. Test method for hydraulic fluids based on glycols and glycol borates with respect to precipitation tendency. 5,750,407, Cl. 436-131.000.

Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., to Control Systems, Inc. Graphics accelerator chip and method. 5,751,295, Cl. 345-501.000.

Beckman Instruments, Inc.: *See—*
- Katzman, Steven P.; and Glenday, Ronald C., 5,750,074, Cl. 422-102.000.

Beckmann, Ronald Lee: *See—*
- Lu, Jian Gang; and Beckmann, Ronald Lee, 5,749,606, Cl. 285-86.000.

Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., to Lockheed Martin Corporation. Launch mount pedestal and umbilical mast. 5,750,915, Cl. 89-1.800.

Bedzyk, Mark David, to Eastman Kodak Company. Zoom lens mechanism with focus camming mechanism. 5,751,500, Cl. 359-740.000.

Beecham Group plc.: *See—*
- Geerlandt, Hervé; and Henry, Claudine Grand', 5,750,684, Cl. 540-319.000.

Beeley, Lee James; and Dean, David Kenneth, to SmithKline Beecham plc. Heterocyclic ethanolamine derivatives with β-adrenoreceptor agonistic activity. 5,750,701, Cl. 546-157.000.

Behl, Sanjay; Nemeh, Saad; Willis, Mitchell J.; and Berberich, Joseph P., to Engelhard Corporation. Delaminated kaolin pigments their preparation and use in paper coating. 5,749,958, Cl. 106-416.000.

Behle, Robert W.: *See—*
- Shasha, Baruch S.; McGuire, Michael R.; and Behle, Robert W., 5,750,467, Cl. 504-116.000.

Behnke, Willi; and Sagemüller, Burkhard, to Claas KGaA. Device for and method of calibrating the measurements of a product stream. 5,750,877, Cl. 73-1.330.

BEHR GmbH & Co.: *See—*
- Damsohn, Herbert; and Schmitz, Albert, 5,749,414, Cl. 165-178.000.

Behring Diagnostics GmbH: *See—*
- Cerutti, Peter; Whitcomb, Jeannette; Zijlstra, Jacob; and de Villiers, Ethel-Michelle, 5,750,334, Cl. 435-5.000.

Beicher, Horst: *See—*
- Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, 5,750,602, Cl. 524-127.000.

Beiersdorf Ag: *See—*
- Gohla, Sven; Müller, Anja; and Nielsen, Jens, 5,750,124, Cl. 424-401.000.

Beight, Douglas W.: *See—*
- Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.

Beinborn, Martin: *See—*
- Kopin, Alan S.; and Beinborn, Martin, 5,750,353, Cl. 435-7.210.

Beitel, Bradley James: *See—*
- Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.

Belbenoit, Maurice. Raised floor with modular slabs. 5,749,188, Cl. 52-263.000.

Belcher, Iain Russell, to Mono Pumps Limited. Downhole pump drive head assembly. 5,749,416, Cl. 166-68.500.

Beldex Corporation: *See—*
- Shimotoyodome, Gyo; and Sugiura, Isao, 5,751,392, Cl. 349-187.000.

Bell Atlantic Network Services, Inc.: *See—*
- Farris, Robert D.; and Backus, Richard G., 5,751,789, Cl. 379-34.000.
- Voit, Eric A.; Kostreski, Bruce; Liptak, Lance; and DePaul, Kenneth, 5,751,707, Cl. 370-384.000.

Bell Communications Research, Inc.: *See—*
- Anderson, Milton M., 5,751,812, Cl. 380-48.000.
- Bala, Krishna; Brackett, Charles Arthur; and Song, Ghie Hugh, 5,751,868, Cl. 385-16.000.
- Smyk, Darek Andrew, 5,751,961, Cl. 395-200.470.

Bell, Lawrence I.: *See—*
- Yee, Jeng-Jung; Bell, Lawrence I.; and Narasimmon, Raj G., 5,750,177, Cl. 426-582.000.

Bell, Lillian Anne: *See—*
- Sledziewski, Andrzej Z.; Bell, Lillian Anne; and Kindsvogel, Wayne R., 5,750,375, Cl. 435-69.700.

Bell, Maria L.: *See—*
- Fischer, Timothy J.; Bell, Maria L.; and Bowling, Regina J., 5,749,976, Cl. 134-22.120.

Bell, Robert H.: *See—*
- Polito, Anthony J.; Bailey, Ronald E.; Timmons, William W.; and Bell, Robert H., 5,749,140, Cl. 29-527.100.

Bellas, Jeffrey J.; Boling, Clyde W.; Brunner, Dennis M.; and Feldman, Steven, to Minnesota Mining and Manufacturing Company. Electrical connector with ground clip. 5,749,741, Cl. 439-95.000.

Belloir, Pierre-Frederic J.: *See—*
- Grootjans, Jacques F.; Belloir, Pierre-Frederic J.; and Romers, Eric J.G.M., 5,750,814, Cl. 585-323.000.

Belmont, Brian V.: *See—*
- Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., 5,751,998, Cl. 395-490.000.

Belmont, James A.: *See—*
- Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,749,950, Cl. 106-316.000.

Belokin, Martin P.: *See—*
- Belokin, Paul; Belokin, Martin P.; and Belokin, Norman P., 5,749,479, Cl. 211-113.000.

Belokin, Norman P.: *See—*
- Belokin, Paul; Belokin, Martin P.; and Belokin, Norman P., 5,749,479, Cl. 211-113.000.

Belokin, Paul; Belokin, Martin P.; and Belokin, Norman P. Display assembly. 5,749,479, Cl. 211-113.000.

Beltzer, Morton: *See—*
- Kim, Jeenok T.; Berlowitz, Paul Joseph; Francisco, Manuel A.; and Beltzer, Morton, 5,750,478, Cl. 508-331.000.

Belyayev, Vladimir Petrovich, to Radva Corporation. Formulation for producing heat insulating material and method for producing the same. 5,749,960, Cl. 106-600.000.

Ben Hughes Communication Products Company: *See—*
- Bourbeau, Roger R., 5,749,270, Cl. 81-9.400.

Benchmarc Display, Incorporated: *See—*
- Krebs, Jimmy M., 5,749,475, Cl. 211-24.000.

Bend Research, Inc.: *See—*
- Smith, Kelly L.; and Herbig, Scott H., 5,750,126, Cl. 424-405.000.

Bender, Blake: *See—*

- Rhodes, Ken; Coelho, Rohan; Bender, Blake; and Frank, Davis, 5,751,270, Cl. 345-118.000.

Bender, Franz, to Mercedes-Benz AG. Value control for an internal combustion engine. 5,749,350, Cl. 123-571.000.

Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., to Boston Scientific Technology, Inc. Bone anchor implantation device and method. 5,749,884, Cl. 606-167.000.

Benecke, Jurgen: *See—*
- Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, 5,750,444, Cl. 442-62.000.

Beneker, Gerrit V.: *See—*
- Detweiler, Charles A.; Deland, Daniel L.; and Beneker, Gerrit V., 5,749,349, Cl. 123-520.000.

Benner, Christopher T.; and Harambasic, Nicholas, to Longview Fibre Company. Paperboard container for fluids having an improved lower fitment restraint structure. 5,749,489, Cl. 220-465.000.

Benner, Robert E.: *See—*
- Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.

Bennett, Alan B.; Brummell, David A.; and Grantz, Alexander A., to University of California, The Regents of the. Nucleic acids encoding ascorbate free radial reductase and their uses. 5,750,872, Cl. 800-205.000.

Bennett, Allen: *See—*
- Stillwagon, Ross I.; Fischbach, Fernando; and Bennett, Allen, 5,749,379, Cl. 132-200.000.

Bennett, Paul: *See—*
- Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.

Bennua-Skalmowski, Bärbel: *See—*
- Vorbrüggen, Helmut; Krolikiewicz, Konrad; and Bennua-Skalmowski, Bärbel, 5,750,676, Cl. 536-55.300.

Benson, Max Loell: *See—*
- Shakib, Darren Arthur; Rockenbeck, William H.; Benson, Max Loell; and Joshi, Milind Madhukar, 5,752,025, Cl. 395-613.000.

Benthin Aktiengesellschaft: *See—*
- Benthin, Siegfried, 5,749,406, Cl. 160-176.10V.

Benthin, Siegfried, to Benthin Aktiengesellschaft. Vertical blind with a crank rod for operation. 5,749,406, Cl. 160-176.10V.

Benzenberg, Craig Kay; Mann, Lloyd Steven; Oslund, Lawrence Carl; and Roe, Colleen Ann, to Alcatel Network Systems, Inc. Electronic work environment for a data processing system. 5,751,943, Cl. 395-183.160.

Berardi, Anthony Ronald: *See—*
- Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, 5,749,468, Cl. 206-455.000.

Berberich, Joseph P.: *See—*
- Behl, Sanjay; Nemeh, Saad; Willis, Mitchell J.; and Berberich, Joseph P., 5,749,958, Cl. 106-416.000.

Berg, Alan Dean: *See—*
- Crane, Robert Scott; Kolena, David Philip; and Berg, Alan Dean, 5,749,135, Cl. 29-415.000.

Berg Technology, Inc.: *See—*
- Yu, Wang-I; and Lin, Jui-Chu, 5,749,750, Cl. 439-637.000.

Berger, David I.: *See—*
- Katz, Eric R.; and Berger, David I., 5,750,275, Cl. 428-694.00R.

Berger, Erwin: *See—*
- Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, 5,749,291, Cl. 101-91.000.

Berka, Randy Michael; Thompson, Sheryl Ann; and Xu, Feng, to Novo Nordish Bio Tech, Inc. Purified scytalidium laccases and nucleic acids encoding same. 5,750,388, Cl. 435-189.000.

Berlincourt, Don A., to Channel Products, Inc. Multi-burner gas control apparatus. 5,749,718, Cl. 431-60.000.

Berlowitz, Paul Joseph, to Exxon Research and Engineering Company. Additive combination to reduce deposit forming tendencies and improve antioxidancy of aviation turbine oils. 5,750,475, Cl. 508-258.000.

Berlowitz, Paul Joseph: *See—*
- Kim, Jeenok T.; Berlowitz, Paul Joseph; Francisco, Manuel A.; and Beltzer, Morton, 5,750,478, Cl. 508-331.000.

Bernasconi, Ermanno: *See—*
- Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.

Bernasconi, Matthew, to Opaltone International Limited. Color printing process and product. 5,751,326, Cl. 347-115.000.

Bernert, Richard; and Reich, Stefan, to Voith Sulzer Papiermaschinen GmbH. Apparatus for the application of at least one liquid medium onto a moving material web. 5,749,972, Cl. 118-414.000.

Berneth, Horst: *See—*
- Böcker, Thomas; Berneth, Horst; and Giera, Henry, 5,749,925, Cl. 8-436.000.

Bertka, Jeffrey T.: *See—*
- Froelich, Thomas E., Sr.; and Bertka, Jeffrey T., 5,749,816, Cl. 482-123.000.

Bertoni, Amilcare: *See—*
- Cannata, Vincenzo; Bertoni, Amilcare; and Bianchi, Stefano, 5,750,793, Cl. 568-315.000.

Bertsch, James L.: *See—*
- Apffel, James A.; Werlich, Mark H.; Bertsch, James L.; and Goodley, Paul C., 5,750,988, Cl. 250-288.000.

Bertuzzi, Dale Charles, Jr.; Bezusko, Michael James; and Nuss, David Allen, to General Motors Corporation. Maximum retention serviceable high voltage spark plug adapter. 5,749,742, Cl. 439-125.000.

Beseup, Terrance L.: *See—*
- Hachey, Kathleen A.; Stump, Larry K.; Beseup, Terrance L.; and Kusilek, Thomas V., 5,750,191, Cl. 427-163.400.

Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Rack for a switching cabinet. 5,749,476, Cl. 211-26.000.

Bestwick, Richard Keith; and Ferro, Adolph J., to Epitope, Inc. Regulated expression of heterologous genes in plants. 5,750,864, Cl. 800-205.000.

Bestwick, Richard Keith: *See—*
- Mathews, Helena V.; Bestwick, Richard Keith; and Ferro, Adolph J., 5,750,870, Cl. 800-205.000.

BetzDearborn Inc.: *See—*
- Hart, Paul R.; and Dion, Michael A., 5,750,052, Cl. 252-321.000.

Beuck, Martin: *See—*
- Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.

Bevacqua, Andrew J.: *See—*
- Lahanas, Konstantinos M.; Toma, Daniela; Bevacqua, Andrew J.; and Cioca, Gheorghe, 5,750,125, Cl. 424-401.000.

Bevan, John: *See—*
- Wofford, Bill; Jackson, Marc; and Bevan, John, 5,750,823, Cl. 588-210.000.

Bezdin, Haim: *See—*
- Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.

Bezusko, Michael James: *See—*
- Bertuzzi, Dale Charles, Jr.; Bezusko, Michael James; and Nuss, David Allen, 5,749,742, Cl. 439-125.000.

Bhargava, Gautam; Narang, Inderpal Singh; and Teng, James Z., to International Business Machines Corporation. Computer program product for continuous destaging of changed data from a shared cache in a multisystem shared disk environment wherein castout interest is established in a hierarchical fashion. 5,751,992, Cl. 395-457.000.

Bhargava, Gautam; Goel, Piyush; and Iyer, Balakrishna Ragmavendra, to International Business Machines Corporation. Method and apparatus for executing complex SQL queries using projection operations. 5,752,017, Cl. 395-602.000.

Bhattacharyya, Alakananda; Foral, Michael J.; and Reagan, William J., to Amoco Corporation. Process for removing sulfur oxides or nitrogen oxides from a gaseous mixture in an FCC process. 5,750,020, Cl. 208-113.000.

Bi, Ning: *See—*
- DeJaco, Andrew P.; and Bi, Ning, 5,751,901, Cl. 395-2.250.

Bianca, Giuseppe; and Bogursky, Robert M., to Auto Splice Systems, Inc. Miniature jumper switch with wire contact maker. 5,749,458, Cl. 200-541.000.

Bianchi, Marina; Cerami, Anthony; Tracey, Kevin J.; and Ulrich, Peter, to Picower Institute for Medical Research, The. Guanylhydrazones and their use to treat inflammatory conditions. 5,750,573, Cl. 514-597.000.

Bianchi, Stefano: *See—*
- Cannata, Vincenzo; Bertoni, Amilcare; and Bianchi, Stefano, 5,750,793, Cl. 568-315.000.

Bianco, Sebastiano, to Bianco, Sebastiano. Potentiation of the antireactive-antiasthmatic effect of inhaled loop diuretics by inhaled non-steroidal anti-inflammatory drugs. 5,750,559, Cl. 514-428.000.

Bickham, Stephen R.: *See—*
- Halvorson, Todd; Bickham, Stephen R.; and Cutler, David, 5,749,346, Cl. 123-486.000.

Biederman, Scott William: *See—*
- Siak, June-Sang; Biederman, Scott William; Whited, William Thomas; and Datte, Mark Allen, 5,749,409, Cl. 164-23.000.

Bieker, Michael C. Blood collection tube holder. 5,749,504, Cl. 224-221.000.

Bier, Mark E., to Finnigan Corporation. Method of reducing noise in an ion trap mass spectrometer coupled to an atmospheric pressure ionization source. 5,750,993, Cl. 250-282.000.

Bignon, Daniel: *See—*
- Lallier, Jean-Pierre; and Bignon, Daniel, 5,749,977, Cl. 134-40.000.

Bihn, Daniel G.: *See—*
- Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Bilyeu, Paul D.; Hinant, Felicia M.; Hobby, James H.; and Hoffman, Donel A. Child-proof seat belt buckle assembly. 5,749,130, Cl. 24-637.000.

Binder, Frederick, to Research Plastics, Inc. Caulking tube air escape structure. 5,749,499, Cl. 222-327.000.

Binns, Julie Stephanie: *See—*
- Rashid, Abdul; Stevens, Howard Norman Ernest; Binns, Julie Stephanie; and Mackie, James Leonard, 5,750,143, Cl. 424-451.000.

Biomeasure, Inc.: *See—*
- Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, 5,750,646, Cl. 530-314.000.

Biomicron: *See—*
- Duvillier, Eric; Gineston, Jean-Marie; and De Roaldes, Olivier, 5,749,876, Cl. 606-88.000.

- Biosource Technologies, Inc.: *See—*
  - Turpen, Thomas H., 5,750,863, Cl. 800-205.000.
- Biotechnnology Research & Development Corporation: *See—*
  - Shasha, Baruch S.; McGuire, Michael R.; and Behle, Robert W., 5,750,467, Cl. 504-116.000.
- Biphase Energy Company: *See—*
  - Hays, Lance G., 5,750,040, Cl. 210-787.000.
- Birch, Martin John: *See—*
  - Crossland, William Alden; and Birch, Martin John, 5,751,266, Cl. 345-96.000.
- Bird, Colin Roger; Grierson, Donald; and Schuch, Wolfgang Walter, to Zeneca Limited. Process for modifying the production of carotenoids in plants, and DNA, constructs and cells therefor. 5,750,865, Cl. 800-205.000.
- Bird, Thomas B.: *See—*
  - Jewett, Thomas E.; and Bird, Thomas B., 5,749,180, Cl. 52-154.000.
- Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., to Commonwealth Scientific and Industrial Research Organisation. Feed movement mechanism and control system for a multi-beam antenna. 5,751,254, Cl. 343-761.000.
- Birkmayer, Joerg G. D., to Birkmayer Pharmaceuticals, Inc. NADH and NADPH therapeutic agents for nasal, sublingual, rectal and dermal administration. 5,750,512, Cl. 514-52.000.
- Birkmayer Pharmaceuticals, Inc.: *See—*
  - Birkmayer, Joerg G. D., 5,750,512, Cl. 514-52.000.
- Birkness, Kristin A.: *See—*
  - Quinn, Frederick D.; and Birkness, Kristin A., 5,750,329, Cl. 435-1.100.
- Birnkraut, Ingo: *See—*
  - Klinge, Bernd; Gutknecht, Michael; Weise, Bernd; and Birnkraut, Ingo, 5,749,721, Cl. 431-328.000.
- Birsching, Joel Edward, to General Motors Corporation. Power steering gear for motor vehicle. 5,749,432, Cl. 180-443.000.
- Bischoff, Hilmar: *See—*
  - Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.
- Bischoff, Holger: *See—*
  - Heim, Gunther; Überreiter, Thomas; Hock, Jürgen; and Bischoff, Holger, 5,749,176, Cl. 49-502.000.
- Bisco, Inc.: *See—*
  - Qian, Xuejun; Suh, Byoung I.; Hamer, Martin; and Tobias, Russell H., 5,749,733, Cl. 433-228.100.
- Bisgaier, Charles Larry; Creger, Paul Leroy; Saltiel, Alan Robert; and Tafuri, Sherrie Rae, to Warner-Lambert Company. Carboxyalkylethers, formulations, and treatment of vascular diseases. 5,750,569, Cl. 514-547.000.
- Bissessur, Hans; Mestric, Roland; and Duchet, Christian, to Alcatel Alsthom Compagnie Generale d'Electricite. Wavelength demultiplexer. 5,751,872, Cl. 385-37.000.
- Bissinger, Peter: *See—*
  - Zech, Joachim; Wanek, Erich; Lechner, Günther; and Bissinger, Peter, 5,750,589, Cl. 523-109.000.
- Bitha, Panayota: *See—*
  - Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
- Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, to Elmo Company Limited. Camera presentation supporting system. 5,751,355, Cl. 348-375.000.
- Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, to Otis Elevator Company. Extra deck elevator shuttle. 5,749,441, Cl. 187-249.000.
- Bizot, Paul M.; Bailey, Bruce R.; and Hicks, Peter D., to Nalco Chemical Company. Use of tartronic acid as an oxygen scavenger. 5,750,037, Cl. 210-750.000.
- Björklund, Per-Erik, to Asea Brown Boveri AB. HVDC transmission. 5,751,563, Cl. 363-35.000.
- Blaauw, David T.: *See—*
  - Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., 5,751,593, Cl. 364-488.000.
- Black, Alistair D.: *See—*
  - Chan, Kurt; and Black, Alistair D., 5,751,715, Cl. 370-455.000.
- Black & Decker Inc.: *See—*
  - Carbone, Richard C., 5,749,644, Cl. 362-198.000.
- Black, Colin I.: *See—*
  - Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.
- Black, F. Martin; and Dye, G. Frank, to Reader Vision, Inc. Scanned flip-disk sign improvements. 5,751,269, Cl. 345-108.000.
- Black, Michael F., to Texas Instruments Incopprporated. Circuit to indicate phase lock in a multimode phase lock loop with anti-jamming security. 5,751,195, Cl. 331-17.000.
- Blackmon, James B.; Stone, Kenneth W.; and Kusek, Stephen M., to McDonnell Douglas Corporation. Light-weight reflector facet. 5,751,503, Cl. 359-846.000.
- Blackner, Anthony M.; and Zierten, Thomas A., to Boeing Company, The. Method and apparatus for reducing airframe aerosound. 5,749,546, Cl. 244-215.000.
- Blackwell, Steven R.; Polk, Charles E.; and Morgan, Jason N., to Motorola, Inc. Contention resolution for a shared access bus. 5,751,974, Cl. 395-301.000.
- Blake, Andy F.; and Tarr, William C., to Shasta Industries, Inc. Vacuum system for removal of debris from swimming pools. 5,750,022, Cl. 210-169.000.
- Blake, Michael Andrew; Ford, Carl Benjamin, III; and Mak, Pak-kin, to International Business Machines Corporation. Computer architecture incorporating processor clusters and hierarchical cache memories. 5,752,264, Cl. 711-144.000.
- Blake, Russ; Baghai, M. Reza; and Smith, Lee A., to Microsoft Corporation. Method and system for determining an optimal placement order for code portions within a module. 5,752,038, Cl. 395-709.000.
- Blakeley, José A.: *See—*
  - Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
- Blakeslee, Jeffrey J.: *See—*
  - Holmes, Brian M.; Blakeslee, Jeffrey J.; and Dolecek, Victor D., 5,750,025, Cl. 210-361.000.
- Blanc, Louis, to Microfil Industries S.A. Resilient prosthesis for widening a channel, particularly a blood vessel, and method for making same. 5,749,919, Cl. 623-1.000.
- Blanchard, Pierre: *See—*
  - Suptitz, Eric; Blanchard, Pierre; and Collier, James, 5,751,284, Cl. 324-127.000.
- Blasi, Jane A.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Blasiak, Dariusz Andrzej: *See—*
  - Frank, Mark Steven; Tayloe, Daniel Richard; and Blasiak, Dariusz Andrzej, 5,752,187, Cl. 455-428.000.
- Bleser, Dennis: *See—*
  - Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, 5,751,788, Cl. 378-197.000.
- Bliss, Brian Joseph, to Harbison-Walker Refractories Company. Removable reference plate. 5,750,878, Cl. 73-1.790.
- Bliss, John: *See—*
  - Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., 5,751,009, Cl. 250-551.000.
- Blissard, Gary W.; and Monsma, Scott C., to Boyce Thompson Institute for Plant Research, Inc. Baculovirus cloning system. 5,750,383, Cl. 435-172.300.
- Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, to Elop Electro-Optics Industries, Ltd. Apparatus and method for inspecting articles such as agricultural produce. 5,751,833, Cl. 382-110.000.
- Bliven, David C.: *See—*
  - Mattis, John Seymour; and Bliven, David C., 5,749,942, Cl. 95-46.000.
- Bloch, Ricardo Alfredo: *See—*
  - Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Watts, Raymond Frederick, 5,750,476, Cl. 508-291.000.
- Block Drug Company, The: *See—*
  - Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.
- Bloemer, Mark J.: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- Bloks, Rudolf H. J., to U.S. Philips Corporation. System for adjusting timing of output data in response to potential discontinuities in a timing signal. 5,751,721, Cl. 370-509.000.
- Blood, Roger Morton, to International Business Machines Corporation. Method and system for modifying an internal data processing system identification. 5,752,004, Cl. 395-500.000.
- Bloom, Leonard: *See—*
  - Abidin, Michael R.; and Lehmbeck, Steven P., 5,749,886, Cl. 606-182.000.
- Blum, Harald; Sickert, Armin; and Hovestadt, Wieland, to Bayer Aktiengesellschaft. Aqueous, crosslinkable binder dispersions having a low solvent content. 5,750,613, Cl. 524-457.000.
- Blum, Josy Jean: *See—*
  - Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, 5,749,981, Cl. 148-595.000.
- Blum, Yigal; and McDermott, Gregory A., to SRI International. Dehydrocoupling treatment and hydrosilylation of silicon-containing polymers, and compounds and articles produced thereby. 5,750,643, Cl. 528-481.000.
- Blumenthal, Mitchell J.; Sharak, Matthew L.; and Paul, Charles W., to National Starch and Chemical Investment Holding Corporation. Hot melt adhesives based on sulfonated polyesters. 5,750,605, Cl. 524-230.000.
- Board of Governors of Wayne State Univ., The: *See—*
  - Chretien, Paul B.; and Mutchnick, Milton G., 5,750,501, Cl. 514-12.000.
- Board of Regents, The University of Texas: *See—*
  - Hansen, Eric J.; Helminen, Merja E.; and Maciver, Isobel, 5,750,117, Cl. 424-251.100.
- Board of Supervisors of Louisiana University and Agricultural and Mechanical College, The: *See—*
  - Cincotta, Anthony H.; and Meier, Albert H., 5,750,519, Cl. 514-200.000.
- Bocherel, Pascal: *See—*
  - Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.

- Bockelman, David E., to Motorola, Inc. Method and apparatus for characterizing a multiport circuit. 5,751,153, Cl. 324-638.000.
- Böcker, Thomas; Berneth, Horst; and Giera, Henry, to Bayer Aktiengesellschaft. Dyeing or printing process with new and known cationic 4,5-dihydro-iH-1,2,3-triazolium compounds as dyestuffs and new cationic 4,5-dihydro-1H-1,2,3-triazolium compounds. 5,749,925, Cl. 8-436.000.
- Bodet, Jean-Francois: *See—*
  - DeBlock, Frans; and Bodet, Jean-Francois, 5,750,491, Cl. 510-521.000.
- Bodiford, Glen. Insulating sleeve removing device. 5,749,136, Cl. 29-426.500.
- Bodnar, Ernest R., to Rotary Press Systems Inc. Method and apparatus for manufacturing a hot rolled beam. 5,749,256, Cl. 72-333.000.
- Boehm, Michael James; Straub, Peter John; and Kirkwood, Richard Darrell, to General Motors Corporation. Thermal probe assembly with mold-over crimp sensor packaging. 5,749,656, Cl. 374-185.000.
- Boehmer, Dennis A.; and Gibson, Richard L., Jr., to Vernay Laboratories, Inc. Check valve including molded valve seat. 5,749,394, Cl. 137-533.150.
- Boehringer Ingelheim Vetmedica GmbH: *See—*
  - Schleicher, Werner; and Werner, Herbert, 5,750,135, Cl. 424-442.000.
- Boehringer Mannheim Gmbh: *See—*
  - Herrmann, Rupert; Josel, Hans-Peter; Drexhage, Karl-Heinz; and Arden-Jacob, Jutta, 5,750,409, Cl. 436-517.000.
- Boeing Company, The: *See—*
  - Blackner, Anthony M.; and Zierten, Thomas A., 5,749,546, Cl. 244-215.000.
  - Thaniyavarn, Suwat, 5,751,248, Cl. 342-368.000.
- Bogaert, Jan Van den: *See—*
  - Leenders, Luc; Oelbrandt, Leo; Bogaert, Jan Van den; and Desie, Guido, 5,751,325, Cl. 347-96.000.
- Bogan, Richard T.: *See—*
  - Edgar, Kevin J.; and Bogan, Richard T., 5,750,677, Cl. 536-63.000.
- Bogdanowicz, Mitchell Joseph; Hagmaier, Charles Peter; and Gutierrez, Leslie, to Eastman Kodak Company. Color motion picture print films for telecine transfer applications. 5,750,320, Cl. 430-383.000.
- Bogursky, Robert M.: *See—*
  - Bianca, Giuseppe; and Bogursky, Robert M., 5,749,458, Cl. 200-541.000.
- Bohacik, Richard P., to Component Hardware Group, Inc. Wall bracket for a pre-rinse assembly. 5,749,179, Cl. 52-127.200.
- Böhm, Ludwig: *See—*
  - Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.
- Böhner, Ralf: *See—*
  - Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.
- Bokelmann, Paul R.; Schumacher, Thomas R.; and Winberg, Arvid E., to Damrow Company, Inc. Bulk cheese transfer and containerizing system. 5,749,204, Cl. 53-471.000.
- Boku, Kazutake: *See—*
  - Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Boku, Kazutake, 5,751,464, Cl. 359-208.000.
- Bolan, Michael L.: *See—*
  - Glick, Mark; Fekete, Nicholas M.G.; Bolan, Michael L.; and Owens, Jeffrey D., 5,749,253, Cl. 70-278.000.
- Boldrini, Fulvio, to G. D. S.p.A. Equipment for conveying articles of rod-like appearance, in particular cigarettes. 5,749,782, Cl. 454-370.000.
- Bolen, Pat A.: *See—*
  - Henderson, Brent E.; Bolen, Pat A.; and DeFranco, John A., 5,749,744, Cl. 439-164.000.
- Bolin, Mark Robert; Kishi, Gregory Tad; and McIntosh, Michael Philip, to International Business Machines Corporation. Method and apparatus for image acquisition with adaptive compensation for image exposure variation. 5,751,844, Cl. 382-156.000.
- Boling, Clyde W.: *See—*
  - Bellas, Jeffrey J.; Boling, Clyde W.; Brunner, Dennis M.; and Feldman, Steven, 5,749,741, Cl. 439-95.000.
- Boling, Harry O., III, to RF Monolithics, Inc. Low-power, self-quenching superregenerative detector. 5,751,197, Cl. 331-107.00A.
- Bollu, Michael: *See—*
  - Von Basse, Paul-Werner; Bollu, Michael; Thewes, Roland; and Schmitt-Landsiedel, Doris, 5,751,742, Cl. 371-40.180.
- Bolvari, Anne E.: *See—*
  - Davies, Mark; and Bolvari, Anne E., 5,750,620, Cl. 525-67.000.
- Bombardelli, Ezio; De Bellis, Paolo; and Gabetta, Bruno, to Indena S.p.A. 10-deacetylbaccatine III and 10-deacetyl 14β-hydroxybaccatine III derivatives, a process for the preparation thereof and pharmaceutical compositions containing them. 5,750,562, Cl. 514-449.000.
- Bonaddio, Vincenzo A.: *See—*
  - Denney, Denys; Contreras, Jose de Jesus Munoz; Bonaddio, Vincenzo A.; and Johnsin, David M., 5,749,993, Cl. 156-214.000.
- Bond, James D.: *See—*
  - Sangster, Bruce; and Bond, James D., 5,750,072, Cl. 422-22.000.
- Bono, Hubert; Michel, France; and Rey, Patrice, to Commissariat a l'Energie Atomique. Method for manufacturing a structure with a useful layer held at a distance from a substrate by abutments, and for detaching such a layer. 5,750,420, Cl. 438-52.000.
- Booher, Richard N.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., to Eli Lilly and Company. 6 heterocyclic-4-amino-1,3,4,5-tetrahydrobenz[CD]indoles. 5,750,554, Cl. 514-397.000.
- Boone, Debra Cheryl; and Tomic, Mladomir, to Coca-Cola Company, The. Conduit member for collapsible container. 5,749,493, Cl. 222-105.000.
- Borden, George Rome: *See—*
  - Kashiwagi, Kouichi; Masui, Toshiyuki; and Borden, George Rome, 5,751,285, Cl. 345-349.000.
- Borden, John. Panoramic indexing camera mount. 5,752,113, Cl. 396-428.000.
- Boreczky, Eric: *See—*
  - Pettersson, Bjorn Ola Alfons; Plavnik, Alex; and Boreczky, Eric, 5,749,331, Cl. 123-193.200.
- Borino, Anthony V.: *See—*
  - Gamble, Richard A.; and Borino, Anthony V., 5,749,110, Cl. 5-493.000.
- Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., to Merck & Co., Inc. Bradykinin B2 receptor midified transgenic non-human animals. 5,750,826, Cl. 800-2.000.
- Born, Jean-Jacques: *See—*
  - Farine, Pierre-André; and Born, Jean-Jacques, 5,751,666, Cl. 368-140.000.
- Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, to Ohio Electronic Engravers, Inc. Method and apparatus for aligning a cylinder in an engraver. 5,751,435, Cl. 358-299.000.
- Borst, Jan: *See—*
  - Harder, Sven; and Borst, Jan, 5,749,780, Cl. 454-359.000.
- Bortnik, Michael; and Sadovsky, Vadim A. Probeless microprocessor based controller for open recirculating evaporative cooling systems. 5,751,599, Cl. 364-505.000.
- Borton, Michael D.; Carolan, Kevin M.; and Hubble, Fred F., III, to Xerox Corporation. Adaptive sensor and interface. 5,751,443, Cl. 356-446.000.
- Bos, Johannes: *See—*
  - Schomaker, Elwin; Bos, Johannes; and Middelhoek, Erik Leonard, 5,750,030, Cl. 210-679.000.
- Bostater, Charles R., Jr., to KB Science. Scalable non-contact optical backscatter insertion probe. 5,751,424, Cl. 356-342.000.
- Boston Advanced Technologies, Inc.: *See—*
  - Clarke, Richard H., 5,750,995, Cl. 250-339.120.
- Boston Scientific Technology, Inc.: *See—*
  - Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., 5,749,884, Cl. 606-167.000.
- Botos, Matthew J.; Sizer, Charles E.; and Palanipian, Sevugan, to Tetra Laval Holdings & Finance, S.A. Process and article for determining the residence time of a food particle. 5,750,907, Cl. 73-865.800.
- Botvin, Arthur D. Document for conducting electronic financial transactions. 5,750,972, Cl. 235-379.000.
- Bourbeau, Roger R., to Ben Hughes Communication Products Company. Coaxial cable coring tool. 5,749,270, Cl. 81-9.400.
- Boumas, Redha Mohammed, to International Business Machines Corp. Method for determining an optimal segmentation size for file transmission in a communications system. 5,751,970, Cl. 395-200.660.
- Bourns, Inc.: *See—*
  - Brandestini, Marco, 5,751,230, Cl. 341-10.000.
- Bourque, Daniel R. Tunable joint for a pool cue having compressive inserts. 5,749,788, Cl. 473-44.000.
- Boursat, Jean-Dominique: *See—*
  - Bastart, Jean-Pierre; Boursat, Jean-Dominique; Commercon, Alain; and Leconte, Jean-Pierre, 5,750,738, Cl. 549-510.000.
- Boury, Nabil. Storage rack for compact discs or the like. 5,749,636, Cl. 312-201.000.
- Boutique, Jean-Pol; and Delplancke, Patrick Firmin A., to Procter & Gamble Company, The, N-alkyl polyhydroxy fatty acid amide compositions and their method of synthesis. 5,750,748, Cl. 554-66.000.
- Bowden, Charles M.: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- Bowden, Edwin Vincent, to Spooner Industries Limited. Web dryer with coanda air bars. 5,749,164, Cl. 34-641.000.
- Bowden, Martin Charles, to Zeneca Limited. Halogenated esters useful as intermediates for insecticides. 5,750,769, Cl. 560-184.000.
- Bowden, Martin Charles, to Zeneca Limited. Process for preparing 4,4,4-trichlorobutyl acetate. 5,750,773, Cl. 560-226.000.
- Bowden, Martin Charles: *See—*
  - Jones, John David; Bowden, Martin Charles; and Brown, Stephen Martin, 5,750,694, Cl. 544-334.000.
- Bower, Larry O.: *See—*
  - Cowley, Tom J.; Bower, Larry O.; and Egan, Philip S., 5,751,214, Cl. 340-573.000.
- Bowers, Wayne E.: *See—*
  - Epperly, W. Robert; Sprague, Barry N.; Kelso, Danny T.; and Bowers, Wayne E., 5,749,928, Cl. 44-358.000.
- Bowie, Lemuel J., to Evanston Hospital Corporation. Detection of human α-thalassemia mutations and their use as predictors of blood-related disorders. 5,750,345, Cl. 435-6.000.
- Bowles Fluidics Corporation: *See—*
  - Stouffer, Ronald D., 5,749,525, Cl. 239-284.100.
- Bowling, Jonathan S., to Fisher-Rosemount Systems, Inc. Real-time process control simulation method and apparatus. 5,752,008, Cl. 395-500.000.
- Bowling, Regina J.: *See—*
  - Fischer, Timothy J.; Bell, Maria L.; and Bowling, Regina J., 5,749,976, Cl. 134-22.120.
- Bowman, Lyn; and McEntee, Jarlath, to Ohio University. Microminiature stirling cycle cryocoolers and engines. 5,749,226, Cl. 60-520.000.

- Boyce, C. Bradford; Pittman, Guy P.; and Lewis, Bolivar F., III, to LaRoche Industries, Inc. Process for photochlorination. 5,750,010, Cl. 204-157.940.
- Boyce Thompson Institute for Plant Research, Inc.: *See—*
  - Blissard, Gary W.; and Monsma, Scott C., 5,750,383, Cl. 435-172.300.
- Boyd, Robert E.; Rasmussen, Chris Royce; and Press, Jeffrey B., to Ortho Pharmaceutical Corporation. 4-[(thien-3-yl)methyl]-imidazole analgesics. 5,750,720, Cl. 548-315.100.
- BP Chemicals Limited: *See—*
  - Clode, Kirsten Everald; Watson, Derrick John; and Vercauteren, Carl Josef Elsa, 5,750,007, Cl. 203-3.000.
  - Dossett, Stephen John, 5,750,456, Cl. 502-155.000.
- Braceras, George M.; and Evans, Donald A., to International Business Machines Corporation. Two stage sensing for large static memory arrays. 5,751,648, Cl. 365-205.000.
- Brackett, Charles Arthur: *See—*
  - Bala, Krishna; Brackett, Charles Arthur; and Song, Ghie Hugh, 5,751,868, Cl. 385-16.000.
- Bracken, Douglas C.; and Wister, William R., III. Method for creating a conjugated profile corresponding to a conjugate surface in a motion conversion device. 5,751,587, Cl. 364-474.240.
- Bracy, Barton W.; and Schmieding, Reinhold, to Arthrex, Inc. Endoscopic screw anchor extractor. 5,749,878, Cl. 606-104.000.
- Bradley, C. Thomas: *See—*
  - Synder, Bobbie L.; Bradley, C. Thomas; and Horner, Paul W., 5,749,628, Cl. 297-411.360.
- Bradley, Havyn Eugene: *See—*
  - Mills, Louis Thomas; Butler, Richard M.; and Bradley, Havyn Eugene, 5,750,422, Cl. 438-112.000.
- Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, to Pioneer Electronic Corporation. Apparatus for controlling bias amount of focus error signal. 5,751,674, Cl. 369-44.350.
- Brady, Charles P., to Progressive Tool & Industries Company. Weld cable end. 5,750,933, Cl. 174-135.000.
- Braegas, Peter: *See—*
  - Siegle, Gert; Braegas, Peter; Kaesser, Jürgen; and Suchowerskyj, Wadym, 5,752,177, Cl. 455-186.100.
- Brailove, Adam A.: *See—*
  - Rose, Peter H.; and Brailove, Adam A., 5,751,003, Cl. 250-492.210.
- Braithwaite, Dana Helen: *See—*
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- Brammall, Terrence N.; Mills, Randel; Ridenour, Rodney; and Stevenson, David, to Transguard Industries, Inc. Bolt seal assembly and tool therefor. 5,749,610, Cl. 292-327.000.
- Branc, Joseph R.: *See—*
  - Stanfield, Joel D.; Branc, Joseph R.; Feldpausch, Thomas G.; and Miller, William L., 5,751,221, Cl. 340-825.350.
- Brandestini, Marco, to Bourns, Inc. Digital input and control device. 5,751,230, Cl. 341-10.000.
- Brandis, John: *See—*
  - Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
- Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, to Lexmark International, Inc. Ink jet cartridge body with vented die cavity. 5,751,324, Cl. 347-87.000.
- Brandt, William P.: *See—*
  - Crowther, William R.; and Brandt, William P., 5,751,710, Cl. 370-423.000.
- Brantford Chemicals Inc.: *See—*
  - Murthy, K.S. Keshava; Weeratunga, Gamini; Radatus, Bruno Konrad; and Sidhu, Kanwar Pal Singh, 5,750,714, Cl. 548-205.000.
  - Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., 5,750,719, Cl. 548-268.601.
- Brasch, William R., to LeaRonal, Inc. Cyanide-free monovalent copper electroplating solutions. 5,750,018, Cl. 205-295.000.
- Braun Aktiengesellschaft: *See—*
  - Barnes, Clive; and Crichton, Trevor John, 5,750,956, Cl. 219-121.710.
  - Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.
- Breed Automotive Technology, Inc.: *See—*
  - Exner, Gregory F.; Hofer, John Curtis; Durrani, Sheryar; and Matsu, Richard L., 5,749,598, Cl. 280-728.200.
  - Seeger, Donald Edwin, 5,750,922, Cl. 149-24.000.
- Breil, Jürgen; and Steffl, Manfred, to Bruckner Maschinenbau GmbH. Transport device for a continuous moving sheet, in particular stretching device for a plastic film webs. 5,749,131, Cl. 26-89.000.
- Breindel, Harold. Men's padded brief. 5,749,101, Cl. 2-403.000.
- Breivik, Kåre; Egge, Trygve G.; and Herstad, Sverre, to Den Norske Stats Oljeselskap A.S., I & K Patent. Vessel for production and/or loading/unloading and transport of hydrocarbons from offshore fields, and/or for carrying out well operations. 5,749,758, Cl. 441-5.000.
- Brennenstuhl, Werner; Mittermeier, Manfred; and Huber, Wilhelm, to Wacker-Chemie GmbH. Compressible silicon rubber. 5,750,581, Cl. 521-54.000.
- Brenner, Douglas M.: *See—*
  - Li, Kenneth K.; Brenner, Douglas M.; and Chen, Chingfa, 5,751,869, Cl. 385-33.000.
- Brenner, Richard A.; and Romanelli, Dennis, to Amarr Company; and RBI, Inc. Folding garage door with reinforcing struts. 5,749,407, Cl. 160-229.100.
- Bresolin, Valerio. Device for heating and maintaining a constant temperature in a liquid, in particular the water of aquariums. 5,750,960, Cl. 219-494.000.
- Breton, Bruno: *See—*
  - Parent, Leon-Etienne; Mailloux, Alexandre; and Breton, Bruno, 5,749,934, Cl. 71-24.000.
- Breuner, Erich H. Portable, steering wheel mountable, computer table. 5,749,306, Cl. 108-44.000.
- Briancon, Alain Charles Louis: *See—*
  - Lin, Jyh-Han; and Briancon, Alain Charles Louis, 5,752,194, Cl. 455-452.000.
- Brice, Steve; Kingsley, Gary; and Payne, David, to Delta America Ltd. Optical projector. 5,749,641, Cl. 353-81.000.
- Brick, Mary Christine: *See—*
  - Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.
- Bridges, Jack E., to EOR International, Inc. Selective excitation of heating electrodes for oil wells. 5,751,895, Cl. 392-306.000.
- Bridges, Mark E., to Eastman Kodak Company. Printer with support shoe and media metering therein. 5,751,334, Cl. 347-262.000.
- Bridges, Russell P.: *See—*
  - Linman, E. Kelly; and Bridges, Russell P., 5,749,989, Cl. 156-160.000.
- Bridgestone Corporation: *See—*
  - Yokoyama, Hideaki; and Mukai, Uchu, 5,749,983, Cl. 152-209.00R.
- Bridgestone Sports Co., Ltd.: *See—*
  - Shimosaka, Hirotaka; and Ihara, Keisuke, 5,749,796, Cl. 473-365.000.
- Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, to Perkin-Elmer Corporation, The. Host organism capture. 5,750,346, Cl. 435-6.000.
- Briggs, Steven P., to Pioneer Hi-Bred International, Inc. Use of the indeterminate gametophyte gene for maize improvement. 5,749,169, Cl. 47-58.000.
- Brigham and Women's Hospital: *See—*
  - Simchowitz, Louis; and Serhan, Charles N., 5,750,354, Cl. 435-7.240.
- Bright, Danielle A.; and Pirrelli, Ronald L., to Akzo Nobel nv. Process for the formation of hydrocarbyl bis(hydrocarbyl phosphate). 5,750,756, Cl. 558-162.000.
- Bright, James A.: *See—*
  - Kanuchok, John M.; Burnworth, Jeffrey A.; and Bright, James A., 5,751,532, Cl. 361-94.000.
- Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased (by Patricia B. Zimmerman, legal representative), to Reemay Inc. Spun-bonded web. 5,750,151, Cl. 425-66.000.
- Brill, Wolfgang K.-D: *See—*
  - Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, 5,750,666, Cl. 536-23.100.
- Bringley, Joseph F.: *See—*
  - Lambert, Patrick M.; Trauernicht, David P.; and Bringley, Joseph F., 5,750,318, Cl. 430-346.000.
- Brink, Andrew Edwin; Pruett, Wayne Payton; Cherry, Clinton; and Shackelford, Kay Hunt. Thermally stable polyesters formed utilizing antimony compounds as catalysts. 5,750,635, Cl. 528-285.000.
- Brinker, Ronald J.: *See—*
  - Wright, Daniel R.; Brinker, Ronald J.; Sandbrink, Joseph J.; and Wideman, Al S., 5,750,468, Cl. 504-206.000.
- Brinton, Charles C., Jr., to Bactex, Inc. Haemophilus influenzae pilus vaccines. 5,750,116, Cl. 424-242.100.
- Bristol-Myers Squibb Company: *See—*
  - Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingsbee, Derek A.; and Cederholm-Williams, Stewart A., 5,750,657, Cl. 530-382.000.
  - Patell, Mahesh, 5,750,145, Cl. 424-478.000.
  - Robl, Jeffrey A., 5,750,687, Cl. 540-527.000.
- British Nuclear Fuels plc: *See—*
  - Smart, Neil Graham, 5,750,081, Cl. 423-3.000.
- British Telecommunications public limited company: *See—*
  - Frost, Peter Lewis John; and Jessop, Paul David, 5,749,565, Cl. 254-134.400.
- Brittell, Gerald A. Special effect lamps. 5,749,646, Cl. 362-231.000.
- Britton, Michael J.: *See—*
  - Engfer, Jeffrey R.; and Britton, Michael J., 5,749,792, Cl. 473-300.000.
- Broadbent, Roland James, to Prodrive Engineering Limited. Gear change mechanism. 5,749,264, Cl. 74-335.000.
- Brobst, Thomas J.: *See—*
  - Wurz, Albert; Yeh, Edward P.; and Brobst, Thomas J., 5,750,004, Cl. 156-360.000.
- Bröcker, Franz Josef; Stroezel, Manfred; and Rheude, Udo, to BASF Aktiengesellschaft. Preparation of alkenes by partial hydrogenation of alkynes over fixed-bed palladium catalysts. 5,750,806, Cl. 568-909.500.
- Brocklehurst, Alan, to GKN Westland Helicopters Limited. Method and apparatus for determining the airspeed of rotary wing aircraft. 5,750,891, Cl. 73-178.00H.

- Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; Osborn, Rupert William; and Rees, Sarah Bronwen, to Zeneca Agrochemicals. Antimicrobial proteins. 5,750,504, Cl. 514-12.000.
- Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, to Hoffmann-La Roche Inc. Asymmetric hydrogenation process using ruthenium-diphosphine complexe. 5,750,690, Cl. 544-234.000.
- Bromander, Thomas S.: *See—*
  - Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.
- Bromley, Mark: *See—*
  - Guzovskiy, Aleksandr; Zak, Robert C., Jr.; and Bromley, Mark, 5,752,258, Cl. 711-120.000.
- Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., to Agfa Division, Bayer Corporation. A scanning system. 5,751,447, Cl. 358-487.000.
- Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., to Abbott Laboratories. Oxime derivatives of indole and idene compounds as inhibitors of prostaglandin biosynthesis. 5,750,558, Cl. 514-415.000.
- Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., to Advanced Cardiovascular Systems, Inc. Method and system for holding the position of a guiding member. 5,749,370, Cl. 128-772.000.
- Brooks, Frank, to SAF T LOK Corporation. Gun lock assembly. 5,749,166, Cl. 42-70.110.
- Brooks, Kenneth Ross: *See—*
  - Bagherpour, Bo; Hesse, Ralph Kurt; and Brooks, Kenneth Ross, 5,751,079, Cl. 310-59.000.
- Brooksby, Glen William: *See—*
  - Harrison, Daniel David; Pradeep, Anantha Krishnan; Brooksby, Glen William; and Hladik, Stephen Michael, 5,752,218, Cl. 701-207.000.
- Brose, Michael P.: *See—*
  - Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., 5,749,852, Cl. 604-96.000.
- Brosius, William L.: *See—*
  - Ballard, Gerald L.; and Brosius, William L., 5,751,523, Cl. 361-42.000.
- Bross, Hermann-Josef: *See—*
  - Vogt, Hans-Günter; Grave, Heinrich; Bross, Hermann-Josef; and Matner, Martin, 5,750,618, Cl. 524-836.000.
- Brother Kogyo Kabushiki Kaisha: *See—*
  - Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,751,583, Cl. 364-470.080.
  - Sato, Shougo, 5,752,146, Cl. 399-284.000.
- Brow, Richard A.; and Hossli, Robert I., to United Dominion Industries. Building panel with double interlock joint and internal gutter. 5,749,282, Cl. 52-235.000.
- Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, to DuPont Merck Pharmaceutical Company, The. Blockade of neuronal m-channels as a therapeutic approach to the treatment of neurological disease. 5,750,528, Cl. 514-253.000.
- Brown, Glen W., to Advanced Micro Devices, Inc. Implementation of a digital decimation filter and method. 5,751,615, Cl. 364-724.100.
- Brown, Jerry S.; and Conkling, John A., to United States of America, Navy. Insensitive binary explosive production process. 5,750,057, Cl. 264-3.200.
- Brown, John Hiram; LaCount, Kenneth Harry; and Petty, Terry Lyle, to Kimberly-Clark Corp. Gravity-operated dispensing apparatus. 5,749,538, Cl. 242-559.200.
- Brown, John Michael: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Brown, Kevin J.; Harwood, William R.; and Bates, Terence, to Elekta AB. Apparatus for treating a patient. 5,751,781, Cl. 378-65.000.
- Brown, Paul Philip; and Sorensen, Jens Ole, to Universal Ventures. Hollow stackable product with curved sidestrips in longitudinal folds of conically contoured sidewalls. 5,749,514, Cl. 229-400.000.
- Brown, Richard I.; and Min, Kyungyoon, to Baxter International Inc. Blood processing systems and methods for collecting mono nuclear cells. 5,750,039, Cl. 210-782.000.
- Brown, Richard Talbot: *See—*
  - Scheinmann, Feodor; Turner, Nicholas John; Carter, Neil Edward; and Brown, Richard Talbot, 5,750,381, Cl. 435-128.000.
- Brown, Stephen Martin: *See—*
  - Jones, John David; Bowden, Martin Charles; and Brown, Stephen Martin, 5,750,694, Cl. 544-334.000.
- Browning, Jim; Watkins, Charles M.; and Cathey, David A., to Micron Display Technology, Inc. Method and apparatus for testing emissive cathodes. 5,751,262, Cl. 345-75.000.
- Broze, Guy: *See—*
  - Oldenhove, Louis; and Broze, Guy, 5,750,487, Cl. 510-365.000.
- Bruce Industries, Inc.: *See—*
  - Abbott, Louis Eugene, 5,751,117, Cl. 315-244.000.
- Brück, Rolf: *See—*
  - Maus, Wolfgang; Swars, Helmut; and Brück, Rolf, 5,751,602, Cl. 364-557.000.
- Brucker, Charles F.: *See—*
  - Hatwar, Tukaram K.; Tyan, Yuan-Sheng; and Brucker, Charles F., 5,750,274, Cl. 428-694.0MM.
- Bruckert, Eugene J., to Motorola, Inc. Method and apparatus for power control in a communication system. 5,751,763, Cl. 375-200.000.
- Bruckert, William F.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Bruckner Maschinenbau GmbH: *See—*
  - Breil, Jürgen; and Steffl, Manfred, 5,749,131, Cl. 26-89.000.
- Brummell, David A.: *See—*
  - Bennett, Alan B.; Brummell, David A.; and Grantz, Alexander A., 5,750,872, Cl. 800-205.000.
- Brumwell, Dennis A.; Perttu, Joseph S.; Kroll, Mark W.; and Nelson, Randall S., to Angeion Corporation. Shield for implantable cardioverter defibrillator. 5,749,910, Cl. 607-36.000.
- Brun, Charles J., Jr.: *See—*
  - Schock, Richard J., Jr.; and Brun, Charles J., Jr., 5,750,161, Cl. 425-468.000.
- Brunet, Stéphane: *See—*
  - Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.
- Brungart, Douglas S. Simplified analog virtual externalization for stereophonic audio. 5,751,817, Cl. 381-25.000.
- Brunn, Randy J.; Gran, William O.; and Junk, James P., to Red Devil Equipment Company. Mixing apparatus and method. 5,749,652, Cl. 366-209.000.
- Brunnell, Stephen M.: *See—*
  - Fergason, Jeffrey K.; Fry, David; and Brunnell, Stephen M., 5,749,096, Cl. 2-8.000.
- Brunner, Dennis M.: *See—*
  - Bellas, Jeffrey J.; Boling, Clyde W.; Brunner, Dennis M.; and Feldman, Steven, 5,749,741, Cl. 439-95.000.
- Bruno, James F.; and Hass, Albert L., to Bruno, James F. Drain assembly. 5,749,105, Cl. 4-295.000.
- Bruzzese, Tiberio, to Prospa B.V. Salts of a polyunsaturated fatty acid and pharmaceutical formulations containing them. 5,750,572, Cl. 514-560.000.
- Bryans, Justin Stephen; Folkes, Adrian John; and Latham, Christopher John, to Xenova Limited. Pharmaceutical diketopiperazine compounds. 5,750,530, Cl. 514-255.000.
- Bryant, Bruce David; Krishnaswami, Vasanth; and Marko, Kenneth Andrew, to Ford Global Technologies, Inc. Misfire detector with torsional oscillation filtering. 5,752,213, Cl. 701-111.000.
- Bryant, Frank Randolph; and Nguyen, Loi Ngoc, to SGS-Thomson Microelectronics, Inc. Intermediate structure for integrated circuit devices. 5,751,064, Cl. 257-752.000.
- Bryant, Henry Uhlman; Finley, Don Richard; and Matsumoto, Ken, to Eli Lilly and Company. Pyridine compounds intermediates processes compositions and methods. 5,750,708, Cl. 546-334.000.
- Bryant, Robert Cooper: *See—*
  - O'Brien, Michael Joseph; Bryant, Robert Cooper; and Colleluori, Richard Alexander, 5,752,104, Cl. 396-191.000.
- Bryant, Steven M.; and Loewenthal, Kenneth H., to Eastman Kodak Company. Neural network solder paste inspection system. 5,751,910, Cl. 395-22.000.
- Bryant, Timothy D.: *See—*
  - Hall, Thomas E., Jr.; and Bryant, Timothy D., 5,750,002, Cl. 156-313.000.
- Bryant, William A.; and Santhanam, A. T., to Kennametal, Inc. Coated cutting tool having an outer layer of TiC. 5,750,247, Cl. 428-323.000.
- Brydges, Warren F.: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Buchanan, Darrell: *See—*
  - Rippel, Wally E.; and Buchanan, Darrell, 5,751,150, Cl. 324-537.000.
- Buchanan, James Michael: *See—*
  - McMahon, Scott H. R.; Buchanan, James Michael; and Horne, Stephen C., 5,751,173, Cl. 327-170.000.
- Buchanan, Robert A.; Krishnamurti, Ramesh; Hichri, Habib; and Johnson, David C., to Occidental Chemical Corporation. Method of making m-chlorobenzotrifluoride. 5,750,811, Cl. 570-208.000.
- Bucher Leichtbau AG: *See—*
  - Bucher, Peter, 5,749,193, Cl. 52-506.060.
- Bucher, Peter, to Bucher Leichtbau AG. Impact wall element. 5,749,193, Cl. 52-506.060.
- Buck, Arthur Glen; Beck, Doris Arlene; and Chy, Sokha, to Whitaker Corporation, The. Electrical cable for use in a medical surgery environment. 5,750,930, Cl. 174-102.00R.
- Buechele, Wolfgang: *See—*

  - Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
- Buhler, Michael: *See—*
  - Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.
- Bührmann, Joachim: *See—*
  - Steenblock, Roland Eugen; and Bührmann, Joachim, 5,750,232, Cl. 428-98.000.
- Bui, Loc V.: *See—*
  - Banning, Jeffery H.; King, Clifford R.; Bui, Loc V.; and Titterington, Donald R., 5,750,604, Cl. 524-187.000.
- Bulang, Siegfried: *See—*
  - Wolf, Hubert; Bulang, Siegfried; and Cohrs, Olaf, 5,749,930, Cl. 55-242.000.
- Bull, Jeffrey; White, Michael J.; and Kaufman, Larry, to United States of America, National Aeronautics and Space Administration. Ablation resistant zirconium and hafnium ceramics. 5,750,450, Cl. 501-91.000.
- Bull, S.A.: *See—*
  - Geymond, Jean Paul; and Paltrinieri, Massimo, 5,752,253, Cl. 707-503.000.
- Bullister, Edward T. Two— and three—dimensional trackball with coordinate transformations. 5,751,275, Cl. 345-167.000.
- Bullock, Graeme: *See—*
  - Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.
- Bunton, William Patterson: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
  - Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
- Burch, Ronald H; Cancienne, Warren E., Jr.; Rodboon, Somsak S.; and Morales, Eric W., to Laitram Corporation, The. Slabbing apparatus and method. 5,749,777, Cl. 452-149.000.
- Burckhartzmeyer, Jerry J.; Crabb, Elmer R.; Lehnhoff, Terry F.; and Watson, Alva L., Jr., to Caterpillar Inc. Belted work machine. 5,749,423, Cl. 180-9.540.
- Burgess, Leslie; Butcher, Jane Lesley; Ryan, Thomas Anthony; and Clayton, Peter Paul, to Imperial Chemical Industries PLC. Production of hyrofluorocarbons. 5,750,807, Cl. 570-142.000.
- Burgin, Henry Earl: *See—*
  - Amonett, Daniel Keith; Weaver, Robert Francis; and Burgin, Henry Earl, 5,750,948, Cl. 200-38.00R.
- Burgot, Jean-Louis: *See—*
  - Christen, Marie-Odile; and Burgot, Jean-Louis, 5,750,560, Cl. 514-441.000.
- Buri, Gerhard; and Bader, Josef, to ZF Friedrichshafen AG. Toothed-wheel gearchange. 5,749,263, Cl. 74-331.000.
- Burk, Robert M.: *See--*
  - Chen, June; Burk, Robert M.; and Woodward, David F., 5,750,784, Cl. 564-171.000.
- Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., to Xerox Corporation. Thermal ink-jet printhead with a thermally isolated heating element in each ejector. 5,751,315, Cl. 347-63.000.
- Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., to Chiron Corporation. Recombinant herpes simplex gB-gD vaccine. 5,750,114, Cl. 424-231.100.
- Burkhalter, Swinton B.: *See—*
  - Sexton, Frank M.; and Burkhalter, Swinton B., 5,752,236, Cl. 705-4.000.
- Burleigh Instruments Inc: *See—*
  - Henderson, David A., 5,751,090, Cl. 310-328.000.
- Burns, Christopher: *See—*
  - Baudoin, Bernard; Burns, Christopher; Commercon, Alain; and Le Brun, Alain, 5,750,567, Cl. 514-510.000.
- Burns, Daniel D.: *See—*
  - Frink, Neal A.; Burns, Daniel D.; Frink, Paul G.; and Ciric, Amy, 5,752,206, Cl. 588-20.000.
- Burns, Gary Thomas; Hahn, James Richard; and Reese, Clifford Carlton, to Dow Corning Corporation. Hydrophobic organosilicate-modified silica gels. 5,750,610, Cl. 524-434.000.
- Burns Philp Food Inc.: *See—*
  - Ellis, M. Jeffrey, 5,749,478, Cl. 211-59.200.
- Burns, S. M.: *See—*
  - Martin, A. J.; and Burns, S. M., 5,752,070, Cl. 395-800.330.
- Burnworth, Jeffrey A.: *See—*
  - Kanuchok, John M.; Burnworth, Jeffrey A.; and Bright, James A., 5,751,532, Cl. 361-94.000.
- Buro Eco-Home: *See—*
  - Bangma, Pier, 5,749,196, Cl. 52-561.000.
- Bush, Karen: *See—*
  - Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
- Bush, M. Elizabeth; and Fain, Eric S., to Pacesetter, Inc. Method and apparatus for delivering defibrillation shocks with improved effectiveness. 5,749,901, Cl. 607-5.000.
- Busseau, Isabelle: *See—*
  - Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, 5,750,652, Cl. 530-350.000.
- Buswell, Richard F.; Cohen, Ronald; McNeilly, Leonard; and Watkins, David S., to Ballard Power Systems Inc. Apparatus for the two-stage selective oxidation of carbon monoxide in a hydrogen-containing gas mixture. 5,750,076, Cl. 422-115.000.
- Butcher, Jane Lesley: *See—*
  - Burgess, Leslie; Butcher, Jane Lesley; Ryan, Thomas Anthony; and Clayton, Peter Paul, 5,750,807, Cl. 570-142.000.
- Butcher, Mark S.: *See—*
  - Gertz, Jonathan; Butcher, Mark S.; and Tuomy, James M., 5,751,818, Cl. 381-55.000.
- Butcher, Ronald S.; and Coslovi, Ilario A., to National Steel Car Ltd. Pivotable sidewall mounted container stop for railcar well. 5,749,686, Cl. 410-94.000.
- Butler, C. P.; and Butler, F. M., Jr. Toothbrush for implementing the bass brushing technique. 5,749,381, Cl. 132-309.000.
- Butler, David W.: *See—*
  - Chern, Engmin James; and Butler, David W., 5,750,895, Cl. 73-614.000.
- Butler, F. M., Jr.: *See—*
  - Butler, C. P.; and Butler, F. M., Jr., 5,749,381, Cl. 132-309.000.
- Butler, Peter O.; and Suarez-Gartner, Ricardo E., to Intel Corporation. Method and apparatus for reducing warpage of an assembly substrate. 5,751,556, Cl. 361-773.000.
- Butler, Richard M.: *See—*
  - Mills, Louis Thomas; Butler, Richard M.; and Bradley, Havyn Eugene, 5,750,422, Cl. 438-112.000.
- Butterly, Paul Gerard: *See—*
  - Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, 5,750,685, Cl. 540-349.000.
- Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, to Bayer Aktiengesellschaft. Process for the continuous preparation of benzyl alcohol. 5,750,801, Cl. 568-715.000.
- Byker, Harlan J., to Gentex Corporation. Variable reflectance automobile mirror. 5,751,467, Cl. 359-272.000.
- Bymaster, Franklin Porter; and Shannon, Harlan E., to Novo Nordisk A/S. Method of treating schizophrenia. 5,750,541, Cl. 514-318.000.
- C. R. Bard, Inc.: *See—*
  - Heske, Norbert; and Heske, Thomas, 5,749,887, Cl. 606-185.000.
- C.S.I.R.: *See—*
  - Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, 5,750,401, Cl. 435-430.000.
- Cabletron System, Inc.: *See—*
  - Mayo, Gregory E.; Desroches, Roger G.; and Nedde, David N., 5,751,965, Cl. 395-200.540.
- Cabletron Systems, Inc.: *See—*
  - Dobbins, Kurt A.; Cullerot, David L.; Negus, Stephen H.; and Haggerty, William T., 5,751,971, Cl. 395-200.680.
- Cabot Corporation: *See—*
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,749,950, Cl. 106-316.000.
- Cadden, Thomas: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- Cadence Design Systems, Inc.: *See—*
  - McGeer, Patrick C.; Saldanha, Alexander; and Sangiovanni-Vincentelli, Alberto, 5,752,000, Cl. 395-500.000.
- CagEnt Technologies, Inc.: *See—*
  - Gray, Donald M., III; and Needle, David L., 5,752,073, Cl. 395-800.350.
- Cahill, Sally E.: *See—*
  - Albarella, James P.; Cahill, Sally E.; Johnson, Gary M.; and Pugia, Michael J., 5,750,405, Cl. 436-88.000.
- Cai, Xiong; Fura, Aberra; and Qian, Changgeng, to Cytomed, Inc. Compounds and methods for the treatment of cardiovascular, inflammatory and immune disorders. 5,750,565, Cl. 514-473.000.
- Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, to Merck & Co., Inc. Cycloalkyl tachykinin receptor antagonists. 5,750,549, Cl. 514-364.000.
- Calgene, Inc.: *See—*
  - Del Vecchio, Anthony J.; Jungermann, Eric; and Basu, Hemendra N., 5,750,481, Cl. 510-152.000.
  - Moloney, Maurice M.; and Radke, Sharon, 5,750,871, Cl. 800-205.000.
  - Shewmaker, Christine K.; and Facciotti, Daniel, 5,750,385, Cl. 435-172.300.
  - Shewmaker, Christine K., 5,750,869, Cl. 800-205.000.
- Califano, Andrea: *See—*
  - Rigoutsos, Isidore; and Califano, Andrea, 5,752,019, Cl. 395-603.000.

- California Institute of Technology: *See—*
  - Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., 5,750,815, Cl. 585-511.000.
  - Lutes, George F.; and Yao, Xiaotian Steve, 5,751,747, Cl. 372-2.000.
  - Martin, A. J.; and Burns, S. M., 5,752,070, Cl. 395-800.330.
- Callahan, Sean Michael: *See—*
  - Hoddie, Peter; Batson, James D.; and Callahan, Sean Michael, 5,751,281, Cl. 345-302.000.
- Callaway Golf Company: *See—*
  - Schmidt, Glenn H.; and Helmstetter, Richard C., 5,749,795, Cl. 473-350.000.
- Calocero, Michele: *See—*
  - Fratello, Luigi; and Calocero, Michele, 5,750,239, Cl. 428-195.000.
- Calsonic Corporation: *See—*
  - Umemura, Yukio, 5,749,712, Cl. 417-269.000.
- Calton, Dean Scott: *See—*
  - Coellner, James A.; and Calton, Dean Scott, 5,749,230, Cl. 62-94.000.
- Cambra, Lance E.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Cameron, Alexander John; and Dorst, Leendert, to Philips Electronics North America Corporation. Path planning in an uncertain environment. 5,751,573, Cl. 364-167.010.
- Camis, Thomas: *See—*
  - Bearss, James G.; and Camis, Thomas, 5,751,329, Cl. 347-156.000.
- Cammue, Bruno Philippe Angelo: *See—*
  - Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; Osborn, Rupert William; and Rees, Sarah Bronwen, 5,750,504, Cl. 514-12.000.
- Campana, Thomas J., Jr., to NTP Incorporated. System for wireless serial transmission of encoded information. 5,751,773, Cl. 375-346.000.
- Campbell, David, to Hedley Purvis Ltd A Company of Great Britain and Northern Ireland. Reaction nut with cam action quick fastening. 5,749,691, Cl. 421-483.000.
- Campbell, Gary F.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Campbell, Mark C.: *See—*
  - Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.
- Campbell, Sterrett P.: *See—*
  - Rose, Jackie Lee; and Campbell, Sterrett P., 5,750,169, Cl. 426-231.000.
- Canada, Robert O., III: *See—*
  - Frichtel, John S.; Canada, Robert O., III; and Gwin, Kennard N., 5,752,198, Cl. 455-524.000.
- Cancer Research Campaign Technology Limited: *See—*
  - Denny, William Alexander; Palmer, Brian Desmond; and Wilson, William Robert, 5,750,782, Cl. 564-166.000.
- Cancienne, Warren E., Jr.: *See—*
  - Burch, Ronald H.; Cancienne, Warren E., Jr.; Rodboon, Somsak S.; and Morales, Eric W., 5,749,777, Cl. 452-149.000.
- Canfield, Lyle Dean: *See—*
  - Schulman, Joseph H.; and Canfield, Lyle Dean, 5,750,926, Cl. 174-52.300.
- Cannata, Vincenzo; Bertoni, Amilcare; and Bianchi, Stefano, to Alfa Chemicals Italiana S.p.A. Process for the synthesis of nabumetone. 5,750,793, Cl. 568-315.000.
- Cannon, Gregory Lewis: *See—*
  - Dorenbosch, Jheroen; Ayerst, Douglas Irvin; and Cannon, Gregory Lewis, 5,752,166, Cl. 455-67.100.
- Cannon Rubber Limited: *See—*
  - Williams, Roger Leonard; and Edgerley, David Anthony, 5,749,850, Cl. 604-74.000.
- Cannon, Thomas G.; DeHart, Daniel L.; and Krug, Eric M., to Onkor, Ltd. System for printing social expression cards. 5,751,590, Cl. 364-479.030.
- Canon Kabushiki Kaisha: *See—*
  - Aita, Shuichi; Kukimoto, Tsutomu; Yoshida, Satoshi; and Hano, Yoshifumi, 5,751,405, Cl. 355-269.000.
  - Chiba, Hiroshi, 5,749,274, Cl. 82-1.110.
  - Danzuka, Toshimitsu; Sakemi, Yuji; Fukushima, Hisashi; and Menjo, Takeshi, 5,752,140, Cl. 399-270.000.
  - Fujiwara, Yasuo; and Kobayashi, Hiroo, 5,752,131, Cl. 399-106.000.
  - Fukuda, Yasuaki; and Matsumoto, Shigeyuki, 5,751,780, Cl. 378-35.000.
  - Hamano, Hiroyuki, 5,751,496, Cl. 359-677.000.
  - Harada, Takuto, 5,751,922, Cl. 395-112.000.
  - Hasegawa, Masanobu; Yoshii, Minoru; and Takeuchi, Seiji, 5,750,294, Cl. 430-22.000.
  - Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.
  - Hirabayashi, Yasuji, 5,751,856, Cl. 382-232.000.
  - Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.
  - Ikeda, Hiroaki, 5,751,849, Cl. 382-176.000.
  - Imaeda, Eiji, 5,751,700, Cl. 370-263.000.
  - Inaba, Kohji; Kato, Kazunori; and Hayase, Kengo, 5,750,303, Cl. 430-110.000.
  - Inoue, Hiroshi, 5,751,277, Cl. 345-200.000.
  - Inoue, Masahiro; and Sakemi, Yuji, 5,752,151, Cl. 399-350.000.
  - Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.
  - Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, 5,749,570, Cl. 271-10.130.
  - Kanbayashi, Makoto; and Fujita, Ryoichi, 5,750,298, Cl. 430-45.000.
  - Kanda, Toshiyuki; Takabayashi, Hiroshi; and Onitsuka, Yoshihiro, 5,751,386, Cl. 349-65.000.
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
  - Kataoka, Hiromi; Masuda, Shunichi; Saito, Tetsuo; and Yamamoto, Kazuma, 5,751,925, Cl. 395-115.000.
  - Kataoka, Yoshiharu; Kawashima, Haruna; and Yamada, Yuichi, 5,751,428, Cl. 356-401.000.
  - Kato, Hiroaki, 5,750,897, Cl. 73-663.000.
  - Kimura, Kazumi; Mitsutake, Hideaki; Yano, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, 5,749,642, Cl. 353-98.000.
  - Kitagishi, Nozomu, 5,751,480, Cl. 359-485.000.
  - Koike, Hisashi, 5,751,430, Cl. 358-296.000.
  - Komura, Akihiko; Onuma, Kenji; and Akena, Mayumi, 5,749,973, Cl. 118-626.000.
  - Kosaka, Tetsuo; Sakurai, Atsushi; and Tamura, Junichi, 5,751,898, Cl. 395-2.500.
  - Koyama, Takeshi, 5,751,409, Cl. 356-3.140.
  - Kuroda, Ryo; and Shido, Shunichi, 5,751,686, Cl. 369-126.000.
  - Maekawa, Yoshito, 5,751,722, Cl. 370-522.000.
  - Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.
  - Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, 5,751,396, Cl. 351-221.000.
  - Melen, Roger D.; and Krtolica, Boris, 5,752,079, Cl. 395-827.000.
  - Mogi, Hirokazu, 5,751,351, Cl. 348-239.000.
  - Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, 5,751,404, Cl. 355-53.000.
  - Muramatsu, Masanori, 5,752,126, Cl. 399-44.000.
  - Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.
  - Nagano, Akihiko; Yamada, Akira; and Irie, Yoshiaki, 5,752,090, Cl. 396-51.000
  - Nobuta, Hiroshi, 5,751,449, Cl. 358-501.000.
  - Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.
  - Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, 5,750,302, Cl. 430-106.600.
  - Ohnuma, Nobuo; and Ohta, Takatoshi, 5,751,929, Cl. 395-129.000.
  - Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.
  - Sakaki, Mamoru; and Kurabayashi, Yutaka, 5,751,306, Cl. 347-22.000.
  - Sato, Hiroaki; and Okazaki, Hiroshi, 5,751,959, Cl. 395-200.350.
  - Sato, Hiroshi; Fukae, Kimitoshi; and Takehara, Nobuyoshi, 5,751,133, Cl. 320-13.000.
  - Shiratori, Tsutomu, 5,751,669, Cl. 369-13.000.
  - Silverbrook, Kia; and Naylor, William Clark, Jr., 5,751,272, Cl. 345-149.000.
  - Sugiyama, Kazuhide, 5,752,129, Cl. 399-92.000.
  - Suzuki, Kenji, 5,750,985, Cl. 250-234.000.
  - Suzuki, Masao; and Nakazato, Saburo, 5,751,354, Cl. 348-349.000.
  - Takakura, Hiroshi; Ishihara, Satoshi; and Yasuda, Keiko, 5,752,053, Cl. 395-766.000.
  - Takano, Takao, 5,751,172, Cl. 327-113.000.
  - Takeda, Toshihiko; Kuroda, Ryo; and Yasuda, Susumu, 5,751,684, Cl. 369-126.000.
  - Takizawa, Hiroshi, 5,751,743, Cl. 371-41.000.
  - Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, 5,752,130, Cl. 399-101.000.
  - Tanaka, Mitsugu, 5,751,504, Cl. 360-19.100.
  - Tateno, Tetsuya; and Minami, Yuji, 5,751,233, Cl. 341-67.000.
  - Tsuboi, Takayuki, 5,752,095, Cl. 396-80.000.
  - Usui, Fumiaki; Takeshi, Kunio; Hosoya, Jun; and Terasawa, Chiaki, 5,751,497, Cl. 359-687.000.

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Yokoyama, Yuko; and Shimamune, Masayuki, 5,751,391, Cl. 349-153.000.

Yonehara, Takao; Sato, Nobuhiko; Sakaguchi, Kiyofumi; and Kondo, Shigeki, 5,750,000, Cl. 156-630.100.

Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.

Yuza, Akira; Adachi, Nobukazu; Kuroda, Akira; and Sugita, Takeshi, 5,752,149, Cl. 399-329.000.

Canon Kaubshiki Kaisha: *See—*

Kobayashi, Shigetada, 5,751,857, Cl. 382-232.000.

Canter, Stanley, to Space Systems/Loreal, Inc. Voltage converter with battery discharge protection. 5,751,140, Cl. 323-282.000.

Carbone, Richard C., to Black & Decker Inc. Flexible electrical device with attachable ends. 5,749,644, Cl. 362-198.000.

Carcia, Joseph Recarsens: *See—*

Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.

Cardenas, Robert Lee: *See—*

Mangolds, Arnie; Farinella, Michael David; Deguire, Daniel Rene; and Cardenas, Robert Lee, 5,750,918, Cl. 102-502.000.

Cardi-Act, L.L.C.: *See—*

Schneider, Charles W., Sr., 5,749,374, Cl. 128-870.000.

Cardiac Mariners, Inc.: *See—*

Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.

Cardiac Pacemakers, Inc.: *See—*

Westlund, Randy W., 5,749,911, Cl. 607-36.000.

Cardionetics Limited: *See—*

Gamlyn, Lee; O'Sullivan, Siobhan; Needham, Philip; and Harris, Tom, 5,749,367, Cl. 128-696.000.

Cardiovascular Imaging Systems, Inc.: *See—*

Jang, Yue-Teh; Salmon, Stephen M.; White, David A.; and Garcia, Rizza A., 5,749,848, Cl. 604-53.000.

Carey, Danuta H.; Geberth, John D.; Walsh, John; and Hosley, Daniel S., to Titan Tool, Inc. Reversible spray tip. 5,749,528, Cl. 239-119.000.

Cargill Incorporated: *See—*

Debonte, Lorin R.; Loh, Willie H.-T.; and Zhegong, Fan, 5,750,827, Cl. 800-200.000.

Caristi, Anthony J.: *See—*

Prior, Edward B.; Caristi, Anthony J.; Lazo, Luis A.; and Prior, John E., 5,751,074, Cl. 307-118.000.

Carl-Zeiss-Stiftung: *See—*

Flöther, Werner; and Hohberg, Gerhard, 5,749,745, Cl. 439-349.000.

Carlin, Edward Paul: *See—*

Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.

Carlisle Management Company: *See—*

Carrier, Thomas Gordon, 5,749,620, Cl. 296-180.100.

Carlson, Kenneth; and Hucks, Charles, to Dimensions International, Inc. Non-intrusive data interface system for air traffic control. 5,752,216, Cl. 701-117.000.

Carlson, Richard R.: *See—*

De Bastiani, Norman P.; and Carlson, Richard R., 5,749,292, Cl. 101-129.000.

Carlson, Robert M.; Krasutsky, Pavel A.; and Karim, M. Reza-Ul, to University of Minnesota, Regents of The. Use of betulin and analogs thereof to treat herpesvirus infection. 5,750,578, Cl. 514-766.000.

Carolan, Kevin M.: *See—*

Borton, Michael D.; Carolan, Kevin M.; and Hubble, Fred F., III, 5,751,443, Cl. 356-446.000.

Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, to Air Products and Chemicals, Inc. Series planar design for solid electrolyte oxygen pump. 5,750,279, Cl. 429-32.000.

Carpino, Louis A.; and El-Faham, Ayman Ahmed, to Research Corporation Technologies, Inc. Synthesis and use of amino acid fluorides as peptide coupling reagents. 5,750,767, Cl. 560-161.000.

Carr, Richard Gregory; and Pope, Francis Joseph, III. Telecommunications service provisioning. 5,751,802, Cl. 379-201.000.

Carr, Ronald L., to KC Multi-Ring Products, Inc. Joint assembly employing multi-ring gasket. 5,749,607, Cl. 285-93.000.

Carrano, Richard; and Hanna, Mark C., to Dalow Industries Inc. 14K gold alloy with silver, copper, zinc and cobalt. 5,749,979, Cl. 148-430.000.

Carreel, Eric: *See—*

Lewiner, Jacques; and Carreel, Eric, 5,751,241, Cl. 342-104.000.

Carrier Corporation: *See—*

Dolan, Robert P.; Phillips, Thomas R.; DeWolf, Thomas L.; and Hill, Mark A., 5,751,948, Cl. 395-185.070.

Maciulewicz, Stephen M., 5,751,572, Cl. 364-132.000.

Carrier, Thomas Gordon, to Carlisle Management Company. Tailgate assembly for open top load carrying container. 5,749,620, Cl. 296-180.100.

Carter, Neil Edward: *See—*

Scheinmann, Feodor; Turner, Nicholas John; Carter, Neil Edward; and Brown, Richard Talbot, 5,750,381, Cl. 435-128.000.

Carter, Philip S., Jr. Electrically small receiving antennas. 5,751,255, Cl. 343-866.000.

Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, to Competitve Technologies, Inc. Polynucleotide phosphorodithioate compounds. 5,750,666, Cl. 536-23.100.

Carver, Donald P.: *See—*

Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.

Cary, Carolyn M.: *See—*

Garber, Sharon R.; Glaser, Rena H.; and Cary, Carolyn M., 5,752,054, Cl. 395-767.000.

Casa Herrera, Inc.: *See—*

Funk, Garrett T., 5,749,283, Cl. 99-339.000.

Case Western Reserve University: *See—*

Schmidt, Paul Herman; and Angus, John C., 5,750,210, Cl. 427-577.000.

Casey, Robert J.: *See—*

Olsen, Daniel M.; Scott, Noel D.; and Casey, Robert J., 5,751,291, Cl. 345-422.000.

Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., to Donnelly Corporation. Elemental semiconductor mirror for vehicles. 5,751,489, Cl. 359-603.000.

Casley, Ross T.: *See—*

Osborne, Randy B.; Howard, John H.; Casley, Ross T.; and Hahn, Douglas J., 5,751,951, Cl. 395-200.800.

Cassel, Wendell Richard; Corbin, David Richard; and Rao, V.N. Mallikarjuna, to Du Pont de Nemours, E. I., and Company. Dehydrohalogenation processes. 5,750,808, Cl. 570-157.000.

Cassetti, David K.; and Wszolek, Philip, to VLSI Technology. System and method for enabling and disabling writeback cache. 5,752,262, Cl. 711-135.000.

Cassidy, Terence: *See—*

Doidge, Jeffrey; and Cassidy, Terence, 5,749,681, Cl. 405-302.200.

Castaneda, Julio C.; Frandsen, Troy V.; and Greco, Paul M., to Motorola Inc. Electronic device with switch and pivotable actuator assembly. 5,749,457, Cl. 200-343.000.

Castegnier, Adrien; and Lepine, Normand, to Elcorsy Technology Inc. Stabilized electrocoagulation printing ink. 5,750,593, Cl. 523-161.000.

Castelli, Francesco; Invernizzi, Gianpietro; and Reale, Omar, to Reeves Brothers, Inc. Arrangement for securing a printing blanket to a cylinder. 5,749,298, Cl. 101-415.100.

Castor, Trevor P., to Alphios Corporation. Method and apparatus for isolating therapeutic compositions from source materials. 5,750,709, Cl. 546-348.000.

Caterpillar Inc.: *See—*

Burckhartzmeyer, Jerry J.; Crabb, Elmer R.; Lehnhoff, Terry F.; and Watson, Alva L., Jr., 5,749,423, Cl. 180-9.540.

Etheridge, Colin J., 5,749,217, Cl. 60-39.230.

Kilty, Alan L.; Ludewig, Howard W.; and Wallace, Brian L., 5,750,957, Cl. 219-130.010.

Sarangapani, Jagannathan, 5,752,207, Cl. 701-26.000.

Schricker, David R., 5,750,887, Cl. 73-117.300.

Cathey, David A.: *See—*

Browning, Jim; Watkins, Charles M.; and Cathey, David A., 5,751,262, Cl. 345-75.000.

Cavallerano, Alan; and Ciacci, Claudio, to Philips Electronics North America Corporation. Distributed duty-cycle operation of digital light-modulators. 5,751,264, Cl. 345-85.000.

Caveny, William J.: *See—*

Mehta, Sudhir; and Caveny, William J., 5,749,418, Cl. 166-292.000.

CB Worldwide Inc.: *See—*

Welch, James W., 5,750,196, Cl. 427-290.000.

Cedars-Sinai Medical Center: *See—*

Targan, Stephan R.; and Vidrich, Alda, 5,750,355, Cl. 435-7.240.

Cederholm-Williams, Stewart A.: *See—*

Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingsbee, Derek A.; and Cederholm-Williams, Stewart A., 5,750,657, Cl. 530-382.000.

Celik, Tantek, to Apple Computer, Inc. System for binding document parts and handlers by fidelity of parts or by automatic translation of parts. 5,752,056, Cl. 395-778.000.

Cell Therapeutics, Inc.: *See—*

Klein, J. Peter; Underiner, Gail E.; and Kumar, Anil M., 5,750,575, Cl. 514-617.000.

Centerfield Kahushiki Kaisha: *See—*

Yamashita, Takeshi; and Yamashita, Hiro, 5,752,157, Cl. 422-186.010.

Centers for Disease Control and Prevention: *See—*

Quinn, Frederick D.; and Birkness, Kristin A., 5,750,329, Cl. 435-1.100.

Central Research Laboratories Limited: *See—*

Philp, Adam Rupert; Sibbald, Alastair; Clemow, Richard David; and Nackvi, Fawad, 5,751,815, Cl. 381-17.000.

Centre National de la Recherche Scientifique (C.N.R.S.): *See—*

Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.

Ceram Optec Industries, Inc.: *See—*

Krivoshlykov, Sergej G.; and Skutnik, Bolesh J., 5,751,871, Cl. 385-33.000.

Ceramaspeed Limited: *See—*

Plumptre, David Aubrey, 5,750,959, Cl. 269-465.000.

Cerami, Anthony: *See—*

Bianchi, Marina; Cerami, Anthony; Tracey, Kevin J.; and Ulrich, Peter, 5,750,573, Cl. 514-597.000.

Cerberus AG: *See—*

Werner, Jürg; and Schlegel, Max, 5,751,209, Cl. 340-286.050.

Cerutti, Peter; Whitcomb, Jeannette; Zijlstra, Jacob; and de Villiers, Ethel-Michelle, to Behring Diagnostics GmbH. Detection of human papillomavirus mRNA in cervical smears. 5,750,334, Cl. 435-5.000.

Cesarini, Peter M.: *See—*

Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, 5,749,885, Cl. 606-170.000.

Chahaan, Rakan C.: *See—*

Fricke, David M.; Hansen, Mark D.; and Chahaan, Rakan C., 5,750,890, Cl. 73-146.000.

Chae, Jeong Seok: *See—*

Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.

Chaffin, Kimberly Ann, to Ford Global Technologies, Inc. Method for dielectrically heating an adhesive. 5,750,970, Cl. 219-765.000.

Chagnon, Florent. Animal stall. 5,749,322, Cl. 119-509.000.

Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., to Vista Medical Technologies, Inc. Stereoscopic endoscope system. 5,751,341, Cl. 348-65.000.

Challener, William A., IV, to Imation Corp. Achromatic polarization-rotating right-angle prism system. 5,751,482, Cl. 359-487.000.

Chalupa, Leos; and Patocka, Miroslav, to Motorola, Inc. Method and apparatus for electronically commuting an electric motor. 5,751,128, Cl. 318-439.000.

Chamberlain Group, Inc., The: *See—*

Fitzgibbon, James J., 5,751,224, Cl. 340-825.220.

Chamberlain, Peter; and Cole, Richard Everett, to Allied Colloids Limited. Irrigation process. 5,749,672, Cl. 405-36.000.

Chan, Joseph; and Nishiguchi, Masayuki, to Sony Corporation. Method and apparatus for reducing noise in speech signal. 5,752,226, Cl. 704-233.000.

Chan, Kurt; and Black, Alistair D., to Gadzoox Microsystems, Inc. Accelerator fiber channel hub and protocol. 5,751,715, Cl. 370-455.000.

Chan, Lawrence C. B., to Baylor College of Medicine. Human and mouse very low density lipoprotein receptors and methods for use of such receptors. 5,750,367, Cl. 435-69.100.

Chan, May L.; and Turner, Alan D. Waste-free method of making molding powder. 5,750,921, Cl. 149-19.920.

Chandler, Christophe: *See—*

Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.

Chandler, Paul E.: *See—*

Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., 5,749,364, Cl. 128-662.020.

Chandraratna, Roshantha A. S., to Allergan. Disubstituted acetylenes bearing heterobicyclic groups and heteroaromatic or phenyl groups having retinoid like activity. 5,750,693, Cl. 544-253.000.

Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, to Lucent Technologies Inc. Process for fabricating a device. 5,750,312, Cl. 430-273.100.

Chang, Hsiao-Shih; Kane, James A.; and Whitted, Graham B., III, to United Microelectronics Corporation; and Meridian Semiconductor, Inc. Method and apparatus for simultaneously executing instructions in a pipelined microprocessor. 5,751,984, Cl. 395-392.000.

Chang, Hui: *See—*

Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.

Chang, Hwai-Tsu: *See—*

Chiueh, Tzi-Dar; Chang, Hwai-Tsu; Hsu, Fang-Ru; and Meng, Wan-Yu, 5,751,913, Cl. 395-27.000.

Chang, I-Chen. Video/audio medium rack. 5,749,477, Cl. 211-40.000.

Chang, Kuang-Yeh, to United Microelectronics Corp. Self-aligned non-volatile process with differentially grown gate oxide thickness. 5,750,428, Cl. 438-264.000.

Chang, Kyeong Ho: *See—*

Kim, Jin Baek; Jung, Min Ho; and Chang, Kyeong Ho, 5,750,680, Cl. 540-200.000.

Chang, Mike F.: *See—*

Hshieh, Fwu-Iuan; Chang, Mike F.; Van der Linde, Jan; and Ho, Yueh-Se, 5,750,416, Cl. 437-40.0AS.

Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., to G.D. Searle & Co. Retroviral protease inhibitors and combinations thereof. 5,750,648, Cl. 530-331.000.

Chang, Shu: *See—*

Mammino, Joseph C.; Herbert, William G.; Chang, Shu; and Ludwig, Theodore C., 5,752,144, Cl. 399-249.000.

Chang, Shu-chuan, to Huang Ching-Feng. Height adjusting device for a chair. 5,749,557, Cl. 248-405.000.

Chang, Shyh-Ming: *See—*

Tang, Pao-Yun; Chang, Shyh-Ming; Lee, Yu-Chi; and Fang, Su-Yu, 5,749,997, Cl. 156-249.000.

Chang, Tiang Shing: *See—*

Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.

Chang, Yun Chea; Rodgers, James; and Pepe, Joseph Philip, to Eastman Kodak Company. Mixed ripeners for silver halide emulsion formation. 5,750,327, Cl. 430-569.000.

Channel Products, Inc.: *See—*

Berlincourt, Don A., 5,749,718, Cl. 431-60.000.

Chao, Raymond. Moveable aperture for alteration of intake manifold cross sectional area. 5,749,342, Cl. 123-184.560.

Chapman, Chris C.: *See—*

Lamar, David A.; Chapman, Chris C.; and Elliott, Michael L., 5,749,932, Cl. 65-135.700.

Chapman, John H.: *See—*

Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., 5,749,227, Cl. 60-657.000.

Chapman, Michael Allen, to Pioneer Hi-Bred International, Inc. Inbred maize line PHOAA. 5,750,829, Cl. 800-200.000.

Chapman, Michael Allen, to Pioneer Hi-Bred International, Inc. Inbred maize line PH38D. 5,750,847, Cl. 800-200.000.

Chappell, Martin N. Container for medication. 5,751,660, Cl. 368-10.000.

Chartered Semiconductor Manufacturing Company Ltd.: *See—*

Pan, Yang, 5,750,435, Cl. 438-525.000.

Chartered Semiconductor Manufacturing, Ltd.: *See—*

Chi, Keh-Fei Chris, 5,751,580, Cl. 364-468.070.

Chartpak, Inc.: *See—*

De Bastiani, Norman P.; and Carlson, Richard R., 5,749,292, Cl. 101-129.000.

Chatenever, David: *See—*

Strobl, Karlheinz; Kennedy, Bryan D.; Chatenever, David; and Irion, Klaus, 5,751,340, Cl. 348-65.000.

Chattejee, Sugata: *See—*

Gupta, Niranjan Lal; Sankaran, Ramanathan; Chattejee, Sugata; and Krishna, Tumma Hari, 5,750,683, Cl. 540-214.000.

Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, to AT&T Corp. System and method for providing a message system subscriber with a roaming mailbox. 5,751,792, Cl. 379-89.000.

Chauquet, Jacques, to Erico International Corporation. Bus bar assembly, fastening system therefor, and method. 5,749,671, Cl. 403-384.000.

Chauret, Nathalie: *See—*

Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.

Chauvin, Yves; Hirschauer, André; and Olivier, Hélène, to Institut Francais Du Petrole. Catalytic composition and process for the alkylation of aliphatic hydrocarbons. 5,750,455, Cl. 502-164.000.

Chee, U. Hiram: *See—*

Palermo, Thomas J.; Samson, Gene; Mirigian, Gregory E.; and Chee, U. Hiram, 5,749,837, Cl. 600-585.000.

Chee, Uriel Hiram: *See—*

Hergenrother, Robert; Chee, Uriel Hiram; and Schaller, Laurent, 5,750,206, Cl. 427-490.000.

Cheesman, Edward Hollister: *See—*

Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.

Chemunex: *See—*

Drocourt, Jean-Louis; Guillet, Jean-Gérard; and Groner, Warren, 5,751,839, Cl. 382-133.000.

Chen, Chao-Yueh, to Fitness Quest, Inc. Structure of matching weights for a health exercise machine. 5,749,814, Cl. 482-93.000.

Chen, Cheng Nan: *See—*

Lee, Cheng Ho; and Chen, Cheng Nan, 5,749,278, Cl. 83-588.000.

Chen, Chengjun Julian; Gopinath, Ramesh Ambat; Monkowski, Michael Daniel; and Picheny, Michael Alan, to International Business Machines Corporation. Statistical acoustic processing method and apparatus for speech recognition using a toned phoneme system. 5,751,905, Cl. 395-2.630.

Chen, Chi Yueh: *See—*

Hersh, Ahron; and Chen, Chi Yueh, 5,749,447, Cl. 190-112.000.

Chen, Chia Shing; Hung, Chun-Hsiung; Wan, Ray-Lin; and Kamei, Teruhiko, to Macronix International Co., Ltd. Automatic programming algorithm for page mode flash memory with variable programming pulse height and pulse width. 5,751,637, Cl. 365-185.330.

Chen, Chingfa: *See—*

Li, Kenneth K.; Brenner, Douglas M.; and Chen, Chingfa, 5,751,869, Cl. 385-33.000.

Chen, Chin-Long; Hsiao, Mu-Yue; Lipponer, Walter Heinrich; and Shen, William Wu, to International Business Machines Corporation. Memory implemented error detection and correction code with address parity bits. 5,751,745, Cl. 371-51.100.

Chen, Datong: *See—*

Shyu, Tai-Ching; Chen, Datong; and Liu, Jun, 5,751,189, Cl. 330-9.000.

Chen, David Yu, to United Microelectronics Corporation. Power conservation in synchronous SRAM cache memory blocks of a computer system. 5,752,045, Cl. 395-750.000.

Chen, Diana; Jiang, Wenbin; and Lebby, Michael S., to Motorola, Inc. Switchable lens and method of making. 5,751,471, Cl. 359-319.000.

Chen, Fu-Chen: *See—*

Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, 5,749,819, Cl. 483-39.000.

- Chen, Ga-Lane: *See—*
  - Tang, Xiaoxia; and Chen, Ga-Lane, 5,750,270, Cl. 428-611.000.
- Chen, Howard Y.: *See—*
  - Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., 5,750,826, Cl. 800-2.000.
- Chen, James. Protective casing for non-sheathing transformer. 5,751,204, Cl. 336-98.000.
- Chen, Jun Wei: *See—*
  - Yilmaz, Hamza; Williams, Richard K.; Cornell, Michael E.; and Chen, Jun Wei, 5,751,054, Cl. 257-603.000.
- Chen, June; Burk, Robert M.; and Woodward, David F., to Allergan. Method for effecting vasodilation with (1,5-inter) aryl prostaglandin derivatives. 5,750,784, Cl. 564-171.000.
- Chen, Ke-Horng: *See—*
  - Kuo, Sy-Yen; Chiueh, Tzi-Dar; and Chen, Ke-Horng, 5,751,174, Cl. 327-199.000.
- Chen, Kuo-Chun; Trester, Paul W.; and Mazdiyasni, Khodabakhsh S., to General Atomics. Stable fiber interfaces for beryllium matrix composites. 5,752,156, Cl. 419-11.000.
- Chen, Kuo-Wei Herman; Paul, Sanjoy; and Sabnani, Krishan Kumar, to Lucent Technologies Inc. Method and system for data transfer in the presence of disconnects. 5,751,719, Cl. 370-473.000.
- Chen, Ling; Sung, Hung-Cheng; and Lo, Chi-Shiung, to Taiwan Semiconductor Manufacturing Company Ltd. Self-aligned source/drain mask ROM memory cell using trench etched channel. 5,751,040, Cl. 257-332.000.
- Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., to AT&T Corp. Network based multimedia messaging method and system. 5,751,791, Cl. 379-88.000.
- Chen, Philip L.; and Sheng, Thomas, to Avision, Inc. Edge-flat image scanning system. 5,751,461, Cl. 359-201.000.
- Chen, Ping: *See—*
  - Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.
- Chen, Tao, to Qualcomm Incorporated. Method and apparatus for determining the rate of received data in a variable rate communication system. 5,751,725, Cl. 371-5.500.
- Chen, Xuemin; and Liu, Vincent, to General Instrument Corporation. Scene change detector for digital video. 5,751,378, Cl. 348-700.000.
- Chen, Yen-Lane: *See—*
  - Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,134, Cl. 424-434.000.
  - Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,136, Cl. 424-448.000.
- Chen, Yuhpyng L.: *See—*
  - Villalobos, Anabella; Nagel, Arthur A.; and Chen, Yuhpyng L., 5,750,542, Cl. 514-322.000.
- Cheng, Jeng-Kuo. Automatic X ray developing device. 5,752,123, Cl. 396-621.000.
- Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, to Nestec S.A. Method of making coffee particles containing aroma. 5,750,178, Cl. 426-594.000.
- Cheng, Seng Hing; Fang, Shaona Lee; Hoppe, Henry, IV; and Smith, Alan Edward, to Genzyme Corporation. Methods and therapeutic compositions for treating cystic fibrosis. 5,750,571, Cl. 514-557.000.
- Cheng, Sterling. Dental light curing device. 5,749,724, Cl. 433-29.000.
- Chennakeshu, Sandeep: *See—*
  - Epperson, Darrell; Chennakeshu, Sandeep; and Karabinis, Peter Dimitrios, 5,752,204, Cl. 455-575.000.
- Chenoweth, Ed: *See—*
  - Levy, Paul S.; and Chenoweth, Ed, 5,751,151, Cl. 324-537.000.
- Cheong, Catherine L.; and Rigby, David, to Johnson & Johnson Medical, Inc. Wound dressing package. 5,749,842, Cl. 602-41.000.
- Chepegin, Dmitry Vyacheslavovich: *See—*
  - Shashkovsky, Sergei Gennadievich; Kamrukov, Alexander Semyonovich; Chepegin, Dmitry Vyacheslavovich; and Bandurkin, Victor Vladimirovich, 5,750,205, Cl. 427-535.000.
- Cheris, Albert B.; Staubitz, Robert B.; and Repp, Timothy, to Tenex Corporation. Compact disc binder and disc carrier used in same. 5,749,464, Cl. 206-308.100.
- Cherksey, Bruce D., to New York University Medical Center, The. Method for transplanting cells into the brain and therapeutic uses therefor. 5,750,103, Cl. 424-93.210.
- Cherksey, Bruce D. Membrane Na^+ channel protein and related therapeutic compounds. 5,750,697, Cl. 544-409.000.
- Chern, Engmin James; and Butler, David W., to United States of America, National Aeronautics and Space Administration. Method and apparatus for dual amplitude dual time-of-flight ultrasonic imaging. 5,750,895, Cl. 73-614.000.
- Chern, Terry Song-Hsing; Keller, David Gerard; and MacFadden, Kenneth Orville, to W. R. Grace & Co. -Conn. Continuous process to produce lithium-polymer batteries. 5,749,927, Cl. 29-623.500.
- Cherny, Julius, to Mottola Cherny & Associates, Inc. Method and apparatus for providing professional liability coverage. 5,752,237, Cl. 705-4.000.
- Cherpeck, Richard E.; Morris, Jack E.; and Ahmadi, Majid R., to Chevron Chemical Company. Fuel additive compositions containing aromatic esters of polyalkylphenoxyalkanols and poly (oxyalkylene) amines. 5,749,929, Cl. 44-387.000.
- Cherry, Clinton: *See—*
  - Brink, Andrew Edwin; Pruett, Wayne Payton; Cherry, Clinton; and Shackelford, Kay Hunt, 5,750,635, Cl. 528-285.000.
- Chesebrough-Pond's Co., Division of Conopco, Inc.: *See—*
  - Znaiden, Alexander Paul; Crotty, Brian Andrew; and Johnson, Anthony, 5,750,123, Cl. 424-401.000.
- Cheung, Alex: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Chevalier, Pascal: *See—*
  - Monot, Jean-Jacques; Pipon, Francois; Multedo, Gilbert; and Chevalier, Pascal, 5,752,168, Cl. 455-67.300.
- Chevallier, Christophe J.: *See—*
  - Roohparvar, Frankie F.; and Chevallier, Christophe J., 5,751,944, Cl. 395-183.180.
- Chevron Chemical Company: *See—*
  - Cherpeck, Richard E.; Morris, Jack E.; and Ahmadi, Majid R., 5,749,929, Cl. 44-387.000.
- Chi, Ignacio; Ramaswami, Karthik; Kuo, Han C.; and Todino, Christa, to Duracell inc. Process for improving lithium ion cell. 5,750,282, Cl. 429-49.000.
- Chi, Keh-Fei Chris, to Chartered Semiconductor Manufacturing, Ltd. Fuzzy logic method and system for adjustment of priority rating of work in process in a production line. 5,751,580, Cl. 364-468.070.
- Chiao, T. T.: *See—*
  - Christensen, Richard M.; and Chiao, T. T., 5,750,244, Cl. 428-308.400.
- Chiba, Hiroshi, to Canon Kabushiki Kaisha. Cylindrical member and method of manufacturing the same. 5,749,274, Cl. 82-1.110.
- Chiba, Noboru: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Chida, Nakaya: *See—*
  - Ogata, Seiji; Sakurada, Yuzo; Chida, Nakaya; and Hisamune, Takeshi, 5,751,002, Cl. 250-492.210.
- Chien, Chung-Jen: *See—*
  - Choi, Jeong Yeol; Chien, Chung-Jen; Han, Chung-Chyung; and Lien, Chuen-Der, 5,750,424, Cl. 438-199.000.
- Chien, Sun-Chieh: *See—*
  - Hsue, Chen-Chiu; and Chien, Sun-Chieh, 5,750,438, Cl. 438-627.000.
- Childers, Winthrop D.: *See—*
  - Swanson, David W.; Marler, Jaren D.; and Childers, Winthrop D., 5,751,323, Cl. 347-87.000.
- Children's Hospital of Philadelphia, The: *See—*
  - Clark, H. Fred; Offit, Paul; and Plotkin, Stanley A., 5,750,109, Cl. 424-205.100.
- Chimura, Kazuo: *See—*
  - Matsuoka, Hiroshi; Chimura, Kazuo; and Kariya, Shigeki, 5,749,556, Cl. 248-349.100.
- Chin, Vincent G.: *See—*
  - Coley, Brett Angus; Chin, Vincent G.; Downing, Patrick Francis; and Wormald, David M., 5,751,914, Cl. 395-51.000.
- Chinlund, Donald B. Mounting plate assembly for use with a dental articulator. 5,749,725, Cl. 433-60.000.
- Chip Express (Israel) Ltd.: *See—*
  - Yoeli, Uzi; Rotem, Eran; Janai, Meir; and Orbach, Zvi, 5,751,165, Cl. 326-47.000.
- Chiron Corporation: *See—*
  - Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,750,114, Cl. 424-231.100.
  - Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,750,350, Cl. 435-7.100.
  - Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,750,655, Cl. 530-351.000.
- Chiron Diagnostics Corporation: *See—*
  - Dorenkott, Jeffrey S.; Wilder, Steven E.; Nyugen, Dinh; and Murthy, Kurukundi Ramesh, 5,750,881, Cl. 73-37.000.
  - Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., 5,750,906, Cl. 73-863.730.
- Chishima, Masamitsu; and Ito, Tomonari, to Sumitomo Wiring Systems, Ltd. Joint connector. 5,749,753, Cl. 439-752.500.
- Chi Sing, Eduardo: *See—*
  - Hart, Charles C.; Chi Sing, Eduardo; and Ashby, Mark P., 5,749,882, Cl. 606-159.000.
- Chisso Corporation: *See—*
  - Ito, Hidemi; Taniguchi, Masahiko; Tsujiyama, Yoshimi; and Katsuya, Masahito, 5,750,256, Cl. 428-375.000.
  - Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, 5,750,753, Cl. 556-440.000.
  - Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, 5,750,600, Cl. 524-100.000.
  - Shimpuku, Takashi; and Atsumi, Nobukazu, 5,750,616, Cl. 524-496.000.
- Chittipeddi, Sailesh; Cochran, William Thomas; and Smooha, Yehuda, to Lucent Technologies Inc. Integrated circuit with active devices under bond pads. 5,751,065, Cl. 257-758.000.
- Chittum, Jack Everett: *See—*
  - Ghorpade, Sureshchandra Chintaman; Chittum, Jack Everett; and Romero, Mark Anthony, 5,749,933, Cl. 65-511.000.
- Chiu, Chun Ta. Portable oil container. 5,749,485, Cl. 220-4.120.
- Chiu, Chun-Mu. Earthen kiln cooking pot. 5,749,284, Cl. 99-340.000.

- Chiu, George: *See—*
  - McMahon, Jack; and Chiu, George, 5,751,068, Cl. 257-774.000.
- Chiu, Ing Ming; and Poulin, Matthew L., to Ohio State University Research Foundation, The. Isolated nucleic acid encoding a newt acidic fibroblast growth factor (AFGF). 5,750,365, Cl. 435-691.000.
- Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, to International Business Machines Corp. Method for creating a hypertext language for a distributed computer network. 5,752,022, Cl. 395-610.000.
- Chiueh, Tzi-Dar; Chang, Hwai-Tsu; Hsu, Fang-Ru; and Meng, Wan-Yu, to Industrial Technology Research Institute. Reconfigurable neural network and difference-square neuron. 5,751,913, Cl. 395-27.000.
- Chiueh, Tzi-Dar: *See—*
  - Kuo, Sy-Yen; Chiueh, Tzi-Dar; and Chen, Ke-Horng, 5,751,174, Cl. 327-199.000.
- Cho, Chih-Chen: *See—*
  - Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,750,415, Cl. 437-195.000.
- Cho, Jin Ki: *See—*
  - Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.
- Cho, Jong-ho: *See—*
  - Kim, Choong-lak; and Cho, Jong-ho, 5,750,295, Cl. 430-25.000.
- Cho, Sung-Bae: *See—*
  - Choi, Hyung-Jin; Cho, Sung-Bae; Jung, Suk-Jin; and Lee, Hyung-Kil, 5,751,734, Cl. 371-43.400.
- Cho, Young Ki: *See—*
  - Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.
- Choi, Hyung-Jin; Cho, Sung-Bae; Jung, Suk-Jin; and Lee, Hyung-Kil, to Samsung Electronics Co., Ltd. Decoding method and apparatus using trace deletion for Viterbi algorithm. 5,751,734, Cl. 371-43.400.
- Choi, Jeong Yeol; Chien, Chung-Jen; Han, Chung-Chyung; and Lien, Chuen-Der, to Integrated Device Technology, Inc. Method for fabricating a CMOS device. 5,750,424, Cl. 438-199.000.
- Choi, Jung-dal; Jun, Sung-bu; and Kim, Byeung-chul, to Samsung Electronics Co., Ltd. Nand type non-volatile memory device. 5,751,045, Cl. 257-392.000.
- Choi, Woong Lim; Ra, Kyeong Man; and Hur, Kyung Myung, to LG Semicon Co., Ltd. Device for and method of sensing data of multi-bit memory cell. 5,751,632, Cl. 365-185.030.
- Choi, Yeon Shik: *See—*
  - Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.
- Choo, Qui-Lim: *See—*
  - Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,750,350, Cl. 435-7.100.
- Chou, Ting C.: *See—*
  - Kennelly, Teresa; Hochmuth, John K.; Chou, Ting C.; and Farrauto, Robert J., 5,750,458, Cl. 502-304.000.
- Choucri, Nazli; and Kousoum, Juliana, to Massachusetts Institute of Technology. Networked database system for geographically dispersed global sustainability data. 5,752,023, Cl. 395-610.000.
- Chow, Mina W. B.: *See—*
  - Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., 5,749,370, Cl. 128-772.000.
- Choy, Tae-Goo: *See—*
  - Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, 5,750,452, Cl. 501-138.000.
- Chretien, Paul B.; and Mutchnick, Milton G., to Alpha 1 Biomedicals, Inc.; and Board of Governors of Wayne State Univ., The. Method and composition for treatment of patients having decompensated liver disease. 5,750,501, Cl. 514-12.000.
- Christ, William J.; Rossignol, Daniel P.; Kobayashi, Seiichi; and Kawata, Tsutomu, to Eisai Co., Ltd. Substituted liposaccharides useful in the treatment and prevention of endotoxemia. 5,750,664, Cl. 536-17.200.
- Christen, Marie-Odile; and Burgot, Jean-Louis, to Laboratoires De Therapeutique Moderne. Therapeutic compositions based on 1,2-dithiole-3-thione derivatives. 5,750,560, Cl. 514-441.000.
- Christensen, Douglas A.: *See—*
  - Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.
- Christensen, Keld; and Jensen, Torben, to Aktiebolaget Electrolux. Apparatus for controlling the heating of foodstuffs. 5,750,963, Cl. 219-497.000.
- Christensen, Reed K.; and Martell, Robert W., to Intel Corporation. Trace event detection during trace enable transitions. 5,751,942, Cl. 395-183.140.
- Christensen, Reed K.; and Wolper, Andre Eberhard, to Intel Corporation. Method and apparatus for providing precise fault tracing in a superscalar microprocessor. 5,752,013, Cl. 395-568.000.
- Christensen, Richard M.; and Chiao, T. T. High strength polymeric-fiber composites. 5,750,244, Cl. 428-308.400.
- Christensen, Svend: *See—*
  - Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
- Christenson, Barry Odell: *See—*
  - Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, 5,749,223, Cl. 60-300.000.
- Christy, Orrin D.: *See—*
  - Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A., 5,751,307, Cl. 347-33.000.
- Chromatic Research, Inc.: *See—*
  - Purcell, Stephen C., 5,751,622, Cl. 364-757.000.
- Chronopol, Inc.: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Chrysanthis, Chris A. Fly and insect trap. 5,749,168, Cl. 43-122.000.
- Chrysler Corporation: *See—*
  - Ackerman, Robert S.; and Ozark, L. John, 5,749,694, Cl. 414-462.000.
  - Tavian, Armando; and Kargilis, Alexander, 5,749,236, Cl. 62-186.000.
  - Watson, Earl L.; and Akemann, Nicolaas C., 5,749,611, Cl. 292-336.300.
- Chu, Alice S.: *See—*
  - Xiong, Yusheng; Wu, Margaret M.; Young, L. Brewster; and Chu, Alice S., 5,750,480, Cl. 508-580.000.
- Chu, Daniel T.: *See—*
  - Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.
- Chu, Keting; and Williams, Lewis T., to University of California, The Regents of the. Protein, FAF1, which potentiates Fas-mediated apoptosis and uses thereof. 5,750,653, Cl. 530-350.000.
- Chudoba, Paul; and Polizzi, Jerome, to NuVisions International, Inc. Coupling device for linking optical fiber connectors. 5,751,874, Cl. 385-72.000.
- Chugai Seiyaku Kabushiki Kaisha: *See—*
  - Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, 5,750,825, Cl. 800-2.000.
- Chugun, Emi: *See—*
  - Yoshihara, Toru; and Chugun, Emi, 5,750,099, Cl. 424-70.170.
- Chun, Lee Meng, to Taiwan Semiconductor Manufacturing Company, Ltd. Chuck for holding semiconductor photolithography masks. 5,750,003, Cl. 156-345.000.
- Chun, Russell K.: *See—*
  - Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
- Chung-Do Pharmaceutical Co., Ltd.: *See—*
  - Huh, Nam Won; Park, Yong Ae; and Kim, Yong Ho, 5,750,359, Cl. 435-19.000.
- Chung, Il-sub: *See—*
  - Lee, June-key; Chung, Il-sub; aod Desu, Seshu Babu, 5,751,540, Cl. 361-321.400.
- Chung, In Sool; and Lee, Jae Jin, to Hyundai Electronics Industries Co., Ltd. DRAM with reduced leakage current. 5,751,653, Cl. 365-230.060.
- Chung, Joo T.: *See—*
  - Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.
- Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, to Korea Telecommunication Authority. Beat frequency stabilizing apparatus of pulse light and probe light for measuring strain distribution of optical fiber. 5,751,413, Cl. 356-73.100.
- Chung, Young, to Rockwell International Corp. Method of preparing organically modified aluminosilcates sol-gel films. 5,750,203, Cl. 427-380.000.
- Chuniaud, Rene: *See—*
  - Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,751,714, Cl. 370-452.000.
- Church, Mark A.; and Desouches, Alain Michel, to International Business Machines Corporation. Lapping process using micro-advancement for optimizing flatness of a magnetic head air bearing surface. 5,749,769, Cl. 451-5.000.
- Chy, Sokha: *See—*
  - Buck, Arthur Glen; Beck, Doris Arlene; and Chy, Sokha, 5,750,930, Cl. 174-102.00R.
- Ciabatti, Romeo: *See—*
  - Malabarba, Adriano; Ciabatti, Romeo; Panzone, Gianbattista; and Marazzi, Alessandra Maria, 5,750,509, Cl. 514-11.000.
- Ciacci, Claudio: *See—*
  - Cavallerano, Alan; and Ciacci, Claudio, 5,751,264, Cl. 345-85.000.
- Ciba Specialty Chemicals Corporation: *See—*
  - Eldin, Sameer Hosam; Iqbal, Abul; Hao, Zhimin; and Lamatsch, Bernd, 5,750,723, Cl. 548-453.000.
  - Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., 5,750,765, Cl. 560-126.000.
  - Reichert, Hans; Müller, Bernhard; and Tzikas, Athanassios, 5,750,662, Cl. 534-612.000.
  - Zambounis, John; and Hall-Goulle, Véronique, 5,750,758, Cl. 558-276.000.
- Cierpka, Henning F.: *See—*
  - Lutz, Jürg; and Cierpka, Henning F., 5,750,139, Cl. 424-448.000.
- Cigan, Andrew M.; and Albertsen, Marc C., to Pioneer Hi-Bred International, Inc. Reversible nuclear genetic system for male sterility in transgenic plants. 5,750,868, Cl. 800-205.000.

- Cignal Global Communications, Inc.: *See—*
  - Land, Mark S.; Kruy, Steven J.; Perlman, Andrew T.; and Walvick, Edward A., 5,751,706, Cl. 370-352.000.
- Cimenti, Giovanni: *See—*
  - Lonardi, Emile; and Cimenti, Giovanni, 5,749,820, Cl. 384-620.000.
- Cincinnati Milacron Inc.: *See—*
  - Wissmann, Siegfried R.; Schmitt, William T.; and Murdock, David E., 5,750,158, Cl. 425-144.000.
- Cincotta, Anthony H.; and Meier, Albert H., to Board of Supervisors of Louisiana University and Agricultural and Mechanical College, The; and Ergo Research Corporation. Process for the long term reduction of body fat stores, insulin resistance, hyperinsulinemia and hyperglycemia in vertebrates. 5,750,519, Cl. 514-200.000.
- Cinquina, Patrizia; Magnone, Giuseppe; and Manciocco, Guido, to Videocolor, S.p.A. Anti-glare, anti-static coating for a reflective-transmissive surface. 5,750,054, Cl. 252-500.000.
- Cinquina, Patrizia: *See—*
  - Magnone, Giuseppe; Manciocco, Guido; and Cinquina, Patrizia, 5,750,187, Cl. 427-64.000.
- Cioca, Gheorghe: *See—*
  - Lahanas, Konstantinos M.; Toma, Daniela; Bevacqua, Andrew J.; and Cioca, Gheorghe, 5,750,125, Cl. 424-401.000.
- Ciric, Amy: *See—*
  - Frink, Neal A.; Burns, Daniel D.; Frink, Paul G.; and Ciric, Amy, 5,752,206, Cl. 588-20.000.
- Cirrus Logic, Inc.: *See—*
  - Glover, Neal, 5,751,733, Cl. 371-40.300.
  - Han, Robin Sungsoo, 5,751,265, Cl. 345-88.000.
- Cisco Technology, Inc.: *See—*
  - Crowther, William R.; and Brandt, William P., 5,751,710, Cl. 370-423.000.
- Citizen Watch Co., Ltd.: *See—*
  - Higuchi, Haruhiko; and Suzuki, Noritoshi, 5,751,664, Cl. 368-112.000.
- City of Hope Research Institute: *See—*
  - Itakura, Keiichi; and Rossi, John J., 5,750,380, Cl. 435-91.100.
- CKD Corporation: *See—*
  - Tamura, Akira; Yamada, Osamichi; Endo, Tadashi; and Uematsu, Eiji, 5,751,083, Cl. 310-80.000.
- Claas KGaA: *See—*
  - Behnke, Willi; and Sagemüller, Burkhard, 5,750,877, Cl. 73-1.330.
  - Pollklas, Manfred, 5,749,783, Cl. 460-119.000.
- Claber S.p.A.: *See—*
  - Roman, Gianfranco, 5,749,524, Cl. 239-240.000.
- Clancy, Joanna, to Pfizer Inc. Pharmaceutical agents for the treatment of disorders caused by helicobacter pylori or other spiral urease-positive gram-negative bacteria. 5,750,535, Cl. 514-294.000.
- Clapper, Ronald C., Jr. Electronic gaming apparatus and method. 5,749,784, Cl. 463-17.000.
- Clarian & GmbH: *See—*
  - Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.
- Clariant Finance (BVI) Limited: *See—*
  - Rahman, M. Dalil; and Aubin, Daniel P., 5,750,031, Cl. 210-681.000.
  - Rahman, M. Dalil; and Aubin, Daniel, 5,750,632, Cl. 528-129.000.
- Clariant GmbH: *See—*
  - Wagner, Adalbert; Kleemann, Heinz-Werner; Regnat, Dieter; and Kleiner, Hans-Jerg, 5,750,728, Cl. 549-57.000.
- Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, to SmithKline Beecham, p.l.c. Process for preparing potassium clavulanate in rossette form. 5,750,685, Cl. 540-349.000.
- Clark, H. Fred; Offit, Paul; and Plotkin, Stanley A., to Wistar Institute of Anatomy & Biology, The; and Children's Hospital of Philadelphia, The. Rotavirus reassortant vaccine. 5,750,109, Cl. 424-205.100.
- Clark, Jay; LaMarche, Jonathan; and Tuttle, Robert J., Sr., to Itronix Corporation. Cradle assembly for portable computing devices and method. 5,751,546, Cl. 361-686.000.
- Clark, Kirtland P., to Dynax Corporation. Fluorochemical foam stabilizers and film formers. 5,750,043, Cl. 252-2.000.
- Clark, Roger Allen: *See—*
  - Nichols, Gary Arthur; and Clark, Roger Allen, 5,749,343, Cl. 123-350.000.
- Clark, Scott M., to IDEXX Laboratories, Inc. Reversible flow chromatographic binding assay. 5,750,333, Cl. 435-5.000.
- Clark, William L., to Unarco Material Handling, Inc. Storage rack beam having surface enabling indicia at low elevation to be easily read. 5,749,482, Cl. 211-191.000.
- Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, to Block Drug Company, The. Denture adhesive containing partial zirconium, calcium, sodium gantrez salt. 5,750,591, Cl. 523-120.000.
- Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., to General Electric Company. Interstage seal assembly for a turbine. 5,749,701, Cl. 415-115.000.
- Clarke, Jonathon P.; and Norton, Brian A., to General Electric Company. Retention system for bar-type damper of rotor blade. 5,749,705, Cl. 416-190.000.
- Clarke, Richard H., to Boston Advanced Technologies, Inc. Methods and devices for fuel characterization and optimal fuel identification on-site at a fuel delivery dispenser. 5,750,995, Cl. 250-339.120.
- Clarson, Stephen J.: *See—*
  - Takeoka, Toru; Clarson, Stephen J.; and Goldslager, Barry, 5,750,588, Cl. 522-66.000.
- Claussner, Andre; Goubet, Francois; and Teutsch, Jean, to Roussel Uclaf. New optionally substituted phenylimidazolidines, their preparation process and intermediates, their use as medicaments and the pharmaceutical compositions containing them. 5,750,553, Cl. 514-392.000.
- Clayton, James E. Thin multichip module including a connector frame socket having first and second apertures. 5,751,553, Cl. 361-749.000.
- Clayton, Peter Paul: *See—*
  - Burgess, Leslie; Butcher, Jane Lesley; Ryan, Thomas Anthony; and Clayton, Peter Paul, 5,750,807, Cl. 570-142.000.
- Claytor, Nancy A. Method and apparatus for designing quilts. 5,749,149, Cl. 33-1.00F.
- Clemens, J. Daniel: *See—*
  - Eyre, David R.; Clemens, J. Daniel; and Ochs, Vincent W., 5,750,647, Cl. 530-328.000.
- Clemow, Richard David: *See—*
  - Philp, Adam Rupert; Sibbald, Alastair; Clemow, Richard David; and Nackvi, Fawad, 5,751,815, Cl. 381-17.000.
- Clewett, Richard H.: *See—*
  - Kyle, Richard F.; Clewett, Richard H.; and Wright, Drew D., 5,749,872, Cl. 606-69.000.
- Clifford, Paul Thomas, to Nokia Mobile Phones Limited. Transmitters for radio telephone base stations. 5,752,170, Cl. 455-126.000.
- Climate Supply (Atlantic) Inc.: *See—*
  - Thomas, James V.; Thomas, Devin James; and Ross, Kenneth Garfield, 5,749,245, Cl. 62-623.000.
- Clive, Derrick L.J.: *See—*
  - Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., 5,750,719, Cl. 548-268.600.
- Cloarec, Bernard: *See—*
  - Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
- Clode, Kirsten Everald; Watson, Derrick John; and Vercauteren, Carl Josef Elsa, to BP Chemicals Limited. Process for the recovery of a carbonylation product. 5,750,007, Cl. 203-3.000.
- Close, John W., Jr.; and Wulf, Martin L. Auto-rack sidescreen securement apparatus for the prevention of theft and vandalism. 5,749,303, Cl. 105-404.000.
- Close, Paul: *See—*
  - Abbott, Michael J.; Close, Paul; and Smith, Kevin P., 5,751,280, Cl. 345-302.000.
- Clothier, Darrell S. Nailing gun carrier. 5,749,508, Cl. 227-7.000.
- Clothier, Michael F.: *See—*
  - Lee, Byung H.; and Clothier, Michael F., 5,750,695, Cl. 544-341.000.
- Cloutier, Robert P.; Kiesow, Ronald H.; and Malloy Desormeaux, Stephen G., to Eastman Kodak Company. Rental camera with key-opening lock to deter customer reuse after completed exposure. 5,752,085, Cl. 396-6.000.
- CMS Gillbreth Packaging Systems, Inc.: *See—*
  - Rello, Robert Michael; Yager, Michael; and Martinez, Ramon Antonio, 5,749,990, Cl. 156-187.000.
- Coaldrake, Peter Donald; and Tollakson, Steven Wayne, to Pioneer Hi-Bred International, Inc. Hybrid maize plant and seed (3341). 5,750,839, Cl. 800-200.000.
- Coates Brothers PLC: *See—*
  - Ivory, Nicholas Eric; and Thatcher, Wrenford John, 5,750,291, Cl. 430-11.000.
- Coates, David: *See—*
  - Goulding, Mark; Coates, David; and Greenfield, Simon, 5,750,051, Cl. 252-299.650.
- Coats, Wayne E. Lawn mower piloting system. 5,749,207, Cl. 56-10.20A.
- Cobb, Joshua M.: *See—*
  - Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
- Cobe Laboratories, Inc.: *See—*
  - Holmes, Brian M.; Blakeslee, Jeffrey J.; and Dolecek, Victor D., 5,750,025, Cl. 210-361.000.
- Coca-Cola Company, The: *See—*
  - Boone, Debra Cheryl; and Tomic, Mladomir, 5,749,493, Cl. 222-105.000.
- Cochcroft, Arthur F., Jr., to NCR Corporation. Method and apparatus for detecting thrashing in a cache memory. 5,752,261, Cl. 711-133.000.
- Cochran, William Thomas: *See—*
  - Chittipeddi, Sailesh; Cochran, William Thomas; and Smooha, Yehuda, 5,751,065, Cl. 257-758.000.
- Cochrane, Benjamin. Laser bonded tamper proof press-on cap and seal. 5,749,201, Cl. 53-281.000.
- Coddington, John Deane: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

- Coelho, Philip H.; and Wolf, Terry, to ThermoGenesis Corp. Fibrinogen processing apparatus, method and container. 5,750,658, Cl. 530-382.000.
- Coelho, Rohan: *See—*
  - Rhodes, Ken; Coelho, Rohan; Bender, Blake; and Frank, Davis, 5,751,270, Cl. 345-118.000.
- Coellner, James A.; and Calton, Dean Scott, to Engelhard/ICC. Method for creating a humidity gradient within an air conditioned zone. 5,749,230, Cl. 62-94.000.
- Coffey, B. Howard; and Coffey, Gary L., to Coffey Marketing Corporation. Arrow lubricant container-applicator system. 5,749,440, Cl. 184-102.000.
- Coffey, Gary L.: *See—*
  - Coffey, B. Howard; and Coffey, Gary L., 5,749,440, Cl. 184-102.000.
- Coffey, Johnnie A.; Foster, Larry Steven; Horrall, Paul Douglas; and McIntyre, John Randolph, to Lexmark International, Inc. Door operated charge member positioning. 5,752,135, Cl. 399-115.000.
- Coffey Marketing Corporation: *See—*
  - Coffey, B. Howard; and Coffey, Gary L., 5,749,440, Cl. 184-102.000.
- Cogent Light Technologies, Inc.: *See—*
  - Li, Kenneth K.; Brenner, Douglas M.; and Chen, Chingfa, 5,751,869, Cl. 385-33.000.
- Cognex Corporation: *See—*
  - Michael, David, 5,751,853, Cl. 382-203.000.
- Cohen, Allen L. Game controller for infants. 5,751,273, Cl. 345-156.000.
- Cohen, Alon, to VocalTec Ltd. System and method for distributing multimedia presentations in a computer network. 5,751,968, Cl. 395-200.610.
- Cohen, Earl T., to Exponential Technology, Inc. Sign-extension merge/mask, rotate/shift, and boolean operations executed in a vectored mux on an ALU. 5,751,614, Cl. 364-716.020.
- Cohen, Edith, to Lucent Technologies Inc. Method and apparatus for estimating transitive closure and reachability. 5,752,241, Cl. 707-3.000.
- Cohen, Fred E.: *See—*
  - Prusiner, Stanley B.; Kaneko, Kiyotoshi; and Cohen, Fred E., 5,750,361, Cl. 435-23.000.
- Cohen, Jonathan Drew, to United States of America, Secretary of NSA. Language-independent method of generating index terms. 5,752,051, Cl. 395-751.000.
- Cohen, Ronald: *See—*
  - Buswell, Richard F.; Cohen, Ronald; McNeilly, Leonard; and Watkins, David S., 5,750,076, Cl. 422-115.000.
- Cohrs, Olaf: *See—*
  - Wolf, Hubert; Bulang, Siegfried; and Cohrs, Olaf, 5,749,930, Cl. 55-242.000.
- Colburn, Joel: *See—*
  - Good, Robert J.; and Colburn, Joel, 5,749,358, Cl. 128-205.230.
- Cole, Clinton S., to Heartstream, Inc. System and method for collecting and storing electrotherapy data on a detachable memory device. 5,749,913, Cl. 607-59.000.
- Cole, Clinton S.: *See—*
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,904, Cl. 607-7.000.
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,905, Cl. 607-7.000.
- Cole, Gary Lee; Engleman, Scott Phillip; and Pritko, Steven Michael, to International Business Machines Corporation. Server computer for selecting program updates for a client computer based on results of recognizer program(s) furnished to the client computer. 5,752,042, Cl. 395-712.000.
- Cole, Richard Everett: *See—*
  - Chamberlain, Peter; and Cole, Richard Everett, 5,749,672, Cl. 405-36.000.
- Cole, Richard S.: *See—*
  - Shiels, Martin A.; Cole, Richard S.; Rankin, Paul J.; and Freitag, Rosa, 5,751,953, Cl. 395-200.090.
- Coley, Brett Angus; Chin, Vincent G.; Downing, Patrick Francis; and Wormald, David M., to International Business Machines Corporation. Method and system for correlating a plurality of events within a data processing system. 5,751,914, Cl. 395-51.000.
- Colgate-Palmolive Co.: *See—*
  - Oldenhove, Louis; and Broze, Guy, 5,750,487, Cl. 510-365.000.
- Colleluori, Richard Alexander: *See—*
  - O'Brien, Michael Joseph; Bryant, Robert Cooper; and Colleluori, Richard Alexander, 5,752,104, Cl. 396-191.000.
- Colley, Charles D.: *See—*
  - Migachyov, Valery; and Colley, Charles D., 5,751,606, Cl. 364-558.000.
- Collier, James: *See—*
  - Suptitz, Eric; Blanchard, Pierre; and Collier, James, 5,751,284, Cl. 324-127.000.
- Collins, Mark L.; Halbert, Donald N.; King, Walter; and Lawrie, Jonathan M., to Amoco Corporation. Target and background capture methods with amplification for affinity assays. 5,750,338, Cl. 435-6.000.
- Collins, William. Compact disc pagkage with spines. 5,749,463, Cl. 206-308.100.
- Colombani, Piero; and Stucchi, Alessandro, to Lentek S.r.l. Method and device for the controlled forming and feeding of a gaseous atmosphere having at least two components, and application in plants of thermal or carburizing treatment. 5,749,978, Cl. 148-216.000.
- Colon, Cesar: *See—*
  - Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,750,745, Cl. 552-581.000.
- Colon, Jose. Hand truck for easy removal of carried objects. 5,749,587, Cl. 280-47.270.
- ColorSpan Corporation: *See—*
  - Erickson, Paul E., 5,751,321, Cl. 347-85.000.
- Colossal Graphics Incorporated: *See—*
  - Robertson, Larry W.; and Fitzgerald, Mark C., 5,751,319, Cl. 347-85.000.
- Colson, Wendell B., to Hunter Douglas Inc. Fabric for an architectural covering and method and apparatus of manufacturing same. 5,749,404, Cl. 160-84.040.
- Colvin, Daniel Scott: *See—*
  - Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, 5,751,579, Cl. 364-426.015.
- Colvin, Vicki L.: *See—*
  - Alivisatos, A. Paul; and Colvin, Vicki L., 5,751,018, Cl. 257-64.000.
- Colwell, Robert P.: *See—*
  - Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., 5,751,986, Cl. 395-394.000.
- Combustion Engineering, Inc.: *See—*
  - Gan, Zhongxue; Fitzgibbons, Lance Terrance; Tang, Qing; and Katz, Jeffrey Sherman, 5,751,610, Cl. 364-571.030.
- Command Audio Corporation: *See—*
  - Ryan, John O., 5,751,806, Cl. 380-9.000.
- Commercon, Alain: *See—*
  - Bastart, Jean-Pierre; Boursat, Jean-Dominique; Commercon, Alain; and Leconte, Jean-Pierre, 5,750,738, Cl. 549-510.000.
  - Baudoin, Bernard; Burns, Christopher; Commercon, Alain; and Le Brun, Alain, 5,750,567, Cl. 514-510.000.
- Commissariat a l'Energie Atomique: *See—*
  - Bono, Hubert; Michel, France; and Rey, Patrice, 5,750,420, Cl. 438-52.000.
- Commonwealth Scientific and Industrial Research Organisation: *See—*
  - Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., 5,751,254, Cl. 343-761.000.
  - Field, John S., 5,750,884, Cl. 73-54.240.
- Compac Corporation: *See—*
  - Petty, Charles J., 5,750,225, Cl. 428-362.000.
- Compag Computer Corporation: *See—*
  - Granzow, Daniel B., 5,751,318, Cl. 347-68.000.
- Compagnie Générale Des Etablissements Michelin - Michelin & Cie: *See—*
  - Muhlhoff, Olivier; and Pompier, Jean-Pierre, 5,749,982, Cl. 152-158.000.
- Compaq Computer Corporation: *See—*
  - Alexander, Dennis J., 5,751,977, Cl. 395-306.000.
  - Crisan, Adrian, 5,751,950, Cl. 395-188.010.
  - Elkhoury, Bassam N.; McFarland, Scott T.; and Perez, Miguel A., 5,752,265, Cl. 711-146.000.
  - Faulk, Richard A., 5,751,565, Cl. 363-41.000.
  - Korinsky, George K., 5,751,550, Cl. 361-695.000.
  - Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., 5,751,998, Cl. 395-490.000.
- Competitve Technologies, Inc.: *See—*
  - Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, 5,750,666, Cl. 536-23.100.
- Component Hardware Group, Inc.: *See—*
  - Bohacik, Richard P., 5,749,179, Cl. 52-127.200.
- Composite Structures International, Inc.: *See—*
  - Albrecht, Donald H., 5,749,555, Cl. 248-346.000.
- Computer Identics, Inc.: *See—*
  - Swithers, David Jonathan; and Rysin, Alex A., 5,750,980, Cl. 250-214.0AG.
- Computer Products, Inc.: *See—*
  - Ho, Francis Man Shuen; and Lee, Robert Chun Fung, 5,751,561, Cl. 363-21.000.
- Conboy, Michael R.: *See—*
  - Tau, Lok L.; Conboy, Michael R.; and Jackson, Thomas P., 5,751,581, Cl. 364-468.220.
- CONDEA Vista Company: *See—*
  - Weerasooriya, Upali; and Lin, John, 5,750,749, Cl. 554-69.000.
- Conforti, Lucio, to SASIB Beverage S.p.A. Process for filling containers, in particular cans, with liquids, and a filler valve group for carrying out the process. 5,749,403, Cl. 141-276.000.
- Conkling, John A.: *See—*
  - Brown, Jerry S.; and Conkling, John A., 5,750,057, Cl. 264-3.200.
- Conkling, Mark A.; Opperman, Charles H.; and Taylor, Christopher G., to North Carolina State University. Pathogen-resistant transgenic plants. 5,750,386, Cl. 435-172.300.
- Connell, Richard: *See—*
  - Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.
- Conner Peripherals, Inc.: *See—*
  - Tang, Xiaoxia; and Chen, Ga-Lane, 5,750,270, Cl. 428-611.000.
- Contet, Jean-Pierre; Duprat, Stéphane Courdavault; Storet, Yvan; and Vindret, Jean-Francois, to Stepan Europe. Surfactants based on quaternary ammonium compounds preparation processes softening bases and compositions derived. 5,750,492, Cl. 510-527.000.
- Continental X-Ray Corporation: *See—*
  - Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, 5,751,788, Cl. 378-197.000.
- Contreras, Jose de Jesus Munoz: *See—*
  - Denney, Denys; Contreras, Jose de Jesus Munoz; Bonaddio, Vincenzo A.; and Johnsin, David M., 5,749,993, Cl. 156-214.000.

- Control Systems, Inc.: *See—*
  - Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., 5,751,295, Cl. 345-501.000.
- Cook, Jane Kathleen Alexandra, to Akzo Nobel N.V. Poultry vaccine. 5,750,113, Cl. 424-222.100.
- Cook, Melvin S. Staple overlap. 5,749,896, Cl. 606-219.000.
- Cook, P. Dan; Acevedo, Oscar L.; and Andrews, Robert S., to ISIS Pharmaceuticals, Inc. Synthesis of 3-deazapurines. 5,750,692, Cl. 544-253.000.
- Cook, Robert L.: *See—*
  - Singh, Jagdish P.; Yueh, Fang-Yu; Cook, Robert L.; and Zhang, Hansheng, 5,751,416, Cl. 356-311.000.
- Cook, Roger B. Braided or twisted line. 5,749,214, Cl. 57-310.000.
- Cook, William L.: *See—*
  - Johnson, Elliott Will Henry; Stepp, Robert Wellington, III; and Cook, William L., 5,749,944, Cl. 95-150.000.
- Coolegem, Karel Gerard: *See—*
  - Anstötz, Karin Helene Maria; and Coolegem, Karel Gerard, 5,751,271, Cl. 345-146.000.
- Cooley, David M.: *See—*
  - Kaewell, John D., Jr.; and Cooley, David M., 5,752,190, Cl. 455-436.000.
- Coombs, Jeffrey Stuart, to FHE Technology Limited. Production of powder. 5,749,938, Cl. 75-332.000.
- Cooney, Anthony: *See—*
  - Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.
- Cooper, Guy F., to United States of America, Navy. Water heated panels for simulating the infrared signature of a target. 5,751,006, Cl. 250-495.100.
- Cooper, J. Carl, to Pixel Instruments Corp. Delay detector apparatus and method for multiple video sources. 5,751,368, Cl. 348-512.000.
- Corbett, Desmond: *See—*
  - Warren, Andrew; and Corbett, Desmond, 5,749,123, Cl. 16-83.000.
- Corbett, Tim J.; Scholer, Raymond P.; and Gonzalez, Fernando, to Micron Technology, Inc. Semiconductor reliability test chip. 5,751,015, Cl. 257-48.000.
- Corbin, David Richard: *See—*
  - Cassel, Wendell Richard; Corbin, David Richard; and Rao, V.N. Mallikarjuna, 5,750,808, Cl. 570-157.000
- Corella, Joseph A., II; and Neigh, Kevin M., to Mine Safety Appliances Company. Process for the reduction of copper oxide. 5,750,087, Cl. 423-604.000.
- Cornelissen, Hugo J.; Savert, Cornelis J.; and Leijten, Johannes T.H., to U.S. Philips Corporation. Rapidly scanning cathode-ray tube laser. 5,749,638, Cl. 313-461.000.
- Cornell, Michael E.: *See—*
  - Yilmaz, Hamza; Williams, Richard K.; Cornell, Michael E.; and Chen, Jun Wei, 5,751,054, Cl. 257-603.000.
- Corning Incorporated: *See—*
  - Gadkaree, Kishor P.; and Johnson, Timothy V., 5,750,026, Cl. 210-502.100.
- Cornish, Darryl J.: *See—*
  - Huston, Charles D.; and Cornish, Darryl J., 5,751,244, Cl. 342-357.000.
- Cornwell, J. Bennette, III: *See—*
  - Harrison, Edward F., Jr.; and Cornwell, J. Bennette, III, 5,749,215, Cl. 57-337.000.
- Coronado, Martin P.; and Mackenzie, Alan, to Baker Hughes Incorporated. Completion apparatus and method. 5,749,419, Cl. 166-387.000.
- Cortec Corporation: *See—*
  - Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.
- Cortech, Inc.: *See—*
  - Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., 5,750,506, Cl. 514-15.000.
- Coslovi, Ilario A.: *See—*
  - Butcher, Ronald S.; and Coslovi, Ilario A., 5,749,686, Cl. 410-94.000.
- Cosmo Research Institue: *See—*
  - Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.
- Cossandi, Antonio: *See—*
  - Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,749,126, Cl. 19-102.000.
- Cotton Incorporated: *See—*
  - Wedegaertner, Thomas C.; Valco, Thomas D.; and Lalor, William F., 5,750,466, Cl. 504-100.000.
- Couch, Johnny D.; and Huether, James L., to Sega Enterprises, Ltd. Perpheral input device with six-axis capability. 5,749,577, Cl. 273-148.00B.
- Council of Scientific and Industrial Research: *See—*
  - Deshmukh, Abdul Rakeeb Abdul Subhan; Naik, Rajan Hiralal; Tandel, Sagun Kashinath; and Rajappa, Srinivasachari, 5,750,757, Cl. 558-232.000.
- Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T., Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., to Philip Morris Incorporated. Electrical heater of an electrical smoking system. 5,750,964, Cl. 219-535.000.
- Court, John J.: *See—*
  - Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., 5,750,550, Cl. 514-373.000.
- Coutts, Michael G., to NCR Corporation. Self-service device with an animated user interface to assist the operator to effect a transaction. 5,752,239, Cl. 705-26.000.
- Couvrat, Marc: *See—*
  - Abiko, Shigeshi; Mizushima, Shintaro; and Couvrat, Marc, 5,751,618, Cl. 364-736.010.
- Cowfer, Joseph Allen; Johnston, Victor James; and Popiel, Lawrence, to Geon Company, The. Method for reducing formation of polychlorinated aromatic compounds during air oxychlorination of C_1–C_3 Hydrocarbons. 5,750,812, Cl. 570-245.000.
- Cowger, Bruce; Hall, Ronald W.; Gast, Paul D.; and Shibata, Alan, to Hewlett-Packard Company. Ink delivery system for a printer. 5,751,300, Cl. 347-6.000.
- Cowley, Tom J.; Bower, Larry O.; and Egan, Philip S., to AlertCare, Inc. Patient activity monitoring device with multiple sensors. 5,751,214, Cl. 340-573.000.
- Cox, Bruce Russell: *See—*
  - Evans, Joel Franklin; Cox, Bruce Russell; Dodd, Michael Thomas; and Hopkins, Jeffrey Jon, 5,750,122, Cl. 424-401.000.
- Cox, Gaylen J.: *See—*
  - Skinner, Gregory C.; and Cox, Gaylen J., 5,749,729, Cl. 433-136.000.
- Cox, Ingemar J.; and Roy, Sebastien, to Nec Research Institute, Inc. Correction of camera motion between two image frames. 5,751,838, Cl. 382-107.000.
- Cox, Kenneth Charles; and Eick, Stephen Gregory, to Lucent Technologies Inc. Three dimensional graphical display of information. 5,751,931, Cl. 395-140.000.
- Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, to Tulane Educational Fund, The Administrators of the; and Biomeasure, Inc. Bradykinin analogs with non-peptide bond. 5,750,646, Cl. 530-314.000.
- Coy, Gerald L.; and Dempsey, Neil J., to Xerox Corporation. Method of diagnosing a drive train having multiple servo motors. 5,751,123, Cl. 318-34.000.
- Crabb, Elmer R.: *See—*
  - Burckhartzmeyer, Jerry J.; Crabb, Elmer R.; Lehnhoff, Terry F.; and Watson, Alva L., Jr., 5,749,423, Cl. 180-9.540.
- Craddock, Robert E.: *See—*
  - Gehrs, Donald F.; and Craddock, Robert E., 5,751,543, Cl. 361-641.000.
- Cramer, Bernhard M., to Schneider (Europe) A.G. Method of using an aspiration catheter. 5,749,858, Cl. 604-164.000.
- Crameri, Yvo: *See—*
  - Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, 5,750,690, Cl. 544-234.000.
- Crane, Robert Scott; Kolena, David Philip; and Berg, Alan Dean, to General Motors Corporation. Method for extruding integral seat back frame. 5,749,135, Cl. 29-415.000.
- Crawford, Gregory P.; Fiske, Thomas G.; and Silverstein, Louis D., to Xerox Corporation. Enhanced off-axis viewing performance of liquid crystal display employing a fiberoptic faceplate in conjunction with dual negative retarders and a brightness enhancing film on the illumination source. 5,751,390, Cl. 349-120.000.
- CRC Industries, Inc.: *See—*
  - Haskell, Malcolm W.; Miller, Richard; and Zefferi, Suzanne, 5,750,488, Cl. 510-412.000.
- Creger, Paul Leroy: *See—*
  - Bisgaier, Charles Larry; Creger, Paul Leroy; Saltiel, Alan Robert; and Tafuri, Sherrie Rae, 5,750,569, Cl. 514-547.000.
- Cremeans, George E.: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Cresens, Marc L.: *See—*
  - Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., 5,751,447, Cl. 358-487.000.
- Crichton, Trevor John: *See—*
  - Barnes, Clive; and Crichton, Trevor John, 5,750,956, Cl. 219-121.710.
- Cripps, Michael J., to NCR Corporation. Method and apparatus for recovering aborted file (or data) transmission. 5,752,251, Cl. 707-202.000.
- Crisan, Adrian, to Compaq Computer Corporation. Secure power supply for protecting the shutdown of a computer system. 5,751,950, Cl. 395-188.010
- Crisologo, Nieves Marzan: *See—*
  - Taskovich, Lina Tormen; Yum, Su Il; Lee, Eun Soo; and Crisologo, Nieves Marzan, 5,750,137, Cl. 424-448.000.
- Critz, Brenda S.: *See—*
  - Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.
- Crocker, Mark; and Herold, Rudolf Henri Max, to Shell Oil Company. Preparation of oxirane compounds with titanasilsesquioxane catalysts. 5,750,741, Cl. 549-525.000.
- Cromer, Robert H.; and Potter, Kenneth B., to General Electric Co. Wear reduction kit for gas turbine combustors. 5,749,218, Cl. 60-39.310.
- Cromer, Robert Harold: *See—*
  - Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.
- Cross, Sheree Elizabeth: *See—*

  - Roberts, Michael Stephen; Cross, Sheree Elizabeth; and Singh, Parminder, 5,750,141, Cl. 424-449.000.
- Crossland, William Alden; and Birch, Martin John, to Northern Telecom Limited. Co-ordinate addressing of liquid crystal cells. 5,751,266, Cl. 345-96.000.
- Crotty, Brian Andrew: *See—*
  - Znaiden, Alexander Paul; Crotty, Brian Andrew; and Johnson, Anthony, 5,750,123, Cl. 424-401.000.
- Crowe, Lawrence E., to Sundstrand Corporation. Heat exchanger for high power electrical component and package incorporating same. 5,749,413, Cl. 165-80.100.
- Crowhurst, David B.: *See—*
  - Romerein, Robert L.; Crowhurst, David B.; and Allinson, Christopher A., 5,750,929, Cl. 174-88.00C.
- Crowley, H. W., to Roll Systems, Inc. System and method for directly feeding paper to printing devices. 5,751,298, Cl. 346-136.000.
- Crowley, Patrick Jelf; Lawson, Kevin Robert; Smith, Douglas John; and Moseley, Donn Warwick, to Zeneca Limited. Fungicide intermediates. 5,750,778, Cl. 562-605.000.
- Crowther, William R.; and Brandt, William P., to Cisco Technology, Inc. Technique for connecting cards of a distributed network switch. 5,751,710, Cl. 370-423.000.
- Crump, Dwayne Thomas; Norris, Duane Edward; and Pancoast, Steven Taylor, to International Business Machines Corporation. Computer system having multi-level suspend timers to suspend from operation in attended and unattended modes. 5,752,044, Cl. 395-750.000.
- Crump, Paul William: *See—*
  - Vadgama, Pankaj Madganlal; and Crump, Paul William, 5,749,832, Cl. 600-345.000.
- Crystal Semiconductor: *See—*
  - Pietruszynski, David Michael; Austin, James Duh; and Kirkland, Brian, 5,751,179, Cl. 327-379.000.
- Cserteg, Istvanne; Tokes, Jozsef; Wursching, Istvan; and Fulop, Jozsef, to General Electric Company. Assembly arrangement for a compact fluorescent lamp. 5,751,105, Cl. 313-493.000.
- CTA International: *See—*
  - Mornay, Emmanuel; and Simon, Georges, 5,750,916, Cl. 89-33.170.
- CTI Pet Systems, Inc.: *See—*
  - Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,750,991, Cl. 250-363.030.
- Cuche, Cyril, to SMH Management Services AG. Extensible clasp for a bracelet. 5,749,128, Cl. 24-71.00J.
- Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., to Symetrix Corporation. High dielectric constant barium-strontium-niobium oxides for integrated circuit applications. 5,751,034, Cl. 257-295.000.
- Cudden, Charles, to Ford Global Technologies, Inc. Vehicle hood check and damping mechanism. 5,749,425, Cl. 180-69.200.
- Culcasi, Marcel: *See—*
  - Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, François; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.
- Culler, Gregory D., to W. L. Gore & Associates, Inc. Infra-red reflective coverings. 5,750,242, Cl. 428-209.000.
- Cullerot, David L.: *See—*
  - Dobbins, Kurt A.; Cullerot, David L.; Negus, Stephen H.; and Haggerty, William T., 5,751,971, Cl. 395-200.680.
- Culligan International Company: *See—*
  - Zabinski, John E.; and Rehfeldt, Roger, 5,751,598, Cl. 364-500.000.
- Cully, Jan: *See—*
  - Heidlas, Jurgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rudiger, 5,750,180, Cl. 426-614.000.
- Cummings, Gerald, to S. C. Johnson & Son, Inc. Glass cleaning composition. 5,750,482, Cl. 510-182.000.
- Cummings, Richard Dale: *See—*
  - Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.
- Cummins-Allison Corp.: *See—*
  - Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,751,840, Cl. 382-135.000.
- Cummins Engine Company, Inc.: *See—*
  - Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.
- Cundiff, Robert J.: *See—*
  - Sheppard, Paul W., III; Becker, Larry W.; and Cundiff, Robert J., 5,750,035, Cl. 210-719.000.
- Cunningham, Adam Douglas: *See—*
  - Kaufman, John Wilson; Knaub, John Edward; and Cunningham, Adam Douglas, 5,750,973, Cl. 235-441.000.
- Cunningham, Raymond T.: *See—*
  - Tang, Jiansheng; Cunningham, Raymond T.; and Yang, Bo, 5,750,070, Cl. 422-16.000.
- Cunnyngham, Charles Thomas. Inbred maize line PH15A. 5,750,830, Cl. 800-200.000.
- Cuppy, Michael J. Catheter system. 5,749,857, Cl. 604-164.000.
- Curran, Timothy Thomas: *See—*
  - Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.
- Curtis, Stephen. Collapsible sports racquet. 5,749,574, Cl. 273-73.00J.
- Cushman, Paul W.; Won, King L.; Mehta, Bakulesh A.; and Akselrod, Mark, to Network General Technology Corporation. System and method for automatically identifying and analyzing active channels in an ATM network. 5,751,698, Cl. 370-252.000
- Cutler, David: *See—*
  - Halvorson, Todd; Bickham, Stephen R.; and Cutler, David, 5,749,346, Cl. 123-486.000.
- Cutler, David N.; and Lenzmeier, Charles T., to Microsoft Corporation. Queue object for controlling concurrency in a computer system. 5,752,031, Cl. 395-673.000.
- Cutler, Donald R.; Pailthorp, Robert M.; and Unrath, Mark A., to Electro Scientific Industries, Inc. High speed, high accuracy multi-stage tool positioning system. 5,751,585, Cl. 364-474.030.
- Cutts, Richard W., Jr.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Cynosure, Inc.: *See—*
  - Furumoto, Horace W., 5,749,868, Cl. 606-9.000.
- Cypress Semiconductor Corporation: *See—*
  - Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., 5,751,644, Cl. 365-194.000.
  - Watt, Jeffrey; and Walker, Andrew, 5,751,507, Cl. 361-56.000.
- Cyrix Corporation: *See—*
  - Garibay, Raul A., Jr.; Quattromani, Marc A.; and Beard, Douglas, 5,752,274, Cl. 711-206.000.
- Cytel Corporation: *See—*
  - Fikes, John D.; Livingston, Brian D.; Sette, Alessandro D.; and Sidney, John C., 5,750,395, Cl. 435-325.000.
- Cytomed, Inc.: *See—*
  - Cai, Xiong; Fura, Aberra; and Qian, Changgeng, 5,750,565, Cl. 514-473.000.
- Czekai, David Alan: *See—*
  - Texter, John; Sharma, Ravi; and Czekai, David Alan, 5,750,321, Cl. 430-449.000.
- Czukerberg, Shirley: *See—*
  - Feldman, Jacobo; and Czukerberg, Shirley, 5,749,667, Cl. 402-79.000.
- Dabecki, Stephen J.: *See—*
  - Radhakrishnan, Sivakumar; and Dabecki, Stephen J., 5,751,697, Cl. 370-229.000.
- DaCruz, Claudia P.: *See—*
  - Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., 5,751,034, Cl. 257-295.000.
- D'Addeo, Michael Lee, to Motorola, Inc. Electrical device structure having reduced crowbar current and power consumption. 5,751,180, Cl. 327-379.000.
- Daems, Daniel; and Macken, Luk, to N.V. Raychem S.A. Optical fibre organizer. 5,751,882, Cl. 385-135.000.
- Daewoo Electronics Co., Ltd.: *See—*
  - Hur, Se-Hum, 5,751,493, Cl. 359-630.000.
  - Im, Yong-Hee, 5,751,732, Cl. 371-37.110.
  - Jung, Sung-Chil, 5,749,249, Cl. 68-15.000.
  - Kim, Jin-Hun, 5,751,361, Cl. 348-409.000.
  - Kim, Keum-Mo, 5,751,520, Cl. 360-107.000.
  - Kim, Si-Hwan, 5,749,327, Cl. 122-13.100.
  - Kim, Sung-Bum, 5,749,248, Cl. 68-4.000.
  - Lee, Min-Sup, 5,751,362, Cl. 348-416.000.
  - Lee, Moon-Keol, 5,751,370, Cl. 348-556.000.
- Daffonchio, Luisa: *See—*
  - Mantovanini, Marco; Melillo, Gabriella; and Daffonchio, Luisa, 5,750,536, Cl. 514-300.000.
- Dai-Ichi Seiko Co., Ltd.: *See—*
  - Ishii, Masaaki, 5,750,423, Cl. 438-112.000.
- Dai Nippon Printing Co., Ltd.: *See—*
  - Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, 5,750,238, Cl. 428-195.000.
  - Ota, Hisaki; and Nakamura, Takamasa, 5,749,293, Cl. 101-157.000.
- Dai, Wei William; and Ng, Yu Kwong, to Allied Telesyn Int'l Corp. Network interfacing apparatus and method using attachment port and repeater. 5,751,952, Cl. 395-200.800.
- Daicel Chemical Industrial, Ltd.: *See—*
  - Koyama, Hiroshi; and Takemoto, Etsuo, 5,750,792, Cl. 564-507.000.
- Daicel Chemical Industries, Ltd.: *See—*
  - Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, 5,750,717, Cl. 548-240.000.
- Daikin Industries, Ltd.: *See—*
  - Miura, Toshiro; Soda, Yoshihiro; and Hayashi, Tadao, 5,750,606, Cl. 524-244.000.
  - Shibanuma, Takashi; Homoto, Yukio; Komatsu, Satoshi; and Yoshimura, Toshikazu, 5,750,809, Cl. 570-169.000.
  - Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, to Hitachi, Ltd. Cooling device of multi-chip module. 5,751,062, Cl. 257-722.000.

Dailey, William L.: *See—*

Eberhardt, Anthony N.; Dailey, William L.; and Harada, John A., 5,751,549, Cl. 361-687.000.

Daimler-Benz Aerospace AG: *See—*

Seckler, Joachim; and Geiss, Klaus-Peter, 5,750,917, Cl. 102-476.000.

Daimler-Benz AG: *See—*

Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.

Daimon, Goro: *See—*

Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.

Daimon, Hideo: *See—*

Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, 5,750,747, Cl. 554-36.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*

Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.

Dairyland Electrical Industries, Inc.: *See—*

Pelly, Brian R.; and Tachick, Henry N., 5,751,530, Cl. 361-56.000.

Dakota Gasification Company: *See—*

Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., 5,750,009, Cl. 203-64.000.

Dallaire, Michel: *See—*

Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.

Dallas Enviro-Tek International, Inc.: *See—*

Allin, Gaylord; and Gorham, Mark, 5,750,237, Cl. 428-182.000.

Dallas Semiconductor Corporation: *See—*

Glick, Mark; Fekete, Nicholas M.G.; Bolan, Michael L.; and Owens, Jeffrey D., 5,749,253, Cl. 70-278.000.

Guillot, Joe; Dinh, Michael Quan; Roberts, Bill; and McLemore, Linda M., 5,749,143, Cl. 29-841.000.

Dalow Industries Inc.: *See—*

Carrano, Richard; and Hanna, Mark C., 5,749,979, Cl. 148-430.000.

Dalton, John Carl, to Apple Computer, Inc. System and method for adapting the thresholds of a dither matrix to the amplitude of an input signal. 5,751,920, Cl. 395-109.000.

Dalzell, William H.; and Loshak, Igor, to Polaroid Corporation. Laminar light-polarizing lens blank for producing prescription lens. 5,751,481, Cl. 359-485.000.

D'Ambra, Thomas E., to Albany Molecular Research, Inc. Piperidine derivatives and process for their production. 5,750,703, Cl. 546-240.000.

Damon, Brian Wesley, to Lexmark International, Inc. Method for enhanced print quality on print engines with at least one high resolution dimension. 5,751,470, Cl. 358-298.000.

Damrow Company, Inc.: *See—*

Bokelmann, Paul R.; Schumacher, Thomas R.; and Winberg, Arvid E., 5,749,204, Cl. 53-471.000.

Damsohn, Herbert; and Schmitz, Albert, to BEHR GmbH & Co. Connection between tubes and tube bottom for a heat exchanger. 5,749,414, Cl. 165-178.000.

Dana Corporation: *See—*

Krisher, James A., 5,749,594, Cl. 280-661.000.

Dandia, Sanjay, to LSI Logic Corporation. Method for making a surface-mount technology plastic-package ball-grid array integrated circuit. 5,749,999, Cl. 156-285.000.

Daniels, Dean Jeffrey: *See—*

Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.

Daniels, John J. Fishing reel with electronically variable brake for preventing backlash. 5,749,533, Cl. 242-287.000.

Danielson, Victor G.: *See—*

Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., 5,750,029, Cl. 210-634.000.

Danilewicz, John Christopher; Ellis, David; and Kobylecki, Ryszard Jurek, to Pfizer Inc. Antithrombotic amidinophenylalanine and amidinopyridylalanine derivatives. 5,750,520, Cl. 514-212.000.

Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, to Sansha Electric Manufacturing Company, Limited. Power supply apparatus for arc-utilizing equipment. 5,751,568, Cl. 363-95.000.

Dann, Jeffrey A.: *See—*

Gloth, David; and Dann, Jeffrey A., 5,749,870, Cl. 606-45.000.

Danner, Mark C.; and Klaber, Kenneth E., to Dow Chemical Company, The. Protective coating for metal surfaces. 5,750,252, Cl. 428-332.000.

Danzl, Martin: *See—*

Weissbrich, Alfons; Danzl, Martin; and Mayer, Johann, 5,749,617, Cl. 296-107.000.

Danzuka, Toshimitsu; Sakemi, Yuji; Fukushima, Hisashi; and Menjo, Takeshi, to Canon Kabushiki Kaisha. Developing device using development bias having oscillating part and a quiescent part. 5,752,140, Cl. 399-270.000.

Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., to Dentsply Research & Development Corp. Transducer activated subgingival tool tip. 5,749,727, Cl. 433-119.000.

Daouse, Alain; and Plessier, Alain, to Nestec S.A. Process for providing filled, extruded dough products. 5,750,170, Cl. 426-283.000.

Darsow, Gerhard; and Petruck, Gerd-Michael, to Bayer Aktiengesellschaft. Process for the preparation of D,L-menthol. 5,750,803, Cl. 568-830.000.

Darty, Mark Anthony; Prickett, Guy Brent; and Schwarz, Charles Raymond, to McDonnell Douglas Corporation. Modular solid state power controller with microcontroller. 5,752,047, Cl. 395-750.010.

Dasgupta, Falguni; and Musser, John Henry, to Glycomed Incorporated. Sialic acid/fucose based medicaments. 5,750,508, Cl. 514-25.000.

Data Race: *See—*

Staples, Leven E., 5,752,082, Cl. 395-882.000.

Datta, Dipti Kr.; and Richarz, Werner, to Air Handling Engineering Ltd. Fan for air handling system. 5,749,702, Cl. 415-119.000.

Datte, Mark Allen: *See—*

Siak, June-Sang; Biederman, Scott William; Whited, William Thomas; and Datte, Mark Allen, 5,749,409, Cl. 164-23.000.

Dauerer, Norman Joseph; and Kelley, Edward Emile, to International Business Machines Corporation. Notification of disconnected service machines that have stopped running. 5,751,966, Cl. 395-200.540.

David Sarnoff Research Center Inc.: *See—*

Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.

Davidson, Deborah Nicole: *See—*

Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.

Davies, Glen T. Wild game field removal system. 5,749,506, Cl. 224-501.000.

Davies, Mark; and Bolvari, Anne E., to Kawasaki Chemical Holding Co., Inc. Toughened polymeric compositions and methods of improving friction and wear properties of tribological systems. 5,750,620, Cl. 525-67.000.

Davies, Susan; and Davy, Gloria E., to U S WEST Technologies, Inc. Method and instructions for visual voice messaging user interface. 5,751,793, Cl. 379-89.000.

Davis, Alan L.: *See—*

Leach, Jerald G.; Simar, Laurence R.; Davis, Alan L.; and Tatge, Reid E., 5,751,991, Cl. 395-421.040.

Davis, Brian T., to S. C. Johnson & Son, Inc. Container and retractable hanger system. 5,749,497, Cl. 222-181.200.

Davis, Darwin Darrell; and Wilhoit, Eugene Dennis, to Du Pont de Nemours, E. I., and Company. Nitric acid hydrolysis of polyamides. 5,750,791, Cl. 564-488.000.

Davis, Derek L.; and Jones, Peter, to Intel Corporation. Apparatus and method for securing captured data transmitted between two sources. 5,751,809, Cl. 380-23.000.

Davis, Gary E. Multi-purpose mobile hoist. 5,749,697, Cl. 414-680.000.

Davis, Keith L.; and Petersen, Kirk A., to Hon Industries Inc. Hinge bracket for a cabinet door. 5,749,125, Cl. 16-382.000.

Davis, Michael. Foot-operable cursor control device. 5,751,274, Cl. 345-157.000.

Davy, Gloria E.: *See—*

Davies, Susan; and Davy, Gloria E., 5,751,793, Cl. 379-89.000.

Dawson, Peter F.: *See—*

Leibovitz, Jacques; Dawson, Peter F.; Nagesh, Voddarahalli K.; and Irby, Greg M., 5,749,988, Cl. 156-94.000.

Day, Delbert E., to University of Missouri, The Curators of the. Iron phosphate compositions for containment of hazardous metal waste. 5,750,824, Cl. 588-256.000.

Deagan, John C., to Vigil, Thomas R. Automatic self-filling bird feeder. 5,749,316, Cl. 119-57.800.

Deale, Michael J.: *See—*

Zweben, Monte; Deale, Michael J.; Vershel, Mark A.; and Pettus, Christophe E., 5,751,958, Cl. 395-200.340.

Dean, David Kenneth: *See—*

Beeley, Lee James; and Dean, David Kenneth, 5,750,701, Cl. 546-157.000.

DeAngelis, Andrew V. Printing method and apparatus. 5,749,567, Cl. 270-7.000.

DeBalko, George Andrew, to Lucent Technologies Inc. Coaxial cable surge protector. 5,751,534, Cl. 361-119.000.

De Bastiani, Norman P.; and Carlson, Richard R., to Chartpak, Inc. Relief decorating of ceramic articles using screen printing processes. 5,749,292, Cl. 101-129.000.

De Bellis, Paolo: *See—*

Bombardelli, Ezio; De Bellis, Paolo; and Gabetta, Bruno, 5,750,562, Cl. 514-449.000.

DeBlock, Frans; and Bodet, Jean-Francois, to Procter & Gamble Company, The. Super concentrate emulsions with fabric actives. 5,750,491, Cl. 510-521.000.

Debonte, Lorin R.; Loh, Willie H.-T.; and Zhegong, Fan, to Cargill Incorporated. Canola variety producing a seed with reduced glucosinolates and linolenic acid yielding an oil with low sulfur, improved sensory characteristics and increased oxidative stability. 5,750,827, Cl. 800-200.000.

De Caris, Sandro; and Ansaloni, Angelo, to MG2 S.p.A. Method of weighing drugs and relative drug metering machine. 5,750,938, Cl. 177-50.000.

De Cock, Etienne Marie; De Schamphelaere, Lucien Amede; and Grobben, Alfons Jakob, to Xeikon N.V. Printer including temperature controlled LED recording heads. 5,751,327, Cl. 347-130.000.

DeCoste, Charles Leonard, Jr.: *See—*

Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, 5,751,324, Cl. 347-87.000.

Decrescenzo, Gary A.: *See—*

Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.

Dederer, Jeffrey T.: *See—*

Gillett, James E.; Dederer, Jeffrey T.; and Zafred, Paolo R., 5,750,278, Cl. 429-24.000.

Dedrick, Rick, to Intel Corporation. Consumer-driven electronic information pricing mechanism. 5,752,238, Cl. 705-14.000.

Deevi, Seetharama: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

DeFelsko Corporation: *See—*

Koch, Frank J.; Vandervalk, Leon C.; and Beamish, David J., 5,751,608, Cl. 364-563.000.

Defieuw, Geert: *See—*

Horsten, Bartholomeus; Loccufier, Johan; Defieuw, Geert; and Leenders, Luc, 5,750,319, Cl. 430-346.000.

DeFranco, John A.: *See—*

Henderson, Brent E.; Bolen, Pat A.; and DeFranco, John A., 5,749,744, Cl. 439-164.000.

Degenhardt, Jon R.: *See—*

Hahn, Samuel S.; LeGault, Kenn; Wheeler, Maxon; and Degenhardt, Jon R., 5,751,287, Cl. 345-351.000.

De Greef, Willem Marius: *See—*

Doornekamp, Martin; Van Veldhuisen, Willem; and De Greef, Willem Marius, 5,749,453, Cl. 198-400.000.

DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, to Orion-Yhtymä Oy. Triphenylethylenes for the prevention and treatment of osteoporosis. 5,750,576, Cl. 514-720.000.

de Groot, Peter, to ZYGO Corporation. Optical gap measuring apparatus and method. 5,751,427, Cl. 356-358.000.

Deguire, Daniel Rene: *See—*

Mangolds, Arnie; Farinella, Michael David; Deguire, Daniel Rene; and Cardenas, Robert Lee, 5,750,918, Cl. 102-502.000.

Degussa Aktiengellschaft: *See—*

Olip, Vinzenz; and Steiner, Norbert, 5,749,923, Cl. 8-102.000.

DeHart, Daniel L.: *See—*

Cannon, Thomas G.; DeHart, Daniel L.; and Krug, Eric M., 5,751,590, Cl. 364-479.030.

Deisel Technology Company: *See—*

Straub, Robert D.; Teerman, Richard Frederic; Stegink, Thomas M.; and Ogren, Daniel B., 5,749,717, Cl. 417-505.000.

DeJaco, Andrew P.; and Bi, Ning, to Qualcomm Incorporated. Method for searching an excitation codebook in a code excited linear prediction (CELP) coder. 5,751,901, Cl. 395-2.250.

De Jong, Jurjen Jan: *See—*

Lazarz, Donald; and De Jong, Jurjen Jan, 5,749,155, Cl. 34-90.000.

DeJonge, Stuart, Sr.; and Weinstein, Jack, to Primary Delivery Systems, Inc. Squeeze and rotate to lift captive cap dispenser. 5,749,496, Cl. 222-153.140.

De Keyzer, Noel Raymond Maurice: *See—*

Gerard, Eric-Jack; De Keyzer, Noel Raymond Maurice; and Van De Vliet, Birgitte Maria Ludovica Christine, 5,750,607, Cl. 524-271.000.

Dekker, André: *See—*

Haapanen, Mika; and Dekker, André, 5,751,194, Cl. 331-17.000.

Dekont Teknik AB: *See—*

Öberg, Dan, 5,749,189, Cl. 52-298.000.

Deland, Daniel L.: *See—*

Detweiler, Charles A.; Deland, Daniel L.; and Beneker, Gerrit V., 5,749,349, Cl. 123-520.000.

Delaney, Michael R.; and Tilley, Allen D., to Mend Technologies, Inc. Medical device. 5,749,602, Cl. 285-61.000.

Delatorre, Leroy C., to Panex Corporation. Production log. 5,749,417, Cl. 166-254.200.

Delgado, Pete: *See—*

Hellberg, Mark; Delgado, Pete; and Nixon, Jon C., 5,750,564, Cl. 514-469.000.

DeLisle, David J.: *See—*

DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.

Dell USA, L.P.: *See—*

McMahan, Robert L.; and Martinez, Maureen, 5,749,637, Cl. 312-223.200.

Dellaporta, Stephen L., to Yale University. Nucleic acid molecules that encode tassel seed 2(TS2), a protein involved in the control of flower development in plants. 5,750,873, Cl. 800-205.000.

Delli Bovi, Pasquale: *See—*

Basilico, Claudio; and Delli Bovi, Pasquale, 5,750,659, Cl. 530-399.000.

Delmore, Michael D.; and Maier, Gary W., to Minnesota Mining & Manufacturing Company. Die for extruding one or more fluid streams. 5,750,159, Cl. 425-190.000.

DeLouise, Lisa A.: *See—*

Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., 5,751,317, Cl. 347-65.000.

Delp, Gary S.; Leichty, Philip L.; and Slane, Albert A., to International Business Machines Corporation. System for minimizing latency data reception and handling data packet error if detected while transferring data packet from adapter memory to host memory. 5,752,078, Cl. 395-827.000.

Delplancke, Patrick Firmin A.: *See—*

Boutique, Jean-Pol; and Delplancke, Patrick Firmin A., 5,750,748, Cl. 554-66.000.

Delta America Ltd.: *See—*

Brice, Steve; Kingsley, Gary; and Payne, David, 5,749,641, Cl. 353-81.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., to Wisconsin Alumni Research Foundation. Homologated vitamin D2 compounds and the corresponding 1α-hydroxylated derivatives. 5,750,746, Cl. 552-653.000.

Del Vecchio, Anthony J.; Jungermann, Eric; and Basu, Hemendra N., to Calgene, Inc. Soaps produced from high laurate canola oil-based fatty acids. 5,750,481, Cl. 510-152.000.

DeMeerleer, Jan Richard: *See—*

Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, 5,751,324, Cl. 347-87.000.

Demenus, Richard D.: *See—*

Kehr, Bruce A.; Lerner, David; Demenus, Richard D.; and Edl, Michael J., 5,752,235, Cl. 705-3.000.

Dempsey, Neil J.: *See—*

Coy, Gerald L.; and Dempsey, Neil J., 5,751,123, Cl. 318-34.000.

Den Norske Stats Oljeselskap A.S., I & K Patent: *See—*

Breivik, Kåre; Egge, Trygve G.; and Herstad, Sverre, 5,749,758, Cl. 441-5.000.

Dengensha Manufacturing Company Limited: *See—*

Sato, Yoshio; and Kameta, Keiji, 5,750,953, Cl. 219-90.000.

Denison, Dean R.: *See—*

Weise, Mark; and Denison, Dean R., 5,750,211, Cl. 427-579.000.

Denley, Robert: *See—*

Moore, Phillip; Lancaster, Patrick R.; and Denley, Robert, 5,749,206, Cl. 53-556.000.

Denner, Brett Willian: *See—*

Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, 5,749,542, Cl. 244-53.00B.

Denney, Denys; Contreras, Jose de Jesus Munoz; Bonaddio, Vincenzo A.; and Johnsin, David M., to Foamex L.P. Method of making an automotive carpeting with precut conforming foam underlayment. 5,749,993, Cl. 156-214.000.

Dennison, Charles H.; and Marr, Ken, to Micron Technology, Inc. Semiconductor device with V_T implant. 5,751,046, Cl. 257-392.000.

Denny, William Alexander; Palmer, Brian Desmond; and Wilson, William Robert, to Cancer Research Campaign Technology Limited. Nitroaniline derivatives and their use as anti-tumour agents. 5,750,782, Cl. 564-166.000.

Denso Corporataion: *See—*

Suzuki, Megumi; Asai, Akiyoshi; and Sakakibara, Jun, 5,751,041, Cl. 257-357.000.

Denso Corporation: *See—*

Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, 5,751,240, Cl. 342-70.000.

Shirai, Noriaki; Hibino, Katsuhiko; and Nishimura, Takao, 5,751,211, Cl. 340-435.000.

Torii, Mikio; and Tanizawa, Seiji, 5,749,347, Cl. 123-516.000.

Toyama, Koichi; and Yamamoto, Noboru, 5,751,121, Cl. 315-307.000.

Yoshiume, Naoki; and Miwa, Makoto, 5,749,344, Cl. 123-399.000.

Dent, Paul W., to Ericsson Inc. Multichannel receiver using analysis by synthesis. 5,751,762, Cl. 375-200.000.

Dentifax International, Inc.: *See—*

Zielinski, David M.; and Engelman, Melvin A., 5,749,411, Cl. 164-244.000.

Denton, Gary Allen; and Dreyfuss, David Daniel, to Lexmark International, Inc. Combined electrophotographic and ink jet printing. 5,751,299, Cl. 347-2.000.

Dentsply Research & Development Corp.: *See—*

Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., 5,749,727, Cl. 433-119.000.

Denzer, Dirk: *See—*

Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.

Deora, Ajit: *See—*

Naidu, Anand; Deora, Ajit; and Arunarthi, Venkatesham, 5,752,002, Cl. 395-500.000.

DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., to Duracell Inc. Seal for electrochemical cell. 5,750,283, Cl. 429-56.000.

DePaul, Kenneth: *See—*

Voit, Eric A.; Kostreski, Bruce; Liptak, Lance; and DePaul, Kenneth, 5,751,707, Cl. 370-384.000.

De Roaldes, Olivier: *See—*

- Duvillier, Eric; Gineston, Jean-Marie; and De Roaldes, Olivier, 5,749,876, Cl. 606-88.000.
- DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., to Packard Bell NEC. Write inhibited registers. 5,752,063, Cl. 395-800.000.
- Deroux-Dauphin, Patrice; and Francois, Christian, to Temento Systems. Testable electronic system. 5,751,736, Cl. 371-22.310.
- Dertinger, Stephen: *See—*
  - Tometsko, Andrew M., deceased; Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, 5,750,330, Cl. 435-2.000.
- Desai, Ranjit C.: *See—*
  - Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., 5,750,550, Cl. 514-373.000.
- Desai, Ranjit Chimanlal, to Sanofi Winthrop, Inc. 2-(2, 3, 5, 6-tetrafluoro-4-pyridyl)1, 2, 5-thiadiazolidin-3-one 1, 1-dioxides and compositions and method of use thereof. 5,750,546, Cl. 514-342.000.
- Desario, Alphonse J. Pedicure kit. 5,749,377, Cl. 132-73.500.
- De Schamphelaere, Lucien Amede: *See—*
  - De Cock, Etienne Marie; De Schamphelaere, Lucien Amede; and Grobben, Alfons Jakob, 5,751,327, Cl. 347-130.000.
- Deshmukh, Abdul Rakeeb Abdul Subhan; Naik, Rajan Hiralal; Tandel, Sagun Kashinath; and Rajappa, Srinivasachari, to Council of Scientific and Industrial Research. Pesticidal ester preparation. 5,750,757, Cl. 558-232.000.
- Deshpande, Narayan V.: *See—*
  - Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., 5,751,315, Cl. 347-63.000.
  - Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., 5,751,317, Cl. 347-65.000.
- Desie, Guido: *See—*
  - Leenders, Luc; Oelbrandt, Leo; Bogaert, Jan Van den; and Desie, Guido, 5,751,325, Cl. 347-96.000.
- DeSilva, Renuka: *See—*
  - Akhavan-Tafti, Hashem; DeSilva, Renuka; Arghavani, Zahra; and Schoenfelner, Barry A., 5,750,698, Cl. 546-102.000.
- Desouches, Alain Michel: *See—*
  - Church, Mark A.; and Desouches, Alain Michel, 5,749,769, Cl. 451-5.000.
- Desroches, Roger G.: *See—*
  - Mayo, Gregory E.; Desroches, Roger G.; and Nedde, David N., 5,751,965, Cl. 395-200.540.
- Desselle, Alex S. Aerial photography device. 5,752,088, Cl. 396-12.000.
- Desu, Seshu Babu: *See—*
  - Lee, June-key; Chung, Il-sub; and Desu, Seshu Babu, 5,751,540, Cl. 361-321.400.
- Detering, Brent A.; Donaldson, Alan D.; Fincke, James R.; and Kong, Peter C., to Lockheed Idaho Technologies Company. Fast quench reactor and method. 5,749,937, Cl. 75-10.190.
- Detweiler, Charles A.; Deland, Daniel L.; and Beneker, Gerrit V., to Eaton Corporation. Fuel vapor control system. 5,749,349, Cl. 123-520.000.
- Deutsche Forschungsanstalt fur Luftund Raumfahrt e.V.: *See—*
  - Roehle, Ingo; and Schodl, Richard, 5,751,410, Cl. 356-28.000.
- Deutsche ITT Industries GmbH: *See—*
  - Theus, Ulrich, 5,751,826, Cl. 381-119.000.
- Deutsche Thomson Brandt GmbH: *See—*
  - Goseberg, Walter, 5,751,205, Cl. 336-178.000.
- Dev, Roger H.; and Nelson, Mark H. System for determining the status of an entity in a computer network. 5,751,933, Cl. 395-182.020.
- de Villiers, Ethel-Michelle: *See—*
  - Cerutti, Peter; Whitcomb, Jeannette; Zijlstra, Jacob; and de Villiers, Ethel-Michelle, 5,750,334, Cl. 435-5.000.
- Devine, Maryann: *See—*
  - Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Watts, Raymond Frederick, 5,750,476, Cl. 508-291.000.
- Devine Rendezvous: *See—*
  - Batchelor, William Herbert, 5,749,220, Cl. 60-39.750.
- Devro-Teepak, Inc.: *See—*
  - Kearby, Ronald S.; Fox, Mark Lee; and Kelley, Mark David, 5,750,217, Cl. 428-34.800.
- Dewan, Jennifer E.: *See—*
  - Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.
- DeWolf, Thomas L.: *See—*
  - Dolan, Robert P.; Phillips, Thomas R.; DeWolf, Thomas L.; and Hill, Mark A., 5,751,948, Cl. 395-185.070.
- Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, to George Koch Sons, Inc. Multi-zone method for controlling voc and nox emissions in a flatline conveyor wafer drying system. 5,749,160, Cl. 34-502.000.
- Dharchoudhury, Abhijit: *See—*
  - Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., 5,751,593, Cl. 364-488.000.
- Diamant Boart, Inc.: *See—*
  - Markley, Charles E.; and Younger, Rick, 5,749,353, Cl. 125-20.000.
- Diamond Multimedia Systems, Inc.: *See—*
  - Keller, James A.; and Flory, Kevin J., 5,752,032, Cl. 395-681.000.
- Diana, Guy Dominic: *See—*
  - Aldous, David J.; Bailey, Thomas R.; Diana, Guy Dominic; and Nitz, Theodore J., 5,750,527, Cl. 514-252.000.
- Diaz, Zaida; and Wilkey, John David, to Shell Oil Company. Removal of lithium from polymer cements. 5,750,032, Cl. 210-688.000.
- Didona, Kevin M.: *See—*
  - Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., 5,749,227, Cl. 60-657.000.
- Diederich, Robert J.: *See—*
  - Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, 5,750,652, Cl. 530-350.000.
- Dieffenderfer, James Warren: *See—*
  - Wilkinson, Paul Amba; Dieffenderfer, James Warren; Kogge, Peter Michael; and Schoonover, Nicholas Jerome, 5,752,067, Cl. 395-800.160.
- Diehl, Arnold: *See—*
  - Dose, Rolf; and Diehl, Arnold, 5,749,678, Cl. 405-184.000.
- Diehl, Charles F.; and Tancrede, Jean M., to Dow Chemical Co., The; and Exxon Chemical Patents, Inc. Hot-melt adhesives for disposable items and articles made therefrom. 5,750,623, Cl. 525-98.000.
- Diehl Remscheid GmbH & Co.: *See—*
  - Wiesner, Hagen Heinz; and Spies, Klaus, 5,749,634, Cl. 305-42.000.
- Dien, Ghing-Hsin. Dual/multiple voltage level input switching power supply. 5,751,564, Cl. 363-37.000.
- Dietrich, Gabriele; Smith, Jane; and Peng, Jianying, to American Cyanamid Company. AHAS promoter useful for expression of introduced genes in plants. 5,750,866, Cl. 800-205.000.
- Digdigan, Larry V.: *See—*
  - Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
- Digestive Care Inc.: *See—*
  - Sipos, Tibor, 5,750,104, Cl. 424-94.210.
- Digital Equipment Corporation: *See—*
  - Jarvis, Neil Alasdair James, 5,752,255, Cl. 711-3.000.
  - Williams, Simon Mark; and McGeary, Michael Lawrence, 5,751,554, Cl. 361-760.000.
- Digital Theater System, Inc.: *See—*
  - Beard, Terry D., 5,751,398, Cl. 352-236.000.
- Dike, David Z.: *See—*
  - Ellsworth, William D.; Dike, David Z.; and Laber, David I., 5,749,822, Cl. 493-248.000.
- Dilling, Peter; and Huguenin, Sallie B., to Westvaco Corporation. Method of preparing high activity sulfonated lignin dye dispersants. 5,749,926, Cl. 8-524.000.
- Dimensions International, Inc.: *See—*
  - Carlson, Kenneth; and Hucks, Charles, 5,752,216, Cl. 701-117.000.
- Dine, Osman Saim: *See—*
  - Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.
- Dingsor, Andrew Dwight, to International Business Machines Corporation. Apparatus, method and article of manufacture for carrier frequency compensation in a FM radio transmitter. 5,751,114, Cl. 375-222.000.
- Dinh, Khanh, to Heat Pipe Technology, Inc.; and Tropic-Kool Engineering Corp. Roof curb assembly with integral dehumidifier heat pipe controlled by a bypass system. 5,749,415, Cl. 165-297.000.
- Dinh, Michael Quan: *See—*
  - Guillot, Joe; Dinh, Michael Quan; Roberts, Bill; and McLemore, Linda M., 5,749,143, Cl. 29-841.000.
- Dinkins, Gilbert M., to Eon Corporation. Cellular digital signaling. 5,751,693, Cl. 370-95.100.
- Dion, Michael A.: *See—*
  - Hart, Paul R.; and Dion, Michael A., 5,750,052, Cl. 252-321.000.
- DIRO, Inc.: *See—*
  - Morgan, Vincent J.; and Shepherd, Norman J., 5,749,731, Cl. 433-173.000.
- Divivier, Robert J.; Haines, Ralph; Nemirovsky, Mario D.; and Perez, Alexander, to National Semiconductor Corporation. Pipelined microprocessor that pipelines memory requests to an external memory. 5,752,269, Cl. 711-169.000.
- Divivier, Robert James: *See—*
  - Nemirovsky, Mario; Perez, Alexander; Divivier, Robert James; and Sankar, Narendra, 5,752,273, Cl. 711-201.000.
- Dix, Dan, to Moldex-Metric, Inc. Headband with break-away cord attachment. 5,749,373, Cl. 128-864.000.
- Dix, Johannes Peter: *See—*
  - Schröder, Gunter-Rudolf; Mayer, Udo; Baus, Ulf; and Dix, Johannes Peter, 5,750,742, Cl. 552-109.000.
- Dixon, Richard A.; Paiva, Nancy L.; and Oommen, Abraham, to Samuel Roberts Noble Foundation, Inc., The. Isoflavone reductase promoter. 5,750,399, Cl. 435-419.000.
- Dixy Yarns, Inc.: *See—*
  - Rees, John Joseph M.; and Hixon, Leonard L., Jr., 5,749,212, Cl. 57-225.000.
- Dobbins, Kurt A.; Cullerot, David L.; Negus, Stephen H.; and Haggerty, William T., to Cabletron Systems, Inc. Internet protocol (IP) work group routing. 5,751,971, Cl. 395-200.680.
- Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, to Hoffmann-La Roche Inc. Process for producing hydrophobic polypeptides and proteins, and fusion proteins for use in producing same. 5,750,374, Cl. 435-69.700.

- Dobrovolny, Pierre, to Zenith Electronics Corporation. Selective RF circuit with varactor tuned and switched bandpass filters. 5,752,179, Cl. 455-266.000.
- Dobson, Douglas A.: *See—*
  - Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.
- Dockter, Michael Jon: *See—*
  - Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, 5,752,022, Cl. 395-610.000.
- Documagix, Inc.: *See—*
  - Hahn, Samuel S.; LeGault, Kenn; Wheeler, Maxon; and Degenhardt, Jon R., 5,751,287, Cl. 345-351.000.
- Dodd, Michael Thomas: *See—*
  - Evans, Joel Franklin; Cox, Bruce Russell; Dodd, Michael Thomas; and Hopkins, Jeffrey Jon, 5,750,122, Cl. 424-401.000.
- Doddington, George R.: *See—*
  - Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.
- Dodo, Toshihiro: *See—*
  - Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, 5,750,267, Cl. 428-469.000.
- Doehler, Sigrid Anni Lore: *See—*
  - Dorff, Peter; Kowalewski, Joern; Doehler, Sigrid Anni Lore; and Krabbenhoeft, Uwe-Jens, 5,751,845, Cl. 382-162.000.
- Doemens, Günter; and Gilch, Markus, to Siemens Aktiengesellschaft. Force a displacement sensor with a capacitive transducer. 5,750,904, Cl. 73-862.623.
- Doherty, Donald B.: *See—*
  - Markandey, Vishal; Doherty, Donald B.; and Gove, Robert J., 5,751,379, Cl. 348-759.000.
- Doi, Shuji: *See—*
  - Andreatta, Alejandro; and Doi, Shuji, 5,751,389, Cl. 349-97.000.
- Doidge, Jeffrey; and Cassidy, Terence, to Edgar Allen Engineering Limited. High tensile strand, anchorages and methods of installation thereof. 5,749,681, Cl. 405-302.200.
- Doitel, Ofer: *See—*
  - Raab, Ilan; Manghirmalani, Ravi; Doitel, Ofer; and Izbicki, Lynne Marie, 5,751,967, Cl. 395-200.580.
- Dokyi, Emmanuel K., to Eastman Kodak Company. Method of mounting filters on image sensors. 5,750,982, Cl. 250-226.000.
- Dolan, Mary Louis: *See—*
  - Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
- Dolan, Robert P.; Phillips, Thomas R.; DeWolf, Thomas L.; and Hill, Mark A., to Carrier Corporation. System for processing HVAC control information. 5,751,948, Cl. 395-185.070.
- Dolby Laboratories Licensing Corporation: *See—*
  - Fielder, Louis Dunn, 5,752,225, Cl. 704-229.000.
- Dolecek, Victor D.: *See—*
  - Holmes, Brian M.; Blakeslee, Jeffrey J.; and Dolecek, Victor D., 5,750,025, Cl. 210-361.000.
- Dolendo, Edward E.: *See—*
  - Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., 5,749,881, Cl. 606-151.000.
- Dombrowski, Edward J., Jr.; Jones, Robert L.; Warner, John C.; and Yang, Jiyue, to Polaroid Corporation. Thermographic recording films. 5,750,463, Cl. 503-204.000.
- Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, to Polaroid Corporation. Thermographic recording. 5,750,464, Cl. 503-204.000.
- DOMPE ' SpA: *See—*
  - Mantovanini, Marco; Melillo, Gabriella; and Daffonchio, Luisa, 5,750,536, Cl. 514-300.000.
- Domzalski, Ken, to 3266974 Canada Inc. Exercising machine with direct drive to weight stack. 5,749,813, Cl. 482-97.000.
- Donaldson, Alan D.: *See—*
  - Detering, Brent A.; Donaldson, Alan D.; Fincke, James R.; and Kong, Peter C., 5,749,937, Cl. 75-10.190.
- Donelli, Giordano; Rosellini, Massimiliano; Taliento, Raffaella; and Dore', Fausto, to Industrie Chimiche Caffaro, S.p.A. Process for making paper and cardboard. 5,750,006, Cl. 162-181.500.
- Donnelly Corporation: *See—*
  - Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,751,489, Cl. 359-603.000.
- Donovan, Kenneth B.; Ferrell, Richard A.; Heidrich, Arthur J.; and Zirpolo, Dominick S., to Lockheed Martin Corporation. System and method for accurate and efficient geodetic database retrieval. 5,751,612, Cl. 364-578.000.
- Doornekamp, Martin; Van Veldhuisen, Willem; and De Greef, Willem Marius, to FPS Food Processing Systems B.V. Apparatus for orienting eggs on a second conveyor with their points to one side. 5,749,453, Cl. 198-400.000.
- Dore', Fausto: *See—*
  - Donelli, Giordano; Rosellini, Massimiliano; Taliento, Raffaella; and Dore', Fausto, 5,750,006, Cl. 162-181.500.
- Dorenbos, David, to Motorola, Inc. Use of an encryption server for encrypting messages. 5,751,813, Cl. 380-49.000.
- Dorenbosch, Jheroen; Ayerst, Douglas Irvin; and Cannon, Gregory Lewis, to Motorola, Inc. Method and apparatus for controlling how a receiver responds to a message. 5,752,166, Cl. 455-67.100.
- Dorenkott, Jeffrey S.; Wilder, Steven E.; Nyugen, Dinh; and Murthy, Kurukundi Ramesh, to Chiron Diagnostics Corporation. Method and apparatus for aspirating and dispensing sample fluids. 5,750,881, Cl. 73-37.000.
- Dorff, Peter; Kowalewski, Joern; Doehler, Sigrid Anni Lore; and Krabbenhoeft, Uwe-Jens, to Linotype Hell AG. Method for generating smooth color corrections in a color space, particularly a CIELAB color space. 5,751,845, Cl. 382-162.000.
- Dorio, Michael A.: *See—*
  - Driscoll, Michael E.; Dorio, Michael A.; and Keogh, Frank T., 5,749,722, Cl. 432-118.000.
- Dörner, Stefan; Kemker, Uwe; Simm, Hans-Peter; and Lapp, Oliver, to Vorwerk & Co. Interholding GmbH. Food processor. 5,749,285, Cl. 99-348.000.
- Dorrough, Michael L. Level meter for digitally-encoded audio. 5,751,819, Cl. 381-56.000.
- Dorst, Leendert: *See—*
  - Cameron, Alexander John; and Dorst, Leendert, 5,751,573, Cl. 364-167.010.
- Dosaka, Katsumi: *See—*
  - Yamazaki, Akira; and Dosaka, Katsumi, 5,751,655, Cl. 365-233.000.
- Dose, Rolf; and Diehl, Arnold, to Putzmeister-Werk Maschinenfabrik GmbH. Device for driving a tunnel or drain pipe. 5,749,678, Cl. 405-184.000.
- Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, to Optec Dai-Itchi Denko Co., Ltd.; and Dainichiseika Color & Chemicals Mfg. Co., Ltd. Insulated electric wire. 5,750,257, Cl. 428-379.000.
- Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, to Matsushita Electric Industrial Co., Ltd. Reference voltage supply circuit and voltage feedback circuit. 5,751,142, Cl. 323-316.000.
- Dossett, Stephen John, to BP Chemicals Limited. Catalyst composition for preparing polyketones. 5,750,456, Cl. 502-155.000.
- Doty, Douglas E.; Johnsen, David G.; and Moore, Donald W. Persistent heap for dynamic picture objects. 5,751,613, Cl. 364-578.000.
- Dou, Xiaoming; Yamaguchi, Yoshinori; and Uenoyama, Harumi, to Kyoto Dai-ichi Kagaku Co., Ltd. Method of and apparatus for immune analysis. 5,750,410, Cl. 436-525.000.
- Dow Chemical Company, The: *See—*
  - Danner, Mark C.; and Klaber, Kenneth E., 5,750,252, Cl. 428-332.000.
  - Diehl, Charles F.; and Tancrede, Jean M., 5,750,623, Cl. 525-98.000.
  - Kiefer, Garry E.; Simon, Jaime; and Garlich, Joseph R., 5,750,660, Cl. 534-10.000.
  - Myers, Michael O., 5,750,656, Cl. 528-373.000.
- Dow Corning Corporation: *See—*
  - Burns, Gary Thomas; Hahn, James Richard; and Reese, Clifford Carlton, 5,750,610, Cl. 524-434.000.
  - LeGrow, Gary Edward; and Smith, John Cyrus, Jr., 5,750,098, Cl. 424-70.120.
- Dow Corning Toray Silicone Co., Ltd.: *See—*
  - Manzouji, Ryuko; and Okawa, Tadashi, 5,750,587, Cl. 522-15.000.
- Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., to University of Alabama at Huntsville. Photonic bandgap apparatus and method for delaying photonic signals. 5,751,466, Cl. 359-248.000.
- Downing, Patrick Francis: *See—*
  - Coley, Brett Angus; Chin, Vincent G.; Downing, Patrick Francis; and Wormald, David M., 5,751,914, Cl. 395-51.000.
- Downs, Walter S., III: *See—*
  - Babu, Mangalore S.; Nahar, Jinen K.; Rogers, Gregory B.; and Downs, Walter S., III, 5,751,717, Cl. 370-466.000.
- Doyle, Michael P., to Vinzoyl Technical Services, LLC. High shear asphalt compositions. 5,749,953, Cl. 106-273.100.
- Doyle, Michael V. Method for selection of biologically active peptide sequences. 5,750,344, Cl. 435-6.000.
- Dozier, Camille Louise: *See—*
  - Mannette, Michael Russell; Dozier, Camille Louise; and Nguyen, Tom, 5,751,772, Cl. 375-316.000.
- Dozier, Charles Wayne; and Mitchell, Thomas William, to Dozier Financial Corporation. Image retention and information security system. 5,751,345, Cl. 348-153.000.
- Dozier, Charles Wayne; and Mitchell, Thomas William, to Dozier Financial Corporation. Image retention and information security system. 5,751,346, Cl. 348-153.000.
- Dozier Financial Corporation: *See—*
  - Dozier, Charles Wayne; and Mitchell, Thomas William, 5,751,345, Cl. 348-153.000.
  - Dozier, Charles Wayne; and Mitchell, Thomas William, 5,751,346, Cl. 348-153.000.
- Dr. Boy GmbH: *See—*
  - Klein, Heinz Hermann; and Filippi, Werner, 5,750,163, Cl. 425-590.000.
- Draeger, Nicholas: *See—*
  - Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, 5,750,374, Cl. 435-69.700.
- Drake, Donald J., to Xerox Corporation. Hybrid ink jet printer with alignment of scanning printheads to pagewidth printbar. 5,751,311, Cl. 347-43.000.

Draper, Kenneth G.: *See—*

Thompson, James D.; and Draper, Kenneth G., 5,750,390, Cl. 435-195.000.

Drechsel, Arno. Jet actuator particularly for pulse sprinklers. 5,749,523, Cl. 239-233.000.

Dreese, Delbert R.: *See—*

Humphries, Robert D.; Dreese, Delbert R.; Taylor, Louis L.; and Parker, Dennis Clay, 5,749,936, Cl. 71-64.050.

Dreier, Kimberly Ann: *See—*

Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.

Drennen, James K., III; and Kirsch, John D., to Holy Ghost, Duquesne University of the. Apparatus for nondestructively inspecting a coated article and associated method. 5,750,996, Cl. 250-341.200.

Dresser-Rand Company: *See—*

Astor, John J., 5,749,670, Cl. 403-269.000.

Drewes, Ulfert: *See—*

Hegner, Frank; Schmidt, Elke Maria; Drewes, Ulfert; and Martin, Rainer, 5,750,899, Cl. 73-756.000.

Drexhage, Karl-Heinz: *See—*

Herrmann, Rupert; Josel, Hans-Peter; Drexhage, Karl-Heinz; and Arden-Jacob, Jutta, 5,750,409, Cl. 436-517.000.

Drexler, Barry Lee: *See—*

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

Dreyfuss, David Daniel: *See—*

Denton, Gary Allen; and Dreyfuss, David Daniel, 5,751,299, Cl. 347-2.000.

Driedger, Paul E.; and Quick, James, to Procyon Pharmaceuticals, Inc. Protein kinase C Modulators. L. 5,750,568, Cl. 514-533.000.

Driscoll, Michael E.; Dorio, Michael A.; and Keogh, Frank T., to American Gas Furnace Company. Single charge continuous rotary retort furnace with an accessible door. 5,749,722, Cl. 432-118.000.

Drocourt, Jean-Louis; Guillet, Jean-Gérard; and Groner, Warren, to Chemunex. Apparatus and process for the detection and counting of rarely occurring mammalian cells. 5,751,839, Cl. 382-133.000.

Drohan, William, to ADE Corproation. Testing system with real time/off line functionality allocation. 5,750,908, Cl. 73-865.900.

Drossapharm AG: *See—*

Lutz, Jürg; and Cierpka, Henning F., 5,750,139, Cl. 424-448.000.

DSC Communications Corporation: *See—*

Elliott, Paul M., 5,751,724, Cl. 370-536.000.

Du, Benjamin R. Positive displacement pump including modular pump component. 5,749,709, Cl. 417-44.800.

Du Pont de Nemours, E. I., and Company: *See—*

Barsotti, Robert John; and Scopazzi, Christopher, 5,750,619, Cl. 525-65.000.

Cassel, Wendell Richard; Corbin, David Richard; and Rao, V.N. Mallikarjuna, 5,750,808, Cl. 570-157.000.

Davis, Darwin Darrell; and Wilhoit, Eugene Dennis, 5,750,791, Cl. 564-488.000.

Gam, Allisa, 5,750,596, Cl. 523-404.000.

Geadelmann, Jon L.; and Leto, Kenneth, 5,750,851, Cl. 800-200.000.

Gridnev, Alexei Alexeyevich, 5,750,772, Cl. 560-218.000.

Hayashi, Ryuichi, 5,750,639, Cl. 528-310.000.

Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, 5,750,215, Cl. 428-34.200.

Kamireddy, Balreddy; and Murray, William Mark, 5,750,471, Cl. 504-269.000.

Page, Loretta Ann Grezzo; and Pearlstine, Kathryn Amy, 5,750,594, Cl. 523-161.000.

Pechhold, Engelbert; and Murphy, Peter Michael, 5,750,445, Cl. 442-168.000.

Powers, Ervin Townsend, Jr.; and Rudisill, Edgar North, 5,750,152, Cl. 425-72.200.

Shen, Zhi-Yuan, 5,750,473, Cl. 505-210.000.

Trouilhet, Yves, 5,750,611, Cl. 524-450.000.

Uy, William Cheng, 5,750,064, Cl. 264-204.000.

DuBell, Thomas L., to United Technologies Corporation. Combustor with first and second zones. 5,749,219, Cl. 60-39.360.

DuBose, Richard G.; and Teague, Martin, to Microtest, Inc. Method and apparatus for concurrently measuring near end crosstalk at two ends of a cable. 5,751,152, Cl. 324-628.000.

Duchet, Christian: *See—*

Bissessur, Hans; Mestric, Roland; and Duchet, Christian, 5,751,872, Cl. 385-37.000.

Dudek, Eric Alan: *See—*

Lindner, Robert; Dudek, Eric Alan; and Louies, Bernard Daniel, 5,750,608, Cl. 524-399.000.

Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, to Mikoh Technology Limited. Diffraction viewing device to aid in authenticating an optical surface. 5,751,412, Cl. 356-71.000.

Duell, Samuel I. In-line sewage pump. 5,749,102, Cl. 4-431.000.

Dufresne, Claude: *See—*

Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.

Duh, Ben, to Shell Oil Company. Process for the crystallization of polyethylene naphthalate prepolymers and the solid stating of those crystallized prepolymers. 5,750,644, Cl. 528-481.000.

Duke University: *See—*

Kovacs, Stephen G., 5,749,839, Cl. 601-153.000.

Dulong, Carole, to Intel Corporation. Method and apparatus employing Viterbi scoring using SIMD instructions for data recognition. 5,752,001, Cl. 395-500.000.

Dumortier, André; and Faget, Jean-Gabriel, to Societe Europeene de Propulsion. Device for controlling a spacecraft by gating gas via a moving nozzle. 5,749,559, Cl. 251-30.030.

Dun & Bradstreet Software Services, Inc.: *See—*

Familiar, Robert F., 5,752,027, Cl. 395-614.000.

Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., to Exxon Chemical Patents Inc. High viscosity complex alcohol esters. 5,750,750, Cl. 554-117.000.

Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., to Dakota Gasification Company. Method for purifying natural cresylic acid mixtures. 5,750,009, Cl. 203-64.000.

Duncan, Thomas Edwin: *See—*

Lukich, Lewis Timothy; Duncan, Thomas Edwin; and Lansinger, Colleen Marie, 5,750,615, Cl. 524-495.000.

Dundas, Dennis L.; and Klinedinst, Paul W., to Graham Engineering Corporation. Apparatus for trimming the neck of blow molded plastic bottles and method. 5,749,275, Cl. 83-24.000.

Dunn, Matthew W. Interactive entertainment network system and method with analog video startup loop for video-on-demand. 5,752,160, Cl. 455-5.100.

Dupechez, Thierry: *See—*

Bastart, Jean-Pierre; Dupechez, Thierry; and Fahre, Jean-Louis, 5,750,561, Cl. 514-449.000.

DuPont Merck Pharmaceutical Company, The: *See—*

Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.

Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.

Duprat, Stéphane Courdavault: *See—*

Contet, Jean-Pierre; Duprat, Stéphane Courdavault; Storet, Yvan; and Vindret, Jean-Francois, 5,750,492, Cl. 510-527.000.

Dupre, Hernan K. Control system for snow making devices. 5,749,517, Cl. 239-14.200.

Duprez, Wayne R., to Standard-Thomson Corporation. Valve venting apparatus. 5,749,515, Cl. 236-34.500.

Duracell inc.: *See—*

Chi, Ignacio; Ramaswami, Karthik; Kuo, Han C.; and Todino, Christa, 5,750,282, Cl. 429-49.000.

DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.

Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.

Duret, Pierre, to Institute Francais du Petrole. Two-stroke internal-combustion engine depollution process and associated applications. 5,749,333, Cl. 123-295.000.

Durette, Philippe L.: *See—*

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Durgin, George A.: *See—*

Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., 5,749,701, Cl. 415-115.000.

Durrani, Sheryar: *See—*

Exner, Gregory F.; Hofer, John Curtis; Durrani, Sheryar; and Matsu, Richard L., 5,749,598, Cl. 280-728.200.

DUSA Pharmaceuticals, Inc.: *See—*

Menon, I. Aravindakshan; and Haberman, Herbert F., 5,750,093, Cl. 424-59.000.

Dusserre-Telmon, Guy Franck Paul; Plona, Daniel Georges; and Tourne, Christophe Yvon Gabriel, to Societe Nationale d'Etude de Contruction de Moteurs d'Aviation "Snecma". Bearing assembly with dynamic drainage supplied with lubricant. 5,749,660, Cl. 384-475.000.

Duttweiler, Donald Lars; Kawahara, Toshiro; Kim, Cheng; and Miki, Toshio, to Lucent Technologies Inc. Intelligent near-end speech detection. 5,752,229, Cl. 704-270.000.

Duval, Christopher R.: *See—*

Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., 5,751,447, Cl. 358-487.000.

Duvillier, Eric; Gineston, Jean-Marie; and De Roaldes, Olivier, to Biomicron; and Ortho Diffusion & Recherche. Apparatus for resection of the condyles of the knee for putting a prosthesis into place, and method for putting such an apparatus into position. 5,749,876, Cl. 606-88.000.

Dybalski, Ronald Henry: *See—*

Avila, Javier; Obermeyer, James Andrew; Speck, Michael H.; and Dybalski, Ronald Henry, 5,749,554, Cl. 248-311.200.

Dye, G. Frank: *See—*

Black, F. Martin; and Dye, G. Frank, 5,751,269, Cl. 345-108.000.

Dyer, Paul Nigel: *See—*

Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.

Dynamic Air, Inc.: *See—*

Steele, James R., 5,749,609, Cl. 285-226.000.

Dynamic Mixers Inc.: *See—*

Schobert-Csongor, Desider G.; and Schott, Nick Reinhold, 5,749,649, Cl. 366-76.400.

Dynamit Nobel Aktiengesellschaft: *See—*

Redecker, Klaus; Schreiner, Gunter; and Spranger, Wolfgang, 5,750,920, Cl. 149-11.000.

Dynaproducts, Inc.: *See—*

Zebuhr, William H., 5,749,380, Cl. 132-216.000.

Dynax Corporation: *See—*

Clark, Kirtland P., 5,750,043, Cl. 252-2.000.

Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., to Motorola, Inc. Adaptable portable radio. 5,752,205, Cl. 455-575.000.

Eagle Creek, Inc.: *See—*

Wulf, Katherine; and Barker, Richard Steven, 5,749,503, Cl. 224-153.000.

Earl, Richard Alan: *See—*

Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.

Earle, Anthony; and Wells, Leslie Robert, to Eastman Kodak Company. Photographic processing apparatus. 5,752,121, Cl. 396-606.000.

Earle, Anthony: *See—*

Glover, Edward Charles; and Earle, Anthony, 5,752,124, Cl. 396-626.000.

Easley, Michael A.; and Horn, William E., Jr., to Aluminum Company of America. High surface area meixnerite from hydrotalcites infiltrated with metal salts. 5,750,453, Cl. 502-84.000.

Eastman Chemical Company: *See—*

Edgar, Kevin J.; and Bogan, Richard T., 5,750,677, Cl. 536-63.000.

Johnson, Elliott Will Henry; Stepp, Robert Wellington, III; and Cook, William L., 5,749,944, Cl. 95-150.000.

McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, 5,751,011, Cl. 250-559.330.

Park, Vernon Kee, 5,750,269, Cl. 428-484.000.

Eastman, Jay M.; and Quinn, Anna Marie, to PSC Inc. Optical system for scanning and reading bar codes which is adapted to be configured in a hand held unit. 5,750,976, Cl. 235-472.000.

Eastman Kodak Company: *See—*

Antoniades, Michael George; Wen, Xin; and Herman, Mark Jay, 5,750,326, Cl. 430-568.000.

Bedzyk, Mark David, 5,751,500, Cl. 359-740.000.

Bogdanowicz, Mitchell Joseph; Hagmaier, Charles Peter; and Gutierrez, Leslie, 5,750,320, Cl. 430-383.000.

Bridges, Mark E., 5,751,334, Cl. 347-262.000.

Bryant, Steven M.; and Loewenthal, Kenneth H., 5,751,910, Cl. 395-22.000.

Chang, Yun Chea; Rodgers, James; and Pepe, Joseph Philip, 5,750,327, Cl. 430-569.000.

Cloutier, Robert P.; Kiesow, Ronald H.; and Malloy Desormeaux, Stephen G., 5,752,085, Cl. 396-6.000.

Dokyi, Emmanuel K., 5,750,982, Cl. 250-226.000.

Earle, Anthony; and Wells, Leslie Robert, 5,752,121, Cl. 396-606.000.

Gasper, John; and Schildkraut, Jay Stuart, 5,752,152, Cl. 399-366.000.

Glover, Edward Charles; and Earle, Anthony, 5,752,124, Cl. 396-626.000.

Hatwar, Tukaram K.; Tyan, Yuan-Sheng; and Brucker, Charles F., 5,750,274, Cl. 428-694.0MM.

Lambert, Patrick M.; Trauernicht, David P.; and Bringley, Joseph F., 5,750,318, Cl. 430-346.000.

Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, 5,750,465, Cl. 503-227.000.

Maher, James C.; Tyagi, Dinesh; and Locke, John R., 5,750,307, Cl. 430-125.000.

Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, 5,749,468, Cl. 206-455.000.

McGuckin, Hugh G.; Badger, John S.; and Kurz, Edward A., 5,750,322, Cl. 430-463.000.

McIntyre, Dale F.; Pagano, Daniel M.; Patton, David L.; and Weissberger, Edward, 5,751,399, Cl. 353-120.000.

McIntyre, Dale F.; and Schrock, Anthony W., 5,752,115, Cl. 396-431.000.

McIntyre, Dale Frederick, 5,752,097, Cl. 396-157.000.

Melpolder, Sharon Marilyn; Smith, Dennis Edward; Wheeler, Christopher Edwin; and Muehlbauer, John Leonard, 5,750,328, Cl. 430-619.000.

Meyers, Mark Marshall, 5,751,492, Cl. 359-619.000.

Morton, Roger Roy A., 5,752,111, Cl. 396-324.000.

Mydlarz, Jerzy Z.; Klaus, Roger L.; and Saeva, Franklin D., 5,750,324, Cl. 430-567.000.

O'Brien, Michael Joseph; Bryant, Robert Cooper; and Colleluori, Richard Alexander, 5,752,104, Cl. 396-191.000.

Sangregory, Jude A., 5,752,087, Cl. 396-6.000.

Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.

Schrock, Anthony Ward, 5,752,100, Cl. 396-129.000.

Szajewski, Richard Peter, 5,750,325, Cl. 430-567.000.

Tang, Manh; and Hadley, Keith A., 5,751,601, Cl. 364-526.000.

Texter, John; Sharma, Ravi; and Czekai, David Alan, 5,750,321, Cl. 430-449.000.

Wilson, John C.; and Fields, Robert D., 5,750,305, Cl. 430-110.000.

Wilson, John C.; and Fields, Robert D., 5,750,715, Cl. 548-209.000.

Eaton Corporation: *See—*

Detweiler, Charles A.; Deland, Daniel L.; and Beneker, Gerrit V., 5,749,349, Cl. 123-520.000.

Gehrs, Donald F.; and Craddock, Robert E., 5,751,543, Cl. 361-641.000.

Rose, Peter H.; and Brailove, Adam A., 5,751,003, Cl. 250-492.210.

Schlotterer, John C.; and Elms, Robert T., 5,751,234, Cl. 341-139.000.

Weimer, Michael G.; Wetzel, David K.; and Powers, Larry D., 5,750,905, Cl. 73-863.000.

Eberhardt, Anthony N.; Dailey, William L.; and Harada, John A., to Sun Microsystems, Inc. Hard disk drive assembly which has a plenum chamber and a fan assemhly that is perpendicular to a rack chamber. 5,751,549, Cl. 361-687.000.

Ebert Composites Corporation: *See—*

Johnson, David W., 5,749,198, Cl. 52-651.040.

Ebisawa, Isao: *See—*

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Ebner, Fritz F.: *See—*

Narendranath, Nagesh H.; and Ebner, Fritz F., 5,751,433, Cl. 358-298.000.

Narendranath, Nagesh H.; and Ebner, Fritz F., 5,751,434, Cl. 358-298.000.

Ebner, Walter B.: *See—*

Xie, Like; Fouchard, David T.; Ebner, Walter B.; and Megahed, El-Sayed, 5,750,288, Cl. 429-229.000.

Eby, William H.; and Schechinger, Elmer F., to Stine Seed Farm, Inc. Soybean cultivar 16502112. 5,750,859, Cl. 800-200.000.

Eby, William H.; and Schechinger, Elmer F., to Stine Seed Farm, Inc. Soybean cultivar 01136F. 5,750,860, Cl. 800-200.000.

Eccles, John N.: *See—*

Riach, David J. A.; Longmore, Richard J.; and Eccles, John N., 5,751,842, Cl. 382-137.000.

Eck, Herbert; Fleischmann, Gerald; and Wierer, Konrad, to Wacker-Chemie GmbH. Process for the preparation of biologically degradable aqueous dispersions. 5,750,617, Cl. 524-718.000.

Eckardt, Helmut; Schröder, Klaus; Ehritt, Jürgen; and Hübel, Uwe, to Battenfeld GmbH. Device for the injection molding of plastic objects enclosing hollow spaces and process for operating it. 5,750,155, Cl. 425-130.000.

Eckmann, Elizabeth J.: *See—*

Kish, Frederick A.; Eckmann, Elizabeth J.; and Shelton, Lawrence S., 5,749,692, Cl. 411-453.000.

Ecolab Inc.: *See—*

Falbaum, David J.; Hei, Robert D.; Maier, Helmut K.; and Mattia, Paul J., 5,750,484, Cl. 510-276.000.

Eda, Masami: *See—*

Shinya, Nozomi; and Eda, Masami, 5,749,401, Cl. 141-80.000.

Edgar Allen Engineering Limited: *See—*

Doidge, Jeffrey; and Cassidy, Terence, 5,749,681, Cl. 405-302.200.

Edgar, Kevin J.; and Bogan, Richard T., to Eastman Chemical Company. Direct process for the production of cellulose esters. 5,750,677, Cl. 536-63.000.

Edgerley, David Anthony: *See—*

Williams, Roger Leonard; and Edgerley, David Anthony, 5,749,850, Cl. 604-74.000.

Edl, Michael J.: *See—*

Kehr, Bruce A.; Lerner, David; Demenus, Richard D.; and Edl, Michael J., 5,752,235, Cl. 705-3.000.

Edstrom, Gene: *See—*

Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,751,936, Cl. 395-182.050.

Edward B. Prior & Associates: *See—*

Prior, Edward B.; Caristi, Anthony J.; Lazo, Luis A.; and Prior, John E., 5,751,074, Cl. 307-118.000.

- Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, to Whitaker Corporation, The. Optical fiber ferrule. 5,751,875, Cl. 385-84.000.
- Edwards, Daniel A.: *See—*
  - Bagwell, Alan C.; and Edwards, Daniel A., 5,749,488, Cl. 220-269.000.
- Edwards, David Scott: *See—*
  - Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.
- Edwards, John R.: *See—*
  - Hyde, Darryl L.; and Edwards, John R., 5,751,514, Cl. 360-97.010.
- Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, to Johnson & Johnson Vision Products, Inc. Automated apparatus and method for consolidating products for packaging. 5,749,205, Cl. 53-542.000.
- Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., to Vidamed, Inc. Medical probe device with optical viewing capability. 5,749,846, Cl. 604-22.000.
- Edwards, Tim J.: *See—*
  - Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., 5,751,593, Cl. 364-488.000.
- Edwards, William Thomas, to Regenix Marketing Systems, Inc. Hair treatment system and kit for invigorating hair growth. 5,750,108, Cl. 424-195.100.
- Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingsbee, Derek A.; and Cederholm-Williams, Stewart A., to Bristol-Myers Squibb Company. Methods and compositions using fibrin monomer to make a fibrin sealant. 5,750,657, Cl. 530-382.000.
- Edwin, Tarun J.: *See—*
  - Banas, Christopher E.; and Edwin, Tarun J., 5,749,880, Cl. 606-198.000.
- Effelsberg, Uwe: *See—*
  - Kraiczek, Karsten G.; and Effelsberg, Uwe, 5,750,978, Cl. 250-216.000.
- EFKA-Werke Fritz Kiehn GmbH: *See—*
  - Ruppert, Heinrich W.; and Gätschmann, Klaus G., 5,749,378, Cl. 131-70.000.
- Egan, Philip S.: *See—*
  - Cowley, Tom J.; Bower, Larry O.; and Egan, Philip S., 5,751,214, Cl. 340-573.000.
- Egge, Trygve G.: *See—*
  - Breivik, Kåre; Egge, Trygve G.; and Herstad, Sverre, 5,749,758, Cl. 441-5.000.
- Eggeman, Timothy J.: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Ehritt, Jürgen: *See—*
  - Eckardt, Helmut; Schröder, Klaus; Ehritt, Jürgen; and Hübel, Uwe, 5,750,155, Cl. 425-130.000.
- Eibl, Ludwig: *See—*
  - Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, 5,750,634, Cl. 528-254.000.
- Eichbauer, George, to Tenneco Packaging. Stretch wrap films. 5,749,202, Cl. 53-399.000.
- Eichhorn, Thomas J.: *See—*
  - Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, 5,751,435, Cl. 358-299.000.
- Eick, Stephen Gregory: *See—*
  - Cox, Kenneth Charles; and Eick, Stephen Gregory, 5,751,931, Cl. 395-140.000.
- Eifuku, Hideki, to Matsushita Electric Industrial Co., Ltd. Semiconductor chip bonding method. 5,749,510, Cl. 228-122.100.
- Eiko Electric Products Corp.: *See—*
  - Wang, Yulis, 5,749,518, Cl. 239-17.000.
- Eilam, Yair: *See—*
  - Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.
- Eisai Co., Ltd.: *See—*
  - Christ, William J.; Rossignol, Daniel P.; Kobayashi, Seiichi; and Kawata, Tsutomu, 5,750,664, Cl. 536-17.200.
- Eisenbach, Lea; and Feldman, Michael, to Yeda Research and Development Co., Ltd. Double transfectants of the MHC genes as cellular vaccines for immuno prevention of tumor metastasis. 5,750,102, Cl. 424-93.210.
- Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., to Sanofi. 2-(pyrazol-5-yl-oxymethyl)-1,2-benzisothiazol-3 (2H)-One 1, 1-dioxides and compositions and method of use thereof. 5,750,550, Cl. 514-373.000.
- EJOT Verbindung Stechnik GmbH & Co. KG: *See—*
  - Konig, Gottfried, 5,749,689, Cl. 411-387.000.
- Eklund, Karl-Gunnar; and Mattsson, Tommy, to AB Volvo. Process for producing an adhesive bond in a folder joint. 5,749,992, Cl. 156-212.000.
- Elcorsy Technology Inc.: *See—*
  - Castegnier, Adrien; and Lepine, Normand, 5,750,593, Cl. 523-161.000.
- Elder, Vincent A., to Recot, Inc. Method and apparatus for determining the salt content of snack foods. 5,750,883, Cl. 73-53.010.
- Eldin, Sameer Hosam; Iqbal, Abul; Hao, Zhimin; and Lamatsch, Bernd, to Ciba Specialty Chemicals Corporation. Polymerizable diketopyrrolopyrroles and polymers prepared therewith. 5,750,723, Cl. 548-453.000.
- Electra Form, Inc.: *See—*
  - Schock, Richard J., Jr.; and Brun, Charles J., Jr., 5,750,161, Cl. 425-468.000.
- Electric Boat Corporation: *See—*
  - Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., 5,749,227, Cl. 60-657.000.
- Electro Scientific Industries, Inc.: *See—*
  - Cutler, Donald R.; Pailthorp, Robert M.; and Unrath, Mark A., 5,751,585, Cl. 364-474.030.
- Electronic Data Systems Corporation: *See—*
  - Havens, Charnell T., 5,752,242, Cl. 707-3.000.
- Electronics and Telecommunications Research Center: *See—*
  - Hyun, Kyung-Sook; Kwon, O-Kyun; Kim, Kwang-Joon; and Lee, El-Hang, 5,751,468, Cl. 359-282.000.
- Electronics and Telecommunications Research Institute: *See—*
  - Han, Jong-Seok; Hahn, Woo-Jong; and Yoon, Suk-Han, 5,751,934, Cl. 345-182.020.
  - Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, 5,750,452, Cl. 501-138.000.
  - Sung, Gun-Yong; and Suh, Jeong-Dae, 5,750,474, Cl. 505-329.000.
- Elekta AB: *See—*
  - Brown, Kevin J.; Harwood, William R.; and Bates, Terence, 5,751,781, Cl. 378-65.000.
- Elf Atochem Deutschland GmbH: *See—*
  - Steenblock, Roland Eugen; and Bührmann, Joachim, 5,750,232, Cl. 428-98.000.
- Elf Atochem S.A.: *See—*
  - Lallier, Jean-Pierre; and Bignon, Daniel, 5,749,977, Cl. 134-40.000.
  - Paul, Jean Michel; Samuel, Yves; and Esch, Marc, 5,750,771, Cl. 560-205.000.
  - Schirmann, Jean-Pierre; Hub, Serge; and Lantz, Andre, 5,750,810, Cl. 570-171.000.
- El-Faham, Ayman Ahmed: *See—*
  - Carpino, Louis A.; and El-Faham, Ayman Ahmed, 5,750,767, Cl. 560-161.000.
- Eli France: *See—*
  - Krivohlavek, Dennis; King, Gayle; and Planche, Jean-Pascal, 5,750,598, Cl. 524-71.000.
- Eli Lilly and Company: *See—*
  - Booher, Richard N.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,750,554, Cl. 514-397.000.
  - Bryant, Henry Uhlman; Finley, Don Richard; and Matsumoto, Ken, 5,750,708, Cl. 546-334.000.
  - Kjell, Douglas P.; and Perry, Fred M., 5,750,688, Cl. 540-596.000.
  - Monn, James A.; and Schoepp, Darryle D., 5,750,566, Cl. 514-510.000.
- Elias, Martin Charles; Johnston, Scott Anthony; and Hesling, Mark Ronald, to AOFR Pty. Limited. Fibre optic couplers. 5,751,873, Cl. 385-51.000.
- Elizabeth Arden: *See—*
  - Rokitowski, Karen Lee, 5,750,121, Cl. 424-401.000.
- Elizabeth Arden, a Division of Conopco, Inc.: *See—*
  - Rokitowski, Karen Lee, 5,750,127, Cl. 424-401.000.
- Elkhoury, Bassam N.; McFarland, Scott T.; and Perez, Miguel A., to Compaq Computer Corporation. Memory accessing in a multi-processor system using snooping. 5,752,265, Cl. 711-146.000.
- Elkins, John: *See—*
  - Lacey, William J.; and Elkins, John, 5,749,360, Cl. 128-207.140.
- Ellacott, Bruce Arthur. Object-oriented query mechanism. 5,752,028, Cl. 395-614.000.
- Elling, Lothar; and Kula, Maria-Regina, to Forschungszentrum Julich GmbH. Purified saccharose-synthase, process for its production and its use. 5,750,389, Cl. 435-193.000.
- Elliott, Michael L.: *See—*
  - Lamar, David A.; Chapman, Chris C.; and Elliott, Michael L., 5,749,932, Cl. 65-135.700.
- Elliott, Paul M., to DSC Communications Corporation. Demultiplexer for a multi-bitline bus. 5,751,724, Cl. 370-536.000.
- Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, to Abbott Laboratories. 3-descladinose-2,3-anhydroerythromycin derivatives. 5,750,510, Cl. 514-29.000.
- Elliott, Robert S.; and Frasnetti, Luca, to Whirlpool Europe B.V. Method and circuit for increasing the life of solenoid valves. 5,749,388, Cl. 137-1.000.
- Elliott, William B.: *See—*
  - Paulot, William M.; Probst, Joseph M.; and Elliott, William B., 5,750,286, Cl. 429-211.000.
- Ellis, Charles N.: *See—*
  - Voorhees, John J.; Ellis, Charles N.; and Griffiths, Christopher E. M., 5,750,570, Cl. 514-557.000.
- Ellis, David: *See—*
  - Danilewicz, John Christopher; Ellis, David; and Kobylecki, Ryszard Jurek, 5,750,520, Cl. 514-212.000.
- Ellis, M. Jeffrey, to Burns Philp Food Inc. In-line gravity feed shelf system. 5,749,478, Cl. 211-59.200.
- Ellis, Philip C.: *See—*
  - Meck, Leslie A.; and Ellis, Philip C., 5,749,612, Cl. 292-347.000.
- Ellsworth, William D.; Dike, David Z.; and Laber, David I., to Proven Designs, Inc. Gusset folding mechanism and method for plastic bag making machine. 5,749,822, Cl. 493-248.000.
- Elmendorf, Peter Claude: *See—*
  - Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, 5,751,595, Cl. 364-490.000.
- Elmo Company Limited: *See—*

  - Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,751,355, Cl. 348-375.000.
- Elms, Robert T.: *See—*
  - Schlotterer, John C.; and Elms, Robert T., 5,751,234, Cl. 341-139.000.
- Elonex PLC, Ltd.: *See—*
  - Kikinis, Dan, 5,752,075, Cl. 395-821.000.
- Elop Electro-Optics Industries, Ltd.: *See—*
  - Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.
- Elpatronic AG: *See—*
  - Aebersold, Hans; Gross, Norbert; and Urech, Werner, 5,749,511, Cl. 228-212.000.
- Elrod, Harry Frank: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Elsag International B. V.: *See—*
  - Hall, George R.; Barnett, Daniel C.; Smith, Robert A.; and Jewett, Scotty Y., 5,750,408, Cl. 436-137.000.
- Elsag International N.V.: *See—*
  - Schwiderski, Hans W., 5,750,902, Cl. 73-861.120.
- Eltro GmbH: *See—*
  - Wichmann, Gunter, 5,751,239, Cl. 342-68.000.
- Emarine, Chad A.: *See—*
  - Lucetti, Joseph J., 5,749,793, Cl. 473-324.000.
- EMC Corporation: *See—*
  - Ofek, Yuval; and Vishlitzky, Natan, 5,751,993, Cl. 395-463.000.
  - Stanley, Rick J.; and Raguin, Michel M., 5,751,594, Cl. 364-490.000.
- Emerson Electric Co.: *See—*
  - Amonett, Daniel Keith; Weaver, Robert Francis; and Burgin, Henry Earl, 5,750,948, Cl. 200-38.00R.
- Emhart Glass Machinery Investments Inc.: *See—*
  - Meyer, Willi, 5,749,553, Cl. 248-298.100.
- Emisphere Technologies, Inc.: *See—*
  - Kantor, Martin L., 5,750,147, Cl. 424-491.000.
- Emitec Gesellschaft Fuer Emissiontechnologie mbH: *See—*
  - Maus, Wolfgang; Swars, Helmut; and Brück, Rolf, 5,751,602, Cl. 364-557.000.
- Emmot, Darel N., to Hewlett-Packard Company. Texture mapping method and system. 5,751,292, Cl. 345-430.000.
- Emory University: *See—*
  - Medford, Russell M.; Alexander, R. Wayne; Parthasarathy, Sampath; and Khan, Bobby V., 5,750,351, Cl. 435-7.210.
- Empak, Inc.: *See—*
  - Gregerson, Barry, 5,749,467, Cl. 206-445.000.
- Emura, Katsumi: *See—*
  - Shibutani, Makoto; and Emura, Katsumi, 5,751,455, Cl. 359-126.000.
- Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, to Takasago International Corporation. Process for producing trans-3-isocamphylcyclohexanol. 5,750,804, Cl. 568-834.000.
- Enck, Richard S., to Kevex X-Ray. X-ray tube. 5,751,784, Cl. 378-140.000.
- Endo, Kaoru: *See—*
  - Sugiyama, Mikio; and Endo, Kaoru, 5,751,858, Cl. 382-236.000.
- Endo, Shiro: *See—*
  - Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.
- Endo, Tadashi: *See—*
  - Tamura, Akira; Yamada, Osamichi; Endo, Tadashi; and Uematsu, Eiji, 5,751,083, Cl. 310-80.000.
- Endo, Yasuhiro: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
- Endoluminal Therapeutics, Inc.: *See—*
  - Slepian, Marvin J.; and Schindler, Anton, 5,749,922, Cl. 623-1.000.
- Endotex Interventional Systems, Inc.: *See—*
  - Hogendijk, Michael; and Wholey, Mark H., 5,749,918, Cl. 623-1.000.
- EndoVascular Technologies, Inc.: *See—*
  - Quiachon, Dinah B.; Piplani, Alec A.; and Baughman, Larry G., 5,749,920, Cl. 623-1.000.
- Eng, Edward D.: *See—*
  - Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, 5,751,792, Cl. 379-89.000.
- Eng, Kai Yin; and Karol, Mark John, to Lucent Technologies Inc. Access method for broadband and narrowband networks. 5,751,708, Cl. 370-389.000.
- Engel, Eytan: *See—*
  - Shor, Joseph; Engel, Eytan; and Baron, Natan, 5,751,178, Cl. 327-333.000.
- Engelhard Corporation: *See—*
  - Behl, Sanjay; Nemeh, Saad; Willis, Mitchell J.; and Berberich, Joseph P., 5,749,958, Cl. 106-416.000.
- Engelhard/ICC: *See—*
  - Coellner, James A.; and Calton, Dean Scott, 5,749,230, Cl. 62-94.000.
- Engelhardt, Heinz: *See—*
  - Haas, Peter; Engelhardt, Heinz; and Müllner, Stefan, 5,750,679, Cl. 536-127.000.
- Engelhardt, Thomas; and Hähn, Reinhard. Iodine adsorption agent. 5,750,461, Cl. 502-347.000.
- Engelman, Melvin A.: *See—*
  - Zielinski, David M.; and Engelman, Melvin A., 5,749,411, Cl. 164-244.000.
- Engelson, Erik T., to Target Therapeutics, Inc. Variable stiffness balloon catheter. 5,749,849, Cl. 604-53.000.
- Engelson, Erik T., to Target Therapeutics, Inc. Aneurysm closure method. 5,749,894, Cl. 606-213.000.
- Engelson, Erik T.: *See—*
  - Ken, Christopher G. M.; and Engelson, Erik T., 5,749,891, Cl. 606-200.000.
- Engfer, Jeffrey R.; and Britton, Michael J. Golf club handle oversize grip kit. 5,749,792, Cl. 473-300.000.
- Engineering & Research Associates, Inc.: *See—*
  - Taylor, Junius E., 5,750,971, Cl. 219-769.000.
- Engitec S.p.A.: *See—*
  - Olper, Marco, 5,750,019, Cl. 205-563.000.
- Engle, James Donald: *See—*
  - Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
- Engleman, Scott Phillip: *See—*
  - Cole, Gary Lee; Engleman, Scott Phillip; and Pritko, Steven Michael, 5,752,042, Cl. 395-712.000.
- Enirisorse S.p.A.: *See—*
  - Marella, Marcello; Meregalli, Letizia; and Tomaselli, Michele, 5,750,459, Cl. 502-304.000.
- Enomoto, Kunio: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Enomoto, Takamichi: *See—*
  - Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.
- ENVEC Mess- und Regeltechnik GmbH + Co.: *See—*
  - Hegner, Frank; Schmidt, Elke Maria; Drewes, Ulfert; and Martin, Rainer, 5,750,899, Cl. 73-756.000.
- Envirogen, Inc.: *See—*
  - Frisch, Sam, 5,750,028, Cl. 210-618.000.
- Eon Corporation: *See—*
  - Dinkins, Gilbert M., 5,751,693, Cl. 370-95.100.
- EOR International, Inc.: *See—*
  - Bridges, Jack E., 5,751,895, Cl. 392-306.000.
- Epitope, Inc.: *See—*
  - Bestwick, Richard Keith; and Ferro, Adolph J., 5,750,864, Cl. 800-205.000.
- Epler, Frederick A.: *See—*
  - Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., 5,751,760, Cl. 379-210.000.
  - Fuller, Robert M.; Epler, Frederick A.; and Oates, Eugene W., 5,752,191, Cl. 455-445.000.
- Epperly, W. Robert; Sprague, Barry N.; Kelso, Danny T.; and Bowers, Wayne E., to Platinum Plus, Inc. Method for reducing emissions from or increasing the utilizable energy of fuel for powering internal combustion engines. 5,749,928, Cl. 44-358.000.
- Epperson, Darrell; Chennakeshu, Sandeep; and Karabinis, Peter Dimitrios, to Telefonaktiebolaget L M Ericsson (publ). Antenna assembly for radiotelephonic device. 5,752,204, Cl. 455-575.000.
- Epperson, Darrell G.: *See—*
  - Patterson, Gregory S.; and Epperson, Darrell G., 5,749,754, Cl. 439-824.000.
- Epting, J. Carrol, to Renfro Corporation. Article collection and distribution system. 5,749,682, Cl. 406-1.000.
- Equitz, William Robinson: *See—*
  - Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.
- Equos Research Co., Ltd.: *See—*
  - Kamiya, Kazuo; Morimoto, Hirofumi; and Yokoyama, Shoji, 5,751,228, Cl. 340-988.000.
- Eray, David, to Eta sa Fabriques d'Ebauches. Push button and method for assembling such push button. 5,751,668, Cl. 368-290.000.
- Erazo, Jorge G.: *See—*
  - Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., 5,751,127, Cl. 318-370.000.
- Erdman, David Donald: *See—*
  - Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, 5,751,875, Cl. 385-84.000.
- Erdmann, Christoph: *See—*

Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.
Ergo Research Corporation: *See—*
Cincotta, Anthony H.; and Meier, Albert H., 5,750,519, Cl. 514-200.000.
Erickson, Paul E., to ColorSpan Corporation. Continuous ink refill system for disposable ink jet cartridges having a predetermined ink capacity. 5,751,321, Cl. 347-85.000.
Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., to Lasermaster Corporation. Printing medium management apparatus. 5,751,303, Cl. 347-16.000.
Erico International Corporation: *See—*
Chauquet, Jacques, 5,749,671, Cl. 403-384.000.
Ericsson, Inc.: *See—*
Babu, Mangalore S.; Nahar, Jinen K.; Rogers, Gregory B.; and Downs, Walter S., III, 5,751,717, Cl. 370-466.000.
Dent, Paul W., 5,751,762, Cl. 375-200.000.
Frichtel, John S.; Canada, Robert O., III; and Gwin, Kennard N., 5,752,198, Cl. 455-524.000.
Mendolia, Gregory S., 5,751,804, Cl. 379-433.000.
Patterson, Gregory S.; and Epperson, Darrell G., 5,749,754, Cl. 439-824.000.
Eriksen, Peter Bonne: *See—*
Weibel, Helle; and Eriksen, Peter Bonne, 5,750,140, Cl. 424-449.000.
Erker, Gerhard: *See—*
Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, 5,750,752, Cl. 556-1.000.
Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, to Kuhn S.A. Valve having four connection ports and two positions. 5,749,390, Cl. 137-106.000.
Erway, Dale E. Method of preparing a refrigerated potato product. 5,750,165, Cl. 426-49.000.
Escallier, Bernard. Method of fabrication of electrical cable connector, electrical cable, and high-voltage transformer equipped with such cables. 5,750,928, Cl. 174-84.00R.
Esch, Marc: *See—*
Paul, Jean Michel; Samuel, Yves; and Esch, Marc, 5,750,771, Cl. 560-205.000.
Essex Corporation: *See—*
Turpin, Terry M., 5,751,243, Cl. 342-179.000.
Estee Lauder, Inc.: *See—*
Lahanas, Konstantinos M.; Toma, Daniela; Bevacqua, Andrew J.; and Cioca, Gheorghe, 5,750,125, Cl. 424-401.000.
Eta sa Fabriques d'Ebauches: *See—*
Eray, David, 5,751,668, Cl. 368-290.000.
Taghezout, Daho, 5,751,086, Cl. 310-112.000.
Etheridge, Colin J., to Caterpillar Inc. Low emission combustion system for a gas turbine engine. 5,749,217, Cl. 60-39.230.
Ethicon Endo-Surgery, Inc.: *See—*
Schulze, Dale R.; and McMillen, Troy A., 5,749,898, Cl. 606-228.000.
Etter, Stefan: *See—*
Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, 5,749,291, Cl. 101-91.000.
Eubanks, Mary Wilkes. Method and materials for conferring tripsacum genes in maize. 5,750,828, Cl. 800-200.000.
Evanko, William A.: *See—*
Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
Evans, Allan; Van Blaricom, Charles; and Hunter, April, to Stanford Telecommunications, Inc. Network protocol for wireless broadband ISDN using ATM. 5,751,702, Cl. 370-314.000.
Evans, Daniel R., to Evans Machine Company, Inc. Meat deboning apparatus. 5,749,776, Cl. 452-138.000.
Evans, Donald A.: *See—*
Braceras, George M.; and Evans, Donald A., 5,751,648, Cl. 365-205.000.
Evans, Gretta S. Foldable garment attachment assembly. 5,749,098, Cl. 2-123.000.
Evans, Hank A. Ergonomic toilet seat assembly for adults and children. 5,749,104, Cl. 4-239.000.
Evans, Joel Franklin; Cox, Bruce Russell; Dodd, Michael Thomas; and Hopkins, Jeffrey Jon, to Procter & Gamble Company, The. Compositions for treating hair or skin. 5,750,122, Cl. 424-401.000.
Evans, John S.: *See—*
Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., 5,752,059, Cl. 395-800.000.
Evans Machine Company, Inc.: *See—*
Evans, Daniel R., 5,749,776, Cl. 452-138.000.
Evans, Michael A.: *See—*
Lenker, Jay A.; Evans, Michael A.; Kim, Steven W.; and Kinney, Edward V., 5,749,921, Cl. 623-1.000.
Evans, Samuel: *See—*
Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., 5,750,765, Cl. 560-126.000.
Evans, Steven: *See—*
Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.
Evans, Tom K.: *See—*
Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,750,202, Cl. 427-376.400.
Evanston Hospital Corporation: *See—*
Bowie, Lemuel J., 5,750,345, Cl. 435-6.000.
Evenstad, Damon F.; and Evenstad, Steven C. Color lithographic reproduction. 5,750,297, Cl. 430-42.000.
Evenstad, Steven C.: *See—*
Evenstad, Damon F.; and Evenstad, Steven C., 5,750,297, Cl. 430-42.000.
Ewert, Warren M.: *See—*
Scharre, Mark D.; Ewert, Warren M.; and Hunt, Harold R., 5,750,798, Cl. 568-697.000.
Excel Industries, Inc.: *See—*
Mariel, James Gregory, 5,749,174, Cl. 49-352.000.
Exner, Gregory F.; Hofer, John Curtis; Durrani, Sheryar; and Matsu, Richard L., to Breed Automotive Technology, Inc. Steering wheel assembly. 5,749,598, Cl. 280-728.200.
Exponential Technology, Inc.: *See—*
Cohen, Earl T., 5,751,614, Cl. 364-716.020.
Exsted, Bert J.; and Kangas, Steven L., to Minnesota Mining and Manufacturing Company. Thermally induced phase separated azlactone membrane. 5,750,245, Cl. 428-315.500.
Exxon Chemical Patents, Inc.: *See—*
Diehl, Charles F.; and Tancrede, Jean M., 5,750,623, Cl. 525-98.000.
Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., 5,750,750, Cl. 554-117.000.
Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Watts, Raymond Frederick, 5,750,476, Cl. 508-291.000.
Exxon Research and Engineering Company: *See—*
Berlowitz, Paul Joseph, 5,750,475, Cl. 508-258.000.
Kim, Jeenok T.; Berlowitz, Paul Joseph; Francisco, Manuel A.; and Beltzer, Morton, 5,750,478, Cl. 508-331.000.
Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., 5,750,819, Cl. 585-734.000.
Eyre, David R.; Clemens, J. Daniel; and Ochs, Vincent W., to Washington Research Foundation; and Ostex International, Inc. Synthetic peptide analogs of NTx. 5,750,647, Cl. 530-328.000.
Ezzell, Stephen A.; Sahouani, Hassan; and Thurber, Ernest L., to Minnesota Mining and Manufacturing Company. Polyimide angularity enhancement layer. 5,750,641, Cl. 528-353.000.
F.LLI Marzoli & C. S.p.A.: *See—*
Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,749,126, Cl. 19-102.000.
Fabre, Jean-Louis: *See—*
Bastart, Jean-Pierre; Dupechez, Thierry; and Fabre, Jean-Louis, 5,750,561, Cl. 514-449.000.
Facciotti, Daniel: *See—*
Shewmaker, Christine K.; and Facciotti, Daniel, 5,750,385, Cl. 435-172.300.
FAG OEM und Handel AG: *See—*
Moller, Rainer, 5,749,661, Cl. 384-526.000.
Faget, Jean-Gabriel: *See—*
Dumortier, André; and Faget, Jean-Gabriel, 5,749,559, Cl. 251-30.030.
Faiello, Gary Francis: *See—*
Wilburn, Donald William; and Faiello, Gary Francis, 5,749,779, Cl. 454-65.000.
Fain, Eric S.: *See—*
Bush, M. Elizabeth; and Fain, Eric S., 5,749,901, Cl. 607-5.000.
Fair, James A., to Varian Associates, Inc. Method and structure for reducing short circuits between overlapping conductors. 5,751,019, Cl. 257-68.000.
Fairbrother, John E.: *See—*
Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingsbee, Derek A.; and Cederholm-Williams, Stewart A., 5,750,657, Cl. 530-382.000.
Fairley, Jeffrey D. Apparatus for the mobile fixation of bones. 5,749,873, Cl. 606-70.000.
Fakhruddin, Saifuddin: *See—*
DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.
Falbaum, David J.; Hei, Robert D.; Maier, Helmut K.; and Mattia, Paul J., to Ecolab Inc. Composition and improved pH driven method for wastewater separation using and amphoteric carboxylate and a cationic destabilizer composition. 5,750,484, Cl. 510-276.000.
Falter, Julia Anne: *See—*
Farina, Thomas Edward; Geick, Kenneth Scott; and Falter, Julia Anne, 5,750,061, Cl. 264-117.000.
Familiar, Robert F., to Dun & Bradstreet Software Services, Inc. Apparatus and process for creating and accessing a database centric object. 5,752,027, Cl. 395-614.000.
Fan, Chen-tung. Shower head mounting assembly. 5,749,552, Cl. 248-205.800.
Fan, Tso Yee: *See—*
Jeys, Thomas H.; and Fan, Tso Yee, 5,751,472, Cl. 359-330.000.
Fan, Yang-Sheng: *See—*
Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, 5,749,819, Cl. 483-39.000.
Fang, Shaona Lee: *See—*
Cheng, Seng Hing; Fang, Shaona Lee; Hoppe, Henry, IV; and Smith, Alan Edward, 5,750,571, Cl. 514-557.000.

Fang, Su-Yu: *See—*
Tang, Pao-Yun; Chang, Shyh-Ming; Lee, Yu-Chi; and Fang, Su-Yu, 5,749,997, Cl. 156-249.000.
Fanshier, Stephen Reid; Pare, My Tien; Nacional, Anthony Bautista; and Klekas, Steven Lynn, to NCR Corporation. Object-based systems management of computer networks. 5,751,962, Cl. 395-200.530.
Fanuc, Ltd.: *See—*
Hara, Ryuichi; and Nagayama, Atsuo, 5,751,130, Cl. 318-575.000.
Farber, Joel Frank: *See—*
Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, 5,752,022, Cl. 395-610.000.
Farina, Thomas Edward; Geick, Kenneth Scott; and Falter, Julia Anne, to Lonza Inc. Halohydantoin forms produced by melt extrusion and method for making. 5,750,061, Cl. 264-117.000.
Farine, Pierre-André; and Born, Jean-Jacques, to Asulab S.A. Electronic timepiece comprising a generator driven by a spring barrel. 5,751,666, Cl. 368-140.000.
Farinella, Michael David: *See—*
Mangolds, Arnie; Farinella, Michael David; Deguire, Daniel Rene; and Cardenas, Robert Lee, 5,750,918, Cl. 102-502.000.
Farr, Mina, to Hewlett Packard Company. Method and system having relaxed front end distortion requirements. 5,751,863, Cl. 382-275.000.
Farrauto, Robert J.: *See—*
Kennelly, Teresa; Hochmuth, John K.; Chou, Ting C.; and Farrauto, Robert J., 5,750,458, Cl. 502-304.000.
Farrell, Barbara L., to Xerox Corporation. System and method for generating and utilizing histogram data from a scanned image. 5,751,848, Cl. 382-172.000.
Farris, Robert D.; and Backus, Richard G., to Bell Atlantic Network Services, Inc. SNID with wireless backup. 5,751,789, Cl. 379-34.000.
Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., to Lucent Technologies. Technique for efficiently allocating handwidth to multimedia calls in a communications system. 5,751,712, Cl. 370-431.000.
Fastenmeier, Karl: *See—*
Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased, 5,749,869, Cl. 606-34.000.
Fathi, Zakaryae; Gerard, Richard S.; and Wei, Jianghua, to Lambda Technologies, Inc. System and apparatus for reducing arcing and localized heating during microwave processing. 5,750,968, Cl. 219-736.000.
Faulk, Richard A., to Compaq Computer Corporation. Controlling pulse skip modulation in power conversion. 5,751,565, Cl. 363-41.000.
Faulkner, James W. Urinary incontinence control device. 5,749,826, Cl. 600-29.000.
Faust, John E.; and Meier, John R., to U S West Technologies, Inc. Method for automatically collecting and delivering application event data in an interactive network. 5,752,159, Cl. 455-5.100.
Faust, Raimund Josef; Allen, Danuta Eva; and Lutz, Silvia, to Agfa-Gevaert AG. Graft copolymers and colorless, transparent electrophotographic toners comprising these. 5,750,306, Cl. 430-115.000.
Fava, Natale. Opto-electronic system for the acquisition of signals indicating the presence of a voltage and its phase. 5,751,143, Cl. 324-96.000.
Faxnet Corp.: *See—*
Kugell, Stanley; and Friend, David, 5,751,794, Cl. 379-89.000.
Feciura, Paul N.; and Lee, Anthony N. Speed jump rope ball-bearing swivel attachment. 5,749,812, Cl. 482-82.000.
Fedde, Mickiel P.; and Klimisch, Kevin W., to Minnesota Mining and Manufacturing Company. Vehicle detector system with presence mode counting. 5,751,225, Cl. 340-941.000.
Fehr, Walter R.; and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Soybeans capable of forming a vegetable oil having specified concentrations of palmitic and stearic acids. 5,750,844, Cl. 800-200.000.
Fehr, Walter R.; and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Soybeans capable of forming a vegetable oil having a low saturated fatty acid content. 5,750,845, Cl. 800-200.000.
Fehr, Walter R.; and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Elevated palmitic acid production in soybeans. 5,750,846, Cl. 800-200.000.
Fehring, John David: *See—*
Jensen, Eric Lee; Kruckemeyer, William Charles; and Fehring, John David, 5,749,596, Cl. 280-689.000.
Feicht, Douglas Bruce: *See—*
Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, 5,749,614, Cl. 294-64.100.
Feigelson, Gregg Brian: *See—*
Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
Fekete, Nicholas M.G.: *See—*
Glick, Mark; Fekete, Nicholas M.G.; Bolan, Michael L.; and Owens, Jeffrey D., 5,749,253, Cl. 70-278.000.
Felder, Mitchell S.: *See—*
Ollar, Robert A.; and Felder, Mitchell S., 5,750,363, Cl. 435-29.000.
Feldkamp, Lee Albert: *See—*
Madau, Dinu Petre; and Feldkamp, Lee Albert, 5,751,908, Cl. 395-3.000.
Feldman, Jacobo; and Czukerberg, Shirley. Notebook system. 5,749,667, Cl. 402-79.000.
Feldman, Michael: *See—*
Eisenbach, Lea; and Feldman, Michael, 5,750,102, Cl. 424-93.210.
Feldman, Steven: *See—*
Bellas, Jeffrey J.; Boling, Clyde W.; Brunner, Dennis M.; and Feldman, Steven, 5,749,741, Cl. 439-95.000.
Feldpausch, Thomas G.: *See—*
Stanfield, Joel D.; Branc, Joseph R.; Feldpausch, Thomas G.; and Miller, William L., 5,751,221, Cl. 340-825.350.
Fenicem Minerals, Inc.: *See—*
Krofchak, David, 5,749,962, Cl. 106-714.000.
Fensch, Thierry; and Sevenhans, Jan, to SGS-Thomson Microelectronics S.A. Transmission circuit of a line encoded signal on a telephone line. 5,751,775, Cl. 375-371.000.
Fenstermaker, Charles L. Upper body exerciser. 5,749,810, Cl. 482-57.000.
Ferag AG: *See—*
Reist, Walter, 5,749,568, Cl. 271-9.010.
Fergason, Jeffrey K.; Fry, David; and Brunnell, Stephen M., to Ilixco, Inc. Helmet with high performance head and face protection utilizing complementary materials. 5,749,096, Cl. 2-8.000.
Fergason, Jeffrey K.; and Fergason, John D., to OSD Envizion, Inc. Liquid crystal lens driver electronics for eye protection, high speed shuttering with consistent performance. 5,751,258, Cl. 345-7.000.
Fergason, John D.: *See—*
Fergason, Jeffrey K.; and Fergason, John D., 5,751,258, Cl. 345-7.000.
Ferguson, David E., to Amalgamated Software of North America, Inc. Digital computer for adding and subtracting. 5,751,623, Cl. 364-781.000.
Ferguson, R. Daniel: *See—*
Kinney, Richard R.; Pandolfe, William D.; and Ferguson, R. Daniel, 5,749,650, Cl. 366-176.200.
Ferguson, Robert I.: *See—*
Zbikowski, Mark; and Ferguson, Robert I., 5,752,252, Cl. 707-205.000.
Feron, Paul Hubert Maria: *See—*
Jansen, Albert Edward; and Feron, Paul Hubert Maria, 5,749,941, Cl. 95-44.000.
Ferrari, Franco, to Ing Nino Ferrari-Impresa Construzioni Generale SRL. Underground tank for storage of liquids at ambient temperature and low temperature liquified gases. 5,749,675, Cl. 405-52.000.
Ferrell, Paul; and Hudson, Alice P. Presticide compositions. 5,750,130, Cl. 424-417.000.
Ferrell, Richard A.: *See—*
Donovan, Kenneth B.; Ferrell, Richard A.; Heidrich, Arthur J.; and Zirpolo, Dominick S., 5,751,612, Cl. 364-578.000.
Ferro, Adolph J.: *See—*
Bestwick, Richard Keith; and Ferro, Adolph J., 5,750,864, Cl. 800-205.000.
Mathews, Helena V.; Bestwick, Richard Keith; and Ferro, Adolph J., 5,750,870, Cl. 800-205.000.
Fesus, Laszlo; and Piacentini, Mauro, to LXR Biotechnology Inc. Method for quantitatively measuring apoptosis. 5,750,360, Cl. 435-23.000.
Fetisov, Sergei Jurievich: *See—*
Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.
Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., to Intel Corporation. Computer system with self-consistent ordering mechanism. 5,751,986, Cl. 395-394.000.
Fetzer, Thomas: *See—*
Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
Fewkes, Roy: *See—*
Sumiejski, James L.; Fewkes, Roy; and Tipton, Craig Daniel, 5,750,477, Cl. 508-331.000.
FHE Technology Limited: *See—*
Coombs, Jeffrey Stuart, 5,749,938, Cl. 75-332.000.
Fibox Oy AB: *See—*
Sonntag, John-Erik; and Ropponen, Matti, 5,750,924, Cl. 174-50.000.
Fibrogenex, Inc.: *See—*
Goodheart, Clyde R.; and Silverman, Ralph H., 5,750,378, Cl. 435-70.300.
Fiekowsky, Peter J.: *See—*
Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
Field, John S., to Commonwealth Scientific and Industrial Research Organisation. Complex viscosity and complex modulus measurement device and method. 5,750,884, Cl. 73-54.240.
Fielder, Louis Dunn, to Dolby Laboratories Licensing Corporation. Method and apparatus for split-band encoding and split-band decoding of audio information using adaptive bit allocation to adjacent subbands. 5,752,225, Cl. 704-229.000.
Fields, Robert D.: *See—*
Wilson, John C.; and Fields, Robert D., 5,750,305, Cl. 430-110.000.
Wilson, John C.; and Fields, Robert D., 5,750,715, Cl. 548-209.000.
Fields, Stanley: *See—*
Wickens, Marvin P.; and Fields, Stanley, 5,750,667, Cl. 536-23.100.
Fieschi, Jacques: *See—*
Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,751,714, Cl. 370-452.000.

- Figura, Thomas A.; and Howard, Bradley J., to Micron Technology, Inc. Mask having a tapered profile used during the formation of a semiconductor device. 5,750,441, Cl. 438-751.000.
- Fikes, John D.; Livingston, Brian D.; Sette, Alessandro D.; and Sidney, John C., to Cytel Corporation. DNA encoding MAGE-1 C-terminal cytotoxic t lymphocyte immunogenic peptides. 5,750,395, Cl. 435-325.000.
- Filippi, Werner: *See—*
  - Klein, Heinz Hermann; and Filippi, Werner, 5,750,163, Cl. 425-590.000.
- Filippov, Eugene A.: *See—*
  - Gotovchikov, Vitaly T.; Ivanov, Alexander V.; and Filippov, Eugene A., 5,750,822, Cl. 588-11.000.
- Filla, Deborah S.: *See—*
  - Lai, John T.; and Filla, Deborah S., 5,750,787, Cl. 564-409.000.
- Fina Research, S.A.: *See—*
  - Grootjans, Jacques F.; Belloir, Pierre-Frederic J.; and Romers, Eric J.G.M., 5,750,814, Cl. 585-323.000.
- Fincke, James R.: *See—*
  - Detering, Brent A.; Donaldson, Alan D.; Fincke, James R.; and Kong, Peter C., 5,749,937, Cl. 75-10.190.
- Findeisen, Kurt: *See—*
  - Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
- Findley, Craig Alan. Signaling device. 5,751,212, Cl. 340-468.000.
- Findley, Philip; Mortimer, Keith; and Marshall, David, to Technoflex Innovations Limited. Coating of surfaces of articles. 5,750,240, Cl. 428-195.000.
- Finke, Paul: *See—*
  - Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.
- Finley, Don Richard: *See—*
  - Bryant, Henry Uhlman; Finley, Don Richard; and Matsumoto, Ken, 5,750,708, Cl. 546-334.000.
- Finnigan Corporation: *See—*
  - Bier, Mark E., 5,750,993, Cl. 250-282.000.
- Fiorino, Mary E.; Frankenthal, Robert P.; and Sinclair, James D., to Lucent Technologies Inc. Corrosion protection employing alternating voltage. 5,750,071, Cl. 422-7.000.
- Firefly AB: *See—*
  - Jansson, Lennart Carl Erik, 5,749,420, Cl. 169-54.000.
- Fischbach, Fernando: *See—*
  - Stillwagon, Ross I.; Fischbach, Fernando; and Bennett, Allen, 5,749,379, Cl. 132-200.000.
- Fischbach, Pierre: *See—*
  - Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.
- Fischell, David R.: *See—*
  - Fischell, Robert E.; Fischell, David R.; Fischell, Tim A.; and Turnland, Todd H., 5,749,825, Cl. 600-3.000.
- Fischell, Robert E.; Fischell, David R.; Fischell, Tim A.; and Turnland, Todd H., to IsoStent, Inc. Means method for treatment of stenosed arterial bifurcations. 5,749,825, Cl. 600-3.000.
- Fischell, Tim A.: *See—*
  - Fischell, Robert E.; Fischell, David R.; Fischell, Tim A.; and Turnland, Todd H., 5,749,825, Cl. 600-3.000.
- Fischer, Timothy J.; Bell, Maria L.; and Bowling, Regina J., to Akzo Nobel N.V. Cleaning solution for automated analyzers. 5,749,976, Cl. 134-22.120.
- Fischer, Wolfgang: *See—*
  - Knoll, Heinz; and Fischer, Wolfgang, 5,749,601, Cl. 280-805.000.
- fischerwerke, Artur Fischer GmbH & Co. KG: *See—*
  - Arnold, Norbert; Haug, Willi; and Lind, Stefan, 5,749,963, Cl. 106-724.000.
- Fish, Donald D. Diamond belt for cutting stones. 5,749,775, Cl. 451-298.000.
- Fisher Dynamics Corporation: *See—*
  - Robinson, David L., 5,749,625, Cl. 297-367.000.
- Fisher, Edward; Liu, Ju-Chao (by Tehyi Lui, his legal representative), to Loctite Corporation. Non-ozone depleting co-solvent compositions and adhesive promoter compositions based thereon. 5,749,956, Cl. 106-287.280.
- Fisher-Rosemount Systems, Inc.: *See—*
  - Bowling, Jonathan S., 5,752,008, Cl. 395-500.000.
  - Morrison, Steven Michael, 5,752,007, Cl. 395-500.000.
- Fisher, Stephen: *See—*
  - Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., 5,752,059, Cl. 395-800.000.
- Fiske, Thomas G.: *See—*
  - Crawford, Gregory P.; Fiske, Thomas G.; and Silverstein, Louis D., 5,751,390, Cl. 349-120.000.
- Fitness Quest, Inc.: *See—*
  - Chen, Chao-Yueh, 5,749,814, Cl. 482-93.000.
- Fitzgerald, Mark C.: *See—*
  - Robertson, Larry W.; and Fitzgerald, Mark C., 5,751,319, Cl. 347-85.000.
- Fitzgibbon, James J., to Chamberlain Group, Inc., The. Code learning system for a movable barrier operator. 5,751,224, Cl. 340-825.220.
- Fitzgibbons, Lance Terrance: *See—*
  - Gan, Zhongxue; Fitzgibbons, Lance Terrance; Tang, Qing; and Katz, Jeffrey Sherman, 5,751,610, Cl. 364-571.030.
- Fixtures Manufacturing Corporation: *See—*
  - Synder, Bobbie L.; Bradley, C. Thomas; and Horner, Paul W., 5,749,628, Cl. 297-411.360.
- Flachenecker, Gerhard, deceased (by Hildegard Flachenecker, legal representative): *See—*
  - Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased, 5,749,869, Cl. 606-34.000.
- Flachenecker, Hildegard, legal representative: *See—*
  - Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased, 5,749,869, Cl. 606-34.000.
- Flanery, Ansel Bernard, Jr.; Reams, Lowell Allan; and Zagata, Mark Alan, to Ford Global Technologies, Inc. Barrel throttle valve. 5,749,335, Cl. 123-337.000.
- Fleck, Alvin A.: *See—*
  - Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
- Fleisaman, Roc V.: *See—*
  - Hansen, Borg; Gonzalez, Rafael; and Fleisaman, Roc V., 5,749,107, Cl. 4-541.100.
- Fleischer, Bruce Martin: *See—*
  - Agarwal, Ramesh Chandra; Fleischer, Bruce Martin; and Gustavson, Fred Gehrung, 5,751,619, Cl. 364-736.020.
- Fleischhauer, Grier S.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Fleischmann, Gerald: *See—*
  - Eck, Herbert; Fleischmann, Gerald; and Wierer, Konrad, 5,750,617, Cl. 524-718.000.
- Fleming, James Michael: *See—*
  - Vonderhaar, Michael Francis; and Fleming, James Michael, 5,750,066, Cl. 264-510.000.
- FLEXcon Company Inc.: *See—*
  - McDonough, Neil; and Pennace, John R., 5,751,256, Cl. 343-873.000.
- Flick, Kenneth E. Vehicle window speaker mounting accessory and related methods. 5,750,942, Cl. 181-141.000.
- Flickner, Myron Dale: *See—*
  - Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.
- Flory, Kevin J.: *See—*
  - Keller, James A.; and Flory, Kevin J., 5,752,032, Cl. 395-681.000.
- Flöther, Werner; and Hohberg, Gerhard, to Carl-Zeiss-Stiftung. Adapter connector and camera assembly equipped with said adapter connector. 5,749,745, Cl. 439-349.000.
- Fluoroware, Inc.: *See—*
  - Williams, Randall S., 5,749,469, Cl. 206-710.000.
- Flynn, Daphne: *See—*
  - Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.
- Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., to Hoechst Marion Roussel Inc. Mercaptoacetylamide disulfide derivatives useful as inhibitors of enkephalinase and ACE. 5,750,521, Cl. 514-214.000.
- Flynn, Gary Alan: *See—*
  - Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.
- Flynn, Rachel J.: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- Flynn, Richard M.: *See—*
  - Vitcak, Daniel R.; and Flynn, Richard M., 5,750,797, Cl. 568-683.000.
- Foamex L.P.: *See—*
  - Denney, Denys; Contreras, Jose de Jesus Munoz; Bonaddio, Vincenzo A.; and Johnsin, David M., 5,749,993, Cl. 156-214.000.
- Focal, Inc.: *See—*
  - Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.
  - Slepian, Marvin J., 5,749,915, Cl. 623-1.000.
- Foley, Terry J., to Holden's Foundation Seeds, Inc. Inbred corn line LH242. 5,750,850, Cl. 800-200.000.
- Folkes, Adrian John: *See—*
  - Bryans, Justin Stephen; Folkes, Adrian John; and Latham, Christopher John, 5,750,530, Cl. 514-255.000.
- Foltz, Robert S.: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Fonash, Stephen J., to Penn State Research Foundation, The. Non-contact electro-optic detection of photovoltages created in a semiconductor by a probe beam. 5,750,981, Cl. 250-214.00R.
- Fong, Jon: *See—*

  - Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
- Fontaine, Lucian P.: *See—*
  - DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.
- Fontaine, Lucien P.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Foo, Khim H.: *See—*
  - Hileman, Vince; and Foo, Khim H., 5,751,551, Cl. 361-753.000.
- Foral, Michael J.: *See—*
  - Bhattacharyya, Alakananda; Foral, Michael J.; and Reagan, William J., 5,750,020, Cl. 208-113.000.
- Ford, Carl Benjamin, III: *See—*
  - Blake, Michael Andrew; Ford, Carl Benjamin, III; and Mak, Pak-kin, 5,752,264, Cl. 711-144.000.
- Ford Global Technologies, Inc.: *See—*
  - Bryant, Bruce David; Krishnaswami, Vasanth; and Marko, Kenneth Andrew, 5,752,213, Cl. 701-111.000.
  - Chaffin, Kimberly Ann, 5,750,970, Cl. 219-765.000.
  - Cudden, Charles, 5,749,425, Cl. 180-69.200.
  - Flanery, Ansel Bernard, Jr.; Reams, Lowell Allan; and Zagata, Mark Alan, 5,749,335, Cl. 123-337.000.
  - Fricke, David M.; Hansen, Mark D.; and Chabaan, Rakan C., 5,750,890, Cl. 73-146.000.
  - Gonzalez, Cesar, 5,751,077, Cl. 310-12.000.
  - Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.
  - Hrovat, Davorin D.; and Tran, Minh N., 5,749,428, Cl. 180-197.000.
  - Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, 5,751,579, Cl. 364-426.015.
- Ford Motor Company: *See—*
  - Bagherpour, Bo; Hesse, Ralph Kurt; and Brooks, Kenneth Ross, 5,751,079, Cl. 310-59.000.
  - Heath, Gerald Arthur; Obriot, Kelly Michael; Simplicean, Ionel Eugene; and Stancu, Sorin, 5,749,629, Cl. 297-411.360.
  - Kennedy, John F.; and Adrian, Andrew, 5,751,148, Cl. 324-501.000.
  - Madau, Dinu Petre; and Feldkamp, Lee Albert, 5,751,908, Cl. 395-3.000.
- Ford, Robert B.: *See—*
  - Kehao, Sokphal; and Ford, Robert B., 5,751,217, Cl. 340-636.000.
- Ford, Stephen J.: *See—*
  - Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
- Forhan, Michael A.: *See—*
  - Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., 5,751,127, Cl. 318-370.000.
- Foringer, Lyle L.: *See—*
  - McEntire, Edward E.; and Foringer, Lyle L., 5,750,770, Cl. 560-200.000.
- Fork, Richard L.: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., to Remote Source Lighting International, Inc. Optical fiber lensed illumination coupler. 5,751,870, Cl. 385-33.000.
- Forney, John R.; Yang, Shiguang; and Healey, Mark C., to Utah State University. Method of controlling cryptosporidium infectons using protease inhibitors. 5,750,496, Cl. 514-2.000.
- Forsberg, Stefan; and Rüegg, Hans, to Von Roll Umwelttechnik AG. Process and apparatus for the thermal production of energy from waste material, particulary refuse. 5,749,309, Cl. 110-346.000.
- Forschungszentrum Julich GmbH: *See—*
  - Elling, Lothar; and Kula, Maria-Regina, 5,750,389, Cl. 435-193.000.
- Forsline, Ladd B. Paint applicator having an improved working tip. 5,749,117, Cl. 15-245.100.
- Forson, Henry, to Hughes Electronics. Method and apparatus for navigating an on-screen program guide. 5,751,372, Cl. 348-569.000.
- Fortier, Paul J., to United States of America, Navy. Early commit locking computer database protocol. 5,752,026, Cl. 395-614.000.
- Fosdick, Eric L., to International Business Machines Corporation. Method and system for licensing program management within a distributed data processing system. 5,752,041, Cl. 395-712.000.
- Fosfoquim S.A.: *See—*
  - Horn Feja, Franziskus, 5,749,684, Cl. 406-141.000.
- Foster, John K.: *See—*
  - Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., 5,749,950, Cl. 106-316.000.
- Foster, John R. Valve refacing tool. 5,749,774, Cl. 451-252.000.
- Foster, Larry Steven: *See—*
  - Coffey, Johnnie A.; Foster, Larry Steven; Horrall, Paul Douglas; and McIntyre, John Randolph, 5,752,135, Cl. 399-115.000.
- Foster-Miller, Inc.: *See—*
  - Mangolds, Arnie; Farinella, Michael David; Deguire, Daniel Rene; and Cardenas, Robert Lee, 5,750,918, Cl. 102-502.000.
- Foster, Rorbert L.: *See—*
  - Tunkel, Lev; Krasovitski, Boris; and Foster, Rorbert L., 5,749,231, Cl. 62-5.000.
- Fouchard, David T.: *See—*
  - Xie, Like; Fouchard, David T.; Ebner, Walter B.; and Megahed, El-Sayed, 5,750,288, Cl. 429-229.000.
- Foulkes, Harvey B.: *See—*
  - Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., 5,749,727, Cl. 433-119.000.
- Fowler, Daniel L.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
  - Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
- Fox, Mark Lee: *See—*
  - Kearby, Ronald S.; Fox, Mark Lee; and Kelley, Mark David, 5,750,217, Cl. 428-34.800.
- Fox, Richard, to AlliedSignal Inc. Air contamination monitor. 5,750,999, Cl. 250-343.000.
- FPS Food Processing Systems B.V.: *See—*
  - Doornekamp, Martin; Van Veldhuisen, Willem; and De Greef, Willem Marius, 5,749,453, Cl. 198-400.000.
- Fraile-Mora, Jesus: *See—*
  - Garcia-Gutierrez, Pedro A.; and Fraile-Mora, Jesus, 5,751,535, Cl. 361-143.000.
- Framatome: *See—*
  - Magnin, Bernard, 5,751,778, Cl. 376-260.000.
- Framatome Connectors International: *See—*
  - Wuyts, Robert, 5,751,847, Cl. 382-165.000.
- Framatome Connectors International S.A.: *See—*
  - Genta, Alessandro; and Rampone, Renzo, 5,749,755, Cl. 439-856.000.
- Francisco, Manuel A.: *See—*
  - Kim, Jeenok T.; Berlowitz, Paul Joseph; Francisco, Manuel A.; and Beltzer, Morton, 5,750,478, Cl. 508-331.000.
- Francois, Christian: *See—*
  - Deroux-Dauphin, Patrice; and Francois, Christian, 5,751,736, Cl. 371-22.310.
- Frandsen, Troy V.: *See—*
  - Castaneda, Julio C.; Frandsen, Troy V.; and Greco, Paul M., 5,749,457, Cl. 200-343.000.
- Frank, Davis: *See—*
  - Rhodes, Ken; Coelho, Rohan; Bender, Blake; and Frank, Davis, 5,751,270, Cl. 345-118.000.
- Frank, Glenn R.: *See—*
  - Tripp, Cynthia Ann; Frank, Glenn R.; and Grieve, Robert B., 5,750,391, Cl. 435-212.000.
- Frank, Mark Steven; Tayloe, Daniel Richard; and Blasiak, Dariusz Andrzej, to Motorola, Inc. Method and apparatus for optimal hand-offs in a satellite cellular communication system. 5,752,187, Cl. 455-428.000.
- Franke, John. Rotatable head hairbrush. 5,749,115, Cl. 15-160.000.
- Frankenthal, Robert P.: *See—*
  - Fiorino, Mary E.; Frankenthal, Robert P.; and Sinclair, James D., 5,750,071, Cl. 422-7.000.
- Franklin, Michael S.: *See—*
  - Scott, Daniel B.; and Franklin, Michael S., 5,749,151, Cl. 33-370.000.
- Frasnetti, Luca: *See—*
  - Elliott, Robert S.; and Frasnetti, Luca, 5,749,388, Cl. 137-1.000.
- Fratello, Luigi; and Calocero, Michele. Process of making true copies of majolica tiles and the like. 5,750,239, Cl. 428-195.000.
- Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V.: *See—*
  - Fuchs, Helmut, 5,750,944, Cl. 181-290.000.
  - Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, 5,750,185, Cl. 427-8.000.
- Frazzitta, Joseph. Method of coating a surface. 5,750,186, Cl. 427-8.000.
- Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., to Litton Systems, Inc. Apparatus and method for detecting rotation rate, Faraday bias and cavity length in a ring laser gyroscope. 5,751,425, Cl. 356-350.000.
- Fredlund, John Randall: *See—*
  - Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, 5,749,468, Cl. 206-455.000.
- Fredrickson, Raymond L.: *See—*
  - Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.

- Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., to International Business Machines Corporation. Multi-wavelength programmable laser processing mechanisms and apparatus utilizing vaporization detection. 5,751,588, Cl. 364-474.280.
- Freightliner Corporation: *See—*
  - Loutzenhiser, Douglas J., 5,749,391, Cl. 137-204.000.
- Freitag, Rosa: *See—*
  - Shiels, Martin A.; Cole, Richard S.; Rankin, Paul J.; and Freitag, Rosa, 5,751,953, Cl. 395-200.090.
- French, John F.: *See—*
  - Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.
- Frers, Klaus Dieter, to Auto Electronics Corporation. Vehicle harmful gas detection apparatus. 5,750,880, Cl. 73-31.020.
- Freundorfer, Alois Peter: *See—*
  - Nguyen, Thé Linh; and Freundorfer, Alois Peter, 5,751,190, Cl. 330-54.000.
- Frey, Normam Walter; and Albertson, Robert Jeffery, to Michelin Recherche et Technique S.A. Tire monitoring system and method. 5,749,984, Cl. 152-415.000.
- Freymuth, Christopher Anthony: *See—*
  - Afsar, Muhammad; and Freymuth, Christopher Anthony, 5,751,946, Cl. 395-185.030.
- Frichtel, John S.; Canada, Robert O., III; and Gwin, Kennard N., to Ericsson Inc. Single site, split location trunked radio communications system. 5,752,198, Cl. 455-524.000.
- Fricke, Andreas; Luxem, Heiner; and Stadler, Lothar, to Heidelberger Druckmaschinen AG. Gripper control for a cyclically rockingly driven pregripper for single-sheet transport in a sheet-fed printing press. 5,749,572, Cl. 271-268.000.
- Fricke, David M.; Hansen, Mark D.; and Chabaan, Rakan C., to Ford Global Technologies, Inc. Method and apparatus for modelling a tire for use with a vehicle spindle-coupled simulator. 5,750,890, Cl. 73-146.000.
- Friede, Dirk; Hage, Hermann; Herzner, Karl-Heinz; and Scholz, Volker, to Rofin-Sinar Laser GmbH. Laser system and method with thermally compensated optics. 5,751,750, Cl. 372-34.000.
- Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, to Novartis Corp. 1-in-(halo-3-pyridylmethyl)[-N-methylamino-1-alklamino-2-nitroethy-lene derivatives for controlling fleas in domestic animals. 5,750,548, Cl. 514-357.000.
- Friedman, Doron; and Aldouby, Yanir, to Pharmos Corporation. Dry compositions for preparing submicron emulsions. 5,750,142, Cl. 420-450.000.
- Friend, David: *See—*
  - Kugell, Stanley; and Friend, David, 5,751,794, Cl. 379-89.000.
- Frink, Neal A.; Burns, Daniel D.; Frink, Paul G.; and Ciric, Amy. In-situ decontamination and recovery of metal from process equipment. 5,752,206, Cl. 588-20.000.
- Frink, Paul G.: *See—*
  - Frink, Neal A.; Burns, Daniel D.; Frink, Paul G.; and Ciric, Amy, 5,752,206, Cl. 588-20.000.
- Frisch, Sam, to Envirogen, Inc. Biomass separation apparatus and method with media return. 5,750,028, Cl. 210-618.000.
- Fritschy, Michael A.: *See—*
  - Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith. Graham, 5,749,885, Cl. 606-170.000.
- Fritz, Bernard L.; and Fritz, Bryan L. Automobile racing board game. 5,749,582, Cl. 273-246.000.
- Fritz, Bryan L.: *See—*
  - Fritz, Bernard L.; and Fritz, Bryan L., 5,749,582, Cl. 273-246.000.
- Froelich, Thomas E., Sr.; and Bertka, Jeffrey T., to Froelich, Sr., Thomas E. Floor mountable and adjustable rotating resistance exerciser. 5,749,816, Cl. 482-123.000.
- Fröhlich, Anja: *See—*
  - Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, 5,750,669, Cl. 536-24.300.
- Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, to BASF Aktiengesellschaft. Methods for identifying substances with a potential herbicidal or growth-regulating action by means of plant transporter proteins, the use of the transporter proteins, and substances with a herbicidal and growth-regulating action. 5,750,362, Cl. 435-29.000.
- Fromson, Howard A.; Gracia, Robert F.; and Rubin, Steven A., to Fromson, Howard A. Method for selectively imaging a lithographic printing plate. 5,750,314, Cl. 430-302.000.
- Frost, Peter Lewis John; and Jessop, Paul David, to British Telecommunications public limited company. Optical fibre installation tool. 5,749,565, Cl. 254-134.400.
- Frouin, Marc: *See—*
  - Ripoll, Jean-Louis; Frouin, Marc; and Janon, Frederic, 5,752,257, Cl. 711-114.000.
- Fry, David: *See—*
  - Fergason, Jeffrey K.; Fry, David; and Brunnell, Stephen M., 5,749,096, Cl. 2-8.000.
- Frye, William H.: *See—*
  - Wyles, Richard H.; and Frye, William H., 5,751,005, Cl. 250-370.060.
- Fu, Gregory C.: *See—*
  - Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., 5,750,815, Cl. 585-511.000.
- Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, to Schering Corporation. Process for preparing delta 9, 11 and 21-chlorocorticosteroids. 5,750,745, Cl. 552-581.000.
- Fuchs, Hans-Herbert: *See—*
  - Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.
- Fuchs, Helmut, to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V. Foil sound absorbers. 5,750,944, Cl. 181-290.000.
- Fuji Electric Co., LTD.: *See—*
  - Toyozaki, Jiro; Yanase, Takao; Ishii, Shinichi; and Aihara, Takashi, 5,751,567, Cl. 363-89.000.
  - Urushidani, Tatsuo; and Ogino, Shinji, 5,750,434, Cl. 438-478.000.
- Fuji Jukogyo Kabushiki Kaisha: *See—*
  - Kawahira, Izuru; and Miyachi, Yoshihiko, 5,749,221, Cl. 60-274.000.
  - Matsumoto, Shinji, 5,749,141, Cl. 29-714.000.
- Fuji Photo Film Company, Ltd.: *See—*
  - Inuiya, Masafumi; and Nakayama, Yoshiaki, 5,751,348, Cl. 348-220.000.
  - Ishikawa, Takatoshi, 5,752,122, Cl. 396-612.000.
  - Matsui, Seiichi; Nakane, Yoshio; and Saito, Kenji, 5,751,349, Cl. 348-228.000.
  - Mizuta, Akira; and Ogawa, Masazumi, 5,749,455, Cl. 198-626.500.
  - Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.
  - Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, 5,751,402, Cl. 355-40.000.
  - Nakamura, Takashi; Fukuzawa, Hiroshi; and Ono, Michio, 5,750,755, Cl. 558-84.000.
  - Negishi, Kenji; Noguchi, Osamu; and Okoyama, Kazuo, 5,752,086, Cl. 396-6.000.
  - Ogawa, Hiroshi; Yoshida, Tuneo; and Kato, Shinichi, 5,750,233, Cl. 428-141.000.
  - Ono, Shuji, 5,751,831, Cl. 382-103.000.
  - Sato, Kenichiro; Sakaguchi, Shinji; and Momota, Makoto, 5,750,310, Cl. 430-192.000.
  - Sato, Morimasa; and Sugiyama, Takekatsu, 5,750,292, Cl. 430-15.000.
  - Shibasaki, Souhei; Sawano, Yukio; Hanaoka, Shuzo; and Takano, Hiroyoshi, 5,749,662, Cl. 400-82.000.
  - Takaoka, Naoki; and Takagi, Atsushi, 5,751,401, Cl. 355-32.000.
  - Toji, Shigeo; Yoshida, Masanori; and Misawa, Atsushi, 5,752,098, Cl. 396-85.000.
  - Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, 5,751,748, Cl. 372-31.000.
  - Yoshida, Yutaka, 5,751,505, Cl. 360-48.000.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Ishiguro, Minoru; and Yoshida, Hideo, 5,752,093, Cl. 396-61.000.
  - Minami, Itsuji, 5,749,827, Cl. 600-109.000.
  - Tanaka, Minoru; Yamamoto, Shigeru; and Mori, Yoshitaka, 5,751,353, Cl. 348-335.000.
  - Tanaka, Yasuhiko, 5,752,120, Cl. 396-536.000.
- Fuji Xerox Co., Ltd.: *See—*
  - Ando, Toshiaki, 5,752,020, Cl. 395-604.000.
  - Fujimoto, Masakazu, 5,751,921, Cl. 395-109.000.
  - Nakatsuyama, Hisashi; Okumura, Yo; and Uchida, Go, 5,752,021, Cl. 395-605.000.
  - Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.
  - Sumikawa, Takeshi; and Ito, Isao, 5,752,139, Cl. 399-264.000.
- Fujie, Naofumi: *See—*
  - Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, 5,749,173, Cl. 49-349.000.
- Fujihara, Yuji: *See—*
  - Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.
- Fujii, Atsushi: *See—*
  - Takemura, Osamu; Kimura, Takahiko; and Fujii, Atsushi, 5,751,314, Cl. 347-55.000.
- Fujii, Hiroaki; Kakuta, Hitoshi; and Takamoto, Yoshifumi, to Hitachi, Ltd. Disk array apparatus and method for dividing and reading/writing partial data across a plurality of drive groups utilizing parallel processing. 5,752,256, Cl. 711-114.000.
- Fujii, Katsuhiko: *See—*
  - Ozawa, Takayuki; Sugiyama, Satoru; Kitahara, Shigehisa; and Fujii, Katsuhiko, 5,750,507, Cl. 514-19.000.
- Fujii, Satoshi: *See—*
  - Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, 5,750,243, Cl. 428-216.000.
- Fujikawa, Takuya; and Abe, Katsuhiko, to Zexel Corporation. Solenoid fuel injection valve. 5,749,527, Cl. 239-585.300.
- Fujimoto, Hidetoshi: *See—*
  - Ishizaki, Takashi; and Fujimoto, Hidetoshi, 5,752,217, Cl. 701-201.000.
- Fujimoto, Hiroaki: *See—*
  - Gohara, Yoshihiro; Fujimoto, Hiroaki; and Nanami, Masayoshi, 5,749,338, Cl. 123-73.00A.

- Fujimoto, Kazuhisa; Matsuno, Toshinohu; and Inoue, Kaoru, to Matsushita Electric Industrial Co., Ltd. Field effect transistor. 5,751,030, Cl. 257-194.000.
- Fujimoto, Masakazu, to Fuji Xerox Co., Ltd. Document image processing device for converting monochrome images to color images. 5,751,921, Cl. 395-109.000.
- Fujimura, Sayuri, to NEC Corporation. Microcomputer with memory bank configuration and register bank configuration. 5,751,988, Cl. 395-405.000.
- Fujino, Kenichi: *See—*
  - Sakai, Kazuhiko; Adachi, Tatsuhiko; Nakayama, Norihiro; and Fujino, Kenichi, 5,750,258, Cl. 428-405.000.
- Fujino, Makoto: *See—*
  - Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishibashi, Osamu, 5,750,592, Cl. 523-161.000.
- Fujino, Yoshifumi: *See—*
  - Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.
- Fujioka, Tetsuya, to Ricoh Company, Ltd. Image reading device for accurately reading spread pages of a book document. 5,751,446, Cl. 358-474.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Nomura, Kazuhiko; and Yamaguchi, Isamu, 5,750,537, Cl. 514-304.000.
  - Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl. 546-121.000.
- Fujishima, Tatsumi: *See—*
  - Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, 5,752,148, Cl. 399-329.000.
- Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, to Denso Corporation. FMCW radar system for detecting distance, relative velocity and azimuth of a target obstacle. 5,751,240, Cl. 342-70.000.
- Fujita, Hideo: *See—*
  - Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.
- Fujita, Ryoichi: *See—*
  - Kanbayashi, Makoto; and Fujita, Ryoichi, 5,750,298, Cl. 430-45.000.
- Fujita, Toshio: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Fujitsu Automation Limited: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- Fujitsu Limited: *See—*
  - Furusawa, Toyoaki; Matsumura, Minehiro; and Nishimura, Toshihiro, 5,751,296, Cl. 345-520.000.
  - Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, 5,751,924, Cl. 395-115.000.
  - Hasegawa, Shinya, 5,751,682, Cl. 369-112.000.
  - Hegland, Markus; and Nakanishi, Makoto, 5,751,616, Cl. 364-725.020.
  - Iigahama, Yukio; and Fukuhara, Motohiko, 5,751,387, Cl. 349-95.000.
  - Ishikawa, Hiroshi; Yamaguchi, Nohuyasu; Iwamoto, Yasuhide; and Iida, Atsuo, 5,750,941, Cl. 178-19.000.
  - Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, 5,751,877, Cl. 385-93.000.
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
  - Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.
  - Kikkawa, Toshihide, 5,751,028, Cl. 257-192.000.
  - Kuwatsuka, Haruhiko, 5,751,758, Cl. 372-96.000.
  - Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,751,936, Cl. 395-182.050.
  - Matsuda, Shinji, 5,750,997, Cl. 250-341.800.
  - Matsunaga, Ryotaro, 5,751,960, Cl. 395-200.360.
  - Mihara, Satoru, 5,750,208, Cl. 427-539.000.
  - Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikaku; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.
  - Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.
  - Mori, Atuko, 5,751,799, Cl. 379-114.000.
  - Murai, Yukako; Suzuki, Akio; Tabata, Yoshio; Saito, Keiichi; and Amagai, Tamio, 5,751,438, Cl. 358-403.000.
  - Nakahara, Masaru; Nakashima, Kazuo; and Utsumi, Kenichi, 5,752,009, Cl. 395-500.000.
  - Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.
  - Nakajima, Yoshifumi; and Koyama, Yoshito, 5,751,193, Cl. 331-3.000.
  - Nakazawa, Fumihiko; Okumura, Hitoshi; Sano, Satoshi; and Abe, Fumitaka, 5,751,406, Cl. 356-3.030.
  - Ogura, Kiyonori, 5,751,047, Cl. 257-394.000.
  - Okano, Mitsunobu; and Yamashita, Yasuhiro, 5,751,597, Cl. 364-491.000.
  - Sakai, Akira; Ichikawa, Miki; and Urita, Seiichi, 5,751,577, Cl. 364-191.000.
  - Soumiya, Toshio; Abe, Shunji; Katoh, Masafumi; and Watanabe, Naotoshi, 5,751,691, Cl. 370-17.000.
  - Tomita, Hiroyoshi, 5,751,652, Cl. 365-226.000.
  - Uchida, Toru, 5,751,753, Cl. 372-45.000.
  - Ueno, Makoto; Kunugi, Takeshi; Ohyama, Kazuya; and Yazaki, Hiroomi, 5,752,189, Cl. 455-435.000.
  - Yamamoto, Takuji; and Kuwata, Naoki, 5,751,185, Cl. 327-558.000.
  - Yoshida, Hiroshi, 5,752,060, Cl. 395-800.000.
- Fujitsuna, Masami: *See—*
  - Kato, Yoshifumi; Yamauchi, Ichiro; Fujitsuna, Masami; and Tashiro, Tsutomu, 5,752,210, Cl. 701-51.000.
- Fujiwara, Ken: *See—*
  - Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.
- Fujiwara, Yasuo; and Kobayashi, Hiroo, to Canon Kabushiki Kaisha. Developing apparatus with a removahle sealing film and process cartridge and image forming apparatus including such a developing apparatus. 5,752,131, Cl. 399-106.000.
- Fukada, Taisei: *See—*
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
- Fukae, Kimitoshi: *See—*
  - Sato, Hiroshi; Fukae, Kimitoshi; and Takehara, Nobuyoshi, 5,751,133, Cl. 320-13.000.
- Fukawa, Yuuzou: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Fukaya, Chikara: *See—*
  - Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.
- Fuke, Hiromi: *See—*
  - Inoue, Tetsuo; Tomita, Hiroshi; Mizoguchi, Tetsuhiko; and Fuke, Hiromi, 5,750,273, Cl. 428-692.000.
- Fukuchi, Hiroyuki; and Osa, Kinya, to Nippon Steel Corporation. Moving picture signal decoder. 5,751,888, Cl. 386-68.000.
- Fukuchi, Masakazu: *See—*
  - Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.
- Fukuda, Eiji: *See—*
  - Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, 5,749,747, Cl. 439-358.000.
- Fukuda, Haruhiko: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Fukuda, Jun: *See—*
  - Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.
- Fukuda, Masaru: *See—*
  - Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, 5,749,747, Cl. 439-358.000.
- Fukuda, Motoi: *See—*
  - Satake, Toshimi; Takano, Toshiyuki; Fukuda, Motoi; and Uehori, Yukiko, 5,750,253, Cl. 428-342.000.
- Fukuda, Nobuhiro: *See—*
  - Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, 5,750,267, Cl. 428-469.000.
- Fukuda, Seiji; Nakamura, Sunao; and Ohno, Yotaro, to NKK Corporation. Gas heating apparatus with dual burners. 5,749,720, Cl. 431-285.000.
- Fukuda, Yasuaki; and Matsumoto, Shigeyuki, to Canon Kabushiki Kaisha. X-ray mask structure, preparation thereof and X-ray exposure method. 5,751,780, Cl. 378-35.000.
- Fukuhara, Motohiko: *See—*
  - Iigahama, Yukio; and Fukuhara, Motohiko, 5,751,387, Cl. 349-95.000.
- Fukui, Kiyoshi: *See—*
  - Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.
- Fukui, Yutaka: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Fukumoto, Masaharu: *See—*
  - Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.
- Fukunaga, Hiroyuki: *See—*

  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Fukuno, Akira: *See*—
  - Yoneyama, Tetsuhito; Yamamoto, Tomomi; Hidaka, Tetsuya; and Fukuno, Akira, 5,750,044, Cl. 252-62.540.
- Fukuoka, Katsumi, to Kyouryou Hozen Inc. Method of reinforcing concrete made construction and fixture used therefor. 5,749,200, Cl. 52-741.100.
- Fukushima, Hirotaka; and Hasegawa, Toshiaki, to Yazaki Corporation. Charging connector for electric vehicle. 5,751,135, Cl. 320-107.000.
- Fukushima, Hisashi: *See*—
  - Danzuka, Toshimitsu; Sakemi, Yuji; Fukushima, Hisashi; and Menjo, Takeshi, 5,752,140, Cl. 399-270.000.
- Fukushima, Shigeru: *See*—
  - Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.
- Fukushima, Yoshiaki: *See*—
  - Yamada, Yuri; Inagaki, Shinji; and Fukushima, Yoshiaki, 5,750,085, Cl. 423-328.200.
- Fukushima, Yoshihiro: *See*—
  - Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, 5,750,304, Cl. 430-110.000.
- Fukushima, Yoshihito, to Sony Corporation. Magneto-optical disk having variable thickness recording layer but adequate uniform reflectance value. 5,751,670, Cl. 369-13.000.
- Fukuta, Ken; Sano, Toshihiro; and Hirota, Tsutomu, to NGK Insulators, Ltd. Apparatus for coating outer peripheral surface of columnar structural body with a coating material. 5,749,970, Cl. 118-320.000.
- Fukutome, Yasuyuki: *See*—
  - Shiraishi, Takashi; Yamaguchi, Masao; and Fukutome, Yasuyuki, 5,751,462, Cl. 359-204.000.
- Fukuzawa, Hiroshi: *See*—
  - Nakamura, Takashi; Fukuzawa, Hiroshi; and Ono, Michio, 5,750,755, Cl. 558-84.000.
- Fulcher, Donald L.: *See*—
  - Johnson, David A.; Kline, Eric V.; and Fulcher, Donald L., 5,749,738, Cl. 439-66.000.
- Fulkerson, Don K.: *See*—
  - Stotelmyer, L. Scott; and Fulkerson, Don K., 5,749,402, Cl. 141-83.000.
- Fuller, James W.; and Roberts, Randall K., to Otis Elevator Company. Active elevator hitch. 5,750,945, Cl. 187-292.000.
- Fuller, Peter Armstrong; Schmidt, Herbert; Steiger, Debra Kay; and Grace, Dorman John, III. Soybean variety 93B41. 5,750,853, Cl. 800-200.000.
- Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., to Aspect Telecommunications Corporation. Controller for a telephone system with code screening of incoming calls. 5,751,760, Cl. 379-210.000.
- Fuller, Robert M.; Epler, Frederick A.; and Oates, Eugene W., to AccessLine Technologies, Inc. Telephone control system which connects a caller with a subscriber AT A telephone address. 5,752,191, Cl. 455-445.000.
- Fulop, Jozsef: *See*—
  - Cserteg, Istvanne; Tokes, Jozsef; Wursching, Istvan; and Fulop, Jozsef, 5,751,105, Cl. 313-493.000.
- Fulta Electric Machinery Co., Ltd.: *See*—
  - Furuta, Mikio, 5,749,170, Cl. 47-62.000.
- Fumioka, Jun: *See*—
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
- Funahashi, Takahiko, to WACOM Co., Ltd. Angular information input system. 5,751,229, Cl. 341-5.000.
- Funaki, Hideyuki: *See*—
  - Yasuhara, Norio; Nakagawa, Akio; Matsudai, Tomoko; and Funaki, Hideyuki, 5,751,022, Cl. 257-133.000.
- Funasaka, Tsukasa: *See*—
  - Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, 5,751,091, Cl. 310-339.000.
- Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, to Mita Industrial Co., Ltd. Toner for a two-component type developer. 5,750,301, Cl. 430-106.600.
- Funda, Janez; LaRose, David Arthur; and Taylor, Russell Highsmith, to International Business Machines Corporation. Method of creating an image of an anatomical feature where the feature is within a patient's body. 5,749,362, Cl. 128-653.100.
- Funk, Garrett T., to Casa Herrera, Inc. Oven with slide-out transfer guides. 5,749,283, Cl. 99-339.000.
- Fura, Aberra: *See*—
  - Cai, Xiong; Fura, Aberra; and Qian, Changgeng, 5,750,565, Cl. 514-473.000.
- Furman, Alla: *See*—
  - Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.
- Furness, Thomas A., III: *See*—
  - Melville, Charles D.; Furness, Thomas A., III; and Tidwell, Michael R., 5,751,465, Cl. 359-213.000.
- Furuichi, Kozo: *See*—
  - Yuasa, Hiroshi; and Furuichi, Kozo, 5,750,246, Cl. 428-318.400.
- Furukawa Electric Co., Ltd.: *See*—
  - Konda, Eiji; Ishii, Nobuhisa; and Matsuoka, Ryuichi, 5,751,881, Cl. 385-110.000.
- Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, to Sankyo Company, Limited. Composition and method for the treatment of prophylaxis of viral infections using modified oligodeoxyribonucleotides. 5,750,511, Cl. 514-44.000.
- Furukawa, Hideyasu: *See*—
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiha, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Furumoto, Horace W., to Cynosure, Inc. Near infra-red selective photothermolysis for ectatic vessels and method therefor. 5,749,868, Cl. 606-9.000.
- Furusawa, Hiroyuki: *See*—
  - Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.
- Furusawa, Takashi: *See*—
  - Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.
- Furusawa, Toyoaki; Matsumura, Minehiro; and Nishimura, Toshihiro, to Fujitsu Limited. Video presentation system. 5,751,296, Cl. 345-520.000.
- Furuta, Mikio, to Fulta Electric Machinery Co., Ltd. Automatic water supply device. 5,749,170, Cl. 47-62.000.
- Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, to Hitachi Maxell, Ltd. Organic triblock compound solid lubricant comprising the same and magnetic recording medium. 5,750,747, Cl. 554-36.000.
- Furuyama, Osamu; Hamamura, Kazunari; and Motozawa, Masahiro, to Henkel Corporation. Composition and process for prepainting treatment of plastics. 5,750,198, Cl. 427-322.000.
- Furuyama, Shizuo: *See*—
  - Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, 5,751,828, Cl. 381-199.000.
- Fushimi, Akira: *See*—
  - Miyazoe, Seigo; Fushimi, Akira; and Inoue, Masanobu, 5,750,624, Cl. 525-100.000.
- Fusion Medical Technologies, Inc.: *See*—
  - Sawyer, Philip N.; Wallace, Donald G.; and Yamamoto, Ronald K., 5,749,895, Cl. 606-214.000.
- Futaba Denshi Kogyo K.K.: *See*—
  - Mihira, Akihiro; and Mizohata, Tadashi, 5,751,106, Cl. 313-495.000.
- Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
  - Tanaka, Masahiro, 5,751,237, Cl. 341-176.000.
- Futamura, Masao: *See*—
  - Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,751,583, Cl. 364-470.080.
- G.D. Searle & Co.: *See*—
  - Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.
- G. D. S.p.A.: *See*—
  - Boldrini, Fulvio, 5,749,782, Cl. 454-370.000.
- Gabetta, Bruno: *See*—
  - Bombardelli, Ezio; De Bellis, Paolo; and Gabetta, Bruno, 5,750,562, Cl. 514-449.000.
- Gabriel, Ernst: *See*—
  - Zeitler, Walter; and Gabriel, Ernst, 5,751,120, Cl. 315-307.000.
- Gabriel, Richard L.: *See*—
  - Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, 5,750,713, Cl. 548-202.000.
- Gadkaree, Kishor P.; and Johnson, Timothy V., to Corning Incorporated. Device for removal of contaminants from fluid streams. 5,750,026, Cl. 210-502.100.
- Gadzoox Microsystems, Inc.: *See*—
  - Chan, Kurt; and Black, Alistair D., 5,751,715, Cl. 370-455.000.
- Gaillard, Pierre, to Alcatel Cable France. Optical unit for an optical fiber telecommunications cable, and an optical fiber cable including such a unit. 5,751,880, Cl. 385-109.000.
- Galic, George J.: *See*—
  - Maus, Steven M.; and Galic, George J., 5,750,060, Cl. 264-40.500.
  - Maus, Steven M.; and Galic, George J., 5,750,156, Cl. 425-139.000.
- Galic Maus Ventures: *See*—
  - Maus, Steven M.; and Galic, George J., 5,750,060, Cl. 264-40.500.
  - Maus, Steven M.; and Galic, George J., 5,750,156, Cl. 425-139.000.
- Gallenkamp, Bernd; Rohe, Lothar; and Marhold, Albrecht, to Bayer Aktiengesellschaft. 1,3-dimethyl-5-fluoro-pyrazole-4-carbonyl fluoride. 5,750,721, Cl. 548-374.100.
- Gallone, Flavio, to Signal Lux S.p.A. Electric low-voltage connecting terminal, in particular for luminous signallers. 5,749,749, Cl. 439-617.000.
- Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., to Motorola, Inc. Data processing system and method thereof. 5,752,074, Cl. 395-800.000.
- Galvin, George Frederic. Crank mechanism. 5,749,262, Cl. 74-44.000.
- Gam, Allisa, to Du Pont de Nemours, E. I., and Company. Cathodic electrocoating compositions containing an anticrater agent. 5,750,596, Cl. 523-404.000.
- Gamble, Richard A.; and Borino, Anthony V. Box spring wrap and dust ruffle system. 5,749,110, Cl. 5-493.000.

- Gamlyn, Lee; O'Sullivan, Siobhan; Needham, Philip; and Harris, Tom, to Cardionetics Limited. Heart monitoring apparatus and method. 5,749,367, Cl. 128-696.000.
- Gammel, Michele B.; and Adamo, Joseph A., to Texas Instruments Incorporated. Method and system for performing speaker verification on a spoken utterance. 5,752,231, Cl. 704-273.000.
- Gan, Zhongxue; Fitzgibbons, Lance Terrance; Tang, Qing; and Katz, Jeffrey Sherman, to Combustion Engineering, Inc. On-line robot work-cell calibration. 5,751,610, Cl. 364-571.030.
- Gande, Matthew E.: *See*—
  - Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., 5,750,765, Cl. 560-126.000.
- Gandhi, Haren Sakarlal: *See*—
  - Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.
- Gandy, James; Ahmed, Jubayer; and Janysek, Don Ray, to Signtech USA., Ltd. Apparatus for guiding and tensioning a substrate. 5,751,308, Cl. 347-33.000.
- Ganguly, Ashit K.: *See*—
  - Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 5,750,532, Cl. 514-274.000.
- Gansen, Peter; and Gricar, James R., to Bayer Corporation. Process for the production of molded polyurethane products. 5,750,583, Cl. 521-78.000.
- Garber, Sharon R.; Glaser, Rena H.; and Cary, Carolyn M., to Minnesota Mining and Manufacturing Company. System and method for developing and/or maintaining multiple workplace protection programs. 5,752,054, Cl. 395-767.000.
- Garbolino, Glenn: *See*—
  - Nguyen, Hien; Martens, Nicolas; and Garbolino, Glenn, 5,750,446, Cl. 442-337.000.
- Garcia, David J.: *See*—
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Garcia, Rigoberto Felipe; Vasudevan, Tirucherai Varahan; Post, Albert Joseph; and Hsu, Feng-Lung Gordon, to Lever Brothers Company, Division of Conopco, Inc. Liquid detergent compostions containing structuring polymers for enhanced suspending power and good pourability. 5,750,489, Cl. 510-417.000.
- Garcia, Rizza A.: *See*—
  - Jang, Yue-Teh; Salmon, Stephen M.; White, David A.; and Garcia, Rizza A., 5,749,848, Cl. 604-53.000.
- Garcia, Ruben G.: *See*—
  - Law, David Chee-Fai; Sandoval, Christopher Paul; and Garcia, Ruben G., 5,749,954, Cl. 106-282.000.
- Garcia-Gutierrez, Pedro A.; and Fraile-Mora, Jesus, to Qualitas Asessoria Profesional, S.A. Control circuits for an electromagnetic flow meter. 5,751,535, Cl. 361-143.000.
- Garcon-Johnson, Nathalie Marie-Josephe Claude: *See*—
  - Prieels, John Paul; Garcon-Johnson, Nathalie Marie-Josephe Claude; Slaoui, Moncef; and Pala, Pietro, 5,750,110, Cl. 424-208.100.
- Gardiner, Neil Stockenstrom: *See*—
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- Gardner, Henry J. Vehicle air bag guard. 5,749,599, Cl. 280-748.000.
- Gardner, Ronald S.: *See*—
  - Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingshee, Derek A.; and Cederholm-Williams, Stewart A., 5,750,657, Cl. 530-382.000.
- Gardner, Thomas Haley, to General Motors Corporation. Hydraulic punch actuator with centering apparatus. 5,749,279, Cl. 83-639.100.
- Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, to Merck Frosst Canada. Heteroaryl diol acids as leukotriene antagonists. 5,750,539, Cl. 514-311.000.
- Garibay, Raul A., Jr.; Quattromani, Marc A.; and Beard, Douglas, to Cyrix Corporation. Address translation unit employing a victim TLB. 5,752,274, Cl. 711-206.000.
- Garlich, Joseph R.: *See*—
  - Kiefer, Garry E.; Simon, Jaime; and Garlich, Joseph R., 5,750,660, Cl. 534-10.000.
- Garmong, Victor H. Shielded enclosure. 5,749,178, Cl. 52-79.100.
- Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., to Genentech, Inc. Enrichment method for variant proteins having altered binding properties, M13 phagemids, and growth hormone variants. 5,750,373, Cl. 435-69.400.
- Garrett, Frank: *See*—
  - Kuebler, Siegfried; and Garrett, Frank, 5,749,798, Cl. 473-549.000.
- Garrett-Roe, Anita Mallory. Three digit fingernail protector. 5,749,097, Cl. 2-21.000.
- Garwood, Robert: *See*—
  - Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, 5,750,178, Cl. 426-594.000.
- Gasman, Robert C.: *See*—
  - Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.
- Gasper, John; and Schildkraut, Jay Stuart, to Eastman Kodak Company. Copy restrictive system. 5,752,152, Cl. 399-366.000.
- Gasse, Andreas; and Klein, Rudi, to Wolff Walsrode AG. Heat-sealable multilayer film having good surface slip with improved thermoformability based on polyamide and polyolefins. 5,750,262, Cl. 428-423.500.
- Gast, Paul D.: *See*—
  - Cowger, Bruce; Hall, Ronald W.; Gast, Paul D.; and Shibata, Alan, 5,751,300, Cl. 347-6.000.
- Gates, Alfred S., Jr.; North, Bernard; and Shaffer, William R., to Kennametal Inc. Green honed cutting insert and method of making the same. 5,752,155, Cl. 419-5.000.
- Gates, Cynthia A.: *See*—
  - Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.
- Gätschmann, Klaus G.: *See*—
  - Ruppert, Heinrich W.; and Gätschmann, Klaus G., 5,749,378, Cl. 131-70.000.
- Gatto, Donald F.: *See*—
  - Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.
- Gaudreault, René C.; and Poyet, Patrick, to Universite Laval. Certain carbanate anti-cancer agents. 5,750,547, Cl. 514-346.000.
- Gauthier, Lloyd W.: *See*—
  - DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.
- Gaz de France: *See*—
  - Guillet, Rémi, 5,749,328, Cl. 122-31.100.
  - Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.
- Gaz Metropolitain: *See*—
  - Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.
- GE Yokogawa Medical Systems, Limited: *See*—
  - Yoshitome, Eiji, 5,751,782, Cl. 378-98.500.
- Geadelmann, Jon L.; and Leto, Kenneth, to Holden's Foundation Seeds, Inc.; and Du Pont de Nemours, E. I., and Company. Inbred corn line QH101. 5,750,851, Cl. 800-200.000.
- Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, to Amrad Corporation Limited. Leukaemia inhibitory factor. 5,750,654, Cl. 530-351.000.
- Geberth, John D.: *See*—
  - Carey, Danuta H.; Geberth, John D.; Walsh, John; and Hosley, Daniel S., 5,749,528, Cl. 239-119.000.
- Gedde, Lance D.: *See*—
  - Quinn, James P.; and Gedde, Lance D., 5,751,578, Cl. 364-453.000.
- Geerlandt, Hervé; and Henry, Claudine Grand', to Beecham Group plc. Process for the preparatin of β-lactam compounds. 5,750,684, Cl. 540-319.000.
- Gehrs, Donald F.; and Craddock, Robert E., to Eaton Corporation. Sealing cover assembly for electrical bus connections. 5,751,543, Cl. 361-641.000.
- Geib, Heribert, to Siemens Aktiengesellschaft. Method and arrangement for coding and decoding a video data stream for all picture elements of the video data stream. 5,751,357, Cl. 348-400.000.
- Geick, Kenneth Scott: *See*—
  - Farina, Thomas Edward; Geick, Kenneth Scott; and Falter, Julia Anne, 5,750,061, Cl. 264-117.000.
- Geier, George J., to Motorola, Inc. Method for heading error suppression in dead reckoning systems. 5,752,220, Cl. 701-217.000.
- Geiss, Klaus-Peter: *See*—
  - Seckler, Joachim; and Geiss, Klaus-Peter, 5,750,917, Cl. 102-476.000.
- Geissler, Paul R.: *See*—
  - Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., 5,750,750, Cl. 554-117.000.
- Geiwitz, Roger: *See*—
  - Thomson, Robert David; and Geiwitz, Roger, 5,751,949, Cl. 395-187.010.
- Geke, Juergen; Speckmann, Horst-Dieter; Stedry, Bernd; and Westfechtel, Alfred, to Henkel Kommanditgesellschaft auf Aktien. Use of guanidinium salts of unsaturated fatty acids as corrosion inhibitors. 5,749,947, Cl. 106-14.420.
- Gelman Sciences: *See*—
  - Kinsel, David I., 5,749,726, Cl. 433-80.000.
- Gelner, Larry: *See*—
  - Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.
- Genda, Kyoji: *See*—
  - Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,752,109, Cl. 396-311.000.

- Genentech, Inc.: *See—*
  - Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, Davld J., 5,750,373, Cl. 435-69.400.
- General Atomics: *See—*
  - Chen, Kuo-Chun; Trester, Paul W.; and Mazdiyasni, Khodabakhsh S., 5,752,156, Cl. 419-11.000.
- General Electric Company: *See—*
  - Abuaf, Nesim; and Goebel, Steven George, 5,749,229, Cl. 60-752.000.
  - Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., 5,749,701, Cl. 415-115.000.
  - Clarke, Jonathon P.; and Norton, Brian A., 5,749,705, Cl. 416-190.000.
  - Cromer, Robert H.; and Potter, Kenneth B., 5,749,218, Cl. 60-39.310.
  - Cserteg, Istvanne; Tokes, Jozsef; Wursching, Istvan; and Fulop, Jozsef, 5,751,105, Cl. 313-493.000.
  - Granfors, Paul R.; Morvan, Jean-Claude; and Saunders, Rowland F., 5,751,783, Cl. 378-108.000.
  - Harrison, Daniel David; Pradeep, Anantha Krishnan; Brooksby, Glen William; and Hladik, Stephen Michael, 5,752,218, Cl. 701-207.000.
  - Hushek, Stephen G., 5,749,834, Cl. 600-410.000.
  - Jackson, Wade Lee, 5,749,550, Cl. 248-188.200.
  - Sivavec, Timothy Mark, 5,750,036, Cl. 210-747.000.
  - Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.
  - Soules, Thomas F.; Hraboczki, Marton; and Lahl, John R., 5,751,104, Cl. 313-493.000.
  - White, Raymond Alan; and Solomon, Harvey Donald, 5,750,954, Cl. 219-121.450.
  - Zalar, Frank E., 5,751,095, Cl. 313-113.000.
- General Instrument Corporation: *See—*
  - Chen, Xuemin; and Liu, Vincent, 5,751,378, Cl. 348-700.000.
- General Motors Corporation: *See—*
  - Avila, Javier; Obermeyer, James Andrew; Speck, Michael H.; and Dybalski, Ronald Henry, 5,749,554, Cl. 248-311.200.
  - Baumgartner, Ernst Severin, 5,749,633, Cl. 303-113.100.
  - Bertuzzi, Dale Charles, Jr.; Bezusko, Michael James; and Nuss, David Allen, 5,749,742, Cl. 439-125.000.
  - Birsching, Joel Edward, 5,749,432, Cl. 180-443.000.
  - Boehm, Michael James; Straub, Peter John; and Kirkwood, Richard Darrell, 5,749,656, Cl. 374-185.000.
  - Crane, Robert Scott; Kolena, David Philip; and Berg, Alan Dean, 5,749,135, Cl. 29-415.000.
  - Gardner, Thomas Haley, 5,749,279, Cl. 83-639.100.
  - Grochowski, Edwin Thomas, 5,749,451, Cl. 192-70.250.
  - Jeffcoat, Keith, 5,749,247, Cl. 66-198.000.
  - Jensen, Eric Lee; Kruckemeyer, William Charles; and Fehring, John David, 5,749,596, Cl. 280-689.000.
  - Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, 5,749,223, Cl. 60-300.000.
  - Lambert, David Kay; and Groblicki, Peter John, 5,750,886, Cl. 73-117.300.
  - Lu, Jian Gang; and Beckmann, Ronald Lee, 5,749,606, Cl. 285-86.000.
  - Nichols, Gary Arthur; and Clark, Roger Allen, 5,749,343, Cl. 123-350.000.
  - Pattok, Eric David, 5,749,786, Cl. 464-106.000.
  - Peterson, Terry Robert, 5,749,431, Cl. 180-422.000.
  - Rajashekara, Kaushik; Gorti, Bhanuprasad Venkata; McMullen, Steven Robert; and Raibert, Robert Joseph, 5,751,069, Cl. 290-40.00C.
  - Ross, Christian Eric, 5,751,073, Cl. 307-10.500.
  - Siak, June-Sang; Biederman, Scott William; Whited, William Thomas; and Datte, Mark Allen, 5,749,409, Cl. 164-23.000.
  - Van Maanen, Keith D., 5,749,439, Cl. 184-6.120.
- General Nanotechnology, L.L.C.: *See—*
  - Kley, Victor B., 5,751,683, Cl. 369-126.000.
- General Products Company, Inc.: *See—*
  - McKann, H. Smith, 5,749,184, Cl. 52-204.100.
- Genetic Therapy, Inc.: *See—*
  - Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., 5,750,396, Cl. 435-357.000.
- Genovese, Frank C., to Xerox Corporation. Multiple laser beam differential intensity and start of scan sensing. 5,750,986, Cl. 250-235.000.
- Genta, Alessandro; and Rampone, Renzo, to Framatome Connectors International S.A. Female electric terminal. 5,749,755, Cl. 439-856.000.
- Gentex Corporation: *See—*
  - Byker, Harlan J., 5,751,467, Cl. 359-272.000.
- Genzyme Corporation: *See—*
  - Cheng, Seng Hing; Fang, Shaona Lee; Hoppe, Henry, IV; and Smith, Alan Edward, 5,750,571, Cl. 514-557.000.
- Geo-Microbial Technologies, Inc.: *See—*
  - Hitzman, Donald O.; Sperl, George T.; and Sandbeck, Kenneth A., 5,750,392, Cl. 435-243.000.
- Geon Company, The: *See—*
  - Cowfer, Joseph Allen; Johnston, Victor James; and Popiel, Lawrence, 5,750,812, Cl. 570-245.000.
- George Koch Sons, Inc.: *See—*
  - Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.
- George Paddock, Inc.: *See—*
  - Paddock, George K.; Haarhoff, Christopher C.; and O'Kane, Mark D., 5,752,112, Cl. 396-421.000.
- Georges, Sébastien: *See—*
  - Hund, René; and Georges, Sébastien, 5,750,614, Cl. 524-460.000.
- Georghiou, Paris, to Seabright Corporation Limited. Chromotropic acid-formaldehyde and 1-naphthol-formaldehyde polymeric compounds. 5,750,577, Cl. 514-232.000.
- Gerard, Eric-Jack; De Keyzer, Noel Raymond Maurice; and Van De Vliet, Birgitte Maria Ludovica Christine, to Shell Oil Company. Adhesive compositions comprising block copolymers of a monovinylaromatic compound and butadiene. 5,750,607, Cl. 524-271.000.
- Gerard, Richard S.: *See—*
  - Fathi, Zakaryae; Gerard, Richard S.; and Wei, Jianghua, 5,750,968, Cl. 219-736.000.
- Gerber, Matthias: *See—*
  - Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.
- Gerber, Michael J., to Somatogen, Inc. Treatment of adverse effects associated with administration of extracellular hemoglobin. 5,750,132, Cl. 424-423.000.
- Gerhards, Ronald H.: *See—*
  - Scholefield, Christopher; and Gerhards, Ronald H., 5,752,193, Cl. 455-452.000.
- Gerhardt, Paul M.: *See—*
  - Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., 5,751,712, Cl. 370-431.000.
- German, Neal. Dual maze. 5,749,575, Cl. 273-113.000.
- Germinario, Michael: *See—*
  - Sears, Jerome; Parfomak, Walter; Kluss, Walter J.; and Germinario, Michael, 5,751,131, Cl. 318-778.000.
- Gertz, Jonathan; Butcher, Mark S.; and Tuomy, James M., to Audio Authority Corporation. Circuit system for switching loudspeakers. 5,751,818, Cl. 381-55.000.
- Gestigkeit, Roland: *See—*
  - Sezi, Recai; Ahne, Hellmut; and Gestigkeit, Roland, 5,750,638, Cl. 528-310.000.
- Getman, Daniel P.: *See—*
  - Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.
- Geymond, Jean Paul; and Paltrinieri, Massimo, to Bull, S.A. Process and device for the automatic generation of spreadsheets. 5,752,253, Cl. 707-503.000.
- GfT Gesellschaft fuer Tauchtechnik mbH & Co. KG: *See—*
  - Kromp, Thomas, 5,749,679, Cl. 405-186.000.
- Ghaffari, Touraj, to Sensormatic Electronics Corporation. Synchronized network of electronic devices including back-up master units. 5,751,220, Cl. 340-825.210.
- Ghorpade, Sureshchandra Chintaman; Chittum, Jack Everett; and Romero, Mark Anthony, to Johns Manville International, Inc. Apparatus and method for producing glass fibers. 5,749,933, Cl. 65-511.000.
- Gibson, Bruce David, to Lexmark International, Inc. Method of inhibiting a print artifact associated with a printer pause. 5,751,312, Cl. 347-43.000.
- Gibson, Oliver E., Jr. Calorimetric wattmeter for testing microwave ovens. 5,749,654, Cl. 374-32.000.
- Gibson, Richard L., Jr.: *See—*
  - Boehmer, Dennis A.; and Gibson, Richard L., Jr., 5,749,394, Cl. 137-533.150.
- Giera, Henry: *See—*
  - Böcker, Thomas; Berneth, Horst; and Giera, Henry, 5,749,925, Cl. 8-436.000.
- Giffen, Robert E.: *See—*
  - Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., 5,751,127, Cl. 318-370.000.
- Gifford, David K., to Massachusetts Institute of Technology. Screening for genetic variation. 5,750,335, Cl. 435-6.000.
- Gil, Gyoung-Seon, to LG Semicon Co., Ltd. Semiconductor memory device and method thereof. 5,751,640, Cl. 365-156.000.
- Gilbert, Adam M., to American Home Products Corporation. Fluorinated N-arylmethylamino derivatives of cyclobutene-3,4-diones. 5,750,574, Cl. 514-604.000.
- Gilbert, Ira H., to Massachusetts Institute of Technology. Mesh parallel computer architecture apparatus and associated methods. 5,752,068, Cl. 395-800.160.
- Gilch, Markus: *See—*
  - Doemens, Günter; and Gilch, Markus, 5,750,904, Cl. 73-862.623.
- Gilchrest, Barbara A.; and Gordon, Philip R., to Trustees of Boston University, The. Methods for increasing melanin content in melanocytes using diacylglycerols and uses thereof. 5,750,091, Cl. 424-59.000.
- Gilead Sciences,Inc.: *See—*
  - Alexander, Petr; and Prisbe, Ernest J., 5,750,729, Cl. 549-216.000.
- Gilhousen, Klein S., to QUALCOMM Incorporated. System and method for orthogonal spread spectrum sequence generation in variable data rate systems. 5,751,761, Cl. 375-200.000.
- Gill, Hardayal Singh, to International Business Machines Corporation. Differential spin valve sensor structure. 5,751,521, Cl. 360-113.000.
- Gill, Michael A., to Solvay Animal Health, Inc. Canine coronavirus vaccine from feline enteric coronavirus. 5,750,112, Cl. 424-221.100.

- Gillespie, Byron; Goldschmidt, Marc; Sych, Terry; and Young, Bruce, to Intel Corporation. Method and apparatus for interfacing a device compliant to a first bus protocol to an external bus having a second bus protocol and for providing virtual functions through a multi-function intelligent bridge. 5,751,975, Cl. 395-306.000.
- Gillett, James E.; Dederer, Jeffrey T.; and Zafred, Paolo R., to Westinghouse Electric Corporation. Self-cooling mono-container fuel cell generators and power plants using an array of such generators. 5,750,278, Cl. 429-24.000.
- Gilling, Simon Peter, to Lucas Industries Public Limited Company. Apparatus and method for cruise control. 5,749,426, Cl. 180-167.000.
- Gineston, Jean-Marie: *See—*
  - Duvillier, Eric; Gineston, Jean-Marie; and De Roaldes, Olivier, 5,749,876, Cl. 606-88.000.
- Ginetti, Arnold; and Spyrou, Athanasius W., to VLSI Technology, Inc. Automated system and method for identifying critical timing paths in integrated circuit layouts for use with automated circuit layout system. 5,751,596, Cl. 364-491.000.
- Gingras-Taylor, Lynn. Self-adhesive corner reinforcement for cardboard boxes. 5,749,512, Cl. 229-199.000.
- Girard, Michel; Rowe, Keith; Matthews, Joseph H., III; and Lawler, Frank, to Microsoft Corporation. System and method for calling video on demand using an electronic programming guide. 5,751,282, Cl. 345-327.000.
- Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., to Schering Corporation. Pharmaceutically active compounds. 5,750,532, Cl. 514-274.000.
- Giwer, Matthias M. Ceramic mass loaded longitudinal vibrator. 5,751,659, Cl. 367-158.000.
- GKN Westland Helicopters Limited: *See—*
  - Brocklehurst, Alan, 5,750,891, Cl. 73-178.00H.
- Glantz, Jerald, to SIMS Deltec, Inc. Method and apparatus for location of a catheter tip. 5,749,835, Cl. 600-424.000.
- Glaser, Rena H.: *See—*
  - Garber, Sharon R.; Glaser, Rena H.; and Cary, Carolyn M., 5,752,054, Cl. 395-767.000.
- Glausch, Ralf; Reinhard, Georg; Jircik, Renate; and Rammelt, Ursula, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Anticorrosive pigment preparation containing metal oxide-coated platelet adjuvant. 5,749,946, Cl. 106-14.170.
- Glenday, Ronald C.: *See—*
  - Katzman, Steven P.; and Glenday, Ronald C., 5,750,074, Cl. 422-102.000.
- Glew, Andrew F.; and Hinton, Glenn J., to Intel Corporation. Method and apparatus for processing memory-type information within a microprocessor. 5,751,996, Cl. 711-145.000.
- Glew, Andrew F.: *See—*
  - Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
  - Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., 5,751,986, Cl. 395-394.000.
- Glick, Mark; Fekete, Nicholas M.G.; Bolan, Michael L.; and Owens, Jeffrey D., to Dallas Semiconductor Corporation. Electrical/mechanical access control systems and methods. 5,749,253, Cl. 70-278.000.
- Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., to Heartstream, Inc. Electrotherapy method utilizing patient dependent electrical parameters. 5,749,904, Cl. 607-7.000.
- Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., to Heartstream, Inc. Electrotherapy method utilizing patient dependent electrical parameters. 5,749,905, Cl. 607-7.000.
- Globespan Technologies, Inc.: *See—*
  - Langberg, Ehud; and Scholtz, William Henry, 5,751,701, Cl. 370-281.000.
- Gloth, David; and Dann, Jeffrey A., to NEBL, Inc. Electrode for coagulation and resection. 5,749,870, Cl. 606-45.000.
- Glotin, Joël, to Zefal. Pump connector device. 5,749,392, Cl. 137-231.000.
- Glover, Bryan K.: *See—*
  - Marker, Terry L.; Muldoon, Brian S.; Glover, Bryan K.; and Vora, Bipin V., 5,750,800, Cl. 568-678.000.
- Glover, Edward Charles; and Earle, Anthony, to Eastman Kodak Company. Handling of solutions. 5,752,124, Cl. 396-626.000.
- Glover, Neal, to Cirrus Logic, Inc. Interleaved redundancy sector for correcting an unrecoverable sector in a disc storage device. 5,751,733, Cl. 371-40.300.
- Glycomed Incorporated: *See—*
  - Dasgupta, Falguni; and Musser, John Henry, 5,750,508, Cl. 514-25.000.
- Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., to Texas Instruments Incorporated. Low dielectric constant layers via immiscible sol-gel processing. 5,750,415, Cl. 437-195.000.
- Gnatjuk, Sevastian Dmitrievich. Autonomous on-board satellite control system. 5,749,545, Cl. 244-164.000.
- Go, Hata: *See—*
  - Hideki, Kawai; Takayuki, Imaoka; and Go, Hata, 5,750,716, Cl. 549-210.000.
- Gobbi, Rosa Maria, to Horse Vitality Ltd. Pharmaceutical and dermocosmetic compositions containing equine colostrum. 5,750,149, Cl. 424-535.000.
- Godeau, Denis, to Hutchinson. Watertight coupling between a tube and an endpiece and method of manufacturing it. 5,749,995, Cl. 156-242.000.
- Godec, Richard D.; Kosenka, Paul P.; and Hutte, Richard S., to Sievers Instruments, Inc. Reagentless oxidation reactor in a carbon measuring system. 5,750,073, Cl. 422-79.000.
- Godfrey, Russell E.: *See—*
  - Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenhurg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
- Goebel, Steven George: *See—*
  - Abuaf, Nesim; and Goebel, Steven George, 5,749,229, Cl. 60-752.000.
- Goedecke Aktiengesellschaft: *See—*
  - Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.
- Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V. Method for electron beam deposition of multicomponent evaporants. 5,750,185, Cl. 427-8.000.
- Goel, Piyush: *See—*
  - Bhargava, Gautam; Goel, Piyush; and Iyer, Balakrishna Ragmavendra, 5,752,017, Cl. 395-602.000.
- Goeserich, Manfred H.: *See—*
  - Bailey, Raymond E.; McCubbin, Robert K.; Goeserich, Manfred H.; and Altavela, Robert P., 5,751,316, Cl. 347-63.000.
- Gohara, Yoshihiro; Fujimoto, Hiroaki; and Nanami, Masayoshi, to Sanshin Kogyo Kabushiki Kaisha. Fuel-increasing system for an engine. 5,749,338, Cl. 123-73.00A.
- Gohla, Sven; Müller, Anja; and Nielsen, Jens, to Beiersdorf Ag. W/O/W emulsions. 5,750,124, Cl. 424-401.000.
- Goke, L. Rodney: *See—*
  - Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.
- Gokinko, Jeff: *See—*
  - Yiu, Hing Leung; Gokinko, Jeff; and Zoerner, Glen, 5,752,077, Cl. 395-827.000.
- Gold, Larry: *See—*
  - Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, 5,750,342, Cl. 435-6.000.
- Golden Supreme, Inc.: *See—*
  - Stillwagon, Ross I.; Fischbach, Fernando; and Bennett, Allen, 5,749,379, Cl. 132-200.000.
- Golden Valley Microwave Foods, Inc.: *See—*
  - Schellhaass, Steven R., 5,750,166, Cl. 426-93.000.
- Goldfeld, Dorian: *See—*
  - Anshel, Michael M.; and Goldfeld, Dorian, 5,751,808, Cl. 380-23.000.
- Goldman, Don S., to Baxter International, Inc. Apparatus and method for non invasively identifying components of liquid medium within a bag. 5,750,998, Cl. 250-343.000.
- Goldman, Julian M. Real-time waveform analysis using artificial neural networks. 5,751,911, Cl. 395-22.000.
- Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, to Bayer Aktiengesellschaft. Benzyloxy-substituted phenylglycinolamides. 5,750,783, Cl. 564-166.000.
- Goldschmidt, Marc: *See—*
  - Gillespie, Byron; Goldschmidt, Marc; Sych, Terry; and Young, Bruce, 5,751,975, Cl. 395-306.000.
- Goldslager, Barry: *See—*
  - Takeoka, Toru; Clarson, Stephen J.; and Goldslager, Barry, 5,750,588, Cl. 522-66.000.
- Golliher, Waldo R.: *See—*
  - Stephenson, Michael J.; Golliher, Waldo R.; and Haas, Paul, 5,752,158, Cl. 423-261.000.
- Gomez, Donald T.: *See—*
  - Hillenbrand, Christopher F.; and Gomez, Donald T., 5,749,312, Cl. 114-21.200.
- Gonzalez, Cesar, to Ford Global Technologies, Inc. Fluid-cooled linear motor armature. 5,751,077, Cl. 310-12.000.
- Gonzalez, Fernando: *See—*
  - Corbett, Tim J.; Scholer, Raymond P.; and Gonzalez, Fernando, 5,751,015, Cl. 257-48.000.
- Gonzalez, Rafael: *See—*
  - Hansen, Borg; Gonzalez, Rafael; and Fleisaman, Roc V., 5,749,107, Cl. 4-541.100.
- Good, Robert J.; and Colburn, Joel, to Nellcor Puritan Bennett Incorporated. Resuscitator bag exhaust port with CO_2 indicator. 5,749,358, Cl. 128-205.230.
- Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, to U.K. of Gt. Britain, Secretary of State for Defence in her Britannic Majesty's Government of the; and N. Ireland of Defence Evaluation Research Agency, DRA. Discotic compounds for use in liquid crystal mixtures. 5,750,050, Cl. 252-299.620.
- Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., to Cortech, Inc. Bradykinin antagonists with extended hydrophobic side chains. 5,750,506, Cl. 514-15.000.
- Goodheart, Clyde R.; and Silverman, Ralph H., to Fibrogenex, Inc. Method for preparing cellular fibronectin. 5,750,378, Cl. 435-70.300.
- Goodley, Paul C.: *See—*
  - Apffel, James A.; Werlich, Mark H.; Bertsch, James L.; and Goodley, Paul C., 5,750,988, Cl. 250-288.000.
- Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, to Libbey-Owens-Ford Co.; and Pilkington PLC. Coatings on glass. 5,749,931, Cl. 65-60.100.

- Goodman, Ronald D., to Libbey-Owens-Ford Co. Coated glass article having a pyrolytic solar control coating. 5,750,265, Cl. 428-432.000.
- Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, to Libbey-Owens-Ford Co.; and Pilkington PLC. Coatings on glass. 5,751,484, Cl. 359-512.000.
- Goodwin, John C., III, to NCR Corporation. System and method for printing overlays for electronic display devices. 5,751,919, Cl. 395-101.000.
- Goodwin, Michael W., to Texas Instruments Incorporated. Two-color infrared detector. 5,751,049, Cl. 257-440.000.
- GoodYear Tire & Rubber Company, The: *See—*
  - Lukich, Lewis Timothy; Duncan, Thomas Edwin; and Lansinger, Colleen Marie, 5,750,615, Cl. 524-495.000.
  - Ngoc, Hung Dang; and Salazar, Mariano, 5,750,263, Cl. 428-424.400.
  - Sturm, Budd Harvey, 5,750,786, Cl. 564-403.000.
  - Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, 5,749,981, Cl. 148-595.000.
- Goossen, LaVern Roy: *See—*
  - Anderson, J. Dale; and Goossen, LaVern Roy, 5,749,289, Cl. 100-88.000.
- Gopinath, Ramesh Ambat: *See—*
  - Chen, Chengjun Julian; Gopinath, Ramesh Ambat; Monkowski, Michael Daniel; and Picheny, Michael Alan, 5,751,905, Cl. 395-2.630.
- Gorca Memory Systems: *See—*
  - Helbig, Walter A., Sr., 5,751,740, Cl. 371-37.100.
- Gordon, Philip R.: *See—*
  - Gilchrest, Barbara A.; and Gordon, Philip R., 5,750,091, Cl. 424-59.000.
- Gore, David W., to Incre, L.L.C. Method for freeform fabrication by molten metal deposition. 5,749,408, Cl. 164-4.100.
- Gorham, Mark: *See—*
  - Allin, Gaylord; and Gorham, Mark, 5,750,237, Cl. 428-182.000.
- Gormley, Austin: *See—*
  - Topping, Allen; Kuperschmidt, Vladimir; and Gormley, Austin, 5,751,835, Cl. 382-115.000.
- Gornish, Edward H.; Holler, Anne M.; and Hsu, Wei Chung, to Hewlett-Packard Company. Method of prefetching data for references with multiple stride directions. 5,752,037, Cl. 395-709.000.
- Gorti, Bhanuprasad Venkata: *See—*
  - Rajashekara, Kaushik; Gorti, Bhanuprasad Venkata; McMullen, Steven Robert; and Raibert, Robert Joseph, 5,751,069, Cl. 290-40.00C.
- Goseberg, Walter, to Deutsche Thomson Brandt GmbH. High-voltage transformer for a television receiver. 5,751,205, Cl. 336-178.000.
- Goss, Lawrence T.: *See—*
  - Goss, William A.; and Goss, Lawrence T., 5,749,152, Cl. 33-381.000.
- Goss, Ralph Richard: *See—*
  - Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
- Goss, William A.; and Goss, Lawrence T. Spirit level vial construction. 5,749,152, Cl. 33-381.000.
- Gossler Thermal Ceramics GMBH: *See—*
  - Klinge, Bernd; Gutknecht, Michael; Weise, Bernd; and Birnkraut, Ingo, 5,749,721, Cl. 431-328.000.
- Goto, Akihiro: *See—*
  - Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.
- Gotoh, Masaru: *See—*
  - Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.
- Gotovchikov, Vitaly T.; Ivanov, Alexander V.; and Filippov, Eugene A., to Institute of Chemical Technology (PlasTech). Processing of solid mixed waste containing radioactive and hazardous materials. 5,750,822, Cl. 588-11.000.
- Gottschalk, Axel; Stadler, Raimund; and Krappe, Udo, to BASF Aktiengesellschaft. Multiphase polymer blends. 5,750,621, Cl. 525-68.000.
- Goubet, Francois: *See—*
  - Claussner, Andre; Goubet, Francois; and Teutsch, Jean, 5,750,553, Cl. 514-392.000.
- Gouda, Hirofumi; and Tanaka, Takayoshi, to Idemitsu Petrochemical Co., Ltd. Gas-introduced injection molding and method of obtaining the same. 5,750,068, Cl. 264-572.000.
- Gough, Nicholas Martin: *See—*
  - Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.
- Goulait, David Joseph Kenneth: *See—*
  - Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.
- Goulding, Mark; Coates, David; and Greenfield, Simon, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Reactive terphenyls. 5,750,051, Cl. 252-299.650.
- Goutzoulis, Anastasios P.; and Zomp, John M., to Northrop Grumman Corporation. Transmit-receive fiber-optic manifold for phase array antennas. 5,751,242, Cl. 342-158.000.
- Gove, Robert J.: *See—*
  - Markandey, Vishal; Doherty, Donald B.; and Gove, Robert J., 5,751,379, Cl. 348-759.000.
- Gover, Frank Carl; Levine, Frank Eliot; and Welbon, Edward Hugh, to International Business Machines Corporation. Method and system for performance monitoring through monitoring an order of processor events during execution in a processing system. 5,752,062, Cl. 355-800.000.
- Gower, Stefan F., to Sybase, Inc. Database system with methods for controlling object interaction by establishing database contracts between objects. 5,751,909, Cl. 395-11.000.
- Grabovac, Bosko. CNC machine tool. 5,751,586, Cl. 364-474.110.
- Grabowski, Danuta; Kolberg, Uwe; Weitzel, Alwin; and Winkler-Trudewig, Magdalena, to Schott Glaswerke. Copper(II) oxide-containing aluminophosphate glasses. 5,750,448, Cl. 501-47.000.
- Grace, Dorman John, III: *See—*
  - Fuller, Peter Armstrong; Schmidt, Herbert; Steiger, Debra Kay; and Grace, Dorman John, III, 5,750,853, Cl. 800-200.000.
- Gracia, Robert F.: *See—*
  - Fromson, Howard A.; Gracia, Robert F.; and Rubin, Steven A., 5,750,314, Cl. 430-302.000.
- Graetzel, Michael: *See—*
  - Saaman, Ary; Poscio, Patrick; and Graetzel, Michael, 5,750,138, Cl. 424-448.000.
- Graham Engineering Corporation: *See—*
  - Dundas, Dennis L.; and Klinedinst, Paul W., 5,749,275, Cl. 83-24.000.
- Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., to Cummins Engine Company, Inc. Electronically controlled continuous lubricating oil replacement system. 5,749,339, Cl. 123-73.0AD.
- Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, to Lucent Technologies Inc. Wound optical fiber cable including robust component cable(s) and a system for manufacture of the cable. 5,751,879, Cl. 385-103.000.
- Gran, William O.: *See—*
  - Brunn, Randy J.; Gran, William O.; and Junk, James P., 5,749,652, Cl. 366-209.000.
- Granfors, Paul R.; Morvan, Jean-Claude; and Saunders, Rowland F., to General Electric Company. Detector for automatic exposure control on an x-ray imaging system. 5,751,783, Cl. 378-108.000.
- Grant, William H.: *See—*
  - Heminger, David M.; Mirtich, Vincent L.; and Grant, William H., 5,751,052, Cl. 257-577.000.
- Grantz, Alexander A.: *See—*
  - Bennett, Alan B.; Brummell, David A.; and Grantz, Alexander A., 5,750,872, Cl. 800-205.000.
- Granzow, Daniel B., to Compag Computer Corporation. Elongated ink jet printhead using joined piezoelectric actuator. 5,751,318, Cl. 347-68.000.
- Grapar Corporation: *See—*
  - Parslow, Harold W., Jr., 5,749,383, Cl. 134-56.00R.
- Gras, Rainer, to Huels Aktiengesellschaft. Polyisocyanates containing uretdione groups. 5,750,727, Cl. 548-951.000.
- Grave, Heinrich: *See—*
  - Vogt, Hans-Günter; Grave, Heinrich; Bross, Hermann-Josef; and Matner, Martin, 5,750,618, Cl. 524-836.000.
- Graves, Bradford T.: *See—*
  - Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,751,840, Cl. 382-135.000.
- Gray, Donald M., III; and Needle, David L., to CagEnt Technologies, Inc. Digital signal processor architecture. 5,752,073, Cl. 395-800.350.
- Gray, George William: *See—*
  - Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.
- Grebe, Bruce: *See—*
  - Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.
- Greco, Paul M.: *See—*
  - Castaneda, Julio C.; Frandsen, Troy V.; and Greco, Paul M., 5,749,457, Cl. 200-343.000.
- Greelis, John P.: *See—*
  - Bacich, Steven R.; Greelis, John P.; Nguyen, Hien; and Nguyen, Tuoc, 5,749,889, Cl. 606-198.000.
- Green, Andre. Adjustable cup bra. 5,749,768, Cl. 450-65.000.
- Green Cross Corporation, The: *See—*
  - Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.
- Green, Mark M., to Hayes Soloway, Hennessey, Grossman & Hage. Chiral optical polymer based information storage material. 5,750,049, Cl. 252-299.010.
- Green, Robert B.: *See—*
  - Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., 5,750,906, Cl. 73-863.730.
- Greenamyer, Lara L.: *See—*
  - Myers, Robert A.; Greenamyer, Lara L.; and Kasha, Robert J., 5,751,825, Cl. 381-118.000.
- Greenberg, Melvin: *See—*
  - Supcoe, Robert F.; and Greenberg, Melvin, 5,749,959, Cl. 106-428.000.
- Greene, Ronald: *See—*
  - Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.

- Greenfield, Simon: *See—*
  - Goulding, Mark; Coates, David; and Greenfield, Simon, 5,750,051, Cl. 252-299.650.
- Greer, David A.: *See—*
  - Wood, James A.; and Greer, David A., 5,752,212, Cl. 701-71.000.
- Greff, Gary S. Preparation of fresh comminuted onions. 5,750,181, Cl. 426-615.000.
- Gregerson, Barry, to Empak, Inc. Wafer suspension box. 5,749,467, Cl. 206-445.000.
- Greywall, Dennis Stanley: *See—*
  - Arney, Susanne C.; Greywall, Dennis Stanley; Walker, James A.; and Yurke, Bernard, 5,751,469, Cl. 359-291.000.
- Gricar, James R.: *See—*
  - Gansen, Peter; and Gricar, James R., 5,750,583, Cl. 521-78.000.
- Gridnev, Alexei Alexeyevich, to Du Pont de Nemours, E. I., and Company. Decolorization of hydroxy-containing methacrylate homopolymers and copolymers. 5,750,772, Cl. 560-218.000.
- Griersen, Donald: *See—*
  - Bird, Colin Roger; Grierson, Donald; and Schuch, Wolfgang Walter, 5,750,865, Cl. 800-205.000.
- Griesgraber, George W.: *See—*
  - Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.
- Grieve, Robert B.: *See—*
  - Tripp, Cynthia Ann; Frank, Glenn R.; and Grieve, Robert B., 5,750,391, Cl. 435-212.000.
- Griffin, Wayne P.: *See—*
  - Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., 5,751,341, Cl. 348-65.000.
- Griffiths, Christopher E. M.: *See—*
  - Voorhees, John J.; Ellis, Charles N.; and Griffiths, Christopher E. M., 5,750,570, Cl. 514-557.000.
- Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, to Institut gornogo dela Sibirskogo otdelenia Rossiiskoi Akademii nauk. Apparatus for impact action. 5,749,677, Cl. 405-184.000.
- Grimes Aerospace Company: *See—*
  - Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., 5,751,127, Cl. 318-370.000.
- Grimm, Jean-Paul: *See—*
  - Guo, Chaoying; and Grimm, Jean-Paul, 5,752,180, Cl. 455-319.000.
- Grinberg, Alexander: *See—*
  - Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, 5,749,885, Cl. 606-170.000.
- Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, to Taras Development. Method and system for computerized learning, response, and evaluation. 5,749,736, Cl. 434-322.000.
- Grobben, Alfons Jakob: *See—*
  - De Cock, Etienne Marie; De Schamphelaere, Lucien Amede; and Grobben, Alfons Jakob, 5,751,327, Cl. 347-130.000.
- Groblicki, Peter John: *See—*
  - Lambert, David Kay; and Groblicki, Peter John, 5,750,886, Cl. 73-117.300.
- Grochowski, Edwin Thomas, to General Motors Corporation. Clutch assembly with a piston stroke adjuster. 5,749,451, Cl. 192-70.250.
- Grönen, Jürgen: *See—*
  - Mayer, Eduard; and Grönen, Jürgen, 5,750,580, Cl. 521-51.000.
- Groner, Warren: *See—*
  - Drocourt, Jean-Louis; Guillet, Jean-Gérard; and Groner, Warren, 5,751,839, Cl. 382-133.000.
- Grootjans, Jacques F.; Belloir, Pierre-Frederic J.; and Romers, Eric J.G.M., to Fina Research, S.A. Process for the alkylation of aromatics. 5,750,814, Cl. 585-323.000.
- Grosbach, Lyle Edwin: *See—*
  - Krolak, David John; Grosbach, Lyle Edwin; Levenstein, Sheldon B.; and Irish, John David, 5,751,990, Cl. 395-417.000.
- Gross, Norbert: *See—*
  - Aebersold, Hans; Gross, Norbert; and Urech, Werner, 5,749,511, Cl. 228-212.000.
- Gross, Stephen F.; and Hessel, John F., to Henkel Corporation. Solid soap/syndet composition. 5,750,663, Cl. 536-4.100.
- Grosswald, Ralph R.; Anderson, Jeffory B.; and Andrew, Clair S., to GS Technologies, Inc. Apparatus for the manufacture of pharmaceutical cellulose capsules. 5,750,157, Cl. 425-143.000.
- Grosveld, Gerard C.: *See—*
  - Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., 5,750,396, Cl. 435-357.000.
- Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., to California Institute of Technology. Olefin metathesis coupling using ruthenium and osmium carbene complexes. 5,750,815, Cl. 585-511.000.
- Gruppo Lepetit S.p.A.: *See—*
  - Malabarba, Adriano; Ciabatti, Romeo; Panzone, Gianbattista; and Marazzi, Alessandra Maria, 5,750,509, Cl. 514-11.000.
- Grützmann, Rudi: *See—*
  - Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.
- GS Technologies, Inc.: *See—*
  - Grosswald, Ralph R.; Anderson, Jeffory B.; and Andrew, Clair S., 5,750,157, Cl. 425-143.000.
- Gsell, Laurenz: *See—*
  - Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, 5,750,548, Cl. 514-357.000.
- GT Bicycles, Inc.: *See—*
  - Itson, Joseph Derwood, 5,749,615, Cl. 296-26.000.
- Guala, Ernesto; and Guala, Gianni, to Industrie Borla S.p.A. Connector with protection valve for medical infusion/transfusion lines and the like. 5,749,861, Cl. 604-249.000.
- Guala, Gianni: *See—*
  - Guala, Ernesto; and Guala, Gianni, 5,749,861, Cl. 604-249.000.
- Guarrera, Donna J.: *See—*
  - Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.
- Gubelmann, Michel: *See—*
  - Aubry, Alain; Gubelmann, Michel; and Le Govic, Anne-Marie, 5,750,777, Cl. 562-549.000.
- Guegnaud, Hervé; and Robbe, Michel, to Matra Communication. FM demodulator using a switched capacitor phase shifter. 5,751,188, Cl. 329-323.000.
- Guette, Jean-Paul: *See—*
  - Huynh, Anh Hoa; Tran, Joanne; Scherninski, François; and Guette, Jean-Paul, 5,750,722, Cl. 548-427.000.
- Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, to Alcatel Italia S.p.A. Fractionally spaced equalizing circuits and method. 5,751,768, Cl. 375-234.000.
- Guibas, Leonidas John: *See—*
  - Marimont, David H.; and Guibas, Leonidas John, 5,751,852, Cl. 382-180.000.
- Guillaud, Marc Jean: *See—*
  - Vandeputte, Joris Frans; Guillaud, Marc Jean; and Milward, Francis William, 5,750,118, Cl. 424-262.100.
- Guillerm, Thierry: *See—*
  - Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000.
- Guillet, Jean-Gérard: *See—*
  - Drocourt, Jean-Louis; Guillet, Jean-Gérard; and Groner, Warren, 5,751,839, Cl. 382-133.000.
- Guillet, Rémi, to Gaz de France. Boiler for heating a working fluid. 5,749,328, Cl. 122-31.100.
- Guillot, Joe; Dinh, Michael Quan; Roberts, Bill; and McLemore, Linda M., to Dallas Semiconductor Corporation. Process for forming a module. 5,749,143, Cl. 29-841.000.
- Gullicksrud, John Theodore; Lidberg, Dale Joseph; and Seyfert, Michael David, to International Business Machines Corporation. Device for improving computer cage slot keying. 5,751,558, Cl. 361-801.000.
- Gullion, Steven Dwayne: *See—*
  - Wilkins, Robert Lee; Gullion, Steven Dwayne; and Jones, Charles Edward, 5,749,608, Cl. 285-123.120.
- Gundersen, Borge Peter: *See—*
  - Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
- Gundjian, Arshavir, to Nocopi Technologies, Inc. Latent image printing process and apparatus and substrate therefor. 5,750,462, Cl. 503-201.000.
- Guo, Chaoying; and Grimm, Jean-Paul, to Thomson Consumer Electronics S.A. Converter for processing RF signals having different polarizations. 5,752,180, Cl. 455-319.000.
- Gupta, Niranjan Lal; Sankaran, Ramanathan; Chattejee, Sugata; and Krishna, Tummа Hari, to Lupin Laboratories, Ltd. Process for the stereospecific snythesis of keto-enol tautomeric mixture of p-nitrobenzyl (1R,6R,7R)-7-phenoxyactamido-3-oxo-cepham-4-(R/S)-carboxylate-1-oxide and p-nitrobenzyl (1R,6R,7R-7-phenoxyacetamido-3-hydroxy-3-cephem-4-carboxylate-1-oxide. 5,750,683, Cl. 540-214.000.
- Gupta, Umesh C., to Vickers, Incorporated. High starting torque induction motor. 5,751,082, Cl. 310-72.000.
- Guri, Assaf Z.; and Patel, Kishor N., to Plant Cell Technology, Inc. Compositions and methods to prevent microbial contamination of plant tissue culture media. 5,750,402, Cl. 435-431.000.
- Guskey, Gerald John, to Procter & Gamble Company, The. Low residue antiperspirant gel-solid stick compositions containing select gellants. 5,750,096, Cl. 424-65.000.
- Gustafson, David T.: *See—*
  - Yip, William Chunhung; and Gustafson, David T., 5,751,718, Cl. 370-468.000.
- Gustavson, Fred Gehrung: *See—*
  - Agarwal, Ramesh Chandra; Fleischer, Bruce Martin; and Gustavson, Fred Gehrung, 5,751,619, Cl. 364-736.020.
- Guth, Paul J., to Ranpak Corp. Conversion machine loader and method. 5,749,824, Cl. 493-464.000.
- Gutierrez, Leslie: *See—*
  - Bogdanowicz, Mitchell Joseph; Hagmaier, Charles Peter; and Gutierrez, Leslie, 5,750,320, Cl. 430-383.000.

- Gutknecht, Michael: *See—*
  - Klinge, Bernd; Gutknecht, Michael; Weise, Bernd; and Birnkraut, Ingo, 5,749,721, Cl. 431-328.000.
- Guy, Rodney K.: *See—*
  - Nicolaou, K. C.; Nantermet, Philippe G.; Guy, Rodney K.; and Ueno, Hiroaki, 5,750,691, Cl. 544-238.000.
- Guzik, Kenneth J.; and Seybold, John L. C., to Motorola, Inc. Method of splitting handwritten input. 5,751,851, Cl. 382-179.000.
- Guzinski, James A.; and Schulze, Mark H., to Kalamazoo Holdings, Inc. Process for producing a water-soluble lipidic hop extract. 5,750,179, Cl. 426-600.000.
- Guzman, Eri. Airtight cigar package. 5,749,461, Cl. 206-245.000.
- Guzovskiy, Aleksandr; Zak, Robert C., Jr.; and Bromley, Mark, to Sun Microsystems, Inc. Encoding method for directory state in cache coherent distributed shared memory system. 5,752,258, Cl. 711-120.000.
- Gwaltney, Mark A., to Xerox Corporation. Highlight gloss for xerographic engine. 5,751,432, Cl. 358-296.000.
- Gwin, Kennard N.: *See—*
  - Frichtel, John S.; Canada, Robert O., III; and Gwin, Kennard N., 5,752,198, Cl. 455-524.000.
- Haapanen, Mika; and Dekker, André, to Nokia Telecommunications OY. Phase-locked loop having charge pump controlled according to temperature and frequency. 5,751,194, Cl. 331-17.000.
- Haarhoff, Christopher C.: *See—*
  - Paddock, George K.; Haarhoff, Christopher C.; and O'Kane, Mark D., 5,752,112, Cl. 396-421.000.
- Haas, David J.: *See—*
  - Schaefer, Carl G., Jr.; McCool, Kelly M.; and Haas, David J., 5,751,609, Cl. 364-565.000.
- Haas, Paul: *See—*
  - Stephenson, Michael J.; Golliher, Waldo R.; and Haas, Paul, 5,752,158, Cl. 423-261.000.
- Haas, Peter; Engelhardt, Heinz; and Müllner, Stefan, to Hoechst Aktiengesellschaft. Process for obtaining pharmacologically active compounds from complex mixtures of substances. 5,750,679, Cl. 536-127.000.
- Habbaba, Faris S.: *See—*
  - Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.
- Haberman, Herbert F.: *See—*
  - Menon, I. Aravindakshan; and Haberman, Herbert F., 5,750,093, Cl. 424-59.000.
- Habuka, Hitoshi; Mayuzumi, Masanori; Tate, Naoto; and Katayama, Masatake, to Shin-Etsu Handotai Co., Ltd. Method of chemical vapor deposition and reactor therefor. 5,749,974, Cl. 118-725.000.
- Hachey, Kathleen A.; Stump, Larry K.; Beseup, Terrance L.; and Kusilek, Thomas V., to Minnesota Mining and Manufacturing Company. Retroreflective elements. 5,750,191, Cl. 427-163.400.
- Hachigo, Akihiro: *See—*
  - Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, 5,750,243, Cl. 428-216.000.
- Hachisuka, Hisao: *See—*
  - Ohara, Tomomi; and Hachisuka, Hisao, 5,750,633, Cl. 528-174.000.
  - Shimazu, Akira; Ikeda, Kenichi; and Hachisuka, Hisao, 5,749,943, Cl. 95-50.000.
- Hack, Thomas Peter: *See—*
  - Jordan, Mark George; Terry, Francis H.; and Hack, Thomas Peter, 5,751,139, Cl. 323-222.000.
- Hada, Daniel H.: *See—*
  - Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
- Haddad, Michel G.; and Becker, Alvin G., to National Instruments Corporation. Method and apparatus for providing isolation from hazardous voltage levels in a hybrid instrumentation system. 5,751,536, Cl. 361-191.000.
- Haddock, Nicholas: *See—*
  - Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, 5,752,016, Cl. 395-600.000.
- Hadley, Keith A.: *See—*
  - Tang, Manh; and Hadley, Keith A., 5,751,601, Cl. 364-526.000.
- Hadley, LeMoyne F., to Hewlett-Packard Company. Method and apparatus for dynamically aligning a printer printhead. 5,751,305, Cl. 347-19.000.
- Hafez, Raed Mouaffac: *See—*
  - Antol, Shawn Richard; and Hafez, Raed Mouaffac, 5,752,048, Cl. 395-750.050.
- Hage, Hermann: *See—*
  - Friede, Dirk; Hage, Hermann; Herzner, Karl-Heinz; and Scholz, Volker, 5,751,750, Cl. 372-34.000.
- Hagen, Gary P.; and Spangler, Michael J., to Amoco Corporation. Continuous catalytic process for preparation of organic carbonates. 5,750,759, Cl. 558-277.000.
- Haggar Clothing Co.: *See—*
  - Staub, John Christian; Ubil, Kent Delmar; and Throgmorton, Pamela Jane, 5,749,163, Cl. 34-597.000.
- Haggerty, William T.: *See—*
  - Dobbins, Kurt A.; Cullerot, David L.; Negus, Stephen H.; and Haggerty, William T., 5,751,971, Cl. 395-200.680.
- Hagirahm, Hassan: *See—*
  - Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., 5,751,712, Cl. 370-431.000.
- Hagiuda, Nobuyoshi: *See—*
  - Matsui, Hideki; Sakamoto, Hiroshi; Takayanagi, Ryotaro; and Hagiuda, Nobuyoshi, 5,752,102, Cl. 396-156.000.
- Hagiwara, Toshimitsu: *See—*
  - Matsushima, Yoshimasa; Sugiyama, Hiroshi; and Hagiwara, Toshimitsu, 5,750,785, Cl. 564-315.000.
- Hagmaier, Charles Peter: *See—*
  - Bogdanowicz, Mitchell Joseph; Hagmaier, Charles Peter; and Gutierrez, Leslie, 5,750,320, Cl. 430-383.000.
- Hahn, Douglas J.: *See—*
  - Osborne, Randy B.; Howard, John H.; Casley, Ross T.; and Hahn, Douglas J., 5,751,951, Cl. 395-200.800.
- Hahn, James Richard: *See—*
  - Burns, Gary Thomas; Hahn, James Richard; and Reese, Clifford Carlton, 5,750,610, Cl. 524-434.000.
- Hähn, Reinhard: *See—*
  - Engelhardt, Thomas; and Hähn, Reinhard, 5,750,461, Cl. 502-347.000.
- Hahn, Samuel S.; LeGault, Kenn; Wheeler, Maxon; and Degenhardt, Jon R., to Documagix, Inc. System for organizing document icons with suggestions, folders, drawers, and cabinets. 5,751,287, Cl. 345-351.000.
- Hahn, Tae W.: *See—*
  - Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., 5,751,425, Cl. 356-350.000.
- Hahn, Woo-Jong: *See—*
  - Han, Jong-Seok; Hahn, Woo-Jong; and Yoon, Suk-Han, 5,751,934, Cl. 345-182.020.
- Hahnewald, Andrea: *See—*
  - Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, 5,749,165, Cl. 38-93.000.
- Hain, Ronald J. Adjustable securing apparatus. 5,749,685, Cl. 410-7.000.
- Haines, Ralph: *See—*
  - Divivier, Robert J.; Haines, Ralph; Nemirovsky, Mario D.; and Perez, Alexander, 5,752,269, Cl. 711-169.000.
- Hajalogol, Mohammad R.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Hakki, A-Hamid; and Hakky, Said I. Combined echo-electrocardiographic probe. 5,749,833, Cl. 600-380.000.
- Hakky, Said I.: *See—*
  - Hakki, A-Hamid; and Hakky, Said I., 5,749,833, Cl. 600-380.000.
- Hal Computer Systems, Inc.: *See—*
  - Shen, Gene W.; Szeto, John; Patkar, Niteen A.; and Shebanow, Michael C., 5,751,985, Cl. 395-394.000.
- Halbert, Donald N.: *See—*
  - Collins, Mark L.; Halbert, Donald N.; King, Walter; and Lawrie, Jonathan M., 5,750,338, Cl. 435-6.000.
- Hale, Jeffrey: *See—*
  - Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.
- Hall, Charles William; Rizzi, Julian Dominick; and Stubecki, John Arthur, to International Business Machines Corporation. Docking station for a portable computer providing rotational movement of the computer's viewable screen in three different planes. 5,751,548, Cl. 361-686.000.
- Hall, David B.: *See—*
  - Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., 5,751,425, Cl. 356-350.000.
- Hall, George R.; Barnett, Daniel C.; Smith, Robert A.; and Jewett, Scotty Y., to Elsag International B. V. Method of modifying an automotive type oxygen sensor for use in an industrial process analyzer. 5,750,408, Cl. 436-137.000.
- Hall, Herbert L., Jr., to Owens-Corning Fiberglas Technology, Inc. Air bearing assist in pneumatic forming of thin foil materials. 5,749,254, Cl. 72-60.000.
- Hall, Joseph F., Jr. Fire finding apparatus. 5,751,215, Cl. 340-584.000.
- Hall, Ronald W.: *See—*
  - Cowger, Bruce; Hall, Ronald W.; Gast, Paul D.; and Shibata, Alan, 5,751,300, Cl. 347-6.000.
- Hall, Thomas E., Jr.; and Bryant, Timothy D., to United States of America, National Aeronautics and Space Administration. Method for fabricating piezoelectric polymer acoustic sensors. 5,750,002, Cl. 156-313.000.
- Hall-Goulle, Véronique: *See—*
  - Zambounis, John; and Hall-Goulle, Véronique, 5,750,758, Cl. 558-276.000.
- Halliburton Energy Services, Inc.: *See—*
  - Mehta, Sudhir; and Caveny, William J., 5,749,418, Cl. 166-292.000.
- Halpaap, Reinhard: *See—*
  - Laas, Hans-Josef; Halpaap, Reinhard; Pedain, Josef; and König, Klaus, 5,750,629, Cl. 528-45.000.
- Halpern, David Marcos. Medical instrument. 5,749,883, Cl. 606-159.000.
- Halstrøm, John: *See—*
  - Havelund, Svend; Halstrøm, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, 5,750,497, Cl. 514-3.000.

- Halvorson, Todd; Bickham, Stephen R.; and Cutler, David, to Hirel Holdings, Inc. Electronic control unit for controlling an electronic injector fuel delivery system and method of controlling an electronic injector fuel delivery system. 5,749,346, Cl. 123-486.000.
- Hama, Itsuo; Okamoto, Takahiro; Sasamoto, Hisashi; and Nakamura, Hirofumi, to Lion Corporation. Method of producing an alkylene oxide adduct of a compound having one or more active hydrogen. 5,750,796, Cl. 568-618.000.
- Hama, Satoshi: *See—*
  - Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, 5,749,548, Cl. 248-49.000.
- Hama, Takashi: *See—*
  - Inoue, Nozomu; Hama, Takashi; Nomura, Yujiro; and Takada, Kyu, 5,751,463, Cl. 359-205.000.
- Hamabe, Kojiro, to NEC Corporation. Channel reuse in cellular mobile communication with interference signal levels of different radio channels measured at regular and shorter refresh intervals. 5,752,192, Cl. 455-450.000.
- Hamada, Kiyoshi; and Ishimoto, Shin-ichi, to Mitsubishi Denki Kabushiki Kaisha. Communication connection apparatus for use in direct connection between facsimile modem apparatus and facsimile apparatus. 5,751,442, Cl. 358-442.000.
- Hamada, Masataka: *See—*
  - Akamatsu, Norihiko; Hamada, Masataka; Yukawa, Kazuhiko; and Ootsuka, Hiroshi, 5,752,101, Cl. 396-155.000.
- Hamada, Shuta: *See—*
  - Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.
- Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, to Fujitsu Limited. Multiple overlay printing and outputting device and multiple overlay printing system. 5,751,924, Cl. 395-115.000.
- Hamada, Yasunori: *See—*
  - Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,749,473, Cl. 209-584.000.
- Hamada, Yoshiaki: *See—*
  - Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.
- Hamagishi, Goro; Mashitani, Ken; Nakayama, Eiji; and Tanase, Susumu, to Sanyo Electric Co., Ltd. Three-dimensional display. 5,751,479, Cl. 359-464.000.
- Hamakawa, Hiroyuki: *See—*
  - Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.
- Hamamatsu Photonics K.K.: *See—*
  - Takahashi, Hironori; and Aoshima, Shinichiro, 5,751,419, Cl. 356-321.000.
- Hamamatsu Photonics Kabushiki Kaisha: *See—*
  - Ohmi, Tadahiro; Inaba, Hitoshi; and Ikedo, Tomoyuki, 5,750,011, Cl. 204-164.000.
- Hamamura, Kazunari: *See—*
  - Furuyama, Osamu; Hamamura, Kazunari; and Motozawa, Masahiro, 5,750,198, Cl. 427-322.000.
- Hamano, Hiroyuki, to Canon Kabushiki Kaisha. Zoom lens of rear focus type. 5,751,496, Cl. 359-677.000.
- Hamauji, Kazuhiro: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Hamer, Martin: *See—*
  - Qian, Xuejun; Suh, Byoung I.; Hamer, Martin; and Tobias, Russell H., 5,749,733, Cl. 433-228.100.
- Hammang, Joseph P.: *See—*
  - Weiss, Samuel; Reynolds, Brent; Hammang, Joseph P.; and Baetge, E. Edward, 5,750,376, Cl. 435-69.520.
- Hammond, Earl G.: *See—*
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,844, Cl. 800-200.000.
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,845, Cl. 800-200.000.
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,846, Cl. 800-200.000.
- Hammond, Gary N., to Intel Corporation. Translation look-aside buffer including a single page size translation unit. 5,752,275, Cl. 711-207.000.
- Hammond, Mark S.; and McClain, Timothy W., to SI Diamond Technology, Inc. System and method for depositing coating of modulated composition. 5,750,207, Cl. 427-576.000.
- Hammond, William A.: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Hamouda, Hechmi; Barker, Roger L.; and Millsaps, Darrin S., to North Carolina State University. Apparatus for simulating the thermoregulatory responses of human skin and related method for predicting fabric comfort level. 5,749,259, Cl. 73-159.000.
- Hamper, Douglas R.: *See—*
  - O'Donnell, Joseph A.; and Hamper, Douglas R., 5,749,853, Cl. 604-97.000.
- Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, to BASF Aktiengesellschaft. Substituted trifluoromethylpyridlines. 5,750,705, Cl. 546-297.000.
- Hamprecht, Rainer; and Müller, Claudia, to Bayer Aktiengesellschaft. Cyanation of double bond systems. 5,750,761, Cl. 558-423.000.
- Hampton, David: *See—*
  - Young, Neil P.; and Hampton, David, 5,749,547, Cl. 246-4.000.
- Hampton, John T., III; Trainor, William F.; and Bandy, Thomas R., to Protechnics International, Inc. Electrically insulative threaded connection. 5,749,605, Cl. 285-48.000.
- Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, to Lockheed Martin Corporation. Transition shoulder system and method for diverting boundary layer air. 5,749,542, Cl. 244-53.00B.
- Han, Chung-Chyung: *See—*
  - Choi, Jeong Yeol; Chien, Chung-Jen; Han, Chung-Chyung; and Lien, Chuen-Der, 5,750,424, Cl. 438-199.000.
- Han, Jong-Seok; Hahn, Woo-Jong; and Yoon, Suk-Han, to Electronics and Telecommunications Research Institute. Non-blocking fault-tolerant gamma network for multi-processor system. 5,751,934, Cl. 345-182.020.
- Han, Robin Sungsoo, to Cirrus Logic, Inc. Apparatus and method for producing shaded images on display screens. 5,751,265, Cl. 345-88.000.
- Hanada, Yuhko: *See—*
  - Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.
- Hanafy, Amin M.: *See—*
  - Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., 5,749,364, Cl. 128-662.020.
- Hanai, Nobuo: *See—*
  - Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, 5,750,078, Cl. 424-133.100.
- Hanamura, Naoki, to Yamaha Hatsudoki Kabushiki Kaisha. Method and device for adjusting nozzle height for recognition in surface mounter. 5,749,142, Cl. 29-833.000.
- Hanaoka, Shuzo: *See—*
  - Shibasaki, Souhei; Sawano, Yukio; Hanaoka; Shuzo; and Takano, Hiroyoshi, 5,749,662, Cl. 400-82.000.
- Hanato, Hiroyuki: *See—*
  - Higuchi, Kaoru; Ishii, Hiroshi; and Hanato, Hiroyuki, 5,751,331, Cl. 347-217.000.
- Hanaya, Morimasa, to Tokushu Paper Mfg. Co., Ltd. Method and apparatus for picking up packaged sheets. 5,749,693, Cl. 414-277.000.
- Hancock, Larry R.: *See—*
  - Klinkner, Allen O.; and Hancock, Larry R., 5,749,310, Cl. 111-200.000.
- Hancock, Warren J.: *See—*
  - Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., 5,751,254, Cl. 343-761.000.
- Haneda, Satoshi, to Konica Corporation. Multi-color image forming apparatus having a plurality of detachable units. 5,752,137, Cl. 399-223.000.
- Haneda, Satoshi: *See—*
  - Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.
- Hanna, Keith James: *See—*
  - Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.
- Hanna, Mark C.: *See—*
  - Carrano, Richard; and Hanna, Mark C., 5,749,979, Cl. 148-430.000.
- Hanna, Nabil: *See—*
  - Newman, Roland A.; Hanna, Nabil; and Raab, Ronald W., 5,750,105, Cl. 424-133.100.
- Hano, Yoshifumi: *See—*
  - Aita, Shuichi; Kukimoto, Tsutomu; Yoshida, Satoshi; and Hano, Yoshifumi, 5,751,405, Cl. 355-269.000.
- Hansen, Borg; Gonzalez, Rafael; and Fleisaman, Roc V., to Softub, Inc. Spa apparatus with hanging structural liner. 5,749,107, Cl. 4-541.100.
- Hansen, Eric J.; Helminen, Merja E.; and Maciver, Isobel, to Board of Regents, The University of Texas. Methods and compositions relating to useful antigens of moraxella catarrhalis. 5,750,117, Cl. 424-251.100.
- Hansen, Iver. Portable air conditioner. 5,749,359, Cl. 128-205.250.
- Hansen, Kristian Tage: *See—*
  - Sauerberg, Per; and Hansen, Kristian Tage, 5,750,538, Cl. 514-305.000.
- Hansen, Mark D.: *See—*
  - Fricke, David M.; Hansen, Mark D.; and Chabaan, Rakan C., 5,750,890, Cl. 73-146.000.
- Hanssen, Jeffrey Scott, to United States of America, Navy. Optical protection apparatus for use with night vision devices. 5,751,380, Cl. 349-1.000.
- Hansson, Gunnar Christer, to Atlas Copco Tools AB. Multi-core cable for electrically communicating a hand held power nutrunner with a power supply and control unit. 5,750,932, Cl. 174-113.00R.
- Hanyu, Yukio: *See—*
  - Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.
- Hao, Zhimin: *See—*
  - Eldin, Sameer Hosam; Iqbal, Abul; Hao, Zhimin; and Lamatsch, Bernd, 5,750,723, Cl. 548-453.000.
- Hara, Hiroshi: *See—*
  - Yokozawa, Takeshi; Hara, Hiroshi; and Yamamoto, Takanobu, 5,751,749, Cl. 372-32.000.
- Hara, Kazuo: *See—*

Nomoto, Shinichi; Kobayashi, Hideo; Honda, Teruhiko; and Hara, Kazuo, 5,751,247, Cl. 342-359.000.

Hara, Minoru: *See—*

Tsutsumi, Motoko; Hara, Minoru; and Kishida, Kenichi, 5,752,094, Cl. 396-76.000.

Hara, Ryuichi; and Nagayama, Atsuo, to Fanuc, Ltd. Time constant setting method for a track program of a robot. 5,751,130, Cl. 318-575.000.

Hara, Tomoyuki: *See—*

Takasaki, Toshiharu; and Hara, Tomoyuki, 5,752,211, Cl. 701-69.000.

Harada, John A.: *See—*

Eberhardt, Anthony N.; Dailey, William L.; and Harada, John A., 5,751,549, Cl. 361-687.000.

Harada, Kazuaki: *See—*

Tsuchiya, Masakazu; and Harada, Kazuaki, 5,750,500, Cl. 514-11.000.

Harada, Makoto: *See—*

Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.

Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, to Nippon Shokubai Co., Ltd. Liquid absorbable material and method for production thereof. 5,750,582, Cl. 521-64.000.

Harada, Shizuko: *See—*

Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,750,331, Cl. 435-5.000.

Harada, Tadashi; and Uchida, Kihachiro, to Koito Manufacturing Co., Ltd. Bulb socket for vehicular lamp. 5,749,743, Cl. 439-336.000.

Harada, Takuto, to Canon Kabushiki Kaisha. Output control apparatus and method with variable output settings. 5,751,922, Cl. 395-112.000.

Harada, Yasoo: *See—*

Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, 5,751,029, Cl. 257-194.000.

Sawada, Minoru; and Harada, Yasoo, 5,751,027, Cl. 257-192.000.

Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, to NKK Corporation; and Kyodo Printing Co., Ltd. Ester copolymer resin, alloy thereof and packaging material using the same. 5,750,219, Cl. 428-35.700.

Harambasic, Nicholas: *See—*

Benner, Christopher T.; and Harambasic, Nicholas, 5,749,489, Cl. 220-465.000.

Harbison-Walker Refractories Company: *See—*

Bliss, Brian Joseph, 5,750,878, Cl. 73-1.790.

Harder, Sven; and Borst, Jan, to Icopa A/S. Roof vent. 5,749,780, Cl. 454-359.000.

Hardie, William: *See—*

McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,750,931, Cl. 174-110.0PM.

Hareyama, Nobuo; and Yokoyama, Hiroshi, to Sony Corporation. Integrated circuit and transmitter/receiver. 5,752,169, Cl. 455-76.000.

Hargis, David E.; and Nelte, Sven E., to Laser Power Corporation. Deep blue microlaser. 5,751,751, Cl. 372-41.000.

Harichian, Bijan: *See—*

Vermeer, Robert; and Harichian, Bijan, 5,750,733, Cl. 549-346.000.

Härkönen, Pirkko: *See—*

DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.

Harper Trucks, Inc.: *See—*

Stallbaumer, John J.,'5,749,588, Cl. 280-47.270.

Harrell, John P.; and Wheeler, Bryce A., to Hughes Aircraft Company. Optical system with an articulated mirror unit. 5,751,460, Cl. 359-198.000.

Harris Corporation: *See—*

McLachlan, Craig J., 5,750,432, Cl. 438-404.000.

Seccia, Joseph Lee; and Twitchell, Edwin Ray, 5,751,347, Cl. 348-181.000.

Wheatley, William E.; and Wilson, Robert James, Jr., 5,750,936, Cl. 174-138.00G.

Harris, James Alexander. Stairway climbing apparatus and method. 5,749,808, Cl. 482-52.000.

Harris, Joel M.: *See—*

Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.

Harris, Thomas David: *See—*

Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.

Harris, Tom: *See—*

Gamlyn, Lee; O'Sullivan, Siobhan; Needham, Philip; and Harris, Tom, 5,749,367, Cl. 128-696.000.

Harris-Kelson, Tracy A.: *See—*

Robey, Frank A.; Harris-Kelson, Tracy A.; and Robert-Guroff, Marjorie, 5,750,332, Cl. 435-5.000.

Harrison, Daniel David; Pradeep, Anantha Krishnan; Brooksby, Glen William; and Hladik, Stephen Michael, to General Electric Company. Reduced-power GPS-based system for tracking multiple objects from a central location. 5,752,218, Cl. 701-207.000.

Harrison, David F., to Apple Computer, Inc. System for decentralizing backing store control of virtual memory in a computer. 5,751,989, Cl. 395-413.000.

Harrison, Edward F., Jr.; and Cornwell, J. Bennette, III, to Hurley & Harrison, Inc. (the New Entity). Rotator assembly. 5,749,215, Cl. 57-337.000.

Harrison, Keith: *See—*

Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, 5,752,016, Cl. 395-600.000.

Harrison, Robert G.; and Lamson, Robert D. Information retrieval and presentation systems with direct access to retrievable items of information. 5,751,369, Cl. 348-552.000.

Harrow, Scott: *See—*

Hicok, Gary; Potts, Kenneth; and Harrow, Scott, 5,751,235, Cl. 341-140.000.

Hart, Charles C.; Chi Sing, Eduardo; and Ashby, Mark P., to Applied Medical Resources Corporation. Apparatus for disrupting vein valves. 5,749,882, Cl. 606-159.000.

Hart, John H., to 3 Com Corporation. Architecture for managing traffic in a virtual LAN environment. 5,752,003, Cl. 395-500.000.

Hart, Paul R.; and Dion, Michael A., to BetzDearborn Inc. Foam control method. 5,750,052, Cl. 252-321.000.

Harte, Gerard: *See—*

Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.

Hartenstein, Johannes: *See—*

Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.

Hartig, Paul Richard: *See—*

Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.

Harton, Austin V.: *See—*

Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., 5,751,009, Cl. 250-551.000.

Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, to Daimler-Benz AG; and BASF Aktiengesellschaft. Catalyst and process for its production. 5,750,460, Cl. 502-342.000.

Harumoto, Katsumi: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Harvie, James Lumsden, to Imperial Chemical Industries PLC. Production of dicarboxylic acids or esters thereof. 5,750,776, Cl. 562-483.000.

Harward, Mark G.: *See—*

Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.

Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., 5,751,162, Cl. 326-37.000.

Harwood, William R.: *See—*

Brown, Kevin J.; Harwood, William R.; and Bates, Terence, 5,751,781, Cl. 378-65.000.

Hasebe, Ren: *See—*

Arita, Yoshitaka; Ohta, Akihiko; Hasebe, Ren; and Saito, Noboru, 5,750,768, Cl. 560-177.000.

Hasegawa Hamono Kabushiki Kaisha: *See—*

Hasegawa, Yoshinobu, 5,749,147, Cl. 30-134.000.

Hasegawa, Katsuya: *See—*

Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,751,375, Cl. 348-571.000.

Hasegawa, Kayo: *See—*

Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.

Hasegawa, Mamoru: *See—*

Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, 5,750,078, Cl. 424-133.100.

Hasegawa, Masanobu; Yoshii; Minoru; and Takeuchi, Seiji, to Canon Kabushiki Kaisha. Best focus determining method. 5,750,294, Cl. 430-22.000.

Hasegawa, Shinya, to Fujitsu Limited. Compact size magneto-optical head with a hologram and a beam splitting means. 5,751,682, Cl. 369-112.000.

Hasegawa, Tomoya: *See—*

Umehara, Kazuyuki; Uchida, Masayuki; and Hasegawa, Tomoya, 5,749,187, Cl. 52-241.000.

Hasegawa, Toshiaki: *See—*

Fukushima, Hirotaka; and Hasegawa, Toshiaki, 5,751,135, Cl. 320-107.000.

Hasegawa, Yoshinobu, to Hasegawa Hamono Kabushiki Kaisha. Gripping scissors. 5,749,147, Cl. 30-134.000.

Haseler, Jeffrey David: *See—*

Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, 5,750,685, Cl. 540-349.000.

Hashiguchi, Tadato: *See—*

Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Hashimoto, Akihiko; and Watanabe, Yasuhiko, to Nippon Telegraph and Telephone Corp. Pattern generation method and apparatus for automatic generation of continuous tile patterns along any arbitrary side. 5,751,293, Cl. 345-430.000.

Hashimoto, Hideyuki: *See—*

Yamada, Minoru; Hashimoto, Hideyuki; Yabe, Yasuhiro; and Honda, Kenji, 5,751,522, Cl. 360-113.000.

Hashimoto, Kimio, to Kabushikigaisha Daiwa Riken Kogyo. Container. 5,749,465, Cl. 206-361.000.

Hashimoto, Koichi: *See—*

Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.

Hashimoto, Takashi: *See—*

Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, 5,751,568, Cl. 363-95.000.

Hashimoto, Takeshi: *See—*

Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.

Hashimoto, Toru: *See—*

Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, 5,750,888, Cl. 73-118.100.

Hashimoto, Yasuharu: *See—*

Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, 5,751,091, Cl. 310-339.000.

Hashimoto, Yasuhiro: *See—*

Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Utatsu, Hiroshige, 5,752,125, Cl. 399-8.000.

Hashimoto, Yuusaku: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Haskell, Malcolm W.; Miller, Richard; and Zefferi, Suzanne, to CRC Industries, Inc. Fluorinated cleaning solvents. 5,750,488, Cl. 510-412.000.

Hass, Albert L.: *See—*

Bruno, James F.; and Hass, Albert L., 5,749,105, Cl. 4-295.000.

Hassett, John J., to AT/COMM Incorporated. Electronic parking and dispatching management method and apparatus. 5,751,973, Cl. 395-213.000.

Hassler, Kerry Wayne; and Richman, Paul Lawrence, to Lucent Technologies Inc. Broadcasting of information through telephone switching system display messages. 5,751,795, Cl. 379-93.170.

Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Real image finder system for a camera. 5,752,107, Cl. 396-296.000.

Hata, Tetsuya, to Kabushiki Kaisha Toshiba. Bearing unit, carriage assembly with the bearing unit, and magnetic disk apparatus. 5,751,519, Cl. 360-106.000.

Hata, Yukitsugu: *See—*

Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.

Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, to Shin-Etsu Chemical Co., Ltd. Chemically amplified positive resist composition. 5,750,309, Cl. 430-170.000.

Hatanaka, Haruyo: *See—*

Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, 5,750,372, Cl. 435-69.100.

Hatfull, Graham F.: *See—*

Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, 5,750,384, Cl. 435-172.300.

Hato, Yukinori: *See—*

Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.

Hatton, Ray C.: *See—*

Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.

Hattori, Atsushi: *See—*

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Hattori, Eiji: *See—*

Shima, Koji; Hattori, Eiji; and Oguri, Yasuo, 5,750,048, Cl. 252-71.000.

Hattori, Tadashi: *See—*

Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.

Hattori, Yutaka: *See—*

Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.

Hatwar, Tukaram K.; Tyan, Yuan-Sheng; and Brucker, Charles F., to Eastman Kodak Company. Multilayer magnetooptic recording media. 5,750,274, Cl. 428-694.0MM.

Haug, Willi: *See—*

Arnold, Norbert; Haug, Willi; and Lind, Stefan, 5,749,963, Cl. 106-724.000.

Haughan, Kerry P.: *See—*

Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., 5,752,138, Cl. 399-264.000.

Haupenthal, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet transfer device of a sheet-fed rotary printing press. 5,749,296, Cl. 101-410.000.

Häussling, Lukas; Neuhauser, Horst; and Paulus, Wolfgang, to BASF Aktiengesellschaft. Preparation of amines from compounds having at least 3 cyano groups. 5,750,788, Cl. 564-415.000.

Havelund, Svend; Halstrøm, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, to Novo Nordisk A/S. Acylated insulin. 5,750,497, Cl. 514-3.000.

Havemann, Robert H., to Texas Instruments Incorporated. Structure with selective gap fill of submicron interconnects. 5,751,066, Cl. 257-759.000.

Havens, Charnell T., to Electronic Data Systems Corporation. System and method for automated retrieval of information. 5,752,242, Cl. 707-3.000.

Hawkins, Andrew L.: *See—*

Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., 5,751,644, Cl. 365-194.000.

Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., to Xerox Corporation. Feedback control system for polymer modification of toner resins and toners. 5,750,909, Cl. 73-866.000.

Hawthorne, Richard C.: *See—*

Li, Li; and Hawthorne, Richard C., 5,749,975, Cl. 134-1.300.

Hay & Forage Industries: *See—*

Anderson, J. Dale; and Goossen, LaVern Roy, 5,749,289, Cl. 100-88.000.

Hayano, Kiminori, to NEC Corporation. Semiconductor device equipped with electrostatic breakdown protection circuit. 5,751,051, Cl. 257-546.000.

Hayase, Kengo: *See—*

Inaba, Kohji; Kato, Kazunori; and Hayase, Kengo, 5,750,303, Cl. 430-110.000.

Hayashi, Bunya; Asou, Yoshio; and Ishikawa, Makoto, to SMC Corporation. Selector valve aggregate. 5,749,395, Cl. 137-596.160.

Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, to Hitachi, Ltd.; Babcock-Hitachi Kabushiki Kaisha; Hitachi Nuclear Engineering Co., Ltd.; and Hitachi Kiso Co., Ltd. Method and apparatus for performing preventive maintenance on the bottom portion of a reactor pressure vessel using cavitation bubbles. 5,749,384, Cl. 134-167.00R.

Hayashi, Hidetoshi: *See—*

Nagata, Teruyuki; Hayashi, Hidetoshi; and Mizuta, Hideki, 5,750,779, Cl. 562-828.000.

Hayashi, Kazuyuki; Iwasaki, Keisuke; Tanaka, Yasuyuki; and Morii, Hiroko, to Toda Kogyo Corporation. Hematite particles and magnetic recording medium having a non-magnetic under-coat layer containing hematite (Fe_2O_3) particles.. 5,750,250, Cl. 428-328.000.

Hayashi, Kunio, to Kabushiki Kaisha Toshiba. Axial gap type electric motor with dynamic pressure air bearing. 5,751,085, Cl. 310-90.000.

Hayashi, Nobuyuki: *See—*

Nagao, Yasuhiro; Shiga, Tsutomu; and Hayashi, Nobuyuki, 5,751,070, Cl. 290-46.000.

Hayashi, Ryuichi, to Du Pont de Nemours, E. I., and Company. Polyamide resin composition and molding thereof. 5,750,639, Cl. 528-310.000.

Hayashi, Tadao: *See—*

Miura, Toshiro; Soda, Yoshihiro; and Hayashi, Tadao, 5,750,606, Cl. 524-244.000.

Hayashi, Takahiro: *See—*

Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.

Hayashi, Takayuki: *See—*

Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.

Hayashi, Toshihiko: *See—*

Tada, Akira; and Hayashi, Toshihiko, 5,750,223, Cl. 428-35.800.

Hayashi, Yutaka: *See—*

Aozasa, Hiroshi; and Hayashi, Yutaka, 5,751,037, Cl. 257-315.000.

Hayashibe, Shigeaki: *See—*

Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.

Hayashida, Akira: *See—*

Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, 5,750,636, Cl. 528-310.000.

Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, 5,750,637, Cl. 528-310.000.

Hayes, Patrick H.: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Hayes Soloway, Hennessey, Grossman & Hage: *See—*

Green, Mark M., 5,750,049, Cl. 252-299.010.

Hays, Lance G., to Biphase Energy Company. Three-phase rotary separator. 5,750,040, Cl. 210-787.000.

- Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, to Mita Industrial Co., Ltd. Process unit. 5,752,132, Cl. 399-111.000.
- Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, to Mita Industrial Co., Ltd. Process unit of image forming machine having pre-transfer guide. 5,752,134, Cl. 399-113.000.
- Hazumi, Hiroshi: *See—*
  - Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, 5,751,240, Cl. 342-70.000.
- Head, Larry J.: *See—*
  - Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.
- Head, Philip. Method of accessing a sub sea well and a guide arrangement therefor. 5,749,676, Cl. 405-171.000.
- Healey, Mark C.: *See—*
  - Forney, John R.; Yang, Shiguang; and Healey, Mark C., 5,750,496, Cl. 514-2.000.
- Heartport, Inc.: *See—*
  - Vierra, Mark A.; and Roth, Alex T., 5,749,892, Cl. 600-204.000.
- Heartstream, Inc.: *See—*
  - Cole, Clinton S., 5,749,913, Cl. 607-59.000.
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,904, Cl. 607-7.000.
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,905, Cl. 607-7.000.
- Heat Pipe Technology, Inc.: *See—*
  - Dinh, Khanh, 5,749,415, Cl. 165-297.000.
- Heath, Gerald Arthur; Obriot, Kelly Michael; Simplicean, Ionel Eugene; and Stancu, Sorin, to Ford Motor Company. Console assembly with adjustable armrest. 5,749,629, Cl. 297-411.360.
- Hecht, Daniel H.; and Schulz, David A., to Amoco Corporation. Method for the preparation of high modulus carbon and graphite articles. 5,750,058, Cl. 264-29.600.
- Heddle, Robert: *See—*
  - Tsutsui, Kyoya; and Heddle, Robert, 5,752,224, Cl. 704-225.000.
- Hedley Purvis Ltd A Company of Great Britain and Northern Ireland: *See—*
  - Campbell, David, 5,749,691, Cl. 421-433.000.
- Heeks, George J.: *See—*
  - Badesha, Santokh S.; Heeks, George J.; and Henry, Arnold W., 5,750,204, Cl. 427-387.000.
- Hegland, Markus; and Nakanishi, Makoto, to Fujitsu Limited; and Australian National University, The. Memory-distributed parallel computer and method for fast fourier transformation. 5,751,616, Cl. 364-725.020.
- Hegner, Frank; Schmidt, Elke Maria; Drewes, Ulfert; and Martin, Rainer, to ENVEC Mess- und Regeltechnik GmbH + Co. Capacitive pressure sensor with sensing element mechanically isolated from the casing. 5,750,899, Cl. 73-756.000.
- Hei, Robert D.: *See—*
  - Falbaum, David J.; Hei, Robert D.; Maier, Helmut K.; and Mattia, Paul J., 5,750,484, Cl. 510-276.000.
- Heidelberg Harris, Inc.: *See—*
  - Richards, John, 5,749,823, Cl. 493-417.000.
- Heidelberg Harris S.A.: *See—*
  - Récolet, Francois; and Métrope, Jacques, 5,749,297, Cl. 101-415.100.
- Heidelberger Druckmaschinen AG: *See—*
  - Fricke, Andreas; Luxem, Heiner; and Stadler, Lothar, 5,749,572, Cl. 271-268.000.
  - Heiler, Peter, 5,749,571, Cl. 271-213.000.
  - Récolet, Francois; and Métrope, Jacques, 5,749,297, Cl. 101-415.100.
  - Richards, John, 5,749,823, Cl. 493-417.000.
  - Ruf, Bernd; and Lötsch, Kurt, 5,749,294, Cl. 101-232.000.
- Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
  - Haupenthal, Rudi, 5,749,296, Cl. 101-410.000.
- Heidlas, Jurgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rudiger, to SKW Trostberg Aktiengesellschaft. Process for obtaining lipid fractions from egg products in powder form. 5,750,180, Cl. 426-614.000.
- Heidorn, George E.: *See—*
  - Richardson, Stephen Darrow; and Heidorn, George E., 5,752,052, Cl. 395-759.000.
- Heidrich, Arthur J.: *See—*
  - Donovan, Kenneth B.; Ferrell, Richard A.; Heidrich, Arthur J.; and Zirpolo, Dominick S., 5,751,612, Cl. 364-578.000.
- Heiler, Peter, to Heidelberger Druckmaschinen AG. Device for forming a sheet pile. 5,749,571, Cl. 271-213.000.
- Heim, Gunther; Überreiter, Thomas; Hock, Jürgen; and Bischoff, Holger, to Ymos Aktiengesellschaft Industrieprodukte. Motor vehicle door. 5,749,176, Cl. 49-502.000.
- Heim, Richard Dean: *See—*
  - Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
- Heinau, Martina: *See—*
  - Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
- Heindl, Detlef: *See—*
  - Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.
- Heineken Technical Services B.V.: *See—*
  - Lucassen, Ronald, 5,750,174, Cl. 426-521.000.
- Heinen, Horst; Rieck, Konrad; Kawka, Martin; and Schattauer, Jürgen, to NSM Aktiengesellschaft. Gaming machine. 5,749,576, Cl. 273-138.100.
- Heinz, Ralph D., to Renkus-Heinz, Inc. Speaker array with improved phase characteristics. 5,750,943, Cl. 181-152.000.
- Heinze, William C., to Honeywell, Inc. Subtractive color LCD utilizing circular notch polarizers and including a triband or broadband filter tuned light source or dichroic sheet color polarizers. 5,751,385, Cl. 349-61.000.
- Heinzmann, Helmut: *See—*
  - Leitenberger, Werner; and Heinzmann, Helmut, 5,749,157, Cl. 34-117.000.
- Heistracher, Elisabeth: *See—*
  - Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, 5,750,705, Cl. 546-297.000.
- Helber, Margaret Jones: *See—*
  - Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.
- Helbig, Walter A., Sr., to Gorca Memory Systems. Error detection and correction system for use with address translation memory controller. 5,751,740, Cl. 371-37.100.
- Helfer, Farrel Bruce: *See—*
  - Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, 5,749,981, Cl. 148-595.000.
- Helfer, Roland: *See—*
  - Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.
- Hellberg, Mark; Delgado, Pete; and Nixon, Jon C. Anti-oxidant esters of non-steroidal anti-inflammatory agents. 5,750,564, Cl. 514-469.000.
- Hellbrugge, Luiz Henrique. Method for blow molding hollow article with annular chime and deeply recessed ends. 5,750,067, Cl. 264-515.000.
- Hellinger, Frank; and Vaisanen, Ari, to R. Stahl Fördertechnik GmbH. Lifting appliance with traveling mechanism and low pendulum oscillation during braking. 5,751,126, Cl. 318-362.000.
- Helminen, Merja E.: *See—*
  - Hansen, Eric J.; Helminen, Merja E.; and Maciver, Isobel, 5,750,117, Cl. 424-251.100.
- Helmstetter, Richard C.: *See—*
  - Schmidt, Glenn H.; and Helmstetter, Richard C., 5,749,795, Cl. 473-350.000.
- Heminger, David M.; and Slaughter, Joseph H., to Motorola, Inc. High voltage current limiter and method for making. 5,751,025, Cl. 257-173.000.
- Heminger, David M.; Mirtich, Vincent L.; and Grant, William H., to Motorola, Inc. Inductive driver circuit and method therefor. 5,751,052, Cl. 257-577.000.
- Hempel, Wolfgang: *See—*
  - Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, 5,750,185, Cl. 427-8.000.
- Henderson, Brent E.; Bolen, Pat A.; and DeFranco, John A. Electrical connector with EMI/RFI shielding. 5,749,744, Cl. 439-164.000.
- Henderson, Brett Tamatea: *See—*
  - Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.
- Henderson, David A., to Burleigh Instruments Inc. Peristaltic driver apparatus. 5,751,090, Cl. 310-328.000.
- Henderson, Eric A., to Hewlett-Packard Company. Log access interface between a network and repositories. 5,752,247, Cl. 707-102.000.
- Henkel Corporation: *See—*
  - Arora, Kartar S.; and Wiggins, Michael S., 5,750,595, Cl. 523-404.000.
  - Furuyama, Osamu; Hamamura, Kazunari; and Motozawa, Masahiro, 5,750,198, Cl. 427-322.000.
  - Gross, Stephen F.; and Hessel, John F., 5,750,663, Cl. 536-4.100.
- Henkel Kommanditgesellschaft auf Aktien: *See—*
  - Geke, Juergen; Speckmann, Horst-Dieter; Stedry, Bernd; and Westfechtel, Alfred, 5,749,947, Cl. 106-14.420.
  - Ibanez, Pilar; Josa, Jaume; and Osset, Miguel, 5,750,486, Cl. 510-356.000.
  - Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, 5,750,490, Cl. 510-504.000.
- Hennemann, Afred: *See—*
  - Kieser, Manfred; Hennemann, Afred; and Stahlecker, Otto, 5,749,957, Cl. 106-403.000.
- Henner, Dennis J.: *See—*
  - Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.
- Henry, Arnold W.: *See—*
  - Badesha, Santokh S.; Heeks, George J.; and Henry, Arnold W., 5,750,204, Cl. 427-387.000.
- Henry, Claudine Grand': *See—*
  - Geerlandt, Hervé; and Henry, Claudine Grand', 5,750,684, Cl. 540-319.000.
- Henry, Glenn; and Parks, Terry, to Integrated Device Technology, Inc. Method and apparatus for repetitive execution of string instructions without branch or loop microinstructions. 5,752,015, Cl. 395-588.000.
- Henry, Mark S.; and King, Brian P., to Allison Engine Company, Inc.; and Allison Advanced Development Company. High speed, high temperature hybrid magnetic thrust bearing. 5,749,700, Cl. 415-104.000.

- Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, to Ford Global Technologies, Inc. Nox trap with improved performance. 5,750,082, Cl. 423-213.500.
- Heraeus Kulzer GmbH: *See—*
  - Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.
- Herbert, Brian K., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Dual-mode graphics controller with preemptive video access. 5,752,010, Cl. 395-509.000.
- Herbert, William G.: *See—*
  - Mammino, Joseph C.; Herbert, William G.; Chang, Shu; and Ludwig, Theodore C., 5,752,144, Cl. 399-249.000.
- Herbig, Scott H.: *See—*
  - Smith, Kelly L.; and Herbig, Scott H., 5,750,126, Cl. 424-405.000.
- Herbst, Walter B. Interior door closer and method. 5,749,122, Cl. 16-70.000.
- Hergenrother, Robert; Chee, Uriel Hiram; and Schaller, Laurent, to Target Therapeutics, Inc. Method of pretreating metal surfaces for subsequent polymer coating. 5,750,206, Cl. 427-490.000.
- Heritage, Trevor William: *See—*
  - Hurst, John Robert; and Heritage, Trevor William, 5,751,605, Cl. 364-496.000.
- Herman, Mark Jay: *See—*
  - Antoniades, Michael George; Wen, Xin; and Herman, Mark Jay, 5,750,326, Cl. 430-568.000.
- Hernandez, Jose H.: *See—*
  - Hsia, Edward; Hernandez, Jose H.; and Suanya, Sayan, 5,751,633, Cl. 365-185.090.
- Hernandez, Thomas J.; and Mangold, Richard P., to Intel Corporation. Method and apparatus for managing power consumption of external devices for personal computers using a power management coordinator. 5,752,050, Cl. 395-750.070.
- Herner, Arthur C.: *See—*
  - Walcher, James G.; Limbird, James R.; and Herner, Arthur C., 5,749,434, Cl. 182-45.000.
- Herold, Rudolf Henri Max: *See—*
  - Crocker, Mark; and Herold, Rudolf Henri Max, 5,750,741, Cl. 549-525.000.
- Herr, Wolfgang: *See—*
  - Hüttenhofer, Klaus; Herr, Wolfgang; Sprehe, Josef; and Spielmann, Horst, 5,749,651, Cl. 366-181.500.
- Herrmann, Hans-Friedrich: *See—*
  - Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.
- Herrmann, Rupert; Josel, Hans-Peter; Drexhage, Karl-Heinz; and Arden-Jacob, Jutta, to Boehringer Mannheim Gmbh. Pentacyclic compounds and their use as absorption or fluorescent dyes. 5,750,409, Cl. 436-517.000.
- Hersh, Ahron; and Chen, Chi Yueh, to Rosetti Handbags and Accessories Ltd. Handbag having compartmentalized storage area. 5,749,447, Cl. 190-112.000.
- Herstad, Sverre: *See—*
  - Breivik, Kåre; Egge, Trygve G.; and Herstad, Sverre, 5,749,758, Cl. 441-5.000.
- Hertel, Richard J., to ITT Industries, Inc. Accountability and theft protection via the global positioning system. 5,751,246, Cl. 342-357.000.
- Herzner, Karl-Heinz: *See—*
  - Friede, Dirk; Hage, Hermann; Herzner, Karl-Heinz; and Scholz, Volker, 5,751,750, Cl. 372-34.000.
- Heska Corporation: *See—*
  - Tripp, Cynthia Ann; Frank, Glenn R.; and Grieve, Robert B., 5,750,391, Cl. 435-212.000.
- Heske, Norbert; and Heske, Thomas, to C. R. Bard, Inc. Twisted strand localization wire. 5,749,887, Cl. 606-185.000.
- Heske, Thomas: *See—*
  - Heske, Norbert; and Heske, Thomas, 5,749,887, Cl. 606-185.000.
- Hesling, Mark Ronald: *See—*
  - Elias, Martin Charles; Johnston, Scott Anthony; and Hesling, Mark Ronald, 5,751,873, Cl. 385-51.000.
- Hess, John W.: *See—*
  - Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., 5,750,826, Cl. 800-2.000.
- Hess, Michael F.: *See—*
  - Kieval, Robert S.; and Hess, Michael F., 5,749,906, Cl. 607-9.000.
- Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, to Clarian & GmbH. Process for the preparation of polyolefin waxes. 5,750,813, Cl. 585-12.000.
- Hesse, Ralph Kurt: *See—*
  - Bagherpour, Bo; Hesse, Ralph Kurt; and Brooks, Kenneth Ross, 5,751,079, Cl. 310-59.000.
- Hessel, John F.: *See—*
  - Gross, Stephen F.; and Hessel, John F., 5,750,663, Cl. 536-4.100.
- Hettinga, Siebolt. Metal reinforced plastic article and method of forming same. 5,750,001, Cl. 156-303.100.
- Hewlett-Packard Company: *See—*
  - Apffel, James A.; Werlich, Mark H.; Bertsch, James L.; and Goodley, Paul C., 5,750,988, Cl. 250-288.000.
  - Bearss, James G.; and Camis, Thomas, 5,751,329, Cl. 347-156.000.
  - Cowger, Bruce; Hall, Ronald W.; Gast, Paul D.; and Shibata, Alan, 5,751,300, Cl. 347-6.000.
  - Emmot, Darel N., 5,751,292, Cl. 345-430.000.
  - Farr, Mina, 5,751,863, Cl. 382-275.000.
  - Gornish, Edward H.; Holler, Anne M.; and Hsu, Wei Chung, 5,752,037, Cl. 395-709.000.
  - Hadley, LeMoyne F., 5,751,305, Cl. 347-19.000.
  - Henderson, Eric A., 5,752,247, Cl. 707-102.000.
  - Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.
  - Kraiczek, Karsten G.; and Effelsberg, Uwe, 5,750,978, Cl. 250-216.000.
  - Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.
  - Miller, Gary L.; and Williams, Kenneth R., 5,751,322, Cl. 347-86.000.
  - Mills, Louis Thomas; Butler, Richard M.; and Bradley, Havyn Eugene, 5,750,422, Cl. 438-112.000.
  - Nguyen, Khe C., 5,750,300, Cl. 430-78.000.
  - Olsen, Daniel M.; Scott, Noel D.; and Casey, Robert J., 5,751,291, Cl. 345-422.000.
  - Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
  - Solomon, Rodney J.; and Yeung, Hubert K., 5,749,828, Cl. 600-141.000.
  - Stephens, Fred O.; and Bassett, Jonathan D., 5,751,529, Cl. 360-128.000.
  - Swanson, David W.; Marler, Jaren D.; and Childers, Winthrop D., 5,751,323, Cl. 347-87.000.
  - Tobin, Paul G.; Naaseh-Shahry, Hosein; and Undy, Stephen R., 5,751,735, Cl. 371-22.500.
  - Tsang, Joseph W.; and Moffatt, John R., 5,749,952, Cl. 106-31.640.
  - Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, 5,752,016, Cl. 395-600.000.
  - Yi, You-Wen, 5,751,685, Cl. 369-126.000.
- Heylbroeck, Albert. Liquid fuel burners. 5,749,713, Cl. 431-8.000.
- Heyndricks, Joel: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- Hibi, Yasushi: *See—*
  - Wada, Tohru; and Hibi, Yasushi, 5,751,429, Cl. 356-419.000.
- Hibino, Hideo; Kazami, Kazuyuki; Yokonuma, Norikazu; and Okutsu, Hisashi, to Nikon Corporation. Film image reproduction signal output apparatus. 5,751,343, Cl. 348-96.000.
- Hibino, Katsuhiko: *See—*
  - Shirai, Noriaki; Hibino, Katsuhiko; and Nishimura, Takao, 5,751,211, Cl. 340-435.000.
- Hichri, Habib: *See—*
  - Buchanan, Robert A.; Krishnamurti, Ramesh; Hichri, Habib; and Johnson, David C., 5,750,811, Cl. 570-208.000.
- Hichwa, Bryant P.: *See—*
  - Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,751,489, Cl. 359-603.000.
- Hicks, Jennifer, to Asgrow Seed Company. Soybean cultivar 922144460593. 5,750,861, Cl. 800-200.000.
- Hicks, Peter D.: *See—*
  - Bizot, Paul M.; Bailey, Bruce R.; and Hicks, Peter D., 5,750,037, Cl. 210-750.000.
- Hicok, Gary; Potts, Kenneth; and Harrow, Scott, to VLSI Technology. System and method for enhancing joystick performance. 5,751,235, Cl. 341-140.000.
- Hidaka, Kishio: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Hidaka, Tetsuya: *See—*
  - Yoneyama, Tetsuhito; Yamamoto, Tomomi; Hidaka, Tetsuya; and Fukuno, Akira, 5,750,044, Cl. 252-62.540.
- Hidan Co.: *See—*
  - Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.
- Hideki, Kawai; Takayuki, Imaoka; and Go, Hata, to Toray Industries, Inc. Method of producing platinum (II) complex. 5,750,716, Cl. 549-210.000.
- Hideo, Nitta; Tomoki, Soutome; and Yoshiro, Shimizu, to Hitachi Metals, Ltd. Non-magnetic substrate material and slider assembly for use in flying-type magnetic head. 5,751,516, Cl. 360-103.000.
- Higaki, Kenjiro: *See—*
  - Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, 5,750,243, Cl. 428-216.000.
- Higgins, Charles T.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, to Unisys Corporation. Document image compression system and method. 5,751,846, Cl. 382-169.000.
- Higuchi, Haruhiko; and Suzuki, Noritoshi, to Citizen Watch Co., Ltd. Hand rotating mechanism for electronic watch. 5,751,664, Cl. 368-112.000.

- Higuchi, Kaoru; Ishii, Hiroshi; and Hanato, Hiroyuki, to Sharp Kabushiki Kaisha. Ink sheet transfer control apparatus for giving a specified value of tension to ink sheet to implement stable transfer. 5,751,331, Cl. 347-217.000.
- Higurashi, Seiji: *See—*
  - Ogasawara, Jin; Higurashi, Seiji; Shindo, Tomoyuki; and Suwa, Tetsuya, 5,751,509, Cl. 360-70.000.
- Hikita, Toshiya: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Hildebrand, Keith R.; and Shapland, J. Edward, to Iotek, Inc. Delivering an agent to an organ. 5,749,845, Cl. 604-21.000.
- Hileman, Vince; and Foo, Khim H., to Sun Microsystems, Inc. Universal hard drive bracket with shock and vibrational isolation and electrical grounding. 5,751,551, Cl. 361-753.000.
- Hilfiker, William K.; and Taylor, Thomas P., to Hilfiker, William K. Wire mat connector. 5,749,680, Cl. 405-262.000.
- Hill, Mark A.: *See—*
  - Dolan, Robert P.; Phillips, Thomas R.; DeWolf, Thomas L.; and Hill, Mark A., 5,751,948, Cl. 395-185.070.
- Hillenbrand, Christopher F.; and Gomez, Donald T., to United States of America, Navy. System for deploying weapons carried in an annular configuration in a UUV. 5,749,312, Cl. 114-21.200.
- Hillman, Melville E. D.: *See—*
  - Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
- Hillmyer, Marc A.: *See—*
  - Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., 5,750,815, Cl. 585-511.000.
- Hilton, Douglas James: *See—*
  - Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.
- Himes, Glenn Roy, to Shell Oil Company. High temperature low viscosity thermoplastic elastomer block copolymer compositions. 5,750,622, Cl. 525-92.00D.
- Hinant, Felicia M.: *See—*
  - Bilyeu, Paul D.; Hinant, Felicia M.; Hobby, James H.; and Hoffman, Donel A., 5,749,130, Cl. 24-637.000.
- Hindmarsh, Paul: *See—*
  - Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.
- Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., to Hewlett-Packard Company. Object oriented framework for testing software. 5,751,941, Cl. 395-183.140.
- Hinds, Frank C. Advanced aerosol container. 5,749,502, Cl. 222-401.000.
- Hinenoya, Saburou: *See—*
  - Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.
- Hinotani, Hiroaki: *See—*
  - Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, 5,752,148, Cl. 399-329.000.
- Hintikka, Paul N.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Hinton, Glenn J.: *See—*
  - Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
  - Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., 5,751,986, Cl. 395-394.000.
  - Glew, Andrew F.; and Hinton, Glenn J., 5,751,996, Cl. 711-145.000.
- Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, to Canon Kabushiki Kaisha. Ink jet recording having temperature control function. 5,751,304, Cl. 347-17.000.
- Hirabayashi, Yasuji, to Canon Kabushiki Kaisha. System for processing a quantized vector using spatial frequency correlations. 5,751,856, Cl. 382-232.000.
- Hiraga, Ryo: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Hirai, Kiminori: *See—*
  - Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.
- Hirai, Makoto, to Matsushita Electric Ind. Image forming apparatus and method for creating motion blur. 5,751,376, Cl. 348-579.000.
- Hiraishi, Wataru: *See—*
  - Nosu, Tsutomu; Hiraishi, Wataru; and Sawa, Yoshiharu, 5,750,609, Cl. 524-413.000.
- Hirakoso, Yutaka: *See—*
  - Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.
- Hiramatsu, Soichi: *See—*
  - Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.
- Hirane, Ken. Method for backwashing water processing systems. 5,750,041, Cl. 210-795.000.
- Hirano, Hirosaburo; Yamamoto, Yuji; and Ito, Shinji, to Showa Aluminum Corporation. Method of making refrigerant tubes for heat exchangers. 5,749,144, Cl. 29-890.04L.
- Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, to Matsushita Electronics Corporation. Ferroelectric memory devices and method for testing them. 5,751,628, Cl. 365-145.000.
- Hirano, Hiroshige; and Nakakuma, Tetsuji, to Matsushita Electronics Corporation. Electric signal supply circuit and semiconductor memory device. 5,751,650, Cl. 365-210.000.
- Hirano, Masao: *See—*
  - Koike, Sou; and Hirano, Masao, 5,749,175, Cl. 49-368.000.
- Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, to Sumitomo Chemical Company Limited. Unsaturated imide compounds containing alicyclic structure, process for producing the same and intermediate therefor. 5,750,789, Cl. 564-428.000.
- Hirano, Yoshihiro: *See—*
  - Sakauchi, Kazuo; Hirano, Yoshihiro; and Uchikawa, Akira, 5,749,967, Cl. 117-200.000.
- Hirata, Kei: *See—*
  - Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.
- Hiratani, Hajime: *See—*
  - Nakanishi, Koichiro; Nomura, Keiichi; Tajima, Kyoko; Hiratani, Hajime; and Kato, Kazuo, 5,750,650, Cl. 530-350.000.
- Hirato, Yasuhiro: *See—*
  - Kimura, Hiromi; Yamada, Kanji; and Hirato, Yasuhiro, 5,749,211, Cl. 57-217.000.
- Hirayama, Hideaki: *See—*
  - Shimizu, Kuniyasu; and Hirayama, Hideaki, 5,752,268, Cl. 711-162.000.
- Hirayama, Koichi; Nakai, Masatoshi; and Shimoda, Kenji, to Kabushiki Kaisha Toshiba. Multi-scene recording medium and apparatus for reproducing data therefrom. 5,751,892, Cl. 386-92.000.
- Hird, Michael: *See—*
  - Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.
- Hirel Holdings, Inc.: *See—*
  - Halvorson, Todd; Bickham, Stephen R.; and Cutler, David, 5,749,346, Cl. 123-486.000.
- Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, to Hitachi, Ltd. Method and apparatus for aiding configuration management of a computer system. 5,751,575, Cl. 364-188.000.
- Hirose, Tokuzo. Pearl and method for producing same. 5,749,319, Cl. 119-244.000.
- Hirose, Toshiyuki: *See—*
  - Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, 5,751,584, Cl. 364-474.200.
- Hiroshima, Sotaro: *See—*
  - Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, 5,751,935, Cl. 395-182.040.
- Hirota, Tsutomu: *See—*
  - Fukuta, Ken; Sano, Toshihiro; and Hirota, Tsutomu, 5,749,970, Cl. 118-320.000.
- Hiroya, Masaaki; and Sano, Koichi, to Hitachi, Ltd. Communication service system employing translation rules for communicating data in different languages along a network. 5,751,957, Cl. 395-200.330.
- Hirschauer, André: *See—*
  - Chauvin, Yves; Hirschauer, André; and Olivier, Hélène, 5,750,455, Cl. 502-164.000.
- Hisamune, Takeshi: *See—*
  - Ogata, Seiji; Sakurada, Yuzo; Chida, Nakaya; and Hisamune, Takeshi, 5,751,002, Cl. 250-492.210.
- Hitachi Car Engineering Co., Ltd.: *See—*
  - Tamaki, Shigeo; and Tokumoto, Shigeru, 5,749,336, Cl. 123-337.000.
- Hitachi Electronic Devices Co., Ltd.: *See—*

  - Takanobu, Hiroshi; and Ishikawa, Akimasa, 5,751,101, Cl. 313-405.000.
- Hitachi Engineering Co., Ltd.: *See—*
  - Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.
- Hitachi Kiso Co., Ltd.: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Hitachi, Ltd.: *See—*
  - Amada, Nobutaka, 5,751,506, Cl. 360-51.000.
  - Arai, Kouji; Satoh, Takao; and Yamamoto, Akira, 5,751,937, Cl. 395-182.050.
  - Arakawa, Fumio, 5,751,621, Cl. 364-748.070.
  - Aramaki, Toru; Ishida, Kiyoshi; and Watanabe, Toshio, 5,751,339, Cl. 348-17.000.
  - Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.
  - Fujii, Hiroaki; Kakuta, Hitoshi; and Takamoto, Yoshifumi, 5,752,256, Cl. 711-114.000.
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
  - Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.
  - Hiroya, Masaaki; and Sano, Koichi, 5,751,957, Cl. 395-200.330.
  - Hoshino, Takashi; Ikeda, Tetsuya; and Ishii, Junichi, 5,751,689, Cl. 369-275.300.
  - Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, 5,750,987, Cl. 250-251.000.
  - Ishibashi, Toshiaki; Ohnishi, Kunikazu; Inoue, Masayuki; and Suzuki, Yoshio, 5,751,680, Cl. 369-109.000.
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
  - Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.
  - Koike, Ryuichi; Banno, Hiroshi; Ito, Tamotsu; and Takeuchi, Takashi, 5,751,671, Cl. 369-14.000.
  - Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, 5,751,935, Cl. 395-182.040.
  - Konno, Chisato; and Okochi, Toshio, 5,752,030, Cl. 395-672.000.
  - Kowatari, Takehiko; Arai, Nobukatsu; and Kobayashi, Chihiro, 5,750,889, Cl. 73-118.200.
  - Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, 5,752,214, Cl. 701-111.000.
  - Mizuno, Fumio; and Satoh, Osamu, 5,750,990, Cl. 250-307.000.
  - Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.
  - Ochi, Hisaaki; Yamamoto, Etsuji; Sawaya, Kumio; and Adachi, Saburo, 5,751,600, Cl. 364-524.000.
  - Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.
  - Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.
  - Oshima, Yoshimitsu, 5,751,288, Cl. 345-357.000.
  - Sekimoto, Takao; Sakashita, Masahiro; Ando, Kenji; and Tsukada, Mitsushige, 5,752,233, Cl. 705-1.000.
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
  - Takanobu, Hiroshi; and Ishikawa, Akimasa, 5,751,101, Cl. 313-405.000.
  - Tamaki, Shigeo; and Tokumoto, Shigeru, 5,749,336, Cl. 123-337.000.
  - Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,749,473, Cl. 209-584.000.
- Hitachi Maxell, Ltd.: *See—*
  - Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, 5,750,747, Cl. 554-36.000.
- Hitachi Metals, Ltd.: *See—*
  - Abe, Tooru, 5,751,092, Cl. 310-359.000.
  - Hideo, Nitta; Tomoki, Soutome; and Yoshiro, Shimizu, 5,751,516, Cl. 360-103.000.
- Hitachi Nuclear Engineering Co., Ltd.: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Hitachi Zosen Corporation: *See—*
  - Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu, 5,749,307, Cl. 110-222.000.
  - Yoshimasa, Yokoyama, 5,750,235, Cl. 428-182.000.
- Hitzman, Donald O.; Sperl, George T.; and Sandbeck, Kenneth A., to Geo-Microbial Technologies, Inc. Composition for reducing the amount of and preventing the formation of hydrogen sulfide in an aqueous system, particularly in an aqueous system used in oil field applications. 5,750,392, Cl. 435-243.000.
- Hixon, Leonard L., Jr.: *See—*
  - Rees, John Joseph M.; and Hixon, Leonard L., Jr., 5,749,212, Cl. 57-225.000.
- HK Medical Technologies Incorporated: *See—*
  - Migachyov, Valery; and Colley, Charles D., 5,751,606, Cl. 364-558.000.
- Hladik, Stephen Michael: *See—*
  - Harrison, Daniel David; Pradeep, Anantha Krishnan; Brooksby, Glen William; and Hladik, Stephen Michael, 5,752,218, Cl. 701-207.000.
- Hlasta, Dennis J.: *See—*
  - Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., 5,750,550, Cl. 514-373.000.
- Ho, Francis Man Shuen; and Lee, Robert Chun Fung, to Computer Products, Inc. Low cost AC-to-DC converter having input current with reduced harmonics. 5,751,561, Cl. 363-21.000.
- Ho, Yueh-Se: *See—*
  - Hshieh, Fwu-Iuan; Chang, Mike F.; Van der Linde, Jan; and Ho, Yueh-Se, 5,750,416, Cl. 437-40.0AS.
- Hobbs, Gary Lamont, to Lucent Technologies Inc. Inclusion of audio signal within video signal. 5,751,366, Cl. 348-480.000.
- Hobby, James H.: *See—*
  - Bilyeu, Paul D.; Hinant, Felicia M.; Hobby, James H.; and Hoffman, Donel A., 5,749,130, Cl. 24-637.000.
- Hochiki Kabushiki Kaisha: *See—*
  - Narumiya, Junichi, 5,751,216, Cl. 340-630.000.
- Hochmuth, John K.: *See—*
  - Kennelly, Teresa; Hochmuth, John K.; Chou, Ting C.; and Farrauto, Robert J., 5,750,458, Cl. 502-304.000.
- Hock, Jürgen: *See—*
  - Heim, Gunther; Überreiter, Thomas; Hock, Jürgen; and Bischoff, Holger, 5,749,176, Cl. 49-502.000.
- Hoddie, Peter; Batson, James D.; and Callahan, Sean Michael, to Apple Computer, Inc. Apparatus and method for storing a movie within a movie. 5,751,281, Cl. 345-302.000.
- Hodgson, David Michael; and Witherington, Jason, to University of Reading, The. Rearrangement of epoxides. 5,750,805, Cl. 568-838.000.
- Hodgson, John Edward; and Lawlor, Elizabeth Jane, to SmithKline Beecham p.l.c. DNA encoing leucyl TRNA synthetase from staphylococcus aureus. 5,750,387, Cl. 435-183.000.
- Hoechst AG: *See—*
  - Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, 5,750,221, Cl. 428-35.700.
- Hoechst Aktiengesellschaft: *See—*
  - Becker, Wilfried, 5,750,407, Cl. 436-131.000.
  - Haas, Peter; Engelhardt, Heinz; and Müllner, Stefan, 5,750,679, Cl. 536-127.000.
  - Mann, Heinz-Josef, 5,749,964, Cl. 106-805.000.
  - Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, 5,750,669, Cl. 536-24.300.
  - Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, 5,750,752, Cl. 556-1.000.
  - Scholz, Guido; and Pirig, Wolf-Dieter, 5,749,948, Cl. 106-18.150.
  - Staendeke, Horst, 5,750,601, Cl. 524-117.000.
  - Vorbrüggen, Helmut; Krolikiewicz, Konrad; and Bennua-Skalmowski, Bärbel, 5,750,676, Cl. 536-55.300.
- Hoechst Celanese Corporation: *See—*
  - Shepperd, Paul W., III; Becker, Larry W.; and Cundiff, Robert J., 5,750,035, Cl. 210-719.000.
- Hoechst Marion Roussel Inc.: *See—*
  - Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.
- Hoeger, Carl A.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. Receptor-selective somatostatin analogs. 5,750,499, Cl. 514-9.000.
- Hoekstra, George: *See—*
  - Voith, Raymond Paul; Sudhaman, Sujit; and Hoekstra, George, 5,751,741, Cl. 371-37.700.
- Hoeprich, Paul D., Jr.: *See—*
  - Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
- Hoerner, Brian; Quan, Kam; and Smith, Frank, to Itronix Corporation. Gas gauging system and method for monitoring battery capacity for battery powered electronic devices. 5,751,134, Cl. 320-21.000.
- Hofer, John Curtis: *See—*
  - Exner, Gregory F.; Hofer, John Curtis; Durrani, Sheryar; and Matsu, Richard L., 5,749,598, Cl. 280-728.200.
- Hoffman, Donel A.: *See—*
  - Bilyeu, Paul D.; Hinant, Felicia M.; Hobby, James H.; and Hoffman, Donel A., 5,749,130, Cl. 24-637.000.
- Hoffman-La Roche Inc.: *See—*
  - Baggiolini, Enrico Giuseppe, deceased; Shiuey, Shian-Jan; and Uskokovic, Milan Radoje, 5,750,517, Cl. 514-167.000.
- Hoffmann, Erhard-Günther: *See—*
  - Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, 5,750,801, Cl. 568-715.000.
- Hoffmann-La Roche Inc.: *See—*
  - Alber, Gottfried; and Angehrn, Peter, 5,750,503, Cl. 514-12.000.
  - Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, 5,750,706, Cl. 546-279.100.
  - Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, 5,750,690, Cl. 544-234.000.

- Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, 5,750,374, Cl. 435-69.700.
- Hohler, Markus; and Vogt, Peter, 5,750,649, Cl. 530-338.000.
- Hofmann, Rudolf, to U.S. Philips Corporation. Adaptive prediction filter using block floating point format and minimal recursive recomputations. 5,751,902, Cl. 395-2.280.
- Hogendijk, Michael; and Wholey, Mark H., to Endotex Interventional Systems, Inc. Intraluminal graft and method for inserting the same. 5,749,918, Cl. 623-1.000.
- Hohberg, Gerhard: *See—*
  - Flöther, Werner; and Hohberg, Gerhard, 5,749,745, Cl. 439-349.000.
- Hohenegger, Karl; and Wierer, Peter, to Balzers Aktiengesellschaft. High-reflection silver mirror. 5,751,474, Cl. 359-360.000.
- Hohler, Markus; and Vogt, Peter, to Hoffmann-La Roche Inc. Process for producing amides using catalytic amounts of an N-hydroxy compound. 5,750,649, Cl. 530-338.000.
- Hohlweg, Rolf: *See—*
  - Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,750,518, Cl. 514-183.000.
- Hohner, Gerd: *See—*
  - Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.
- Hokkanen, Petri, to Nokia Telecommunications Oy. Method and apparatus for comparing averages of signal levels of receivers of receiver unit for automatically providing indication of a defective receiver. 5,752,165, Cl. 455-67.100.
- Holden's Foundation Seeds, Inc.: *See—*
  - Foley, Terry J., 5,750,850, Cl. 800-200.000.
  - Geadelmann, Jon L.; and Leto, Kenneth, 5,750,851, Cl. 800-200.000.
- Holhammar, Jörgen, to Vattenfall AB. Wall socket. 5,751,542, Cl. 361-623.000.
- Holland, Dewey T. Heated wiper blade. 5,749,118, Cl. 15-250.070.
- Hollar, Richard T.: *See—*
  - Pelham, Marilyn M.; and Hollar, Richard T., 5,749,314, Cl. 119-28.500.
- Holler, Anne M.: *See—*
  - Gornish, Edward H.; Holler, Anne M.; and Hsu, Wei Chung, 5,752,037, Cl. 395-709.000.
- Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., to Apple Computer, Inc. Apparatus and method for representing electronic mail. 5,752,059, Cl. 395-800.000.
- Hollingsbee, Derek A.: *See—*
  - Edwardson, Peter A. D.; Fairbrother, John E.; Gardner, Ronald S.; Hollingsbee, Derek A.; and Cederholm-Williams, Stewart A., 5,750,657, Cl. 530-382.000.
- Holm, Paige M.; and Terwilliger, Chris, to Motorola, Inc. Semiconductor array and switches formed on a common substrate for array testing purposes. 5,751,159, Cl. 324-767.000.
- Holmes, Beth Annice, to Asgrow Seed Company. Soybean cultivar 92417111. 5,750,855, Cl. 800-200.000.
- Holmes, Brian M.; Blakeslee, Jeffrey J.; and Dolecek, Victor D., to Cobe Laboratories, Inc. Disposable for an apheresis system with a contoured support. 5,750,025, Cl. 210-361.000.
- Holson, Edward: *See—*
  - Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.
- Holy Ghost, Duquesne University of the: *See—*
  - Drennen, James K., III; and Kirsch, John D., 5,750,996, Cl. 250-341.200.
- Homoto, Yukio: *See—*
  - Shibanuma, Takashi; Homoto, Yukio; Komatsu, Satoshi; and Yoshimura, Toshikazu, 5,750,809, Cl. 570-169.000.
- Hon Hai Precision Ind. Co., Ltd.: *See—*
  - Tan, Haw-Chan; and Ma, Frank C., 5,749,746, Cl. 439-357.000.
- Hon Industries Inc.: *See—*
  - Davis, Keith L.; and Petersen, Kirk A., 5,749,125, Cl. 16-382.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Kiuchi, Takeo; Tamagawa, Yutaka; and Ibaraki, Shigeru, 5,751,137, Cl. 322-14.000.
  - Shimada, Takamichi; and Sekine, Noboru, 5,749,805, Cl. 477-116.000.
  - Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.
- Honda, Hiroki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a bipolar transistor and method of manufacturing the same. 5,751,053, Cl. 257-592.000.
- Honda, Kenji: *See—*
  - Yamada, Minoru; Hashimoto, Hideyuki; Yabe, Yasuhiro; and Honda, Kenji, 5,751,522, Cl. 360-113.000.
- Honda, Masami; and Miura, Yosuke, to Kabushiki Kaisha Toshiba. Electronic device system including a portable electronic device having a handwriting input device locked to an expansion station when the power switch of the portable electronic device is turned on. 5,751,547, Cl. 361-686.000.
- Honda, Mizuho: *See—*
  - Taoka, Naoaki; Honda, Mizuho; Inoue, Kenji; and Kan, Kazunori, 5,750,382, Cl. 435-135.000.
- Honda, Shinsuke, to Sansho Seiyaku Co., Ltd. Preparation for epidermis. 5,750,563, Cl. 514-460.000.
- Honda, Teruhiko: *See—*
  - Nomoto, Shinichi; Kobayashi, Hideo; Honda, Teruhiko; and Hara, Kazuo, 5,751,247, Cl. 342-359.000.
- Honda, Toshiyuki: *See—*
  - Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, 5,751,628, Cl. 365-145.000.
- Honda, Tsutomu: *See—*
  - Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.
- Honda, Yoshikazu: *See—*
  - Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,750,331, Cl. 435-5.000.
- Honeywell, Inc.: *See—*
  - Heinze, William C., 5,751,385, Cl. 349-61.000.
  - Larson, Brent D., 5,751,388, Cl. 349-96.000.
- Hong, Seong-doo: *See—*
  - Kim, Myeong-kyu; and Hong, Seong-doo, 5,751,400, Cl. 354-159.000.
- Hong, Weon Ki, to Samsung Electro-Mechanics Co., Ltd. Spindle motor having hydrodynamic bearing. 5,751,080, Cl. 310-67.00R.
- Honma, Akihiro: *See—*
  - Isozaki, Tsuyoshi; Kurokawa, Masahiro; and Honma, Akihiro, 5,750,739, Cl. 549-515.000.
- Hood, C. Fred: *See—*
  - Wright, Steven L.; and Hood, C. Fred, 5,751,421, Cl. 356-328.000.
- Hood, Larry L.; and Mendez G., Antonio, to Refractec Inc. Method and apparatus for modifications of visual acuity by thermal means. 5,749,871, Cl. 606-50.000.
- Hoorne, Dirk; and Auda, Mahroussa, to Imperial Chemical Industries PLC. Hydrocarbyl polysaccharide compositions. 5,750,513, Cl. 514-54.000.
- Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, to United Air Llines. Airline baggage cart. 5,749,589, Cl. 280-47.340.
- Hopkins, Jeffrey Jon: *See—*
  - Evans, Joel Franklin; Cox, Bruce Russell; Dodd, Michael Thomas; and Hopkins, Jeffrey Jon, 5,750,122, Cl. 424-401.000.
- Hoppe, Henry, IV: *See—*
  - Cheng, Seng Hing; Fang, Shaona Lee; Hoppe, Henry, IV; and Smith, Alan Edward, 5,750,571, Cl. 514-557.000.
- Hopper, William J. Aquadynamic swim apparatus. 5,749,759, Cl. 441-60.000.
- Hori, Masakatsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Release button mechanism of camera. 5,752,117, Cl. 396-504.000.
- Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, to Kirin Beer Kabushiki Kaisha; Kirin Beverage Corporation; and Mitui Petrochemical Industries, Ltd. Bag for bag-in-box. 5,750,216, Cl. 428-34.300.
- Horn, William E., Jr.: *See—*
  - Easley, Michael A.; and Horn, William E., Jr., 5,750,453, Cl. 502-84.000.
- Horne, Stephen C.: *See—*
  - McMahon, Scott H. R.; Buchanan, James Michael; and Horne, Stephen C., 5,751,173, Cl. 327-170.000.
- Horne, Stephen Edward: *See—*
  - Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., 5,750,719, Cl. 548-268.600.
- Horner, Paul W.: *See—*
  - Synder, Bobbie L.; Bradley, C. Thomas; and Horner, Paul W., 5,749,628, Cl. 297-411.360.
- Horn Feja, Franziskus, to Fosfoquim S.A. Particulate material feeding apparatus and process. 5,749,684, Cl. 406-141.000.
- Horrall, Paul Douglas: *See—*
  - Coffey, Johnnie A.; Foster, Larry Steven; Horrall, Paul Douglas; and McIntyre, John Randolph, 5,752,135, Cl. 399-115.000.
- Horse Vitality Ltd: *See—*
  - Gobbi, Rosa Maria, 5,750,149, Cl. 424-535.000.
- Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, to Tandem Computers Incorporated. Fail-fast, fail-functional, fault-tolerant multiprocessor system. 5,751,932, Cl. 395-182.100.
- Horst, Robert W., to Tandem Computers Incorporated. Computer architecture capable of concurrent issuance and execution of general purpose multiple instructions. 5,752,064, Cl. 395-800.000.
- Horsten, Bartholomeus; Loccufier, Johan; Defieuw, Geert; and Leenders, Luc, to Agfa-Gevaert. Substantially non-photosensitive thermographic recording material with improved stability and image-tone. 5,750,319, Cl. 430-346.000.
- Horton, John Arthur: *See—*
  - Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, 5,749,223, Cl. 60-300.000.
- Horvath, Joseph G.; and Miller, James C., to Automeg, Inc. Electric motor monitoring circuit. 5,751,132, Cl. 318-798.000.
- Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, to Unisia Jecs Corporation; and Nissan Motor Co., Ltd. Valve lifter for internal combustion engines. 5,749,341, Cl. 123-90.350.

- Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, to Taiho Kogyo Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Exhaust gas recirculation system. 5,749,563, Cl. 251-61.500.
- Hoshi, Masamichi: *See—*
  - Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.
- Hoshikawa, Shigeyuki: *See—*
  - Ikesugi, Hiroshi; and Hoshikawa, Shigeyuki, 5,751,876, Cl. 385-86.000.
- Hoshino, Takashi; Ikeda, Tetsuya; and Ishii, Junichi, to Hitachi, Ltd. Information recording medium. 5,751,689, Cl. 369-275.300.
- Hoshino, Toshiyuki: *See—*
  - Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.
- Hosley, Daniel S.: *See—*
  - Carey, Danuta H.; Geberth, John D.; Walsh, John; and Hosley, Daniel S., 5,749,528, Cl. 239-119.000.
- Hosoda, Kenichiro: *See—*
  - Aoyagi, Hiromi; Ariyama, Yoshihiro; and Hosoda, Kenichiro, 5,752,223, Cl. 704-219.000.
- Hosoe, Yuzuru: *See—*
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
- Hosoya, Jun: *See—*
  - Usui, Fumiaki; Takeshi, Kunio; Hosoya, Jun; and Terasawa, Chiaki, 5,751,497, Cl. 359-687.000.
- Hospitak, Inc.: *See—*
  - Lacey, William J.; and Elkins, John, 5,749,360, Cl. 128-207.140.
- Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, to JHC Ventures, L.P. Trailer suspension. 5,749,595, Cl. 280-688.000.
- Hossli, Robert I.: *See—*
  - Brow, Richard A.; and Hossli, Robert I., 5,749,282, Cl. 52-235.000.
- Hotoda, Hitoshi: *See—*
  - Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, 5,750,511, Cl. 514-44.000.
- Hotta, Yasuhiro, to Sharp Kabushiki Kaisha. Semiconductor memory device. 5,751,657, Cl. 365-238.500.
- Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., to Suprex Corporation. Method and apparatus for determination of analyte concentration. 5,750,029, Cl. 210-634.000.
- Houck, Willie G., Jr.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Houg, Todd C.: *See—*
  - Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., 5,751,295, Cl. 345-501.000.
- Houghton, Kenneth Arthur, to Reckitt & Colman Products Limited. Improvements in flip-top type carton containers. 5,749,462, Cl. 206-268.000.
- Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, to Chiron Corporation. Hepatitis δ diagnostics. 5,750,350, Cl. 435-7.100.
- House Ear Institute: *See—*
  - Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.
- Hovestadt, Wieland: *See—*
  - Blum, Harald; Sickert, Armin; and Hovestadt, Wieland, 5,750,613, Cl. 524-457.000.
- Howard, Albert R. Audio power amplifier device for micro-computers. 5,751,816, Cl. 381-24.000.
- Howard, Bradley J.: *See—*
  - Figura, Thomas A.; and Howard, Bradley J., 5,750,441, Cl. 438-751.000.
- Howard, James Kent: *See—*
  - Ahlert, Richard Henry; Howard, James Kent; Ullah, Muhammad Inayet; and Umphress, Richard Donald, 5,750,231, Cl. 428-65.500.
- Howard, John H.: *See—*
  - Osborne, Randy B.; Howard, John H.; Casley, Ross T.; and Hahn, Douglas J., 5,751,951, Cl. 395-200.800.
- Howard, Paul Glor, to Lucent Technologies Inc. Compression of text images by soft pattern matching. 5,751,859, Cl. 382-238.000.
- Howe Furniture Corporation: *See—*
  - Loescher, William A., 5,749,121, Cl. 16-43.000.
- Hoyt, Matthew B., to BASF Corporation. Plate-type sheath/core-switching device and method of use. 5,750,063, Cl. 264-172.150.
- Hozumi, Taro: *See—*
  - Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.
- Hraboczki, Marton: *See—*
  - Soules, Thomas F.; Hraboczki, Marton; and Lahl, John R., 5,751,104, Cl. 313-493.000.
- Hretsina, Gary. Taxiway marker. 5,751,226, Cl. 340-947.000.
- Hrovat, Davorin D.; and Tran, Minh N., to Ford Global Technologies, Inc. Traction control through an effective static linearization. 5,749,428, Cl. 180-197.000.
- Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, to Ford Global Technologies, Inc. Vehicle control system employing improved methods and apparatus for estimating applied wheel torque. 5,751,579, Cl. 364-426.015.
- Hrovat, Mirko I., to Magnetic Vision Technologies, Inc. Surface coil for high resolution imaging. 5,751,146, Cl. 324-318.000.
- Hshieh, Fwu-Iuan; Chang, Mike F.; Van der Linde, Jan; and Ho, Yueh-Se, to Siliconix Incorporated. Method of forming a lateral field effect transistor having reduced drain-to-source on-resistance. 5,750,416, Cl. 437-40.0AS.
- Hsia, Edward; Hernandez, Jose H.; and Suanya, Sayan, to Advanced Micro Devices, Inc. Method of screening hot temperature erase rejects at room temperature. 5,751,633, Cl. 365-185.090.
- Hsiao, Mu-Yue: *See—*
  - Chen, Chin-Long; Hsiao, Mu-Yue; Lipponer, Walter Heinrich; and Shen, William Wu, 5,751,745, Cl. 371-51.100.
- Hsiao, Ray-Ling. Quantitative skin allergic test device. 5,749,836, Cl. 600-556.000.
- Hsieh, Aquino, to Jet General Investment Company. Collapsible luggage piece and cart. 5,749,446, Cl. 190-107.000.
- Hsieh, Hsing-Chi. Easily adjustable fastening belt for holding a dive knife. 5,749,127, Cl. 24-3.130.
- Hsing Chau Industrial Co., Ltd.: *See—*
  - Wu, Peter, 5,750,923, Cl. 174-35.00R.
- Hsu, Fang-Ru: *See—*
  - Chiueh, Tzi-Dar; Chang, Hwai-Tsu; Hsu, Fang-Ru; and Meng, Wan-Yu, 5,751,913, Cl. 395-27.000.
- Hsu, Feng-Lung Gordon: *See—*
  - Garcia, Rigoberto Felipe; Vasudevan, Tirucherai Varahan; Post, Albert Joseph; and Hsu, Feng-Lung Gordon, 5,750,489, Cl. 510-417.000.
- Hsu, Stephen Charles: *See—*
  - Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.
- Hsu, Wei Chung: *See—*
  - Gornish, Edward H.; Holler, Anne M.; and Hsu, Wei Chung, 5,752,037, Cl. 395-709.000.
- Hsue, Chen-Chiu; and Chien, Sun-Chieh, to United Microelectronics Corporation. Method for fabricating a local interconnection structure. 5,750,438, Cl. 438-627.000.
- Huang Ching-Feng: *See—*
  - Chang, Shu-chuan, 5,749,557, Cl. 248-405.000.
- Huang, Chun-Kai: *See—*
  - Lee, Ruen-Rone; and Huang, Chun-Kai, 5,751,290, Cl. 345-421.000.
- Huang, Hwang-Wen, to Inteplast Corporation. Process for the production of calendered film of polypropylene resin. 5,750,645, Cl. 528-502.00B.
- Huang, Philine: *See—*
  - Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, 5,749,819, Cl. 483-39.000.
- Huang, Rong-Ting; Wright, Phil; and Joseph, Eric D., to Motorola, Inc. Drive device and method for scanning a monolithic integrated LED array. 5,751,263, Cl. 345-82.000.
- Huang, Tai-Long. Operating device for a venetian blind to control raising and lowering of the salts and to adjust tilting angle of the slats. 5,749,405, Cl. 160-168.10R.
- Huang, Yufeng; Alvesteffer, William J.; and Outlaw, Ronald A., to Teledyne Industries, Inc. Laminar flow element with inboard sensor taps and coaxial laminar flow guides. 5,750,892, Cl. 73-202.000.
- Huang, Yu-Wen: *See—*
  - Su, Yang-Chun; and Huang, Yu-Wen, 5,751,860, Cl. 382-244.000.
- Hub, Serge: *See—*
  - Schirmann, Jean-Pierre; Hub, Serge; and Lantz, Andre, 5,750,810, Cl. 570-171.000.
- Hubbard, Carolyn Parks: *See—*
  - Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.
- Hubbell, Brenda C. Gel textured honey product. 5,750,175, Cl. 426-573.000.
- Hubbell Incorporated: *See—*
  - Swift, Thomas R.; and Richter, Kevin R., 5,749,740, Cl. 439-92.000.
- Hubble, Fred F., III: *See—*
  - Borton, Michael D.; Carolan, Kevin M.; and Hubble, Fred F., III, 5,751,443, Cl. 356-446.000.
- Hübel, Uwe: *See—*
  - Eckardt, Helmut; Schröder, Klaus; Ehritt, Jürgen; and Hübel, Uwe, 5,750,155, Cl. 425-130.000.
- Huber, Christian: *See—*
  - Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, 5,750,634, Cl. 528-254.000.
- Huber, Isabelle: *See—*
  - Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, 5,750,706, Cl. 546-279.100.
- Huber, Thomas, to Telair International Cargo Systems GmbH. Method and apparatus for controlling cargo in an aircraft. 5,749,543, Cl. 244-118.100.
- Huber, Wilhelm: *See—*
  - Brennenstuhl, Werner; Mittermeier, Manfred; and Huber, Wilhelm, 5,750,581, Cl. 521-54.000.
- Hucks, Charles: *See—*
  - Carlson, Kenneth; and Hucks, Charles, 5,752,216, Cl. 701-117.000.
- Hudson, Alice P.: *See—*
  - Ferrell, Paul; and Hudson, Alice P., 5,750,130, Cl. 424-417.000.
- Huels Aktiengesellschaft: *See—*

Gras, Rainer, 5,750,727, Cl. 548-951.000.

Huether, James L.: *See—*

Couch, Johnny D.; and Huether, James L., 5,749,577, Cl. 273-148.00B.

Hugentobler, Monte K.; and Mandracchia, Efrain Anthony, to SonicForce, L.L.C. Acoustic strain gauge and assembly and method for measuring strain. 5,750,900, Cl. 73-779.000.

Hughes Aircraft Company: *See—*

Harrell, John P.; and Wheeler, Bryce A., 5,751,460, Cl. 359-198.000.

Morgan, Felix E.; Page, Randall S.; and Monaco, Sam D., 5,750,896, Cl. 73-622.000.

Schaffner, James H.; and Yap, Daniel, 5,751,867, Cl. 385-3.000.

Stotelmyer, L. Scott; and Fulkerson, Don K., 5,749,402, Cl. 141-83.000.

Vali, Victor; Shih, I-Fu; and Bates, Kenn S., 5,750,901, Cl. 73-800.000.

Hughes Electronics: *See—*

Forson, Henry, 5,751,372, Cl. 348-569.000.

Kaewell, John D., Jr.; and Cooley, David M., 5,752,190, Cl. 455-436.000.

Swaminathan, Kumar; and Vemuganti, Murthy, 5,751,903, Cl. 395-2.390.

Hughes, Gary B.: *See—*

Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,750,202, Cl. 427-376.400.

Huguenin, Sallie B.: *See—*

Dilling, Peter; and Huguenin, Sallie B., 5,749,926, Cl. 8-524.000.

Huh, Nam Won; Park, Yong Ae; and Kim, Yong Ho, to Chung-Do Pharmaceutical Co., Ltd. Composition for detecting leucocyte and proteinase in urine and its measuring device. 5,750,359, Cl. 435-19.000.

Human Genome Sciences, Inc.: *See—*

Li, Yi; Rosen, Craig A.; and Kumar, Chandrika, 5,750,370, Cl. 435-69.100.

Humburg, Michael, to J. Eberspächer GmbH & Co. Vehicle heater with control device. 5,749,516, Cl. 237-2.00A.

Humphries, Robert D.; Dreese, Delbert R.; Taylor, Louis L.; and Parker, Dennis Clay, to A.J. Sackett and Sons Company. Method of producing dry granular fertilizer and soil amendments using clay slurry and dry chemicals. 5,749,936, Cl. 71-64.050.

Hund, René; and Georges, Sébastien, to S.N.F. Process for preparing stable emulsions of polyelectrolytes of high molecular weight as reverse emulsion. 5,750,614, Cl. 524-460.000.

Hung, Chun-Hsiung: *See—*

Chen, Chia Shing; Hung, Chun-Hsiung; Wan, Ray-Lin; and Kamei, Teruhiko, 5,751,637, Cl. 365-185.330.

Hunsaker, Mikal C.: *See—*

Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., 5,751,998, Cl. 395-490.000.

Hunt, David S.: *See—*

Scheffelin, Joseph E.; Hunt, David S.; Yoong, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.

Hunt, Harold R.: *See—*

Scharre, Mark D.; Ewert, Warren M.; and Hunt, Harold R., 5,750,798, Cl. 568-697.000.

Hunt, Jeffery Scott: *See—*

Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., 5,751,644, Cl. 365-194.000.

Hunter, April: *See—*

Evans, Allan; Van Blaricom, Charles; and Hunter, April, 5,751,702, Cl. 370-314.000.

Hunter Douglas Inc.: *See—*

Colson, Wendell B., 5,749,404, Cl. 160-84.040.

Hur, Kyung Myung: *See—*

Choi, Woong Lim; Ra, Kyeong Man; and Hur, Kyung Myung, 5,751,632, Cl. 365-185.030.

Hur, Se-Hurn, to Daewoo Electronics Co., Ltd. Head-mounted display apparatus with a single image display device. 5,751,493, Cl. 359-630.000.

Hurkmans, Petrus L. W.: *See—*

Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 5,749,501, Cl. 222-384.000.

Hurley & Harrison, Inc. (the New Entity): *See—*

Harrison, Edward F., Jr.; and Cornwell, J. Bennette, III, 5,749,215, Cl. 57-337.000.

Hurst, John Robert; and Heritage, Trevor William, to Tripos, Inc. Molecular hologram QSAR. 5,751,605, Cl. 364-496.000.

Hushek, Stephen G., to General Electric Company. Intersecting multislice MRI data acquistion method. 5,749,834, Cl. 600-410.000.

Husky Injection Molding Systems Ltd.: *See—*

Schad, Robert; and Arnott, Robin, 5,750,162, Cl. 425-533.000.

Huston, Charles D.; and Cornish, Darryl J. Method and apparatus for calibration of a GPS receiver. 5,751,244, Cl. 342-357.000.

Hutchinson: *See—*

Godeau, Denis, 5,749,995, Cl. 156-242.000.

Hutchinson, Donald P., to Lockheed Martin Energy Systems, Inc. Method and apparatus for coherent imaging of infrared energy. 5,751,830, Cl. 382-103.000.

Hutchinson, James L.: *See—*

Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Hutchinson, Ronald M. Automotive mobile telephone antenna silencer. 5,751,251, Cl. 343-715.000.

Hutchison, Alan: *See—*

Albaugh, Pamela; and Hutchison, Alan, 5,750,702, Cl. 546-183.000.

Huth, Andreas; and Turski, Lechoslaw, to Schering Aktiengesellschaft. Quinoxalinedione derivatives, their production and use in pharmaceutical agents. 5,750,525, Cl. 514-249.000.

Hutte, Richard S.: *See—*

Godec, Richard D.; Kosenka, Paul P.; and Hutte, Richard S., 5,750,073, Cl. 422-79.000.

Hüttenhofer, Klaus; Herr, Wolfgang; Sprehe, Josef; and Spielmann, Horst, to Siemens Aktiengesellschaft. Combined feed and mixing device. 5,749,651, Cl. 366-181.500.

Hutzler, Richard Wayne: *See—*

Opresko, Stephen Thomas; and Hutzler, Richard Wayne, 5,751,103, Cl. 313-477.00R.

Huynh, Anh Hoa; Tran, Joanne; Scherninski, François; and Guette, Jean-Paul, to Societe D'etudes et de Recherches Biologiques. Method for the preparation of high purity substituted benz [E] indoles and the alkaline salts thereof. 5,750,722, Cl. 548-427.000.

Hwang, Shih Ming. Vehicle security system using an existing switch device, ignition key manipulation, and remote control transmitter to disarm the system and program security codes. 5,751,072, Cl. 307-10.400.

Hwang, Wen-Miin: *See—*

Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, 5,749,819, Cl. 483-39.000.

Hyatt, Gary F., to Vesture Corporation. Thermal retention device. 5,750,962, Cl. 219-528.000.

Hybridon, Inc.: *See—*

Iyer, Radhakrishnan P.; Yu, Dong; Agrawal, Sudhir; and Tan, Weitian, 5,750,674, Cl. 536-26.700.

Hyde, Darryl L.; and Edwards, John R., to Western Digital Corporation. Intelligent disk drive having spring contacts on a board assembly for connecting to exterior-facing electrical contacts coupled to a spindle motor. 5,751,514, Cl. 360-97.010.

Hyun, Kyung-Sook; Kwon, O-Kyun; Kim, Kwang-Joon; and Lee, El-Hang, to Electronics and Telecommunications Research Center. Vertical modulator with dual mode DBR. 5,751,468, Cl. 359-282.000.

Hyundai Electronics America: *See—*

Herbert, Brian K., 5,752,010, Cl. 395-509.000.

Hyundai Electronics Industries Co., Ltd.: *See—*

Chung, In Sool; and Lee, Jae Jin, 5,751,653, Cl. 365-230.060.

Kim, Jin Baek; Jung, Min Ho; and Chang, Kyeong Ho, 5,750,680, Cl. 540-200.000.

Kim, You Taeq, 5,751,726, Cl. 371-6.000.

Hyundai Motor Company: *See—*

Jang, Jae Dirk; and Lim, Kibeen, 5,749,806, Cl. 477-133.000.

Sae Il, Kim, 5,749,487, Cl. 220-86.200.

Ianni, John J.: *See—*

Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.

Ibanez, Pilar; Josa, Jaume; and Osset, Miguel, to Henkel Kommanditgesellschaft auf Aktien. Low-foaming cleaning formulations. 5,750,486, Cl. 510-356.000.

Ibaraki, Shigeru: *See—*

Kiuchi, Takeo; Tamagawa, Yutaka; and Ibaraki, Shigeru. 5,751,137, Cl. 322-14.000.

Ichie, Kazuko: *See—*

Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.

Ichikawa, Akira: *See—*

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Ichikawa, Hiroyuki: *See—*

Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.

Ichikawa, Miki: *See—*

Sakai, Akira; Ichikawa, Miki; and Urita, Seiichi, 5,751,577, Cl. 364-191.000.

Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, to Hitachi, Ltd. Ion beam processing apparatus. 5,750,987, Cl. 250-251.000.

Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, to Canon Kabushiki Kaisha. Camera featuring a single drive source and a plurality of selectable drive transmission mechanisms. 5,752,096, Cl. 396-85.000.

Icopa A/S: *See—*

Harder, Sven; and Borst, Jan, 5,749,780, Cl. 454-359.000.

Ide, Kazuhisa: *See—*

Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, 5,750,228, Cl. 428-64.100.

IDEC Pharmaceuticals Corporation: *See—*

Newman, Roland A.; Hanna, Nabil; and Raab, Ronald W., 5,750,105, Cl. 424-133.100.

Idei, Akio: *See—*

Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.

Idemitsu Petrochemical Co., Ltd.: *See—*

Gouda, Hirofumi; and Tanaka, Takayoshi, 5,750,068, Cl. 264-572.000.

IDEXX Laboratories, Inc.: *See—*

Clark, Scott M., 5,750,333, Cl. 435-5.000.

Ieki, Atsushi, to Okuma Corporation. Optical encoder used for position detection based upon a plurality of signals. 5,750,984, Cl. 250-231.160.

Iemura, Masahito: *See—*

Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, 5,750,516, Cl. 514-100.000.

Iga, Katsumi: *See—*

Yamagata, Yutaka; Iga, Katsumi; and Okada, Hiroaki, 5,750,100, Cl. 424-85.200.

Igarashi, Katsuji: *See—*

Tsutsui, Keiichi; and Igarashi, Katsuji, 5,751,675, Cl. 369-44.270.

Igarashi, Koichi: *See—*

Senoo, Masaharu; Watanabe, Tatsuya; and Igarashi, Koichi, 5,750,371, Cl. 435-69.100.

Igashira, Toshihiko: *See—*

Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko. 5,749,330, Cl. 123-41.100.

Igaue, Takamitsu: *See—*

Yamamoto, Masamitsu; Igaue, Takamitsu; and Sasaki, Toru, 5,749,865, Cl. 604-385.200.

Ihara Chemical Industry Co., Ltd.: *See—*

Sugiyama, Tatsuo; and Nakayama, Tadashi, 5,750,763, Cl. 560-17.000.

Ihara, Keisuke: *See—*

Shimosaka, Hirotaka; and Ihara, Keisuke, 5,749,796, Cl. 473-365.000.

Iida, Atsuhiro; Yokota, Kazumi; Ikeda, Eiji; and Sasayama, Tomoki, to Shimadzu Corporation. Spectropotometer with a field restrictor and its application to a colorimeter. 5,751,420, Cl. 356-328.000.

Iida, Atsuo: *See—*

Ishikawa, Hiroshi; Yamaguchi, Nobuyasu; Iwamoto, Yasuhide; and Iida, Atsuo, 5,750,941, Cl. 178-19.000.

Iida, Masahiko: *See—*

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Iigahama, Yukio; and Fukuhara, Motohiko, to Fujitsu Limited. Fresnel lens and liquid crystal display device. 5,751,387, Cl. 349-95.000.

Iijima, Kazuyuki: *See—*

Nishiguchi, Masayuki; Iijima, Kazuyuki; Matsumoto, Jun; and Omori, Shiro, 5,752,222, Cl. 704-201.000.

Iijima, Masaki: *See—*

Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, 5,750,083, Cl. 423-228.000.

Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, to Dai Nippon Printing Co., Ltd. Electrostatic information recording medium. 5,750,238, Cl. 428-195.000.

Iijima, Shuji; and Nishizawa, Akio, to Nikon Corporation. Apparatus that uses a photographic film. 5,752,110, Cl. 396-319.000.

Iikawa, Tsutomu: *See—*

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Ikariya, Takao: *See—*

Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.

Ikeda Bussan Co., Ltd.: *See—*

Yoshida, Tomonori, 5,749,624, Cl. 297-367.000.

Yoshida, Tomonori, 5,749,626, Cl. 297-367.000.

Yuasa, Hiroshi; and Furuichi, Kozo, 5,750,246, Cl. 428-318.400.

Ikeda, Eiji: *See—*

Iida, Atsuhiro; Yokota, Kazumi; Ikeda, Eiji; and Sasayama, Tomoki, 5,751,420, Cl. 356-328.000.

Ikeda, Hiroaki, to Canon Kabushiki Kaisha. Method and apparatus for processing a document. 5,751,849, Cl. 382-176.000.

Ikeda, Kenichi; Asai, Yuichi; and Arai, Yuji, to NEC Corporation. Method of treating waste water to remove harmful ion by coagulating sedimentation. 5,750,033, Cl. 210-711.000.

Ikeda, Kenichi: *See—*

Shimazu, Akira; Ikeda, Kenichi; and Hachisuka, Hisao, 5,749,943, Cl. 95-50.000.

Ikeda, Sumio: *See—*

Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.

Ikeda, Tadayoshi: *See—*

Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.

Ikeda, Tetsuya: *See—*

Hoshino, Takashi; Ikeda, Tetsuya; and Ishii, Junichi, 5,751,689, Cl. 369-275.300.

Ikedo, Tomoyuki: *See—*

Ohmi, Tadahiro; Inaba, Hitoshi; and Ikedo, Tomoyuki, 5,750,011, Cl. 204-164.000.

Ikesugi, Hiroshi; and Hoshikawa, Shigeyuki, to Molex Incorporated. Optical fiber cable connector. 5,751,876, Cl. 385-86.000.

Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, to Santen Seiyaku Kabushiki Kaisha. Animal rearing apparatus. 5,749,321, Cl. 119-458.000.

Ilixco, Inc.: *See—*

Fergason, Jeffrey K.; Fry, David; and Brunnell, Stephen M., 5,749,096, Cl. 2-8.000.

Illinois Tool Works Inc.: *See—*

Kish, Frederick A.; Eckmann, Elizabeth J.; and Shelton, Lawrence S., 5,749,692, Cl. 411-453.000.

Im, Yong-Hee, to Daewoo Electronics Co., Ltd. Polynomial evaluator for use in a reed-solomon decoder. 5,751,732, Cl. 371-37.110.

Imaeda, Eiji, to Canon Kabushiki Kaisha. Communication terminal apparatus. 5,751,700, Cl. 370-263.000.

Imafuji, Osamu: *See—*

Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, 5,751,756, Cl. 372-46.000.

Imagyn Medical, Inc.: *See—*

Bacich, Steven R.; Greelis, John P.; Nguyen, Hien; and Nguyen, Tuoc, 5,749,889, Cl. 606-198.000.

Imai, Keiji: *See—*

Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.

Imai, Megumi: *See—*

Sato, Tadashige; Imai, Megumi; and Takahashi, Tsuneteru, 5,751,026, Cl. 257-190.000.

Imai, Rihoko: *See—*

Itoh, Hisato; Misawa, Tsutami; Ogiso, Akira; and Imai, Rihoko, 5,751,483, Cl. 359-502.000.

Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.

Imamura, Hirohisa, to NEC Corporation. Control of clock signal in semiconductor device. 5,751,175, Cl. 327-291.000.

Imamura, Masanaga: *See—*

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.

Imamura, Takashi: *See—*

Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.

Imation Corp: *See—*

Ryther, Robert James, 5,750,260, Cl. 428-421.000.

Imation Corp.: *See—*

Challener, William A., IV, 5,751,482, Cl. 359-487.000.

Schug, Heinrich; Schlickhoff, Reiner; and Pieper, Reinhold, 5,750,961, Cl. 219-497.000.

Imazu, Katsuhiro: *See—*

Komatsu, Ikuo; Sato, Nobuyuki; and Imazu, Katsuhiro, 5,750,222, Cl. 428-35.800.

Imburgia, Richard, to Pharmaceutical Systems, Inc. Unitary biological indicator for gaseous sterilants and process. 5,750,184, Cl. 427-2.130.

Imfeld, Marquard: *See—*

Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, 5,750,690, Cl. 544-234.000.

IMI Wilshire Inc.: *See—*

Wolski, Peter; and Long, Michael S., 5,749,494, Cl. 222-129.100.

Imperial Chemical Industries PLC: *See—*

Burgess, Leslie; Butcher, Jane Lesley; Ryan, Thomas Anthony; and Clayton, Peter Paul, 5,750,807, Cl. 570-142.000.

Harvie, James Lumsden, 5,750,776, Cl. 562-483.000.

Hoorne, Dirk; and Auda, Mahroussa, 5,750,513, Cl. 514-54.000.

Phanopoulos, Christopher; and Vanden Ecker, Jacobus Margareta Valentijn, 5,750,201, Cl. 427-375.000.

Impra, Inc.: *See—*

Banas, Christopher E.; and Edwin, Tarun J., 5,749,880, Cl. 606-198.000.

Imura, Kozo: *See—*

Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.

Imura, Yoshio: *See—*

Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.

Inaba, Hitoshi: *See—*

Ohmi, Tadahiro; Inaba, Hitoshi; and Ikedo, Tomoyuki, 5,750,011, Cl. 204-164.000.

Inaba, Kohji; Kato, Kazunori; and Hayase, Kengo, to Canon Kabushiki Kaisha. Toner for developing electrostatic image. 5,750,303, Cl. 430-110.000.

Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, to Yazaki Corporation. Partial-fitting prevention connector. 5,749,747, Cl. 439-358.000.

Inadome, Kiyotaka, to Nikon Corporation. Zoom lens system. 5,751,499, Cl. 359-699.000.

Inagaki, Shinji: *See—*

Yamada, Yuri; Inagaki, Shinji; and Fukushima, Yoshiaki, 5,750,085, Cl. 423-328.200.

Inalfa Industries B.V.: *See—*

Smith, Robert, 5,749,621, Cl. 296-219.000.

- Inamori, Yoshimitsu; and Oda, Koichi, to Sharp Kabushiki Kaisha. Clocking method and apparatus for display device with calculation operation. 5,751,278, Cl. 345-211.000.
- Inaoka, Toru: *See—*
  - Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,750,582, Cl. 521-64.000.
- Inazuka, Masahiro: *See—*
  - Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, 5,752,107, Cl. 396-296.000.
- Inazumi, Mitsuhiro, to Seiko Epson Corporation. Speech recognition system using neural networks. 5,751,904, Cl. 395-2.410.
- Incre, L.L.C.: *See—*
  - Gore, David W., 5,749,408, Cl. 164-4.100.
- Indena S.p.A.: *See—*
  - Bombardelli, Ezio; De Bellis, Paolo; and Gabetta, Bruno, 5,750,562, Cl. 514-449.000.
- Indian Industries, Inc.: *See—*
  - Allshouse, James R.; and Petrole, Christopher P., 5,749,351, Cl. 124-25.600.
- Industrial Technology Research Institute: *See—*
  - Chiueh, Tzi-Dar; Chang, Hwai-Tsu; Hsu, Fang-Ru; and Meng, Wan-Yu, 5,751,913, Cl. 395-27.000.
  - Lee, Ruen-Rone; and Huang, Chun-Kai, 5,751,290, Cl. 345-421.000.
  - Lin, Andrew S., 5,750,013, Cl. 204-192.140.
  - Tang, Pao-Yun; Chang, Shyh-Ming; Lee, Yu-Chi; and Fang, Su-Yu, 5,749,997, Cl. 156-249.000.
- Industrie Borla S.p.A.: *See—*
  - Guala, Ernesto; and Guala, Gianni, 5,749,861, Cl. 604-249.000.
- Industrie Chimiche Caffaro, S.p.A.: *See—*
  - Donelli, Giordano; Rosellini, Massimiliano; Taliento, Raffaella; and Dore', Fausto, 5,750,006, Cl. 162-181.500.
- Infectech, Inc.: *See—*
  - Ollar, Robert-A.; and Felder, Mitchell S., 5,750,363, Cl. 435-29.000.
- InforMedix, Inc.: *See—*
  - Kehr, Bruce A.; Lerner, David; Demenus, Richard D.; and Edl, Michael J., 5,752,235, Cl. 705-3.000.
- Infoseek Corporation: *See—*
  - Kirsch, Steven T., 5,751,956, Cl. 395-200.330.
- Ing Nino Ferrari-Impresa Construzioni Generale SRL: *See—*
  - Ferrari, Franco, 5,749,675, Cl. 405-52.000.
- Innovative Enterprises, Inc.: *See—*
  - Strauser, Buford R., 5,749,513, Cl. 229-199.000.
- Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, to Japan National Oil Corporation; Sekiyushigen Kaihatsu Kabushiki Kaisha; and Cosmo Research Institue. Method for oxidative coupling of methane comprising catalytic cracking. 5,750,821, Cl. 585-943.000.
- Inoue, Daijirou: *See—*
  - Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, 5,751,029, Cl. 257-194.000.
- Inoue, Hideya: *See—*
  - Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.
- Inoue, Hiroshi, to Canon Kabushiki Kaisha. Image information control apparatus and display system. 5,751,277, Cl. 345-200.000.
- Inoue, Kaoru: *See—*
  - Fujimoto, Kazuhisa; Matsuno, Toshinobu; and Inoue, Kaoru, 5,751,030, Cl. 257-194.000.
- Inoue, Kenji: *See—*
  - Taoka, Naoaki; Honda, Mizuho; Inoue, Kenji; and Kan, Kazunori, 5,750,382, Cl. 435-135.000.
- Inoue, Kozo: *See—*
  - Tsunematsu, Shuji; Yamada, Hideo; Abe, Eiichi; and Inoue, Kozo, 5,750,038, Cl. 210-777.000.
- Inoue, Makoto: *See—*
  - Nishimoto, Mitsuhiko; and Inoue, Makoto, 5,752,209, Cl. 701-41.000.
- Inoue, Masahiro; and Sakemi, Yuji, to Canon Kabushiki Kaisha. Image forming apparatus having a cleaning blade with a tensile strength from 80 to 120 KG/CM^2. 5,752,151, Cl. 399-350.000.
- Inoue, Masanobu: *See—*
  - Miyazoe, Seigo; Fushimi, Akira; and Inoue, Masanobu, 5,750,624, Cl. 525-100.000.
- Inoue, Masayuki: *See—*
  - Ishibashi, Toshiaki; Ohnishi, Kunikazu; Inoue, Masayuki; and Suzuki, Yoshio, 5,751,680, Cl. 369-109.000.
- Inoue, Nozomu; Hama, Takashi; Nomura, Yujiro; and Takada, Kyu, to Seiko Epson Corporation. Optical scanner. 5,751,463, Cl. 359-205.000.
- Inoue, Sadayuki; Ishimoto, Junko; and Onishi, Ken, to Mitsubishi Denki Kabushiki. High-efficiency encoding apparatus and high-efficiency decoding apparatus. 5,751,232, Cl. 341-63.000.
- Inoue, Sadayuki: *See—*
  - Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, 5,751,890, Cl. 386-79.000.
- Inoue, Seiji: *See—*
  - Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.
- Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, to Hidan Co. Cosmetic container having an insert sleeve to improve air tightness and rotational characteristics. 5,749,664, Cl. 401-78.000.
- Inoue, Takashi: *See—*
  - Kobayashi, Hideo; Inoue, Takashi; and Ishikawa, Hiroyasu, 5,751,703, Cl. 370-321.000.
- Inoue, Tetsuo; Tomita, Hiroshi; Mizoguchi, Tetsuhiko; and Fuke, Hiromi, to Kabushiki Kaisha Toshiba. Soft magnetic thin film and thin film magnetic element using the same. 5,750,273, Cl. 428-692.000.
- Inoue, Toshiyuki: *See—*
  - Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, 5,751,748, Cl. 372-31.000.
- Inoue, Yoichiro: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Inoue, Yushi; and Yamaha, Takahisa, to Yamaha Corporation. Method of forming multi-layer wiring utilizing hydrogen silsesquioxane resin. 5,750,403, Cl. 438-787.000.
- Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased (by Kunie Matsushiro, legal representative); Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Cooling system for an internal combustion engine. 5,749,330, Cl. 123-41.100.
- Institut Francais Du Petrole: *See—*
  - Chauvin, Yves; Hirschauer, André; and Olivier, Hélène, 5,750,455, Cl. 502-164.000.
  - Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, 5,749,985, Cl. 156-64.000.
- Institut Für Neue Materialien Gemeinnützige GmbH: *See—*
  - Nass, Rüdiger; Aslan, Mesut; Albayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, 5,750,193, Cl. 427-213.310.
- Institut gornogo dela Sibirskogo otdelenia Rossiiskoi Akademii nauk: *See—*
  - Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.
- Institute Francais du Petrole: *See—*
  - Duret, Pierre, 5,749,333, Cl. 123-295.000.
- Institute of Chemical Technology (PlasTech): *See—*
  - Gotovchikov, Vitaly T.; Ivanov, Alexander V.; and Filippov, Eugene A., 5,750,822, Cl. 588-11.000.
- Institute of Gas Technology: *See—*
  - Kilbane, John J., II, 5,750,065, Cl. 264-344.000.
- Instrumentation Metrics, Inc.: *See—*
  - Schlager, Kenneth J., 5,750,994, Cl. 250-339.110.
- Integrated Device Technology, Inc.: *See—*
  - Choi, Jeong Yeol; Chien, Chung-Jen; Han, Chung-Chyung; and Lien, Chuen-Der, 5,750,424, Cl. 438-199.000.
  - Henry, Glenn; and Parks, Terry, 5,752,015, Cl. 395-588.000.
  - Mick, John; Miller, Michael; Smith, Jeff; and Baumann, Mark, 5,751,638, Cl. 365-189.040.
- Intel Corporation: *See—*
  - Astle, Brian, 5,751,861, Cl. 382-250.000.
  - Butler, Peter O.; and Suarez-Gartner, Ricardo E., 5,751,556, Cl. 361-773.000.
  - Christensen, Reed K.; and Martell, Robert W., 5,751,942, Cl. 395-183.140.
  - Christensen, Reed K.; and Wolper, Andre Eberhard, 5,752,013, Cl. 395-568.000.
  - Davis, Derek L.; and Jones, Peter, 5,751,809, Cl. 380-23.000.
  - Dedrick, Rick, 5,752,238, Cl. 705-14.000.
  - Dulong, Carole, 5,752,001, Cl. 395-500.000.
  - Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., 5,751,986, Cl. 395-394.000.
  - Gillespie, Byron; Goldschmidt, Marc; Sych, Terry; and Young, Bruce, 5,751,975, Cl. 395-306.000.
  - Glew, Andrew F.; and Hinton, Glenn J., 5,751,996, Cl. 711-145.000.
  - Hammond, Gary N., 5,752,275, Cl. 711-207.000.
  - Hernandez, Thomas J.; and Mangold, Richard P., 5,752,050, Cl. 395-750.070.
  - Iverson, Vaughn, 5,751,231, Cl. 341-59.000.
  - Landolf, David E., 5,751,603, Cl. 364-492.000.
  - McMahon, Jack; and Chiu, George, 5,751,068, Cl. 257-774.000.
  - Munson, Bill A., 5,752,076, Cl. 395-825.000.
  - Rhodes, Ken; Coelho, Rohan; Bender, Blake; and Frank, Davis, 5,751,270, Cl. 345-118.000.
  - Ryan, Lawrence D., 5,752,080, Cl. 395-828.000.
  - Sarangdhar, Nitin V., 5,751,995, Cl. 395-472.000.
  - Tubbs, Graham S.; and Abel, James Charles, 5,752,071, Cl. 395-800.340.
- Inteplast Corporation: *See—*
  - Huang, Hwang-Wen, 5,750,645, Cl. 528-502.00B.
- Intermec Corporation: *See—*
  - Austin, Pixie Ann; Wiklof, Christopher A.; and Aragon, Cathy L., 5,751,330, Cl. 347-171.000.
- Intermill, Allan Webster; and Nagy, Charles Chris, to UCAR Carbon Technology Corporation. Pre-heating furnace for baked amorphous carbon bodies. 5,751,759, Cl. 373-123.000.
- International Business Machine Corp.: *See—*
  - Redpath, Richard J.; and Smith, Rodney A., 5,752,055, Cl. 395-777.000.
  - Sakairi, Takashi, 5,752,254, Cl. 707-530.000.
- International Business Machines Corporation: *See—*

  - Afsar, Muhammad; and Freymuth, Christopher Anthony, 5,751,946, Cl. 395-185.030.
  - Agarwal, Ramesh Chandra; Fleischer, Bruce Martin; and Gustavson, Fred Gehrung, 5,751,619, Cl. 364-736.020.
  - Agarwal, Ramesh Chandra, 5,752,072, Cl. 395-800.340.
  - Aggarwal, Charu Chandra; Wolf, Joel Leonard; and Yu, Philip Shi-Lung, 5,751,336, Cl. 348-7.000.
  - Ahlert, Richard Henry; Howard, James Kent; Ullah, Muhammad Inayet; and Umphress, Richard Donald, 5,750,231, Cl. 428-65.500.
  - Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,751,714, Cl. 370-452.000.
  - Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.
  - Bealkowski, Richard; and Ozaki, Brenda M., 5,752,066, Cl. 395-800.010.
  - Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, 5,751,595, Cl. 364-490.000.
  - Bhargava, Gautam; Narang, Inderpal Singh; and Teng, James Z., 5,751,992, Cl. 395-457.000.
  - Bhargava, Gautam; Goel, Piyush; and Iyer, Balakrishna Ragmavendra, 5,752,017, Cl. 395-602.000.
  - Blake, Michael Andrew; Ford, Carl Benjamin, III; and Mak, Pak-kin, 5,752,264, Cl. 711-144.000.
  - Blood, Roger Morton, 5,752,004, Cl. 395-500.000.
  - Bolin, Mark Robert; Kishi, Gregory Tad; and McIntosh, Michael Philip, 5,751,844, Cl. 382-156.000.
  - Boumas, Redha Mohammed, 5,751,970, Cl. 395-200.660.
  - Braceras, George M.; and Evans, Donald A., 5,751,648, Cl. 365-205.000.
  - Chen, Chengjun Julian; Gopinath, Ramesh Ambat; Monkowski, Michael Daniel; and Picheny, Michael Alan, 5,751,905, Cl. 395-2.630.
  - Chen, Chin-Long; Hsiao, Mu-Yue; Lipponer, Walter Heinrich; and Shen, William Wu, 5,751,745, Cl. 371-51.100.
  - Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, 5,752,022, Cl. 395-610.000.
  - Church, Mark A.; and Desouches, Alain Michel, 5,749,769, Cl. 451-5.000.
  - Cole, Gary Lee; Engleman, Scott Phillip; and Pritko, Steven Michael, 5,752,042, Cl. 395-712.000.
  - Coley, Brett Angus; Chin, Vincent G.; Downing, Patrick Francis; and Wormald, David M., 5,751,914, Cl. 395-51.000.
  - Crump, Dwayne Thomas; Norris, Duane Edward; and Pancoast, Steven Taylor, 5,752,044, Cl. 395-750.000.
  - Dauerer, Norman Joseph; and Kelley, Edward Emile, 5,751,966, Cl. 395-200.540.
  - Delp, Gary S.; Leichty, Philip L.; and Slane, Albert A., 5,752,078, Cl. 395-827.000.
  - Dingsor, Andrew Dwight, 5,751,114, Cl. 375-222.000.
  - Fosdick, Eric L., 5,752,041, Cl. 395-712.000.
  - Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
  - Funda, Janez; LaRose, David Arthur; and Taylor, Russell Highsmith, 5,749,362, Cl. 128-653.100.
  - Gill, Hardayal Singh, 5,751,521, Cl. 360-113.000.
  - Gover, Frank Carl; Levine, Frank Eliot; and Welbon, Edward Hugh, 5,752,062, Cl. 355-800.000.
  - Gullicksrud, John Theodore; Lidberg, Dale Joseph; and Seyfert, Michael David, 5,751,558, Cl. 361-801.000.
  - Hall, Charles William; Rizzi, Julian Dominick; and Stubecki, John Arthur, 5,751,548, Cl. 361-686.000.
  - Jensen, David John; and Lingafelt, Charles Steven, 5,751,559, Cl. 361-802.000.
  - Karidis, John Peter, 5,751,508, Cl. 360-97.010.
  - Kasson, James Matthews; Nin, Sigfredo Ismael; Plouffe, Wilfred Edmund, Jr.; and Pryor, Duaine Wright, Jr., 5,751,926, Cl. 395-119.000.
  - Krolak, David John; Grosbach, Lyle Edwin; Levenstein, Sheldon B.; and Irish, John David, 5,751,990, Cl. 395-417.000.
  - Laine, Eric Herman; and Wilson, James Warren, 5,751,060, Cl. 257-702.000.
  - Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,751,945, Cl. 395-184.010.
  - Liu, Peichun Peter, 5,752,260, Cl. 711-129.000.
  - Mallick, Soummya; and Loper, Albert John, 5,752,014, Cl. 395-587.000.
  - Mandelman, Jack Allan; and Potter, Micheal David, 5,751,097, Cl. 313-310.000.
  - Martens, David James, 5,751,727, Cl. 371-21.100.
  - Musashi, Kazuyuki; and Morishima, Hiroshi, 5,751,980, Cl. 395-354.000.
  - Ordanic, Zvonimir; and Spitz, David John, 5,751,964, Cl. 395-200.540.
  - Ottesen, Hal Hjalmar; Smith, Gordon J.; and Van Leeuwen, George Willard, 5,751,883, Cl. 386-27.000.
  - Palagonia, Anthony Michael, 5,751,057, Cl. 257-691.000.
  - Rigoutsos, Isidore; and Califano, Andrea, 5,752,019, Cl. 395-603.000.
  - Rindtorff, Klaus, 5,751,850, Cl. 382-178.000.
  - Robinson, Christopher Frederick; and Stickel, Werner, 5,751,004, Cl. 250-492.230.
  - Rogers, Richard Michael; and Lagarde, Konrad Charles, 5,752,246, Cl. 707-10.000.
  - Smith, Gordon J.; and Ottesen, Hal Hjalmar, 5,751,510, Cl. 360-67.000.
  - Staiger, Dieter E., 5,752,065, Cl. 395-800.010.
  - Wilkinson, Paul Amba; Dieffenderfer, James Warren; Kogge, Peter Michael; and Schoonover, Nicholas Jerome, 5,752,067, Cl. 395-800.160.
- International Computers Limited: *See—*
  - Turner, Edwin, 5,751,223, Cl. 340-825.540.
- International Hardcoat, Inc.: *See—*
  - Stadler, David M.; and Pernick, Jeffrey R., 5,750,014, Cl. 204-224.00R.
- in't Zandt, Hubertus W.G., to Océ-Nederland B.V. Roller fuser assembly for reproduction systems. 5,752,147, Cl. 399-325.000.
- Inui, Hiroshi: *See—*
  - Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, 5,752,145, Cl. 399-256.000.
- Inui, Toshiharu: *See—*
  - Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.
- Inuiya, Masafumi; and Nakayama, Yoshiaki, to Fuji Photo Film Company, Ltd. Movie camera for storing movie and still images in proper chronology on a common recording medium. 5,751,348, Cl. 348-220.000.
- Inventio AG: *See—*
  - Zhou, Tian, 5,751,076, Cl. 310-12.000.
- Invernizzi, Gianpietro: *See—*
  - Castelli, Francesco; Invernizzi, Gianpietro; and Reale, Omar, 5,749,298, Cl. 101-415.100.
- inVoice Technology, Inc.: *See—*
  - Wong, Sau C.; and So, Hock C., 5,751,635, Cl. 365-185.190.
- Invotronics Manufacturing: *See—*
  - Vergin, William E., 5,751,129, Cl. 318-467.000.
- Iotek, Inc.: *See—*
  - Hildebrand, Keith R.; and Shapland, J. Edward, 5,749,845, Cl. 604-21.000.
- Iowa State University Research Foundation, Inc.: *See—*
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,844, Cl. 800-200.000.
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,845, Cl. 800-200.000.
  - Fehr, Walter R.; and Hammond, Earl G., 5,750,846, Cl. 800-200.000.
- Iqbal, Abul: *See—*
  - Eldin, Sameer Hosam; Iqbal, Abul; Hao, Zhimin; and Lamatsch, Bernd, 5,750,723, Cl. 548-453.000.
- Irby, Greg M.: *See—*
  - Leibovitz, Jacques; Dawson, Peter F.; Nagesh, Voddarahalli K.; and Irby, Greg M., 5,749,988, Cl. 156-94.000.
- Ireland, Philip J.: *See—*
  - Wolstenholme, Graham R.; and Ireland, Philip J., 5,751,012, Cl. 257-5.000.
- Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, to Micron Technology, Inc. Multiple species sputtering for improved bottom coverage and improved sputter rate. 5,750,012, Cl. 204-192.120.
- Irie, Yoshiaki: *See—*
  - Nagano, Akihiko; Yamada, Akira; and Irie, Yoshiaki, 5,752,090, Cl. 396-51.000.
- Irion, Klaus: *See—*
  - Strobl, Karlheinz; Kennedy, Bryan D.; Chatenever, David; and Irion, Klaus, 5,751,340, Cl. 348-65.000.
- Irish, John David: *See—*
  - Krolak, David John; Grosbach, Lyle Edwin; Levenstein, Sheldon B.; and Irish, John David, 5,751,990, Cl. 395-417.000.
- IRORI: *See—*
  - Nova, Michael P.; and Senyei, Andrew E., 5,751,629, Cl. 365-151.000.
- Irvin Automotive Products, Inc.: *See—*
  - Jones, James Gavin, 5,749,618, Cl. 296-978.000.
- Isaac, Amos. Windshield wiper blade deicer. 5,749,119, Cl. 15-250.190.
- Isabelle, Charles J.: *See—*
  - Kearney, Hugh L.; Isabelle, Charles J.; Kish, Jules G.; and Noehren, William L., 5,749,449, Cl. 192-41.00S.
- Isco, Inc.: *See—*
  - Allington, Robert W.; Walters, Henry LeRoy; Jameson, Daniel Gene; and Tehrani, Yoossef, 5,750,027, Cl. 210-511.000.
- Iseki, Yukimasa: *See—*
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
- Ishibashi, Akihiko: *See—*
  - Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.
- Ishibashi, Osamu: *See—*
  - Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishibashi, Osamu, 5,750,592, Cl. 523-161.000.
- Ishibashi, Toshiaki; Ohnishi, Kunikazu; Inoue, Masayuki; and Suzuki, Yoshio, to Hitachi, Ltd. Optical disk drive. 5,751,680, Cl. 369-109.000.
- Ishida, Hiroshi: *See—*
  - Mukai, Takuzou; and Ishida, Hiroshi, 5,751,088, Cl. 310-239.000.

Ishida, Kenichi; Kishimoto, Michinori; Yamamoto, Takashi; and Sushihara, Koji, to Matsushita Electric Industrial Co., Ltd. Reproducing signal amplifier and central value signal generator. 5,751,191, Cl. 330-125.000.

Ishida, Kiyoshi: *See—*

Aramaki, Toru; Ishida, Kiyoshi; and Watanabe, Toshio, 5,751,339, Cl. 348-17.000.

Ishida, Shinji: *See—*

Yasuzato, Tadao; and Ishida, Shinji, 5,750,290, Cl. 430-5.000.

Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, to Aisin Seiki Kabushiki Kaisha. Power window regulator apparatus. 5,749,173, Cl. 49-349.000.

Ishida, Yoshinobu: *See—*

Sugiyama, Kazuhiro; Ono, Yukari; and Ishida, Yoshinobu, 5,752,221, Cl. 704-201.000.

Ishigaki, Kouji: *See—*

Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Ishiguro, Minoru; and Yoshida, Hideo, to Fuji Photo Optical Co., Ltd. Built-in flash camera. 5,752,093, Cl. 396-61.000.

Ishiguro, Tsutomu: *See—*

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawa-sai, Satoshi, 5,749,829, Cl. 600-153.000.

Ishihara, Satoshi: *See—*

Takakura, Hiroshi; Ishihara, Satoshi; and Yasuda, Keiko, 5,752,053, Cl. 395-766.000.

Ishihara, Toshinobu: *See—*

Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, 5,750,309, Cl. 430-170.000.

Ishihara, Yuzi: *See—*

Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.

Ishii, Hiroshi: *See—*

Higuchi, Kaoru; Ishii, Hiroshi; and Hanato, Hiroyuki, 5,751,331, Cl. 347-217.000.

Ishii, Junichi: *See—*

Hoshino, Takashi; Ikeda, Tetsuya; and Ishii, Junichi, 5,751,689, Cl. 369-275.300.

Ishii, Masaaki, to Dai-Ichi Seiko Co., Ltd. Method for encapsulation of semiconductor devices with resin and leadframe therefor. 5,750,423, Cl. 438-112.000.

Ishii, Nobuhisa: *See—*

Konda, Eiji; Ishii, Nobuhisa; and Matsuoka, Ryuichi, 5,751,881, Cl. 385-110.000.

Ishii, Shinichi: *See—*

Toyozaki, Jiro; Yanase, Takao; Ishii, Shinichi; and Aihara, Takashi, 5,751,567, Cl. 363-89.000.

Ishii, Tetsuya; Kuriwaki, Masashi; and Kubota, Yasuyuki, to Sekisui Kagaku Kogyo Kabushiki Kaisya. Osteoporosis diagnosing apparatus and method. 5,749,363, Cl. 128-661.030.

Ishikawa, Akimasa: *See—*

Takanobu, Hiroshi; and Ishikawa, Akimasa, 5,751,101, Cl. 313-405.000.

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, to Hitachi, Ltd. Magnetic recording media and magnetic recording system using the same. 5,750,230, Cl. 428-65.300.

Ishikawa, Hiraku; and Usami, Tatsuya, to NEC Corporation. Semiconductor device having a polysilicon resistor element with increased stability and method of fabricating same. 5,751,050, Cl. 257-538.000.

Ishikawa, Hiroshi; Yamaguchi, Nobuyasu; Iwamoto, Yasuhide; and Iida, Atsuo, to Fujitsu Limited. Ultrasonic coordinates input device. 5,750,941, Cl. 178-19.000.

Ishikawa, Hiroyasu: *See—*

Kobayashi, Hideo; Inoue, Takashi; and Ishikawa, Hiroyasu, 5,751,703, Cl. 370-321.000.

Ishikawa, Hitoshi: *See—*

Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, 5,749,173, Cl. 49-349.000.

Ishikawa, Kimihiro: *See—*

Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.

Ishikawa, Makoto: *See—*

Hayashi, Bunya; Asou, Yoshio; and Ishikawa, Makoto, 5,749,395, Cl. 137-596.160.

Ishikawa, Takashi: *See—*

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Color photographic processing method and apparatus. 5,752,122, Cl. 396-612.000.

Ishikawajima-Harima Heavy Industries Co., Ltd.: *See—*

Yokozawa, Takeshi; Hara, Hiroshi; and Yamamoto, Takanobu, 5,751,749, Cl. 372-32.000.

Ishikura, Yasuhisa: *See—*

Tanaka, Takaaki; Yamauchi, Masahide; Ishikura, Yasuhisa; and Aoki, Masaki, 5,751,102, Cl. 313-466.000.

Ishimaru, Seijiro: *See—*

Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.

Ishimaru, Toshiaki: *See—*

Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji, 5,752,089, Cl. 396-48.000.

Ishimoto, Junko: *See—*

Inoue, Sadayuki; Ishimoto, Junko; and Onishi, Ken, 5,751,232, Cl. 341-63.000.

Ishimoto, Kazuhisa: *See—*

Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.

Ishimoto, Shin-ichi: *See—*

Hamada, Kiyoshi; and Ishimoto, Shin-ichi, 5,751,442, Cl. 358-442.000.

Ishimura, Shizuka, to Sanyo Electric Co., Ltd. Remote control signal receiving circuit capable of processing a signal from a plurality of kinds of remote control transmitter. 5,752,184, Cl. 455-352.000.

Ishimura, Shizuka: *See—*

Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.

Ishiwata, Hiroshi; and Nagano, Chikara, to Olympus Optical Co., Ltd. Phase contrast microscope. 5,751,475, Cl. 359-387.000.

Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, to Fujitsu Limited. Semiconductor laser module. 5,751,877, Cl. 385-93.000.

Ishizaki, Shuji: *See—*

Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.

Ishizaki, Takashi; and Fujimoto, Hidetoshi, to Nippondenso Co., Ltd. Navigation system having optimal destination route setting capability. 5,752,217, Cl. 701-201.000.

ISIS Pharmaceuticals, Inc.: *See—*

Cook, P. Dan; Acevedo, Oscar L.; and Andrews, Robert S., 5,750,692, Cl. 544-253.000.

Isobe, Akira, to NEC Corporation. Polishing apparatus for finishing semiconductor wafer at high polishing rate under economical running cost. 5,749,771, Cl. 451-41.000.

Isopahkala, Jouko. Retractable balcony glass structure. 5,749,172, Cl. 49-127.000.

IsoStent, Inc.: *See—*

Fischell, Robert E.; Fischell, David R.; Fischell, Tim A.; and Turnland, Todd H., 5,749,825, Cl. 600-3.000.

Isover Saint-Gobain: *See—*

Reyes Zorrilla, Juan A., 5,749,399, Cl. 138-155.000.

Isozaki, Tsuyoshi; Kurokawa, Masahiro; and Honma, Akihiro, to Mitsubishi Gas Chemical Company, Inc. Process for producing glycidyl ester of acrylic acid or methacrylic acid. 5,750,739, Cl. 549-515.000.

IST Strahlentechnik Metz GmbH: *See—*

Jung, Joachim; and Schwarz, Bernd, 5,751,008, Cl. 250-504.00R.

Iswandhi, Geoffrey I.: *See—*

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

Itabashi, Mayumi: *See—*

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Itakura, Keiichi; and Rossi, John J., to City of Hope Research Institute. DNA polymerase mediated synthesis of double stranded nucleic acids. 5,750,380, Cl. 435-91.100.

Italtraco S.r.l.: *See—*

Torini, Alberto, 5,750,393, Cl. 435-243.000.

Ito, Hidemi; Taniguchi, Masahiko; Tsujiyama, Yoshimi; and Katsuya, Masahito, to Chisso Corporation. Water-repellent fiber and nonwovens made of the fiber. 5,750,256, Cl. 428-375.000.

Ito, Hideo: *See—*

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawa-sai, Satoshi, 5,749,829, Cl. 600-153.000.

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Structure of color selecting electrode assembly for color cathode ray tubes. 5,751,098, Cl. 313-402.000.

Ito, Isao: *See—*

Sumikawa, Takeshi; and Ito, Isao, 5,752,139, Cl. 399-264.000.

Ito, Katsuyuki: *See—*

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Ito, Kenichi: *See—*

Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.

Ito, Koichi: *See—*

Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.

Ito, Nobuei: *See—*

Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.

Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, to Canon Kabushiki Kaisha. Liquid crystal device. 5,750,214, Cl. 428-1.000.

Ito, Shinji: *See—*

Hirano, Hirosaburo; Yamamoto, Yuji; and Ito, Shinji, 5,749,144, Cl. 29-890.04L.

Ito, Takayuki; Sasagawa, Hideto; and Watanabe, Takeshi, to Alps Electric Co., Ltd. Coordinate input tablet with notched film substrate. 5,750,940, Cl. 178-18.000.

Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens system. 5,751,498, Cl. 359-692.000.

Ito, Tamotsu: *See—*

Koike, Ryuichi; Banno, Hiroshi; Ito, Tamotsu; and Takeuchi, Takashi, 5,751,671, Cl. 369-14.000.

Ito, Tatsuya: *See—*

Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishibashi, Osamu, 5,750,592, Cl. 523-161.000.

Ito, Tetsuro: *See—*

Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, 5,752,150, Cl. 399-330.000.

Ito, Tomonari: *See—*

Chishima, Masamitsu; and Ito, Tomonari, 5,749,753, Cl. 439-752.500.

Ito, Toshikazu: *See—*

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Ito, Tsutomu: *See—*

Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.

Itoda, Norio: *See—*

Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, 5,750,753, Cl. 556-440.000.

Itoh, Hisato; Misawa, Tsutami; Ogiso, Akira; and Imai, Rihoko, to Mitsui Toatsu Chemicals, Inc. Color filter having polarizability. 5,751,483, Cl. 359-502.000.

Itoh, Hisato: *See—*

Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.

Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.

Itoh, Junji: *See—*

Nakatsuka, Tadayoshi; Itoh, Junji; Yamamoto, Shinji; and Nishitsuji, Mitsuru, 5,752,182, Cl. 455-333.000.

Itoh, Junko: *See—*

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Itoh, Yasuo, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory device for storing multivalue data and readout/write-in method therefor. 5,751,634, Cl. 365-185.170.

Itronix Corporation: *See—*

Clark, Jay; LaMarche, Jonathan; and Tuttle, Robert J., Sr., 5,751,546, Cl. 361-686.000.

Hoerner, Brian; Quan, Kam; and Smith, Frank, 5,751,134, Cl. 320-21.000.

Itson, Joseph Derwood, to GT Bicycles, Inc. Cycling and skating ramp trailer. 5,749,615, Cl. 296-26.000.

ITT Industries, Inc.: *See—*

Hertel, Richard J., 5,751,246, Cl. 342-357.000.

Ivanov, Alexander V.: *See—*

Gotovchikov, Vitaly T.; Ivanov, Alexander V.; and Filippov, Eugene A., 5,750,822, Cl. 588-11.000.

Iverson, Vaughn, to Intel Corporation. Method and apparatus for run-length encoding using special long-run codes. 5,751,231, Cl. 341-59.000.

Ivory, Nicholas Eric; and Thatcher, Wrenford John, to Coates Brothers PLC. Image-forming process. 5,750,291, Cl. 430-11.000.

Iwade, Shinji: *See—*

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Iwamoto, Kazuyo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Wide view angle display apparatus. 5,751,259, Cl. 345-8.000.

Iwamoto, Yasuhide: *See—*

Ishikawa, Hiroshi; Yamaguchi, Nobuyasu; Iwamoto, Yasuhide; and Iida, Atsuo, 5,750,941, Cl. 178-19.000.

Iwanaga, Toshiaki, to NEC Corporation. Magnetio optical disk recording device capable of verifying recorded state during recording and checking erased state during erasing. 5,751,677, Cl. 369-54.000.

Iwanami, Wataru: *See—*

Kobayashi, Koichi; Iwanami, Wataru; and Kanai, Taiyo, 5,750,241, Cl. 428-199.000.

Iwasaki, Keisuke: *See—*

Hayashi, Kazuyuki; Iwasaki, Keisuke; Tanaka, Yasuyuki; and Morii, Hiroko, 5,750,250, Cl. 428-328.000.

Iwasaki, Osamu: *See—*

Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, to Canon Kabushiki Kaisha. Sheet conveying apparatus. 5,749,570, Cl. 271-10.130.

Iyer, Balakrishna Ragmavendra: *See—*

Bhargava, Gautam; Goel, Piyush; and Iyer, Balakrishna Ragmavendra, 5,752,017, Cl. 395-602.000.

Iyer, Radhakrishnan P.; Yu, Dong; Agrawal, Sudhir; and Tan, Weitian, to Hybridon, Inc. Methods and compounds for the stereoselective enrichment of oligonucleotide diastereomers and oligonucleotides thereby produced. 5,750,674, Cl. 536-26.700.

Izbicki, Lynne Marie: *See—*

Raab, Ilan; Manghirmalani, Ravi; Doitel, Ofer; and Izbicki, Lynne Marie, 5,751,967, Cl. 395-200.580.

Izuchi, Shuhei; and Matsumoto, Tsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Method for improving aluminum alloy cast structural member. 5,749,980, Cl. 148-525.000.

Izumi, Takashi: *See—*

Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.

J.A.L. Taiwan Ltd.: *See—*

Yu, Jason, 5,749,640, Cl. 353-51.000.

J.C.Robinson Seed Company: *See—*

Koopman, Michael A., 5,750,852, Cl. 800-200.000.

J. E. Thomas Specialties Limited: *See—*

Romerein, Robert L.; Crowhurst, David B.; and Allinson, Christopher A., 5,750,929, Cl. 174-88.00C.

J. Eberspächer GmbH & Co.: *See—*

Humburg, Michael, 5,749,516, Cl. 237-2.00A.

Jackson, Benton H.: *See—*

Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., 5,751,295, Cl. 345-501.000.

Jackson, Marc: *See—*

Wofford, Bill; Jackson, Marc; and Bevan, John, 5,750,823, Cl. 588-210.000.

Jackson, Michael. Massline loudspeaker enclosure. 5,749,433, Cl. 181-156.000.

Jackson, Thomas P.: *See—*

Tau, Lok L.; Conboy, Michael R.; and Jackson, Thomas P., 5,751,581, Cl. 364-468.220.

Jackson, Wade Lee, to General Electric Company. Appliance leveling system allowing adjustment of rear supports without access to rear of cabinet. 5,749,550, Cl. 248-188.200.

Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, to Albert Einstein College of Medicine of Yeshiva University; and University of Pittsburgh. L5 shuttle phasmids. 5,750,384, Cl. 435-172.300.

Jacovelli, Matthew George. Tray for use in automobiles. 5,749,305, Cl. 108-44.000.

Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, to Du Pont de Nemours, E. I., and Company. High speed process for making fully-oriented nylon yarns and made thereby. 5,750,215, Cl. 428-34.200.

Jaklin, Hans. Concrete or mortar resistant to spalling under fire attack. 5,749,961, Cl. 106-672.000.

Jakob, Peter: *See—*

Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, 5,750,374, Cl. 435-69.700.

James, Greg A.: *See—*

Washington, Kirk B.; Kenna, John T.; James, Greg A.; and Ramji, Shiraz N., 5,750,281, Cl. 429-39.000.

Jameson, Daniel Gene: *See—*

Allington, Robert W.; Walters, Henry LeRoy; Jameson, Daniel Gene; and Tehrani, Yoossef, 5,750,027, Cl. 210-511.000.

Jamieson, Brian Thomas, to Prime Technology, Inc. Display device for linearly displaying a non-linear input variable. 5,751,611, Cl. 364-573.000.

Janai, Meir: *See—*

Yoeli, Uzi; Rotem, Eran; Janai, Meir; and Orbach, Zvi, 5,751,165, Cl. 326-47.000.

Jang, Jae Dirk; and Lim, Kibeen, to Hyundai Motor Company. System and method for controlling hydraulic pressure of an automatic transmission for vehicles. 5,749,806, Cl. 477-133.000.

Jang, Jin; Lim, Hong Joo; and Ryu, Bong Yool, to LG Electronics Inc. Thin film transistor having double gate insulating layer. 5,751,017, Cl. 257-57.000.

Jang, Yue-Teh; Salmon, Stephen M.; White, David A.; and Garcia, Rizza A., to Cardiovascular Imaging Systems, Inc. Catheter system having imaging, balloon angioplasty, and stent deployment capabilities, and method of use for guided stent deployment. 5,749,848, Cl. 604-53.000.
Jank, Werner A., to Jank, Werner A. Floor cover, especially sports field cover. 5,749,787, Cl. 472-92.000.
Janky, James M.; Klein, Eric A.; and Schipper, John F., to Trimble Navigation Ltd. Vehicle route and schedule exception reporting system. 5,751,245, Cl. 342-357.000.
Janon, Frederic: *See—*
  Ripoll, Jean-Louis; Frouin, Marc; and Janon, Frederic, 5,752,257, Cl. 711-114.000.
Jansen, Albert Edward; and Feron, Paul Hubert Maria, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO. Method for gas absorption across a membrane. 5,749,941, Cl. 95-44.000.
Jansen, Bernd: *See—*
  Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, 5,750,221, Cl. 428-35.700.
Jansen, Ursula: *See—*
  Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, 5,750,801, Cl. 568-715.000.
Janssen, Michael, to Advanced Coronary Intervention. Catheter for obstructed stent. 5,749,914, Cl. 607-116.000.
Jansson, Lennart Carl Erik, to Firefly AB. Device for particles detection in a pipeline. 5,749,420, Cl. 169-54.000.
Jänti, Arto; and Katisko, Keijo, to Nokia Telecommunications Oy. Method and apparatus for replacing a failed channel unit of a sectored base station, in a cellular radio system, with an additional channel unit. 5,752,161, Cl. 455-8.000.
Janusz, John Michael: *See—*
  Wu, Laurence Ichih; and Janusz, John Michael, 5,750,543, Cl. 514-337.000.
Janysek, Don Ray: *See—*
  Gandy, James; Ahmed, Jubayer; and Janysek, Don Ray, 5,751,308, Cl. 347-33.000.
Japan as represented by Director General of Agency of Industrial Science and Technology: *See—*
  Tsunematsu, Shuji; Yamada, Hideo; Abe, Eiichi; and Inoue, Kozo, 5,750,038, Cl. 210-777.000.
Japan as represented by Director General of Agency of National Institute of Health: *See—*
  Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,750,331, Cl. 435-5.000.
Japan Elanco Company Limited: *See—*
  Yamamoto, Taizo; Yagyu, Motohiro; Kawaguchi, Yosihisa; and Nagao, Akira, 5,750,979, Cl. 250-223.00R.
Japan Metals & Chemicals Co., Ltd.: *See—*
  Takehara, Hisao; Shimizugawa, Ryoichi; and Tokai, Toshihiko, 5,749,935, Cl. 71-62.000.
Japan National Oil Corporation: *See—*
  Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.
Japan Tobacco Inc.: *See—*
  Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.
Jardine, A. Peter, to Research Foundation of State University of New York, The. Active and adaptive damping devices for shock and noise suppression. 5,750,272, Cl. 428-686.000.
Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, to Nordson Corporation. Breathable fabric lamination, apparatus and methods. 5,750,444, Cl. 442-62.000.
Jarvis, Neil Alasdair James, to Digital Equipment Corporation. Dynamic non-coherent cache memory resizing mechanism. 5,752,255, Cl. 711-3.000.
Jasper, Carolyn Mae: *See—*
  Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.
Jasperson, Ann. Lava-producing playball. 5,749,799, Cl. 473-594.000.
Javad Positioning, LLC: *See—*
  Ashjaee, Javad, 5,749,549, Cl. 248-168.000.
Jayaraman, Raj; Xia, Yongping; Venkitasubrahmanian, Sreeraman; and Leyton, Paul, to Philips Electronics North America Corporation. Lamp controller with lamp status detection and safety circuitry. 5,751,115, Cl. 315-225.000.
JDM, Ltd.: *See—*
  Sandofsky, Marc D.; and Ward, David F., 5,749,237, Cl. 62-209.000.
Jeffcoat, Keith, to General Motors Corporation. Knitted cover and a knitting method. 5,749,247, Cl. 66-198.000.
Jehle, Robert E., to United States of America, Navy. Self-adjusting obturator for projectile launching. 5,750,919, Cl. 102-532.000.
Jeman Technologies, Inc.: *See—*
  Malackowski, James E.; and Stathis, Kristi L., 5,752,186, Cl. 455-414.000.
Jenkins, Artis Cornell: *See—*
  Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, 5,751,879, Cl. 385-103.000.
Jenkinson, Timothy: *See—*
  Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,749,931, Cl. 65-60.100.
  Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,751,484, Cl. 359-512.000.
Jensen, David John; and Lingafelt, Charles Steven, to International Business Machines Corporation. Apparatus for inserting PC cards having recessed guide paths with multiple levels in the guide paths. 5,751,559, Cl. 361-802.000.
Jensen, Eric Lee; Kruckemeyer, William Charles; and Fehring, John David, to General Motors Corporation. Latchable stabilizer bar actuator. 5,749,596, Cl. 280-689.000.
Jensen, James Allen: *See—*
  Becker, Kurt Joseph; Jensen, James Allen; and Lukacs, Alexander, III, 5,750,628, Cl. 528-25.000.
Jensen, Torben: *See—*
  Christensen, Keld; and Jensen, Torben, 5,750,963, Cl. 219-497.000.
Jeon, Yong-Weon: *See—*
  Sohn, Jang Sub; and Jeon, Yong-Weon, 5,751,176, Cl. 327-295.000.
Jeong, Bong-mo: *See—*
  Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, 5,750,296, Cl. 430-28.000.
Jerdee, Jeffrey S., to Wagner Spray Tech Corporation. Heat gun fan assembly. 5,749,704, Cl. 415-211.200.
Jervis, James E.: *See—*
  Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.
Jessee, Ernest Edward: *See—*
  McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, 5,751,011, Cl. 250-559.330.
Jessell, Thomas M.; and Klar, Avihu, to Trustees of Columbia University in City of New York, The. Cloning, expression and uses of a secreted protein, F-spondin. 5,750,502, Cl. 514-12.000.
Jessop, Paul David: *See—*
  Frost, Peter Lewis John; and Jessop, Paul David, 5,749,565, Cl. 254-134.400.
Jet General Investment Company: *See—*
  Hsieh, Aquino, 5,749,446, Cl. 190-107.000.
Jewett, Douglas Eugene: *See—*
  Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
Jewett, Scotty Y.: *See—*
  Hall, George R.; Barnett, Daniel C.; Smith, Robert A.; and Jewett, Scotty Y., 5,750,408, Cl. 436-137.000.
Jewett, Thomas E.; and Bird, Thomas B., to Asset Purchase Co. LLC. Ground anchor. 5,749,180, Cl. 52-154.000.
Jeys, Thomas H.; and Fan, Tso Yee, to Massachusetts Institute of Technology. Multi-pass optical parametric generator. 5,751,472, Cl. 359-330.000.
JGC Corporation: *See—*
  Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, 5,749,548, Cl. 248-49.000.
JHC Ventures, L.P.: *See—*
  Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, 5,749,595, Cl. 280-688.000.
Jiang, Wayne: *See—*
  Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000.
Jiang, Wenbin; Shieh, Chan-Long; and Lebby, Michael S., to Motorola, Inc. VCSEL with integrated MSM photodetector. 5,751,757, Cl. 372-50.000.
Jiang, Wenbin: *See—*
  Chen, Diana; Jiang, Wenbin; and Lebby, Michael S., 5,751,471, Cl. 359-319.000.
Jing, Tianwei: *See—*
  Lindsay, Stuart M.; and Jing, Tianwei, 5,750,989, Cl. 250-306.000.
Jing, Zhenxue; and Walker, James K., to Nanoptics, Inc. Materials and methods for improved radiography. 5,751,787, Cl. 378-169.000.
Jircik, Renate: *See—*
  Glausch, Ralf; Reinhard, Georg; Jircik, Renate; and Rammelt, Ursula, 5,749,946, Cl. 106-14.170.
Jirgal, James J., to VLSI Technology, Inc. Signalling system and method for allowing a direct memory access (DMA) input/output (I/O) device on the peripheral component interconnect (PCI) bus to perform DMA transfers. 5,752,081, Cl. 395-842.000.
Jo, Sang-youn, to Samsung Electronics Co., Ltd. Methods of forming electrically isolated active region pedestals using trench-based isolation techniques. 5,750,433, Cl. 438-424.000.
Johansson, Ingemar Sven; and Nilsson, Ake Lennart, to Atlas Copco Berema AB. Pneumatic impact breaker. 5,749,421, Cl. 173-162.200.
John, Peter Crook Lloyd, to Australian National University, The. Control of plant cell proliferation and growth. 5,750,862, Cl. 800-205.000.
Johns Hopkins University, The: *See—*
  Vogelstein, Bert; Kinzler, Kenneth W.; and Papadopoulos, Nickolas, 5,750,352, Cl. 435-7.210.

Johns Manville International, Inc.: *See—*
  Ghorpade, Sureshchandra Chintaman; Chittum, Jack Everett; and Romero, Mark Anthony, 5,749,933, Cl. 65-511.000.
  Law, David Chee-Fai; Sandoval, Christopher Paul; and Garcia, Ruben G., 5,749,954, Cl. 106-282.000.
Johnsen, David G.: *See—*
  Doty, Douglas E.; Johnsen, David G.; and Moore, Donald W., 5,751,613, Cl. 364-578.000.
Johnsen, James B.; and Oien, Hal J., to Jordco, Inc. Dental organizer for light-sensitive materials. 5,749,730, Cl. 433-163.000.
Johnsin, David M.: *See—*
  Denney, Denys; Contreras, Jose de Jesus Munoz; Bonaddio, Vincenzo A.; and Johnsin, David M., 5,749,993, Cl. 156-214.000.
Johnson & Johnson Medical, Inc.: *See—*
  Cheong, Catherine L.; and Rigby, David, 5,749,842, Cl. 602-41.000.
Johnson & Johnson Vision Products, Inc.: *See—*
  Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
Johnson, Anthony: *See—*
  Znaiden, Alexander Paul; Crotty, Brian Andrew; and Johnson, Anthony, 5,750,123, Cl. 424-401.000.
Johnson, Bruce R., to Weld Technology Industries, L.L.C. Welding gun with anti-rotation cylinder and internal proximity switch. 5,750,952, Cl. 219-89.000.
Johnson, Carl W.: *See—*
  Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.
Johnson, David A.; Kline, Eric V.; and Fulcher, Donald L., to JohnsTech International Corporation. Electrical interconnect contact system. 5,749,738, Cl. 439-66.000.
Johnson, David C.; and York, Ian A., to Johnson, David C.; and York, Ian A. Vector, element and method for inhibiting immune recognition. 5,750,398, Cl. 435-375.000.
Johnson, David C.: *See—*
  Buchanan, Robert A.; Krishnamurti, Ramesh; Hichri, Habib; and Johnson, David C., 5,750,811, Cl. 570-208.000.
Johnson, David W., to Ebert Composites Corporation. Tapered composite elevated support structure. 5,749,198, Cl. 52-651.040.
Johnson, Elliott Will Henry; Stepp, Robert Wellington, III; and Cook, William L., to Eastman Chemical Company. Process and apparatus for the removal of dimethyl ester vapors or particles emitted during the storage of dimethyl esters. 5,749,944, Cl. 95-150.000.
Johnson, Esther T. Dual reflective element vehicle side view mirror assembly. 5,751,490, Cl. 359-605.000.
Johnson, Gary M.: *See—*
  Albarella, James P.; Cahill, Sally E.; Johnson, Gary M.; and Pugia, Michael J., 5,750,405, Cl. 436-88.000.
Johnson, Jack W.: *See—*
  Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., 5,750,819, Cl. 585-734.000.
Johnson, John R.; and Mercier, Diana M., to Avery Dennison Corporation. Interior automotive laminate with thermoplastic low gloss coating. 5,750,234, Cl. 428-141.000.
Johnson, Lawrence A.; and Schmeisser, Heinz H. Press transfer apparatus. 5,749,290, Cl. 100-207.000.
Johnson, Lynda K.: *See—*
  Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., 5,750,815, Cl. 585-511.000.
Johnson, Marc, to Scott Westlake. Height and tilt indicator for forklift truck. 5,749,696, Cl. 414-635.000.
Johnson, Peter R. Timepiece having disks of graduated design density. 5,751,663, Cl. 368-77.000.
Johnson, Stephen S.: *See—*
  Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
Johnson, Thomas Franklin: *See—*
  Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, 5,749,595, Cl. 280-688.000.
Johnson, Thomas H.; Justice, Gene L.; and Lundgreen, Michael W., to Weigh-Tronix, Inc. Multi-load cell force sensing apparatus. 5,750,937, Cl. 177-25.110.
Johnson, Tim: *See—*
  Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.
Johnson, Timothy V.: *See—*
  Gadkaree, Kishor P.; and Johnson, Timothy V., 5,750,026, Cl. 210-502.100.
Johnson, William M.: *See—*
  Witt, David B.; and Johnson, William M., 5,751,981, Cl. 395-380.000.
JohnsTech International Corporation: *See—*
  Johnson, David A.; Kline, Eric V.; and Fulcher, Donald L., 5,749,738, Cl. 439-66.000.
Johnston, Scott Anthony: *See—*
  Elias, Martin Charles; Johnston, Scott Anthony; and Hesling, Mark Ronald, 5,751,873, Cl. 385-51.000.
Johnston, Victor James: *See—*
  Cowfer, Joseph Allen; Johnston, Victor James; and Popiel, Lawrence, 5,750,812, Cl. 570-245.000.
Jolly, Colin Kenneth, to Reddie & Grose. Panel joint system. 5,749,197, Cl. 52-584.100.
Jonassen, Ib: *See—*
  Havelund, Svend; Halstrøm, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, 5,750,497, Cl. 514-3.000.
Jones, Allen, to PDQ Manufacturing, Inc. Motor vehicle dryer with Coanda effect drying. 5,749,161, Cl. 34-541.000.
Jones, Allen, to PDQ Manufacturing, Inc. Motor vehicle dryer. 5,749,162, Cl. 34-566.000.
Jones, Charles Edward: *See—*
  Wilkins, Robert Lee; Gullion, Steven Dwayne; and Jones, Charles Edward, 5,749,608, Cl. 285-123.120.
Jones, Clay LaMoyne, to Microtest, Inc. Foreign file system establishing method which uses a native file system virtual device driver. 5,752,005, Cl. 395-500.000.
Jones, Curtis Willard, Jr.: *See—*
  Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
  Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
Jones, James Gavin, to Irvin Automotive Products, Inc. Visor with telescoping extender blade. 5,749,618, Cl. 296-978.000.
Jones, J. Barclay, to American PCS L.P. Autonomous remote measurement unit for a personal communications service system. 5,752,164, Cl. 455-33.100.
Jones, Jill S.: *See—*
  Jones, Robert A.; and Jones, Jill S., 5,749,326, Cl. 119-798.000.
Jones, John Clifford: *See—*
  Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.
Jones, John David; Bowden, Martin Charles; and Brown, Stephen Martin, to Zeneca Limited. Process for the preparation of 4,6-dichloropyrimidine. 5,750,694, Cl. 544-334.000.
Jones, Kyle David: *See—*
  Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.
Jones, Michael L.: *See—*
  Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., 5,749,881, Cl. 606-151.000.
Jones, Peter: *See—*
  Davis, Derek L.; and Jones, Peter, 5,751,809, Cl. 380-23.000.
Jones, Raymond Vincent Heavon; and Simpson, Elizabeth Shearer Currie, to Zeneca Limited. Process for preparing epoxides from carbonyl compounds using sulphonium or sulphoxonium ylides and intermediates useful therein. 5,750,740, Cl. 549-519.000.
Jones, Richard E.; and Li, Mike T., to Matrix Pharmaceutical, Inc. Translucent collagen formulations with a cytotoxic drug. 5,750,146, Cl. 424-484.000.
Jones, Robert A.; and Jones, Jill S., to Jones, Robert A.; and Jones, Jill S. Extendible restraining device. 5,749,326, Cl. 119-798.000.
Jones, Robert L.: *See—*
  Dombrowski, Edward J., Jr.; Jones, Robert L.; Warner, John C.; and Yang, Jiyue, 5,750,463, Cl. 503-204.000.
  Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.
Jones, William F.: *See—*
  Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,750,991, Cl. 250-363.030.
Jordaan, Johannes Clemens Maria: *See—*
  Barton, Roger Edgar Charles; and Jordaan, Johannes Clemens Maria, 5,750,220, Cl. 428-35.700.
Jordan, Mark George; Terry, Francis H.; and Hack, Thomas Peter, to Unitrode Corporation. Multiplexing power converter. 5,751,139, Cl. 323-222.000.
Jordco, Inc.: *See—*
  Johnsen, James B.; and Oien, Hal J., 5,749,730, Cl. 433-163.000.
Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, to Novo Nordisk A/S. Heterocyclic compounds. 5,750,518, Cl. 514-183.000.
Josa, Jaume: *See—*
  Ibanez, Pilar; Josa, Jaume; and Osset, Miguel, 5,750,486, Cl. 510-356.000.
Jose, Ian Charles: *See—*
  Reiter, Allen; and Jose, Ian Charles, 5,752,243, Cl. 707-3.000.
Josel, Hans-Peter: *See—*
  Herrmann, Rupert; Josel, Hans-Peter; Drexhage, Karl-Heinz; and Arden-Jacob, Jutta, 5,750,409, Cl. 436-517.000.

Joseph, Eric D.: *See—*
- Huang, Rong-Ting; Wright, Phil; and Joseph, Eric D., 5,751,263, Cl. 345-82.000.

Josephs, Harold. Safety guard for pedestrian-operated machines having rotatable blades. 5,751,124, Cl. 318-139.000.

Joshi, Milind Madhukar: *See—*
- Shakib, Darren Arthur; Rockenbeck, William H.; Benson, Max Loell; and Joshi, Milind Madhukar, 5,752,025, Cl. 395-613.000.

Joshi, Vikram: *See—*
- Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., 5,751,034, Cl. 257-295.000.

Jubb, Jayne: *See—*
- Baardman, Frank; and Jubb, Jayne, 5,750,642, Cl. 528-392.000.

Judith05751306, .: *See—*
- Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A., 5,751,307, Cl. 347-33.000.

Judith Baggiolini, Barbara, Executrix: *See—*
- Baggiolini, Enrico Giuseppe, deceased; Shiuey, Shian-Jan; and Uskokovic, Milan Radoje, 5,750,517, Cl. 514-167.000.

Juengling, Werner, to Micron Technology, Inc. Germanium as an antireflective coating and method of use. 5,750,442, Cl. 438-761.000.

Jun, Sung-bu: *See—*
- Choi, Jung-dal; Jun, Sung-bu; and Kim, Byeung-chul, 5,751,045, Cl. 257-392.000.

Jung, Hee-Duck, to SamSung Electronics Co., Ltd. Desktop personal computer with an easy assembly structure. 5,751,545, Cl. 361-683.000.

Jung, Joachim; and Schwarz, Bernd, to IST Strahlentechnik Metz GmbH. Ultraviolet emitter. 5,751,008, Cl. 250-504.00R.

Jung, Michelle L.: *See—*
- Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., 5,749,364, Cl. 128-662.020.

Jung, Min Ho: *See—*
- Kim, Jin Baek; Jung, Min Ho; and Chang, Kyeong Ho, 5,750,680, Cl. 540-200.000.

Jung, Richard Hanson: *See—*
- Li, Changming; and Jung, Richard Hanson, 5,751,541, Cl. 361-525.000.

Jung, Suk-Jin: *See—*
- Choi, Hyung-Jin; Cho, Sung-Bae; Jung, Suk-Jin; and Lee, Hyung-Kil, 5,751,734, Cl. 371-43.400.

Jung, Sung-Chil, to Daewoo Electronics Co., Ltd. Washing machine. 5,749,249, Cl. 68-15.000.

Jungermann, Eric: *See—*
- Del Vecchio, Anthony J.; Jungermann, Eric; and Basu, Hemendra N., 5,750,481, Cl. 510-152.000.

Jungmann, Christa Maria: *See—*
- Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.

Junk, James P.: *See—*
- Brunn, Randy J.; Gran, William O.; and Junk, James P., 5,749,652, Cl. 366-209.000.

Justice, Gene L.: *See—*
- Johnson, Thomas H.; Justice, Gene L.; and Lundgreen, Michael W., 5,750,937, Cl. 177-25.110.

Kabushiki Kaisha: *See—*
- Matsutani, Kanji; Sugino, Motoichi; and Yagisawa, Hiroshi, 5,749,897, Cl. 606-222.000.

Kabushiki Kaisha Endo Seisakusho: *See—*
- Kobayashi, Kenji; and Takeda, Hitoshi, 5,749,794, Cl. 473-342.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
- Izuchi, Shuhei; and Matsumoto, Tsuyoshi, 5,749,980, Cl. 148-525.000.
- Yoshino, Fumito, 5,750,955, Cl. 219-121.460.

Kabushiki Kaisha Riken: *See—*
- Sakata, Tatsuei, 5,750,266, Cl. 428-457.000.

Kabushiki Kaisha Shinkawa: *See—*
- Kikuchi, Eiji, 5,749,442, Cl. 187-272.000.

Kabushiki Kaisha Tec: *See—*
- Suzuki, Masashi, 5,750,977, Cl. 235-472.000.

Kabushiki Kaisha Topcon: *See—*
- Ohtomo, Fumio; and Tokuda, Yoshikatsu, 5,751,408, Cl. 356-5.140.

Kabushiki Kaisha Toshiba: *See—*
- Arakawa, Yutaka, 5,751,947, Cl. 395-185.070.
- Hata, Tetsuya, 5,751,519, Cl. 360-106.000.
- Hayashi, Kunio, 5,751,085, Cl. 310-90.000.
- Hirayama, Koichi; Nakai, Masatoshi; and Shimoda, Kenji, 5,751,892, Cl. 386-92.000.
- Honda, Masami; and Miura, Yosuke, 5,751,547, Cl. 361-686.000.
- Inoue, Tetsuo; Tomita, Hiroshi; Mizoguchi, Tetsuhiko; and Fuke, Hiromi, 5,750,273, Cl. 428-692.000.
- Itoh, Yasuo, 5,751,634, Cl. 365-185.170.
- Kameda, Yasushi; and Segawa, Makoto, 5,751,035, Cl. 257-300.000.
- Karouji, Yasuhito, 5,751,912, Cl. 395-62.000.
- Kasahara, Akihiro, 5,751,515, Cl. 360-103.000.
- Nakamoto, Masayuki; and Ono, Tomio, 5,749,762, Cl. 445-50.000.
- Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, 5,751,636, Cl. 365-189.290.
- Nishimura, Takashi; and Takahashi, Toru, 5,751,094, Cl. 313-2.100.
- Ohsawa, Takashi, 5,751,639, Cl. 365-226.000.
- Sakaue, Kenji, 5,751,711, Cl. 370-431.000.
- Shimizu, Kuniyasu; and Hirayama, Hideaki, 5,752,268, Cl. 711-162.000.
- Shimoda, Kenji; Abe, Shuji; and Kurihara, Kouichi, 5,751,893, Cl. 386-111.000.
- Shiraishi, Takashi; Yamaguchi, Masao; and Fukutome, Yasuyuki, 5,751,462, Cl. 359-204.000.
- Suzuki, Hirotaka, 5,752,043, Cl. 395-737.000.
- Tanabe, Noboru, 5,752,272, Cl. 711-171.000.
- Watanabe, Naofumi; and Tanaka, Shigeru, 5,751,837, Cl. 382-131.000.
- Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, 5,750,436, Cl. 438-558.000.
- Yasuhara, Norio; Nakagawa, Akio; Matsudai, Tomoko; and Funaki, Hideyuki, 5,751,022, Cl. 257-133.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
- Kimura, Kazuya; and Makino, Yoshihiro, 5,749,710, Cl. 417-63.000.

Kabushiki Kaisha Toyota Chou Kenyusho: *See—*
- Yamada, Yuri; Inagaki, Shinji; and Fukushima, Yoshiaki, 5,750,085, Cl. 423-328.200.

Kabushiki Kaisya Advance: *See—*
- Otsuki, Kazunori; and Watanabe, Shinichirou, 5,751,805, Cl. 380-4.000.

Kabushiki Kaisya VISTA: *See—*
- Arai, Saburo, 5,749,255, Cl. 72-150.000.

Kabushikigaisha Daiwa Riken Kogyo: *See—*
- Hashimoto, Kimio, 5,749,465, Cl. 206-361.000.

Kaczmarek, Richard T., to Reltec Corporation. Cup and diode assembly for overvoltage protectors and communications lines. 5,751,533, Cl. 361-119.000.

Kadono, Hidehiko: *See—*
- Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.

Kadono, Shinya; and Tsuda, Kenjiro, to Matsushita Electric Industrial Co., Ltd. Picture coding apparatus and decoding apparatus. 5,751,377, Cl. 348-586.000.

Kaesser, Jürgen: *See—*
- Siegle, Gert; Braegas, Peter; Kaesser, Jürgen; and Suchowerskyj, Wadym, 5,752,177, Cl. 455-186.100.

Kaewell, John D., Jr.; and Cooley, David M., to Hughes Electronics. Supervisory audio tone based carrier-to-interference measurement in a mobile cellular communication system. 5,752,190, Cl. 455-436.000.

Kafri, Oded, to Veritas Technology Solutions Ltd. File encryption method. 5,751,814, Cl. 380-49.000.

Kagabu, Shinzo: *See—*
- Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 5,750,704, Cl. 546-275.100.

Kagalwala, Raxit A.: *See—*
- Venkata, Subrahmanyam S.; Raju, N. Ravisekhar; Kagalwala, Raxit A.; and Sastry, Vedula V., 5,751,138, Cl. 323-207.000.

Kage, Tsuyoshi: *See—*
- Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.

Kago, Yoshiyuki: *See—*
- Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.

Kahn, H. Dante, III. Deceleration device. 5,749,535, Cl. 242-371.000.

Kai, Eiichi: *See—*
- Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.

Kai, Tadao; and Katayama, Akira, to Nikon Corporation. Camera having animage blur suppression device. 5,752,091, Cl. 396-52.000.

Kaijo Corporation: *See—*
- Miyoshi, Hideaki, 5,749,698, Cl. 414-786.000.

Kajii, Masahiko: *See—*
- Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.

Kakizaki, Akemi: *See—*
- Nitta, Yoshio; and Kakizaki, Akemi, 5,751,440, Cl. 358-434.000.

Kakuta, Hitoshi: *See—*
- Fujii, Hiroaki; Kakuta, Hitoshi; and Takamoto, Yoshifumi, 5,752,256, Cl. 711-114.000.

Kalamazoo Holdings, Inc.: *See—*
- Guzinski, James A.; and Schulze, Mark H., 5,750,179, Cl. 426-600.000.

Kambara, Goro. Solidifiable flexible tube. 5,749,398, Cl. 138-113.000.

Kameda, Yasushi; and Segawa, Makoto, to Kabushiki Kaisha Toshiba. Semiconductor device provided with LDD transistors. 5,751,035, Cl. 257-300.000.

Kamei, Teruhiko: *See—*
- Chen, Chia Shing; Hung, Chun-Hsiung; Wan, Ray-Lin; and Kamei, Teruhiko, 5,751,637, Cl. 365-185.330.

Kamensky, Veniamin Viktorovich: *See—*
- Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.

Kameswaran, Venkataraman, to American Cyanamid Company. Process for the manufacture of 2-aryl-5-perfluoroalkylpyrrole derivatives and intermediates useful therefor. 5,750,726, Cl. 548-561.000.

Kameta, Keiji: *See—*

- Sato, Yoshio; and Kameta, Keiji, 5,750,953, Cl. 219-90.000.

Kameyama, Nobuyuki: *See—*
- Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.

Kamireddy, Balreddy; and Murray, William Mark, to Du Pont de Nemours, E. I., and Company. Cyclic sulfonamide herbicides. 5,750,471, Cl. 504-269.000.

Kamishita, Takuzo; and Miyazaki, Takashi, to Toko Yakuhin Kogyo Kabushiki Kaisha. Quick-drying gel-type disinfectant for hands and fingers. 5,750,579, Cl. 514-772.600.

Kamiya, Kazuo; Morimoto, Hirofumi; and Yokoyama, Shoji, to Aisin AW Co., Ltd.; and Equos Research Co., Ltd. Guide system. 5,751,228, Cl. 340-988.000.

Kamiya, Ryo, to Yamaha Corporation. Music system and electronic musical instrument. 5,750,913, Cl. 84-625.000.

Kamrukov, Alexander Semyonovich: *See—*
- Shashkovsky, Sergei Gennadievich; Kamrukov, Alexander Semyonovich; Chepegin, Dmitry Vyacheslavovich; and Bandurkin, Victor Vladimirovich, 5,750,205, Cl. 427-535.000.

Kamura, Hitoshi: *See—*
- Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, 5,750,888, Cl. 73-118.100.
- Oda, Hideyuki; Kamura, Hitoshi; and Murakami, Nobuaki, 5,749,334, Cl. 123-305.000.

Kan, Kazunori: *See—*
- Taoka, Naoaki; Honda, Mizuho; Inoue, Kenji; and Kan, Kazunori, 5,750,382, Cl. 435-135.000.

Kanagawa, Shuichi: *See—*
- Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.

Kanai, Taiyo: *See—*
- Kobayashi, Koichi; Iwanami, Wataru; and Kanai, Taiyo, 5,750,241, Cl. 428-199.000.

Kanazawa, Shigeo: *See—*
- Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.

Kanbayashi, Makoto; and Fujita, Ryoichi, to Canon Kabushiki Kaisha. Yellow toner for developing electrostatic image, two component developer, image sheet. 5,750,298, Cl. 430-45.000.

Kanda, Toshiyuki; Takabayashi, Hiroshi; and Onitsuka, Yoshihiro, to Canon Kabushiki Kaisha. Illumination device with luminance distribution adjusting reflection plate and liquid crystal display apparatus including same. 5,751,386, Cl. 349-65.000.

Kane, James A.: *See—*
- Chang, Hsiao-Shih; Kane, James A.; and Whitted, Graham B., III, 5,751,984, Cl. 395-392.000.

Kanebo Ltd.: *See—*
- Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.

Kaneka Corporation: *See—*
- Taoka, Naoaki; Honda, Mizuho; Inoue, Kenji; and Kan, Kazunori, 5,750,382, Cl. 435-135.000.

Kaneko, Kivotoshi: *See—*
- Prusiner, Stanley B.; Kaneko, Kivotoshi; and Cohen, Fred E., 5,750,361, Cl. 435-23.000.

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, to Olympus Optical Co., Ltd. Fluorescent endoscope apparatus. 5,749,830, Cl. 600-160.000.

Kaneko, Masakatsu: *See—*
- Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, 5,750,511, Cl. 514-44.000.

Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, to Canon Kabushiki Kaisha. Image processing apparatus which can update program. 5,752,040, Cl. 395-712.000.

Kaneko, Tetsuya: *See—*
- Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.

Kaneko, Tokuharu: *See—*
- Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Kaneko, Yoshio: *See—*
- Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Kaneko, Yoshiyuki: *See—*
- Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.

Kaneko, Yuji; Ueda, Tadao; Watanabe, Yoshihiro; and Toyonaga, Tatsuo, to Sodick Co., Ltd. Power supply system for an electric discharge machine. 5,750,951, Cl. 219-69.180.

Kanematsu, Daigoro: *See—*
- Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, to Nippondenso Co., Ltd. Electroluminescent device and method for producing same. 5,751,108, Cl. 313-503.000.

Kanenwischer, Bryon M., to R.A. Hanson Company, Inc. Mobile conveyor including alignment system. 5,749,452, Cl. 198-301.000.

Kang-hee Hahn: *See—*
- Kim, Cho-kwon, 5,749,761, Cl. 446-60.000.

Kang, Young H.; and Stack, Gary P., to American Home Products Corporation. Indolealkyl derivatives of benzodioxanmethylamine. 5,750,724, Cl. 548-454.000.

Kangas, Lauri: *See—*
- DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.

Kangas, Steven L.: *See—*
- Exsted, Bert J.; and Kangas, Steven L., 5,750,245, Cl. 428-315.500.

Kansai Electric Power Co., Inc., The: *See—*
- Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, 5,750,083, Cl. 423-228.000.

Kanto Kagaku Kabushiki Kaisha: *See—*
- Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.

Kantor, Martin L., to Emisphere Technologies, Inc. Method of solubilizing and encapsulating itraconazole. 5,750,147, Cl. 424-491.000.

Kanuchok, John M.; Burnworth, Jeffrey A.; and Bright, James A., to Basler Electric Company. Intergrating reset overcurrent relay. 5,751,532, Cl. 361-94.000.

Kao Corporation: *See—*
- Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, 5,750,304, Cl. 430-110.000.
- Yoshihara, Toru; and Chugun, Emi, 5,750,099, Cl. 424-70.170.

Kapetanakis, Ana: *See—*
- Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.

Kapoor, Vijay, to Motorola, Inc. Apparatus and methods for predicting and managing congestion in a network. 5,751,969, Cl. 395-200.650.

Kappel, Thomas F., to Mallinckrodt Medical, Inc. Inflatable blanket having selective air flow patterns. 5,749,109, Cl. 5-423.000.

Karabinis, Peter Dimitrios: *See—*
- Epperson, Darrell; Chennakeshu, Sandeep; and Karabinis, Peter Dimitrios, 5,752,204, Cl. 455-575.000.

Karaki, Mitsuhiro: *See—*
- Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.

Kargilis, Alexander: *See—*
- Tavian, Armando; and Kargilis, Alexander, 5,749,236, Cl. 62-186.000.

Karidis, John Peter, to International Business Machines Corporation. Disk drive with actuator to overcome stiction. 5,751,508, Cl. 360-97.010.

Karim, M. Reza-Ul: *See—*
- Carlson, Robert M.; Krasutsky, Pavel A.; and Karim, M. Reza-Ul, 5,750,578, Cl. 514-766.000.

Kariya, Shigeki: *See—*
- Matsuoka, Hiroshi; Chimura, Kazuo; and Kariya, Shigeki, 5,749,556, Cl. 248-349.100.

Karl, James S. Portable miniature golf game. 5,749,789, Cl. 473-162.000.

Karl Storz GmbH & Co.: *See—*
- Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased, 5,749,869, Cl. 606-34.000.
- Strobl, Karlheinz; Kennedy, Bryan D.; Chatenever, David; and Irion, Klaus, 5,751,340, Cl. 348-65.000.

Karol, Mark John: *See—*
- Eng, Kai Yin; and Karol, Mark John, 5,751,708, Cl. 370-389.000.

Karoui, Hakim: *See—*
- Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.

Karouji, Yasuhito, to Kabushiki Kaisha Toshiba. Schematic diagram creating system. 5,751,912, Cl. 395-62.000.

Karube, Shunichi, to NEC Corporation. CMOS output buffer circuit which converts CMOS logic signals to ECL logic signals and which discharges parasitic load capacitances. 5,751,167, Cl. 326-73.000.

Kasahara, Akihiro, to Kabushiki Kaisha Toshiba. Recording and reproducting head slider having multiple slider rails and a projection portion. 5,751,515, Cl. 360-103.000.

Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, to Fujitsu Limited; Kyushu Fujitsu Electronics Limited; and Fujitsu Automation Limited. Semiconductor device, carrier for carrying semiconductor device, and method of testing and producing semiconductor device. 5,750,421, Cl. 438-106.000.

Kasai, Kenichi: *See—*

Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.

Kase, John C. Breath air flow gauge. 5,749,368, Cl. 128-725.000.

Kase, Toshiyuki; and Nishikawa, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method of adjusting beam axis of optical pick-up. 5,751,491, Cl. 359-618.000.

Kaseda, Chosei: *See—*

Ohtsuka, Akira; and Kaseda, Chosei, 5,750,879, Cl. 73-9.000.

Kasha, Robert J.: *See—*

Myers, Robert A.; Greenamyer, Lara L.; and Kasha, Robert J., 5,751,825, Cl. 381-118.000.

Kashio, Shigetora: *See—*

Tamada, Hiroshi; Kashio, Shigetora; and Adachi, Tamio, 5,750,313, Cl. 430-280.100.

Kashiwabara, Yoshiro: *See—*

Kusano, Taizou; Kashiwabara, Yoshiro; Wada, Yasuhiro; and Umeda, Keisuke, 5,751,676, Cl. 369-50.000.

Kashiwagi, Kouichi; Masui, Toshiyuki; and Borden, George Rome, to Sharp Kabushiki Kaisha. Parameter processing device for setting a parameter value using a movable slide operator and including means for fine-adjusting the parameter value. 5,751,285, Cl. 345-349.000.

Kashiwagi, Toshio: *See—*

Onodera, Junichi; Sato, Shingo; Kashiwagi, Toshio; and Tetsuhiro, Isobe, 5,750,379, Cl. 435-72.000.

Kashiyama, Motohisa; and Tsuji, Masanori, to Yazaki Corporation. Electrical connector. 5,749,752, Cl. 439-733.100.

Kasper, Gerhard: *See—*

Ritrosi, Joe; Schmitt, Gary; Quintino, Carl; and Kasper, Gerhard, 5,749,389, Cl. 137-15.000.

Kasson, James Matthews; Nin, Sigfredo Ismael; Plouffe, Wilfred Edmund, Jr.; and Pryor, Duaine Wright, Jr., to International Business Machines Corporation. Function approximation using a centered cubic packing with tetragonal disphenoid extraction. 5,751,926, Cl. 395-119.000.

Katagiri, Tsutomu: *See—*

Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.

Katakura, Shinichi: *See—*

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Katanosaka, Naoki, to NEC Corporation. Semiconductor memory IC testing device. 5,751,728, Cl. 371-21.200.

Kataoka, Hiromi; Masuda, Shunichi; Saito, Tetsuo; and Yamamoto, Kazuma, to Canon Kabushiki Kaisha. Image processing apparatus. 5,751,925, Cl. 395-115.000.

Kataoka, Yoshiharu; Kawashima, Haruna; and Yamada, Yuichi, to Canon Kabushiki Kaisha. Exposure method and exposure apparatus using the same. 5,751,428, Cl. 356-401.000.

Katayama, Akira: *See—*

Kai, Tadao; and Katayama, Akira, 5,752,091, Cl. 396-52.000.

Katayama, Masatake: *See—*

Habuka, Hitoshi; Mayuzumi, Masanori; Tate, Naoto; and Katayama, Masatake, 5,749,974, Cl. 118-725.000.

Katisko, Keijo: *See—*

Jäntti, Arto; and Katisko, Keijo, 5,752,161, Cl. 455-8.000.

Kato, Hiroaki, to Canon Kabushiki Kaisha. Active anti-vibration apparatus and method of manufacturing the same. 5,750,897, Cl. 73-663.000.

Kato, Kazunori: *See—*

Inaba, Kohji; Kato, Kazunori; and Hayase, Kengo, 5,750,303, Cl. 430-110.000.

Kato, Kazuo: *See—*

Nakanishi, Koichiro; Nomura, Keiichi; Tajima, Kyoko; Hiratani, Hajime; and Kato, Kazuo, 5,750,650, Cl. 530-350.000.

Kato, Kinya: *See—*

Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,751,452, Cl. 359-52.000.

Kato, Naoki; and Kawasaki, Masayuki, to Pentel Kabushiki Kaisha. Knock-type liquid applicator. 5,749,665, Cl. 401-264.000.

Kato, Shinichi: *See—*

Ogawa, Hiroshi; Yoshida, Tuneo; and Kato, Shinichi, 5,750,233, Cl. 428-141.000.

Kato, Taisei: *See—*

Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.

Kato, Takero: *See—*

Yamada, Shigeo; Kato, Takero; Nagai, Hiromi; and Kitamura, Kazuo, 5,749,600, Cl. 280-751.000.

Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, to Minolta Co., Ltd. Heating apparatus. 5,752,150, Cl. 399-330.000.

Kato, Takeshi: *See—*

Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, 5,752,148, Cl. 399-329.000.

Kato, Tetsuo: *See—*

Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.

Kato, Yoshifumi; Yamauchi, Ichiro; Fujitsuna, Masami; and Tashiro, Tsutomu, to Nippondenso Co., Ltd. Method and apparatus for controlling speed-change transient mode of automatic transmissions. 5,752,210, Cl. 701-51.000.

Kato, Yoshiki: *See—*

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Katoh, Masafumi: *See—*

Soumiya, Toshio; Abe, Shunji; Katoh, Masafumi; and Watanabe, Naotoshi, 5,751,691, Cl. 370-17.000.

Katoh, Yukio: *See—*

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Katseff, Howard Paul: *See—*

Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.

Katsuki, Syunji: *See—*

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Katsumata, Masaaki; and Kusakabe, Satoshi, to Roland Kabushiki Kaisha. Waveform data compression apparatus and waveform data expansion apparatus. 5,751,771, Cl. 375-240.000.

Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Graphic processing system. 5,751,930, Cl. 395-137.000.

Katsurada, Masanori: *See—*

Yoneda, Fumio; Watanabe, Mayumi; Sakae, Masatoshi; Katsurada, Masanori; and Sabato, Takaaki, 5,750,712, Cl. 548-186.000.

Katsuya, Masahito: *See—*

Ito, Hidemi; Taniguchi, Masahiko; Tsujiyama, Yoshimi; and Katsuya, Masahito, 5,750,256, Cl. 428-375.000.

Katz, Eric R.; and Berger, David I., to Read-Rite Corporation. Thin film heads with insulated laminations for improved high frequency performance. 5,750,275, Cl. 428-694.00R.

Katz, Jeffrey Sherman: *See—*

Gan, Zhongxue; Fitzgibbons, Lance Terrance; Tang, Qing; and Katz, Jeffrey Sherman, 5,751,610, Cl. 364-571.030.

Katzin, Doron: *See—*

Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.

Katzman, Steven P.; and Glenday, Ronald C., to Beckman Instruments, Inc. Reagent segment. 5,750,074, Cl. 422-102.000.

Kauffman, Ralph; and Lee, Roger, to Micron Technology, Inc. Programmable non-volatile memory cell and method of forming a non-volatile memory cell. 5,751,039, Cl. 257-316.000.

Kaufman, John Wilson; Knaub, John Edward; and Cunningham, Adam Douglas, to Whitaker Corporation, The. Card reader. 5,750,973, Cl. 235-441.000.

Kaufman, Larry: *See—*

Bull, Jeffrey; White, Michael J.; and Kaufman, Larry, 5,750,450, Cl. 501-91.000.

Kaufman, Mark I.; and Meeks, Donald J., Jr. Multistory building complex with access between garage parking decks and each building floor at same elevation. 5,749,186, Cl. 52-236.300.

Kawabata, Muneo: *See—*

Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Kawabe, Kuniyasu: *See—*

Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, 5,750,304, Cl. 430-110.000.

Kawachi, Genshiro: *See—*

Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.

Kawaguchi, Chiaki: *See—*

Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.

Kawaguchi, Hitoshi: *See—*

Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.

Kawaguchi, Kenji: *See—*

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Kawaguchi, Tohru: *See—*

Mizutani, Hideo; and Kawaguchi, Tohru, 5,751,403, Cl. 355-53.000.

Kawaguchi, Yosihisa: *See—*

Yamamoto, Taizo; Yagyu, Motohiro; Kawaguchi, Yosihisa; and Nagao, Akira, 5,750,979, Cl. 250-223.00R.

Kawahara, Megumi; Yamada, Ikuko; Shoshi, Masayuki; and Kojima, Akio, to Ricoh Company, Ltd. Cyclopentadiene derivative compounds and electrophotographic photoconductor comprising one cyclopentadiene derivative compound. 5,750,762, Cl. 558-423.000.

Kawahara, Toshiro: *See—*

Duttweiler, Donald Lars; Kawahara, Toshiro; Kim, Cheng; and Miki, Toshio, 5,752,229, Cl. 704-270.000.

Kawahira, Izuru; and Miyachi, Yoshihiko, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system and method thereof. 5,749,221, Cl. 60-274.000.

Kawakami, Hideaki: *See—*

Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.

Kawakami, Kumiko: *See—*

Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.

Kawamoto, Hideo: *See—*

Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.

Kawamoto, Yoshihisa: *See—*

Maeda, Keiji; and Kawamoto, Yoshihisa, 5,750,154, Cl. 425-116.000.

Kawamura, Akira: *See—*

Matsui, Takeshi; and Kawamura, Akira, 5,751,476, Cl. 359-411.000.

Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, to Fujitsu Limited. Manufacture of semiconductor device using a-c anti-reflection coating. 5,750,316, Cl. 430-311.000.

Kawamura, Keizou: *See—*

Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.

Kawamura, Shoji: *See—*

Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji, 5,752,089, Cl. 396-48.000.

Kawamura, Tarou: *See—*

Tsutsumi, Kazuo; Takada, Tomoaki; Sakakida, Yasufumi; and Kawamura, Tarou, 5,750,084, Cl. 423-239.100.

Kawano, Makoto: *See—*

Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, 5,751,584, Cl. 364-474.200.

Kawasaki Chemical Holding Co., Inc.: *See—*

Davies, Mark; and Bolvari, Anne E., 5,750,620, Cl. 525-67.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*

Tsutsumi, Kazuo; Takada, Tomoaki; Sakakida, Yasufumi; and Kawamura, Tarou, 5,750,084, Cl. 423-239.100.

Kawasaki Kasei Chemicals Ltd.: *See—*

Suganuma, Hiroyuki, 5,750,743, Cl. 552-271.000.

Kawasaki, Masayuki: *See—*

Kato, Naoki; and Kawasaki, Masayuki, 5,749,665, Cl. 401-264.000.

Kawasaki, Shigeru: *See—*

Kimura, Kazumi; Mitsutake, Hideaki; Yano, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, 5,749,642, Cl. 353-98.000.

Kawase, Hiromitsu: *See—*

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.

Kawashima, Haruna: *See—*

Kataoka, Yoshiharu; Kawashima, Haruna; and Yamada, Yuichi, 5,751,428, Cl. 356-401.000.

Kawashima, Riichirou: *See—*

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Kawashima, Shunji: *See—*

Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, 5,749,570, Cl. 271-10.130.

Kawata, Tsutomu: *See—*

Christ, William J.; Rossignol, Daniel P.; Kobayashi, Seiichi; and Kawata, Tsutomu, 5,750,664, Cl. 536-17.200.

Kawka, Martin: *See—*

Heinen, Horst; Rieck, Konrad; Kawka, Martin; and Schattauer, Jürgen, 5,749,576, Cl. 273-138.100.

Kaya, Cetin; and Tigelaar, Howard, to Texas Instruments Incorporated. Non-volatile memory cell structure and process for forming same. 5,750,427, Cl. 438-264.000.

Kayakiri, Hiroshi: *See—*

Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl. 546-121.000.

Kazama, Shigenori; and Sasaki, Ryo, to Nissan Motor Co., Ltd. Method of producing corona discharge and electrostatic painting system employing corona discharge. 5,749,529, Cl. 239-690.000.

Kazami, Kazuyuki: *See—*

Hibino, Hideo; Kazami, Kazuyuki; Yokonuma, Norikazu; and Okutsu, Hisashi, 5,751,343, Cl. 348-96.000.

Kazemzadeh, Massoud, to MJM Technologies, L.L.P. Method of manufacturing syrup-infused food pieces. 5,750,173, Cl. 426-516.000.

Kaziwara, Hisashi: *See—*

Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.

Kazui, Kimihiko: *See—*

Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.

KB Science: *See—*

Bostater, Charles R., Jr., 5,751,424, Cl. 356-342.000.

KC Multi-Ring Products, Inc.: *See—*

Carr, Ronald L., 5,749,607, Cl. 285-93.000.

Kehao, Sokphal; and Ford, Robert B., to Motorola, Inc. Method and apparatus for assessing available battery life in a rechargeable battery. 5,751,217, Cl. 340-636.000.

Kearby, Ronald S.; Fox, Mark Lee; and Kelley, Mark David, to Devro-Teepak, Inc. Methods and materials for splicing tubular food casings. 5,750,217, Cl. 428-34.800.

Kearney, Hugh L.; Isabelle, Charles J.; Kish, Jules G.; and Noehren, William L., to Sikorsky Aircraft Corporation. Coil spring for overrunning spring clutches. 5,749,449, Cl. 192-41.00S.

Keating, Pierce V., to Motorola, Inc. Emitter coupled logic (ECL) gate which generates intermediate signals of four different voltages. 5,751,169, Cl. 326-126.000.

Keeble, Jamie: *See—*

Kraus, Joey; Keeble, Jamie; and Moore, Jimmy, 5,749,500, Cl. 222-377.000.

Keefe, Jerome F. Locking device and ski security system. 5,749,251, Cl. 70-30.000.

Keen, Billy J., Jr.: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Kehne, John H.: *See—*

Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.

Kehr, Bruce A.; Lerner, David; Demenus, Richard D.; and Edl, Michael J., to InforMedix, Inc. Electronic medication monitoring and dispensing method. 5,752,235, Cl. 705-3.000.

Keicher, Roger Myron, to RKR Advantage Inc. Dispensing bottle hanger. 5,749,490, Cl. 220-481.000.

Kejha, Joseph B. Lightweight current collectors and carriers. 5,750,289, Cl. 429-233.000.

Keller, David Gerard: *See—*

Chern, Terry Song-Hsing; Keller, David Gerard; and MacFadden, Kenneth Orville, 5,749,927, Cl. 29-623.500.

Keller, James A.; and Flory, Kevin J., to Diamond Multimedia Systems, Inc. Adaptive device driver using controller hardware sub-element identifier. 5,752,032, Cl. 395-681.000.

Kelley, Edward Emile: *See—*

Dauerer, Norman Joseph; and Kelley, Edward Emile, 5,751,966, Cl. 395-200.540.

Kelley, Mark David: *See—*

Kearby, Ronald S.; Fox, Mark Lee; and Kelley, Mark David, 5,750,217, Cl. 428-34.800.

Kelso, Danny T.: *See—*

Epperly, W. Robert; Sprague, Barry N.; Kelso, Danny T.; and Bowers, Wayne E., 5,749,928, Cl. 44-358.000.

Kelton, James Robert: *See—*

Mueller, Bruce Dale; Mannette, Michael Russell; and Kelton, James Robert, 5,752,183, Cl. 455-343.000.

Kemker, Uwe: *See—*

Dörner, Stefan; Kemker, Uwe; Simm, Hans-Peter; and Lapp, Oliver, 5,749,285, Cl. 99-348.000.

Kempe, Tomas, to Barrskogen, Inc. Anhydrous amine cleavage of oligonucleotides. 5,750,672, Cl. 536-25.310.

Ken, Christopher G. M.; and Engelson, Erik T., to Target Therapeutics, Inc. Multiple layered vaso-occlusive coils. 5,749,891, Cl. 606-200.000.

Kenna, John T.: *See—*

Washington, Kirk B.; Kenna, John T.; James, Greg A.; and Ramji, Shiraz N., 5,750,281, Cl. 429-39.000.

Kennametal, Inc.: *See—*

Bryant, William A.; and Santhanam, A. T., 5,750,247, Cl. 428-323.000.

Gates, Alfred S., Jr.; North, Bernard; and Shaffer, William R., 5,752,155, Cl. 419-5.000.

Kennedy, Bryan D.: *See—*

Strobl, Karlheinz; Kennedy, Bryan D.; Chatenever, David; and Irion, Klaus, 5,751,340, Cl. 348-65.000.

Kennedy, John F.; and Adrian, Andrew, to Ford Motor Company. Method for detecting electrical connection between antenna and receiver for a motor vehicle. 5,751,148, Cl. 324-501.000.

Kennedy, Michael: *See—*

McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,750,931, Cl. 174-110.0PM.

Kennelly, Teresa; Hochmuth, John K.; Chou, Ting C.; and Farrauto, Robert J. Combustion catalysts containing binary oxides and processes using the same. 5,750,458, Cl. 502-304.000.

Kenney, Yvonne M.: *See—*

Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.

Keogh, Frank T.: *See—*

Driscoll, Michael E.; Dorio, Michael A.; and Keogh, Frank T., 5,749,722, Cl. 432-118.000.

Kern, Alfred: *See—*

Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, 5,750,634, Cl. 528-254.000.

Ketteler, Alfons, to Robert Bosch GmbH. Device for the mutual alignment and attachment of two components. 5,749,669, Cl. 403-12.000.

Kettner, Catherine E., to Reynolds Consumer Products, Inc. Closure arrangement for attachment to outside of bag. 5,749,658, Cl. 383-204.000.

Kevex X-Ray: *See—*

Enck, Richard S., 5,751,784, Cl. 378-140.000.

Keyence Corporation: *See—*

Sasaki, Ryoichi; Tanai, Naoki; and Suhara, Masaaki, 5,750,974, Cl. 235-454.000.

Khaile, Thebeeapelo John: *See—*

Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.

Khan, Bobby V.: *See—*

Medford, Russell M.; Alexander, R. Wayne; Parthasarathy, Sampath; and Khan, Bobby V., 5,750,351, Cl. 435-7.210.

Kharshan, Margarita: *See—*

Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.

Khon, Trinh Cam. Method for isolating DNA from biological cells. 5,750,671, Cl. 536-25.400.

Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, to Continental X-Ray Corporation. Universal radiographic/fluoroscopic digital room. 5,751,788, Cl. 378-197.000.

Kickelhain, Jorg, to LPKF CAD/CAM Systeme GmbH. Process for the deposition of structured metallic coatings on glass substrates. 5,750,212, Cl. 427-581.000.

Kidd, Robert Charles: *See—*

Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, 5,751,846, Cl. 382-169.000.

Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, to Matsushita Electric Industrial Co., Ltd. Semiconductor light-emitting device and production method thereof. 5,751,013, Cl. 257-13.000.

Kiefer, Garry E.; Simon, Jaime; and Garlich, Joseph R., to Dow Chemical Company, The. Bicyclopolyazamacrocyclophosphonic acid half esters. 5,750,660, Cl. 534-10.000.

Kieser, Manfred; Hennemann, Afred; and Stahlecker, Otto, to Merck Patent Gesellschaft mit beschrankter Haftung. Effect powder coatings. 5,749,957, Cl. 106-403.000.

Kiesow, Ronald H.: *See—*

Cloutier, Robert P.; Kiesow, Ronald H.; and Malloy Desormeaux, Stephen G., 5,752,085, Cl. 396-6.000.

Kieval, Robert S.; and Hess, Michael F., to Medtronic, Inc. Dual chamber pacing system and method with continual adjustment of the AV escape interval so as to maintain optimized ventricular pacing for treating cardiomyopathy. 5,749,906, Cl. 607-9.000.

Kikinis, Dan, to Elonex PLC, Ltd. Integrated computer Scanner printer in a single system enclosure sharing control circuitry and light source wherein a single CPU performing all of the control tasks. 5,752,075, Cl. 395-821.000.

Kikkawa, Toshihide, to Fujitsu Limited. Semiconductor device formed on a substrate having an off-angle surface. 5,751,028, Cl. 257-192.000.

Kikuchi, Eiji, to Kabushiki Kaisha Shinkawa. Lead frame magazine fastening structure. 5,749,442, Cl. 187-272.000.

Kikuchi Kogyo Co., Ltd.: *See—*

Kikuchi, Koichi; and Tukamoto, Tadashi, 5,749,210, Cl. 57-58.490.

Kikuchi, Koichi; and Tukamoto, Tadashi, to Kikuchi Kogyo Co., Ltd. Creel with two-for-one twisting units. 5,749,210, Cl. 57-58.490.

Kikyohara, Tadashi: *See—*

Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.

Kilbane, John J., II, to Institute of Gas Technology. Adsorption of PCB's using biosorbents. 5,750,065, Cl. 264-344.000.

Kilgore, John C., III. Wall toggle. 5,749,687, Cl. 411-29.000.

Kilty, Alan L.; Ludewig, Howard W.; and Wallace, Brian L., to Caterpillar Inc. Method for arc welding fault detection. 5,750,957, Cl. 219-130.010.

Kim, Byeung-chul: *See—*

Choi, Jung-dal; Jun, Sung-bu; and Kim, Byeung-chul, 5,751,045, Cl. 257-392.000.

Kim, Chang Seop: *See—*

Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.

Kim, Changhoe, to Samsung Display Devices Co., Ltd. Electron gun for a color cathode ray tube. 5,751,100, Cl. 313-414.000.

Kim, Cheng: *See—*

Duttweiler, Donald Lars; Kawahara, Toshiro; Kim, Cheng; and Miki, Toshio, 5,752,229, Cl. 704-270.000.

Kim, Cho-kwon, to Kang-hee Hahn. Model glider having twin propellers. 5,749,761, Cl. 446-60.000.

Kim, Choong-lak; and Cho, Jong-ho, to Samsung Display Devices Co., Ltd. Method for screening a panel of a color CRT. 5,750,295, Cl. 430-25.000.

Kim, Hae In. Washing machine. 5,749,250, Cl. 68-171.000.

Kim, Ik Geun: *See—*

Ryu, Sang Chul; and Kim, Ik Geun, 5,749,241, Cl. 62-340.000.

Kim, In C.; Thompson, Donald M.; and Sarto, Gloria E., to University of New Mexico. In situ hybridization solution and process. 5,750,340, Cl. 435-6.000.

Kim, In-soo: *See—*

Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.

Kim, Jae Kyu: *See—*

Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.

Kim, Jeenok T.; Berlowitz, Paul Joseph; Francisco, Manuel A.; and Beltzer, Morton, to Exxon Research and Engineering Company. High load-carrying turbo oils containing amine phosphate and sulfurized fatty acid. 5,750,478, Cl. 508-331.000.

Kim, Jin Baek; Jung, Min Ho; and Chang, Kyeong Ho, to Hyundai Electronics Industries Co., Ltd.; and Korea Advanced Institute of Science & Technology. N-vinyllactam derivatives and polymer thereof. 5,750,680, Cl. 540-200.000.

Kim, Jin-Hun, to Daewoo Electronics Co., Ltd. Method and apparatus for correcting errors in a transmitted video signal. 5,751,361, Cl. 348-409.000.

Kim, Keum-Mo, to Daewoo Electronics Co., Ltd. Head drum assembly of a video cassette recorder. 5,751,520, Cl. 360-107.000.

Kim, Ki Yeul: *See—*

Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.

Kim, Kwang-Joon: *See—*

Hyun, Kyung-Sook; Kwon, O-Kyun; Kim, Kwang-Joon; and Lee, El-Hang, 5,751,468, Cl. 359-282.000.

Kim, Man-Tae; Kim, Min-Sik; and Park, Jin-Hong, to Samsung Display Devices'Co., Ltd. Visual inspection system for a product. 5,751,342, Cl. 348-92.000.

Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, to Samsung Display Devices Co., Ltd. Photo-conductive composition and CRT bulb having photo-conductive layer formed of the same. 5,750,296, Cl. 430-28.000.

Kim, Min-Sik: *See—*

Kim, Man-Tae; Kim, Min-Sik; and Park, Jin-Hong, 5,751,342, Cl. 348-92.000.

Kim, Myeong-kyu; and Hong, Seong-doo, to Samsung Aerospace Industries, Ltd. Conversion system for a camera. 5,751,400, Cl. 354-159.000.

Kim, Seong-Woo: *See—*

Kim, Yong-Geun; and Kim, Seong-Woo, 5,751,448, Cl. 358-498.000.

Kim, Si-Hwan, to Daewoo Electronics Co., Ltd. Method for controlling gas supply of a gas boiler. 5,749,327, Cl. 122-13.100.

Kim, Steven W.: *See—*

Lenker, Jay A.; Evans, Michael A.; Kim, Steven W.; and Kinney, Edward V., 5,749,921, Cl. 623-1.000.

Kim, Sun Hyuk: *See—*

Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, 5,750,646, Cl. 530-314.000.

Kim, Sung-Bum, to Daewoo Electronics Co., Ltd. Washing machine having a detachable washing bucket. 5,749,248, Cl. 68-4.000.

Kim, Tae-Hong: *See—*

Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, 5,750,452, Cl. 501-138.000.

Kim, Yong Ho: *See—*

Huh, Nam Won; Park, Yong Ae; and Kim, Yong Ho, 5,750,359, Cl. 435-19.000.

Kim, Yong-Geun; and Kim, Seong-Woo, to SamSung Electronics Co., Ltd. Methods of operating an image forming apparatus having a shared paper transmission path. 5,751,448, Cl. 358-498.000.

Kim, You Taeq, to Hyundai Electronics Industries, Co. Ltd. Representative value selector and an embodying method therefor. 5,751,726, Cl. 371-6.000.

Kim, Young Hyeon; and Seong, Pil Young, to Samsung Electronics Co., Ltd. Method and apparatus for controlling movements of a chip mounting robot. 5,751,917, Cl. 395-89.000.

Kim, Young-ho: *See—*

Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.

Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, to Chisso Corporation. Method for manufacturing acryloxypropysilane. 5,750,753, Cl. 556-440.000.

Kimbara, Masahiko, to Three-D Composites Research Corporation. Yarn tensioning method and device for textile weaving machines. 5,749,281, Cl. 87-56.000.

Kimberly-Clark Corp.: *See—*

Brown, John Hiram; LaCount, Kenneth Harry; and Petty, Terry Lyle, 5,749,538, Cl. 242-559.200.

McGowan, James Earl, Jr., 5,749,203, Cl. 53-432.000.

Kiml, Helmut, to Texas Instuments Deutschland GmbH. Bus signal detector. 5,751,692, Cl. 370-85.100.

Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, to Kurashiki Boseki Kabushiki Kaisha; and Kyoto Daiichi Kagaku Co., Ltd. Spectrometry and optical method and apparatus for obtaining a stable spectrum with use of an informationless spectrum contained therein. 5,751,418, Cl. 356-319.000.

Kimura, Hiromi; Yamada, Kanji; and Hirato, Yasuhiro, to Nippon Steel Corporation; and Nippon Steel Chemical Co., Ltd. Fiber-reinforced plastic bar and production method thereof. 5,749,211, Cl. 57-217.000.

Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, to Sanyo Electric Co., Ltd. FM radio receiver and signal processing device used therein. 5,752,176, Cl. 455-184.100.

Kimura, Kazumi; Mitsutake, Hideaki; Yano, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, to Canon Kabushiki Kaisha. Illuminating optical system and projector utilizing the same. 5,749,642, Cl. 353-98.000.

Kimura, Kazuya; and Makino, Yoshihiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Refrigerant compressor with rotation detecting means. 5,749,710, Cl. 417-63.000.

Kimura, Koichi: *See—*

Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.

Kimura, Takahiko: *See—*

Takemura, Osamu; Kimura, Takahiko; and Fujii, Atsushi, 5,751,314, Cl. 347-55.000.

Kimura, Yasuki; Shirase, Takashi; Okamura, Masamitsu; and Maezono, Shuichi, to Mitsubishi Denki Kabushiki Kaisha. Electron gun assembling apparatus and method of assembling electron gun. 5,749,760, Cl. 445-4.000.

Kindsvogel, Wayne R.: *See—*

Sledziewski, Andrzej Z.; Bell, Lillian Anne; and Kindsvogel, Wayne R., 5,750,375, Cl. 435-69.700.

King, Brian P.: *See—*

Henry, Mark S.; and King, Brian P., 5,749,700, Cl. 415-104.000.

King, Chi-Hsin Richard: *See—*

Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.

King, Clifford R.: *See—*

Banning, Jeffery H.; King, Clifford R.; Bui, Loc V.; and Titterington, Donald R., 5,750,604, Cl. 524-187.000.

King, Edward C.: *See—*

Weisser, Pirmin L.; Vermeer, Fulps V.; and King, Edward C., 5,751,994, Cl. 395-464.000.

King, Gayle: *See—*

Krivohlavek, Dennis; King, Gayle; and Planche, Jean-Pascal, 5,750,598, Cl. 524-71.000.

King, Julie Ann: *See—*

Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.

King, Stephen Wayne, to Union Carbide Chemicals & Plastics Technology Corporation. Reductive amination catalysts. 5,750,790, Cl. 564-469.000.

King, Walter: *See—*

Collins, Mark L.; Halbert, Donald N.; King, Walter; and Lawrie, Jonathan M., 5,750,338, Cl. 435-6.000.

Kingsley, Gary: *See—*

Brice, Steve; Kingsley, Gary; and Payne, David, 5,749,641, Cl. 353-81.000.

Kinney, Edward V.: *See—*

Lenker, Jay A.; Evans, Michael A.; Kim, Steven W.; and Kinney, Edward V., 5,749,921, Cl. 623-1.000.

Kinney, Michael A.: *See—*

Trainor, John J.; Laplace, Carl J.; Kinney, Michael A.; and Reilly, Joseph F., 5,751,222, Cl. 340-825.050.

Kinney, Richard R.; Pandolfe, William D.; and Ferguson, R. Daniel, to APV Homogenizer Group, a Division of APV North America, Inc. Homogenization valve. 5,749,650, Cl. 366-176.200.

Kinney, William A.: *See—*

Sabb, Annmarie Louise; and Kinney, William A., 5,750,522, Cl. 514-243.000.

Kinoshita, Atsushi: *See—*

Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, 5,751,568, Cl. 363-95.000.

Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, to Kanebo Ltd. Organic electrolytic cell. 5,750,287, Cl. 429-218.000.

Kinoshita, Hiroyuki: *See—*

Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.

Kinsel, David I., to Gelman Sciences. Disposable point of use filtration element for purifying air and water supplies to dental handpieces. 5,749,726, Cl. 433-80.000.

Kinugawa Rubber Ind. Co., Ltd.: *See—*

Numakami, Youichi, 5,749,261, Cl. 74-18.100.

Kinzler, Kenneth W.: *See—*

Vogelstein, Bert; Kinzler, Kenneth W.; and Papadopoulos, Nickolas, 5,750,352, Cl. 435-7.210.

Kirbie, Martin: *See—*

Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, 5,749,595, Cl. 280-688.000.

Kirchhoff, Volker: *See—*

Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, 5,750,185, Cl. 427-8.000.

Kirin Beer Kabushiki Kaisha: *See—*

Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.

Kirin Beverage Corporation: *See—*

Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.

Kirkland, Brian: *See—*

Pietruszynski, David Michael; Austin, James Dub; and Kirkland, Brian, 5,751,179, Cl. 327-379.000.

Kirkpatrick, Terence D.: *See—*

Austin, Keith G.; Erazo, Jorge G.; Kirkpatrick, Terence D.; Giffen, Robert E.; and Forhan, Michael A., 5,751,127, Cl. 318-370.000.

Kirkwood, Richard Darrell: *See—*

Boehm, Michael James; Straub, Peter John; and Kirkwood, Richard Darrell, 5,749,656, Cl. 374-185.000.

Kirsch, John D.: *See—*

Drennen, James K., III; and Kirsch, John D., 5,750,996, Cl. 250-341.200.

Kirsch, Jürgen: *See—*

Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, 5,750,602, Cl. 524-127.000.

Kirsch, Steven T., to Infoseek Corporation. Method and apparatus for redirection of server external hyper-link references. 5,751,956, Cl. 395-200.330.

Kirtland, Charles: *See—*

Moyer, William C.; Kirtland, Charles; and Arends, John H., 5,752,267, Cl. 711-167.000.

Kish, Frederick A.; Eckmann, Elizabeth J.; and Shelton, Lawrence S., to Illinois Tool Works Inc. Fastener with polymer-coated shank. 5,749,692, Cl. 411-453.000.

Kish, Jules G.: *See—*

Kearney, Hugh L.; Isabelle, Charles J.; Kish, Jules G.; and Noehren, William L., 5,749,449, Cl. 192-41.00S.

Kishi, Gregory Tad: *See—*

Bolin, Mark Robert; Kishi, Gregory Tad; and McIntosh, Michael Philip, 5,751,844, Cl. 382-156.000.

Kishi, Takahiro: *See—*

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.

Kishida, Kenichi: *See—*

Tsutsumi, Motoko; Hara, Minoru; and Kishida, Kenichi, 5,752,094, Cl. 396-76.000.

Kishimoto, Michinori: *See—*

Ishida, Kenichi; Kishimoto, Michinori; Yamamoto, Takashi; and Sushihara, Koji, 5,751,191, Cl. 330-125.000.

Kishore, Ganesh Murthy: *See—*

Barry, Gerard Francis; Kishore, Ganesh Murthy; and Krohn, Bradley Martin, 5,750,876, Cl. 800-205.000.

Kister, January, to Probe Technology. Method and apparatus for aligning probes. 5,751,157, Cl. 324-758.000.

Kitada, Chieko: *See—*

Suzuki, Nobuhiro; Odaka, Asano; and Kitada, Chieko, 5,750,349, Cl. 435-7.100.

Kitagawa, Junichi: *See—*

Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.

Kitagishi, Nozomu, to Canon Kabushiki Kaisha. Plate-like polarizing element, a polarizing conversion unit provided with the element, and a projector provided with the unit. 5,751,480, Cl. 359-485.000.

Kitahara, Shigehisa: *See—*

Ozawa, Takayuki; Sugiyama, Satoru; Kitahara, Shigehisa; and Fujii, Katsuhiko, 5,750,507, Cl. 514-19.000.

Kitajima, Masaaki: *See—*

Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.

Kitakohji, Toshisuke: *See—*

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Kitamura, Atsuyuki: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Kitamura, Kazuo: *See—*

Yamada, Shigeo; Kato, Takero; Nagai, Hiromi; and Kitamura, Kazuo, 5,749,600, Cl. 280-751.000.

Kitayama, Shinichiro: *See—*

Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.

Kitayoshi, Hitoshi, to Advantest Corporation. Radio propagation simulation method wave field strength inference method and three-dimensional delay spread inference method. 5,752,167, Cl. 455-67.100.

Kittelberger, J. Stephen: *See—*

- Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.
- Kiuchi, Takeo; Tamagawa, Yutaka; and Ibaraki, Shigeru, to Honda Giken Kogyo Kabushiki Kaisha. Control system for electric power generating apparatus on vehicle. 5,751,137, Cl. 322-14.000.
- Kivari, Raimo, to Nokia Mobile Phones Limited. Mobile terminal having power saving mode that monitors specified numbers of filler messages. 5,752,201, Cl. 455-574.000.
- Kjell, Douglas P.; and Perry, Fred M., to Eli Lilly and Company. Process for preparing benzoic acid derivative intermediates and benzothiophene pharmaceutical agents. 5,750,688, Cl. 540-596.000.
- Klaber, Kenneth E.: *See—*
  - Danner, Mark C.; and Klaber, Kenneth E., 5,750,252, Cl. 428-332.000.
- Klar, Avihu: *See—*
  - Jessell, Thomas M.; and Klar, Avihu, 5,750,502, Cl. 514-12.000.
- Klaus, Roger L.: *See—*
  - Mydlarz, Jerzy Z.; Klaus, Roger L.; and Saeva, Franklin D., 5,750,324, Cl. 430-567.000.
- Klecka, James Stevens: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Kleemann, Heinz-Werner: *See—*
  - Wagner, Adalbert; Kleemann, Heinz-Werner; Regnat, Dieter; and Kleiner, Hans-Jerg, 5,750,728, Cl. 549-57.000.
- Klein, Eric A.: *See—*
  - Janky, James M.; Klein, Eric A.; and Schipper, John F., 5,751,245, Cl. 342-357.000.
- Klein, Heinz Hermann; and Filippi, Werner, to Dr. Boy GmbH. Hydraulic mould closure device for an injection moulding machine. 5,750,163, Cl. 425-590.000.
- Klein, J. Peter; Underiner, Gail E.; and Kumar, Anil M., to Cell Therapeutics, Inc. Substituted amino alcohol compounds. 5,750,575, Cl. 514-617.000.
- Klein, Robert Dennis: *See—*
  - Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, 5,751,846, Cl. 382-169.000.
- Klein, Rudi: *See—*
  - Gasse, Andreas; and Klein, Rudi, 5,750,262, Cl. 428-423.500.
- Kleiner, Hans-Jerg: *See—*
  - Wagner, Adalbert; Kleemann, Heinz-Werner; Regnat, Dieter; and Kleiner, Hans-Jerg, 5,750,728, Cl. 549-57.000.
- Kleinsasser, Jonathan. Flooring slat for an animal pen. 5,749,323, Cl. 119-530.000.
- Klekas, Steven Lynn: *See—*
  - Fanshier, Stephen Reid; Pare, My Tien; Nacional, Anthony Bautista; and Klekas, Steven Lynn, 5,751,962, Cl. 395-200.530.
- Kletsky, Jeffrey Marc; and Tsui, Ernest T., to Applied Signal Technology, Inc. Non-invasive digital communications test system. 5,751,766, Cl. 375-224.000.
- Kleve, Brian W.: *See—*
  - Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., 5,751,303, Cl. 347-16.000.
- Kley, Victor B., to General Nanotechnology, L.L.C. Nanometer scale data storage device and associated positioning system. 5,751,683, Cl. 369-126.000.
- Klimenko, Vladimir Alexeevich: *See—*
  - Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.
- Klimisch, Kevin W.: *See—*
  - Fedde, Mickiel P.; and Klimisch, Kevin W., 5,751,225, Cl. 340-941.000.
- Kline, Daniel S. Posture training device. 5,749,838, Cl. 601-71.000.
- Kline, Eric V.: *See—*
  - Johnson, David A.; Kline, Eric V.; and Fulcher, Donald L., 5,749,738, Cl. 439-66.000.
- Kline, Ladd M.: *See—*
  - Andres, James J.; and Kline, Ladd M., 5,749,194, Cl. 52-506.060.
- Klinedinst, Paul W.: *See—*
  - Dundas, Dennis L.; and Klinedinst, Paul W., 5,749,275, Cl. 83-24.000.
- Klinge, Bernd; Gutknecht, Michael; Weise, Bernd; and Birnkraut, Ingo, to Gossler Thermal Ceramics GMBH. Ceramic combustion support element for surface burners and process for producing the same. 5,749,721, Cl. 431-328.000.
- Klinkner, Allen O.; and Hancock, Larry R., to Alwyn Company, Inc. Planter hex drive shaft repair kit. 5,749,310, Cl. 111-200.000.
- Klintz, Ralf: *See—*
  - Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, 5,750,705, Cl. 546-297.000.
- Kluss, Walter J.: *See—*
  - Sears, Jerome; Parfomak, Walter; Kluss, Walter J.; and Genninario, Michael, 5,751,131, Cl. 318-778.000.
- Knaub, John Edward: *See—*
  - Kaufman, John Wilson; Knaub, John Edward; and Cunningham, Adam Douglas, 5,750,973, Cl. 235-441.000.
- Knaus, Dennis A. Stability control agent composition for polyolefin foam. 5,750,584, Cl. 521-97.000.
- Knell, Marcus: *See—*
  - Krummel, Guenter; and Knell, Marcus, 5,750,766, Cl. 560-82.000.
- Knoll, Charles L.: *See—*
  - Wilk, Peter J.; Knoll, Charles L.; and Wexler, Eugene, 5,749,376, Cl. 128-898.000.
- Knoll, Heinz; and Fischer, Wolfgang, to Mercedes-Benz AG. Belt force limiter for a vehicle seat belt. 5,749,601, Cl. 280-805.000.
- Ko, Jung Wan, to SamSung Electronics Co., Ltd. High-resolution video tape recorder systems and methods for recording and recovering video compatibly with the normal-VHS format system. 5,751,884, Cl. 386-33.000.
- Kobak, Roger Leo; Yount, Gary L.; Stirbis, James S.; and Weil, William W., to Preferred Machining Corporation. Fluid dispensing system. 5,749,969, Cl. 118-319.000.
- Kobata, Tadashi: *See—*
  - Okado, Makoto; Ueda, Yoshihiro; Kobata, Tadashi; and Taniguchi, Masami, 5,752,127, Cl. 399-76.000.
- Kobayashi, Chihiro: *See—*
  - Kowatari, Takehiko; Arai, Nobukatsu; and Kobayashi, Chihiro, 5,750,889, Cl. 73-118.200.
- Kobayashi, Fumiyuki: *See—*
  - Daikoku, Takahiro; Kobayashi, Fumiyuki; Ashiwake, Noriyuki; Kasai, Kenichi; Kawamura, Keizou; and Idei, Akio, 5,751,062, Cl. 257-722.000.
- Kobayashi, Hideo; Inoue, Takashi; and Ishikawa, Hiroyasu, to Kokusai Denshin Denwa Co., Ltd. Energy dispersal method for TDMA carrier. 5,751,703, Cl. 370-321.000.
- Kobayashi, Hideo: *See—*
  - Nomoto, Shinichi; Kobayashi, Hideo; Honda, Teruhiko; and Hara, Kazuo, 5,751,247, Cl. 342-359.000.
- Kobayashi, Hideyuki; and Toda, Koichi, to Singer Company N.V., The. Presser foot device for sewing machine. 5,749,311, Cl. 112-240.000.
- Kobayashi, Hiroo: *See—*
  - Fujiwara, Yasuo; and Kobayashi, Hiroo, 5,752,131, Cl. 399-106.000.
- Kobayashi, Hiroyuki: *See—*
  - Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, 5,752,130, Cl. 399-101.000.
- Kobayashi, Kazushi: *See—*
  - Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.
- Kobayashi, Kazutada: *See—*
  - Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji, 5,752,089, Cl. 396-48.000.
- Kobayashi, Kenji; and Takeda, Hitoshi, to Kabushiki Kaisha Endo Seisakusho. Golf club head. 5,749,794, Cl. 473-342.000.
- Kobayashi, Kenzo: *See—*
  - Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, 5,750,987, Cl. 250-251.000.
- Kobayashi, Koichi; Iwanami, Wataru; and Kanai, Taiyo, to Seiko Epson Corporation. Method of forming colored relief-and-indentation patterns and a thermal transfer foil. 5,750,241, Cl. 428-199.000.
- Kobayashi, Masaharu: *See—*
  - Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.
- Kobayashi, Masaki: *See—*
  - Wakabayashi, Toshitsuga; and Kobayashi, Masaki, 5,751,367, Cl. 348-511.000.
- Kobayashi, Misao, to Nisca Corporation. Sorter with different bin positions. 5,749,573, Cl. 271-293.000.
- Kobayashi, Seiichi: *See—*
  - Christ, William J.; Rossignol, Daniel P.; Kobayashi, Seiichi; and Kawata, Tsutomu, 5,750,664, Cl. 536-17.200.
- Kobayashi, Shigetada, to Canon Kaubshiki Kaisha. Image processing method. 5,751,857, Cl. 382-232.000.
- Kobayashi, Tetsuo: *See—*
  - Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirohumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.
- Kobylecki, Ryszard Jurek: *See—*
  - Danilewicz, John Christopher; Ellis, David; and Kobylecki, Ryszard Jurek, 5,750,520, Cl. 514-212.000.
- Koch, Frank J.; Vandervalk, Leon C.; and Beamish, David J., to DeFelsko Corporation. Coating thickness gauge. 5,751,608, Cl. 364-563.000.
- Kock, Bernhard, to Mannesmann Aktiengesellschaft. Device to reduce ventilation loss of a high-speed gear mechanism. 5,749,267, Cl. 74-467.000.
- Kodaira, Jun-ichi: *See—*
  - Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,751,459, Cl. 359-197.000.
- Kodama, Kenichi: *See—*
  - Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, 5,751,748, Cl. 372-31.000.
- Kodama, Tatsuhiko: *See—*

  - Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, 5,750,825, Cl. 800-2.000.
- Koebler, Douglas J.: *See—*
  - Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., 5,750,029, Cl. 210-634.000.
- Koenig & Bauer-Albert Aktiengesellschaft: *See—*
  - Barrois, Claus Dieter; Lindner, Georg Johann; and Zelfel, Hans-Jürgen, 5,749,299, Cl. 101-483.000.
- Kogge, Peter Michael: *See—*
  - Wilkinson, Paul Amba; Dieffenderfer, James Warren; Kogge, Peter Michael; and Schoonover, Nicholas Jerome, 5,752,067, Cl. 395-800.160.
- Kogure, Yasuo: *See—*
  - Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, 5,751,935, Cl. 395-182.040.
- Kohama, Tokio: *See—*
  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Kohlberg, Elon. Mathematical teaching apparatus. 5,749,734, Cl. 434-195.000.
- Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, to Bayer AG. Flameproofed polycarbonate/ABS blends resistant to stress cracking. 5,750,602, Cl. 524-127.000.
- Kohtz, Robert A.: *See—*
  - DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.
- Koike, Hisashi, to Canon Kabushiki Kaisha. Output apparatus and method capable of emulating a mode of received data. 5,751,430, Cl. 358-296.000.
- Koike, Ryuichi; Banno, Hiroshi; Ito, Tamotsu; and Takeuchi, Takashi, to Hitachi, Ltd. Information recording media and optical disk, disk having specific data so that a visible pattern of characters or graphics appear on a copy disk. 5,751,671, Cl. 369-14.000.
- Koike, Sou; and Hirano, Masao, to YKK Architectural Products Inc. Structure of mating portions of double door assembly. 5,749,175, Cl. 49-368.000.
- Koito Manufacturing Co., Ltd.: *See—*
  - Harada, Tadashi; and Uchida, Kihachiro, 5,749,743, Cl. 439-336.000.
- Koizumi, Makoto: *See—*
  - Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, 5,750,511, Cl. 514-44.000.
- Kojima, Akio: *See—*
  - Kawahara, Megumi; Yamada, Ikuko; Shoshi, Masayuki; and Kojima, Akio, 5,750,762, Cl. 558-423.000.
- Kojima, Kiyoshi: *See—*
  - Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, 5,751,828, Cl. 381-199.000.
- Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, to Hitachi, Ltd. Radio paging system. 5,751,935, Cl. 395-182.040.
- Kojro, Allan: *See—*
  - Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, 5,751,788, Cl. 378-197.000.
- Kokubo, Hiroyasu: *See—*
  - Maruyama, Naosuke; Kokubo, Hiroyasu; and Nakamura, Shin-Ichiro, 5,750,148, Cl. 424-494.000.
- Kokunishi, Motohide: *See—*
  - Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.
- Kokusai Denshin Denwa Co., Ltd.: *See—*
  - Kobayashi, Hideo; Inoue, Takashi; and Ishikawa, Hiroyasu, 5,751,703, Cl. 370-321.000.
- Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
  - Nomoto, Shinichi; Kobayashi, Hideo; Honda, Teruhiko; and Hara, Kazuo, 5,751,247, Cl. 342-359.000.
- Kolasa, Teodozyj: *See—*
  - Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., 5,750,558, Cl. 514-415.000.
- Kolberg, Uwe: *See—*
  - Grabowski, Danuta; Kolberg, Uwe; Weitzel, Alwin; and Winkler-Trudewig, Magdalena, 5,750,448, Cl. 501-47.000.
- Kolch, Walter: *See—*
  - Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.
- Kolczynski, Raymond Joseph: *See—*
  - Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.
- Kolen, John F.: *See—*
  - Large, Edward W.; and Kolen, John F., 5,751,899, Cl. 395-2.160.
- Kolena, David Philip: *See—*
  - Crane, Robert Scott; Kolena, David Philip; and Berg, Alan Dean, 5,749,135, Cl. 29-415.000.
- Kollie, Thomas G.: *See—*
  - Ludtka, Gerard M.; Kollie, Thomas G.; Watkin, David C.; and Walton, David G., 5,750,882, Cl. 73-38.000.
- Komatsu, Hiroshi, to Seiko Epson Corporation. Field-discharge fluorescent-display with fluorescent layer including glass. 5,751,107, Cl. 313-496.000.
- Komatsu, Hisateru: *See—*
  - Konno, Makoto; Shibata, Akira; Watanabe, Takashi; and Komatsu, Hisateru, 5,751,518, Cl. 360-104.000.
- Komatsu, Ikuo; Sato, Nobuyuki; and Imazu, Katsuhiro, to Toyo Seikan Kaisya, Ltd. Seamless can with necked-in portion. 5,750,222, Cl. 428-35.800.
- Komatsu, Satoshi: *See—*
  - Shibanuma, Takashi; Homoto, Yukio; Komatsu, Satoshi; and Yoshimura, Toshikazu, 5,750,809, Cl. 570-169.000.
- Komine, Hitoshi, to Olympus Optical Co., Ltd. Video image processing apparatus. 5,751,886, Cl. 386-48.000.
- Komiyama, Manabu: *See—*
  - Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, 5,751,877, Cl. 385-93.000.
- Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, to Shin-Etsu Chemical Co., Ltd. Process for the preparation of a high-molecular-weight polycarbodiimide solution. 5,750,636, Cl. 528-310.000.
- Komoto, Yasuyoshi: *See—*
  - Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, 5,750,637, Cl. 528-310.000.
- Komura, Akihiko; Onuma, Kenji; and Akena, Mayumi, to Canon Kabushiki Kaisha. Apparatus for spraying particulate material in an evaporatable dispersion having elecrical potential. 5,749,973, Cl. 118-626.000.
- Kon, Akihiko; and Naruse, Akihiko, to Yamatake-Honeywell Co. Ltd. Building management system having set offset value learning and set bias value determining system for controlling thermal environment. 5,751,916, Cl. 395-77.000.
- Konda, Eiji; Ishii, Nobuhisa; and Matsuoka, Ryuichi, to Furukawa Electric Co., Ltd. Optical fiber cable. 5,751,881, Cl. 385-110.000.
- Kondo, Hiroto: *See—*
  - Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, 5,750,372, Cl. 435-69.100.
- Kondo, Masahiko: *See—*
  - Yamada, Nobuaki; Kondo, Masahiko; Okamoto, Masayuki; and Kozaki, Shuichi, 5,751,382, Cl. 349-12.000.
- Kondo, Shigeki: *See—*
  - Yonehara, Takao; Sato, Nobuhiko; Sakaguchi, Kiyofumi; and Kondo, Shigeki, 5,750,000, Cl. 156-630.100.
- Kondoh, Masahiro: *See—*
  - Morikawa, Sumio; Ohga, Toshiji; and Kondoh, Masahiro, 5,749,146, Cl. 30-134.000.
- Kondrats, Nicholas: *See—*
  - Woodhall, Edward W.; and Kondrats, Nicholas, 5,750,190, Cl. 427-156.000.
- Könemann, Martin: *See—*
  - Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, 5,750,752, Cl. 556-1.000.
- Kong, Peter C.: *See—*
  - Detering, Brent A.; Donaldson, Alan D.; Fincke, James R.; and Kong, Peter C., 5,749,937, Cl. 75-10.190.
- Konica Corporation: *See—*
  - Haneda, Satoshi, 5,752,137, Cl. 399-223.000.
  - Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.
- Konica Corporation and Mitsubishi Chemical Corporation: *See—*
  - Taniguchi, Tetsuya; Sasa, Nobumasa; and Shimizu, Kunio, 5,750,311, Cl. 430-253.000.
- Konig, Gottfried, to EJOT Verbindung Stechnik GmbH & Co. KG. Drill, particulary drilling screw. 5,749,689, Cl. 411-387.000.
- König, Klaus: *See—*
  - Laas, Hans-Josef; Halpaap, Reinhard; Pedain, Josef; and König, Klaus, 5,750,629, Cl. 528-45.000.
- Konigsfeld, Kris G.: *See—*
  - Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
- Koninklijke PTT Nederland N.V.: *See—*
  - Anstötz, Karin Helene Maria; and Coolegem, Karel Gerard, 5,751,271, Cl. 345-146.000.
- Konno, Chisato; and Okochi, Toshio, to Hitachi, Ltd. Program execution control in parallel processor system for parallel execution of plural jobs by selected number of processors. 5,752,030, Cl. 395-672.000.
- Konno, Makoto; Shibata, Akira; Watanabe, Takashi; and Komatsu, Hisateru, to Mitsumi Electric Co., Ltd. Head feeding mechanism in magnetic recording and reproducing device. 5,751,518, Cl. 360-104.000.
- Konomi, Masao: *See—*
  - Yamaguchi, Noboru; and Konomi, Masao, 5,751,822, Cl. 381-94.100.
- Kool, Eric T., to Research Corporation Technologies Inc. Stem-loop oligonucleotides containing parallel and antiparallel binding domains. 5,750,670, Cl. 536-24.300.
- Koonen, Antonius Marcellus Jozef, to Lucent Technologies Inc. Multiwavelength add/drop multiplexer. 5,751,456, Cl. 359-127.000.
- Koopman, Michael A., to J.C.Robinson Seed Company. Inbred corn line NR 109. 5,750,852, Cl. 800-200.000.
- Kopchick, John Joseph: *See—*
  - Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.

Kopin, Alan S.; and Beinborn, Martin, to New England Medical Center Hospitals, Inc. Assay for non-peptide agonists to peptide hormone receptors. 5,750,353, Cl. 435-7.210.

Kopin Corporation: *See—*

Zavracky, Matthew; Odryna, Vic; and Mansell, Barry, 5,751,261, Cl. 345-55.000.

Kopka, Ihor: *See—*

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Koralek, Richard: *See—*

Pressey, James; Koralek, Richard; and Smith, Francis J., 5,751,769, Cl. 375-235.000.

Korea Advanced Institute of Science & Technology: *See—*

Kim, Jin Baek; Jung, Min Ho; and Chang, Kyeong Ho, 5,750,680, Cl. 540-200.000.

Korea Telecommunication Authority: *See—*

Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.

Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, 5,750,452, Cl. 501-138.000.

Korinsky, George K., to Compaq Computer Corporation. Ultra-quiet, thermally efficient cooling system for forced air cooled electronics. 5,751,550, Cl. 361-695.000.

Kornachuk, Steve P.; and Becker, Scott T., to Artisan Components, Inc. High speed memory output circuitry and methods for implementing same. 5,751,649, Cl. 365-205.000.

Kosaka, Tetsuo; Sakurai, Atsushi; and Tamura, Junichi, to Canon Kabushiki Kaisha. Speech recognition method and apparatus for use therein. 5,751,898, Cl. 395-2.500.

Kose Corporation: *See—*

Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.

Kosenka, Paul P.: *See—*

Godec, Richard D.; Kosenka, Paul P.; and Hutte, Richard S., 5,750,073, Cl. 422-79.000.

Kosich, Joseph, to Wheelock Inc. Synchronized video/audio alarm system. 5,751,210, Cl. 340-293.000.

Kostic, Zoran; and Pavlovic, Gordana, to Lucent Technologies Inc. Technique for minimizing the variance of interference in packetized interference-limited wireless communication systems. 5,751,704, Cl. 370-335.000.

Kostreski, Bruce: *See—*

Voit, Eric A.; Kostreski, Bruce; Liptak, Lance; and DePaul, Kenneth, 5,751,707, Cl. 370-384.000.

Kotani, Noriyasu: *See—*

Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.

Kotlarz, Ronald: *See—*

Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.

Kousoum, Juliana: *See—*

Choucri, Nazli; and Kousoum, Juliana, 5,752,023, Cl. 395-610.000.

Kovacs, Gregory J.: *See—*

Parker, Delmer G.; and Kovacs, Gregory J., 5,751,437, Cl. 358-300.000.

Kovacs, Stephen G., to Duke University. Direct mechanical bi-ventricular cardiac assist device. 5,749,839, Cl. 601-153.000.

Kowalewski, Joern: *See—*

Dorff, Peter; Kowalewski, Joern; Doehler, Sigrid Anni Lore; and Krabbenhoeft, Uwe-Jens, 5,751,845, Cl. 382-162.000.

Kowatari, Takehiko; Arai, Nobukatsu; and Kobayashi, Chihiro, to Hitachi, Ltd. Air flow rate measuring apparatus and air flow rate measuring method. 5,750,889, Cl. 73-118.200.

Koyama, Hiroshi; and Takemoto, Etsuo, to Daicel Chemical Industrial, Ltd. Highly purified 1-aminopropanediol-2,3. 5,750,792, Cl. 564-507.000.

Koyama, Masahisa: *See—*

Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.

Koyama, Takeshi, to Canon Kabushiki Kaisha. Multi-point distance measuring apparatus. 5,751,409, Cl. 356-3.140.

Koyama, Yoshito: *See—*

Nakajima, Yoshifumi; and Koyama, Yoshito, 5,751,193, Cl. 331-3.000.

Koyano, Masahiro: *See—*

Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.

Koyasu, Yukio: *See—*

Ushikubo, Takashi; Koyasu, Yukio; and Nakamura, Hiroya, 5,750,760, Cl. 558-319.000.

Koyo Seiko Co., Ltd.: *See—*

Nishimoto, Mitsuhiko; and Inoue, Makoto, 5,752,209, Cl. 701-41.000.

Kozaki, Shuichi: *See—*

Yamada, Nobuaki; Kondo, Masahiko; Okamoto, Masayuki; and Kozaki, Shuichi, 5,751,382, Cl. 349-12.000.

Kozuka, Michihiro: *See—*

Tomita, Mihoko; and Kozuka, Michihiro, 5,751,477, Cl. 359-447.000.

Krabbenhoeft, Uwe-Jens: *See—*

Dorff, Peter; Kowalewski, Joern; Doehler, Sigrid Anni Lore; and Krabbenhoeft, Uwe-Jens, 5,751,845, Cl. 382-162.000.

Kraiczek, Karsten G.; and Effelsberg, Uwe, to Hewlett-Packard Company. Method and apparatus for temperature compensated optical sensor mounting. 5,750,978, Cl. 250-216.000.

Krakirian, Shahe H., to Adaptec, Inc. Method for receiving a first SCSI command subsequent receiving second SCSI command and starting data transfer, reconnecting and performing data transfer for first SCSI command. 5,752,083, Cl. 395-894.000.

Kramer, Ronald A., to Bandon Corp. Enclosed fluid system conditioner and process therefor. 5,750,479, Cl. 508-463.000.

Kranich, Uwe, to Advanced Micro Devices, Inc. Apparatus and method for reducing read miss latency by predicting sequential instruction read-aheads. 5,752,263, Cl. 711-137.000.

Kranzen, Bruno: *See—*

Rajkanan, Kamal; and Kranzen, Bruno, 5,750,426, Cl. 438-210.000.

Krappe, Udo: *See—*

Gottschalk, Axel; Stadler, Raimund; and Krappe, Udo, 5,750,621, Cl. 525-68.000.

Krasovitski, Boris: *See—*

Tunkel, Lev; Krasovitski, Boris; and Foster, Rorbert L., 5,749,231, Cl. 62-5.000.

Krasutsky, Pavel A.: *See—*

Carlson, Robert M.; Krasutsky, Pavel A.; and Karim, M. Reza-Ul, 5,750,578, Cl. 514-766.000.

Krau, Michael P.: *See—*

DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.

Kraus, Joey; Keeble, Jamie; and Moore, Jimmy. Liquid retrieving adaptor for cylindrical containers. 5,749,500, Cl. 222-377.000.

Krause, John C.: *See—*

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.

Krausman, David T.: *See—*

Allen, Richard P.; and Krausman, David T., 5,749,372, Cl. 128-782.000.

Krauss, Walter: *See—*

Specht, Martin; and Krauss, Walter, 5,749,536, Cl. 242-374.000.

Krebs, Jimmy M., to Benchmarc Display, Incorporated. Tire support. 5,749,475, Cl. 211-24.000.

Kreemer, Gary Allen, to Sanilift Company, Ltd., The. Toilet seat having a sanitary lifting surface. 5,749,103, Cl. 4-237.000.

Kreiter, Alexander; and Kremastiotis, Vassilis, to Oce Printing Systems GmbH. Method and apparatus for avoiding slip in transporting a recording substrate in a fixing station of an electrographic printer or copier. 5,752,153, Cl. 399-384.000.

Kremastiotis, Vassilis: *See—*

Kreiter, Alexander; and Kremastiotis, Vassilis, 5,752,153, Cl. 399-384.000.

Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, to General Motors Corporation. Exhaust management system. 5,749,223, Cl. 60-300.000.

Krevalis, Martin A.: *See—*

Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., 5,750,750, Cl. 554-117.000.

Krisher, James A., to Dana Corporation. Method and structure for camber and caster adjustment for motor vehicle wheel end assembly. 5,749,594, Cl. 280-661.000.

Krishna, Tumma Hari: *See—*

Gupta, Niranjan Lal; Sankaran, Ramanathan; Chattejee, Sugata; and Krishna, Tumma Hari, 5,750,683, Cl. 540-214.000.

Krishnamurti, Ramesh: *See—*

Buchanan, Robert A.; Krishnamurti, Ramesh; Hichri, Habib; and Johnson, David C., 5,750,811, Cl. 570-208.000.

Krishnaswami, Vasanth: *See—*

Bryant, Bruce David; Krishnaswami, Vasanth; and Marko, Kenneth Andrew, 5,752,213, Cl. 701-111.000.

Krivohlavek, Dennis; King, Gayle; and Planche, Jean-Pascal, to Eli France. Bitumen/polymer composition vulcanizable at temperatures below 100°C. 5,750,598, Cl. 524-71.000.

Krivoshlykov, Sergej G.; and Skutnik, Bolesh J., to Ceram Optec Industries, Inc. Method for coupling of semiconductor lasers into optical fibers. 5,751,871, Cl. 385-33.000.

Krofchak, David, to Fenicem Minerals, Inc. Method of making cement from base metal smelter slag. 5,749,962, Cl. 106-714.000.

Krohn, Bradley Martin: *See—*

Barry, Gerard Francis; Kishore, Ganesh Murthy; and Krohn, Bradley Martin, 5,750,876, Cl. 800-205.000.

Krolak, David John; Grosbach, Lyle Edwin; Levenstein, Sheldon B.; and Irish, John David, to International Business Machines Corporation. Abridged virtual address cache directory. 5,751,990, Cl. 395-417.000.

Krolikiewicz, Konrad: *See—*

Vorbrüggen, Helmut; Krolikiewicz, Konrad; and Bennua-Skalmowski, Bärbel, 5,750,676, Cl. 536-55.300.

Kroll, Mark W.: *See—*

Brumwell, Dennis A.; Perttu, Joseph S.; Kroll, Mark W.; and Nelson, Randall S., 5,749,910, Cl. 607-36.000.

Kromp, Thomas, to GfT Gesellschaft fuer Tauchtechnik mbH & Co. KG. Method and device for letting out gas from life jackets of divers. 5,749,679, Cl. 405-186.000.

Kroona, Heather B.: *See—*

Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., 5,750,506, Cl. 514-15.000.

Krtolica, Boris: *See—*

Melen, Roger D.; and Krtolica, Boris, 5,752,079, Cl. 395-827.000.

Kruckemeyer, William Charles: *See—*

Jensen, Eric Lee; Kruckemeyer, William Charles; and Fehring, John David, 5,749,596, Cl. 280-689.000.

Krug, Eric M.: *See—*

Cannon, Thomas G.; DeHart, Daniel L.; and Krug, Eric M., 5,751,590, Cl. 364-479.030.

Krüger, Martin; Seelen, Werner; and Turski, Lechoslaw, to Schering Aktiengesellschaft. Pyrido [1,2,3-DE]quinoxaline derivatives, process for their production and their use in pharmaceutical agents. 5,750,526, Cl. 514-250.000.

Krüger, Niels; and Steinbüchel, Alexander, to Monsanto Company. DNA sequence useful for the production of polyhydroxyalkanoates. 5,750,848, Cl. 800-205.000.

Krummel, Guenter; and Knell, Marcus, to American Cyanamid Company. Process for the preparation of arylmalonates. 5,750,766, Cl. 560-82.000.

Kruy, Steven J.: *See—*

Land, Mark S.; Kruy, Steven J.; Perlman, Andrew T.; and Walvick, Edward A., 5,751,706, Cl. 370-352.000.

Krzeminski, Jacek: *See—*

Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Krzeminski, Jacek; and Nawrot, Barbara, 5,750,675, Cl. 536-27.210.

Kubby, Joel A.: *See—*

Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., 5,751,317, Cl. 347-65.000.

Küber, Frank: *See—*

Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, 5,750,752, Cl. 556-1.000.

Kuberasampath, Thangavel: *See—*

Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,750,651, Cl. 530-350.000.

Kubo, Jon C.: *See—*

Ringland, William K.; and Kubo, Jon C., 5,751,829, Cl. 382-100.000.

Kubo, Manfred: *See—*

Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, 5,750,444, Cl. 442-62.000.

Kubo, Minoru: *See—*

Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.

Kubo, Norio: *See—*

Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.

Kuboshima, Katsumi: *See—*

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.

Kubota, Kazuhide: *See—*

Yoshiike, Etsuko; Takemoto, Kiyohiko; and Kubota, Kazuhide, 5,749,951, Cl. 106-31.270.

Kubota, Yasuyuki: *See—*

Ishii, Tetsuya; Kuriwaki, Masashi; and Kubota, Yasuyuki, 5,749,363, Cl. 128-661.030.

Kuchel, Bernhard W.: *See—*

Mauldin, Michael W.; and Kuchel, Bernhard W., 5,749,133, Cl. 29-91.100.

Kuebler, Siegfried; and Garrett, Frank, to Wilson Sporting Goods Co. Racket for tennis or the like games. 5,749,798, Cl. 473-549.000.

Kuehn, Eberhard: *See—*

Sezi, Racai; Ahne, Hellmut; and Kuehn, Eberhard, 5,750,711, Cl. 548-165.000.

Kugell, Stanley; and Friend, David, to Faxnet Corp. Proactive voice mail service. 5,751,794, Cl. 379-89.000.

Kuhn, Alfred K.: *See—*

Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., 5,750,009, Cl 203-64.000.

Kuhn S.A.: *See—*

Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.

Kukimoto, Tsutomu: *See—*

Aita, Shuichi; Kukimoto, Tsutomu; Yoshida, Satoshi; and Hano, Yoshifumi, 5,751,405, Cl. 355-269.000.

Kula, Maria-Regina: *See—*

Elling, Lothar; and Kula, Maria-Regina, 5,750,389, Cl. 435-193.000.

Kulite Semiconductor Products, Inc.: *See—*

Kurtz, Anthony D.; Ned, Alexander A.; and Vergel de Dios, Timoteo I., 5,750,898, Cl. 73-727.000.

Kuljis, Zoran R. Computer mouse hook. 5,750,934, Cl. 174-135.000.

Kullick, Steven E.; Spirakis, Charles S.; and Titus, Diane J., to Apple Computer, Inc. Method and apparatus for transferring archival data among an arbitrarily large number of computer devices in a networked computer environment. 5,751,997, Cl. 395-489.000.

Kulp, Jack H.; and Wehring, Billy E., to Traffix Devices. Stackable vertical panel. 5,749,673, Cl. 404-10.000.

Kulpe, Jürgen: *See—*

Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, 5,750,221, Cl. 428-35.700.

Kumagai, Tomoyuki: *See—*

Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, 5,749,563, Cl. 251-61.500.

Kumamoto, Satoshi: *See—*

Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, 5,751,584, Cl. 364-474.200.

Kumar, Ananda H.; and Shamouilian, Shamouil, to Applied Materials, Inc. Multielectrode electrostatic chuck with fuses. 5,751,537, Cl. 361-234.000.

Kumar, Anil M.: *See—*

Klein, J. Peter; Underiner, Gail E.; and Kumar, Anil M., 5,750,575, Cl. 514-617.000.

Kumar, Chandrika: *See—*

Li, Yi; Rosen, Craig A.; and Kumar, Chandrika, 5,750,370, Cl. 435-69.100.

Kume, Masahiro: *See—*

Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, 5,751,756, Cl. 372-46.000.

Kumegawa, Masahiro: *See—*

Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Kundrat, David M., to Armco Inc. Melting of NI laterite in making NI alloyed iron or steel. 5,749,939, Cl. 75-560.000.

Kung, Teh-Ming: *See—*

Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, 5,750,465, Cl. 503-227.000.

Kunse, Thomas R., to Northern Logistics, L.L.C. Dry van trailer conversion and material handling method. 5,749,683, Cl. 406-41.000.

Kunugi, Takeshi: *See—*

Ueno, Makoto; Kunugi, Takeshi; Ohyama, Kazuya; and Yazaki, Hiroomi, 5,752,189, Cl. 455-435.000.

Kuo, Gee-Hong: *See—*

Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., 5,750,550, Cl. 514-373.000.

Kuo, Han C.: *See—*

Chi, Ignacio; Ramaswami, Karthik; Kuo, Han C.; and Todino, Christa, 5,750,282, Cl. 429-49.000.

Kuo, Sy-Yen; Chiueh, Tzi-Dar; and Chen, Ke-Horng, to National Science Council of Republic of China. Double edge triggered flip-flop. 5,751,174, Cl. 327-199.000.

Kuperschmidt, Vladimir: *See—*

Topping, Allen; Kuperschmidt, Vladimir; and Gormley, Austin, 5,751,835, Cl. 382-115.000.

Kurabayashi, Yutaka: *See—*

Sakaki, Mamoru; and Kurabayashi, Yutaka, 5,751,306, Cl. 347-22.000.

Kuragaki, Satoru: *See—*

Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, 5,752,214, Cl. 701-111.000.

Kuramochi, Junko: *See—*

Kimura, Kazumi; Mitsutake, Hideaki; Yano, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, 5,749,642, Cl. 353-98.000.

Kuramoto, Shinichi: *See—*

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.

Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, to Showa Denko K.K. Method of forming solder film. 5,750,271, Cl. 428-624.000.

Kuraray Co., Ltd.: *See—*

Yoshimura, Osamu; and Matsuzaki, Ichiro, 5,751,478, Cl. 359-453.000.

Kurashiki Boseki Kabushiki Kaisha: *See—*

Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.

Yuasa, Hiroshi; and Furuichi, Kozo, 5,750,246, Cl. 428-318.400.

Kurata, Kenichirou: *See—*

Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, 5,752,214, Cl. 701-111.000.

Kurebayashi, Youichi: *See—*

Nakata, Koichi; Mogi, Kazuhisa; and Kurebayashi, Youichi, 5,751,147, Cl. 324-399.000.

Kurihara, Hiroki: *See—*

Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, 5,750,825, Cl. 800-2.000.

Kurihara, Kenichi; Ata, Masafumi; Matsute, Masataka; and Watanabe, Haruo, to Sony Corporation. Magnetic recording medium comprising magnetic particles, binder, and a cure agent of isocyanurate trimers, pentamers and heptamers. 5,750,261, Cl. 428-422.800.

Kurihara, Kouichi: *See—*

- Shimoda, Kenji; Abe, Shuji; and Kurihara, Kouichi, 5,751,893, Cl. 386-111.000.

- Kurihara, Yukiko: *See—*
  - Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, 5,750,825, Cl. 800-2.000.
- Kurimoto, Tadashi: *See—*
  - Mera, Yukinori; Nishi, Naoki; Kurimoto, Tadashi; and Sato, Hiroki, 5,750,524, Cl. 514-247.000.
- Kuriwaki, Masashi: *See—*
  - Ishii, Tetsuya; Kuriwaki, Masashi; and Kubota, Yasuyuki, 5,749,363, Cl. 128-661.030.
- Kuriyama, Mitsuo: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Kurlenya, Mikhail Vladimirovich: *See—*
  - Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.
- Kuroda, Akira: *See—*
  - Yuza, Akira; Adachi, Nobukazu; Kuroda, Akira; and Sugita, Takeshi, 5,752,149, Cl. 399-329.000.
- Kuroda, Hiroshi: *See—*
  - Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, 5,752,214, Cl. 701-111.000.
- Kuroda, Ryo; and Shido, Shunichi, to Canon Kabushiki Kaisha. Scanning probe tip covered with an electrical resistance to limit recording/reproducing current. 5,751,686, Cl. 369-126.000.
- Kuroda, Ryo: *See—*
  - Takeda, Toshihiko; Kuroda, Ryo; and Yasuda, Susumu, 5,751,684, Cl. 369-126.000.
- Kurokawa, Masahiro: *See—*
  - Isozaki, Tsuyoshi; Kurokawa, Masahiro; and Honma, Akihiro, 5,750,739, Cl. 549-515.000.
- Kurosawa, Koichi: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Kurotaka, Shigeo: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Kuroyanagi, Satoshi: *See—*
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
- Kurtz, Anthony D.; Ned, Alexander A.; and Vergel de Dios, Timoteo I., to Kulite Semiconductor Products, Inc. Passivation/patterning of PZR diamond films for high temperature transducer operability. 5,750,898, Cl. 73-727.000.
- Kurtz, Stuart Jacob, to Union Carbide Chemicals & Plastics Technology Corporation. Continuous squeeze flow mixing process. 5,749,653, Cl. 366-256.000.
- Kurz, Edward A.: *See—*
  - McGuckin, Hugh G.; Badger, John S.; and Kurz, Edward A., 5,750,322, Cl. 430-463.000.
- Kurz, Hans-Joachim, to Baldwin-Gegenheimer GmbH. Temperature control device in printing machines. 5,749,295, Cl. 101-350.100.
- Kusaba, Takashi: *See—*
  - Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, 5,752,130, Cl. 399-101.000.
- Kusaka, Hiroaki: *See—*
  - Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.
- Kusakabe, Satoshi: *See—*
  - Katsumata, Masaaki; and Kusakabe, Satoshi, 5,751,771, Cl. 375-240.000.
- Kusano, Satoshi, to Pioneer Electronic Corporation. Image scanning system. 5,751,866, Cl. 382-312.000.
- Kusano, Taizou; Kashiwabara, Yoshiro; Wada, Yasuhiro; and Umeda, Keisuke, to Matsushita Electric Industrial Co., Ltd. Optical disk recording and reproducing method and apparatus therefor. 5,751,676, Cl. 369-50.000.
- Kusek, Stephen M.: *See—*
  - Blackmon, James B.; Stone, Kenneth W.; and Kusek, Stephen M., 5,751,503, Cl. 359-846.000.
- Kuselman, Ilya: *See—*
  - Sherman, Felix; Kuselman, Ilya; and Shenbar, Avinoam, 5,750,404, Cl. 436-42.000.
- Kushida, Tomoyoshi, to Toyota Jidosha Kabushiki Kaisha. Semiconductor device and manufacture method of the same. 5,750,429, Cl. 438-268.000.
- Kusilek, Thomas V.: *See—*
  - Hachey, Kathleen A.; Stump, Larry K.; Beseup, Terrance L.; and Kusilek, Thomas V., 5,750,191, Cl. 427-163.400.
- Kusumoto, Toshihiko: *See—*
  - Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.
- Kuthyar, Ashok K.: *See—*
  - Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.
- Kutz, Kurt. Screw nut fastener assembly. 5,749,690, Cl. 411-431.000.
- Kuwabara, Nobuyuki: *See—*
  - Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.
- Kuwahara, Shigeki: *See—*
  - Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.
- Kuwaki, Tetsuo: *See—*
  - Nishida, Haruo; Yamashita, Mitsuhiro; Ochi, Yoshiki; and Kuwaki, Tetsuo, 5,750,218, Cl. 428-35.500.
- Kuwana, Yoshihisa: *See—*
  - Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, 5,750,078, Cl. 424-133.100.
- Kuwata, Haruhiko: *See—*
  - Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, 5,751,203, Cl. 336-65.000.
- Kuwata, Naoki: *See—*
  - Yamamoto, Takuji; and Kuwata, Naoki, 5,751,185, Cl. 327-558.000.
- Kuwatsuka, Haruhiko, to Fujitsu Limited. Phase conjugate wave generating device, wavelength converting method, optical dispersion compensating method and multi-wavelength light generating device. 5,751,758, Cl. 372-96.000.
- Kvaerner Oilfield Products: *See—*
  - Wilkins, Robert Lee; Gullion, Steven Dwayne; and Jones, Charles Edward, 5,749,608, Cl. 285-123.120.
- Kwak, Sung Hoon: *See—*
  - Baek, Dae Bong; and Kwak, Sung Hoon, 5,751,160, Cl. 326-27.000.
- Kwart, Marion: *See—*
  - Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, 5,750,362, Cl. 435-29.000.
- Kwon, Byoung Ha; and Lee, Hyeong Kook, to L.G. Electronics Inc. Magnet assembly for linear motor. 5,751,075, Cl. 310-12.000.
- Kwon, O-Kyun: *See—*
  - Hyun, Kyung-Sook; Kwon, O-Kyun; Kim, Kwang-Joon; and Lee, El-Hang, 5,751,468, Cl. 359-282.000.
- Kwon, Tae-Kyong, to LG Electronics, Inc. Recording/reproducing system of a DVCR. 5,751,894, Cl. 386-116.000.
- Kwon, Young Key; Mesropian, Ashot; Lee, Kwang Min; and Soboley, Sergey, to Rocky Mountain Instrument Company. Method and apparatus for cylindrical coordinate laser engraving. 5,751,436, Cl. 358-299.000.
- Kyle, Richard F.; Clewett, Richard H.; and Wright, Drew D., to Ace Medical Company. Keyed/keyless barrel for bone plates. 5,749,872, Cl. 606-69.000.
- Kyocera Corporation: *See—*
  - Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.
- Kyodo Printing Co., Ltd.: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Kyoto Dai-ichi Kagaku Co., Ltd.: *See—*
  - Dou, Xiaoming; Yamaguchi, Yoshinori; and Uenoyama, Harumi, 5,750,410, Cl. 436-525.000.
- Kyoto Daiichi Kagaku Co., Ltd.: *See—*
  - Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.
- Kyouryou Hozen Inc.: *See—*
  - Fukuoka, Katsumi, 5,749,200, Cl. 52-741.100.
- Kyowa Chemical Industry Co., Ltd.: *See—*
  - Nosu, Tsutomu; Hiraishi, Wataru; and Sawa, Yoshiharu, 5,750,609, Cl. 524-413.000.
- Kyowa Hakko Kogyo Co., Ltd.: *See—*
  - Oda, Hideki; Nakagawa, Satoshi; and Anazawa, Hideharu, 5,750,368, Cl. 435-69.100.
  - Saito, Chiaki; and Ohuchi, Kozo, 5,750,164, Cl. 426-47.000.
  - Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, 5,750,078, Cl. 424-133.100.
- Kyoya, Shouichi, to Alps Electric Co., Ltd. Light-emitting module. 5,751,878, Cl. 385-93.000.
- Kyte, Terreena. Disposable self-capping needle. 5,749,860, Cl. 604-192.000.
- Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, to Brother Kogyo Kabushiki Kaisha. Embroidery data processing method. 5,751,583, Cl. 364-470.080.
- Kyushu Fujitsu Electronics Limited: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- L.D. Kichler Co., The: *See—*
  - Porter, David H.; and Milicia, Libbe A., 5,749,643, Cl. 362-146.000.

- L.G. Electronics Inc.: *See—*
  - Kwon, Byoung Ha; and Lee, Hyeong Kook, 5,751,075, Cl. 310-12.000.
- L&P Property Management Co.: *See—*
  - Barnett, Clayton M., 5,749,108, Cl. 5-264.100.
- Laabs, Gary R.; and Anderson, Donald R., to Laabs, Gary R. Centrally installed cleaning/washing system for buildings. 5,749,526, Cl. 239-307.000.
- Laas, Hans-Josef; Halpaap, Reinhard; Pedain, Josef; and König, Klaus, to Bayer Aktiengesellschaft. Uretdione diisocyanates and a process for their production. 5,750,629, Cl. 528-45.000.
- Labelle, Marc: *See—*
  - Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.
- Laber, David I.: *See—*
  - Ellsworth, William D.; Dike, David Z.; and Laber, David I., 5,749,822, Cl. 493-248.000.
- Laboratoires De Therapeutique Moderne: *See—*
  - Christen, Marie-Odile; and Burgot, Jean-Louis, 5,750,560, Cl. 514-441.000.
- Laboratoires Goemar S.A.: *See—*
  - Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
- Lacas, Mark A.; and Warman, David J., to MediaLink Technologies Corporation. Communicating system. 5,751,713, Cl. 370-445.000.
- Lacey, William J.; and Elkins, John, to Hospitak, Inc. Tracheostomy mask with tracheostomy tube alignment stabilizer. 5,749,360, Cl. 128-207.140.
- LaCount, Kenneth Harry: *See—*
  - Brown, John Hiram; LaCount, Kenneth Harry; and Petty, Terry Lyle, 5,749,538, Cl. 242-559.200.
- LaCroix, Price W.: *See—*
  - Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
- Lagarde, Konrad Charles: *See—*
  - Rogers, Richard Michael; and Lagarde, Konrad Charles, 5,752,246, Cl. 707-10.000.
- Lagerquist, Roger: *See—*
  - Vidal, Claude A.; Plyley, Alan K.; Redmond, Russell J.; and Lagerquist, Roger, 5,749,893, Cl. 606-205.000.
- Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, to Hewlett-Packard Company. Boundary scan testing device. 5,751,737, Cl. 371-22.320.
- Lahanas, Konstantinos M.; Toma, Daniela; Bevacqua, Andrew J.; and Cioca, Gheorghe, to Estee Lauder, Inc. Clear cosmetic sticks and process for its preparation. 5,750,125, Cl. 424-401.000.
- Lahens, Albert. Spark plug having a plurality of vertical ground electrodes and a vertical cylindrical shaped center electrode in parallel formation for use in a internal combustion engine. 5,751,096, Cl. 313-141.000.
- Lahl, John R.: *See—*
  - Soules, Thomas F.; Hraboczki, Marton; and Lahl, John R., 5,751,104, Cl. 313-493.000.
- Lai, Jing-Shiun, to Shansun Technology Company, Ltd. Camera having a screen adjustment frame. 5,752,116, Cl. 396-435.000.
- Lai, Jing-Shiun, to Shansun Technology Company, Ltd. Camera. 5,752,118, Cl. 396-513.000.
- Lai, John T.; and Filla, Deborah S., to B. F. Goodrich Company. Liquid alkylated diphenylamine antioxidant. 5,750,787, Cl. 564-409.000.
- Laine, Aire: *See—*
  - DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.
- Laine, Eric Herman; and Wilson, James Warren, to International Business Machines Corporation. Electronic package. 5,751,060, Cl. 257-702.000.
- Laing, Karsten Andreas. Circulation-heating element device. 5,749,715, Cl. 417-313.000.
- Laitram Corporation, The: *See—*
  - Burch, Ronald H.; Cancienne, Warren E., Jr.; Rodbcon, Somsak S.; and Morales, Eric W., 5,749,777, Cl. 452-149.000.
- Lake, Staffan; and Stjernschantz, Johan, to Pharmacia & Upjohn Aktiebolag. DNA encoding a prostaglandin F28 receptor, a host cell transformed therewith and an expression product thereof. 5,750,369, Cl. 435-69.100.
- Lallier, Jean-Pierre; and Bignon, Daniel, to Elf Atochem S.A. Process and composition for degreasing the surface of an object. 5,749,977, Cl. 134-40.000.
- Lalor, William F.: *See—*
  - Wedegaertner, Thomas C.; Valco, Thomas D.; and Lalor, William F., 5,750,466, Cl. 504-100.000.
- LAM Research Corporation: *See—*
  - Weise, Mark; and Denison, Dean R., 5,750,211, Cl. 427-579.000.
- Lamar, David A.; Chapman, Chris C.; and Elliott, Michael L., to Battelle Memorial Institute. Refractory electrodes for joule heating and methods of using same. 5,749,932, Cl. 65-135.700.
- LaMarche, Jonathan: *See—*
  - Clark, Jay; LaMarche, Jonathan; and Tuttle, Robert J., Sr., 5,751,546, Cl. 361-686.000.
- Lamatsch, Bernd: *See—*
  - Eldin, Sameer Hosam; Iqbal, Abul; Hao, Zhimin; and Lamatsch, Bernd, 5,750,723, Cl. 548-453.000.
- Lambda Technologies, Inc.: *See—*
  - Fathi, Zakaryae; Gerard, Richard S.; and Wei, Jianghua, 5,750,968, Cl. 219-736.000.
- Lambert, David Kay; and Groblicki, Peter John, to General Motors Corporation. Engine emissions analyzer with diagnostic. 5,750,886, Cl. 73-117.300.
- Lambert, Patrick M.; Trauernicht, David P.; and Bringley, Joseph F., to Eastman Kodak Company. Laser imaging element. 5,750,318, Cl. 430-346.000.
- Lamson, Robert D.: *See—*
  - Harrison, Robert G.; and Lamson, Robert D., 5,751,369, Cl. 348-552.000.
- Lanaud, Christophe: *See—*
  - Sey, Jean-Claude; Vittoz, Daniel; and Lanaud, Christophe, 5,751,206, Cl. 336-192.000.
- Lancaster, Patrick R.: *See—*
  - Moore, Phillip; Lancaster, Patrick R.; and Denley, Robert, 5,749,206, Cl. 53-556.000.
- Land, Mark S.; Kruy, Steven J.; Perlman, Andrew T.; and Walvick, Edward A., to Cignal Global Communications, Inc. System and method for establishing a call telecommunications path. 5,751,706, Cl. 370-352.000.
- Landers, Robert J.: *See—*
  - Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., 5,751,162, Cl. 326-37.000.
- Landolf, David E., to Intel Corporation. Asymmetrical power supply. 5,751,603, Cl. 364-492.000.
- Landry, Christine J. T.: *See—*
  - Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, 5,750,465, Cl. 503-227.000.
- Lang, Kurt; and Schmid, Friedbert, to Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH. Open end spinning apparatus. 5,749,216, Cl. 57-413.000.
- Langberg, Ehud; and Scholtz, William Henry, to Globespan Technologies, Inc. Rate adaptive digital subscriber line ("RADSL") modem. 5,751,701, Cl. 370-281.000.
- Langer, Robert S.: *See—*
  - Zewert, Thomas E.; Pliquett, Uwe; Langer, Robert S.; and Weaver, James C., 5,749,847, Cl. 604-49.000.
- Lansinger, Colleen Marie: *See—*
  - Lukich, Lewis Timothy; Duncan, Thomas Edwin; and Lansinger, Colleen Marie, 5,750,615, Cl 524-495.000.
- Lantech, Inc.: *See—*
  - Moore, Phillip; Lancaster, Patrick R.; and Denley, Robert, 5,749,206, Cl. 53-556.000.
- Lantz, Andre: *See—*
  - Schirmann, Jean-Pierre; Hub, Serge; and Lantz, Andre, 5,750,810, Cl. 570-171.000.
- Lanxide Technology Company, LP: *See—*
  - Becker, Kurt Joseph; Jensen, James Allen; and Lukacs, Alexander, III, 5,750,628, Cl. 528-25.000.
- Laplace, Carl J.: *See—*
  - Trainor, John J.; Laplace, Carl J.; Kinney, Michael A.; and Reilly, Joseph F., 5,751,222, Cl. 340-825.050.
- LaPlante, Mark J.: *See—*
  - Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
- Lapp, Oliver: *See—*
  - Dörner, Stefan; Kemker, Uwe; Simm, Hans-Peter; and Lapp, Oliver, 5,749,285, Cl. 99-348.000.
- Lardner, Thomas J.: *See—*
  - Russell, Jonathan C.; and Lardner, Thomas J., 5,750,894, Cl. 73-581.000.
- Large, Edward W.; and Kolen, John F. Method and apparatus of analysis of signals from non-stationary processes possessing temporal structure such as music, speech, and other event sequences. 5,751,899, Cl. 395-2.160.
- Larner, Joseph, to University of Virginia Patents Foundation, The. Method for detecting insulin resistance. 5,750,348, Cl. 435-7.100.
- LaRoche Industries, Inc.: *See—*
  - Boyce, C. Bradford; Pittman, Guy P.; and Lewis, Bolivar F., III, 5,750,010, Cl. 204-157.940.
- Laron, Israel: *See—*
  - Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.
- LaRose, David Arthur: *See—*
  - Funda, Janez; LaRose, David Arthur; and Taylor, Russell Highsmith, 5,749,362, Cl. 128-653.100.
- Laroy, Bernard C.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajaligol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Larrick, James W.: *See—*
  - Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,750,655, Cl. 530-351.000.
- Larson, Brent D., to Honeywell Inc. High efficiency polarized display. 5,751,388, Cl. 349-96.000.

- Larson, David; Stubbs, Robert E.; and Edstrom, Gene, to Fujitsu Limited. Checking for proper locations of storage devices in a storage device array. 5,751,936, Cl. 395-182.050.
- Laser Power Corporation: *See—*
  - Hargis, David E.; and Nelte, Sven E., 5,751,751, Cl. 372-41.000.
- Lasermaster Corporation: *See—*
  - Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., 5,751,303, Cl. 347-16.000.
- Latham, Christopher John: *See—*
  - Bryans, Justin Stephen; Folkes, Adrian John; and Latham, Christopher John, 5,750,530, Cl. 514-255.000.
- Lattery, Jerome E., to Parker, Lore. Moisture sensing electronic irrigation control. 5,749,521, Cl. 239-64.000.
- Lattice Semiconductor Corporation: *See—*
  - Tang, Howard; and Parker, Daniel V., 5,751,163, Cl. 326-38.000.
- Lattuca, Michael David: *See—*
  - Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, 5,751,324, Cl. 347-87.000.
- Lau, Kai-Ming. Condom improving device. 5,749,862, Cl. 604-353.000.
- Lautenschläger, Werner. Method and device for the extraction treatment of a sample. 5,750,008, Cl. 203-43.000.
- Lavelle, Shay Joseph: *See—*
  - Shortt, James Joseph; and Lavelle, Shay Joseph, 5,749,751, Cl. 439-721.000.
- Laventure, David. Sealing membrane and method of sealing. 5,749,195, Cl. 52-514.000.
- Lavoie, Andre: *See—*
  - Lavoie, Pierre; Lavoie, Andre; and Lavoie, Denis, 5,749,498, Cl. 222-192.000.
- Lavoie, Denis: *See—*
  - Lavoie, Pierre; Lavoie, Andre; and Lavoie, Denis, 5,749,498, Cl. 222-192.000.
- Lavoie, Pierre; Lavoie, Andre; and Lavoie, Denis. Applicator and spreader tool for adhesives. 5,749,498, Cl. 222-192.000.
- Law, David Chee-Fai; Sandoval, Christopher Paul; and Garcia, Ruben G., to Johns Manville International, Inc. Perlite-based insulation board. 5,749,954, Cl. 106-282.000.
- Lawell, Terry G.: *See—*
  - Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.
- Lawhorn, David E.: *See—*
  - Booher, Richard N.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,750,554, Cl. 514-397.000.
- Lawler, Frank: *See—*
  - Girard, Michel; Rowe, Keith; Matthews, Joseph H., III; and Lawler, Frank, 5,751,282, Cl. 345-327.000.
- Lawlor, Elizabeth Jane: *See—*
  - Hodgson, John Edward; and Lawlor, Elizabeth Jane, 5,750,387, Cl. 435-183.000.
- Lawrie, Jonathan M.: *See—*
  - Collins, Mark L.; Halbert, Donald N.; King, Walter; and Lawrie, Jonathan M., 5,750,338, Cl. 435-6.000.
- Lawson, Kevin Robert: *See—*
  - Crowley, Patrick Jelf; Lawson, Kevin Robert; Smith, Douglas John; and Moseley, Donn Warwick, 5,750,778, Cl. 562-605.000.
- Lax, Ronald G.: *See—*
  - Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., 5,749,846, Cl. 604-22.000.
- Layne, James L., to Span Tech Corporation. Conveyor system with driven roller transfer assembly. 5,749,454, Cl. 198-464.400.
- Lazarz, Donald; and De Jong, Jurjen Jan, to American National Can Company; and VMI-EPE-Holland B.V. Device for removing liquid on a gauze conveyor and hollow roll comprising a tube for use in such a device. 5,749,155, Cl. 34-90.000.
- Lazo, Luis A.: *See—*
  - Prior, Edward B.; Caristi, Anthony J.; Lazo, Luis A.; and Prior, John E., 5,751,074, Cl. 307-118.000.
- Le, Hiep M.: *See—*
  - Mays, Lonne L.; Martin, Jean-Baptiste; Le, Hiep M.; and Lippmann, James G., 5,751,061, Cl. 257-707.000.
- Leach, Jerald G.; Simar, Laurence R.; Davis, Alan L.; and Tatge, Reid E., to Texas Instruments Incorporated. Processing devices with improved addressing capabilities, systems and methods. 5,751,991, Cl. 395-421.040.
- LeaRonal, Inc.: *See—*
  - Brasch, William R., 5,750,018, Cl. 205-295.000.
- Lebby, Michael S.: *See—*
  - Chen, Diana; Jiang, Wenbin; and Lebby, Michael S., 5,751,471, Cl. 359-319.000.
  - Jiang, Wenbin; Shieh, Chan-Long; and Lebby, Michael S., 5,751,757, Cl. 372-50.000.
- Le Brun, Alain: *See—*
  - Baudoin, Bernard; Burns, Christopher; Commercon, Alain; and Le Brun, Alain, 5,750,567, Cl. 514-510.000.
- Lechner, Günther: *See—*
  - Zech, Joachim; Wanek, Erich; Lechner, Günther; and Bissinger, Peter, 5,750,589, Cl. 523-109.000.
- Leclerc, David M.: *See—*
  - Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., 5,751,447, Cl. 358-487.000.
- Leconte, Jean-Pierre: *See—*
  - Bastart, Jean-Pierre; Boursat, Jean-Dominique; Commercon, Alain; and Leconte, Jean-Pierre, 5,750,738, Cl. 549-510.000.
- Lee, Anthony N.: *See—*
  - Feciura, Paul N.; and Lee, Anthony N., 5,749,812, Cl. 482-82.000.
- Lee, Byung H., to Pharmacia & Upjohn Company. 14-substituted marcfortines and derivatives useful as antiparasitic agents. 5,750,533, Cl. 514-278.000.
- Lee, Byung H.; and Clothier, Michael F., to Pharmacia & Upjohn Company. Antiparasitic paraherquamides. 5,750,695, Cl. 544-341.000.
- Lee, Cheng Ho; and Chen, Cheng Nan. Mold-pressing device. 5,749,278, Cl. 83-588.000.
- Lee, Dong-Ho, to Samsung Electronics Co., Ltd. Integrated computer and printer system and method for managing power source therefor. 5,752,049, Cl. 395-750.050.
- Lee, Edward W.: *See—*
  - Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., 5,749,727, Cl. 433-119.000.
- Lee, El-Hang: *See—*
  - Hyun, Kyung-Sook; Kwon, O-Kyun; Kim, Kwang-Joon; and Lee, El-Hang, 5,751,468, Cl. 359-282.000.
- Lee, Eun Soo: *See—*
  - Taskovich, Lina Tormen; Yum, Su Il; Lee, Eun Soo; and Crisologo, Nieves Marzan, 5,750,137, Cl. 424-448.000.
- Lee, Ho Bum: *See—*
  - Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.
- Lee, Ho Kyeong, to LG Electronics Inc. Microwave choke apparatus for microwave oven. 5,750,969, Cl. 219-742.000.
- Lee, Hyeong Kook: *See—*
  - Kwon, Byoung Ha; and Lee, Hyeong Kook, 5,751,075, Cl. 310-12.000.
- Lee, Hyung-Kil: *See—*
  - Choi, Hyung-Jin; Cho, Sung-Bae; Jung, Suk-Jin; and Lee, Hyung-Kil, 5,751,734, Cl. 371-43.400.
- Lee, Jae Jin: *See—*
  - Chung, In Sool; and Lee, Jae Jin, 5,751,653, Cl. 365-230.060.
- Lee, Jin-Yuan, to Taiwan Semiconductor Manufacturing Company Ltd. Manufacture device of four transistor sram cell layout and device. 5,751,044, Cl. 257-380.000.
- Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, to Yuhan Corporation. Pyrimidine derivatives and processes for the preparation thereof. 5,750,531, Cl. 514-256.000.
- Lee, June-key; Chung, Il-sub; and Desu, Seshu Babu, to Samsung Electronics Co., Ltd. Ferroelectric capacitor with rhodium electrodes. 5,751,540, Cl. 361-321.400.
- Lee, Junning: *See—*
  - Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,750,745, Cl. 552-581.000.
- Lee, Kwang Min: *See—*
  - Kwon, Young Key; Mesropian, Ashot; Lee, Kwang Min; and Soboley, Sergey, 5,751,436, Cl. 358-299.000.
- Lee, Kyung-Young, to SamSung Electronics Co., Ltd. Circuit for generating strobe signals to LED print head. 5,751,332, Cl. 347-240.000.
- Lee, Min-Sup, to Daewoo Electronics, Co., Ltd. Apparatus for encoding a video signal using feature point based motion estimation. 5,751,362, Cl. 348-416.000.
- Lee, Moon-Keol, to Daewoo Electronics Co., Ltd. Horizontal size adjusting apparatus of a monitor. 5,751,370, Cl. 348-556.000.
- Lee, Robert Chun Fung: *See—*
  - Ho, Francis Man Shuen; and Lee, Robert Chun Fung, 5,751,561, Cl. 363-21.000.
- Lee, Roger: *See—*
  - Kauffman, Ralph; and Lee, Roger, 5,751,039, Cl. 257-316.000.
- Lee, Ruen-Rone; and Huang, Chun-Kai, to Industrial Technology Research Institute. Three dimensional graphics system and method with correction to z buffer value errors. 5,751,290, Cl. 345-421.000.
- Lee, Sang Ho: *See—*
  - Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.
- Lee, Sang-Lak: *See—*
  - Sheen, Yong-Hoo; Park, Gwi-Tae; Yoo, Ji-Yoon; and Lee, Sang-Lak, 5,751,511, Cl. 360-73.110.
- Lee, Sang-O, to Samsung Electronics Co., Ltd. Bipolar transistor circuit having a free collector. 5,751,183, Cl. 327-542.000.
- Lee Shuknecht & Sons, Inc.: *See—*
  - Shuknecht, Lee N., 5,750,171, Cl. 426-481.000.
- Lee, Suk-Jin: *See—*
  - Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, 5,750,452, Cl. 501-138.000.
- Lee, Sung Tae, to Samsung Electronics Co., Ltd. Muffler for a reciprocating compressor. 5,749,714, Cl. 417-312.000.
- Lee, Wendy: *See—*
  - Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., 5,750,558, Cl. 514-415.000.
- Lee, Whal-Sun: *See—*

  - Park, Kyoung Ho, 5,749,300, Cl. 101-488.000.
- Lee, Yong Hee; and Seo, Young Woo, to Samsung Electronics Co., Ltd. Semiconductor device having a contact window structure. 5,751,048, Cl. 257-412.000.
- Lee, Yu-Chi: *See—*
  - Tang, Pao-Yun; Chang, Shyh-Ming; Lee, Yu-Chi; and Fang, Su-Yu. 5,749,997, Cl. 156-249.000.
- Leemans, Jan: *See—*
  - Williams, Mark; and Leemans, Jan, 5,750,867, Cl. 800-205.000.
- Leenders, Luc; Oelbrandt, Leo; Bogaert, Jan Van den; and Desie, Guido, to Agfa-Gevaert, N.V. Ink jet printing process. 5,751,325, Cl. 347-96.000.
- Leenders, Luc: *See—*
  - Horsten, Bartholomeus; Loccufier, Johan; Defieuw, Geert; and Leenders, Luc, 5,750,319, Cl. 430-346.000.
- LeGault, Kenn: *See—*
  - Hahn, Samuel S.; LeGault, Kenn; Wheeler, Maxon; and Degenhardt, Jon R., 5,751,287, Cl. 345-351.000.
- Legome, Mark J.: *See—*
  - Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., 5,749,884, Cl. 606-167.000.
- Le Govic, Anne-Marie: *See—*
  - Aubry, Alain; Gubelmann, Michel; and Le Govic, Anne-Marie, 5,750,777, Cl. 562-549.000.
- LeGrow, Gary Edward; and Smith, John Cyrus, Jr., to Dow Corning Corporation. Silicone compositions for skin care. 5,750,098, Cl. 424-70.120.
- Lehmbeck, Steven P.: *See—*
  - Abidin, Michael R.; and Lehmbeck, Steven P., 5,749,886, Cl. 606-182.000.
- Lehnhoff, Terry F.: *See—*
  - Burckhartzmeyer, Jerry J.; Crabb, Elmer R.; Lehnhoff, Terry F.; and Watson, Alva L., Jr., 5,749,423, Cl. 180-9.540.
- Leibovitz, Jacques; Dawson, Peter F.; Nagesh, Voddarahalli K.; and Irby, Greg M. Reworkable die attachment to heat spreader. 5,749,988, Cl. 156-94.000.
- Leichty, Philip L.: *See—*
  - Delp, Gary S.; Leichty, Philip L.; and Slane, Albert A., 5,752,078, Cl. 395-827.000.
- Leidreiter, Holger; and Müller, Felix, to Th. Goldschmidt AG. Use of diacetyl tartrate esters of fatty acid glycerides as hair conditioner additives. 5,750,097, Cl. 424-70.100.
- Leijten, Johannes T.H.: *See—*
  - Cornelissen, Hugo J.; Savert, Cornelis J.; and Leijten, Johannes T.H., 5,749,638, Cl. 313-461.000.
- Leitenberger, Werner; and Heinzmann, Helmut, to Voith Sulzer Papiermaschinen GmbH. Dryer section for an apparatus for the production of a paper web. 5,749,157, Cl. 34-117.000.
- Lembcke, Jeffrey J., to Baker Hughes Incorporated. Downhole tool sealing system with cylindrical biasing member with narrow width and wider width openings. 5,749,585, Cl. 277-116.200.
- Lemma, Solomon, to B.F. Goodrich Company, The. Anti-icing fluids. 5,750,047, Cl. 252-70.000.
- Le Moigne, Francois: *See—*
  - Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.
- Lenker, Jay A.; Evans, Michael A.; Kim, Steven W.; and Kinney, Edward V., to Medtronic, Inc. Apparatus and methods for compression of endoluminal prostheses. 5,749,921, Cl. 623-1.000.
- Lennox Industries Inc.: *See—*
  - Roan, Rodney S.; Rakowski, Mark R.; and Oglesby, Myron C., Jr., 5,749,355, Cl. 126-110.00R.
- Lentek S.r.l.: *See—*
  - Colombani, Piero; and Stucchi, Alessandro, 5,749.978, Cl. 148-216.000.
- Lenzmeier, Charles T.: *See—*
  - Cutler, David N.; and Lenzmeier, Charles T., 5,752,031, Cl. 395-673.000.
- Leonardo, Joseph L.: *See—*
  - Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.
- Leong, John: *See—*
  - Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
- Leong, Liem H.; and Storey, Brian E., to NCR Corporation. Method and apparatus for scanning bank notes. 5,751,841, Cl. 382-137.000.
- Le Pennec, Jean-Francois: *See—*
  - Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,751,714, Cl. 370-452.000.
- Lepine, Normand: *See—*
  - Castegnier, Adrien; and Lepine, Normand, 5,750,593, Cl. 523-161.000.
- Lepper, John Mark: *See—*
  - Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
- Lerner, David: *See—*
  - Kehr, Bruce A.; Lerner, David; Demenus, Richard D.; and Edl, Michael J., 5,752,235, Cl. 705-3.000.
- Lerner, Oded, to TRW Inc. Automatic gain control of a torque sensor for a power assist steering system. 5,752,208, Cl. 701-41.000.
- Lester, James Marsh, to Redstone Engineering. Low-temperature refrigeration system with precise temperature control. 5,749,243, Cl. 62-434.000.
- Leto, Kenneth: *See—*
  - Geadelmann, Jon L.; and Leto, Kenneth, 5,750,851, Cl. 800-200.000.
- LeVasseur, Craig, to NSI Corporation. High density plug-in dimmer module for lighting control systems. 5,751,119, Cl. 315-291.000.
- Levasseur, Florence: *See—*
  - Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
- Levasseur, Glenn N.: *See—*
  - Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., 5,749,227, Cl. 60-657.000.
- Levenstein, Sheldon B.: *See—*
  - Krolak, David John; Grosbach, Lyle Edwin; Levenstein, Sheldon B.; and Irish, John David, 5,751,990, Cl. 395-417.000.
- Lever Brothers Company, Division of Conopco, Inc.: *See—*
  - Garcia, Rigoberto Felipe; Vasudevan, Tirucherai Varahan; Post, Albert Joseph; and Hsu, Feng-Lung Gordon, 5,750,489, Cl. 510-417.000.
  - Vermeer, Robert; and Harichian, Bijan, 5,750,733, Cl. 549-346.000.
- Levin, David S.: *See—*
  - Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.
- Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, to International Business Machines Corporation. Method and system for performance monitoring stalls to identify pipeline bottlenecks and stalls in a processing system. 5,751,945, Cl. 395-184.010.
- Levine, Frank Eliot: *See—*
  - Gover, Frank Carl; Levine, Frank Eliot; and Welbon, Edward Hugh, 5,752,062, Cl. 355-800.000.
- Levine, Marc Alan: *See—*
  - Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.
- Leviton Manufacturing Co., Inc.: *See—*
  - Balaban, David B.; and Tufano, Anthony, 5,749,459, Cl. 200-559.000.
- Levy, Joseph M.: *See—*
  - Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., 5,750,029, Cl. 210-634.000.
- Levy, Paul S.; and Chenoweth, Ed, to VLSI Technology. Integrated circuit test apparatus. 5,751,151, Cl. 324-537.000.
- Lew, Yung-hai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, to SamSung Electronics Co., Ltd. Method and apparatus for discriminating vehicle types. 5,750,069, Cl. 340-933.000.
- Lewiner, Jacques; and Carreel, Eric. Method and apparatus for measuring the speed of a moving body. 5,751,241, Cl. 342-104.000.
- Lewis, Bolivar F., III: *See—*
  - Boyce, C. Bradford; Pittman, Guy P.; and Lewis, Bolivar F., III, 5,750,010, Cl. 204-157.940.
- Lewis, Michael: *See—*
  - Nykaza, Janet; and Lewis, Michael, 5,750,854, Cl. 800-200.000.
- Lexmark International, Inc.: *See—*
  - Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, 5,751,324, Cl. 347-87.000.
  - Coffey, Johnnie A.; Foster, Larry Steven; Horrall, Paul Douglas; and McIntyre, John Randolph, 5,752,135, Cl. 399-115.000.
  - Damon, Brian Wesley, 5,751,470, Cl. 358-298.000.
  - Denton, Gary Allen; and Dreyfuss, David Daniel, 5,751,299, Cl. 347-2.000.
  - Gibson, Bruce David, 5,751,312, Cl. 347-43.000.
- Leybold Aktiengesellschaft: *See—*
  - Abelen, Thomas; Arndt, Lutz; and Muller, Peter, 5,749,716, Cl. 417-410.300.
- Leyten, Lukas: *See—*
  - Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.
- Leyton, Paul: *See—*
  - Jayaraman, Raj; Xia, Yongping; Venkitasubrahmanian, Sreeraman; and Leyton, Paul, 5,751,115, Cl. 315-225.000.
- LG Electronics Inc.: *See—*
  - Jang, Jin; Lim, Hong Joo; and Ryu, Bong Yool, 5,751,017, Cl. 257-57.000.
  - Kwon, Tae-Kyong, 5,751,894, Cl. 386-116.000.
  - Lee, Ho Kyeong, 5,750,969, Cl. 219-742.000.
  - Lyu, Ki Hyun, 5,751,020, Cl. 257-72.000.
  - Park, Hanee, 5,751,122, Cl. 315-368.160.
  - Sheen, Yong-Hoo; Park, Gwi-Tae; Yoo, Ji-Yoon; and Lee, Sang-Lak, 5,751,511, Cl. 360-73.110.
- LG Semicon Co., Ltd.: *See—*
  - Baek, Dae Bong; and Kwak, Sung Hoon, 5,751,160, Cl. 326-27.000.
  - Choi, Woong Lim; Ra, Kyeong Man; and Hur, Kyung Myung, 5,751,632, Cl. 365-185.030.
  - Gil, Gyoung-Seon, 5,751,640, Cl. 365-156.000.
  - Pyeon, Hong Beom, 5,751,170, Cl. 327-57.000.
  - Sohn, Jang Sub; and Jeon, Yong-Weon, 5,751,176, Cl. 327-295.000.
  - Son, Jeong-Hwan, 5,750,430, Cl. 438-303.000.
  - Yu, Young J., 5,751,032, Cl. 257-233.000.

Li, Changming; and Jung, Richard Hanson, to Motorola, Inc. Polymer electrodes for energy storage devices and method of making same. 5,751,541, Cl. 361-525.000.
Li, Kenneth K.; Brenner, Douglas M.; and Chen, Chingfa, to Cogent Light Technologies, Inc. Optical system for coupling light from a single fiber optic into a fiber bundle. 5,751,869, Cl. 385-33.000.
Li, Li; and Hawthorne, Richard C., to Micron Technology, Inc. Process for dry cleaning wafer surfaces using a surface diffusion layer. 5,749,975, Cl. 134-1.300.
Li, Mike T.: *See—*
Jones, Richard E.; and Li, Mike T., 5,750,146, Cl. 424-484.000.
Li, Steve, to SPOT Technology, Inc. Lens mounting structure of a scanner. 5,751,501, Cl. 359-819.000.
Li, Yi; Rosen, Craig A.; and Kumar, Chandrika, to Human Genome Sciences, Inc. Nucleic acid encoding human endothlein-bombesin receptor and method of producing the receptor. 5,750,370, Cl. 435-69.100.
Liang, Chung-Ho. Oil supply and return tube structure for oil tanks in cars and ships. 5,750,021, Cl. 210-86.000.
Libbey-Owens-Ford Co.: *See—*
Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,749,931, Cl. 65-60.100.
Goodman, Ronald D., 5,750,265, Cl. 428-432.000.
Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,751,484, Cl. 359-512.000.
Lidberg, Dale Joseph: *See—*
Gullicksrud, John Theodore; Lidberg, Dale Joseph; and Seyfert, Michael David, 5,751,558, Cl. 361-801.000.
Lidke, Steven L.: *See—*
Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., 5,751,303, Cl. 347-16.000.
Lieber, Glen L.: *See—*
Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., 5,749,852, Cl. 604-96.000.
Lien, Chuen-Der: *See—*
Choi, Jeong Yeol; Chien, Chung-Jen; Han, Chung-Chyung; and Lien, Chuen-Der, 5,750,424, Cl. 438-199.000.
Lienart, Yvette Janine: *See—*
Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
Lifshitz, Lior; and Wiesenberg, Raphael, to Shira Computers Ltd. Method for conversion of a color electronic pre-press system data file to a page description language data file. 5,752,057, Cl. 395-785.000.
Likins, Robert Dean: *See—*
Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, 5,751,435, Cl. 358-299.000.
Lim, Dae Sung: *See—*
Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.
Lim, Hong Joo: *See—*
Jang, Jin; Lim, Hong Joo; and Ryu, Bong Yool, 5,751,017, Cl. 257-57.000.
Lim, Kibeen: *See—*
Jang, Jae Dirk; and Lim, Kibeen, 5,749,806, Cl. 477-133.000.
Lima-Marques, Luis: *See—*
Staples, Phillip Eric; and Lima-Marques, Luis, 5,752,142, Cl 399-241.000.
Limbird, James R.: *See—*
Walcher, James G.; Limbird, James R.; and Herner, Arthur C., 5,749,434, Cl. 182-45.000.
Lin, Andrew S., to Industrial Technology Research Institute. Electrode membrane assembly and method for manufacturing the same. 5,750,013, Cl. 204-192.140.
Lin, David M., to United States of America, Air Force. Active corner reflector. 5,751,238, Cl. 342-5.000.
Lin, John: *See—*
Weerasooriya, Upali; and Lin, John, 5,750,749, Cl. 554-69.000.
Lin, Jui-Chu: *See—*
Yu, Wang-I; and Lin, Jui-Chu, 5,749,750, Cl. 439-637.000.
Lin, Jyh-Han; and Briancon, Alain Charles Louis, to Motorola, Inc. Method and apparatus for assigning channels to transmitters in a radio communication system. 5,752,194, Cl. 455-452.000.
Lin, Patrick. Frame for a tabletop barbecue grill. 5,749,354, Cl. 126-25.00R.
Lin, Ting Fung. Stepping and swinging exerciser. 5,749,809, Cl. 482-52.000.
Lin, Wen-Chien. Lamp for decorative light strings. 5,749,648, Cl. 362-353.000.
Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, to American Cyanamid Company. Novel 2-thiosubstituted carbapenems. 5,750,735, Cl. 549-475.000.
Lincoln, James F.: *See—*
Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., 5,752,138, Cl. 399-264.000.
Lincoln, Timothy L.: *See—*
Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.
Lind, Stefan: *See—*
Arnold, Norbert; Haug, Willi; and Lind, Stefan, 5,749,963, Cl. 106-724.000.
Linde Aktiengesellschaft: *See—*
Rottmann, Dietrich, 5,749,246, Cl. 62-654.000.
Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased (by Hildegard Flachenecker, legal representative), to Karl Storz GmbH & Co. High-frequency surgical generator for cutting tissue. 5,749,869, Cl. 606-34.000.
Linder, Gerald S. Malleable introducer. 5,749,357, Cl. 128-200.260.
Lindig, Markus: *See—*
Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
Lindley, David A.: *See—*
Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., 5,751,644, Cl. 365-194.000.
Lindner, Georg Johann: *See—*
Barrois, Claus Dieter; Lindner, Georg Johann; and Zelfel, Hans-Jürgen, 5,749,299, Cl. 101-483.000.
Lindner, Robert; Dudek, Eric Alan; and Louies, Bernard Daniel, to Allied-Signal Inc. External lubricant compositions for rigid vinyl polymers. 5,750,608, Cl. 524-399.000.
Lindsay, Stuart M.; and Jing, Tianwei, to Molecular Imaging Corporation. Scanning probe microscope for use in fluids. 5,750,989, Cl. 250-306.000.
Lines, Valerie L., to Mosaid Technologies Incorporated. Dynamic memory word line driver. 5,751,643, Cl. 365-189.110.
Lingafelt, Charles Steven: *See—*
Jensen, David John; and Lingafelt, Charles Steven, 5,751,559, Cl. 361-802.000.
Link, Daniel J.: *See—*
Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., 5,749,227, Cl. 60-657.000.
Linman, E. Kelly; and Bridges, Russell P., to Procter & Gamble Company, The. Continuous, high-speed method for producing a pant-style garment having a pair of elasticized leg openings. 5,749,989, Cl. 156-160.000.
Linotype Hell AG: *See—*
Dorff, Peter; Kowalewski, Joern; Doehler, Sigrid Anni Lore; and Krabbenhoeft, Uwe-Jens, 5,751,845, Cl. 382-162.000.
Lion Corporation: *See—*
Hama, Itsuo; Okamoto, Takahiro; Sasamoto, Hisashi; and Nakamura, Hirofumi, 5,750,796, Cl. 568-618.000.
Lipinsky, Edward S.: *See—*
Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.
Lipowicz, Peter J.: *See—*
Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
Lippmann, James G.: *See—*
Mays, Lonne L.; Martin, Jean-Baptiste; Le, Hiep M.; and Lippmann, James G., 5,751,061, Cl. 257-707.000.
Lipponer, Walter Heinrich: *See—*
Chen, Chin-Long; Hsiao, Mu-Yue; Lipponer, Walter Heinrich; and Shen, William Wu, 5,751,745, Cl. 371-51.100.
Lipps, John D. Portable exercise device. 5,749,815, Cl. 482-122.000.
Liptak, Lance: *See—*
Voit, Eric A.; Kostreski, Bruce; Liptak, Lance; and DePaul, Kenneth, 5,751,707, Cl. 370-384.000.
Liquid Air Corporation: *See—*
Ritrosi, Joe; Schmitt, Gary; Quintino, Carl; and Kasper, Gerhard, 5,749,389, Cl. 137-15.000.
Lisk, James R., Jr., to BASF Corporation. Image analysis method for determining pigment levels in fabric. 5,751,834, Cl. 382-111.000.
Litron Laboratories: *See—*
Tometsko, Andrew M., deceased; Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, 5,750,330, Cl. 435-2.000.
Litton Systems, Inc.: *See—*
Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., 5,751,425, Cl. 356-350.000.
Liu, David K. Y.; and Ting, Wenchi. Flash memory cell and a new method for sensing the content of the new memory cell. 5,751,631, Cl. 365-185.010.
Liu, Ju-Chao (by Tehyi Lui, his legal representative): *See—*
Fisher, Edward; Liu, Ju-Chao, 5,749,956, Cl. 106-287.280.
Liu, Jun: *See—*
Shyu, Tai-Ching; Chen, Datong; and Liu, Jun, 5,751,189, Cl. 330-9.000.
Liu, Peichun Peter, to International Business Machines Corporation. High-speed, multiple-port, interleaved cache with arbitration of multiple access addresses. 5,752,260, Cl. 711-129.000.
Liu, Shuang: *See—*
Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.
Liu, Tasi-Fa. Dual purpose ratchet screwdriver. 5,749,271, Cl. 81-60.000.
Liu, Vincent: *See—*
Chen, Xuemin; and Liu, Vincent, 5,751,378, Cl. 348-700.000.
Livingston, Brian D.: *See—*
Fikes, John D.; Livingston, Brian D.; Sette, Alessandro D.; and Sidney, John C., 5,750,395, Cl. 435-325.000.

Livingstone Legend Enterprises (Proprietary) Ltd.: *See—*
Zaaiman, Ben Thomas; Putter, Paul-Boer; Vermeulen, Pieter Johannes Erasmus; and Loubser, Gerrit Jacobus, 5,752,215, Cl. 701-117.000.
Lo, Chi-Shiung: *See—*
Chen, Ling; Sung, Hung-Cheng; and Lo, Chi-Shiung, 5,751,040, Cl. 257-332.000.
Loccufier, Johan: *See—*
Horsten, Bartholomeus; Loccufier, Johan; Defieuw, Geert; and Leenders, Luc, 5,750,319, Cl. 430-346.000.
Locke, John R.: *See—*
Maher, James C.; Tyagi, Dinesh; and Locke, John R., 5,750,307, Cl. 430-125.000.
Lockheed Idaho Technologies Company: *See—*
Detering, Brent A.; Donaldson, Alan D.; Fincke, James R.; and Kong, Peter C., 5,749,937, Cl. 75-10.190.
Lockheed Martin Aerospace Corp.: *See—*
Pressey, James; Koralek, Richard; and Smith, Francis J., 5,751,769, Cl. 375-235.000.
Lockheed Martin Corporation: *See—*
Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
Donovan, Kenneth B.; Ferrell, Richard A.; Heidrich, Arthur J.; and Zirpolo, Dominick S., 5,751,612, Cl. 364-578.000.
Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, 5,749,542, Cl. 244-53.00B.
Pontus, John; and Young, Stephen H., 5,749,177, Cl. 52-79.100.
Weir, Michael Paul, 5,751,779, Cl. 377-60.000.
Lockheed Martin Corp. Missiles & Space: *See—*
Loewenthal, Stuart H., 5,751,078, Cl. 310-36.000.
Lockheed Martin Energy Research Corporation: *See—*
Ludtka, Gerard M.; Kollie, Thomas G.; Watkin, David C.; and Walton, David G., 5,750,882, Cl. 73-38.000.
Lockheed Martin Energy Systems, Inc.: *See—*
Hutchinson, Donald P., 5,751,830, Cl. 382-103.000.
Loctite Corporation: *See—*
Fisher, Edward; Liu, Ju-Chao, 5,749,956, Cl. 106-287.280.
Loeb, Gerald E.: *See—*
Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.
Loebig, Norbert, to Siemens Aktiengesellschaft. Method for loading software in communication systems with non-redundant, decentralized equipment. 5,751,574, Cl. 364-187.000.
Loescher, William A., to Howe Furniture Corporation. Wheel and housing for table leg. 5,749,121, Cl. 16-43.000.
Loewenthal, Kenneth H.: *See—*
Bryant, Steven M.; and Loewenthal, Kenneth H., 5,751,910, Cl. 395-22.000.
Loewenthal, Stuart H., to Lockheed Martin Corp. Missiles & Space. Reactionless, momentum compensated payload positioner. 5,751,078, Cl. 310-36.000.
Logie, Alexander W., to NCR Corporation. Stack transport device. 5,749,456, Cl. 198-626.500.
Loh, Willie H.-T.: *See—*
Debonte, Lorin R.; Loh, Willie H.-T.; and Zhegong, Fan, 5,750,827, Cl. 800-200.000.
Lohr, Georg: *See—*
Lindenmeier, Heinz; Lohr, Georg; Fastenmeier, Karl; Flachenecker, Gerhard, deceased, 5,749,869, Cl. 606-34.000.
LoJacono, Richard J., to LoJacono, Sr., Francis X. Apparatus and method for tuning guitars. 5,750,910, Cl. 84-314.00N.
LoJacono, Sr., Francis X.: *See—*
LoJacono, Richard J., 5,750,910, Cl. 84-314.00N.
Lonardi, Emile; and Cimenti, Giovanni, to Paul Wurth S.A. Suspension device for a rotating body. 5,749,820, Cl. 384-620.000.
Lonberg, Nils: *See—*
Meade, Harry; and Lonberg, Nils, 5,750,172, Cl. 426-580.000.
Long, David C.: *See—*
Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
Long, Michael S.: *See—*
Wolski, Peter; and Long, Michael S., 5,749,494, Cl. 222-129.100.
Longmore, Richard J.: *See—*
Riach, David J. A.; Longmore, Richard J.; and Eccles, John N., 5,751,842, Cl. 382-137.000.
Longoni, Davide: *See—*
Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.
Longview Fibre Company: *See—*
Benner, Christopher T.; and Harambasic, Nicholas, 5,749,489, Cl. 220-465.000.
Lonseal Corporation: *See—*
Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, 5,750,600, Cl. 524-100.000.
Lonza Inc.: *See—*
Farina, Thomas Edward; Geick, Kenneth Scott; and Falter, Julia Anne, 5,750,061, Cl. 264-117.000.
Loper, Albert John: *See—*
Mallick, Soummya; and Loper, Albert John, 5,752,014, Cl. 395-587.000.
Lopez, Gilberto. Educational board game for preparing for a driver's license examination. 5,749,580, Cl. 273-243.000.
Loral Fairchild Corp.: *See—*
Purdom, Gregory W., 5,750,925, Cl. 174-52.100.
L'Oreal: *See—*
Arnaud, Pascal; and Mellul, Myriam, 5,750,095, Cl. 424-64.000.
Miguel-Colombel, Dolores, 5,750,120, Cl. 224-401.000.
Lorenz, Stanley: *See—*
Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
Loshak, Igor: *See—*
Dalzell, William H.; and Loshak, Igor, 5,751,481, Cl. 359-485.000.
Lötsch, Kurt: *See—*
Ruf, Bernd; and Lötsch, Kurt, 5,749,294, Cl. 101-232.000.
Loubser, Gerrit Jacobus: *See—*
Zaaiman, Ben Thomas; Putter, Paul-Boer; Vermeulen, Pieter Johannes Erasmus; and Loubser, Gerrit Jacobus, 5,752,215, Cl. 701-117.000.
Loughmiller, Daniel R., to Micron Technology, Inc. Method and apparatus for selectively deriving a boosted voltage exceeding an internal voltage. 5,751,158, Cl. 324-763.000.
Louies, Bernard Daniel: *See—*
Lindner, Robert; Dudek, Eric Alan; and Louies, Bernard Daniel, 5,750,608, Cl. 524-399.000.
Loutzenhiser, Douglas J., to Freightliner Corporation. Condensate drainage system for pneumatic tanks. 5,749,391, Cl. 137-204.000.
Low, Stephen G.: *See—*
Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
Lowman, Henry B.: *See—*
Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.
Loyd, Buzz: *See—*
Loyd, Casey; and Loyd, Buzz, 5,749,106, Cl. 4-541.100.
Loyd, Casey; and Loyd, Buzz. Portable spa with access stairway set into indentation within side walls. 5,749,106, Cl. 4-541.100.
LPKF CAD/CAM Systeme GmbH: *See—*
Kickelhain, Jorg, 5,750,212, Cl. 427-581.000.
LSI Logic Corporation: *See—*
Dandia, Sanjay, 5,749,999, Cl. 156-285.000.
Wei, Shuran; and Bach, Randall, 5,751,161, Cl. 326-30.000.
LTG Lufttechnische Gesellschaft mit beschrankrankter Haftung: *See—*
Mokler, Bernhard, 5,749,156, Cl. 34-105.000.
Lu, Jian Gang; and Beckmann, Ronald Lee, to General Motors Corporation. Connector assembly with retainer. 5,749,606, Cl. 285-86.000.
Lu, Sheng-nan. Hinge for notebook computer. 5,749,124, Cl. 16-307.000.
Lubrizol Corporation, The: *See—*
Sumiejski, James L.; Fewkes, Roy; and Tipton, Craig Daniel, 5,750,477, Cl. 508-331.000.
Lucas Industries Public Limited Company: *See—*
Gilling, Simon Peter, 5,749,426, Cl. 180-167.000.
Lucassen, Ronald, to Heineken Technical Services B.V. Process and apparatus for pasteurizing liquid contained in containers. 5,750,174, Cl. 426-521.000.
Lucent Technologies: *See—*
Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., 5,751,712, Cl. 370-431.000.
Lucent Technologies Inc.: *See—*
Ahuja, Sudhir Raman, 5,752,185, Cl. 455-414.000.
Ardon, Menachem Tsur, 5,751,800, Cl. 379-134.000.
Arney, Susanne C.; Greywall, Dennis Stanley; Walker, James A.; and Yurke, Bernard, 5,751,469, Cl. 359-291.000.
Arntz, Bernard James, 5,751,250, Cl. 342-373.000.
Basore, David Lee; and Meisel, William Stuart, 5,752,232, Cl. 704-275.000.
Bechtel, Gordon L.; and Newton, Curtis J., 5,751,696, Cl. 370-223.000.
Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, 5,750,312, Cl. 430-273.100.
Chen, Kuo-Wei Herman; Paul, Sanjoy; and Sabnani, Krishan Kumar, 5,751,719, Cl. 370-473.000.
Chittipeddi, Sailesh; Cochran, William Thomas; and Smooha, Yehuda, 5,751,065, Cl. 257-758.000.
Cohen, Edith, 5,752,241, Cl. 707-3.000.
Cox, Kenneth Charles; and Eick, Stephen Gregory, 5,751,931, Cl. 395-140.000.
DeBalko, George Andrew, 5,751,534, Cl. 361-119.000.
Duttweiler, Donald Lars; Kawahara, Toshiro; Kim, Cheng; and Miki, Toshio, 5,752,229, Cl. 704-270.000.

Eng, Kai Yin; and Karol, Mark John, 5,751,708, Cl. 370-389.000.
Fiorino, Mary E.; Frankenthal, Robert P.; and Sinclair, James D., 5,750,071, Cl. 422-7.000.
Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, 5,751,879, Cl. 385-103.000.
Hassler, Kerry Wayne; and Richman, Paul Lawrence, 5,751,795, Cl. 379-93.170.
Hobbs, Gary Lamont, 5,751,366, Cl. 348-480.000.
Howard, Paul Glor, 5,751,859, Cl. 382-238.000.
Koonen, Antonius Marcellus Jozef, 5,751,456, Cl. 359-127.000.
Kostic, Zoran; and Pavlovic, Gordana, 5,751,704, Cl. 370-335.000.
Moebius, Bernd; Olive, Joseph Philip; Tanenblatt, Michael Abraham; and VanSanten, Jan Pieter, 5,751,907, Cl. 395-2.760.
Pladek, Robert B., 5,751,824, Cl. 381-104.000.
Rathnavelu, Sunder Raj, 5,751,709, Cl. 370-395.000.
Seshadri, Nambirajan; and Sundberg, Carl-Erik Wilhelm, 5,751,739, Cl. 371-30.000.
Stevens, David L., 5,750,935, Cl. 174-138.00G.
Wang, Jin-Der, 5,751,774, Cl. 375-367.000.
Zhang, Yun, 5,750,017, Cl. 205-102.000.
Lucetti, Joseph J., to Emarine, Chad A. Monolithic pebble head golf club. 5,749,793, Cl. 473-324.000.
Ludewig, Howard W.: *See—*
Kilty, Alan L.; Ludewig, Howard W.; and Wallace, Brian L., 5,750,957, Cl. 219-130.010.
Ludtka, Gerard M.; Kollie, Thomas G.; Watkin, David C.; and Walton, David G., to Lockheed Martin Energy Research Corporation. Gas permeability measurements for film envelope materials. 5,750,882, Cl. 73-38.000.
Ludwig Institute for Cancer Research: *See—*
Van Snick, Jacques; Uyttenhove, Catherine; and Simpson, Richard J., 5,750,377, Cl. 435-70.300.
Ludwig, Lester Frank, Jr., to Visionary Corporate Technologies. Methods and systems for multimedia communications via public telephone networks. 5,751,338, Cl. 348-17.000.
Ludwig, Theodore C.: *See—*
Mammino, Joseph C.; Herbert, William G.; Chang, Shu; and Ludwig, Theodore C., 5,752,144, Cl. 399-249.000.
Luedtke, Roy, Jr., to Pioneer Hi-Bred International, Inc. Inbred maize line PH47A. 5,750,835, Cl. 800-200.000.
Luedtke, Roy, Jr., to Pioneer Hi-Bred International, Inc. Hybrid maize plant & seed (3914). 5,750,842, Cl. 800-200.000.
Luedtke, Roy, Jr., to Pioneer Hi-Bred International, Inc. Hybrid maize plant & seed (3940). 5,750,843, Cl. 800-200.000.
Luedtke, Roy, Jr.: *See—*
Puskaric, Vladimir; and Luedtke, Roy, Jr., 5,750,838, Cl. 800-200.000
Lui, Tehyi, his legal representative: *See—*
Fisher, Edward; Liu, Ju-Chao, 5,749,956, Cl. 106-287.280.
Lukacs, Alexander, III: *See—*
Becker, Kurt Joseph; Jensen, James Allen; and Lukacs, Alexander, III, 5,750,628, Cl. 528-25.000.
Lukich, Lewis Timothy; Duncan, Thomas Edwin; and Lansinger, Colleen Marie, to GoodYear Tire & Rubber Company, The. Use of fullerene carbon in curable rubber compounds. 5,750,615, Cl. 524-495.000.
Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, to Eastman Kodak Company. Plasticizers for dye-donor element used in thermal dye transfer. 5,750,465, Cl. 503-227.000.
Lumigen, Inc.: *See—*
Akhavan-Tafti, Hashem; DeSilva, Renuka; Arghavani, Zahra; and Schoenfelner, Barry A., 5,750,698, Cl. 546-102.000.
Lundgreen, Michael W.: *See—*
Johnson, Thomas H.; Justice, Gene L.; and Lundgreen, Michael W., 5,750,937, Cl. 177-25.110.
Lundquist, Ingemar H.: *See—*
Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., 5,749,846, Cl. 604-22.000.
Lunetta, Steven E.: *See—*
Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., 5,750,413, Cl. 436-537.000.
Lupin Laboratories, Ltd.: *See—*
Gupta, Niranjan Lal; Sankaran, Ramanathan; Chattejee, Sugata; and Krishna, Tumma Hari, 5,750,683, Cl. 540-214.000.
Lürssen, Klaus: *See—*
Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
Luschi, Carlo: *See—*
Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, 5,751,768, Cl. 375-234.000.
Lutes, George F.; and Yao, Xiaotian Steve, to California Institute of Technology. Linear swept frequency generator. 5,751,747, Cl. 372-2.000.
Lutz, Jürg; and Cierpka, Henning F., to Drossapharm AG. Transdermal therapeutic system for the delivery of 5,6-benzo-alpha-pyrone. 5,750,139, Cl. 424-448.000.
Lutz, Silvia: *See—*
Faust, Raimund Josef; Allen, Danuta Eva; and Lutz, Silvia, 5,750,306, Cl. 430-115.000.
Luxem, Heiner: *See—*
Fricke, Andreas; Luxem, Heiner; and Stadler, Lothar, 5,749,572, Cl. 271-268.000.
LXR Biotechnology Inc.: *See—*
Fesus, Laszlo; and Piacentini, Mauro, 5,750,360, Cl. 435-23.000.
Lyberg, Bertil, to Telia AB. Method and arrangement for speech to text conversion. 5,752,227, Cl. 704-235.000.
Lydall, Inc.: *See—*
Muzio, Joseph R., Jr.; and McGivern, Kenneth James, Sr., 5,749,537, Cl. 242-439.500.
Lynam, Niall R.: *See—*
Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,751,489, Cl. 359-603.000.
Lynx Therapeutics, Inc.: *See—*
Macevicz, Stephen C., 5,750,341, Cl. 435-6.000.
Lyster, Thomas D.: *See—*
Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,904, Cl. 607-7.000.
Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,905, Cl. 607-7.000.
Lyu, Ki Hyun, to LG Electronics Inc. Structure of a liquid crystal display unit having exposed channel region. 5,751,020, Cl. 257-72.000.
M. Hidalgo Beistequi, S.A.: *See—*
Pascual, D. Samual Botella, 5,749,400, Cl. 139-421.000.
M4 Environmental L.P.: *See—*
Stephenson, Michael J.; Golliher, Waldo R.; and Haas, Paul, 5,752,158, Cl. 423-261.000.
Ma, Fanfeng: *See—*
Vosika, Gerald J.; and Ma, Fanfeng, 5,750,665, Cl. 536-17.200.
Ma, Frank C.: *See—*
Tan, Haw-Chan; and Ma, Frank C., 5,749,746, Cl. 439-357.000.
Ma, Michael: *See—*
Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, 5,750,666, Cl. 536-23.100.
Maag, Hans; Rose, Samuel J.; and Schmidt, Beat, to Syntex Inc. Methods of detecting nucleic acids with nucleotide probes containing 4'-substituted nucleotides and kits therefor. 5,750,343, Cl. 435-6.000.
Maar, Karl, to MTU Motoren- und Turbinen-Union Muenchen GmhH. Turbine blade wheel assembly with rotor blades fixed to the rotor wheel by rivets. 5,749,706, Cl. 416-220.00R.
Maas, Dana J.: *See—*
Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., 5,750,009, Cl. 203-64.000.
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., to AFA Products, Inc. Shroud and skeletal body for trigger sprayer. 5,749,501, Cl. 222-384.000.
Macauley, Richard Peter; Sita, Lewis Henry; and Stokesbury, Elwood Lamar, to Abbott Laboratories. Light excluding multi-layer plastic barrier bottle. 5,750,226, Cl. 428-36.400.
MacCoss, Malcolm: *See—*
Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.
MacDermid Imaging Technology, Inc.: *See—*
Rach, Joseph F., 5,750,315, Cl. 430-306.000.
MacDonald, R. Ian; and Willemsen, Herman W., to Northern Telecom Limited. Wavelength bypassed ring networks. 5,751,454, Cl. 359-119.000.
MacDonald, Robert J.: *See—*
Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.
Mace, Jean-Michel; and Moerenhout, Jacques, to Shell Oil Company. Multilayer polymer system comprising at least one engineering thermoplast layer and at least one soft touch composition layer, and compositions to be used therefore. 5,750,268, Cl. 428-475.800.
Macevicz, Stephen C., to Lynx Therapeutics, Inc. DNA sequencing by parallel oligonucleotide extensions. 5,750,341, Cl. 435-6.000.
MacFadden, Kenneth Orville: *See—*
Chern, Terry Song-Hsing; Keller, David Gerard; and MacFadden, Kenneth Orville, 5,749,927, Cl. 29-623.500.
Maciulewicz, Stephen M., to Carrier Corporation. HVAC communication network. 5,751,572, Cl. 364-132.000.
Maciver, Isobel: *See—*
Hansen, Eric J.; Helminen, Merja E.; and Maciver, Isobel, 5,750,117, Cl. 424-251.100.
Macken, Luk: *See—*
Daems, Daniel; and Macken, Luk, 5,751,882, Cl. 385-135.000.
Mackenzie, Alan: *See—*
Coronado, Martin P.; and Mackenzie, Alan, 5,749,419, Cl. 166-387.000.
Mackie, James Leonard: *See—*
Rashid, Abdul; Stevens, Howard Norman Ernest; Binns, Julie Stephanie; and Mackie, James Leonard, 5,750,143, Cl. 424-451.000.
Macon, Charles E., Jr.; and Morphew, William H. System and method for instantiating a sharable, presistent parameterized collection class and real time process control system embodying the same. 5,752,249, Cl. 707-103.000.
Macronix International Co., Ltd.: *See—*
Chen, Chia Shing; Hung, Chun-Hsiung; Wan, Ray-Lin; and Kamei, Teruhiko, 5,751,637, Cl. 365-185.330.
Madau, Dinu Petre; and Feldkamp, Lee Albert, to Ford Motor Company. Fuzzy logic output defuzzification. 5,751,908, Cl. 395-3.000.
Madland, Paul D.: *See—*

Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
Madsen, Peter: *See—*
Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,750,518, Cl. 514-183.000.
Maeda, Hiroshi: *See—*
Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.
Maeda, Keiji; and Kawamoto, Yoshihisa, to Towa Corporation. Resin sealing/molding apparatus for electronic parts. 5,750,154, Cl. 425-116.000.
Maeda, Yukari: *See—*
Ogoshi, Takeshi; and Maeda, Yukari, 5,751,451, Cl. 358-527.000.
Maekawa, Yoshito, to Canon Kabushiki Kaisha. Method of displaying a frozen image when transmission of image information is suspended in a multimedia system. 5,751,722, Cl. 370-522.000.
Maemura, Kousei; and Yamamoto, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Power amplifier circuit. 5,751,181, Cl. 327-434.000.
Maeshima, Masanobu: *See—*
Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.
Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, 5,752,145, Cl. 399-256.000.
Maezono, Shuichi: *See—*
Kimura, Yasuki; Shirase, Takashi; Okamura, Masamitsu; and Maezono, Shuichi, 5,749,760, Cl. 445-4.000.
MAG Instrument, Inc.: *See—*
Maglica, Anthony, 5,749,645, Cl. 362-205.000.
Maggioni, Christoph; and Wirtz, Brigitte, to Siemens Aktiengesellschaft. Method for detecting the spatial position and rotational position of suitably marked objects in digital image sequences. 5,751,843, Cl. 382-154.000.
Maghoul, Farzin: *See—*
Parrish, Jeff W.; and Maghoul, Farzin, 5,752,245, Cl. 707-10.000.
Magill, Alan. Health monitoring. 5,749,365, Cl. 128-671.000.
Maginot, Thomas J. Method for implanting an end portion of a graft within the body of a patient during a bypass grafting procedure. 5,749,375, Cl. 128-898.000.
Maglica, Anthony, to MAG Instrument, Inc. Flashlight. 5,749,645, Cl. 362-205.000.
Magnetek: *See—*
Mortimer, George W., 5,751,118, Cl. 315-291.000.
Magnetek Corporation: *See—*
Ballard, Gerald L.; and Brosius, William L., 5,751,523, Cl. 361-42.000.
Magnetic Vision Technologies, Inc.: *See—*
Hrovat, Mirko I., 5,751,146, Cl. 324-318.000.
Magnin, Bernard, to Framatome. Method for captively attaching a guide cone of tubular shape and a thermal sleeve of an adaptor passing through the head of the vessel of a nuclear reactor. 5,751,778, Cl. 376-260.000.
Magnone, Giuseppe; Manciocco, Guido; and Cinquina, Patrizia, to Videocolor, S.p.A. Process of manufacturing a cathode-ray tube with an anti-glare, anti-static, dark faceplate coating. 5,750,187, Cl. 427-64.000.
Magnone, Giuseppe: *See—*
Cinquina, Patrizia; Magnone, Giuseppe; and Manciocco, Guido, 5,750,054, Cl. 252-500.000.
Magnotti, Joseph C.; and Nelson, Larry A. 32N +D bit key encryption-decryption system using chaos. 5,751,811, Cl. 380-28.000.
Mahant-Shetti, Shivaling: *See—*
Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., 5,751,162, Cl. 326-37.000.
Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., to Texas Instruments Incorporated. Distributed processing memory chip with embedded logic having both data memory and broadcast memory. 5,751,987, Cl. 395-405.000.
Mahapatra, Amaresh; and Narayanan, S. Anantha, to Ramar Corporation. Method of fabrication an optical waveguide. 5,749,132, Cl. 29-25.350.
Maher, James C.; Tyagi, Dinesh; and Locke, John R., to Eastman Kodak Company. Photoconductor cleaning brush to prevent formation of photoconductor scum. 5,750,307, Cl. 430-125.000.
Mahmud, Khaled; Belmont, James A.; Adams, Curtis E.; and Foster, John K., to Cabot Corporation. Ink and coating compositions containing silicon-treated carbon black. 5,749,950, Cl. 106-316.000.
Maienfisch, Peter: *See—*
Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, 5,750,548, Cl. 514-357.000.
Maier, Gary W.: *See—*
Delmore, Michael D.; and Maier, Gary W., 5,750,159, Cl. 425-190.000.
Maier, Helmut K.: *See—*
Falbaum, David J.; Hei, Robert D.; Maier, Helmut K.; and Mattia, Paul J., 5,750,484, Cl. 510-276.000.
Maile, Karen. Braking system incorporating continuously variable transmission. 5,749,448, Cl. 192-4.00A.
Mailloux, Alexandre: *See—*
Parent, Leon-Etienne; Mailloux, Alexandre; and Breton, Bruno, 5,749,934, Cl. 71-24.000.
Main, William E., to Motorola, Inc. Integrated circuit and method for generating a transimpedance function. 5,751,192, Cl. 330-293.000.
Mak, Pak-kin: *See—*
Blake, Michael Andrew; Ford, Carl Benjamin, III; and Mak, Pak-kin, 5,752,264, Cl. 711-144.000.
Makibayashi, Yasuhiro: *See—*
Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, 5,749,563, Cl. 251-61.500.
Makihata, Kazuhisa, to NEC Corporation. Voice information service device and voice information service method. 5,751,790, Cl. 379-71.000.
Makino, Yoshihiro: *See—*
Kimura, Kazuya; and Makino, Yoshihiro, 5,749,710, Cl. 417-63.000.
Makinwa, Kofi A.A.; and Mateman, Paul, to U.S. Phillips Corporation. Data processing system comprising a graphic tablet and a stylus, and stylus for use in such a system. 5,750,939, Cl. 178-18.000.
Malabarba, Adriano; Ciabatti, Romeo; Panzone, Gianbattista; and Marazzi, Alessandra Maria, to Gruppo Lepetit S.p.A. Amide derivatives of antibiotic A 40926. 5,750,509, Cl. 514-11.000.
Malackowski, James E.; and Stathis, Kristi L., to Jeman Technologies, Inc. Access free wireless telephony fulfillment service system. 5,752,186, Cl. 455-414.000.
Malanowski, Chet: *See—*
Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
Malek, Shahin Shane. Staple removing device. 5,749,564, Cl. 254-28.000.
Maley, Ronald Joseph: *See—*
Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
Malik, Shaukat Hussain: *See—*
Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, 5,750,685, Cl. 540-349.000.
Mallick, Soummya; and Loper, Albert John, to International Business Machines Corporation. Automatic selection of branch prediction methodology for subsequent branch instruction based on outcome of previous branch prediction. 5,752,014, Cl. 395-587.000.
Mallinckrodt Medical, Inc.: *See—*
Kappel, Thomas F., 5,749,109, Cl. 5-423.000.
Mallison, Moira: *See—*
Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
Malloy Desormeaux, Stephen G.: *See—*
Cloutier, Robert P.; Kiesow, Ronald H.; and Malloy Desormeaux, Stephen G., 5,752,085, Cl. 396-6.000.
Malone, Francis Joseph, Jr.: *See—*
Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, 5,750,215, Cl. 428-34.200.
Malone, Matthew: *See—*
Uzumcu, Albert I.; Malone, Matthew; and Schweizer, Russell J., 5,749,770, Cl. 451-28.000.
Mammino, Joseph C.; Herbert, William G.; Chang, Shu; and Ludwig, Theodore C., to Xerox Corporation. Method of fabricating a reclaimable uniform conditioning blotter roll. 5,752,144, Cl. 399-249.000.
Manciocco, Guido: *See—*
Cinquina, Patrizia; Magnone, Giuseppe; and Manciocco, Guido, 5,750,054, Cl. 252-500.000.
Magnone, Giuseppe; Manciocco, Guido; and Cinquina, Patrizia, 5,750,187, Cl. 427-64.000.
Mandelman, Jack Allan; and Potter, Micheal David, to International Business Machines Corporation. Lateral field emission devices for display elements and methods of fabrication. 5,751,097, Cl. 313-310.000.
Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, to Gaz de France; Gaz Metropolitain; New York Gas Group; and Sofame. Low NOX and CO emissions direct contact high temperature water heater. 5,749,356, Cl. 126-359.000.
Mandracchia, Efrain Anthony: *See—*
Hugentobler, Monte K.; and Mandracchia, Efrain Anthony, 5,750,900, Cl. 73-779.000.
Mandralis, Zenon Ioannis: *See—*
Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, 5,750,178, Cl. 426-594.000.
Manghirmalani, Ravi: *See—*
Raab, Ilan; Manghirmalani, Ravi; Doitel, Ofer; and Izbicki, Lynne Marie, 5,751,967, Cl. 395-200.580.
Mangold, Richard P.: *See—*
Hernandez, Thomas J.; and Mangold, Richard P., 5,752,050, Cl. 395-750.070
Mangolds, Arnie; Farinella, Michael David; Deguire, Daniel Rene; and Cardenas, Robert Lee, to Foster-Miller, Inc. Ballistically deployed restraining net. 5,750,918, Cl. 102-502.000.
Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, to Eastman Kodak Company. Film holder for use in making an index print. 5,749,468, Cl. 206-455.000.
Manjula, Belur N.: *See—*
Acharya, A. Seetharama; Manjula, Belur N.; and Smith, Paul K., 5,750,725, Cl. 548-545.000.

Mann, Brian M., to Pacesetter, Inc. System and method for identifying and displaying medical data which violate programmable alarm conditions. 5,749,907, Cl. 607-27.000.

Mann, Heinz-Josef, to Hoechst Aktiengesellschaft. Building material mixture. 5,749,964, Cl. 106-805.000.

Mann, Lloyd Steven: *See*—

  Benzenberg, Craig Kay; Mann, Lloyd Steven; Oslund, Lawrence Carl; and Roe, Colleen Ann, 5,751,943, Cl. 395-183.160.

Mann, Stephan, to Rasmussen GmbH. Holding device for a hose clip. 5,749,603, Cl. 285-23.000.

Mannesmann Aktiengesellschaft: *See*—

  Kock, Bernhard, 5,749,267, Cl. 74-467.000.

  Möller, Rudolf; and Müller, Peter, 5,749,562, Cl. 251-367.000.

Mannette, Michael Russell; Dozier, Camille Louise; and Nguyen, Tom, to Motorola, Inc. Method for locating a channel in a communication system. 5,751,772, Cl. 375-316.000.

Mannette, Michael Russell: *See*—

  Mueller, Bruce Dale; Mannette, Michael Russell; and Kelton, James Robert, 5,752,183, Cl. 455-343.000.

Manning, Monte, to Micron Technology, Inc. Redundancy elements using thin film transistors (TFTS). 5,751,646, Cl. 365-200.000.

Manning, Troy A.: *See*—

  Thompson, J. Wayne; and Manning, Troy A., 5,751,031, Cl. 257-208.000.

Manowski, Maxwell E.: *See*—

  Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., 5,751,760, Cl. 379-210.000.

Mansberger, Robert L., II: *See*—

  Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, 5,751,875, Cl. 385-84.000.

Mansell, Barry: *See*—

  Zavracky, Matthew; Odryna, Vic; and Mansell, Barry, 5,751,261, Cl. 345-55.000.

Mantovanini, Marco; Melillo, Gabriella; and Daffonchio, Luisa, to DOMPE SpA. Tropyl 7-azaindol-3-ylcarboxyamides as antitussive agent. 5,750,536, Cl. 514-300.000.

Manzouji, Ryuko; and Okawa, Tadashi, to Dow Corning Toray Silicone Co., Ltd. Radiation curable silicone release coating compositions. 5,750,587, Cl. 522-15.000.

Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, to AECI Limited. Synthesis and resolution of propionic acid derivatives. 5,750,764, Cl. 560-56.000.

Marazzi, Alessandra Maria: *See*—

  Malabarba, Adriano; Ciabatti, Romeo; Panzone, Gianbattista; and Marazzi, Alessandra Maria, 5,750,509, Cl. 514-11.000.

Marchetto, Carlo. Towing device for two-or three-wheel vehicles. 5,749,592, Cl. 280-292.000.

Marecki, Nelda M.: *See*—

  Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,134, Cl. 424-434.000.

  Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,136, Cl. 424-448.000.

Marella, Marcello; Meregalli, Letizia; and Tomaselli, Michele, to Enirisorse S.p.A. Sol-gel process for obtaining pure and mixed oxide zirconia spheres, microspheres and washcoats, useful as catalysts or catalyst supports. 5,750,459, Cl. 502-304.000.

Margolis, Geoffrey; and Pelaez, Joaquin. Method for producing a low fat meat product. 5,750,182, Cl. 426-646.000.

Marhold, Albrecht: *See*—

  Gallenkamp, Bernd; Rohe, Lothar; and Marhold, Albrecht, 5,750,721, Cl. 548-374.100.

Mariel, James Gregory, to Excel Industries, Inc. Window regulator with spring retainer. 5,749,174, Cl. 49-352.000.

Marimont, David H.; and Guibas, Leonidas John, to Xerox Corporation. Image structure map data structure for spatially indexing an imgage. 5,751,852, Cl. 382-180.000.

Mark, John G.: *See*—

  Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., 5,751,425, Cl. 356-350.000.

Markandey, Vishal; Doherty, Donald B.; and Gove, Robert J., to Texas Instruments Incorporated. Method to reduce perceptual contouring in display systems. 5,751,379, Cl. 348-759.000.

Marker, Terry L.; Muldoon, Brian S.; Glover, Bryan K.; and Vora, Bipin V., to UOP. Process for producing diisopropyl ether from propane. 5,750,800, Cl. 568-678.000.

Markley, Charles E.; and Younger, Rick, to Diamant Boart, Inc. Cutting blade with an impact load prevention layer. 5,749,353, Cl. 125-20.000.

Marko, Kenneth Andrew: *See*—

  Bryant, Bruce David; Krishnaswami, Vasanth; and Marko, Kenneth Andrew, 5,752,213, Cl. 701-111.000.

Markowitz, Robert Edward: *See*—

  Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.

Markussen, Jan: *See*—

  Havelund, Svend; Halstrom, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, 5,750,497, Cl. 514-3.000.

Marler, Jaren D.: *See*—

  Swanson, David W.; Marler, Jaren D.; and Childers, Winthrop D., 5,751,323, Cl. 347-87.000.

Marr, Ken: *See*—

  Dennison, Charles H.; and Marr, Ken, 5,751,046, Cl. 257-392.000.

Marshall, David: *See*—

  Findley, Philip; Mortimer, Keith; and Marshall, David, 5,750,240, Cl. 428-195.000.

Martell, Robert W.: *See*—

  Christensen, Reed K.; and Martell, Robert W., 5,751,942, Cl. 395-183.140.

Martens, David James, to International Business Machines Corporation. Dynamic latch circuit for utilization with high-speed memory arrays. 5,751,727, Cl. 371-21.100.

Martens, Nicolas: *See*—

  Nguyen, Hien; Martens, Nicolas; and Garbolino, Glenn, 5,750,446, Cl. 442-337.000.

Martin, A. J.; and Burns, S. M., to California Institute of Technology. Asynchronous processors. 5,752,070, Cl. 395-800.330.

Martin, Andrew Terry. Modular loudspeaker enclosure suspension rigging method. 5,749,137, Cl. 29-434.000.

Martin, George: *See*—

  Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,750,655, Cl. 530-351.000.

Martin, Jean-Baptiste: *See*—

  Mays, Lonne L.; Martin, Jean-Baptiste; Le, Hiep M.; and Lippmann, James G., 5,751,061, Cl. 257-707.000.

Martin, John; and Miller, Eric J., to S. C. Johnson & Son, Inc. Liquid air freshener dispenser device with capillary wicking means. 5,749,520, Cl. 239-44.000.

Martin, Pierre, to Novartis Corporation. Nucleosides with 2'-O-modifications. 5,750,673, Cl. 536-26.100.

Martin, Rainer: *See*—

  Hegner, Frank; Schmidt, Elke Maria; Drewes, Ulfert; and Martin, Rainer, 5,750,899, Cl. 73-756.000.

Martinez, Ivan V., to Alcoa Fujikura Ltd. Temporary fuse disconnect system. 5,751,208, Cl. 337-198.000.

Martinez, Maureen: *See*—

  McMahan, Robert L.; and Martinez, Maureen, 5,749,637, Cl. 312-223.200.

Martinez, Ramon Antonio: *See*—

  Rello, Robert Michael; Yager, Michael; and Martinez, Ramon Antonio, 5,749,990, Cl. 156-187.000.

Martini, Norbert: *See*—

  Strittmatter, Günter; and Martini, Norbert, 5,750,874, Cl. 800-205.000.

Martinuzzo, Steven: *See*—

  Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.

Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, to Canon Kabushiki Kaisha. Sheet post-treatment apparatus of line-up free type. 5,752,154, Cl. 399-407.000.

Maruyama, Kouji: *See*—

  Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.

Maruyama, Masakatsu: *See*—

  Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, 5,751,142, Cl. 323-316.000.

Maruyama, Naosuke; Kokubo, Hiroyasu; and Nakamura, Shin-Ichiro, to Shin-Etsu Chemical Co., Ltd. Method for preparing solid enteric pharmaceutical preparation. 5,750,148, Cl. 424-494.000.

Maruyama, Tamotsu; and Sato, Shigeyuki, to Shin-Etsu Handotai Co., Ltd. Semiconductor single crystalline substrate and method for production thereof. 5,751,055, Cl. 257-618.000.

Mascarenhas, Anthony Francis: *See*—

  Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, 5,750,401, Cl. 435-430.000.

Maschinenfabrik Kemper GmbH: *See*—

  Wuebbels, Richard; and Resing, Alfons, 5,749,208, Cl. 56-10.300.

Mashiko, Takashi: *See*—

  Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.

Mashitani, Ken: *See*—

  Hamagishi, Goro; Mashitani, Ken; Nakayama, Eiji; and Tanase, Susumu, 5,751,479, Cl. 359-464.000.

Massachusetts Institute of Technology: *See*—

  Choucri, Nazli; and Kousoum, Juliana, 5,752,023, Cl. 395-610.000.

  Gifford, David K., 5,750,335, Cl. 435-6.000.

  Gilbert, Ira H., 5,752,068, Cl. 395-800.160.

  Jeys, Thomas H.; and Fan, Tso Yee, 5,751,472, Cl. 359-330.000.

  Zewert, Thomas E.; Pliquett, Uwe; Langer, Robert S.; and Weaver, James C., 5,749,847, Cl. 604-49.000.

Masuda, Keiji: *See*—

  Taka, Kyosuke; Masuda, Keiji; and Mukai, Kan, 5,751,431, Cl. 358-296.000.

Masuda, Shunichi: *See*—

  Kataoka, Hiromi; Masuda, Shunichi; Saito, Tetsuo; and Yamamoto, Kazuma, 5,751,925, Cl. 395-115.000.

Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, to Canon Kabushiki Kaisha. Ophthalmic apparatus including ocular fundus illuminating system for illuminating the fundus of the eye to be examined through the pupil thereof. 5,751,396, Cl. 351-221.000.

Masui, Toshiyuki: *See*—

  Kashiwagi, Kouichi; Masui, Toshiyuki; and Borden, George Rome, 5,751,285, Cl. 345-349.000.

Masumoto, Takahiko: *See*—

  Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.

Masunaga, Makoto. Image transmission system and terminal device. 5,751,445, Cl. 358-426.000.

Masunaga Optical Mfg. Co., Ltd.: *See*—

  Masunaga, Satoru, 5,751,394, Cl. 351-118.000.

Masunaga, Satoru, to Masunaga Optical Mfg. Co., Ltd. Adjustable temple frame mounting structure in spectacles. 5,751,394, Cl. 351-118.000.

Matai, Masahiro; and Yonekura, Kunitoshi, to NEC Corporation. Radio receiver with automatic adjustment of oscillation frequencies. 5,752,174, Cl. 455-183.100.

Matayoshi, Hirobumi: *See*—

  Inoue, Takashi; Ito, Kenichi; Kobayashi, Tetsuo; Matayoshi, Hirobumi; Koyama, Masahisa; and Fujita, Hideo, 5,749,664, Cl. 401-78.000.

Mateman, Paul: *See*—

  Makinwa, Kofi A.A.; and Mateman, Paul, 5,750,939, Cl. 178-18.000.

Matero, Jorma, to Nokia Mobile Phones Limited. Distributed transmitter output power control circuit and method for a radio telephone. 5,752,172, Cl. 455-127.000.

Matey, James Regis: *See*—

  Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.

Mateyko, Peter T. Soft-tissue injury assessment system. 5,749,361, Cl. 128-653.100.

Matheis, Mark A. (.): *See*—

  Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A., 5,751,307, Cl. 347-33.000.

Mathews, Helena V.; Bestwick, Richard Keith; and Ferro, Adolph J., to Agritope, Inc. Plant genetic transformation methods and transgenic plants. 5,750,870, Cl. 800-205.000.

Mathis, Terry Don: *See*—

  Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, 5,751,879, Cl. 385-103.000.

Matlock, Dale: *See*—

  Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.

Matner, Martin: *See*—

  Vogt, Hans-Günter; Grave, Heinrich; Bross, Hermann-Josef; and Matner, Martin, 5,750,618, Cl. 524-836.000.

Matra Communication: *See*—

  Guegnaud, Hervé; and Robbe, Michel, 5,751,188, Cl. 329-323.000.

Matrix Biotechnologies, Inc.: *See*—

  Schwartz, Robert E., 5,749,874, Cl. 606-75.000.

Matrix Pharmaceutical, Inc.: *See*—

  Jones, Richard E.; and Li, Mike T., 5,750,146, Cl. 424-484.000.

Matson, Carl G., to Triangle Engineering of Arkansas Inc. Easily serviceable fan with universal subframe assembly and tensionable guards. 5,749,708, Cl. 416-247.00R.

Matsu, Richard L.: *See*—

  Exner, Gregory F.; Hofer, John Curtis; Durrani, Sheryar; and Matsu, Richard L., 5,749,598, Cl. 280-728.200.

Matsubara, Miyuki: *See*—

  Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.

Matsubara, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Semiconductor Software Co., Ltd. Non-contact IC card, non-contact IC card system, and non-contact IC card data communication method. 5,751,765, Cl. 375-219.000.

Matsuda, Shinji, to Fujitsu Limited. Method and apparatus for observing wiring patterns of printed circuit board. 5,750,997, Cl. 250-341.800.

Matsudai, Tomoko: *See*—

  Yasuhara, Norio; Nakagawa, Akio; Matsudai, Tomoko; and Funaki, Hideyuki, 5,751,022, Cl. 257-133.000.

Matsui, Hideki; Sakamoto, Hiroshi; Takayanagi, Ryotaro; and Hagiuda, Nobuyoshi, to Nikon Corporation. Electronic flashing device. 5,752,102, Cl. 396-156.000.

Matsui, Seiichi; Nakane, Yoshio; and Saito, Kenji, to Fuji Photo Film Co., Ltd. White balance control device and method using a variable region to reduce deterioration of reproduced color when a user manually selects a light source. 5,751,349, Cl. 348-228.000.

Matsui, Takeshi; and Kawamura, Akira, to Sony Corporation. Display device. 5,751,476, Cl. 359-411.000.

Matsui, Tsutomu, to NEC Corporation. Tracking signal detection with a photodetector receiving one of a ∓1st-order polarized light. 5,751,681, Cl. 369-112.000.

Matsuki, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having parallel overlapping main current terminals. 5,751,058, Cl. 257-692.000.

Matsumori, Akira, to Takeda Chemical Industries, Ltd. Treatment for viral diseases. 5,750,551, Cl. 514-381.000.

Matsumoto, Hiroo: *See*—

  Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, 5,750,523, Cl. 514-247.000.

Matsumoto, Jun: *See*—

  Nishiguchi, Masayuki; Iijima, Kazuyuki; Matsumoto, Jun; and Omori, Shiro, 5,752,222, Cl. 704-201.000.

Matsumoto, Kazunori: *See*—

  Shimogama, Shigeru; Nakajima, Hiroshi; and Matsumoto, Kazunori, 5,751,918, Cl. 395-99.000.

Matsumoto, Ken: *See*—

  Bryant, Henry Uhlman; Finley, Don Richard; and Matsumoto, Ken, 5,750,708, Cl. 546-334.000.

Matsumoto, Manabu: *See*—

  Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.

Matsumoto, Michihiro: *See*—

  Takai, Yuji; Nakatani, Kazue; and Matsumoto, Michihiro, 5,751,592, Cl. 364-488.000.

Matsumoto, Mikio: *See*—

  Nakajima, Yuki; and Matsumoto, Mikio, 5,749,222, Cl. 60-274.000.

Matsumoto, Shigeyuki: *See*—

  Fukuda, Yasuaki; and Matsumoto, Shigeyuki, 5,751,780, Cl. 378-35.000.

Matsumoto, Shinji, to Fuji Jukogyo Kabushiki Kaisha. Automatic tire valve insertion apparatus for tubeless tire. 5,749,141, Cl. 29-714.000.

Matsumoto, Shuichi, to Yamaha Corporation. Formant converting apparatus modifying singing voice to emulate model voice. 5,750,912, Cl. 84-609.000.

Matsumoto, Takahiro: *See*—

  Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.

Matsumoto, Takashi: *See*—

  Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, 5,750,523, Cl. 514-247.000.

Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, to Mitsubishi Jidosha Kogyo Kabushi Kaisha. Fault diagnostic method and apparatus for fuel evaporative emission control system. 5,750,888, Cl. 73-118.100.

Matsumoto, Tsuyoshi: *See*—

  Izuchi, Shuhei; and Matsumoto, Tsuyoshi, 5,749,980, Cl. 148-525.000.

Matsumura, Asayuki: *See*—

  Ariyoshi, Yūji; and Matsumura, Asayuki, 5,751,687, Cl. 369-202.000.

Matsumura, Kenji: *See*—

  Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, 5,749,548, Cl. 248-49.000.

Matsumura, Kohji: *See*—

  Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, 5,751,029, Cl. 257-194.000.

Matsumura, Minehiro: *See*—

  Furusawa, Toyoaki; Matsumura, Minehiro; and Nishimura, Toshihiro, 5,751,296, Cl. 345-520.000.

Matsunaga, Ryotaro, to Fujitsu Limited. Electronic mail system using double forwarding suppressing function for administrating electronic message that having data format that can not be handled at destination side. 5,751,960, Cl. 395-200.360.

Matsuno, Kenji: *See*—

  Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, 5,750,652, Cl. 530-350.000.

Matsuno, Toshinobu: *See*—

  Fujimoto, Kazuhisa; Matsuno, Toshinobu; and Inoue, Kaoru, 5,751,030, Cl. 257-194.000.

Matsuo, Hirokazu: *See*—

  Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, 5,749,569, Cl. 271-10.110.

Matsuo, Shigeru: *See*—

  Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.

Matsuo, Takashi: *See*—

  Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, 5,750,753, Cl. 556-440.000.

Matsuoka, Hiroshi; Chimura, Kazuo; and Kariya, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Rotating apparatus. 5,749,556, Cl. 248-349.100.

Matsuoka, Ryuichi: *See*—

  Konda, Eiji; Ishii, Nobuhisa; and Matsuoka, Ryuichi, 5,751,881, Cl. 385-110.000.

Matsuoka, Shinji: *See*—

  Uematsu, Yoshihiko; and Matsuoka, Shinji, 5,751,720, Cl. 370-503.000.

Matsushima, Yoshimasa; Sugiyama, Hiroshi; and Hagiwara, Toshimitsu, to Takasago International Corporation. 1,4-bis(2', 2'-diphenylvinyl)benzene derivative and charge transporting material and electrophotographic photoreceptor using the same. 5,750,785, Cl. 564-315.000.

- Matsushiro, Kunie, legal representative: *See—*
  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Matsushiro, Ryuichi, deceased (by Kunie Matsushiro, legal representative): *See—*
  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Matsushita Electric Ind.: *See—*
  - Hirai, Makoto, 5,751,376, Cl. 348-579.000.
- Matsushita Electric Industrial Co., Inc.: *See—*
  - Ueno, Iwao; and Wakahata, Yasuo, 5,750,264, Cl. 428-426.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Ariyoshi, Yūji; and Matsumura, Asayuki, 5,751,687, Cl. 369-202.000.
  - Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, 5,751,142, Cl. 323-316.000.
  - Eifuku, Hideki, 5,749,510, Cl. 228-122.100.
  - Fujimoto, Kazuhisa; Matsuno, Toshinobu; and Inoue, Kaoru, 5,751,030, Cl. 257-194.000.
  - Ishida, Kenichi; Kishimoto, Michinori; Yamamoto, Takashi; and Sushihara, Koji, 5,751,191, Cl. 330-125.000.
  - Kadono, Shinya; and Tsuda, Kenjiro, 5,751,377, Cl. 348-586.000.
  - Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.
  - Kusano, Taizou; Kashiwabara, Yoshiro; Wada, Yasuhiro; and Umeda, Keisuke, 5,751,676, Cl. 369-50.000.
  - Michiue, Makoto, 5,752,061, Cl. 395-800.000.
  - Miyaji, Atsuko; Omori, Motoji; and Tatebayashi, Makoto, 5,751,810, Cl. 380-28.000.
  - Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, 5,751,688, Cl. 369-270.000.
  - Nakatsuka, Tadayoshi; Itoh, Junji; Yamamoto, Shinji; and Nishitsuji, Mitsuru, 5,752,182, Cl. 455-333.000.
  - Ninomiya, Kazuki; Yoshioka, Shirou; and Nishiyama, Tamotsu, 5,751,374, Cl. 348-571.000.
  - Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,751,375, Cl. 348-571.000.
  - Nishimoto, Mitsuhiko; and Inoue, Makoto, 5,752,209, Cl. 701-41.000.
  - Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, 5,750,228, Cl. 428-64.100.
  - Sakemi, Shoji, 5,750,199, Cl. 427-357.000.
  - Shimogama, Shigeru; Nakajima, Hiroshi; and Matsumoto, Kazunori, 5,751,918, Cl. 395-99.000.
  - Suzuki, Takao, 5,751,999, Cl. 395-494.000.
  - Takai, Yuji; Nakatani, Kazue; and Matsumoto, Michihiro, 5,751,592, Cl. 364-488.000.
  - Tanaka, Takaaki; Yamauchi, Masahide; Ishikura, Yasuhisa; and Aoki, Masaki, 5,751,102, Cl. 313-466.000.
  - Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, 5,751,203, Cl. 336-65.000.
  - Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, 5,751,828, Cl. 381-199.000.
  - Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Boku, Kazutake, 5,751,464, Cl. 359-208.000.
- Matsushita Electronics Corporation: *See—*
  - Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, 5,751,628, Cl. 365-145.000.
  - Hirano, Hiroshige; and Nakakuma, Tetsuji, 5,751,650, Cl. 365-210.000.
  - Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, 5,751,756, Cl. 372-46.000.
- Matsushita, Masatoshi: *See—*
  - Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, 5,751,142, Cl. 323-316.000.
- Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, to Sanyo Electric Co., Ltd. Field-effect semiconductor device having heterojunction. 5,751,029, Cl. 257-194.000.
- Matsushita, Takehiro: *See—*
  - Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, 5,751,924, Cl. 395-115.000.
- Matsutani, Kanji; Sugino, Motoichi; and Yagisawa, Hiroshi, to Kabushiki Kaisha; and Matsutani Seisakusho. Surgical needle and mold for manufacturing the same. 5,749,897, Cl. 606-222.000.
- Matsutani Seisakusho: *See—*
  - Matsutani, Kanji; Sugino, Motoichi; and Yagisawa, Hiroshi, 5,749,897, Cl. 606-222.000.
- Matsute, Masataka: *See—*
  - Kurihara, Kenichi; Ata, Masafumi; Matsute, Masataka; and Watanabe, Haruo, 5,750,261, Cl. 428-422.800.
- Matsuura, Chifumi: *See—*
  - Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.
- Matsuura, Kazuo: *See—*
  - Shimizu, Hiroyuki; Sano, Akira; and Matsuura, Kazuo, 5,750,454, Cl. 502-114.000.
- Matsuura, Manabu: *See—*
  - Namimatsu, Ken; and Matsuura, Manabu, 5,749,265, Cl. 74-459.000.
- Matsuura, Toru: *See—*
  - Ando, Shinji; Matsuura, Toru; Sasaki, Shigekuni; and Yamamoto, Fumio, 5,750,731, Cl. 549-241.000.
- Matsuzaki, Ichiro: *See—*
  - Yoshimura, Osamu; and Matsuzaki, Ichiro, 5,751,478, Cl. 359-453.000.
- Matsuzaki, Yoriaki: *See—*
  - Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.
- Matsuzawa, Kunihiko, to NEC Corporation. Bidirectional printer interface having function of notifying print data abnormalities from printer to host unit. 5,751,923, Cl. 395-114.000.
- Matthews, David J.: *See—*
  - Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.
- Matthews, Joseph H., III: *See—*
  - Girard, Michel; Rowe, Keith; Matthews, Joseph H., III; and Lawler, Frank, 5,751,282, Cl. 345-327.000.
- Mattia, Paul J.: *See—*
  - Falbaum, David J.; Hei, Robert D.; Maier, Helmut K.; and Mattia, Paul J., 5,750,484, Cl. 510-276.000.
- Mattis, John Seymour; and Bliven, David C., to Raychem Corporation. Apparatus for extracting a gas from a liquid and delivering the gas to a collection station. 5,749,942, Cl. 95-46.000.
- Mattsson, Tommy: *See—*
  - Eklund, Karl-Gunnar; and Mattsson, Tommy, 5,749,992, Cl. 156-212.000.
- Mauldin, Michael W.; and Kuchel, Bernhard W., to Simmons Company. Method and apparatus for forming strings of pocketed springs. 5,749,133, Cl. 29-91.100.
- Maus, Gary K.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Maus, Steven M.; and Galic, George J., to Galic Maus Ventures. Method and apparatus for injection compression molding and ejecting paired thermoplastic spectacle lens suited for fully automated dip hardcoating. 5,750,060, Cl. 264-40.500.
- Maus, Steven M.; and Galic, George J., to Galic Maus Ventures. Apparatus for injection-compression molding and ejecting paired thermoplastic spectacle lens suited for fully automated dip hardcoating. 5,750,156, Cl. 425-139.000.
- Maus, Wolfgang; Swars, Helmut; and Brück, Rolf, to Emitec Gesellschaft Fuer Emissiontechnologie mbH. Method of monitoring the operation of a catalytic converter. 5,751,602, Cl. 364-557.000.
- Max-Planck-Gesellschaft Zur Forderung: *See—*
  - Strittmatter, Günter; and Martini, Norbert, 5,750,874, Cl. 800-205.000.
- Maxwell Laboratories, Inc.: *See—*
  - Stevenson, Robert A.; and Ni, Dick H., 5,751,539, Cl. 361-302.000.
- May, Timothy J., to Reynolds Consumer Products Inc. Flexible package with hanghole and tear string and method and apparatus for making the same. 5,749,657, Cl. 383-9.000.
- Mayer, Eduard; and Grönen, Jürgen, to Bayer Aktiengesellschaft. Polyurethane elastomers prepared from aliphatic polyisocyanates and polyesterether polyols. 5,750,580, Cl. 521-51.000.
- Mayer, Johann: *See—*
  - Weissbrich, Alfons; Danzl, Martin; and Mayer, Johann, 5,749,617, Cl. 296-107.000.
- Mayer, Udo: *See—*
  - Schloesser, Ulrike; and Mayer, Udo, 5,750,661, Cl. 534-604.000.
  - Schröder, Gunter-Rudolf; Mayer, Udo; Baus, Ulf; and Dix, Johannes Peter, 5,750,742, Cl. 552-109.000.
- Mayo, Gregory E.; Desroches, Roger G.; and Nedde, David N., to Cabletron System, Inc. Network connection status monitor and display. 5,751,965, Cl. 395-200.540.
- Mays, Lonne L.; Martin, Jean-Baptiste; Le, Hiep M.; and Lippmann, James G., to Motorola, Inc. Semiconductor diode device with non-planar heatsink and method of manufacture. 5,751,061, Cl. 257-707.000.
- Mayuzumi, Masanori: *See—*
  - Habuka, Hitoshi; Mayuzumi, Masanori; Tate, Naoto; and Katayama, Masatake, 5,749,974, Cl. 118-725.000.
- Mazdiyasni, Khodabakhsh S.: *See—*
  - Chen, Kuo-Chun; Trester, Paul W.; and Mazdiyasni, Khodabakhsh S., 5,752,156, Cl. 419-11.000.
- McAdam, James: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- McAdam, Ruth: *See—*
  - Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, 5,750,384, Cl. 435-172.300.
- McBride, Sterling Eduard: *See—*
  - Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, 5,751,836, Cl. 382-117.000.
- McCallum, Brent Neal: *See—*
  - Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, 5,749,542, Cl. 244-53.00B.
- McCarthy, Richard C.: *See—*

  - Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.
- McClain, Timothy W.: *See—*
  - Hammond, Mark S.; and McClain, Timothy W., 5,750,207, Cl. 427-576.000.
- McCool, Kelly M.: *See—*
  - Schaefer, Carl G., Jr.; McCool, Kelly M.; and Haas, David J., 5,751,609, Cl. 364-565.000.
- McCrory, Duane J., to Unisys Corporation. Video hardware for protected, multiprocessing systems. 5,751,979, Cl. 395-343.000.
- McCroskey, William K.; and Vickers, David S., to SMV America, Inc. Prefilter collimator for PET gamma camera. 5,751,000, Cl. 250-363.030.
- McCubbin, Robert K.: *See—*
  - Bailey, Raymond E.; McCubbin, Robert K.; Goeserich, Manfred H.; and Altavela, Robert P., 5,751,316, Cl. 347-63.000.
- McCutcheon, Michael A.: *See—*
  - Spack, Edward G.; Wehner, Nancy G.; and McCutcheon, Michael A., 5,750,356, Cl. 435-7.240.
- McDermott, Gregory A.: *See—*
  - Blum, Yigal; and McDermott, Gregory A., 5,750,643, Cl. 528-481.000.
- McDermott, Kevin. Direction indicator for navigation. 5,749,150, Cl. 33-361.000.
- McDonnell, Damien Gerard: *See—*
  - Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.
- McDonnell Douglas Corporation: *See—*
  - Blackmon, James B.; Stone, Kenneth W.; and Kusek, Stephen M., 5,751,503, Cl. 359-846.000.
  - Darty, Mark Anthony; Prickett, Guy Brent; and Schwarz, Charles Raymond, 5,752,047, Cl. 395-750.010.
- McDonough, Neil; and Pennace, John R., to FLEXcon Company Inc. Resonant tag labels and method of making same. 5,751,256, Cl. 343-873.000.
- McEldowney, Carl, to Aluminum Company of America. Rivet in a converted can end, method of manufacture, and tooling. 5,749,257, Cl. 72-354.600.
- McEntee, Jarlath: *See—*
  - Bowman, Lyn; and McEntee, Jarlath, 5,749,226, Cl. 60-520.000.
- McEntire, Edward E.; and Foringer, Lyle L., to PPG Industries, Inc. Unsaturated mono-esters and their use in coating compositions. 5,750,770, Cl. 560-200.000.
- McFarland, Scott T.: *See—*
  - Elkhoury, Bassam N.; McFarland, Scott T.; and Perez, Miguel A., 5,752,265, Cl. 711-146.000.
- McFarland, Stephen J.: *See—*
  - Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.
- McFarlin, Lawrence. Archery cross hair sight protector. 5,749,352, Cl. 124-87.000.
- McGarry, Mark William: *See—*
  - Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, 5,749,614, Cl. 294-64.100.
- McGarry, Susan J.: *See—*
  - Tsuji, Bruce H.; McGarry, Susan J.; and Sparksman, Steven W., 5,752,195, Cl. 455-462.000.
- McGeary, Michael Lawrence: *See—*
  - Williams, Simon Mark; and McGeary, Michael Lawrence, 5,751,554, Cl. 361-760.000.
- McGee, William G.: *See—*
  - Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, 5,749,885, Cl. 606-170.000.
- McGeer, Patrick C.; Saldanha, Alexander; and Sangiovanni-Vincentelli, Alberto, to Cadence Design Systems, Inc. System and method for simulating discrete functions using ordered decision arrays. 5,752,000, Cl. 395-500.000.
- McGill, Shane Robert, to McGill Technology Limited. Frozen product storage and dispensing apparatus. 5,749,240, Cl. 62-250.000.
- McGill Technology Limited: *See—*
  - McGill, Shane Robert, 5,749,240, Cl. 62-250.000.
- McGivern, Kenneth James, Sr.: *See—*
  - Muzio, Joseph R., Jr.; and McGivern, Kenneth James, Sr., 5,749,537, Cl. 242-439.500.
- McGowan, James Earl, Jr., to Kimberly-Clark Corporation. Method of packaging a medical article. 5,749,203, Cl. 53-432.000.
- McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, to W. L. Gore & Associates, Inc. Electrical cable with improved insulation and process for making same. 5,750,931, Cl. 174-110.0PM.
- McGuckin, Hugh G.; Badger, John S.; and Kurz, Edward A., to Eastman Kodak Company. Processing silver halide films with an aqueous phospholipid rinse solution. 5,750,322, Cl. 430-463.000.
- McGuire, Michael R.: *See—*
  - Shasha, Baruch S.; McGuire, Michael R.; and Behle, Robert W., 5,750,467, Cl. 504-116.000.
- McHugh, Gerard: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- McHugh, William T.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- MCI Corporation: *See—*
  - Thomson, Robert David; and Geiwitz, Roger, 5,751,949, Cl. 395-187.010.
- McIlvain, Charles Neil: *See—*
  - McIlvain, Gary Eugene; and McIlvain, Charles Neil, 5,749,668, Cl. 482-79.000.
- McIlvain, Gary Eugene; and McIlvain, Charles Neil. Apparatus for exercising and/or rehabilitating an ankle. 5,749,668, Cl. 482-79.000.
- McInnes, Ian J.: *See—*
  - Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., 5,751,254, Cl. 343-761.000.
- McIntosh Laboratory, Inc.: *See—*
  - Smith, David L., 5,751,821, Cl. 381-90.000.
- McIntosh, Michael Philip: *See—*
  - Bolin, Mark Robert; Kishi, Gregory Tad; and McIntosh, Michael Philip, 5,751,844, Cl. 382-156.000.
- McIntyre, Dale F.; Pagano, Daniel M.; Patton, David L.; and Weissberger, Edward, to Eastman Kodak Company. Film slides having data windows. 5,751,399, Cl. 353-120.000.
- McIntyre, Dale F.; and Schrock, Anthony W., to Eastman Kodak Company. Autofocus camera with power control for emitted beam. 5,752,115, Cl. 396-431.000.
- McIntyre, Dale Frederick, to Eastman Kodak Company. Apparatus for supporting a camera to face a subject to be photographed and for illuminating the subject. 5,752,097, Cl. 396-157.000.
- McIntyre, John Randolph: *See—*
  - Coffey, Johnnie A.; Foster, Larry Steven; Horrall, Paul Douglas; and McIntyre, John Randolph, 5,752,135, Cl. 399-115.000.
- McKann, H. Smith, to General Products Company, Inc. Light frame system with fastener clips. 5,749,184, Cl. 52-204.100.
- McKay, Brent Matthew: *See—*
  - Vanden Heuvel, Dean Paul; McKay, Brent Matthew; and Tooker, James Morris, 5,751,723, Cl. 370-528.000.
- McKinley, Arthur C.: *See—*
  - Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., 5,751,341, Cl. 348-65.000.
- McKinley, Harry R.: *See—*
  - Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., 5,751,341, Cl. 348-65.000.
- McLachlan, Craig J., to Harris Corporation. Defect control in formation of dielectrically isolated semiconductor device regions. 5,750,432, Cl. 438-404.000.
- McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, to Eastman Chemical Company. System for punching holes in a spinnerette. 5,751,011, Cl. 250-559.330.
- McLemore, Linda M.: *See—*
  - Guillot, Joe; Dinh, Michael Quan; Roberts, Bill; and McLemore, Linda M., 5,749,143, Cl. 29-841.000.
- McMahan, Kevin W.: *See—*
  - Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., 5,749,701, Cl. 415-115.000.
- McMahan, Robert L.; and Martinez, Maureen, to Dell USA, L.P. Computer system chassis having a selectively extendible support assembly for conversion between desktop and tower patforms. 5,749,637, Cl. 312-223.200.
- McMahon, Jack; and Chiu, George, to Intel Corporation. Tape with solder forms for semiconductor devices. 5,751,068, Cl. 257-774.000.
- McMahon, Kelly B.: *See—*
  - Thomas, Larry A.; and McMahon, Kelly B., 5,751,116, Cl. 315-240.000.
- McMahon, Scott H. R.; Buchanan, James Michael; and Horne, Stephen C., to Advanced Micro Devices, Inc. Variable strength clock signal driver and method of manufacturing the same. 5,751,173, Cl. 327-170.000.
- McMillen, Troy A.: *See—*
  - Schulze, Dale R.; and McMillen, Troy A., 5,749,898, Cl. 606-228.000.
- McMullen, Steven Robert: *See—*
  - Rajashekara, Kaushik; Gorti, Bhanuprasad Venkata; McMullen, Steven Robert; and Raibert, Robert Joseph, 5,751,069, Cl. 290-40.00C.
- McNeil-PPC, Inc.: *See—*
  - Nguyen, Hien; Martens, Nicolas; and Garbolino, Glenn, 5,750,446, Cl. 442-337.000.
- McNeilly, Leonard: *See—*
  - Buswell, Richard F.; Cohen, Ronald; McNeilly, Leonard; and Watkins, David S., 5,750,076, Cl. 422-115.000.
- McNelis, John M.: *See—*
  - Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., 5,751,034, Cl. 257-295.000.
- McVicar, Martin: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- Meade, Harry; and Lonberg, Nils, to Pharming B.V. Transgenic non human mammal milk. 5,750,172, Cl. 426-580.000.

Meck, Leslie A.; and Ellis, Philip C., to Baldwin Hardware Corporation. Oval door knob construction. 5,749,612, Cl. 292-347.000.

MEDAR, Inc.: *See*—

Robinson, David A., 5,751,450, Cl. 358-504.000.

Medford, Russell M.; Alexander, R. Wayne; Parthasarathy, Sampath; and Khan, Bobby V., to Emory University. Treatment for atherosclerosis and other cardiovascular and inflammatory diseases. 5,750,351, Cl. 435-7.210.

MediaLink Technologies Corporation: *See*—

Lacas, Mark A.; and Warman, David J., 5,751,713, Cl. 370-445.000.

Medsker, Robert Eugene; Patel, Raman; and Sabet, Sabet-Abdou, to Advanced Elastomer Systems, L.P. Phenolic resin curatives which form nonstaining thermoplastic elastomers. 5,750,625, Cl. 525-133.000.

Medtronic, Inc.: *See*—

Kieval, Robert S.; and Hess, Michael F., 5,749,906, Cl. 607-9.000.

Lenker, Jay A.; Evans, Michael A.; Kim, Steven W.; and Kinney, Edward V., 5,749,921, Cl. 623-1.000.

Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.

Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., 5,749,852, Cl. 604-96.000.

Meeks, Donald J., Jr.: *See*—

Kaufman, Mark I.; and Meeks, Donald J., Jr., 5,749,186, Cl. 52-236.300.

Meenen, Raymond P.: *See*—

Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.

Megahed, El-Sayed: *See*—

Xie, Like; Fouchard, David T.; Ebner, Walter B.; and Megahed, El-Sayed, 5,750,288, Cl. 429-229.000.

Mehdi, Shujaath: *See*—

Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.

Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., to Texas Instruments Incorporated. Field programmable gate array logic module configurable as combinational or sequential circuits. 5,751,162, Cl. 326-37.000.

Mehlberg, Robert L.; and Young, James B., to Amoco Corporation. Alkylation process. 5,750,818, Cl. 585-709.000.

Mehta, Bakulesh A.: *See*—

Cushman, Paul W.; Won, King L.; Mehta, Bakulesh A.; and Akselrod, Mark, 5,751,698, Cl. 370-252.000.

Mehta, Sudhir; and Caveny, William J., to Halliburton Energy Services, Inc.; and Atlantic Richfield Company. Cementitious compositions and methods for use in subterranean wells. 5,749,418, Cl. 166-292.000.

Meier, Albert H.: *See*—

Cincotta, Anthony H.; and Meier, Albert H., 5,750,519, Cl. 514-200.000.

Meier, John R.: *See*—

Faust, John E.; and Meier, John R., 5,752,159, Cl. 455-5.100.

Meischen, Sandra J.: *See*—

Van Pelt, Vince; Meischen, Sandra J.; and Timpson, Clifford J., 5,750,992, Cl. 250-372.000.

Meisel, William Stuart: *See*—

Basore, David Lee; and Meisel, William Stuart, 5,752,232, Cl. 704-275.000.

Meiser, Manfred: *See*—

Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.

Meissner, Hans-Jurgen: *See*—

Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, 5,750,444, Cl. 442-62.000.

Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., to Focal, Inc. Device for priming for improved adherence of gels to substrates. 5,749,968, Cl. 118-300.000.

Melen, Robert E.: *See*—

Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.

Melen, Roger D.; and Krtolica, Boris, to Canon Kabushiki Kaisha. System for reading parameters from portable key module and transferring these parameters to controller to effect distribution and storage of electronic document data throughout network. 5,752,079, Cl. 395-827.000.

Melillo, Gabriella: *See*—

Mantovanini, Marco; Melillo, Gabriella; and Daffonchio, Luisa, 5,750,536, Cl. 514-300.000.

Melino, Robert H., to Xerox Corporation. Dynamic control of a ROS diode laser to improve output imaging. 5,751,333, Cl. 347-247.000.

Mellul, Myriam: *See*—

Arnaud, Pascal; and Mellul, Myriam, 5,750,095, Cl. 424-64.000.

Melpolder, Sharon Marilyn; Smith, Dennis Edward; Wheeler, Christopher Edwin; and Muehlbauer, John Leonard, to Eastman Kodak Company. Thermally processable imaging element comprising polymeric matte particles. 5,750,328, Cl. 430-619.000.

Melville, Charles D.; Furness, Thomas A., III; and Tidwell, Michael R., to University of Washington. Miniature optical scanner for a two axis scanning system. 5,751,465, Cl. 359-213.000.

Menchetti, Robert J., to National Gypsum Company. Corner clips for horizontal framing. 5,749,192, Cl. 52-489.100.

Mend Technologies, Inc.: *See*—

Delaney, Michael R.; and Tilley, Allen D., 5,749,602, Cl. 285-61.000.

Mendez G., Antonio: *See*—

Hood, Larry L.; and Mendez G., Antonio, 5,749,871, Cl. 606-50.000.

Mendolia, Gregory S., to Ericsson, Inc. Audio input for flip type telephones. 5,751,804, Cl. 379-433.000.

Meng, Wan-Yu: *See*—

Chiueh, Tzi-Dar; Chang, Hwai-Tsu; Hsu, Fang-Ru; and Meng, Wan-Yu, 5,751,913, Cl. 395-27.000.

Menjo, Takeshi: *See*—

Danzuka, Toshimitsu; Sakemi, Yuji; Fukushima, Hisashi; and Menjo, Takeshi, 5,752,140, Cl. 399-270.000.

Menon, I. Aravindakshan; and Haberman, Herbert F., to DUSA Pharmaceuticals, Inc. 33 Lipomelanin sunscreen composition. 5,750,093, Cl. 424-59.000.

Mentink, Laurentius A. G., to Applied Power Inc. Motor vehicle with foldable roof, and foldable roof for such a motor vehicle. 5,749,619, Cl. 296-107.000.

Menu, Eric P., to Motorola, Inc. Method for forming a thin film of a non-stoichiometric metal oxide. 5,750,188, Cl. 427-126.300.

Mera, Yukinori; Nishi, Naoki; Kurimoto, Tadashi; and Sato, Hiroki, to Zeria Pharmaceutical Co., Ltd. Remedy for hyperlipidemia. 5,750,524, Cl. 514-247.000.

Mercedes-Benz AG: *See*—

Bender, Franz, 5,749,350, Cl. 123-571.000.

Knoll, Heinz; and Fischer, Wolfgang, 5,749,601, Cl. 280-805.000.

Mercier, Diana M.: *See*—

Johnson, John R.; and Mercier, Diana M., 5,750,234, Cl. 428-141.000.

Merck & Co., Inc.: *See*—

Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., 5,750,826, Cl. 800-2.000.

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Merck Frosst Canada: *See*—

Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.

Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—

Glausch, Ralf; Reinhard, Georg; Jircik, Renate; and Rammelt, Ursula, 5,749,946, Cl. 106-14.170.

Goulding, Mark; Coates, David; and Greenfield, Simon, 5,750,051, Cl. 252-299.650.

Kieser, Manfred; Hennemann, Afred; and Stahlecker, Otto, 5,749,957, Cl. 106-403.000.

Meredith, Sheldon Kent; and Steele, Walter Brian, to Radio Frequency Systems, Inc. Modular interconnect matrix for matrix connection of a plurality of antennas with a plurality of radio channel units. 5,752,200, Cl. 455-562.000.

Meredith, Susan Stone: *See*—

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

Meregalli, Letizia: *See*—

Marella, Marcello; Meregalli, Letizia; and Tomaselli, Michele, 5,750,459, Cl. 502-304.000.

Meridian Semiconductor, Inc.: *See*—

Chang, Hsiao-Shih; Kane, James A.; and Whitted, Graham B., III, 5,751,984, Cl. 395-392.000.

Merk, Holger: *See*—

Stohbe, Anatoli; and Merk, Holger, 5,751,570, Cl. 364-140.000.

Merrell Pharmaceuticals Inc.: *See*—

Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, 5,750,744, Cl. 552-515.000.

Mesropian, Ashot: *See*—

Kwon, Young Key; Mesropian, Ashot; Lee, Kwang Min; and Soboley, Sergey, 5,751,436, Cl. 358-299.000.

Mestric, Roland: *See*—

Bissessur, Hans; Mestric, Roland; and Duchet, Christian, 5,751,872, Cl. 385-37.000.

Metcalf, Donald: *See*—

Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.

Metel, Omer; and Pretorius, Francois, to Safetran Systems Corporation. Geographic train control. 5,751,569, Cl. 364-132.000.

Metivaud, Guy: *See*—

Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, 5,749,985, Cl. 156-64.000.

Métrope, Jacques: *See*—

Récolet, Francois; and Métrope, Jacques, 5,749,297, Cl. 101-415.100.

Metzler, Donald L. Invalid bed guard sheet. 5,749,112, Cl. 5-663.000.

Metzner, Christoph: *See*—

Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, 5,750,185, Cl. 427-8.000.

Meucci, Victoria P.: *See*—

Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., 5,750,413, Cl. 436-537.000.

Meurer, Laura: *See*—

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Mewshaw, Richard E.; and Stack, Gary P., to American Home Products Corporation. 2-(aminomethyl)-3,4,7,9-tetrahydro-2H-pyrano-[2,3-E]indol-8-ones and derivatives. 5,750,556, Cl. 514-411.000.

Meyer, Charles S.; and Allen, Neill J., to Nvision, Inc. Switcher for flexibly interconnecting communication ports. 5,751,764, Cl. 375-219.000.

Meyer, Jeffery A. Method for controlling ectoparasites. 5,750,514, Cl. 514-63.000.

Meyer, Thomas A.; Ando, Michael E.; and Powell, Jimmy B., to Schering-Plough HealthCare Products, Inc. Sunless tanning composition and method. 5,750,092, Cl. 424-59.000.

Meyer, Willi, to Emhart Glass Machinery Investments Inc. Deflector mounting. 5,749,553, Cl. 248-298.100.

Meyers, Mark Marshall, to Eastman Kodak Company. Diffractive/Refractive lenslet array incorporating a second aspheric surface. 5,751,492, Cl. 359-619.000.

Meyers, Steven C.: *See*—

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

MG Nitrogen Services, Inc.: *See*—

Michael, Keith, 5,749,422, Cl. 175-71.000.

MG2 S.p.A.: *See*—

De Canis, Sandro; and Ansaloni, Angelo, 5,750,938, Cl. 177-50.000.

Micco, Felice A.; and Banton, Martin E., to Xerox Corporation. Method and apparatus for image rotation with reduced memory using JPEG compression. 5,751,865, Cl. 382-296.000.

Michael, David, to Cognex Corporation. Locating shapes in two-dimensional space curves. 5,751,853, Cl. 382-203.000.

Michael, Keith, to MG Nitrogen Services, Inc. Non-cryogenic nitrogen for on-site downhole drilling and post drilling operations. 5,749,422, Cl. 175-71.000.

Michel, France: *See*—

Bono, Hubert; Michel, France; and Rey, Patrice, 5,750,420, Cl. 438-52.000.

Michel, Patrick: *See*—

Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,751,714, Cl. 370-452.000.

Michelin Recherche et Technique S.A.: *See*—

Frey, Normain Walter; and Albertson, Robert Jeffery, 5,749,984, Cl. 152-415.000.

Michigan Molecular Institute: *See*—

Saam, John C., 5,750,751, Cl. 554-165.000.

Michiue, Makoto, to Matsushita Electric Industrial Co., Ltd. Arrangement of data processing system having plural arithmetic logic circuits. 5,752,061, Cl. 395-800.000.

Michlbauer, Franz: *See*—

Heidlas, Jurgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rudiger, 5,750,180, Cl. 426-614.000.

Mick, John; Miller, Michael; Smith, Jeff; and Baumann, Mark, to Integrated Device Technology, Inc. Mail-box design for non-blocking communication across ports of a multi-port device. 5,751,638, Cl. 365-189.040.

Microfil Industries S.A.: *See*—

Blanc, Louis, 5,749,919, Cl. 623-1.000.

Micron Display Technology, Inc.: *See*—

Browning, Jim; Watkins, Charles M.; and Cathey, David A., 5,751,262, Cl. 345-75.000.

Micron Quantum Devices, Inc.: *See*—

Roohparvar, Frankie F.; and Chevallier, Christophe J., 5,751,944, Cl. 395-183.180.

Micron Technology, Inc.: *See*—

Corbett, Tim J.; Scholer, Raymond P.; and Gonzalez, Fernando, 5,751,015, Cl. 257-48.000.

Dennison, Charles H.; and Marr, Ken, 5,751,046, Cl. 257-392.000.

Figura, Thomas A.; and Howard, Bradley J., 5,750,441, Cl. 438-751.000.

Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.

Juengling, Werner, 5,750,442, Cl. 438-761.000.

Kauffman, Ralph; and Lee, Roger, 5,751,039, Cl. 257-316.000.

Li, Li; and Hawthorne, Richard C., 5,749,975, Cl. 134-1.300.

Loughmiller, Daniel R., 5,751,158, Cl. 324-763.000.

Manning, Monte, 5,751,646, Cl. 365-200.000.

O'Toole, James E., 5,751,647, Cl. 365-200.000.

Roberts, Ceredig, 5,751,630, Cl. 365-154.000.

Sandhu, Gurtej S., 5,751,896, Cl. 392-416.000.

Schaefer, Scott, 5,751,656, Cl. 365-233.500.

Seyyedy, Mirmajid, 5,751,626, Cl. 365-145.000.

Thompson, J. Wayne; and Manning, Troy A., 5,751,031, Cl. 257-208.000.

Wolstenholme, Graham R.; and Ireland, Philip J., 5,751,012, Cl. 257-5.000.

MicroQuest Diagnostics, Inc.: *See*—

Olstein, Alan D.; and Albert, Richard, 5,750,357, Cl. 435-7.320.

Microsoft Corporation: *See*—

Blake, Russ; Baghai, M. Reza; and Smith, Lee A., 5,752,038, Cl. 395-709.000.

Cutler, David N.; and Lenzmeier, Charles T., 5,752,031, Cl. 395-673.000.

Girard, Michel; Rowe, Keith; Matthews, Joseph H., III; and Lawler, Frank, 5,751,282, Cl. 345-327.000.

Reiter, Allen; and Jose, Ian Charles, 5,752,243, Cl. 707-3.000.

Richardson, Stephen Darrow; and Heidorn, George E., 5,752,052, Cl. 395-759.000.

Shakib, Darren Arthur; Rockenbeck, William H.; Benson, Max Loell; and Joshi, Milind Madhukar, 5,752,025, Cl. 395-613.000.

Shih, Yung-Ho, 5,751,276, Cl. 345-178.000.

Smith, Matthew W., 5,751,283, Cl. 345-342.000.

Zbikowski, Mark; and Ferguson, Robert I., 5,752,252, Cl. 707-205.000.

Microtest, Inc.: *See*—

DuBose, Richard G.; and Teague, Martin, 5,751,152, Cl. 324-628.000.

Jones, Clay LaMoyne, 5,752,005, Cl. 395-500.000.

Middelhoek, Erik Leonard: *See*—

Schomaker, Elwin; Bos, Johannes; and Middelhoek, Erik Leonard, 5,750,030, Cl. 210-679.000.

Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, to Medtronic, Inc. Device or apparatus for manipulating matter. 5,749,879, Cl. 606-139.000.

Migachyov, Valery; and Colley, Charles D., to HK Medical Technologies Incorporated. Automatic valve test apparatus. 5,751,606, Cl. 364-558.000.

Migny, Philippe, to Securite et Signalisation. Matrix array display panel. 5,749,647, Cl. 362-248.000.

Miguel-Colombel, Dolores, to L'Oreal. Cosmetic composition in the form of a solid dispersion comprising a fatty phase, a polyhydric alcohol and colorless fillers. 5,750,120, Cl. 224-401.000.

Mihara, Satoru, to Fujitsu Limited. Method for plasma downstream processing. 5,750,208, Cl. 427-539.000.

Mihara, Takashi, to Olympus Optical Co., Ltd. Ferroelectric memory and recording device using the same. 5,751,625, Cl. 365-145.000.

Mihira, Akihiro; and Mizohata, Tadashi, to Futaba Denshi Kogyo K.K. Fluorescent display tube. 5,751,106, Cl. 313-495.000.

Mikagi, Kaoru, to NEC Corporation. Compact semiconductor device having excellent electrical characteristics and long time reliability. 5,751,067, Cl. 257-764.000.

Mikata, Yuichi: *See*—

Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, 5,750,436, Cl. 438-558.000.

Miki, Toshio: *See*—

Duttweiler, Donald Lars; Kawahara, Toshiro; Kim, Cheng; and Miki, Toshio, 5,752,229, Cl. 704-270.000.

Miki Trading Co., Ltd.: *See*—

Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.

Mikoh Technology Limited: *See*—

Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.

Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, to Cortec Corporation. Corrosion inhibitor for reducing corrosion in metallic concrete reinforcements. 5,750,053, Cl. 252-389.520.

Milicia, Libbe A.: *See*—

Porter, David H.; and Milicia, Libbe A., 5,749,643, Cl. 362-146.000.

Milius, Richard A.: *See*—

Neumeyer, John L.; Milius, Richard A.; Tamagnan, Gilles; and Wang, Shaoyin, 5,750,089, Cl. 424-1.850.

Miller, A. Glenn, Jr.; and Miller, Martha C. Poultry house cleaner apparatus. 5,749,114, Cl. 15-93.100.

Miller, David Darrell: *See*—

Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.

Miller, David J.: *See*—

Hinds, David; Kapetanakis, Ana; McFarland, Stephen J.; Campbell, Mark C.; Levin, David S.; and Miller, David J., 5,751,941, Cl. 395-183.140.

Miller, Dennis Brian: *See*—

Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, 5,749,614, Cl. 294-64.100.

Miller, Donald E.: *See*—

Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.

Miller, Eric J., to S. C. Johnson & Son, Inc. Liquid air freshener dispenser device with nonporous wicking means. 5,749,519, Cl. 239-44.000.

Miller, Eric J.: *See—*

Martin, John; and Miller, Eric J., 5,749,520, Cl. 239-44.000.

Miller, Gary L.; and Williams, Kenneth R., to Hewlett-Packard Company. Limited access needle/septum ink-supply interface mechanism. 5,751,322, Cl. 347-86.000.

Miller, James C.: *See—*

Horvath, Joseph G.; and Miller, James C., 5,751,132, Cl. 318-798.000.

Miller, James E.: *See—*

Nappi, Bruce; Schroeder, William; and Miller, James E., 5,751,260, Cl. 345-8.000.

Miller, Martha C.: *See—*

Miller, A. Glenn, Jr.; and Miller, Martha C., 5,749,114, Cl. 15-93.100.

Miller, Marvin J.: *See—*

Teng, Min; and Miller, Marvin J., 5,750,681, Cl. 540-203.000.

Miller, Michael: *See—*

Mick, John; Miller, Michael; Smith, Jeff; and Baumann, Mark, 5,751,638, Cl. 365-189.040.

Miller, Myron W. Storage rack and structural beam therefor. 5,749,481, Cl. 211-191.000.

Miller, Nigel David, to Smith & Nephew Group Research Centre. Woven or knitted elastic bandages having controlled compressive forces. 5,749,843, Cl. 602-75.000.

Miller, Richard: *See—*

Haskell, Malcolm W.; Miller, Richard; and Zefferi, Suzanne, 5,750,488, Cl. 510-412.000.

Miller, William L.: *See—*

Stanfield, Joel D.; Branc, Joseph R.; Feldpausch, Thomas G.; and Miller, William L., 5,751,221, Cl. 340-825.350.

Mills, Louis Thomas; Butler, Richard M.; and Bradley, Havyn Eugene, to Hewlett-Packard Company. Method for making integrated circuit packaging with reinforced leads. 5,750,422, Cl. 438-112.000.

Mills, Randel: *See—*

Brammall, Terrence N.; Mills, Randel; Ridenour, Rodney; and Stevenson, David, 5,749,610, Cl. 292-327.000.

Mills, Sander G.: *See—*

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Mills, Stuart D., to Zeneca Limited. Heterocyclic compounds. 5,750,754, Cl. 558-52.000.

Millsaps, Darrin S.: *See—*

Hamouda, Hechmi; Barker, Roger L.; and Millsaps, Darrin S., 5,749,259, Cl. 73-159.000.

Milman, Oscar: *See—*

Rabinovich, Pavel; Shochat, Michael; Zeldin, Vladimir; and Milman, Oscar, 5,749,369, Cl. 128-734.000.

Milward, Francis William: *See—*

Vandeputte, Joris Frans; Guillaud, Marc Jean; and Milward, Francis William, 5,750,118, Cl. 424-262.100.

Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, to Kansai Electric Power Co., Inc., The; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for the removal of hydrogen sulfide present in gases. 5,750,083, Cl. 423-228.000.

Min, Kyungyoon: *See—*

Brown, Richard I.; and Min, Kyungyoon, 5,750,039, Cl. 210-782.000.

Minakawa, Yumiko: *See—*

Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.

Minami, Itsuji, to Fuji Photo Optical Co., Ltd. Objective optical member with air gap for endoscope imaging unit. 5,749,827, Cl. 600-109.000.

Minami, Yuji: *See—*

Tateno, Tetsuya; and Minami, Yuji, 5,751,233, Cl. 341-67.000.

Minas, Maritess E.: *See—*

Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., 5,749,852, Cl. 604-96.000.

Minato, Tsuyoshi: *See—*

Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakibara, Keisuke; and Minato, Tsuyoshi, 5,749,129, Cl. 24-452.000.

Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, to Fujitsu Limited. Instance updating method and apparatus therefor. 5,752,250, Cl. 707-200.000.

Mine Safety Appliances Company: *See—*

Corella, Joseph A., II; and Neigh, Kevin M., 5,750,087, Cl. 423-604.000.

Minford, Eric: *See—*

Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.

Minnesota Mining and Manufacturing Company: *See—*

Bellas, Jeffrey J.; Boling, Clyde W.; Brunner, Dennis M.; and Feldman, Steven, 5,749,741, Cl. 439-95.000.

Delmore, Michael D.; and Maier, Gary W., 5,750,159, Cl. 425-190.000.

Exsted, Bert J.; and Kangas, Steven L., 5,750,245, Cl. 428-315.500.

Ezzell, Stephen A.; Sahouani, Hassan; and Thurber, Ernest L., 5,750,641, Cl. 528-353.000.

Fedde, Mickiel P.; and Klimisch, Kevin W., 5,751,225, Cl. 340-941.000.

Garber, Sharon R.; Glaser, Rena H.; and Cary, Carolyn M., 5,752,054, Cl. 395-767.000.

Hachey, Kathleen A.; Stump, Larry K.; Beseup, Terrance L.; and Kusilek, Thomas V., 5,750,191, Cl. 427-163.400.

Sengupta, Ashok, 5,750,630, Cl. 528-59.000.

Sundet, Douglas C., 5,749,994, Cl. 156-230.000.

Vitcak, Daniel R.; and Flynn, Richard M., 5,750,797, Cl. 568-683.000.

Minolta Camera Kabushiki Kaisha: *See—*

Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, 5,749,569, Cl. 271-10.110.

Minolta Co., Ltd.: *See—*

Akamatsu, Norihiko; Hamada, Masataka; Yukawa, Kazuhiko; and Ootsuka, Hiroshi, 5,752,101, Cl. 396-155.000.

Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, 5,752,150, Cl. 399-330.000.

Ogoshi, Takeshi; and Maeda, Yukari, 5,751,451, Cl. 358-527.000.

Shinya, Nozomi; and Eda, Masami, 5,749,401, Cl. 141-80.000.

Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, 5,752,148, Cl. 399-329.000.

Minor, Raymond B.: *See—*

McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,750,931, Cl. 174-110.0PM.

Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, to Hitachi, Ltd. Method and apparatus for controller power train of motor vehicle. 5,752,214, Cl. 701-111.000.

Mirigian, Gregory E.: *See—*

Palermo, Thomas J.; Samson, Gene; Mirigian, Gregory E.; and Chee, U. Hiram, 5,749,837, Cl. 600-585.000.

Mirtich, Vincent L.: *See—*

Heminger, David M.; Mirtich, Vincent L.; and Grant, William H., 5,751,052, Cl. 257-577.000.

Misawa, Atsushi: *See—*

Toji, Shigeo; Yoshida, Masanori; and Misawa, Atsushi, 5,752,098, Cl. 396-85.000.

Misawa, Junichi; and Suenaga, Yutaka, to Nikon Corporation. Shake-preventing correction optical system. 5,751,486, Cl. 359-557.000.

Misawa, Tsutami: *See—*

Itoh, Hisato; Misawa, Tsutami; Ogiso, Akira; and Imai, Rihoko, 5,751,483, Cl. 359-502.000.

Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.

Mischke, Mark R.: *See—*

Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.

Miser, Donald E.: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Misono, Makoto: *See—*

Na, Kyutae; Okuhara, Toshio; and Misono, Makoto, 5,750,457, Cl. 502-211.000.

Mississippi State University: *See—*

Singh, Jagdish P.; Yueh, Fang-Yu; Cook, Robert L.; and Zhang, Hansheng, 5,751,416, Cl. 356-311.000.

Mistry, Jyotsna T.: *See—*

Mistry, Thakor R.; and Mistry, Jyotsna T., 5,749,623, Cl. 297-281.000.

Mistry, Thakor R.; and Mistry, Jyotsna T. Reversible swing with storage cabinets. 5,749,623, Cl. 297-281.000.

Mita Industrial Co., Ltd.: *See—*

Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.

Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.

Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.

Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, 5,752,145, Cl. 399-256.000.

Okado, Makoto; Ueda, Yoshihiro; Kobata, Tadashi; and Taniguchi, Masami, 5,752,127, Cl. 399-76.000.

Takemura, Osamu; Kimura, Takahiko; and Fujii, Atsushi, 5,751,314, Cl. 347-55.000.

Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.

Mita Industries Co. Ltd: *See—*

Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Utatsu, Hiroshige, 5,752,125, Cl. 399-8.000.

Yamashita, Yuji, 5,752,128, Cl. 399-80.000.

Mitchell, Andrew L.; and Patchel, Kenneth A., to Ultraflex Systems, Inc. Dynamic splint. 5,749,840, Cl. 602-5.000.

Mitchell, John R., to Particle Measuring Systems, Inc. In-situ particle detection utilizing optical coupling. 5,751,422, Cl. 356-337.000.

Mitchell, Thomas William: *See—*

Dozier, Charles Wayne; and Mitchell, Thomas William, 5,751,345, Cl. 348-153.000.

Dozier, Charles Wayne; and Mitchell, Thomas William, 5,751,346, Cl. 348-153.000.

Mitsubishi Chemical Corporation: *See—*

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Shima, Koji; Hattori, Eiji; and Oguri, Yasuo, 5,750,048, Cl. 252-71.000.

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Ushikubo, Takashi; Koyasu, Yukio; and Nakamura, Hiroya, 5,750,760, Cl. 558-319.000.

Mitsubishi Denki Kabushiki: *See—*

Inoue, Sadayuki; Ishimoto, Junko; and Onishi, Ken, 5,751,232, Cl. 341-63.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*

Akamatsu, Koji, 5,751,155, Cl. 324-678.000.

Aono, Shinji, 5,751,023, Cl. 257-138.000.

Hamada, Kiyoshi; and Ishimoto, Shin-ichi, 5,751,442, Cl. 358-442.000.

Honda, Hiroki, 5,751,053, Cl. 257-592.000.

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Kimura, Yasuki; Shirase, Takashi; Okamura, Masamitsu; and Maezono, Shuichi, 5,749,760, Cl. 445-4.000.

Maemura, Kousei; and Yamamoto, Kazuya, 5,751,181, Cl. 327-434.000.

Matsubara, Toshiyuki, 5,751,765, Cl. 375-219.000.

Matsuki, Masatoshi, 5,751,058, Cl. 257-692.000.

Matsuoka, Hiroshi; Chimura, Kazuo; and Kariya, Shigeki, 5,749,556, Cl. 248-349.100.

Ohji, Hiroshi, 5,750,251, Cl. 428-332.000.

Ooishi, Tsukasa, 5,751,627, Cl. 365-145.000.

Ooishi, Tsukasa, 5,751,651, Cl. 365-226.000.

Sato, Tatsushi; and Sendai, Tomoko, 5,751,589, Cl. 364-474.350.

Suda, Eiichi; Nihei, Takayuki; and Tanaka, Kyoko, 5,752,033, Cl. 395-701.000.

Sugiyama, Kazuhiro; Ono, Yukari; and Ishida, Yoshinobu, 5,752,221, Cl. 704-201.000.

Takagi, Kazuhisa, 5,751,754, Cl. 372-46.000.

Takahashi, Hideki, 5,751,024, Cl. 257-139.000.

Tsugai, Masahiro, 5,751,154, Cl. 324-661.000.

Tsukikawa, Yasuhiko, 5,751,645, Cl. 365-194.000.

Umetsu, Minoru, 5,751,963, Cl. 395-200.530.

Wada, Tomohisa, 5,752,270, Cl. 711-169.000.

Wakabayashi, Toshitsugu; and Kobayashi, Masaki, 5,751,367, Cl. 348-511.000.

Yamabuchi, Hiroshi, 5,751,407, Cl. 356-3.050.

Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, 5,751,890, Cl. 386-79.000.

Yamazaki, Akira; and Dosaka, Katsumi, 5,751,655, Cl. 365-233.000.

Mitsubishi Electric Information Technology Center America, Inc.: *See—*

Osborne, Randy B.; Howard, John H.; Casley, Ross T.; and Hahn, Douglas J., 5,751,951, Cl. 395-200.800.

Mitsubishi Electric Semiconductor Software Co., Ltd.: *See—*

Matsubara, Toshiyuki, 5,751,765, Cl. 375-219.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*

Isozaki, Tsuyoshi; Kurokawa, Masahiro; and Honma, Akihiro, 5,750,739, Cl. 549-515.000.

Mitsubishi Jidosha Kogyo Kabushi Kaisha: *See—*

Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, 5,750,888, Cl. 73-118.100.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*

Oda, Hideyuki; Kamura, Hitoshi; and Murakami, Nobuaki, 5,749,334, Cl. 123-305.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*

Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, 5,750,083, Cl. 423-228.000.

Mitsubishi Kasei Corporation: *See—*

Sato, Tadashige; Imai, Megumi; and Takahashi, Tsuneteru, 5,751,026, Cl. 257-190.000.

Mitsubishi Paper Mills Limited: *See—*

Ogawa, Susumu; Senoh, Hideaki; Andoh, Masaru; and Nomura, Hideki, 5,750,200, Cl. 427-361.000.

Mitsuhashi, Satoshi: *See—*

Suzuki, Kazuhiro; Mitsuhashi, Satoshi; and Ando, Yuji, 5,751,358, Cl. 348-405.000.

Mitsui Toatsu Chemicals, Inc.: *See—*

Itoh, Hisato; Misawa, Tsutami; Ogiso, Akira; and Imai, Rihoko, 5,751,483, Cl. 359-502.000.

Nagata, Teruyuki; Hayashi, Hidetoshi; and Mizuta, Hideki, 5,750,779, Cl. 562-828.000.

Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.

Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.

Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, 5,750,267, Cl. 428-469.000.

Mitsumi Electric Co., Ltd.: *See—*

Konno, Makoto; Shibata, Akira; Watanabe, Takashi; and Komatsu, Hisateru, 5,751,518, Cl. 360-104.000.

Mitsuoka, Shigeaki: *See—*

Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, 5,750,083, Cl. 423-228.000.

Mitsutake, Hideaki: *See—*

Kimura, Kazumi; Mitsutake, Hideaki; Yano, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, 5,749,642, Cl. 353-98.000.

Mittermeier, Manfred: *See—*

Brennenstuhl, Werner; Mittermeier, Manfred; and Huber, Wilhelm, 5,750,581, Cl. 521-54.000.

Mitui Petrochemical Industries, Ltd.: *See—*

Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.

Miura, Toshihide: *See—*

Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.

Miura, Toshiro; Soda, Yoshihiro; and Hayashi, Tadao, to Daikin Industries, Ltd. Aqueous fluorine-containing polymer dispersion. 5,750,606, Cl. 524-244.000.

Miura, Yosuke: *See—*

Honda, Masami; and Miura, Yosuke, 5,751,547, Cl. 361-686.000.

Miwa, Makoto: *See—*

Yoshiume, Naoki; and Miwa, Makoto, 5,749,344, Cl. 123-399.000.

Miya, Tatsuya, to NEC Corporation. Frequency converter circuit structure having two sources. 5,751,033, Cl. 257-270.000.

Miyachi, Tatsuo: *See—*

Murata, Norihiko; and Miyachi, Tatsuo, 5,750,893, Cl. 73-204.110.

Miyachi, Yoshihiko: *See—*

Kawahira, Izuru; and Miyachi, Yoshihiko, 5,749,221, Cl. 60-274.000.

Miyagawa, Tomoko: *See—*

Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.

Miyaji, Atsuko; Omori, Motoji; and Tatebayashi, Makoto, to Matsushita Electric Industrial Co., Ltd. Bit agitator. 5,751,810, Cl. 380-28.000.

Miyaji, Hiromasa: *See—*

Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, 5,750,078, Cl. 424-133.100.

Miyake, Jiro: *See—*

Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,751,375, Cl. 348-571.000.

Miyake, Mitsuhiro: *See—*

Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, 5,750,888, Cl. 73-118.100.

Miyamoto, Eiichi: *See—*

Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.

Miyamoto, Hidenori; and Soshi, Isao, to Nikon Corporation. Arrangement of structure in a camera for reduced thickness. 5,752,119, Cl. 396-535.000.

Miyamoto, Hidenori: *See—*

Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.

Miyamoto, Ryoichi: *See—*

Yoshida, Tatsumasa; and Miyamoto, Ryoichi, 5,751,198, Cl. 332-100.000.

Miyamoto, Yoshihiro, to NEC Corporation. System and method for coding and/or decoding image-adaptive split region of motion picture. 5,751,363, Cl. 348-416.000.

Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, to Japan as represented by Director General of Agency of National Institute of Health. Diagnostic reagent for hepatitus C. 5,750,331, Cl. 435-5.000.

Miyasaka, Hideki: *See—*

Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.

Miyasaka, Tetsuo: *See—*

Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji, 5,752,089, Cl. 396-48.000.

Miyashita, Satoru; and Takemoto, Kiyohiko, to Seiko Epson Corporation. Hydrophilic ink passage. 5,751,313, Cl. 347-45.000.

Miyata, Hideo; Sasaki, Toru; and Morikawa, Kohei, to Showa Denko K.K. Method for producing N-phosphonomethylglycine. 5,750,774, Cl. 562-17.000.

Miyata, Kazushi: *See—*

Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, 5,750,747, Cl. 554-36.000.

Miyatake, Masanori: *See—*

Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.

Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, to Fujitsu Limited. Method controlling memory access operations by changing respective priorities thereof, based on a situation of the memory, and a system and an integrated circuit implementing the method. 5,752,266, Cl. 711-158.000.

Miyazaki, Hajime: *See—*

Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, 5,751,091, Cl. 310-339.000.

- Miyazaki, Satoshi: *See—*
  - Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji. 5,752,089, Cl. 396-48.000.
- Miyazaki, Takashi: *See—*
  - Kamishita, Takuzo; and Miyazaki, Takashi, 5,750,579, Cl. 514-772.600.
- Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Shoji, to Olympus Optical Co., Ltd. System operable with a given apparatus and capable of pseudo-rewriting a program. 5,752,089, Cl 396-48.000.
- Miyazawa, Yoshinori: *See—*
  - Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishihashi, Osamu, 5,750,592, Cl. 523-161.000.
- Miyazoe, Seigo; Fushimi, Akira; and Inoue, Masanobu, to Nippon Paint Co., Ltd. Curable resin composition, coating composition, coating method and coated article. 5,750,624, Cl. 525-100.000.
- Miyoshi, Hideaki, to Kaijo Corporation. Substrate transport apparatus and substrate transport path adjustment method. 5,749,698, Cl. 414-786.000.
- Miyoshi, Takeshi: *See—*
  - Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, 5,749,586, Cl. 277-608.000.
- Mizobe, Hoyo: *See—*
  - Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.
- Mizoe, Kiyoshi: *See—*
  - Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.
- Mizoguchi, Tetsuhiko: *See—*
  - Inoue, Tetsuo; Tomita, Hiroshi; Mizoguchi, Tetsuhiko; and Fuke, Hiromi, 5,750,273, Cl. 428-692.000.
- Mizohata, Tadashi: *See—*
  - Mihira, Akihiro; and Mizohata, Tadashi, 5,751,106, Cl. 313-495.000.
- Mizumura, Tetsuo: *See—*
  - Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, 5,750,747, Cl. 554-36.000.
- Mizuno, Akio: *See—*
  - Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,751,355, Cl. 348-375.000.
- Mizuno, Fumio; and Satoh, Osamu, to Hitachi, Ltd. Method for measuring critical dimension of pattern on sample. 5,750,990, Cl. 250-307.000.
- Mizuno, Hiroshi: *See—*
  - Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, 5,751,240, Cl. 342-70.000.
- Mizuno, Masahiro: *See—*
  - Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,751,583, Cl. 364-470.080.
- Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, to Matsushita Electric Industrial Co., Ltd. Optical disc clamp mechanism for use in selectively clamping a mini disc or a compact disc in an optical disc apparatus. 5,751,688, Cl. 369-270.000.
- Mizushima, Shintaro: *See—*
  - Abiko, Shigeshi; Mizushima, Shintaro; and Couvrat, Marc, 5,751,618, Cl. 364-736.010.
- Mizuta, Akira; and Ogawa, Masazumi, to Fuji Photo Film Co., Ltd. Method and apparatus for transferring workpieces. 5,749,455, Cl. 198-626.500.
- Mizuta, Hideki: *See—*
  - Nagata, Teruyuki; Hayashi, Hidetoshi; and Mizuta, Hideki, 5,750,779, Cl. 562-828.000.
- Mizutani, Hideo; and Kawaguchi, Tohru, to Nikon Corporation. Projection exposure apparatus and method. 5,751,403, Cl. 355-53.000.
- MJM Technologies, L.L.P.: *See—*
  - Kazemzadeh, Massoud, 5,750,173, Cl. 426-516.000.
- MKE-Quantum Components Colorado LLC: *See—*
  - Schemmel, Terence D., 5,751,526, Cl. 360-113.000.
- Mobil Oil Corporation: *See—*
  - Xiong, Yusheng; Wu, Margaret M.; Young, L. Brewster; and Chu, Alice S., 5,750,480, Cl. 508-580.000.
- Mochida, Mitsuyoshi: *See—*
  - Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.
- Mochida, Tetsuya: *See—*
  - Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,751,976, Cl. 395-306.000.
- Mochizuki, Koji: *See—*
  - Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, 5,751,142, Cl. 323-316.000.
- Modular Process Technology Corp.: *See—*
  - Shates, Steven C., 5,749,966, Cl. 117-79.000.
- Moebius, Bernd; Olive, Joseph Philip; Tanenblatt, Michael Abraham; and VanSanten, Jan Pieter, to Lucent Technologies Inc. Speech synthesizer having an acoustic element database. 5,751,907, Cl. 395-2.760
- Moerenhout, Jacques: *See—*
  - Mace, Jean-Michel; and Moerenhout, Jacques, 5,750,268, Cl. 428-475.800.
- Moffatt, John R.: *See—*
  - Tsang, Joseph W.; and Moffatt, John R., 5,749,952, Cl. 106-31.640.
- Moffett, Carol: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- Moffett Research and Development Limited: *See—*
  - Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
- Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, to Moffett Research and Development Limited. Forklift truck mounting frame. 5,749,695, Cl. 414-467.000.
- Mogi, Hirokazu, to Canon Kabushiki Kaisha. Video camera apparatus with inhibition of image display during initialization. 5,751,351, Cl. 348-239.000.
- Mogi, Kazuhisa: *See—*
  - Nakata, Koichi; Mogi, Kazuhisa; and Kurebayashi, Youichi, 5,751,147, Cl. 324-399.000.
- Mohl, Kevin M.: *See—*
  - Duncan, David H.; Baker, Gene G.; Kuhn, Alfred K.; Maas, Dana J.; and Mohl, Kevin M., 5,750,009, Cl. 203-64.000.
- Mohri, Masanari: *See—*
  - Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, 5,751,688, Cl. 369-270.000.
- Mohror, Robert Alvin, to Pioneer Hi-Bred International, Inc. Inbred maize line PH44G. 5,750,832, Cl. 800-200.000.
- Mokler, Bernhard, to LTG Lufttechnische Gesellschaft mit beschrankrankter Haftung. Drying apparatus for cans using heated air. 5,749,156, Cl. 34-105.000.
- Molaug, Ole. Pipe tractor. 5,749,397, Cl. 138-89.000.
- Moldex-Metric, Inc.: *See—*
  - Dix, Dan, 5,749,373, Cl. 128-864.000.
- Molecular Imaging Corporation: *See—*
  - Lindsay, Stuart M.; and Jing, Tianwei, 5,750,989, Cl. 250-306.000.
- Molex Incorporated: *See—*
  - Ikesugi, Hiroshi; and Hoshikawa, Shigeyuki, 5,751,876, Cl. 385-86.000.
  - Zuin, Gianni, 5,749,737, Cl. 439-500.000.
- Moll, William F.: *See—*
  - Shaked, Dov; Banin, Amos; Moll, William F.; and Aguilar, Iwona M., 5,749,955, Cl. 106-287.170.
- Moller, Rainer, to FAG OEM und Handel AG. Plastic separator cage for ball bearings. 5,749,661, Cl. 384-526.000.
- Möller, Rudolf; and Müller, Peter, to Mannesmann Aktiengesellschaft. Modular valve arrangement. 5,749,562, Cl. 251-367.000.
- Molnlycke AB: *See—*
  - Wannebo, Andreas, 5,749,987, Cl. 156-64.000.
- Moloney, Maurice M.; and Radke, Sharon, to Calgene, Inc. Transformation and foreign gene expression in *Brassica* species. 5,750,871, Cl. 800-205.000.
- Momoi, Hiroshi: *See—*
  - Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, 5,751,203, Cl. 336-65.000.
- Momose, Shigeyoshi: *See—*
  - Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.
- Momota, Kenji: *See—*
  - Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, 5,750,511, Cl. 514-44.000.
- Momota, Makoto: *See—*
  - Sato, Kenichiro; Sakaguchi, Shinji; and Momota, Makoto, 5,750,310, Cl. 430-192.000.
- Momoyama, Chikako: *See—*
  - Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.
- Monaco, Sam D.: *See—*
  - Morgan, Felix E.; Page, Randall S.; and Monaco, Sam D., 5,750,896, Cl. 73-622.000.
- Monier, Guy, to SGS-Thomson Microelectronics S.A. Method for the production of an error correction parameter associated with the implementation of modular operations according to the Montgomery method. 5,751,620, Cl. 364-746.100.
- Monkowski, Michael Daniel: *See—*
  - Chen, Chengjun Julian; Gopinath, Ramesh Ambat; Monkowski, Michael Daniel; and Picheny, Michael Alan, 5,751,905, Cl. 395-2.630.
- Monma, Akio; Yamanobe, Yasunori; and Sato, Takashi, to Sumitomo Metal Mining Co., Ltd. CRT magnetic compensating circuit with parallel amorphous wires in the sensor. 5,751,112, Cl. 315-8.000.
- Monn, James A.; and Schoepp, Darryle D., to Eli Lilly and Company. Synthetic excitatory amino acids. 5,750,566, Cl. 514-510.000.
- Mono Pumps Limited: *See—*
  - Belcher, Iain Russell, 5,749,416, Cl. 166-68.500.
- Monot, Jean-Jacques; Pipon, Francois; Multedo, Gilbert; and Chevalier, Pascal, to Thomson-CSF. Multisensor reception method for a fixed base station of a communications network exchanging data with mobile stations and device for its implementation. 5,752,168, Cl. 455-67.300.
- Monsanto Company: *See—*
  - Barry, Gerard Francis; Kishore, Ganesh Murthy; and Krohn, Bradley Martin, 5,750,876, Cl. 800-205.000.
  - Krüger, Niels; and Steinbüchel, Alexander, 5,750,848, Cl. 800-205.000.
  - Wright, Daniel R.; Brinker, Ronald J.; Sandbrink, Joseph J.; and Wideman, Al S., 5,750,468, Cl. 504-206.000.

- Monsma, Scott C.: *See—*
  - Blissard, Gary W.; and Monsma, Scott C., 5,750,383, Cl. 435-172.300.
- Monson, Robert J., to Ag-Chem Equipment Co., Inc. Animated map display method for computer-controlled agricultural product application equipment. 5,751,576, Cl. 364-188.000.
- Montavon, François: *See—*
  - Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, 5,750,690, Cl. 544-234.000.
- Montenarh, Matthias: *See—*
  - Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, 5,750,669, Cl. 536-24.300.
- Montminy, Marc R., to Salk Institute for Biological Studies, The. Assays for the identification of compounds which inhibit activation of cAMP and mitogen responsive genes. 5,750,336, Cl. 435-6.000.
- Moon, Sung-Soo. Process for plating palladium or palladium alloy onto iron-nickel alloy substrate. 5,750,016, Cl. 205-50.000.
- Moore Business Forms, Inc.: *See—*
  - Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A., 5,751,307, Cl. 347-33.000.
- Moore, Donald W.: *See—*
  - Doty, Douglas E.; Johnsen, David G.; and Moore, Donald W., 5,751,613, Cl. 364-578.000.
- Moore, Eugene R. Method for alleviating the symptoms of arthritis in mammals. 5,750,144, Cl. 424-451.000.
- Moore, Jay Gary. Wrist brace watch. 5,749,841, Cl. 602-21.000.
- Moore, Jimmy: *See—*
  - Kraus, Joey; Keeble, Jamie; and Moore, Jimmy, 5,749,500, Cl. 222-377.000.
- Moore, Phillip; Lancaster, Patrick R.; and Denley, Robert, to Lantech, Inc. Stretch wrapping apparatus. 5,749,206, Cl. 53-556.000.
- Moore, Steven Jerome. Apparatus and method for controlling animal behavior. 5,749,324, Cl. 119-719.000.
- Moorehouse, Jeffrey Allen: *See—*
  - Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, 5,749,542, Cl. 244-53.00B.
- Moorhouse, Abigail A.: *See—*
  - Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
- Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased (by Virginia B. Wilent, administratrix); Moorhouse, Abigail A.; and Melen, Robert E., to Cardiac Mariners, Inc. Image reconstruction methods. 5,751,785, Cl. 378-146.000.
- Morales, Eric W.: *See—*
  - Burch, Ronald H.; Cancienne, Warren E., Jr.; Rodboon, Somsak S.; and Morales, Eric W., 5,749,777, Cl. 452-149.000.
- Moran, Mark B., to United States of America, Navy. Deposition of diamond on oxidizable material. 5,750,195, Cl. 427-249.000.
- Moreau, Jacques-Pierre: *See—*
  - Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, 5,750,646, Cl. 530-314.000.
- Moremen, Kelley Wilson: *See—*
  - Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.
- Morgan, Carlton B.: *See—*
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,904, Cl. 607-7.000.
  - Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,905, Cl. 607-7.000.
- Morgan, Felix E.; Page, Randall S.; and Monaco, Sam D., to Hughes Aircraft Company. Tool joint sensor. 5,750,896, Cl. 73-622.000.
- Morgan, Jason N.: *See—*
  - Blackwell, Steven R.; Polk, Charles E.; and Morgan, Jason N., 5,751,974, Cl. 395-301.000.
- Morgan, Vincent J.; and Shepherd, Norman J., to DIRO, Inc. Apparatus for preserving interdental papilla and method for using. 5,749,731, Cl. 433-173.000.
- Mori, Atuko, to Fujitsu Limited. Method and device for charging during data communication time in a data switching network. 5,751,799, Cl. 379-114.000.
- Mori, Hiroaki: *See—*
  - Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.
- Mori, Hitomi: *See—*
  - Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.
- Mori, Shinichiro: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Mori, Tetsuya: *See—*
  - Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, 5,751,404, Cl. 355-53.000.
- Mori, Yoshitaka: *See—*
  - Tanaka, Minoru; Yamamoto, Shigeru; and Mori, Yoshitaka, 5,751,353, Cl. 348-335.000.
- Morigami, Yuusuke: *See—*
  - Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, 5,749,569, Cl. 271-10.110.
  - Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, 5,752,150, Cl. 399-330.000.
- Moriguchi, Haruo: *See—*
  - Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, 5,751,568, Cl. 363-95.000.
- Morii, Hiroko: *See—*
  - Hayashi, Kazuyuki; Iwasaki, Keisuke; Tanaka, Yasuyuki; and Morii, Hiroko, 5,750,250, Cl. 428-328.000.
- Morikawa, Kohei: *See—*
  - Miyata, Hideo; Sasaki, Toru; and Morikawa, Kohei, 5,750,774, Cl. 562-17.000.
- Morikawa, Kunihiko, to Nissan Motor Co., Ltd. Reduction gear device with differential gear mechanism for electric vehicle. 5,751,081, Cl. 310-83.000.
- Morikawa, Sumio; Ohga, Toshiji; and Kondoh, Masahiro, to Ohyodo Diesel Co., Ltd. Scissors type steel shearing apparatus with polygonal shearing blades. 5,749,146, Cl. 30-134.000.
- Morimoto, Eiichi, to Murata Kikai Kabushiki Kaisha. Communication method and communication terminal apparatus capable of full-duplex or half-duplex communication. 5,751,441, Cl. 358-435.000.
- Morimoto, Hirofumi: *See—*
  - Kamiya, Kazuo; Morimoto, Hirofumi; and Yokoyama, Shoji, 5,751,228, Cl. 340-988.000.
- Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, to Nissan Chemical Industries, Ltd. Herbicidal 2,6-disubstituted pyridine compounds and compositions. 5,750,470, Cl. 504-253.000.
- Morimoto, Shinichi, to Shimano Inc. Brake mechanism for double-bearing fishing reel. 5,749,534, Cl. 242-288.000.
- Morimoto, Shoji: *See—*
  - Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.
- Morimoto, Yoshinori: *See—*
  - Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, 5,751,748, Cl. 372-31.000.
- Morinaka, Ren: *See—*
  - Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiru; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
- Morishima, Hiroshi: *See—*
  - Musashi, Kazuyuki; and Morishima, Hiroshi, 5,751,980, Cl. 395-354.000.
- Moritz, Steven Harry: *See—*
  - Sawyer, Steven Paul; Armbruster, Peter Joseph; and Moritz, Steven Harry, 5,752,162, Cl. 455-13.100.
- Moriwake, Katsuakira; and Shiraishi, Toshihiro, to Sony Corporation. Image data processing apparatus. 5,751,864, Cl. 382-276.000.
- Moriwaki, Nobuyuki: *See—*
  - Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, 5,751,628, Cl. 365-145.000.
- Moriya, Koichi: *See—*
  - Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 5,750,704, Cl. 546-275.100.
- Moriyama, Jiro: *See—*
  - Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.
- Moriyama, Takashi: *See—*
  - Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.
- Morley, John E., to Apple Computer, Inc. Software emulation system with dynamic translation of emulated instructions for increased processing speed. 5,751,982, Cl. 395-800.000.
- Mornay, Emmanuel; and Simon, Georges, to CTA International. Transmission device having a central rotating wheel and a laying mechanism with such a device. 5,750,916, Cl. 89-33.170.
- Morohashi, Mamoru: *See—*
  - Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, 5,749,548, Cl. 248-49.000.
- Morphew, William H.: *See—*
  - Macon, Charles E., Jr.; and Morphew, William H., 5,752,249, Cl. 707-103.000.
- Morris, Jack E.: *See—*
  - Cherpeck, Richard E.; Morris, Jack E.; and Ahmadi, Majid R., 5,749,929, Cl. 44-387.000.
- Morris, Jack William: *See—*
  - Brandon, Fred Young; DeCoste, Charles Leonard, Jr.; DeMeerleer, Jan Richard; Lattuca, Michael David; and Morris, Jack William, 5,751,324, Cl. 347-87.000.
- Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., to Abbott Laboratories. Immunoassay reagents and method for determining cyclosporine. 5,750,413, Cl. 436-537.000.
- Morrison, Steven Michael, to Fisher-Rosemount Systems, Inc. System and method using separators for developing training records for use in creating an empirical model of a process. 5,752,007, Cl. 395-500.000.

- Morrissey, James H., to Oklahoma Medical Research Foundation. Quantitative clotting assay for activated factor VII. 5,750,358, Cl. 435-13.000.
- Morrow, Donald Lee, to Pioneer Hi-Bred International, Inc. Hybrid maize plant and seeds (3237). 5,750,841, Cl. 800-200.000.
- Morsbach, Bernd: *See—*
  - Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
- Mortenson, Robert F.: *See—*
  - Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.
- Mortimer, George W., to Magnetek. Universal input dimmer interface. 5,751,118, Cl. 315-291.000.
- Mortimer, Keith: *See—*
  - Findley, Philip; Mortimer, Keith; and Marshall, David, 5,750,240, Cl. 428-195.000.
- Morton, Roger Roy A., to Eastman Kodak Company. Multi-lens camera which records status on film. 5,752,111, Cl. 396-324.000.
- Morvan, Jean-Claude: *See—*
  - Granfors, Paul R.; Morvan, Jean-Claude; and Saunders, Rowland F., 5,751,783, Cl. 378-108.000.
- Mosaid Technologies Incorporated: *See—*
  - Lines, Valerie L., 5,751,643, Cl. 365-189.110.
- Moseley, Donn Warwick: *See—*
  - Crowley, Patrick Jelf; Lawson, Kevin Robert; Smith, Douglas John; and Moseley, Donn Warwick, 5,750,778, Cl. 562-605.000.
- Moses, Peter Rick: *See—*
  - DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.
- Mossman, Bruce: *See—*
  - Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000.
- Motomi, Kiyoshi: *See—*
  - Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, 5,750,309, Cl. 430-170.000.
- Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, to Fuji Photo Film Co., Ltd. Lens-fitted photo film unit and electronic flash device for use therewith. 5,752,084, Cl. 396-6.000.
- Motorola: *See—*
  - Smith, Stephen Lee, 5,752,012, Cl. 395-559.000.
- Motorola, Inc.: *See—*
  - Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., 5,751,009, Cl. 250-551.000.
  - Antol, Shawn Richard; and Hafez, Raed Mouaffac, 5,752,048, Cl. 395-750.050.
  - Blackwell, Steven R.; Polk, Charles E.; and Morgan, Jason N., 5,751,974, Cl. 395-301.000.
  - Bockelman, David E., 5,751,153, Cl. 324-638.000.
  - Bruckert, Eugene J., 5,751,763, Cl. 375-200.000.
  - Castaneda, Julio C.; Frandsen, Troy V.; and Greco, Paul M., 5,749,457, Cl. 200-343.000.
  - Chalupa, Leos; and Patocka, Miroslav, 5,751,128, Cl. 318-439.000.
  - Chen, Diana; Jiang, Wenbin; and Lebby, Michael S., 5,751,471, Cl. 359-319.000.
  - D'Addeo, Michael Lee, 5,751,180, Cl. 327-379.000.
  - Dorenbos, David, 5,751,813, Cl. 380-49.000.
  - Dorenbosch, Jheroen; Ayerst, Douglas Irvin; and Cannon, Gregory Lewis, 5,752,166, Cl. 455-67.100.
  - Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.
  - Frank, Mark Steven; Tayloe, Daniel Richard; and Blasiak, Dariusz Andrzej, 5,752,187, Cl. 455-428.000.
  - Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.
  - Geier, George J., 5,752,220, Cl. 701-217.000.
  - Guzik, Kenneth J.; and Seybold, John L. C., 5,751,851, Cl. 382-179.000.
  - Heminger, David M.; and Slaughter, Joseph H., 5,751,025, Cl. 257-173.000.
  - Heminger, David M.; Mirtich, Vincent L.; and Grant, William H., 5,751,052, Cl. 257-577.000.
  - Holm, Paige M.; and Terwilliger, Chris, 5,751,159, Cl. 324-767.000.
  - Huang, Rong-Ting; Wright, Phil; and Joseph, Eric D., 5,751,263, Cl. 345-82.000.
  - Jiang, Wenbin; Shieh, Chan-Long; and Lebby, Michael S., 5,751,757, Cl. 372-50.000.
  - Kapoor, Vijay, 5,751,969, Cl. 395-200.650.
  - Kchao, Sokphal; and Ford, Robert B., 5,751,217, Cl. 340-636.000.
  - Keating, Pierce V., 5,751,169, Cl. 326-126.000.
  - Li, Changming; and Jung, Richard Hanson, 5,751,541, Cl. 361-525.000.
  - Lin, Jyh-Han; and Briancon, Alain Charles Louis, 5,752,194, Cl. 455-452.000.
  - Main, William E., 5,751,192, Cl. 330-293.000.
  - Mannette, Michael Russell; Dozier, Camille Louise; and Nguyen, Tom, 5,751,772, Cl. 375-316.000.
  - Mays, Lonne L.; Martin, Jean-Baptiste; Le, Hiep M.; and Lippmann, James G., 5,751,061, Cl. 257-707.000.
  - Menu, Eric P., 5,750,188, Cl. 427-126.300.
  - Moyer, William C.; Kirtland, Charles; and Arends, John H., 5,752,267, Cl. 711-167.000.
  - Mueller, Bruce Dale; Mannette, Michael Russell; and Kelton, James Robert, 5,752,183, Cl. 455-343.000.
  - Obright, Michael H., 5,752,202, Cl. 455-574.000.
  - Pavio, Anthony M., 5,751,201, Cl. 333-219.000.
  - Pendalwar, Shekhar L.; Oliver, Manuel; and Venugopal, Ganesh, 5,750,284, Cl. 429-197.000.
  - Pfizenmayer, Henry L.; and Wernett, Frederick C., III, 5,751,555, Cl. 361-763.000.
  - Phillips, James Patrick, 5,751,252, Cl. 343-726.000.
  - Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., 5,751,593, Cl. 364-488.000.
  - Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, 5,749,614, Cl. 294-64.100.
  - Robinson, Edward Herbert, 5,752,163, Cl. 455-31.300.
  - Sawyer, Steven Paul; Armbruster, Peter Joseph; and Moritz, Steven Harry, 5,752,162, Cl. 455-13.100.
  - Scanlan, Christopher M.; and Raleigh, Carl J., 5,751,552, Cl. 361-707.000.
  - Scholefield, Christopher; and Gerhards, Ronald H., 5,752,193, Cl. 455-452.000.
  - Shieh, Jhy-Jer; and Tang, Dandas K., 5,751,166, Cl. 326-71.000.
  - Shor, Joseph; Engel, Eytan; and Baron, Natan, 5,751,178, Cl. 327-333.000.
  - Tipple, David R., 5,751,978, Cl. 395-309.000.
  - Vanden Heuvel, Dean Paul; McKay, Brent Matthew; and Tooker, James Morris, 5,751,723, Cl. 370-528.000.
  - Vanell, James F.; Ward, Steven D.; and Mullins, James M., 5,750,440, Cl. 438-692.000.
  - Voith, Raymond Paul; Sudhaman, Sujit; and Hoekstra, George, 5,751,741, Cl. 371-37.700.
  - Wendorff, Wilhard C.; Schwarz, Roland; and Amato, Guiseppe, 5,751,938, Cl. 395-182.080.
  - Yip, William Chunhung; and Gustafson, David T., 5,751,718, Cl. 370-468.000.
  - Yiu, Hing Leung; Gokinko, Jeff; and Zoerner, Glen, 5,752,077, Cl. 395-827.000.
  - Zafar, Sufi, 5,750,419, Cl. 438-3.000.
- Motoyoshi, Teruo: *See—*
  - Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.
- Motozawa, Masahiro: *See—*
  - Furuyama, Osamu; Hamamura, Kazunari; and Motozawa, Masahiro, 5,750,198, Cl. 427-322.000.
- Mottola Cherny & Associates, Inc.: *See—*
  - Cherny, Julius, 5,752,237, Cl. 705-4.000.
- Mount Sinai Medical Center, The: *See—*
  - Palese, Peter; and O'Neill, Robert, 5,750,394, Cl. 435-252.300.
- Mount Sinai School Of Medicine Of The City University Of New York: *See—*
  - Sealfon, Stuart C., 5,750,366, Cl. 435-69.100.
  - Srivastava, Pramod K., 5,750,119, Cl. 424-277.100.
- Mourot, Christophe, to Alcatel N.V. Encoding/interleaving method and corresponding deinterleaving/decoding method. 5,751,730, Cl. 371-37.400.
- Mowery, Timothy W. Evaporator for an ice making machine. 5,749,242, Cl. 62-347.000.
- Moy, Christian: *See—*
  - Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, 5,749,291, Cl. 101-91.000.
- Moyer, Bryon I.: *See—*
  - Sharpe-Geisler, Bradley A.; and Moyer, Bryon I., 5,751,164, Cl. 326-38.000.
- Moyer, William C.; Kirtland, Charles; and Arends, John H., to Motorola Inc. A data processing system for accessing an external device during a burst mode of operation and method therefor. 5,752,267, Cl. 711-167.000.
- Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., to CTI Pet Systems, Inc. Method and apparatus for forming multidimenstional attenuation correction data in tomography applications. 5,750,991, Cl. 250-363.030.
- Moyses, Eric William: *See—*
  - Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, 5,750,548, Cl. 514-357.000.
- Mozumder, Purnendu K.: *See—*
  - Saxena, Sharad; Mozumder, Purnendu K.; Shinn, Gregory B.; and Taylor, Kelly J., 5,751,582, Cl. 364-468.160.
- MTD Products Inc: *See—*
  - Thomason, Scott, 5,749,209, Cl. 56-17.200.
- MTU Motoren- und Turbinen-Union Muenchen GmbH: *See—*
  - Maar, Karl, 5,749,706, Cl. 416-220.00R.
- Muehlbauer, John Leonard: *See—*
  - Melpolder, Sharon Marilyn; Smith, Dennis Edward; Wheeler, Christopher Edwin; and Muehlbauer, John Leonard, 5,750,328, Cl. 430-619.000.

- Mueller, Bruce Dale; Mannette, Michael Russell; and Kelton, James Robert, to Motorola, Inc. Method and apparatus for reducing power consumption in a subscriber unit of a communication system. 5,752,183, Cl. 455-343.000.
- Mueller, Richard A.: *See—*
  - Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.
- Muhlhoff, Olivier; and Pompier, Jean-Pierre, to Compagnie Générale Des Etablissements Michelin - Michelin & Cie. Rim and assembly of tire and/or ring-shaped tread support on same. 5,749,982, Cl. 152-158.000.
- Mukai, Kan: *See—*
  - Taka, Kyosuke; Masuda, Keiji; and Mukai, Kan, 5,751,431, Cl. 358-296.000.
- Mukai, Takuzou; and Ishida, Hiroshi, to Nippondenso Co., Ltd. Alternator for vehicle. 5,751,088, Cl. 310-239.000.
- Mukai, Uchu: *See—*
  - Yokoyama, Hideaki; and Mukai, Uchu, 5,749,983, Cl. 152-209.00R.
- Mukerji, Pradip: *See—*
  - Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.
- Mukherjee, Satyendranath, to Philips Electronics North America Corporation. Electrically erasable and programmable read only memory (EEPROM) having multiple overlapping metallization layers. 5,751,038, Cl. 257-316.000.
- Muldoon, Brian S.: *See—*
  - Marker, Terry L.; Muldoon, Brian S.; Glover, Bryan K.; and Vora, Bipin V., 5,750,800, Cl. 568-678.000.
- Müller, Anja: *See—*
  - Gohla, Sven; Müller, Anja; and Nielsen, Jens, 5,750,124, Cl. 424-401.000.
- Müller, Bernhard: *See—*
  - Reichert, Hans; Müller, Bernhard; and Tzikas, Athanassios, 5,750,662, Cl. 534-612.000.
- Muller, Christiaan; Zhou, Chong Wu; and Reed, Mark A., to Yale University. Mechanically controllable break transducer. 5,751,156, Cl. 324-699.000.
- Müller, Claudia: *See—*
  - Hamprecht, Rainer; and Müller, Claudia, 5,750,761, Cl. 558-423.000.
- Muller, Dieter; and Oechsle, Markus, to Voith Sulzer Papiermaschinen Gmbh. Apparatus for the application of steam onto a paper web. 5,749,158, Cl. 34-119.000.
- Müller, Felix: *See—*
  - Leidreiter, Holger; and Müller, Felix, 5,750,097, Cl. 424-70.100.
- Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, to Bayer Aktiengesellschaft. Intermediates for herbicidal sulphonylaminocarbonyltriazolinones having substituents which are bonded via sulphur. 5,750,718, Cl. 548-263.600.
- Müller, Martin: *See—*
  - Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, 5,749,291, Cl. 101-91.000.
- Muller, Paul F.: *See—*
  - Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., 5,749,370, Cl. 128-772.000.
- Muller, Peter: *See—*
  - Abelen, Thomas; Arndt, Lutz; and Muller, Peter, 5,749,716, Cl. 417-410.300.
  - Möller, Rudolf; and Müller, Peter, 5,749,562, Cl. 251-367.000.
- Müller, Ulrich: *See—*
  - Goldmann, Siegfried; Müller, Ulrich; Connell, Richard; Bischoff, Hilmar; Denzer, Dirk; Grützmann, Rudi; and Beuck, Martin, 5,750,783, Cl. 564-166.000.
- Mullins, James M.: *See—*
  - Vanell, James F.; Ward, Steven D.; and Mullins, James M., 5,750,440, Cl. 438-692.000.
- Müllner, Stefan: *See—*
  - Haas, Peter; Engelhardt, Heinz; and Müllner, Stefan, 5,750,679, Cl. 536-127.000.
- Multedo, Gilbert: *See—*
  - Monot, Jean-Jacques; Pipon, Francois; Multedo, Gilbert; and Chevalier, Pascal, 5,752,168, Cl. 455-67.300.
- Mumick, Inderpal Singh; and Silberschatz, Abraham, to AT&T Corp. Passive information access system. 5,751,798, Cl. 379-112.000.
- Münch, Udo: *See—*
  - Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.
- Munley, William Joseph, Jr.: *See—*
  - Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., 5,750,750, Cl. 554-117.000.
- Munson, Bill A., to Intel Corporation. Dynamic programming of bus master channels by intelligent peripheral devices using communication packets. 5,752,076, Cl. 395-825.000.
- Munters Euroform GMBH: *See—*
  - Wolf, Hubert; Bulang, Siegfried; and Cohrs, Olaf, 5,749,930, Cl. 55-242.000.
- Murai, Kazuo: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, to Daicel Chemical Industries, Ltd. 2-isoxazoline derivative and process for producing the same, and process for producing related derivatives from the same. 5,750,717, Cl. 548-240.000.
- Murai, Yukako; Suzuki, Akio; Tabata, Yoshio; Saito, Keiichi; and Amagai, Tamio, to Fujitsu Limited. Data transfer method and data transfer apparatus for image reading apparatus and image reading apparatus with data transfer apparatus. 5,751,438, Cl. 358-403.000.
- Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, to Canon Kabushiki Kaisha. Exposure apparatus and method wherein alignment is carried out by comparing marks which are incident on both reticle stage and wafer stage reference plates. 5,751,404, Cl. 355-53.000.
- Murakami, Koji: *See—*
  - Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, 5,750,515, Cl. 514-63.000.
- Murakami, Nobuaki: *See—*
  - Oda, Hideyuki; Kamura, Hitoshi; and Murakami, Nobuaki, 5,749,334, Cl. 123-305.000.
- Murakami, Tomohiro: *See—*
  - Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.
- Murakami, Yutaka: *See—*
  - Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,751,690, Cl. 369-275.300.
- Muramatsu, Masanori, to Canon Kabushiki Kaisha. Image forming apparatus. 5,752,126, Cl. 399-44.000.
- Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakibara, Keisuke; and Minato, Tsuyoshi, to YKK Corporation. Molded surface fastener, and method and apparatus for manufacturing the same. 5,749,129, Cl. 24-452.000.
- Murat Manufacturing Co., Ltd.: *See—*
  - Nakamura, Takeshi, 5,751,093, Cl. 310-369.000.
- Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, to Canon Kabushiki Kaisha. Charging member with surface layer comprising polymers, and image forming apparatus using the same. 5,751,801, Cl. 399-176.000.
- Murata Kikai Kabushiki Kaisha: *See—*
  - Morimoto, Eiichi, 5,751,441, Cl. 358-435.000.
- Murata, Norihiko; and Miyachi, Tatsuo, to Ricoh Co., Ltd. Thermally sensing type flowing velocity measuring apparatus. 5,750,893, Cl. 73-204.110.
- Murata, Takahiko: *See—*
  - Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.
- Murata, Yasuyuki; and Nakanishi, Yoshinori, to Shell Oil Company. Halogenated epoxy resin, production of said resin, flame retardant, and flame-retarded epoxy resin composition. 5,750,631, Cl. 528-98.000.
- Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, to Sanyo Electric Co., Ltd. Absorption type refrigerator. 5,749,244, Cl. 62-476.000.
- Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, to Proctor & Gamble Company, The. Cleaning/sanitizing methods, compositions, and/or articles for fabric. 5,749,924, Cl. 8-137.000.
- Murdock, David E.: *See—*
  - Wissmann, Siegfried R.; Schmitt, William T.; and Murdock, David E., 5,750,158, Cl. 425-144.000.
- Muroyama, Koutarou: *See—*
  - Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.
- Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, to OncorMed, Inc. Coding sequences of the human BRCA1 gene. 5,750,400, Cl. 435-6.000.
- Murphy, Peter Michael: *See—*
  - Pechhold, Engelbert; and Murphy, Peter Michael, 5,750,445, Cl. 442-168.000.
- Murray, Inc.: *See—*
  - Pitman, Richard James; and Baggett, Thomas Doyle, 5,750,056, Cl. 261-37.000.
- Murray, John F.: *See—*
  - Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.
- Murray, William Mark: *See—*
  - Kamireddy, Balreddy; and Murray, William Mark, 5,750,471, Cl. 504-269.000.
- Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., to Brantford Chemicals Inc. Commercial process for the manufacture of fluconazole and intermediates useful in the manufacture thereof. 5,750,719, Cl. 548-268.600.

Murthy, K.S. Keshava; Weeratunga, Gamini; Radatus, Bruno Konrad; and Sidhu, Kanwar Pal Singh, to Brantford Chemicals Inc. Process for the manufacture of related intermediates including cistofur. 5,750,714, Cl. 548-205.000.

Murthy, Kurukundi Ramesh: *See—*

Dorenkott, Jeffrey S.; Wilder, Steven E.; Nyugen, Dinh; and Murthy, Kurukundi Ramesh, 5,750,881, Cl. 73-37.000.

Musashi, Kazuyuki; and Morishima, Hiroshi, to International Business Machines Corp. Method and system for displacing a dialogue box. 5,751,980, Cl. 395-354.000.

Musser, John Henry: *See—*

Dasgupta, Falguni; and Musser, John Henry, 5,750,508, Cl. 514-25.000.

Mutchnick, Milton G.: *See—*

Chretien, Paul B.; and Mutchnick, Milton G., 5,750,501, Cl. 514-12.000.

Muto, Yukiyoshi: *See—*

Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,751,583, Cl. 364-470.080.

Mutoh Industries Ltd.: *See—*

Shirosaki, Akimitsu; and Toshiaki, Matsushima, 5,751,297, Cl. 346-136.000.

Muzio, Joseph R., Jr.; and McGivern, Kenneth James, Sr., to Lydall, Inc. Method of wrapping cryogenic insulation around an inner cryogenic tank. 5,749,537, Cl. 242-439.500.

Mydlarz, Jerzy Z.; Klaus, Roger L.; and Saeva, Franklin D., to Eastman Kodak Company. High chloride emulsions with improved reciprocity. 5,750,324, Cl. 430-567.000.

Myers, Michael O., to Dow Chemical Company, The. Process for sulfonating or sulfating polymers. 5,750,656, Cl. 528-373.000.

Myers, Richard: *See—*

Traina, John E.; Myers, Richard; and Smierciak, Edward A., 5,751,423, Cl. 356-338.000.

Myers, Robert A.; Greenamyer, Lara L.; and Kasha, Robert J. Combination electronic metronome and headphone unit. 5,751,825, Cl. 381-118.000.

Myers, Stephen Joe: *See—*

Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, 5,749,223, Cl. 60-300.000.

Myers, William Loring, to University Corporation for Atmospheric Research. Virtual reality imaging system with image replay. 5,751,289, Cl. 345-419.000.

Myerson, Robert F.; Wall, Daniel G.; and O'Hagan, Timothy P., to Teletransactions, Inc. Hand held bar code dataform reader having a rotatable reading assembly. 5,750,975, Cl. 235-472.000.

N. Ireland of Defence Evaluation Research Agency, DRA: *See—*

Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.

N.V. Raychem S.A.: *See—*

Daems, Daniel; and Macken, Luk, 5,751,882, Cl. 385-135.000.

Na, Kyutae; Okuhara, Toshio; and Misono, Makoto, to Nippon Oil Company, Ltd. Solid acid catalyst for paraffin conversion and process for paraffin conversion using the same. 5,750,457, Cl. 502-211.000.

Naaseh-Shahry, Hosein: *See—*

Tobin, Paul G.; Naaseh-Shahry, Hosein; and Undy, Stephen R., 5,751,735, Cl. 371-22.500.

Nacional, Anthony Bautista: *See—*

Fanshier, Stephen Reid; Pare, My Tien; Nacional, Anthony Bautista; and Klekas, Steven Lynn, 5,751,962, Cl. 395-200.530.

Nackvi, Fawad: *See—*

Philp, Adam Rupert; Sibbald, Alastair; Clemow, Richard David; and Nackvi, Fawad, 5,751,815, Cl. 381-17.000.

Nadgauda, Rajani Satish: *See—*

Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, 5,750,401, Cl. 435-430.000.

Nagai, Hiromi: *See—*

Yamada, Shigeo; Kato, Takero; Nagai, Hiromi; and Kitamura, Kazuo, 5,749,600, Cl. 280-751.000.

Nagai, Hisao: *See—*

Yamauchi, Kosaku; Tsutsumikoshi, Shinobu; and Nagai, Hisao, 5,749,429, Cl. 180-205.000.

Nagai, Jun: *See—*

Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.

Naganawa, Hiroshi: *See—*

Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, 5,751,240, Cl. 342-70.000.

Nagano, Akihiko; Yamada, Akira; and Irie, Yoshiaki, to Canon Kabushiki Kaisha. Optical device having a line of sight detection apparatus. 5,752,090, Cl. 396-51.000.

Nagano, Chikara: *See—*

Ishiwata, Hiroshi; and Nagano, Chikara, 5,751,475, Cl. 359-387.000.

Nagao, Akira: *See—*

Yamamoto, Taizo; Yagyu, Motohiro; Kawaguchi, Yosihisa; and Nagao, Akira, 5,750,979, Cl. 250-223.00R.

Nagao, Kazuya: *See—*

Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.

Nagao, Yasuhiro; Shiga, Tsutomu; and Hayashi, Nobuyuki, to Nippondenso Co., Ltd. Combined starter and generator apparatus. 5,751,070, Cl. 290-46.000.

Nagaoka, Kazuhiko: *See—*

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Nagarqala, Nazifa Najmuddin: *See—*

Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, 5,750,401, Cl. 435-430.000.

Nagasaka, Eiichi: *See—*

Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, 5,751,091, Cl. 310-339.000.

Nagasaka, Fumio: *See—*

Nakamura, Eri; and Nagasaka, Fumio, 5,752,036, Cl. 395-706.000.

Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, to Konica Corporation. Electrophotographic color image forming apparatus with image exposure means inside of photoreceptor drum. 5,752,133, Cl. 399-112.000.

Nagata, Kenichi: *See—*

Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, 5,750,228, Cl. 428-64.100.

Nagata, Takeshi: *See—*

Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, 5,750,309, Cl. 430-170.000.

Nagata, Teruyuki; Hayashi, Hidetoshi; and Mizuta, Hideki, to Mitsui Toatsu Chemicals, Inc. Preparation process of acyl halide or sulfonyl halide. 5,750,779, Cl. 562-828.000.

Nagatsuka, Ikutaroh: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Nagayama, Atsuo: *See—*

Hara, Ryuichi; and Nagayama, Atsuo, 5,751,130, Cl. 318-575.000.

Nagel, Arthur A.: *See—*

Villalobos, Anabella; Nagel, Arthur A.; and Chen, Yuhpyng L., 5,750,542, Cl. 514-322.000.

Nagel, Thomas; and Richard, Ulf, to Technische Universitaet Dresden. Synchronous belt drive. 5,749,800, Cl. 474-84.000.

Nagesh, Voddarahalli K.: *See—*

Leibovitz, Jacques; Dawson, Peter F.; Nagesh, Voddarahalli K.; and Irby, Greg M., 5,749,988, Cl. 156-94.000.

Nagira, Jiro: *See—*

Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Utatsu, Hiroshige, 5,752,125, Cl. 399-8.000.

Nagura, Hideo: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Nagura, Shigehiro: *See—*

Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, 5,750,309, Cl. 430-170.000.

Nagy, Charles Chris: *See—*

Intermill, Allan Webster; and Nagy, Charles Chris, 5,751,759, Cl. 373-123.000.

Nahar, Jinen K.: *See—*

Babu, Mangalore S.; Nahar, Jinen K.; Rogers, Gregory B.; and Downs, Walter S., III, 5,751,717, Cl. 370-466.000.

Naidu, Anand; Deora, Ajit; and Arunarthi, Venkatesham, to Sand Microelectronics, Inc. Method and apparatus for performance optimization of integrated circuit designs. 5,752,002, Cl. 395-500.000.

Naik, Rajan Hiralal: *See—*

Deshmukh, Abdul Rakeeb Abdul Subhan; Naik, Rajan Hiralal; Tandel, Sagun Kashinath; and Rajappa, Srinivasachari, 5,750,757, Cl. 558-232.000.

Naito, Masaru, to Yamaha Corporation. Method of making aluminum alloy wiring with less silicon nodule. 5,750,439, Cl. 438-648.000.

Naito, Youichiro: *See—*

Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.

Nakabeppu, Hitoshi: *See—*

Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, 5,750,523, Cl. 514-247.000.

Nakagawa, Akio: *See—*

Yasuhara, Norio; Nakagawa, Akio; Matsudai, Tomoko; and Funaki, Hideyuki, 5,751,022, Cl. 257-133.000.

Nakagawa, Satoshi: *See—*

Oda, Hideki; Nakagawa, Satoshi; and Anazawa, Hideharu, 5,750,368, Cl. 435-69.100.

Nakagawasai, Satoshi: *See—*

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.

Nakahara, Masaru; Nakashima, Kazuo; and Utsumi, Kenichi, to Fujitsu Limited. Recording medium for electronic publications including multiple format emulation. 5,752,009, Cl. 395-500.000.

Nakahata, Akinobu: *See—*

Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, 5,752,145, Cl. 399-256.000.

Nakahata, Hideaki: *See—*

Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, 5,750,243, Cl. 428-216.000.

Nakahira, Kunimitsu: *See—*

Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.

Nakai, Masatoshi: *See—*

Hirayama, Koichi; Nakai, Masatoshi; and Shimoda, Kenji, 5,751,892, Cl. 386-92.000.

Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, to Otsuka Pharmaceutical Co., Ltd. Apoptosis regulating compostion. 5,750,529, Cl. 514-254.000.

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itahashi, Mayumi, to Fujitsu Limited. Environment monitoring test piece and test method. 5,750,406, Cl. 436-116.000.

Nakajima, Hiroshi: *See—*

Shimogama, Shigeru; Nakajima, Hiroshi; and Matsumoto, Kazunori, 5,751,918, Cl. 395-99.000.

Nakajima, Kikuo: *See—*

Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, 5,750,079, Cl. 422-138.000.

Nakajima, Nobuhiro: *See—*

Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.

Nakajima, Yoshifumi; and Koyama, Yoshito, to Fujitsu Limited. Rubidium atomic oscillator with laser diode wavelength adjustment. 5,751,193, Cl. 331-3.000.

Nakajima, Yuki; and Matsumoto, Mikio, to Nissan Motor Co., Ltd. Catalyst soundness assessment device. 5,749,222, Cl. 60-274.000.

Nakakuma, Tetsuji: *See—*

Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, 5,751,628, Cl. 365-145.000.

Hirano, Hiroshige; and Nakakuma, Tetsuji, 5,751,650, Cl. 365-210.000.

Nakamoto, Masayuki; and Ono, Tomio, to Kabushiki Kaisha Toshiba. Field emission cold cathode and method for production thereof. 5,749,762, Cl. 445-50.000.

Nakamura, Eri; and Nagasaka, Fumio, to Seiko Epson Corporation. Apparatus for generating a program for parallel processing. 5,752,036, Cl. 395-706.000.

Nakamura, Hirofumi: *See—*

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Hama, Itsuo; Okamoto, Takahiro; Sasamoto, Hisashi; and Nakamura, Hirofumi, 5,750,796, Cl. 568-618.000.

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Nakamura, Hiroya: *See—*

Ushikubo, Takashi; Koyasu, Yukio; and Nakamura, Hiroya, 5,750,760, Cl. 558-319.000.

Nakamura, Ikuro: *See—*

Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.

Nakamura, Jun-ichi: *See—*

Nakatsu, Hiroshi; and Nakamura, Jun-ichi, 5,751,014, Cl. 257-25.000.

Nakamura, Kaoru: *See—*

Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.

Nakamura, Kazunari: *See—*

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, to Fuji Photo Film Co., Ltd. Microfilm cassette and microfilm camera. 5,751,402, Cl. 355-40.000.

Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, to Senju Pharmaceutical Co., Ltd. Phosphoric diester. 5,750,516, Cl. 514-100.000.

Nakamura, Shigeyoshi: *See—*

Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.

Nakamura, Shinichi: *See—*

Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Nakamura, Shin-Ichiro: *See—*

Maruyama, Naosuke; Kokubo, Hiroyasu; and Nakamura, Shin-Ichiro, 5,750,148, Cl. 424-494.000.

Nakamura, Shinji: *See—*

Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, 5,751,203, Cl. 336-65.000.

Nakamura, Sunao: *See—*

Fukuda, Seiji; Nakamura, Sunao; and Ohno, Yotaro, 5,749,720, Cl. 431-285.000.

Nakamura, Takamasa: *See—*

Ota, Hisaki; and Nakamura, Takamasa, 5,749,293, Cl. 101-157.000.

Nakamura, Takashi; Fukuzawa, Hiroshi; and Ono, Michio, to Fuji Photo Film Co., Ltd. Silver halide color photosensitive material. 5,750,755, Cl. 558-84.000.

Nakamura, Takeshi, to Murat Manufacturing Co., Ltd. Vibrating gyroscope. 5,751,093, Cl. 310-369.000.

Nakamura, Tohru: *See—*

Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, 5,751,688, Cl. 369-270.000.

Nakamura, Yukitaka: *See—*

Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.

Nakane, George: *See—*

Hirano, Hiroshige; Moriwaki, Nobuyuki; Nakakuma, Tetsuji; Honda, Toshiyuki; and Nakane, George, 5,751,628, Cl. 365-145.000.

Nakane, Yoshio: *See—*

Matsui, Seiichi; Nakane, Yoshio; and Saito, Kenji, 5,751,349, Cl. 348-228.000.

Nakanishi, Akira: *See—*

Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,752,109, Cl. 396-311.000.

Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; and Toshikage, Hideki, 5,752,114, Cl. 396-429.000.

Nakanishi, Koichiro; Nomura, Keiichi; Tajima, Kyoko; Hiratani, Hajime; and Kato, Kazuo. Fibrinolytic protein and production method thereof. 5,750,650, Cl. 530-350.000.

Nakanishi, Makoto: *See—*

Hegland, Markus; and Nakanishi, Makoto, 5,751,616, Cl. 364-725.020.

Nakanishi, Tatsuaki: *See—*

Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, 5,749,563, Cl. 251-61.500.

Nakanishi, Yoshinori: *See—*

Murata, Yasuyuki; and Nakanishi, Yoshinori, 5,750,631, Cl. 528-98.000.

Nakano, Hiroyuki: *See—*

Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.

Nakano, Tomoharu; and Shiono, Katsuji, to Sanyo Chemical Industries, Ltd. Fluorine-containing dioxolane compound, electrolytic solution composition, battery and capacitor. 5,750,730, Cl. 549-229.000.

Nakano, Yuji: *See—*

Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, 5,749,570, Cl. 271-10.130.

Nakao, Tomoaki, to Sharp Kabushiki Kaisha. Operational amplifier circuit with an extended input voltage range. 5,751,186, Cl. 327-562.000.

Nakashima, Kazuo: *See—*

Nakahara, Masaru; Nakashima, Kazuo; and Utsumi, Kenichi, 5,752,009, Cl. 395-500.000.

Nakasuji, Mamoru, to Nikon Corporation. Mask holding device and method for holding mask. 5,751,538, Cl. 361-234.000.

Nakata, Koichi; Mogi, Kazuhisa; and Kurebayashi, Youichi, to Toyota Jidosha Kabushiki Kaisha. Preignition detecting method. 5,751,147, Cl. 324-399.000.

Nakatani, Hiroto: *See—*

Fujita, Akihiso; Hazumi, Hiroshi; Mizuno, Hiroshi; Nakatani, Hiroto; and Naganawa, Hiroshi, 5,751,240, Cl. 342-70.000.

Nakatani, Kazue: *See—*

Takai, Yuji; Nakatani, Kazue; and Matsumoto, Michihiro, 5,751,592, Cl. 364-488.000.

Nakatsu, Hiroshi; and Nakamura, Jun-ichi, to Sharp Kabushiki Kaisha. Semiconductor light emitting device. 5,751,014, Cl. 257-25.000.

Nakatsuka, Tadayoshi; Itoh, Junji; Yamamoto, Shinji; and Nishitsuji, Mitsuru, to Matsushita Electric Industrial Co., Ltd. Hybrid IC. 5,752,182, Cl. 455-333.000.

Nakatsuyama, Hisashi; Okumura, Yo; and Uchida, Go, to Fuji Xerox Co., Ltd. Document database management apparatus capable of conversion between retrieval formulae for different schemata. 5,752,021, Cl. 395-605.000.

Nakauchi, Toyokazu: *See—*

Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, 5,750,600, Cl. 524-100.000.

Nakaue, Takahisa; Maeshima, Masanobu; Nakahata, Akinobu; Aoki, Takeshi; and Inui, Hiroshi, to Mita Industrial Co., Ltd. Apparatus for feeding a developing agent through a device for developing an electrostatic latent image. 5,752,145, Cl. 399-256.000.

Nakayama, Eiji: *See—*

Hamagishi, Goro; Mashitani, Ken; Nakayama, Eiji; and Tanase, Susumu, 5,751,479, Cl. 359-464.000.

Nakayama, Hiroshi; Ogushi, Koichiro; and Aimori, Tomio, to Nakayama Iron Works, Ltd. Method for operating an eccentric jaw crusher. 5,749,530, Cl. 241-27.000.

Nakayama Iron Works, Ltd.: *See—*

Nakayama, Hiroshi; Ogushi, Koichiro; and Aimori, Tomio, 5,749,530, Cl. 241-27.000.

Nakayama, Masao: *See—*

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Nakayama, Norihiro: *See—*
Sakai, Kazuhiko; Adachi, Tatsuhiko; Nakayama, Norihiro; and Fujino, Kenichi, 5,750,258, Cl. 428-405.000.

Nakayama, Tadashi: *See—*
Sugiyama, Tatsuo; and Nakayama, Tadashi, 5,750,763, Cl. 560-17.000.

Nakayama, Yoshiaki: *See—*
Inuiya, Masafumi; and Nakayama, Yoshiaki, 5,751,348, Cl. 348-220.000.

Nakayasu, Yuichi: *See—*
Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, 5,750,238, Cl. 428-195.000.

Nakazato, Saburo: *See—*
Suzuki, Masao; and Nakazato, Saburo, 5,751,354, Cl. 348-349.000.

Nakazawa, Akihiko: *See—*
Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, 5,752,130, Cl. 399-101.000.

Nakazawa, Fumihiko; Okumura, Hitoshi; Sano, Satoshi; and Abe, Fumitaka, to Fujitsu Limited. Range finding apparatus. 5,751,406, Cl. 356-3.030.

Nakazawa, Ikuo: *See—*
Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.

Nakazawa, Masaaki: *See—*
Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.

Nalamasu, Omkaram: *See—*
Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, 5,750,312, Cl. 430-273.100.

Nalco Chemical Company: *See—*
Bizot, Paul M.; Bailey, Bruce R.; and Hicks, Peter D., 5,750,037, Cl. 210-750.000.
Tang, Jiansheng; Cunningham, Raymond T.; and Yang, Bo, 5,750,070, Cl. 422-16.000.
Wong Shing, Jane B.; and Tubergen, Karen R., 5,750,034, Cl. 210-705.000.

Nambu, Fumio: *See—*
Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,750,544, Cl. 514-337.000.

Namimatsu, Ken; and Matsuura, Manabu, to NSK, Ltd. Ball screw device. 5,749,265, Cl. 74-459.000.

Nanami, Masayoshi: *See—*
Gohara, Yoshihiro; Fujimoto, Hiroaki; 'and Nanami, Masayoshi, 5,749,338, Cl. 123-73.00A.

Nanba, Tomiyuki: *See—*
Tomomasa, Satoshi; Nanba, Tomiyuki; and Soyama, Yoshikazu, 5,750,094, Cl. 424-64.000.

Nanba, Yoshiaki: *See—*
Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Nanoptics, Inc.: *See—*
Jing, Zhenxue; and Walker, James K., 5,751,787, Cl. 378-169.000.

Nantermet, Philippe G.: *See—*
Nicolaou, K. C.; Nantermet, Philippe G.; Guy, Rodney K.; and Ueno, Hiroaki, 5,750,691, Cl. 544-238.000.

Naoi, Toshimichi: *See—*
Shiino, Haruhiro; Yamaguchi, Norio; and Naoi, Toshimichi, 5,751,776, Cl. 375-371.000.

Naori, Nobuhisa: *See—*
Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.

Napolitano, David J.: *See—*
Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., 5,749,364, Cl. 128-662.020.

Nappi, Bruce; Schroeder, William; and Miller, James E., to United States of America, Navy. Sensory integrated data interface. 5,751,260, Cl. 345-8.000.

NaPro BioTherapeutics, Inc.: *See—*
Sisti, Nicholas J., 5,750,736, Cl. 549-510.000.

Narang, Inderpal Singh: *See—*
Bhargava, Gautam; Narang, Inderpal Singh; and Teng, James Z., 5,751,992, Cl. 395-457.000.

Narasimmon, Raj G.: *See—*
Yee, Jeng-Jung; Bell, Lawrence I.; and Narasimmon, Raj G., 5,750,177, Cl. 426-582.000.

Narayanan, S. Anantha: *See—*
Mahapatra, Amaresh; and Narayanan, S. Anantha, 5,749,132, Cl. 29-25.350.

Narendranath, Nagesh H.; and Ebner, Fritz F., to Xerox Corporation. Draft printing system. 5,751,433, Cl. 358-298.000.

Narendranath, Nagesh H.; and Ebner, Fritz F., to Xerox Corporation. Area dependent draft printing system. 5,751,434, Cl. 358-298.000.

Narita, Katutoshi, to Nippon Mining & Metals Co., Inc. Method for producing high grade reduced silver. 5,749,940, Cl. 75-711.000.

Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, to Kabushiki Kaisha Toshiba. Semiconductor memory device having data erasing mechanism. 5,751,636, Cl. 365-189.290.

Narumiya, Junichi, to Hochiki Kabushiki Kaisha. Projected beam-type smoke detector and receiving unit. 5,751,216, Cl. 340-630.000.

Naruse, Akihiko: *See—*
Kon, Akihiko; and Naruse, Akihiko, 5,751,916, Cl. 395-77.000.

Nass, Rüdiger; Aslan, Mesut; Albayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, to Institut Für Neue Materialien Gemeinnützige GmbH. Process for producing tin sintered bodies and coatings. 5,750,193, Cl. 427-213.310.

Nast, Kurt; Berger, Erwin; Etter, Stefan; Moy, Christian; and Müller, Martin, to Ascom Hasler Mailing Systems AG. System for setting date wheels in a postage meter. 5,749,291, Cl. 101-91.000.

National Gypsum Company: *See—*
Menchetti, Robert J., 5,749,192, Cl. 52-489.100.

National Instruments Corporation: *See—*
Haddad, Michel G.; and Becker, Alvin G., 5,751,536, Cl. 361-191.000.

National Science Council: *See—*
Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, 5,749,819, Cl. 483-39.000.
Yoa-Pu, Hu Oliver; Wang, Jhi-Joung; and Shung-Tai, Ho, 5,750,534, Cl. 514-282.000.

National Science Council of Republic of China: *See—*
Kuo, Sy-Yen; Chiueh, Tzi-Dar; and Chen, Ke-Horng, 5,751,174, Cl. 327-199.000.

National Semiconductor Corporation: *See—*
Divivier, Robert J.; Haines, Ralph; Nemirovsky, Mario D.; and Perez, Alexander, 5,752,269, Cl. 711-169.000.
Nemirovsky, Mario; Perez, Alexander; Divivier, Robert James; and Sankar, Narendra, 5,752,273, Cl. 711-201.000.

National Starch and Chemical Investment Holding Corporation: *See—*
Blumenthal, Mitchell J.; Sharak, Matthew L.; and Paul, Charles W., 5,750,605, Cl. 524-230.000.

National Steel Car Ltd.: *See—*
Butcher, Ronald S.; and Coslovi, Ilario A., 5,749,686, Cl. 410-94.000.

Nautilus Acquisition Corporation: *See—*
Webb, Gregory M., 5,749,807, Cl. 482-52.000.

Naves, Neil H.: *See—*
Benderev, Theodore V.; Naves, Neil H.; and Legome, Mark J., 5,749,884, Cl. 606-167.000.

Nawamaki, Tsutomu: *See—*
Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.

Nawrot, Barbara: *See—*
Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Krzeminski, Jacek; and Nawrot, Barbara, 5,750,675, Cl. 536-27.210.

Naylor, William Clark, Jr.: *See—*
Silverbrook, Kia; and Naylor, William Clark, Jr., 5,751,272, Cl. 345-149.000.

NCR Corporation: *See—*
Alonso-Cedo, Teodoro G., 5,752,230, Cl. 704-270.000.
Baur, Peter F., 5,751,453, Cl. 359-60.000.
Cochcroft, Arthur F., Jr., 5,752,261, Cl. 711-133.000.
Coutts, Michael G., 5,752,239, Cl. 705-26.000.
Cripps, Michael J., 5,752,251, Cl. 707-202.000.
Fanshier, Stephen Reid; Pare, My Tien; Nacional, Anthony Bautista; and Klekas, Steven Lynn, 5,751,962, Cl. 395-200.530.
Goodwin, John C., III, 5,751,919, Cl. 395-101.000.
Leong, Liem H.; and Storey, Brian E., 5,751,841, Cl. 382-137.000.
Logie, Alexander W., 5,749,456, Cl. 198-626.500.
Riach, David J. A.; Longmore, Richard J.; and Eccles, John N., 5,751,842, Cl. 382-137.000.
Seybold, James M., 5,749,139, Cl. 29-525.000.
Weisser, Pirmin L.; Vermeer, Fulps V.; and King, Edward C., 5,751,994, Cl. 395-464.000.

NDT Technologies, Incorporated: *See—*
Weischedel, Herbert R., 5,751,144, Cl. 324-240.000.

NEBL, Inc.: *See—*
Gloth, David; and Dann, Jeffrey A., 5,749,870, Cl. 606-45.000.

NEC Corporation: *See—*
Akiya, Makoto, 5,752,171, Cl. 455-126.000.
Asada, Susumu, 5,751,591, Cl. 364-488.000.
Baba, Mikio, 5,751,063, Cl. 257-723.000.
Fujimura, Sayuri, 5,751,988, Cl. 395-405.000.
Hamabe, Kojiro, 5,752,192, Cl. 455-450.000.
Hayano, Kiminori, 5,751,051, Cl. 257-546.000.
Ikeda, Kenichi; Asai, Yuichi; and Arai, Yuji, 5,750,033, Cl. 210-711.000.
Imamura, Hirohisa, 5,751,175, Cl. 327-291.000.
Ishikawa, Hiraku; and Usami, Tatsuya, 5,751,050, Cl. 257-538.000.
Isobe, Akira, 5,749,771, Cl. 451-41.000.
Iwanaga, Toshiaki, 5,751,677, Cl. 369-54.000.
Karube, Shunichi, 5,751,167, Cl. 326-73.000.
Katanosaka, Naoki, 5,751,728, Cl. 371-21.200.
Makihata, Kazuhisa, 5,751,790, Cl. 379-71.000.
Matai, Masahiro; and Yonekura, Kunitoshi, 5,752,174, Cl. 455-183.100.
Matsui, Tsutomu, 5,751,681, Cl. 369-112.000.
Matsuzawa, Kunihiko, 5,751,923, Cl. 395-114.000.
Mikagi, Kaoru, 5,751,067, Cl. 257-764.000.
Miya, Tatsuya, 5,751,033, Cl. 257-270.000.
Miyamoto, Yoshihiro, 5,751,363, Cl. 348-416.000.

Nitta, Yoshio; and Kakizaki, Akemi, 5,751,440, Cl. 358-434.000.
Oda, Noriaki, 5,750,437, Cl. 438-592.000.
Ohashi, Satoshi, 5,751,695, Cl. 370-218.000.
Ohta, Toshiyuki, 5,751,607, Cl. 364-578.000.
Okumura, Fujio, 5,751,279, Cl. 345-212.000.
Saito, Shuichi, 5,751,954, Cl. 395-200.150.
Sato, Toshifumi, 5,751,705, Cl. 370-335.000.
Serizawa, Masahiro, 5,751,900, Cl. 395-2.160.
Shibutani, Makoto; and Emura, Katsumi, 5,751,455, Cl. 359-126.000.
Sugiyama, Mikio; and Endo, Kaoru, 5,751,858, Cl. 382-236.000.
Tanaka, Mitsumasa, 5,751,360, Cl. 348-409.000.
Tatsumi, Satoshi, 5,751,767, Cl. 375-224.000.
Tsujimoto, Ichiro, 5,752,173, Cl. 455-137.000.
Yamashita, Koji, 5,752,203, Cl. 455-575.000.
Yasuzato, Tadao; and Ishida, Shinji, 5,750,290, Cl. 430-5.000.
Yokoyama, Yutaka, 5,751,365, Cl. 348-416.000.
Yoshida, Toshirou; and Suzuki, Tetsuya, 5,751,458, Cl. 359-173.000.

Nec Research Institute, Inc.: *See—*
Cox, Ingemar J.; and Roy, Sebastien, 5,751,838, Cl. 382-107.000.

Ned, Alexander A.: *See—*
Kurtz, Anthony D.; Ned, Alexander A.; and Vergel de Dios, Timoteo I., 5,750,898, Cl. 73-727.000.

Nedde, David N.: *See—*
Mayo, Gregory E.; Desroches, Roger G.; and Nedde, David N., 5,751,965, Cl. 395-200.540.

Nedder, David J.: *See—*
Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.

Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO: *See—*
Jansen, Albert Edward; and Feron, Paul Hubert Maria, 5,749,941, Cl. 95-44.000.

Needham, Philip: *See—*
Gamlyn, Lee; O'Sullivan, Siobhan; Needham, Philip; and Harris, Tom, 5,749,367, Cl. 128-696.000.

Needle, David L.: *See—*
Gray, Donald M., III; and Needle, David L., 5,752,073, Cl. 395-800.350.

Negishi, Kenji; Noguchi, Osamu; and Okoyama, Kazuo, to Fuji Photo Film Co., Ltd. Lens-fitted photo film unit with supported film advance wheel. 5,752,086, Cl. 396-6.000.

Negus, Stephen H.: *See—*
Dobbins, Kurt A.; Cullerot, David L.; Negus, Stephen H.; and Haggerty, William T., 5,751,971, Cl. 395-200.680.

Neider, Thomas M.; and Rudt, Robert L. Method and apparatus for finishing a continuous sheet of paper. 5,750,259, Cl. 428-411.100.

Neigh, Kevin M.: *See—*
Corella, Joseph A., II; and Neigh, Kevin M., 5,750,087, Cl. 423-604.000.

Nellcor Puritan Bennett Incorporated: *See—*
Good, Robert J.; and Colburn, Joel, 5,749,358, Cl. 128-205.230.

Nellissen, Antonius J. M., to U.S. Philips Corporation. Method of manufacturing a device having a support bar with conductor tracks for electrically contacting a semiconductor element. 5,750,417, Cl. 437-209.000.

Nelson, Larry A.: *See—*
Magnotti, Joseph C.; and Nelson, Larry A., 5,751,811, Cl. 380-28.000.

Nelson, Mark H.: *See—*
Dev, Roger H.; and Nelson, Mark H., 5,751,933, Cl. 395-182.020

Nelson, Randall S.: *See—*
Brumwell, Dennis A.; Perttu, Joseph S.; Kroll, Mark W.; and Nelson, Randall S., 5,749,910, Cl. 607-36.000.

Nelson, Wayne: *See—*
Winterble, Charles; Nelson, Wayne; and Stanley, Lawrence G., 5,751,218, Cl. 340-693.000.

Nelte, Sven E.: *See—*
Hargis, David E.; and Nelte, Sven E., 5,751,751, Cl. 372-41.000.

Nemeh, Saad: *See—*
Behl, Sanjay; Nemeh, Saad; Willis, Mitchell J.; and Berberich, Joseph P., 5,749,958, Cl. 106-416.000.

Nemirovsky, Mario; Perez, Alexander; Divivier, Robert James; and Sankar, Narendra, to National Semiconductor Corporation. Apparatus and method for efficiently determining addresses for misaligned data stored in memory. 5,752,273, Cl. 711-201.000.

Nemirovsky, Mario D.: *See—*
Divivier, Robert J.; Haines, Ralph; Nemirovsky, Mario D.; and Perez, Alexander, 5,752,269, Cl. 711-169.000.

Nepela, Daniel A.; and Sarhadi, Siamak, to Read-Rite Corporation. Multi-layer exchange coupled magnetic poles with approximate zero magnetostriction. 5,751,528, Cl. 360-126.000.

Nestec S.A.: *See—*
Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, 5,750,178, Cl. 426-594.000.
Daouse, Alain; and Plessier, Alain, 5,750,170, Cl. 426-283.000.

Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., to Ciba Specialty Chemicals Corporation. 7-substituted quinone methides as inhibitors for unsaturated monomers. 5,750,765, Cl. 560-126.000.

Network General Technology Corporation: *See—*
Cushman, Paul W.; Won, King L.; Mehta, Bakulesh A.; and Akselrod, Mark, 5,751,698, Cl. 370-252.000.

Netzer, Yishay. Window capacitive moisture sensor. 5,751,071, Cl. 307-10.100.

Neudecker, Albrecht, to Siemens Aktiengesellschaft. Circuit arrangement for compensating frequency deviations of a voltage-controlled oscillator, using a second oscillator. 5,751,196, Cl. 331-47.000.

Neuhauser, Horst: *See—*
Häussling, Lukas; Neuhauser, Horst; and Paulus, Wolfgang, 5,750,788, Cl. 564-415.000.

Neuhof, Markus: *See—*
Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.

Neumann, Karl H.: *See—*
Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,750,202, Cl. 427-376.400.

Neumann, Wolfgang: *See—*
Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, 5,750,221, Cl. 428-35.700.

Neumeyer, John L.; Milius, Richard A.; Tamagnan, Gilles; and Wang, Shaoyin, to Neuro Imaging Technologies, LLC. Halogenated neuroprobe for mapping monoamine reuptake sites. 5,750,089, Cl. 424-1.850.

Neurim Pharmacueticals Ltd.: *See—*
Zisapel, Nava, 5,750,557, Cl. 514-415.000.

Neuro Imaging Technologies, LLC: *See—*
Neumeyer, John L.; Milius, Richard A.; Tamagnan, Gilles; and Wang, Shaoyin, 5,750,089, Cl. 424-1.850.

Neurogen Corporation: *See—*
Alhaugh, Pamela; and Hutchison, Alan, 5,750,702, Cl. 546-183.000.
Yuan, Jun; and Wasley, Jan W. F., 5,750,700, Cl. 546-148.000.

NeuroSpheres Holdings Ltd.: *See—*
Weiss, Samuel; Reynolds, Brent; Hammang, Joseph P.; and Baetge, E. Edward, 5,750,376, Cl. 435-69.520.

New England Medical Center Hospitals, Inc.: *See—*
Kopin, Alan S.; and Beinborn, Martin, 5,750,353, Cl. 435-7.210.

New York Gas Group: *See—*
Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.

New York University: *See—*
Basilico, Claudio; and Delli Bovi, Pasquale, 5,750,659, Cl. 530-399.000.

New York University Medical Center, The: *See—*
Cherksey, Bruce D., 5,750,103, Cl. 424-93.210.

Newman, Roland A.; Hanna, Nabil; and Raab, Ronald W., to IDEC Pharmaceuticals Corporation. Recombinant antibodies for human therapy. 5,750,105, Cl. 424-133.100.

Newton, Curtis J.: *See—*
Bechtel, Gordon L.; and Newton, Curtis J., 5,751,696, Cl. 370-223.000.

Newton, Wayne McCall: *See—*
Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, 5,751,879, Cl. 385-103.000.

NeXstar Pharmaceuticals, Inc.: *See—*
Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, 5,750,342, Cl. 435-6.000.

Ng, Yu Kwong: *See—*
Dai, Wei William; and Ng, Yu Kwong, 5,751,952, Cl. 395-200.800.

NGK Insulators, Ltd.: *See—*
Fukuta, Ken; Sano, Toshihiro; and Hirota, Tsutomu, 5,749,970, Cl. 118-320.000.

Ngo, Tuan V., to VTC Inc. Predriver for fast current switching through a two-terminal inductive load. 5,751,171, Cl. 327-110.000.

Ngoc, Hung Dang; and Salazar, Mariano, to Goodyear Tire & Rubber Company, The. Low fogging rubbery polymer. 5,750,263, Cl. 428-424.400.

Nguyen, Hien; Martens, Nicolas; and Garbolino, Glenn, to McNeil-PPC, Inc. Absorbent body. 5,750,446, Cl. 442-337.000.

Nguyen, Hien: *See—*
Bacich, Steven R.; Greelis, John P.; Nguyen, Hien; and Nguyen, Tuoc, 5,749,889, Cl. 606-198.000.

Nguyen, Khe C., to Hewlett-Packard Company. Photoconductor comprising a complex between metal oxide phthalocyanine compounds and hydroxy compounds. 5,750,300, Cl. 430-78.000.

Nguyen, Loi Ngoc: *See—*
Bryant, Frank Randolph; and Nguyen, Loi Ngoc, 5,751,064, Cl. 257-752.000.

Nguyen, SonBinh T.: *See—*
Grubbs, Robert H.; Nguyen, SonBinh T.; Hillmyer, Marc A.; Fu, Gregory C.; and Johnson, Lynda K., 5,750,815, Cl. 585-511.000.

Nguyen, Thé Linh; and Freundorfer, Alois Peter, to Northern Telecom Limited. Gain-controlled amplifier and distributed amplifier. 5,751,190, Cl. 330-54.000.

Nguyen, Tom: *See—*
Mannette, Michael Russell; Dozier, Camille Louise; and Nguyen, Tom, 5,751,772, Cl. 375-316.000.

Nguyen, Tuoc: *See—*
Bacich, Steven R.; Greelis, John P.; Nguyen, Hien; and Nguyen, Tuoc, 5,749,889, Cl. 606-198.000.

Ni, Chong Yang. Apparatus for making a welding flux coating continously on a welding electrode. 5,749,971, Cl. 118-407.000.

Ni, Dick H.: *See—*
Stevenson, Robert A.; and Ni, Dick H., 5,751,539, Cl. 361-302.000.

Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Watts, Raymond Frederick, to Exxon Chemical Patents Inc. Power transmitting fluids with improved anti-shudder durability. 5,750,476, Cl. 508-291.000.

Niblack, Carlton Wayne: *See—*
  Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.

Niblick International AB: *See—*
  Åberg, Kenneth, 5,749,991, Cl. 156-187.000.

Nice, Edouard Collins: *See—*
  Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.

Nichols, Constance H.: *See—*
  Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowiez, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Nichols, Gary Arthur; and Clark, Roger Allen, to General Motors Corporation. Adaptive electronic throttle control. 5,749,343, Cl. 123-350.000.

Nickell, Andrew D., to Asgrow Seed Company. Soybean cultivar 9314919423034. 5,750,856, Cl. 800-200.000.

Nicol, Mark D.: *See—*
  DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.

Nicola, Nicos Anthony: *See—*
  Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.

Nicolai, Jean, to SGS Thomson Microelectronics, S.A. Microprocessor integrated circuit working in internal ROM and external RAM mode. 5,751,940, Cl. 395-183.030.

Nicolai, Walter: *See—*
  Besserer, Horst; Müneh, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.

Nicolaou, K. C.; Nantermet, Philippe G.; Guy, Rodney K.; and Ueno, Hiroaki, to Scripps Research Institute, The. Access to taxol analogs. 5,750,691, Cl. 544-238.000.

Nicoll-Griffith, Deborah: *See—*
  Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.

Nielsen, Jens: *See—*
  Gohla, Sven; Müller, Anja; and Nielsen, Jens, 5,750,124, Cl. 424-401.000.

Nielsen, John: *See—*
  Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, 5,750,666, Cl. 536-23.100.

Niemann, David A.: *See—*
  Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.

Nienhuis, Arthur W.: *See—*
  Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., 5,750,396, Cl. 435-357.000.

Nihei, Takayuki: *See—*
  Suda, Eiichi; Nihei, Takayuki; and Tanaka, Kyoko, 5,752,033, Cl. 395-701.000.

Nihira, Yoshito; Nomura, Takeshi; and Onizuka, Masahiro, to TDK Corporation. Preparation of ferrite materials. 5,750,045, Cl. 252-62.560.

Nihon Bayer Agrochem K.K.: *See—*
  Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 5,750,704, Cl. 546-275.100.

Nihon Firmenich K.K.: *See—*
  Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.

Nihon Musen Kabushiki Kaisha: *See—*
  Yamashita, Kazuo; Takeuchi, Yoshihiko; and Watanabe, Masahiro, 5,751,200, Cl. 333-197.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
  Ogata, Seiji; Sakurada, Yuzo; Chida, Nakaya; and Hisamune, Takeshi, 5,751,002, Cl. 250-492.210.

Niihara, Koichi; and Yamakawa, Akira, to Sumitomo Electric Industries, Ltd. Ceramic porous bodies and method of producing the same. 5,750,449, Cl. 501-80.000.

Niina, Makoto: *See—*
  Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.

Nikon Corporation: *See—*
  Hibino, Hideo; Kazami, Kazuyuki; Yokonuma, Norikazu; and Okutsu, Hisashi, 5,751,343, Cl. 348-96.000.
  Iijima, Shuji; and Nishizawa, Akio, 5,752,110, Cl. 396-319.000.
  Inadome, Kiyotaka, 5,751,499, Cl. 359-699.000.
  Kai, Tadao; and Katayama, Akira, 5,752,091, Cl. 396-52.000.
  Matsui, Hideki; Sakamoto, Hiroshi; Takayanagi, Ryotaro; and Hagiuda, Nobuyoshi, 5,752,102, Cl. 396-156.000.
  Misawa, Junichi; and Suenaga, Yutaka, 5,751,486, Cl. 359-557.000.
  Miyamoto, Hidenori; and Soshi, Isao, 5,752,119, Cl. 396-535.000.
  Mizutani, Hideo; and Kawaguchi, Tohru, 5,751,403, Cl. 355-53.000.
  Nakasuji, Mamoru, 5,751,538, Cl. 361-234.000.
  Ohishi, Sueyuki; and Terui, Nobuhiko, 5,752,092, Cl. 396-53.000.
  Suzuki, Kenzaburo, 5,751,485, Cl. 359-557.000.
  Suzuki, Masami, 5,751,495, Cl. 359-644.000.
  Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.
  Watanabe, Tsuneo, 5,751,502, Cl. 359-823.000.
  Yamano, Shozo, 5,752,106, Cl. 396-263.000.

Nilsson, Ake Lennart: *See—*
  Johansson, Ingemar Sven; and Nilsson, Ake Lennart, 5,749,421, Cl. 173-162.200.

Nin, Sigfredo Ismael: *See—*
  Kasson, James Matthews; Nin, Sigfredo Ismael; Plouffe, Wilfred Edmund, Jr.; and Pryor, Duaine Wright, Jr., 5,751,926, Cl. 395-119.000.

Ninnemann, Olaf: *See—*
  Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, 5,750,362, Cl. 435-29.000.

Ninomiya, Kazuki; Yoshioka, Shirou; and Nishiyama, Tamotsu, to Matsushita Electric Industrial Co., Ltd. Processing of pixel data according to different broadcasting systems. 5,751,374, Cl. 348-571.000.

Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, to Matsushita Electric Industrial Co., Ltd. Processing of pixel data at an operating frequency higher than the sampling rate of the input signal. 5,751,375, Cl. 348-571.000.

Nippon Inorganic Colour & Chemical Co., Ltd.: *See—*
  Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.

Nippon Leakless Industry Co., Ltd.: *See—*
  Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.

Nippon Mining & Metals Co., Inc.: *See—*
  Narita, Katutoshi, 5,749,940, Cl. 75-711.000.

Nippon Oil Company, Ltd.: *See—*
  Na, Kyutae; Okuhara, Toshio; and Misono, Makoto, 5,750,457, Cl. 502-211.000.
  Shimizu, Hiroyuki; Sano, Akira; and Matsuura, Kazuo, 5,750,454, Cl. 502-114.000.

Nippon Paint Co., Ltd.: *See—*
  Miyazoe, Seigo; Fushimi, Akira; and Inoue, Masanobu, 5,750,624, Cl. 525-100.000.

Nippon Paper Industries Co., Ltd.: *See—*
  Satake, Toshimi; Takano, Toshiyuki; Fukuda, Motoi; and Uehori, Yukiko, 5,750,253, Cl. 428-342.000.

Nippon Pillar Packing Co., Ltd.: *See—*
  Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, 5,749,586, Cl. 277-608.000.

Nippon Shokubai Co., Ltd.: *See—*
  Arita, Yoshitaka; Ohta, Akihiko; Hasebe, Ren; and Saito, Noboru, 5,750,768, Cl. 560-177.000.
  Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,750,582, Cl. 521-64.000.

Nippon Shokubai, Ltd.: *See—*
  Saito, Noboru, 5,750,795, Cl. 568-397.000.

Nippon Soken, Inc.: *See—*
  Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.

Nippon Steel Chemical Co., Ltd.: *See—*
  Kimura, Hiromi; Yamada, Kanji; and Hirato, Yasuhiro, 5,749,211, Cl. 57-217.000.

Nippon Steel Corporation: *See—*
  Fukuchi, Hiroyuki; and Osa, Kinya, 5,751,888, Cl. 386-68.000.
  Kimura, Hiromi; Yamada, Kanji; and Hirato, Yasuhiro, 5,749,211, Cl. 57-217.000.
  Suzuki, Hiroshi, 5,751,356, Cl. 348-390.000.

Nippon Telegraph & Telephone Corporation: *See—*
  Ando, Shinji; Matsuura, Toru; Sasaki, Shigekuni; and Yamamoto, Fumio, 5,750,731, Cl. 549-241.000.
  Hashimoto, Akihiko; and Watanabe, Yasuhiko, 5,751,293, Cl. 345-430.000.
  Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,751,452, Cl. 359-52.000.
  Uematsu, Yoshihiko; and Matsuoka, Shinji, 5,751,720, Cl. 370-503.000.

Nippondenso Co., Ltd.: *See—*
  Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
  Ishizaki, Takashi; and Fujimoto, Hidetoshi, 5,752,217, Cl. 701-201.000.
  Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.
  Kato, Yoshifumi; Yamauchi, Ichiro; Fujitsuna, Masami; and Tashiro, Tsutomu, 5,752,210, Cl. 701-51.000.

  Mukai, Takuzou; and Ishida, Hiroshi, 5,751,088, Cl. 310-239.000.
  Nagao, Yasuhiro; Shiga, Tsutomu; and Hayashi, Nobuyuki, 5,751,070, Cl. 290-46.000.
  Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.

Nisca Corporation: *See—*
  Kobayashi, Misao, 5,749,573, Cl. 271-293.000.

Nishi, Naoki: *See—*
  Mera, Yukinori; Nishi, Naoki; Kurimoto, Tadashi; and Sato, Hiroki, 5,750,524, Cl. 514-247.000.

Nishida, Haruo; Yamashita, Mitsuhiro; Ochi, Yoshiki; and Kuwaki, Tetsuo, to Tokuyama Corporation. Biodegradable aliphatic polyester, melt-extrusion film thereof, and process for the production thereof. 5,750,218, Cl. 428-35.500.

Nishida, Takao, to Olympus Optical Co., Ltd. Electronic flash device. 5,752,103, Cl. 396-173.000.

Nishiguchi, Masayuki; Iijima, Kazuyuki; Matsumoto, Jun; and Omori, Shiro, to Sony Corporation. Speech decoding method and apparatus. 5,752,222, Cl. 704-201.000.

Nishiguchi, Masayuki: *See—*
  Chan, Joseph; and Nishiguchi, Masayuki, 5,752,226, Cl. 704-233.000.

Nishikawa, Hiroshi: *See—*
  Kase, Toshiyuki; and Nishikawa, Hiroshi, 5,751,491, Cl. 359-618.000.

Nishikawa, Masahiro: *See—*
  Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, 5,750,717, Cl. 548-240.000.

Nishikibe, Masaru: *See—*
  Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.

Nishimoto, Mitsuhiko; and Inoue, Makoto, to Koyo Seiko Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Electric power steering apparatus. 5,752,209, Cl. 701-41.000.

Nishimura, Eiji, to Sega Enterprises, Ltd. Simulating multi-stage speed change shift lever operating device. 5,749,268, Cl. 74-473.00R.

Nishimura, Hiroko: *See—*
  Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, to Fuji Xerox Co., Ltd. Rotating type developing apparatus. 5,752,141, Cl. 399-227.000.

Nishimura, Takao: *See—*
  Shirai, Noriaki; Hibino, Katsuhiko; and Nishimura, Takao, 5,751,211, Cl. 340-435.000.

Nishimura, Takashi; and Takahashi, Toru, to Kabushiki Kaisha Toshiba. Cathode ray tube construction for big screen display using a plurality of electron guns. 5,751,094, Cl. 313-2.100.

Nishimura, Toshihiro: *See—*
  Furusawa, Toyoaki; Matsumura, Minehiro; and Nishimura, Toshihiro, 5,751,296, Cl. 345-520.000.

Nishimura, Yoshiaki: *See—*
  Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.

Nishino, Aya: *See—*
  Akutagawa, Tadamasa; Sano, Shigeru; and Nishino, Aya, 5,750,285, Cl. 429-92.000.

Nishio, Takeyoshi: *See—*
  Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.

Nishio, Yoshimichi: *See—*
  Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.

Nishishita, Kunihiko, to Zexel Corporation. Laminated heat exchanger. 5,751,414, Cl. 356-237.000.

Nishitsuji, Mitsuru: *See—*
  Nakatsuka, Tadayoshi; Itoh, Junji; Yamamoto, Shinji; and Nishitsuji, Mitsuru, 5,752,182, Cl. 455-333.000.

Nishiwaki, Mitsuhiro: *See—*
  Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.

Nishiyama, Tamotsu: *See—*
  Ninomiya, Kazuki; Yoshioka, Shirou; and Nishiyama, Tamotsu, 5,751,374, Cl. 348-571.000.
  Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,751,375, Cl. 348-571.000.

Nishizawa, Akio: *See—*
  Iijima, Shuji; and Nishizawa, Akio, 5,752,110, Cl. 396-319.000.

Nishizawa, Hiroyuki: *See—*
  Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,751,459, Cl. 359-197.000.

Nisley, Donald L., to Reliance Electric Industrial Company. Bearing take-up apparatus utilizing conventional flange bearing. 5,749,659, Cl. 384-260.000.

Nissan Chemical Industries, Ltd.: *See—*
  Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.
  Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, 5,750,523, Cl. 514-247.000.

Nissan Motor Co., Ltd.: *See—*
  Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.
  Kazama, Shigenori; and Sasaki, Ryo, 5,749,529, Cl. 239-690.000.
  Morikawa, Kunihiko, 5,751,081, Cl. 310-83.000.
  Nakajima, Yuki; and Matsumoto, Mikio, 5,749,222, Cl. 60-274.000.
  Takasaki, Toshiharu; and Hara, Tomoyuki, 5,752,211, Cl. 701-69.000.
  Toukura, Nobusuke, 5,749,804, Cl. 477-47.000.

Nitta, Hajime; and Ota, Kiyoshi, to Sony Corporation. Apparatus and method of decoding data groups of pictures. 5,751,887, Cl. 386-68.000.

Nitta, Yoshio; and Kakizaki, Akemi, to NEC Corporation. Transmission speed control system for facsimile picture signals in mobile radio communication. 5,751,440, Cl. 358-434.000.

Nitto Boseki Co., Ltd.: *See—*
  Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, 5,750,255, Cl. 428-359.000.

Nitto Denko Corporation: *See—*
  Ohara, Tomomi; and Hachisuka, Hisao, 5,750,633, Cl. 528-174.000.

Nitz, Theodore J.: *See—*
  Aldous, David J.; Bailey, Thomas R.; Diana, Guy Dominic; and Nitz, Theodore J., 5,750,527, Cl. 514-252.000.

Nixon, Jon C.: *See—*
  Hellberg, Mark; Delgado, Pete; and Nixon, Jon C., 5,750,564, Cl. 514-469.000.

Njamela, Owen Lungile: *See—*
  Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.

NKK Corporation: *See—*
  Fukuda, Seiji; Nakamura, Sunao; and Ohno, Yotaro, 5,749,720, Cl. 431-285.000.
  Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.

Nobelnv, Akzo: *See—*
  Schomaker, Elwin; Bos, Johannes; and Middelhoek, Erik Leonard, 5,750,030, Cl. 210-679.000.

Noble, Stephen William, Jr., to Pioneer Hi-Bred International, Inc. Inbred maize line PH05W. 5,750,849, Cl. 800-200.000.

Nobuta, Hiroshi, to Canon Kabushiki Kaisha. Image communicating apparatus. 5,751,449, Cl. 358-501.000.

Nocopi Technologies, Inc.: *See—*
  Gundjian, Arshavir, 5,750,462, Cl. 503-201.000.

Noda, Naoki: *See—*
  Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, 5,750,753, Cl. 556-440.000.

Noda, Satoshi: *See—*
  Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,750,271, Cl. 428-624.000.

Noda, Yutaka: *See—*
  Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, 5,751,584, Cl. 364-474.200.

Noehren, William L.: *See—*
  Kearney, Hugh L.; Isabelle, Charles J.; Kish, Jules G.; and Noehren, William L., 5,749,449, Cl. 192-41.00S.

Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, to Hitachi, Ltd. Hydraulic drive device for circuit breaker and circuit breaker using the same. 5,750,950, Cl. 218-154.000.

Noguchi, Masato: *See—*
  Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, 5,752,107, Cl. 396-296.000.

Noguchi, Osamu: *See—*
  Negishi, Kenji; Noguchi, Osamu; and Okoyama, Kazuo, 5,752,086, Cl. 396-6.000.

Nojima, Takashi: *See—*
  Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.

Nokia Mobile Phones Limited: *See—*
  Clifford, Paul Thomas, 5,752,170, Cl. 455-126.000.
  Kivari, Raimo, 5,752,201, Cl. 455-574.000.
  Matero, Jorma, 5,752,172, Cl. 455-127.000.

Nokia Telecommunications Oy: *See—*
  Ahvenainen, Jouko; and Sillanpää , Anna, 5,752,196, Cl. 455-518.000.
  Haapanen, Mika; and Dekker, André, 5,751,194, Cl. 331-17.000.
  Hokkanen, Petri, 5,752,165, Cl. 455-67.100.
  Jäntti, Arto; and Katisko, Keijo, 5,752,161, Cl. 455-8.000.
  Rautiola, Markku, 5,752,197, Cl. 455-522.000.

Nomai SA: *See—*
  Ripoll, Jean-Louis; Frouin, Marc; and Janon, Frederic, 5,752,257, Cl. 711-114.000.

Nomoto, Shinichi; Kobayashi, Hideo; Honda, Teruhiko; and Hara, Kazuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Fixed earth station. 5,751,247, Cl. 342-359.000.

Nomoto, Takashi: *See—*

Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.

Nomoto, Yuji, to Unisia Jecs Corporation. Water pumps. 5,749,707, Cl. 416-223.00B.

Nomura, Hideki: *See—*

Ogawa, Susumu; Senoh, Hideaki; Andoh, Masaru; and Nomura, Hideki, 5,750,200, Cl. 427-361.000.

Nomura, Ichiro: *See—*

Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.

Nomura, Kazuhiko; and Yamaguchi, Isamu, to Fujisawa Pharmaceutical Co., Ltd. Use of 5HT$_3$ antagonist to treat impotence. 5,750,537, Cl. 514-304.000.

Nomura, Keiichi: *See—*

Nakanishi, Koichiro; Nomura, Keiichi; Tajima, Kyoko; Hiratani, Hajime; and Kato, Kazuo, 5,750,650, Cl. 530-350.000.

Nomura, Manabu. Hair growth promoter. 5,750,107, Cl. 424-195.100.

Nomura, Takao: *See—*

Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.

Nomura, Takeshi: *See—*

Nihira, Yoshito; Nomura, Takeshi; and Onizuka, Masahiro, 5,750,045, Cl. 252-62.560.

Nomura, Toshiro: *See—*

Matsumoto, Takuya; Hashimoto, Toru; Miyake, Mitsuhiro; Kamura, Hitoshi; and Nomura, Toshiro, 5,750,888, Cl. 73-118.100.

Nomura, Yujiro: *See—*

Inoue, Nozomu; Hama, Takashi; Nomura, Yujiro; and Takada, Kyu, 5,751,463, Cl. 359-205.000.

Nordson Corporation: *See—*

Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, 5,750,444, Cl. 442-62.000.

Norris, Derek John: *See—*

Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., 5,750,719, Cl. 548-268.600.

Norris, Duane Edward: *See—*

Crump, Dwayne Thomas; Norris, Duane Edward; and Pancoast, Steven Taylor, 5,752,044, Cl. 395-750.000.

North, Bernard: *See—*

Gates, Alfred S., Jr.; North, Bernard; and Shaffer, William R., 5,752,155, Cl. 419-5.000.

North Carolina State University: *See—*

Conkling, Mark A.; Opperman, Charles H.; and Taylor, Christopher G., 5,750,386, Cl. 435-172.300.

Hamouda, Hechmi; Barker, Roger L.; and Millsaps, Darrin S., 5,749,259, Cl. 73-159.000.

Northern Logistics, L.L.C.: *See—*

Kunse, Thomas R., 5,749,683, Cl. 406-41.000.

Northern Telecom Limited: *See—*

Crossland, William Alden; and Birch, Martin John, 5,751,266, Cl. 345-96.000.

MacDonald, R. Ian; and Willemsen, Herman W., 5,751,454, Cl. 359-119.000.

Nguyen, Thé Linh; and Freundorfer, Alois Peter, 5,751,190, Cl. 330-54.000.

Tsuji, Bruce H.; McGarry, Susan J.; and Sparksman, Steven W., 5,752,195, Cl. 455-462.000.

Northrop Grumman Corporation: *See—*

Goutzoulis, Anastasios P.; and Zomp, John M., 5,751,242, Cl. 342-158.000.

Norton, Brian A.: *See—*

Clarke, Jonathon P.; and Norton, Brian A., 5,749,705, Cl. 416-190.000.

Norton, Joseph W.: *See—*

Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., 5,751,593, Cl. 364-488.000.

Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, to Canon Kabushiki Kaisha. Positional deviation measuring device and method for measuring the positional deviation between a plurality of diffraction gratings formed on the same object. 5,751,426, Cl. 356-356.000.

Nosu, Tsutomu; Hiraishi, Wataru; and Sawa, Yoshiharu, to Kyowa Chemical Industry Co., Ltd. Ultraviolet protective agent. 5,750,609, Cl. 524-413.000.

Nova, Michael P.; and Senyei, Andrew E., to IRORI. Remotely programmable matrices with memories. 5,751,629, Cl. 365-151.000.

Novartis AG: *See—*

Ostberg, Lars G., 5,750,106, Cl. 424-142.100.

Novartis Corp.: *See—*

Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, 5,750,548, Cl. 514-357.000.

Martin, Pierre, 5,750,673, Cl. 536-26.100.

Novo Nordish Bio Tech, Inc: *See—*

Berka, Randy Michael; Thompson, Sheryl Ann; and Xu, Feng, 5,750,388, Cl. 435-189.000.

Novo Nordisk A/S: *See—*

Bymaster, Franklin Porter; and Shannon, Harlan E., 5,750,541, Cl. 514-318.000.

Havelund, Svend; Halstrøm, John; Jonassen, Ib; Andersen, Asser Sloth; and Markussen, Jan, 5,750,497, Cl. 514-3.000.

Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,750,518, Cl. 514-183.000.

Sauerberg, Per; and Hansen, Kristian Tage, 5,750,538, Cl. 514-305.000.

Weibel, Helle; and Eriksen, Peter Bonne, 5,750,140, Cl. 424-449.000.

Nowack, William: *See—*

Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.

Noyori, Ryoji: *See—*

Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.

Nozokido, Yutaka; Akitaya, Shinichi; Arai, Akinori; and Nakauchi, Toyokazu, to Chisso Corporation; and Lonseal Corporation. Nonflammable olefin thermoplastic elastomer composition for use in skins of interior automotive trim and laminate sheet made therefrom. 5,750,600, Cl. 524-100.000.

NSI Corporation: *See—*

LeVasseur, Craig, 5,751,119, Cl. 315-291.000.

NSK, Ltd.: *See—*

Namimatsu, Ken; and Matsuura, Manabu, 5,749,265, Cl. 74-459.000.

Tsukada, Toru, 5,749,266, Cl. 74-459.000.

NSM Aktiengesellschaft: *See—*

Heinen, Horst; Rieck, Konrad; Kawka, Martin; and Schattauer, Jürgen, 5,749,576, Cl. 273-138.100.

NTP Incorporated: *See—*

Campana, Thomas J., Jr., 5,751,773, Cl. 375-346.000.

NTT Data Communications Systems Corp.: *See—*

Tanimura, Morimasa, 5,752,039, Cl. 395-712.000.

Numakami, Youichi, to Kinugawa Rubber Ind. Co., Ltd. Noise insulation arrangement for shift lever. 5,749,261, Cl. 74-18.100.

Numata, Ken, to Texas Instruments Incorporated. Reliable metal leads in high speed LSI semiconductors using dummy leads. 5,751,056, Cl. 257-666.000.

Nunes, Brendon. Clock with object receiving volume. 5,751,667, Cl. 368-223.000.

Nunome, Tetsuo: *See—*

Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.

Nuss, David Allen: *See—*

Bertuzzi, Dale Charles, Jr.; Bezusko, Michael James; and Nuss, David Allen, 5,749,742, Cl. 439-125.000.

Nutt, Ronald: *See—*

Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,750,991, Cl. 250-363.030.

NuVisions International, Inc.: *See—*

Chudoba, Paul; and Polizzi, Jerome, 5,751,874, Cl. 385-72.000.

Nuyken, Oskar: *See—*

Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.

Nvision, Inc.: *See—*

Meyer, Charles S.; and Allen, Neill J., 5,751,764, Cl. 375-219.000.

Nykaza, Janet; and Lewis, Michael, to Asgrow Seed Company. Soybean cultivar 9311779400012. 5,750,854, Cl. 800-200.000.

Nynex Science & Technology: *See—*

Silverman, Kim Ernest Alexander, 5,751,906, Cl. 395-2.690.

Nyugen, Dinh: *See—*

Dorenkott, Jeffrey S.; Wilder, Steven E.; Nyugen, Dinh; and Murthy, Kurukundi Ramesh, 5,750,881, Cl. 73-37.000.

O.M.A.C. Societa per Azioni: *See—*

Ruozi, Giuseppe, 5,750,966, Cl. 219-692.000.

Oakes, Janette V.: *See—*

Stalker, David M.; Shewmaker, Christine K.; and Oakes, Janette V., 5,750,875, Cl. 800-205.000.

Oaki, Yoshinao: *See—*

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Oates, Eugene W.: *See—*

Fuller, Robert M.; Epler, Frederick A.; and Oates, Eugene W., 5,752,191, Cl. 455-445.000.

Obara, Hisanori: *See—*

Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,750,582, Cl. 521-64.000.

Obayashi, Shunzi: *See—*

Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,752,109, Cl. 396-311.000.

Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; and Toshikage, Hideki, 5,752,114, Cl. 396-429.000.

Oberg, Arthur E.; and Wissman, Charles H., to Tempo Research Corporation. Method and apparatus for high frequency time domain reflectometry. 5,751,149, Cl. 324-533.000.

Öberg, Dan, to Dekont Teknik AB. Post device. 5,749,189, Cl. 52-298.000.

Obermeyer, James Andrew: *See—*

Avila, Javier; Obermeyer, James Andrew; Speck, Michael H.; and Dybalski, Ronald Henry, 5,749,554, Cl. 248-311.200.

Obi, Etsushi: *See—*

Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, 5,751,636, Cl. 365-189.290.

Object Technology Licensing Corporation: *See—*

Parrish, Jeff W.; and Maghoul, Farzin, 5,752,245, Cl. 707-10.000.

O'Brien, Francis J., Jr., to United States of America, Navy. Approximation method for workplace layout using convex polygon envelope. 5,751,294, Cl. 345-440.000.

O'Brien, Michael Joseph; Bryant, Robert Cooper; and Colleluori, Richard Alexander, to Eastman Kodak Company. Multi-lamp flash wheel and camera. 5,752,104, Cl. 396-191.000.

O'Brien, Sean D.: *See—*

Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., 5,751,315, Cl. 347-63.000.

O'Brien, Tim: *See—*

Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.

Obright, Michael H., to Motorola, Inc. Method of message delivery adapted for a power conservation system. 5,752,202, Cl. 455-574.000.

Obriot, Kelly Michael: *See—*

Heath, Gerald Arthur; Obriot, Kelly Michael; Simplicean, Ionel Eugene; and Stanciu, Sorin, 5,749,629, Cl. 297-411.360.

Occidental Chemical Corporation: *See—*

Buchanan, Robert A.; Krishnamurti, Ramesh; Hichri, Habib; and Johnson, David C., 5,750,811, Cl. 570-208.000.

Océ-Nederland B.V.: *See—*

in't Zandt, Hubertus W.G., 5,752,147, Cl. 399-325.000.

Oce Printing Systems GmbH: *See—*

Kreiter, Alexander; and Kremastiotis, Vassilis, 5,752,153, Cl. 399-384.000.

Ochi, Hisaaki; Yamamoto, Etsuji; Sawaya, Kumio; and Adachi, Saburo, to Hitachi, Ltd. Method and apparatus for the analysis of electromagnetics. 5,751,600, Cl. 364-524.000.

Ochi, Tatsuya: *See—*

Minowa, Toshimichi; Kuroda, Hiroshi; Kuragaki, Satoru; Kurata, Kenichirou; and Ochi, Tatsuya, 5,752,214, Cl. 701-111.000.

Ochi, Yoshiki: *See—*

Nishida, Haruo; Yamashita, Mitsuhiro; Ochi, Yoshiki; and Kuwaki, Tetsuo, 5,750,218, Cl. 428-35.500.

Ochiiwa, Masashi: *See—*

Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.

Ochs, Vincent W.: *See—*

Eyre, David R.; Clemens, J. Daniel; and Ochs, Vincent W., 5,750,647, Cl. 530-328.000.

Oda, Hideki; Nakagawa, Satoshi; and Anazawa, Hideharu, to Kyowa Hakko Kogyo Co., Ltd. Process for producing a substance. 5,750,368, Cl. 435-69.100.

Oda, Hideyuki; Kamura, Hitoshi; and Murakami, Nobuaki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control system and method for in-cylinder injection internal combustion engine. 5,749,334, Cl. 123-305.000.

Oda, Koichi: *See—*

Inamori, Yoshimitsu; and Oda, Koichi, 5,751,278, Cl. 345-211.000.

Oda, Kyosuke: *See—*

Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.

Oda, Masaaki: *See—*

Watanabe, Kazuhiro; Oshima, Michihiro; Setoguchi, Kazuhiro; and Oda, Masaaki, 5,750,194, Cl. 427-216.000.

Oda, Nobuyuki: *See—*

Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,751,355, Cl. 348-375.000.

Oda, Noriaki, to NEC Corporation. Method of fabricating semiconductor device. 5,750,437, Cl. 438-592.000.

Odagiri, Hiroyuki; and Yasukawa, Naoaki, to Seiko Instruments Inc.; and Seiko Epson Corporation. Motion compensating pulse rate monitor with motion sensor and level discriminator. 5,749,366, Cl. 128-690.000.

Odaka, Asano: *See—*

Suzuki, Nobuhiro; Odaka, Asano; and Kitada, Chieko, 5,750,349, Cl. 435-7.100.

O'Donnell, Joseph A.; and Hamper, Douglas R., to Advanced Cardiovascular Systems, Inc. Inflation control system with elapsed time measurement. 5,749,853, Cl. 604-97.000.

Odryna, Vic: *See—*

Zavracky, Matthew; Odryna, Vic; and Mansell, Barry, 5,751,261, Cl. 345-55.000.

Oechsle, Markus: *See—*

Muller, Dieter; and Oechsle, Markus, 5,749,158, Cl. 34-119.000.

Oechslin, Thomas A.: *See—*

Wieder, Steven M.; and Oechslin, Thomas A., 5,749,116, Cl. 15-160.000.

Oelbrandt, Leo: *See—*

Leenders, Luc; Oelbrandt, Leo; Bogaert, Jan Van den; and Desie, Guido, 5,751,325, Cl. 347-96.000.

Ofek, Yuval; and Vishlitzky, Natan, to EMC Corporation. Cache management system. 5,751,993, Cl. 395-463.000.

Offit, Paul: *See—*

Clark, H. Fred; Offit, Paul; and Plotkin, Stanley A., 5,750,109, Cl. 424-205.100.

Ogasawara, Jin; Higurashi, Seiji; Shindo, Tomoyuki; and Suwa, Tetsuya, to Victor Company of Japan, Ltd. Drum servo system using a PLL with frequency divided reference clock signals as an input. 5,751,509, Cl. 360-70.000.

Ogata, Kazumi: *See—*

Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, 5,750,516, Cl. 514-100.000.

Ogata, Seiji; Sakurada, Yuzo; Chida, Nakaya; and Hisamune, Takeshi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Ion implantation apparatus. 5,751,002, Cl. 250-492.210.

Ogawa, Hiroshi; Yoshida, Tuneo; and Kato, Shinichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,750,233, Cl. 428-141.000.

Ogawa, Hirotsugu: *See—*

Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.

Ogawa, Kazuhiro: *See—*

Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.

Ogawa, Kimiaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure control device. 5,751,352, Cl. 348-364.000.

Ogawa, Masazumi: *See—*

Mizuta, Akira; and Ogawa, Masazumi, 5,749,455, Cl. 198-626.500.

Ogawa, Shigeki: *See—*

Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, 5,751,404, Cl. 355-53.000.

Ogawa, Susumu; Senoh, Hideaki; Andoh, Masaru; and Nomura, Hideki, to Mitsubishi Paper Mills Limited. Ink jet recording sheet and process for its production. 5,750,200, Cl. 427-361.000.

Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, to Canon Kabushiki Kaisha. Magnetic toner for developing electrostatic image, image forming process, and process cartridge. 5,750,302, Cl. 430-106.600.

Ogino, Shinji: *See—*

Urushidani, Tatsuo; and Ogino, Shinji, 5,750,434, Cl. 438-478.000.

Ogiso, Akira; Imai, Rihoko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, to Mitsui Toatsu Chemicals, Inc. Quinophthalone compounds and polarizing films using same. 5,750,599, Cl. 524-90.000.

Ogiso, Akira: *See—*

Itoh, Hisato; Misawa, Tsutami; Ogiso, Akira; and Imai, Rihoko, 5,751,483, Cl. 359-502.000.

Oglesby, Myron C., Jr.: *See—*

Roan, Rodney S.; Rakowski, Mark R.; and Oglesby, Myron C., Jr., 5,749,355, Cl. 126-110.00R.

Ogoshi, Takeshi; and Maeda, Yukari, to Minolta Co., Ltd. Film image reading system. 5,751,451, Cl. 358-527.000.

Ogren, Daniel B.: *See—*

Strauh, Robert D.; Teerman, Richard Frederic; Stegink, Thomas M.; and Ogren, Daniel B., 5,749,717, Cl. 417-505.000.

Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, to Mitsui Toatsu Chemicals, Inc.; and Yamamoto Chemicals, Inc. Phthalocyanine compound and optical recording medium containing it. 5,750,229, Cl. 428-64.100.

Ogura Clutch Co., Ltd.: *See—*

Seino, Toshiteru, 5,751,202, Cl. 335-296.000.

Ogura, Kiyonori, to Fujitsu Limited. Semiconductor circuit with reduced P-N junction capacitance. 5,751,047, Cl. 257-394.000.

Oguri, Yasuo: *See—*

Shima, Koji; Hattori, Eiji; and Oguri, Yasuo, 5,750,048, Cl. 252-71.000.

Ogushi, Koichiro: *See—*

Nakayama, Hiroshi; Ogushi, Koichiro; and Aimori, Tomio, 5,749,530, Cl. 241-27.000.

O'Hagan, Timothy P.: *See—*

Myerson, Robert F.; Wall, Daniel G.; and O'Hagan, Timothy P., 5,750,975, Cl. 235-472.000.

Ohara, Tomomi; and Hachisuka, Hisao, to Nitto Denko Corporation. Dope for cast formation and method of manufacturing the same. 5,750,633, Cl. 528-174.000.

Ohashi, Satoshi, to NEC Corporation. ATM cell flow control apparatus. 5,751,695, Cl. 370-218.000.

Ohga, Toshiji: *See—*

Morikawa, Sumio; Ohga, Toshiji; and Kondoh, Masahiro, 5,749,146, Cl. 30-134.000.

Ohio Electronic Engravers, Inc.: *See—*

Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, 5,751,435, Cl. 358-299.000.

Ohio State University Research Foundation, The: *See—*

Chiu, Ing Ming; and Poulin, Matthew L., 5,750,365, Cl. 435-691.000.

Ohio University: *See—*

Bowman, Lyn; and McEntee, Jarlath, 5,749,226, Cl. 60-520.000.

Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, to Pioneer Video Corporation; and Pioneer Electronic Corporation. Optical disk having pattern displayed thereon and apparatus for manufacturing same. 5,751,690, Cl. 369-275.300.

Ohishi, Shotaro: *See—*

Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, 5,750,987, Cl. 250-251.000.

Ohishi, Sueyuki; and Terui, Nobuhiko, to Nikon Corporation. Control unit for a vibration compensation device for use in an optical imaging system. 5,752,092, Cl. 396-53.000.

Ohji, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Multilayered soft magnetic film and magnetic head using the same. 5,750,251, Cl. 428-332.000.

Ohki, Hiroyuki: *See—*

Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Ohki, Naoyuki: *See—*

Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Ohkuma, Takashi: *See—*

Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.

Ohkura, Yukiko: *See—*

Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.

Ohmi, Tadahiro; Inaba, Hitoshi; and Ikedo, Tomoyuki, to Ohmi, Tadahiro; Takasago Netsugaku Kogyo Kabushiki Kaisa; and Hamamatsu Photonics Kabushiki Kaisha. Apparatus and method for producing gaseous ions by use of x-rays, and various apparatuses and structures using them. 5,750,011, Cl. 204-164.000.

Ohnaka, Kiyoshi: *See—*

Kidoguchi, Isao; Adachi, Hideto; Ishibashi, Akihiko; Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kubo, Minoru, 5,751,013, Cl. 257-13.000.

Ohnari, Masatoshi: *See—*

Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.

Ohnishi, Hiroki: *See—*

Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.

Ohnishi, Kunikazu: *See—*

Ishibashi, Toshiaki; Ohnishi, Kunikazu; Inoue, Masayuki; and Suzuki, Yoshio, 5,751,680, Cl. 369-109.000.

Ohnishi, Shuji: *See—*

Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, 5,750,079, Cl. 422-138.000.

Ohno, Eiji: *See—*

Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, 5,750,228, Cl. 428-64.100.

Ohno, Michio: *See—*

Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.

Ohno, Yotaro: *See—*

Fukuda, Seiji; Nakamura, Sunao; and Ohno, Yotaro, 5,749,720, Cl. 431-285.000.

Ohnuma, Nobuo; and Ohta, Takatoshi, to Canon Kabushiki Kaisha. Image processing apparatus. 5,751,929, Cl. 395-129.000.

Ohsawa, Hirokazu: *See—*

Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.

Ohsawa, Takashi, to Kabushiki Kaisha Toshiba. DRAM having a power supply voltage lowering circuit. 5,751,639, Cl. 365-226.000.

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, to Ricoh Company, Ltd. Method of forming colored image by use of inorganic toner, inorganic toner for developing latent electrostatic image, and colored toner image bearing image transfer medium. 5,750,299, Cl. 430-47.000.

Ohta, Akihiko: *See—*

Arita, Yoshitaka; Ohta, Akihiko; Hasebe, Ren; and Saito, Noboru, 5,750,768, Cl. 560-177.000.

Ohta, Takatoshi: *See—*

Ohnuma, Nobuo; and Ohta, Takatoshi, 5,751,929, Cl. 395-129.000.

Ohta, Toshiyuki, to NEC Corporation. Method of sputter deposition simulation by inverse trajectory calculation. 5,751,607, Cl. 364-578.000.

Ohta, Yukio: *See—*

Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, 5,749,747, Cl. 439-358.000.

Ohtomo, Fumio; and Tokuda, Yoshikatsu, to Kabushiki Kaisha Topcon. Surveying apparatus. 5,751,408, Cl. 356-5.140.

Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, to Topcon Corporation. Marking apparatus having feedback-controlled rotational laser beam. 5,751,459, Cl. 359-197.000.

Ohtsuka, Akira; and Kaseda, Chosei, to Yamatake-Honeywell Co., Ltd. Stick-slip detection method and apparatus. 5,750,879, Cl. 73-9.000.

Ohuchi, Kozo: *See—*

Saito, Chiaki; and Ohuchi, Kozo, 5,750,164, Cl. 426-47.000.

Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, to Ono Pharmaceuticals Co., Ltd. Fused phenol derivatives. 5,750,544, Cl. 514-337.000.

Ohura, Masaki: *See—*

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Ohwaki, Kenji: *See—*

Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 5,750,540, Cl. 514-318.000.

Ohya, Toshio: *See—*

Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, 5,751,877, Cl. 385-93.000.

Ohyama, Hiroaki: *See—*

Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.

Ohyama, Kazuhiro: *See—*

Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, 5,751,828, Cl. 381-199.000.

Ohyama, Kazuya: *See—*

Ueno, Makoto; Kunugi, Takeshi; Ohyama, Kazuya; and Yazaki, Hiroomi, 5,752,189, Cl. 455-435.000.

Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, to Sony Corporation. Television function selection method, television receiver and remote commander for television receiver. 5,751,373, Cl. 348-569.000.

Ohyodo Diesel Co., Ltd.: *See—*

Morikawa, Sumio; Ohga, Toshiji; and Kondoh, Masahiro, 5,749,146, Cl. 30-134.000.

Oi, Ryu: *See—*

Ogiso, Akira; Imai, Riboko; Misawa, Tsutami; Oi, Ryu; Matsuzaki, Yoriaki; and Itoh, Hisato, 5,750,599, Cl. 524-90.000.

Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.

Oien, Hal J.: *See—*

Johnsen, James B.; and Oien, Hal J., 5,749,730, Cl. 433-163.000.

Oil-Dri Corporation of America: *See—*

Shaked, Dov; Banin, Amos; Moll, William F.; and Aguilar, Iwona M., 5,749,955, Cl. 106-287.170.

Oka, Toshimitsu: *See—*

Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, 5,749,173, Cl. 49-349.000.

Okabayashi, Eiji: *See—*

Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, 5,752,150, Cl. 399-330.000.

Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, 5,752,148, Cl. 399-329.000.

Okabayashi, Hiroyuki: *See—*

Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, 5,751,402, Cl. 355-40.000.

Okada, Akira: *See—*

Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, 5,749,548, Cl. 248-49.000.

Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, 5,750,255, Cl. 428-359.000.

Okada, Hiroaki: *See—*

Yamagata, Yutaka; Iga, Katsumi; and Okada, Hiroaki, 5,750,100, Cl. 424-85.200.

Okada, Takehiro: *See—*

Akaboshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.

Okado, Makoto; Ueda, Yoshihiro; Kobata, Tadashi; and Taniguchi, Masami, to Mita Industrial Co., Ltd. Image forming apparatus provided with a movement control mechanism for optical system. 5,752,127, Cl. 399-76.000.

Okamoto, Masayuki: *See—*

Yamada, Nobuaki; Kondo, Masahiko; Okamoto, Masayuki; and Kozaki, Shuichi, 5,751,382, Cl. 349-12.000.

Okamoto, Shigeru: *See—*

Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, 5,751,568, Cl. 363-95.000.

Okamoto, Takahiro: *See—*

Hama, Itsuo; Okamoto, Takahiro; Sasamoto, Hisashi; and Nakamura, Hirofumi, 5,750,796, Cl. 568-618.000.

Okamura, Kouji: *See—*

Yokota, Noriaki; and Okamura, Kouji, 5,751,673, Cl. 369-32.000.

Okamura, Masamitsu: *See—*

Kimura, Yasuki; Shirase, Takashi; Okamura, Masamitsu; and Maezono, Shuichi, 5,749,760, Cl. 445-4.000.

O'Kane, Mark D.: *See—*

Paddock, George K.; Haarhoff, Christopher C.; and O'Kane, Mark D., 5,752,112, Cl. 396-421.000.

Okano, Mitsunobu; and Yamashita, Yasuhiro, to Fujitsu Limited. CAD apparatus for LSI or printed circuit board. 5,751,597, Cl. 364-491.000.

Okano, Takeshi: *See—*

Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Okase, Wataru, to Tokyo Electron Limited; and Tokyo Electron Tohoku Ltd. Heat treatment apparatus. 5,749,723, Cl. 432-241.000.

Okawa, Tadashi: *See—*

Manzouji, Ryuko; and Okawa, Tadashi, 5,750,587, Cl. 522-15.000.

Okazaki, Hideo; and Oku, Kinuko, to Traditional Chinese Medicine Research Laboratory, Inc. Compositions for treating affected tissues, method for the preparation and usage thereof. 5,750,150, Cl. 424-682.000.

Okazaki, Hiroshi: *See—*

Sato, Hiroaki; and Okazaki, Hiroshi, 5,751,959, Cl. 395-200.350.

Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, to Hitachi, Ltd. Bus system for use with information processing apparatus. 5,751,976, Cl. 395-306.000.

Oki Electric Industry Co., Ltd.: *See—*

Aoyagi, Hiromi; Ariyama, Yoshihiro; and Hosoda, Kenichiro, 5,752,223, Cl. 704-219.000.

Shiino, Haruhiro; Yamaguchi, Norio; and Naoi, Toshimichi, 5,751,776, Cl. 375-371.000.

Shimokawa, Kimiaki, 5,749,772, Cl. 451-53.000.

Tanoi, Satoru, 5,751,177, Cl. 327-333.000.

Tanoi, Satoru, 5,751,665, Cl. 368-120.000.

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Yoshida, Tatsumasa; and Miyamoto, Ryoichi, 5,751,198, Cl. 332-100.000.

Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu, to Hitachi Zosen Corporation. Refuse incineration facility including material crusher and melt burner. 5,749,307, Cl. 110-222.000.

Okino, Yoshiharu: *See—*

Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, 5,751,748, Cl. 372-31.000.

Oklahoma Medical Research Foundation: *See—*

Morrissey, James H., 5,750,358, Cl. 435-13.000.

Okochi, Toshio: *See—*

Konno, Chisato; and Okochi, Toshio, 5,752,030, Cl. 395-672.000.

Okoshi, Takeshi: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Okoyama, Kazuo: *See—*

Negishi, Kenji; Noguchi, Osamu; and Okoyama, Kazuo, 5,752,086, Cl. 396-6.000.

Oku, Kinuko: *See—*

Okazaki, Hideo; and Oku, Kinuko, 5,750,150, Cl. 424-682.000.

Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, to Fujisawa Pharmaceutical Co., Ltd. Method of preparing certain 3-halo-imidazopyridines. 5,750,699, Cl. 546-121.000.

Okubo, Hiromi: *See—*

Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Okubo, Nobuyuki: *See—*

Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, 5,750,302, Cl. 430-106.600.

Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, to Kyocera Corporation. Ceramic glow plug. 5,750,958, Cl. 219-267.000.

Okuhara, Toshio: *See—*

Na, Kyutae; Okuhara, Toshio; and Misono, Makoto, 5,750,457, Cl. 502-211.000.

Okuma Corporation: *See—*

Ieki, Atsushi, 5,750,984, Cl. 250-231.160.

Okumura, Fujio, to NEC Corporation. Active matrix type liquid crystal display and method driving the same. 5,751,279, Cl. 345-212.000.

Okumura, Hitoshi: *See—*

Nakazawa, Fumihiko; Okumura, Hitoshi; Sano, Satoshi; and Abe, Fumitaka, 5,751,406, Cl. 356-3.030.

Okumura, Toshiaki: *See—*

Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, 5,751,396, Cl. 351-221.000.

Okumura, Yo: *See—*

Nakatsuyama, Hisashi; Okumura, Yo; and Uchida, Go, 5,752,021, Cl. 395-605.000.

Okutsu, Hisashi: *See—*

Hibino, Hideo; Kazami, Kazuyuki; Yokonuma, Norikazu; and Okutsu, Hisashi, 5,751,343, Cl. 348-96.000.

Oldenhove, Louis; and Broze, Guy, to Colgate-Palmolive Co. Tricritical point compositions. 5,750,487, Cl. 510-365.000.

Olip, Vinzenz; and Steiner, Norbert, to Degussa Aktiengellschaft. Method for bleaching denim textile material. 5,749,923, Cl. 8-102.000.

Olive, Joseph Philip: *See—*

Moebius, Bernd; Olive, Joseph Philip; Tanenblatt, Michael Abraham; and VanSanten, Jan Pieter, 5,751,907, Cl. 395-2.760.

Oliver, Manuel: *See—*

Pendalwar, Shekhar L.; Oliver, Manuel; and Venugopal, Ganesh, 5,750,284, Cl. 429-197.000.

Olivier, Hélène: *See—*

Chauvin, Yves; Hirschauer, André; and Olivier, Hélène, 5,750,455, Cl. 502-164.000.

Ollar, Robert-A.; and Felder, Mitchell S., to Infectech, Inc. Method for determining the antimicrobial agent sensitivity of a nonparaffinophilic microorganism and an associated apparatus. 5,750,363, Cl. 435-29.000.

Olney, Andrew H., to Analog Devices, Inc. EOS/ESD Protection circuit for an integrated circuit with operating/test voltages exceeding power supply rail voltages. 5,751,525, Cl. 361-56.000.

Olney, Gifford James, to Smiths Industries PLC. Hydraulic systems and valve assemblies. 5,749,225, Cl. 60-477.000.

O'Loughlin, Brian: *See—*

O'Loughlin, Maureen; and O'Loughlin, Brian, 5,751,885, Cl. 386-46.000.

O'Loughlin, Maureen; and O'Loughlin, Brian. Centralized video system. 5,751,885, Cl. 386-46.000.

Olper, Marco, to Engitec S.p.A. Process for hydrometallurgic and electrochemical treatment of sulfur antimony ores with production of electrolytic antimony and elemental sulfur. 5,750,019, Cl. 205-563.000.

Olsen, Daniel M.; Scott, Noel D.; and Casey, Robert J., to Hewlett-Packard Company. System and method for accelerated occlusion culling. 5,751,291, Cl. 345-422.000.

Olsen, Uffe Bang: *See—*

Jørgensen, Tine Krogh; Andersen, Knud Erik; Andersen, Henrik Sune; Hohlweg, Rolf; Madsen, Peter; and Olsen, Uffe Bang, 5,750,518, Cl. 514-183.000.

Olson, Kenneth F.; and Parker, William S., to SurVivaLink Corporation. Recorded data correction method and apparatus for isolated clock systems. 5,749,902, Cl. 607-5.000.

Olson, Sheri J.: *See—*

Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.

Olstein, Alan D.; and Albert, Richard, to MicroQuest Diagnostics, Inc. Method of rapid analyte detection. 5,750,357, Cl. 435-7.320.

Olympus Optical Co., Ltd.: *See—*

Ishiwata, Hiroshi; and Nagano, Chikara, 5,751,475, Cl. 359-387.000.

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Komine, Hitoshi, 5,751,886, Cl. 386-48.000.

Mihara, Takashi, 5,751,625, Cl. 365-145.000.

Miyazawa, Azuma; Miyazaki, Satoshi; Miyasaka, Tetsuo; Ishimaru, Toshiaki; Kobayashi, Kazutada; and Kawamura, Sboji, 5,752,089, Cl. 396-48.000.

Nishida, Takao, 5,752,103, Cl. 396-173.000.

Tsutsumi, Motoko; Hara, Minoru; and Kishida, Kenichi, 5,752,094, Cl. 396-76.000.

Wada, Tohru; and Hibi, Yasushi, 5,751,429, Cl. 356-419.000.

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.

Olympus Optical., Ltd.: *See—*

Takahashi, Koichi, 5,751,494, Cl. 359-631.000.

Omi, Kyoji: *See—*

Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

OmniVision Technologies, Inc.: *See—*

Shyu, Tai-Ching; Chen, Datong; and Liu, Jun, 5,751,189, Cl. 330-9.000.

Omori, Motoji: *See—*

Miyaji, Atsuko; Omori, Motoji; and Tatebayashi, Makoto, 5,751,810, Cl. 380-28.000.

Omori, Shiro: *See—*

Nishiguchi, Masayuki; Iijima, Kazuyuki; Matsumoto, Jun; and Omori, Shiro, 5,752,222, Cl. 704-201.000.

Omvik, John F.: *See—*

Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclere, David M., 5,751,447, Cl. 358-487.000.

OncorMed, Inc.: *See—*

Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.

O'Neill, Robert: *See—*

Palese, Peter; and O'Neill, Robert, 5,750,394, Cl. 435-252.300.

O'Neill, Roger A.: *See—*

Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.

Onishi, Ken: *See—*

Inoue, Sadayuki; Ishimoto, Junko; and Onishi, Ken, 5,751,232, Cl. 341-63.000.

Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, 5,751,890, Cl. 386-79.000.

Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, to Sharp Kabushiki Kaisha; and Kanto Kagaku Kabushiki Kaisha. Polymerizable compound and liquid crystal display device using the same. 5,750,213, Cl. 428-1.000.

Onitsuka, Yoshihiro: *See—*

Kanda, Toshiyuki; Takabayashi, Hiroshi; and Onitsuka, Yoshihiro, 5,751,386, Cl. 349-65.000.

Onizuka, Masahiro: *See—*

Nihira, Yoshito; Nomura, Takeshi; and Onizuka, Masahiro, 5,750,045, Cl. 252-62.560.

Onkor, Ltd.: *See—*

Cannon, Thomas G.; DeHart, Daniel L.; and Krug, Eric M., 5,751,590, Cl. 364-479.030.

Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, to Hitachi, Ltd. Active matrix LCD device with image signal lines having a multilayered structure. 5,751,381, Cl. 349-42.000.

Ono, Michio: *See—*

Nakamura, Takashi; Fukuzawa, Hiroshi; and Ono, Michio, 5,750,755, Cl. 558-84.000.

Ono Pharmaceuticals Co., Ltd.: *See—*

Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,750,544, Cl. 514-337.000.

Ono, Shuji, to Fuji Photo Film Co., Ltd. Method for extracting object images and method for detecting movements thereof. 5,751,831, Cl. 382-103.000.

Ono, Tomio: *See—*

Nakamoto, Masayuki; and Ono, Tomio, 5,749,762, Cl. 445-50.000.

Ono, Tomohiro: *See—*

Takechi, Hiroaki; and Ono, Tomohiro, 5,751,136, Cl. 320-150.000.

Ono, Yukari: *See—*

Sugiyama, Kazuhiro; Ono, Yukari; and Ishida, Yoshinobu, 5,752,221, Cl. 704-201.000.

Onoda, Takeshi: *See—*

Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.

Onodera, Junichi; Sato, Shingo; Kashiwagi, Toshio; and Tetsuhiro, Isobe, to Toyo Ink Manufacturing Co., Ltd. Process for the production of carthamin. 5,750,379, Cl. 435-72.000.

Onomura, Osamu: *See—*

Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, 5,750,717, Cl. 548-240.000.

Onuma, Kenji: *See—*

Komura, Akihiko; Onuma, Kenji; and Akena, Mayumi, 5,749,973, Cl. 118-626.000.

Ooishi, Tsukasa, to Mitsubishi Denki Kabushiki Kaisha. Memory cell that can store data nonvolatily using a ferroelectric capacitor, and a semiconductor memory device including such a memory cell. 5,751,627, Cl. 365-145.000.

Ooishi, Tsukasa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device having a hierarchical power source configuration. 5,751,651, Cl. 365-226.000.

Oommen, Abraham: *See—*

Dixon, Richard A.; Paiva, Nancy L.; and Oommen, Abraham, 5,750,399, Cl. 435-419.000.

Ooms, Pieter: *See—*

Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, 5,750,801, Cl. 568-715.000.

Oonuki, Hisao: *See—*

Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, 5,750,987, Cl. 250-251.000.

Ootsuka, Hiroshi: *See—*

Akamatsu, Norihiko; Hamada, Masataka; Yukawa, Kazuhiko; and Ootsuka, Hiroshi, 5,752,101, Cl. 396-155.000.

Opaltone International Limited: *See—*

Bernasconi, Matthew, 5,751,326, Cl. 347-115.000.

Operschall, Hermann; Weber, Jakob; Steiner, Klaus-Alfred; and Ring, Stefan, to Siemens Aktiengesellschaft. Installation for decontaminating a radioactively contaminated surface. 5,749,470, Cl. 209-2.000.

Opperman, Charles H.: *See—*

Conkling, Mark A.; Opperman, Charles H.; and Taylor, Christopher G., 5,750,386, Cl. 435-172.300.

Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, to Stryker Corporation. Cartilage and bone-inducing proteins. 5,750,651, Cl. 530-350.000.

Oprescu, Florin; and Teener, Michael D., to Apple Computer, Inc. Power management system for computer device interconnection bus. 5,752,046, Cl. 395-750.010.

Opresko, Stephen Thomas; and Hutzler, Richard Wayne, to Thomson Consumer Electronics, Inc. Color picture tube having improved funnel. 5,751,103, Cl. 313-477.00R.

Optec Dai-Itchi Denko Co., Ltd.: *See—*

Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.

Or, Yat Sun: *See—*

Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.

Orbach, Zvi: *See—*

Yoeli, Uzi; Rotem, Eran; Janai, Meir; and Orbach, Zvi, 5,751,165, Cl. 326-47.000.

Ordanic, Zvonimir; and Spitz, David John, to International Business Machines Corporation. System and method for automatic determination of thresholds in network management. 5,751,964, Cl. 395-200.540.

Orion-Yhtymä Oy: *See—*

DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.

Ortery, James: *See—*

Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.

Orth, Jonathan Alan, to Advanced Micro Devices, Inc. Process and system for flattening secondary edgebeads on resist coated wafers. 5,750,317, Cl. 430-327.000.

Ortho Diffusion & Recherche: *See—*

Duvillier, Eric; Gineston, Jean-Marie; and De Roaldes, Olivier, 5,749,876, Cl. 606-88.000.

Ortho Pharmaceutical Corporation: *See—*

Boyd, Robert E.; Rasmussen, Chris Royce; and Press, Jeffrey B., 5,750,720, Cl. 548-315.100.

Orthosonics Ltd.: *See—*

Young, Michael John Radley, 5,749,877, Cl. 606-99.000.

Osa, Kinya: *See—*

Fukuchi, Hiroyuki; and Osa, Kinya, 5,751,888, Cl. 386-68.000.

Osaka Gas Co., Ltd.: *See—*

Akagi, Kosuke, 5,750,280, Cl. 429-32.000.

Osaka, Tadashi: *See—*

Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,749,473, Cl. 209-584.000.

Osaki, Akira: *See—*

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Osawa, Hiroshi: *See—*

Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.

Osborn, Rupert William: *See—*

Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; Osborn, Rupert William; and Rees, Sarah Bronwen, 5,750,504, Cl. 514-12.000.

Osborn, Stephen G.: *See—*

Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.

Osborne, Randy B.; Howard, John H.; Casley, Ross T.; and Hahn, Douglas J., to Mitsubishi Electric Information Technology Center America, Inc. Network interface. 5,751,951, Cl. 395-200.800.

OSD Envizion, Inc.: *See—*

Fergason, Jeffrey K.; and Fergason, John D., 5,751,258, Cl. 345-7.000.

Osgood, Alan G. Color motion depth effect system. 5,751,397, Cl. 352-86.000.

Oshiki, Toshiyuki: *See—*

Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.

Oshikiri, Masamitsu: *See—*

Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, 5,751,636, Cl. 365-189.290.

Oshima, Michihiro: *See—*

Watanabe, Kazuhiro; Oshima, Michihiro; Setoguchi, Kazuhiro; and Oda, Masaaki, 5,750,194, Cl. 427-216.000.

Oshima, Tadasi: *See—*

Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.

Oshima, Yoshimitsu, to Hitachi, Ltd. Program display method and device, and also program generation method and device. 5,751,288, Cl. 345-357.000.

Oslund, Lawrence Carl: *See—*

Benzenberg, Craig Kay; Mann, Lloyd Steven; Oslund, Lawrence Carl; and Roe, Colleen Ann, 5,751,943, Cl. 395-183.160.

Osset, Miguel: *See—*

Ibanez, Pilar; Josa, Jaume; and Osset, Miguel, 5,750,486, Cl. 510-356.000.

Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, 5,750,490, Cl. 510-504.000.

Ostberg, Lars G., to Novartis AG. Human monoclonal antibodies to cytomegalovirus. 5,750,106, Cl. 424-142.100.

Ostex International, Inc.: *See—*

Eyre, David R.; Clemens, J. Daniel; and Ochs, Vincent W., 5,750,647, Cl. 530-328.000.

O'Sullivan, Siobhan: *See—*

Gamlyn, Lee; O'Sullivan, Siobhan; Needham, Philip; and Harris, Tom, 5,749,367, Cl. 128-696.000.

Ota, Atsushi: *See—*

Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.

Ota, Hisaki; and Nakamura, Takamasa, to Dai Nippon Printing Co., Ltd. Inking apparatus for use in printing press. 5,749,293, Cl. 101-157.000.

Ota, Kiyoshi: *See—*

Nitta, Hajime; and Ota, Kiyoshi, 5,751,887, Cl. 386-68.000.

Otaka, Masahiro: *See—*

Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.

Otis Elevator Company: *See—*

Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.

Fuller, James W.; and Roberts, Randall K., 5,750,945, Cl. 187-292.000.

Romão, Ulisses G., 5,749,443, Cl. 187-384.000.

Skalski, Clement A., 5,749,444, Cl. 187-409.000.

Thangavelu, Kandasamy, 5,750,946, Cl. 187-392.000.

Otobe, Yukio: *See—*

Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.

O'Toole, James E., to Micron Technology, Inc. On-chip memory redundancy circuitry for programmable non-volatile memories, and methods for programming same. 5,751,647, Cl. 365-200.000.

Otsuka, Naoji: *See—*

Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*

Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.

Otsuki, Kazunori; and Watanabe, Shinichirou, to Kabushiki Kaisya Advance. Data-protecting system. 5,751,805, Cl. 380-4.000.

Ottesen, Hal Hjalmar; Smith, Gordon J.; and Van Leeuwen, George Willard, to International Business Machines Corporation. Multimedia direct access storage device and formatting method. 5,751,883, Cl. 386-27.000.

Ottesen, Hal Hjalmar: *See—*

Smith, Gordon J.; and Ottesen, Hal Hjalmar, 5,751,510, Cl. 360-67.000.

Ottinger, James C.: *See—*

Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.

Outlaw, Ronald A.: *See—*

Huang, Yufeng; Alvesteffer, William J.; and Outlaw, Ronald A., 5,750,892, Cl. 73-202.000.

Overby, Lacy Rasco: *See—*

Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,750,350, Cl. 435-7.100.

Overton, Frank Hudson: *See—*

Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, 5,750,215, Cl. 428-34.200.

Oviedo-Reyes, Alfonso. Separating stock hydraulic crossbow. 5,749,348, Cl. 124-25.000.

Owens-Corning Fiberglas Technology, Inc.: *See—*

Hall, Herbert L., Jr., 5,749,254, Cl. 72-60.000.

Owens, Jeffrey D.: *See—*

Glick, Mark; Fekete, Nicholas M.G.; Bolan, Michael L.; and Owens, Jeffrey D., 5,749,253, Cl. 70-278.000.

Ozaki, Brenda M.: *See—*

Bealkowski, Richard; and Ozaki, Brenda M., 5,752,066, Cl. 395-800.010.

Ozaki, Hiroshi: *See—*

Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Ozaki, Yoshifumi: *See—*

Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Ozark, L. John: *See—*

Ackerman, Robert S.; and Ozark, L. John, 5,749,694, Cl. 414-462.000.

Ozawa, Takayuki; Sugiyama, Satoru; Kitahara, Shigehisa; and Fujii, Katsuhiko, to Teijin Limited. Method for preventing or treating arrhythmia. 5,750,507, Cl. 514-19.000.

Ozawa, Toshiyuki: *See—*

Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka, Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.

Ozkaynak, Engin: *See—*

Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,750,651, Cl. 530-350.000.

Pacesetter, Inc.: *See—*

Bush, M. Elizabeth; and Fain, Eric S., 5,749,901, Cl. 607-5.000.

Mann, Brian M., 5,749,907, Cl. 607-27.000.

Snell, Jeffery D., 5,749,908, Cl. 607-30.000.

Pachl, Carol: *See—*

Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,750,114, Cl. 424-231.100.

Packard Bell NEC: *See—*

DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Krau, Michael P.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,752,063, Cl. 395-800.000.

Paddock, George K.; Haarhoff, Christopher C.; and O'Kane, Mark D., to George Paddock, Inc. Mounting system for body mounted camera equipment. 5,752,112, Cl. 396-421.000.

Pagani, Giorgio, to Urea Casale S.A. Method for in-situ modernization of a urea synthesis reactor. 5,750,080, Cl. 422-193.000.

Pagano, Daniel M.: *See—*

McIntyre, Dale F.; Pagano, Daniel M.; Patton, David L.; and Weissberger, Edward, 5,751,399, Cl. 353-120.000.

Page, Christopher Lyndon, to Tarmac Construction Limited. Treatments for concrete. 5,750,276, Cl. 428-703.000.

Page, Loretta Ann Grezzo; and Pearlstine, Kathryn Amy, to Du Pont de Nemours, E. I., and Company. Ink set and process for alleviating bleed in printed elements. 5,750,594, Cl. 523-161.000.

Page, Randall S.: *See—*

Morgan, Felix E.; Page, Randall S.; and Monaco, Sam D., 5,750,896, Cl. 73-622.000.

Paget, Charles J., Jr.: *See—*

Booher, Richard N.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,750,554, Cl. 514-397.000.

Pailthorp, Robert M.: *See—*

Cutler, Donald R.; Pailthorp, Robert M.; and Unrath, Mark A., 5,751,585, Cl. 364-474.030.

Pais, Idan: *See—*

Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.

Paiva, Nancy L.: *See—*

Dixon, Richard A.; Paiva, Nancy L.; and Oommen, Abraham, 5,750,399, Cl. 435-419.000.

Pajdowski, Mark A.: *See—*

Phan, Duc T.; and Pajdowski, Mark A., 5,751,513, Cl. 360-78.070.

Pala, Pietro: *See—*

Prieels, John Paul; Garcon-Johnson, Nathalie Marie-Josephe Claude; Slaoui, Moncef; and Pala, Pietro, 5,750,110, Cl. 424-208.100.

Palagonia, Anthony Michael, to International Business Machines Corporation. Lead on chip lead frame design without jumpover wiring. 5,751,057, Cl. 257-691.000.

Palanipian, Sevugan: *See—*

Botos, Matthew J.; Sizer, Charles E.; and Palanipian, Sevugan, 5,750,907, Cl. 73-865.800.

Palatov, Dennis. Barrel type internal combustion engine. 5,749,337, Cl. 123-56.200.

Palermo, Thomas J.; Samson, Gene; Mirigian, Gregory E.; and Chee, U. Hiram, to Target Therapeutics, Inc. Enhanced lubricity guidewire. 5,749,837, Cl. 600-585.000.

Palese, Peter; and O'Neill, Robert, to Mount Sinai Medical Center, The. Identification and use of antiviral compounds that inhibit interaction of host cell proteins and viral proteins required for viral replication. 5,750,394, Cl. 435-252.300.

Palmer, Brian Desmond: *See—*

Denny, William Alexander; Palmer, Brian Desmond; and Wilson, William Robert, 5,750,782, Cl. 564-166.000.

Palmer, Kenneth Joseph: *See—*

Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, 5,749,981, Cl. 148-595.000.

Paltrinieri, Massimo: *See—*

Geymond, Jean Paul; and Paltrinieri, Massimo, 5,752,253, Cl. 707-503.000.

Pan Communications, Inc.: *See—*

Yamaguchi, Noboru; and Konomi, Masao, 5,751,822, Cl. 381-94.100.

Pan, Yang, to Chartered Semiconductor Manufacturing Company Ltd. Method for minimizing the hot carrier effect in N-MOSFET devices. 5,750,435, Cl. 438-525.000.

Pancoast, Steven Taylor: *See—*

Crump, Dwayne Thomas; Norris, Duane Edward; and Pancoast, Steven Taylor, 5,752,044, Cl. 395-750.000.

Pandolfe, William D.: *See—*

Kinney, Richard R.; Pandolfe, William D.; and Ferguson, R. Daniel, 5,749,650, Cl. 366-176.200.

Panex Corporation: *See—*

Delatorre, Leroy C., 5,749,417, Cl. 166-254.200.

Pankiewicz, Krzysztof W.: *See—*

Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Krzeminski, Jacek; and Nawrot, Barbara, 5,750,675, Cl. 536-27.210.

Panner, Jeannie Harrigan: *See—*

Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, 5,751,595, Cl. 364-490.000.

Panter Master Controls, Inc.: *See—*

Panter, Ronald L.; and Taylor, John J., 5,751,832, Cl. 382-104.000.

Panter, Ronald L.; and Taylor, John J., to Progressive Tool & Industries Co.; and Panter Master Controls, Inc. Headlight aiming apparatus. 5,751,832, Cl. 382-104.000.

Panzone, Gianbattista: *See—*

- Malabarba, Adriano; Ciabatti, Romeo; Panzone, Gianbattista; and Marazzi, Alessandra Maria, 5,750,509, Cl. 514-11.000.
- Papadopoulos, Nickolas: *See—*
  - Vogelstein, Bert; Kinzler, Kenneth W.; and Papadopoulos, Nickolas, 5,750,352, Cl. 435-7.210.
- Papworth, David B.: *See—*
  - Abramson, Jeffrey M.; Papworth, David B.; Akkary, Haitham H.; Glew, Andrew F.; Hinton, Glenn J.; Konigsfeld, Kris G.; and Madland, Paul D., 5,751,983, Cl. 395-392.000.
  - Fetterman, Michael A.; Hinton, Glenn J.; Papworth, David B.; Glew, Andrew F.; and Colwell, Robert P., 5,751,986, Cl. 395-394.000.
- Paquin, Geoffrey J.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Paradyne Corporation: *See—*
  - Scott, Robert Earl; and Zuranski, Edward S., 5,751,796, Cl. 379-93.310.
  - Scott, Robert Earl, 5,752,199, Cl. 455-557.000.
- Parashar Holdings Pty Ltd: *See—*
  - Powell, Andrew Robert, 5,749,859, Cl. 604-167.000.
- Parasharami, Varsha Anil: *See—*
  - Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, 5,750,401, Cl. 435-430.000.
- Pare, My Tien: *See—*
  - Fanshier, Stephen Reid; Pare, My Tien; Nacional, Anthony Bautista; and Klekas, Steven Lynn, 5,751,962, Cl. 395-200.530.
- Parent, Leon-Etienne; Mailloux, Alexandre; and Breton, Bruno. Peat based compositions. 5,749,934, Cl. 71-24.000.
- Parfomak, Walter: *See—*
  - Sears, Jerome; Parfomak, Walter; Kluss, Walter J.; and Germinario, Michael, 5,751,131, Cl. 318-778.000.
- Park, Gwi-Tae: *See—*
  - Sheen, Yong-Hoo; Park, Gwi-Tae; Yoo, Ji-Yoon; and Lee, Sang-Lak, 5,751,511, Cl. 360-73.110.
- Park, Haesun: *See—*
  - Park, Kinam; and Park, Haesun, 5,750,585, Cl. 521-143.000.
- Park, Hanee, to LG Electronics Inc. Digital convergence correction system. 5,751,122, Cl. 315-368.160.
- Park, Il Oung, to Samsung Electro-Mechanics Co., Ltd. Air discharge guiding arrangement for preventing the scattering of foreign matter of a spindle motor. 5,751,084, Cl. 310-90.000.
- Park, Jin-Hong: *See—*
  - Kim, Man-Tae; Kim, Min-Sik; and Park, Jin-Hong, 5,751,342, Cl. 348-92.000.
- Park, Jung-Rae; Kim, Tae-Hong; Lee, Suk-Jin; and Choy, Tae-Goo, to Korea Telecommunication Authority; and Electronics And Telecommunications Research Institute. Dielectric ceramic composition for microwave. 5,750,452, Cl. 501-138.000.
- Park, Kinam; and Park, Haesun, to Purdue Research Foundation. Super absorbent hydrogel foams. 5,750,585, Cl. 521-143.000.
- Park, Kyoung Ho, to Lee, Whal-Sun. Transfer rolling process and device for producing banners. 5,749,300, Cl. 101-488.000.
- Park, Sae Joon. Automatic pneumatic pump including a tank with inlet and outlet and a pump connected to the inlet. 5,749,711, Cl. 417-120.000.
- Park, Sang-il: *See—*
  - Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.
- Park, Vernon Kee, to Eastman Chemical Company. Removable coating composition and process for protecting surfaces. 5,750,269, Cl. 428-484.000.
- Park, Wan-woo: *See—*
  - Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, 5,750,296, Cl. 430-28.000.
- Park, Won-seo: *See—*
  - Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.
- Park, Yong Ae: *See—*
  - Huh, Nam Won; Park, Yong Ae; and Kim, Yong Ho, 5,750,359, Cl. 435-19.000.
- Park, Yong-sung: *See—*
  - Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.
- Parker, Daniel V.: *See—*
  - Tang, Howard; and Parker, Daniel V., 5,751,163, Cl. 326-38.000.
- Parker, Delmer G.; and Kovacs, Gregory J., to Xerox Corporation. Development combination exposure and recharge scheme to eliminate development defects in two pass process color xerocolography. 5,751,437, Cl. 358-300.000.
- Parker, Dennis Clay: *See—*
  - Humphries, Robert D.; Dreese, Delbert R.; Taylor, Louis L.; and Parker, Dennis Clay, 5,749,936, Cl. 71-64.050.
- Parker, Kenneth P.: *See—*
  - Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.
- Parker, Lore: *See—*
  - Lattery, Jerome E., 5,749,521, Cl. 239-64.000.
- Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., to Chiron Diagnostics Corporation. Multifunction valve. 5,750,906, Cl. 73-863.730.
- Parker, William S.: *See—*
  - Olson, Kenneth F.; and Parker, William S., 5,749,902, Cl. 607-5.000.
- Parkinson, Christopher John: *See—*
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- Parkinson, Nigel Christopher; and Van Sickle, Andrew Paul, to Rhone-Poulenc Rorer Limited. Process for the preparation of steroid derivatives. 5,750,734, Cl. 549-432.000.
- Parks, Terry: *See—*
  - Henry, Glenn; and Parks, Terry, 5,752,015, Cl. 395-588.000.
- Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A. (.), to Moore Business Forms, Inc. Print cartridge cleaning apparatus and method using water and air. 5,751,307, Cl. 347-33.000.
- Parrish, Jeff W.; and Maghoul, Farzin, to Object Technology Licensing Corporation. Object-oriented system for configuration history management with a project workspace and project history database for draft identification. 5,752,245, Cl. 707-10.000.
- Parslow, Harold W., Jr., to Grapar Corporation. Non-linear chain belt type conveyor. 5,749,383, Cl. 134-56.00R.
- Parthasarathy, Sampath: *See—*
  - Medford, Russell M.; Alexander, R. Wayne; Parthasarathy, Sampath; and Khan, Bobby V., 5,750,351, Cl. 435-7.210.
- Particle Measuring Systems, Inc.: *See—*
  - Mitchell, John R., 5,751,422, Cl. 356-337.000.
- Pascual, D. Samual Botella, to M. Hidalgo Beistequi, S.A. Process for the manufacture of a figured elastic fabric made by the jacquard system. 5,749,400, Cl. 139-421.000.
- Pascucci, Luigi, to SGS-Thomson Microelectronics S.r.l. Driver device for selection lines for a multiplexer, to be used in a wide range of supply voltages, particularly for non-volatile memories. 5,751,654, Cl. 365-230.060.
- Pasini, Giovanni Battista: *See—*
  - Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, 5,749,126, Cl. 19-102.000.
- Passeri, Robert V., Jr. Golf ball putter. 5,749,791, Cl. 473-251.000.
- Patchel, Kenneth A.: *See—*
  - Mitchell, Andrew L.; and Patchel, Kenneth A., 5,749,840, Cl. 602-5.000.
- Patel, Kishor N.: *See—*
  - Guri, Assaf Z.; and Patel, Kishor N., 5,750,402, Cl. 435-431.000.
- Patel, Piyush M.: *See—*
  - Rose, Scott M.; and Patel, Piyush M., 5,752,244, Cl. 707-5.000.
- Patel, Raman: *See—*
  - Medsker, Robert Eugene; Patel, Raman; and Sabet, Sabet-Abdou, 5,750,625, Cl. 525-133.000.
- Patel, Vijay Somabhai: *See—*
  - McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, 5,751,011, Cl. 250-559.330.
- Patell, Mahesh, to Bristol-Myers Squibb Company. Stable gelatin coated aspirin tablets. 5,750,145, Cl. 424-478.000.
- Patelli, Silvano; Cossandi, Antonio; and Pasini, Giovanni Battista, to F.LLI Marzoli & C. S.p.A. Device for guiding and coupling the sliding flat with the drive belt in a flat card. 5,749,126, Cl. 19-102.000.
- Patients Solutions: *See—*
  - Withers, Andrew, 5,752,234, Cl. 705-2.000.
- Patier, Pascale: *See—*
  - Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
- Patkar, Niteen A.: *See—*
  - Shen, Gene W.; Szeto, John; Patkar, Niteen A.; and Shebanow, Michael C., 5,751,985, Cl. 395-394.000.
- Patocka, Miroslav: *See—*
  - Chalupa, Leos; and Patocka, Miroslav, 5,751,128, Cl. 318-439.000.
- Patriot Sensors & Controls Corporation: *See—*
  - Bebensee, Douglas W.; and Stringer, Michael J., 5,749,224, Cl. 60-473.000.
- Patterson, Daniel G.: *See—*
  - Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
- Patterson, Gregory S.; and Epperson, Darrell G., to Ericsson, Inc. Radiotelephone having a combination fastener and electrical connector. 5,749,754, Cl. 439-824.000.
- Pattok, Eric David, to General Motors Corporation. Shaft coupling in motor vehicle steering shaft. 5,749,786, Cl. 464-106.000.
- Patton, David L.: *See—*
  - McIntyre, Dale F.; Pagano, Daniel M.; Patton, David L.; and Weissberger, Edward, 5,751,399, Cl. 353-120.000.
- Patton, David Lynn: *See—*
  - Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, 5,749,468, Cl. 206-455.000.
- Paul, Charles W.: *See—*

  - Blumenthal, Mitchell J.; Sharak, Matthew L.; and Paul, Charles W., 5,750,605, Cl. 524-230.000.
- Paul, Jean Michel; Samuel, Yves; and Esch, Marc, to ELF Atochem S.A. Process for the manufacture of sec-butyl acrylate by reaction of acrylic acid and butene isomers. 5,750,771, Cl. 560-205.000.
- Paul, Sanjoy: *See—*
  - Chen, Kuo-Wei Herman; Paul, Sanjoy; and Sabnani, Krishan Kumar, 5,751,719, Cl. 370-473.000.
- Paul Wurth S.A.: *See—*
  - Lonardi, Emile; and Cimenti, Giovanni, 5,749,820, Cl. 384-620.000.
- Paulot, William M.; Probst, Joseph M.; and Elliott, William B., to Wilson Greatbatch Ltd. Dual connection tab current collector. 5,750,286, Cl. 429-211.000.
- Paulson, Peter O., to Weed-Master Western Inc. Pesticide composition. 5,750,128, Cl. 424-407.000.
- Paulus, Wolfgang: *See—*
  - Häussling, Lukas; Neuhauser, Horst; and Paulus, Wolfgang, 5,750,788, Cl. 564-415.000.
- Pauser, Michael Leon: *See—*
  - Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, 5,752,022, Cl. 395-610.000.
- Pavio, Anthony M., to Motorola, Inc. Resonator with metal layers devoid of DC connection and semiconductor device in substrate. 5,751,201, Cl. 333-219.000.
- Pavlovic, Gordana: *See—*
  - Kostic, Zoran; and Pavlovic, Gordana, 5,751,704, Cl. 370-335.000.
- Pawate, Basavaraj I.: *See—*
  - Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.
- Pawlowski, Adam: *See—*
  - Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.
- Payette, Michel. Fondue cooking apparatus. 5,749,286, Cl. 99-413.000.
- Payne, David: *See—*
  - Brice, Steve; Kingsley, Gary; and Payne, David, 5,749,641, Cl. 353-81.000.
- Payne, Leslie, to United States of America, National Aeronautics and Space Administration. Segmented cold cathode display panel. 5,751,109, Cl. 313-542.000.
- Payne, Michael, to Procter & Gamble Company, The. Fluid acquisition and distribution member for absorbent core. 5,749,863, Cl. 604-376.000.
- Paz de Araujo, Carlos A.: *See—*
  - Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., 5,751,034, Cl. 257-295.000.
- PDQ Manufacturing, Inc.: *See—*
  - Jones, Allen, 5,749,161, Cl. 34-541.000.
  - Jones, Allen, 5,749,162, Cl. 34-566.000.
- Peak Enterprises, Inc.: *See—*
  - Wieder, Steven M.; and Oechslin, Thomas A., 5,749,116, Cl. 15-160.000.
- Pearce, Tony M., to TekSource, LC. Gelatinous cushions with buckling columns. 5,749,111, Cl. 5-652.000.
- Pearlstine, Kathryn Amy: *See—*
  - Page, Loretta Ann Grezzo; and Pearlstine, Kathryn Amy, 5,750,594, Cl. 523-161.000.
- Pechhold, Engelbert; and Murphy, Peter Michael, to Du Pont de Nemours, E. I., and Company. Treatment of polyamide materials with partial fluoroesters or fluorothioesters of maleic acid polymers and sulfonated aromatic condensates. 5,750,445, Cl. 442-168.000.
- Pedain, Josef: *See—*
  - Laas, Hans-Josef; Halpaap, Reinhard; Pedain, Josef; and König, Klaus, 5,750,629, Cl. 528-45.000.
- Peeraer, Jan M.: *See—*
  - Stoffels, Jan A.J.; Vandeperre, Denise K.L.; and Peeraer, Jan M., 5,751,111, Cl. 313-606.000.
- Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., to Xerox Corporation. Thermal ink-jet printhead with an optimized fluid flow channel in each ejector. 5,751,317, Cl. 347-65.000.
- Peg Perego Pines S.p.A.: *See—*
  - Perego, Gianluca, 5,749,627, Cl. 297-370.000.
- Pelaez, Joaquin: *See—*
  - Margolis, Geoffrey; and Pelaez, Joaquin, 5,750,182, Cl. 426-646.000.
- Pelham, Marilyn M.; and Hollar, Richard T. Covered dog bed. 5,749,314, Cl. 119-28.500.
- Pelly, Brian R.; and Tachick, Henry N., to Dairyland Electrical Industries, Inc. High power DC blocking device for AC and fault current grounding. 5,751,530, Cl. 361-56.000.
- Pendalwar, Shekhar L.; Oliver, Manuel; and Venugopal, Ganesh, to Motorola, Inc. Electrolyte composition for rechargeable electrochemical cells. 5,750,284, Cl. 429-197.000.
- Peng, Jianying: *See—*
  - Dietrich, Gabriele; Smith, Jane; and Peng, Jianying, 5,750,866, Cl. 800-205.000.
- Penn State Research Foundation, The: *See—*
  - Fonash, Stephen J., 5,750,981, Cl. 250-214.00R.
  - Weiss, William J., 5,751,125, Cl. 318-280.000.
- Pennace, John R.: *See—*
  - McDonough, Neil; and Pennace, John R., 5,751,256, Cl. 343-873.000.
- Pentel Kabushiki Kaisha: *See—*
  - Kato, Naoki; and Kawasaki, Masayuki, 5,749,665, Cl. 401-264.000.
  - Takahashi, Kazunari, 5,749,663, Cl. 401-31.000.
- Penwest Foods Co.: *See—*
  - Woerman, John Harold; and Wu, Yangsheng, 5,750,168, Cl. 426-102.000.
- PeopleSoft, Inc.: *See—*
  - Zweben, Monte; Deale, Michael J.; Vershel, Mark A.; and Pettus, Christophe E., 5,751,958, Cl. 395-200.340.
- Pepe, Joseph Philip: *See—*
  - Chang, Yun Chea; Rodgers, James; and Pepe, Joseph Philip, 5,750,327, Cl. 430-569.000.
- Perdreaux, Rene: *See—*
  - Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., 5,749,727, Cl. 433-119.000.
- Perego, Gianluca, to Peg Perego Pines S.p.A. Pushchair with backrest adjustment by centralized control. 5,749,627, Cl. 297-370.000.
- Perez, Alexander: *See—*
  - Divivier, Robert J.; Haines, Ralph; Nemirovsky, Mario D.; and Perez, Alexander, 5,752,269, Cl. 711-169.000.
  - Nemirovsky, Mario; Perez, Alexander; Divivier, Robert James; and Sankar, Narendra, 5,752,273, Cl. 711-201.000.
- Perez, Miguel A.: *See—*
  - Elkhoury, Bassam N.; McFarland, Scott T.; and Perez, Miguel A., 5,752,265, Cl. 711-146.000.
- Peris, Daniel: *See—*
  - Roullet, André; and Peris, Daniel, 5,752,175, Cl. 455-183.100.
- Perkin-Elmer Corporation, The: *See—*
  - Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
- Perlman, Andrew T.: *See—*
  - Land, Mark S.; Kruy, Steven J.; Perlman, Andrew T.; and Walvick, Edward A., 5,751,706, Cl. 370-352.000.
- Perlman, Kato L.: *See—*
  - DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,750,746, Cl. 552-653.000.
- Pernick, Jeffrey R.: *See—*
  - Stadler, David M.; and Pernick, Jeffrey R., 5,750,014, Cl. 204-224.00R.
- Perry, Fred M.: *See—*
  - Kjell, Douglas P.; and Perry, Fred M., 5,750,688, Cl. 540-596.000.
- Perttu, Joseph S.: *See—*
  - Brumwell, Dennis A.; Perttu, Joseph S.; Kroll, Mark W.; and Nelson, Randall S., 5,749,910, Cl. 607-36.000.
- Petersen, Kirk A.: *See—*
  - Davis, Keith L.; and Petersen, Kirk A., 5,749,125, Cl. 16-382.000.
- Peterson, Terry Robert, to General Motors Corporation. Vehicle power steering system. 5,749,431, Cl. 180-422.000.
- Petkovic, Dragutin: *See—*
  - Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.
- Petralia, Richard C: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Petrole, Christopher P.: *See—*
  - Allshouse, James R.; and Petrole, Christopher P., 5,749,351, Cl. 124-25.600.
- Petroleum Energy Center: *See—*
  - Shimazu, Akira; Ikeda, Kenichi; and Hachisuka, Hisao, 5,749,943, Cl. 95-50.000.
- Petrosino, Gianluca, to SGS-Thomson Microelectronics, Inc. Microprocessor memory test circuit and method. 5,751,641, Cl. 365-189.050.
- Petrosov, V. A.: *See—*
  - Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., 5,751,113, Cl. 315-111.210.
- Petruck, Gerd-Michael: *See—*
  - Darsow, Gerhard; and Petruck, Gerd-Michael, 5,750,803, Cl. 568-830.000.
- Pettenon, Paolo, to Sicce S.p.A. Self-priming pumping device for hydraulic circuits. 5,750,023, Cl. 210-169.000.
- Petterson, Tor. Sheet dispenser and method. 5,749,492, Cl. 221-1.000.
- Pettersson, Bjorn Ola Alfons; Plavnik, Alex; and Boreczky, Eric, to Tecsyn, Inc. Powdered metal cylinder liners. 5,749,331, Cl. 123-193.200.
- Pettus, Christophe E.: *See—*
  - Zweben, Monte; Deale, Michael J.; Vershel, Mark A.; and Pettus, Christophe E., 5,751,958, Cl. 395-200.340.
- Petty, Charles J., to Compac Corporation. Laminated vapor barrier. 5,750,225, Cl. 428-362.000.
- Petty, Terry Lyle: *See—*
  - Brown, John Hiram; LaCount, Kenneth Harry; and Petty, Terry Lyle, 5,749,538, Cl. 242-559.200.
- Pfizenmayer, Henry L.; and Wernett, Frederick C., III, to Motorola, Inc. Electronic component having reduced capacitance. 5,751,555, Cl. 361-763.000.
- Pfizer: *See—*
  - Villalobos, Anabella; Nagel, Arthur A.; and Chen, Yuhpyng L., 5,750,542, Cl. 514-322.000.

Pfizer Inc.: *See—*
  Clancy, Joanna, 5,750,535, Cl. 514-294.000.
  Danilewicz, John Christopher; Ellis, David; and Kobylecki, Ryszard Jurek, 5,750,520, Cl. 514-212.000.
  Quallich, George J., 5,750,794, Cl. 568-322.000.
  Spargo, Peter Lionel, 5,750,707, Cl. 546-321.000.

Phadke, Chandrashekhar Hari; Nagarqala, Nazifa Najmuddin; Parasharami, Varsha Anil; Nadgauda, Rajani Satish; and Mascarenhas, Anthony Francis, to C.S.I.R. Cultural medium for bamboo shoot sprouting and multiplication and a method for sprouting and multiplication of bamboo plantlets. 5,750,401, Cl. 435-430.000.

Phan, Duc T.; and Pajdowski, Mark A., to Seagate Technology, Inc. Method for carrying out seeks in a hard disc drive to limit the generation of acoustic noise. 5,751,513, Cl. 360-78.070.

Phan, Tan Thanh. Ratchet screw driver. 5,749,272, Cl. 81-62.000.

Phanopoulos, Christopher; and Vanden Ecker, Jacobus Margareta Valentijn, to Imperial Chemical Industries PLC. Process for binding lignocellulosic material. 5,750,201, Cl. 427-375.000.

Pharm-Eco Laboratories, Inc.: *See—*
  Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, 5,750,713, Cl. 548-202.000.

Pharmaceutical Systems, Inc.: *See—*
  Imburgia, Richard, 5,750,184, Cl. 427-2.130.

Pharmacia & Upjohn Aktiebolag: *See—*
  Lake, Staffan; and Stjernschantz, Johan, 5,750,369, Cl. 435-69.100.

Pharmacia & Upjohn Company: *See—*
  Lee, Byung H., 5,750,533, Cl. 514-278.000.
  Lee, Byung H.; and Clothier, Michael F., 5,750,695, Cl. 544-341.000.

Pharming B.V.: *See—*
  Meade, Harry; and Lonberg, Nils, 5,750,172, Cl. 426-580.000.

Pharmos Corporation: *See—*
  Friedman, Doron; and Aldouby, Yanir, 5,750,142, Cl. 420-450.000.

Phero Tech Inc.: *See—*
  Wakarchuk, David A., 5,750,129, Cl. 424-408.000.

Philip Morris Incorporated: *See—*
  Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Philips Electronics North America Corporation: *See—*
  Cameron, Alexander John; and Dorst, Leendert, 5,751,573, Cl. 364-167.010.
  Cavallerano, Alan; and Ciacci, Claudio, 5,751,264, Cl. 345-85.000.
  Jayaraman, Raj; Xia, Yongping; Venkitasubrahmanian, Sreeraman; and Leyton, Paul, 5,751,115, Cl. 315-225.000.
  Mukherjee, Satyendranath, 5,751,038, Cl. 257-316.000.

Phillips, Dennis Earl; and Wright, Dennis Nathan. Converter dolly lift mechanism. 5,749,593, Cl. 280-476.100.

Phillips, Duncan Adrian Sidney: *See—*
  Thomson, Gordon Alexander; and Phillips, Duncan Adrian Sidney, 5,750,689, Cl. 544-75.000.

Phillips, James Patrick, to Motorola, Inc. Method and antenna for providing an omnidirectional pattern. 5,751,252, Cl. 343-726.000.

Phillips Petroleum Company: *See—*
  Scharre, Mark D.; Ewert, Warren M.; and Hunt, Harold R., 5,750,798, Cl. 568-697.000.

Phillips, Thomas R.: *See—*
  Dolan, Robert P.; Phillips, Thomas R.; DeWolf, Thomas L.; and Hill, Mark A., 5,751,948, Cl. 395-185.070.

Phillips, Timothy Jonathan: *See—*
  Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.

Philp, Adam Rupert; Sibbald, Alastair; Clemow, Richard David; and Nackvi, Fawad, to Central Research Laboratories Limited. Apparatus for audio signal stereophonic adjustment. 5,751,815, Cl. 381-17.000.

Phone-Poulenc Rorer SA.: *See—*
  Baudoin, Bernard; Burns, Christopher; Commercon, Alain; and Le Brun, Alain, 5,750,567, Cl. 514-510.000.

Pi, Rafael: *See—*
  Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, 5,750,490, Cl. 510-504.000.

Piacentini, Mauro: *See—*
  Fesus, Laszlo; and Piacentini, Mauro, 5,750,360, Cl. 435-23.000.

Piacentino, Ray. Simulating the assembly of an automobile. 5,749,579, Cl. 273-237.000.

Piatak, Michael: *See—*
  Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,750,655, Cl. 530-351.000.

Picheny, Michael Alan: *See—*
  Chen, Chengjun Julian; Gopinath, Ramesh Ambat; Monkowski, Michael Daniel; and Picheny, Michael Alan, 5,751,905, Cl. 395-2.630.

Pichon, Dean M.: *See—*
  Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.

Pickett, James K.: *See—*
  Roberts, James S.; and Pickett, James K., 5,752,069, Cl. 395-800.230.

Pickup, Lansing Dunn: *See—*
  Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, 5,751,595, Cl. 364-490.000.

Picower Institute for Medical Research, The: *See—*
  Bianchi, Marina; Cerami, Anthony; Tracey, Kevin J.; and Ulrich, Peter, 5,750,573, Cl. 514-597.000.

Pictor, Robert A.: *See—*
  Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., 5,752,138, Cl. 399-264.000.

Pieper, Reinhold: *See—*
  Schug, Heinrich; Schlickhoff, Reiner; and Pieper, Reinhold, 5,750,961, Cl. 219-497.000.

Pierce, James Michael: *See—*
  Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.

Pietri, Sylvia: *See—*
  Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.

Pietruszynski, David Michael; Austin, James Dub; and Kirkland, Brian, to Crystal Semiconductor. Output driver for PCI bus. 5,751,179, Cl. 327-379.000.

Pilkington PLC: *See—*
  Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,749,931, Cl. 65-60.100.
  Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,751,484, Cl. 359-512.000.

Pillsbury Company, The: *See—*
  Rice, Michael J., 5,749,460, Cl. 220-23.830.

Pinault, Robert J.: *See—*
  Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.

Pinto, Patrick A.: *See—*
  Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 5,750,532, Cl. 514-274.000.

Pinto, Timothy Martin: *See—*
  McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, 5,751,011, Cl. 250-559.330.

Pioneer Electronic Corporation: *See—*
  Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.
  Kusano, Satoshi, 5,751,866, Cl. 382-312.000.
  Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,751,690, Cl. 369-275.300.
  Yamamoto, Yuji, 5,752,178, Cl. 455-186.100.
  Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.

Pioneer Hi-Bred International, Inc.: *See—*
  Briggs, Steven P., 5,749,169, Cl. 47-58.000.
  Chapman, Michael Allen, 5,750,829, Cl. 800-200.000.
  Chapman, Michael Allen, 5,750,847, Cl. 800-200.000.
  Cigan, Andrew M.; and Albertsen, Marc C., 5,750,868, Cl. 800-205.000.
  Coaldrake, Peter Donald; and Tollakson, Steven Wayne, 5,750,839, Cl. 800-200.000.
  Luedtke, Roy, Jr., 5,750,835, Cl. 800-200.000.
  Luedtke, Roy, Jr., 5,750,842, Cl. 800-200.000.
  Luedtke, Roy, Jr., 5,750,843, Cl. 800-200.000.
  Mohror, Robert Alvin, 5,750,832, Cl. 800-200.000.
  Morrow, Donald Lee, 5,750,841, Cl. 800-200.000.
  Noble, Stephen William, Jr., 5,750,849, Cl. 800-200.000.
  Puskaric, Vladimir; and Luedtke, Roy, Jr., 5,750,838, Cl. 800-200.000.
  Roundy, Theron Eugene, 5,750,831, Cl. 800-200.000.
  Segebart, Robert Lee, 5,750,834, Cl. 800-200.000.
  Wright, Steven L.; and Hood, C. Fred, 5,751,421, Cl. 356-328.000.

Pioneer Video Corporation: *See—*
  Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,751,690, Cl. 369-275.300.

Piplani, Alec A.: *See—*
  Quiachon, Dinah B.; Piplani, Alec A.; and Baughman, Larry G., 5,749,920, Cl. 623-1.000.

Pipon, Francois: *See—*
  Monot, Jean-Jacques; Pipon, Francois; Multedo, Gilbert; and Chevalier, Pascal, 5,752,168, Cl. 455-67.300.

Pireh, Daisy: *See—*
  Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.

Pirig, Wolf-Dieter: *See—*
  Scholz, Guido; and Pirig, Wolf-Dieter, 5,749,948, Cl. 106-18.150.

Pirrelli, Ronald L.: *See—*
  Bright, Danielle A.; and Pirrelli, Ronald L., 5,750,756, Cl. 558-162.000.

Pitchford, Terry L.: *See—*
  Wronkiewicz, Robert D.; Pitchford, Terry L.; Schuller, Daniel J.; and Vennen, Emmanuel Vander, 5,749,301, Cl. 105-199.300.

Pitman, Richard James; and Baggett, Thomas Doyle, to Murray, Inc. Remotely controlled primer actuator for power equipment engines. 5,750,056, Cl. 261-37.000.

Pittman, Guy P.: *See—*
  Boyce, C. Bradford; Pittman, Guy P.; and Lewis, Bolivar F., III, 5,750,010, Cl. 204-157.940.

Pixel Instruments Corp.: *See—*
  Cooper, J. Carl, 5,751,368, Cl. 348-512.000.

Pladek, Robert B., to Lucent Technologies Inc. Method of stabilizing the level of an audio signal in television broadcasting. 5,751,824, Cl. 381-104.000.

Planche, Jean-Pascal: *See—*
  Krivohlavek, Dennis; King, Gayle; and Planche, Jean-Pascal, 5,750,598, Cl. 524-71.000.

Plant Cell Technology, Inc.: *See—*
  Guri, Assaf Z.; and Patel, Kishor N., 5,750,402, Cl. 435-431.000.

Plant Genetic Systems, N.V.: *See—*
  Williams, Mark; and Leemans, Jan, 5,750,867, Cl. 800-205.000.

Plastics Engineering Company: *See—*
  Waitkus, Phillip A., 5,750,597, Cl. 524-35.000.

Platinum Plus, Inc.: *See—*
  Epperly, W. Robert; Sprague, Barry N.; Kelso, Danny T.; and Bowers, Wayne E., 5,749,928, Cl. 44-358.000.

Plattner, Jacob J.: *See—*
  Elliott, Richard L.; Or, Yat Sun; Chu, Daniel T.; Griesgraber, George W.; Plattner, Jacob J.; and Pireh, Daisy, 5,750,510, Cl. 514-29.000.

Plavnik, Alex: *See—*
  Pettersson, Bjorn Ola Alfons; Plavnik, Alex; and Boreczky, Eric, 5,749,331, Cl. 123-193.200.

Plavskih, Vladimir Dmitrievich: *See—*
  Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.

Plessier, Alain: *See—*
  Daouse, Alain; and Plessier, Alain, 5,750,170, Cl. 426-283.000.

Plettner, Horst: *See—*
  Rees, Volker; Schumacher, Martin; and Plettner, Horst, 5,750,949, Cl. 218-43.000.

Pliquett, Uwe: *See—*
  Zewert, Thomas E.; Pliquett, Uwe; Langer, Robert S.; and Weaver, James C., 5,749,847, Cl. 604-49.000.

PLM AB: *See—*
  Quasters, Mikael, 5,750,224, Cl. 428-35.700.

Plona, Daniel Georges: *See—*
  Dusserre-Telmon, Guy Franck Paul; Plona, Daniel Georges; and Tourne, Christophe Yvon Gabriel, 5,749,660, Cl. 384-475.000.

Plotkin, Stanley A.: *See—*
  Clark, H. Fred; Offit, Paul; and Plotkin, Stanley A., 5,750,109, Cl. 424-205.100.

Plouffe, Wilfred Edmund, Jr.: *See—*
  Kasson, James Matthews; Nin, Sigfredo Ismael; Plouffe, Wilfred Edmund, Jr.; and Pryor, Duaine Wright, Jr., 5,751,926, Cl. 395-119.000.

Plumptre, David Aubrey, to Ceramaspeed Limited. Electric heater. 5,750,959, Cl. 269-465.000.

Plyley, Alan K.: *See—*
  Vidal, Claude A.; Plyley, Alan K.; Redmond, Russell J.; and Lagerquist, Roger, 5,749,893, Cl. 606-205.000.

PMC-Sierra, Inc.: *See—*
  Radhakrishnan, Sivakumar; and Dabecki, Stephen J., 5,751,697, Cl. 370-229.000.

Poess, Hans-Joachim, to Vacuumschmelze GmbH. Annular core for a choke, in particular for radio interference suppression of semiconductor circuits by the phase control method. 5,751,207, Cl. 336-233.000.

Poisson, Renald. Apparatus and method of playing a basketball board game. 5,749,581, Cl. 273-244.000.

Polaroid Corporation: *See—*
  Dalzell, William H.; and Loshak, Igor, 5,751,481, Cl. 359-485.000.
  Dombrowski, Edward J., Jr.; Jones, Robert L.; Warner, John C.; and Yang, Jiyue, 5,750,463, Cl. 503-204.000.
  Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.

Polito, Anthony J.; Bailey, Ronald E.; Timmons, William W.; and Bell, Robert H., to Allegheny Ludlum Corporation. Ballistic resistant metal armor plate. 5,749,140, Cl. 29-527.100.

Polizzi, Jerome: *See—*
  Chudoba, Paul; and Polizzi, Jerome, 5,751,874, Cl. 385-72.000.

Polk, Charles E.: *See—*
  Blackwell, Steven R.; Polk, Charles E.; and Morgan, Jason N., 5,751,974, Cl. 395-301.000.

Pollklas, Manfred, to Claas KGaA. Device for automatic filling of load containers. 5,749,783, Cl. 460-119.000.

Polysaccharide Industries AB PSI: *See—*
  Svensson, Sigfrid, 5,750,189, Cl. 421-154.000.

Pomerantz, Roger J.: *See—*
  Bagasra, Omar; and Pomerantz, Roger J., 5,750,347, Cl. 435-6.000.

Pomme, Vincent, to Valeo Climatisation. Refrigerant fluid reservoir for a heat pump installation. 5,749,239, Cl. 62-225.000.

Pompier, Jean-Pierre: *See—*
  Muhlhoff, Olivier; and Pompier, Jean-Pierre, 5,749,982, Cl. 152-158.000.

Poncet, Philippe: *See—*
  Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.

Pontus, John; and Young, Stephen H., to Lockheed Martin Corporation. Pistol range backstop. 5,749,177, Cl. 52-79.100.

Pope, Francis Joseph, III: *See—*
  Carr, Richard Gregory; and Pope, Francis Joseph, III, 5,751,802, Cl. 379-201.000.

Pope, Peter: *See—*
  DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.

Popiel, Lawrence: *See—*
  Cowfer, Joseph Allen; Johnston, Victor James; and Popiel, Lawrence, 5,750,812, Cl. 570-245.000.

Porous Media Corporation: *See—*
  Spearman, Michael R., 5,750,024, Cl. 210-315.000.

Porter, David H.; and Milicia, Libbe A., to L.D. Kichler Co., The. Step light with diffuser. 5,749,643, Cl. 362-146.000.

Porter, Scott D. Work platform providing refuse container lid. 5,749,486, Cl. 220-23.860.

Portillo, Franco: *See—*
  Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.

Poscio, Patrick: *See—*
  Saaman, Ary; Poscio, Patrick; and Graetzel, Michael, 5,750,138, Cl. 424-448.000.

Post, Albert Joseph: *See—*
  Garcia, Rigoberto Felipe; Vasudevan, Tirucherai Varahan; Post, Albert Joseph; and Hsu, Feng-Lung Gordon, 5,750,489, Cl. 510-417.000.

Post-Mix Equipment AB: *See—*
  Adolfsson, Bengt, 5,749,233, Cl. 62-50.200.

Potter, Kenneth B.: *See—*
  Cromer, Robert H.; and Potter, Kenneth B., 5,749,218, Cl. 60-39.310.

Potter, Micheal David: *See—*
  Mandelman, Jack Allan; and Potter, Micheal David, 5,751,097, Cl. 313-310.000.

Potters Industries, Inc.: *See—*
  Walther, James F.; Teichmann, Robert J.; and Wasowicz, Andrew M., 5,750,249, Cl. 428-328.000.

Potts, Kenneth: *See—*
  Hicok, Gary; Potts, Kenneth; and Harrow, Scott, 5,751,235, Cl. 341-140.000.

Poulin, Matthew L.: *See—*
  Chiu, Ing Ming; and Poulin, Matthew L., 5,750,365, Cl. 435-691.000.

Powell, Andrew Robert, to Parashar Holdings Pty Ltd. Catheter or cannula system. 5,749,859, Cl. 604-167.000.

Powell, Bruce A.: *See—*
  Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.

Powell, Jimmy B.: *See—*
  Meyer, Thomas A.; Ando, Michael E.; and Powell, Jimmy B., 5,750,092, Cl. 424-59.000.

Powell, Suzanne: *See—*
  Baillely, Gerard Marcel; and Powell, Suzanne, 5,750,485, Cl 510-315.000.

Powerchip Semiconductor Corp.: *See—*
  Wu, Shye-Lin, 5,750,431, Cl. 438-396.000.

Powers, Daniel J.: *See—*
  Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,904, Cl. 607-7.000.
  Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,749,905, Cl. 607-7.000.

Powers, Ervin Townsend, Jr.; and Rudisill, Edgar North, to Du Pont de Nemours, E. I., and Company. Wand purging for electrostatic charging system in flash spinning apparatus. 5,750,152, Cl. 425-72.200.

Powers, Larry D.: *See—*
  Weimer, Michael G.; Wetzel, David K.; and Powers, Larry D., 5,750,905, Cl. 73-863.000.

Powersoft Corporation: *See—*
  Sheffield, Kim A., 5,752,018, Cl. 395-602.000.

Poyet, Patrick: *See—*
  Gaudreault, René C.; and Poyet, Patrick, 5,750,547, Cl. 514-346.000.

Pozzi, Giovanni: *See—*
  Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.

PPG Industries, Inc.: *See—*
  McEntire, Edward E.; and Foringer, Lyle L., 5,750,770, Cl. 560-200.000.

Pradeep, Anantha Krishnan: *See—*
  Harrison, Daniel David; Pradeep, Anantha Krishnan; Brooksby, Glen William; and Hladik, Stephen Michael, 5,752,218, Cl. 701-207.000.

Preferred Machining Corporation: *See—*
  Kobak, Roger Leo; Yount, Gary L.; Stirbis, James S.; and Weil, William W., 5,749,969, Cl. 118-319.000.

Press, Jeffrey B.: *See—*

Boyd, Robert E.; Rasmussen, Chris Royce; and Press, Jeffrey B., 5,750,720, Cl. 548-315.100.
Pressey, James; Koralek, Richard; and Smith, Francis J., to Lockbeed Martin Aerospace Corp. Programmable digital linear and nonlinear transversal equalizer. 5,751,769, Cl. 375-235.000.
Pretorius, Francois: *See—*
Metel, Omer; and Pretorius, Francois, 5,751,569, Cl. 364-132.000.
Pricken, Guy Brent: *See—*
Darty, Mark Anthony; Prickett, Guy Brent; and Schwarz, Charles Raymond, 5,752,047, Cl. 395-750.010.
Prieels, John Paul; Garcon-Johnson, Nathalie Marie-Josephe Claude; Slaoui, Moncef; and Pala, Pietro, to SmithKline Beecham Biologicals, s.a. Vaccine composition containing adjuvants. 5,750,110, Cl. 424-208.100.
Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, to Abbott Laboratories. Transgenic non-human mammal milk comprising 2'-fucosyl-lactose. 5,750,176, Cl. 426-580.000.
Primary Delivery Systems, Inc.: *See—*
DeJonge, Stuart, Sr.; and Weinstein, Jack, 5,749,496, Cl. 222-153.140.
Prime Technology, Inc.: *See—*
Jamieson, Brian Thomas, 5,751,611, Cl. 364-573.000.
Primo Microphones, Inc.: *See—*
Takahashi, Masahiko, 5,751,827, Cl. 381-190.000.
Prince, Brian K.: *See—*
Wolford, Larry L.; and Prince, Brian K., 5,749,560, Cl. 251-214.000.
Prior, Edward B.; Caristi, Anthony J.; Lazo, Luis A.; and Prior, John E., to Edward B. Prior & Associates. Non-metallic liquid tilt switch and circuitry. 5,751,074, Cl. 307-118.000.
Prior, John E.: *See—*
Prior, Edward B.; Caristi, Anthony J.; Lazo, Luis A.; and Prior, John E., 5,751,074, Cl. 307-118.000.
Prisbe, Ernest J.: *See—*
Alexander, Petr; and Prisbe, Ernest J., 5,750,729, Cl. 549-216.000.
Pritko, Steven Michael: *See—*
Cole, Gary Lee; Engleman, Scott Phillip; and Pritko, Steven Michael, 5,752,042, Cl. 395-712.000.
Probe Technology: *See—*
Kister, January, 5,751,157, Cl. 324-758.000.
Probst, Joseph M.: *See—*
Paulot, William M.; Probst, Joseph M.; and Elliott, William B., 5,750,286, Cl. 429-211.000.
Process Instruments, Inc.: *See—*
Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.
Procter & Gamble Company, The: *See—*
Baillely, Gerard Marcel; and Powell, Suzanne, 5,750,485, Cl. 510-315.000.
Boutique, Jean-Pol; and Delplancke, Patrick Firmin A., 5,750,748, Cl. 554-66.000.
DeBlock, Frans; and Bodet, Jean-Francois, 5,750,491, Cl. 510-521.000.
Evans, Joel Franklin; Cox, Bruce Russell; Dodd, Michael Thomas; and Hopkins, Jeffrey Jon, 5,750,122, Cl. 424-401.000.
Guskey, Gerald John, 5,750,096, Cl. 424-65.000.
Linman, E. Kelly; and Bridges, Russell P., 5,749,989, Cl. 156-160.000.
Payne, Michael, 5,749,863, Cl. 604-376.000.
Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.
Vonderhaar, Michael Francis; and Fleming, James Michael, 5,750,066, Cl. 264-510.000.
Wu, Laurence Ichih; and Janusz, John Michael, 5,750,543, Cl. 514-337.000.
Proctor & Gamble Company, The: *See—*
Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.
Procyon Pharmaceuticals, Inc.: *See—*
Driedger, Paul E.; and Quick, James, 5,750,568, Cl. 514-533.000.
Prodrive Engineering Limited: *See—*
Broadbent, Roland James, 5,749,264, Cl. 74-335.000.
Progressive Tool & Industries Company: *See—*
Brady, Charles P., 5,750,933, Cl. 174-135.000.
Panter, Ronald L.; and Taylor, John J., 5,751,832, Cl. 382-104.000.
Prospa B.V.: *See—*
Bruzzese, Tiberio, 5,750,572, Cl. 514-560.000.
Prost, Roger, to Thomson-CSF Semiconducteurs Specifiques. Pyroelectric sensor. 5,751,059, Cl. 257-701.000.
Protechnics International, Inc.: *See—*
Hampton, John T., III; Trainor, William F.; and Bandy, Thomas R., 5,749,605, Cl. 285-48.000.
Proudian, Derek: *See—*
Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, 5,752,016, Cl. 395-600.000.
Proven Designs, Inc.: *See—*
Ellsworth, William D.; Dike, David Z.; and Laber, David I., 5,749,822, Cl. 493-248.000
Pruessner, Manfred Karl, to United States of America, Navy. Signal processor for narrow band sonar signals. 5,751,658, Cl. 367-98.000
Pruett, Wayne Payton: *See—*
Brink, Andrew Edwin; Pruett, Wayne Payton; Cherry, Clinton; and Shackelford, Kay Hunt, 5,750,635, Cl. 528-285.000.
Prusiner, Stanley B.; Kaneko, Kiyotoshi; and Cohen, Fred E., to University of California, The Regents of the. Formation and use of prion protein (PRP) complexes. 5,750,361, Cl. 435-23.000.
Prutchi, David: *See—*
Schroeppel, Edward A.; Prutchi, David; and Routh, André G., 5,749,900, Cl. 607-4.000.
Pryor, Duaine Wright, Jr.: *See—*
Kasson, James Matthews; Nin, Sigfredo Ismael; Plouffe, Wilfred Edmund, Jr.; and Pryor, Duaine Wright, Jr., 5,751,926, Cl. 395-119.000.
PSC Inc.: *See—*
Eastman, Jay M.; and Quinn, Anna Marie, 5,750,976, Cl. 235-472.000.
Puddu, Giancarlo, to Arthrex, Inc. Bone plate system for proximal tibial osteotomy. 5,749,875, Cl. 606-87.000.
Pugh, Richard: *See—*
Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
Pugia, Michael J.: *See—*
Alharella, James P.; Cahill, Sally E.; Johnson, Gary M.; and Pugia, Michael J., 5,750,405, Cl 436-88.000.
Pullela, Satyamurthy; Dharchoudhury, Abhijit; Blaauw, David T.; Edwards, Tim J.; and Norton, Joseph W., to Motorola, Inc. Accurate delay prediction based on multi-model analysis. 5,751,593, Cl. 364-488.000.
Purcell, Stephen C., to Chromatic Research, Inc. Structure and method for signed multiplication using large multiplier having two embedded signed multipliers. 5,751,622, Cl. 364-757.000.
Purdom, Gregory W., to Loral Fairchild Corp. Flight crash survivable storage unit with boiler for flight recorder memory. 5,750,925, Cl. 174-52.100.
Purdue Research Foundation: *See—*
Park, Kinam; and Park, Haesun, 5,750,585, Cl. 521-143.000.
Puskaric, Vladimir; and Luedtke, Roy, Jr., to Pioneer Hi-Bred International, Inc. Hybrid maize plant & seed (3941). 5,750,838, Cl. 800-200.000.
Putter, Paul-Boer: *See—*
Zaaiman, Ben Thomas; Putter, Paul-Boer; Vermeulen, Pieter Johannes Erasmus; and Loubser, Gerrit Jacobus, 5,752,215, Cl. 701-117.000.
Putzmeister-Werk Maschinenfabrik GmbH: *See—*
Dose, Rolf; and Diehl, Arnold, 5,749,678, Cl. 405-184.000.
Pyeon, Hong Beom, to LG Semicon Co., Ltd. Circuit for low voltage sense amplifier. 5,751,170, Cl. 327-57.000.
Pyka, Walter R.: *See—*
Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.
Qian, Changgeng: *See—*
Cai, Xiong; Fura, Aberra; and Qian, Changgeng, 5,750,565, Cl. 514-473.000.
Qian, Xuejun; Suh, Byoung I.; Hamer, Martin; and Tobias, Russell H., to Bisco, Inc. One-component primer/bonding-resin system. 5,749,733, Cl. 433-228.100.
Qualcomm Incorporated: *See—*
Chen, Tao, 5,751,725, Cl. 371-5.500.
DeJaco, Andrew P.; and Bi, Ning, 5,751,901, Cl. 395-2.250.
Gilhousen, Klein S., 5,751,761, Cl. 375-200.000.
Qualitas Asessoria Profesional, S.A.: *See—*
Garcia-Gutierrez, Pedro A.; and Fraile-Mora, Jesus, 5,751,535, Cl. 361-143.000.
Quallich, George J., to Pfizer Inc. Process for preparing chiral tetralone. 5,750,794, Cl. 568-322.000.
Quan, Kam: *See—*
Hoerner, Brian; Quan, Kam; and Smith, Frank, 5,751,134, Cl. 320-21.000.
Quasters, Mikael, to PLM AB. Plastic container. 5,750,224, Cl. 428-35.700.
Quattromani, Marc A.: *See—*
Garibay, Raul A., Jr.; Quattromani, Marc A.; and Beard, Douglas, 5,752,274, Cl. 711-206.000.
Quiachon, Dinah B.; Piplani, Alec A.; and Baughman, Larry G., to Endo-Vascular Technologies, Inc. Multicapsule intraluminal grafting system and method. 5,749,920, Cl. 623-1.000.
Quick, James: *See—*
Driedger, Paul E.; and Quick, James, 5,750,568, Cl. 514-533.000.
Quinn, Anna Marie: *See—*
Eastman, Jay M.; and Quinn, Anna Marie, 5,750,976, Cl. 235-472.000.
Quinn, Frederick D.; and Birkness, Kristin A., to Centers for Disease Control and Prevention. Methods and compositions for an artificial lung organ culture system. 5,750,329, Cl. 435-1.100.
Quinn, James P.; and Gedde, Lance D., to Recon/Optical, Inc. Platform attitude measurement system. 5,751,578, Cl. 364-453.000.
Quinn, Michael; and Shoemaker, Michael B., to Apple Computer, Inc. System for run-time configuration of network data transfer paths. 5,751,972, Cl. 395-200.100.
Quinn, Paul: *See—*
Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.
Quintino, Carl: *See—*
Ritrosi, Joe; Schmitt, Gary; Quintino, Carl; and Kasper, Gerhard, 5,749,389, Cl. 137-15.000.

R.A. Hanson Company, Inc.: *See—*
Kanenwischer, Bryon M., 5,749,452, Cl. 198-301.000.
R.F. Environmental Systems, Inc.: *See—*
Wofford, Bill; Jackson, Marc; and Bevan, John, 5,750,823, Cl. 588-210.000.
R.P. Scherer Corporation: *See—*
Rashid, Abdul; Stevens, Howard Norman Ernest; Binns, Julie Stephanie; and Mackie, James Leonard, 5,750,143, Cl. 424-451.000.
R.S. Medical Monitoring Ltd.: *See—*
Rabinovich, Pavel; Shochat, Michael; Zeldin, Vladimir; and Milman, Oscar, 5,749,369, Cl. 128-734.000.
R. Stahl Fördertechnik GmbH: *See—*
Hellinger, Frank; and Vaisanen, Ari, 5,751,126, Cl. 318-362.000.
Ra, Kyeong Man: *See—*
Choi, Woong Lim; Ra, Kyeong Man; and Hur, Kyung Myung, 5,751,632, Cl. 365-185.030.
Raab, Ilan; Manghirmalani, Ravi; Doitel, Ofer; and Izbicki, Lynne Marie, to Bay Networks Group, Inc. Method and apparatus for automatically configuring a network device to support a virtual network. 5,751,967, Cl. 395-200.580.
Raab, Ronald W.: *See—*
Newman, Roland A.; Hanna, Nabil; and Raab, Ronald W., 5,750,105, Cl. 424-133.100.
Rabinovich, Pavel; Shochat, Michael; Zeldin, Vladimir; and Milman, Oscar, to R.S. Medical Monitoring Ltd. Method and device for stable impedance plethysmography. 5,749,369, Cl. 128-734.000.
Rach, Joseph F., to MacDermid Imaging Technology, Inc. Compressible printing plates and manufacturing process therefor. 5,750,315, Cl. 430-306.000.
Radatus, Bruno Konrad: *See—*
Murthy, K.S. Keshava; Weeratunga, Gamini; Radatus, Bruno Konrad; and Sidhu, Kanwar Pal Singh, 5,750,714, Cl. 548-205.000.
Rademacher, Wilhelm: *See—*
Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.
Radhakrishnan, Sivakumar; and Dabecki, Stephen J., to PMC-Sierra, Inc. Allowed cell rate reciprocal approximation in rate-based available bit rate schedulers. 5,751,697, Cl. 370-229.000.
Radio Frequency Systems, Inc.: *See—*
Meredith, Sheldon Kent; and Steele, Walter Brian, 5,752,200, Cl. 455-562.000.
Radke, Sharon: *See—*
Moloney, Maurice M.; and Radke, Sharon, 5,750,871, Cl. 800-205.000.
Radke, William H., to Sun Microsystems, Inc. Multidimensional aspects of an ASIC bus structure. 5,751,699, Cl. 370-258.000.
Radva Corporation: *See—*
Belyayev, Vladimir Petrovich, 5,749,960, Cl. 106-600.000.
Raguin, Michel M.: *See—*
Stanley, Rick J.; and Raguin, Michel M., 5,751,594, Cl. 364-490.000.
Rahman, M. Dalil; and Aubin, Daniel P., to Clariant Finance (BVI) Limited. Process for producing surfactant having a low metal ion level and developer produced therefrom. 5,750,031, Cl. 210-681.000.
Rahman, M. Dalil; and Aubin, Daniel, to Clariant Finance (BVI) Limited. Isolation of novolak resin by low temperature sub surface forced steam distillation. 5,750,632, Cl. 528-129.000.
Raibert, Robert Joseph: *See—*
Rajashekara, Kaushik; Gorti, Bhanuprasad Venkata; McMullen, Steven Robert; and Raibert, Robert Joseph, 5,751,069, Cl. 290-40.00C.
Raith, Alex Krister, to Telefonaktiebolaget LM Ericsson. Simplifying decoding of codewords in a wireless communication system. 5,751,731, Cl. 371-37.010.
Rajappa, Srinivasachari: *See—*
Deshmukh, Abdul Rakeeb Abdul Subhan; Naik, Rajan Hiralal; Tandel, Sagun Kashinath; and Rajappa, Srinivasachari, 5,750,757, Cl. 558-232.000.
Rajashekara, Kaushik; Gorti, Bhanuprasad Venkata; McMullen, Steven Robert; and Raibert, Robert Joseph, to General Motors Corporation. Heat engine generator control system. 5,751,069, Cl. 290-40.00C.
Rajewski, Robert Karl. Velocity sealed flare tip. 5,749,719, Cl. 431-202.000.
Rajkanan, Kamal; and Kranzen, Bruno, to Zilog, Inc. Method of making MOS precision capacitor with low voltage coefficient. 5,750,426, Cl. 438-210.000.
Rajopadhye, Milind: *See—*
Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 5,750,088, Cl. 424-1.690.
Raju, N. Ravisekhar: *See—*
Venkata, Subrahmanyam S.; Raju, N. Ravisekhar; Kagalwala, Raxit A.; and Sastry, Vedula V., 5,751,138, Cl. 323-207.000.
Rakowski, Mark R.: *See—*
Roan, Rodney S.; Rakowski, Mark R.; and Oglesby, Myron C., Jr., 5,749,355, Cl. 126-110.00R.
Raleigh, Carl J.: *See—*
Scanlan, Christopher M.; and Raleigh, Carl J., 5,751,552, Cl. 361-707.000.
Rallison, Richard D.: *See—*
Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., 5,751,415, Cl. 356-301.000.
Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., to Chiron Corporation. Multifunctional M-CSF proteins and genes encoding therefor. 5,750,655, Cl. 530-351.000.
Ram, Siya: *See—*
Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, 5,750,713, Cl. 548-202.000.
Ramalho-Ortigao, Jose Flavio: *See—*
Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, 5,750,669, Cl. 536-24.300.
Ramamurthy, Ram S.: *See—*
Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.
Ramar Corporation: *See—*
Mahapatra, Amaresh; and Narayanan, S. Anantha, 5,749,132, Cl. 29-25.350.
Ramaswami, Karthik: *See—*
Chi, Ignacio; Ramaswami, Karthik; Kuo, Han C.; and Todino, Christa, 5,750,282, Cl. 429-49.000.
Rameau, Cyril: *See—*
Barbot, Gérard; Rameau, Cyril; and Sanchez, Patrick F., 5,749,318, Cl. 119-166.000.
Ramji, Shiraz N.: *See—*
Washington, Kirk B.; Kenna, John T.; James, Greg A.; and Ramji, Shiraz N., 5,750,281, Cl. 429-39.000.
Rammelt, Ursula: *See—*
Glausch, Ralf; Reinhard, Georg; Jircik, Renate; and Rammelt, Ursula, 5,749,946, Cl. 106-14.170.
Rampone, Renzo: *See—*
Genta, Alessandro; and Rampone, Renzo, 5,749,755, Cl. 439-856.000.
Rankin, Paul J.: *See—*
Shiels, Martin A.; Cole, Richard S.; Rankin, Paul J.; and Freitag, Rosa, 5,751,953, Cl. 395-200.090.
Ranpak Corp.: *See—*
Guth, Paul J., 5,749,824, Cl. 493-464.000.
Ratzel, Richard O.; and Siekmann, Dirk Johannes, 5,749,539, Cl. 242-598.300.
Simmons, James A., 5,749,821, Cl. 493-3.000.
Rao, Chepur P.; and Thurston, Bryan A., to Tower Manufacturing Corporation. Rotary electric switch with conductive plates. 5,750,947, Cl. 200-6.00R.
Rao, V.N. Mallikarjuna: *See—*
Cassel, Wendell Richard; Corbin, David Richard; and Rao, V.N. Mallikarjuna, 5,750,808, Cl. 570-157.000.
Rapp, Doris R. Tool handle extension. 5,749,613, Cl. 294-58.000.
Rashid, Abdul; Stevens, Howard Norman Ernest; Binns, Julie Stephanie; and Mackie, James Leonard, to R.P. Scherer Corporation. Controlled release device. 5,750,143, Cl. 424-451.000.
Rasmussen, Chris Royce: *See—*
Boyd, Robert E.; Rasmussen, Chris Royce; and Press, Jeffrey B., 5,750,720, Cl. 548-315.100.
Rasmussen GmbH: *See—*
Mann, Stephan, 5,749,603, Cl. 285-23.000.
Rasmussen, James E.: *See—*
Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., 5,750,906, Cl. 73-863.730.
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., to Cummins-Allison Corp. Method and apparatus for currency discrimination. 5,751,840, Cl. 382-135.000.
Rathnavelu, Sunder Raj, to Lucent Technologies Inc. Adaptive time slot scheduling apparatus and method for end-points in an ATM network. 5,751,709, Cl. 370-395.000.
Ratnani, Kébir: *See—*
Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.
Ratzel, Richard O.; and Siekmann, Dirk Johannes, to Ranpak Corp. Dunnage-creating machine with plugless paper roll and method. 5,749,539, Cl. 242-598.300.
Ratzlaff, Cordell R.: *See—*
Holleran, Patrick A.; Arrouye, Yan; Ratzlaff, Cordell R.; Fisher, Stephen; and Evans, John S., 5,752,059, Cl. 395-800.000.
Rault, Pierre, to SGS-Thomson Microelectronics S.A. Protection circuit against high energy overvoltages, having a controlled clipping voltage. 5,751,531, Cl. 361-56.000.
Rautiola, Markku, to Nokia Telecommunications Oy. Method for adjusting transmission power in a radio system, and an exchange. 5,752,197, Cl. 455-522.000.
Ravn, Thomas Christian: *See—*
Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.
Rawert, Jurgen: *See—*
Wichert, Burkhard; Sauerbier, Dieter; and Rawert, Jurgen, 5,750,131, Cl. 424-422.000.
Raychem Corporation: *See—*
Mattis, John Seymour; and Bliven, David C., 5,749,942, Cl. 95-46.000.
Rayovac Corporation: *See—*
Xie, Like; Fouchard, David T.; Ebner, Walter B.; and Megahed, El-Sayed, 5,750,288, Cl. 429-229.000.

Raytheon Company: *See—*
Wyles, Richard H.; and Frye, William H., 5,751,005, Cl. 250-370.060.
RBI, Inc.: *See—*
Brenner, Richard A.; and Romanelli, Dennis, 5,749,407, Cl. 160-229.100.
Read-Rite Corporation: *See—*
Katz, Eric R.; and Berger, David I., 5,750,275, Cl. 428-694.00R.
Nepela, Daniel A.; and Sarhadi, Siamak, 5,751,528, Cl. 360-126.000.
Reader Vision, Inc.: *See—*
Black, F. Martin; and Dye, G. Frank, 5,751,269, Cl. 345-108.000.
Reagan, William J.: *See—*
Bhattacharyya, Alakananda; Foral, Michael J.; and Reagan, William J., 5,750,020, Cl. 208-113.000.
Reale, Omar: *See—*
Castelli, Francesco; Invernizzi, Gianpietro; and Reale, Omar, 5,749,298, Cl. 101-415.100.
Reams, Lowell Allan: *See—*
Flanery, Ansel Bernard, Jr.; Reams, Lowell Allan; and Zagata, Mark Alan, 5,749,335, Cl. 123-337.000.
Reck, Reinhard: *See—*
Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.
Reckitt & Colman Products Limited: *See—*
Houghton, Kenneth Arthur, 5,749,462, Cl. 206-268.000.
Récolet, Francois; and Métrope, Jacques, to Heidelberg Harris S.A.; and Heidelberger Druckmaschinen AG. Device for connecting retaining elements and a crosspiece on a printing-form cylinder. 5,749,297, Cl. 101-415.100.
Recon/Optical, Inc.: *See—*
Quinn, James P.; and Gedde, Lance D., 5,751,578, Cl. 364-453.000.
Recot, Inc.: *See—*
Elder, Vincent A., 5,750,883, Cl. 73-53.010.
Red Devil Equipment Company: *See—*
Brunn, Randy J.; Gran, William O.; and Junk, James P., 5,749,652, Cl. 366-209.000.
Reddie & Grose: *See—*
Jolly, Colin Kenneth, 5,749,197, Cl. 52-584.100.
Redecker, Klaus; Schreiner, Gunter; and Spranger, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Granulated, stabilized α-and β-octogen. 5,750,920, Cl. 149-11.000.
Redford, Peter M.; and Stern, Donald S., to TV Interactive Data Corporation. Interactive book, magazine and audio/video compact disk box. 5,749,735, Cl. 434-307.00R.
Redmond, Russell J.: *See—*
Vidal, Claude A.; Plyley, Alan K.; Redmond, Russell J.; and Lagerquist, Roger, 5,749,893, Cl. 606-205.000.
Redpath, Richard J.; and Smith, Rodney A., to International Business Machine Corp. Systems and method for automatically linking parts within compound documents. 5,752,055, Cl. 395-777.000.
Redstone Engineering: *See—*
Lester, James Marsh, 5,749,243, Cl. 62-434.000.
Reed, Mark A.: *See—*
Muller, Christiaan; Zhou, Chong Wu; and Reed, Mark A., 5,751,156, Cl. 324-699.000.
Reemay Inc.: *See—*
Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
Rees, John Joseph M.; and Hixon, Leonard L., Jr., to Dixy Yarns, Inc. Elastomeric core/staple fiber wrap yarn. 5,749,212, Cl. 57-225.000.
Rees, Sarah Bronwen: *See—*
Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; Osborn, Rupert William; and Rees, Sarah Bronwen, 5,750,504, Cl. 514-12.000.
Rees, Volker; Schumacher, Martin; and Plettner, Horst, to ABB Patent GmbH. Metal-encapsulated, gas-insulated high-voltage circuit-breaker. 5,750,949, Cl. 218-43.000.
Reese, Clifford Carlton: *See—*
Burns, Gary Thomas; Hahn, James Richard; and Reese, Clifford Carlton, 5,750,610, Cl. 524-434.000.
Reeves Brothers, Inc.: *See—*
Castelli, Francesco; Invernizzi, Gianpietro; and Reale, Omar, 5,749,298, Cl. 101-415.100.
Refractec Inc.: *See—*
Hood, Larry L.; and Mendez G., Antonio, 5,749,871, Cl. 606-50.000.
Regenix Marketing Systems, Inc.: *See—*
Edwards, William Thomas, 5,750,108, Cl. 424-195.100.
Regnat, Dieter: *See—*
Wagner, Adalbert; Kleemann, Heinz-Werner; Regnat, Dieter; and Kleiner, Hans-Jerg, 5,750,728, Cl. 549-57.000.
Rehfeldt, Roger: *See—*
Zabinski, John E.; and Rehfeldt, Roger, 5,751,598, Cl. 364-500.000.
Reich, Stefan: *See—*
Bernert, Richard; and Reich, Stefan, 5,749,972, Cl. 118-414.000.
Reichert, Hans; Müller, Bernhard; and Tzikas, Athanassios, to Ciba Specialty Chemicals Corporation. Disazo dyes containing haloacryloylamino or dihalopropionylamino and substituted triazinyl reactive groups. 5,750,662, Cl. 534-612.000.
Reichmanis, Elsa: *See—*
Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, 5,750,312, Cl. 430-273.100.
Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, to Motorola, Inc. Vacuum pickup tool for placing balls in a customized pattern. 5,749,614, Cl. 294-64.100.
Reilly, Joseph F.: *See—*
Trainor, John J.; Laplace, Carl J.; Kinney, Michael A.; and Reilly, Joseph F., 5,751,222, Cl. 340-825.050.
Reimers, Eric W. Powered cart for golf bag. 5,749,424, Cl. 180-19.200.
Reinhard, Georg: *See—*
Glausch, Ralf; Reinhard, Georg; Jircik, Renate; and Rammelt, Ursula, 5,749,946, Cl. 106-14.170.
Reinhardt, Senter B., Jr.: *See—*
Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
Reinhart, Thomas: *See—*
Bauer, Kurt H.; and Reinhart, Thomas, 5,750,678, Cl. 536-103.000.
Reist, Walter, to Ferag AG. Apparatus and method for supplying printed products to a processing section. 5,749,568, Cl. 271-9.010.
Reitan, Oyvind. Catheter pump. 5,749,855, Cl. 604-151.000.
Reiter, Allen; and Jose, Ian Charles, to Microsoft Corporation. Computer method and storage structure for storing and accessing multidimensional data. 5,752,243, Cl. 707-3.000.
Reliance Electric Industrial Company: *See—*
Nisley, Donald L., 5,749,659, Cl. 384-260.000.
Rello, Robert Michael; Yager, Michael; and Martinez, Ramon Antonio, to CMS Gillbreth Packaging Systems, Inc. Method and apparatus for applying labels to articles using bottom feed conveying unit. 5,749,990, Cl. 156-187.000.
Reltec Corporation: *See—*
Kaczmarek, Richard T., 5,751,533, Cl. 361-119.000.
Remerowski, David L., to Senco rp. Resiliently expandable ring seal for combustion chamber of propellant tool. 5,749,509, Cl. 227-10.000.
Remote Source Lighting International, Inc.: *See—*
Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,751,870, Cl. 385-33.000.
Renfro Corporation: *See—*
Epting, J. Carrol, 5,749,682, Cl. 406-1.000.
Renkus-Heinz, Inc.: *See—*
Heinz, Ralph D., 5,750,943, Cl. 181-152.000.
Rennat Trust: *See—*
Tanner, Noel, 5,749,472, Cl. 209-458.000.
Repin, Anatoly Antonovich: *See—*
Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.
Repp, Timothy: *See—*
Cheris, Albert B.; Staubitz, Robert B.; and Repp, Timothy, 5,749,464, Cl. 206-308.100.
Rescalli, Carlo, to Snamprogetti S.p.A. Process for the synthesis of urea comprising two separate reaction zones. 5,750,780, Cl. 564-67.000.
Research Corporation Technologies, Inc.: *See—*
Carpino, Louis A.; and El-Faham, Ayman Ahmed, 5,750,767, Cl. 560-161.000.
Kool, Eric T., 5,750,670, Cl. 536-24.300.
Research Foundation of State University of New York, The: *See—*
Jardine, A. Peter, 5,750,272, Cl. 428-686.000.
Research Plastics, Inc.: *See—*
Binder, Frederick, 5,749,499, Cl. 222-327.000.
Resing, Alfons: *See—*
Wuebbels, Richard; and Resing, Alfons, 5,749,208, Cl. 56-10.300.
ReSound Corporation: *See—*
Taenzer, Jon C., 5,751,820, Cl. 381-68.000.
Rey, Patrice: *See—*
Bono, Hubert; Michel, France; and Rey, Patrice, 5,750,420, Cl. 438-52.000.
Reyes, Daniel. Autofoldable garment hanger for motor vehicle. 5,749,505, Cl. 224-482.000.
Reyes Zorrilla, Juan A., to Isover Saint-Gobain. End sections of connections for mineral wool conduits of the "Climaver Plus" type. 5,749,399, Cl. 138-155.000.
Reynolds, Brent: *See—*
Weiss, Samuel; Reynolds, Brent; Hammang, Joseph P.; and Baetge, E. Edward, 5,750,376, Cl. 435-69.520.
Reynolds Consumer Products, Inc.: *See—*
Kettner, Catherine E., 5,749,658, Cl. 383-204.000.
May, Timothy J., 5,749,657, Cl. 383-9.000.
Reynolds Metals Company: *See—*
Bagwell, Alan C.; and Edwards, Daniel A., 5,749,488, Cl. 220-269.000
Rezanka, Ivan, to Xerox Corporation. Transducer power dissipation control in a thermal ink jet printhead. 5,751,302, Cl. 347-9.000.
RF Monolithics, Inc.: *See—*
Boling, Harry O., III, 5,751,197, Cl. 331-107.00A.
Rheinheimer, Joachim: *See—*

Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.
Rheox, Inc.: *See—*
Tavares, Bruce, 5,749,949, Cl. 106-313.000.
Rheude, Udo: *See—*
Bröcker, Franz Josef; Stroezel, Manfred; and Rheude, Udo, 5,750,806, Cl. 568-909.500.
Rhoades, Martin Richard, to Sargent & Greenleaf. Manipulation resistant combination lock and method. 5,749,252, Cl. 70-276.000.
Rhodes, Howard: *See—*
Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.
Rhodes, Ken; Coelho, Rohan; Bender, Blake; and Frank, Davis, to Intel Corporation. Method and apparatus for displaying an image using direct memory access. 5,751,270, Cl. 345-118.000.
Rhodes, William K., to Asgrow Seed Company. Soybean cultivar 9390369478967. 5,750,857, Cl. 800-200.000.
Rhodes, William K., to Asgrow Seed Company. Soybean cultivar 90139820837. 5,750,858, Cl. 800-200.000.
Rhone Merieux: *See—*
Vandeputte, Joris Frans; Guillaud, Marc Jean; and Milward, Francis William, 5,750,118, Cl. 424-262.100.
Rhone-Poulenc Chimie: *See—*
Aubry, Alain; Gubelmann, Michel; and Le Govic, Anne-Marie, 5,750,777, Cl. 562-549.000.
Rhone-Poulenc Rorer Limited: *See—*
Parkinson, Nigel Christopher; and Van Sickle, Andrew Paul, 5,750,734, Cl. 549-432.000.
Rhone-Poulenc Rorer, S.A.: *See—*
Bastart, Jean-Pierre; Dupechez, Thierry; and Fabre, Jean-Louis, 5,750,561, Cl. 514-449.000.
Bastart, Jean-Pierre; Boursat, Jean-Dominique; Commercon, Alain; and Leconte, Jean-Pierre, 5,750,738, Cl. 549-510.000.
Riach, David J. A.; Longmore, Richard J.; and Eccles, John N., to NCR Corporation. Document transaction apparatus. 5,751,842, Cl. 382-137.000.
Ribozyme Pharmaceuticals, Inc.: *See—*
Thompson, James D.; and Draper, Kenneth G., 5,750,390, Cl. 435-195.000.
Ricardo Consulting Engineers Limited: *See—*
Warburton, Alan; and Atkin, Graham, 5,749,340, Cl. 123-90.160.
Rice, Michael J., to Pillsbury Company, The. Undercup assembly. 5,749,460, Cl. 220-23.830.
Richard, Ulf: *See—*
Nagel, Thomas; and Richard, Ulf, 5,749,800, Cl. 474-84.000.
Richards, John, to Heidelberger Druckmaschinen AG; and Heidelberg Harris, Inc. Signature control in a high speed printing press. 5,749,823, Cl. 493-417.000.
Richardson, Stephen Darrow; and Heidorn, George E., to Microsoft Corporation. Method and system for bootstrapping statistical processing into a rule-based natural language parser. 5,752,052, Cl. 395-759.000.
Richardt, Randal James: *See—*
Chiu, Suet Mui; Dockter, Michael Jon; Farber, Joel Frank; Pauser, Michael Leon; and Richardt, Randal James, 5,752,022, Cl. 395-610.000.
Richarz, Werner: *See—*
Datta, Dipti Kr.; and Richarz, Werner, 5,749,702, Cl. 415-119.000.
Richelsoph, Marc, to Spinal Innovations. Fusion implant. 5,749,916, Cl. 623-17.000.
Richey, Richard Mark; and Richey, Sandra Barbara. Pet litter cabinet. 5,749,317, Cl. 119-166.000.
Richey, Sandra Barbara: *See—*
Richey, Richard Mark; and Richey, Sandra Barbara, 5,749,317, Cl. 119-166.000.
Richman, Paul Lawrence: *See—*
Hassler, Kerry Wayne; and Richman, Paul Lawrence, 5,751,795, Cl. 379-93.170.
Richter, Kevin R.: *See—*
Swift, Thomas R.; and Richter, Kevin R., 5,749,740, Cl. 439-92.000.
Ricoh Company, Ltd.: *See—*
Abe, Michiharu, 5,750,293, Cl. 430-21.000.
Fujioka, Tetsuya, 5,751,446, Cl. 358-474.000.
Kawahara, Megumi; Yamada, Ikuko; Shoshi, Masayuki; and Kojima, Akio, 5,750,762, Cl. 558-423.000.
Murata, Norihiko; and Miyachi, Tatsuo, 5,750,893, Cl. 73-204.110.
Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.
Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
Ridenour, Rodney: *See—*
Brammall, Terrence N.; Mills, Randel; Ridenour, Rodney; and Stevenson, David, 5,749,610, Cl. 292-327.000.
Rieck, Konrad: *See—*
Heinen, Horst; Rieck, Konrad; Kawka, Martin; and Schattauer, Jürgen, 5,749,576, Cl. 273-138.100.
Rieckmann, Gustav: *See—*
Jarrell, Curt; Kubo, Manfred; Meissner, Hans-Jurgen; Rieckmann, Gustav; and Benecke, Jurgen, 5,750,444, Cl. 442-62.000.
Riedel, Michael; Küber, Frank; Aulbach, Michael; Erker, Gerhard; and Könemann, Martin, to Hoechst Aktiengesellschaft. Transition metal compound. 5,750,752, Cl. 556-1.000.
Ricke Corporation: *See—*
Trout, Stanley D., 5,749,484, Cl. 215-219.000.
Riesmeier, Jörg: *See—*
Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, 5,750,362, Cl. 435-29.000.
Rieter Ingolstadt Spinnereimaschinenbau AG: *See—*
Stephan, Adalbert, 5,749,213, Cl. 57-304.000.
Rigby, David: *See—*
Cheong, Catherine L.; and Rigby, David, 5,749,842, Cl. 602-41.000.
Rigoutsos, Isidore; and Califano, Andrea, to International Business Machines Corporation. System and method for confirmationally-flexible molecular identification. 5,752,019, Cl. 395-603.000.
Riker Laboratories, Inc.: *See—*
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,134, Cl. 424-434.000.
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,136, Cl. 424-448.000.
Riley, Kenneth L.: *See—*
Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., 5,750,819, Cl. 585-734.000.
Rimlinger, Charles H., Jr. Method and apparatus for advancing a tool on a lathe. 5,749,273, Cl. 82-1.110.
Rindtorff, Klaus, to International Business Machines Corporation. Method for image segmentation and classification of image elements for documents processing. 5,751,850, Cl. 382-178.000.
Ring, Stefan: *See—*
Operschall, Hermann; Weber, Jakob; Steiner, Klaus-Alfred; and Ring, Stefan, 5,749,470, Cl. 209-2.000.
Ringland, William K.; and Kubo, Jon C., to Autodesk, Inc. Spectrally coordinated pattern search-imaging system and method. 5,751,829, Cl. 382-100.000.
Ripoll, Jean-Louis; Frouin, Marc; and Janon, Frederic, to Nomai SA. Redundant array of removable cartridge disk drives. 5,752,257, Cl. 711-114.000.
Rippel, Wally E.; and Buchanan, Darrell, to AeroVironment. Bidirectional load and source cycler. 5,751,150, Cl. 324-537.000.
Riser, Andrew P.: *See—*
Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,751,870, Cl. 385-33.000.
Ritrosi, Joe; Schmitt, Gary; Quintino, Carl; and Kasper, Gerhard, to Liquid Air Corporation. Purgeable connection for gas supply cabinet. 5,749,389, Cl. 137-15.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See—*
Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.
Rivier, Jean E. F.: *See—*
Hoeger, Carl A.; and Rivier, Jean E. F., 5,750,499, Cl. 514-9.000.
Rizzi, Julian Dominick: *See—*
Hall, Charles William; Rizzi, Julian Dominick; and Stubecki, John Arthur, 5,751,548, Cl. 361-686.000.
RKR Advantage Inc.: *See—*
Keicher, Roger Myron, 5,749,490, Cl. 220-481.000.
Roan, Rodney S.; Rakowski, Mark R.; and Oglesby, Myron C., Jr., to Lennox Industries Inc. Multi-position furnace with condensing heat exchanger. 5,749,355, Cl. 126-110.00R.
Robbe, Michel: *See—*
Guegnaud, Hervé; and Robbe, Michel, 5,751,188, Cl. 329-323.000.
Robert Bosch GmbH: *See—*
Ketteler, Alfons, 5,749,669, Cl. 403-12.000.
Siegle, Gert; Braegas, Peter; Kaesser, Jürgen; and Suchowerskyj, Wadym, 5,752,177, Cl. 455-186.100.
Robert-Guroff, Marjorie: *See—*
Robey, Frank A.; Harris-Kelson, Tracy A.; and Robert-Guroff, Marjorie, 5,750,332, Cl. 435-5.000.
Roberts, Bill: *See—*
Guillot, Joe; Dinh, Michael Quan; Roberts, Bill; and McLemore, Linda M., 5,749,143, Cl. 29-841.000.
Roberts, Ceredig, to Micron Technology, Inc. SRAM cell employing substantially vertically elongated pull-up resistors. 5,751,630, Cl. 365-154.000.
Roberts, James S.; and Pickett, James K., to Advanced Micro Devices, Inc. Superscalar microprocessor employing away prediction structure. 5,752,069, Cl. 395-800.230.
Roberts, Michael Stephen; Cross, Sheree Elizabeth; and Singh, Parminder, to University of Queensland, The. Administration of vaso-active agent and therapeutic agent. 5,750,141, Cl. 424-449.000.
Roberts, Randall K.: *See—*
Fuller, James W.; and Roberts, Randall K., 5,750,945, Cl. 187-292.000.
Robertson, Larry W.; and Fitzgerald, Mark C., to Colossal Graphics Incorporated. Bulk ink delivery system and method. 5,751,319, Cl. 347-85.000.
Robey, Frank A.; Harris-Kelson, Tracy A.; and Robert-Guroff, Marjorie, to United States of America, Health and Human Services. Peptomers with enhanced immunogenicity. 5,750,332, Cl. 435-5.000.
Robichaud, Albert: *See—*

Caldwell, Charles G.; Chen, Ping; Durette, Philippe L.; Finke, Paul; Hale, Jeffrey; Holson, Edward; Kopka, Ihor; MacCoss, Malcolm; Meurer, Laura; Mills, Sander G.; and Robichaud, Albert, 5,750,549, Cl. 514-364.000.

Robinson, Bethany Scott: *See—*

Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.

Robinson, Christopher Frederick; and Stickel, Werner, to International Business Machines Corporation. Projection reticle transmission control for coulomb interaction analysis. 5,751,004, Cl. 250-492.230.

Robinson, David A., to MEDAR, Inc. Method and system for measuring color difference. 5,751,450, Cl. 358-504.000.

Robinson, David L., to Fisher Dynamics Corporation. Seat recliner for reducing chucking. 5,749,625, Cl. 297-367.000.

Robinson, Edward Herbert, to Motorola, Inc. Method and apparatus for one-way receiver operation from a two-way communication device. 5,752,163, Cl. 455-31.300.

Robl, Jeffrey A., to Bristol-Myers Squibb Company. Azepinone compounds useful in the inhibition of ACE and NEP. 5,750,687, Cl. 540-527.000.

Rochas, Cyrille: *See—*

Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.

Rochette, Daniel; Wood, John; and Angers, Christian, to Steris Corporation. Method and apparatus for loosely retaining instruments in a washing system rack assembly. 5,749,385, Cl. 134-199.000.

Rockenbeck, William H.: *See—*

Shakib, Darren Arthur; Rockenbeck, William H.; Benson, Max Loell; and Joshi, Milind Madhukar, 5,752,025, Cl. 395-613.000.

Rockford Corporation: *See—*

Strickland, James C.; and Albers, Mark D., 5,751,823, Cl. 381-94.600.

Rockwell International Corp.: *See—*

Chung, Young, 5,750,203, Cl. 427-380.000.

Rocky Mountain Instrument Company: *See—*

Kwon, Young Key; Mesropian, Ashot; Lee, Kwang Min; and Soboley, Sergey, 5,751,436, Cl. 358-299.000.

Rodboon, Somsak S.: *See—*

Burch, Ronald H.; Cancienne, Warren E., Jr.; Rodboon, Somsak S.; and Morales, Eric W., 5,749,777, Cl. 452-149.000.

Rodgers, James: *See—*

Chang, Yun Chea; Rodgers, James; and Pepe, Joseph Philip, 5,750,327, Cl. 430-569.000.

Rodriguez, Sheila Snyder: *See—*

Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, 5,749,866, Cl. 604-385.200.

Roe, Colleen Ann: *See—*

Benzenberg, Craig Kay; Mann, Lloyd Steven; Oslund, Lawrence Carl; and Roe, Colleen Ann, 5,751,943, Cl. 395-183.160.

Roe, Donald Carroll; Goulait, David Joseph Kenneth; Rodriguez, Sheila Snyder; Carlin, Edward Paul; Dreier, Kimberly Ann; Jasper, Carolyn Mae; and Daniels, Dean Jeffrey, to Procter & Gamble Company, The. Absorbent article with multiple zone structural elastic-like film web extensible waist feature. 5,749,866, Cl. 604-385.200.

Roehle, Ingo; and Schodl, Richard, to Deutsche Forschungsanstalt fur Luftund Raumfahrt e.V. Method for measuring flow vectors in gas flows. 5,751,410, Cl. 356-28.000.

Roerig, Scott. Suspension fork assembly. 5,749,590, Cl. 280-276.000.

Roettgen, Leslie A.: *See—*

Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehoower, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.

Rofin-Sinar Laser GmbH: *See—*

Friede, Dirk; Hage, Hermann; Herzner, Karl-Heinz; and Scholz, Volker, 5,751,750, Cl. 372-34.000.

Rogers, Gregory B.: *See—*

Babu, Mangalore S.; Nahar, Jinen K.; Rogers, Gregory B.; and Downs, Walter S., III, 5,751,717, Cl. 370-466.000.

Rogers, Richard Michael; and Lagarde, Konrad Charles, to International Business Machines Corporation. Service agent for fulfilling requests of a web browser. 5,752,246, Cl. 707-10.000.

Rogers, Spencer: *See—*

Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000

Rohe, Lothar: *See—*

Gallenkamp, Bernd; Rohe, Lothar; and Marhold, Albrecht, 5,750,721, Cl. 548-374.100.

Rohm Co., Ltd.: *See—*

Sakamoto, Kazuhisa, 5,750,443, Cl. 438-795.000.

Shakuda, Yukio, 5,751,752, Cl. 372-45.000.

Shibata, Kazutaka, 5,750,153, Cl. 425-116.000.

Rokitowski, Karen Lee, to Elizabeth Arden. Color cosmetic composition containing alcohol modified wax. 5,750,121, Cl. 424-401.000.

Rokitowski, Karen Lee, to Elizabeth Arden, a Division of Conopco, Inc. Color cosmetic composition containing alcohol modified wax. 5,750,127, Cl. 424-401.000.

Rokukawa, Yasuko: *See—*

Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.

Roland, Fredrick Richard: *See—*

Szymanski, John George; Stanley, Robert Henry, Jr.; and Roland, Fredrick Richard, 5,749,269, Cl. 74-574.000.

Roland Kabushiki Kaisha: *See—*

Katsumata, Masaaki; and Kusakabe, Satoshi, 5,751,771, Cl. 375-240.000.

Roll Systems, Inc.: *See—*

Crowley, H. W., 5,751,298, Cl. 346-136.000.

Roman, Gianfranco, to Claber S.p.A. Side driving element for an irrigation device with an oscillating arm. 5,749,524, Cl. 239-240.000.

Romanelli, Dennis: *See—*

Brenner, Richard A.; and Romanelli, Dennis, 5,749,407, Cl. 160-229.100.

Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., to Santa Barbara Research Center. Preparation of gold-coated molybdenum articles and articles prepared thereby. 5,750,202, Cl. 427-376.400.

Romão, Ulisses G., to Otis Elevator Company. Elevator based security system. 5,749,443, Cl. 187-384.000.

Romerein, Robert L.; Crowhurst, David B.; and Allinson, Christopher A., to J. E. Thomas Specialties Limited. Terminal assembly for a CATV. 5,750,929, Cl. 174-88.00C.

Romero, Mark Anthony: *See—*

Ghorpade, Sureshchandra Chintaman; Chittum, Jack Everett; and Romero, Mark Anthony, 5,749,933, Cl. 65-511.000.

Romers, Eric J.G.M.: *See—*

Grootjans, Jacques F.; Belloir, Pierre-Frederic J.; and Romers, Eric J.G.M., 5,750,814, Cl. 585-323.000.

Roohparvar, Frankie F.; and Chevallier, Christophe J., to Micron Quantum Devices, Inc. Non-volatile memory system having automatic cycling test function. 5,751,944, Cl. 395-183.180.

Ropponen, Matti: *See—*

Sonntag, John-Erik; and Ropponen, Matti, 5,750,924, Cl. 174-50.000.

Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, to Hoechst Aktiengesellschaft. Oligonucleotide analogs with terminal 3'-3' or 5'-5' internucleotide linkages. 5,750,669, Cl. 536-24.300.

Rose, Jackie Lee; and Campbell, Sterrett P., to Southern Bakeries, Inc. Method and apparatus for dividing baker's dough into dough balls. 5,750,169, Cl. 426-231.000.

Rose, Peter H.; and Brailove, Adam A., to Eaton Corporation. Loadlock assembly for an ion implantation system. 5,751,003, Cl. 250-492.210.

Rose, Samuel J.: *See—*

Maag, Hans; Rose, Samuel J.; and Schmidt, Beat, 5,750,343, Cl. 435-6.000.

Rose, Scott M.; and Patel, Piyush M., to Andersen Consulting LLP. Computerized multimedia asset management system. 5,752,244, Cl. 707-5.000.

Roselle, Brian Joseph: *See—*

Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.

Rosellini, Massimiliano: *See—*

Donelli, Giordano; Rosellini, Massimiliano; Taliento, Raffaella; and Dore', Fausto, 5,750,006, Cl. 162-181.500.

Rosen, Craig A.: *See—*

Li, Yi; Rosen, Craig A.; and Kumar, Chandrika, 5,750,370, Cl. 435-69.100.

Rosenberg, Iris. Open toe sock. 5,749,100, Cl. 2-239.000.

Rosetti Handbags and Accessories Ltd.: *See—*

Hersh, Ahron; and Chen, Chi Yueh, 5,749,447, Cl. 190-112.000.

Rosevear, Thomas: *See—*

Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, 5,751,788, Cl. 378-197.000.

Ross, Christian Eric, to General Motors Corporation. Vehicle passive keyless entry and passive engine starting system. 5,751,073, Cl. 307-10.500.

Ross, Kenneth Garfield: *See—*

Thomas, James V.; Thomas, Devin James; and Ross, Kenneth Garfield, 5,749,245, Cl. 62-623.000.

Ross, Roger Allen: *See—*

Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, 5,750,215, Cl. 428-34.200.

Rossi, John J.: *See—*

Itakura, Keiichi; and Rossi, John J., 5,750,380, Cl. 435-91.100.

Rossides, Michael T. Communications system using bets. 5,749,785, Cl. 463-25.000.

Rossignol, Daniel P.: *See—*

Christ, William J.; Rossignol, Daniel P.; Kobayashi, Seiichi; and Kawata, Tsutomu, 5,750,664, Cl. 536-17.200.

Roszkowski, Mark E.: *See—*

Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., 5,752,138, Cl. 399-264.000.

Rotary Press Systems Inc.: *See—*

Bodnar, Ernest R., 5,749,256, Cl. 72-333.000.

Rotem, Eran: *See—*

Yoeli, Uzi; Rotem, Eran; Janai, Meir; and Orbach, Zvi, 5,751,165, Cl. 326-47.000.

Roth, Alex T.: *See—*

Vierra, Mark A.; and Roth, Alex T., 5,749,892, Cl. 600-204.000.

Roth, Charles Philip: *See—*

Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,751,945, Cl. 395-184.010.

Rothkirch, Horst. Safety device for emergency exits. 5,749,438, Cl. 182-138.000.

Rottmann, Dietrich, to Linde Aktiengesellschaft. Method and device for obtaining oxygen and nitrogen at superatmospheric pressure. 5,749,246, Cl. 62-654.000.

Roule, Thomas Richard: *See—*

Manico, Joseph Anthony; Patton, David Lynn; Roule, Thomas Richard; Fredlund, John Randall; and Berardi, Anthony Ronald, 5,749,468, Cl. 206-455.000.

Roullet, André; and Peris, Daniel, to Thomson-CSF. Frequency synthesizer for V/UHF wideband receiver. 5,752,175, Cl. 455-183.100.

Roondy, Theron Eugene, to Pioneer Hi-Bred International, Inc. Inbred maize line PH25A. 5,750,831, Cl. 800-200.000.

Roussel Uclaf: *See—*

Claussner, Andre; Goubet, Francois; and Teutsch, Jean, 5,750,553, Cl. 514-392.000.

Routh, André G.: *See—*

Schroeppel, Edward A.; Prutchi, David; and Routh, André G., 5,749,900, Cl. 607-4.000.

Rowe, Keith: *See—*

Girard, Michel; Rowe, Keith; Matthews, Joseph H., III; and Lawler, Frank, 5,751,282, Cl. 345-327.000.

Roy, Sebastien: *See—*

Cox, Ingemar J.; and Roy, Sebastien, 5,751,838, Cl. 382-107.000.

Royal Truck Bodies, Inc.: *See—*

Aros, Carlos Joaquin; and Throndson Aros, Sylvan S., 5,750,236, Cl. 428-178.000.

RSW, Inc., Specialty Tapes Division: *See—*

Starkey, John F., 5,750,254, Cl. 428-343.000.

Rubin, Steven A.: *See—*

Fromson, Howard A.; Gracia, Robert F.; and Rubin, Steven A., 5,750,314, Cl. 430-302.000.

Rudisill, Edgar North: *See—*

Powers, Ervin Townsend, Jr.; and Rudisill, Edgar North, 5,750,152, Cl. 425-72.200.

Rudman, Barry: *See—*

Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,750,053, Cl. 252-389.520.

Rudolph, Claus: *See—*

Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.

Rudt, Robert L.: *See—*

Neider, Thomas M.; and Rudt, Robert L., 5,750,259, Cl. 428-411.100.

Rueger, David C.: *See—*

Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,750,651, Cl. 530-350.000.

Rüegg, Hans: *See—*

Forsberg, Stefan; and Rüegg, Hans, 5,749,309, Cl. 110-346.000.

Ruf, Bernd; and Lötsch, Kurt, to Heidelberger Druckmaschinen AG. Device for centrally adjusting sheet-guiding elements of a sheet-fed rotary printing press. 5,749,294, Cl. 101-232.000.

Ruiz Busquets, Josep, to AlliedSignal Europe Services Techniques. Disk brake with improved recoil. 5,749,445, Cl. 188-73.450.

Runciman, Herbert Morrison, to Barr & Stroud Limited. Dual waveband optical system. 5,751,473, Cl. 359-356.000.

Ruozi, Giuseppe, to O.M.A.C. Societa per Azioni. Plant for pasteurizing or sterilising solid or liquid food products using microwaves. 5,750,966, Cl. 219-692.000.

Ruppert, Heinrich W.; and Gätschmann, Klaus G., to EFKA-Werke Fritz Kiehn GmbH. Tobacco product for the self-preparation of a cigarette, especially of filter-tipped cigarette and method of forming the cigarette. 5,749,378, Cl. 131-70.000.

Russek, Steven Lee: *See—*

Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.

Russell, Jonathan C.; and Lardner, Thomas J., to United States as represented by the Secretary of Transportation, The Government of the. Measurement of tension using natural frequency of vibration. 5,750,894, Cl. 73-581.000.

Rustenburg, Louis E.: *See—*

Bedegrew, Ernest R.; MacDonald, Robert J.; Rustenburg, Louis E.; Godfrey, Russell E.; Hada, Daniel H.; Fredrickson, Raymond L.; Digdigan, Larry V.; Niemann, David A.; and Chun, Russell K., 5,750,915, Cl. 89-1.800.

Rustici, David J.: *See—*

Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Ryan, Daniel F.: *See—*

Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., 5,750,819, Cl. 585-734.000.

Ryan, John O., to Command Audio Corporation. Audio information dissemination using various transmission modes. 5,751,806, Cl. 380-9.000.

Ryan, Lawrence D., to Intel Corporation. Cable terminal unit using bit set for selectively enabling a plurality of hardware functions with some functions having a plurality of selectively enabled hardware functions. 5,752,080, Cl. 395-828.000.

Ryan, Thomas Anthony: *See—*

Burgess, Leslie; Butcher, Jane Lesley; Ryan, Thomas Anthony; and Clayton, Peter Paul, 5,750,807, Cl. 570-142.000.

Ryhänen, Tapani, to Vaisala, Oy. Method of linearizing a flow velocity sensor, a linearized flow velocity measurement apparatus and system. 5,750,903, Cl. 73-861.480.

Rykowski, Ronald F.: *See—*

Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,751,870, Cl. 385-33.000.

Rysin, Alex A.: *See—*

Swithers, David Jonathan; and Rysin, Alex A., 5,750,980, Cl. 250-214.0AG.

Ryther, Robert James, to Imation Corp. Development/transport rollers having a fluorocarbon coating for use in automated thermal development equipment. 5,750,260, Cl. 428-421.000.

Ryu, Bong Yool: *See—*

Jang, Jin; Lim, Hong Joo; and Ryu, Bong Yool, 5,751,017, Cl. 257-57.000.

Ryu, Sang Chul; and Kim, Ik Geun, to Samsung Electronics Co., Ltd. Freezer compartment structure for refrigerators. 5,749,241, Cl. 62-340.000.

S-B Power Tool Company: *See—*

Uzumcu, Albert I.; Malone, Matthew; and Schweizer, Russell J., 5,749,770, Cl. 451-28.000.

S. C. Johnson & Son, Inc.: *See—*

Cummings, Gerald, 5,750,482, Cl. 510-182.000.

Davis, Brian T., 5,749,497, Cl. 222-181.200.

Martin, John; and Miller, Eric J., 5,749,520, Cl. 239-44.000.

Miller, Eric J., 5,749,519, Cl. 239-44.000.

S.N.F.: *See—*

Hund, René; and Georges, Sébastien, 5,750,614, Cl. 524-460.000.

Saadeh, Theresa, to Badger Meter, Inc. Automatic meter reading system with multitasking control. 5,751,797, Cl. 379-106.030.

Saam, John C., to Michigan Molecular Institute. Glycol co-esters of drying-oil fatty acids and vinyl carboxylic acids made via biphasic catalysis and resulting products. 5,750,751, Cl. 554-165.000.

Saaman, Ary; Poscio, Patrick; and Graetzel, Michael, to Westonbridge International Limited. Adhesive patch for the transdermal administration of a medication. 5,750,138, Cl. 424-448.000.

Sabato, Takaaki: *See—*

Yoneda, Fumio; Watanabe, Mayumi; Sakae, Masatoshi; Katsurada, Masanori; and Sabato, Takaaki, 5,750,712, Cl. 548-186.000.

Sabb, Annmarie Louise; and Kinney, William A., to American Home Products Corporation. Pyrrolo[1,2-d] [1,2,4]triazine derivatives. 5,750,522, Cl. 514-243.000.

Sabet, Sabet-Abdou: *See—*

Medsker, Robert Eugene; Patel, Raman; and Sabet, Sabet-Abdou, 5,750,625, Cl. 525-133.000.

Sabnani, Krishan Kumar: *See—*

Chen, Kuo-Wei Herman; Paul, Sanjoy; and Sabnani, Krishan Kumar, 5,751,719, Cl. 370-473.000.

Sachdev, Manoj; and Atzema, Botjo, to U.S.Philips Corporation. I_{DDQ}-testing of bias generator circuit. 5,751,141, Cl. 323-312.000.

Sachdeva, Yesh P.: *See—*

Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, 5,750,713, Cl. 548-202.000.

Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., to Applied Medical Resources. Laparoscopic surgical clamp. 5,749,881, Cl. 606-151.000.

Sadamura, Hiroyoshi: *See—*

Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.

Saderholm, Davin G. Integral cover-deployment chute for side airbag module. 5,749,597, Cl. 280-728.200.

Sadou, Kouichi: *See—*

Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.

Sadounichvili, Larisa: *See—*

Sadounichvili, Tengiz; and Sadounichvili, Larisa, 5,749,583, Cl. 273-261.000.

Sadounichvili, Tengiz; and Sadounichvili, Larisa. Apparatus and method of playing an expanded chess game. 5,749,583, Cl. 273-261.000.

Sadovsky, Vadim A.: *See—*

Bortnik, Michael; and Sadovsky, Vadim A., 5,751,599, Cl. 364-505.000.

Saeijs, Ronald W.J.J.: *See—*

Van Gestel, Wilhelmus J.; and Saeijs, Ronald W.J.J., 5,751,889, Cl. 386-68.000.

Sae Il, Kim, to Hyundai Motor Company. Device for preventing gush of fuel oil from the fuel tank. 5,749,487, Cl. 220-86.200.

Saeva, Franklin D.: *See—*

Mydlarz, Jerzy Z.; Klaus, Roger L.; and Saeva, Franklin D., 5,750,324, Cl. 430-567.000.

SAF T LOK Corporation: *See—*

Brooks, Frank, 5,749,166, Cl. 42-70.110.

Safetran Systems Corporation: *See—*

Metel, Omer; and Pretorius, Francois, 5,751,569, Cl. 364-132.000.

- Safety Equipment Inc.: *See—*
  - Walcher, James G.; Limbird, James R.; and Herner, Arthur C., 5,749,434, Cl. 182-45.000.
- Sagemüller, Burkhard: *See—*
  - Behnke, Willi; and Sagemüller, Burkhard, 5,750,877, Cl. 73-1.330.
- Sahouani, Hassan: *See—*
  - Ezzell, Stephen A.; Sahouani, Hassan; and Thurber, Ernest L., 5,750,641, Cl. 528-353.000.
- Saigo, Yukio: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, to Canon Kabushiki Kaisha. Ink jet recording apparatus having ink jet head moving structure for gap spacing and recovery. 5,751,301, Cl. 347-8.000.
- Saito, Chiaki; and Ohuchi, Kozo, to Kyowa Hakko Kogyo Co., Ltd. Method of decreasing cholesterol concentration in food. 5,750,164, Cl. 426-47.000.
- Saito, Fumio: *See—*
  - Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.
- Saito, Hiroyuki: *See—*
  - Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.
- Saito, Izumu: *See—*
  - Miyamura, Tatsuo; Saito, Izumu; Harada, Shizuko; and Honda, Yoshikazu, 5,750,331, Cl. 435-5.000.
- Saito, Keiichi: *See—*
  - Murai, Yukako; Suzuki, Akio; Tahata, Yoshio; Saito, Keiichi; and Amagai, Tamio, 5,751,438, Cl. 358-403.000.
- Saito, Kenji: *See—*
  - Matsui, Seiichi; Nakane, Yoshio; and Saito, Kenji, 5,751,349, Cl. 348-228.000.
- Saito, Noboru, to Nippon Shokubai, Ltd. Process for production of ketone. 5,750,795, Cl. 568-397.000.
- Saito, Noboru: *See—*
  - Arita, Yoshitaka; Ohta, Akihiko; Hasebe, Ren; and Saito, Noboru, 5,750,768, Cl. 560-177.000.
- Saito, Noriko: *See—*
  - Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, 5,750,516, Cl. 514-100.000.
- Saito, Shuichi, to NEC Corporation. Router device and data communication system capable of suppressing traffic increase in communications among a plurality of lan segments. 5,751,954, Cl. 395-200.150.
- Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, to Sony Corporation. Photographic camera system. 5,752,109, Cl. 396-311.000.
- Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; and Toshikage, Hideki, to Sony Corporation. Photographic and video image system. 5,752,114, Cl. 396-429.000.
- Saito, Tetsuo: *See—*
  - Kataoka, Hiromi; Masuda, Shunichi; Saito, Tetsuo; and Yamamoto, Kazuma, 5,751,925, Cl. 395-115.000.
- Saitoh, Kenji: *See—*
  - Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.
- Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji, Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, to Ricoh Company, Ltd. Original-discrimination system for discriminating special document, and image forming apparatus, image processing apparatus and duplicator using the original-discrimination system. 5,751,854, Cl. 382-218.000.
- Saka, Yuuji; and Shibata, Hideaki, to Sumitomo Wiring Systems, Ltd. Branch connection device for an automotive vehicle. 5,749,739, Cl. 439-76.200.
- Sakae, Masatoshi: *See—*
  - Yoneda, Fumio; Watanabe, Mayumi; Sakae, Masatoshi; Katsurada, Masanori; and Sabato, Takaaki, 5,750,712, Cl. 548-186.000.
- Sakaguchi, Kiyofumi: *See—*
  - Yonehara, Takao; Sato, Nobuhiko; Sakaguchi, Kiyofumi; and Kondo, Shigeki, 5,750,000, Cl. 156-630.100.
- Sakaguchi, Shinji: *See—*
  - Sato, Kenichiro; Sakaguchi, Shinji; and Momota, Makoto, 5,750,310, Cl. 430-192.000.
- Sakai, Akira; Ichikawa, Miki; and Urita, Seiichi, to Fujitsu Limited. Production data preparing system for producing a metal mask plate. 5,751,577, Cl. 364-191.000.
- Sakai, Fumio: *See—*
  - Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, 5,751,404, Cl. 355-53.000.
- Sakai, Ikunori: *See—*
  - Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.
- Sakai, Kazuhiko; Adachi, Tatsuhiko; Nakayama, Norihiro; and Fujino, Kenichi, to Ube Nitto Kasei Co., Ltd. Crosslinked resin-coated silica fine particles and process for the production thereof. 5,750,258, Cl. 428-405.000.
- Sakai, Shigenobu: *See—*
  - Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,751,452, Cl. 359-52.000.
- Sakai, Takekazu: *See—*
  - Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,750,271, Cl. 428-624.000.
- Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, to Suntory Limited. Vector having promoter that is inducible by methanol and/or glycerol. 5,750,372, Cl. 435-69.100.
- Sakairi, Takashi, to International Business Machine Corp. Method and system for controlling clipboards in a shared application progam. 5,752,254, Cl. 707-530.000.
- Sakaiya, Hiroyuki: *See—*
  - Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.
- Sakaki, Mamoru; and Kurabayashi, Yutaka, to Canon Kabushiki Kaisha. Stack of recording sheets with cleaning sheets dispersed therein and method of maintaining recording apparatus. 5,751,306, Cl. 347-22.000.
- Sakakibara, Jun: *See—*
  - Suzuki, Megumi; Asai, Akiyoshi; and Sakakibara, Jun, 5,751,041, Cl. 257-357.000.
- Sakakibara, Keisuke: *See—*
  - Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakibara, Keisuke; and Minato, Tsuyoshi, 5,749,129, Cl. 24-452.000.
- Sakakida, Yasufumi: *See—*
  - Tsutsumi, Kazuo; Takada, Tomoaki; Sakakida, Yasufumi; and Kawamura, Tarou, 5,750,084, Cl. 423-239.100.
- Sakamoto, Eiichi: *See—*
  - Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, 5,750,255, Cl. 428-359.000.
- Sakamoto, Hiroshi: *See—*
  - Matsui, Hideki; Sakamoto, Hiroshi; Takayanagi, Ryotaro; and Hagiuda, Nobuyoshi, 5,752,102, Cl. 396-156.000.
- Sakamoto, Kazuhisa, to Rohm Co., Ltd. Method of manufacturing semiconductor device. 5,750,443, Cl. 438-795.000.
- Sakano, Yukio: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Sakashita, Masahiro: *See—*
  - Sekimoto, Takao; Sakashita, Masahiro; Ando, Kenji; and Tsukada, Mitsushige, 5,752,233, Cl. 705-1.000.
- Sakata, Tatsuei, to Kabushiki Kaisha Riken. Sliding material for light metal materials. 5,750,266, Cl. 428-457.000.
- Sakauchi, Kazuo; Hirano, Yoshihiro; and Uchikawa, Akira, to SEH America, Inc. Puller cell. 5,749,967, Cl. 117-200.000.
- Sakaue, Kenji, to Kabushiki Kaisha Toshiba. Digital information processing device. 5,751,711, Cl. 370-431.000.
- Sakaue, Takahiro: *See—*
  - Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, 5,750,516, Cl. 514-100.000.
- Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical information storage medium. 5,750,228, Cl. 428-64.100.
- Sakemi, Shoji, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for mounting soldering balls onto surfaces of electronic components. 5,750,199, Cl. 427-357.000.
- Sakemi, Yuji: *See—*
  - Danzuka, Toshimitsu; Sakemi, Yuji; Fukushima, Hisashi; and Menjo, Takeshi, 5,752,140, Cl. 399-270.000.
  - Inoue, Masahiro; and Sakemi, Yuji, 5,752,151, Cl. 399-350.000.
- Sakiyama, Shiro: *See—*
  - Dosho, Shiro; Sakiyama, Shiro; Maruyama, Masakatsu; Matsushita, Masatoshi; and Mochizuki, Koji, 5,751,142, Cl. 323-316.000.
- Sakuma, Masao: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- Sakurada, Yuzo: *See—*
  - Ogata, Seiji; Sakurada, Yuzo; Chida, Nakaya; and Hisamune, Takeshi, 5,751,002, Cl. 250-492.210.
- Sakurai, Atsushi: *See—*
  - Kosaka, Tetsuo; Sakurai, Atsushi; and Tamura, Junichi, 5,751,898, Cl. 395-2.500.
- Sakuta, Hiroki: *See—*
  - Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.
- Sakuta, Maki: *See—*
  - Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.
- Sakya, Subas: *See—*

  - Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
- Salanitro, Joseph Patrick, to Shell Oil Company. Biodegradation of ethers using an isolated mixed bacterial culture. 5,750,364, Cl. 435-42.000.
- Salazar, Mariano: *See—*
  - Ngoc, Hung Dang; and Salazar, Mariano, 5,750,263, Cl. 428-424.400.
- Saldanha, Alexander: *See—*
  - McGeer, Patrick C.; Saldanha, Alexander; and Sangiovanni-Vincentelli, Alberto, 5,752,000, Cl. 395-500.000.
- Salford Ultrafine Chemicals and Research Limited: *See—*
  - Scheinmann, Feodor; Turner, Nicholas John; Carter, Neil Edward; and Brown, Richard Talbot, 5,750,381, Cl. 435-128.000.
- Salimi, Bijan: *See—*
  - Beatty, Harry John, III; Elmendorf, Peter Claude; Panner, Jeannie Harrigan; Salimi, Bijan; and Pickup, Lansing Dunn, 5,751,595, Cl. 364-490.000.
- Salk Institute for Biological Studies, The: *See—*
  - Hoeger, Carl A.; and Rivier, Jean E. F., 5,750,499, Cl. 514-9.000.
  - Montminy, Marc R., 5,750,336, Cl. 435-6.000.
- Salmon, Stephen M.: *See—*
  - Jang, Yue-Teh; Salmon, Stephen M.; White, David A.; and Garcia, Rizza A., 5,749,848, Cl. 604-53.000.
- Saltiel, Alan Robert: *See—*
  - Bisgaier, Charles Larry; Creger, Paul Leroy; Saltiel, Alan Robert; and Tafuri, Sherrie Rae, 5,750,569, Cl. 514-547.000.
- Salto, Francisco: *See—*
  - Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.
- Samoto, Tetsuo, to Sony Corporation. Method for producing magnetic recording medium and apparatus therefor. 5,750,209, Cl. 427-569.000.
- Samson, Gene: *See—*
  - Palermo, Thomas J.; Samson, Gene; Mirigian, Gregory E.; and Chee, U. Hiram, 5,749,837, Cl. 600-585.000.
- Samsung Aerospace Industries, Ltd.: *See—*
  - Kim, Myeong-kyu; and Hong, Seong-doo, 5,751,400, Cl. 354-159.000.
- Samsung Display Devices Co., Ltd.: *See—*
  - Kim, Changhoe, 5,751,100, Cl. 313-414.000.
  - Kim, Choong-lak; and Cho, Jong-ho, 5,750,295, Cl. 430-25.000.
  - Kim, Man-Tae; Kim, Min-Sik; and Park, Jin-Hong, 5,751,342, Cl. 348-92.000.
  - Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, 5,750,296, Cl. 430-28.000.
- Samsung Electro-Mechanics Co., Ltd.: *See—*
  - Hong, Weon Ki, 5,751,080, Cl. 310-67.00R.
  - Park, Il Oung, 5,751,084, Cl. 310-90.000.
- Samsung Electronics Co., Ltd.: *See—*
  - Choi, Hyung-Jin; Cho, Sung-Bae; Jung, Suk-Jin; and Lee, Hyung-Kil, 5,751,734, Cl. 371-43.400.
  - Choi, Jung-dal; Jun, Sung-bu; and Kim, Byeung-chul, 5,751,045, Cl. 257-392.000.
  - Jo, Sang-youn, 5,750,433, Cl. 438-424.000.
  - Jung, Hee-Duck, 5,751,545, Cl. 361-683.000.
  - Kim, Yong-Geun; and Kim, Seong-Woo, 5,751,448, Cl. 358-498.000.
  - Kim, Young Hyeon; and Seong, Pil Young, 5,751,917, Cl. 395-89.000.
  - Ko, Jung Wan, 5,751,884, Cl. 386-33.000.
  - Lee, Dong-Ho, 5,752,049, Cl. 395-750.050.
  - Lee, June-key; Chung, Il-sub; and Desu, Seshu Babu, 5,751,540, Cl. 361-321.400.
  - Lee, Kyung-Young, 5,751,332, Cl. 347-240.000.
  - Lee, Sang-O, 5,751,183, Cl. 327-542.000.
  - Lee, Sung Tae, 5,749,714, Cl. 417-312.000.
  - Lee, Yong Hee; and Seo, Young Woo, 5,751,048, Cl. 257-412.000.
  - Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.
  - Ryu, Sang Chul; and Kim, Ik Geun, 5,749,241, Cl. 62-340.000.
  - Song, Kwang-Ho, 5,751,544, Cl. 361-681.000.
  - Wong, Roney S., 5,751,617, Cl. 364-734.000.
  - Yoo, Jei-hwan, 5,751,642, Cl. 365-189.060.
- Samuel Roberts Noble Foundation, Inc., The: *See—*
  - Dixon, Richard A.; Paiva, Nancy L.; and Oommen, Abraham, 5,750,399, Cl. 435-419.000.
- Samuel, Vincent D., Jr. Golf umbrella and support. 5,749,386, Cl. 135-16.000.
- Samuel, Yves: *See—*
  - Paul, Jean Michel; Samuel, Yves; and Esch, Marc, 5,750,771, Cl. 560-205.000.
- Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., to Xerox Corporation. Imaging member end flange and end flange assembly. 5,752,136, Cl. 399-117.000.
- Sanchez, Patrick F.: *See—*
  - Barbot, Gérard; Rameau, Cyril; and Sanchez, Patrick F., 5,749,318, Cl. 119-166.000.
- Sand Microelectronics, Inc.: *See—*
  - Naidu, Anand; Deora, Ajit; and Arunarthi, Venkatesham, 5,752,002, Cl. 395-500.000.
- Sandbeck, Kenneth A.: *See—*
  - Hitzman, Donald O.; Sperl, George T.; and Sandbeck, Kenneth A., 5,750,392, Cl. 435-243.000.
- Sandbrink, Joseph J.: *See—*
  - Wright, Daniel R.; Brinker, Ronald J.; Sandbrink, Joseph J.; and Wideman, Al S., 5,750,468, Cl. 504-206.000.
- Sanden Corporation: *See—*
  - Ueda, Katsumi, 5,749,235, Cl. 62-160.000.
- Sandhu, Gurtej S., to Micron Technology, Inc. Method and apparatus to compensate for non-uniform film growth during chemical vapor deposition. 5,751,896, Cl. 392-416.000.
- Sandhu, Sukesh: *See—*
  - Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.
- Sandofsky, Marc D.; and Ward, David F., to JDM, Ltd. Refrigerant system flash gas suppressor with variable speed drive. 5,749,237, Cl. 62-209.000.
- Sandoval, Christopher Paul: *See—*
  - Law, David Chee-Fai; Sandoval, Christopher Paul; and Garcia, Ruben G., 5,749,954, Cl. 106-282.000.
- Sangiovanni-Vincentelli, Alberto: *See—*
  - McGeer, Patrick C.; Saldanha, Alexander; and Sangiovanni-Vincentelli, Alberto, 5,752,000, Cl. 395-500.000.
- Sangregory, Jude A., to Eastman Kodak Company. One-time-use camera with front and rear cover parts that can be bent apart to permit battery to drop out of chamber. 5,752,087, Cl. 396-6.000.
- Sangster, Bruce; and Bond, James D. Sterilization by magnetic field stimulation of a mist or vapor. 5,750,072, Cl. 422-22.000.
- Sanilift Company, Ltd., The: *See—*
  - Kreemer, Gary Allen, 5,749,103, Cl. 4-237.000.
- Sankar, Narendra: *See—*
  - Nemirovsky, Mario; Perez, Alexander; Divivier, Robert James; and Sankar, Narendra, 5,752,273, Cl. 711-201.000.
- Sankaran, Ramanathan: *See—*
  - Gupta, Niranjan Lal; Sankaran, Ramanathan; Chattejee, Sugata; and Krishna, Tumma Hari, 5,750,683, Cl. 540-214.000.
- Sankei Giken Kogyo Kabushiki Kaisya: *See—*
  - Arai, Saburo, 5,749,255, Cl. 72-150.000.
- Sankyo Company, Limited: *See—*
  - Furukawa, Hidehiko; Momota, Kenji; Hotoda, Hitoshi; Koizumi, Makoto; and Kaneko, Masakatsu, 5,750,511, Cl. 514-44.000.
- Sano, Akira: *See—*
  - Shimizu, Hiroyuki; Sano, Akira; and Matsuura, Kazuo, 5,750,454, Cl. 502-114.000.
- Sano, Koichi: *See—*
  - Hiroya, Masaaki; and Sano, Koichi, 5,751,957, Cl. 395-200.330.
- Sano, Satoshi: *See—*
  - Nakazawa, Fumihiko; Okumura, Hitoshi; Sano, Satoshi; and Abe, Fumitaka, 5,751,406, Cl. 356-3.030.
- Sano, Shigeru: *See—*
  - Akutagawa, Tadamasa; Sano, Shigeru; and Nishino, Aya, 5,750,285, Cl. 429-92.000.
- Sano, Shigeyuki: *See—*
  - Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.
- Sano, Toshihiro: *See—*
  - Fukuta, Ken; Sano, Toshihiro; and Hirota, Tsutomu, 5,749,970, Cl. 118-320.000.
- Sanofi: *See—*
  - Aldous, David J.; Bailey, Thomas R.; Diana, Guy Dominic; and Nitz, Theodore J., 5,750,527, Cl. 514-252.000.
  - Eissenstat, Michael A.; Kuo, Gee-Hong; Desai, Ranjit C.; Hlasta, Dennis J.; and Court, John J., 5,750,550, Cl. 514-373.000.
- Sanofi Winthrop, Inc.: *See—*
  - Desai, Ranjit Chimanlal, 5,750,546, Cl. 514-342.000.
- Sansha Electric Manufacturing Company, Limited: *See—*
  - Danjo, Kenzo; Kinoshita, Atsushi; Okamoto, Shigeru; Moriguchi, Haruo; and Hashimoto, Takashi, 5,751,568, Cl. 363-95.000.
- Sanshin Kogyo Kabushiki Kaisha: *See—*
  - Gohara, Yoshihiro; Fujimoto, Hiroaki; and Nanami, Masayoshi, 5,749,338, Cl. 123-73.00A.
  - Suganuma, Noboru, 5,749,757, Cl. 440-83.000.
- Sansho Seiyaku Co., Ltd.: *See—*
  - Honda, Shinsuke, 5,750,563, Cl. 514-460.000.
- Santa Barbara Research Center: *See—*
  - Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,750,202, Cl. 427-376.400.
- Santel, Hans-Joachim: *See—*
  - Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
- Santen Seiyaku Kabushiki Kaisha: *See—*
  - Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.
- Santhanam, A. T.: *See—*
  - Bryant, William A.; and Santhanam, A. T., 5,750,247, Cl. 428-323.000.
- Sanyo Chemical Industries, Ltd.: *See—*
  - Nakano, Tomoharu; and Shiono, Katsuji, 5,750,730, Cl. 549-229.000.
- Sanyo Electric Co., Ltd.: *See—*
  - Hamagishi, Goro; Mashitani, Ken; Nakayama, Eiji; and Tanase, Susumu, 5,751,479, Cl. 359-464.000.
  - Ishimura, Shizuka, 5,752,184, Cl. 455-352.000.

Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.

Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, 5,751,029, Cl. 257-194.000.

Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.

Sawada, Minoru; and Harada, Yasoo, 5,751,027, Cl. 257-192.000.

Takano, Yoshiaki, 5,749,234, Cl. 62-125.000.

Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.

Sarangapani, Jagannathan, to Caterpillar Inc. Method and apparatus for determining a path for a machine between a predetermined route and a final position. 5,752,207, Cl. 701-26.000.

Sarangdhar, Nitin V., to Intel Corporation. Apparatus and method of maintaining processor ordering in a multiprocessor system which includes one or more processors that execute instructions speculatively. 5,751,995, Cl. 395-472.000.

Sargent & Greenleaf: *See—*

Rhoades, Martin Richard, 5,749,252, Cl. 70-276.000.

Sarhadi, Siamak: *See—*

Nepela, Daniel A.; and Sarhadi, Siamak, 5,751,528, Cl. 360-126.000.

Sarto, Gloria E.: *See—*

Kim, In C.; Thompson, Donald M.; and Sarto, Gloria E., 5,750,340, Cl. 435-6.000.

Sasa, Nobumasa: *See—*

Taniguchi, Tetsuya; Sasa, Nobumasa; and Shimizu, Kunio, 5,750,311, Cl. 430-253.000.

Sasagawa, Hideto: *See—*

Ito, Takayuki; Sasagawa, Hideto; and Watanabe, Takeshi, 5,750,940, Cl. 178-18.000.

Sasaki, Kunio: *See—*

Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu, 5,749,307, Cl. 110-222.000.

Sasaki, Ryo: *See—*

Kazama, Shigenori; and Sasaki, Ryo, 5,749,529, Cl. 239-690.000.

Sasaki, Ryoichi; Tanai, Naoki; and Suhara, Masaaki, to Keyence Corporation. Lighring apparatus having light emitting diodes arranged in a plurality of planes on a printed circuit board. 5,750,974, Cl. 235-454.000.

Sasaki, Shigekuni: *See—*

Ando, Shinji; Matsuura, Toru; Sasaki, Shigekuni; and Yamamoto, Fumio, 5,750,731, Cl. 549-241.000.

Sasaki, Takashi: *See—*

Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.

Sasaki, Toru: *See—*

Miyata, Hideo; Sasaki, Toru; and Morikawa, Kohei, 5,750,774, Cl. 562-17.000.

Yamamoto, Masamitsu; Igaue, Takamitsu; and Sasaki, Toru, 5,749,865, Cl. 604-385.200.

Sasamoto, Hisashi: *See—*

Hama, Itsuo; Okamoto, Takahiro; Sasamoto, Hisashi; and Nakamura, Hirofumi, 5,750,796, Cl. 568-618.000.

Sasayama, Tomoki: *See—*

Iida, Atsuhiro; Yokota, Kazumi; Ikeda, Eiji; and Sasayama, Tomoki, 5,751,420, Cl. 356-328.000.

SASIB Beverage S.p.A.: *See—*

Conforti, Lucio, 5,749,403, Cl. 141-276.000

Sastry, Vedula V.: *See—*

Venkata, Subrahmanyam S.; Raju, N. Ravisekhar; Kagalwala, Raxit A.; and Sastry, Vedula V., 5,751,138, Cl. 323-207.000.

Satake, Toshimi; Takano, Toshiyuki; Fukuda, Motoi; and Uehori, Yukiko, to Nippon Paper Industries Co., Ltd. Printing paper and newsprint paper with improved water absorptivity and the manufacturing process. 5,750,253, Cl. 428-342.000.

Satchwell, Thomas Erwin, III. Collapsible railing for mounting on a vehicle roof. 5,749,436, Cl. 182-127.000.

Sather, Bradley T. Exercise apparatus and method for performing push-up exercises and the like. 5,749,818, Cl. 482-141.000.

Sato, Hiroaki; and Okazaki, Hiroshi, to Canon Kabushiki Kaisha. Communication terminal, supervisory system and communication method. 5,751,959, Cl. 395-200.350.

Sato, Hiroki: *See—*

Mera, Yukinori; Nishi, Naoki; Kurimoto, Tadashi; and Sato, Hiroki, 5,750,524, Cl. 514-247.000.

Sato, Hiroshi; Fukae, Kimitoshi; and Takehara, Nobuyoshi, to Canon Kabushiki Kaisha. Charge/discharge control method, charge/discharge controller, and power generation system with charge/discharge controller. 5,751,133, Cl. 320-13.000.

Sato, Kazunori: *See—*

Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.

Sato, Kenichiro; Sakaguchi, Shinji; and Momota, Makoto, to Fuji Photo Film Co., Ltd. Positive photoresist composition. 5,750,310, Cl. 430-192.000.

Sato, Mitsuhiko: *See—*

Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.

Sato, Morimasa; and Sugiyama, Takekatsu, to Fuji Photo Film Co., Ltd. Ultraviolet absorber precursor compound, photosensitive resin composition comprising the same and image forming process. 5,750,292, Cl. 430-15.000.

Sato, Nobuhiko: *See—*

Yonehara, Takao; Sato, Nobuhiko; Sakaguchi, Kiyofumi; and Kondo, Shigeki, 5,750,000, Cl. 156-630.100.

Sato, Nobuyuki: *See—*

Komatsu, Ikuo, Sato, Nobuyuki; and Imazu, Katsuhiro, 5,750,222, Cl. 428-35.800.

Sato, Seisuke: *See—*

Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.

Sato, Shigeyuki: *See—*

Maruyama, Tamotsu; and Sato, Shigeyuki, 5,751,055, Cl. 257-618.000.

Sato, Shingo: *See—*

Onodera, Junichi; Sato, Shingo; Kashiwagi, Toshio; and Tetsuhiro, Isobe, 5,750,379, Cl. 435-72.000.

Sato, Shougo, to Brother Kogyo Kabushiki Kaisha. Electrophotographic type image forming device providing positive charge to toners. 5,752,146, Cl. 399-284.000.

Sato, Tadashi, to Seiko Instruments Inc. Recording data erecting apparatus. 5,752,108, Cl. 396-310.000.

Sato, Tadashi: *See—*

Ichimura, Satoshi; Sato, Tadashi; Kobayashi, Kenzo; Ohishi, Shotaro; and Oonuki, Hisao, 5,750,987, Cl. 250-251.000.

Sato, Tadashige; Imai, Megumi; and Takahashi, Tsuneteru, to Mitsubishi Kasei Corporation. Epitaxial wafer of gallium arsenide phosphide. 5,751,026, Cl. 257-190.000.

Sato, Takashi: *See—*

Monma, Akio; Yamanobe, Yasunori; and Sato, Takashi, 5,751,112, Cl. 315-8.000.

Sato, Tatsushi; and Sendai, Tomoko, to Mitsubishi Denki Kabushiki Kaisha. Method for creating a machining condition series. 5,751,589, Cl. 364-474.350.

Sato, Toshifumi, to NEC Corporation. Code division multiple access base station transmitter. 5,751,705, Cl. 370-335.000.

Sato, Yoshio; and Kameta, Keiji, to Dengensha Manufacturing Company Limited. Motor-driven X-type resistance spot welding gun. 5,750,953, Cl. 219-90.000.

Sato, Yuji; and Tanaka, Manabu, to Sharp Kabushiki Kaisha. Liquid crystal display device. 5,751,267, Cl. 345-96.000.

Satoh, Michiko: *See—*

Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Satoh, Osamu: *See—*

Mizuno, Fumio; and Satoh, Osamu, 5,750,990, Cl. 250-307.000.

Satoh, Shigeki: *See—*

Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl. 546-121.000.

Satoh, Shunichi: *See—*

Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, 5,751,877, Cl. 385-93.000.

Satoh, Takao: *See—*

Arai, Kouji; Satoh, Takao; and Yamamoto, Akira, 5,751,937, Cl. 395-182.050.

Satonaka, Hisashi; and Tokoru, Setsuo, to Toyota Jidosha Kabushiki Kaisha. Constant speed regulator apparatus. 5,749,427, Cl. 180-179.000.

Sauer, Richard A., to Air Liquide America Corporation. Apparatus and method for producing and injecting sterile cryogenic liquids. 5,749,232, Cl. 62-50.100.

Sauerberg, Per; and Hansen, Kristian Tage, to Novo Nordisk A/S. Method of treating hypercholesterolemia and related disorders. 5,750,538, Cl. 514-305.000.

Sauerbier, Dieter: *See—*

Wichert, Burkhard; Sauerbier, Dieter; and Rawert, Jurgen, 5,750,131, Cl. 424-422.000.

Saund, Eric, to Xerox Corporation. Method and apparatus for detecting whether an electronic image has been faxed. 5,751,855, Cl. 382-224.000.

Saunders, Rowland F.: *See—*

Granfors, Paul R.; Morvan, Jean-Claude; and Saunders, Rowland F., 5,751,783, Cl. 378-108.000.

Savage, Leland Manfred: *See—*

McLaughlin, Michael Ray; Pinto, Timothy Martin; Jessee, Ernest Edward; Savage, Leland Manfred; and Patel, Vijay Somabhai, 5,751,011, Cl. 250-559.330.

Savert, Cornelis J.: *See—*

Cornelissen, Hugo J.; Savert, Cornelis J.; and Leijten, Johannes T.H., 5,749,638, Cl. 313-461.000.

Sawa, Yoshiharu: *See—*

Nosu, Tsutomu; Hiraishi, Wataru; and Sawa, Yoshiharu, 5,750,609, Cl. 524-413.000.

Sawada, Minoru; and Harada, Yasoo, to Sanyo Electric Co., Ltd. Field effect semiconductor device with a low-noise drift layer and a high-power drift layer. 5,751,027, Cl. 257-192.000.

Sawada, Minoru: *See—*

Matsushita, Shigeharu; Inoue, Daijirou; Matsumura, Kohji; Sawada, Minoru; and Harada, Yasoo, 5,751,029, Cl. 257-194.000.

Sawada, Yuki: *See—*

Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl. 546-121.000.

Sawano, Yukio: *See—*

Shibasaki, Souhei; Sawano, Yukio; Hanaoka, Shuzo; and Takano, Hiroyoshi, 5,749,662, Cl. 400-82.000.

Sawaya, Kumio: *See—*

Ochi, Hisaaki; Yamamoto, Etsuji; Sawaya, Kumio; and Adachi, Saburo, 5,751,600, Cl. 364-524.000.

Sawyer, Philip N.; Wallace, Donald G.; and Yamamoto, Ronald K., to Fusion Medical Technologies, Inc. Method for bonding or fusion of biological tissue and material. 5,749,895, Cl. 606-214.000.

Sawyer, Steven Paul; Armbruster, Peter Joseph; and Moritz, Steven Harry, to Motorola, Inc. Methods for assigning subscriber units to visited gateways. 5,752,162, Cl. 455-13.100.

Saxena, Sharad; Mozumder, Purnendu K.; Shinn, Gregory B.; and Taylor, Kelly J., to Texas Instruments Incorporated. Controlling process modules using site models and monitor wafer control. 5,751,582, Cl. 364-468.160.

Scalora, Michael: *See—*

Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.

Scanlan, Christopher M.; and Raleigh, Carl J., to Motorola, Inc. Semiconductor device balancing thermal expansion coefficient mismatch. 5,751,552, Cl. 361-707.000.

Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, to Eastman Kodak Company. Solid particle dispersions for imaging elements. 5,750,323, Cl. 430-512.000.

Schachtele, Christoph: *See—*

Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, 5,750,555, Cl. 514-410.000.

Schad, Robert; and Arnott, Robin, to Husky Injection Molding Systems Ltd. Turret article molding machine including blow molding station. 5,750,162, Cl. 425-533.000.

Schaefer, Carl G., Jr.; McCool, Kelly M.; and Haas, David J., to United States of America, Navy. Neural network based method for estimating helicopter low airspeed. 5,751,609, Cl. 364-565.000.

Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, to Heraeus Kulzer GmbH. Polymerizable material. 5,750,590, Cl. 523-115.000.

Schaefer, Scott, to Micron Technology, Inc. Synchronous DRAM memory with asynchronous column decode. 5,751,656, Cl. 365-233.500.

Schäfer, Peter: *See—*

Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, 5,750,705, Cl. 546-297.000.

Schaffer, Robert: *See—*

Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., 5,751,303, Cl. 347-16.000.

Schaffner, James H.; and Yap, Daniel, to Hughes Aircraft Company. Polarization-insensitive, electro-optic modulator. 5,751,867, Cl. 385-3.000.

Schaller, Laurent: *See—*

Hergenrother, Robert; Chee, Uriel Hiram; and Schaller, Laurent, 5,750,206, Cl. 427-490.000.

Schambil, Fred: *See—*

Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, 5,750,490, Cl. 510-504.000.

Scharf, Robert E. Bull nose corner marking apparatus. 5,749,154, Cl. 33-563.000.

Scharre, Mark D.; Ewert, Warren M.; and Hunt, Harold R., to Phillips Petroleum Company. Method for making ether from a paraffin feedstock. 5,750,798, Cl. 568-697.000.

Schattauer, Jürgen: *See—*

Heinen, Horst; Rieck, Konrad; Kawka, Martin; and Schattauer, Jürgen, 5,749,576, Cl. 273-138.100.

Schaus, John M.: *See—*

Booher, Richard N.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,750,554, Cl. 514-397.000.

Schechinger, Elmer F.: *See—*

Eby, William H.; and Schechinger, Elmer F., 5,750,859, Cl. 800-200.000.

Eby, William H.; and Schechinger, Elmer F., 5,750,860, Cl. 800-200.000.

Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, to Hoechst AG. Abrasion-resistant fluoropolymer mixtures. 5,750,221, Cl. 428-35.700.

Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, to Hewlett-Packard Company. Ink recharger for inkjet print cartridge having sliding valve connectable to print cartridge. 5,751,320, Cl. 347-85.000.

Scheinmann, Feodor; Turner, Nicholas John; Carter, Neil Edward; and Brown, Richard Talbot, to Salford Ultrafine Chemicals and Research Limited. Enzymatic process formaking morphine-6-glucuronide or substituted morphine-6-glucuronide. 5,750,381, Cl. 435-128.000.

Schellhaass, Steven R., to Golden Valley Microwave Foods, Inc. Composition and method for flavoring popcorn product. 5,750,166, Cl. 426-93.000.

Schelter, Denise B.: *See—*

Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.

Schemmel, Terence D., to MKE-Quantum Components Colorado LLC. Flux enhanced write transducer and process for producing the same in conjunction with shared shields on magnetoresistive read heads. 5,751,526, Cl. 360-113.000.

Schenke, Bernd-Ulrich: *See—*

Buysch, Hans-Josef; Jansen, Ursula; Ooms, Pieter; Hoffmann, Erhard-Günther; and Schenke, Bernd-Ulrich, 5,750,801, Cl. 568-715.000.

Schering Akiengesellschaft: *See—*

Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, 5,750,342, Cl. 435-6.000.

Schering Aktiengesellschaft: *See—*

Huth, Andreas; and Turski, Lechoslaw, 5,750,525, Cl. 514-249.000.

Krüger, Martin; Seelen, Werner; and Turski, Lechoslaw, 5,750,526, Cl. 514-250.000.

Schering Corporation: *See—*

Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,750,745, Cl. 552-581.000.

Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 5,750,532, Cl. 514-274.000.

Schering-Plough HealthCare Products, Inc.: *See—*

Meyer, Thomas A.; Ando, Michael E.; and Powell, Jimmy B., 5,750,092, Cl. 424-59.000.

Scherninski, François: *See—*

Huynh, Anh Hoa; Tran, Joanne; Scherninski, François; and Guette, Jean-Paul, 5,750,722, Cl. 548-427.000.

Scherrer, Robert A.: *See—*

Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,134, Cl. 424-434.000.

Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., 5,750,136, Cl. 424-448.000.

Scherzinger, Werner, to Sipra Patententwicklungs- U. Beteiligungsgesellschaft MBH. Circular braiding machine with inner and outer spools arranged on circular track. 5,749,280, Cl. 87-48.000.

Schildkraut, Jay Stuart: *See—*

Gasper, John; and Schildkraut, Jay Stuart, 5,752,152, Cl. 399-366.000.

Schiller, Nicolas: *See—*

Goedicke, Klaus; Metzner, Christoph; Kirchhoff, Volker; Hempel, Wolfgang; and Schiller, Nicolas, 5,750,185, Cl. 427-8.000.

Schilling, Kevin H.: *See—*

Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., 5,750,732, Cl. 549-274.000.

Schinazi, Raymond F.: *See—*

Sommadossi, Jean-Pierre; and Schinazi, Raymond F., 5,750,493, Cl. 514-1.000.

Schindler, Anton: *See—*

Slepian, Marvin J.; and Schindler, Anton, 5,749,922, Cl. 623-1.000.

Schipper, John F.: *See—*

Janky, James M.; Klein, Eric A.; and Schipper, John F., 5,751,245, Cl. 342-357.000.

Schirmann, Jean-Pierre; Hub, Serge; and Lantz, Andre, to Elf Atochem S.A. Method for coproducing difluoromethane and 1,1,1,2-tetrafluoroethane. 5,750,810, Cl. 570-171.000.

Schlager, Kenneth J., to Instrumentation Metrics, Inc. Positive correlation filter systems and methods of use thereof. 5,750,994, Cl. 250-339.110.

Schlang, Martin: *See—*

Tresp, Volker; Schürmann, Bernd; and Schlang, Martin, 5,751,571, Cl. 364-148.000.

Schlegel, Max: *See—*

Werner, Jürg; and Schlegel, Max, 5,751,209, Cl. 340-286.050.

Schleicher, Andreas: *See—*

Scheckenbach, Helmut; Schleicher, Andreas; Kulpe, Jürgen; Neumann, Wolfgang; and Jansen, Bernd, 5,750,221, Cl. 428-35.700.

Schleicher, Werner; and Werner, Herbert, to Boehringer Ingelheim Vetmedica GmbH. Stabilized feed additive and process for the preparation thereof. 5,750,135, Cl. 424-442.000.

Schlickhoff, Reiner: *See—*

Schug, Heinrich; Schlickhoff, Reiner; and Pieper, Reinhold, 5,750,961, Cl. 219-497.000.

Schloesser, Ulrike; and Mayer, Udo, to BASF Aktiengesellschaft. Basic dyes based on amides of J-acid (1-hydroxy-6-aminonaphthalene-3-sulfonic acid) and amides of J-acid. 5,750,661, Cl. 534-604.000.

Schlotterer, John C.; and Elms, Robert T., to Eaton Corporation. Sure chip. 5,751,234, Cl. 341-139.000.

Schlumberger Industries, Inc.: *See—*

Swanson, Scott C., 5,750,983, Cl. 250-231.130.

Schmeisser, Heinz H.: *See—*

Johnson, Lawrence A.; and Schmeisser, Heinz H., 5,749,290, Cl. 100-207.000.

Schmid, Donald T. Insulated masonry member configured to compensate for mold wear. 5,749,191, Cl. 52-405.100.

Schmid, Friedbert: *See—*

Lang, Kurt; and Schmid, Friedbert, 5,749,216, Cl. 57-413.000.

Schmidt, Beat: *See—*

Maag, Hans; Rose, Samuel J.; and Schmidt, Beat, 5,750,343, Cl. 435-6.000.

Schmidt, Elke Maria: *See—*

  Hegner, Frank; Schmidt, Elke Maria; Drewes, Ulfert; and Martin, Rainer, 5,750,899, Cl. 73-756.000.
Schmidt, Frede. Control arrangement for a cooling apparatus. 5,749,238, Cl. 62-211.000.
Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Iron golf club head with dual intersecting recesses. 5,749,795, Cl. 473-350.000.
Schmidt, Helmut: *See—*
  Nass, Rüdiger; Aslan, Mesut; Albayrak, Sener; Schmidt, Helmut; and Arpac, Ertugrul, 5,750,193, Cl. 427-213.310.
Schmidt, Herbert: *See—*
  Fuller, Peter Armstrong; Schmidt, Herbert; Steiger, Debra Kay; and Grace, Dorman John, III, 5,750,853, Cl. 800-200.000.
Schmidt, Paul Herman; and Angus, John C., to Case Western Reserve University. Hydrogenated carbon composition. 5,750,210, Cl. 427-577.000.
Schmidt, Robert R.: *See—*
  Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
Schmieding, Reinhold: *See—*
  Bracy, Barton W.; and Schmieding, Reinhold, 5,749,878, Cl. 606-104.000.
Schmitt, Gary: *See—*
  Ritrosi, Joe; Schmitt, Gary; Quintino, Carl; and Kasper, Gerhard, 5,749,389, Cl. 137-15.000.
Schmitt, Jacques: *See—*
  Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, 5,749,985, Cl. 156-64.000.
Schmitt, William T.: *See—*
  Wissmann, Siegfried R.; Schmitt, William T.; and Murdock, David E., 5,750,158, Cl. 425-144.000.
Schmitt-Landsiedel, Doris: *See—*
  Von Basse, Paul-Werner; Bollu, Michael; Thewes, Roland; and Schmitt-Landsiedel, Doris, 5,751,742, Cl. 371-40.180.
Schmitz, Albert: *See—*
  Damsohn, Herbert; and Schmitz, Albert, 5,749,414, Cl. 165-178.000.
Schnee, Robert Alan. Navigation system for a marine vessel in low light conditions. 5,751,344, Cl. 348-113.000.
Schneider (Europe) A.G.: *See—*
  Cramer, Bernhard M., 5,749,858, Cl. 604-164.000.
Schneider, Charles W., Sr., to Cardi-Act, L.L.C. Patient-transport and treatment apparatus. 5,749,374, Cl. 128-870.000.
Schneider, Dan: *See—*
  Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, 5,750,342, Cl. 435-6.000.
Schneider Electric, S.A.: *See—*
  Suptitz, Eric; Blanchard, Pierre; and Collier, James, 5,751,284, Cl. 324-127.000.
Schneider, Fernand: *See—*
  Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, 5,750,706, Cl. 546-279.100.
Schnoes, Heinrich K.: *See—*
  DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,750,746, Cl. 552-653.000.
Schobert-Csongor, Desider G.; and Schott, Nick Reinhold, to Dynamic Mixers Inc. Satellite extruder arrangement for polymer melt mixing with a dynamic mixer. 5,749,649, Cl. 366-76.400.
Schock, Richard J., Jr.; and Brun, Charles J., Jr., to Electra Form, Inc. Quick change mold tooling. 5,750,161, Cl. 425-468.000.
Schödel, Dieter: *See—*
  Schaefer, Roland; Heindl, Detlef; Schödel, Dieter; Nuyken, Oskar; Böhner, Ralf; and Erdmann, Christoph, 5,750,590, Cl. 523-115.000.
Schodl, Richard: *See—*
  Roehle, Ingo; and Schodl, Richard, 5,751,410, Cl. 356-28.000.
Schoen, Neil C. Compact man-portable emergency oxygen supply system. 5,750,077, Cl. 422-122.000.
Schoenfelner, Barry A.: *See—*
  Akhavan-Tafti, Hashem; DeSilva, Renuka; Arghavani, Zahra; and Schoenfelner, Barry A., 5,750,698, Cl. 546-102.000.
Schoepp, Darryle D.: *See—*
  Monn, James A.; and Schoepp, Darryle D., 5,750,566, Cl. 514-510.000.
Scholefield, Christopher; and Gerhards, Ronald H., to Motorola, Inc. Method and apparatus for communicating in a wireless communication system. 5,752,193, Cl. 455-452.000.
Scholer, Raymond P.: *See—*
  Corbett, Tim J.; Scholer, Raymond P.; and Gonzalez, Fernando, 5,751,015, Cl. 257-48.000.
Scholtz, William Henry: *See—*
  Langberg, Ehud; and Scholtz, William Henry, 5,751,701, Cl. 370-281.000.
Scholz, Guido; and Pirig, Wolf-Dieter, to Hoechst Aktiengesellschaft. Expandable, flame-retardant coating compositions. 5,749,948, Cl. 106-18.150.
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., to Riker Laboratories, Inc. Bioadhesive composition and patch. 5,750,134, Cl. 424-434.000.
Scholz, Matthew T.; Scherrer, Robert A.; Marecki, Nelda M.; Chen, Yen-Lane; and Barkhaus, Joan K., to Riker Laboratories, Inc. Bioadhesive composition and patch. 5,750,136, Cl. 424-448.000.
Scholz, Volker: *See—*
  Friede, Dirk; Hage, Hermann; Herzner, Karl-Heinz; and Scholz, Volker, 5,751,750, Cl. 372-34.000.
Schomaker, Elwin; Bos, Johannes; and Middelhoek, Erik Leonard, to Nobelnv, Akzo. Use of synthetic granulate or powder for the removal of liquid, gaseous and/or dissolved constituents from a process stream. 5,750,030, Cl. 210-679.000.
Schönborn, Hartmut; Alschweig, Günther; Fuchs, Hans-Herbert; Hahnewald, Andrea; Auria, Augustin; and Carcia, Joseph Recarsens, to Braun Aktiengesellschaft. Electric pressing iron with coated soleplate. 5,749,165, Cl. 38-93.000.
Schoonover, Nicholas Jerome: *See—*
  Wilkinson, Paul Amba; Dieffenderfer, James Warren; Kogge, Peter Michael; and Schoonover, Nicholas Jerome, 5,752,067, Cl. 395-800.160.
Schott Glaswerke: *See—*
  Grabowski, Danuta; Kolberg, Uwe; Weitzel, Alwin; and Winkler-Trudewig, Magdalena, 5,750,448, Cl. 501-47.000.
Schott, Nick Reinhold: *See—*
  Schobert-Csongor, Desider G.; and Schott, Nick Reinhold, 5,749,649, Cl. 366-76.400.
Schouten, Frank, to Tebel-MKT B.V. Perforated drainage pipe for draining whey/curd mass. 5,749,287, Cl. 99-458.000.
Schreiber Foods, Inc.: *See—*
  Yee, Jeng-Jung; Bell, Lawrence I.; and Narasimmon, Raj G., 5,750,177, Cl. 426-582.000.
Schreiner, Gunter: *See—*
  Redecker, Klaus; Schreiner, Gunter; and Spranger, Wolfgang, 5,750,920, Cl. 149-11.000.
Schricker, David R., to Caterpillar Inc. Method for determining a remaining life of engine oil. 5,750,887, Cl. 73-117.300.
Schrier, Carla Christina, to Akzo Nobel N.V. Mild newcastle disease virus vaccine. 5,750,111, Cl. 424-214.100.
Schrock, Anthony W.: *See—*
  McIntyre, Dale F.; and Schrock, Anthony W., 5,752,115, Cl. 396-431.000.
Schrock, Anthony Ward, to Eastman Kodak Company. Driver circuit for a camera autofocus laser diode with provision for fault protection. 5,752,100, Cl. 396-129.000.
Schröder, Gunter-Rudolf; Mayer, Udo; Baus, Ulf; and Dix, Johannes Peter, to BASF Aktiengesellschaft. Oligomeric triarylmethane dyes. 5,750,742, Cl. 552-109.000.
Schröder, Klaus: *See—*
  Eckardt, Helmut; Schröder, Klaus; Ehritt, Jürgen; and Hübel, Uwe, 5,750,155, Cl. 425-130.000.
Schroeder, William: *See—*
  Nappi, Bruce; Schroeder, William; and Miller, James E., 5,751,260, Cl. 345-8.000.
Schroeppel, Edward A.; Prutchi, David; and Routh, André G., to Sulzer Intermedics Inc. Implantable medical device responsive to heart rate variability analysis. 5,749,900, Cl. 607-4.000.
Schroeppel, Edward A.; and Spehr, Paul R., to Sulzer Intermedics Inc. Transcutaneous energy coupling using piezoelectric device. 5,749,909, Cl. 607-33.000.
Schrum, David Keith: *See—*
  Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
Schuch, Wolfgang Walter: *See—*
  Bird, Colin Roger; Grierson, Donald; and Schuch, Wolfgang Walter, 5,750,865, Cl. 800-205.000.
Schug, Heinrich; Schlickhoff, Reiner; and Pieper, Reinhold, to Imation Corp. Method for controlling the actual temperature of an intermittently operated heating means, particularly of an electric heating means. 5,750,961, Cl. 219-497.000.
Schüler, Matthias: *See—*
  Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.
Schulkind, Richard L.: *See—*
  Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., 5,750,906, Cl. 73-863.730.
Schuller, Daniel J.: *See—*
  Wronkiewicz, Robert D.; Pitchford, Terry L.; Schuller, Daniel J.; and Vennen, Emmanuel Vander, 5,749,301, Cl. 105-199.300.
Schulman, Joseph H.; and Canfield, Lyle Dean, to Alfred E. Mann Foundation for Scientific Research. Hermetically sealed electrical feedthrough for use with implantable electronic devices. 5,750,926, Cl. 174-52.300.
Schultz, Christopher J.: *See—*
  Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
Schulz, David A.: *See—*
  Hecht, Daniel H.; and Schulz, David A., 5,750,058, Cl. 264-29.600.
Schulze, Dale R.; and McMillen, Troy A., to Ethicon Endo-Surgery, Inc. Suture cartridge assembly for a surgical knot. 5,749,898, Cl. 606-228.000.
Schulze, Mark H.: *See—*
  Guzinski, James A.; and Schulze, Mark H., 5,750,179, Cl. 426-600.000.
Schumacher, Martin: *See—*
  Rees, Volker; Schumacher, Martin; and Plettner, Horst, 5,750,949, Cl. 218-43.000.
Schumacher, Thomas R.: *See—*

  Bokelmann, Paul R.; Schumacher, Thomas R.; and Winberg, Arvid E., 5,749,204, Cl. 53-471.000.
Schürmann, Bernd: *See—*
  Tresp, Volker; Schürmann, Bernd; and Schlang, Martin, 5,751,571, Cl. 364-148.000.
Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., to Medtronic, Inc. Sheath system for autoperfusion dilatation catheter balloon. 5,749,852, Cl. 604-96.000.
Schwartz, Robert E., to Matrix Biotechnologies, Inc. Cartilage repair unit and method of assembling same. 5,749,874, Cl. 606-75.000.
Schwarz, Bernd: *See—*
  Jung, Joachim; and Schwarz, Bernd, 5,751,008, Cl. 250-504.00R.
Schwarz, Charles Raymond: *See—*
  Darty, Mark Anthony; Prickett, Guy Brent; and Schwarz, Charles Raymond, 5,752,047, Cl. 395-750.010.
Schwarz, Roland: *See—*
  Wendorff, Wilhard C.; Schwarz, Roland; and Amato, Guiseppe, 5,751,938, Cl. 395-182.080.
Schweid, Stuart A.: *See—*
  Williams, Dawn M.; and Schweid, Stuart A., 5,751,862, Cl. 382-260.000.
Schweitzer, James M.: *See—*
  Paroff, Paul J.; Christy, Orrin D.; Schweitzer, James M.; Matheis, Mark A., 5,751,307, Cl. 347-33.000.
Schweizer, Russell J.: *See—*
  Uzumcu, Albert I.; Malone, Matthew; and Schweizer, Russell J., 5,749,770, Cl. 451-28.000.
Schwenkler, Robert S. Method for precision cleaning and drying surfaces. 5,749,159, Cl. 34-426.000.
Schwiderski, Hans W., to Elsag International N.V. Magnetoinductive flow meter. 5,750,902, Cl. 73-861.120.
Scimed Life Systems, Inc.: *See—*
  Wang, Lixiao, 5,749,851, Cl. 604-96.000.
Scopazzi, Christopher: *See—*
  Barsotti, Robert John; and Scopazzi, Christopher, 5,750,619, Cl. 525-65.000.
Scott, Daniel B.; and Franklin, Michael S. Level mount and method of measuring the level of a member. 5,749,151, Cl. 33-370.000.
Scott, Noel D.: *See—*
  Olsen, Daniel M.; Scott, Noel D.; and Casey, Robert J., 5,751,291, Cl. 345-422.000.
Scott, Richard Mark; and Shaw, Robert William, to Shell Oil Company. Oil-soluble reaction products of polyenes. 5,750,640, Cl. 528-332.000.
Scott, Robert Earl; and Zuranski, Edward S., to Paradyne Corporation. Rapid startup protocol for communication between a plurality of modems. 5,751,796, Cl. 379-93.310.
Scott, Robert Earl, to Paradyne Corporation. Method and apparatus for sending faxes over analog cellular. 5,752,199, Cl. 455-557.000.
Scott Westlake: *See—*
  Johnson, Marc, 5,749,696, Cl. 414-635.000.
Scripps Research Institute, The: *See—*
  Nicolaou, K. C.; Nantermet, Philippe G.; Guy, Rodney K.; and Ueno, Hiroaki, 5,750,691, Cl. 544-238.000.
Seabright Corporation Limited: *See—*
  Georghiou, Paris, 5,750,577, Cl. 514-232.000.
Seagate Technology, Inc.: *See—*
  Anderson, David Bruce, 5,751,512, Cl. 360-78.040.
  Phan, Duc T.; and Pajdowski, Mark A., 5,751,513, Cl. 360-78.070.
Sealfon, Stuart C., to Mount Sinai School Of Medicine Of The City University Of New York. Cloning and expression of gonadotropin-releasing hormone receptor. 5,750,366, Cl. 435-69.100.
Sears, Jerome; Parfomak, Walter; Kluss, Walter J.; and Germinario, Michael, to AlliedSignal, Inc. Dynamic rate feedback PM motor starting technique. 5,751,131, Cl. 318-778.000.
Seaton, Robert W., Jr.: *See—*
  Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.
Seccia, Joseph Lee; and Twitchell, Edwin Ray, to Harris Corporation. Vestigial sideband test signal generator and method. 5,751,347, Cl. 348-181.000.
Seckler, Joachim; and Geiss, Klaus-Peter, to Daimler-Benz Aerospace AG. Warhead. 5,750,917, Cl. 102-476.000.
Secretary Of State For Defence In Her Britannic Majesty's Government Of The United Kingdom Of Great Britain And Northern Ireland, The: *See—*
  Squirrell, David J., 5,750,337, Cl. 435-6.000.
Securite et Signalisation: *See—*
  Migny, Philippe, 5,749,647, Cl. 362-248.000.
Seeger, Donald Edwin, to Breed Automotive Technology, Inc. Autoignition system for airbag inflator. 5,750,922, Cl. 149-24.000.
Seelen, Werner: *See—*
  Krüger, Martin; Seelen, Werner; and Turski, Lechoslaw, 5,750,526, Cl. 514-250.000.
Sega Enterprises, Ltd.: *See—*
  Couch, Johnny D.; and Huether, James L., 5,749,577, Cl. 273-148.00B.
  Nishimura, Eiji, 5,749,268, Cl. 74-473.00R.
Segami, Tetsuya: *See—*
  Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.
Segawa, Makoto: *See—*
  Kameda, Yasushi; and Segawa, Makoto, 5,751,035, Cl. 257-300.000.
Segebart, Robert Lee, to Pioneer Hi-Bred International, Inc. Inbred maize line PH80B. 5,750,834, Cl. 800-200.000.
SEH America, Inc.: *See—*
  Sakauchi, Kazuo; Hirano, Yoshihiro; and Uchikawa, Akira, 5,749,967, Cl. 117-200.000.
Seibold, Andrea: *See—*
  Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.
Seido, Nobuo: *See—*
  Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.
Seifert, Holger: *See—*
  Adams, Stefan; and Seifert, Holger, 5,750,586, Cl. 521-159.000.
Seiko Epson Corporation: *See—*
  Inazumi, Mitsuhiro, 5,751,904, Cl. 395-2.410.
  Inoue, Nozomu; Hama, Takashi; Nomura, Yujiro; and Takada, Kyu, 5,751,463, Cl. 359-205.000.
  Kobayashi, Koichi; Iwanami, Wataru; and Kanai, Taiyo, 5,750,241, Cl. 428-199.000.
  Komatsu, Hiroshi, 5,751,107, Cl. 313-496.000.
  Miyashita, Satoru; and Takemoto, Kiyohiko, 5,751,313, Cl. 347-45.000.
  Nakamura, Eri; and Nagasaka, Fumio, 5,752,036, Cl. 395-706.000.
  Odagiri, Hiroyuki; and Yasukawa, Naoaki, 5,749,366, Cl. 128-690.000.
  Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishibashi, Osamu, 5,750,592, Cl. 523-161.000.
  Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, 5,751,091, Cl. 310-339.000.
  Yoshiike, Etsuko; Takemoto, Kiyohiko; and Kubota, Kazuhide, 5,749,951, Cl. 106-31.270.
Seiko Instruments Inc.: *See—*
  Odagiri, Hiroyuki; and Yasukawa, Naoaki, 5,749,366, Cl. 128-690.000.
  Sato, Tadashi, 5,752,108, Cl. 396-310.000.
Seino, Toshiteru, to Ogura Clutch Co., Ltd. Electromagnetic coupling device. 5,751,202, Cl. 335-296.000.
Seitz, David R.: *See—*
  Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, 5,751,435, Cl. 358-299.000.
Seki, Seizo, to Sony Corporation. Packaging method and packaging structure for articles such as those having rectangular parallelepiped shape. 5,749,466, Cl. 206-387.100.
Sekiguchi, Kyoji: *See—*
  Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, 5,751,396, Cl. 351-221.000.
Sekiguchi, Yoshitoshi: *See—*
  Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu, 5,749,307, Cl. 110-222.000.
Sekimoto, Takao; Sakashita, Masahiro; Ando, Kenji; and Tsukada, Mitsushige, to Hitachi, Ltd. System and method for budget compilation under parallel/distributed processing. 5,752,233, Cl. 705-1.000.
Sekine, Noboru: *See—*
  Shimada, Takamichi; and Sekine, Noboru, 5,749,805, Cl. 477-116.000.
Sekine, Shinichi: *See—*
  Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
Sekisui Kagaku Kogyo Kabushiki Kaisya: *See—*
  Ishii, Tetsuya; Kuriwaki, Masashi; and Kubota, Yasuyuki, 5,749,363, Cl. 128-661.030.
Sekiyushigen Kaihatsu Kabushiki Kaisha: *See—*
  Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.
Selecman, George: *See—*
  Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.
Seliger, Hartmut: *See—*
  Rösch, Hannelore; Fröhlich, Anja; Ramalho-Ortigao, Jose Flavio; Montenarh, Matthias; and Seliger, Hartmut, 5,750,669, Cl. 536-24.300.
Sencorp: *See—*
  Remerowski, David L., 5,749,509, Cl. 227-10.000.
Sendai, Tomoko: *See—*
  Sato, Tatsushi; and Sendai, Tomoko, 5,751,589, Cl. 364-474.350.
Sendax, Victor. Dental implantation. 5,749,732, Cl. 433-174.000.
Sengupta, Ashok, to Minnesota Mining and Manufacturing Company. Water-based polyurethane polymer, release coating, adhesive tape and process of preparation. 5,750,630, Cl. 528-59.000.
Senju Pharmaceutical Co., Ltd.: *See—*
  Nakamura, Masayuki; Ogata, Kazumi; Sakaue, Takahiro; Saito, Noriko; and Iemura, Masahito, 5,750,516, Cl. 514-100.000.
Senoh, Hideaki: *See—*
  Ogawa, Susumu; Senoh, Hideaki; Andoh, Masaru; and Nomura, Hideki, 5,750,200, Cl. 427-361.000.
Senoo, Masaharu; Watanabe, Tatsuya; and Igarashi, Koichi. Water-soluble mutein of FGF receptor, DNA and production thereof. 5,750,371, Cl. 435-69.100.
Sensormatic Electronics Corporation: *See—*
  Ghaffari, Touraj, 5,751,220, Cl. 340-825.210.
Sensui, Takayuki: *See—*

- Takebayashi, Tatsuhide; and Sensui, Takayuki, 5,752,099, Cl. 396-114.000.
- Senter, John: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- Sentoku, Koichi: *See—*
  - Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; 'Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.
- Senyei, Andrew E.: *See—*
  - Nova, Michael P.; and Senyei, Andrew E., 5,751,629, Cl. 365-151.000.
- Seo, Young Woo: *See—*
  - Lee, Yong Hee; and Seo, Young Woo, 5,751,048, Cl. 257-412.000.
- Seong, Pil Young: *See—*
  - Kim, Young Hyeon; and Seong, Pil Young, 5,751,917, Cl. 395-89.000.
- Sequa Corporation: *See—*
  - Williams, Robert, 5,749,631, Cl. 198-441.000.
- Serhan, Charles N.: *See—*
  - Simchowitz, Louis; and Serhan, Charles N., 5,750,354, Cl. 435-7.240.
- Serizawa, Masahiro, to NEC Corporation. Speech pitch lag coding apparatus and method. 5,751,900, Cl. 395-2.160.
- Seshadri, Nambirajan; and Sundberg, Carl-Erik Wilhelm, to Lucent Technologies, Inc. Methods of and devices for enhancing communications that use spread spectrum technology. 5,751,739, Cl. 371-30.000.
- Setoguchi, Kazuhiro: *See—*
  - Watanabe, Kazuhiro; Oshima, Michihiro; Setoguchi, Kazuhiro; and Oda, Masaaki, 5,750,194, Cl. 427-216.000.
- Sette, Alessandro D.: *See—*
  - Fikes, John D.; Livingston, Brian D.; Sette, Alessandro D.; and Sidney, John C., 5,750,395, Cl. 435-325.000.
- Sevenhans, Jan: *See—*
  - Fensch, Thierry; and Sevenhans, Jan, 5,751,775, Cl. 375-371.000.
- Sexton, Frank M.; and Burkhalter, Swinton B. Life insurance method, and system. 5,752,236, Cl. 705-4.000.
- Sey, Jean-Claude; Vittoz, Daniel; and Lanaud, Christophe, to Thomson Television Components France. Degaussing coil. 5,751,206, Cl. 336-192.000.
- Seybold, James M., to NCR Corporation. System and method for assembling a part having a body and a cover having interference fit retaining pins and body shafts. 5,749,139, Cl. 29-525.000.
- Seybold, John L. C.: *See—*
  - Guzik, Kenneth J.; and Seybold, John L. C., 5,751,851, Cl. 382-179.000.
- Seyfert, Michael David: *See—*
  - Gullicksrud, John Theodore; Lidberg, Dale Joseph; and Seyfert, Michael David, 5,751,558, Cl. 361-801.000.
- Seyyedy, Mirmajid, to Micron Technology, Inc. Ferroelectric memory using ferroelectric reference cells. 5,751,626, Cl. 365-145.000.
- Sezi, Racai; Ahne, Hellmut; and Kuehn, Eberhard, to Siemens Aktiengesellschaft. Dicarboxylic acid derivatives. 5,750,711, Cl. 548-165.000.
- Sezi, Recai; Ahne, Hellmut; and Gestigkeit, Roland, to Siemens Aktiengesesllschaft. Method for the production of poly-o-hydroxyamides. 5,750,638, Cl. 528-310.000.
- SGS-Thomson Microelectronics, Inc.: *See—*
  - Bryant, Frank Randolph; and Nguyen, Loi Ngoc, 5,751,064, Cl. 257-752.000.
  - Petrosino, Gianluca, 5,751,641, Cl. 365-189.050.
- SGS-Thomson Microelectronics S.A.: *See—*
  - Fensch, Thierry; and Sevenhans, Jan, 5,751,775, Cl. 375-371.000.
  - Monier, Guy, 5,751,620, Cl. 364-746.100.
  - Nicolai, Jean, 5,751,940, Cl. 395-183.030.
  - Rault, Pierre, 5,751,531, Cl. 361-56.000.
- SGS-Thomson Microelectronics S.r.l.: *See—*
  - Pascucci, Luigi, 5,751,654, Cl. 365-230.060.
- Shackelford, Francis H., Jr. Watercraft lift. 5,749,313, Cl. 114-48.000.
- Shackelford, Kay Hunt: *See—*
  - Brink, Andrew Edwin; Pruett, Wayne Payton; Cherry, Clinton; and Shackelford, Kay Hunt, 5,750,635, Cl. 528-285.000.
- Shaffer, William R.: *See—*
  - Gates, Alfred S., Jr.; North, Bernard; and Shaffer, William R., 5,752,155, Cl. 419-5.000.
- Shaked, Dov; Banin, Amos; Moll, William F.; and Aguilar, Iwona M., to Oil-Dri Corporation of America. Clay activation with metal salts. 5,749,955, Cl. 106-287.170.
- Shakib, Darren Arthur; Rockenbeck, William H.; Benson, Max Loell; and Joshi, Milind Madhukar, to Microsoft Corporation. Method, computer program product, and system for creating and displaying a categorization table. 5,752,025, Cl. 395-613.000.
- Shaknovich, Alexander. Method and system for stent placement in ostial lesions. 5,749,890, Cl. 606-198.000.
- Shakuda, Yukio, to Rohm Co., Ltd. Semiconductor light emitting device and manufacturing method therefor. 5,751,752, Cl. 372-45.000.
- Shamouilian, Shamouil: *See—*
  - Kumar, Ananda H.; and Shamouilian, Shamouil, 5,751,537, Cl. 361-234.000.
- Shannon, Harlan E.: *See—*
  - Bymaster, Franklin Porter; and Shannon, Harlan E., 5,750,541, Cl. 514-318.000.
- Shannon, Robert V.: *See—*
  - Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.
- Shansun Technology Company, Ltd.: *See—*
  - Lai, Jing-Shiun, 5,752,116, Cl. 396-435.000.
  - Lai, Jing-Shiun, 5,752,118, Cl. 396-513.000.
- Shapland, J. Edward: *See—*
  - Hildebrand, Keith R.; and Shapland, J. Edward, 5,749,845, Cl. 604-21.000.
- Sharak, Matthew L.: *See—*
  - Blumenthal, Mitchell J.; Sharak, Matthew L.; and Paul, Charles W., 5,750,605, Cl. 524-230.000.
- Sharan, Sujit: *See—*
  - Ireland, P. J.; Rhodes, Howard; Sharan, Sujit; Sandhu, Sukesh; O'Brien, Tim; and Johnson, Tim, 5,750,012, Cl. 204-192.120.
- Sharkey, Hugh R.: *See—*
  - Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., 5,749,846, Cl. 604-22.000.
- Sharma, Ravi: *See—*
  - Texter, John; Sharma, Ravi; and Czekai, David Alan, 5,750,321, Cl. 430-449.000.
- Sharp, Gary D., to University of Colorado, The Board of Regents of the. Color polarizers for polarizing an additive color spectrum along a first axis and it's compliment along a second axis. 5,751,384, Cl. 349-18.000.
- Sharp Kabushiki Kaisha: *See—*
  - Higuchi, Kaoru; Ishii, Hiroshi; and Hanato, Hiroyuki, 5,751,331, Cl. 347-217.000.
  - Hotta, Yasuhiro, 5,751,657, Cl. 365-238.500.
  - Inamori, Yoshimitsu; and Oda, Koichi, 5,751,278, Cl. 345-211.000.
  - Kashiwagi, Kouichi; Masui, Toshiyuki; and Borden, George Rome, 5,751,285, Cl. 345-349.000.
  - Nakao, Tomoaki, 5,751,186, Cl. 327-562.000.
  - Nakatsu, Hiroshi; and Nakamura, Jun-ichi, 5,751,014, Cl. 257-25.000.
  - Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.
  - Sato, Yuji; and Tanaka, Manabu, 5,751,267, Cl. 345-96.000.
  - Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,184, Cl. 327-552.000.
  - Taka, Kyosuke; Masuda, Keiji; and Mukai, Kan, 5,751,431, Cl. 358-296.000.
  - Yamada, Nobuaki; Kondo, Masahiko; Okamoto, Masayuki; and Kozaki, Shuichi, 5,751,382, Cl. 349-12.000.
  - Yamanaka, Atsushi, 5,751,383, Cl. 349-13.000.
  - Yokota, Noriaki; and Okamura, Kouji, 5,751,673, Cl. 369-32.000.
  - Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,624, Cl. 364-841.000.
- Sharpe-Geisler, Bradley A.; and Moyer, Bryon I., to Advanced Micro Devices, Inc. Programmable logic device with multi-level power control. 5,751,164, Cl. 326-38.000.
- Shasha, Baruch S.; McGuire, Michael R.; and Behle, Robert W., to United States of America, Agriculture; and Biotechnnology Research & Development Corporation. Lignin-based pest control formulations. 5,750,467, Cl. 504-116.000.
- Shashkovsky, Sergei Gennadievich; Kamrukov, Alexander Semyonovich; Chepegin, Dmitry Vyacheslavovich; and Bandurkin, Victur Vladimirovich, to Woodford Trading Limited. Surface treatment of metals by shock-compressed plasma. 5,750,205, Cl. 427-535.000.
- Shasta Industries, Inc.: *See—*
  - Blake, Andy F.; and Tarr, William C., 5,750,022, Cl. 210-169.000.
- Shates, Steven C., to Modular Process Technology Corp. Process for depositing diamond and refractory materials. 5,749,966, Cl. 117-79.000.
- Shaw, Robert William: *See—*
  - Scott, Richard Mark; and Shaw, Robert William, 5,750,640, Cl. 528-332.000.
- Shaw, Sen-Yen. Illuminating timepiece. 5,751,662, Cl. 368-67.000.
- Shebanow, Michael C.: *See—*
  - Shen, Gene W.; Szeto, John; Patkar, Niteen A.; and Shebanow, Michael C., 5,751,985, Cl. 395-394.000.
- Sheen, Yong-Hoo; Park, Gwi-Tae; Yoo, Ji-Yoon; and Lee, Sang-Lak, to LG Electronics Inc. Capstan phase control method for video cassette tape recorder. 5,751,511, Cl. 360-73.110.
- Sheffield, Kim A., to Powersoft Corporation. Buffered database table interface object system. 5,752,018, Cl. 395-602.000.
- Shell Oil Company: *See—*
  - Baardman, Frank; and Jubb, Jayne, 5,750,642, Cl. 528-392.000.
  - Barton, Roger Edgar Charles; and Jordaan, Johannes Clemens Maria, 5,750,220, Cl. 428-35.700.
  - Crocker, Mark; and Herold, Rudolf Henri Max, 5,750,741, Cl. 549-525.000.
  - Diaz, Zaida; and Wilkey, John David, 5,750,032, Cl. 210-688.000.
  - Duh, Ben, 5,750,644, Cl. 528-481.000.
  - Gerard, Eric-Jack; De Keyzer, Noel Raymond Maurice; and Van De Vliet, Birgitte Maria Ludovica Christine, 5,750,607, Cl. 524-271.000.
  - Himes, Glenn Roy, 5,750,622, Cl. 525-92.00D.
  - Mace, Jean-Michel; and Moerenhout, Jacques, 5,750,268, Cl. 428-475.800.
  - Murata, Yasuyuki; and Nakanishi, Yoshinori, 5,750,631, Cl. 528-98.000.
  - Salanitro, Joseph Patrick, 5,750,364, Cl. 435-42.000.
  - Scott, Richard Mark; and Shaw, Robert William, 5,750,640, Cl. 528-332.000.
  - St. Clair, David John, 5,750,627, Cl. 525-162.000.

  - Van Der Steen, Frederik Hendrik; and Walhof, Judith Johanna Berendina, 5,750,055, Cl. 260-665.00R.
- Shelton, Lawrence S.: *See—*
  - Kish, Frederick A.; Eckmann, Elizabeth J.; and Shelton, Lawrence S., 5,749,692, Cl. 411-453.000.
- Shelton, Mark Alan: *See—*
  - Shelton, William Ewart Alan; and Shelton, Mark Alan, 5,749,531, Cl. 242-131.100.
- Shelton, William Ewart Alan; and Shelton, Mark Alan, to Alan Shelton Limited. Yarn creels. 5,749,531, Cl. 242-131.100.
- Shen, Chung-Shan. Pneumatic controlled infusion device. 5,749,854, Cl. 604-131.000.
- Shen, Gene W.; Szeto, John; Patkar, Niteen A.; and Shebanow, Michael C., to Hal Computer Systems, Inc. Processor structure and method for tracking instruction status to maintain precise state. 5,751,985, Cl. 395-394.000.
- Shen, Henry H.: *See—*
  - Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, 5,751,792, Cl. 379-89.000.
- Shen, William Wu: *See—*
  - Chen, Chin-Long; Hsiao, Mu-Yue; Lipponer, Walter Heinrich; and Shen, William Wu, 5,751,745, Cl. 371-51.100.
- Shen, Zhi-Yuan, to Du Pont de Nemours, E. I., and Company. Planar high temperature superconductor filters with backside coupling. 5,750,473, Cl. 505-210.000.
- Shenbar, Avinoam: *See—*
  - Sherman, Felix; Kuselman, Ilya; and Shenbar, Avinoam, 5,750,404, Cl. 436-42.000.
- Sheng, Thomas: *See—*
  - Chen, Philip L.; and Sheng, Thomas, 5,751,461, Cl. 359-201.000.
- Shepherd, Norman J.: *See—*
  - Morgan, Vincent J.; and Shepherd, Norman J., 5,749,731, Cl. 433-173.000.
- Sheppard, Robert E.: *See—*
  - Weber, Reinhart; and Sheppard, Robert E., 5,750,160, Cl. 425-290.000.
- Shepperd, Paul W., III; Becker, Larry W.; and Cundiff, Robert J., to Hoechst Celanese Corporation. Process for dye removal. 5,750,035, Cl. 210-719.000.
- Sheridon, Nicholas K., to Xerox Corporation. Pseudo-four color twisting ball display. 5,751,268, Cl. 345-107.000.
- Sherman, Felix; Kuselman, Ilya; and Shenbar, Avinoam. Reagent for the determination of water AMD ene-diols or thiols. 5,750,404, Cl. 436-42.000.
- Shewmaker, Christine K.; and Facciotti, Daniel, to Calgene, Inc. Methods and compositions for regulated transcription and expression of heterologous genes. 5,750,385, Cl. 435-172.300.
- Shewmaker, Christine K., to Calgene, Inc. Soluble solids modification using sucrose phosphate synthase encoding sequences. 5,750,869, Cl. 800-205.000.
- Shewmaker, Christine K.: *See—*
  - Stalker, David M.; Shewmaker, Christine K.; and Oakes, Janette V., 5,750,875, Cl. 800-205.000.
- Shiau, Ming-Jong; and Tippet, John C., to TRW Inc. Combline multiplexer with planar common junction input. 5,751,199, Cl. 333-134.000.
- Shibano, Yuji: *See—*
  - Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, 5,750,372, Cl. 435-69.100.
- Shibanuma, Takashi; Homoto, Yukio; Komatsu, Satoshi; and Yoshimura, Toshikazu, to Daikin Industries Ltd. Methods of producing 1,1,1,2,2-pentafluoroethane. 5,750,809, Cl. 570-169.000.
- Shibasaki, Souhei; Sawano, Yukio; Hanaoka, Shuzo; and Takano, Hiroyoshi, to Fuji Photo Film Co., Ltd. Printing method for recording apparatus with multiple print heads. 5,749,662, Cl. 400-82.000.
- Shibata, Akira: *See—*
  - Konno, Makoto; Shibata, Akira; Watanabe, Takashi; and Komatsu, Hisateru, 5,751,518, Cl. 360-104.000.
- Shibata, Alan: *See—*
  - Cowger, Bruce; Hall, Ronald W.; Gast, Paul D.; and Shibata, Alan, 5,751,300, Cl. 347-6.000.
- Shibata, Hideaki: *See—*
  - Saka, Yuuji; and Shibata, Hideaki, 5,749,739, Cl. 439-76.200.
- Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, to Taiho Pharmaceutical Co., Ltd. Cancer metastasis inhibitor. 5,750,515, Cl. 514-63.000.
- Shibata, Kazutaka, to Rohm Co. Ltd. Mold device and process for resin-packaging semiconductor devices. 5,750,153, Cl. 425-116.000.
- Shibata, Mitsuhiro: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
- Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, to Japan Tobacco Inc. Dioxacycloalkane compound having renin-inhibitory activity. 5,750,696, Cl. 544-374.000.
- Shibutani, Makoto; and Emura, Katsumi, to NEC Corporation. Optical transmission system and optical network terminals used therein. 5,751,455, Cl. 359-126.000.
- Shidara, Shinichi: *See—*
  - Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, 5,751,402, Cl. 355-40.000.
- Shido, Shunichi: *See—*
  - Kuroda, Ryo; and Shido, Shunichi, 5,751,686, Cl. 369-126.000.
- Shieh, Chan-Long: *See—*
  - Jiang, Wenhin; Shieh, Chan-Long; and Lebby, Michael S., 5,751,757, Cl. 372-50.000.
- Shieh, Jhy-Jer; and Tang, Dandas K., to Motorola, Inc. Input buffer circuit and method. 5,751,166, Cl. 326-71.000.
- Shield, Fred: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- Shiels, Martin A.; Cole, Richard S.; Rankin, Paul J.; and Freitag, Rosa, to U.S. Philips Corporation. Interactive entertainment personalisation. 5,751,953, Cl. 395-200.090.
- Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, to Hitachi, Ltd. Steam-turbine power plant and steam turbine. 5,749,228, Cl. 60-679.000.
- Shiga, Tsutomu: *See—*
  - Nagao, Yasuhiro; Shiga, Tsutomu; and Hayashi, Nobuyuki, 5,751,070, Cl. 290-46.000.
- Shih, I-Fu: *See—*
  - Vali, Victor; Shih, I-Fu; and Bates, Kenn S., 5,750,901, Cl. 73-800.000.
- Shih, Yung-Ho, to Microsoft Corporation. Method for calibrating touch panel displays. 5,751,276, Cl. 345-178.000.
- Shiino, Haruhiro; Yamaguchi, Norio; and Naoi, Toshimichi, to Oki Electric Industry Co., Ltd. Receiver for a digital communication system. 5,751,776, Cl. 375-371.000.
- Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, to Sumitomo Electric Industries, Ltd. Surface acoustic wave device and diamond base material for the same. 5,750,243, Cl. 428-216.000.
- Shim, Jae-ho: *See—*
  - Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, 5,750,296, Cl. 430-28.000.
- Shima, Koji; Hattori, Eiji; and Oguri, Yasuo, to Mitsubishi Chemical Corporation. Electroviscous fluid. 5,750,048, Cl. 252-71.000.
- Shimada, Takamichi; and Sekine, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling gear shift in automatic transmission. 5,749,805, Cl. 477-116.000.
- Shimadzu Corporation: *See—*
  - Iida, Atsuhiro; Yokota, Kazumi; Ikeda, Eiji; and Sasayama, Tomoki, 5,751,420, Cl. 356-328.000.
  - Shimizu, Koji, 5,751,145, Cl. 324-309.000.
- Shimakata, Masashi: *See—*
  - Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.
- Shimamune, Masayuki: *See—*
  - Yokoyama, Yuko; and Shimamune, Masayuki, 5,751,391, Cl. 349-153.000.
- Shimano Inc.: *See—*
  - Morimoto, Shinichi, 5,749,534, Cl. 242-288.000.
- Shimazu, Akira; Ikeda, Kenichi; and Hachisuka, Hisao, to Petroleum Energy Center. Method of selectively separating unsaturated hydrocarbon. 5,749,943, Cl. 95-50.000.
- Shimizu, Hiroyuki; Sano, Akira; and Matsuura, Kazuo, to Nippon Oil Co., Ltd. Catalyst composition and process for the production of olefinic polymers. 5,750,454, Cl. 502-114.000.
- Shimizu, Koji, to Shimadzu Corporation. MR imaging method and apparatus with water signal supression. 5,751,145, Cl. 324-309.000.
- Shimizu, Kunio: *See—*
  - Taniguchi, Tetsuya; Sasa, Nobumasa; and Shimizu, Kunio, 5,750,311, Cl. 430-253.000.
- Shimizu, Kuniyasu; and Hirayama, Hideaki, to Kabushiki Kaisha Toshiba. Minimum-delay recoverable disk control system using checkpoints and nonvolatile memory. 5,752,268, Cl. 711-162.000.
- Shimizu, Nobuo: *See—*
  - Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.
- Shimizu, Osamu: *See—*
  - Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, 5,750,238, Cl. 428-195.000.
- Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, to Daikin Industries, Ltd. Thermoplastic resin composition. 5,750,626, Cl. 525-151.000.
- Shimizu, Yoshitake: *See—*
  - Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; Kubo, Norio; Nagao, Kazuya; and Asano, Terumichi, 5,750,301, Cl. 430-106.600.
- Shimizugawa, Ryoichi: *See—*
  - Takehara, Hisao; Shimizugawa, Ryoichi; and Tokai, Toshihiko, 5,749,935, Cl. 71-62.000.
- Shimoda, Kenji; Abe, Shuji; and Kurihara, Kouichi, to Kabushiki Kaisha Toshiba. Variable length code recording/playback apparatus. 5,751,893, Cl. 386-111.000.
- Shimoda, Kenji: *See—*
  - Hirayama, Koichi; Nakai, Masatoshi; and Shimoda, Kenji, 5,751,892, Cl. 386-92.000.
- Shimogama, Shigeru; Nakajima, Hiroshi; and Matsumoto, Kazunori, to Matsushita Electric Industrial Co., Ltd. Safety circuit for teaching operation of robot. 5,751,918, Cl. 395-99.000.

- Shimojo, Shigeru: *See—*
  - Mimura, Tomio; Shimojo, Shigeru; Iijima, Masaki; and Mitsuoka, Shigeaki, 5,750,083, Cl. 423-228.000.
- Shimokawa, Kimiaki, to Oki Electric Industry Co., Ltd. Method and apparatus for polishing wafer. 5,749,772, Cl. 451-53.000.
- Shimomi, Akira: *See—*
  - Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.
- Shimosaka, Hirotaka; and Ihara, Keisuke, to Bridgestone Sports Co., Ltd. Wound golf ball. 5,749,796, Cl. 473-365.000.
- Shimotani, Hideo: *See—*
  - Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu, 5,749,307, Cl. 110-222.000.
- Shimotoyodome, Gyo; and Sugiura, Isao, to Beldex Corporation. Process for filling liquid crystal by gradually easing the level of negative pressure. 5,751,392, Cl. 349-187.000.
- Shimpuku, Takashi; and Atsumi, Nobukazu, to Chisso Corporation. Fiber-reinforced thermoplastic resin composite material. 5,750,616, Cl. 524-496.000.
- Shimura, Michio, to Advantest Corp. Pattern generator cicuit for semiconductor test systerm. 5,751,738, Cl. 371-27.700.
- Shin-Etsu Chemical Co., Ltd.: *See—*
  - Hatakeyama, Jun; Nagura, Shigehiro; Motomi, Kiyoshi; Nagata, Takeshi; and Ishihara, Toshinobu, 5,750,309, Cl. 430-170.000.
  - Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, 5,750,636, Cl. 528-310.000.
  - Maruyama, Naosuke; Kokubo, Hiroyasu; and Nakamura, Shin-Ichiro, 5,750,148, Cl. 424-494.000.
  - Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, 5,750,637, Cl. 528-310.000.
  - Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, 5,750,079, Cl. 422-138.000.
- Shin-Etsu Handotai Co., Ltd.: *See—*
  - Habuka, Hitoshi; Mayuzumi, Masanori; Tate, Naoto; and Katayama, Masatake, 5,749,974, Cl. 118-725.000.
  - Maruyama, Tamotsu; and Sato, Shigeyuki, 5,751,055, Cl. 257-618.000.
- Shinada, Makoto: *See—*
  - Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, 5,751,203, Cl. 336-65.000.
- Shindo, Tomoyuki: *See—*
  - Ogasawara, Jin; Higurashi, Seiji; Shindo, Tomoyuki; and Suwa, Tetsuya, 5,751,509, Cl. 360-70.000.
- Shinkai, Naruto: *See—*
  - Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.
- Shinn, Gregory B.: *See—*
  - Saxena, Sharad; Mozumder, Purnendu K.; Shinn, Gregory B.; and Taylor, Kelly J., 5,751,582, Cl. 364-468.160.
- Shinnumadate, Satomi: *See—*
  - Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.
- Shinohara, Junko: *See—*
  - Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, 5,751,890, Cl. 386-79.000.
- Shinohara, Masahiko: *See—*
  - Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.
- Shinomoto, Sayaka: *See—*
  - Furutani, Takahiro; Daimon, Hideo; Shinomoto, Sayaka; Miyata, Kazushi; and Mizumura, Tetsuo, 5,750,747, Cl. 554-36.000.
- Shinozuka, Masakazu; Miyazawa, Yoshinori; Fujino, Makoto; Ito, Tatsuya; and Ishibashi, Osamu, to Seiko Epson Corporation. Ink composition for ink jet recording. 5,750,592, Cl. 523-161.000.
- Shintani, Peter, to Sony Corporation. Viewing restricting method and viewing restricting apparatus. 5,751,335, Cl. 348-5.500.
- Shintani, Peter, to Sony Corporation. Picture receiving apparatus. 5,751,371, Cl. 348-564.000.
- Shinya, Nozomi; and Eda, Masami, to Minolta Co., Ltd. Powder filling method. 5,749,401, Cl. 141-80.000.
- Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Bayer Agrochem K.K. 1-heterocyclymethyl-2-halonitromethyl-imidazolines and-tetrahydropyrimidines. 5,750,704, Cl. 546-275.100.
- Shiomi, Motonobu: *See—*
  - Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.
- Shiomi, Yutaka: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
- Shiono, Katsuji: *See—*
  - Nakano, Tomoharu; and Shiono, Katsuji, 5,750,730, Cl. 549-229.000.
- Shira Computers Ltd.: *See—*
  - Lifshitz, Lior; and Wiesenberg, Raphael, 5,752,057, Cl. 395-785.000.
- Shirai, Naoki: *See—*
  - Murata, Jun; Shirai, Naoki; Nishimura, Yoshiaki; Ishihara, Yuzi; Mizoe, Kiyoshi; and Ashibe, Tsunenori, 5,751,801, Cl. 399-176.000.
- Shirai, Noriaki; Hibino, Katsuhiko; and Nishimura, Takao, to Denso Corporation. Obstacle warning system for a vehicle. 5,751,211, Cl. 340-435.000.
- Shiraishi, Takashi; Yamaguchi, Masao; and Fukutome, Yasuyuki, to Kabushiki Kaisha Toshiba. Multi-beam exposure unit. 5,751,462, Cl. 359-204.000.
- Shiraishi, Toshihiro: *See—*
  - Moriwake, Katsuakira; and Shiraishi, Toshihiro, 5,751,864, Cl. 382-276.000.
- Shirakata, Tizou: *See—*
  - Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, 5,751,924, Cl. 395-115.000.
- Shirane, Takashi: *See—*
  - Harada, Yasuhiro; Mori, Shinichiro; Hasegawa, Kayo; Kitagawa, Junichi; Inoue, Yoichiro; Kai, Eiichi; Sekine, Shinichi; Fukawa, Yuuzou; Shirane, Takashi; and Hamauji, Kazuhiro, 5,750,219, Cl. 428-35.700.
- Shirase, Takashi: *See—*
  - Kimura, Yasuki; Shirase, Takashi; Okamura, Masamitsu; and Maezono, Shuichi, 5,749,760, Cl. 445-4.000.
- Shiratori, Tsutomu, to Canon Kabushiki Kaisha. Overwritable magnetooptical recording method in which the recording medium is cooled after irradiation. 5,751,669, Cl. 369-13.000.
- Shiroishi, Yoshihiro: *See—*
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
- Shiromoto, Yoshio: *See—*
  - Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, 5,751,924, Cl. 395-115.000.
- Shirosaki, Akimitsu; and Toshiaki, Matsushima, to Mutoh Industries Ltd. Control method for paper-driven type automatic drafting machine. 5,751,297, Cl. 346-136.000.
- Shiseido Company, Ltd.: *See—*
  - Tomomasa, Satoshi; Nanba, Tomiyuki; and Soyama, Yoshikazu, 5,750,094, Cl. 424-64.000.
- Shitara, Kenya; Hanai, Nobuo; Hasegawa, Mamoru; Miyaji, Hiromasa; and Kuwana, Yoshihisa, to Kyowa Hakko Kogyo Co., Ltd. Process for producing humanized chimera antibody. 5,750,078, Cl. 424-133.100.
- Shiuey, Shian-Jan: *See—*
  - Baggiolini, Enrico Giuseppe, deceased; Shiuey, Shian-Jan; and Uskokovic, Milan Radoje, 5,750,517, Cl. 514-167.000.
- Shmuel Hershkovit: *See—*
  - Shpater, Pinhas, 5,751,803, Cl. 379-379.000.
- Shochat, Michael: *See—*
  - Rabinovich, Pavel; Shochat, Michael; Zeldin, Vladimir; and Milman, Oscar, 5,749,369, Cl. 128-734.000.
- Shoemaker, Michael B.: *See—*
  - Quinn, Michael; and Shoemaker, Michael B., 5,751,972, Cl. 395-200.100.
- Shoji, Takashi: *See—*
  - Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,750,271, Cl. 428-624.000.
- Shon, Moon Kyu: *See—*
  - Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Y-on Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.
- Shor, Joseph; Engel, Eytan; and Baron, Natan, to Motorola, Inc. Apparatus and method for shifting signal levels. 5,751,178, Cl. 327-333.000.
- Shortt, James Joseph; and Lavelle, Shay Joseph, to Square D Company. Circuit breaker. 5,749,751, Cl. 439-721.000.
- Shoshi, Masayuki: *See—*
  - Kawahara, Megumi; Yamada, Ikuko; Shoshi, Masayuki; and Kojima, Akio, 5,750,762, Cl. 558-423.000.
- Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, to Yozan Inc.; and Sharp Kabushiki Kaisha. Low electrical power consumption filter circuit. 5,751,184, Cl. 327-552.000.
- Shou, Guoliang: *See—*
  - Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,624, Cl. 364-841.000.
- Showa Aluminum Corporation: *See—*
  - Hirano, Hirosaburo; Yamamoto, Yuji; and Ito, Shinji, 5,749,144, Cl. 29-890.04L.
- Showa Denko K.K.: *See—*
  - Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,750,271, Cl. 428-624.000.
  - Miyata, Hideo; Sasaki, Toru; and Morikawa, Kohei, 5,750,774, Cl. 562-17.000.
- Shpater, Pinhas, to Shmuel Hershkovit. Telephone line coupler. 5,751,803, Cl. 379-379.000.
- Shudo, Koichi: *See—*
  - Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, 5,750,515, Cl. 514-63.000.
- Shuknecht, Lee N., to Lee Shuknecht & Sons, Inc. Finish topping machine for bulb crops. 5,750,171, Cl. 426-481.000.
- Shung-Tai, Ho: *See—*
  - Yoa-Pu, Hu Oliver; Wang, Jhi-Joung; and Shung-Tai, Ho, 5,750,534, Cl. 514-282.000.
- Shuttleworth, Leslie: *See—*
  - Scaringe, Raymond Peter; Miller, David Darrell; Brick, Mary Christine; Shuttleworth, Leslie; Helber, Margaret Jones; and Evans, Steven, 5,750,323, Cl. 430-512.000.

- Shyu, Tai-Ching; Chen, Datong; and Liu, Jun, to OmniVision Technologies, Inc. Charge amplifier for MOS imaging array and method of making same. 5,751,189, Cl. 330-9.000.
- SI Diamond Technology, Inc.: *See—*
  - Hammond, Mark S.; and McClain, Timothy W., 5,750,207, Cl. 427-576.000.
- Siak, June-Sang; Biederman, Scott William; Whited, William Thomas; and Datte, Mark Allen, to General Motors Corporation. Method of forming refractory coated foundry core. 5,749,409, Cl. 164-23.000.
- Sibbald, Alastair: *See—*
  - Philp, Adam Rupert; Sibbald, Alastair; Clemow, Richard David; and Nackvi, Fawad, 5,751,815, Cl. 381-17.000.
- Sicce S.p.A.: *See—*
  - Pettenon, Paolo, 5,750,023, Cl. 210-169.000.
- Sickert, Armin: *See—*
  - Blum, Harald; Sickert, Armin; and Hovestadt, Wieland, 5,750,613, Cl. 524-457.000.
- Sidhu, Kanwar Pal Singh: *See—*
  - Murthy, K.S. Keshava; Weeratunga, Gamini; Radatus, Bruno Konrad; and Sidhu, Kanwar Pal Singh, 5,750,714, Cl. 548-205.000.
- Sidney, John C.: *See—*
  - Fikes, John D.; Livingston, Brian D.; Sette, Alessandro D.; and Sidney, John C., 5,750,395, Cl. 435-325.000.
- Sidot, Christian; and Tarlier, Michel, to Societe Francaise Hoechst. Sodium orthohydroxymandelate/phenol/water complex, preparation process and use for isolation of sodium orthohydroxymandelate. 5,750,775, Cl. 562-470.000.
- Siegle, Gert; Braegas, Peter; Kaesser, Jürgen; and Suchowerskyj, Wadym, to Robert Bosch GmbH. Radio receiver, in particular a vehicle radio receiver. 5,752,177, Cl. 455-186.100.
- Siekmann, Dirk Johannes: *See—*
  - Ratzel, Richard O.; and Siekmann, Dirk Johannes, 5,749,539, Cl. 242-598.300.
- Siemens Aktiengesellschaft: *See—*
  - Doemens, Günter; and Gilch, Markus, 5,750,904, Cl. 73-862.623.
  - Geib, Heribert, 5,751,357, Cl. 348-400.000.
  - Hüttenhofer, Klaus; Herr, Wolfgang; Sprehe, Josef; and Spielmann, Horst, 5,749,651, Cl. 366-181.500.
  - Loebig, Norbert, 5,751,574, Cl. 364-187.000.
  - Maggioni, Christoph; and Wirtz, Brigitte, 5,751,843, Cl. 382-154.000.
  - Neudecker, Albrecht, 5,751,196, Cl. 331-47.000.
  - Operschall, Hermann; Weber, Jakob; Steiner, Klaus-Alfred; and Ring, Stefan, 5,749,470, Cl. 209-2.000.
  - Sezi, Recai; Ahne, Hellmut; and Kuehn, Eberhard, 5,750,711, Cl. 548-165.000.
  - Tresp, Volker; Schürmann, Bernd; and Schlang, Martin, 5,751,571, Cl. 364-148.000.
  - Von Basse, Paul-Werner; Bollu, Michael; Thewes, Roland; and Schmitt-Landsiedel, Doris, 5,751,742, Cl. 371-40.180.
  - Vongehr, Otto, 5,751,566, Cl. 363-71.000.
- Siemens Aktiengesesllschaft: *See—*
  - Sezi, Recai; Ahne, Hellmut; and Gestigkeit, Roland, 5,750,638, Cl. 528-310.000.
- Siemens Components, Inc.: *See—*
  - Whitney, David, 5,750,414, Cl. 437-154.000.
- Siemens Energy & Automation, Inc.: *See—*
  - Trainor, John J.; Laplace, Carl J.; Kinney, Michael A.; and Reilly, Joseph F., 5,751,222, Cl. 340-825.050.
- Siemens Stromberg-Carlson: *See—*
  - Zeitler, Walter; and Gabriel, Ernst, 5,751,120, Cl. 315-307.000.
- Siemers, David C.: *See—*
  - Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.
- Sievers Instruments, Inc.: *See—*
  - Godec, Richard D.; Kosenka, Paul P.; and Hutte, Richard S., 5,750,073, Cl. 422-79.000.
- Signal Lux S.p.A.: *See—*
  - Gallone, Flavio, 5,749,749, Cl. 439-617.000.
- Signtech USA, Ltd.: *See—*
  - Gandy, James; Ahmed, Jubayer; and Janysek, Don Ray, 5,751,308, Cl. 347-33.000.
- Sikorsky Aircraft Corporation: *See—*
  - Kearney, Hugh L.; Isabelle, Charles J.; Kish, Jules G.; and Noehren, William L., 5,749,449, Cl. 192-41.00S.
- Silberschatz, Abraham: *See—*
  - Mumick, Inderpal Singh; and Silberschatz, Abraham, 5,751 798, Cl. 379-112.000.
- Silicon Graphics, Inc.: *See—*
  - Abbott, Michael J.; Close, Paul; and Smith, Kevin P., 5,751,280, Cl. 345-302.000.
- Siliconix Incorporated: *See—*
  - Hshieh, Fwu-Iuan; Chang, Mike F.; Van der Linde, Jan; and Ho, Yueh-Se, 5,750,416, Cl. 437-40.0AS.
  - Yilmaz, Hamza; Williams, Richard K.; Cornell, Michael E.; and Chen, Jun Wei, 5,751,054, Cl. 257-603.000.
- Sillanpää , Anna: *See—*
  - Ahvenainen, Jouko; and Sillanpää , Anna, 5,752,196, Cl. 455-518.000.
- Silva, David J., to AST Research, Inc. Printed circuit board having a triple pattern footprint for receiving one of three component packages. 5,751,557, Cl. 361-777.000.
- Silverbrook, Kia; and Naylor, William Clark, Jr., to Canon Kabushiki Kaisha. Display pixel balancing for a multi color discrete level display. 5,751,272, Cl. 345-149.000.
- Silverman, Kim Ernest Alexander, to Nynex Science & Technology. Method for synthesizing speech from text and for spelling all or portions of the text by analogy. 5,751,906, Cl. 395-2.690.
- Silverman, Ralph H.: *See—*
  - Goodheart, Clyde R.; and Silverman, Ralph H., 5,750,378, Cl. 435-70.300.
- Silverstein, Louis D.: *See—*
  - Crawford, Gregory P.; Fiske, Thomas G.; and Silverstein, Louis D., 5,751,390, Cl. 349-120.000.
- Simak, Thomas: *See—*
  - Khutoryansky, Oscar; Bleser, Dennis; Kojro, Allan; Simak, Thomas; and Rosevear, Thomas, 5,751,788, Cl. 378-197.000.
- Simar, Laurence R.: *See—*
  - Leach, Jerald G.; Simar, Laurence R.; Davis, Alan L.; and Tatge, Reid E., 5,751,991, Cl. 395-421.040.
- Simchowitz, Louis; and Serhan, Charles N., to Brigham and Women's Hospital. Lipoxin transport system and uses therefor. 5,750,354, Cl. 435-7.240.
- Simm, Hans-Peter: *See—*
  - Dörner, Stefan; Kemker, Uwe; Simm, Hans-Peter; and Lapp, Oliver, 5,749,285, Cl. 99-348.000.
- Simmons Company: *See—*
  - Mauldin, Michael W.; and Kuchel, Bernhard W., 5,749,133, Cl. 29-91.100.
- Simmons, James A., to Ranpak Corp. Cushioning conversion system for converting paper stock into cushioning material with a staging area and a pick and place assembly. 5,749,821, Cl. 493-3.000.
- Simon, Georges: *See—*
  - Mornay, Emmanuel; and Simon, Georges, 5,750,916, Cl. 89-33.170.
- Simon, Jaime: *See—*
  - Kiefer, Garry E.; Simon, Jaime; and Garlich, Joseph R., 5,750,660, Cl. 534-10.000.
- Simplex Time Recorder Company: *See—*
  - Winterble, Charles; Nelson, Wayne; and Stanley, Lawrence G., 5,751,218, Cl. 340-693.000.
- Simplicean, Ionel Eugene: *See—*
  - Heath, Gerald Arthur; Obriot, Kelly Michael; Simplicean, Ionel Eugene; and Stancu, Sorin, 5,749,629, Cl. 297-411.360.
- Simpson, Elizabeth A.: *See—*
  - Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., 5,750,413, Cl. 436-537.000.
- Simpson, Elizabeth Shearer Currie: *See—*
  - Jones, Raymond Vincent Heavon; and Simpson, Elizabeth Shearer Currie, 5,750,740, Cl. 549-519.000.
- Simpson, Michael P.: *See—*
  - Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
- Simpson, Richard J.: *See—*
  - Van Snick, Jacques; Uyttenhove, Catherine; and Simpson, Richard J., 5,750,377, Cl. 435-70.300.
- Simpson, Richard John: *See—*
  - Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.
- SIMS Deltec, Inc.: *See—*
  - Glantz, Jerald, 5,749,835, Cl. 600-424.000.
- Sinclair, James D.: *See—*
  - Fiorino, Mary E.; Frankenthal, Robert P.; and Sinclair, James D., 5,750,071, Cl. 422-7.000.
- Singer Company N.V., The: *See—*
  - Kobayashi, Hideyuki; and Toda, Koichi, 5,749,311, Cl. 112-240.000.
- Singh, Jagdish P.; Yueh, Fang-Yu; Cook, Robert L.; and Zhang, Hansheng, to Mississippi State University. Analytical method using laser-induced breakdown spectroscopy. 5,751,416, Cl. 356-311.000.
- Singh, Parminder: *See—*
  - Roberts, Michael Stephen; Cross, Sheree Elizabeth; and Singh, Parminder, 5,750,141, Cl. 424-449.000.
- Sipos, Tibor, to Digestive Care Inc. High buffer-containing enteric coating digestive enzyme bile acid compositions and method of treating digestive disorders therewith. 5,750,104, Cl. 424-94.210.
- Sipra Patententwicklungs- U. Beteiligungsgesellschaft MBH: *See—*
  - Scherzinger, Werner, 5,749,280, Cl. 87-48.000.
- Sisti, Nicholas J., to NaPro BioTherapeutics, Inc. Method for acylating 10-deacetylbaccatin III selectively at the c-10 position. 5,750,736, Cl. 549-510.000.
- Sisti, Nicholas J.; and Swindell, Charles S. Method for paclitaxel synthesis. 5,750,737, Cl. 549-510.000.
- Sita, Lewis Henry: *See—*
  - Macauley, Richard Peter; Sita, Lewis Henry; and Stokesbury, Elwood Lamar, 5,750,226, Cl. 428-36.400.
- Sivavec, Timothy Mark, to General Electric Company. Composition and method for ground water remediation. 5,750,036, Cl. 210-747.000.
- Siviero, Enrico: *See—*

- Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.
- Sizer, Charles E.: *See—*
  - Botos, Matthew J.; Sizer, Charles E.; and Palanipian, Sevugan, 5,750,907, Cl. 73-865.800.
- Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, to Smith & Nephew, Inc. Surgical instrument with embedded coding element. 5,749,885, Cl. 606-170.000.
- Skaling, Tim. Device for home roasting of coffee beans. 5,749,288, Cl. 99-483.000.
- Skalski, Clement A., to Otis Elevator Company. Contactless slide guide for elevators. 5,749,444, Cl. 187-409.000.
- Skillicorn, Brian: *See—*
  - Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
- Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, to General Electric Company. Combined brush seal and labyrinth seal segment for rotary machines. 5,749,584, Cl. 277-53.000.
- Skinner, Gregory C.; and Cox, Gaylen J. Dental absorbency device. 5,749,729, Cl. 433-136.000.
- Skinner, Larkin P. Assembly of corrugated panels into a web. 5,749,998, Cl. 156-265.000.
- Skitka, John Nicholas: *See—*
  - Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, 5,751,875, Cl. 385-84.000.
- Skubic, Robert L.: *See—*
  - Erickson, Paul R.; Kleve, Brian W.; Schaffer, Robert; Lidke, Steven L.; and Skubic, Robert L., 5,751,303, Cl. 347-16.000.
- Skutnik, Bolesh J.: *See—*
  - Krivoshlykov, Sergej G.; and Skutnik, Bolesh J., 5,751,871, Cl. 385-33.000.
- SKW Trostberg Aktiengesellschaft: *See—*
  - Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, 5,750,634, Cl. 528-254.000.
  - Heidlas, Jurgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rudiger, 5,750,180, Cl. 426-614.000.
- Slane, Albert A.: *See—*
  - Delp, Gary S.; Leichty, Philip L.; and Slane, Albert A., 5,752,078, Cl. 395-827.000.
- Slaoui, Moncef: *See—*
  - Prieels, John Paul; Garcon-Johnson, Nathalie Marie-Josephe Claude; Slaoui, Moncef; and Pala, Pietro, 5,750,110, Cl. 424-208.100.
- Slaughter, Joseph H.: *See—*
  - Heminger, David M.; and Slaughter, Joseph H., 5,751,025, Cl. 257-173.000.
- Sledziewski, Andrzej Z.; Bell, Lillian Anne; and Kindsvogel, Wayne R., to ZymoGenetics, Inc. Methods of producing secreted receptor analogs and biologically active dimerized polypeptide fusions. 5,750,375, Cl. 435-69.700.
- Slepian, Marvin J., to Focal, Inc. Polymeric endoluminal paving process. 5,749,915, Cl. 623-1.000.
- Slepian, Marvin J.; and Schindler, Anton, to Endoluminal Therapeutics, Inc. Biodegradable polymeric endoluminal sealing process, apparatus and polymeric products for use therein. 5,749,922, Cl. 623-1.000.
- Sliwa, John W., Jr.; Jung, Michelle L.; Chandler, Paul E.; Hanafy, Amin M.; and Napolitano, David J., to Acuson Corporation. Method and apparatus for mapping pressure and tissue properties. 5,749,364, Cl. 128-662.020.
- Sloan, Charles L.: *See—*
  - Bridgham, John A.; Brandis, John; Leong, John; Hoeprich, Paul D., Jr.; Sloan, Charles L.; O'Neill, Roger A.; and Andre, Charles, 5,750,346, Cl. 435-6.000.
- Sloan-Kettering Institute for Cancer Research: *See—*
  - Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Krzeminski, Jacek; and Nawrot, Barbara, 5,750,675, Cl. 536-27.210.
- Sluiter, David O.: *See—*
  - Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., 5,751,295, Cl. 345-501.000.
- Smart, Neil Graham, to British Nuclear Fuels plc. Solvent extraction of metal containing species. 5,750,081, Cl. 423-3.000.
- SMC Corporation: *See—*
  - Hayashi, Bunya; Asou, Yoshio; and Ishikawa, Makoto, 5,749,395, Cl. 137-596.160.
- Smetana, Alfred J.: *See—*
  - Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.
- SMH Management Services AG: *See—*
  - Cuche, Cyril, 5,749,128, Cl. 24-71.00J.
- Smierciak, Edward A.: *See—*
  - Traina, John E.; Myers, Richard; and Smierciak, Edward A., 5,751,423, Cl. 356-338.000.
- Smith, Alan Edward: *See—*
  - Cheng, Seng Hing; Fang, Shaona Lee; Hoppe, Henry, IV; and Smith, Alan Edward, 5,750,571, Cl. 514-557.000.
- Smith & Nephew Group Research Centre: *See—*
  - Miller, Nigel David, 5,749,843, Cl. 602-75.000.
- Smith & Nephew, Inc.: *See—*
  - Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, 5,749,885, Cl. 606-170.000.
- Smith, David Fletcher: *See—*
  - Prieto, Pedro Antonio; Smith, David Fletcher; Cummings, Richard Dale; Kopchick, John Joseph; Mukerji, Pradip; Moremen, Kelley Wilson; and Pierce, James Michael, 5,750,176, Cl. 426-580.000.
- Smith, David L., to McIntosh Laboratory, Inc. Speaker system with reconfigurable, high-frequency dispersion pattern. 5,751,821, Cl. 381-90.000.
- Smith, Dennis Edward: *See—*
  - Melpolder, Sharon Marilyn; Smith, Dennis Edward; Wheeler, Christopher Edwin; and Muehlbauer, John Leonard, 5,750,328, Cl. 430-619.000.
- Smith, Derek J.: *See—*
  - Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.
- Smith, Douglas John: *See—*
  - Crowley, Patrick Jelf; Lawson, Kevin Robert; Smith, Douglas John; and Moseley, Donn Warwick, 5,750,778, Cl. 562-605.000.
- Smith, Douglas M. Method of producing linerless thermal labels. 5,750,192, Cl. 427-208.000.
- Smith, Douglas M.: *See—*
  - Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,750,415, Cl. 437-195.000.
- Smith, Francis J.: *See—*
  - Pressey, James; Koralek, Richard; and Smith, Francis J., 5,751,769, Cl. 375-235.000.
- Smith, Frank: *See—*
  - Hoerner, Brian; Quan, Kam; and Smith, Frank, 5,751,134, Cl. 320-21.000.
- Smith, Gordon J.; and Ottesen, Hal Hjalmar, to International Business Machines Corporation. Method and apparatus for restoring a thermal response signal of a magnetoresistive head. 5,751,510, Cl. 360-67.000.
- Smith, Gordon J.: *See—*
  - Ottesen, Hal Hjalmar; Smith, Gordon J.; and Van Leeuwen, George Willard, 5,751,883, Cl. 386-27.000.
- Smith, Graham: *See—*
  - Sjostrom, Douglas D.; Fritschy, Michael A.; Cesarini, Peter M.; Grinberg, Alexander; McGee, William G.; and Smith, Graham, 5,749,885, Cl. 606-170.000.
- Smith, James S.; Levasseur, Glenn N.; Chapman, John H.; Link, Daniel J.; and Didona, Kevin M., to Electric Boat Corporation. Steam seal air removal system. 5,749,227, Cl. 60-657.000.
- Smith, Jane: *See—*
  - Dietrich, Gabriele; Smith, Jane; and Peng, Jianying, 5,750,866, Cl. 800-205.000.
- Smith, J. Bruce, to Thomas Jefferson University. Methods for identifying fetal cells. 5,750,339, Cl. 435-6.000.
- Smith, Jeff: *See—*
  - Mick, John; Miller, Michael; Smith, Jeff; and Baumann, Mark, 5,751,638, Cl. 365-189.040.
- Smith, John Cyrus, Jr.: *See—*
  - LeGrow, Gary Edward; and Smith, John Cyrus, Jr., 5,750,098, Cl. 424-70.120.
- Smith, Kelly L.; and Herbig, Scott H., to Bend Research, Inc. Labile insecticide compositions. 5,750,126, Cl. 424-405.000.
- Smith, Kevin P.: *See—*
  - Abbott, Michael J.; Close, Paul; and Smith, Kevin P., 5,751,280, Cl. 345-302.000.
- Smith, Lee A.: *See—*
  - Blake, Russ; Baghai, M. Reza; and Smith, Lee A., 5,752,038, Cl. 395-709.000.
- Smith, Lee M.; Benner, Robert E.; Christensen, Douglas A.; Harris, Joel M.; Johnson, Carl W.; and Rallison, Richard D., to Process Instruments, Inc. Raman spectroscopy apparatus and method for continuous chemical analysis of fluid streams. 5,751,415, Cl. 356-301.000.
- Smith, Matthew W., to Microsoft Corporation. Resizing a window and an object on a display screen. 5,751,283, Cl. 345-342.000.
- Smith, Paul K.: *See—*
  - Acharya, A. Seetharama; Manjula, Belur N.; and Smith, Paul K., 5,750,725, Cl. 548-545.000.
- Smith, Robert, to Inalfa Industries B.V. Opening roof for a vehicle. 5,749,621, Cl. 296-219.000.
- Smith, Robert A.: *See—*
  - Hall, George R.; Barnett, Daniel C.; Smith, Robert A.; and Jewett, Scotty Y., 5,750,408, Cl. 436-137.000.
- Smith, Rodney A.: *See—*
  - Redpath, Richard J.; and Smith, Rodney A., 5,752,055, Cl. 395-777.000.
- Smith, Stephen Lee, to Motorola. Computational array with self timed computational element and method of self timed calculation. 5,752,012, Cl. 395-559.000.
- SmithKline Beecham Biologicals, s.a: *See—*
  - Prieels, John Paul; Garcon-Johnson, Nathalie Marie-Josephe Claude; Slaoui, Moncef; and Pala, Pietro, 5,750,110, Cl. 424-208.100.
- SmithKline Beecham, p.l.c.: *See—*
  - Clark, Dennis Edward; Malik, Shaukat Hussain; Butterly, Paul Gerard; Badman, Clive Elton; and Haseler, Jeffrey David, 5,750,685, Cl. 540-349.000.

  - Hodgson, John Edward; and Lawlor, Elizabeth Jane, 5,750,387, Cl. 435-183.000.
- SmithKline Beecham plc: *See—*
  - Beeley, Lee James; and Dean, David Kenneth, 5,750,701, Cl. 546-157.000.
- Smiths Industries PLC: *See—*
  - Olney, Gifford James, 5,749,225, Cl. 60-477.000.
- Smooha, Yehuda: *See—*
  - Chittipeddi, Sailesh; Cochran, William Thomas; and Smooha, Yehuda, 5,751,065, Cl. 257-758.000.
- Smrt, Thomas J. Marking device with distance measuring capability. 5,749,522, Cl. 239-71.000.
- SMV America, Inc.: *See—*
  - McCroskey, William K.; and Vickers, David S., 5,751,000, Cl. 250-363.030.
- Smyk, Darek Andrew, to Bell Communications Research, Inc. Integrated internet system for translating logical addresses of internet documents to physical addresses using integrated service control point. 5,751,961, Cl. 395-200.470.
- Snamprogetti S.p.A.: *See—*
  - Rescalli, Carlo, 5,750,780, Cl. 564-67.000.
- Snell, Jeffery D., to Pacesetter, Inc. Methods and apparatus for annotating data in an implantable device programmer using digitally recorded sound. 5,749,908, Cl. 607-30.000.
- So, Hock C.: *See—*
  - Wong, Sau C.; and So, Hock C., 5,751,635, Cl. 365-185.190.
- Soane Biosciences: *See—*
  - Soane, David S.; and Soane, Zoya M., 5,750,015, Cl. 204-454.000.
- Soane, David S.; and Soane, Zoya M., to Soane Biosciences. Method and device for moving molecules by the application of a plurality of electrical fields. 5,750,015, Cl. 204-454.000.
- Soane, Zoya M.: *See—*
  - Soane, David S.; and Soane, Zoya M., 5,750,015, Cl. 204-454.000.
- Soboley, Sergey: *See—*
  - Kwon, Young Key; Mesropian, Ashot; Lee, Kwang Min; and Soboley, Sergey, 5,751,436, Cl. 358-299.000.
- Societe Aerospatiale: *See—*
  - Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, 5,749,985, Cl. 156-64.000.
- Societe D'etudes et de Recherches Biologiques: *See—*
  - Huynh, Anh Hoa; Tran, Joanne; Scheminski, François; and Guette, Jean-Paul, 5,750,722, Cl. 548-427.000.
- Societe Europeene de Propulsion: *See—*
  - Dumortier, André; and Faget, Jean-Gabriel, 5,749,559, Cl. 251-30.030.
- Societe Francaise Hoechst: *See—*
  - Sidot, Christian; and Tarlier, Michel, 5,750,775, Cl. 562-470.000.
- Societe Nationale d'Etude de Contruction de Moteurs d'Aviation "Snecma": *See—*
  - Dusserre-Telmon, Guy Franck Paul; Plona, Daniel Georges; and Tourne, Christophe Yvon Gabriel, 5,749,660, Cl. 384-475.000.
- Soda, Yoshihiro: *See—*
  - Miura, Toshiro; Soda, Yoshihiro; and Hayashi, Tadao, 5,750,606, Cl. 524-244.000.
- Sodick Co., Ltd.: *See—*
  - Kaneko, Yuji; Ueda, Tadao; Watanabe, Yoshihiro; and Toyonaga, Tatsuo, 5,750,951, Cl. 219-69.180.
- Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, to Ajinomoto Co., Inc.; Nihon Firmenich K.K.; and Systems Bio-Industries Co., Ltd. Transparent gelatin gel type air freshener. 5,750,498, Cl. 512-4.000.
- Sofame: *See—*
  - Mandeville, Luc; Bocherel, Pascal; Ratnani, Kébir; Dallaire, Michel; and Brunet, Stéphane, 5,749,356, Cl. 126-359.000.
- Softub, Inc.: *See—*
  - Hansen, Borg; Gonzalez, Rafael; and Fleisaman, Roc V., 5,749,107, Cl. 4-541.100.
- Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, to Antibioticos S.p.A. Glutaryl 7-ACA derivatives and processes for obtaining them. 5,750,682, Cl. 540-215.000.
- Sohn, Jang Sub; and Jeon, Yong-Weon, to LG Semicon Co., Ltd. Clock generator for generating complementary clock signals with minimal time differences. 5,751,176, Cl. 327-295.000.
- Solid Phase Sciences Corporation: *See—*
  - Sucholeiki, Irving, 5,750,412, Cl. 436-525.000.
- Solomon, Edward G.: *See—*
  - Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
- Solomon, Harvey Donald: *See—*
  - White, Raymond Alan; and Solomon, Harvey Donald, 5,750,954, Cl. 219-121.450.
- Solomon, Rodney J.; and Yeung, Hubert K., to Hewlett-Packard Company. Bending neck for use with invasive medical devices. 5,749,828, Cl. 600-141.000.
- Solutia Inc.: *See—*
  - Asrar, Jawed, 5,750,603, Cl. 524-139.000.
- Solvay Animal Health, Inc.: *See—*
  - Gill, Michael A., 5,750,112, Cl. 424-221.100.
- Somatogen, Inc.: *See—*
  - Gerber, Michael J., 5,750,132, Cl. 424-423.000.
- Someno, Yoshihiro, to Alps Electric Co., Ltd. Multilayered filter films and method for making the same. 5,751,487, Cl. 359-589.000.
- Sommadossi, Jean-Pierre; and Schinazi, Raymond F., to Schinazi, Raymond F.; and University of Alabama at Birmingham. Method to improve the biological and antiviral activity of protease inhibitors. 5,750,493, Cl. 514-1.000.
- Sommer, Ronald G., to Bayer Corporation. Sol particle decay protection immunoassay. 5,750,411, Cl. 436-525.000.
- Son, Jeong-Hwan, to LG Semicon Co., Ltd. Method for making metal oxide semiconductor field effect transistor (MOSFET). 5,750,430, Cl. 438-303.000.
- Sonetsuji, Noboru: *See—*
  - Ishizaka, Tetsuo; Ohya, Toshio; Satoh, Shunichi; Sonetsuji, Noboru; and Komiyama, Manabu, 5,751,877, Cl. 385-93.000.
- Song, Byung-Jun. Cutting apparatus and automatic cutting system of blade's raw material of blanking die. 5,749,276, Cl. 83-76.900.
- Song, Ghie Hugh: *See—*
  - Bala, Krishna; Brackett, Charles Arthur; and Song, Ghie Hugh, 5,751,868, Cl. 385-16.000.
- Song, Kwang-Ho, to SamSung Electronics Co., Ltd. Computer with a detachable hinged LCD display cable connection. 5,751,544, Cl. 361-681.000.
- Song, Suk Young: *See—*
  - Chung, Min Ho; Murakami, Tomohiro; Song, Suk Young; Kim, Ki Yeul; Lee, Ho Bum; Cho, Jin Ki; and Cho, Young Ki, 5,751,413, Cl. 356-73.100.
- SonicForce, L.L.C.: *See—*
  - Hugentobler, Monte K.; and Mandracchia, Efrain Anthony, 5,750,900, Cl. 73-779.000.
- Sonnier, David P.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, to Tandem Computers Incorporated. Method of synchronizing a pair of central processor units for duplex, lock-step operation by copying data into a corresponding locations of another memory. 5,751,955, Cl. 395-200.190.
- Sonntag, John-Erik; and Ropponen, Matti, to Fibox Oy AB. Electronics and instrumentation enclosure. 5,750,924, Cl. 174-50.000.
- Sony Corporation: *See—*
  - Aozasa, Hiroshi; and Hayashi, Yutaka, 5,751,037, Cl. 257-315.000.
  - Chan, Joseph; and Nishiguchi, Masayuki, 5,752,226, Cl. 704-233.000.
  - Fukushima, Yoshihito, 5,751,670, Cl. 369-13.000.
  - Hareyama, Nobuo; and Yokoyama, Hiroshi, 5,752,169, Cl. 455-76.000.
  - Kurihara, Kenichi; Ata, Masafumi; Matsute, Masataka; and Watanabe, Haruo, 5,750,261, Cl. 428-422.800.
  - Matsui, Takeshi; and Kawamura, Akira, 5,751,476, Cl. 359-411.000.
  - Moriwake, Katsuakira; and Shiraishi, Toshihiro, 5,751,864, Cl. 382-276.000.
  - Nishiguchi, Masayuki; Iijima, Kazuyuki; Matsumoto, Jun; and Omori, Shiro, 5,752,222, Cl. 704-201.000.
  - Nitta, Hajime; and Ota, Kiyoshi, 5,751,887, Cl. 386-68.000.
  - Ohyama, Tomoko; Ohkura, Yukiko; Fukumoto, Masaharu; Sano, Shigeyuki; Rokukawa, Yasuko; Endo, Shiro; Oda, Kyosuke; Minakawa, Yumiko; and Matsuura, Chifumi, 5,751,373, Cl. 348-569.000.
  - Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,752,109, Cl. 396-311.000.
  - Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; and Toshikage, Hideki, 5,752,114, Cl. 396-429.000.
  - Samoto, Tetsuo, 5,750,209, Cl. 427-569.000.
  - Seki, Seizo, 5,749,466, Cl. 206-387.100.
  - Shintani, Peter, 5,751,335, Cl. 348-5.500.
  - Shintani, Peter, 5,751,371, Cl. 348-564.000.
  - Suzuki, Kazuhiro; Mitsuhashi, Satoshi; and Ando, Yuji, 5,751,358, Cl. 348-405.000.
  - Suzuki, Teruhiko; and Yagasaki, Yoichi, 5,751,359, Cl. 348-405.000.
  - Tanaka, Akira, 5,751,036, Cl. 257-315.000.
  - Tanaka, Satomi, 5,751,350, Cl. 348-231.000.
  - Tanaka, Yozo, 5,751,678, Cl. 369-84.000.
  - Toft, Rolf, 5,751,694, Cl. 370-109.000.
  - Tsutsui, Keiichi; and Igarashi, Katsuji, 5,751,675, Cl. 369-44.270.
  - Tsutsui, Kyoya; and Heddle, Robert, 5,752,224, Cl. 704-225.000.
  - Yamakawa, Akio; and Utsumi, Masamichi, 5,751,679, Cl. 369-103.000.
  - Yankowski, Carl J., 5,751,672, Cl. 369-30.000.
  - Yasuda, Kazunori; and Uchide, Kouichi, 5,751,364, Cl. 348-416.000.
- Sony Electronics Inc.: *See—*
  - Toft, Rolf, 5,751,694, Cl. 370-109.000.
  - Yankowski, Carl J., 5,751,672, Cl. 369-30.000.
- Sorensen, Jens Ole: *See—*

- Brown, Paul Philip; and Sorensen, Jens Ole, 5,749,514, Cl. 229-400.000.
- Sorkin, Felix L. Method and apparatus for an intermediate anchorage of a post-tension system. 5,749,185, Cl. 52-223.130.
- Soshi, Isao: *See—*
  - Miyamoto, Hidenori; and Soshi, Isao, 5,752,119, Cl. 396-535.000.
- Soubeyrand, Michel J.: *See—*
  - Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,749,931, Cl. 65-60.100.
  - Goodman, Ronald D.; Soubeyrand, Michel J.; and Jenkinson, Timothy, 5,751,484, Cl. 359-512.000.
- Soules, Thomas F.; Hraboczki, Marton; and Lahl, John R., to General Electric Company. Compact fluorescent lamp having a helical lamp envelope. 5,751,104, Cl. 313-493.000.
- Soumiya, Toshio; Abe, Shunji; Katoh, Masafumi; and Watanabe, Naotoshi, to Fujitsu Limited. Connection admission control system. 5,751,691, Cl. 370-17.000.
- Southern Bakeries, Inc.: *See—*
  - Rose, Jackie Lee; and Campbell, Sterrett P., 5,750,169, Cl. 426-231.000.
- Southpac Trust International, Inc.: *See—*
  - Weder, Donald E., 5,749,171, Cl. 47-72.000.
- Soyama, Yoshikazu: *See—*
  - Tomomasa, Satoshi; Nanba, Tomiyuki; and Soyama, Yoshikazu, 5,750,094, Cl. 424-64.000.
- Spaapen, Antonius J.; Van Haastrecht, Johannes T.J.; and Van Gennip, Theodorus J.M.J., to U.S. Philips Corporation. Electrodeless low-pressure discharge lamp. 5,751,110, Cl. 313-550.000.
- Space Power, Inc.: *See—*
  - Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., 5,751,113, Cl. 315-111.210.
- Space Systems/Loreal, Inc.: *See—*
  - Canter, Stanley, 5,751,140, Cl. 323-282.000.
- Spack, Edward G.; Wehner, Nancy G.; and McCutcheon, Michael A., to Anergen, Inc. Method for monitoring T cell reactivity. 5,750,356, Cl. 435-7.240.
- Spaleck, Walter: *See—*
  - Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.
- Spalvieri, Arnaldo: *See—*
  - Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, 5,751,768, Cl. 375-234.000.
- Span Tech Corporation: *See—*
  - Layne, James L., 5,749,454, Cl. 198-464.400.
- Spangler, Michael J.: *See—*
  - Hagen, Gary P.; and Spangler, Michael J., 5,750,759, Cl. 558-277.000.
- Spanjer, Tjerk G.: *See—*
  - Van der Poel, Willibrordus A. J. A.; and Spanjer, Tjerk G., 5,751,099, Cl. 313-412.000.
- Spargo, Peter Lionel, to Pfizer Inc. Separation of the enantiomers of amlodipine via their diastereomeric tartrates. 5,750,707, Cl. 546-321.000.
- Sparks, Charles; Schmitt, Jacques; Metivaud, Guy; and Auberon, Marcel, to Institut Francais du Petrole; and Societe Aerospatiale. Process for optimizing multilayered tubes made of composite materials and tubes obtained through the process. 5,749,985, Cl. 156-64.000.
- Sparksman, Steven W.: *See—*
  - Tsuji, Bruce H.; McGarry, Susan J.; and Sparksman, Steven W., 5,752,195, Cl. 455-462.000.
- Spearman, Michael R., to Porous Media Corporation. Conical coalescing filter. 5,750,024, Cl. 210-315.000.
- Specht, Martin; and Krauss, Walter, to TRW Occupant Restraint Systems GmbH. Coupling for torque transfer from a propellant-operated rotary drive, on a belt shaft of a seat belt retractor for tensioning a seat belt. 5,749,536, Cl. 242-374.000.
- Speck, Michael H.: *See—*
  - Avila, Javier; Obermeyer, James Andrew; Speck, Michael H.; and Dybalski, Ronald Henry, 5,749,554, Cl. 248-311.200.
- Speck, Ulrich: *See—*
  - Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, 5,750,342, Cl. 435-6.000.
- Speckmann, Horst-Dieter: *See—*
  - Geke, Juergen; Speckmann, Horst-Dieter; Stedry, Bernd; and Westfechtel, Alfred, 5,749,947, Cl. 106-14.420.
- Speed, Harold H., III; and Spurlin, James C., to Texas Instruments Incorporated. Bus switch integrated circuit with voltage translation. 5,751,168, Cl. 326-83.000.
- Speer, Andrew J., III: *See—*
  - Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, 5,749,595, Cl. 280-688.000.
- Spehr, Paul R.: *See—*
  - Schroeppel, Edward A.; and Spehr, Paul R., 5,749,909, Cl. 607-33.000.
- Sperl, George T.: *See—*
  - Hitzman, Donald O.; Sperl, George T.; and Sandbeck, Kenneth A., 5,750,392, Cl. 435-243.000.
- Spielmann, Horst: *See—*
  - Hüttenhofer, Klaus; Herr, Wolfgang; Sprehe, Josef; and Spielmann, Horst, 5,749,651, Cl. 366-181.500.
- Spies, Klaus: *See—*
  - Wiesner, Hagen Heinz; and Spies, Klaus, 5,749,634, Cl. 305-42.000.
- Spike, Frederick W., to Sun International Trading , Ltd. Chromotography vial. 5,750,075, Cl. 422-102.000.
- Spinal Innovations: *See—*
  - Richelsoph, Marc, 5,749,916, Cl. 623-17.000.
- Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH: *See—*
  - Lang, Kurt; and Schmid, Friedbert, 5,749,216, Cl. 57-413.000.
- Spirakis, Charles S.: *See—*
  - Kullick, Steven E.; Spirakis, Charles S.; and Titus, Diane J., 5,751,997, Cl. 395-489.000.
- Spiridigliozzi, John C.: *See—*
  - Melanson, David A.; Levine, Marc Alan; Spiridigliozzi, John C.; Bromander, Thomas S.; Pichon, Dean M.; Selecman, George; and Nedder, David J., 5,749,968, Cl. 118-300.000.
- Spitz, David John: *See—*
  - Ordanic, Zvonimir; and Spitz, David John, 5,751,964, Cl. 395-200.540.
- Sponsel, Michael Charles: *See—*
  - Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, 5,751,875, Cl. 385-84.000.
- Spooner Industries Limited: *See—*
  - Bowden, Edwin Vincent, 5,749,164, Cl. 34-641.000.
- SPOT Technology, Inc.: *See—*
  - Li, Steve, 5,751,501, Cl. 359-819.000.
- Sprague, Barry N.: *See—*
  - Epperly, W. Robert; Sprague, Barry N.; Kelso, Danny T.; and Bowers, Wayne E., 5,749,928, Cl. 44-358.000.
- Spranger, Wolfgang: *See—*
  - Redecker, Klaus; Schreiner, Gunter; and Spranger, Wolfgang, 5,750,920, Cl. 149-11.000.
- Sprauer, Joseph E., Jr. Microwavable container with steam vent valve. 5,750,967, Cl. 219-735.000.
- Sprehe, Josef: *See—*
  - Hüttenhofer, Klaus; Herr, Wolfgang; Sprehe, Josef; and Spielmann, Horst, 5,749,651, Cl. 366-181.500.
- Sprey, Mark A.: *See—*
  - Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., 5,751,254, Cl. 343-761.000.
- Spurlin, James C.: *See—*
  - Speed, Harold H., III; and Spurlin, James C., 5,751,168, Cl. 326-83.000.
- Spyrou, Athanasius W.: *See—*
  - Ginetti, Arnold; and Spyrou, Athanasius W., 5,751,596, Cl. 364-491.000.
- Square D Company: *See—*
  - Shortt, James Joseph; and Lavelle, Shay Joseph, 5,749,751, Cl. 439-721.000.
  - Swindler, David L., 5,751,524, Cl. 361-42.000.
- Squirrell, David J., to Secretary Of State For Defence In Her Britannic Majesty's Government Of The United Kingdom Of Great Britain And Northern Ireland, The. Methods for detecting nucleic acid sequences using evanescent wave detection. 5,750,337, Cl. 435-6.000.
- SRI International: *See—*
  - Blum, Yigal; and McDermott, Gregory A., 5,750,643, Cl. 528-481.000.
- Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., to Texas Instruments Incorporated. Apparatus and method for providing an event detection notification service via an in-line wrapper sentry for a programming language. 5,752,034, Cl. 395-704.000.
- Srivastava, Pramod K., to Mount Sinai School of Medicine Of The City University of New York. Immunotherapeutic stress protein-peptide complexes against cancer. 5,750,119, Cl. 424-277.100.
- St. Judes Children's Research Hospital: *See—*
  - Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., 5,750,396, Cl. 435-357.000.
- Stacey, Karen Lynne. Combination lotto checker and scraper. 5,749,578, Cl. 273-148.00R.
- Stack, Gary P.: *See—*
  - Kang, Young H.; and Stack, Gary P., 5,750,724, Cl. 548-454.000.
  - Mewshaw, Richard E.; and Stack, Gary P., 5,750,556, Cl. 514-411.000.
- Stadler, David M.; and Pernick, Jeffrey R., to International Hardcoat, Inc. Apparatus for selectively coating metal parts. 5,750,014, Cl. 204-224.00R.
- Stadler, Lothar: *See—*
  - Fricke, Andreas; Luxem, Heiner; and Stadler, Lothar, 5,749,572, Cl. 271-268.000.
- Stadler, Raimund: *See—*
  - Gottschalk, Axel; Stadler, Raimund; and Krappe, Udo, 5,750,621, Cl. 525-68.000.
- Stadlwieser, Josef: *See—*
  - Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, 5,750,706, Cl. 546-279.100.
- Staendeke, Horst, to Hoechst Aktiengesellschaft. Flame retardant polymeric compositions. 5,750,601, Cl. 524-117.000.
- Stahlecker, Otto: *See—*
  - Kieser, Manfred; Hennemann, Afred; and Stahlecker, Otto, 5,749,957, Cl. 106-403.000.
- Staiger, Dieter E., to International Business Machines Corporation. One cycle processor for real time processing. 5,752,065, Cl. 395-800.010.
- Stalker, David M.; Shewmaker, Christine K.; and Oakes, Janette V. Glycogen biosynthetic enzymes in plants. 5,750,875, Cl. 800-205.000.
- Stallbaumer, John J., to Harper Trucks, Inc. Composite hand truck. 5,749,588, Cl. 280-47.270.
- Stamford Investments, Inc.: *See—*
  - Wood, Graham Robert, 5,749,480, Cl. 211-169.100.
- Stancil, Charles J.: *See—*
  - Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., 5,751,998, Cl. 395-490.000.
- Stancu, Sorin: *See—*

  - Heath, Gerald Arthur; Obriot, Kelly Michael; Simplicean, Ionel Eugene; and Stancu, Sorin, 5,749,629, Cl. 297-411.360.
- Standard-Thomson Corporation: *See—*
  - Duprez, Wayne R., 5,749,515, Cl. 236-34.500.
- Stanfield, Joel D.; Branc, Joseph R.; Feldpausch, Thomas G.; and Miller, William L., to Steelcase Inc. Electronic system, components and method for tracking files. 5,751,221, Cl. 340-825.350.
- Stanford Telecommunications, Inc.: *See—*
  - Evans, Allan; Van Blaricom, Charles; and Hunter, April, 5,751,702, Cl. 370-314.000.
- Stanley, Lawrence G.: *See—*
  - Winterble, Charles; Nelson, Wayne; and Stanley, Lawrence G., 5,751,218, Cl. 340-693.000.
- Stanley, Rick J.; and Raguin, Michel M., to EMC Corporation. Aperture control system for printed circuit board fabrication. 5,751,594, Cl. 364-490.000.
- Stanley, Robert Henry, Jr.: *See—*
  - Szymanski, John George; Stanley, Robert Henry, Jr.; and Roland, Fredrick Richard, 5,749,269, Cl. 74-574.000.
- Staples, Leven E., to Data Race. System for multiplexing pins of a PC card socket and PC card bus adapter for providing audio communication between PC card and computer sound system. 5,752,082, Cl. 395-882.000.
- Staples, Phillip Eric; and Lima-Marques, Luis, to Watermark Imaging Ltd. Method and apparatus for developing electrostatic images. 5,752,142, Cl. 399-241.000.
- Starchem, Inc.: *See—*
  - van Dijk, Christiaan P., 5,750,799, Cl. 568-698.000.
- Starke, Roger Kurt: *See—*
  - Kreucher, John Eric; Christenson, Barry Odell; Starke, Roger Kurt; Myers, Stephen Joe; and Horton, John Arthur, 5,749,223, Cl. 60-300.000.
- Starkey, John F., to RSW, Inc., Specialty Tapes Division. Tape with plural adhesive zones and an automobile protection arrangement. 5,750,254, Cl. 428-343.000.
- Stathis, Kristi L.: *See—*
  - Malackowski, James E.; and Stathis, Kristi L., 5,752,186, Cl. 455-414.000.
- Staub, John Christian; Ubil, Kent Delmar; and Throgmorton, Pamela Jane, to Haggar Clothing Co. Apparatus and method for imparting wrinkle-resistant properties to garments and other articles. 5,749,163, Cl. 34-597.000.
- Staubitz, Robert B.: *See—*
  - Cheris, Albert B.; Staubitz, Robert B.; and Repp, Timothy, 5,749,464, Cl. 206-308.100.
- St. Clair, David John, to Shell Oil Company. Crosslinkable hydroxy terminated polydiene polymer coating compositions for use on substrates and a process for preparing them. 5,750,627, Cl. 525-162.000.
- Steckle, Charles E.: *See—*
  - Clarke, Jonathon P.; Steckle, Charles E.; McMahan, Kevin W.; Durgin, George A.; and Bauer, Randall C., 5,749,701, Cl. 415-115.000.
- Stedry, Bernd: *See—*
  - Geke, Juergen; Speckmann, Horst-Dieter; Stedry, Bernd; and Westfechtel, Alfred, 5,749,947, Cl. 106-14.420.
- Steelcase Inc.: *See—*
  - Stanfield, Joel D.; Branc, Joseph R.; Feldpausch, Thomas G.; and Miller, William L., 5,751,221, Cl. 340-825.350.
- Steele, James R., to Dynamic Air, Inc. Flexible connector with flow passage integrity. 5,749,609, Cl. 285-226.000.
- Steele, Ronald Edward: *See—*
  - Jaegge, Walter John; Malone, Francis Joseph, Jr.; Overton, Frank Hudson; Ross, Roger Allen; and Steele, Ronald Edward, 5,750,215, Cl. 428-34.200.
- Steele, Walter Brian: *See—*
  - Meredith, Sheldon Kent; and Steele, Walter Brian, 5,752,200, Cl. 455-562.000.
- Steenblock, Roland Eugen; and Bührmann, Joachim, to Elf Atochem Deutschland GmbH. Plastic composite material, a method of producing it and the use of this material. 5,750,232, Cl. 428-98.000.
- Steenkamp, Lucia Hendrina: *See—*
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- Steever, Joel A., to Thomas Body Parts, Inc. Hose bed divider for a fire truck. 5,749,616, Cl. 296-37.600.
- Steffl, Manfred: *See—*
  - Breil, Jürgen; and Steffl, Manfred, 5,749,131, Cl. 26-89.000.
- Stegink, Thomas M.: *See—*
  - Straub, Robert D.; Teerman, Richard Frederic; Stegink, Thomas M.; and Ogren, Daniel B., 5,749,717, Cl. 417-505.000.
- Stegmueller, Karl, to AEG Sachsenwerk GmbH. Testing instrument with a display element. 5,751,219, Cl. 340-815.400.
- Stehouwer, David M.: *See—*
  - Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.
- Steiger, Debra Kay: *See—*
  - Fuller, Peter Armstrong; Schmidt, Herbert; Steiger, Debra Kay; and Grace, Dorman John, III, 5,750,853, Cl. 800-200.000.
- Steinbrecher, Martin C.: *See—*
  - Wylder, Robert N.; and Steinbrecher, Martin C., 5,749,491, Cl. 220-719.000.
- Steinbüchel, Alexander: *See—*
  - Krüger, Niels; and Steinbüchel, Alexander, 5,750,848, Cl. 800-205.000.
- Steiner, Klaus-Alfred: *See—*
  - Operschall, Hermann; Weber, Jakob; Steiner, Klaus-Alfred; and Ring, Stefan, 5,749,470, Cl. 209-2.000.
- Steiner, Norbert: *See—*
  - Olip, Vinzenz; and Steiner, Norbert, 5,749,923, Cl. 8-102.000.
- Stening, Belinda: *See—*
  - Duell, Graham; Bullock, Graeme; Flynn, Daphne; Martinuzzo, Steven; Stening, Belinda; and Atherton, Peter Samuel, 5,751,412, Cl. 356-71.000.
- Stenton, Philip: *See—*
  - Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, 5,752,016, Cl. 395-600.000.
- Stepan Europe: *See—*
  - Contet, Jean-Pierre; Duprat, Stéphane Courdavault; Storet, Yvan; and Vindret, Jean-Francois, 5,750,492, Cl. 510-527.000.
- Stephan, Adalbert, to Rieter Ingolstadt Spinnereimaschinenbau AG. Process and device to connect a negative-pressure channel to a negative-pressure line in textile machines. 5,749,213, Cl. 57-304.000.
- Stephens, Andrew; Schneider, Dan; Gold, Larry; and Speck, Ulrich, to NeXstar Pharmaceuticals, Inc.; and Schering Akiengesellschaft. Nucleic acid ligands of tissue target. 5,750,342, Cl. 435-6.000.
- Stephens, Fred O.; and Bassett, Jonathan D., to Hewlett-Packard Company. Magnetic head protection for a cartridge tape drive. 5,751,529, Cl. 360-128.000.
- Stephenson, Michael J.; Golliher, Waldo R.; and Haas, Paul, to M4 Environmental L.P. Thermal process for the conversion of uranium hexafluoride. 5,752,158, Cl. 423-261.000.
- Stepp, Robert Wellington, III: *See—*
  - Johnson, Elliott Will Henry; Stepp, Robert Wellington, III; and Cook, William L., 5,749,944, Cl. 95-150.000.
- Steris Corporation: *See—*
  - Rochette, Daniel; Wood, John; and Angers, Christian, 5,749,385, Cl. 134-199.000.
- Stern, Donald S.: *See—*
  - Redford, Peter M.; and Stern, Donald S., 5,749,735, Cl. 434-307.00R.
- Stern, Leif Einar, to Aspect International AB. Dispenser for dispensing two liquid products. 5,749,495, Cl. 222-134.000.
- Stevens, David L., to Lucent Technologies Inc. Mounting device for attaching a component through an aperture in a circuit board. 5,750,935, Cl. 174-138.00G.
- Stevens, Howard Norman Ernest: *See—*
  - Rashid, Abdul; Stevens, Howard Norman Ernest; Binns, Julie Stephanie; and Mackie, James Leonard, 5,750,143, Cl. 424-451.000.
- Stevens, William H.: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Stevenson, David: *See—*
  - Brammall, Terrence N.; Mills, Randel; Ridenour, Rodney; and Stevenson, David, 5,749,610, Cl. 292-327.000.
- Stevenson, Robert A.; and Ni, Dick H., to Maxwell Laboratories, Inc. EMI filter for human implantable heart defibrillators and pacemakers. 5,751,539, Cl. 361-302.000.
- Stewart, Andrew O.: *See—*
  - Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., 5,750,558, Cl. 514-415.000.
- Stickel, Werner: *See—*
  - Robinson, Christopher Frederick; and Stickel, Werner, 5,751,004, Cl. 250-492.230.
- Stiffler, Jack J., to Texas Micro, Inc. Main memory system and checkpointing protocol for fault-tolerant computer system using an exclusive-or memory. 5,751,939, Cl. 395-182.130.
- Stillwagon, Ross I.; Fischbach, Fernando; and Bennett, Allen, to Golden Supreme, Inc. Non-numeric temperature indicating method for a hair styling iron. 5,749,379, Cl. 132-200.000.
- Stine Seed Farm, Inc: *See—*
  - Eby, William H.; and Schechinger, Elmer F., 5,750,859, Cl. 800-200.000.
- Stine Seed Farm, Inc.: *See—*
  - Eby, William H.; and Schechinger, Elmer F., 5,750,860, Cl. 800-200.000.
- Stirbis, James S.: *See—*
  - Kobak, Roger Leo; Yount, Gary L.; Stirbis, James S.; and Weil, William W., 5,749,969, Cl. 118-319.000.
- Stjernschantz, Johan: *See—*
  - Lake, Staffan; and Stjernschantz, Johan, 5,750,369, Cl. 435-69.100.
- Stobbe, Anatoli; and Merk, Holger, to Stobbe, Anatoli. Method of automatically identifying an unknown number of transponders with a reader and identification system for executing the method. 5,751,570, Cl. 364-140.000.
- Stober + Morlock Warmekraft Gesellschaft mbh: *See—*
  - Von Erichsen, Volker, 5,749,703, Cl. 415-148.000.
- Stoffels, Jan A.J.; Vandeperre, Denise K.L.; and Peeraer, Jan M., to U.S. Philips Corporation. High-pressure metal halide lamp. 5,751,111, Cl. 313-606.000.
- Stokesbury, Elwood Lamar: *See—*

- Macauley, Richard Peter; Sita, Lewis Henry; and Stokesbury, Elwood Lamar, 5,750,226, Cl. 428-36.400.
- Stolzenbach, James C.: *See—*
  - Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.
- Stone, Henry D., to United States of America, Agriculture. Ovo immunization of avian embryos with oil-emulsion vaccines. 5,750,101, Cl. 424-85.200.
- Stone, Kenneth W.: *See—*
  - Blackmon, James B.; Stone, Kenneth W.; and Kusek, Stephen M., 5,751,503, Cl. 359-846.000.
- Stopperan, Jahn. Pinwheels for playground equipment. 5,749,765, Cl. 446-217.000.
- Storage Technology Corporation: *See—*
  - Sundaram, Ramesh; and Barber, Terry J., 5,751,527, Cl. 360-122.000.
- Storet, Yvan: *See—*
  - Contet, Jean-Pierre; Duprat, Stéphane Courdavault; Storet, Yvan; and Vindret, Jean-Francois, 5,750,492, Cl. 510-527.000.
- Storey, Brian E.: *See—*
  - Leong, Liem H.; and Storey, Brian E., 5,751,841, Cl. 382-137.000.
- Stotelmyer, L. Scott; and Fulkerson, Don K., to Hughes Aircraft Company. Integrated storage and transfer system and method for spacecraft propulsion systems. 5,749,402, Cl. 141-83.000.
- Stouffer, Ronald D., to Bowles Fluidics Corporation. Fluidic washer systems for vehicles. 5,749,525, Cl. 239-284.100.
- Strackbein, Heinrich: *See—*
  - Besserer, Horst; Münch, Udo; Neuhof, Markus; Nicolai, Walter; Pawlowski, Adam; Schüler, Matthias; and Strackbein, Heinrich, 5,749,476, Cl. 211-26.000.
- Strader, Catherine D.: *See—*
  - Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., 5,750,826, Cl. 800-2.000.
- Strang, Harry: *See—*
  - Müller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; Findeisen, Kurt; Lindig, Markus; Lürssen, Klaus; and Strang, Harry, 5,750,718, Cl. 548-263.600.
- Straub, Peter John: *See—*
  - Boehm, Michael James; Straub, Peter John; and Kirkwood, Richard Darrell, 5,749,656, Cl. 374-185.000.
- Straub, Robert D.; Teerman, Richard Frederic; Stegink, Thomas M.; and Ogren, Daniel B., to Deisel Technology Company. Electromagnetic fuel pump for a common rail fuel injection system. 5,749,717, Cl. 417-505.000.
- Strauser, Buford R., to Innovative Enterprises, Inc. Corrugated paperboard box with reinforced side walls. 5,749,513, Cl. 229-199.000.
- Strauss, Klaus Dieter, to Volkswagen AG. Method for monitoring serial transmission of digital data messages on a single-wire multiplex connection between intercommunicating signal-processing devices. 5,751,746, Cl. 371-67.100.
- Streber, Wolfgang: *See—*
  - Frommer, Wolf-Bernd; Ninnemann, Olaf; Streber, Wolfgang; Riesmeier, Jörg; and Kwart, Marion, 5,750,362, Cl. 435-29.000.
- Strickland, James C.; and Albers, Mark D., to Rockford Corporation. Audio amplifier system with improved isolation between preamplifier and power amplifier. 5,751,823, Cl. 381-94.600.
- Stridsberg Innovation AB: *See—*
  - Stridsberg, Lennart, 5,751,089, Cl. 310-266.000.
- Stridsberg, Lennart, to Stridsberg Innovation AB. Brushless DC motors/generators. 5,751,089, Cl. 310-266.000.
- Stringer, Michael J.: *See—*
  - Bebensee, Douglas W.; and Stringer, Michael J., 5,749,224, Cl. 60-473.000.
- Strittmatter, Günter; and Martini, Norbert, to Max-Planck-Gesellschaft Zur Forderung. Fungus-responsive chimaeric gene. 5,750,874, Cl. 800-205.000.
- Strobl, Karlheinz; Kennedy, Bryan D.; Chatenever, David; and Irion, Klaus, to Karl Storz GmbH & Co. Method and apparatus for reducing the inherently dark grid pattern from the video display of images from fiber optic bundles. 5,751,340, Cl. 348-65.000.
- Stroezel, Manfred: *See—*
  - Bröcker, Franz Josef; Stroezel, Manfred; and Rheude, Udo, 5,750,806, Cl. 568-909.500.
- Strohmeyer, Timothy W.: *See—*
  - Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
- Stromme, Lars R.: *See—*
  - Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,751,840, Cl. 382-135.000.
- Stryker Corporation: *See—*
  - Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,750,651, Cl. 530-350.000.
- Stubbs, Robert E.: *See—*
  - Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,751,936, Cl. 395-182.050.
- Stubecki, John Arthur: *See—*
  - Hall, Charles William; Rizzi, Julian Dominick; and Stubecki, John Arthur, 5,751,548, Cl. 361-686.000.
- Stüber, Dietrich: *See—*
  - Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, 5,750,374, Cl. 435-69.700.
- Stucchi, Alessandro: *See—*
  - Colombani, Piero; and Stucchi, Alessandro, 5,749,978, Cl. 148-216.000.
- Stucker, David Scott. Hybrid maize plant & seed (3496). 5,750,837, Cl. 800-200.000.
- Stump, Larry K.: *See—*
  - Hachey, Kathleen A.; Stump, Larry K.; Beseup, Terrance L.; and Kusilek, Thomas V., 5,750,191, Cl. 427-163.400.
- Stuntebeck, Peter H.: *See—*
  - Chen, Mon-Mei; Katseff, Howard Paul; Kuthyar, Ashok K.; Markowitz, Robert Edward; Mortenson, Robert F.; Ramamurthy, Ram S.; Robinson, Bethany Scott; and Stuntebeck, Peter H., 5,751,791, Cl. 379-88.000.
- Sturm, Budd Harvey, to Goodyear Tire & Rubber Company, The. Process for the preparation of unsubstituted and substituted diaryl phenylenediamines. 5,750,786, Cl. 564-403.000.
- Su, Yang-Chun; and Huang, Yu-Wen, to Acer Peripherals, Inc. Method for compressing and decompressing digital image data. 5,751,86(, Cl. 382-244.000.
- Suanya, Sayan: *See—*
  - Hsia, Edward; Hernandez, Jose H.; and Suanya, Sayan, 5,751,633, Cl. 365-185.090.
- Suarez-Gartner, Ricardo E.: *See—*
  - Butler, Peter O.; and Suarez-Gartner, Ricardo E., 5,751,556, Cl. 361-773.000.
- Subbiah, Mantharam: *See—*
  - Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.
- Subramanian, Vijay: *See—*
  - van Ooij, Wim J.; Subramanian, Vijay; and Zhang, Chunbin, 5,750,197, Cl. 427-318.000.
- Sucholeiki, Irving, to Solid Phase Sciences Corporation. Paramagnetic scintillation particles and assay. 5,750,412, Cl. 436-525.000.
- Suchowerskyj, Wadym: *See—*
  - Siegle, Gert; Braegas, Peter; Kaesser, Jürgen; and Suchowerskyj, Wadym, 5,752,177, Cl. 455-186.100.
- Suda, Eiichi; Nihei, Takayuki; and Tanaka, Kyoko, to Mitsubishi Denki Kabushiki Kaisha. Programming device for programmable controller, functional unit for programmable controller, and method of inputting memory display for programming device. 5,752,033, Cl. 395-701.000.
- Suda, Tomonori: *See—*
  - Minatogawa, Masamitsu; Sakuta, Maki; Ichie, Kazuko; Momoyama, Chikako; Hayashi, Takahiro; Hanada, Yuhko; and Suda, Tomonori, 5,752,250, Cl. 707-200.000.
- Sudhaman, Sujit: *See—*
  - Voith, Raymond Paul; Sudhaman, Sujit; and Hoekstra, George, 5,751,741, Cl. 371-37.700.
- Suenaga, Yutaka: *See—*
  - Misawa, Junichi; and Suenaga, Yutaka, 5,751,486, Cl. 359-557.000.
- Sueper, David Martin: *See—*
  - Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., 5,751,712, Cl. 370-431.000.
- Suganuma, Hiroyuki, to Kawasaki Kasei Chemicals Ltd. Method for preparing a solution of an alkali salt of anthrahydroquinone. 5,750,743, Cl. 552-271.000.
- Suganuma, Noboru, to Sanshin Kogyo Kabushiki Kaisha. Impeller shaft journal for jet pump. 5,749,757, Cl. 440-83.000.
- Sugi, Hikaru: *See—*
  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Sugimoto, Hitoshi: *See—*
  - Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.
- Sugimoto, Kenichi: *See—*
  - Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.
- Sugimoto, Tatsuo: *See—*
  - Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.
- Sugino, Motoichi: *See—*
  - Matsutani, Kanji; Sugino, Motoichi; and Yagisawa, Hiroshi, 5,749,897, Cl. 606-222.000.
- Sugita, Takeshi: *See—*
  - Yuza, Akira; Adachi, Nobukazu; Kuroda, Akira; and Sugita, Takeshi, 5,752,149, Cl. 399-329.000.
- Sugiura, Isao: *See—*
  - Shimotoyodome, Gyo; and Sugiura, Isao, 5,751,392, Cl. 349-187.000.
- Sugiura, Masanori: *See—*
  - Akaboshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.
- Sugiyama, Hiroshi: *See—*

  - Matsushima, Yoshimasa; Sugiyama, Hiroshi; and Hagiwara, Toshimitsu, 5,750,785, Cl. 564-315.000.
- Sugiyama, Kayoko: *See—*
  - Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, 5,750,238, Cl. 428-195.000.
- Sugiyama, Kazuhide, to Canon Kabushiki Kaisha. Image forming apparatus having a supplemental heating source. 5,752,129, Cl. 399-92.000.
- Sugiyama, Kazuhiro; Ono, Yukari; and Ishida, Yoshinobu, to Mitsubishi Denki Kabushiki Kaisha. Method of efficiently recording an audio signal in semiconductor memory. 5,752,221, Cl. 704-201.000.
- Sugiyama, Mikio; and Endo, Kaoru, to NEC Corporation. Moving picture coding apparatus. 5,751,858, Cl. 382-236.000.
- Sugiyama, Satoru: *See—*
  - Ozawa, Takayuki; Sugiyama, Satoru; Kitahara, Shigehisa; and Fujii, Katsuhiko, 5,750,507, Cl. 514-19.000.
- Sugiyama, Takekatsu: *See—*
  - Sato, Morimasa; and Sugiyama, Takekatsu, 5,750,292, Cl. 430-15.000.
- Sugiyama, Tatsuo; and Nakayama, Tadashi, to Ihara Chemical Industry Co., Ltd. Process for production of thioaryl compound. 5,750,763, Cl. 560-17.000.
- Suh, Byoung I.: *See—*
  - Qian, Xuejun; Suh, Byoung I.; Hamer, Martin; and Tobias, Russell H., 5,749,733, Cl. 433-228.100.
- Suh, Jeong-Dae: *See—*
  - Sung, Gun-Yong; and Suh, Jeong-Dae, 5,750,474, Cl. 505-329.000.
- Suhara, Masaaki: *See—*
  - Sasaki, Ryoichi; Tanai, Naoki; and Suhara, Masaaki, 5,750,974, Cl. 235-454.000
- Suka, Munehiro: *See—*
  - Kimura, Kazuhiro; Hayashibe, Shigeaki; Hirakoso, Yutaka; Masumoto, Takahiko; Ishimura, Shizuka; Ozawa, Toshiyuki; and Suka, Munehiro, 5,752,176, Cl. 455-184.100.
- Sullivan, Kevin J.: *See—*
  - Parker, Norman K.; Rasmussen, James E.; Schulkind, Richard L.; Sullivan, Kevin J.; and Green, Robert B., 5,750,906, Cl. 73-863.730.
- Sullivan, Steven K.: *See—*
  - Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
- Sulzer Intermedics Inc.: *See—*
  - Schroeppel, Edward A.; Prutchi, David; and Routh, André G., 5,749,900, Cl. 607-4.000.
  - Schroeppel, Edward A.; and Spehr, Paul R., 5,749,909, Cl. 607-33.000.
- Sumida, Hiroyasu: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Sumiejski, James L.; Fewkes, Roy; and Tipton, Craig Daniel, to Lubrizol Corporation, The. Lubricant compositions to reduce noise in a push belt continuous variable transmission. 5,750,477, Cl. 508-331.000.
- Sumikawa, Takeshi; and Ito, Isao, to Fuji Xerox Co., Ltd. Dual-component magnetic brush developing device. 5,752,139, Cl. 399-264.000.
- Sumita, Yoshihiro: *See—*
  - Sunagawa, Makoto; Yamaga, Hiroshi; and Sumita, Yoshihiro, 5,750,686, Cl. 540-350.000.
- Sumitomo Chemical Company: *See—*
  - Andreatta, Alejandro; and Doi, Shuji, 5,751,389, Cl. 349-97.000.
- Sumitomo Chemical Company Limited: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
  - Yoshida, Yoshifumi; Tanigawa, Akira; and Yamamoto, Satoshi, 5,750,781, Cl. 564-153.000.
- Sumitomo Electric Industries, Ltd.: *See—*
  - Niihara, Koichi; and Yamakawa, Akira, 5,750,449, Cl. 501-80.000.
  - Shikata, Shin-ichi; Nakahata, Hideaki; Higaki, Kenjiro; Fujii, Satoshi; and Hachigo, Akihiro, 5,750,243, Cl. 428-216.000.
- Sumitomo Metal Mining Co., Ltd.: *See—*
  - Monma, Akio; Yamanobe, Yasunori; and Sato, Takashi, 5,751,112, Cl. 315-8.000.
- Sumitomo Pharmaceuticals Company, Limited: *See—*
  - Sunagawa, Makoto; Yamaga, Hiroshi; and Sumita, Yoshihiro, 5,750,686, Cl. 540-350.000.
- Sumitomo Wiring Systems, Ltd.: *See—*
  - Chishima, Masamitsu; and Ito, Tomonari, 5,749,753, Cl. 439-752.500.
  - Saka, Yuuji; and Shibata, Hideaki, 5,749,739, Cl. 439-76.200.
- Sun, Erli: *See—*
  - Inomata, Makoto; Katagiri, Tsutomu; Imura, Kozo; and Sun, Erli, 5,750,821, Cl. 585-943.000.
- Sun International Trading , Ltd.: *See—*
  - Spike, Frederick W., 5,750,075, Cl. 422-102.000.
- Sun Microsystems, Inc.: *See—*
  - Aybay, Gunes, 5,751,729, Cl. 371-21.100.
  - Eberhardt, Anthony N.; Dailey, William L.; and Harada, John A., 5,751,549, Cl. 361-687.000.
  - Guzovskiy, Aleksandr; Zak, Robert C., Jr.; and Bromley, Mark, 5,752,258, Cl. 711-120.000.
  - Hileman, Vince; and Foo, Khim H., 5,751,551, Cl. 361-753.000.
  - Radke, William H., 5,751,699, Cl. 370-258.000.
  - Van De Vanter, Michael L., 5,752,058, Cl. 395-793.000.
  - Yung, Robert, 5,752,271, Cl. 711-171.000.
- Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, to Pharm-Eco Laboratories, Inc. Stereoselective method for synthesizing dolaphenine. 5,750,713, Cl. 548-202.000.
- Sunagawa, Makoto; Yamaga, Hiroshi; and Sumita, Yoshihiro, to Sumitomo Pharmaceuticals Company, Limited. Carbapenem compounds and process for producing the same. 5,750,686, Cl. 540-350.000.
- Sundaram, Ramesh; and Barber, Terry J., to Storage Technology Corporation. Magnetic tape head contour with land widths to optimize flying height and a sufficient number of bleed slots to uniformly maintain the flying height of the tape. 5,751,527, Cl. 360-122.000.
- Sundberg, Carl-Erik Wilhelm: *See—*
  - Seshadri, Nambirajan; and Sundberg, Carl-Erik Wilhelm, 5,751,739, Cl. 371-30.000.
- Sundet, Douglas C., to Minnesota Mining and Manufacturing Company. Laminate for precise application of graphics to a substrate. 5,749,994, Cl. 156-230.000.
- Sundstrand Corporation: *See—*
  - Crowe, Lawrence E., 5,749,413, Cl. 165-80.100.
- Sung, Gun-Yong; and Suh, Jeong-Dae, to Electronics and Telecommunications Research Institute. Method for manufacturing a superconductor-insulator-superconductor Josephson tunnel junction. 5,750,474, Cl. 505-329.000.
- Sung, Hung-Cheng: *See—*
  - Chen, Ling; Sung, Hung-Cheng; and Lo, Chi-Shiung, 5,751,040, Cl. 257-332.000.
- Sunseri, Earl: *See—*
  - Sunseri, Robert; and Sunseri, Earl, 5,749,797, Cl. 473-451.000.
- Sunseri, Robert; and Sunseri, Earl. Automatic pitching device and methods of constructing and utilizing same. 5,749,797, Cl. 473-451.000.
- Suntory Limited: *See—*
  - Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, 5,750,372, Cl. 435-69.100.
- Supcoe, Robert F.; and Greenberg, Melvin, to United States of America, Navy. Dark coating with low solar infrared absorbing properties. 5,749,959, Cl. 106-428.000.
- Suprex Corporation: *See—*
  - Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., 5,750,029, Cl. 210-634.000.
- Suptitz, Eric; Blanchard, Pierre; and Collier, James, to Schneider Electric, S.A. Current signal correction process and device. 5,751,284, Cl. 324-127.000.
- SurVivaLink Corporation: *See—*
  - Olson, Kenneth F.; and Parker, William S., 5,749,902, Cl. 607-5.000.
- Sushihara, Koji: *See—*
  - Ishida, Kenichi; Kishimoto, Michinori; Yamamoto, Takashi; and Sushihara, Koji, 5,751,191, Cl. 330-125.000.
- Sutherland, Jeffrey W., to Teletransactions, Inc. Programmable shelf tag and method for changing and updating shelf tag information. 5,751,257, Cl. 345-2.000.
- Suwa, Tetsuya: *See—*
  - Ogasawara, Jin; Higurashi, Seiji; Shindo, Tomoyuki; and Suwa, Tetsuya, 5,751,509, Cl. 360-70.000.
- Suzuki, Akio: *See—*
  - Murai, Yukako; Suzuki, Akio; Tabata, Yoshio; Saito, Keiichi; and Amagai, Tamio, 5,751,438, Cl. 358-403.000.
- Suzuki, Hidetoshi: *See—*
  - Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.
- Suzuki, Hiroshi, to Nippon Steel Corporation. Video/audio signal coding system and method. 5,751,356, Cl. 348-390.000.
- Suzuki, Hiroshi: *See—*
  - Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, 5,750,825, Cl. 800-2.000.
- Suzuki, Hirotaka, to Kabushiki Kaisha Toshiba. Interrupt control system provided in a computer. 5,752,043, Cl. 395-737.000.
- Suzuki Kabushiki Kaisha: *See—*
  - Yamauchi, Kosaku; Tsutsumikoshi, Shinobu; and Nagai, Hisao, 5,749,429, Cl. 180-205.000.
- Suzuki, Katsuya: *See—*
  - Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.
- Suzuki, Kazuhiro; Mitsuhashi, Satoshi; and Ando, Yuji, to Sony Corporation. Video encoder with quantization controlled by inter-picture correlation. 5,751,358, Cl. 348-405.000.
- Suzuki, Kenji, to Canon Kabushiki Kaisha. High speed and high precisioin image scanning apparatus. 5,750,985, Cl. 250-234.000.
- Suzuki, Kenji: *See—*
  - Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.
- Suzuki, Kenzaburo, to Nikon Corporation. Lens capable of short distance photographing with vibration reduction function. 5,751,485, Cl. 359-557.000.
- Suzuki, Masami, to Nikon Corporation. Eyepiece lens. 5,751,495, Cl. 359-644.000.

- Suzuki, Masao; and Nakazato, Saburo, to Canon Kabushiki Kaisha. Image sensing apparatus and method with exposure performed based on focus evaluation values. 5,751,354, Cl. 348-349.000.
- Suzuki, Masashi, to Kabushiki Kaisha Tec. Optical code reader having plural spot beams which intersect one another a preset distance away from a reading window of the optical code reader. 5,750,977, Cl. 235-472.000.
- Suzuki, Masayuki: *See—*
  - Kanemura, Takashi; Suzuki, Masayuki; Hattori, Yutaka; Ito, Nobuei; Hattori, Tadashi; and Kanazawa, Shigeo, 5,751,108, Cl. 313-503.000.
- Suzuki, Megumi; Asai, Akiyoshi; and Sakakibara, Jun, to Denso Corporataion. Semiconductor integrated circuit device. 5,751,041, Cl. 257-357.000.
- Suzuki, Nobuhiro; Odaka, Asano; and Kitada, Chieko, to Takeda Chemical Industries Ltd. Antibodies to β-amyloids or their derivatives and use thereof. 5,750,349, Cl. 435-7.100.
- Suzuki, Noritoshi: *See—*
  - Higuchi, Haruhiko; and Suzuki, Noritoshi, 5,751,664, Cl. 368-112.000.
- Suzuki, Ryoichi: *See—*
  - Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.
- Suzuki, Shunji: *See—*
  - Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, 5,750,302, Cl. 430-106.600.
- Suzuki, Takao, to Matsushita Electric Industrial Co., Ltd. Processor and data memory for outputting and receiving data on different buses for storage in the same location. 5,751,999, Cl. 395-494.000.
- Suzuki, Takashi: *See—*
  - Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.
- Suzuki, Teruhiko; and Yagasaki, Yoichi, to Sony Corporation. Method for quantizing compressed video signals. 5,751,359, Cl. 348-405.000.
- Suzuki, Tetsuo: *See—*
  - Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.
- Suzuki, Tetsuya: *See—*
  - Yoshida, Toshirou; and Suzuki, Tetsuya, 5,751,458, Cl. 359-173.000.
- Suzuki, Tomoko: *See—*
  - Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, 5,751,636, Cl. 365-189.290.
- Suzuki, Toshiro: *See—*
  - Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, 5,751,935, Cl. 395-182.040.
- Suzuki, Yasuaki: *See—*
  - Ishida, Toshihiko; Oka, Toshimitsu; Fujie, Naofumi; Ishikawa, Hitoshi; and Suzuki, Yasuaki, 5,749,173, Cl. 49-349.000.
- Suzuki, Yoshio: *See—*
  - Ishibashi, Toshiaki; Ohnishi, Kunikazu; Inoue, Masayuki; and Suzuki, Yoshio, 5,751,680, Cl. 369-109.000.
- Svedala-Arbra AB: *See—*
  - Andersson, Anders, 5,749,471, Cl. 209-314.000.
- Svennesson, Björn A.: *See—*
  - Äström, Bo A. V.; and Svennesson, Björn A., 5,752,188, Cl. 455-433.000.
- Svensson, Sigfrid, to Polysaccharide Industries AB PSI. Process for protecting a surface from non-desired contamination. 5,750,189, Cl. 421-154.000.
- Swain, Eugene A.: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Swaminathan, Kumar; and Vemuganti, Murthy, to Hughes Electronics. Low rate multi-mode CELP codec that encodes line SPECTRAL frequencies utilizing an offset. 5,751,903, Cl. 395-2.390.
- Swanson, David W.; Marler, Jaren D.; and Childers, Winthrop D., to Hewlett-Packard Company. Adhesiveless printhead attachment for ink-jet pen. 5,751,323, Cl. 347-87.000.
- Swanson, Scott C., to Schlumberger Industries, Inc. Meter sensor light tamper detector. 5,750,983, Cl. 250-231.130.
- Swars, Helmut: *See—*
  - Maus, Wolfgang; Swars, Helmut; and Brück, Rolf, 5,751,602, Cl. 364-557.000
- Swift, Thomas R.; and Richter, Kevin R., to Hubbell Incorporated. Bonding strap for non-metallic electrical enclosure. 5,749,740, Cl. 439-92.000.
- Swindell, Charles S.: *See—*
  - Sisti, Nicholas J.; and Swindell, Charles S., 5,750,737, Cl. 549-510.000.
- Swindler, David L., to Square D Company. Ground fault protection circuit for a multiple source system. 5,751,524, Cl. 361-42.000.
- Swithers, David Jonathan; and Rysin, Alex A., to Computer Identics, Inc. High-speed, high-resolution optical scanner system. 5,750,980, Cl. 250-214.0AG.
- Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, to DuPont Merck Pharmaceutical Company, The. Stable hydrazones linked to a peptide moiety as reagents for the preparation of radiopharmaceuticals. 5,750,088, Cl. 424-1.690.
- Sybase, Inc.: *See—*
  - Gower, Stefan F., 5,751,909, Cl. 395-11.000.
- Sych, Terry: *See—*
  - Gillespie, Byron; Goldschmidt, Marc; Sych, Terry; and Young, Bruce, 5,751,975, Cl. 395-306.000.
- Sydenstricker, Anita S. Fish aquarium background device and method for providing. 5,749,320, Cl. 119-253.000.
- Sylvester, Thomas Gerard: *See—*
  - Hamstra, Jeffrey William; McCallum, Brent Neal; Sylvester, Thomas Gerard; Denner, Brett Willian; and Moorehouse, Jeffrey Allen, 5,749,542, Cl. 244-53.00B.
- Symbios Logic Inc.: *See—*
  - Herbert, Brian K., 5,752,010, Cl. 395-509.000.
- Symetrix Corporation: *See—*
  - Cuchiaro, Joseph D.; Joshi, Vikram; DaCruz, Claudia P.; McNelis, John M.; and Paz de Araujo, Carlos A., 5,751,034, Cl. 257-295.000.
- SymmetriCom, Inc.: *See—*
  - Zampetti, George, 5,751,777, Cl. 375-376.000.
- Synder, Bobbie L.; Bradley, C. Thomas; and Horner, Paul W., to Fixtures Manufacturing Corporation. Vertically adjustable chair arm with rotatable armrest. 5,749,628, Cl. 297-411.360.
- Synodis, Joseph: *See—*
  - Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.
- Syntex Inc.: *See—*
  - Maag, Hans; Rose, Samuel J.; and Schmidt, Beat, 5,750,343, Cl. 435-6.000.
- Systemix, Inc.: *See—*
  - Tsukamoto, Ann; Baum, Charles M.; Aihara, Yukoh; and Weissman, Irving, 5,750,397, Cl. 435-372.000.
- Systems Bio-Industries Co., Ltd.: *See—*
  - Soeda, Takahiko; Shinohara, Masahiko; Hozumi, Taro; and Sato, Seisuke, 5,750,498, Cl. 512-4.000.
- Szajewski, Richard Peter, to Eastman Kodak Company. Photographic Element containing high chloride tabular grain silver halide emulsions with [111] crystallographic faces. 5,750,325, Cl. 430-567.000.
- Szeto, John: *See—*
  - Shen, Gene W.; Szeto, John; Patkar, Niteen A.; and Shebanow, Michael C., 5,751,985, Cl. 395-394.000.
- Szymanski, John George; Stanley, Robert Henry, Jr.; and Roland, Fredrick Richard, to Vibratech, Inc. Dual-mode, viscous crankshaft vibration damper. 5,749,269, Cl. 74-574.000.
- T Deux C: *See—*
  - Bardin, Daniel, 5,749,899, Cl. 606-232.000.
- T.P.A. Impex S.p.A.: *See—*
  - Amoretti, Luigi, 5,749,120, Cl. 15-339.000.
- Tabata, Toshikazu. Solid buffing compound. 5,749,773, Cl. 451-66.000.
- Tabata, Yoshio: *See—*
  - Murai, Yukako; Suzuki, Akio; Tabata, Yoshio; Saito, Keiichi; and Amagai, Tamio, 5,751,438, Cl. 358-403.000.
- Tachibana, Hajime: *See—*
  - Nakamura, Kiyoji; Okabayashi, Hiroyuki; Ashizawa, Mutsumi; Shidara, Shinichi; and Tachibana, Hajime, 5,751,402, Cl. 355-40.000.
- Tachick, Henry N.: *See—*
  - Pelly, Brian R.; and Tachick, Henry N., 5,751,530, Cl. 361-56.000.
- Tachikawa, Michiyoshi: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Tada, Akira; and Hayashi, Toshihiko, to Toyo Seikan Kaisha, Ltd. Polyamideimide inner surface-coated metal container. 5,750,223, Cl. 428-35.800.
- Taenzer, Jon C., to ReSound Corporation. Integrated circuit design for a personal use wireless communication system utilizing reflection. 5,751,820, Cl. 381-68.000.
- Tafuri, Sherrie Rae: *See—*
  - Bisgaier, Charles Larry; Creger, Paul Leroy; Saltiel, Alan Robert; and Tafuri, Sherrie Rae, 5,750,569, Cl. 514-547.000.
- Taghezout, Daho, to Eta SA Fabriques d'Ebauches. Multipolar motor with two rotors. 5,751,086, Cl. 310-112.000.
- Taguchi, Ichiro: *See—*
  - Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, 5,752,107, Cl. 396-296.000.
- Tahara, Hisatsugu: *See—*
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
- Tai, Makoto: *See—*
  - Doshita, Hideo; Koyano, Masahiro; Goto, Akihiro; Ishimoto, Kazuhisa; and Tai, Makoto, 5,750,257, Cl. 428-379.000.
- Taiho Kogyo Co., Ltd.: *See—*
  - Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, 5,749,563, Cl. 251-61.500.
- Taiho Pharmaceutical Co., Ltd.: *See—*
  - Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, 5,750,515, Cl. 514-63.000.
- Taiwan Semiconductor Manufacturing Company Ltd.: *See—*
  - Chen, Ling; Sung, Hung-Cheng; and Lo, Chi-Shiung, 5,751,040, Cl. 257-332.000.
  - Chun, Lee Meng, 5,750,003, Cl. 156-345.000.

  - Lee, Jin-Yuan, 5,751,044, Cl. 257-380.000.
  - You, Chue-San, 5,751,043, Cl. 257-380.000.
- Tajima, Kyoko: *See—*
  - Nakanishi, Koichiro; Nomura, Keiichi; Tajima, Kyoko; Hiratani, Hajime; and Kato, Kazuo, 5,750,650, Cl. 530-350.000.
- Taka, Kyosuke; Masuda, Keiji; and Mukai, Kan, to Sharp Kabushiki Kaisha. Digital image forming apparatus capable of easily installing and removing optical scanner unit. 5,751,431, Cl. 358-296.000.
- Takabayashi, Hiroshi: *See—*
  - Kanda, Toshiyuki; Takabayashi, Hiroshi; and Onitsuka, Yoshihiro, 5,751,386, Cl. 349-65.000.
- Takada, Kyu: *See—*
  - Inoue, Nozomu; Hama, Takashi; Nomura, Yujiro; and Takada, Kyu, 5,751,463, Cl. 359-205.000.
- Takada, Tomoaki: *See—*
  - Tsutsumi, Kazuo; Takada, Tomoaki; Sakakida, Yasufumi; and Kawamura, Tarou, 5,750,084, Cl. 423-239.100.
- Takagi, Atsushi: *See—*
  - Takaoka, Naoki; and Takagi, Atsushi, 5,751,401, Cl. 355-32.000.
- Takagi, Junichi: *See—*
  - Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.
- Takagi, Kazuhisa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser including tunnel diode for reducing contact resistance. 5,751,754, Cl. 372-46.000.
- Takahashi, Hideki, to Mitsubishi Denki Kabushiki Kaisha. Insulated gate semiconductor device. 5,751,024, Cl. 257-139.000.
- Takahashi, Hironori; and Aoshima, Shinichiro, to Hamamatsu Photonics K.K. Optical delay apparatus. 5,751,419, Cl. 356-321.000.
- Takahashi, Hiroshi: *See—*
  - Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.
- Takahashi, Hiroyuki; and Yamamoto, Nobuhiko, to Toyoda Koki Kabushiki Kaisha. Pressurized fluid supply hose and method of manufacturing the same. 5,749,396, Cl. 138-26.000.
- Takahashi, Kazunari, to Pentel Kabushiki Kaisha. Multiplex writing instrument. 5,749,663, Cl. 401-31.000.
- Takahashi, Kiichiro: *See—*
  - Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.
  - Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.
- Takahashi, Koichi, to Olympus Optical., Ltd. Image display apparatus. 5,751,494, Cl. 359-631.000.
- Takahashi, Makoto, to Yamaha Corporation. Electronic musical instrument having an effect data converting function. 5,750,914, Cl. 84-626.000.
- Takahashi, Masahiko, to Primo Microphones, Inc. Piezoelectric speaker. 5,751,827, Cl. 381-190.000.
- Takahashi, Mayumi: *See—*
  - Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.
- Takahashi, Osamu; Hashimoto, Yasuharu; Nagasaka, Eiichi; Miyazaki, Hajime; and Funasaka, Tsukasa, to Seiko Epson Corporation. Piezoelectric power generator for a portable power supply unit and portable electronic device equipped with same. 5,751,091, Cl. 310-339.000.
- Takahashi, Toru: *See—*
  - Nishimura, Takashi; and Takahashi, Toru, 5,751,094, Cl. 313-2.100.
- Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, to Nikon Corporation. Operation method of device loaded with a film unit. 5,752,105, Cl. 396-207.000.
- Takahashi, Tsuneteru: *See—*
  - Sato, Tadashige; Imai, Megumi; and Takahashi, Tsuneteru, 5,751,026, Cl. 257-190.000.
- Takahashi, Yuji: *See—*
  - Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.
- Takahashi, Yukio: *See—*
  - Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.
- Takahashi, Yutaka: *See—*
  - Horino, Morikatsu; Kage, Tsuyoshi; Takahashi, Yutaka; and Shimomi, Akira, 5,750,216, Cl. 428-34.300.
- Takai, Yuji; Nakatani, Kazue; and Matsumoto, Michihiro, to Matsushita Electric Industrial Co., Ltd. Apparatus and method of supporting functional design of logic circuit and apparatus and method of verifying functional design of logic circuit. 5,751,592, Cl. 364-488.000.
- Takakura, Hiroshi; Ishihara, Satoshi; and Yasuda, Keiko, to Canon Kabushiki Kaisha. Document processing apparatus for processing a document and associated format information. 5,752,053, Cl. 395-766.000.
- Takamizawa, Minoru: *See—*
  - Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, 5,750,636, Cl. 528-310.000.
  - Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, 5,750,637, Cl. 528-310.000.
- Takamoto, Yoshifumi: *See—*
  - Fujii, Hiroaki; Kakuta, Hitoshi; and Takamoto, Yoshifumi, 5,752,256, Cl. 711-114.000.
- Takamura, Tsukasa: *See—*
  - Arakawa, Eitaro; Kato, Tetsuo; Takamura, Tsukasa; Imai, Keiji; Segami, Tetsuya; and Nakamura, Yukitaka, 5,750,552, Cl. 514-386.000.
- Takano, Hiroyoshi: *See—*
  - Shibasaki, Souhei; Sawano, Yukio; Hanaoka, Shuzo; and Takano, Hiroyoshi, 5,749,662, Cl. 400-82.000.
- Takano, Takao, to Canon Kabushiki Kaisha. Electronic apparatus having a computer. 5,751,172, Cl. 327-113.000.
- Takano, Toshiyuki: *See—*
  - Satake, Toshimi; Takano, Toshiyuki; Fukuda, Motoi; and Uehori, Yukiko, 5,750,253, Cl. 428-342.000.
- Takano, Yoshiaki, to Sanyo Electric Co., Ltd. Transportable storage cabinet. 5,749,234, Cl. 62-125.000.
- Takanobu, Hiroshi; and Ishikawa, Akimasa, to Hitachi, Ltd.; and Hitachi Electronic Devices Co., Ltd. Cathode ray tube having a contact spring fixed to an end of the shield cup with a micro vickers hardness of 250-400. 5,751,101, Cl. 313-405.000.
- Takaoka, Naoki; and Takagi, Atsushi, to Fuji Photo Film Co., Ltd. Method of determining amount of exposure. 5,751,401, Cl. 355-32.000.
- Takasago International Corporation: *See—*
  - Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.
  - Matsushima, Yoshimasa; Sugiyama, Hiroshi; and Hagiwara, Toshimitsu, 5,750,785, Cl. 564-315.000.
- Takasago Netsugaku Kogyo Kabushiki Kaisa: *See—*
  - Ohmi, Tadahiro; Inaba, Hitoshi; and Ikedo, Tomoyuki, 5,750,011, Cl. 204-164.000.
- Takasaki, Toshiharu; and Hara, Tomoyuki, to Nissan Motor Co., Ltd. Control system for distributing drive torque between front and rear wheels of vehicle. 5,752,211, Cl. 701-69.000.
- Takase, Ichiro: *See—*
  - Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, 5,750,717, Cl. 548-240.000.
- Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, to Mitsui Toatsu Chemicals, Inc. Transparent conductive laminate. 5,750,267, Cl. 428-469.000.
- Takatori, Sunao: *See—*
  - Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,184, Cl. 327-552.000.
  - Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,624, Cl. 364-841.000.
- Takaura, Keisuke: *See—*
  - Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.
- Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, to Matsushita Electronics Corporation. Semiconductor laser device for use as a light source of an optical disk or the like. 5,751,756, Cl. 372-46.000.
- Takayanagi, Ryotaro: *See—*
  - Matsui, Hideki; Sakamoto, Hiroshi; Takayanagi, Ryotaro; and Hagiuda, Nobuyoshi, 5,752,102, Cl. 396-156.000.
- Takayuki, Imaoka: *See—*
  - Hideki, Kawai; Takayuki, Imaoka; and Go, Hata, 5,750,716, Cl. 549-210.000.
- Takebayashi, Tatsuhide; and Sensui, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Optical unit for detecting a focus state. 5,752,099, Cl. 396-114.000.
- Takebe, Kazuo: *See—*
  - Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,750,789, Cl. 564-428.000.
- Takechi, Hiroaki; and Ono, Tomohiro, to Yamaha Hatsudoki Kabushiki Kaisha. Checking method of connection between secondary battery and battery charger and checking device. 5,751,136, Cl. 320-150.000.
- Takeda Chemical Industries, Ltd.: *See—*
  - Matsumori, Akira, 5,750,551, Cl. 514-381.000.
  - Suzuki, Nobuhiro; Odaka, Asano; and Kitada, Chieko, 5,750,349, Cl. 435-7.100.
  - Yamagata, Yutaka; Iga, Katsumi; and Okada, Hiroaki, 5,750,100, Cl. 424-85.200.
- Takeda Food Products, Ltd.: *See—*
  - Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.
- Takeda, Hiroshi: *See—*
  - Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.
- Takeda, Hitoshi: *See—*
  - Kobayashi, Kenji; and Takeda, Hitoshi, 5,749,794, Cl. 473-342.000.
- Takeda, Shinji: *See—*

  - Akahoshi, Fumihiko; Okada, Takehiro; Takeda, Shinji; Naito, Youichiro; Fukaya, Chikara; Kuwahara, Shigeki; Kajii, Masahiko; Nishimura, Hiroko; and Sugiura, Masanori, 5,750,545, Cl. 514-340.000.
- Takeda, Toshihiko; Kuroda, Ryo; and Yasuda, Susumu, to Canon Kabushiki Kaisha. Recording/reproducing apparatus and method for recording/reproducing information using probe. 5,751,684, Cl. 369-126.000.
- Takeda, Toshihiko: *See—*
  - Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.
- Takeda, Yasuaki: *See—*
  - Ito, Nobuhiro; Takeda, Yasuaki; Hanyu, Yukio; Asaoka, Masanobu; Nakazawa, Ikuo; Asao, Yasufumi; and Moriyama, Takashi, 5,750,214, Cl. 428-1.000.
- Takeda, Yasuhide: *See—*
  - Nogami, Tadahiko; Daimon, Goro; Takeda, Yasuhide; Kawamoto, Hideo; Sadou, Kouichi; Maeda, Hiroshi; and Sadamura, Hiroyoshi, 5,750,950, Cl. 218-154.000.
- Takehana, Sakae: *See—*
  - Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.
- Takehara, Hisao; Shimizugawa, Ryoichi; and Tokai, Toshihiko, to Japan Metals & Chemicals Co., Ltd. Manganese fertilizer. 5,749,935, Cl. 71-62.000.
- Takehara, Nobuyoshi: *See—*
  - Sato, Hiroshi; Fukae, Kimitoshi; and Takehara, Nobuyoshi, 5,751,133, Cl. 320-13.000.
- Takemoto, Etsuo: *See—*
  - Koyama, Hiroshi; and Takemoto, Etsuo, 5,750,792, Cl. 564-507.000.
- Takemoto, Kiyohiko: *See—*
  - Miyashita, Satoru; and Takemoto, Kiyohiko, 5,751,313, Cl. 347-45.000.
  - Yoshiike, Etsuko; Takemoto, Kiyohiko; and Kubota, Kazuhide, 5,749,951, Cl. 106-31.270.
- Takemura, Osamu; Kimura, Takahiko; and Fujii, Atsushi, to Mita Industrial Co., Ltd. Print head in powder jet image forming apparatus having a matrix electrode and a grid electrode. 5,751,314, Cl. 347-55.000.
- Takemura, Shinichi: *See—*
  - Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.
- Takenaka, Masashi: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- Takeoka, Toru; Clarson, Stephen J.; and Goldslager, Barry, to Three Bond Co., Ltd. Radiation-curable silicone composition. 5,750,588, Cl. 522-66.000.
- Takeshi, Kunio: *See—*
  - Usui, Fumiaki; Takeshi, Kunio; Hosoya, Jun; and Terasawa, Chiaki, 5,751,497, Cl. 359-687.000.
- Takeshita, Masatoshi: *See—*
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
- Takeuchi, Seiji: *See—*
  - Hasegawa, Masanobu; Yoshii, Minoru; and Takeuchi, Seiji, 5,750,294, Cl. 430-22.000.
- Takeuchi, Takashi: *See—*
  - Koike, Ryuichi; Banno, Hiroshi; Ito, Tamotsu; and Takeuchi, Takashi, 5,751,671, Cl. 369-14.000.
- Takeuchi, Yoshihiko: *See—*
  - Yamashita, Kazuo; Takeuchi, Yoshihiko; and Watanabe, Masahiro, 5,751,200, Cl. 333-197.000.
- Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, to Shin-Etsu Chemical Co., Ltd. Process for the preparation of a polycarbodiimide solution. 5,750,637, Cl. 528-310.000.
- Takiguchi, Yasuyuki: *See—*
  - Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, 5,750,636, Cl. 528-310.000.
- Takizawa, Hiroshi, to Canon Kabushiki Kaisha. Information transmission method and apparatus. 5,751,743, Cl. 371-41.000.
- Takizawa, Mitsuharu: *See—*
  - Kaneko, Satoshi; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Fukada, Taisei; Iseki, Yukimasa; Sato, Mitsuhiko; and Takizawa, Mitsuharu, 5,752,040, Cl. 395-712.000.
- Takizawa, Toshiaki: *See—*
  - Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakihara, Keisuke; and Minato, Tsuyoshi, 5,749,129, Cl. 24-452.000.
- Talaalout, L.: *See—*
  - Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., 5,751,113, Cl. 315-111.210.
- Taliento, Raffaella: *See—*
  - Donelli, Giordano; Rosellini, Massimiliano; Taliento, Raffaella; and Dore', Fausto, 5,750,006, Cl. 162-181.500.
- Talley, John J.: *See—*
  - Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.
- Tamada, Hiroshi; Kashio, Shigetora; and Adachi, Tamio, to Toray Industries, Inc. Photosensitive resin composition and process for producing the same. 5,750,313, Cl. 430-280.100.
- Tamagawa, Yutaka: *See—*
  - Kiuchi, Takeo; Tamagawa, Yutaka; and Ibaraki, Shigeru, 5,751,137, Cl. 322-14.000.
- Tamagnan, Gilles: *See—*
  - Neumeyer, John L.; Milius, Richard A.; Tamagnan, Gilles; and Wang, Shaoyin, 5,750,089, Cl. 424-1.850.
- Tamaki, Shigeo; and Tokumoto, Shigeru, to Hitachi, Ltd.; and Hitachi Car Engineering Co., Ltd. Intake valve control system for internal combustion engine. 5,749,336, Cl. 123-337.000.
- Tamamoto, Junichi: *See—*
  - Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,749,473, Cl. 209-584.000.
- Tamura, Akira; Yamada, Osamichi; Endo, Tadashi; and Uematsu, Eiji, to CKD Corporation. Magnetic screw conveying apparatus. 5,751,083, Cl. 310-80.000.
- Tamura, Junichi: *See—*
  - Kosaka, Tetsuo; Sakurai, Atsushi; and Tamura, Junichi, 5,751,898, Cl. 395-2.500.
- Tamura, Kouji; Morohashi, Mamoru; Okada, Akira; Matsumura, Kenji; and Hama, Satoshi, to JGC Corporation. Thermal insulating support device for piping. 5,749,548, Cl. 248-49.000.
- Tamura, Masakazu: *See—*
  - Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, 5,750,255, Cl. 428-359.000.
- Tamura, Motoichi, to Yamaha Corporation. Sound generation method using hardware and software sound sources. 5,750,911, Cl. 84-602.000.
- Tamura, Osamu: *See—*
  - Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, 5,750,302, Cl. 430-106.600.
- Tan, Haw-Chan; and Ma, Frank C., to Hon Hai Precision Ind. Co., Ltd. Cable connector structure. 5,749,746, Cl. 439-357.000.
- Tan, Weitian: *See—*
  - Iyer, Radhakrishnan P.; Yu, Dong; Agrawal, Sudhir; and Tan, Weitian, 5,750,674, Cl. 536-26.700.
- Tanabe, Noboru, to Kabushiki Kaisha Toshiba. Memory access control device with prefetch and read out block length control functions. 5,752,272, Cl. 711-171.000.
- Tanada, Shinichi: *See—*
  - Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.
- Tanahashi, Katsuyuki; Tsutsui, Hiroshi; Yamamoto, Yoshihisa; and Tsukamoto, Kazumasa, to Aisin AW Co., Ltd. Automatic transmission control apparatus. 5,749,802, Cl. 475-120.000.
- Tanahashi, Kiwamu: *See—*
  - Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.
- Tanai, Naoki: *See—*
  - Sasaki, Ryoichi; Tanai, Naoki; and Suhara, Masaaki, 5,750,974, Cl. 235-454.000.
- Tanaka, Akira, to Sony Corporation. Floating gate type non-volatile semiconductor memory device. 5,751,036, Cl. 257-315.000.
- Tanaka, Atsushi; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Ashibe, Tsunenori; and Kusaba, Takashi, to Canon Kabushiki Kaisha. Image forming apparatus for cleaning residual toner from an intermediate transfer member. 5,752,130, Cl. 399-101.000.
- Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, to Mitsubishi Chemical Corporation. Process for producing α-olefin oligomers and α-olefin oligomer compositions. 5,750,817, Cl. 585-520.000.
- Tanaka, Hirokazu: *See—*
  - Oku, Teruo; Kayakiri, Hiroshi; Satoh, Shigeki; Abe, Yoshito; Sawada, Yuki; and Tanaka, Hirokazu, 5,750,699, Cl. 546-121.000.
- Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, to Nippon Telegraph and Telephone Corporation. Optical devices with high polymer material and method of forming the same. 5,751,452, Cl. 359-52.000.
- Tanaka, Kyoko: *See—*
  - Suda, Eiichi; Nihei, Takayuki; and Tanaka, Kyoko, 5,752,033, Cl. 395-701.000.
- Tanaka, Manabu: *See—*
  - Sato, Yuji; and Tanaka, Manabu, 5,751,267, Cl. 345-96.000.
- Tanaka, Masahiro, to Futaba Denshi Kogyo Kabushiki Kaisha. Trimming unit of radio control apparatus. 5,751,237, Cl. 341-176.000.
- Tanaka, Minoru; Yamamoto, Shigeru; and Mori, Yoshitaka, to Fuji Photo Optical Co., Ltd. Switching apparatus for TV lens unit switching. 5,751,353, Cl. 348-335.000.
- Tanaka, Mitsugu, to Canon Kabushiki Kaisha. Digital video and audio signal recording apparatus. 5,751,504, Cl. 360-19.100.
- Tanaka, Mitsumasa, to NEC Corporation. Code amount controlling method for coded pictures. 5,751,360, Cl. 348-409.000.
- Tanaka, Nariaki: *See—*

  - Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.
  - Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.
- Tanaka, Satomi, to Sony Corporation. Dual mode electronic camera having a large recording capacity. 5,751,350, Cl. 348-231.000.
- Tanaka, Shigeru: *See—*
  - Watanabe, Naofumi; and Tanaka, Shigeru, 5,751,837, Cl. 382-131.000.
- Tanaka, Takaaki; Yamauchi, Masahide; Ishikura, Yasuhisa; and Aoki, Masaki, to Matsushita Electric Industrial Co., Ltd. Monochromatic cathode ray tube having scattered electron suppressing layer. 5,751,102, Cl. 313-466.000.
- Tanaka, Takayoshi: *See—*
  - Gouda, Hirofumi; and Tanaka, Takayoshi, 5,750,068, Cl. 264-572.000.
- Tanaka, Yasuhiko, to Fuji Photo Optical Co., Ltd. Mechanism for opening and closing a film chamber of a photographic camera. 5,752,120, Cl. 396-536.000.
- Tanaka, Yasuyuki: *See—*
  - Hayashi, Kazuyuki; Iwasaki, Keisuke; Tanaka, Yasuyuki; and Morii, Hiroko, 5,750,250, Cl. 428-328.000.
- Tanaka, Yozo, to Sony Corporation. Dubbing system. 5,751,678, Cl. 369-84.000.
- Tanase, Susumu: *See—*
  - Hamagishi, Goro; Mashitani, Ken; Nakayama, Eiji; and Tanase, Susumu, 5,751,479, Cl. 359-464.000.
- Tancrede, Jean M.: *See—*
  - Diehl, Charles F.; and Tancrede, Jean M., 5,750,623, Cl. 525-98.000.
- Tandel, Sagun Kashinath: *See—*
  - Deshmukh, Abdul Rakeeb Abdul Subhan; Naik, Rajan Hiralal; Tandel, Sagun Kashinath; and Rajappa, Srinivasachari, 5,750,757, Cl. 558-232.000.
- Tandem Computers Incorporated: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
  - Horst, Robert W., 5,752,064, Cl. 395-800.000.
  - Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.
- Tandon, Manoj: *See—*
  - Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Wans, Raymond Frederick, 5,750,476, Cl. 508-291.000.
- Tanenblatt, Michael Abraham: *See—*
  - Moebius, Bernd; Olive, Joseph Philip; Tanenblatt, Michael Abraham; and VanSanten, Jan Pieter, 5,751,907, Cl. 395-2.760.
- Tang, Dandas K.: *See—*
  - Shieh, Jhy-Jer; and Tang, Dandas K., 5,751,166, Cl. 326-71.000.
- Tang, Howard; and Parker, Daniel V., to Lattice Semiconductor Corporation. Parallel programming of in-system (ISP) programmable devices using an automatic tester. 5,751,163, Cl. 326-38.000.
- Tang, Jiansheng; Cunningham, Raymond T.; and Yang, Bo, to Nalco Chemical Company. Use of biodegradable polymers in preventing corrosion and scale build-up. 5,750,070, Cl. 422-16.000.
- Tang, Manh; and Hadley, Keith A., to Eastman Kodak Company. Autocalibration of optical sensors. 5,751,601, Cl. 364-526.000.
- Tang, Pao-Yun; Chang, Shyh-Ming; Lee, Yu-Chi; and Fang, Su-Yu, to Industrial Technology Research Institute. Composite bump tape automated bonding method and bonded structure. 5,749,997, Cl. 156-249.000.
- Tang, Qing: *See—*
  - Gan, Zhongxue; Fitzgibbons, Lance Terrance; Tang, Qing; and Katz, Jeffrey Sherman, 5,751,610, Cl. 364-571.030.
- Tang, Xiaoxia; and Chen, Ga-Lane, to Conner Peripherals, Inc. Multi-layer magnetic recording media. 5,750,270, Cl. 428-611.000.
- Tani, Yoshiki: *See—*
  - Sakai, Yasuyoshi; Tani, Yoshiki; Shibano, Yuji; Kondo, Hiroto; and Hatanaka, Haruyo, 5,750,372, Cl. 435-69.100.
- Tanifuji, Yoichi: *See—*
  - Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, 5,750,079, Cl. 422-138.000.
- Tanigawa, Akira: *See—*
  - Yoshida, Yoshifumi; Tanigawa, Akira; and Yamamoto, Satoshi, 5,750,781, Cl. 564-153.000.
- Taniguchi, Masahiko: *See—*
  - Ito, Hidemi; Taniguchi, Masahiko; Tsujiyama, Yoshimi; and Katsuya, Masahito, 5,750,256, Cl. 428-375.000.
- Taniguchi, Masami: *See—*
  - Okado, Makoto; Ueda, Yoshihiro; Kobata, Tadashi; and Taniguchi, Masami, 5,752,127, Cl. 399-76.000.
- Taniguchi, Norio: *See—*
  - Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
- Taniguchi, Tetsuya; Sasa, Nobumasa; and Shimizu, Kunio, to Konica Corporation and Mitsubishi Chemical Corporation. Image-formable material with releaseable cushion layer. 5,750,311, Cl. 430-253.000.
- Taniguro, Masahiro: *See—*
  - Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.
- Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, to Nissan Chemical Industries, Ltd. Pyridazinone derivatives. 5,750,523, Cl. 514-247.000.
- Tanimura, Morimasa, to NTT Data Communications Systems Corp. Executable file difference extraction/update system and executable file difference extraction method. 5,752,039, Cl. 395-712.000.
- Tanimura, Tosiyasu: *See—*
  - Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, 5,749,586, Cl. 277-608.000.
- Tanizawa, Seiji: *See—*
  - Torii, Mikio; and Tanizawa, Seiji, 5,749,347, Cl. 123-516.000.
- Tann, Chou-Hong: *See—*
  - Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,750,745, Cl. 552-581.000.
- Tanner, Noel, to A.U. Mines, Inc.; and Rennat Trust. Dynamic mining system comprising hydrated multiple recovery sites and related methods. 5,749,472, Cl. 209-458.000.
- Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Variable level shifter and multiplier suitable for low-voltage differential operation. 5,751,177, Cl. 327-333.000.
- Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Clock distributing circuit. 5,751,665, Cl. 368-120.000.
- Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, to Oki Electric Industry Co., Ltd. Printer having circuit for providing improved printing quality. 5,751,328, Cl. 347-130.000.
- Taoka, Naoaki; Honda, Mizuho; Inoue, Kenji; and Kan, Kazunori, to Kaneka Corporation. Process for producing optically active 2-alkoxycyclohexanol derivatives. 5,750,382, Cl. 435-135.000.
- Taras Development: *See—*
  - Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000.
- Targan, Stephan R.; and Vidrich, Alda, to Cedars-Sinai Medical Center. Methods for selectively detecting perinuclear anti-neutrophil cytoplasmic antibody of ulcerative colitis or primary sclerosing cholangitis. 5,750,355, Cl. 435-7.240.
- Target Therapeutics, Inc.: *See—*
  - Engelson, Erik T., 5,749,849, Cl. 604-53.000.
  - Engelson, Erik T., 5,749,894, Cl. 606-213.000.
  - Hergenrother, Robert; Chee, Uriel Hiram; and Schaller, Laurent, 5,750,206, Cl. 427-490.000.
  - Ken, Christopher G. M.; and Engelson, Erik T., 5,749,891, Cl. 606-200.000.
  - Palermo, Thomas J.; Samson, Gene; Mirigian, Gregory E.; and Chee, U. Hiram, 5,749,837, Cl. 600-585.000.
- Tarlier, Michel: *See—*
  - Sidot, Christian; and Tarlier, Michel, 5,750,775, Cl. 562-470.000.
- Tarmac Construction Limited: *See—*
  - Page, Christopher Lyndon, 5,750,276, Cl. 428-703.000.
- Tarr, William C.: *See—*
  - Blake, Andy F.; and Tarr, William C., 5,750,022, Cl. 210-169.000.
- Tashiro, Tsutomu: *See—*
  - Kato, Yoshifumi; Yamauchi, Ichiro; Fujitsuna, Masami; and Tashiro, Tsutomu, 5,752,210, Cl. 701-51.000.
- Taskovich, Lina Tormen; Yum, Su Il; Lee, Eun Soo; and Crisologo, Nieves Marzan. Monoglyceride/lactate ester permeation enhancer. 5,750,137, Cl. 424-448.000.
- Tata, Giovanni: *See—*
  - Griswold, Michael R.; Guillerm, Thierry; Jiang, Wayne; Mossman, Bruce; Rogers, Spencer; and Tata, Giovanni, 5,749,736, Cl. 434-322.000.
- Tatara, Hirokazu, to Yazaki Corporation. Data transmission system. 5,751,770, Cl. 375-238.000.
- Tate, Naoto: *See—*
  - Habuka, Hitoshi; Mayuzumi, Masanori; Tate, Naoto; and Katayama, Masatake, 5,749,974, Cl. 118-725.000.
- Tatebayashi, Makoto: *See—*
  - Miyaji, Atsuko; Omori, Motoji; and Tatebayashi, Makoto, 5,751,810, Cl. 380-28.000.
- Tatemichi, Yoshihiko: *See—*
  - Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, 5,749,996, Cl. 156-244.240.
- Tateno, Tetsuya; and Minami, Yuji, to Canon Kabushiki Kaisha. Decoding apparatus and method therefor. 5,751,233, Cl. 341-67.000.
- Tatge, Reid E.: *See—*
  - Leach, Jerald G.; Simar, Laurence R.; Davis, Alan L.; and Tatge, Reid E., 5,751,991, Cl. 395-421.040.
- Tatsumi, Satoshi, to NEC Corporation. Channel quality monitoring by detecting, based on a fading pitch detected in an RSSI, a BER in an accumulated phase likelihood datum. 5,751,767, Cl. 375-224.000.
- Tau, Lok L.; Conboy, Michael R.; and Jackson, Thomas P., to Advanced Micro Devices. Material movement server. 5,751,581, Cl. 364-468.220.

Tavares, Bruce, to Rheox, Inc. Anti-abrasion ink additives and printing inks containing such additives. 5,749,949, Cl. 106-313.000.
Tavian, Armando; and Kargilis, Alexander, to Chrysler Corporation. Automatic air recirculation system. 5,749,236, Cl. 62-186.000.
Tayloe, Daniel Richard: *See—*
  Frank, Mark Steven; Tayloe, Daniel Richard; and Blasiak, Dariusz Andrzej, 5,752,187, Cl. 455-428.000.
Taylor, Christopher G.: *See—*
  Conkling, Mark A.; Opperman, Charles H.; and Taylor, Christopher G., 5,750,386, Cl. 435-172.300.
Taylor, Dale M.: *See—*
  Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.
Taylor, Gary Newton: *See—*
  Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, 5,750,312, Cl. 430-273.100.
Taylor, John E.: *See—*
  Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, 5,750,646, Cl. 530-314.000.
Taylor, John J.: *See—*
  Panter, Ronald L.; and Taylor, John J., 5,751,832, Cl. 382-104.000.
Taylor, Junius E., to Engineering & Research Associates, Inc. Apparatus for controlling RF generators to weld plastic materials. 5,750,971, Cl. 219-769.000.
Taylor, Kelly J.: *See—*
  Saxena, Sharad; Mozumder, Purnendu K.; Shinn, Gregory B.; and Taylor, Kelly J., 5,751,582, Cl. 364-468.160.
Taylor, Louis L.: *See—*
  Humphries, Robert D.; Dreese, Delbert R.; Taylor, Louis L.; and Parker, Dennis Clay, 5,749,936, Cl. 71-64.050.
Taylor, Mark: *See—*
  Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., 5,751,998, Cl. 395-490.000.
Taylor, Russell Highsmith: *See—*
  Funda, Janez; LaRose, David Arthur; and Taylor, Russell Highsmith, 5,749,362, Cl. 128-653.100.
Taylor, Sven: *See—*
  Barbier, Pierre; Huber, Isabelle; Schneider, Fernand; Stadlwieser, Josef; and Taylor, Sven, 5,750,706, Cl. 546-279.100.
Taylor, Thomas P.: *See—*
  Hilfiker, William K.; and Taylor, Thomas P., 5,749,680, Cl. 405-262.000.
Tazartes, Daniel A.: *See—*
  Frederick, Donald A.; Mark, John G.; Tazartes, Daniel A.; Hall, David B.; and Hahn, Tae W., 5,751,425, Cl. 356-350.000.
TDK Corporation: *See—*
  Nihira, Yoshito; Nomura, Takeshi; and Onizuka, Masahiro, 5,750,045, Cl. 252-62.560.
  Yoneyama, Tetsuhito; Yamamoto, Tomomi; Hidaka, Tetsuya; and Fukuno, Akira, 5,750,044, Cl. 252-62.540.
Teague, Martin: *See—*
  DuBose, Richard G.; and Teague, Martin, 5,751,152, Cl. 324-628.000.
Tebeau, Jason. Baby bottle. 5,749,483, Cl. 215-11.400.
Tebel-MKT B.V.: *See—*
  Schouten, Frank, 5,749,287, Cl. 99-458.000.
Technische Universitaet Dresden: *See—*
  Nagel, Thomas; and Richard, Ulf, 5,749,800, Cl. 474-84.000.
Technoflex Innovations Limited: *See—*
  Findley, Philip; Mortimer, Keith; and Marshall, David, 5,750,240, Cl. 428-195.000.
Tecsyn, Inc.: *See—*
  Pettersson, Bjorn Ola Alfons; Plavnik, Alex; and Boreczky, Eric, 5,749,331, Cl. 123-193.200.
Teener, Michael D.: *See—*
  Oprescu, Florin; and Teener, Michael D., 5,752,046, Cl. 395-750.010.
Teerman, Richard Frederic: *See—*
  Straub, Robert D.; Teerman, Richard Frederic; Stegink, Thomas M.; and Ogren, Daniel B., 5,749,717, Cl. 417-505.000.
Tegeler, Ferdinand, to ABB Henschel AG. Rail-borne motor coach. 5,749,302, Cl. 105-397.000.
Tehrani, Yoossef: *See—*
  Allington, Robert W.; Walters, Henry LeRoy; Jameson, Daniel Gene; and Tehrani, Yoossef, 5,750,027, Cl. 210-511.000.
Teichmann, Robert J.: *See—*
  Walther, James F.; Teichmann, Robert J.; and Wasowicz, Andrew M., 5,750,249, Cl. 428-328.000.
Teijin Limited: *See—*
  Ozawa, Takayuki; Sugiyama, Satoru; Kitahara, Shigehisa; and Fujii, Katsuhiko, 5,750,507, Cl. 514-19.000.
TekSource, LC: *See—*
  Pearce, Tony M., 5,749,111, Cl. 5-652.000.
Tektronix, Inc.: *See—*
  Banning, Jeffery H.; King, Clifford R.; Bui, Loc V.; and Titterington, Donald R., 5,750,604, Cl. 524-187.000.
Telair International Cargo Systems GmbH: *See—*
  Huber, Thomas, 5,749,543, Cl. 244-118.100.
Teledyne Industries, Inc.: *See—*
  Huang, Yufeng; Alvesteffer, William J.; and Outlaw, Ronald A., 5,750,892, Cl. 73-202.000.
Telefonaktiebolaget L M Ericsson (publ): *See—*
  Epperson, Darrell; Chennakeshu, Sandeep; and Karabinis, Peter Dimitrios, 5,752,204, Cl. 455-575.000.
Telefonaktiebolaget LM Ericsson: *See—*
  Raith, Alex Krister, 5,751,731, Cl. 371-37.010.
  Weinholt, Dan Rutger, 5,751,187, Cl. 329-304.000.
  Äström, Bo A. V.; and Svennesson, Björn A., 5,752,188, Cl. 455-433.000.
Teleha, Christopher Allan: *See—*
  Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.
TeleSuite Corporation: *See—*
  Allen, David Lee; and Williams, Herold, 5,751,337, Cl. 348-15.000.
Teletransactions, Inc.: *See—*
  Myerson, Robert F.; Wall, Daniel G.; and O'Hagan, Timothy P., 5,750,975, Cl. 235-472.000.
  Sutherland, Jeffrey W., 5,751,257, Cl. 345-2.000.
Telia AB: *See—*
  Lyberg, Bertil, 5,752,227, Cl. 704-235.000.
Tellam, Mark E.: *See—*
  Brook, Mark G.; Tellam, Mark E.; Omvik, John F.; Cresens, Marc L.; Duval, Christopher R.; and Leclerc, David M., 5,751,447, Cl. 358-487.000.
Temento Systems: *See—*
  Deroux-Dauphin, Patrice; and Francois, Christian, 5,751,736, Cl. 371-22.310.
Tempo Research Corporation: *See—*
  Oberg, Arthur E.; and Wissman, Charles H., 5,751,149, Cl. 324-533.000.
Tenex Corporation: *See—*
  Cheris, Albert B.; Staubitz, Robert B.; and Repp, Timothy, 5,749,464, Cl. 206-308.100.
Teng, James Z.: *See—*
  Bhargava, Gautam; Narang, Inderpal Singh; and Teng, James Z., 5,751,992, Cl. 395-457.000.
Teng, Min; and Miller, Marvin J., to University of Notre Dame Du Lac. Bicyclic beta-lactams and process therefor. 5,750,681, Cl. 540-203.000.
Tenneco Packaging: *See—*
  Eichbauer, George, 5,749,202, Cl. 53-399.000.
Tennessee Valley Authority: *See—*
  Van Pelt, Vince; Meischen, Sandra J.; and Timpson, Clifford J., 5,750,992, Cl. 250-372.000.
Terachi, Takumi: *See—*
  Morimoto, Katsushi; Ohnari, Masatoshi; Furusawa, Hiroyuki; Terachi, Takumi; Nawamaki, Tsutomu; Ishikawa, Kimihiro; Nakahira, Kunimitsu; and Kawaguchi, Chiaki, 5,750,470, Cl. 504-253.000.
Terada, Takashi: *See—*
  Hazama, Hiroyuki; Gotoh, Masaru; Terada, Takashi; Nakajima, Nobuhiro; Hamakawa, Hiroyuki; and Tanaka, Nariaki, 5,752,132, Cl. 399-111.000.
  Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.
Terada, Takuji: *See—*
  Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.
Teraguchi, Nobuaki. Semiconductor light-emitting device. 5,751,021, Cl. 257-103.000.
Teraoka, Masao; and Yamazaki, Nobushi, to Tochigi Fuji Sangyo Kabushiki Kaisha. Differential unit. 5,749,801, Cl. 475-88.000.
Teraoka, Masao; and Yamazaki, Nobushi, to Tochigi Fuji Sangyo Kabushiki Kaisha. Differential apparatus. 5,749,803, Cl. 475-249.000.
Terasaki Denki Sangyo Kabushiki Kaisha: *See—*
  Yamauchi, Noriyuki, 5,751,604, Cl. 364-494.000.
Terasawa, Chiaki: *See—*
  Usui, Fumiaki; Takeshi, Kunio; Hosoya, Jun; and Terasawa, Chiaki, 5,751,497, Cl. 359-687.000.
Terashima, Hideyuki: *See—*
  Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, 5,749,570, Cl. 271-10.130.
Terashima, Masaharu: *See—*
  Okigami, Noboru; Sekiguchi, Yoshitoshi; Sasaki, Kunio; Shimotani, Hideo; and Terashima, Masaharu. 5,749,307, Cl. 110-222.000.
Terrassan, Daniele Mario: *See—*
  Sogli, Loris; Longoni, Davide; Pozzi, Giovanni; Siviero, Enrico; Terrassan, Daniele Mario; Bernasconi, Ermanno; and Salto, Francisco, 5,750,682, Cl. 540-215.000.
Terry, Francis H.: *See—*
  Jordan, Mark George; Terry, Francis H.; and Hack, Thomas Peter, 5,751,139, Cl. 323-222.000.
Terui, Nobuhiko: *See—*
  Ohishi, Sueyuki; and Terui, Nobuhiko, 5,752,092, Cl. 396-53.000.
Terwilliger, Chris: *See—*
  Holm, Paige M.; and Terwilliger, Chris, 5,751,159, Cl. 324-767.000.
Tetra Laval Holdings & Finance, S.A.: *See—*
  Botos, Matthew J.; Sizer, Charles E.; and Palanipian, Sevugan, 5,750,907, Cl. 73-865.800.
Tetsuhiro, Isobe: *See—*
  Onodera, Junichi; Sato, Shingo; Kashiwagi, Toshio; and Tetsuhiro, Isobe, 5,750,379, Cl. 435-72.000.
Teutsch, Jean: *See—*
  Claussner, Andre; Goubet, Francois; and Teutsch, Jean, 5,750,553, Cl. 514-392.000.

Texas Instruments Incopprporated: *See—*
  Black, Michael F., 5,751,195, Cl. 331-17.000.
Texas Instruments Incorporated: *See—*
  Abiko, Shigeshi; Mizushima, Shintaro; and Couvrat, Marc, 5,751,618, Cl. 364-736.010.
  Gammel, Michele B.; and Adamo, Joseph A., 5,752,231, Cl. 704-273.000.
  Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,750,415, Cl. 437-195.000.
  Goodwin, Michael W., 5,751,049, Cl. 257-440.000.
  Havemann, Robert H., 5,751,066, Cl. 257-759.000.
  Kaya, Cetin; and Tigelaar, Howard, 5,750,427, Cl. 438-264.000.
  Leach, Jerald G.; Simar, Laurence R.; Davis, Alan L.; and Tatge, Reid E., 5,751,991, Cl. 395-421.040.
  Mahant-Shetti, Shivaling S.; Smith, Derek J.; Pawate, Basavaraj I.; Doddington, George R.; Bean, Warren L.; Harward, Mark G.; and Aton, Thomas J., 5,751,987, Cl. 395-405.000.
  Markandey, Vishal; Doherty, Donald B.; and Gove, Robert J., 5,751,379, Cl. 348-759.000.
  Mehendale, Mahesh; Mahant-Shetti, Shivaling; Agarwala, Manisha; Harward, Mark G.; and Landers, Robert J., 5,751,162, Cl. 326-37.000.
  Numata, Ken, 5,751,056, Cl. 257-666.000.
  Saxena, Sharad; Mozumder, Purnendu K.; Shinn, Gregory B.; and Taylor, Kelly J., 5,751,582, Cl. 364-468.160.
  Speed, Harold H., III; and Spurlin, James C., 5,751,168, Cl. 326-83.000.
  Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
  Thiel, Frank L., IV, 5,751,182, Cl. 327-539.000.
  Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., 5,750,277, Cl. 429-7.000.
Texas Instuments Deutschland GmbH: *See—*
  Kiml, Helmut, 5,751,692, Cl. 370-85.100.
Texas Micro, Inc.: *See—*
  Stiffler, Jack J., 5,751,939, Cl. 395-182.130.
Texter, John; Sharma, Ravi; and Czekai, David Alan, to Eastman Kodak Company. Process for buffering concentrated aqueous slurries. 5,750,321, Cl. 430-449.000.
Th. Goldschmidt AG: *See—*
  Leidreiter, Holger; and Müller, Felix, 5,750,097, Cl. 424-70.100.
Thall, Edmond H. Retinal diagnostic device. 5,751,395, Cl. 351-221.000.
Thanasiu, Eva: *See—*
  Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.
Thangavelu, Kandasamy, to Otis Elevator Company. Estimation of lobby traffic and traffic rate using fuzzy logic to control elevator dispatching for single source traffic. 5,750,946, Cl. 187-392.000.
Thaniyavarn, Suwat, to Boeing Company, The. Phased array beam controller using integrated electro-optic circuits. 5,751,248, Cl. 342-368.000.
Thatcher, Wrenford John: *See—*
  Ivory, Nicholas Eric; and Thatcher, Wrenford John, 5,750,291, Cl. 430-11.000.
Thera Patent GmbH & Co. KG Gesellschaft fur: *See—*
  Zech, Joachim; Wanek, Erich; Lechner, Günther; and Bissinger, Peter, 5,750,589, Cl. 523-109.000.
ThermoGenesis Corp.: *See—*
  Coelho, Philip H.; and Wolf, Terry, 5,750,658, Cl. 530-382.000.
Theus, Ulrich, to Deutsche ITT Industries GmbH. Monolithically integrable mixer network for a mixer console. 5,751,826, Cl. 381-119.000.
Thewes, Roland: *See—*
  Von Basse, Paul-Werner; Bollu, Michael; Thewes, Roland; and Schmitt-Landsiedel, Doris, 5,751,742, Cl. 371-40.180.
Thiel, Frank L., IV, to Texas Instruments Incorporated. Rapid start-up circuit for voltage reference and method of operation. 5,751,182, Cl. 327-539.000.
Thiruvengadam, Tiruvettipuram K.: *See—*
  Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,750,745, Cl. 552-581.000.
Thomas, Alan E.: *See—*
  Thomas, C. Douglas; and Thomas, Alan E., 5,752,011, Cl. 395-556.000.
Thomas Body Parts, Inc.: *See—*
  Steever, Joel A., 5,749,616, Cl. 296-37.600.
Thomas, C. Douglas; and Thomas, Alan E. Method and system for controlling a processor's clock frequency in accordance with the processor's temperature. 5,752,011, Cl. 395-556.000.
Thomas, Devin James: *See—*
  Thomas, James V.; Thomas, Devin James; and Ross, Kenneth Garfield, 5,749,245, Cl. 62-623.000.
Thomas, James V.; Thomas, Devin James; and Ross, Kenneth Garfield, to Climate Supply (Atlantic) Inc. Refrigerant separation system. 5,749,245, Cl. 62-623.000.
Thomas Jefferson University: *See—*
  Bagasra, Omar; and Pomerantz, Roger J., 5,750,347, Cl. 435-6.000.
  Smith, J. Bruce, 5,750,339, Cl. 435-6.000.
Thomas, Larry A.; and McMahon, Kelly B. Apparatus to retrofit an HID light fixture. 5,751,116, Cl. 315-240.000.
Thomason, Scott, to MTD Products Inc. Single lever height adjustment mechanism and method for a lawn mower. 5,749,209, Cl. 56-17.200.
Thompson, Craig W.: *See—*
  Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
Thompson, Donald M.: *See—*
  Kim, In C.; Thompson, Donald M.; and Sarto, Gloria E., 5,750,340, Cl. 435-6.000.
Thompson, James D.; and Draper, Kenneth G., to Ribozyme Pharmaceuticals, Inc. Method and reagent for treatment of diseases caused by expression of the bcl-2 gene. 5,750,390, Cl. 435-195.000.
Thompson, James E.: *See—*
  Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas Franklin; Kirbie, Martin; and Speer, Andrew J., III, 5,749,595, Cl. 280-688.000.
Thompson, J. Wayne; and Manning, Troy A., to Micron Technology, Inc. Memory and other integrated circuitry having a conductive interconnect line pitch of less than 0.6 micron. 5,751,031, Cl. 257-208.000.
Thompson, Larry Flack: *See—*
  Chandross, Edwin Arthur; Nalamasu, Omkaram; Reichmanis, Elsa; Taylor, Gary Newton; and Thompson, Larry Flack, 5,750,312, Cl. 430-273.100.
Thompson, Sheryl Ann: *See—*
  Berka, Randy Michael; Thompson, Sheryl Ann; and Xu, Feng, 5,750,388, Cl. 435-189.000.
Thompson, Todd. Portable ice fishing hut. 5,749,387, Cl. 135-146.000.
Thomson Consumer Electronics, Inc.: *See—*
  Opresko, Stephen Thomas; and Hutzler, Richard Wayne, 5,751,103, Cl. 313-477.00R.
Thomson Consumer Electronics S.A.: *See—*
  Guo, Chaoying; and Grimm, Jean-Paul, 5,752,180, Cl. 455-319.000.
Thomson-CSF: *See—*
  Monot, Jean-Jacques; Pipon, Francois; Multedo, Gilbert; and Chevalier, Pascal, 5,752,168, Cl. 455-67.300.
  Roullet, André; and Peris, Daniel, 5,752,175, Cl. 455-183.100.
Thomson-CSF Semiconducteurs Specifiques: *See—*
  Prost, Roger, 5,751,059, Cl. 257-701.000.
Thomson, Gordon Alexander; and Phillips, Duncan Adrian Sidney, to Zeneca Limited. Triphendioxazine compounds. 5,750,689, Cl. 544-75.000.
Thomson, Robert David; and Geiwitz, Roger, to MCI Corporation. Data security system and method. 5,751,949, Cl. 395-187.010.
Thomson Television Components France: *See—*
  Sey, Jean-Claude; Vittoz, Daniel; and Lanaud, Christophe, 5,751,206, Cl. 336-192.000.
Three Bond Co., Ltd.: *See—*
  Takeoka, Toru; Clarson, Stephen J.; and Goldslager, Barry, 5,750,588, Cl. 522-66.000.
Three-D Composites Research Corporation: *See—*
  Kimbara, Masahiko, 5,749,281, Cl. 87-56.000.
Throgmorton, Pamela Jane: *See—*
  Staub, John Christian; Ubil, Kent Delmar; and Throgmorton, Pamela Jane, 5,749,163, Cl. 34-597.000.
Throndson Aros, Sylvan S.: *See—*
  Aros, Carlos Joaquin; and Throndson Aros, Sylvan S., 5,750,236, Cl. 428-178.000.
Thurber, Ernest L.: *See—*
  Ezzell, Stephen A.; Sahouani, Hassan; and Thurber, Ernest L., 5,750,641, Cl. 528-353.000.
Thurfjell, Jens. Heat-storage device. 5,749,329, Cl. 123-41.140.
Thurm, Kenneth R. Motorcycle leaf spring suspension system. 5,749,591, Cl. 280-284.000.
Thurston, Bryan A.: *See—*
  Rao, Chepur P.; and Thurston, Bryan A., 5,750,947, Cl. 200-6.00R.
Tidwell, Michael R.: *See—*
  Melville, Charles D.; Furness, Thomas A., III; and Tidwell, Michael R., 5,751,465, Cl. 359-213.000.
Tigelaar, Howard: *See—*
  Kaya, Cetin; and Tigelaar, Howard, 5,750,427, Cl. 438-264.000.
Tilley, Allen D.: *See—*
  Delaney, Michael R.; and Tilley, Allen D., 5,749,602, Cl. 285-61.000.
Timmons, William W.: *See—*
  Polito, Anthony J.; Bailey, Ronald E.; Timmons, William W.; and Bell, Robert H., 5,749,140, Cl. 29-527.100.
Timpone, Leonard: *See—*
  Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
Timpson, Clifford J.: *See—*
  Van Pelt, Vince; Meischen, Sandra J.; and Timpson, Clifford J., 5,750,992, Cl. 250-372.000.
Tinembart, Olivier: *See—*
  Friedel, Thomas; Moyses, Eric William; Tinembart, Olivier; Maienfisch, Peter; and Gsell, Laurenz, 5,750,548, Cl. 514-357.000.
Ting, Wenchi: *See—*
  Liu, David K. Y.; and Ting, Wenchi, 5,751,631, Cl. 365-185.010.
Tippet, John C.: *See—*
  Shiau, Ming-Jong; and Tippet, John C., 5,751,199, Cl. 333-134.000.
Tipple, David R., to Motorola, Inc. Multi-purpose peripheral bus driver apparatus and method. 5,751,978, Cl. 395-309.000.
Tipton, Craig Daniel: *See—*
  Sumiejski, James L.; Fewkes, Roy; and Tipton, Craig Daniel, 5,750,477, Cl. 508-331.000.
Titan Tool, Inc.: *See—*

- Carey, Danuta H.; Geberth, John D.; Walsh, John; and Hosley, Daniel S., 5,749,528, Cl. 239-119.000.

- Titterington, Donald R.: *See—*
  - Banning, Jeffery H.; King, Clifford R.; Bui, Loc V.; and Titterington, Donald R., 5,750,604, Cl. 524-187.000.
- Titus, Diane J.: *See—*
  - Kullick, Steven E.; Spirakis, Charles S.; and Titus, Diane J., 5,751,997, Cl. 395-489.000.
- Tobias, Russell H.: *See—*
  - Qian, Xuejun; Suh, Byoung I.; Hamer, Martin; and Tobias, Russell H., 5,749,733, Cl. 433-228.100.
- Tobin, Paul G.; Naaseh-Shahry, Hosein; and Undy, Stephen R., to Hewlett-Packard Company. Integrated debug trigger method and apparatus for an integrated circuit. 5,751,735, Cl. 371-22.500.
- Tocci, Michael D.: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- Tochigi Fuji Sangyo Kabushiki Kaisha: *See—*
  - Teraoka, Masao; and Yamazaki, Nobushi, 5,749,801, Cl. 475-88.000.
  - Teraoka, Masao; and Yamazaki, Nobushi, 5,749,803, Cl. 475-249.000.
- Toda, Junji: *See—*
  - Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.
- Toda Kogyo Corporation: *See—*
  - Hayashi, Kazuyuki; Iwasaki, Keisuke; Tanaka, Yasuyuki; and Morii, Hiroko, 5,750,250, Cl. 428-328.000.
- Toda, Koichi: *See—*
  - Kobayashi, Hideyuki; and Toda, Koichi, 5,749,311, Cl. 112-240.000.
- Toda, Masaaki: *See—*
  - Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,750,544, Cl. 514-337.000.
- Todd, Rodger: *See—*
  - Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, 5,749,981, Cl. 148-595.000.
- Todino, Christa: *See—*
  - Chi, Ignacio; Ramaswami, Karthik; Kuo, Han C.; and Todino, Christa, 5,750,282, Cl. 429-49.000.
- Toft, Rolf, to Sony Corporation; and Sony Electronics Inc. Methods and apparatus for synchronizing temporally related data streams. 5,751,694, Cl. 370-109.000.
- Toji, Shigeo; Yoshida, Masanori; and Misawa, Atsushi, to Fuji Photo Film Co., Ltd. Auto focussing method and device. 5,752,098, Cl. 396-85.000.
- Tokai, Toshihiko: *See—*
  - Takehara, Hisao; Shimizugawa, Ryoichi; and Tokai, Toshihiko, 5,749,935, Cl. 71-62.000.
- Tokes, Jozsef: *See—*
  - Cserteg, Istvanne; Tokes, Jozsef; Wursching, Istvan; and Fulop, Jozsef, 5,751,105, Cl. 313-493.000.
- Tokimatsu, Hiroyuki: *See—*
  - Nagase, Hisayoshi; Haneda, Satoshi; Tokimatsu, Hiroyuki; Hamada, Shuta; Miura, Toshihide; Fukuchi, Masakazu; and Ikeda, Tadayoshi, 5,752,133, Cl. 399-112.000.
- Toko Yakuhin Kogyo Kabushiki Kaisha: *See—*
  - Kamishita, Takuzo; and Miyazaki, Takashi, 5,750,579, Cl. 514-772.600.
- Tokoro, Setsuo: *See—*
  - Satonaka, Hisashi; and Tokoro, Setsuo, 5,749,427, Cl. 180-179.000.
- Tokuda, Yoshikatsu: *See—*
  - Ohtomo, Fumio; and Tokuda, Yoshikatsu, 5,751,408, Cl. 356-5.140.
- Tokumoto, Shigeru: *See—*
  - Tamaki, Shigeo; and Tokumoto, Shigeru, 5,749,336, Cl. 123-337.000.
- Tokushu Paper Mfg. Co., Ltd.: *See—*
  - Hanaya, Morimasa, 5,749,693, Cl. 414-277.000.
- Tokuyama Corporation: *See—*
  - Nishida, Haruo; Yamashita, Mitsuhiro; Ochi, Yoshiki; and Kuwaki, Tetsuo, 5,750,218, Cl. 428-35.500.
- Tokyo Electron Kabushiki Kaisha: *See—*
  - Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, 5,750,436, Cl. 438-558.000.
- Tokyo Electron Limited: *See—*
  - Okase, Wataru, 5,749,723, Cl. 432-241.000.
- Tokyo Electron Tohoku Kabushiki Kaisha: *See—*
  - Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, 5,750,436, Cl. 438-558.000.
- Tokyo Electron Tohoku Ltd: *See—*
  - Okase, Wataru, 5,749,723, Cl. 432-241.000.
- Tollakson, Steven Wayne: *See—*
  - Coaldrake, Peter Donald; and Tollakson, Steven Wayne, 5,750,839, Cl. 800-200.000.
- Toma, Daniela: *See—*
  - Lahanas, Konstantinos M.; Toma, Daniela; Bevacqua, Andrew J.; and Cioca, Gheorghe, 5,750,125, Cl. 424-401.000.
- Tomaselli, Michele: *See—*
  - Marella, Marcello; Meregalli, Letizia; and Tomaselli, Michele, 5,750,459, Cl. 502-304.000.
- Tomazin, Thomas J.: *See—*
  - Gallup, Michael G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,752,074, Cl. 395-800.000.
- Tombeur, Antoon M. H.: *See—*
  - Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.
- Tometsko, Andrew M., deceased (by Carol R. Tometsko, executrix); Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, to Litron Laboratories. Method and composition for lyophilizing red blood cells. 5,750,330, Cl. 435-2.000.
- Tometsko, Carol R., executrix: *See—*
  - Tometsko, Andrew M., deceased; Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, 5,750,330, Cl. 435-2.000.
- Tometsko, Kenneth: *See—*
  - Tometsko, Andrew M., deceased; Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, 5,750,330, Cl. 435-2.000.
- Tomic, Mladomir: *See—*
  - Boone, Debra Cheryl; and Tomic, Mladomir, 5,749,493, Cl. 222-105.000.
- Tominaga, Michiaki: *See—*
  - Nakai, Satoru; Aihara, Koutoku; Mori, Hitomi; Tominaga, Michiaki; Adachi, Masakazu; Ichikawa, Hiroyuki; Akamatsu, Seiji; and Saito, Fumio, 5,750,529, Cl. 514-254.000.
- Tomita, Hironori: *See—*
  - Mizuno, Osamu; Nakamura, Tohru; Aikoh, Hideki; Tomita, Hironori; and Mohri, Masanari, 5,751,688, Cl. 369-270.000.
- Tomita, Hiroshi: *See—*
  - Inoue, Tetsuo; Tomita, Hiroshi; Mizoguchi, Tetsuhiko; and Fuke, Hiromi, 5,750,273, Cl. 428-692.000.
- Tomita, Hiroyoshi, to Fujitsu Limited. Semiconductor apparatus having a voltage unit and a backup unit for providing a reduced power consumption. 5,751,652, Cl. 365-226.000.
- Tomita, Mihoko; and Kozuka, Michihiro, to Tomy Company, Ltd. Transferring device. 5,751,477, Cl. 359-447.000.
- Tomiyama, Koichi. *See—*
  - Ogawa, Yoshihiro; Tomiyama, Koichi; Tamura, Osamu; Okubo, Nobuyuki; and Suzuki, Shunji, 5,750,302, Cl. 430-106.600.
- Tomizawa, Tsutomu; Tatemichi, Yoshihiko; Fujiwara, Ken; Hoshi, Masamichi; and Nakano, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha; and Nippon Leakless Industry Co., Ltd. Method of producing reclaimed joint sheet and the reclaimed jointsheet. 5,749,996, Cl. 156-244.240.
- Tomoki, Soutome: *See—*
  - Hideo, Nitta; Tomoki, Soutome; and Yoshiro, Shimizu, 5,751,516, Cl. 360-103.000.
- Tomomasa, Satoshi; Nanba, Tomiyuki; and Soyama, Yoshikazu, to Shiseido Company, Ltd. Lipstick overcoat composition. 5,750,094, Cl. 424-64.000.
- Tomy Company, Ltd.: *See—*
  - Tomita, Mihoko; and Kozuka, Michihiro, 5,751,477, Cl. 359-447.000.
- Tonteling, Charles N. A.; Palmer, Kenneth Joseph; Helfer, Farrel Bruce; Todd, Rodger; and Blum, Josy Jean, to Goodyear Tire & Rubber Company, The. Process for producing patented steel wire. 5,749,981, Cl. 148-595.000.
- Tooker, James Morris: *See—*
  - Vanden Heuvel, Dean Paul; McKay, Brent Matthew; and Tooker, James Morris, 5,751,723, Cl. 370-528.000.
- Topcon Corporation: *See—*
  - Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,751,459, Cl. 359-197.000.
- Topping, Allen; Kuperschmidt, Vladimir; and Gormley, Austin. Method and apparatus for the automated identification of individuals by the nail beds of their fingernails. 5,751,835, Cl. 382-115.000.
- Toray Industries, Inc.: *See—*
  - Hideki, Kawai; Takayuki, Imaoka; and Go, Hata, 5,750,716, Cl. 549-210.000.
  - Tamada, Hiroshi; Kashio, Shigetora; and Adachi, Tamio, 5,750,313, Cl. 430-280.100.
- Tordo, Paul: *See—*
  - Barbe Frejaville, Claudine Marie Clemence; Karoui, Hakim; Le Moigne, Francois; Culcasi, Marcel; Pietri, Sylvia; and Tordo, Paul, 5,750,710, Cl. 548-111.000.
- Torii, Mikio; and Tanizawa, Seiji, to Denso Corporation. Fuel leakage prevention system having latch-engaged valve. 5,749,347, Cl. 123-516.000.
- Torini, Alberto, to Italtraco S.r.l. Process for preparing biomass to improve the kinetics of solid-state oxidative biotransformations. 5,750,393, Cl. 435-243.000.
- Toriumi, Masaki: *See—*
  - Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.
- Toro Company, The: *See—*
  - White, Donald M., III; and Wadzinski, Chris A., 5,749,148, Cl. 30-276.000.
- Torous, Dorothea: *See—*
  - Tometsko, Andrew M., deceased; Dertinger, Stephen; Torous, Dorothea; and Tometsko, Kenneth, 5,750,330, Cl. 435-2.000.
- Torres, Eric R.; and Almanza, Jesus. Portable device to allow for simultaneous duplex printing and scanning on single pass machines. 5,749,551, Cl. 248-205.100.
- Toshiaki, Matsushima: *See—*
  - Shirosaki, Akimitsu; and Toshiaki, Matsushima, 5,751,297, Cl. 346-136.000.
- Toshiba Kikai Kabushiki Kaisha: *See—*
  - Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, 5,751,584, Cl. 364-474.200.
- Toshikage, Hideki: *See—*

  - Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,752,109, Cl. 396-311.000.
  - Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; and Toshikage, Hideki, 5,752,114, Cl. 396-429.000.
- Toukura, Nobusuke, to Nissan Motor Co., Ltd. Continuously variable transmission control apparatus. 5,749,804, Cl. 477-47.000.
- Tourne, Christophe Yvon Gabriel: *See—*
  - Dusserre-Telmon, Guy Franck Paul; Plona, Daniel Georges; and Tourne, Christophe Yvon Gabriel, 5,749,660, Cl. 384-475.000.
- Tow, Agnes C.: *See—*
  - Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, 5,751,792, Cl. 379-89.000.
- Towa Corporation: *See—*
  - Bandoh, Kazuhiko, 5,750,059, Cl. 264-39.000.
  - Maeda, Keiji; and Kawamoto, Yoshihisa, 5,750,154, Cl. 425-116.000.
- Tower Manufacturing Corporation: *See—*
  - Rao, Chepur P.; and Thurston, Bryan A., 5,750,947, Cl. 200-6.00R.
- Toyama, Koichi; and Yamamoto, Noboru, to Denso Corporation. High voltage discharge bulb control. 5,751,121, Cl. 315-307.000.
- Toyama, Yoshikuni: *See—*
  - Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Yatsuka, Takeshi, 5,750,248, Cl. 428-323.000.
- Toyo Ink Manufacturing Co., Ltd.: *See—*
  - Onodera, Junichi; Sato, Shingo; Kashiwagi, Toshio; and Tetsuhiro, Isobe, 5,750,379, Cl. 435-72.000.
- Toyo Seikan Kaisha, Ltd.: *See—*
  - Tada, Akira; and Hayashi, Toshihiko, 5,750,223, Cl. 428-35.800.
- Toyo Seikan Kaisya, Ltd.: *See—*
  - Komatsu, Ikuo; Sato, Nobuyuki; and Imazu, Katsuhiro, 5,750,222, Cl. 428-35.800.
- Toyoda Koki Kabushiki Kaisha: *See—*
  - Takahashi, Hiroyuki; and Yamamoto, Nobuhiko, 5,749,396, Cl. 138-26.000.
- Toyoda, Takaaki: *See—*
  - Emura, Makoto; Toyoda, Takaaki; Seido, Nobuo; Harada, Makoto; Noyori, Ryoji; Ikariya, Takao; and Ohkuma, Takashi, 5,750,804, Cl. 568-834.000.
- Toyonaga, Tatsuo: *See—*
  - Kaneko, Yuji; Ueda, Tadao; Watanabe, Yoshihiro; and Toyonaga, Tatsuo, 5,750,951, Cl. 219-69.180.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Hosaka, Yuji; Makibayashi, Yasuhiro; Kumagai, Tomoyuki; and Nakanishi, Tatsuaki, 5,749,563, Cl. 251-61.500.
  - Kushida, Tomoyoshi, 5,750,429, Cl. 438-268.000.
  - Nakata, Koichi; Mogi, Kazuhisa; and Kurebayashi, Youichi, 5,751,147, Cl. 324-399.000.
  - Satonaka, Hisashi; and Tokoro, Setsuo, 5,749,427, Cl. 180-179.000.
  - Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.
  - Yamada, Shigeo; Kato, Takero; Nagai, Hiromi; and Kitamura, Kazuo, 5,749,600, Cl. 280-751.000.
  - Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.
- Toyozaki, Jiro; Yanase, Takao; Ishii, Shinichi; and Aihara, Takashi, to Fuji Electric Co., LTD. AC-DC converter. 5,751,567, Cl. 363-89.000.
- Tracey, Kevin J.: *See—*
  - Bianchi, Marina; Cerami, Anthony; Tracey, Kevin J.; and Ulrich, Peter, 5,750,573, Cl. 514-597.000.
- Traditional Chinese Medicine Research Laboratory, Inc.: *See—*
  - Okazaki, Hideo; and Oku, Kinuko, 5,750,150, Cl. 424-682.000.
- Traffix Devices: *See—*
  - Kulp, Jack H.; and Wehring, Billy E., 5,749,673, Cl. 404-10.000.
- Traina, John E.; Myers, Richard; and Smierciak, Edward A., to United Sciences, Inc. Opacity and forward scattering monitor using beam-steered solid-state light source. 5,751,423, Cl. 356-338.000.
- Trainor, John J.; Laplace, Carl J.; Kinney, Michael A.; and Reilly, Joseph F., to Siemens Energy & Automation, Inc. Reconfigurable communications module. 5,751,222, Cl. 340-825.050.
- Trainor, William F.: *See—*
  - Hampton, John T., III; Trainor, William F.; and Bandy, Thomas R., 5,749,605, Cl. 285-48.000.
- Tran, Don H.: *See—*
  - Schwab, Sharon; Lieber, Glen L.; Tran, Don H.; Brose, Michael P.; and Minas, Maritess E., 5,749,852, Cl. 604-96.000.
- Tran, Joanne: *See—*
  - Huynh, Anh Hoa; Tran, Joanne; Scheminski, François; and Guette, Jean-Paul, 5,750,722, Cl. 548-427.000.
- Tran, Minh N.: *See—*
  - Hrovat, Davorin D.; and Tran, Minh N., 5,749,428, Cl. 180-197.000.
- Tran, Ngoc Minh: *See—*
  - Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, 5,751,579, Cl. 364-426.015.
- Tran, Thang M., to Advanced Micro Devices, Inc. Instruction cache configured to provide instructions to a microprocessor having a clock cycle time less than a cache access time of said instruction cache. 5,752,259, Cl. 711-125.000.
- Transguard Industries, Inc.: *See—*
  - Brammall, Terrence N.; Mills, Randel; Ridenour, Rodney; and Stevenson, David, 5,749,610, Cl. 292-327.000.
- Tran Thanh, Kiem-Ngoe: *See—*
  - Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, 5,750,472, Cl. 504-292.000.
- Trauernicht, David P.: *See—*
  - Lambert, Patrick M.; Trauernicht, David P.; and Bringley, Joseph F., 5,750,318, Cl. 430-346.000.
- Treml, Christian, to Bayerische Motoren Werke Aktiengesellschaft. Fuel system. 5,749,345, Cl. 123-456.000.
- Tresp, Volker; Schürmann, Bernd; and Schlang, Martin, to Siemens Aktiengesellschaft. Process and apparatus for determining optimum values for manipulated variables of a technical system. 5,751,571, Cl. 364-148.000.
- Trester, Paul W.: *See—*
  - Chen, Kuo-Chun; Trester, Paul W.; and Mazdiyasni, Khodabakhsh S., 5,752,156, Cl. 419-11.000.
- Tri-Continent Scientific, Inc.: *See—*
  - Walters, Stephen M., 5,751,661, Cl. 368-10.000.
- Triangle Engineering of Arkansas Inc.: *See—*
  - Matson, Carl G., 5,749,708, Cl. 416-247.00R.
- Trimberger, Stephen M., to Xilinx, Inc. Method for compiling and executing programs for reprogrammable instruction set accelerator. 5,752,035, Cl. 395-705.000.
- Trimble, Laird: *See—*
  - Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.
- Trimble Navigation Ltd.: *See—*
  - Janky, James M.; Klein, Eric A.; and Schipper, John F., 5,751,245, Cl. 342-357.000.
- Trinh, Toan: *See—*
  - Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.
- Tripos, Inc.: *See—*
  - Hurst, John Robert; and Heritage, Trevor William, 5,751,605, Cl. 364-496.000.
- Tripp, Cynthia Ann; Frank, Glenn R.; and Grieve, Robert B., to Heska Corporation. Filariid nematode cysteine protease proteins. 5,750,391, Cl. 435-212.000.
- Tropic-Kool Engineering Corp.: *See—*
  - Dinh, Khanh, 5,749,415, Cl. 165-297.000.
- Trostmann, Uwe; Schachtele, Christoph; Hartenstein, Johannes; Rudolph, Claus; Barth, Hubert; Reck, Reinhard; and Kolch, Walter, to Goedecke Aktiengesellschaft. Bis-indolyl maleinimide or indolopyrrolo carbazole containing an amino acid as PKC inhibitors. 5,750,555, Cl. 514-410.000.
- Trottman, Gerda Huber: *See—*
  - Döbeli, Heinz; Draeger, Nicholas; Trottman, Gerda Huber; Jakob, Peter; and Stüber, Dietrich, 5,750,374, Cl. 435-69.700.
- Trouilhet, Yves, to Du Pont de Nemours, E. I., and Company. Thermoplastic composition having adsorption agent to reduce offensive odors and flavors. 5,750,611, Cl. 524-450.000.
- Trout, Stanley D., to Rieke Corporation. Tamper-evident child-resistant closure. 5,749,484, Cl. 215-219.000.
- Trumbauer, Myrna E.: *See—*
  - Borkowski, Joseph A.; Chen, Howard Y.; Hess, John W.; Strader, Catherine D.; and Trumbauer, Myrna E., 5,750,826, Cl. 800-2.000.
- Trustees of Boston University, The: *See—*
  - Gilchrest, Barbara A.; and Gordon, Philip R., 5,750,091, Cl. 424-59.000.
- Trustees of Columbia University in City of New York, The: *See—*
  - Jessell, Thomas M.; and Klar, Avihu, 5,750,502, Cl. 514-12.000.
- TRW Inc.: *See—*
  - Lerner, Oded, 5,752,208, Cl. 701-41.000.
  - Shiau, Ming-Jong; and Tippet, John C., 5,751,199, Cl. 333-134.000.
  - Tsukamoto, Yasuhiro, 5,750,062, Cl. 264-154.000.
- TRW Occupant Restraint Systems GmbH: *See—*
  - Specht, Martin; and Krauss, Walter, 5,749,536, Cl. 242-374.000.
- Tsai, Kai-Mou. Hair clip and ornamental plate arrangement. 5,749,382, Cl. 132-275.000.
- Tsang, Joseph W.; and Moffatt, John R., to Hewlett-Packard Company. Preparation of microemulsion and micellar color inks from modified water-soluble color chromaphores for thermal ink-jet printing. 5,749,952, Cl. 106-31.640.
- Tseng, Shao-Chien. Contracting structure on bicycle seats. 5,749,622, Cl. 297-195.100.
- Tsuboi, Akio: *See—*
  - Araki, Yoshitaka; Ishikawa, Takashi; Nakamura, Hirofumi; Tsuboi, Akio; Nanba, Yoshiaki; Okano, Takeshi; Aoshima, Takayuki; and Iwade, Shinji, 5,750,816, Cl. 585-512.000.
- Tsuboi, Shinichi: *See—*
  - Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 5,750,704, Cl. 546-275.100.
- Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Magnification change-over device for camera. 5,752,095, Cl. 396-80.000.
- Tsuboi, Takayuki: *See—*
  - Ichino, Kazushige; Suzuki, Ryoichi; Tsuboi, Takayuki; Hamada, Yoshiaki; Fujihara, Yuji; and Kaneko, Yoshiyuki, 5,752,096, Cl. 396-85.000.

Tsuchiya, Masakazu; and Harada, Kazuaki, to Wako Pure Chemical Industries, Ltd. Process for inhibiting activity of endotoxin. 5,750,500, Cl. 514-11.000.

Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, to Banyu Pharmaceutical Co., Ltd. 1,4-di-substituted piperidine derivatives. 5,750,540, Cl. 514-318.000.

Tsuda, Kenjiro: *See*—
Kadono, Shinya; and Tsuda, Kenjiro, 5,751,377, Cl. 348-586.000.

Tsuda, Nobuhiko: *See*—
Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Tsugai, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. capacitive sensor interface circuit. 5,751,154, Cl. 324-661.000.

Tsui, Ernest T.: *See*—
Kletsky, Jeffrey Marc; and Tsui, Ernest T., 5,751,766, Cl. 375-224.000.

Tsuji, Bruce H.; McGarry, Susan J.; and Sparksman, Steven W., to Northern Telecom Limited. Cordless telephone terminal. 5,752,195, Cl. 455-462.000.

Tsuji, Kazuto: *See*—
Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.

Tsuji, Masanori: *See*—
Kashiyama, Motohisa; and Tsuji, Masanori, 5,749,752, Cl. 439-733.100.

Tsuji, Toshihiko: *See*—
Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.

Tsujimoto, Ichiro, to NEC Corporation. Diversity communication system with adaptably oriented multiple beam patterns. 5,752,173, Cl. 455-137.000.

Tsujimura, Shigeru: *See*—
Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.

Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, to Mita Industrial Co., Ltd. Electrophotographic developing method using developing bias voltage based on light decay characteristics of photosensitive material. 5,750,308, Cl. 430-120.000.

Tsujiyama, Yoshimi: *See*—
Ito, Hidemi; Taniguchi, Masahiko; Tsujiyama, Yoshimi; and Katsuya, Masahito, 5,750,256, Cl. 428-375.000.

Tsukada, Mitsushige: *See*—
Sekimoto, Takao; Sakashita, Masahiro; Ando, Kenji; and Tsukada, Mitsushige, 5,752,233, Cl. 705-1.000.

Tsukada, Toru, to NSK LTD. With a lubricant supply member ball screw-nut machine. 5,749,266, Cl. 74-459.000.

Tsukahara, Daiki: *See*—
Takahashi, Tsugio; Aoki, Hitoshi; Imura, Yoshio; Miyamoto, Hidenori; Tsukahara, Daiki; Kotani, Noriyasu; Inoue, Hideya; and Nagai, Jun, 5,752,105, Cl. 396-207.000.

Tsukamoto, Ann; Baum, Charles M.; Aihara, Yukoh; and Weissman, Irving, to Systemix, Inc. Human hematopoietic stem cell. 5,750,397, Cl. 435-372.000.

Tsukamoto, Kazumasa: *See*--
Tanahashi, Katsuyuki; Tsutsui, Hiroshi; Yamamoto, Yoshihisa; and Tsukamoto, Kazumasa, 5,749,802, Cl. 475-120.000.

Tsukamoto, Yasuhiro, to TRW Inc. Method of manufacturing an air bag cover. 5,750,062, Cl. 264-154.000.

Tsukikawa, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with reduced output noise. 5,751,645, Cl. 365-194.000.

Tsumura, Makoto: *See*—
Ono, Kikuo; Ogawa, Kazuhiro; Suzuki, Takashi; Anno, Kouichi; Sakuta, Hiroki; Tsumura, Makoto; Kitajima, Masaaki; and Kawachi, Genshiro, 5,751,381, Cl. 349-42.000.

Tsunematsu, Shuji; Yamada, Hideo; Abe, Eiichi; and Inoue, Kozo, to Japan as represented by Director General of Agency of Industrial Science and Technology. Method for the preparation of acid-resistant calcium silicate. 5,750,038, Cl. 210-777.000.

Tsuru, Shinji: *See*—
Tanaka, Keiji; Kato, Kinya; Tsuru, Shinji; and Sakai, Shigenobu, 5,751,452, Cl. 359-52.000.

Tsuruoka, Yoshiaki: *See*—
Iijima, Masayuki; Shimizu, Osamu; Nakayasu, Yuichi; Tsuruoka, Yoshiaki; and Sugiyama, Kayoko, 5,750,238, Cl. 428-195.000.

Tsuruta, Seiji: *See*—
Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.

Tsuruzoe, Nobutomo: *See*—
Tanikawa, Keizo; Matsumoto, Takashi; Matsumoto, Hiroo; Tsuruzoe, Nobutomo; and Nakabeppu, Hitoshi, 5,750,523, Cl. 514-247.000.

Tsutsui, Hiroshi: *See*—
Tanahashi, Katsuyuki; Tsutsui, Hiroshi; Yamamoto, Yoshihisa; and Tsukamoto, Kazumasa, 5,749,802, Cl. 475-120.000.

Tsutsui, Keiichi; and Igarashi, Katsuji, to Sony Corporation. Recording and/or reproduction apparatus and method for optical record medium. 5,751,675, Cl. 369-44.270.

Tsutsui, Kyoya; and Heddle, Robert, to Sony Corporation. Information encoding method and apparatus, information decoding method and apparatus information transmission method and information recording medium. 5,752,224, Cl. 704-225.000.

Tsutsumi, Kazuo; Takada, Tomoaki; Sakakida, Yasufumi; and Kawamura, Tarou, to Kawasaki Jukogyo Kabushiki Kaisha. Fluidized-bed denitrating method. 5,750,084, Cl. 423-239.100.

Tsutsumi, Motoko; Hara, Minoru; and Kishida, Kenichi, to Olympus Optical Co., Ltd. Autozoon apparatus for camera. 5,752,094, Cl. 396-76.000.

Tsutsumi, Yutaka; Kuwata, Haruhiko; Shinada, Makoto; Momoi, Hiroshi; and Nakamura, Shinji, to Matsushita Electric Industrial Co., Ltd. Inductor with terminal table. 5,751,203, Cl. 336-65.000.

Tsutsumikoshi, Shinobu: *See*—
Yamauchi, Kosaku; Tsutsumikoshi, Shinobu; and Nagai, Hisao, 5,749,429, Cl. 180-205.000.

Tubbs, Graham S.; and Abel, James Charles, to Intel Corporation. Function coprocessor. 5,752,071, Cl. 395-800.340.

Tubby, Francis Bruce: *See*—
DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.

Tubergen, Karen R.: *See*—
Wong Shing, Jane B.; and Tubergen, Karen R., 5,750,034, Cl. 210-705.000.

Tufano, Anthony: *See*—
Balaban, David B.; and Tufano, Anthony, 5,749,459, Cl. 200-559.000.

Tukamoto, Tadashi: *See*—
Kikuchi, Koichi; and Tukamoto, Tadashi, 5,749,210, Cl. 57-58.490.

Tulane Educational Fund, The Administrators of the: *See*—
Coy, David H.; Moreau, Jacques-Pierre; Taylor, John E.; and Kim, Sun Hyuk, 5,750,646, Cl. 530-314.000.

Tunkel, Lev; Krasovitski, Boris; and Foster, Rorbert L., to Universal Vortex, Inc. Non-freezing vortex tube. 5,749,231, Cl. 62-5.000.

Tuomy, James M.: *See*—
Gertz, Jonathan; Butcher, Mark S.; and Tuomy, James M., 5,751,818, Cl. 381-55.000.

Tuot, James: *See*—
Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, 5,750,178, Cl. 426-594.000.

Tupitsin, Sergei Konstantinovich: *See*—
Grigoraschenko, Vladimir Alexandrovich; Kamensky, Veniamin Viktorovich; Klimenko, Vladimir Alexeevich; Kurlenya, Mikhail Vladimirovich; Plavskih, Vladimir Dmitrievich; Repin, Anatoly Antonovich; Tupitsin, Sergei Konstantinovich; and Fetisov, Sergei Jurievich, 5,749,677, Cl. 405-184.000.

Turner, Alan D.: *See*—
Chan, May L.; and Turner, Alan D., 5,750,921, Cl. 149-19.920.

Turner, Cornelius E. Television stand. 5,749,304, Cl. 108-20.000.

Turner, David Wayne: *See*—
Duncan, Carolyn Boggus; Geissler, Paul R.; Turner, David Wayne; Munley, William Joseph, Jr.; and Krevalis, Martin A., 5,750,750, Cl. 554-117.000.

Turner, Edwin, to International Computers Limited. Electronic identification system. 5,751,223, Cl. 340-825.540.

Turner, Nicholas John: *See*—
Scheinmann, Feodor; Turner, Nicholas John; Carter, Neil Edward; and Brown, Richard Talbot, 5,750,381, Cl. 435-128.000.

Turnland, Todd H.: *See*—
Fischell, Robert E.; Fischell, David R.; Fischell, Tim A.; and Turnland, Todd H., 5,749,825, Cl. 600-3.000.

Turnquist, Norman Arnold: *See*—
Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.

Turpen, Thomas H., to Biosource Technologies, Inc. Viral amplification of recombinant messenger RNA in transgenic plants. 5,750,863, Cl. 800-205.000.

Turpin, Terry M., to Essex Corporation. Image synthesis using time sequential holography. 5,751,243, Cl. 342-179.000.

Turski, Lechoslaw: *See*—
Huth, Andreas; and Turski, Lechoslaw, 5,750,525, Cl. 514-249.000.
Krüger, Martin; Seelen, Werner; and Turski, Lechoslaw, 5,750,526, Cl. 514-250.000.

Turuta, Syoichi: *See*—
Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.

Tuttle, Robert J., Sr.: *See*—
Clark, Jay; LaMarche, Jonathan; and Tuttle, Robert J., Sr., 5,751,546, Cl. 361-686.000.

Tuzuki, Tomio: *See*—
Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,751,355, Cl. 348-375.000.

TV Interactive Data Corporation: *See*—
Redford, Peter M.; and Stern, Donald S., 5,749,735, Cl. 434-307.00R.

Twitchell, Edwin Ray: *See*—
Seccia, Joseph Lee; and Twitchell, Edwin Ray, 5,751,347, Cl. 348-181.000.

Tyagi, Dinesh: *See*—
Maher, James C.; Tyagi, Dinesh; and Locke, John R., 5,750,307, Cl. 430-125.000.

Tyan, Yuan-Sheng: *See*—
Hatwar, Tukaram K.; Tyan, Yuan-Sheng; and Brucker, Charles F., 5,750,274, Cl. 428-694.0MM.

Tyneski, Frank M.: *See*—
Dzung, John C.; Murray, John F.; Meenen, Raymond P.; Gatto, Donald F.; Habbaba, Faris S.; and Tyneski, Frank M., 5,752,205, Cl. 455-575.000.

Tzannes, Marcos: *See*—
Tzannes, Michael; and Tzannes, Marcos, 5,751,716, Cl. 370-468.000.

Tzannes, Michael; and Tzannes, Marcos, to Aware, Inc. Multi-carrier transmission system adapted for packet data transfer. 5,751,716, Cl. 370-468.000.

Tzikas, Athanassios: *See*—
Reichert, Hans; Müller, Bernhard; and Tzikas, Athanassios, 5,750,662, Cl. 534-612.000.

U.K. of Gt. Britain, Secretary of State for Defence in her Britannic Majesty's Government of the: *See*—
Goodby, John William; Hird, Michael; Beattie, David Richard; Hindmarsh, Paul; Gray, George William; McDonnell, Damien Gerard; Jones, John Clifford; and Phillips, Timothy Jonathan, 5,750,050, Cl. 252-299.620.

U S WEST Technologies, Inc.: *See*—
Davies, Susan; and Davy, Gloria E., 5,751,793, Cl. 379-89.000.
Faust, John E.; and Meier, John R., 5,752,159, Cl. 455-5.100.

Ube Industries, Ltd.: *See*—
Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, 5,750,612, Cl. 524-451.000.

Ube Nitto Kasei Co., Ltd.: *See*—
Sakai, Kazuhiko; Adachi, Tatsuhiko; Nakayama, Norihiro; and Fujino, Kenichi, 5,750,258, Cl. 428-405.000.

Überreiter, Thomas: *See*—
Heim, Gunther; Überreiter, Thomas; Hock, Jürgen; and Bischoff, Holger, 5,749,176, Cl. 49-502.000.

Ubil, Kent Delmar: *See*—
Staub, John Christian; Ubil, Kent Delmar; and Throgmorton, Pamela Jane, 5,749,163, Cl. 34-597.000.

UCAR Carbon Technology Corporation: *See*—
Intermill, Allan Webster; and Nagy, Charles Chris, 5,751,759, Cl. 373-123.000.

Uchida, Go: *See*—
Nakatsuyama, Hisashi; Okumura, Yo; and Uchida, Go, 5,752,021, Cl. 395-605.000.

Uchida, Itsuo: *See*—
Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.

Uchida, Kihachiro: *See*—
Harada, Tadashi; and Uchida, Kihachiro, 5,749,743, Cl. 439-336.000.

Uchida, Masayuki: *See*—
Umehara, Kazuyuki; Uchida, Masayuki; and Hasegawa, Tomoya, 5,749,187, Cl. 52-241.000.

Uchida, Toru, to Fujitsu Limited. Semiconductor laser with lattice mismatch. 5,751,753, Cl. 372-45.000.

Uchida, Toshio: *See*—
Nishimura, Masayuki; Hashimoto, Yuusaku; Okoshi, Takeshi; Ozaki, Yoshifumi; Harumoto, Katsumi; Nagura, Hideo; Uchida, Toshio; Hirata, Kei; Kitamura, Atsuyuki; and Nagatsuka, Ikutaroh, 5,752,141, Cl. 399-227.000.

Uchide, Kouichi: *See*—
Yasuda, Kazunori; and Uchide, Kouichi, 5,751,364, Cl. 348-416.000.

Uchikawa, Akira: *See*—
Sakauchi, Kazuo; Hirano, Yoshihiro; and Uchikawa, Akira, 5,749,967, Cl. 117-200.000.

Uchiyama, Keiji: *See*—
Motomura, Katsumi; Uchiyama, Keiji; Kameyama, Nobuyuki; Imamura, Takashi; Mochida, Mitsuyoshi; Hata, Yukitsugu; and Takagi, Junichi, 5,752,084, Cl. 396-6.000.

Uchiyama, Kyouji: *See*—
Okuda, Norio; Arima, Hiroyuki; Uchiyama, Kyouji; Ohno, Michio; Ohyama, Hiroaki; Fukuda, Jun; and Niina, Makoto, 5,750,958, Cl. 219-267.000.

Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, to Toyota Jidosha Kabushiki Kaisha. Process for casting pipe with transversal hole, and casting die for the same. 5,749,410, Cl. 164-113.000.

Udoh, Yasuo: *See*—
Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, to Matsushita Electric Industrial Co., Ltd. Magnetic circuit unit for loud-speaker and method of manufacturing the same. 5,751,828, Cl. 381-199.000.

Ueda, Katsumi, to Sanden Corporation. Air conditioner for vehicles. 5,749,235, Cl. 62-160.000.

Ueda, Tadao: *See*—
Kaneko, Yuji; Ueda, Tadao; Watanabe, Yoshihiro; and Toyonaga, Tatsuo, 5,750,951, Cl. 219-69.180.

Ueda, Takuya; Nakajima, Kikuo; Tanifuji, Yoichi; Amano, Tadashi; and Ohnishi, Shuji, to Shin-Etsu Chemical Co., Ltd. Polymerization apparatus of producing vinyl chloride type polymer. 5,750,079, Cl. 422-138.000.

Ueda, Yasuhiro: *See*—
Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Ueda, Yoichiro: *See*—
Murai, Yoshiyuki; Nishikawa, Masahiro; Ueda, Yoichiro; Onomura, Osamu; and Takase, Ichiro, 5,750,717, Cl. 548-240.000.

Ueda, Yoshihiro: *See*—
Okado, Makoto; Ueda, Yoshihiro; Kobata, Tadashi; and Taniguchi, Masami, 5,752,127, Cl. 399-76.000.

Uegomori, Shinichi: *See*—
Murayama, Tomoyuki; Turuta, Syoichi; Ikeda, Sumio; Hoshino, Toshiyuki; Ishizaki, Shuji; and Uegomori, Shinichi, 5,749,244, Cl. 62-476.000.

Uehori, Yukiko: *See*—
Satake, Toshimi; Takano, Toshiyuki; Fukuda, Motoi; and Uehori, Yukiko, 5,750,253, Cl. 428-342.000.

Uejima, Atsushi; Okino, Yoshiharu; Morimoto, Yoshinori; Inoue, Toshiyuki; and Kodama, Kenichi, to Fuji Photo Film Co., Ltd. System for monitoring amount of light emitted from surface emitting laser. 5,751,748, Cl. 372-31.000.

Uematsu, Eiji: *See*—
Tamura, Akira; Yamada, Osamichi; Endo, Tadashi; and Uematsu, Eiji, 5,751,083, Cl. 310-80.000.

Uematsu, Takanori: *See*—
Lagrotta, Joseph M.; Hutchinson, James L.; Bihn, Daniel G.; Parker, Kenneth P.; Rustici, David J.; Takaura, Keisuke; Kawabata, Muneo; Ohki, Hiroyuki; and Uematsu, Takanori, 5,751,737, Cl. 371-22.320.

Uematsu, Yoshihiko; and Matsuoka, Shinji, to Nippon Telegraph and Telephone Corporation. Pointer processor and pointer processing scheme for SDH/SONET transmission system. 5,751,720, Cl. 370-503.000.

Ueno, Hiroaki: *See*—
Nicolaou, K. C.; Nantermet, Philippe G.; Guy, Rodney K.; and Ueno, Hiroaki, 5,750,691, Cl. 544-238.000.

Ueno, Iwao; and Wakahata, Yasuo, to Matsushita Electric Industrial Co., Inc. Electronic component and method for fabricating the same. 5,750,264, Cl. 428-426.000.

Ueno, Makoto; Kunugi, Takeshi; Ohyama, Kazuya; and Yazaki, Hiroomi, to Fujitsu Limited. Mobile communication system which prohibits service to a mobile station having an ID number upon receiving a non-coincidence notice from the mobile station. 5,752,189, Cl. 455-435.000.

Ueno, Yasunori: *See*—
Miyawaki, Katsuki; Otobe, Yukio; Kazui, Kimihiko; Miyasaka, Hideki; Ueno, Yasunori; and Maruyama, Kouji, 5,752,266, Cl. 711-158.000.

Uenoyama, Harumi: *See*—
Dou, Xiaoming; Yamaguchi, Yoshinori; and Uenoyama, Harumi, 5,750,410, Cl. 436-525.000.
Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.

Ueoka, Atsushi: *See*—
Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.

Ueshiba, Mamoru: *See*—
Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.

Uhl, Rainer. Arrangement for confocal fluorescence microscopy. 5,751,417, Cl. 356-318.000.

Ukai, Takeshi: *See*—
Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Ukai, Yoshio: *See*—
Hirosawa, Toshio; Ito, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Inoue, Seiji; and Ukai, Yoshio, 5,751,575, Cl. 364-188.000.

Ukura, John R.: *See*—
Becklund, Thomas K.; Houg, Todd C.; Jackson, Benton H.; Sluiter, David O.; and Ukura, John R., 5,751,295, Cl. 345-501.000.

Ullah, Muhammad Inayet: *See*—
Ahlert, Richard Henry; Howard, James Kent; Ullah, Muhammad Inayet; and Umphress, Richard Donald, 5,750,231, Cl. 428-65.500.

Ulrich, Peter: *See*—
Bianchi, Marina; Cerami, Anthony; Tracey, Kevin J.; and Ulrich, Peter, 5,750,573, Cl. 514-597.000.

Ultraflex Systems, Inc.: *See*—
Mitchell, Andrew L.; and Patchel, Kenneth A., 5,749,840, Cl. 602-5.000.

Umbarger, Daryl. Reversible track link for an endless track. 5,749,635, Cl. 305-190.000.

Umeda, Keisuke: *See*—
Kusano, Taizou; Kashiwabara, Yoshiro; Wada, Yasuhiro; and Umeda, Keisuke, 5,751,676, Cl. 369-50.000.

Umehara, Hideki: *See*—

  - Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.
- Umehara, Kazuyuki; Uchida, Masayuki; and Hasegawa, Tomoya, to Yoshino Gypsum Co., Ltd. Partition wall. 5,749,187, Cl. 52-241.000.
- Umemura, Yukio, to Calsonic Corporation. Variable displacement swash plate type compressor. 5,749,712, Cl. 417-269.000.
- Umetsu, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Hierarchical network management system operating as a proxy agent for enhancing processing efficiency. 5,751,963, Cl. 395-200.530.
- Umezawa, Katsushi: *See—*
  - Usui, Masayoshi; and Umezawa, Katsushi, 5,749,138, Cl. 29-516.000.
- Umphress, Richard Donald: *See—*
  - Ahlert, Richard Henry; Howard, James Kent; Ullah, Muhammad Inayet; and Umphress, Richard Donald, 5,750,231, Cl. 428-65.500.
- Unarco Material Handling, Inc.: *See—*
  - Clark, William L., 5,749,482, Cl. 211-191.000.
- Underiner, Gail E.: *See—*
  - Klein, J. Peter; Underiner, Gail E.; and Kumar, Anil M., 5,750,575, Cl. 514-617.000.
- Undy, Stephen R.: *See—*
  - Tobin, Paul G.; Naaseh-Shahry, Hosein; and Undy, Stephen R., 5,751,735, Cl. 371-22.500.
- Ung, Lu-Hsiung. Gravity unloading mechanism. 5,749,630, Cl. 298-18.000.
- Uni-Charm Corporation: *See—*
  - Yamamoto, Masamitsu; Igaue, Takamitsu; and Sasaki, Toru, 5,749,865, Cl. 604-385.200.
- Union Carbide Chemicals & Plastics Technology Corporation: *See—*
  - King, Stephen Wayne, 5,750,790, Cl. 564-469.000.
  - Kurtz, Stuart Jacob, 5,749,653, Cl. 366-256.000.
- Unisia Jecs Corporation: *See—*
  - Hosaka, Noriomi; Kikyohara, Tadashi; Tsuruta, Seiji; Abo, Sadayuki; Toriumi, Masaki; and Ariga, Kenji, 5,749,341, Cl. 123-90.350.
  - Nomoto, Yuji, 5,749,707, Cl. 416-223.00B.
- Unisys Corporation: *See—*
  - Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, 5,751,846, Cl. 382-169.000.
  - McCrory, Duane J., 5,751,979, Cl. 395-343.000.
- United Air Llines: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- United Dominion Industries: *See—*
  - Brow, Richard A.; and Hossli, Robert I., 5,749,282, Cl. 52-235.000.
- United Microelectronics Corporation: *See—*
  - Chang, Hsiao-Shih; Kane, James A.; and Whitted, Graham B., III, 5,751,984, Cl. 395-392.000.
  - Chang, Kuang-Yeh, 5,750,428, Cl. 438-264.000.
  - Chen, David Yu, 5,752,045, Cl. 395-750.000.
  - Hsue, Chen-Chiu; and Chien, Sun-Chieh, 5,750,438, Cl. 438-627.000.
- United Sciences, Inc.: *See—*
  - Traina, John E.; Myers, Richard; and Smierciak, Edward A., 5,751,423, Cl. 356-338.000.
- United States as represented by the Secretary of Transportation, The Government of the' *See—*
  - Russell, Jonathan C.; and Lardner, Thomas J., 5,750,894, Cl. 73-581.000.
- United States of America
  - Agriculture: *See—*
    - Shasha, Baruch S.; McGuire, Michael R.; and Behle, Robert W., 5,750,467, Cl. 504-116.000.
    - Stone, Henry D., 5,750,101, Cl. 424-85.200.
  - Air Force: *See—*
    - Lin, David M., 5,751,238, Cl. 342-5.000.
  - Health and Human Services: *See—*
    - Robey, Frank A.; Harris-Kelson, Tracy A.; and Robert-Guroff, Marjorie, 5,750,332, Cl. 435-5.000.
  - National Aeronautics and Space Administration: *See—*
    - Bull, Jeffrey; White, Michael J.; and Kaufman, Larry, 5,750,450, Cl. 501-91.000.
    - Chern, Engmin James; and Butler, David W., 5,750,895, Cl. 73-614.000.
    - Hall, Thomas E., Jr.; and Bryant, Timothy D., 5,750,002, Cl. 156-313.000.
    - Payne, Leslie, 5,751,109, Cl. 313-542.000.
  - Navy: *See—*
    - Brown, Jerry S.; and Conkling, John A., 5,750,057, Cl. 264-3.200.
    - Cooper, Guy F., 5,751,006, Cl. 250-495.100.
    - Fortier, Paul J., 5,752,026, Cl. 395-614.000.
    - Hanssen, Jeffrey Scott, 5,751,380, Cl. 349-1.000.
    - Hillenbrand, Christopher F.; and Gomez, Donald T., 5,749,312, Cl. 114-21.200.
    - Jehle, Robert E., 5,750,919, Cl. 102-532.000.
    - Moran, Mark B., 5,750,195, Cl. 427-249.000.
    - Nappi, Bruce; Schroeder, William; and Miller, James E., 5,751,260, Cl. 345-8.000.
    - O'Brien, Francis J., Jr., 5,751,294, Cl. 345-440.000.
    - Pruessner, Manfred Karl, 5,751,658, Cl. 367-98.000.
    - Schaefer, Carl G., Jr.; McCool, Kelly M.; and Haas, David J., 5,751,609, Cl. 364-565.000.
    - Supcoe, Robert F.; and Greenberg, Melvin, 5,749,959, Cl. 106-428.000.
  - Secretary of NSA: *See—*
    - Cohen, Jonathan Drew, 5,752,051, Cl. 395-751.000.
- U.S. Philips Corporation: *See—*
  - Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.
  - Bloks, Rudolf H. J., 5,751,721, Cl. 370-509.000.
  - Cornelissen, Hugo J.; Savert, Cornelis J.; and Leijten, Johannes T.H., 5,749,638, Cl. 313-461.000.
  - Hofmann, Rudolf, 5,751,902, Cl. 395-2.280.
  - Nellissen, Antonius J. M., 5,750,417, Cl. 437-209.000.
  - Shiels, Martin A.; Cole, Richard S.; Rankin, Paul J.; and Freitag, Rosa, 5,751,953, Cl. 395-200.090.
  - Spaapen, Antonius J.; Van Haastrecht, Johannes T.J.; and Van Gennip, Theodorus J.M.J., 5,751,110, Cl. 313-550.000.
  - Stoffels, Jan A.J.; Vandeperre, Denise K.L.; and Peeraer, Jan M., 5,751,111, Cl. 313-606.000.
  - Van Gestel, Wilhelmus J.; and Saeijs, Ronald W.J.J., 5,751,889, Cl. 386-68.000.
  - Van der Poel, Willibrordus A. J. A.; and Spanjer, Tjerk G., 5,751,099, Cl. 313-412.000.
  - Vink, Teunis J.; and Walrave, Willem, 5,751,016, Cl. 257-50.000.
  - Vorenkamp, Pieter; Venes, Arnoldus G.W.; and Van De Plassche, Rudy J., 5,751,236, Cl. 341-155.000.
  - Welters, Wilhelmus J. J.; and Wijdenes, Jacob, 5,751,786, Cl. 378-156.000.
- U.S. Phillips Corporatinn: *See—*
  - Makinwa, Kofi A.A.; and Mateman, Paul, 5,750,939, Cl. 178-18.000.
- U.S. Scientific, L.L.C.: *See—*
  - Bachik, Alan, 5,749,308, Cl. 110-344.000.
- United States Surgical Corporation: *See—*
  - Vidal, Claude A.; Plyley, Alan K.; Redmond, Russell J.; and Lagerquist, Roger, 5,749,893, Cl. 606-205.000.
- U.S.Philips Corporation: *See—*
  - Sachdev, Manoj; and Atzema, Botjo, 5,751,141, Cl. 323-312.000.
- United Technologies Corporation: *See—*
  - DuBell, Thomas L., 5,749,219, Cl. 60-39.360.
- Unitrode Corporation: *See—*
  - Jordan, Mark George; Terry, Francis H.; and Hack, Thomas Peter, 5,751,139, Cl. 323-222.000.
- Universal Ventures: *See—*
  - Brown, Paul Philip; and Sorensen, Jens Ole, 5,749,514, Cl. 229-400.000.
- Universal Vortex, Inc.: *See—*
  - Tunkel, Lev; Krasovitski, Boris; and Foster, Rorbert L., 5,749,231, Cl. 62-5.000.
- Universite Laval: *See—*
  - Gaudreault, René C.; and Poyet, Patrick, 5,750,547, Cl. 514-346.000.
- University Corporation for Atmospheric Research: *See—*
  - Myers, William Loring, 5,751,289, Cl. 345-419.000.
- University of Alabama at Birmingham: *See—*
  - Sommadossi, Jean-Pierre; and Schinazi, Raymond F., 5,750,493, Cl. 514-1.000.
- University of Alabama at Huntsville: *See—*
  - Dowling, Jonathan P.; Scalora, Michael; Bloemer, Mark J.; Bowden, Charles M.; Flynn, Rachel J.; Fork, Richard L.; Reinhardt, Senter B., Jr.; and Tocci, Michael D., 5,751,466, Cl. 359-248.000.
- University of CAlifornia, The Regents of the: *See—*
  - Alivisatos, A. Paul; and Colvin, Vicki L., 5,751,018, Cl. 257-64.000.
  - Bennett, Alan B.; Brummell, David A.; and Grantz, Alexander A., 5,750,872, Cl. 800-205.000.
  - Chu, Keting; and Williams, Lewis T., 5,750,653, Cl. 530-350.000.
  - Prusiner, Stanley B.; Kaneko, Kiyotoshi; and Cohen, Fred E., 5,750,361, Cl. 435-23.000.
  - Woo, David D. L., 5,750,495, Cl. 514-2.000.
- University of Cincinnati, The: *See—*
  - van Ooij, Wim J.; Subramanian, Vijay; and Zhang, Chunbin, 5,750,197, Cl. 427-318.000.
- University of Colorado, The Board of Regents of the: *See—*
  - Sharp, Gary D., 5,751,384, Cl. 349-18.000.
- University of Michigan, The Regents of the: *See—*
  - Voorhees, John J.; Ellis, Charles N.; and Griffiths, Christopher E. M., 5,750,570, Cl. 514-557.000.
- University of Minnesota, Regents of The: *See—*
  - Carlson, Robert M.; Krasutsky, Pavel A.; and Karim, M. Reza-Ul, 5,750,578, Cl. 514-766.000.
- University of Missouri, The Curators of the: *See—*
  - Day, Delbert E., 5,750,824, Cl. 588-256.000.
- University of New Mexico: *See—*
  - Kim, In C.; Thompson, Donald M.; and Sarto, Gloria E., 5,750,340, Cl. 435-6.000.
- University of Notre Dame Du Lac: *See—*
  - Teng, Min; and Miller, Marvin J., 5,750,681, Cl. 540-203.000.
- University of Pittsburgh: *See—*
  - Jacobs, William R.; Hatfull, Graham F.; Bardarov, Stoyan; and McAdam, Ruth, 5,750,384, Cl. 435-172.300.
- University of Queensland, The: *See—*
  - Roberts, Michael Stephen; Cross, Sheree Elizabeth; and Singh, Parminder, 5,750,141, Cl. 424-449.000.
- University of Reading, The: *See—*

  - Hodgson, David Michael; and Witherington, Jason, 5,750,805, Cl. 568-838.000.
- University of Virginia Patents Foundation, The: *See—*
  - Larner, Joseph, 5,750,348, Cl. 435-7.100.
- University of Washington: *See—*
  - Melville, Charles D.; Furness, Thomas A., III; and Tidwell, Michael R., 5,751,465, Cl. 359-213.000.
  - Venkata, Subrahmanyam S.; Raju, N. Ravisekhar; Kagalwala, Raxit A.; and Sastry, Vedula V., 5,751,138, Cl. 323-207.000.
- Unrath, Mark A.: *See—*
  - Cutler, Donald R.; Pailthorp, Robert M.; and Unrath, Mark A., 5,751,585, Cl. 364-474.030.
- Unrath, Ralph: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- UOP: *See—*
  - Marker, Terry L.; Muldoon, Brian S.; Glover, Bryan K.; and Vora, Bipin V., 5,750,800, Cl. 568-678.000.
- Urata, Hisao: *See—*
  - Tanaka, Eiji; Urata, Hisao; Oshiki, Toshiyuki; Aoshima, Takayuki; Kawashima, Riichirou; Iwade, Shinji; Nakamura, Hirofumi; Katsuki, Syunji; and Okano, Takeshi, 5,750,817, Cl. 585-520.000.
- Urea Casale S.A.: *See—*
  - Pagani, Giorgio, 5,750,080, Cl. 422-193.000.
- Urech, Werner: *See—*
  - Aebersold, Hans; Gross, Norbert; and Urech, Werner, 5,749,511, Cl. 228-212.000.
- Urita, Seiichi: *See—*
  - Sakai, Akira; Ichikawa, Miki; and Urita, Seiichi, 5,751,577, Cl. 364-191.000.
- Urushidani, Tatsuo; and Ogino, Shinji, to Fuji Electric Co. Ltd. Surface polishing of silicon carbide electronic device substrate using CEO_2. 5,750,434, Cl. 438-478.000.
- Usami, Tatsuya: *See—*
  - Ishikawa, Hiraku; and Usami, Tatsuya, 5,751,050, Cl. 257-538.000.
- Ushikubo, Takashi; Koyasu, Yukio; and Nakamura, Hiroya, to Mitsubishi Chemical Corporation. Method for producing a nitrile. 5,750,760, Cl. 558-319.000.
- Uskokovic, Milan Radoje: *See—*
  - Baggiolini, Enrico Giuseppe, deceased; Shiuey, Shian-Jan; and Uskokovic, Milan Radoje, 5,750,517, Cl. 514-167.000.
- Usui, Fumiaki; Takeshi, Kunio; Hosoya, Jun; and Terasawa, Chiaki, to Canon Kabushiki Kaisha. Zoom lens. 5,751,497, Cl. 359-687.000.
- Usui Kokusai Sangyo Kaisha Limited: *See—*
  - Usui, Masayoshi; and Umezawa, Katsushi, 5,749,138, Cl. 29-516.000.
- Usui, Masayoshi; and Umezawa, Katsushi, to Usui Kokusai Sangyo Kaisha Limited. Connecting and fixing method for metallic pipes with small diameter. 5,749,138, Cl. 29-516.000.
- Utah State University: *See—*
  - Forney, John R.; Yang, Shiguang; and Healey, Mark C., 5,750,496, Cl. 514-2.000.
- Utatsu, Hiroshige: *See—*
  - Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Utatsu, Hiroshige, 5,752,125, Cl. 399-8.000.
- Utsumi, Kenichi: *See—*
  - Nakahara, Masaru; Nakashima, Kazuo; and Utsumi, Kenichi, 5,752,009, Cl. 395-500.000.
- Utsumi, Masamichi: *See—*
  - Yamakawa, Akio; and Utsumi, Masamichi, 5,751,679, Cl. 369-103.000.
- Uy, William Cheng, to Du Pont de Nemours, E. I., and Company. Dry spinning process for producing zein fibers. 5,750,064, Cl. 264-204.000.
- Uyttenhove, Catherine: *See—*
  - Van Snick, Jacques; Uyttenhove, Catherine; and Simpson, Richard J., 5,750,377, Cl. 435-70.300.
- Uzawa, Shigeyuki: *See—*
  - Murakami, Eiichi; Sakai, Fumio; Uzawa, Shigeyuki; Ogawa, Shigeki; and Mori, Tetsuya, 5,751,404, Cl. 355-53.000.
- Uzumcu, Albert I.; Malone, Matthew; and Schweizer, Russell J., to S-B Power Tool Company. Method and apparatus for sanding a plurality of work-pieces having respective surfaces of varying contours. 5,749,770, Cl. 451-28.000.
- Väänänen, Kalervo: *See—*
  - DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.
- Vacuum Metallurgical Co., Ltd.: *See—*
  - Watanabe, Kazuhiro; Oshima, Michihiro; Setoguchi, Kazuhiro; and Oda, Masaaki, 5,750,194, Cl. 427-216.000.
- Vacuumschmelze GmbH: *See—*
  - Poess, Hans-Joachim, 5,751,207, Cl. 336-233.000.
- Vadgama, Pankaj Madganlal; and Crump, Paul William, to Victoria University of Manchester, The. Monitoring systems. 5,749,832, Cl. 600-345.000.
- Vaisala, Oy: *See—*
  - Ryhänen, Tapani, 5,750,903, Cl. 73-861.480.
- Vaisanen, Ari: *See—*
  - Hellinger, Frank; and Vaisanen, Ari, 5,751,126, Cl. 318-362.000.
- Valco, Thomas D.: *See—*
  - Wedegaertner, Thomas C.; Valco, Thomas D.; and Lalor, William F., 5,750,466, Cl. 504-100.000.
- Valenzuela, Pablo D. T.: *See—*
  - Burke, Rae Lyn; Pachl, Carol; and Valenzuela, Pablo D. T., 5,750,114, Cl. 424-231.100.
- Valeo Climatisation: *See—*
  - Pomme, Vincent, 5,749,239, Cl. 62-225.000.
- Valeo Thermique Moteur: *See—*
  - Balthazard, Patrick, 5,749,412, Cl. 165-67.000.
- Vali, Victor; Shih, I-Fu; and Bates, Kenn S., to Hughes Aircraft Company. Optical fiber apparatus and method for measuring geological strains. 5,750,901, Cl. 73-800.000.
- Vallach, Efraim: *See—*
  - Blit, Shmuel; Bartfeld, Eyal; Pais, Idan; Eilam, Yair; Vallach, Efraim; Bezdin, Haim; Laron, Israel; and Katzin, Doron, 5,751,833, Cl. 382-110.000.
- Van Alen, Alexander: *See—*
  - Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, 5,749,790, Cl. 473-245.000.
- Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, to Arrowhead Innovations Corporation. Adjustable golf club. 5,749,790, Cl. 473-245.000.
- Van Alen, James L., Jr.: *See—*
  - Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, 5,749,790, Cl. 473-245.000.
- Van Alen, Jeanne B.: *See—*
  - Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, 5,749,790, Cl. 473-245.000.
- Van Alen, Robert B.: *See—*
  - Van Alen, James L., II; Van Alen, Robert B.; Van Alen, Jeanne B.; Van Alen, James L., Jr.; and Van Alen, Alexander, 5,749,790, Cl. 473-245.000.
- Van Alstyne, David C. System for photopyrolitically removing a contaminant. 5,751,897, Cl. 392-419.000.
- Van Blaricom, Charles: *See—*
  - Evans, Allan; Van Blaricom, Charles; and Hunter, April, 5,751,702, Cl. 370-314.000.
- Van Den Bosch, Johannes Franciscus, to Akzo Nobel N. V. *Escherichia coli* vaccine. 5,750,115, Cl. 424-241.100.
- Vanden Ecker, Jacobus Margareta Valentijn: *See—*
  - Phanopoulos, Christopher; and Vanden Ecker, Jacobus Margareta Valentijn, 5,750,201, Cl. 427-375.000.
- Vanden Heuvel, Dean Paul; McKay, Brent Matthew; and Tooker, James Morris, to Motorola, Inc. Method and system for overhead bandwidth recovery in a packetized network. 5,751,723, Cl. 370-528.000.
- Vandeperre, Denise K.L.: *See—*
  - Stoffels, Jan A.J.; Vandeperre, Denise K.L.; and Peeraer, Jan M., 5,751,111, Cl. 313-606.000.
- Van De Plassche, Rudy J.: *See—*
  - Vorenkamp, Pieter; Venes, Arnoldus G.W.; and Van De Plassche, Rudy J., 5,751,236, Cl. 341-155.000.
- Vandeputte, Joris Frans; Guillaud, Marc Jean; and Milward, Francis William, to Rhone Merieux. Vaccine method against swine dysentery. 5,750,118, Cl. 424-262.100.
- Van der Linde, Jan: *See—*
  - Hshieh, Fwu-Iuan; Chang, Mike F.; Van der Linde, Jan; and Ho, Yueh-Se, 5,750,416, Cl. 437-40.0AS.
- Van der Poel, Willibrordus A. J. A.; and Spanjer, Tjerk G., to U.S. Philips Corporation. Display device and colour cathode ray tube for use in a display device. 5,751,099, Cl. 313-412.000.
- Van Der Steen, Frederik Hendrik; and Walhof, Judith Johanna Berendina, to Shell Oil Company. Process for the preparation of industrially applicable difunctional anionic polymerization initiators and their use. 5,750,055, Cl. 260-665.00R.
- Vandervalk, Leon C.: *See—*
  - Koch, Frank J.; Vandervalk, Leon C.; and Beamish, David J., 5,751,608, Cl. 364-563.000.
- Van De Vanter, Michael L., to Sun Microsystems, Inc. System and method for inter-token whitespace representation and textual editing behavior in a program editor. 5,752,058, Cl. 395-793.000.
- Van De Vliet, Birgitte Maria Ludovica Christine: *See—*
  - Gerard, Eric-Jack; De Keyzer, Noel Raymond Maurice; and Van De Vliet, Birgitte Maria Ludovica Christine, 5,750,607, Cl. 524-271.000.
- van Dijk, Christiaan P., to Starchem, Inc. Dimethyl ether production and recovery from methanol. 5,750,799, Cl. 568-698.000.
- van Dyk, Karl: *See—*
  - Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.
- Van Eeden Skein, Etienne: *See—*
  - Marais, Stephanus Francois; Khaile, Thebeeapelo John; Njamela, Owen Lungile; Braithwaite, Dana Helen; Davidson, Deborah Nicole; Jungmann, Christa Maria; Parkinson, Christopher John; Gardiner, Neil Stockenstrom; Steenkamp, Lucia Hendrina; and Van Eeden Skein, Etienne, 5,750,764, Cl. 560-56.000.
- Vanell, James F.; Ward, Steven D.; and Mullins, James M., to Motorola, Inc. Apparatus and method for dynamically mixing slurry for chemical mechanical polishing. 5,750,440, Cl. 438-692.000.
- Van Gennip, Theodorus J.M.J.: *See—*
  - Spaapen, Antonius J.; Van Haastrecht, Johannes T.J.; and Van Gennip, Theodorus J.M.J., 5,751,110, Cl. 313-550.000.

Van Gestel, Wilhelmus J.; and Saeijs, Ronald W.J.J., to U.S. Philips Corporation. Recording and reproduction of a trick mode video signal. 5,751,889, Cl. 386-68.000.

Van Haastrecht, Johannes T.J.: *See—*

Spaapen, Antonius J.; Van Haastrecht, Johannes T.J.; and Van Gennip, Theodorus J.M.J., 5,751,110, Cl. 313-550.000.

Vanin, Elio F.: *See—*

Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., 5,750,396, Cl. 435-357.000.

Van Leeuwen, George Willard: *See—*

Ottesen, Hal Hjalmar; Smith, Gordon J.; and Van Leeuwen, George Willard, 5,751,883, Cl. 386-27.000.

Van Maanen, Keith D., to General Motors Corporation. Hydraulic fluid storage for a powertrain. 5,749,439, Cl. 184-6.120.

van Ooij, Wim J.; Subramanian, Vijay; and Zhang, Chunbin, to University of Cincinnati, The. Method of preventing corrosion of metals using silanes. 5,750,197, Cl. 427-318.000.

Van Pelt, Vince; Meischen, Sandra J.; and Timpson, Clifford J., to Tennessee Valley Authority. Method to compensate for interferences to mercury measurement in gases. 5,750,992, Cl. 250-372.000.

VanSanten, Jan Pieter: *See—*

Moebius, Bernd; Olive, Joseph Philip; Tanenblatt, Michael Abraham; and VanSanten, Jan Pieter, 5,751,907, Cl. 395-2.760.

Van Sickle, Andrew Paul: *See—*

Parkinson, Nigel Christopher; and Van Sickle, Andrew Paul, 5,750,734, Cl. 549-432.000.

Van Sinderen, Jan: *See—*

Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.

Van Snick, Jacques; Uyttenhove, Catherine; and Simpson, Richard J., to Ludwig Institute for Cancer Research. Process for preparing mammalian T cell growth factor P40. 5,750,377, Cl. 435-70.300.

Van Veldhuisen, Willem: *See—*

Doornekamp, Martin; Van Veldhuisen, Willem; and De Greef, Willem Marius, 5,749,453, Cl. 198-400.000.

Varian Associates, Inc.: *See—*

Fair, James A., 5,751,019, Cl. 257-68.000.

Vasin, A. I.: *See—*

Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., 5,751,113, Cl. 315-111.210.

Vasudevan, Tirucherai Varahan: *See—*

Garcia, Rigoberto Felipe; Vasudevan, Tirucherai Varahan; Post, Albert Joseph; and Hsu, Feng-Lung Gordon, 5,750,489, Cl. 510-417.000.

Vattenfall AB: *See—*

Holhammar, Jörgen, 5,751,542, Cl. 361-623.000.

Vavrinak, Ronald. Foundation protection panel system. 5,749,182, Cl. 52-169.140.

Vazquez, Michael L.: *See—*

Chang, Min S.; Getman, Daniel P.; Mueller, Richard A.; Ottinger, James C.; Stolzenbach, James C.; Talley, John J.; Vazquez, Michael L.; and Decrescenzo, Gary A., 5,750,648, Cl. 530-331.000.

Vemuganti, Murthy: *See—*

Swaminathan, Kumar; and Vemuganti, Murthy, 5,751,903, Cl. 395-2.390.

Venes, Arnoldus G.W.: *See—*

Vorenkamp, Pieter; Venes, Arnoldus G.W.; and Van De Plassche, Rudy J., 5,751,236, Cl. 341-155.000.

Venkata, Subrahmanyam S.; Raju, N. Ravisekhar; Kagalwala, Raxit A.; and Sastry, Vedula V., to University of Washington. Active power conditioner for reactive and harmonic compensation having PWM and stepped-wave inverters. 5,751,138, Cl. 323-207.000.

Venkitasubrahmanian, Sreeraman: *See—*

Jayaraman, Raj; Xia, Yongping; Venkitasubrahmanian, Sreeraman; and Leyton, Paul, 5,751,115, Cl. 315-225.000.

Vennen, Emmanuel Vander: *See—*

Wronkiewicz, Robert D.; Pitchford, Terry L.; Schuller, Daniel J.; and Vennen, Emmanuel Vander, 5,749,301, Cl. 105-199.300.

Venugopal, Ganesh: *See—*

Pendalwar, Shekhar L.; Oliver, Manuel; and Venugopal, Ganesh, 5,750,284, Cl. 429-197.000.

Verbeke, Gentil, to Agfa-Gevaert. Cassette for photo-stimulable radiography. 5,751,001, Cl. 250-484.400.

Vercauteren, Carl Josef Elsa: *See—*

Clode, Kirsten Everald; Watson, Derrick John; and Vercauteren, Carl Josef Elsa, 5,750,007, Cl. 203-3.000.

Vergel de Dios, Timoteo I.: *See—*

Kurtz, Anthony D.; Ned, Alexander A.; and Vergel de Dios, Timoteo I., 5,750,898, Cl. 73-727.000.

Vergin, William E., to Invotronics Manufacturing. Memory seat module having integrated sensors. 5,751,129, Cl. 318-467.000.

Veritas Technology Solutions Ltd.: *See—*

Kafri, Oded, 5,751,814, Cl. 380-49.000.

Vermeer, Fulps V.: *See—*

Weisser, Pirmin L.; Vermeer, Fulps V.; and King, Edward C., 5,751,994, Cl. 395-464.000.

Vermeer, Robert; and Harichian, Bijan, to Lever Brothers Company Division of Conopco, Inc. Hydroxy containing alkyl glycamides, low foaming detergent compositions comprising such and a process for their manufacture. 5,750,733, Cl. 549-346.000.

Vermeulen, Pieter Johannes Erasmus: *See—*

Zaaiman, Ben Thomas; Putter, Paul-Boer; Vermeulen, Pieter Johannes Erasmus; and Loubser, Gerrit Jacobus, 5,752,215, Cl. 701-117.000.

Vernay Laboratories, Inc.: *See—*

Boehmer, Dennis A.; and Gibson, Richard L., Jr., 5,749,394, Cl. 137-533.150.

Versace, Richard W.: *See—*

Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 5,750,532, Cl. 514-274.000.

Verser, Dan W.; Cheung, Alex; Eggeman, Timothy J.; Evanko, William A.; Schilling, Kevin H.; Meiser, Manfred; Allen, Anthony E.; Hillman, Melville E. D.; Cremeans, George E.; and Lipinsky, Edward S., to Chronopol, Inc. Method to produce cyclic esters. 5,750,732, Cl. 549-274.000.

Vershel, Mark A.: *See—*

Zweben, Monte; Deale, Michael J.; Vershel, Mark A.; and Pettus, Christophe E., 5,751,958, Cl. 395-200.340.

Vesture Corporation: *See—*

Hyatt, Gary F., 5,750,962, Cl. 219-528.000.

Vibratech, Inc.: *See—*

Szymanski, John George; Stanley, Robert Henry, Jr.; and Roland, Fredrick Richard, 5,749,269, Cl. 74-574.000.

Vice, Michael W., to Watkins-Johnson Company. Method and apparatus for reducing inermodulation distortion in a mixer. 5,752,181, Cl. 455-326.000.

Vickers, David S.: *See—*

McCroskey, William K.; and Vickers, David S., 5,751,000, Cl. 250-363.030.

Vickers, Incorporated: *See—*

Gupta, Umesh C., 5,751,082, Cl. 310-72.000.

Victor Company of Japan, Ltd.: *See—*

Ogasawara, Jin; Higurashi, Seiji; Shindo, Tomoyuki; and Suwa, Tetsuya, 5,751,509, Cl. 360-70.000.

Victoria University of Manchester, The: *See—*

Vadgama, Pankaj Madganlal; and Crump, Paul William, 5,749,832, Cl. 600-345.000.

Vidal, Claude A.; Plyley, Alan K.; Redmond, Russell J.; and Lagerquist, Roger, to United States Surgical Corporation. Surgical instrument having an articulated jaw structure and a detachable knife. 5,749,893, Cl. 606-205.000.

Vidamed, Inc.: *See—*

Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James Allen, Jr., 5,749,846, Cl. 604-22.000.

Videocolor, S.p.A.: *See—*

Cinquina, Patrizia; Magnone, Giuseppe; and Manciocco, Guido, 5,750,054, Cl. 252-500.000.

Magnone, Giuseppe; Manciocco, Guido; and Cinquina, Patrizia, 5,750,187, Cl. 427-64.000.

Vidrich, Alda: *See—*

Targan, Stephan R.; and Vidrich, Alda, 5,750,355, Cl. 435-7.240.

Viens, Raymond J. Wallboard T-square with sharpener. 5,749,153, Cl. 33-474.000.

Vierra, Mark A.; and Roth, Alex T., to Heartport, Inc. Device for isolating a surgical site. 5,749,892, Cl. 600-204.000.

Vigil, Thomas R.: *See—*

Deagan, John C., 5,749,316, Cl. 119-57.800.

Villalobos, Anabella; Nagel, Arthur A.; and Chen, Yuhpyng L., to Pfizer. Benzisoxazole and benzisothizole derivatives as cholinesterase inhibitors. 5,750,542, Cl. 514-322.000.

Vindret, Jean-Francois: *See—*

Contet, Jean-Pierre; Duprat, Stéphane Courdavault; Storet, Yvan; and Vindret, Jean-Francois, 5,750,492, Cl. 510-527.000.

Vink, Teunis J.; and Walrave, Willem, to U.S. Philips Corporation. Device having a switch comprising a chromium layer. 5,751,016, Cl. 257-50.000.

Vinzoyl Technical Services, LLC: *See—*

Doyle, Michael P., 5,749,953, Cl. 106-273.100.

Viriyayuthakorn, Montri: *See—*

Graham, Lionell; Jenkins, Artis Cornell; Mathis, Terry Don; Newton, Wayne McCall; and Viriyayuthakorn, Montri, 5,751,879, Cl. 385-103.000.

Vishlitzky, Natan: *See—*

Ofek, Yuval; and Vishlitzky, Natan, 5,751,993, Cl. 395-463.000.

Visionary Corporate Technologies: *See—*

Ludwig, Lester Frank, Jr., 5,751,338, Cl. 348-17.000.

Visser, Hendrik A.: *See—*

Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.

Vista Medical Technologies, Inc.: *See—*

Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., 5,751,341, Cl. 348-65.000.

Vitale, Frank: *See—*

Vitale, Ralph; and Vitale, Frank, 5,749,566, Cl. 267-64.230.

Vitale, Ralph; and Vitale, Frank. Self compensating fluid spring assembly. 5,749,566, Cl. 267-64.230.

Vitcak, Daniel R.; and Flynn, Richard M., to Minnesota Mining and Manufacturing Company. Process for the production of hydrufluoroethers. 5,750,797, Cl. 568-683.000.

Vittoz, Daniel: *See—*

Sey, Jean-Claude; Vittoz, Daniel; and Lanaud, Christophe, 5,751,206, Cl. 336-192.000.

Viturro, R. Enrique: *See—*

Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., 5,751,315, Cl. 347-63.000.

Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., 5,751,317, Cl. 347-65.000.

Viza, Daniel Joseph: *See—*

Reid, Ellen Margaret; Feicht, Douglas Bruce; Miller, Dennis Brian; Viza, Daniel Joseph; and McGarry, Mark William, 5,749,614, Cl. 294-64.100.

Vlahek, Josip. Fishing equipment. 5,749,167, Cl. 43-42.060.

VLSI Technology: *See—*

Cassetti, David K.; and Wszolek, Philip, 5,752,262, Cl. 711-135.000.

Hicok, Gary; Potts, Kenneth; and Harrow, Scott, 5,751,235, Cl. 341-140.000.

Levy, Paul S.; and Chenoweth, Ed, 5,751,151, Cl. 324-537.000.

VLSI Technology, Inc.: *See—*

Ginetti, Arnold; and Spyrou, Athanasius W., 5,751,596, Cl. 364-491.000.

Jirgal, James J., 5,752,081, Cl. 395-842.000.

VMI-EPE-Holland B.V.: *See—*

Lazarz, Donald; and De Jong, Jurjen Jan, 5,749,155, Cl. 34-90.000.

Vo, Thong H.: *See—*

Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.

VocalTec Ltd.: *See—*

Cohen, Alon, 5,751,968, Cl. 395-200.610.

Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, to Whitaker Corporation, The. Sealed corrosion-proof crimped terminal of splice. 5,749,756, Cl. 439-879.000.

Voelkel, Theodor: *See—*

Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, 5,750,490, Cl. 510-504.000.

Vogelbacher, Uwe Josef: *See—*

Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.

Vogelstein, Bert; Kinzler, Kenneth W.; and Papadopoulos, Nickolas, to Johns Hopkins University, The. Mono-allelic mutation analysis for identifying germline mutations. 5,750,352, Cl. 435-7.210.

Vogt, Hans-Günter; Grave, Heinrich; Bross, Hermann-Josef; and Matner, Martin, to Bayer AG. Process for the production of latices based on conjugated dienes by emulsion polymerisation. 5,750,618, Cl. 524-836.000.

Vogt, Peter: *See—*

Hohler, Markus; and Vogt, Peter, 5,750,649, Cl. 530-338.000.

Voigt, Hartmut: *See—*

Hess, Reiner; Voigt, Hartmut; Herrmann, Hans-Friedrich; Böhm, Ludwig; Spaleck, Walter; and Hohner, Gerd, 5,750,813, Cl. 585-12.000.

Voit, Eric A.; Kostreski, Bruce; Liptak, Lance; and DePaul, Kenneth, to Bell Atlantic Network Services, Inc. AIN interaction through wireless digital video network. 5,751,707, Cl. 370-384.000.

Voith, Raymond Paul; Sudhanian, Sujit; and Hoekstra, George, to Motorola, Inc. Rate-adapted communication system and method for efficient buffer utilization thereof. 5,751,741, Cl. 371-37.700.

Voith Sulzer Papiermaschinen GmbH: *See—*

Bernert, Richard; and Reich, Stefan, 5,749,972, Cl. 118-414.000.

Leitenberger, Werner; and Heinzmann, Helmut, 5,749,157, Cl. 34-117.000.

Muller, Dieter; and Oechsle, Markus, 5,749,158, Cl. 34-119.000.

Volk, Daniel J., to Volk Enterprises, Inc. Hinged poultry hock retainer. 5,749,778, Cl. 452-174.000.

Volk Enterprises, Inc.: *See—*

Volk, Daniel J., 5,749,778, Cl. 452-174.000.

Volkswagen AG: *See—*

Strauss, Klaus Dieter, 5,751,746, Cl. 371-67.100.

Vollbrecht, Heinz-Rudiger: *See—*

Heidlas, Jurgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rudiger, 5,750,180, Cl. 426-614.000.

Von Roll Umwelttechnik AG: *See—*

Forsberg, Stefan; and Rüegg, Hans, 5,749,309, Cl. 110-346.000.

von Ahn, Volker H.: *See—*

Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., 5,750,765, Cl. 560-126.000.

Von Basse, Paul-Werner; Bollu, Michael; Thewes, Roland; and Schmitt-Landsiedel, Doris, to Siemens Aktiengesellschaft. Serially accessible memory means with high error correctability. 5,751,742, Cl. 371-40.180.

Vonderhaar, Michael Francis; and Fleming, James Michael, to Procter & Gamble Company, The. Method for forming an intermittent stream of particles for application to a fibrous web. 5,750,066, Cl. 264-510.000.

Von Erichsen, Volker, to Stober + Morlock Warmekraft Gesellschaft mbh. Shaft assembly for gas control flap in a gas turbine. 5,749,703, Cl. 415-148.000.

Vongehr, Otto, to Siemens Aktiengesellschaft. Current stabilizer with step-up transformer. 5,751,566, Cl. 363-71.000.

Voorhees, Donna Sue. Draining disposable fluid-tight ear protector. 5,749,099, Cl. 2-209.000.

Voorhees, John J.; Ellis, Charles N.; and Griffiths, Christopher E. M., to University of Michigan, The Regents of the. Method of treatment of hyperpigmentation in black skin with retinoic acid and method of lightening black skin with retinoic acid. 5,750,570, Cl. 514-557.000.

Vora, Bipin V.: *See—*

Marker, Terry L.; Muldoon, Brian S.; Glover, Bryan K.; and Vora, Bipin V., 5,750,800, Cl. 568-678.000.

Vorbrüggen, Helmut; Krolikiewicz, Konrad; and Bennua-Skalmowski, Bärbel, to Hoechst Aktiengesellschaft. Process for preparing nucleosides with unprotected sugars. 5,750,676, Cl. 536-55.300.

Vorenkamp, Pieter; Venes, Arnoldus G.W.; and Van De Plassche, Rudy J., to U.S. Philips Corporation. A/D conversion with folding and interpolation. 5,751,236, Cl. 341-155.000.

Vorwerk & Co. Interholding GmbH: *See—*

Dörner, Stefan; Kemker, Uwe; Simm, Hans-Peter; and Lapp, Oliver, 5,749,285, Cl. 99-348.000.

Vosika, Gerald J.; and Ma, Fanfeng. Preparation of glucosaminyl muramic acid derivatives. 5,750,665, Cl. 536-17.200.

VTC Inc.: *See—*

Ngo, Tuan V., 5,751,171, Cl. 327-110.000.

Vu, Viet H.; Fontaine, Lucien P.; McHugh, William T.; Pinault, Robert J.; Blasi, Jane A.; Sullivan, Steven K.; Paquin, Geoffrey J.; Johnson, Stephen S.; Maus, Gary K.; and Cambra, Lance E., to Texas Instruments Incorporated; and Duracell Inc. Current interrupter for electrochemical cells. 5,750,277, Cl. 429-7.000.

W. L. Gore & Associates, Inc.: *See—*

Culler, Gregory D., 5,750,242, Cl. 428-209.000.

McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,750,931, Cl. 174-110.0PM.

W. R. Grace & Co. -Conn.: *See—*

Chern, Terry Song-Hsing; Keller, David Gerard; and MacFadden, Kenneth Orville, 5,749,927, Cl. 29-623.500.

Wacker-Chemie GmbH: *See—*

Brennenstuhl, Werner; Mittermeier, Manfred; and Huber, Wilhelm, 5,750,581, Cl. 521-54.000.

Eck, Herbert; Fleischmann, Gerald; and Wierer, Konrad, 5,750,617, Cl. 524-718.000.

WACOM Co., Ltd.: *See—*

Funahashi, Takahiko, 5,751,229, Cl. 341-5.000.

Wada, Katsuo: *See—*

Abe, Makoto; Wada, Katsuo; Miyoshi, Takeshi; Tanimura, Tosiyasu; and Akai, Tetsuya, 5,749,586, Cl. 277-608.000.

Wada, Katsuyuki: *See—*

Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,750,582, Cl. 521-64.000.

Wada, Tohru; and Hibi, Yasushi, to Olympus Optical Co., Ltd. Color classification system and method capable of automatically exchanging optical band-pass filters according to the object. 5,751,429, Cl. 356-419.000.

Wada, Tomohisa, to Mitsubishi Denki Kabushiki Kaisha. Method of executing read and write operations in a synchronous random access memory. 5,752,270, Cl. 711-169.000.

Wada, Yasuhiro: *See—*

Kusano, Taizou; Kashiwabara, Yoshiro; Wada, Yasuhiro; and Umeda, Keisuke, 5,751,676, Cl. 369-50.000.

Wade, Craig Michael. Motorized sunscreen for motor vehicles. 5,751,488, Cl. 359-601.000.

Wadzinski, Chris A.: *See—*

White, Donald M., III; and Wadzinski, Chris A., 5,749,148, Cl. 30-276.000.

Wagemans, Antonius G.: *See—*

Baltus, Petrus G. M.; Leyten, Lukas; Van Sinderen, Jan; Tombeur, Antoon M. H.; Visser, Hendrik A.; and Wagemans, Antonius G., 5,751,249, Cl. 342-372.000.

Wagner, Adalbert; Kleemann, Heinz-Werner; Regnat, Dieter; and Kleiner, Hans-Jerg, to Clariant GmbH. Process for the preparation of aromatic bromomethyl compounds. 5,750,728, Cl. 549-57.000.

Wagner Spray Tech Corporation: *See—*

Jerdee, Jeffrey S., 5,749,704, Cl. 415-211.200.

Waitkus, Phillip A., to Plastics Engineering Company. Thermosetting resin compositions. 5,750,597, Cl. 524-35.000.

Wakabayashi, Toshitsugu; and Kobayashi, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Video signal detecting apparatus. 5,751,367, Cl. 348-511.000.

Wakahata, Yasuo: *See—*

Ueno, Iwao; and Wakahata, Yasuo, 5,750,264, Cl. 428-426.000.

Wakai & Co., Ltd.: *See—*

Wakai, Takao, 5,749,688, Cl. 411-42.000.

Wakai, Takao, to Wakai & Co., Ltd. Screw fixing plug. 5,749,688, Cl. 411-42.000.

Wakamiya, Masayuki: *See—*

Ueda, Hiroshi; Ohyama, Kazuhiro; Furuyama, Shizuo; Kojima, Kiyoshi; and Wakamiya, Masayuki, 5,751,828, Cl. 381-199.000.

Wakarchuk, David A., to Phero Tech Inc. Composite polymer matrices for controlled release of semiochemicals. 5,750,129, Cl. 424-408.000.

Wakasugi, Nobuo: *See—*

Tanuma, Jiro; Ito, Katsuyuki; Katakura, Shinichi; Wakasugi, Nobuo; Nagaoka, Kazuhiko; and Ito, Toshikazu, 5,751,328, Cl. 347-130.000.

Wako Pure Chemical Industries, Ltd.: *See—*

Tsuchiya, Masakazu; and Harada, Kazuaki, 5,750,500, Cl. 514-11.000.

Walch, Martin: *See—*

Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.

Walcher, James G.; Limbird, James R.; and Herner, Arthur C., to Safety Equipment Inc. Roof edge protection system. 5,749,434, Cl. 182-45.000.

Walhof, Judith Johanna Berendina: *See—*

Van Der Steen, Frederik Hendrik; and Walhof, Judith Johanna Berendina, 5,750,055, Cl. 260-665.00R.

Walker, Alan H., to Axiohm IPB Inc. Cutting mechanism for receipt printer. 5,749,277, Cl. 83-563.000.

Walker, Andrew: *See—*

Watt, Jeffrey; and Walker, Andrew, 5,751,507, Cl. 361-56.000.

Walker, James A.: *See—*

Arney, Susanne C.; Greywall, Dennis Stanley; Walker, James A.; and Yurke, Bernard, 5,751,469, Cl. 359-291.000.

Walker, James K.: *See—*

Jing, Zhenxue; and Walker, James K., 5,751,787, Cl. 378-169.000.

Wall, Daniel G.: *See—*

Myerson, Robert F.; Wall, Daniel G.; and O'Hagan, Timothy P., 5,750,975, Cl. 235-472.000.

Wallace, Brian L.: *See—*

Kilty, Alan L.; Ludewig, Howard W.; and Wallace, Brian L., 5,750,957, Cl. 219-130.010.

Wallace, Donald G.: *See—*

Sawyer, Philip N.; Wallace, Donald G.; and Yamamoto, Ronald K., 5,749,895, Cl. 606-214.000.

Wallo, William H. Wall-mounted picture hanger. 5,749,558, Cl. 248-475.100.

Walrave, Willem: *See—*

Vink, Teunis J.; and Walrave, Willem, 5,751,016, Cl. 257-50.000.

Walsh, John: *See—*

Carey, Danuta H.; Geberth, John D.; Walsh, John; and Hosley, Daniel S., 5,749,528, Cl. 239-119.000.

Walter, Helmut: *See—*

Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.

Walters, Henry LeRoy: *See—*

Allington, Robert W.; Walters, Henry LeRoy; Jameson, Daniel Gene; and Tehrani, Yoossef, 5,750,027, Cl. 210-511.000.

Walters, Stephen M., to Tri-Continent Scientific, Inc. Medication dosage timing apparatus. 5,751,661, Cl. 368-10.000.

Walther, James F.; Teichmann, Robert J.; and Wasowicz, Andrew M., to Potters Industries, Inc. Galvanically compatible conductive filler and methods of making same. 5,750,249, Cl. 428-328.000.

Walton, David G.: *See—*

Ludtka, Gerard M.; Kollie, Thomas G.; Watkin, David C.; and Walton, David G., 5,750,882, Cl. 73-38.000.

Walvick, Edward A.: *See—*

Land, Mark S.; Kruy, Steven J.; Perlman, Andrew T.; and Walvick, Edward A., 5,751,706, Cl. 370-352.000.

Walz, Leonhard: *See—*

Hartweg, Martin; Heinau, Martina; Seibold, Andrea; Walz, Leonhard; Fetzer, Thomas; Morsbach, Bernd; and Buechele, Wolfgang, 5,750,460, Cl. 502-342.000.

Wan, Ray-Lin: *See—*

Chen, Chia Shing; Hung, Chun-Hsiung; Wan, Ray-Lin; and Kamei, Teruhiko, 5,751,637, Cl. 365-185.330.

Wan, Samuel C.: *See—*

Binar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.

Wanek, Erich: *See—*

Zech, Joachim; Wanek, Erich; Lechner, Günther; and Bissinger, Peter, 5,750,589, Cl. 523-109.000.

Wang, Daniel Tsu-Fang: *See—*

Edwards, Russell James; Dolan, Mary Louis; Christensen, Svend; Gundersen, Borge Peter; Lepper, John Mark; Wang, Daniel Tsu-Fang; Abrams, Richard Wayne; and Ravn, Thomas Christian, 5,749,205, Cl. 53-542.000.

Wang, Jerry C.: *See—*

Graham, John P.; Wang, Jerry C.; Roettgen, Leslie A.; Carver, Donald P.; Black, Colin I.; Stehouwer, David M.; and Hatton, Ray C., 5,749,339, Cl. 123-73.0AD.

Wang, Jhi-Joung: *See—*

Yoa-Pu, Hu Oliver; Wang, Jhi-Joung; and Shung-Tai, Ho, 5,750,534, Cl. 514-282.000.

Wang, Jin-Der, to Lucent Technologies Inc. Transmission system for digital audio broadcasting. 5,751,774, Cl. 375-367.000.

Wang, Kang-Sheng: *See—*

Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,750,350, Cl. 435-7.100.

Wang, Lixiao, to Scimed Life Systems, Inc. Stent installation method using balloon catheter having stepped compliance curve. 5,749,851, Cl. 604-96.000.

Wang, Shaoyin: *See—*

Neumeyer, John L.; Milius, Richard A.; Tamagnan, Gilles; and Wang, Shaoyin, 5,750,089, Cl. 424-1.850.

Wang, Yulis, to Eiko Electric Products Corp. Adjustable multi-pattern miniature fountain sprinkler. 5,749,518, Cl. 239-17.000.

Wannebo, Andreas, to Molnlycke AB. Method of controlling the power of a welding unit in ultrasonic welding operations and an arrangement for carrying out the method. 5,749,987, Cl. 156-64.000.

Warburton, Alan; and Atkin, Graham, to Ricardo Consulting Engineers Limited. Hydraulic tappets. 5,749,340, Cl. 123-90.160.

Ward, David F.: *See—*

Sandofsky, Marc D.; and Ward, David F., 5,749,237, Cl. 62-209.000.

Ward, Michael J., to Adobe Systems Incorporated. Imaging apparatus for copying bound documents. 5,751,444, Cl. 358-471.000.

Ward, Steven D.: *See—*

Vanell, James F.; Ward, Steven D.; and Mullins, James M., 5,750,440, Cl. 438-692.000.

Ward, Thomas Edward: *See—*

Murch, Bruce Prentiss; Roselle, Brian Joseph; Jones, Kyle David; Baker, Keith Homer; Ward, Thomas Edward; and Trinh, Toan, 5,749,924, Cl. 8-137.000.

Warman, David J.: *See—*

Lacas, Mark A.; and Warman, David J., 5,751,713, Cl. 370-445.000.

Warner, John C.: *See—*

Dombrowski, Edward J., Jr.; Jones, Robert L.; Warner, John C.; and Yang, Jiyue, 5,750,463, Cl. 503-204.000.

Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.

Warner-Lambert Company: *See—*

Bisgaier, Charles Larry; Creger, Paul Leroy; Saltiel, Alan Robert; and Tafuri, Sherrie Rae, 5,750,569, Cl. 514-547.000.

Warren, Andrew; and Corbett, Desmond. Safety device. 5,749,123, Cl. 16-83.000.

Warrin, George H.: *See—*

Dao, Huy-Can; Warrin, George H.; Foulkes, Harvey B.; Perdreaux, Rene; and Lee, Edward W., 5,749,727, Cl. 433-119.000.

Warshawsky, Alan M.: *See—*

Flynn, Gary A.; Beight, Douglas W.; Mehdi, Shujaath; Warshawsky, Alan M.; French, John F.; and Kehne, John H., 5,750,521, Cl. 514-214.000.

Washington, Kirk B.; Kenna, John T.; James, Greg A.; and Ramji, Shiraz N., to Ballard Power Systems Inc. Edge manifold assembly for an electrochemical fuel cell stack. 5,750,281, Cl. 429-39.000.

Washington Research Foundation: *See—*

Eyre, David R.; Clemens, J. Daniel; and Ochs, Vincent W., 5,750,647, Cl. 530-328.000.

Washizuka, Nobuhiko: *See—*

Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.

Wasley, Jan W. F.: *See—*

Yuan, Jun; and Wasley, Jan W. F., 5,750,700, Cl. 546-148.000.

Wason, Thomas D. Method and apparatus for producing three dimensional displays on a two dimensional surface. 5,751,927, Cl. 395-119.000.

Wasowicz, Andrew M.: *See—*

Walther, James F.; Teichmann, Robert J.; and Wasowicz, Andrew M., 5,750,249, Cl. 428-328.000.

Watabe, Masataka: *See—*

Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,750,271, Cl. 428-624.000.

Watanabe, Haruo: *See—*

Kurihara, Kenichi; Ata, Masafumi; Matsute, Masataka; and Watanabe, Haruo, 5,750,261, Cl. 428-422.800.

Watanabe, Hiroki: *See—*

Hamada, Takao; Matsushita, Takehiro; Shirakata, Tizou; Shiromoto, Yoshio; and Watanabe, Hiroki, 5,751,924, Cl. 395-115.000.

Watanabe, Kazuhiro; Oshima, Michihiro; Setoguchi, Kazuhiro; and Oda, Masaaki, to Vacuum Metallurgical Co., Ltd. Process for producing a metal paste. 5,750,194, Cl. 427-216.000.

Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Krzeminski, Jacek; and Nawrot, Barbara, to Sloan-Kettering Institute for Cancer Research. 2'-"up" fluorinated 2'-deoxy-arabinofuranosylpurines. 5,750,675, Cl. 536-27.210.

Watanabe, Masahiro: *See—*

Yamashita, Kazuo; Takeuchi, Yoshihiko; and Watanabe, Masahiro, 5,751,200, Cl. 333-197.000.

Watanabe, Masaru: *See—*

Hazama, Hiroyuki; Watanabe, Masaru; Akiyama, Yukinori; Maeshima, Masanobu; Ogawa, Hirotsugu; and Murata, Takahiko, 5,752,134, Cl. 399-113.000.

Watanabe, Mayumi: *See—*

Yoneda, Fumio; Watanabe, Mayumi; Sakae, Masatoshi; Katsurada, Masanori; and Sabato, Takaaki, 5,750,712, Cl. 548-186.000.

Watanabe, Naofumi; and Tanaka, Shigeru, to Kabushiki Kaisha Toshiba. X-ray CT scanner system having a plurality of x-ray scanner apparatus. 5,751,837, Cl. 382-131.000.

Watanabe, Naotoshi: *See—*

Soumiya, Toshio; Abe, Shunji; Katoh, Masafumi; and Watanabe, Naotoshi, 5,751,691, Cl. 370-17.000.

Watanabe, Shinichirou: *See—*

Otsuki, Kazunori; and Watanabe, Shinichirou, 5,751,805, Cl. 380-4.000.

Watanabe, Takashi: *See—*

Konno, Makoto; Shibata, Akira; Watanabe, Takashi; and Komatsu, Hisateru, 5,751,518, Cl. 360-104.000.

Watanabe, Takeshi: *See—*

Ito, Takayuki; Sasagawa, Hideto; and Watanabe, Takeshi, 5,750,940, Cl. 178-18.000.

Watanabe, Tatsuya: *See—*

Senoo, Masaharu; Watanabe, Tatsuya; and Igarashi, Koichi, 5,750,371, Cl. 435-69.100.

Watanabe, Toshio: *See—*

Aramaki, Toru; Ishida, Kiyoshi; and Watanabe, Toshio, 5,751,339, Cl. 348-17.000.

Watanabe, Tsuneo, to Nikon Corporation. Lens barrel with built-in ultrasonic motor. 5,751,502, Cl. 359-823.000.

Watanabe, Yasuhiko: *See—*

Hashimoto, Akihiko; and Watanabe, Yasuhiko, 5,751,293, Cl. 345-430.000.

Watanabe, Yoichiro: *See—*

Ohshima, Kouchi; Kuramoto, Shinichi; Kawase, Hiromitsu; Watanabe, Yoichiro; Enomoto, Takamichi; Imamura, Masanaga; Kuboshima, Katsumi; and Toda, Junji, 5,750,299, Cl. 430-47.000.

Watanabe, Yoshihiro: *See—*

Kaneko, Yuji; Ueda, Tadao; Watanabe, Yoshihiro; and Toyonaga, Tatsuo, 5,750,951, Cl. 219-69.180.

Watatani, Yoshinori: *See—*

Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.

Watermark Imaging Ltd.: *See—*

Staples, Phillip Eric; and Lima-Marques, Luis, 5,752,142, Cl. 399-241.000.

Watkin, David C.: *See—*

Ludtka, Gerard M.; Kollie, Thomas G.; Watkin, David C.; and Walton, David G., 5,750,882, Cl. 73-38.000.

Watkins, Charles M.: *See—*

Browning, Jim; Watkins, Charles M.; and Cathey, David A., 5,751,262, Cl. 345-75.000.

Watkins, David S.: *See—*

Buswell, Richard F.; Cohen, Ronald; McNeilly, Leonard; and Watkins, David S., 5,750,076, Cl. 422-115.000.

Watkins-Johnson Company: *See—*

Vice, Michael W., 5,752,181, Cl. 455-326.000.

Watkins, Michael L.: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subbiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Watkins, William Lewis Henderson: *See—*

Hepburn, Jeffrey Scott; Thanasiu, Eva; Watkins, William Lewis Henderson; Hubbard, Carolyn Parks; Dobson, Douglas A.; and Gandhi, Haren Sakarlal, 5,750,082, Cl. 423-213.500.

Watson, Alva L., Jr.: *See—*

Burckhartzmeyer, Jerry J.; Crabb, Elmer R.; Lehnhoff, Terry F.; and Watson, Alva L., Jr., 5,749,423, Cl. 180-9.540.

Watson, Derrick John: *See—*

Clode, Kirsten Everald; Watson, Derrick John; and Vercauteren, Carl Josef Elsa, 5,750,007, Cl. 203-3.000.

Watson, Earl L.; and Akemann, Nicolaas C., to Chrysler Corporation. Door latch remote control assembly. 5,749,611, Cl. 292-336.300.

Watson, William Joel: *See—*

Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.

Sonnier, David Paul; Baker, William Edward; Bunton, William Patterson; Fowler, Daniel L.; Jones, Curtis Willard, Jr.; Krause, John C.; Simpson, Michael P.; and Watson, William Joel, 5,751,955, Cl. 395-200.190.

Watt, Jeffrey; and Walker, Andrew, to Cypress Semiconductor Corporation. KSD protection apparatus having floating EDS bus and semiconductor structure. 5,751,507, Cl. 361-56.000.

Wattron, Bernard: *See—*

Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.

Watts, Raymond Frederick: *See—*

Nibert, Roger Keith; Bloch, Ricardo Alfredo; Devine, Maryann; Tandon, Manoj; and Watts, Raymond Frederick, 5,750,476, Cl. 508-291.000.

Wayman, William H., to Xerox Corporation. Liquid immersion development apparatus having efficient charge dissipating development electrode. 5,752,143, Cl. 399-248.000.

Weaver, James C.: *See—*

Zewert, Thomas E.; Pliquett, Uwe; Langer, Robert S.; and Weaver, James C., 5,749,847, Cl. 604-49.000.

Weaver, Robert Francis: *See—*

Amonett, Daniel Keith; Weaver, Robert Francis; and Burgin, Henry Earl, 5,750,948, Cl. 200-38.00R.

Weaver, William C. Method and apparatus for generating a predetermined amount of ozone using ultraviolet light. 5,751,007, Cl. 250-504.00R.

Webasto Karosseriesysteme GmbH: *See—*

Weissbrich, Alfons; Danzl, Martin; and Mayer, Johann, 5,749,617, Cl. 296-107.000.

Webb, Gregory M., to Nautilus Acquisition Corporation. Exercise apparatus and associated method including rheological fluid brake. 5,749,807, Cl. 482-52.000.

Weber, Jakob: *See—*

Operschall, Hermann; Weber, Jakob; Steiner, Klaus-Alfred; and Ring, Stefan, 5,749,470, Cl. 209-2.000.

Weber Manufacturing Limited: *See—*

Weber, Reinhart; and Sheppard, Robert E., 5,750,160, Cl. 425-290.000.

Weber, Reinhart; and Sheppard, Robert E., to Weber Manufacturing Limited. Nickel shell door molds and method of forming same. 5,750,160, Cl. 425-290.000.

Wedegaertner, Thomas C.; Valco, Thomas D.; and Lalor, William F., to Cotton Incorporated. Coated cottonseed and a process for its manufacture. 5,750,466, Cl. 504-100.000.

Weder, Donald E., to Southpac Trust International, Inc. Sleeve having a detachable portion forming a skirt and methods. 5,749.171, Cl. 47-72.000.

Weed-Master Western Inc.: *See—*

Paulson, Peter O., 5,750,128, Cl. 424-407.000.

Weerasooriya, Upali; and Lin, John, to CONDEA Vista Company. Polyhydroxy-fatty amide surfactant composition and method of preparing same. 5,750,749, Cl. 554-69.000.

Weeratunga, Gamini: *See—*

Murthy, K.S. Keshava; Weeratunga, Gamini; Radatus, Bruno Konrad; and Sidhu, Kanwar Pal Singh, 5,750,714, Cl. 548-205.000.

Murthy, Keshava K.S.; Weeratunga, Gamini; Norris, Derek John; Horne, Stephen Edward; and Clive, Derrick L.J., 5,750,719, Cl. 548-268.600.

Wehner, Nancy G.: *See—*

Spack, Edward G.; Wehner, Nancy G.; and McCutcheon, Michael A., 5,750,356, Cl. 435-7.240.

Wehring, Billy E.: *See—*

Kulp, Jack H.; and Wehring, Billy E., 5,749,673, Cl. 404-10.000.

Wei, Chiu N. Multiple grade flush adsorption separation process. 5,750,820, Cl. 585-826.000.

Wei, Jianghua: *See—*

Fathi, Zakaryae; Gerard, Richard S.; and Wei, Jianghua, 5,750,968, Cl. 219-736.000.

Wei, Shuran; and Bach, Randall, to LSI Logic Corporation. Update scheme for impedance controlled I/O buffers. 5,751,161, Cl. 326-30.000.

Weibel, Helle; and Eriksen, Peter Bonne, to Novo Nordisk A/S. Transdermal delivery of tiagabine. 5,750,140, Cl. 424-449.000.

Weichmann, Josef: *See—*

Albrecht, Gerhard; Weichmann, Josef; Eibl, Ludwig; Huber, Christian; and Kern, Alfred, 5,750,634, Cl. 528-254.000.

Weider, Richard: *See—*

Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, 5,750,602, Cl. 524-127.000.

Weigh-Tronix, Inc.: *See—*

Johnson, Thomas H.; Justice, Gene L.; and Lundgreen, Michael W., 5,750,937, Cl. 177-25.110.

Weil, William W.: *See—*

Kobak, Roger Leo; Yount, Gary L.; Stirbis, James S.; and Weil, William W., 5,749,969, Cl. 118-319.000.

Weimer, Michael G.; Wetzel, David K.; and Powers, Larry D., to Eaton Corporation. Beverage dispenser tap cover with position sensing switch. 5,750,905, Cl. 73-863.000.

Weiner, Amy Joan: *See—*

Houghton, Michael; Wang, Kang-Sheng; Choo, Qui-Lim; Weiner, Amy Joan; and Overby, Lacy Rasco, 5,750,350, Cl. 435-7.100.

Weinholt, Dan Rutger, to Telefonaktiebolaget LM Ericsson. Method and device for phase-modulated signals. 5,751,187, Cl. 329-304.000.

Weinstein, Jack: *See—*

DeJonge, Stuart, Sr.; and Weinstein, Jack, 5,749,496, Cl. 222-153.140.

Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Flynn, Gary Alan; King, Chi-Hsin Richard; and Curran, Timothy Thomas, to Merrell Pharmaceuticals Inc. Process for the preparation of 4-amino- 4-3-ketosteroids via 4-nitro- 4-3-ketosteroids. 5,750,744, Cl. 552-515.000.

Weir, Michael Paul, to Lockheed Martin Corporation. General absolute value circuit. 5,751,779, Cl. 377-60.000.

Weischedel, Herbert R., to NDT Technologies, Incorporated. Method and device including primary and auxiliary magnetic poles for nondestructive detection of structural faults. 5,751,144, Cl. 324-240.000.

Weise, Bernd: *See—*

Klinge, Bernd; Gutknecht, Michael; Weise, Bernd; and Birnkraut, Ingo, 5,749,721, Cl. 431-328.000.

Weise, Mark; and Denison, Dean R., to LAM Research Corporation. Process for depositing a SiO_x film having reduced intrinsic stress and/or reduced hydrogen content. 5,750,211, Cl. 427-579.000.

Weiss, Samuel; Reynolds, Brent; Hammang, Joseph P.; and Baetge, E. Edward, to NeuroSpheres Holdings Ltd. In vitro growth and proliferation of genetically modified multipotent neural stem cells and their progeny. 5,750,376, Cl. 435-69.520.

Weiss, William J., to Penn State Research Foundation, The. Artificial heart with sensorless motor. 5,751,125, Cl. 318-280.000.

Weissberger, Edward: *See—*

McIntyre, Dale F.; Pagano, Daniel M.; Patton, David L.; and Weissberger, Edward, 5,751,399, Cl. 353-120.000.

Weissbrich, Alfons; Danzl, Martin; and Mayer, Johann, to Webasto Karosseriesysteme GmbH. Motor vehicle roof with a control by which it can be opened by motor through various interim stages. 5,749,617, Cl. 296-107.000.

- Weisser, Pirmin L.; Vermeer, Fulps V.; and King, Edward C., to NCR Corporation. System and method for enhancing computer operation by prefetching data elements on a common bus without delaying bus access by multiple bus masters. 5,751,994, Cl. 395-464.000.
- Weissman, Irving: *See—*
  - Tsukamoto, Ann; Baum, Charles M.; Aihara, Yukoh; and Weissman, Irving, 5,750,397, Cl. 435-372.000.
- Weitzel, Alwin: *See—*
  - Grabowski, Danuta; Kolberg, Uwe; Weitzel, Alwin; and Winkler-Trudewig, Magdalena, 5,750,448, Cl. 501-47.000.
- Welbon, Edward Hugh: *See—*
  - Gover, Frank Carl; Levine, Frank Eliot; and Welbon, Edward Hugh, 5,752,062, Cl. 355-800.000.
  - Levine, Frank Eliot; Roth, Charles Philip; and Welbon, Edward Hugh, 5,751,945, Cl. 395-184.010.
- Welch, James W., to CB Worldwide Inc. Process for manufacturing dog chew toys of tire sidewalls. 5,750,196, Cl. 427-290.000.
- Welch, Michael C.; and Zack, Kenneth L., to BASF Corporation. Nonphosphate machine dishwashing compositions containing polycarboxylate polymers and nonionic graft copolymers of vinyl acetate and polyalkylene oxide. 5,750,483, Cl. 510-230.000.
- Weld Technology Industries, L.L.C.: *See—*
  - Johnson, Bruce R., 5,750,952, Cl. 219-89.000.
- Weller, Ronald K. Free-standing ladder supported tool holder. 5,749,437, Cl. 182-129.000.
- Wells, David L.: *See—*
  - Srivastava, Aditya; Blakeley, José A.; Ford, Stephen J.; Mallison, Moira; Thompson, Craig W.; and Wells, David L., 5,752,034, Cl. 395-704.000.
- Wells, Donald Horace. Antenna coupling system. 5,751,253, Cl. 343-749.000.
- Wells, James A.: *See—*
  - Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 5,750,373, Cl. 435-69.400.
- Wells, Leslie Robert: *See—*
  - Earle, Anthony; and Wells, Leslie Robert, 5,752,121, Cl. 396-606.000.
- Welters, Wilhelmus J. J.; and Wijdenes, Jacob, to U.S. Philips Corporation. X-ray examination apparatus comprising a filter. 5,751,786, Cl. 378-156.000.
- Wen, Xin: *See—*
  - Antoniades, Michael George; Wen, Xin; and Herman, Mark Jay, 5,750,326, Cl. 430-568.000.
- Wendorff, Wilhard C.; Schwarz, Roland; and Amato, Guiseppe, to Motorola, Inc. Peripheral module and microprocessor system. 5,751,938, Cl. 395-182.080.
- Werbos, Paul J. Elastic fuzzy logic system. 5,751,915, Cl. 395-61.000.
- Werlich, Mark H.: *See—*
  - Apffel, James A.; Werlich, Mark H.; Bertsch, James L.; and Goodley, Paul C., 5,750,988, Cl. 250-288.000.
- Werner, Herbert: *See—*
  - Schleicher, Werner; and Werner, Herbert, 5,750,135, Cl. 424-442.000.
- Werner, Jürg; and Schlegel, Max, to Cerberus AG. System for the early detection of fires. 5,751,209, Cl. 340-286.050.
- Wernett, Frederick C., III: *See—*
  - Pfizenmayer, Henry L.; and Wernett, Frederick C., III, 5,751,555, Cl. 361-763.000.
- Werth, Elmer D. Tooling and method for forming a container. 5,749,258, Cl. 72-467.000.
- Wes Wastes Limited: *See—*
  - Worthington, Albert Edward, 5,749,561, Cl. 251-229.000.
- Western Digital Corporation: *See—*
  - Agarwal, Shashi B., 5,751,517, Cl. 360-103.000.
  - Hyde, Darryl L.; and Edwards, John R., 5,751,514, Cl. 360-97.010.
- Westfall, Scott: *See—*
  - Cheng, Pu-Sheng; Garwood, Robert; Mandralis, Zenon Ioannis; Tuot, James; and Westfall, Scott, 5,750,178, Cl. 426-594.000.
- Westfechtel, Alfred: *See—*
  - Geke, Juergen; Speckmann, Horst-Dieter; Stedry, Bernd; and Westfechtel, Alfred, 5,749,947, Cl. 106-14.420.
- Westinghouse Air Brake Company: *See—*
  - Wood, James A.; and Greer, David A., 5,752,212, Cl. 701-71.000.
- Westinghouse Electric Corporation: *See—*
  - Gillett, James E.; Dederer, Jeffrey T.; and Zafred, Paolo R., 5,750,278, Cl. 429-24.000.
- Westlund, Randy W., to Cardiac Pacemakers, Inc. Implantable tissue stimulator incorporating deposited multilayer capacitor. 5,749,911, Cl. 607-36.000.
- Westonbridge International Limited: *See—*
  - Saaman, Ary; Poscio, Patrick; and Graetzel, Michael, 5,750,138, Cl. 424-448.000.
- Westphalen, Karl-Otto: *See—*
  - Baumann, Ernst; Rheinheimer, Joachim; Vogelbacher, Uwe Josef; Gerber, Matthias; Rademacher, Wilhelm; Walter, Helmut; and Westphalen, Karl-Otto, 5,750,469, Cl. 504-243.000.
- Westvaco Corporation: *See—*
  - Dilling, Peter; and Huguenin, Sallie B., 5,749,926, Cl. 8-524.000.
- Wetzel, David K.: *See—*
  - Weimer, Michael G.; Wetzel, David K.; and Powers, Larry D., 5,750,905, Cl. 73-863.000.
- Wexler, Eugene: *See—*
  - Wilk, Peter J.; Knoll, Charles L.; and Wexler, Eugene, 5,749,376, Cl. 128-898.000.
- Weyburne, Michael Alan: *See—*
  - Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, 5,751,579, Cl. 364-426.015.
- Whalley, Eric T.: *See—*
  - Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., 5,750,506, Cl. 514-15.000.
- Wheatley, William E.; and Wilson, Robert James, Jr., to Harris Corporation. Printed wiring board hardware captivation method. 5,750,936, Cl. 174-138.00G.
- Wheeler, Bryce A.: *See—*
  - Harrell, John P.; and Wheeler, Bryce A., 5,751,460, Cl. 359-198.000.
- Wheeler, Christopher Edwin: *See—*
  - Melpolder, Sharon Marilyn; Smith, Dennis Edward; Wheeler, Christopher Edwin; and Muehlbauer, John Leonard, 5,750,328, Cl. 430-619.000.
- Wheeler, Maxon: *See—*
  - Hahn, Samuel S.; LeGault, Kenn; Wheeler, Maxon; and Degenhardt, Jon R., 5,751,287, Cl. 345-351.000.
- Wheeler, William B. Refrigerant system lubricant and method. 5,750,046, Cl. 252-68.000.
- Wheelock Inc.: *See—*
  - Kosich, Joseph, 5,751,210, Cl. 340-293.000.
- Whirlpool Europe B.V.: *See—*
  - Elliott, Robert S.; and Frasnetti, Luca, 5,749,388, Cl. 137-1.000.
- Whitaker Corporation, The: *See—*
  - Buck, Arthur Glen; Beck, Doris Arlene; and Chy, Sokha, 5,750,930, Cl. 174-102.00R.
  - Edwards, Bryan Thomas; Erdman, David Donald; Mansberger, Robert L., II; Skitka, John Nicholas; and Sponsel, Michael Charles, 5,751,875, Cl. 385-84.000.
  - Kaufman, John Wilson; Knaub, John Edward; and Cunningham, Adam Douglas, 5,750,973, Cl. 235-441.000.
  - Vockroth, William Joseph; Engle, James Donald; Goss, Ralph Richard; Heim, Richard Dean; Maley, Ronald Joseph; and Schrum, David Keith, 5,749,756, Cl. 439-879.000.
- Whitcomb, Jeannette: *See—*
  - Cerutti, Peter; Whitcomb, Jeannette; Zijlstra, Jacob; and de Villiers, Ethel-Michelle, 5,750,334, Cl. 435-5.000.
- White, David A.: *See—*
  - Jang, Yue-Teh; Salmon, Stephen M.; White, David A.; and Garcia, Rizza A., 5,749,848, Cl. 604-53.000.
- White, Donald M., III; and Wadzinski, Chris A., to Toro Company, The. Filament trimmer head. 5,749,148, Cl. 30-276.000.
- White, Michael J.: *See—*
  - Bull, Jeffrey; White, Michael J.; and Kaufman, Larry, 5,750,450, Cl. 501-91.000.
- White, Raymond Alan; and Solomon, Harvey Donald, to General Electric Company. Water exclusion device for underwater welding. 5,750,954, Cl. 219-121.450.
- Whited, William Thomas: *See—*
  - Siak, June-Sang; Biederman, Scott William; Whited, William Thomas; and Datte, Mark Allen, 5,749,409, Cl. 164-23.000.
- Whiteside, Patricia L.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Whitney, David, to Siemens Components, Inc. Method of fabricating a semiconductor device. 5,750,414, Cl. 437-154.000.
- Whittaker, Stephen; Harrison, Keith; Stenton, Philip; Proudian, Derek; and Haddock, Nicholas, to Hewlett-Packard Company. Method and apparatus for database interrogation using a user-defined table. 5,752,016, Cl. 395-600.000.
- Whitted, Graham B., III: *See—*
  - Chang, Hsiao-Shih; Kane, James A.; and Whitted, Graham B., III, 5,751,984, Cl. 395-392.000.
- Wholey, Mark H.: *See—*
  - Hogendijk, Michael; and Wholey, Mark H., 5,749,918, Cl. 623-1.000.
- Wiacek, Marian: *See—*
  - DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.
- Wichert, Burkhard; Sauerbier, Dieter; and Rawert, Jurgen, to Asta Medica Aktiengesellschaft. Ifosfamide lyophilizate preparations. 5,750,131, Cl. 424-422.000.
- Wichmann, Gunter, to Eltro GmbH. Distance sensor for projectile fuzes. 5,751,239, Cl. 342-68.000.
- Wickens, Marvin P.; and Fields, Stanley, to Wisconsin Alumni Research Foundation. System to detect protein-RNA interactions. 5,750,667, Cl. 536-23.100.
- Wideman, Al S.: *See—*
  - Wright, Daniel R.; Brinker, Ronald J.; Sandbrink, Joseph J.; and Wideman, Al S., 5,750,468, Cl. 504-206.000.

- Widmer, Erich: *See—*
  - Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, François; and Widmer, Erich, 5,750,690, Cl. 544-234.000.
- Wiebe, Valerie: *See—*
  - DeGregorio, Michael; Wiebe, Valerie; Kangas, Lauri; Härkönen, Pirkko; Väänänen, Kalervo; and Laine, Aire, 5,750,576, Cl. 514-720.000.
- Wieder, Steven M.; and Oechslin, Thomas A., to Peak Enterprises, Inc. Tongue hygiene device. 5,749,116, Cl. 15-160.000.
- Wierer, Konrad: *See—*
  - Eck, Herbert; Fleischmann, Gerald; and Wierer, Konrad, 5,750,617, Cl. 524-718.000.
- Wierer, Peter: *See—*
  - Hohenegger, Karl; and Wierer, Peter, 5,751,474, Cl. 359-360.000.
- Wierschke, Gilbert W.: *See—*
  - Bittar, Joseph; Bennett, Paul; Wierschke, Gilbert W.; Wan, Samuel C.; Powell, Bruce A.; Barker, Frederick H.; McCarthy, Richard C.; and Cooney, Anthony, 5,749,441, Cl. 187-249.000.
- Wierzba, Konstanty: *See—*
  - Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, 5,750,515, Cl. 514-63.000.
- Wiesenberg, Raphael: *See—*
  - Lifshitz, Lior; and Wiesenberg, Raphael, 5,752,057, Cl. 395-785.000.
- Wiesner, Hagen Heinz; and Spies, Klaus, to Diehl Remscheid GmbH & Co. Elastic mounting for track pivot pins in endless hinged vehicular crawler drive tracks. 5,749,634, Cl. 305-42.000.
- Wiggins, Michael S.: *See—*
  - Arora, Kartar S.; and Wiggins, Michael S., 5,750,595, Cl. 523-404.000.
- Wijdenes, Jacob: *See—*
  - Welters, Wilhelmus J. J.; and Wijdenes, Jacob, 5,751,786, Cl. 378-156.000.
- Wiklof, Christopher A.: *See—*
  - Austin, Pixie Ann; Wiklof, Christopher A.; and Aragon, Cathy L., 5,751,330, Cl. 347-171.000.
- Wilburn, Donald William; and Faiello, Gary Francis, to Wilburn's Body Shop, Inc. Movable overhead ventilation assembly and filtering method. 5,749,779, Cl. 454-65.000.
- Wilburn's Body Shop, Inc.: *See—*
  - Wilburn, Donald William; and Faiello, Gary Francis, 5,749,779, Cl. 454-65.000.
- Wilder, Steven E.: *See—*
  - Dorenkott, Jeffrey S.; Wilder, Steven E.; Nyugen, Dinh; and Murthy, Kurukundi Ramesh, 5,750,881, Cl. 73-37.000.
- Wildes, Richard Patrick; Asmuth, Jane Circle; Hanna, Keith James; Hsu, Stephen Charles; Kolczynski, Raymond Joseph; Matey, James Regis; and McBride, Sterling Eduard, to David Sarnoff Research Center Inc. Automated, non-invasive iris recognition system and method. 5,751,836, Cl. 382-117.000.
- Wilent, John W., deceased (by Virginia B. Wilent, administratrix): *See—*
  - Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
- Wilent, Virginia B., administratrix: *See—*
  - Moorman, Jack W.; Skillicorn, Brian; Solomon, Edward G.; Fiekowsky, Peter J.; Wilent, John W., deceased; Moorhouse, Abigail A.; and Melen, Robert E., 5,751,785, Cl. 378-146.000.
- Wilhelm, Joel: *See—*
  - Ermacora, Rino; Fischbach, Pierre; Helfer, Roland; Walch, Martin; Wattron, Bernard; and Wilhelm, Joel, 5,749,390, Cl. 137-106.000.
- Wilhoit, Eugene Dennis: *See—*
  - Davis, Darwin Darrell; and Wilhoit, Eugene Dennis, 5,750,791, Cl. 564-488.000.
- Wilk, Peter J.; Knoll, Charles L.; and Wexler, Eugene. Medical treatment and waste disposal method. 5,749,376, Cl. 128-898.000.
- Wilkerson, Wendell Wilkie: *See—*
  - Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.
- Wilkey, John David: *See—*
  - Diaz, Zaida; and Wilkey, John David, 5,750,032, Cl. 210-688.000.
- Wilkins, Robert Lee; Gullion, Steven Dwayne; and Jones, Charles Edward, to Kvaerner Oilfield Products. Lateral connector for tube assembly. 5,749,608, Cl. 285-123.120.
- Wilkinson, Paul Amba; Dieffenderfer, James Warren; Kogge, Peter Michael; and Schoonover, Nicholas Jerome, to International Business Machines Corporation. Fully scalable parallel processing system having asynchronous SIMD processing. 5,752,067, Cl. 395-800.160.
- Willemsen, Herman W.: *See—*
  - MacDonald, R. Ian; and Willemsen, Herman W., 5,751,454, Cl. 359-119.000.
- Williams, Anthony D. Pipe coupling system and method. 5,749,604, Cl. 285-39.000.
- Williams, Dawn M.; and Schweid, Stuart A., to Xerox Corporation. Self-timed two-dimensional filter. 5,751,862, Cl. 382-260.000.
- Williams, Frank A.: *See—*
  - Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
- Williams, Glen P.: *See—*
  - Houck, Raymond K.; Koebler, Douglas J.; Williams, Glen P.; Levy, Joseph M.; and Danielson, Victor G., 5,750,029, Cl. 210-634.000.
- Williams, Herold: *See—*
  - Allen, David Lee; and Williams, Herold, 5,751,337, Cl. 348-15.000.
- Williams, John K.: *See—*
  - Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.
- Williams, Kenneth R.: *See—*
  - Miller, Gary L.; and Williams, Kenneth R., 5,751,322, Cl. 347-86.000.
- Williams, Lewis T.: *See—*
  - Chu, Keting; and Williams, Lewis T., 5,750,653, Cl. 530-350.000.
- Williams, Mark; and Leemans, Jan, to Plant Genetic Systems, N.V. Maintenance of male-sterile plants. 5,750,867, Cl. 800-205.000.
- Williams, Randall S., to Fluoroware, Inc. Wafer carrier. 5,749,469, Cl. 206-710.000.
- Williams, Richard K.: *See—*
  - Yilmaz, Hamza; Williams, Richard K.; Cornell, Michael E.; and Chen, Jun Wei, 5,751,054, Cl. 257-603.000.
- Williams, Robert, to Sequa Corporation. Dual can rotating transfer plate to conveyor belt. 5,749,631, Cl. 198-441.000.
- Williams, Roger Leonard; and Edgerley, David Anthony, to Cannon Rubber Limited. Breast pump. 5,749,850, Cl. 604-74.000.
- Williams, Simon Mark; and McGeary, Michael Lawrence, to Digital Equipment Corporation. Testable chip carrier. 5,751,554, Cl. 361-760.000.
- Williams, Steven Ray. HVAC register box. 5,749,190, Cl. 52-302.100.
- Willis, Edward K.: *See—*
  - Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
- Willis, Mitchell J.: *See—*
  - Behl, Sanjay; Nemeh, Saad; Willis, Mitchell J.; and Berberich, Joseph P., 5,749,958, Cl. 106-416.000.
- Willson, Tracy Ann: *See—*
  - Gearing, David Paul; Gough, Nicholas Martin; Hilton, Douglas James; King, Julie Ann; Metcalf, Donald; Nice, Edouard Collins; Nicola, Nicos Anthony; Simpson, Richard John; and Willson, Tracy Ann, 5,750,654, Cl. 530-351.000.
- Wilsch-Irrgang, Anneliese; Schambil, Fred; Voelkel, Theodor; Osset, Miguel; and Pi, Rafael, to Henkel Kommanditgesellschaft auf Aktien. Detergent mixtures. 5,750,490, Cl. 510-504.000.
- Wilson, Donna Kaye: *See—*
  - Sun, Xiaoyong; Sachdeva, Yesh P.; Wilson, Donna Kaye; Gabriel, Richard L.; and Ram, Siya, 5,750,713, Cl. 548-202.000.
- Wilson, Frank: *See—*
  - Hopkins, Anthony; Matlock, Dale; Senter, John; Shield, Fred; Malanowski, Chet; Ortery, James; Wilson, Frank; Timpone, Leonard; Pugh, Richard; Heyndricks, Joel; Kotlarz, Ronald; Lorenz, Stanley; and Unrath, Ralph, 5,749,589, Cl. 280-47.340.
- Wilson Greatbatch Ltd.: *See—*
  - Paulot, William M.; Probst, Joseph M.; and Elliott, William B., 5,750,286, Cl. 429-211.000.
- Wilson, Jack H., Sr. Method of pavement repair. 5,749,674, Cl. 404-75.000.
- Wilson, James Warren: *See—*
  - Laine, Eric Herman; and Wilson, James Warren, 5,751,060, Cl. 257-702.000.
- Wilson, John C.; and Fields, Robert D., to Eastman Kodak Company. Poly[(2-(sulfonamidomethylene)-2-cyanoacetamido)phenyl acrylate] charge-control agents for electrostatographic toners and developers. 5,750,305, Cl. 430-110.000.
- Wilson, John C.; and Fields, Robert D., to Eastman Kodak Company. Bis[(1,2-benzisothiazol-3(2H)-ylidene 1,1-dioxide)acetates] charge-control agents. 5,750,715, Cl. 548-209.000.
- Wilson, Merrill Anderson: *See—*
  - Carolan, Michael Francis; Dyer, Paul Nigel; Minford, Eric; Russek, Steven Lee; Wilson, Merrill Anderson; Taylor, Dale M.; and Henderson, Brett Tamatea, 5,750,279, Cl. 429-32.000.
- Wilson, Robert James, Jr.: *See—*
  - Wheatley, William E.; and Wilson, Robert James, Jr., 5,750,936, Cl. 174-138.00G.
- Wilson, Roger F. Skiing simulator. 5,749,811, Cl. 482-71.000.
- Wilson Sporting Goods Co.: *See—*
  - Kuebler, Siegfried; and Garrett, Frank, 5,749,798, Cl. 473-549.000.
- Wilson, Stephen R.: *See—*
  - Bird, Trevor S.; Sprey, Mark A.; McInnes, Ian J.; Hancock, Warren J.; and Wilson, Stephen R., 5,751,254, Cl. 343-761.000.
- Wilson, Stephen S.: *See—*
  - Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,751,870, Cl. 385-33.000.
- Wilson, William Robert: *See—*

Denny, William Alexander; Palmer, Brian Desmond; and Wilson, William Robert, 5,750,782, Cl. 564-166.000.

Winberg, Arvid E.: *See—*

Bokelmann, Paul R.; Schumacher, Thomas R.; and Winberg, Arvid E., 5,749,204, Cl. 53-471.000.

Winbond Electronics Corporation: *See—*

Yu, Ta-Lee, 5,751,042, Cl. 257-360.000.

Wincott, Francine E.: *See—*

Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., 5,750,506, Cl. 514-15.000.

Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., to Xerox Corporation. Vacuum assisted bead pick off apparatus having a spiral plural level surface. 5,752,138, Cl. 399-264.000.

Winkler-Trudewig, Magdalena: *See—*

Grabowski, Danuta; Kolberg, Uwe; Weitzel, Alwin; and Winkler-Trudewig, Magdalena, 5,750,448, Cl. 501-47.000.

Winter, Roland A. E.: *See—*

Nesvadba, Peter; Evans, Samuel; Gande, Matthew E.; von Ahn, Volker H.; and Winter, Roland A. E., 5,750,765, Cl. 560-126.000.

Winterble, Charles; Nelson, Wayne; and Stanley, Lawrence G., to Simplex Time Recorder Company. Smoke detector housing for improved smoke collection. 5,751,218, Cl. 340-693.000.

Wirtz, Brigitte: *See—*

Maggioni, Christoph; and Wirtz, Brigitte, 5,751,843, Cl. 382-154.000.

Wisconsin Alumni Research Foundation: *See—*

Akhtar, Masood, 5,750,005, Cl. 162-72.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,750,746, Cl. 552-653.000.

Wickens, Marvin P.; and Fields, Stanley, 5,750,667, Cl. 536-23.100.

Wissman, Charles H.: *See—*

Oberg, Arthur E.; and Wissman, Charles H., 5,751,149, Cl. 324-533.000.

Wissmann, Siegfried R.; Schmitt, William T.; and Murdock, David E., to Cincinnati Milacron Inc. Preheating apparatus for an extruder. 5,750,158, Cl. 425-144.000.

Wissner, Michael J., to Avid Technology, Inc. Method and apparatus for representing and editing multimedia compositions using references to tracks in the composition to define components of the composition. 5,752,029, Cl. 395-615.000.

Wistar Institute of Anatomy & Biology, The: *See—*

Clark, H. Fred; Offit, Paul; and Plotkin, Stanley A., 5,750,109, Cl. 424-205.100.

Wister, William R., III: *See—*

Brackett, Douglas C.; and Wister, William R., III, 5,751,587, Cl. 364-474.240.

Witherington, Jason: *See—*

Hodgson, David Michael; and Witherington, Jason, 5,750,805, Cl. 568-838.000.

Withers, Andrew, to Patients Solutions. Method and apparatus for managing disposable medical supplies appropriate for a single patient visit. 5,752,234, Cl. 705-2.000.

Witt, David B.; and Johnson, William M., to Advanced Micro Devices, Inc. High performance superscalar microprocessor including a speculative instruction queue for byte-aligning CISC instructions stored in a variable byte-length format. 5,751,981, Cl. 395-380.000.

Wittenbrink, Robert J.; Ryan, Daniel F.; Baird, William C., Jr.; Riley, Kenneth L.; and Johnson, Jack W., to Exxon Research and Engineering Company. Process for hydroconversion of paraffin containing feeds. 5,750,819, Cl. 585-734.000.

Witter, Lowell F. Drywall tool. 5,749,113, Cl. 7-166.000.

Wittmann, Dieter: *See—*

Köhler, Burkhard; Kirsch, Jürgen; Weider, Richard; Wittmann, Dieter; and Beicher, Horst, 5,750,602, Cl. 524-127.000.

Woerman, John Harold; and Wu, Yangsheng, to Penwest Foods Co. Tapioca starch containing french fry formulations and method of making. 5,750,168, Cl. 426-102.000.

Wofford, Bill; Jackson, Marc; and Bevan, John, to R.F. Environmental Systems, Inc. Process and device for destruction of halohydrocarbons. 5,750,823, Cl. 588-210.000.

Wolf, Hubert; Bulang, Siegfried; and Cohrs, Olaf, to Munters Euroform GMBH. Mist collector arrangement for gas washers. 5,749,930, Cl. 55-242.000.

Wolf, Joel Leonard: *See—*

Aggarwal, Charu Chandra; Wolf, Joel Leonard; and Yu, Philip Shi-Lung, 5,751,336, Cl. 348-7.000.

Wolf, Terry: *See—*

Coelho, Philip H.; and Wolf, Terry, 5,750,658, Cl. 530-382.000.

Wolfe, Christopher Edward: *See—*

Skinner, David Robert; Bagepalli, Bharat S.; Cromer, Robert Harold; Dine, Osman Saim; Turnquist, Norman Arnold; and Wolfe, Christopher Edward, 5,749,584, Cl. 277-53.000.

Wolff, Daniel: *See—*

Dexter, Jeffrey L.; Siemers, David C.; Head, Larry J.; Miller, Donald E.; Grebe, Bruce; Nowack, William; and Wolff, Daniel, 5,749,160, Cl. 34-502.000.

Wolff Walsrode AG: *See—*

Gasse, Andreas; and Klein, Rudi, 5,750,262, Cl. 428-423.500.

Wolford, Larry L.; and Prince, Brian K., to Atlantic Richfield Company. Valve packing assembly. 5,749,560, Cl. 251-214.000.

Wolper, Andre Eberhard: *See—*

Christensen, Reed K.; and Wolper, Andre Eberhard, 5,752,013, Cl. 395-568.000.

Wolski, Peter; and Long, Michael S., to IMI Wilshire Inc. Juice dispenser. 5,749,494, Cl. 222-129.100.

Wolstenholme, Graham R.; and Ireland, Philip J., to Micron Technology, Inc. Polysilicon pillar diode for use in a non-volatile memory cell. 5,751,012, Cl. 257-5.000.

Won, King L.: *See—*

Cushman, Paul W.; Won, King L.; Mehta, Bakulesh A.; and Akselrod, Mark, 5,751,698, Cl. 370-252.000.

Wong, Eddie: *See—*

Clarke, Hal C.; Ahn, Hyung-Kook; Wong, Eddie; Gasman, Robert C.; Smetana, Alfred J.; Synodis, Joseph; and Chang, Tiang Shing, 5,750,591, Cl. 523-120.000.

Wong, Roney S., to Samsung Electronics Co., Ltd. Calculating the average of two integer numbers rounded away from zero in a single instruction cycle. 5,751,617, Cl. 364-734.000.

Wong, Sau C.; and So, Hock C., to inVoice Technology, Inc. Read circuits for analog memory cells. 5,751,635, Cl. 365-185.190.

Wong Shing, Jane B.; and Tubergen, Karen R., to Nalco Chemical Company. Hydrophilic dispersion polymers for the clarification of deinking process waters. 5,750,034, Cl. 210-705.000.

Woo, Chang-sup: *See—*

Lew, Yung-bai; Park, Won-seo; Park, Yong-sung; Kim, Young-ho; Park, Sang-il; Kim, In-soo; and Woo, Chang-sup, 5,750,069, Cl. 340-933.000.

Woo, David D. L., to University of California, The Regents of the. Treatment of cystic disease with TNF-α . 5,750,495, Cl. 514-2.000.

Wood, Graham Robert, to Stamford Investments, Inc. Pivotal display rack. 5,749,480, Cl. 211-169.100.

Wood, James A.; and Greer, David A., to Westinghouse Air Brake Company. Proportional polarity shift wheel slide protection. 5,752,212, Cl. 701-71.000.

Wood, John: *See—*

Rochette, Daniel; Wood, John; and Angers, Christian, 5,749,385, Cl. 134-199.000.

Wood, Lonnie. Concealed weapon holder. 5,749,507, Cl. 224-587.000.

Woodbury, E. Arthur: *See—*

Chaleki, Christopher R.; Griffin, Wayne P.; Woodbury, E. Arthur; McKinley, Arthur C.; and McKinley, Harry R., 5,751,341, Cl. 348-65.000.

Woodcock, Timothy P. Bicycle display rack. 5,749,474, Cl. 211-18.000.

Woodford Trading Limited: *See—*

Shashkovsky, Sergei Gennadievich; Kamrukov, Alexander Semyonovich; Chepegin, Dmitry Vyacheslavovich; and Bandurkin, Victor Vladimirovich, 5,750,205, Cl. 427-535.000.

Woodhall, Edward W.; and Kondrats, Nicholas. Protective coating and method of using such coating. 5,750,190, Cl. 427-156.000.

Woodnorth, Douglas J.: *See—*

DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.

Woods, Curtis: *See—*

Bornhorst, Kenneth F., Jr.; Likins, Robert Dean; Eichhorn, Thomas J.; Seitz, David R.; and Woods, Curtis, 5,751,435, Cl. 358-299.000.

Woodward, David F.: *See—*

Chen, June; Burk, Robert M.; and Woodward, David F., 5,750,784, Cl. 564-171.000.

Work, Thomas Randolph: *See—*

Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.

Wormald, David M.: *See—*

Coley, Brett Angus; Chin, Vincent G.; Downing, Patrick Francis; and Wormald, David M., 5,751,914, Cl. 395-51.000.

Worthington, Albert Edward, to Wes Wastes Limited. Plug assembly. 5,749,561, Cl. 251-229.000.

Wrenn, Susan E.: *See—*

Counts, Mary E.; Deevi, Seetharama; Fleischhauer, Grier S.; Hajalogol, Mohammad R.; Hayes, Patrick H.; Higgins, Charles T.; Houck, Willie G., Jr.; Keen, Billy J., Jr.; Laroy, Bernard C.; Lipowicz, Peter J.; Miser, Donald E.; Nichols, Constance H.; Stevens, William H.; Subhiah, Mantharam; Watkins, Michael L.; and Wrenn, Susan E., 5,750,964, Cl. 219-535.000.

Wright, Daniel R.; Brinker, Ronald J.; Sandbrink, Joseph J.; and Wideman, Al S., to Monsanto Company. Glyphosate formulations containing etheramine surfactants. 5,750,468, Cl. 504-206.000.

Wright, Dennis Nathan: *See—*

Phillips, Dennis Earl; and Wright, Dennis Nathan, 5,749,593, Cl. 280-476.100.

Wright, Drew D.: *See—*

Kyle, Richard F.; Clewett, Richard H.; and Wright, Drew D., 5,749,872, Cl. 606-69.000.

Wright, Phil: *See—*

Huang, Rong-Ting; Wright, Phil; and Joseph, Eric D., 5,751,263, Cl. 345-82.000.

Wright, Steven L.; and Hood, C. Fred, to Pioneer Hi-Bred International, Inc. Near infrared spectrometer used in combination with a combine for real time grain analysis. 5,751,421, Cl. 356-328.000.

Wright, William. Bay or bow window support system. 5,749,183, Cl. 52-201.000.

Wronkiewicz, Robert D.; Pitchford, Terry L.; Schuller, Daniel J.; and Vennen, Emmanuel Vander, to AMSTED Industries Incorporated. Multi-rate vertical load support for an outboard bearing railway truck. 5,749,301, Cl. 105-199.300.

Wszolek, Philip: *See—*

Cassetti, David K.; and Wszolek, Philip, 5,752,262, Cl. 711-135.000.

Wu, Laurence Ichih; and Janusz, John Michael, to Procter & Gamble Company, The. Dihydrobenzofuran and related compounds useful as anti-inflammatory agents. 5,750,543, Cl. 514-337.000.

Wu, Margaret M.: *See—*

Xiong, Yusheng; Wu, Margaret M.; Young, L. Brewster; and Chu, Alice S., 5,750,480, Cl. 508-580.000.

Wu, Peter, to Hsing Chau Industrial Co., Ltd. Electric shielding metal shell receptacle having movable binding strips. 5,750,923, Cl. 174-35.00R.

Wu, Ping: *See—*

Ansel, George M.; Hunt, Jeffery Scott; Wu, Ping; Lindley, David A.; and Hawkins, Andrew L., 5,751,644, Cl. 365-194.000.

Wu, Shye-Lin, to Powerchip Semiconductor Corp. Method for fabricating a stacked capacitor. 5,750,431, Cl. 438-396.000.

Wu, Yangsheng: *See—*

Woerman, John Harold; and Wu, Yangsheng, 5,750,168, Cl. 426-102.000.

Wuebbels, Richard; and Resing, Alfons, to Maschinenfabrik Kemper GmbH. Mowing apparatus. 5,749,208, Cl. 56-10.300.

Wulf, Katherine; and Barker, Richard Steven, to Eagle Creek, Inc. Convertible luggage system. 5,749,503, Cl. 224-153.000.

Wulf, Martin L.: *See—*

Close, John W., Jr.; and Wulf, Martin L., 5,749,303, Cl. 105-404.000.

Wunderlich, Russell J.; Taylor, Mark; Stancil, Charles J.; Hunsaker, Mikal C.; and Belmont, Brian V., to Compaq Computer Corporation. Memory accessing system with portions of memory being selectively write protectable and relocatable based on predefined register bits and memory selection RAM outputs. 5,751,998, Cl. 395-490.000.

Wursching, Istvan: *See—*

Cserteg, Istvanne; Tokes, Jozsef; Wursching, Istvan; and Fulop, Jozsef, 5,751,105, Cl. 313-493.000.

Wurz, Albert; Yeh, Edward P.; and Brobst, Thomas J., to Accu-Sort Systems, Inc. Label applicator. 5,750,004, Cl. 156-360.000.

Wuyts, Robert, to Framatome Connectors International. Method and apparatus for determining the color or color code of an object. 5,751,847, Cl. 382-165.000.

Wyatt, Karl W.: *See—*

Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., 5,751,009, Cl. 250-551.000.

Wyatt, Tracy A.: *See—*

Wyatt, W. Tison, 5,749,986, Cl. 156-64.000.

Wyatt, W. Tison, to Wyatt, Tracy A. Control of batching and curing processes. 5,749,986, Cl. 156-64.000.

Wylder, Robert N.; and Steinbrecher, Martin C. Reusable cover for rendering a conventional reusable drinking container spill resistant. 5,749,491, Cl. 220-719.000.

Wyles, Richard H.; and Frye, William H., to Raytheon Company. Low-crosstalk column differencing circuit architecture for integrated two-color focal plane arrays. 5,751,005, Cl. 250-370.060.

Wylie, Andrew: *See—*

Moffett, Robert; Moffett, Carol; McAdam, James; Quinn, Paul; McHugh, Gerard; Harte, Gerard; Wylie, Andrew; McVicar, Martin; and Cadden, Thomas, 5,749,695, Cl. 414-467.000.

Xeikon N.V.: *See—*

De Cock, Etienne Marie; De Schamphelaere, Lucien Amede; and Grobben, Alfons Jakob, 5,751,327, Cl. 347-130.000.

Xenova Limited: *See—*

Bryans, Justin Stephen; Folkes, Adrian John; and Latham, Christopher John, 5,750,530, Cl. 514-255.000.

Xerox Corporation: *See—*

Badesha, Santokh S.; Heeks, George J.; and Henry, Arnold W., 5,750,204, Cl. 427-387.000.

Bailey, Raymond E.; McCubbin, Robert K.; Goeserich, Manfred H.; and Altavela, Robert P., 5,751,316, Cl. 347-63.000.

Borton, Michael D.; Carolan, Kevin M.; and Hubble, Fred F., III, 5,751,443, Cl. 356-446.000.

Burke, Cathie J.; Viturro, R. Enrique; Andrews, John R.; Deshpande, Narayan V.; and O'Brien, Sean D., 5,751,315, Cl. 347-63.000.

Coy, Gerald L.; and Dempsey, Neil J., 5,751,123, Cl. 318-34.000.

Crawford, Gregory P.; Fiske, Thomas G.; and Silverstein, Louis D., 5,751,390, Cl. 349-120.000.

Drake, Donald J., 5,751,311, Cl. 347-43.000.

Farrell, Barbara L., 5,751,848, Cl. 382-172.000.

Genovese, Frank C., 5,750,986, Cl. 250-235.000.

Gwaltney, Mark A., 5,751,432, Cl. 358-296.000.

Hawkins, Michael G.; Chang, Hui; Chung, Joo T.; Dewan, Jennifer E.; Ianni, John J.; Kittelberger, J. Stephen; Leonardo, Joseph L.; Lincoln, Timothy L.; and Kenney, Yvonne M., 5,750,909, Cl. 73-866.000.

Mammino, Joseph C.; Herbert, William G.; Chang, Shu; and Ludwig, Theodore C., 5,752,144, Cl. 399-249.000.

Marimont, David H.; and Guibas, Leonidas John, 5,751,852, Cl. 382-180.000.

Melino, Robert H., 5,751,333, Cl. 347-247.000.

Micco, Felice A.; and Banton, Martin E., 5,751,865, Cl. 382-296.000.

Narendranath, Nagesh H.; and Ebner, Fritz F., 5,751,433, Cl. 358-298.000.

Narendranath, Nagesh H.; and Ebner, Fritz F., 5,751,434, Cl. 358-298.000.

Parker, Delmer G.; and Kovacs, Gregory J., 5,751,437, Cl. 358-300.000.

Peeters, Eric; Viturro, R. Enrique; Deshpande, Narayan V.; Kubby, Joel A.; and DeLouise, Lisa A., 5,751,317, Cl. 347-65.000.

Rezanka, Ivan, 5,751,302, Cl. 347-9.000.

Sanchez, Ismael R.; Foltz, Robert S.; Brydges, Warren F.; Hammond, William A.; Swain, Eugene A.; Williams, John K.; Petralia, Richard C; and Vo, Thong H., 5,752,136, Cl. 399-117.000.

Saund, Eric, 5,751,855, Cl. 382-224.000.

Sheridon, Nicholas K., 5,751,268, Cl. 345-107.000.

Wayman, William H., 5,752,143, Cl. 399-248.000.

Williams, Dawn M.; and Schweid, Stuart A., 5,751,862, Cl. 382-260.000.

Wing, Joseph M.; Roszkowski, Mark E.; Haughan, Kerry P.; Lincoln, James F.; and Pictor, Robert A., 5,752,138, Cl. 399-264.000.

Xia, Yongping: *See—*

Jayaraman, Raj; Xia, Yongping; Venkitasubrahmanian, Sreeraman; and Leyton, Paul, 5,751,115, Cl. 315-225.000.

Xie, Like; Fouchard, David T.; Ebner, Walter B.; and Megahed, El-Sayed, to Rayovac Corporation. Modified lithium nickel oxide compounds for electrochemical cathodes and cells. 5,750,288, Cl. 429-229.000.

Xilinx, Inc.: *See—*

Baxter, Glenn A., 5,752,006, Cl. 395-500.000.

Trimberger, Stephen M., 5,752,035, Cl. 395-705.000.

Xiong, Yusheng; Wu, Margaret M.; Young, L. Brewster; and Chu, Alice S., to Mobil Oil Corporation. Alkylated anisole lubricant basestock. 5,750,480, Cl. 508-580.000.

Xu, Feng: *See—*

Berka, Randy Michael; Thompson, Sheryl Ann; and Xu, Feng, 5,750,388, Cl. 435-189.000.

Xu, Tian: *See—*

Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, 5,750,652, Cl. 530-350.000.

Xu, Xin: *See—*

Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.

Yabe, Hisao: *See—*

Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, 5,749,829, Cl. 600-153.000.

Yabe, Shinryo: *See—*

Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, 5,750,090, Cl. 424-59.000.

Yabe, Yasuhiro: *See—*

Yamada, Minoru; Hashimoto, Hideyuki; Yabe, Yasuhiro; and Honda, Kenji, 5,751,522, Cl. 360-113.000.

Yaegashi, Hisao: *See—*

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, 5,751,310, Cl. 347-43.000.

Yagasaki, Yoichi: *See—*

Suzuki, Teruhiko; and Yagasaki, Yoichi, 5,751,359, Cl. 348-405.000.

Yager, Michael: *See—*

Rello, Robert Michael; Yager, Michael; and Martinez, Ramon Antonio, 5,749,990, Cl. 156-187.000.

Yagisawa, Hiroshi: *See—*

Matsutani, Kanji; Sugino, Motoichi; and Yagisawa, Hiroshi, 5,749,897, Cl. 606-222.000.

Yagyu, Motohiro: *See—*

Yamamoto, Taizo; Yagyu, Motohiro; Kawaguchi, Yosihisa; and Nagao, Akira, 5,750,979, Cl. 250-223.00R.

Yahata, Ken: *See—*

Komoto, Yasuyoshi; Takiguchi, Yasuyuki; Yahata, Ken; Hayashida, Akira; and Takamizawa, Minoru, 5,750,636, Cl. 528-310.000.

Takiguchi, Yasuyuki; Yahata, Ken; Komoto, Yasuyoshi; Hayashida, Akira; and Takamizawa, Minoru, 5,750,637, Cl. 528-310.000.

Yahisa, Yotsuo: *See—*

Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Yale University: *See—*

Artavanis-Tsakonas, Spyridon; Busseau, Isabelle; Diederich, Robert J.; Xu, Tian; and Matsuno, Kenji, 5,750,652, Cl. 530-350.000.

Dellaporta, Stephen L., 5,750,873, Cl. 800-205.000.

Muller, Christiaan; Zhou, Chong Wu; and Reed, Mark A., 5,751,156, Cl. 324-699.000.

Yamabuchi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Optical radar device. 5,751,407, Cl. 356-3.050.

Yamada, Akira: *See—*

Ito, Hideya; Morimoto, Shoji; Ichikawa, Akira; Itoh, Junko; Kawaguchi, Kenji; Yamada, Akira; Hattori, Atsushi; and Sakaiya, Hiroyuki, 5,751,098, Cl. 313-402.000.

Nagano, Akihiko; Yamada, Akira; and Irie, Yoshiaki, 5,752,090, Cl. 396-51.000.

Yamada, Hideo: *See—*

Tsunematsu, Shuji; Yamada, Hideo; Abe, Eiichi; and Inoue, Kozo, 5,750,038, Cl. 210-777.000.

Yamada, Ikuko: *See—*
- Kawahara, Megumi; Yamada, Ikuko; Shoshi, Masayuki; and Kojima, Akio, 5,750,762, Cl. 558-423.000.

Yamada, Kanji: *See—*
- Kimura, Hiromi; Yamada, Kanji; and Hirato, Yasuhiro, 5,749,211, Cl. 57-217.000.

Yamada, Kazuhiro: *See—*
- Hasushita, Sachio; Noguchi, Masato; Yamada, Kazuhiro; Taguchi, Ichiro; and Inazuka, Masahiro, 5,752,107, Cl. 396-296.000.

Yamada, Minoru; Hashimoto, Hideyuki; Yabe, Yasuhiro; and Honda, Kenji, to Alps Electric Co., Ltd. Combined-type thin film magnetic head with inductive magnetic head having low-inductive core. 5,751,522, Cl. 360-113.000.

Yamada, Noboru: *See—*
- Sakaue, Yoshitaka; Ohno, Eiji; Ide, Kazuhisa; Nagata, Kenichi; and Yamada, Noboru, 5,750,228, Cl. 428-64.100.

Yamada, Nobuaki; Kondo, Masahiko; Okamoto, Masayuki; and Kozaki, Shuichi, to Sharp Kabushiki Kaisha. Liquid crystal display input/output device. 5,751,382, Cl. 349-12.000.

Yamada, Nobuaki: *See—*
- Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.

Yamada, Norio: *See—*
- Shiga, Masao; Hiraga, Ryo; Onoda, Takeshi; Shimizu, Nobuo; Yamada, Norio; Kuriyama, Mitsuo; Hidaka, Kishio; Nakamura, Shigeyoshi; Fukui, Yutaka; and Fujita, Toshio, 5,749,228, Cl. 60-679.000.

Yamada, Osamichi: *See—*
- Tamura, Akira; Yamada, Osamichi; Endo, Tadashi; and Uematsu, Eiji, 5,751,083, Cl. 310-80.000.

Yamada, Seiji: *See—*
- Naruke, Kiyomi; Suzuki, Tomoko; Yamada, Seiji; Obi, Etsushi; and Oshikiri, Masamitsu, 5,751,636, Cl. 365-189.290.

Yamada, Shigeo; Kato, Takero; Nagai, Hiromi; and Kitamura, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Door trim energy absorbing structure. 5,749,600, Cl. 280-751.000.

Yamada, Yasuki: *See—*
- Shibata, Saizo; Yamada, Yasuki; Ando, Koji; Fukui, Kiyoshi; Nakamura, Ikuro; and Uchida, Itsuo, 5,750,696, Cl. 544-374.000.

Yamada, Yuichi: *See—*
- Kataoka, Yoshiharu; Kawashima, Haruna; and Yamada, Yuichi, 5,751,428, Cl. 356-401.000.

Yamada, Yuji: *See—*
- Shibata, Jiro; Wierzba, Konstanty; Murakami, Koji; Yamada, Yuji; and Shudo, Koichi, 5,750,515, Cl. 514-63.000.

Yamada, Yuri; Inagaki, Shinji; and Fukushima, Yoshiaki, to Kabushiki Kaisha Toyota Chou Kenyusho. Process for manufacturing a silica porous material. 5,750,085, Cl. 423-328.200.

Yamaga, Hiroshi: *See—*
- Sunagawa, Makoto; Yamaga, Hiroshi; and Sumita, Yoshihiro, 5,750,686, Cl. 540-350.000.

Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, to Tokyo Electron Kabushiki Kaisha; Tokyo Electron Tohoku Kabushiki Kaisha; and Kabushiki Kaisha Toshiba. Thermal processing method and apparatus therefor. 5,750,436, Cl. 438-558.000.

Yamagata, Yutaka; Iga, Katsumi; and Okada, Hiroaki, to Takeda Chemical Industries, Ltd. Sustained releasable parenteral pharmaceutical preparations and method of producing the same. 5,750,100, Cl. 424-85.200.

Yamaguchi, Isamu: *See—*
- Nomura, Kazuhiko; and Yamaguchi, Isamu, 5,750,537, Cl. 514-304.000.

Yamaguchi, Masao: *See—*
- Shiraishi, Takashi; Yamaguchi, Masao; and Fukutome, Yasuyuki, 5,751,462, Cl. 359-204.000.

Yamaguchi, Noboru; and Konomi, Masao, to Pan Communications, Inc. Ambient noise suppression circuit. 5,751,822, Cl. 381-94.100.

Yamaguchi, Nobuyasu: *See—*
- Ishikawa, Hiroshi; Yamaguchi, Nobuyasu; Iwamoto, Yasuhide; and Iida, Atsuo, 5,750,941, Cl. 178-19.000.

Yamaguchi, Norio: *See—*
- Shiino, Haruhiro; Yamaguchi, Norio; and Naoi, Toshimichi, 5,751,776, Cl. 375-371.000.

Yamaguchi, Seitaro: *See—*
- Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Yamaguchi, Takashi; Asano, Tetsuya; Fukushima, Yoshihiro; Akiyama, Koji; and Kawabe, Kuniyasu, to Kao Corporation. Encapsulated toner for heat-and-pressure fixing and method for producing the same. 5,750,304, Cl. 430-110.000.

Yamaguchi, Yoshinori: *See—*
- Dou, Xiaoming; Yamaguchi, Yoshinori; and Uenoyama, Harumi, 5,750,410, Cl. 436-525.000.

Yamaha Corporation: *See—*
- Inoue, Yushi; and Yamaha, Takahisa, 5,750,403, Cl. 438-787.000.
- Kamiya, Ryo, 5,750,913, Cl. 84-625.000.
- Matsumoto, Shuichi, 5,750,912, Cl. 84-609.000.
- Naito, Masaru, 5,750,439, Cl. 438-648.000.
- Takahashi, Makoto, 5,750,914, Cl. 84-626.000.
- Tamura, Motoichi, 5,750,911, Cl. 84-602.000.
- Yokoyama, Kenji, 5,751,560, Cl. 363-18.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
- Hanamura, Naoki, 5,749,142, Cl. 29-833.000.
- Takechi, Hiroaki; and Ono, Tomohiro, 5,751,136, Cl. 320-150.000.

Yamaha, Takahisa: *See—*
- Inoue, Yushi; and Yamaha, Takahisa, 5,750,403, Cl. 438-787.000.

Yamakawa, Akio; and Utsumi, Masamichi, to Sony Corporation. Hologram formed on an objective lens for one defracting light beams which are separated by more than one track width. 5,751,679, Cl. 369-103.000.

Yamakawa, Akira: *See—*
- Niihara, Koichi; and Yamakawa, Akira, 5,750,449, Cl. 501-80.000.

Yamakawa, Shinji: *See—*
- Saitoh, Takashi; Saitoh, Takashi; Takahashi, Hiroshi; Kaneko, Yoshio; Kurotaka, Shigeo; Hikita, Toshiya; Omi, Kyoji; Aida, Midori; Yamakawa, Shinji; Okubo, Hiromi; Ishigaki, Kouji; Ukai, Takeshi; Murai, Kazuo; Fukuda, Haruhiko; Sakano, Yukio; Hashiguchi, Tadato; Tachikawa, Michiyoshi; and Sumida, Hiroyasu, 5,751,854, Cl. 382-218.000.

Yamamoto, Akihito: *See—*
- Yamaga, Kenichi; Mikata, Yuichi; and Yamamoto, Akihito, 5,750,436, Cl. 438-558.000.

Yamamoto, Akira: *See—*
- Arai, Kouji; Satoh, Takao; and Yamamoto, Akira, 5,751,937, Cl. 395-182.050.

Yamamoto Chemicals, Inc.: *See—*
- Oguchi, Takahisa; Umehara, Hideki; Sugimoto, Kenichi; Oi, Ryu; and Itoh, Hisato, 5,750,229, Cl. 428-64.100.

Yamamoto, Etsuji: *See—*
- Ochi, Hisaaki; Yamamoto, Etsuji; Sawaya, Kumio; and Adachi, Saburo, 5,751,600, Cl. 364-524.000.

Yamamoto, Fumio: *See—*
- Ando, Shinji; Matsuura, Toru; Sasaki, Shigekuni; and Yamamoto, Fumio, 5,750,731, Cl. 549-241.000.

Yamamoto, Kazuma: *See—*
- Kataoka, Hiromi; Masuda, Shunichi; Saito, Tetsuo; and Yamamoto, Kazuma, 5,751,925, Cl. 395-115.000.

Yamamoto, Kazuya: *See—*
- Maemura, Kousei; and Yamamoto, Kazuya, 5,751,181, Cl. 327-434.000.

Yamamoto, Makoto: *See—*
- Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,184, Cl. 327-552.000.
- Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,624, Cl. 364-841.000.

Yamamoto, Masamitsu; Igaue, Takamitsu; and Sasaki, Toru, to Uni-Charm Corporation. Absorbent article of pants type. 5,749,865, Cl. 604-385.200.

Yamamoto, Noboru: *See—*
- Toyama, Koichi; and Yamamoto, Noboru, 5,751,121, Cl. 315-307.000.

Yamamoto, Nobuhiko: *See—*
- Takahashi, Hiroyuki; and Yamamoto, Nobuhiko, 5,749,396, Cl. 138-26.000.

Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, to Takeda Food Products, Ltd.; and Miki Trading Co., Ltd. Process for producing proteinaceous microparticles. 5,750,183, Cl. 426-656.000.

Yamamoto, Osamu: *See—*
- Masuda, Takashi; Sekiguchi, Kyoji; Okumura, Toshiaki; Aoki, Hiroshi; and Yamamoto, Osamu, 5,751,396, Cl. 351-221.000.

Yamamoto, Ronald K.: *See—*
- Sawyer, Philip N.; Wallace, Donald G.; and Yamamoto, Ronald K., 5,749,895, Cl. 606-214.000.

Yamamoto, Satoshi: *See—*
- Yoshida, Yoshifumi; Tanigawa, Akira; and Yamamoto, Satoshi, 5,750,781, Cl. 564-153.000.

Yamamoto, Shigeru: *See—*
- Tanaka, Minoru; Yamamoto, Shigeru; and Mori, Yoshitaka, 5,751,353, Cl. 348-335.000.

Yamamoto, Shinji: *See—*
- Nakatsuka, Tadayoshi; Itoh, Junji; Yamamoto, Shinji; and Nishitsuji, Mitsuru, 5,752,182, Cl. 455-333.000.

Yamamoto, Taizo; Yagyu, Motohiro; Kawaguchi, Yosihisa; and Nagao, Akira, to Japan Elanco Company Limited. Side face examination apparatus for pressed articles, conveyor for pressed articles and external appearance examination apparatus for pressed articles. 5,750,979, Cl. 250-223.00R.

Yamamoto, Takanobu: *See—*
- Yokozawa, Takeshi; Hara, Hiroshi; and Yamamoto, Takanobu, 5,751,749, Cl. 372-32.000.

Yamamoto, Takashi: *See—*
- Ishida, Kenichi; Kishimoto, Michinori; Yamamoto, Takashi; and Sushihara, Koji, 5,751,191, Cl. 330-125.000.

Yamamoto, Takuji; and Kuwata, Naoki, to Fujitsu Limited. Low pass filter circuit utilizing transistors as inductive elements. 5,751,185, Cl. 327-558.000.

Yamamoto, Tomomi: *See—*
- Yoneyama, Tetsuhito; Yamamoto, Tomomi; Hidaka, Tetsuya; and Fukuno, Akira, 5,750,044, Cl. 252-62.540.

Yamamoto, Tomoo: *See—*
- Ishikawa, Akira; Hosoe, Yuzuru; Shiroishi, Yoshihiro; Takeshita, Masatoshi; Yahisa, Yotsuo; Yamamoto, Tomoo; Osaki, Akira; Tanahashi, Kiwamu; Fumioka, Jun; Kato, Yoshiki; Ohura, Masaki; and Katoh, Yukio, 5,750,230, Cl. 428-65.300.

Yamamoto, Yoshiharu: *See—*
- Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Boku, Kazutake, 5,751,464, Cl. 359-208.000.

Yamamoto, Yoshihiro: *See—*

- Yamamoto, Norio; Yamamoto, Yoshihiro; Nunome, Tetsuo; Muroyama, Koutarou; and Kusaka, Hiroaki, 5,750,183, Cl. 426-656.000.

Yamamoto, Yoshihisa: *See—*
- Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.
- Tanahashi, Katsuyuki; Tsutsui, Hiroshi; Yamamoto, Yoshihisa; and Tsukamoto, Kazumasa, 5,749,802, Cl. 475-120.000.

Yamamoto, Yuji, to Pioneer Electronic Corporation. Waveform identity discriminating circuit. 5,752,178, Cl. 455-186.100.

Yamamoto, Yuji: *See—*
- Hirano, Hirosaburo; Yamamoto, Yuji; and Ito, Shinji, 5,749,144, Cl. 29-890.04L.

Yamanaka, Atsushi, to Sharp Kabushiki Kaisha. Image display device having a pixel multiplying means. 5,751,383, Cl. 349-13.000.

Yamanaka, Yasutoshi: *See—*
- Inque, Yoshimitsu; Yamanaka, Yasutoshi; Matsushiro, Ryuichi, deceased; Sugi, Hikaru; Hayashi, Takayuki; Sugimoto, Tatsuo; Ito, Koichi; Fukunaga, Hiroyuki; Kohama, Tokio; and Igashira, Toshihiko, 5,749,330, Cl. 123-41.100.

Yamanashi, Makoto: *See—*
- Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, 5,749,747, Cl. 439-358.000.

Yamane, Noriyasu: *See—*
- Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Yamano, Shozo, to Nikon Corporation. Automatic focus camera. 5,752,106, Cl. 396-263.000.

Yamanobe, Yasunori: *See—*
- Monma, Akio; Yamanobe, Yasunori; and Sato, Takashi, 5,751,112, Cl. 315-8.000.

Yamaoka, Nobuki: *See—*
- Ohira, Hiroyuki; Yamaoka, Nobuki; and Murakami, Yutaka, 5,751,690, Cl. 369-275.300.

Yamasaki, Tatsuo; Asamura, Masako; Inoue, Sadayuki; Shinohara, Junko; and Onishi, Ken, to Mitsubishi Denki Kabushiki Kaisha. Magnetic type recording and reproducing apparatus. 5,751,890, Cl. 386-79.000.

Yamasaki, Yutaka: *See—*
- Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.

Yamasawa, Atsushi: *See—*
- Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, 5,750,255, Cl. 428-359.000.

Yamashita, Hiro: *See—*
- Yamashita, Takeshi; and Yamashita, Hiro, 5,752,157, Cl. 422-186.010.

Yamashita, Kazuo; Takeuchi, Yoshihiko; and Watanabe, Masahiro, to Nihon Musen Kabushiki Kaisha. Composite longitudinal vibration mechanical filter having undesired vibration absorber. 5,751,200, Cl. 333-197.000.

Yamashita, Koji, to NEC Corporation. Portable radio apparatus having cable-incorporated hand strap. 5,752,203, Cl. 455-575.000.

Yamashita, Mitsuhiro: *See—*
- Nishida, Haruo; Yamashita, Mitsuhiro; Ochi, Yoshiki; and Kuwaki, Tetsuo, 5,750,218, Cl. 428-35.500.

Yamashita, Mutsushi: *See—*
- Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, 5,751,227, Cl. 340-928.000.

Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, to Hitachi, Ltd. Apparatus for sorting sheets or the like. 5,749,473, Cl. 209-584.000.

Yamashita, Takeshi; and Yamashita, Hiro, to Centerfield Kabushiki Kaisha; and Yamashita, Hiro. Liquid fuel reforming apparatus. 5,752,157, Cl. 422-186.010.

Yamashita, Yasuhiro: *See—*
- Okano, Mitsunobu; and Yamashita, Yasuhiro, 5,751,597, Cl. 364-491.000.

Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Utatsu, Hiroshige, to Mita Industries Co. Ltd. Maintenance management system for image forming equipment. 5,752,125, Cl. 399-8.000.

Yamashita, Yuji, to Mita Industries Co. Ltd. Image forming apparatus with contract renewal device. 5,752,128, Cl. 399-80.000.

Yamatake-Honeywell Co. Ltd.: *See—*
- Kon, Akihiko; and Naruse, Akihiko, 5,751,916, Cl. 395-77.000.
- Ohtsuka, Akira; and Kaseda, Chosei, 5,750,879, Cl. 73-9.000.

Yamato, Takafumi: *See—*
- Shimizu, Tetsuo; Yamamoto, Yoshihisa; Yamaguchi, Seitaro; Tsuda, Nobuhiko; Yamane, Noriyasu; Yamato, Takafumi; Kumegawa, Masahiro; and Araki, Takayuki, 5,750,626, Cl. 525-151.000.

Yamauchi, Ichiro: *See—*
- Kato, Yoshifumi; Yamauchi, Ichiro; Fujitsuna, Masami; and Tashiro, Tsutomu, 5,752,210, Cl. 701-51.000.

Yamauchi, Kosaku; Tsutsumikoshi, Shinobu; and Nagai, Hisao, to Suzuki Kabushiki Kaisha. Power assist apparatus of power assisted bicycle. 5,749,429, Cl. 180-205.000.

Yamauchi, Masahide: *See—*
- Tanaka, Takaaki; Yamauchi, Masahide; Ishikura, Yasuhisa; and Aoki, Masaki, 5,751,102, Cl. 313-466.000.

Yamauchi, Noriyuki, to Terasaki Denki Sangyo Kabushiki Kaisha. Cogeneration system. 5,751,604, Cl. 364-494.000.

Yamazaki, Akira; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Synchronous type semiconductor memory device having internal operation timings determined by count values of an internal counter. 5,751,655, Cl. 365-233.000.

Yamazaki, Kiyoshi, to Yugen Kaisha Yamasei Gankyo. Spectacles frame having biased auxiliary temples. 5,751,393, Cl. 351-63.000.

Yamazaki, Nobushi: *See—*
- Teraoka, Masao; and Yamazaki, Nobushi, 5,749,801, Cl. 475-88.000.
- Teraoka, Masao; and Yamazaki, Nobushi, 5,749,803, Cl. 475-249.000.

Yamazaki, Shiori: *See—*
- Nakajima, Eiichi; Udoh, Yasuo; Iikawa, Tsutomu; Kitakohji, Toshisuke; Motoyoshi, Teruo; Furusawa, Takashi; Yamazaki, Shiori; Nakayama, Masao; Satoh, Michiko; Fukushima, Shigeru; and Itabashi, Mayumi, 5,750,406, Cl. 436-116.000.

Yamazato, Ichiro: *See—*
- Tsujita, Mitsuji; Tanaka, Nariaki; Terada, Takashi; Terada, Takuji; Yamazato, Ichiro; and Miyamoto, Eiichi, 5,750,308, Cl. 430-120.000.

Yan, Hong-Sen; Hwang, Wen-Miin; Chen, Fu-Chen; Huang, Philine; and Fan, Yang-Sheng, to National Science Council. Automatic tool changing apparatus. 5,749,819, Cl. 483-39.000.

Yanagi, Haruyuki: *See—*
- Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,751,301, Cl. 347-8.000.

Yanai, Naoki: *See—*
- Kimura, Eiichi; Yanai, Naoki; Shiomi, Motonobu; Ashibe, Emi; Yamasaki, Yutaka; and Uenoyama, Harumi, 5,751,418, Cl. 356-319.000.

Yanase, Takao: *See—*
- Toyozaki, Jiro; Yanase, Takao; Ishii, Shinichi; and Aihara, Takashi, 5,751,567, Cl. 363-89.000.

Yang, Bo: *See—*
- Tang, Jiansheng; Cunningham, Raymond T.; and Yang, Bo, 5,750,070, Cl. 422-16.000.

Yang, Deuk-yong: *See—*
- Kim, Min-ho; Jeong, Bong-mo; Shim, Jae-ho; Park, Wan-woo; and Yang, Deuk-yong, 5,750,296, Cl. 430-28.000.

Yang, Gang: *See—*
- Chau, Nga V.; Eng, Edward D.; Shen, Henry H.; Tow, Agnes C.; and Yang, Gang, 5,751,792, Cl. 379-89.000.

Yang, Jiyue: *See—*
- Dombrowski, Edward J., Jr.; Jones, Robert L.; Warner, John C.; and Yang, Jiyue, 5,750,463, Cl. 503-204.000.
- Dombrowski, Edward J., Jr.; Guarrera, Donna J.; Jones, Robert L.; Mischke, Mark R.; Warner, John C.; and Yang, Jiyue, 5,750,464, Cl. 503-204.000.

Yang, Shiguang: *See—*
- Forney, John R.; Yang, Shiguang; and Healey, Mark C., 5,750,496, Cl. 514-2.000.

Yang, Tai-Her. Armature winding offset angle excited and speed controlled rectifier type electric machine. 5,751,087, Cl. 310-179.000.

Yang, Tsai Chen. Valve sealing mechanism for faucet. 5,749,393, Cl. 137-454.200.

Yang, Yanping; Vanin, Elio F.; Grosveld, Gerard C.; and Nienhuis, Arthur W., to St. Judes Children's Research Hospital; and Genetic Therapy, Inc. Stable virus packaging cell lines. 5,750,396, Cl. 435-357.000.

Yanker, Peter Cornelius: *See—*
- Barber, Ronald Jason; Beitel, Bradley James; Equitz, William Robinson; Flickner, Myron Dale; Niblack, Carlton Wayne; Petkovic, Dragutin; Work, Thomas Randolph; and Yanker, Peter Cornelius, 5,751,286, Cl. 345-348.000.

Yankowski, Carl J., to Sony Corporation; and Sony Electronics Inc. Compact disc changer utilizing disc database. 5,751,672, Cl. 369-30.000.

Yano, Kentaro; Otsuka, Naoji; Moriyama, Jiro; Kuwabara, Nobuyuki; Ebisawa, Isao; Arai, Atsushi; Yaegashi, Hisao; Inui, Toshiharu; Takahashi, Kiichiro; Iwasaki, Osamu; and Kanematsu, Daigoro, to Canon Kabushiki Kaisha. Ink jet recording apparatus capable of preventing blotting at boundary of colors and recording method therefor. 5,751,310, Cl. 347-43.000.

Yano, Kentaro: *See—*
- Hirabayashi, Hiromitsu; Otsuka, Naoji; Yano, Kentaro; Sugimoto, Hitoshi; Matsubara, Miyuki; Takahashi, Kiichiro; and Iwasaki, Osamu, 5,751,304, Cl. 347-17.000.

Yano, Kohtaro: *See—*
- Kimura, Kazumi; Mitsutake, Hideaki; Yaoo, Kohtaro; Kawasaki, Shigeru; and Kuramochi, Junko, 5,749,642, Cl. 353-98.000.

Yao, Teruyoshi: *See—*
- Kawamura, Eiichi; Yao, Teruyoshi; Naori, Nobuhisa; Hashimoto, Koichi; Kobayashi, Masaharu; and Oshima, Tadasi, 5,750,316, Cl. 430-311.000.

Yao, Xiaotian Steve: *See—*
- Lutes, George F.; and Yao, Xiaotian Steve, 5,751,747, Cl. 372-2.000.

Yap, Daniel: *See—*
- Schaffner, James H.; and Yap, Daniel, 5,751,867, Cl. 385-3.000.

Yashiro, Masahiko: *See—*
- Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tanada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,752,154, Cl. 399-407.000.

Yashnov, Y. M.; Petrosov, V. A.; Baranov, V. I.; Vasin, A. I.; and Talaalout, L., to Space Power, Inc. Closed electron drift hall effect plasma accelerator with all magnetic sources located to the rear of the anode. 5,751,113, Cl. 315-111.210.
Yasuda, Akio: *See—*
Kojima, Takafumi; Hiroshima, Sotaro; Suzuki, Toshiro; Kogure, Yasuo; and Yasuda, Akio, 5,751,935, Cl. 395-182.040.
Yasuda, Kazunori; and Uchide, Kouichi, to Sony Corporation. Method of and apparatus for detecting a motion of image information, method of and apparatus for encoding image information, image information transmitting system, image information recording system and recording medium. 5,751,364, Cl. 348-416.000.
Yasuda, Keiko: *See—*
Takakura, Hiroshi; Ishihara, Satoshi; and Yasuda, Keiko, 5,752,053, Cl. 395-766.000.
Yasuda, Susumu: *See—*
Takeda, Toshihiko; Kuroda, Ryo; and Yasuda, Susumu, 5,751,684, Cl. 369-126.000.
Yasuhara, Norio; Nakagawa, Akio; Matsudai, Tomoko; and Funaki, Hideyuki, to Kabushiki Kaisha Toshiba. Thyristor. 5,751,022, Cl. 257-133.000.
Yasukawa, Naoaki: *See—*
Odagiri, Hiroyuki; and Yasukawa, Naoaki, 5,749,366, Cl. 128-690.000.
Yasuzato, Tadao; and Ishida, Shinji, to NEC Corporation. Photo mask and fabrication process therefor. 5,750,290, Cl. 430-5.000.
Yata, Shizukuni: *See—*
Kinoshita, Hajime; Ando, Nobuo; Anekawa, Akihiro; Hashimoto, Takeshi; Hato, Yukinori; and Yata, Shizukuni, 5,750,287, Cl. 429-218.000.
Yatsuka, Takeshi, to Toyo Boseki Kabushiki Kaisha. Magnetic recording medium prepared from a specified magnetic paint. 5,750,248, Cl. 428-323.000.
Yau, Eric: *See—*
Caruthers, Marvin H.; Brill, Wolfgang K.-D; Yau, Eric; Ma, Michael; and Nielsen, John, 5,750,666, Cl. 536-23.100.
Yazaki Corporation: *See—*
Fukushima, Hirotaka; and Hasegawa, Toshiaki, 5,751,135, Cl. 320-107.000.
Inaba, Shigemitsu; Yamanashi, Makoto; Ohta, Yukio; Fukuda, Masaru; and Fukuda, Eiji, 5,749,747, Cl. 439-358.000.
Kashiyama, Motohisa; and Tsuji, Masanori, 5,749,752, Cl. 439-733.100.
Tatara, Hirokazu, 5,751,770, Cl. 375-238.000.
Yazaki, Hiroomi: *See—*
Ueno, Makoto; Kunugi, Takeshi; Ohyama, Kazuya; and Yazaki, Hiroomi, 5,752,189, Cl. 455-435.000.
Yazaki, Yoshio; Kurihara, Hiroki; Kurihara, Yukiko; Suzuki, Hiroshi; and Kodama, Tatsuhiko, to Chugai Seiyaku Kabushiki Kaisha. Mouse with defective endotheline-1 gene function. 5,750,825, Cl. 800-2.000.
Yeda Research and Development Co., Ltd.: *See—*
Eisenbach, Lea; and Feldman, Michael, 5,750,102, Cl. 424-93.210.
Yee, Jeng-Jung; Bell, Lawrence I.; and Narasimmon, Raj G., to Schreiber Foods, Inc. Cheese with improved melt properties and methods of producing same. 5,750,177, Cl. 426-582.000.
Yeh, Edward P.: *See—*
Wurz, Albert; Yeh, Edward P.; and Brobst, Thomas J., 5,750,004, Cl. 156-360.000.
Yeh, Jang-Hun: *See—*
Anderson, Samuel J.; Harton, Austin V.; Yeh, Jang-Hun; Bliss, John; and Wyatt, Karl W., 5,751,009, Cl. 250-551.000.
Yen, Robert Chihsung: *See—*
Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, 5,751,846, Cl. 382-169.000.
Yergey, James: *See—*
Gareau, Yves; Dufresne, Claude; Labelle, Marc; Yergey, James; Xu, Xin; Nicoll-Griffith, Deborah; Chauret, Nathalie; and Trimble, Laird, 5,750,539, Cl. 514-311.000.
Yester, John Loring: *See—*
Hrovat, Davorin David; Colvin, Daniel Scott; Weyburne, Michael Alan; Tran, Ngoc Minh; and Yester, John Loring, 5,751,579, Cl. 364-426.015.
Yeung, Hubert K.: *See—*
Solomon, Rodney J.; and Yeung, Hubert K., 5,749,828, Cl. 600-141.000.
Yi, You-Wen, to Hewlett-Packard Company. Probe for memory device having movable media. 5,751,685, Cl. 369-126.000.
Yilmaz, Hamza; Williams, Richard K.; Cornell, Michael E.; and Chen, Jun Wei, to Siliconix incorporated. Zener diodes on the same wafer with BiCDMOS structures. 5,751,054, Cl. 257-603.000.
Yip, William Chunhung; and Gustafson, David T., to Motorola, Inc. Simultaneous transfer of voice and data information using multi-rate vocoder and byte control protocol. 5,751,718, Cl. 370-468.000.
Yiu, Hing Leung; Gokinko, Jeff; and Zoerner, Glen, to Motorola, Inc. Data processing system having a multi-function input/output port with individual pull-up and pull-down control. 5,752,077, Cl. 395-827.000.
YKK Architectural Products Inc.: *See—*
Koike, Sou; and Hirano, Masao, 5,749,175, Cl. 49-368.000.
YKK Corporation: *See—*
Murasaki, Ryuichi; Takizawa, Toshiaki; Akeno, Mitsuru; Sakakibara, Keisuke; and Minato, Tsuyoshi, 5,749,129, Cl. 24-452.000.
Ymos Aktiengesellschaft Industrieprodukte: *See—*
Heim, Gunther; Überreiter, Thomas; Hock, Jürgen; and Bischoff, Holger, 5,749,176, Cl. 49-502.000.
Yoa-Pu, Hu Oliver; Wang, Jhi-Joung; and Shung-Tai, Ho, to National Science Council. Nalbuphine esters having long acting analgesic action and method of use. 5,750,534, Cl. 514-282.000.
Yock, Paul G. Method of using angioplasty apparatus facilitating rapid exchanges. 5,749,888, Cl. 606-194.000.
Yoden, Naoyuki: *See—*
Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, 5,752,228, Cl. 704-260.000.
Yoeli, Uzi; Rotem, Eran; Janai, Meir; and Orbach, Zvi, to Chip Express (Israel) Ltd. High speed customizable logic array device. 5,751,165, Cl. 326-47.000.
Yokoi, Takeshi; Kishi, Takahiro; Ishiguro, Tsutomu; Nakazawa, Masaaki; Takahashi, Yukio; Ito, Hideo; Yabe, Hisao; and Nakagawasai, Satoshi, to Olympus Optical Co., Ltd. Endoscope system. 5,749,829, Cl. 600-153.000.
Yokono, Kojiro: *See—*
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,749,763, Cl. 445-51.000.
Yokonuma, Norikazu: *See—*
Hibino, Hideo; Kazami, Kazuyuki; Yokonuma, Norikazu; and Okutsu, Hisashi, 5,751,343, Cl. 348-96.000.
Yokota, Kazumi: *See—*
Iida, Atsuhiro; Yokota, Kazumi; Ikeda, Eiji; and Sasayama, Tomoki, 5,751,420, Cl. 356-328.000.
Yokota, Noriaki; and Okamura, Kouji, to Sharp Kabushiki Kaisha. Quick response optical disk system providing accurate displacement of a pick-up and method therefor. 5,751,673, Cl. 369-32.000.
Yokoyama, Hideaki; and Mukai, Uchu, to Bridgestone Corporation. Pneumatic tire with cap and base structure. 5,749,983, Cl. 152-209.00R.
Yokoyama, Hiroshi: *See—*
Hareyama, Nobuo; and Yokoyama, Hiroshi, 5,752,169, Cl. 455-76.000.
Yokoyama, Kenji, to Yamaha Corporation. Switching power circuit with current resonance for zero current switching. 5,751,560, Cl. 363-18.000.
Yokoyama, Minoru: *See—*
Iwata, Naohiro; Yokoyama, Minoru; Nakano, Yuji; Kawashima, Shunji; and Terashima, Hideyuki, 5,749,570, Cl. 271-10.130.
Yokoyama Sankoh Co., Ltd.: *See—*
Yoshimasa, Yokoyama, 5,750,235, Cl. 428-182.000.
Yokoyama, Shoji: *See—*
Kamiya, Kazuo; Morimoto, Hirofumi; and Yokoyama, Shoji, 5,751,228, Cl. 340-988.000.
Yokoyama, Yuko; and Shimamune, Masayuki, to Canon Kabushiki Kaisha. Liquid crystal device with elongated projection height smaller than liquid crystal thickness and process for producing same. 5,751,391, Cl. 349-153.000.
Yokoyama, Yutaka, to NEC Corporation. Motion compensated inter-frame prediction method and apparatus using motion vector interpolation with adaptive representation point addition. 5,751,365, Cl. 348-416.000.
Yokozawa, Takeshi; Hara, Hiroshi; and Yamamoto, Takanobu, to Ishikawajima-Harima Heavy Industries Co., Ltd. Laser oscillator and method for controlling the same. 5,751,749, Cl. 372-32.000.
Yoneda, Fumio; Watanabe, Mayumi; Sakae, Masatoshi; Katsurada, Masanori; and Sabato, Takaaki. 2-(n-cyanoimino)-thiazolidin-4-one derivatives. 5,750,712, Cl. 548-186.000.
Yoneda, Satoru; Kato, Takeshi; Okabayashi, Eiji; Hinotani, Hiroaki; and Fujishima, Tatsumi, to Minolta Co., Ltd. Electromagnetic induction heating type fixing device and method. 5,752,148, Cl. 399-329.000.
Yoneda, Satoru: *See—*
Kato, Takeshi; Okabayashi, Eiji; Yoneda, Satoru; Morigami, Yuusuke; and Ito, Tetsuro, 5,752,150, Cl. 399-330.000.
Yoneda, Yoshiyuki: *See—*
Kasai, Junichi; Tsuji, Kazuto; Taniguchi, Norio; Mashiko, Takashi; Sakuma, Masao; Saigo, Yukio; Yoneda, Yoshiyuki; and Takenaka, Masashi, 5,750,421, Cl. 438-106.000.
Yonehara, Takao; Sato, Nobuhiko; Sakaguchi, Kiyofumi; and Kondo, Shigeki, to Canon Kabushiki Kaisha. Semiconductor member, and process for preparing same and semiconductor device formed by use of same. 5,750,000, Cl. 156-630.100.
Yonekura, Kunitoshi: *See—*
Matai, Masahiro; and Yonekura, Kunitoshi, 5,752,174, Cl. 455-183.100.
Yonekura, Tamotsu: *See—*
Ikuse, Toshimi; Nishiwaki, Mitsuhiro; Yonekura, Tamotsu; Nakamura, Kaoru; Watatani, Yoshinori; and Ueshiba, Mamoru, 5,749,321, Cl. 119-458.000.
Yoneyama, Tetsuhito; Yamamoto, Tomomi; Hidaka, Tetsuya; and Fukuno, Akira, to TDK Corporation. Magnet and bonded magnet. 5,750,044, Cl. 252-62.540.
Yoo, Jei-hwan, to Samsung Electronics Co., Ltd. Voltage control circuit for input and output lines of semiconductor memory device. 5,751,642, Cl. 365-189.060.
Yoo, Ji-Yoon: *See—*
Sheen, Yong-Hoo; Park, Gwi-Tae; Yoo, Ji-Yoon; and Lee, Sang-Lak, 5,751,511, Cl. 360-73.110.
Yoon, Suk-Han: *See—*
Han, Jong-Seok; Hahn, Woo-Jong; and Yoon, Suk-Han, 5,751,934, Cl. 345-182.020.
Yoppolo, Robert A.: *See—*
DePalma, Christopher L.; Fontaine, Lucian P.; Moses, Peter Rick; Wiacek, Marian; Yoppolo, Robert A.; Pope, Peter; Tubby, Francis Bruce; and Woodnorth, Douglas J., 5,750,283, Cl. 429-56.000.

York, Ian A.: *See—*
Johnson, David C.; and York, Ian A., 5,750,398, Cl. 435-375.000.
Yoshida, Hayato: *See—*
Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, 5,752,219, Cl. 701-213.000.
Yoshida, Hideo: *See—*
Ishiguro, Minoru; and Yoshida, Hideo, 5,752,093, Cl. 396-61.000.
Yoshida, Hiroshi, to Fujitsu Limited. File access scheme in distributed data processing system. 5,752,060, Cl. 395-800.000.
Yoshida, Ichiro; Kato, Taisei; Ando, Toshihide; Matsumoto, Manabu; Yamashita, Mutsushi; and Kago, Yoshiyuki, to Nippondenso Co., Ltd. Communication system for vehicles. 5,751,227, Cl. 340-928.000.
Yoshida, Kazushi: *See—*
Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,749,473, Cl. 209-584.000.
Yoshida, Masahiko: *See—*
Onishi, Noriaki; Yamada, Nobuaki; Yoshida, Masahiko; Mizobe, Hoyo; and Suzuki, Kenji, 5,750,213, Cl. 428-1.000.
Yoshida, Masanori: *See—*
Toji, Shigeo; Yoshida, Masanori; and Misawa, Atsushi, 5,752,098, Cl. 396-85.000.
Yoshida, Sakae; Shinnumadate, Satomi; Yabe, Shinryo; Momose, Shigeyoshi; and Hirai, Kiminori, to Nippon Inorganic Colour & Chemical Co., Ltd.; and Kose Corporation. Silica-cerium oxide composite particles, method for the preparation thereof and resin composition and a cosmetic composition compounded therewith. 5,750,090, Cl. 424-59.000.
Yoshida, Satoshi: *See—*
Aita, Shuichi; Kukimoto, Tsutomu; Yoshida, Satoshi; and Hano, Yoshifumi, 5,751,405, Cl. 355-269.000.
Yoshida, Shigeaki: *See—*
Katsura, Koyo; Matsuo, Shigeru; Yoshida, Shigeaki; Takeda, Hiroshi; and Kaziwara, Hisashi, 5,751,930, Cl. 395-137.000.
Yoshida, Shinichi: *See—*
Uda, Seiji; Karaki, Mitsuhiro; Yoshida, Shinichi; Kadono, Hidehiko; Ota, Atsushi; and Mori, Hiroaki, 5,749,410, Cl. 164-113.000.
Yoshida, Shizuo; Tamura, Masakazu; Sakamoto, Eiichi; Okada, Akira; and Yamasawa, Atsushi, to Nitto Boseki Co., Ltd. High strength rock wool and process for producing same. 5,750,255, Cl. 428-359.000.
Yoshida, Tatsumasa; and Miyamoto, Ryoichi, to Oki Electric Industry Co., Ltd. Angular modulator with a phase variation divided and integrated. 5,751,198, Cl. 332-100.000.
Yoshida, Tomonori, to Ikeda Bussan Co., Ltd. Seat reclining device. 5,749,624, Cl. 297-367.000.
Yoshida, Tomonori, to Ikeda Bussan Co., Ltd. Rotary-cam type reclining device. 5,749,626, Cl. 297-367.000.
Yoshida, Toshirou; and Suzuki, Tetsuya, to NEC Corporation. Optical double transmission system. 5,751,458, Cl. 359-173.000.
Yoshida, Tuneo: *See—*
Ogawa, Hiroshi; Yoshida, Tuneo; and Kato, Shinichi, 5,750,233, Cl. 428-141.000.
Yoshida, Yoshifumi; Tanigawa, Akira; and Yamamoto, Satoshi, to Sumitomo Chemical Company, Limited. Process for preparing an aqueous copolymer solution. 5,750,781, Cl. 564-153.000.
Yoshida, Yutaka, to Fuji Photo Film Co., Ltd. Magnetic recording layer formed on a photographic film and having an identification code which identifies information segments, and method for recording the same. 5,751,505, Cl. 360-48.000.
Yoshihara, Masaya: *See—*
Kaneko, Mamoru; Ueda, Yasuhiro; Takehana, Sakae; Yoshihara, Masaya; Iida, Masahiko; Shinkai, Naruto; Nakamura, Kazunari; Washizuka, Nobuhiko; Oaki, Yoshinao; and Suzuki, Katsuya, 5,749,830, Cl. 600-160.000.
Yoshihara, Tohru; Tsujimura, Shigeru; Takemura, Shinichi; Shimakata, Masashi; Adachi, Masaya; Yoshida, Hayato; Ando, Hitoshi; and Honda, Tsutomu, to Pioneer Electronic Corporation. Navigation apparatus for vehicles. 5,752,219, Cl. 701-213.000.
Yoshihara, Toru; and Chugun, Emi, to Kao Corporation. Two-pack type keratinous fiber treating composition. 5,750,099, Cl. 424-70.170.
Yoshii, Minoru: *See—*
Hasegawa, Masanobu; Yoshii, Minoru; and Takeuchi, Seiji, 5,750,294, Cl. 430-22.000.
Nose, Noriyuki; Yoshii, Minoru; Saitoh, Kenji; Osawa, Hiroshi; Sentoku, Koichi; Tsuji, Toshihiko; and Matsumoto, Takahiro, 5,751,426, Cl. 356-356.000.
Yoshiike, Etsuko; Takemoto, Kiyohiko; and Kubota, Kazuhide, to Seiko Epson Corporation. Ink composition for color ink jet recording and recording method with the same. 5,749,951, Cl. 106-31.270.
Yoshikawa, Akio: *See—*
Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, 5,751,756, Cl. 372-46.000.
Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Boku, Kazutake, to Matsushita Electric Industrial Co., Ltd. Optical scanner, image forming apparatus and image reading apparatus. 5,751,464, Cl. 359-208.000.
Yoshikubo, Fujio: *See—*
Hayashi, Eisaku; Kurosawa, Koichi; Yoshikubo, Fujio; Furukawa, Hideyasu; Morinaka, Ren; Enomoto, Kunio; Otaka, Masahiro; Chiba, Noboru; and Sato, Kazunori, 5,749,384, Cl. 134-167.00R.
Yoshimasa, Yokoyama, to Yokoyama Sankoh Co., Ltd.; and Hitachi Zosen Corporation. Base board for layered corrugated fiberboard structure. 5,750,235, Cl. 428-182.000.
Yoshimatsu, Shunji: *See—*
Kimae, Yoichi; Yoshimatsu, Shunji; Itoda, Norio; Matsuo, Takashi; and Noda, Naoki, 5,750,753, Cl. 556-440.000.
Yoshimura, Hideaki: *See—*
Bradshaw, Alex; Sasaki, Takashi; Fujino, Yoshifumi; Nishio, Yoshimichi; Miyagawa, Tomoko; Takahashi, Mayumi; and Yoshimura, Hideaki, 5,751,674, Cl. 369-44.350.
Yoshimura, Osamu; and Matsuzaki, Ichiro, to Kuraray Co., Ltd. Rear-projection screen. 5,751,478, Cl. 359-453.000.
Yoshimura, Toshikazu: *See—*
Shibanuma, Takashi; Homoto, Yukio; Komatsu, Satoshi; and Yoshimura, Toshikazu, 5,750,809, Cl. 570-169.000.
Yoshino, Fumito, to Kabushiki Kaisha Kobe Seiko Sho. High efficiency, variable position plasma welding process. 5,750,955, Cl. 219-121.460.
Yoshino Gypsum Co., Ltd.: *See—*
Umehara, Kazuyuki; Uchida, Masayuki; and Hasegawa, Tomoya, 5,749,187, Cl. 52-241.000.
Yoshino, Kenichirou: *See—*
Ohtomo, Fumio; Nishizawa, Hiroyuki; Kodaira, Jun-ichi; and Yoshino, Kenichirou, 5,751,459, Cl. 359-197.000.
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, to Canon Kabushiki Kaisha. Display device with electron-emitting device with electron-emitting region insulted from electrodes. 5,749,763, Cl. 445-51.000.
Yoshioka, Shirou: *See—*
Ninomiya, Kazuki; Yoshioka, Shirou; and Nishiyama, Tamotsu, 5,751,374, Cl. 348-571.000.
Yoshiro, Shimizu: *See—*
Hideo, Nitta; Tomoki, Soutome; and Yoshiro, Shimizu, 5,751,516, Cl. 360-103.000.
Yoshitome, Eiji, to GE Yokogawa Medical Systems, Limited. X-ray computerized tomography apparatus and method for controlling the same. 5,751,782, Cl. 378-98.500.
Yoshiume, Naoki; and Miwa, Makoto, to Denso Corporation. Fuel supply control for internal combustion engine by intake air pressure estimation. 5,749,344, Cl. 123-399.000.
You, Chue-San, to Taiwan Semiconductor Manufacturing Company, Ltd. SRAM with SIPOS resistor. 5,751,043, Cl. 257-380.000.
You, Kyu Jae. Process for producing ultrafine particles of colloidal calcium carbonate. 5,750,086, Cl. 423-432.000.
Young, Bruce: *See—*
Gillespie, Byron; Goldschmidt, Marc; Sych, Terry; and Young, Bruce, 5,751,975, Cl. 395-306.000.
Young Dental Manufacturing Company: *See—*
Bailey, Ronald L., 5,749,728, Cl. 433-125.000.
Young, James B.: *See—*
Mehlberg, Robert L.; and Young, James B., 5,750,818, Cl. 585-709.000.
Young, L. Brewster: *See—*
Xiong, Yusheng; Wu, Margaret M.; Young, L. Brewster; and Chu, Alice S., 5,750,480, Cl. 508-580.000.
Young, Mark E.: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
Young, Michael John Radley, to Orthosonics Ltd. Tool bit for use in ultrasonic removal of plastics embedment of an osteal prosthesis. 5,749,877, Cl. 606-99.000.
Young, Neil P.; and Hampton, David, to Young, Neil P. Control of model vehicles on a track. 5,749,547, Cl. 246-4 000.
Young, Stephen H.: *See—*
Pontus, John; and Young, Stephen H., 5,749,177, Cl. 52-79.100.
Younger, Rick: *See—*
Markley, Charles E.; and Younger, Rick, 5,749,353, Cl. 125-20.000.
Yount, Gary L.: *See—*
Kobak, Roger Leo; Yount, Gary L.; Stirbis, James S.; and Weil, William W., 5,749,969, Cl. 118-319.000.
Yozan Inc.: *See—*
Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,184, Cl. 327-552.000.
Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, 5,751,624, Cl. 364-841.000.
Yu, Chung Cheng. Expanding file. 5,749,666, Cl. 402-18.000.
Yu, Dong: *See—*
Iyer, Radhakrishnan P.; Yu, Dong; Agrawal, Sudhir; and Tan, Weitian, 5,750,674, Cl. 536-26.700.
Yu, Jason, to J.A.L. Taiwan Ltd. Apparatus for projecting moving and changing colored light rays along a horizontal axis, the light rays being rotatable synchronously about the horizontal axis. 5,749,640, Cl. 353-51.000.
Yu, Philip Shi-Lung: *See—*
Aggarwal, Charu Chandra; Wolf, Joel Leonard; and Yu, Philip Shi-Lung, 5,751,336, Cl. 348-7.000.
Yu, Ta-Lee, to Winbond Electronics Corporation. Internal ESD protection circuit for semiconductor devices. 5,751,042, Cl. 257-360.000.
Yu, Wang-I; and Lin, Jui-Chu, to Berg Technology, Inc. Connector. 5,749,750, Cl. 439-637.000.
Yu, Young J., to LG Semicon Co., Ltd. Color linear charge coupled device and method for driving the same. 5,751,032, Cl. 257-233.000.

Yuan, Jun; and Wasley, Jan W. F., to Neurogen Corporation. Certain 1-substituted aminomethyl imidazole and pyrrole derivatives: novel dopamine receptor subtype specific ligands. 5,750,700, Cl. 546-148.000.
Yuasa, Akihiko; Noda, Yutaka; Kumamoto, Satoshi; Kawano, Makoto; and Hirose, Toshiyuki, to Toshiba Kikai Kabushiki Kaisha. Method for checking interference, method for checking processing program, and method for checking processing propriety. 5,751,584, Cl. 364-474.200.
Yuasa Corporation: *See—*
Akutagawa, Tadamasa; Sano, Shigeru; and Nishino, Aya, 5,750,285, Cl. 429-92.000.
Yuasa, Hiroshi; and Furuichi, Kozo, to Kurashiki Boseki Kabushiki Kaisha; and Ikeda Bussan Co., Ltd. Facing for seat. 5,750,246, Cl. 428-318.400.
Yueh, Fang-Yu: *See—*
Singh, Jagdish P.; Yueh, Fang-Yu; Cook, Robert L.; and Zhang, Hansheng, 5,751,416, Cl. 356-311.000.
Yugen Kaisha Yamasei Gankyo: *See—*
Yamazaki, Kiyoshi, 5,751,393, Cl. 351-63.000.
Yuhan Corporation: *See—*
Lee, Jong Wook; Chae, Jeong Seok; Kim, Chang Seop; Kim, Jae Kyu; Lim, Dae Sung; Shon, Moon Kyu; Choi, Yeon Shik; and Lee, Sang Ho, 5,750,531, Cl. 514-256.000.
Yukawa, Kazuhiko: *See—*
Akamatsu, Norihiko; Hamada, Masataka; Yukawa, Kazuhiko; and Ootsuka, Hiroshi, 5,752,101, Cl. 396-155.000.
Yum, Su Il: *See—*
Taskovich, Lina Tormen; Yum, Su Il; Lee, Eun Soo; and Crisologo, Nieves Marzan, 5,750,137, Cl. 424-448.000.
Yumura, Takeshi; Ohnishi, Hiroki; Miyatake, Masanori; Yoden, Naoyuki; Ochiiwa, Masashi; and Izumi, Takashi, to Sanyo Electric Co., Ltd. Speech synthesis apparatus and read out time calculating apparatus to finish reading out text. 5,752,228, Cl. 704-260.000.
Yung, Robert, to Sun Microsystems, Inc. Method and apparatus for using double precision addressable registers for single precision data. 5,752,271, Cl. 711-171.000.
Yuri, Masaaki: *See—*
Takayama, Toru; Imafuji, Osamu; Yuri, Masaaki; Kume, Masahiro; and Yoshikawa, Akio, 5,751,756, Cl. 372-46.000.
Yurke, Bernard: *See—*
Arney, Susanne C.; Greywall, Dennis Stanley; Walker, James A.; and Yurke, Bernard, 5,751,469, Cl. 359-291.000.
Yuza, Akira; Adachi, Nobukazu; Kuroda, Akira; and Sugita, Takeshi, to Canon Kabushiki Kaisha. Image heating apparatus using endless web guided by a guide having inclined surfaces. 5,752,149, Cl. 399-329.000.
Yvin, Jean-Claude; Levasseur, Florence; Amin-Gendy, Cyrille; Tran Thanh, Kiem-Ngoe; Patier, Pascale; Rochas, Cyrille; Lienart, Yvette Janine; and Cloarec, Bernard, to Laboratoires Goemar S.A. Laminarin as a seed germination and plant growth accelerator. 5,750,472, Cl. 504-292.000.
Zaaiman, Ben Thomas; Putter, Paul-Boer; Vermeulen, Pieter Johannes Erasmus; and Loubser, Gerrit Jacobus, to Livingstone Legend Enterprises (Propiretary) Ltd. Apparatus and method for classifying vehicles using electromagnetic waves and pattern recognition. 5,752,215, Cl. 701-117.000.
Zabinski, John E.; and Rehfeldt, Roger, to Culligan International Company. Water softening apparatus with microprocessor control. 5,751,598, Cl. 364-500.000.
Zack, Kenneth L.: *See—*
Welch, Michael C.; and Zack, Kenneth L., 5,750,483, Cl. 510-230.000.
Zaczek, Robert: *See—*
Brown, Barry Stephen; Aiken, Simon Piers; Zaczek, Robert; Hartig, Paul Richard; Teleha, Christopher Allan; Wilkerson, Wendell Wilkie; and Earl, Richard Alan, 5,750,528, Cl. 514-253.000.
Zadini, Filiberto P.; and Zadini, Giorgio. Automatic guidewire placement device for medical catheters. 5,749,371, Cl. 128-772.000.
Zadini, Filiberto P.; and Zadini, Giorgio C. Needle stick protective apparatus for manual catheter placement devices. 5,749,856, Cl. 604-162.000.
Zadini, Giorgio: *See—*
Zadini, Filiberto P.; and Zadini, Giorgio, 5,749,371, Cl. 128-772.000.
Zadini, Giorgio C.: *See—*
Zadini, Filiberto P.; and Zadini, Giorgio C., 5,749,856, Cl. 604-162.000.
Zadno, Reza: *See—*
Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; van Dyk, Karl; Jervis, James E.; and Zadno, Reza, 5,749,879, Cl. 606-139.000.
Zafar, Sufi, to Motorola, Inc. Process for forming a semiconductor device having a ferroelectric capacitor. 5,750,419, Cl. 438-3.000.
Zafred, Paolo R.: *See—*
Gillett, James E.; Dederer, Jeffrey T.; and Zafred, Paolo R., 5,750,278, Cl. 429-24.000.
Zagar, Cyrill: *See—*
Hamprecht, Gerhard; Heistracher, Elisabeth; Klintz, Ralf; Schäfer, Peter; and Zagar, Cyrill, 5,750,705, Cl. 546-297.000.
Zagata, Mark Alan: *See—*
Flanery, Ansel Bernard, Jr.; Reams, Lowell Allan; and Zagata, Mark Alan, 5,749,335, Cl. 123-337.000.
Zajac, Mariola B.: *See—*
Morrison, Marjorie A.; Lunetta, Steven E.; Meucci, Victoria P.; Zajac, Mariola B.; and Simpson, Elizabeth A., 5,750,413, Cl. 436-537.000.
Zak, Robert C., Jr.: *See—*
Guzovskiy, Aleksandr; Zak, Robert C., Jr.; and Bromley, Mark, 5,752,258, Cl. 711-120.000.
Zalar, Frank E., to General Electric Company. Simulated reflector lamp using par lamp components. 5,751,095, Cl. 313-113.000.
Zalinski, Charles Martin: *See—*
Higgins-Luthman, Michael John; Kidd, Robert Charles; Klein, Robert Dennis; Yen, Robert Chihsung; and Zalinski, Charles Martin, 5,751,846, Cl. 382-169.000.
Zalzala, Linda Ellen: *See—*
Horst, Robert W.; Baker, William Edward; Banton, Randall G.; Brown, John Michael; Bruckert, William F.; Bunton, William Patterson; Campbell, Gary F.; Coddington, John Deane; Cutts, Richard W., Jr.; Drexler, Barry Lee; Elrod, Harry Frank; Fowler, Daniel L.; Garcia, David J.; Hintikka, Paul N.; Iswandhi, Geoffrey I.; Jewett, Douglas Eugene; Jones, Curtis Willard, Jr.; Klecka, James Stevens; Krause, John C.; Low, Stephen G.; Meredith, Susan Stone; Meyers, Steven C.; Sonnier, David P.; Watson, William Joel; Whiteside, Patricia L.; Williams, Frank A.; and Zalzala, Linda Ellen, 5,751,932, Cl. 395-182.100.
Zambounis, John; and Hall-Goulle, Véronique, to Ciba Specialty Chemicals Corporation. Pyrocarbonic acid diesters and the preparation and use thereof. 5,750,758, Cl. 558-276.000.
Zampetti, George, to SymmetriCom, Inc. Multiple input frequency locked loop. 5,751,777, Cl. 375-376.000.
Zapata, Elizabeth: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
Zavracky, Matthew; Odryna, Vic; and Mansell, Barry, to Kopin Corporation. Control system for display panels. 5,751,261, Cl. 345-55.000.
Zbikowski, Mark; and Ferguson, Robert I., to Microsoft Corporation. Storage of file data on disk in multiple representations. 5,752,252, Cl. 707-205.000.
Zebuhr, William H., to Dynaproducts, Inc. Automated dental cleaner. 5,749,380, Cl. 132-216.000.
Zech, Joachim; Wanek, Erich; Lechner, Günther; and Bissinger, Peter, to Thera Patent GmbH & Co. KG Gesellschaft fur. Hydrophilated dental impression compounds. 5,750,589, Cl. 523-109.000.
Zefal: *See—*
Glotin, Joël, 5,749,392, Cl. 137-231.000.
Zefferi, Suzanne: *See—*
Haskell, Malcolm W.; Miller, Richard; and Zefferi, Suzanne, 5,750,488, Cl. 510-412.000.
Zeitler, Walter; and Gabriel, Ernst, to Siemens Stromberg-Carlson. DC operated electronic ballast for fluorescent light. 5,751,120, Cl. 315-307.000.
Zeldin, Vladimir: *See—*
Rabinovich, Pavel; Shochat, Michael; Zeldin, Vladimir; and Milman, Oscar, 5,749,369, Cl. 128-734.000.
Zelfel, Hans-Jürgen: *See—*
Barrois, Claus Dieter; Lindner, Georg Johann; and Zelfel, Hans-Jürgen, 5,749,299, Cl. 101-483.000.
Zemitis, Martin S. Slide fastener repair system. 5,749,134, Cl. 29-402.080.
Zeneca Agrochemicals: *See—*
Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; Osborn, Rupert William; and Rees, Sarah Bronwen, 5,750,504, Cl. 514-12.000.
Zeneca Limited: *See—*
Bird, Colin Roger; Grierson, Donald; and Schuch, Wolfgang Walter, 5,750,865, Cl. 800-205.000.
Bowden, Martin Charles, 5,750,769, Cl. 560-184.000.
Bowden, Martin Charles, 5,750,773, Cl. 560-226.000.
Crowley, Patrick Jelf; Lawson, Kevin Robert; Smith, Douglas John; and Moseley, Donn Warwick, 5,750,778, Cl. 562-605.000.
Jones, John David; Bowden, Martin Charles; and Brown, Stephen Martin, 5,750,694, Cl. 544-334.000.
Jones, Raymond Vincent Heavon; and Simpson, Elizabeth Shearer Currie, 5,750,740, Cl. 549-519.000.
Mills, Stuart D., 5,750,754, Cl. 558-52.000.
Thomson, Gordon Alexander; and Phillips, Duncan Adrian Sidney, 5,750,689, Cl. 544-75.000.
Zeng, Bin: *See—*
Murphy, Patricia D.; Allen, Antonette C.; Alvares, Christopher P.; Critz, Brenda S.; Olson, Sheri J.; Schelter, Denise B.; and Zeng, Bin, 5,750,400, Cl. 435-6.000.
Zeng, Fan-Gang: *See—*
Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., 5,749,912, Cl. 607-57.000.
Zenith Electronics Corporation: *See—*
Dobrovolny, Pierre, 5,752,179, Cl. 455-266.000.
Zepeda, Alfred: *See—*
Scheffelin, Joseph E.; Hunt, David S.; Young, Mark E.; Zapata, Elizabeth; Zepeda, Alfred; Schultz, Christopher J.; and Fong, Jon, 5,751,320, Cl. 347-85.000.
Zeria Pharmaceutical Co., Ltd.: *See—*
Mera, Yukinori; Nishi, Naoki; Kurimoto, Tadashi; and Sato, Hiroki, 5,750,524, Cl. 514-247.000.
Zewert, Thomas E.; Pliquett, Uwe; Langer, Robert S.; and Weaver, James C., to Massachusetts Institute of Technology. Delivery of nucleotides into organisms by electroporation. 5,749,847, Cl. 604-49.000.
Zexel Corporation: *See—*
Fujikawa, Takuya; and Abe, Katsuhiko, 5,749,527, Cl. 239-585.300.
Nishishita, Kunihiko, 5,751,414, Cl. 356-237.000.
ZF Friedrichshafen AG: *See—*

Buri, Gerhard; and Bader, Josef, 5,749,263, Cl. 74-331.000.
Zhang, Chaoying; Portillo, Franco; Zeng, Fan-Gang; Shannon, Robert V.; and Loeb, Gerald E., to House Ear Institute; and Advanced Bionics Corporation. Low-cost, four-channel cochlear implant. 5,749,912, Cl. 607-57.000.
Zhang, Chunbin: *See—*
van Ooij, Wim J.; Subramanian, Vijay; and Zhang, Chunbin, 5,750,197, Cl. 427-318.000.
Zhang, Hansheng: *See—*
Singh, Jagdish P.; Yueh, Fang-Yu; Cook, Robert L.; and Zhang, Hansheng, 5,751,416, Cl. 356-311.000.
Zhang, Yun, to Lucent Technologies Inc. Tin electroplating process. 5,750,017, Cl. 205-102.000.
Zhegong, Fan: *See—*
Debonte, Lorin R.; Loh, Willie H.-T.; and Zhegong, Fan, 5,750,827, Cl. 800-200.000.
Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; and Takatori, Sunao, to Sharp Kabushiki Kaisha; and Yozan Inc. Complex number calculation circuit. 5,751,624, Cl. 364-841.000.
Zhou, Chong Wu: *See—*
Muller, Christiaan; Zhou, Chong Wu; and Reed, Mark A., 5,751,156, Cl. 324-699.000.
Zhou, Tian, to Inventio AG. Drive system for lifts. 5,751,076, Cl. 310-12.000.
Ziegler, Carl Bernard: *See—*
Lin, Yang-I; Bitha, Panayota; Sakya, Subas; Strohmeyer, Timothy W.; Bush, Karen; Ziegler, Carl Bernard; and Feigelson, Gregg Brian, 5,750,735, Cl. 549-475.000.
Zielinski, David M.; and Engelman, Melvin A., to Dentifax International, Inc. Spruing assembly. 5,749,411, Cl. 164-244.000.
Ziemins, Uldis A.: *See—*
Freedenberg, Candace J.; Long, David C.; Cobb, Joshua M.; LaPlante, Mark J.; Ziemins, Uldis A.; Patterson, Daniel G.; and Balz, James G., 5,751,588, Cl. 364-474.280.
Zierten, Thomas A.: *See—*
Blackner, Anthony M.; and Zierten, Thomas A., 5,749,546, Cl. 244-215.000.
Zijlstra, Jacob: *See—*
Cerutti, Peter; Whitcomb, Jeannette; Zijlstra, Jacob; and de Villiers, Ethel-Michelle, 5,750,334, Cl. 435-5.000.
Zilog, Inc.: *See—*
Rajkanan, Kamal; and Kranzen, Bruno, 5,750,426, Cl. 438-210.000.
Zimmerman, Leon H., deceased (by Patricia B. Zimmerman, legal representative): *See—*
Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
Zimmerman, Patricia B., legal representative: *See—*
Brignola, Edward L.; Fleck, Alvin A.; LaCroix, Price W.; Willis, Edward K.; Zimmerman, Leon H., deceased, 5,750,151, Cl. 425-66.000.
Zirpolo, Dominick S.: *See—*
Donovan, Kenneth B.; Ferrell, Richard A.; Heidrich, Arthur J.; and Zirpolo, Dominick S., 5,751,612, Cl. 364-578.000.
Zisapel, Nava, to Neurim Pharmacueticals Ltd. Method and pharmaceutical formulation for treating benign prostatic hyperplasia. 5,750,557, Cl. 514-415.000.
Znaiden, Alexander Paul; Crotty, Brian Andrew; and Johnson, Anthony, to Chesebrough-Pond's Co., Division of Conopco, Inc. Vitamin C delivery system. 5,750,123, Cl. 424-401.000.
Zoerner, Glen: *See—*
Yiu, Hing Leung; Gokinko, Jeff; and Zoerner, Glen, 5,752,077, Cl. 395-827.000.
Zomp, John M.: *See—*
Goutzoulis, Anastasios P.; and Zomp, John M., 5,751,242, Cl. 342-158.000.
Zrust, Terry L.: *See—*
Farwell, Charles Yeomans; Gerhardt, Paul M.; Hagirahm, Hassan; Sueper, David Martin; and Zrust, Terry L., 5,751,712, Cl. 370-431.000.
Zuin, Gianni, to Molex Incorporated. Motor mounting bracket for PCB. 5,749,737, Cl. 439-500.000.
Zummach, Dana A.: *See—*
Goodfellow, Val S.; Kroona, Heather B.; Whalley, Eric T.; Wincott, Francine E.; and Zummach, Dana A., 5,750,506, Cl. 514-15.000.
Zuranski, Edward S.: *See—*
Scott, Robert Earl; and Zuranski, Edward S., 5,751,796, Cl. 379-93.310.
Zweben, Monte; Deale, Michael J.; Vershel, Mark A.; and Pettus, Christophe E., to PeopleSoft, Inc. Allowing inconsistency in a distributed client-server application. 5,751,958, Cl. 395-200.340.
Zyagawa, Yasutoshi; Nishio, Takeyoshi; Nomura, Takao; Akagawa, Tomohiko; Sakai, Ikunori; and Hinenoya, Saburou, to Toyota Jidosha Kabushiki Kaisha; and Ube Industries, Ltd. Polypropylene resin composition for car interior fittings. 5,750,612, Cl. 524-451.000.
ZYGO Corporation: *See—*
de Groot, Peter, 5,751,427, Cl. 356-358.000.
ZymoGenetics, Inc.: *See—*
Sledziewski, Andrzej Z.; Bell, Lillian Anne; and Kindsvogel, Wayne R., 5,750,375, Cl. 435-69.700.
3 Com Corporation: *See—*
Hart, John H., 5,752,003, Cl. 395-500.000.
3266974 Canada Inc.: *See—*
Domzalski, Ken, 5,749,813, Cl. 482-97.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12th DAY OF MAY, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Micro Devices, Inc.: *See—*
  Johnson, William M., RE. 35,794, Cl. 395-586.000.
Amstad, John H. Food processing machine. RE. 35,789, Cl. 99-625.000.
Baroid Technology, Inc.: *See—*
  Pustanyk, Randal Harold; and Comeau, Laurier Emilo, RE. 35,790, Cl. 415-40.000.
Brunninger, Manfred: *See—*
  Theurer, Josef; and Brunninger, Manfred, RE. 35,788, Cl. 37-104.000.
Cap, Heinrich: *See—*
  Elsasser, Dieter; von der Heide, Johann; and Cap, Heinrich, RE. 35,792, Cl. 360-98.070.
Comeau, Laurier Emilo: *See—*
  Pustanyk, Randal Harold; and Comeau, Laurier Emilo, RE. 35,790, Cl. 415-40.000.
Elsasser, Dieter; von der Heide, Johann; and Cap, Heinrich, to Papst Licensing, GmbH. Disk storage drive. RE. 35,792, Cl. 360-98.070.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H: *See—*
  Theurer, Josef; and Brunninger, Manfred, RE. 35,788, Cl. 37-104.000.
Fuji Hunt Photographic Chemicals, Inc.: *See—*
  Kim, Hongzoon; and Pfeiffer, Charles J., RE. 35,795, Cl. 430-458.000.
Halpern, B. James, to Measuring & Monitoring Services, Inc. Measuring and monitoring system. RE. 35,793, Cl. 364-483.000.
Johnson, William M., to Advanced Micro Devices, Inc. System for reducing delay for execution subsequent to correctly predicted branch instruction using fetch information stored with each block of instructions in cache. RE. 35,794, Cl. 395-586.000.
Kim, Hongzoon; and Pfeiffer, Charles J., to Fuji Hunt Photographic Chemicals, Inc. Method of making flowable alkaline thiosulfate/alkaline sulfite and the product thereof. RE. 35,795, Cl. 430-458.000.
Measuring & Monitoring Services, Inc.: *See—*
  Halpern, B. James, RE. 35,793, Cl. 364-483.000.
Papst Licensing, GmbH: *See—*
  Elsasser, Dieter; von der Heide, Johann; and Cap, Heinrich, RE. 35,792, Cl. 360-98.070.
Pfeiffer, Charles J.: *See—*
  Kim, Hongzoon; and Pfeiffer, Charles J., RE. 35,795, Cl. 430-458.000.
Pustanyk, Randal Harold; and Comeau, Laurier Emilo, to Baroid Technology, Inc. System for drilling deviated boreholes. RE. 35,790, Cl. 415-40.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Method of and arrangement for rehabilitating a ballast bed of a track. RE. 35,788, Cl. 37-104.000.
Volz, Richard J., to Volz, Richard J. Printed sheet with integrally formed stamps. RE. 35,791, Cl. 283-71.000.
von der Heide, Johann: *See—*
  Elsasser, Dieter; von der Heide, Johann; and Cap, Heinrich, RE. 35,792, Cl. 360-98.070.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Avnir, David; Ottolenghi, Michael; Braun, Sergei; and Zusman, Riyka, to Hebrew University of Jerusalem, YISSUM, Research Development Company of the. Doped sol-gel glasses for obtaining chemical interactions. B1 292,801, Cl. 525-54.100.
Braun, Sergei: *See—*
  Avnir, David; Ottolenghi, Michael; Braun, Sergei; and Zusman, Riyka, B1 292,801, Cl. 525-54.100.
Dainippon Screen Mfg. Co., Ltd.: *See—*
  Iwasa, Hiroshi, B1 477,259, Cl. 347-238.000.
Hebrew University of Jerusalem, YISSUM, Research Development Company of the: *See—*
  Avnir, David; Ottolenghi, Michael; Braun, Sergei; and Zusman, Riyka, B1 292,801, Cl. 525-54.100.
Iwasa, Hiroshi, to Dainippon Screen Mfg. Co., Ltd. Multiple beam scanning apparatus, light source unit, and method of manufacturing the same. B1 477,259, Cl. 347-238.000.
Ottolenghi, Michael: *See—*
  Avnir, David; Ottolenghi, Michael; Braun, Sergei; and Zusman, Riyka, B1 292,801, Cl. 525-54.100.
Zusman, Riyka: *See—*
  Avnir, David; Ottolenghi, Michael; Braun, Sergei; and Zusman, Riyka, B1 292,801, Cl. 525-54.100.

LIST OF DESIGN PATENTEES

Adamovich, Dennis John, to Coca-Cola Compay, The. Bench. 394,165, Cl. D6-358.000.
Aftanas, Jeffrey M.: *See—*
  Cucheran, John S.; Sparham, Jon D.; and Aftanas, Jeffrey M., 394,240, Cl. D12-412.000.
Akita, Michio: *See—*
  Kirihara, Kazushi; and Akita, Michio, 394,254, Cl. D14-121.000.
Aleco Furniture Mfg Inc.: *See—*
  Diramarian, Arsho, 394,176, Cl. D6-334.000.
Alvern Norway AS: *See—*
  Alvern, Stein; and Alvern, Oyvind, 394,269, Cl. D15-9.200.
Alvern, Øyvind: *See—*
  Alvern, Stein; and Alvern, Øyvind, 394,269, Cl. D15-9.200.
Alvern, Stein; and Alvern, Øyvind, to Alvern Norway AS. Combined fuel, air, oil and windshield washer fluid dispensing unit with washing facilities. 394,269, Cl. D15-9.200.
American Standard Inc.: *See—*
  Bertoli, Franco, 394,308, Cl. D23-293.100.
Amplitude L.C.: *See—*
  Cross, David W.; and Farres, Gregory M., 394,262, Cl. D14-188.000.
Amundson, Neil Thomas: *See—*
  Mackert, Ross Austin; and Amundson, Neil Thomas, 394,298, Cl. D22-122.000.
Amway Corporation: *See—*
  Fiore, Trevor, 394,210, Cl. D9-529.000.
Anderson, Torrence: *See—*
  Tisbo, Thomas A.; Anderson, Torrence; and Uffner, Michael G., 394,169, Cl. D6-434.000.
Anscher, Joseph, to National Molding Corp. Swivel hook. 394,202, Cl. D8-367.000.
Aquino, Salvatore. Storage rack for electronic remote controls. 394,174, Cl. D6-476.000.
Arita, Toyomi; Uemura, Shigehiro; and Takada, Kazuo, to Sanyo Electric Co., Ltd. Food processor. 394,183, Cl. D7-384.000.
Armchair World: *See—*
  Fisher, Gary R., 394,301, Cl. D23-201.000.
Arnfelt, David A. Lid for a cooler. 394,190, Cl. D7-606.000.
Arnfelt, David A. Lid for a cooler. 394,191, Cl. D7-606.000.
Arnone, Paul A., to Motorola, Inc. Set of icons for a computer display screen. 394,251, Cl. D14-114.500.
Asics Corporation: *See—*
  Takaoka, Norio; and Mitani, Kenichi, 394,141, Cl. D2-954.000.
  Tsujino, Kanzo, 394,332, Cl. D29-121.000.
  Tsujino, Kanzo, 394,333, Cl. D29-121.000.
Augenstein, Leonhard. Lotto toy. 394,284, Cl. D21-37.000.
Auldridge, Dan Hart. Window screen remover. 394,195, Cl. D8-88.000.
Ausmark International Pty Ltd.: *See—*
  Thompson, Garry Owen, 394,312, Cl. D23-418.000.

Authentic Fitness Products, Inc.: *See—*
  Hall, Stephen John; Petrie, Aidan; Lane, Stephen; and Mathews, John, 394,275, Cl. D16-303.000.
Axelro, Jerry: *See—*
  Loo, Dennis; and Axelro, Jerry, 394,265, Cl. D14-224.000.
Bankhead Golf Company, L.L.C.: *See—*
  Bankhead, Sam D., 394,292, Cl. D21-217.000.
Bankhead, Sam D., to Bankhead Golf Company, L.L.C. Convertible golf club. 394,292, Cl. D21-217.000.
Bates, Aaron, to Mead Corporation, The. Basket carrier. 394,205, Cl. D9-346.000.
Bell, Fred. Pendant. 394,226, Cl. D11-79.000.
Beltran, Alejandro Machado: *See—*
  Beltran, Carlos Machado; and Beltran, Alejandro Machado, 394,291, Cl. D21-223.000.
Beltran, Carlos Machado; and Beltran, Alejandro Machado. Combination golf putter and golf ball display stand and putt practice device. 394,291, Cl. D21-223.000.
Bemis Manufacturing Company: *See—*
  Seaman, John W.; Hulsebus, Randy K.; and DeLay, Daniel, 394,311, Cl. D23-364.000.
Berger, Gerhard, to Freudenberg, Carl. Flooring surface. 394,319, Cl. D25-163.000.
Berger, Gerhard, to Freudenberg, Carl. Flooring surface. 394,320, Cl. D25-163.000.
Bertoli, Franco, to American Standard Inc. Lavatory. 394,308, Cl. D23-293.100.
Best, Christopher Brian; and Davidson, William F., to Cobra Golf, Inc. Golf club head. 394,290, Cl. D21-220.000.
Birrell, James S., to Precor Incorporated. Workout level display indicator. 394,282, Cl. D20-19.000.
Blake, Gerald L.: *See—*
  Harris, Jack E.; Bromwell, Robert A.; Sommer, Karl L.; and Blake, Gerald L., 394,302, Cl. D23-202.000.
Boesel, George F. W.: *See—*
  Brunsdon, Robert T.; and Boesel, George F. W., 394,194, Cl. D8-50.000.
Boulay, Olivier Pierre: *See—*
  Haller, Uwe; Leschke, Harald; Boulay, Olivier Pierre; and Lo, Anthony W. K., 394,238, Cl. D12-209.000.
Braun Aktiengesellschaft: *See—*
  Ullmann, Roland, 394,329, Cl. D28-49.000.
Bright Yin Huey Co., Ltd.: *See—*
  Hsu, Keen, 394,325, Cl. D26-87.000.
Brodbeck, Stefan, to Tressor TV Produktions GmbH. Interactive communications device. 394,245, Cl. D14-150.000.
Bromwell, Robert A.: *See—*
  Harris, Jack E.; Bromwell, Robert A.; Sommer, Karl L.; and Blake, Gerald L., 394,302, Cl. D23-202.000.
Brown, John R.: *See—*
  Dalton, David R.; and Brown, John R., 394,322, Cl. D26-48.000.
Brunsdon, Robert T.; and Boesel, George F. W., to Hunt Holdings, Inc. Upright stapler. 394,194, Cl. D8-50.000.
Caldwell, Carol. Doll having a bagel-shaped head with bagel-shaped trimmings. 394,289, Cl. D21-155.000.
Canon Kabushiki Kaisha: *See—*
  Miyahara, Kazuhiko, 394,155, Cl. D3-267.000.
Carp, Richard Nikolaas, to Unipath Limited. Combined housing and removable cap of a sample analyzer. 394,317, Cl. D24-223.000.
Carter, Tommy L.: *See—*
  Newell, Roger; and Carter, Tommy L., 394,201, Cl. D8-356.000.
Celestina-Krevh, Maryann C., to Century Products Company. Childs car seat shell. 394,162, Cl. D6-333.000.
Century Products Company: *See—*
  Celestina-Krevh, Maryann C., 394,162, Cl. D6-333.000.
Chan, Raymond, to IDT International Limited. Voice memo. 394,261, Cl. D14-167.000.
Cheris, Albert B.; and Dziersk, Mark, to Tenex Corporation. File box. 394,280, Cl. D19-75.000.
Chi-Kong, Pang: *See—*
  Ka Hung, Joseph Chan; and Chi-Kong, Pang, 394,257, Cl. D14-149.000.
Chiu, Si Fu. Flashlight. 394,321, Cl. D26-37.000.
Christopher, Lynda D. Toilet paper dispenser. 394,177, Cl. D6-523.000.
Chrysler Corporation: *See—*
  Trostle, Mark; Dayton, William A.; Morley, Darrel L.; and Miglia, David M., 394,232, Cl. D12-91.000.
Clark-Keller, Jennifer J.: *See—*
  Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
Clivio, Franco, to Gardena Kress & Kastner GmbH. Hose coupling with water stop. 394,306, Cl. D23-262.000.
Cobra Golf, Inc.: *See—*
  Best, Christopher Brian; and Davidson, William F., 394,290, Cl. D21-220.000.
Coca-Cola Company, The: *See—*
  Adamovich, Dennis John, 394,165, Cl. D6-358.000.
Coleman Safety and Security Products, Inc.: *See—*
  Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,219, Cl. D10-50.000.
  Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,220, Cl. D10-50.000.
Coleman, Stephen A.: *See—*
  Napoleone, Nunzio; Coleman, Stephen A.; and DeSimone, Kendra J., 394,255, Cl. D14-124.000.
Collins, Mary F.: *See—*
  Sedighzadeh, Marny M.; and Collins, Mary F., 394,330, Cl. D28-63.000.
Contico International, Inc.: *See—*
  Dickinson, Thomas; and Gale, Bradley D., 394,157, Cl. D3-318.000.
Cosmoda Concept Corporation: *See—*
  Melanson, A. Michael; and Menceles, Andrew Z., 394,156, Cl. D3-271.000.
Croghan, Morris T. Base mold for concrete post. 394,271, Cl. D15-136.000.
Cross, David W.; and Farres, Gregory M., to Amplitude L.C. Audio amplifier. 394,262, Cl. D14-188.000.
Cucheran, John S.; Sparham, Jon D.; and Aftanas, Jeffrey M., to JAC Products, Inc. Pair of ski racks. 394,240, Cl. D12-412.000.
Curry, Jon Kevin, to Curry, Jon Kevin. Holiday pet stocking. 394,229, Cl. D11-126.000.
Cyr, Roch: *See—*
  St-Pierre, Yvon; Dubeau, Andre; and Cyr, Roch, 394,180, Cl. D6-571.000.
Daiwa Seiko, Inc.: *See—*
  Miyazaki, Takeo; and Itoh, Yukio, 394,299, Cl. D22-137.000.
Dalton, David R.; and Brown, John R., to Eveready Battery Company, Inc. Lantern. 394,322, Cl. D26-48.000.
Dart Industries Inc.: *See—*
  Laib, Douglas M., 394,217, Cl. D10-46.200.
Davidson, William F.: *See—*
  Best, Christopher Brian; and Davidson, William F., 394,290, Cl. D21-220.000.
Davis, Brian T.: *See—*
  Reynaert, Scott M.; and Davis, Brian T., 394,188, Cl. D7-584.000.
  Reynaert, Scott M.; and Davis, Brian T., 394,189, Cl. D7-584.000.
Dawkins, David. Criss cross board game. 394,283, Cl. D21-34.000.
Day, Brian: *See—*
  Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,219, Cl. D10-50.000.
  Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,220, Cl. D10-50.000.
Dayton, William A.: *See—*
  Trostle, Mark; Dayton, William A.; Morley, Darrel L.; and Miglia, David M., 394,232, Cl. D12-91.000.
De Blaay, William E., to L. & J.G. Stickley, Inc. Triple dresser. 394,171, Cl. D6-446.000.
Deglon, Thierry, to Ets Jean Deglon. Round cake server. 394,192, Cl. D7-688.000.
Deglon, Thierry, to Ets Jean Deglon. Double lemon decorator. 394,193, Cl. D7-693.000.
DeLay, Daniel: *See—*
  Seaman, John W.; Hulsebus, Randy K.; and DeLay, Daniel, 394,311, Cl. D23-364.000.
Demore, Anthony, to Rubbermaid Incorporated. Lid for jar. 394,184, Cl. D7-391.000.
Denny, Stephen: *See—*
  Waterbury, David H.; Denny, Stephen; and Distaso, Kimberly, 394,207, Cl. D9-415.000.
DeSimone, Kendra J.: *See—*
  Napoleone, Nunzio; Coleman, Stephen A.; and DeSimone, Kendra J., 394,255, Cl. D14-124.000.
Dickinson, Thomas; and Gale, Bradley D., to Contico International, Inc. Storage container handle. 394,157, Cl. D3-318.000.
Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, to Play Industries, Inc. Front panel for a modular computer hardware component. 394,252, Cl. D14-115.000.
Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, to Play Industries, Inc. Front panel for a modular computer hardware component. 394,253, Cl. D14-115.000.
Diramarian, Arsho, to Aleco Furniture Mfg Inc. Chair. 394,176, Cl. D6-334.000.
Distaso, Kimberly: *See—*
  Waterbury, David H.; Denny, Stephen; and Distaso, Kimberly, 394,207, Cl. D9-415.000.
Dodane, Paul. Cookware handle. 394,186, Cl. D7-395.000.
Dominion Homes, Inc.: *See—*
  Riat, William J., 394,318, Cl. D25-17.000.
Donghia Furniture Co., Ltd.: *See—*
  Hutton, John, 394,168, Cl. D6-393.000.
  Hutton, John, 394,327, Cl. D26-110.000.
Dorn, Colleen: *See—*
  Dorn, Jerry; and Dorn, Colleen, 394,334, Cl. D30-121.000.
Dorn, Jerry; and Dorn, Colleen. Animal nursing feeder. 394,334, Cl. D30-121.000.
Duan, Alex, to Topvision Technologies, Inc. Liquid crystal display. 394,248, Cl. D14-113.000.
Dubeau, Andre: *See—*
  St-Pierre, Yvon; Dubeau, Andre; and Cyr, Roch, 394,180, Cl. D6-571.000.
Dudley, James: *See—*

  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Dziersk, Mark: *See—*
  - Cheris, Albert B.; and Dziersk, Mark, 394,280, Cl. D19-75.000.
- E-Z Catch and Company: *See—*
  - Newell, Roger; and Carter, Tommy L., 394,201, Cl. D8-356.000.
- Ecolab, Inc.: *See—*
  - Mackert, Ross Austin; and Amundson, Neil Thomas, 394,298, Cl. D22-122.000.
- Eddy, John W.; Needham, Kelley S.; and Harlan, Jeffrey L., to Kel-Jac Engineering and Plastic Sales, Inc. Shell and cover for water coolers. 394,185, Cl. D7-392.000.
- Egelja, Amy: *See—*
  - Egelja, Sinisa; Egelja, Amy; and Rall, Matthew, 394,146, Cl. D2-970.000.
- Egelja, Sinisa; Egelja, Amy; and Rall, Matthew, to Items International, Inc. Boot upper. 394,146, Cl. D2-970.000.
- Elkins, Erich C.: *See—*
  - Kodama, Kelly L.; Elkins, Erich C.; and Haller, Jeffrey T., 394,316, Cl. D24-158.000.
- Encon, Inc.: *See—*
  - Harris, Jack E.; Bromwell, Robert A.; Sommer, Karl L.; and Blake, Gerald L., 394,302, Cl. D23-202.000.
- Ericsson Business Mobile Networks B.V.: *See—*
  - Hogenbirk, Harm Willem, 394,266, Cl. D14-240.000.
- Estapé, Jorge; and Estapé, Joyce. Bed frame. 394,167, Cl. D6-393.000.
- Estapé, Joyce: *See—*
  - Estapé, Jorge; and Estapé, Joyce, 394,167, Cl. D6-393.000.
- Ets Jean Deglon: *See—*
  - Deglon, Thierry, 394,192, Cl. D7-688.000.
  - Deglon, Thierry, 394,193, Cl. D7-693.000.
- Evans, Jarred; and Schild, Rolf, to Huntleigh Technology PLC. Minipump. 394,268, Cl. D15-7.000.
- Eveready Battery Company, Inc.: *See—*
  - Dalton, David R.; and Brown, John R., 394,322, Cl. D26-48.000.
- Farres, Gregory M.: *See—*
  - Cross, David W.; and Farres, Gregory M., 394,262, Cl. D14-188.000.
- Fiore, Trevor, to Amway Corporation. Container. 394,210, Cl. D9-529.000.
- First Years Inc., The: *See—*
  - Rossman, Jon R.; and Hotaling, Bryan R., 394,166, Cl. D6-367.000.
- Fischer, Roy, to JBL, Incorporated. Loudspeaker enclosure. 394,263, Cl. D14-214.000.
- Fisher, Gary R., to Armchair World. Table top water fountain with platform for decorative objects. 394,301, Cl. D23-201.000.
- Fisher, Michael G. Surgical saw blade hub. 394,315, Cl. D24-146.000.
- Fisher, Ralph L.: *See—*
  - Samuels, Francis D.; Samuels, Raymond B.; and Fisher, Ralph L., 394,300, Cl. D22-148.000.
- Fitzgerald, Robert M. Base for a telephone headset. 394,258, Cl. D14-150.000.
- Freudenberg, Carl: *See—*
  - Berger, Gerhard, 394,319, Cl. D25-163.000.
  - Berger, Gerhard, 394,320, Cl. D25-163.000.
- G.K. Packaging, Inc.: *See—*
  - Kuzma, Gene J.; and Weaver, Douglas W., 394,211, Cl. D9-542.000.
- Gale, Bradley D.: *See—*
  - Dickinson, Thomas; and Gale, Bradley D., 394,157, Cl. D3-318.000.
- Garcon! Brands Limited: *See—*
  - Millet, Stéphane, 394,209, Cl. D9-430.000.
- Gardena Kress & Kastner GmbH: *See—*
  - Clivio, Franco, 394,306, Cl. D23-262.000.
- Garza, Marcelo Garza Laguera. Toilet. 394,309, Cl. D23-301.000.
- George, Bonnie J.; and George, Gerald O. Collector's thimble. 394,150, Cl. D3-29.000.
- George, Gerald O.: *See—*
  - George, Bonnie J.; and George, Gerald O., 394,150, Cl. D3-29.000.
- Glickman, Joel: *See—*
  - Hirose, Tomiyuki; and Glickman, Joel, 394,286, Cl. D21-108.000.
- Gogan, Donald M.; and Williams, Geoffrey T., to Harley-Davidson Motor Company. Motorcycle sissy bar side plate. 394,234, Cl. D12-114.000.
- Greenleaf, Inc.: *See—*
  - Yarbrough, Denada A., 394,160, Cl. D6-310.000.
- Gremchuck, Alan. Toilet paper container. 394,178, Cl. D6-524.000.
- GTC Properties, Inc.: *See—*
  - Plogman, David, 394,213, Cl. D10-15.000.
- Gunnerson, Lane Nathan. Shirt decoration. 394,135, Cl. D2-717.000.
- Haack, Raymond R.: *See—*
  - Strandell, Timothy B.; and Haack, Raymond R., 394,270, Cl. D15-80.000.
- Habib, Pierre, to Leader Industries Inc. Display stand. 394,173, Cl. D6-474.000.
- Haddad, Alan. Baby booties. 394,138, Cl. D2-900.000.
- Hall, Stephen John; Petrie, Aidan; Lane, Stephen; and Mathews, John, to Authentic Fitness Products, Inc. Frontpiece for swim goggles. 394,275, Cl. D16-303.000.
- Haller, Jeffrey T.: *See—*
  - Kodama, Kelly L.; Elkins, Erich C.; and Haller, Jeffrey T., 394,316, Cl. D24-158.000.
- Haller, Uwe; Leschke, Harald; Boulay, Olivier Pierre; and Lo, Anthony W. K., to Mercedes-Benz AG. Front face of a vehicle wheel. 394,238, Cl. D12-209.000.
- Halm, Hans: *See—*
  - Krämer, Hans; and Halm, Hans, 394,158, Cl. D4-113.000.
- Harlan, Jeffrey L.: *See—*
  - Eddy, John W.; Needham, Kelley S.; and Harlan, Jeffrey L., 394,185, Cl. D7-392.000.
- Harley-Davidson Motor Company: *See—*
  - Gogan, Donald M.; and Williams, Geoffrey T., 394,234, Cl. D12-114.000.
- Harris, Jack E.; Bromwell, Robert A.; Sommer, Karl L.; and Blake, Gerald L., to Encon, Inc. Container for bulk materials. 394,302, Cl. D23-202.000.
- Hartford, Stephen Andrew: *See—*
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Hartzheim, G. Douglas. Slab on grade chair. 394,200, Cl. D8-354.000.
- Hayes Microcomputer Products, Inc.: *See—*
  - Wells, J. Stephen, 394,267, Cl. D14-242.000.
- Hercules Products: *See—*
  - Pucci, Joseph, 394,303, Cl. D23-207.000.
- Higashihara, Tohru: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Hillmer, Robert E.: *See—*
  - Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
- Hirahata, Aki. Split toe sneaker. 394,139, Cl. D2-902.000.
- Hirose, Tomiyuki; and Glickman, Joel. Spring-driven motor for construction toy. 394,286, Cl. D21-108.000.
- Hitachi, Ltd.: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Hodes, Alan, to Pen-Tab Industries, Inc. Exterior of a binder cover. 394,279, Cl. D19-26.000.
- Hodges, Douglas. Transmission support stand. 394,199, Cl. D8-349.000.
- Hogenbirk, Harm Willem, to Ericsson Business Mobile Networks B.V. Base station. 394,266, Cl. D14-240.000.
- Hon, Chan Chung, to Sunrich Manufactory Ltd. Pop up magnifier. 394,272, Cl. D16-135.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Yamamoto, Shoji; and Shibata, Yumio, 394,233, Cl. D12-110.000.
- Hosick, Frank A. Forearm crutch. 394,148, Cl. D3-8.000.
- Hotaling, Bryan R.: *See—*
  - Rossman, Jon R.; and Hotaling, Bryan R., 394,166, Cl. D6-367.000.
- Hsu, Keen, to Bright Yin Huey Co., Ltd. Wall lamp. 394,325, Cl. D26-87.000.
- Huang, Huo-Tu. Table lamp. 394,324, Cl. D26-65.000.
- Huffer, Starla D.: *See—*
  - Steinke, Gustav J.; and Huffer, Starla D., 394,235, Cl. D12-180.000.
- Hulsebus, Randy K.: *See—*
  - Seaman, John W.; Hulsebus, Randy K.; and DeLay, Daniel, 394,311, Cl. D23-364.000.
- Hunt Holdings, Inc.: *See—*
  - Brunsdon, Robert T.; and Boesel, George F. W., 394,194, Cl. D8-50.000.
- Huntleigh Technology PLC: *See—*
  - Evans, Jarred; and Schild, Rolf, 394,268, Cl. D15-7.000.
- Hutton, John, to Donghia Furniture Co., Ltd. Bed. 394,168, Cl. D6-393.000.
- Hutton, John, to Donghia Furniture Co., Ltd. Lamp body. 394,327, Cl. D26-110.000.
- IDT International Limited: *See—*
  - Chan, Raymond, 394,261, Cl. D14-167.000.
- Iida, Koichi: *See—*
  - Sakamoto, Harumi; and Iida, Koichi, 394,264, Cl. D14-218.000.
- Iikura, Yukio: *See—*
  - Ito, Masafumi; Sube, Minoru; Watanabe, Hiroyuki; and Iikura, Yukio, 394,260, Cl. D14-156.000.
- Imperial Tobacco Limited: *See—*
  - St-Pierre, Yvon; Dubeau, Andre; and Cyr, Roch, 394,180, Cl. D6-571.000.
- INTERLEGO AG: *See—*
  - Jensen, Hanne Davidsen; Leadbetter, Paul; and Jensen, Arne Egholm, 394,287, Cl. D21-108.000.
- International Brake Industries, Inc.: *See—*
  - Steinke, Gustav J.; and Huffer, Starla D., 394,235, Cl. D12-180.000.
- Ishibashi, Kiyofumi: *See—*
  - Nishimura, Shinichiro; Namaizawa, Shigeru; Taki, Toshiro; and Ishibashi, Kiyofumi, 394,223, Cl. D10-104.000.
- Ishii, Daisuke, to Sony Kabushiki Kaisha. Video camera combined with video tape recorder. 394,273, Cl. D16-202.000.
- Items International, Inc.: *See—*
  - Egelja, Sinisa; Egelja, Amy; and Rall, Matthew, 394,146, Cl. D2-970.000.

- Ito, Masafumi; Sube, Minoru; Watanabe, Hiroyuki; and Iikura, Yukio, to Teac Corporation. Combined digital audio disc player and tape recorder. 394,260, Cl. D14-156.000.
- Itoh, Yukio: *See—*
  - Miyazaki, Takeo; and Itoh, Yukio, 394,299, Cl. D22-137.000.
- Iwagami, Tooru: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- JAC Products, Inc.: *See—*
  - Cucheran, John S.; Sparham, Jon D.; and Aftanas, Jeffrey M., 394,240, Cl. D12-412.000.
- Japan Radio Co., Ltd.: *See—*
  - Nishimura, Shinichiro; Namaizawa, Shigeru; Taki, Toshiro; and Ishibashi, Kiyofumi, 394,223, Cl. D10-104.000.
- JBL, Incorporated: *See—*
  - Fischer, Roy, 394,263, Cl. D14-214.000.
- Jensen, Arne Egholm: *See—*
  - Jensen, Hanne Davidsen; Leadbetter, Paul; and Jensen, Arne Egholm, 394,287, Cl. D21-108.000.
- Jensen, Hanne Davidsen; Leadbetter, Paul; and Jensen, Arne Egholm, to INTERLEGO AG. Three dimensional ornament for toys. 394,287, Cl. D21-108.000.
- Jewelex New York Ltd.: *See—*
  - Mehta, Ritesh B., 394,225, Cl. D11-26.000.
- Johnson Service Company: *See—*
  - Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
- Juno Lighting, Inc.: *See—*
  - Wachter, Peter F.; and O'Rourke, John J., 394,241, Cl. D13-110.000.
- Kabushiki Kaisha Toshiba: *See—*
  - Kondo, Osamu, 394,247, Cl. D14-107.000.
  - Suzuki, Shogo, 394,274, Cl. D16-202.000.
- Ka Hung, Joseph Chan; and Chi-Kong, Pang, to Vtech Communications Ltd. Telephone base housing. 394,257, Cl. D14-149.000.
- Kao, Shiu Wen: *See—*
  - Moore, Jerome; Moore, Gwendolyn; and Kao, Shiu Wen, 394,314, Cl. D24-134.000.
- Kaufman, Krina S.: *See—*
  - Littman, Sandra E.; and Kaufman, Krina S., 394,326, Cl. D26-106.000.
- Kawafuji, Hisashi: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- Kaye, Daniel A.: *See—*
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Kel-Jac Engineering and Plastic Sales, Inc.: *See—*
  - Eddy, John W.; Needham, Kelley S.; and Harlan, Jeffrey L., 394,185, Cl. D7-392.000.
- Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., to Johnson Service Company. Quantum user interface module. 394,218, Cl. D10-50.000.
- Kirihara, Kazushi; and Akita, Michio, to Sony Corporation. Video cassette. 394,254, Cl. D14-121.000.
- Kitamura, Hideaki: *See—*
  - Kubo, Jiro; Tatsumi, Yoshikazu; and Kitamura, Hideaki, 394,172, Cl. D6-474.000.
- Knuth, James H. Firearm trigger guard cover. 394,297, Cl. D22-108.000.
- Kodama, Kelly L.; Elkins, Erich C.; and Haller, Jeffrey T., to Siemens Medical Sysems, Inc. Radiation therapy machine. 394,316, Cl. D24-158.000.
- Koizumi, Shigeru: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Kondo, Osamu, to Kabushiki Kaisha Toshiba. Unit for extention of functions of electronic computers. 394,247, Cl. D14-107.000.
- Krämer, Hans; and Halm, Hans, to SmithKline Beecham Consumer Healthcare GmbH. Travel cap. 394,158, Cl. D4-113.000.
- Kubo, Jiro; Tatsumi, Yoshikazu; and Kitamura, Hideaki, to Matsushita Electric Industrial Co., Ltd. Stand for a monitor and keyboard. 394,172, Cl. D6-474.000.
- Kumagai, Kenta: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Kuo, Yu-Neng, to Le Yuan Industrial Co., Ltd. Spray gun. 394,304, Cl. D23-226.000.
- Kuo, Yu-Neng, to Le Yuan Industrial Co., Ltd. Spray gun. 394,305, Cl. D23-226.000.
- Kuzma, Gene J.; and Weaver, Douglas W., to G.K. Packaging, Inc. Combined bottle and cap. 394,211, Cl. D9-542.000.
- L. & J.G. Stickley, Inc.: *See—*
  - De Blaay, William E., 394,171, Cl. D6-446.000.
- Laib, Douglas M., to Dart Industries Inc. Measuring cup. 394,217, Cl. D10-46.200.
- Lane, Stephen: *See—*
  - Hall, Stephen John; Petrie, Aidan; Lane, Stephen; and Mathews, John, 394,275, Cl. D16-303.000.
- Langlois, Michael, to Mitel Corporation. Telephone base. 394,259, Cl. D14-151.000.
- L'Article Chaussant Europeen: *See—*
  - Merceron, Jean-Paul, 394,142, Cl. D2-960.000.
- Le Yuan Industrial Co., Ltd.: *See—*
  - Kuo, Yu-Neng, 394,304, Cl. D23-226.000.
  - Kuo, Yu-Neng, 394,305, Cl. D23-226.000.
- Leadbetter, Paul: *See—*
  - Jensen, Hanne Davidsen; Leadbetter, Paul; and Jensen, Arne Egholm, 394,287, Cl. D21-108.000.
- Leader Industries Inc.: *See—*
  - Habib, Pierre, 394,173, Cl. D6-474.000.
- Lechner, Thomas J.: *See—*
  - Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
- Lee, David. Fishing anchor. 394,239, Cl. D12-215.000.
- Leschke, Harald: *See—*
  - Haller, Uwe; Leschke, Harald; Boulay, Olivier Pierre; and Lo, Anthony W. K., 394,238, Cl. D12-209.000.
- Leung, Sin Ming, to Make Wood Industries Limited. Design for an oval picture frame. 394,159, Cl. D6-309.000.
- Lewis, Sally Sirkin. Ottoman. 394,163, Cl. D6-349.000.
- Lin, Stephen. Combination stacked paper, calculator and business card holder. 394,277, Cl. D18-2.000.
- Little Tikes Commercial Play Systems Inc.: *See—*
  - McLean, Kyle, 394,296, Cl. D21-242.000.
- Littman, Sandra E.; and Kaufman, Krina S., to Sandy Littman, Inc. Table Lamp. 394,326, Cl. D26-106.000.
- Lo, Anthony W. K.: *See—*
  - Haller, Uwe; Leschke, Harald; Boulay, Olivier Pierre; and Lo, Anthony W. K., 394,238, Cl. D12-209.000.
- Lohrding, Bradley K.; Michieli, Matthew R.; and Mitchell, Jay R., to Motorola, Inc. Portable radiotelephone. 394,256, Cl. D14-138.000.
- Loo, Dennis; and Axelro, Jerry. Speaker stand. 394,265, Cl. D14-224.000.
- Loverin, Marc R., to SRL, Inc. Element for a shoe upper. 394,140, Cl. D2-946.000.
- MacDonald, Sumner. Key ring holder. 394,151, Cl. D3-207.000.
- MacDonald, Sumner. Key ring holder. 394,152, Cl. D3-207.000.
- Mackert, Ross Austin; and Amundson, Neil Thomas, to Ecolab, Inc. Insect attractant cover. 394,298, Cl. D22-122.000.
- Maggi, Renzo, to Salvas S.p.A. In line skate. 394,293, Cl. D21-226.000.
- Magnum Industries Limited: *See—*
  - Tsui, Chi Fai, 394,161, Cl. D6-310.000.
- Maitra, Sidhartha, to Multi-Tech Systems, Inc. Icon for a display screen. 394,250, Cl. D14-114.200.
- Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 394,244, Cl. D13-182.000.
- Make Wood Industries Limited: *See—*
  - Leung, Sin Ming, 394,159, Cl. D6-309.000.
- Mancini, Nicholas J., III. Cap for motorcycle gas tank fill port. 394,237, Cl. D12-197.000.
- Manitowoc Foodservice Group, Inc.: *See—*
  - Strandell, Timothy B.; and Haack, Raymond R., 394,270, Cl. D15-80.000.
- Mann, Grant, to Talent Toy Industries, Inc. Klacker set. 394,285, Cl. D21-62.000.
- Marrelli, John C.: *See—*
  - Rutledge, Gary L., 394,208, Cl. D9-430.000.
- Martin, John C. Oil change reminder for key rings. 394,153, Cl. D3-208.000.
- Mathews, John: *See—*
  - Hall, Stephen John; Petrie, Aidan; Lane, Stephen; and Mathews, John, 394,275, Cl. D16-303.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Kubo, Jiro; Tatsumi, Yoshikazu; and Kitamura, Hideaki, 394,172, Cl. D6-474.000.
- Mazda, Masayosi. Bellows container. 394,212, Cl. D9-557.000.
- McGuire, Martha L.: *See—*
  - Morrish, David L., 394,206, Cl. D9-417.000.
- McLean, Kyle, to Little Tikes Commercial Play Systems Inc. Frog playground sculpture. 394,296, Cl. D21-242.000.
- Mead Corporation, The: *See—*
  - Bates, Aaron, 394,205, Cl. D9-346.000.
- Mehta, Merwan B.; and Mehta, Rukshana M. Illuminated wreath. 394,228, Cl. D11-120.000.
- Mehta, Ritesh B., to Jewelex New York Ltd. Ring. 394,225, Cl. D11-26.000.
- Mehta, Rukshana M.: *See—*
  - Mehta, Merwan B.; and Mehta, Rukshana M., 394,228, Cl. D11-120.000.
- Melanson, A. Michael; and Menceles, Andrew Z., to Cosmoda Concept Corporation. Emergency road kit. 394,156, Cl. D3-271.000.
- Menceles, Andrew Z.: *See—*
  - Melanson, A. Michael; and Menceles, Andrew Z., 394,156, Cl. D3-271.000.
- Mercedes-Benz AG: *See—*
  - Haller, Uwe; Leschke, Harald; Boulay, Olivier Pierre; and Lo, Anthony W. K., 394,238, Cl. D12-209.000.

- Merceron, Jean-Paul, to L'Article Chaussant Europeen. Shoe sole. 394,142, Cl. D2-960.000.
- Metsa-Ketela, Heikki: *See—*
  - Vainio, Erkki; and Metsa-Ketela, Heikki, 394,222, Cl. D10-68.000.
- Michieli, Matthew R.: *See—*
  - Lohrding, Bradley K.; Michieli, Matthew R.; and Mitchell, Jay R., 394,256, Cl. D14-138.000.
- Miglia, David M.: *See—*
  - Trostle, Mark; Dayton, William A.; Morley, Darrel L.; and Miglia, David M., 394,232, Cl. D12-91.000.
- Miller, Dougald. Emergency sign for vehicles. 394,281, Cl. D20-10.000.
- Millet, Stéphane, to Garcon! Brands Limited. Wine bottle holder. 394,209, Cl. D9-430.000.
- Mitani, Kenichi: *See—*
  - Takaoka, Norio; and Mitani, Kenichi, 394,141, Cl. D2-954.000.
- Mitchell, Betty Jane. Combined infant blanket and changing pad. 394,181, Cl. D6-603.000.
- Mitchell, Jay R.: *See—*
  - Lohrding, Bradley K.; Michieli, Matthew R.; and Mitchell, Jay R., 394,256, Cl. D14-138.000.
- Mitel Corporation: *See—*
  - Langlois, Michael, 394,259, Cl. D14-151.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- Miyahara, Kazuhiko, to Canon Kabushiki Kaisha. Camera case. 394,155, Cl. D3-267.000.
- Miyazaki, Takeo; and Itoh, Yukio, to Daiwa Seiko, Inc. Fishing reel spool. 394,299, Cl. D22-137.000.
- Montgomery, Joseph Paul: *See—*
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Moore, Gwendolyn: *See—*
  - Moore, Jerome; Moore, Gwendolyn; and Kao, Shiu Wen, 394,314, Cl. D24-134.000.
- Moore, Jerome; Moore, Gwendolyn; and Kao, Shiu Wen. Delrin cardiocare stethoscope. 394,314, Cl. D24-134.000.
- Moore, Michael Richard Young: *See—*
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Mori, Satoshi: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- Morley, Darrel L.: *See—*
  - Trostle, Mark; Dayton, William A.; Morley, Darrel L.; and Miglia, David M., 394,232, Cl. D12-91.000.
- Morrish, David L., to McGuire, Martha L. Combined dispenser package with flat rolled product. 394,206, Cl. D9-417.000.
- Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, to Coleman Safety and Security Products, Inc. Thermostat. 394,219, Cl. D10-50.000.
- Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, to Coleman Safety and Security Products, Inc. Thermostat. 394,220, Cl. D10-50.000.
- Motorola, Inc.: *See—*
  - Arnone, Paul A., 394,251, Cl. D14-114.500.
  - Lohrding, Bradley K.; Michieli, Matthew R.; and Mitchell, Jay R., 394,256, Cl. D14-138.000.
- Mueller, Herbert W.: *See—*
  - Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
- Multi-Tech Systems, Inc.: *See—*
  - Maitra, Sidhartha, 394,250, Cl. D14-114.200.
- Nadar, Paul, to Royal Plastics Inc. Support bracket. 394,203, Cl. D8-381.000.
- Nadel, Craig P. Slipper. 394,137, Cl. D2-898.000.
- Namaizawa, Shigeru: *See—*
  - Nishimura, Shinichiro; Namaizawa, Shigeru; Taki, Toshiro; and Ishibashi, Kiyofumi, 394,223, Cl. D10-104.000.
- Napoleone, Nunzio; Coleman, Stephen A.; and DeSimone, Kendra J., to PictureTel Corporation. Integral videoconferencing system. 394,255, Cl. D14-124.000.
- National Molding Corp.: *See—*
  - Anscher, Joseph, 394,202, Cl. D8-367.000.
- Needham, Kelley S.: *See—*
  - Eddy, John W.; Needham, Kelley S.; and Harlan, Jeffrey L., 394,185, Cl. D7-392.000.
- Newell, Roger; and Carter, Tommy L., to E-Z Catch and Company. Rod holder surface mount bracket with swivel plate. 394,201, Cl. D8-356.000.
- Nike, Inc.: *See—*
  - Peschel, David K., 394,276, Cl. D16-315.000.
  - Schenone, David J., 394,147, Cl. D2-972.000.
- Nishimura, Shinichiro; Namaizawa, Shigeru; Taki, Toshiro; and Ishibashi, Kiyofumi, to Japan Radio Co., Ltd. Fish finder. 394,223, Cl. D10-104.000.
- Noda, Sukehisa: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- Nowicki, Sandra A. Animal type font. 394,278, Cl. D18-27.000.
- O'Brien, Kevin P. Spacer device for dispensing inhalant medication. 394,313, Cl. D24-110.000.
- Olson, Ogden R. Desk. 394,175, Cl. D6-495.000.
- O'Rourke, John J.: *See—*
  - Wachter, Peter F.; and O'Rourke, John J., 394,241, Cl. D13-110.000.
- Orrico, Mario; and Velazquez, Herb. Device for making heated beverages in a microwave oven. 394,187, Cl. D7-533.000.
- Palumbo, Lisa Mary. Combined suntan lotion distributor and cap therefor. 394,328, Cl. D28-7.000.
- Panossian, Raffy. Shelf unit. 394,179, Cl. D6-566.000.
- Parant, Pierre-Louis, to Surfbike Products Inc. Water floatable board. 394,294, Cl. D21-228.000.
- Park, Chong Hwan. Electric connector. 394,242, Cl. D13-146.000.
- Parmar, Sunita J., to Reebok International Ltd. Shoe upper. 394,144, Cl. D2-969.000.
- Paus, Michael J., to Universal Furniture Industries, Inc. Cabinet. 394,170, Cl. D6-436.000.
- Pen-Tab Industries, Inc.: *See—*
  - Hodes, Alan, 394,279, Cl. D19-26.000.
- Peschel, David K., to Nike, Inc. Eyewear lens front. 394,276, Cl. D16-315.000.
- Petrie, Aidan: *See—*
  - Hall, Stephen John; Petrie, Aidan; Lane, Stephen; and Mathews, John, 394,275, Cl. D16-303.000.
- PictureTel Corporation: *See—*
  - Napoleone, Nunzio; Coleman, Stephen A.; and DeSimone, Kendra J., 394,255, Cl. D14-124.000.
- Pierce, Ian, to Tromar Corporation. Background plate for a sports trophy. 394,231, Cl. D11-164.000.
- Play Industries, Inc.: *See—*
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,252, Cl. D14-115.000.
  - Dingman, Gerald A.; Dudley, James; Hartford, Stephen Andrew; Kaye, Daniel A.; Montgomery, Joseph Paul; and Moore, Michael Richard Young, 394,253, Cl. D14-115.000.
- Plogman, David, to GTC Properties, Inc. Clock. 394,213, Cl. D10-15.000.
- Precor Incorporated: *See—*
  - Birrell, James S., 394,282, Cl. D20-19.000.
- Price, Macille Rose. Liquid container with bath brush. 394,331, Cl. D28-63.000.
- Pucci, Joseph, to Hercules Products. Water ionizer. 394,303, Cl. D23-207.000.
- Quinlan, David: *See—*
  - Riley, Judith R.; and Quinlan, David, 394,215, Cl. D10-30.000.
- Rall, Matthew: *See—*
  - Egelja, Sinisa; Egelja, Amy; and Rall, Matthew, 394,146, Cl. D2-970.000.
- Rector, Frederick. Shower head valve. 394,310, Cl. D23-304.000.
- Reebok International Ltd.: *See—*
  - Parmar, Sunita J., 394,144, Cl. D2-969.000.
- Reynaert, Scott M.; and Davis, Brian T., to S. C. Johnson & Son, Inc. Container. 394,188, Cl. D7-584.000.
- Reynaert, Scott M.; and Davis, Brian T., to S. C. Johnson & Son, Inc. Container. 394,189, Cl. D7-584.000.
- Riat, William J., to Dominion Homes, Inc. Condominium facade. 394,318, Cl. D25-17.000.
- Richardson, Phil G. Portable ice skate blade sharpener. 394,196, Cl. D8-91.000.
- Richlin, Sidney. Pierced cap. 394,136, Cl. D2-866.000.
- Riley, Judith R.; and Quinlan, David, to Timex Corporation. Wristwatch case. 394,215, Cl. D10-30.000.
- Rockport Company, Inc., The: *See—*
  - Sink, Jeffrey A., 394,143, Cl. D2-960.000.
  - von Conta, Peter, 394,145, Cl. D2-969.000.
- Rossman, Jon R.; and Hotaling, Bryan R., to First Years Inc., The. Adjustable chair. 394,166, Cl. D6-367.000.
- Royal Plastics Inc.: *See—*
  - Nadar, Paul, 394,203, Cl. D8-381.000.
- Rozenwasser, Avraham Moshe: *See—*
  - Rozenwasser, David, 394,224, Cl. D11-13.000.
- Rozenwasser, David, to Rozenwasser, Avraham Moshe. Jewelry chain. 394,224, Cl. D11-13.000.
- Rubbermaid Incorporated: *See—*
  - Demore, Anthony, 394,184, Cl. D7-391.000.
- Rudich, George, Jr.: *See—*
  - Keto, Steven E.; Mueller, Herbert W.; Lechner, Thomas J.; Clark-Keller, Jennifer J.; Rudich, George, Jr.; and Hillmer, Robert E., 394,218, Cl. D10-50.000.
- Rutledge, Gary L., to Marrelli, John C. Combined storage and dispensing container. 394,208, Cl. D9-430.000.
- S. C. Johnson & Son, Inc.: *See—*
  - Reynaert, Scott M.; and Davis, Brian T., 394,188, Cl. D7-584.000.
  - Reynaert, Scott M.; and Davis, Brian T., 394,189, Cl. D7-584.000.
- Safrit, Donald E. Go-kart seat. 394,164, Cl. D6-356.000.

- Sakamoto, Harumi; and Iida, Koichi, to Sharp Kabushiki Kaisha. Remote controller for video projector. 394,264, Cl. D14-218.000.
- Salvas S.p.A.: *See—*
  - Maggi, Renzo, 394,293, Cl. D21-226.000.
- Samuels, Francis D.; Samuels, Raymond B.; and Fisher, Ralph L. Combination fishing rod holder, uitilitarian hook and beverage holder. 394,300, Cl. D22-148.000.
- Samuels, Raymond B.: *See—*
  - Samuels, Francis D.; Samuels, Raymond B.; and Fisher, Ralph L., 394,300, Cl. D22-148.000.
- Sandy Littman, Inc.: *See—*
  - Littman, Sandra E.; and Kaufman, Krina S., 394,326, Cl. D26-106.000.
- Sang, Daniel Lai Kong, to Timex Corp. Casing for a watch. 394,214, Cl. D10-30.000.
- Sano, Norifumi: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Sanyo Electric Co., Ltd.: *See—*
  - Arita, Toyomi; Uemura, Shigehiro; and Takada, Kazuo, 394,183, Cl. D7-384.000.
- Schenone, David J., to Nike, Inc. Portion of a shoe upper. 394,147, Cl. D2-972.000.
- Schild, Rolf: *See—*
  - Evans, Jarred; and Schild, Rolf, 394,268, Cl. D15-7.000.
- Seaman, John W.; Hulsebus, Randy K.; and DeLay, Daniel, to Bemis Manufacturing Company. Portable air purifier. 394,311, Cl. D23-364.000.
- Seddon, Edward T. Multiple compartment dispenser. 394,204, Cl. D9-341.000.
- Sedighzadeh, Marty M.; and Collins, Mary F. Sponge mitten. 394,330, Cl. D28-63.000.
- Sharp Kabushiki Kaisha: *See—*
  - Sakamoto, Harumi; and Iida, Koichi, 394,264, Cl. D14-218.000.
- Sherle Wagner International LLC: *See—*
  - Wagner, Sherle, 394,307, Cl. D23-285.000.
- Shibata, Yumio: *See—*
  - Yamamoto, Shoji; and Shibata, Yumio, 394,233, Cl. D12-110.000.
- Siat, Benoit, to Socomec (societe Anonyme). Fuse switch with handle. 394,243, Cl. D13-158.000.
- Siemens Medical Sysems, Inc.: *See—*
  - Kodama, Kelly L.; Elkins, Erich C.; and Haller, Jeffrey T., 394,316, Cl. D24-158.000.
- Siler, Buzz. Automated teller machine cassette lock. 394,198, Cl. D8-346.000.
- Sink, Jeffrey A., to Rockport Company, Inc., The. Shoe sole. 394,143, Cl. D2-960.000.
- Smith, David J., to Steere Enterprises. Ball holder. 394,154, Cl. D3-257.000.
- SmithKline Beecham Consumer Healthcare GmbH: *See—*
  - Krämer, Hans; and Halm, Hans, 394,158, Cl. D4-113.000.
- Socomec (societe Anonyme): *See—*
  - Siat, Benoit, 394,243, Cl. D13-158.000.
- Sommer, Karl L.: *See—*
  - Harris, Jack E.; Brumwell, Robert A.; Sommer, Karl L.; and Blake, Gerald L., 394,302, Cl. D23-202.000.
- Sony Corporation: *See—*
  - Kirihara, Kazushi; and Akita, Michio, 394,254, Cl. D14-121.000.
  - Takahashi, Kazuo; Yamamoto, Kazuyuki; Watanabe, Minoru; and Yamada, Takashi, 394,249, Cl. D14-114.000.
  - Waterbury, David H.; Denny, Stephen; and Distaso, Kimberly, 394,207, Cl. D9-415.000.
- Sony Electronics, Inc.: *See—*
  - Waterbury, David H.; Denny, Stephen; and Distaso, Kimberly, 394,207, Cl. D9-415.000.
- Sony Kabushiki Kaisha: *See—*
  - Ishii, Daisuke, 394,273, Cl. D16-202.000.
- Southpac Trust International, Inc.: *See—*
  - Weder, Donald E.; and Straeter, Joseph G., 394,230, Cl. D11-164.000.
- Southworth, Grant L. Golf hole flag pin. 394,295, Cl. D21-234.000.
- Sparham, Jon D.: *See—*
  - Cucheran, John S.; Sparham, Jon D.; and Aftanas, Jeffrey M., 394,240, Cl. D12-412.000.
- SRL, Inc.: *See—*
  - Loverin, Marc R., 394,140, Cl. D2-946.000.
- Stearns, David: *See—*
  - Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,219, Cl. D10-50.000.
  - Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,220, Cl. D10-50.000.
- Steere Enterprises: *See—*
  - Smith, David J., 394,154, Cl. D3-257.000.
- Steinke, Gustav J.; and Huffer, Starla D., to International Brake Industries, Inc. Disc brake shim. 394,235, Cl. D12-180.000.
- St-Pierre, Yvon; Dubeau, Andre; and Cyr, Roch, to Imperial Tobacco Limited. Cigarette pack display unit. 394,180, Cl. D6-571.000.
- Straeter, Joseph G.: *See—*
  - Weder, Donald E.; and Straeter, Joseph G., 394,230, Cl. D11-164.000.
- Strandell, Timothy B.; and Haack, Raymond R., to Manitowoc Foodservice Group, Inc. Ice machine. 394,270, Cl. D15-80.000.
- Sube, Minoru: *See—*
  - Ito, Masafumi; Sube, Minoru; Watanabe, Hiroyuki; and Iikura, Yukio, 394,260, Cl. D14-156.000.
- Sunaga, Kazuyuki: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Suncast Corporation: *See—*
  - Tisbo, Thomas A.; Anderson, Torrence; and Uffner, Michael G., 394,169, Cl. D6-434.000.
- Sunrich Manufactory Ltd.: *See—*
  - Hon, Chan Chung, 394,272, Cl. D16-135.000.
- Surfbike Products Inc.: *See—*
  - Parant, Pierre-Louis, 394,294, Cl. D21-228.000.
- Suunto Oy: *See—*
  - Vainio, Erkki; and Metsa-Ketela, Heikki, 394,222, Cl. D10-68.000.
- Suzuki, Shogo, to Kabushiki Kaisha Toshiba. Camera for electronic computers. 394,274, Cl. D16-202.000.
- Takada, Kazuo: *See—*
  - Arita, Toyomi; Uemura, Shigehiro; and Takada, Kazuo, 394,183, Cl. D7-384.000.
- Takagi, Yoshio: *See—*
  - Majumdar, Gorab; Mori, Satoshi; Noda, Sukehisa; Iwagami, Tooru; Takagi, Yoshio; and Kawafuji, Hisashi, 394,244, Cl. D13-182.000.
- Takahashi, Kazuo; Yamamoto, Kazuyuki; Watanabe, Minoru; and Yamada, Takashi, to Sony Corporation. Magnetic disc for computer. 394,249, Cl. D14-114.000.
- Takaoka, Norio; and Mitani, Kenichi, to Asics Corporation. Shoe sole. 394,141, Cl. D2-954.000.
- Taki, Toshiro: *See—*
  - Nishimura, Shinichiro; Namaizawa, Shigeru; Taki, Toshiro; and Ishibashi, Kiyofumi, 394,223, Cl. D10-104.000.
- Talent Toy Industries, Inc.: *See—*
  - Mann, Grant, 394,285, Cl. D21-62.000.
- Tatsumi, Yoshikazu: *See—*
  - Kubo, Jiro; Tatsumi, Yoshikazu; and Kitamura, Hideaki, 394,172, Cl. D6-474.000.
- Teac Corporation: *See—*
  - Ito, Masafumi; Sube, Minoru; Watanabe, Hiroyuki; and Iikura, Yukio, 394,260, Cl. D14-156.000.
- Tenex Corporation: *See—*
  - Cheris, Albert B.; and Dziersk, Mark, 394,280, Cl. D19-75.000.
- Thompson, Garry Owen, to Ausmark International Pty Ltd. Burner part. 394,312, Cl. D23-418.000.
- Timex Corp: *See—*
  - Sang, Daniel Lai Kong, 394,214, Cl. D10-30.000.
- Timex Corporation: *See—*
  - Riley, Judith R.; and Quinlan, David, 394,215, Cl. D10-30.000.
  - Toribio, Nimfa Barz, 394,216, Cl. D10-32.000.
- Tisbo, Thomas A.; Anderson, Torrence; and Uffner, Michael G., to Suncast Corporation. Storage locker. 394,169, Cl. D6-434.000.
- Topvision Technologies, Inc.: *See—*
  - Duan, Alex, 394,248, Cl. D14-113.000.
- Toribio, Nimfa Barz, to Timex Corp. Watch and bracelet. 394,216, Cl. D10-32.000.
- Trahan, Michael W. Alligator head hand puppet. 394,288, Cl. D21-153.000.
- Tressor TV Produktions GmbH: *See—*
  - Brodbeck, Stefan, 394,245, Cl. D14-150.000.
- Tromar Corporation: *See—*
  - Pierce, Ian, 394,231, Cl. D11-164.000.
- Trostle, Mark; Dayton, William A.; Morley, Darrel L.; and Miglia, David M., to Chrysler Corporation. Vehicle body. 394,232, Cl. D12-91.000.
- Truax, Clarence E. Survey marker. 394,221, Cl. D10-66.000.
- Tsui, Chi Fai, to Magnum Industries Limited. Photo/picture frame. 394,161, Cl. D6-310.000.
- Tsujino, Kanzo, to Asics Corporation. Knee pad. 394,332, Cl. D29-121.000.
- Tsujino, Kanzo, to ASICS Corporation. Knee pad. 394,333, Cl. D29-121.000.
- Tsukaguchi, Tamotsu: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Turner, Lance. Protective cover for a padlock. 394,149, Cl. D8-346.000.
- Uemura, Shigehiro: *See—*
  - Arita, Toyomi; Uemura, Shigehiro; and Takada, Kazuo, 394,183, Cl. D7-384.000.
- Uffner, Michael G.: *See—*
  - Tisbo, Thomas A.; Anderson, Torrence; and Uffner, Michael G., 394,169, Cl. D6-434.000.
- Ullmann, Roland, to Braun Aktiengesellschaft. Dry shaver. 394,329, Cl. D28-49.000.
- Unipath Limited: *See—*
  - Carp, Richard Nikolaas, 394,317, Cl. D24-223.000.
- Universal Furniture Industries, Inc.: *See—*
  - Paus, Michael J., 394,170, Cl. D6-436.000.
- Utsuki, Toshiyuki: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Vainio, Erkki; and Metsa-Ketela, Heikki, to Suunto Oy. Body for combination instrument. 394,222, Cl. D10-68.000.
- Van Deursen, Gary: *See—*
  - Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,219, Cl. D10-50.000.

- Morrow, James; Day, Brian; Stearns, David; and Van Deursen, Gary, 394,220, Cl. D10-50.000.
- Velazquez, Herb: *See—*
  - Orrico, Mario; and Velazquez, Herb, 394,187, Cl. D7-533.000.
- Verlengiere, Arthur R. Muffler. 394,236, Cl. D12-194.000.
- von Conta, Peter, to Rockport Company, Inc., The. Shoe upper. 394,145, Cl. D2-969.000.
- Vtech Communications Ltd.: *See—*
  - Ka Hung, Joseph Chan; and Chi-Kong, Pang, 394,257, Cl. D14-149.000.
- Wachter, Peter F.; and O'Rourke, John J., to Juno Lighting, Inc. Low profile transformer housing. 394,241, Cl. D13-110.000.
- Wagner, Sherle, to Sherle Wagner International LLC. Lavatory bowl. 394,307. Cl. D23-285.000.
- Watanabe, Hiroyuki: *See—*
  - Ito, Masafumi; Sube, Minoru; Watanabe, Hiroyuki; and Iikura, Yukio, 394,260, Cl. D14-156.000.
- Watanabe, Minoru: *See—*
  - Takahashi, Kazuo; Yamamoto, Kazuyuki; Watanabe, Minoru; and Yamada, Takashi, 394,249, Cl. D14-114.000.
- Waterbury, David H.; Denny, Stephen; and Distaso, Kimberly, to Sony Corporation; and Sony Electronics, Inc. Battery pack. 394,207, Cl. D9-415.000.
- Weaver, Douglas W.: *See—*
  - Kuzma, Gene J.; and Weaver, Douglas W., 394,211, Cl. D9-542.000.
- Weder, Donald E.; and Straeter, Joseph G., to Southpac Trust International, Inc. Flower pot cover. 394,230, Cl. D11-164.000.
- Wells, J. Stephen, to Hayes Microcomputer Products, Inc. Modem. 394,267, Cl. D14-242.000.
- West, Mark. Light fixture for mounting on a wall. 394,323, Cl. D26-63.000.
- Williams, Geoffrey T.: *See—*
  - Gogan, Donald M.; and Williams, Geoffrey T., 394,234, Cl. D12-114.000.
- Woerly, Michael. Animal ear fob. 394,227, Cl. D11-81.000.
- Woolrich, Peter. Disc holder. 394,182. Cl. 206-308.300
- Yamada, Takashi: *See—*
  - Takahashi, Kazuo; Yamamoto, Kazuyuki; Watanabe, Minoru; and Yamada, Takashi, 394,249. Cl. D14-114.000.
- Yamamoto, Kazuyuki: *See—*
  - Takahashi, Kazuo; Yamamoto, Kazuyuki; Watanabe, Minoru; and Yamada, Takashi, 394,249, Cl. D14-114.000.
- Yamamoto, Shoji; and Shibata, Yumio, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 394,233, Cl. D12-110.000.
- Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, to Hitachi, Ltd. Computer housing. 394,246, Cl. D14-102.000.
- Yarbrough, Denada A., to Greenleaf, Inc. Foldable easel. 394,160, Cl. D6-310.000.
- Yonezawa, Yutaka: *See—*
  - Yamamoto, Takashi; Utsuki, Toshiyuki; Kumagai, Kenta; Higashihara, Tohru; Yonezawa, Yutaka; Tsukaguchi, Tamotsu; Sunaga, Kazuyuki; Koizumi, Shigeru; and Sano, Norifumi, 394,246, Cl. D14-102.000.
- Zeller, Noel E. Portable cable lock. 394,197, Cl. D8-333.000.

LIST OF PLANT PATENTEES

- Ball Horticultural Company: *See—*
  - Trees, Scott C., 10,395, Cl. Plt.-87.120.
  - Trees, Scott C., 10,396, Cl. Plt.-87.120.
  - Trees, Scott C., 10,397, Cl. Plt.-87.120.
  - Trees, Scott C., 10,398, Cl. Plt.-87.120.
  - Trees, Scott C., 10,399, Cl. Plt.-87.120.
- Briggs Nursery, Inc.: *See—*
  - McCulloch, Steven M., 10,388, Cl. Plt.-55.000.
- Clearwater Nursery, Inc.: *See—*
  - Hesse, Peter S., 10,390, Cl. Plt.-74.100.
- Demeyer, Caroline: *See—*
  - Pieters, Luc; and Demeyer, Caroline, 10,400, Cl. Plt.-88.800.
- Exotic Plant: *See—*
  - Pieters, Luc; and Demeyer, Caroline, 10,400, Cl. Plt.-88.800.
- Gardner, Leith Marie: *See—*
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,385, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,386, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,387, Cl. Plt.-43.200.
- Glicenstein, Leon, to Yoder Brothers, Inc. Chrysanthemum plant named 'Traviata'. 10,391, Cl. Plt.-77.000.
- Hesse, Peter S., to Clearwater Nursery, Inc. Chrysanthemum plant named 'Raspberry Ice', 10,390, Cl. Plt.-74.100.
- McCulloch, Steven M., to Briggs Nursery, Inc. Rhododendron plant named 'Northern Starburst'. 10,388, Cl. Plt.-55.000.
- Pieters, Luc; and Demeyer, Caroline, to Exotic Plant. Vriesea plant named Apollo. 10,400, Cl. Plt.-88.800.
- Plate, Renate, to Wolfgang Bock, Pflanzenexport KG. Phalaenopsis orchid plant named 'Abylos'. 10,392, Cl. Plt.-87.300.
- Plate, Renate, to Wolfgang Bock Pflanzenexport KG. Doritaenopsis orchid plant named 'Aposya'. 10,393, Cl. Plt.-87.300.
- Plate, Renate, to Wolfgang Bock Pflanzenexport KG. Phalaenopsis orchid plant named 'Sylba'. 10,394, Cl. Plt.-87.300.
- Ranch, Paul Ecke: *See—*
  - Sorensen, Carl Aksel Kragh, 10,389, Cl. Plt.-68.100.
- Sorensen, Carl Aksel Kragh, to Ranch, Paul Ecke. Osteospermum plant named 'Cape Daisy Zulu'. 10,389, Cl. Plt.-68.100.
- Trees, Scott C., to Ball Horticultural Company. Geranium plant named 'Purple Rose'. 10,395, Cl. Plt.-87.120.
- Trees, Scott C., to Ball Horticultural Company. Geranium plant named 'Pink Passion'. 10,396, Cl. Plt.-87.120.
- Trees, Scott C., to Ball Horticultural Company. Geranium plant named 'BFP-1409 Light Salmon'. 10,397, Cl. Plt.-87.120.
- Trees, Scott C., to Ball Horticultural Company. Geranium plant named 'BFP-484 White'. 10,398, Cl. Plt.-87.120.
- Trees, Scott C., to Ball Horticultural Company. Geranium plant named 'BFP-1328 Red'. 10,399, Cl. Plt.-87.120.
- Wolfgang Bock, Pflanzenexport KG: *See—*
  - Plate, Renate, 10,392, Cl. Plt.-87.300.
  - Plate, Renate, 10,393, Cl. Plt.-87.300.
  - Plate, Renate, 10,394, Cl. Plt.-87.300.
- Yoder Brothers, Inc.: *See—*
  - Glicenstein, Leon, 10,391, Cl. Plt.-77.000.
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene. Plum tree "Joanna Red". 10,385, Cl. Plt.-38.100.
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene. Interspecific tree "Geo Pride". 10,386, Cl. Plt.-38.100.
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene. Peach tree 'Valley Sweet'. 10,387, Cl. Plt.-43.200.
- Zaiger, Gary Neil: *See—*
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,385, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,386, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,387, Cl. Plt.-43.200.
- Zaiger, Grant Gene: *See—*
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,385, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,386, Cl. Plt.-38.100.
  - Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,387, Cl. Plt.-43.200.

CLASSIFICATION OF PATENTS

ISSUED MAY 12, 1998

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

8	5,749,096
21	5,749,097
123	5,749,098
209	5,749,099
239	5,749,100
403	5,749,101

CLASS 4

237	5,749,103
239	5,749,104
295	5,749,105
431	5,749,102
541.1	5,749,106
	5,749,107

CLASS 5

264.1	5,749,108
423	5,749,109
493	5,749,110
652	5,749,111
663	5,749,112

CLASS 7

166	5,749,113

CLASS 8

102	5,749,923
137	5,749,924
436	5,749,925
524	5,749,926

CLASS 15

93.1	5,749,114
160	5,749,115
	5,749,116
245.1	5,749,117
250.07	5,749,118
250.19	5,749,119
339	5,749,120

CLASS 16

43	5,749,121
70	5,749,122
83	5,749,123
307	5,749,124
382	5,749,125

CLASS 19

102	5,749,126

CLASS 24

3.13	5,749,127
71 J	5,749,128
452	5,749,129
637	5,749,130

CLASS 26

89	5,749,131

CLASS 29

25.35	5,749,132
91.1	5,749,133
402.08	5,749,134
415	5,749,135
426.5	5,749,136
434	5,749,137
516	5,749,138
525	5,749,139
527.1	5,749,140
623.5	5,749,927
714	5,749,141
833	5,749,142
841	5,749,143
890.04 L	5,749,144

CLASS 30

114	5,749,145
134	5,749,146
	5,749,147
276	5,749,148

CLASS 33

1 F	5,749,149
361	5,749,150
370	5,749,151
381	5,749,152
474	5,749,153
563	5,749,154

CLASS 34

90	5,749,155
105	5,749,156
117	5,749,157
119	5,749,158
426	5,749,159
502	5,749,160
541	5,749,161
566	5,749,162
597	5,749,163
641	5,749,164

CLASS 37

104	RE. 35,788

CLASS 38

93	5,749,165

CLASS 42

70.11	5,749,166

CLASS 43

42.06	5,749,167
122	5,749,168

CLASS 44

358	5,749,928
387	5,749,929

CLASS 47

58	5,749,169
62	5,749,170
72	5,749,171

CLASS 49

127	5,749,172
349	5,749,173
352	5,749,174
368	5,749,175
502	5,749,176

CLASS 52

79.1	5,749,177
	5,749,178
127.2	5,749,179
154	5,749,180
169.14	5,749,182
169.6	5,749,181
201	5,749,183
204.1	5,749,184
223.13	5,749,185
235	5,749,282
236.3	5,749,186
241	5,749,187
263	5,749,188
298	5,749,189
302.1	5,749,190
405.1	5,749,191
489.1	5,749,192
506.06	5,749,193
	5,749,194
514	5,749,195
561	5,749,196
584.1	5,749,197
651.04	5,749,198
729.1	5,749,199
741.1	5,749,200

CLASS 53

281	5,749,201
399	5,749,202
432	5,749,203
471	5,749,204
542	5,749,205
556	5,749,206

CLASS 55

242	5,749,930

CLASS 56

10.2 A	5,749,207
10.3	5,749,208
17.2	5,749,209

CLASS 57

58.49	5,749,210
217	5,749,211
225	5,749,212
304	5,749,213
310	5,749,214
337	5,749,215
413	5,749,216

CLASS 60

39 23	5,749,217
39.31	5,749,218
39.36	5,749,219
39.75	5,749,220
274	5,749,221
	5,749,222
300	5,749,223
473	5,749,224
477	5,749,225
520	5,749,226
657	5,749,227
679	5,749,228
752	5,749,229

CLASS 62

5	5,749,231
50.1	5,749,232
50.2	5,749,233
94	5,749,230
125	5,749,234
160	5,749,235
186	5,749,236
209	5,749,237
211	5,749,238
225	5,749,239
250	5,749,240
340	5,749,241
347	5,749,242
434	5,749,243
476	5,749,244
623	5,749,245
654	5,749,246

CLASS 65

60.1	5,749,931
135.7	5,749,932
511	5,749,933

CLASS 66

198	5,749,247

CLASS 68

4	5,749,248
15	5,749,249
171	5,749,250

CLASS 70

30	5,749,251
276	5,749,252
278	5,749,253

CLASS 71

24	5,749,934
62	5,749,935
64.05	5,749,936

CLASS 72

60	5,749,254
150	5,749,255
333	5,749,256
354.6	5,749,257
467	5,749,258

CLASS 73

1.33	5,750,877
1.79	5,750,878
9	5,750,879
31.02	5,750,880
37	5,750,881
38	5,750,882
53.01	5,750,883
54.24	5,750,884
117.3	5,750,886
	5,750,887
118.1	5,750,888
118.2	5,750,889
146	5,750,890
159	5,749,259
178 H	5,750,891
202	5,750,892
204.11	5,750,893
581	5,750,894
614	5,750,895
622	5,750,896
663	5,750,897
727	5,750,898
756	5,750,899
779	5,750,900
800	5,750,901
861.12	5,750,902
861.48	5,750,903
862.623	5,750,904
863	5,750,905
863.73	5,750,906
865.8	5,750,907
865.9	5,750,908
866	5,750,909

CLASS 74

18.1	5,749,261
44	5,749,262
331	5,749,263
335	5,749,264
459	5,749,265
	5,749,266
467	5,749,267
473 R	5,749,268
574	5,749,269

CLASS 75

10.19	5,749,937
332	5,749,938
560	5,749,939
711	5,749,940

CLASS 81

9.4	5,749,270
60	5,749,271
62	5,749,272

CLASS 82

1.11	5,749,273
	5,749,274

CLASS 83

24	5,749,275
76.9	5,749,276
563	5,749,277
588	5,749,278
639.1	5,749,279

CLASS 84

314 N	5,750,910
602	5,750,911
609	5,750,912
625	5,750,913
626	5,750,914

CLASS 87

48	5,749,280
56	5,749,281

CLASS 89

1.8	5,750,915
33.17	5,750,916

CLASS 95

44	5,749,941
46	5,749,942
50	5,749,943
150	5,749,944
248	5,749,945

CLASS 99

339	5,749,283
340	5,749,284
348	5,749,285
413	5,749,286
458	5,749,287
483	5,749,288
625	RE. 35,789

CLASS 100

88	5,749,289
207	5,749,290

CLASS 101

91	5,749,291
129	5,749,292
157	5,749,293
232	5,749,294
350.1	5,749,295
410	5,749,296
415.1	5,749,297
	5,749,298
483	5,749,299
488	5,749,300

CLASS 102

476	5,750,917
502	5,750,918
532	5,750,919

CLASS 105

199.3	5,749,301
397	5,749,302
404	5,749,303

CLASS 106

14.17	5,749,946
14.42	5,749,947
18.15	5,749,948
31.27	5,749,951
31.64	5,749,952
273.1	5,749,953
282	5,749,954
287.17	5,749,955
287.28	5,749,956
313	5,749,949
316	5,749,950
403	5,749,957
416	5,749,958
428	5,749,959
600	5,749,960
672	5,749,961
714	5,749,962
724	5,749,963
805	5,749,964

CLASS 108

20	5,749,304
44	5,749,305
	5,749,306

CLASS 110

222	5,749,307
344	5,749,308
346	5,749,309

CLASS 111

200	5,749,310

CLASS 112

240	5,749,311

CLASS 114

21.2	5,749,312
48	5,749,313

CLASS 117

79	5,749,966
200	5,749,967

CLASS 118

300	5,749,968
319	5,749,969
320	5,749,970
407	5,749,971
414	5,749,972
626	5,749,973
725	5,749,974

CLASS 119

28.5	5,749,314
52.1	5,749,315
57.8	5,749,316
166	5,749,317
	5,749,318
244	5,749,319
253	5,749,320
458	5,749,321
509	5,749,322
530	5,749,323
719	5,749,324
792	5,749,325
798	5,749,326

CLASS 122

13.1	5,749,327
31.1	5,749,328

CLASS 123

41.1	5,749,330
41.14	5,749,329
56.2	5,749,337
73 A	5,749,338
73 AD	5,749,339
90.16	5,749,340
90.35	5,749,341
184.56	5,749,342
193.2	5,749,331
295	5,749,333
305	5,749,334
337	5,749,335
	5,749,336
350	5,749,343
399	5,749,344
456	5,749,345
486	5,749,346
516	5,749,347
520	5,749,349
571	5,749,350

CLASS 124

25	5,749,348
25.6	5,749,351
87	5,749,352

CLASS 125

20	5,749,353

CLASS 126

25 R	5,749,354
110 R	5,749,355
359	5,749,356

CLASS 128

200.26	5,749,357
205.23	5,749,358
205.25	5,749,359
207.14	5,749,360
653.1	5,749,361
	5,749,362
661.03	5,749,363
662.02	5,749,364
671	5,749,365
690	5,749,366
696	5,749,367
725	5,749,368
734	5,749,369
772	5,749,370
	5,749,371
782	5,749,372
864	5,749,373
870	5,749,374
898	5,749,375
	5,749,376

CLASS 131

70	5,749,378

CLASS 132

73.5	5,749,377
200	5,749,379
216	5,749,380
275	5,749,382
309	5,749,381

CLASS 134

1.3	5,749,975
22.12	5,749,976
40	5,749,977
56 R	5,749,383
167 R	5,749,384
199	5,749,385

CLASS 135

16	5,749,386
146	5,749,387

CLASS 137

1	5,749,388
15	5,749,389
106	5,749,390
204	5,749,391
231	5,749,392
454.2	5,749,393
533.15	5,749,394
596.16	5,749,395

CLASS 138

26	5,749,396
89	5,749,397
113	5,749,398
155	5,749,399

CLASS 139

421	5,749,400

CLASS 141

80	5,749,401
83	5,749,402
276	5,749,403

CLASS 148

216	5,749,978
430	5,749,979
525	5,749,980
595	5,749,981

CLASS 149

11	5,750,920
19.92	5,750,921
24	5,750,922

CLASS 152

158	5,749,982
209 R	5,749,983
415	5,749,984

CLASS 156

64	5,749,985
	5,749,986
	5,749,987
94	5,749,988
160	5,749,989
187	5,749,990
	5,749,991
212	5,749,992
214	5,749,993
230	5,749,994
242	5,749,995
244.24	5,749,996
249	5,749,997
265	5,749,998
285	5,749,999
303.1	5,750,001
313	5,750,002
345	5,750,003
360	5,750,004
630.1	5,750,000

CLASS 160

84.04	5,749,404
168.1 R	5,749,405
176.1 V	5,749,406
229.1	5,749,407

CLASS 162

72	5,750,005
181.5	5,750,006

CLASS 164

4.1	5,749,408
23	5,749,409
113	5,749,410
244	5,749,411

CLASS 165

67	5,749,412
80.1	5,749,413
178	5,749,414
297	5,749,415

CLASS 166

68.5	5,749,416
254.2	5,749,417
292	5,749,418
387	5,749,419

CLASS 169

54	5,749,420

CLASS 173

162.2	5,749,421

CLASS 174

35 R	5,750,923
50	5,750,924
52.1	5,750,925
52.3	5,750,926
68.3	5,750,927
84 R	5,750,928
88 C	5,750,929
102 R	5,750,930
110 PM	5,750,931
113 R	5,750,932
135	5,750,933
	5,750,934
138 G	5,750,935
	5,750,936

CLASS 175

71	5,749,422

CLASS 177

25.11	5,750,937
50	5,750,938

CLASS 178

18	5,750,939
	5,750,940
19	5,750,941

CLASS 180

9.54	5,749,423
19.2	5,749,424
69.2	5,749,425
167	5,749,426
179	5,749,427
197	5,749,428
205	5,749,429
422	5,749,431
443	5,749,432

CLASS 181

141	5,750,942
152	5,750,943
156	5,749,433
290	5,750,944

CLASS 182

45	5,749,434
127	5,749,436
129	5,749,437
138	5,749,438

CLASS 184

6.12	5,749,439
102	5,749,440

CLASS 187

249	5,749,441
272	5,749,442
292	5,750,945
384	5,749,443
392	5,750,946
409	5,749,444

CLASS 188

73.45	5,749,445

CLASS 190

107	5,749,446
112	5,749,447

CLASS 192

4 A	5,749,448
41 S	5,749,449
70.25	5,749,451

CLASS 198

301	5,749,452
400	5,749,453
441	5,749,631
464.4	5,749,454
626.5	5,749,455
	5,749,456

CLASS 200

6 R	5,750,947
38 R	5,750,948
343	5,749,457
541	5,749,458
559	5,749,459

CLASS 203

3	5,750,007
43	5,750,008
64	5,750,009

CLASS 204

157.94	5,750,010
164	5,750,011
192.12	5,750,012
192.14	5,750,013
224 R	5,750,014
454	5,750,015

CLASS 205

50	5,750,016
102	5,750,017
295	5,750,018
563	5,750,019

CLASS 206

245	5,749,461
268	5,749,462
308.1	5,749,463
	5,749,464
361	5,749,465
387.1	5,749,466
445	5,749,467
455	5,749,468
710	5,749,469

CLASS 208

113	5,750,020

CLASS 209

2	5,749,470
314	5,749,471
458	5,749,472
584	5,749,473

CLASS 210

86	5,750,021
169	5,750,022
	5,750,023
315	5,750,024
361	5,750,025
502.1	5,750,026
511	5,750,027
618	5,750,028
634	5,750,029
679	5,750,030
681	5,750,031
688	5,750,032
705	5,750,034
711	5,750,033
719	5,750,035
747	5,750,036
750	5,750,037
777	5,750,038
782	5,750,039
787	5,750,040
795	5,750,041

CLASS 211

18	5,749,474
24	5,749,475
26	5,749,476
40	5,749,477
59.2	5,749,478
113	5,749,479
169.1	5,749,480
191	5,749,481
	5,749,482

CLASS 215

11.4	5,749,483
219	5,749,484

CLASS 218

43	5,750,949
154	5,750,950

CLASS 219

69.18	5,750,951
89	5,750,952
90	5,750,953
121.45	5,750,954
121.46	5,750,955
121.71	5,750,956
130.01	5,750,957
267	5,750,958
494	5,750,960
497	5,750,961
	5,750,963
528	5,750,962
535	5,750,964
692	5,750,966
735	5,750,967
736	5,750,968
742	5,750,969
765	5,750,970
769	5,750,971

CLASS 220

4.12	5,749,485
23.83	5,749,460
23.86	5,749,486
86.2	5,749,487
269	5,749,488
465	5,749,489
481	5,749,490
719	5,749,491

CLASS 221

1	5,749,492

CLASS 222

105	5,749,493
129.1	5,749,494
134	5,749,495
153.14	5,749,496
181.2	5,749,497
192	5,749,498
327	5,749,499
377	5,749,500
384	5,749,501
401	5,749,502

CLASS 224

153	5,749,503
221	5,749,504
401	5,750,120
482	5,749,505
501	5,749,506
587	5,749,507

CLASS 227

7	5,749,508
10	5,749,509

CLASS 228

122.1	5,749,510
212	5,749,511

CLASS 229

199	5,749,512
	5,749,513
400	5,749,514

CLASS 235

379	5,750,972
441	5,750,973
454	5,750,974
472	5,750,975
	5,750,976
	5,750,977

CLASS 236

34.5	5,749,515

CLASS 237

2 A	5,749,516

CLASS 239

14.2	5,749,517
17	5,749,518
44	5,749,519
	5,749,520
64	5,749,521
71	5,749,522
119	5,749,528
233	5,749,523
240	5,749,524
284.1	5,749,525
307	5,749,526
585.3	5,749,527
690	5,749,529

CLASS 241

27	5,749,530

CLASS 242

131.1	5,749,531
287	5,749,533
288	5,749,534
371	5,749,535
374	5,749,536
439.5	5,749,537
559.2	5,749,538
598.3	5,749,539

CLASS 244

17.13	5,749,540
53 B	5,749,542
118.1	5,749,543
164	5,749,545
215	5,749,546

CLASS 246

4	5,749,547

CLASS 248

49	5,749,548
168	5,749,549
188.2	5,749,550
205.1	5,749,551
205.8	5,749,552
298.1	5,749,553
311.2	5,749,554
346	5,749,555
349.1	5,749,556
405	5,749,557
475.1	5,749,558

CLASS 250

214 AG	5,750,980
214 R	5,750,981
216	5,750,978
223 R	5,750,979
226	5,750,982
231.13	5,750,983
231.16	5,750,984
234	5,750,985
235	5,750,986
251	5,750,987
282	5,750,993
288	5,750,988
306	5,750,989
307	5,750,990
339.11	5,750,994
339.12	5,750,995
341.2	5,750,996
341.8	5,750,997
343	5,750,998
	5,750,999
363.03	5,750,991
	5,751,000
370.06	5,751,005
372	5,750,992
484.4	5,751,001
492.21	5,751,002
	5,751,003
492.23	5,751,004
495.1	5,751,006
504 R	5,751,007
	5,751,008
551	5,751,009
559.33	5,751,011

CLASS 251

30.03	5,749,559
61.5	5,749,563
214	5,749,560
229	5,749,561
367	5,749,562

CLASS 252

2	5,750,043
62.54	5,750,044
62.56	5,750,045
68	5,750,046
70	5,750,047
71	5,750,048
299.01	5,750,049
299.62	5,750,050
299.65	5,750,051
321	5,750,052
389.52	5,750,053
500	5,750,054

CLASS 254

28	5,749,564
134.4	5,749,565

CLASS 257

5	5,751,012
13	5,751,013
25	5,751,014
48	5,751,015
50	5,751,016
57	5,751,017
64	5,751,018
68	5,751,019
72	5,751,020
103	5,751,021
133	5,751,022
138	5,751,023
139	5,751,024
173	5,751,025
190	5,751,026
192	5,751,027
	5,751,028
194	5,751,029
	5,751,030
208	5,751,031
233	5,751,032
270	5,751,033
295	5,751,034
300	5,751,035
315	5,751,036
	5,751,037
316	5,751,038
	5,751,039
332	5,751,040
357	5,751,041
360	5,751,042
380	5,751,043
	5,751,044
392	5,751,045
	5,751,046
394	5,751,047
412	5,751,048
440	5,751,049
538	5,751,050
546	5,751,051
577	5,751,052
592	5,751,053
603	5,751,054
618	5,751,055
666	5,751,056
691	5,751,057
692	5,751,058
701	5,751,059
702	5,751,060
707	5,751,061
722	5,751,062
723	5,751,063
752	5,751,064
758	5,751,065
759	5,751,066
764	5,751,067
774	5,751,068

CLASS 260

665 R	5,750,055

CLASS 261

37	5,750,056

CLASS 264

3.2	5,750,057
29.6	5,750,058
39	5,750,059
40.5	5,750,060
117	5,750,061
154	5,750,062
172.15	5,750,063
204	5,750,064
344	5,750,065
510	5,750,066
515	5,750,067
572	5,750,068

CLASS 267

64.23	5,749,566

CLASS 269

465	5,750,959

CLASS 270

7	5,749,567

CLASS 271

9.01	5,749,568
10.11	5,749,569
10.13	5,749,570
213	5,749,571
268	5,749,572
293	5,749,573

CLASS 273

73 J	5,749,574
113	5,749,575
138.1	5,749,576
148 B	5,749,577
148 R	5,749,578
237	5,749,579
243	5,749,580
244	5,749,581
246	5,749,582
261	5,749,583

CLASS 277

53	5,749,584
116.2	5,749,585
608	5,749,586

CLASS 280

47.27	5,749,587
	5,749,588
47.34	5,749,589
276	5,749,590
284	5,749,591
292	5,749,592
476.1	5,749,593
661	5,749,594
688	5,749,595
689	5,749,596
728.2	5,749,597
	5,749,598
748	5,749,599
751	5,749,600
805	5,749,601

CLASS 283

71	RE. 35,791

CLASS 285

23	5,749,603
39	5,749,604
48	5,749,605
61	5,749,602
86	5,749,606
93	5,749,607
123.12	5,749,608
226	5,749,609

CLASS 290

40 C	5,751,069
46	5,751,070

CLASS 292

327	5,749,610
336.3	5,749,611
347	5,749,612

CLASS 294

58	5,749,613
64.1	5,749,614

CLASS 296

26	5,749,615
37.6	5,749,616
107	5,749,617
	5,749,619
180.1	5,749,620
219	5,749,621
978	5,749,618

CLASS 297

195.1	5,749,622
281	5,749,623
367	5,749,624
	5,749,625
	5,749,626
370	5,749,627
411.36	5,749,628
	5,749,629

CLASS 298

18	5,749,630

CLASS 303

113.1	5,749,633

CLASS 305

42	5,749,634
190	5,749,635

CLASS 307

10.1	5,751,071
10.4	5,751,072
10.5	5,751,073
118	5,751,074

CLASS 310

12	5,751,075
	5,751,076
	5,751,077
36	5,751,078
59	5,751,079
67 R	5,751,080
72	5,751,082
80	5,751,083
83	5,751,081
90	5,751,084
	5,751,085
112	5,751,086
179	5,751,087
239	5,751,088
266	5,751,089
328	5,751,090
339	5,751,091
359	5,751,092
369	5,751,093

CLASS 312

201	5,749,636
223.2	5,749,637

CLASS 313

2.1	5,751,094
113	5,751,095
141	5,751,096
310	5,751,097
402	5,751,098
405	5,751,101
412	5,751,099
414	5,751,100
461	5,749,638
466	5,751,102
477 R	5,751,103
493	5,751,104
	5,751,105
495	5,751,106
496	5,751,107
503	5,751,108
542	5,751,109
550	5,751,110
606	5,751,111

CLASS 315

8	5,751,112
111.21	5,751,113
225	5,751,115
240	5,751,116
244	5,751,117
291	5,751,118
	5,751,119
307	5,751,120
	5,751,121
368.16	5,751,122

CLASS 318

34	5,751,123
139	5,751,124
280	5,751,125
362	5,751,126
370	5,751,127
439	5,751,128
467	5,751,129
575	5,751,130
778	5,751,131
798	5,751,132

CLASS 320

13	5,751,133
21	5,751,134
107	5,751,135
150	5,751,136

CLASS 322

14	5,751,137

CLASS 323

207	5,751,138
222	5,751,139
282	5,751,140
312	5,751,141
316	5,751,142

CLASS 324

96	5,751,143
127	5,751,284
240	5,751,144
309	5,751,145
318	5,751,146
399	5,751,147
501	5,751,148
533	5,751,149
537	5,751,150
	5,751,151
628	5,751,152
638	5,751,153
661	5,751,154
678	5,751,155
699	5,751,156
758	5,751,157
763	5,751,158
767	5,751,159

CLASS 326

27	5,751,160
30	5,751,161
37	5,751,162
38	5,751,163
	5,751,164
47	5,751,165
71	5,751,166
73	5,751,167
83	5,751,168
126	5,751,169

CLASS 327

57	5,751,170
110	5,751,171
113	5,751,172
170	5,751,173
199	5,751,174
291	5,751,175
295	5,751,176
333	5,751,177
	5,751,178
379	5,751,179
	5,751,180
434	5,751,181
539	5,751,182
542	5,751,183
552	5,751,184
558	5,751,185
562	5,751,186

CLASS 329

304	5,751,187
323	5,751,188

CLASS 330

9	5,751,189
54	5,751,190
125	5,751,191
293	5,751,192

CLASS 331

3	5,751,193
17	5,751,194
	5,751,195
47	5,751,196
107 A	5,751,197

CLASS 332

100	5,751,198

CLASS 333

134	5,751,199
197	5,751,200
219	5,751,201

CLASS 335

296	5,751,202

CLASS 336

65	5,751,203
98	5,751,204
178	5,751,205
192	5,751,206
233	5,751,207

CLASS 337

198	5,751,208

CLASS 340

286.05	5,751,209
293	5,751,210
435	5,751,211
468	5,751,212
572	5,751,213
573	5,751,214
584	5,751,215
630	5,751,216
636	5,751,217
693	5,751,218
815.4	5,751,219
825.05	5,751,222
825.21	5,751,220
825.22	5,751,224
825.35	5,751,221
825.54	5,751,223
928	5,751,227
933	5,750,069
941	5,751,225
947	5,751,226
988	5,751,228

CLASS 341

5	5,751,229
10	5,751,230
59	5,751,231
63	5,751,232
67	5,751,233
139	5,751,234
140	5,751,235
155	5,751,236
176	5,751,237

CLASS 342

5	5,751,238
68	5,751,239
70	5,751,240
104	5,751,241
158	5,751,242
179	5,751,243
357	5,751,244
	5,751,245
	5,751,246
359	5,751,247
368	5,751,248
372	5,751,249
373	5,751,250

CLASS 343

715	5,751,251
726	5,751,252
749	5,751,253
761	5,751,254
866	5,751,255
873	5,751,256

CLASS 345

2	5,751,257
7	5,751,258
8	5,751,259
	5,751,260
55	5,751,261
75	5,751,262
82	5,751,263
85	5,751,264
88	5,751,265
96	5,751,266
	5,751,267
107	5,751,268
108	5,751,269
118	5,751,270
146	5,751,271
149	5,751,272
156	5,751,273
157	5,751,274
167	5,751,275
178	5,751,276
182.02	5,751,934
200	5,751,277
211	5,751,278
212	5,751,279
302	5,751,280
	5,751,281
327	5,751,282
342	5,751,283
348	5,751,286
349	5,751,285
351	5,751,287
357	5,751,288
419	5,751,289
421	5,751,290
422	5,751,291
430	5,751,292
	5,751,293
440	5,751,294
501	5,751,295
520	5,751,296

CLASS 346

136	5,751,297
	5,751,298

CLASS 347

2	5,751,299
6	5,751,300
8	5,751,301
9	5,751,302
16	5,751,303
17	5,751,304
19	5,751,305
22	5,751,306
33	5,751,307
	5,751,308
43	5,751,310
	5,751,311
	5,751,312
45	5,751,313
55	5,751,314
63	5,751,315
	5,751,316
65	5,751,317
68	5,751,318
85	5,751,319
	5,751,320
	5,751,321
86	5,751,322
87	5,751,323
	5,751,324
96	5,751,325
115	5,751,326
130	5,751,327
	5,751,328
156	5,751,329
171	5,751,330
217	5,751,331
238	B1 477,259
240	5,751,332
247	5,751,333
262	5,751,334

CLASS 348

5.5	5,751,335
7	5,751,336
15	5,751,337
17	5,751,338
	5,751,339
65	5,751,340
	5,751,341
92	5,751,342
96	5,751,343
113	5,751,344
153	5,751,345
	5,751,346
181	5,751,347
220	5,751,348
228	5,751,349
231	5,751,350
239	5,751,351
335	5,751,353
349	5,751,354
364	5,751,352
375	5,751,355
390	5,751,356
400	5,751,357
405	5,751,358
	5,751,359
409	5,751,360
	5,751,361
416	5,751,362
	5,751,363
	5,751,364
	5,751,365
480	5,751,366
511	5,751,367
512	5,751,368
552	5,751,369
556	5,751,370
564	5,751,371
569	5,751,372
	5,751,373
571	5,751,374
	5,751,375
579	5,751,376
586	5,751,377
700	5,751,378
759	5,751,379

CLASS 349

1	5,751,380
12	5,751,382
13	5,751,383
18	5,751,384
42	5,751,381
61	5,751,385
65	5,751,386
95	5,751,387
96	5,751,388
97	5,751,389
120	5,751,390
153	5,751,391
187	5,751,392

CLASS 351

63	5,751,393
118	5,751,394
221	5,751,395
	5,751,396

CLASS 352

86	5,751,397
236	5,751,398

CLASS 353

51	5,749,640
81	5,749,641
98	5,749,642
120	5,751,399

CLASS 354

159	5,751,400

CLASS 355

32	5,751,401
40	5,751,402
53	5,751,403
	5,751,404
269	5,751,405
800	5,752,062

CLASS 356

3.03	5,751,406
3.05	5,751,407
3.14	5,751,409
5.14	5,751,408
28	5,751,410
71	5,751,412
73.1	5,751,413
237	5,751,414
301	5,751,415
311	5,751,416
318	5,751,417
319	5,751,418
321	5,751,419
328	5,751,420
	5,751,421
337	5,751,422
338	5,751,423
342	5,751,424
350	5,751,425
356	5,751,426
358	5,751,427
401	5,751,428
419	5,751,429
446	5,751,443

CLASS 358

296	5,751,430
	5,751,431
	5,751,432
298	5,751,433
	5,751,434
	5,751,470
299	5,751,435
	5,751,436
300	5,751,437
403	5,751,438
426	5,751,445
434	5,751,440
435	5,751,441
442	5,751,442
471	5,751,444
474	5,751,446
487	5,751,447
498	5,751,448
501	5,751,449
504	5,751,450
527	5,751,451

CLASS 359

52	5,751,452
60	5,751,453
119	5,751,454
126	5,751,455
127	5,751,456
173	5,751,458
197	5,751,459
198	5,751,460
201	5,751,461
204	5,751,462
205	5,751,463
208	5,751,464
213	5,751,465
248	5,751,466
272	5,751,467
282	5,751,468
291	5,751,469
319	5,751,471
330	5,751,472
356	5,751,473
360	5,751,474
387	5,751,475
411	5,751,476
447	5,751,477
453	5,751,478
464	5,751,479
485	5,751,480
	5,751,481
487	5,751,482
502	5,751,483
512	5,751,484
557	5,751,485
	5,751,486
589	5,751,487
601	5,751,488
603	5,751,489
605	5,751,490
618	5,751,491
619	5,751,492
630	5,751,493
631	5,751,494
644	5,751,495
677	5,751,496
687	5,751,497
692	5,751,498
699	5,751,499
740	5,751,500
819	5,751,501
823	5,751,502
846	5,751,503

CLASS 360

19.1	5,751,504
48	5,751,505
51	5,751,506
67	5,751,510
70	5,751,509
73.11	5,751,511
78.04	5,751,512
78.07	5,751,513
97.01	5,751,508
	5,751,514
98.07	RE. 35,792
103	5,751,515
	5,751,516
	5,751,517
104	5,751,518
106	5,751,519
107	5,751,520
113	5,751,521
	5,751,522
	5,751,526
122	5,751,527
126	5,751,528
128	5,751,529

CLASS 361

42	5,751,523
	5,751,524
56	5,751,507
	5,751,525
	5,751,530
	5,751,531
94	5,751,532
119	5,751,533
	5,751,534
143	5,751,535
191	5,751,536
234	5,751,537
	5,751,538
302	5,751,539
321.4	5,751,540
525	5,751,541
623	5,751,542
641	5,751,543
681	5,751,544
683	5,751,545
686	5,751,546
	5,751,547
	5,751,548
687	5,751,549
695	5,751,550
707	5,751,552
749	5,751,553
753	5,751,551
760	5,751,554
763	5,751,555
773	5,751,556
777	5,751,557
801	5,751,558
802	5,751,559

CLASS 362

146	5,749,643
198	5,749,644
205	5,749,645
231	5,749,646
248	5,749,647
353	5,749,648

CLASS 363

18	5,751,560
21	5,751,561
35	5,751,563
37	5,751,564
41	5,751,565
71	5,751,566
89	5,751,567
95	5,751,568

CLASS 364

132	5,751,569
	5,751,572
140	5,751,570
148	5,751,571
167.01	5,751,573
187	5,751,574
188	5,751,575
	5,751,576
191	5,751,577
426.015	5,751,579
453	5,751,578
468.07	5,751,580
468.16	5,751,582
468.22	5,751,581
470.08	5,751,583
474.03	5,751,585
474.11	5,751,586
474.2	5,751,584
474.24	5,751,587
474.28	5,751,588
474.35	5,751,589
479.03	5,751,590
483	RE. 35,793
488	5,751,591
	5,751,592
	5,751,593
490	5,751,594
	5,751,595
491	5,751,596
	5,751,597
492	5,751,603
494	5,751,604
496	5,751,605
500	5,751,598
505	5,751,599

524	5,751,600
526	5,751,601
557	5,751,602
558	5,751,606
563	5,751,608
565	5,751,609
571.03	5,751,610
573	5,751,611
578	5,751,607
	5,751,612
	5,751,613
716.02	5,751,614
724.1	5,751,615
725.02	5,751,616
734	5,751,617
736.01	5,751,618
736.02	5,751,619
746.1	5,751,620
748.07	5,751,621
757	5,751,622
781	5,751,623
841	5,751,624

CLASS 365

145	5,751,625
	5,751,626
	5,751,627
	5,751,628
151	5,751,629
154	5,751,630
156	5,751,640
185.01	5,751,631
185.03	5,751,632
185.09	5,751,633
185.17	5,751,634
185.19	5,751,635
185.33	5,751,637
189.04	5,751,638
189.05	5,751,641
189.06	5,751,642
189.11	5,751,643
189.29	5,751,636
194	5,751,644
	5,751,645
200	5,751,646
	5,751,647
205	5,751,648
	5,751,649
210	5,751,650
226	5,751,639
	5,751,651
	5,751,652
230.06	5,751,653
	5,751,654
233	5,751,655
233.5	5,751,656
238.5	5,751,657

CLASS 366

76.4	5,749,649
176.2	5,749,650
181.5	5,749,651
209	5,749,652
256	5,749,653

CLASS 367

98	5,751,658
158	5,751,659

CLASS 368

10	5,751,660
	5,751,661
67	5,751,662
77	5,751,663
112	5,751,664
120	5,751,665
140	5,751,666
223	5,751,667
290	5,751,668

CLASS 369

13	5,751,669
	5,751,670
14	5,751,671
30	5,751,672
32	5,751,673
44.27	5,751,675
44.35	5,751,674
50	5,751,676
54	5,751,677
84	5,751,678
103	5,751,679
109	5,751,680
112	5,751,681
	5,751,682
126	5,751,683
	5,751,684
	5,751,685
	5,751,686
202	5,751,687
270	5,751,688
275.3	5,751,689
	5,751,690

CLASS 370

17	5,751,691
85.1	5,751,692
95.1	5,751,693
109	5,751,694
218	5,751,695
223	5,751,696
229	5,751,697
252	5,751,698
258	5,751,699
263	5,751,700
281	5,751,701
314	5,751,702
321	5,751,703
335	5,751,704
	5,751,705
352	5,751,706
384	5,751,707
389	5,751,708
395	5,751,709
423	5,751,710
431	5,751,711
	5,751,712
445	5,751,713
452	5,751,714
455	5,751,715
466	5,751,717
468	5,751,716
	5,751,718
473	5,751,719
503	5,751,720
509	5,751,721
522	5,751,722
528	5,751,723
536	5,751,724

CLASS 371

5.5	5,751,725
6	5,751,726
21.1	5,751,727
	5,751,729
21.2	5,751,728
22.31	5,751,736
22.32	5,751,737
22.5	5,751,735
27.7	5,751,738
30	5,751,739
37.01	5,751,731
37.1	5,751,740
37.11	5,751,732
37.4	5,751,730
37.7	5,751,741
40.18	5,751,742
40.3	5,751,733
41	5,751,743
43.4	5,751,734
49.1	5,751,744
51.1	5,751,745
67.1	5,751,746

CLASS 372

2	5,751,747
31	5,751,748
32	5,751,749
34	5,751,750
41	5,751,751
45	5,751,752
	5,751,753
46	5,751,754
	5,751,756
50	5,751,757
96	5,751,758

CLASS 373

123	5,751,759

CLASS 374

32	5,749,654
185	5,749,656

CLASS 375

200	5,751,761
	5,751,762
	5,751,763
219	5,751,764
	5,751,765
222	5,751,114
224	5,751,766
	5,751,767
234	5,751,768
235	5,751,769
238	5,751,770
240	5,751,771
316	5,751,772
346	5,751,773
367	5,751,774
371	5,751,775
	5,751,776
376	5,751,777

CLASS 376

260	5,751,778

CLASS 377

60	5,751,779

CLASS 378

35	5,751,780
65	5,751,781
98.5	5,751,782
108	5,751,783
140	5,751,784
146	5,751,785
156	5,751,786
169	5,751,787
197	5,751,788

CLASS 379

34	5,751,789
71	5,751,790
88	5,751,791
89	5,751,792
	5,751,793
	5,751,794
93.17	5,751,795
93.31	5,751,796
106.03	5,751,797
112	5,751,798
114	5,751,799
134	5,751,800
201	5,751,802
210	5,751,760
379	5,751,803
433	5,751,804

CLASS 380

4	5,751,805
9	5,751,806
23	5,751,808
	5,751,809
28	5,751,810
	5,751,811
48	5,751,812
49	5,751,813
	5,751,814

CLASS 381

17	5,751,815
24	5,751,816
25	5,751,817
55	5,751,818
56	5,751,819
68	5,751,820
90	5,751,821
94.1	5,751,822
94.6	5,751,823
104	5,751,824
118	5,751,825
119	5,751,826
190	5,751,827
199	5,751,828

CLASS 382

100	5,751,829
103	5,751,830
	5,751,831
104	5,751,832
107	5,751,838
110	5,751,833
111	5,751,834
115	5,751,835
117	5,751,836
131	5,751,837
133	5,751,839
135	5,751,840
137	5,751,841
	5,751,842
154	5,751,843
156	5,751,844
162	5,751,845
165	5,751,847
169	5,751,846
172	5,751,848
176	5,751,849
178	5,751,850
179	5,751,851
180	5,751,852
203	5,751,853
218	5,751,854
224	5,751,855
232	5,751,856
	5,751,857
236	5,751,858
238	5,751,859
244	5,751,860
250	5,751,861
260	5,751,862
275	5,751,863
276	5,751,864
296	5,751,865
312	5,751,866

CLASS 383

9	5,749,657
204	5,749,658

CLASS 384

260	5,749,659
475	5,749,660
526	5,749,661
620	5,749,820

CLASS 385

3	5,751,867
16	5,751,868
33	5,751,869
	5,751,870
	5,751,871
37	5,751,872
51	5,751,873
72	5,751,874
84	5,751,875
86	5,751,876
93	5,751,877
	5,751,878
103	5,751,879
109	5,751,880
110	5,751,881
135	5,751,882

CLASS 386

27	5,751,883
33	5,751,884
46	5,751,885
48	5,751,886
68	5,751,887
	5,751,888
	5,751,889
79	5,751,890
92	5,751,892
111	5,751,893
116	5,751,894

CLASS 392

306	5,751,895
416	5,751,896
419	5,751,897

CLASS 395

2.16	5,751,899
	5,751,900
2.25	5,751,901
2.28	5,751,902
2.39	5,751,903
2.41	5,751,904
2.5	5,751,898
2.63	5,751,905
2.69	5,751,906
2.76	5,751,907
3	5,751,908
11	5,751,909
22	5,751,910
	5,751,911
27	5,751,913
51	5,751,914
61	5,751,915
62	5,751,912
77	5,751,916
89	5,751,917
99	5,751,918
101	5,751,919
109	5,751,920
	5,751,921
112	5,751,922
114	5,751,923
115	5,751,924
	5,751,925
119	5,751,926
	5,751,927
124	5,751,928
129	5,751,929
137	5,751,930
140	5,751,931
182.02	5,751,933
182.04	5,751,935
182.05	5,751,936
	5,751,937
182.08	5,751,938
182.1	5,751,932
182.13	5,751,939
183.03	5,751,940
183.14	5,751,941
	5,751,942
183.16	5,751,943
183.18	5,751,944
184.01	5,751,945
185.03	5,751,946
185.07	5,751,947
	5,751,948
187.01	5,751,949
188.01	5,751,950
200.09	5,751,953
200.1	5,751,972
200.15	5,751,954
200.19	5,751,955
200.33	5,751,956
	5,751,957
200.34	5,751,958
200.35	5,751,959
200.36	5,751,960
200.47	5,751,961
200.53	5,751,962
	5,751,963
200.54	5,751,964
	5,751,965
	5,751,966
200.58	5,751,967
200.61	5,751,968
200.65	5,751,969
200.66	5,751,970
200.68	5,751,971
200.8	5,751,951
	5,751,952
213	5,751,973
301	5,751,974
306	5,751,975
	5,751,976
	5,751,977
309	5,751,978
343	5,751,979
354	5,751,980
380	5,751,981
392	5,751,983
	5,751,984
394	5,751,985
	5,751,986
405	5,751,987
	5,751,988
413	5,751,989
417	5,751,990
421.04	5,751,991
457	5,751,992
463	5,751,993
464	5,751,994
472	5,751,995
489	5,751,997
490	5,751,998
494	5,751,999
500	5,752,000
	5,752,001
	5,752,002
	5,752,003
	5,752,004
	5,752,005
	5,752,006
	5,752,007
	5,752,008
	5,752,009
509	5,752,010
556	5,752,011
559	5,752,012
568	5,752,013
586	RE. 35,794
587	5,752,014
588	5,752,015
600	5,752,016
602	5,752,017
	5,752,018
603	5,752,019
604	5,752,020
605	5,752,021
610	5,752,022
	5,752,023
613	5,752,025
614	5,752,026
	5,752,027
	5,752,028
615	5,752,029
672	5,752,030
673	5,752,031
681	5,752,032
701	5,752,033
704	5,752,034
705	5,752,035
706	5,752,036
709	5,752,037
	5,752,038
712	5,752,039
	5,752,040
	5,752,041
	5,752,042
737	5,752,043
750	5,752,044
	5,752,045
750.01	5,752,046
	5,752,047
750.05	5,752,048
	5,752,049
750.07	5,752,050
751	5,752,051
759	5,752,052
766	5,752,053
767	5,752,054
777	5,752,055
778	5,752,056
785	5,752,057
793	5,752,058
800	5,751,982
	5,752,059
	5,752,060
	5,752,061
	5,752,063
	5,752,064
	5,752,074
800.01	5,752,065
	5,752,066
800.16	5,752,067
	5,752,068
800.23	5,752,069
800.33	5,752,070
800.34	5,752,071
	5,752,072
800.35	5,752,073
821	5,752,075
825	5,752,076
827	5,752,077
	5,752,078
	5,752,079
828	5,752,080
842	5,752,081
882	5,752,082
894	5,752,083

CLASS 396

6	5,752,084
	5,752,085
	5,752,086
	5,752,087
12	5,752,088
48	5,752,089
51	5,752,090
52	5,752,091
53	5,752,092
61	5,752,093
76	5,752,094
80	5,752,095
85	5,752,096
	5,752,098
114	5,752,099
129	5,752,100
155	5,752,101
156	5,752,102
157	5,752,097
173	5,752,103
191	5,752,104
207	5,752,105
263	5,752,106
296	5,752,107
310	5,752,108
311	5,752,109
319	5,752,110
324	5,752,111
421	5,752,112
428	5,752,113
429	5,752,114
431	5,752,115
435	5,752,116
504	5,752,117
513	5,752,118
535	5,752,119
536	5,752,120
606	5,752,121
612	5,752,122
621	5,752,123
626	5,752,124

CLASS 399

8	5,752,125
44	5,752,126
76	5,752,127
80	5,752,128
92	5,752,129
101	5,752,130
106	5,752,131
111	5,752,132
112	5,752,133
113	5,752,134
115	5,752,135
117	5,752,136
176	5,751,801
223	5,752,137
227	5,752,141
241	5,752,142
248	5,752,143
249	5,752,144
256	5,752,145
264	5,752,138
	5,752,139
270	5,752,140
284	5,752,146
325	5,752,147
329	5,752,148
	5,752,149
330	5,752,150
350	5,752,151
366	5,752,152
384	5,752,153
407	5,752,154

CLASS 400

82	5,749,662

CLASS 401

31	5,749,663
78	5,749,664

264	5,749,665

CLASS 402

18	5,749,666
79	5,749,667

CLASS 403

12	5,749,669
269	5,749,670
384	5,749,671

CLASS 404

10	5,749,673
75	5,749,674

CLASS 405

36	5,749,672
52	5,749,675
171	5,749,676
184	5,749,677
	5,749,678
186	5,749,679
262	5,749,680
302.2	5,749,681

CLASS 406

1	5,749,682
41	5,749,683
141	5,749,684

CLASS 410

7	5,749,685
94	5,749,686

CLASS 411

29	5,749,687
42	5,749,688
387	5,749,689
431	5,749,690
453	5,749,692

CLASS 414

277	5,749,693
462	5,749,694
467	5,749,695
635	5,749,696
680	5,749,697
786	5,749,698

CLASS 415

40	RE. 35,790
104	5,749,700
115	5,749,701
119	5,749,702
148	5,749,703
211.2	5,749,704

CLASS 416

190	5,749,705
220 R	5,749,706
223 B	5,749,707
247 R	5,749,708

CLASS 417

44.8	5,749,709
63	5,749,710
120	5,749,711
269	5,749,712
312	5,749,714
313	5,749,715
410.3	5,749,716
505	5,749,717

CLASS 419

5	5,752,155
11	5,752,156

CLASS 420

450	5,750,142

CLASS 421

154	5,750,189
433	5,749,691

CLASS 422

7	5,750,071
16	5,750,070
22	5,750,072
79	5,750,073
102	5,750,074
	5,750,075
115	5,750,076
122	5,750,077
138	5,750,079
186.01	5,752,157
193	5,750,080

CLASS 423

3	5,750,081
213.5	5,750,082
228	5,750,083
239.1	5,750,084
261	5,752,158
328.2	5,750,085
432	5,750,086
604	5,750,087

CLASS 424

1.69	5,750,088
1.85	5,750,089
59	5,750,090
	5,750,091
	5,750,092
	5,750,093
64	5,750,094
	5,750,095
65	5,750,096
70.1	5,750,097
70.12	5,750,098
70.17	5,750,099
85.2	5,750,100
	5,750,101
93.21	5,750,102
	5,750,103
94.21	5,750,104
133.1	5,750,078
	5,750,105
142.1	5,750,106
195.1	5,750,107
	5,750,108
205.1	5,750,109
208.1	5,750,110
214.1	5,750,111
221.1	5,750,112
222.1	5,750,113
231.1	5,750,114
241.1	5,750,115
242.1	5,750,116
262.1	5,750,118
277.1	5,750,119
401	5,750,121
	5,750,122
	5,750,123
	5,750,124
	5,750,125
	5,750,127
405	5,750,126
407	5,750,128
408	5,750,129
417	5,750,130
422	5,750,131
423	5,750,132
434	5,750,134
442	5,750,135
448	5,750,136
	5,750,137
	5,750,138
	5,750,139
449	5,750,140
	5,750,141
451	5,750,143
	5,750,144
478	5,750,145
484	5,750,146
491	5,750,147
494	5,750,148
535	5,750,149
682	5,750,150

CLASS 425

66	5,750,151
72.2	5,750,152
116	5,750,153
	5,750,154
130	5,750,155
139	5,750,156
143	5,750,157
144	5,750,158
190	5,750,159
290	5,750,160
468	5,750,161
533	5,750,162
590	5,750,163

CLASS 426

47	5,750,164
49	5,750,165
93	5,750,166
102	5,750,168
231	5,750,169
283	5,750,170
481	5,750,171
516	5,750,173
521	5,750,174
573	5,750,175
580	5,750,172
	5,750,176
582	5,750,177
594	5,750,178
600	5,750,179
614	5,750,180
615	5,750,181
646	5,750,182
656	5,750,183

CLASS 427

2.13	5,750,184
8	5,750,185
	5,750,186
64	5,750,187
126.3	5,750,188
156	5,750,190
163.4	5,750,191
208	5,750,192
213.31	5,750,193
216	5,750,194
249	5,750,195
290	5,750,196
318	5,750,197
322	5,750,198
357	5,750,199
361	5,750,200
375	5,750,201
376.4	5,750,202
380	5,750,203
387	5,750,204
490	5,750,206
535	5,750,205
539	5,750,208
569	5,750,209
576	5,750,207
577	5,750,210
579	5,750,211
581	5,750,212

CLASS 428

1	5,750,213
	5,750,214
34.2	5,750,215
34.3	5,750,216
34.8	5,750,217
35.5	5,750,218
35.7	5,750,219
	5,750,220
	5,750,221
	5,750,224
35.8	5,750,222
	5,750,223
36.4	5,750,226
42.2	5,750,227
64.1	5,750,228
	5,750,229
65.3	5,750,230
65.5	5,750,231
98	5,750,232
141	5,750,233
	5,750,234
178	5,750,236
182	5,750,235
	5,750,237
195	5,750,238
	5,750,239
	5,750,240
199	5,750,241
209	5,750,242
216	5,750,243
308.4	5,750,244
315.5	5,750,245
318.4	5,750,246
323	5,750,247
	5,750,248
328	5,750,249
	5,750,250
332	5,750,251
	5,750,252
342	5,750,253
343	5,750,254
359	5,750,255
362	5,750,225
375	5,750,256
379	5,750,257
405	5,750,258
411.1	5,750,259
421	5,750,260
422.8	5,750,261
423.5	5,750,262
424.4	5,750,263
426	5,750,264
432	5,750,265
457	5,750,266
469	5,750,267
475.8	5,750,268
484	5,750,269
611	5,750,270
624	5,750,271
686	5,750,272
692	5,750,273
694 MM	5,750,274
694 R	5,750,275
703	5,750,276

CLASS 429

7	5,750,277
24	5,750,278
32	5,750,279
	5,750,280
39	5,750,281
49	5,750,282
56	5,750,283
92	5,750,285
197	5,750,284
211	5,750,286
218	5,750,287
229	5,750,288
233	5,750,289

CLASS 430

5	5,750,290
11	5,750,291
15	5,750,292
21	5,750,293
22	5,750,294
25	5,750,295
28	5,750,296
42	5,750,297
45	5,750,298
47	5,750,299
78	5,750,300
106.6	5,750,301
	5,750,302
110	5,750,303
	5,750,304
	5,750,305
115	5,750,306
120	5,750,308
125	5,750,307
170	5,750,309
192	5,750,310
253	5,750,311
273.1	5,750,312
280.1	5,750,313
302	5,750,314
306	5,750,315
311	5,750,316
327	5,750,317
346	5,750,318
	5,750,319
383	5,750,320
449	5,750,321
458	RE. 35,795
463	5,750,322
512	5,750,323
567	5,750,324
	5,750,325
568	5,750,326
569	5,750,327
619	5,750,328

CLASS 431

8	5,749,713
60	5,749,718
202	5,749,719
285	5,749,720
328	5,749,721

CLASS 432

118	5,749,722
241	5,749,723

CLASS 433

29	5,749,724
60	5,749,725
80	5,749,726
119	5,749,727
125	5,749,728
136	5,749,729
163	5,749,730
173	5,749,731
174	5,749,732
228.1	5,749,733

CLASS 434

195	5,749,734
307 R	5,749,735
322	5,749,736

CLASS 435

1.1	5,750,329
2	5,750,330
5	5,750,331
	5,750,332
	5,750,333
	5,750,334
6	5,750,335
	5,750,336
	5,750,337
	5,750,338
	5,750,339
	5,750,340
	5,750,341
	5,750,342
	5,750,343
	5,750,344
	5,750,345
	5,750,346
	5,750,347
	5,750,400
7.1	5,750,348
	5,750,349
	5,750,350
7.21	5,750,351
	5,750,352
	5,750,353
7.24	5,750,354
	5,750,355
	5,750,356
7.32	5,750,357
13	5,750,358
19	5,750,359
23	5,750,360
	5,750,361
29	5,750,362
	5,750,363
42	5,750,364
69.1	5,750,366
	5,750,367
	5,750,368
	5,750,369
	5,750,370
	5,750,371
	5,750,372
69.4	5,750,373
69.52	5,750,376
69.7	5,750,374
	5,750,375
70.3	5,750,377
	5,750,378
72	5,750,379
91.1	5,750,380
128	5,750,381
135	5,750,382
172.3	5,750,383
	5,750,384
	5,750,385
	5,750,386
183	5,750,387
189	5,750,388
193	5,750,389
195	5,750,390
212	5,750,391
243	5,750,392
	5,750,393
252.3	5,750,394
325	5,750,395
357	5,750,396
372	5,750,397
375	5,750,398
419	5,750,399
430	5,750,401
431	5,750,402
691	5,750,365

CLASS 436

42	5,750,404
88	5,750,405
116	5,750,406
131	5,750,407
137	5,750,408
517	5,750,409
525	5,750,410
	5,750,411
	5,750,412
537	5,750,413

CLASS 437

40 AS	5,750,416
154	5,750,414
195	5,750,415
209	5,750,417

CLASS 438

3	5,750,419
52	5,750,420
106	5,750,421
112	5,750,422
	5,750,423
199	5,750,424
210	5,750,426
264	5,750,427
	5,750,428
268	5,750,429
303	5,750,430
396	5,750,431
404	5,750,432
424	5,750,433
478	5,750,434
525	5,750,435
558	5,750,436
592	5,750,437
627	5,750,438
648	5,750,439
692	5,750,440
751	5,750,441
761	5,750,442
787	5,750,403
795	5,750,443

CLASS 439

66	5,749,738
76.2	5,749,739
92	5,749,740
95	5,749,741
125	5,749,742
164	5,749,744
336	5,749,743
349	5,749,745
357	5,749,746
358	5,749,747
500	5,749,737
617	5,749,749
637	5,749,750
721	5,749,751
733.1	5,749,752
752.5	5,749,753
824	5,749,754
856	5,749,755
879	5,749,756

CLASS 440

83	5,749,757

CLASS 441

5	5,749,758
60	5,749,759

CLASS 442

62	5,750,444
168	5,750,445
337	5,750,446

CLASS 445

4	5,749,760
50	5,749,762
51	5,749,763

CLASS 446

27	5,749,764
60	5,749,761
217	5,749,765

CLASS 450

41	5,749,767
65	5,749,768

CLASS 451

5	5,749,769
28	5,749,770
41	5,749,771
53	5,749,772
66	5,749,773
252	5,749,774
298	5,749,775

CLASS 452

138	5,749,776
149	5,749,777
174	5,749,778

CLASS 454

65	5,749,779
359	5,749,780
370	5,749,782

CLASS 455

5.1	5,752,159
	5,752,160
8	5,752,161
13.1	5,752,162
31.3	5,752,163
33.1	5,752,164
67.1	5,752,165
	5,752,166
	5,752,167
67.3	5,752,168
76	5,752,169
126	5,752,170
	5,752,171
127	5,752,172
137	5,752,173
183.1	5,752,174
	5,752,175
184.1	5,752,176
186.1	5,752,177
	5,752,178
266	5,752,179
319	5,752,180
326	5,752,181
333	5,752,182
343	5,752,183
352	5,752,184
414	5,752,185
	5,752,186
428	5,752,187
433	5,752,188
435	5,752,189
436	5,752,190
445	5,752,191
450	5,752,192
452	5,752,193
	5,752,194
462	5,752,195
518	5,752,196
522	5,752,197
524	5,752,198
557	5,752,199
562	5,752,200
574	5,752,201

	5,752,202
575	5,752,203
	5,752,204
	5,752,205

CLASS 460

119	5,749,783

CLASS 463

17	5,749,784
25	5,749,785

CLASS 464

106	5,749,786

CLASS 472

92	5,749,787

CLASS 473

44	5,749,788
162	5,749,789
245	5,749,790
251	5,749,791
300	5,749,792
324	5,749,793
342	5,749,794
350	5,749,795
365	5,749,796
451	5,749,797
549	5,749,798
594	5,749,799

CLASS 474

84	5,749,800

CLASS 475

88	5,749,801
120	5,749,802
249	5,749,803

CLASS 477

47	5,749,804
116	5,749,805
133	5,749,806

CLASS 482

52	5,749,807
	5,749,808
	5,749,809
57	5,749,810
71	5,749,811
79	5,749,668
82	5,749,812
93	5,749,814
97	5,749,813
122	5,749,815
123	5,749,816
141	5,749,818

CLASS 483

39	5,749,819

CLASS 493

3	5,749,821
248	5,749,822
417	5,749,823
464	5,749,824

CLASS 501

47	5,750,448
80	5,750,449
91	5,750,450
138	5,750,452

CLASS 502

84	5,750,453
114	5,750,454
155	5,750,456
164	5,750,455
211	5,750,457
304	5,750,458
	5,750,459
342	5,750,460
347	5,750,461

CLASS 503

201	5,750,462
204	5,750,463
	5,750,464
227	5,750,465

CLASS 504

100	5,750,466
116	5,750,467
206	5,750,468
243	5,750,469
253	5,750,470
269	5,750,471
292	5,750,472

CLASS 505

210	5,750,473
329	5,750,474

CLASS 508

258	5,750,475
291	5,750,476
331	5,750,477
	5,750,478
463	5,750,479
580	5,750,480

CLASS 510

152	5,750,481
182	5,750,482
230	5,750,483
276	5,750,484
315	5,750,485
356	5,750,486
365	5,750,487
412	5,750,488
417	5,750,489
504	5,750,490
521	5,750,491
527	5,750,492

CLASS 512

4	5,750,498

CLASS 514

1	5,750,493
2	5,750,495
	5,750,496
3	5,750,497
9	5,750,499
11	5,750,500
	5,750,509
12	5,750,501
	5,750,502
	5,750,503
	5,750,504
15	5,750,506
19	5,750,507
25	5,750,508
29	5,750,510
52	5,750,512
54	5,750,513
63	5,750,514
	5,750,515
100	5,750,516
167	5,750,517
183	5,750,518
200	5,750,519
212	5,750,520
214	5,750,521
232	5,750,577
243	5,750,522
247	5,750,523
	5,750,524
249	5,750,525
250	5,750,526
252	5,750,527
253	5,750,528
254	5,750,529
255	5,750,530
256	5,750,531
274	5,750,532
278	5,750,533
282	5,750,534
294	5,750,535
300	5,750,536
304	5,750,537
305	5,750,538
311	5,750,539
318	5,750,540
	5,750,541
322	5,750,542
337	5,750,543
	5,750,544
340	5,750,545
342	5,750,546
346	5,750,547
357	5,750,548
364	5,750,549
373	5,750,550
381	5,750,551
386	5,750,552
392	5,750,553
397	5,750,554
410	5,750,555
411	5,750,556
415	5,750,557
	5,750,558
428	5,750,559
441	5,750,560
449	5,750,561
	5,750,562
460	5,750,563
469	5,750,564
473	5,750,565
510	5,750,566
	5,750,567
533	5,750,568
547	5,750,569
557	5,750,570
	5,750,571
560	5,750,572
597	5,750,573
604	5,750,574
617	5,750,575
720	5,750,576
766	5,750,578
772.6	5,750,579

CLASS 521

51	5,750,580
54	5,750,581
64	5,750,582
78	5,750,583
97	5,750,584
143	5,750,585
159	5,750,586

CLASS 522

15	5,750,587
66	5,750,588

CLASS 523

109	5,750,589
115	5,750,590
120	5,750,591
161	5,750,592
	5,750,593
	5,750,594
404	5,750,595
	5,750,596

CLASS 524

35	5,750,597
71	5,750,598
90	5,750,599
100	5,750,600
117	5,750,601
127	5,750,602
139	5,750,603
187	5,750,604
230	5,750,605
244	5,750,606
271	5,750,607
399	5,750,608
413	5,750,609
434	5,750,610
450	5,750,611
451	5,750,612
457	5,750,613
460	5,750,614
495	5,750,615
496	5,750,616
718	5,750,617
836	5,750,618

CLASS 525

54.1	B1 292,801
65	5,750,619
67	5,750,620
68	5,750,621
92 D	5,750,622
98	5,750,623
100	5,750,624
133	5,750,625
151	5,750,626
162	5,750,627

CLASS 528

25	5,750,628
45	5,750,629
59	5,750,630
98	5,750,631
129	5,750,632
174	5,750,633
254	5,750,634
285	5,750,635
310	5,750,636
	5,750,637
	5,750,638
	5,750,639
332	5,750,640
353	5,750,641
373	5,750,656
392	5,750,642
481	5,750,643
	5,750,644
502 B	5,750,645

CLASS 530

314	5,750,646
328	5,750,647
331	5,750,648
338	5,750,649
350	5,750,650
	5,750,651
	5,750,652
	5,750,653
351	5,750,654
382	5,750,657
	5,750,658
399	5,750,659

CLASS 534

10	5,750,660
604	5,750,661
612	5,750,662

CLASS 536

4.1	5,750,663
17.2	5,750,664
	5,750,665
23.1	5,750,666
	5,750,667
24.3	5,750,669
25.31	5,750,672
25.4	5,750,671
26.1	5,750,673
26.7	5,750,674
27.21	5,750,675
55.3	5,750,676
63	5,750,677
103	5,750,678
127	5,750,679

CLASS 540

200	5,750,680
203	5,750,681
215	5,750,682
	5,750,683
319	5,750,684
349	5,750,685
350	5,750,686
527	5,750,687
596	5,750,688

CLASS 544

75	5,750,689
234	5,750,690
238	5,750,691
253	5,750,692
	5,750,693
334	5,750,694
341	5,750,695
374	5,750,696
409	5,750,697

CLASS 546

102	5,750,698
121	5,750,699
148	5,750,700
157	5,750,701
183	5,750,702
240	5,750,703
275.1	5,750,704
279.1	5,750,706
297	5,750,705
321	5,750,707
334	5,750,708
348	5,750,709

CLASS 548

111	5,750,710
165	5,750,711
186	5,750,712
202	5,750,713
205	5,750,714
209	5,750,715
240	5,750,717
263.6	5,750,718
268.6	5,750,719
315.1	5,750,720
374.1	5,750,721
427	5,750,722
453	5,750,723
454	5,750,724
545	5,750,725
561	5,750,726
951	5,750,727

CLASS 549

57	5,750,728
210	5,750,716
216	5,750,729
229	5,750,730
241	5,750,731
274	5,750,732
346	5,750,733
432	5,750,734
475	5,750,735
510	5,750,736
	5,750,737
	5,750,738
515	5,750,739
519	5,750,740
525	5,750,741

CLASS 552

109	5,750,742
271	5,750,743
515	5,750,744
581	5,750,745
653	5,750,746

CLASS 554

36	5,750,747
66	5,750,748
69	5,750,749
117	5,750,750
165	5,750,751

CLASS 556

1	5,750,752
440	5,750,753

CLASS 558

52	5,750,754
84	5,750,755
162	5,750,756
232	5,750,757
276	5,750,758
277	5,750,759
319	5,750,760
423	5,750,761
	5,750,762

CLASS 560

17	5,750,763
56	5,750,764
82	5,750,766
126	5,750,765
161	5,750,767
177	5,750,768
184	5,750,769
200	5,750,770
205	5,750,771
218	5,750,772
226	5,750,773

CLASS 562

17	5,750,774
470	5,750,775
483	5,750,776
549	5,750,777
605	5,750,778
828	5,750,779

CLASS 564

67	5,750,780
153	5,750,781
166	5,750,782
	5,750,783
171	5,750,784
315	5,750,785
403	5,750,786
409	5,750,787
415	5,750,788
428	5,750,789
469	5,750,790
488	5,750,791
507	5,750,792

CLASS 568

315	5,750,793
322	5,750,794
397	5,750,795
618	5,750,796
678	5,750,800
683	5,750,797
697	5,750,798
698	5,750,799
715	5,750,801
814	5,750,802
830	5,750,803
834	5,750,804
838	5,750,805
909.5	5,750,806

CLASS 570

142	5,750,807
157	5,750,808
169	5,750,809
171	5,750,810
208	5,750,811
245	5,750,812

CLASS 585

12	5,750,813
323	5,750,814
511	5,750,815
512	5,750,816
520	5,750,817
709	5,750,818
734	5,750,819
826	5,750,820
943	5,750,821

CLASS 588

11	5,750,822
20	5,752,206
210	5,750,823
256	5,750,824

CLASS 600

3	5,749,825
29	5,749,826
109	5,749,827
141	5,749,828
153	5,749,829
160	5,749,830
204	5,749,892
301	5,749,831
345	5,749,832
380	5,749,833
410	5,749,834
424	5,749,835
556	5,749,836
585	5,749,837

CLASS 601

71	5,749,838
153	5,749,839

CLASS 602

5	5,749,840
21	5,749,841
41	5,749,842
75	5,749,843

CLASS 604

21	5,749,845
22	5,749,846
49	5,749,847
53	5,749,848
	5,749,849
74	5,749,850
96	5,749,851
	5,749,852
97	5,749,853
131	5,749,854
151	5,749,855
162	5,749,856
164	5,749,857
	5,749,858
167	5,749,859
192	5,749,860
249	5,749,861
353	5,749,862
376	5,749,863
385.2	5,749,865
	5,749,866

CLASS 606

4	5,749,867
9	5,749,868
34	5,749,869
45	5,749,870
50	5,749,871
69	5,749,872
70	5,749,873
75	5,749,874
87	5,749,875
88	5,749,876
99	5,749,877
104	5,749,878
139	5,749,879
151	5,749,881
159	5,749,882
	5,749,883
167	5,749,884
170	5,749,885
182	5,749,886
185	5,749,887
194	5,749,888
198	5,749,880
	5,749,889
	5,749,890
200	5,749,891
205	5,749,893
213	5,749,894
214	5,749,895
219	5,749,896
222	5,749,897
228	5,749,898
232	5,749,899

CLASS 607

4	5,749,900
5	5,749,901
	5,749,902
7	5,749,904
	5,749,905
9	5,749,906
27	5,749,907
30	5,749,908
33	5,749,909
36	5,749,910
	5,749,911
57	5,749,912
59	5,749,913
116	5,749,914

CLASS 623

1	5,749,915
	5,749,918
	5,749,919
	5,749,920
	5,749,921
	5,749,922
17	5,749,916

CLASS 701

26	5,752,207
41	5,752,208

	5,752,209
51	5,752,210
69	5,752,211
71	5,752,212
111	5,752,213
	5,752,214
117	5,752,215
	5,752,216
201	5,752,217
207	5,752,218
213	5,752,219
217	5,752,220

CLASS 704

201	5,752,221
	5,752,222
219	5,752,223
225	5,752,224
229	5,752,225
233	5,752,226
235	5,752,227
260	5,752,228
270	5,752,229
	5,752,230
273	5,752,231
275	5,752,232

CLASS 705

1	5,752,233
2	5,752,234
3	5,752,235
4	5,752,236
	5,752,237
14	5,752,238
26	5,752,239

CLASS 707

3	5,752,241
	5,752,242
	5,752,243
5	5,752,244
10	5,752,245
	5,752,246
102	5,752,247
103	5,752,249
200	5,752,250
202	5,752,251
205	5,752,252
503	5,752,253
530	5,752,254

CLASS 711

3	5,752,255
114	5,752,256
	5,752,257
120	5,752,258
125	5,752,259
129	5,752,260
133	5,752,261
135	5,752,262
137	5,752,263
144	5,752,264
145	5,751,996
146	5,752,265
158	5,752,266
162	5,752,268
167	5,752,267
169	5,752,269
	5,752,270
171	5,752,271
	5,752,272
201	5,752,273
206	5,752,274
207	5,752,275

CLASS 800

2	5,750,825
	5,750,826
200	5,750,827
	5,750,828
	5,750,829
	5,750,830
	5,750,831
	5,750,832
	5,750,834
	5,750,835
	5,750,837
	5,750,838
	5,750,839
	5,750,841
	5,750,842
	5,750,843
	5,750,844
	5,750,845
	5,750,846
	5,750,847
	5,750,849
	5,750,850
	5,750,851
	5,750,852
	5,750,853
	5,750,854
	5,750,855
	5,750,856
	5,750,857
	5,750,858
	5,750,859
	5,750,860
	5,750,861
205	5,750,848
	5,750,862
	5,750,864
	5,750,865
	5,750,866
	5,750,867
	5,750,868
	5,750,869
	5,750,870
	5,750,871
	5,750,872
	5,750,873
	5,750,874
	5,750,875
	5,750,876

CLASSIFICATION OF DESIGNS

D2—	717	394,135
	866	394,136
	898	394,137
	900	394,138
	902	394,139
	946	394,140
	954	394,141
	960	394,142
		394,143
	969	394,144
		394,145
	970	394,146
	972	394,147
D3—	8	394,148
	29	394,150
	207	394,151
		394,152
	208	394,153
	257	394,154
	267	394,155
	271	394,156
	318	394,157
D4—	113	394,158
D6—	309	394,159
	310	394,160
		394,161
	333	394,162
	334	394,176
	349	394,163
	356	394,164
	358	394,165
	367	394,166
	393	394,167
		394,168
	434	394,169
	436	394,170
	446	394,171
	474	394,172
		394,173
	476	394,174
	495	394,175
	523	394,177
	524	394,178
	566	394,179
	571	394,180
	603	394,181
D7—	384	394,183
	391	394,184
	392	394,185
	395	394,186
	533	394,187
	584	394,188
		394,189
	606	394,190
		394,191
	688	394,192
	693	394,193
D8—	50	394,194
	88	394,195
	91	394,196
	333	394,197
	346	394,149
		394,198
	349	394,199
	354	394,200
	356	394,201
	367	394,202
	381	394,203
D9—	341	394,204
	346	394,205
	415	394,207
	417	394,206
	430	394,208
		394,209
	529	394,210
	542	394,211
	557	394,212
D10—	15	394,213
	30	394,214
		394,215
	32	394,216
	46.2	394,217
	50	394,218
		394,219
		394,220
	66	394,221
	68	394,222
	104	394,223
D11—	13	394,224
	26	394,225
	79	394,226
	81	394,227
	120	394,228
	126	394,229
	164	394,230
		394,231
D12—	91	394,232
	110	394,233
	114	394,234
	180	394,235
	194	394,236
	197	394,237
	209	394,238
	215	394,239
	412	394,240
D13—	110	394,241
	146	394,242
	158	394,243
	182	394,244
D14—	102	394,246
	107	394,247
	113	394,248
	114	394,249
	114.2	394,250
	114.5	394,251
	115	394,252
		394,253
	121	394,254
	124	394,255
	138	394,256
	149	394,257
	150	394,245
		394,258
	151	394,259
	156	394,260
	167	394,261
	188	394,262
	214	394,263
	218	394,264
	224	394,265
	240	394,266
	242	394,267
D15—	7	394,268
	9.2	394,269
	80	394,270
	136	394,271
D16—	135	394,272
	202	394,273
		394,274
	303	394,275
	315	394,276
D18—	2	394,277
	27	394,278
D19—	26	394,279
	75	394,280
D20—	10	394,281
	19	394,282
D21—	34	394,283
	37	394,284
	62	394,285
	108	394,286
		394,287
	153	394,288
	155	394,289
	217	394,292
	220	394,290
	223	394,291
	226	394,293
	228	394,294
	234	394,295
	242	394,296
D22—	108	394,297
	122	394,298
	137	394,299
	148	394,300
D23—	201	394,301
	202	394,302
	207	394,303
	226	394,304
		394,305
	262	394,306
	285	394,307
	293.1	394,308
	301	394,309
	304	394,310
	364	394,311
	418	394,312
D24—	110	394,313
	134	394,314
	146	394,315
	158	394,316
	223	394,317
D25—	17	394,318
	163	394,319
		394,320
D26—	37	394,321
	48	394,322
	63	394,323
	65	394,324
	87	394,325
	106	394,326
	110	394,327
D28—	7	394,328
	49	394,329
	63	394,330
		394,331
D29—	121	394,332
		394,333
D30—	121	394,334
206—	308.3	394,182

CLASSIFICATION OF PLANTS

P—	38.1	10,385
		10,386
	43.2	10,387
	55	10,388
	68.1	10,389
	74.1	10,390
	77	10,391
	87.12	10,395
		10,396
		10,397
		10,398
		10,399
	87.3	10,392
		10,393
		10,394
	88.8	10,400

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,749,136
5,749,181
5,749,331
5,749,502
5,749,886
5,750,493
5,750,992
5,751,490
5,751,503
5,751,974
5,752,047
02 : 5,751,744
04 : 5,749,203
5,749,431
5,749,433
5,749,880
5,749,915
5,749,922
5,749,953
5,750,022
5,750,188
5,750,440
5,750,971
5,750,989
5,750,999
5,751,009
5,751,025
5,751,052
5,751,061
5,751,068
5,751,140
5,751,151
5,751,152
5,751,159
5,751,166
5,751,192
5,751,201
5,751,235
5,751,263
5,751,385
5,751,388
5,751,471
5,751,552
5,751,555
5,751,613
5,751,641
5,751,718
5,751,723
5,751,757
5,751,809
5,751,823
5,751,844
5,751,969
5,751,975
5,752,005
5,752,012
5,752,071
5,752,081
5,752,162
5,752,187
5,752,200
5,752,220
5,752,249
5,752,262
05 : 5,749,708
5,750,823
06 : 5,749,096
5,749,099
5,749,106
5,749,107
5,749,115
5,749,134
5,749,137
5,749,168
5,749,190
5,749,198
5,749,201
5,749,217
5,749,272
5,749,283
5,749,288
5,749,314
5,749,337
5,749,342
5,749,357
5,749,364
5,749,370
5,749,371
5,749,373
5,749,379
5,749,398
5,749,402
5,749,437
5,749,458
5,749,483
5,749,491
5,749,492
5,749,503
5,749,514
5,749,547
5,749,549
5,749,560
5,749,577
5,749,591
5,749,604
5,749,615
5,749,645
5,749,654
5,749,672
5,749,673
5,749,709
5,749,715
5,749,729
5,749,735
5,749,746
5,749,767
5,749,769
5,749,784
5,749,789
5,749,793
5,749,795
5,749,837
5,749,838
5,749,846
5,749,848
5,749,849
5,749,852
5,749,853
5,749,856
5,749,871
5,749,879
5,749,881
5,749,882
5,749,884
5,749,888
5,749,889
5,749,891
5,749,892
5,749,893
5,749,894
5,749,901
5,749,908
5,749,912
5,749,918
5,749,920
5,749,921
5,749,929
5,749,942
5,749,945
5,749,966
5,749,988
5,749,993
5,749,999
5,750,015
5,750,040
5,750,072
5,750,074
5,750,105
5,750,108
5,750,114
5,750,137
5,750,146
5,750,182
5,750,190
5,750,195
5,750,202
5,750,203
5,750,206
5,750,211
5,750,230
5,750,231
5,750,236
5,750,244
5,750,270
5,750,275
5,750,300
5,750,317
5,750,336
5,750,341
5,750,343
5,750,344
5,750,346
5,750,350
5,750,355
5,750,356
5,750,361
5,750,373
5,750,380
5,750,385
5,750,388
5,750,395
5,750,397
5,750,414
5,750,416
5,750,424
5,750,426
5,750,450
5,750,481
5,750,495
5,750,499
5,750,508
5,750,576
5,750,643
5,750,653
5,750,658
5,750,671
5,750,681
5,750,691
5,750,692
5,750,693
5,750,729
5,750,784
5,750,802
5,750,815
5,750,869
5,750,871
5,750,872
5,750,875
5,750,900
5,750,901
5,750,910
5,750,915
5,750,921
5,750,926
5,750,927
5,750,943
5,750,988
5,750,993
5,750,998
5,751,005
5,751,006
5,751,018
5,751,019
5,751,040
5,751,054
5,751,072
5,751,078
5,751,115
5,751,116
5,751,119
5,751,149
5,751,150
5,751,157
5,751,163
5,751,164
5,751,189
5,751,199
5,751,214
5,751,215
5,751,245
5,751,255
5,751,258
5,751,265
5,751,268
5,751,272
5,751,280
5,751,281
5,751,286
5,751,287
5,751,319
5,751,320
5,751,323
5,751,338
5,751,368
5,751,375
5,751,378
5,751,380
5,751,389
5,751,398
5,751,425
5,751,444
5,751,460
5,751,461
5,751,507
5,751,513
5,751,514
5,751,517
5,751,521
5,751,528
5,751,530
5,751,537
5,751,539
5,751,549
5,751,551
5,751,557
5,751,569
5,751,586
5,751,596
5,751,599
5,751,614
5,751,617
5,751,622
5,751,623
5,751,629

5,751,631
5,751,633
5,751,635
5,751,637
5,751,638
5,751,649
5,751,660
5,751,661
5,751,683
5,751,694
5,751,699
5,751,702
5,751,713
5,751,715
5,751,724
5,751,725
5,751,729
5,751,747
5,751,751
5,751,764
5,751,766
5,751,769
5,751,777
5,751,784
5,751,785
5,751,806
5,751,816
5,751,819
5,751,820
5,751,825
5,751,829
5,751,835
5,751,851
5,751,852
5,751,855
5,751,863
5,751,867
5,751,869
5,751,870
5,751,897
5,751,901
5,751,909
5,751,920
5,751,926
5,751,932
5,751,944
5,751,952
5,751,956
5,751,958
5,751,962
5,751,967
5,751,972
5,751,984
5,751,985
5,751,989
5,751,992
5,751,994
5,751,997
5,752,000
5,752,001
5,752,002
5,752,003
5,752,006
5,752,011
5,752,016
5,752,017
5,752,022
5,752,032
5,752,035
5,752,037
5,752,046
5,752,056
5,752,058
5,752,059
5,752,070
5,752,073
5,752,075
5,752,079
5,752,083
5,752,112
5,752,156
5,752,181
5,752,208
5,752,225
5,752,245
5,752,247
5,752,257
5,752,269
5,752,271
5,752,273
5,752,275
08 5,749,180
5,749,243
5,749,258
5,749,404
5,749,467
5,749,575
5,749,914
5,749,933
5,749,954
5,749,969
5,750,025
5,750,073

5,750,132
5,750,168
5,750,342
5,750,390
5,750,391
5,750,422
5,750,506
5,750,666
5,750,732
5,751,034
5,751,289
5,751,291
5,751,292
5,751,384
5,751,422
5,751,436
5,751,526
5,751,527
5,751,529
5,751,590
5,751,712
5,751,733
5,751,735
5,751,737
5,751,793
5,751,795
5,751,911
5,751,936
5,751,949
5,752,010
5,752,159
5,752,265
09 : 5,749,121
5,749,227
5,749,270
5,749,441
5,749,444
5,749,449
5,749,533
5,749,566
5,749,644
5,749,740
5,749,799
5,749,928
5,749,956
5,750,076
5,750,123
5,750,314
5,750,535
5,750,542
5,750,652
5,750,700
5,750,702
5,750,765
5,750,783
5,750,794
5,750,873
5,750,894
5,750,934
5,750,945
5,750,946
5,751,144
5,751,156
5,751,427
5,751,610
5,751,611
5,751,906
10 5,749,840
5,750,064
5,750,315
5,750,471
5,750,473
5,750,528
5,750,594
5,750,628
5,750,772
5,750,808
11 : 5,749,785
5,751,658
5,752,164
12 : 5,749,116
5,749,152
5,749,166
5,749,205
5,749,219
5,749,220
5,749,304
5,749,346
5,749,348
5,749,360
5,749,415
5,749,436
5,749,457
5,749,505
5,749,507
5,749,535
5,749,558
5,749,574
5,749,587
5,749,599
5,749,614
5,749,667
5,749,811

5,749,833
5,749,878
5,750,169
5,750,432
5,750,922
5,750,925
5,750,975
5,751,120
5,751,132
5,751,153
5,751,169
5,751,217
5,751,220
5,751,424
5,751,587
5,751,612
5,751,787
5,751,796
5,751,811
5,752,066
5,752,199
13 : 5,749,114
5,749,118
5,749,133
5,749,381
5,749,481
5,749,493
5,749,538
5,749,778
5,749,958
5,750,058
5,750,101
5,750,284
5,750,329
5,750,351
5,750,444
5,750,942
5,750,983
5,751,879
5,751,919
5,752,234
5,752,236
15 : 5,751,982
16 : 5,749,159
5,749,317
5,749,937
5,749,975
5,750,012
5,750,441
5,750,442
5,751,012
5,751,015
5,751,031
5,751,039
5,751,046
5,751,158
5,751,262
5,751,329
5,751,626
5,751,630
5,751,646
5,751,647
5,751,656
5,751,896
17 5,749,112
5,749,113
5,749,122
5,749,155
5,749,171
5,749,232
5,749,301
5,749,316
5,749,389
5,749,413
5,749,423
5,749,464
5,749,475
5,749,480
5,749,494
5,749,522
5,749,551
5,749,589
5,749,636
5,749,692
5,749,725
5,749,733
5,749,744
5,749,770
5,749,791
5,749,798
5,749,826
5,749,841
5,749,955
5,750,020
5,750,034
5,750,037
5,750,039
5,750,065
5,750,070
5,750,184
5,750,297
5,750,345
5,750,378

5,750,413
5,750,467
5,750,510
5,750,514
5,750,558
5,750,648
5,750,759
5,750,800
5,750,818
5,750,834
5,750,837
5,750,839
5,750,887
5,750,907
5,750,957
5,751,224
5,751,252
5,751,347
5,751,532
5,751,533
5,751,541
5,751,578
5,751,598
5,751,763
5,751,772
5,751,773
5,751,788
5,751,800
5,751,802
5,751,813
5,751,840
5,751,895
5,751,931
5,752,048
5,752,064
5,752,179
5,752,183
5,752,186
5,752,207
5,752,230
5,752,244
18 5,749,130
5,749,151
5,749,160
5,749,174
5,749,339
5,749,351
5,749,375
5,749,484
5,749,540
5,749,594
5,749,610
5,749,700
5,749,775
5,750,217
5,750,234
5,750,405
5,750,411
5,750,541
5,750,554
5,750,566
5,750,585
5,750,688
5,750,708
5,750,830
5,750,855
5,750,948
5,751,007
5,751,069
5,751,074
5,751,118
5,751,246
5,751,366
19 : 5,749,125
5,749,169
5,749,214
5,749,387
5,749,512
5,749,526
5,750,001
5,750,157
5,750,844
5,750,845
5,750,846
5,750,849
5,750,850
5,750,852
5,750,853
5,750,859
5,750,860
5,750,861
5,750,868
5,751,138
5,751,421
20 : RE. 35,789
5,749,289
5,749,588
5,749,696
5,750,841
21 : 5,749,108
5,749,206
5,749,252
5,749,440

5,749,454
5,749,550
5,751,299
5,751,312
5,751,324
5,751,470
5,751,818
5,752,135
22 : 5,749,777
5,750,010
5,750,237
5,750,623
5,750,646
5,750,656
5,750,750
5,750,819
5,752,088
23 : 5,749,774
5,749,788
5,750,333
24 : 5,749,150
5,749,372
5,749,525
5,749,623
5,749,808
5,749,825
5,749,936
5,749,959
5,750,077
5,750,332
5,750,352
5,750,370
5,750,501
5,750,550
5,750,672
5,750,857
5,750,858
5,750,895
5,750,919
5,751,109
5,751,243
5,751,707
5,751,903
5,751,915
5,752,051
5,752,235
25 : 5,749,132
5,749,237
5,749,251
5,749,292
5,749,515
5,749,649
5,749,650
5,749,731
5,749,734
5,749,776
5,749,828
5,749,847
5,749,868
5,749,870
5,749,885
5,749,907
5,749,950
5,749,979
5,750,088
5,750,089
5,750,091
5,750,172
5,750,210
5,750,277
5,750,282
5,750,283
5,750,335
5,750,338
5,750,353
5,750,412
5,750,463
5,750,464
5,750,519
5,750,565
5,750,568
5,750,571
5,750,651
5,750,664
5,750,674
5,750,709
5,750,713
5,750,767
5,750,906
5,750,908
5,750,918
5,750,980
5,751,146
5,751,218
5,751,256
5,751,260
5,751,261
5,751,275
5,751,298
5,751,336
5,751,340
5,751,341
5,751,472

5,751,481
5,751,525
5,751,594
5,751,672
5,751,696
5,751,710
5,751,716
5,751,794
5,751,853
5,751,871
5,751,939
5,751,941
5,751,951
5,751,973
5,751,993
5,752,018
5,752,023
5,752,027
5,752,029
5,752,068
5,752,113
5,752,258
26 : 5,749,105
5,749,135
5,749,223
5,749,224
5,749,236
5,749,326
5,749,335
5,749,343
5,749,349
5,749,374
5,749,383
5,749,388
5,749,409
5,749,425
5,749,428
5,749,432
5,749,439
5,749,448
5,749,451
5,749,486
5,749,504
5,749,506
5,749,567
5,749,590
5,749,598
5,749,606
5,749,611
5,749,618
5,749,625
5,749,629
5,749,635
5,749,683
5,749,694
5,749,717
5,749,764
5,749,786
5,749,797
5,749,860
5,750,014
5,750,067
5,750,082
5,750,098
5,750,144
5,750,179
5,750,483
5,750,533
5,750,569
5,750,570
5,750,596
5,750,610
5,750,695
5,750,698
5,750,751
5,750,854
5,750,878
5,750,886
5,750,890
5,750,933
5,750,952
5,751,073
5,751,077
5,751,079
5,751,124
5,751,129
5,751,148
5,751,208
5,751,221
5,751,467
5,751,489
5,751,579
5,751,832
5,751,846
5,751,908
5,752,063
5,752,213
27 : 5,749,148
5,749,310
5,749,460
5,749,469
5,749,609
5,749,652

5,749,704
5,749,738
5,749,765
5,749,835
5,749,851
5,749,857
5,749,872
5,749,902
5,749,906
5,749,910
5,749,911
5,750,024
5,750,053
5,750,060
5,750,112
5,750,134
5,750,136
5,750,156
5,750,159
5,750,166
5,750,173
5,750,245
5,750,260
5,750,357
5,750,484
5,750,578
5,750,641
5,750,665
5,750,797
5,750,829
5,750,847
5,750,851
5,750,937
5,750,970
5,751,161
5,751,171
5,751,225
5,751,295
5,751,303
5,751,321
5,751,482
5,751,510
5,751,512
5,751,558
5,751,576
5,751,883
5,751,990
5,752,041
5,752,054
5,752,078
28 : 5,749,674
5,751,082
5,751,416
5,751,523
5,751,543
5,751,644
29 : 5,749,109
5,749,353
5,749,358
5,749,513
5,749,582
5,749,602
5,749,628
5,749,728
5,749,741
5,750,354
5,750,468
5,750,603
5,750,824
5,750,876
5,751,488
5,751,605
30 : 5,749,424
5,749,508
5,749,685
5,750,995
5,751,761
31 : 5,749,303
5,750,027
5,750,831
32 : 5,749,500
5,751,117
33 : 5,749,195
5,749,380
5,749,823
5,749,968
5,751,003
5,751,139
5,751,447
5,751,817
5,751,933
5,751,965
5,751,971
34 : RE. 35,793
RE. 35,795
5,749,179
5,749,183
5,749,231
5,749,305
5,749,528
5,749,579
5,749,631
5,749,653

5,749,722
5,749,727
5,749,792
5,749,896
5,749,923
5,749,949
5,750,017
5,750,028
5,750,031
5,750,061
5,750,071
5,750,103
5,750,104
5,750,106
5,750,125
5,750,145
5,750,225
5,750,249
5,750,312
5,750,347
5,750,394
5,750,402
5,750,446
5,750,458
5,750,475
5,750,476
5,750,478
5,750,488
5,750,489
5,750,517
5,750,522
5,750,532
5,750,549
5,750,556
5,750,605
5,750,619
5,750,632
5,750,685
5,750,697
5,750,724
5,750,725
5,750,726
5,750,733
5,750,745
5,750,826
5,750,827
5,750,898
5,751,096
5,751,131
5,751,210
5,751,250
5,751,469
5,751,534
5,751,698
5,751,701
5,751,704
5,751,708
5,751,709
5,751,719
5,751,739
5,751,740
5,751,774
5,751,791
5,751,798
5,751,812
5,751,824
5,751,836
5,751,838
5,751,859
5,751,861
5,751,868
5,751,884
5,751,907
5,751,961
5,752,080
5,752,185
5,752,216
5,752,229
5,752,232
5,752,241
5,752,251
35 : 5,749,521
5,750,340
5,750,896
36 5,749,100
5,749,101
5,749,119
5,749,153
5,749,191
5,749,192
5,749,194
5,749,202
5,749,218
5,749,229
5,749,269
5,749,277
5,749,324
5,749,362
5,749,376
5,749,377
5,749,411
5,749,447
5,749,459

5,749,463
5,749,468
5,749,478
5,749,490
5,749,537
5,749,564
5,749,578
5,749,584
5,749,732
5,749,822
5,749,874
5,749,890
5,749,895
5,750,018
5,750,026
5,750,036
5,750,049
5,750,062
5,750,119
5,750,121
5,750,127
5,750,141
5,750,147
5,750,171
5,750,186
5,750,192
5,750,204
5,750,259
5,750,272
5,750,274
5,750,286
5,750,305
5,750,307
5,750,318
5,750,320
5,750,321
5,750,322
5,750,323
5,750,324
5,750,325
5,750,326
5,750,327
5,750,328
5,750,330
5,750,366
5,750,383
5,750,384
5,750,400
5,750,465
5,750,502
5,750,573
5,750,574
5,750,591
5,750,659
5,750,675
5,750,703
5,750,715
5,750,735
5,750,756
5,750,811
5,750,909
5,750,936
5,750,954
5,750,967
5,750,976
5,750,982
5,750,986
5,751,004
5,751,038
5,751,060
5,751,090
5,751,097
5,751,123
5,751,264
5,751,274
5,751,302
5,751,307
5,751,311
5,751,315
5,751,316
5,751,317
5,751,333
5,751,334
5,751,399
5,751,432
5,751,433
5,751,434
5,751,437
5,751,443
5,751,492
5,751,500
5,751,508
5,751,548
5,751,572
5,751,573
5,751,588
5,751,595
5,751,601
5,751,608
5,751,619
5,751,706
5,751,745
5,751,779

5,751,808
5,751,821
5,751,839
5,751,848
5,751,862
5,751,865
5,751,905
5,751,910
5,751,948
5,751,966
5,752,019
5,752,042
5,752,067
5,752,072
5,752,085
5,752,087
5,752,097
5,752,100
5,752,104
5,752,111
5,752,115
5,752,136
5,752,138
5,752,143
5,752,144
5,752,152
5,752,218
5,752,237
5,752,246
5,752,264
37 : 5,749,098
5,749,259
5,749,313
5,749,407
5,749,482
5,749,682
5,749,697
5,749,754
5,749,779
5,749,839
5,749,976
5,749,986
5,750,035
5,750,046
5,750,063
5,750,075
5,750,386
5,750,466
5,750,828
5,750,832
5,750,962
5,750,968
5,751,114
5,751,222
5,751,269
5,751,559
5,751,731
5,751,914
5,751,927
5,751,943
5,751,964
5,751,970
5,752,044
5,752,055
5,752,204
38 5,749,818
5,750,009
5,750,181
5,750,835
5,750,838
5,750,842
5,750,843
39 : 5,749,103
5,749,139
5,749,182
5,749,209
5,749,226
5,749,254
5,749,257
5,749,279
5,749,315
5,749,386
5,749,394
5,749,434
5,749,509
5,749,539
5,749,554
5,749,596
5,749,633
5,749,643
5,749,656
5,749,687
5,749,701
5,749,705
5,749,718
5,749,726
5,749,742
5,749,815
5,749,816
5,749,821
5,749,824
5,749,863
5,749,866

5,749,898
5,749,924
5,749,931
5,749,939
5,749,981
5,749,989
5,750,047
5,750,066
5,750,096
5,750,122
5,750,130
5,750,158
5,750,161
5,750,176
5,750,178
5,750,197
5,750,226
5,750,252
5,750,265
5,750,365
5,750,408
5,750,477
5,750,479
5,750,482
5,750,521
5,750,543
5,750,588
5,750,615
5,750,625
5,750,644
5,750,744
5,750,786
5,750,787
5,750,812
5,750,881
5,751,000
5,751,095
5,751,104
5,751,127
5,751,238
5,751,253
5,751,257
5,751,337
5,751,435
5,751,484
5,751,759
5,751,899
5,752,206
40 5,749,207
5,749,352
5,750,215
5,750,358
5,750,392
5,750,399
5,750,598
5,750,798
5,751,283
41 : 5,749,306
5,749,391
5,749,408
5,749,607
5,749,641
5,749,730
5,749,952
5,750,126
5,750,604
5,750,864
5,750,870
5,750,930
5,751,231
5,751,270
5,751,300
5,751,305
5,751,556
5,751,585
5,751,603
5,751,663
5,751,942
5,751,983
5,751,986
5,751,995
5,751,996
5,752,013
5,752,050
5,752,076
5,752,215
5,752,238
42 RE. 35,791
5,749,117
5,749,140
5,749,178
5,749,230
5,749,275
5,749,282
5,749,496
5,749,517
5,749,612
5,749,613
5,749,616
5,749,620
5,749,646
5,749,670
5,749,756

5,749,768
5,749,790
5,749,813
5,749,990
5,750,004
5,750,029
5,750,087
5,750,109
5,750,116
5,750,165
5,750,227
5,750,242
5,750,247
5,750,278
5,750,279
5,750,289
5,750,339
5,750,363
5,750,387
5,750,445
5,750,453
5,750,480
5,750,527
5,750,539
5,750,546
5,750,567
5,750,583
5,750,584
5,750,595
5,750,608
5,750,620
5,750,663
5,750,687
5,750,720
5,750,736
5,750,737
5,750,770
5,750,931
5,750,973
5,750,981
5,750,996
5,751,103
5,751,125
5,751,212
5,751,234
5,751,242
5,751,423
5,751,874
5,751,875
5,751,979
5,752,155
5,752,190
44 5,749,312
5,750,043
5,750,376
5,750,947
5,751,294
5,751,390
5,752,026
45 5,749,149
5,749,177
5,749,215
5,749,659
5,749,926
5,749,984
5,752,212
5,752,261
47 5,749,212
5,749,273
5,749,593
5,749,668
5,749,916
5,749,944
5,750,056
5,750,092
5,750,151
5,750,175
5,750,396
5,750,635
5,750,677
5,750,882
5,750,991
5,751,011
5,751,466
5,751,524
5,751,830
5,752,158
48 RE. 35,794
5,749,097
5,749,104
5,749,110
5,749,143
5,749,163
5,749,185
5,749,186
5,749,242
5,749,253
5,749,308
5,749,355
5,749,417
5,749,418
5,749,419
5,749,422

5,749,479
5,749,542
5,749,555
5,749,581
5,749,585
5,749,595
5,749,605
5,749,608
5,749,637
5,749,680
5,749,690
5,749,900
5,749,909
5,749,998
5,750,032
5,750,052
5,750,196
5,750,207
5,750,269
5,750,364
5,750,367
5,750,415
5,750,419
5,750,427
5,750,564
5,750,622
5,750,627
5,750,660
5,750,749
5,750,791
5,750,799
5,750,820
5,750,883
5,750,935
5,750,972
5,751,049
5,751,056
5,751,064
5,751,065
5,751,066
5,751,162
5,751,168
5,751,173
5,751,179
5,751,180
5,751,182
5,751,195
5,751,197
5,751,244
5,751,308
5,751,318
5,751,344
5,751,345
5,751,346
5,751,379
5,751,395
5,751,536
5,751,550
5,751,553
5,751,565
5,751,581
5,751,582
5,751,593
5,751,606
5,751,615
5,751,717
5,751,727
5,751,741
5,751,945
5,751,946
5,751,950
5,751,955
5,751,977
5,751,978
5,751,981
5,751,987
5,751,991
5,751,998
5,752,004
5,752,007
5,752,008
5,752,014
5,752,015
5,752,034
5,752,062
5,752,069
5,752,074
5,752,077
5,752,082
5,752,163
5,752,166
5,752,194
5,752,205
5,752,231
5,752,242
5,752,259
5,752,260
5,752,267
5,752,274
49 : 5,749,111
5,749,154
5,749,472
5,749,736
5,749,810
5,750,496
5,751,415
5,751,834
50 : 5,751,057
5,751,648
51 : 5,749,102
5,749,184
5,749,488
5,749,807
5,749,812
5,749,927
5,750,002
5,750,057
5,750,152
5,750,348
5,750,892
5,750,964
5,751,273
5,751,372
5,751,540
5,751,609
5,751,659
5,751,693
5,751,789
5,751,792
5,751,804
5,752,198
53 5,749,199
5,749,452
5,749,489
5,749,546
5,749,831
5,749,904
5,749,905
5,749,913
5,749,932
5,749,967
5,749,974
5,750,375
5,750,575
5,750,647
5,750,866
5,751,134
5,751,248
5,751,276
5,751,282
5,751,322
5,751,330
5,751,369
5,751,397
5,751,465
5,751,546
5,751,760
5,752,025
5,752,031
5,752,038
5,752,052
5,752,160
5,752,191
5,752,202
5,752,243
5,752,252
54 : 5,749,320
5,750,790
55 : 5,749,161
5,749,162
5,749,204
5,749,290
5,749,368
5,749,497
5,749,519
5,749,520
5,749,657
5,749,658
5,749,834
5,749,845
5,749,994
5,750,005
5,750,177
5,750,191
5,750,254
5,750,288
5,750,597
5,750,667
5,750,746
5,750,856
5,750,905
5,750,994
5,751,251
5,751,783
5,751,797

DESIGN PATENTS

04 · 394,177
394,229
394,237
394,263
394,285
05 394,181
06 394,136
394,143
394,149
394,163
394,167
394,176
394,178
394,185
394,199
394,200
394,201
394,206
394,210
394,226
394,236
394,250
394,252
394,253
394,265
394,276
394,277
394,290
394,291
394,301
394,315
394,316
394,323
394,332
394,333
08 . 394,258
394,330
09 . 394,145
394,215
12 : 394,217
394,227
13 : 394,165
394,205
394,213
394,267
394,302
394,314
17 : 394,169
394,172
394,187
394,219
394,220
394,230
394,241
394,251
394,256
394,280
19 : 394,175
394,262
21 : 394,221
22 : 394,288
25 : 394,140
394,144
394,166
394,194
394,255
26 : 394,153
394,188
394,189
394,232
394,240
394,283
27 : 394,135
394,190
394,191
394,298
29 : 394,157
394,228
394,296
34 : 394,137
394,207
394,300
394,310
36 394,138
394,139
394,168
394,171
394,197
394,202
394,289
394,307
394,326
394,327
394,328
37 . 394,164
394,170
394,174
394,239
394,292
39 : 394,154
394,162
394,184
394,211
394,235
394,297
394,303
394,313
394,318
394,322
394,331
41 : 394,147
394,150
394,198
42 : 394,146
394,204
394,286
394,334
44 : 394,151
394,152
394,275
45 : 394,160
48 : 394,195
394,208
49 : 394,295
51 : 394,279
53 : 394,148
394,282
55 : 394,218
394,234
394,270
394,278
394,311

PLANT PATENTS

06 : 10,385
10,386
10,387
10,390
10,391
10,395
10,396
10,397
10,398
10,399
53 : 10,388

U. S. GOVERNMENT PRINTING OFFICE : 1998 O - 179-274 QL 3

CHANGE OF ADDRESS FORM

NAME - FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY

STATE

ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Goverment Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
* 5606

☐ **YES,** enter ______ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $______. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

____
Company or personal name (Please type or print)

____
Additional address/attention line

____
Street address

____
City, State, Zip code

____
Daytime phone including area code

____
Purchase order number (optional)

For privacy protection, check the box below:
☐ Do not make my name available to other mailers

Check method of payment:
☐ Check payable to Superintendent of Documents
☐ GPO Deposit Account ☐☐☐☐☐☐☐ – ☐
☐ VISA ☐ MasterCard
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
☐☐☐☐ (expiration date)

____
Authorizing signature 4/95

Charge your order. It's easy!

Fax your orders (202) 512–2250

Phone your orders (202) 512–1800

Thank you for your order!

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

OL

10

SS

2

Y

2

98

MI

VOL

210

ISS

END